APRIL 2007

# BUCKEYE/SUN VALLEY AREA DRAINAGE MASTER STUDY
# TECHNICAL DATA NOTEBOOK

CONTRACT FCD 2002C027

## VOLUME IV-A: AREA 2 FLOODPLAIN DELINEATION REPORT

**FINAL**

PREPARED FOR

Flood Control District of Maricopa County

2801 W. DURANGO STREET
PHOENIX, ARIZONA 85009-6399

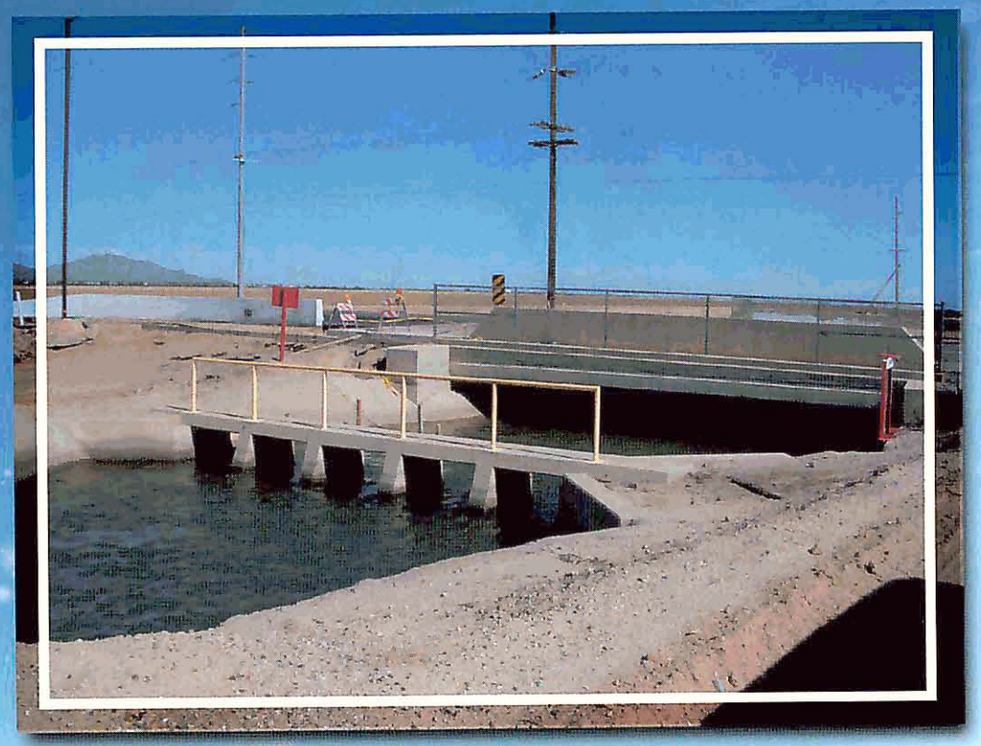
PREPARED BY

PBS&J

7310 N. 16TH STREET, SUITE 310
PHOENIX, ARIZONA 85020-5250
PHONE: (602) 943-1003 FAX: (602) 943-1303

IN ASSOCIATION WITH

LTM Engineering, Inc
epg
AYRES ASSOCIATES
Entellus



# Federal Emergency Management Agency

Washington, D.C. 20472

MAR 1 3 2007

FLOOD CONTROL DISTRICT
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|---|---|
| CH & GM | FINANCE |
| PIO | LANDS |
| ADMIN | O & M |
| REG | P & PM |
| ENG | FILE |
| CONTRACTS | |
| ROUTING | |

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Bobby Bryant
Mayor, Town of Buckeye
100 North Apache Road, Suite A
Goodyear, AZ 85326

IN REPLY REFER TO:
Case No.: 07-09-0135P
Community Name: Town of Buckeye, AZ
Community No.: 040039
Effective Date of This Revision: JUN 2 8 2007

HASSAYAMPA RIVER EAST TRIBUTARIES

Dear Mayor Bryant:

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

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7175, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Max H. Yuan, P.E., Project Engineer
Engineering Management Section
Mitigation Division

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Division

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: (See attached list.)

# Buckeye/Sun Valley Area Drainage Master Study

## Contract FCD 2002C027

# Technical Data Notebook

# Volume IV-A: Area 2 Floodplain Delineation Report

April 2007

Prepared for

Flood Control District of Maricopa County

2801 W. Durango Street
Phoenix, Arizona 85009-6399

Prepared by

PBSJ


http://www.pbsj.com
7310 N. 16th Street, Suite 310
Phoenix, Arizona 85020-5250
Phone: (602) 943-1003 Fax: (602) 943-1303


Registered Professional Engineer (Civil) CERTIFICATE NO. 42801 STEPHEN W. ROGERS Date Signed 4-2-07 ARIZONA U.S.A.

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# 1 Introduction

## 1.1 Purpose of the Study

The Flood Control District of Maricopa County (District) contracted with PBS&J to perform the Buckeye/Sun Valley Area Drainage Master Study (ADMS) to identify drainage, erosion, and sediment problems, evaluate existing floodplain delineations and delineate additional floodplains, identify a range of solutions, and develop preliminary development guidelines for the area. The ADMS encompasses 280 square miles and is divided into four distinct hydrologic study areas.

The purpose of Technical Data Notebook Volume IV-A is to provide updated hydrology for existing and future conditions and hydraulic models for existing conditions floodplain analysis for Area 2. Approximately 12.5 miles of floodplain will be delineated for a 100-year flood event.

## 1.2 Project Authorization

A notice to proceed (NTP) for this study was issued in June 2003 by the District. The FCD Contract Number for this project is 2002C027 and Ms. Valerie Swick is the project manager from the District.

## 1.3 Location of Study

Area 2 is located in the southwest portion of the Buckeye/Sun Valley ADMS Area as shown in Figure 1-1. The area covers approximately 12 square miles and is bounded by the Buckeye Flood Retarding Structure #1 (FRS) on the north, the Hassayampa River on the west, Johnson Road on the east, and the Southern Pacific Railroad on the south. The area covers part of Township 1N Range 5W and a small portion of Township 1S Range 5W.

## 1.4 Methodology Used for Hydrology and Hydraulics

The previous hydrology model of the area (McLaughlin Kmetty Engineers, 1992) was used as a basis for and comparison to the results produced in this study. HEC-1 embedded in WMS Version 7.0 (September 2003) was used to model the hydrologic response of the watershed for

the 100-year, 6- and 24-hour events. The HEC-1 parameters were determined using the methods described in the Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology, hereinafter referred to as the Hydrology Manual (Sabol et al., 1995).

The steady flow model, HEC-RAS version 3.1.2, was used to model the hydraulic response of the tributaries draining into the lower Hassayampa River. The HEC-RAS model parameters were determined using the methods described in the Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics, hereinafter referred to as the Hydraulics Manual (Sabol et al., 1995).

## 1.5 Acknowledgements

Ms. Valerie Swick, CFM (Project Manager, Flood Control District of Maricopa County) and Mr. Amir Motamedi, P.E. (Branch Manager, Flood Control District of Maricopa County) provided guidance during the course of study. Dr. Bing Zhao, P.E., (Branch Manager, Engineering Division, Flood Control District of Maricopa County) and Ms. Julie Cox (Hydrologist, Engineering Division, Flood Control District of Maricopa County) provided advice on technical issues and other suggestions. Mr. Joe Blanton (Town Manager, Town of Buckeye) provided assistance in historical flooding records. Ms. Kathryn Gross (Hydrologist, Engineering Division, Flood Control District of Maricopa County) and Mr. Richard Harris (Project Manager, Flood Control District of Maricopa County) completed the studies floodplain reviews.

## 1.6 Brief Description of Study Results

The results of the Area 2 hydrology study indicate that the 100-year, 6-hour storm event peak flows and runoff volumes are generally larger compared to the 100-year, 24-hour storm event. Overall the average unit discharge (cfs/mi$^2$) is comparable to similar conditions in the region and indirect methods outlined in the Hydrology Manual.

The future condition hydrologic analysis reveals an approximate increase of 13% in excess runoff volume generated from overland flow within future development. All increased runoff was contained in retention basins simulated as diversion outflows in HEC-1 (USACE, 1998).

One unique situation in this area is the fact that the reaches modeled were created before the construction of the FRS located upstream of the delineations. In the past, larger flows were routed through this area from the White Tank Mountains and into the Hassayampa River. The runoff from pre-FRS conditions created channels that generally contained the 100-year flood event. After construction of the FRS, runoff from the White Tank Mountains was contained behind the FRS, which drains into the Hassayampa River, and does not enter the reaches delineated in this study.

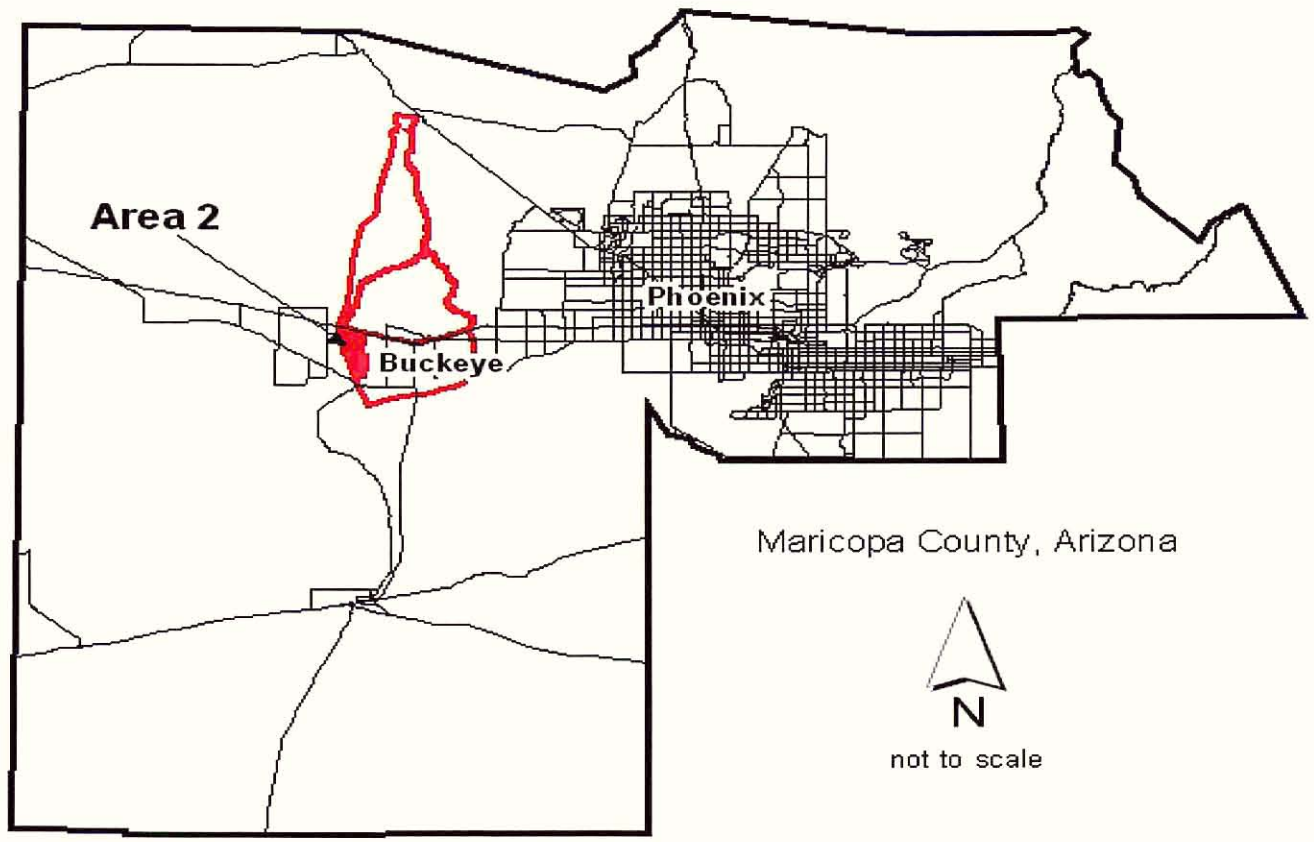


**Figure 1-1 Buckeye/Sun Valley ADMS Vicinity Map**

# 2 ADWR/FEMA Forms

## Study Documentation Abstract for FEMA Submittals

### 2.1.1 Date Study Accepted

N/A

### 2.1.2 Study Contractor

PBS&J, 4601 DTC Blvd, Suite 700, Denver, Colorado, 80237.

Technical contact: Steve Rogers, P.E., CFM

### 2.1.3 FEMA Technical Review Contractor

N/A

### 2.1.4 FEMA Regional Reviewer

N/A

### 2.1.5 State Technical Reviewer

N/A

### 2.1.6 Local Technical Reviewer

Flood Control District of Maricopa County, Arizona

### 2.1.7 Reach Description

Tributaries 1E, 3E, and 4E of the Hassayampa River

### 2.1.8 USGS Quad Sheets

N/A

### 2.1.9 Unique Conditions and Problems

N/A

### 2.1.10 Coordination of Peak Discharges

N/A

## 2.2 MT-2 FEMA Forms

### 2.2.1 Overview and Concurrence Form

This form is submitted separately for each community.

FEDERAL EMERGENCY MANAGEMENT AGENCY

# OVERVIEW & CONCURRENCE FORM

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

## PAPERWORK BURDEN DISCLOSURE NOTICE

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

## A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

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

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

## B. OVERVIEW

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

| Community No. | Community Name | State | Map No. | Panel No. | Effective Date |
|---|---|---|---|---|---|
| Ex: 480301<br>480287 | City of Katy<br>Harris County | TX<br>TX | 480301<br>48201C | 0005D<br>0220G | 02/08/83<br>09/28/90 |
| 040037 | Uninc. Maricopa County - map panels 2005G, 2015G, 2480G* | AZ | 4013C | * | 07/19/01 |
| | | | | | |

2. Flooding Source: Tributaries 1E, 3E and 4E of the Hassayampa River

3. Project Name/Identifier: Buckeye/Sun Valley Area Drainage Master Study (Area 2)

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

5. Basis for Request and Type of Revision:

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

☐ Physical Change ☑ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ Other (Attach Description)

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

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

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

## C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☑ Yes Fee amount: $ 0

☐ No, Attach Explanation

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

## D. SIGNATURE

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

| | | |
|---|---|---|
| Name: Stephen W. Rogers, P.E., CFM | Company: PBS&J | |
| Mailing Address:<br>4601 DTC Boulevard<br>Suite 700<br>Denver, Colorado 80237 | Daytime Telephone No.:<br>(303) 221-7275 | Fax No.:<br>(303) 221-7276 |
| | E-Mail Address: srogers@pbsj.com | |
| Signature of Requester (required): | | Date: 2/21/06 |

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

| | | |
|---|---|---|
| Community Official's Name and Title:<br>Timothy S. Phillips, P.E., Acting Chief Engineer and General Manager | | Telephone No.:<br>(602) 506-1501 |
| Community Name:<br>Unincorporated Maricopa County | Community Official's Signature (required): | Date: |

### CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

| | | |
|---|---|---|
| Certifier's Name:<br>Stephen W. Rogers, P.E., CFM | License No.:<br>42881 | Expiration Date:<br>June 21, 2008 |
| Company Name:<br>PBS&J | Telephone No.:<br>(303) 221-7275 | Fax No.:<br>(303) 221-7276 |
| Signature: | | Date: 2/21/06 |

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

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

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 2/21/06 ARIZONA U.S.A.

FEDERAL EMERGENCY MANAGEMENT AGENCY

# OVERVIEW & CONCURRENCE FORM

*O.M.B No. 3067-0148*
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*This request is for a (check one):*

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

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| 040039 | Town of Buckeye - map panels 2005G, 2015G, 2480G* | AZ | 4013C | * | 07/19/01 |
| | | | | | |

2. Flooding Source: Tributaries 1E, 3E and 4E of the Hassayampa River

3. *Project Name/Identifier:* Buckeye/Sun Valley Area Drainage Master Study (Area 2)

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

5. Basis for Request and Type of Revision:

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

☐ Physical Change ☑ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ Other (Attach Description)

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

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

Types of Flooding: ☑ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)

☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

Structures: ☐ Channelization ☐ Levee/Floodwall ☑ Bridge/Culvert

☐ Dam ☐ Fill ☐ Other, Attach Description

## C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☑ Yes Fee amount: $ 0

☐ No, Attach Explanation

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

## D. SIGNATURE

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

| | | |
|---|---|---|
| Name: Stephen W. Rogers, P.E. | Company: PBS&J | |
| Mailing Address:<br>4601 DTC Boulevard<br>Suite 700<br>Denver, CO 80237 | Daytime Telephone No.:<br>(303) 221-7275 | Fax No.:<br>(303) 221-7276 |
| | E-Mail Address: srogers@pbsj.com | |
| Signature of Requester (required): | | Date:<br>August 25, 2005 |

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

| | | |
|---|---|---|
| Community Official's Name and Title: TOWN ENGINEER | | Telephone No.: ~~(602) 506-1501~~ 623-547-4661 |
| Community Name:<br>Town of Buckeye | Community Official's Signature (required): | Date:<br>11-11-05 |

### CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

| | | |
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| Certifier's Name:<br>Stephen W. Rogers, P.E. | License No.:<br>42881 | Expiration Date:<br>June 21, 2008 |
| Company Name:<br>PBS&J | Telephone No.:<br>(303) 221-7275 | Fax No.:<br>(303) 221-7276 |
| Signature: | | Date:<br>August 25, 2005 |

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

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

Registered Professional Engineer (Civil) CERTIFICATE NO 42881 STEPHEN W. ROGERS Date Signed 8/25/05 ARIZONA U.S.A.

### 2.2.2 Riverine Hydrology and Hydraulics Form

This form is submitted separately for each flooding source.

FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE HYDROLOGY & HYDRAULICS FORM

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

## PAPERWORK REDUCTION ACT

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

Flooding Source: Tributary 1E of the Hassayampa River
**Note:** Fill out one form for each flooding source studied

## A. HYDROLOGY

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

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

2. Comparison of Representative 1%-Annual-Chance Discharges

| Location | Drainage Area (Sq. Mi.) | FIS (cfs) | Revised (cfs) |
|---|---|---|---|
| Trib 1E, R2 & 1E1 | 2.69 | N/A | 1485 |
| XS 3.883 | 3.63 | N/A | 1840 |

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

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

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

4. Review/Approval of Analysis

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

5. Impacts of Sediment Transport on Hydrology

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

## B. HYDRAULICS

1. Reach to be Revised

| | Description | Cross Section | Water-Surface Elevations (ft.) Effective | Proposed/Revised |
|---|---|---|---|---|
| Downstream Limit | Confluence w/ Hassayampa River | 0.190 | N/A | 872.24 |
| Upstream Limit | Limit of Detailed Study | 5.971 | N/A | 1035.10 |

2. Hydraulic Method Used

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

## B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

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

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

4. Models Submitted

| | | |
|---|---|---|
| Duplicate Effective Model* | Natural File Name: | Floodway File Name: |
| Corrected Effective Model* | Natural File Name: | Floodway File Name: |
| Existing or Pre-Project Conditions Model | Natural File Name: trib1E.pri (Pr 1) | Floodway File Name: trib1E.pri (Pr 3) |
| Revised or Post-Project Conditions Model | Natural File Name: | Floodway File Name: |
| Other - (attach description) | Natural File Name: | Floodway File Name: |

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

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

## C. MAPPING REQUIREMENTS

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

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

## D. COMMON REGULATORY REQUIREMENTS

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

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

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

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

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

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

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

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

FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE HYDROLOGY & HYDRAULICS FORM

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

## PAPERWORK REDUCTION ACT

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Flooding Source: Tributary 3E of the Hassayampa River
**Note:** Fill out one form for each flooding source studied

## A. HYDROLOGY

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

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

2. Comparison of Representative 1%-Annual-Chance Discharges

| Location | Drainage Area (Sq. Mi.) | FIS (cfs) | *Revised (cfs)* |
|---|---|---|---|
| Upstream Limit of Study | 0.95 | N/A | 758 |

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

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

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

4. *Review/Approval of Analysis*

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

5. Impacts of Sediment Transport on Hydrology

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

## B. HYDRAULICS

1. Reach to be Revised

| | Description | Cross Section | Water-Surface Elevations (ft.) Effective | Proposed/Revised |
|---|---|---|---|---|
| Downstream Limit | Confluence w/ Hassayampa River | 0.089 | N/A | 921.26 |
| Upstream Limit | Limit of Detailed Study | 1.553 | N/A | 980.26 |

2. Hydraulic Method Used

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

## B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

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

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

4. Models Submitted

| | | |
|---|---|---|
| Duplicate Effective Model* | Natural File Name: | Floodway File Name: |
| Corrected Effective Model* | Natural File Name: | Floodway File Name: |
| Existing or Pre-Project Conditions Model | Natural File Name: trib3E.pri (Prof 1) | Floodway File Name: trib3E.pri (Prof 3) |
| Revised or Post-Project Conditions Model | Natural File Name: | Floodway File Name: |
| Other - (attach description) | Natural File Name: | Floodway File Name: |

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

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

## C. MAPPING REQUIREMENTS

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

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

## D. COMMON REGULATORY REQUIREMENTS

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

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

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

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

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

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

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

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

FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE HYDROLOGY & HYDRAULICS FORM

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

## PAPERWORK REDUCTION ACT

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Flooding Source: Tributary 4E of the Hassayampa River
**Note:** Fill out one form for each flooding source studied

## A. HYDROLOGY

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

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

2. Comparison of Representative 1%-Annual-Chance Discharges

| Location | Drainage Area (Sq. Mi.) | FIS (cfs) | Revised (cfs) |
|---|---|---|---|
| XS 3.710 | 0.91 | N/A | 500 |
| XS 0.281 | 0.30 | N/A | 422 |

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

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

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

4. Review/Approval of Analysis

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

5. Impacts of Sediment Transport on Hydrology

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

## B. HYDRAULICS

1. Reach to be Revised

| | Description | Cross Section | Water-Surface Elevations (ft.) Effective | Proposed/Revised |
|---|---|---|---|---|
| Downstream Limit | Confluence w/ Hassayampa River | 1.153 | N/A | 947.05 |
| Upstream Limit | Limit of Detailed Study | 3.710 | N/A | 1033.74 |

2. Hydraulic Method Used

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

## B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

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

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

4. Models Submitted

| | | |
|---|---|---|
| Duplicate Effective Model* | Natural File Name: | Floodway File Name: |
| Corrected Effective Model* | Natural File Name: | Floodway File Name: |
| Existing or Pre-Project Conditions Model | Natural File Name: trib4E.prj (Prof 1) | Floodway File Name: trib4E.prj (Prof 3) |
| Revised or Post-Project Conditions Model | Natural File Name: | Floodway File Name: |
| Other - (attach description) | Natural File Name: | Floodway File Name: |

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

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

## C. MAPPING REQUIREMENTS

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

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

## D. COMMON REGULATORY REQUIREMENTS

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

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

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

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

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

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

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

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

### 2.2.3 Riverine Structures Form

This form is submitted for Tributary 1E of the Hassayampa River.

FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

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

## PAPERWORK REDUCTION ACT

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Flooding Source: Tributary 1E of the Hassayampa River
**Note:** Fill out one form for each flooding source studied

## A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

**1. Name of Structure:**

Type (check one): ☐ Channelization ☑ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: 2.438 miles upstream of confluence with Hassayampa River

Downstream Limit/Cross Section: Cross-section 0.190

Upstream Limit/Cross Section: Cross-section 5.971

**2. Name of Structure:**

Type (check one): ☐ Channelization ☑ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: 1.323 miles upstream of confluence with Hassayampa River

Downstream Limit/Cross Section: Cross-section 0.190

Upstream Limit/Cross Section: Cross-section 5.971

**3. Name of Structure:**

Type (check one) ☐ Channelization ☑ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section: Cross-section 5.971

**NOTE: For more structures, attach additional pages as needed.**

## B. CHANNELIZATION

*Flooding Source:*

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

*The design elevation in the channel is based on (check one):*

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

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

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

## C. BRIDGE/CULVERT

Flooding Source:

Name of Structure:

1. *This revision reflects (check one):*

- ☑ New bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☑ Dimensions (height, width, span, radius, length)
- ☑ Shape (culverts only)
- ☐ Material
- ☐ Beveling or Rounding
- ☐ Wing Wall Angle
- ☐ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☐ Low Chord Elevations – Upstream and Downstream
- ☐ Top of Road Elevations – Upstream and Downstream
- ☑ Structure Invert Elevations – Upstream and Downstream
- ☐ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

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

## D. DAM

*Flooding Source:*

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of *existing dam*
2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency

   ☐ Private organization Name of the agency or organization:
3. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).
4. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.
5. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

| FREQUENCY (% annual chance) | FIS | REVISED |
|---|---|---|
| 10-year (10%) | | |
| 50-year (2%) | | |
| 100-year (1%) | | |
| 500-year (0.2%) | | |
| Normal Pool Elevation | | |

6. *Please attach a copy of the formal* Operation and Maintenance Plan

## E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

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

b. Levee elements and locations are (check one):

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

c. Structural Type (check one):

☐ monolithic cast-in place reinforced concrete
☐ reinforced concrete masonry block
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

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

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

| | | |
|---|---|---|
| 3.0 feet or more at the downstream end and throughout | ☐ Yes | ☐ No |
| 3.5 feet or more at the upstream end | ☐ Yes | ☐ No |
| 4.0 feet within 100 feet upstream of all structures and/or constrictions | ☐ Yes | ☐ No |

Coastal

| | | |
|---|---|---|
| 1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater). | ☐ Yes | ☐ No |
| 2.0 feet above the 1%-annual-chance stillwater surge elevation | ☐ Yes | ☐ No |

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(*ii*) of the *NFIP Regulations*.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

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

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

Note: Geotechnical and geologic data

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

4. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: *(min.) to* *(max.)*

d. Embankment material is protected by (describe what kind):

e. *Riprap Design Parameters* (check one): ☐ Velocity ☐ Tractive stress
Attach references

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

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

4. *Embankment Protection (continued)*

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

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

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength $\phi$ = degrees, c = psf

slope: SS = (h) to (v)

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

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

c. Summary of stability analysis results:

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

(Reference: USACE EM-1110-2-1913 Table 6-1)

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

If Yes, describe methodology used:

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

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

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

h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Foundation scour protection is provided check box

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ $P_A$ = psf; $P_p$ = psf

☐ Surcharge-Slope @ ☐ surface psf

☐ Wind @ $P_w$ = psf

☐ Seepage (Uplift); ☐ Earthquake @ $P_{eq}$ = %g

☐ 1%-annual-chance significant wave height: ft.

☐ *1%-annual-chance significant wave period:* sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

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

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

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

e. Foundation bearing strength for each soil type:

| *Bearing Pressure* | Sustained Load (psf) | Short Term Load (psf) |
|---|---|---|
| Computed design maximum | | |
| Maximum allowable | | |

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

*Attach engineering analysis to support construction plans.*

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage ☐ Yes ☐ No
Ponding elevation vs. gravity flow ☐ Yes ☐ No
Differential head vs. gravity flow ☐ Yes ☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

- Gravity flow (Interior Watershed) ☐ Yes ☐ No
- Common storm (River Watershed) ☐ Yes ☐ No
- Historical ponding probability ☐ Yes ☐ No
- Coastal wave overtopping ☐ Yes ☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

8. *Interior Drainage (continued)*

I. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

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

Will the operation be automatic? ☐ Yes ☐ No

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

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

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

9. Other Design Criteria

a. The following items have been addressed as stated:

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

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

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

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

## E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

    b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations? ☐ Yes ☐ No

    c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations? ☐ Yes ☐ No

    If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
    If No, please attach supporting documentation.

12. Operations and Maintenance Plan

    Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

## F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

# 3 Survey and Mapping Information

## 3.1 Field Survey Information

The first field investigation was conducted on January 12, 2004, to scope out the critical features of the watershed and to identify problematic areas. Pictures #1-21 (Appendix C) were taken to document field conditions. A second field survey was conducted on February 5, 2004, after the sub-basin boundaries were delineated, and the physical parameters for each basin were selected Photos taken during the second field survey are not included because a description of the photos does not exist.

The third survey was conducted on April 7, 2004, to determine channel routings and other hydraulic parameters. The survey included a typical 8-point cross section measurement, and estimation of Manning's "n" for left overbank (LOB), main channel, and right overbank (ROB) (Appendix C, Photos L01-PX to L21-PX). The nomenclature first gives the location number and then the photo number taken at that location. The fourth and fifth field surveys were conducted on May 21, 2004, and August 4, 2004, respectively. Unfortunately, a description of the photos taken during final two field visits does not exist, and these photos will not be included in Appendix C.

## 3.2 Mapping

Kenney Aerial Mapping, Inc. prepared mapping for Buckeye Areas 1 and 2 and a portion of Area 3 for the District in 2003. The new mapping provided two-foot contour data. Aerial photography was flown in December 2003 as part of the District's ongoing effort to maintain current aerial photography for the entire county. The aerial photography provided by the District for the study area is 2003 one-foot resolution orthophotography images in MrSID format. Elevation reference marks used in floodplain mapping was provided by Engineering Alliance and is noted on all floodplain work maps.

The mapping datum reflects the national standards used by the District. The horizontal datum is the projected State Plane NAD 1983, Arizona Central, while the vertical datum is the NAVD 1988 system.

# 4 Hydrology

## 4.1 Method Description

The hydrologic response of Area 2 to the 100-year 6-hour and 100-year 24-hour storm events was simulated using the modified U.S. Army Corps of Engineers HEC-1 (May 1998) computer program embedded in WMS 7.0 (January 2003). The HEC-1 parameters were determined using the methods described in the Hydrology Manual. The computational interval used to determine the unit hydrograph for each sub-basin was 5 minutes.

## 4.2 Parameter Estimation

This section includes a complete description of the methodology and calculations used to develop the hydrology.

### 4.2.1 Drainage Area Boundaries

The watershed for the Hassayampa Area (Area 2) of the Buckeye/Sun Valley ADMS is approximately 12 square miles. The boundaries include the FRS on the north, Johnson Road on the east, Southern Pacific Railroad on the south, and the Hassayampa River on the west. Flow directions are generally in a southwest direction and all runoff empties into the Hassayampa River.

The watershed is mostly natural desert land with very few dwellings. A small portion of the land is used for agriculture. Other structures to note include Interstate 10, the Roosevelt Irrigation District Canal and multiple paved and unpaved roads. Figure 4-1 (Pocket) shows the drainage area boundaries, major sub-basin boundaries, and concentration points.

### 4.2.2 Watershed Work Maps

The watershed work maps include the HEC-1 schematic map (Figure 4-1), the drainage basin map showing lag flow paths and routing reaches (Figure 4-2), soil map (Figure 4-3), the land use map for existing conditions (Figure 4-4), the flow map for existing conditions (Figure 4-5), and the watershed workmap (Figure 4-6). The naming convention for each sub-basin uses letters in sequential order according to the sub-watershed. For example, sub-watershed E contains 4 sub-basins labeled E1 through E4. Each concentration point is labeled according to the name of the

sub-watershed with the most upstream concentration point labeled first in sequential order. For example, sub-watershed E has three concentration points labeled 1E through 3E. The routing reaches are named according to the beginning and ending concentration points. For example, routing reach 1E-2E begins at point 1E and ends at point 2E.

### 4.2.3 Gage Data

There is no existing precipitation gage station or stream gage station within the study watershed.

### 4.2.4 Statistical Parameters

Statistical parameters such as rainfall depths and rainfall distributions for each storm event are based on the data and methodologies provided in the Hydrology Manual.

### 4.2.5 Precipitation

#### 4.2.5.1 Rainfall Depths

The NOAA Atlas 2 rainfall depth isopluvial maps are stored as digital files in WMS. Each area-weighted point precipitation value is computed automatically using tools provided in WMS according to the watershed size and location. The point precipitation summary is shown in Table 4-1. Point precipitation-values are then adjusted with aerial reduction factors (JD record) in HEC-1. WMS also provides tools to compute aerial reduction according to the Depth-Area Reduction Curves as outlined in the Hydrology Manual.

**Table 4-1 Summary of Rainfall Depths**

| Storm Event | Depth [in] |
|---|---|
| 100-yr, 6-hr | 3.29 |
| 100-yr, 24-hr | 4.10 |

#### 4.2.5.2 Rainfall Distributions

Both the 6-hour and 24-hour rainfall distributions are based on the Hydrology Manual. WMS provides tools to automatically produce rainfall distributions for various rainfall depths and events. The 24-hour rainfall distribution provided in the Hydrology Manual is the SCS Type II distribution. The 6-hour rainfall distribution varies with the size of the sub-basin and is interpolated from five different dimensionless storm patterns provided in the Hydrology Manual.

### 4.2.6 Physical Parameters

This section describes the methods used for estimation of the physical hydrologic parameters such as rainfall loss, unit hydrograph, and lag time.

#### 4.2.6.1 Rainfall Losses

The Green-Ampt procedure was used to compute rainfall losses in accordance with the Hydrology Manual. The District provided digital soil and land use files (GIS shape file format) to compute the Green-Ampt parameters. The digital soil file corresponds to SCS soils maps (Camp, 1986). The GIS land use shape file is based on the 2000 digital GIS data given by the Maricopa Association of Governments (MAG 2000), which is the most current land use information. Figures 4-3 and 4-4 describe the soil and land use conditions.

WMS provides a tool to perform the Green-Ampt calculations automatically using the land use shape file, soil shape file, and soil and land use lookup tables. The lookup tables relate each unique soil and land use type to essential parameters such as XKSAT, RTIMP, and IA. Both the soil and land use lookup tables were originally provided by the District, and then each entry was evaluated and modified as necessary according to the characteristics of the region. These lookup tables can be found in Appendix D.2, while the Green-Ampt rainfall loss parameters used in the HEC-1 input files (Appendix D.6) can be found in Table D.2-3 for existing conditions, respectively. This study assumes that the Green & Ampt loss parameters do not change with storm return frequencies. The Town of Buckeye also has land use coverage for the area, but it was determined that the MAG land use codes for Area 2 were similar to the Buckeye codes so the MAG land use codes were used to model the hydrology in the area.

Six major land uses were identified for the watershed, which are vacant, transportation, large lot residential/single family (1 dwelling per acre to 2 dwelling per acre), very small lot residential/single family, agriculture, and water (MAG, 2000). The surface retention losses, percent imperviousness, and vegetation cover for each land use type were estimated based on the Hydrology Manual and digital GIS land use maps (MAG, 2000). The values used for surface retention loss values, percent imperviousness, and vegetation cover are shown, in Appendix D.2.

#### 4.2.6.2 Unit Hydrograph

The Maricopa County S-Graph method was used to compute unit hydrographs in accordance with the Hydrology Manual. The Maricopa County S-Graph most relevant to this area is the Desert/Rangeland S-Graph. The unit hydrographs were computed automatically using WMS. The input for WMS to determine the unit hydrograph includes the S-Graph type and lag time. The unit hydrographs can be found in the UI records in each HEC-1 output file (see Appendix D.6).

#### 4.2.6.3 Lag Time

Four parameters were used to estimate the lag time for each sub-basin. These four parameters are the watershed hydraulic length (L), the slope of the longest overland flow path (S), the distance along the main channel from the point of reference to a point opposite the centroid ($L_{ca}$), and the basin roughness (Kn). WMS has the tools to compute the first three parameters (L, $L_{ca}$, and S) using GIS data and contour maps. However, the $L_{ca}$ algorithm used in WMS has limitations and sometimes returns incorrect values. Therefore, the $L_{ca}$ parameter was computed using the tools in AutoCAD to manually measure the distance. The basin roughness is a composite Manning's n-value for all the channels in the sub-basin. An appropriate basin roughness value is determined for each sub-basin based on field observation, aerial photographs, soil maps, and land use maps. Lag time for each basin is calculated by using the formula in the Hydrology Manual. The parameters for lag time calculation are summarized in Table D.2-4 (Appendix D.2).

Desert/Rangeland S-graphs are used for gently sloping natural areas and were used exclusively for this area. The selection of the Kn-value correlates with the type of S-graph selected. As a result, the Kn-value range is 0.02 to 0.03 as shown in Table 5-4 of the Hydrology Manual. However, based upon our field survey of the base material, vegetation, obstruction, and irregularity in the basins, we determined a range of 0.04 to 0.06 was more appropriate. The selection of the Kn-value is in agreement with studies conducted with similar surface geographic watersheds (Zhao, 2003).

#### 4.2.6.4 Channel Routing Parameters

The normal depth channel routing in HEC-1 was used to route runoff hydrographs through sub-basins. The routing paths for the drainage area can be found in Figure 4-2. The channel routing

parameters include NSTPS (the number of sub-reaches to be divided for the routing reach by HEC-1), initial outflow, Manning's n-values for LOB, main channel, and ROB, reach length, bed slope for the routing reach, and an eight-point cross section (RX-RY data). The initial outflow was set as the initial inflow, which is usually zero cfs, implying a dry channel when routing starts. The eight-point cross section data was obtained from field surveys. The reach length and channel bed slope are automatically computed using tools provided in WMS 7.0. The estimation of Manning's n-value was based on field observations, aerial photos, land use maps, and soil maps using the procedures in USGS technical report Estimated Manning's Roughness Coefficients for Stream Channels and Floodplain in Maricopa County, Arizona. (USGS, 1991). NSTEPS values for routing reaches were calculated by an iterative process in WMS 7.0. All channel routing parameters are summarized in Table D.3-1 through Table D.3-3 in Appendix D.3.

## 4.3 Problems Encountered During the Study

### 4.3.1 Special Problems and Solutions

Several issues have already been discussed in the previous sections, such as unit hydrographs and basin roughness Kn-values. This section covers specials issues encountered during the study.

#### 4.3.1.1 Land Use Determination

Figure 4-4 shows a road system in the upper central portion of the vacant land use area. After examining aerial photography in the area, it was determined that there is one dwelling unit per 26 acres. Additionally, most of the parcels are approximately four and one-half acres. Due to the extremely low residential density, the area was modeled as being vacant.

#### 4.3.1.2 Abandoned RID Canal

The Roosevelt Irrigation District's canal runs east to west through the Buckeye area delivering water to this vast agriculture region. The canal ends at Johnson Road with a wasteway continuing westward. Originally the canal was constructed to carry excess water to the west and drain into the Hassayampa River. However, this portion of the canal has been abandoned and the excess irrigation water currently empties into White Tanks Wash, created before the construction of the FRS.

The abandoned canal does play a role in how the runoff in this area drains to the south and into the Hassayampa River. In sub-basin A1, the canal is breached, allowing runoff to continue its natural path towards the Hassayampa River. There is a breach in the canal in sub-basin C1, but the wash is blocked by the adjacent canal maintenance road. The road creates some upstream storage, which was included in the hydraulic model outlined in Section 5. In sub-basin E3, the canal has been removed where White Tank Wash cuts through.

#### 4.3.1.3 RID Base Flow

The RID is allocated a maximum flow of 450 cfs per discussion with Stan Ashby, Superintendent of the RID. Under normal operating conditions, the gate at Johnson Road remains closed. The gate is opened only during maintenance or if the canal is threatened with overtopping. The assumption is made that during storm events the gate is opened to allow the maximum flow though to combine with runoff in sub-basin E3. Therefore, the HEC-1 model was set up with a base flow of 450 cfs in sub-basin E3.

#### 4.3.1.4 Model Warning and Error Messages

No error messages are presented in the computer model output files. There are several warning messages regarding channel routing, including the following:

```
*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN
2617. TO 3974.

THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN
PEAK INFLOWS.

THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A
LONGER REACH.)
```

A test was conducted by decreasing NSTEPS until the warning message disappeared. Since the "modified puls" routing method was not used, and there is less than 3% difference in peak discharge after the NSTEPS was changed, this type of warning was ignored.

## 4.4 Calibration

Calibration was not performed due to the lack of gage stations within the watershed. However, verification was performed (see Section 4.5.2, this report).

## 4.5 Final Results

### 4.5.1 Hydrologic Analysis Results

Table 4-2 lists the existing condition results for each sub-basin, routed flows, and combination points in Area 2. The volume from sub-basin E3 seems high, but it includes the base flow used to simulate inflow from the RID. The unit discharge rates are all fairly close and in the range of 450-600 cfs. Each sub-basin in this area has similar characteristics, so a relatively narrow range is expected for the unit discharge. Exceptions occur with the sub-basins that are considerably smaller, and, as expected, the unit discharge is higher. Table 4-3 gives runoff volumes for concentration points for the existing 100-Year, 6-hour conditions model.

The existing condition discharges used for Tributary 4E do not necessarily correspond to the HEC-1 output because there were split flows and combined flows from the sub-basins. The discharge at Tributary 4E, Reach 3 cross-section 3.710 is 500 cfs and was calculated using the discharge calculated at HEC-1 Station A1 which is 929 cfs. Since cross-section 3.710 is the limit of detailed study and occurs upstream from Station A1 (HEC-RAS Station 2.395), the 500 cfs was computed by using a ratio of the known drainage areas (0.91 $mi^2$ for Station 3.710 and 1.63 $mi^2$) to the calculated discharge for Station A1. The discharge from Tributary 4E, Reach 2 cross-section 1.965 was computed using the HEC-RAS optimization function for split flow. It was determined that 299 cfs would be split to this cross-section out of the 929 cfs total. The discharge at Tributary 4E1, Reach 2 cross-section 0.647 is 630 cfs. This discharge was split from the discharge at Tributary 4E, Reach 3 cross-section 2.395 (929 cfs) using the HEC-RAS optimization function for split flow. The discharge at Tributary 4E1, Reach 1 is 1052 cfs which is a combination of the discharges for Tributary 4E1, Reach 2 cross-section 0.647 and Tributary 4E2, Reach 1 cross-section 0.201. The discharge at Tributary 4E2, Reach 1 cross-section 0.281 is 422 cfs from the HEC-1 model station 2R. The discharge at Tributary 4E, Reach 1 cross-section 1.238 is a combination of Tributary 4E1, Reach 1 cross-section 0.201 (1052 cfs) and Tributary 4E, Reach 2 cross-section 1.965 (299 cfs). Table 4-4 gives summary of the discharges for Tributary 4E.

**Table 4-2 Existing Condition Hydrologic Response**

| | | 100-year 6-hour | | | | 100-year 24-hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Area [mi] | Peak [cfs] | $T_p$ [hr] | Volume [ac-ft] | Unit Discharge [cfs/mi$^2$] | Peak [cfs] | $T_p$ [hr] | Volume [ac-ft] | Unit Discharge [cfs/mi$^2$] |
| 1E | 2.69 | 1,318 | 5.00 | 170 | 490 | 1,236 | 13.00 | 158 | 459 |
| 1E-2E | 2.69 | 1,250 | 5.50 | 170 | 465 | 1,166 | 13.50 | 158 | 433 |
| 2E | 3.63 | 1,840 | 5.42 | 6,408 | 507 | 1,813 | 13.42 | 6,404 | 499 |
| 2E-3E | 3.63 | 1,779 | 5.75 | 6,390 | 490 | 1,750 | 13.75 | 6,386 | 482 |
| 3E | 4.37 | 1,807 | 5.75 | 6,422 | 414 | 1,822 | 13.75 | 6,425 | 417 |
| A1 | 1.63 | 929 | 5.00 | 113 | 571 | 803 | 12.92 | 98 | 493 |
| B1 | 0.30 | 422 | 4.42 | 24 | 1,405 | 307 | 12.42 | 18 | 1,022 |
| C1 | 0.95 | 758 | 4.67 | 70 | 800 | 613 | 12.67 | 55 | 647 |
| D1 | 0.69 | 646 | 4.58 | 53 | 940 | 497 | 12.58 | 40 | 723 |
| E1 | 1.47 | 772 | 5.08 | 101 | 526 | 656 | 13.00 | 86 | 447 |
| E2 | 1.22 | 713 | 5.00 | 87 | 583 | 590 | 13.00 | 73 | 482 |
| E3 | 0.94 | 1,095 | 4.75 | 6,259 | 1,162 | 976 | 12.75 | 6,247 | 1,035 |
| E4 | 0.74 | 559 | 4.75 | 51 | 755 | 435 | 12.67 | 40 | 588 |

**Table 4-3 Runoff Volumes for Concentration Points for Existing 100-Year, 6-Hour Conditions**

| | | 100-YR 6-HR (existing) | |
|---|---|---|---|
| Station | Area [mi2] | Peak [cfs] | Volume [ac-ft] |
| A1 | 1.63 | 929 | 113 |
| B1 | 0.30 | 422 | 24 |
| C1 | 0.95 | 758 | 70 |
| D1 | 0.69 | 646 | 53 |
| E1 | 1.47 | 772 | 101 |
| E2 | 1.22 | 713 | 87 |
| E3 | 0.94 | 1,095 | 6,259 |
| E4 | 0.74 | 559 | 51 |

**Table 4-4 Peak Discharges Used in Tributary 4E HEC-RAS Model**

| Tributary, Reach | Cross-Section | Peak Discharge in HEC-RAS Model (cfs)_ |
|---|---|---|
| 4E, Reach 3 | 3.710 | 500 |
| 4E, Reach 3 | 2.395 | 929 |
| 4E, Reach 2 | 1.965 | 299 |
| 4E, Reach 1 | 1.238 | 1351 |
| 4E1, Reach 2 | 0.647 | 630 |

| Tributary, Reach | Cross-Section | Peak Discharge in HEC-RAS Model (cfs)_ |
|---|---|---|
| 4E1, Reach 1 | 0.201 | 1052 |
| 4E2, Reach 1 | 0.281 | 422 |

### 4.5.2 Verification of Results

A previous study was conducted in the area in 1992 by McLaughlin Kmetty Engineers as part of the Buckeye Area Flood Delineation Study. The sub-basin boundaries are very similar with the exception that McLaughlin Kmetty used the abandoned RID canal as part of the delineation boundaries. The assumption made in this study is that the flow continues through the abandoned canal, while McLaughlin assumed the flow to be routed along the canal to the west and then into the Hassayampa River. As a result, the sub-basins are similar in characteristics, but the sizes vary. Table 4-5 lists the comparison between the two studies by showing the sum of the area and peak flows from two sub-basins that would equal the same area relative to the other study. Five of the eight of the sub-basins compared closely to each other. The sub-basins that have dramatically different peak discharges (sub-basins C1, D1, and E4) can be attributed to changes in S-Graph assignments for the two studies. The PBS&J study used Desert-Rangeland for the S-Graph, and the MKE study used the Phoenix Valley S-Graph. Tables 4-6 and 4-7 show the existing rainfall loss parameters for the PBS&J and for MKE studies, respectively. Tables 4-8 and 4-9 give the unit hydrograph lag time calculation parameters for the PBS&J and MKE studies, respectively.

**Table 4-5 Hydrologic Results Compared with MKE for the Existing 100-YR, 6-HR Conditions**

| Buckeye/Sun Valley ADMS | | | | McLaughlin Kmetty Eng. | | |
|---|---|---|---|---|---|---|
| Station | Area [mi$^2$] | Peak [cfs] | | Station | Area [mi$^2$] | Peak [cfs] |
| A1 | 1.63 | 929 | | 73 | 2.06 | 1375 |
| B1 | 0.30 | 422 | | - | - | - |
| SUM | 1.93 | 1,351 | <--> | SUM | 2.06 | 1,375 |
| | | | | | | |
| C1 | 0.95 | 758 | | 75 | 0.54 | 594 |
| - | - | - | | 78 | 0.41 | 732 |
| SUM | 0.95 | 758 | <--> | SUM | 0.95 | 1,326 |
| | | | | | | |
| E1 | 1.47 | 772 | | 74 | 2.69 | 1603 |
| E2 | 1.22 | 713 | | - | - | - |

| Buckeye/Sun Valley ADMS | | | | McLaughlin Kmetty Eng. | | |
|---|---|---|---|---|---|---|
| Station | Area [mi$^2$] | Peak [cfs] | | Station | Area [mi$^2$] | Peak [cfs] |
| SUM | 2.69 | 1,485 | <--> | SUM | 2.69 | 1,603 |
| | | | | | | |
| D1 | 0.69 | 646 | | 76 | 0.06 | 134 |
| - | - | - | | 79 | 0.78 | 891 |
| SUM | 0.69 | 646 | <--> | SUM | 0.84 | 1,025 |
| | | | | | | |
| E3 | 0.94 | 1095 | | 77 | 0.23 | 353 |
| - | - | - | | 80 | 0.64 | 792 |
| SUM | 0.94 | 1,095 | <--> | SUM | 0.87 | 1,145 |
| | | | | | | |
| E4 | 0.74 | 559 | | 81 | 0.63 | 757 |
| - | - | - | | 82 | 0.26 | 351 |
| SUM | 0.74 | 559 | <--> | SUM | 0.89 | 1,108 |

**Table 4-6 Existing PBS&J Rainfall Loss Parameters**

| Subbasin | Area [mi$^2$] | IA | DTHETA | PSIF | XKSAT | RTIMP |
|---|---|---|---|---|---|---|
| **A1** | 1.63 | 0.343 | 0.347 | 4.498 | 0.339 | 2.145 |
| **B1** | 0.30 | 0.350 | 0.350 | 4.624 | 0.315 | 0.000 |
| **C1** | 0.95 | 0.350 | 0.350 | 4.669 | 0.311 | 0.000 |
| **D1** | 0.69 | 0.350 | 0.350 | 4.642 | 0.317 | 0.000 |
| **E1** | 1.47 | 0.343 | 0.347 | 4.362 | 0.364 | 2.082 |
| **E2** | 1.22 | 0.348 | 0.343 | 4.461 | 0.354 | 2.288 |
| **E3** | 0.94 | 0.402 | 0.306 | 4.245 | 0.444 | 1.589 |
| **E4** | 0.74 | 0.389 | 0.324 | 4.185 | 0.421 | 0.000 |

**Table 4-7 MKE Existing Rainfall Loss Parameters**

| Subbasin | Area [mi$^2$] | IA | DTHETA | PSIF | XKSAT | RTIMP |
|---|---|---|---|---|---|---|
| **73** | 2.06 | 0.350 | 0.350 | 3.770 | 0.317 | 0.000 |
| **74** | 2.69 | 0.350 | 0.350 | 3.870 | 0.340 | 0.000 |
| **75** | 0.54 | 0.350 | 0.350 | 3.550 | 0.274 | 0.000 |
| **76** | 0.06 | 0.350 | 0.350 | 3.610 | 0.285 | 0.000 |
| **77** | 0.23 | 0.350 | 0.350 | 4.080 | 0.380 | 0.000 |
| **78** | 0.41 | 0.350 | 0.350 | 3.610 | 0.285 | 0.000 |
| **79** | 0.78 | 0.350 | 0.350 | 3.610 | 0.285 | 0.000 |
| **80** | 0.64 | 0.380 | 0.290 | 4.030 | 0.414 | 0.000 |
| **81** | 0.63 | 0.400 | 0.260 | 4.080 | 0.447 | 0.000 |
| **82** | 0.26 | 0.390 | 0.270 | 4.030 | 0.400 | 0.000 |

**Table 4-8 PBS&J Unit Hydrograph Lag Time Calculation Parameters**

| Subbasin | Area [mi$^2$] | L [ft] | $L_{ca}$ [ft] | Max Elev [ft] | Min Elev [ft] | S [ft/mi] | S-Graph Type | $K_n$ | Lag [min] |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 1.63 | 15,616 | 9,120 | 1,060.7 | 963.2 | 32.98 | Des Rnglnd | 0.050 | 69 |
| B1 | 0.30 | 7,098 | 3,466 | 1,036.0 | 959.1 | 57.24 | Des Rnglnd | 0.050 | 31 |
| C1 | 0.95 | 14,004 | 5,581 | 1,037.7 | 927.4 | 41.60 | Des Rnglnd | 0.050 | 52 |
| D1 | 0.69 | 10,801 | 5,153 | 997.6 | 913.6 | 41.10 | Des Rnglnd | 0.050 | 46 |
| E1 | 1.47 | 16,819 | 9,573 | 1,068.2 | 979.2 | 27.95 | Des Rnglnd | 0.050 | 75 |
| E2 | 1.22 | 15,678 | 8,798 | 1,060.8 | 979.2 | 27.48 | Des Rnglnd | 0.050 | 70 |
| E3 | 0.94 | 14,352 | 5,236 | 1,000.6 | 930.1 | 25.93 | Des Rnglnd | 0.050 | 56 |
| E4 | 0.74 | 10,558 | 6,552 | 934.1 | 876.2 | 28.98 | Des Rnglnd | 0.050 | 53 |

**Table 4-9 MKE Unit Hydrograph Lag Time Calculation Parameters**

| Subbasin | Area [mi$^2$] | L [ft] | $L_{ca}$ [ft] | Max Elev [ft] | Min Elev [ft] | S [ft/mi] | S-Graph Type | $K_n$ | Lag [min] |
|---|---|---|---|---|---|---|---|---|---|
| 73 = A1&B1 | 2.06 | 14,520 | 8,818 | N/A | N/A | 33.00 | Phx Valley | 0.050 | 66 |
| 75 = C1 | 0.54 | 9,979 | 4,858 | N/A | N/A | 29.00 | Phx Valley | 0.050 | 46 |
| 78 = C1 | 0.41 | 5,386 | 3,115 | N/A | N/A | 59.00 | Phx Valley | 0.050 | 27 |
| 76 = D1 | 0.06 | 2,006 | 1,214 | N/A | N/A | 50.00 | Phx Valley | 0.050 | 13 |
| 79 = D1 | 0.78 | 8,606 | 5,861 | N/A | N/A | 42.00 | Phx Valley | 0.050 | 44 |
| 74 = E1&E2 | 2.69 | 16,368 | 7,920 | N/A | N/A | 30.00 | Phx Valley | 0.050 | 68 |
| 77 = E3 | 0.23 | 6,019 | 2,006 | N/A | N/A | 25.00 | Phx Valley | 0.050 | 28 |
| 80 = E3 | 0.64 | 7,498 | 3,854 | N/A | N/A | 31.00 | Phx Valley | 0.050 | 37 |
| 81 = E4 | 0.63 | 5,491 | 3,274 | N/A | N/A | 31.00 | Phx Valley | 0.050 | 31 |
| 82 = E4 | 0.26 | 5,597 | 4,224 | N/A | N/A | 32.00 | Phx Valley | 0.050 | 34 |

Other verifications include indirect methods presented in the Hydrology Manual. The results using indirect method No. 2 – USGS data for Arizona are presented in Figure 4-7. The LP3 regression curve and 75% tolerance limits from the USGS data are plotted along with the 100-year storm event peak discharges and trendline from this study. The results fit within the tolerance limits, and the trendline is very similar to the USGS's.

The second indirect method uses the Boughton and Malvick Envelope Curves, as presented in Figure 4-8. The Boughton and Malvick Envelope Curves are plotted along with the 100-year storm event peak discharge and trendline from this study. The results are all under the Boughton Envelope Curve, and are in agreement with the Malvick Envelope Curve.

The third indirect method of verification uses the USGS regional regression method (Thomas et al., 1995). Table 4-10 shows the USGS envelope curve data, 100-year regional data, and 100-

year low-to-middle elevation peak discharges compared to basin size. The comparison made for the three different indirect verification types indicates that the results from this study are relatively low compared with the regional 100-year discharges, but are all above the low-to-middle elevation-values. The results are in agreement with those studies conducted in comparable areas (Zhao, 2003).

**Table 4-10 USGS Regression Data**

(Digitized from Figure 41 in Thomas et al., 1995)

| Drainage Area [sq-mi] | Envelope [cfs] | Regional [cfs] | Low-to-Middle Elevation [cfs] |
|---|---|---|---|
| 0.1 | 300 | 182 | 110 |
| 0.2 | 700 | 308 | 156 |
| 0.3 | 1,162 | 419 | 192 |
| 0.4 | 1,600 | 522 | 222 |
| 0.5 | 2,028 | 618 | 249 |
| 0.6 | 2,500 | 710 | 273 |
| 0.7 | 3,000 | 798 | 296 |
| 0.8 | 3,500 | 884 | 317 |
| 0.9 | 3,887 | 967 | 336 |
| 1 | 4,403 | 1,047 | 355 |
| 2 | 7,878 | 1,678 | 505 |
| 3 | 10,676 | 2,210 | 621 |
| 4 | 13,809 | 2,688 | 720 |
| 5 | 16,047 | 3,128 | 806 |

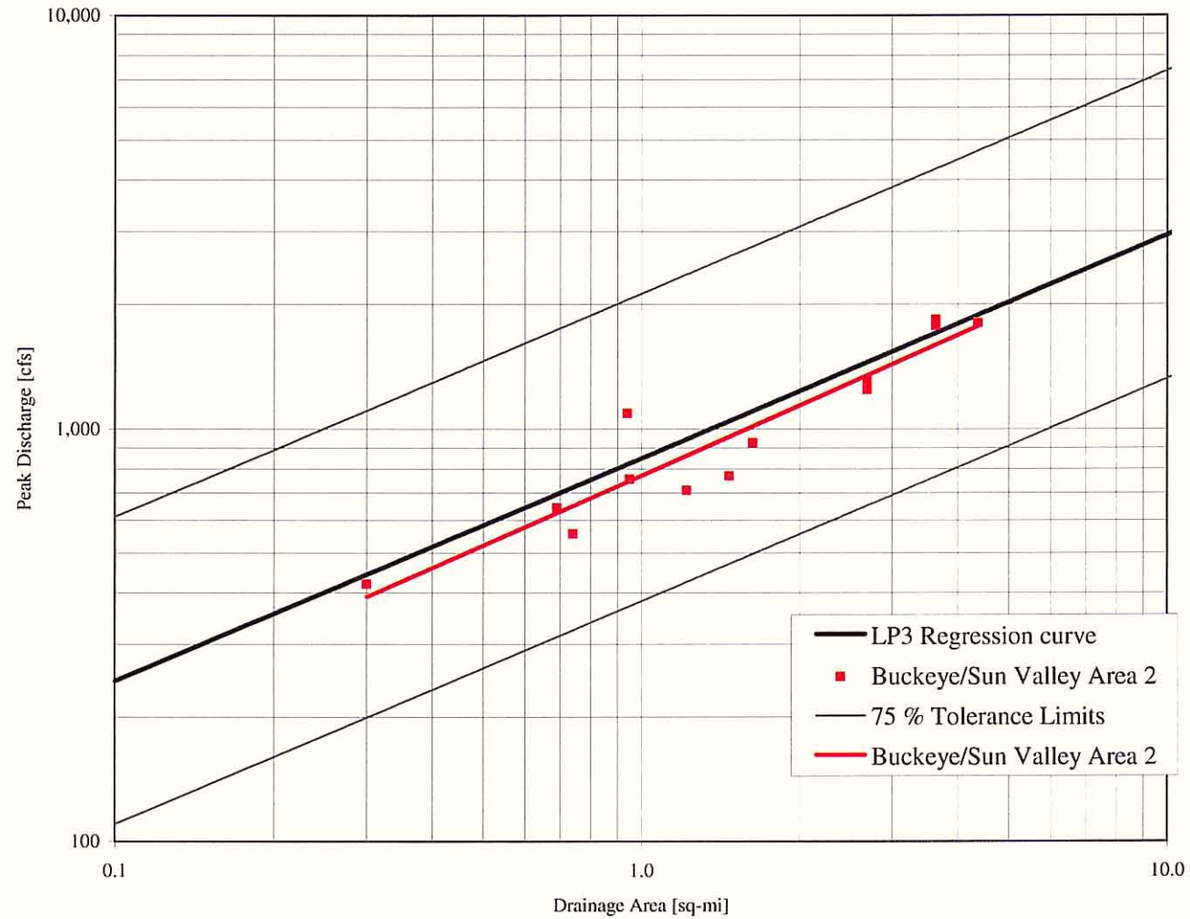



**Figure 4-7 Indirect Method Verification - USGS LP3 Analysis**

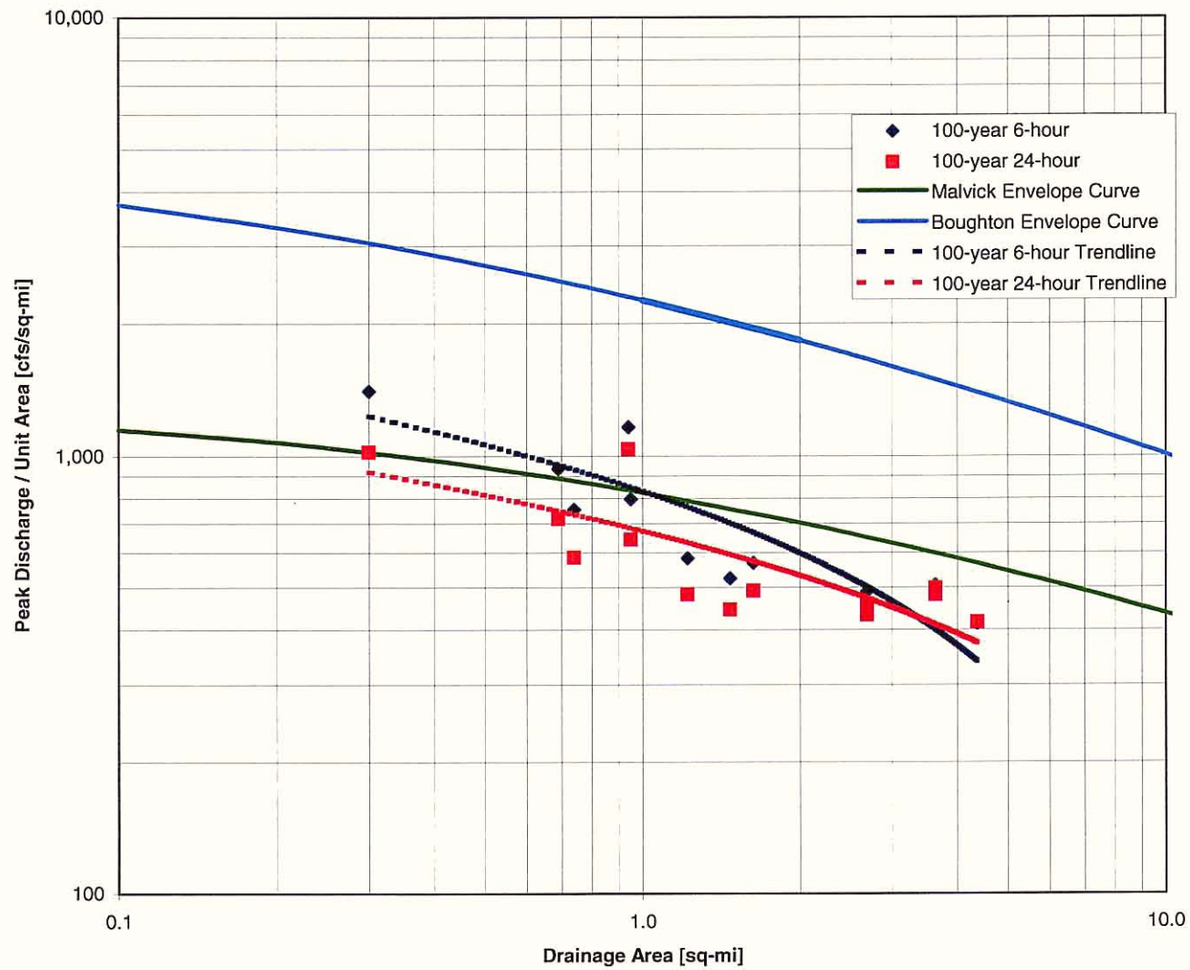



**Figure 4-8 Indirect Method Verification - Boughton and Malvick Envelope Curves**

# 5 Hydraulics

## 5.1 Method Description

The study area includes four separate tributaries to the Hassayampa River. These tributaries are located just south of I-10 on the eastern side of the Hassayampa River in Buckeye, Arizona. The land use for Buckeye south of I-10 is primarily agriculture fields except for this portion of the study. Although some areas in Area 2 are used for agricultural purposes, most of the land is vacant or natural desert rangeland. Just north of I-10 is the SCS Buckeye Flood Retarding Structure (FRS) #1. Before the construction of the FRS, the existing washes delineated in this study were created by runoff from the White Tank Mountains before it combined with the Hassayampa River. The contributing area for runoff after the construction of the FRS is limited to the area south or downstream of the FRS.

The model used to determine the water surface profiles, along with delineating the floodplain boundaries, was HEC-RAS, produced by the US Army Corps of Engineers. The process of creating geometry data and establishing the base for the model relied heavily on tools provided in WMS. Using WMS, cross sections were laid out spatially with an approximate spacing of 200 feet. The roughness values for each cross section were also generated using WMS and the process is outlined in section 5.3.1.2.

## 5.2 Work Study Maps

Twelve maps are included in this report to display the three tributaries with delineated floodplains and floodways. Sheets 1-3 contain Tributary 4E, sheets 4-5 contain Tributary 3E, and sheets 6-12 contain Tributary 1E. The nomenclature for the tributaries to the Hassayampa River originally began as the North, Central, and South Tributaries. However, the District later developed a more systematic way of naming the washes. Each reach is now named as part of the Hassayampa River East Tributary nomenclature. For example, the north reach is formally called the Hassayampa Tributary 3E. A total of six reaches were delineated and are listed below.

- Hassayampa Tributary 1E
- Hassayampa Tributary 1E1
- Hassayampa Tributary 3E

- Hassayampa Tributary 4E
- Hassayampa Tributary 4E1
- Hassayampa Tributary 4E2

Full scale (1"=200') work-study maps are provided as attachments (Figures 5-1 to 5-13, or Cover and Sheets 1 through 12).

## 5.3 Parameter Estimation

### 5.3.1 Roughness Coefficient

There are two options for entering Manning's n-values into the HEC-RAS model. In the first option, the modeler enters three separate values for the LOB, ROB and main channel. The second option allows the modeler to vary the coefficients horizontally. The later option was selected for this study to more accurately model the natural conditions. The first option specifies a change in n-value at the bank points for each cross section, but the change in n-value may not always occur at the bank point. The second option can model the exact location of the change in n-value, whether it is at the bank station or not.

Two steps were used to generate the horizontal variations in the Manning's n-value for each cross section. The first step was to determine the horizontal variations using WMS with aerial photos and field verification. WMS actually prepares the geometry data for HEC-RAS, which includes the hydraulic baseline, bank stations, and cross section locations. A second coverage in WMS divides the entire reach into multiple regions showing the different n-value locations based upon the base materials, obstructions, vegetative covers, and irregularities. When a unique Manning's n-value is assigned for each region, WMS transfers the roughness data from the GIS coverage to each cross section. For this study, the Manning's n GIS coverage was prepared by using aerial photos to identify the apparent locations where the n-value changes along each reach and cross section. Each of these locations was then field verified and photographed during the reconnaissance portion of the study. The GIS map was digitized using discerning characteristics such as reach boundaries and vegetation.

The second step was to assign a Manning's n-value for each region determined in the first step. The Manning's n coefficients were determined using the methodology outlined in "Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County,

Arizona" (USGS, 1991). The basic process is to select an n-value for the bed material and then increase the value according to surface irregularities, obstructions, and vegetation as shown in equation 5-1.

$$n = n_b + n_1 + n_2 + n_3 \quad \textbf{Equation 5-1}$$

where

$n_b$ = base value of n for a straight uniform channel

$n_1$ = value for surface irregularities

$n_2$ = value for obstructions

$n_3$ = value for vegetation

The base value for each tributary was determined to be similar with no major differences. It is generally a firm soil with scattered cobble approximately 1"-3". Figure 5-14 is a sample picture of the soil found in the main channel of the Tributary 3E. The same base value is used for each tributary; however, isolated areas contained less cobble and finer sands.

**Figure 5-14 Typical Base Material**

After the base n-value was selected, the remaining components were added with individual sections for each reach. The vegetation values range from little or no vegetation (Figure 5-15) in some overbank locations to very thick and dense shrubs and trees (Figure 5-16) near the end of

the RID Canal. Most overbank sections had little or no obstructions, while the main channels varied from no obstructions to dense tree trunks and exposed roots. The channel irregularities were negligible with smooth channel characteristics except for some locations where the RID Canal dumps water into the Tributary 1E causing irregularities. These values are shown in Figure 5-17 with each n-value shaded and the location of the photographs taken during the field reconnaissance portion of the study. Each photograph can be found in Appendix E1.2 with an explanation of the location and direction.

**Figure 5-15 Typical Overbank Section with Sparse Vegetation**

**Figure 5-16 Typical Overbank Section with Dense Vegetation**

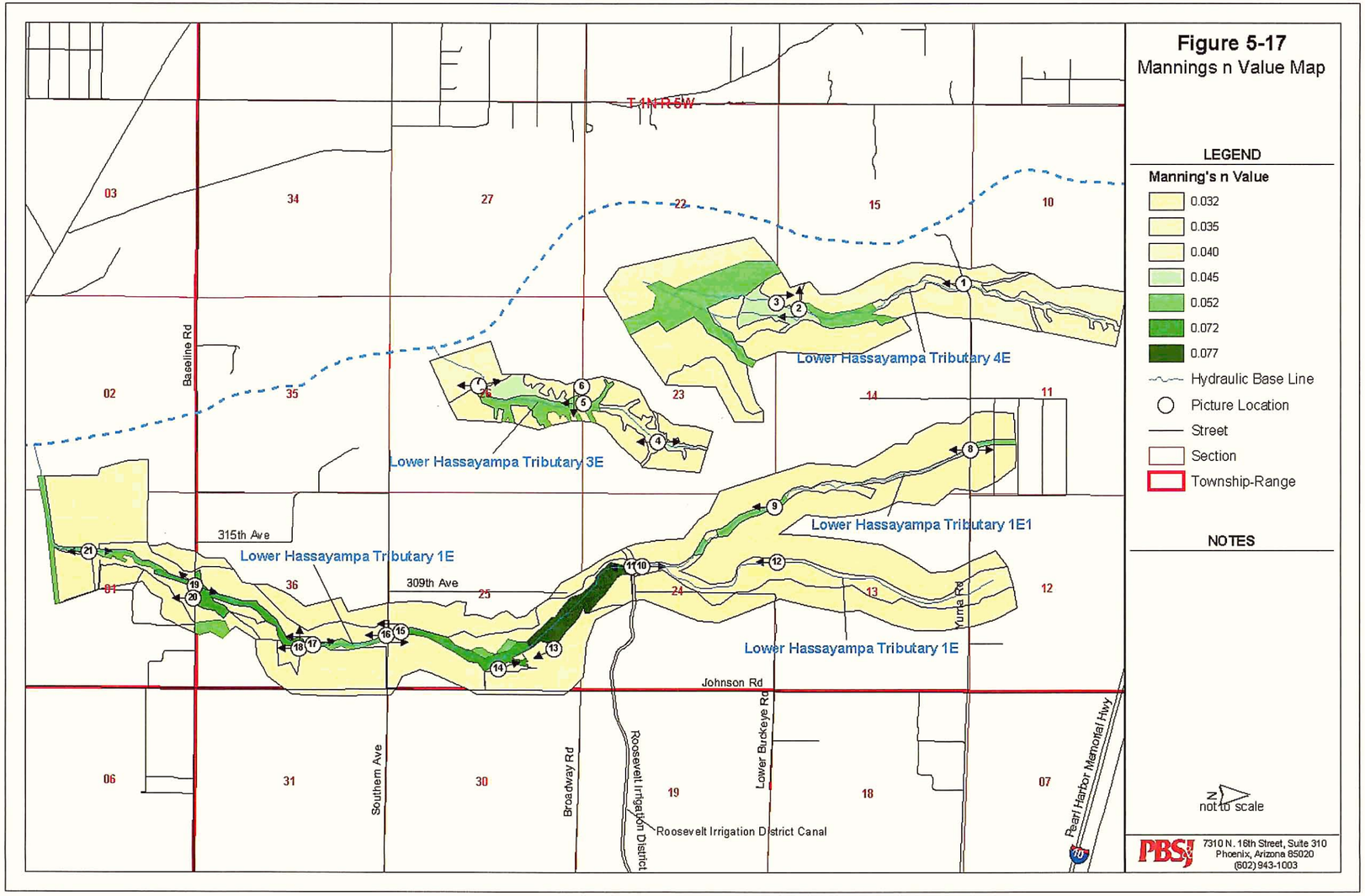



**Figure 5-17 Manning's n-value Map**

### 5.3.2 Expansion and Contraction Coefficients

All the expansion and contraction coefficients were set to the HEC-RAS suggestions for gradual transitions of 0.1 for contraction and 0.3 for expansion. The only exceptions were on Tributary 1E near the culverts modeled at Southern and Baseline Roads. These coefficients were set to 0.3 and 0.5 for contraction and expansion, respectively. Also, Tributary 3E included previously listed coefficients in the location of the in-line weir used to simulate the road parallel to the abandoned RID canal crossing the reach.

## 5.4 Cross Section Description

Initially, the cross sections were created using AutoCAD and its Land Desktop package. The minimum spacing for cross sections as outlined in the Hydraulics Manual is 500 feet. Using AutoCAD, each reach was set up as an alignment and STA labels generated. A quick and easy way to spatially generate cross sections spaced at 500 feet was to use the STA ticks and expand them to the appropriate width across the reach and floodplain. Additional modifications were performed to re-align parts of the sections perpendicular to the flow. Where needed, additional cross sections were added, removed, or redistributed to improve the simulation.

WMS was the program used to prepare the cross sections and other geometry data for HEC-RAS. The AutoCAD file with the cross sections was read into WMS. The process for extracting each cross section profile was completed using the WMS Riverine Module. WMS uses the polylines from AutoCAD and contour data to create a cross section profile. When the WMS procedure is completed, it generates the HEC-RAS *.g01 geometry file.

The first simulations in HEC-RAS used 500-foot cross section spacing. As a result, several warning messages appeared at each cross section. The description of these warnings is outlined in Section 5.7.2. To eliminate the multiple warnings, cross section spacing was reduced to approximately 200 feet.

## 5.5 Modeling Considerations

### 5.5.1 Hydraulic Jump and Drop Analysis

N/A

### 5.5.2 Bridges and Culverts

Two bridges were modeled within HEC-RAS. Both are located on tributary 1E. The reach intersects Southern and Baseline Roads with culverts at both locations. The input data for the HEC-RAS model such as location, length, slope, diameter, and type were obtained from a field inspection. Appendix C.3 lists the field notes and pictures obtained from the inspection.

### 5.5.3 Levees and Dikes

Tributary 1E contains two man-made levees. The first is located just south of Southern Avenue and runs parallel to the reach for about one-half mile. The second levee is on the south end of the reach just downstream of Baseline Road. Both of the levees were constructed to contain the large runoff events and prevent flooding of the agriculture areas adjacent to the reach. Figures 5-18 and 5-19 show a side-by-side comparison of the location of the south levee in 1949 and 2003.

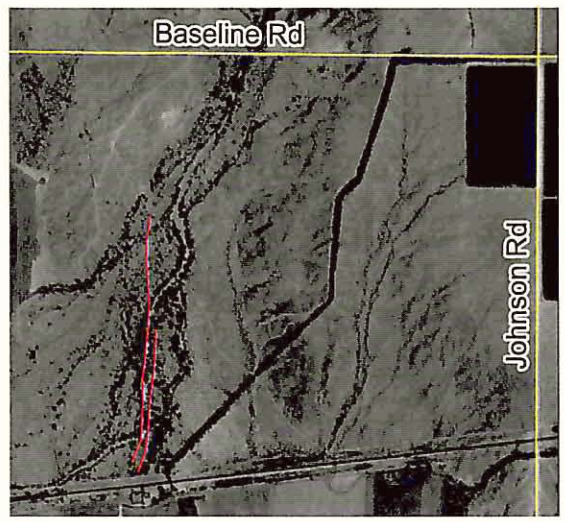



**Figure 5-18 1949 Aerial Photo without Levee**

**Figure 5-19 2003 Aerial Photo with Levee**

Note: the red lines depict the approximate location of the levee.

The levees were first modeled with a virtual HEC-RAS levee placed on the top of the levee. This prevents the model from using the area on the opposite side of the levee in the conveyance calculations until the levee is overtopped. After discussion with the District, another approach was used to determine the most conservative result. Since the levee-like features did not meet

FEMA levee criteria, it was decided that they would not be treated as levees in the study. To generate conservative water surface elevations, ineffective flow areas were used.

### 5.5.4 Islands and Flow Splits

Two islands of significance exist in the study. The first is located in Tributary 4E just upstream of the confluence with the Hassayampa River. This island was treated with a flow split in the model and is split into two reaches as Tributary 4E and Tributary 4E1. HEC-RAS allows the modeler to manually enter the distribution of flow between the two reaches or have the model automatically compute the flow distribution with the flow optimization algorithm. The later was used to more accurately obtain the flow distribution.

The second island is found in Tributary 1E in Reach 2. Figure 5-20 identifies the method used to model the split flow in HEC-RAS. The decision was made to have one reach and spread the cross sections over the entire region. This method was chosen because the 100-year flood event inundates the entire region and the length of the split flow is relatively short before the reaches merge.

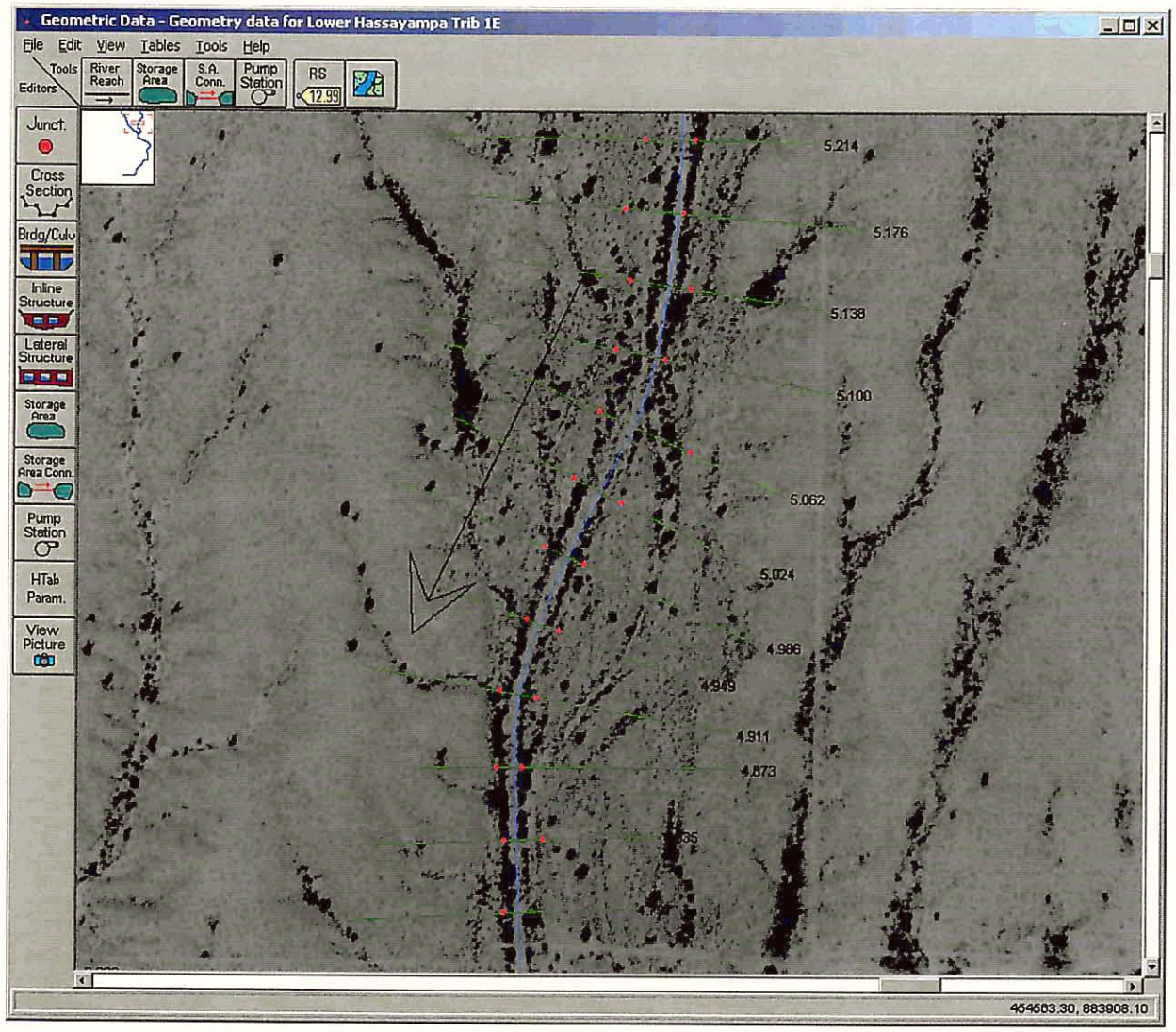



**Figure 5-20 HEC-RAS screen shot of split flow in Tributary 1E Reach 2**

### 5.5.5 Ineffective Flow Areas

When using an ineffective flow area in HEC-RAS, the model includes the area in storage calculations and wetted cross-section parameters but does not include the area as part of the active flow area. Ineffective flows were used in this study to include all possible floodplain areas. In some cases, the extracted cross-sections would sufficiently convey the 100-year flood event. However, the aerial photos or contours may show additional sources of historical flooding outside the delineated boundary. Ineffective flow areas were used when cross-sections were extended to cover the floodplain, and the extension was set as an ineffective flow area. Another case where ineffective flow was used is in two locations where levees had been constructed.

Both levees are found in the Hassayampa Tributary 1E in Reach 1. These levees are also documented in sections 5.5.3.

### 5.5.6 Supercritical Flow

N/A

## 5.6 Floodway Modeling

The floodway modeling methodology comes from the procedures outlined in the Hydraulics Manual. The first step was to use the encroachment method #4 with equal conveyance reduction. The guidelines allow a maximum of one-foot increase in water surface elevation. Once HEC-RAS generates the method #4 encroachments, method #1 is applied to the model. This method requires a manual selection for the location of the floodway encroachment. Method #4 acts as the starting basis for the method #1 selection. Using method #1 turns into an iterative process in some locations to keep the increase in water surface elevation under one foot.

## 5.7 Problems Encountered During the Study

### 5.7.1 Special Problems and Solutions

#### 5.7.1.1 Datum Conversion

Although the vertical datum conversion from NGVD 1929 to NAVD 1988 was performed using the CORPSCON program (USACE), the District wanted to provide an average conversion factor that can be used to revert back to the NGVD 1929 elevations. Using the guidelines set forth in Appendix B of FEMA's Guidelines and Specifications for Flood Hazard Mapping Partners, it was determined that 2.08 ± 0.25 feet can be used for an average conversion factor for the study area. Table 5-1 gives the conversion factors in a reach by reach format.

**Table 5-1 Datum Conversion Factors**

| Stream/Reach | Minimum Conversion | Maximum Conversion | Average Conversion | Maximum Offset | Begin Station | End Station |
|---|---|---|---|---|---|---|
| Tributary 1E | 2.070 | 2.100 | 2.082 | 0.018 | Entire Reach | |
| Tributary 3E | 2.077 | 2.083 | 2.080 | 0.003 | Entire Reach | |
| Tributary 4E | 2.080 | 2.087 | 2.083 | 0.004 | Entire Reach | |

#### 5.7.1.2 Negative Surcharges

For small number of cross-sections, it was impossible to eliminate negative surcharges. The range of negative surcharges is from 0.04 feet to 0.01 feet. Encroachment method 4 was used initially to set encroachment stations to a water surface elevation rise of one foot in order to give a general idea of where the encroachments. Method 1 was then used to set the final encroachment stations, ensuring that the floodway surcharge was no greater than one foot. Negative surcharges can be caused by excessive encroachment or insufficient encroachment at downstream cross-sections.

#### 5.7.1.3 Baseline for Tributary 4E, Reach 1 at Limit of Detailed Study

During low flow periods, Tributary 4E, Reach 1, follows the presently identified baseline. For the 100-year flood, the baseline will connect with the Hassayampa River.

#### 5.7.1.4 Extended Cross-Sections

Cross-sections 0.065 and 0.125 of Tributary 4E1, Reach 1 and 0.883 of Tributary 1E, Reach 1 do not contain the floodplain limits and have been extended. Cross-sections 0.065 and 0.125 of Tributary 4E1, Reach 1 have been extended to accommodate the Hassayampa River. At cross-section 0.883 of Tributary 1E, Reach 1, the cross-section was extended to effectively model the ineffective flow area.

### 5.7.2 Modeling Warning and Error Messages

No error messages were found in the hydraulic model; however, many warnings show up in each of the three delineated reaches. The following is a comprehensive list of the warnings found in the HEC-RAS model:

*Warning: Divided flow computed for this cross-section.*

*Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross-sections.*

*Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross-section. This may indicate the need for additional cross-sections.*

These messages are common and required additional investigation. The initial delineation included a cross-section spacing of 500 feet. As a result, the conveyance ratio and energy loss warnings appeared at virtually every cross section. A simple test was performed to determine if

decreasing the cross-section spacing would eliminate the warnings. Even with a spacing of 100 feet, the warnings remained for the majority of the cross-sections in the models. The water surface elevations from the multiple tests showed a 0.5-foot average difference between the 500 and 200 foot spacing and little change between the 200 and 100 foot spacing. The final cross-section spacing used was approximately 200 feet.

The divided flow warning exists when the flow is split within the cross-section. The divided flows in this study were not significant enough to consider using separate reaches in the HEC-RAS model.

## 5.8 Calibration

The area does not contain any gage data to properly calibrate the HEC-RAS model.

## 5.9 Final Results

### 5.9.1 Hydraulic Analysis Results

Tables 5-2, 5-3, and 5-4 give summaries of the results from the HEC-RAS models for streams, culverts, and in-line weirs, respectively.

**Table 5-2 HEC-RAS Normal Stream Results Summary**

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | 2 | 5.971 | 713 | 1032.9 | 1035.1 | | 1035.2 | 0.004045 | 2.64 | 292.8 | 360.79 | 0.47 |
| 1E | 2 | 5.933 | 713 | 1032.4 | 1034.1 | | 1034.2 | 0.005517 | 2.75 | 248.36 | 303.66 | 0.54 |
| 1E | 2 | 5.895 | 713 | 1031.2 | 1032.9 | | 1033.1 | 0.005866 | 3.72 | 210.76 | 238.83 | 0.59 |
| 1E | 2 | 5.857 | 713 | 1030.2 | 1032.03 | | 1032.2 | 0.003691 | 2.97 | 263.83 | 280.9 | 0.47 |
| 1E | 2 | 5.82 | 713 | 1029.6 | 1030.83 | 1030.7 | 1031 | 0.010087 | 3.74 | 204.23 | 319.48 | 0.73 |
| 1E | 2 | 5.782 | 713 | 1027.5 | 1028.96 | 1028.8 | 1029.2 | 0.008577 | 3.86 | 212.66 | 352.25 | 0.69 |
| 1E | 2 | 5.744 | 713 | 1026 | 1027.8 | 1027.4 | 1028 | 0.004348 | 3.37 | 235.92 | 292.09 | 0.53 |
| 1E | 2 | 5.706 | 713 | 1025 | 1026.57 | 1026.5 | 1026.8 | 0.00804 | 4.15 | 202.29 | 280.02 | 0.69 |
| 1E | 2 | 5.668 | 713 | 1023.7 | 1025.77 | 1025.3 | 1025.9 | 0.00286 | 2.97 | 285.35 | 288.03 | 0.43 |
| 1E | 2 | 5.63 | 713 | 1022.6 | 1024.55 | 1024.5 | 1024.9 | 0.010597 | 5.13 | 174.73 | 254.2 | 0.8 |
| 1E | 2 | 5.592 | 713 | 1021.5 | 1023.45 | | 1023.6 | 0.00401 | 3.21 | 253.52 | 301.32 | 0.5 |
| 1E | 2 | 5.554 | 713 | 1020.5 | 1022.61 | | 1022.8 | 0.004772 | 3.56 | 250.47 | 322.78 | 0.54 |
| 1E | 2 | 5.517 | 713 | 1019.8 | 1021.52 | | 1021.7 | 0.005838 | 3.72 | 222.04 | 270.85 | 0.59 |
| 1E | 2 | 5.479 | 713 | 1018.4 | 1020.64 | | 1020.8 | 0.00369 | 3.27 | 274.91 | 344.99 | 0.48 |

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | 2 | 5.441 | 713 | 1017.3 | 1019.48 | | 1019.7 | 0.008417 | 4.17 | 197.31 | 253.67 | 0.7 |
| 1E | 2 | 5.403 | 713 | 1016 | 1018.54 | | 1018.7 | 0.003436 | 2.87 | 266.82 | 259.6 | 0.45 |
| 1E | 2 | 5.365 | 713 | 1015.2 | 1017.42 | 1017.3 | 1017.7 | 0.007497 | 4.53 | 202.5 | 300.43 | 0.73 |
| 1E | 2 | 5.327 | 713 | 1014.3 | 1016.26 | | 1016.4 | 0.005178 | 3.17 | 270.31 | 363.67 | 0.54 |
| 1E | 2 | 5.289 | 713 | 1013.2 | 1015.45 | | 1015.6 | 0.003554 | 2.87 | 283.33 | 353.05 | 0.46 |
| 1E | 2 | 5.252 | 713 | 1012.5 | 1014.58 | | 1014.7 | 0.004876 | 3.4 | 242.07 | 323.37 | 0.54 |
| 1E | 2 | 5.214 | 713 | 1011.4 | 1013.65 | | 1013.8 | 0.004463 | 3.27 | 258.17 | 304.75 | 0.52 |
| 1E | 2 | 5.176 | 713 | 1011 | 1012.75 | | 1012.9 | 0.004224 | 3.11 | 251.54 | 260.9 | 0.51 |
| 1E | 2 | 5.138 | 713 | 1010.1 | 1011.83 | 1011.5 | 1012 | 0.004829 | 3.03 | 249.84 | 305.36 | 0.52 |
| 1E | 2 | 5.1 | 713 | 1009.3 | 1010.81 | | 1011 | 0.005472 | 3.17 | 246.89 | 322.48 | 0.55 |
| 1E | 2 | 5.062 | 713 | 1008 | 1009.52 | 1009.3 | 1009.7 | 0.007756 | 3.16 | 225.8 | 298.37 | 0.63 |
| 1E | 2 | 5.024 | 713 | 1006.8 | 1007.99 | | 1008.2 | 0.00628 | 2.69 | 216.45 | 247.84 | 0.56 |
| 1E | 2 | 4.986 | 713 | 1005.3 | 1006.59 | | 1006.8 | 0.007432 | 3.37 | 188.2 | 180.56 | 0.63 |
| 1E | 2 | 4.949 | 713 | 1004 | 1005.3 | 1004.9 | 1005.5 | 0.005812 | 2.98 | 195.27 | 186.25 | 0.56 |
| 1E | 2 | 4.911 | 713 | 1002.6 | 1004.17 | | 1004.4 | 0.00612 | 3.55 | 209.85 | 204.91 | 0.59 |
| 1E | 2 | 4.873 | 713 | 1001.1 | 1003.22 | | 1003.4 | 0.004102 | 3.36 | 231.05 | 227.38 | 0.5 |
| 1E | 2 | 4.835 | 713 | 999.96 | 1002.39 | | 1002.6 | 0.003678 | 3.64 | 220.29 | 211.9 | 0.49 |
| 1E | 2 | 4.797 | 713 | 998.94 | 1001.78 | 1001.3 | 1001.9 | 0.002923 | 3.3 | 261.81 | 222.03 | 0.44 |
| 1E | 2 | 4.759 | 713 | 998.24 | 1001.09 | | 1001.3 | 0.003615 | 3.89 | 244.96 | 233.65 | 0.5 |
| 1E | 2 | 4.721 | 713 | 997.08 | 1000.11 | 1000.1 | 1000.4 | 0.005165 | 4.74 | 225.4 | 384.78 | 0.6 |
| 1E | 2 | 4.683 | 713 | 996.21 | 998.97 | | 999.29 | 0.005732 | 4.8 | 175.91 | 188.15 | 0.63 |
| 1E | 2 | 4.646 | 713 | 995.13 | 998.15 | 997.89 | 998.29 | 0.003953 | 3.7 | 287.94 | 422.7 | 0.51 |
| 1E | 2 | 4.569 | 713 | 993.77 | 996.49 | | 996.67 | 0.004291 | 3.98 | 234.16 | 257.91 | 0.53 |
| 1E | 2 | 4.506 | 713 | 992.56 | 994.09 | 994 | 994.41 | 0.012787 | 4.5 | 158.74 | 200.88 | 0.87 |
| 1E | 2 | 4.45 | 713 | 990.72 | 992.09 | | 992.21 | 0.004541 | 2.84 | 262.04 | 313.11 | 0.51 |
| 1E | 2 | 4.41 | 713 | 989.24 | 990.75 | | 990.97 | 0.008235 | 3.83 | 199.07 | 244.71 | 0.68 |
| 1E | 2 | 4.372 | 713 | 987.79 | 989.46 | | 989.63 | 0.005434 | 3.33 | 218.83 | 223.29 | 0.56 |
| 1E | 2 | 4.334 | 713 | 986.47 | 988.17 | | 988.34 | 0.007577 | 3.45 | 217.25 | 269.63 | 0.64 |
| 1E | 2 | 4.296 | 713 | 985.26 | 987.37 | | 987.47 | 0.002707 | 2.6 | 290.27 | 343.26 | 0.41 |
| 1E | 2 | 4.259 | 713 | 984.2 | 986.59 | | 986.74 | 0.005015 | 3.47 | 247.91 | 314.23 | 0.55 |
| 1E | 2 | 4.221 | 713 | 983.28 | 985.24 | 985.12 | 985.45 | 0.008607 | 3.98 | 208.78 | 301.29 | 0.7 |
| 1E | 2 | 4.183 | 713 | 982.46 | 984.01 | | 984.14 | 0.004908 | 3.08 | 259.9 | 340.88 | 0.53 |
| 1E | 2 | 4.145 | 713 | 980.83 | 983.05 | | 983.19 | 0.004615 | 3.22 | 248.64 | 321.29 | 0.57 |
| 1E | 1 | 4.072 | 1485 | 977.71 | 981.98 | | 982.14 | 0.002098 | 3.55 | 531.37 | 481.1 | 0.4 |
| 1E | 1 | 4.034 | 1485 | 977.17 | 981.23 | | 981.53 | 0.00466 | 4.88 | 372.21 | 331.69 | 0.58 |
| 1E | 1 | 3.996 | 1485 | 976.75 | 980.19 | | 980.48 | 0.005981 | 4.73 | 361.84 | 329.41 | 0.64 |
| 1E | 1 | 3.958 | 1485 | 976.36 | 978.99 | | 979.22 | 0.00641 | 4.24 | 396.52 | 407.59 | 0.67 |
| 1E | 1 | 3.92 | 1485 | 974.65 | 977.9 | | 978.17 | 0.004448 | 4.24 | 364.9 | 209.55 | 0.5 |
| 1E | 1 | 3.883 | 1840 | 972.89 | 977.27 | | 977.36 | 0.003354 | 2.48 | 796.86 | 389.62 | 0.26 |
| 1E | 1 | 3.845 | 1840 | 973.18 | 976.45 | | 976.53 | 0.005039 | 2 | 848.41 | 569.17 | 0.27 |
| 1E | 1 | 3.807 | 1840 | 972.15 | 975.62 | | 975.68 | 0.004391 | 1.99 | 941.09 | 580.19 | 0.25 |
| 1E | 1 | 3.769 | 1840 | 970.6 | 974.96 | | 975.02 | 0.00316 | 2.17 | 1003.88 | 485.93 | 0.23 |
| 1E | 1 | 3.731 | 1840 | 969.91 | 974.45 | | 974.5 | 0.002401 | 2.06 | 1078.19 | 490 | 0.2 |
| 1E | 1 | 3.692 | 1840 | 968.51 | 973.46 | | 973.62 | 0.008883 | 3.55 | 642.66 | 433.02 | 0.38 |

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | 1 | 3.653 | 1840 | 967.7 | 971.62 | | 971.77 | 0.008967 | 3.05 | 602.96 | 279.19 | 0.37 |
| 1E | 1 | 3.614 | 1840 | 965.95 | 969.91 | | 970.03 | 0.008034 | 2.81 | 654.65 | 315.88 | 0.34 |
| 1E | 1 | 3.576 | 1840 | 965.03 | 968.2 | | 968.34 | 0.008864 | 2.96 | 630.86 | 353.04 | 0.36 |
| 1E | 1 | 3.538 | 1840 | 964.98 | 967.77 | | 967.83 | 0.001097 | 1.05 | 1190.56 | 504.35 | 0.13 |
| 1E | 1 | 3.5 | 1840 | 964.98 | 967.32 | 966.21 | 967.4 | 0.005747 | 2.18 | 845.37 | 657.4 | 0.28 |
| 1E | 1 | 3.462 | 1840 | 964.39 | 965.81 | | 965.94 | 0.007291 | 1.74 | 752.49 | 682.14 | 0.29 |
| 1E | 1 | 3.425 | 1840 | 962.84 | 964.66 | | 964.73 | 0.004649 | 1.76 | 908.4 | 673.91 | 0.25 |
| 1E | 1 | 3.387 | 1840 | 961.58 | 963.67 | | 963.74 | 0.005836 | 1.93 | 896.1 | 746.89 | 0.28 |
| 1E | 1 | 3.349 | 1840 | 958.53 | 961.87 | | 961.99 | 0.013483 | 2.81 | 689.57 | 674.94 | 0.42 |
| 1E | 1 | 3.311 | 1840 | 956.92 | 960.4 | | 960.47 | 0.004758 | 2.2 | 868.2 | 571.03 | 0.27 |
| 1E | 1 | 3.273 | 1840 | 956.99 | 959.61 | | 959.68 | 0.00335 | 2.04 | 879.55 | 739.89 | 0.29 |
| 1E | 1 | 3.235 | 1840 | 957.19 | 958.92 | | 958.97 | 0.003603 | 1.71 | 982.62 | 1113.78 | 0.28 |
| 1E | 1 | 3.197 | 1840 | 957.09 | 957.98 | 957.74 | 958.08 | 0.005325 | 1.67 | 786.93 | 1123.88 | 0.41 |
| 1E | 1 | 3.122 | 1840 | 954.55 | 955.54 | 955.26 | 955.68 | 0.008032 | 1.69 | 696.04 | 890.96 | 0.34 |
| 1E | 1 | 3.084 | 1840 | 953.01 | 954.13 | 953.7 | 954.24 | 0.004393 | 1.38 | 725.79 | 776.25 | 0.3 |
| 1E | 1 | 3.046 | 1840 | 951.29 | 952.6 | | 952.78 | 0.009127 | 1.54 | 587.6 | 712.53 | 0.37 |
| 1E | 1 | 2.972 | 1840 | 947.98 | 951.2 | 950.49 | 951.26 | 0.003099 | 1.83 | 946.78 | 980.19 | 0.27 |
| 1E | 1 | 2.935 | 1840 | 947.76 | 950.4 | 949.88 | 950.5 | 0.006366 | 2.58 | 729.21 | 762.44 | 0.39 |
| 1E | 1 | 2.897 | 1840 | 945.11 | 948.35 | 948.05 | 948.51 | 0.014688 | 3.27 | 582.82 | 675.34 | 0.54 |
| 1E | 1 | 2.852 | 1840 | 942.97 | 946.83 | | 946.91 | 0.003628 | 2.32 | 834.64 | 567.42 | 0.28 |
| 1E | 1 | 2.814 | 1840 | 940.58 | 944.72 | 944.09 | 945.28 | 0.027753 | 6.11 | 316.04 | 271.6 | 0.75 |
| 1E | 1 | 2.776 | 1840 | 935.88 | 942.83 | | 943.05 | 0.005601 | 3.72 | 494.84 | 131.63 | 0.34 |
| 1E | 1 | 2.738 | 1840 | 935.33 | 942.13 | | 942.23 | 0.002883 | 2.64 | 696.71 | 221.98 | 0.26 |
| 1E | 1 | 2.7 | 1840 | 933.97 | 941.48 | | 941.61 | 0.003361 | 2.92 | 649.27 | 350.39 | 0.29 |
| 1E | 1 | 2.662 | 1840 | 932.7 | 940.42 | | 940.63 | 0.007733 | 3.98 | 550.02 | 489.89 | 0.39 |
| 1E | 1 | 2.624 | 1840 | 932.37 | 939.14 | | 939.27 | 0.005768 | 3.37 | 645.08 | 535.6 | 0.33 |
| 1E | 1 | 2.587 | 1840 | 931.08 | 938.3 | | 938.4 | 0.003566 | 2.72 | 763.08 | 504.93 | 0.26 |
| 1E | 1 | 2.549 | 1840 | 930.62 | 937.24 | | 937.4 | 0.00821 | 3.34 | 580.37 | 513.14 | 0.38 |
| 1E | 1 | 2.511 | 1840 | 929.6 | 935.96 | | 936.1 | 0.005151 | 3.16 | 635.36 | 494.75 | 0.31 |
| 1E | 1 | 2.473 | 1840 | 928.97 | 934.2 | | 934.49 | 0.013925 | 4.55 | 434.7 | 295.52 | 0.5 |
| 1E | 1 | 2.445 | 1840 | 925.8 | 933.32 | 931.82 | 933.4 | 0.003699 | 2.49 | 820 | 616.99 | 0.27 |
| 1E | 1 | 2.438 | Culvert | | | | | | | | | |
| 1E | 1 | 2.432 | 1840 | 925.1 | 933.32 | 930.89 | 933.34 | 0.000511 | 1.39 | 1636.96 | 1039.46 | 0.14 |
| 1E | 1 | 2.397 | 1840 | 925.18 | 932.67 | 930.56 | 933.03 | 0.005332 | 4.85 | 379.33 | 642.78 | 0.47 |
| 1E | 1 | 2.359 | 1840 | 924.16 | 931.69 | 930.02 | 932 | 0.004852 | 4.49 | 414.72 | 748.59 | 0.47 |
| 1E | 1 | 2.321 | 1840 | 923.1 | 930.85 | 928.56 | 931.14 | 0.00376 | 4.31 | 426.86 | 973.81 | 0.43 |
| 1E | 1 | 2.283 | 1840 | 922.06 | 929.19 | 928.14 | 929.89 | 0.011304 | 6.72 | 273.88 | 658.79 | 0.67 |
| 1E | 1 | 2.245 | 1840 | 920.8 | 927.63 | 926.41 | 928.41 | 0.011248 | 7.1 | 259.21 | 803.7 | 0.65 |
| 1E | 1 | 2.208 | 1840 | 919.91 | 926.26 | 925.17 | 926.54 | 0.00693 | 4.69 | 449.93 | 713.98 | 0.49 |
| 1E | 1 | 2.17 | 1840 | 919.28 | 925.15 | 923.97 | 925.36 | 0.004651 | 3.79 | 503.45 | 740.65 | 0.42 |
| 1E | 1 | 2.132 | 1840 | 919.47 | 923.88 | 923.39 | 924.14 | 0.00853 | 4.37 | 477.61 | 956.86 | 0.57 |
| 1E | 1 | 2.094 | 1840 | 918.12 | 922.92 | 922.54 | 923.02 | 0.003654 | 2.59 | 745.11 | 1053.56 | 0.34 |
| 1E | 1 | 2.056 | 1840 | 917.85 | 921.31 | 920.89 | 921.69 | 0.013244 | 4.9 | 375.19 | 729.6 | 0.66 |
| 1E | 1 | 2.018 | 1840 | 917.34 | 919.37 | 919.3 | 919.78 | 0.021439 | 5.41 | 358.08 | 350.53 | 0.85 |

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | 1 | 1.98 | 1840 | 915.76 | 917.83 | | 918.01 | 0.004499 | 1.44 | 569.32 | 469.94 | 0.25 |
| 1E | 1 | 1.942 | 1840 | 913.68 | 916.7 | | 916.87 | 0.007411 | 2.47 | 573.85 | 550.57 | 0.34 |
| 1E | 1 | 1.905 | 1840 | 912.11 | 915.8 | | 915.89 | 0.003937 | 2.31 | 810.52 | 681.26 | 0.26 |
| 1E | 1 | 1.867 | 1840 | 910.82 | 915.01 | | 915.12 | 0.005276 | 2.88 | 689.15 | 562.66 | 0.31 |
| 1E | 1 | 1.829 | 1840 | 909.8 | 914.16 | | 914.25 | 0.003606 | 2.48 | 754.73 | 504.11 | 0.26 |
| 1E | 1 | 1.791 | 1840 | 909.24 | 913.29 | | 913.44 | 0.004456 | 2.59 | 627.8 | 399.23 | 0.28 |
| 1E | 1 | 1.753 | 1840 | 907.65 | 912.6 | | 912.69 | 0.002776 | 2.19 | 772.82 | 380.82 | 0.23 |
| 1E | 1 | 1.715 | 1840 | 908.98 | 911.67 | | 911.87 | 0.005038 | 4.06 | 566.39 | 331.97 | 0.53 |
| 1E | 1 | 1.677 | 1840 | 908.63 | 910.61 | | 910.8 | 0.005213 | 2.77 | 549.26 | 396.65 | 0.45 |
| 1E | 1 | 1.64 | 1840 | 907.51 | 910.03 | | 910.18 | 0.004027 | 1.67 | 659.27 | 423.56 | 0.25 |
| 1E | 1 | 1.602 | 1840 | 905.46 | 908.48 | | 908.66 | 0.008391 | 3.02 | 542.77 | 362.14 | 0.37 |
| 1E | 1 | 1.564 | 1840 | 903.79 | 907.29 | | 907.42 | 0.004557 | 2.47 | 654.01 | 374.75 | 0.3 |
| 1E | 1 | 1.526 | 1840 | 903.14 | 906.38 | | 906.5 | 0.004362 | 2.36 | 693.54 | 412.04 | 0.28 |
| 1E | 1 | 1.488 | 1840 | 902.09 | 905.47 | | 905.55 | 0.002909 | 1.95 | 807.84 | 406.74 | 0.23 |
| 1E | 1 | 1.45 | 1840 | 901.42 | 904.87 | | 904.98 | 0.005242 | 2.12 | 703.61 | 379.08 | 0.29 |
| 1E | 1 | 1.412 | 1840 | 901.99 | 903.21 | | 903.36 | 0.008912 | 1.53 | 614.41 | 351.93 | 0.32 |
| 1E | 1 | 1.374 | 1840 | 899.69 | 902.66 | | 902.71 | 0.001972 | 1.31 | 1048.44 | 480.59 | 0.18 |
| 1E | 1 | 1.33 | 1840 | 896 | 901.9 | 900.66 | 902.01 | 0.00609 | 2.71 | 715.6 | 425.18 | 0.32 |
| 1E | 1 | 1.323 | Culvert | | | | | | | | | |
| 1E | 1 | 1.312 | 1840 | 895.5 | 900.91 | | 901.05 | 0.005055 | 3.02 | 661.89 | 525.37 | 0.33 |
| 1E | 1 | 1.223 | 1840 | 894.87 | 898.35 | | 898.46 | 0.004631 | 2.45 | 691.3 | 606.21 | 0.32 |
| 1E | 1 | 1.185 | 1840 | 891.67 | 897.21 | 896.22 | 897.38 | 0.005917 | 3.18 | 567.2 | 353.05 | 0.36 |
| 1E | 1 | 1.147 | 1840 | 891.54 | 894.77 | | 895.26 | 0.022071 | 5.82 | 334.93 | 214.41 | 0.66 |
| 1E | 1 | 1.109 | 1840 | 890.15 | 894.38 | | 894.5 | 0.001209 | 2.84 | 747.76 | 272.92 | 0.27 |
| 1E | 1 | 1.072 | 1840 | 889.38 | 893.22 | 893.22 | 893.79 | 0.018717 | 7.01 | 330.06 | 264.53 | 0.79 |
| 1E | 1 | 1.035 | 1840 | 887.45 | 892.14 | 890.56 | 892.27 | 0.00216 | 2.91 | 666.15 | 326.15 | 0.31 |
| 1E | 1 | 0.997 | 1840 | 886.6 | 891.52 | 890.79 | 891.69 | 0.00388 | 3.66 | 559.16 | 342.95 | 0.4 |
| 1E | 1 | 0.959 | 1840 | 886.08 | 890.65 | 889.91 | 890.87 | 0.004712 | 4.09 | 518.53 | 500.32 | 0.43 |
| 1E | 1 | 0.921 | 1840 | 883.54 | 888.92 | 888.35 | 889.41 | 0.012084 | 5.69 | 336.46 | 354.97 | 0.64 |
| 1E | 1 | 0.883 | 1840 | 883.53 | 888.61 | 886.4 | 888.69 | 0.001439 | 2.02 | 816.89 | 758.51 | 0.22 |
| 1E | 1 | 0.845 | 1840 | 882.26 | 887.76 | 886.7 | 888.11 | 0.007126 | 5.08 | 416.19 | 970.1 | 0.51 |
| 1E | 1 | 0.807 | 1840 | 881.36 | 886.49 | 885.43 | 886.79 | 0.005942 | 4.71 | 453.12 | 800.78 | 0.47 |
| 1E | 1 | 0.77 | 1840 | 879.87 | 885.68 | 883.6 | 885.93 | 0.003181 | 3.99 | 461.5 | 1071.84 | 0.37 |
| 1E | 1 | 0.732 | 1840 | 879.39 | 885.14 | 882.88 | 885.35 | 0.002565 | 3.66 | 502.44 | 1417.21 | 0.33 |
| 1E | 1 | 0.695 | 1840 | 879.28 | 884.29 | 882.7 | 884.63 | 0.005403 | 4.74 | 388.53 | 2101.77 | 0.45 |
| 1E | 1 | 0.656 | 1840 | 877.73 | 882.15 | 881.54 | 882.88 | 0.014638 | 6.84 | 269.18 | 1985.71 | 0.72 |
| 1E | 1 | 0.618 | 1840 | 876.82 | 880.99 | 880.54 | 881.15 | 0.004775 | 3.98 | 666.44 | 2226.17 | 0.42 |
| 1E | 1 | 0.58 | 1840 | 876.54 | 879.43 | 879.25 | 879.74 | 0.011433 | 5.08 | 424.39 | 962.57 | 0.62 |
| 1E | 1 | 0.542 | 1840 | 875.92 | 878.35 | 878.35 | 878.43 | 0.00409 | 2.68 | 846.28 | 1841.36 | 0.36 |
| 1E | 1 | 0.494 | 1840 | 875.29 | 877.59 | | 877.63 | 0.002597 | 2.19 | 1119.25 | 1678.23 | 0.28 |
| 1E | 1 | 0.418 | 1840 | 872.76 | 876.37 | 876.17 | 876.46 | 0.003696 | 3.29 | 909.83 | 1438.42 | 0.36 |
| 1E | 1 | 0.342 | 1840 | 870.9 | 874.92 | 874.67 | 875.03 | 0.003412 | 3.29 | 818.07 | 1223.42 | 0.35 |
| 1E | 1 | 0.266 | 1840 | 870.13 | 873.68 | 873.14 | 873.76 | 0.002925 | 2.88 | 854.23 | 1117.04 | 0.33 |
| 1E | 1 | 0.19 | 1840 | 867.74 | 872.24 | 871.8 | 872.4 | 0.004007 | 3.69 | 598.58 | 676.93 | 0.39 |

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E1 | 1 | 1.927 | 772 | 1036 | 1038.19 | 1037.7 | 1038.3 | 0.007018 | 3.19 | 249.77 | 217.25 | 0.47 |
| 1E1 | 1 | 1.889 | 772 | 1034.6 | 1036.56 | | 1036.8 | 0.008428 | 3.8 | 203.93 | 152.83 | 0.52 |
| 1E1 | 1 | 1.851 | 772 | 1033.2 | 1035.35 | | 1035.5 | 0.004905 | 2.97 | 266.3 | 203.97 | 0.41 |
| 1E1 | 1 | 1.813 | 772 | 1032.2 | 1034.67 | | 1034.8 | 0.002657 | 2.46 | 314.37 | 169.23 | 0.32 |
| 1E1 | 1 | 1.775 | 772 | 1031.2 | 1033.06 | 1033.1 | 1033.6 | 0.018468 | 5.92 | 130.32 | 120.8 | 1.01 |
| 1E1 | 1 | 1.737 | 772 | 1028.9 | 1031.16 | | 1031.4 | 0.006285 | 4.23 | 182.45 | 112.69 | 0.59 |
| 1E1 | 1 | 1.699 | 772 | 1027.6 | 1029.7 | | 1030 | 0.008415 | 4.35 | 177.34 | 135.97 | 0.67 |
| 1E1 | 1 | 1.661 | 772 | 1026.4 | 1028.62 | | 1028.8 | 0.004187 | 3.56 | 217.14 | 140.63 | 0.5 |
| 1E1 | 1 | 1.624 | 772 | 1025.2 | 1027.32 | | 1027.7 | 0.008005 | 4.74 | 162.75 | 107.61 | 0.68 |
| 1E1 | 1 | 1.586 | 772 | 1024 | 1026.2 | | 1026.4 | 0.004786 | 3.65 | 211.68 | 144.4 | 0.53 |
| 1E1 | 1 | 1.548 | 772 | 1022.7 | 1024.88 | 1024.5 | 1025.2 | 0.007945 | 4.46 | 173.26 | 173.79 | 0.67 |
| 1E1 | 1 | 1.51 | 772 | 1021.6 | 1023.57 | | 1023.8 | 0.005876 | 3.87 | 199.52 | 144.28 | 0.58 |
| 1E1 | 1 | 1.472 | 772 | 1019.8 | 1022.1 | | 1022.4 | 0.007882 | 4.67 | 165.42 | 111.82 | 0.68 |
| 1E1 | 1 | 1.434 | 772 | 1018.8 | 1020.99 | | 1021.2 | 0.004821 | 3.6 | 214.67 | 146.71 | 0.52 |
| 1E1 | 1 | 1.396 | 772 | 1017.6 | 1019.98 | 1019.3 | 1020.2 | 0.004953 | 3.83 | 201.55 | 230.14 | 0.52 |
| 1E1 | 1 | 1.358 | 772 | 1016.3 | 1018.59 | | 1019 | 0.008149 | 4.76 | 162.11 | 96.83 | 0.65 |
| 1E1 | 1 | 1.321 | 772 | 1014.9 | 1017.21 | | 1017.4 | 0.006562 | 3.88 | 198.87 | 161.7 | 0.62 |
| 1E1 | 1 | 1.283 | 772 | 1014 | 1016.43 | | 1016.6 | 0.002886 | 3.2 | 241.6 | 129.78 | 0.41 |
| 1E1 | 1 | 1.245 | 772 | 1013.4 | 1015.7 | | 1015.9 | 0.004132 | 3.59 | 215.14 | 122.93 | 0.48 |
| 1E1 | 1 | 1.207 | 772 | 1012.6 | 1014.81 | | 1015 | 0.004646 | 3.73 | 206.97 | 128.12 | 0.52 |
| 1E1 | 1 | 1.169 | 772 | 1011.6 | 1013.58 | | 1013.8 | 0.008621 | 3.76 | 219.66 | 261.97 | 0.63 |
| 1E1 | 1 | 1.131 | 772 | 1010.4 | 1012.5 | | 1012.6 | 0.003937 | 2.91 | 265.5 | 197.41 | 0.44 |
| 1E1 | 1 | 1.093 | 772 | 1010 | 1011.56 | | 1011.7 | 0.005367 | 3.09 | 250.13 | 213.77 | 0.5 |
| 1E1 | 1 | 1.052 | 772 | 1008.9 | 1010.36 | | 1010.5 | 0.005836 | 3.18 | 242.65 | 211.09 | 0.52 |
| 1E1 | 1 | 1.008 | 772 | 1007.7 | 1009.35 | | 1009.5 | 0.003584 | 2.52 | 306.54 | 272.67 | 0.42 |
| 1E1 | 1 | 0.968 | 772 | 1006.9 | 1008.35 | | 1008.5 | 0.005985 | 3.05 | 253.18 | 231.6 | 0.51 |
| 1E1 | 1 | 0.929 | 772 | 1005.9 | 1007.33 | | 1007.5 | 0.004262 | 2.86 | 282.06 | 296.77 | 0.47 |
| 1E1 | 1 | 0.89 | 772 | 1004.6 | 1006.39 | | 1006.6 | 0.004397 | 3.24 | 237.95 | 182.46 | 0.5 |
| 1E1 | 1 | 0.852 | 772 | 1003.7 | 1005.46 | | 1005.6 | 0.005092 | 3.13 | 246.43 | 219.06 | 0.52 |
| 1E1 | 1 | 0.814 | 772 | 1003.1 | 1004.45 | | 1004.6 | 0.005025 | 2.98 | 258.84 | 235.12 | 0.5 |
| 1E1 | 1 | 0.777 | 772 | 1002.2 | 1003.81 | | 1003.9 | 0.002462 | 2.3 | 336.38 | 276.34 | 0.37 |
| 1E1 | 1 | 0.739 | 772 | 1000.8 | 1003.04 | | 1003.2 | 0.005513 | 3 | 257.31 | 163.79 | 0.42 |
| 1E1 | 1 | 0.701 | 772 | 1000.1 | 1002.01 | | 1002.1 | 0.004934 | 2.89 | 266.75 | 170.46 | 0.41 |
| 1E1 | 1 | 0.663 | 772 | 999.36 | 1001.16 | | 1001.3 | 0.003909 | 2.52 | 305.85 | 234.89 | 0.39 |
| 1E1 | 1 | 0.625 | 772 | 997.84 | 1000.34 | 999.55 | 1000.5 | 0.003966 | 2.85 | 270.48 | 171.32 | 0.4 |
| 1E1 | 1 | 0.587 | 772 | 997.22 | 999.18 | 998.61 | 999.35 | 0.008267 | 3.32 | 232.56 | 234.7 | 0.49 |
| 1E1 | 1 | 0.549 | 772 | 996.07 | 997.78 | | 997.92 | 0.006192 | 2.98 | 259.49 | 196.93 | 0.46 |
| 1E1 | 1 | 0.511 | 772 | 994.58 | 996.69 | | 996.81 | 0.004973 | 2.74 | 281.93 | 194.89 | 0.4 |
| 1E1 | 1 | 0.474 | 772 | 993.8 | 995.53 | 994.97 | 995.66 | 0.006687 | 2.9 | 266.47 | 230.26 | 0.45 |
| 1E1 | 1 | 0.436 | 772 | 992.37 | 993.76 | | 993.93 | 0.011617 | 3.39 | 227.97 | 208.39 | 0.57 |
| 1E1 | 1 | 0.398 | 772 | 990.83 | 992.37 | | 992.46 | 0.004918 | 2.32 | 332.31 | 299.43 | 0.39 |
| 1E1 | 1 | 0.359 | 772 | 990 | 991.17 | | 991.27 | 0.006832 | 2.6 | 297.63 | 342.56 | 0.48 |
| 1E1 | 1 | 0.319 | 772 | 988.16 | 989.93 | | 990.06 | 0.004973 | 2.95 | 261.79 | 286.58 | 0.54 |
| 1E1 | 1 | 0.293 | 772 | 987.23 | 989.3 | | 989.45 | 0.00385 | 3.06 | 252 | 203.65 | 0.49 |

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E1 | 1 | 0.254 | 772 | 986.34 | 988.32 | | 988.44 | 0.006233 | 2.83 | 272.88 | 214.35 | 0.44 |
| 1E1 | 1 | 0.216 | 772 | 985.47 | 987.4 | | 987.49 | 0.003665 | 2.3 | 338.38 | 262.28 | 0.34 |
| 1E1 | 1 | 0.178 | 772 | 984.61 | 986.31 | | 986.53 | 0.006348 | 3.8 | 203.22 | 172.39 | 0.62 |
| 1E1 | 1 | 0.141 | 772 | 983.8 | 985.41 | | 985.54 | 0.003888 | 3.16 | 279.53 | 318.22 | 0.49 |
| 1E1 | 1 | 0.102 | 772 | 981.93 | 984.28 | | 984.51 | 0.006541 | 3.91 | 197.7 | 168.96 | 0.63 |
| 1E1 | 1 | 0.062 | 772 | 979.57 | 983.01 | | 983.27 | 0.00531 | 4.13 | 186.94 | 120.73 | 0.58 |
| 3E | 1 | 1.553 | 758 | 975.75 | 980.26 | | 980.55 | 0.0043 | 4.33 | 175.07 | 61.04 | 0.45 |
| 3E | 1 | 1.515 | 758 | 975.25 | 978.87 | 978.15 | 979.38 | 0.008237 | 5.72 | 132.47 | 166.36 | 0.65 |
| 3E | 1 | 1.478 | 758 | 974.47 | 978.71 | 976.45 | 978.78 | 0.001093 | 2.1 | 361.17 | 171 | 0.23 |
| 3E | 1 | 1.44 | 758 | 972.65 | 978.71 | 974.05 | 978.72 | 0.000082 | 0.83 | 916.39 | 269.12 | 0.07 |
| 3E | 1 | 1.421 | 758 | 971.21 | 978.7 | | 978.71 | 0.000041 | 0.76 | 1079.68 | 188.72 | 0.05 |
| 3E | 1 | 1.402 | 758 | 971.23 | 978.69 | | 978.71 | 0.000059 | 1.13 | 869.63 | 305.76 | 0.08 |
| 3E | 1 | 1.378 | 758 | 969.69 | 978.69 | 971.48 | 978.7 | 0.000012 | 0.52 | 1702.8 | 295.77 | 0.03 |
| 3E | 1 | 1.359 | Inl Struct | | | | | | | | | |
| 3E | 1 | 1.326 | 758 | 964.75 | 967.85 | | 968.02 | 0.003915 | 3.41 | 231.39 | 160.13 | 0.45 |
| 3E | 1 | 1.288 | 758 | 963.35 | 965.76 | 965.74 | 966.37 | 0.021149 | 6.26 | 121.03 | 96.54 | 0.99 |
| 3E | 1 | 1.25 | 758 | 960.53 | 964.36 | | 964.57 | 0.004428 | 4.05 | 219.06 | 150.03 | 0.49 |
| 3E | 1 | 1.213 | 758 | 959.99 | 962.5 | 962.44 | 962.99 | 0.016935 | 5.96 | 138.71 | 119.94 | 0.9 |
| 3E | 1 | 1.175 | 758 | 957.5 | 960.29 | | 960.49 | 0.008858 | 3.86 | 217.9 | 227.9 | 0.63 |
| 3E | 1 | 1.137 | 758 | 956.46 | 958.91 | | 959.08 | 0.005667 | 3.73 | 240.21 | 226.38 | 0.53 |
| 3E | 1 | 1.099 | 758 | 955.19 | 957.42 | | 957.71 | 0.009189 | 4.88 | 189.32 | 174.24 | 0.68 |
| 3E | 1 | 1.061 | 758 | 952.35 | 956.25 | | 956.45 | 0.004442 | 3.92 | 226.35 | 166.48 | 0.49 |
| 3E | 1 | 1.023 | 758 | 951.49 | 955.09 | 954.5 | 955.4 | 0.006243 | 4.6 | 178.06 | 118.04 | 0.58 |
| 3E | 1 | 0.985 | 758 | 950.08 | 953.47 | 953.06 | 953.74 | 0.011327 | 4.44 | 186.72 | 127.29 | 0.59 |
| 3E | 1 | 0.948 | 758 | 949.22 | 951.95 | 951.27 | 952.07 | 0.00585 | 2.92 | 278.38 | 201.69 | 0.41 |
| 3E | 1 | 0.91 | 758 | 948.55 | 950.44 | | 950.6 | 0.009743 | 3.33 | 252.16 | 259.77 | 0.52 |
| 3E | 1 | 0.872 | 758 | 946.4 | 948.6 | | 948.75 | 0.00859 | 3.47 | 254.02 | 225.11 | 0.5 |
| 3E | 1 | 0.834 | 758 | 944.2 | 946.84 | 946.43 | 947.01 | 0.008834 | 3.8 | 238.78 | 199.9 | 0.52 |
| 3E | 1 | 0.796 | 758 | 942.92 | 945.39 | | 945.48 | 0.006229 | 3.09 | 321.46 | 316.96 | 0.43 |
| 3E | 1 | 0.758 | 758 | 940.79 | 943.89 | | 944.04 | 0.008282 | 3.62 | 264.67 | 254.69 | 0.5 |
| 3E | 1 | 0.72 | 758 | 940.27 | 942.5 | | 942.57 | 0.006367 | 2.78 | 366.3 | 458.71 | 0.42 |
| 3E | 1 | 0.682 | 758 | 938.56 | 941.04 | 940.75 | 941.16 | 0.008217 | 3.55 | 313.83 | 404.29 | 0.49 |
| 3E | 1 | 0.645 | 758 | 936.61 | 939.58 | | 939.68 | 0.006585 | 2.94 | 314.41 | 330.92 | 0.43 |
| 3E | 1 | 0.607 | 758 | 935.34 | 938.26 | | 938.38 | 0.00636 | 2.93 | 271.44 | 205.38 | 0.43 |
| 3E | 1 | 0.569 | 758 | 934.96 | 937.15 | | 937.26 | 0.005166 | 2.83 | 293.59 | 215.46 | 0.39 |
| 3E | 1 | 0.531 | 758 | 933.64 | 935.87 | | 936.05 | 0.007727 | 3.72 | 226.37 | 149.78 | 0.49 |
| 3E | 1 | 0.493 | 758 | 932.49 | 934.11 | | 934.25 | 0.009937 | 3.07 | 256.47 | 246.19 | 0.51 |
| 3E | 1 | 0.455 | 758 | 930.91 | 932.28 | | 932.37 | 0.009027 | 2.49 | 322.07 | 449.19 | 0.47 |
| 3E | 1 | 0.418 | 758 | 929.91 | 930.86 | 930.48 | 930.92 | 0.005956 | 2.07 | 377.21 | 520.12 | 0.4 |
| 3E | 1 | 0.379 | 758 | 927.99 | 929.33 | | 929.44 | 0.009624 | 2.84 | 305.64 | 441.89 | 0.5 |
| 3E | 1 | 0.299 | 758 | 925.61 | 926.64 | | 926.68 | 0.004516 | 1.94 | 466.88 | 787.26 | 0.38 |
| 3E | 1 | 0.229 | 758 | 923.45 | 924.26 | 924.07 | 924.33 | 0.009689 | 2.36 | 362.55 | 766.13 | 0.53 |
| 3E | 1 | 0.167 | 758 | 921.81 | 922.87 | | 922.9 | 0.002469 | 1.39 | 604.98 | 994.45 | 0.28 |
| 3E | 1 | 0.089 | 758 | 920.48 | 921.26 | 921.06 | 921.31 | 0.007004 | 1.75 | 455.86 | 1028.84 | 0.43 |

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4E | 3 | 3.71 | 500 | 1031.7 | 1033.74 | | 1034 | 0.012721 | 4.22 | 129.1 | 191.77 | 0.74 |
| 4E | 3 | 3.673 | 500 | 1030.5 | 1032.5 | | 1032.6 | 0.004177 | 2.59 | 193.27 | 180.92 | 0.44 |
| 4E | 3 | 3.635 | 500 | 1029.3 | 1031.41 | | 1031.6 | 0.006707 | 3.17 | 159.64 | 166.69 | 0.55 |
| 4E | 3 | 3.602 | 500 | 1028.2 | 1030.41 | | 1030.6 | 0.005022 | 3.04 | 164.49 | 148.67 | 0.51 |
| 4E | 3 | 3.56 | 500 | 1027.4 | 1028.83 | | 1029 | 0.010273 | 3.46 | 144.77 | 186.5 | 0.68 |
| 4E | 3 | 3.522 | 500 | 1026 | 1027.45 | | 1027.6 | 0.005353 | 2.58 | 194.09 | 224.15 | 0.49 |
| 4E | 3 | 3.485 | 500 | 1024.8 | 1026.37 | | 1026.5 | 0.005377 | 2.85 | 175.18 | 171.24 | 0.5 |
| 4E | 3 | 3.448 | 500 | 1023.7 | 1025.1 | 1024.8 | 1025.3 | 0.007633 | 3.22 | 166.27 | 199.75 | 0.57 |
| 4E | 3 | 3.41 | 500 | 1022.1 | 1023.8 | | 1023.9 | 0.005714 | 2.9 | 193 | 246.49 | 0.5 |
| 4E | 3 | 3.372 | 500 | 1020.6 | 1022.53 | 1022.3 | 1022.7 | 0.007123 | 3.86 | 163.29 | 218.23 | 0.58 |
| 4E | 3 | 3.335 | 500 | 1019.8 | 1021.26 | | 1021.4 | 0.006163 | 2.92 | 185.53 | 241.73 | 0.51 |
| 4E | 3 | 3.297 | 500 | 1018.2 | 1019.57 | 1019.5 | 1019.7 | 0.01171 | 3.45 | 161.39 | 277.44 | 0.68 |
| 4E | 3 | 3.26 | 500 | 1016.8 | 1018.04 | 1017.7 | 1018.1 | 0.005691 | 2.49 | 209.54 | 292.65 | 0.48 |
| 4E | 3 | 3.222 | 500 | 1014.8 | 1016.81 | | 1017 | 0.005663 | 3.45 | 154.18 | 140.14 | 0.54 |
| 4E | 3 | 3.184 | 500 | 1013.9 | 1015.73 | | 1015.9 | 0.005412 | 3.42 | 181.85 | 222.19 | 0.51 |
| 4E | 3 | 3.147 | 500 | 1012.8 | 1014.56 | | 1014.7 | 0.00719 | 3.43 | 165.14 | 211.23 | 0.57 |
| 4E | 3 | 3.11 | 500 | 1011.5 | 1013.6 | | 1013.7 | 0.00379 | 2.9 | 212.45 | 239.45 | 0.43 |
| 4E | 3 | 3.072 | 500 | 1010.1 | 1012.63 | 1012.3 | 1012.8 | 0.006485 | 3.57 | 149.39 | 141.2 | 0.56 |
| 4E | 3 | 3.036 | 500 | 1008.7 | 1011.55 | 1010.8 | 1011.8 | 0.004693 | 3.61 | 139.98 | 95.52 | 0.49 |
| 4E | 3 | 2.998 | 500 | 1007.4 | 1010.44 | 1010.2 | 1010.7 | 0.006479 | 4.21 | 152.73 | 174.51 | 0.57 |
| 4E | 3 | 2.96 | 500 | 1006.8 | 1008.89 | 1008.6 | 1009.1 | 0.009434 | 3.71 | 140.48 | 165.05 | 0.65 |
| 4E | 3 | 2.923 | 500 | 1004.6 | 1007.14 | | 1007.4 | 0.007983 | 4.04 | 131.08 | 179.37 | 0.68 |
| 4E | 3 | 2.886 | 500 | 1003.9 | 1005.77 | 1005.7 | 1005.9 | 0.00694 | 2.99 | 220.16 | 484.69 | 0.54 |
| 4E | 3 | 2.848 | 500 | 1002.8 | 1004.51 | | 1004.6 | 0.006326 | 2.64 | 237.95 | 508.96 | 0.51 |
| 4E | 3 | 2.81 | 500 | 1001.9 | 1002.99 | 1002.8 | 1003.1 | 0.009052 | 2.72 | 192.1 | 355.67 | 0.58 |
| 4E | 3 | 2.772 | 500 | 999.87 | 1001.42 | | 1001.5 | 0.006241 | 2.52 | 184.88 | 221.42 | 0.5 |
| 4E | 3 | 2.735 | 500 | 998.33 | 1000.19 | | 1000.3 | 0.006883 | 3.09 | 174.35 | 207.11 | 0.54 |
| 4E | 3 | 2.697 | 500 | 997.02 | 998.69 | | 998.86 | 0.006978 | 3.6 | 161.25 | 191.56 | 0.57 |
| 4E | 3 | 2.659 | 500 | 995.66 | 997.43 | | 997.56 | 0.006322 | 3.14 | 172.87 | 190.26 | 0.55 |
| 4E | 3 | 2.622 | 500 | 994.72 | 996.29 | | 996.43 | 0.005125 | 3.12 | 170.65 | 163.3 | 0.49 |
| 4E | 3 | 2.584 | 500 | 993.44 | 994.95 | | 995.13 | 0.008526 | 3.7 | 150.07 | 181.62 | 0.62 |
| 4E | 3 | 2.546 | 500 | 992.17 | 993.8 | | 993.91 | 0.004335 | 2.86 | 192.69 | 198.68 | 0.46 |
| 4E | 3 | 2.508 | 500 | 990.44 | 992.18 | 992.12 | 992.47 | 0.014334 | 4.64 | 121.44 | 154.16 | 0.81 |
| 4E | 3 | 2.47 | 500 | 989.54 | 991.02 | | 991.08 | 0.00378 | 2.37 | 244.54 | 332.02 | 0.41 |
| 4E | 3 | 2.433 | 500 | 988.08 | 990.08 | | 990.18 | 0.006083 | 3.04 | 197.14 | 265.8 | 0.51 |
| 4E | 3 | 2.395 | 929 | 986.85 | 988.6 | | 988.73 | 0.007884 | 2.97 | 335.71 | 332.73 | 0.46 |
| 4E | 3 | 2.362 | 929 | 985.99 | 987.47 | | 987.55 | 0.006391 | 1.97 | 415.84 | 450.38 | 0.39 |
| 4E | 3 | 2.324 | 929 | 984.67 | 986.17 | | 986.25 | 0.006229 | 2.26 | 425.87 | 488.46 | 0.4 |
| 4E | 3 | 2.287 | 929 | 983.74 | 984.94 | | 985.01 | 0.005687 | 1.9 | 429.82 | 447.52 | 0.38 |
| 4E | 3 | 2.249 | 929 | 981.96 | 983.63 | | 983.72 | 0.007351 | 2.77 | 381.29 | 394.14 | 0.46 |
| 4E | 3 | 2.211 | 929 | 981.09 | 982.32 | | 982.4 | 0.005743 | 2.31 | 415.92 | 433.44 | 0.39 |
| 4E | 3 | 2.171 | 929 | 979.71 | 981.12 | | 981.2 | 0.005846 | 2.31 | 416.59 | 467.28 | 0.39 |
| 4E | 3 | 2.132 | 929 | 978.23 | 979.99 | | 980.08 | 0.005128 | 2.49 | 413.99 | 404.82 | 0.38 |
| 4E | 3 | 2.093 | 929 | 976.84 | 978.55 | 978.22 | 978.69 | 0.009474 | 3.14 | 314.25 | 332.82 | 0.52 |

| Tributary | River Reach | Sta | Q Total (cfs) | Min Ch Elev (ft) | W.S. Elev (ft) | Crit.W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Ch (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4E | 3 | 2.055 | 929 | 974.12 | 977.2 | | 977.3 | 0.005147 | 2.83 | 403.32 | 479.48 | 0.44 |
| 4E | 3 | 2.017 | 929 | 974.39 | 976.34 | | 976.4 | 0.004042 | 2.26 | 491.25 | 645.96 | 0.38 |
| 4E | 2 | 1.965 | 299 | 971.56 | 974.41 | | 974.54 | 0.010062 | 3 | 122.66 | 325.01 | 0.62 |
| 4E | 2 | 1.927 | 299 | 970.67 | 973.53 | | 973.58 | 0.002629 | 1.96 | 182.58 | 217.42 | 0.31 |
| 4E | 2 | 1.889 | 299 | 970.51 | 972.39 | 972.27 | 972.57 | 0.012799 | 3.72 | 95.26 | 135.68 | 0.66 |
| 4E | 2 | 1.855 | 299 | 969.32 | 970.06 | 969.89 | 970.13 | 0.012005 | 2.05 | 136.3 | 288.73 | 0.55 |
| 4E | 2 | 1.793 | 299 | 967.04 | 968.14 | | 968.19 | 0.003879 | 1.97 | 176.65 | 311 | 0.36 |
| 4E | 2 | 1.751 | 299 | 965.65 | 966.6 | 966.5 | 966.72 | 0.016461 | 3 | 114.2 | 303.58 | 0.68 |
| 4E | 2 | 1.7 | 299 | 964.32 | 965.24 | | 965.27 | 0.002895 | 1.45 | 227.71 | 394.36 | 0.3 |
| 4E | 2 | 1.662 | 299 | 962.84 | 964.08 | 964 | 964.18 | 0.015167 | 2.97 | 135.29 | 323.21 | 0.59 |
| 4E | 2 | 1.597 | 299 | 960.53 | 961.46 | 961.21 | 961.48 | 0.004194 | 1.19 | 284.48 | 671.18 | 0.29 |
| 4E | 2 | 1.521 | 299 | 956.99 | 957.43 | 957.43 | 957.55 | 0.040869 | 2.86 | 118.01 | 539.16 | 0.85 |
| 4E | 2 | 1.452 | 299 | 953.59 | 954.64 | 954.05 | 954.65 | 0.001292 | 1.01 | 409.28 | 784.92 | 0.18 |
| 4E | 1 | 1.238 | 1351 | 947 | 949.08 | 948.69 | 949.18 | 0.008583 | 2.66 | 536.32 | 645.3 | 0.47 |
| 4E | 1 | 1.153 | 1351 | 945.45 | 947.05 | 946.51 | 947.1 | 0.002955 | 1.96 | 723.05 | 788.1 | 0.34 |
| 4E1 | 2 | 0.647 | 630 | 973.09 | 974.47 | | 974.56 | 0.005597 | 2.47 | 264.61 | 293.89 | 0.44 |
| 4E1 | 2 | 0.606 | 630 | 971.61 | 972.72 | 972.58 | 972.84 | 0.012751 | 2.86 | 235.46 | 438.99 | 0.62 |
| 4E1 | 2 | 0.562 | 630 | 969.27 | 970.77 | 970.46 | 970.87 | 0.005892 | 2.68 | 273.75 | 366.51 | 0.45 |
| 4E1 | 2 | 0.513 | 630 | 966.45 | 968.63 | 968.46 | 968.8 | 0.011695 | 3.47 | 201.68 | 278.83 | 0.62 |
| 4E1 | 2 | 0.447 | 630 | 964.82 | 966.57 | | 966.63 | 0.003728 | 1.98 | 353.84 | 440.59 | 0.35 |
| 4E1 | 2 | 0.379 | 630 | 962.81 | 964.65 | 964.25 | 964.78 | 0.006903 | 2.85 | 232.27 | 291.16 | 0.49 |
| 4E1 | 2 | 0.322 | 630 | 961.19 | 963.01 | 962.56 | 963.13 | 0.004488 | 2.82 | 245.54 | 299.74 | 0.45 |
| 4E1 | 1 | 0.201 | 1052 | 956.47 | 957.94 | 957.69 | 958.11 | 0.013666 | 4.07 | 329.79 | 386.18 | 0.7 |
| 4E1 | 1 | 0.125 | 1052 | 952.05 | 954.34 | | 954.44 | 0.006502 | 2.94 | 445.18 | 485.31 | 0.43 |
| 4E1 | 1 | 0.065 | 1052 | 950.4 | 952.61 | | 952.67 | 0.004799 | 2.52 | 533.79 | 557.76 | 0.37 |
| 4E2 | 1 | 0.281 | 422 | 971.63 | 973.68 | 973.52 | 973.88 | 0.017748 | 3.71 | 125.98 | 192.62 | 0.67 |
| 4E2 | 1 | 0.229 | 422 | 969.61 | 970.53 | 970.19 | 970.62 | 0.008436 | 1.78 | 183.9 | 266.91 | 0.42 |
| 4E2 | 1 | 0.172 | 422 | 966.48 | 967.65 | 967.4 | 967.75 | 0.010938 | 2.88 | 174.32 | 247.12 | 0.52 |
| 4E2 | 1 | 0.132 | 422 | 965.09 | 965.88 | 965.52 | 965.94 | 0.006175 | 1.77 | 223.27 | 297.99 | 0.37 |

**Table 5-3 HEC-RAS Culvert Results Summary**

| Tributary | Reach | River Sta (ft) | Culvert | E.G. US (ft) | W.S US (ft) | E.G. IC (ft) | E.G OC (ft) | Min El Weir Flow (ft) | Q Culvert Group (cfs) | Q Weir (cfs) | Delta WS Culv (ft) | Vel US Culv (ft/s) | Vel DS Culv (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | 1 | 2.438 | #1 | 933.41 | 933.32 | 933.4 | 933.4 | 930.05 | 5.07 | 1834.9 | 0 | 1.61 | 1.61 |
| 1E | 1 | 1.323 | #2 | 902.02 | 901.9 | 902 | 902 | 899.75 | 16.44 | 1820.4 | 0.99 | 5.23 | 5.23 |

**Table 5-4 *HEC-RAS* In-Line Weir Results Summary**

| Tributary | Reach | River Sta (ft) | E.G. Elev (ft) | W.S. Elev (ft) | Q Total (cfs) | Q Weir (cfs) |
|---|---|---|---|---|---|---|
| 3E | 1 | 1.359 | 978.7 | 978.69 | 758 | 758 |

### 5.9.2 Verification of Results

No effective model exists for the three tributaries studied; therefore a verification of the hydraulic results can not be provided.

# 6 Erosion and Sediment Transport

Not applicable for this study.

# 7 Draft FIS Report Data

## 7.1 Summary of Discharges

| Flooding Source and Location | Drainage Area (square miles) | Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance | 2-Percent-Annual-Chance | 1-Percent-Annual-Chance | 0.2-Percent-Annual-Chance |
|---|---|---|---|---|---|
| Hassayampa River, Tributary 1E | | | | | |
| At upstream limit of detailed study, Reach 2 | 1.22 | --[1] | --[1] | 713 | --[1] |
| At confluence of Tributary 1E1, Reach 1 | 3.53 | --[1] | --[1] | 1,840 | --[1] |
| At upstream limit of detailed study for Tributary 1E1, Reach 1 | 1.47 | --[1] | --[1] | 772 | --[1] |
| Hassayampa River, Tributary 3E | | | | | |
| At upstream limit of detailed study | 0.95 | --[1] | --[1] | 758 | --[1] |
| Hassayampa River, Tributary 4E | | | | | |
| At upstream limit of detailed study for Tributary 4E2, Reach 1 | 0.30 | --[1] | --[1] | 422 | --[1] |
| At upstream limit of detailed study for Tributary 4E, Reach 1 | 1.93 | --[1] | --[1] | 1,351 | --[1] |

[1] Data Not Available

## 7.2 Floodway Data

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| HASSAYAMPA RIVER TRIBUTARY 1E, R1 | | | | | | | | |
| A | 1,003 | 447 | 1,347 | 3.1 | 872.2 | 872.2 | 873.1 | 0.9 |
| B | 2,207 | 1,438 | 910 | 2.0 | 876.4 | 876.4 | 877.0 | 0.6 |
| C | 3,263 | 1,051 | 959 | 2.8 | 881.0 | 881.0 | 881.0 | 0.0 |
| D | 4,261 | 234 | 780 | 4.1 | 886.5 | 886.5 | 886.5 | 0.0 |
| E | 5,264 | 307 | 579 | 3.3 | 891.5 | 891.5 | 891.5 | 0.0 |
| F | 6,257 | 353 | 567 | 3.2 | 897.2 | 897.2 | 897.8 | 0.6 |
| G | 7,255 | 481 | 1,048 | 1.8 | 902.7 | 902.7 | 902.7 | 0.0 |
| H | 8,258 | 375 | 654 | 2.8 | 907.3 | 907.3 | 907.4 | 0.1 |
| I | 9,456 | 399 | 628 | 2.9 | 913.3 | 913.3 | 913.4 | 0.1 |
| J | 10,454 | 470 | 569 | 3.2 | 917.8 | 917.8 | 917.8 | 0.0 |
| K | 11,458 | 292 | 956 | 3.7 | 925.2 | 925.2 | 925.4 | 0.2 |
| L | 12,656 | 115 | 893 | 4.9 | 932.7 | 932.7 | 932.7 | 0.0 |
| M | 13,659 | 505 | 763 | 2.4 | 938.3 | 938.3 | 939.3 | 1.0 |
| N | 14,657 | 132 | 495 | 3.7 | 942.8 | 942.8 | 943.1 | 0.3 |
| O | 15,692 | 827 | 1,643 | 1.9 | 951.2 | 951.2 | 951.7 | 0.5 |
| P | 16,880 | 1,124 | 787 | 2.3 | 958.0 | 958.0 | 958.9 | 0.9 |

[1]Feet above confluence with Hassayampa River

TABLE 7-2

FEDERAL EMERGENCY MANAGEMENT AGENCY
**MARICOPA COUNTY, AZ**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**TRIBUTARY 1E**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| HASSAYAMPA RIVER TRIBUTARY 1E, R1 | | | | | | | | |
| Q | 17,883 | 747 | 896 | 2.1 | 963.7 | 963.7 | 963.9 | 0.2 |
| R | 18,881 | 353 | 631 | 2.9 | 968.2 | 968.2 | 968.3 | 0.1 |
| S | 20,101 | 580 | 941 | 2.0 | 975.6 | 975.6 | 975.6 | 0.0 |
| T | 21,099 | 329 | 632 | 4.1 | 980.2 | 980.2 | 981.0 | 0.8 |
| HASSAYAMPA RIVER TRIBUTARY 1E, R2 | | | | | | | | |
| A | 22,287 | 301 | 209 | 3.4 | 985.2 | 985.2 | 985.5 | 0.3 |
| B | 23,285 | 245 | 199 | 3.6 | 990.8 | 990.8 | 990.8 | 0.0 |
| C | 24,531 | 423 | 288 | 2.5 | 998.2 | 998.2 | 998.9 | 0.7 |
| D | 25,729 | 227 | 231 | 3.1 | 1,003.2 | 1,003.2 | 1,003.4 | 0.2 |
| E | 26,928 | 322 | 247 | 2.9 | 1,010.8 | 1,010.8 | 1,011.0 | 0.2 |
| F | 27,926 | 353 | 283 | 2.5 | 1,015.5 | 1,015.5 | 1,015.6 | 0.1 |
| G | 28,929 | 345 | 275 | 2.6 | 1,020.6 | 1,020.6 | 1,021.1 | 0.5 |
| H | 30,128 | 280 | 202 | 3.5 | 1,026.6 | 1,026.6 | 1,027.0 | 0.4 |
| I | 31,326 | 304 | 248 | 2.9 | 1,034.1 | 1,034.1 | 1,034.5 | 0.4 |

[1]Feet above confluence with Hassayampa River

TABLE 7-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**MARICOPA COUNTY, AZ**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**TRIBUTARY 1E**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| HASSAYAMPA RIVER TRIBUTARY 1E1, R1 | | | | | | | | |
| A | 327 | 121 | 187 | 4.1 | 9.83.0 | 983.0 | 983.4 | 0.4 |
| B | 1,547 | 204 | 252 | 3.1 | 989.3 | 989.3 | 989.3 | 0.0 |
| C | 2,698 | 195 | 282 | 2.7 | 996.7 | 996.7 | 996.7 | 0.0 |
| D | 3,701 | 170 | 267 | 2.9 | 1,002.0 | 1,002.0 | 1,002.0 | 0.0 |
| E | 4,699 | 182 | 238 | 3.2 | 1,006.4 | 1,006.4 | 1,006.4 | 0.0 |
| F | 5,771 | 214 | 250 | 3.1 | 1,011.6 | 1,011.6 | 1,011.6 | 0.0 |
| G | 6,774 | 130 | 242 | 3.2 | 1,016.4 | 1,016.4 | 1,016.4 | 0.0 |
| H | 7,973 | 144 | 200 | 3.9 | 1,023.6 | 1,023.6 | 1,023.6 | 0.0 |
| I | 8,971 | 136 | 177 | 4.4 | 1,029.7 | 1,029.7 | 1,029.7 | 0.0 |
| J | 9,974 | 153 | 204 | 3.8 | 1,036.6 | 1,036.6 | 1,036.9 | 0.3 |

[1]Feet above confluence with Tributary 1E

TABLE 7-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**MARICOPA COUNTY, AZ**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**TRIBUTARY 1E**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| HASSAYAMPA RIVER TRIBUTARY 3E | | | | | | | | |
| A | 470 | 1029 | 456 | 1.7 | 921.3 | 921.3 | 921.3 | 0.0 |
| B | 1,579 | 787 | 467 | 1.6 | 926.6 | 926.6 | 926.8 | 0.2 |
| C | 2,603 | 246 | 256 | 3.0 | 934.1 | 934.1 | 935.1 | 1.0 |
| D | 3,601 | 404 | 314 | 2.4 | 941.0 | 941.0 | 941.9 | 0.9 |
| E | 4,604 | 255 | 254 | 3.0 | 948.6 | 948.6 | 949.4 | 0.8 |
| F | 5,602 | 166 | 226 | 3.4 | 956.3 | 956.3 | 956.4 | 0.1 |
| G | 6,600 | 150 | 219 | 3.5 | 964.4 | 964.4 | 964.8 | 0.4 |
| H | 7,503 | 189 | 1,080 | 0.7 | 978.7 | 978.7 | 978.7 | 0.0 |
| I | 8,200 | 61 | 175 | 4.3 | 980.3 | 980.3 | 980.3 | 0.0 |

[1]Feet above confluence with Hassayampa River

TABLE 7-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**MARICOPA COUNTY, AZ**
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**TRIBUTARY 3E**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| HASSAYAMPA RIVER TRIBUTARY 4E, R1 | | | | | | | | |
| A | 6,537 | 645 | 536 | 2.5 | 949.1 | 949.1 | 949.3 | 0.2 |
| HASSAYAMPA RIVER TRIBUTARY 4E, R2 | | | | | | | | |
| A | 7,667 | 785 | 409 | 0.7 | 954.6 | 954.6 | 954.8 | 0.2 |
| B | 8,432 | 671 | 284 | 1.1 | 961.5 | 961.5 | 961.9 | 0.4 |
| C | 9,245 | 304 | 114 | 2.6 | 966.6 | 966.6 | 966.8 | 0.2 |
| D | 9,974 | 136 | 95 | 3.1 | 972.4 | 972.4 | 972.8 | 0.4 |
| HASSAYAMPA RIVER TRIBUTARY 4E, R3 | | | | | | | | |
| A | 11,051 | 333 | 314 | 3.0 | 978.6 | 978.6 | 978.9 | 0.3 |
| B | 12,075 | 448 | 430 | 2.2 | 984.9 | 984.9 | 984.9 | 0.0 |
| C | 12,846 | 266 | 197 | 2.5 | 990.1 | 990.1 | 991.0 | 0.9 |
| D | 13,644 | 182 | 150 | 3.3 | 995.0 | 995.0 | 995.4 | 0.4 |
| E | 14,636 | 221 | 185 | 2.7 | 1,001.4 | 1,001.4 | 1,002.2 | 0.8 |
| F | 15,433 | 179 | 131 | 3.8 | 1,007.1 | 1,007.1 | 1,007.3 | 0.2 |
| G | 16,421 | 239 | 212 | 2.4 | 1,013.6 | 1,013.6 | 1,014.0 | 0.4 |
| H | 17,408 | 277 | 161 | 3.1 | 1,019.6 | 1,019.6 | 1,019.6 | 0.0 |
| I | 18,205 | 200 | 166 | 3.0 | 1,025.1 | 1,025.1 | 1,025.2 | 0.1 |
| J | 19,393 | 181 | 193 | 2.6 | 1,032.5 | 1,032.5 | 1,032.5 | 0.0 |

[1]Feet above confluence with Hassayampa River

TABLE 7-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**MARICOPA COUNTY, AZ**

**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**TRIBUTARY 4E**

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|---|---|---|---|---|---|---|---|---|
| CROSS SECTION | DISTANCE[1] | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| HASSAYAMPA RIVER TRIBUTARY 4E1, R1 | | | | | | | | |
| A | 343 | 558 | 534 | 2.0 | 952.6 | 952.6 | 953.0 | 0.4 |
| B | 1,061 | 386 | 323 | 3.2 | 957.9 | 957.9 | 958.1 | 0.2 |
| HASSAYAMPA RIVER TRIBUTARY 4E1, R2 | | | | | | | | |
| A | 2,001 | 291 | 232 | 2.7 | 964.7 | 964.7 | 964.7 | 0.0 |
| B | 3,200 | 439 | 235 | 2.7 | 972.7 | 972.7 | 972.9 | 0.2 |
| HASSAYAMPA RIVER TRIBUTARY 4E2, R1 | | | | | | | | |
| A | 697 | 298 | 223 | 1.9 | 965.9 | 965.9 | 966.2 | 0.3 |
| B | 1,484 | 193 | 126 | 3.4 | 973.7 | 973.7 | 974.0 | 0.3 |

[1]Feet above confluence with Tributary 4E

TABLE 7-2

FEDERAL EMERGENCY MANAGEMENT AGENCY

**MARICOPA COUNTY, AZ**

**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**TRIBUTARY 4E**

## 7.3 Flood Profiles

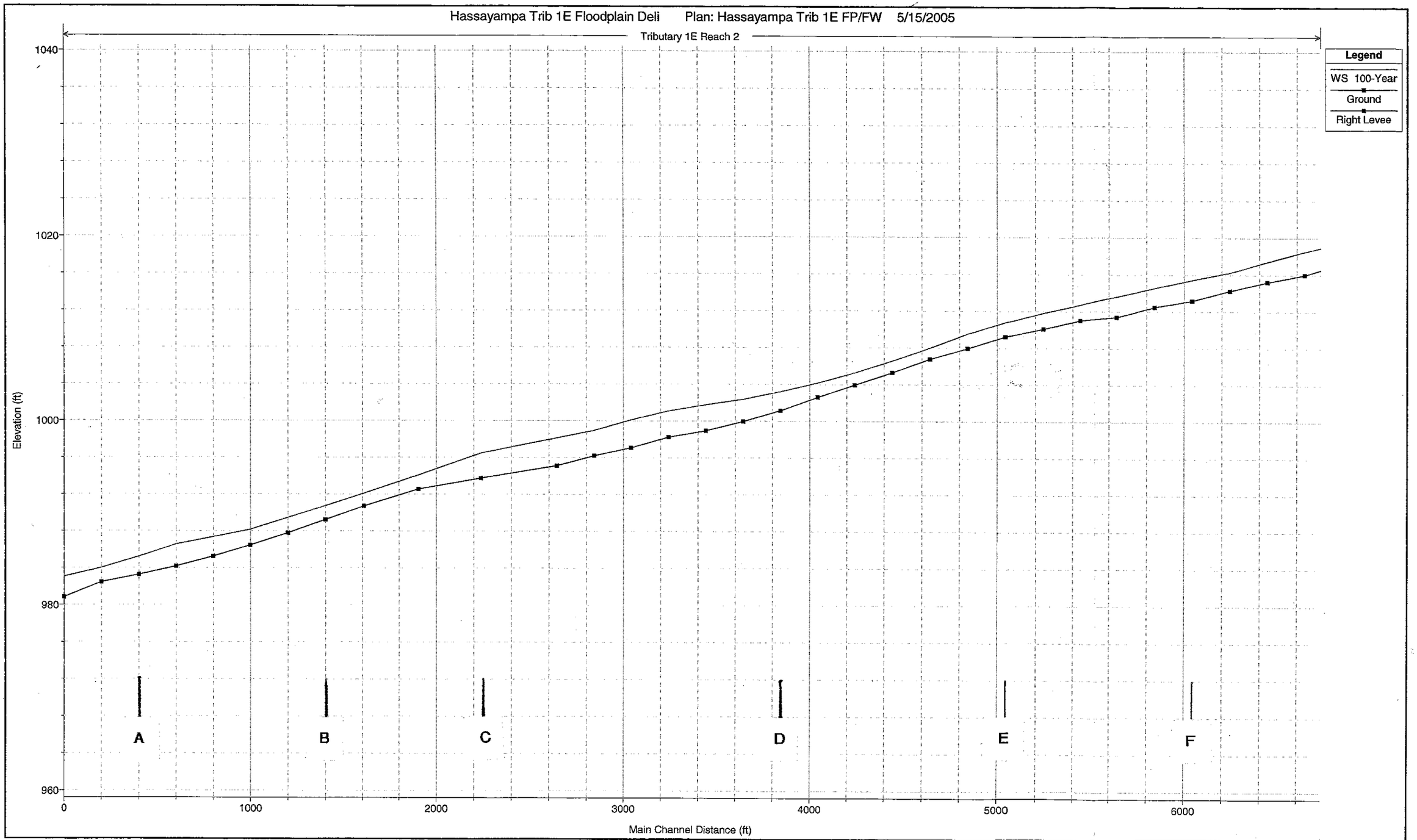
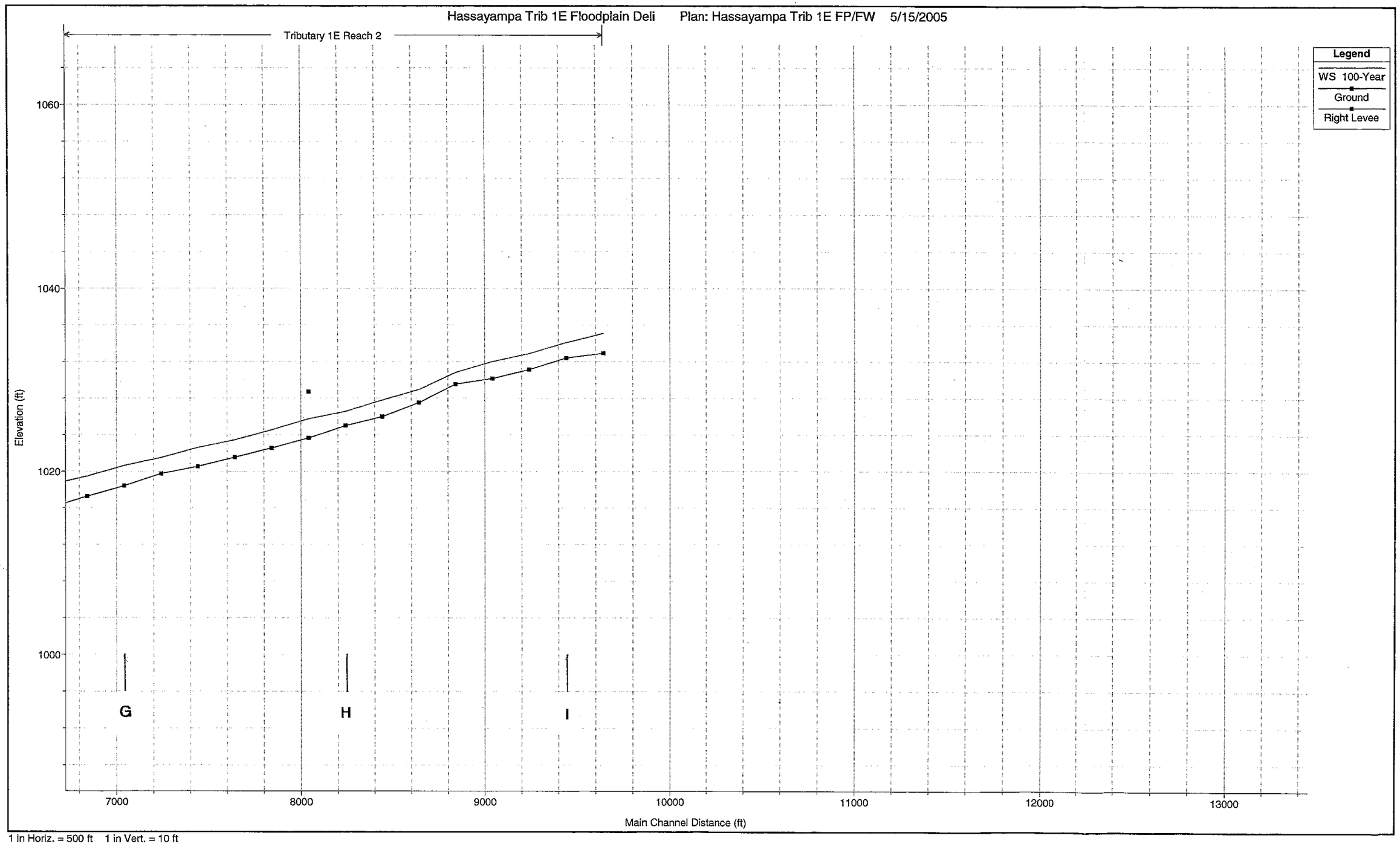
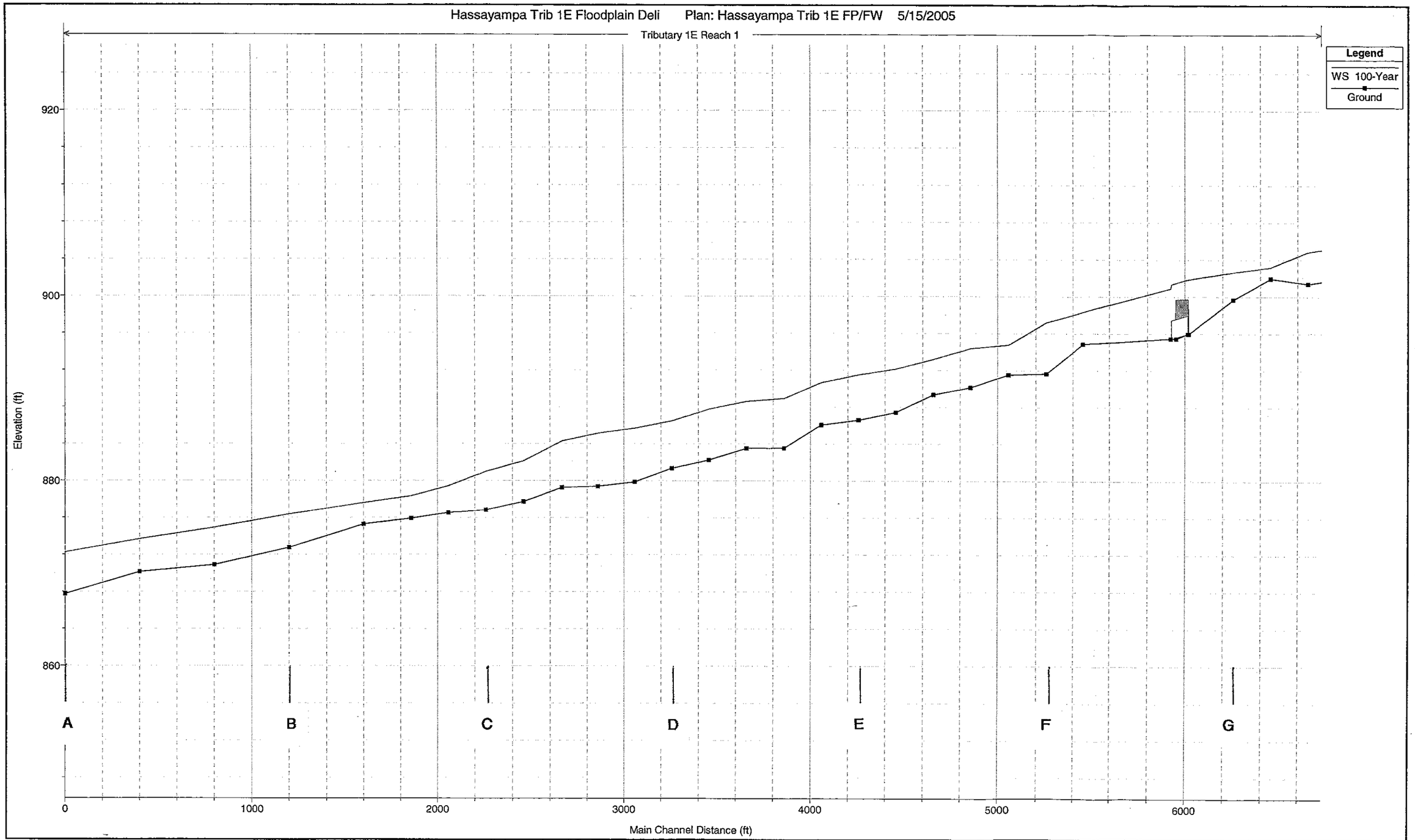

Hassayampa Trib 1E Floodplain Deli Plan: Hassayampa Trib 1E FP/FW 5/15/2005
Tributary 1E Reach 2
Legend
WS 100-Year
Ground
Right Levee
Elevation (ft)
1040
1020
1000
980
960
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)
A
B
C
D
E
F
1 in Horiz. = 500 ft 1 in Vert. = 10 ft

FIGURE 7–1

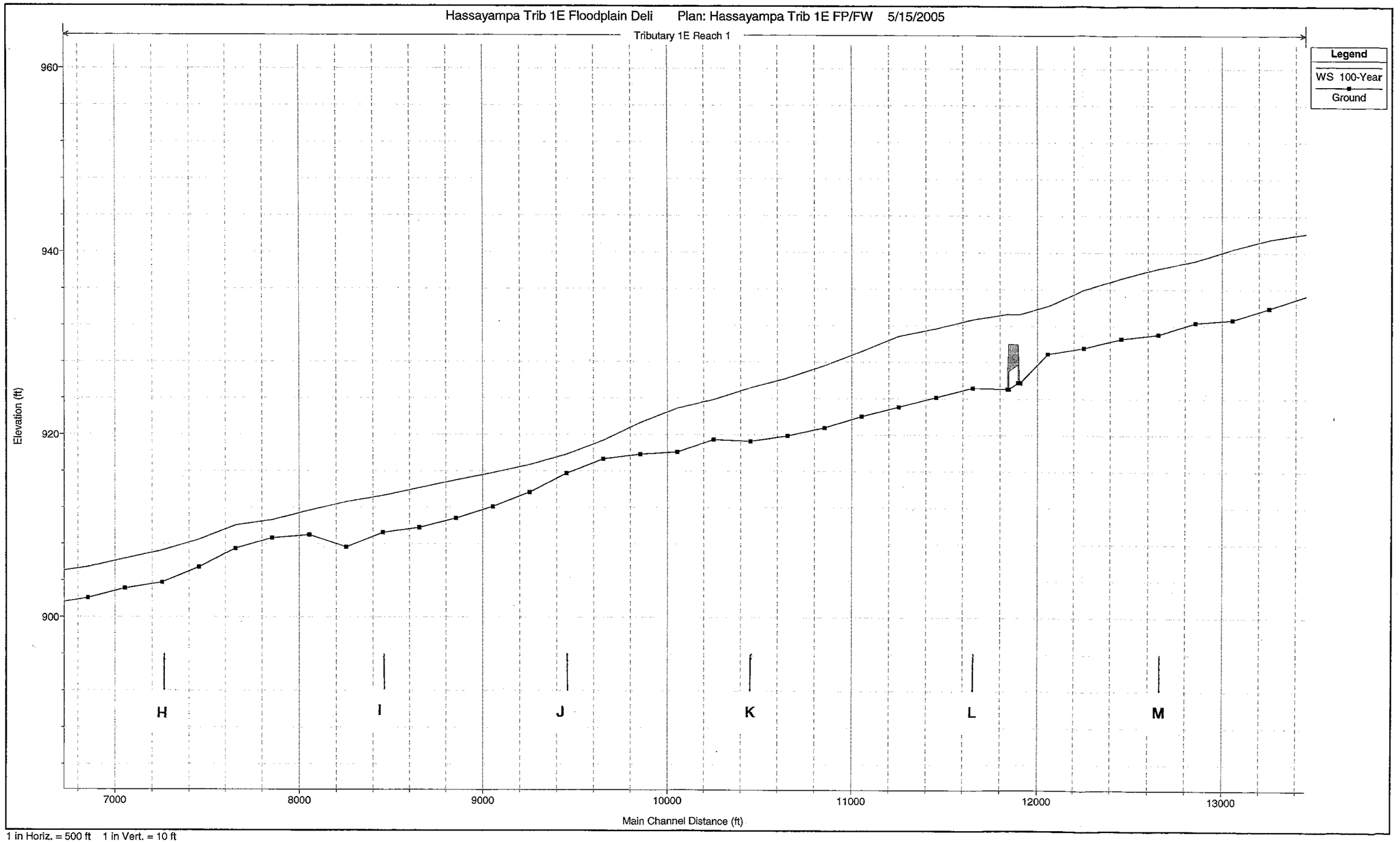



1 in Horiz. = 500 ft 1 in Vert. = 10 ft

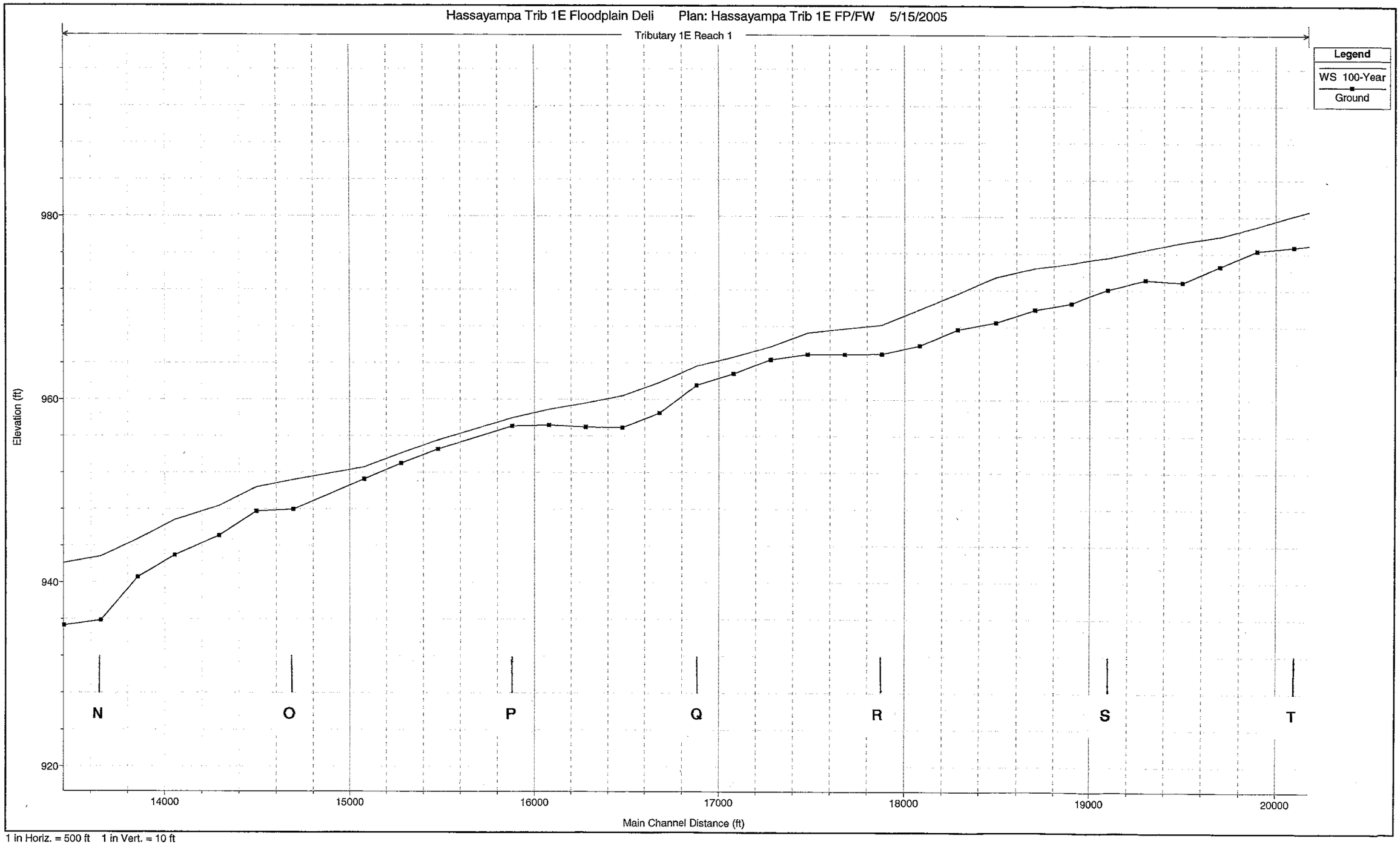



1 in Horiz. = 500 ft 1 in Vert. = 10 ft

FIGURE 7-2

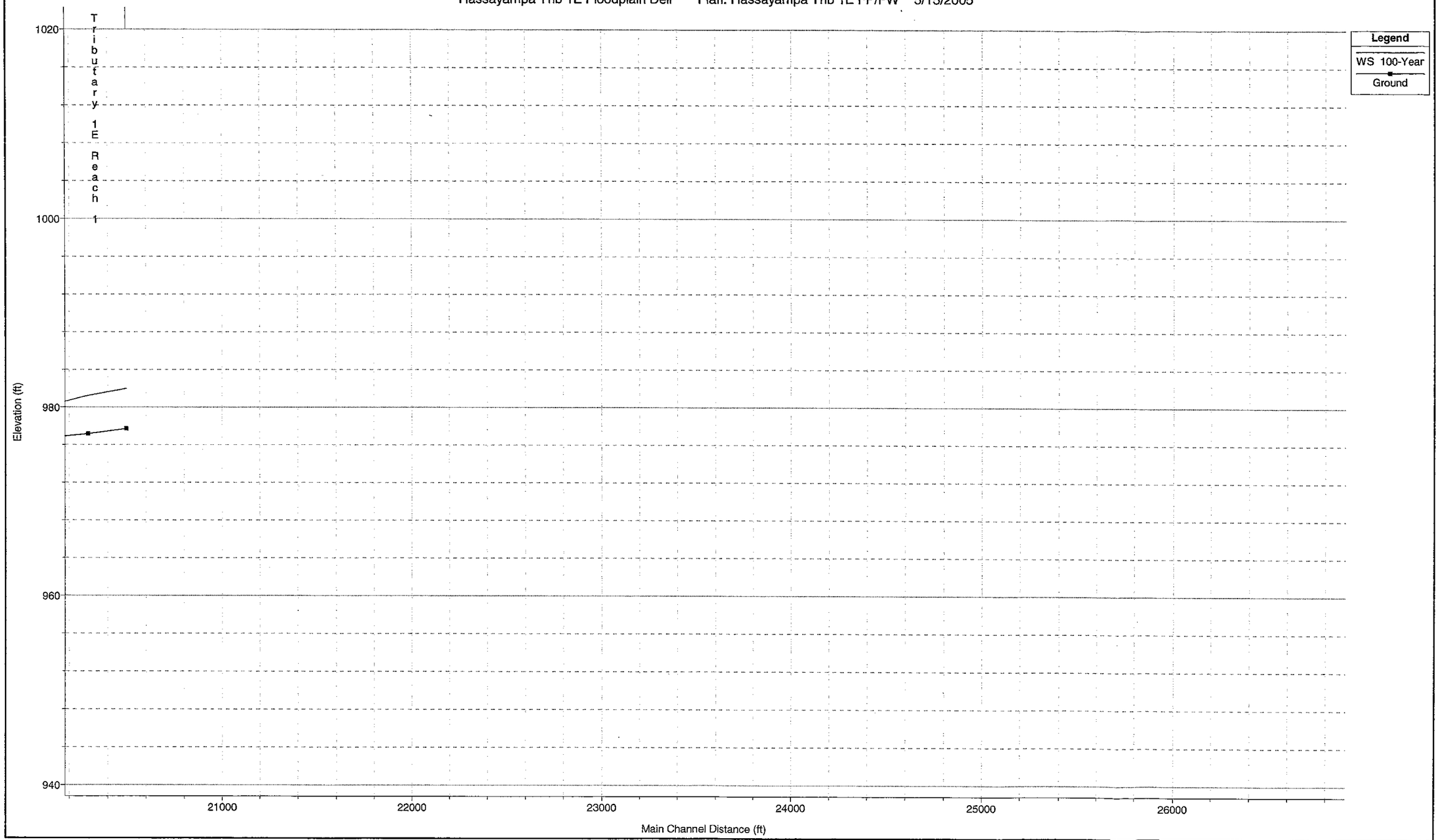



1 in Horiz. = 500 ft 1 in Vert. = 10 ft

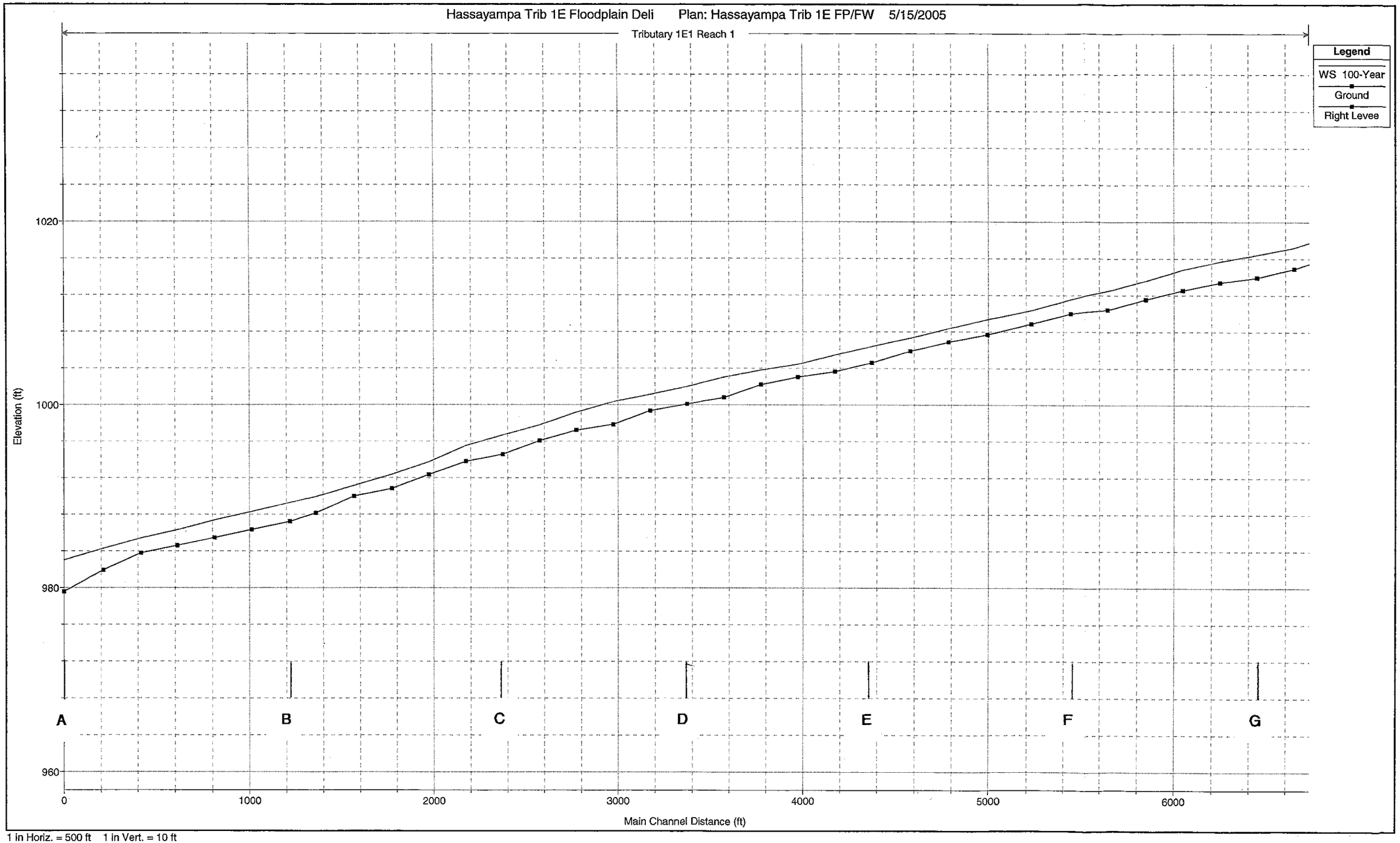



1 in Horiz. = 500 ft 1 in Vert. = 10 ft

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/15/2005

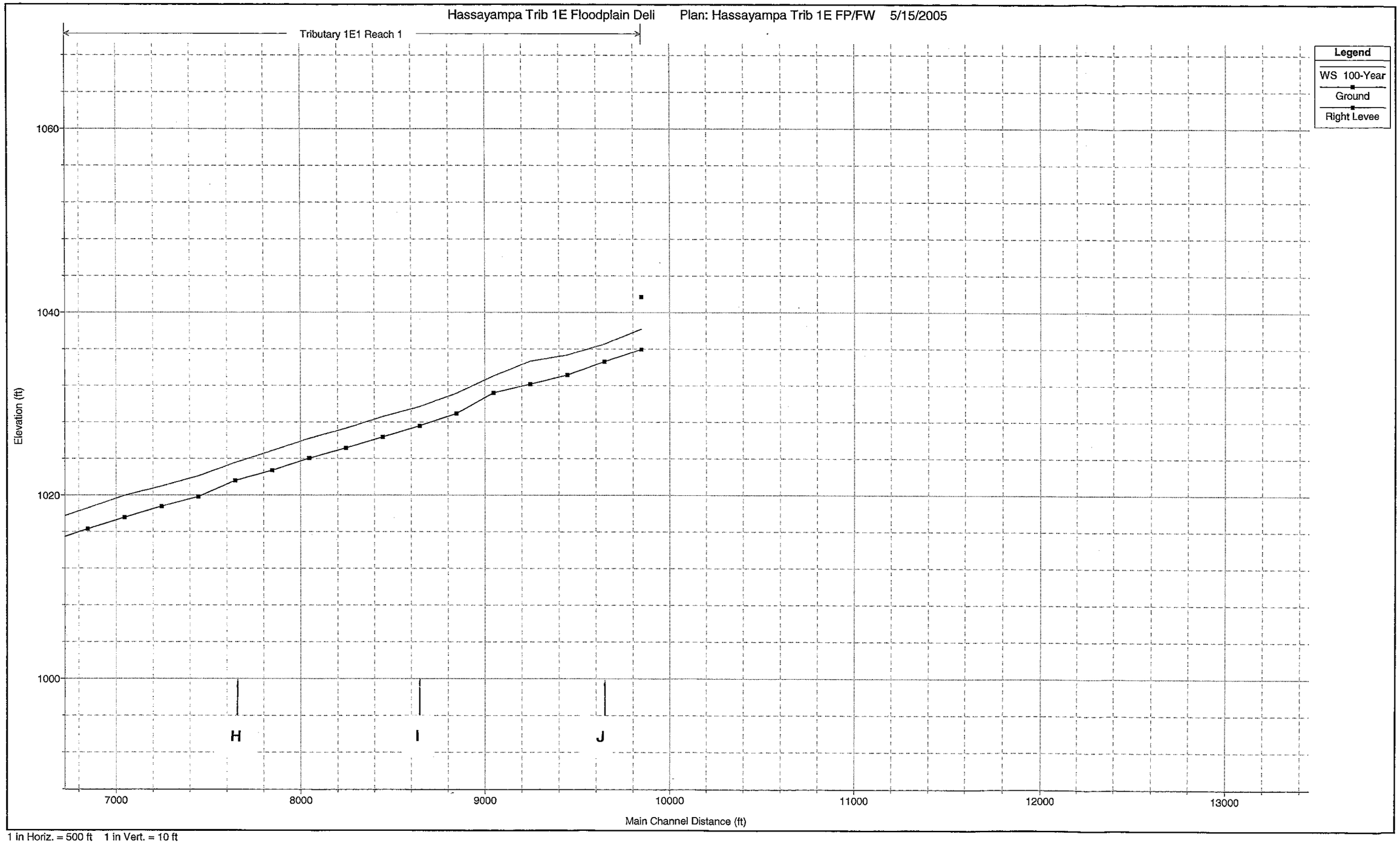



1 in Horiz. = 500 ft  1 in Vert. = 10 ft

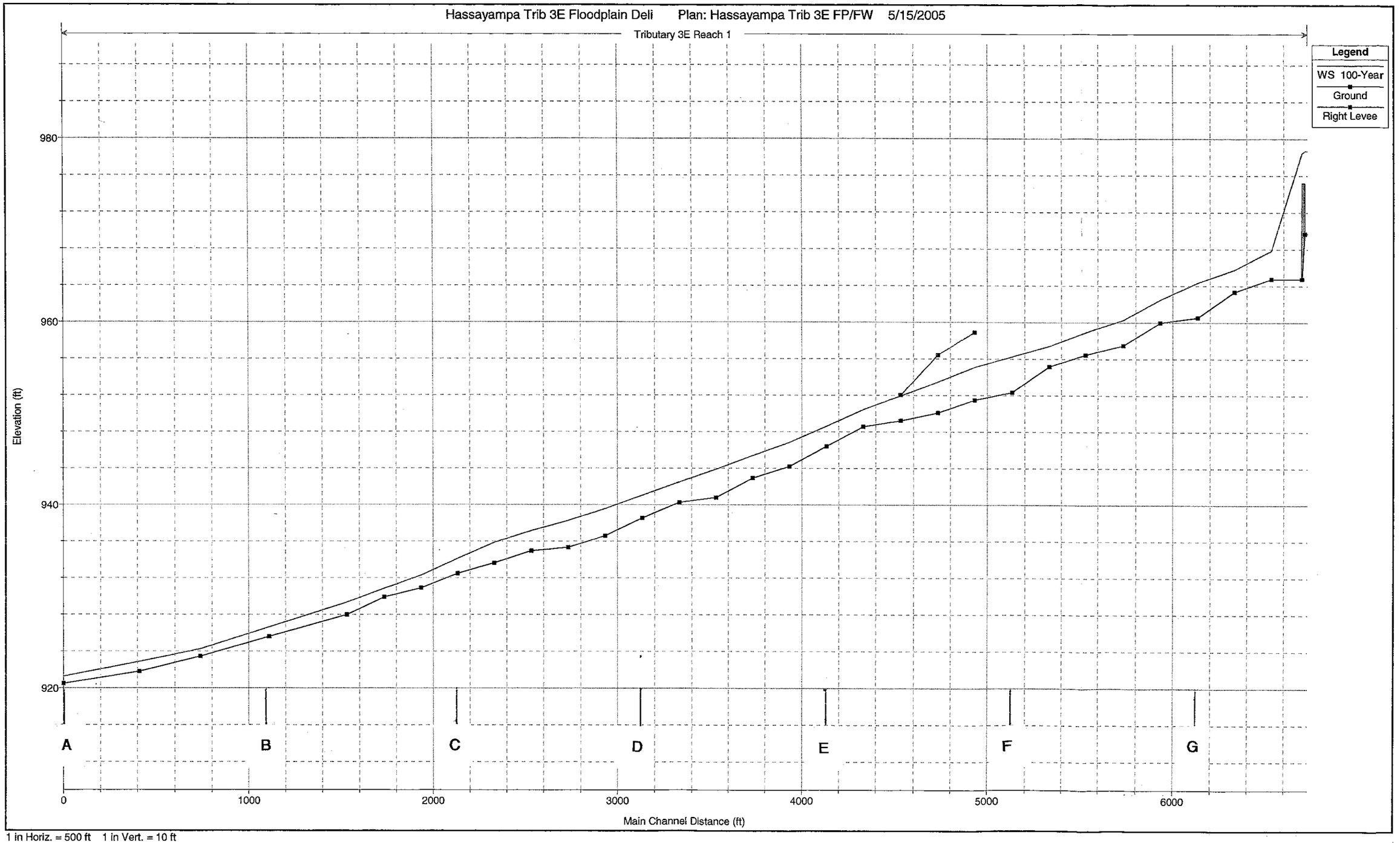



1 in Horiz. = 500 ft 1 in Vert. = 10 ft

FIGURE 7– 3



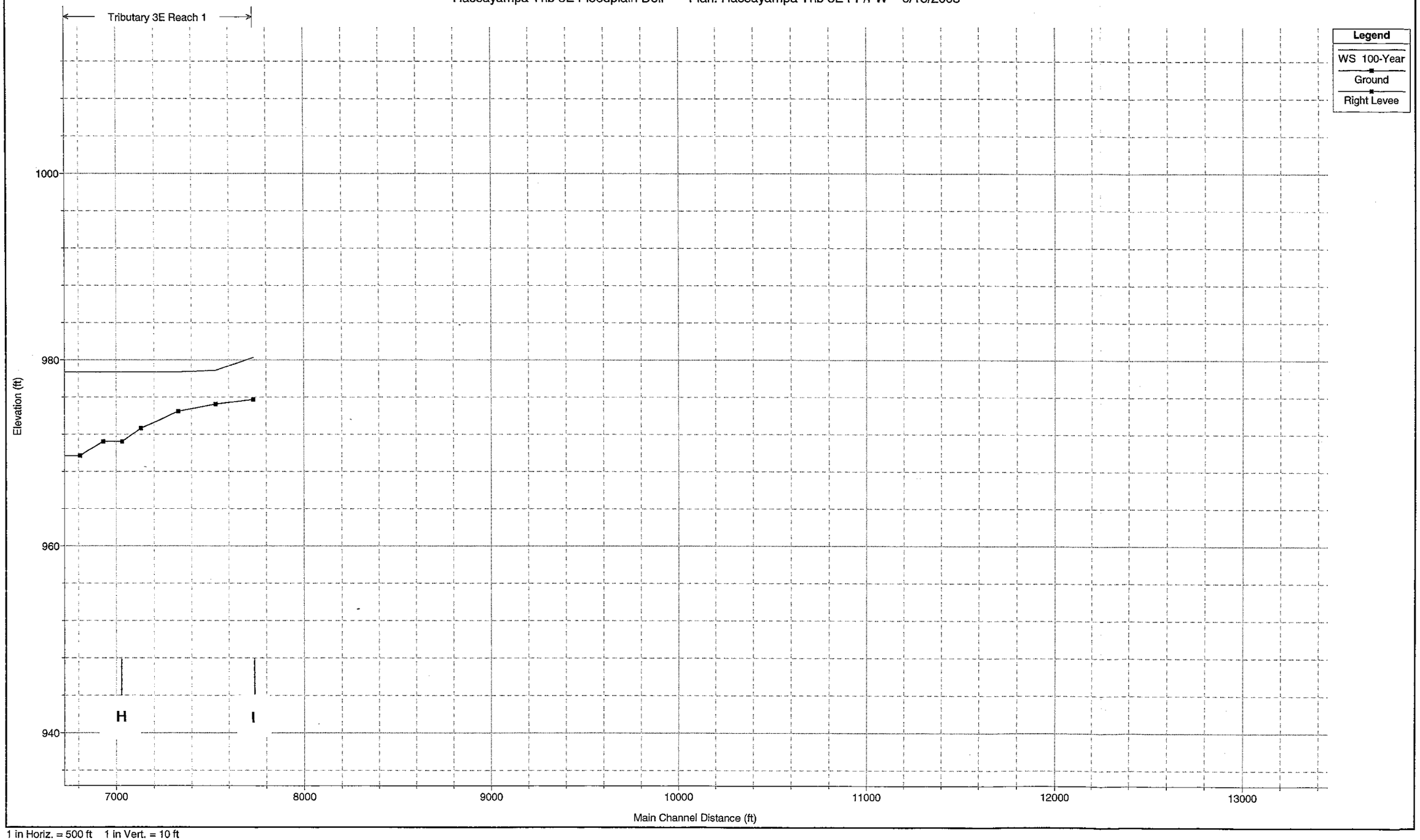

1 in Horiz. = 500 ft 1 in Vert. = 10 ft



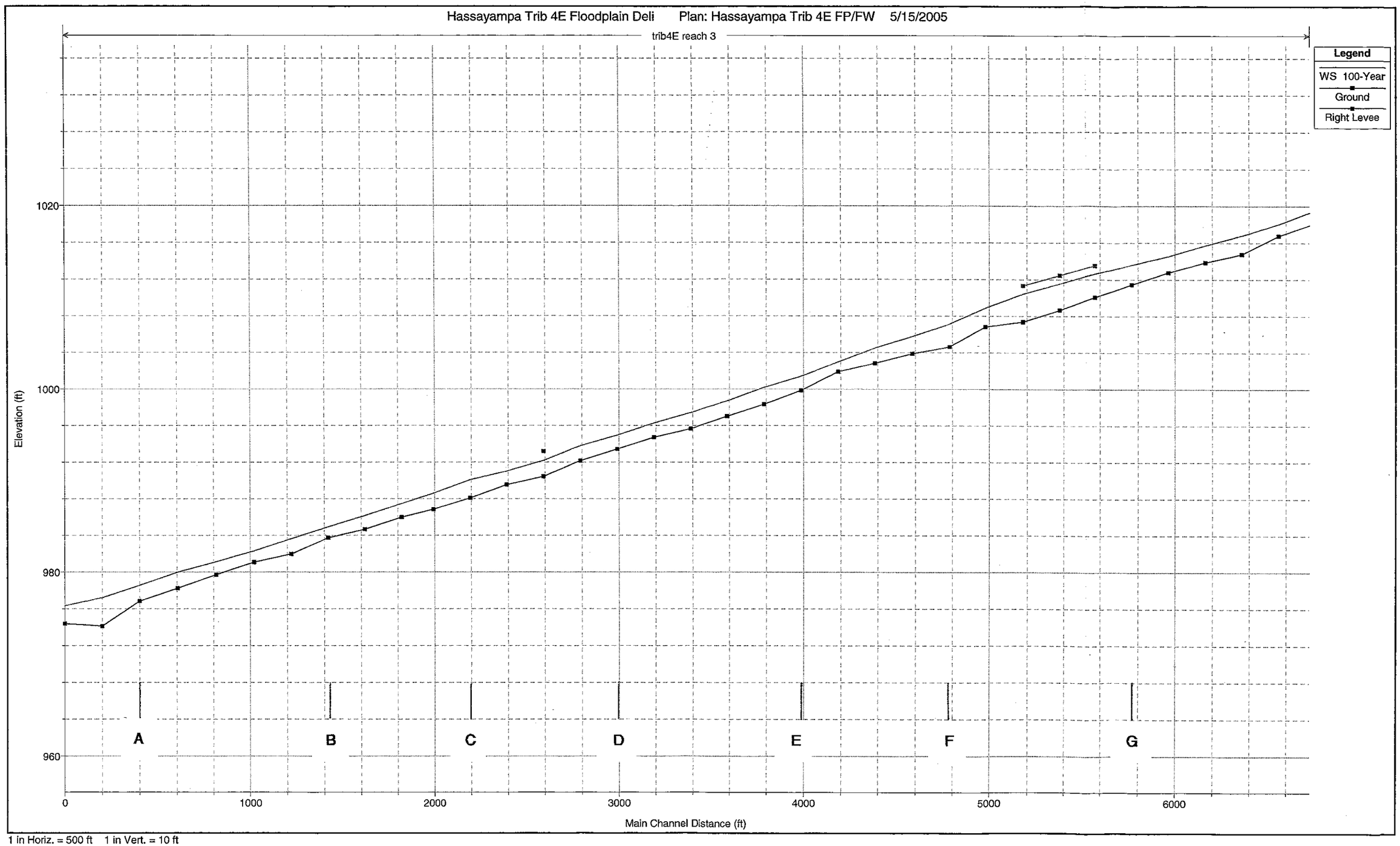

1 in Horiz. = 500 ft 1 in Vert. = 10 ft

FIGURE 7–4

Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/15/2005

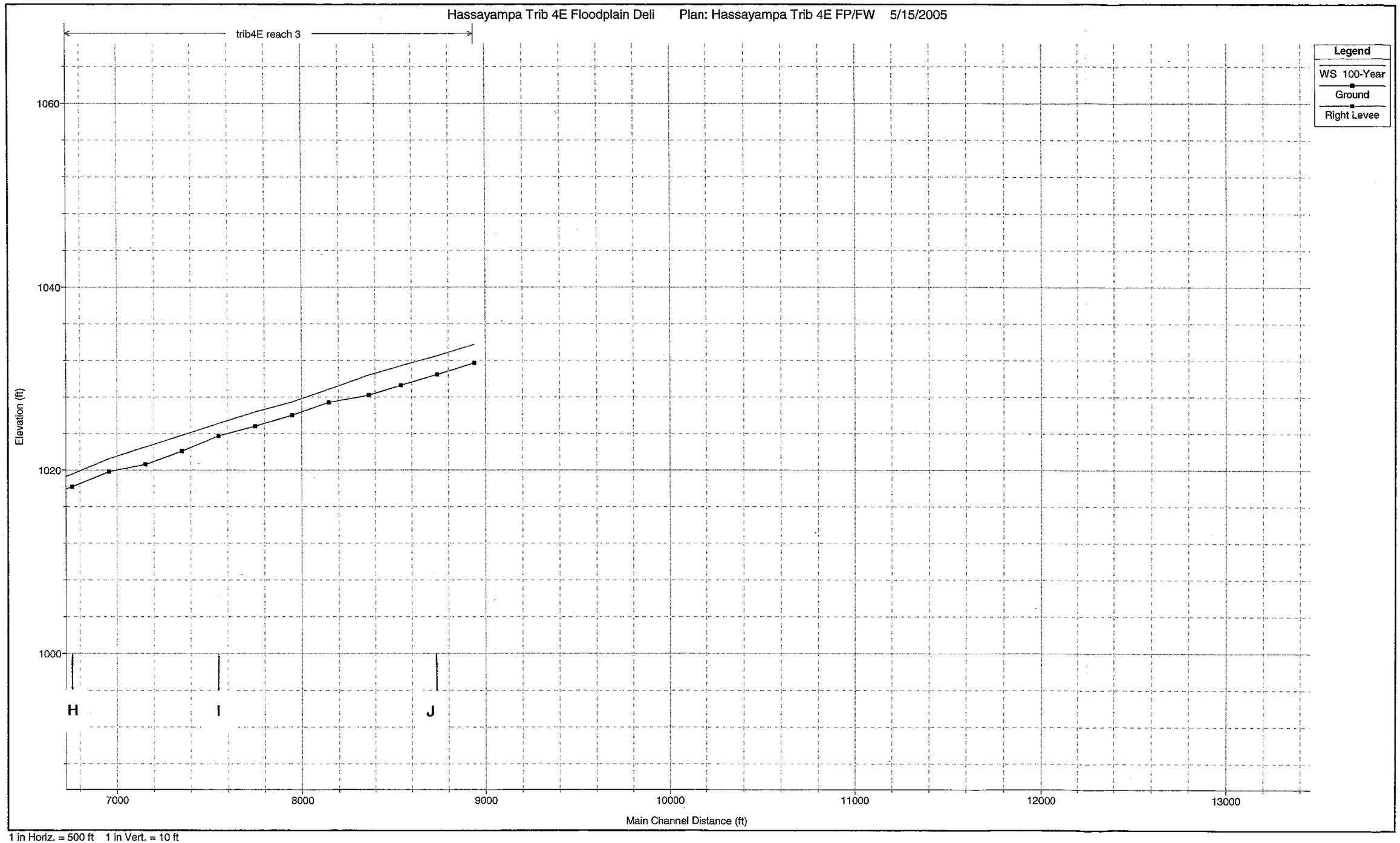



1 in Horiz. = 500 ft  1 in Vert. = 10 ft

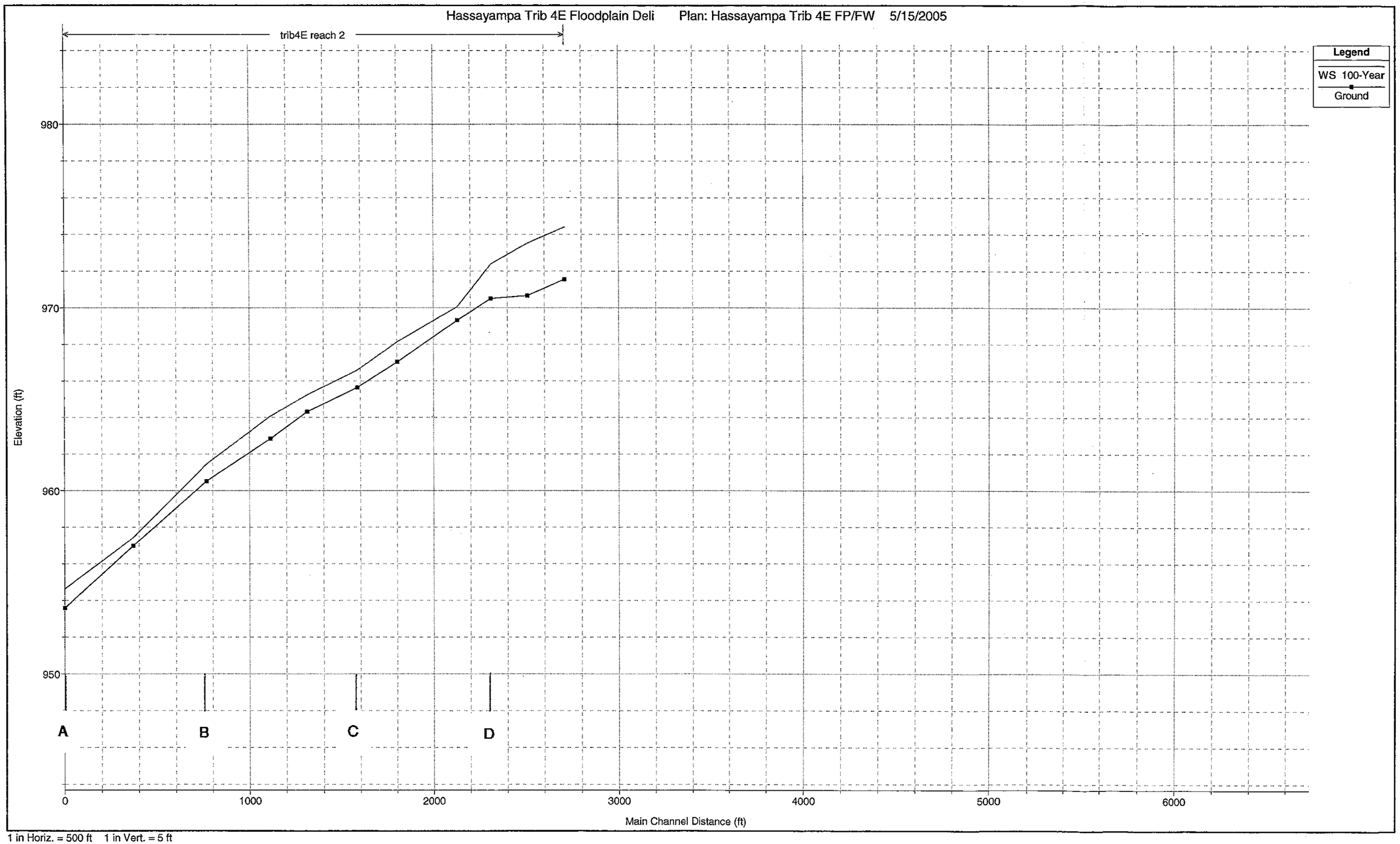



1 in Horiz. = 500 ft 1 in Vert. = 10 ft

FIGURE 7–5




1 in Horiz. = 500 ft 1 in Vert. = 10 ft




1 in Horiz. = 500 ft 1 in Vert. = 5 ft

FIGURE 7–6

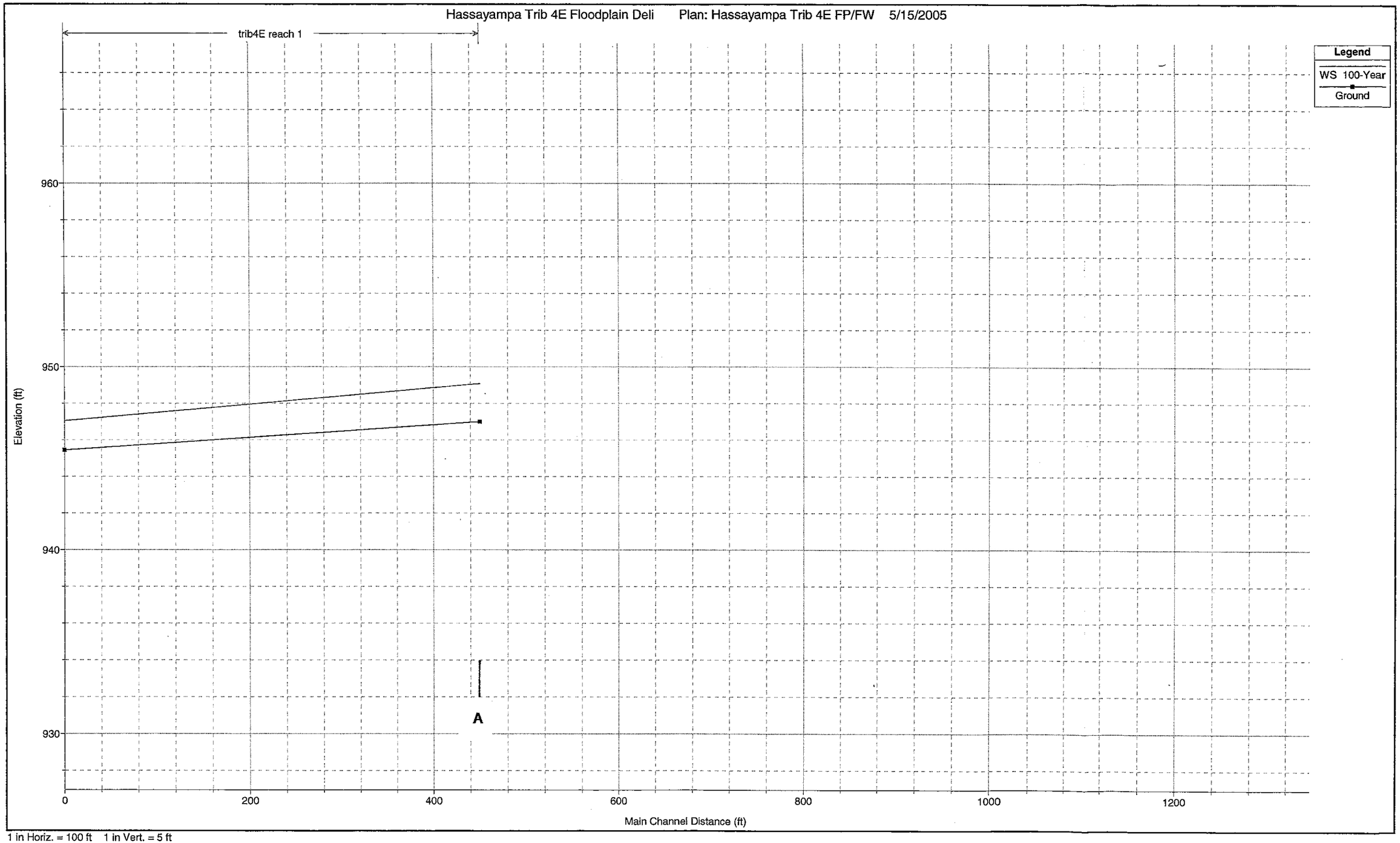
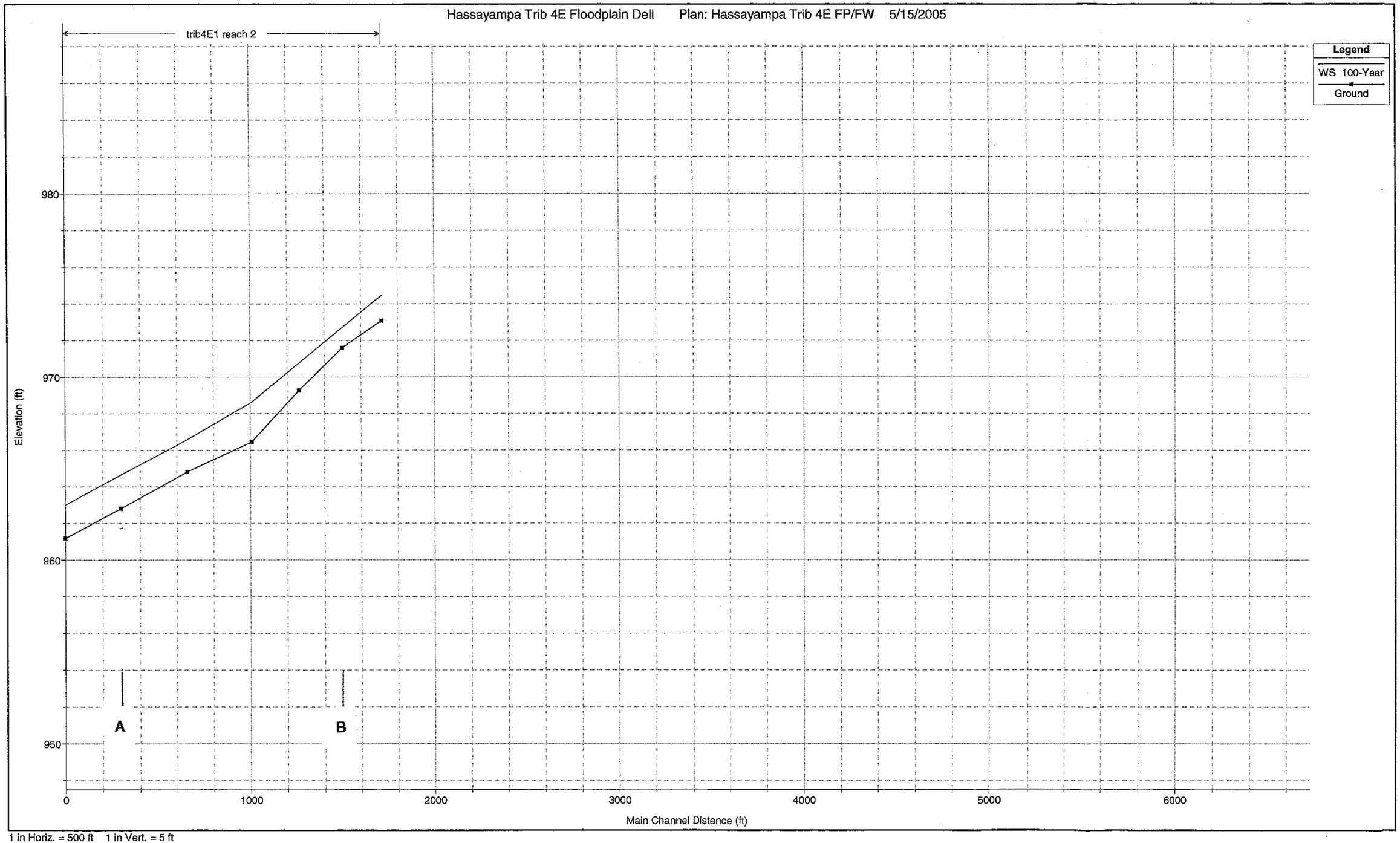
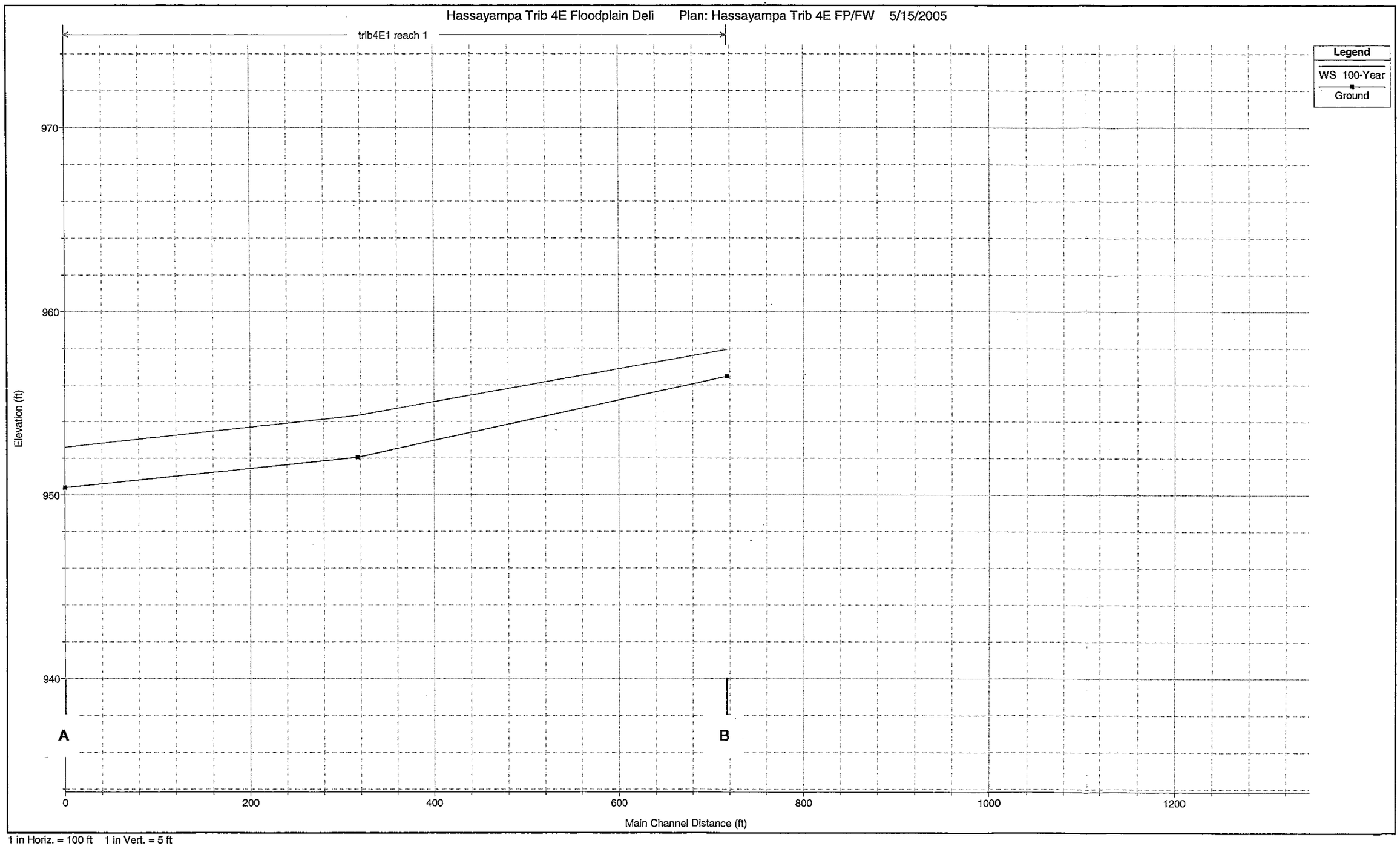

Hassayampa Trib 4E Floodplain Deli Plan: Hassayampa Trib 4E FP/FW 5/15/2005
trib4E reach 1
Legend
WS 100-Year
Ground
960
950
940
930
Elevation (ft)
A
0
200
400
600
800
1000
1200
Main Channel Distance (ft)
1 in Horiz. = 100 ft 1 in Vert. = 5 ft

FIGURE 7–7



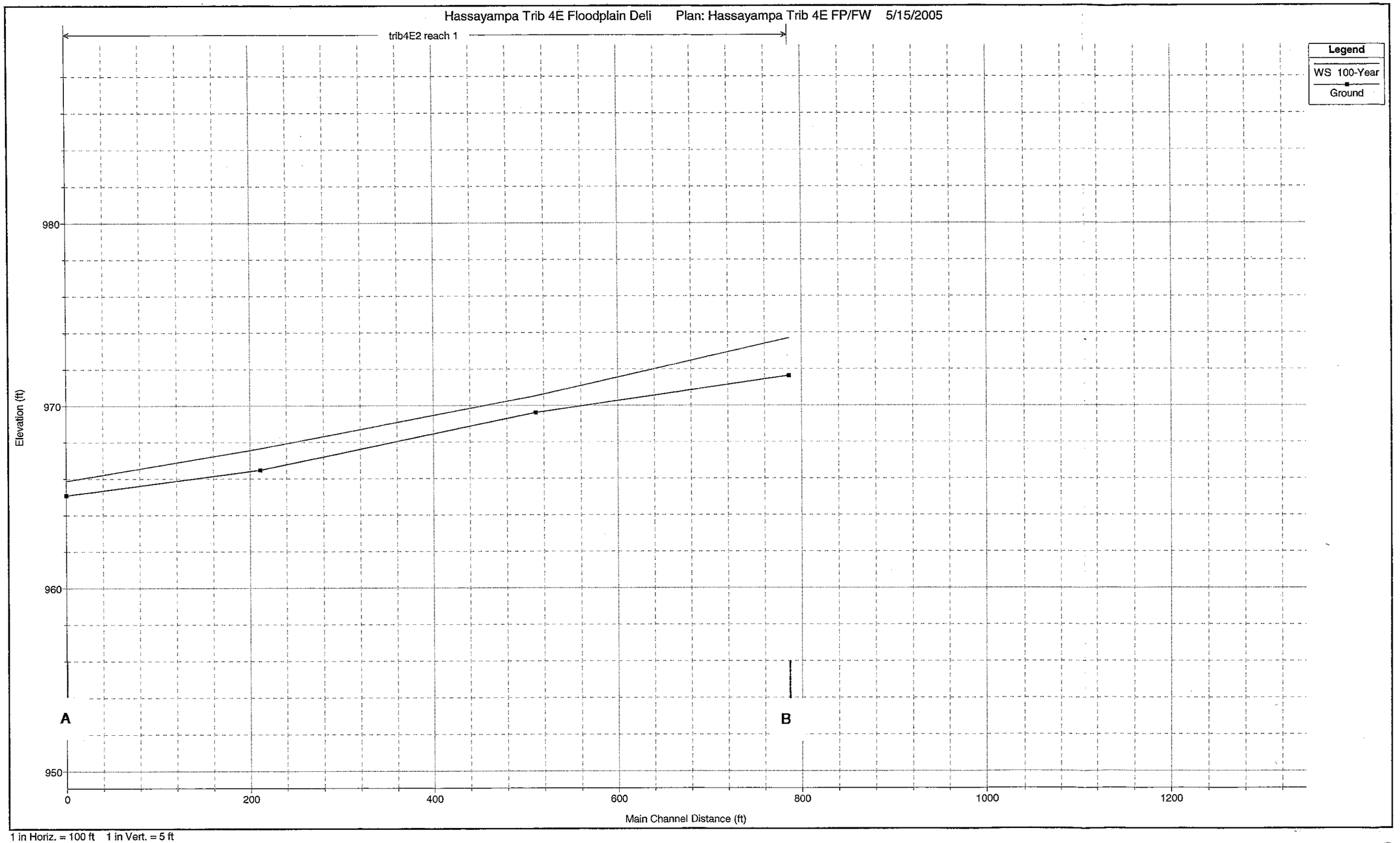

1 in Horiz. = 500 ft 1 in Vert. = 5 ft

FIGURE 7–8




1 in Horiz. = 100 ft 1 in Vert. = 5 ft

FIGURE 7-9




1 in Horiz. = 100 ft 1 in Vert. = 5 ft

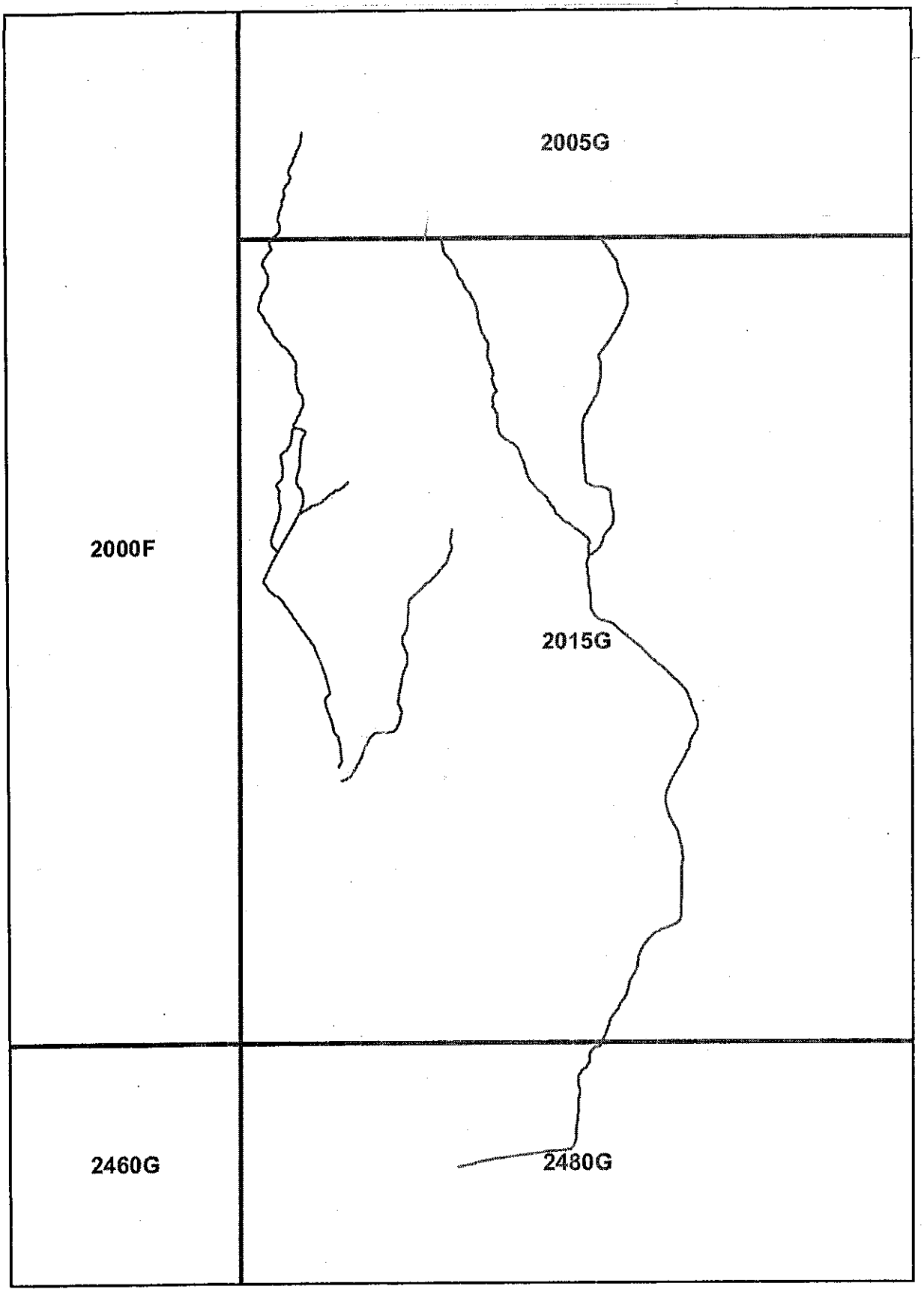
FIGURE 7-10

## 7.4 Annotated Firm Panels

The base flood elevations (BFEs) were placed according to the standards given in Appendix C of the Guidelines and Specifications for Flood Hazard Mapping Partners (FEMA, 2003).

FIGURE 7-11

FIRM PANEL SCHEMATIC



## NOTES TO USERS

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To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles, Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations** shown on this map apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was *Arizona State Plane Zone 3176 (central Arizona)*. The **horizontal datum** was *NAD83, GRS80 spheroid*. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the *National Geodetic Vertical Datum of 1929*. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(310) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov.

**Base map** information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Maricopa County. Orthophoto images were produced at a scale of 1:9000 using HARN for control. Aerial photography is dated December 2000 to December 2002.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

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Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

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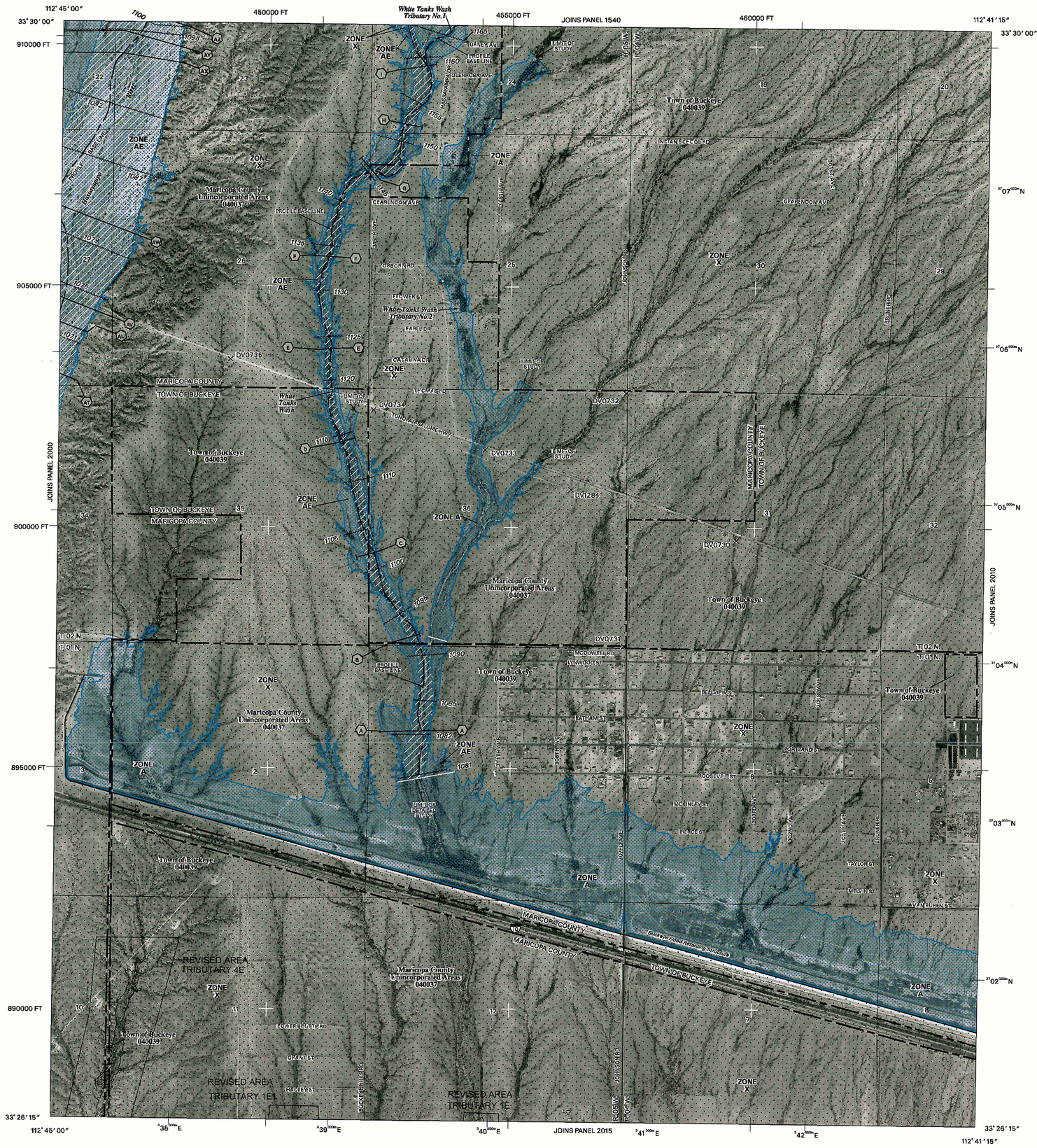


## LEGEND

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

| | |
|---|---|
| ZONE A | No Base Flood Elevations determined. |
| ZONE AE | Base Flood Elevations determined. |
| ZONE AH | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined. |
| ZONE AO | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined. |
| ZONE AR | Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| ZONE A99 | Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. |
| ZONE V | Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined. |
| ZONE VE | Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined. |

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

| | |
|---|---|
| ZONE X | Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. |

**OTHER AREAS**

| | |
|---|---|
| ZONE X | Areas determined to be outside the 0.2% annual chance floodplain. |
| ZONE D | Areas in which flood hazards are undetermined, but possible. |

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones, and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

~~~513~~~ Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

\* Referenced to the National Geodetic Vertical Datum of 1929

(A)———(A) Cross section line

(2)- - - - -(2) Transect line

112° 07′ 08″, 33° 25′ 41″ Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere.

$^{43}76^{000m}$E 1000-meter Universal Transverse Mercator grid tick values zone 12.

875000 FT 5000-foot grid tick values: Arizona State Plane coordinate system, central zone (FIPSZONE 3176) NAD83 (Transverse Mercator)

×DV2313 Bench mark (see explanation in Notes to Users section of this FIRM panel)

• M1.5 River Mile

MAP REPOSITORY
Refer to Repositories Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
**April 16, 1988**

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
**September 4, 1991, September 30, 1995, July 19, 2001**

September 30, 2005 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to incorporate previously issued Letters of Map Amendment.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

**MAP SCALE 1" = 1000'**

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

**PANEL 2005H**

# FIRM
## FLOOD INSURANCE RATE MAP
## MARICOPA COUNTY, ARIZONA
## AND INCORPORATED AREAS

**PANEL 2005 OF 4350**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| BUCKEYE, TOWN OF | 040039 | 2005 | H |
| MARICOPA COUNTY | 040037 | 2005 | H |

Figure 7-12

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**04013C2005H**

**MAP REVISED**
**SEPTEMBER 30, 2005**

Federal Emergency Management Agency
~~~

# NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

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The **projection** used in the preparation of this map was *Arizona State Plane Zone 3176 (central Arizona)*. The **horizontal datum** was *NAD83, GRS80 spheroid*. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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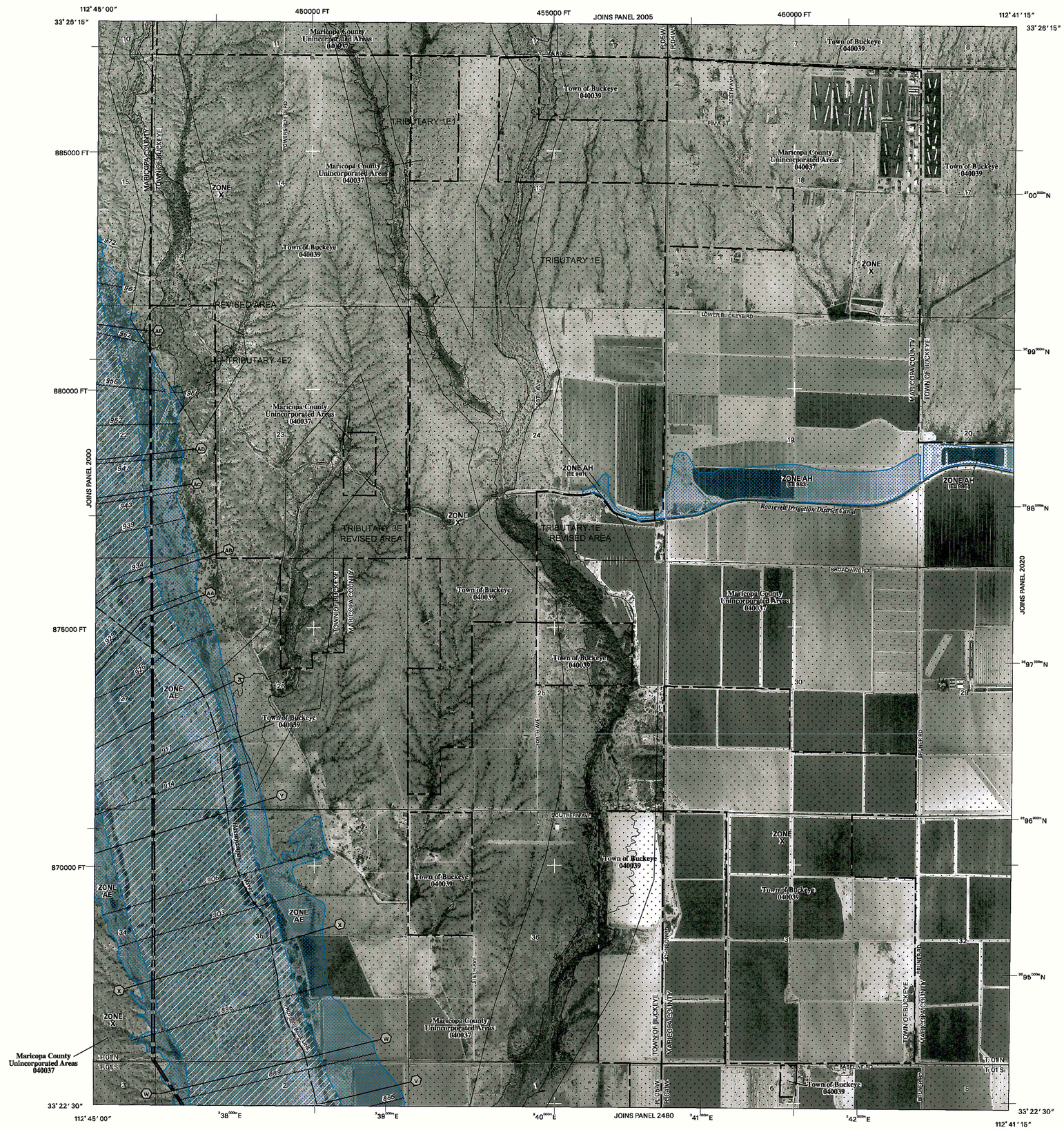


# LEGEND

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The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

| | |
|---|---|
| ZONE A | No Base Flood Elevations determined. |
| ZONE AE | Base Flood Elevations determined. |
| ZONE AH | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined |
| ZONE AO | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined |
| ZONE AR | Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| ZONE A99 | Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. |
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FLOODWAY AREAS IN ZONE AE

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OTHER FLOOD AREAS

| | |
|---|---|
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OTHER AREAS

| | |
|---|---|
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OTHERWISE PROTECTED AREAS (OPAs)

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1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones, and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

| | |
|---|---|
| 513 | Base Flood Elevation line and value; elevation in feet* |
| (EL 987) | Base Flood Elevation value where uniform within zone; elevation in feet* |

* Referenced to the National Geodetic Vertical Datum of 1929

| | |
|---|---|
| (A)———(A) | Cross section line |
| (2)- - - - -(2) | Transect line |
| 112° 07′ 08″, 33° 25′ 41″ | Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere. |
| 4275000 FT E | 1000-meter Universal Transverse Mercator grid tick values zone 12 |
| 875000 FT | 5000-foot grid tick values: Arizona State Plane coordinate system, central zone (FIPSZONE 3176) NAD83 (Transverse Mercator) |
| ×DV2313 | Bench mark (see explanation in Notes to Users section of this FIRM panel) |
| • M1.5 | River Mile |

MAP REPOSITORY
Refer to Repositories Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
April 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 4, 1991, September 30, 1998, July 19, 2001

September 30, 2005 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to incorporate previously issued Letters of Map Amendment.

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MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2015H

# FIRM
## FLOOD INSURANCE RATE MAP
## MARICOPA COUNTY, ARIZONA
## AND INCORPORATED AREAS

**PANEL 2015 OF 4350**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| BUCKEYE, TOWN OF | 040039 | 2015 | H |
| MARICOPA COUNTY | 040037 | 2015 | H |

Figure 7-13

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**04013C2015H**

**MAP REVISED**
**SEPTEMBER 30, 2005**

Federal Emergency Management Agency

## NOTES TO USERS

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(310) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

**Base map** information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Maricopa County. Orthophoto images were produced at a scale of 1:6000 using HARN for control. Aerial photography is dated December 2000 to December 2002.

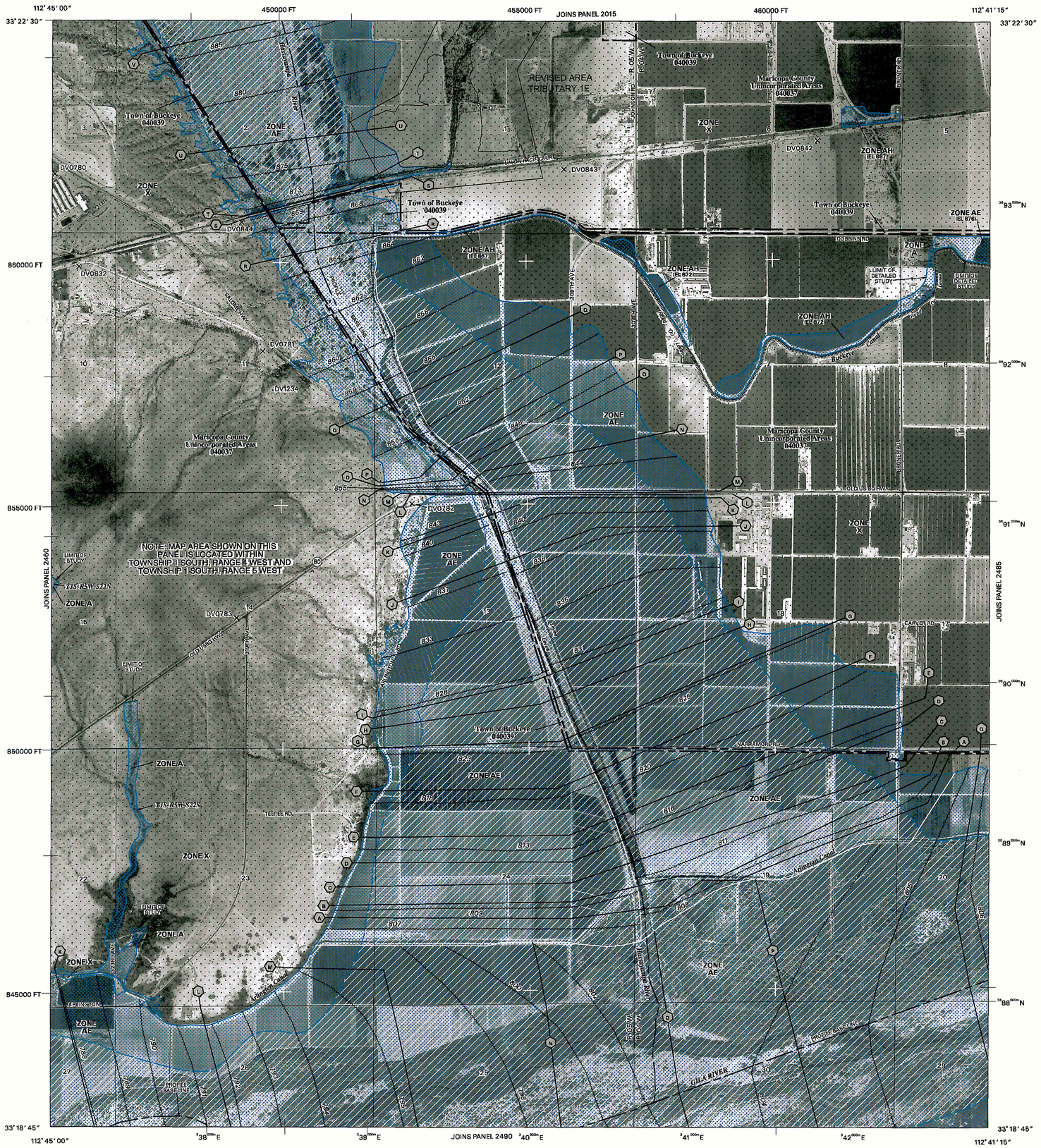
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMAMAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.




## LEGEND

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

| | |
|---|---|
| ZONE A | No Base Flood Elevations determined. |
| ZONE AE | Base Flood Elevations determined. |
| ZONE AH | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined. |
| ZONE AO | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined. |
| ZONE AR | Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| ZONE A99 | Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. |
| ZONE V | Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined. |
| ZONE VE | Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined. |

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

| | |
|---|---|
| ZONE X | Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. |

**OTHER AREAS**

| | |
|---|---|
| ZONE X | Areas determined to be outside the 0.2% annual chance floodplain. |
| ZONE D | Areas in which flood hazards are undetermined, but possible. |

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones, and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

| | |
|---|---|
| 513 | Base Flood Elevation line and value; elevation in feet* |
| (EL 987) | Base Flood Elevation value where uniform within zone; elevation in feet* |

* Referenced to the National Geodetic Vertical Datum of 1929

| | |
|---|---|
| A — A | Cross section line |
| 2 - - - - 2 | Transect line |
| 112°07′08″, 33°25′41″ | Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere. |
| 4176000M E | 1000-meter Universal Transverse Mercator grid tick values zone 12. |
| 875000 FT | 5000-foot grid tick values: Arizona State Plane coordinate system, central zone (FIPSZONE 3176) NAD83 (Transverse Mercator) |
| ×DV2313 | Bench mark (see explanation in Notes to Users section of this FIRM panel) |
| • M1.5 | River Mile |

MAP REPOSITORY
Refer to Repositories Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
**April 15, 1988**

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
**September 4, 1991, September 30, 1995, July 19, 2001**

September 30, 2005 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to incorporate previously issued Letters of Map Amendment.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

**MAP SCALE 1" = 1000′**

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

**PANEL 2480H**

# FIRM
## FLOOD INSURANCE RATE MAP
## MARICOPA COUNTY, ARIZONA
## AND INCORPORATED AREAS

**PANEL 2480 OF 4350**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| BUCKEYE, TOWN OF | 040039 | 2480 | H |
| MARICOPA COUNTY | 040037 | 2480 | H |

Figure 7-14

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**04013C2480H**

**MAP REVISED**
**SEPTEMBER 30, 2005**

Federal Emergency Management Agency

# A. References


1. McLaughlin Kmetty Engineers, LTD. 1992. Buckeye Area Flood Delineation Study, Hydrology Report. *Flood Control District of Maricopa County – FCD 90-6.*

2. McLaughlin Kmetty Engineers, LTD. 1992. Buckeye Area Flood Delineation Study, Hydrology Report, Appendices AA and BB. *Flood Control District of Maricopa County – FCD 90-6.*

3. Sabol, G.V., et al. 1995. Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology. *Prepared for the Flood Control District of Maricopa County.*

4. Sabol, G.V., et al. 1995. Drainage Design Manual for Maricopa County, Arizona, Volume II, Hydraulics. *Prepared for the Flood Control District of Maricopa County.*

5. Hydrologic Engineering Center. 1998. HEC-1 Flood Hydrograph Package, User's Manual. *US Army Corps of Engineers.*

6. Brigham Young University. 2003. WMS 7.0 Reference Manual. Engineering Computer Graphics Laboratory, Brigham Young University, Provo, Utah.

7. Camp, P.D. 1986. Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona. *Soil Conservation Service, United States Department of Agriculture.*

8. Maricopa Association of Governments. 2000. The Digital GIS Land Use Maps for Maricopa County *(Updated every 5 years).*

9. Zhao, Bing. 2003. Hydrologic Study for Bonita Dam, Maricopa County, Arizona. *Prepared for the Flood Control District of Maricopa County.*

10. USGS. 1991. Estimated Manning's Roughness Coefficients for Stream Channels and Floodplains in Maricopa County, Arizona. *Water Resource Diversion, USGS.*

11. FEMA. April 2003. Guidelines & Specifications for Flood Hazard Mapping Partners.

# B. General Documentation & Correspondence

The general documentation and correspondence for this project are organized in the Project Administration Report for the Buckeye/Sun Valley ADMS included in Volume VIII, Supporting Documents. The following sections are included in the Project Administration Report.

## B.1 Special Problem Reports

N/A

## B.2 Contact (telephone) Reports

N/A

## B.3 Meeting Minutes or Reports

N/A

## B.4 General Correspondence

N/A

## B.5 Contract Documents

N/A

**ANNOUNCEMENT OF INTENT TO PERFORM FLOODPLAIN/FLOODWAY DELINEATION STUDY IN THE BUCKEYE/SUN VALLEY AREA**

The Flood Control District of Maricopa County (District) has contracted with Fuller/Hydrology & Geomorphology to perform a floodplain/floodway delineation of approximately 13 miles of tributaries to the Hassayampa River. The study area includes Jackrabbit Wash from the confluence with the Hassayampa River upstream to the Central Arizona Project Canal crossing near the intersection of the Missouri Avenue and 315th Avenue alignments. The study also includes a branch of Jackrabbit Wash from its confluence with the Hassayampa River upstream to the main stem of Jackrabbit Wash near the intersection of the Tonopah Highway and the 331st Avenue alignments. The study area includes portions of the following Sections: Township 2 North, Range 4 West; Sections 3, 9, 10, 14, 15, 22, 27, and Township 3 North Range 5 West; Sections 9, 16, 21, 33. This study will examine and delineate flood hazards and determine flood elevations for the area. The elevations will then be used to determine the flood insurance rates used by the Federal Emergency Management Agency (FEMA). This announcement is intended to inform all interested persons and communities of the commencement of this study so that they may have an opportunity to bring any relevant technical information to the attention of the District, to be considered during the course of this study. Your comments should be addressed to John Hathaway, Project Manager, The Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, AZ 85009, (602) 506-0503.

Published: August 11, 25, 2005

# AFFIDAVIT OF PUBLICATION

FLOODPLAIN STUDY-BUCKEYE/SUN VALLEY AREA

Arizona Business Gazette

The business resource.

PO BOX 194
Phoenix, Arizona 85001-0194
(602) 271-7300

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

Ondrea Sheppard, being first duly sworn, upon oath deposes and says: That she is the marketing/sales lead of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published weekly at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates indicated.

02/11/2005
08/25/2005

Ondrea Sheppard

Sworn to before me this
1st day of
March A.D. 2006

OFFICIAL SEAL
MARILYN GREENWOOD
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My Comm. Expires May 23, 2007

Marilyn Greenwood
Notary Public

# C. Survey Field Notes

## C.1 Survey Field Notes for Aerial Mapping Control

N/A

## C.2 Survey Field Notes for Hydrologic Modeling

Photos 1 through 23 are from the January 12, 2004, field visit, and photos 24and 32 are from the February 5, 2004, field visit.

## C.3 Survey Field Notes for Hydraulic Modeling

Field survey notes for the Baseline Road and Southern Road Culverts are attached. The photos for determining Manning's n-values are in Appendix E.

**Picture.1**

Retention basin near end of RID just west of Johnson Road – Looking east

**Picture.2**

Retention basin near end of RID just west of Johnson Road – Looking west

**Picture.3**

North of RID between Johnson Road & end of RID - Looking east

**Picture.4**

North of RID between Johnson Road & end of RID - Looking east

**Picture.5**

North of RID looking towards end of RID

**Picture.6**

Minor was flowing south towards RID- Looking southeast

**Picture.7**
End of RID – Looking southwest

**Picture.8**
End of RID – Looking west

**Picture.9**
Intersection of RID & main channel for sub-basin C1 – Looking west

**Picture.10**
Intersection of RID & main channel for sub-basin C1 – Looking northwest

**Picture.11**
Intersection of RID & main channel for sub-basin C1

**Picture.12**
Wash blocked by abandoned RID

**Picture.13**
Abandoned RID

**Picture.14**
Field just south of RID & just west of Johnson Road – Looking north

**Picture.15**
Main flow path just south of the end of RID

**Picture.16**
Field just south of RID & just west of Johnson Road – Looking southeast

**Picture. 17**
Field just south of RID & just west of Johnson Road – Looking northwest

**Picture.18**
Culvert on Southern – Looking north (upstream)

**Picture.19**

Culvert on Southern – Looking south (downstream)

**Picture.20**

Culvert on Southern between 315th and 313th

**Picture.21**

End of wash that empties into farm field – Looking west

**Picture.22**

Culvert on Baseline Rd between 313th and 309th – Looking south

**Picture.23**

Culvert on Baseline Rd between 313th and 309th – Looking north

**Picture.24**

Main channel between end of RID and Southern Rd (E3) – Looking south

**Picture.25**
Right of bank (E3) – Looking south

**Picture.26**
Right of bank (E3) – Looking south

**Picture.27**
Left of bank between Baseline and Southern Rd & between Johnson Rd and 309th (E4) – Looking north

**Picture.28**
Left of bank (E4) – Looking north

**Picture.29**
Main channel E4 – Looking south

**Picture.30**
Main channel E4 – Looking south

**Picture.31**
Main channel E4 – Looking west

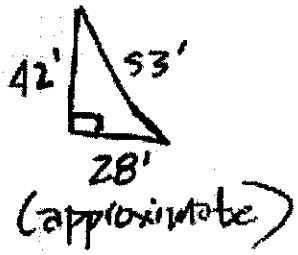
**Picture.32**
Left of bank E4 – Looking south

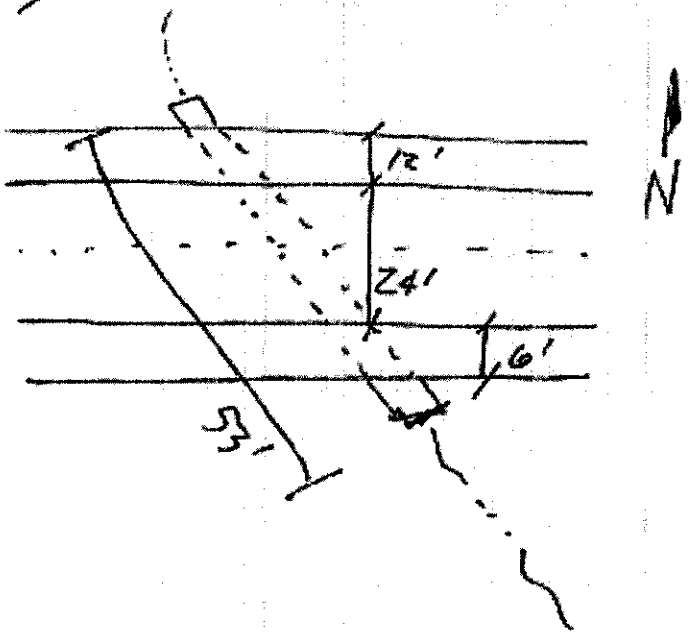
PBSJ

COMP. BY:
CHK. BY:
DATE: 4/8/04
SHEET NO.:
JOB NO.: 540293

Subject: Buckeye/Sun Valley ADMS
Southern Rd Culvert (Area 2)

- Type: RCP
- Diam: 2 feet
  length: 53 ft
  Roadway width:
  skew:




| | height (relativ to 13 |
|---|---|
| - top inlet headwall | 2.7' |
| - inlet invert | 6.7' |
| - ℄ Southern Rd above culvert | 2.5' |
| - N side of road | |
| - S side of road | |
| - outlet invert | 5.4+2 = 7.4' |

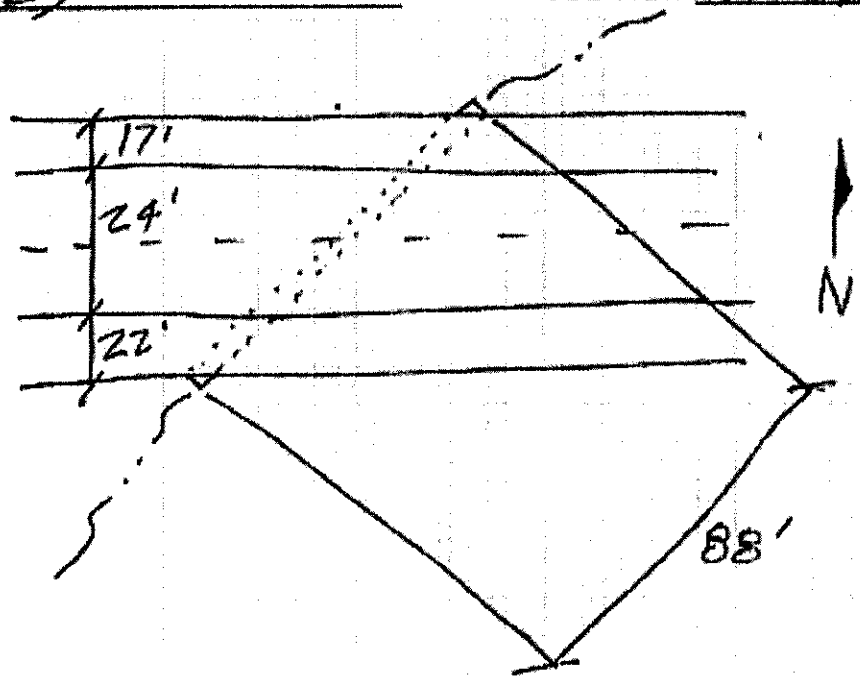
pic #1: outlet
#2: inlet
#3: inlet

PBSJ

COMP. BY:
CHK. BY:
DATE: 4/8/04
SHEET NO.:
JOB NO.: 540293

Subject: Buckeye/Sun Valley ADMS
Baseline Rd Culvert (Area 2)

Type: RCP
Diam: 2 ft
Length: 88 ft
skew:




pic #1: outlet
pic #2: inlet
#3: fish in stream

| | height (relative to BM |
|---|---|
| outlet invert | 6.0'+2=8. |
| inlet invert | 5.5'+2=7. |
| ℄ Baseline Rd | 3.5' |

# D. Hydrologic Analysis Supporting Documentation

## D.1 Precipitation Data

**Table D.1-1**

**Rainfall Amount from Isopluvial Maps in FCDMC Hydrology Manual**

| Storm Event | Depth [in] |
|---|---|
| 100-yr, 6-hr | 3.29 |
| 100-yr, 24-hr | 4.10 |

## D.2 Physical Parameter Calculations

**Table D.2-1**

**Existing Conditions Land Use Look-up Table for Area 2**

| LU Code | Land Use Description | IA | RTIMP | % Veg | Saturation |
|---|---|---|---|---|---|
| 130 | Large Lot Residential - Single Family (1 du per acre to 2 du per acre) | 0.30 | 15 | 50 | normal |
| 160 | Very Small Lot Residential - Single Family (>6 du per acre-includes mobile home | 0.25 | 40 | 50 | normal |
| 610 | Transportation (Includes railroads, railyards, transit centers and freeways) | 0.10 | 80 | 75 | normal |
| 740 | Water | 0.00 | 100 | 0 | wet |
| 750 | Agriculture | 0.50 | 0 | 85 | normal |
| 900 | Vacant (Existing land use database only) | 0.35 | 0 | 25 | dry |

**Table D.2-2**

**Soil Map look-up Table for Buckeye Area 2**

| TYPE | XKSAT | ROCKOUT | DESCRIPTION | SOIL_LID |
|---|---|---|---|---|
| RpE | 0.29 | 0.00 | Rillito-Perryville complex, 5 to 20 percent slopes | 651545128 |
| RaA | 0.39 | 0.00 | Rillito sandy loam, 0 to 1 percent slopes | 651542120 |
| PRB | 0.28 | 0.00 | Perryville-Rillito complex, 0 to 3 percent slopes | 651505422 |
| PeB | 0.38 | 0.00 | Perryville gravelly loam, 1 to 3 percent slopes | 651502922 |
| PeA | 0.37 | 0.00 | Perryville gravelly loam, 0 to 1 percent slopes | 651502920 |
| LEV | 0.00 | 0.00 | Man-made levee | 651422862 |
| GYD | 0.26 | 0.00 | Gunsight-Rillito complex, 0 to 10 percent slopes | 651326826 |
| GWD | 0.35 | 0.00 | Gunsight-Pinal complex, 1 to 10 percent slopes | 651326426 |
| GgA | 0.25 | 0.00 | Gilman loan, 0 to 1 percent slopes | 651323320 |
| AGB | 0.40 | 0.00 | Antho-Carrizo complex, 0 to 3 percent slopes | 651203222 |
| AdA | 0.40 | 0.00 | Antho gravelly sandy loam, 0 to 1 percent slopes | 651202720 |

| TYPE | XKSAT | ROCKOUT | DESCRIPTION | SOIL_LID |
|---|---|---|---|---|
| AbA | 0.38 | 0.00 | Anthosandy loam, 0 to 1 percent slopes | 651202320 |
| PT | 0.40 | 0.00 | Pinal gravelly loam | 6515058 |
| Pa | 0.40 | 0.00 | Perryville sandy loam | 6515021 |
| Lb | 0.40 | 0.00 | Laveen sandy loam | 6514223 |
| GM | 0.29 | 0.00 | Gilman-Antho association | 6513244 |
| Ge | 0.26 | 0.00 | Gilman fine sandy loam | 6513229 |
| Cp | 0.40 | 0.00 | Coolidge sandy loam | 6512451 |
| CF | 0.50 | 0.00 | Carrizo and Brios soils | 6512430 |
| Bs | 0.39 | 0.00 | Brios sandy loam | 6512257 |
| Ae | 0.39 | 0.00 | Antho-Brios sandy loams | 6512029 |

**Table D.2-3**

**Summary of Green & Ampt Parameters for Buckeye Area 2 Existing Conditions**

| Subbasin | Area [mi$^2$] | IA | DTHETA | PSIF | XKSAT | RTIMP |
|---|---|---|---|---|---|---|
| A1 | 1.63 | 0.343 | 0.347 | 4.498 | 0.339 | 2.145 |
| B1 | 0.30 | 0.350 | 0.350 | 4.624 | 0.315 | 0.000 |
| C1 | 0.95 | 0.350 | 0.350 | 4.669 | 0.311 | 0.000 |
| D1 | 0.69 | 0.350 | 0.350 | 4.642 | 0.317 | 0.000 |
| E1 | 1.47 | 0.343 | 0.347 | 4.362 | 0.364 | 2.082 |
| E2 | 1.22 | 0.348 | 0.343 | 4.461 | 0.354 | 2.288 |
| E3 | 0.94 | 0.402 | 0.306 | 4.245 | 0.444 | 1.589 |
| E4 | 0.74 | 0.389 | 0.324 | 4.185 | 0.421 | 0.000 |

**Table D.2-4**

**Summary of Lag Time Estimation for Buckeye Area 2 Sub-basins**

| Subbasin | Area [mi$^2$] | L [ft] | $L_{ca}$ [ft] | Max Elev [ft] | Min Elev [ft] | S [ft/mi] | S-Graph Type | $K_n$ | Lag [min] |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 1.63 | 15,616 | 9,120 | 1,060.7 | 963.2 | 32.98 | Des Rnglnd | 0.050 | 69 |
| B1 | 0.30 | 7,098 | 3,466 | 1,036.0 | 959.1 | 57.24 | Des Rnglnd | 0.050 | 31 |
| C1 | 0.95 | 14,004 | 5,581 | 1,037.7 | 927.4 | 41.60 | Des Rnglnd | 0.050 | 52 |
| D1 | 0.69 | 10,801 | 5,153 | 997.6 | 913.6 | 41.10 | Des Rnglnd | 0.050 | 46 |
| E1 | 1.47 | 16,819 | 9,573 | 1,068.2 | 979.2 | 27.95 | Des Rnglnd | 0.050 | 75 |
| E2 | 1.22 | 15,678 | 8,798 | 1,060.8 | 979.2 | 27.48 | Des Rnglnd | 0.050 | 70 |
| E3 | 0.94 | 14,352 | 5,236 | 1,000.6 | 930.1 | 25.93 | Des Rnglnd | 0.050 | 56 |
| E4 | 0.74 | 10,558 | 6,552 | 934.1 | 876.2 | 28.98 | Des Rnglnd | 0.050 | 53 |

## D.3 Hydrograph Routing Data

**Table D.3-1**

**Summary of Routing Channel Parameters – Length, Slope and Manning's n**

| Routing Channel | L [ft] | Max El. | Min El. | S [ft/ft] | n-left | n-channel | n-right |
|---|---|---|---|---|---|---|---|
| 1E-2E | 9,559 | 979.2 | 930.1 | 0.00514 | 0.05 | 0.07 | 0.05 |
| 2E-3E | 10,646 | 930.1 | 876.2 | 0.00506 | 0.055 | 0.03 | 0.055 |

**Table D.3-2**

**Summary of Routing Channel Parameters – Representative Cross Section Cooridinates**

| X-Section Data | | | | |
|---|---|---|---|---|
| | 1E-2E | | 2E-3E | |
| Point | X | Y | X | Y |
| 1 | 0 | 10.5 | 0 | 7.5 |
| 2 | 15 | 4.5 | 15 | 4 |
| 3 | 45 | 2 | 35 | 3 |
| 4 | 55 | 0 | 40 | 0 |
| 5 | 75 | 0 | 60 | 0 |
| 6 | 85 | 2 | 65 | 3 |
| 7 | 115 | 4.5 | 85 | 4 |
| 8 | 130 | 10.5 | 100 | 7.5 |

## D.4 Flow Splits and Diversion Data

N/A

## D.5 Hydrologic Calculations

### D.5.1 HEC-1 Output File 100-Year 6-Hour (Existing Conditions)

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY  1991            *
*           VERSION 4.0.1E          *
*                                   *
*  RUN DATE _______ TIME _______    *
*                                   *
*************************************
```

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

```
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

                                        HEC-1 INPUT                                                    PAGE  1

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

  1           ID   Buckeye/Sun Valley ADMS - 03 May 2004
  2           ID   PBS&J - Modelers: Jacob Lesue & Wen Chen
  3           ID   100-year 6-hour
  4           ID   Existing Conditions
  5           ID   Area 2
  6           ID   Rainfall Loss Method - Green & Ampt
  7           ID   Unit Hydrograph Method - FCDMC S-Graph
  8           ID   Channel Routing Method - Normal Depth
  9           ID   Land Use - FCDMC GIS Data: mag_landuse (2000)
 10           ID   Soil Data - USDA SCS Soil Survey (1972 & 1981)
 11           ID   Units - L(mi)   Lca(mi)   S(ft/mi)   LAG(min)
              *DIAGRAM
 12           IT       5  1JAN94       0    2000
 13           IO       3
 14           IN      15 01JAN94       0
 15           JD   3.299    0.01
              * 6-hour distribution, pattern 1.0
 16           PC     0.0   0.008   0.016   0.025   0.033   0.041    0.05   0.058   0.066   0.074
 17           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931    0.95
 18           PC   0.962   0.972   0.983   0.991     1.0
 19           IN      15 01JAN94       0
 20           JD   3.279     0.5
              * 6-hour distribution, pattern 1.0
 21           PC     0.0   0.008   0.016   0.025   0.033   0.041    0.05   0.058   0.066   0.074
 22           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931    0.95
 23           PC   0.962   0.972   0.983   0.991     1.0
 24           IN      15 01JAN94       0
 25           JD   3.256     1.0
              * 6-hour distribution, pattern 1.4
 26           PC     0.0  0.0084   0.016   0.025  0.0334  0.0414  0.0504  0.0584  0.0664  0.0748
 27           PC   0.087  0.0994  0.1188   0.148  0.2304  0.4067  0.7778  0.8813  0.9186  0.9452
 28           PC  0.9572  0.9684  0.9798  0.9898     1.0
 29           IN      15 01JAN94       0
 30           JD   3.167     5.0
              * 6-hour distribution, pattern 2.3
 31           PC     0.0   0.011  0.0173  0.0267  0.0387   0.049  0.0593  0.0693  0.0797  0.0903
 32           PC   0.103  0.1173  0.1383  0.1827  0.2693   0.458   0.686  0.8233  0.8893  0.9293
 33           PC  0.9487   0.962  0.9743  0.9877     1.0
 34           IN      15 01JAN94       0
 35           JD   3.101    10.0
              * 6-hour distribution, pattern 2.7
 36           PC     0.0  0.0134  0.0189  0.0287  0.0443  0.0574  0.0694  0.0818  0.0949  0.1076
 37           PC  0.1223  0.1382  0.1604  0.2063  0.2902  0.4664  0.6764  0.8069  0.8765  0.9189
 38           PC  0.9471  0.9608  0.9735  0.9873     1.0

 39           KK      E2
 40           KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 41           KM            L=2.97     Lca=1.67     S=27.48     Kn=0.050     LAG=70.0
 42           KM            S-GRAPH TYPE=DESERT RANGELAND
 43           KO       0       0     0.0       1      22
 44           BA   1.223
```

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 45          LG   0.348   0.343   4.461   0.354   2.288
             * E2
 46          UI     0.0   58.83   58.83   58.83  144.86  208.85  279.67  342.88  405.24   457.0
 47          UI  507.81  529.31  563.74  563.74  555.85  533.62  497.45  434.25  391.56  340.11
                                          HEC-1 INPUT                                          PAGE  2
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 48          UI  302.44  266.78  236.95  210.69  181.23  162.62  138.96  125.18   110.9    98.6
 49          UI    90.2   76.44   62.35   62.35   52.28   40.27   40.27   40.27   40.27   20.75
 50          UI   14.32   14.32   14.32   14.32   14.32   14.32   14.32   14.32   14.32   14.32
 51          UI   14.32   14.32     0.0
 52          KK      E1
 53          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 54          KM            L=3.19     Lca=1.81     S=27.95     Kn=0.050     LAG=75.0
 55          KM            S-GRAPH TYPE=DESERT RANGELAND
 56          KO       0       0     0.0       1      22
 57          BA  1.4663
 58          LG   0.343   0.347   4.362   0.364   2.082
             * E1
 59          UI     0.0   65.83   65.83   65.83  133.71  212.83  283.95  353.35  417.84  469.07
 60          UI  544.82  578.46  602.95  630.83  630.83  621.37  596.51  565.09  496.91  450.85
 61          UI  395.94   351.1  316.81  280.75   249.5  222.83  197.54  180.24  148.98  137.95
 62          UI   124.1  111.01  100.93   91.12   69.77   69.77   68.29   45.06   45.06   45.06
 63          UI   45.06   44.48   16.02   16.02   16.02   16.02   16.02   16.02   16.02   16.02
 64          UI   16.02   16.02   16.02   16.02   16.02   16.02
 65          KK      1E   CNAME   1E-2E
 66          KO       0       0     0.0       0      22
 67          HC       2
 68          KK   1E-2E   CNAME      1E
 69          KO       0       0     0.0       0      22
 70          RS       7    FLOW     0.0     0.0
 71          RC    0.05    0.07    0.05  9559.0  0.0051     0.0
             * 1E-2E
 72          RX     0.0    15.0    45.0    55.0    75.0    85.0   115.0   130.0
 73          RY    10.5     4.5     2.0     0.0     0.0     2.0     4.5    10.5
 74          KK      E3
 75          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 76          KM            L=2.72     Lca=0.99     S=25.93     Kn=0.050     LAG=56.0
 77          KM            S-GRAPH TYPE=DESERT RANGELAND
 78          KO       0       0     0.0       1      22
 79          BA  0.9425
 80          BF   450.0     0.0     1.0
 81          LG   0.402   0.306   4.245   0.444   1.589
             * E3
 82          UI     0.0   56.67   56.67  101.72  193.55  277.61  352.61  421.01  484.48  516.56
 83          UI   543.1  541.36  515.53  472.72  403.34  343.83  295.16   254.8   215.6  185.13
 84          UI  160.09  132.41   113.9  101.35    86.9   70.93   60.07   56.56   38.79   38.79
 85          UI   38.79   28.75   13.79   13.79   13.79   13.79   13.79   13.79   13.79   13.79
 86          UI   13.79   13.79
 87          KK      2E   CNAME   2E-3E
 88          KO       0       0     0.0       0      22
 89          HC       2
                                          HEC-1 INPUT                                          PAGE  3
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 90          KK   2E-3E   CNAME      2E
 91          KO       0       0     0.0       0      22
 92          RS       5    FLOW     0.0     0.0
 93          RC   0.055    0.03   0.055 10646.0  0.0051     0.0
             * 2E-3E
 94          RX     0.0    15.0    35.0    40.0    60.0    65.0    85.0   100.0
 95          RY     7.5     4.0     3.0     0.0     0.0     3.0     4.0     7.5
 96          KK      E4
 97          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 98          KM            L=2.00     Lca=1.24     S=28.98     Kn=0.050     LAG=53.0
 99          KM            S-GRAPH TYPE=DESERT RANGELAND
100          KO       0       0     0.0       1      22
101          BA  0.7401
102          BF     0.0     0.0     0.0
103          LG   0.389   0.324   4.185   0.421     0.0
             * E4
104          UI     0.0   47.02   47.02   96.57  173.26  247.62  312.68  368.15  416.75  440.62
105          UI  450.61  438.38   410.6  347.57  298.99  252.38   214.2  181.58  153.89  132.33
106          UI   107.9   92.15   80.49    72.1   52.01   49.84    39.2   32.19   32.19   31.34
107          UI   11.44   11.44   11.44   11.44   11.44   11.44   11.44   11.44   11.44     0.0
108          KK      3E   CNAME     13R
109          KO       0       0     0.0       0      22
110          HC       2
111          KK     13R   CNAME      3E
112          KO       0       0     0.0       0      22
113          RN     13R
114          KK      D1
115          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
116          KM            L=2.05     Lca=0.98     S=41.10     Kn=0.050     LAG=46.0
117          KM            S-GRAPH TYPE=DESERT RANGELAND
118          KO       0       0     0.0       1      22
119          BA  0.6874
120          LG    0.35    0.35   4.642   0.317     0.0
             * D1
121          UI     0.0   50.32   50.32  141.34  228.99  312.52  384.55  444.86  474.65  481.62
122          UI  455.19  400.91  332.15  274.33  228.36  187.75  154.57  127.52  104.38   88.96
123          UI   77.15   56.45   53.33   35.26   34.44   34.44   15.23   12.25   12.25   12.25
124          UI   12.25   12.25   12.25   12.25     0.0
125          KK      4R   CNAME      1D
126          KO       0       0     0.0       0      22
127          RN      4R
128          KK      C1
129          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
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 130          KM            L=2.65      Lca=1.06      S=41.60      Kn=0.050      LAG=52.0
 131          KM            S-GRAPH TYPE=DESERT RANGELAND
 132          KO       0       0      0.0        1       22
 133          BA   0.947
 134          LG    0.35    0.35    4.669    0.311      0.0
              * C1

                                          HEC-1 INPUT                                                    PAGE  4

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

 135          UI     0.0   61.32   61.32  131.22  233.88  329.66  413.44  491.65  546.63  581.16
 136          UI  587.64  561.55  521.37  439.42  369.44  313.69  266.99  226.51  188.91  160.51
 137          UI  133.36   115.6   96.21    84.2   64.99   63.11   41.97   41.97   41.97   26.09
 138          UI   14.92   14.92   14.92   14.92   14.92   14.92   14.92   14.92   14.92     0.0

 139          KK      3R   CNAME      1C
 140          KO       0       0      0.0        0       22
 141          RN      3R

 142          KK      B1
 143          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 144          KM            L=1.34      Lca=0.66      S=57.24      Kn=0.050      LAG=31.0
 145          KM            S-GRAPH TYPE=DESERT RANGELAND
 146          KO       0       0      0.0        1       22
 147          BA  0.3003
 148          LG    0.35    0.35    4.624    0.315      0.0
              * B1
 149          UI     0.0   32.62   70.32  160.06  235.61  291.03  312.58  291.47  230.86  173.86
 150          UI  132.12   99.49   73.87   56.67   42.44    32.8   22.33   21.44    7.94    7.94
 151          UI    7.94    7.94    7.94     0.0

 152          KK      2R   CNAME      1B
 153          KO       0       0      0.0        0       22
 154          RN      2R

 155          KK      A1
 156          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 157          KM            L=2.96      Lca=1.73      S=32.98      Kn=0.050      LAG=69.0
 158          KM            S-GRAPH TYPE=DESERT RANGELAND
 159          KO       0       0      0.0        1       22
 160          BA   1.628
 161          LG   0.343   0.347    4.498    0.339    2.145
              * A1
 162          UI     0.0   79.44   79.44   79.44  202.48  287.09  387.46  471.36  550.52  628.97
 163          UI  692.49  723.86  761.33  761.33  744.73   712.6  657.55  568.77  509.79  446.69
 164          UI  392.19  351.67  304.09   269.9  236.73  213.32   177.4  158.52  149.77  121.82
 165          UI  121.81   86.84    84.2    84.2   56.31   54.38   54.38   54.38   43.92   19.34
 166          UI   19.34   19.34   19.34   19.34   19.34   19.34   19.34   19.34   19.34   19.34
 167          UI   19.34     0.0

 168          KK      1R   CNAME      1A
 169          KO       0       0      0.0        0       22
 170          RN      1R
 171          ZZ
```

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 | E2 | 713. | 5.00 | 175. | 44. | 15. | 1.22 | | |
| + | HYDROGRAPH AT | E1 | 772. | 5.08 | 203. | 51. | 17. | 1.47 | | |
| + | 2 COMBINED AT | 1E | 1318. | 5.00 | 342. | 86. | 29. | 2.69 | | |
| + | ROUTED TO | 1E-2E | 1250. | 5.50 | 340. | 86. | 29. | 2.69 | | |
| + | HYDROGRAPH AT | E3 | 1095. | 4.75 | 578. | 482. | 461. | 0.94 | | |
| + | 2 COMBINED AT | 2E | 1840. | 5.42 | 874. | 557. | 486. | 3.63 | | |
| + | ROUTED TO | 2E-3E | 1779. | 5.75 | 874. | 557. | 486. | 3.63 | | |
| + | HYDROGRAPH AT | E4 | 559. | 4.75 | 104. | 26. | 9. | 0.74 | | |
| + | 2 COMBINED AT | 3E | 1807. | 5.75 | 936. | 573. | 491. | 4.37 | | |
| + | ROUTED TO | 13R | 1807. | 5.75 | 936. | 573. | 491. | 4.37 | | |
| + | HYDROGRAPH AT | D1 | 646. | 4.58 | 107. | 27. | 9. | 0.69 | | |
| + | ROUTED TO | 4R | 646. | 4.58 | 107. | 27. | 9. | 0.69 | | |
| + | HYDROGRAPH AT | C1 | 758. | 4.67 | 141. | 35. | 12. | 0.95 | | |
| + | ROUTED TO | 3R | 758. | 4.67 | 141. | 35. | 12. | 0.95 | | |
| + | HYDROGRAPH AT | B1 | 422. | 4.42 | 49. | 12. | 4. | 0.30 | | |
| + | ROUTED TO | 2R | 422. | 4.42 | 49. | 12. | 4. | 0.30 | | |
| | HYDROGRAPH AT | | | | | | | | | |

```
+                          A1      929.    5.00        228.        57.        19.      1.63

        ROUTED TO
+                          1R      929.    5.00        228.        57.        19.      1.63


*** NORMAL END OF HEC-1 ***
```

## D.5.2 HEC-1 Output File 100-Year 24-Hour (Existing Conditions)

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1*************************************                    *************************************
 *                                   *                    *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                    *   U.S. ARMY CORPS OF ENGINEERS    *
 *            MAY  1991              *                    *   HYDROLOGIC ENGINEERING CENTER   *
 *          VERSION 4.0.1E           *                    *         609 SECOND STREET         *
 *                                   *                    *      DAVIS, CALIFORNIA 95616      *
 * RUN DATE _________ TIME _________ *                    *          (916) 551-1748           *
 *                                   *                    *                                   *
 *************************************                    *************************************
```

```
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

                                        HEC-1 INPUT                                          PAGE  1

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

   1          ID   Buckeye/Sun Valley ADMS - 03 May 2004
   2          ID   PBS&J - Modelers: Jacob Lesue & Wen Chen
   3          ID   100-year 24-hour
   4          ID   Existing Conditions
   5          ID   Area 2
   6          ID   Rainfall Loss Method - Green & Ampt
   7          ID   Unit Hydrograph Method - FCDMC S-Graph
   8          ID   Channel Routing Method - Normal Depth
   9          ID   Land Use - FCDMC GIS Data: mag_landuse (2000)
  10          ID   Soil Data - USDA SCS Soil Survey (1972 & 1981)
  11          ID   Units - L(mi)   Lca(mi)   S(ft/mi)   LAG(min)
              *DIAGRAM
  12          IT       5  1JAN94       0    2000
  13          IO       3
  14          IN      15 01JAN94       0
  15          JD   4.104    0.01
              * 24-hour distribution
  16          PC     0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
  17          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
  18          PC   0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
  19          PC    0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
  20          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
  21          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
  22          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
  23          PC   0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
  24          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
  25          PC   0.983   0.986   0.989   0.992   0.995   0.998     1.0
  26          IN      15 01JAN94       0
  27          JD   3.899    10.0
              * 24-hour distribution
  28          PC     0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
  29          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
  30          PC   0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
  31          PC    0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
  32          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
  33          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
  34          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
  35          PC   0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
  36          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
  37          PC   0.983   0.986   0.989   0.992   0.995   0.998     1.0

  38          KK      E2
  39          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  40          KM            L=2.97      Lca=1.67      S=27.48      Kn=0.050      LAG=70.0
  41          KM            S-GRAPH TYPE=DESERT RANGELAND
  42          KO       0        0     0.0        1       22
  43          BA   1.223
  44          LG   0.348   0.343   4.461   0.354   2.288
              * E2
  45          UI     0.0   58.83   58.83   58.83  144.86  208.85  279.67  342.88  405.24   457.0
  46          UI  507.81  529.31  563.74  563.74  555.85  533.62  497.45  434.25  391.56  340.11
  47          UI  302.44  266.78  236.95  210.69  181.23  162.62  138.96  125.18   110.9    98.6
  48          UI    90.2   76.44   62.35   62.35   52.28   40.27   40.27   40.27   40.27   20.75
  49          UI   14.32   14.32   14.32   14.32   14.32   14.32   14.32   14.32   14.32   14.32
  50          UI   14.32   14.32     0.0

                                        HEC-1 INPUT                                          PAGE  2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  51          KK      E1
  52          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  53          KM            L=3.19     Lca=1.81     S=27.95     Kn=0.050     LAG=75.0
  54          KM            S-GRAPH TYPE=DESERT RANGELAND
  55          KO       0       0     0.0       1      22
  56          BA  1.4663
  57          LG   0.343   0.347   4.362   0.366   2.082
              * E1
  58          UI     0.0   65.83   65.83   65.83  133.71  212.83  283.95  353.35  417.84  469.07
  59          UI  544.82  578.46  602.95  630.83  630.83  621.37  596.51  565.09  496.91  450.85
  60          UI  395.94   351.1  316.81  280.75   249.5  222.83  197.54  180.24  148.98  137.95
  61          UI   124.1  111.01  100.93   91.12   69.77   69.77   68.29   45.06   45.06   45.06
  62          UI   45.06   44.48   16.02   16.02   16.02   16.02   16.02   16.02   16.02   16.02
  63          UI   16.02   16.02   16.02   16.02   16.02   16.02

  64          KK      1E   CNAME   1E-2E
  65          KO       0       0     0.0       0      22
  66          HC       2

  67          KK   1E-2E   CNAME      1E
  68          KO       0       0     0.0       0      22
  69          RS       7    FLOW     0.0     0.0
  70          RC    0.05    0.07    0.05  9559.0  0.0051     0.0
              * 1E-2E
  71          RX     0.0    15.0    45.0    55.0    75.0    85.0   115.0   130.0
  72          RY    10.5     4.5     2.0     0.0     0.0     2.0     4.5    10.5

  73          KK      E3
  74          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  75          KM            L=2.72     Lca=0.99     S=25.93     Kn=0.050     LAG=56.0
  76          KM            S-GRAPH TYPE=DESERT RANGELAND
  77          KO       0       0     0.0       1      22
  78          BA  0.9425
  79          BF   450.0     0.0     1.0
  80          LG   0.402   0.306   4.245   0.444   1.589
              * E3
  81          UI     0.0   56.67   56.67  101.72  193.55  277.61  352.61  421.01  484.48  516.56
  82          UI   543.1  541.36  515.53  472.72  403.34  343.83  295.16   254.8   215.6  185.13
  83          UI  160.09  132.41   113.9  101.35    86.9   70.93   60.07   56.56   38.79   38.79
  84          UI   38.79   28.75   13.79   13.79   13.79   13.79   13.79   13.79   13.79   13.79
  85          UI   13.79   13.79

  86          KK      2E   CNAME   2E-3E
  87          KO       0       0     0.0       0      22
  88          HC       2

  89          KK   2E-3E   CNAME      2E
  90          KO       0       0     0.0       0      22
  91          RS       5    FLOW     0.0     0.0
  92          RC   0.055    0.03   0.055 10646.0  0.0051     0.0
              * 2E-3E
  93          RX     0.0    15.0    35.0    40.0    60.0    65.0    85.0   100.0
  94          RY     7.5     4.0     3.0     0.0     0.0     3.0     4.0     7.5
```



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

  95          KK      E4
  96          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  97          KM            L=2.00     Lca=1.24     S=28.98     Kn=0.050     LAG=53.0
  98          KM            S-GRAPH TYPE=DESERT RANGELAND
  99          KO       0       0     0.0       1      22
 100          BA  0.7401
 101          BF     0.0     0.0     0.0
 102          LG   0.389   0.324   4.185   0.421     0.0
              * E4
 103          UI     0.0   47.02   47.02   96.57  173.26  247.62  312.68  368.15  416.75  440.62
 104          UI  450.61  436.38   410.6  347.57  298.99  252.38   214.2  181.58  153.89  132.33
 105          UI   107.9   92.15   80.49    72.1   52.01   49.84    39.2   32.19   32.19   31.34
 106          UI   11.44   11.44   11.44   11.44   11.44   11.44   11.44   11.44   11.44     0.0

 107          KK      3E   CNAME     13R
 108          KO       0       0     0.0       0      22
 109          HC       2

 110          KK     13R   CNAME      3E
 111          KO       0       0     0.0       0      22
 112          RN     13R

 113          KK      D1
 114          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 115          KM            L=2.05     Lca=0.98     S=41.10     Kn=0.050     LAG=46.0
 116          KM            S-GRAPH TYPE=DESERT RANGELAND
 117          KO       0       0     0.0       1      22
 118          BA  0.6874
 119          LG    0.35    0.35   4.642   0.317     0.0
              * D1
 120          UI     0.0   50.32   50.32  141.34  228.99  312.52  384.55  444.86  474.65  481.62
 121          UI  455.19  400.91  332.15  274.33  228.36  187.75  154.57  127.52  104.38   88.96
 122          UI   77.15   54.45   53.33   35.26   34.44   34.44   15.23   12.25   12.25   12.25
 123          UI   12.25   12.25   12.25   12.25     0.0

 124          KK      4R   CNAME      1D
 125          KO       0       0     0.0       0      22
 126          RN      4R

 127          KK      C1
 128          KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 129          KM            L=2.65     Lca=1.06     S=41.60     Kn=0.050     LAG=52.0
 130          KM            S-GRAPH TYPE=DESERT RANGELAND
 131          KO       0       0     0.0       1      22
 132          BA   0.947
 133          LG    0.35    0.35   4.669   0.311     0.0
              * C1
 134          UI     0.0   61.32   61.32  131.22  233.88  329.66  413.44  491.65  545.63  581.16
 135          UI  587.64  561.55  521.37  439.42  369.44  313.69  266.99  226.51  188.91  160.51
 136          UI  133.36   115.6   96.21    84.2   64.99   63.11   41.97   41.97   41.97   26.09
 137          UI   14.92   14.92   14.92   14.92   14.92   14.92   14.92   14.92   14.92     0.0
```

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                                        HEC-1 INPUT                                                    PAGE  4

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


  138           KK      3R   CNAME      1C
  139           KO       0       0     0.0       0      22
  140           RN      3R

  141           KK      B1
  142           KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  143           KM            L=1.34     Lca=0.66     S=57.24     Kn=0.050     LAG=31.0
  144           KM            S-GRAPH TYPE=DESERT RANGELAND
  145           KO       0       0     0.0       1      22
  146           BA  0.3003
  147           LG    0.35    0.35   4.624   0.315     0.0
                * B1
  148           UI     0.0   32.62   70.32  160.06  235.61  291.03  312.58  291.47  230.86  173.86
  149           UI  132.12   99.49   73.87   56.67   42.44    32.8   22.33   21.44    7.94    7.94
  150           UI    7.94    7.94    7.94     0.0

  151           KK      2R   CNAME      1B
  152           KO       0       0     0.0       0      22
  153           RN      2R

  154           KK      A1
  155           KM            THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  156           KM            L=2.96     Lca=1.73     S=32.98     Kn=0.050     LAG=69.0
  157           KM            S-GRAPH TYPE=DESERT RANGELAND
  158           KO       0       0     0.0       1      22
  159           BA   1.628
  160           LG   0.343   0.347   4.498   0.339   2.145
                * A1
  161           UI     0.0   79.44   79.44   79.44  202.48  287.09  387.46  471.36  550.52  628.97
  162           UI  692.49  723.86  761.33  761.33  744.73   712.6  657.55  568.77  509.79  446.69
  163           UI  392.19  351.67  304.09   269.9  236.73  213.32   177.4  158.52  149.77  121.82
  164           UI  121.81   86.84    84.2    84.2   56.31   54.38   54.38   54.38   43.92   19.34
  165           UI   19.34   19.34   19.34   19.34   19.34   19.34   19.34   19.34   19.34   19.34
  166           UI   19.34     0.0

  167           KK      1R   CNAME      1A
  168           KO       0       0     0.0       0      22
  169           RN      1R
  170           ZZ
```

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 | E2 | 590. | 13.00 | 144. | 37. | 12. | 1.22 | | |
| + | HYDROGRAPH AT | E1 | 656. | 13.00 | 171. | 44. | 15. | 1.47 | | |
| + | 2 COMBINED AT | 1E | 1236. | 13.00 | 312. | 80. | 27. | 2.69 | | |
| + | ROUTED TO | 1E-2E | 1166. | 13.50 | 310. | 80. | 27. | 2.69 | | |
| + | HYDROGRAPH AT | E3 | 976. | 12.75 | 553. | 476. | 459. | 0.94 | | |
| + | 2 COMBINED AT | 2E | 1813. | 13.42 | 858. | 555. | 485. | 3.63 | | |
| + | ROUTED TO | 2E-3E | 1750. | 13.75 | 858. | 555. | 485. | 3.63 | | |
| + | HYDROGRAPH AT | E4 | 435. | 12.67 | 80. | 20. | 7. | 0.74 | | |
| + | 2 COMBINED AT | 3E | 1822. | 13.75 | 935. | 574. | 492. | 4.37 | | |
| + | ROUTED TO | 13R | 1822. | 13.75 | 935. | 574. | 492. | 4.37 | | |
| + | HYDROGRAPH AT | D1 | 497. | 12.58 | 81. | 20. | 7. | 0.69 | | |
| + | ROUTED TO | 4R | 497. | 12.58 | 81. | 20. | 7. | 0.69 | | |
| + | HYDROGRAPH AT | C1 | 613. | 12.67 | 111. | 28. | 9. | 0.95 | | |
| + | ROUTED TO | 3R | 613. | 12.67 | 111. | 28. | 9. | 0.95 | | |
| + | HYDROGRAPH AT | B1 | 307. | 12.42 | 36. | 9. | 3. | 0.30 | | |
| + | ROUTED TO | 2R | 307. | 12.42 | 36. | 9. | 3. | 0.30 | | |
| + | HYDROGRAPH AT | A1 | 803. | 12.92 | 193. | 49. | 16. | 1.63 | | |
| + | ROUTED TO | 1R | 803. | 12.92 | 193. | 49. | 16. | 1.63 | | |

*** NORMAL END OF HEC-1 ***

# E. Hydraulic Analysis Supporting Documentation

## E.1 Roughness Coefficient Estimation

### For Tributaries 1E, 3E, and 4E – All Reaches

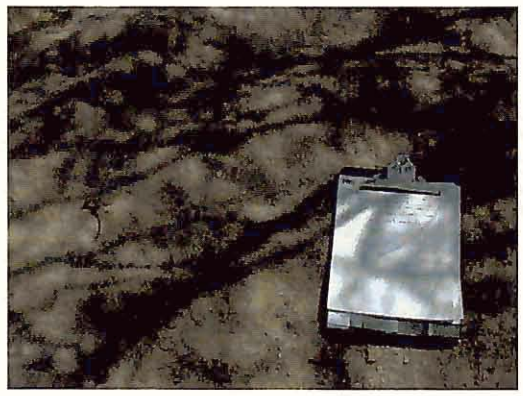
Photos L01-PX through L21-PX are from the May 21, 2004 field visit and correspond to the picture locations noted in Figure 5-17. The photo nomenclature describes the location number (LX) and also the number of the photo (PX) taken at that location.

**Picture.L01-P1**
Hassayampa Tributary 4E

**Picture.L01-P2**
Hassayampa Tributary 4E

**Picture.L01-P3**
Hassayampa Tributary 4E

**Picture.L02-P1**
Hassayampa Tributary 4E



**Picture.L02-P2**
Hassayampa Tributary 4E

**Picture.L02-P3**
Hassayampa Tributary 4E

**Picture.L03-P1**
Hassayampa Tributary 4E

**Picture.L03-P2**
Hassayampa Tributary 4E

**Picture.L04-P1**
Hassayampa Tributary 3E

**Picture.L04-P2**
Hassayampa Tributary 3E

**Picture.L04-P3**
Hassayampa Tributary 3E

**Picture.L05-P1**
Hassayampa Tributary 3E

**Picture.L06-P1**
Hassayampa Tributary 3E

**Picture.L07-P1**
Hassayampa Tributary 3E

**Picture.L07-P2**
Hassayampa Tributary 3E

**Picture.L08-P1**
Hassayampa Tributary 1E

**Picture. L08-P2**
Hassayampa Tributary 1E

**Picture.L08-P3**
Hassayampa Tributary 1E

**Picture.L08-P4**
Hassayampa Tributary 1E

**Picture.L08-P5**
Hassayampa Tributary 1E

**Picture.L08-P6**
Hassayampa Tributary 1E

**Picture.L09-P1**
Hassayampa Tributary 1E

**Picture.L09-P2**
Hassayampa Tributary 1E

**Picture.L09-P3**
Hassayampa Tributary 1E

**Picture.L10-P1**
Hassayampa Tributary 1E

**Picture.L10-P2**
Hassayampa Tributary 1E

**Picture.L11-P1**
Hassayampa Tributary 1E

**Picture.L11-P2**
Hassayampa Tributary 1E

**Picture.L12-P1**
Hassayampa Tributary 1E

**Picture.L-12-P2**
Hassayampa Tributary 1E

**Picture.L13-P1**
Hassayampa Tributary 1E

**Picture.L14-P1**
Hassayampa Tributary 1E

**Picture.L15-P1**
Hassayampa Tributary 1E

**Picture.L15-P2**
Hassayampa Tributary 1E

**Picture.L16-P1**
Hassayampa Tributary 1E

**Picture.L16-P2**
Hassayampa Tributary 1E

**Picture.L17-P1**
Hassayampa Tributary 1E

**Picture.L17-P2**
Hassayampa Tributary 1E

**Picture.L18-P1**
Hassayampa Tributary 1E

**Picture.L18-P2**
Hassayampa Tributary 1E

**Picture.L18-P3**
Hassayampa Tributary 1E

**Picture.L19-P1**
Hassayampa Tributary 1E

**Picture.L19-P2**
Hassayampa Tributary 1E

**Picture.L20-P1**
Hassayampa Tributary 1E

**Picture.L21-P1**
Hassayampa Tributary 1E

**Picture.L21-P2**
Hassayampa Tributary 1E

**Picture.L21-P3**
Hassayampa Tributary 1E

**Picture.L21-P4**
Hassayampa Tributary 1E

**Picture.L21-P5**
Hassayampa Tributary 1E

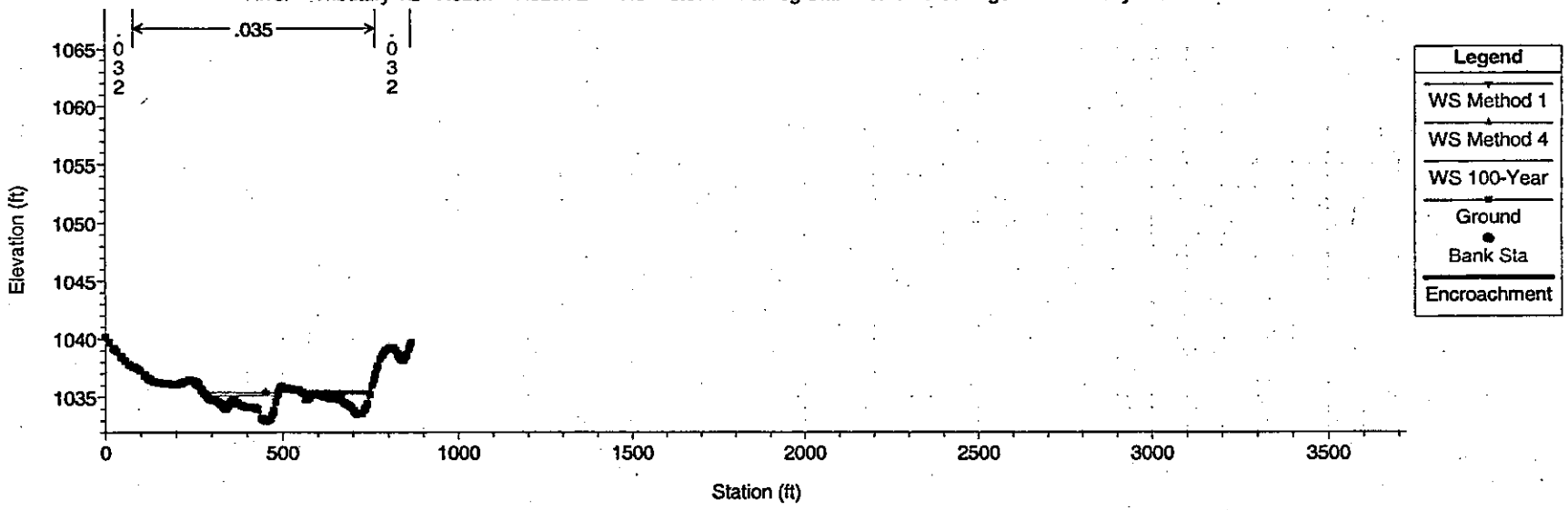
**Picture.L21-P6**
Hassayampa Tributary 1E

## E.2 Cross Section Plots

### E.2.1 Tributary 1E – All Reaches

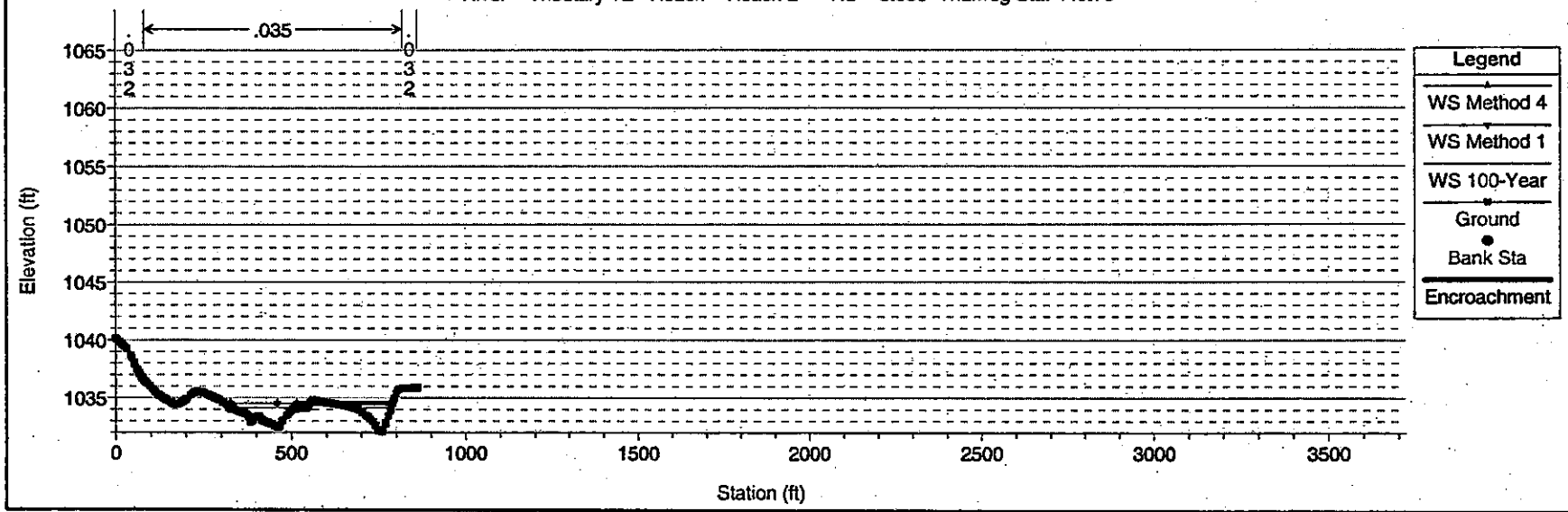
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.971  Thalweg Sta. 443.40 - Discharge from A2-100y6hr.out HEC-1 model

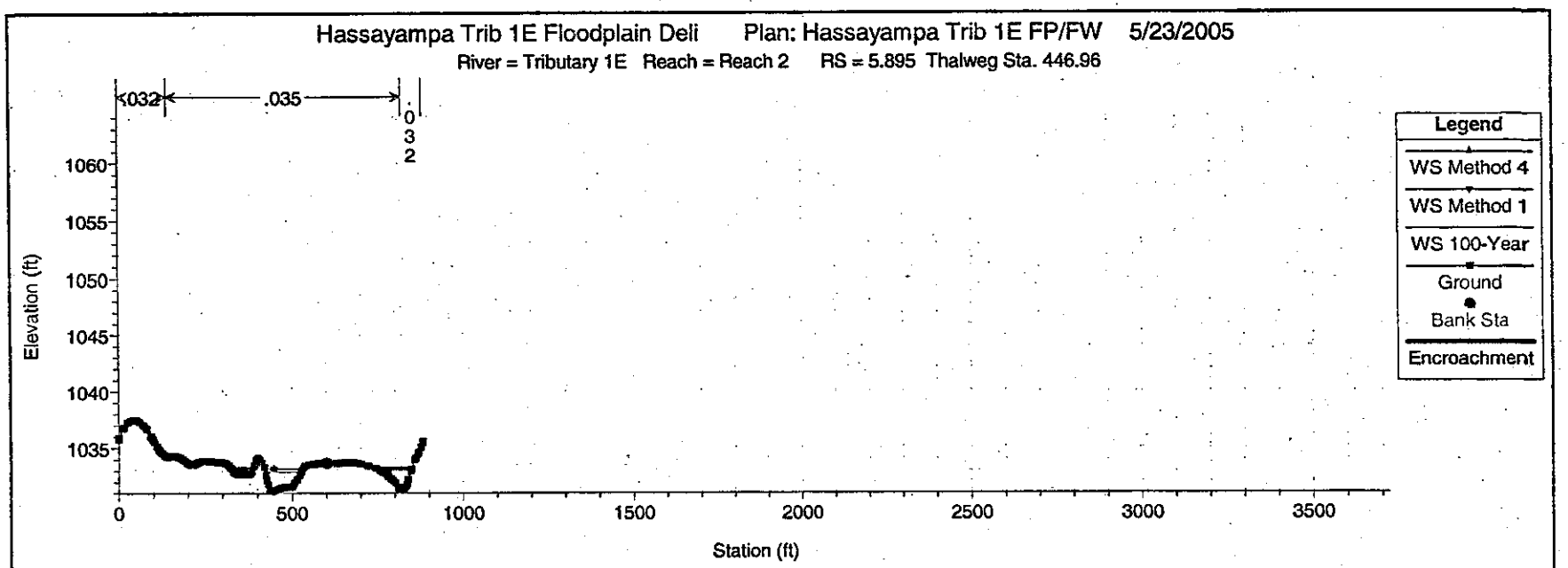


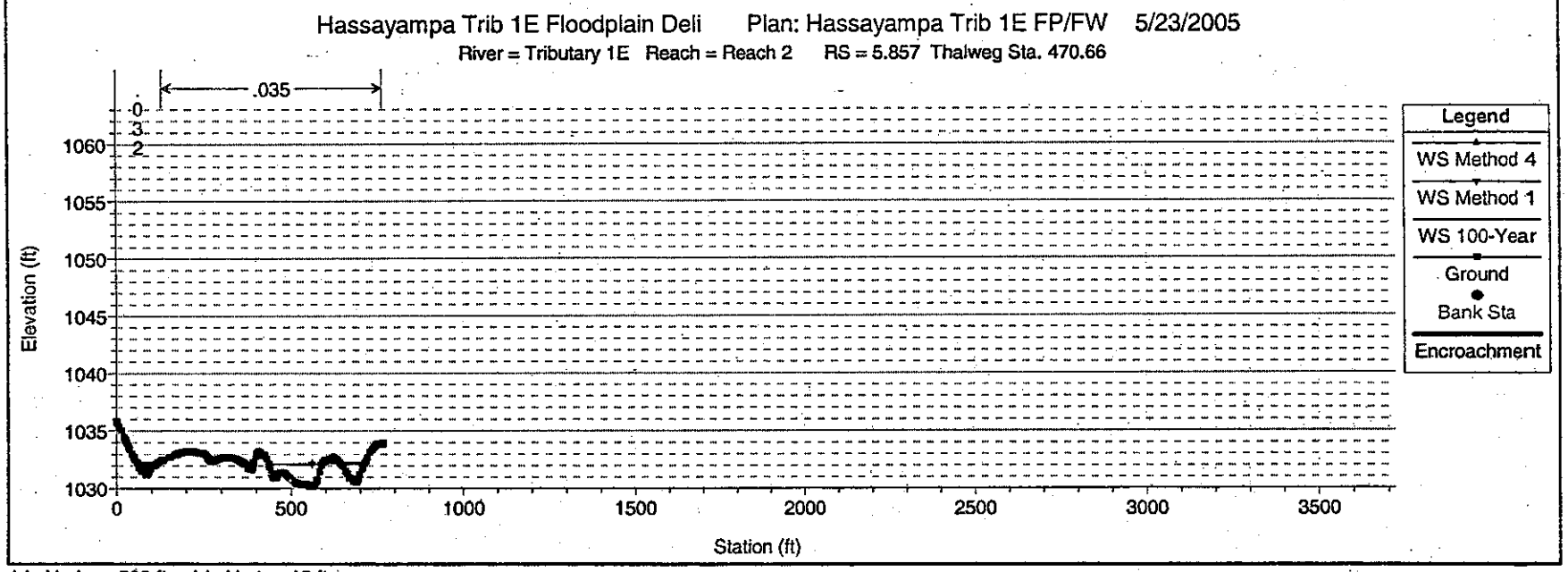

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.933  Thalweg Sta. 440.70

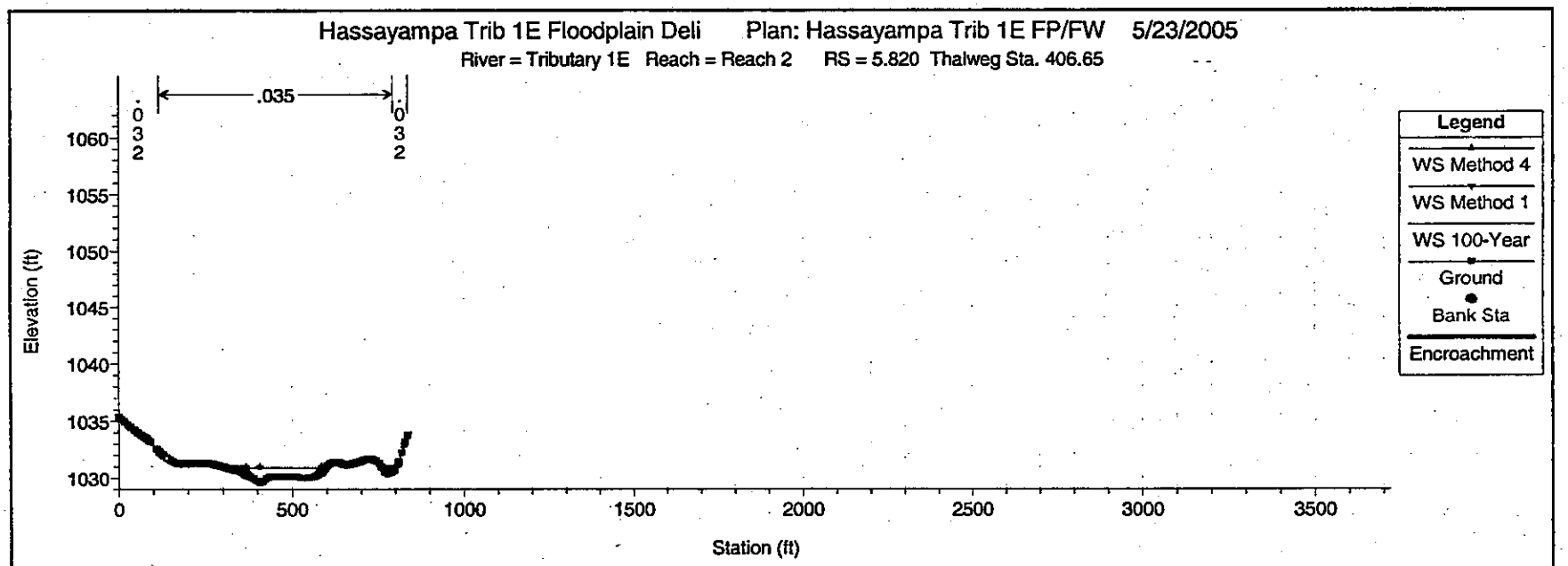


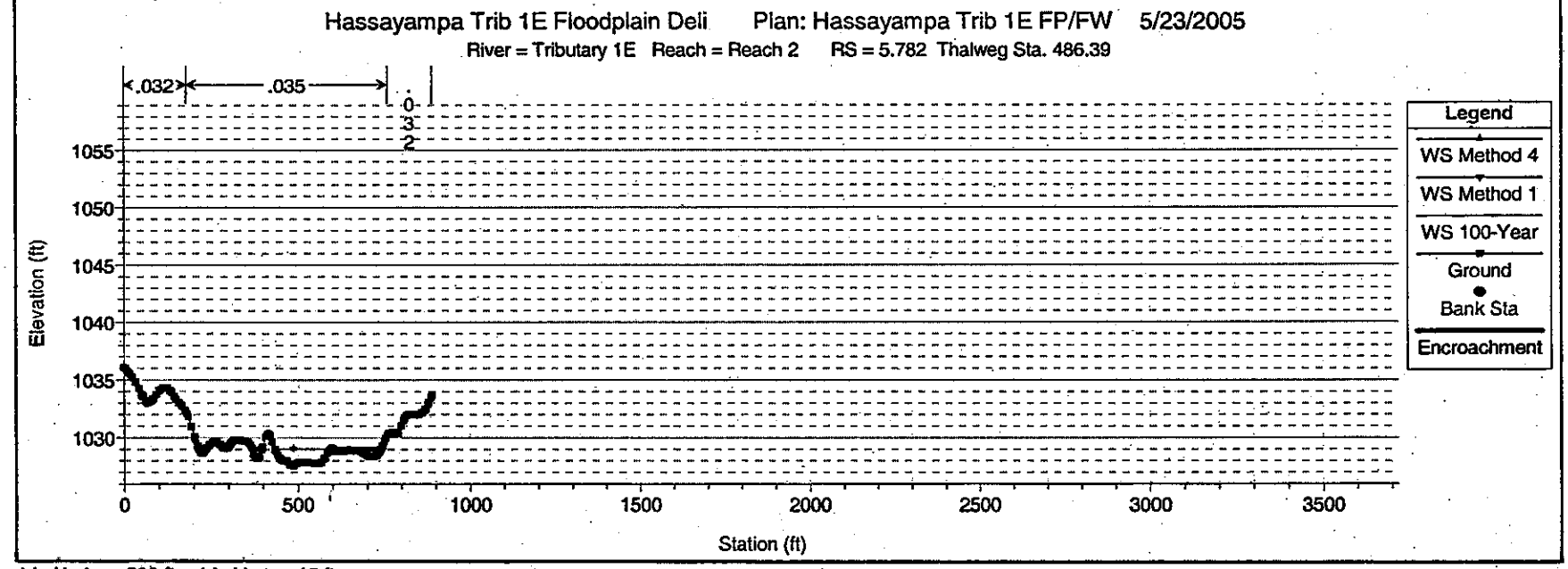

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



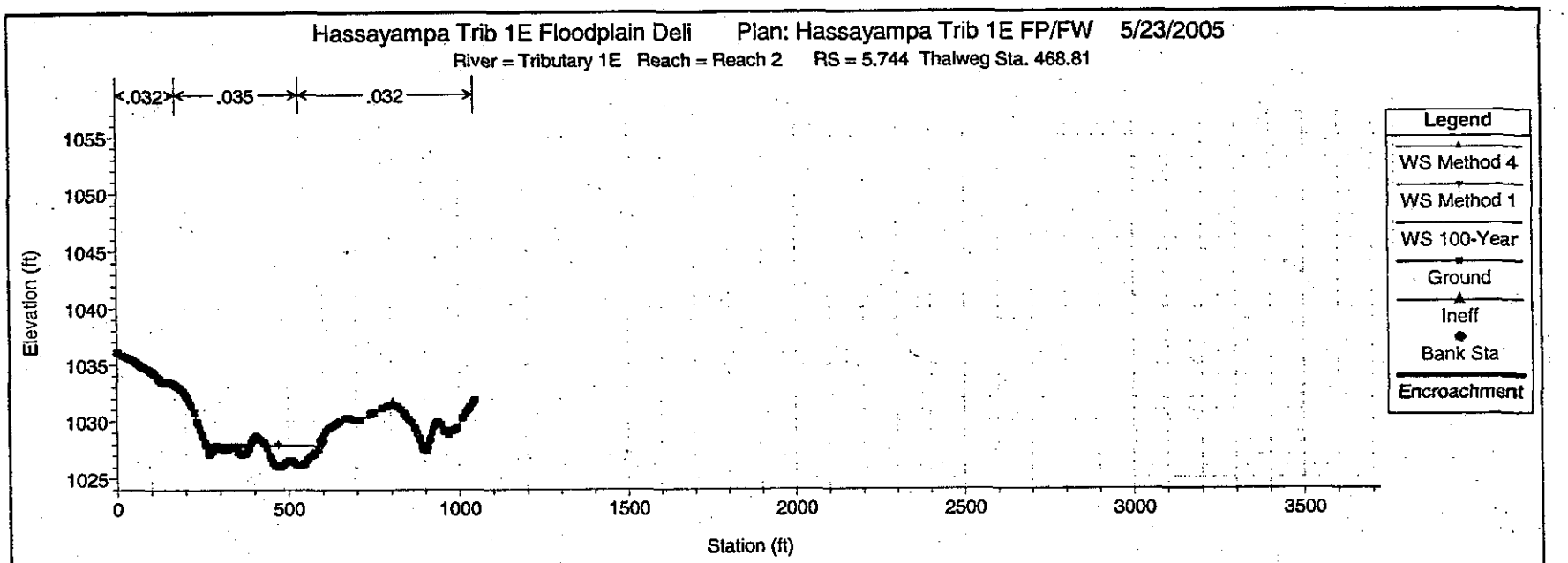



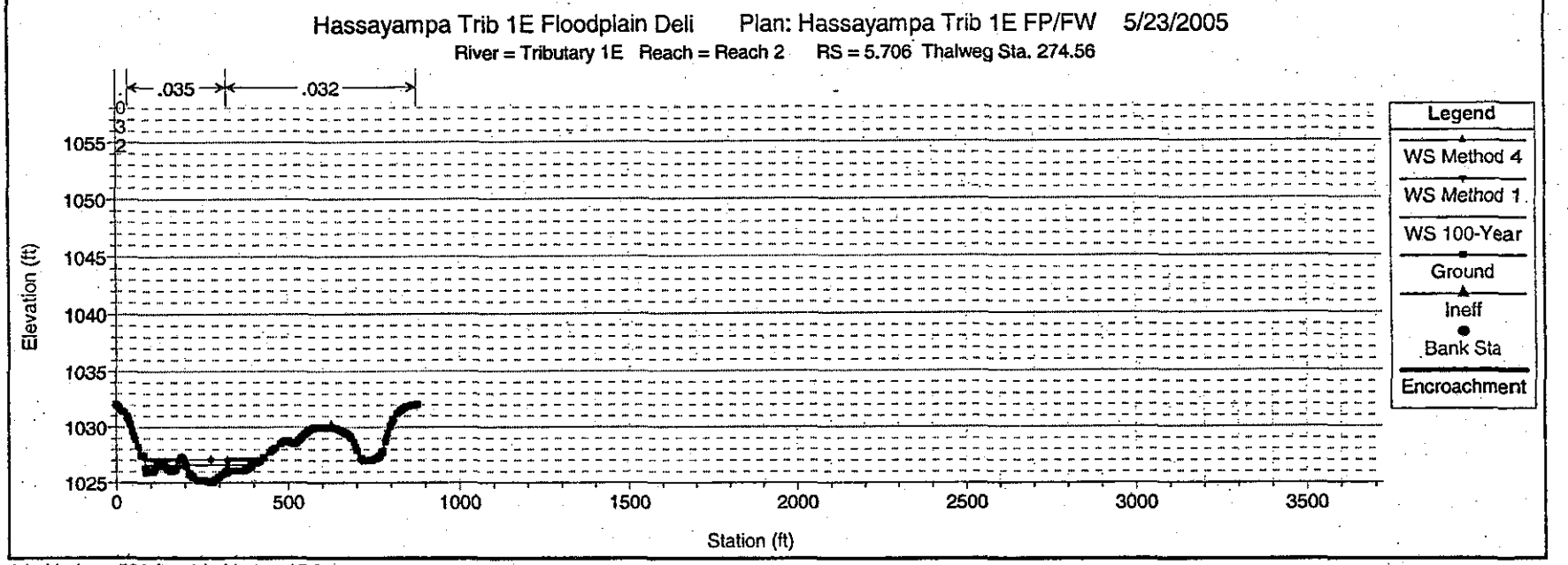

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

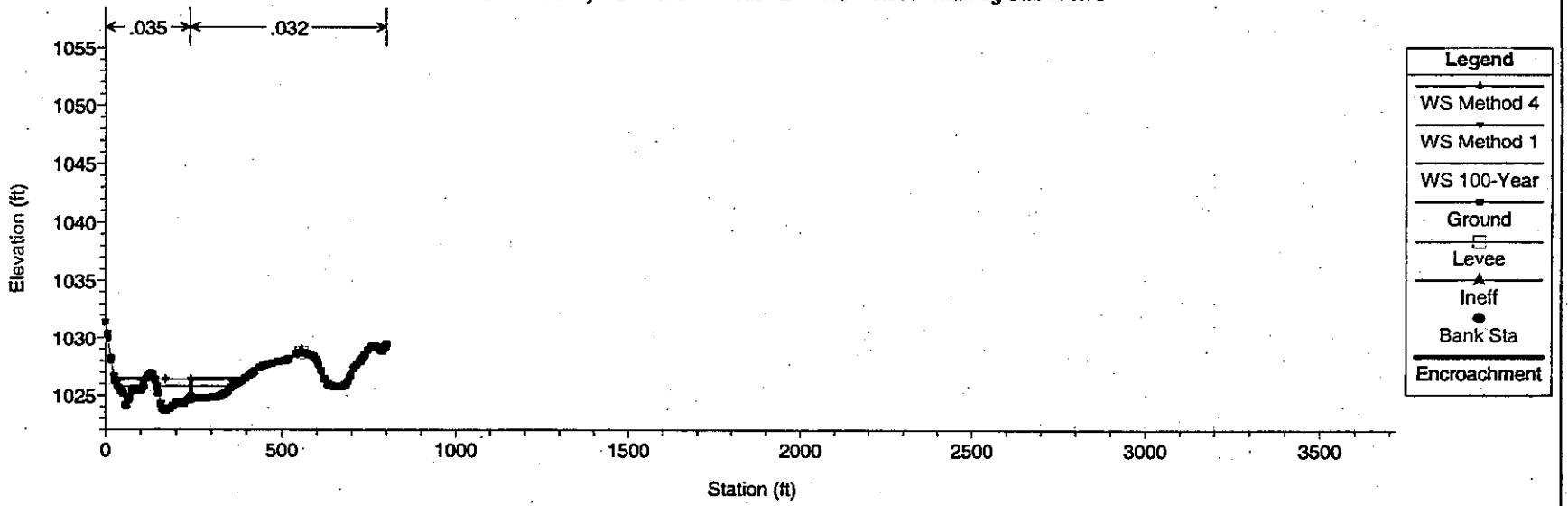



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

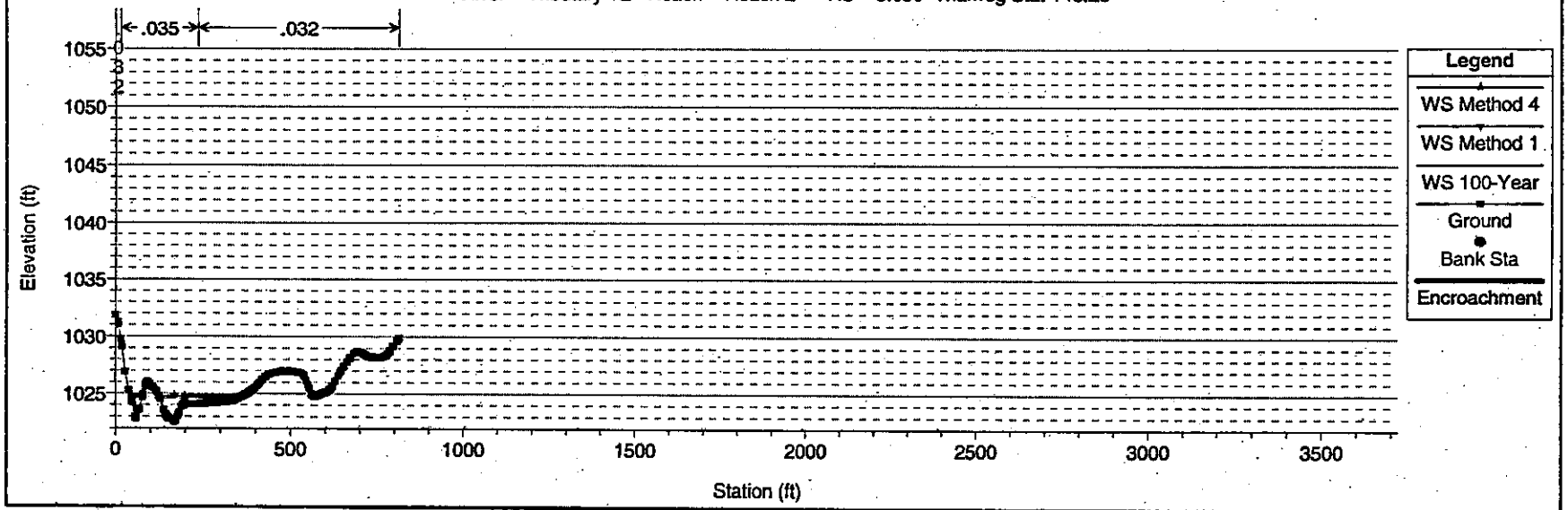
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.668  Thalweg Sta. 170.75

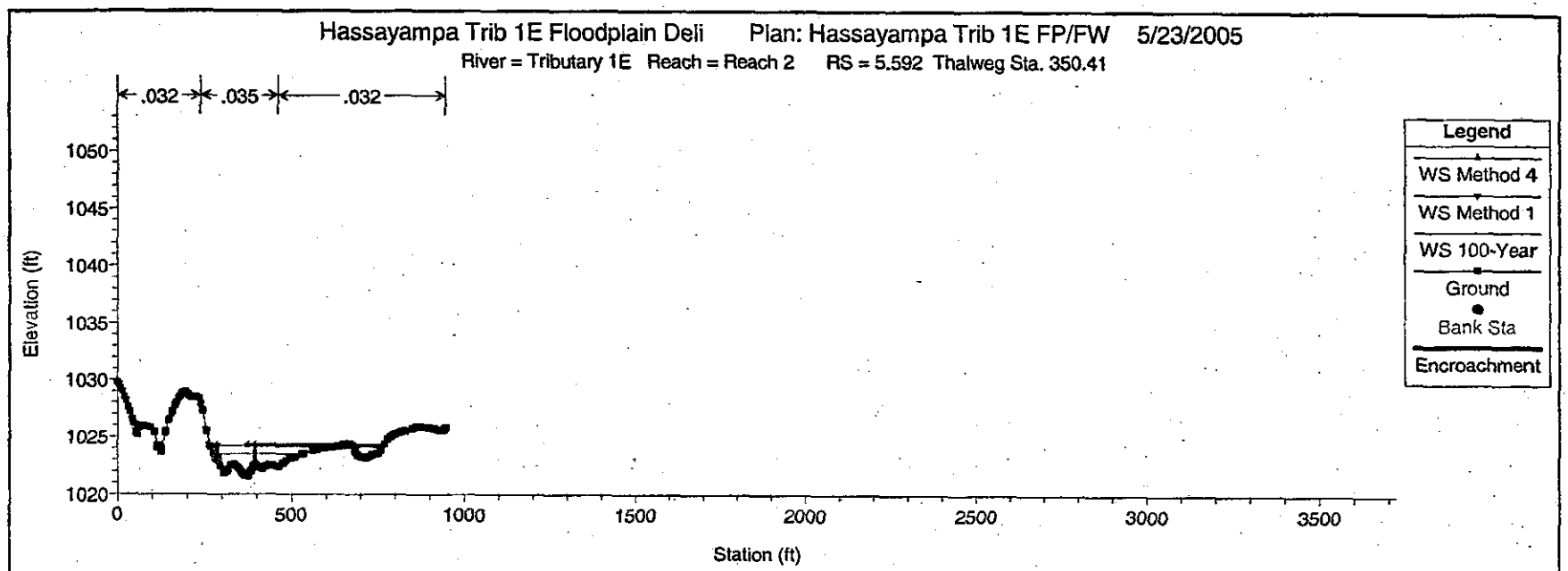


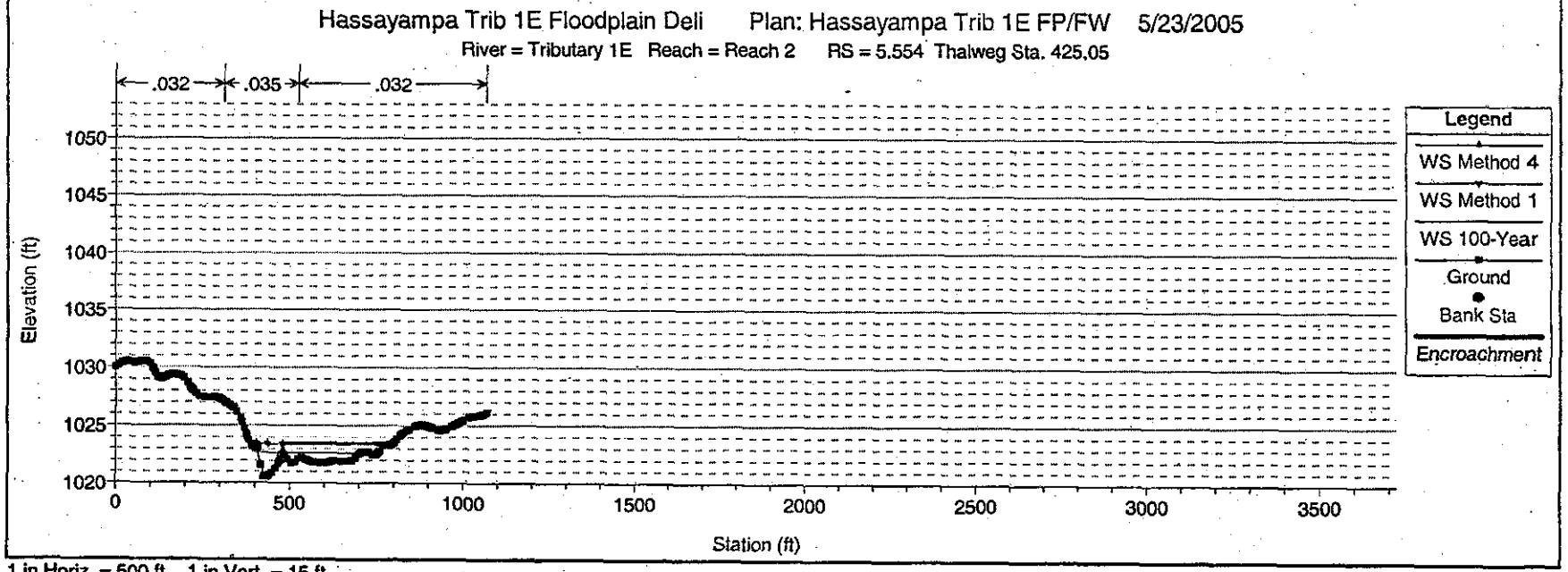

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.630  Thalweg Sta. 148.26




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

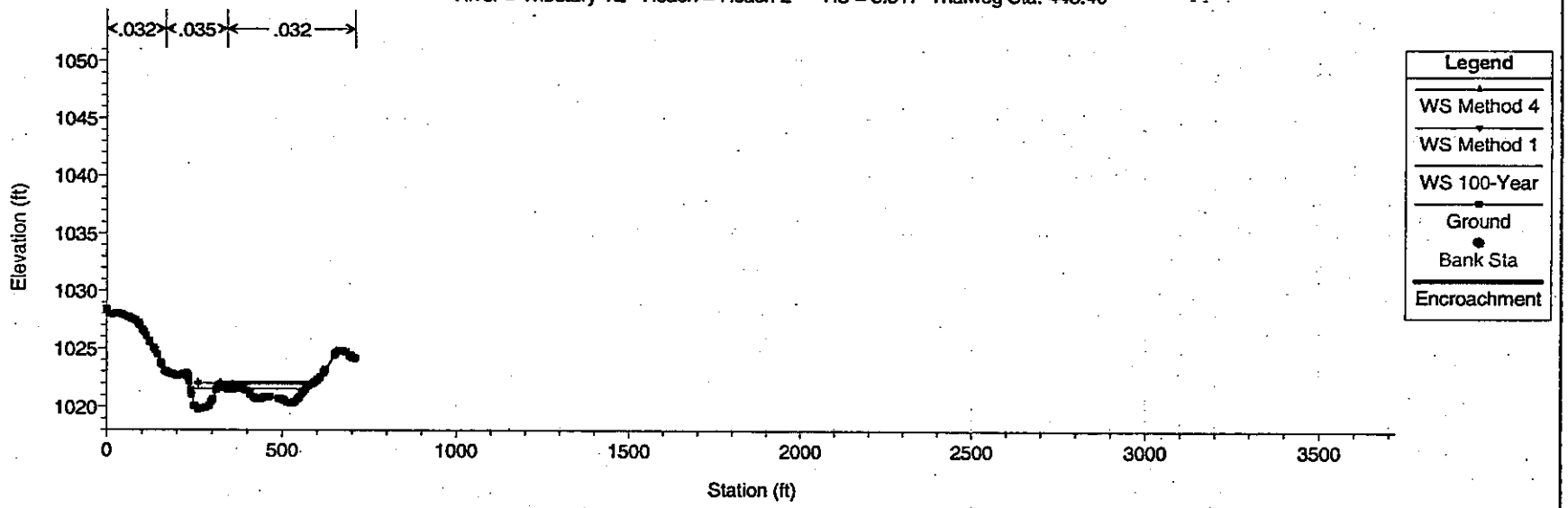



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

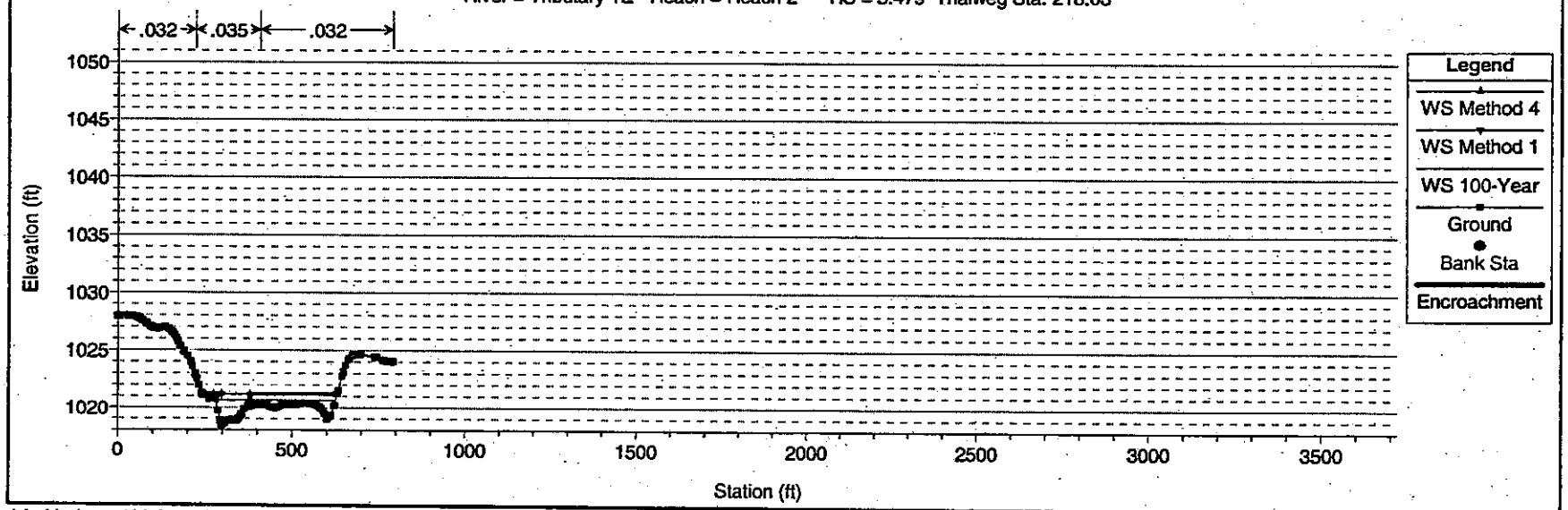
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.517  Thalweg Sta. 443.40

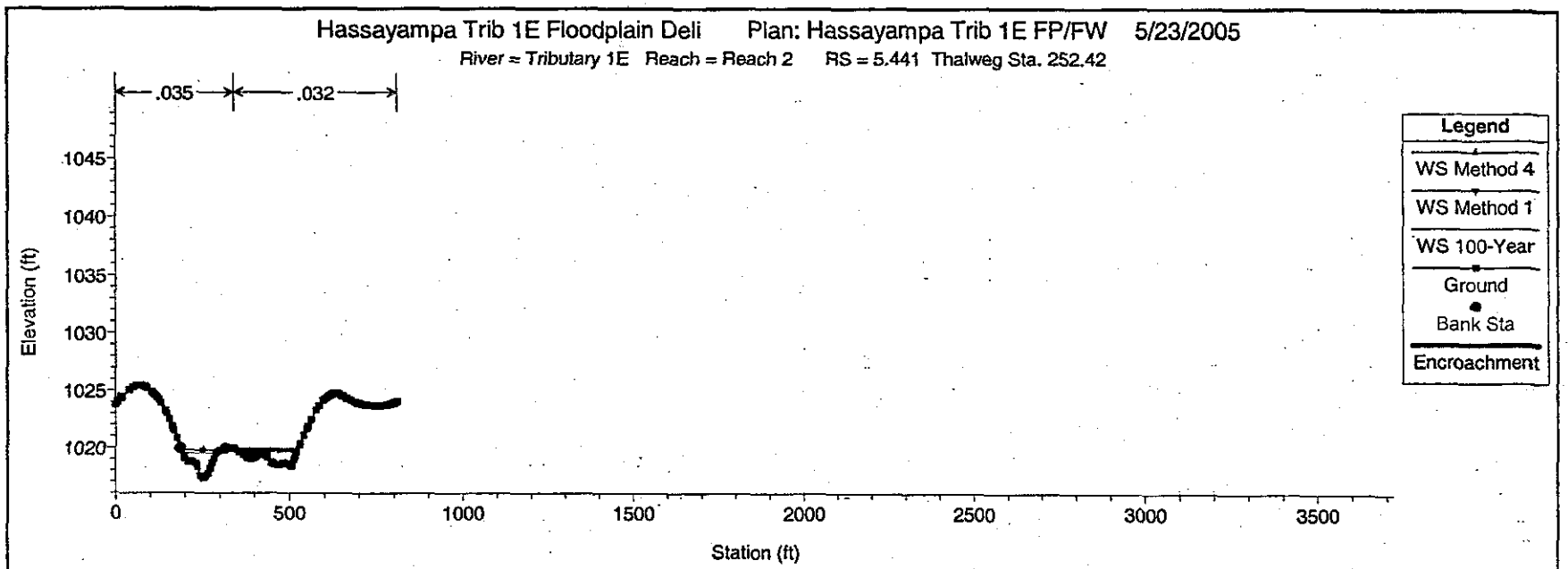


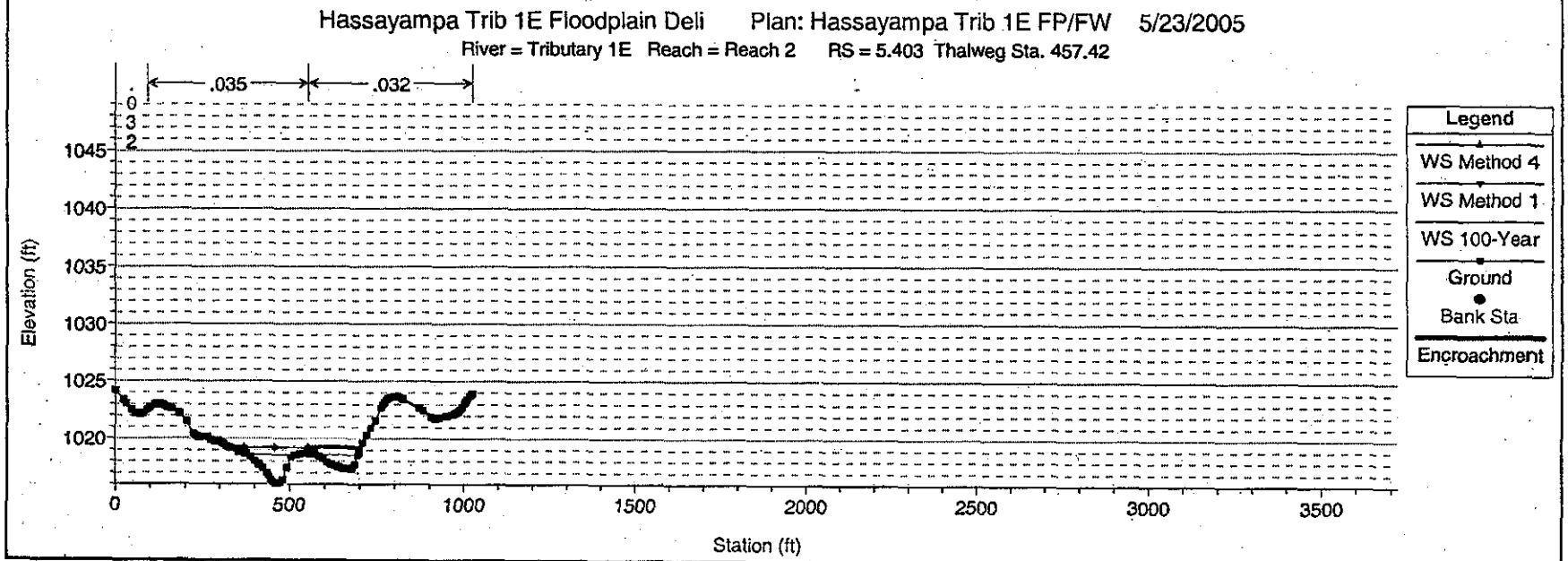

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.479  Thalweg Sta. 218.03

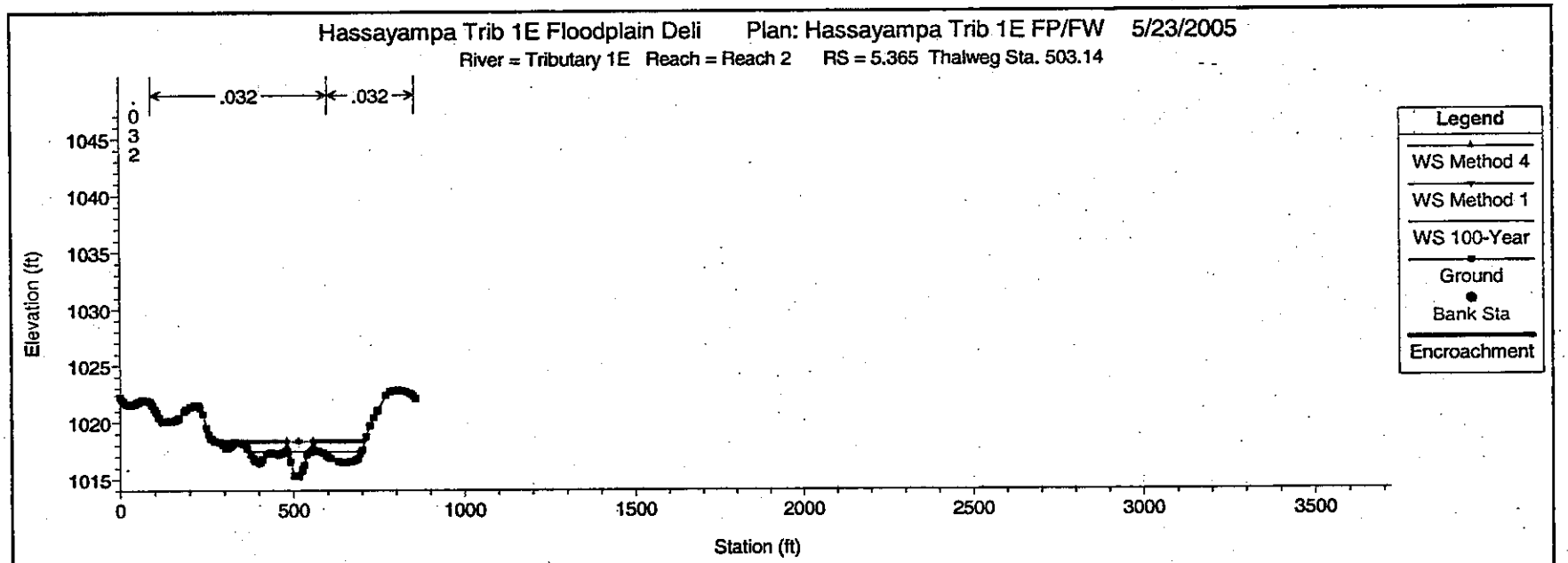


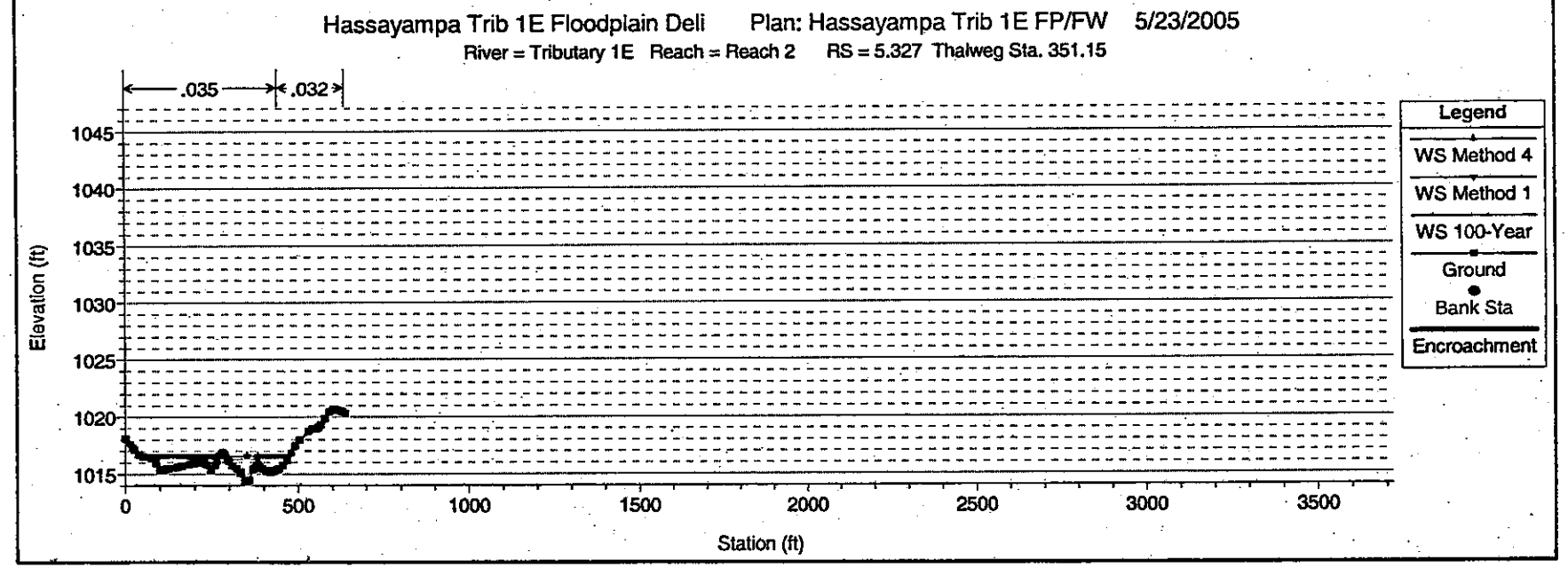

1 in Horiz. = 500 ft  1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

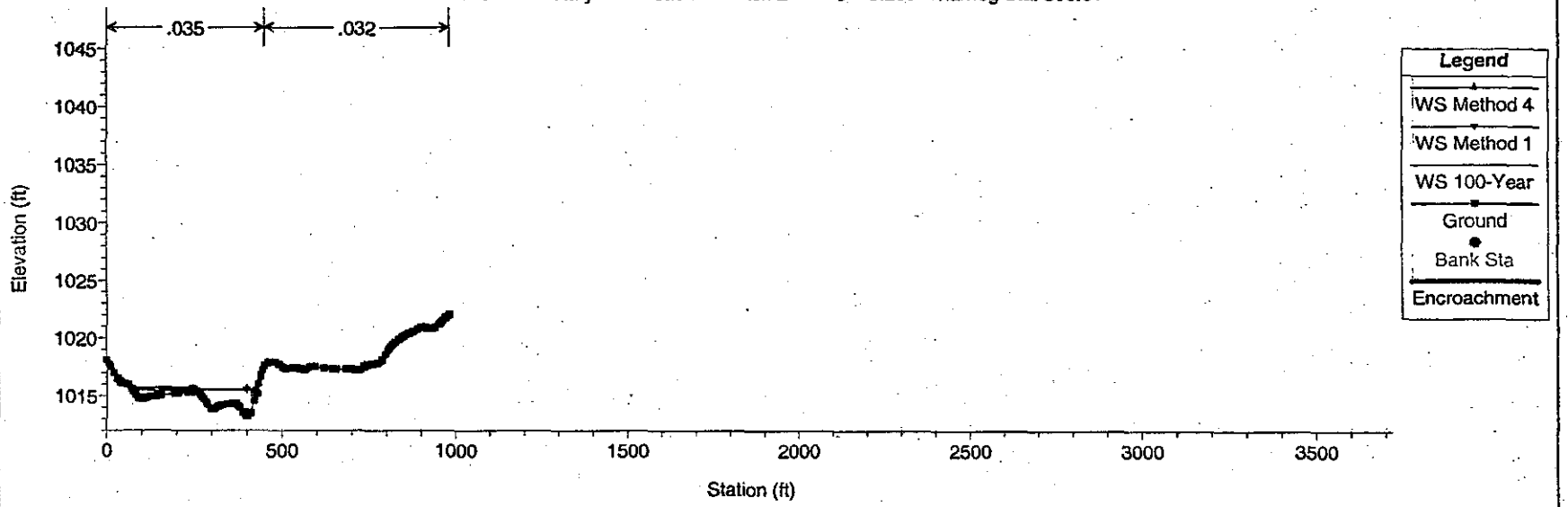



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

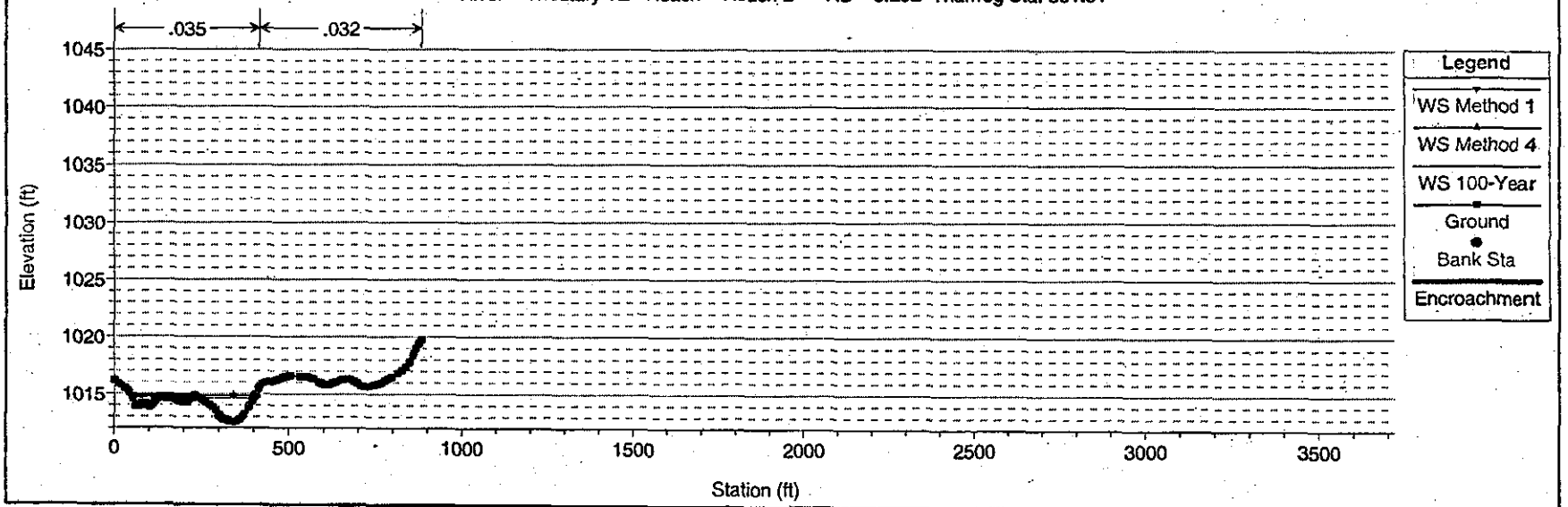
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.289  Thalweg Sta. 398.61

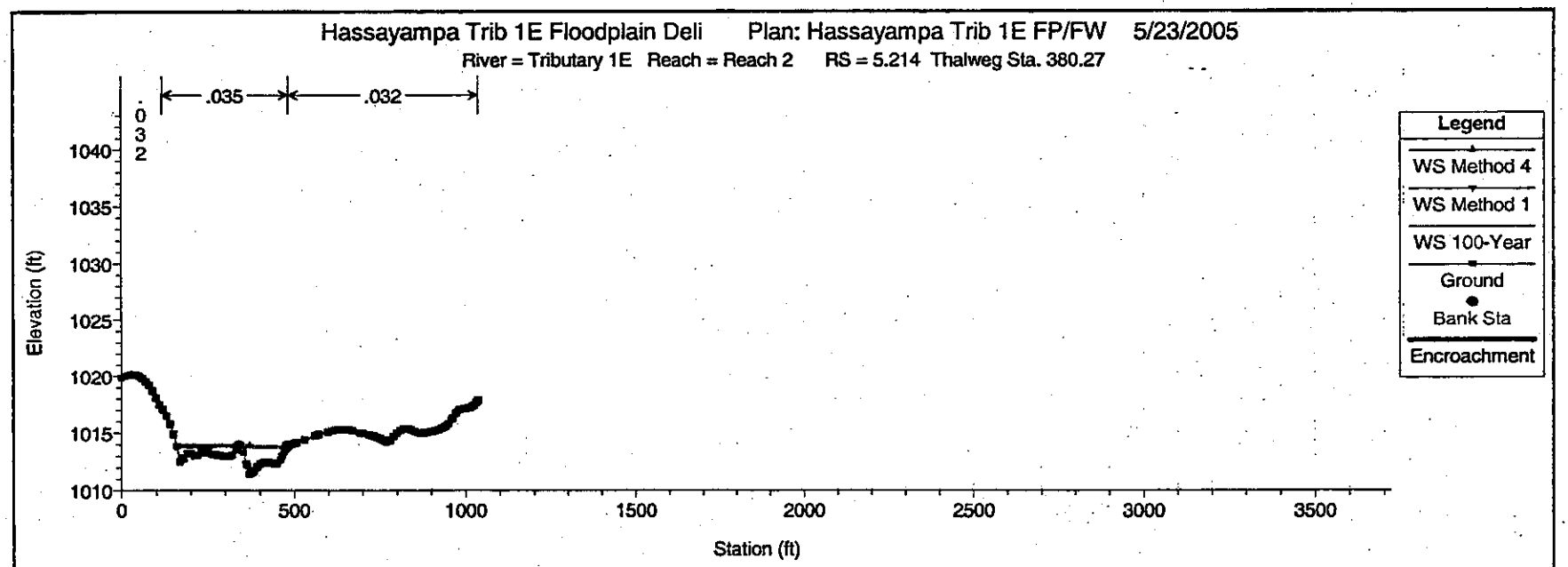


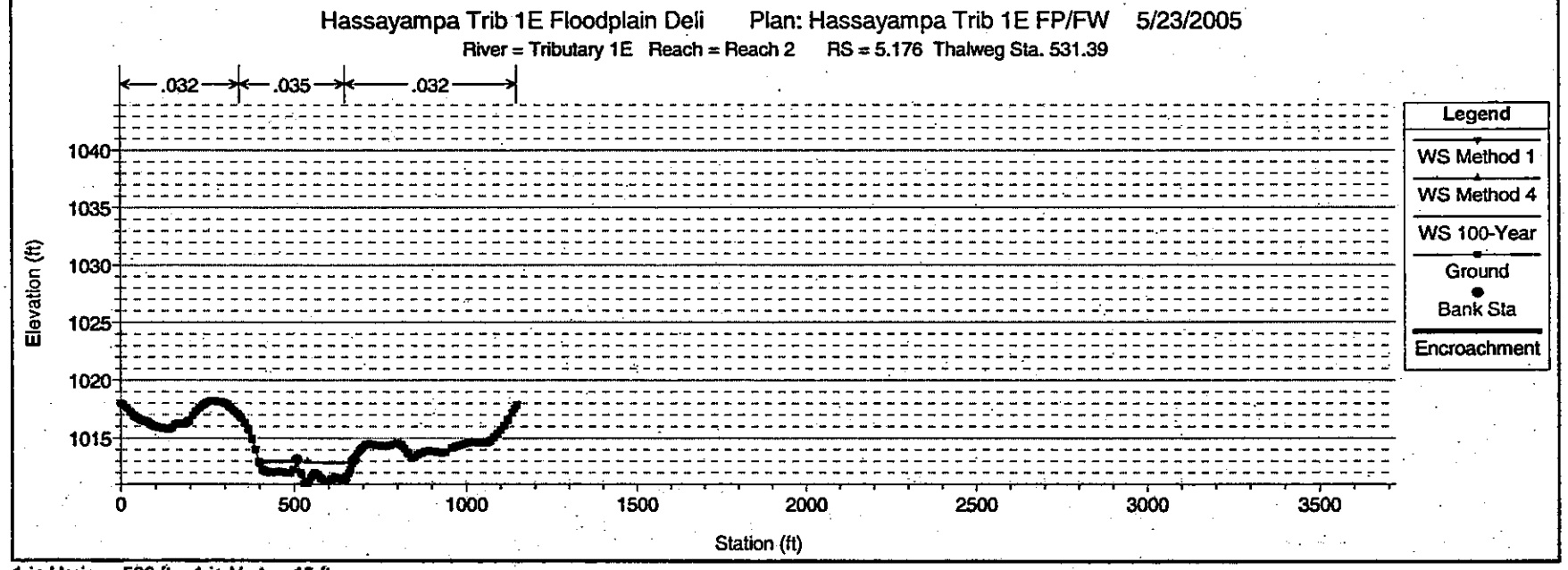

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 5.252  Thalweg Sta. 331.51

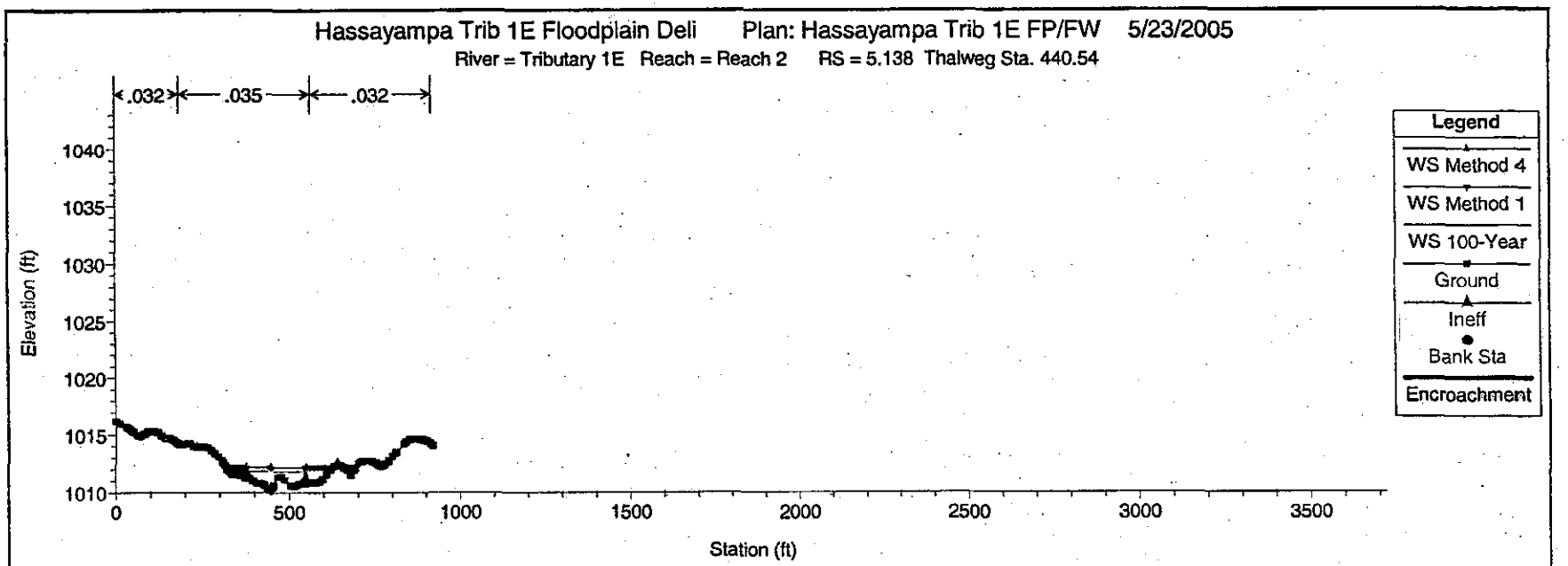


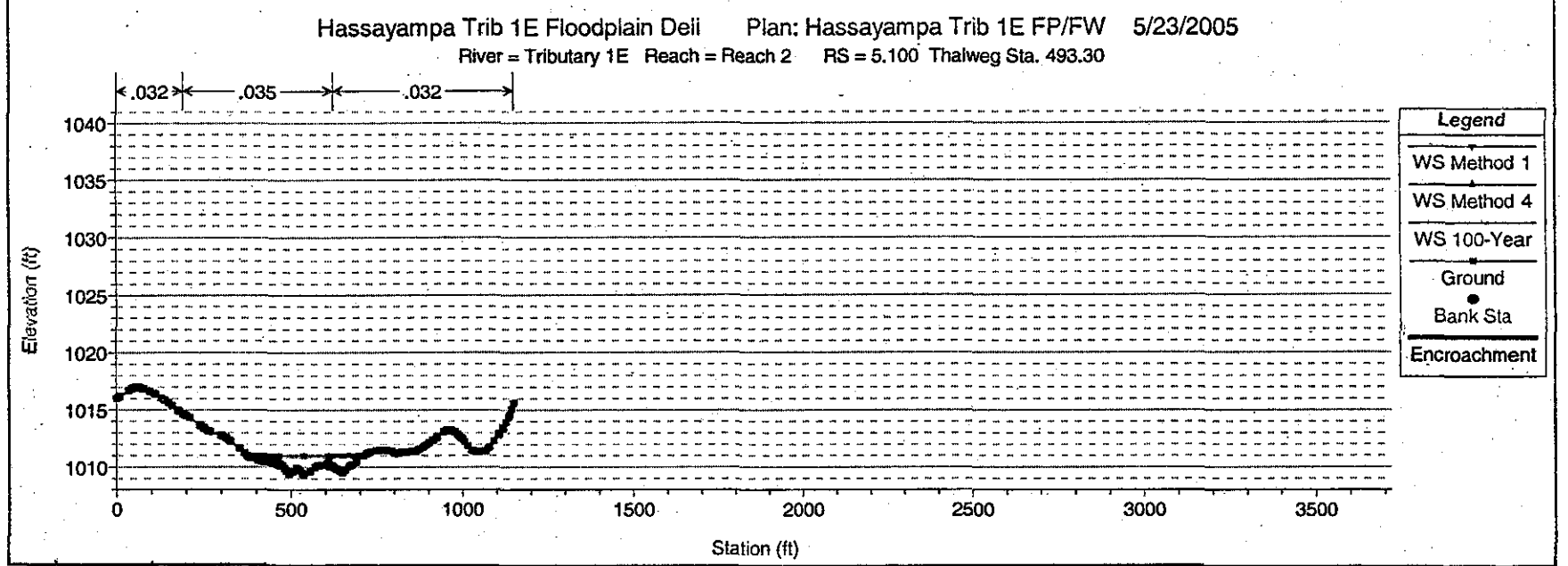

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



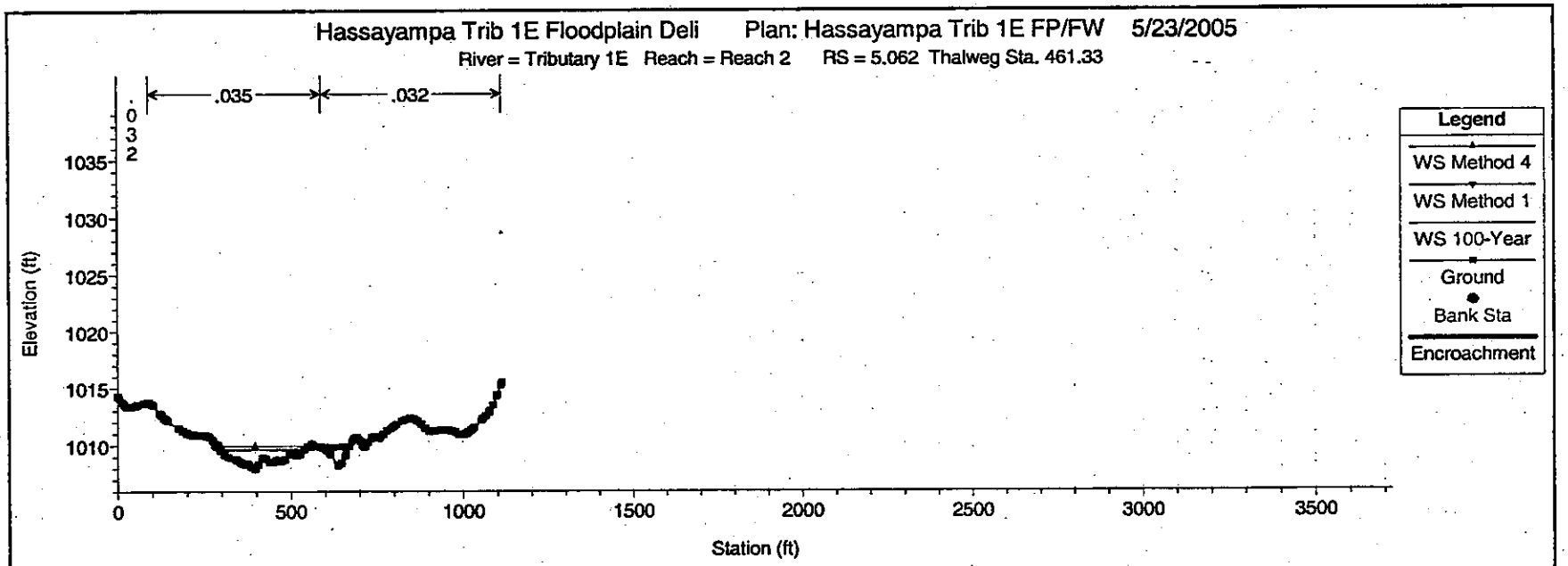



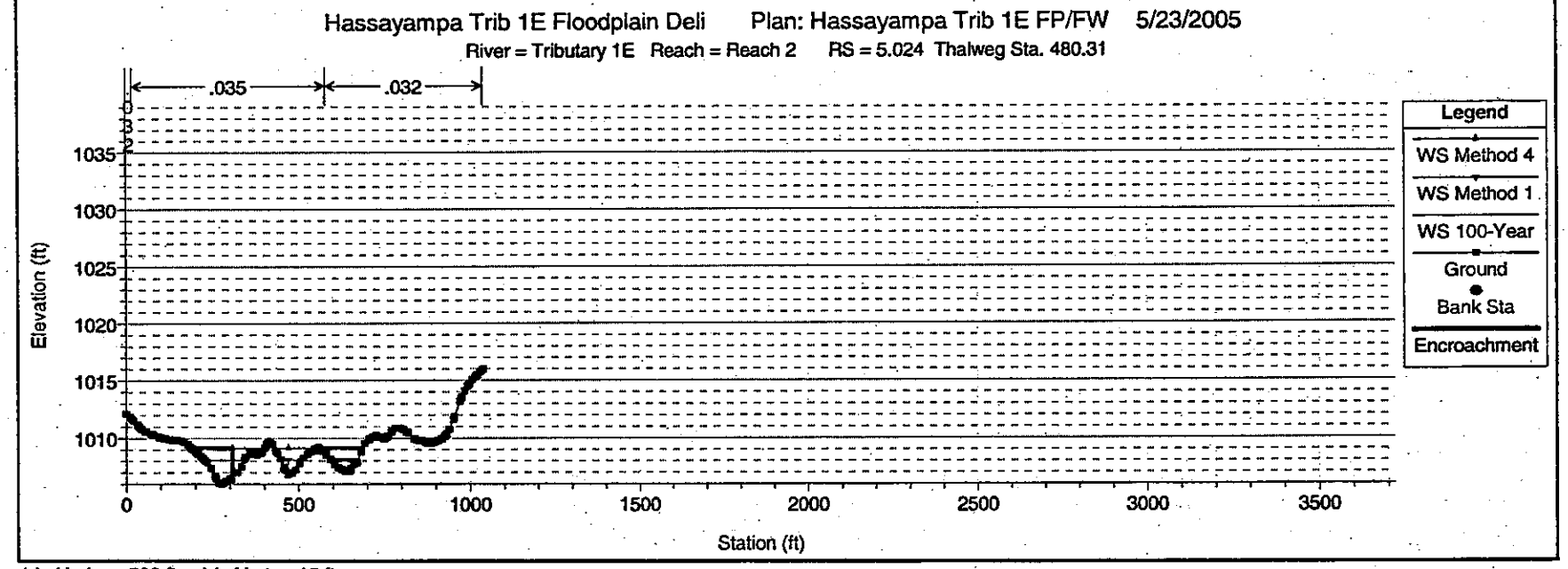

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



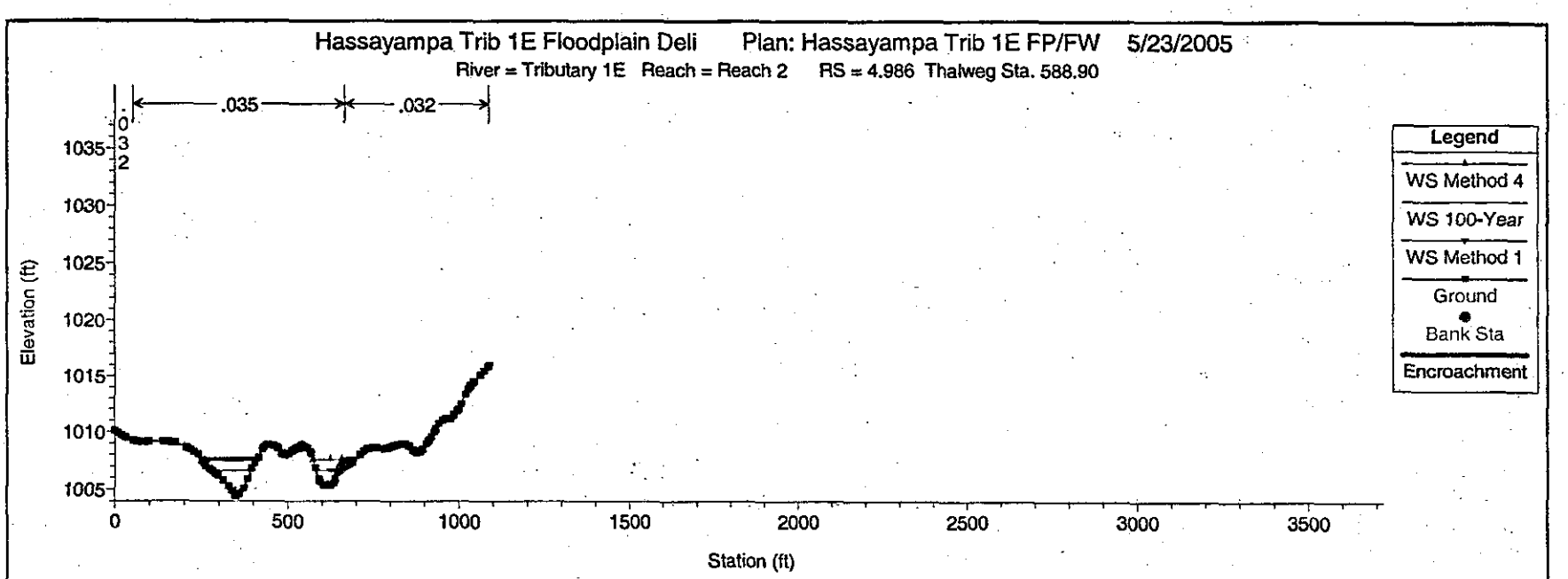



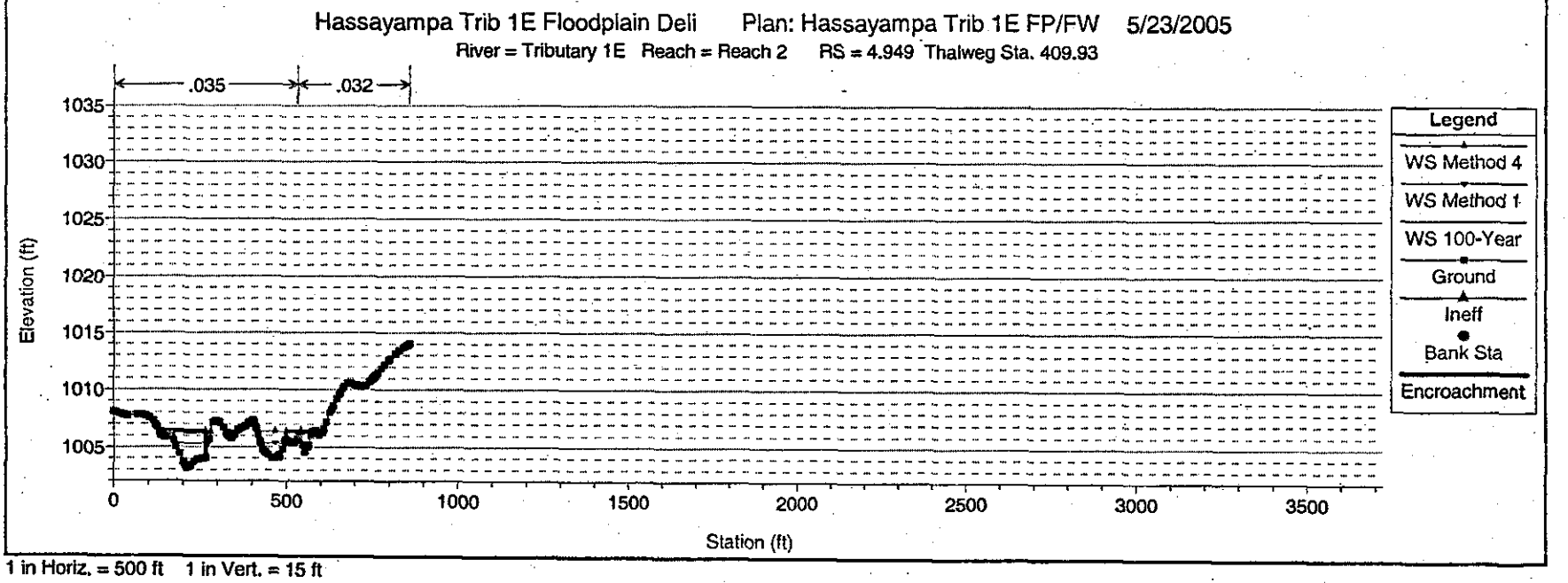

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



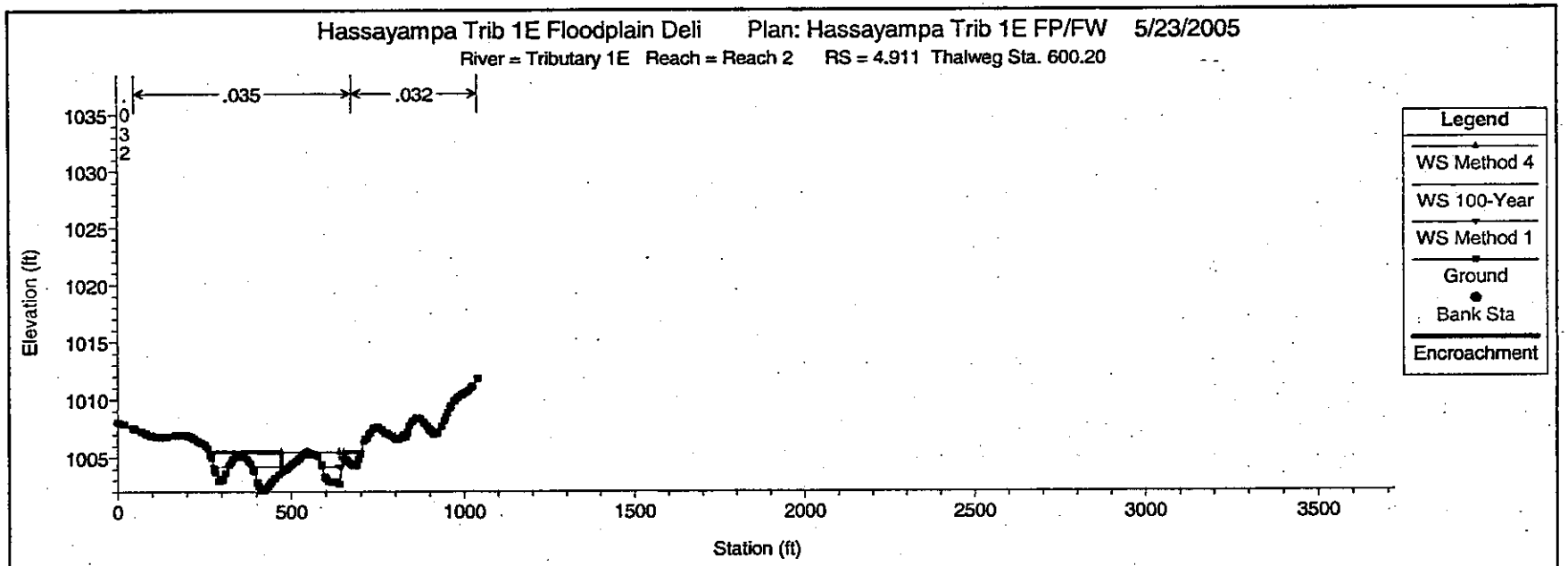



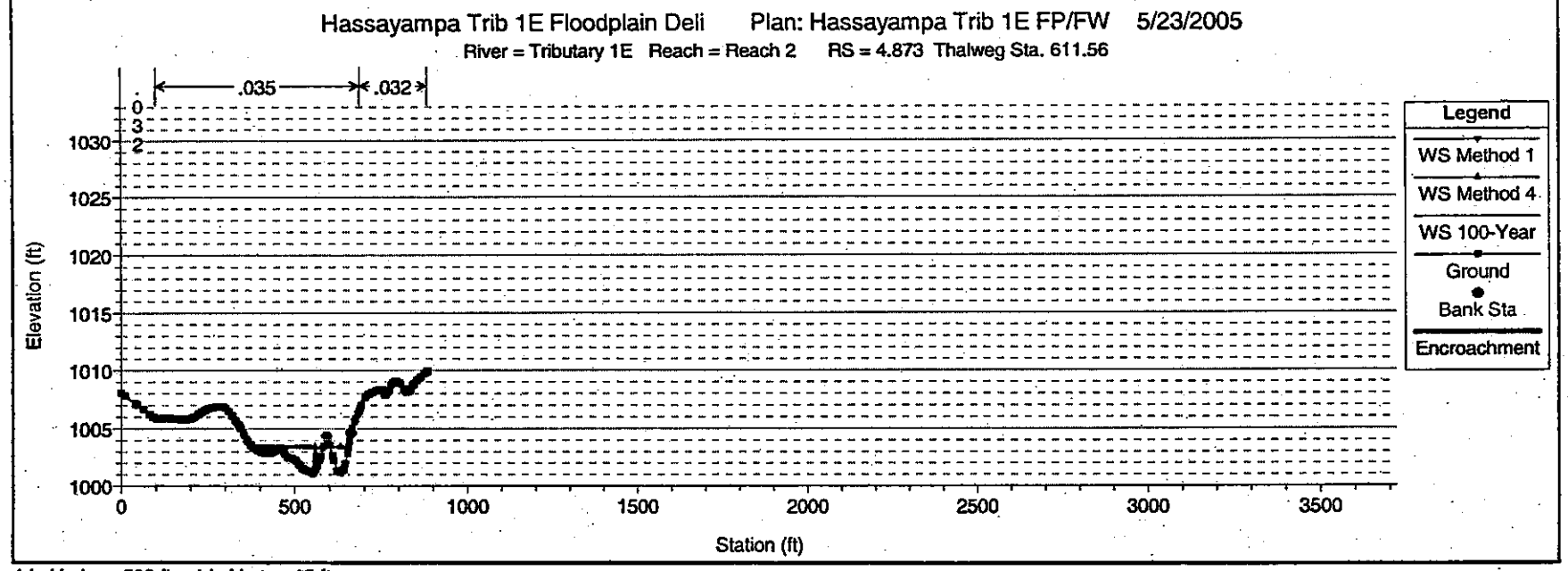

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

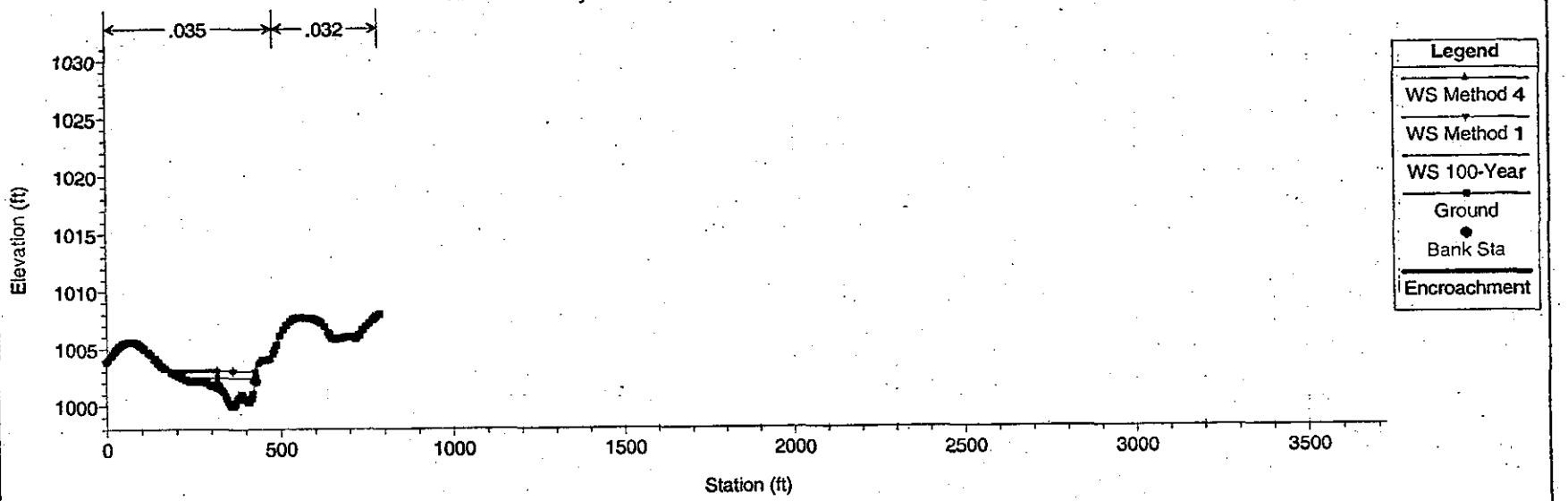



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

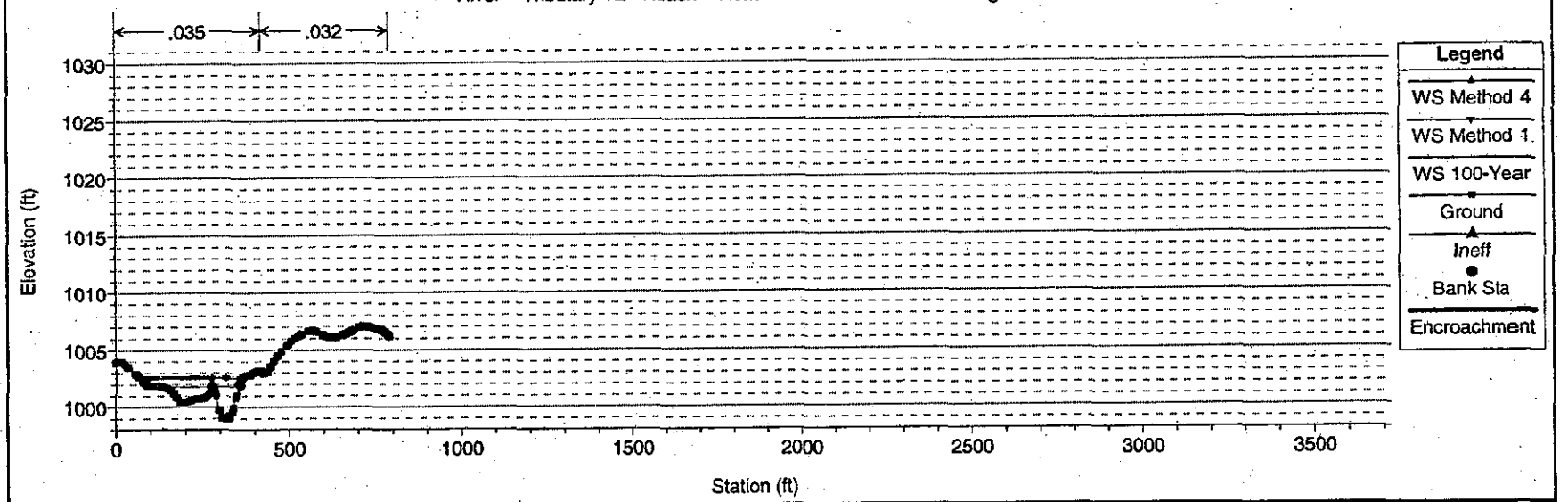
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 4.835  Thalweg Sta. 396.26




Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

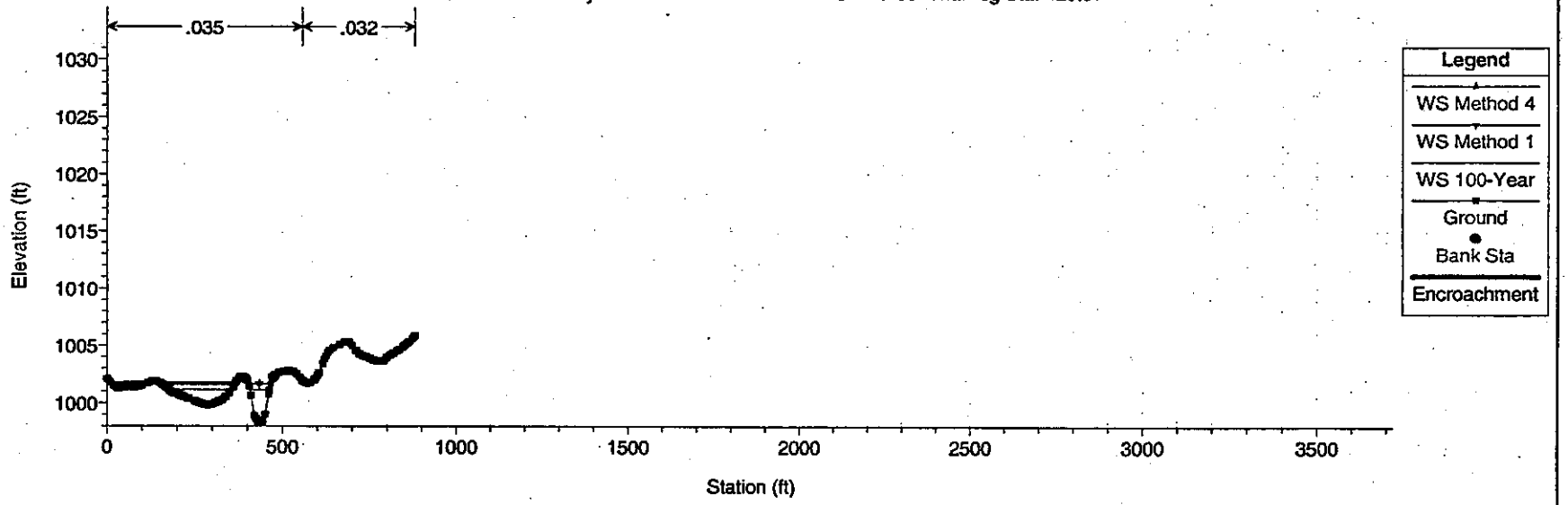
River = Tributary 1E  Reach = Reach 2  RS = 4.797  Thalweg Sta. 315.66




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

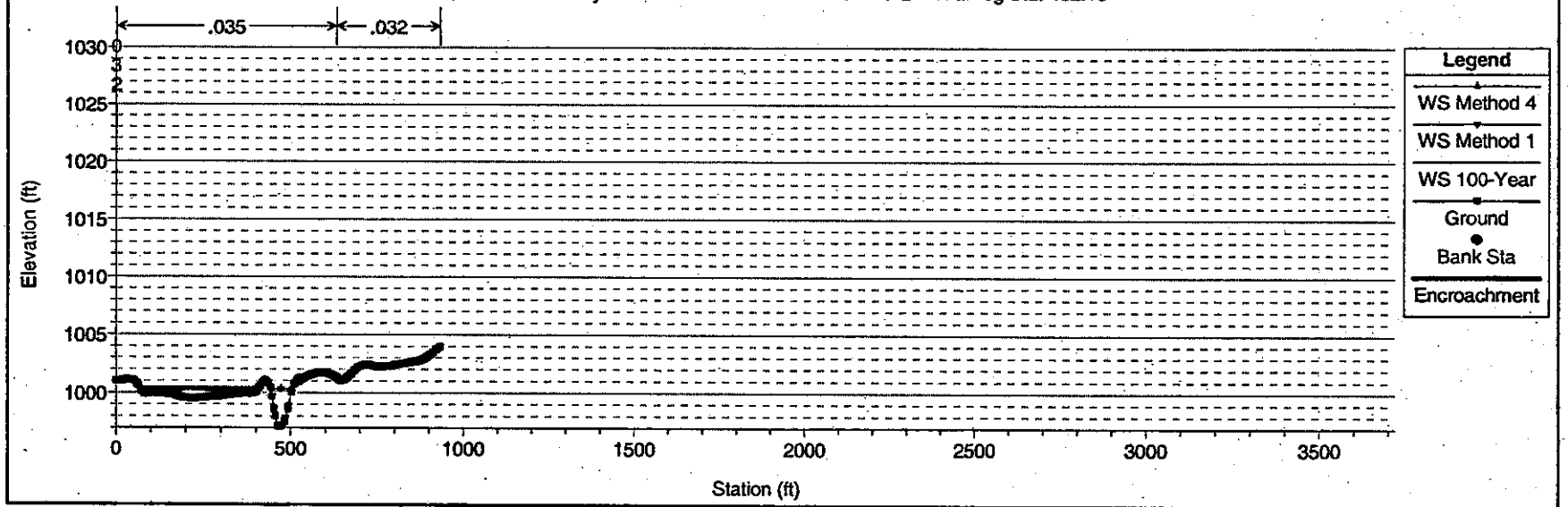
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 4.759  Thalweg Sta. 429.97

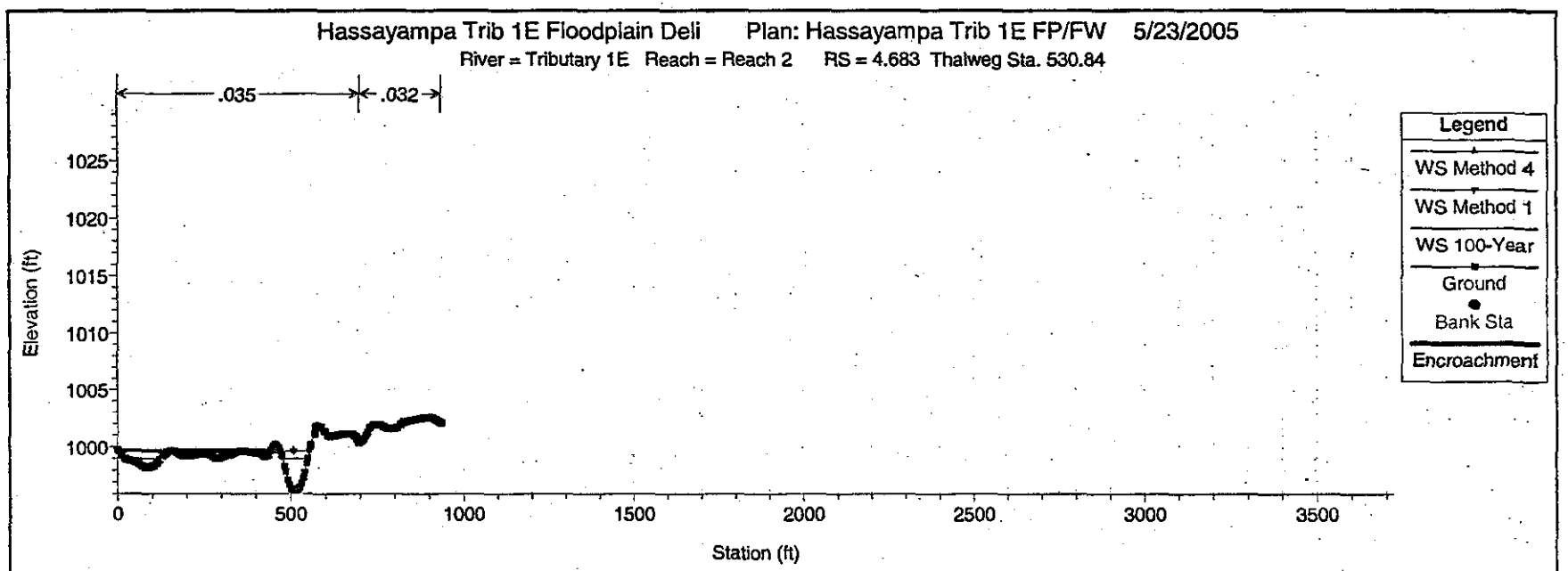


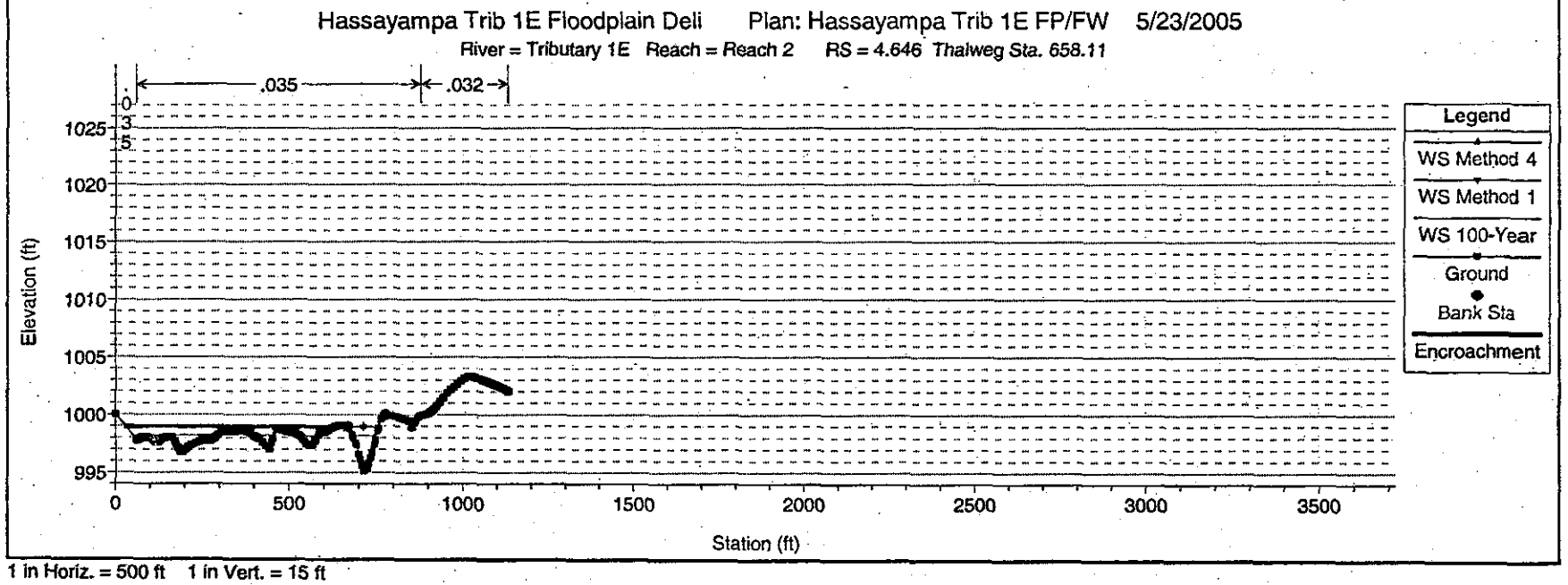

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 4.721  Thalweg Sta. 482.18




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

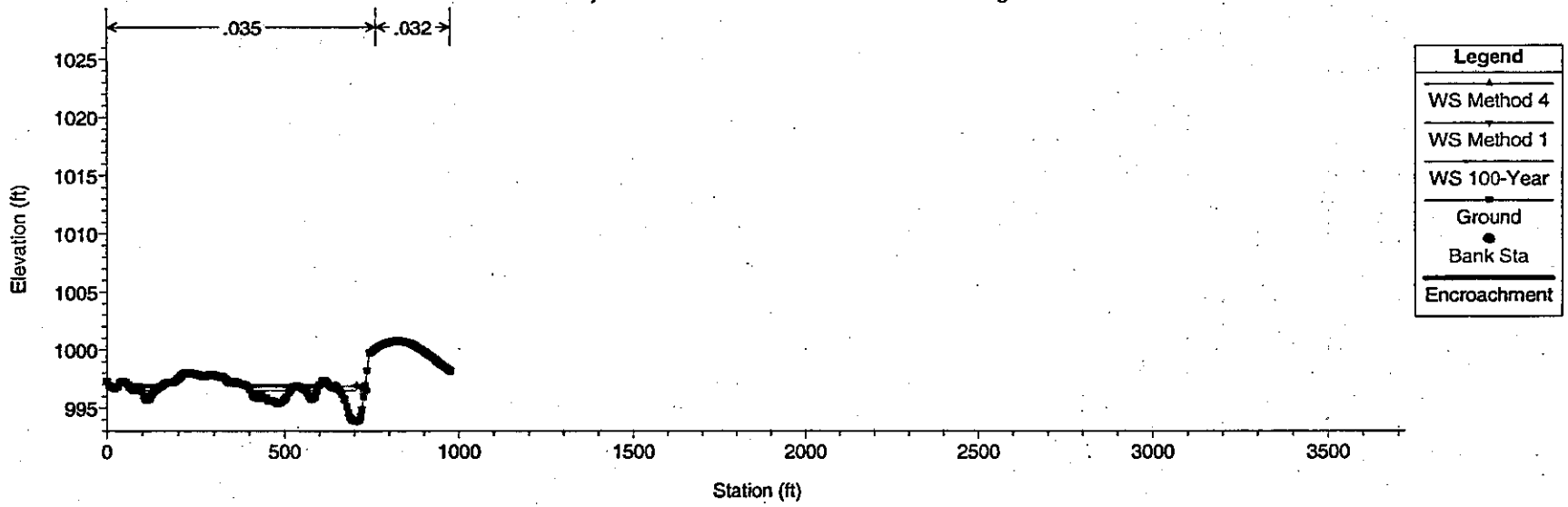



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

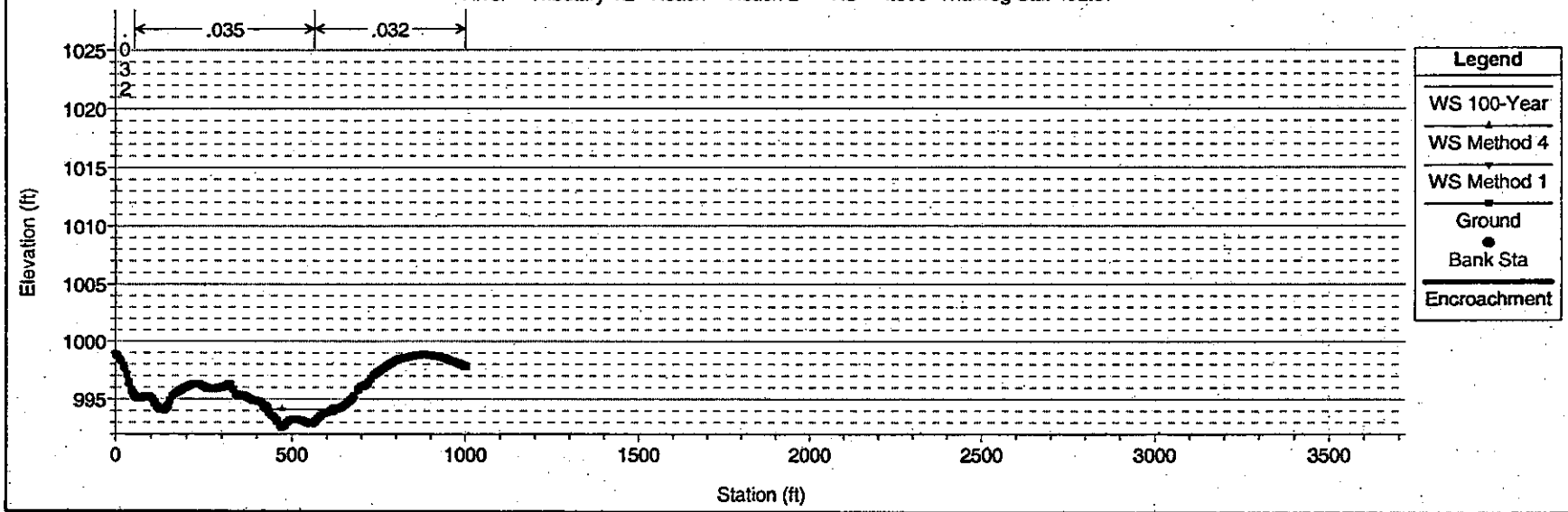
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 4.569  Thalweg Sta. 699.99

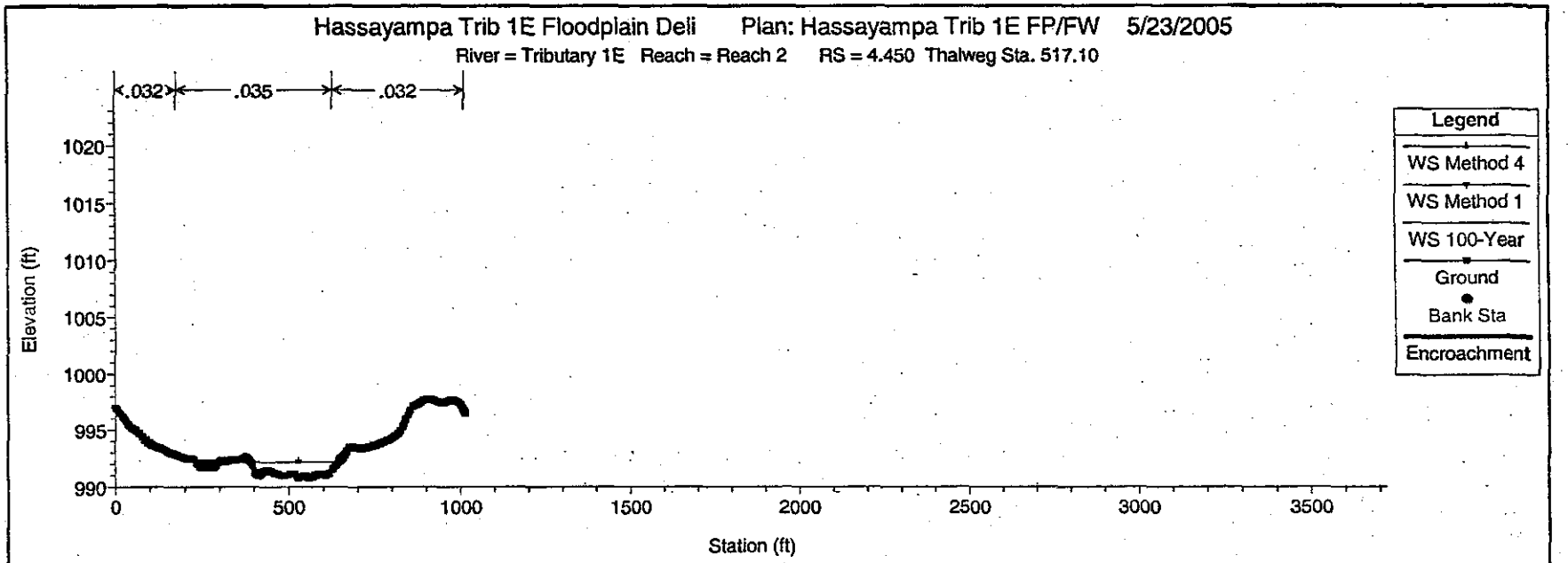


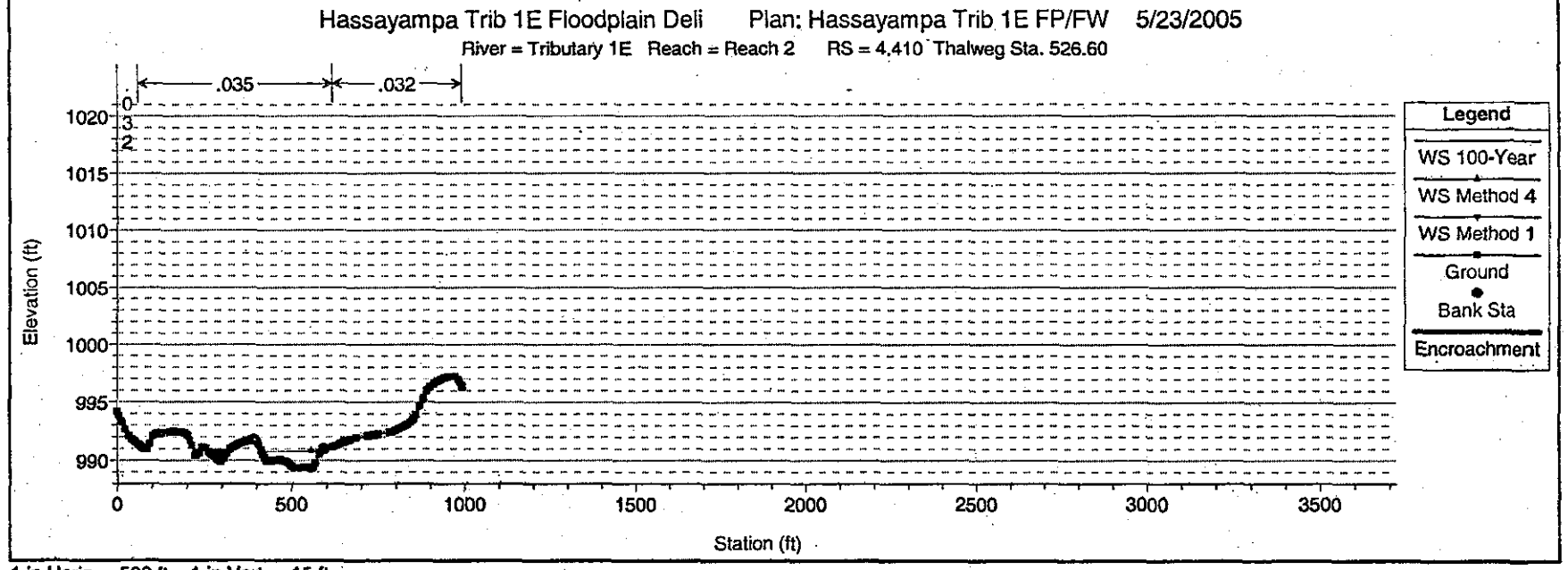

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 2  RS = 4.506  Thalweg Sta. 492.37

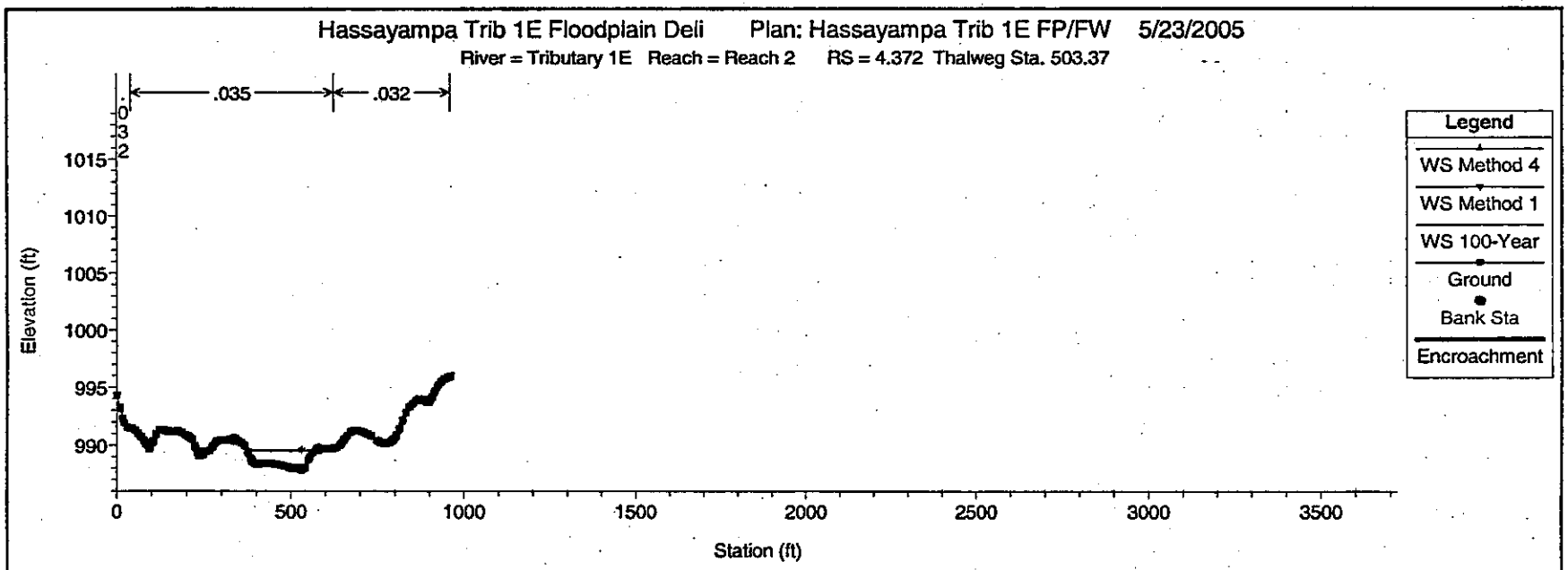


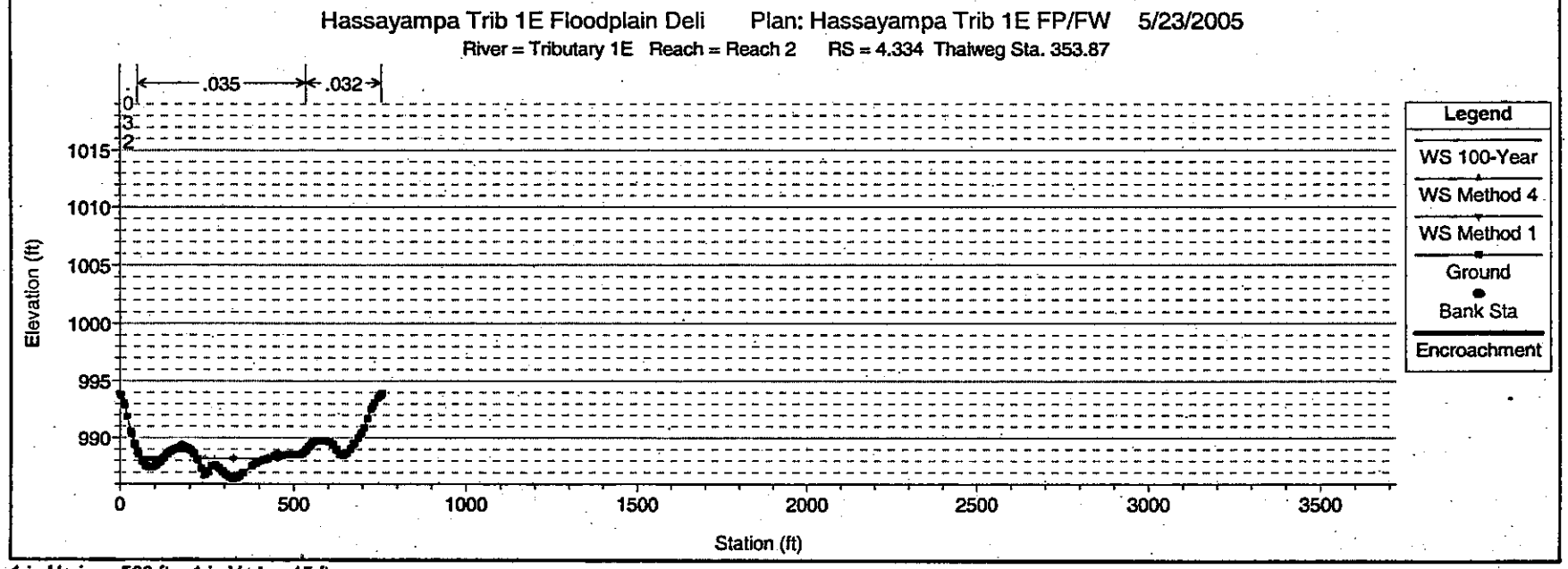

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



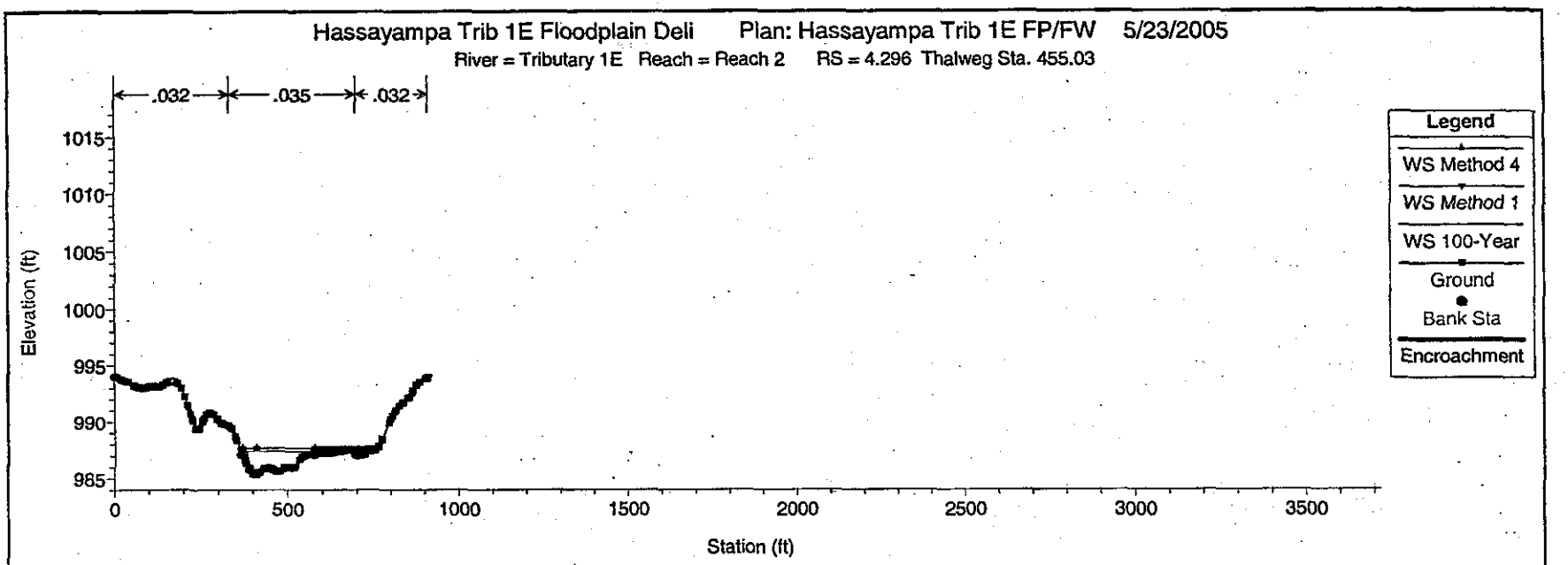



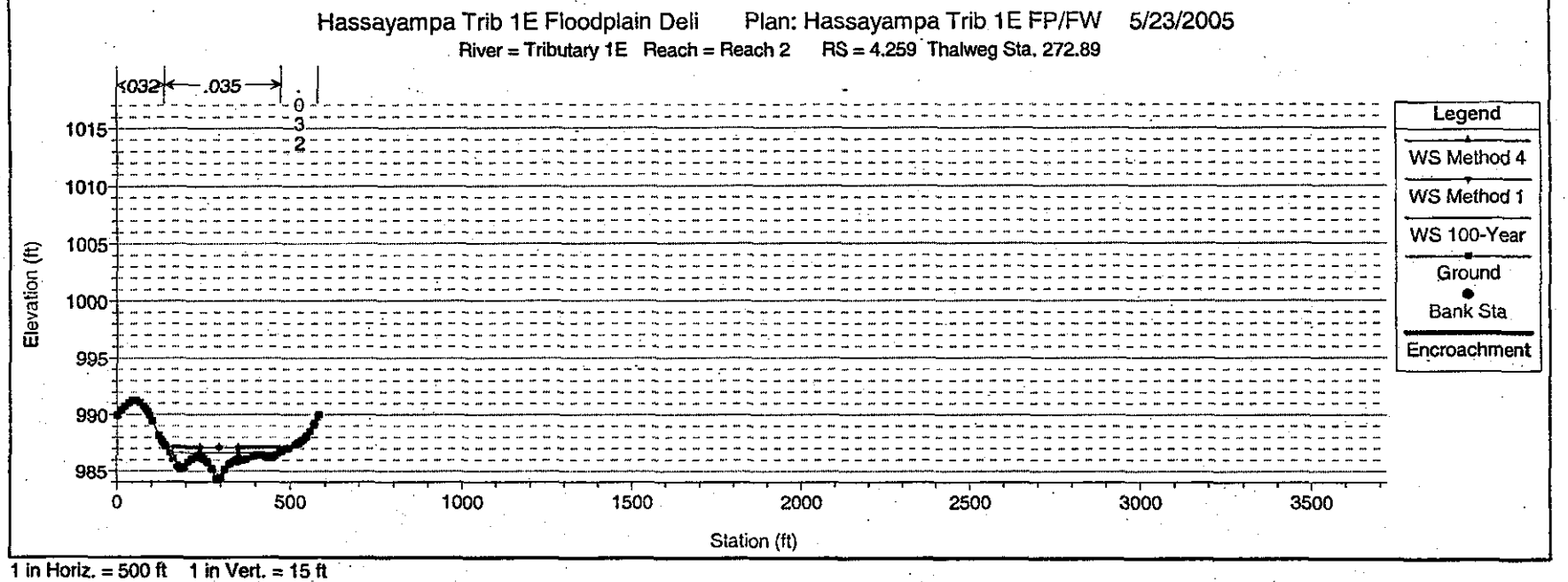

*1 in Horiz. = 500 ft 1 in Vert. = 15 ft*



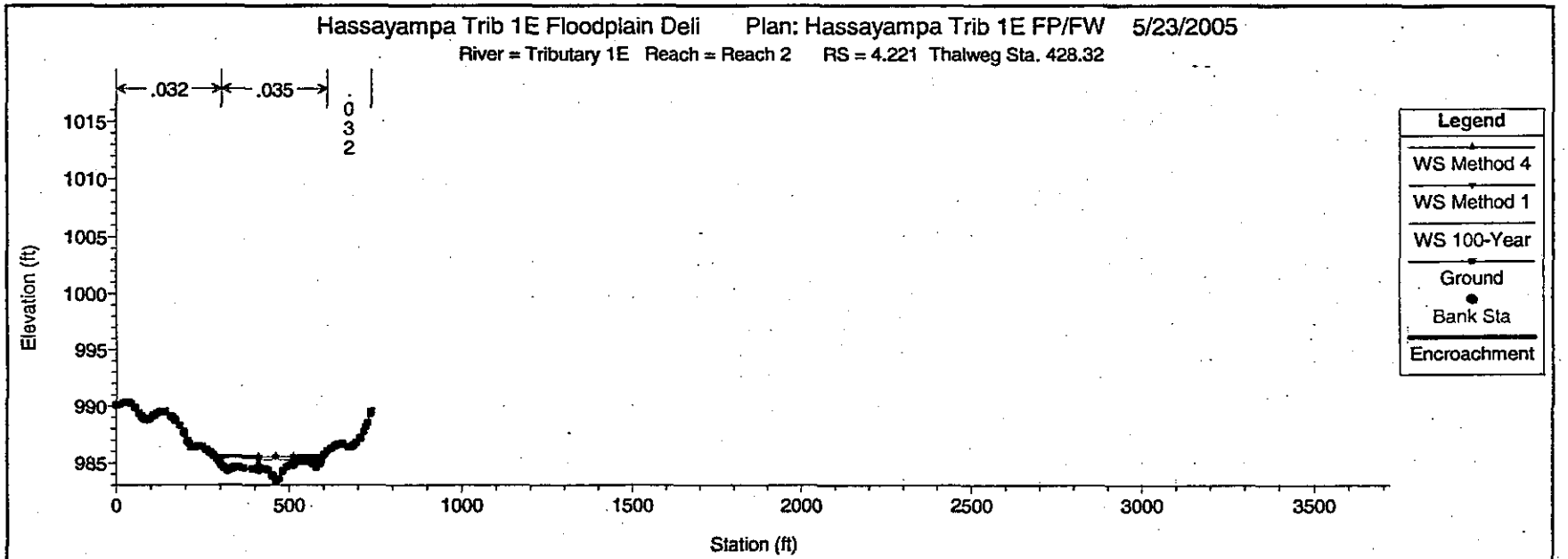



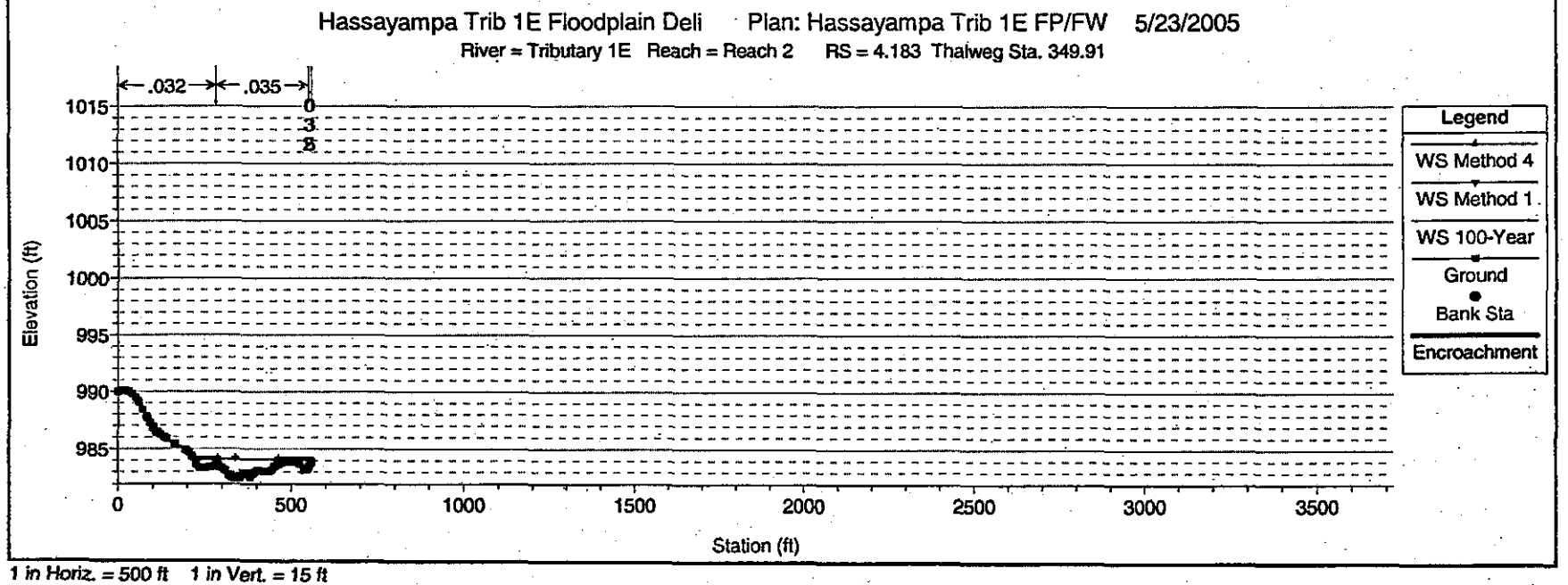

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



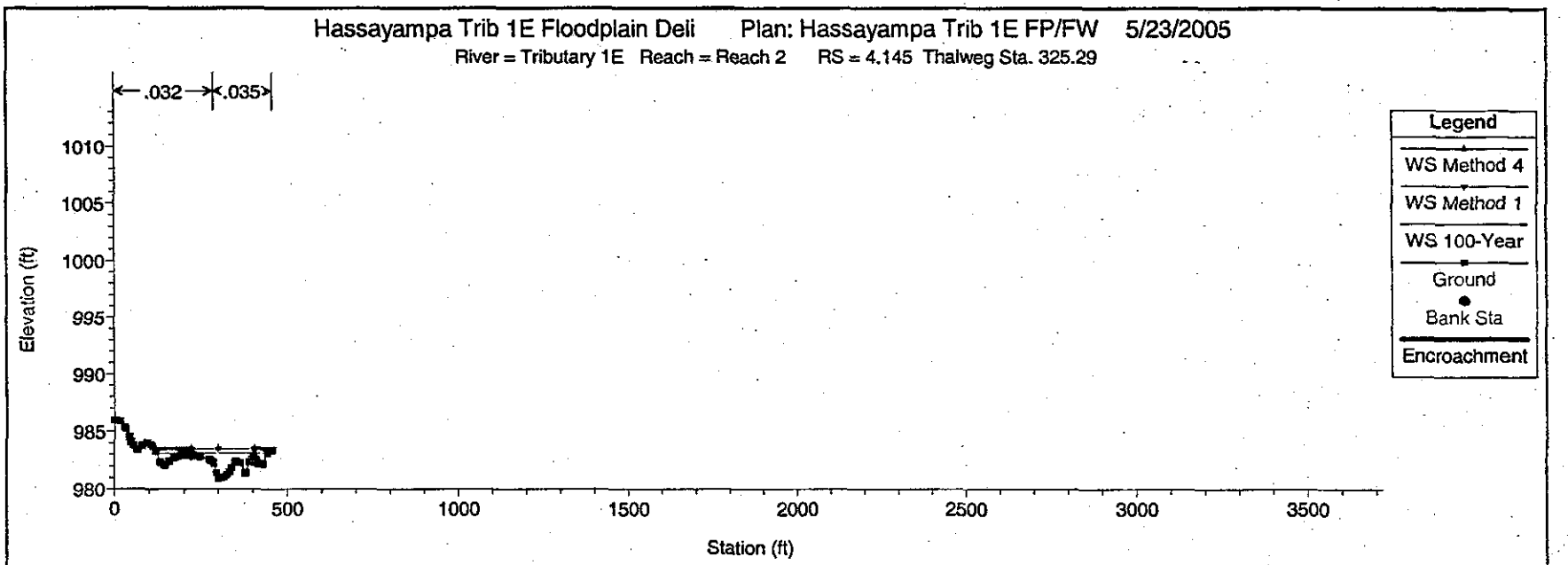



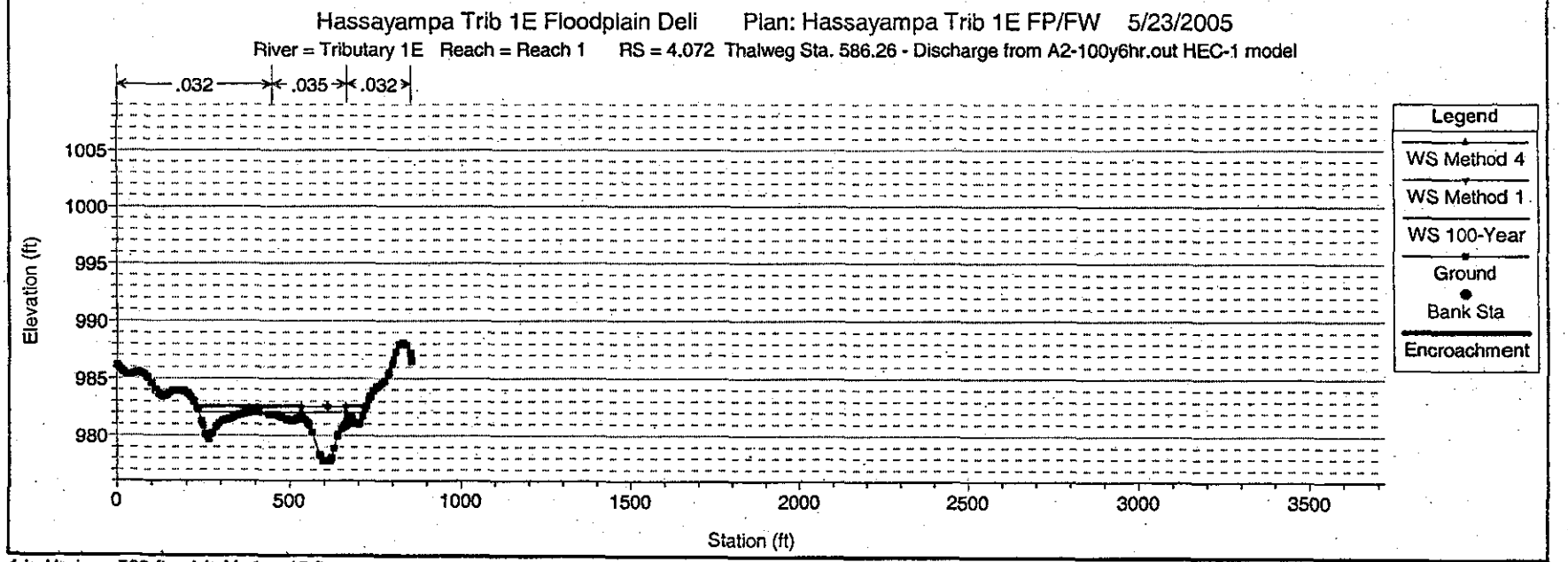

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



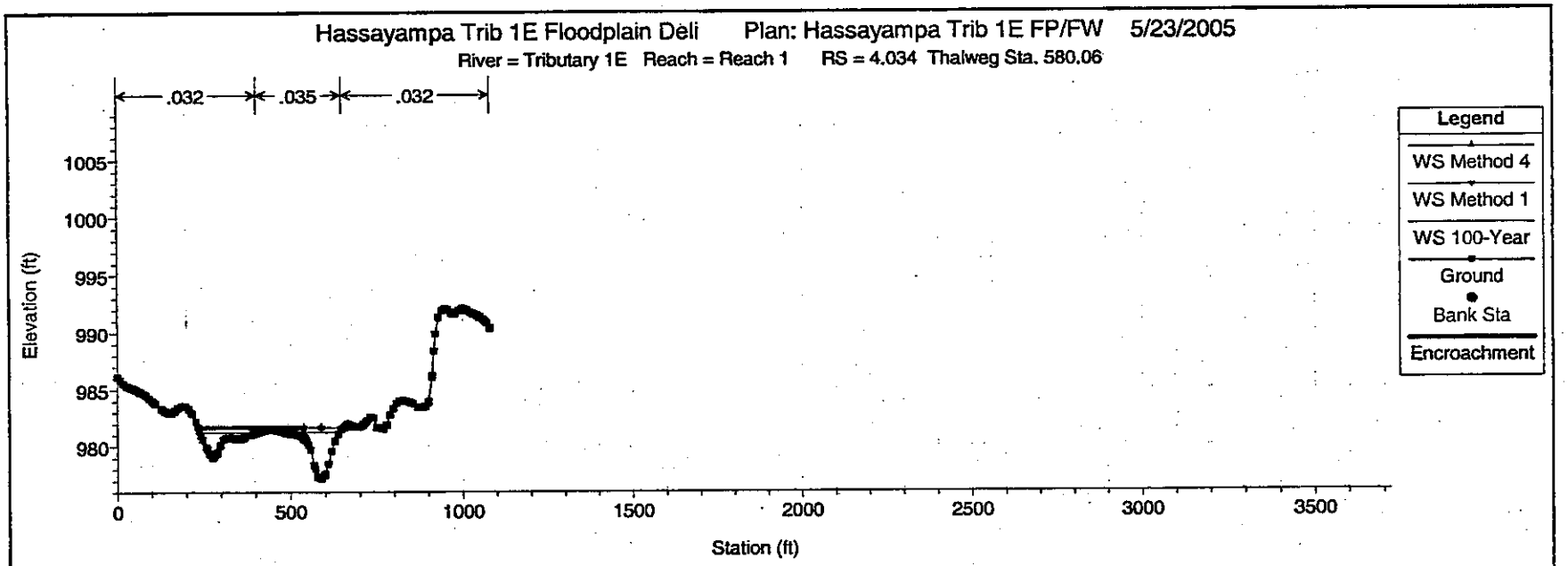



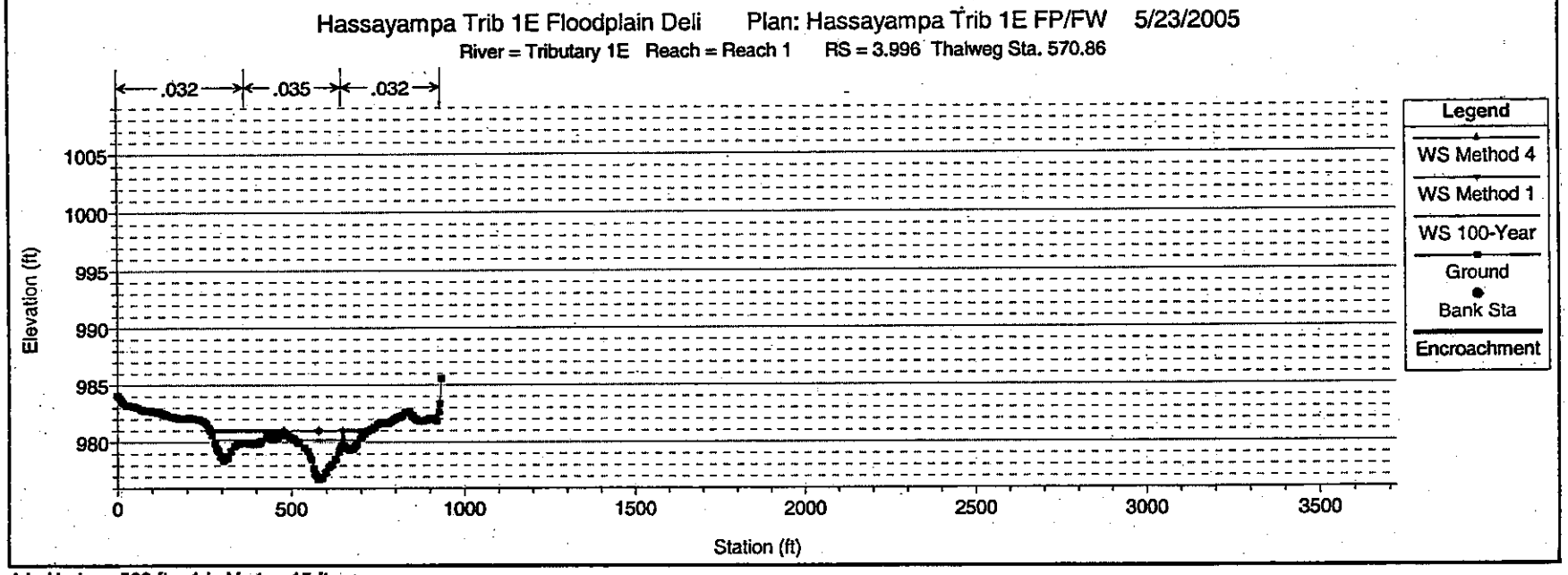

*1 in Horiz. = 500 ft 1 in Vert. = 15 ft*



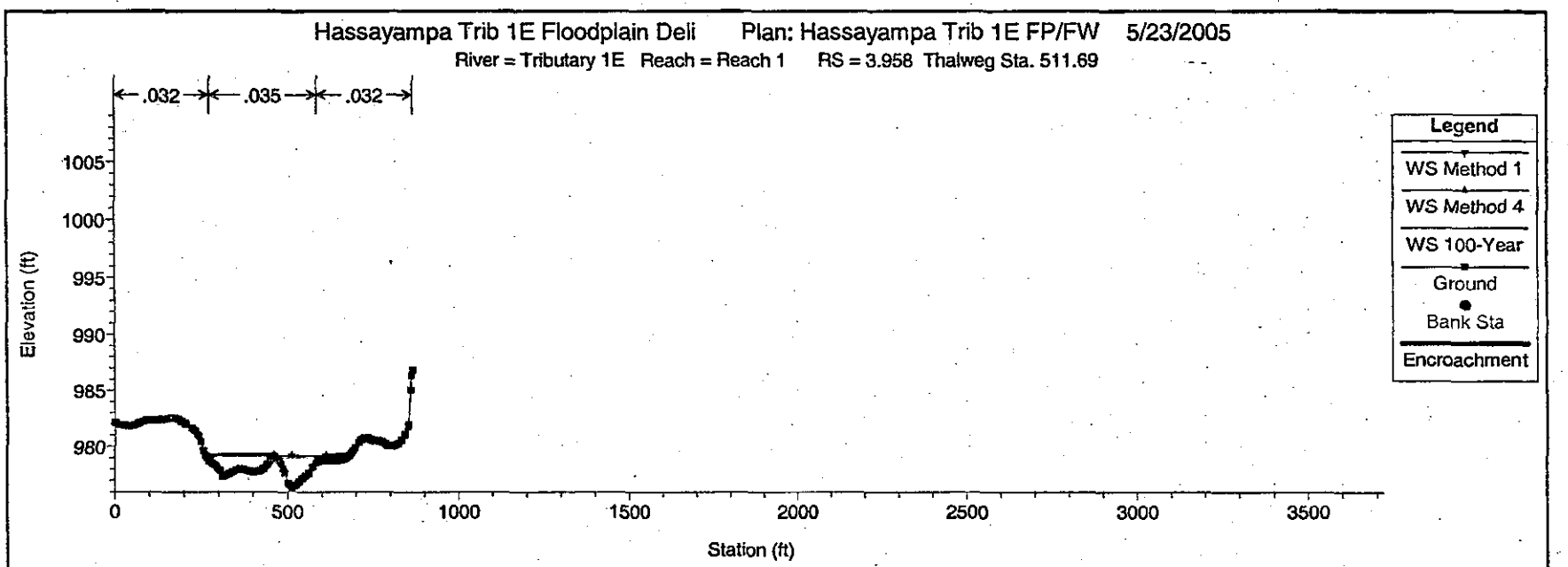



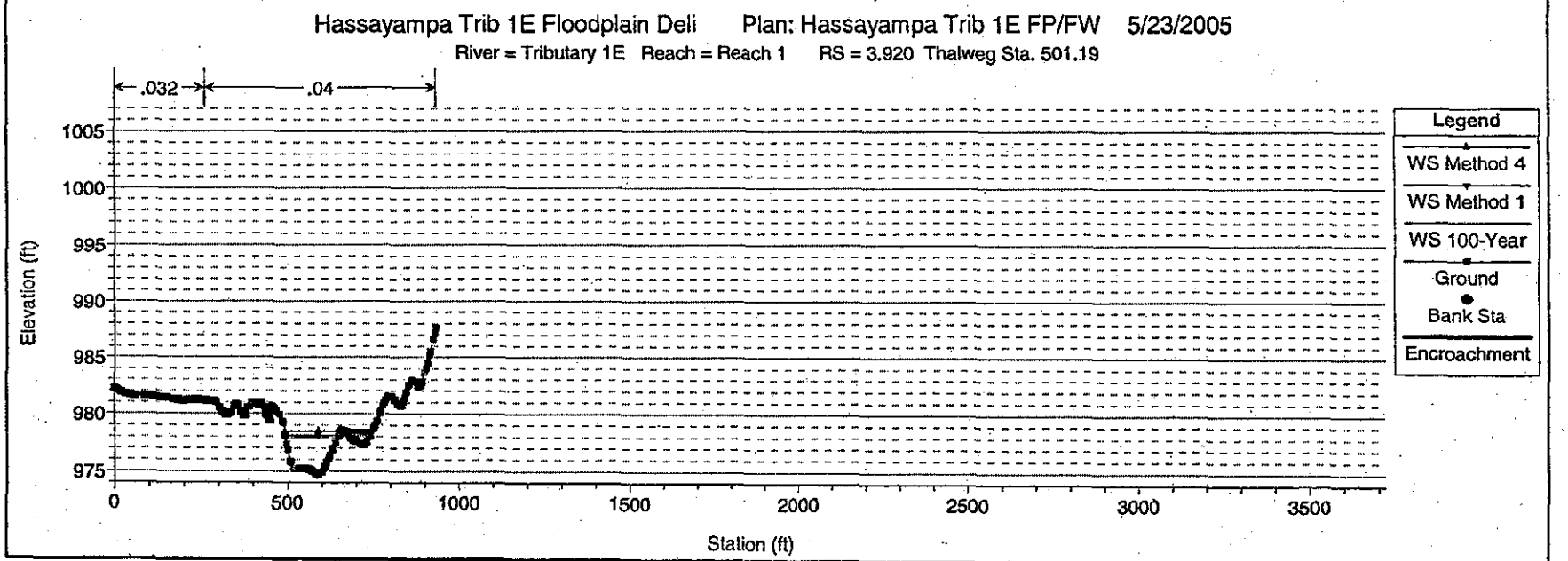

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



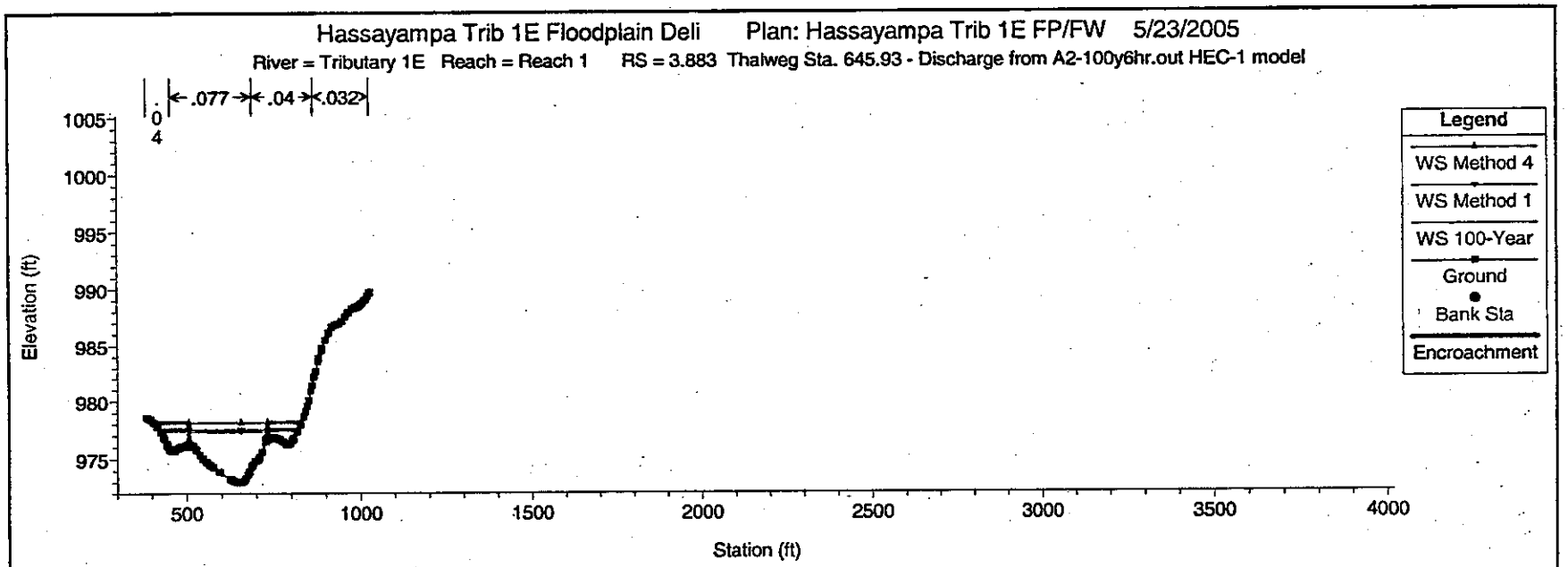



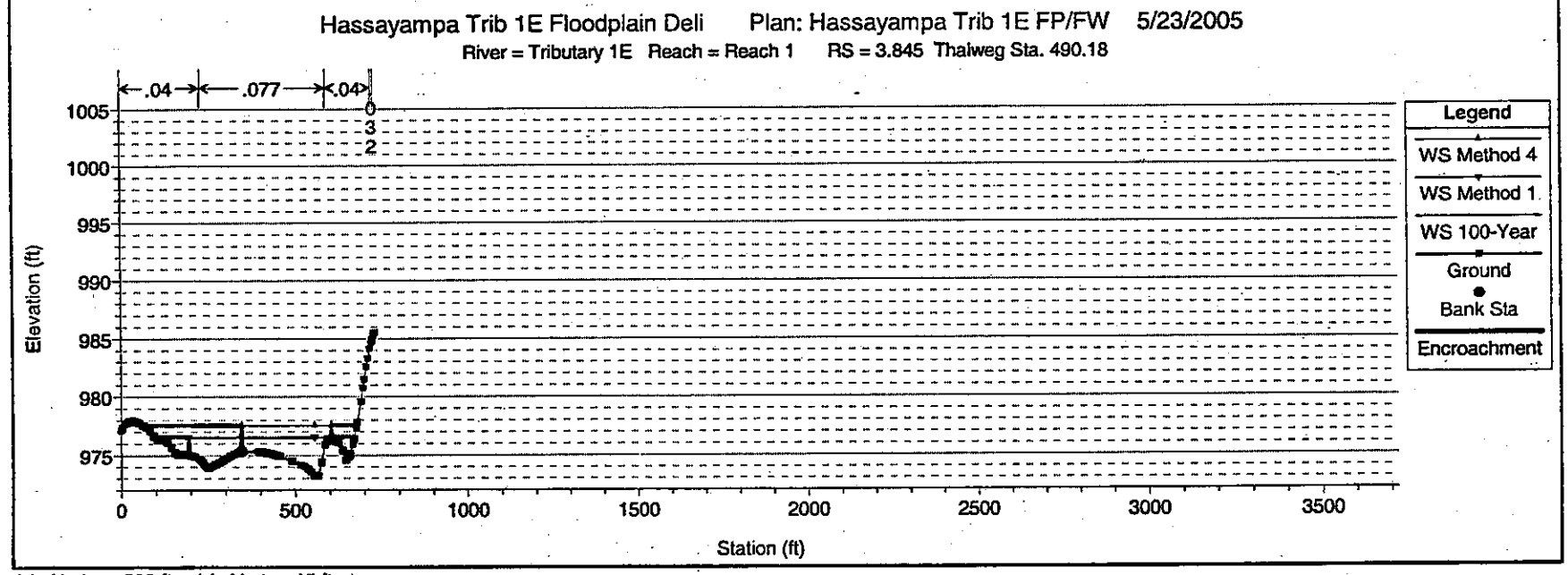

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

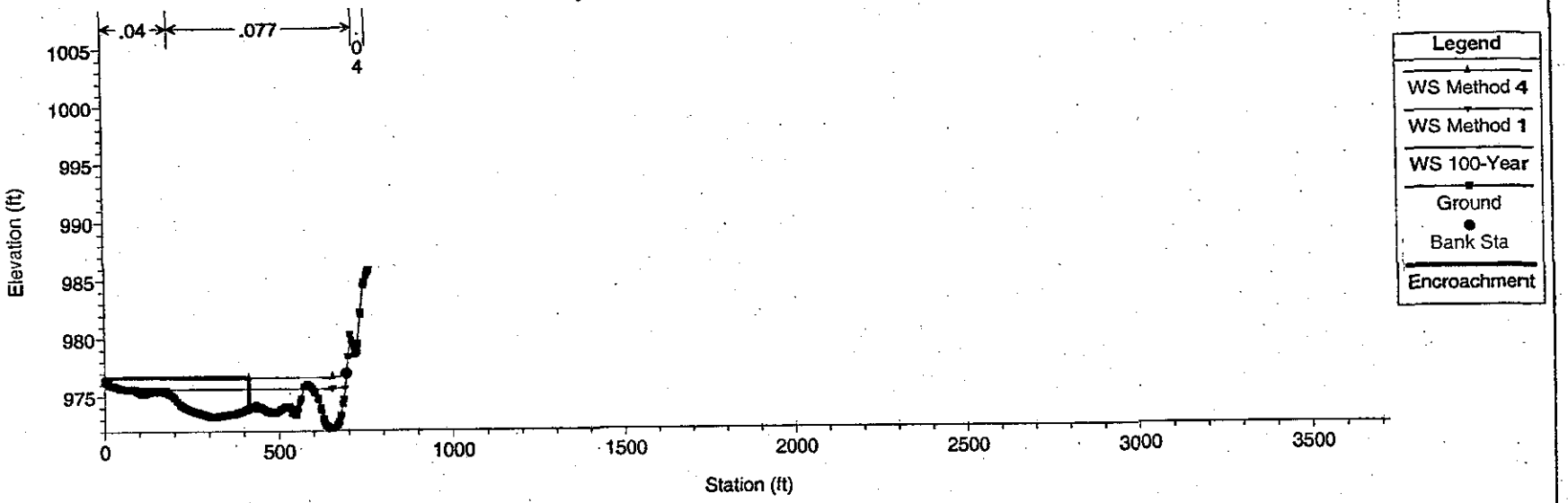



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

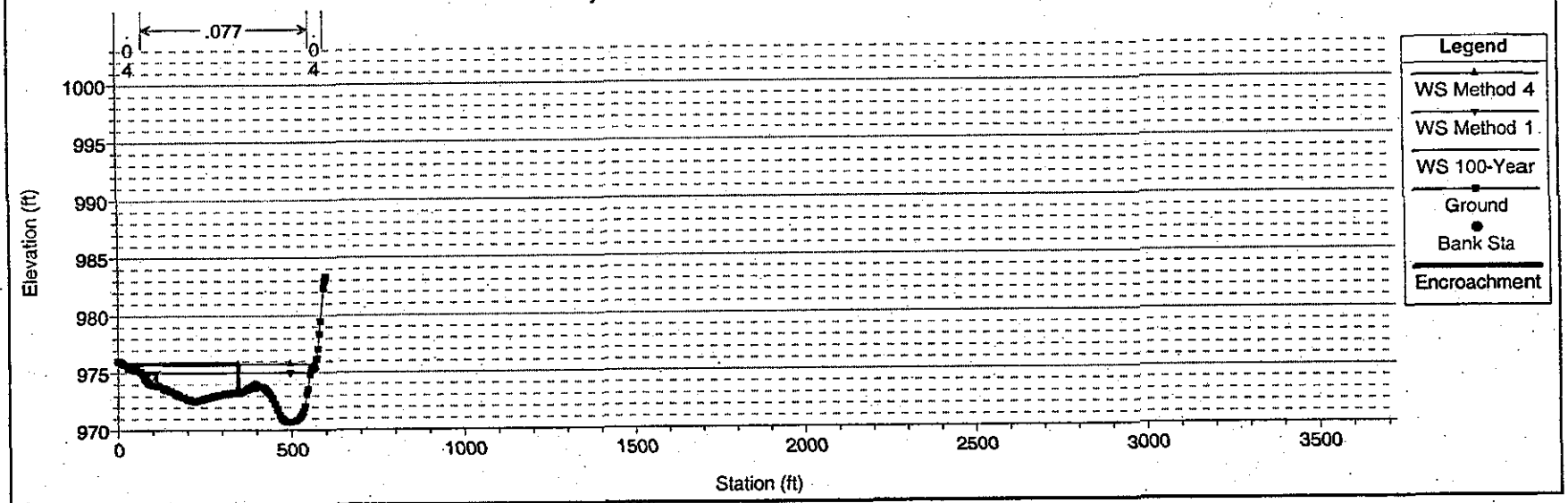
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 3.807  Thalweg Sta. 579.64




Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

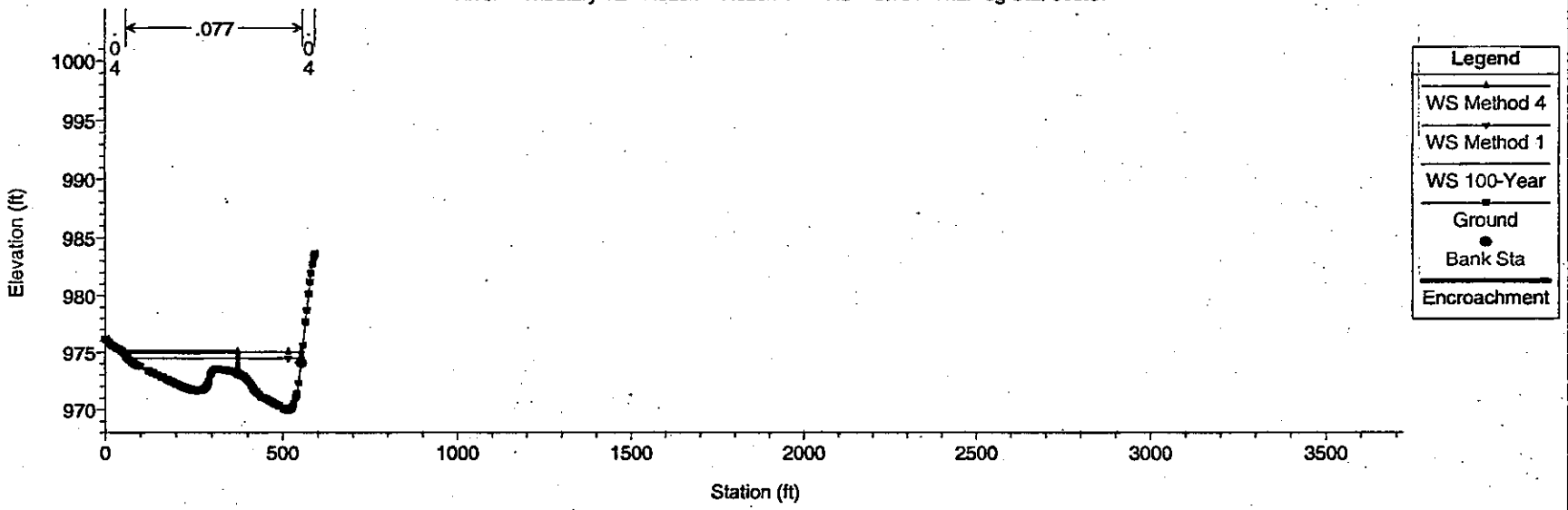
River = Tributary 1E  Reach = Reach 1  RS = 3.769  Thalweg Sta. 501.66




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

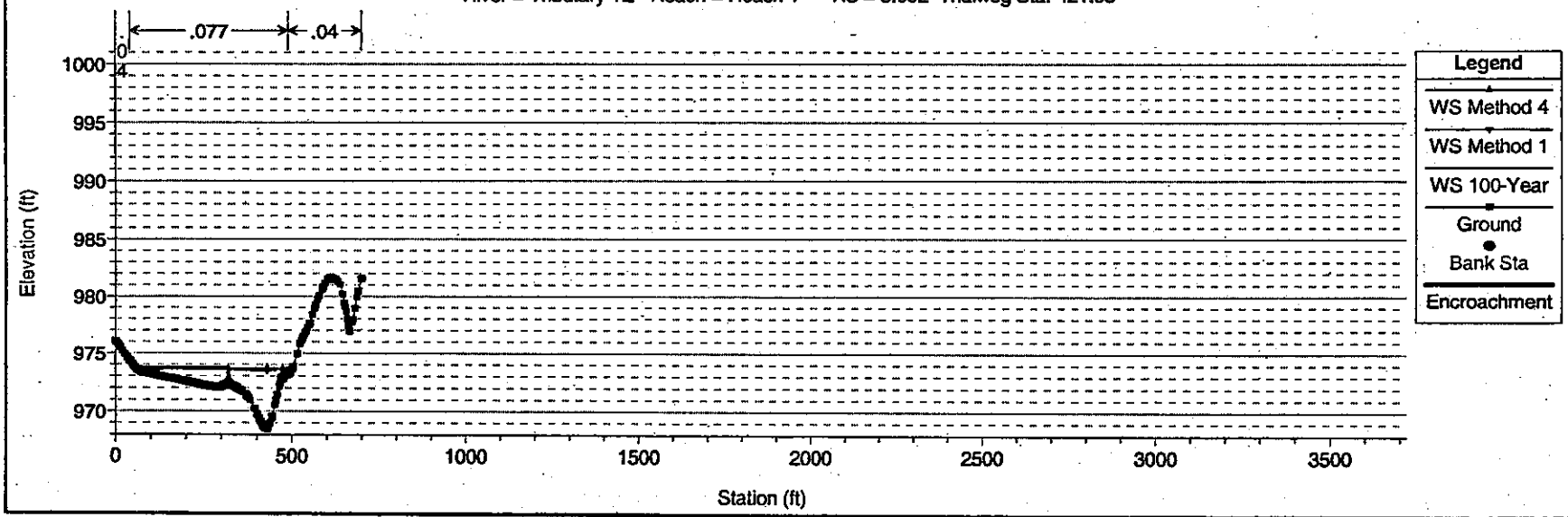
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 3.731  Thalweg Sta. 503.57

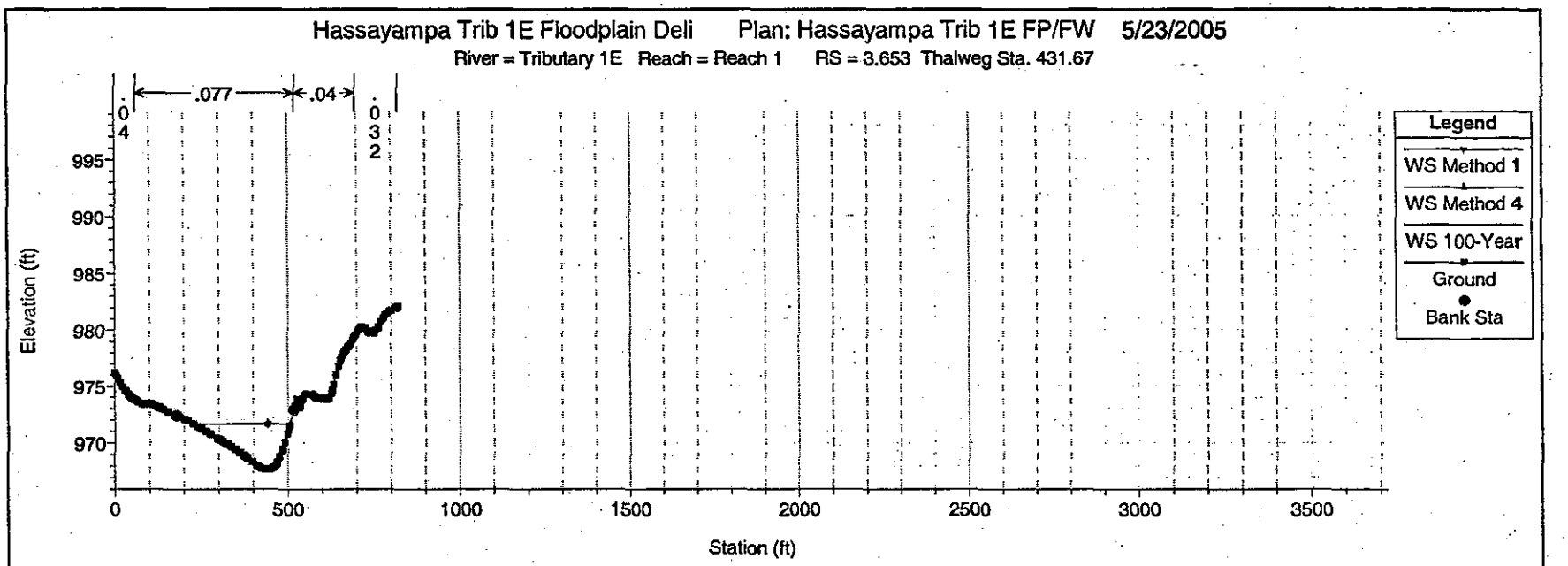


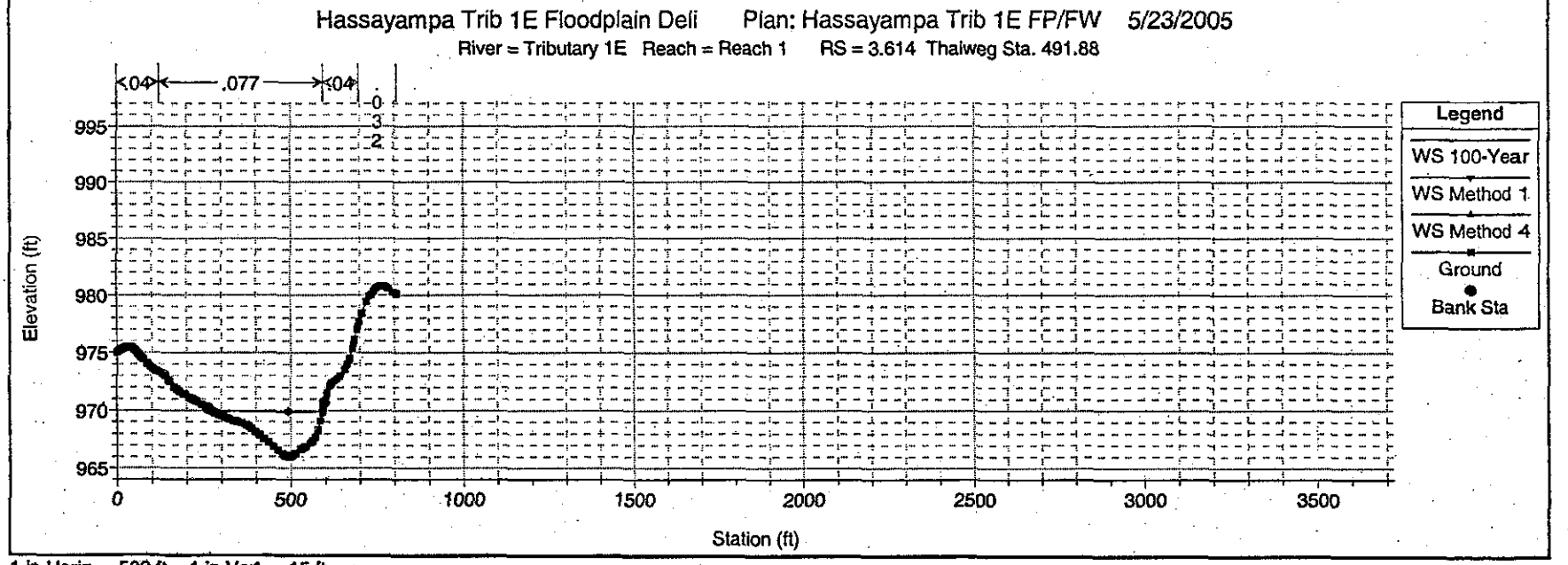

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 3.692  Thalweg Sta. 421.95

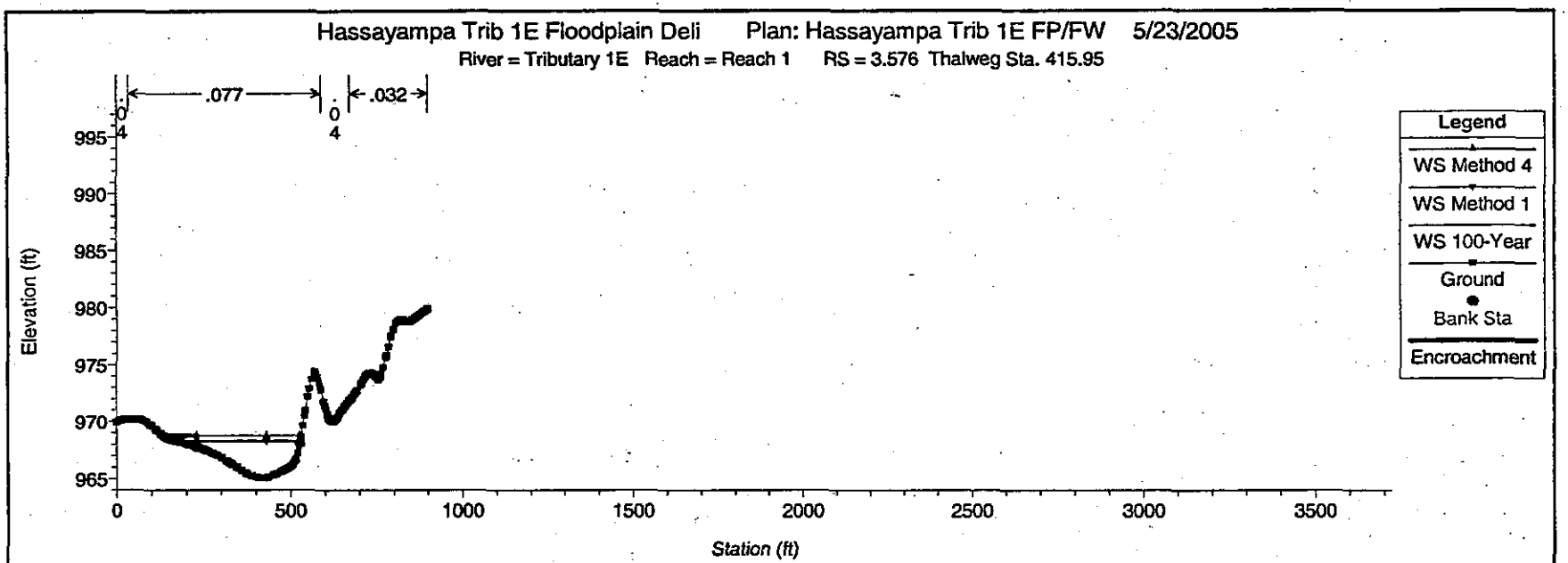


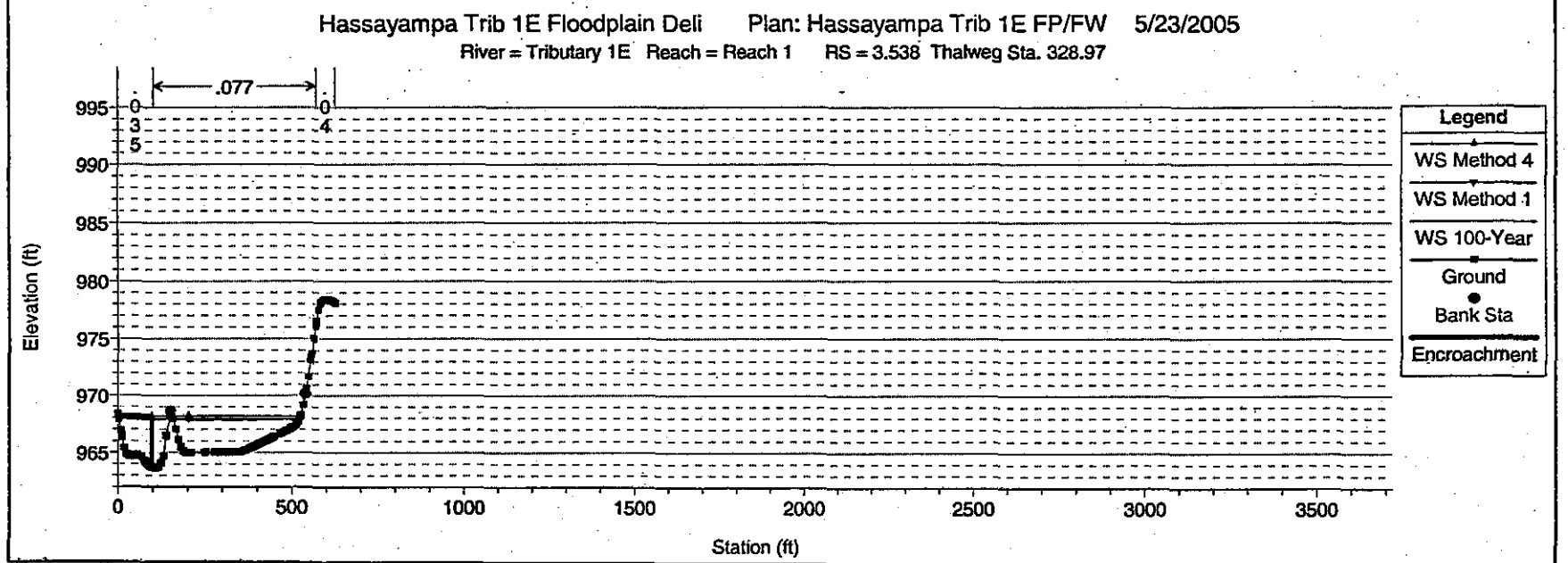

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



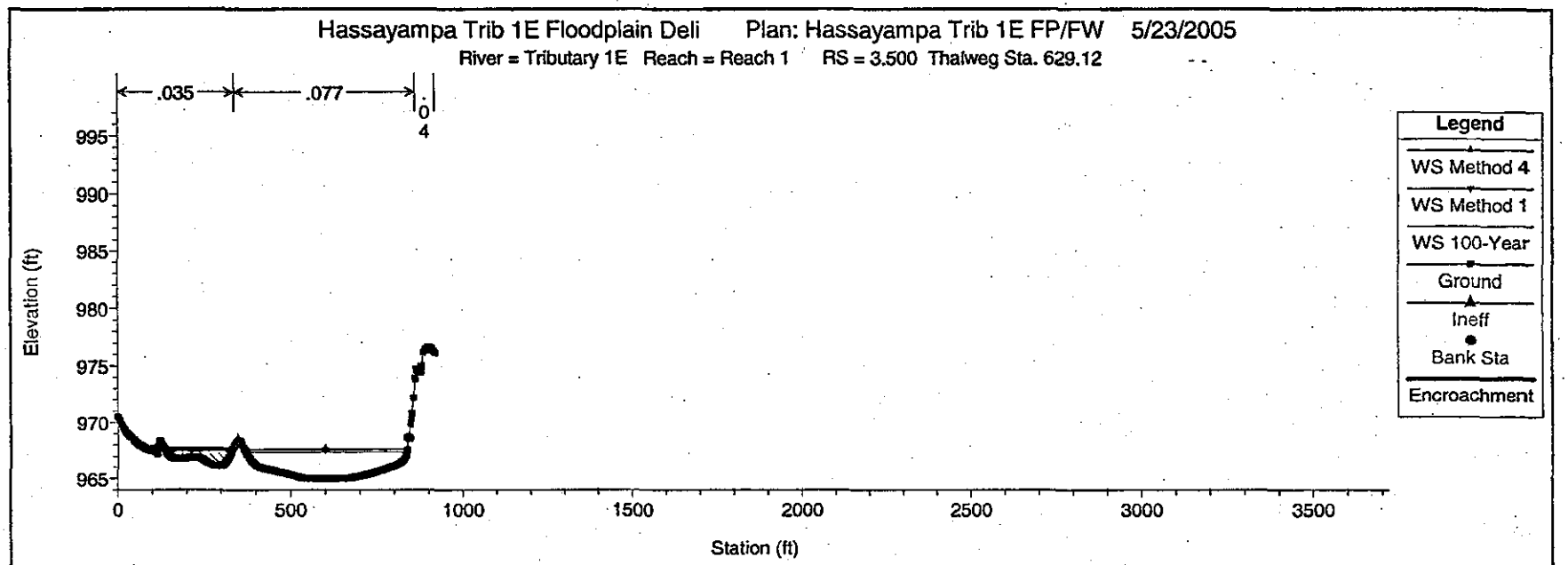



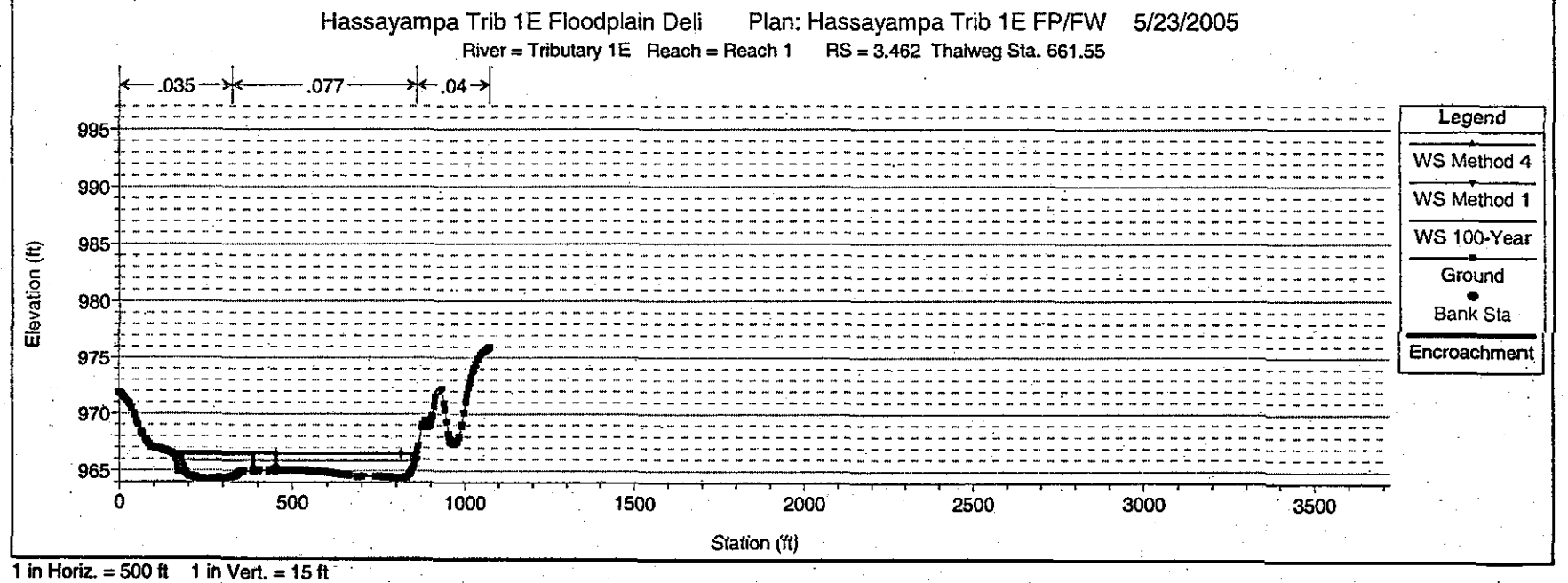

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



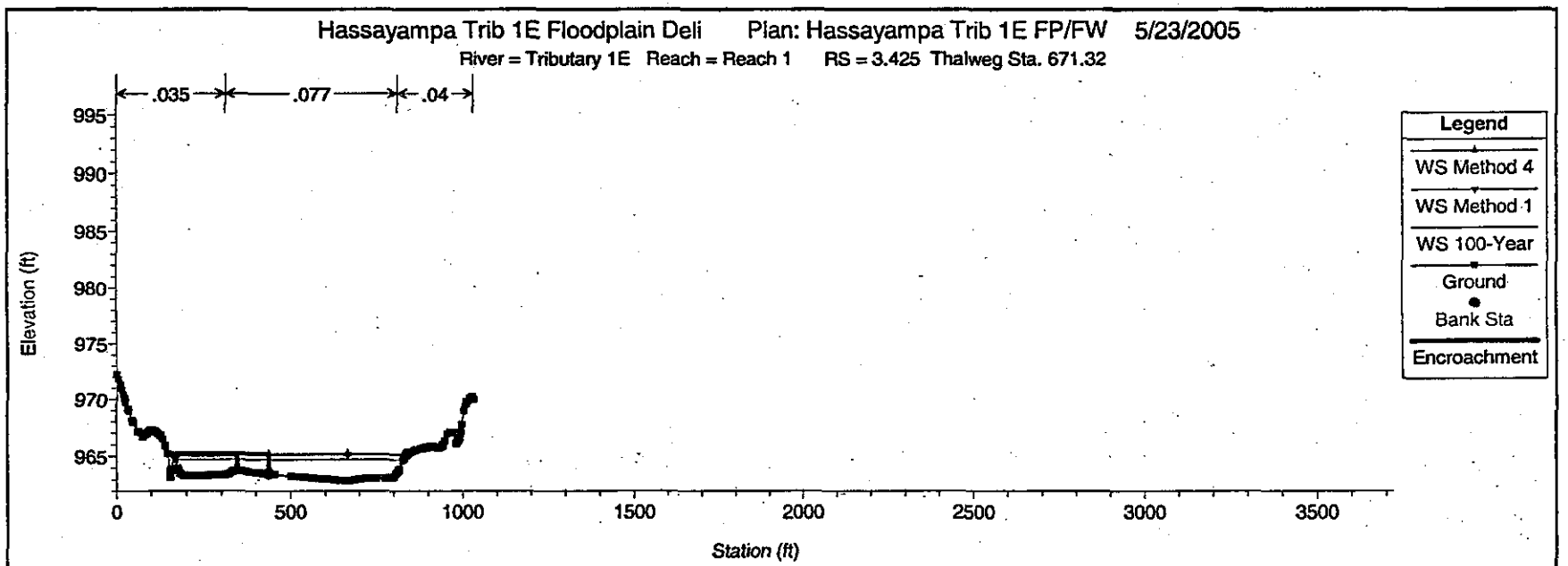



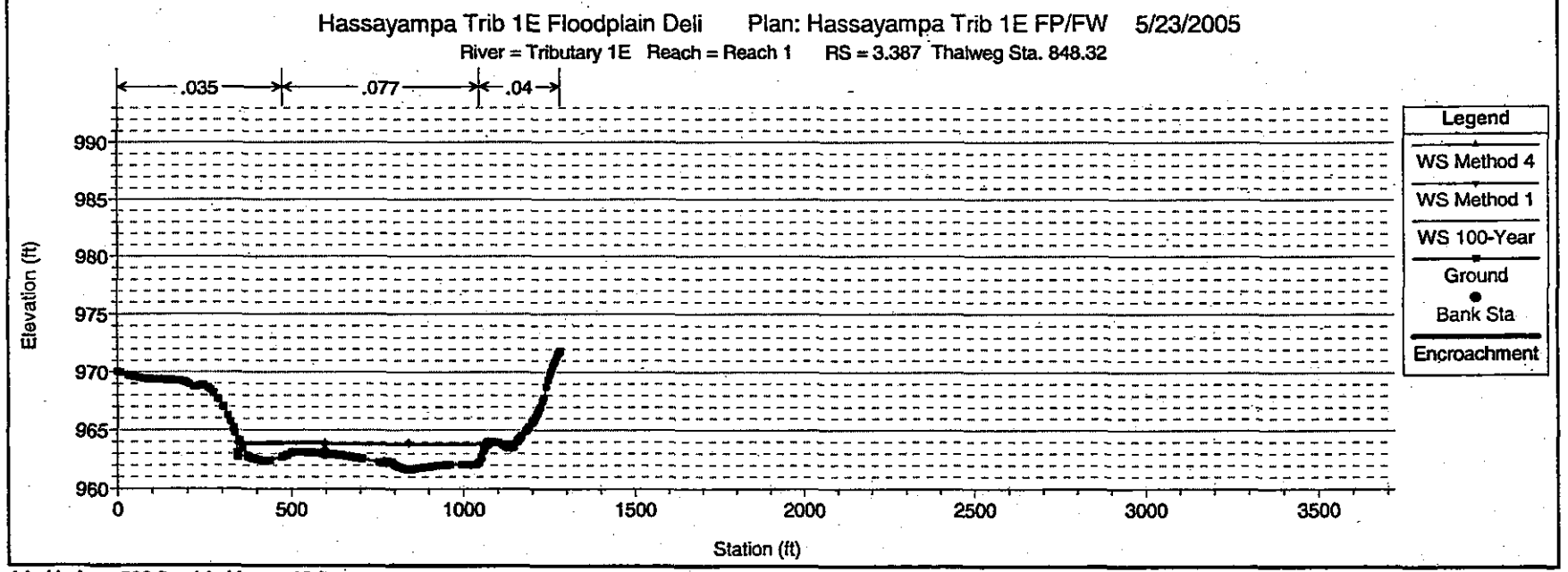

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



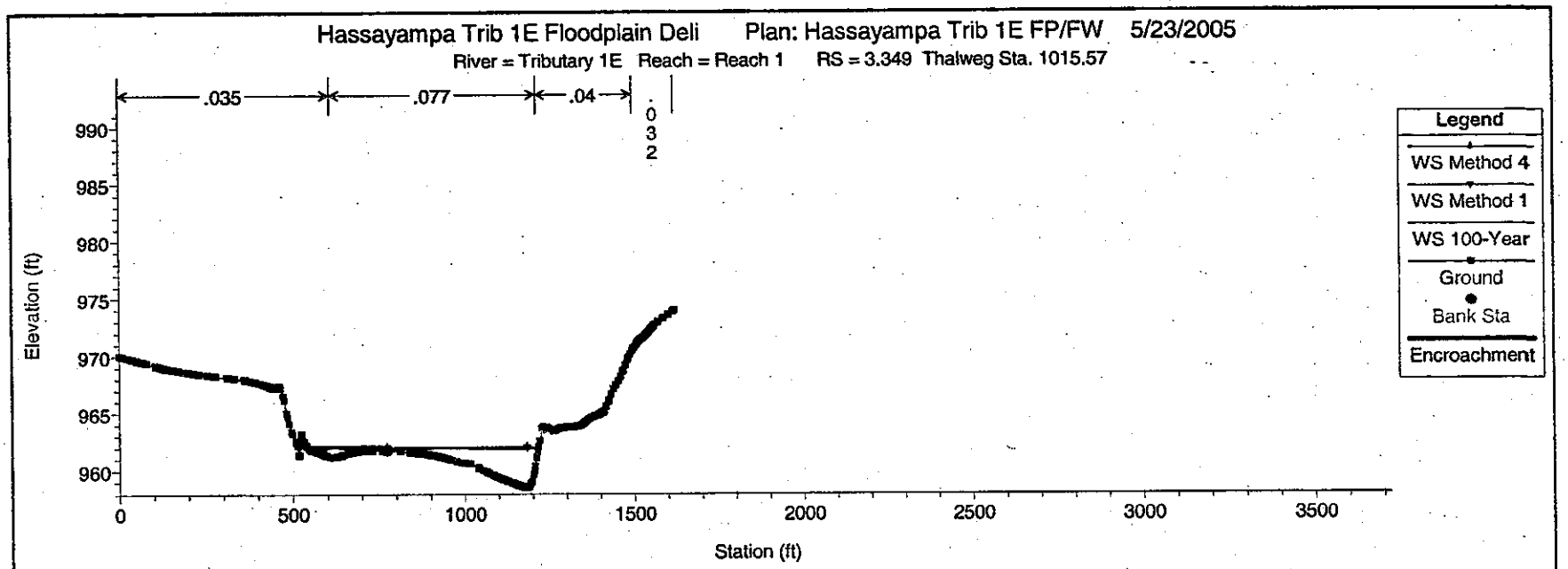



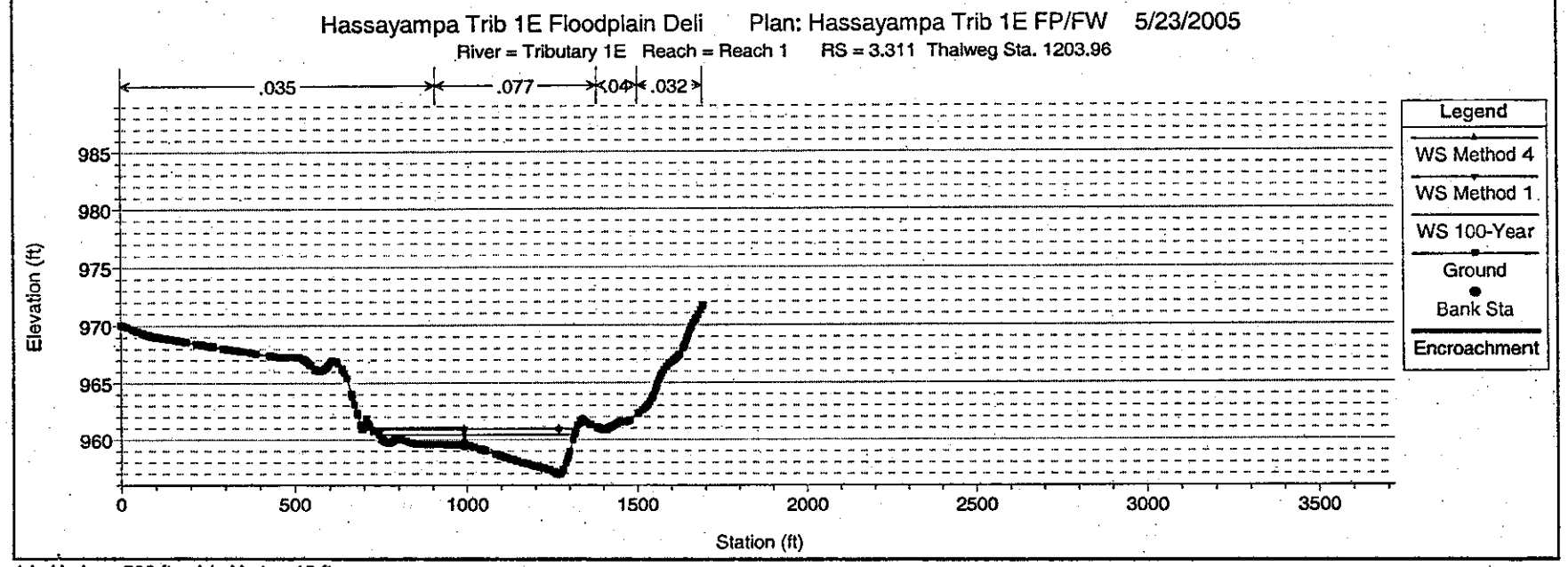

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



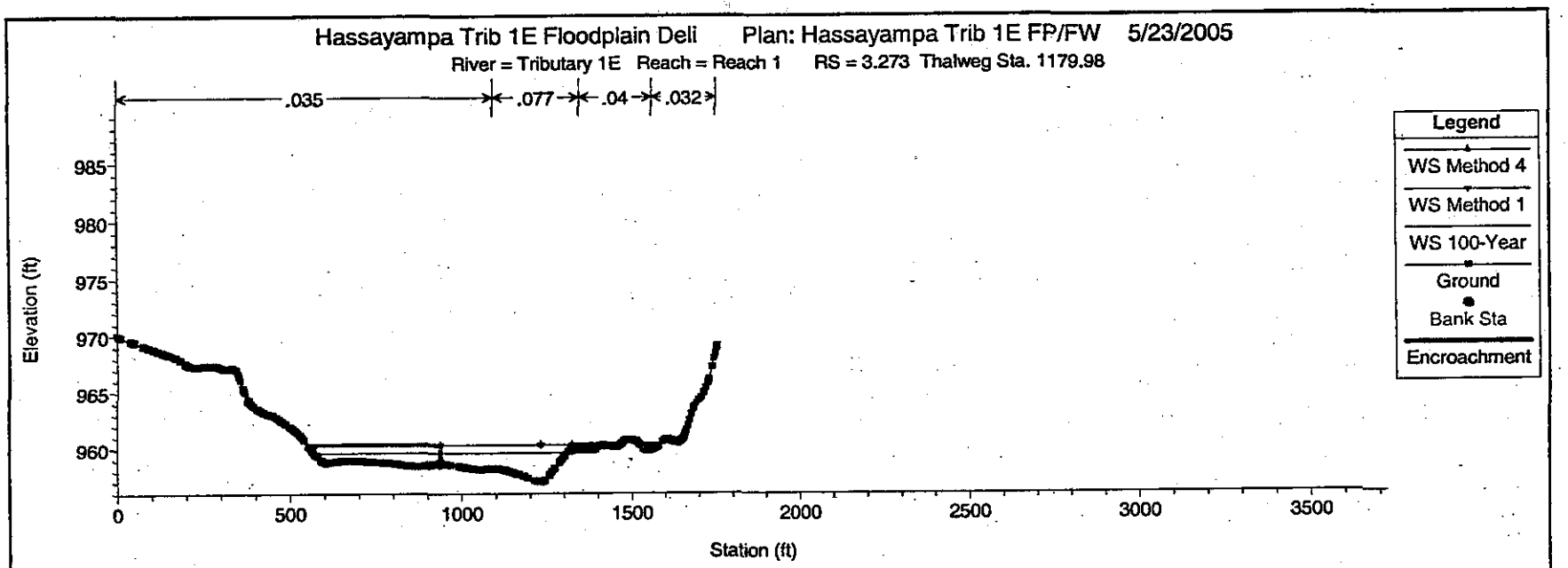



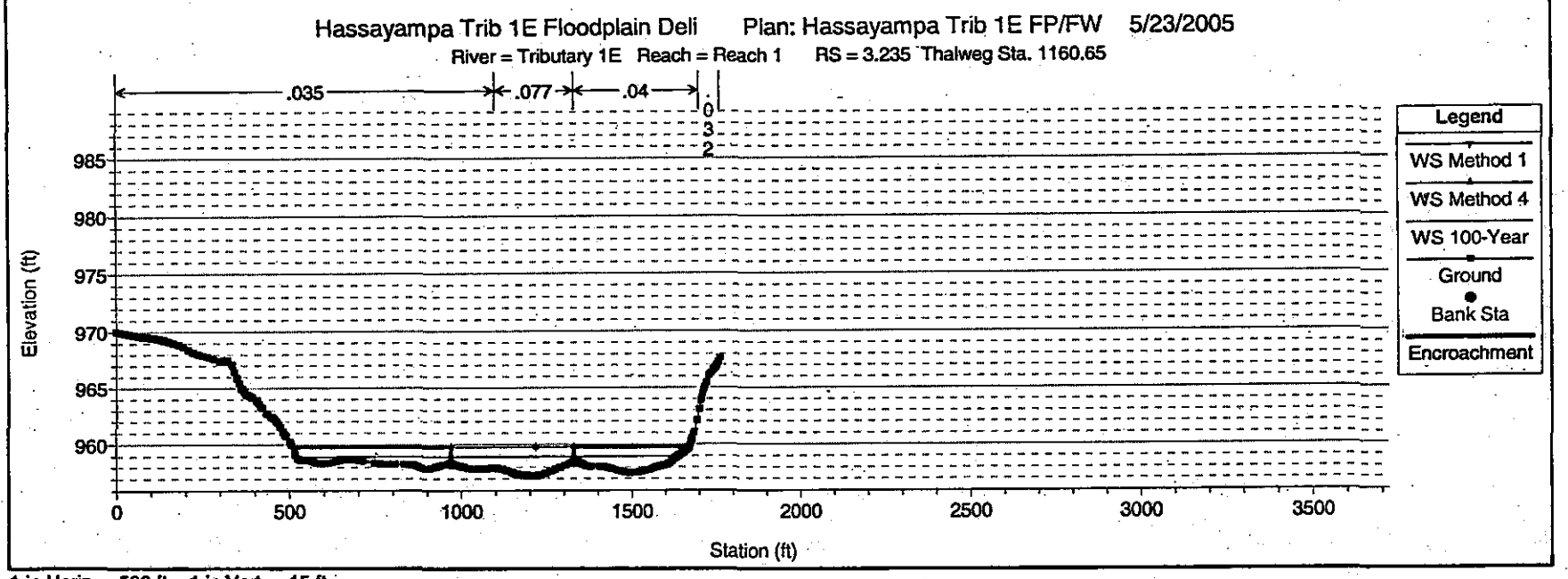

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



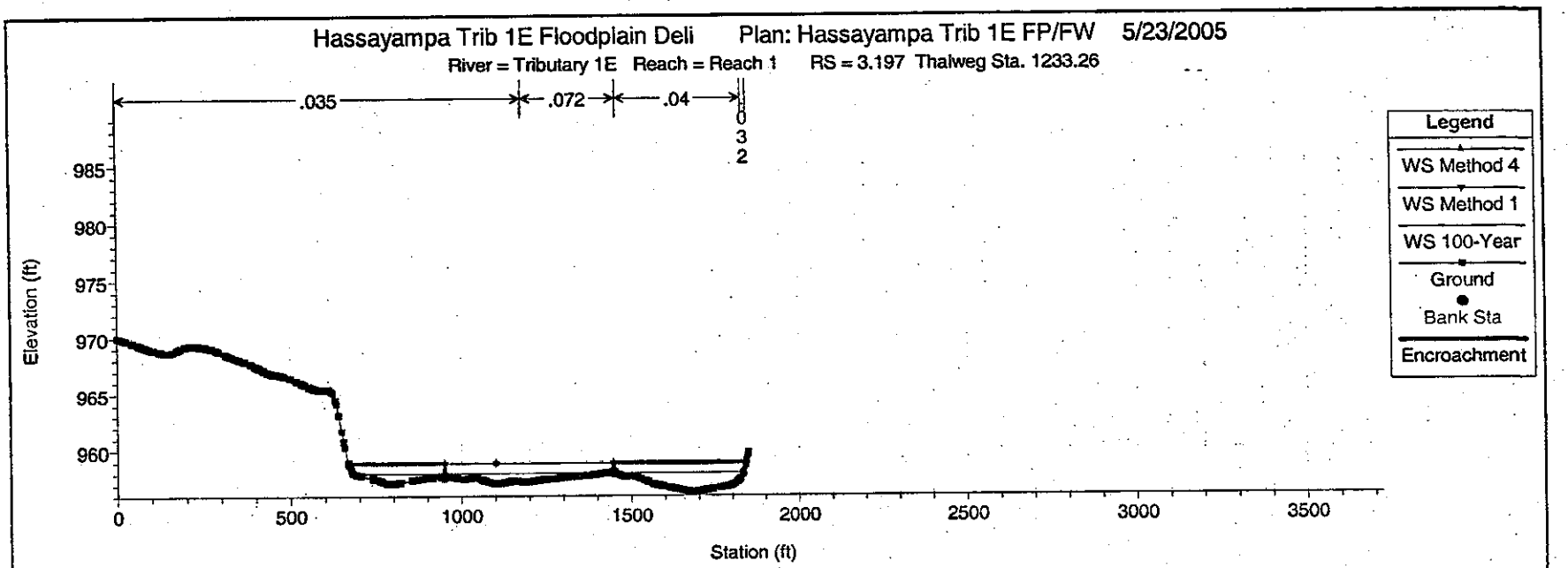



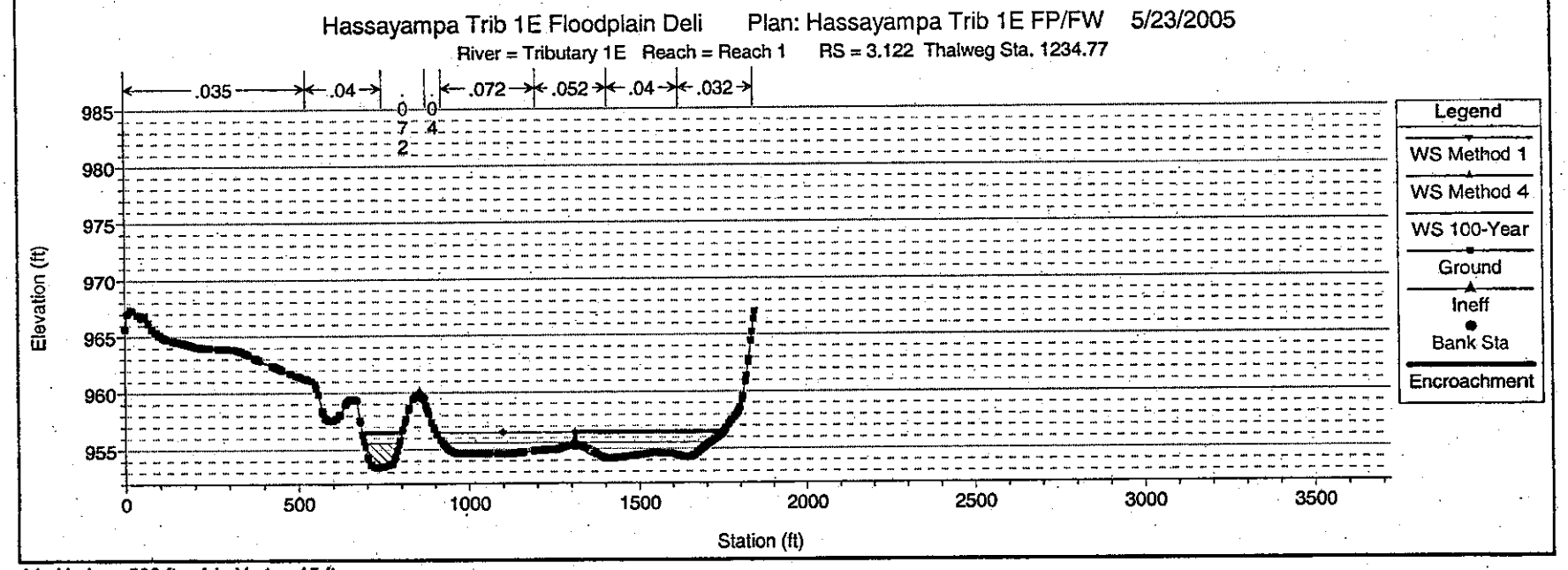

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



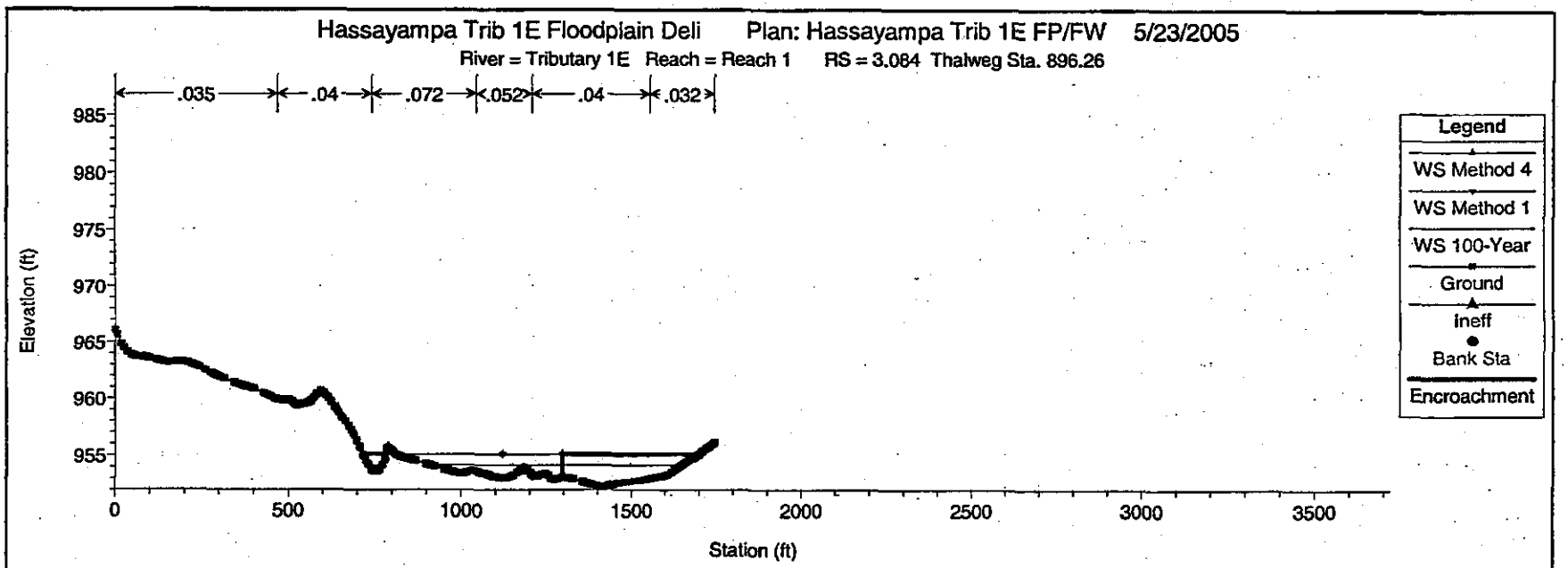



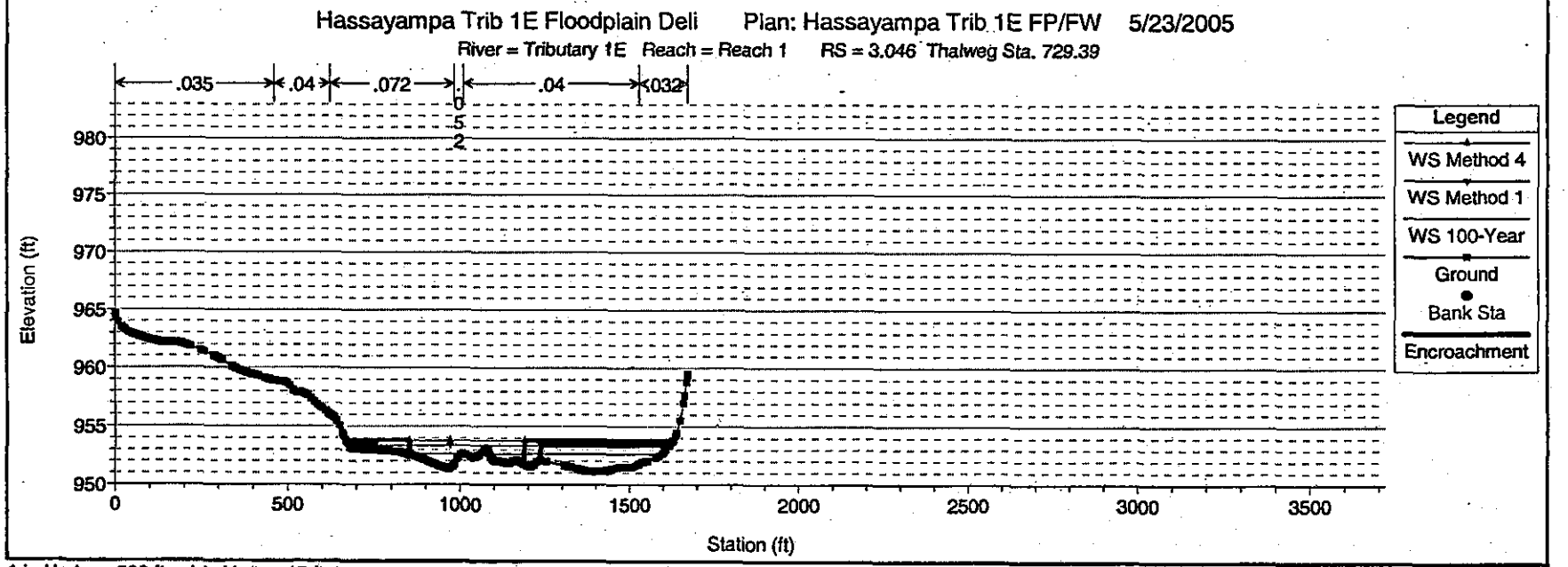

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



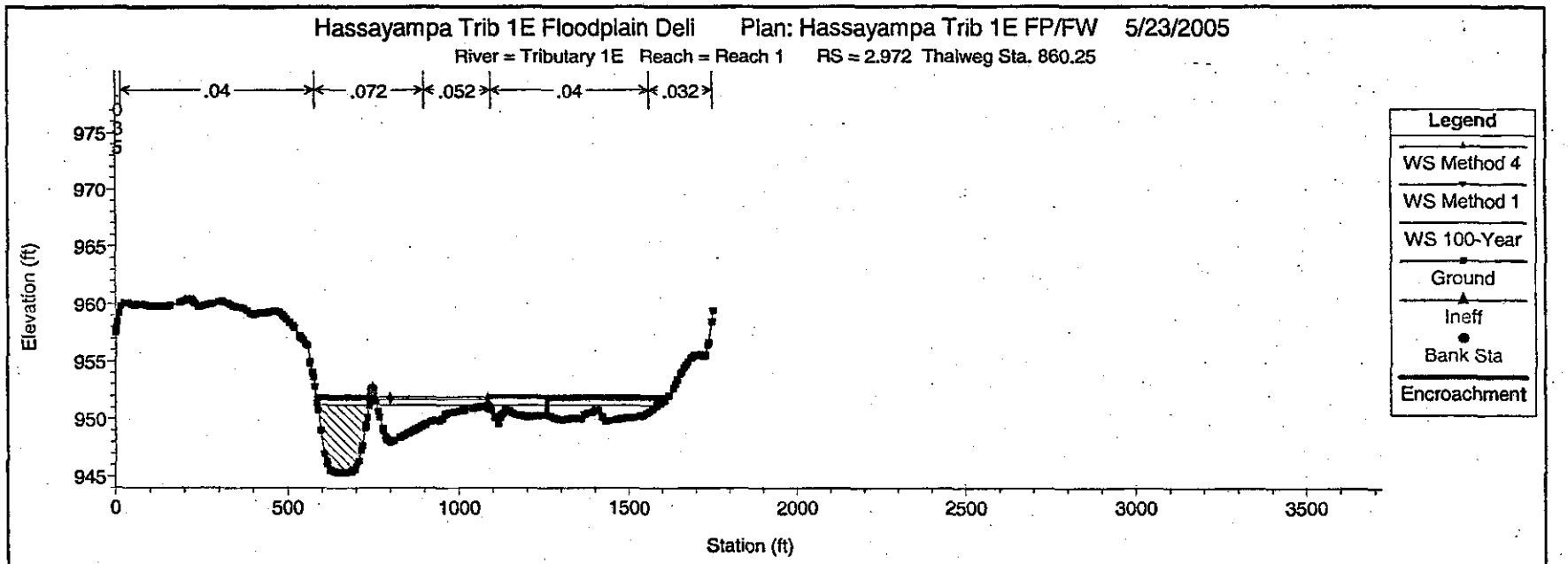



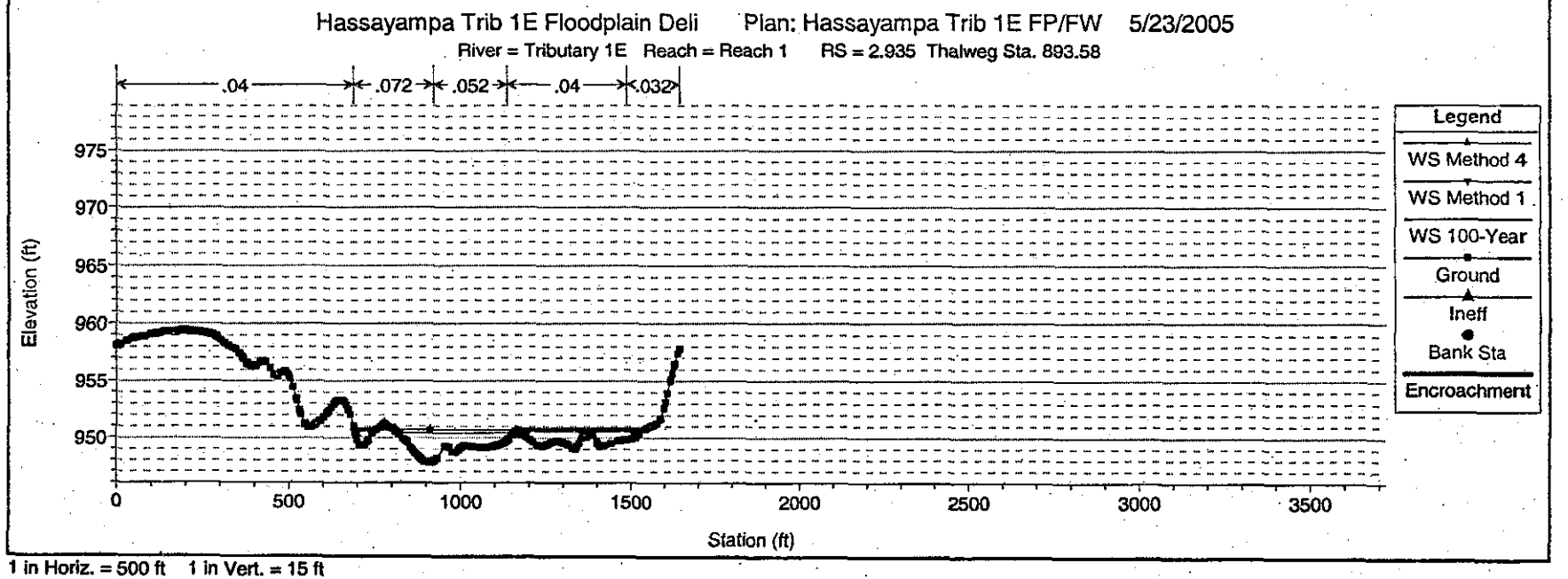

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

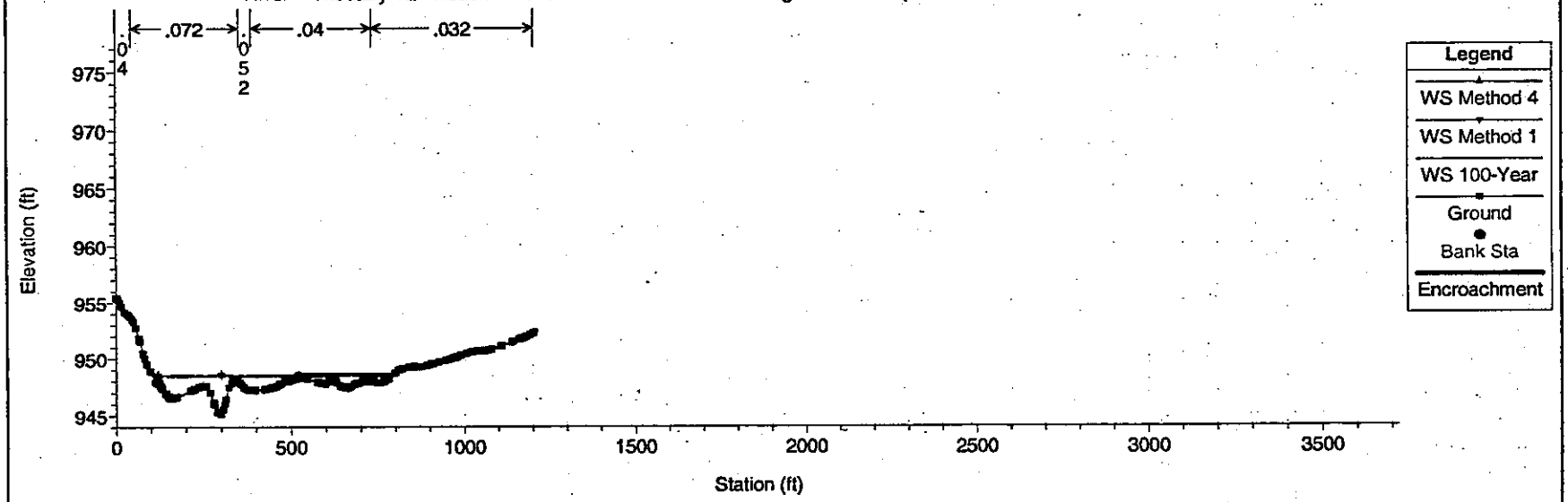



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

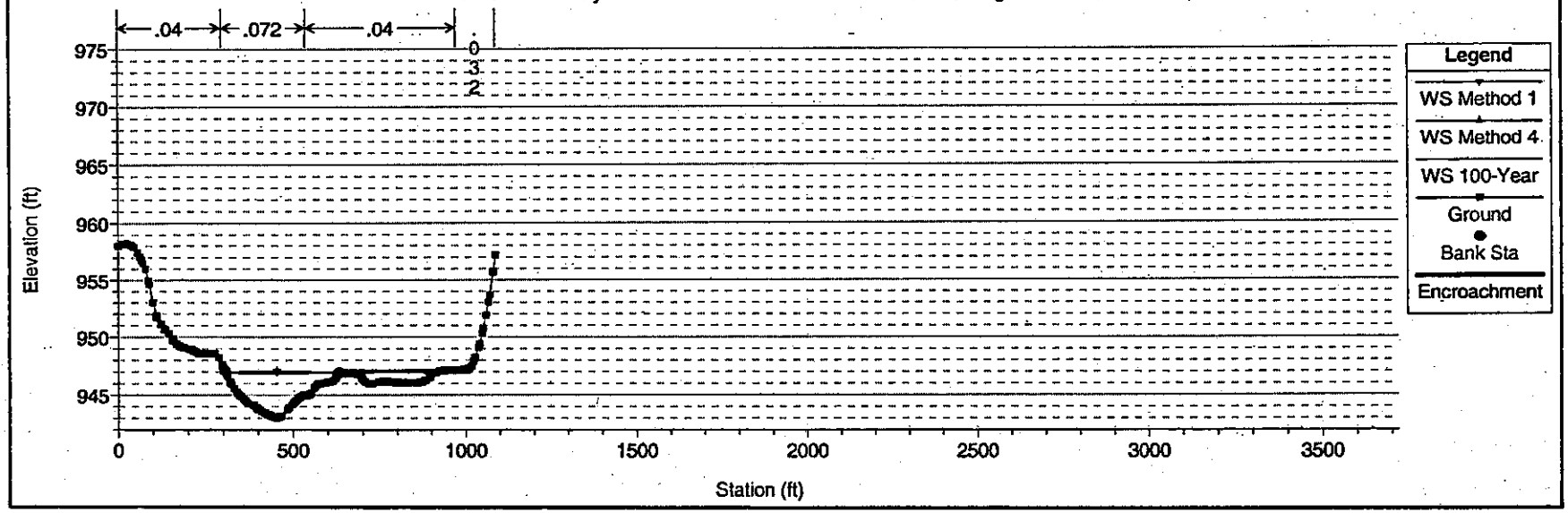
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 2.897  Thalweg Sta. 289.46 (HEC-RAS XS has been trimmed and does not re

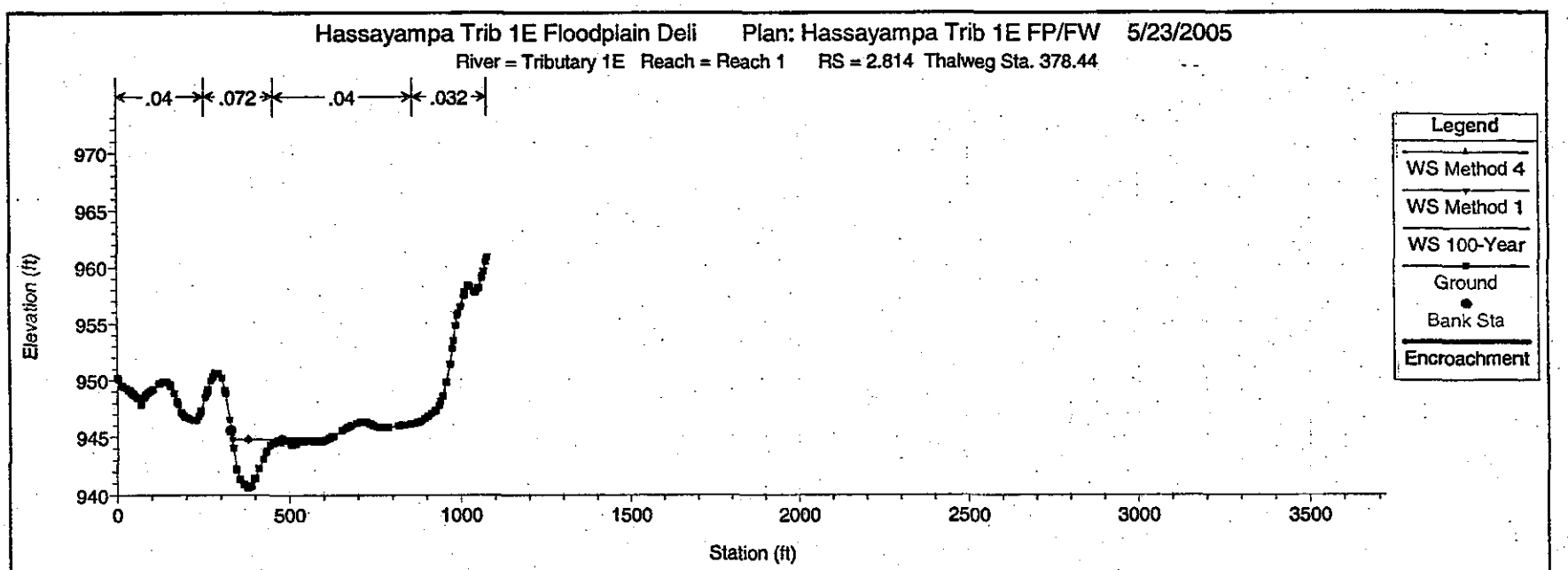


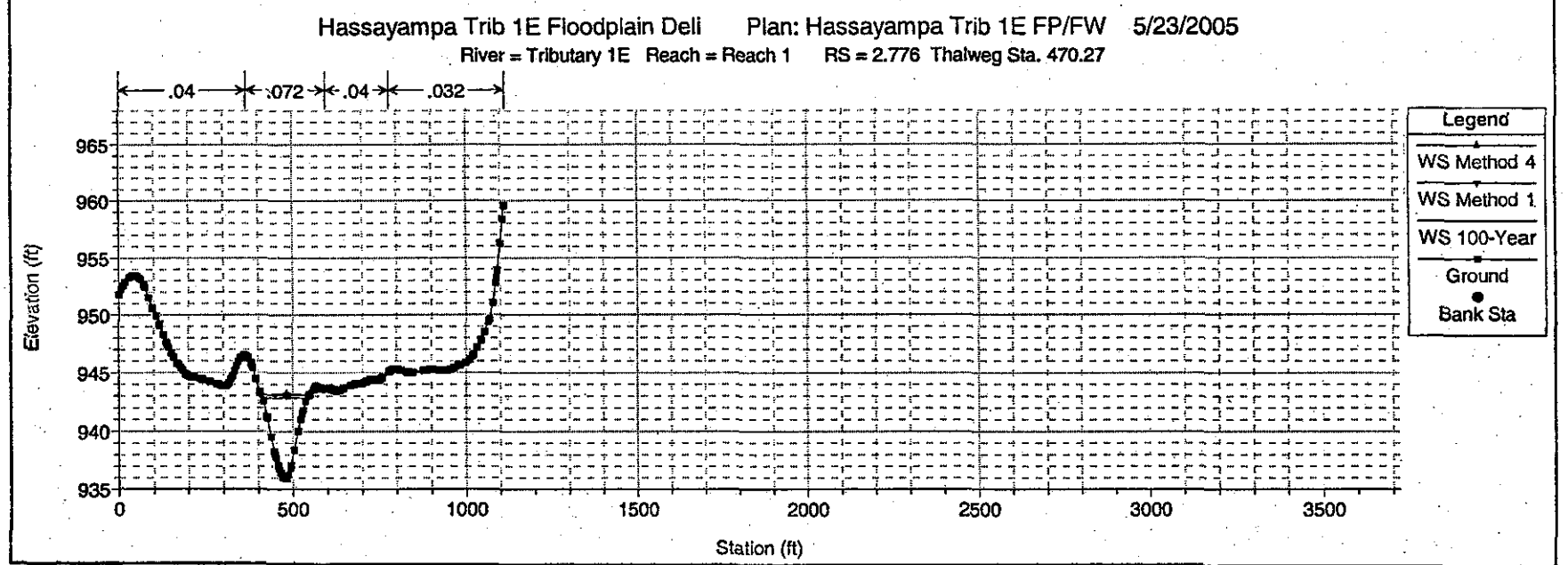

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 2.852  Thalweg Sta. 452.98

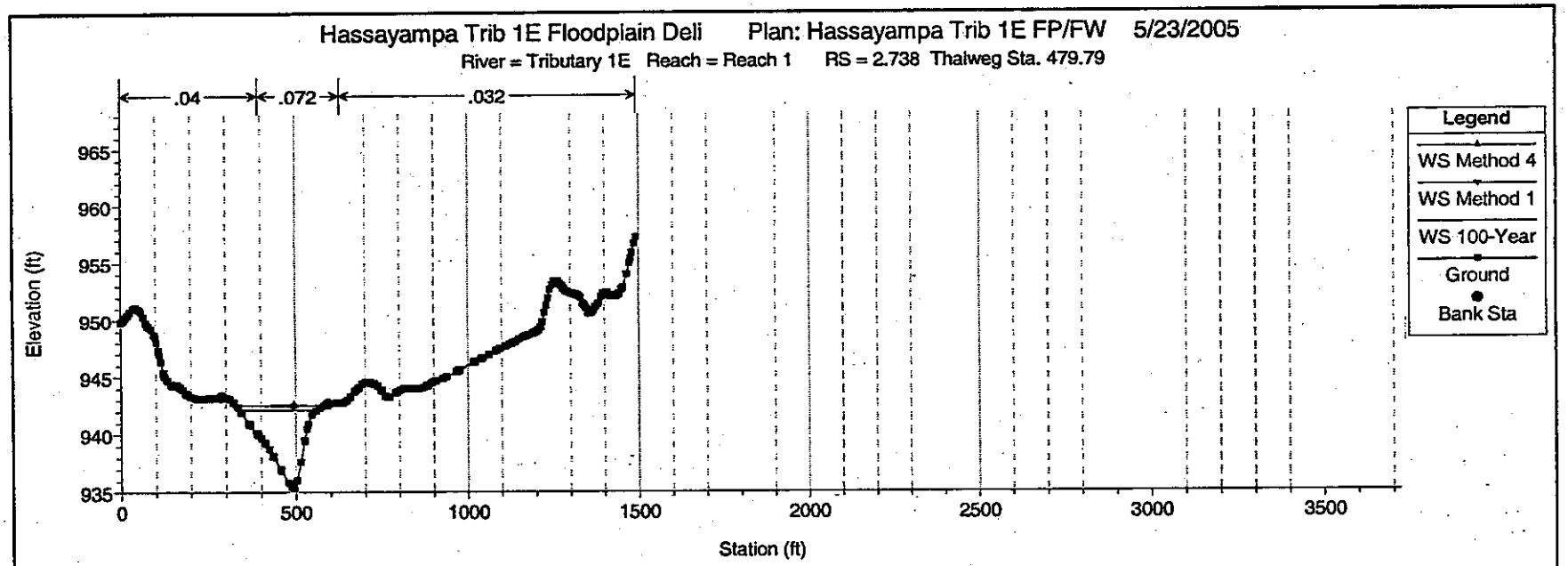


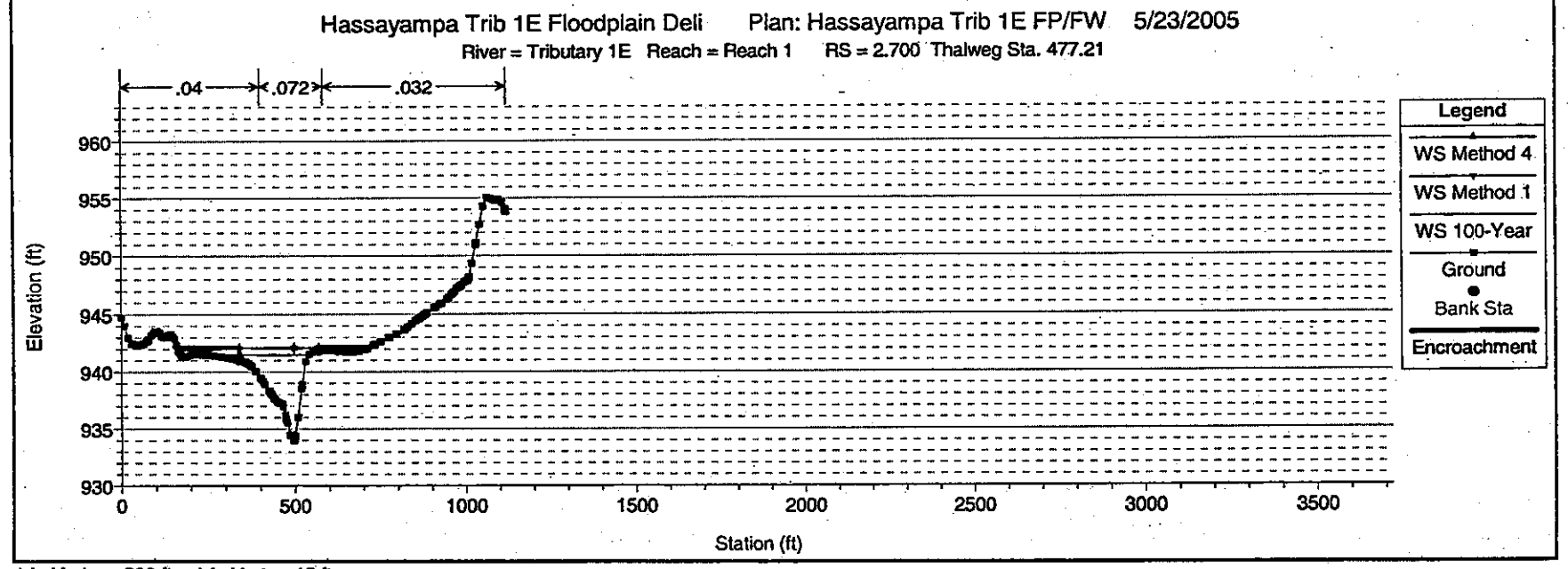

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



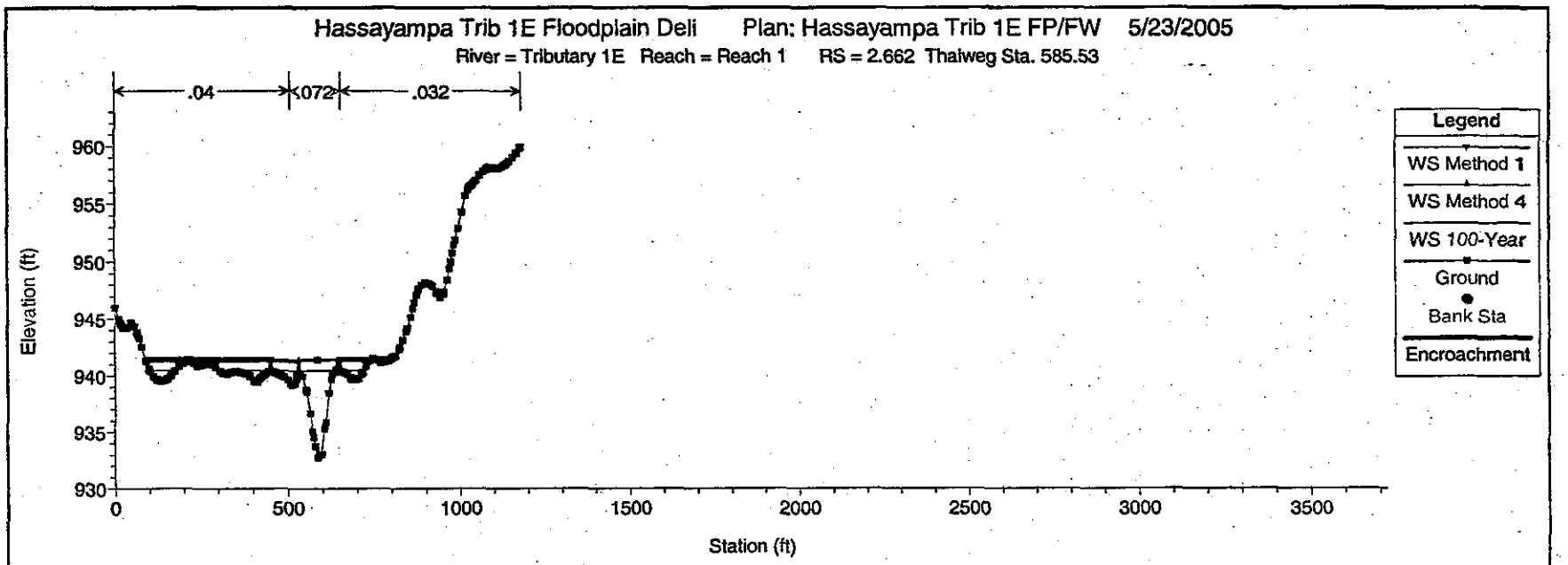



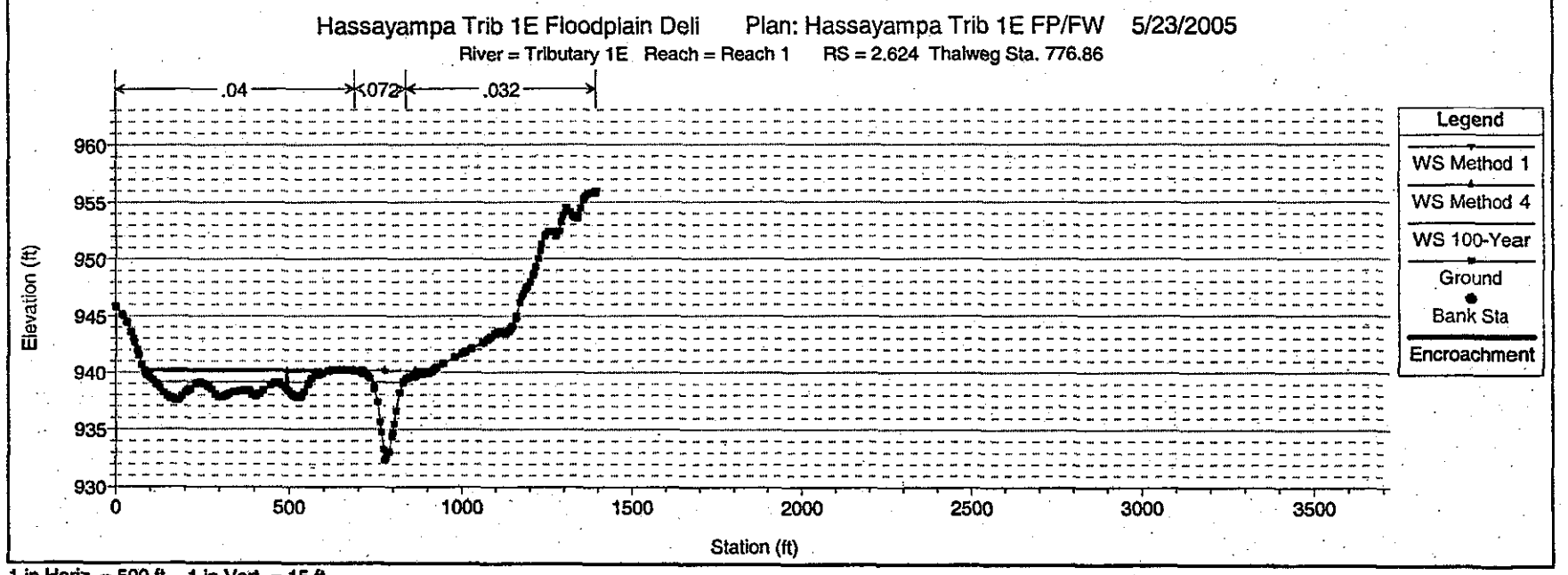

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



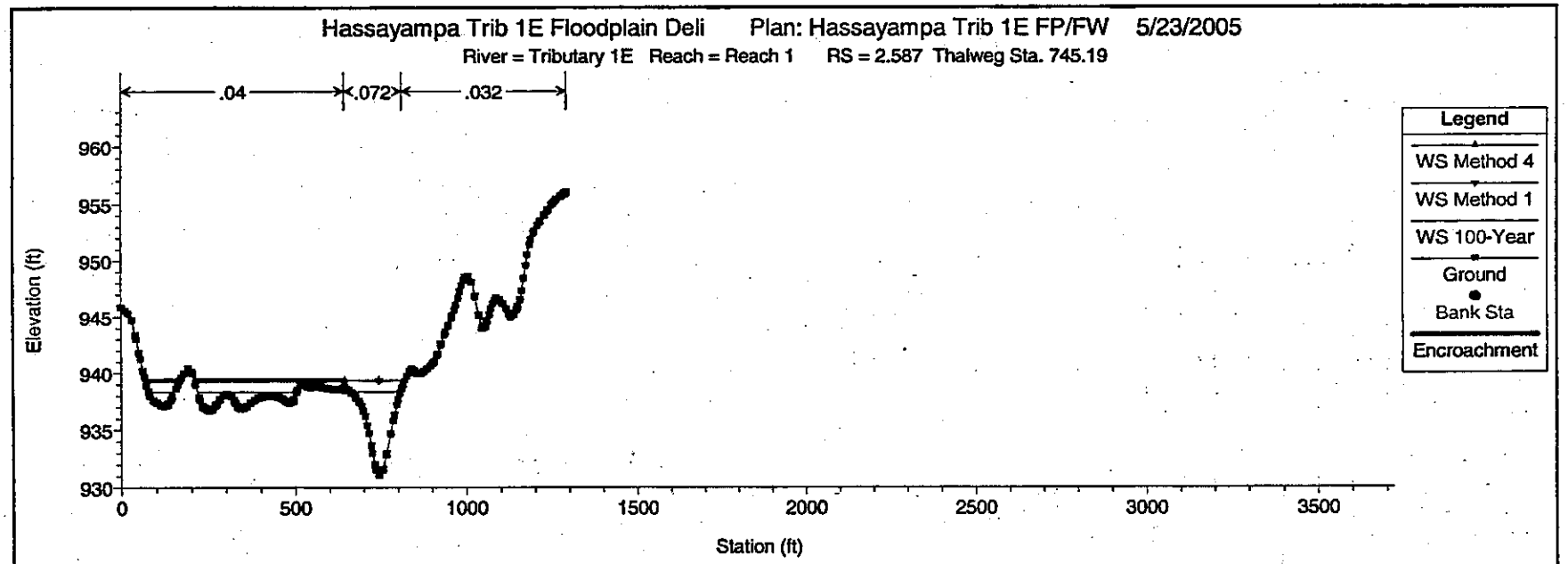



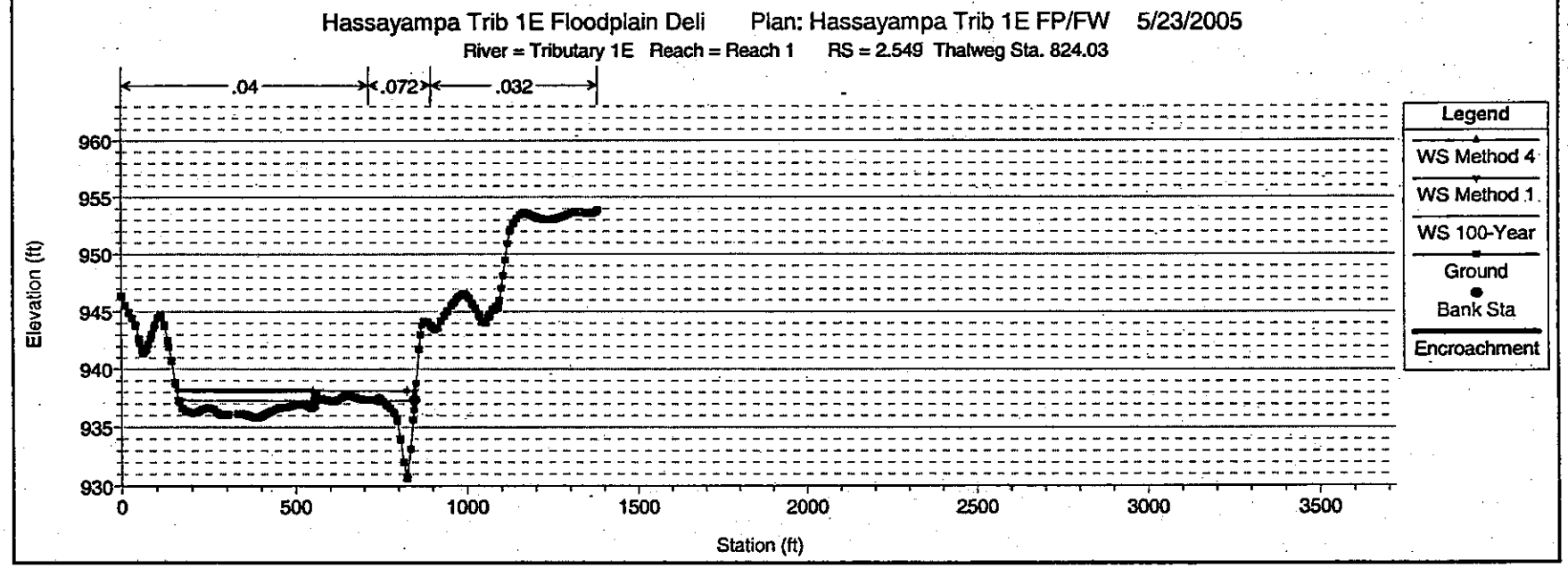

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



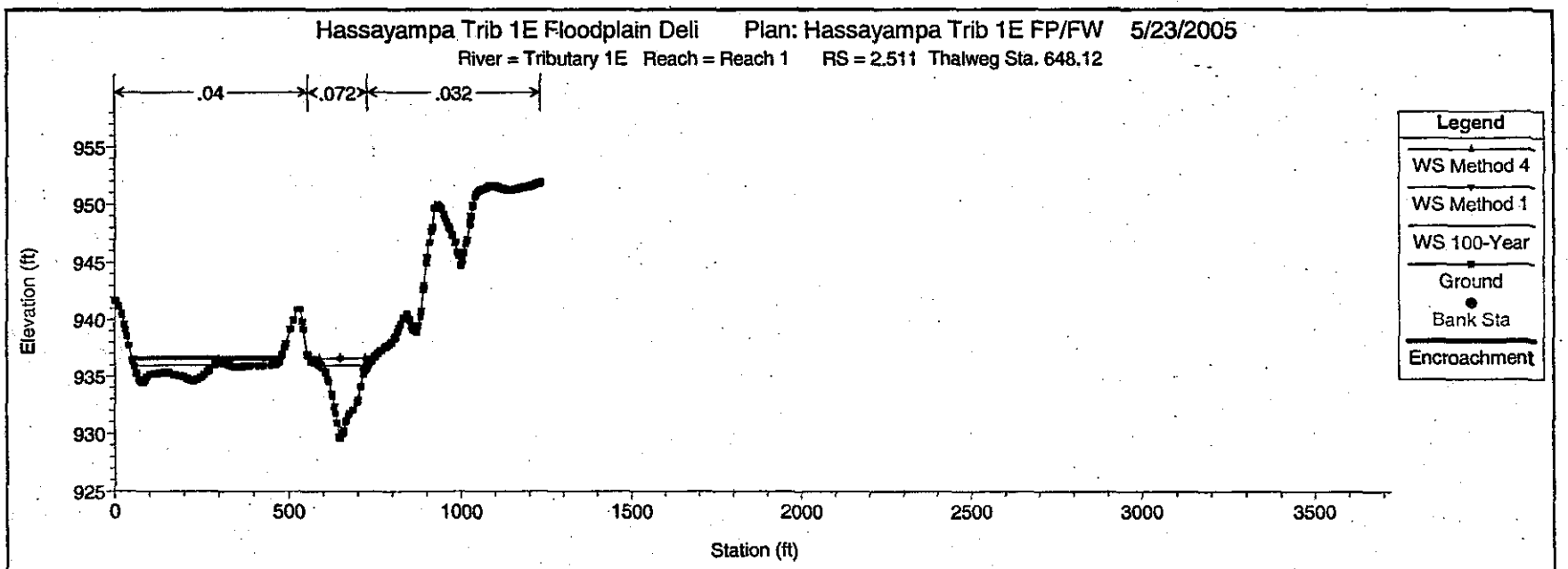



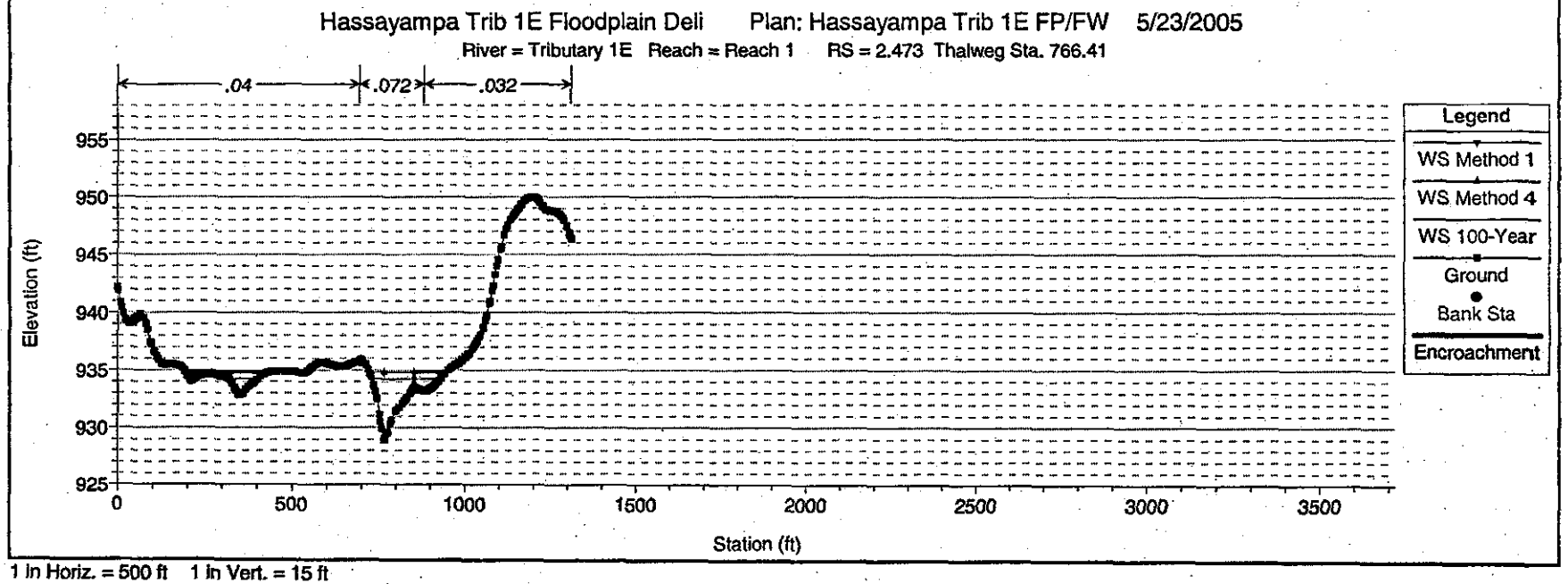

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



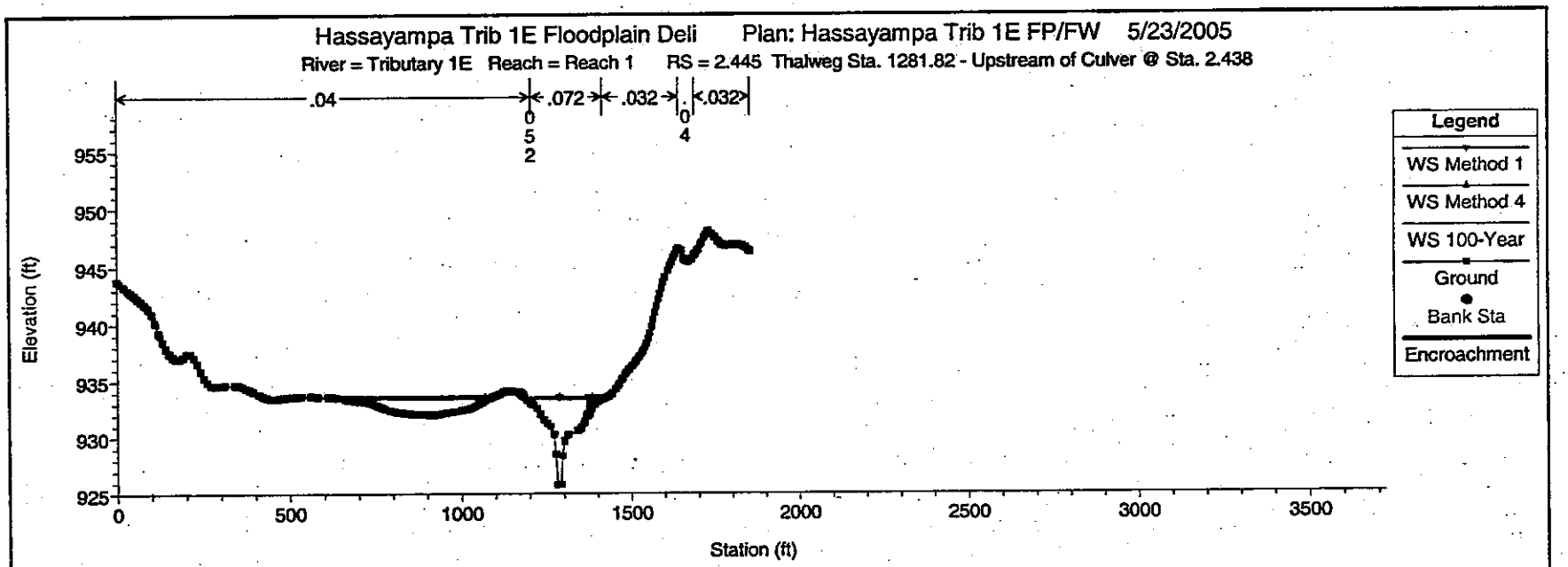



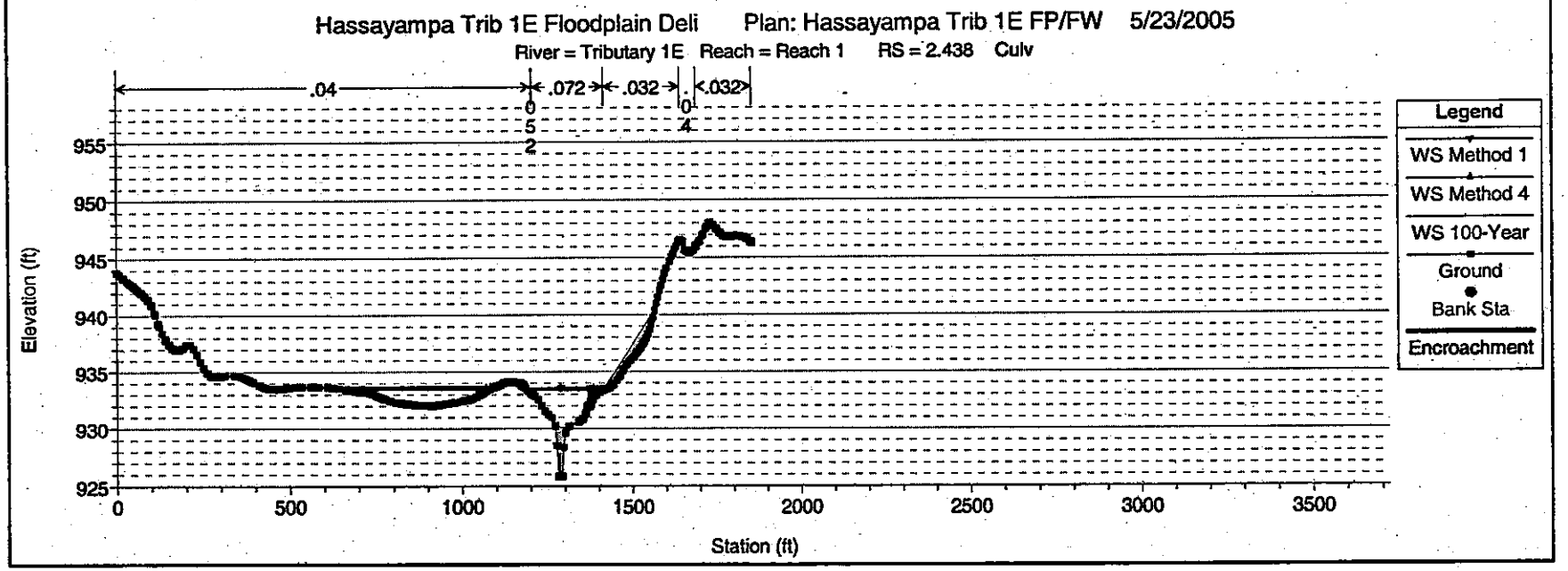

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



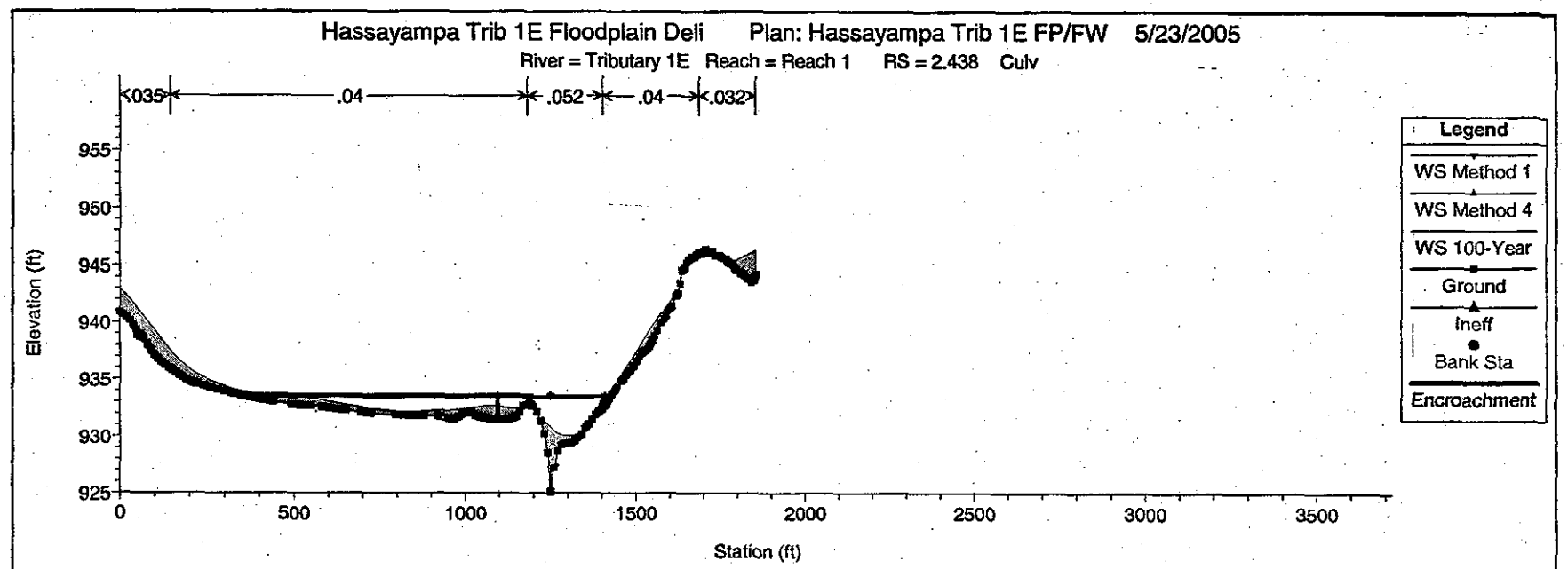



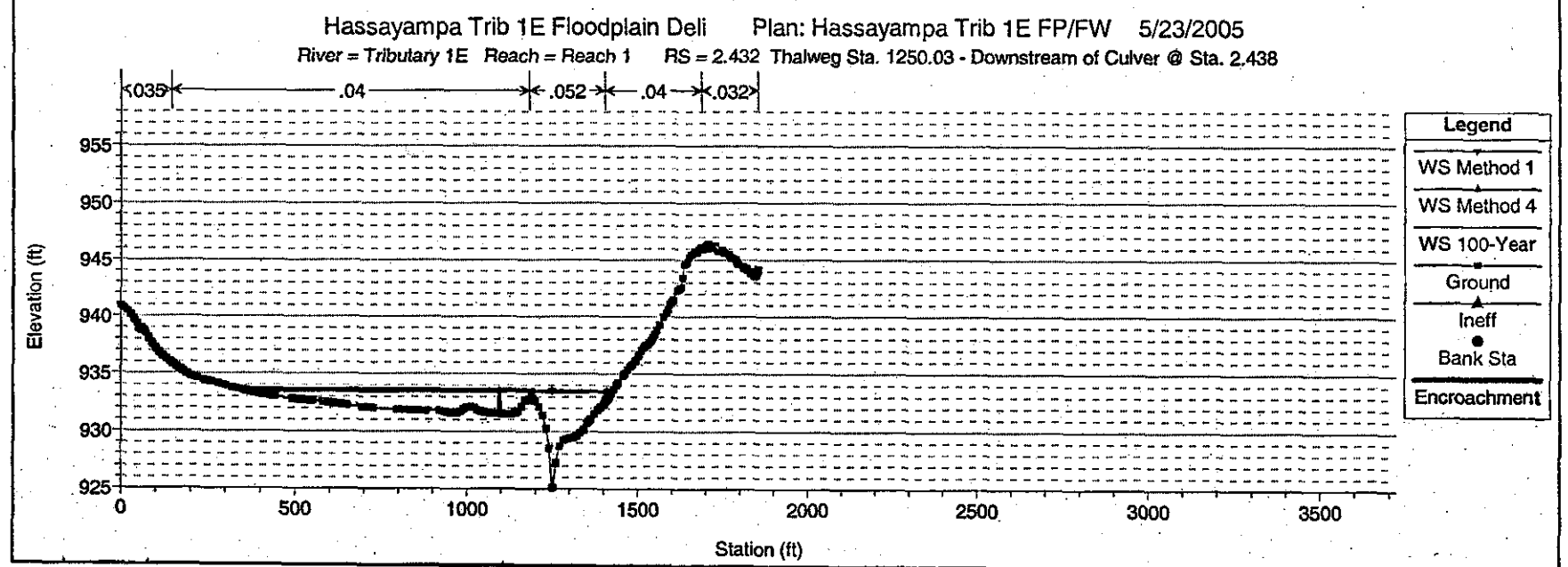

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



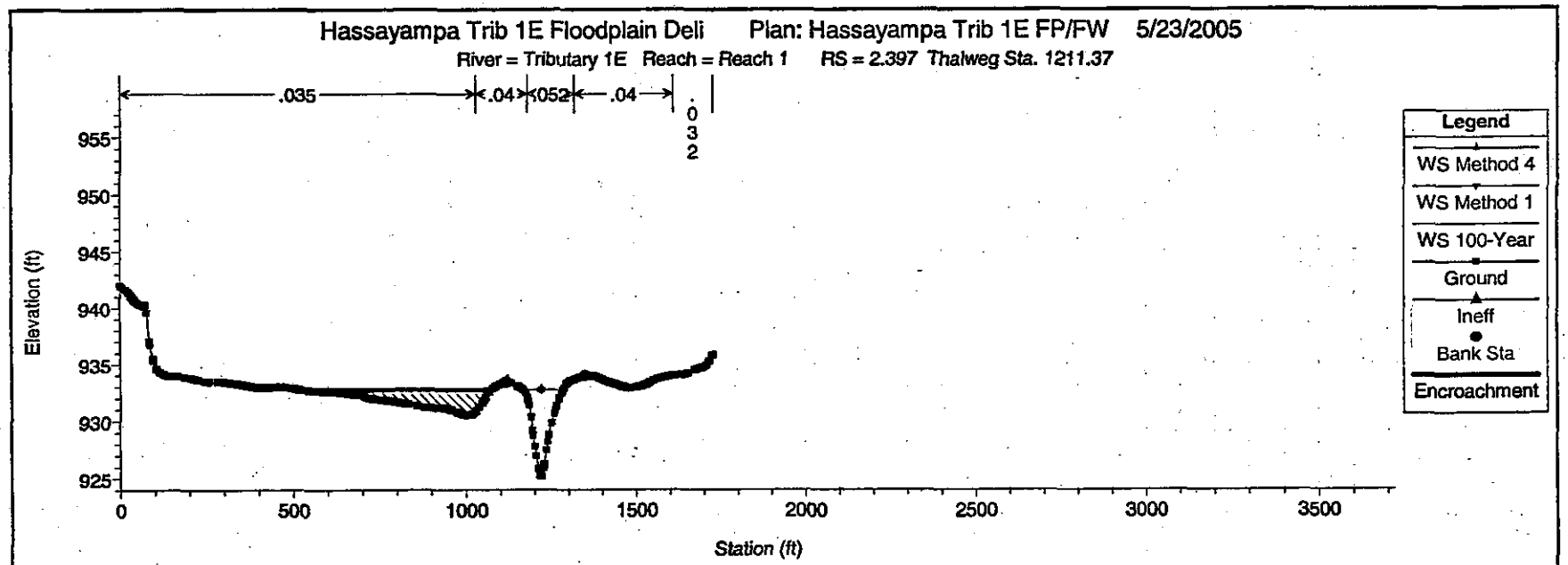



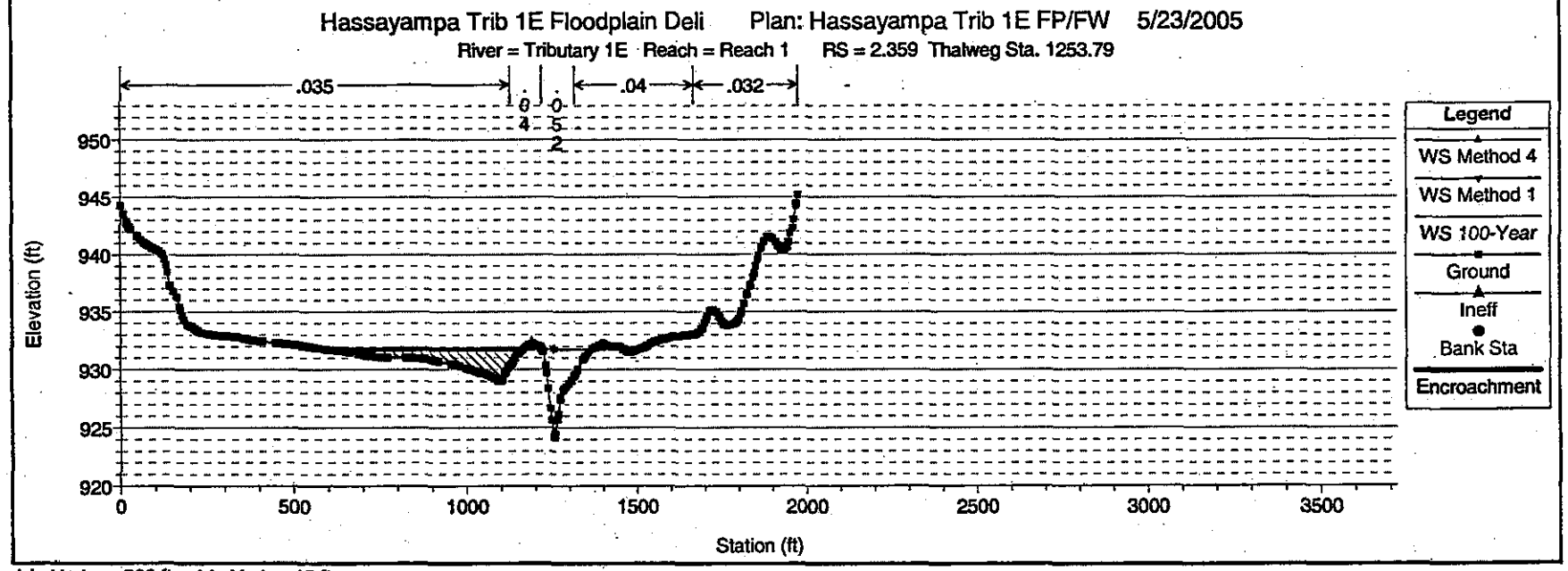

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



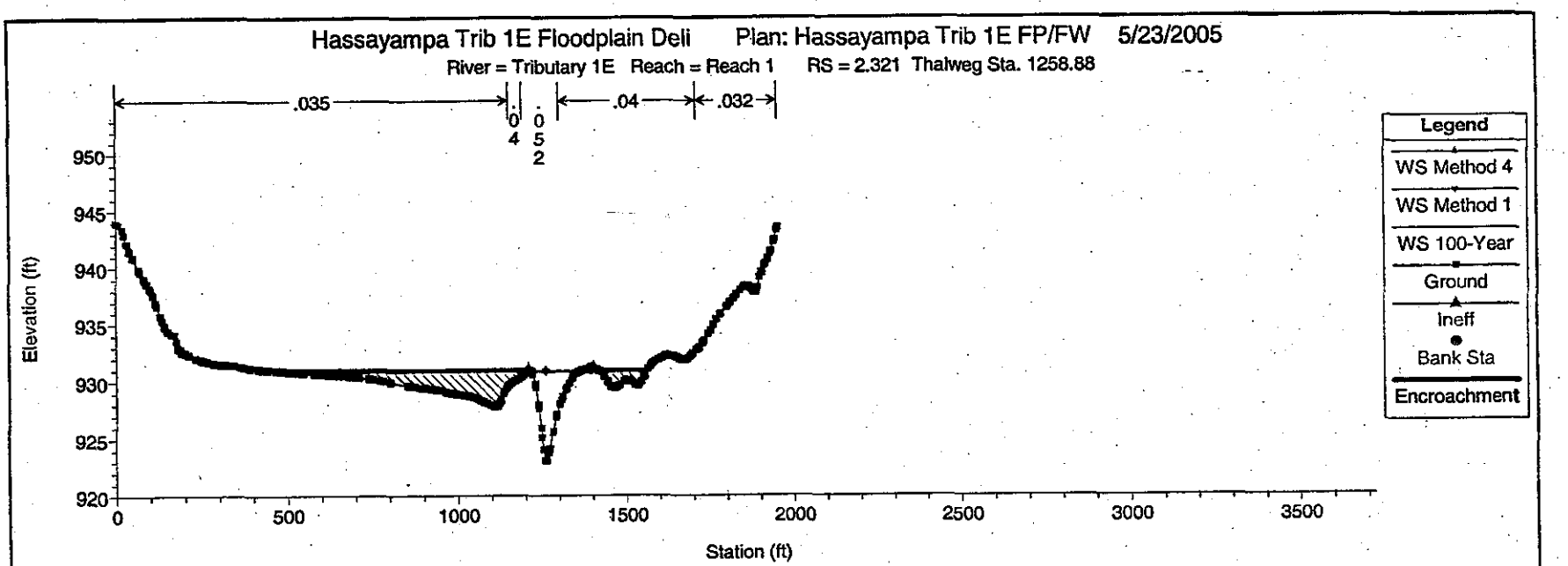



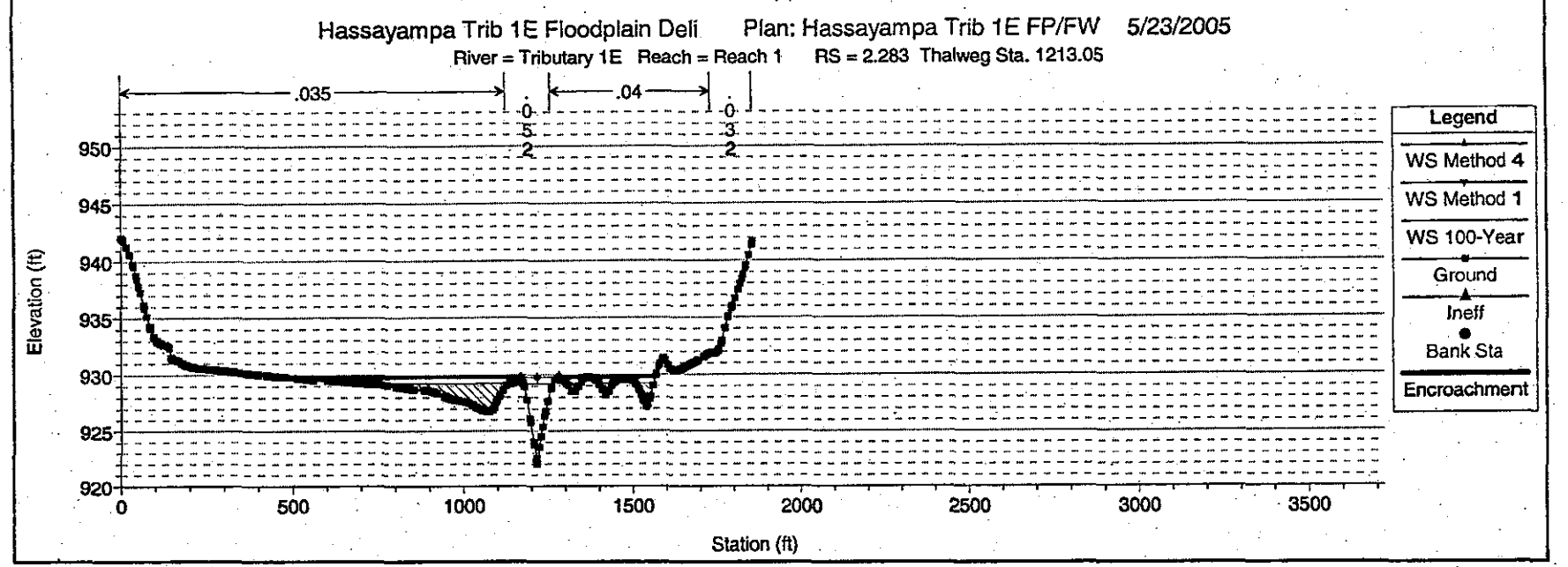

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



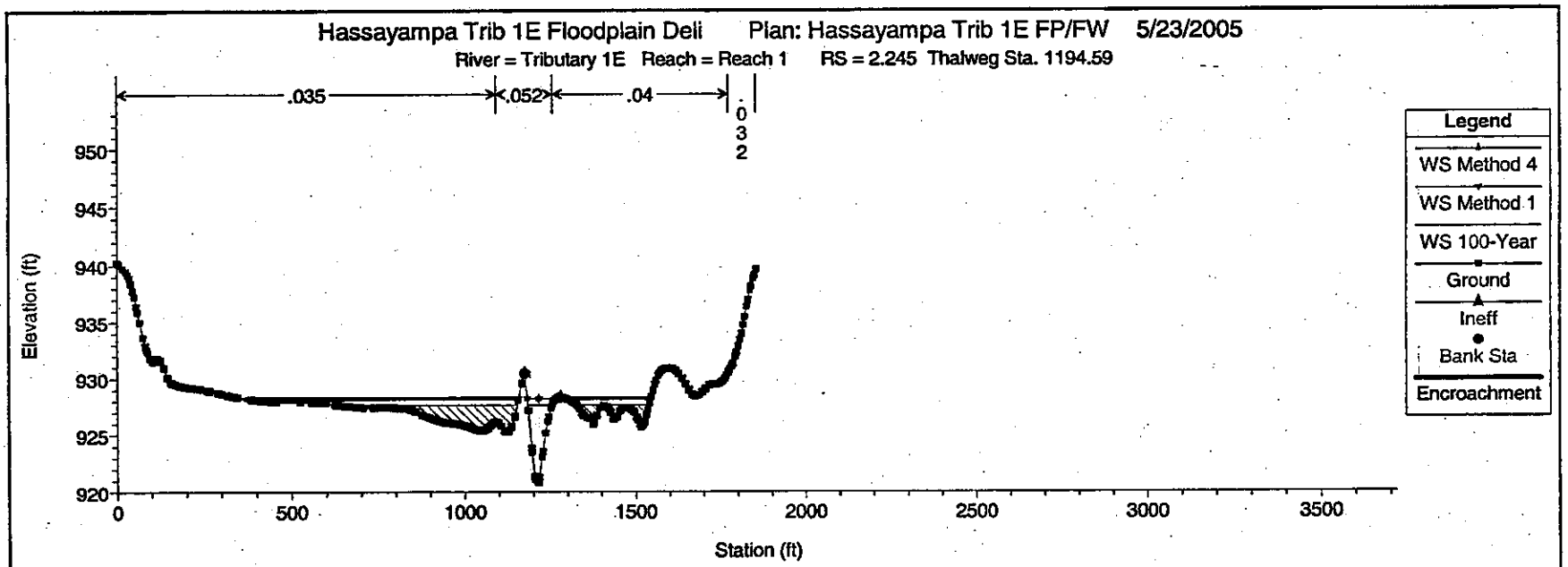



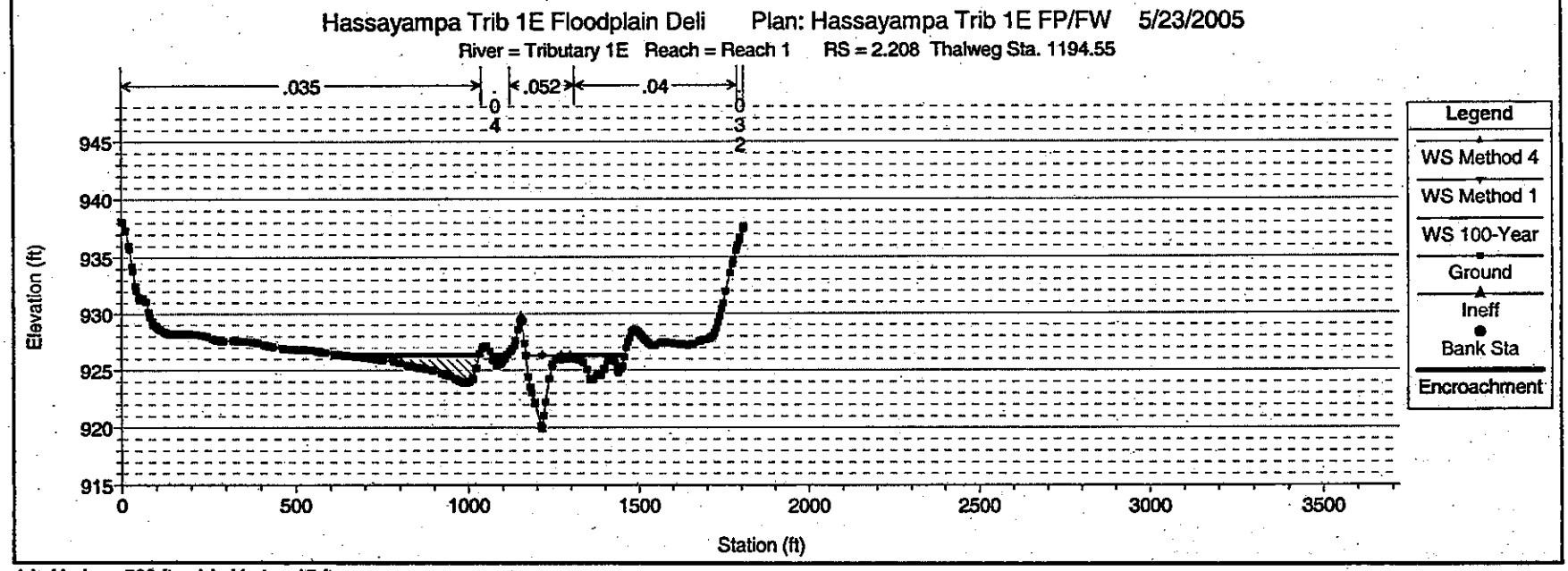

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



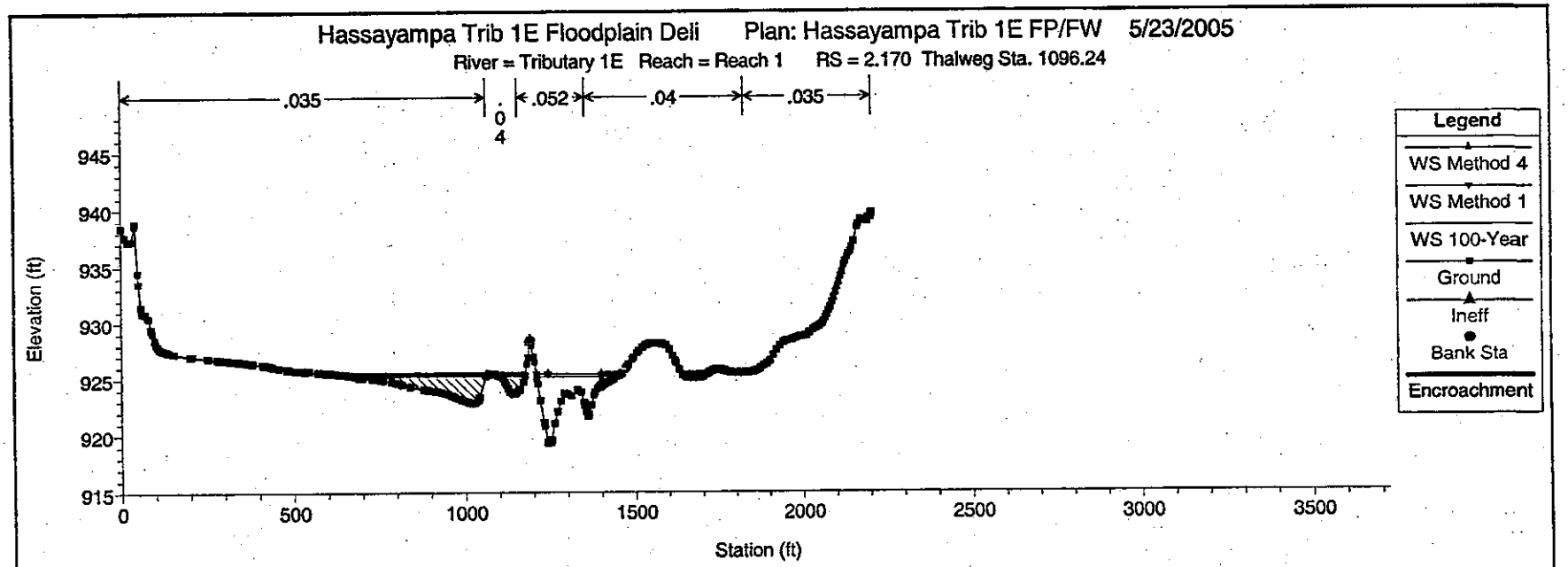



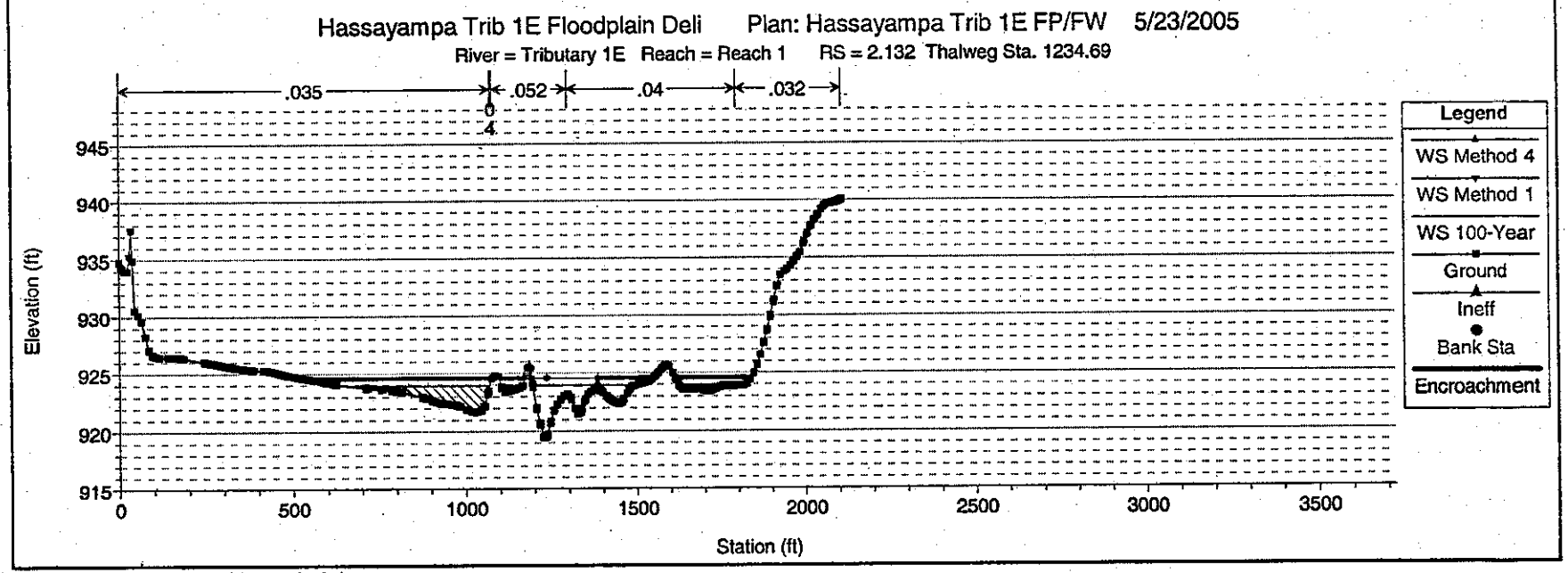

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



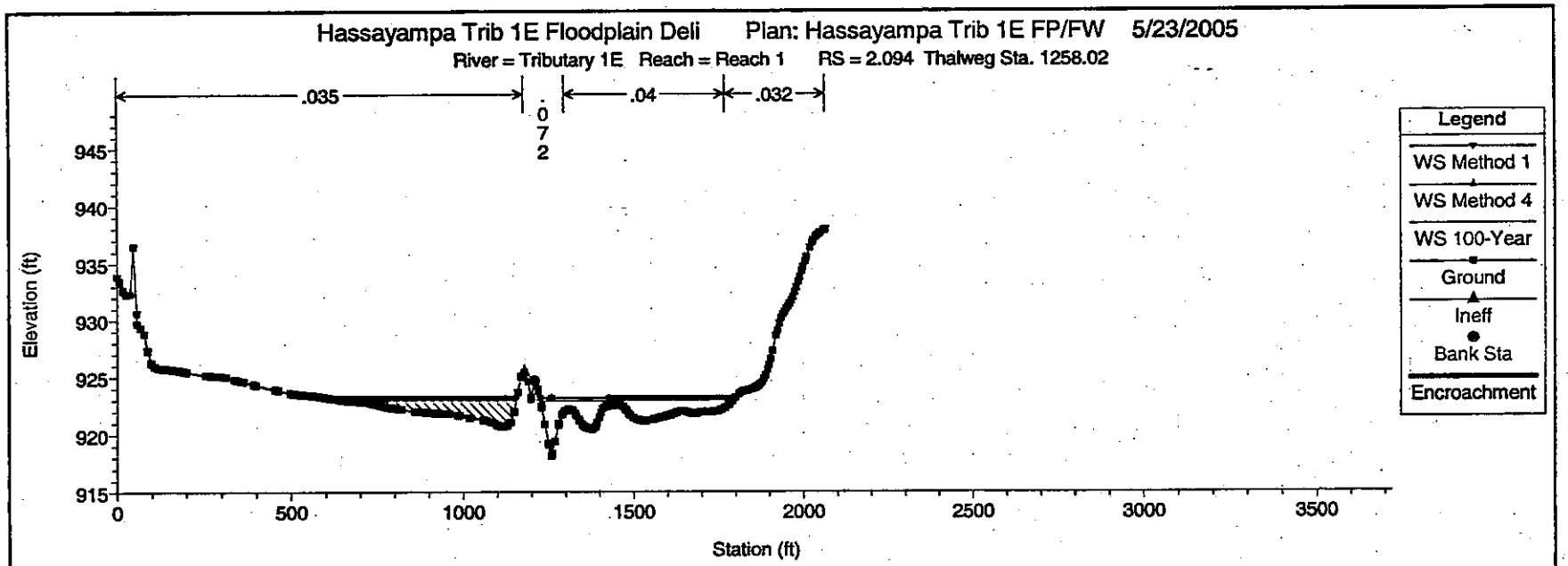



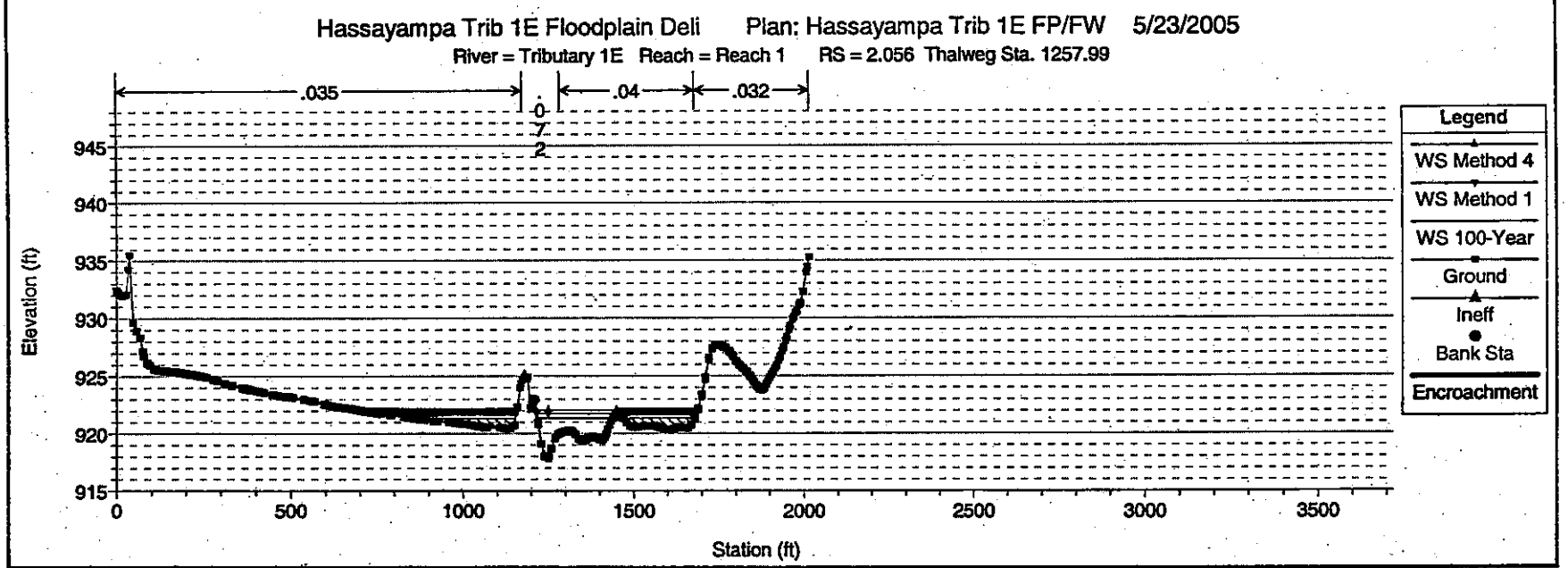

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



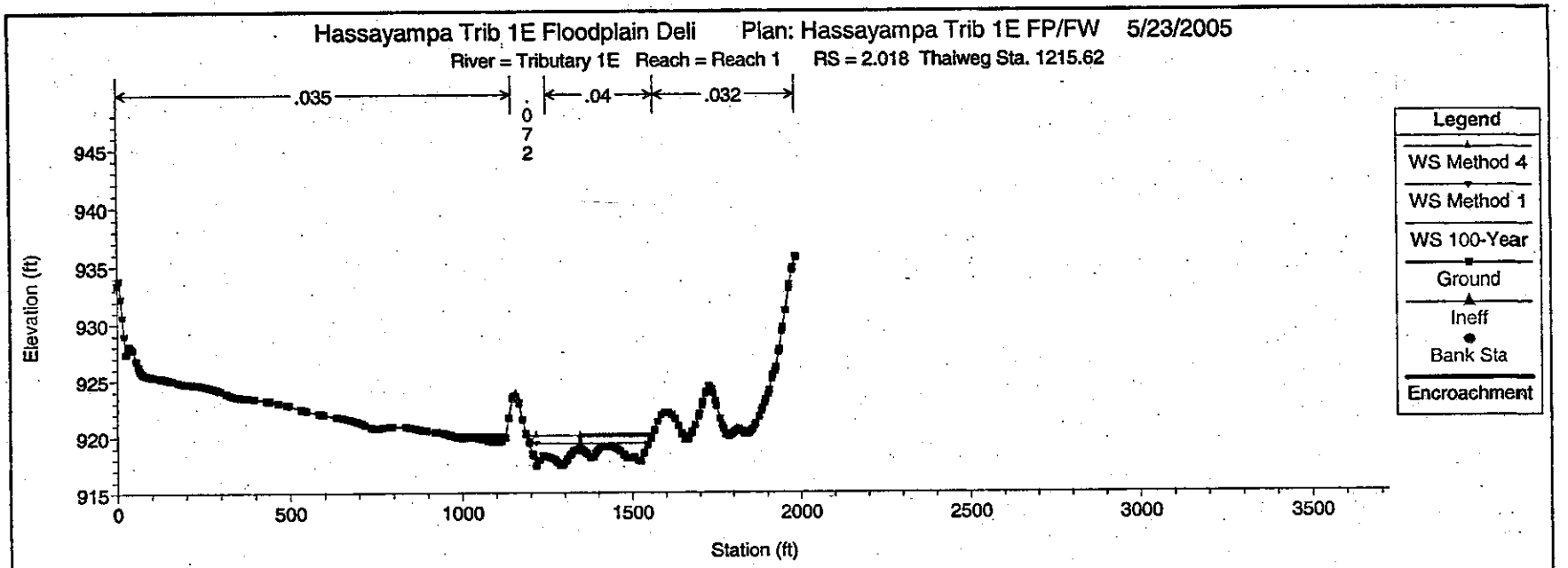



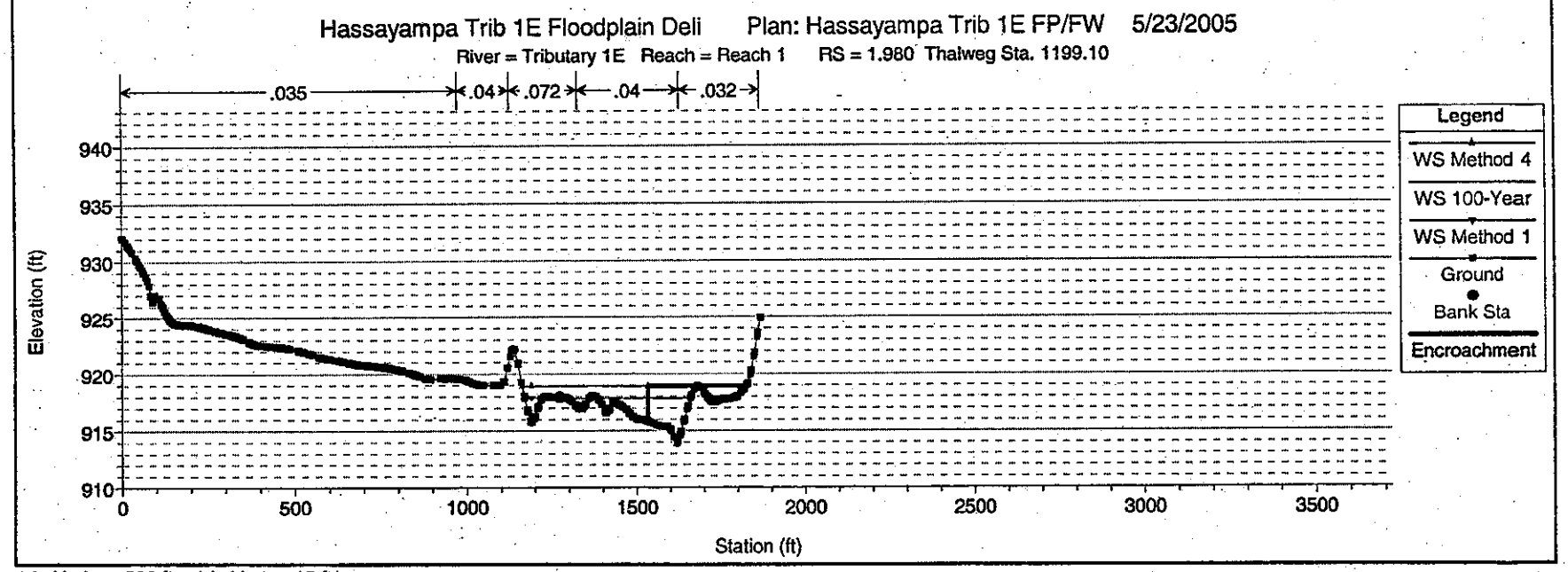

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



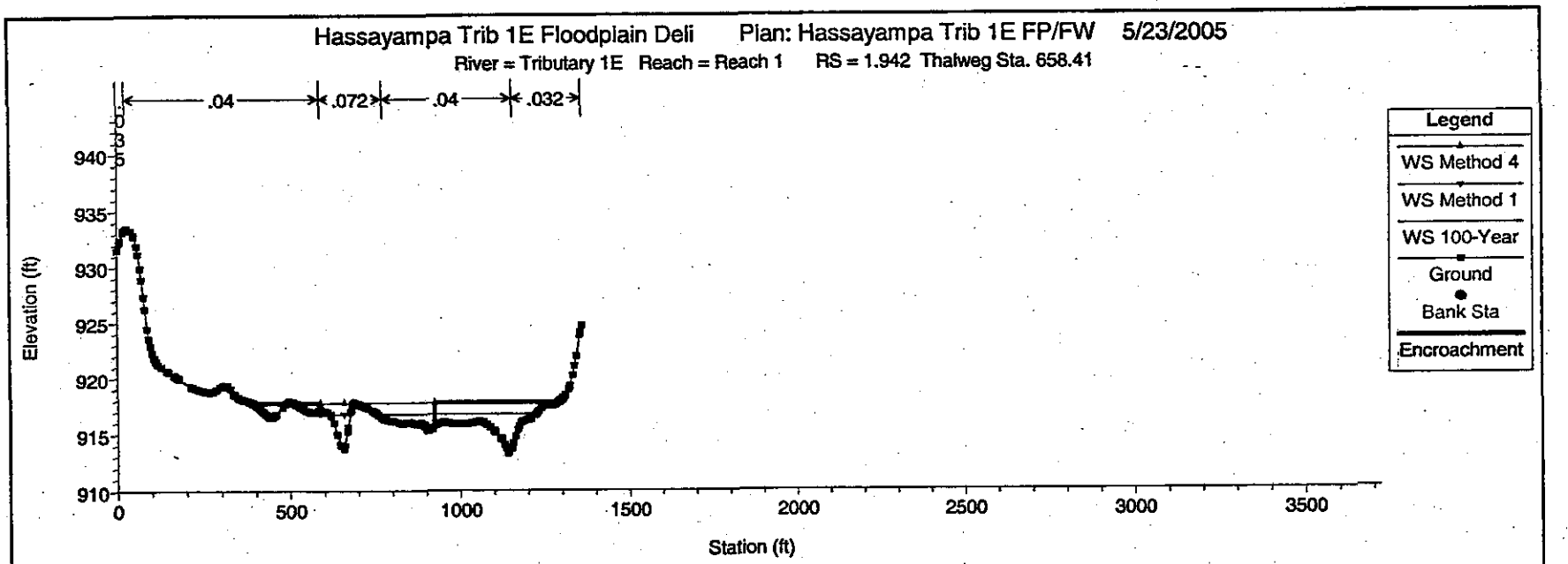



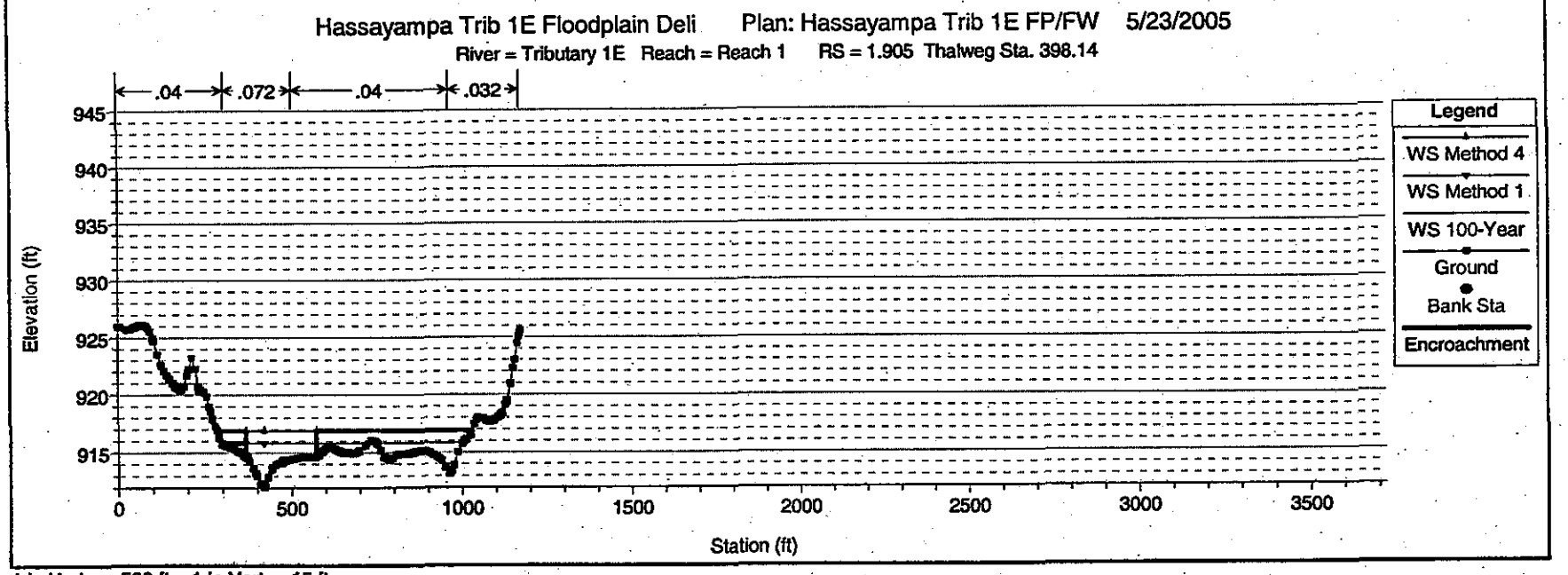

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



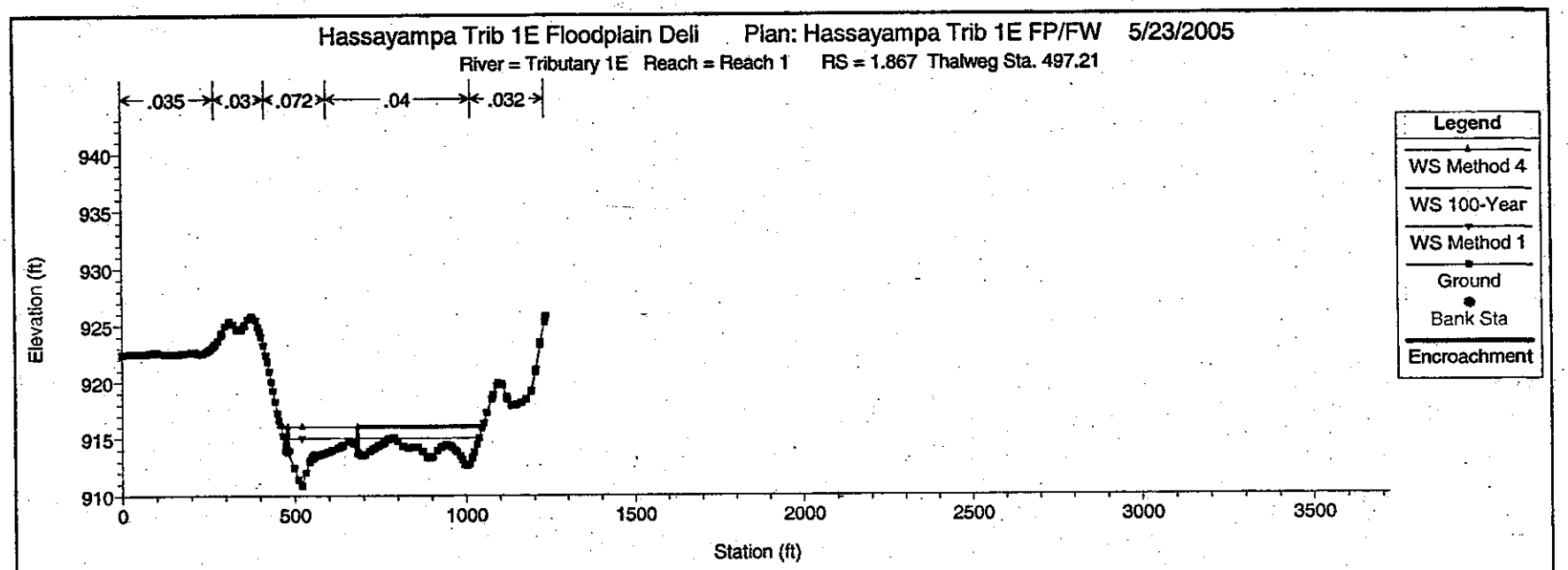



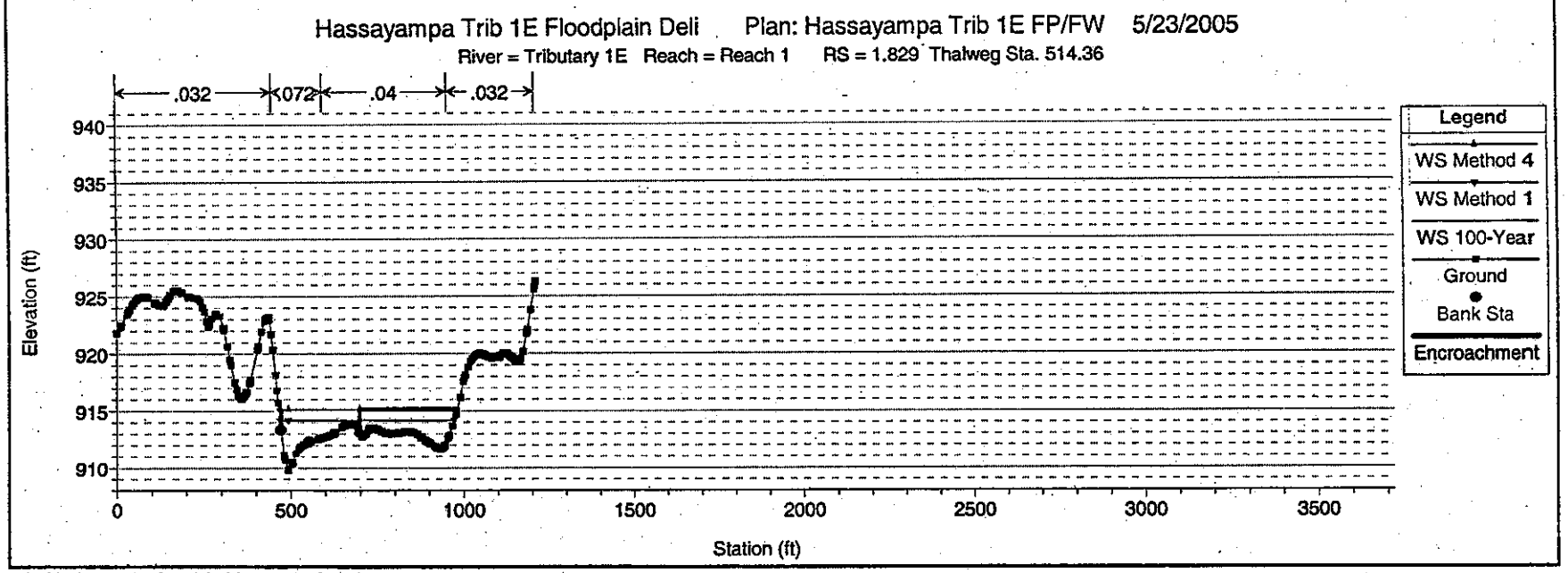

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

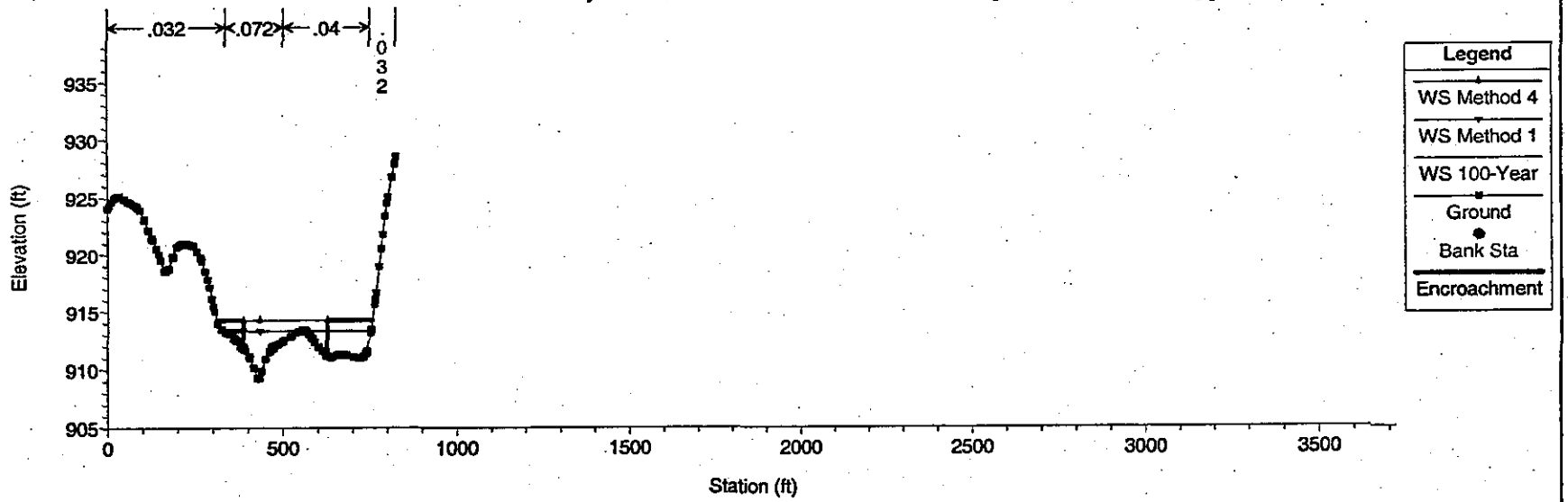



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

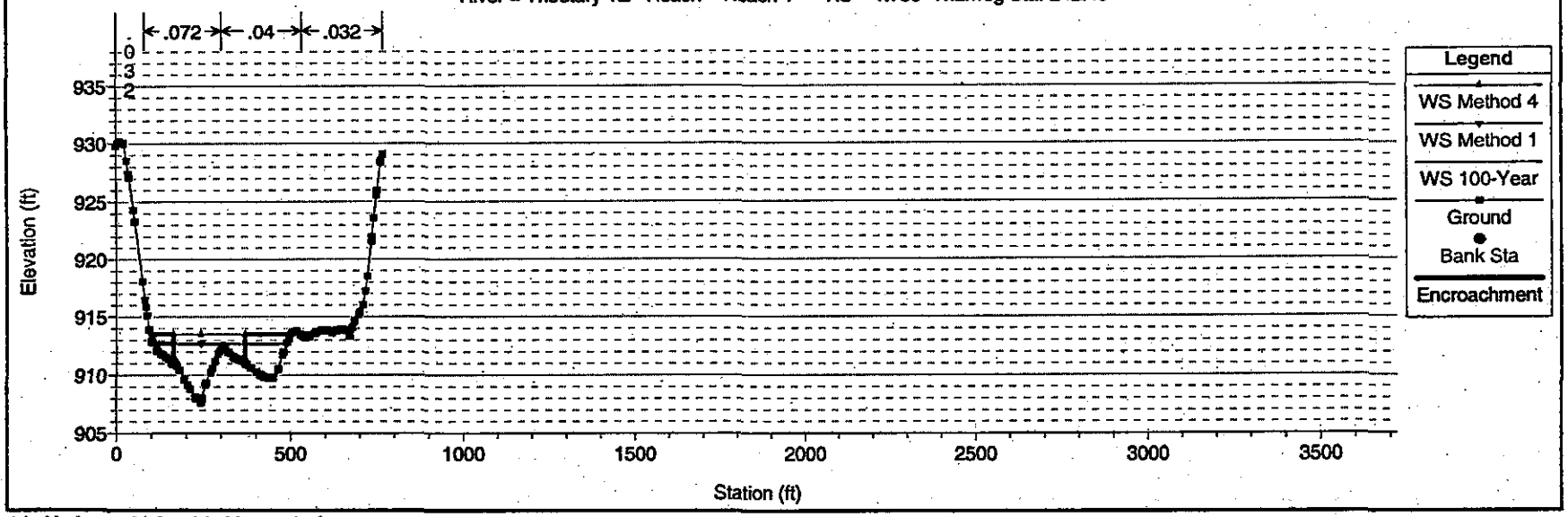
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.791  Thalweg Sta. 427.85

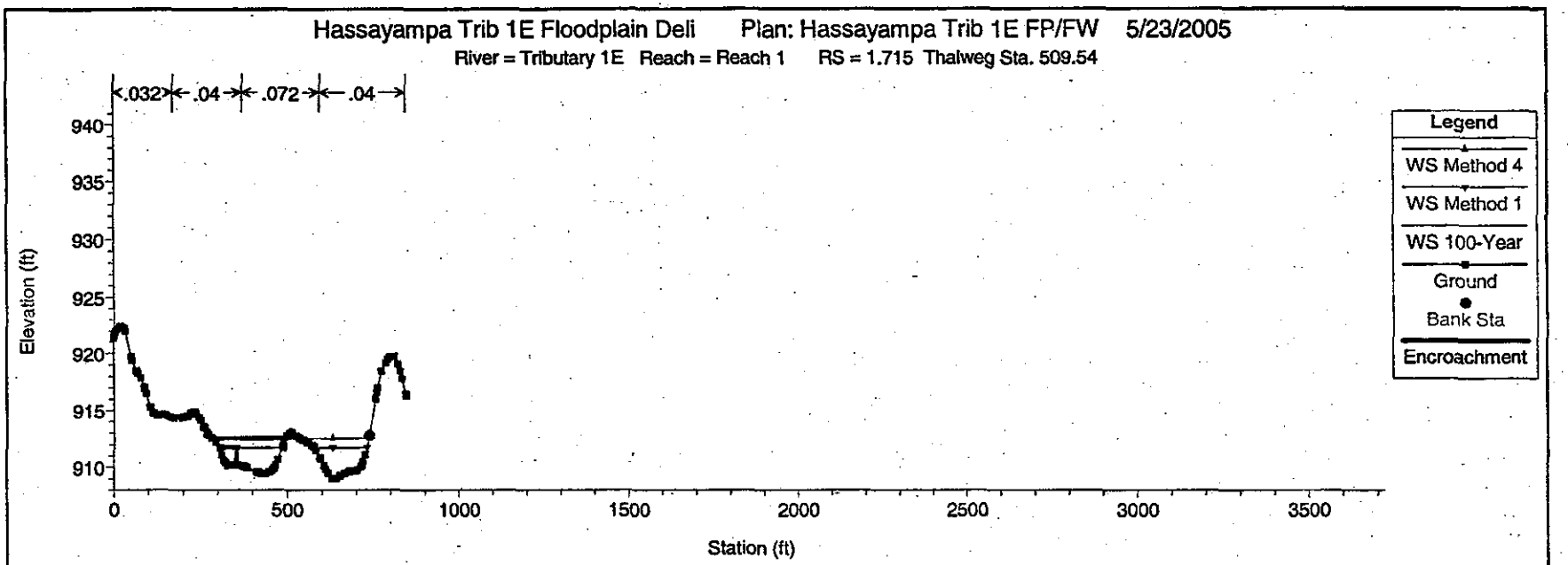


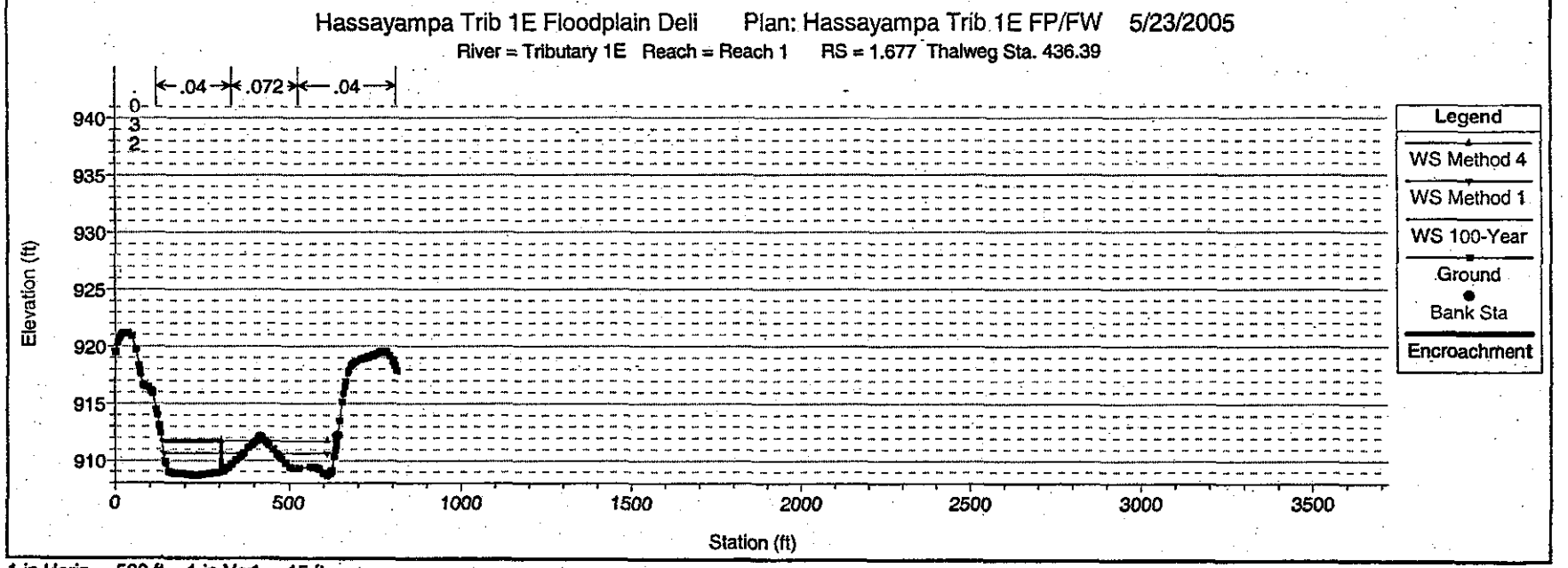

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.753  Thalweg Sta. 242.45




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

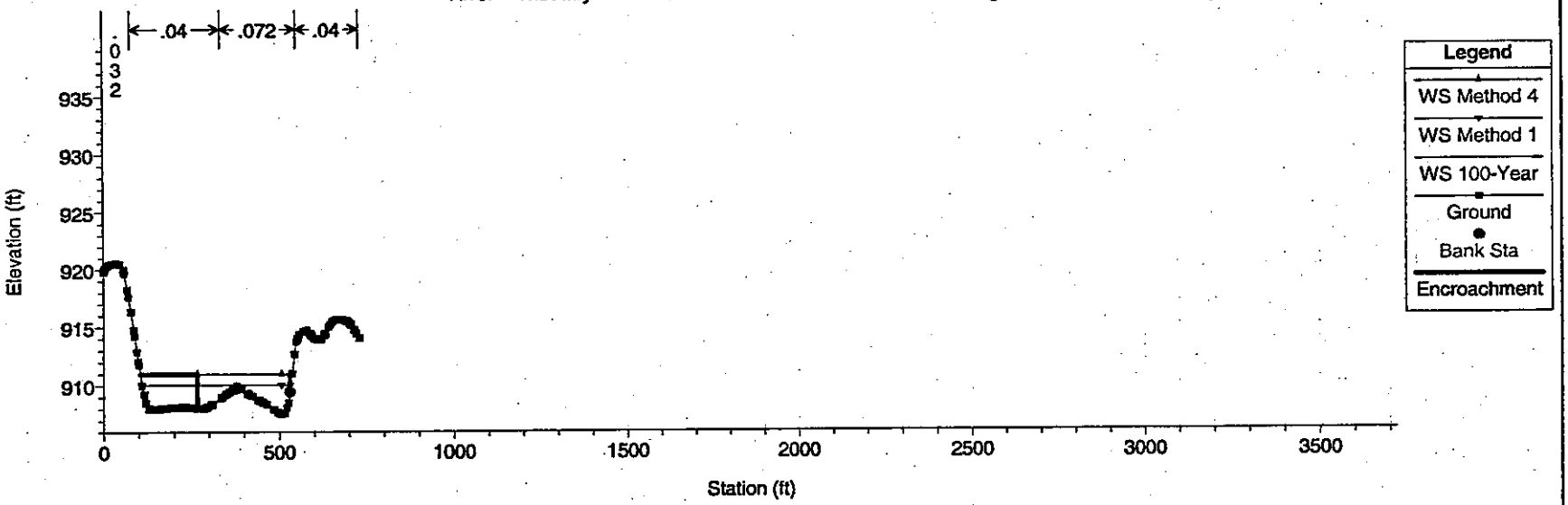



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

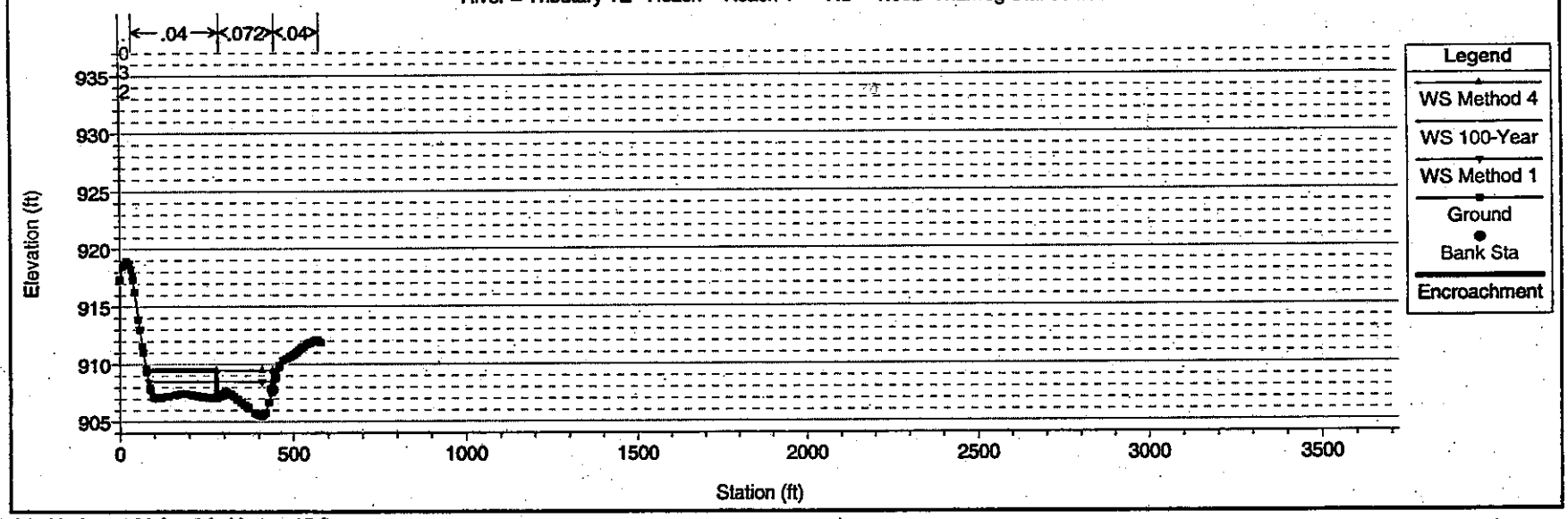
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.640  Thalweg Sta. 410.30




Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

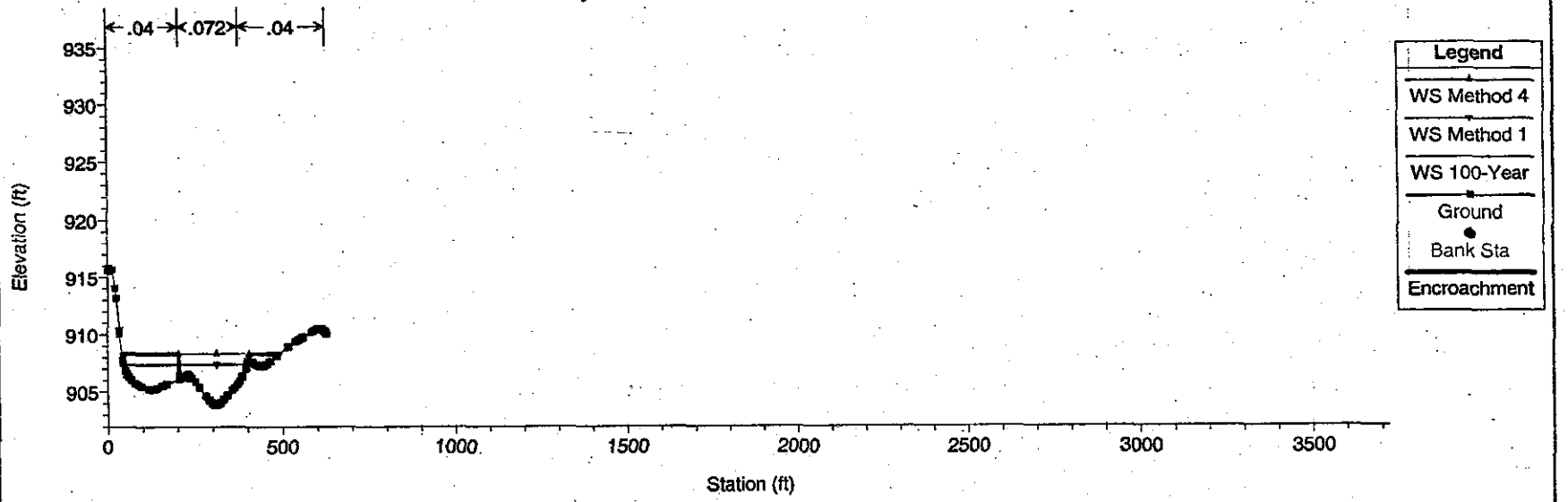
River = Tributary 1E  Reach = Reach 1  RS = 1.602  Thalweg Sta. 392.99




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

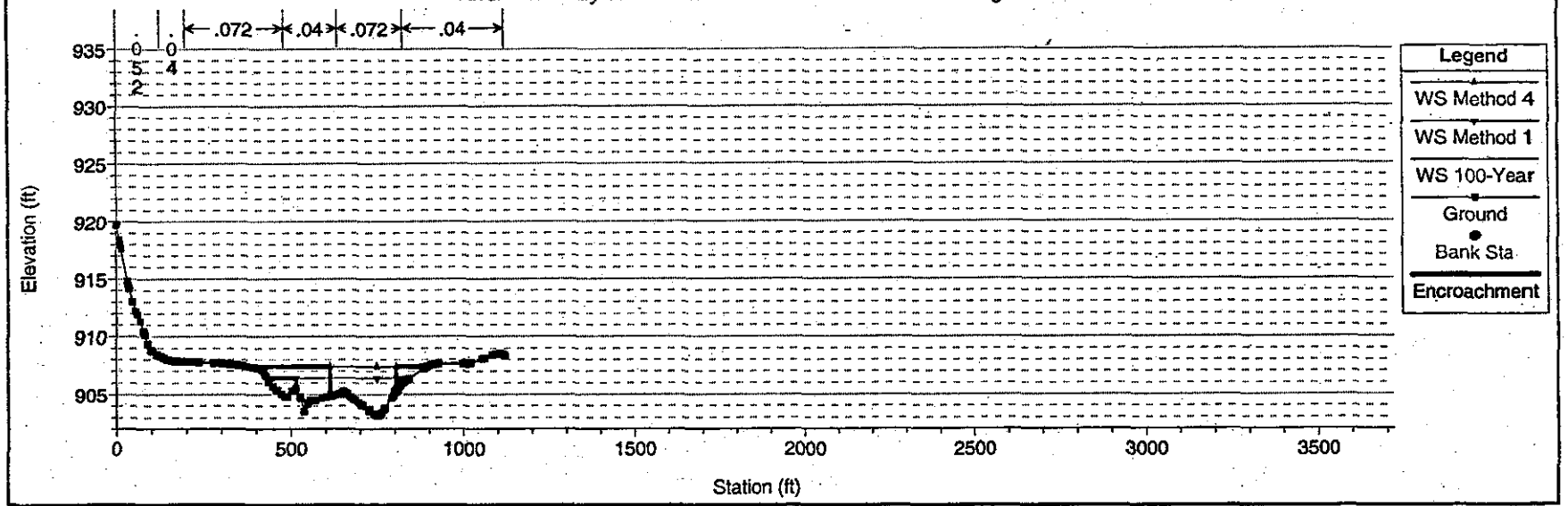
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.564  Thalweg Sta. 205.65




Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

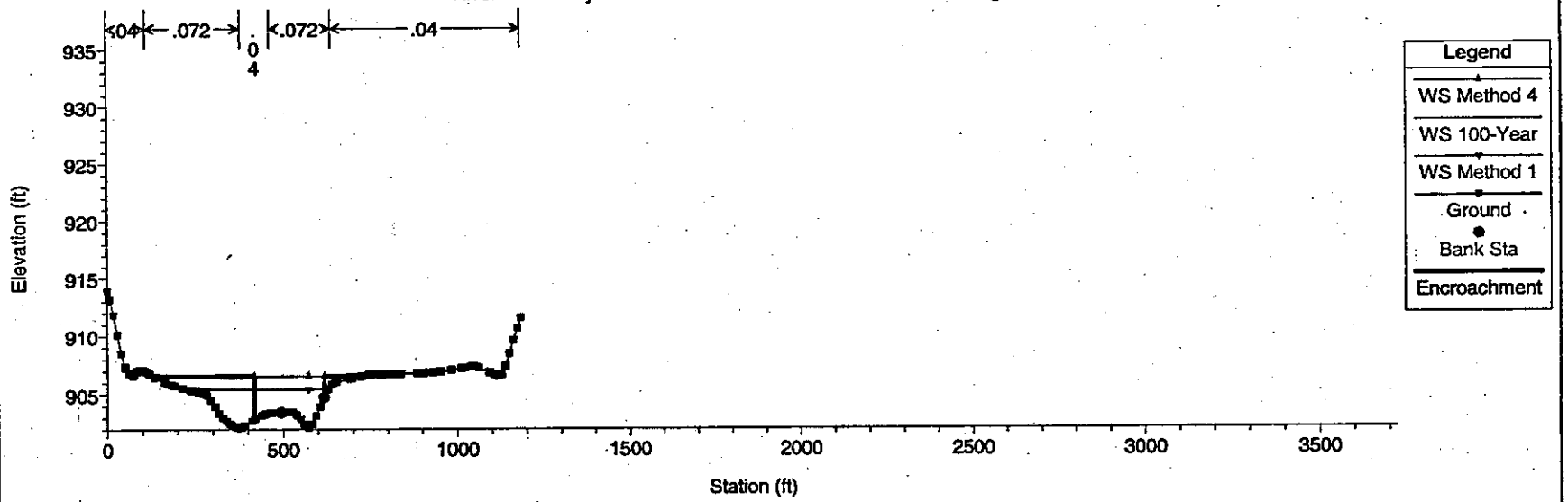
River = Tributary 1E  Reach = Reach 1  RS = 1.526  Thalweg Sta. 724.72




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

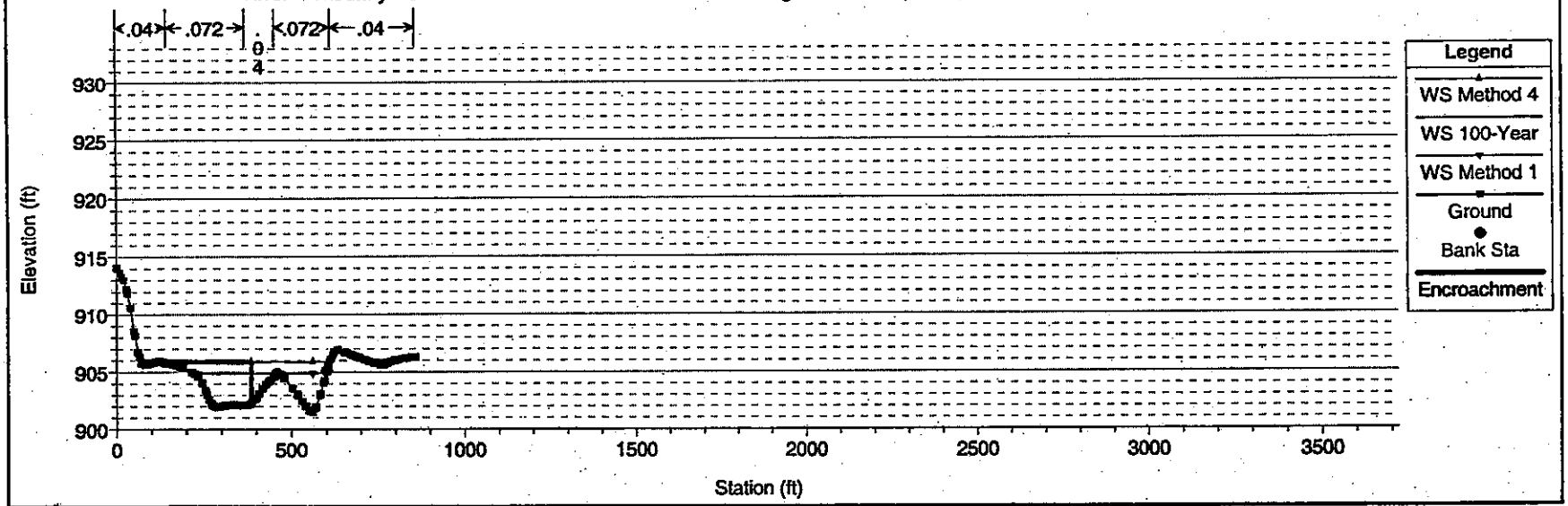
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.488  Thalweg Sta. 572.27

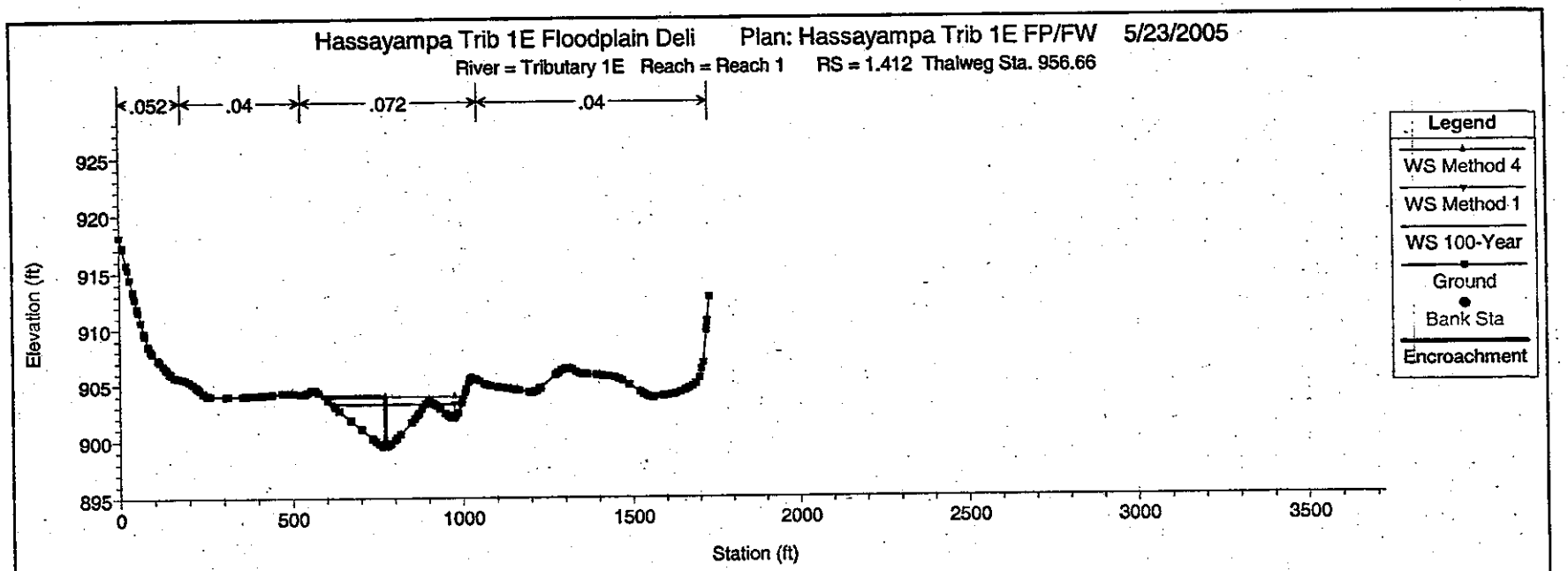


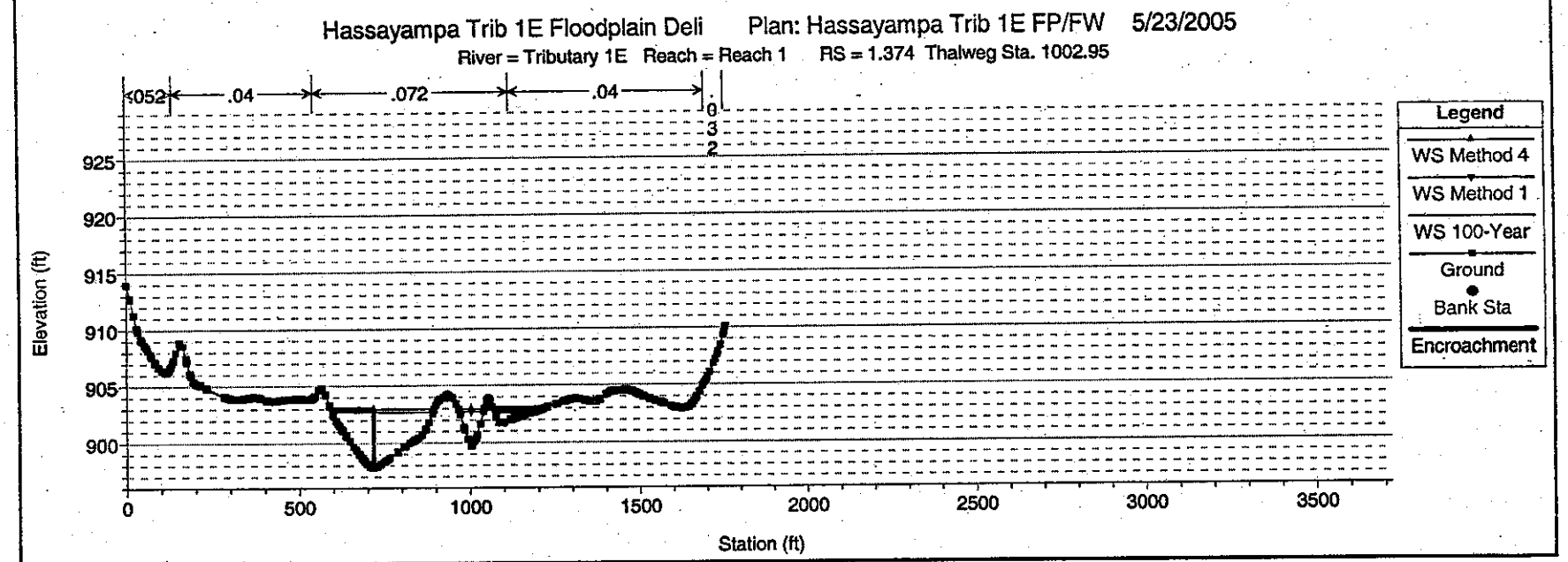

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.450  Thalweg Sta. 550.76 (HEC-RAS XS has been trimmed and does not re

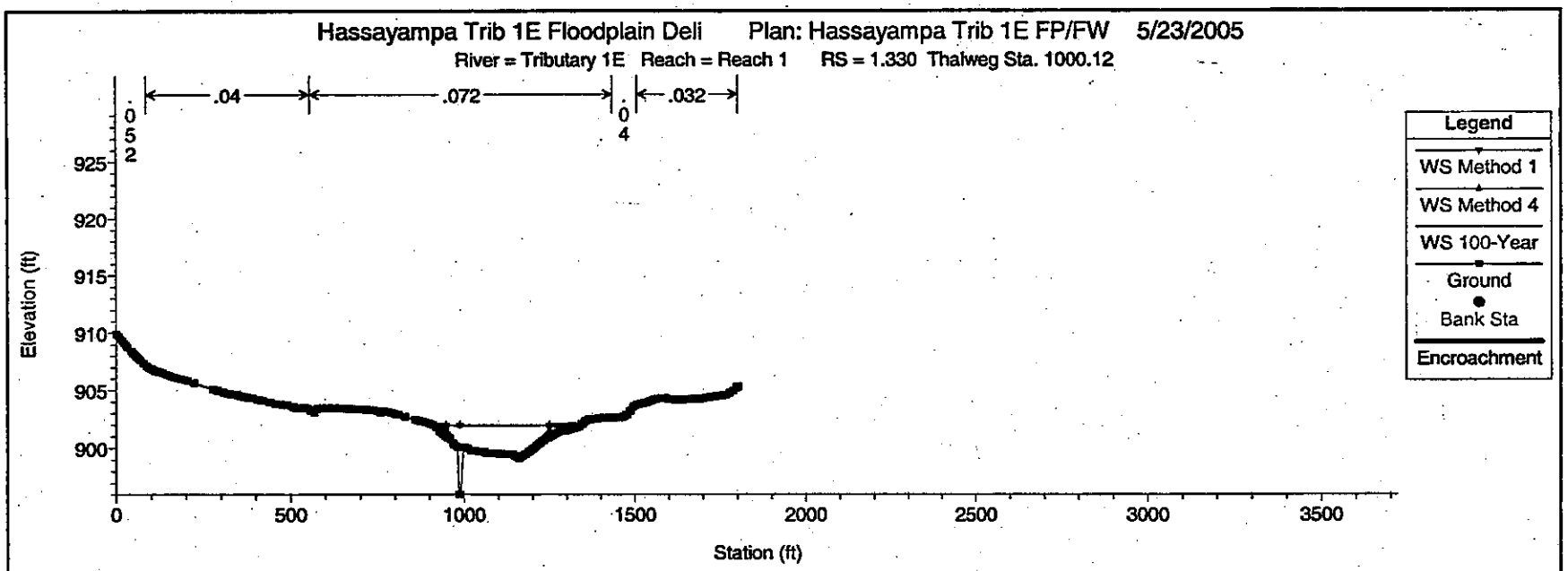


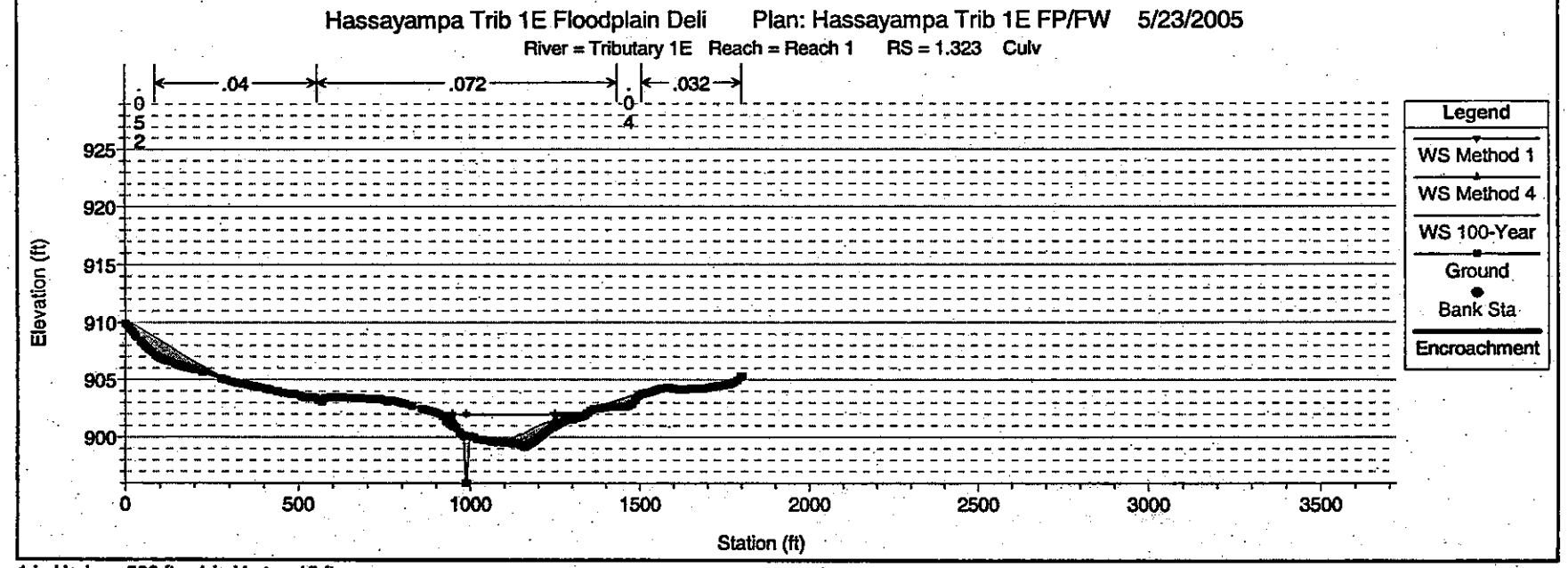

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



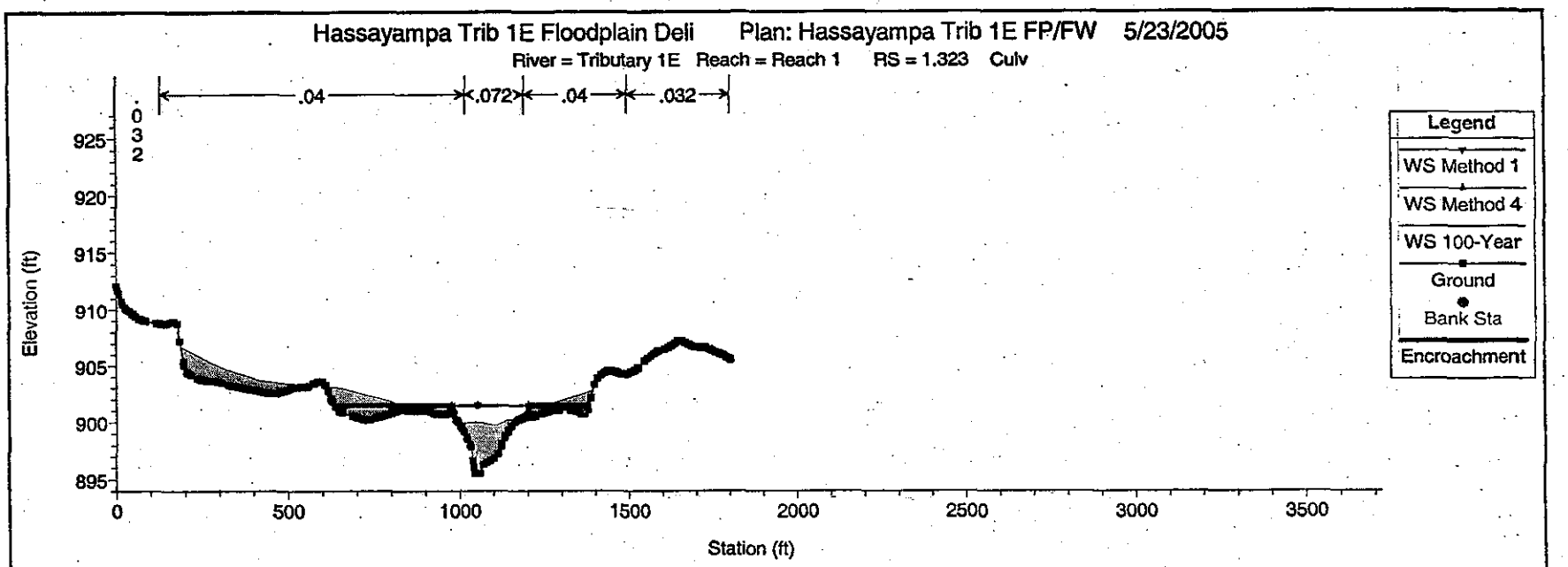



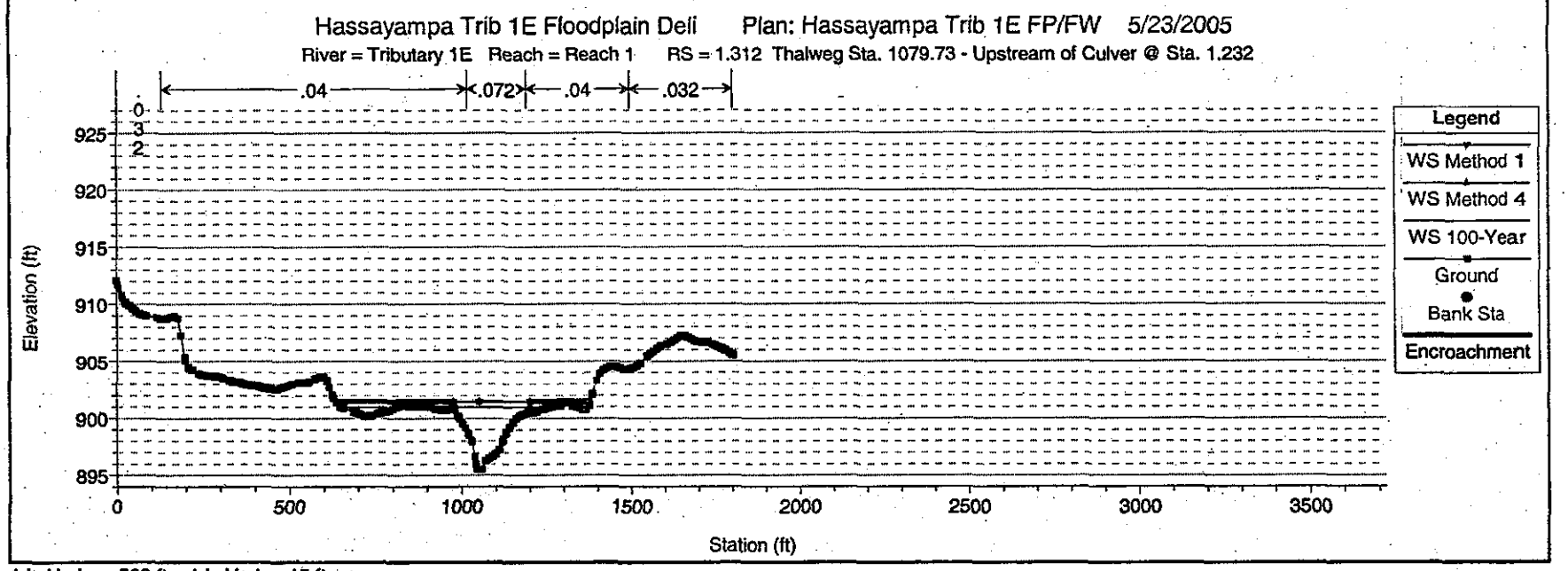

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

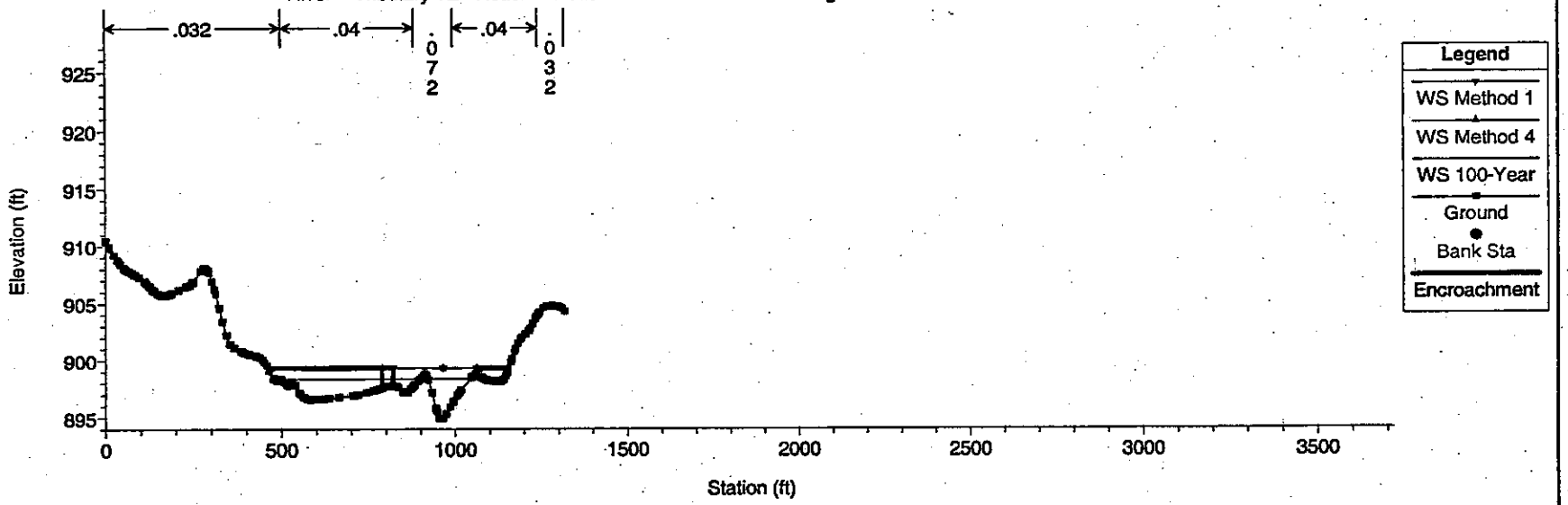



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

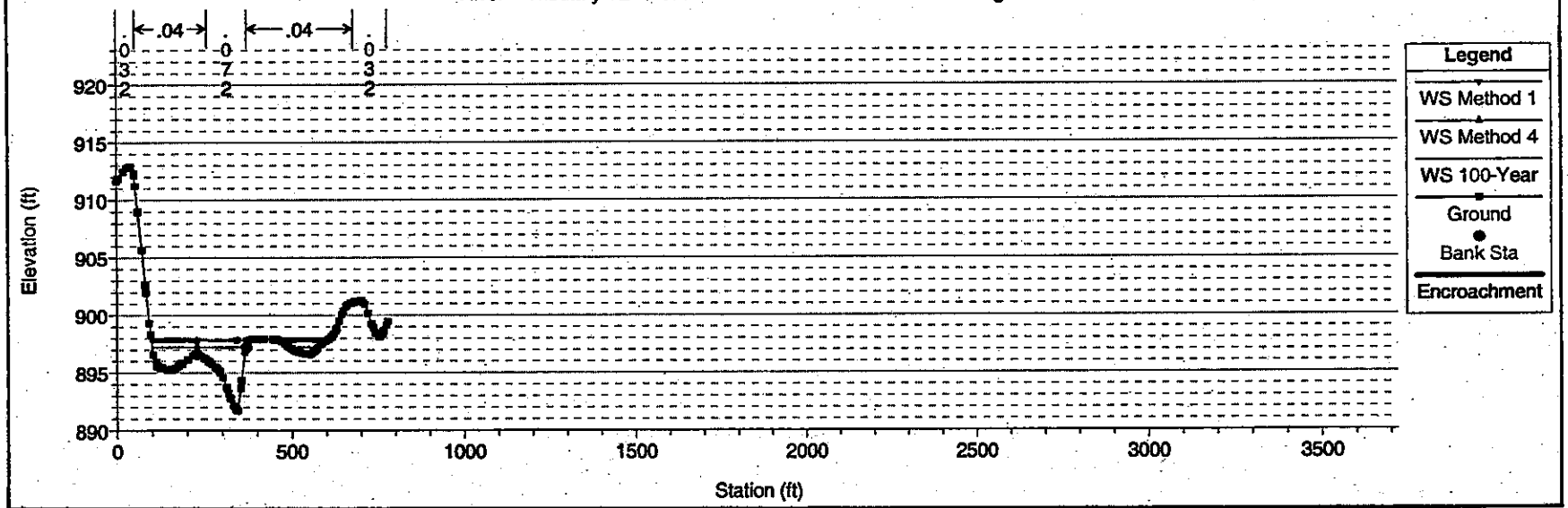
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.223  Thalweg Sta. 954.55 - Downstream of Culver @ Sta. 1.232

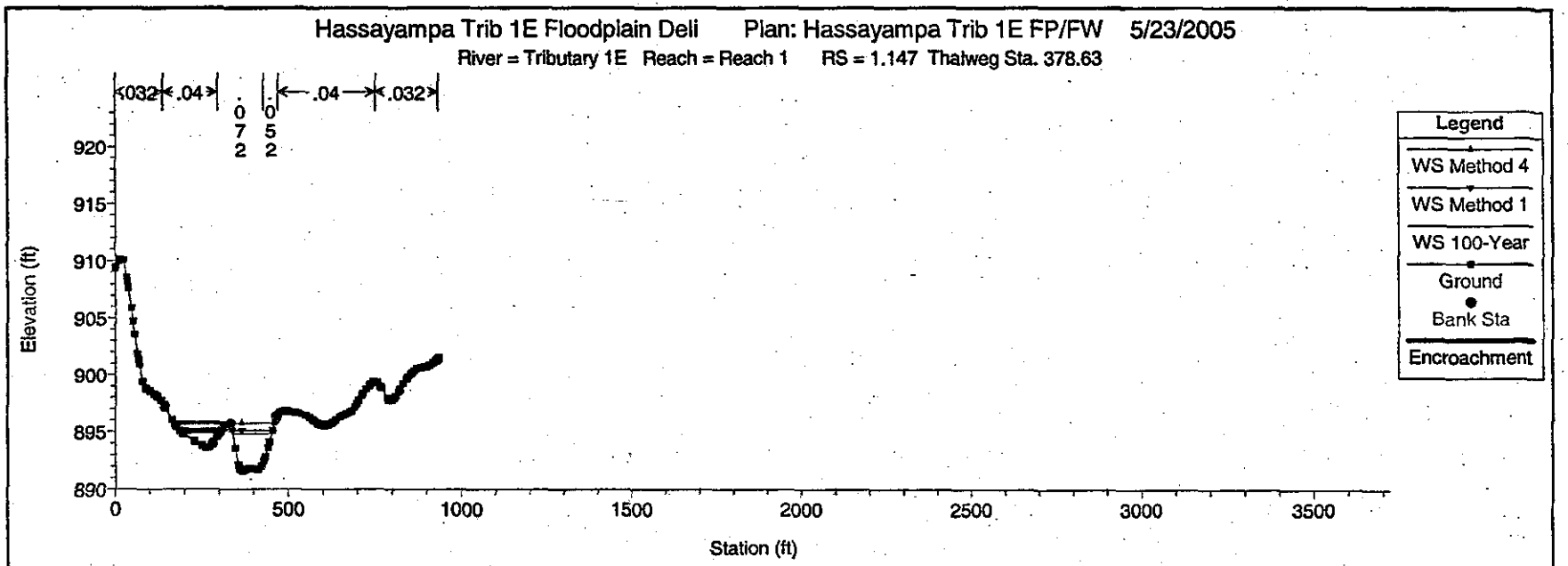


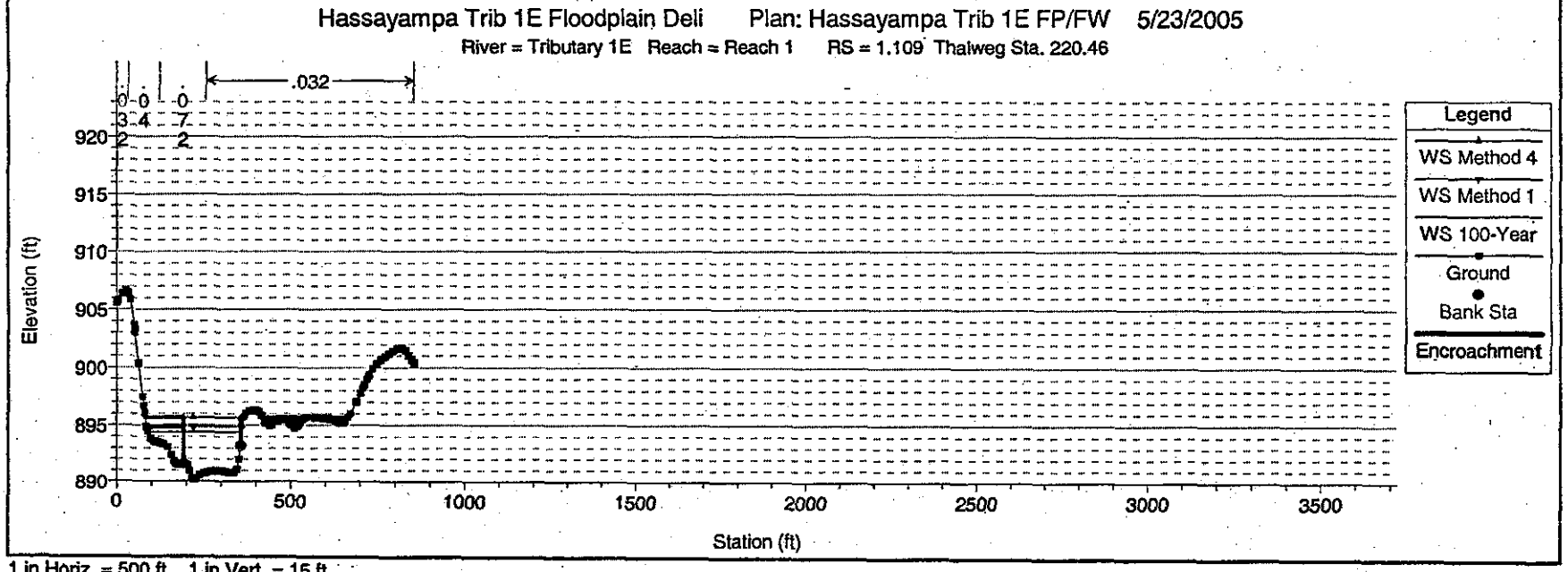

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.185  Thalweg Sta. 333.21




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

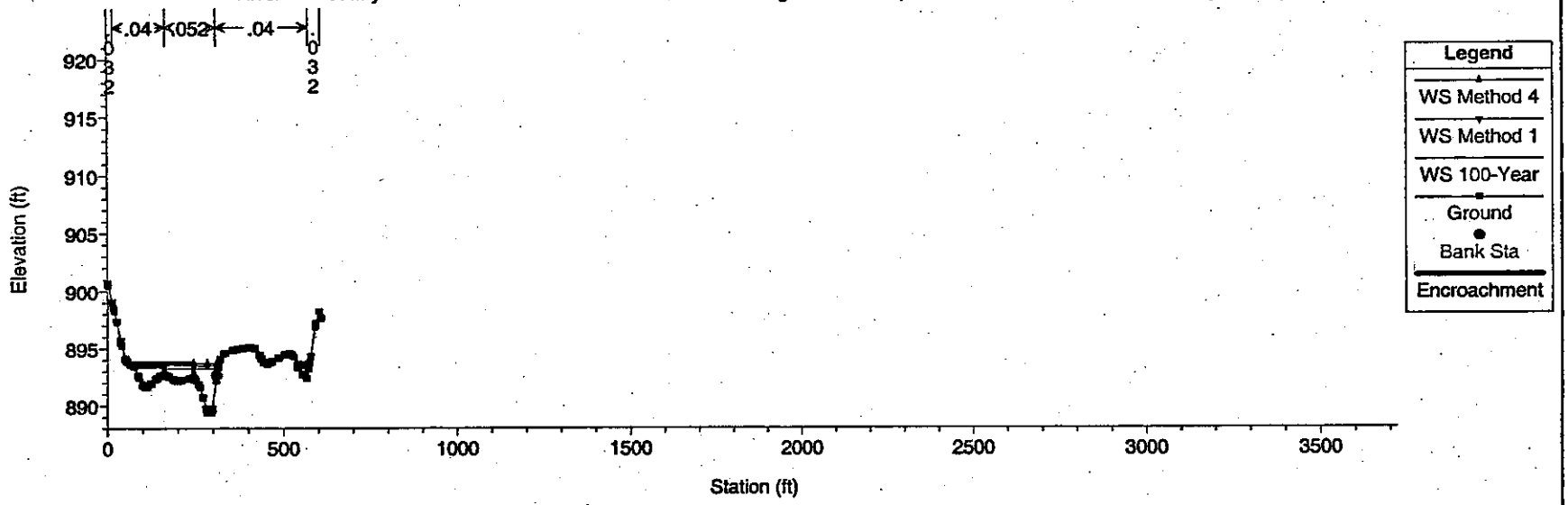



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

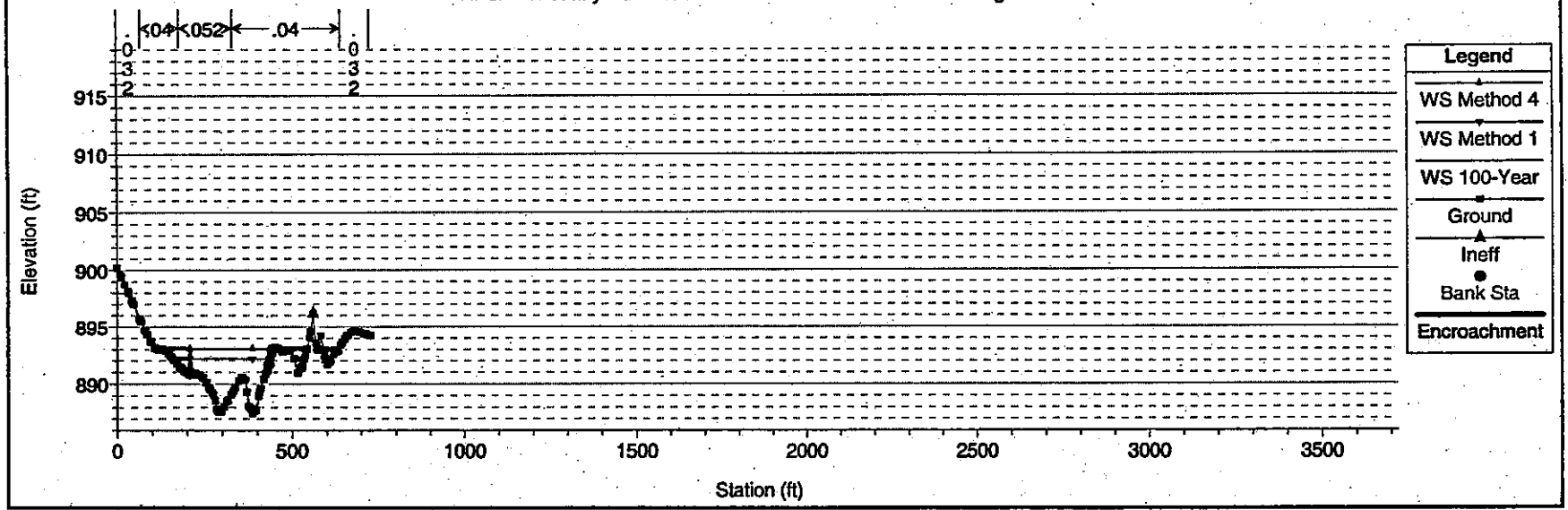
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = 1.072  Thalweg Sta. 283.56 (HEC-RAS XS has been trimmed and does not re




Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

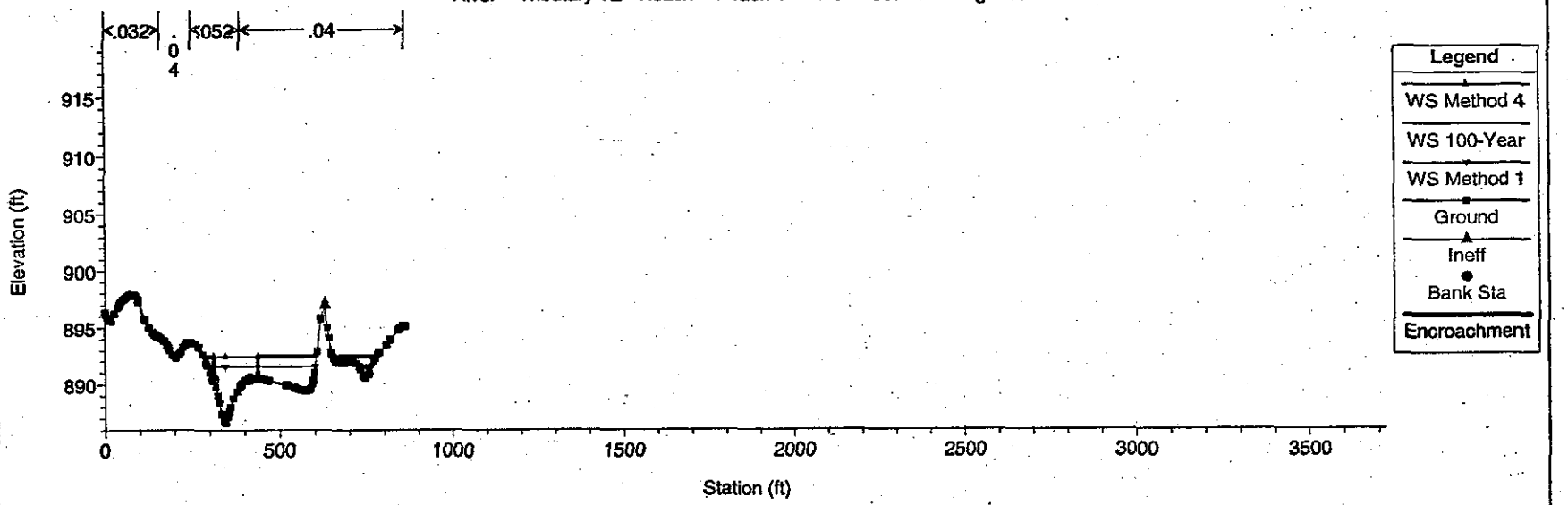
River = Tributary 1E  Reach = Reach 1  RS = 1.035  Thalweg Sta. 315.49




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

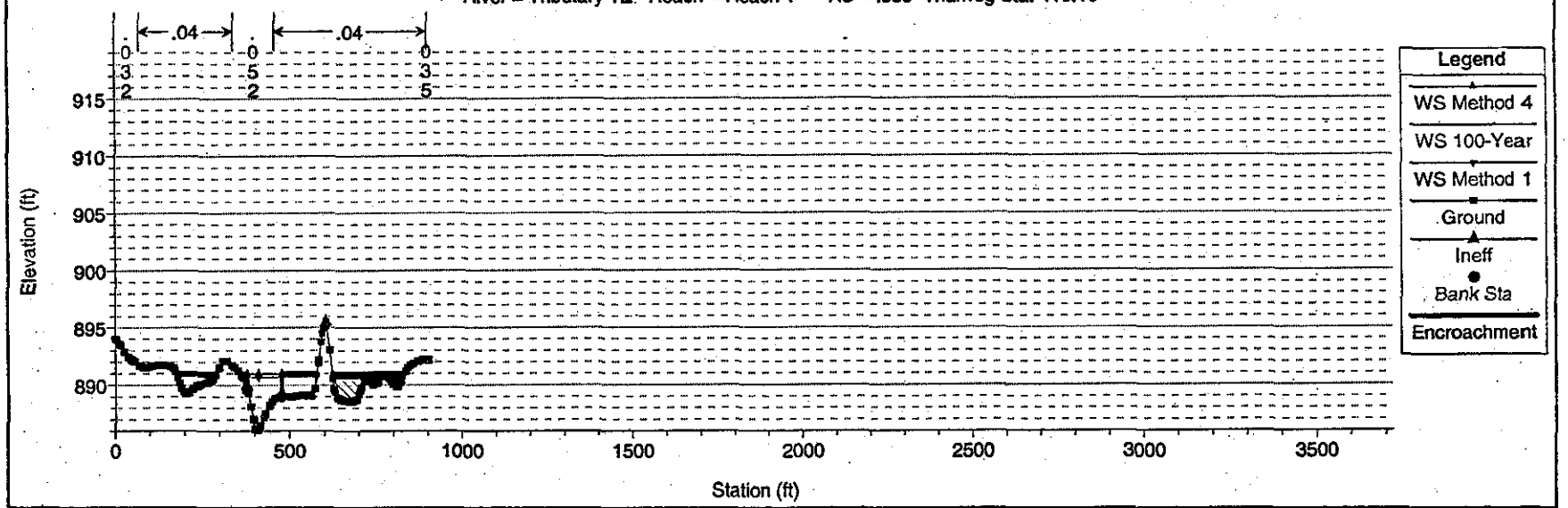
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = .997  Thalweg Sta. 345.20




Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

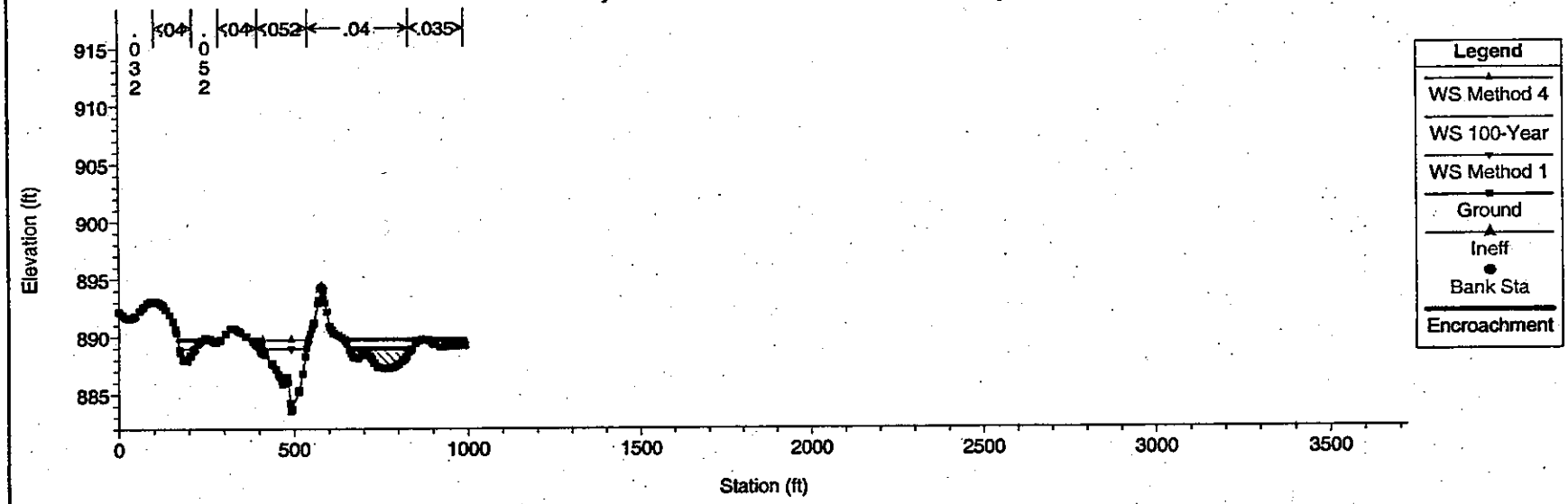
River = Tributary 1E  Reach = Reach 1  RS = .959  Thalweg Sta. 410.10




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

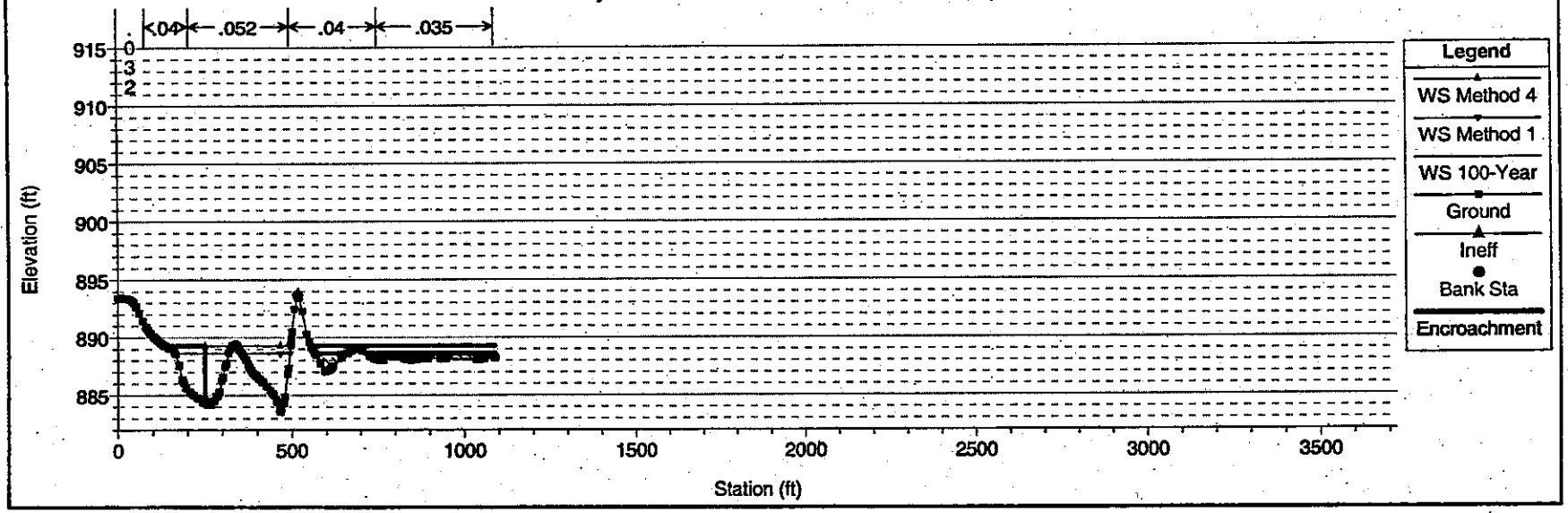
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = .921  Thalweg Sta. 491.45

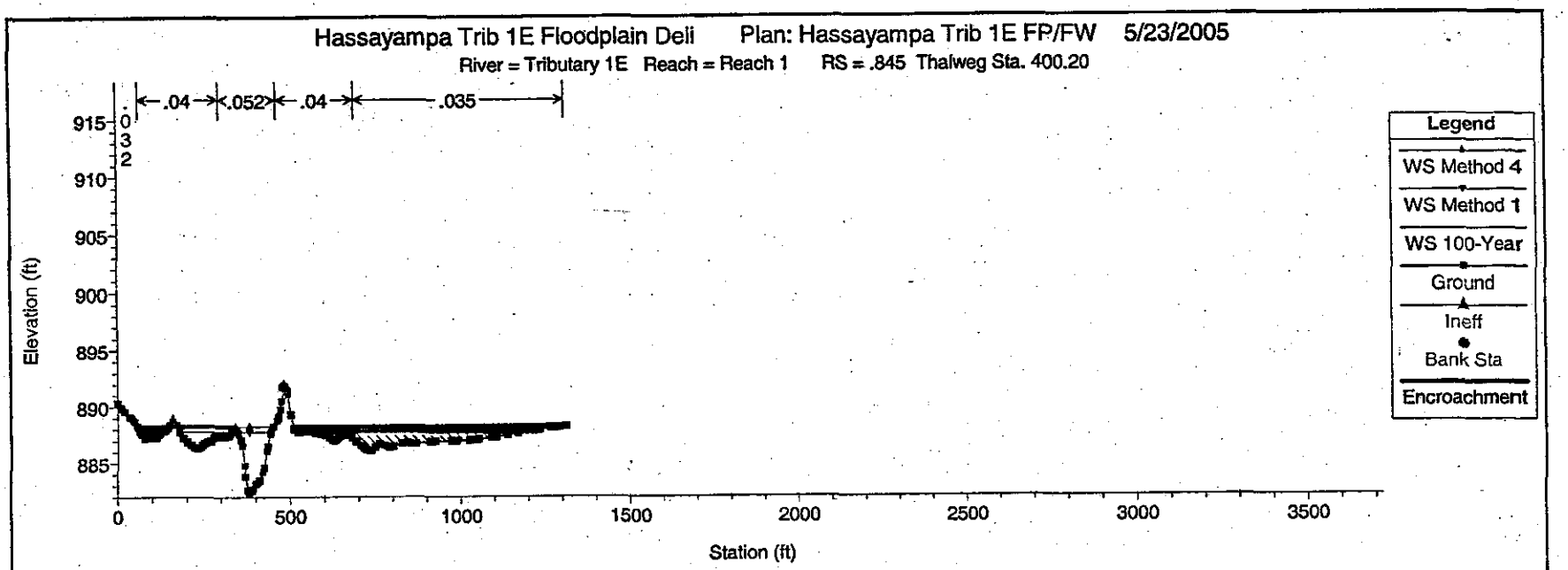


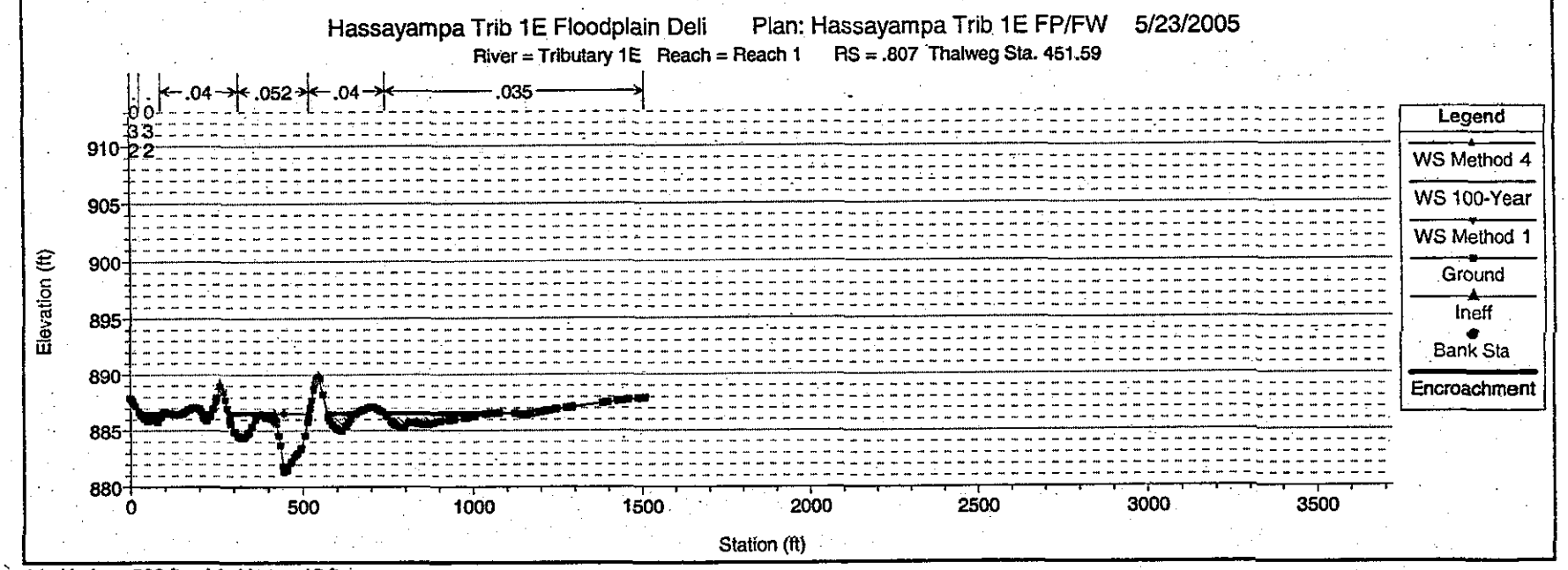

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = .883  Thalweg Sta. 466.74

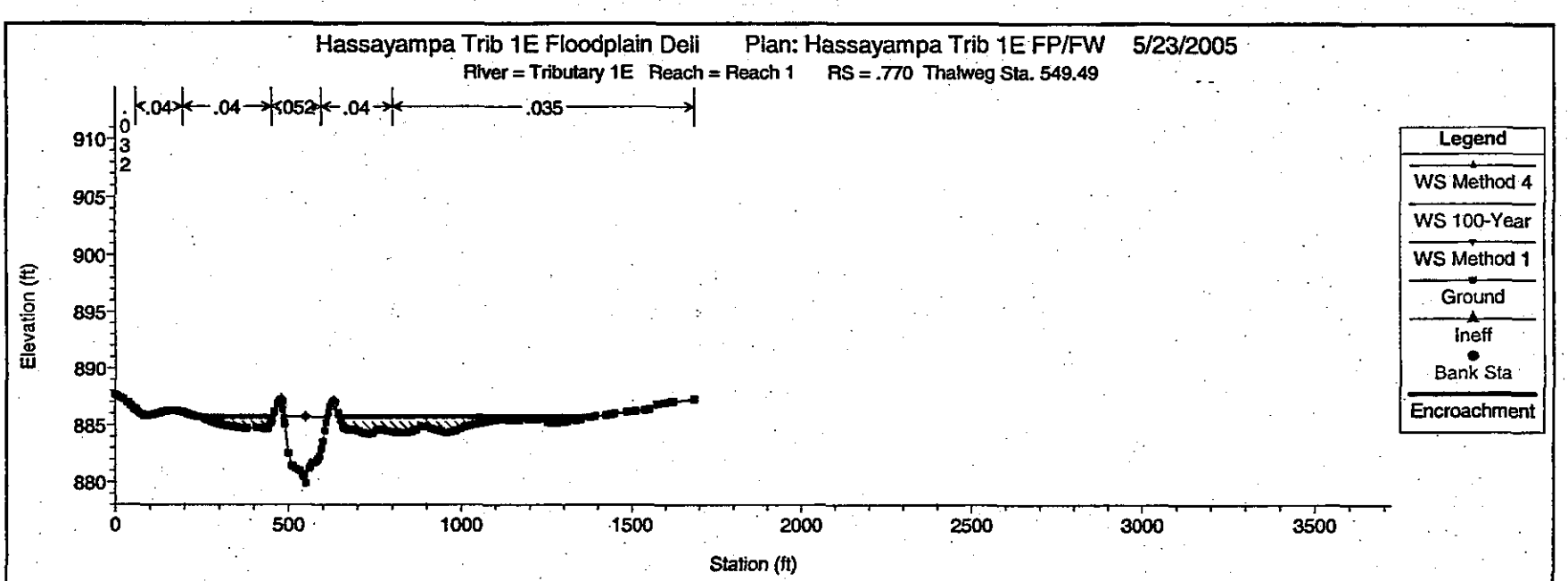


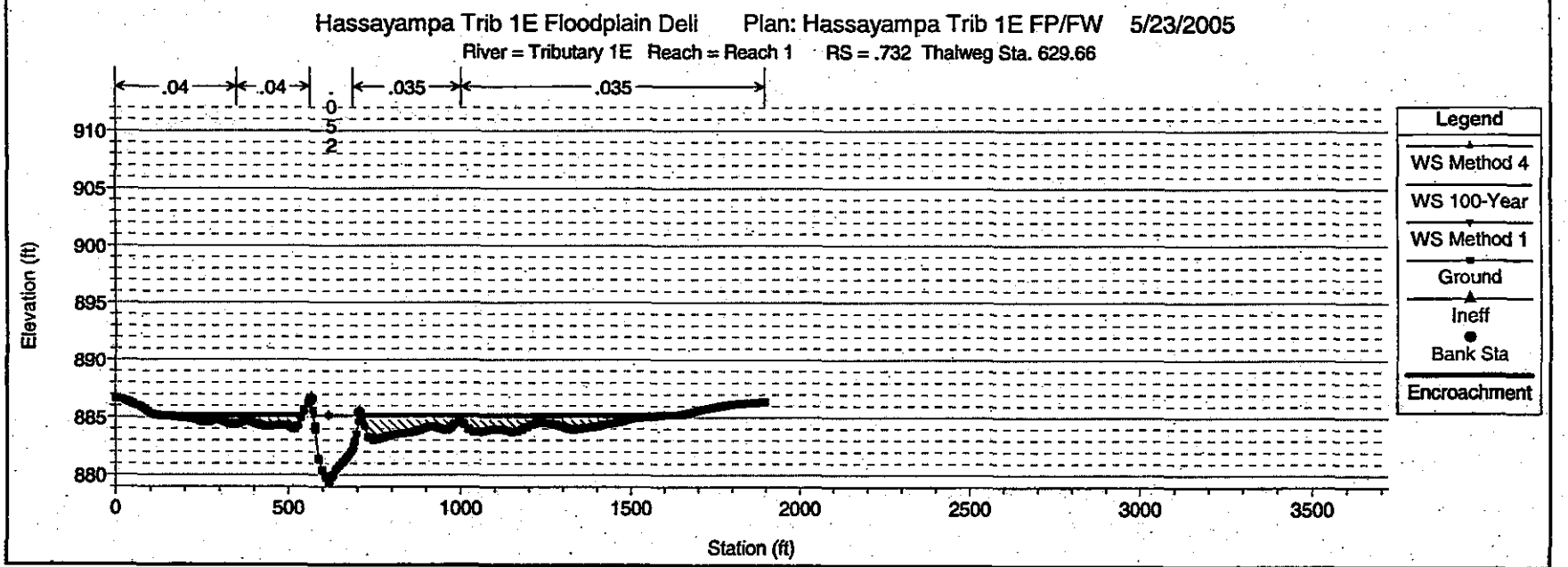

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



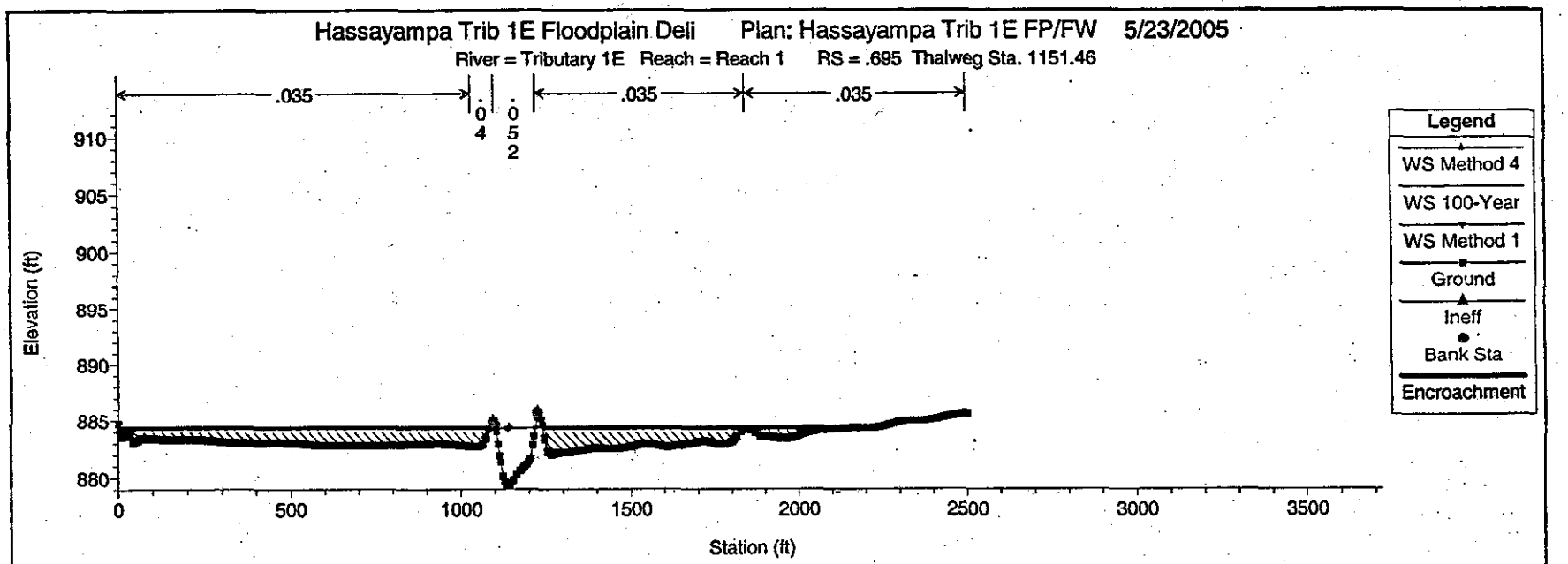



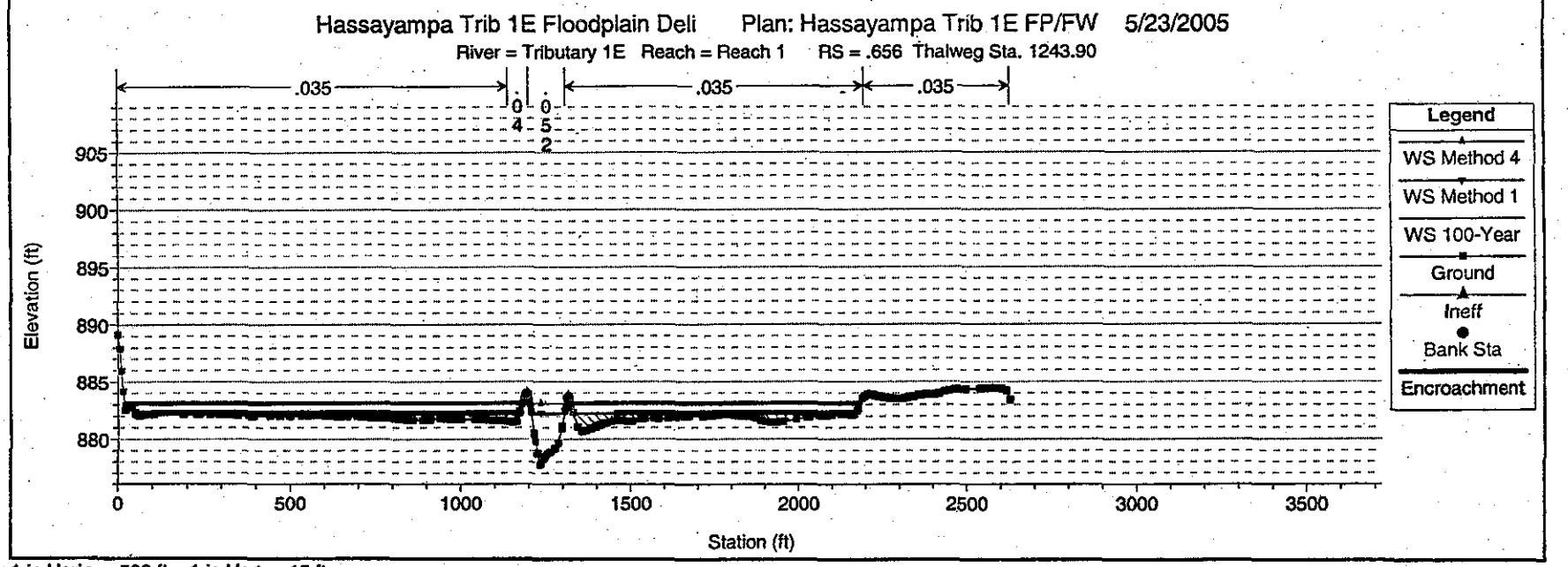

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



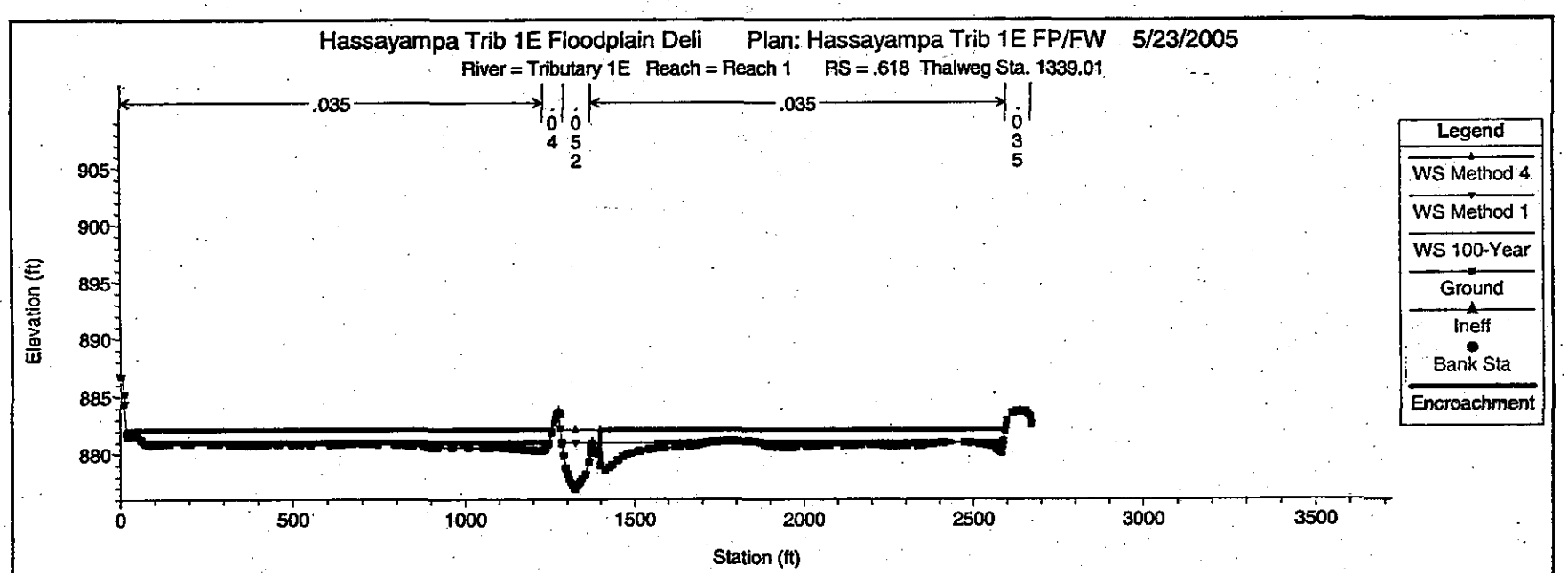



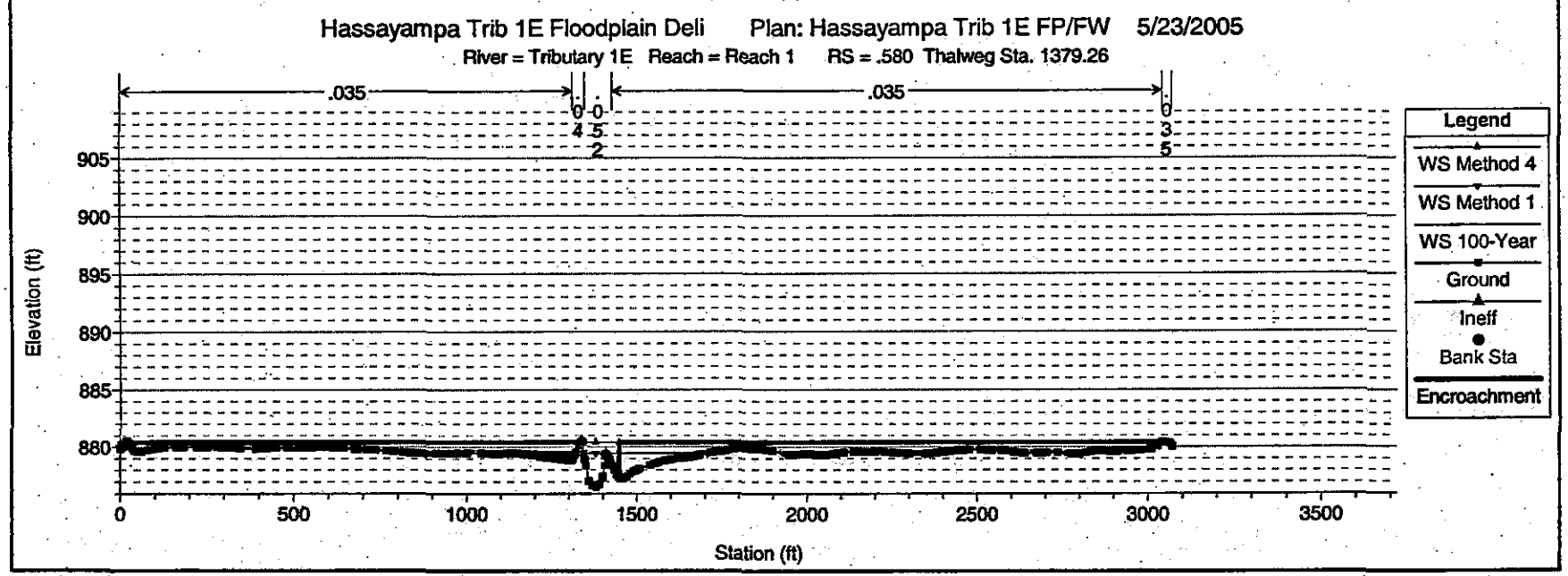

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



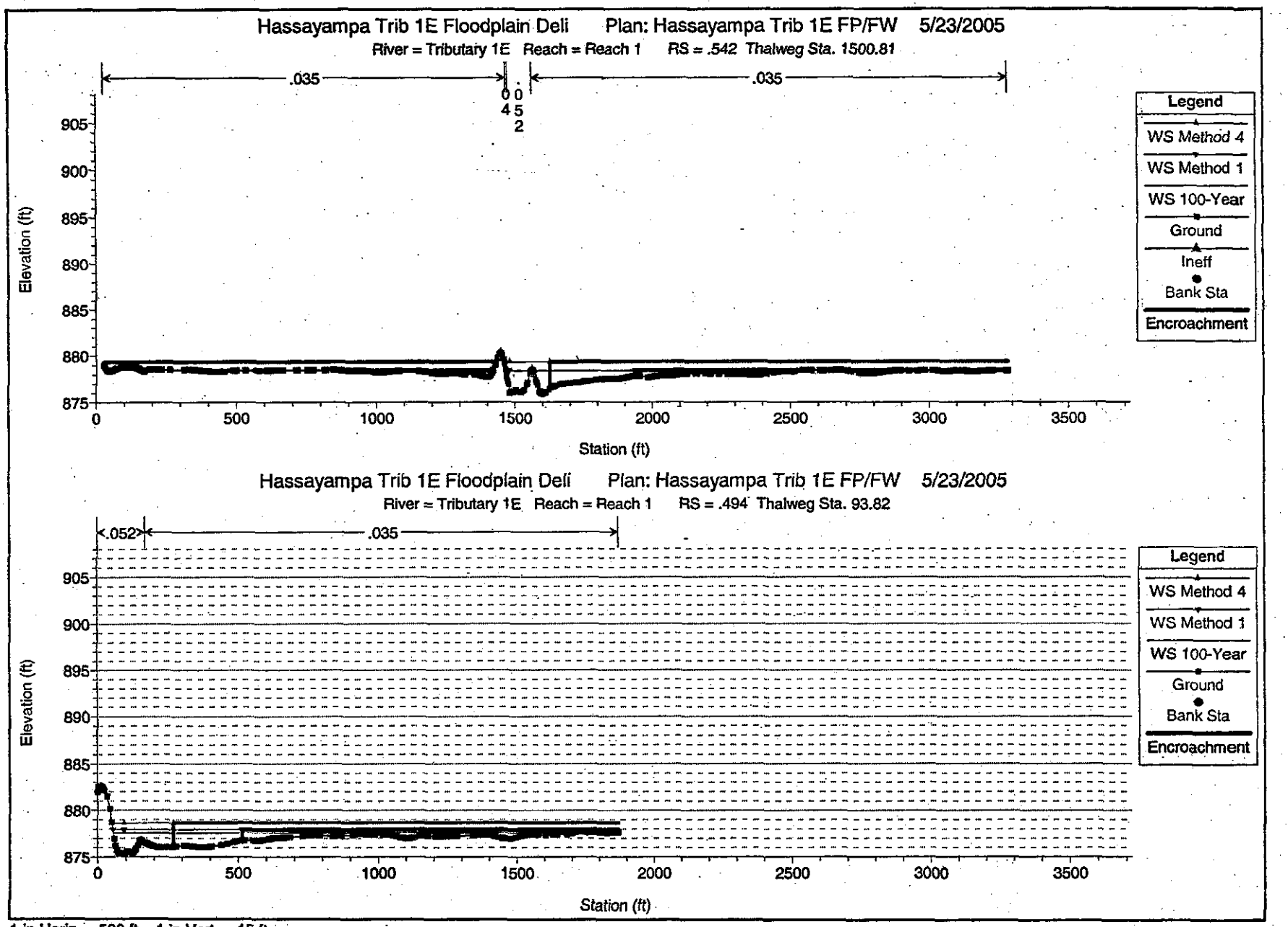




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

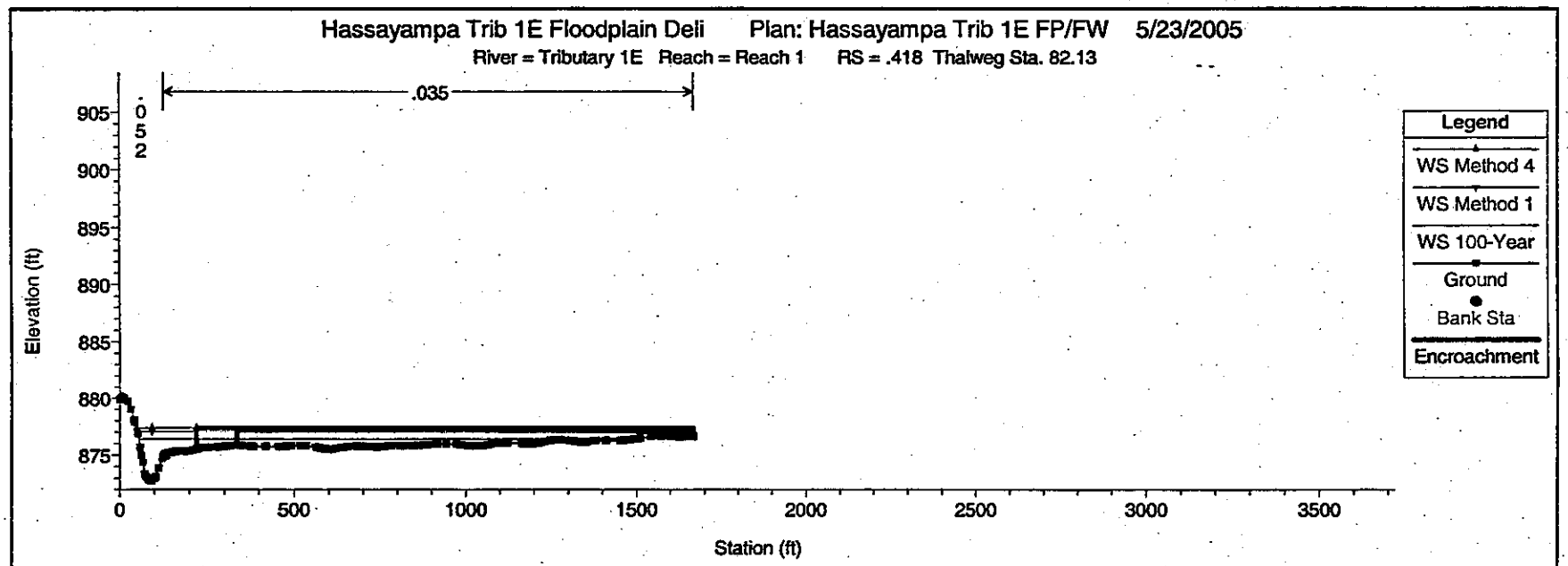


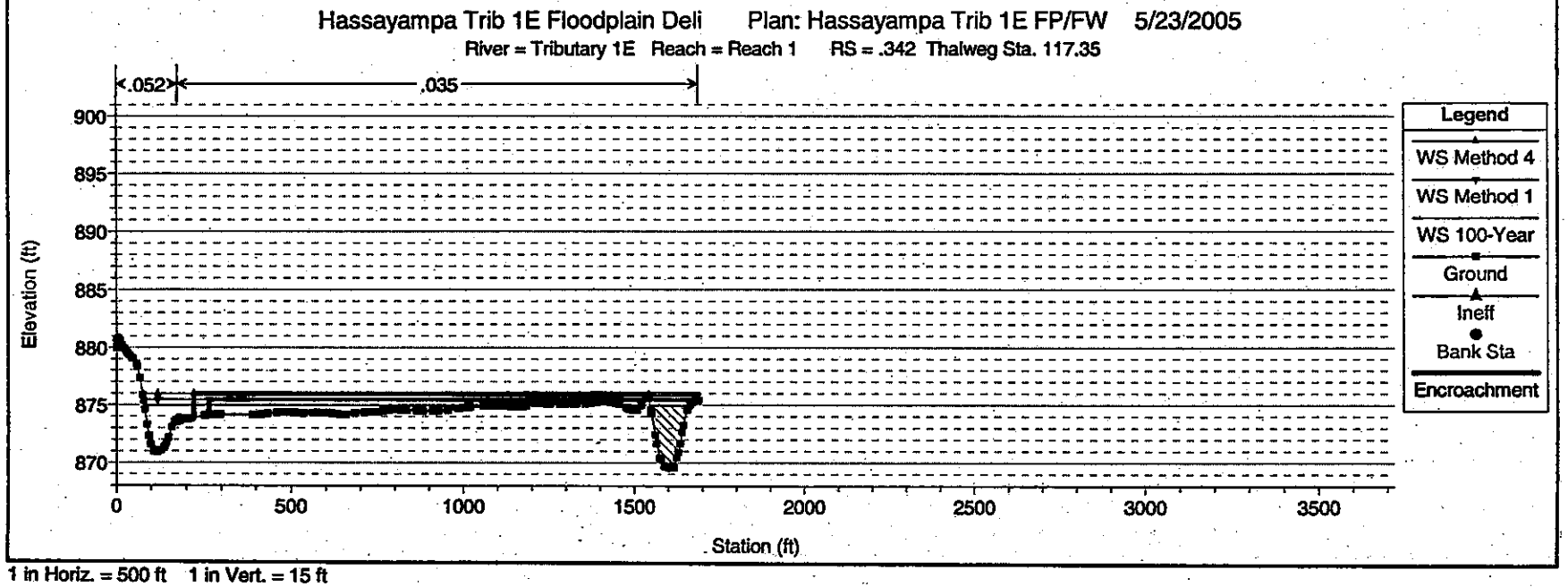




1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

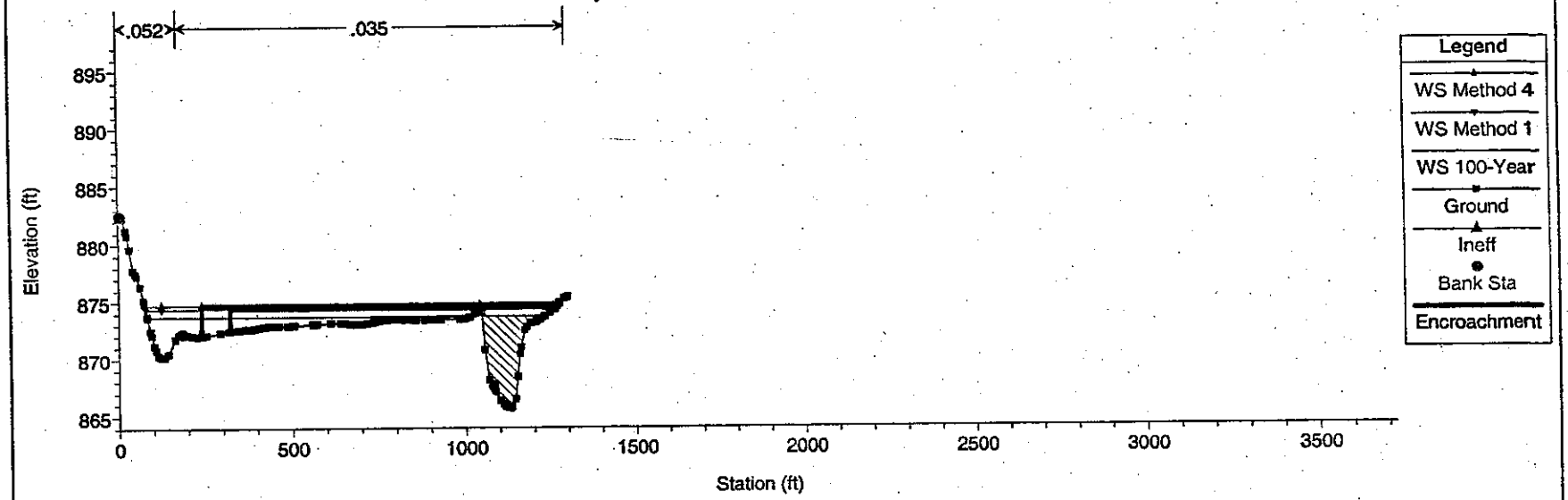



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

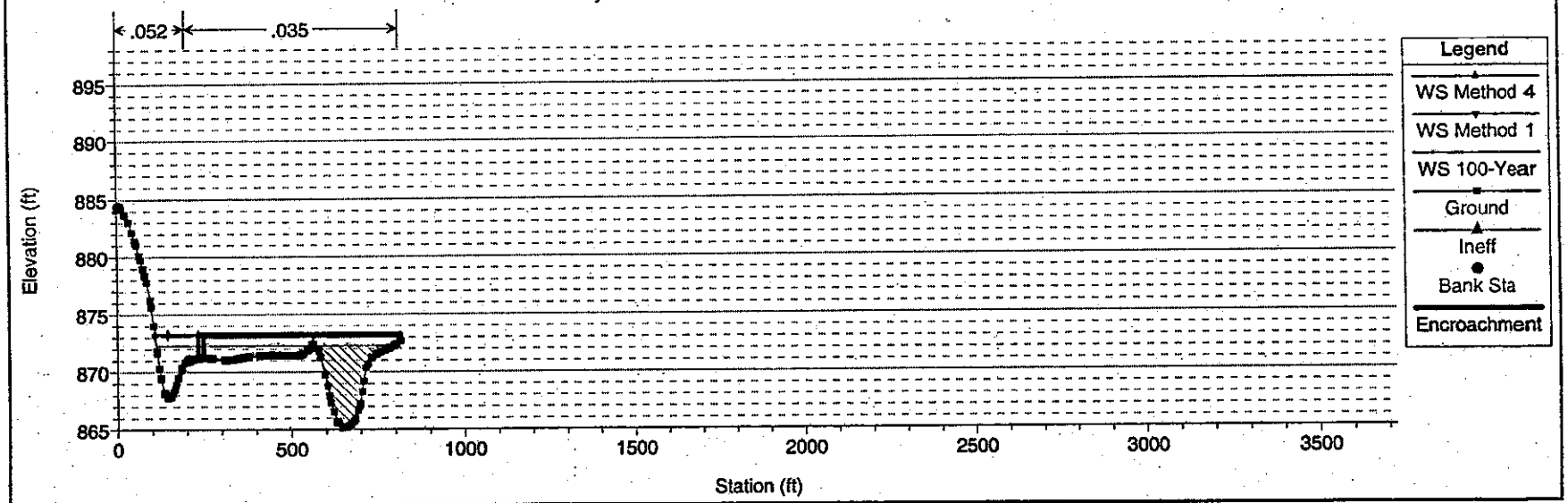
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = .266  Thalweg Sta. 112.24

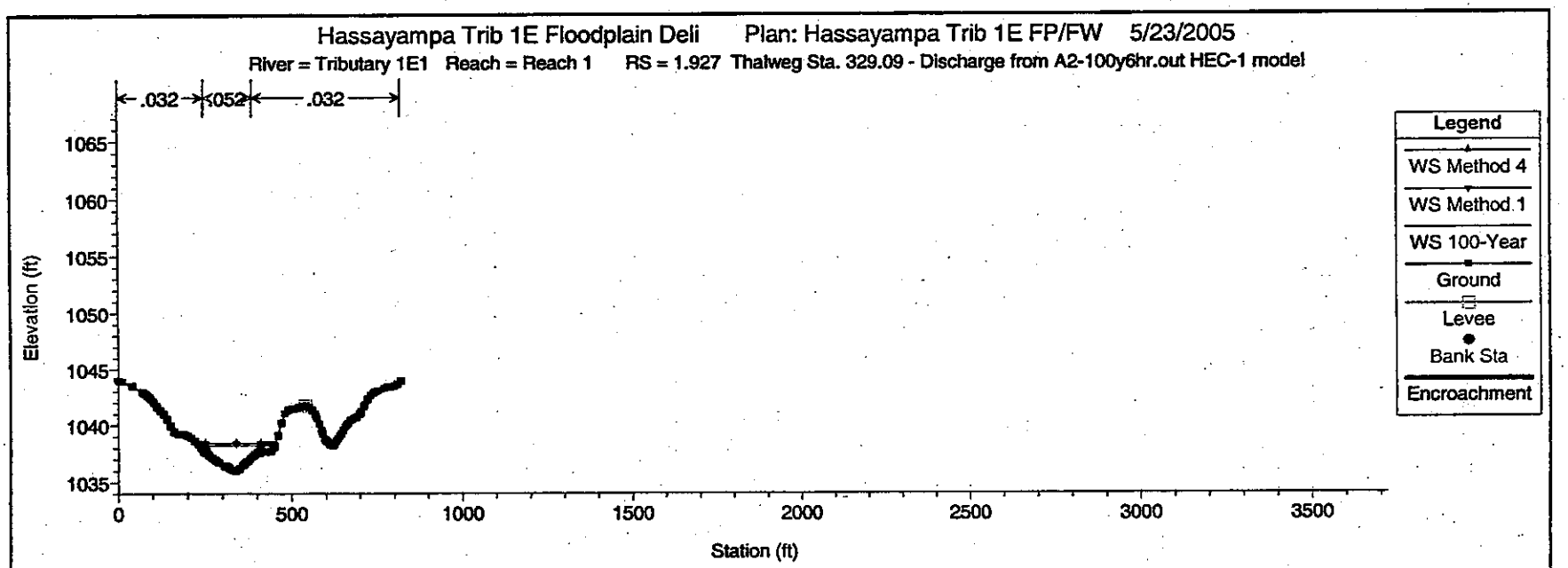


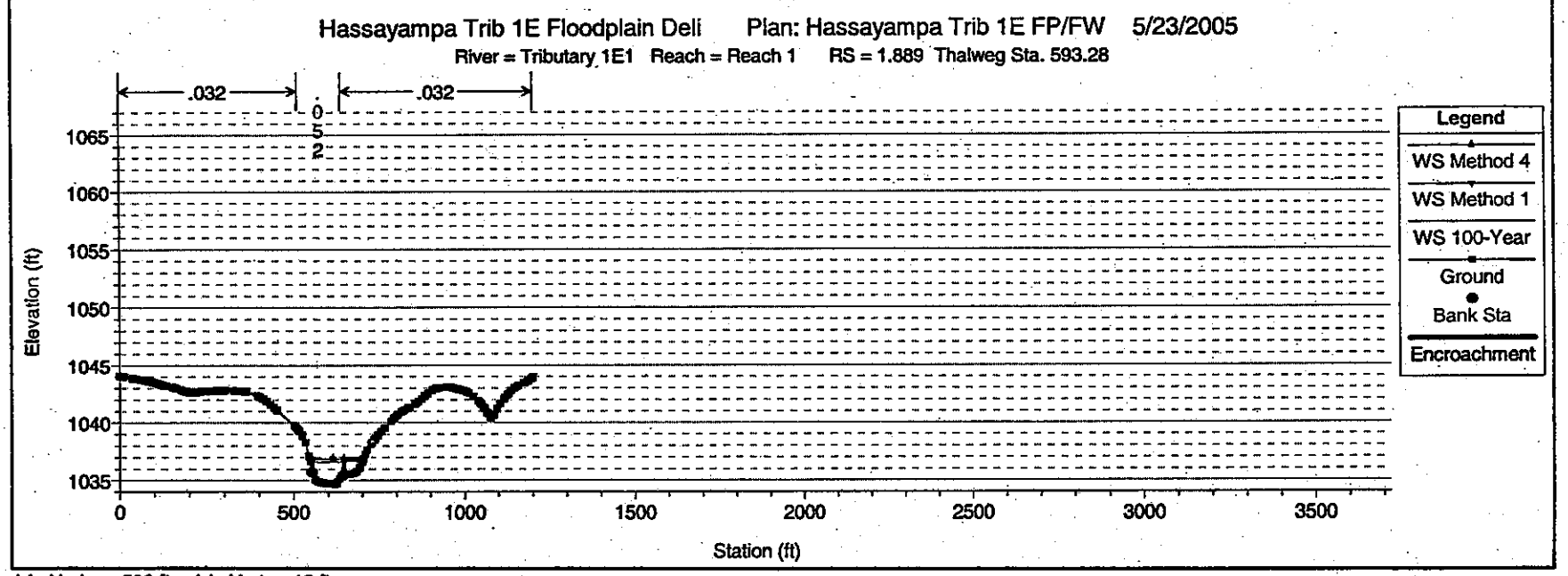

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E  Reach = Reach 1  RS = .190  Thalweg Sta. 136.21




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

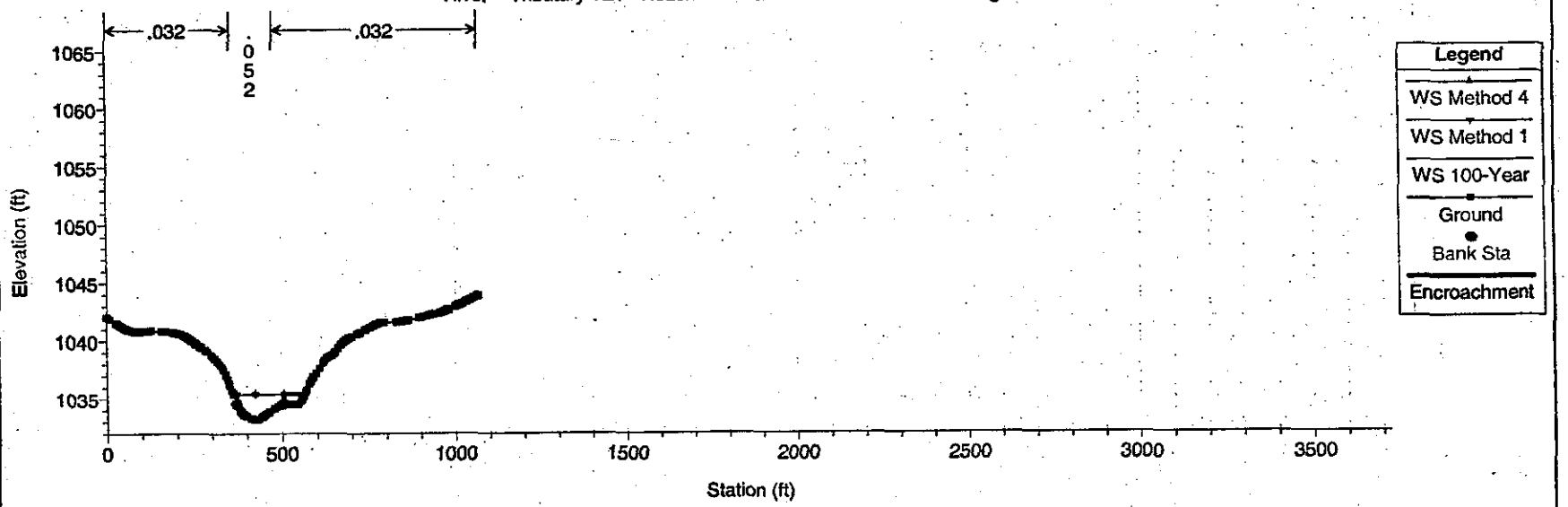



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

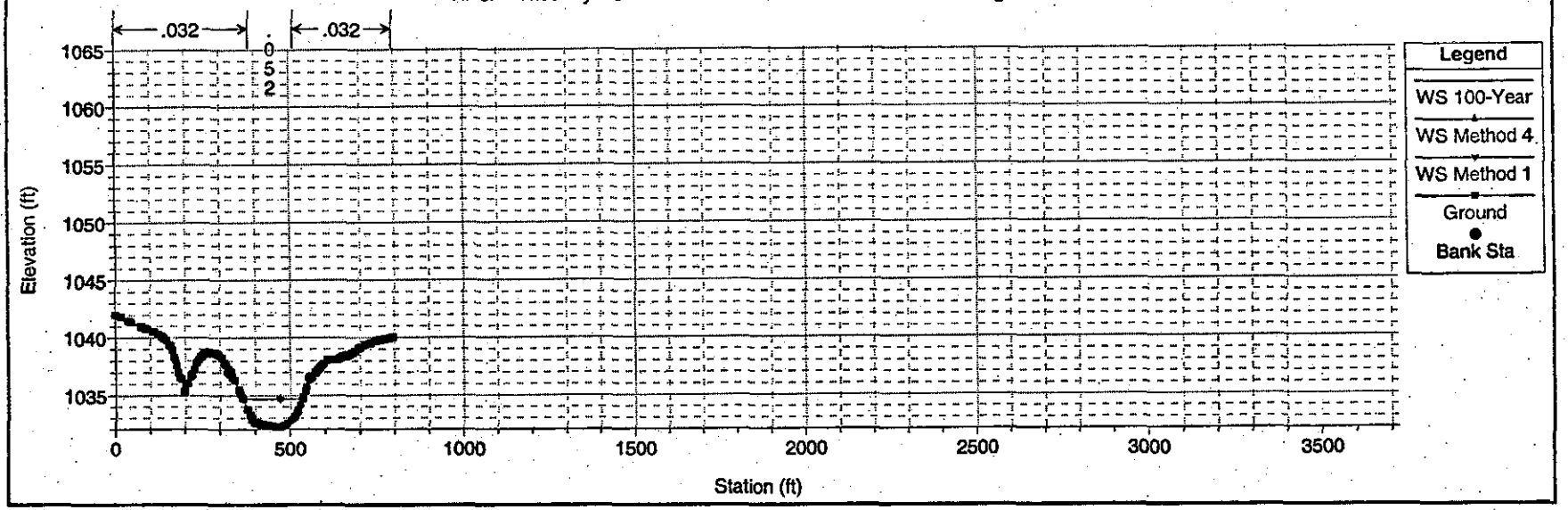
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.851  Thalweg Sta. 422.54

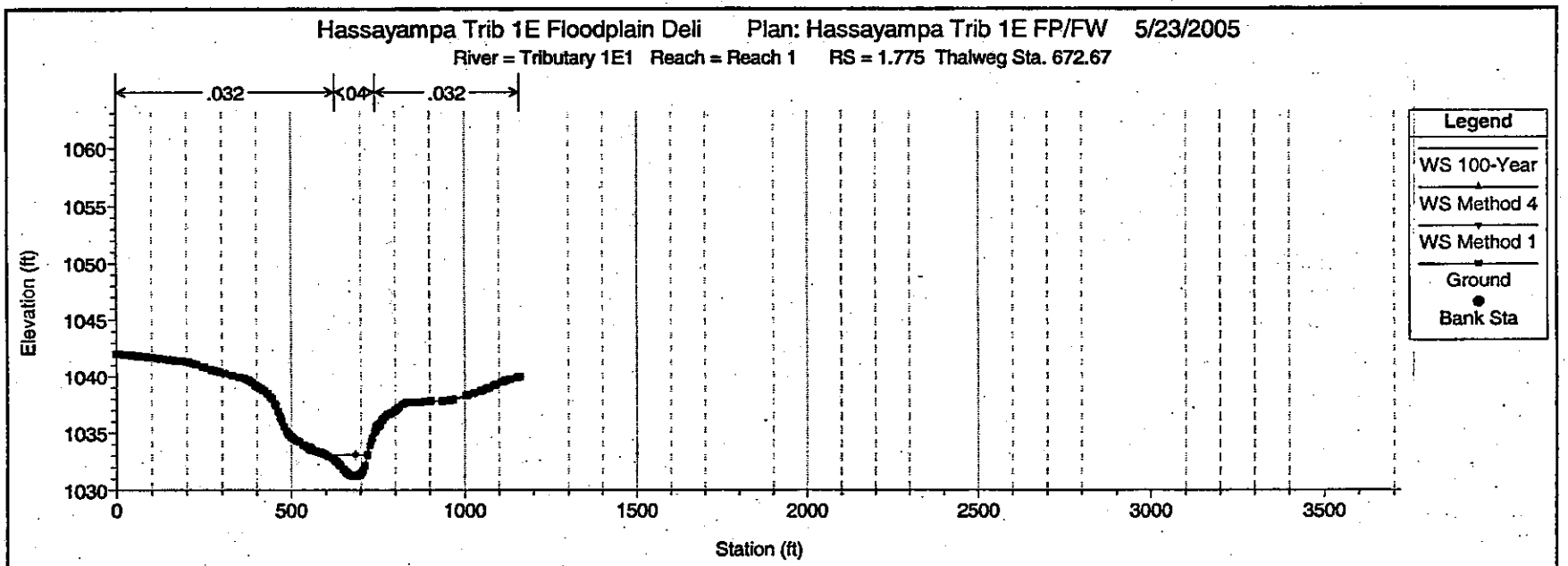


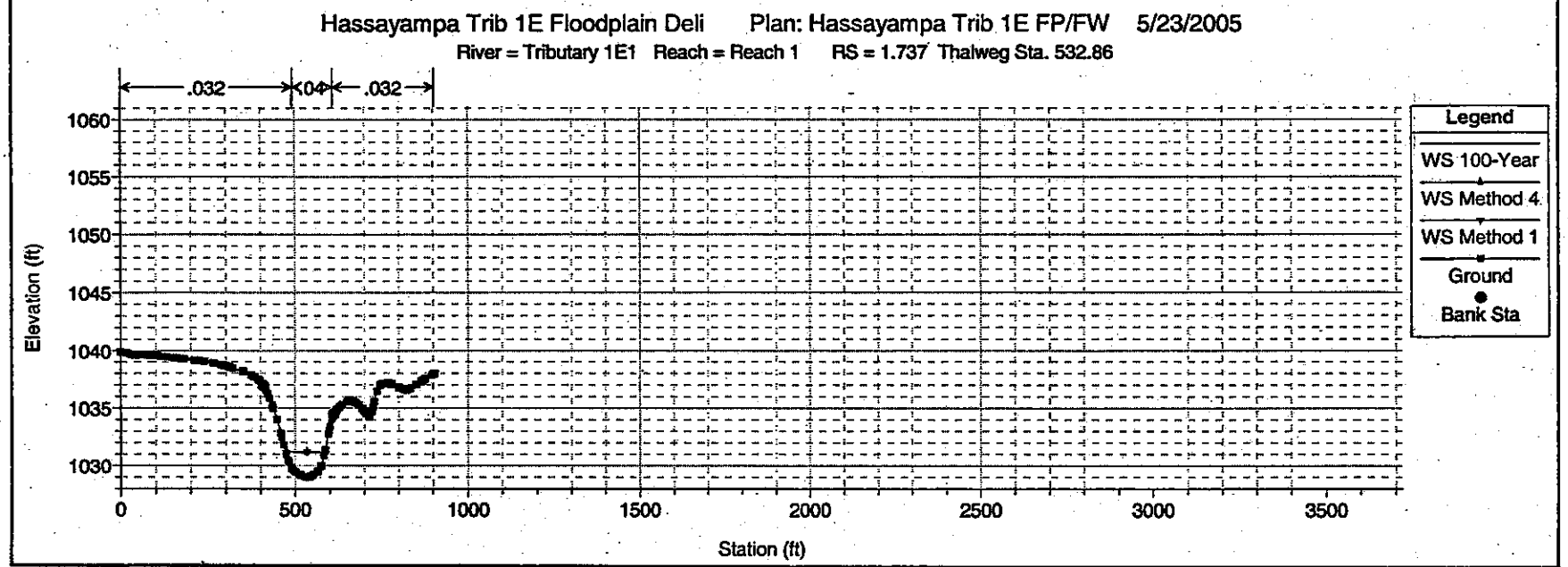

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.813  Thalweg Sta. 441.00

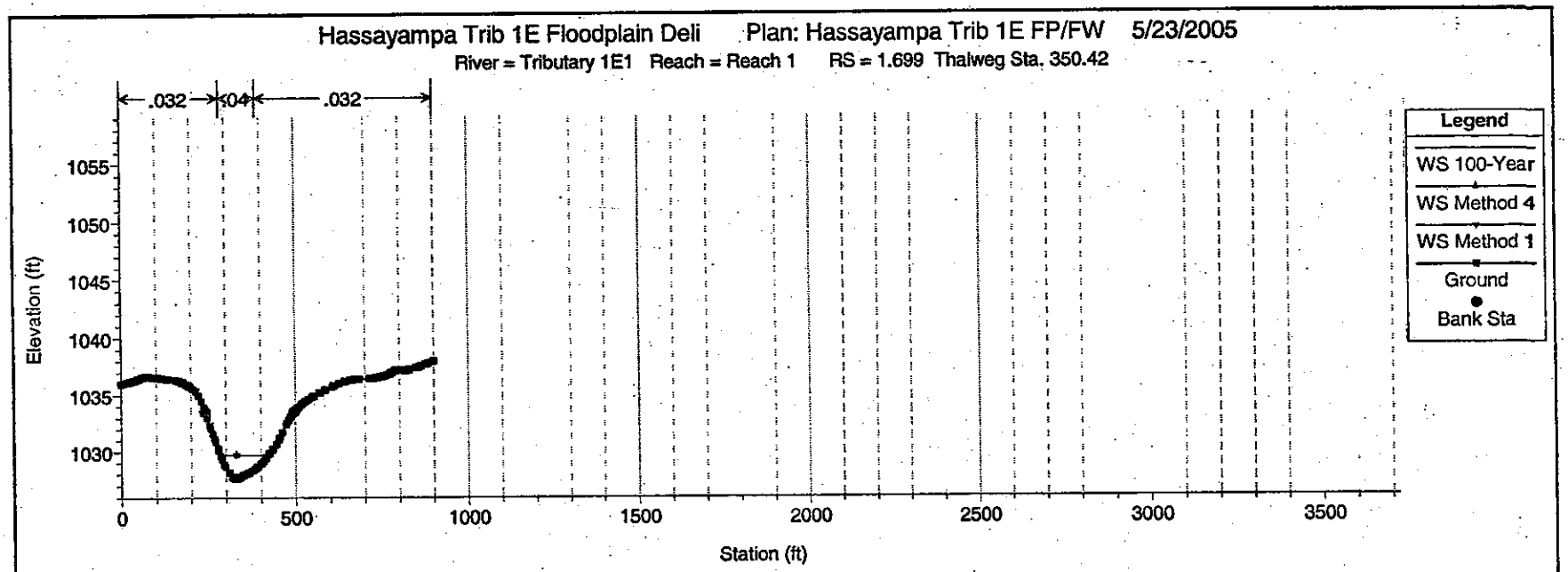


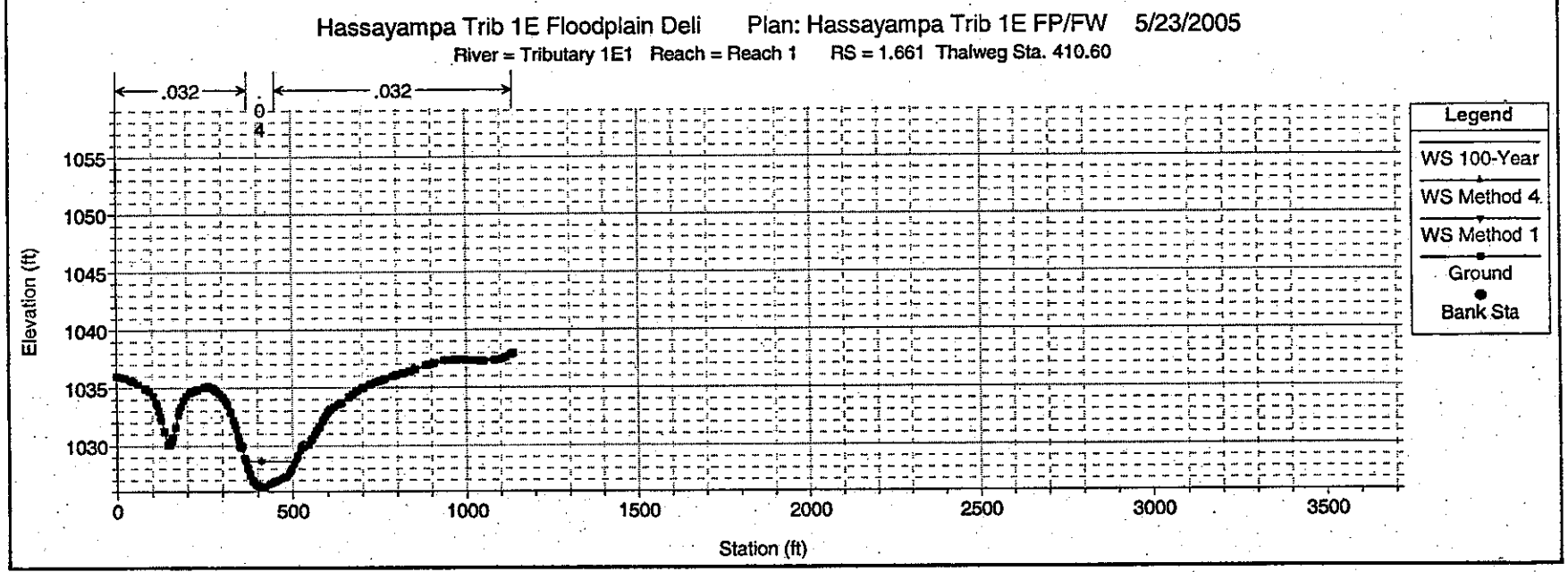

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



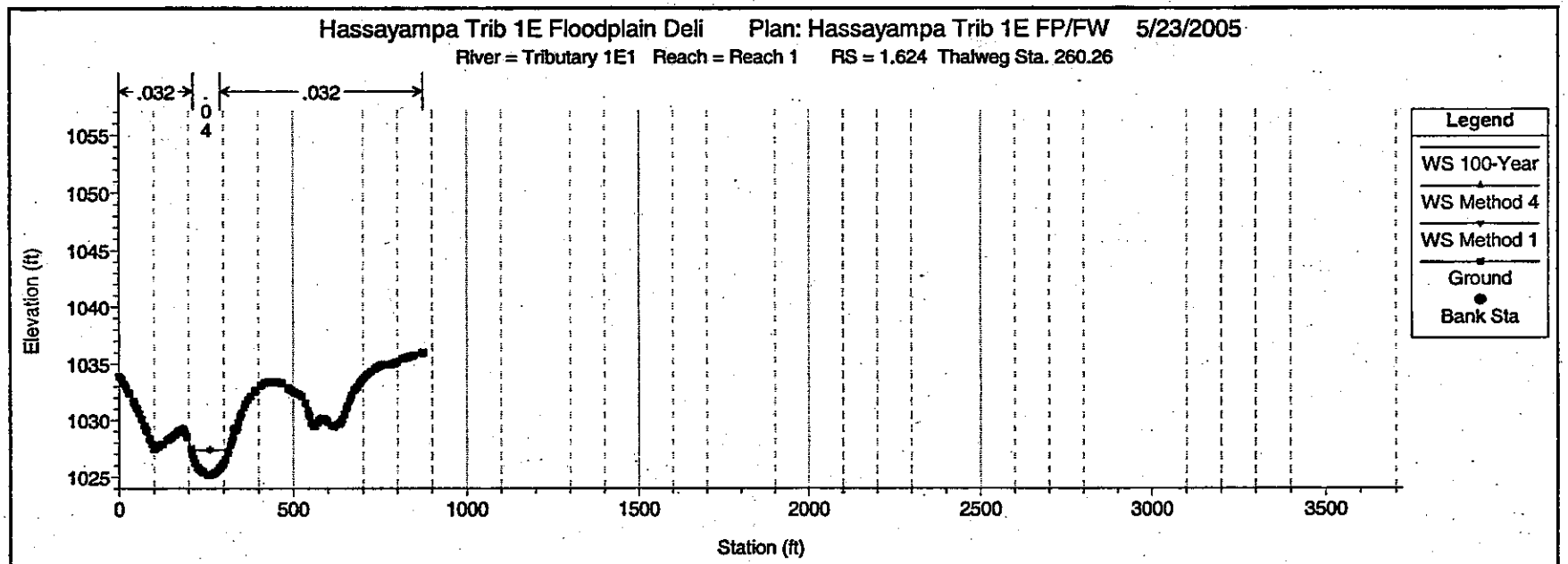



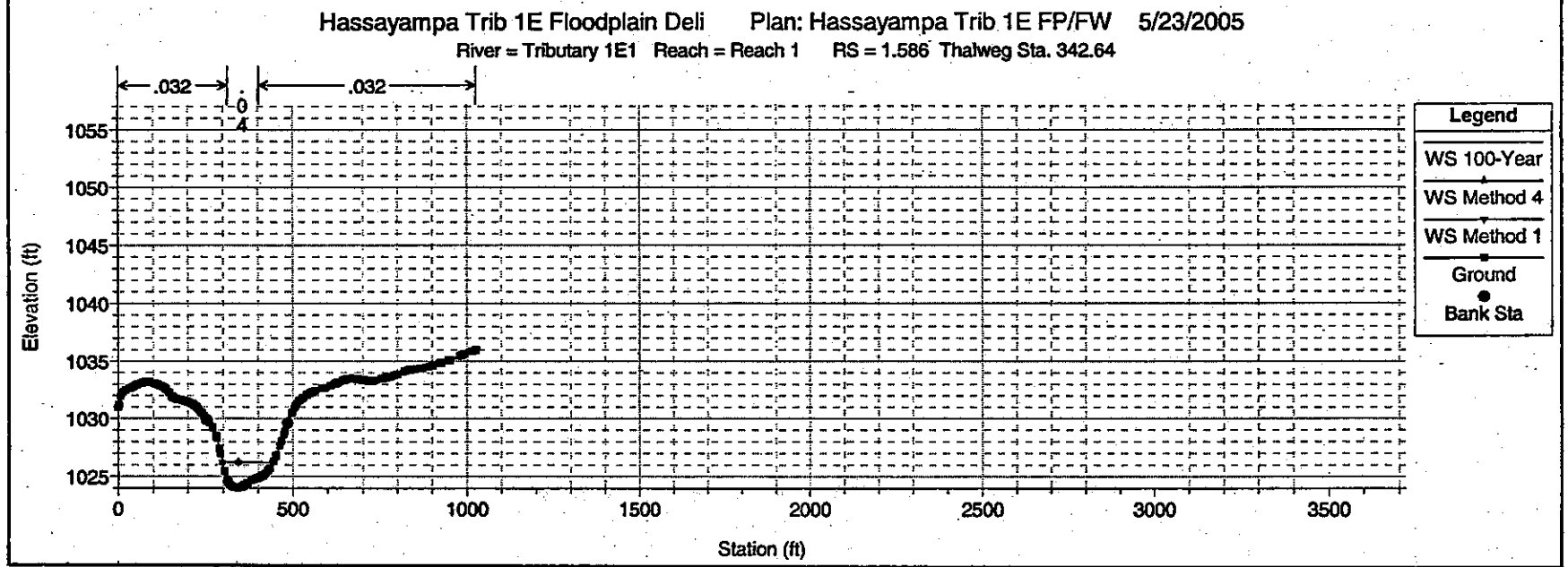

1 in Horiz. = 500 ft 1 in Vert. = 15 ft



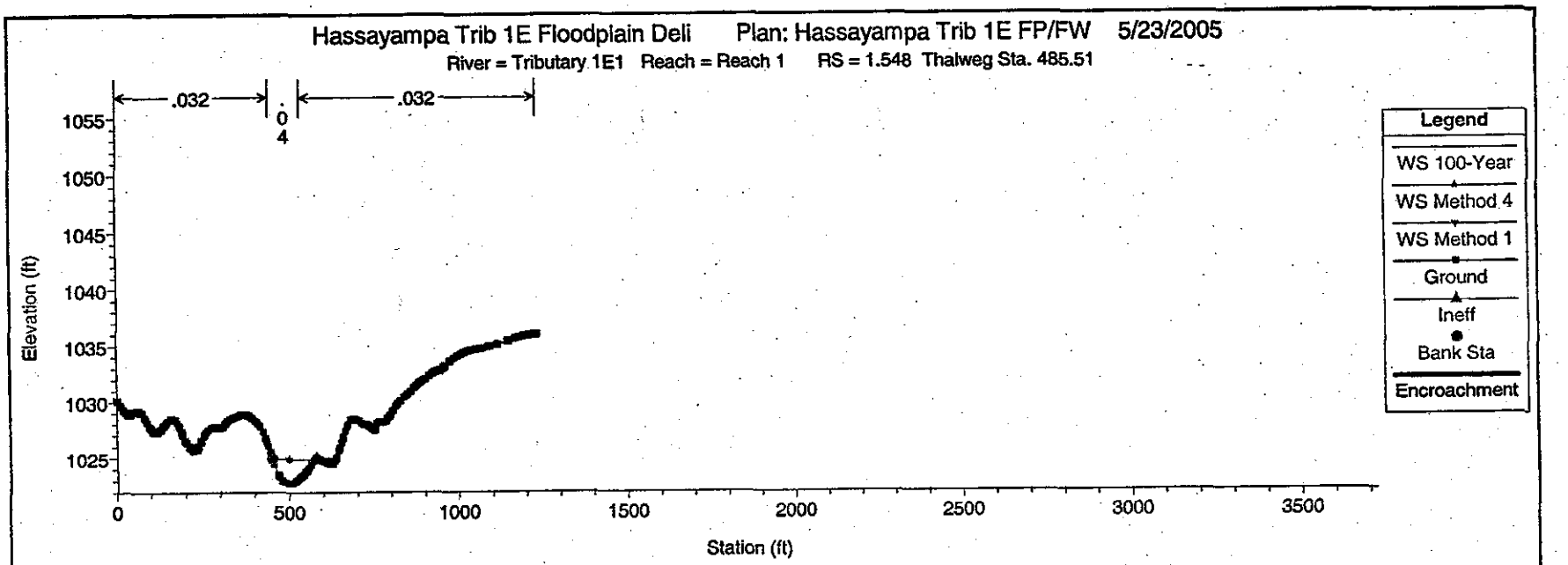



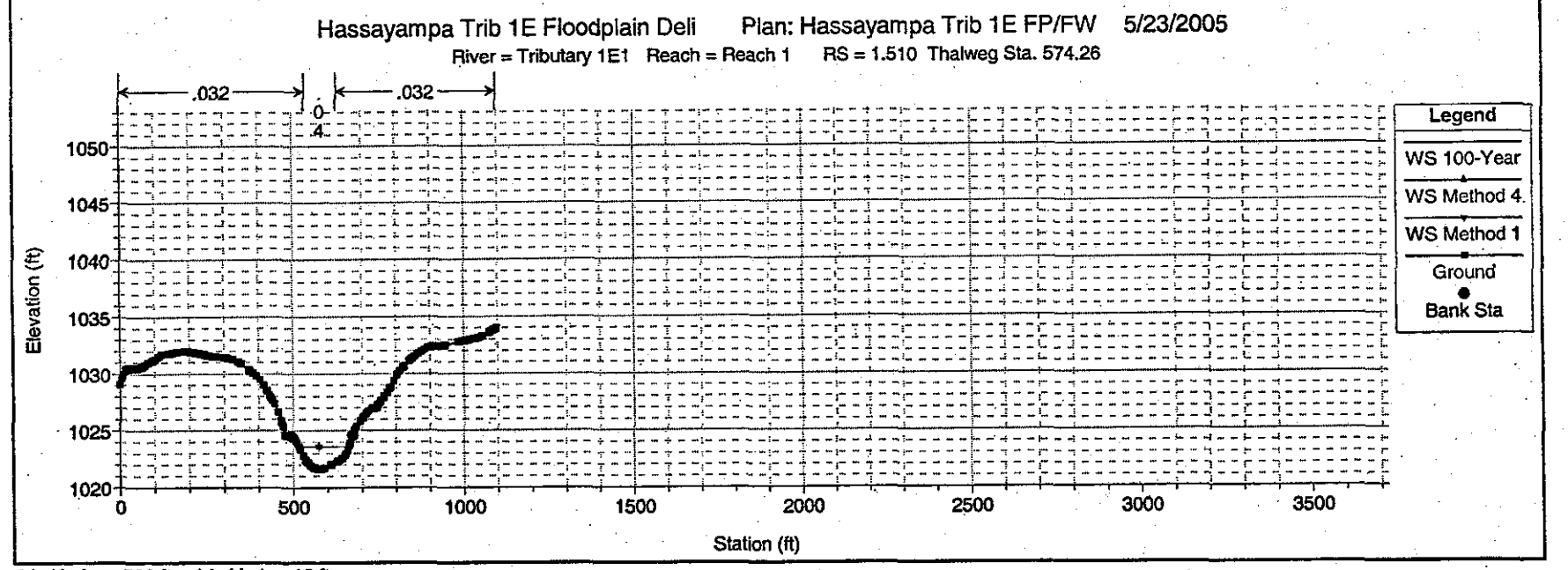

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

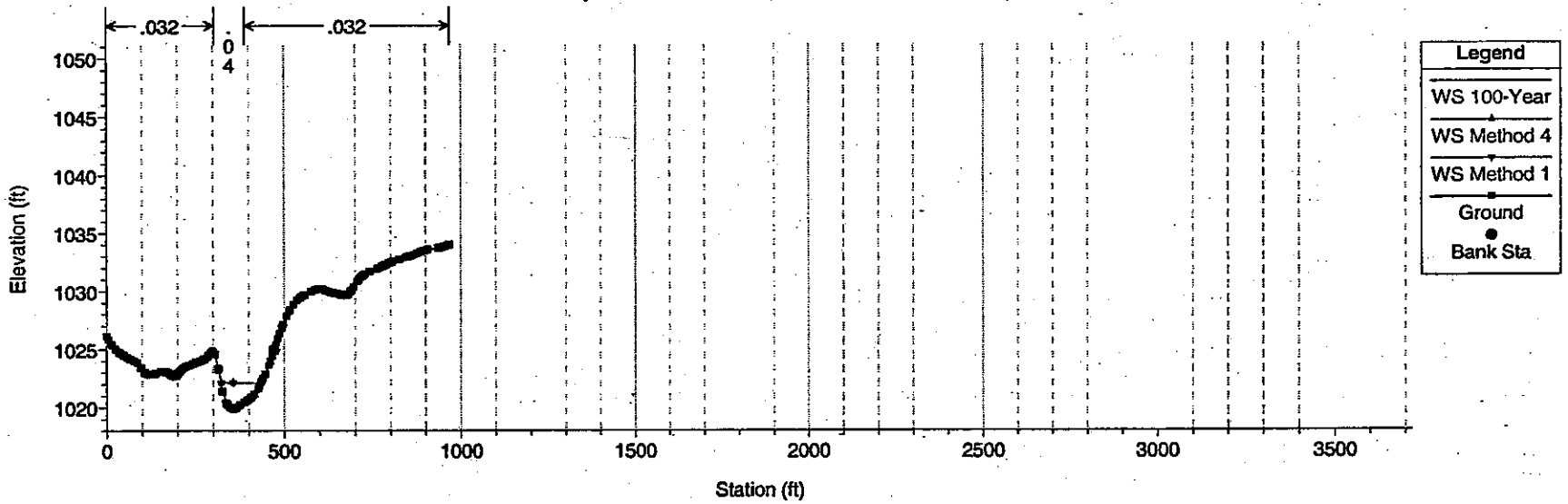



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

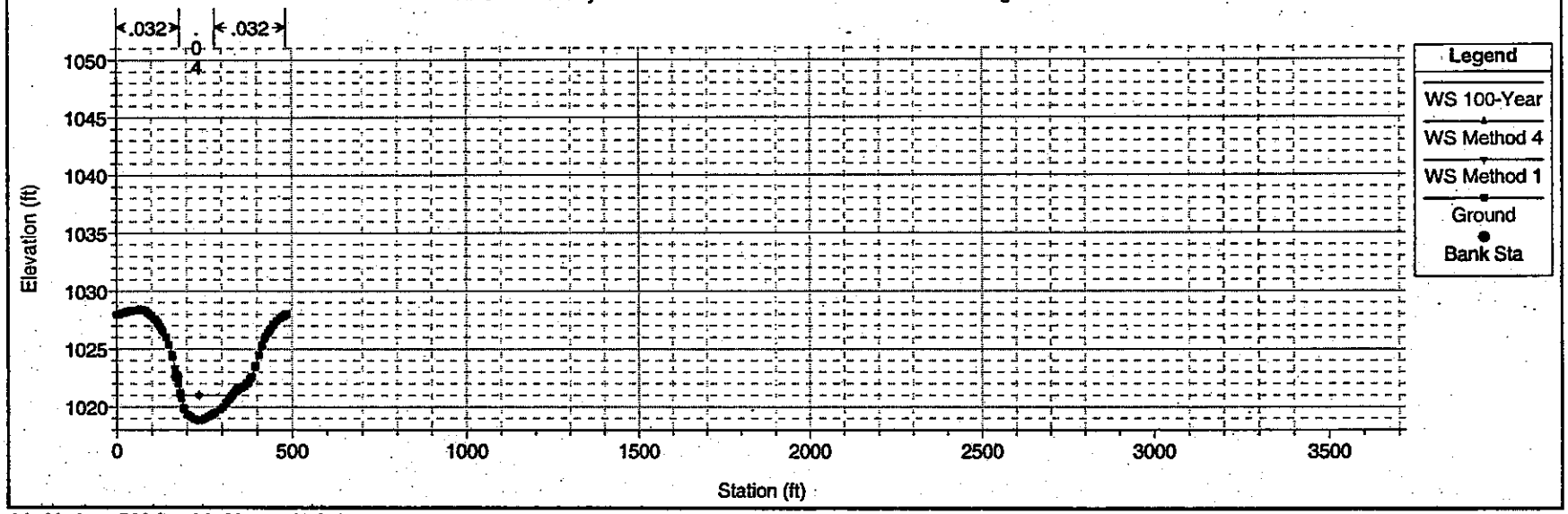
Hassayampa Trib 1E Floodplain Deli Plan: Hassayampa Trib 1E FP/FW 5/23/2005

River = Tributary 1E1 Reach = Reach 1 RS = 1.472 Thalweg Sta. 356.22




Hassayampa Trib 1E Floodplain Deli Plan: Hassayampa Trib 1E FP/FW 5/23/2005

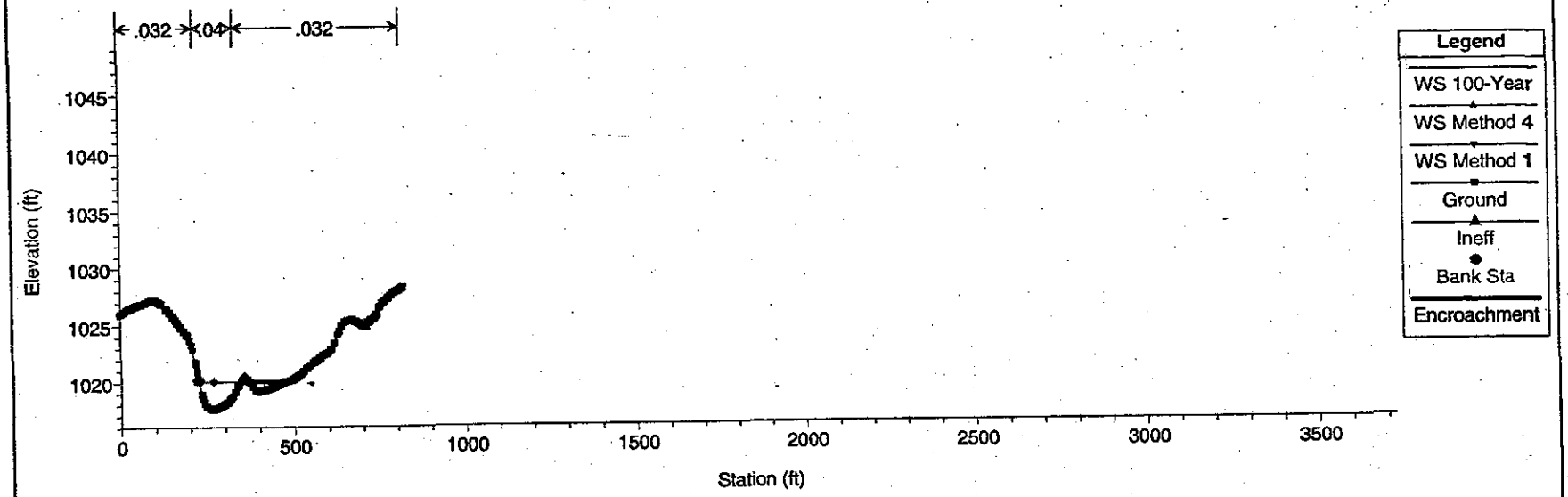
River = Tributary 1E1 Reach = Reach 1 RS = 1.434 Thalweg Sta. 241.76




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

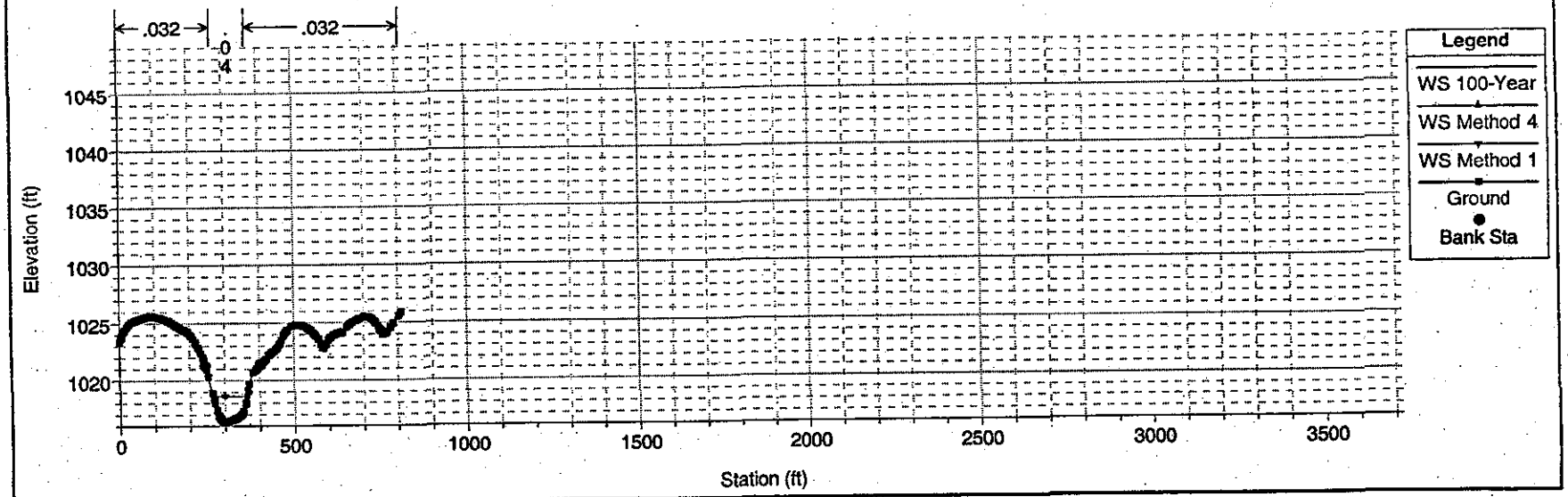
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.396  Thalweg Sta. 272.95

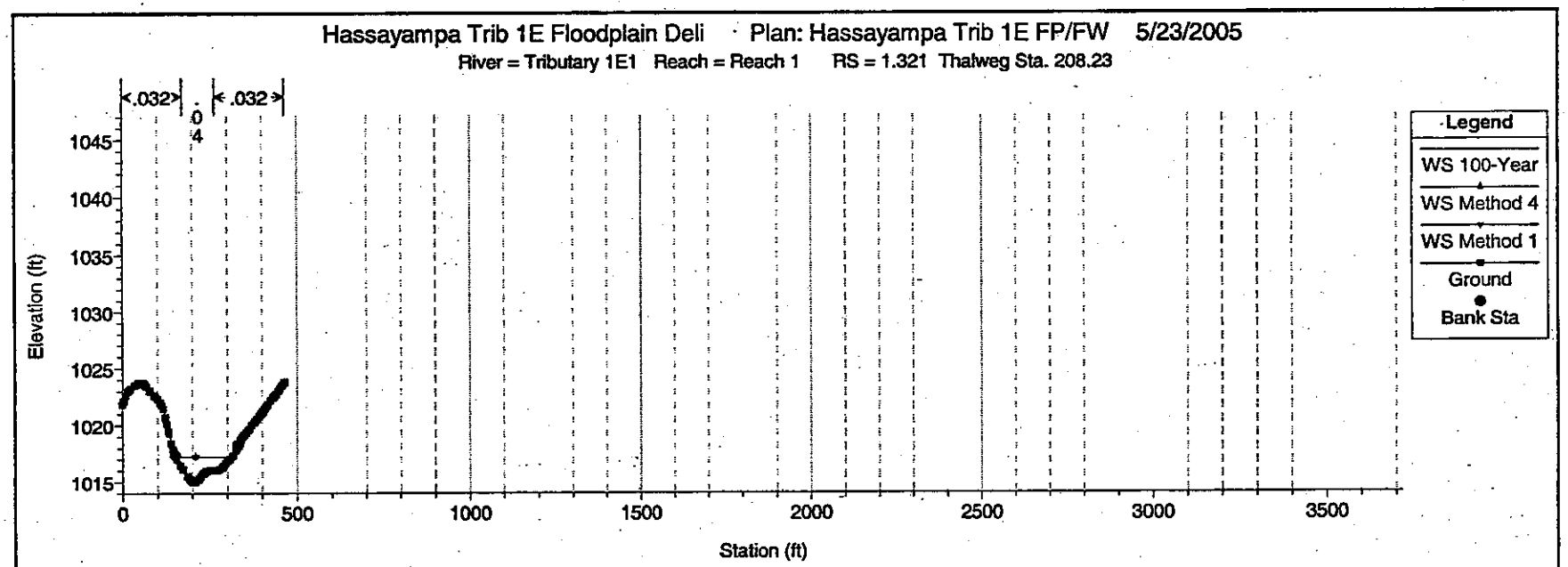


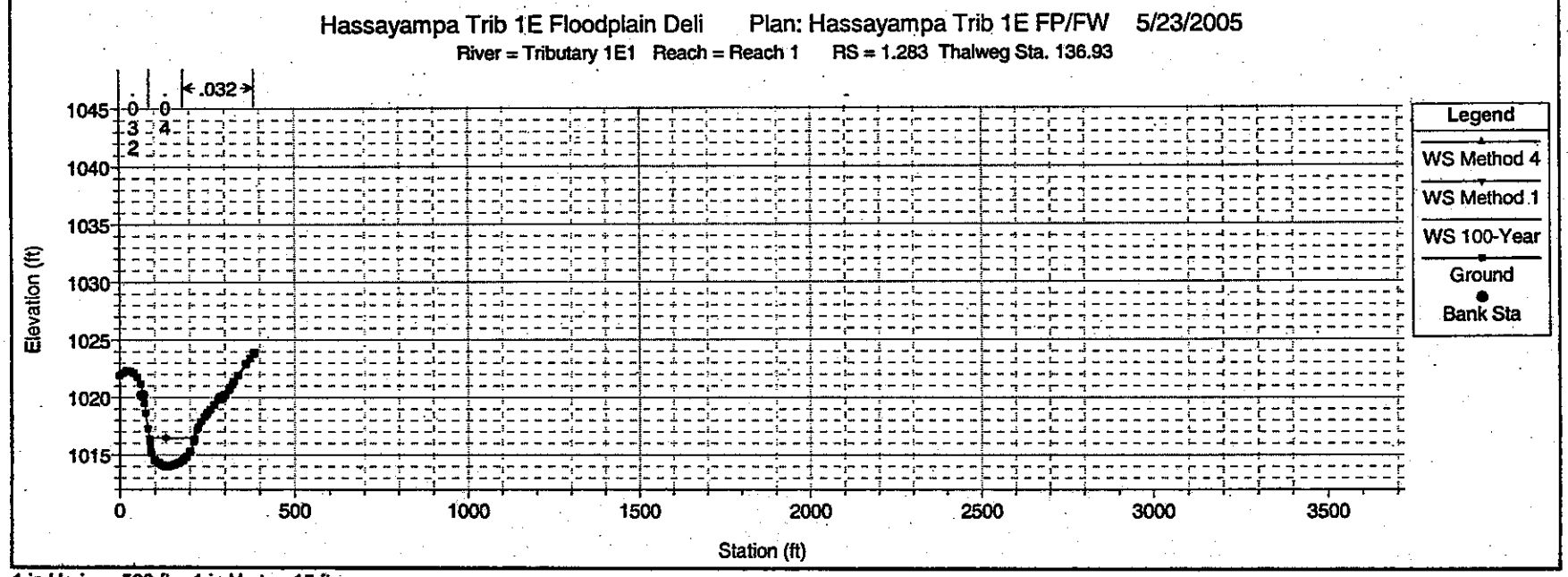

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.358  Thalweg Sta. 315.34




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

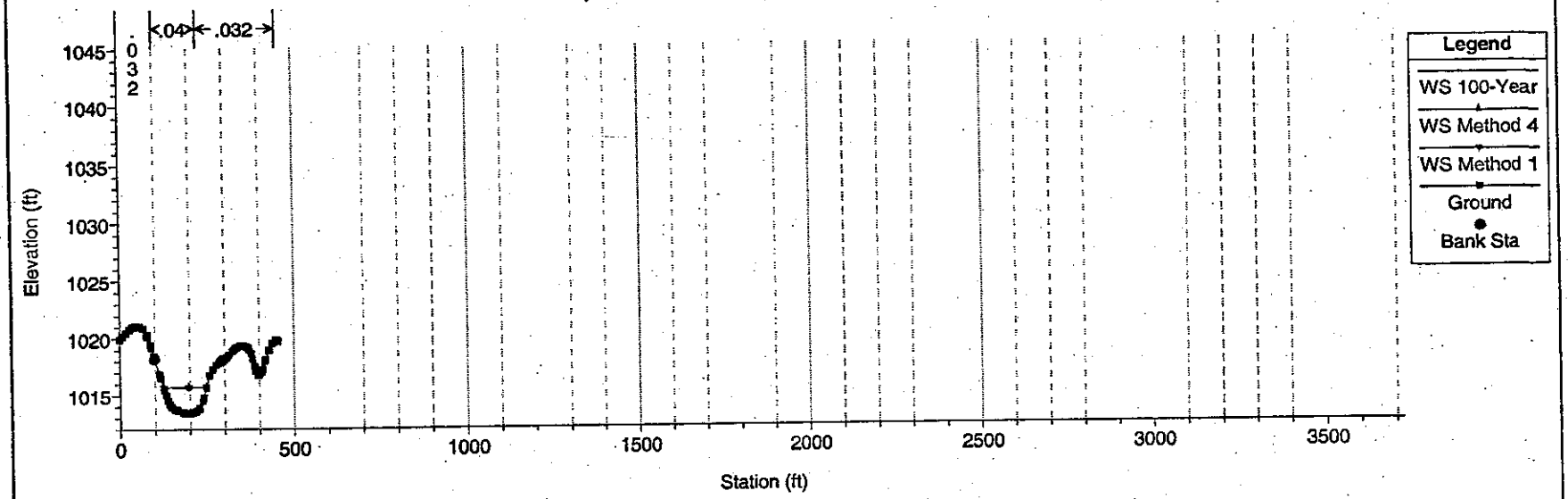



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

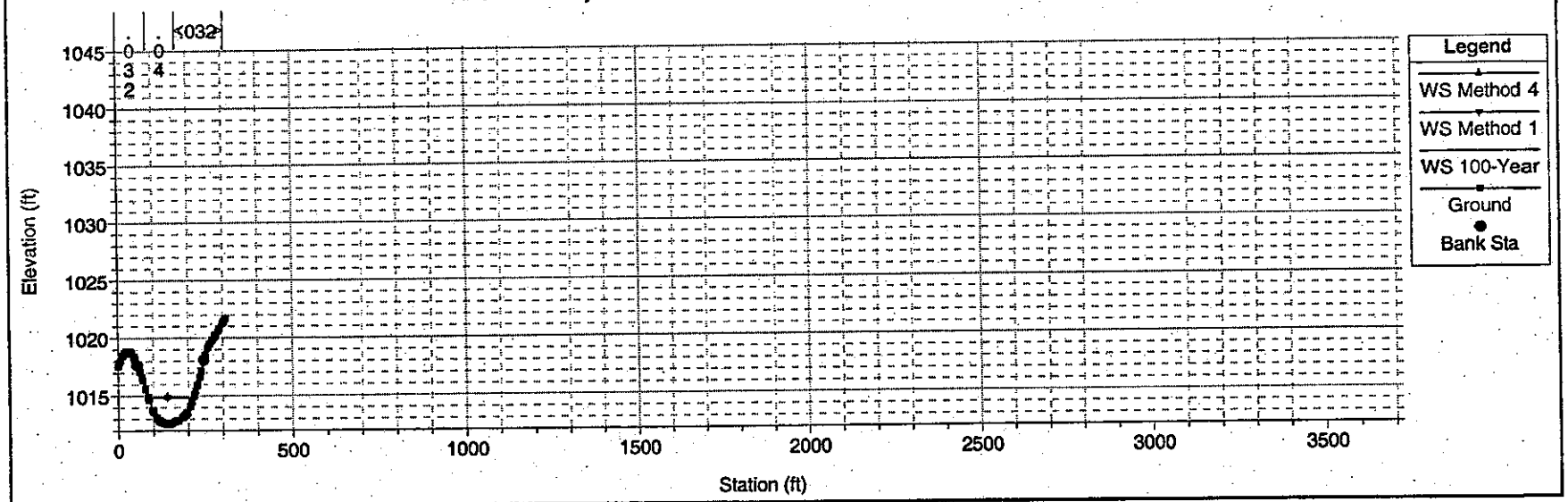
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.245  Thalweg Sta. 116.71

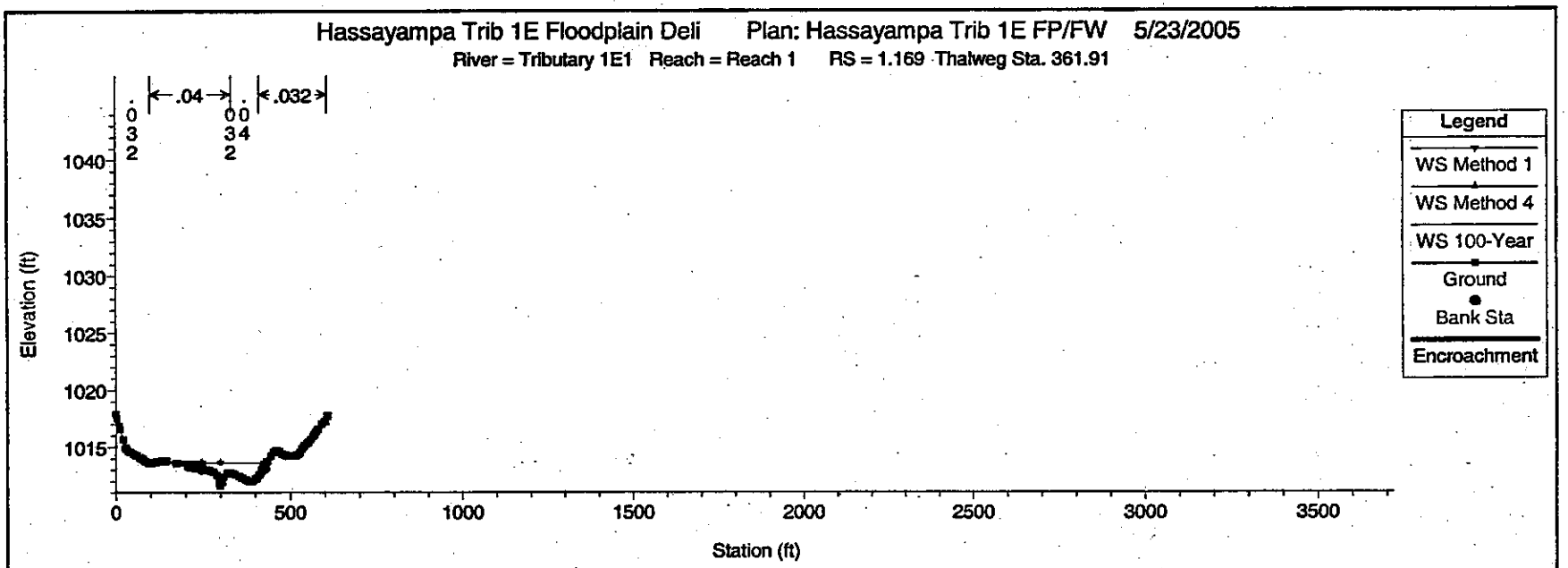


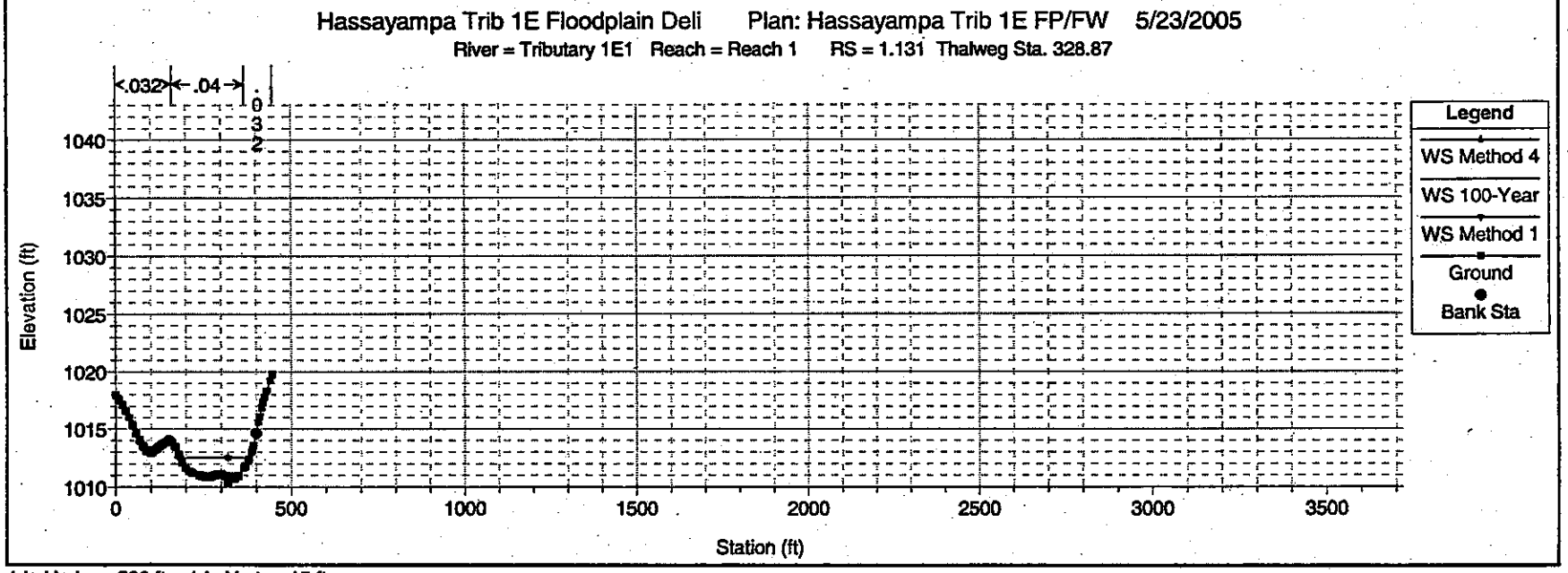

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.207  Thalweg Sta. 140.43




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

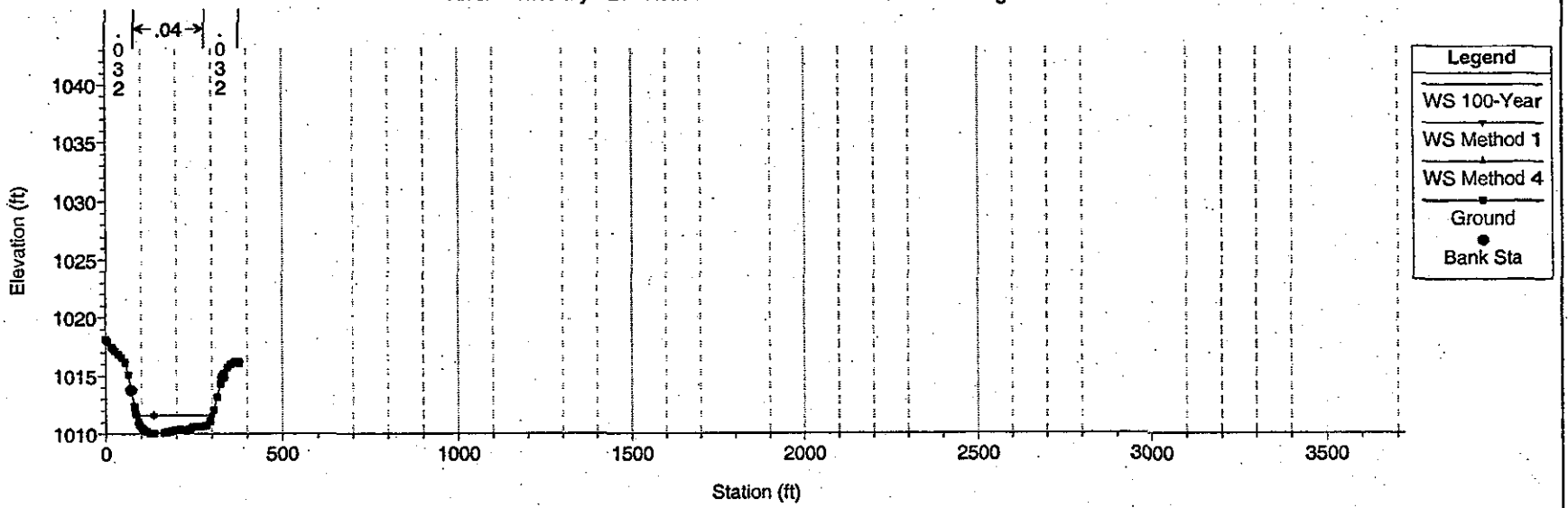



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

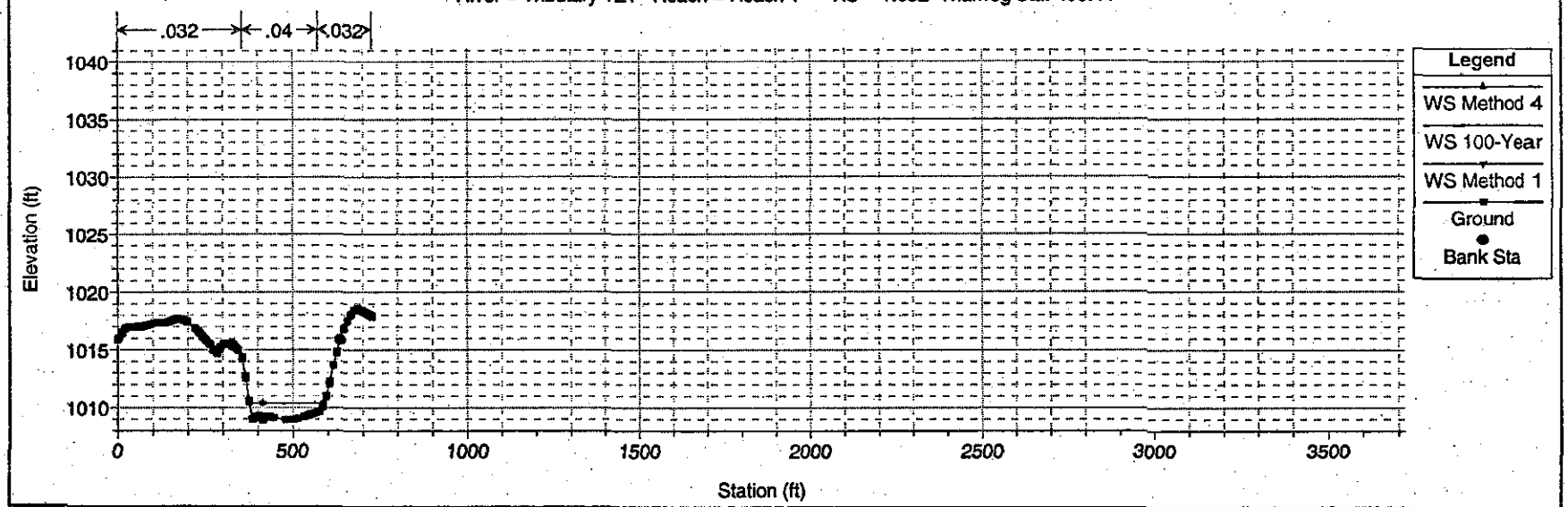
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.093  Thalweg Sta. 218.14

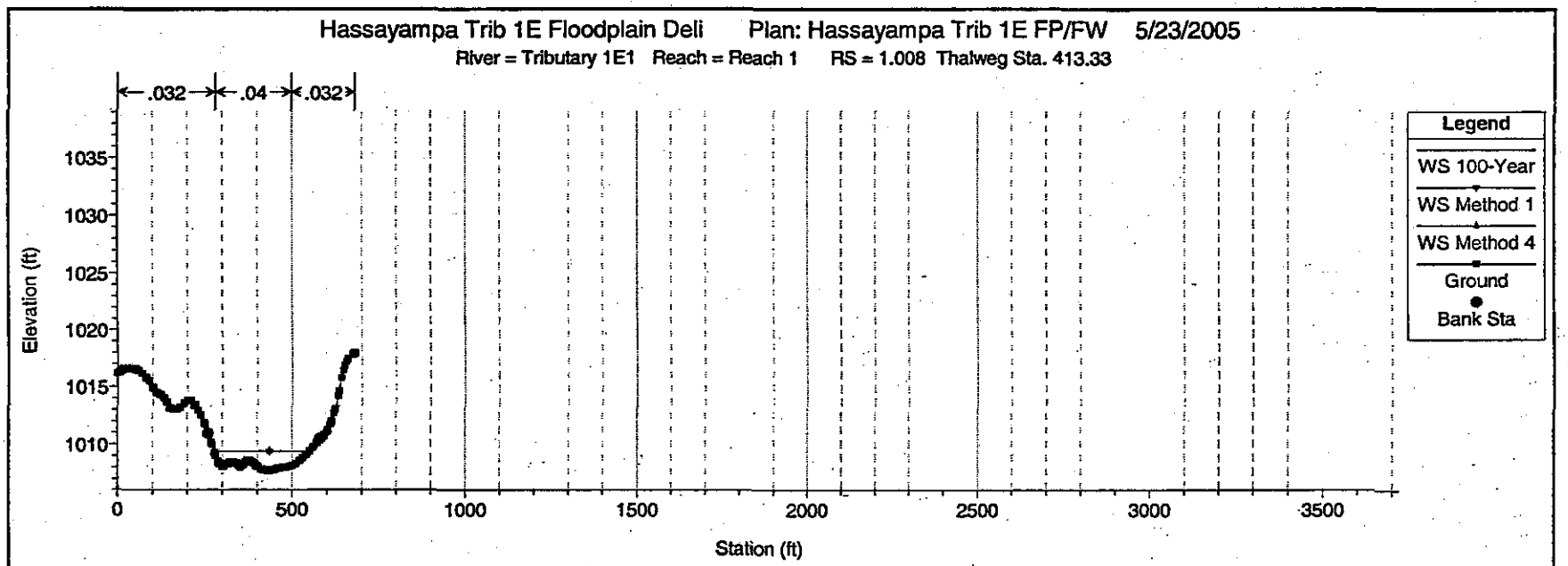


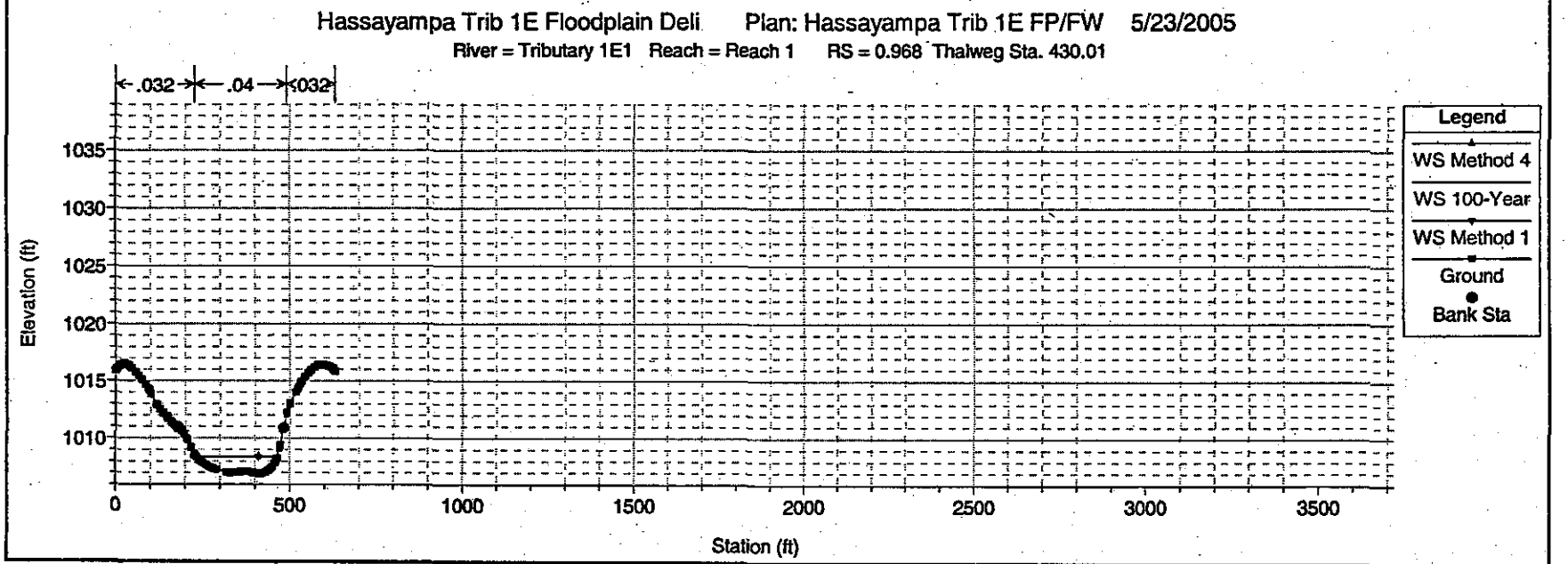

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 1.052  Thalweg Sta. 406.44

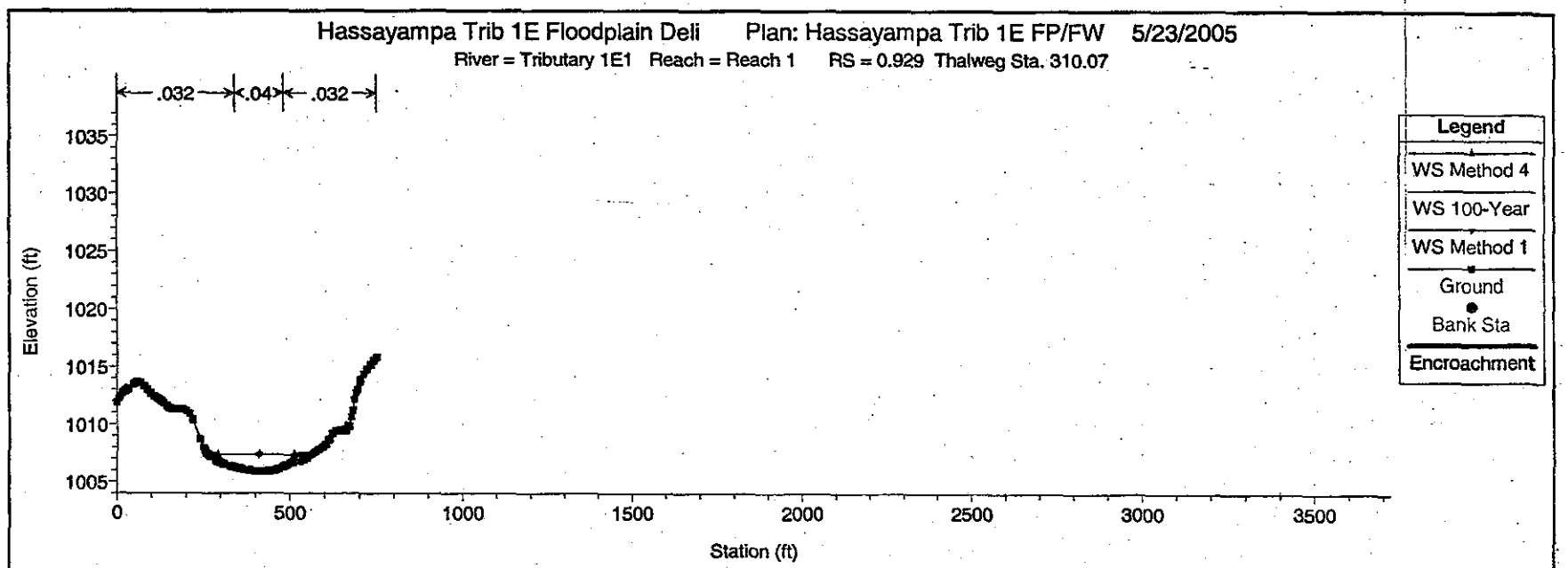


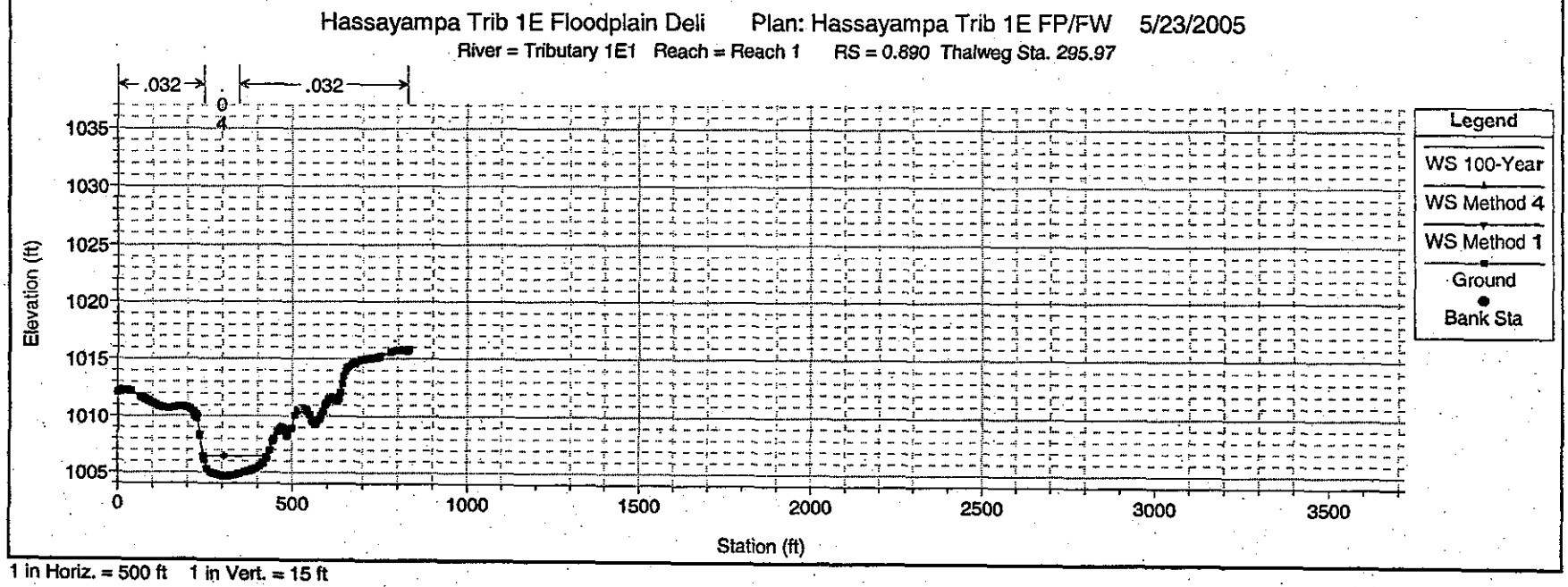

1 in Horiz. = 500 ft  1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

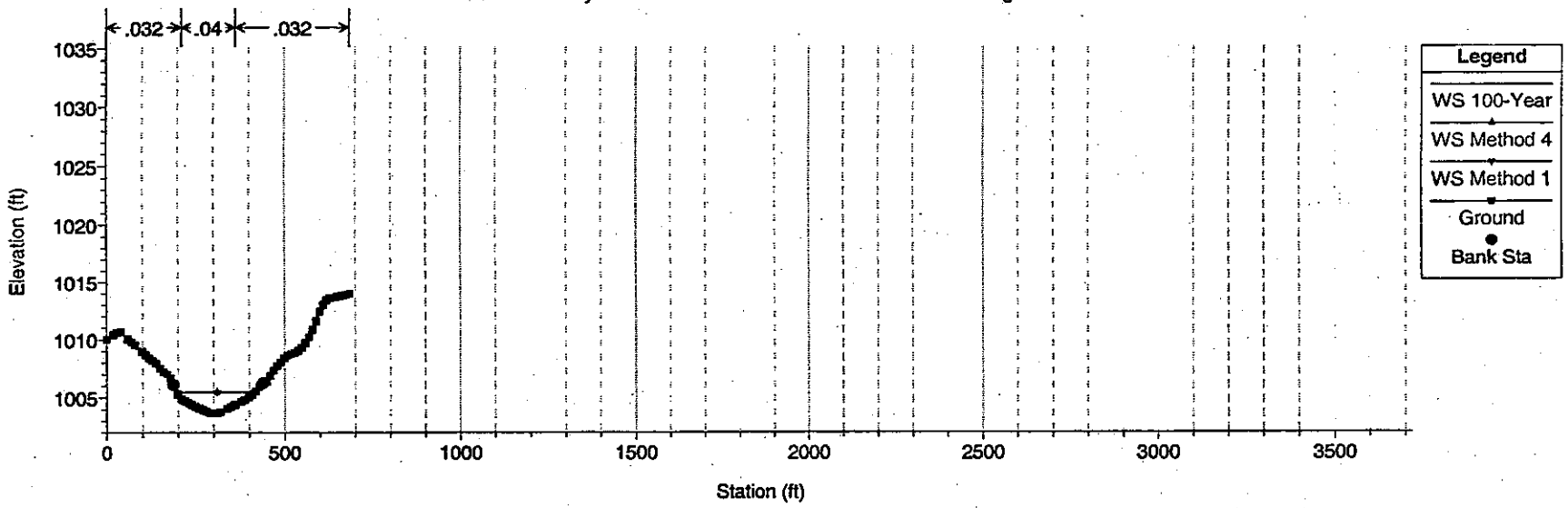



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

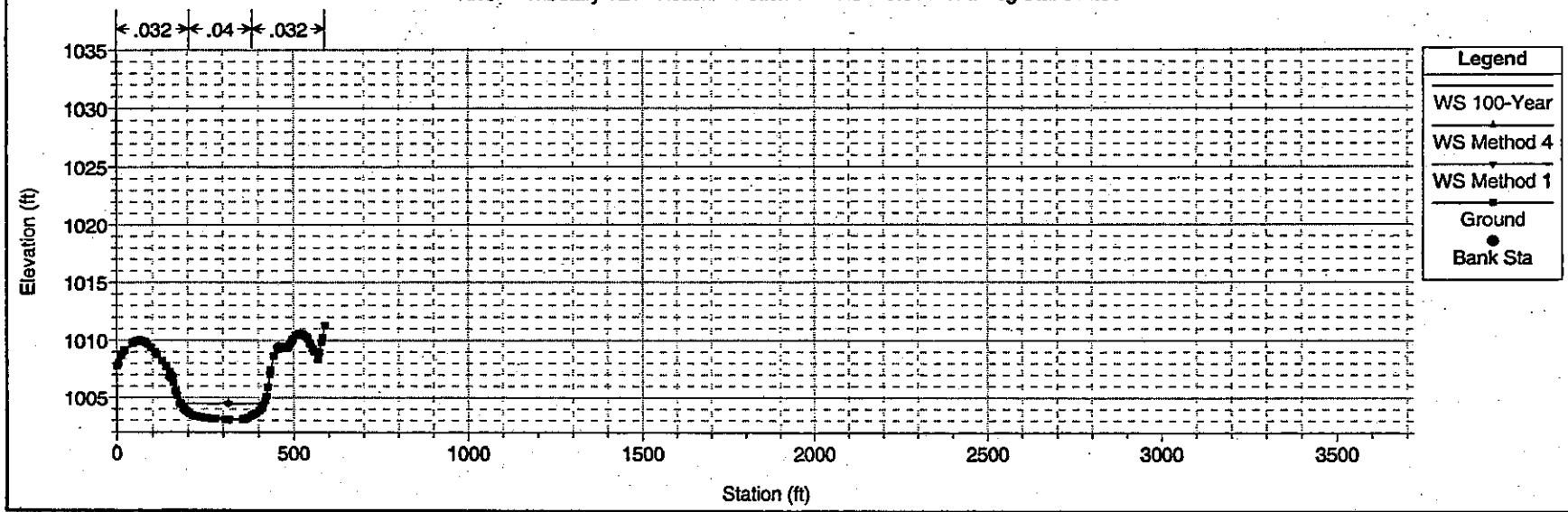
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 0.852  Thalweg Sta. 319.17




Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

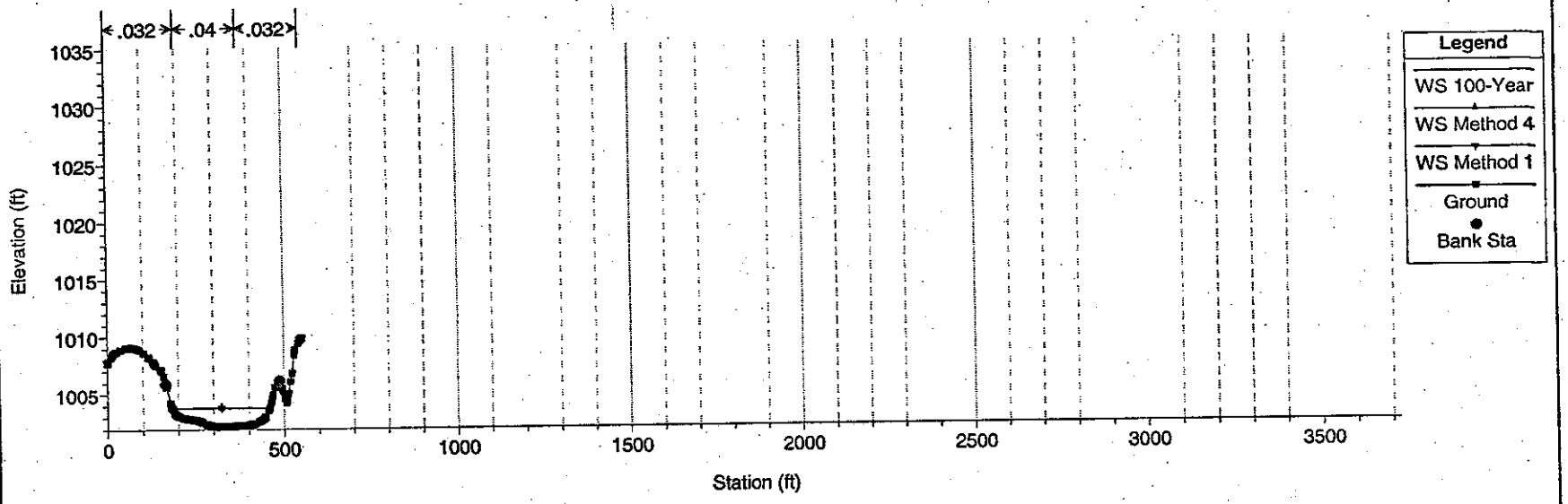
River = Tributary 1E1  Reach = Reach 1  RS = 0.814  Thalweg Sta. 314.90




1 in Horiz. = 500 ft  1 in Vert. = 15 ft

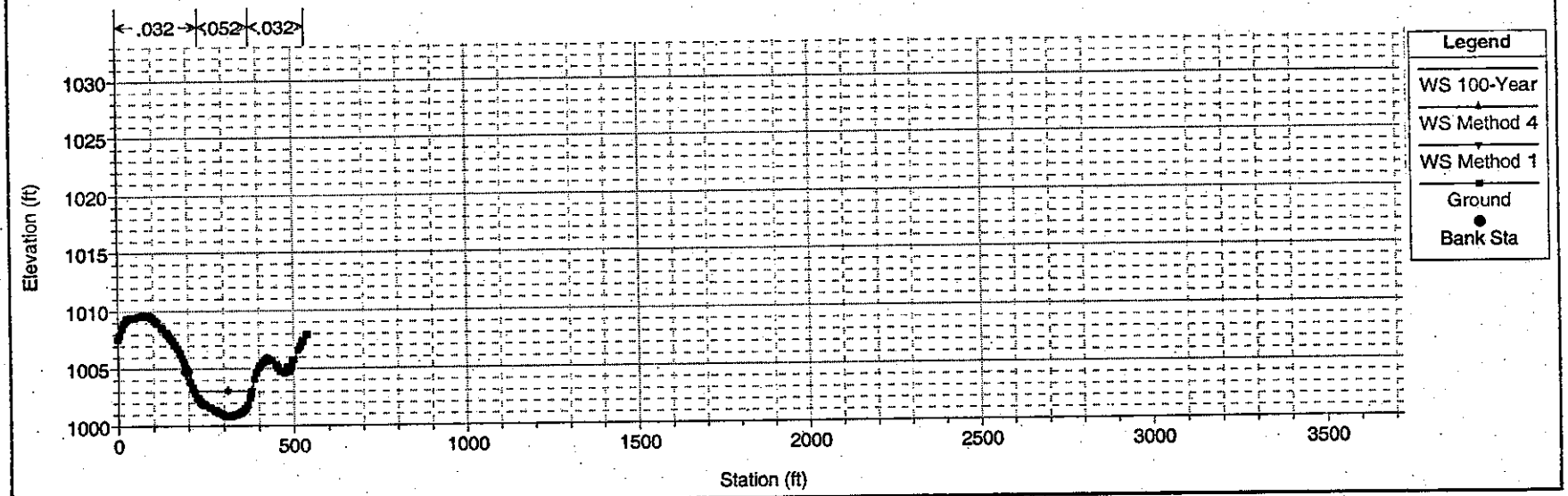
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 0.777  Thalweg Sta. 315.28

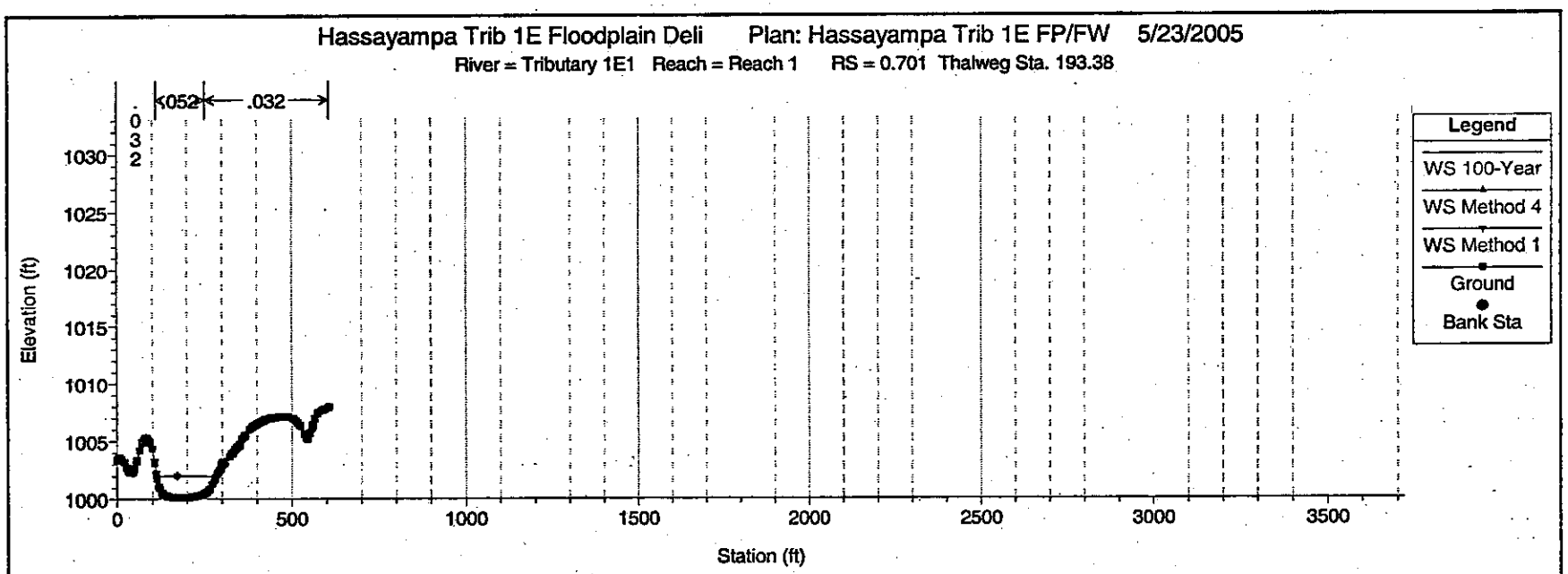


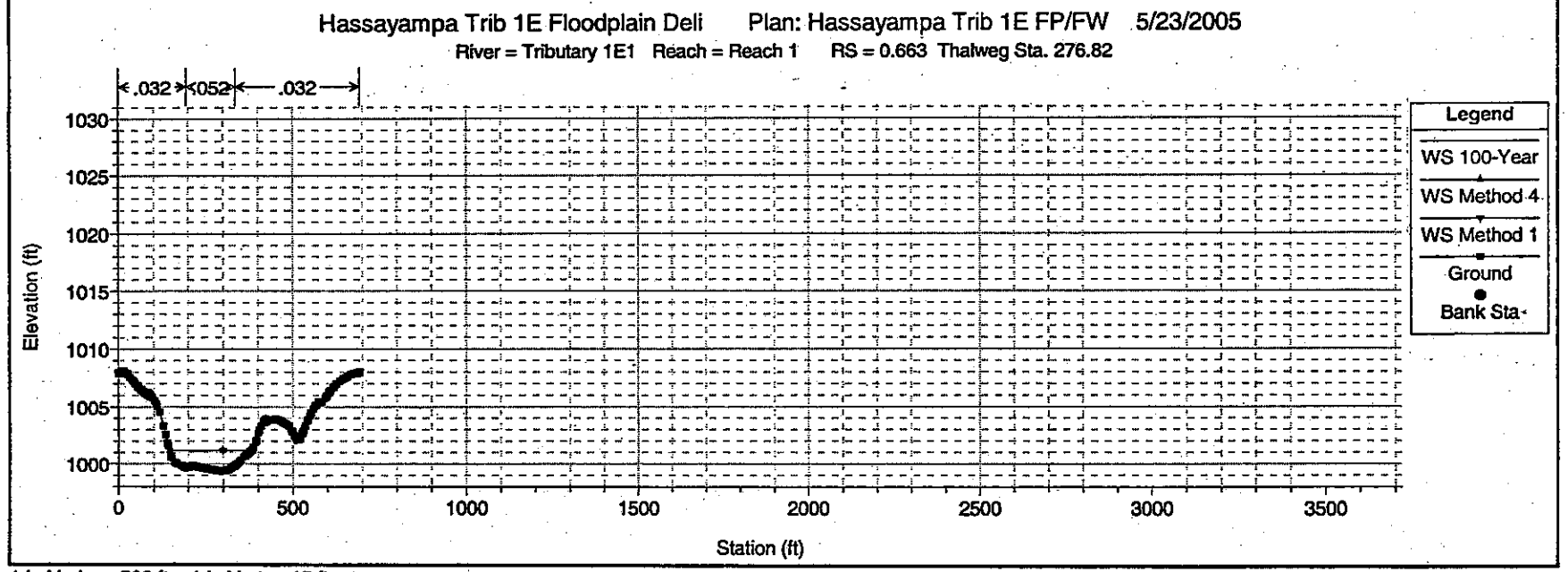

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 0.739  Thalweg Sta. 310.88

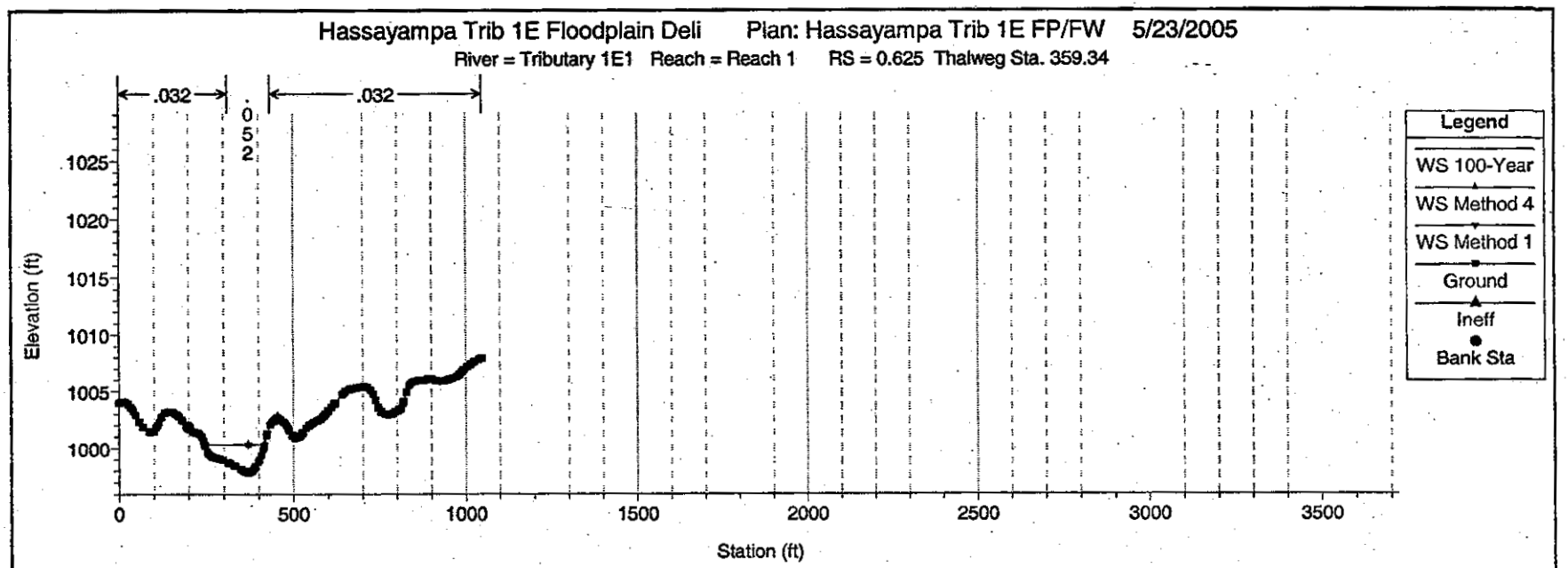


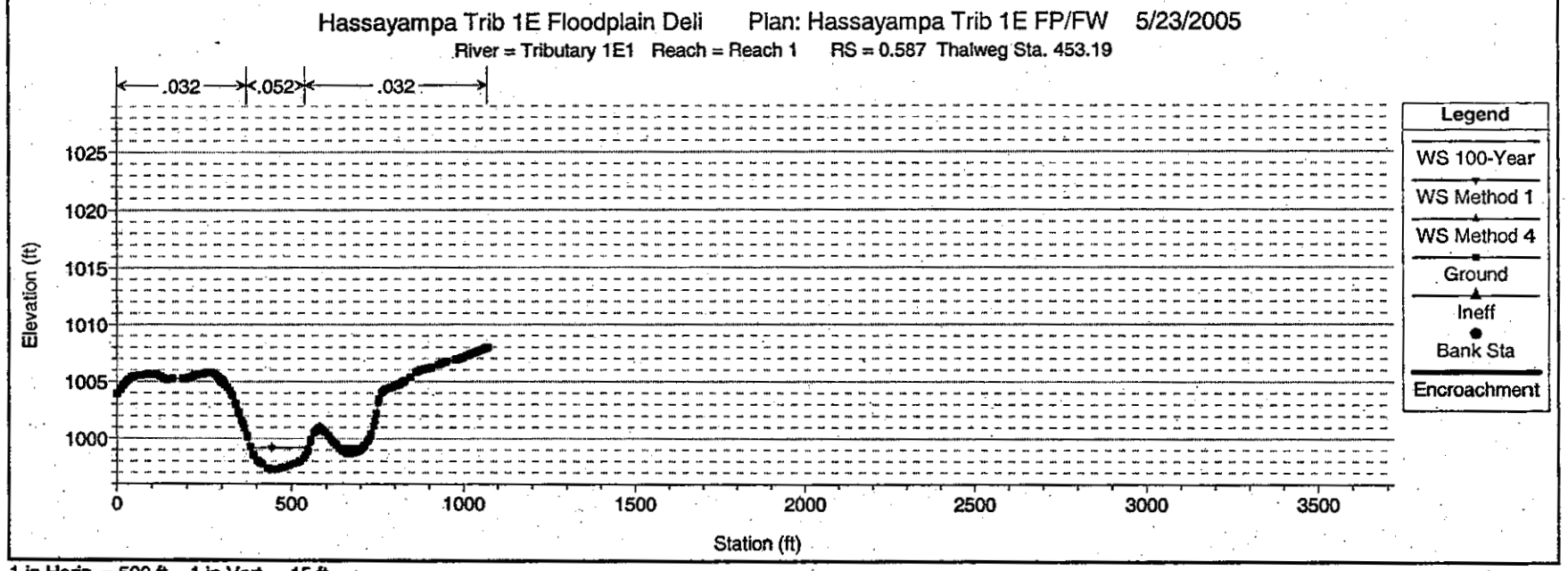

1 in Horiz. = 500 ft  1 in Vert. = 15 ft



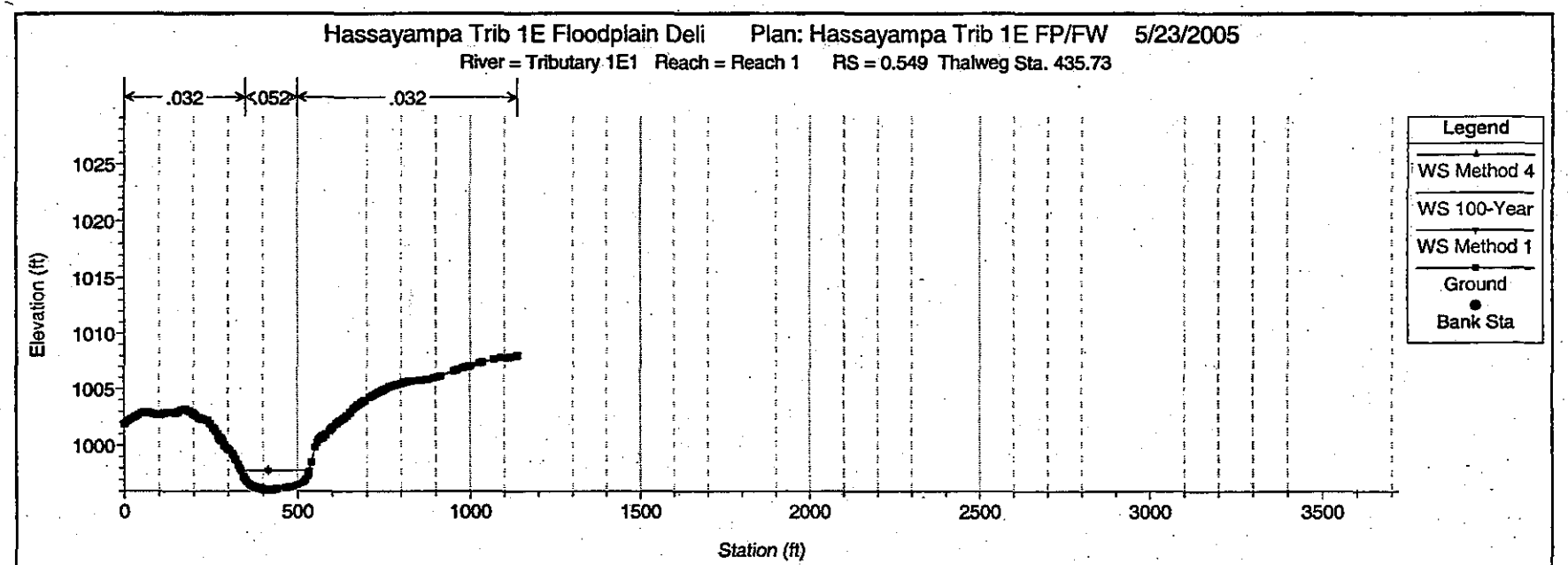



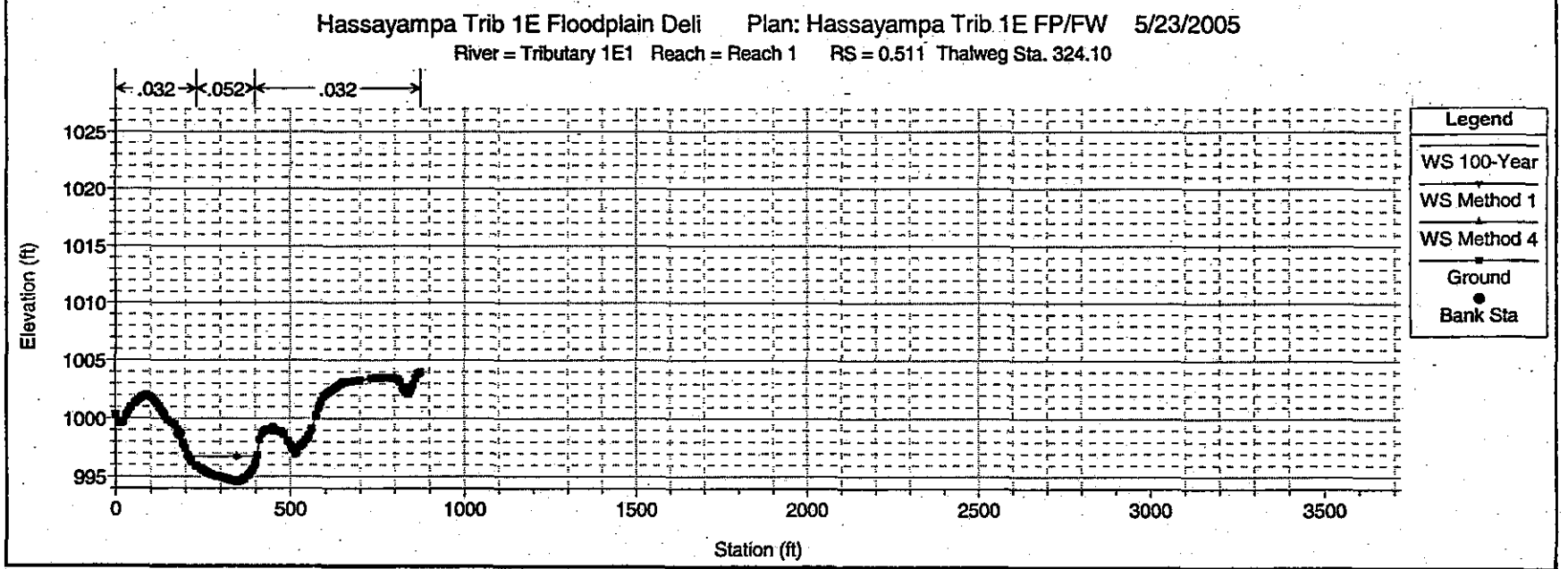

1 in Horiz. = 500 ft 1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

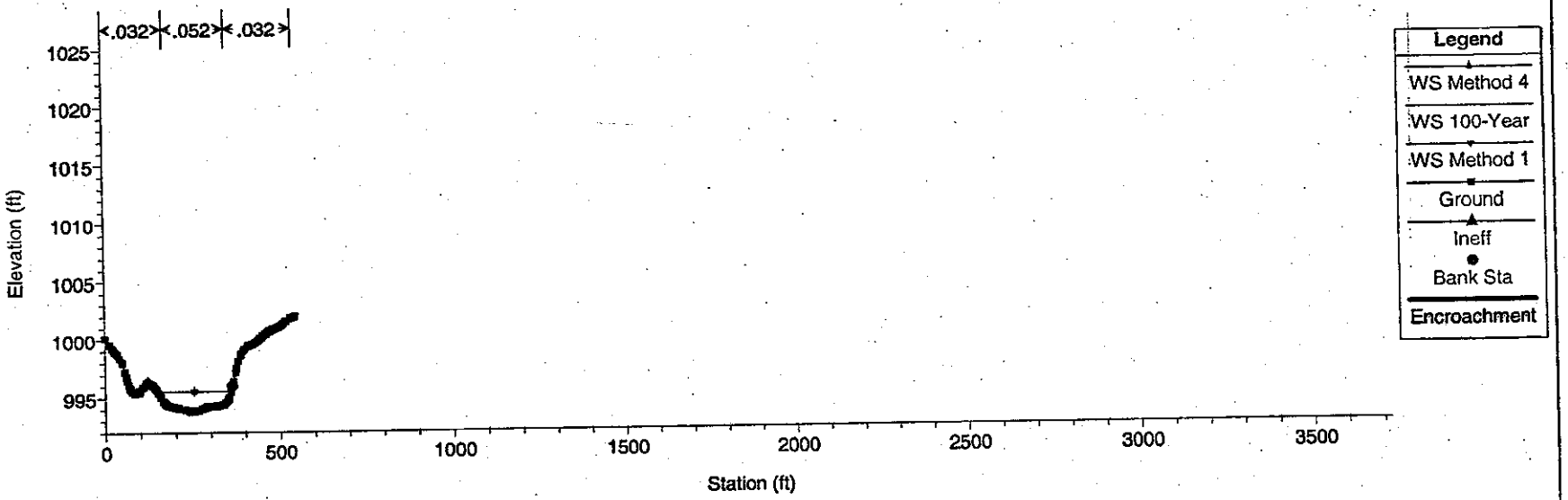



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

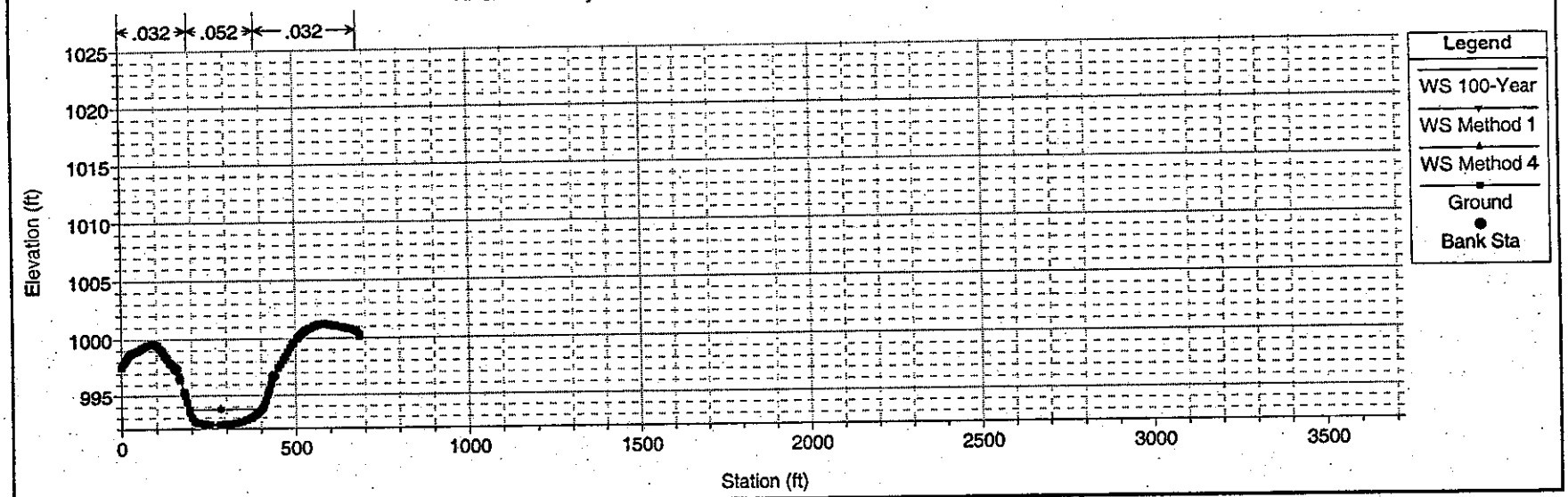
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 0.474  Thalweg Sta. 264.96

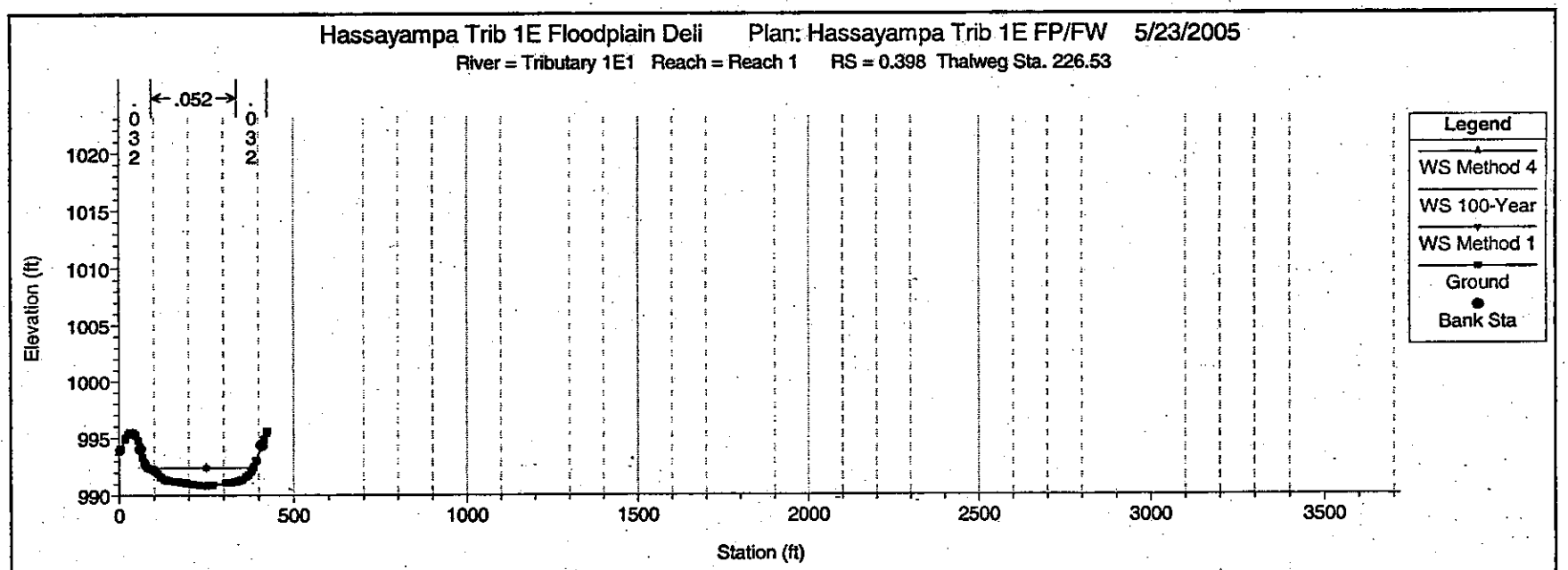


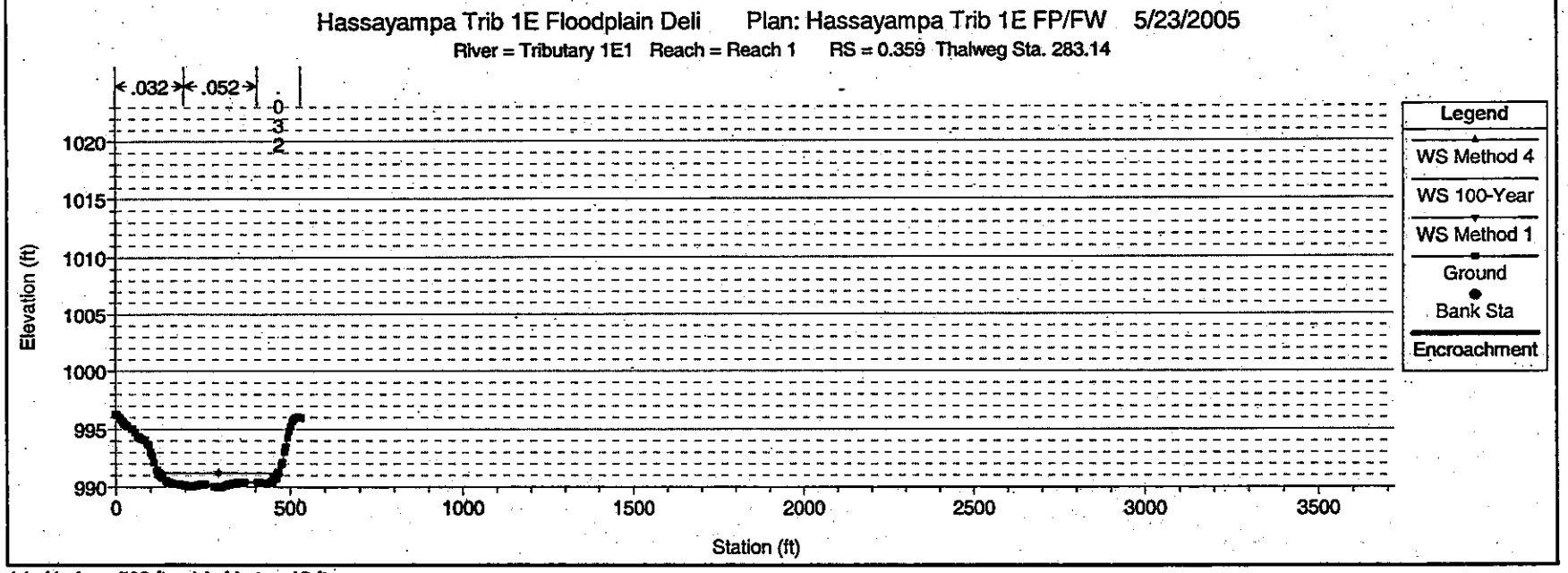

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 0.436  Thalweg Sta. 312.93

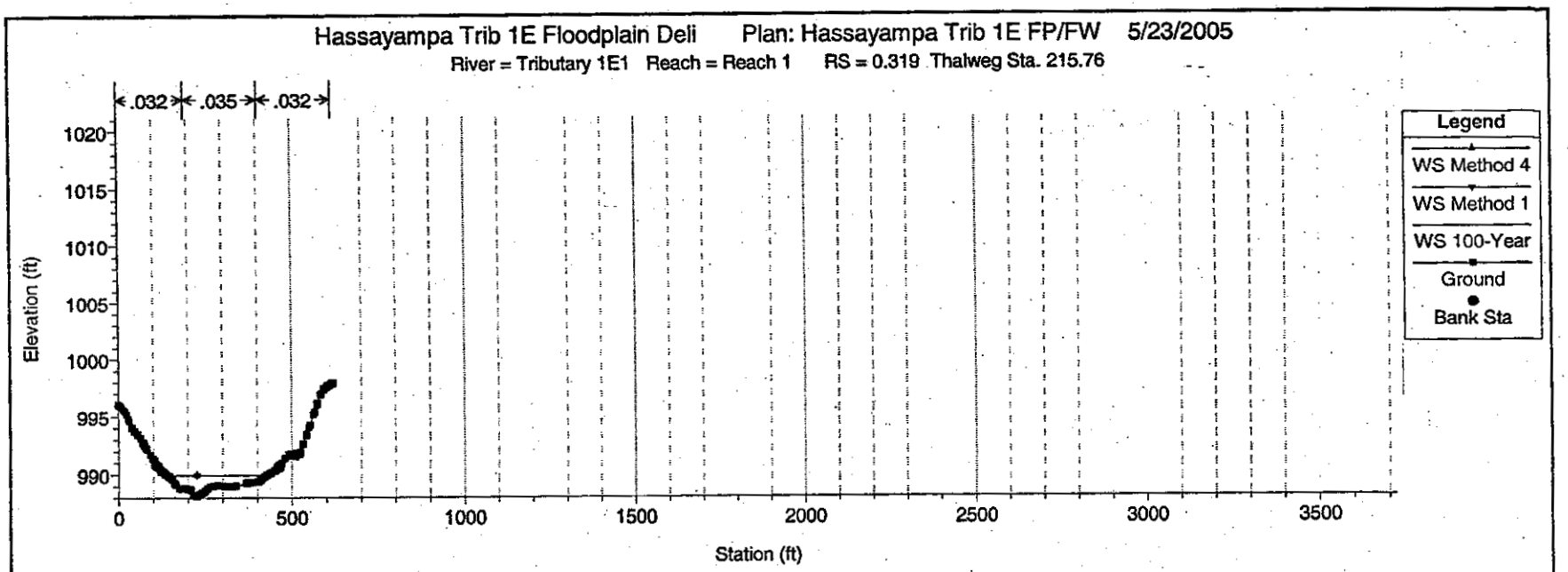


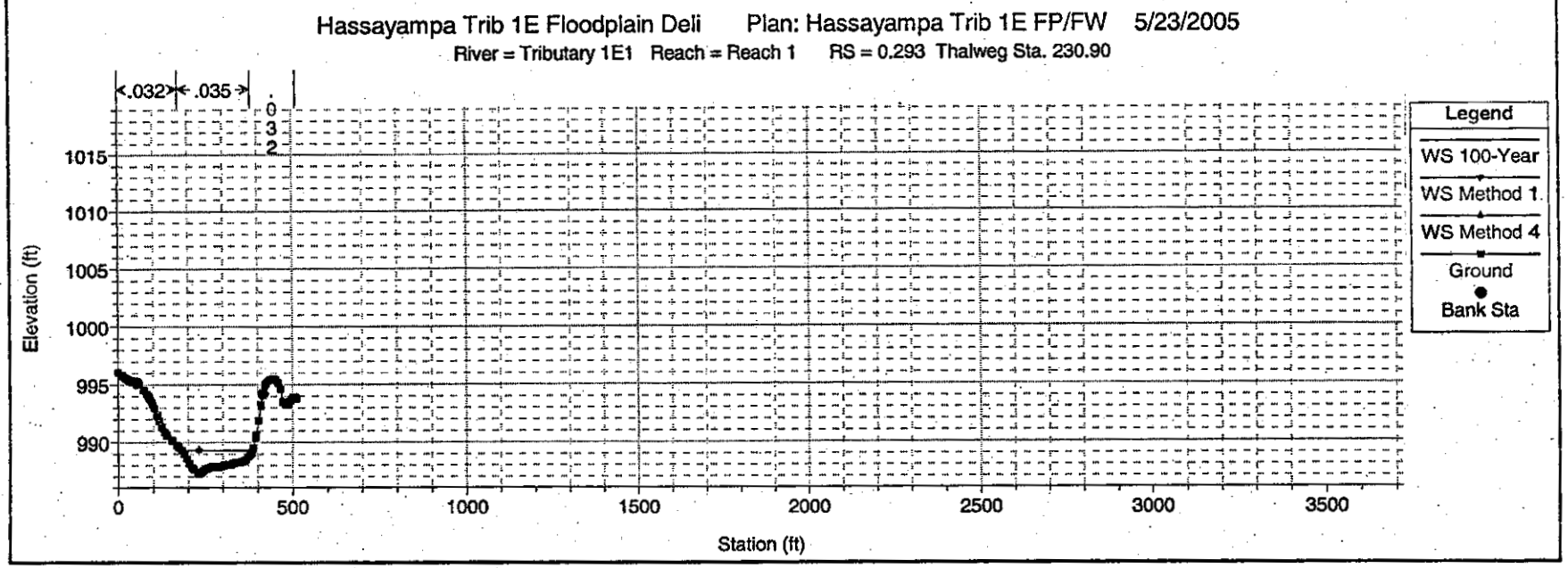

1 in Horiz. = 500 ft  1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

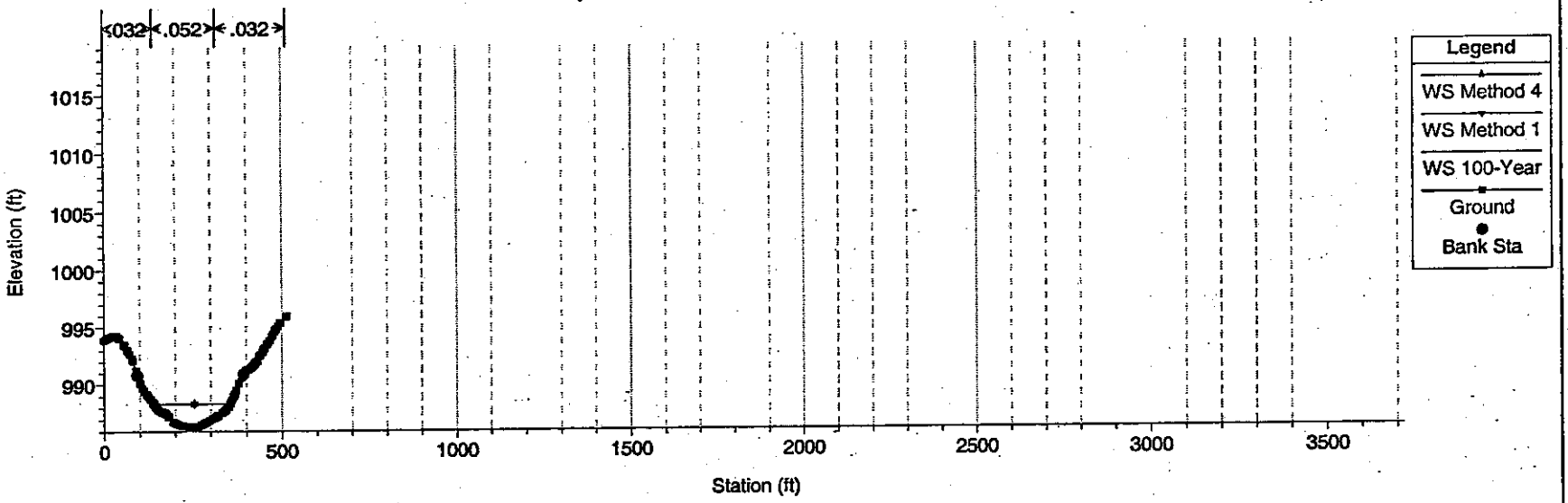



1 in Horiz. = 500 ft 1 in Vert. = 15 ft

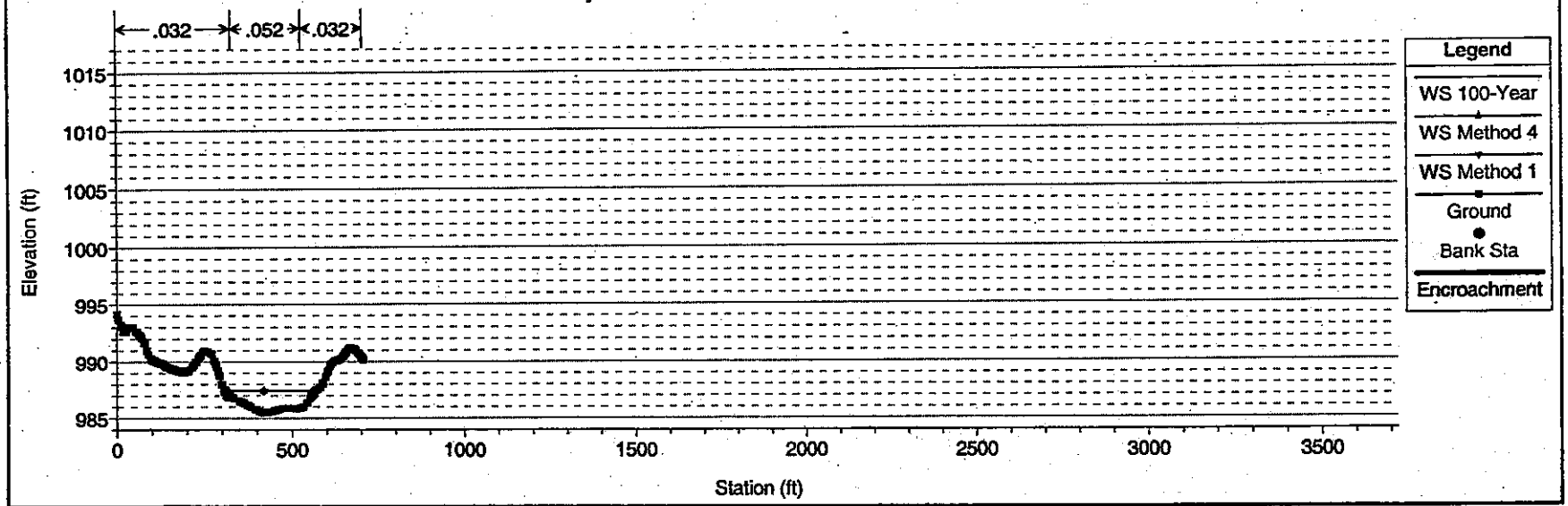
Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 0.254  Thalweg Sta. 251.43

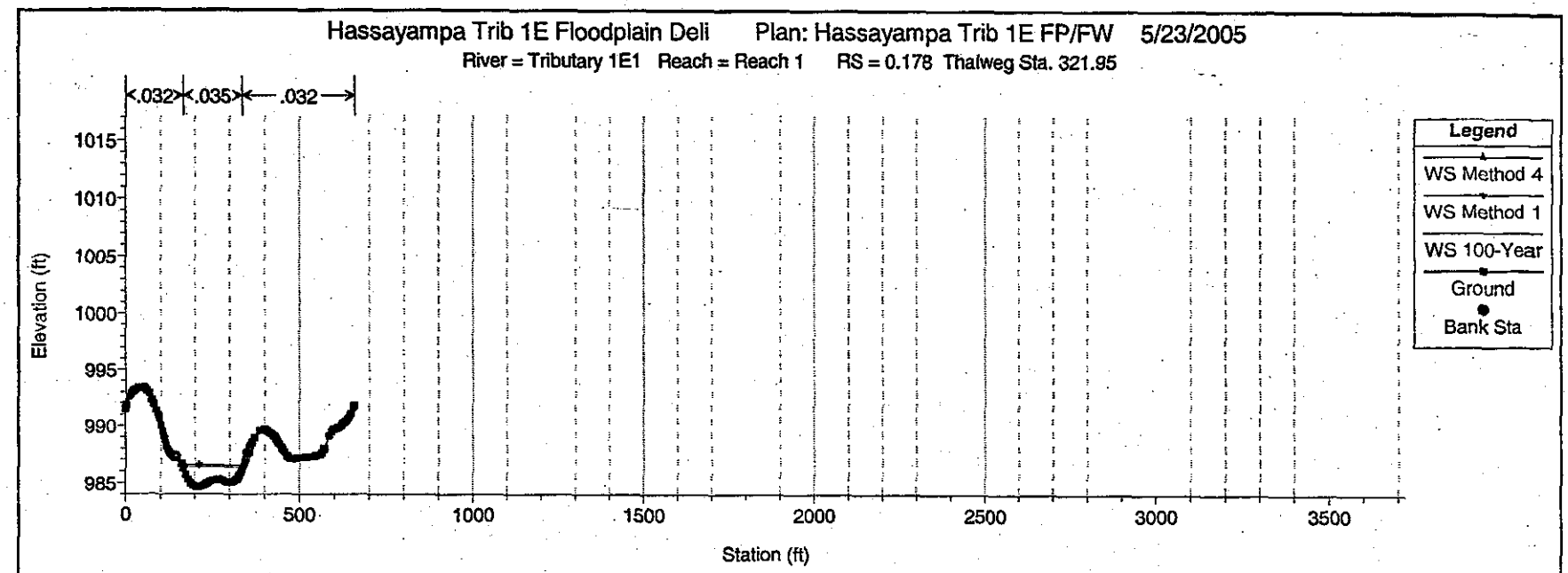


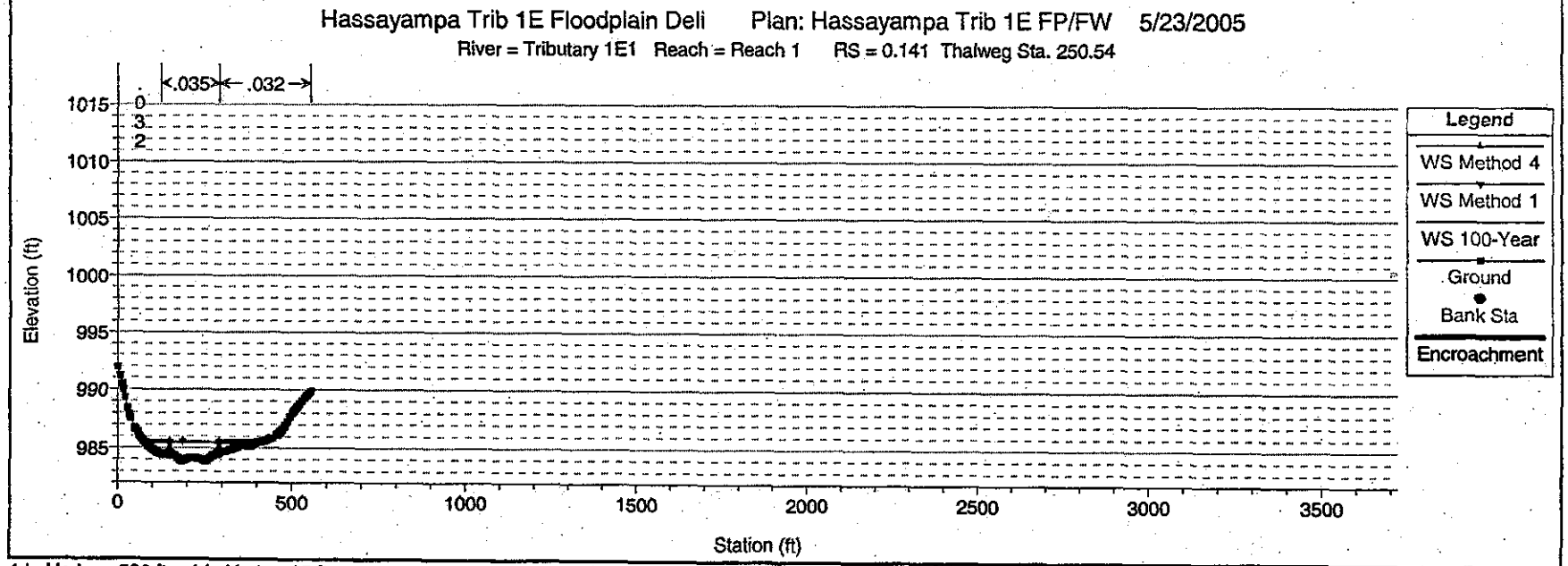

Hassayampa Trib 1E Floodplain Deli  Plan: Hassayampa Trib 1E FP/FW  5/23/2005

River = Tributary 1E1  Reach = Reach 1  RS = 0.216  Thalweg Sta. 454.48

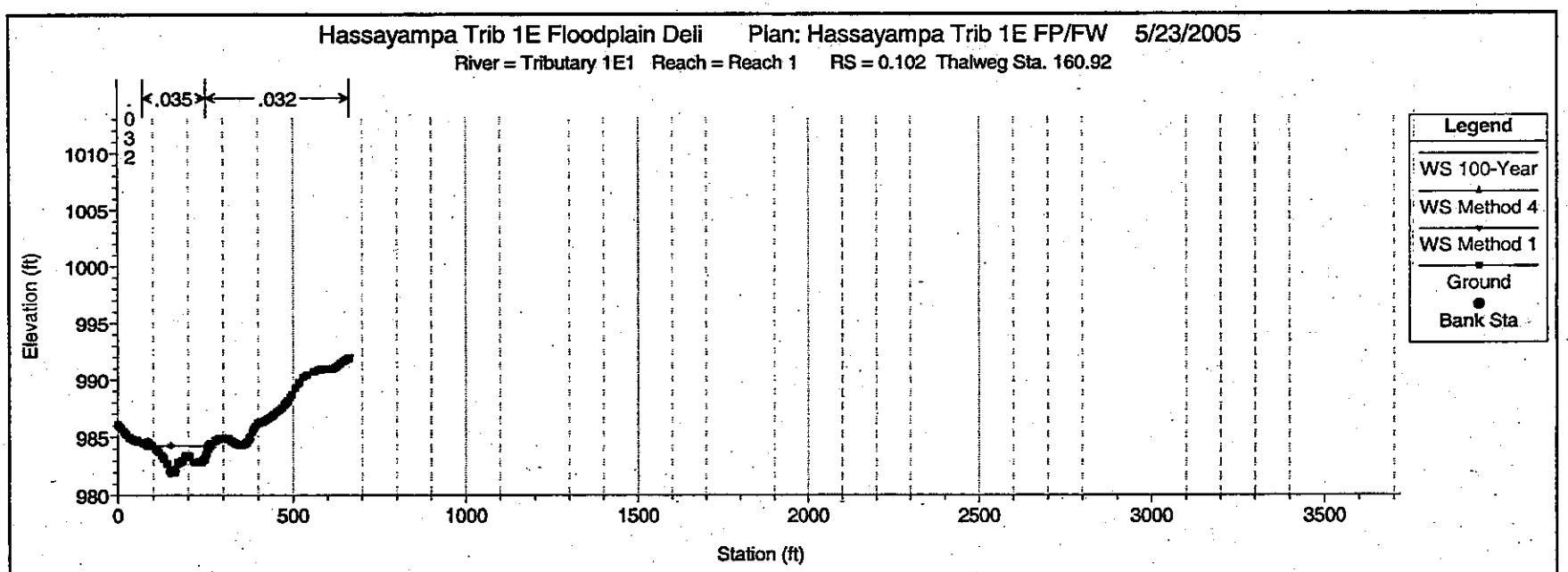


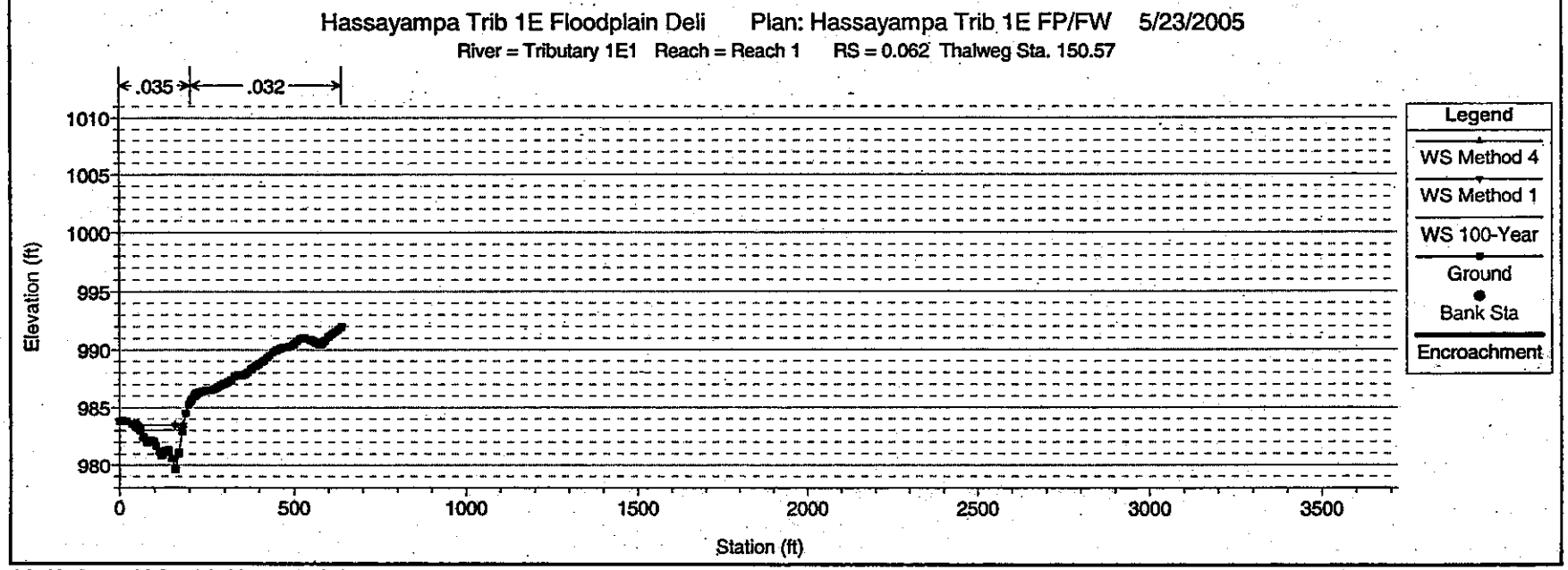

1 in Horiz. = 500 ft  1 in Vert. = 15 ft




1 in Horiz. = 500 ft 1 in Vert. = 15 ft



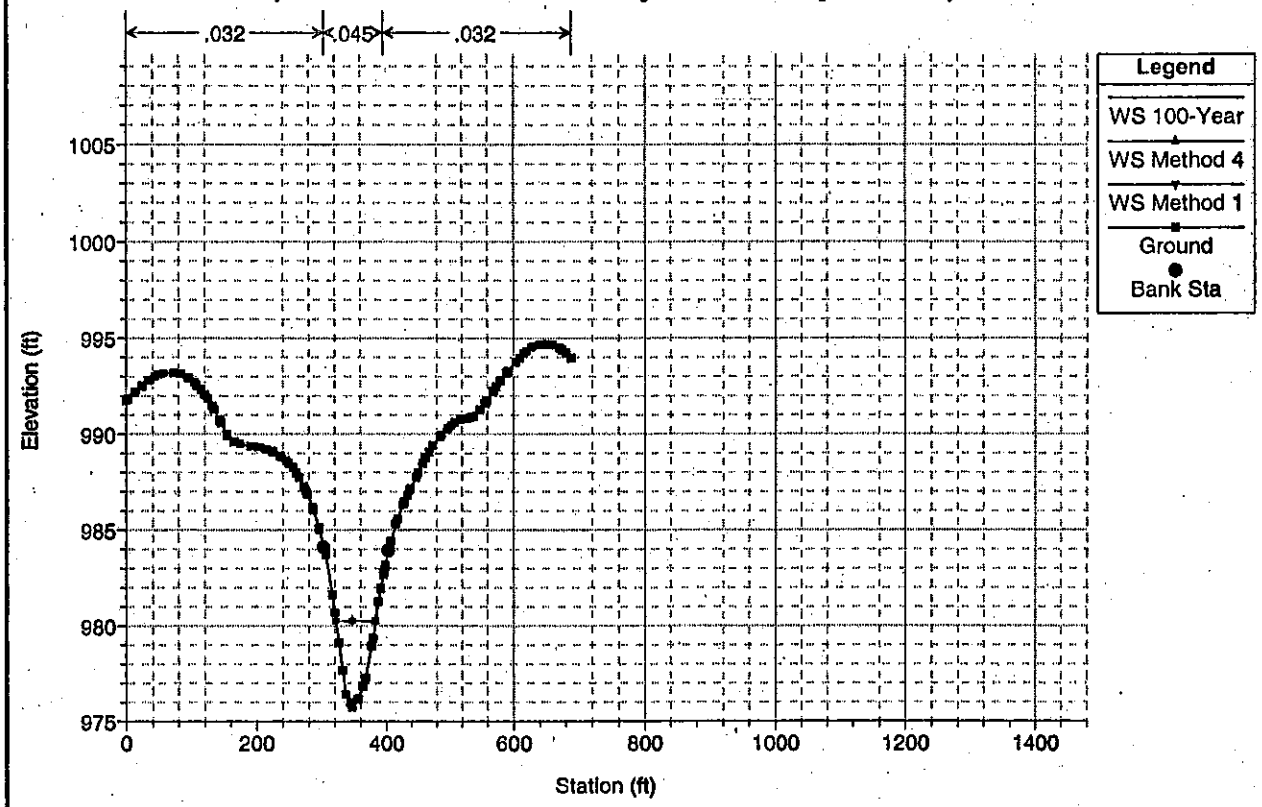




1 in Horiz. = 500 ft 1 in Vert. = 15 ft

### 3.2.2 Tributary 3E – All Reaches

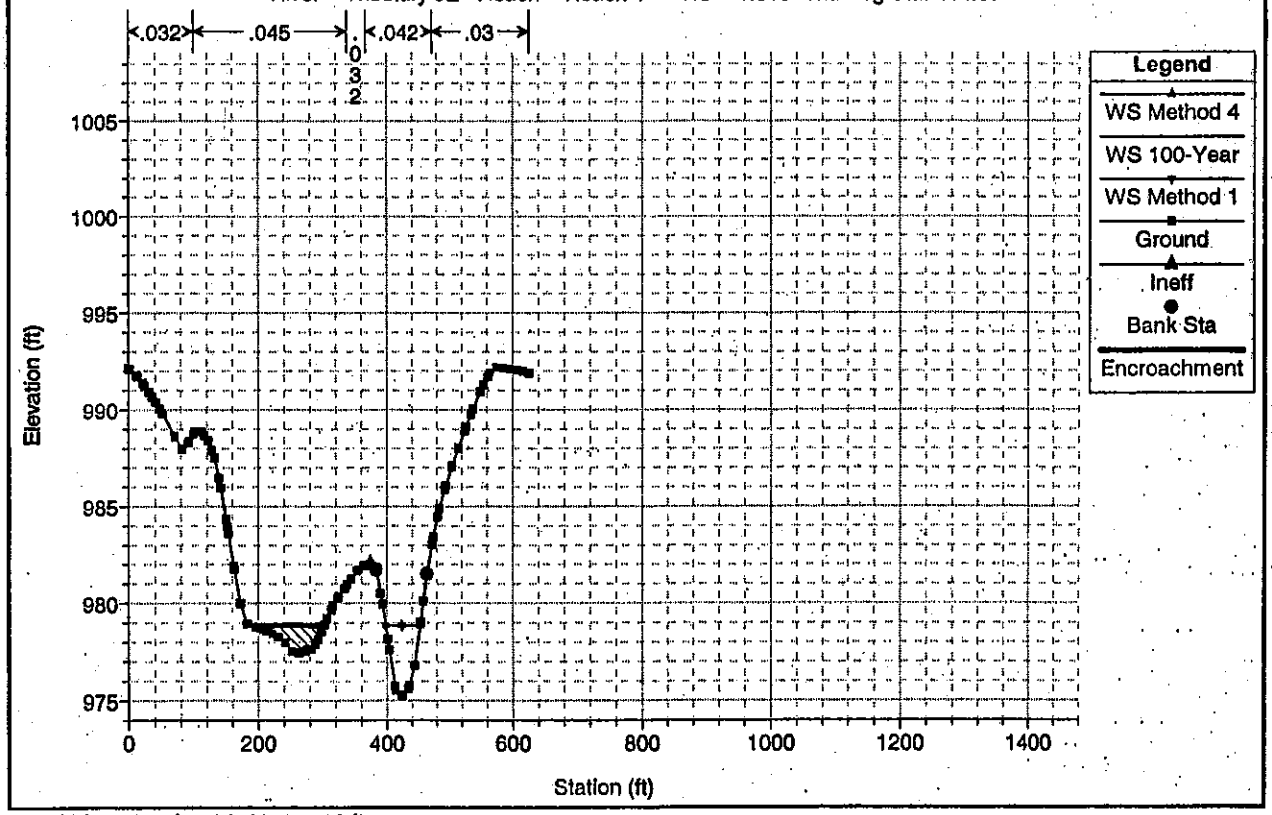
Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.553 Thalweg Sta. 346.61 - Discharge from A2 - 100y6h.out HEC-1 Model




Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

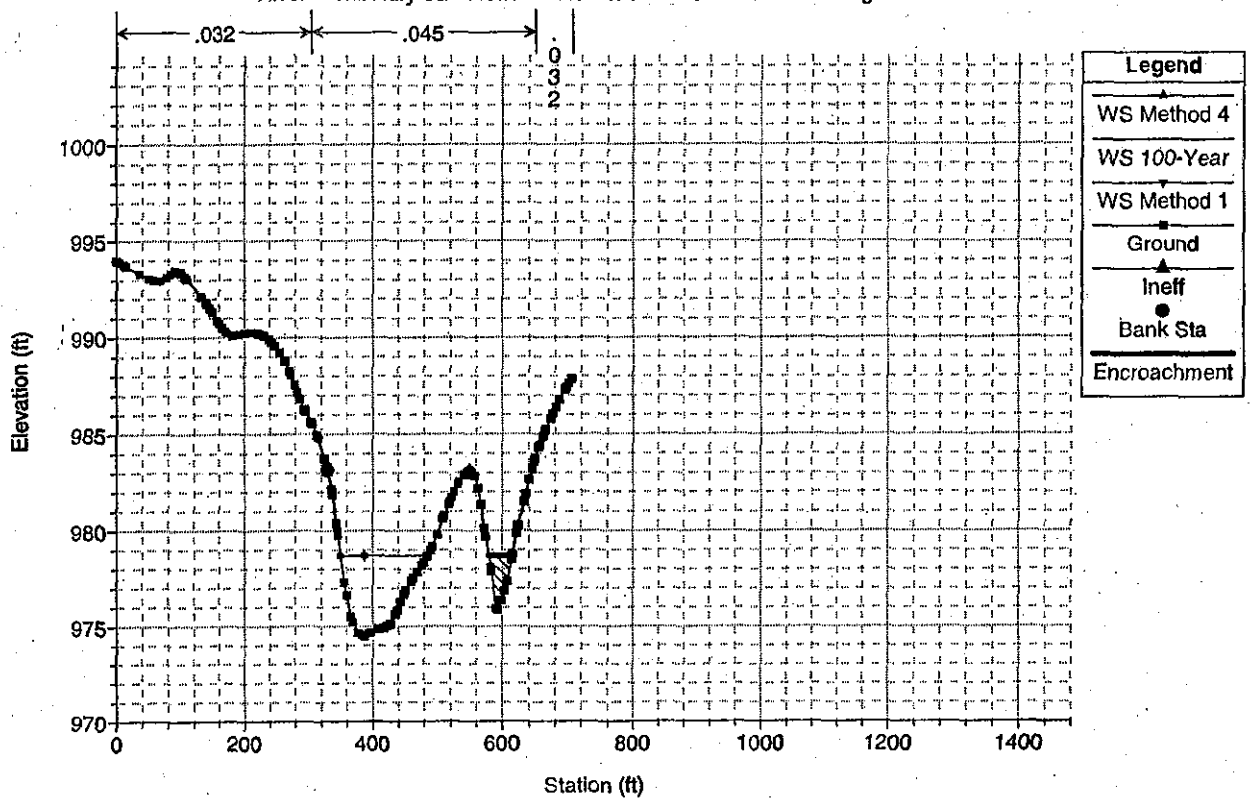
River = Tributary 3E  Reach = Reach 1  RS = 1.515 Thalweg Sta. 414.07




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

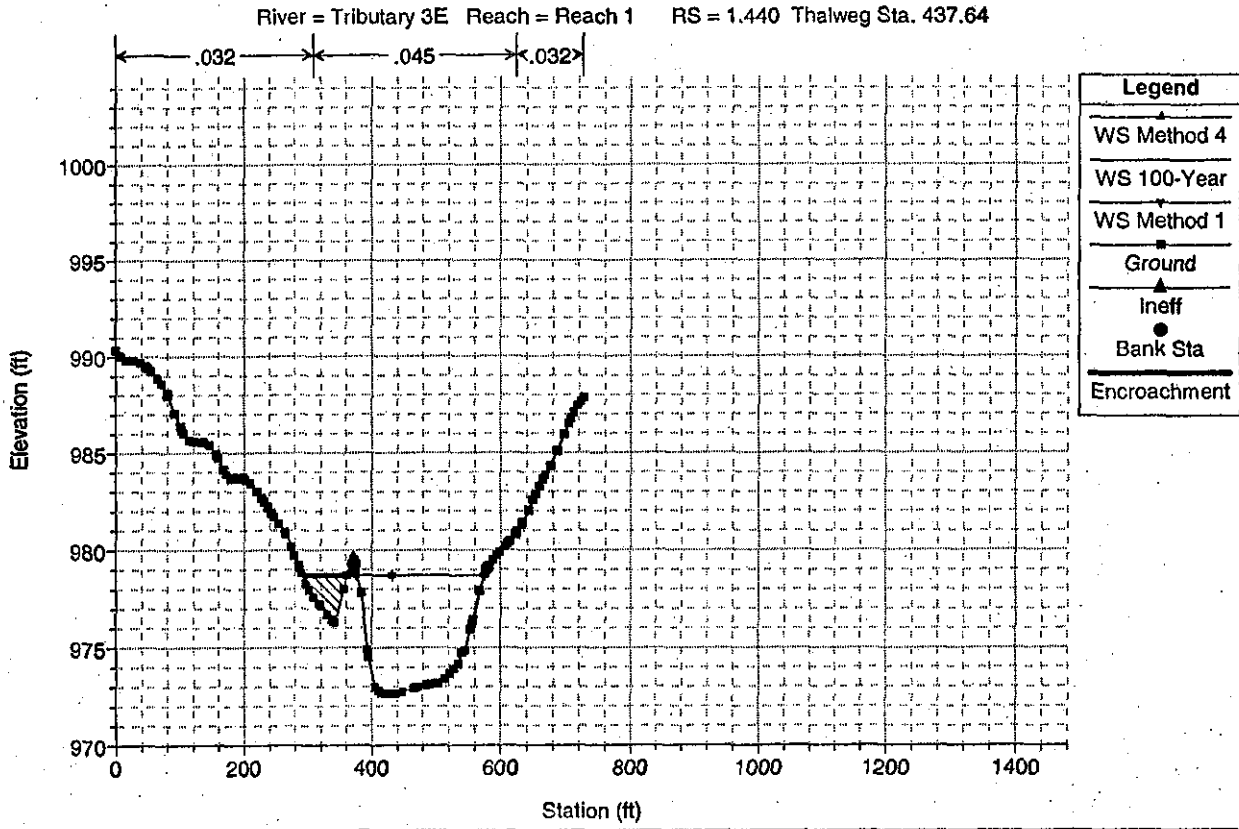
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.478  Thalweg Sta. 418.11




Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

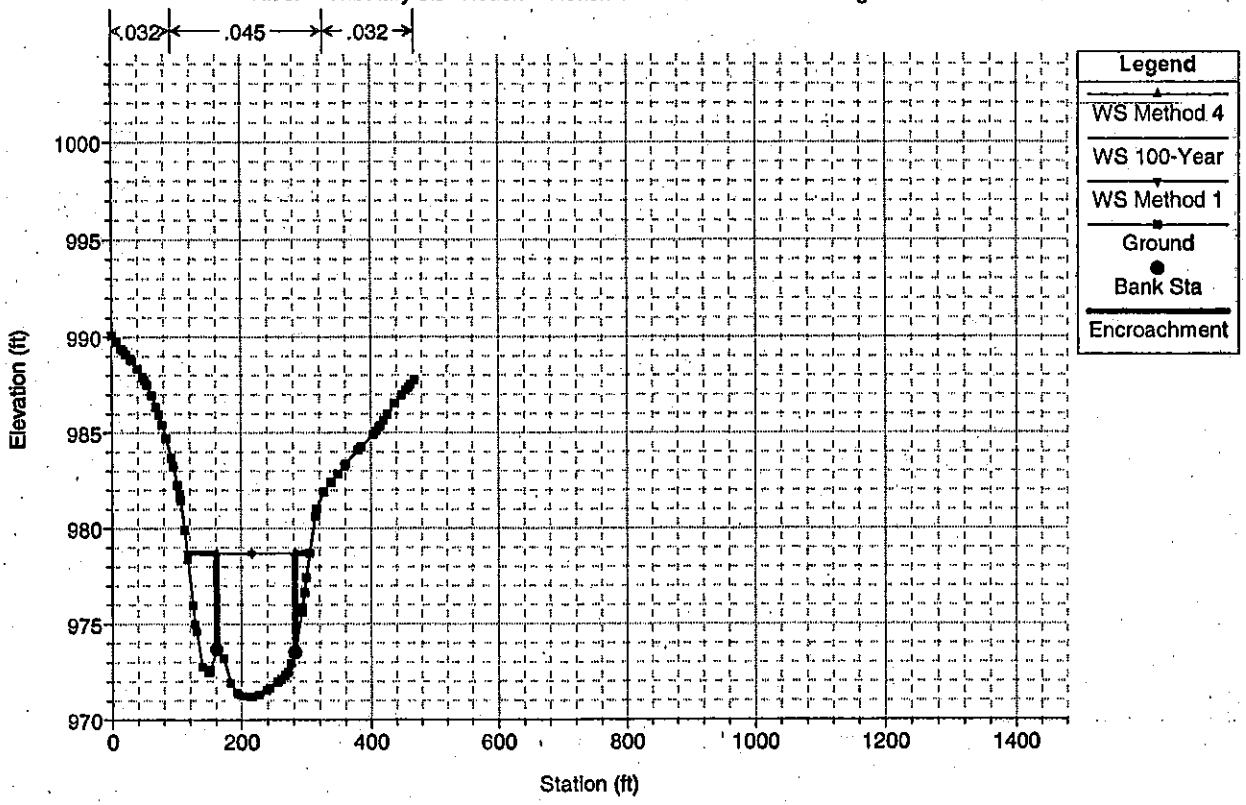
River = Tributary 3E  Reach = Reach 1  RS = 1.440  Thalweg Sta. 437.64




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

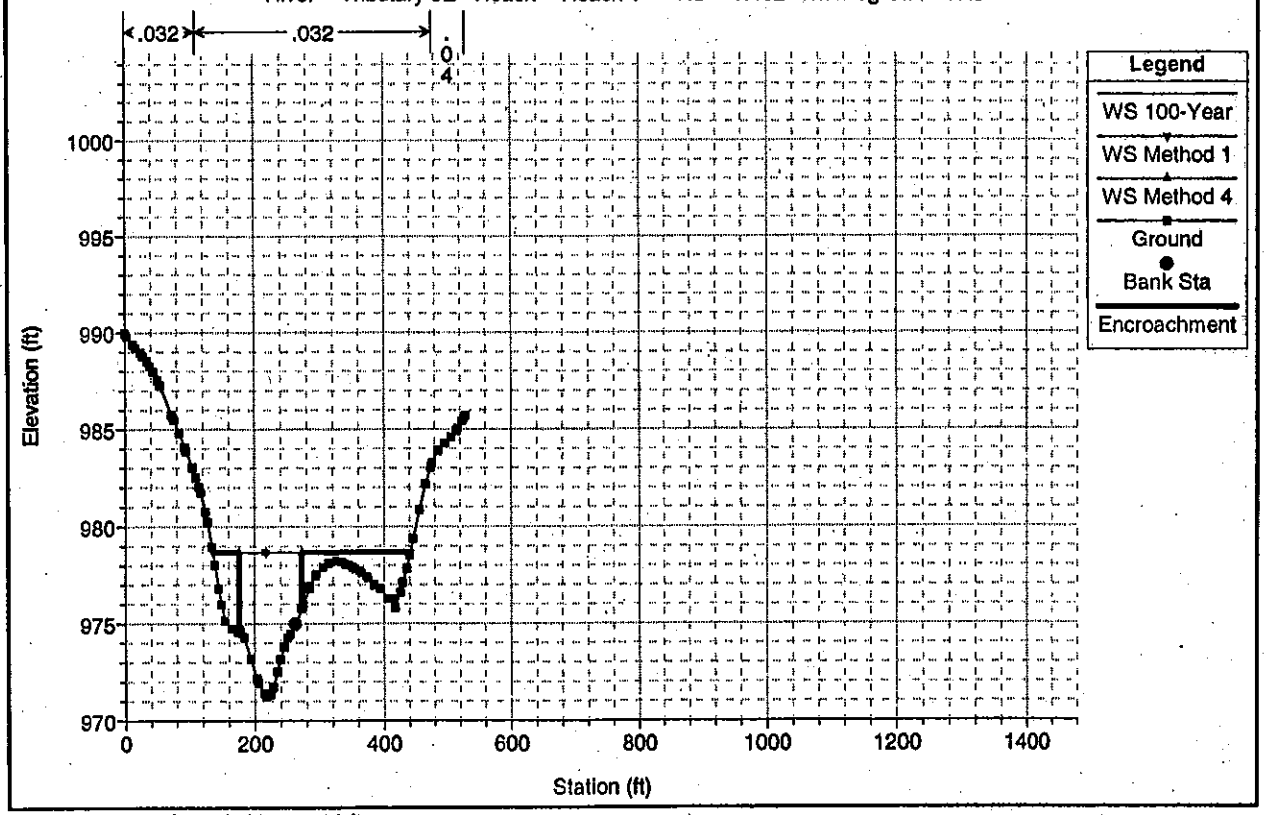
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.421  Thalweg Sta. 216.68




Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

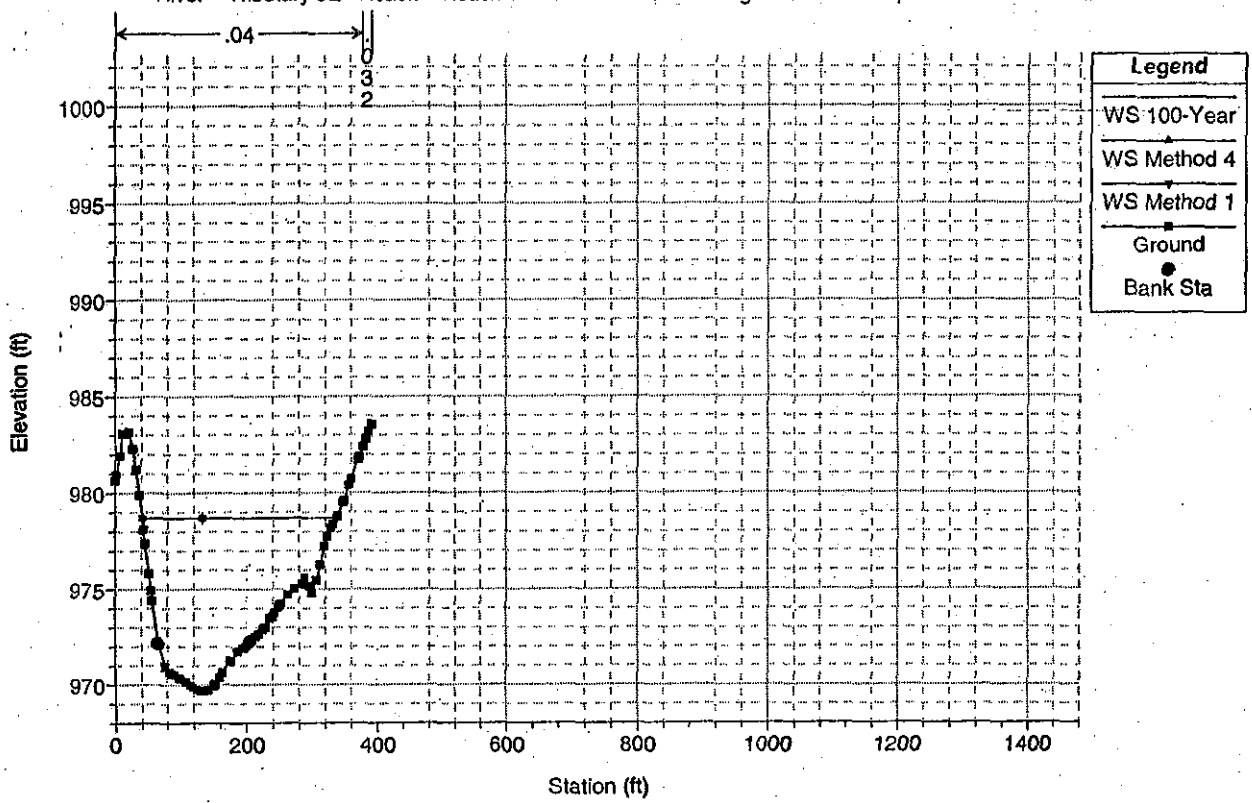
River = Tributary 3E  Reach = Reach 1  RS = 1.402  Thalweg Sta. 217.26




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

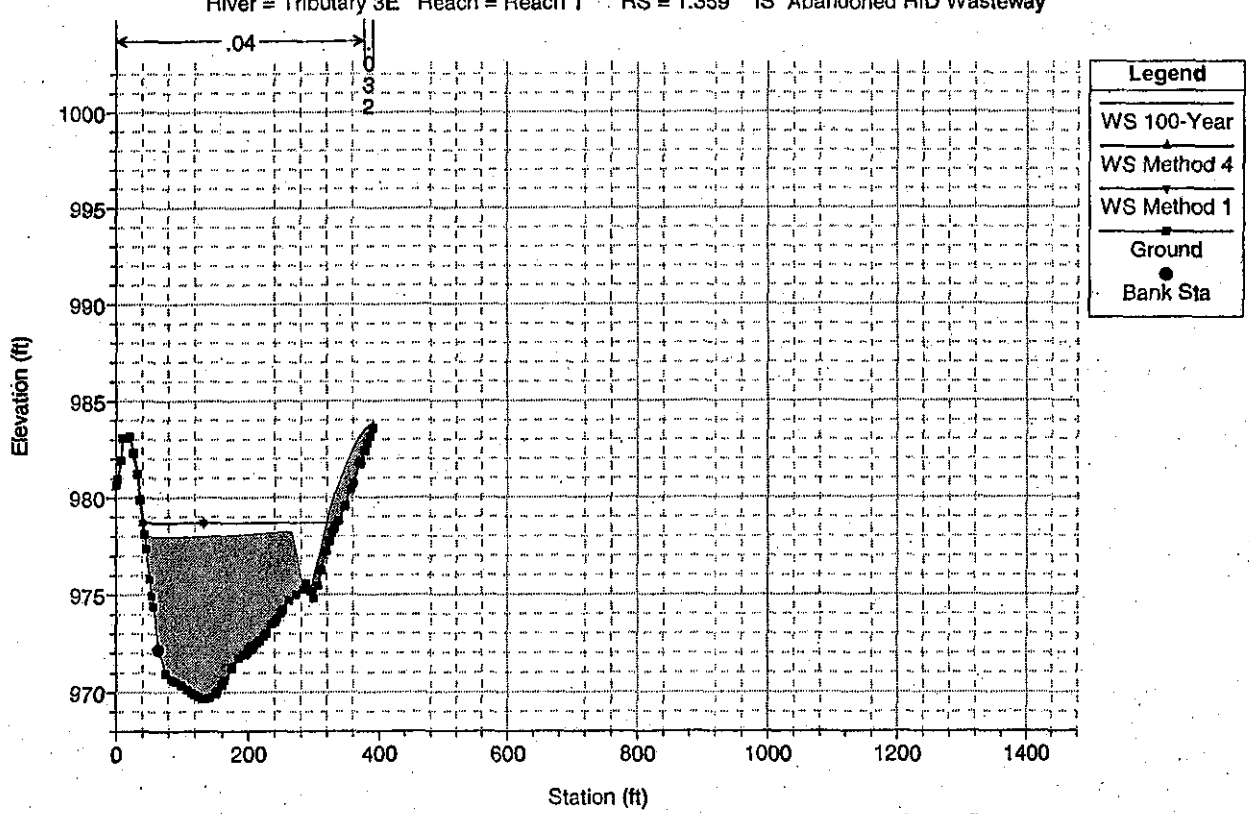
Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.378 Thalweg Sta. 130.82 - Upstream of Inline weir




Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

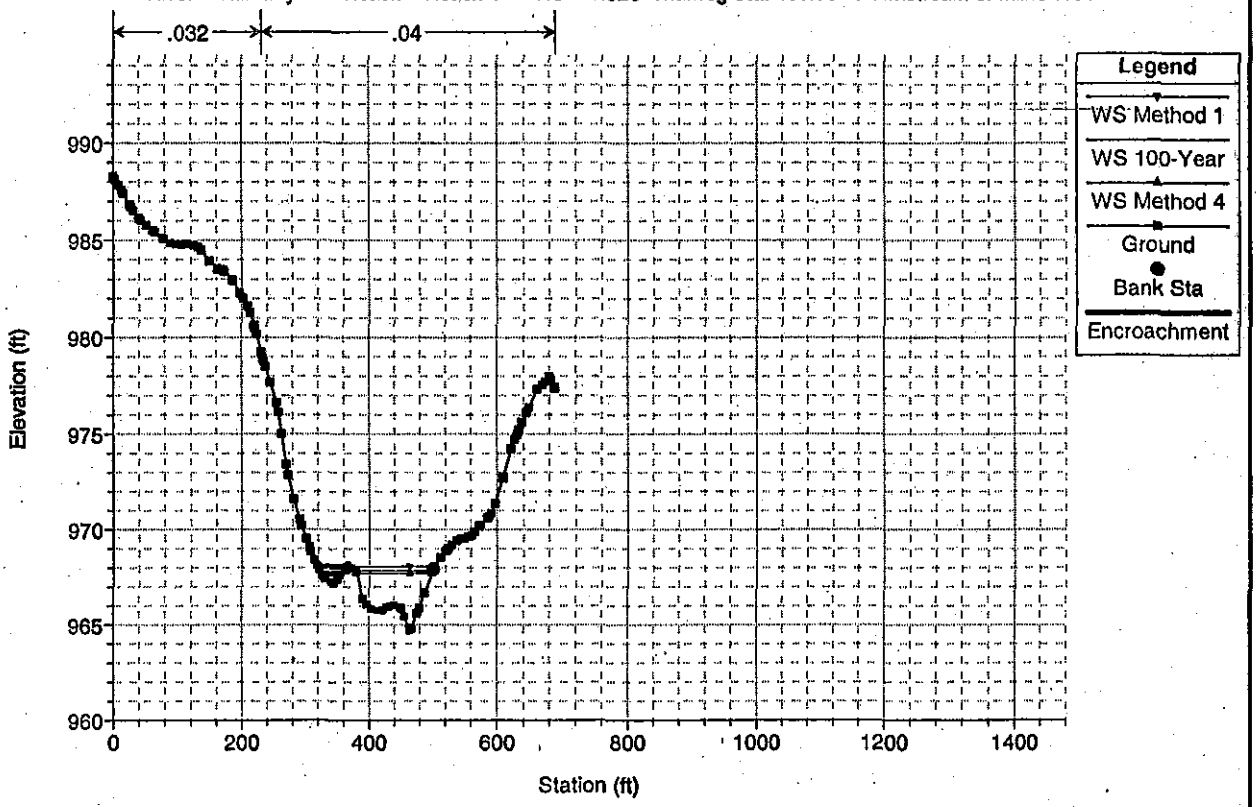
River = Tributary 3E  Reach = Reach 1  RS = 1.359  IS Abandoned RID Wasteway




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

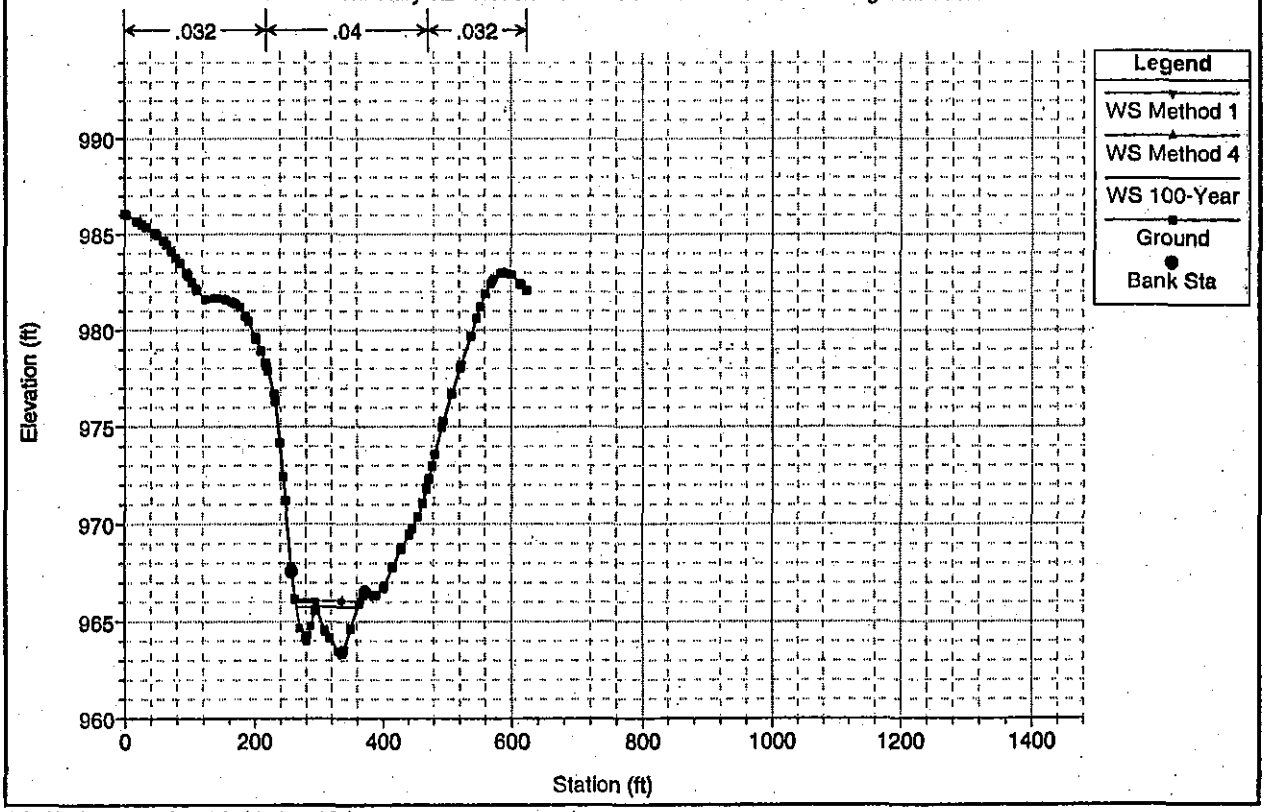
Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.326  Thalweg Sta. 463.96 - Downstream of Inline Weir




Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

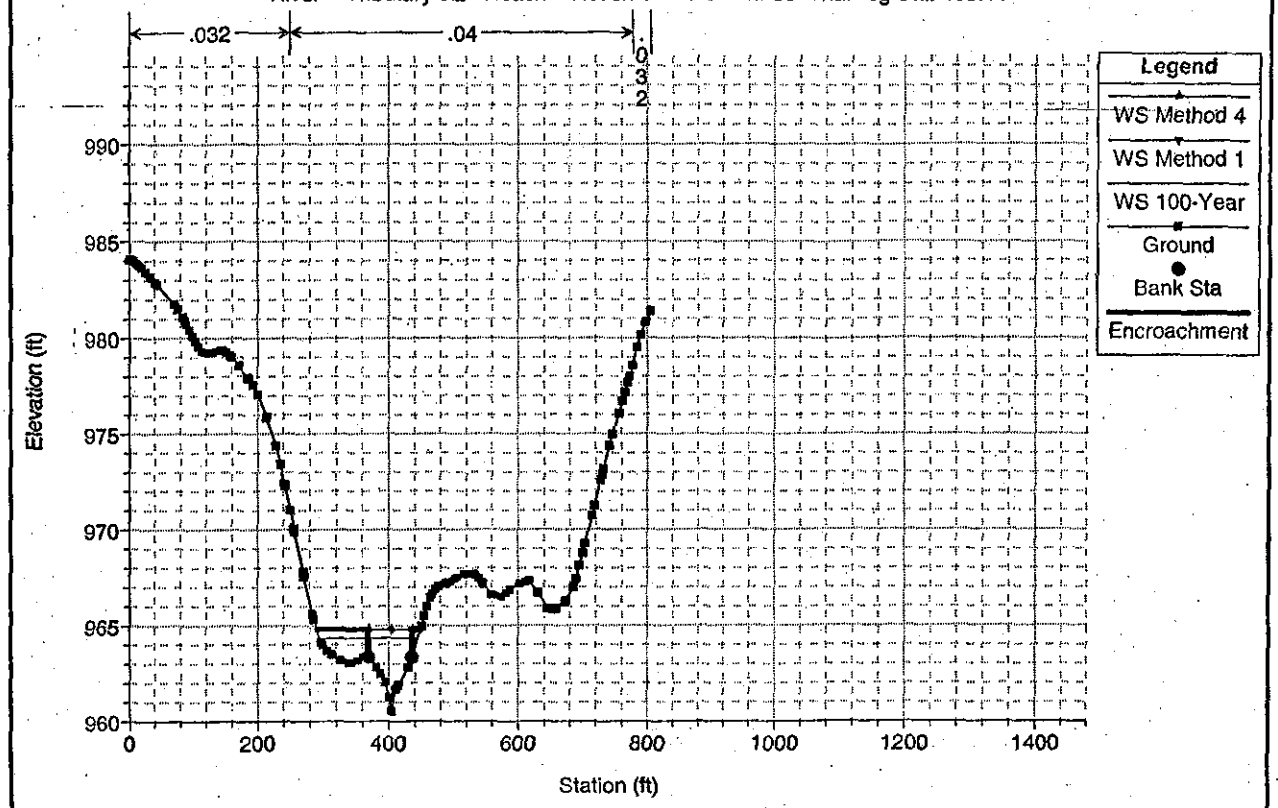
River = Tributary 3E  Reach = Reach 1  RS = 1.288  Thalweg Sta. 336.63




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

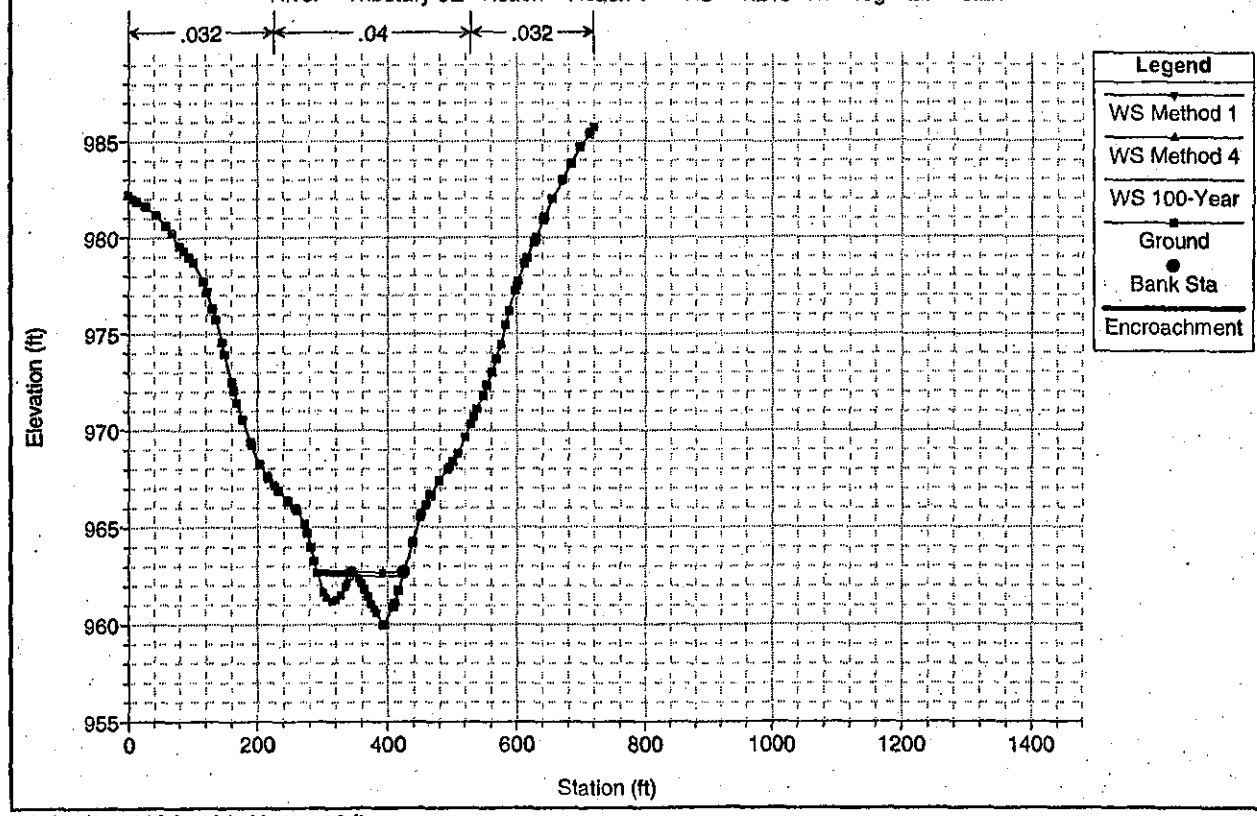
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.250  Thalweg Sta. 405.15




Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

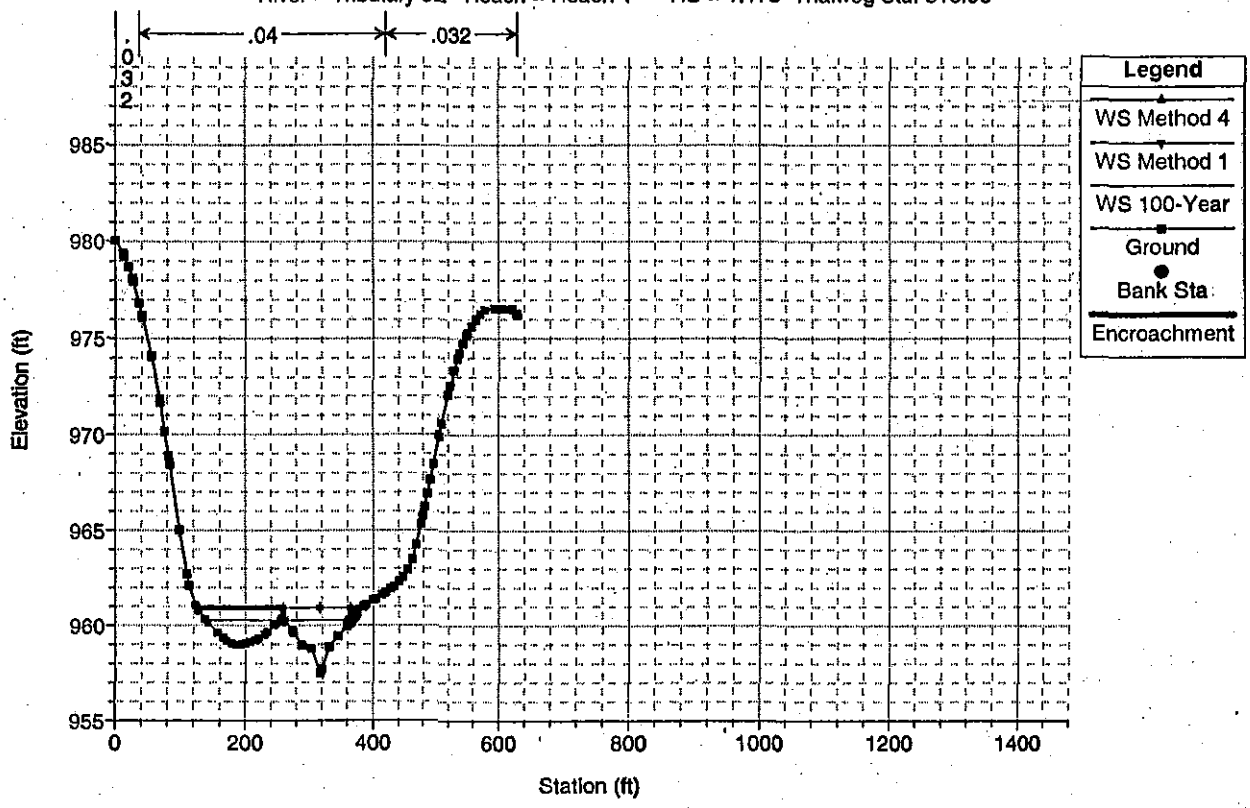
River = Tributary 3E  Reach = Reach 1  RS = 1.213  Thalweg Sta. 393.22




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

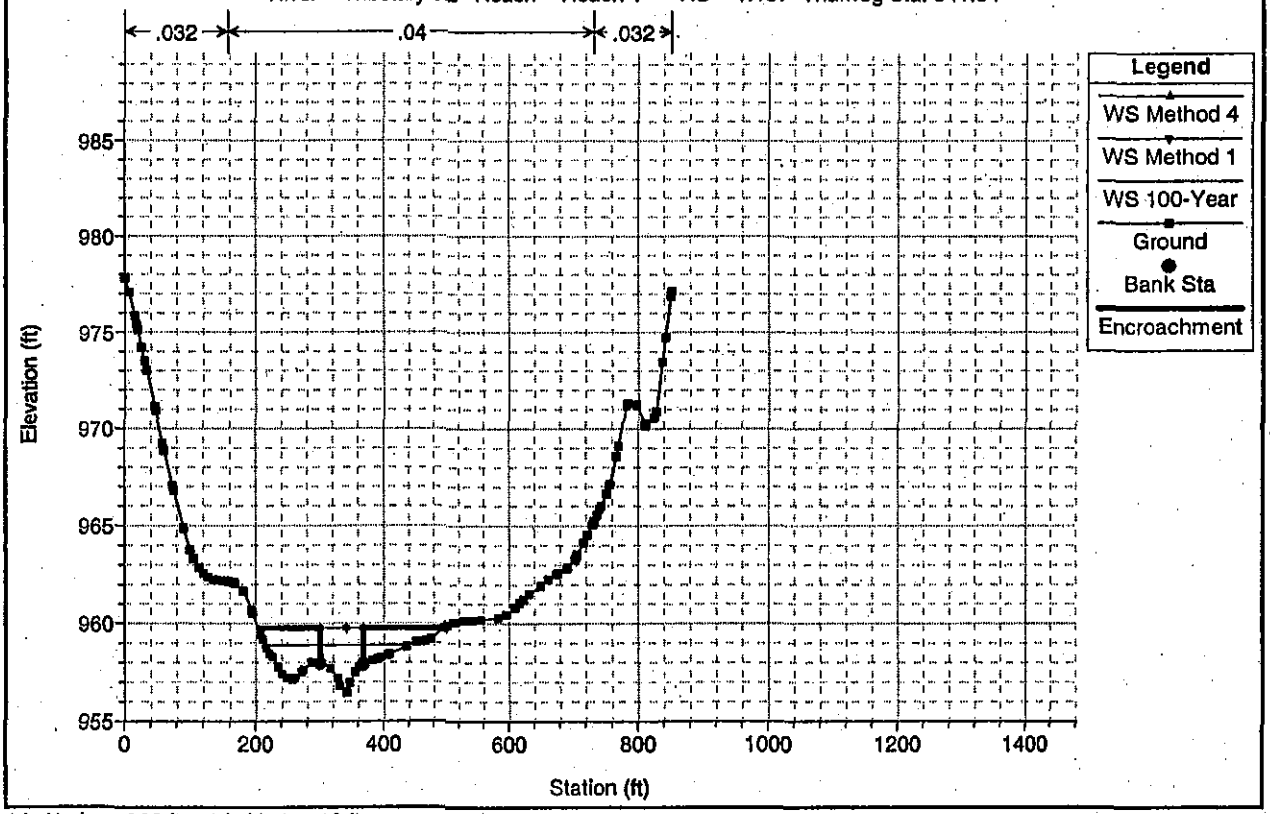
Hassayampa Trib 3E Floodplain Dell Plan: Hassayampa Trib 3E FP/FW 5/19/2005

River = Tributary 3E Reach = Reach 1 RS = 1.175 Thalweg Sta. 316.96




Hassayampa Trib 3E Floodplain Dell Plan: Hassayampa Trib 3E FP/FW 5/19/2005

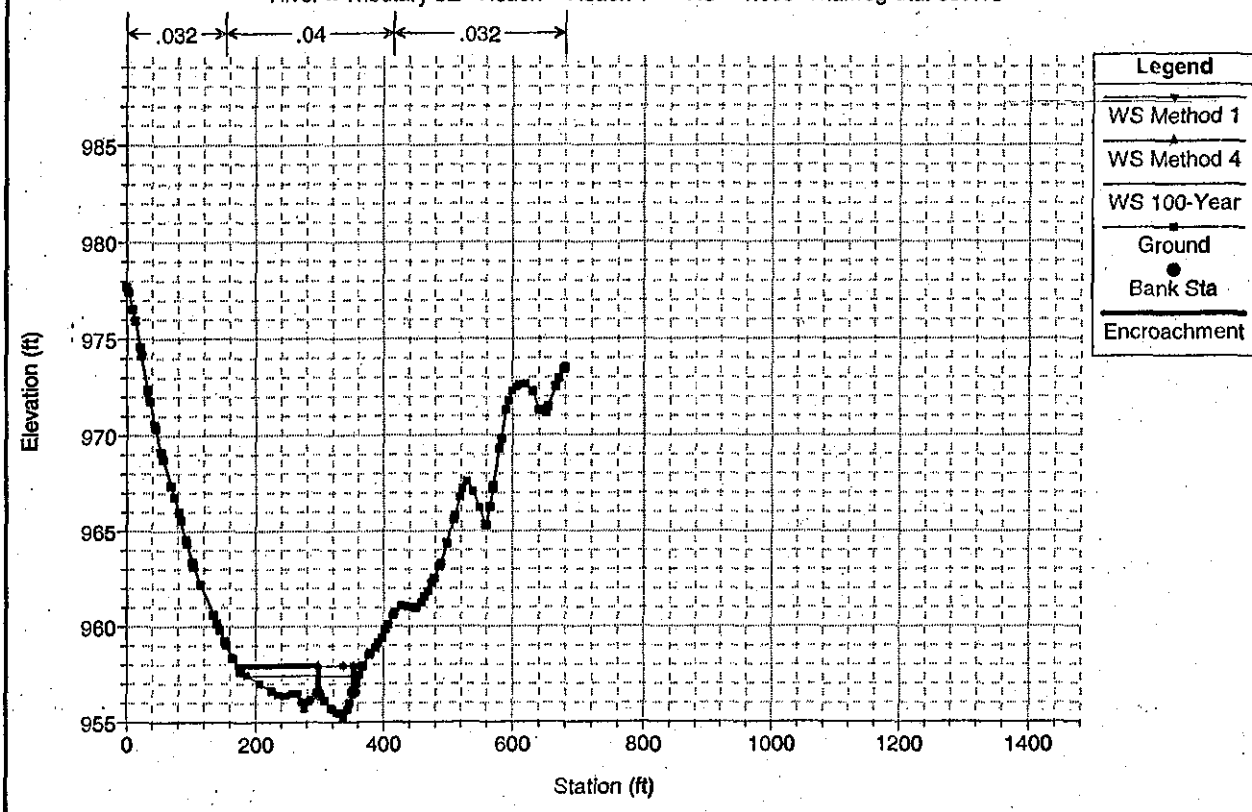
River = Tributary 3E Reach = Reach 1 RS = 1.137 Thalweg Sta. 341.54




1 in Horiz. = 300 ft 1 in Vert. = 10 ft

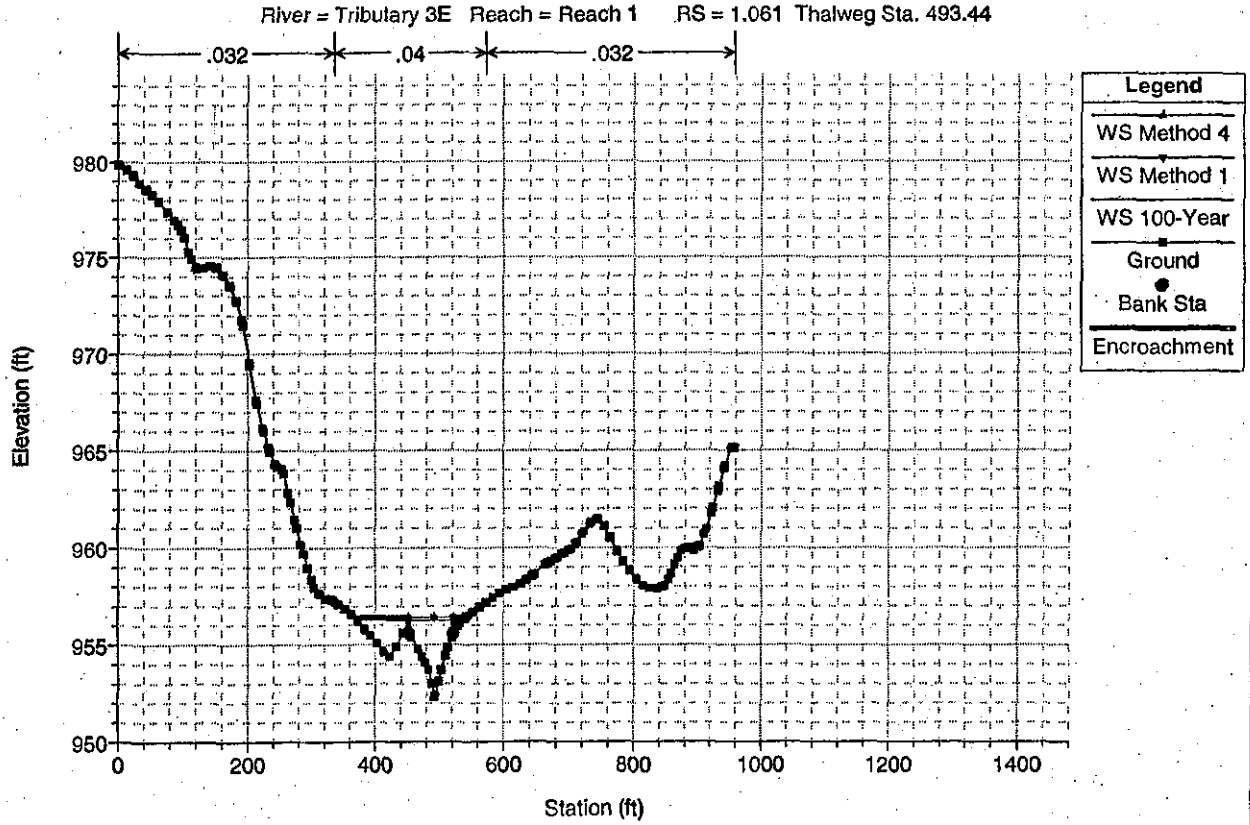
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.099  Thalweg Sta. 337.10




Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

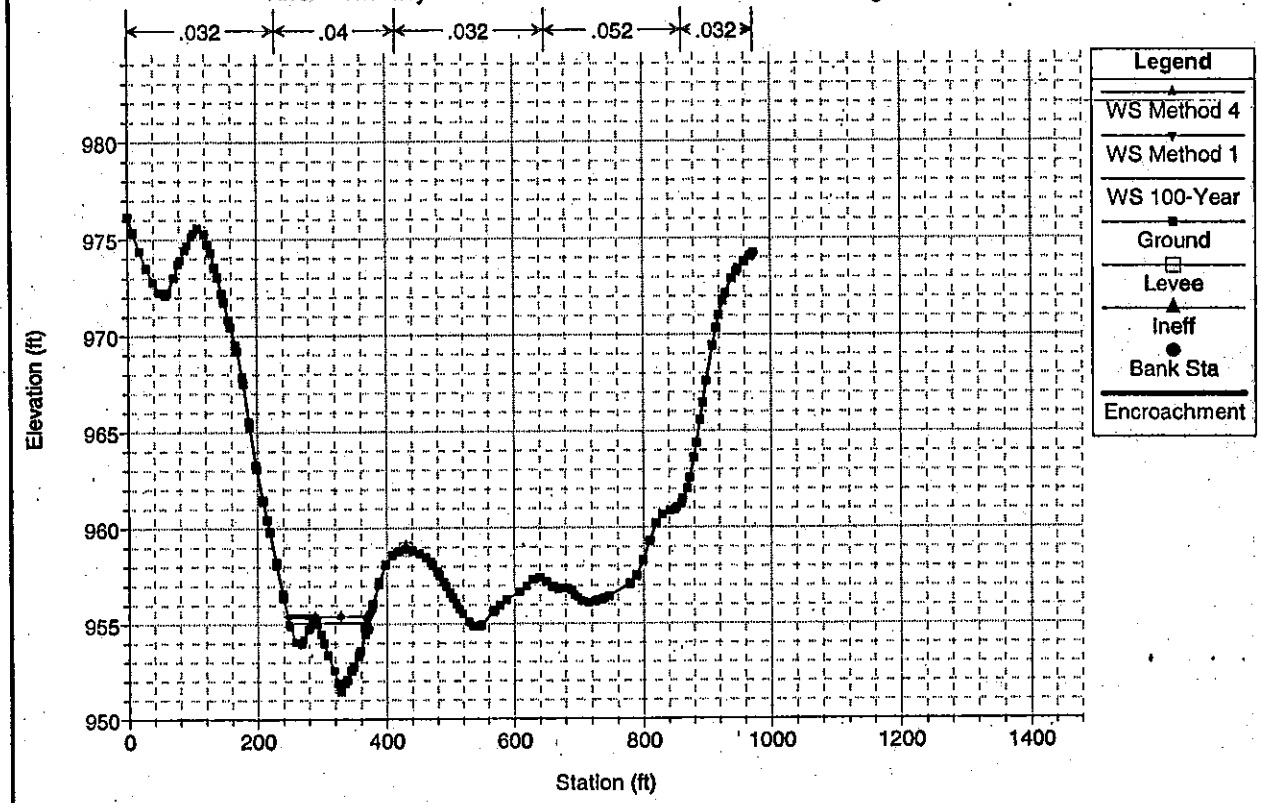
River = Tributary 3E  Reach = Reach 1  RS = 1.061  Thalweg Sta. 493.44




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

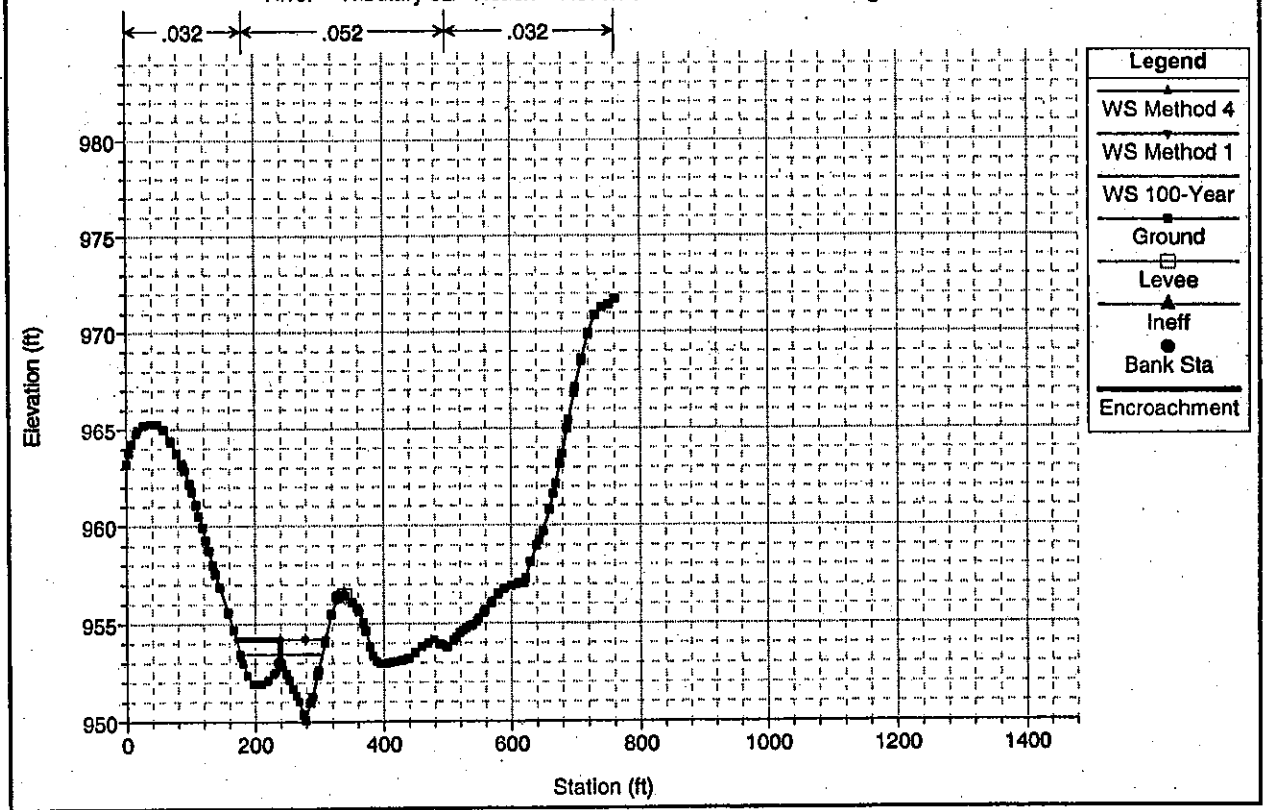
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 1.023  Thalweg Sta. 329.08

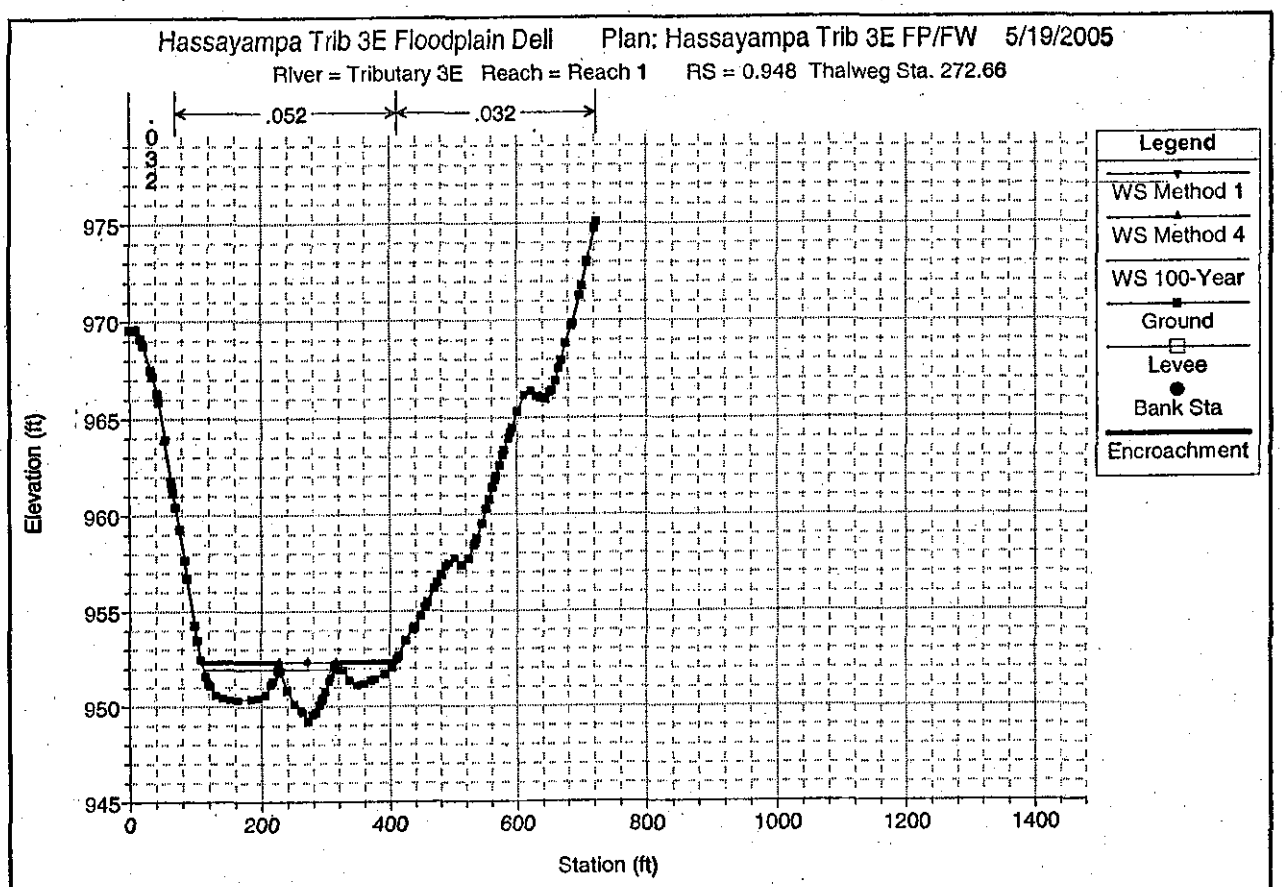


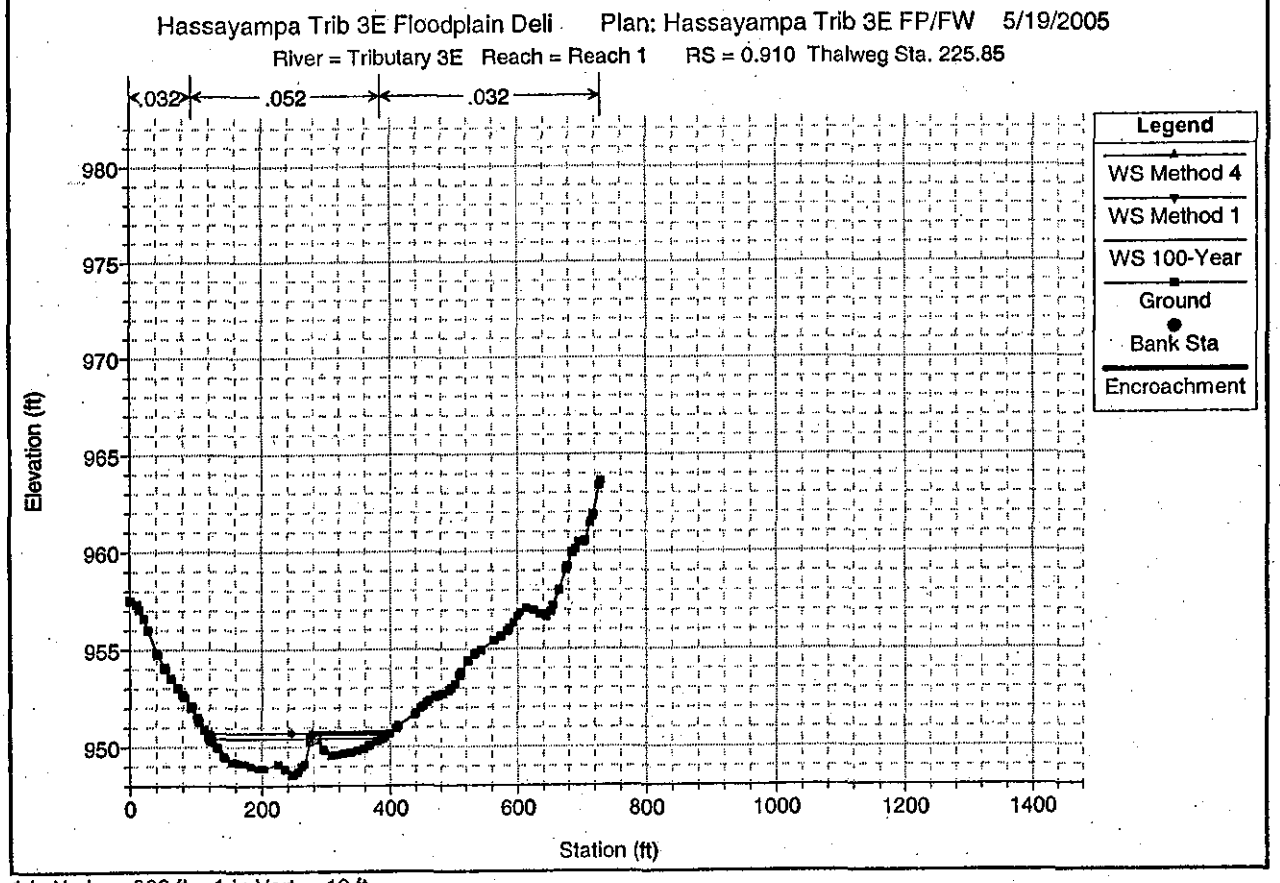

Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 0.985  Thalweg Sta. 278.94




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

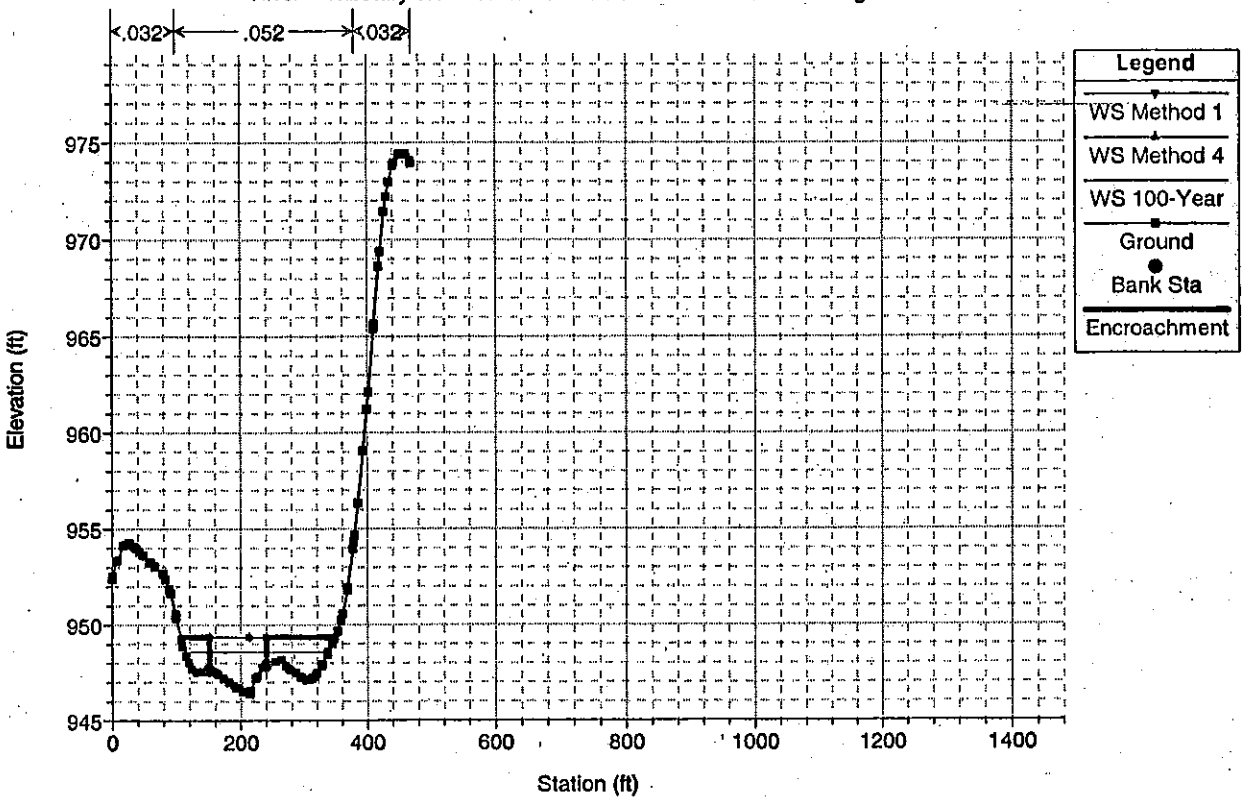



1 in Horiz. = 300 ft 1 in Vert. = 10 ft

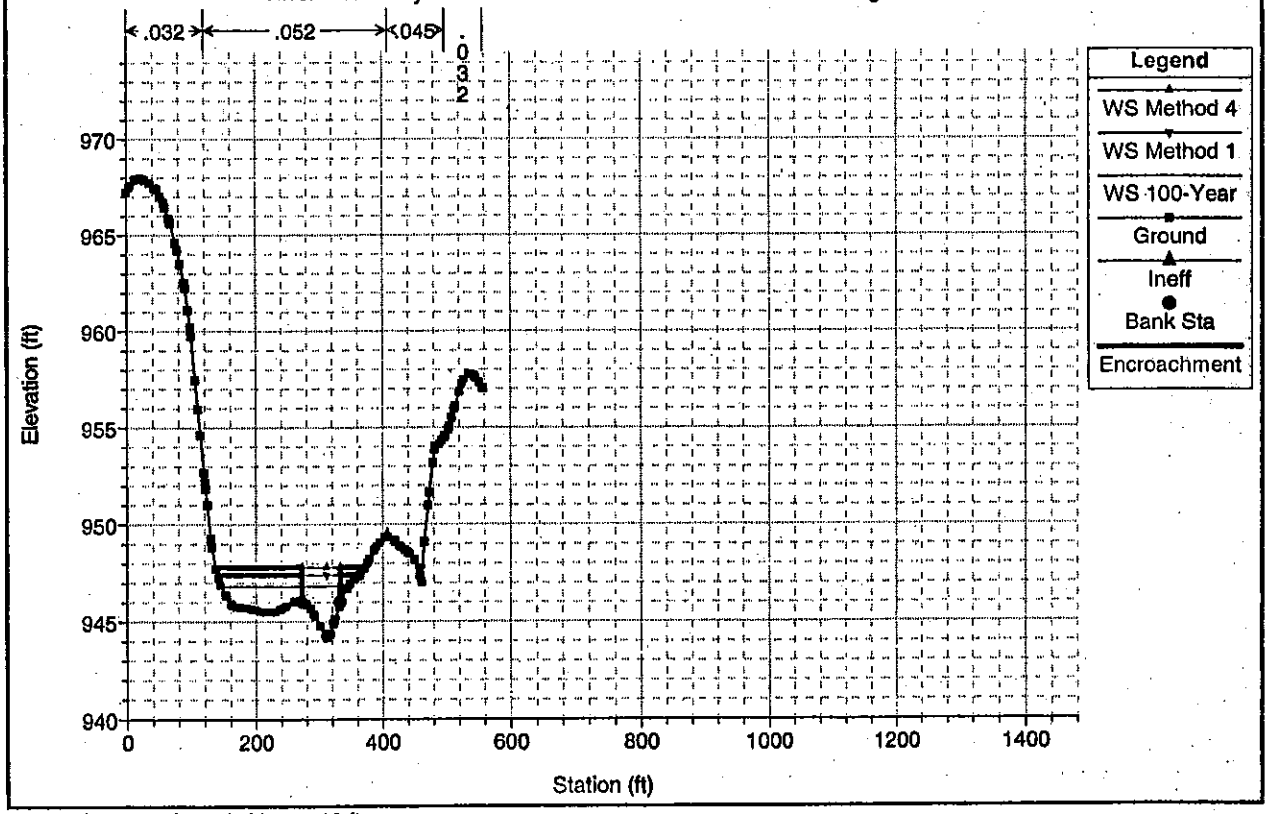
Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 0.872  Thalweg Sta. 213.34




Hassayampa Trib 3E Floodplain Dell  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

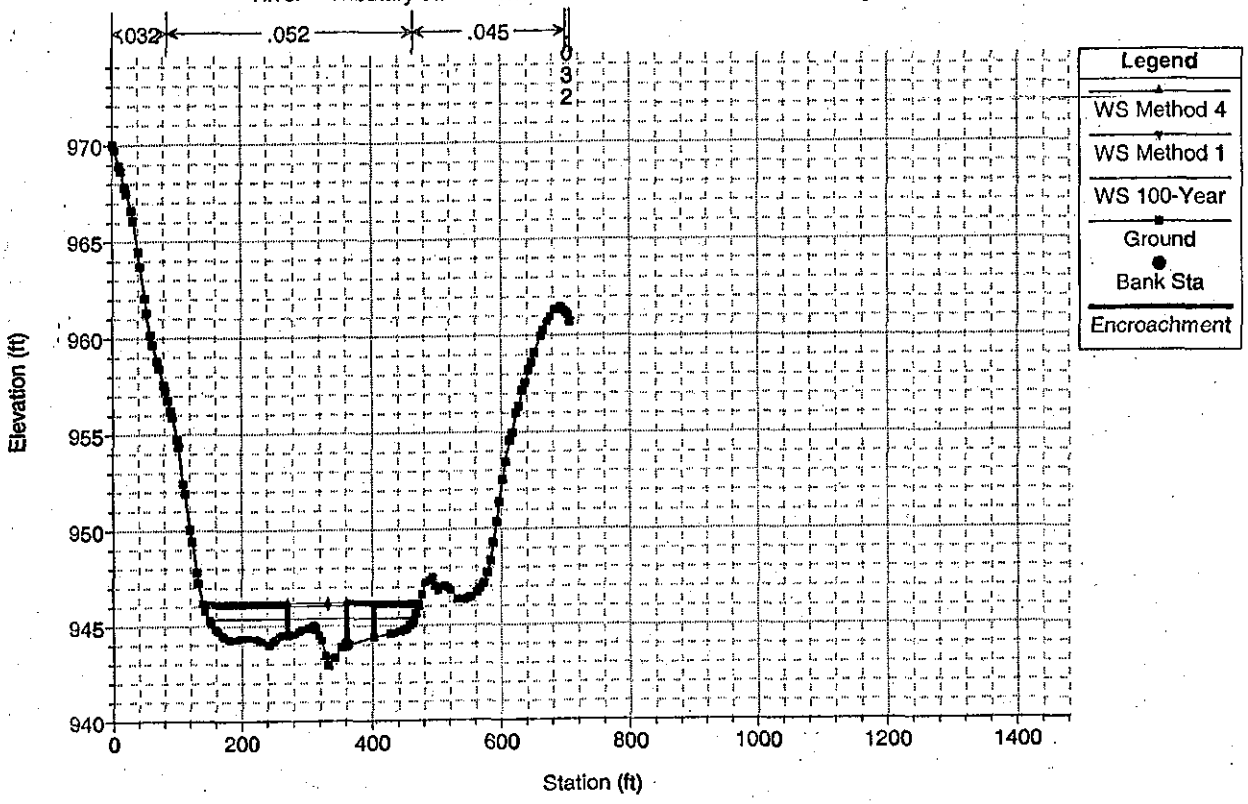
River = Tributary 3E  Reach = Reach 1  RS = 0.834  Thalweg Sta. 312.10




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

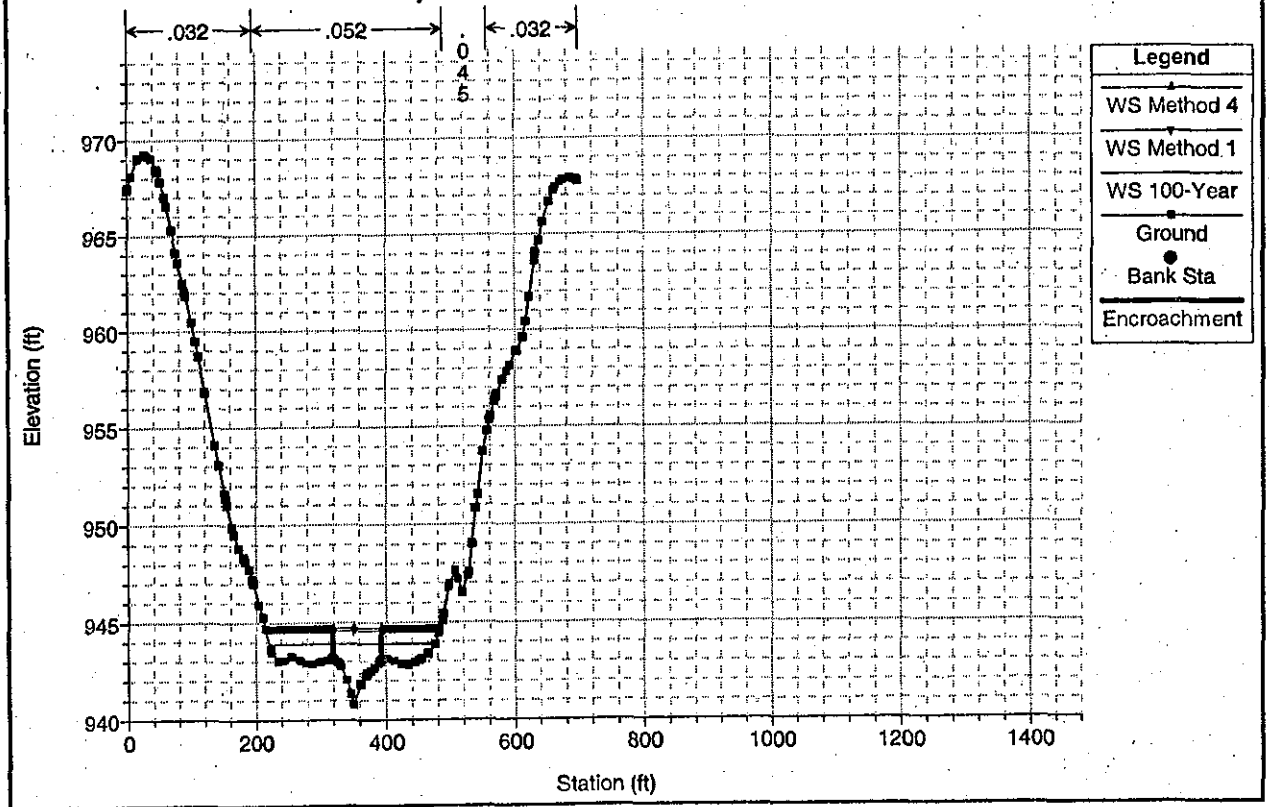
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 0.796  Thalweg Sta. 332.93




Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

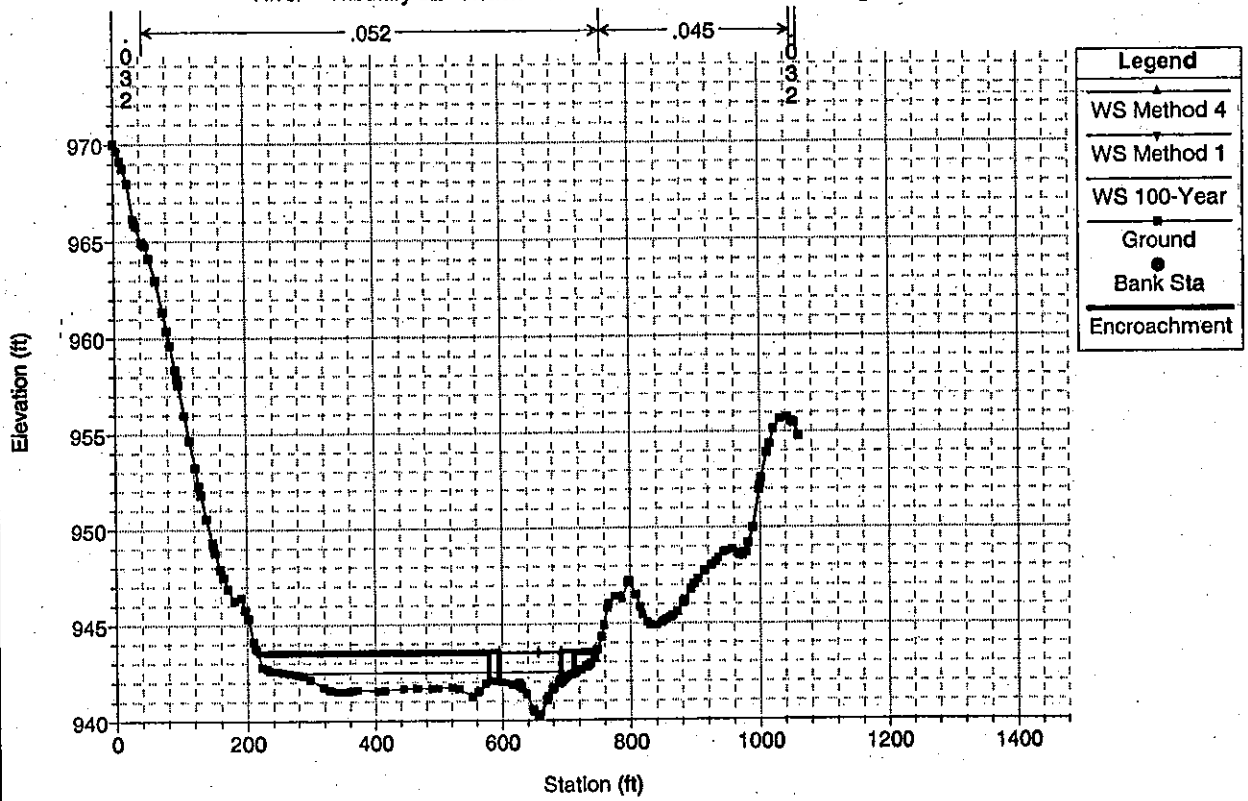
River = Tributary 3E  Reach = Reach 1  RS = 0.758  Thalweg Sta. 350.95




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

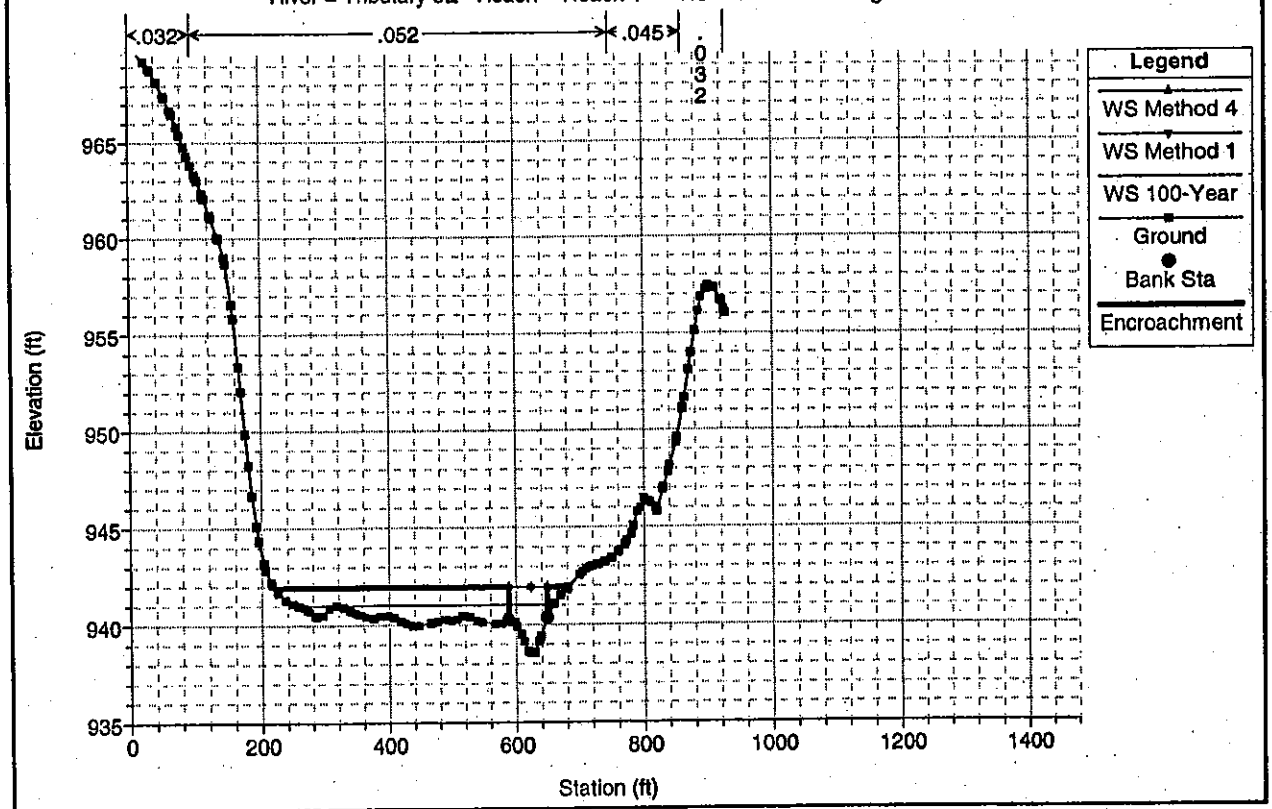
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 0.720  Thalweg Sta. 657.08




Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

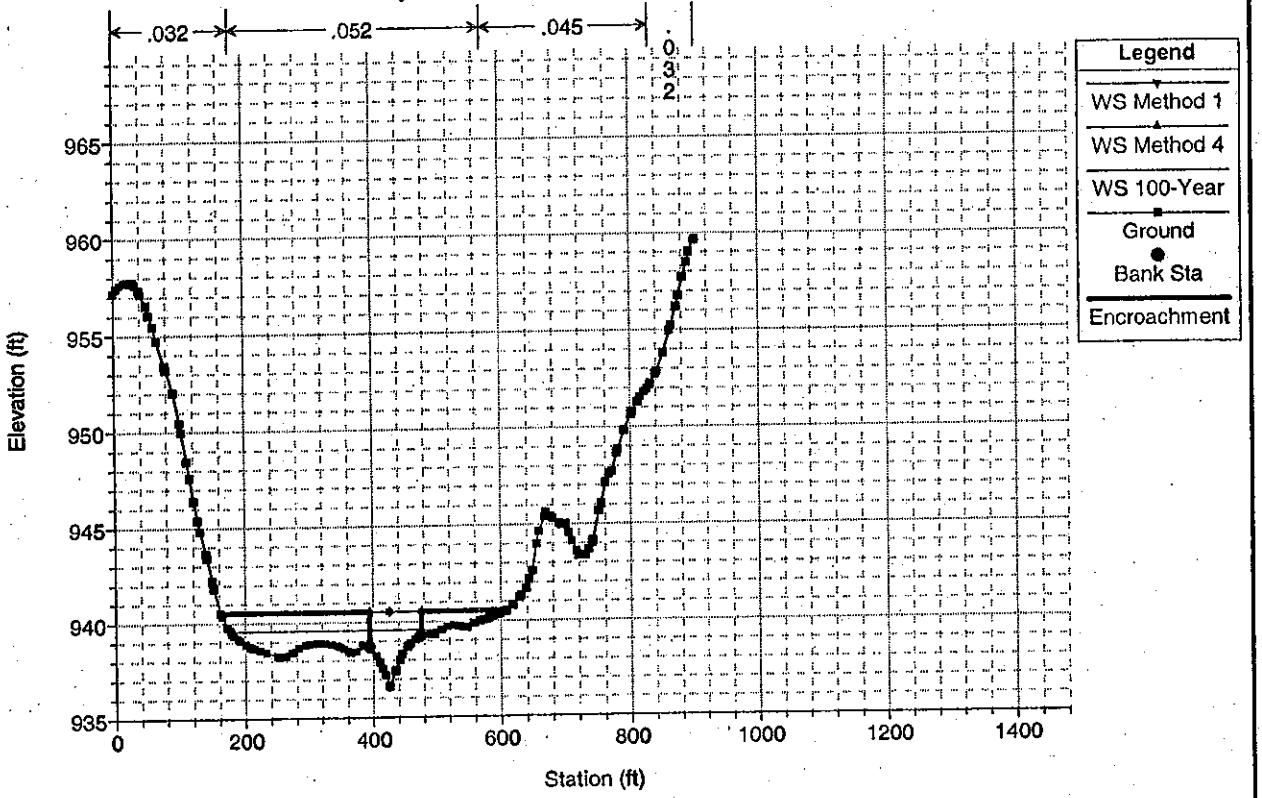
River = Tributary 3E  Reach = Reach 1  RS = 0.682  Thalweg Sta. 623.26




1 in Horiz. = 300 ft  1 in Vert. = 10 ft

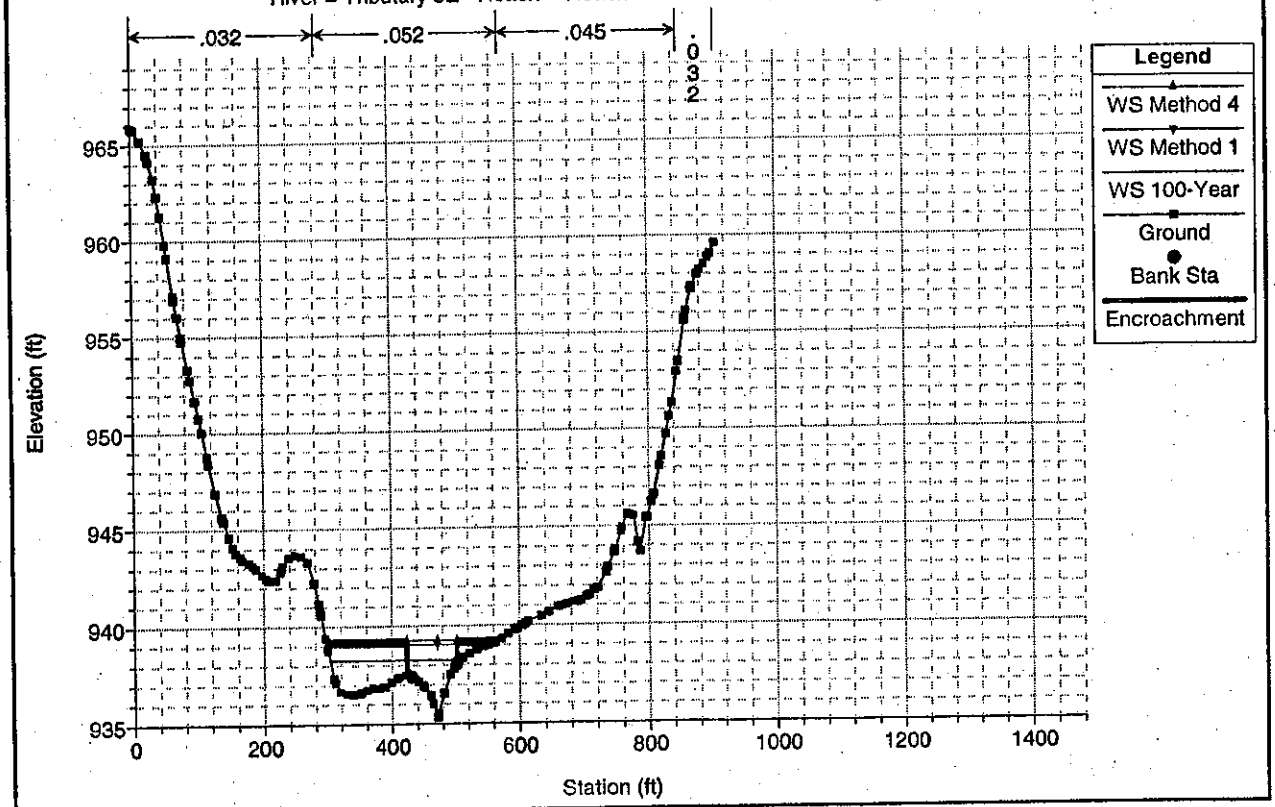
Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 0.645  Thalweg Sta. 425.75

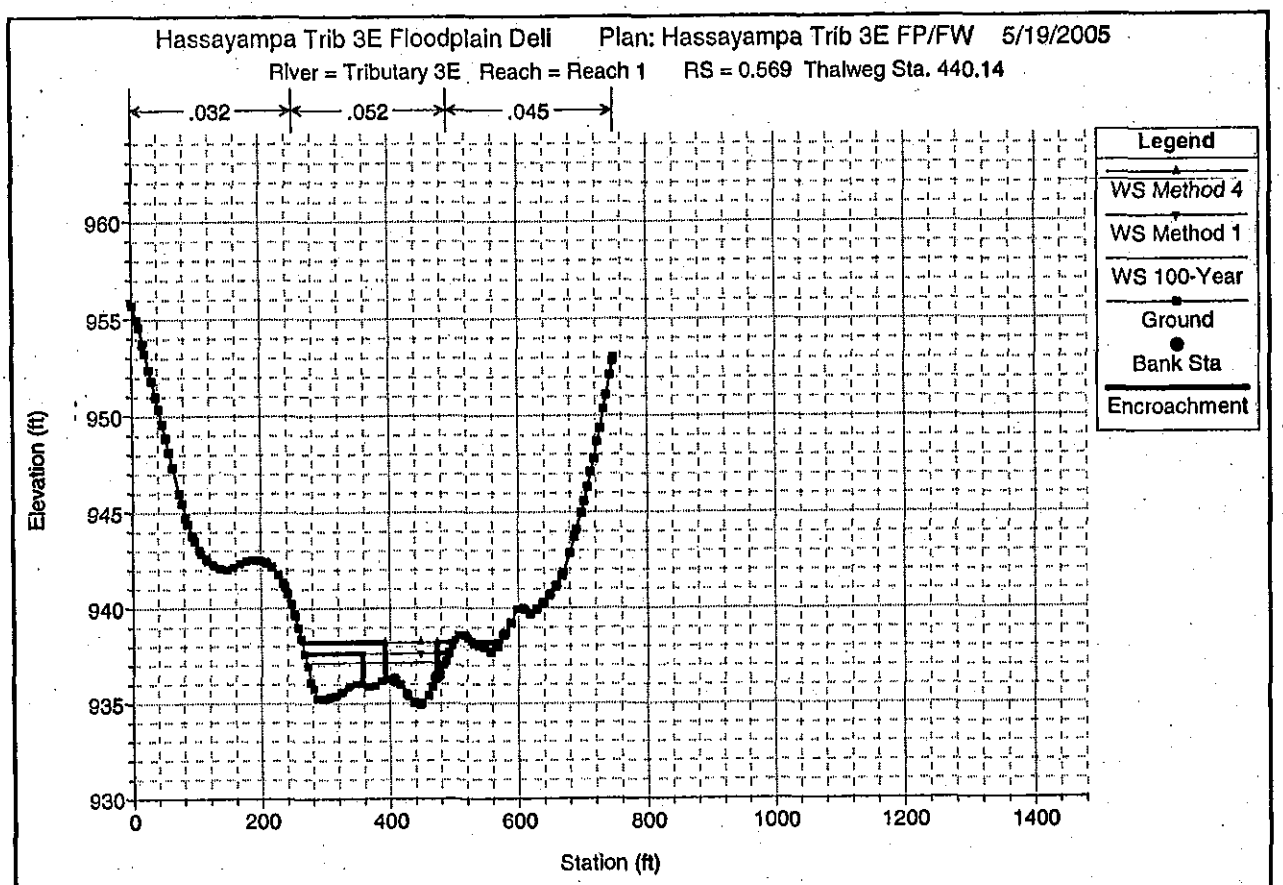


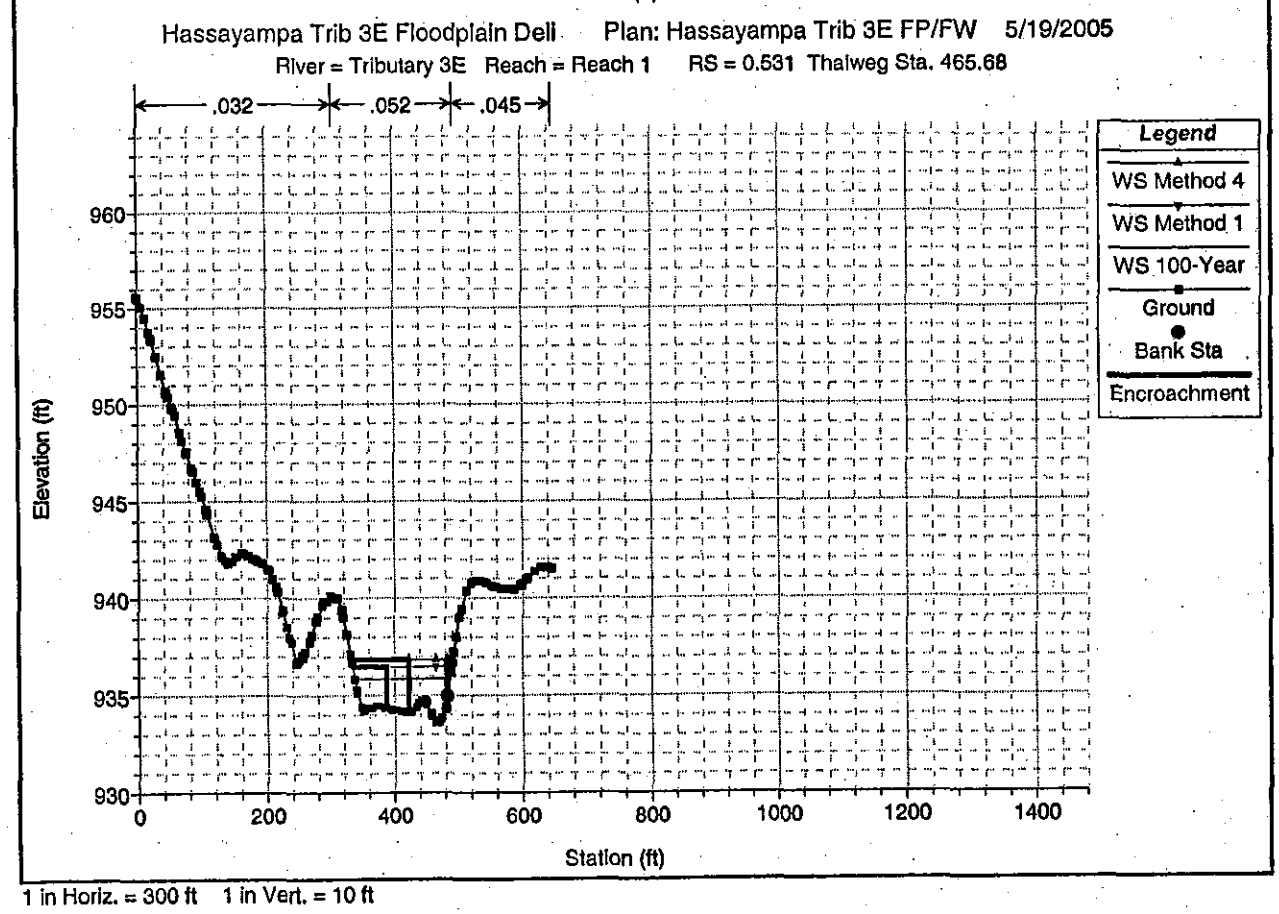

Hassayampa Trib 3E Floodplain Deli  Plan: Hassayampa Trib 3E FP/FW  5/19/2005

River = Tributary 3E  Reach = Reach 1  RS = 0.607  Thalweg Sta. 471.78

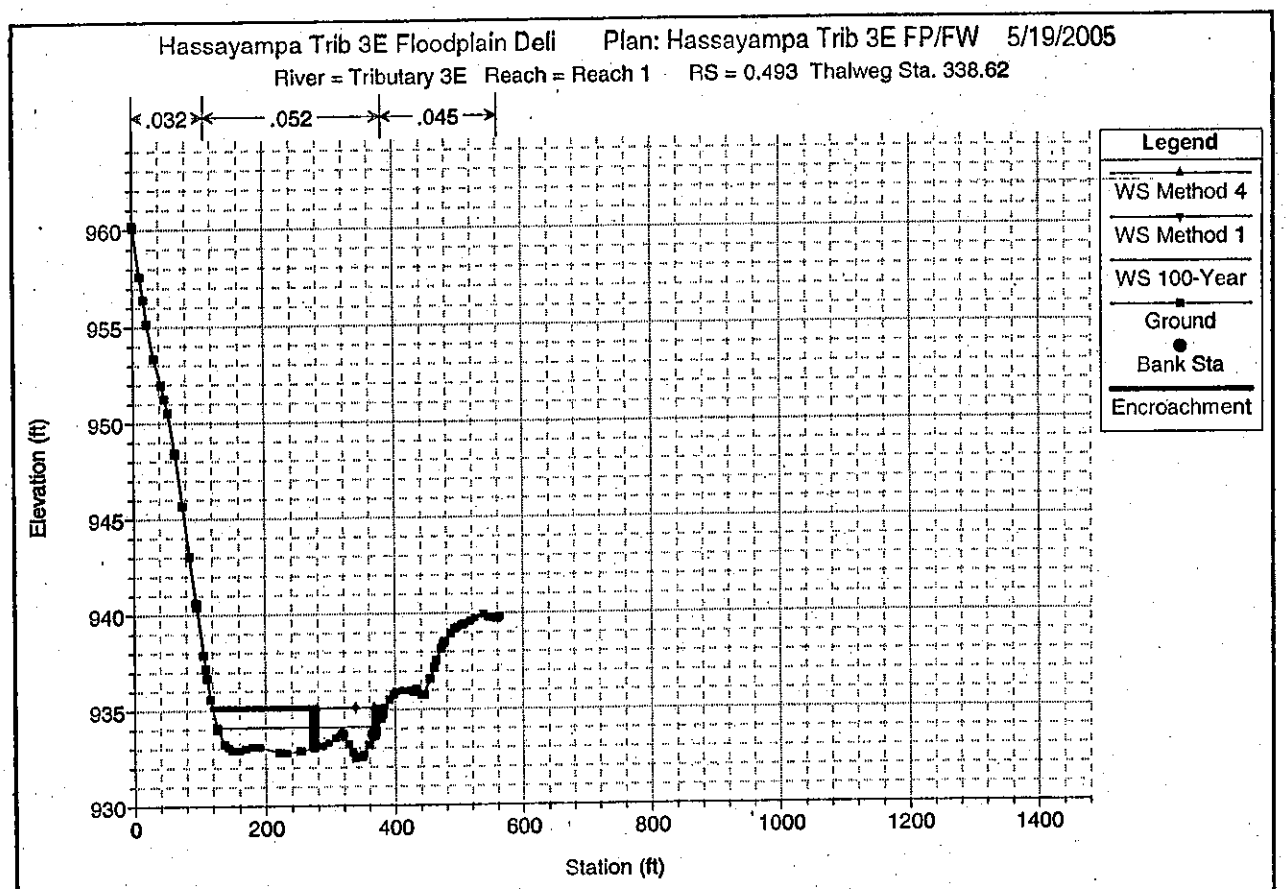


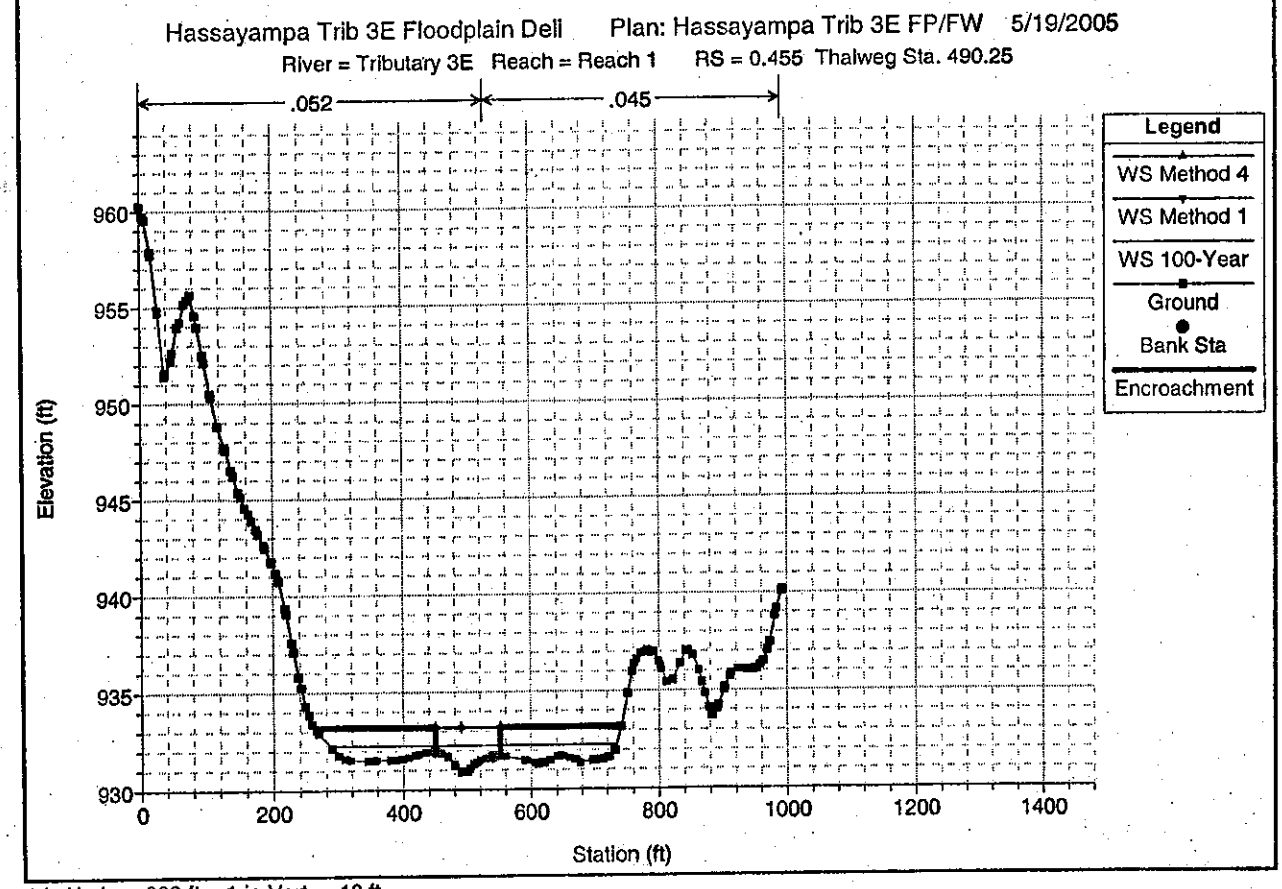

1 in Horiz. = 300 ft  1 in Vert. = 10 ft



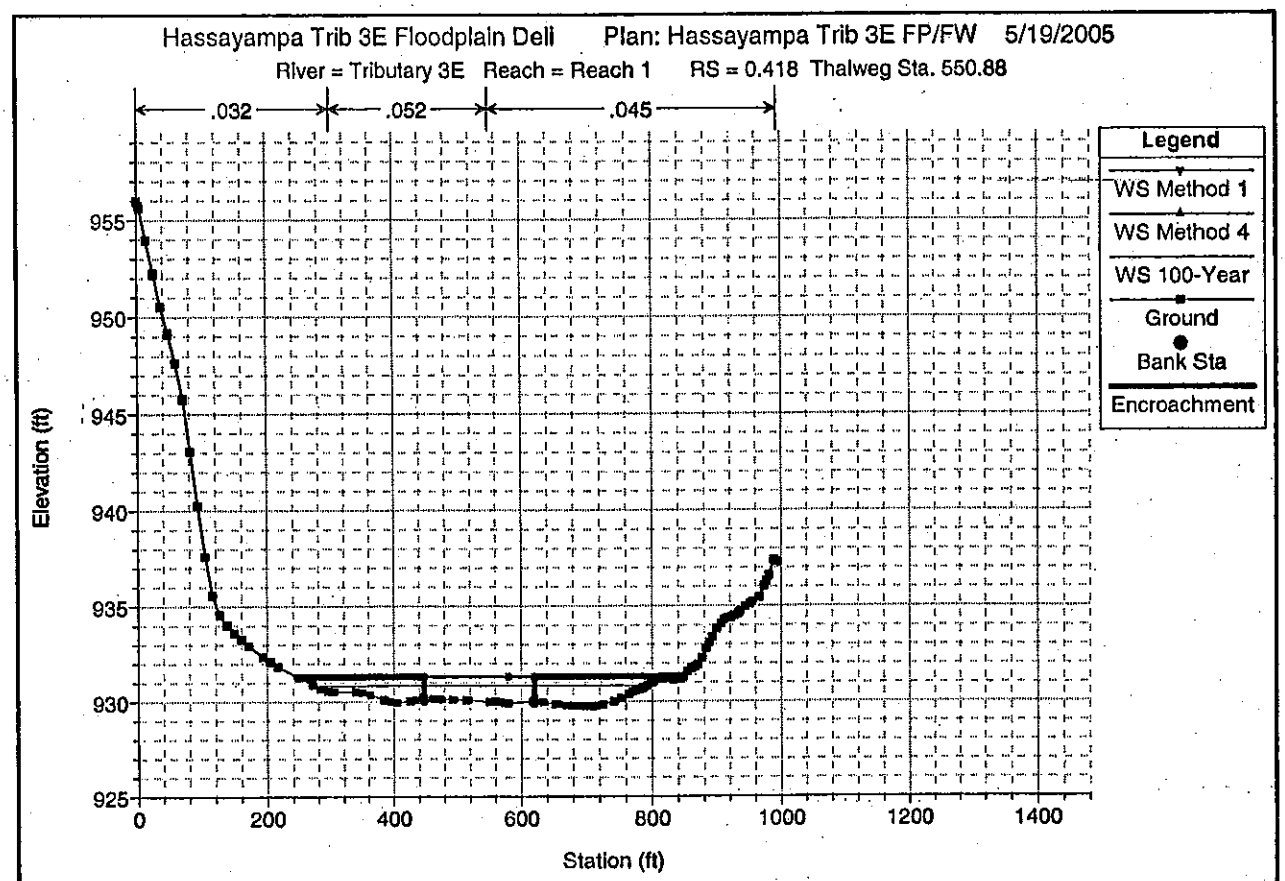



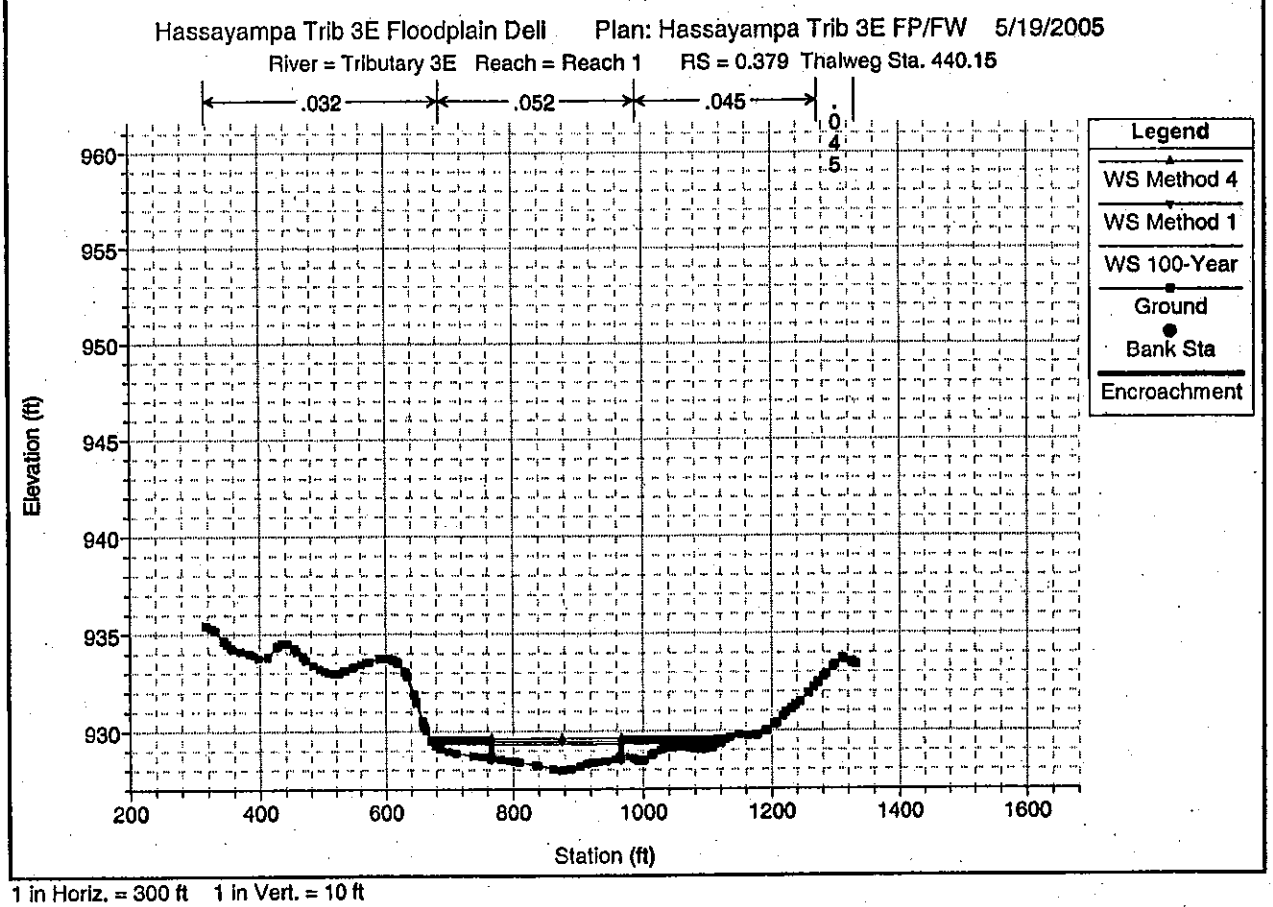

1 in Horiz. = 300 ft 1 in Vert. = 10 ft




1 in Horiz. = 300 ft 1 in Vert. = 10 ft

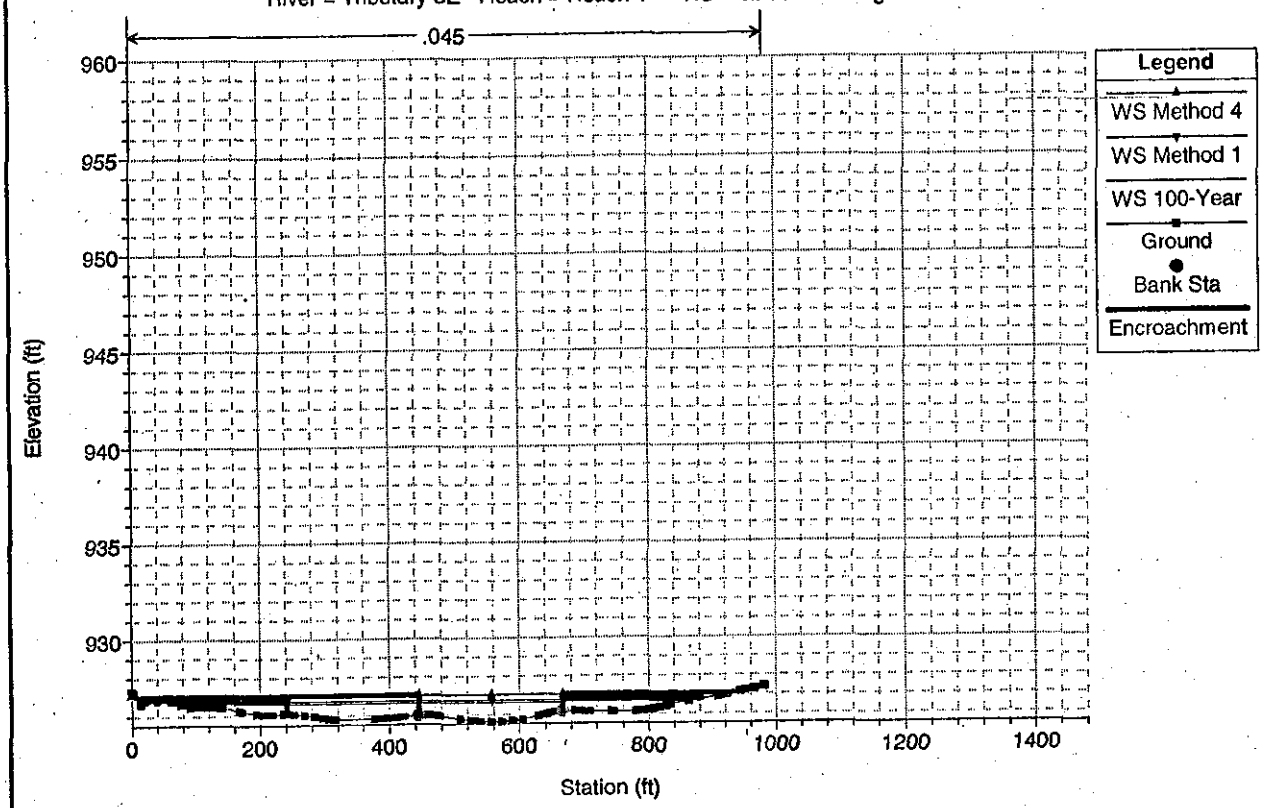



1 in Horiz. = 300 ft 1 in Vert. = 10 ft

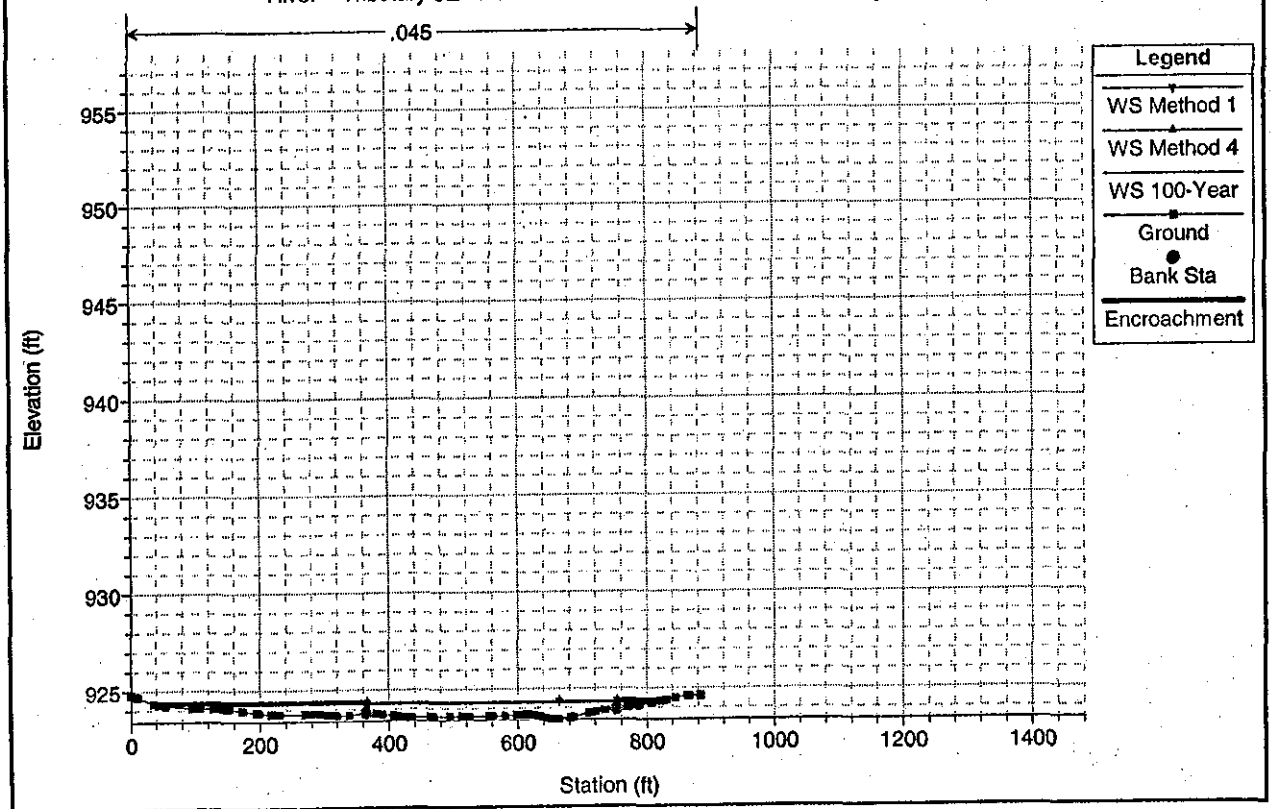
Hassaya pa Trib 3E Floodplain Deli Plan: Hassayampa Trib 3E FP/FW 5/19/2005

River = Tributary 3E Reach = Reach 1 RS = 0.299 Thalweg Sta. 541.55




Hassayampa Trib 3E Floodplain Deli Plan: Hassayampa Trib 3E FP/FW 5/19/2005

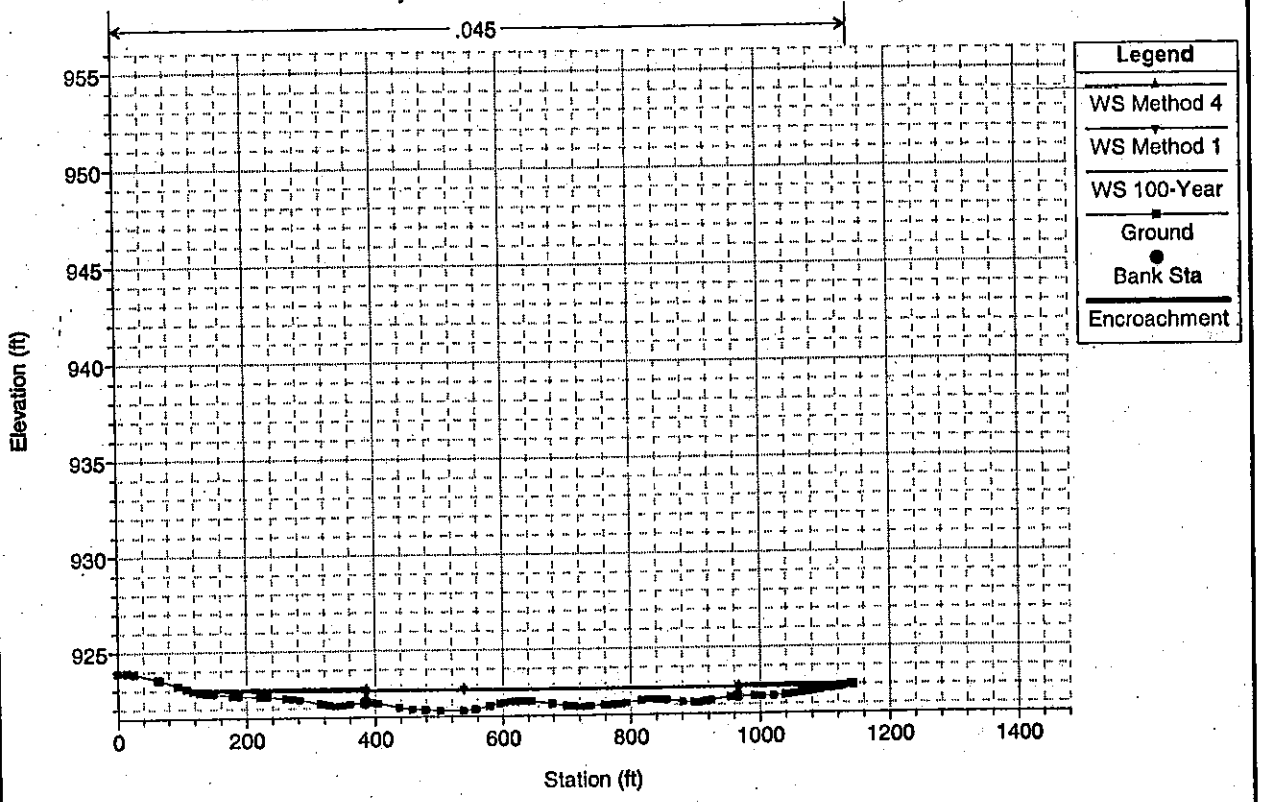
River = Tributary 3E Reach = Reach 1 RS = 0.229 Thalweg Sta. 555.98




1 in Horiz. = 300 ft 1 in Vert. = 10 ft

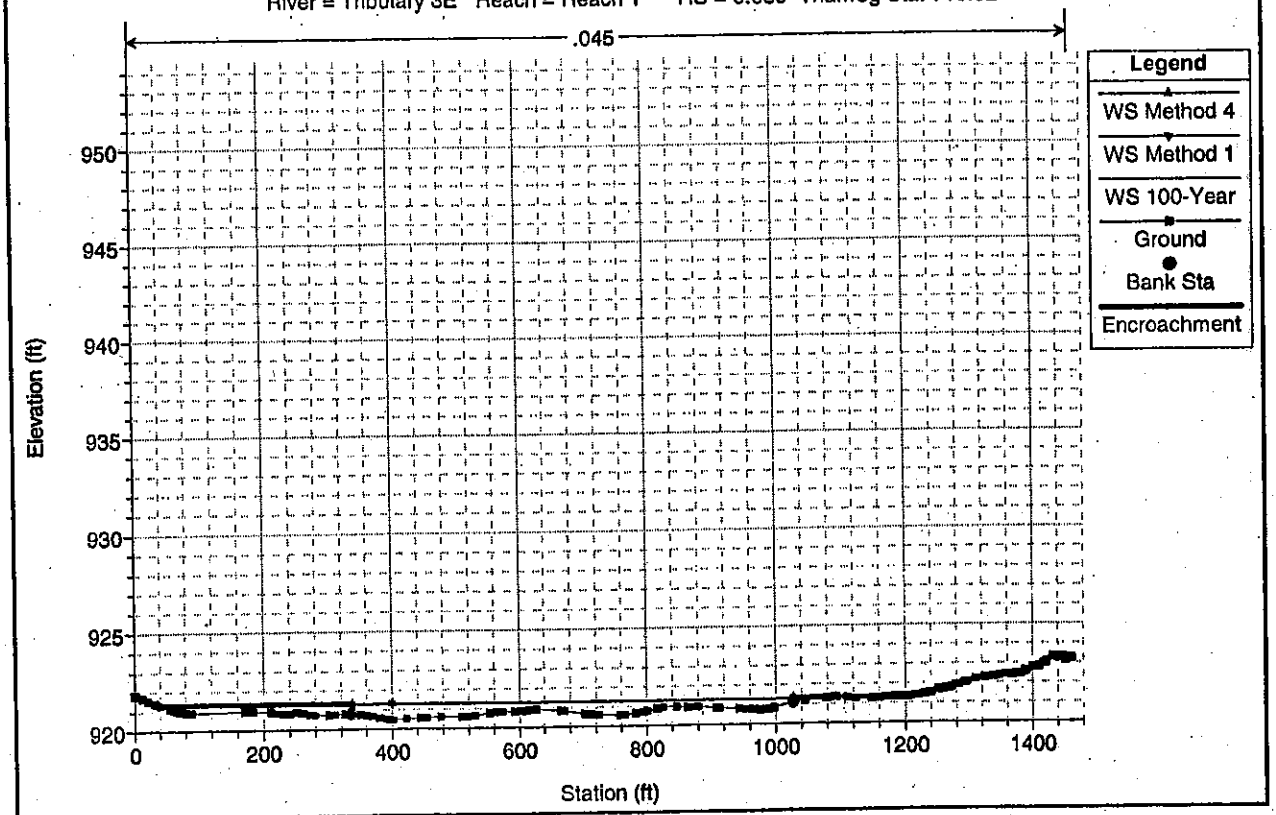
Hassayampa Trib 3E Floodplain Deli Plan: Hassayampa Trib 3E FP/FW 5/19/2005

River = Tributary 3E Reach = Reach 1 RS = 0.167 Thalweg Sta. 578.96



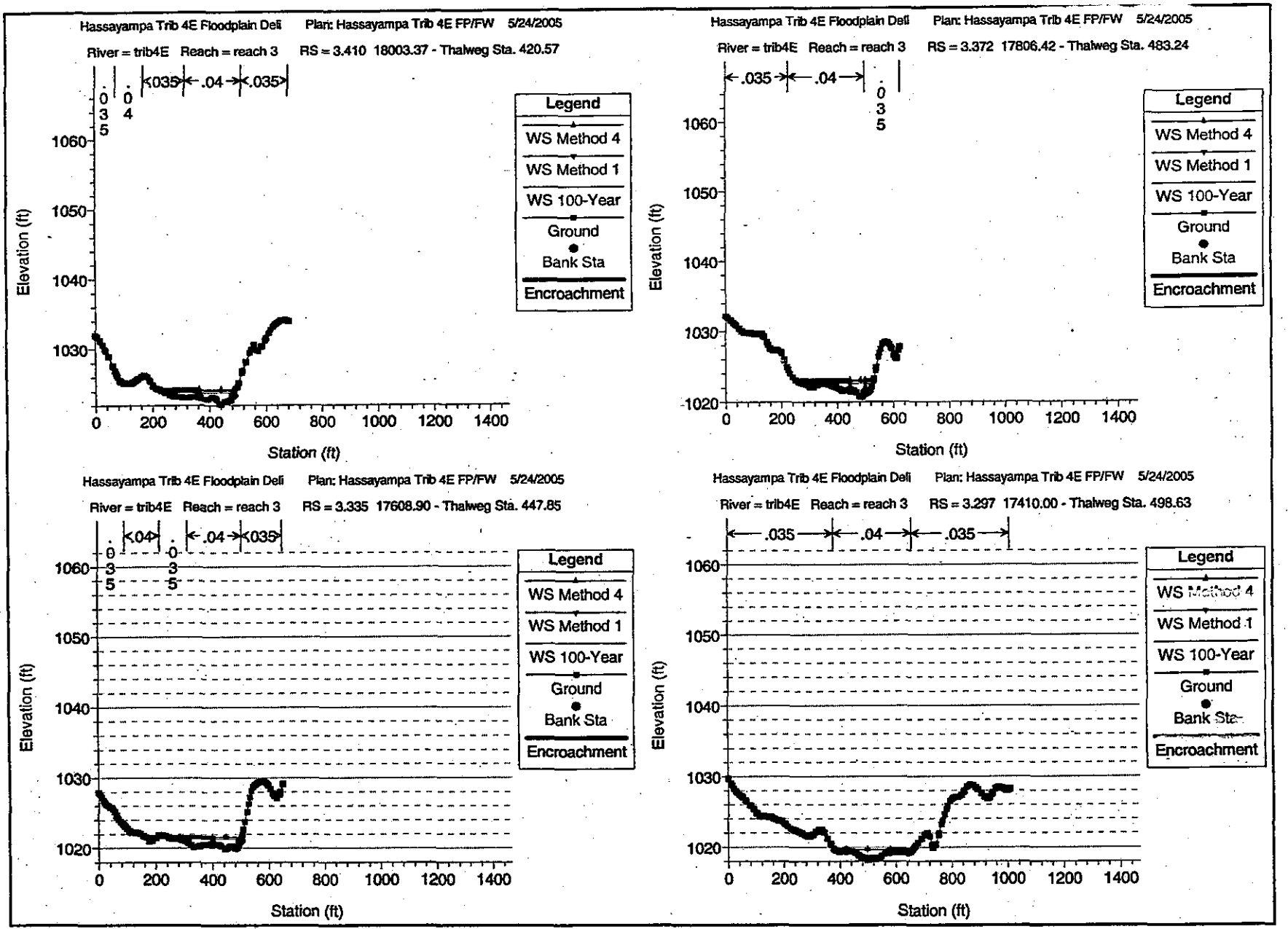

Hassayampa Trib 3E Floodplain Deli Plan: Hassayampa Trib 3E FP/FW 5/19/2005

River = Tributary 3E Reach = Reach 1 RS = 0.089 Thalweg Sta. 710.92

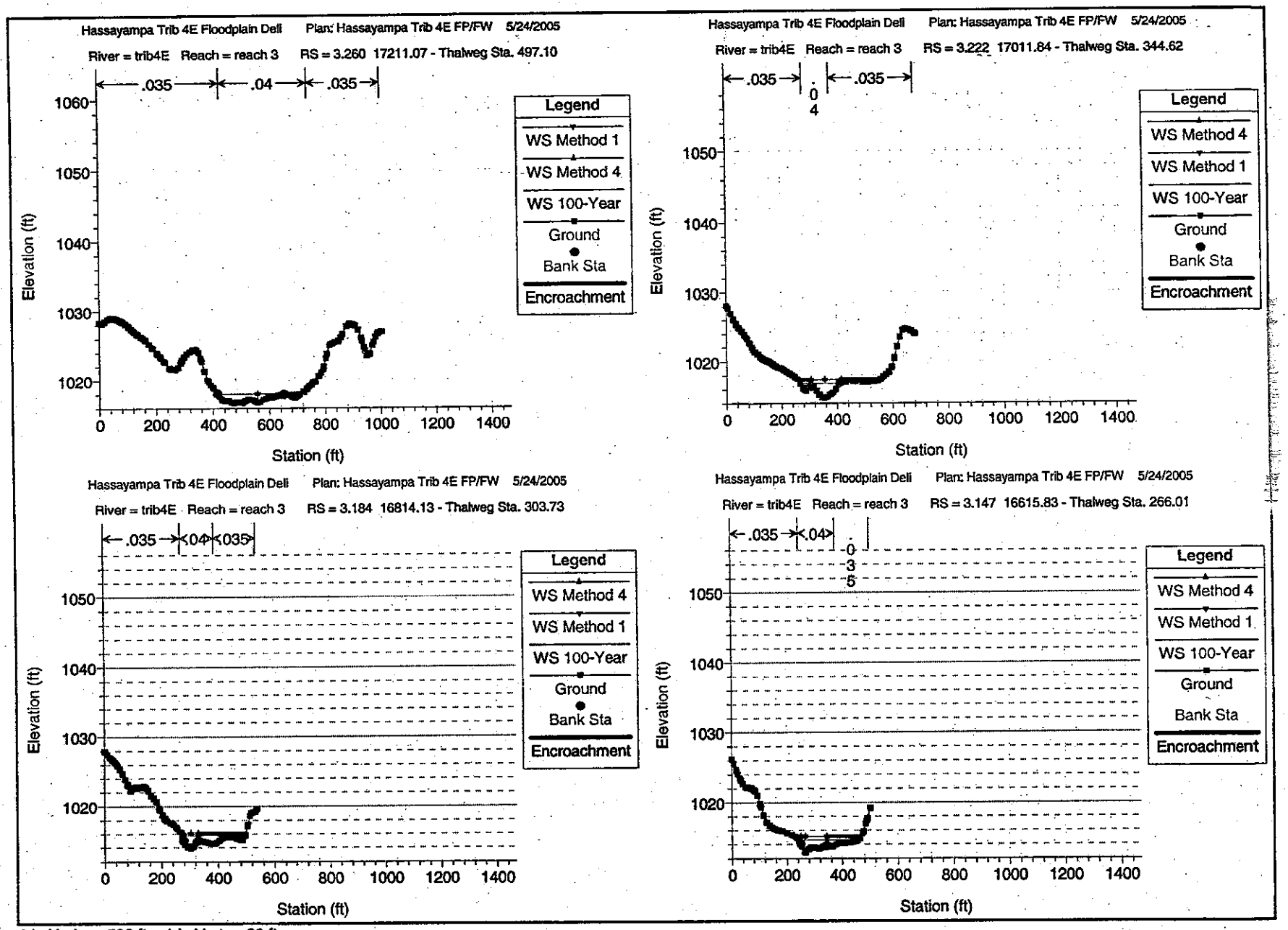



1 in Horiz. = 300 ft 1 in Vert. = 10 ft

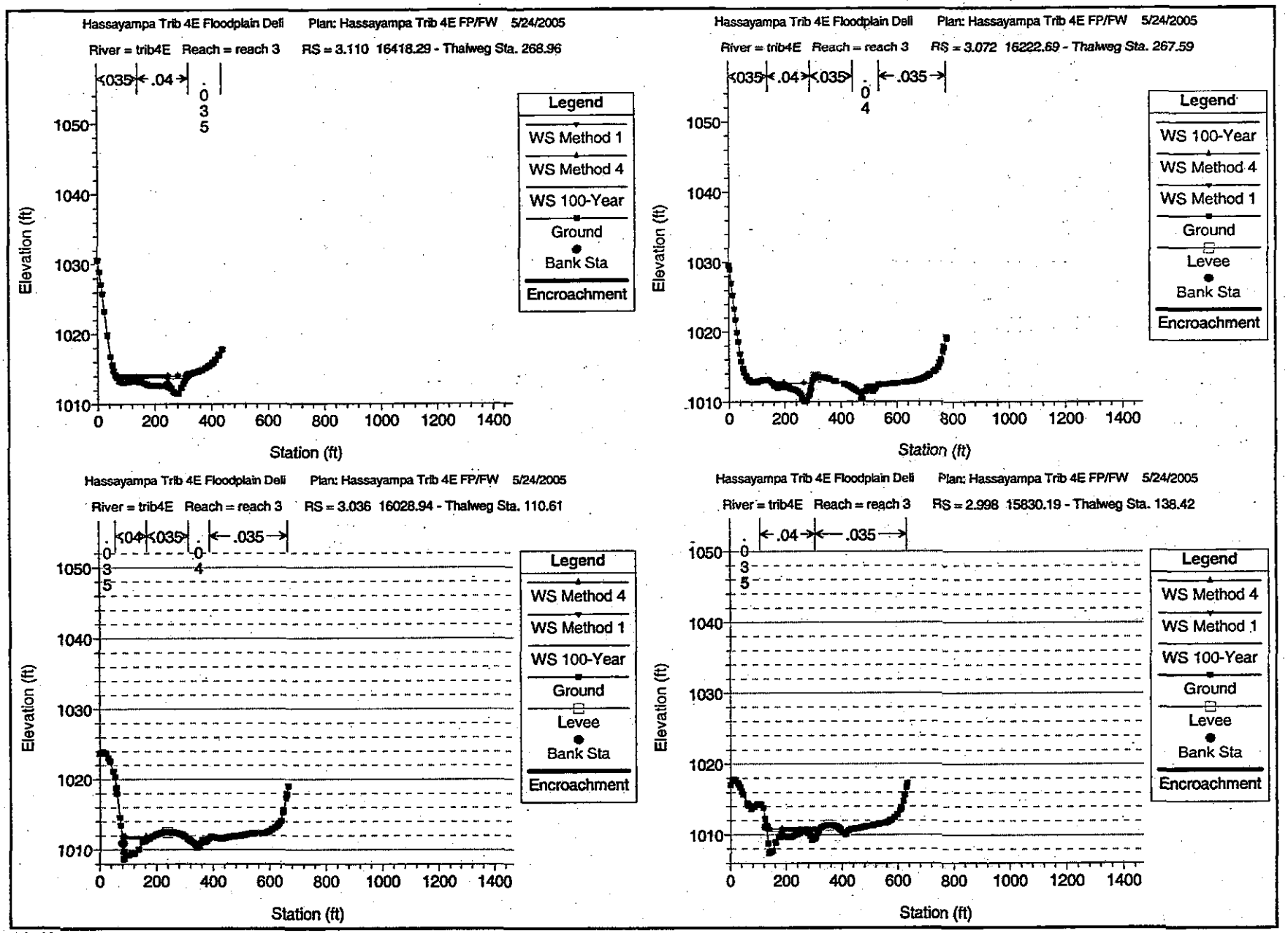
### 3.2.3 Tributary 4E – All Reaches




1 in Horiz. = 500 ft 1 in Vert. = 20 ft



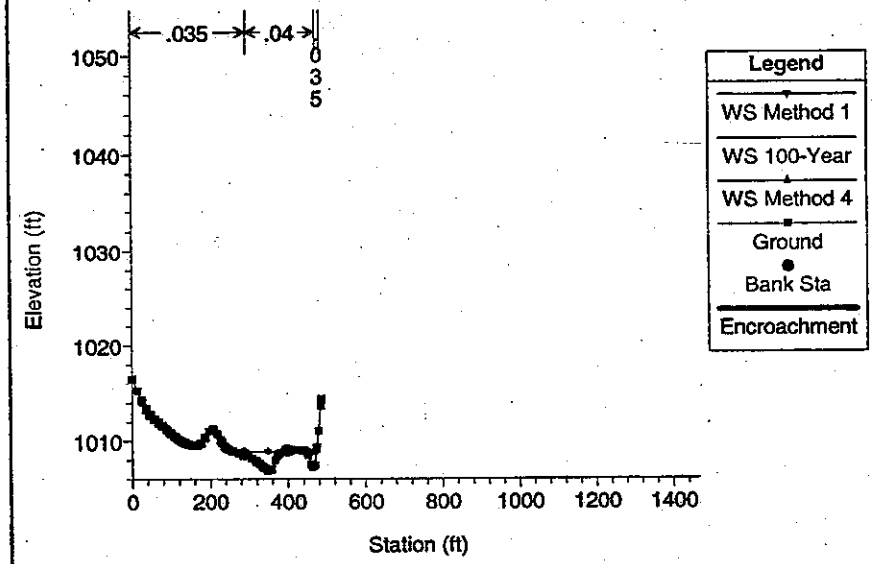

1 in Horiz. = 500 ft 1 in Vert. = 20 ft




1 in Horiz. = 500 ft 1 in Vert. = 20 ft

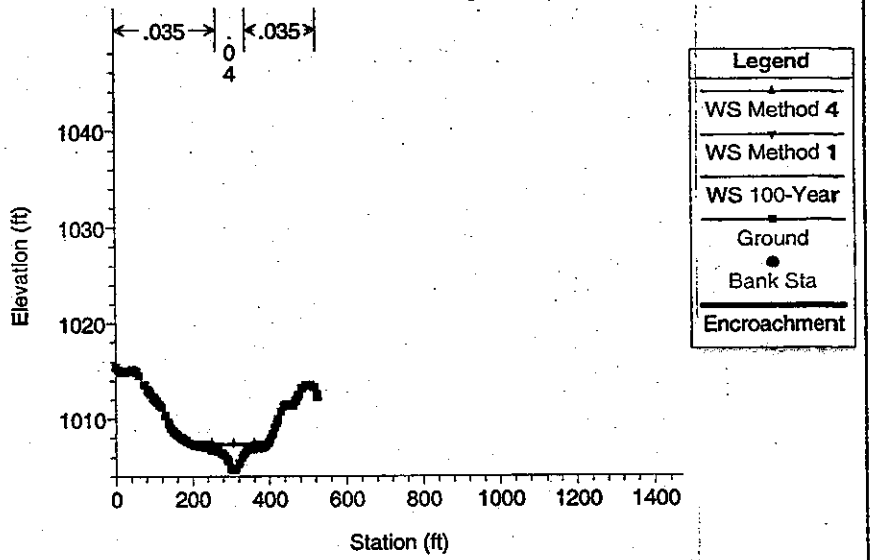
Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.960  15630.74 - Thalweg Sta. 347.16



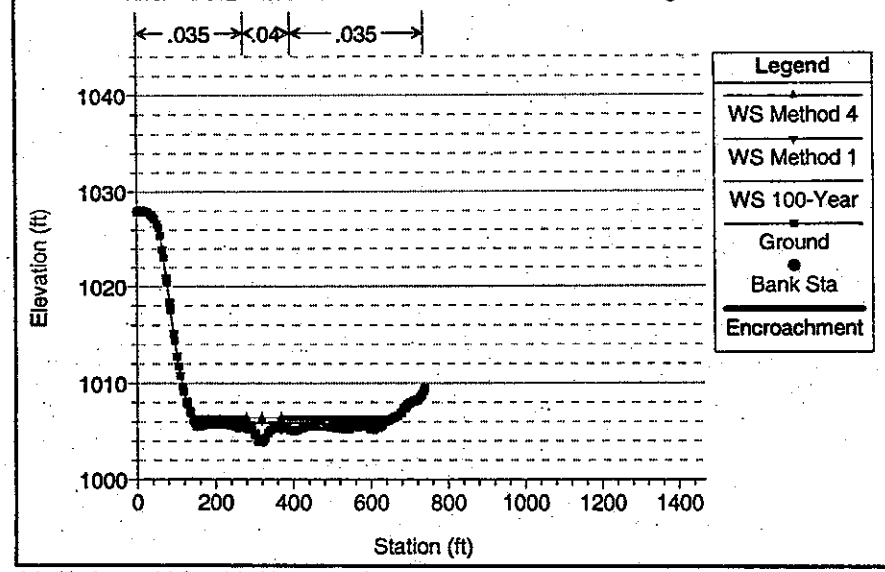

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.923  15435.60 - Thalweg Sta. 306.30



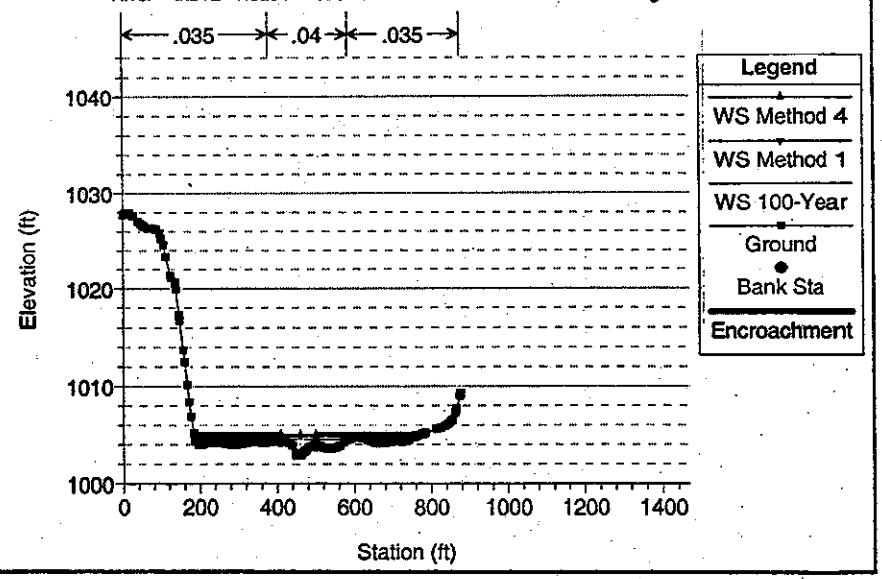

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.886  15235.72 - Thalweg Sta. 319.09




Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

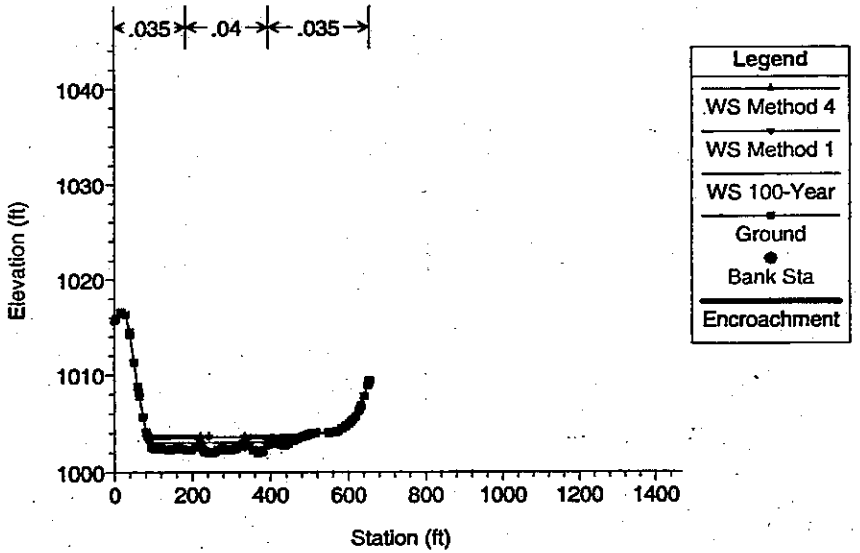
River = trib4E  Reach = reach 3  RS = 2.848  15036.38 - Thalweg Sta. 439.97




1 in Horiz. = 500 ft  1 in Vert. = 20 ft

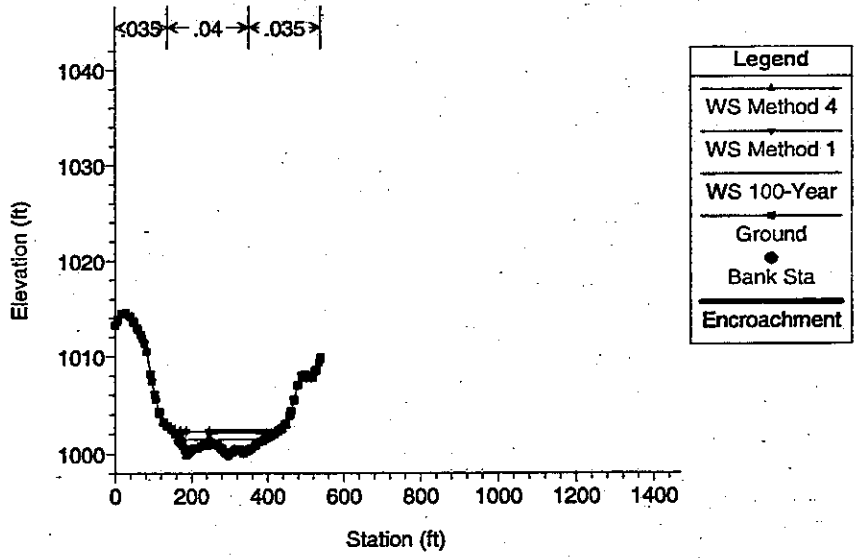
Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.810  14836.72 - Thalweg Sta. 243.61



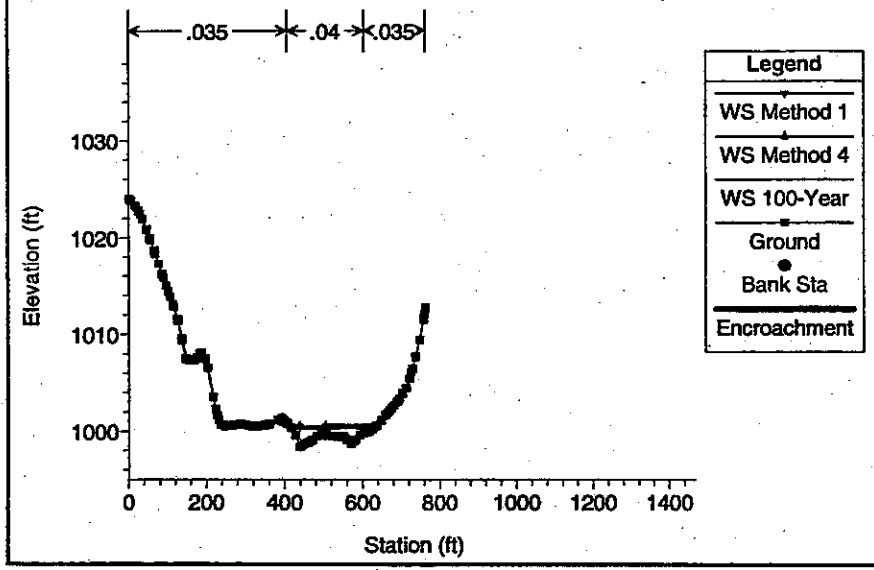

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.772  14638.14 - Thalweg Sta. 187.03



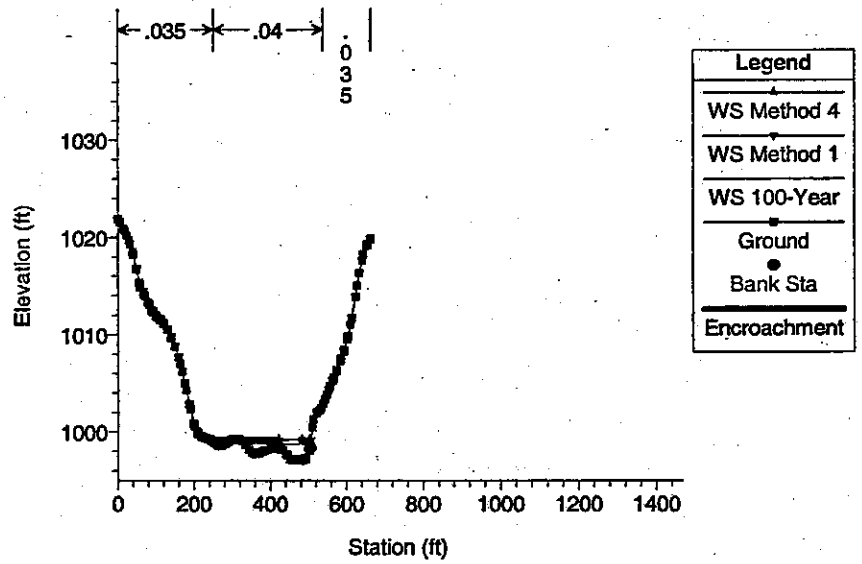

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.735  14438.48 - Thalweg Sta. 438.71

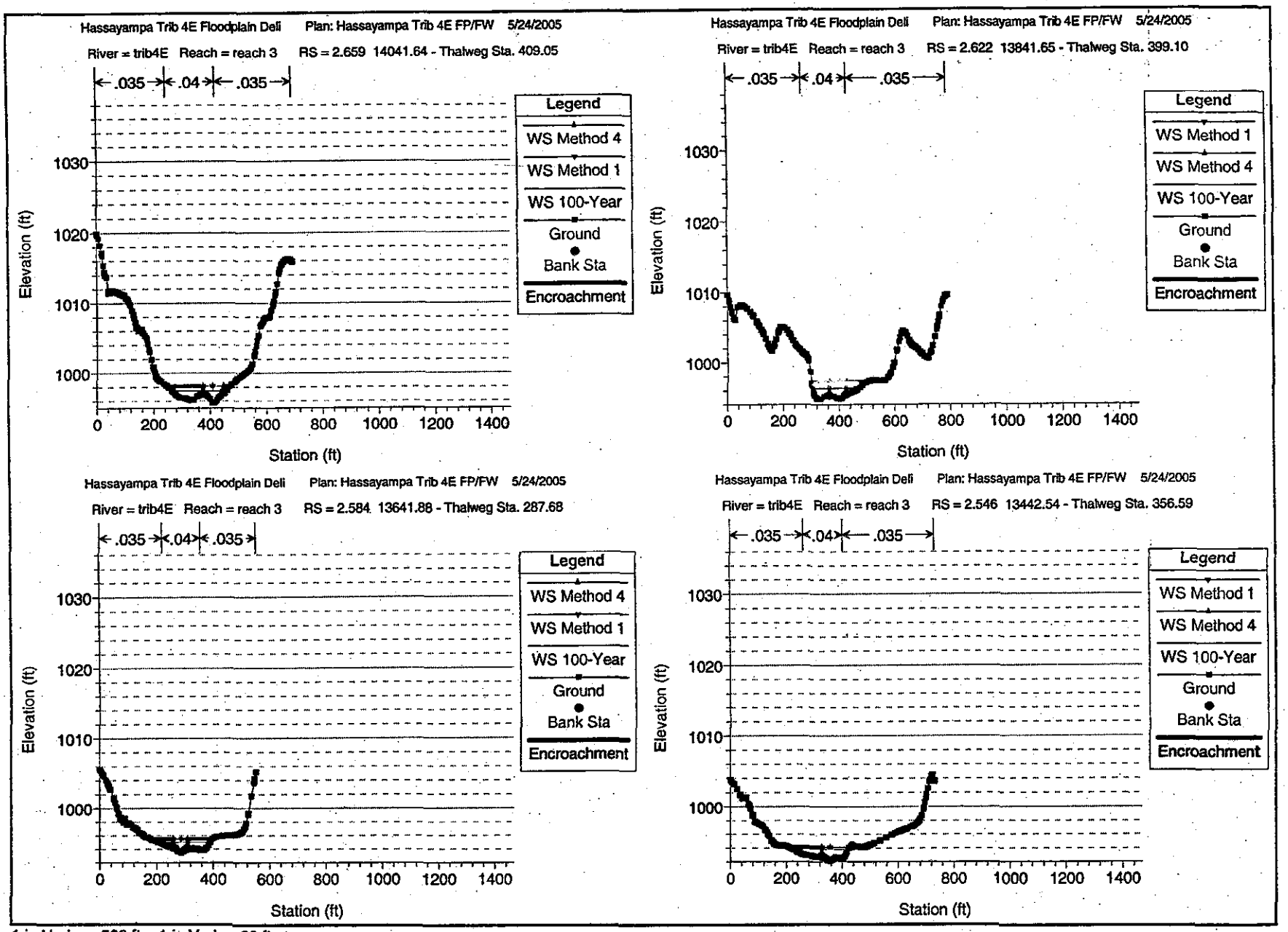



Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

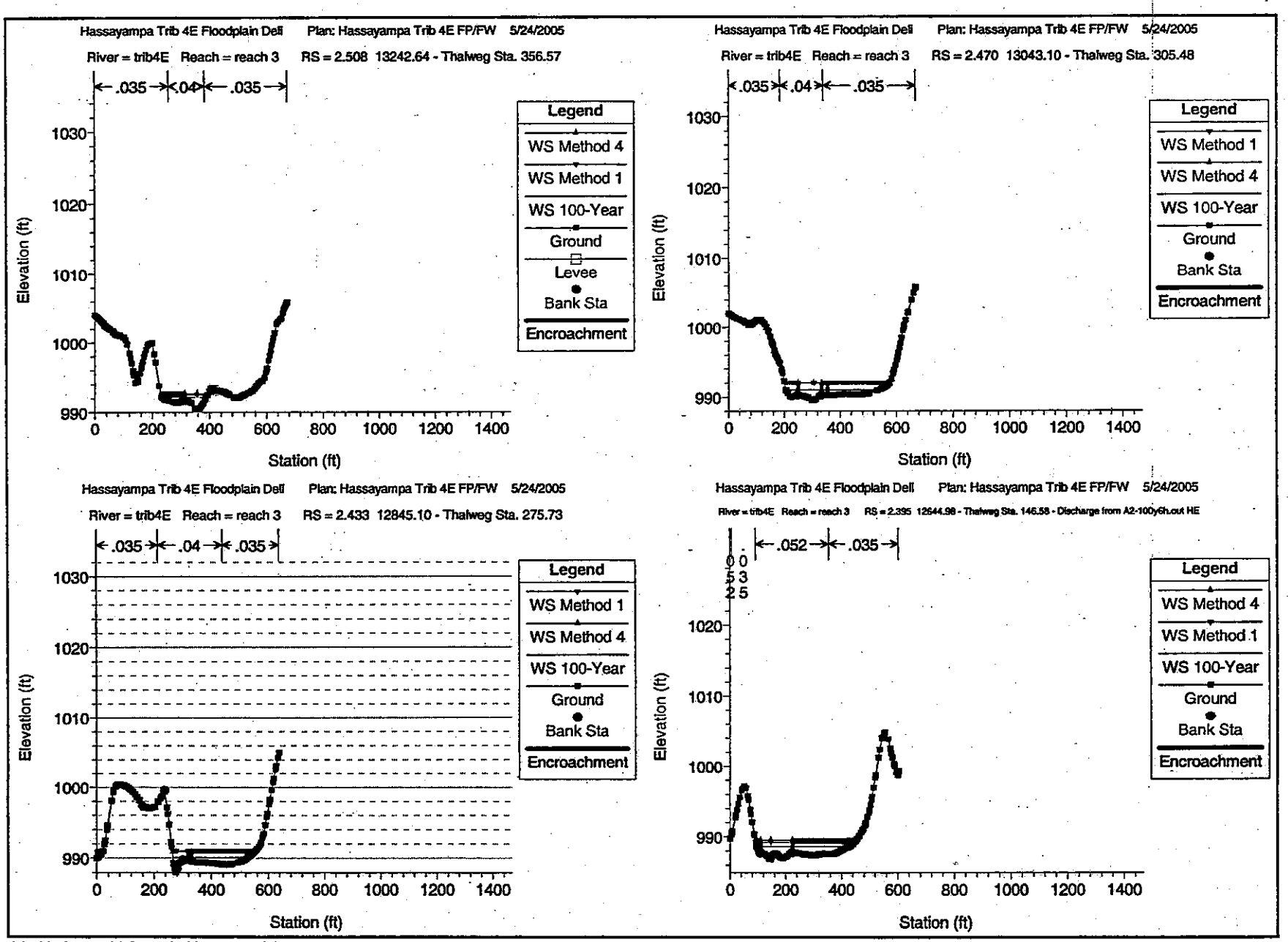
River = trib4E  Reach = reach 3  RS = 2.697  14239.45 - Thalweg Sta. 451.90



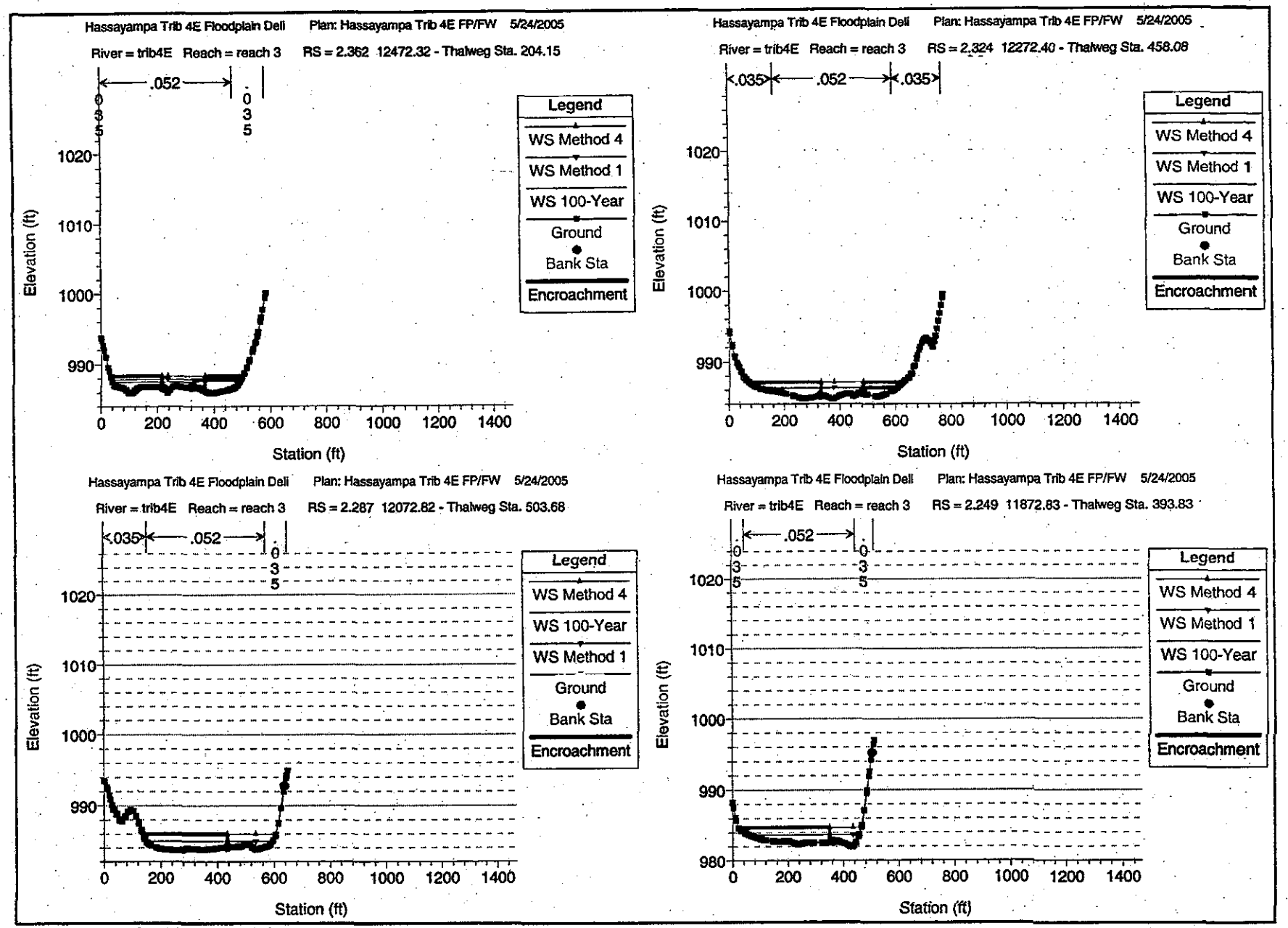

1 in Horiz. = 500 ft  1 in Vert. = 20 ft




1 in Horiz. = 500 ft 1 in Vert. = 20 ft



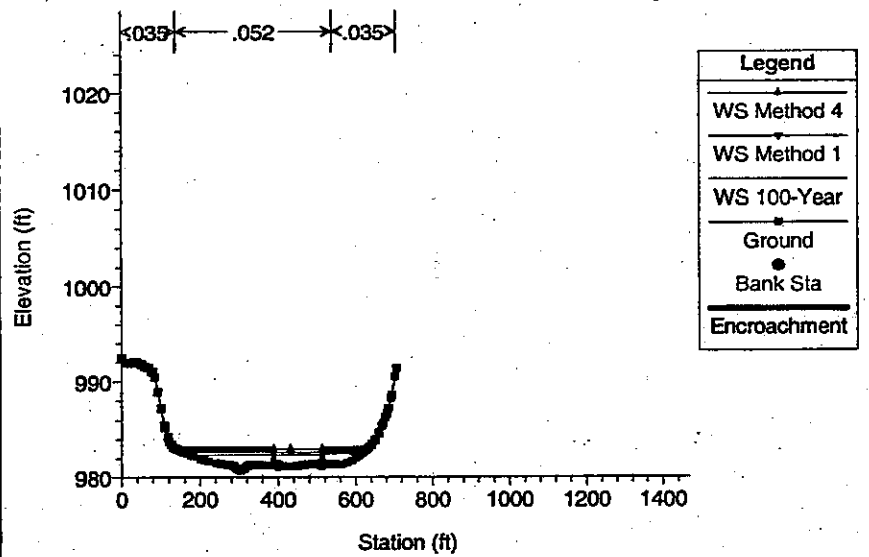

1 in Horiz. = 500 ft 1 in Vert. = 20 ft




1 in Horiz. = 500 ft 1 in Vert. = 20 ft

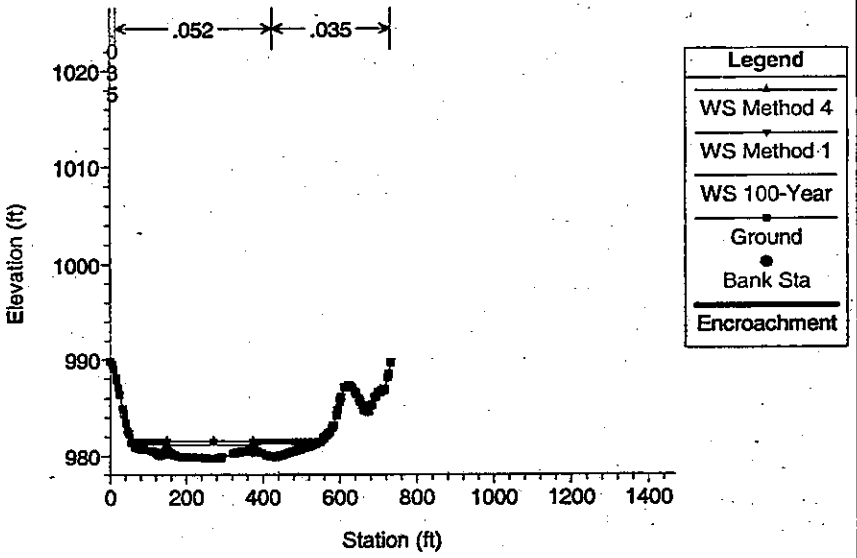
Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.211  11672.72 - Thalweg Sta. 477.44



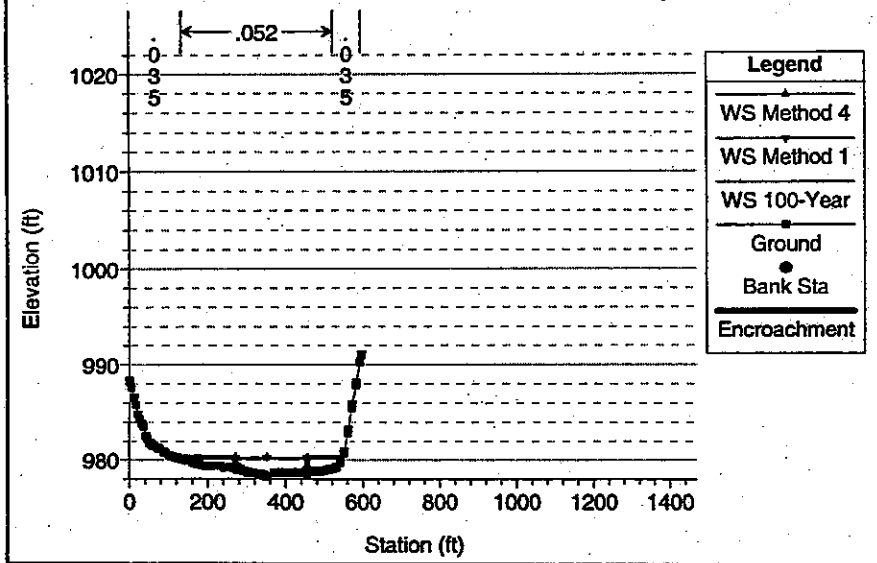

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.171  11465.47 - Thalweg Sta. 271.76



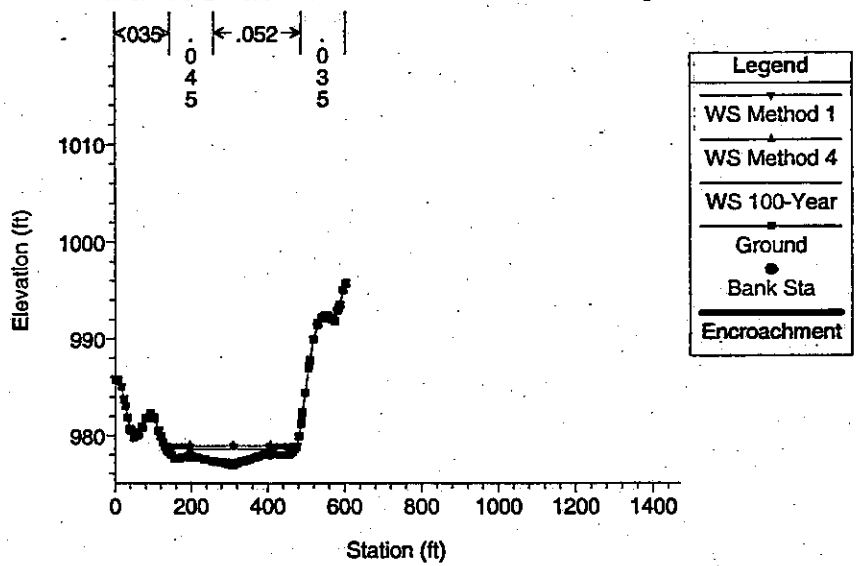

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 3  RS = 2.132  11255.33 - Thalweg Sta. 351.71

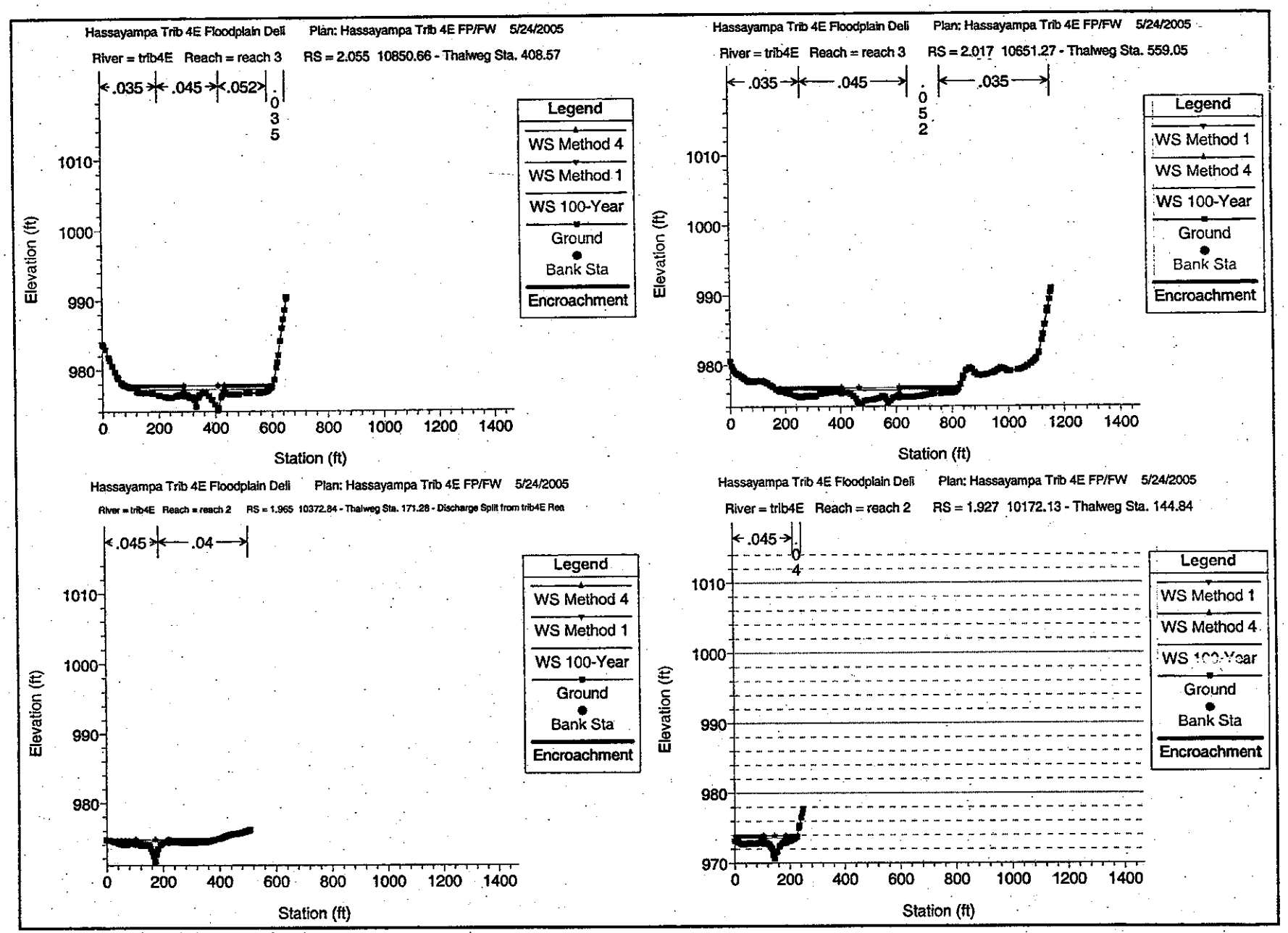



Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

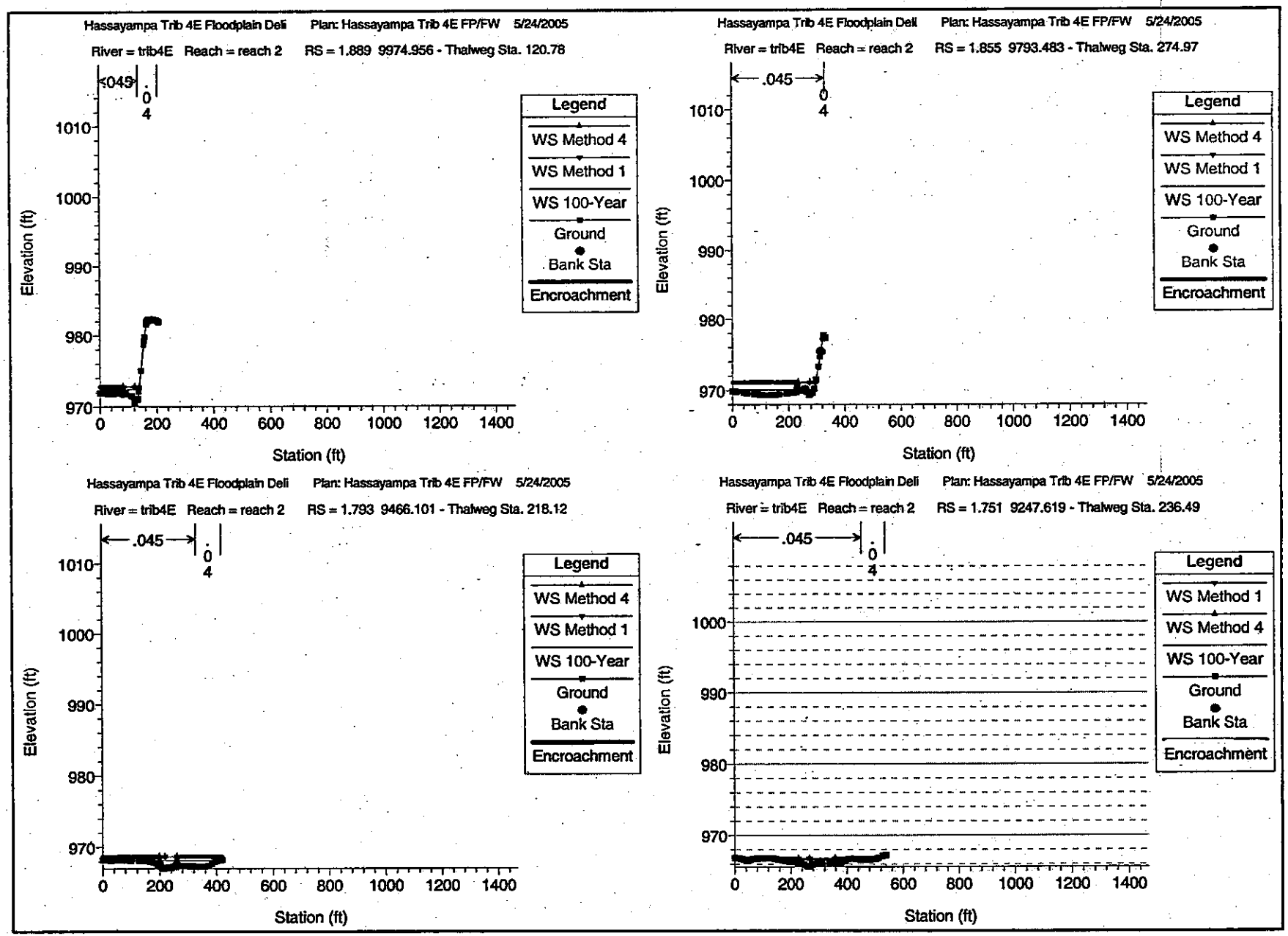
River = trib4E  Reach = reach 3  RS = 2.093  11050.37 - Thalweg Sta. 310.90



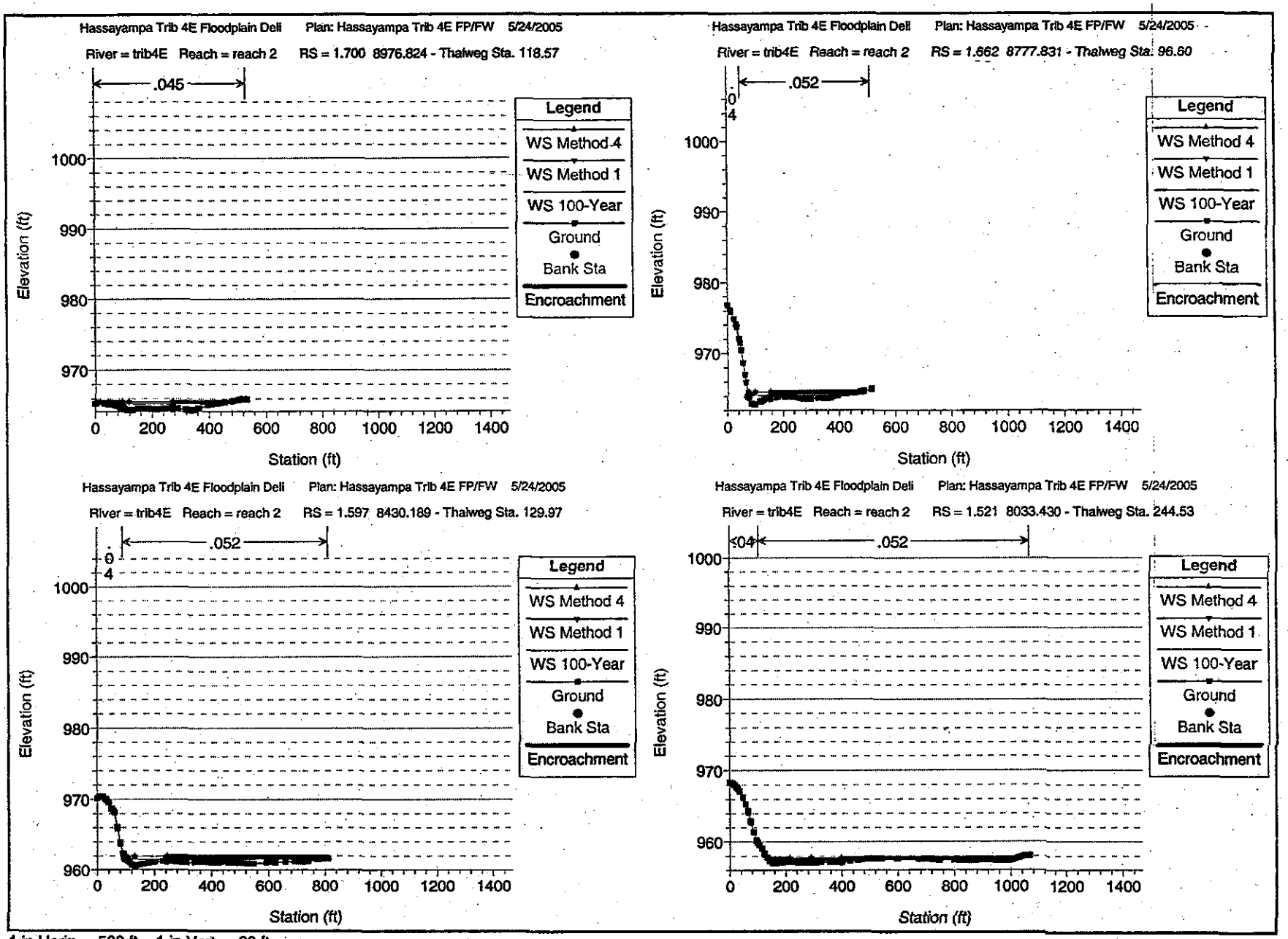

1 in Horiz. = 500 ft  1 in Vert. = 20 ft




1 in Horiz. = 500 ft 1 in Vert. = 20 ft



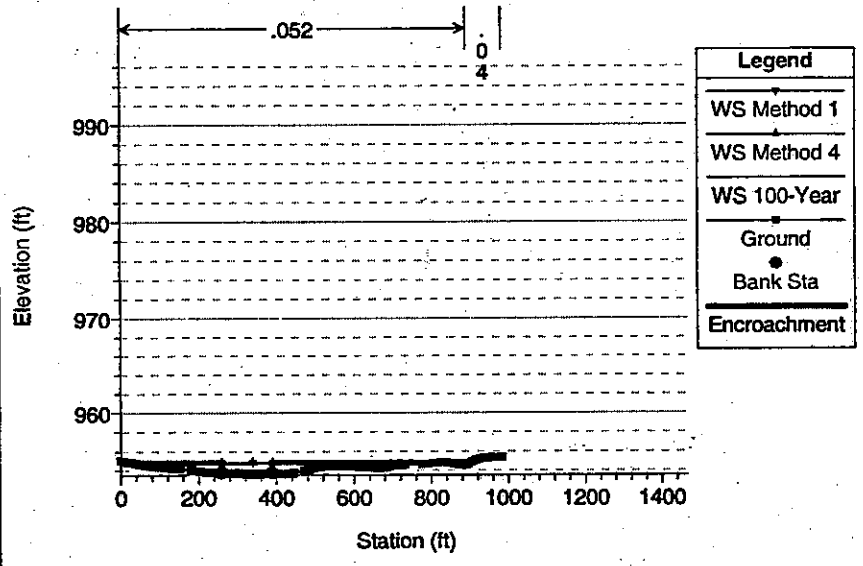

1 in Horiz. = 500 ft 1 in Vert. = 20 ft




1 in Horiz. = 500 ft 1 in Vert. = 20 ft

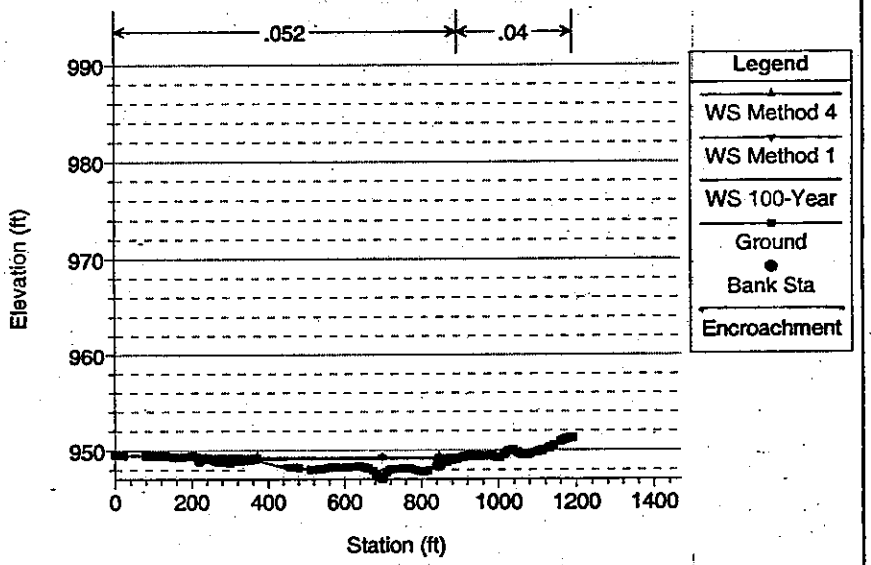
Hassayampa Trib 4E Floodplain Dell  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 2  RS = 1.452  7663.984 - Thalweg Sta. 360.07



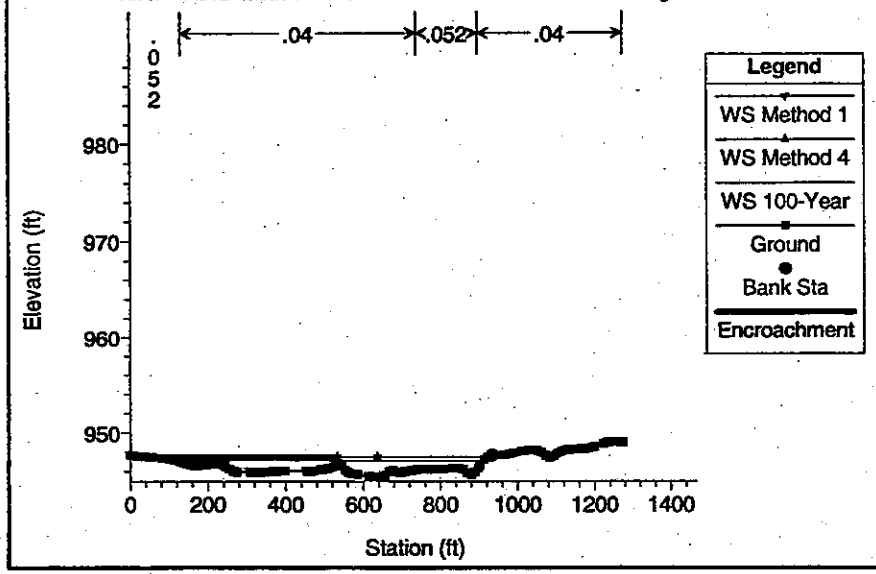

Hassayampa Trib 4E Floodplain Dell  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 1  RS = 1.238  6537.890 - Thalweg Sta. 696.13 - Discharge 1351 CFS from combin



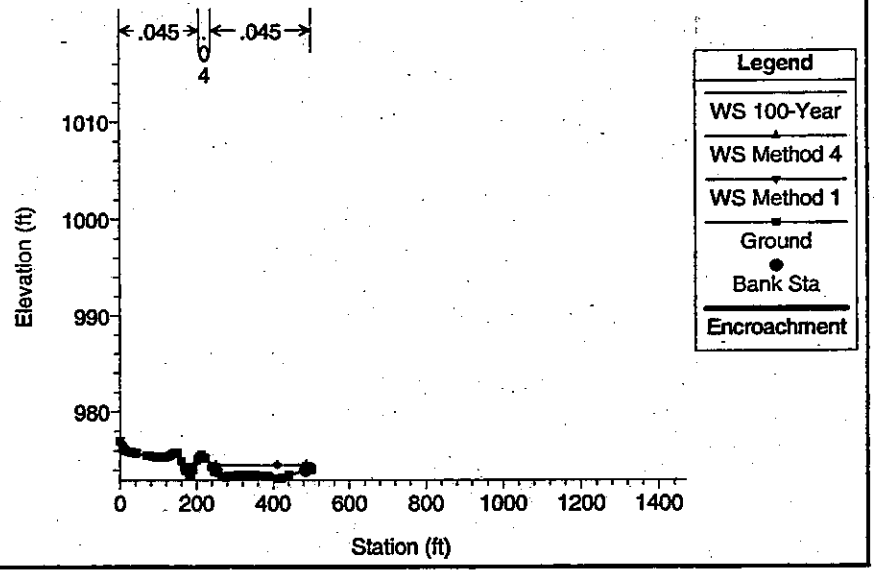

Hassayampa Trib 4E Floodplain Dell  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E  Reach = reach 1  RS = 1.153  6087.856 - Thalweg Sta. 635.67




Hassayampa Trib 4E Floodplain Dell  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

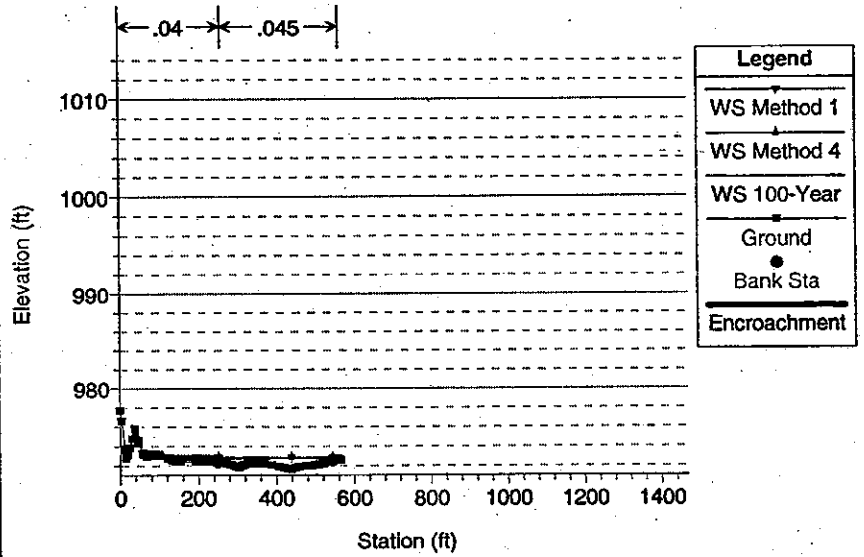
River = trib4E1  Reach = reach 2  RS = 0.647  3415.340 - Thalweg Sta. 410.83 - Discharge Split from trib4E Rea




1 in Horiz. = 500 ft  1 in Vert. = 20 ft

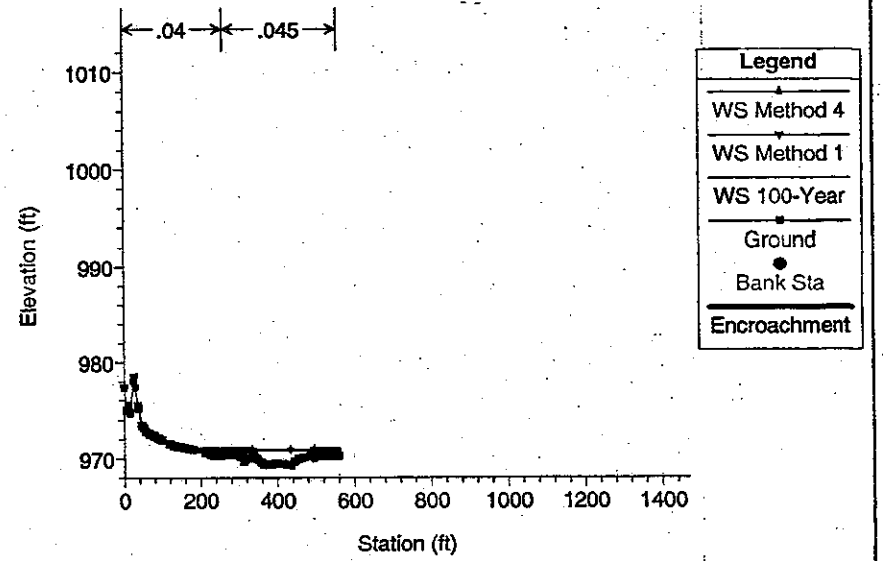
Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E1  Reach = reach 2  RS = 0.606  3200.929 - Thalweg Sta. 407.95



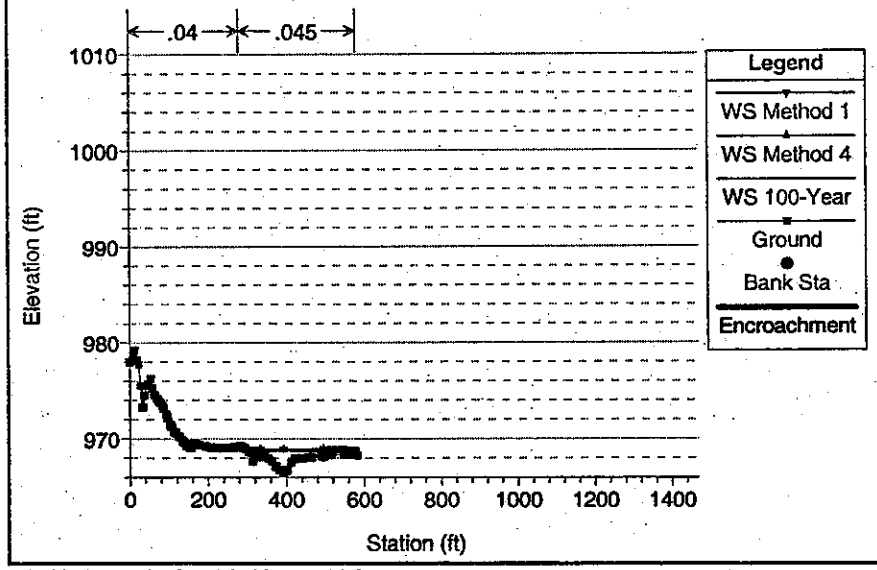

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E1  Reach = reach 2  RS = 0.562  2964.810 - Thalweg Sta. 392.96



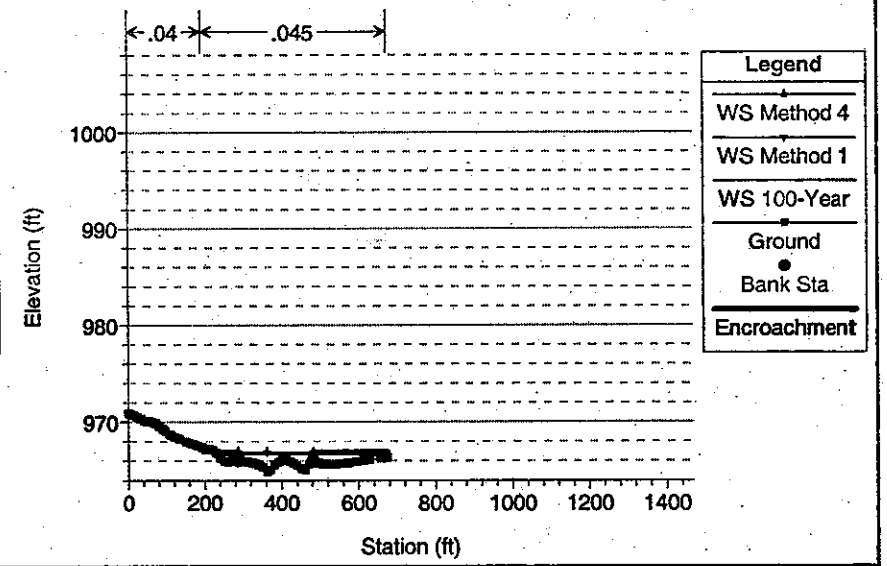

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E1  Reach = reach 2  RS = 0.513  2710.211 - Thalweg Sta. 383.20




Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

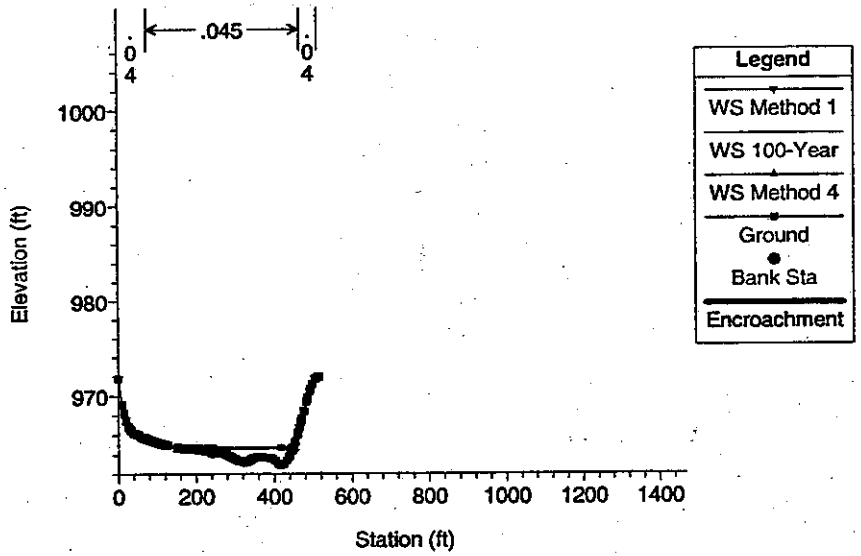
River = trib4E1  Reach = reach 2  RS = 0.447  2358.414 - Thalweg Sta. 439.26




1 in Horiz. = 500 ft  1 in Vert. = 20 ft

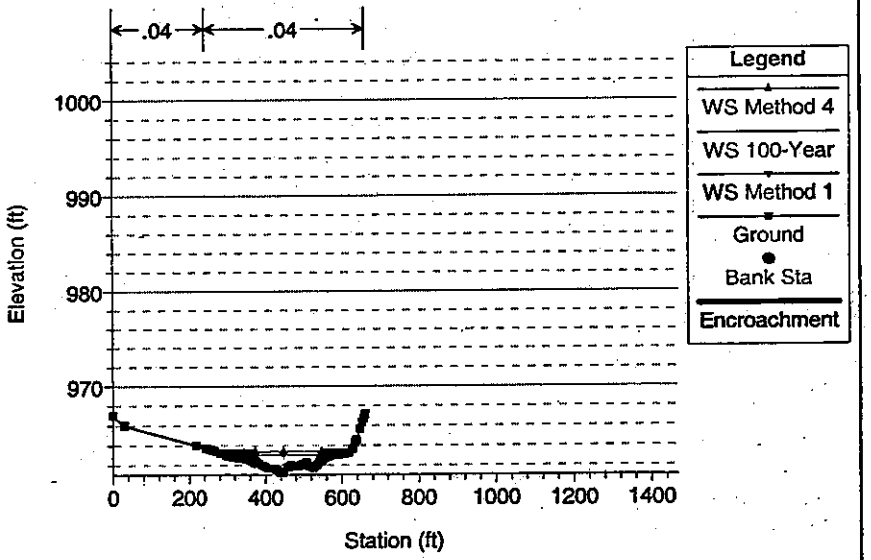
Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E1  Reach = reach 2  RS = 0.379  1998.612 - Thalweg Sta. 416.79



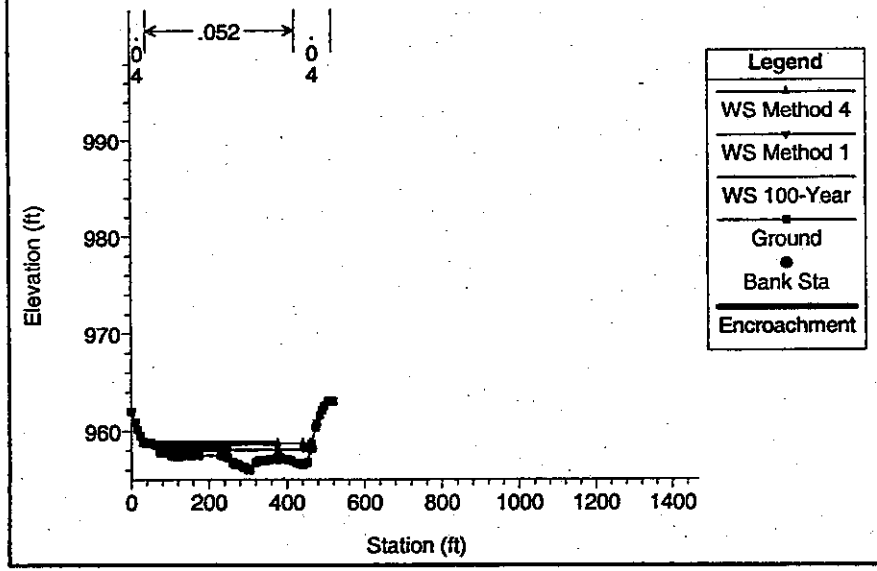

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E1  Reach = reach 2  RS = 0.322  1702.303 - Thalweg Sta. 526.44



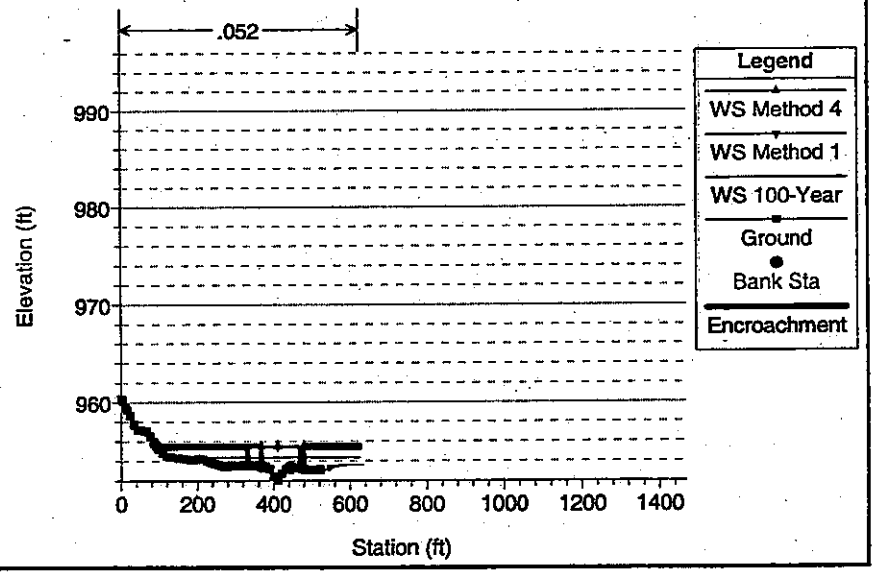

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E1  Reach = reach 1  RS = 0.201  1090.129 - Thalweg Sta. 441.11 - Discharge 1052 CFS from combine




Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

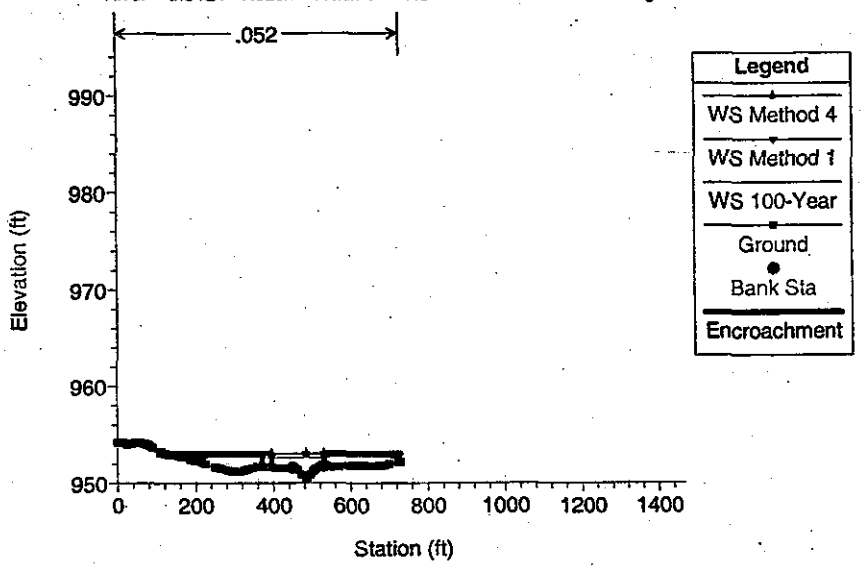
River = trib4E1  Reach = reach 1  RS = 0.125  659.438 - Thalweg Sta. 410.90




1 in Horiz. = 500 ft  1 in Vert. = 20 ft

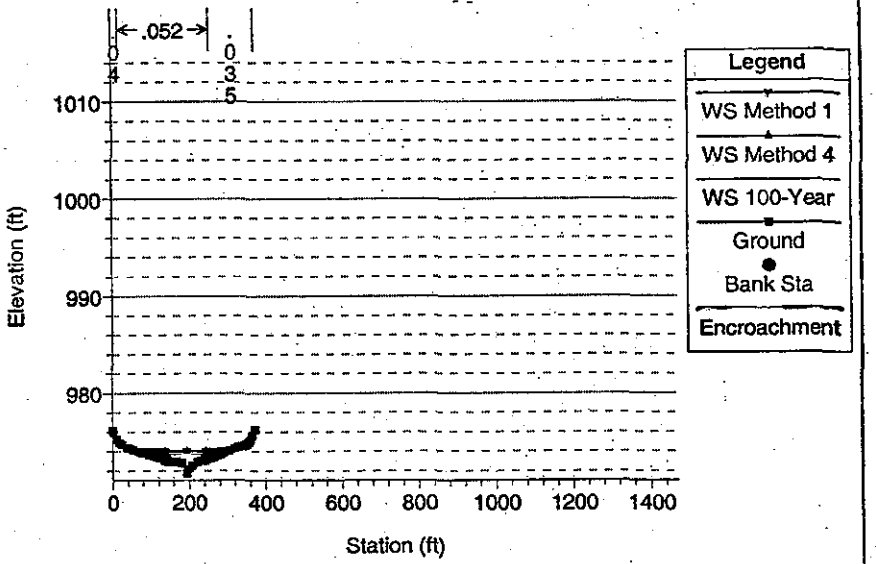
Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E1  Reach = reach 1  RS = 0.065  342.611 - Thalweg Sta. 484.06



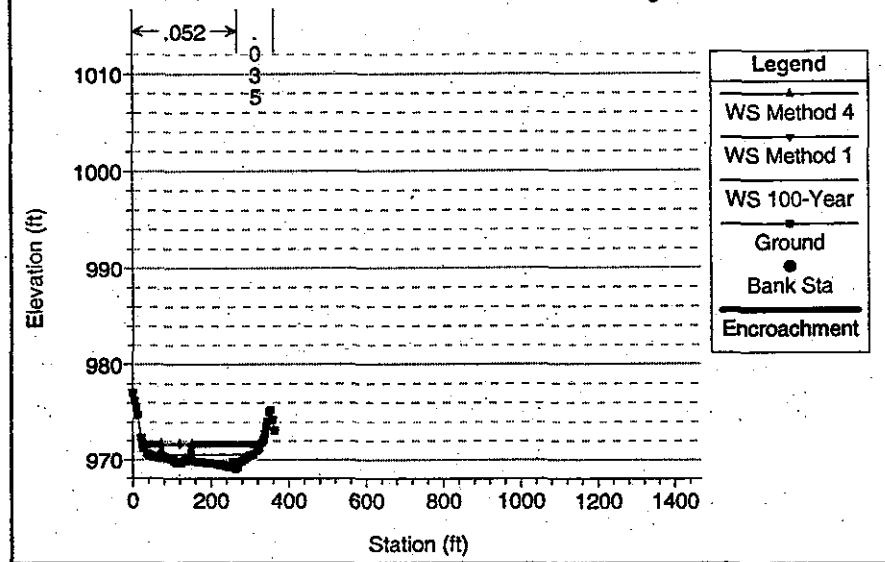

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E2  Reach = reach 1  RS = 0.281  Thalweg Sta. 193.66 - Discharge 422 from A2-100y6h.out HEC-1 Mod



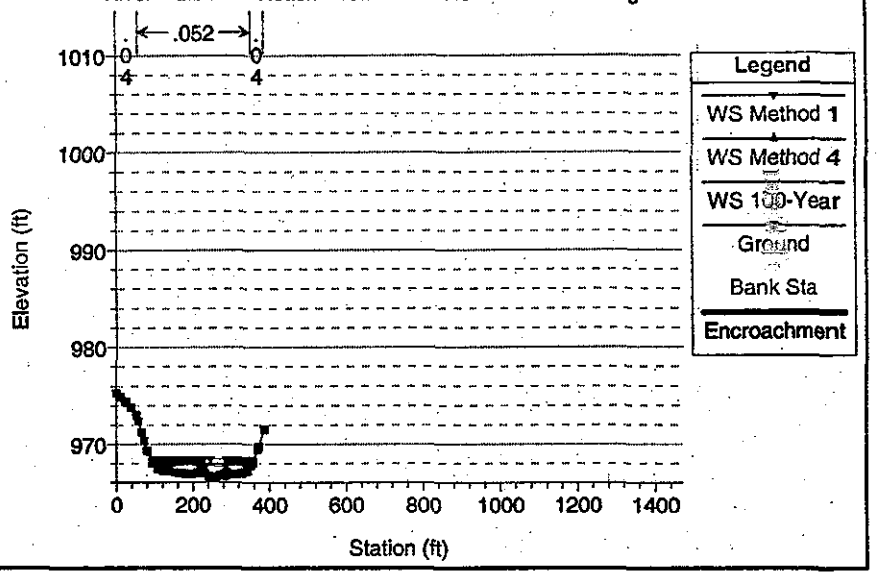

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E2  Reach = reach 1  RS = 0.229  Thalweg Sta. 118.88




Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

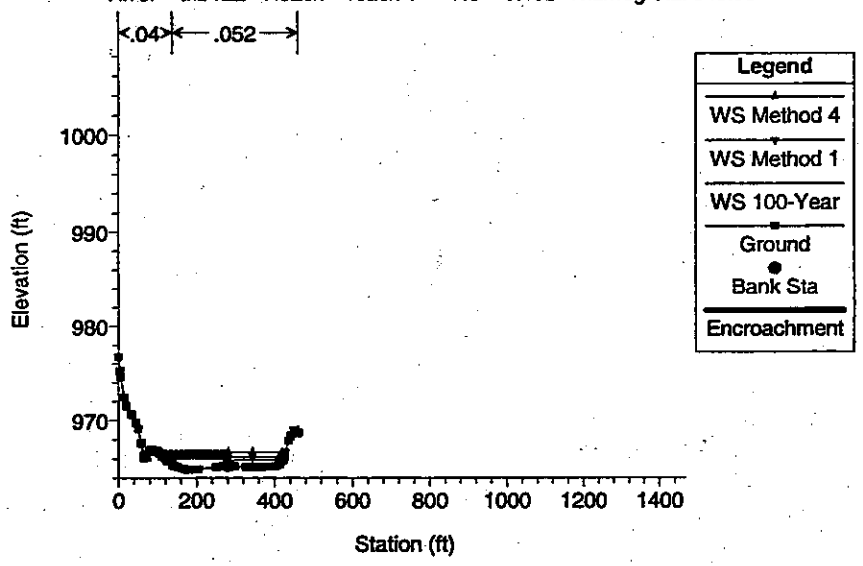
River = trib4E2  Reach = reach 1  RS = 0.172  Thalweg Sta. 245.62




1 in Horiz. = 500 ft  1 in Vert. = 20 ft

Hassayampa Trib 4E Floodplain Deli  Plan: Hassayampa Trib 4E FP/FW  5/24/2005

River = trib4E2  Reach = reach 1  RS = 0.132  Thalweg Sta. 343.06




1 in Horiz. = 500 ft  1 in Vert. = 20 ft

## E.3 Expansion and Contraction Coefficients

### E.3.1 Tributary 1E – All Reaches, Expansion and Contraction Coefficients

Expansion and contraction coefficients were 0.3 and 0.1, respectively, for the entire length of the Tributary 1E. The only exceptions were near the culverts modeled at Southern and Baseline Roads.

### E.3.2 Tributary 3E – All Reaches, Expansion Contraction Coefficients

Expansion and contraction coefficients were 0.3 and 0.1, respectively, for the entire length of the Tributary 3E. The only exception was at the location of the in-line weir.

### E.3.3 Tributary 4E – All Reaches, Expansion Contraction Coefficients

Expansion and contraction coefficients were 0.3 and 0.1, respectively, for the entire length of the Tributary 4E.

## E.4 Analysis of Structures

### E.4.1 Tributary 1E – All Reaches, Structures

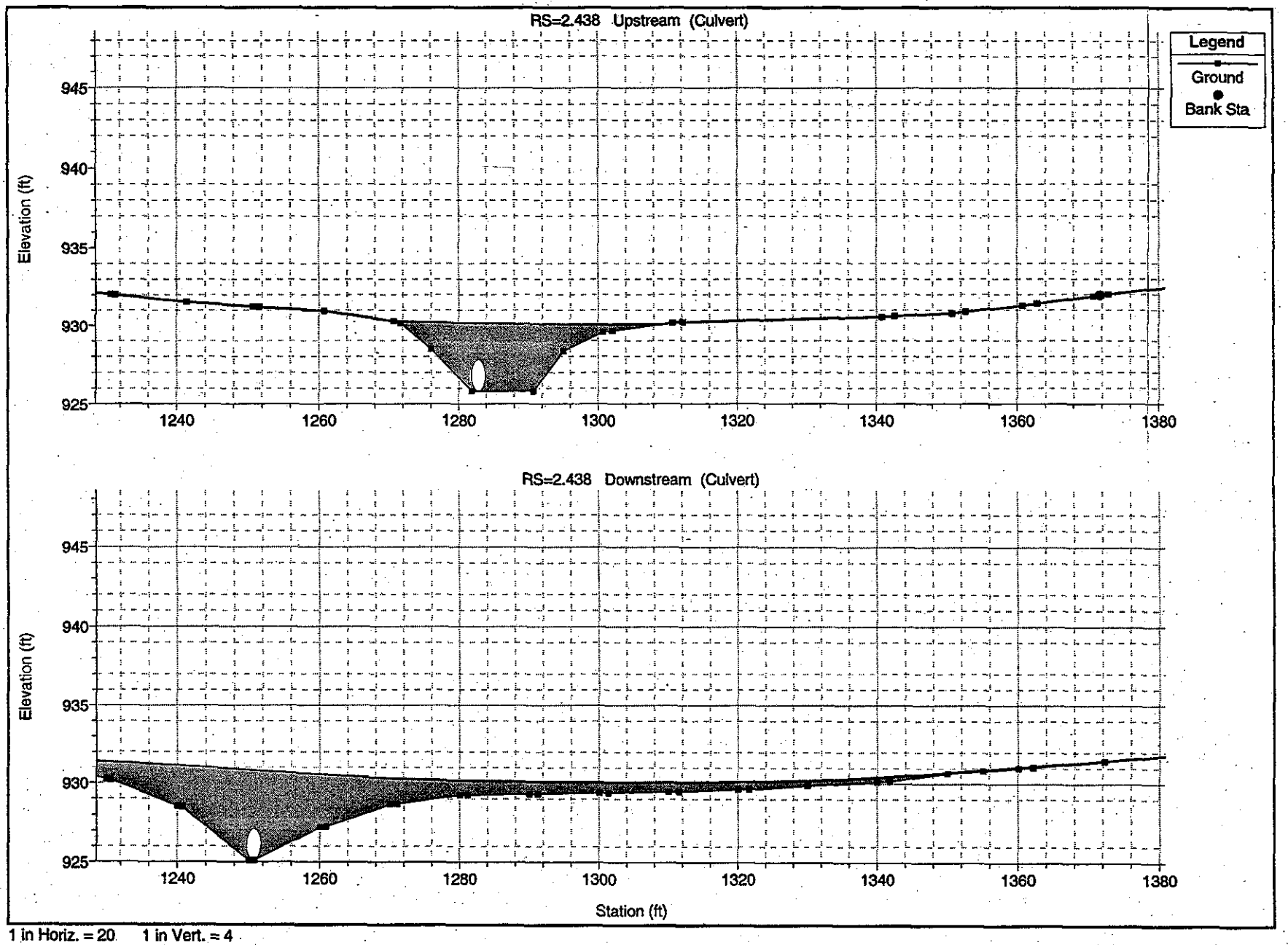
| Station | Culvert Location |
|---|---|
| 2.438 | Southern Road |
| 1.323 | Baseline Road |

### E.4.2 Tributary 3E – All Reaches, Structures

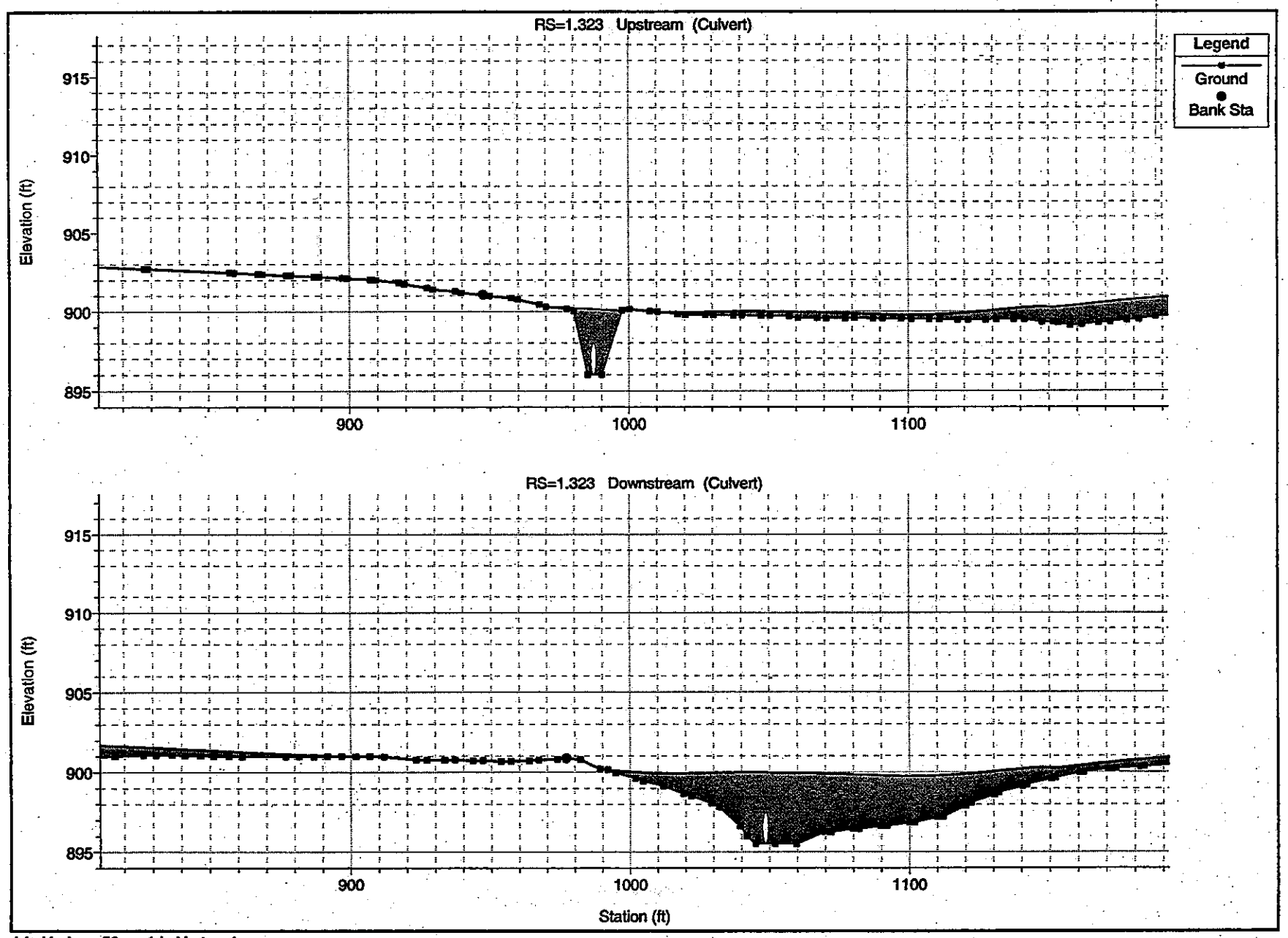
Station
1.359 – In-Line Weir

### E.4.3 Tributary 4E – All Reaches, Structures

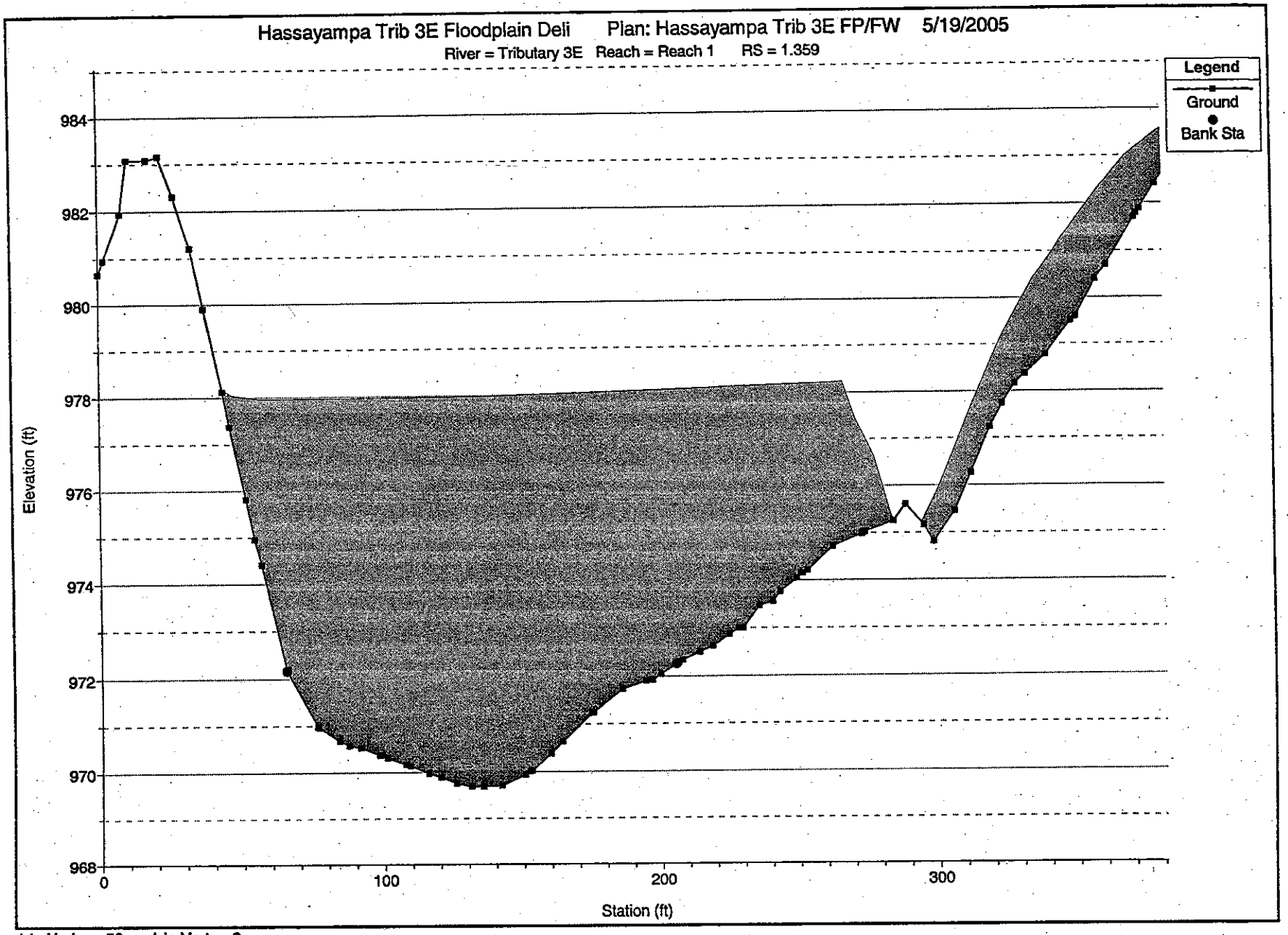
N/A




1 in Horiz. = 20 1 in Vert. = 4




1 in Horiz. = 50 1 in Vert. = 4




1 in Horiz. = 50 1 in Vert. = 3

## E.5 Hydraulic Calculations

### E.5.1 Water Surface Elevation HEC-RAS Output for Tributary 1E – All Reaches, Existing 100-Year, 6-Hour Event

HEC-RAS Plan: Trib 1E

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E1 | Reach 1 | 1.927 | 100-Year | 772.00 | 1035.97 | 1038.19 | 1037.67 | 1038.34 | 0.007018 | 3.19 | 249.77 | 217.25 | 0.47 |
| Tributary 1E1 | Reach 1 | 1.927 | Method 4 | 772.00 | 1035.97 | 1038.38 | 1037.66 | 1038.52 | 0.005302 | 3.00 | 257.17 | 158.73 | 0.42 |
| Tributary 1E1 | Reach 1 | 1.927 | Method 1 | 772.00 | 1035.97 | 1038.38 | 1037.66 | 1038.52 | 0.005302 | 3.00 | 257.17 | 158.73 | 0.42 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.889 | 100-Year | 772.00 | 1034.64 | 1036.56 | | 1036.79 | 0.008428 | 3.80 | 203.93 | 152.83 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.889 | Method 4 | 772.00 | 1034.64 | 1036.85 | | 1037.14 | 0.008986 | 4.29 | 179.82 | 91.51 | 0.54 |
| Tributary 1E1 | Reach 1 | 1.889 | Method 1 | 772.00 | 1034.64 | 1036.85 | | 1037.14 | 0.008986 | 4.29 | 179.82 | 91.51 | 0.54 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.851 | 100-Year | 772.00 | 1033.18 | 1035.35 | | 1035.49 | 0.004905 | 2.97 | 266.30 | 203.97 | 0.41 |
| Tributary 1E1 | Reach 1 | 1.851 | Method 4 | 772.00 | 1033.18 | 1035.39 | | 1035.58 | 0.006582 | 3.48 | 222.09 | 134.31 | 0.48 |
| Tributary 1E1 | Reach 1 | 1.851 | Method 1 | 772.00 | 1033.18 | 1035.39 | | 1035.58 | 0.006582 | 3.48 | 222.09 | 134.31 | 0.48 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.813 | 100-Year | 772.00 | 1032.16 | 1034.67 | | 1034.76 | 0.002657 | 2.46 | 314.37 | 169.23 | 0.32 |
| Tributary 1E1 | Reach 1 | 1.813 | Method 4 | 772.00 | 1032.16 | 1034.67 | | 1034.76 | 0.002657 | 2.46 | 314.37 | 169.23 | 0.32 |
| Tributary 1E1 | Reach 1 | 1.813 | Method 1 | 772.00 | 1032.16 | 1034.67 | | 1034.76 | 0.002657 | 2.46 | 314.37 | 169.23 | 0.32 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.775 | 100-Year | 772.00 | 1031.21 | 1033.06 | 1033.06 | 1033.60 | 0.018468 | 5.92 | 130.32 | 120.80 | 1.01 |
| Tributary 1E1 | Reach 1 | 1.775 | Method 4 | 772.00 | 1031.21 | 1033.06 | 1033.06 | 1033.60 | 0.018468 | 5.92 | 130.32 | 120.80 | 1.01 |
| Tributary 1E1 | Reach 1 | 1.775 | Method 1 | 772.00 | 1031.21 | 1033.06 | 1033.06 | 1033.60 | 0.018468 | 5.92 | 130.32 | 120.80 | 1.01 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.737 | 100-Year | 772.00 | 1028.94 | 1031.16 | | 1031.43 | 0.006285 | 4.23 | 182.45 | 112.69 | 0.59 |
| Tributary 1E1 | Reach 1 | 1.737 | Method 4 | 772.00 | 1028.94 | 1031.16 | | 1031.43 | 0.006285 | 4.23 | 182.45 | 112.69 | 0.59 |
| Tributary 1E1 | Reach 1 | 1.737 | Method 1 | 772.00 | 1028.94 | 1031.16 | | 1031.43 | 0.006285 | 4.23 | 182.45 | 112.69 | 0.59 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.699 | 100-Year | 772.00 | 1027.59 | 1029.70 | | 1029.99 | 0.008415 | 4.35 | 177.34 | 135.97 | 0.67 |
| Tributary 1E1 | Reach 1 | 1.699 | Method 4 | 772.00 | 1027.59 | 1029.70 | | 1029.99 | 0.008415 | 4.35 | 177.34 | 135.97 | 0.67 |
| Tributary 1E1 | Reach 1 | 1.699 | Method 1 | 772.00 | 1027.59 | 1029.70 | | 1029.99 | 0.008415 | 4.35 | 177.34 | 135.97 | 0.67 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.661 | 100-Year | 772.00 | 1026.38 | 1028.62 | | 1028.81 | 0.004187 | 3.56 | 217.14 | 140.63 | 0.50 |
| Tributary 1E1 | Reach 1 | 1.661 | Method 4 | 772.00 | 1026.38 | 1028.62 | | 1028.81 | 0.004187 | 3.56 | 217.14 | 140.63 | 0.50 |
| Tributary 1E1 | Reach 1 | 1.661 | Method 1 | 772.00 | 1026.38 | 1028.62 | | 1028.81 | 0.004187 | 3.56 | 217.14 | 140.63 | 0.50 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.624 | 100-Year | 772.00 | 1025.17 | 1027.32 | | 1027.67 | 0.008005 | 4.74 | 162.75 | 107.61 | 0.68 |
| Tributary 1E1 | Reach 1 | 1.624 | Method 4 | 772.00 | 1025.17 | 1027.32 | | 1027.67 | 0.008005 | 4.74 | 162.75 | 107.61 | 0.68 |
| Tributary 1E1 | Reach 1 | 1.624 | Method 1 | 772.00 | 1025.17 | 1027.32 | | 1027.67 | 0.008005 | 4.74 | 162.75 | 107.61 | 0.68 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.586 | 100-Year | 772.00 | 1024.04 | 1026.20 | | 1026.41 | 0.004786 | 3.65 | 211.68 | 144.40 | 0.53 |
| Tributary 1E1 | Reach 1 | 1.586 | Method 4 | 772.00 | 1024.04 | 1026.20 | | 1026.41 | 0.004786 | 3.65 | 211.68 | 144.40 | 0.53 |
| Tributary 1E1 | Reach 1 | 1.586 | Method 1 | 772.00 | 1024.04 | 1026.20 | | 1026.41 | 0.004786 | 3.65 | 211.68 | 144.40 | 0.53 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.546 | 100-Year | 772.00 | 1022.73 | 1024.88 | 1024.48 | 1025.19 | 0.007945 | 4.46 | 173.26 | 173.79 | 0.67 |
| Tributary 1E1 | Reach 1 | 1.546 | Method 4 | 772.00 | 1022.73 | 1024.88 | 1024.48 | 1025.19 | 0.007947 | 4.46 | 173.24 | 126.17 | 0.67 |
| Tributary 1E1 | Reach 1 | 1.546 | Method 1 | 772.00 | 1022.73 | 1024.88 | 1024.48 | 1025.19 | 0.007947 | 4.46 | 173.24 | 126.17 | 0.67 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tributary 1E1 | Reach 1 | 1.510 | 100-Year | 772.00 | 1021.60 | 1023.57 | | 1023.80 | 0.005876 | 3.87 | 199.52 | 144.28 | 0.58 |
| Tributary 1E1 | Reach 1 | 1.510 | Method 4 | 772.00 | 1021.60 | 1023.57 | | 1023.80 | 0.005876 | 3.87 | 199.52 | 144.28 | 0.58 |
| Tributary 1E1 | Reach 1 | 1.510 | Method 1 | 772.00 | 1021.60 | 1023.57 | | 1023.80 | 0.005876 | 3.87 | 199.52 | 144.28 | 0.58 |
| Tributary 1E1 | Reach 1 | 1.472 | 100-Year | 772.00 | 1019.84 | 1022.10 | | 1022.44 | 0.007882 | 4.67 | 165.42 | 111.82 | 0.68 |
| Tributary 1E1 | Reach 1 | 1.472 | Method 4 | 772.00 | 1019.84 | 1022.10 | | 1022.44 | 0.007882 | 4.67 | 165.42 | 111.82 | 0.68 |
| Tributary 1E1 | Reach 1 | 1.472 | Method 1 | 772.00 | 1019.84 | 1022.10 | | 1022.44 | 0.007882 | 4.67 | 165.42 | 111.82 | 0.68 |
| Tributary 1E1 | Reach 1 | 1.434 | 100-Year | 772.00 | 1018.79 | 1020.99 | | 1021.19 | 0.004821 | 3.60 | 214.67 | 146.71 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.434 | Method 4 | 772.00 | 1018.79 | 1020.99 | | 1021.19 | 0.004821 | 3.60 | 214.67 | 146.71 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.434 | Method 1 | 772.00 | 1018.79 | 1020.99 | | 1021.19 | 0.004821 | 3.60 | 214.67 | 146.71 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.396 | 100-Year | 772.00 | 1017.58 | 1019.98 | 1019.28 | 1020.21 | 0.004953 | 3.83 | 201.55 | 230.14 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.396 | Method 4 | 772.00 | 1017.58 | 1019.98 | 1019.28 | 1020.21 | 0.004953 | 3.83 | 201.55 | 120.02 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.396 | Method 1 | 772.00 | 1017.58 | 1019.98 | 1019.28 | 1020.21 | 0.004953 | 3.83 | 201.55 | 120.02 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.358 | 100-Year | 772.00 | 1016.31 | 1018.59 | | 1018.95 | 0.008149 | 4.76 | 162.11 | 96.83 | 0.65 |
| Tributary 1E1 | Reach 1 | 1.358 | Method 4 | 772.00 | 1016.31 | 1018.59 | | 1018.95 | 0.008149 | 4.76 | 162.11 | 96.83 | 0.65 |
| Tributary 1E1 | Reach 1 | 1.358 | Method 1 | 772.00 | 1016.31 | 1018.59 | | 1018.95 | 0.008149 | 4.76 | 162.11 | 96.83 | 0.65 |
| Tributary 1E1 | Reach 1 | 1.321 | 100-Year | 772.00 | 1014.92 | 1017.21 | | 1017.44 | 0.006562 | 3.88 | 198.87 | 161.70 | 0.62 |
| Tributary 1E1 | Reach 1 | 1.321 | Method 4 | 772.00 | 1014.92 | 1017.21 | | 1017.44 | 0.006562 | 3.88 | 198.87 | 161.70 | 0.62 |
| Tributary 1E1 | Reach 1 | 1.321 | Method 1 | 772.00 | 1014.92 | 1017.21 | | 1017.44 | 0.006562 | 3.88 | 198.87 | 161.70 | 0.62 |
| Tributary 1E1 | Reach 1 | 1.283 | 100-Year | 772.00 | 1013.95 | 1016.43 | | 1016.59 | 0.002886 | 3.20 | 241.60 | 129.78 | 0.41 |
| Tributary 1E1 | Reach 1 | 1.283 | Method 4 | 772.00 | 1013.95 | 1016.43 | | 1016.59 | 0.002885 | 3.20 | 241.62 | 129.78 | 0.41 |
| Tributary 1E1 | Reach 1 | 1.283 | Method 1 | 772.00 | 1013.95 | 1016.43 | | 1016.59 | 0.002885 | 3.20 | 241.62 | 129.78 | 0.41 |
| Tributary 1E1 | Reach 1 | 1.245 | 100-Year | 772.00 | 1013.40 | 1015.70 | | 1015.90 | 0.004132 | 3.59 | 215.14 | 122.93 | 0.48 |
| Tributary 1E1 | Reach 1 | 1.245 | Method 4 | 772.00 | 1013.40 | 1015.70 | | 1015.90 | 0.004136 | 3.59 | 215.06 | 122.91 | 0.48 |
| Tributary 1E1 | Reach 1 | 1.245 | Method 1 | 772.00 | 1013.40 | 1015.70 | | 1015.90 | 0.004136 | 3.59 | 215.06 | 122.91 | 0.48 |
| Tributary 1E1 | Reach 1 | 1.207 | 100-Year | 772.00 | 1012.55 | 1014.81 | | 1015.02 | 0.004646 | 3.73 | 206.97 | 128.12 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.207 | Method 4 | 772.00 | 1012.55 | 1014.84 | | 1015.05 | 0.004335 | 3.64 | 211.89 | 129.08 | 0.50 |
| Tributary 1E1 | Reach 1 | 1.207 | Method 1 | 772.00 | 1012.55 | 1014.84 | | 1015.05 | 0.004336 | 3.64 | 211.88 | 129.08 | 0.50 |
| Tributary 1E1 | Reach 1 | 1.169 | 100-Year | 772.00 | 1011.55 | 1013.58 | | 1013.79 | 0.008621 | 3.76 | 219.66 | 261.97 | 0.63 |
| Tributary 1E1 | Reach 1 | 1.169 | Method 4 | 772.00 | 1011.55 | 1013.59 | | 1013.82 | 0.009248 | 3.91 | 197.58 | 177.95 | 0.65 |
| Tributary 1E1 | Reach 1 | 1.169 | Method 1 | 772.00 | 1011.55 | 1013.59 | | 1013.82 | 0.009245 | 3.91 | 197.61 | 177.95 | 0.65 |
| Tributary 1E1 | Reach 1 | 1.131 | 100-Year | 772.00 | 1010.41 | 1012.50 | | 1012.63 | 0.003937 | 2.91 | 265.50 | 197.41 | 0.44 |
| Tributary 1E1 | Reach 1 | 1.131 | Method 4 | 772.00 | 1010.41 | 1012.50 | | 1012.63 | 0.003935 | 2.91 | 265.56 | 197.42 | 0.44 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tributary 1E1 | Reach 1 | 1.131 | Method 4 | 772.00 | 1010.41 | 1012.50 | | 1012.63 | 0.003937 | 2.91 | 265.50 | 197.41 | 0.44 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.093 | 100-Year | 772.00 | 1010.01 | 1011.56 | | 1011.71 | 0.005367 | 3.09 | 250.13 | 213.77 | 0.50 |
| Tributary 1E1 | Reach 1 | 1.093 | Method 4 | 772.00 | 1010.01 | 1011.56 | | 1011.71 | 0.005383 | 3.09 | 249.89 | 213.75 | 0.50 |
| Tributary 1E1 | Reach 1 | 1.093 | Method 1 | 772.00 | 1010.01 | 1011.56 | | 1011.71 | 0.005367 | 3.09 | 250.13 | 213.77 | 0.50 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.052 | 100-Year | 772.00 | 1008.90 | 1010.36 | | 1010.52 | 0.005836 | 3.18 | 242.65 | 211.09 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.052 | Method 4 | 772.00 | 1008.90 | 1010.36 | | 1010.52 | 0.005788 | 3.17 | 243.27 | 211.14 | 0.52 |
| Tributary 1E1 | Reach 1 | 1.052 | Method 1 | 772.00 | 1008.90 | 1010.36 | | 1010.52 | 0.005836 | 3.18 | 242.65 | 211.09 | 0.52 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 1.008 | 100-Year | 772.00 | 1007.69 | 1009.35 | | 1009.45 | 0.003584 | 2.52 | 306.54 | 272.67 | 0.42 |
| Tributary 1E1 | Reach 1 | 1.008 | Method 4 | 772.00 | 1007.69 | 1009.34 | | 1009.44 | 0.003666 | 2.54 | 304.38 | 272.32 | 0.42 |
| Tributary 1E1 | Reach 1 | 1.008 | Method 1 | 772.00 | 1007.69 | 1009.35 | | 1009.45 | 0.003584 | 2.52 | 306.54 | 272.67 | 0.42 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.968 | 100-Year | 772.00 | 1006.87 | 1008.35 | | 1008.49 | 0.005985 | 3.05 | 253.18 | 231.60 | 0.51 |
| Tributary 1E1 | Reach 1 | 0.968 | Method 4 | 772.00 | 1006.87 | 1008.38 | | 1008.52 | 0.005438 | 2.96 | 261.07 | 232.72 | [illegible] |
| Tributary 1E1 | Reach 1 | 0.968 | Method 1 | 772.00 | 1006.87 | 1008.35 | | 1008.49 | 0.005985 | 3.05 | 253.18 | 231.60 | 0.51 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.929 | 100-Year | 772.00 | 1005.89 | 1007.33 | | 1007.45 | 0.004262 | 2.86 | 282.06 | 296.77 | 0.47 |
| Tributary 1E1 | Reach 1 | 0.929 | Method 4 | 772.00 | 1005.89 | 1007.35 | | 1007.49 | 0.004624 | 3.01 | 256.81 | 220.33 | 0.49 |
| Tributary 1E1 | Reach 1 | 0.929 | Method 1 | 772.00 | 1005.89 | 1007.33 | | 1007.45 | 0.004262 | 2.86 | 282.06 | 296.77 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.890 | 100-Year | 772.00 | 1004.61 | 1006.39 | | 1006.56 | 0.004397 | 3.24 | 237.95 | 182.46 | 0.50 |
| Tributary 1E1 | Reach 1 | 0.890 | Method 4 | 772.00 | 1004.61 | 1006.39 | | 1006.56 | 0.004397 | 3.24 | 237.95 | 182.46 | 0.50 |
| Tributary 1E1 | Reach 1 | 0.890 | Method 1 | 772.00 | 1004.61 | 1006.39 | | 1006.56 | 0.004397 | 3.24 | 237.95 | 182.46 | 0.50 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.852 | 100-Year | 772.00 | 1003.65 | 1005.46 | | 1005.61 | 0.005092 | 3.13 | 246.43 | 219.06 | 0.52 |
| Tributary 1E1 | Reach 1 | 0.852 | Method 4 | 772.00 | 1003.65 | 1005.46 | | 1005.61 | 0.005092 | 3.13 | 246.43 | 219.06 | 0.52 |
| Tributary 1E1 | Reach 1 | 0.852 | Method 1 | 772.00 | 1003.65 | 1005.46 | | 1005.61 | 0.005092 | 3.13 | 246.43 | 219.06 | 0.52 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.814 | 100-Year | 772.00 | 1003.05 | 1004.45 | | 1004.59 | 0.005025 | 2.98 | 258.84 | 235.12 | 0.50 |
| Tributary 1E1 | Reach 1 | 0.814 | Method 4 | 772.00 | 1003.05 | 1004.45 | | 1004.59 | 0.005025 | 2.98 | 258.84 | 235.12 | 0.50 |
| Tributary 1E1 | Reach 1 | 0.814 | Method 1 | 772.00 | 1003.05 | 1004.45 | | 1004.59 | 0.005025 | 2.98 | 258.84 | 235.12 | 0.50 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.777 | 100-Year | 772.00 | 1002.22 | 1003.81 | | 1003.89 | 0.002462 | 2.30 | 336.38 | 276.34 | 0.37 |
| Tributary 1E1 | Reach 1 | 0.777 | Method 4 | 772.00 | 1002.22 | 1003.81 | | 1003.89 | [illegible] | 2.30 | 336.38 | 276.34 | 0.37 |
| Tributary 1E1 | Reach 1 | 0.777 | Method 1 | 772.00 | 1002.22 | 1003.81 | | 1003.89 | 0.002462 | 2.30 | 336.38 | 276.34 | 0.37 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.739 | 100-Year | 772.00 | 1000.80 | 1003.04 | | 1003.18 | 0.005513 | 3.00 | 257.31 | 163.79 | 0.42 |
| Tributary 1E1 | Reach 1 | 0.739 | Method 4 | 772.00 | 1000.80 | 1003.04 | | 1003.18 | 0.005513 | 3.00 | 257.31 | 163.79 | 0.42 |
| Tributary 1E1 | Reach 1 | 0.739 | Method 1 | 772.00 | 1000.80 | 1003.04 | | 1003.18 | 0.005513 | 3.00 | 257.31 | 163.79 | 0.42 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.701 | 100-Year | 772.00 | 1000.09 | 1002.01 | | 1002.14 | 0.004934 | 2.89 | 266.75 | 170.46 | 0.41 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E1 | Reach 1 | 0.701 | Method 4 | 772.00 | 1000.09 | 1002.01 | | 1002.14 | 0.004934 | 2.89 | 266.75 | 170.46 | 0.41 |
| Tributary 1E1 | Reach 1 | 0.701 | Method 1 | 772.00 | 1000.09 | 1002.01 | | 1002.14 | 0.004934 | 2.89 | 266.75 | 170.46 | 0.41 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.663 | 100-Year | 772.00 | 999.36 | 1001.16 | | 1001.25 | 0.003909 | 2.52 | 305.85 | 234.89 | 0.39 |
| Tributary 1E1 | Reach 1 | 0.663 | Method 4 | 772.00 | 999.36 | 1001.16 | | 1001.25 | 0.003909 | 2.52 | 305.85 | 234.89 | 0.39 |
| Tributary 1E1 | Reach 1 | 0.663 | Method 1 | 772.00 | 999.36 | 1001.16 | | 1001.25 | 0.003909 | 2.52 | 305.85 | 234.89 | 0.39 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.625 | 100-Year | 772.00 | 997.84 | 1000.34 | 999.55 | 1000.46 | 0.003966 | 2.85 | 270.48 | 171.32 | 0.40 |
| Tributary 1E1 | Reach 1 | 0.625 | Method 4 | 772.00 | 997.84 | 1000.34 | 999.55 | 1000.46 | 0.003966 | 2.85 | 270.48 | 171.32 | 0.40 |
| Tributary 1E1 | Reach 1 | 0.625 | Method 1 | 772.00 | 997.84 | 1000.34 | 999.55 | 1000.46 | 0.003966 | 2.85 | 270.48 | 171.32 | 0.40 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.587 | 100-Year | 772.00 | 997.22 | 999.18 | 998.61 | 999.35 | 0.008267 | 3.32 | 232.56 | 234.70 | 0.49 |
| Tributary 1E1 | Reach 1 | 0.587 | Method 4 | 772.00 | 997.22 | 999.18 | 998.61 | 999.35 | 0.008268 | 3.32 | 232.55 | 166.30 | 0.49 |
| Tributary 1E1 | Reach 1 | 0.587 | Method 1 | 772.00 | 997.22 | 999.18 | 998.60 | 999.35 | 0.008267 | 3.32 | 232.56 | 166.30 | 0.49 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.549 | 100-Year | 772.00 | 996.07 | 997.78 | | 997.92 | 0.006192 | 2.98 | 259.49 | 196.93 | 0.46 |
| Tributary 1E1 | Reach 1 | 0.549 | Method 4 | 772.00 | 996.07 | 997.78 | | 997.92 | 0.006191 | 2.97 | 259.50 | 196.93 | 0.46 |
| Tributary 1E1 | Reach 1 | 0.549 | Method 1 | 772.00 | 996.07 | 997.78 | | 997.92 | 0.006192 | 2.98 | 259.49 | 196.93 | 0.46 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.511 | 100-Year | 772.00 | 994.58 | 996.69 | | 996.81 | 0.004973 | 2.74 | 281.93 | 194.89 | 0.40 |
| Tributary 1E1 | Reach 1 | 0.511 | Method 4 | 772.00 | 994.58 | 996.69 | | 996.81 | 0.004976 | 2.74 | 281.88 | 194.88 | 0.40 |
| Tributary 1E1 | Reach 1 | 0.511 | Method 1 | 772.00 | 994.58 | 996.69 | | 996.81 | 0.004973 | 2.74 | 281.93 | 194.89 | 0.40 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.474 | 100-Year | 772.00 | 993.80 | 995.53 | 994.97 | 995.66 | 0.006687 | 2.90 | 266.47 | 230.26 | 0.45 |
| Tributary 1E1 | Reach 1 | 0.474 | Method 4 | 772.00 | 993.80 | 995.53 | 994.97 | 995.66 | 0.006669 | 2.89 | 266.69 | 211.08 | 0.45 |
| Tributary 1E1 | Reach 1 | 0.474 | Method 1 | 772.00 | 993.80 | 995.53 | 994.97 | 995.66 | 0.006687 | 2.90 | 266.47 | 211.05 | 0.45 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.436 | 100-Year | 772.00 | 992.37 | 993.76 | | 993.93 | 0.011617 | 3.39 | 227.97 | 208.39 | 0.57 |
| Tributary 1E1 | Reach 1 | 0.436 | Method 4 | 772.00 | 992.37 | 993.75 | | 993.93 | 0.011704 | 3.39 | 227.43 | 208.31 | 0.57 |
| Tributary 1E1 | Reach 1 | 0.436 | Method 1 | 772.00 | 992.37 | 993.76 | | 993.93 | 0.011617 | 3.39 | 227.97 | 208.39 | 0.57 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.398 | 100-Year | 772.00 | 990.83 | 992.37 | | 992.46 | 0.004918 | 2.32 | 332.31 | 299.43 | 0.39 |
| Tributary 1E1 | Reach 1 | 0.398 | Method 4 | 772.00 | 990.83 | 992.38 | | 992.46 | 0.004892 | 2.32 | 332.86 | 299.61 | 0.39 |
| Tributary 1E1 | Reach 1 | 0.398 | Method 1 | 772.00 | 990.83 | 992.37 | | 992.46 | 0.004918 | 2.32 | 332.31 | 299.43 | 0.39 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.359 | 100-Year | 772.00 | 990.00 | 991.17 | | 991.27 | 0.006832 | 2.60 | 297.63 | 342.56 | 0.48 |
| Tributary 1E1 | Reach 1 | 0.359 | Method 4 | 772.00 | 990.00 | 991.17 | | 991.28 | 0.006862 | 2.61 | 295.94 | 330.08 | 0.49 |
| Tributary 1E1 | Reach 1 | 0.359 | Method 1 | 772.00 | 990.00 | 991.17 | | 991.27 | 0.006832 | 2.60 | 297.63 | 342.56 | 0.48 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.319 | 100-Year | 772.00 | 988.16 | 989.93 | | 990.06 | 0.004973 | 2.95 | 261.79 | 286.58 | 0.54 |
| Tributary 1E1 | Reach 1 | 0.319 | Method 4 | 772.00 | 988.16 | 989.93 | | 990.06 | 0.004972 | 2.95 | 261.81 | 286.58 | 0.54 |
| Tributary 1E1 | Reach 1 | 0.319 | Method 1 | 772.00 | 988.16 | 989.93 | | 990.06 | 0.004972 | 2.95 | 261.81 | 286.58 | 0.54 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E1 | Reach 1 | 0.293 | 100-Year | 772.00 | 987.23 | 989.30 | | 989.45 | 0.003850 | 3.06 | 252.00 | 203.65 | 0.49 |
| Tributary 1E1 | Reach 1 | 0.293 | Method 4 | 772.00 | 987.23 | 989.30 | | 989.45 | 0.003860 | 3.07 | 251.78 | 203.61 | 0.49 |
| Tributary 1E1 | Reach 1 | 0.293 | Method 1 | 772.00 | 987.23 | 989.30 | | 989.45 | 0.003857 | 3.07 | 251.85 | 203.62 | 0.49 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.254 | 100-Year | 772.00 | 986.34 | 988.32 | | 988.44 | 0.006233 | 2.83 | 272.88 | 214.35 | 0.44 |
| Tributary 1E1 | Reach 1 | 0.254 | Method 4 | 772.00 | 986.34 | 988.33 | | 988.45 | 0.006095 | 2.81 | 274.88 | 214.74 | 0.44 |
| Tributary 1E1 | Reach 1 | 0.254 | Method 1 | 772.00 | 986.34 | 988.32 | | 988.45 | 0.006138 | 2.81 | 274.25 | 214.62 | 0.44 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.216 | 100-Year | 772.00 | 985.47 | 987.40 | | 987.49 | 0.003665 | 2.30 | 338.38 | 262.28 | 0.34 |
| Tributary 1E1 | Reach 1 | 0.216 | Method 4 | 772.00 | 985.47 | 987.38 | | 987.46 | 0.003967 | 2.36 | 327.61 | 241.29 | 0.36 |
| Tributary 1E1 | Reach 1 | 0.216 | Method 1 | 772.00 | 985.47 | 987.37 | | 987.46 | 0.003942 | 2.35 | 330.74 | 260.88 | 0.36 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.178 | 100-Year | 772.00 | 984.61 | 986.31 | | 986.53 | 0.006348 | 3.80 | 203.22 | 172.89 | 0.62 |
| Tributary 1E1 | Reach 1 | 0.178 | Method 4 | 772.00 | 984.61 | 986.48 | | 986.65 | 0.004110 | 3.32 | 232.20 | 177.04 | 0.51 |
| Tributary 1E1 | Reach 1 | 0.178 | Method 1 | 772.00 | 984.61 | 986.48 | | 986.65 | 0.004110 | 3.32 | 232.20 | 177.04 | 0.51 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.141 | 100-Year | 772.00 | 983.80 | 985.41 | | 985.54 | 0.003888 | 3.16 | 279.53 | 318.22 | 0.49 |
| Tributary 1E1 | Reach 1 | 0.141 | Method 4 | 772.00 | 983.80 | 985.52 | | 985.74 | 0.005285 | 3.84 | 200.95 | 142.69 | 0.57 |
| Tributary 1E1 | Reach 1 | 0.141 | Method 1 | 772.00 | 983.80 | 985.52 | | 985.74 | 0.005285 | 3.84 | 200.95 | 142.69 | 0.57 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.102 | 100-Year | 772.00 | 981.93 | 984.28 | | 984.51 | 0.006541 | 3.91 | 197.70 | 168.96 | 0.63 |
| Tributary 1E1 | Reach 1 | 0.102 | Method 4 | 772.00 | 981.93 | 984.23 | | 984.49 | 0.007263 | 4.07 | 189.90 | 164.32 | 0.67 |
| Tributary 1E1 | Reach 1 | 0.102 | Method 1 | 772.00 | 981.93 | 984.23 | | 984.49 | 0.007264 | 4.07 | 189.89 | 164.32 | 0.67 |
| | | | | | | | | | | | | | |
| Tributary 1E1 | Reach 1 | 0.062 | 100-Year | 772.00 | 979.57 | 983.01 | | 983.27 | 0.005310 | 4.13 | 186.94 | 120.73 | 0.58 |
| Tributary 1E1 | Reach 1 | 0.062 | Method 4 | 772.00 | 979.57 | 983.43 | | 983.59 | 0.002629 | 3.20 | 241.13 | 134.62 | 0.42 |
| Tributary 1E1 | Reach 1 | 0.062 | Method 1 | 772.00 | 979.57 | 983.43 | | 983.59 | 0.002630 | 3.20 | 241.13 | 137.41 | 0.42 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.971 | 100-Year | 713.00 | 1032.94 | 1035.10 | | 1035.20 | 0.004045 | 2.64 | 292.80 | 360.79 | 0.47 |
| Tributary 1E | Reach 2 | 5.971 | Method 4 | 713.00 | 1032.94 | 1035.37 | | 1035.49 | 0.003670 | 2.87 | 248.15 | 209.98 | 0.47 |
| Tributary 1E | Reach 2 | 5.971 | Method 1 | 713.00 | 1032.94 | 1035.37 | | 1035.49 | 0.003666 | 2.87 | 248.25 | 210.00 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.933 | 100-Year | 713.00 | 1032.43 | 1034.10 | | 1034.23 | 0.005517 | 2.75 | 248.36 | 303.66 | 0.54 |
| Tributary 1E | Reach 2 | 5.933 | Method 4 | 713.00 | 1032.43 | 1034.49 | | 1034.66 | 0.004778 | 3.25 | 219.64 | 187.99 | 0.53 |
| Tributary 1E | Reach 2 | 5.933 | Method 1 | 713.00 | 1032.43 | 1034.49 | | 1034.65 | 0.004810 | 3.25 | 219.20 | 187.99 | 0.53 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.895 | 100-Year | 713.00 | 1031.16 | 1032.90 | | 1033.09 | 0.005866 | 3.72 | 210.76 | 238.83 | 0.59 |
| Tributary 1E | Reach 2 | 5.895 | Method 4 | 713.00 | 1031.16 | 1033.18 | | 1033.49 | 0.006956 | 4.47 | 159.63 | 112.50 | 0.66 |
| Tributary 1E | Reach 2 | 5.895 | Method 1 | 713.00 | 1031.16 | 1033.18 | | 1033.49 | 0.006956 | 4.47 | 159.63 | 112.50 | 0.66 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.857 | 100-Year | 713.00 | 1030.17 | 1032.03 | | 1032.15 | 0.003691 | 2.97 | 263.83 | 280.90 | 0.47 |
| Tributary 1E | Reach 2 | 5.857 | Method 4 | 713.00 | 1030.17 | 1032.15 | | 1032.34 | 0.004588 | 3.47 | 205.24 | 154.40 | 0.53 |
| Tributary 1E | Reach 2 | 5.857 | Method 1 | 713.00 | 1030.17 | 1032.15 | | 1032.34 | 0.004588 | 3.47 | 205.24 | 154.40 | 0.53 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 2 | 5.820 | 100-Year | 713.00 | 1029.56 | 1030.83 | 1030.71 | 1031.04 | 0.010087 | [illegible] | [illegible] | 319.48 | 0.73 |
| Tributary 1E | Reach 2 | 5.820 | Method 4 | 713.00 | 1029.56 | 1030.91 | 1030.70 | 1031.12 | 0.008732 | 3.67 | 194.26 | 217.24 | 0.68 |
| Tributary 1E | Reach 2 | 5.820 | Method 1 | 713.00 | 1029.56 | 1030.91 | 1030.70 | 1031.12 | 0.008732 | 3.67 | 194.26 | 217.24 | 0.68 |
| Tributary 1E | Reach 2 | 5.782 | 100-Year | 713.00 | 1027.52 | 1028.96 | 1028.80 | 1029.17 | 0.008577 | 3.86 | 212.66 | 352.25 | 0.69 |
| Tributary 1E | Reach 2 | 5.782 | Method 4 | 713.00 | 1027.52 | 1029.02 | | 1029.30 | 0.009405 | 4.19 | 169.97 | 165.13 | 0.73 |
| Tributary 1E | Reach 2 | 5.782 | Method 1 | 713.00 | 1027.52 | 1029.02 | | 1029.30 | 0.009405 | 4.19 | 169.97 | 165.13 | 0.73 |
| Tributary 1E | Reach 2 | 5.744 | 100-Year | 713.00 | 1025.99 | 1027.80 | 1027.39 | 1027.97 | 0.004348 | 3.37 | 235.92 | 292.09 | 0.53 |
| Tributary 1E | Reach 2 | 5.744 | Method 4 | 713.00 | 1025.99 | 1027.91 | 1027.37 | 1028.08 | 0.004066 | 3.38 | 210.98 | 159.18 | 0.52 |
| Tributary 1E | Reach 2 | 5.744 | Method 1 | 713.00 | 1025.99 | 1027.91 | 1027.37 | 1028.08 | 0.004066 | 3.38 | 210.98 | 159.18 | 0.52 |
| Tributary 1E | Reach 2 | 5.706 | 100-Year | 713.00 | 1025.01 | 1026.57 | 1026.45 | 1026.80 | 0.008040 | 4.15 | 202.29 | 280.02 | 0.69 |
| Tributary 1E | Reach 2 | 5.706 | Method 4 | 713.00 | 1025.01 | 1027.03 | 1026.45 | 1027.24 | 0.004339 | 3.65 | 195.50 | 130.15 | 0.52 |
| Tributary 1E | Reach 2 | 5.706 | Method 1 | 713.00 | 1025.01 | 1027.03 | 1026.46 | 1027.24 | 0.004339 | 3.65 | 195.50 | 130.15 | 0.52 |
| Tributary 1E | Reach 2 | 5.668 | 100-Year | 713.00 | 1023.65 | 1025.77 | 1025.28 | 1025.87 | 0.002860 | 2.97 | 285.35 | 288.03 | 0.43 |
| Tributary 1E | Reach 2 | 5.668 | Method 4 | 713.00 | 1023.65 | 1026.38 | 1025.45 | 1026.57 | 0.002610 | 3.45 | 206.94 | 102.62 | 0.43 |
| Tributary 1E | Reach 2 | 5.668 | Method 1 | 713.00 | 1023.65 | 1026.38 | 1025.46 | 1026.57 | 0.002610 | 3.45 | 206.94 | 102.62 | 0.43 |
| Tributary 1E | Reach 2 | 5.630 | 100-Year | 713.00 | 1022.56 | 1024.55 | 1024.53 | 1024.87 | 0.010597 | 5.13 | 174.73 | 254.20 | 0.80 |
| Tributary 1E | Reach 2 | 5.630 | Method 4 | 713.00 | 1022.56 | 1024.76 | 1024.74 | 1025.46 | 0.015862 | 6.73 | 105.87 | 74.04 | 0.99 |
| Tributary 1E | Reach 2 | 5.630 | Method 1 | 713.00 | 1022.56 | 1024.76 | 1024.74 | 1025.46 | 0.015862 | 6.73 | 105.87 | 74.04 | 0.99 |
| Tributary 1E | Reach 2 | 5.592 | 100-Year | 713.00 | 1021.54 | 1023.45 | | 1023.58 | 0.004010 | 3.21 | 253.52 | 301.32 | 0.50 |
| Tributary 1E | Reach 2 | 5.592 | Method 4 | 713.00 | 1021.54 | 1024.19 | | 1024.35 | 0.002258 | 3.19 | 223.20 | 109.04 | 0.39 |
| Tributary 1E | Reach 2 | 5.592 | Method 1 | 713.00 | 1021.54 | 1024.19 | | 1024.35 | 0.002258 | 3.19 | 223.20 | 109.04 | 0.39 |
| Tributary 1E | Reach 2 | 5.554 | 100-Year | 713.00 | 1020.54 | 1022.61 | | 1022.75 | 0.004772 | 3.56 | 250.47 | 322.78 | 0.54 |
| Tributary 1E | Reach 2 | 5.554 | Method 4 | 713.00 | 1020.54 | 1023.38 | | 1023.70 | 0.004630 | 4.58 | 155.55 | 76.30 | 0.57 |
| Tributary 1E | Reach 2 | 5.554 | Method 1 | 713.00 | 1020.54 | 1023.38 | | 1023.70 | 0.004630 | 4.58 | 155.55 | 76.30 | 0.57 |
| Tributary 1E | Reach 2 | 5.517 | 100-Year | 713.00 | 1019.76 | 1021.52 | | 1021.69 | 0.005838 | 3.72 | 222.04 | 270.85 | 0.59 |
| Tributary 1E | Reach 2 | 5.517 | Method 4 | 713.00 | 1019.76 | 1022.01 | | 1022.44 | 0.008895 | 5.28 | 134.98 | 88.65 | 0.75 |
| Tributary 1E | Reach 2 | 5.517 | Method 1 | 713.00 | 1019.76 | 1022.01 | | 1022.44 | 0.008895 | 5.28 | 134.98 | 88.65 | 0.75 |
| Tributary 1E | Reach 2 | 5.479 | 100-Year | 713.00 | 1018.43 | 1020.64 | | 1020.76 | 0.003690 | 3.27 | [illegible] | 344.99 | 0.48 |
| Tributary 1E | Reach 2 | 5.479 | Method 4 | 713.00 | 1018.43 | 1021.12 | | 1021.33 | 0.003430 | 3.70 | 192.47 | 104.43 | 0.48 |
| Tributary 1E | Reach 2 | 5.479 | Method 1 | 713.00 | 1018.43 | 1021.12 | | 1021.33 | 0.003430 | 3.70 | 192.47 | 104.43 | 0.48 |
| Tributary 1E | Reach 2 | 5.441 | 100-Year | 713.00 | 1017.28 | 1019.48 | | 1019.70 | 0.008417 | 4.17 | 197.31 | 253.67 | 0.70 |
| Tributary 1E | Reach 2 | 5.441 | Method 4 | 713.00 | 1017.28 | 1019.75 | | 1020.16 | 0.011600 | 5.17 | 137.80 | 114.32 | 0.83 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 2 | 5.441 | Method 1 | 713.00 | 1017.28 | 1019.75 | | 1020.16 | 0.011600 | 5.17 | 137.80 | 114.32 | 0.83 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.403 | 100-Year | 713.00 | 1016.02 | 1018.54 | | 1018.65 | 0.003436 | 2.87 | 266.82 | 259.60 | 0.45 |
| Tributary 1E | Reach 2 | 5.403 | Method 4 | 713.00 | 1016.02 | 1019.16 | | 1019.26 | 0.002016 | 2.53 | 281.30 | 182.47 | 0.36 |
| Tributary 1E | Reach 2 | 5.403 | Method 1 | 713.00 | 1016.02 | 1019.16 | | 1019.26 | 0.002016 | 2.53 | 281.30 | 182.47 | 0.36 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.365 | 100-Year | 713.00 | 1015.23 | 1017.42 | 1017.29 | 1017.66 | 0.007497 | 4.53 | 202.50 | 300.43 | 0.73 |
| Tributary 1E | Reach 2 | 5.365 | Method 4 | 713.00 | 1015.23 | 1018.31 | 1017.75 | 1018.66 | 0.004470 | 4.76 | 149.81 | 76.99 | 0.60 |
| Tributary 1E | Reach 2 | 5.365 | Method 1 | 713.00 | 1015.23 | 1018.31 | 1017.75 | 1018.66 | 0.004470 | 4.76 | 149.81 | 76.99 | 0.60 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.327 | 100-Year | 713.00 | 1014.30 | 1016.26 | | 1016.38 | 0.005178 | 3.17 | 270.31 | 363.67 | 0.54 |
| Tributary 1E | Reach 2 | 5.327 | Method 4 | 713.00 | 1014.30 | 1016.53 | 1016.49 | 1017.11 | 0.015872 | 6.12 | 116.44 | 94.07 | 0.97 |
| Tributary 1E | Reach 2 | 5.327 | Method 1 | 713.00 | 1014.30 | 1016.53 | 1016.49 | 1017.11 | 0.015872 | 6.12 | 116.44 | 94.07 | 0.97 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.289 | 100-Year | 713.00 | 1013.20 | 1015.45 | | 1015.56 | 0.003554 | 2.87 | 283.33 | 353.05 | 0.46 |
| Tributary 1E | Reach 2 | 5.289 | Method 4 | 713.00 | 1013.20 | 1015.56 | | 1015.70 | 0.003461 | 3.00 | 237.69 | 179.89 | 0.46 |
| Tributary 1E | Reach 2 | 5.289 | Method 1 | 713.00 | 1013.20 | 1015.56 | | 1015.70 | 0.003461 | 3.00 | 237.69 | 179.89 | 0.46 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.252 | 100-Year | 713.00 | 1012.51 | 1014.58 | | 1014.74 | 0.004876 | 3.40 | 242.07 | 323.37 | 0.54 |
| Tributary 1E | Reach 2 | 5.252 | Method 4 | 713.00 | 1012.51 | 1014.81 | | 1014.97 | 0.003832 | 3.15 | 226.29 | 172.13 | 0.48 |
| Tributary 1E | Reach 2 | 5.252 | Method 1 | 713.00 | 1012.51 | 1014.82 | | 1014.97 | 0.003829 | 3.15 | 226.34 | 172.13 | 0.48 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.214 | 100-Year | 713.00 | 1011.42 | 1013.65 | | 1013.79 | 0.004463 | 3.27 | 258.17 | 304.75 | 0.52 |
| Tributary 1E | Reach 2 | 5.214 | Method 4 | 713.00 | 1011.42 | 1013.85 | | 1014.07 | 0.005336 | 3.78 | 188.58 | 139.90 | 0.57 |
| Tributary 1E | Reach 2 | 5.214 | Method 1 | 713.00 | 1011.42 | 1013.84 | | 1014.07 | 0.005356 | 3.79 | 188.35 | 139.87 | 0.57 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.176 | 100-Year | 713.00 | 1011.04 | 1012.75 | | 1012.88 | 0.004224 | 3.11 | 251.54 | 260.90 | 0.51 |
| Tributary 1E | Reach 2 | 5.176 | Method 4 | 713.00 | 1011.04 | 1012.90 | | 1013.08 | 0.004464 | 3.42 | 208.25 | 161.59 | 0.53 |
| Tributary 1E | Reach 2 | 5.176 | Method 1 | 713.00 | 1011.04 | 1012.90 | | 1013.08 | 0.004420 | 3.41 | 208.91 | 161.69 | 0.53 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.138 | 100-Year | 713.00 | 1010.12 | 1011.83 | 1011.49 | 1011.96 | 0.004829 | 3.03 | 249.84 | 305.36 | 0.52 |
| Tributary 1E | Reach 2 | 5.138 | Method 4 | 713.00 | 1010.12 | 1012.18 | 1011.59 | 1012.32 | 0.003158 | 2.96 | 240.70 | 171.75 | 0.44 |
| Tributary 1E | Reach 2 | 5.138 | Method 1 | 713.00 | 1010.12 | 1012.13 | 1011.59 | 1012.28 | 0.003591 | 3.08 | 231.55 | 171.75 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.100 | 100-Year | 713.00 | 1009.25 | 1010.81 | | 1010.95 | 0.005472 | 3.17 | 246.89 | 322.48 | 0.55 |
| Tributary 1E | Reach 2 | 5.100 | Method 4 | 713.00 | 1009.25 | 1010.84 | | 1011.19 | 0.012076 | 4.78 | 149.18 | 142.59 | 0.82 |
| Tributary 1E | Reach 2 | 5.100 | Method 1 | 713.00 | 1009.25 | 1011.00 | | 1011.27 | 0.007435 | 4.13 | 172.70 | 142.59 | 0.66 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.062 | 100-Year | 713.00 | 1007.95 | 1009.52 | 1009.30 | 1009.68 | 0.007756 | 3.16 | 225.80 | 298.37 | 0.63 |
| Tributary 1E | Reach 2 | 5.062 | Method 4 | 713.00 | 1007.95 | 1009.95 | | 1010.04 | 0.003005 | 2.44 | 292.37 | 272.45 | 0.41 |
| Tributary 1E | Reach 2 | 5.062 | Method 1 | 713.00 | 1007.95 | 1009.67 | 1009.38 | 1009.83 | 0.006671 | 3.22 | 221.13 | 246.55 | 0.60 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 5.024 | 100-Year | 713.00 | 1006.80 | 1007.99 | | 1008.17 | 0.006280 | 2.69 | 216.45 | 247.84 | 0.56 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 2 | 5.024 | Method 4 | 713.00 | 1006.80 | 1009.10 | | 1009.24 | 0.004975 | 3.14 | 232.29 | 221.45 | 0.53 |
| Tributary 1E | Reach 2 | 5.024 | Method 1 | 713.00 | 1006.80 | 1008.05 | | 1008.29 | 0.007371 | 3.01 | 184.93 | 176.15 | 0.61 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.986 | 100-Year | 713.00 | 1005.31 | 1006.59 | | 1006.81 | 0.007432 | 3.37 | 188.20 | 180.56 | 0.63 |
| Tributary 1E | Reach 2 | 4.986 | Method 4 | 713.00 | 1005.31 | 1007.56 | | 1007.98 | 0.007837 | 5.20 | 137.22 | 83.55 | 0.71 |
| Tributary 1E | Reach 2 | 4.986 | Method 1 | 713.00 | 1005.31 | 1006.59 | | 1006.81 | 0.007442 | 3.38 | 188.10 | 180.51 | 0.63 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.949 | 100-Year | 713.00 | 1003.97 | 1005.30 | 1004.94 | 1005.52 | 0.005812 | 2.98 | 195.27 | 186.25 | 0.56 |
| Tributary 1E | Reach 2 | 4.949 | Method 4 | 713.00 | 1003.97 | 1006.32 | 1005.83 | 1006.62 | 0.005687 | 4.56 | 168.28 | 129.55 | 0.61 |
| Tributary 1E | Reach 2 | 4.949 | Method 1 | 713.00 | 1003.97 | 1005.30 | 1004.94 | 1005.52 | 0.005784 | 2.98 | 195.60 | 168.41 | 0.56 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.911 | 100-Year | 713.00 | 1002.62 | 1004.17 | | 1004.35 | 0.006120 | 3.55 | 209.85 | 204.91 | 0.59 |
| Tributary 1E | Reach 2 | 4.911 | Method 4 | 713.00 | 1002.62 | 1005.46 | 1004.79 | 1005.62 | 0.004134 | 3.51 | 222.20 | 178.93 | 0.51 |
| Tributary 1E | Reach 2 | 4.911 | Method 1 | 713.00 | 1002.62 | 1004.17 | | 1004.35 | 0.006213 | 3.57 | 208.72 | 204.45 | 0.60 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.873 | 100-Year | 713.00 | 1001.14 | 1003.22 | | 1003.37 | 0.004102 | 3.36 | 231.05 | 227.38 | 0.50 |
| Tributary 1E | Reach 2 | 4.873 | Method 4 | 713.00 | 1001.14 | 1003.39 | 1003.39 | 1004.11 | 0.016622 | 7.11 | 106.21 | 77.37 | 1.03 |
| Tributary 1E | Reach 2 | 4.873 | Method 1 | 713.00 | 1001.14 | 1003.41 | | 1003.54 | 0.002859 | 2.96 | 248.52 | 174.57 | 0.43 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.835 | 100-Year | 713.00 | 999.96 | 1002.39 | | 1002.58 | 0.003678 | 3.64 | 220.29 | 211.90 | 0.49 |
| Tributary 1E | Reach 2 | 4.835 | Method 4 | 713.00 | 999.96 | 1002.99 | | 1003.12 | 0.001589 | 2.89 | 246.79 | 108.18 | 0.34 |
| Tributary 1E | Reach 2 | 4.835 | Method 1 | 713.00 | 999.96 | 1002.99 | | 1003.12 | 0.001589 | 2.89 | 246.79 | 108.18 | 0.34 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.797 | 100-Year | 713.00 | 998.94 | 1001.78 | 1001.26 | 1001.91 | 0.002923 | 3.30 | 261.81 | 222.03 | 0.44 |
| Tributary 1E | Reach 2 | 4.797 | Method 4 | 713.00 | 998.94 | 1002.52 | 1001.26 | 1002.73 | 0.002289 | 3.64 | 195.90 | 79.89 | 0.41 |
| Tributary 1E | Reach 2 | 4.797 | Method 1 | 713.00 | 998.94 | 1002.52 | 1001.25 | 1002.73 | 0.002289 | 3.64 | 195.90 | 79.89 | 0.41 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.759 | 100-Year | 713.00 | 998.24 | 1001.09 | | 1001.26 | 0.003615 | 3.89 | 244.96 | 233.65 | 0.50 |
| Tributary 1E | Reach 2 | 4.759 | Method 4 | 713.00 | 998.24 | 1001.60 | | 1002.02 | 0.005644 | 5.25 | 135.85 | 63.89 | 0.63 |
| Tributary 1E | Reach 2 | 4.759 | Method 1 | 713.00 | 998.24 | 1001.60 | | 1002.02 | 0.005644 | 5.25 | 135.85 | 63.89 | 0.63 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.721 | 100-Year | 713.00 | 997.08 | 1000.11 | 1000.11 | 1000.39 | 0.005165 | 4.74 | 225.40 | 384.78 | 0.60 |
| Tributary 1E | Reach 2 | 4.721 | Method 4 | 713.00 | 997.08 | 1000.30 | | 1000.78 | 0.006679 | 5.54 | 128.66 | 63.30 | 0.69 |
| Tributary 1E | Reach 2 | 4.721 | Method 1 | 713.00 | 997.08 | 1000.30 | | 1000.78 | 0.006679 | 5.54 | 128.66 | 63.30 | 0.69 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.683 | 100-Year | 713.00 | 996.21 | 998.97 | | 999.29 | 0.005732 | 4.80 | 175.91 | 188.15 | 0.63 |
| Tributary 1E | Reach 2 | 4.683 | Method 4 | 713.00 | 996.21 | 999.61 | | 999.85 | 0.003030 | 3.90 | 182.68 | 84.28 | 0.47 |
| Tributary 1E | Reach 2 | 4.683 | Method 1 | 713.00 | 996.21 | 999.61 | | 999.85 | 0.003030 | 3.90 | 182.68 | 84.28 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.646 | 100-Year | 713.00 | 995.13 | 998.15 | 997.89 | 998.29 | 0.003953 | 3.70 | 287.94 | 422.70 | 0.51 |
| Tributary 1E | Reach 2 | 4.646 | Method 4 | 713.00 | 995.13 | 998.86 | | 999.14 | 0.004142 | 4.22 | 168.80 | 87.46 | 0.54 |
| Tributary 1E | Reach 2 | 4.646 | Method 1 | 713.00 | 995.13 | 998.86 | | 999.14 | 0.004142 | 4.22 | 168.80 | 87.46 | 0.54 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 2 | 4.569 | 100-Year | 713.00 | 993.77 | 996.49 | | 996.67 | 0.004291 | 3.98 | 234.16 | 257.91 | 0.53 |
| Tributary 1E | Reach 2 | 4.569 | Method 4 | 713.00 | 993.77 | 996.87 | | 997.21 | 0.005456 | 4.69 | 152.11 | 82.36 | 0.61 |
| Tributary 1E | Reach 2 | 4.569 | Method 1 | 713.00 | 993.77 | 996.87 | | 997.21 | 0.005456 | 4.69 | 152.11 | 82.36 | 0.61 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.506 | 100-Year | 713.00 | 992.56 | 994.09 | 994.00 | 994.41 | 0.012787 | 4.50 | 158.74 | 200.88 | 0.87 |
| Tributary 1E | Reach 2 | 4.506 | Method 4 | 713.00 | 992.56 | 994.05 | 994.00 | 994.40 | 0.014990 | 4.74 | 150.28 | 189.38 | 0.94 |
| Tributary 1E | Reach 2 | 4.506 | Method 1 | 713.00 | 992.56 | 994.05 | 994.00 | 994.40 | 0.014990 | 4.74 | 150.28 | 189.38 | 0.94 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.450 | 100-Year | 713.00 | 990.72 | 992.09 | | 992.21 | 0.004541 | 2.84 | 262.04 | 313.11 | 0.51 |
| Tributary 1E | Reach 2 | 4.450 | Method 4 | 713.00 | 990.72 | 992.17 | | 992.28 | 0.003934 | 2.75 | 259.33 | 255.57 | 0.48 |
| Tributary 1E | Reach 2 | 4.450 | Method 1 | 713.00 | 990.72 | 992.17 | | 992.28 | 0.003934 | 2.75 | 259.33 | 255.57 | 0.48 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.410 | 100-Year | 713.00 | 989.24 | 990.75 | | 990.97 | 0.008235 | 3.83 | 199.07 | 244.71 | 0.68 |
| Tributary 1E | Reach 2 | 4.410 | Method 4 | 713.00 | 989.24 | 990.75 | | 991.03 | 0.010099 | 4.24 | 168.23 | 169.81 | 0.75 |
| Tributary 1E | Reach 2 | 4.410 | Method 1 | 713.00 | 989.24 | 990.75 | | 991.03 | 0.010099 | 4.24 | 168.23 | 169.81 | 0.75 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.372 | 100-Year | 713.00 | 987.79 | 989.46 | | 989.63 | 0.005434 | 3.33 | 218.83 | 223.29 | 0.56 |
| Tributary 1E | Reach 2 | 4.372 | Method 4 | 713.00 | 987.79 | 989.54 | | 989.69 | 0.004531 | 3.14 | 227.12 | 197.17 | 0.52 |
| Tributary 1E | Reach 2 | 4.372 | Method 1 | 713.00 | 987.79 | 989.54 | | 989.69 | 0.004531 | 3.14 | 227.12 | 197.17 | 0.52 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.334 | 100-Year | 713.00 | 986.47 | 988.17 | | 988.34 | 0.007577 | 3.45 | 217.25 | 269.63 | 0.64 |
| Tributary 1E | Reach 2 | 4.334 | Method 4 | 713.00 | 986.47 | 988.15 | | 988.39 | 0.009951 | 3.92 | 181.84 | 204.01 | 0.73 |
| Tributary 1E | Reach 2 | 4.334 | Method 1 | 713.00 | 986.47 | 988.15 | | 988.39 | 0.009951 | 3.92 | 181.84 | 204.01 | 0.73 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.296 | 100-Year | 713.00 | 985.26 | 987.37 | | 987.47 | 0.002707 | 2.60 | 290.27 | 343.26 | 0.41 |
| Tributary 1E | Reach 2 | 4.296 | Method 4 | 713.00 | 985.26 | 987.66 | | 987.74 | 0.001440 | 2.17 | 328.25 | 208.45 | 0.31 |
| Tributary 1E | Reach 2 | 4.296 | Method 1 | 713.00 | 985.26 | 987.66 | | 987.74 | 0.001440 | 2.17 | 328.25 | 208.45 | 0.31 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.259 | 100-Year | 713.00 | 984.20 | 986.59 | | 986.74 | 0.005015 | 3.47 | 247.91 | 314.23 | 0.55 |
| Tributary 1E | Reach 2 | 4.259 | Method 4 | 713.00 | 984.20 | 987.05 | | 987.27 | 0.003956 | 3.77 | 189.28 | 110.93 | 0.51 |
| Tributary 1E | Reach 2 | 4.259 | Method 1 | 713.00 | 984.20 | 987.05 | | 987.27 | 0.003956 | 3.77 | 189.28 | 110.93 | 0.51 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.221 | 100-Year | 713.00 | 983.28 | 985.24 | 985.12 | 985.45 | 0.008607 | 3.98 | 208.78 | 301.29 | 0.70 |
| Tributary 1E | Reach 2 | 4.221 | Method 4 | 713.00 | 983.28 | 985.51 | 985.37 | 985.97 | 0.012088 | 5.45 | 130.82 | 101.93 | 0.85 |
| Tributary 1E | Reach 2 | 4.221 | Method 1 | 713.00 | 983.28 | 985.51 | 985.37 | 985.97 | 0.012088 | 5.45 | 130.82 | 101.93 | 0.85 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.183 | 100-Year | 713.00 | 982.46 | 984.01 | | 984.14 | 0.004908 | 3.08 | 259.90 | 340.88 | 0.53 |
| Tributary 1E | Reach 2 | 4.183 | Method 4 | 713.00 | 982.46 | 984.12 | | 984.31 | 0.005556 | 3.49 | 204.52 | 175.80 | 0.57 |
| Tributary 1E | Reach 2 | 4.183 | Method 1 | 713.00 | 982.46 | 984.12 | | 984.31 | 0.005556 | 3.49 | 204.52 | 175.80 | 0.57 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 2 | 4.145 | 100-Year | 713.00 | 980.83 | 983.05 | | 983.19 | 0.004615 | 3.22 | 248.64 | 321.29 | 0.57 |
| Tributary 1E | Reach 2 | 4.145 | Method 4 | 713.00 | 980.83 | 983.45 | | 983.57 | 0.002499 | 2.82 | 253.16 | 182.54 | 0.42 |
| Tributary 1E | Reach 2 | 4.145 | Method 1 | 713.00 | 980.83 | 983.45 | | 983.57 | 0.002499 | 2.82 | 253.15 | 182.54 | 0.42 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tributary 1E | Reach 1 | 4.072 | 100-Year | 1485.00 | 977.71 | 981.98 | | 982.14 | 0.002098 | 3.55 | 531.37 | 481.10 | 0.40 |
| Tributary 1E | Reach 1 | 4.072 | Method 4 | 1485.00 | 977.71 | 982.50 | | 982.73 | 0.001927 | 3.81 | 389.27 | 129.98 | 0.39 |
| Tributary 1E | Reach 1 | 4.072 | Method 1 | 1485.00 | 977.71 | 982.50 | | 982.73 | 0.001928 | 3.82 | 389.20 | 129.98 | 0.39 |
| Tributary 1E | Reach 1 | 4.034 | 100-Year | 1485.00 | 977.17 | 981.23 | | 981.53 | 0.004660 | 4.88 | 372.21 | 331.69 | 0.58 |
| Tributary 1E | Reach 1 | 4.034 | Method 4 | 1485.00 | 977.17 | 981.65 | | 982.11 | 0.005150 | 5.47 | 271.34 | 115.54 | 0.63 |
| Tributary 1E | Reach 1 | 4.034 | Method 1 | 1485.00 | 977.17 | 981.64 | | 982.11 | 0.005157 | 5.48 | 271.22 | 115.50 | 0.63 |
| Tributary 1E | Reach 1 | 3.996 | 100-Year | 1485.00 | 976.75 | 980.19 | | 980.48 | 0.005981 | 4.73 | 361.84 | 329.41 | 0.64 |
| Tributary 1E | Reach 1 | 3.996 | Method 4 | 1485.00 | 976.75 | 980.96 | | 981.22 | 0.003409 | 4.09 | 362.82 | 170.46 | 0.49 |
| Tributary 1E | Reach 1 | 3.996 | Method 1 | 1485.00 | 976.75 | 980.95 | | 981.21 | 0.003472 | 4.12 | 360.84 | 170.46 | 0.50 |
| Tributary 1E | Reach 1 | 3.958 | 100-Year | 1485.00 | 976.36 | 978.99 | | 979.22 | 0.006410 | 4.24 | 396.52 | 407.59 | 0.67 |
| Tributary 1E | Reach 1 | 3.958 | Method 4 | 1485.00 | 976.36 | 979.18 | 979.18 | 979.93 | 0.014609 | 6.91 | 214.94 | 150.17 | 1.02 |
| Tributary 1E | Reach 1 | 3.958 | Method 1 | 1485.00 | 976.36 | 979.20 | 979.20 | 979.93 | 0.014029 | 6.82 | 217.78 | 150.17 | 1.00 |
| Tributary 1E | Reach 1 | 3.920 | 100-Year | 1485.00 | 974.65 | 977.90 | | 978.17 | 0.004448 | 4.24 | 364.90 | 209.55 | 0.50 |
| Tributary 1E | Reach 1 | 3.920 | Method 4 | 1485.00 | 974.65 | 978.45 | | 978.63 | 0.002435 | 3.45 | 430.28 | 166.18 | 0.38 |
| Tributary 1E | Reach 1 | 3.920 | Method 1 | 1485.00 | 974.65 | 978.09 | | 978.34 | 0.003674 | 3.99 | 372.49 | 157.81 | 0.46 |
| Tributary 1E | Reach 1 | 3.883 | 100-Year | 1840.00 | 972.89 | 977.27 | | 977.36 | 0.003354 | 2.48 | 796.86 | 389.62 | 0.26 |
| Tributary 1E | Reach 1 | 3.883 | Method 4 | 1840.00 | 972.89 | 978.10 | | 978.18 | 0.001883 | 2.20 | 837.13 | 226.02 | 0.20 |
| Tributary 1E | Reach 1 | 3.883 | Method 1 | 1840.00 | 972.89 | 977.46 | | 977.57 | 0.003560 | 2.66 | 692.97 | 226.02 | 0.27 |
| Tributary 1E | Reach 1 | 3.845 | 100-Year | 1840.00 | 973.18 | 976.45 | | 976.53 | 0.005039 | 2.00 | 848.41 | 569.17 | 0.27 |
| Tributary 1E | Reach 1 | 3.845 | Method 4 | 1840.00 | 973.18 | 977.50 | | 977.61 | 0.004666 | 2.62 | 703.58 | 257.09 | 0.28 |
| Tributary 1E | Reach 1 | 3.845 | Method 1 | 1840.00 | 973.18 | 976.54 | | 976.63 | 0.006170 | 2.28 | 747.21 | 408.58 | 0.30 |
| Tributary 1E | Reach 1 | 3.807 | 100-Year | 1840.00 | 972.15 | 975.62 | | 975.68 | 0.004391 | 1.99 | 941.09 | 580.19 | 0.25 |
| Tributary 1E | Reach 1 | 3.807 | Method 4 | 1840.00 | 972.15 | 976.59 | | 976.69 | 0.004566 | 2.49 | 742.20 | 279.94 | 0.27 |
| Tributary 1E | Reach 1 | 3.807 | Method 1 | 1840.00 | 972.15 | 975.63 | | 975.70 | 0.004414 | 2.00 | 923.65 | 487.12 | 0.25 |
| Tributary 1E | Reach 1 | 3.769 | 100-Year | 1840.00 | 970.60 | 974.96 | | 975.02 | 0.003160 | 2.17 | 1003.88 | 485.93 | 0.23 |
| Tributary 1E | Reach 1 | 3.769 | Method 4 | 1840.00 | 970.60 | 975.74 | | 975.86 | 0.003944 | 2.82 | 685.39 | 216.16 | 0.27 |
| Tributary 1E | Reach 1 | 3.769 | Method 1 | 1840.00 | 970.60 | 974.97 | | 975.03 | 0.003202 | 2.18 | 976.66 | 446.53 | 0.23 |
| Tributary 1E | Reach 1 | 3.731 | 100-Year | 1840.00 | 969.91 | 974.45 | | 974.50 | 0.002401 | 2.06 | 1078.19 | 490.00 | 0.20 |
| Tributary 1E | Reach 1 | 3.731 | Method 4 | 1840.00 | 969.91 | 975.00 | | 975.12 | 0.003494 | 2.73 | 674.40 | 179.01 | 0.25 |
| Tributary 1E | Reach 1 | 3.731 | Method 1 | 1840.00 | 969.91 | 974.45 | | 974.50 | 0.002401 | 2.06 | 1078.22 | 490.00 | 0.20 |
| Tributary 1E | Reach 1 | 3.692 | 100-Year | 1840.00 | 968.51 | 973.46 | | 973.62 | 0.008883 | 3.55 | 642.66 | 433.02 | 0.38 |
| Tributary 1E | Reach 1 | 3.692 | Method 4 | 1840.00 | 968.51 | 973.62 | | 973.89 | 0.011640 | 4.18 | 440.07 | 152.17 | 0.43 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 3.692 | Method 1 | 1840.00 | 968.51 | 973.46 | | 973.62 | 0.008877 | 3.55 | 642.85 | 433.04 | 0.38 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.653 | 100-Year | 1840.00 | 967.70 | 971.62 | | 971.77 | 0.008967 | 3.05 | 602.96 | 279.19 | 0.37 |
| Tributary 1E | Reach 1 | 3.653 | Method 4 | 1840.00 | 967.70 | 971.62 | | 971.77 | 0.008954 | 3.05 | 603.27 | 279.27 | 0.37 |
| Tributary 1E | Reach 1 | 3.653 | Method 1 | 1840.00 | 967.70 | 971.63 | | 971.77 | 0.008940 | 3.05 | 603.62 | 279.35 | 0.37 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.614 | 100-Year | 1840.00 | 965.95 | 969.91 | | 970.03 | 0.008034 | 2.81 | 654.65 | 315.88 | 0.34 |
| Tributary 1E | Reach 1 | 3.614 | Method 4 | 1840.00 | 965.95 | 969.87 | | 969.99 | 0.008489 | 2.87 | 641.45 | 312.84 | 0.35 |
| Tributary 1E | Reach 1 | 3.614 | Method 1 | 1840.00 | 965.95 | 969.89 | | 970.02 | 0.008219 | 2.83 | 649.16 | 314.62 | 0.35 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.576 | 100-Year | 1840.00 | 965.03 | 968.20 | | 968.34 | 0.008864 | 2.96 | 630.86 | 353.04 | 0.36 |
| Tributary 1E | Reach 1 | 3.576 | Method 4 | 1840.00 | 965.03 | 968.72 | | 968.81 | 0.004256 | 2.37 | 775.27 | 297.66 | 0.26 |
| Tributary 1E | Reach 1 | 3.576 | Method 1 | 1840.00 | 965.03 | 968.27 | | 968.39 | 0.007931 | 2.86 | 655.31 | 362.00 | 0.34 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.538 | 100-Year | 1840.00 | 964.98 | 967.77 | | 967.83 | 0.001097 | 1.05 | 1190.56 | 504.35 | 0.13 |
| Tributary 1E | Reach 1 | 3.538 | Method 4 | 1840.00 | 964.98 | 968.16 | | 968.21 | 0.002143 | 1.62 | 1079.97 | 422.36 | 0.18 |
| Tributary 1E | Reach 1 | 3.538 | Method 1 | 1840.00 | 964.98 | 967.90 | | 967.95 | 0.000936 | 1.00 | 1257.94 | 509.03 | 0.12 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.500 | 100-Year | 1840.00 | 964.98 | 967.32 | 966.21 | 967.40 | 0.005747 | 2.18 | 845.37 | 657.40 | 0.28 |
| Tributary 1E | Reach 1 | 3.500 | Method 4 | 1840.00 | 964.98 | 967.60 | 966.21 | 967.66 | 0.003614 | 1.88 | 976.60 | 471.70 | 0.23 |
| Tributary 1E | Reach 1 | 3.500 | Method 1 | 1840.00 | 964.98 | 967.55 | 966.22 | 967.61 | 0.003913 | 1.93 | 952.59 | 470.52 | 0.24 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.462 | 100-Year | 1840.00 | 964.39 | 965.81 | | 965.94 | 0.007291 | 1.74 | 752.49 | 682.14 | 0.29 |
| Tributary 1E | Reach 1 | 3.462 | Method 4 | 1840.00 | 964.39 | 966.51 | | 966.61 | 0.008266 | 2.57 | 716.75 | 402.92 | 0.34 |
| Tributary 1E | Reach 1 | 3.462 | Method 1 | 1840.00 | 964.39 | 966.37 | | 966.46 | 0.008743 | 2.50 | 746.97 | 468.23 | 0.34 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.425 | 100-Year | 1840.00 | 962.84 | 964.66 | | 964.73 | 0.004649 | 1.76 | 908.40 | 673.91 | 0.25 |
| Tributary 1E | Reach 1 | 3.425 | Method 4 | 1840.00 | 962.84 | 965.17 | | 965.25 | 0.005649 | 2.34 | 787.98 | 402.14 | 0.29 |
| Tributary 1E | Reach 1 | 3.425 | Method 1 | 1840.00 | 962.84 | 965.09 | | 965.15 | 0.004941 | 2.13 | 888.09 | 490.71 | 0.27 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.387 | 100-Year | 1840.00 | 961.58 | 963.67 | | 963.74 | 0.005836 | 1.93 | 896.10 | 746.89 | 0.28 |
| Tributary 1E | Reach 1 | 3.387 | Method 4 | 1840.00 | 961.58 | 963.86 | | 963.95 | 0.007685 | 2.39 | 771.48 | 476.11 | 0.33 |
| Tributary 1E | Reach 1 | 3.387 | Method 1 | 1840.00 | 961.58 | 963.86 | | 963.95 | 0.007685 | 2.39 | 771.48 | 476.11 | 0.33 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.349 | 100-Year | 1840.00 | 958.53 | 961.87 | | 961.99 | 0.013483 | 2.81 | 689.57 | 674.94 | [illegible] |
| Tributary 1E | Reach 1 | 3.349 | Method 4 | 1840.00 | 958.53 | 962.02 | | 962.14 | 0.010796 | 2.69 | 684.54 | 442.26 | 0.38 |
| Tributary 1E | Reach 1 | 3.349 | Method 1 | 1840.00 | 958.53 | 962.02 | | 962.14 | 0.010796 | 2.69 | 684.54 | 442.26 | 0.38 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.311 | 100-Year | 1840.00 | 956.92 | 960.40 | | 960.47 | 0.004758 | 2.20 | 868.20 | 571.03 | 0.27 |
| Tributary 1E | Reach 1 | 3.311 | Method 4 | 1840.00 | 956.92 | 960.90 | | 960.97 | 0.003571 | 2.16 | 850.89 | 329.79 | 0.24 |
| Tributary 1E | Reach 1 | 3.311 | Method 1 | 1840.00 | 956.92 | 960.90 | | 960.97 | 0.003571 | 2.16 | 850.89 | 329.79 | 0.24 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 3.273 | 100-Year | 1840.00 | 956.99 | 959.61 | | 959.68 | 0.003350 | 2.04 | 879.55 | 739.89 | 0.29 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta. | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 3.273 | Method 4 | 1840.00 | 956.99 | 960.33 | | 960.41 | 0.002283 | 2.18 | 842.68 | 384.28 | 0.26 |
| Tributary 1E | Reach 1 | 3.273 | Method 1 | 1840.00 | 956.99 | 960.33 | | 960.41 | 0.002283 | 2.18 | 842.68 | 384.28 | 0.26 |
| Tributary 1E | Reach 1 | 3.235 | 100-Year | 1840.00 | 957.19 | 958.92 | | 958.97 | 0.003603 | 1.71 | 982.62 | 1113.78 | 0.28 |
| Tributary 1E | Reach 1 | 3.235 | Method 4 | 1840.00 | 957.19 | 959.72 | | 959.82 | 0.003910 | 2.58 | 713.73 | 359.01 | 0.32 |
| Tributary 1E | Reach 1 | 3.235 | Method 1 | 1840.00 | 957.19 | 959.72 | | 959.82 | 0.003909 | 2.58 | 713.79 | 359.01 | 0.32 |
| Tributary 1E | Reach 1 | 3.197 | 100-Year | 1840.00 | 957.09 | 957.98 | 957.74 | 958.08 | 0.005325 | 1.67 | 786.93 | 1123.88 | 0.41 |
| Tributary 1E | Reach 1 | 3.197 | Method 4 | 1840.00 | 957.09 | 958.86 | 958.23 | 958.97 | 0.004647 | 2.73 | [illegible] | 495.02 | [illegible] |
| Tributary 1E | Reach 1 | 3.197 | Method 1 | 1840.00 | 957.09 | 958.85 | | 958.97 | 0.004672 | 2.73 | 673.94 | 495.02 | 0.41 |
| Tributary 1E | Reach 1 | 3.122 | 100-Year | 1840.00 | 954.55 | 955.54 | 955.26 | 955.68 | 0.008032 | 1.69 | 696.04 | 890.96 | 0.34 |
| Tributary 1E | Reach 1 | 3.122 | Method 4 | 1840.00 | 954.55 | 956.42 | 955.66 | 956.55 | 0.008245 | 2.83 | 649.46 | 407.26 | 0.40 |
| Tributary 1E | Reach 1 | 3.122 | Method 1 | 1840.00 | 954.55 | 956.43 | 955.66 | 956.55 | 0.008097 | 2.82 | 653.01 | 407.41 | 0.39 |
| Tributary 1E | Reach 1 | 3.084 | 100-Year | 1840.00 | 953.01 | 954.13 | 953.70 | 954.24 | 0.004393 | 1.38 | 725.79 | 776.25 | 0.30 |
| Tributary 1E | Reach 1 | 3.084 | Method 4 | 1840.00 | 953.01 | 955.06 | 954.37 | 955.20 | 0.005025 | 2.23 | 683.18 | 484.82 | 0.35 |
| Tributary 1E | Reach 1 | 3.084 | Method 1 | 1840.00 | 953.01 | 955.04 | 954.38 | 955.18 | 0.005271 | 2.26 | 672.08 | 483.92 | 0.35 |
| Tributary 1E | Reach 1 | 3.046 | 100-Year | 1840.00 | 951.29 | 952.60 | | 952.78 | 0.009127 | 1.54 | 587.60 | 712.53 | 0.37 |
| Tributary 1E | Reach 1 | 3.046 | Method 4 | 1840.00 | 951.29 | 953.76 | 953.13 | 953.95 | 0.006544 | 2.79 | 559.69 | 335.94 | 0.38 |
| Tributary 1E | Reach 1 | 3.046 | Method 1 | 1840.00 | 951.29 | 953.29 | 953.02 | 953.54 | 0.010936 | 2.86 | 528.90 | 485.19 | 0.46 |
| Tributary 1E | Reach 1 | 2.972 | 100-Year | 1840.00 | 947.98 | 951.20 | 950.49 | 951.26 | 0.003099 | 1.83 | 946.78 | 980.19 | 0.27 |
| Tributary 1E | Reach 1 | 2.972 | Method 4 | 1840.00 | 947.98 | 951.91 | 950.50 | 952.02 | 0.004347 | 2.64 | [illegible] | 331.24 | 0.32 |
| Tributary 1E | Reach 1 | 2.972 | Method 1 | 1840.00 | 947.98 | 951.67 | 950.59 | 951.75 | 0.002987 | 2.06 | 850.12 | 501.60 | 0.26 |
| Tributary 1E | Reach 1 | 2.935 | 100-Year | 1840.00 | 947.76 | 950.40 | 949.88 | 950.50 | 0.006366 | 2.58 | 729.21 | 762.44 | 0.39 |
| Tributary 1E | Reach 1 | 2.935 | Method 4 | 1840.00 | 947.76 | 950.67 | 949.94 | 950.84 | 0.008427 | 3.27 | 562.07 | 354.77 | 0.46 |
| Tributary 1E | Reach 1 | 2.935 | Method 1 | 1840.00 | 947.76 | 950.67 | 949.94 | 950.84 | 0.008429 | 3.27 | 562.03 | 354.76 | 0.46 |
| Tributary 1E | Reach 1 | 2.897 | 100-Year | 1840.00 | 945.11 | 948.35 | 948.05 | 948.51 | 0.014688 | 3.27 | 582.82 | 675.34 | 0.54 |
| Tributary 1E | Reach 1 | 2.897 | Method 4 | 1840.00 | 945.11 | 948.51 | | 948.70 | 0.013910 | 3.49 | 527.15 | 401.08 | 0.54 |
| Tributary 1E | Reach 1 | 2.897 | Method 1 | 1840.00 | 945.11 | 948.51 | | 948.70 | 0.013906 | 3.49 | 527.49 | 403.57 | 0.54 |
| Tributary 1E | Reach 1 | 2.852 | 100-Year | 1840.00 | 942.97 | 946.83 | | 946.91 | 0.003628 | 2.32 | 834.64 | 567.42 | 0.28 |
| Tributary 1E | Reach 1 | 2.852 | Method 4 | 1840.00 | 942.97 | 946.96 | | 947.06 | 0.004001 | 2.53 | 728.67 | 326.73 | 0.30 |
| Tributary 1E | Reach 1 | 2.852 | Method 1 | 1840.00 | 942.97 | 946.96 | | 947.06 | 0.003997 | 2.52 | 728.87 | 326.74 | 0.30 |
| Tributary 1E | Reach 1 | 2.814 | 100-Year | 1840.00 | 940.58 | 944.72 | 944.09 | 945.28 | 0.027753 | 6.11 | 316.04 | 271.60 | 0.75 |
| Tributary 1E | Reach 1 | 2.814 | Method 4 | 1840.00 | 940.58 | 944.75 | | 945.33 | 0.027739 | 6.14 | 299.46 | 144.34 | 0.75 |
| Tributary 1E | Reach 1 | 2.814 | Method 1 | 1840.00 | 940.58 | 944.74 | | 945.33 | 0.027962 | 6.16 | 298.62 | 144.32 | 0.75 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 2.776 | 100-Year | 1840.00 | 935.88 | 942.83 | | 943.05 | 0.005601 | 3.72 | 494.84 | 131.63 | 0.34 |
| Tributary 1E | Reach 1 | 2.776 | Method 4 | 1840.00 | 935.88 | 943.10 | | 943.29 | 0.004847 | 3.46 | 531.31 | [illegible] | 0.31 |
| Tributary 1E | Reach 1 | 2.776 | Method 1 | 1840.00 | 935.88 | 943.07 | | 943.26 | 0.004931 | 3.49 | 526.55 | 139.77 | 0.32 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.738 | 100-Year | 1840.00 | 935.33 | 942.13 | | 942.23 | 0.002883 | 2.64 | 696.71 | 221.98 | 0.26 |
| Tributary 1E | Reach 1 | 2.738 | Method 4 | 1840.00 | 935.33 | 942.54 | | 942.63 | 0.002204 | 2.31 | 795.83 | 253.83 | 0.23 |
| Tributary 1E | Reach 1 | 2.738 | Method 1 | 1840.00 | 935.33 | 942.50 | | 942.58 | 0.002261 | 2.35 | 783.89 | 249.19 | 0.23 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.700 | 100-Year | 1840.00 | 933.97 | 941.48 | | 941.61 | 0.003361 | 2.92 | 649.27 | 350.39 | 0.29 |
| Tributary 1E | Reach 1 | 2.700 | Method 4 | 1840.00 | 933.97 | 942.09 | | 942.18 | 0.002260 | 2.43 | 758.18 | 229.26 | 0.24 |
| Tributary 1E | Reach 1 | 2.700 | Method 1 | 1840.00 | 933.97 | 942.02 | | 942.11 | 0.002431 | 2.48 | 741.66 | 229.26 | 0.24 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.662 | 100-Year | 1840.00 | 932.70 | 940.42 | | 940.63 | 0.007733 | 3.98 | 550.02 | 489.89 | 0.39 |
| Tributary 1E | Reach 1 | 2.662 | Method 4 | 1840.00 | 932.70 | 941.24 | | 941.48 | 0.005759 | 3.94 | 467.12 | 113.66 | 0.34 |
| Tributary 1E | Reach 1 | 2.662 | Method 1 | 1840.00 | 932.70 | 941.39 | | 941.53 | 0.003426 | 3.15 | 617.53 | 199.61 | 0.27 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.624 | 100-Year | 1840.00 | 932.37 | 939.14 | | 939.27 | 0.005768 | 3.37 | 645.08 | 535.60 | 0.33 |
| Tributary 1E | Reach 1 | 2.624 | Method 4 | 1840.00 | 932.37 | 940.12 | | 940.29 | 0.005918 | 3.35 | 559.12 | 301.87 | 0.36 |
| Tributary 1E | Reach 1 | 2.624 | Method 1 | 1840.00 | 932.37 | 940.13 | | 940.42 | 0.010146 | 4.39 | 428.22 | 231.45 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.587 | 100-Year | 1840.00 | 931.08 | 938.30 | | 938.40 | 0.003566 | 2.72 | 763.08 | 504.93 | 0.26 |
| Tributary 1E | Reach 1 | 2.587 | Method 4 | 1840.00 | 931.08 | 939.31 | | 939.44 | 0.003155 | 2.83 | 649.30 | 176.52 | 0.26 |
| Tributary 1E | Reach 1 | 2.587 | Method 1 | 1840.00 | 931.08 | 939.30 | | 939.40 | 0.002812 | 2.68 | 724.32 | 302.35 | 0.25 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.549 | 100-Year | 1840.00 | 930.62 | 937.24 | | 937.40 | 0.008210 | 3.34 | 580.37 | 513.14 | 0.38 |
| Tributary 1E | Reach 1 | 2.549 | Method 4 | 1840.00 | 930.62 | 938.09 | | 938.37 | 0.010935 | 4.53 | 457.42 | 297.18 | 0.45 |
| Tributary 1E | Reach 1 | 2.549 | Method 1 | 1840.00 | 930.62 | 938.08 | | 938.38 | 0.011745 | 4.71 | 440.19 | 285.85 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.511 | 100-Year | 1840.00 | 929.60 | 935.96 | | 936.10 | 0.005151 | 3.16 | 635.36 | 494.75 | 0.31 |
| Tributary 1E | Reach 1 | 2.511 | Method 4 | 1840.00 | 929.60 | 936.56 | | 936.78 | 0.005869 | 3.74 | 492.24 | 133.12 | 0.34 |
| Tributary 1E | Reach 1 | 2.511 | Method 1 | 1840.00 | 929.60 | 936.55 | | 936.76 | 0.005736 | 3.71 | 507.41 | 172.18 | 0.34 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.473 | 100-Year | 1840.00 | 928.97 | 934.20 | | 934.49 | 0.013925 | 4.55 | 434.70 | 295.52 | 0.50 |
| Tributary 1E | Reach 1 | 2.473 | Method 4 | 1840.00 | 928.97 | 934.77 | | 935.12 | 0.012376 | 4.73 | 389.42 | 129.93 | 0.48 |
| Tributary 1E | Reach 1 | 2.473 | Method 1 | 1840.00 | 928.97 | 934.81 | | 935.15 | 0.012014 | 4.68 | 393.43 | 130.34 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.445 | 100-Year | 1840.00 | 925.80 | 933.32 | 931.82 | 933.40 | 0.003699 | 2.49 | 820.00 | 616.99 | 0.27 |
| Tributary 1E | Reach 1 | 2.445 | Method 4 | 1840.00 | 925.80 | 933.51 | 931.81 | 933.70 | 0.007032 | 3.57 | 524.33 | 216.60 | 0.38 |
| Tributary 1E | Reach 1 | 2.445 | Method 1 | 1840.00 | 925.80 | 933.56 | 931.81 | 933.76 | 0.006935 | 3.56 | 517.13 | 188.39 | 0.38 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.438 | | Culvert | | | | | | | | | |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.432 | 100-Year | 1840.00 | 925.10 | 933.32 | 930.89 | 933.34 | 0.000511 | 1.39 | 1636.96 | 1039.46 | 0.14 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | [illegible] | [illegible] | F[illegible] Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 2.432 | Method 4 | 1840.00 | 925.10 | 933.47 | 930.89 | 933.54 | 0.001220 | 2.21 | 863.80 | 314.15 | 0.22 |
| Tributary 1E | Reach 1 | 2.432 | Method 1 | 1840.00 | 925.10 | 933.52 | 930.89 | 933.62 | 0.001575 | 2.53 | 727.46 | 220.01 | 0.25 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.397 | 100-Year | 1840.00 | 925.18 | 932.67 | 930.56 | 933.03 | 0.005332 | 4.85 | 379.33 | 642.78 | 0.47 |
| Tributary 1E | Reach 1 | 2.397 | Method 4 | 1840.00 | 925.18 | 932.69 | 930.56 | 933.05 | 0.005243 | 4.82 | 382.05 | 116.57 | 0.47 |
| Tributary 1E | Reach 1 | 2.397 | Method 1 | 1840.00 | 925.18 | 932.69 | 930.55 | 933.05 | 0.005243 | 4.82 | 382.05 | 116.57 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.359 | 100-Year | 1840.00 | 924.16 | 931.69 | 930.02 | 932.00 | 0.004852 | 4.49 | 414.72 | 748.59 | 0.47 |
| Tributary 1E | Reach 1 | 2.359 | Method 4 | 1840.00 | 924.16 | 931.74 | 930.02 | 932.04 | 0.004714 | 4.43 | 415.67 | 147.99 | 0.47 |
| Tributary 1E | Reach 1 | 2.359 | Method 1 | 1840.00 | 924.16 | 931.74 | 930.01 | 932.04 | 0.004714 | 4.43 | 415.67 | 147.99 | 0.47 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.321 | 100-Year | 1840.00 | 923.10 | 930.85 | 928.56 | 931.14 | 0.003760 | 4.31 | 426.86 | 973.81 | 0.43 |
| Tributary 1E | Reach 1 | 2.321 | Method 4 | 1840.00 | 923.10 | 930.95 | [illegible] | [illegible] | 0.003487 | 4.17 | 440.86 | 147.14 | 0.42 |
| Tributary 1E | Reach 1 | 2.321 | Method 1 | 1840.00 | 923.10 | 930.95 | 928.56 | 931.22 | 0.003487 | 4.17 | 440.86 | 147.14 | 0.42 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.283 | 100-Year | 1840.00 | 922.06 | 929.19 | 928.14 | 929.89 | 0.011304 | 6.72 | 273.88 | 658.79 | 0.67 |
| Tributary 1E | Reach 1 | 2.283 | Method 4 | 1840.00 | 922.06 | 929.75 | 928.14 | 930.23 | 0.007179 | 5.59 | 329.40 | 111.27 | 0.57 |
| Tributary 1E | Reach 1 | 2.283 | Method 1 | 1840.00 | 922.06 | 929.75 | 928.14 | 930.23 | 0.007179 | 5.59 | 329.40 | 111.27 | 0.57 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.245 | 100-Year | 1840.00 | 920.80 | 927.63 | 926.41 | 928.41 | 0.011248 | 7.10 | 259.21 | 803.70 | 0.65 |
| Tributary 1E | Reach 1 | 2.245 | Method 4 | 1840.00 | 920.80 | 928.21 | 926.41 | 928.78 | 0.007307 | 6.06 | 303.56 | 86.41 | 0.57 |
| Tributary 1E | Reach 1 | 2.245 | Method 1 | 1840.00 | 920.80 | 928.21 | 926.40 | 928.78 | 0.007307 | 6.06 | 303.56 | 86.41 | 0.57 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.208 | 100-Year | 1840.00 | 919.91 | 926.26 | 925.17 | 926.54 | 0.006930 | 4.69 | 449.93 | 713.98 | 0.49 |
| Tributary 1E | Reach 1 | 2.208 | Method 4 | 1840.00 | 919.91 | 926.30 | 925.17 | 926.91 | 0.012245 | 6.29 | 292.75 | 103.11 | 0.66 |
| Tributary 1E | Reach 1 | 2.208 | Method 1 | 1840.00 | 919.91 | 926.30 | 925.17 | 926.91 | 0.012245 | 6.29 | 292.75 | 103.11 | 0.66 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.170 | 100-Year | 1840.00 | 919.28 | 925.15 | 923.97 | 925.36 | 0.004651 | 3.79 | 503.45 | 740.65 | 0.42 |
| Tributary 1E | Reach 1 | 2.170 | Method 4 | 1840.00 | 919.28 | 925.41 | 923.97 | 925.60 | 0.003505 | 3.48 | 528.00 | 191.41 | 0.37 |
| Tributary 1E | Reach 1 | 2.170 | Method 1 | 1840.00 | 919.28 | 925.41 | 923.97 | 925.59 | 0.003512 | 3.49 | 527.69 | 191.40 | 0.37 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.132 | 100-Year | 1840.00 | 919.47 | 923.88 | 923.39 | 924.14 | 0.008530 | 4.37 | 477.61 | 956.86 | 0.57 |
| Tributary 1E | Reach 1 | 2.132 | Method 4 | 1840.00 | 919.47 | 924.53 | 923.45 | 924.77 | 0.004861 | 3.95 | 465.67 | 193.61 | 0.45 |
| Tributary 1E | Reach 1 | 2.132 | Method 1 | 1840.00 | 919.47 | 924.52 | 923.45 | 924.76 | 0.004909 | 3.96 | 464.22 | 193.56 | 0.45 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.094 | 100-Year | 1840.00 | 918.12 | 922.92 | 922.54 | 923.02 | 0.003654 | 2.59 | 745.11 | 1053.56 | 0.34 |
| Tributary 1E | Reach 1 | 2.094 | Method 4 | 1840.00 | 918.12 | 923.13 | 922.55 | 923.44 | 0.009461 | 4.47 | 411.40 | 204.17 | 0.56 |
| Tributary 1E | Reach 1 | 2.094 | Method 1 | 1840.00 | 918.12 | 923.19 | 922.42 | 923.48 | 0.008640 | 4.35 | 422.83 | 204.56 | 0.53 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 2.056 | 100-Year | 1840.00 | 917.85 | 921.31 | 920.89 | 921.69 | 0.013244 | 4.90 | 375.19 | 729.60 | 0.66 |
| Tributary 1E | Reach 1 | 2.056 | Method 4 | 1840.00 | 917.85 | 922.02 | 920.89 | 922.20 | 0.004172 | 3.42 | 538.24 | 235.37 | 0.40 |
| Tributary 1E | Reach 1 | 2.056 | Method 1 | 1840.00 | 917.85 | 921.73 | 920.88 | 921.96 | 0.006597 | 3.92 | 469.39 | 233.91 | 0.49 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 2.018 | 100-Year | 1840.00 | 917.34 | 919.37 | 919.30 | 919.78 | 0.021439 | 5.41 | 358.08 | 350.53 | 0.85 |
| Tributary 1E | Reach 1 | 2.018 | Method 4 | 1840.00 | 917.34 | 920.06 | 919.79 | 920.66 | 0.017057 | 6.25 | 294.37 | 157.43 | 0.81 |
| Tributary 1E | Reach 1 | 2.018 | Method 1 | 1840.00 | 917.34 | 919.38 | 919.30 | 919.79 | 0.020733 | 5.35 | 361.84 | 350.84 | 0.83 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.980 | 100-Year | 1840.00 | 915.76 | 917.83 | | 918.01 | 0.004499 | 1.44 | 569.32 | 469.94 | 0.25 |
| Tributary 1E | Reach 1 | 1.980 | Method 4 | 1840.00 | 915.76 | 918.87 | | 919.02 | 0.004200 | 1.72 | 625.77 | 371.51 | 0.25 |
| Tributary 1E | Reach 1 | 1.980 | Method 1 | 1840.00 | 915.76 | 917.83 | | 918.01 | 0.004569 | 1.45 | 556.30 | 394.41 | 0.25 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.942 | 100-Year | 1840.00 | 913.68 | 916.70 | | 916.87 | 0.007411 | 2.47 | 573.85 | 550.57 | 0.34 |
| Tributary 1E | Reach 1 | 1.942 | Method 4 | 1840.00 | 913.68 | 917.73 | | 917.96 | 0.006996 | 2.62 | 514.87 | 335.99 | 0.34 |
| Tributary 1E | Reach 1 | 1.942 | Method 1 | 1840.00 | 913.68 | 916.72 | | 916.88 | 0.007190 | 2.44 | 576.21 | 525.70 | 0.33 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.905 | 100-Year | 1840.00 | 912.11 | 915.80 | | 915.89 | 0.003937 | 2.31 | 810.52 | 681.26 | 0.26 |
| Tributary 1E | Reach 1 | 1.905 | Method 4 | 1840.00 | 912.11 | 916.85 | | 917.00 | 0.003790 | 2.85 | 602.80 | 205.50 | 0.27 |
| Tributary 1E | Reach 1 | 1.905 | Method 1 | 1840.00 | 912.11 | 915.81 | | 915.90 | 0.004055 | 2.33 | 776.76 | 612.37 | 0.27 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.867 | 100-Year | 1840.00 | 910.82 | 915.01 | | 915.12 | 0.005276 | 2.88 | 689.15 | 562.66 | 0.31 |
| Tributary 1E | Reach 1 | 1.867 | Method 4 | 1840.00 | 910.82 | 916.00 | | 916.19 | 0.005447 | 3.55 | 527.52 | 203.62 | 0.33 |
| Tributary 1E | Reach 1 | 1.867 | Method 1 | 1840.00 | 910.82 | 915.00 | | 915.12 | 0.005294 | 2.88 | 688.33 | 562.37 | 0.31 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.829 | 100-Year | 1840.00 | 909.80 | 914.16 | | 914.25 | 0.003606 | 2.48 | 754.73 | 504.11 | 0.26 |
| Tributary 1E | Reach 1 | 1.829 | Method 4 | 1840.00 | 909.80 | 915.13 | | 915.27 | 0.003786 | 3.05 | 609.49 | 227.10 | 0.27 |
| Tributary 1E | Reach 1 | 1.829 | Method 1 | 1840.00 | 909.80 | 914.18 | | 914.27 | 0.003435 | 2.44 | 765.81 | 504.42 | 0.25 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.791 | 100-Year | 1840.00 | 909.24 | 913.29 | | 913.44 | 0.004456 | 2.59 | 627.80 | 399.23 | 0.28 |
| Tributary 1E | Reach 1 | 1.791 | Method 4 | 1840.00 | 909.24 | 914.25 | | 914.41 | 0.004829 | 3.26 | 566.94 | 239.56 | 0.31 |
| Tributary 1E | Reach 1 | 1.791 | Method 1 | 1840.00 | 909.24 | 913.35 | | 913.49 | 0.004272 | 2.54 | 614.67 | 353.00 | 0.28 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.753 | 100-Year | 1840.00 | 907.65 | 912.60 | | 912.69 | 0.002776 | 2.19 | 772.82 | 380.82 | 0.23 |
| Tributary 1E | Reach 1 | 1.753 | Method 4 | 1840.00 | 907.65 | 913.46 | | 913.59 | 0.003252 | 2.80 | 644.27 | 205.70 | 0.26 |
| Tributary 1E | Reach 1 | 1.753 | Method 1 | 1840.00 | 907.65 | 912.69 | | 912.79 | 0.002577 | 2.14 | 752.04 | 325.30 | 0.22 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.715 | 100-Year | 1840.00 | 908.98 | 911.67 | | 911.87 | 0.005038 | 4.06 | 566.39 | 331.97 | 0.53 |
| Tributary 1E | Reach 1 | 1.715 | Method 4 | 1840.00 | 908.98 | 912.51 | | 912.81 | 0.004272 | 4.38 | 419.91 | 199.18 | 0.53 |
| Tributary 1E | Reach 1 | 1.715 | Method 1 | 1840.00 | 908.98 | 911.72 | | 911.95 | 0.005780 | 4.40 | 519.60 | 286.05 | 0.57 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.677 | 100-Year | 1840.00 | 908.63 | 910.61 | | 910.80 | 0.005213 | 2.77 | 549.26 | 396.65 | 0.45 |
| Tributary 1E | Reach 1 | 1.677 | Method 4 | 1840.00 | 908.63 | 911.70 | | 911.88 | 0.004572 | 3.52 | 548.12 | 306.14 | 0.44 |
| Tributary 1E | Reach 1 | 1.677 | Method 1 | 1840.00 | 908.63 | 910.61 | | 910.80 | 0.005206 | 2.77 | 549.50 | 396.70 | 0.45 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.640 | 100-Year | 1840.00 | 907.51 | 910.03 | | 910.18 | 0.004027 | 1.67 | 659.27 | 423.56 | 0.25 |
| Tributary 1E | Reach 1 | 1.640 | Method 4 | 1840.00 | 907.51 | 910.96 | | 911.13 | 0.004449 | 2.43 | 609.80 | 263.47 | 0.28 |
| Tributary 1E | Reach 1 | 1.640 | Method 1 | 1840.00 | 907.51 | 910.03 | | 910.18 | 0.004003 | 1.67 | 660.54 | 423.59 | 0.24 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 1.602 | 100-Year | 1840.00 | 905.46 | 908.48 | | 908.66 | 0.008391 | 3.02 | 542.77 | 362.14 | 0.37 |
| Tributary 1E | Reach 1 | 1.602 | Method 4 | 1840.00 | 905.46 | 909.46 | | 909.70 | 0.008713 | 3.97 | 461.04 | 161.46 | 0.40 |
| Tributary 1E | Reach 1 | 1.602 | Method 1 | 1840.00 | 905.46 | 908.46 | | 908.65 | 0.008622 | 3.05 | 538.37 | 361.95 | 0.38 |
| Tributary 1E | Reach 1 | 1.564 | 100-Year | 1840.00 | 903.79 | 907.29 | | 907.42 | 0.004557 | 2.47 | 654.01 | 374.75 | 0.30 |
| Tributary 1E | Reach 1 | 1.564 | Method 4 | 1840.00 | 903.79 | 908.28 | | 908.43 | 0.004642 | 3.17 | 594.44 | 200.75 | 0.32 |
| Tributary 1E | Reach 1 | 1.564 | Method 1 | 1840.00 | 903.79 | 907.38 | | 907.50 | 0.003906 | 2.34 | 684.67 | 355.94 | 0.28 |
| Tributary 1E | Reach 1 | 1.526 | 100-Year | 1840.00 | 903.14 | 906.38 | | 906.50 | 0.004362 | 2.36 | 693.54 | 412.04 | 0.28 |
| Tributary 1E | Reach 1 | 1.526 | Method 4 | 1840.00 | 903.14 | 907.35 | | 907.50 | 0.004582 | 3.03 | 589.50 | 192.35 | 0.30 |
| Tributary 1E | Reach 1 | 1.526 | Method 1 | 1840.00 | 903.14 | 906.39 | | 906.55 | 0.005443 | 2.62 | 588.38 | 290.27 | 0.31 |
| Tributary 1E | Reach 1 | 1.488 | 100-Year | 1840.00 | 902.09 | 905.47 | | 905.55 | 0.002909 | 1.95 | 807.84 | 406.74 | 0.23 |
| Tributary 1E | Reach 1 | 1.488 | Method 4 | 1840.00 | 902.09 | 906.56 | | 906.69 | 0.002685 | 2.40 | 664.80 | 198.25 | 0.23 |
| Tributary 1E | Reach 1 | 1.488 | Method 1 | 1840.00 | 902.09 | 905.43 | | 905.52 | 0.002828 | 1.89 | 773.94 | 332.80 | 0.22 |
| Tributary 1E | Reach 1 | 1.450 | 100-Year | 1840.00 | 901.42 | 904.87 | | 904.98 | 0.005242 | 2.12 | 703.61 | 379.08 | 0.29 |
| Tributary 1E | Reach 1 | 1.450 | Method 4 | 1840.00 | 901.42 | 905.85 | | 906.06 | 0.005364 | 2.89 | 544.85 | 216.67 | 0.31 |
| Tributary 1E | Reach 1 | 1.450 | Method 1 | 1840.00 | 901.42 | 904.84 | | 904.96 | 0.005186 | 2.10 | 693.81 | 365.49 | 0.29 |
| Tributary 1E | Reach 1 | 1.412 | 100-Year | 1840.00 | 901.99 | 903.21 | | 903.36 | 0.008912 | 1.53 | 614.41 | 351.93 | 0.32 |
| Tributary 1E | Reach 1 | 1.412 | Method 4 | 1840.00 | 901.99 | 903.92 | | 904.20 | 0.013344 | 2.69 | 461.88 | 230.28 | 0.43 |
| Tributary 1E | Reach 1 | 1.412 | Method 1 | 1840.00 | 901.99 | 903.25 | | 903.39 | 0.008427 | 1.52 | 628.12 | 356.29 | 0.32 |
| Tributary 1E | Reach 1 | 1.374 | 100-Year | 1840.00 | 899.69 | 902.66 | | 902.71 | 0.001972 | 1.31 | 1048.44 | 480.59 | 0.18 |
| Tributary 1E | Reach 1 | 1.374 | Method 4 | 1840.00 | 899.69 | 902.95 | | 903.05 | 0.003677 | 1.89 | 722.66 | 253.47 | 0.24 |
| Tributary 1E | Reach 1 | 1.374 | Method 1 | 1840.00 | 899.69 | 902.70 | | 902.75 | 0.001972 | 1.32 | 1008.04 | 368.07 | 0.18 |
| Tributary 1E | Reach 1 | 1.330 | 100-Year | 1840.00 | 896.00 | 901.90 | 900.66 | 902.01 | 0.006090 | 2.71 | 715.60 | 425.18 | 0.32 |
| Tributary 1E | Reach 1 | 1.330 | Method 4 | 1840.00 | 896.00 | 901.95 | 900.66 | 902.06 | 0.006065 | 2.73 | 673.90 | 300.01 | 0.32 |
| Tributary 1E | Reach 1 | 1.330 | Method 1 | 1840.00 | 896.00 | 901.95 | 900.66 | 902.06 | 0.006057 | 2.73 | 674.17 | 300.01 | 0.32 |
| Tributary 1E | Reach 1 | 1.323 | | Culvert | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.312 | 100-Year | 1840.00 | 895.50 | 900.91 | | 901.05 | 0.005055 | 3.02 | 661.89 | 525.37 | 0.33 |
| Tributary 1E | Reach 1 | 1.312 | Method 4 | 1840.00 | 895.50 | 901.40 | | 901.52 | 0.003255 | 2.71 | 678.52 | 223.94 | 0.27 |
| Tributary 1E | Reach 1 | 1.312 | Method 1 | 1840.00 | 895.50 | 901.48 | | 901.59 | 0.002993 | 2.65 | 695.26 | 223.95 | 0.26 |
| Tributary 1E | Reach 1 | 1.223 | 100-Year | 1840.00 | 894.87 | 898.35 | | 898.46 | 0.004631 | 2.45 | 691.30 | 606.21 | 0.32 |
| Tributary 1E | Reach 1 | 1.223 | Method 4 | 1840.00 | 894.87 | 899.25 | | 899.43 | 0.005501 | 3.33 | 542.03 | 274.40 | 0.38 |
| Tributary 1E | Reach 1 | 1.223 | Method 1 | 1840.00 | 894.87 | 899.31 | | 899.51 | 0.006141 | 3.58 | 507.75 | 242.82 | 0.41 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 1.185 | 100-Year | 1840.00 | 891.67 | 897.21 | 896.22 | 897.38 | 0.005917 | 3.18 | 567.20 | 353.05 | 0.36 |
| Tributary 1E | Reach 1 | 1.185 | Method 4 | 1840.00 | 891.67 | 897.75 | 896.37 | 898.04 | 0.008630 | 4.34 | 423.57 | 141.44 | 0.44 |
| Tributary 1E | Reach 1 | 1.185 | Method 1 | 1840.00 | 891.67 | 897.84 | 896.37 | 898.12 | 0.007817 | 4.22 | 436.50 | 141.44 | 0.42 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.147 | 100-Year | 1840.00 | 891.54 | 894.77 | | 895.26 | 0.022071 | 5.82 | 334.93 | 214.41 | 0.66 |
| Tributary 1E | Reach 1 | 1.147 | Method 4 | 1840.00 | 891.54 | 895.70 | | 896.07 | 0.011339 | 4.87 | 377.78 | 126.80 | 0.50 |
| Tributary 1E | Reach 1 | 1.147 | Method 1 | 1840.00 | 891.54 | 895.06 | | 895.64 | 0.021739 | 6.11 | 300.92 | 115.77 | 0.67 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.109 | 100-Year | 1840.00 | 890.15 | 894.38 | | 894.50 | 0.001209 | 2.84 | 747.76 | 272.92 | 0.27 |
| Tributary 1E | Reach 1 | 1.109 | Method 4 | 1840.00 | 890.15 | 895.59 | | 895.68 | 0.000579 | 2.36 | 780.01 | 165.48 | 0.19 |
| Tributary 1E | Reach 1 | 1.109 | Method 1 | 1840.00 | 890.15 | 894.82 | | 894.95 | 0.001040 | 2.82 | 653.47 | 165.48 | 0.25 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.072 | 100-Year | 1840.00 | 889.38 | 893.22 | 893.22 | 893.79 | 0.018717 | 7.01 | 330.06 | 264.53 | 0.79 |
| Tributary 1E | Reach 1 | 1.072 | Method 4 | 1840.00 | 889.38 | 893.71 | 893.71 | 895.18 | 0.029858 | 9.76 | 188.62 | 64.95 | 1.01 |
| Tributary 1E | Reach 1 | 1.072 | Method 1 | 1840.00 | 889.38 | 893.47 | 893.47 | 894.30 | 0.021682 | 7.98 | 270.90 | 149.08 | 0.86 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 1.035 | 100-Year | 1840.00 | 887.45 | 892.14 | 890.56 | 892.27 | 0.002160 | 2.91 | 666.15 | 326.15 | 0.31 |
| Tributary 1E | Reach 1 | 1.035 | Method 4 | 1840.00 | 887.45 | 893.03 | 890.56 | 893.11 | 0.000927 | 2.28 | 805.92 | 224.70 | 0.21 |
| Tributary 1E | Reach 1 | 1.035 | Method 1 | 1840.00 | 887.45 | 892.15 | 890.56 | 892.29 | 0.002349 | 3.03 | 608.22 | 224.70 | 0.32 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | .997 | 100-Year | 1840.00 | 886.60 | 891.52 | 890.79 | 891.69 | 0.003880 | 3.66 | 559.16 | 342.95 | 0.40 |
| Tributary 1E | Reach 1 | .997 | Method 4 | 1840.00 | 886.60 | 892.42 | 891.07 | 892.74 | 0.004386 | 4.60 | 409.25 | 125.39 | 0.43 |
| Tributary 1E | Reach 1 | .997 | Method 1 | 1840.00 | 886.60 | 891.52 | 890.79 | 891.69 | 0.003880 | 3.66 | 559.16 | 307.31 | 0.40 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | .959 | 100-Year | 1840.00 | 886.08 | 890.65 | 889.91 | 890.87 | 0.004712 | 4.09 | 518.53 | 500.32 | 0.43 |
| Tributary 1E | Reach 1 | .959 | Method 4 | 1840.00 | 886.08 | 890.96 | 890.02 | 891.50 | 0.009038 | 5.94 | 309.53 | 98.19 | 0.59 |
| Tributary 1E | Reach 1 | .959 | Method 1 | 1840.00 | 886.08 | 890.65 | 889.91 | 890.87 | 0.004712 | 4.09 | 518.53 | 315.14 | 0.43 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | .921 | 100-Year | 1840.00 | 883.54 | 888.92 | 888.35 | 889.41 | 0.012084 | 5.69 | 336.46 | 354.97 | 0.64 |
| Tributary 1E | Reach 1 | .921 | Method 4 | 1840.00 | 883.54 | 889.71 | 888.27 | 890.02 | 0.005644 | 4.52 | 407.48 | 131.63 | 0.45 |
| Tributary 1E | Reach 1 | .921 | Method 1 | 1840.00 | 883.54 | 888.92 | 888.35 | 889.41 | 0.012084 | 5.69 | 336.46 | 175.26 | 0.64 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | .883 | 100-Year | 1840.00 | 883.53 | 888.61 | 886.40 | 888.69 | 0.001439 | 2.02 | 816.89 | 758.51 | 0.22 |
| Tributary 1E | Reach 1 | .883 | Method 4 | 1840.00 | 883.53 | 889.26 | 886.88 | 889.36 | 0.001959 | 2.52 | 707.51 | 234.58 | 0.26 |
| Tributary 1E | Reach 1 | .883 | Method 1 | 1840.00 | 883.53 | 888.61 | 886.40 | 888.69 | 0.001438 | 2.02 | 816.91 | 290.25 | 0.22 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | .845 | 100-Year | 1840.00 | 882.26 | 887.76 | 886.70 | 888.11 | 0.007126 | 5.08 | 416.19 | 970.10 | 0.51 |
| Tributary 1E | Reach 1 | .845 | Method 4 | 1840.00 | 882.26 | 888.22 | 886.47 | 888.65 | 0.007193 | 5.22 | 352.22 | 110.06 | 0.51 |
| Tributary 1E | Reach 1 | .845 | Method 1 | 1840.00 | 882.26 | 887.76 | 886.70 | 888.11 | 0.007124 | 5.07 | 416.24 | 252.78 | 0.51 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | .807 | 100-Year | 1840.00 | 881.36 | 886.49 | 885.43 | 886.79 | 0.005942 | 4.71 | 453.12 | 800.78 | 0.47 |
| Tributary 1E | Reach 1 | .807 | Method 4 | 1840.00 | 881.36 | 886.50 | 885.36 | 887.02 | 0.009161 | 5.83 | 315.68 | 100.12 | 0.58 |
| Tributary 1E | Reach 1 | .807 | Method 1 | 1840.00 | 881.36 | 886.49 | 885.43 | 886.79 | 0.005957 | 4.72 | 452.66 | 233.79 | 0.47 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 770 | 100-Year | 1840.00 | 879.87 | 885.68 | 883.60 | 885.93 | 0.003181 | 3.99 | 461.50 | 1071.84 | 0.37 |
| Tributary 1E | Reach 1 | 770 | Method 4 | 1840.00 | 879.87 | 885.69 | 883.60 | 885.93 | 0.003164 | 3.98 | 462.32 | 126.42 | 0.37 |
| Tributary 1E | Reach 1 | 770 | Method 1 | 1840.00 | 879.87 | 885.68 | 883.61 | 885.93 | 0.003193 | 3.99 | 460.90 | 126.29 | 0.37 |
| Tributary 1E | Reach 1 | 732 | 100-Year | 1840.00 | 879.39 | 885.14 | 882.88 | 885.35 | 0.002565 | 3.66 | 502.44 | 1417.21 | 0.33 |
| Tributary 1E | Reach 1 | 732 | Method 4 | 1840.00 | 879.39 | 885.15 | 882.88 | 885.36 | 0.002543 | 3.65 | 503.87 | 132.82 | 0.33 |
| Tributary 1E | Reach 1 | 732 | Method 1 | 1840.00 | 879.39 | 885.13 | 882.88 | 885.34 | 0.002581 | 3.67 | 501.42 | 132.64 | 0.33 |
| Tributary 1E | Reach 1 | 695 | 100-Year | 1840.00 | 879.28 | 884.29 | 882.70 | 884.63 | 0.005403 | 4.74 | 388.53 | 2101.77 | 0.45 |
| Tributary 1E | Reach 1 | 695 | Method 4 | 1840.00 | 879.28 | 884.31 | 882.70 | 884.65 | 0.005284 | 4.70 | 391.47 | 114.20 | 0.45 |
| Tributary 1E | Reach 1 | 695 | Method 1 | 1840.00 | 879.28 | 884.27 | 882.70 | 884.62 | 0.005488 | 4.76 | 386.51 | 113.82 | 0.46 |
| Tributary 1E | Reach 1 | 656 | 100-Year | 1840.00 | 877.73 | 882.15 | 881.54 | 882.88 | 0.014638 | 6.84 | 269.18 | 1985.71 | 0.72 |
| Tributary 1E | Reach 1 | 656 | Method 4 | 1840.00 | 877.73 | 883.08 | 881.54 | 883.47 | 0.006178 | 5.06 | 363.44 | 108.77 | 0.49 |
| Tributary 1E | Reach 1 | 656 | Method 1 | 1840.00 | 877.73 | 882.28 | 881.52 | 882.94 | 0.012855 | 6.54 | 281.41 | 227.25 | 0.68 |
| Tributary 1E | Reach 1 | 618 | 100-Year | 1840.00 | 876.82 | 880.99 | 880.54 | 881.15 | 0.004775 | 3.98 | 666.44 | 2226.17 | 0.42 |
| Tributary 1E | Reach 1 | 618 | Method 4 | 1840.00 | 876.82 | 882.11 | 880.54 | 882.43 | 0.004260 | 4.64 | 400.82 | 117.24 | 0.42 |
| Tributary 1E | Reach 1 | 618 | Method 1 | 1840.00 | 876.82 | 881.01 | 880.55 | 881.25 | 0.005197 | 4.18 | 481.83 | 284.61 | 0.44 |
| Tributary 1E | Reach 1 | 580 | 100-Year | 1840.00 | 876.54 | 879.43 | 879.25 | 879.74 | 0.011433 | 5.08 | 424.39 | 962.57 | 0.62 |
| Tributary 1E | Reach 1 | 580 | Method 4 | 1840.00 | 876.54 | 880.39 | 879.87 | 881.06 | 0.012142 | 6.59 | 278.24 | 108.76 | 0.69 |
| Tributary 1E | Reach 1 | 580 | Method 1 | 1840.00 | 876.54 | 879.44 | 879.25 | 879.77 | 0.011625 | 5.12 | 404.07 | 362.90 | 0.63 |
| Tributary 1E | Reach 1 | 542 | 100-Year | 1840.00 | 875.92 | 878.35 | 878.35 | 878.43 | 0.004090 | 2.68 | 846.28 | 1841.36 | 0.36 |
| Tributary 1E | Reach 1 | 542 | Method 4 | 1840.00 | 875.92 | 879.29 | 878.36 | 879.61 | 0.004413 | 3.68 | 425.77 | [illegible] | [illegible] |
| Tributary 1E | Reach 1 | 542 | Method 1 | 1840.00 | 875.92 | 878.41 | 878.35 | 878.54 | 0.003688 | 2.60 | 636.03 | 469.68 | 0.35 |
| Tributary 1E | Reach 1 | 494 | 100-Year | 1840.00 | 875.29 | 877.59 | | 877.63 | 0.002597 | 2.19 | 1119.25 | 1678.23 | 0.28 |
| Tributary 1E | Reach 1 | 494 | Method 4 | 1840.00 | 875.29 | 878.62 | | 878.79 | 0.002503 | 2.80 | 566.27 | 218.67 | 0.30 |
| Tributary 1E | Reach 1 | 494 | Method 1 | 1840.00 | 875.29 | 877.94 | | 878.01 | 0.001497 | 1.85 | 833.13 | 459.29 | 0.22 |
| Tributary 1E | Reach 1 | 418 | 100-Year | 1840.00 | 872.76 | 876.37 | 876.17 | 876.46 | 0.003696 | 3.29 | 909.83 | 1438.42 | 0.36 |
| Tributary 1E | Reach 1 | 418 | Method 4 | 1840.00 | 872.76 | 877.35 | | 877.61 | 0.003765 | 3.91 | 457.79 | 172.75 | 0.38 |
| Tributary 1E | Reach 1 | 418 | Method 1 | 1840.00 | 872.76 | 877.03 | | 877.20 | 0.003242 | 3.47 | 556.99 | 286.07 | 0.35 |
| Tributary 1E | Reach 1 | 342 | 100-Year | 1840.00 | 870.90 | 874.92 | 874.67 | 875.03 | 0.003412 | 3.29 | 818.07 | 1223.42 | 0.35 |
| Tributary 1E | Reach 1 | 342 | Method 4 | 1840.00 | 870.90 | 875.92 | 874.43 | 876.17 | 0.003413 | 3.93 | 465.93 | 146.70 | 0.37 |
| Tributary 1E | Reach 1 | 342 | Method 1 | 1840.00 | 870.90 | 875.42 | 874.49 | 875.68 | 0.004455 | 4.14 | 456.84 | 188.35 | 0.41 |
| Tributary 1E | Reach 1 | 266 | 100-Year | 1840.00 | 870.13 | 873.68 | 873.14 | 873.76 | 0.002925 | 2.88 | 854.23 | 1117.04 | 0.33 |
| Tributary 1E | Reach 1 | 266 | Method 4 | 1840.00 | 870.13 | 874.68 | 873.14 | 874.90 | 0.002917 | 3.48 | 496.99 | 163.81 | 0.34 |

HEC-RAS Plan: Trib 1E (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Tributary 1E | Reach 1 | 265 | Method 1 | 1840.00 | 870.13 | 874.34 | 873.01 | 874.48 | 0.002042 | 2.75 | 618.15 | 243.98 | 0.28 |
| | | | | | | | | | | | | | |
| Tributary 1E | Reach 1 | 190 | 100 Year | 1840.00 | 867.74 | 872.24 | 871.80 | 872.40 | 0.004007 | 3.69 | 598.58 | 676.93 | 0.39 |
| Tributary 1E | Reach 1 | 190 | Method 4 | 1840.00 | 867.74 | 873.24 | 871.70 | 873.54 | 0.004000 | 4.39 | 421.10 | 124.25 | 0.40 |
| Tributary 1E | Reach 1 | 190 | Method 1 | 1840.00 | 867.74 | 873.08 | 871.75 | 873.36 | 0.004005 | 4.28 | 433.49 | 140.55 | 0.40 |

## E.5.2 Water Surface Elevation HEC-RAS Output for Tributary 3E – All Reaches, Existing 100-Year, 6-Hour Event

HEC-RAS Plan: H Trib 3E River: Tributary 3E Reach: Reach 1

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | [illegible] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Reach 1 | 1.553 | 100-Year | 758.00 | 975.75 | 980.26 | | 980.55 | 0.004300 | 4.33 | 175.07 | 61.04 | 0.45 |
| Reach 1 | 1.553 | Method 4 | 758.00 | 975.75 | 980.26 | | 980.55 | 0.004300 | 4.33 | 175.07 | 61.04 | 0.45 |
| Reach 1 | 1.553 | Method 1 | 758.00 | 975.75 | 980.26 | | 980.55 | 0.004300 | 4.33 | 175.07 | 61.04 | 0.45 |
| | | | | | | | | | | | | |
| Reach 1 | 1.515 | 100-Year | 758.00 | 975.25 | 978.87 | 978.15 | 979.38 | 0.008237 | 5.72 | 132.47 | 166.36 | 0.65 |
| Reach 1 | 1.515 | Method 4 | 758.00 | 975.25 | 978.88 | 978.15 | 979.38 | 0.008130 | 5.70 | [illegible] | 55.12 | 0.65 |
| Reach 1 | 1.515 | Method 1 | 758.00 | 975.25 | 978.87 | 978.16 | 979.38 | 0.008237 | 5.72 | 132.47 | 55.03 | 0.65 |
| | | | | | | | | | | | | |
| Reach 1 | 1.478 | 100-Year | 758.00 | 974.47 | 978.71 | 976.45 | 978.78 | 0.001093 | 2.10 | 361.17 | 171.00 | 0.23 |
| Reach 1 | 1.478 | Method 4 | 758.00 | 974.47 | 978.72 | 976.45 | 978.79 | 0.001075 | 2.09 | 363.27 | 135.29 | 0.22 |
| Reach 1 | 1.478 | Method 1 | 758.00 | 974.47 | 978.71 | 976.44 | 978.78 | 0.001093 | 2.10 | 361.17 | 134.94 | 0.23 |
| | | | | | | | | | | | | |
| Reach 1 | 1.440 | 100-Year | 758.00 | 972.65 | 978.71 | 974.05 | 978.72 | 0.000082 | 0.83 | 916.39 | 269.12 | 0.07 |
| Reach 1 | 1.440 | Method 4 | 758.00 | 972.65 | 978.72 | 974.05 | 978.73 | 0.000082 | 0.82 | 919.47 | 199.27 | 0.07 |
| Reach 1 | 1.440 | Method 1 | 758.00 | 972.65 | 978.71 | 974.06 | 978.72 | 0.000082 | 0.83 | 916.39 | 198.98 | 0.07 |
| | | | | | | | | | | | | |
| Reach 1 | 1.421 | 100-Year | 758.00 | 971.21 | 978.70 | | 978.71 | 0.000041 | 0.76 | 1079.68 | 188.72 | 0.05 |
| Reach 1 | 1.421 | Method 4 | 758.00 | 971.21 | 978.71 | | 978.72 | 0.000070 | [illegible] | [illegible] | 121.45 | 0.06 |
| Reach 1 | 1.421 | Method 1 | 758.00 | 971.21 | 978.70 | | 978.71 | 0.000041 | 0.76 | 1079.68 | 188.72 | 0.05 |
| | | | | | | | | | | | | |
| Reach 1 | 1.402 | 100-Year | 758.00 | 971.23 | 978.69 | | 978.71 | 0.000059 | 1.13 | 869.63 | 305.76 | 0.08 |
| Reach 1 | 1.402 | Method 4 | 758.00 | 971.23 | 978.68 | | 978.71 | 0.000108 | 1.48 | 524.94 | 96.95 | 0.11 |
| Reach 1 | 1.402 | Method 1 | 758.00 | 971.23 | 978.69 | | 978.71 | 0.000059 | 1.13 | 869.63 | 305.76 | 0.08 |
| | | | | | | | | | | | | |
| Reach 1 | 1.378 | 100-Year | 758.00 | 969.69 | 978.69 | 971.48 | 978.70 | 0.000012 | 0.52 | 1702.80 | 295.77 | 0.03 |
| Reach 1 | 1.378 | Method 4 | 758.00 | 969.69 | 978.69 | 971.48 | 978.70 | 0.000012 | 0.52 | 1702.80 | 295.77 | 0.03 |
| Reach 1 | 1.378 | Method 1 | 758.00 | 969.69 | 978.69 | 971.48 | 978.70 | 0.000012 | 0.52 | 1702.80 | 295.77 | 0.03 |
| | | | | | | | | | | | | |
| Reach 1 | 1.359 | | Int Struct | | | | | | | | | |
| | | | | | | | | | | | | |
| Reach 1 | 1.326 | 100-Year | 758.00 | 964.75 | 967.85 | | 968.02 | 0.003915 | 3.41 | 231.39 | 160.13 | 0.45 |
| Reach 1 | 1.326 | Method 4 | 758.00 | 964.75 | 967.72 | | 967.94 | 0.005031 | 3.75 | 202.32 | 119.05 | 0.51 |
| Reach 1 | 1.326 | Method 1 | 758.00 | 964.75 | 968.08 | | 968.23 | 0.003044 | 3.06 | 247.48 | 134.93 | 0.40 |
| | | | | | | | | | | | | |
| Reach 1 | 1.288 | 100-Year | 758.00 | 963.35 | 965.76 | 965.74 | 966.37 | 0.021149 | 6.26 | 121.03 | 96.54 | 0.99 |
| Reach 1 | 1.288 | Method 4 | 758.00 | 963.35 | 966.06 | | 966.46 | 0.010968 | 5.03 | 150.68 | 102.01 | 0.73 |
| Reach 1 | 1.288 | Method 1 | 758.00 | 963.35 | 966.06 | 966.01 | 966.81 | 0.018848 | 6.92 | 109.59 | 68.76 | 0.97 |
| | | | | | | | | | | | | |

HEC-RAS Plan: H Trib 3E River: Tributary 3E Reach: Reach 1 (Continued)

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Reach 1 | 1.250 | 100-Year | 758.00 | 960.53 | 964.36 | | 964.57 | 0.004428 | 4.05 | 219.06 | 150.03 | 0.49 |
| Reach 1 | 1.250 | Method 4 | 758.00 | 960.53 | 964.82 | | 965.12 | 0.004308 | 4.42 | 171.34 | 66.85 | 0.49 |
| Reach 1 | 1.250 | Method 1 | 758.00 | 960.53 | 964.79 | | 965.10 | 0.004299 | 4.46 | 170.87 | 67.64 | 0.49 |
| | | | | | | | | | | | | |
| Reach 1 | 1.213 | 100-Year | 758.00 | 959.99 | 962.50 | 962.44 | 962.99 | 0.016935 | 5.96 | 138.71 | 119.94 | 0.90 |
| Reach 1 | 1.213 | Method 4 | 758.00 | 959.99 | 962.70 | 962.70 | 963.43 | 0.021681 | 6.84 | 110.77 | 78.92 | 1.02 |
| Reach 1 | 1.213 | Method 1 | 758.00 | 959.99 | 962.72 | 962.72 | 963.43 | 0.021017 | 6.78 | 111.84 | 79.37 | 1.00 |
| | | | | | | | | | | | | |
| Reach 1 | 1.175 | 100-Year | 758.00 | 957.50 | 960.29 | | 960.49 | 0.008858 | 3.86 | 217.90 | 227.90 | 0.63 |
| Reach 1 | 1.175 | Method 4 | 758.00 | 957.50 | 960.93 | | 961.18 | 0.005275 | 3.96 | 191.47 | 106.14 | 0.52 |
| Reach 1 | 1.175 | Method 1 | 758.00 | 957.50 | 960.93 | | 961.18 | 0.005275 | 3.96 | 191.47 | 106.14 | 0.52 |
| | | | | | | | | | | | | |
| Reach 1 | 1.137 | 100-Year | 758.00 | 956.46 | 958.91 | | 959.08 | 0.005667 | 3.73 | 240.21 | 226.38 | 0.53 |
| Reach 1 | 1.137 | Method 4 | 758.00 | 956.46 | 959.76 | | 960.11 | 0.005376 | 4.70 | 161.19 | 67.29 | 0.54 |
| Reach 1 | 1.137 | Method 1 | 758.00 | 956.46 | 959.76 | | 960.10 | 0.005390 | 4.71 | 161.06 | 67.29 | 0.54 |
| | | | | | | | | | | | | |
| Reach 1 | 1.099 | 100-Year | 758.00 | 955.19 | 957.42 | | 957.71 | 0.009189 | 4.88 | 189.32 | 174.24 | 0.68 |
| Reach 1 | 1.099 | Method 4 | 758.00 | 955.19 | 957.94 | | 958.57 | 0.011492 | 6.36 | 119.25 | 56.21 | 0.77 |
| Reach 1 | 1.099 | Method 1 | 758.00 | 955.19 | 957.94 | | 958.57 | 0.011374 | 6.34 | 119.64 | 56.21 | 0.77 |
| | | | | | | | | | | | | |
| Reach 1 | 1.061 | 100-Year | 758.00 | 952.35 | 956.25 | | 956.45 | 0.004442 | 3.92 | 226.35 | 166.48 | 0.49 |
| Reach 1 | 1.061 | Method 4 | 758.00 | 952.35 | 956.42 | | 956.80 | 0.006503 | 4.94 | 153.41 | 70.46 | 0.59 |
| Reach 1 | 1.061 | Method 1 | 758.00 | 952.35 | 956.42 | | 956.80 | 0.006576 | 4.96 | 152.88 | 70.46 | 0.59 |
| | | | | | | | | | | | | |
| Reach 1 | 1.023 | 100-Year | 758.00 | 951.49 | 955.09 | 954.50 | 955.40 | 0.006243 | 4.60 | 178.06 | 118.04 | 0.58 |
| Reach 1 | 1.023 | Method 4 | 758.00 | 951.49 | 955.43 | 954.45 | 955.71 | 0.004431 | 4.21 | 180.03 | 79.87 | 0.49 |
| Reach 1 | 1.023 | Method 1 | 758.00 | 951.49 | 955.43 | 954.45 | 955.70 | 0.004368 | 4.20 | 181.59 | 85.00 | 0.49 |
| | | | | | | | | | | | | |
| Reach 1 | 0.985 | 100-Year | 758.00 | 950.08 | 953.47 | 953.06 | 953.74 | 0.011327 | 4.44 | 186.72 | 127.29 | 0.59 |
| Reach 1 | 0.985 | Method 4 | 758.00 | 950.08 | 954.22 | 953.29 | 954.53 | 0.008179 | 4.52 | 167.83 | 71.04 | 0.52 |
| Reach 1 | 0.985 | Method 1 | 758.00 | 950.08 | 954.21 | 953.29 | 954.53 | 0.008185 | 4.52 | 167.79 | 71.04 | 0.52 |
| | | | | | | | | | | | | |
| Reach 1 | 0.948 | 100-Year | 758.00 | 949.22 | 951.95 | 951.27 | 952.07 | 0.005850 | 2.92 | 278.38 | 201.69 | 0.41 |
| Reach 1 | 0.948 | Method 4 | 758.00 | 949.22 | 952.33 | 951.72 | 952.65 | 0.010994 | 4.56 | 166.20 | 87.58 | 0.58 |
| Reach 1 | 0.948 | Method 1 | 758.00 | 949.22 | 952.33 | 951.70 | 952.66 | 0.010957 | 4.56 | 166.38 | 87.58 | 0.58 |
| | | | | | | | | | | | | |
| Reach 1 | 0.910 | 100-Year | 758.00 | 948.55 | 950.44 | | 950.60 | 0.009743 | 3.33 | 252.16 | 259.77 | 0.52 |
| Reach 1 | 0.910 | Method 4 | 758.00 | 948.55 | 950.72 | | 950.87 | 0.007003 | 3.18 | 238.59 | 155.10 | 0.45 |

HEC-RAS Plan: H Trib 3E River: Tributary 3E Reach: Reach 1 (Continued)

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Reach 1 | 0.910 | Method 1 | 758.00 | 948.55 | 950.71 | | 950.87 | 0.007051 | 3.18 | 238.10 | 155.10 | 0.45 |
| | | | | | | | | | | | | |
| Reach 1 | 0.872 | 100-Year | 758.00 | 946.40 | 948.60 | | 948.75 | 0.008590 | 3.47 | 254.02 | 225.11 | 0.50 |
| Reach 1 | 0.872 | Method 4 | 758.00 | 946.40 | 949.34 | | 949.56 | 0.006133 | 3.75 | 202.21 | 90.04 | 0.44 |
| Reach 1 | 0.872 | Method 1 | 758.00 | 946.40 | 949.39 | | 949.60 | 0.005742 | 3.67 | 206.32 | 90.04 | 0.43 |
| | | | | | | | | | | | | |
| Reach 1 | 0.834 | 100-Year | 758.00 | 944.20 | 946.84 | 946.43 | 947.01 | 0.008834 | 3.80 | 238.78 | 199.90 | 0.52 |
| Reach 1 | 0.834 | Method 4 | 758.00 | 944.20 | 947.82 | 946.84 | 948.16 | 0.007954 | 4.70 | 161.21 | 60.60 | 0.51 |
| Reach 1 | 0.834 | Method 1 | 758.00 | 944.20 | 947.41 | 946.84 | 947.89 | 0.013501 | 5.54 | 136.86 | 60.60 | 0.65 |
| | | | | | | | | | | | | |
| Reach 1 | 0.796 | 100-Year | 758.00 | 942.92 | 945.39 | | 945.48 | 0.006229 | 3.09 | 321.46 | 316.96 | 0.43 |
| Reach 1 | 0.796 | Method 4 | 758.00 | 942.92 | 946.21 | | 946.50 | 0.008350 | 4.58 | 182.06 | 90.40 | 0.52 |
| Reach 1 | 0.796 | Method 1 | 758.00 | 942.92 | 946.03 | | 946.20 | 0.005317 | 3.57 | 240.33 | 131.34 | 0.42 |
| | | | | | | | | | | | | |
| Reach 1 | 0.758 | 100-Year | 758.00 | 940.79 | 943.89 | | 944.04 | 0.008282 | 3.62 | 264.67 | 254.69 | 0.50 |
| Reach 1 | 0.758 | Method 4 | 758.00 | 940.79 | 944.75 | | 945.02 | 0.006505 | 4.12 | 183.86 | 73.30 | 0.46 |
| Reach 1 | 0.758 | Method 1 | 758.00 | 940.79 | 944.59 | | 944.89 | 0.008108 | 4.41 | 171.81 | 73.30 | 0.51 |
| | | | | | | | | | | | | |
| Reach 1 | 0.720 | 100-Year | 758.00 | 940.27 | 942.50 | | 942.57 | 0.006367 | 2.78 | 366.30 | 458.71 | 0.42 |
| Reach 1 | 0.720 | Method 4 | 758.00 | 940.27 | 943.59 | | 943.80 | 0.005594 | 3.81 | 211.71 | 97.01 | 0.43 |
| Reach 1 | 0.720 | Method 1 | 758.00 | 940.27 | 943.49 | | 943.65 | 0.004626 | 3.42 | 249.74 | 132.80 | 0.39 |
| | | | | | | | | | | | | |
| Reach 1 | 0.682 | 100-Year | 758.00 | 938.56 | 941.04 | 940.75 | 941.16 | 0.008217 | 3.55 | 313.83 | 404.29 | 0.49 |
| Reach 1 | 0.682 | Method 4 | 758.00 | 938.56 | 941.95 | | 942.34 | 0.009696 | 5.02 | 151.14 | 60.11 | 0.56 |
| Reach 1 | 0.682 | Method 1 | 758.00 | 938.56 | 941.94 | | 942.34 | 0.009724 | 5.02 | 151.01 | 60.11 | 0.56 |
| | | | | | | | | | | | | |
| Reach 1 | 0.645 | 100-Year | 758.00 | 936.61 | 939.58 | | 939.68 | 0.006585 | 2.94 | 314.41 | 330.92 | 0.43 |
| Reach 1 | 0.645 | Method 4 | 758.00 | 936.61 | 940.54 | | 940.77 | 0.006120 | 3.90 | 194.41 | 81.19 | 0.44 |
| Reach 1 | 0.645 | Method 1 | 758.00 | 936.61 | 940.55 | | 940.78 | 0.006011 | 3.88 | 195.49 | 81.19 | 0.44 |
| | | | | | | | | | | | | |
| Reach 1 | 0.607 | 100-Year | 758.00 | 935.34 | 938.26 | | 938.38 | 0.006360 | 2.93 | 271.44 | 205.38 | 0.43 |
| Reach 1 | 0.607 | Method 4 | 758.00 | 935.34 | 939.28 | | 939.53 | 0.006249 | 4.08 | 189.37 | 78.15 | 0.46 |
| Reach 1 | 0.607 | Method 1 | 758.00 | 935.34 | 939.04 | | 939.35 | 0.008690 | 4.51 | 171.52 | 78.66 | 0.53 |
| | | | | | | | | | | | | |
| Reach 1 | 0.569 | 100-Year | 758.00 | 934.96 | 937.15 | | 937.26 | 0.005166 | 2.83 | 293.59 | 215.46 | 0.39 |
| Reach 1 | 0.569 | Method 4 | 758.00 | 934.96 | 938.22 | | 938.43 | 0.004820 | 3.76 | 208.50 | 81.59 | 0.40 |
| Reach 1 | 0.569 | Method 1 | 758.00 | 934.96 | 937.63 | | 937.83 | 0.006524 | 3.74 | 217.38 | 116.31 | 0.45 |
| | | | | | | | | | | | | |

HEC-RAS Plan: H Trib 3E River: Tributary 3E Reach: Reach 1 (Continued)

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Reach 1 | 0.531 | 100-Year | 758.00 | 933.64 | 935.87 | | 936.05 | 0.007727 | 3.72 | 226.37 | 149.78 | 0.49 |
| Reach 1 | 0.531 | Method 4 | 758.00 | 933.64 | 936.87 | | 937.21 | 0.008033 | 4.90 | 162.15 | 61.47 | 0.52 |
| Reach 1 | 0.531 | Method 1 | 758.00 | 933.64 | 936.48 | | 936.67 | 0.005443 | 3.68 | 215.08 | 95.99 | 0.42 |
| | | | | | | | | | | | | |
| Reach 1 | 0.493 | 100-Year | 758.00 | 932.49 | 934.11 | | 934.25 | 0.009937 | 3.07 | 256.47 | 246.19 | 0.51 |
| Reach 1 | 0.493 | Method 4 | 758.00 | 932.49 | 935.15 | | 935.44 | 0.009481 | 4.55 | 175.87 | 88.43 | 0.55 |
| Reach 1 | 0.493 | Method 1 | 758.00 | 932.49 | 935.10 | | 935.34 | 0.007983 | 4.19 | 193.52 | 100.26 | 0.51 |
| | | | | | | | | | | | | |
| Reach 1 | 0.455 | 100-Year | 758.00 | 930.91 | 932.28 | | 932.37 | 0.009027 | 2.49 | 322.07 | 449.19 | 0.47 |
| Reach 1 | 0.455 | Method 4 | 758.00 | 930.91 | 933.23 | | 933.51 | 0.009962 | 4.25 | 179.10 | 100.84 | 0.56 |
| Reach 1 | 0.455 | Method 1 | 758.00 | 930.91 | 933.17 | | 933.47 | 0.011242 | 4.41 | 172.65 | 100.84 | 0.59 |
| | | | | | | | | | | | | |
| Reach 1 | 0.418 | 100-Year | 758.00 | 929.91 | 930.86 | 930.48 | 930.92 | 0.005956 | 2.07 | 377.21 | 520.12 | 0.40 |
| Reach 1 | 0.418 | Method 4 | 758.00 | 929.91 | 931.29 | | 931.48 | 0.010053 | 3.52 | 215.38 | 173.01 | 0.56 |
| Reach 1 | 0.418 | Method 1 | 758.00 | 929.91 | 931.37 | | 931.54 | 0.008087 | 3.29 | 230.08 | 173.01 | 0.50 |
| | | | | | | | | | | | | |
| Reach 1 | 0.379 | 100-Year | 758.00 | 927.99 | 929.33 | | 929.44 | 0.009624 | 2.84 | 305.64 | 441.89 | 0.50 |
| Reach 1 | 0.379 | Method 4 | 758.00 | 927.99 | 929.63 | 929.07 | 929.76 | 0.007123 | 2.88 | 263.25 | 199.78 | 0.44 |
| Reach 1 | 0.379 | Method 1 | 758.00 | 927.99 | 929.46 | | 929.63 | 0.011088 | 3.29 | 230.37 | 199.78 | 0.54 |
| | | | | | | | | | | | | |
| Reach 1 | 0.299 | 100-Year | 758.00 | 925.61 | 926.64 | | 926.68 | 0.004516 | 1.94 | 466.88 | 787.26 | 0.38 |
| Reach 1 | 0.299 | Method 4 | 758.00 | 925.61 | 927.06 | 926.53 | 927.18 | 0.005344 | 2.77 | 274.07 | 221.50 | 0.44 |
| Reach 1 | 0.299 | Method 1 | 758.00 | 925.61 | 926.75 | | 926.81 | 0.004283 | 2.05 | 379.11 | 425.34 | 0.38 |
| | | | | | | | | | | | | |
| Reach 1 | 0.229 | 100-Year | 758.00 | 923.45 | 924.26 | 924.07 | 924.33 | 0.009689 | 2.36 | 362.55 | 766.13 | 0.50 |
| Reach 1 | 0.229 | Method 4 | 758.00 | 923.45 | 924.37 | 924.13 | 924.48 | 0.010184 | 2.69 | 281.89 | 387.86 | 0.56 |
| Reach 1 | 0.229 | Method 1 | 758.00 | 923.45 | 924.37 | 924.13 | 924.48 | 0.010181 | 2.69 | 281.91 | 387.86 | 0.56 |
| | | | | | | | | | | | | |
| Reach 1 | 0.167 | 100-Year | 758.00 | 921.81 | 922.87 | | 922.90 | 0.002469 | 1.39 | 604.98 | 994.45 | 0.28 |
| Reach 1 | 0.167 | Method 4 | 758.00 | 921.81 | 922.96 | 922.47 | 923.00 | 0.002498 | 1.50 | 504.91 | 580.67 | 0.28 |
| Reach 1 | 0.167 | Method 1 | 758.00 | 921.81 | 922.96 | 922.47 | 923.00 | 0.002498 | 1.50 | 504.88 | 580.67 | 0.28 |
| | | | | | | | | | | | | |
| Reach 1 | 0.089 | 100-Year | 758.00 | 920.48 | 921.26 | 921.06 | 921.31 | 0.007004 | 1.75 | 455.86 | 1028.84 | 0.43 |
| Reach 1 | 0.089 | Method 4 | 758.00 | 920.48 | 921.33 | 921.09 | 921.39 | 0.007006 | 1.91 | 396.96 | 690.50 | 0.44 |
| Reach 1 | 0.089 | Method 1 | 758.00 | 920.48 | 921.33 | 921.09 | 921.39 | 0.007008 | 1.91 | 396.92 | 690.50 | 0.44 |

### E.5.3 Water Surface Elevation HEC-RAS Output for Tributary 4E – All Reaches, Existing 100-Year, 6-Hour Event

HEC-RAS Plan: Hassayampa T

| River | Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| trib4E2 | reach 1 | 0.281 | 100-Year | 422.00 | 971.63 | 973.68 | 973.52 | 973.88 | 0.017748 | 3.71 | 125.98 | 192.62 | 0.67 |
| trib4E2 | reach 1 | 0.281 | Method 4 | 422.00 | 971.63 | 973.89 | 973.51 | 974.07 | 0.011601 | 3.40 | 124.21 | 105.53 | 0.55 |
| trib4E2 | reach 1 | 0.281 | Method 1 | 422.00 | 971.63 | 974.04 | | 974.18 | 0.007850 | 3.02 | 139.80 | 105.53 | 0.46 |
| | | | | | | | | | | | | | |
| trib4E2 | reach 1 | 0.229 | 100-Year | 422.00 | 969.61 | 970.53 | 970.19 | 970.62 | 0.008436 | 1.78 | 183.90 | 266.91 | 0.42 |
| trib4E2 | reach 1 | 0.229 | Method 4 | 422.00 | 969.61 | 971.73 | 970.94 | 971.88 | 0.005772 | 3.12 | 136.76 | 77.62 | 0.41 |
| trib4E2 | reach 1 | 0.229 | Method 1 | 422.00 | 969.61 | 971.52 | | 971.74 | 0.010080 | 3.79 | 112.45 | 72.72 | 0.54 |
| | | | | | | | | | | | | | |
| trib4E2 | reach 1 | 0.172 | 100-Year | 422.00 | 966.48 | 967.65 | 967.40 | 967.75 | 0.010938 | 2.88 | 174.32 | 247.12 | 0.52 |
| trib4E2 | reach 1 | 0.172 | Method 4 | 422.00 | 966.48 | 967.93 | 967.85 | 968.43 | 0.031897 | 5.70 | 74.09 | 60.92 | 0.91 |
| trib4E2 | reach 1 | 0.172 | Method 1 | 422.00 | 966.48 | 968.43 | | 968.68 | 0.010263 | 4.03 | 104.78 | 60.92 | 0.54 |
| | | | | | | | | | | | | | |
| trib4E2 | reach 1 | 0.132 | 100-Year | 422.00 | 965.09 | 965.88 | 965.52 | 965.94 | 0.006175 | 1.77 | 223.27 | 297.99 | 0.37 |
| trib4E2 | reach 1 | 0.132 | Method 4 | 422.00 | 965.09 | 966.65 | 965.84 | 966.72 | 0.003253 | 2.08 | 202.92 | 138.61 | 0.30 |
| trib4E2 | reach 1 | 0.132 | Method 1 | 422.00 | 965.09 | 966.17 | 965.84 | 966.32 | 0.011871 | 3.07 | 137.25 | 138.61 | 0.54 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 2 | 0.647 | 100-Year | 630.00 | 973.09 | 974.47 | | 974.56 | 0.005597 | 2.47 | 264.61 | 293.89 | 0.44 |
| trib4E1 | reach 2 | 0.647 | Method 4 | 630.00 | 973.09 | 974.46 | | 974.57 | 0.006572 | 2.67 | 236.29 | 236.75 | 0.47 |
| trib4E1 | reach 2 | 0.647 | Method 1 | 630.00 | 973.09 | 974.45 | | 974.56 | 0.006829 | 2.70 | 233.57 | 236.75 | 0.48 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 2 | 0.606 | 100-Year | 630.00 | 971.61 | 972.72 | 972.58 | 972.84 | 0.012751 | 2.86 | 235.46 | 438.99 | 0.62 |
| trib4E1 | reach 2 | 0.606 | Method 4 | 630.00 | 971.61 | 972.86 | 972.57 | 972.97 | 0.008477 | 2.65 | 237.69 | 293.17 | 0.52 |
| trib4E1 | reach 2 | 0.606 | Method 1 | 630.00 | 971.61 | 972.88 | 972.57 | 972.98 | 0.007968 | 2.60 | 242.17 | 293.17 | 0.50 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 2 | 0.562 | 100-Year | 630.00 | 969.27 | 970.77 | 970.46 | 970.87 | 0.005892 | 2.68 | 273.75 | 366.51 | 0.45 |
| trib4E1 | reach 2 | 0.562 | Method 4 | 630.00 | 969.27 | 970.88 | 970.46 | 971.05 | 0.007782 | 3.27 | 192.69 | 160.73 | 0.53 |
| trib4E1 | reach 2 | 0.562 | Method 1 | 630.00 | 969.27 | 970.85 | 970.46 | 971.02 | 0.008619 | 3.37 | 186.85 | 160.73 | 0.55 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 2 | 0.513 | 100-Year | 630.00 | 966.45 | 968.63 | 968.46 | 968.80 | 0.011695 | 3.47 | 201.68 | 278.83 | 0.62 |
| trib4E1 | reach 2 | 0.513 | Method 4 | 630.00 | 966.45 | 968.85 | | 969.02 | 0.008223 | 3.32 | 189.86 | 161.47 | 0.54 |
| trib4E1 | reach 2 | 0.513 | Method 1 | 630.00 | 966.45 | 968.91 | | 969.07 | 0.006855 | 3.14 | 200.58 | 161.47 | 0.50 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 2 | 0.447 | 100-Year | 630.00 | 964.82 | 966.57 | | 966.63 | 0.003728 | 1.98 | 353.84 | 440.59 | 0.35 |
| trib4E1 | reach 2 | 0.447 | Method 4 | 630.00 | 964.82 | 966.88 | | 966.98 | 0.004208 | 2.51 | 250.87 | 195.71 | 0.39 |
| trib4E1 | reach 2 | 0.447 | Method 1 | 630.00 | 964.82 | 966.78 | | 966.90 | 0.005512 | 2.72 | 231.27 | 195.71 | 0.44 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 2 | 0.379 | 100-Year | 630.00 | 962.81 | 964.65 | 964.25 | 964.78 | 0.006903 | 2.85 | 232.27 | 291.16 | 0.49 |
| trib4E1 | reach 2 | 0.379 | Method 4 | 630.00 | 962.81 | 964.54 | | 964.71 | 0.010394 | 3.25 | 193.66 | 203.43 | 0.59 |
| trib4E1 | reach 2 | 0.379 | Method 1 | 630.00 | 962.81 | 964.72 | 964.25 | 964.84 | 0.005920 | 2.75 | 229.45 | 203.43 | 0.46 |
| | | | | | | | | | | | | | |

HEC-RAS Plan: Hassayampa T (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| trib4E1 | reach 2 | 0.322 | 100-Year | 630.00 | 961.19 | 963.01 | 962.56 | 963.13 | 0.004488 | 2.82 | 245.54 | 299.74 | 0.45 |
| trib4E1 | reach 2 | 0.322 | Method 4 | 630.00 | 961.19 | 963.35 | 962.54 | 963.44 | 0.002260 | 2.34 | 268.80 | 173.75 | 0.33 |
| trib4E1 | reach 2 | 0.322 | Method 1 | 630.00 | 961.19 | 962.99 | 962.54 | 963.13 | 0.005532 | 3.07 | 205.15 | 173.75 | 0.50 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 1 | 0.201 | 100-Year | 1052.00 | 956.47 | 957.94 | 957.69 | 958.11 | 0.013666 | 4.07 | 329.79 | 386.18 | 0.70 |
| trib4E1 | reach 1 | 0.201 | Method 4 | 1052.00 | 956.47 | 958.74 | 958.60 | 959.47 | 0.019251 | 6.84 | 155.13 | 84.58 | 0.89 |
| trib4E1 | reach 1 | 0.201 | Method 1 | 1052.00 | 956.47 | 958.11 | 957.67 | 958.32 | 0.010358 | 3.85 | 282.67 | 211.74 | 0.62 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 1 | 0.125 | 100-Year | 1052.00 | 952.05 | 954.34 | | 954.44 | 0.006502 | 2.94 | 445.18 | 485.31 | 0.43 |
| trib4E1 | reach 1 | 0.125 | Method 4 | 1052.00 | 952.05 | 955.54 | | 955.75 | 0.005107 | 3.83 | 283.46 | 111.75 | 0.42 |
| trib4E1 | reach 1 | 0.125 | Method 1 | 1052.00 | 952.05 | 955.34 | | 955.53 | 0.005028 | 3.68 | 306.95 | 138.00 | 0.41 |
| | | | | | | | | | | | | | |
| trib4E1 | reach 1 | 0.065 | 100-Year | 1052.00 | 950.40 | 952.61 | | 952.67 | 0.004799 | 2.52 | 533.79 | 557.76 | 0.37 |
| trib4E1 | reach 1 | 0.065 | Method 4 | 1052.00 | 950.40 | 953.07 | | 953.39 | 0.011726 | 4.70 | 235.81 | 134.81 | 0.60 |
| trib4E1 | reach 1 | 0.065 | Method 1 | 1052.00 | 950.40 | 952.99 | | 953.26 | 0.010772 | 4.38 | 257.95 | 159.62 | 0.57 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.710 | 100-Year | 500.00 | 1031.71 | 1033.74 | | 1034.00 | 0.012721 | 4.22 | 129.10 | 191.77 | 0.74 |
| trib4E | reach 3 | 3.710 | Method 4 | 500.00 | 1031.71 | 1033.75 | | 1034.06 | 0.014181 | 4.47 | 111.84 | 109.71 | 0.78 |
| trib4E | reach 3 | 3.710 | Method 1 | 500.00 | 1031.71 | 1033.75 | | 1034.05 | 0.013852 | 4.42 | 117.18 | 143.21 | 0.77 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.673 | 100-Year | 500.00 | 1030.46 | 1032.50 | | 1032.61 | 0.004177 | 2.59 | 193.27 | 180.92 | 0.44 |
| trib4E | reach 3 | 3.673 | Method 4 | 500.00 | 1030.46 | 1032.50 | | 1032.61 | 0.004150 | 2.58 | 193.61 | 179.00 | 0.44 |
| trib4E | reach 3 | 3.673 | Method 1 | 500.00 | 1030.46 | 1032.50 | | 1032.61 | 0.004172 | 2.59 | 193.34 | 180.94 | 0.44 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.635 | 100-Year | 500.00 | 1029.27 | 1031.41 | | 1031.57 | 0.006707 | 3.17 | 159.64 | 166.69 | 0.55 |
| trib4E | reach 3 | 3.635 | Method 4 | 500.00 | 1029.27 | 1031.42 | | 1031.57 | 0.006685 | 3.17 | 157.62 | 151.00 | 0.55 |
| trib4E | reach 3 | 3.635 | Method 1 | 500.00 | 1029.27 | 1031.41 | | 1031.56 | 0.006733 | 3.18 | 159.41 | 164.48 | 0.55 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.602 | 100-Year | 500.00 | 1028.19 | 1030.41 | | 1030.55 | 0.005022 | 3.04 | 164.49 | 148.67 | 0.51 |
| trib4E | reach 3 | 3.602 | Method 4 | 500.00 | 1028.19 | 1030.40 | | 1030.54 | 0.005202 | 3.08 | 162.55 | 148.33 | 0.52 |
| trib4E | reach 3 | 3.602 | Method 1 | 500.00 | 1028.19 | 1030.41 | | 1030.56 | 0.004960 | 3.03 | 165.18 | 148.79 | 0.51 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.560 | 100-Year | 500.00 | 1027.40 | 1028.83 | | 1029.02 | 0.010273 | 3.46 | 144.77 | 186.50 | 0.68 |
| trib4E | reach 3 | 3.560 | Method 4 | 500.00 | 1027.40 | 1028.85 | | 1029.03 | 0.009558 | 3.38 | 147.86 | 179.56 | 0.66 |
| trib4E | reach 3 | 3.560 | Method 1 | 500.00 | 1027.40 | 1028.83 | | 1029.02 | 0.010575 | 3.49 | 143.12 | 178.55 | 0.69 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.522 | 100-Year | 500.00 | 1026.00 | 1027.45 | | 1027.56 | 0.005353 | 2.58 | 194.09 | 224.15 | 0.49 |
| trib4E | reach 3 | 3.522 | Method 4 | 500.00 | 1026.00 | 1027.43 | | 1027.54 | 0.005916 | 2.66 | 188.08 | 223.18 | 0.51 |
| trib4E | reach 3 | 3.522 | Method 1 | 500.00 | 1026.00 | 1027.46 | | 1027.56 | 0.005175 | 2.55 | 196.17 | 224.48 | 0.48 |
| | | | | | | | | | | | | | |

HEC-RAS Plan: Hassayampa T (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| trib4E | reach 3 | 3.485 | 100-Year | 500.00 | 1024.81 | 1026.37 | | 1026.50 | 0.005377 | 2.85 | 175.18 | 171.24 | 0.50 |
| trib4E | reach 3 | 3.485 | Method 4 | 500.00 | 1024.81 | 1026.46 | | 1026.56 | 0.004176 | 2.63 | 189.93 | 173.48 | 0.44 |
| trib4E | reach 3 | 3.485 | Method 1 | 500.00 | 1024.81 | 1026.34 | | 1026.47 | 0.005950 | 2.95 | 169.62 | 170.39 | 0.52 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.448 | 100-Year | 500.00 | 1023.74 | 1025.10 | 1024.84 | 1025.25 | 0.007633 | 3.22 | 166.27 | 199.75 | 0.57 |
| trib4E | reach 3 | 3.448 | Method 4 | 500.00 | 1023.74 | 1025.18 | | 1025.39 | 0.008929 | 3.65 | 137.05 | 128.08 | 0.62 |
| trib4E | reach 3 | 3.448 | Method 1 | 500.00 | 1023.74 | 1025.16 | | 1025.29 | 0.006036 | 2.98 | 179.13 | 200.98 | 0.51 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.410 | 100-Year | 500.00 | 1022.07 | 1023.80 | | 1023.91 | 0.005714 | 2.90 | 193.00 | 246.49 | 0.50 |
| trib4E | reach 3 | 3.410 | Method 4 | 500.00 | 1022.07 | 1024.28 | | 1024.39 | 0.003031 | 2.69 | 185.87 | 121.16 | 0.38 |
| trib4E | reach 3 | 3.410 | Method 1 | 500.00 | 1022.07 | 1024.07 | | 1024.22 | 0.004820 | 3.09 | 163.53 | 129.87 | 0.47 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.372 | 100-Year | 500.00 | 1020.62 | 1022.53 | 1022.27 | 1022.71 | 0.007123 | 3.86 | 163.29 | 218.23 | 0.58 |
| trib4E | reach 3 | 3.372 | Method 4 | 500.00 | 1020.62 | 1023.04 | | 1023.43 | 0.008414 | 5.05 | 99.07 | 53.04 | 0.65 |
| trib4E | reach 3 | 3.372 | Method 1 | 500.00 | 1020.62 | 1022.87 | | 1023.11 | 0.006164 | 4.09 | 125.37 | 82.87 | 0.55 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.335 | 100-Year | 500.00 | 1019.84 | 1021.26 | | 1021.37 | 0.006163 | 2.92 | 185.53 | 241.73 | 0.51 |
| trib4E | reach 3 | 3.335 | Method 4 | 500.00 | 1019.84 | 1021.56 | | 1021.79 | 0.007754 | 3.87 | 129.26 | 98.93 | 0.60 |
| trib4E | reach 3 | 3.335 | Method 1 | 500.00 | 1019.84 | 1021.56 | | 1021.79 | 0.007702 | 3.86 | 130.23 | 103.75 | 0.60 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.297 | 100-Year | 500.00 | 1018.17 | 1019.57 | 1019.45 | 1019.74 | 0.011710 | 3.45 | 161.39 | 277.44 | 0.68 |
| trib4E | reach 3 | 3.297 | Method 4 | 500.00 | 1018.17 | 1019.63 | 1019.45 | 1019.85 | 0.012697 | 3.75 | 133.23 | 156.31 | 0.72 |
| trib4E | reach 3 | 3.297 | Method 1 | 500.00 | 1018.17 | 1019.63 | 1019.45 | 1019.85 | 0.012772 | 3.76 | 132.99 | 156.31 | 0.72 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.260 | 100-Year | 500.00 | 1016.76 | 1018.04 | 1017.69 | 1018.13 | 0.005691 | 2.49 | 209.54 | 292.65 | 0.48 |
| trib4E | reach 3 | 3.260 | Method 4 | 500.00 | 1016.76 | 1018.05 | | 1018.15 | 0.005870 | 2.55 | 195.72 | 234.33 | 0.49 |
| trib4E | reach 3 | 3.260 | Method 1 | 500.00 | 1016.76 | 1018.05 | | 1018.15 | 0.005837 | 2.55 | 196.07 | 234.35 | 0.49 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.222 | 100-Year | 500.00 | 1014.76 | 1016.81 | | 1016.98 | 0.005663 | 3.45 | 154.18 | 140.14 | 0.54 |
| trib4E | reach 3 | 3.222 | Method 4 | 500.00 | 1014.76 | 1017.36 | | 1017.47 | 0.002260 | 2.65 | 188.55 | 109.45 | 0.36 |
| trib4E | reach 3 | 3.222 | Method 1 | 500.00 | 1014.76 | 1017.32 | | 1017.44 | 0.002406 | 2.70 | 184.92 | 109.45 | 0.37 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.184 | 100-Year | 500.00 | 1013.87 | 1015.73 | | 1015.86 | 0.005412 | 3.42 | 181.85 | 222.19 | 0.51 |
| trib4E | reach 3 | 3.184 | Method 4 | 500.00 | 1013.87 | 1016.07 | | 1016.57 | 0.011626 | 5.65 | 88.53 | 50.57 | 0.75 |
| trib4E | reach 3 | 3.184 | Method 1 | 500.00 | 1013.87 | 1016.03 | | 1016.51 | 0.011478 | 5.61 | 91.70 | 61.13 | 0.76 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.147 | 100-Year | 500.00 | 1012.79 | 1014.56 | | 1014.71 | 0.007190 | 3.43 | 165.14 | 211.23 | 0.57 |
| trib4E | reach 3 | 3.147 | Method 4 | 500.00 | 1012.79 | 1015.11 | | 1015.26 | 0.003713 | 3.16 | 158.44 | 93.73 | 0.43 |
| trib4E | reach 3 | 3.147 | Method 1 | 500.00 | 1012.79 | 1015.10 | | 1015.24 | 0.003559 | 3.10 | 166.04 | 115.91 | 0.42 |

HEC-RAS Plan: Hassayampa T (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| trib4E | reach 3 | 3.110 | 100-Year | 500.00 | 1011.46 | 1013.60 | | 1013.70 | 0.003790 | 2.90 | 212.45 | 239.45 | 0.43 |
| trib4E | reach 3 | 3.110 | Method 4 | 500.00 | 1011.46 | 1014.00 | | 1014.28 | 0.006792 | 4.23 | 118.13 | 71.16 | 0.58 |
| trib4E | reach 3 | 3.110 | Method 1 | 500.00 | 1011.46 | 1014.01 | | 1014.29 | 0.006722 | 4.22 | 118.58 | 71.29 | 0.58 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.072 | 100-Year | 500.00 | 1010.07 | 1012.63 | 1012.29 | 1012.82 | 0.006485 | 3.57 | 149.39 | 141.20 | 0.56 |
| trib4E | reach 3 | 3.072 | Method 4 | 500.00 | 1010.07 | 1012.63 | 1012.26 | 1012.86 | 0.007594 | 3.85 | 129.73 | 101.29 | 0.60 |
| trib4E | reach 3 | 3.072 | Method 1 | 500.00 | 1010.07 | 1012.61 | 1012.25 | 1012.85 | 0.008001 | 3.92 | 127.67 | 101.18 | 0.61 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 3.036 | 100-Year | 500.00 | 1008.67 | 1011.55 | 1010.76 | 1011.75 | 0.004693 | 3.61 | 139.98 | 95.52 | 0.49 |
| trib4E | reach 3 | 3.036 | Method 4 | 500.00 | 1008.67 | 1011.83 | 1010.76 | 1011.98 | 0.002931 | 3.12 | 160.31 | 81.12 | 0.39 |
| trib4E | reach 3 | 3.036 | Method 1 | 500.00 | 1008.67 | 1011.81 | 1010.76 | 1011.96 | 0.002866 | 3.10 | 166.06 | 106.13 | 0.39 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.998 | 100-Year | 500.00 | 1007.39 | 1010.44 | 1010.16 | 1010.66 | 0.006479 | 4.21 | 152.73 | 174.51 | 0.57 |
| trib4E | reach 3 | 2.998 | Method 4 | 500.00 | 1007.39 | 1010.81 | 1010.15 | 1011.14 | 0.006217 | 4.60 | 108.72 | 53.61 | 0.57 |
| trib4E | reach 3 | 2.998 | Method 1 | 500.00 | 1007.39 | 1010.74 | 1010.15 | 1011.09 | 0.006943 | 4.76 | 104.96 | 53.41 | 0.60 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.960 | 100-Year | 500.00 | 1006.84 | 1008.89 | 1008.55 | 1009.09 | 0.009434 | 3.71 | 140.48 | 165.05 | 0.65 |
| trib4E | reach 3 | 2.960 | Method 4 | 500.00 | 1006.84 | 1008.80 | 1008.69 | 1009.19 | 0.017394 | 5.00 | 100.03 | 101.58 | 0.89 |
| trib4E | reach 3 | 2.960 | Method 1 | 500.00 | 1006.84 | 1008.91 | 1008.71 | 1009.21 | 0.013430 | 4.44 | 115.63 | 136.95 | 0.78 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.923 | 100-Year | 500.00 | 1004.64 | 1007.14 | | 1007.39 | 0.007983 | 4.04 | 131.08 | 179.37 | 0.68 |
| trib4E | reach 3 | 2.923 | Method 4 | 500.00 | 1004.64 | 1007.39 | | 1007.57 | 0.004567 | 3.37 | 148.48 | 110.15 | 0.51 |
| trib4E | reach 3 | 2.923 | Method 1 | 500.00 | 1004.64 | 1007.26 | | 1007.48 | 0.006154 | 3.72 | 134.35 | 110.15 | 0.59 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.886 | 100-Year | 500.00 | 1003.88 | 1005.77 | 1005.65 | 1005.87 | 0.006940 | 2.99 | 220.16 | 484.69 | 0.54 |
| trib4E | reach 3 | 2.886 | Method 4 | 500.00 | 1003.88 | 1006.39 | | 1006.59 | 0.005298 | 3.59 | 139.12 | 88.73 | 0.51 |
| trib4E | reach 3 | 2.886 | Method 1 | 500.00 | 1003.88 | 1005.94 | | 1006.10 | 0.007774 | 3.51 | 157.88 | 184.75 | 0.59 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.848 | 100-Year | 500.00 | 1002.84 | 1004.51 | | 1004.58 | 0.006326 | 2.64 | 237.95 | 508.96 | 0.51 |
| trib4E | reach 3 | 2.848 | Method 4 | 500.00 | 1002.84 | 1005.00 | | 1005.26 | 0.008620 | 4.12 | 121.36 | 91.14 | 0.63 |
| trib4E | reach 3 | 2.848 | Method 1 | 500.00 | 1002.84 | 1004.79 | | 1004.90 | 0.005012 | 2.83 | 186.96 | 198.70 | 0.47 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.810 | 100-Year | 500.00 | 1001.91 | 1002.99 | 1002.81 | 1003.10 | 0.009052 | 2.72 | 192.10 | 355.67 | 0.58 |
| trib4E | reach 3 | 2.810 | Method 4 | 500.00 | 1001.91 | 1003.59 | | 1003.78 | 0.006337 | 3.45 | 144.94 | 113.32 | 0.54 |
| trib4E | reach 3 | 2.810 | Method 1 | 500.00 | 1001.91 | 1003.57 | | 1003.77 | 0.006658 | 3.50 | 142.79 | 113.32 | 0.55 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.772 | 100-Year | 500.00 | 999.87 | 1001.42 | | 1001.54 | 0.006241 | 2.52 | 184.88 | 221.42 | 0.50 |
| trib4E | reach 3 | 2.772 | Method 4 | 500.00 | 999.87 | 1002.24 | | 1002.50 | 0.006510 | 4.05 | 123.46 | 76.42 | 0.56 |
| trib4E | reach 3 | 2.772 | Method 1 | 500.00 | 999.87 | 1002.22 | | 1002.47 | 0.006360 | 4.01 | 128.76 | 92.74 | 0.56 |
| | | | | | | | | | | | | | |

HEC-RAS Plan: Hassayampa T (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| trib4E | reach 3 | 2.735 | 100-Year | 500.00 | 998.33 | 1000.19 | | 1000.32 | 0.006883 | 3.09 | 174.35 | 207.11 | 0.54 |
| trib4E | reach 3 | 2.735 | Method 4 | 500.00 | 998.33 | 1000.46 | | 1000.78 | 0.011725 | 4.56 | 109.72 | 90.10 | 0.73 |
| trib4E | reach 3 | 2.735 | Method 1 | 500.00 | 998.33 | 1000.47 | | 1000.79 | 0.011403 | 4.51 | 110.78 | 90.38 | 0.72 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.697 | 100-Year | 500.00 | 997.02 | 998.69 | | 998.86 | 0.006978 | 3.60 | 161.25 | 191.56 | 0.57 |
| trib4E | reach 3 | 2.697 | Method 4 | 500.00 | 997.02 | 999.17 | | 999.37 | 0.004570 | 3.56 | 140.51 | 81.44 | 0.48 |
| trib4E | reach 3 | 2.697 | Method 1 | 500.00 | 997.02 | 999.12 | | 999.33 | 0.004926 | 3.65 | 137.58 | 83.98 | 0.50 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.659 | 100-Year | 500.00 | 995.66 | 997.43 | | 997.56 | 0.006322 | 3.14 | 172.87 | 190.26 | 0.55 |
| trib4E | reach 3 | 2.659 | Method 4 | 500.00 | 995.66 | 998.10 | | 998.36 | 0.005641 | 4.08 | 122.68 | 72.55 | 0.55 |
| trib4E | reach 3 | 2.659 | Method 1 | 500.00 | 995.66 | 998.09 | | 998.32 | 0.005231 | 3.93 | 132.95 | 95.83 | 0.54 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.622 | 100-Year | 500.00 | 994.72 | 996.29 | | 996.43 | 0.005125 | 3.12 | 170.65 | 163.30 | 0.49 |
| trib4E | reach 3 | 2.622 | Method 4 | 500.00 | 994.72 | 997.17 | | 997.40 | 0.004098 | 3.82 | 130.98 | 60.67 | 0.46 |
| trib4E | reach 3 | 2.622 | Method 1 | 500.00 | 994.72 | 997.19 | | 997.41 | 0.003997 | 3.79 | 131.99 | 60.67 | 0.45 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.584 | 100-Year | 500.00 | 993.44 | 994.95 | | 995.13 | 0.008526 | 3.70 | 150.07 | 181.62 | 0.62 |
| trib4E | reach 3 | 2.584 | Method 4 | 500.00 | 993.44 | 995.48 | | 996.01 | 0.013514 | 5.83 | 85.73 | 51.92 | 0.80 |
| trib4E | reach 3 | 2.584 | Method 1 | 500.00 | 993.44 | 995.43 | | 995.99 | 0.014893 | 6.01 | 83.21 | 51.92 | 0.84 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.546 | 100-Year | 500.00 | 992.17 | 993.80 | | 993.91 | 0.004335 | 2.86 | 1[illegible] | 198.68 | 0.46 |
| trib4E | reach 3 | 2.546 | Method 4 | 500.00 | 992.17 | 994.06 | | 994.26 | 0.005584 | 3.60 | 139.07 | 98.97 | 0.53 |
| trib4E | reach 3 | 2.546 | Method 1 | 500.00 | 992.17 | 994.13 | | 994.31 | 0.004851 | 3.43 | 145.98 | 101.67 | 0.50 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.508 | 100-Year | 500.00 | 990.44 | 992.18 | 992.12 | 992.47 | 0.014334 | 4.64 | 121.44 | 154.16 | 0.81 |
| trib4E | reach 3 | 2.508 | Method 4 | 500.00 | 990.44 | 992.69 | 992.26 | 992.96 | 0.007517 | 4.24 | 118.02 | 83.00 | 0.63 |
| trib4E | reach 3 | 2.508 | Method 1 | 500.00 | 990.44 | 992.50 | 992.26 | 992.87 | 0.011643 | 4.88 | 102.50 | 80.28 | 0.76 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.470 | 100-Year | 500.00 | 989.54 | 991.02 | | 991.08 | 0.003780 | 2.37 | 244.54 | 332.02 | 0.41 |
| trib4E | reach 3 | 2.470 | Method 4 | 500.00 | 989.54 | 991.98 | | 992.11 | 0.002564 | 2.92 | 171.01 | 84.78 | 0.36 |
| trib4E | reach 3 | 2.470 | Method 1 | 500.00 | 989.54 | 992.01 | | 992.09 | 0.001613 | 2.37 | 211.75 | 106.13 | 0.29 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.433 | 100-Year | 500.00 | 988.08 | 990.08 | | 990.18 | 0.006083 | 3.04 | 197.14 | 265.80 | 0.51 |
| trib4E | reach 3 | 2.433 | Method 4 | 500.00 | 988.08 | 990.84 | | 991.22 | 0.009529 | 5.26 | 103.26 | 67.14 | 0.70 |
| trib4E | reach 3 | 2.433 | Method 1 | 500.00 | 988.08 | 990.98 | | 991.42 | 0.009618 | 5.53 | 95.94 | 55.71 | 0.71 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.395 | 100-Year | 929.00 | 986.85 | 988.60 | | 988.73 | 0.007884 | 2.97 | 335.71 | 332.73 | 0.46 |
| trib4E | reach 3 | 2.395 | Method 4 | 929.00 | 986.85 | 989.53 | | 989.74 | 0.006149 | 3.70 | 251.05 | 114.64 | 0.44 |
| trib4E | reach 3 | 2.395 | Method 1 | 929.00 | 986.85 | 989.19 | | 989.45 | 0.009530 | 4.17 | 228.64 | 131.88 | 0.54 |

HEC-RAS Plan: Hassayampa T (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| trib4E | reach 3 | 2.362 | 100-Year | 929.00 | 985.99 | 987.47 | | 987.55 | 0.006391 | 1.97 | 415.84 | 450.38 | 0.39 |
| trib4E | reach 3 | 2.362 | Method 4 | 929.00 | 985.99 | 988.35 | | 988.55 | 0.008051 | 3.62 | 257.81 | 151.89 | 0.49 |
| trib4E | reach 3 | 2.362 | Method 1 | 929.00 | 985.99 | 987.83 | | 987.95 | 0.007381 | 2.71 | 341.91 | 292.83 | 0.44 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.324 | 100-Year | 929.00 | 984.67 | 986.17 | | 986.25 | 0.006229 | 2.26 | 425.87 | 488.46 | 0.40 |
| trib4E | reach 3 | 2.324 | Method 4 | 929.00 | 984.67 | 987.05 | | 987.21 | 0.005694 | 3.23 | 287.50 | 153.27 | 0.42 |
| trib4E | reach 3 | 2.324 | Method 1 | 929.00 | 984.67 | 986.26 | | 986.36 | 0.007357 | 2.59 | 363.56 | 374.10 | 0.44 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.287 | 100-Year | 929.00 | 983.74 | 984.94 | | 985.01 | 0.005687 | 1.90 | 429.82 | 447.52 | 0.38 |
| trib4E | reach 3 | 2.287 | Method 4 | 929.00 | 983.74 | 985.96 | | 986.12 | 0.005229 | 3.14 | 295.60 | 171.88 | 0.42 |
| trib4E | reach 3 | 2.287 | Method 1 | 929.00 | 983.74 | 984.93 | | 985.00 | 0.005907 | 1.92 | 424.85 | 447.29 | 0.39 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.249 | 100-Year | 929.00 | 981.96 | 983.63 | | 983.72 | 0.007351 | 2.77 | 381.29 | 394.14 | 0.46 |
| trib4E | reach 3 | 2.249 | Method 4 | 929.00 | 981.96 | 984.69 | | 984.93 | 0.006689 | 4.02 | 235.15 | 114.02 | 0.49 |
| trib4E | reach 3 | 2.249 | Method 1 | 929.00 | 981.96 | 983.66 | | 983.75 | 0.006664 | 2.68 | 393.65 | 396.61 | 0.44 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.211 | 100-Year | 929.00 | 981.09 | 982.32 | | 982.40 | 0.005743 | 2.31 | 415.92 | 433.44 | 0.39 |
| trib4E | reach 3 | 2.211 | Method 4 | 929.00 | 981.09 | 982.95 | | 983.24 | 0.010965 | 4.29 | 218.06 | 125.06 | 0.57 |
| trib4E | reach 3 | 2.211 | Method 1 | 929.00 | 981.09 | 982.59 | | 982.66 | 0.004404 | 2.33 | 428.53 | 351.17 | 0.35 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.171 | 100-Year | 929.00 | 979.71 | 981.12 | | 981.20 | 0.005846 | 2.31 | 416.59 | 467.28 | 0.39 |
| trib4E | reach 3 | 2.171 | Method 4 | 929.00 | 979.71 | 981.54 | | 981.66 | 0.005313 | 2.72 | 341.02 | 225.90 | 0.39 |
| trib4E | reach 3 | 2.171 | Method 1 | 929.00 | 979.71 | 981.54 | | 981.66 | 0.005313 | 2.72 | 341.02 | 225.90 | 0.39 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.132 | 100-Year | 929.00 | 978.23 | 979.99 | | 980.08 | 0.005128 | 2.49 | 413.99 | 404.82 | 0.38 |
| trib4E | reach 3 | 2.132 | Method 4 | 929.00 | 978.23 | 980.22 | | 980.38 | 0.007013 | 3.21 | 289.85 | 184.40 | 0.45 |
| trib4E | reach 3 | 2.132 | Method 1 | 929.00 | 978.23 | 980.22 | | 980.38 | 0.007013 | 3.21 | 289.85 | 184.40 | 0.45 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.093 | 100-Year | 929.00 | 976.84 | 978.55 | 978.22 | 978.69 | 0.009474 | 3.14 | 314.25 | 332.82 | 0.52 |
| trib4E | reach 3 | 2.093 | Method 4 | 929.00 | 976.84 | 978.91 | | 979.05 | 0.005975 | 2.98 | 311.52 | 209.63 | 0.43 |
| trib4E | reach 3 | 2.093 | Method 1 | 929.00 | 976.84 | 978.91 | | 979.05 | 0.005973 | 2.98 | 311.54 | 209.63 | 0.43 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.055 | 100-Year | 929.00 | 974.12 | 977.20 | | 977.30 | 0.005147 | 2.83 | 403.32 | 479.48 | 0.44 |
| trib4E | reach 3 | 2.055 | Method 4 | 929.00 | 974.12 | 977.70 | | 977.90 | 0.005462 | 3.57 | 259.88 | 143.73 | 0.47 |
| trib4E | reach 3 | 2.055 | Method 1 | 929.00 | 974.12 | 977.70 | | 977.90 | 0.005472 | 3.58 | 259.74 | 143.73 | 0.47 |
| | | | | | | | | | | | | | |
| trib4E | reach 3 | 2.017 | 100-Year | 929.00 | 974.39 | 976.34 | | 976.40 | 0.004042 | 2.26 | 491.25 | 645.96 | 0.38 |
| trib4E | reach 3 | 2.017 | Method 4 | 929.00 | 974.39 | 976.69 | 976.04 | 976.83 | 0.005110 | 3.04 | 305.95 | 207.73 | 0.44 |
| trib4E | reach 3 | 2.017 | Method 1 | 929.00 | 974.39 | 976.70 | 976.04 | 976.84 | 0.005057 | 3.03 | 306.91 | 207.73 | 0.44 |
| | | | | | | | | | | | | | |

HEC-RAS Plan: Hassayampa T (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| trib4E | reach 2 | 1.965 | 100-Year | 299.00 | 971.56 | 974.41 | | 974.54 | 0.010062 | 3.00 | 122.66 | 325.01 | 0.62 |
| trib4E | reach 2 | 1.965 | Method 4 | 299.00 | 971.56 | 974.65 | | 974.76 | 0.006073 | 2.67 | 111.94 | 117.97 | 0.48 |
| trib4E | reach 2 | 1.965 | Method 1 | 299.00 | 971.56 | 974.65 | | 974.76 | 0.006092 | 2.67 | 111.83 | 117.97 | 0.48 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.927 | 100-Year | 299.00 | 970.67 | 973.53 | | 973.58 | 0.002629 | 1.96 | 182.58 | 217.42 | 0.31 |
| trib4E | reach 2 | 1.927 | Method 4 | 299.00 | 970.67 | 973.87 | | 973.95 | 0.002830 | 2.36 | 126.95 | 79.74 | 0.33 |
| trib4E | reach 2 | 1.927 | Method 1 | 299.00 | 970.67 | 973.87 | | 973.96 | 0.002814 | 2.35 | 127.16 | 79.74 | 0.33 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.889 | 100-Year | 299.00 | 970.51 | 972.39 | 972.27 | 972.57 | 0.012799 | 3.72 | 95.26 | 135.68 | 0.66 |
| trib4E | reach 2 | 1.889 | Method 4 | 299.00 | 970.51 | 972.83 | | 973.05 | 0.008343 | 3.75 | 79.77 | 56.59 | 0.56 |
| trib4E | reach 2 | 1.889 | Method 1 | 299.00 | 970.51 | 972.77 | | 973.01 | 0.009653 | 3.92 | 76.24 | 56.41 | 0.59 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.855 | 100-Year | 299.00 | 969.32 | 970.06 | 969.89 | 970.13 | 0.012005 | 2.05 | 136.30 | 288.73 | 0.55 |
| trib4E | reach 2 | 1.855 | Method 4 | 299.00 | 969.32 | 971.12 | 970.76 | 971.35 | 0.010166 | 4.00 | 77.86 | 61.78 | 0.61 |
| trib4E | reach 2 | 1.855 | Method 1 | 299.00 | 969.32 | 971.03 | 970.65 | 971.23 | 0.009378 | 3.71 | 83.92 | 70.15 | 0.58 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.793 | 100-Year | 299.00 | 967.04 | 968.14 | | 968.19 | 0.003879 | 1.97 | 176.65 | 311.00 | 0.36 |
| trib4E | reach 2 | 1.793 | Method 4 | 299.00 | 967.04 | 968.66 | 968.10 | 968.83 | 0.006389 | 3.32 | 90.15 | 61.60 | 0.48 |
| trib4E | reach 2 | 1.793 | Method 1 | 299.00 | 967.04 | 968.66 | 968.10 | 968.83 | 0.006412 | 3.32 | 90.05 | 61.60 | 0.48 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.751 | 100-Year | 299.00 | 965.65 | 966.60 | 966.50 | 966.72 | 0.016461 | 3.00 | 114.20 | 303.58 | 0.68 |
| trib4E | reach 2 | 1.751 | Method 4 | 299.00 | 965.65 | 966.75 | | 966.90 | 0.012994 | 3.08 | 97.05 | 130.01 | 0.63 |
| trib4E | reach 2 | 1.751 | Method 1 | 299.00 | 965.65 | 966.75 | | 966.90 | 0.012892 | 3.07 | 97.28 | 130.01 | 0.63 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.700 | 100-Year | 299.00 | 964.32 | 965.24 | | 965.27 | 0.002895 | 1.45 | 227.71 | 394.36 | 0.30 |
| trib4E | reach 2 | 1.700 | Method 4 | 299.00 | 964.32 | 965.52 | | 965.57 | 0.002499 | 1.66 | 180.40 | 177.55 | 0.29 |
| trib4E | reach 2 | 1.700 | Method 1 | 299.00 | 964.32 | 965.52 | | 965.56 | 0.002517 | 1.66 | 180.01 | 177.55 | 0.29 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.662 | 100-Year | 299.00 | 962.84 | 964.08 | 964.00 | 964.18 | 0.015167 | 2.97 | 135.29 | 323.21 | 0.59 |
| trib4E | reach 2 | 1.662 | Method 4 | 299.00 | 962.84 | 964.54 | 964.07 | 964.69 | 0.009229 | 3.13 | 95.66 | 77.35 | 0.50 |
| trib4E | reach 2 | 1.662 | Method 1 | 299.00 | 962.84 | 964.53 | 964.07 | 964.68 | 0.009228 | 3.13 | 96.07 | 80.50 | 0.50 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.597 | 100-Year | 299.00 | 960.53 | 961.46 | 961.21 | 961.48 | 0.004194 | 1.19 | 284.48 | 671.18 | 0.29 |
| trib4E | reach 2 | 1.597 | Method 4 | 299.00 | 960.53 | 961.89 | 961.46 | 961.97 | 0.006595 | 2.21 | 135.09 | 144.07 | 0.40 |
| trib4E | reach 2 | 1.597 | Method 1 | 299.00 | 960.53 | 961.89 | 961.46 | 961.97 | 0.006581 | 2.21 | 135.63 | 148.53 | 0.40 |
| | | | | | | | | | | | | | |
| trib4E | reach 2 | 1.521 | 100-Year | 299.00 | 956.99 | 957.43 | 957.43 | 957.55 | 0.040869 | 2.86 | 118.01 | 539.16 | 0.85 |
| trib4E | reach 2 | 1.521 | Method 4 | 299.00 | 956.99 | 957.67 | 957.52 | 957.79 | 0.019342 | 2.77 | 107.81 | 184.01 | 0.64 |
| trib4E | reach 2 | 1.521 | Method 1 | 299.00 | 956.99 | 957.67 | 957.52 | 957.79 | 0.019422 | 2.78 | 107.67 | 184.01 | 0.64 |
| | | | | | | | | | | | | | |

HEC-RAS Plan: Hassayampa T (Continued)

| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| trib4E | reach 2 | 1.452 | 100-Year | 299.00 | 953.59 | 954.64 | 954.05 | 954.65 | 0.001292 | 1.01 | 409.28 | 784.92 | 0.18 |
| trib4E | reach 2 | 1.452 | Method 4 | 299.00 | 953.59 | 954.80 | 954.20 | 954.86 | 0.004241 | 2.01 | 148.71 | 130.28 | 0.33 |
| trib4E | reach 2 | 1.452 | Method 1 | 299.00 | 953.59 | 954.80 | 954.20 | 954.86 | 0.004229 | 2.01 | 148.84 | 130.28 | 0.33 |
| | | | | | | | | | | | | | |
| trib4E | reach 1 | 1.238 | 100-Year | 1351.00 | 947.00 | 949.08 | 948.69 | 949.18 | 0.008583 | 2.66 | 536.32 | 645.30 | 0.47 |
| trib4E | reach 1 | 1.238 | Method 4 | 1351.00 | 947.00 | 949.26 | | 949.35 | 0.005525 | 2.38 | 566.53 | 474.59 | 0.38 |
| trib4E | reach 1 | 1.238 | Method 1 | 1351.00 | 947.00 | 949.26 | | 949.35 | 0.005530 | 2.39 | 566.36 | 474.59 | 0.38 |
| | | | | | | | | | | | | | |
| trib4E | reach 1 | 1.153 | 100-Year | 1351.00 | 945.45 | 947.05 | 946.51 | 947.10 | 0.002955 | 1.96 | 723.05 | 788.10 | 0.34 |
| trib4E | reach 1 | 1.153 | Method 4 | 1351.00 | 945.45 | 947.48 | 946.73 | 947.57 | 0.002960 | 2.41 | 560.26 | 389.74 | 0.35 |
| trib4E | reach 1 | 1.153 | Method 1 | 1351.00 | 945.45 | 947.48 | 946.73 | 947.57 | 0.002957 | 2.41 | 560.45 | 389.75 | 0.35 |

### E.5.4 HEC-RAS Report for Tributary 1E – All Reaches, Existing 100-Year, 6-Hour Event

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: Hassayampa Trib 1E Floodplain Deli
Project File : trib1E.prj
Run Date and Time: 5/23/2005 9:07:58 AM

Project in English units

Project Description:
Hassayampa Tributary #1E Floodplain Delineation

Prepared by PBS&J for the
Flood Control District of Maricopa County
Consultant Address: 7310 N. 16th
St., Suite 310, Phoenix, AZ 85281
Contact: Burke Lokey, P.E., CFM
602-943-1003
Contract No. FCD 2002C027.

Topographic Mapping Source: Flown
and Mapped by Kenney Aerial Mapping, Flight Dates: 03/27/2002 and
04/08/2002
2' Contour Interval, Datum: NAVD88.
Study Limits: Lower
Hassayampa River Floodplain downstream, upstream limits are located in Sections
11 and 12 of T1N R5W just south of I-10 and east of Johnson Road.
Discharge
information obtained from the Buckeye/Sun Valley Area Drainage Master Study
Area 2 Hydrology Report, dated November 2004.

Discharge: 713 cfs @ R.S.
5.971,
1485 cfs @ R.S. 4.072,
1840 cfs @ R.S. 3.883, and
772 cfs @ R.S.
1.927.

HEC-RAS Version 3.1.1
Final Model Run: October 2004

PLAN DATA

Plan Title: Hassayampa Trib 1E FP/FW
Plan File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib1E\trib1E.p02

Geometry Title: Geometry data for Hassayampa Trib 1E
Geometry File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib1E\trib1E.g01

Flow Title : Flow rate for Trib 1E @ 100-year 6-hour Storm Event
Flow File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib1E\trib1E.f01

Plan Summary Information:

| | | | | | |
|---|---|---|---|---|---|
| Number of: | Cross Sections | = 194 | Multiple Openings | = | 0 |
| | Culverts | = 2 | Inline Structures | = | 0 |
| | Bridges | = 0 | Lateral Structures | = | 0 |

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Tributary 1E1 Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.927 | Method 4 | 4 | 1 | |
| 1.889 | Method 4 | 4 | 1 | |
| 1.851 | Method 4 | 4 | 1 | |
| 1.813 | Method 4 | 4 | 1 | |
| 1.775 | Method 4 | 4 | 1 | |
| 1.737 | Method 4 | 4 | 1 | |
| 1.699 | Method 4 | 4 | 1 | |
| 1.661 | Method 4 | 4 | 1 | |
| 1.624 | Method 4 | 4 | 1 | |
| 1.586 | Method 4 | 4 | 1 | |
| 1.548 | Method 4 | 4 | 1 | |
| 1.510 | Method 4 | 4 | 1 | |
| 1.472 | Method 4 | 4 | 1 | |
| 1.434 | Method 4 | 4 | 1 | |
| 1.396 | Method 4 | 4 | 1 | |
| 1.358 | Method 4 | 4 | 1 | |
| 1.321 | Method 4 | 4 | 1 | |
| 1.283 | Method 4 | 4 | 1 | |
| 1.245 | Method 4 | 4 | 1 | |
| 1.207 | Method 4 | 4 | 1 | |
| 1.169 | Method 4 | 4 | 1 | |
| 1.131 | Method 4 | 4 | 1 | |
| 1.093 | Method 4 | 4 | 1 | |
| 1.052 | Method 4 | 4 | 1 | |
| 1.008 | Method 4 | 4 | 1 | |
| 0.968 | Method 4 | 4 | 1 | |
| 0.929 | Method 4 | 4 | 1 | |
| 0.890 | Method 4 | 4 | 1 | |
| 0.852 | Method 4 | 4 | 1 | |
| 0.814 | Method 4 | 4 | 1 | |
| 0.777 | Method 4 | 4 | 1 | |
| 0.739 | Method 4 | 4 | 1 | |
| 0.701 | Method 4 | 4 | 1 | |
| 0.663 | Method 4 | 4 | 1 | |
| 0.625 | Method 4 | 4 | 1 | |
| 0.587 | Method 4 | 4 | 1 | |
| 0.549 | Method 4 | 4 | 1 | |
| 0.511 | Method 4 | 4 | 1 | |
| 0.474 | Method 4 | 4 | 1 | |
| 0.436 | Method 4 | 4 | 1 | |
| 0.398 | Method 4 | 4 | 1 | |
| 0.359 | Method 4 | 4 | 1 | |
| 0.319 | Method 4 | 4 | 1 | |
| 0.293 | Method 4 | 4 | 1 | |
| 0.254 | Method 4 | 4 | 1 | |
| 0.216 | Method 4 | 4 | 1 | |
| 0.178 | Method 4 | 4 | 1 | |
| 0.141 | Method 4 | 4 | 1 | |
| 0.102 | Method 4 | 4 | 1 | |
| 0.062 | Method 4 | 4 | 1 | |

River = Tributary 1E Reach = Reach 2

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 5.971 | Method 4 | 4 | 1 | |
| 5.933 | Method 4 | 4 | 1 | |
| 5.895 | Method 4 | 4 | 1 | |
| 5.857 | Method 4 | 4 | 1 | |
| 5.820 | Method 4 | 4 | 1 | |
| 5.782 | Method 4 | 4 | 1 | |
| 5.744 | Method 4 | 4 | 1 | |

| | | | |
|---|---|---|---|
| 5.706 | Method 4 | 4 | 1 |
| 5.668 | Method 4 | 4 | 1 |
| 5.630 | Method 4 | 4 | 1 |
| 5.592 | Method 4 | 4 | 1 |
| 5.554 | Method 4 | 4 | 1 |
| 5.517 | Method 4 | 4 | 1 |
| 5.479 | Method 4 | 4 | 1 |
| 5.441 | Method 4 | 4 | 1 |
| 5.403 | Method 4 | 4 | 1 |
| 5.365 | Method 4 | 4 | 1 |
| 5.327 | Method 4 | 4 | 1 |
| 5.289 | Method 4 | 4 | 1 |
| 5.252 | Method 4 | 4 | 1 |
| 5.214 | Method 4 | 4 | 1 |
| 5.176 | Method 4 | 4 | 1 |
| 5.138 | Method 4 | 4 | 1 |
| 5.100 | Method 4 | 4 | 1 |
| 5.062 | Method 4 | 4 | 1 |
| 5.024 | Method 4 | 4 | 1 |
| 4.986 | Method 4 | 4 | 1 |
| 4.949 | Method 4 | 4 | 1 |
| 4.911 | Method 4 | 4 | 1 |
| 4.873 | Method 4 | 4 | 1 |
| 4.835 | Method 4 | 4 | 1 |
| 4.797 | Method 4 | 4 | 1 |
| 4.759 | Method 4 | 4 | 1 |
| 4.721 | Method 4 | 4 | 1 |
| 4.683 | Method 4 | 4 | 1 |
| 4.646 | Method 4 | 4 | 1 |
| 4.569 | Method 4 | 4 | 1 |
| 4.506 | Method 4 | 4 | 1 |
| 4.450 | Method 4 | 4 | 1 |
| 4.410 | Method 4 | 4 | 1 |
| 4.372 | Method 4 | 4 | 1 |
| 4.334 | Method 4 | 4 | 1 |
| 4.296 | Method 4 | 4 | 1 |
| 4.259 | Method 4 | 4 | 1 |
| 4.221 | Method 4 | 4 | 1 |
| 4.183 | Method 4 | 4 | 1 |
| 4.145 | Method 4 | 4 | 1 |

River = Tributary 1E  Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 4.072 | Method 4 | 4 | 1 | |
| 4.034 | Method 4 | 4 | 1 | |
| 3.996 | Method 4 | 4 | 1 | |
| 3.958 | Method 4 | 4 | 1 | |
| 3.920 | Method 4 | 4 | 1 | |
| 3.883 | Method 4 | 4 | 1 | |
| 3.845 | Method 4 | 4 | 1 | |
| 3.807 | Method 4 | 4 | 1 | |
| 3.769 | Method 4 | 4 | 1 | |
| 3.731 | Method 4 | 4 | 1 | |
| 3.692 | Method 4 | 4 | 1 | |
| 3.653 | Method 4 | 4 | 1 | |
| 3.614 | Method 4 | 4 | 1 | |
| 3.576 | Method 4 | 4 | 1 | |
| 3.538 | Method 4 | 4 | 1 | |
| 3.500 | Method 4 | 4 | 1 | |
| 3.462 | Method 4 | 4 | 1 | |
| 3.425 | Method 4 | 4 | 1 | |
| 3.387 | Method 4 | 4 | 1 | |
| 3.349 | Method 4 | 4 | 1 | |
| 3.311 | Method 4 | 4 | 1 | |
| 3.273 | Method 4 | 4 | 1 | |
| 3.235 | Method 4 | 4 | 1 | |
| 3.197 | Method 4 | 4 | 1 | |
| 3.122 | Method 4 | 4 | 1 | |
| 3.084 | Method 4 | 4 | 1 | |
| 3.046 | Method 4 | 4 | 1 | |
| 2.972 | Method 4 | 4 | 1 | |
| 2.935 | Method 4 | 4 | 1 | |
| 2.897 | Method 4 | 4 | 1 | |
| 2.852 | Method 4 | 4 | 1 | |
| 2.814 | Method 4 | 4 | 1 | |
| 2.776 | Method 4 | 4 | 1 | |
| 2.738 | Method 4 | 4 | 1 | |
| 2.700 | Method 4 | 4 | 1 | |
| 2.662 | Method 4 | 4 | 1 | |

| | | | |
|---|---|---|---|
| 2.624 | Method 4 | 4 | 1 |
| 2.587 | Method 4 | 4 | 1 |
| 2.549 | Method 4 | 4 | 1 |
| 2.511 | Method 4 | 4 | 1 |
| 2.473 | Method 4 | 4 | 1 |
| 2.445 | Method 4 | 4 | 1 |
| 2.438 | Method 4 | 4 | 1 |
| 2.432 | Method 4 | 4 | 1 |
| 2.397 | Method 4 | 4 | 1 |
| 2.359 | Method 4 | 4 | 1 |
| 2.321 | Method 4 | 4 | 1 |
| 2.283 | Method 4 | 4 | 1 |
| 2.245 | Method 4 | 4 | 1 |
| 2.208 | Method 4 | 4 | 1 |
| 2.170 | Method 4 | 4 | 1 |
| 2.132 | Method 4 | 4 | 1 |
| 2.094 | Method 4 | 4 | 1 |
| 2.056 | Method 4 | 4 | 1 |
| 2.018 | Method 4 | 4 | 1 |
| 1.980 | Method 4 | 4 | 1 |
| 1.942 | Method 4 | 4 | 1 |
| 1.905 | Method 4 | 4 | 1 |
| 1.867 | Method 4 | 4 | 1 |
| 1.829 | Method 4 | 4 | 1 |
| 1.791 | Method 4 | 4 | 1 |
| 1.753 | Method 4 | 4 | 1 |
| 1.715 | Method 4 | 4 | 1 |
| 1.677 | Method 4 | 4 | 1 |
| 1.640 | Method 4 | 4 | 1 |
| 1.602 | Method 4 | 4 | 1 |
| 1.564 | Method 4 | 4 | 1 |
| 1.526 | Method 4 | 4 | 1 |
| 1.488 | Method 4 | 4 | 1 |
| 1.450 | Method 4 | 4 | 1 |
| 1.412 | Method 4 | 4 | 1 |
| 1.374 | Method 4 | 4 | 1 |
| 1.330 | Method 4 | 4 | 1 |
| 1.323 | Method 4 | 4 | 1 |
| 1.312 | Method 4 | 4 | 1 |
| 1.223 | Method 4 | 4 | 1 |
| 1.185 | Method 4 | 4 | 1 |
| 1.147 | Method 4 | 4 | 1 |
| 1.109 | Method 4 | 4 | 1 |
| 1.072 | Method 4 | 4 | 1 |
| 1.035 | Method 4 | 4 | 1 |
| .997 | Method 4 | 4 | 1 |
| .959 | Method 4 | 4 | 1 |
| .921 | Method 4 | 4 | 1 |
| .883 | Method 4 | 4 | 1 |
| .845 | Method 4 | 4 | 1 |
| .807 | Method 4 | 4 | 1 |
| .770 | Method 4 | 4 | 1 |
| .732 | Method 4 | 4 | 1 |
| .695 | Method 4 | 4 | 1 |
| .656 | Method 4 | 4 | 1 |
| .618 | Method 4 | 4 | 1 |
| .580 | Method 4 | 4 | 1 |
| .542 | Method 4 | 4 | 1 |
| .494 | Method 4 | 4 | 1 |
| .418 | Method 4 | 4 | 1 |
| .342 | Method 4 | 4 | 1 |
| .266 | Method 4 | 4 | 1 |
| .190 | Method 4 | 4 | 1 |

River = Tributary 1E1 Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.927 | Method 1 | 1 | 250.35 | 409.08 |
| 1.889 | Method 1 | 1 | 553.11 | 644.62 |
| 1.851 | Method 1 | 1 | 370.18 | 504.49 |
| 1.813 | Method 1 | 1 | 0 | |
| 1.775 | Method 1 | 1 | 0 | |
| 1.737 | Method 1 | 1 | 0 | |
| 1.699 | Method 1 | 1 | 0 | |
| 1.661 | Method 1 | 1 | 0 | |
| 1.624 | Method 1 | 1 | 0 | |
| 1.586 | Method 1 | 1 | 0 | |
| 1.548 | Method 1 | 1 | 451.31 | 578.96 |
| 1.510 | Method 1 | 1 | 0 | |
| 1.472 | Method 1 | 1 | 0 | |

| | | | | |
|---|---|---|---|---|
| 1.434 | Method 1 | 1 | 0 | |
| 1.396 | Method 1 | 1 | 223.75 | 354.61 |
| 1.358 | Method 1 | 1 | 0 | |
| 1.321 | Method 1 | 1 | 0 | |
| 1.283 | Method 1 | 1 | 0 | |
| 1.245 | Method 1 | 1 | 0 | |
| 1.207 | Method 1 | 1 | 0 | |
| 1.169 | Method 1 | 1 | 245.98 | 423.93 |
| 1.131 | Method 1 | 1 | 0 | |
| 1.093 | Method 1 | 1 | 0 | |
| 1.052 | Method 1 | 1 | 0 | |
| 1.008 | Method 1 | 1 | 0 | |
| 0.968 | Method 1 | 1 | 0 | |
| 0.929 | Method 1 | 1 | 0 | |
| 0.890 | Method 1 | 1 | 0 | |
| 0.852 | Method 1 | 1 | 0 | |
| 0.814 | Method 1 | 1 | 0 | |
| 0.777 | Method 1 | 1 | 0 | |
| 0.739 | Method 1 | 1 | 0 | |
| 0.701 | Method 1 | 1 | 0 | |
| 0.663 | Method 1 | 1 | 0 | |
| 0.625 | Method 1 | 1 | 0 | |
| 0.587 | Method 1 | 1 | 0 | 581.02 |
| 0.549 | Method 1 | 1 | 0 | |
| 0.511 | Method 1 | 1 | 0 | |
| 0.474 | Method 1 | 1 | 120.63 | |
| 0.436 | Method 1 | 1 | 0 | |
| 0.398 | Method 1 | 1 | 0 | |
| 0.359 | Method 1 | 1 | 0 | |
| 0.319 | Method 1 | 1 | 0 | |
| 0.293 | Method 1 | 1 | 0 | |
| 0.254 | Method 1 | 1 | 0 | |
| 0.216 | Method 1 | 1 | 0 | |
| 0.178 | Method 1 | 1 | 0 | |
| 0.141 | Method 1 | 1 | 148.21 | 290.9 |
| 0.102 | Method 1 | 1 | 0 | |
| 0.062 | Method 1 | 1 | 0 | |

River = Tributary 1E  Reach = Reach 2

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 5.971 | Method 1 | 1 | 0 | 497.37 |
| 5.933 | Method 1 | 1 | 327.04 | 515.03 |
| 5.895 | Method 1 | 1 | 401.31 | 600.42 |
| 5.857 | Method 1 | 1 | 407.4 | 622.74 |
| 5.820 | Method 1 | 1 | 366.52 | 583.76 |
| 5.782 | Method 1 | 1 | 415.19 | 597.74 |
| 5.744 | Method 1 | 1 | 405.88 | 596.63 |
| 5.706 | Method 1 | 1 | 190.92 | 322.51 |
| 5.668 | Method 1 | 1 | 129.64 | 242.69 |
| 5.630 | Method 1 | 1 | 91.84 | 198.32 |
| 5.592 | Method 1 | 1 | 286.5 | 395.54 |
| 5.554 | Method 1 | 1 | 403.25 | 479.55 |
| 5.517 | Method 1 | 1 | 228.45 | 323.49 |
| 5.479 | Method 1 | 1 | 275.33 | 379.76 |
| 5.441 | Method 1 | 1 | 186.8 | 315.97 |
| 5.403 | Method 1 | 1 | 371.08 | 553.55 |
| 5.365 | Method 1 | 1 | 479.94 | 556.93 |
| 5.327 | Method 1 | 1 | 282.16 | 382.15 |
| 5.289 | Method 1 | 1 | 245.22 | 425.11 |
| 5.252 | Method 1 | 1 | 230.25 | 402.38 |
| 5.214 | Method 1 | 1 | 340.14 | 480.29 |
| 5.176 | Method 1 | 1 | 507.85 | 673.38 |
| 5.138 | Method 1 | 1 | 374.72 | 546.47 |
| 5.100 | Method 1 | 1 | 464.56 | 607.15 |
| 5.062 | Method 1 | 1 | 285.8 | 560.46 |
| 5.024 | Method 1 | 1 | 0 | 558.71 |
| 4.986 | Method 1 | 1 | 0 | |
| 4.949 | Method 1 | 1 | 0 | 497.87 |
| 4.911 | Method 1 | 1 | 0 | 649.6 |
| 4.873 | Method 1 | 1 | 461.56 | |
| 4.835 | Method 1 | 1 | 318.1 | 426.28 |
| 4.797 | Method 1 | 1 | 275.81 | 355.7 |
| 4.759 | Method 1 | 1 | 392.53 | 474.38 |
| 4.721 | Method 1 | 1 | 426.28 | |
| 4.683 | Method 1 | 1 | 456.6 | |
| 4.646 | Method 1 | 1 | 668.63 | 776.85 |
| 4.569 | Method 1 | 1 | 646.47 | 728.83 |
| 4.506 | Method 1 | 1 | 423.82 | 619.2 |
| 4.450 | Method 1 | 1 | 376.7 | 651.95 |

| | | | | |
|---|---|---|---|---|
| 4.410 | Method 1 | 1 | 393.92 | |
| 4.372 | Method 1 | 1 | 336.9 | |
| 4.334 | Method 1 | 1 | 179.22 | |
| 4.296 | Method 1 | 1 | 368.78 | 577.23 |
| 4.259 | Method 1 | 1 | 238.12 | 349.05 |
| 4.221 | Method 1 | 1 | 410.68 | 512.61 |
| 4.183 | Method 1 | 1 | 287.78 | 463.58 |
| 4.145 | Method 1 | 1 | 222.1 | 404.64 |

River = Tributary 1E  Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 4.072 | Method 1 | 1 | 533.22 | 663.2 |
| 4.034 | Method 1 | 1 | 537.62 | 666.07 |
| 3.996 | Method 1 | 1 | 477.4 | 647.86 |
| 3.958 | Method 1 | 1 | 461.63 | 611.8 |
| 3.920 | Method 1 | 1 | 456.66 | 656.66 |
| 3.883 | Method 1 | 1 | 505.46 | 731.48 |
| 3.845 | Method 1 | 1 | 194.47 | 603.05 |
| 3.807 | Method 1 | 1 | 175.08 | 693.15 |
| 3.769 | Method 1 | 1 | 107.49 | 562.14 |
| 3.731 | Method 1 | 1 | 0 | |
| 3.692 | Method 1 | 1 | 0 | |
| 3.653 | Method 1 | 1 | 0 | |
| 3.614 | Method 1 | 1 | 0 | |
| 3.576 | Method 1 | 1 | 0 | |
| 3.538 | Method 1 | 1 | 0 | |
| 3.500 | Method 1 | 1 | 352.97 | 841.25 |
| 3.462 | Method 1 | 1 | 387.17 | 855.4 |
| 3.425 | Method 1 | 1 | 347.01 | 839.96 |
| 3.387 | Method 1 | 1 | 596.26 | 1072.37 |
| 3.349 | Method 1 | 1 | 773.54 | 1230.64 |
| 3.311 | Method 1 | 1 | 990.64 | 1338.76 |
| 3.273 | Method 1 | 1 | 938.7 | 1322.98 |
| 3.235 | Method 1 | 1 | 970.26 | 1329.27 |
| 3.197 | Method 1 | 1 | 951.25 | 1446.27 |
| 3.122 | Method 1 | 1 | 865.23 | 1310.64 |
| 3.084 | Method 1 | 1 | 788.16 | 1293.89 |
| 3.046 | Method 1 | 1 | 751.22 | 1236.41 |
| 2.972 | Method 1 | 1 | 748.27 | 1257.29 |
| 2.935 | Method 1 | 1 | 776.79 | 1160.4 |
| 2.897 | Method 1 | 1 | 119.54 | 523.11 |
| 2.852 | Method 1 | 1 | 305.29 | 633.4 |
| 2.814 | Method 1 | 1 | 329.11 | 476.66 |
| 2.776 | Method 1 | 1 | 0 | |
| 2.738 | Method 1 | 1 | 0 | |
| 2.700 | Method 1 | 1 | 338.85 | 568.11 |
| 2.662 | Method 1 | 1 | 450.62 | 650.23 |
| 2.624 | Method 1 | 1 | 585.64 | 883.09 |
| 2.587 | Method 1 | 1 | 518.02 | 841.6 |
| 2.549 | Method 1 | 1 | 563.99 | 851.69 |
| 2.511 | Method 1 | 1 | 533.19 | 732 |
| 2.473 | Method 1 | 1 | 700.2 | 853.61 |
| 2.445 | Method 1 | 1 | 1140.21 | 1371.72 |
| 2.438 | Method 1 | 0 | | |
| 2.432 | Method 1 | 1 | 1190.03 | 1410.04 |
| 2.397 | Method 1 | 1 | 1116.98 | 1350.05 |
| 2.359 | Method 1 | 1 | 1191.88 | 1399.08 |
| 2.321 | Method 1 | 1 | 1217.14 | 1394.64 |
| 2.283 | Method 1 | 1 | 1168.33 | 1279.6 |
| 2.245 | Method 1 | 1 | 1175.72 | 1275.86 |
| 2.208 | Method 1 | 1 | 1155.45 | 1271.17 |
| 2.170 | Method 1 | 1 | 1190.07 | 1399.43 |
| 2.132 | Method 1 | 1 | 1184.15 | 1384.32 |
| 2.094 | Method 1 | 1 | 1208.02 | 1427.77 |
| 2.056 | Method 1 | 1 | 1207.02 | 1448.03 |
| 2.018 | Method 1 | 1 | 1151.54 | |
| 1.980 | Method 1 | 1 | 1135.64 | 1679.24 |
| 1.942 | Method 1 | 1 | 586.16 | |
| 1.905 | Method 1 | 1 | 365.54 | |
| 1.867 | Method 1 | 1 | 0 | |
| 1.829 | Method 1 | 1 | 0 | |
| 1.791 | Method 1 | 1 | 386.24 | |
| 1.753 | Method 1 | 1 | 162.46 | |
| 1.715 | Method 1 | 1 | 353.45 | |
| 1.677 | Method 1 | 1 | 0 | |
| 1.640 | Method 1 | 1 | 0 | |
| 1.602 | Method 1 | 1 | 0 | |
| 1.564 | Method 1 | 1 | 0 | 404.41 |
| 1.526 | Method 1 | 1 | 515.14 | 805.41 |

| | | | | |
|---|---|---|---|---|
| 1.488 | Method 1 | 1 | 283.84 | 616.64 |
| 1.450 | Method 1 | 1 | 234.14 | 601.82 |
| 1.412 | Method 1 | 1 | 0 | 1025.5 |
| 1.374 | Method 1 | 1 | 0 | 1054.19 |
| 1.330 | Method 1 | 1 | 947.45 | 1247.46 |
| 1.323 | Method 1 | 0 | | |
| 1.312 | Method 1 | 1 | 976.86 | 1200.81 |
| 1.223 | Method 1 | 1 | 819.65 | 1062.47 |
| 1.185 | Method 1 | 1 | 228.48 | 369.92 |
| 1.147 | Method 1 | 1 | 333.49 | 466.14 |
| 1.109 | Method 1 | 1 | 192.41 | 357.89 |
| 1.072 | Method 1 | 1 | 161.08 | 310.16 |
| 1.035 | Method 1 | 1 | 208.75 | 433.45 |
| .997 | Method 1 | 1 | 251.56 | 628.94 |
| .959 | Method 1 | 1 | 0 | 603.62 |
| .921 | Method 1 | 1 | 0 | 578.66 |
| .883 | Method 1 | 1 | 0 | 516.75 |
| .845 | Method 1 | 1 | 159.45 | 480.87 |
| .807 | Method 1 | 1 | 260.34 | 546.12 |
| .770 | Method 1 | 1 | 479.22 | 631.93 |
| .732 | Method 1 | 1 | 566.69 | 706.78 |
| .695 | Method 1 | 1 | 1092.53 | 1223.73 |
| .656 | Method 1 | 1 | 1193.37 | 1458.81 |
| .618 | Method 1 | 1 | 1274.85 | 1568.98 |
| .580 | Method 1 | 1 | 1338.85 | 1817.52 |
| .542 | Method 1 | 1 | 1447.33 | 1933.9 |
| .494 | Method 1 | 1 | 14.96 | 513.99 |
| .418 | Method 1 | 1 | 6.67 | 336.23 |
| .342 | Method 1 | 1 | 5.06 | 264.97 |
| .266 | Method 1 | 1 | 5.19 | 321.65 |
| .190 | Method 1 | 1 | 6.51 | 248.46 |

River = Tributary 1E1 Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.927 | PF 4 | 1 | 250.35 | 409.08 |
| 1.889 | PF 4 | 1 | 501.77 | 644.62 |
| 1.851 | PF 4 | 1 | 316.77 | 504.49 |
| 1.813 | PF 4 | 1 | 326.63 | 556.31 |
| 1.775 | PF 4 | 1 | 553.74 | 749.52 |
| 1.737 | PF 4 | 1 | 409.3 | 610.79 |
| 1.699 | PF 4 | 1 | 241.14 | 414.8 |
| 1.661 | PF 4 | 1 | 335.21 | 530.65 |
| 1.624 | PF 4 | 1 | 182.43 | 348.34 |
| 1.586 | PF 4 | 1 | 253.45 | 484.33 |
| 1.548 | PF 4 | 1 | 380.64 | 578.96 |
| 1.510 | PF 4 | 1 | 495.85 | 701.64 |
| 1.472 | PF 4 | 1 | 298.12 | 493.64 |
| 1.434 | PF 4 | 1 | 171.83 | 345.6 |
| 1.396 | PF 4 | 1 | 190.38 | 354.61 |
| 1.358 | PF 4 | 1 | 218.63 | 403.25 |
| 1.321 | PF 4 | 1 | 150.49 | 330.15 |
| 1.283 | PF 4 | 1 | 65.36 | 289.5 |
| 1.245 | PF 4 | 1 | 78.82 | 293.53 |
| 1.207 | PF 4 | 1 | 55.72 | 244.75 |
| 1.169 | PF 4 | 1 | 245.98 | 459.78 |
| 1.131 | PF 4 | 1 | 151.54 | 419.42 |
| 1.093 | PF 4 | 1 | 72.98 | 331.25 |
| 1.052 | PF 4 | 1 | 328.29 | 602.1 |
| 1.008 | PF 4 | 1 | 221.57 | 580.42 |
| 0.968 | PF 4 | 1 | 177.41 | 529.1 |
| 0.929 | PF 4 | 1 | 263.87 | 512.01 |
| 0.890 | PF 4 | 1 | 223.1 | 469.43 |
| 0.852 | PF 4 | 1 | 187.2 | 439.31 |
| 0.814 | PF 4 | 1 | 153.62 | 457.92 |
| 0.777 | PF 4 | 1 | 254.14 | 487.37 |
| 0.739 | PF 4 | 1 | 195.79 | 423.84 |
| 0.701 | PF 4 | 1 | 81.65 | 302.79 |
| 0.663 | PF 4 | 1 | 86.58 | 422.5 |
| 0.625 | PF 4 | 1 | 197.84 | 453.25 |
| 0.587 | PF 4 | 1 | 300.68 | 581.02 |
| 0.549 | PF 4 | 1 | 278.6 | 570.84 |
| 0.511 | PF 4 | 1 | 183.47 | 450.82 |
| 0.474 | PF 4 | 1 | 120.63 | 417.31 |
| 0.436 | PF 4 | 1 | 154.59 | 435.05 |
| 0.398 | PF 4 | 1 | 61.47 | 408.23 |
| 0.359 | PF 4 | 1 | 127.12 | 457.2 |
| 0.319 | PF 4 | 1 | 69.74 | 462.29 |
| 0.293 | PF 4 | 1 | 53.6 | 415.55 |
| 0.254 | PF 4 | 1 | 34.37 | 391.87 |

| | | | | |
|---|---|---|---|---|
| 0.216 | PF 4 | 1 | 316.65 | 595.92 |
| 0.178 | PF 4 | 1 | 141.52 | 363.35 |
| 0.141 | PF 4 | 1 | 148.21 | 290.9 |
| 0.102 | PF 4 | 1 | 84.73 | 261.45 |
| 0.062 | PF 4 | 1 | 47.24 | 219.61 |

River = Tributary 1E  Reach = Reach 2

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 5.971 | PF 4 | 1 | 258.18 | 497.37 |
| 5.933 | PF 4 | 1 | 261.6 | 562.77 |
| 5.895 | PF 4 | 1 | 396.95 | 600.42 |
| 5.857 | PF 4 | 1 | 407.4 | 622.74 |
| 5.820 | PF 4 | 1 | 366.52 | 597.64 |
| 5.782 | PF 4 | 1 | 415.19 | 597.74 |
| 5.744 | PF 4 | 1 | 405.88 | 570.6 |
| 5.706 | PF 4 | 1 | 190.92 | 322.51 |
| 5.668 | PF 4 | 1 | 129.64 | 242.69 |
| 5.630 | PF 4 | 1 | 91.84 | 198.32 |
| 5.592 | PF 4 | 1 | 233.24 | 395.54 |
| 5.554 | PF 4 | 1 | 378.05 | 479.55 |
| 5.517 | PF 4 | 1 | 202.56 | 323.49 |
| 5.479 | PF 4 | 1 | 275.33 | 379.76 |
| 5.441 | PF 4 | 1 | 165.28 | 315.97 |
| 5.403 | PF 4 | 1 | 371.08 | 553.55 |
| 5.365 | PF 4 | 1 | 479.94 | 556.93 |
| 5.327 | PF 4 | 1 | 282.16 | 382.15 |
| 5.289 | PF 4 | 1 | 245.22 | 432.57 |
| 5.252 | PF 4 | 1 | 230.25 | 405.44 |
| 5.214 | PF 4 | 1 | 340.14 | 506.06 |
| 5.176 | PF 4 | 1 | 507.85 | 689.53 |
| 5.138 | PF 4 | 1 | 374.72 | 546.47 |
| 5.100 | PF 4 | 1 | 464.56 | 607.15 |
| 5.062 | PF 4 | 1 | 262.44 | 560.46 |
| 5.024 | PF 4 | 1 | 307.62 | 558.71 |
| 4.986 | PF 4 | 1 | 540.44 | 656.34 |
| 4.949 | PF 4 | 1 | 263.89 | 498.07 |
| 4.911 | PF 4 | 1 | 470.73 | 649.6 |
| 4.873 | PF 4 | 1 | 557.98 | 661.56 |
| 4.835 | PF 4 | 1 | 318.1 | 440.63 |
| 4.797 | PF 4 | 1 | 275.81 | 363.53 |
| 4.759 | PF 4 | 1 | 392.53 | 474.38 |
| 4.721 | PF 4 | 1 | 426.28 | 524.22 |
| 4.683 | PF 4 | 1 | 469.25 | 574.88 |
| 4.646 | PF 4 | 1 | 608.63 | 716.85 |
| 4.569 | PF 4 | 1 | 623.52 | 728.83 |
| 4.506 | PF 4 | 1 | 423.82 | 619.2 |
| 4.450 | PF 4 | 1 | 389.26 | 661.94 |
| 4.410 | PF 4 | 1 | 393.92 | 591.56 |
| 4.372 | PF 4 | 1 | 336.9 | 578.92 |
| 4.334 | PF 4 | 1 | 179.22 | 453.66 |
| 4.296 | PF 4 | 1 | 352.7 | 577.23 |
| 4.259 | PF 4 | 1 | 238.12 | 349.05 |
| 4.221 | PF 4 | 1 | 410.68 | 512.61 |
| 4.183 | PF 4 | 1 | 287.78 | 463.58 |
| 4.145 | PF 4 | 1 | 222.1 | 404.64 |

River = Tributary 1E  Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 4.072 | PF 4 | 1 | 533.22 | 663.2 |
| 4.034 | PF 4 | 1 | 510.62 | 666.07 |
| 3.996 | PF 4 | 1 | 477.4 | 647.86 |
| 3.958 | PF 4 | 1 | 461.63 | 611.8 |
| 3.920 | PF 4 | 1 | 456.66 | 656.66 |
| 3.883 | PF 4 | 1 | 505.46 | 731.48 |
| 3.845 | PF 4 | 1 | 345.96 | 603.05 |
| 3.807 | PF 4 | 1 | 412.01 | 697.55 |
| 3.769 | PF 4 | 1 | 345.35 | 562.14 |
| 3.731 | PF 4 | 1 | 372.38 | 564.85 |
| 3.692 | PF 4 | 1 | 286.89 | 523.4 |
| 3.653 | PF 4 | 1 | 179.54 | 515.67 |
| 3.614 | PF 4 | 1 | 261.29 | 597.57 |
| 3.576 | PF 4 | 1 | 228.98 | 568.42 |
| 3.538 | PF 4 | 1 | 97.03 | 539.81 |
| 3.500 | PF 4 | 1 | 352.97 | 865.47 |
| 3.462 | PF 4 | 1 | 452.48 | 883.91 |
| 3.425 | PF 4 | 1 | 437.82 | 881.11 |
| 3.387 | PF 4 | 1 | 596.26 | 1072.37 |
| 3.349 | PF 4 | 1 | 773.54 | 1230.64 |
| 3.311 | PF 4 | 1 | 990.64 | 1348.75 |

| | | | | |
|---|---|---|---|---|
| 3.273 | PF 4 | 1 | 938.7 | 1322.98 |
| 3.235 | PF 4 | 1 | 970.26 | 1329.27 |
| 3.197 | PF 4 | 1 | 951.25 | 1446.27 |
| 3.122 | PF 4 | 1 | 865.23 | 1310.64 |
| 3.084 | PF 4 | 1 | 788.16 | 1293.89 |
| 3.046 | PF 4 | 1 | 684.16 | 1176.31 |
| 2.972 | PF 4 | 1 | 748.27 | 1084.23 |
| 2.935 | PF 4 | 1 | 776.79 | 1160.4 |
| 2.897 | PF 4 | 1 | 247.32 | 404.45 |
| 2.852 | PF 4 | 1 | 305.29 | 633.4 |
| 2.814 | PF 4 | 1 | 278.23 | 476.66 |
| 2.776 | PF 4 | 1 | 363.27 | 567.67 |
| 2.738 | PF 4 | 1 | 287.98 | 592.38 |
| 2.700 | PF 4 | 1 | 338.85 | 568.11 |
| 2.662 | PF 4 | 1 | 450.62 | 645.26 |
| 2.624 | PF 4 | 1 | 711.85 | 865.38 |
| 2.587 | PF 4 | 1 | 644.1 | 841.6 |
| 2.549 | PF 4 | 1 | 744.7 | 882.63 |
| 2.511 | PF 4 | 1 | 587.93 | 721.05 |
| 2.473 | PF 4 | 1 | 700.2 | 853.61 |
| 2.445 | PF 4 | 1 | 1059.91 | 1355.98 |
| 2.438 | PF 4 | 0 | 0 | 0 |
| 2.432 | PF 4 | 1 | 1058.96 | 1355.03 |
| 2.397 | PF 4 | 1 | 1116.98 | 1350.05 |
| 2.359 | PF 4 | 1 | 1191.88 | 1399.08 |
| 2.321 | PF 4 | 1 | 1217.14 | 1394.64 |
| 2.283 | PF 4 | 1 | 1168.33 | 1279.6 |
| 2.245 | PF 4 | 1 | 1175.72 | 1275.86 |
| 2.208 | PF 4 | 1 | 1155.45 | 1271.17 |
| 2.170 | PF 4 | 1 | 1190.07 | 1399.43 |
| 2.132 | PF 4 | 1 | 1184.15 | 1384.32 |
| 2.094 | PF 4 | 1 | 1208.02 | 1427.77 |
| 2.056 | PF 4 | 1 | 1207.02 | 1448.03 |
| 2.018 | PF 4 | 1 | 1151.54 | 1345.66 |
| 1.980 | PF 4 | 1 | 1135.64 | 1533.27 |
| 1.942 | PF 4 | 1 | 586.16 | 922.07 |
| 1.905 | PF 4 | 1 | 365.54 | 571.62 |
| 1.867 | PF 4 | 1 | 420.03 | 683.01 |
| 1.829 | PF 4 | 1 | 438.96 | 699.16 |
| 1.791 | PF 4 | 1 | 386.24 | 625.8 |
| 1.753 | PF 4 | 1 | 162.46 | 368.16 |
| 1.715 | PF 4 | 1 | 509.54 | 737.07 |
| 1.677 | PF 4 | 1 | 305.64 | 662.54 |
| 1.640 | PF 4 | 1 | 266.33 | 536.69 |
| 1.602 | PF 4 | 1 | 279.11 | 457.63 |
| 1.564 | PF 4 | 1 | 202.99 | 404.41 |
| 1.526 | PF 4 | 1 | 620.94 | 834.8 |
| 1.488 | PF 4 | 1 | 419.4 | 647.55 |
| 1.450 | PF 4 | 1 | 383.95 | 617.13 |
| 1.412 | PF 4 | 1 | 771.88 | 1025.5 |
| 1.374 | PF 4 | 1 | 717.04 | 1054.19 |
| 1.330 | PF 4 | 1 | 969.85 | 1247.46 |
| 1.323 | PF 4 | 0 | 0 | 0 |
| 1.312 | PF 4 | 1 | 976.86 | 1200.81 |
| 1.223 | PF 4 | 1 | 788.6 | 1062.47 |
| 1.185 | PF 4 | 1 | 228.48 | 369.92 |
| 1.147 | PF 4 | 1 | 333.49 | 466.14 |
| 1.109 | PF 4 | 1 | 192.41 | 383.03 |
| 1.072 | PF 4 | 1 | 245.21 | 319.87 |
| 1.035 | PF 4 | 1 | 208.75 | 433.45 |
| .997 | PF 4 | 1 | 251.56 | 425.89 |
| .959 | PF 4 | 1 | 377.47 | 483.59 |
| .921 | PF 4 | 1 | 409.85 | 555.37 |
| .883 | PF 4 | 1 | 250.96 | 577.25 |
| .845 | PF 4 | 1 | 346.87 | 551.1 |
| .807 | PF 4 | 1 | 418.02 | 532.72 |
| .770 | PF 4 | 1 | 483.28 | 619.68 |
| .732 | PF 4 | 1 | 533.35 | 670.86 |
| .695 | PF 4 | 1 | 824.75 | 1031.94 |
| .656 | PF 4 | 1 | 938.94 | 1040.38 |
| .618 | PF 4 | 1 | 985.85 | 1101.38 |
| .580 | PF 4 | 1 | 1030 | 1135.66 |
| .542 | PF 4 | 1 | 1124.99 | 1287.21 |
| .494 | PF 4 | 1 | 14.96 | 269.95 |
| .418 | PF 4 | 1 | 6.67 | 220.2 |
| .342 | PF 4 | 1 | 5.06 | 220.61 |
| .266 | PF 4 | 1 | 5.19 | 238.88 |
| .190 | PF 4 | 1 | 6.51 | 231.5 |

FLOW DATA

Flow Title: Flow rate for Trib 1E @ 100-year 6-hour Storm Event
Flow File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib1E\trib1E.f01

Flow Data (cfs)

| River | Reach | RS | 100-Year | Method 4 | Method 1 |
|---|---|---|---|---|---|
| Tributary 1E | Reach 2 | 5.971 | 713 | 713 | 713 |
| Tributary 1E | Reach 1 | 4.072 | 1485 | 1485 | 1485 |
| Tributary 1E | Reach 1 | 3.883 | 1840 | 1840 | 1840 |
| Tributary 1E1 | Reach 1 | 1.927 | 772 | 772 | 772 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| Tributary 1E | Reach 1 | 100-Year | | Normal S = 0.004 |
| Tributary 1E | Reach 1 | Method 4 | | Normal S = 0.004 |
| Tributary 1E | Reach 1 | Method 1 | | Normal S = 0.004 |

GEOMETRY DATA

Geometry Title: Geometry data for Hassayampa Trib 1E
Geometry File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib1E\trib1E.g01

Reach Connection Table

| River | Reach | Upstream Boundary | Downstream Boundary |
|---|---|---|---|
| Tributary 1E | Reach 2 | | 3 |
| Tributary 1E | Reach 1 | 3 | |
| Tributary 1E1 | Reach 1 | | 3 |

JUNCTION INFORMATION

Name: 3
Description:
Energy computation Method

| Length across Junction River | Reach | Tributary River | Reach | Length | Angle |
|---|---|---|---|---|---|
| Tributary 1E1 | Reach 1 | to Tributary 1E | Reach 1 | 400 | |
| Tributary 1E | Reach 2 | to Tributary 1E | Reach 1 | 400 | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.971

INPUT
Description: Thalweg Sta. 443.40 - Discharge from A2-100y6hr.out HEC-1 model -
Sta. E2 - 713 CFS
Station Elevation Data num= 192

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1040.16 | .09 | 1040.15 | 9.49 | 1039.68 | 20.83 | 1039.2 | 22.25 | 1039.15 |
| 24.91 | 1039.07 | 29.64 | 1038.91 | 43.52 | 1038.47 | 44.42 | 1038.44 | 46.11 | 1038.39 |
| 54.86 | 1038.1 | 66.2 | 1037.77 | 67.32 | 1037.74 | 77.54 | 1037.57 | 78.58 | 1037.56 |
| 81.36 | 1037.54 | 88.51 | 1037.43 | 88.75 | 1037.43 | 88.88 | 1037.42 | 96.14 | 1037.24 |
| 109.72 | 1036.87 | 110.92 | 1036.83 | 111.56 | 1036.81 | 118.31 | 1036.63 | 122.9 | 1036.52 |
| 125.69 | 1036.46 | 134.24 | 1036.31 | 147.86 | 1036.2 | 155.25 | 1036.18 | 156.92 | 1036.17 |
| 168.27 | 1036.13 | 170.02 | 1036.12 | 177.41 | 1036.1 | 179.61 | 1036.1 | 190.95 | 1036.06 |
| 192.19 | 1036.06 | 194.52 | 1036.05 | 199.58 | 1036.05 | 206.97 | 1036.08 | 213.63 | 1036.15 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 214.36 | 1036.16 | 215.72 | 1036.17 | 221.75 | 1036.25 | 224.97 | 1036.3 | 236.31 | 1036.42 |
| 236.92 | 1036.42 | 247.65 | 1036.39 | 258.13 | 1036.13 | 258.18 | 1036.13 | 258.69 | 1036.12 |
| 258.99 | 1036.11 | 270.33 | 1035.66 | 273.46 | 1035.53 | 279.32 | 1035.31 | 280.85 | 1035.24 |
| 281.67 | 1035.21 | 288.24 | 1034.98 | 293.01 | 1034.85 | 295.63 | 1034.8 | 300.53 | 1034.73 |
| 303.02 | 1034.7 | 304.36 | 1034.69 | 310.41 | 1034.67 | 315.7 | 1034.61 | 317.79 | 1034.57 |
| 321.73 | 1034.47 | 325.19 | 1034.39 | 327.04 | 1034.33 | 332.57 | 1034.12 | 338.38 | 1033.97 |
| 339.96 | 1034 | 342.92 | 1034.09 | 347.35 | 1034.24 | 349.72 | 1034.4 | 354.74 | 1034.63 |
| 361.06 | 1034.68 | 362.13 | 1034.68 | 364.13 | 1034.63 | 369.52 | 1034.53 | 372.4 | 1034.43 |
| 383.74 | 1034.27 | 384.29 | 1034.26 | 385.33 | 1034.25 | 391.68 | 1034.17 | 399.07 | 1034.12 |
| 406.42 | 1034.1 | 406.53 | 1034.1 | 413.85 | 1034.11 | 421.23 | 1034.09 | 427.73 | 1033.97 |
| 428.63 | 1033.95 | 429.1 | 1033.93 | 440.45 | 1033.21 | 443.4 | 1033.13 | 448.94 | 1032.99 |
| 450.79 | 1032.95 | 451.79 | 1032.94 | 458.18 | 1032.98 | 463.13 | 1033.09 | 465.57 | 1033.15 |
| 470.13 | 1033.5 | 472.96 | 1033.69 | 474.47 | 1033.86 | 480.34 | 1034.55 | 485.81 | 1035.17 |
| 487.73 | 1035.36 | 495.12 | 1035.73 | 497.15 | 1035.75 | 497.37 | 1035.75 | 502.51 | 1035.74 |
| 508.49 | 1035.74 | 509.9 | 1035.71 | 512.54 | 1035.72 | 517.29 | 1035.7 | 519.83 | 1035.7 |
| 524.67 | 1035.65 | 531.17 | 1035.61 | 532.07 | 1035.6 | 533.73 | 1035.6 | 539.45 | 1035.59 |
| 542.51 | 1035.6 | 546.84 | 1035.55 | 553.85 | 1035.39 | 554.23 | 1035.37 | 554.94 | 1035.33 |
| 565.19 | 1034.83 | 569.01 | 1034.75 | 576.14 | 1034.92 | 576.4 | 1034.92 | 576.54 | 1034.93 |
| 583.78 | 1035.24 | 587.88 | 1035.28 | 598.56 | 1035.19 | 599.22 | 1035.18 | 613.34 | 1035.02 |
| 628.11 | 1034.89 | 639.75 | 1034.83 | 642.89 | 1034.82 | 644.58 | 1034.81 | 657.67 | 1034.8 |
| 660.94 | 1034.77 | 665.06 | 1034.74 | 667.26 | 1034.71 | 674.53 | 1034.5 | 678.6 | 1034.39 |
| 682.14 | 1034.35 | 687.22 | 1034.27 | 689.94 | 1034.21 | 694.61 | 1034.09 | 701.28 | 1033.81 |
| 702 | 1033.77 | 709.39 | 1033.55 | 712.63 | 1033.58 | 716.78 | 1033.6 | 723.97 | 1033.57 |
| 724.17 | 1033.58 | 724.54 | 1033.6 | 731.55 | 1033.91 | 735.31 | 1034.06 | 738.94 | 1034.39 |
| 746.33 | 1035.15 | 746.65 | 1035.18 | 753.72 | 1035.98 | 757.99 | 1036.44 | 761.11 | 1036.82 |
| 762.46 | 1036.96 | 766.95 | 1037.43 | 768.5 | 1037.59 | 769.33 | 1037.66 | 775.89 | 1038.26 |
| 780.67 | 1038.53 | 783.28 | 1038.66 | 788.15 | 1038.87 | 792.01 | 1039.01 | 798.05 | 1039.11 |
| 803.35 | 1039.23 | 809.35 | 1039.24 | 812.83 | 1039.22 | 814.69 | 1039.18 | 820.22 | 1038.97 |
| 826.03 | 1038.69 | 827.61 | 1038.6 | 830.56 | 1038.44 | 834.99 | 1038.19 | 837.37 | 1038.27 |
| 842.38 | 1038.12 | 848.71 | 1038.48 | 849.77 | 1038.53 | 851.75 | 1038.65 | 857.16 | 1039.09 |
| 860.06 | 1039.35 | 863.49 | 1039.62 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 78.58 | .035 | 762.46 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 258.18 | 497.37 | 199.41 | 200 | 212.45 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1035.20 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.035 | 0.035 |
| W.S. Elev (ft) | 1035.10 | Reach Len. (ft) | 199.41 | 200.00 | 212.45 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 193.73 | 99.06 |
| E.G. Slope (ft/ft) | 0.004045 | Area (sq ft) | | 193.73 | 99.06 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 511.21 | 201.79 |
| Top Width (ft) | 360.79 | Top Width (ft) | | 200.38 | 160.41 |
| Vel Total (ft/s) | 2.44 | Avg. Vel. (ft/s) | | 2.64 | 2.04 |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 0.97 | 0.62 |
| Conv. Total (cfs) | 11210.3 | Conv. (cfs) | | 8037.6 | 3172.7 |
| Length Wtd. (ft) | 204.46 | Wetted Per. (ft) | | 200.55 | 160.51 |
| Min Ch El (ft) | 1032.94 | Shear (lb/sq ft) | | 0.24 | 0.16 |
| Alpha | 1.04 | Stream Power (lb/ft s) | | 0.64 | 0.32 |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 13.06 | 34.11 | 8.07 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 21.03 | 27.91 | 13.66 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1035.49 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1035.37 | Reach Len. (ft) | 199.41 | 200.00 | 212.45 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 248.15 | |
| E.G. Slope (ft/ft) | 0.003670 | Area (sq ft) | | 248.15 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 209.98 | Top Width (ft) | | 209.98 | |
| Vel Total (ft/s) | 2.87 | Avg. Vel. (ft/s) | | 2.87 | |
| Max Chl Dpth (ft) | 2.43 | Hydr. Depth (ft) | | 1.18 | |
| Conv. Total (cfs) | 11769.2 | Conv. (cfs) | | 11769.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 210.16 | |
| Min Ch El (ft) | 1032.94 | Shear (lb/sq ft) | | 0.27 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.78 | |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 1.03 | 43.92 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.13 | 29.90 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1035.49 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1035.37 | Reach Len. (ft) | 199.41 | 200.00 | 212.45 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 248.25 | |
| E.G. Slope (ft/ft) | 0.003666 | Area (sq ft) | | 248.25 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 210.00 | Top Width (ft) | | 210.00 | |
| Vel Total (ft/s) | 2.87 | Avg. Vel. (ft/s) | | 2.87 | |
| Max Chl Dpth (ft) | 2.43 | Hydr. Depth (ft) | | 1.18 | |
| Conv. Total (cfs) | 11776.4 | Conv. (cfs) | | 11776.4 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 210.19 | |
| Min Ch El (ft) | 1032.94 | Shear (lb/sq ft) | | 0.27 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.78 | |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 3.31 | 42.10 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.75 | 29.13 | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.933

INPUT
Description: Thalweg Sta. 440.70
Station Elevation Data num= 195

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1040.13 | 1.89 | 1040.08 | 8.77 | 1039.86 | 9.26 | 1039.85 | 10.16 | 1039.83 |
| 16.64 | 1039.66 | 20.14 | 1039.56 | 24.02 | 1039.46 | 31.2 | 1039.24 | 31.4 | 1039.24 |
| 31.51 | 1039.23 | 42.87 | 1038.67 | 46.16 | 1038.44 | 52.24 | 1038.04 | 53.54 | 1037.94 |
| 54.24 | 1037.9 | 60.91 | 1037.45 | 65.61 | 1037.17 | 68.3 | 1037.03 | 73.27 | 1036.79 |
| 75.68 | 1036.67 | 80.89 | 1036.47 | 83.05 | 1036.39 | 88.34 | 1036.26 | 97.81 | 1035.99 |
| 105.2 | 1035.75 | 111.07 | 1035.54 | 112.58 | 1035.49 | 119.95 | 1035.28 | 122.44 | 1035.2 |
| 127.33 | 1035.12 | 134.71 | 1034.95 | 136.38 | 1034.93 | 142.09 | 1034.83 | 145.17 | 1034.76 |
| 156.54 | 1034.57 | 156.85 | 1034.57 | 157.41 | 1034.56 | 164.22 | 1034.46 | 167.91 | 1034.42 |
| 171.6 | 1034.4 | 178.45 | 1034.45 | 179.27 | 1034.45 | 186.37 | 1034.56 | 190.64 | 1034.65 |
| 193.74 | 1034.7 | 199.48 | 1034.83 | 201.12 | 1034.87 | 202.01 | 1034.9 | 213.37 | 1035.21 |
| 220.52 | 1035.38 | 223.26 | 1035.43 | 224.74 | 1035.45 | 230.64 | 1035.51 | 236.11 | 1035.54 |
| 238.02 | 1035.54 | 245.39 | 1035.48 | 247.47 | 1035.46 | 252.78 | 1035.4 | 261.6 | 1035.27 |
| 262.59 | 1035.25 | 267.53 | 1035.19 | 270.2 | 1035.15 | 274.91 | 1035.09 | 281.57 | 1034.99 |
| 282.3 | 1034.97 | 283.63 | 1034.95 | 289.68 | 1034.84 | 292.94 | 1034.79 | 304.3 | 1034.58 |
| 304.67 | 1034.57 | 315.67 | 1034.37 | 319.19 | 1034.32 | 325.7 | 1034.18 | 326.57 | 1034.17 |
| 327.04 | 1034.16 | 333.95 | 1034.04 | 338.4 | 1033.95 | 348.7 | 1033.84 | 349.77 | 1033.83 |
| 356.09 | 1033.76 | 361.14 | 1033.72 | 363.47 | 1033.68 | 367.77 | 1033.62 | 372.5 | 1033.54 |
| 378.22 | 1033.35 | 383.87 | 1032.93 | 385.6 | 1032.89 | 388.8 | 1033.03 | 395.24 | 1033.37 |
| 402.79 | 1033.36 | 406.6 | 1033.43 | 407.74 | 1033.38 | 409.84 | 1033.31 | 415.12 | 1033.09 |
| 417.97 | 1033.05 | 422.5 | 1032.96 | 429.34 | 1032.87 | 429.88 | 1032.86 | 430.88 | 1032.85 |
| 437.26 | 1032.76 | 440.7 | 1032.73 | 451.91 | 1032.56 | 452.01 | 1032.56 | 452.07 | 1032.55 |
| 459.39 | 1032.43 | 463.44 | 1032.46 | 466.78 | 1032.6 | 472.95 | 1032.94 | 474.15 | 1033 |
| 474.8 | 1033.03 | 486.17 | 1033.43 | 488.91 | 1033.51 | 493.99 | 1033.73 | 496.29 | 1033.81 |
| 497.54 | 1033.85 | 503.67 | 1034 | 511.05 | 1034.11 | 515.03 | 1034.12 | 518.43 | 1034.12 |
| 520.27 | 1034.11 | 525.8 | 1034.1 | 533.19 | 1034.06 | 536.06 | 1034.06 | 540.57 | 1034.09 |
| 543 | 1034.17 | 547.94 | 1034.28 | 554.37 | 1034.55 | 555.32 | 1034.6 | 562.7 | 1034.81 |
| 562.77 | 1034.81 | 570.09 | 1034.76 | 577.1 | 1034.62 | 577.47 | 1034.62 | 578.13 | 1034.61 |
| 584.84 | 1034.57 | 588.47 | 1034.57 | 599.16 | 1034.54 | 599.83 | 1034.54 | 611.2 | 1034.52 |
| 614.36 | 1034.51 | 620.2 | 1034.48 | 622.57 | 1034.48 | 633.93 | 1034.41 | 636.49 | 1034.39 |
| 643.88 | 1034.36 | 645.3 | 1034.35 | 658.63 | 1034.28 | 662.27 | 1034.25 | 666.01 | 1034.23 |
| 668.03 | 1034.21 | 673.39 | 1034.17 | 679.4 | 1034.1 | 680.77 | 1034.08 | 683.31 | 1034.05 |
| 690.77 | 1033.94 | 702.13 | 1033.72 | 702.91 | 1033.7 | 713.5 | 1033.47 | 717.67 | 1033.37 |
| 724.87 | 1033.18 | 725.38 | 1033.16 | 732.42 | 1032.92 | 739.8 | 1032.59 | 746.41 | 1032.23 |
| 747.19 | 1032.19 | 747.6 | 1032.18 | 748.99 | 1032.17 | 758.97 | 1032.06 | 769.32 | 1032.72 |
| 770.33 | 1032.79 | 776.7 | 1033.39 | 781.7 | 1033.82 | 784.08 | 1034.05 | 788.48 | 1034.49 |
| 791.46 | 1034.77 | 793.06 | 1034.94 | 798.84 | 1035.35 | 804.43 | 1035.66 | 806.21 | 1035.7 |
| 809.52 | 1035.74 | 813.59 | 1035.77 | 815.8 | 1035.79 | 818.35 | 1035.79 | 820.98 | 1035.79 |
| 827.16 | 1035.82 | 828.36 | 1035.82 | 830.56 | 1035.84 | 835.73 | 1035.83 | 843.11 | 1035.83 |
| 849.9 | 1035.85 | 850.49 | 1035.86 | 851.59 | 1035.87 | 857.88 | 1035.85 | 860.51 | 1035.87 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 80.89 | .035 | 818.35 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 327.04 | 515.03 | 199.17 | 200 | 202.81 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.23 | Element | Left OB | Channel | Right OB |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.035 | 0.035 |
| W.S. Elev (ft) | 1034.10 | Reach Len. (ft) | 199.17 | 200.00 | 202.81 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 146.82 | 101.55 |
| E.G. Slope (ft/ft) | 0.005517 | Area (sq ft) | | 146.82 | 101.55 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 403.42 | 309.58 |
| Top Width (ft) | 303.66 | Top Width (ft) | | 180.43 | 123.24 |
| Vel Total (ft/s) | 2.87 | Avg. Vel. (ft/s) | | 2.75 | 3.05 |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 0.81 | 0.82 |
| Conv. Total (cfs) | 9598.9 | Conv. (cfs) | | 5431.1 | 4167.7 |
| Length Wtd. (ft) | 201.04 | Wetted Per. (ft) | | 180.51 | 123.35 |
| Min Ch El (ft) | 1032.43 | Shear (lb/sq ft) | | 0.28 | 0.28 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 0.77 | 0.86 |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | 13.06 | 33.33 | 7.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 21.03 | 27.03 | 12.97 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.66 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1034.49 | Reach Len. (ft) | 199.17 | 200.00 | 202.81 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 219.64 | |
| E.G. Slope (ft/ft) | 0.004778 | Area (sq ft) | | 219.64 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 187.99 | Top Width (ft) | | 187.99 | |
| Vel Total (ft/s) | 3.25 | Avg. Vel. (ft/s) | | 3.25 | |
| Max Chl Dpth (ft) | 2.43 | Hydr. Depth (ft) | | 1.17 | |
| Conv. Total (cfs) | 10315.0 | Conv. (cfs) | | 10315.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 188.78 | |
| Min Ch El (ft) | 1032.43 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.13 | |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | 1.03 | 42.85 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 28.99 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.65 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1034.49 | Reach Len. (ft) | 199.17 | 200.00 | 202.81 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 219.20 | |
| E.G. Slope (ft/ft) | 0.004810 | Area (sq ft) | | 219.20 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 187.99 | Top Width (ft) | | 187.99 | |
| Vel Total (ft/s) | 3.25 | Avg. Vel. (ft/s) | | 3.25 | |
| Max Chl Dpth (ft) | 2.06 | Hydr. Depth (ft) | | 1.17 | |
| Conv. Total (cfs) | 10281.1 | Conv. (cfs) | | 10281.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 188.77 | |
| Min Ch El (ft) | 1032.43 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.13 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 3.31 | 41.03 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 28.21 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.895

INPUT
Description: Thalweg Sta. 446.96
Station Elevation Data num= 186

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1035.72 | 1.83 | 1035.87 | 13.25 | 1036.69 | 14.08 | 1036.72 | 15.61 | 1036.79 |
| 24.67 | 1037.19 | 28.82 | 1037.26 | 36.08 | 1037.4 | 36.36 | 1037.4 | 43.54 | 1037.44 |
| 47.49 | 1037.45 | 50.9 | 1037.43 | 58.26 | 1037.3 | 58.9 | 1037.28 | 70.32 | 1037.03 |
| 72.99 | 1036.96 | 80.35 | 1036.72 | 81.73 | 1036.66 | 93.15 | 1036.05 | 95.08 | 1035.93 |
| 98.6 | 1035.74 | 102.45 | 1035.52 | 109.81 | 1035.13 | 115.97 | 1034.85 | 117.17 | 1034.8 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 119.34 | 1034.73 | 124.53 | 1034.54 | 131.89 | 1034.36 | 138.8 | 1034.25 | 139.25 | 1034.25 |
| 140.09 | 1034.24 | 141.95 | 1034.23 | 146.62 | 1034.22 | 150.21 | 1034.25 | 160.83 | 1034.27 |
| 161.63 | 1034.27 | 168.7 | 1034.22 | 176.07 | 1034.14 | 183.44 | 1034.02 | 184.45 | 1034 |
| 190.8 | 1033.86 | 195.87 | 1033.73 | 198.16 | 1033.68 | 202.32 | 1033.61 | 205.52 | 1033.54 |
| 207.28 | 1033.52 | 212.88 | 1033.53 | 218.69 | 1033.56 | 220.24 | 1033.59 | 227.61 | 1033.69 |
| 230.11 | 1033.72 | 241.52 | 1033.83 | 242.33 | 1033.83 | 243.81 | 1033.84 | 249.69 | 1033.86 |
| 252.93 | 1033.86 | 257.06 | 1033.84 | 264.35 | 1033.82 | 264.56 | 1033.82 | 271.79 | 1033.78 |
| 275.76 | 1033.77 | 279.15 | 1033.75 | 285.3 | 1033.74 | 287.17 | 1033.74 | 293.87 | 1033.72 |
| 298.59 | 1033.72 | 301.23 | 1033.7 | 306.05 | 1033.68 | 308.6 | 1033.66 | 310 | 1033.64 |
| 315.96 | 1033.49 | 321.42 | 1033.3 | 323.32 | 1033.23 | 330.68 | 1032.93 | 332.83 | 1032.85 |
| 338.06 | 1032.72 | 344.24 | 1032.68 | 345.42 | 1032.67 | 347.54 | 1032.67 | 352.78 | 1032.66 |
| 355.65 | 1032.66 | 367.07 | 1032.64 | 367.5 | 1032.64 | 368.29 | 1032.65 | 374.86 | 1032.68 |
| 378.48 | 1032.75 | 382.23 | 1032.89 | 389.04 | 1033.4 | 389.59 | 1033.44 | 389.9 | 1033.47 |
| 396.95 | 1033.88 | 401.31 | 1033.94 | 404.31 | 1033.91 | 411.68 | 1033.71 | 412.72 | 1033.69 |
| 419.05 | 1033.32 | 424.13 | 1032.55 | 426.41 | 1032.16 | 430.53 | 1031.76 | 435.55 | 1031.25 |
| 441.69 | 1031.22 | 446.96 | 1031.16 | 455.85 | 1031.28 | 458.38 | 1031.31 | 463.22 | 1031.38 |
| 469.79 | 1031.46 | 470.58 | 1031.48 | 472.01 | 1031.49 | 477.94 | 1031.57 | 481.2 | 1031.59 |
| 485.3 | 1031.58 | 492.62 | 1031.46 | 492.76 | 1031.46 | 500.04 | 1031.52 | 504.03 | 1031.72 |
| 507.4 | 1031.92 | 513.5 | 1032.16 | 514.76 | 1032.22 | 515.45 | 1032.25 | 522.12 | 1032.6 |
| 526.86 | 1032.9 | 529.48 | 1033.06 | 534.25 | 1033.26 | 536.84 | 1033.39 | 538.27 | 1033.42 |
| 549.68 | 1033.52 | 555 | 1033.55 | 558.93 | 1033.56 | 566.29 | 1033.6 | 572.51 | 1033.62 |
| 573.66 | 1033.62 | 581.03 | 1033.66 | 588.39 | 1033.68 | 595.34 | 1033.67 | 595.75 | 1033.67 |
| 596.49 | 1033.66 | 600.42 | 1033.65 | 629.58 | 1033.64 | 637.98 | 1033.66 | 639.92 | 1033.66 |
| 640.99 | 1033.67 | 652.41 | 1033.7 | 654.66 | 1033.71 | 658.73 | 1033.71 | 662.02 | 1033.72 |
| 663.82 | 1033.72 | 675.23 | 1033.69 | 676.74 | 1033.69 | 698.06 | 1033.59 | 698.82 | 1033.59 |
| 720.89 | 1033.43 | 720.97 | 1033.43 | 743.72 | 1033.22 | 755.13 | 1033.05 | 757.73 | 1032.99 |
| 762.45 | 1032.89 | 765.09 | 1032.84 | 766.54 | 1032.81 | 777.95 | 1032.53 | 779.82 | 1032.48 |
| 787.18 | 1032.3 | 789.37 | 1032.24 | 794.54 | 1032.09 | 800.78 | 1031.89 | 809.27 | 1031.51 |
| 812.2 | 1031.4 | 816.64 | 1031.32 | 820.84 | 1031.3 | 823.61 | 1031.28 | 824 | 1031.29 |
| 824.69 | 1031.32 | 831.36 | 1031.57 | 835.02 | 1031.81 | 838.72 | 1032.23 | 845.44 | 1032.96 |
| 846.08 | 1033.04 | 846.43 | 1033.07 | 847.66 | 1033.16 | 857.85 | 1033.95 | 860.81 | 1034.13 |
| 866.18 | 1034.44 | 868.17 | 1034.56 | 869.26 | 1034.63 | 875.53 | 1035.05 | 880.68 | 1035.46 |
| 881.67 | 1035.55 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 141.95 | .035 | 820.84 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 401.31 | 600.42 | 198.5 | 200 | 206.94 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1033.09 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.035 | 0.035 | 0.034 |
| W.S. Elev (ft) | 1032.90 | Reach Len. (ft) | 198.50 | 200.00 | 206.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 10.23 | 128.77 | 71.76 |
| E.G. Slope (ft/ft) | 0.005866 | Area (sq ft) | 10.23 | 128.77 | 71.76 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 11.41 | 479.17 | 222.42 |
| Top Width (ft) | 238.83 | Top Width (ft) | 50.88 | 105.04 | 82.91 |
| Vel Total (ft/s) | 3.38 | Avg. Vel. (ft/s) | 1.12 | 3.72 | 3.10 |
| Max Chl Dpth (ft) | 1.74 | Hydr. Depth (ft) | 0.20 | 1.23 | 0.87 |
| Conv. Total (cfs) | 9309.4 | Conv. (cfs) | 149.0 | 6256.4 | 2904.0 |
| Length Wtd. (ft) | 201.66 | Wetted Per. (ft) | 50.88 | 105.18 | 83.01 |
| Min Ch El (ft) | 1031.16 | Shear (lb/sq ft) | 0.07 | 0.45 | 0.32 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.08 | 1.67 | 0.98 |
| Frctn Loss (ft) | 0.93 | Cum Volume (acre-ft) | 13.04 | 32.70 | 7.17 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 20.92 | 26.38 | 12.49 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1033.49 | Element | | | |
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1033.18 | Reach Len. (ft) | 198.50 | 200.00 | 206.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 159.63 | |
| E.G. Slope (ft/ft) | 0.006956 | Area (sq ft) | | 159.63 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 112.50 | Top Width (ft) | | 112.50 | |
| Vel Total (ft/s) | 4.47 | Avg. Vel. (ft/s) | | 4.47 | |
| Max Chl Dpth (ft) | 2.02 | Hydr. Depth (ft) | | 1.42 | |
| Conv. Total (cfs) | 8548.9 | Conv. (cfs) | | 8548.9 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 112.68 | |
| Min Ch El (ft) | 1031.16 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.75 | |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 1.03 | 41.98 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 1.13 | 28.30 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1033.49 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1033.18 | Reach Len. (ft) | 198.50 | 200.00 | 206.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 159.63 | |
| E.G. Slope (ft/ft) | 0.006956 | Area (sq ft) | | 159.63 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 112.50 | Top Width (ft) | | 112.50 | |
| Vel Total (ft/s) | 4.47 | Avg. Vel. (ft/s) | | 4.47 | |
| Max Chl Dpth (ft) | 2.02 | Hydr. Depth (ft) | | 1.42 | |
| Conv. Total (cfs) | 8548.9 | Conv. (cfs) | | 8548.9 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 112.68 | |
| Min Ch El (ft) | 1031.16 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.75 | |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 3.31 | 40.16 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 2.75 | 27.52 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.857

INPUT
Description: Thalweg Sta. 470.66
Station Elevation Data num= 180

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1035.77 | 2.71 | 1035.64 | 7.05 | 1035.32 | 14.18 | 1035 | 14.32 | 1034.99 |
| 14.4 | 1034.98 | 21.6 | 1034.43 | 26.1 | 1034.18 | 28.88 | 1033.94 | 33.45 | 1033.68 |
| 36.16 | 1033.49 | 37.8 | 1033.42 | 43.44 | 1033.01 | 49.5 | 1032.75 | 50.71 | 1032.65 |
| 52.72 | 1032.55 | 57.99 | 1032.31 | 61.2 | 1032.2 | 65.28 | 1031.83 | 71.99 | 1031.62 |
| 72.56 | 1031.6 | 72.9 | 1031.59 | 74.3 | 1031.51 | 84.59 | 1031.21 | 87.11 | 1031.22 |
| 91.26 | 1031.46 | 94.39 | 1031.75 | 96.3 | 1031.73 | 107.99 | 1032 | 108.95 | 1032 |
| 110.53 | 1032.05 | 116.23 | 1032.17 | 119.69 | 1032.31 | 129.8 | 1032.45 | 131.39 | 1032.48 |
| 133.85 | 1032.51 | 152.62 | 1032.72 | 167.19 | 1032.93 | 168.33 | 1032.94 | 174.46 | 1033.01 |
| 178.18 | 1033.06 | 187.6 | 1033.14 | 189.02 | 1033.15 | 189.89 | 1033.15 | 201.58 | 1033.2 |
| 206.87 | 1033.2 | 210.86 | 1033.21 | 213.28 | 1033.2 | 218.14 | 1033.19 | 224.98 | 1033.15 |
| 225.42 | 1033.15 | 226.14 | 1033.14 | 236.68 | 1033.07 | 239.98 | 1033.07 | 245.41 | 1033.05 |
| 247.26 | 1033.05 | 248.38 | 1033.04 | 254.53 | 1032.94 | 260.07 | 1032.72 | 261.82 | 1032.63 |
| 264.68 | 1032.54 | 269.09 | 1032.38 | 271.78 | 1032.36 | 276.37 | 1032.37 | 283.48 | 1032.47 |
| 283.95 | 1032.47 | 290.94 | 1032.56 | 295.17 | 1032.6 | 303.22 | 1032.66 | 305.49 | 1032.67 |
| 306.87 | 1032.68 | 320.06 | 1032.68 | 327.33 | 1032.65 | 330.27 | 1032.65 | 341.28 | 1032.57 |
| 341.97 | 1032.57 | 349.16 | 1032.47 | 353.66 | 1032.39 | 356.45 | 1032.33 | 361.02 | 1032.25 |
| 363.73 | 1032.19 | 365.37 | 1032.15 | 377.07 | 1031.81 | 378.28 | 1031.78 | 385.57 | 1031.64 |
| 388.76 | 1031.83 | 392.85 | 1032.24 | 399.56 | 1032.81 | 400.12 | 1032.86 | 400.46 | 1032.88 |
| 407.4 | 1033.08 | 412.16 | 1033.06 | 418.83 | 1032.95 | 421.97 | 1032.89 | 423.86 | 1032.83 |
| 429.24 | 1032.6 | 435.56 | 1032.14 | 436.52 | 1032.04 | 438.11 | 1031.88 | 443.8 | 1031.27 |
| 447.25 | 1031.05 | 451.08 | 1030.91 | 457.37 | 1030.96 | 458.36 | 1030.96 | 458.96 | 1030.98 |
| 465.63 | 1031.29 | 470.66 | 1031.4 | 472.91 | 1031.41 | 476.64 | 1031.36 | 480.2 | 1031.32 |
| 482.35 | 1031.28 | 487.48 | 1031.09 | 494.05 | 1030.93 | 494.75 | 1030.91 | 495.91 | 1030.88 |
| 502.03 | 1030.68 | 509.31 | 1030.54 | 515.18 | 1030.44 | 516.6 | 1030.41 | 517.45 | 1030.4 |
| 523.87 | 1030.37 | 529.15 | 1030.33 | 531.15 | 1030.34 | 534.45 | 1030.35 | 538.43 | 1030.37 |
| 540.84 | 1030.36 | 545.71 | 1030.3 | 552.55 | 1030.18 | 553.71 | 1030.18 | 560.27 | 1030.17 |
| 564.25 | 1030.19 | 567.54 | 1030.28 | 572.98 | 1030.59 | 575.94 | 1030.75 | 582.11 | 1031.45 |
| 587.64 | 1032.06 | 592.25 | 1032.26 | 596.66 | 1032.38 | 599.34 | 1032.47 | 603.94 | 1032.46 |
| 611.04 | 1032.58 | 611.52 | 1032.58 | 618.5 | 1032.55 | 622.74 | 1032.58 | 625.39 | 1032.56 |
| 625.78 | 1032.56 | 630.8 | 1032.53 | 633.06 | 1032.46 | 634.43 | 1032.43 | 640.34 | 1032.24 |
| 646.14 | 1032.07 | 650.06 | 1031.94 | 657.84 | 1031.51 | 662.17 | 1031.28 | 669.33 | 1030.88 |
| 669.53 | 1030.88 | 669.85 | 1030.87 | 681.23 | 1030.59 | 688.6 | 1030.49 | 691.29 | 1030.68 |
| 692.93 | 1030.82 | 698.57 | 1031.21 | 704.63 | 1031.68 | 705.86 | 1031.75 | 707.87 | 1031.92 |
| 713.13 | 1032.21 | 716.33 | 1032.42 | 720.41 | 1032.68 | 727.14 | 1033.16 | 727.69 | 1033.17 |
| 728.02 | 1033.18 | 734.98 | 1033.41 | 739.73 | 1033.58 | 742.25 | 1033.66 | 746.4 | 1033.81 |
| 749.53 | 1033.82 | 751.43 | 1033.83 | 763.12 | 1033.88 | 764.08 | 1033.88 | 765.67 | 1033.89 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .032 | 131.39 | .035 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

407.4 622.74 237.26 199.71 112.1 .1 .3

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1032.15 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.032 | 0.035 | 0.035 |
| W.S. Elev (ft) | 1032.03 | Reach Len. (ft) | 237.26 | 199.71 | 112.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 23.39 | 186.05 | 54.39 |
| E.G. Slope (ft/ft) | 0.003691 | Area (sq ft) | 23.39 | 186.05 | 54.39 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 33.23 | 551.88 | 127.89 |
| Top Width (ft) | 280.90 | Top Width (ft) | 67.83 | 150.69 | 62.38 |
| Vel Total (ft/s) | 2.70 | Avg. Vel. (ft/s) | 1.42 | 2.97 | 2.35 |
| Max Chl Dpth (ft) | 1.86 | Hydr. Depth (ft) | 0.34 | 1.23 | 0.87 |
| Conv. Total (cfs) | 11736.2 | Conv. (cfs) | 547.0 | 9084.1 | 2105.2 |
| Length Wtd. (ft) | 191.65 | Wetted Per. (ft) | 67.89 | 150.85 | 62.47 |
| Min Ch El (ft) | 1030.17 | Shear (lb/sq ft) | 0.08 | 0.28 | 0.20 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.11 | 0.84 | 0.47 |
| Frctn Loss (ft) | 1.10 | Cum Volume (acre-ft) | 12.96 | 31.98 | 6.87 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 20.65 | 25.79 | 12.15 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1032.34 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1032.15 | Reach Len. (ft) | 237.26 | 199.71 | 112.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 205.24 | |
| E.G. Slope (ft/ft) | 0.004588 | Area (sq ft) | | 205.24 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 154.40 | Top Width (ft) | | 154.40 | |
| Vel Total (ft/s) | 3.47 | Avg. Vel. (ft/s) | | 3.47 | |
| Max Chl Dpth (ft) | 1.98 | Hydr. Depth (ft) | | 1.33 | |
| Conv. Total (cfs) | 10526.7 | Conv. (cfs) | | 10526.7 | |
| Length Wtd. (ft) | 199.71 | Wetted Per. (ft) | | 154.57 | |
| Min Ch El (ft) | 1030.17 | Shear (lb/sq ft) | | 0.38 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.32 | |
| Frctn Loss (ft) | 1.23 | Cum Volume (acre-ft) | 1.03 | 41.14 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.13 | 27.68 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1032.34 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1032.15 | Reach Len. (ft) | 237.26 | 199.71 | 112.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 205.24 | |
| E.G. Slope (ft/ft) | 0.004588 | Area (sq ft) | | 205.24 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 154.40 | Top Width (ft) | | 154.40 | |
| Vel Total (ft/s) | 3.47 | Avg. Vel. (ft/s) | | 3.47 | |
| Max Chl Dpth (ft) | 1.98 | Hydr. Depth (ft) | | 1.33 | |
| Conv. Total (cfs) | 10526.7 | Conv. (cfs) | | 10526.7 | |
| Length Wtd. (ft) | 199.71 | Wetted Per. (ft) | | 154.57 | |
| Min Ch El (ft) | 1030.17 | Shear (lb/sq ft) | | 0.38 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.32 | |
| Frctn Loss (ft) | 1.23 | Cum Volume (acre-ft) | 3.31 | 39.32 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.75 | 26.91 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.820

INPUT
Description: Thalweg Sta. 406.65

Station Elevation Data num= 158

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1035.35 | 5.4 | 1035.21 | 7.44 | 1035.16 | 15.43 | 1034.94 | 16.74 | 1034.91 |
| 25.46 | 1034.69 | 26.03 | 1034.68 | 33.27 | 1034.5 | 35.33 | 1034.44 | 35.49 | 1034.44 |
| 44.62 | 1034.21 | 45.52 | 1034.18 | 53.92 | 1034.01 | 55.55 | 1033.96 | 63.22 | 1033.81 |
| 65.58 | 1033.74 | 72.51 | 1033.63 | 75.62 | 1033.54 | 81.8 | 1033.44 | 85.65 | 1033.31 |
| 91.1 | 1033.17 | 109.69 | 1032.52 | 115.74 | 1032.33 | 117.02 | 1032.28 | 118.99 | 1032.2 |
| 125.77 | 1032.02 | 128.28 | 1031.95 | 137.58 | 1031.74 | 145.83 | 1031.58 | 146.88 | 1031.57 |
| 155.87 | 1031.4 | 156.17 | 1031.4 | 165.47 | 1031.28 | 165.9 | 1031.27 | 174.77 | 1031.24 |
| 175.93 | 1031.23 | 184.05 | 1031.22 | 185.96 | 1031.2 | 195.99 | 1031.2 | 202.65 | 1031.22 |
| 206.02 | 1031.22 | 221.24 | 1031.27 | 236.12 | 1031.27 | 239.83 | 1031.26 | 256.18 | 1031.25 |
| 258.43 | 1031.24 | 266.21 | 1031.22 | 267.71 | 1031.22 | 276.24 | 1031.16 | 277.01 | 1031.16 |
| 286.27 | 1031.08 | 286.75 | 1031.08 | 295.6 | 1031 | 296.3 | 1030.99 | 304.9 | 1030.92 |
| 306.34 | 1030.91 | 314.19 | 1030.83 | 316.37 | 1030.82 | 323.49 | 1030.75 | 326.4 | 1030.73 |
| 332.79 | 1030.67 | 336.43 | 1030.65 | 340.2 | 1030.62 | 351.38 | 1030.51 | 356.49 | 1030.45 |
| 366.52 | 1030.3 | 376.55 | 1030.12 | 379.26 | 1030.08 | 386.59 | 1029.93 | 388.56 | 1029.9 |
| 396.62 | 1029.73 | 406.65 | 1029.56 | 407.15 | 1029.57 | 416.45 | 1029.66 | 416.68 | 1029.67 |
| 425.74 | 1029.91 | 426.71 | 1029.96 | 435.04 | 1030.08 | 436.74 | 1030.08 | 444.34 | 1030.11 |
| 446.77 | 1030.05 | 453.62 | 1030.08 | 456.8 | 1030.04 | 462.92 | 1030.07 | 466.84 | 1030.06 |
| 472.22 | 1030.07 | 476.87 | 1030.06 | 481.51 | 1030.07 | 486.9 | 1030.06 | 490.81 | 1030.08 |
| 496.93 | 1030.08 | 500.11 | 1030.09 | 509.4 | 1030.09 | 516.99 | 1030.03 | 518.7 | 1030.03 |
| 527.02 | 1029.95 | 537.29 | 1029.94 | 540.22 | 1029.95 | 546.58 | 1030 | 547.09 | 1030 |
| 555.88 | 1030.03 | 565.17 | 1030.1 | 567.15 | 1030.14 | 574.47 | 1030.26 | 577.18 | 1030.35 |
| 583.76 | 1030.49 | 587.21 | 1030.62 | 593.06 | 1030.77 | 597.24 | 1030.89 | 597.64 | 1030.9 |
| 602.36 | 1031.08 | 607.27 | 1031.19 | 611.65 | 1031.27 | 617.31 | 1031.32 | 627.34 | 1031.34 |
| 630.25 | 1031.33 | 637.37 | 1031.29 | 639.53 | 1031.27 | 647.4 | 1031.17 | 648.83 | 1031.16 |
| 657.43 | 1031.12 | 658.13 | 1031.12 | 666.97 | 1031.16 | 667.46 | 1031.16 | 676.72 | 1031.23 |
| 677.49 | 1031.24 | 686.02 | 1031.3 | 687.52 | 1031.32 | 695.31 | 1031.4 | 697.56 | 1031.43 |
| 704.61 | 1031.5 | 707.59 | 1031.54 | 717.62 | 1031.63 | 723.2 | 1031.63 | 732.49 | 1031.59 |
| 737.68 | 1031.52 | 741.79 | 1031.48 | 751.08 | 1031.28 | 757.74 | 1030.99 | 760.38 | 1030.91 |
| 767.77 | 1030.56 | 769.68 | 1030.5 | 777.81 | 1030.36 | 778.97 | 1030.35 | 787.84 | 1030.45 |
| 788.27 | 1030.45 | 793.24 | 1030.59 | 793.7 | 1030.6 | 797.57 | 1030.71 | 797.87 | 1030.72 |
| 806.86 | 1031.17 | 807.9 | 1031.24 | 809.12 | 1031.38 | 817.93 | 1032.17 | 825.45 | 1032.91 |
| 827.96 | 1033.17 | 834.74 | 1033.7 | 835.87 | 1033.76 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 117.02 | .035 | 793.24 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 366.52 | 583.76 | 198.68 | 199.97 | 217.11 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.04 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.035 | 0.035 | 0.035 |
| W.S. Elev (ft) | 1030.83 | Reach Len. (ft) | 198.68 | 199.97 | 217.11 |
| Crit W.S. (ft) | 1030.71 | Flow Area (sq ft) | 12.25 | 178.42 | 13.56 |
| E.G. Slope (ft/ft) | 0.010087 | Area (sq ft) | 12.25 | 178.42 | 13.56 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 19.77 | 667.19 | 26.04 |
| Top Width (ft) | 319.48 | Top Width (ft) | 52.63 | 217.24 | 49.62 |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | 1.61 | 3.74 | 1.92 |
| Max Chl Dpth (ft) | 1.27 | Hydr. Depth (ft) | 0.23 | 0.82 | 0.27 |
| Conv. Total (cfs) | 7099.1 | Conv. (cfs) | 196.8 | 6643.0 | 259.3 |
| Length Wtd. (ft) | 200.86 | Wetted Per. (ft) | 52.63 | 217.26 | 49.64 |
| Min Ch El (ft) | 1029.56 | Shear (lb/sq ft) | 0.15 | 0.52 | 0.17 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.24 | 1.93 | 0.33 |
| Frctn Loss (ft) | 1.87 | Cum Volume (acre-ft) | 12.87 | 31.14 | 6.79 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 20.32 | 24.95 | 12.00 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.12 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1030.91 | Reach Len. (ft) | 198.68 | 199.97 | 217.11 |
| Crit W.S. (ft) | 1030.70 | Flow Area (sq ft) | | 194.26 | |
| E.G. Slope (ft/ft) | 0.008732 | Area (sq ft) | | 194.26 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 217.24 | Top Width (ft) | | 217.24 | |
| Vel Total (ft/s) | 3.67 | Avg. Vel. (ft/s) | | 3.67 | |
| Max Chl Dpth (ft) | 1.35 | Hydr. Depth (ft) | | 0.89 | |
| Conv. Total (cfs) | 7630.2 | Conv. (cfs) | | 7630.2 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 218.28 | |
| Min Ch El (ft) | 1029.56 | Shear (lb/sq ft) | | 0.49 | |

| | | | | |
|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.78 |
| Frctn Loss (ft) | 1.81 | Cum Volume (acre-ft) | 1.03 | 40.22 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 26.83 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.12 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1030.91 | Reach Len. (ft) | 198.68 | 199.97 | 217.11 |
| Crit W.S. (ft) | 1030.70 | Flow Area (sq ft) | | 194.26 | |
| E.G. Slope (ft/ft) | 0.008732 | Area (sq ft) | | 194.26 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 217.24 | Top Width (ft) | | 217.24 | |
| Vel Total (ft/s) | 3.67 | Avg. Vel. (ft/s) | | 3.67 | |
| Max Chl Dpth (ft) | 1.35 | Hydr. Depth (ft) | | 0.89 | |
| Conv. Total (cfs) | 7630.2 | Conv. (cfs) | | 7630.2 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 218.28 | |
| Min Ch El (ft) | 1029.56 | Shear (lb/sq ft) | | 0.49 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.78 | |
| Frctn Loss (ft) | 1.81 | Cum Volume (acre-ft) | 3.31 | 38.41 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 26.06 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.782

INPUT
Description: Thalweg Sta. 486.39
Station Elevation Data num= 175

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1036.05 | 2.3 | 1035.99 | 6.67 | 1035.83 | 12.39 | 1035.65 | 15.56 | 1035.53 |
| 22.49 | 1035.28 | 24.44 | 1035.19 | 32.58 | 1034.83 | 33.32 | 1034.79 | 42.21 | 1034.26 |
| 42.67 | 1034.24 | 51.1 | 1033.75 | 52.76 | 1033.65 | 54.96 | 1033.54 | 62.85 | 1033.17 |
| 66.64 | 1033.01 | 72.95 | 1033.13 | 78.32 | 1033.18 | 83.04 | 1033.34 | 93.13 | 1033.72 |
| 101.68 | 1034.07 | 103.22 | 1034.11 | 113 | 1034.32 | 113.32 | 1034.32 | 122.17 | 1034.29 |
| 123.41 | 1034.3 | 131.05 | 1034.08 | 133.5 | 1034.04 | 136.73 | 1033.92 | 143.59 | 1033.58 |
| 148.81 | 1033.31 | 157.7 | 1033 | 163.78 | 1032.81 | 166.58 | 1032.7 | 173.87 | 1032.38 |
| 175.46 | 1032.28 | 179.59 | 1032.04 | 183.96 | 1031.78 | 184.34 | 1031.75 | 193.23 | 1030.94 |
| 194.05 | 1030.87 | 202.12 | 1030.06 | 204.14 | 1029.86 | 211 | 1029.26 | 214.24 | 1028.99 |
| 219.88 | 1028.73 | 224.33 | 1028.62 | 228.77 | 1028.79 | 234.42 | 1028.99 | 237.65 | 1029.13 |
| 244.51 | 1029.35 | 246.53 | 1029.41 | 254.6 | 1029.61 | 255.41 | 1029.62 | 261.38 | 1029.65 |
| 264.3 | 1029.66 | 264.7 | 1029.66 | 274.79 | 1029.4 | 282.06 | 1029.19 | 284.88 | 1029.12 |
| 290.95 | 1029.07 | 294.97 | 1029.08 | 299.84 | 1029.25 | 305.06 | 1029.46 | 308.72 | 1029.59 |
| 315.16 | 1029.75 | 317.6 | 1029.77 | 326.48 | 1029.77 | 335.34 | 1029.73 | 335.56 | 1029.73 |
| 344.25 | 1029.7 | 345.43 | 1029.69 | 353.13 | 1029.65 | 355.53 | 1029.6 | 362.02 | 1029.37 |
| 365.62 | 1029.12 | 370.91 | 1028.58 | 375.71 | 1028.29 | 379.79 | 1028.2 | 385.8 | 1028.23 |
| 388.67 | 1028.35 | 395.89 | 1028.98 | 397.55 | 1029.17 | 405.99 | 1029.98 | 406.44 | 1030 |
| 409.75 | 1030.06 | 415.19 | 1030.17 | 415.32 | 1030.17 | 416.08 | 1030.16 | 424.2 | 1029.62 |
| 433.08 | 1028.99 | 436.26 | 1028.79 | 441.98 | 1028.48 | 446.36 | 1028.23 | 450.86 | 1028.1 |
| 456.45 | 1027.97 | 466.54 | 1027.97 | 468.62 | 1027.9 | 476.63 | 1027.59 | 477.51 | 1027.59 |
| 486.39 | 1027.52 | 486.72 | 1027.52 | 495.27 | 1027.73 | 496.82 | 1027.76 | 504.15 | 1027.83 |
| 506.91 | 1027.85 | 517 | 1027.84 | 521.92 | 1027.82 | 527.09 | 1027.81 | 530.81 | 1027.79 |
| 547.28 | 1027.73 | 557.46 | 1027.74 | 558.12 | 1027.75 | 567.46 | 1027.84 | 575.22 | 1028.14 |
| 577.55 | 1028.26 | 584.11 | 1028.65 | 587.64 | 1028.81 | 592.99 | 1028.9 | 597.74 | 1028.94 |
| 601.87 | 1028.9 | 607.83 | 1028.87 | 609 | 1028.86 | 617.92 | 1028.81 | 628.01 | 1028.82 |
| 628.53 | 1028.83 | 637.41 | 1028.86 | 648.2 | 1028.85 | 655.18 | 1028.86 | 658.29 | 1028.87 |
| 664.06 | 1028.9 | 668.38 | 1028.91 | 672.94 | 1028.91 | 681.83 | 1028.8 | 688.57 | 1028.63 |
| 690.72 | 1028.59 | 698.66 | 1028.43 | 699.6 | 1028.42 | 706.5 | 1028.36 | 708.48 | 1028.35 |
| 717.37 | 1028.35 | 718.84 | 1028.38 | 726.25 | 1028.43 | 728.93 | 1028.56 | 735.13 | 1028.72 |
| 739.03 | 1029.01 | 744.01 | 1029.28 | 749.12 | 1029.69 | 752.9 | 1029.94 | 759.21 | 1030.24 |
| 759.25 | 1030.24 | 761.78 | 1030.34 | 769.3 | 1030.4 | 770.66 | 1030.43 | 779.39 | 1030.31 |
| 779.55 | 1030.31 | 789.49 | 1030.4 | 799.58 | 1030.99 | 806.2 | 1031.47 | 809.67 | 1031.69 |
| 815.08 | 1031.89 | 819.76 | 1031.98 | 823.97 | 1032 | 829.86 | 1031.96 | 839.95 | 1031.93 |
| 841.73 | 1031.94 | 850.04 | 1031.97 | 859.51 | 1032.14 | 860.13 | 1032.15 | 868.39 | 1032.41 |
| 870.22 | 1032.47 | 877.27 | 1032.87 | 880.32 | 1033.07 | 886.15 | 1033.48 | 889.06 | 1033.71 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 179.59 | .035 | 759.25 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 415.19 | 597.74 | 188.74 | 199.97 | 228.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.17 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.035 | 0.035 | 0.035 |
| W.S. Elev (ft) | 1028.96 | Reach Len. (ft) | 188.74 | 199.97 | 228.54 |
| Crit W.S. (ft) | 1028.80 | Flow Area (sq ft) | 18.20 | 160.04 | 34.43 |
| E.G. Slope (ft/ft) | 0.008577 | Area (sq ft) | 18.20 | 160.04 | 34.43 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 41.69 | 618.34 | 52.97 |
| Top Width (ft) | 352.25 | Top Width (ft) | 47.36 | 164.23 | 140.66 |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 2.29 | 3.86 | 1.54 |
| Max Chl Dpth (ft) | 1.44 | Hydr. Depth (ft) | 0.38 | 0.97 | 0.24 |
| Conv. Total (cfs) | 7698.7 | Conv. (cfs) | 450.2 | 6676.6 | 571.9 |
| Length Wtd. (ft) | 200.26 | Wetted Per. (ft) | 47.43 | 164.29 | 140.68 |
| Min Ch El (ft) | 1027.52 | Shear (lb/sq ft) | 0.21 | 0.52 | 0.13 |
| Alpha | 1.19 | Stream Power (lb/ft s) | 0.47 | 2.02 | 0.20 |
| Frctn Loss (ft) | 1.19 | Cum Volume (acre-ft) | 12.80 | 30.36 | 6.67 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 20.09 | 24.07 | 11.53 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.30 | Element | | | |
| Vel Head (ft) | 0.27 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1029.02 | Reach Len. (ft) | 188.74 | 199.97 | 228.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 169.97 | |
| E.G. Slope (ft/ft) | 0.009405 | Area (sq ft) | | 169.97 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 165.13 | Top Width (ft) | | 165.13 | |
| Vel Total (ft/s) | 4.19 | Avg. Vel. (ft/s) | | 4.19 | |
| Max Chl Dpth (ft) | 1.50 | Hydr. Depth (ft) | | 1.03 | |
| Conv. Total (cfs) | 7352.0 | Conv. (cfs) | | 7352.0 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 165.27 | |
| Min Ch El (ft) | 1027.52 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.53 | |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 1.03 | 39.39 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.13 | 25.96 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.30 | Element | | | |
| Vel Head (ft) | 0.27 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1029.02 | Reach Len. (ft) | 188.74 | 199.97 | 228.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 169.97 | |
| E.G. Slope (ft/ft) | 0.009405 | Area (sq ft) | | 169.97 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 165.13 | Top Width (ft) | | 165.13 | |
| Vel Total (ft/s) | 4.19 | Avg. Vel. (ft/s) | | 4.19 | |
| Max Chl Dpth (ft) | 1.50 | Hydr. Depth (ft) | | 1.03 | |
| Conv. Total (cfs) | 7352.0 | Conv. (cfs) | | 7352.0 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 165.27 | |
| Min Ch El (ft) | 1027.52 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.53 | |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 3.31 | 37.57 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 2.75 | 25.18 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E

REACH: Reach 2 RS: 5.744

INPUT
Description: Thalweg Sta. 468.81
Station Elevation Data num= 226

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1036.06 | 3.18 | 1035.99 | 13.78 | 1035.8 | 21.63 | 1035.69 | 29.47 | 1035.6 |
| 34.97 | 1035.55 | 37.31 | 1035.51 | 44 | 1035.41 | 45.16 | 1035.39 | 45.57 | 1035.39 |
| 53.01 | 1035.22 | 56.17 | 1035.17 | 60.85 | 1035.02 | 66.76 | 1034.91 | 68.69 | 1034.86 |
| 74.2 | 1034.79 | 76.55 | 1034.74 | 77.36 | 1034.72 | 84.39 | 1034.64 | 87.96 | 1034.57 |
| 92.23 | 1034.53 | 98.56 | 1034.4 | 100.08 | 1034.38 | 104.42 | 1034.27 | 107.92 | 1034.17 |
| 115.77 | 1033.91 | 119.75 | 1033.77 | 123.62 | 1033.68 | 130.35 | 1033.47 | 131.46 | 1033.47 |
| 134.63 | 1033.44 | 139.3 | 1033.44 | 140.94 | 1033.41 | 147.15 | 1033.44 | 151.54 | 1033.4 |
| 155 | 1033.41 | 162.14 | 1033.3 | 164.84 | 1033.26 | 170.68 | 1033.15 | 172.74 | 1033.1 |
| 178.54 | 1032.99 | 183.34 | 1032.92 | 186.38 | 1032.8 | 193.93 | 1032.59 | 194.22 | 1032.58 |
| 198.92 | 1032.35 | 202.07 | 1032.19 | 204.53 | 1032.11 | 209.91 | 1031.76 | 215.13 | 1031.53 |
| 217.76 | 1031.33 | 225.26 | 1030.79 | 225.61 | 1030.76 | 225.73 | 1030.75 | 233.45 | 1029.96 |
| 236.32 | 1029.73 | 241.29 | 1029.24 | 246.92 | 1028.82 | 249.14 | 1028.62 | 255.47 | 1028.09 |
| 256.99 | 1027.95 | 257.52 | 1027.91 | 264.83 | 1027.27 | 268.12 | 1027.08 | 272.67 | 1027.24 |
| 278.71 | 1027.37 | 280.53 | 1027.45 | 288.37 | 1027.82 | 289.31 | 1027.87 | 296.21 | 1027.8 |
| 299.91 | 1027.74 | 304.06 | 1027.59 | 310.5 | 1027.46 | 319.75 | 1027.51 | 321.1 | 1027.52 |
| 327.6 | 1027.67 | 331.7 | 1027.74 | 335.44 | 1027.75 | 342.3 | 1027.71 | 343.28 | 1027.67 |
| 351.13 | 1027.36 | 352.89 | 1027.3 | 358.98 | 1027.16 | 363.49 | 1027.08 | 366.82 | 1027.09 |
| 374.09 | 1027.16 | 374.66 | 1027.18 | 376.3 | 1027.27 | 382.52 | 1027.57 | 384.69 | 1027.7 |
| 390.36 | 1028.11 | 395.28 | 1028.41 | 398.2 | 1028.45 | 405.88 | 1028.52 | 406.05 | 1028.51 |
| 406.52 | 1028.51 | 413.89 | 1028.38 | 416.48 | 1028.34 | 427.08 | 1028.11 | 429.59 | 1028.03 |
| 436.73 | 1027.7 | 437.68 | 1027.65 | 445.27 | 1027 | 448.27 | 1026.73 | 453.12 | 1026.38 |
| 458.87 | 1026.12 | 460.97 | 1026.07 | 468.81 | 1025.99 | 469.47 | 1025.99 | 476.65 | 1026.03 |
| 480.06 | 1026.06 | 484.51 | 1026.18 | 490.66 | 1026.36 | 492.35 | 1026.4 | 500.19 | 1026.53 |
| 501.26 | 1026.55 | 508.04 | 1026.54 | 511.86 | 1026.47 | 515.88 | 1026.38 | 522.45 | 1026.2 |
| 523.73 | 1026.17 | 531.58 | 1026.09 | 533.05 | 1026.1 | 539.42 | 1026.15 | 543.65 | 1026.22 |
| 547.26 | 1026.29 | 554.25 | 1026.53 | 555.11 | 1026.57 | 557.57 | 1026.66 | 562.96 | 1026.87 |
| 564.84 | 1026.91 | 570.6 | 1027.06 | 570.8 | 1027.06 | 575.44 | 1027.16 | 578.64 | 1027.24 |
| 586.04 | 1027.55 | 586.49 | 1027.57 | 587.78 | 1027.66 | 594.34 | 1028.1 | 596.63 | 1028.29 |
| 602.18 | 1028.72 | 607.23 | 1029.03 | 610.03 | 1029.15 | 617.83 | 1029.38 | 617.99 | 1029.38 |
| 625.72 | 1029.51 | 628.43 | 1029.58 | 633.57 | 1029.66 | 639.03 | 1029.77 | 641.41 | 1029.81 |
| 649.25 | 1029.96 | 649.62 | 1029.96 | 664.95 | 1030.22 | 670.82 | 1030.26 | 672.79 | 1030.27 |
| 678.41 | 1030.23 | 680.63 | 1030.22 | 681.42 | 1030.21 | 696.32 | 1030.07 | 702.61 | 1030.06 |
| 708.62 | 1030.1 | 712.02 | 1030.13 | 738.83 | 1030.58 | 743.4 | 1030.65 | 745 | 1030.67 |
| 751.24 | 1030.77 | 774.78 | 1031.1 | 776.79 | 1031.12 | 790.47 | 1031.3 | 797.99 | 1031.37 |
| 799.25 | 1031.37 | 806.16 | 1031.39 | 808.58 | 1031.39 | 819.18 | 1031.27 | 821.85 | 1031.22 |
| 829.46 | 1031.03 | 829.78 | 1031.03 | 837.55 | 1030.73 | 840.38 | 1030.6 | 845.39 | 1030.39 |
| 850.97 | 1030.18 | 853.23 | 1030.09 | 859.67 | 1029.88 | 861.07 | 1029.83 | 861.57 | 1029.82 |
| 868.93 | 1029.43 | 872.17 | 1029.31 | 876.77 | 1028.91 | 882.77 | 1028.48 | 884.61 | 1028.36 |
| 889.89 | 1027.87 | 892.46 | 1027.65 | 893.37 | 1027.57 | 900.3 | 1027.53 | 903.96 | 1027.39 |
| 908.15 | 1027.83 | 914.56 | 1028.32 | 916 | 1028.47 | 920.09 | 1029 | 923.84 | 1029.46 |
| 925.16 | 1029.63 | 931.68 | 1029.77 | 935.75 | 1029.91 | 939.54 | 1029.82 | 946.35 | 1029.68 |
| 947.38 | 1029.63 | 955.22 | 1029.18 | 956.95 | 1029.07 | 967.55 | 1028.82 | 978.14 | 1029.13 |
| 978.76 | 1029.14 | 986.6 | 1029.18 | 988.74 | 1029.26 | 994.45 | 1029.41 | 1009.51 | 1030.24 |
| 1009.93 | 1030.26 | 1010.72 | 1030.3 | 1017.99 | 1030.63 | 1020.53 | 1030.73 | 1025.83 | 1030.96 |
| 1031.13 | 1031.16 | 1033.67 | 1031.27 | 1040.93 | 1031.57 | 1041.53 | 1031.59 | 1041.73 | 1031.6 |
| 1046.97 | 1031.82 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 172.74 | .035 | 533.05 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 405.88 | 596.63 | 200.33 | 200 | 206.17 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 806.16 | 1046.97 | 1031.39 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.97 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.035 | 0.034 | |
| W.S. Elev (ft) | 1027.80 | Reach Len. (ft) | 200.33 | 200.00 | 206.17 |
| Crit W.S. (ft) | 1027.39 | Flow Area (sq ft) | 41.17 | 194.75 | |
| E.G. Slope (ft/ft) | 0.004348 | Area (sq ft) | 41.17 | 194.75 | 4.13 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 56.86 | 656.14 | |
| Top Width (ft) | 292.09 | Top Width (ft) | 119.46 | 155.41 | 17.22 |
| Vel Total (ft/s) | 3.02 | Avg. Vel. (ft/s) | 1.38 | 3.37 | |
| Max Chl Dpth (ft) | 1.81 | Hydr. Depth (ft) | 0.34 | 1.25 | |
| Conv. Total (cfs) | 10812.8 | Conv. (cfs) | 862.3 | 9950.4 | |
| Length Wtd. (ft) | 200.36 | Wetted Per. (ft) | 119.54 | 155.52 | |
| Min Ch El (ft) | 1025.99 | Shear (lb/sq ft) | 0.09 | 0.34 | |
| Alpha | 1.16 | Stream Power (lb/ft s) | 0.13 | 1.15 | |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | 12.67 | 29.55 | 6.57 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 19.73 | 23.34 | 11.11 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1028.08 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.034 | |
| W.S. Elev (ft) | 1027.91 | Reach Len. (ft) | 200.33 | 200.00 | 206.17 |
| Crit W.S. (ft) | 1027.37 | Flow Area (sq ft) | | 210.98 | |
| E.G. Slope (ft/ft) | 0.004066 | Area (sq ft) | | 210.98 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 159.18 | Top Width (ft) | | 159.18 | |
| Vel Total (ft/s) | 3.38 | Avg. Vel. (ft/s) | | 3.38 | |
| Max Chl Dpth (ft) | 1.92 | Hydr. Depth (ft) | | 1.33 | |
| Conv. Total (cfs) | 11181.5 | Conv. (cfs) | | 11181.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 159.29 | |
| Min Ch El (ft) | 1025.99 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.14 | |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 1.03 | 38.51 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.13 | 25.21 | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1028.08 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.034 | |
| W.S. Elev (ft) | 1027.91 | Reach Len. (ft) | 200.33 | 200.00 | 206.17 |
| Crit W.S. (ft) | 1027.37 | Flow Area (sq ft) | | 210.98 | |
| E.G. Slope (ft/ft) | 0.004066 | Area (sq ft) | | 210.98 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 159.18 | Top Width (ft) | | 159.18 | |
| Vel Total (ft/s) | 3.38 | Avg. Vel. (ft/s) | | 3.38 | |
| Max Chl Dpth (ft) | 1.92 | Hydr. Depth (ft) | | 1.33 | |
| Conv. Total (cfs) | 11181.5 | Conv. (cfs) | | 11181.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 159.29 | |
| Min Ch El (ft) | 1025.99 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.14 | |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 3.31 | 36.70 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.75 | 24.44 | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.706

INPUT
Description: Thalweg Sta. 274.56
Station Elevation Data num= 196

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1032.05 | 1.02 | 1031.98 | 4.93 | 1031.88 | 8.84 | 1031.69 | 10.25 | 1031.66 |
| 16.65 | 1031.44 | 20.87 | 1031.36 | 24.47 | 1031.32 | 31.5 | 1031.01 | 32.29 | 1030.92 |
| 34.47 | 1030.8 | 35.93 | 1030.68 | 40.1 | 1030.32 | 42.13 | 1030.16 | 47.91 | 1029.59 |
| 52.76 | 1029.2 | 55.74 | 1028.87 | 63.39 | 1028.24 | 63.54 | 1028.21 | 63.99 | 1028.19 |
| 71.36 | 1027.5 | 74.02 | 1027.35 | 79.18 | 1027.43 | 84.64 | 1026.28 | 86.99 | 1025.92 |
| 93.53 | 1025.92 | 94.81 | 1025.96 | 95.27 | 1025.94 | 102.62 | 1025.97 | 105.9 | 1025.96 |
| 110.44 | 1026.15 | 116.52 | 1026.42 | 118.26 | 1026.46 | 123.05 | 1026.56 | 126.07 | 1026.65 |
| 127.15 | 1026.66 | 133.88 | 1026.63 | 137.78 | 1026.54 | 141.7 | 1026.43 | 148.41 | 1026.2 |
| 149.51 | 1026.18 | 157.33 | 1026.03 | 159.04 | 1026.01 | 162.66 | 1026.06 | 169.67 | 1026.12 |
| 172.96 | 1026.24 | 180.29 | 1026.55 | 180.77 | 1026.58 | 188.59 | 1027.05 | 190.92 | 1027.12 |
| 191.05 | 1027.11 | 196.4 | 1026.8 | 201.55 | 1026.61 | 204.22 | 1026.4 | 211.64 | 1025.8 |
| 212.04 | 1025.77 | 212.18 | 1025.76 | 219.85 | 1025.57 | 222.8 | 1025.44 | 233.43 | 1025.23 |
| 235.48 | 1025.2 | 241.18 | 1025.19 | 244.06 | 1025.18 | 251.12 | 1025.21 | 254.69 | 1025.21 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 265.32 | 1025.13 | 266.74 | 1025.11 | 274.56 | 1025.01 | 275.95 | 1025.01 | 282.37 | 1025.05 |
| 290.19 | 1025.24 | 297.2 | 1025.47 | 298.01 | 1025.49 | 305.82 | 1025.7 | 307.83 | 1025.76 |
| 318.46 | 1025.95 | 321.45 | 1025.97 | 322.51 | 1025.98 | 329.08 | 1026.03 | 329.26 | 1026.03 |
| 329.77 | 1026.04 | 337.08 | 1026.06 | 339.71 | 1026.06 | 344.9 | 1026.07 | 350.34 | 1026.05 |
| 352.71 | 1026.06 | 353.19 | 1026.06 | 359.3 | 1026.04 | 360.53 | 1026.03 | 360.97 | 1026.03 |
| 368.34 | 1026.04 | 371.6 | 1026.06 | 376.15 | 1026.14 | 382.23 | 1026.26 | 383.98 | 1026.3 |
| 388.83 | 1026.39 | 391.79 | 1026.45 | 392.85 | 1026.48 | 407.42 | 1026.74 | 414.11 | 1026.88 |
| 415.23 | 1026.9 | 418.36 | 1026.97 | 428.32 | 1027.22 | 445.99 | 1027.71 | 446.49 | 1027.72 |
| 447.89 | 1027.76 | 454.31 | 1027.93 | 456.62 | 1027.98 | 462.12 | 1028.12 | 477.43 | 1028.48 |
| 477.76 | 1028.49 | 477.88 | 1028.49 | 485.57 | 1028.66 | 488.5 | 1028.71 | 493.38 | 1028.77 |
| 499.13 | 1028.76 | 501.2 | 1028.74 | 509.01 | 1028.59 | 509.76 | 1028.57 | 516.84 | 1028.51 |
| 520.39 | 1028.53 | 524.65 | 1028.61 | 531.01 | 1028.8 | 532.46 | 1028.85 | 536.49 | 1028.98 |
| 540.28 | 1029.11 | 541.64 | 1029.16 | 548.09 | 1029.37 | 555.91 | 1029.58 | 562.9 | 1029.72 |
| 563.73 | 1029.74 | 571.54 | 1029.87 | 573.53 | 1029.9 | 579.35 | 1029.94 | 587.17 | 1029.97 |
| 594.78 | 1029.94 | 595.55 | 1029.94 | 602.8 | 1029.93 | 605.41 | 1029.92 | 610.62 | 1029.92 |
| 616.04 | 1029.94 | 618.43 | 1029.93 | 626.24 | 1029.93 | 626.67 | 1029.94 | 637.29 | 1029.88 |
| 647.92 | 1029.76 | 649.7 | 1029.73 | 657.51 | 1029.62 | 658.55 | 1029.6 | 665.32 | 1029.5 |
| 669.18 | 1029.43 | 673.14 | 1029.35 | 679.81 | 1029.19 | 680.95 | 1029.15 | 684.14 | 1028.98 |
| 690.43 | 1028.66 | 696.59 | 1028.22 | 701.06 | 1027.88 | 711.69 | 1027.19 | 712.21 | 1027.17 |
| 713.67 | 1027.14 | 720.03 | 1026.97 | 722.32 | 1026.95 | 727.84 | 1026.94 | 743.2 | 1027.01 |
| 743.57 | 1027.01 | 754.2 | 1027.11 | 759.1 | 1027.19 | 764.83 | 1027.3 | 766.92 | 1027.38 |
| 772.73 | 1027.68 | 774.73 | 1027.78 | 775.46 | 1027.83 | 782.55 | 1028.62 | 786.09 | 1029.03 |
| 790.37 | 1029.45 | 796.71 | 1030.01 | 798.18 | 1030.1 | 802.26 | 1030.38 | 806 | 1030.62 |
| 807.34 | 1030.72 | 817.97 | 1031.17 | 821.62 | 1031.28 | 828.6 | 1031.47 | 829.45 | 1031.5 |
| 831.79 | 1031.56 | 837.26 | 1031.68 | 839.22 | 1031.71 | 845.07 | 1031.82 | 849.85 | 1031.86 |
| 860 | 1031.93 | 860.48 | 1031.94 | 861.32 | 1031.94 | 868.52 | 1031.96 | 876.34 | 1032.05 |
| 876.39 | 1032.05 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 35.93 | .035 | 322.51 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 190.92 | 322.51 | 208.06 | 199.97 | 192.58 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 626.24 | 876.39 | 1029.93 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.80 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.035 | 0.035 | 0.032 |
| W.S. Elev (ft) | 1026.57 | Reach Len. (ft) | 208.06 | 199.97 | 192.58 |
| Crit W.S. (ft) | 1026.45 | Flow Area (sq ft) | 32.63 | 137.13 | 32.53 |
| E.G. Slope (ft/ft) | 0.008040 | Area (sq ft) | 32.63 | 137.13 | 32.53 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 66.62 | 569.02 | 77.36 |
| Top Width (ft) | 280.02 | Top Width (ft) | 84.21 | 120.45 | 75.36 |
| Vel Total (ft/s) | 3.52 | Avg. Vel. (ft/s) | 2.04 | 4.15 | 2.38 |
| Max Chl Dpth (ft) | 1.56 | Hydr. Depth (ft) | 0.39 | 1.14 | 0.43 |
| Conv. Total (cfs) | 7951.9 | Conv. (cfs) | 743.0 | 6346.1 | 862.8 |
| Length Wtd. (ft) | 199.18 | Wetted Per. (ft) | 84.30 | 120.50 | 75.37 |
| Min Ch El (ft) | 1025.01 | Shear (lb/sq ft) | 0.19 | 0.57 | 0.22 |
| Alpha | 1.19 | Stream Power (lb/ft s) | 0.40 | 2.37 | 0.52 |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 12.50 | 28.79 | 6.48 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 19.26 | 22.70 | 10.90 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.24 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1027.03 | Reach Len. (ft) | 208.06 | 199.97 | 192.58 |
| Crit W.S. (ft) | 1026.45 | Flow Area (sq ft) | | 195.50 | |
| E.G. Slope (ft/ft) | 0.004339 | Area (sq ft) | | 195.50 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 130.15 | Top Width (ft) | | 130.15 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.65 | |
| Max Chl Dpth (ft) | 2.02 | Hydr. Depth (ft) | | 1.50 | |
| Conv. Total (cfs) | 10824.5 | Conv. (cfs) | | 10824.5 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 131.27 | |
| Min Ch El (ft) | 1025.01 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.47 | |

| | | | | |
|---|---|---|---|---|
| Frctn Loss (ft) | 0.66 | Cum Volume (acre-ft) | 1.03 | 37.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 24.55 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.24 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1027.03 | Reach Len. (ft) | 208.06 | 199.97 | 192.58 |
| Crit W.S. (ft) | 1026.46 | Flow Area (sq ft) | | 195.50 | |
| E.G. Slope (ft/ft) | 0.004339 | Area (sq ft) | | 195.50 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 130.15 | Top Width (ft) | | 130.15 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.65 | |
| Max Chl Dpth (ft) | 2.02 | Hydr. Depth (ft) | | 1.50 | |
| Conv. Total (cfs) | 10824.5 | Conv. (cfs) | | 10824.5 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 131.27 | |
| Min Ch El (ft) | 1025.01 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.47 | |
| Frctn Loss (ft) | 0.66 | Cum Volume (acre-ft) | 3.31 | 35.76 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 23.77 | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.668

INPUT
Description: Thalweg Sta. 170.75
Station Elevation Data num= 168

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1031.32 | 6.31 | 1030.36 | 8.07 | 1029.88 | 15.5 | 1028.19 | 16.38 | 1027.98 |
| 16.59 | 1027.94 | 24.69 | 1026.66 | 26.87 | 1026.26 | 32.99 | 1025.93 | 37.14 | 1025.64 |
| 43.88 | 1025.38 | 47.42 | 1025.29 | 49.61 | 1025.13 | 57.7 | 1024.1 | 57.91 | 1024.1 |
| 58.83 | 1024.15 | 66.22 | 1024.57 | 67.98 | 1024.81 | 74.53 | 1025.34 | 78.26 | 1025.42 |
| 82.84 | 1025.6 | 88.53 | 1025.52 | 91.14 | 1025.47 | 98.81 | 1025.41 | 99.45 | 1025.41 |
| 102.16 | 1025.53 | 107.76 | 1025.76 | 109.09 | 1025.86 | 116.06 | 1026.4 | 119.37 | 1026.62 |
| 124.37 | 1026.75 | 129.64 | 1026.76 | 132.67 | 1026.68 | 139.92 | 1026.4 | 140.99 | 1026.29 |
| 141.59 | 1026.22 | 145.48 | 1025.75 | 149.29 | 1025.3 | 150.2 | 1025.18 | 157.6 | 1024.22 |
| 160.47 | 1023.88 | 165.91 | 1023.73 | 170.75 | 1023.65 | 181.03 | 1023.83 | 182.52 | 1023.86 |
| 190.82 | 1024.06 | 191.31 | 1024.07 | 199.14 | 1024.28 | 201.58 | 1024.36 | 207.44 | 1024.35 |
| 211.86 | 1024.33 | 215.75 | 1024.33 | 222.14 | 1024.3 | 224.05 | 1024.36 | 232.13 | 1024.55 |
| 232.42 | 1024.55 | 240.67 | 1024.69 | 242.39 | 1024.71 | 242.69 | 1024.71 | 247.18 | 1024.72 |
| 248.97 | 1024.73 | 252.97 | 1024.72 | 257.28 | 1024.73 | 275.46 | 1024.73 | 282.2 | 1024.74 |
| 283.8 | 1024.74 | 304.36 | 1024.78 | 307.12 | 1024.79 | 314.64 | 1024.83 | 315.43 | 1024.83 |
| 323.74 | 1024.91 | 324.92 | 1024.92 | 332.05 | 1025.03 | 335.19 | 1025.07 | 340.35 | 1025.2 |
| 345.47 | 1025.3 | 348.66 | 1025.45 | 355.75 | 1025.64 | 356.97 | 1025.68 | 362.11 | 1025.79 |
| 365.27 | 1025.87 | 366.03 | 1025.9 | 373.58 | 1026 | 376.3 | 1026.07 | 381.88 | 1026.17 |
| 386.58 | 1026.27 | 396.86 | 1026.47 | 398.5 | 1026.51 | 406.81 | 1026.69 | 407.14 | 1026.69 |
| 415.12 | 1026.88 | 417.41 | 1026.94 | 423.43 | 1027.08 | 437.97 | 1027.4 | 440.03 | 1027.44 |
| 448.24 | 1027.57 | 448.35 | 1027.57 | 448.76 | 1027.58 | 456.65 | 1027.65 | 458.52 | 1027.67 |
| 468.8 | 1027.73 | 473.26 | 1027.77 | 489.35 | 1027.89 | 489.88 | 1027.89 | 492.09 | 1027.91 |
| 506.49 | 1028.01 | 509.91 | 1028.01 | 514.8 | 1028.09 | 520.19 | 1028.15 | 539.73 | 1028.57 |
| 540.74 | 1028.59 | 548.03 | 1028.68 | 551.02 | 1028.73 | 556.33 | 1028.72 | 561.3 | 1028.73 |
| 571.58 | 1028.64 | 572.95 | 1028.62 | 578.74 | 1028.56 | 581.26 | 1028.53 | 589.56 | 1028.39 |
| 592.13 | 1028.33 | 597.87 | 1028.13 | 602.41 | 1027.89 | 606.18 | 1027.63 | 612.69 | 1027.13 |
| 622.06 | 1026.45 | 622.79 | 1026.4 | 622.96 | 1026.39 | 631.09 | 1026 | 633.24 | 1025.93 |
| 639.41 | 1025.82 | 643.52 | 1025.79 | 647.71 | 1025.75 | 653.8 | 1025.73 | 664.32 | 1025.72 |
| 665.39 | 1025.73 | 672.63 | 1025.75 | 674.35 | 1025.77 | 680.94 | 1025.87 | 684.63 | 1025.98 |
| 689.24 | 1026.23 | 694.91 | 1026.59 | 697.56 | 1026.78 | 705.18 | 1027.28 | 705.86 | 1027.32 |
| 708.71 | 1027.43 | 714.16 | 1027.66 | 715.46 | 1027.69 | 722.47 | 1027.91 | 725.74 | 1027.99 |
| 730.78 | 1028.23 | 736.02 | 1028.43 | 739.09 | 1028.6 | 746.29 | 1028.92 | 747.39 | 1028.96 |
| 755.7 | 1029.23 | 756.57 | 1029.25 | 764.01 | 1029.32 | 766.85 | 1029.32 | 772.31 | 1029.19 |
| 777.12 | 1029.09 | 780.62 | 1028.98 | 787.4 | 1028.83 | 788.92 | 1028.83 | 795.36 | 1029.13 |
| 797.24 | 1029.21 | 797.68 | 1029.24 | 799.95 | 1029.45 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 240.67 | .032 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        129.64  242.69            209.05  199.96  189.21            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  556.33  799.95 1028.72       F
Right Levee     Station=  556.33      Elevation= 1028.72
```

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.87 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.035 | 0.035 | 0.032 |
| W.S. Elev (ft) | 1025.77 | Reach Len. (ft) | 209.05 | 199.96 | 189.21 |
| Crit W.S. (ft) | 1025.28 | Flow Area (sq ft) | 41.17 | 145.02 | 99.17 |
| E.G. Slope (ft/ft) | 0.002860 | Area (sq ft) | 41.17 | 145.02 | 99.17 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 64.02 | 429.98 | 219.00 |
| Top Width (ft) | 288.03 | Top Width (ft) | 72.47 | 97.33 | 118.23 |
| Vel Total (ft/s) | 2.50 | Avg. Vel. (ft/s) | 1.56 | 2.97 | 2.21 |
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | 0.57 | 1.49 | 0.84 |
| Conv. Total (cfs) | 13333.4 | Conv. (cfs) | 1197.1 | 8040.9 | 4095.4 |
| Length Wtd. (ft) | 198.38 | Wetted Per. (ft) | 72.61 | 97.46 | 118.25 |
| Min Ch El (ft) | 1023.65 | Shear (lb/sq ft) | 0.10 | 0.27 | 0.15 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.16 | 0.79 | 0.33 |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 12.32 | 28.14 | 6.19 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 18.89 | 22.20 | 10.47 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.57 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1026.38 | Reach Len. (ft) | 209.05 | 199.96 | 189.21 |
| Crit W.S. (ft) | 1025.45 | Flow Area (sq ft) | | 206.94 | |
| E.G. Slope (ft/ft) | 0.002610 | Area (sq ft) | | 206.94 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 102.62 | Top Width (ft) | | 102.62 | |
| Vel Total (ft/s) | 3.45 | Avg. Vel. (ft/s) | | 3.45 | |
| Max Chl Dpth (ft) | 2.73 | Hydr. Depth (ft) | | 2.02 | |
| Conv. Total (cfs) | 13956.9 | Conv. (cfs) | | 13956.9 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 104.46 | |
| Min Ch El (ft) | 1023.65 | Shear (lb/sq ft) | | 0.32 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.11 | |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | 1.03 | 36.66 | |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 1.13 | 24.01 | |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.57 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1026.38 | Reach Len. (ft) | 209.05 | 199.96 | 189.21 |
| Crit W.S. (ft) | 1025.46 | Flow Area (sq ft) | | 206.94 | |
| E.G. Slope (ft/ft) | 0.002610 | Area (sq ft) | | 206.94 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 102.62 | Top Width (ft) | | 102.62 | |
| Vel Total (ft/s) | 3.45 | Avg. Vel. (ft/s) | | 3.45 | |
| Max Chl Dpth (ft) | 2.73 | Hydr. Depth (ft) | | 2.02 | |
| Conv. Total (cfs) | 13956.9 | Conv. (cfs) | | 13956.9 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 104.46 | |
| Min Ch El (ft) | 1023.65 | Shear (lb/sq ft) | | 0.32 | |

| | | | | |
|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.11 |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | 3.31 | 34.84 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 2.75 | 23.24 |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.630

INPUT
Description: Thalweg Sta. 148.26
Station Elevation Data num= 160

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1031.8 | 8.12 | 1031.19 | 9.35 | 1030.96 | 15.44 | 1029.75 | 18.13 | 1029.21 |
| 18.92 | 1029.03 | 28.14 | 1026.88 | 28.5 | 1026.82 | 38.07 | 1025.25 | 38.15 | 1025.24 |
| 47.64 | 1024.24 | 48.16 | 1024.2 | 57.22 | 1022.94 | 58.17 | 1022.86 | 66.79 | 1023.62 |
| 68.18 | 1023.55 | 76.37 | 1024.6 | 78.19 | 1024.87 | 85.94 | 1025.54 | 88.2 | 1025.84 |
| 91.84 | 1025.84 | 95.51 | 1025.84 | 98.21 | 1025.82 | 105.09 | 1025.6 | 108.22 | 1025.47 |
| 114.66 | 1025.25 | 118.23 | 1025.11 | 124.24 | 1024.76 | 128.24 | 1024.47 | 138.25 | 1023.52 |
| 143.39 | 1023.16 | 148.26 | 1022.92 | 152.96 | 1022.81 | 168.28 | 1022.56 | 172.11 | 1022.73 |
| 178.3 | 1023.05 | 181.68 | 1023.31 | 188.31 | 1023.8 | 198.32 | 1024.03 | 219.98 | 1024.04 |
| 228.35 | 1024.06 | 229.55 | 1024.06 | 236.5 | 1024.08 | 239.13 | 1024.08 | 248.37 | 1024.1 |
| 248.7 | 1024.1 | 255.99 | 1024.11 | 258.28 | 1024.12 | 258.38 | 1024.12 | 267.85 | 1024.14 |
| 268.98 | 1024.14 | 287 | 1024.17 | 288.41 | 1024.18 | 296.57 | 1024.2 | 298.42 | 1024.2 |
| 300.44 | 1024.21 | 318.44 | 1024.26 | 328.45 | 1024.3 | 331.91 | 1024.32 | 338.46 | 1024.38 |
| 348.47 | 1024.52 | 358.48 | 1024.68 | 363.38 | 1024.77 | 368.49 | 1024.85 | 373.17 | 1024.94 |
| 378.5 | 1025.03 | 382.74 | 1025.12 | 388.51 | 1025.23 | 392.31 | 1025.34 | 398.52 | 1025.5 |
| 405.33 | 1025.71 | 408.53 | 1025.82 | 411.46 | 1025.91 | 418.54 | 1026.15 | 421.04 | 1026.23 |
| 428.56 | 1026.46 | 430.61 | 1026.51 | 438.57 | 1026.67 | 440.19 | 1026.69 | 449.76 | 1026.77 |
| 458.59 | 1026.82 | 459.33 | 1026.82 | 468.6 | 1026.88 | 468.91 | 1026.88 | 475.66 | 1026.92 |
| 476.77 | 1026.93 | 478.27 | 1026.94 | 478.65 | 1026.94 | 488.89 | 1026.95 | 495.05 | 1026.94 |
| 499.13 | 1026.91 | 503.43 | 1026.91 | 509.37 | 1026.87 | 511.82 | 1026.87 | 519.62 | 1026.84 |
| 520.21 | 1026.84 | 522.88 | 1026.82 | 528.6 | 1026.79 | 529.86 | 1026.78 | 536.99 | 1026.62 |
| 540.1 | 1026.5 | 545.37 | 1026.13 | 550.34 | 1025.75 | 553.76 | 1025.46 | 560.58 | 1024.94 |
| 562.15 | 1024.88 | 569.22 | 1024.75 | 570.54 | 1024.73 | 570.82 | 1024.73 | 578.92 | 1024.85 |
| 581.06 | 1024.89 | 587.31 | 1024.97 | 591.3 | 1025.04 | 595.7 | 1025.07 | 601.55 | 1025.13 |
| 604.09 | 1025.16 | 611.79 | 1025.3 | 612.47 | 1025.32 | 615.57 | 1025.43 | 620.86 | 1025.63 |
| 622.03 | 1025.68 | 629.25 | 1026.07 | 637.64 | 1026.55 | 642.51 | 1026.82 | 646.02 | 1027 |
| 652.75 | 1027.32 | 654.41 | 1027.39 | 662.8 | 1027.76 | 662.99 | 1027.77 | 671.19 | 1028.1 |
| 673.24 | 1028.19 | 683.48 | 1028.55 | 687.96 | 1028.61 | 693.72 | 1028.71 | 696.35 | 1028.67 |
| 703.96 | 1028.62 | 704.74 | 1028.6 | 708.25 | 1028.54 | 713.13 | 1028.44 | 714.2 | 1028.43 |
| 721.51 | 1028.3 | 724.44 | 1028.26 | 729.9 | 1028.24 | 734.68 | 1028.19 | 738.29 | 1028.21 |
| 744.92 | 1028.18 | 746.68 | 1028.19 | 754.59 | 1028.18 | 755.17 | 1028.18 | 763.45 | 1028.21 |
| 765.41 | 1028.2 | 771.84 | 1028.3 | 775.65 | 1028.31 | 780.23 | 1028.49 | 785.89 | 1028.66 |
| 788.61 | 1028.8 | 797 | 1029.18 | 806.37 | 1029.59 | 807.92 | 1029.66 | 812.73 | 1029.85 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 15.44 | .035 | 236.5 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 91.84 | 198.32 | 206.26 | 199.98 | 198.81 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1024.87 | Element | | | |
| Vel Head (ft) | 0.32 | Wt. n-Val. | 0.035 | 0.035 | 0.033 |
| W.S. Elev (ft) | 1024.55 | Reach Len. (ft) | 206.26 | 199.98 | 198.81 |
| Crit W.S. (ft) | 1024.53 | Flow Area (sq ft) | 27.51 | 90.60 | 56.62 |
| E.G. Slope (ft/ft) | 0.010597 | Area (sq ft) | 27.51 | 90.60 | 56.62 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 110.00 | 464.70 | 138.30 |
| Top Width (ft) | 254.20 | Top Width (ft) | 31.23 | 71.14 | 151.83 |
| Vel Total (ft/s) | 4.08 | Avg. Vel. (ft/s) | 4.00 | 5.13 | 2.44 |
| Max Chl Dpth (ft) | 1.99 | Hydr. Depth (ft) | 0.88 | 1.27 | 0.37 |
| Conv. Total (cfs) | 6926.3 | Conv. (cfs) | 1068.6 | 4514.2 | 1343.5 |
| Length Wtd. (ft) | 200.15 | Wetted Per. (ft) | 31.44 | 71.25 | 151.83 |
| Min Ch El (ft) | 1022.56 | Shear (lb/sq ft) | 0.58 | 0.84 | 0.25 |

| | | | | | |
|---|---|---|---|---|---|
| Alpha | 1.25 | Stream Power (lb/ft s) | 2.32 | 4.31 | 0.60 |
| Frctn Loss (ft) | 1.23 | Cum Volume (acre-ft) | 12.16 | 27.60 | 5.85 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 18.64 | 21.82 | 9.88 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.46 | Element | | | |
| Vel Head (ft) | 0.70 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1024.76 | Reach Len. (ft) | 206.26 | 199.98 | 198.81 |
| Crit W.S. (ft) | 1024.74 | Flow Area (sq ft) | | 105.87 | |
| E.G. Slope (ft/ft) | 0.015862 | Area (sq ft) | | 105.87 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 74.04 | Top Width (ft) | | 74.04 | |
| Vel Total (ft/s) | 6.73 | Avg. Vel. (ft/s) | | 6.73 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | | 1.43 | |
| Conv. Total (cfs) | 5661.2 | Conv. (cfs) | | 5661.2 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 74.89 | |
| Min Ch El (ft) | 1022.56 | Shear (lb/sq ft) | | 1.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 9.43 | |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | 1.03 | 35.94 | |
| C & E Loss (ft) | 0.16 | Cum SA (acres) | 1.13 | 23.61 | |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.46 | Element | | | |
| Vel Head (ft) | 0.70 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1024.76 | Reach Len. (ft) | 206.26 | 199.98 | 198.81 |
| Crit W.S. (ft) | 1024.74 | Flow Area (sq ft) | | 105.87 | |
| E.G. Slope (ft/ft) | 0.015862 | Area (sq ft) | | 105.87 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 74.04 | Top Width (ft) | | 74.04 | |
| Vel Total (ft/s) | 6.73 | Avg. Vel. (ft/s) | | 6.73 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | | 1.43 | |
| Conv. Total (cfs) | 5661.2 | Conv. (cfs) | | 5661.2 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 74.89 | |
| Min Ch El (ft) | 1022.56 | Shear (lb/sq ft) | | 1.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 9.43 | |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | 3.31 | 34.12 | |
| C & E Loss (ft) | 0.16 | Cum SA (acres) | 2.75 | 22.83 | |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.592

INPUT
Description: Thalweg Sta. 350.41
Station Elevation Data num= 175

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1029.76 | 4.85 | 1029.54 | 9.58 | 1029.23 | 14.87 | 1028.9 | 20.23 | 1028.45 |
| 24.88 | 1028.12 | 30.88 | 1027.55 | 34.9 | 1027.18 | 41.53 | 1026.51 | 44.92 | 1026.13 |
| 52.18 | 1025.37 | 54.94 | 1025.17 | 62.83 | 1025.96 | 64.95 | 1025.83 | 73.48 | 1025.97 |
| 74.97 | 1025.89 | 84.14 | 1025.87 | 84.99 | 1025.9 | 94.79 | 1025.81 | 95.01 | 1025.81 |
| 105.03 | 1025.39 | 105.44 | 1025.34 | 115.04 | 1024.06 | 116.08 | 1024.14 | 125.06 | 1023.67 |
| 126.73 | 1023.87 | 135.08 | 1025.24 | 137.39 | 1025.46 | 145.1 | 1026.32 | 148.04 | 1026.5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 155.11 | 1027.02 | 158.69 | 1027.21 | 165.13 | 1027.69 | 169.34 | 1027.94 | 175.15 | 1028.3 |
| 179.99 | 1028.51 | 185.17 | 1028.79 | 190.65 | 1028.88 | 195.18 | 1028.93 | 201.29 | 1028.73 |
| 205.2 | 1028.57 | 211.94 | 1028.43 | 215.22 | 1028.4 | 222.59 | 1028.43 | 225.24 | 1028.47 |
| 233.24 | 1028.34 | 235.25 | 1028.32 | 239.24 | 1027.84 | 243.9 | 1027.27 | 245.27 | 1027.19 |
| 254.55 | 1025.51 | 255.29 | 1025.41 | 265.2 | 1024.14 | 265.31 | 1024.13 | 275.33 | 1023.56 |
| 275.85 | 1023.54 | 285.34 | 1023.09 | 286.5 | 1023.02 | 295.36 | 1022.42 | 305.38 | 1021.87 |
| 307.8 | 1021.83 | 315.4 | 1021.99 | 318.45 | 1022.14 | 325.41 | 1022.5 | 329.1 | 1022.55 |
| 335.43 | 1022.61 | 339.75 | 1022.47 | 345.45 | 1022.32 | 350.41 | 1022.17 | 355.47 | 1021.93 |
| 361.06 | 1021.78 | 365.48 | 1021.59 | 371.71 | 1021.57 | 375.5 | 1021.54 | 382.35 | 1021.95 |
| 385.52 | 1022.1 | 393 | 1022.32 | 395.54 | 1022.46 | 405.55 | 1022.35 | 414.31 | 1022.23 |
| 415.57 | 1022.2 | 424.96 | 1022.39 | 435.59 | 1022.55 | 445.63 | 1022.49 | 446.26 | 1022.48 |
| 455.64 | 1022.38 | 456.92 | 1022.39 | 460.51 | 1022.4 | 461.45 | 1022.41 | 465.66 | 1022.42 |
| 475.68 | 1022.64 | 478.21 | 1022.7 | 485.7 | 1022.9 | 495.71 | 1023.09 | 499.51 | 1023.12 |
| 505.73 | 1023.19 | 510.17 | 1023.22 | 531.47 | 1023.44 | 535.78 | 1023.49 | 563.42 | 1023.75 |
| 574.07 | 1023.84 | 575.86 | 1023.85 | 585.87 | 1023.94 | 595.37 | 1024 | 595.89 | 1024 |
| 604.12 | 1024.03 | 606.02 | 1024.03 | 615.93 | 1024.05 | 616.68 | 1024.06 | 625.94 | 1024.08 |
| 627.33 | 1024.08 | 635.96 | 1024.11 | 637.98 | 1024.13 | 645.98 | 1024.16 | 648.62 | 1024.22 |
| 651.21 | 1024.24 | 656.08 | 1024.25 | 657.66 | 1024.29 | 665.67 | 1024.4 | 666.27 | 1024.4 |
| 674.69 | 1024.25 | 676.46 | 1024.19 | 683.2 | 1023.78 | 686.66 | 1023.63 | 691.72 | 1023.38 |
| 700.23 | 1023.25 | 707.04 | 1023.19 | 708.75 | 1023.19 | 717.23 | 1023.14 | 717.42 | 1023.14 |
| 725.77 | 1023.26 | 734.3 | 1023.41 | 737.62 | 1023.45 | 742.81 | 1023.47 | 747.81 | 1023.5 |
| 751.33 | 1023.56 | 758 | 1023.77 | 759.84 | 1023.86 | 768.19 | 1024.32 | 768.36 | 1024.33 |
| 769.16 | 1024.36 | 776.87 | 1024.72 | 778.39 | 1024.78 | 785.39 | 1024.97 | 788.58 | 1025.04 |
| 793.9 | 1025.14 | 798.77 | 1025.22 | 808.96 | 1025.34 | 810.93 | 1025.36 | 819.15 | 1025.43 |
| 819.44 | 1025.43 | 820.91 | 1025.44 | 827.96 | 1025.5 | 829.35 | 1025.51 | 849.73 | 1025.72 |
| 853.5 | 1025.78 | 859.92 | 1025.86 | 862.02 | 1025.88 | 870.11 | 1025.9 | 870.53 | 1025.9 |
| 879.04 | 1025.86 | 880.31 | 1025.86 | 890.5 | 1025.8 | 896.07 | 1025.79 | 900.69 | 1025.77 |
| 904.6 | 1025.77 | 910.88 | 1025.73 | 913.11 | 1025.71 | 921.08 | 1025.61 | 921.63 | 1025.6 |
| 930.14 | 1025.51 | 931.27 | 1025.51 | 938.66 | 1025.56 | 941.46 | 1025.63 | 945.6 | 1025.82 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 239.24 | .035 | 461.45 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 286.5 | 395.54 | 218.11 | 199.89 | 175.69 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.58 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.035 | 0.035 | 0.034 |
| W.S. Elev (ft) | 1023.45 | Reach Len. (ft) | 218.11 | 199.89 | 175.69 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.80 | 142.55 | 109.17 |
| E.G. Slope (ft/ft) | 0.004010 | Area (sq ft) | 1.80 | 142.55 | 109.17 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 1.69 | 457.94 | 253.37 |
| Top Width (ft) | 301.32 | Top Width (ft) | 8.69 | 109.04 | 183.59 |
| Vel Total (ft/s) | 2.81 | Avg. Vel. (ft/s) | 0.94 | 3.21 | 2.32 |
| Max Chl Dpth (ft) | 1.91 | Hydr. Depth (ft) | 0.21 | 1.31 | 0.59 |
| Conv. Total (cfs) | 11259.5 | Conv. (cfs) | 26.7 | 7231.7 | 4001.1 |
| Length Wtd. (ft) | 189.42 | Wetted Per. (ft) | 8.71 | 109.13 | 183.61 |
| Min Ch El (ft) | 1021.54 | Shear (lb/sq ft) | 0.05 | 0.33 | 0.15 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.05 | 1.05 | 0.35 |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 12.09 | 27.06 | 5.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 18.54 | 21.40 | 9.12 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1024.35 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1024.19 | Reach Len. (ft) | 218.11 | 199.89 | 175.69 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 223.20 | |
| E.G. Slope (ft/ft) | 0.002258 | Area (sq ft) | | 223.20 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 109.04 | Top Width (ft) | | 109.04 | |
| Vel Total (ft/s) | 3.19 | Avg. Vel. (ft/s) | | 3.19 | |
| Max Chl Dpth (ft) | 2.65 | Hydr. Depth (ft) | | 2.05 | |
| Conv. Total (cfs) | 15003.8 | Conv. (cfs) | | 15003.8 | |
| Length Wtd. (ft) | 199.89 | Wetted Per. (ft) | | 112.03 | |
| Min Ch El (ft) | 1021.54 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.90 | |
| Frctn Loss (ft) | 0.63 | Cum Volume (acre-ft) | 1.03 | 35.18 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.13 | 23.19 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1024.35 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1024.19 | Reach Len. (ft) | 218.11 | 199.89 | 175.69 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 223.20 | |
| E.G. Slope (ft/ft) | 0.002258 | Area (sq ft) | | 223.20 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 109.04 | Top Width (ft) | | 109.04 | |
| Vel Total (ft/s) | 3.19 | Avg. Vel. (ft/s) | | 3.19 | |
| Max Chl Dpth (ft) | 2.65 | Hydr. Depth (ft) | | 2.05 | |
| Conv. Total (cfs) | 15003.8 | Conv. (cfs) | | 15003.8 | |
| Length Wtd. (ft) | 199.89 | Wetted Per. (ft) | | 112.03 | |
| Min Ch El (ft) | 1021.54 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.90 | |
| Frctn Loss (ft) | 0.63 | Cum Volume (acre-ft) | 3.31 | 33.37 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 2.75 | 22.41 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.554

INPUT
Description: Thalweg Sta. 425.05
Station Elevation Data num= 170

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1029.96 | 9.43 | 1030.15 | 10.83 | 1030.18 | 21.73 | 1030.35 | 28.68 | 1030.4 |
| 32.63 | 1030.44 | 43.53 | 1030.41 | 47.93 | 1030.38 | 54.43 | 1030.35 | 62.9 | 1030.4 |
| 65.33 | 1030.41 | 67.19 | 1030.43 | 76.23 | 1030.51 | 86.44 | 1030.47 | 87.13 | 1030.47 |
| 88.02 | 1030.45 | 98.03 | 1030.31 | 105.7 | 1029.93 | 108.93 | 1029.79 | 113.15 | 1029.49 |
| 119.83 | 1029.15 | 124.96 | 1029.1 | 130.73 | 1029.01 | 138.28 | 1029.09 | 141.63 | 1029.12 |
| 144.21 | 1029.15 | 152.53 | 1029.29 | 163.4 | 1029.38 | 163.47 | 1029.38 | 174.33 | 1029.35 |
| 182.72 | 1029.28 | 185.24 | 1029.28 | 188.52 | 1029.22 | 196.14 | 1029.06 | 207.04 | 1028.62 |
| 213.64 | 1028.27 | 217.94 | 1028.08 | 221.23 | 1027.98 | 228.84 | 1027.69 | 238.77 | 1027.44 |
| 240.48 | 1027.44 | 259.74 | 1027.41 | 261.54 | 1027.4 | 283.34 | 1027.42 | 289.02 | 1027.41 |
| 294.24 | 1027.37 | 300.26 | 1027.24 | 305.14 | 1027.18 | 312.91 | 1027.01 | 314.15 | 1026.98 |
| 316.04 | 1026.93 | 317.5 | 1026.91 | 326.94 | 1026.73 | 336.76 | 1026.58 | 337.84 | 1026.56 |
| 339.26 | 1026.52 | 348.75 | 1026.15 | 359.65 | 1025.61 | 364.39 | 1025.26 | 370.55 | 1024.72 |
| 375.27 | 1024.26 | 378.05 | 1024.01 | 381.45 | 1023.71 | 389.52 | 1023.34 | 392.35 | 1023.19 |
| 394.52 | 1023.13 | 403.25 | 1023.04 | 413.78 | 1021.6 | 414.15 | 1021.55 | 414.64 | 1021.5 |
| 425.05 | 1020.55 | 433.03 | 1020.57 | 435.95 | 1020.54 | 439.77 | 1020.64 | 446.85 | 1020.86 |
| 457.75 | 1021.26 | 464.89 | 1021.66 | 468.65 | 1021.91 | 471.54 | 1022.01 | 479.51 | 1022.37 |
| 479.55 | 1022.37 | 490.01 | 1022.04 | 490.45 | 1022.02 | 501.35 | 1021.69 | 510.05 | 1021.78 |
| 512.26 | 1021.8 | 523.16 | 1022.1 | 525.43 | 1022.11 | 529.31 | 1022.12 | 534.06 | 1022.15 |
| 544.96 | 1022.02 | 548.56 | 1021.97 | 555.86 | 1021.88 | 565.39 | 1021.79 | 566.76 | 1021.78 |
| 567.81 | 1021.77 | 577.66 | 1021.75 | 581.81 | 1021.75 | 588.01 | 1021.73 | 594.42 | 1021.73 |
| 598.01 | 1021.72 | 608.01 | 1021.74 | 614.2 | 1021.81 | 618.01 | 1021.84 | 624.1 | 1021.9 |
| 628.01 | 1021.92 | 633.99 | 1021.93 | 638.01 | 1021.93 | 648.01 | 1021.91 | 663.68 | 1021.91 |
| 673.57 | 1021.93 | 678.01 | 1021.96 | 688.01 | 1022.2 | 698.01 | 1022.51 | 702.76 | 1022.6 |
| 708.01 | 1022.71 | 712.87 | 1022.7 | 718.01 | 1022.71 | 723.04 | 1022.66 | 738.01 | 1022.5 |
| 742.83 | 1022.48 | 748.01 | 1022.47 | 752.73 | 1022.59 | 758.01 | 1022.75 | 768.02 | 1023.24 |
| 778.02 | 1023.32 | 782.42 | 1023.28 | 788.02 | 1023.24 | 792.31 | 1023.32 | 798.02 | 1023.44 |
| 802.21 | 1023.58 | 808.02 | 1023.79 | 818.02 | 1024.13 | 822 | 1024.23 | 828.02 | 1024.4 |
| 838.02 | 1024.58 | 844.28 | 1024.68 | 861.58 | 1024.92 | 868.02 | 1025 | 878.02 | 1025.05 |
| 881.36 | 1025.04 | 888.02 | 1025.01 | 891.26 | 1024.97 | 898.02 | 1024.92 | 901.15 | 1024.88 |
| 908.02 | 1024.82 | 911.05 | 1024.78 | 928.02 | 1024.61 | 938.03 | 1024.57 | 940.74 | 1024.6 |
| 948.03 | 1024.65 | 950.63 | 1024.7 | 968.03 | 1024.91 | 975.69 | 1025.02 | 980.32 | 1025.08 |
| 988.03 | 1025.2 | 990.21 | 1025.24 | 998.03 | 1025.37 | 1000.11 | 1025.41 | 1018.03 | 1025.69 |
| 1019.9 | 1025.71 | 1028.03 | 1025.78 | 1029.79 | 1025.79 | 1038.03 | 1025.79 | 1039.68 | 1025.8 |
| 1048.03 | 1025.82 | 1049.58 | 1025.84 | 1058.03 | 1025.93 | 1059.47 | 1025.95 | 1067.94 | 1026.1 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 312.91 | .035 | 525.43 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 403.25 | 479.55 | 196.7 | 199.99 | 204.61 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1022.75 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | 0.033 |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 1022.61 | Reach Len. (ft) | 196.70 | 199.99 | 204.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 97.94 | 152.53 |
| E.G. Slope (ft/ft) | 0.004772 | Area (sq ft) | | 97.94 | 152.53 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 348.37 | 364.63 |
| Top Width (ft) | 322.78 | Top Width (ft) | | 73.17 | 249.61 |
| Vel Total (ft/s) | 2.85 | Avg. Vel. (ft/s) | | 3.56 | 2.39 |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | | 1.34 | 0.61 |
| Conv. Total (cfs) | 10321.4 | Conv. (cfs) | | 5042.9 | 5278.4 |
| Length Wtd. (ft) | 202.35 | Wetted Per. (ft) | | 73.33 | 249.64 |
| Min Ch El (ft) | 1020.54 | Shear (lb/sq ft) | | 0.40 | 0.18 |
| Alpha | 1.12 | Stream Power (lb/ft s) | | 1.42 | 0.44 |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 12.08 | 26.51 | 4.94 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 18.52 | 20.99 | 8.24 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.70 | Element | | | |
| Vel Head (ft) | 0.33 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1023.38 | Reach Len. (ft) | 196.70 | 199.99 | 204.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 155.55 | |
| E.G. Slope (ft/ft) | 0.004630 | Area (sq ft) | | 155.55 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 76.30 | Top Width (ft) | | 76.30 | |
| Vel Total (ft/s) | 4.58 | Avg. Vel. (ft/s) | | 4.58 | |
| Max Chl Dpth (ft) | 2.84 | Hydr. Depth (ft) | | 2.04 | |
| Conv. Total (cfs) | 10478.1 | Conv. (cfs) | | 10478.1 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 77.83 | |
| Min Ch El (ft) | 1020.54 | Shear (lb/sq ft) | | 0.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.65 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 1.03 | 34.31 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 22.76 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.70 | Element | | | |
| Vel Head (ft) | 0.33 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1023.38 | Reach Len. (ft) | 196.70 | 199.99 | 204.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 155.55 | |
| E.G. Slope (ft/ft) | 0.004630 | Area (sq ft) | | 155.55 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 76.30 | Top Width (ft) | | 76.30 | |
| Vel Total (ft/s) | 4.58 | Avg. Vel. (ft/s) | | 4.58 | |
| Max Chl Dpth (ft) | 2.84 | Hydr. Depth (ft) | | 2.04 | |
| Conv. Total (cfs) | 10478.1 | Conv. (cfs) | | 10478.1 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 77.83 | |
| Min Ch El (ft) | 1020.54 | Shear (lb/sq ft) | | 0.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.65 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 3.31 | 32.50 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 21.99 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.517

INPUT
Description: Thalweg Sta. 443.40
Station Elevation Data num= 120

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1028.37 | .78 | 1028.33 | 6.68 | 1027.96 | 9.71 | 1027.95 | 17.24 | 1027.9 |
| 27.8 | 1028.01 | 31.9 | 1028 | 41.68 | 1027.92 | 48.92 | 1027.82 | 59.48 | 1027.7 |
| 63.02 | 1027.67 | 70.04 | 1027.52 | 73.65 | 1027.5 | 80.6 | 1027.38 | 89.63 | 1027.15 |
| 91.16 | 1027.09 | 94.13 | 1026.94 | 101.72 | 1026.58 | 105.62 | 1026.38 | 112.28 | 1026.02 |
| 121.61 | 1025.57 | 122.84 | 1025.5 | 133.41 | 1025.02 | 137.59 | 1024.82 | 143.96 | 1024.46 |
| 153.58 | 1023.75 | 154.52 | 1023.67 | 156.37 | 1023.54 | 165.09 | 1023.03 | 167.15 | 1022.99 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 169.56 | 1022.95 | 175.65 | 1022.82 | 185.54 | 1022.76 | 186.2 | 1022.76 | 187.49 | 1022.75 |
| 196.77 | 1022.66 | 202.56 | 1022.66 | 207.33 | 1022.65 | 217.51 | 1022.73 | 217.88 | 1022.73 |
| 218.61 | 1022.72 | 228.45 | 1022.67 | 233.84 | 1022.15 | 239.01 | 1021.41 | 241.72 | 1021.01 |
| 249.56 | 1020.08 | 249.74 | 1020.08 | 260.13 | 1019.76 | 270.69 | 1019.85 | 280.86 | 1019.91 |
| 281.24 | 1019.91 | 281.45 | 1019.92 | 291.81 | 1020.07 | 297.44 | 1020.42 | 302.37 | 1020.65 |
| 311.97 | 1021.42 | 312.93 | 1021.49 | 313.42 | 1021.5 | 323.49 | 1021.76 | 334.05 | 1021.67 |
| 342.79 | 1021.51 | 343.09 | 1021.5 | 344.61 | 1021.47 | 355.17 | 1021.48 | 361.37 | 1021.53 |
| 365.73 | 1021.58 | 374.21 | 1021.6 | 376.29 | 1021.59 | 377.35 | 1021.59 | 386.85 | 1021.53 |
| 397.41 | 1021.4 | 407.97 | 1021.11 | 409.32 | 1021.07 | 418.53 | 1020.83 | 425.31 | 1020.71 |
| 429.09 | 1020.66 | 436.45 | 1020.68 | 438.83 | 1020.68 | 439.65 | 1020.69 | 446.72 | 1020.79 |
| 450.21 | 1020.83 | 454.6 | 1020.85 | 460.77 | 1020.86 | 462.49 | 1020.85 | 489.25 | 1020.73 |
| 492.45 | 1020.71 | 498.69 | 1020.65 | 503.01 | 1020.6 | 505.23 | 1020.56 | 513.57 | 1020.38 |
| 524.13 | 1020.27 | 529.8 | 1020.32 | 534.69 | 1020.38 | 537.2 | 1020.46 | 545.25 | 1020.68 |
| 549.22 | 1020.84 | 555.81 | 1021.13 | 560.92 | 1021.34 | 566.37 | 1021.53 | 576.93 | 1021.79 |
| 585.15 | 1021.96 | 587.49 | 1022 | 592.04 | 1022.1 | 598.05 | 1022.22 | 601.13 | 1022.32 |
| 608.61 | 1022.52 | 617.12 | 1022.91 | 619.17 | 1023 | 623.16 | 1023.2 | 649.09 | 1024.43 |
| 650.85 | 1024.51 | 654.28 | 1024.63 | 661.41 | 1024.82 | 671.97 | 1024.83 | 681.05 | 1024.69 |
| 682.53 | 1024.67 | 693.09 | 1024.41 | 697.04 | 1024.33 | 703.65 | 1024.18 | 708.24 | 1024.14 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 167.15 | .035 | 342.79 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 228.45 | 323.49 | 204.8 | 200 | 196.22 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.69 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.035 | 0.032 |
| W.S. Elev (ft) | 1021.52 | Reach Len. (ft) | 204.80 | 200.00 | 196.22 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 93.40 | 128.64 |
| E.G. Slope (ft/ft) | 0.005838 | Area (sq ft) | | 93.40 | 128.64 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 347.90 | 365.10 |
| Top Width (ft) | 270.85 | Top Width (ft) | | 75.76 | 195.09 |
| Vel Total (ft/s) | 3.21 | Avg. Vel. (ft/s) | | 3.72 | 2.84 |
| Max Chl Dpth (ft) | 1.76 | Hydr. Depth (ft) | | 1.23 | 0.66 |
| Conv. Total (cfs) | 9331.5 | Conv. (cfs) | | 4553.2 | 4778.3 |
| Length Wtd. (ft) | 198.38 | Wetted Per. (ft) | | 75.91 | 195.13 |
| Min Ch El (ft) | 1019.76 | Shear (lb/sq ft) | | 0.45 | 0.24 |
| Alpha | 1.06 | Stream Power (lb/ft s) | | 1.67 | 0.68 |
| Frctn Loss (ft) | 0.91 | Cum Volume (acre-ft) | 12.08 | 26.07 | 4.28 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 18.52 | 20.64 | 7.20 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1022.44 | Element | | | |
| Vel Head (ft) | 0.43 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1022.01 | Reach Len. (ft) | 204.80 | 200.00 | 196.22 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 134.98 | |
| E.G. Slope (ft/ft) | 0.008895 | Area (sq ft) | | 134.98 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 88.65 | Top Width (ft) | | 88.65 | |
| Vel Total (ft/s) | 5.28 | Avg. Vel. (ft/s) | | 5.28 | |
| Max Chl Dpth (ft) | 2.25 | Hydr. Depth (ft) | | 1.52 | |
| Conv. Total (cfs) | 7559.8 | Conv. (cfs) | | 7559.8 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 89.09 | |
| Min Ch El (ft) | 1019.76 | Shear (lb/sq ft) | | 0.84 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.44 | |
| Frctn Loss (ft) | 1.04 | Cum Volume (acre-ft) | 1.03 | 33.65 | |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 1.13 | 22.38 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1022.44 | Element | | | |
| Vel Head (ft) | 0.43 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1022.01 | Reach Len. (ft) | 204.80 | 200.00 | 196.22 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 134.98 | |
| E.G. Slope (ft/ft) | 0.008895 | Area (sq ft) | | 134.98 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |

| | | | | |
|---|---|---|---|---|
| Top Width (ft) | 88.65 | Top Width (ft) | | 88.65 |
| Vel Total (ft/s) | 5.28 | Avg. Vel. (ft/s) | | 5.28 |
| Max Chl Dpth (ft) | 2.25 | Hydr. Depth (ft) | | 1.52 |
| Conv. Total (cfs) | 7559.8 | Conv. (cfs) | | 7559.8 |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 89.09 |
| Min Ch El (ft) | 1019.76 | Shear (lb/sq ft) | | 0.84 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.44 |
| Frctn Loss (ft) | 1.04 | Cum Volume (acre-ft) | 3.31 | 31.83 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 2.75 | 21.61 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.479

INPUT
Description: Thalweg Sta. 218.03
Station Elevation Data num= 125

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1027.87 | 3.36 | 1027.91 | 5.36 | 1027.93 | 29.73 | 1027.92 | 48.59 | 1027.87 |
| 56.11 | 1027.81 | 59.39 | 1027.75 | 61.68 | 1027.69 | 70.2 | 1027.52 | 79.99 | 1027.29 |
| 81.01 | 1027.27 | 82.48 | 1027.25 | 91.82 | 1027.02 | 98.3 | 1026.92 | 102.63 | 1026.87 |
| 108.85 | 1026.85 | 113.43 | 1026.82 | 116.61 | 1026.87 | 134.93 | 1026.95 | 135.05 | 1026.95 |
| 135.22 | 1026.94 | 145.85 | 1026.79 | 153.24 | 1026.58 | 156.66 | 1026.49 | 161.6 | 1026.31 |
| 167.47 | 1026.03 | 171.54 | 1025.72 | 178.27 | 1025.36 | 187.97 | 1024.92 | 189.08 | 1024.86 |
| 189.86 | 1024.83 | 199.89 | 1024.49 | 208.17 | 1024.04 | 210.7 | 1023.89 | 214.34 | 1023.56 |
| 221.5 | 1022.96 | 223.11 | 1022.82 | 226.47 | 1022.52 | 232.31 | 1021.96 | 240.71 | 1021.24 |
| 243.12 | 1021.12 | 244.79 | 1021.08 | 263.1 | 1020.74 | 264.73 | 1020.7 | 267.08 | 1020.69 |
| 273.08 | 1020.72 | 275.33 | 1020.84 | 275.54 | 1020.85 | 280.75 | 1020.61 | 286.35 | 1019.71 |
| 293.46 | 1018.82 | 297.15 | 1018.43 | 299.72 | 1018.48 | 307.96 | 1018.61 | 318.03 | 1018.82 |
| 318.77 | 1018.83 | 319.83 | 1018.84 | 329.57 | 1018.82 | 340.38 | 1018.82 | 346.2 | 1019.01 |
| 351.19 | 1019.2 | 354.66 | 1019.41 | 362 | 1019.84 | 372.57 | 1020.14 | 372.8 | 1020.15 |
| 372.97 | 1020.15 | 379.76 | 1020.18 | 383.61 | 1020.19 | 388.06 | 1020.23 | 394.42 | 1020.21 |
| 398.95 | 1020.23 | 405.22 | 1020.27 | 407.45 | 1020.28 | 409.59 | 1020.29 | 416.03 | 1020.31 |
| 426.84 | 1020.24 | 427.9 | 1020.23 | 437.64 | 1020.06 | 446.2 | 1019.98 | 448.45 | 1019.95 |
| 451.68 | 1019.97 | 459.26 | 1020.03 | 470.07 | 1020.18 | 478.05 | 1020.26 | 480.88 | 1020.27 |
| 482.83 | 1020.27 | 501.14 | 1020.22 | 502.49 | 1020.21 | 504.42 | 1020.21 | 513.3 | 1020.24 |
| 519.45 | 1020.29 | 534.91 | 1020.37 | 545.72 | 1020.37 | 556.07 | 1020.33 | 557.17 | 1020.33 |
| 567.33 | 1020.23 | 574.39 | 1020.12 | 578.14 | 1020.07 | 583.54 | 1019.9 | 588.95 | 1019.7 |
| 592.7 | 1019.42 | 599.75 | 1018.94 | 609.91 | 1019.22 | 610.56 | 1019.25 | 611 | 1019.29 |
| 621.37 | 1020.18 | 629.32 | 1021.14 | 632.17 | 1021.49 | 642.98 | 1022.75 | 647.63 | 1023.13 |
| 653.79 | 1023.67 | 662.66 | 1024.18 | 664.59 | 1024.28 | 665.94 | 1024.31 | 675.4 | 1024.55 |
| 684.25 | 1024.61 | 686.21 | 1024.63 | 697.02 | 1024.64 | 739.19 | 1024.41 | 740.25 | 1024.4 |
| 741.77 | 1024.39 | 761.86 | 1024.16 | 772.67 | 1024.06 | 783.47 | 1024 | 791.17 | 1024.03 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 223.11 | .035 | 407.45 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 275.33 | 379.76 | 210.34 | 199.99 | 193.14 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1020.76 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.035 | 0.032 |
| W.S. Elev (ft) | 1020.64 | Reach Len. (ft) | 210.34 | 199.99 | 193.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 142.50 | 132.41 |
| E.G. Slope (ft/ft) | 0.003690 | Area (sq ft) | | 142.50 | 132.41 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 466.08 | 246.92 |
| Top Width (ft) | 344.99 | Top Width (ft) | | 99.60 | 245.39 |
| Vel Total (ft/s) | 2.59 | Avg. Vel. (ft/s) | | 3.27 | 1.86 |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | | 1.43 | 0.54 |
| Conv. Total (cfs) | 11737.6 | Conv. (cfs) | | 7672.7 | 4064.9 |
| Length Wtd. (ft) | 197.58 | Wetted Per. (ft) | | 99.78 | 245.51 |
| Min Ch El (ft) | 1018.43 | Shear (lb/sq ft) | | 0.33 | 0.12 |
| Alpha | 1.22 | Stream Power (lb/ft s) | | 1.08 | 0.23 |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | 12.08 | 25.53 | 3.70 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 18.52 | 20.24 | 6.21 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.33 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1021.12 | Reach Len. (ft) | 210.34 | 199.99 | 193.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 192.47 | |
| E.G. Slope (ft/ft) | 0.003430 | Area (sq ft) | | 192.47 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 104.43 | Top Width (ft) | | 104.43 | |
| Vel Total (ft/s) | 3.70 | Avg. Vel. (ft/s) | | 3.70 | |
| Max Chl Dpth (ft) | 2.69 | Hydr. Depth (ft) | | 1.84 | |
| Conv. Total (cfs) | 12174.5 | Conv. (cfs) | | 12174.5 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 105.84 | |
| Min Ch El (ft) | 1018.43 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.44 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 1.03 | 32.89 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.13 | 21.94 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.33 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1021.12 | Reach Len. (ft) | 210.34 | 199.99 | 193.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 192.47 | |
| E.G. Slope (ft/ft) | 0.003430 | Area (sq ft) | | 192.47 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 104.43 | Top Width (ft) | | 104.43 | |
| Vel Total (ft/s) | 3.70 | Avg. Vel. (ft/s) | | 3.70 | |
| Max Chl Dpth (ft) | 2.69 | Hydr. Depth (ft) | | 1.84 | |
| Conv. Total (cfs) | 12174.5 | Conv. (cfs) | | 12174.5 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 105.84 | |
| Min Ch El (ft) | 1018.43 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.44 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 3.31 | 31.08 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 2.75 | 21.17 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.441

INPUT
Description: Thalweg Sta. 252.42
Station Elevation Data num= 132

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1023.69 | 6.41 | 1024.05 | 15.75 | 1024.35 | 17.76 | 1024.41 | 19.49 | 1024.45 |
| 40.18 | 1025.02 | 40.44 | 1025.03 | 40.67 | 1025.03 | 51.79 | 1025.28 | 61.84 | 1025.43 |
| 63.14 | 1025.44 | 64.62 | 1025.44 | 74.48 | 1025.46 | 83.02 | 1025.37 | 84.85 | 1025.34 |
| 85.82 | 1025.32 | 89.06 | 1025.23 | 104.19 | 1024.87 | 108.51 | 1024.73 | 113.49 | 1024.58 |
| 119.86 | 1024.41 | 125.37 | 1024.19 | 131.2 | 1023.9 | 142.55 | 1023.23 | 146.54 | 1022.98 |
| 153.89 | 1022.47 | 162.37 | 1021.85 | 165.24 | 1021.63 | 165.28 | 1021.63 | 167.72 | 1021.42 |
| 176.58 | 1020.76 | 186.8 | 1019.89 | 187.93 | 1019.79 | 188.9 | 1019.72 | 199.27 | 1019.04 |
| 210.07 | 1018.72 | 210.61 | 1018.71 | 211.24 | 1018.7 | 221.96 | 1018.76 | 231.25 | 1018.62 |
| 233.31 | 1018.54 | 235.68 | 1018.31 | 244.65 | 1017.5 | 252.42 | 1017.28 | 255.99 | 1017.3 |
| 260.11 | 1017.47 | 267.34 | 1017.68 | 273.6 | 1018.16 | 278.68 | 1018.62 | 284.55 | 1019.02 |
| 290.03 | 1019.44 | 294.77 | 1019.59 | 301.37 | 1019.73 | 315.95 | 1019.88 | 315.97 | 1019.88 |
| 324.06 | 1019.92 | 333.42 | 1019.9 | 337.12 | 1019.9 | 341.9 | 1019.84 | 357.86 | 1019.61 |
| 358.1 | 1019.6 | 358.3 | 1019.6 | 369.44 | 1019.38 | 379.48 | 1019.11 | 380.79 | 1019.09 |
| 382.3 | 1019.08 | 392.13 | 1018.94 | 400.65 | 1019.08 | 403.48 | 1019.15 | 406.73 | 1019.21 |
| 414.82 | 1019.41 | 421.83 | 1019.44 | 426.17 | 1019.44 | 431.17 | 1019.28 | 437.51 | 1019.09 |
| 448.85 | 1018.66 | 455.61 | 1018.52 | 460.2 | 1018.44 | 464.18 | 1018.46 | 471.55 | 1018.51 |
| 482.89 | 1018.64 | 485.35 | 1018.63 | 494.23 | 1018.54 | 504.48 | 1018.38 | 505.58 | 1018.36 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 506.53 | 1018.42 | 513.29 | 1018.93 | 516.92 | 1019.21 | 520.69 | 1019.61 | 527.7 | 1020.21 |
| 528.27 | 1020.26 | 528.92 | 1020.3 | 539.61 | 1021.03 | 548.88 | 1021.57 | 550.96 | 1021.68 |
| 553.35 | 1021.82 | 562.3 | 1022.39 | 577.79 | 1023.26 | 584.99 | 1023.62 | 596.34 | 1024.07 |
| 602.22 | 1024.23 | 607.68 | 1024.36 | 612.41 | 1024.46 | 616.71 | 1024.53 | 619.02 | 1024.58 |
| 624.11 | 1024.66 | 630.37 | 1024.73 | 631.49 | 1024.73 | 633.58 | 1024.72 | 641.72 | 1024.67 |
| 651.1 | 1024.5 | 653.06 | 1024.46 | 664.4 | 1024.26 | 675.53 | 1024.1 | 675.75 | 1024.09 |
| 675.93 | 1024.09 | 687.09 | 1023.96 | 697.11 | 1023.87 | 698.44 | 1023.85 | 699.97 | 1023.84 |
| 709.78 | 1023.76 | 718.28 | 1023.72 | 721.13 | 1023.7 | 743.82 | 1023.64 | 760.63 | 1023.63 |
| 777.85 | 1023.67 | 781.81 | 1023.7 | 789.19 | 1023.74 | 797.72 | 1023.84 | 800.54 | 1023.86 |
| 802.99 | 1023.9 | 810.19 | 1023.99 | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 341.9 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 186.8 | 315.97 | 201.12 | 200 | 199.11 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1019.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.035 | 0.032 |
| W.S. Elev (ft) | 1019.48 | Reach Len. (ft) | 201.12 | 200.00 | 199.11 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 109.61 | 87.70 |
| E.G. Slope (ft/ft) | 0.008417 | Area (sq ft) | | 109.61 | 87.70 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 457.51 | 255.49 |
| Top Width (ft) | 253.67 | Top Width (ft) | | 98.67 | 155.00 |
| Vel Total (ft/s) | 3.61 | Avg. Vel. (ft/s) | | 4.17 | 2.91 |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | | 1.11 | 0.57 |
| Conv. Total (cfs) | 7771.4 | Conv. (cfs) | | 4986.7 | 2784.7 |
| Length Wtd. (ft) | 199.70 | Wetted Per. (ft) | | 98.82 | 155.08 |
| Min Ch El (ft) | 1017.28 | Shear (lb/sq ft) | | 0.58 | 0.30 |
| Alpha | 1.09 | Stream Power (lb/ft s) | | 2.43 | 0.87 |
| Frctn Loss (ft) | 1.02 | Cum Volume (acre-ft) | 12.08 | 24.95 | 3.21 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 18.52 | 19.79 | 5.32 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1020.16 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.42 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1019.75 | Reach Len. (ft) | 201.12 | 200.00 | 199.11 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 137.80 | |
| E.G. Slope (ft/ft) | 0.011600 | Area (sq ft) | | 137.80 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 114.32 | Top Width (ft) | | 114.32 | |
| Vel Total (ft/s) | 5.17 | Avg. Vel. (ft/s) | | 5.17 | |
| Max Chl Dpth (ft) | 2.47 | Hydr. Depth (ft) | | 1.21 | |
| Conv. Total (cfs) | 6620.1 | Conv. (cfs) | | 6620.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 114.48 | |
| Min Ch El (ft) | 1017.28 | Shear (lb/sq ft) | | 0.87 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.51 | |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 1.03 | 32.14 | |
| C & E Loss (ft) | 0.09 | Cum SA (acres) | 1.13 | 21.44 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1020.16 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.42 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1019.75 | Reach Len. (ft) | 201.12 | 200.00 | 199.11 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 137.80 | |
| E.G. Slope (ft/ft) | 0.011600 | Area (sq ft) | | 137.80 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 114.32 | Top Width (ft) | | 114.32 | |
| Vel Total (ft/s) | 5.17 | Avg. Vel. (ft/s) | | 5.17 | |
| Max Chl Dpth (ft) | 2.47 | Hydr. Depth (ft) | | 1.21 | |
| Conv. Total (cfs) | 6620.1 | Conv. (cfs) | | 6620.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 114.48 | |
| Min Ch El (ft) | 1017.28 | Shear (lb/sq ft) | | 0.87 | |

| | | | | |
|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.51 |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 3.31 | 30.32 |
| C & E Loss (ft) | 0.09 | Cum SA (acres) | 2.75 | 20.66 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.403

INPUT
Description: Thalweg Sta. 457.42
Station Elevation Data num= 143

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1024.11 | .37 | 1024.1 | 23.22 | 1023.34 | 30.8 | 1023.04 | 46.07 | 1022.5 |
| 56.35 | 1022.22 | 57.5 | 1022.18 | 58.42 | 1022.17 | 68.93 | 1022.11 | 79.09 | 1022.16 |
| 80.35 | 1022.18 | 91.78 | 1022.47 | 92.26 | 1022.48 | 99.76 | 1022.7 | 114.63 | 1022.96 |
| 120.43 | 1023.01 | 126.06 | 1023 | 133 | 1022.92 | 137.48 | 1022.88 | 146.13 | 1022.73 |
| 148.91 | 1022.71 | 158.56 | 1022.62 | 160.33 | 1022.6 | 160.85 | 1022.6 | 161.77 | 1022.59 |
| 182.44 | 1022.23 | 183.19 | 1022.22 | 184.11 | 1022.18 | 203.11 | 1021.5 | 223.78 | 1020.48 |
| 228.89 | 1020.28 | 235.21 | 1020.2 | 240.32 | 1020.07 | 244.45 | 1020.08 | 251.75 | 1020.15 |
| 263.17 | 1020.16 | 265.12 | 1020.13 | 274.6 | 1019.87 | 285.79 | 1019.68 | 286.32 | 1019.68 |
| 297.45 | 1019.79 | 306.46 | 1019.65 | 308.88 | 1019.57 | 311.87 | 1019.49 | 320.3 | 1019.3 |
| 327.13 | 1019.19 | 331.73 | 1019.13 | 354.58 | 1018.76 | 366.01 | 1018.8 | 368.47 | 1018.79 |
| 371.08 | 1018.76 | 377.44 | 1018.69 | 388.86 | 1018.35 | 389.14 | 1018.34 | 400.29 | 1018 |
| 409.81 | 1017.77 | 411.71 | 1017.71 | 414.07 | 1017.63 | 423.14 | 1017.37 | 434.57 | 1016.95 |
| 439.62 | 1016.69 | 445.99 | 1016.4 | 451.15 | 1016.18 | 457.42 | 1016.02 | 468.84 | 1016.06 |
| 471.82 | 1016.12 | 480.27 | 1016.38 | 490.73 | 1017.33 | 491.7 | 1017.41 | 492.49 | 1017.48 |
| 503.12 | 1018.24 | 513.16 | 1018.48 | 514.55 | 1018.5 | 525.87 | 1018.56 | 525.98 | 1018.56 |
| 533.83 | 1018.61 | 537.4 | 1018.64 | 541.82 | 1018.66 | 548.83 | 1018.71 | 553.55 | 1018.72 |
| 554.5 | 1018.72 | 560.26 | 1018.7 | 567.38 | 1018.62 | 571.68 | 1018.58 | 583.11 | 1018.41 |
| 592.93 | 1018.2 | 594.53 | 1018.17 | 605.96 | 1017.91 | 616.5 | 1017.75 | 617.39 | 1017.73 |
| 618.48 | 1017.72 | 628.81 | 1017.59 | 637.17 | 1017.5 | 640.24 | 1017.46 | 651.66 | 1017.36 |
| 663.09 | 1017.29 | 668.57 | 1017.29 | 674.52 | 1017.32 | 675.93 | 1017.34 | 678.51 | 1017.43 |
| 685.94 | 1017.71 | 695.14 | 1018.48 | 697.37 | 1018.66 | 698.01 | 1018.72 | 699.18 | 1018.82 |
| 708.8 | 1019.61 | 719.85 | 1020.27 | 720.22 | 1020.29 | 720.69 | 1020.32 | 731.65 | 1020.92 |
| 743.08 | 1021.58 | 761.19 | 1022.68 | 765.93 | 1022.94 | 771.79 | 1023.16 | 777.35 | 1023.41 |
| 781.86 | 1023.49 | 788.78 | 1023.6 | 800.21 | 1023.67 | 802.53 | 1023.66 | 811.63 | 1023.6 |
| 822.9 | 1023.44 | 823.06 | 1023.44 | 823.2 | 1023.43 | 868.76 | 1022.68 | 880.19 | 1022.45 |
| 903.04 | 1021.87 | 914.47 | 1021.76 | 925.1 | 1021.81 | 925.89 | 1021.81 | 926.54 | 1021.82 |
| 948.75 | 1021.98 | 950.65 | 1021.99 | 971.6 | 1022.16 | 976.2 | 1022.24 | 983.03 | 1022.34 |
| 988.55 | 1022.52 | 994.45 | 1022.75 | 1001.76 | 1023.07 | 1005.88 | 1023.26 | 1009.22 | 1023.39 |
| 1017.31 | 1023.68 | 1021.79 | 1023.82 | 1025.09 | 1023.9 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 92.26 | .035 | 553.55 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 371.08 | 553.55 | 211.17 | 200 | 199.25 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.65 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.035 | 0.032 |
| W.S. Elev (ft) | 1018.54 | Reach Len. (ft) | 211.17 | 200.00 | 199.25 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 171.48 | 95.34 |
| E.G. Slope (ft/ft) | 0.003436 | Area (sq ft) | | 171.48 | 95.34 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 491.80 | 221.20 |
| Top Width (ft) | 259.60 | Top Width (ft) | | 138.49 | 121.11 |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | | 2.87 | 2.32 |
| Max Chl Dpth (ft) | 2.51 | Hydr. Depth (ft) | | 1.24 | 0.79 |
| Conv. Total (cfs) | 12162.9 | Conv. (cfs) | | 8389.5 | 3773.4 |
| Length Wtd. (ft) | 200.43 | Wetted Per. (ft) | | 138.62 | 121.16 |
| Min Ch El (ft) | 1016.02 | Shear (lb/sq ft) | | 0.27 | 0.17 |
| Alpha | 1.03 | Stream Power (lb/ft s) | | 0.76 | 0.39 |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 12.08 | 24.31 | 2.79 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 18.52 | 19.24 | 4.69 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1019.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1019.16 | Reach Len. (ft) | 211.17 | 200.00 | 199.25 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 281.30 | |
| E.G. Slope (ft/ft) | 0.002016 | Area (sq ft) | | 281.30 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 182.47 | Top Width (ft) | | 182.47 | |
| Vel Total (ft/s) | 2.53 | Avg. Vel. (ft/s) | | 2.53 | |
| Max Chl Dpth (ft) | 3.14 | Hydr. Depth (ft) | | 1.54 | |
| Conv. Total (cfs) | 15880.8 | Conv. (cfs) | | 15880.8 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 183.45 | |
| Min Ch El (ft) | 1016.02 | Shear (lb/sq ft) | | 0.19 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.49 | |
| Frctn Loss (ft) | 0.58 | Cum Volume (acre-ft) | 1.03 | 31.17 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.13 | 20.76 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1019.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1019.16 | Reach Len. (ft) | 211.17 | 200.00 | 199.25 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 281.30 | |
| E.G. Slope (ft/ft) | 0.002016 | Area (sq ft) | | 281.30 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 182.47 | Top Width (ft) | | 182.47 | |
| Vel Total (ft/s) | 2.53 | Avg. Vel. (ft/s) | | 2.53 | |
| Max Chl Dpth (ft) | 3.14 | Hydr. Depth (ft) | | 1.54 | |
| Conv. Total (cfs) | 15880.8 | Conv. (cfs) | | 15880.8 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 183.45 | |
| Min Ch El (ft) | 1016.02 | Shear (lb/sq ft) | | 0.19 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.49 | |
| Frctn Loss (ft) | 0.58 | Cum Volume (acre-ft) | 3.31 | 29.36 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 2.75 | 19.98 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.365

INPUT
Description: Thalweg Sta. 503.14
Station Elevation Data num= 135

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1022.22 | 3.95 | 1022.01 | 6.98 | 1021.9 | 11.11 | 1021.8 | 18.52 | 1021.6 |
| 23.95 | 1021.54 | 30.07 | 1021.51 | 38.44 | 1021.58 | 41.62 | 1021.6 | 43.94 | 1021.65 |
| 49.79 | 1021.73 | 53.17 | 1021.8 | 57.1 | 1021.86 | 63.94 | 1021.98 | 64.71 | 1021.99 |
| 65.78 | 1021.98 | 76.26 | 1021.96 | 83.93 | 1021.86 | 87.81 | 1021.77 | 92.39 | 1021.54 |
| 93.11 | 1021.5 | 99.36 | 1021.21 | 103.93 | 1020.91 | 110.91 | 1020.43 | 120.45 | 1020.12 |
| 122.45 | 1020.04 | 123.92 | 1020.02 | 134 | 1020.08 | 143.92 | 1020.09 | 145.55 | 1020.1 |
| 147.78 | 1020.1 | 157.1 | 1020.13 | 163.91 | 1020.25 | 168.64 | 1020.35 | 183.91 | 1020.93 |
| 188.88 | 1021.09 | 191.74 | 1021.15 | 202.46 | 1021.34 | 203.29 | 1021.36 | 203.9 | 1021.37 |
| 214.84 | 1021.49 | 223.9 | 1021.49 | 226.39 | 1021.46 | 229.79 | 1021.22 | 237.94 | 1020.73 |
| 249.48 | 1019.5 | 254.76 | 1018.96 | 261.03 | 1018.61 | 263.89 | 1018.52 | 272.58 | 1018.33 |
| 283.89 | 1018.26 | 284.13 | 1018.26 | 284.46 | 1018.25 | 295.67 | 1018.03 | 303.88 | 1017.69 |
| 307.22 | 1017.7 | 311.8 | 1017.7 | 318.77 | 1017.87 | 323.88 | 1018.06 | 330.25 | 1018.28 |
| 339.13 | 1018.23 | 341.87 | 1018.23 | 343.87 | 1018.19 | 353.41 | 1018.04 | 363.87 | 1017.74 |
| 364.96 | 1017.71 | 366.46 | 1017.64 | 376.51 | 1017.2 | 383.86 | 1016.83 | 388.06 | 1016.6 |
| 399.6 | 1016.41 | 403.86 | 1016.51 | 411.15 | 1016.72 | 422.7 | 1017.23 | 423.85 | 1017.25 |
| 434.25 | 1017.36 | 443.85 | 1017.24 | 445.8 | 1017.22 | 457.35 | 1017.13 | 463.84 | 1017.22 |
| 468.9 | 1017.36 | 475.81 | 1017.35 | 479.94 | 1017.38 | 480.44 | 1017.38 | 483.84 | 1017.17 |
| 491.99 | 1016.5 | 503.14 | 1015.36 | 503.54 | 1015.32 | 503.83 | 1015.31 | 515.09 | 1015.23 |
| 523.83 | 1015.7 | 526.63 | 1015.91 | 530.48 | 1016.26 | 538.18 | 1017.05 | 543.82 | 1017.28 |
| 549.73 | 1017.46 | 556.93 | 1017.47 | 557.82 | 1017.47 | 561.28 | 1017.48 | 572.82 | 1017.44 |
| 583.81 | 1017.32 | 584.37 | 1017.31 | 585.15 | 1017.29 | 595.92 | 1017.04 | 600.56 | 1016.95 |
| 607.47 | 1016.82 | 630.56 | 1016.56 | 642.12 | 1016.47 | 653.66 | 1016.47 | 663.79 | 1016.53 |
| 665.21 | 1016.53 | 667.15 | 1016.55 | 676.76 | 1016.61 | 683.78 | 1016.73 | 688.31 | 1016.82 |
| 694.49 | 1017.24 | 699.85 | 1017.56 | 711.4 | 1018.71 | 721.83 | 1019.6 | 722.95 | 1019.7 |
| 734.5 | 1020.41 | 743.77 | 1020.96 | 746.05 | 1021.08 | 769.14 | 1022.34 | 780.69 | 1022.65 |
| 783.76 | 1022.68 | 792.24 | 1022.74 | 803.75 | 1022.79 | 803.83 | 1022.79 | 815.34 | 1022.76 |

826.88 1022.68 838.43 1022.55 843.74 1022.45 849.98 1022.3 855.5 1022.06

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 92.39 | .032 | 600.56 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 479.94 | 556.93 | 209.69 | 199.99 | 197.51 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.66 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.032 | 0.032 | 0.032 |
| W.S. Elev (ft) | 1017.42 | Reach Len. (ft) | 209.69 | 199.99 | 197.51 |
| Crit W.S. (ft) | 1017.29 | Flow Area (sq ft) | 41.26 | 82.22 | 79.02 |
| E.G. Slope (ft/ft) | 0.007497 | Area (sq ft) | 41.26 | 82.22 | 79.02 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 87.01 | 372.29 | 253.70 |
| Top Width (ft) | 300.43 | Top Width (ft) | 108.54 | 68.61 | 123.28 |
| Vel Total (ft/s) | 3.52 | Avg. Vel. (ft/s) | 2.11 | 4.53 | 3.21 |
| Max Chl Dpth (ft) | 2.19 | Hydr. Depth (ft) | 0.38 | 1.20 | 0.64 |
| Conv. Total (cfs) | 8234.8 | Conv. (cfs) | 1005.0 | 4299.8 | 2930.1 |
| Length Wtd. (ft) | 201.38 | Wetted Per. (ft) | 108.59 | 68.78 | 123.31 |
| Min Ch El (ft) | 1015.23 | Shear (lb/sq ft) | 0.18 | 0.56 | 0.30 |
| Alpha | 1.20 | Stream Power (lb/ft s) | 0.38 | 2.53 | 0.96 |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 11.98 | 23.73 | 2.39 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 18.26 | 18.77 | 4.13 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.66 | Element | | | |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.032 | |
| W.S. Elev (ft) | 1018.31 | Reach Len. (ft) | 209.69 | 199.99 | 197.51 |
| Crit W.S. (ft) | 1017.75 | Flow Area (sq ft) | | 149.81 | |
| E.G. Slope (ft/ft) | 0.004470 | Area (sq ft) | | 149.81 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 76.99 | Top Width (ft) | | 76.99 | |
| Vel Total (ft/s) | 4.76 | Avg. Vel. (ft/s) | | 4.76 | |
| Max Chl Dpth (ft) | 3.08 | Hydr. Depth (ft) | | 1.95 | |
| Conv. Total (cfs) | 10664.4 | Conv. (cfs) | | 10664.4 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 78.93 | |
| Min Ch El (ft) | 1015.23 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.52 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 1.03 | 30.18 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.13 | 20.16 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.66 | Element | | | |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.032 | |
| W.S. Elev (ft) | 1018.31 | Reach Len. (ft) | 209.69 | 199.99 | 197.51 |
| Crit W.S. (ft) | 1017.75 | Flow Area (sq ft) | | 149.81 | |
| E.G. Slope (ft/ft) | 0.004470 | Area (sq ft) | | 149.81 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 76.99 | Top Width (ft) | | 76.99 | |
| Vel Total (ft/s) | 4.76 | Avg. Vel. (ft/s) | | 4.76 | |
| Max Chl Dpth (ft) | 3.08 | Hydr. Depth (ft) | | 1.95 | |
| Conv. Total (cfs) | 10664.4 | Conv. (cfs) | | 10664.4 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 78.93 | |
| Min Ch El (ft) | 1015.23 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.52 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 3.31 | 28.37 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 2.75 | 19.39 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.327

INPUT
Description: Thalweg Sta. 351.15
Station Elevation Data num= 87

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1018.1 | 2.22 | 1018.05 | 14.46 | 1017.61 | 22 | 1017.32 | 26.71 | 1017.1 |
| 38.96 | 1016.68 | 39.32 | 1016.67 | 51.2 | 1016.5 | 73.97 | 1016.37 | 75.69 | 1016.35 |
| 87.94 | 1015.89 | 100.19 | 1015.37 | 108.61 | 1015.35 | 110.85 | 1015.36 | 112.43 | 1015.37 |
| 121.64 | 1015.44 | 124.68 | 1015.47 | 125.94 | 1015.48 | 149.17 | 1015.56 | 160.59 | 1015.63 |
| 161.42 | 1015.64 | 163.41 | 1015.66 | 185.91 | 1015.81 | 195.24 | 1015.85 | 198.15 | 1015.87 |
| 212.56 | 1015.93 | 222.65 | 1015.95 | 229.89 | 1015.86 | 234.9 | 1015.76 | 246.98 | 1015.31 |
| 247.21 | 1015.31 | 259.39 | 1015.72 | 264.53 | 1016.11 | 271.64 | 1016.57 | 281.86 | 1016.69 |
| 282.16 | 1016.69 | 283.04 | 1016.7 | 283.88 | 1016.7 | 288.75 | 1016.5 | 296.12 | 1016.21 |
| 299.18 | 1016.08 | 308.37 | 1015.67 | 320.62 | 1015.45 | 330.54 | 1015.16 | 332.86 | 1015.1 |
| 333.83 | 1015.03 | 345.11 | 1014.32 | 351.15 | 1014.3 | 357.36 | 1014.45 | 368.48 | 1015.36 |
| 369.6 | 1015.44 | 372.32 | 1015.48 | 381.85 | 1015.64 | 382.15 | 1015.64 | 385.81 | 1015.6 |
| 394.09 | 1015.45 | 406.34 | 1015.26 | 418.59 | 1015.15 | 420.45 | 1015.17 | 430.83 | 1015.24 |
| 437.78 | 1015.35 | 441.39 | 1015.42 | 443.08 | 1015.45 | 455.1 | 1015.73 | 455.33 | 1015.73 |
| 455.88 | 1015.75 | 467.57 | 1016.15 | 479.82 | 1016.81 | 489.75 | 1017.37 | 492.07 | 1017.49 |
| 504.31 | 1017.94 | 528.8 | 1018.67 | 541.05 | 1018.9 | 541.72 | 1018.9 | 553.3 | 1018.93 |
| 559.04 | 1019.05 | 565.54 | 1019.28 | 576.37 | 1019.78 | 577.79 | 1019.85 | 590.04 | 1020.39 |
| 593.7 | 1020.49 | 602.28 | 1020.67 | 614.52 | 1020.59 | 623 | 1020.49 | 626.77 | 1020.46 |
| 628.34 | 1020.44 | 636.92 | 1020.29 | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 441.39 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 282.16 | 382.15 | 161.38 | 199.6 | 212.73 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1016.38 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.035 | 0.035 | 0.035 |
| W.S. Elev (ft) | 1016.26 | Reach Len. (ft) | 161.38 | 199.60 | 212.73 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 108.94 | 92.33 | 69.04 |
| E.G. Slope (ft/ft) | 0.005178 | Area (sq ft) | 108.94 | 92.33 | 69.04 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 230.60 | 292.50 | 189.90 |
| Top Width (ft) | 363.67 | Top Width (ft) | 188.83 | 87.34 | 87.49 |
| Vel Total (ft/s) | 2.64 | Avg. Vel. (ft/s) | 2.12 | 3.17 | 2.75 |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | 0.58 | 1.06 | 0.79 |
| Conv. Total (cfs) | 9908.2 | Conv. (cfs) | 3204.6 | 4064.7 | 2638.9 |
| Length Wtd. (ft) | 192.85 | Wetted Per. (ft) | 188.89 | 87.43 | 87.51 |
| Min Ch El (ft) | 1014.30 | Shear (lb/sq ft) | 0.19 | 0.34 | 0.26 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.39 | 1.08 | 0.70 |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 11.62 | 23.32 | 2.06 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.54 | 18.41 | 3.65 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.11 | Element | | | |
| Vel Head (ft) | 0.58 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1016.53 | Reach Len. (ft) | 161.38 | 199.60 | 212.73 |
| Crit W.S. (ft) | 1016.49 | Flow Area (sq ft) | | 116.44 | |
| E.G. Slope (ft/ft) | 0.015872 | Area (sq ft) | | 116.44 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 94.07 | Top Width (ft) | | 94.07 | |
| Vel Total (ft/s) | 6.12 | Avg. Vel. (ft/s) | | 6.12 | |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 5659.4 | Conv. (cfs) | | 5659.4 | |
| Length Wtd. (ft) | 199.60 | Wetted Per. (ft) | | 95.05 | |
| Min Ch El (ft) | 1014.30 | Shear (lb/sq ft) | | 1.21 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.43 | |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 1.03 | 29.57 | |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 1.13 | 19.77 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.11 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.58 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1016.53 | Reach Len. (ft) | 161.38 | 199.60 | 212.73 |
| Crit W.S. (ft) | 1016.49 | Flow Area (sq ft) | | 116.44 | |
| E.G. Slope (ft/ft) | 0.015872 | Area (sq ft) | | 116.44 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 94.07 | Top Width (ft) | | 94.07 | |
| Vel Total (ft/s) | 6.12 | Avg. Vel. (ft/s) | | 6.12 | |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 5659.4 | Conv. (cfs) | | 5659.4 | |
| Length Wtd. (ft) | 199.60 | Wetted Per. (ft) | | 95.05 | |
| Min Ch El (ft) | 1014.30 | Shear (lb/sq ft) | | 1.21 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.43 | |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 3.31 | 27.76 | |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 2.75 | 18.99 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.289

INPUT
Description: Thalweg Sta. 398.61
Station Elevation Data num= 149

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1018.1 | .12 | 1018.1 | 6.38 | 1017.74 | 10.34 | 1017.5 | 11.39 | 1017.44 |
| 20.56 | 1016.94 | 30.77 | 1016.48 | 37.25 | 1016.25 | 40.99 | 1016.09 | 50.18 | 1016.06 |
| 51.21 | 1016.06 | 60.33 | 1015.97 | 61.43 | 1015.95 | 71.64 | 1015.59 | 76.04 | 1015.38 |
| 81.86 | 1015.09 | 88.96 | 1014.86 | 92.08 | 1014.74 | 101.89 | 1014.7 | 102.3 | 1014.7 |
| 103.82 | 1014.72 | 112.51 | 1014.81 | 122.73 | 1014.89 | 127.75 | 1014.91 | 132.95 | 1014.92 |
| 143.17 | 1014.96 | 144.79 | 1014.97 | 152.55 | 1015 | 153.61 | 1015 | 192.39 | 1015.18 |
| 194.26 | 1015.2 | 201.28 | 1015.23 | 204.47 | 1015.25 | 205.32 | 1015.25 | 231.18 | 1015.3 |
| 235.12 | 1015.32 | 244.11 | 1015.41 | 245.22 | 1015.43 | 245.34 | 1015.43 | 249.99 | 1015.41 |
| 255.56 | 1015.37 | 265.78 | 1015.09 | 269.97 | 1014.91 | 275.99 | 1014.72 | 282.89 | 1014.45 |
| 286.21 | 1014.25 | 295.83 | 1013.91 | 296.43 | 1013.88 | 298.72 | 1013.87 | 306.65 | 1013.86 |
| 316.87 | 1014.05 | 321.68 | 1014.11 | 327.08 | 1014.19 | 347.45 | 1014.26 | 347.54 | 1014.26 |
| 357.74 | 1014.28 | 360.46 | 1014.27 | 367.95 | 1014.29 | 373.4 | 1014.09 | 378.17 | 1013.97 |
| 388.39 | 1013.53 | 396.18 | 1013.27 | 398.61 | 1013.2 | 399.25 | 1013.24 | 408.82 | 1013.51 |
| 419.04 | 1014.49 | 425.11 | 1015.15 | 432.57 | 1016 | 438.04 | 1016.62 | 439.48 | 1016.79 |
| 444.89 | 1017.22 | 449.69 | 1017.58 | 450.23 | 1017.59 | 459.91 | 1017.86 | 463.9 | 1017.89 |
| 470.13 | 1017.96 | 476.82 | 1017.92 | 480.35 | 1017.91 | 489.76 | 1017.72 | 490.56 | 1017.71 |
| 500.78 | 1017.48 | 502.68 | 1017.46 | 511 | 1017.35 | 516.43 | 1017.35 | 531.43 | 1017.39 |
| 533.33 | 1017.4 | 542.35 | 1017.4 | 551.87 | 1017.32 | 554.39 | 1017.31 | 562.09 | 1017.25 |
| 567.33 | 1017.31 | 580.25 | 1017.49 | 582.52 | 1017.53 | 593.18 | 1017.52 | 619.04 | 1017.37 |
| 643.83 | 1017.29 | 651.57 | 1017.28 | 654.04 | 1017.27 | 683.68 | 1017.28 | 684.7 | 1017.29 |
| 694.91 | 1017.29 | 696.61 | 1017.28 | 705.13 | 1017.26 | 709.55 | 1017.22 | 715.35 | 1017.19 |
| 725.57 | 1017.26 | 735.4 | 1017.51 | 735.78 | 1017.51 | 737.24 | 1017.54 | 746 | 1017.68 |
| 756.22 | 1017.72 | 761.26 | 1017.76 | 769.82 | 1017.78 | 776.66 | 1017.85 | 786.87 | 1018.08 |
| 787.12 | 1018.09 | 797.09 | 1018.54 | 803.61 | 1018.9 | 807.31 | 1019.06 | 812.06 | 1019.24 |
| 817.52 | 1019.42 | 825.9 | 1019.63 | 834.69 | 1019.82 | 837.96 | 1019.9 | 845.84 | 1020.05 |
| 848.18 | 1020.11 | 851.75 | 1020.18 | 858.39 | 1020.3 | 864.69 | 1020.39 | 868.61 | 1020.42 |
| 877.61 | 1020.54 | 878.83 | 1020.55 | 889.05 | 1020.76 | 890.54 | 1020.78 | 899.26 | 1020.94 |
| 903.47 | 1020.92 | 909.48 | 1020.93 | 916.4 | 1020.86 | 919.7 | 1020.82 | 929.92 | 1020.81 |
| 932.14 | 1020.83 | 940.14 | 1020.92 | 950.35 | 1021.17 | 955.19 | 1021.31 | 960.57 | 1021.49 |
| 968.11 | 1021.7 | 970.79 | 1021.79 | 980.86 | 1022 | 980.89 | 1022 | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 450.23 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 245.22 | 425.11 | 153.14 | 199.78 | 217.75 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.035 | 0.035 | 0.035 |
| W.S. Elev (ft) | 1015.45 | Reach Len. (ft) | 153.14 | 199.78 | 217.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 65.11 | 217.84 | 0.38 |
| E.G. Slope (ft/ft) | 0.003554 | Area (sq ft) | 65.11 | 217.84 | 0.38 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 86.72 | 626.01 | 0.27 |
| Top Width (ft) | 353.05 | Top Width (ft) | 170.56 | 179.89 | 2.60 |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | 1.33 | 2.87 | 0.70 |
| Max Chl Dpth (ft) | 2.25 | Hydr. Depth (ft) | 0.38 | 1.21 | 0.15 |
| Conv. Total (cfs) | 11960.6 | Conv. (cfs) | 1454.7 | 10501.4 | 4.5 |
| Length Wtd. (ft) | 194.48 | Wetted Per. (ft) | 170.58 | 180.03 | 2.61 |
| Min Ch El (ft) | 1013.20 | Shear (lb/sq ft) | 0.08 | 0.27 | 0.03 |
| Alpha | 1.18 | Stream Power (lb/ft s) | 0.11 | 0.77 | 0.02 |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 11.30 | 22.61 | 1.89 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.88 | 17.80 | 3.43 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1015.56 | Reach Len. (ft) | 153.14 | 199.78 | 217.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 237.69 | |
| E.G. Slope (ft/ft) | 0.003461 | Area (sq ft) | | 237.69 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 179.89 | Top Width (ft) | | 179.89 | |
| Vel Total (ft/s) | 3.00 | Avg. Vel. (ft/s) | | 3.00 | |
| Max Chl Dpth (ft) | 2.36 | Hydr. Depth (ft) | | 1.32 | |
| Conv. Total (cfs) | 12120.4 | Conv. (cfs) | | 12120.4 | |
| Length Wtd. (ft) | 199.78 | Wetted Per. (ft) | | 180.56 | |
| Min Ch El (ft) | 1013.20 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.85 | |
| Frctn Loss (ft) | 0.73 | Cum Volume (acre-ft) | 1.03 | 28.76 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.13 | 19.14 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1015.56 | Reach Len. (ft) | 153.14 | 199.78 | 217.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 237.69 | |
| E.G. Slope (ft/ft) | 0.003461 | Area (sq ft) | | 237.69 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 179.89 | Top Width (ft) | | 179.89 | |
| Vel Total (ft/s) | 3.00 | Avg. Vel. (ft/s) | | 3.00 | |
| Max Chl Dpth (ft) | 2.36 | Hydr. Depth (ft) | | 1.32 | |
| Conv. Total (cfs) | 12120.4 | Conv. (cfs) | | 12120.4 | |
| Length Wtd. (ft) | 199.78 | Wetted Per. (ft) | | 180.56 | |
| Min Ch El (ft) | 1013.20 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.85 | |
| Frctn Loss (ft) | 0.73 | Cum Volume (acre-ft) | 3.31 | 26.95 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.75 | 18.37 | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.252

INPUT
Description: Thalweg Sta. 331.51
Station Elevation Data num= 153

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1016.16 | .13 | 1016.16 | 2.04 | 1016.11 | 10.13 | 1015.87 | 12.35 | 1015.83 |
| 20.14 | 1015.7 | 30.14 | 1015.51 | 32.95 | 1015.43 | 40.15 | 1015.25 | 43.25 | 1015.06 |
| 50.15 | 1014.78 | 53.55 | 1014.5 | 60.16 | 1013.83 | 63.86 | 1013.86 | 70.16 | 1013.82 |
| 74.16 | 1013.95 | 80.16 | 1014.16 | 84.46 | 1014.09 | 90.17 | 1014.08 | 94.76 | 1013.96 |
| 100.17 | 1013.79 | 105.06 | 1013.92 | 110.18 | 1014.04 | 115.37 | 1014.21 | 120.18 | 1014.38 |
| 140.19 | 1014.53 | 150.19 | 1014.56 | 160.2 | 1014.55 | 166.87 | 1014.49 | 170.2 | 1014.47 |
| 177.17 | 1014.4 | 180.21 | 1014.36 | 187.48 | 1014.29 | 197.78 | 1014.22 | 200.21 | 1014.21 |
| 208.09 | 1014.26 | 210.22 | 1014.27 | 218.38 | 1014.49 | 220.22 | 1014.53 | 227.89 | 1014.66 |
| 227.99 | 1014.66 | 230.25 | 1014.7 | 237.32 | 1014.67 | 240.38 | 1014.65 | 246.06 | 1014.57 |
| 250.5 | 1014.42 | 260.63 | 1014.26 | 270.76 | 1014.06 | 272.27 | 1014 | 280.88 | 1013.81 |
| 281.01 | 1013.81 | 281.81 | 1013.79 | 289.75 | 1013.55 | 291 | 1013.54 | 298.49 | 1013.14 |
| 301.13 | 1013.02 | 307.23 | 1012.86 | 311.26 | 1012.72 | 315.96 | 1012.76 | 321.38 | 1012.71 |
| 324.7 | 1012.63 | 331.51 | 1012.54 | 333.44 | 1012.52 | 341.63 | 1012.51 | 342.18 | 1012.51 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 350.92 | 1012.56 | 351.76 | 1012.56 | 359.65 | 1012.7 | 361.88 | 1012.75 | 368.39 | 1013.01 |
| 372.01 | 1013.17 | 382.13 | 1013.73 | 385.87 | 1013.95 | 392.26 | 1014.28 | 394.61 | 1014.43 |
| 402.38 | 1014.77 | 405.44 | 1014.97 | 405.61 | 1014.98 | 411.12 | 1015.36 | 412.49 | 1015.45 |
| 414.32 | 1015.52 | 416.04 | 1015.59 | 422.59 | 1015.84 | 432.69 | 1015.95 | 442.79 | 1016.01 |
| 446.51 | 1016.04 | 452.89 | 1016.07 | 462.99 | 1016.14 | 472.89 | 1016.25 | 473.06 | 1016.26 |
| 481.91 | 1016.39 | 483.19 | 1016.4 | 490.76 | 1016.49 | 493.28 | 1016.51 | 499.61 | 1016.53 |
| 503.38 | 1016.55 | 531.91 | 1016.48 | 543.78 | 1016.47 | 544.4 | 1016.46 | 552.71 | 1016.45 |
| 563.98 | 1016.36 | 570.4 | 1016.26 | 584.18 | 1016.01 | 588.11 | 1015.96 | 594.28 | 1015.85 |
| 602.48 | 1015.76 | 614.48 | 1015.77 | 615.9 | 1015.79 | 624.57 | 1015.9 | 626 | 1015.92 |
| 634.67 | 1016.02 | 637.76 | 1016.06 | 649.52 | 1016.17 | 654.87 | 1016.23 | 661.28 | 1016.25 |
| 664.97 | 1016.28 | 673.04 | 1016.23 | 675.07 | 1016.23 | 684.81 | 1016.11 | 685.17 | 1016.11 |
| 687.4 | 1016.06 | 694.3 | 1015.93 | 695.27 | 1015.91 | 696.56 | 1015.88 | 705.37 | 1015.7 |
| 711.99 | 1015.64 | 715.47 | 1015.62 | 725.57 | 1015.65 | 729.7 | 1015.67 | 743.6 | 1015.76 |
| 745.77 | 1015.77 | 755.36 | 1015.85 | 755.86 | 1015.85 | 758.91 | 1015.88 | 765.96 | 1015.96 |
| 767.13 | 1015.98 | 776.06 | 1016.15 | 778.88 | 1016.19 | 786.16 | 1016.33 | 796.26 | 1016.47 |
| 814.17 | 1016.8 | 825.92 | 1017.05 | 826.56 | 1017.07 | 836.66 | 1017.34 | 837.69 | 1017.36 |
| 846.76 | 1017.72 | 849.44 | 1017.86 | 856.86 | 1018.34 | 861.21 | 1018.61 | 866.96 | 1018.98 |
| 872.97 | 1019.29 | 877.06 | 1019.47 | 883.31 | 1019.72 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 416.04 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 230.25 | 402.38 | 222.52 | 199.97 | 190.53 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.74 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1014.58 | Reach Len. (ft) | 222.52 | 199.97 | 190.53 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 54.47 | 187.60 | |
| E.G. Slope (ft/ft) | 0.004876 | Area (sq ft) | 54.47 | 187.60 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 75.41 | 637.59 | |
| Top Width (ft) | 323.37 | Top Width (ft) | 170.63 | 152.74 | |
| Vel Total (ft/s) | 2.95 | Avg. Vel. (ft/s) | 1.38 | 3.40 | |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | 0.32 | 1.23 | |
| Conv. Total (cfs) | 10211.1 | Conv. (cfs) | 1080.0 | 9131.1 | |
| Length Wtd. (ft) | 204.07 | Wetted Per. (ft) | 170.69 | 152.82 | |
| Min Ch El (ft) | 1012.51 | Shear (lb/sq ft) | 0.10 | 0.37 | |
| Alpha | 1.21 | Stream Power (lb/ft s) | 0.13 | 1.27 | |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | 11.09 | 21.68 | 1.88 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 16.28 | 17.03 | 3.42 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.97 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1014.81 | Reach Len. (ft) | 222.52 | 199.97 | 190.53 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 226.29 | |
| E.G. Slope (ft/ft) | 0.003832 | Area (sq ft) | | 226.29 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 172.13 | Top Width (ft) | | 172.13 | |
| Vel Total (ft/s) | 3.15 | Avg. Vel. (ft/s) | | 3.15 | |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | 1.31 | |
| Conv. Total (cfs) | 11517.8 | Conv. (cfs) | | 11517.8 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 172.38 | |
| Min Ch El (ft) | 1012.51 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.99 | |
| Frctn Loss (ft) | 0.90 | Cum Volume (acre-ft) | 1.03 | 27.70 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 18.33 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.97 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1014.82 | Reach Len. (ft) | 222.52 | 199.97 | 190.53 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 226.34 | |
| E.G. Slope (ft/ft) | 0.003829 | Area (sq ft) | | 226.34 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 172.13 | Top Width (ft) | | 172.13 | |
| Vel Total (ft/s) | 3.15 | Avg. Vel. (ft/s) | | 3.15 | |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | 1.31 | |
| Conv. Total (cfs) | 11522.3 | Conv. (cfs) | | 11522.3 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 172.38 | |

| | | | | |
|---|---|---|---|---|
| Min Ch El (ft) | 1012.51 | Shear (lb/sq ft) | | 0.31 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.99 |
| Frctn Loss (ft) | 0.90 | Cum Volume (acre-ft) | 3.31 | 25.88 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 17.56 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.214

INPUT
Description: Thalweg Sta. 380.27
Station Elevation Data num= 172

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1019.84 | .22 | 1019.84 | 10.22 | 1019.99 | 20.22 | 1020.08 | 30.22 | 1020.14 |
| 40.23 | 1020.14 | 47.55 | 1020.07 | 50.23 | 1020.04 | 57.72 | 1019.87 | 60.23 | 1019.8 |
| 67.89 | 1019.55 | 70.23 | 1019.5 | 78.05 | 1019.22 | 80.23 | 1019.15 | 88.22 | 1018.72 |
| 90.23 | 1018.62 | 98.39 | 1018.09 | 100.23 | 1017.99 | 108.56 | 1017.48 | 110.24 | 1017.42 |
| 117.18 | 1017.09 | 118.73 | 1017.02 | 120.24 | 1016.99 | 128.9 | 1016.49 | 130.24 | 1016.44 |
| 139.07 | 1015.77 | 140.24 | 1015.7 | 149.24 | 1014.91 | 150.24 | 1014.81 | 159.4 | 1013.8 |
| 170.24 | 1012.51 | 179.74 | 1012.81 | 180.24 | 1012.76 | 189.92 | 1013.2 | 190.25 | 1013.22 |
| 200.08 | 1013.23 | 200.25 | 1013.23 | 210.1 | 1012.98 | 210.25 | 1012.97 | 220.25 | 1013.05 |
| 220.42 | 1013.05 | 230.25 | 1013.27 | 230.59 | 1013.27 | 240.25 | 1013.32 | 240.76 | 1013.32 |
| 250.25 | 1013.24 | 250.92 | 1013.24 | 260.26 | 1013.16 | 261.1 | 1013.15 | 270.26 | 1013.09 |
| 271.27 | 1013.09 | 280.26 | 1013.04 | 281.44 | 1013.03 | 290.26 | 1012.99 | 291.6 | 1012.99 |
| 300.26 | 1012.96 | 301.77 | 1012.95 | 310.26 | 1012.95 | 311.94 | 1012.97 | 320.26 | 1013.05 |
| 330.27 | 1013.53 | 332.28 | 1013.57 | 340.14 | 1013.85 | 340.27 | 1013.85 | 342.45 | 1013.75 |
| 350.27 | 1013.5 | 352.62 | 1013.25 | 360.27 | 1012.33 | 362.79 | 1012.17 | 370.27 | 1011.42 |
| 372.95 | 1011.47 | 380.27 | 1011.58 | 383.12 | 1011.69 | 390.27 | 1011.99 | 393.29 | 1012.07 |
| 400.27 | 1012.29 | 403.47 | 1012.32 | 410.28 | 1012.42 | 413.63 | 1012.44 | 420.28 | 1012.46 |
| 423.8 | 1012.46 | 430.28 | 1012.39 | 440.28 | 1012.33 | 444.14 | 1012.32 | 450.28 | 1012.34 |
| 460.28 | 1012.68 | 464.47 | 1012.98 | 470.28 | 1013.36 | 474.65 | 1013.56 | 480.29 | 1013.83 |
| 483.25 | 1013.88 | 484.82 | 1013.9 | 490.29 | 1014 | 494.99 | 1014.03 | 500.29 | 1014.09 |
| 505.15 | 1014.13 | 506.06 | 1014.14 | 530.29 | 1014.37 | 560.3 | 1014.73 | 566.17 | 1014.79 |
| 570.3 | 1014.84 | 596.67 | 1015.04 | 600.3 | 1015.08 | 617.01 | 1015.21 | 620.31 | 1015.23 |
| 637.35 | 1015.27 | 657.69 | 1015.25 | 660.31 | 1015.24 | 667.85 | 1015.2 | 690.31 | 1015 |
| 698.37 | 1014.94 | 700.32 | 1014.92 | 718.7 | 1014.8 | 720.32 | 1014.78 | 728.87 | 1014.7 |
| 730.32 | 1014.69 | 739.04 | 1014.6 | 740.32 | 1014.58 | 749.2 | 1014.49 | 750.32 | 1014.47 |
| 759.37 | 1014.35 | 760.32 | 1014.33 | 769.55 | 1014.19 | 770.33 | 1014.17 | 779.72 | 1014.31 |
| 780.33 | 1014.32 | 789.89 | 1014.66 | 790.33 | 1014.67 | 800.05 | 1014.96 | 800.33 | 1014.97 |
| 810.22 | 1015.21 | 810.33 | 1015.21 | 820.33 | 1015.36 | 830.56 | 1015.35 | 840.34 | 1015.24 |
| 840.73 | 1015.23 | 850.34 | 1015.11 | 850.9 | 1015.11 | 860.34 | 1015 | 869.47 | 1014.95 |
| 871.24 | 1014.95 | 880.34 | 1014.98 | 881.4 | 1014.99 | 890.34 | 1015.04 | 891.57 | 1015.05 |
| 900.34 | 1015.1 | 901.74 | 1015.11 | 910.34 | 1015.16 | 911.92 | 1015.18 | 920.35 | 1015.25 |
| 922.08 | 1015.27 | 930.35 | 1015.38 | 938.35 | 1015.51 | 940.35 | 1015.55 | 942.42 | 1015.6 |
| 950.35 | 1015.78 | 960.35 | 1016.19 | 962.75 | 1016.32 | 970.35 | 1016.67 | 972.92 | 1016.77 |
| 980.35 | 1017.01 | 983.09 | 1017.06 | 993.27 | 1017.13 | 1000.36 | 1017.13 | 1007.22 | 1017.17 |
| 1010.36 | 1017.18 | 1013.6 | 1017.18 | 1020.36 | 1017.36 | 1023.77 | 1017.39 | 1030.36 | 1017.64 |
| 1033.94 | 1017.74 | 1037.01 | 1017.88 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 117.18 | .035 | 483.25 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 340.14 | 480.29 | 244.78 | 200 | 193.98 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1013.79 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1013.65 | Reach Len. (ft) | 244.78 | 200.00 | 193.98 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 96.11 | 162.05 | |
| E.G. Slope (ft/ft) | 0.004463 | Area (sq ft) | 96.11 | 162.05 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 183.56 | 529.44 | |
| Top Width (ft) | 304.75 | Top Width (ft) | 173.84 | 130.91 | |
| Vel Total (ft/s) | 2.76 | Avg. Vel. (ft/s) | 1.91 | 3.27 | |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | 0.55 | 1.24 | |
| Conv. Total (cfs) | 10673.0 | Conv. (cfs) | 2747.7 | 7925.3 | |
| Length Wtd. (ft) | 210.15 | Wetted Per. (ft) | 173.94 | 131.08 | |
| Min Ch El (ft) | 1011.42 | Shear (lb/sq ft) | 0.15 | 0.34 | |
| Alpha | 1.16 | Stream Power (lb/ft s) | 0.29 | 1.13 | |
| Frctn Loss (ft) | 0.91 | Cum Volume (acre-ft) | 10.70 | 20.88 | 1.88 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 15.40 | 16.38 | 3.42 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.07 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1013.85 | Reach Len. (ft) | 244.78 | 200.00 | 193.98 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 188.58 | |
| E.G. Slope (ft/ft) | 0.005336 | Area (sq ft) | | 188.58 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 139.90 | Top Width (ft) | | 139.90 | |
| Vel Total (ft/s) | 3.78 | Avg. Vel. (ft/s) | | 3.78 | |
| Max Chl Dpth (ft) | 2.42 | Hydr. Depth (ft) | | 1.35 | |
| Conv. Total (cfs) | 9760.9 | Conv. (cfs) | | 9760.9 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 140.09 | |
| Min Ch El (ft) | 1011.42 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.70 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 1.03 | 26.75 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 17.62 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.07 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1013.84 | Reach Len. (ft) | 244.78 | 200.00 | 193.98 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 188.35 | |
| E.G. Slope (ft/ft) | 0.005356 | Area (sq ft) | | 188.35 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 139.87 | Top Width (ft) | | 139.87 | |
| Vel Total (ft/s) | 3.79 | Avg. Vel. (ft/s) | | 3.79 | |
| Max Chl Dpth (ft) | 2.42 | Hydr. Depth (ft) | | 1.35 | |
| Conv. Total (cfs) | 9742.8 | Conv. (cfs) | | 9742.8 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 140.05 | |
| Min Ch El (ft) | 1011.42 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.70 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 3.31 | 24.93 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 16.84 | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.176

INPUT
Description: Thalweg Sta. 531.39
Station Elevation Data num= 204

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1018 | 6.2 | 1017.89 | 7.13 | 1017.86 | 16.23 | 1017.61 | 18.06 | 1017.54 |
| 26.27 | 1017.27 | 28.98 | 1017.17 | 36.3 | 1016.94 | 39.9 | 1016.86 | 46.33 | 1016.73 |
| 50.83 | 1016.66 | 56.37 | 1016.56 | 61.74 | 1016.48 | 66.4 | 1016.46 | 72.67 | 1016.39 |
| 76.43 | 1016.37 | 83.59 | 1016.21 | 86.46 | 1016.14 | 94.51 | 1016.02 | 96.5 | 1015.97 |
| 105.44 | 1015.91 | 106.53 | 1015.89 | 116.35 | 1015.84 | 116.56 | 1015.84 | 118.92 | 1015.82 |
| 126.6 | 1015.77 | 127.28 | 1015.77 | 136.63 | 1015.69 | 138.2 | 1015.73 | 146.66 | 1015.84 |
| 156.7 | 1016.16 | 160.05 | 1016.18 | 166.73 | 1016.23 | 176.76 | 1016.18 | 181.89 | 1016.19 |
| 186.8 | 1016.22 | 192.81 | 1016.37 | 196.83 | 1016.48 | 206.86 | 1016.92 | 214.66 | 1017.23 |
| 216.89 | 1017.31 | 225.57 | 1017.55 | 226.93 | 1017.59 | 236.5 | 1017.81 | 236.96 | 1017.82 |
| 242.19 | 1017.94 | 246.99 | 1018.04 | 247.42 | 1018.04 | 257.03 | 1018.17 | 258.34 | 1018.17 |
| 267.06 | 1018.19 | 269.27 | 1018.17 | 277.09 | 1018.15 | 280.18 | 1018.13 | 287.13 | 1018.12 |
| 291.11 | 1018.09 | 297.16 | 1018.06 | 302.03 | 1017.97 | 307.19 | 1017.9 | 312.95 | 1017.68 |
| 317.23 | 1017.57 | 323.88 | 1017.36 | 327.26 | 1017.27 | 334.79 | 1017.09 | 337.29 | 1017.02 |
| 343.05 | 1016.83 | 345.72 | 1016.74 | 347.33 | 1016.68 | 356.64 | 1016.29 | 356.81 | 1016.28 |
| 357.36 | 1016.25 | 365.46 | 1015.79 | 367.39 | 1015.67 | 367.56 | 1015.66 | 377.42 | 1014.94 |
| 378.49 | 1014.85 | 387.46 | 1014.01 | 397.49 | 1012.93 | 400.33 | 1012.78 | 407.52 | 1012.24 |
| 411.26 | 1012.17 | 417.56 | 1012.07 | 422.17 | 1012.05 | 427.59 | 1012.01 | 433.1 | 1012.01 |
| 437.62 | 1012 | 447.66 | 1012.05 | 454.94 | 1012.06 | 457.69 | 1012.07 | 465.87 | 1012.02 |
| 467.72 | 1012.02 | 476.78 | 1011.95 | 477.76 | 1011.95 | 487.71 | 1011.93 | 487.79 | 1011.93 |
| 488.72 | 1011.95 | 497.82 | 1012.22 | 507.85 | 1013.1 | 509.55 | 1012.88 | 517.89 | 1012.01 |
| 520.48 | 1011.77 | 527.92 | 1011.05 | 531.39 | 1011.06 | 537.95 | 1011.04 | 542.32 | 1011.28 |
| 547.99 | 1011.58 | 553.23 | 1011.77 | 558.02 | 1011.97 | 564.16 | 1011.86 | 568.05 | 1011.83 |
| 575.09 | 1011.55 | 578.09 | 1011.45 | 588.12 | 1011.22 | 596.93 | 1011.25 | 598.15 | 1011.25 |
| 607.84 | 1011.42 | 608.19 | 1011.43 | 618.22 | 1011.57 | 618.77 | 1011.57 | 629.7 | 1011.5 |
| 638.28 | 1011.42 | 640.61 | 1011.43 | 648.23 | 1011.45 | 648.32 | 1011.45 | 651.54 | 1011.62 |
| 658.35 | 1011.92 | 662.45 | 1012.26 | 668.38 | 1012.72 | 673.38 | 1013.05 | 678.42 | 1013.42 |
| 684.31 | 1013.67 | 688.45 | 1013.87 | 689.53 | 1013.9 | 695.22 | 1014.07 | 698.48 | 1014.19 |
| 706.15 | 1014.38 | 708.52 | 1014.45 | 717.06 | 1014.49 | 718.55 | 1014.5 | 727.99 | 1014.46 |
| 728.58 | 1014.45 | 738.62 | 1014.4 | 738.92 | 1014.4 | 748.65 | 1014.34 | 749.83 | 1014.33 |
| 758.68 | 1014.27 | 766.2 | 1014.27 | 775.48 | 1014.34 | 778.75 | 1014.38 | 788.78 | 1014.48 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 798.81 | 1014.54 | 808.85 | 1014.43 | 812.59 | 1014.29 | 818.88 | 1014.09 | 826.28 | 1013.79 |
| 828.91 | 1013.66 | 831.14 | 1013.62 | 838.95 | 1013.28 | 840.42 | 1013.31 | 848.98 | 1013.33 |
| 858.53 | 1013.54 | 859.01 | 1013.55 | 869.05 | 1013.68 | 869.98 | 1013.68 | 879.08 | 1013.79 |
| 880.89 | 1013.79 | 889.11 | 1013.87 | 891.82 | 1013.86 | 899.14 | 1013.86 | 909.18 | 1013.83 |
| 914.65 | 1013.78 | 919.21 | 1013.76 | 924.59 | 1013.75 | 929.24 | 1013.71 | 935.51 | 1013.74 |
| 939.28 | 1013.75 | 959.34 | 1014.13 | 968.27 | 1014.25 | 969.38 | 1014.26 | 979.2 | 1014.36 |
| 979.59 | 1014.36 | 989.44 | 1014.45 | 990.12 | 1014.45 | 999.48 | 1014.53 | 1001.04 | 1014.55 |
| 1011.97 | 1014.63 | 1022.88 | 1014.67 | 1029.57 | 1014.64 | 1033.81 | 1014.63 | 1039.61 | 1014.58 |
| 1049.64 | 1014.54 | 1059.67 | 1014.58 | 1066.58 | 1014.71 | 1069.71 | 1014.78 | 1079.74 | 1015.04 |
| 1089.77 | 1015.34 | 1099.34 | 1015.65 | 1099.81 | 1015.67 | 1109.84 | 1016.06 | 1119.87 | 1016.53 |
| 1121.19 | 1016.59 | 1132.1 | 1017.14 | 1139.94 | 1017.52 | 1147.31 | 1017.86 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 343.05 | .035 | 648.23 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 507.85 | 673.38 | 234.24 | 200 | 197.74 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.88 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1012.75 | Reach Len. (ft) | 234.24 | 200.00 | 197.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 67.29 | 184.24 | |
| E.G. Slope (ft/ft) | 0.004224 | Area (sq ft) | 67.29 | 184.24 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 139.77 | 573.23 | |
| Top Width (ft) | 260.90 | Top Width (ft) | 103.00 | 157.90 | |
| Vel Total (ft/s) | 2.83 | Avg. Vel. (ft/s) | 2.08 | 3.11 | |
| Max Chl Dpth (ft) | 1.70 | Hydr. Depth (ft) | 0.65 | 1.17 | |
| Conv. Total (cfs) | 10970.0 | Conv. (cfs) | 2150.4 | 8819.6 | |
| Length Wtd. (ft) | 203.68 | Wetted Per. (ft) | 103.05 | 158.07 | |
| Min Ch El (ft) | 1011.04 | Shear (lb/sq ft) | 0.17 | 0.31 | |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.36 | 0.96 | |
| Frctn Loss (ft) | 0.92 | Cum Volume (acre-ft) | 10.24 | 20.09 | 1.88 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.62 | 15.72 | 3.42 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1013.08 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1012.90 | Reach Len. (ft) | 234.24 | 200.00 | 197.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 208.25 | |
| E.G. Slope (ft/ft) | 0.004464 | Area (sq ft) | | 208.25 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 161.59 | Top Width (ft) | | 161.59 | |
| Vel Total (ft/s) | 3.42 | Avg. Vel. (ft/s) | | 3.42 | |
| Max Chl Dpth (ft) | 1.85 | Hydr. Depth (ft) | | 1.29 | |
| Conv. Total (cfs) | 10671.6 | Conv. (cfs) | | 10671.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 161.77 | |
| Min Ch El (ft) | 1011.04 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.23 | |
| Frctn Loss (ft) | 0.75 | Cum Volume (acre-ft) | 1.03 | 25.84 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 16.92 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1013.08 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1012.90 | Reach Len. (ft) | 234.24 | 200.00 | 197.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 208.91 | |
| E.G. Slope (ft/ft) | 0.004420 | Area (sq ft) | | 208.91 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 161.69 | Top Width (ft) | | 161.69 | |
| Vel Total (ft/s) | 3.41 | Avg. Vel. (ft/s) | | 3.41 | |
| Max Chl Dpth (ft) | 1.86 | Hydr. Depth (ft) | | 1.29 | |
| Conv. Total (cfs) | 10724.5 | Conv. (cfs) | | 10724.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 161.87 | |
| Min Ch El (ft) | 1011.04 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.22 | |
| Frctn Loss (ft) | 0.79 | Cum Volume (acre-ft) | 3.31 | 24.02 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 16.15 | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.138

INPUT
Description: Thalweg Sta. 440.54
Station Elevation Data num= 152

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1016.16 | .54 | 1016.15 | 10.42 | 1015.95 | 10.65 | 1015.94 | 30.89 | 1015.66 |
| 34.32 | 1015.6 | 41 | 1015.47 | 46.26 | 1015.33 | 51.12 | 1015.19 | 61.24 | 1014.95 |
| 70.16 | 1014.85 | 71.35 | 1014.85 | 81.47 | 1015.02 | 82.11 | 1015.03 | 91.59 | 1015.22 |
| 94.06 | 1015.24 | 101.7 | 1015.27 | 106 | 1015.28 | 111.82 | 1015.26 | 117.95 | 1015.19 |
| 121.94 | 1015.17 | 129.9 | 1014.96 | 132.05 | 1014.88 | 141.85 | 1014.71 | 142.17 | 1014.7 |
| 143.95 | 1014.69 | 152.29 | 1014.66 | 153.8 | 1014.64 | 162.4 | 1014.55 | 165.74 | 1014.48 |
| 172.52 | 1014.32 | 177.69 | 1014.22 | 182.64 | 1014.14 | 184.61 | 1014.13 | 189.64 | 1014.12 |
| 192.75 | 1014.13 | 202.87 | 1014.21 | 212.99 | 1014.2 | 213.53 | 1014.19 | 223.11 | 1013.98 |
| 225.48 | 1013.98 | 233.22 | 1013.89 | 237.43 | 1013.91 | 253.46 | 1013.92 | 261.33 | 1013.88 |
| 263.57 | 1013.88 | 273.27 | 1013.64 | 273.69 | 1013.64 | 275.97 | 1013.58 | 283.81 | 1013.34 |
| 285.22 | 1013.29 | 293.92 | 1013.04 | 304.04 | 1012.72 | 309.12 | 1012.54 | 314.16 | 1012.32 |
| 321.07 | 1011.99 | 324.27 | 1011.85 | 333.01 | 1011.61 | 334.39 | 1011.58 | 341.97 | 1011.52 |
| 344.51 | 1011.49 | 344.96 | 1011.49 | 356.91 | 1011.44 | 374.72 | 1011.32 | 374.86 | 1011.32 |
| 380.81 | 1011.23 | 384.97 | 1011.19 | 392.75 | 1011.01 | 395.09 | 1010.97 | 405.21 | 1010.77 |
| 415.32 | 1010.76 | 416.65 | 1010.75 | 425.44 | 1010.66 | 428.6 | 1010.54 | 435.56 | 1010.26 |
| 440.54 | 1010.22 | 445.67 | 1010.12 | 452.49 | 1010.46 | 455.79 | 1010.59 | 465.91 | 1011.28 |
| 473.99 | 1011.34 | 476.03 | 1011.35 | 476.39 | 1011.34 | 486.14 | 1011.04 | 502.07 | 1010.59 |
| 506.37 | 1010.5 | 510.85 | 1010.47 | 516.49 | 1010.53 | 519.62 | 1010.58 | 526.61 | 1010.64 |
| 528.39 | 1010.69 | 546.47 | 1010.86 | 556.96 | 1010.86 | 563.92 | 1010.84 | 567.08 | 1010.83 |
| 571.98 | 1010.84 | 577.19 | 1010.83 | 583.93 | 1010.88 | 587.31 | 1010.89 | 595.88 | 1011.1 |
| 597.43 | 1011.13 | 607.54 | 1011.52 | 607.83 | 1011.53 | 617.66 | 1011.92 | 619.77 | 1012 |
| 627.78 | 1012.25 | 637.89 | 1012.38 | 643.67 | 1012.32 | 648.01 | 1012.31 | 655.62 | 1012.19 |
| 658.13 | 1012.13 | 667.56 | 1011.99 | 668.24 | 1011.95 | 678.36 | 1011.52 | 679.51 | 1011.5 |
| 688.48 | 1011.92 | 691.46 | 1012.08 | 698.59 | 1012.45 | 703.41 | 1012.61 | 708.71 | 1012.66 |
| 715.36 | 1012.69 | 738.02 | 1012.65 | 739.06 | 1012.64 | 739.25 | 1012.64 | 749.18 | 1012.55 |
| 756.46 | 1012.4 | 759.29 | 1012.35 | 765.24 | 1012.27 | 769.41 | 1012.24 | 774.01 | 1012.33 |
| 779.53 | 1012.42 | 787.04 | 1012.66 | 789.64 | 1012.76 | 798.99 | 1013.09 | 799.76 | 1013.11 |
| 809.1 | 1013.41 | 809.88 | 1013.43 | 810.94 | 1013.46 | 834.84 | 1014.19 | 840.23 | 1014.34 |
| 850.34 | 1014.54 | 860.46 | 1014.61 | 861.74 | 1014.61 | 870.03 | 1014.6 | 870.68 | 1014.6 |
| 880.7 | 1014.57 | 882.63 | 1014.56 | 890.81 | 1014.53 | 894.58 | 1014.48 | 900.93 | 1014.42 |
| 911.05 | 1014.22 | 918.44 | 1014.05 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 184.61 | .035 | 563.92 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 374.72 | 546.47 | 205.1 | 200 | 195.1 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 637.89 | 918.44 | 1012.38 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.96 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.035 | 0.035 | 0.033 |
| W.S. Elev (ft) | 1011.83 | Reach Len. (ft) | 205.10 | 200.00 | 195.10 |
| Crit W.S. (ft) | 1011.49 | Flow Area (sq ft) | 16.44 | 179.19 | 54.22 |
| E.G. Slope (ft/ft) | 0.004829 | Area (sq ft) | 16.44 | 179.19 | 56.80 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 23.24 | 543.63 | 146.12 |
| Top Width (ft) | 305.36 | Top Width (ft) | 49.54 | 171.75 | 84.07 |
| Vel Total (ft/s) | 2.85 | Avg. Vel. (ft/s) | 1.41 | 3.03 | 2.70 |
| Max Chl Dpth (ft) | 1.71 | Hydr. Depth (ft) | 0.33 | 1.04 | 0.79 |
| Conv. Total (cfs) | 10260.7 | Conv. (cfs) | 334.5 | 7823.4 | 2102.9 |
| Length Wtd. (ft) | 199.00 | Wetted Per. (ft) | 49.55 | 171.81 | 68.81 |
| Min Ch El (ft) | 1010.12 | Shear (lb/sq ft) | 0.10 | 0.31 | 0.24 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.14 | 0.95 | 0.64 |
| Frctn Loss (ft) | 1.02 | Cum Volume (acre-ft) | 10.02 | 19.25 | 1.76 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.21 | 14.96 | 3.23 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.32 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1012.18 | Reach Len. (ft) | 205.10 | 200.00 | 195.10 |
| Crit W.S. (ft) | 1011.59 | Flow Area (sq ft) | | 240.70 | |
| E.G. Slope (ft/ft) | 0.003158 | Area (sq ft) | | 240.70 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 171.75 | Top Width (ft) | | 171.75 | |
| Vel Total (ft/s) | 2.96 | Avg. Vel. (ft/s) | | 2.96 | |
| Max Chl Dpth (ft) | 2.06 | Hydr. Depth (ft) | | 1.40 | |
| Conv. Total (cfs) | 12686.7 | Conv. (cfs) | | 12686.7 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 174.00 | |
| Min Ch El (ft) | 1010.12 | Shear (lb/sq ft) | | 0.27 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.81 | |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | 1.03 | 24.80 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.13 | 16.16 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.28 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1012.13 | Reach Len. (ft) | 205.10 | 200.00 | 195.10 |
| Crit W.S. (ft) | 1011.59 | Flow Area (sq ft) | | 231.55 | |
| E.G. Slope (ft/ft) | 0.003591 | Area (sq ft) | | 231.55 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 171.75 | Top Width (ft) | | 171.75 | |
| Vel Total (ft/s) | 3.08 | Avg. Vel. (ft/s) | | 3.08 | |
| Max Chl Dpth (ft) | 2.01 | Hydr. Depth (ft) | | 1.35 | |
| Conv. Total (cfs) | 11897.9 | Conv. (cfs) | | 11897.9 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 173.89 | |
| Min Ch El (ft) | 1010.12 | Shear (lb/sq ft) | | 0.30 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.92 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 3.31 | 23.01 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 15.39 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.100

INPUT
Description: Thalweg Sta. 493.30
Station Elevation Data num= 177

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1015.97 | 6.2 | 1016.1 | 9.49 | 1016.16 | 34.95 | 1016.67 | 36.79 | 1016.71 |
| 44.15 | 1016.85 | 46.99 | 1016.9 | 47.69 | 1016.9 | 57.18 | 1016.99 | 60.42 | 1016.97 |
| 67.38 | 1016.94 | 73.15 | 1016.87 | 77.57 | 1016.83 | 95.36 | 1016.63 | 108.16 | 1016.44 |
| 111.35 | 1016.37 | 128.56 | 1016.02 | 136.81 | 1015.84 | 138.75 | 1015.81 | 148.95 | 1015.59 |
| 149.54 | 1015.58 | 159.14 | 1015.36 | 175.01 | 1014.96 | 179.54 | 1014.84 | 189.73 | 1014.64 |
| 192.03 | 1014.6 | 197.77 | 1014.51 | 199.93 | 1014.48 | 210.13 | 1014.3 | 238.67 | 1013.64 |
| 240.72 | 1013.59 | 248.97 | 1013.4 | 250.91 | 1013.35 | 251.39 | 1013.34 | 261.11 | 1013.16 |
| 267.59 | 1013.07 | 300.17 | 1012.74 | 301.89 | 1012.72 | 302.32 | 1012.71 | 312.09 | 1012.56 |
| 315.06 | 1012.49 | 322.29 | 1012.33 | 327.78 | 1012.19 | 351.38 | 1011.63 | 352.88 | 1011.6 |
| 353.25 | 1011.59 | 365.98 | 1011.23 | 373.27 | 1010.98 | 378.71 | 1010.88 | 383.46 | 1010.76 |
| 403.86 | 1010.59 | 404.17 | 1010.58 | 414.05 | 1010.48 | 416.91 | 1010.46 | 424.25 | 1010.42 |
| 429.63 | 1010.41 | 434.45 | 1010.39 | 442.37 | 1010.37 | 444.64 | 1010.36 | 453.78 | 1010.29 |
| 454.84 | 1010.29 | 455.1 | 1010.28 | 464.56 | 1010.25 | 465.04 | 1010.25 | 467.83 | 1010.21 |
| 475.23 | 1010.15 | 480.57 | 1009.88 | 485.43 | 1009.67 | 493.3 | 1009.41 | 495.63 | 1009.31 |
| 504.99 | 1009.56 | 505.82 | 1009.59 | 506.03 | 1009.59 | 516.02 | 1009.87 | 518.76 | 1009.83 |
| 526.21 | 1009.7 | 531.49 | 1009.44 | 536.41 | 1009.25 | 556.19 | 1009.6 | 556.8 | 1009.6 |
| 556.96 | 1009.61 | 569.69 | 1009.94 | 577.2 | 1010.12 | 582.42 | 1010.12 | 587.39 | 1010.15 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 595.15 | 1010.16 | 607.15 | 1010.2 | 607.4 | 1010.2 | 607.72 | 1010.21 | 607.78 | 1010.21 |
| 616.23 | 1010.1 | 617.98 | 1010.09 | 620.61 | 1010.01 | 622.1 | 1009.98 | 628.18 | 1009.84 |
| 633.35 | 1009.8 | 638.37 | 1009.72 | 641.73 | 1009.62 | 648.57 | 1009.48 | 650.23 | 1009.54 |
| 658.59 | 1009.74 | 658.77 | 1009.74 | 668.96 | 1010.06 | 671.54 | 1010.1 | 679.16 | 1010.19 |
| 689.35 | 1010.42 | 709.74 | 1010.95 | 709.8 | 1010.95 | 719.95 | 1011.16 | 722.47 | 1011.2 |
| 730.14 | 1011.31 | 747.94 | 1011.42 | 750.54 | 1011.42 | 760.66 | 1011.46 | 773.4 | 1011.46 |
| 786.13 | 1011.41 | 791.32 | 1011.37 | 798.86 | 1011.23 | 801.52 | 1011.19 | 811.59 | 1011.14 |
| 812.21 | 1011.14 | 824.33 | 1011.24 | 832.11 | 1011.27 | 837.05 | 1011.27 | 849.79 | 1011.31 |
| 852.5 | 1011.33 | 862.51 | 1011.36 | 862.7 | 1011.37 | 863.41 | 1011.37 | 872.89 | 1011.49 |
| 875.25 | 1011.54 | 883.09 | 1011.68 | 887.98 | 1011.79 | 893.29 | 1011.89 | 900.71 | 1012.05 |
| 903.48 | 1012.1 | 913.44 | 1012.32 | 913.68 | 1012.32 | 914.62 | 1012.35 | 923.87 | 1012.56 |
| 926.18 | 1012.62 | 944.27 | 1013.04 | 951.64 | 1013.14 | 954.46 | 1013.2 | 964.37 | 1013.23 |
| 964.85 | 1013.23 | 965.82 | 1013.22 | 974.86 | 1013.11 | 977.1 | 1013.06 | 985.05 | 1012.86 |
| 990.36 | 1012.7 | 995.25 | 1012.54 | 998.87 | 1012.44 | 1005.45 | 1012.21 | 1015.3 | 1011.84 |
| 1015.64 | 1011.83 | 1025.84 | 1011.46 | 1028.03 | 1011.42 | 1036.03 | 1011.32 | 1041.38 | 1011.32 |
| 1046.23 | 1011.34 | 1053.49 | 1011.34 | 1056.43 | 1011.33 | 1066.62 | 1011.34 | 1068.23 | 1011.38 |
| 1076.82 | 1011.64 | 1078.96 | 1011.74 | 1091.69 | 1012.28 | 1104.42 | 1012.79 | 1107.41 | 1012.9 |
| 1117.61 | 1013.35 | 1119.43 | 1013.45 | 1127.8 | 1013.87 | 1134.92 | 1014.33 | 1138 | 1014.56 |
| 1143.42 | 1015.04 | 1149.91 | 1015.57 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 192.03 | .035 | 622.1 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 464.56 | 607.15 | 280.85 | 199.96 | 176.08 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1010.95 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.035 | 0.035 | 0.032 |
| W.S. Elev (ft) | 1010.81 | Reach Len. (ft) | 280.85 | 199.96 | 176.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 27.71 | 144.55 | 74.63 |
| E.G. Slope (ft/ft) | 0.005472 | Area (sq ft) | 27.71 | 144.55 | 74.63 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 41.91 | 458.02 | 213.07 |
| Top Width (ft) | 322.48 | Top Width (ft) | 82.88 | 142.59 | 97.01 |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | 1.51 | 3.17 | 2.85 |
| Max Chl Dpth (ft) | 1.55 | Hydr. Depth (ft) | 0.33 | 1.01 | 0.77 |
| Conv. Total (cfs) | 9638.8 | Conv. (cfs) | 566.5 | 6191.9 | 2880.4 |
| Length Wtd. (ft) | 196.61 | Wetted Per. (ft) | 82.88 | 142.64 | 97.04 |
| Min Ch El (ft) | 1009.25 | Shear (lb/sq ft) | 0.11 | 0.35 | 0.26 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.17 | 1.10 | 0.75 |
| Frctn Loss (ft) | 1.27 | Cum Volume (acre-ft) | 9.92 | 18.51 | 1.46 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.90 | 14.24 | 2.83 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.19 | Element | | | |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1010.84 | Reach Len. (ft) | 280.85 | 199.96 | 176.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 149.18 | |
| E.G. Slope (ft/ft) | 0.012076 | Area (sq ft) | | 149.18 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 142.59 | Top Width (ft) | | 142.59 | |
| Vel Total (ft/s) | 4.78 | Avg. Vel. (ft/s) | | 4.78 | |
| Max Chl Dpth (ft) | 1.59 | Hydr. Depth (ft) | | 1.05 | |
| Conv. Total (cfs) | 6488.2 | Conv. (cfs) | | 6488.2 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 143.86 | |
| Min Ch El (ft) | 1009.25 | Shear (lb/sq ft) | | 0.78 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.74 | |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 1.03 | 23.91 | |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 1.13 | 15.44 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.27 | Element | | | |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1011.00 | Reach Len. (ft) | 280.85 | 199.96 | 176.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 172.70 | |

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.007435 | Area (sq ft) | | | 172.70 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | | 713.00 |
| Top Width (ft) | 142.59 | Top Width (ft) | | | 142.59 |
| Vel Total (ft/s) | 4.13 | Avg. Vel. (ft/s) | | | 4.13 |
| Max Chl Dpth (ft) | 1.75 | Hydr. Depth (ft) | | | 1.21 |
| Conv. Total (cfs) | 8269.0 | Conv. (cfs) | | | 8269.0 |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | | 144.19 |
| Min Ch El (ft) | 1009.25 | Shear (lb/sq ft) | | | 0.56 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | | 2.30 |
| Frctn Loss (ft) | 1.41 | Cum Volume (acre-ft) | | 3.31 | 22.08 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 2.75 | 14.66 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.062

INPUT
Description: Thalweg Sta. 461.33
Station Elevation Data num= 167

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1014.28 | .57 | 1014.26 | 4.11 | 1014.1 | 11.54 | 1013.78 | 17.64 | 1013.59 |
| 22.51 | 1013.41 | 28.43 | 1013.32 | 31.91 | 1013.29 | 33.48 | 1013.31 | 44.45 | 1013.38 |
| 52.75 | 1013.46 | 55.42 | 1013.49 | 57.62 | 1013.52 | 77.07 | 1013.68 | 77.6 | 1013.68 |
| 88.33 | 1013.72 | 90.07 | 1013.69 | 97.59 | 1013.57 | 99.3 | 1013.55 | 101.39 | 1013.49 |
| 121.24 | 1012.77 | 125.7 | 1012.62 | 132.21 | 1012.37 | 137.57 | 1012.24 | 143.19 | 1012.09 |
| 174.34 | 1011.48 | 176.1 | 1011.45 | 187.07 | 1011.22 | 197.53 | 1011.05 | 198.04 | 1011.04 |
| 198.66 | 1011.03 | 209.01 | 1010.93 | 217.51 | 1010.89 | 219.98 | 1010.87 | 230.95 | 1010.84 |
| 252.89 | 1010.86 | 257.49 | 1010.79 | 262.44 | 1010.74 | 263.86 | 1010.72 | 271.62 | 1010.51 |
| 274.83 | 1010.4 | 285.8 | 1009.98 | 295.93 | 1009.57 | 296.77 | 1009.54 | 297.46 | 1009.52 |
| 307.74 | 1009.15 | 318.71 | 1008.97 | 320.25 | 1008.95 | 340.65 | 1008.77 | 344.57 | 1008.71 |
| 351.62 | 1008.58 | 356.99 | 1008.44 | 362.59 | 1008.35 | 364.55 | 1008.37 | 368.89 | 1008.39 |
| 373.56 | 1008.43 | 377.41 | 1008.31 | 384.53 | 1008.13 | 395.5 | 1007.95 | 397.39 | 1008.01 |
| 406.47 | 1008.33 | 417.38 | 1008.93 | 417.52 | 1008.93 | 428.42 | 1008.82 | 437.37 | 1008.55 |
| 439.39 | 1008.5 | 450.36 | 1008.54 | 457.36 | 1008.66 | 461.33 | 1008.72 | 472.3 | 1008.57 |
| 477.35 | 1008.69 | 483.27 | 1008.76 | 494.24 | 1009.2 | 497.33 | 1009.2 | 505.21 | 1009.24 |
| 516.18 | 1009.09 | 517.32 | 1009.1 | 527.15 | 1009.21 | 538.12 | 1009.62 | 539.11 | 1009.65 |
| 549.09 | 1009.93 | 557.3 | 1009.94 | 560.06 | 1009.96 | 560.46 | 1009.96 | 563.43 | 1009.93 |
| 582 | 1009.89 | 587.75 | 1009.83 | 589.37 | 1009.81 | 591.35 | 1009.79 | 598.91 | 1009.65 |
| 603.95 | 1009.52 | 612.07 | 1009.29 | 614.92 | 1009.2 | 636.39 | 1008.26 | 636.86 | 1008.25 |
| 637.24 | 1008.26 | 647.83 | 1008.46 | 657.23 | 1009.08 | 658.8 | 1009.18 | 660.71 | 1009.31 |
| 669.77 | 1009.91 | 677.22 | 1010.33 | 680.74 | 1010.54 | 685.03 | 1010.62 | 691.71 | 1010.7 |
| 697.2 | 1010.52 | 702.68 | 1010.36 | 709.34 | 1010 | 713.65 | 1009.82 | 717.19 | 1009.96 |
| 724.62 | 1010.28 | 733.66 | 1010.61 | 734.99 | 1010.65 | 735.59 | 1010.67 | 742.54 | 1010.72 |
| 746.56 | 1010.73 | 757.53 | 1010.63 | 757.98 | 1010.65 | 768.5 | 1010.92 | 779.47 | 1011.25 |
| 790.44 | 1011.44 | 797.13 | 1011.6 | 801.41 | 1011.68 | 806.61 | 1011.79 | 823.35 | 1012.07 |
| 830.94 | 1012.18 | 845.29 | 1012.33 | 855.26 | 1012.3 | 856.26 | 1012.3 | 863.5 | 1012.13 |
| 867.23 | 1012.07 | 877.08 | 1011.83 | 878.21 | 1011.8 | 879.57 | 1011.76 | 889.18 | 1011.44 |
| 900.15 | 1011.19 | 908.87 | 1011.17 | 911.12 | 1011.18 | 917.06 | 1011.22 | 937.05 | 1011.27 |
| 957.03 | 1011.26 | 965.97 | 1011.22 | 976.84 | 1011.1 | 976.94 | 1011.1 | 977.02 | 1011.09 |
| 987.91 | 1010.91 | 997.01 | 1010.88 | 998.88 | 1010.87 | 1001.16 | 1010.89 | 1007.15 | 1010.96 |
| 1009.85 | 1011 | 1014.71 | 1011.09 | 1022.27 | 1011.25 | 1025.48 | 1011.35 | 1031.79 | 1011.52 |
| 1053.74 | 1012.17 | 1056.97 | 1012.28 | 1064.71 | 1012.51 | 1074.12 | 1012.83 | 1075.68 | 1012.89 |
| 1076.96 | 1012.98 | 1086.65 | 1013.48 | 1096.94 | 1014.26 | 1097.62 | 1014.31 | 1098.44 | 1014.38 |
| 1108.59 | 1015.2 | 1112.02 | 1015.46 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 90.07 | .035 | 589.37 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 285.8 | 560.46 | 246.29 | 200 | 196.81 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.68 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | 0.032 |
| W.S. Elev (ft) | 1009.52 | Reach Len. (ft) | 246.29 | 200.00 | 196.81 |
| Crit W.S. (ft) | 1009.30 | Flow Area (sq ft) | | 185.01 | 40.80 |
| E.G. Slope (ft/ft) | 0.007756 | Area (sq ft) | | 185.01 | 40.80 |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 584.29 | 128.71 |
| Top Width (ft) | 298.37 | Top Width (ft) | | 238.23 | 60.15 |
| Vel Total (ft/s) | 3.16 | Avg. Vel. (ft/s) | | 3.16 | 3.15 |
| Max Chl Dpth (ft) | 1.57 | Hydr. Depth (ft) | | 0.78 | 0.68 |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 8096.2 | Conv. (cfs) | | 6634.7 | 1461.5 |
| Length Wtd. (ft) | 215.57 | Wetted Per. (ft) | | 238.30 | 60.21 |
| Min Ch El (ft) | 1007.95 | Shear (lb/sq ft) | | 0.38 | 0.33 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.19 | 1.04 |
| Frctn Loss (ft) | 1.50 | Cum Volume (acre-ft) | 9.83 | 17.75 | 1.23 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.63 | 13.37 | 2.51 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1010.04 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1009.95 | Reach Len. (ft) | 246.29 | 200.00 | 196.81 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 292.37 | |
| E.G. Slope (ft/ft) | 0.003005 | Area (sq ft) | | 292.37 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 272.45 | Top Width (ft) | | 272.45 | |
| Vel Total (ft/s) | 2.44 | Avg. Vel. (ft/s) | | 2.44 | |
| Max Chl Dpth (ft) | 2.00 | Hydr. Depth (ft) | | 1.07 | |
| Conv. Total (cfs) | 13007.8 | Conv. (cfs) | | 13007.8 | |
| Length Wtd. (ft) | 209.00 | Wetted Per. (ft) | | 272.53 | |
| Min Ch El (ft) | 1007.95 | Shear (lb/sq ft) | | 0.20 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.49 | |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 1.03 | 22.90 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.13 | 14.48 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.83 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1009.67 | Reach Len. (ft) | 246.29 | 200.00 | 196.81 |
| Crit W.S. (ft) | 1009.38 | Flow Area (sq ft) | | 221.13 | |
| E.G. Slope (ft/ft) | 0.006671 | Area (sq ft) | | 221.13 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 246.55 | Top Width (ft) | | 246.55 | |
| Vel Total (ft/s) | 3.22 | Avg. Vel. (ft/s) | | 3.22 | |
| Max Chl Dpth (ft) | 1.72 | Hydr. Depth (ft) | | 0.90 | |
| Conv. Total (cfs) | 8729.3 | Conv. (cfs) | | 8729.3 | |
| Length Wtd. (ft) | 218.68 | Wetted Per. (ft) | | 246.62 | |
| Min Ch El (ft) | 1007.95 | Shear (lb/sq ft) | | 0.37 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.20 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 3.31 | 21.18 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 13.77 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 5.024

INPUT
Description: Thalweg Sta. 480.31
Station Elevation Data num= 163

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1012.09 | 9.93 | 1011.87 | 15.3 | 1011.71 | 17.63 | 1011.63 | 21.14 | 1011.5 |
| 32.33 | 1011.14 | 37.51 | 1010.99 | 43.53 | 1010.79 | 54.73 | 1010.57 | 56.4 | 1010.56 |
| 72.26 | 1010.36 | 77.13 | 1010.31 | 94.85 | 1010.09 | 99.53 | 1010.04 | 110.73 | 1009.94 |
| 126.34 | 1009.86 | 144.33 | 1009.82 | 155.53 | 1009.77 | 166.73 | 1009.66 | 177.93 | 1009.43 |
| 185.21 | 1009.21 | 189.13 | 1009.1 | 192.97 | 1009 | 200.33 | 1008.79 | 205.38 | 1008.66 |
| 207.81 | 1008.6 | 215.18 | 1008.4 | 220.19 | 1008.25 | 222.72 | 1008.19 | 227.64 | 1008.03 |
| 233.93 | 1007.84 | 245.12 | 1007.35 | 256.32 | 1006.67 | 259.6 | 1006.5 | 267.52 | 1006.11 |
| 275.57 | 1006.06 | 278.72 | 1006.03 | 281.81 | 1006.08 | 289.92 | 1006.24 | 301.12 | 1006.4 |
| 304.02 | 1006.48 | 320.77 | 1006.99 | 334.72 | 1007.5 | 343.35 | 1008.15 | 345.92 | 1008.35 |
| 357.12 | 1008.74 | 365.94 | 1008.6 | 368.32 | 1008.57 | 379.52 | 1008.53 | 388.53 | 1008.69 |
| 390.71 | 1008.72 | 391.43 | 1008.75 | 392.86 | 1008.8 | 401.91 | 1009.16 | 411.13 | 1009.48 |
| 413.12 | 1009.56 | 415.07 | 1009.55 | 424.31 | 1009.45 | 433.72 | 1008.86 | 437.27 | 1008.66 |
| 446.72 | 1008.15 | 456.31 | 1007.44 | 457.91 | 1007.34 | 459.49 | 1007.21 | 469.11 | 1006.8 |
| 478.9 | 1006.92 | 480.31 | 1006.95 | 481.7 | 1006.99 | 491.51 | 1007.22 | 501.49 | 1007.73 |
| 502.71 | 1007.8 | 503.11 | 1007.81 | 503.91 | 1007.84 | 513.91 | 1008.24 | 525.11 | 1008.56 |
| 526.12 | 1008.59 | 532.89 | 1008.78 | 536.31 | 1008.82 | 546.68 | 1009 | 547.51 | 1009.02 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 547.78 | 1009.01 | 548.33 | 1009.02 | 558.71 | 1009.03 | 569.27 | 1008.84 | 570.54 | 1008.82 |
| 578.79 | 1008.57 | 581.11 | 1008.5 | 591.86 | 1008.14 | 592.31 | 1008.13 | 592.75 | 1008.11 |
| 603.51 | 1007.71 | 614.45 | 1007.41 | 614.7 | 1007.41 | 614.95 | 1007.4 | 625.91 | 1007.23 |
| 637.05 | 1007.08 | 644.57 | 1007.08 | 648.3 | 1007.15 | 652.01 | 1007.29 | 659.38 | 1007.71 |
| 659.5 | 1007.72 | 659.64 | 1007.71 | 670.7 | 1007.81 | 681.59 | 1008.74 | 681.79 | 1008.76 |
| 681.9 | 1008.78 | 682.23 | 1008.8 | 693.1 | 1009.55 | 703.8 | 1009.83 | 704.3 | 1009.85 |
| 704.82 | 1009.86 | 707.41 | 1009.92 | 715.5 | 1010.09 | 726.01 | 1010.21 | 726.7 | 1010.21 |
| 737.9 | 1010.04 | 748.22 | 1009.94 | 749.1 | 1009.93 | 756.24 | 1010.06 | 760.3 | 1010.17 |
| 770.42 | 1010.53 | 772.59 | 1010.59 | 782.7 | 1010.84 | 793.9 | 1010.85 | 795.18 | 1010.84 |
| 805.1 | 1010.72 | 814.84 | 1010.54 | 816.3 | 1010.52 | 817.78 | 1010.47 | 837.05 | 1009.93 |
| 838.7 | 1009.89 | 849.9 | 1009.75 | 859.26 | 1009.75 | 860.48 | 1009.76 | 861.09 | 1009.75 |
| 867.93 | 1009.65 | 872.29 | 1009.55 | 883.49 | 1009.5 | 890.26 | 1009.58 | 894.69 | 1009.62 |
| 897.71 | 1009.66 | 905.89 | 1009.74 | 917.09 | 1009.93 | 925.9 | 1010.15 | 928.29 | 1010.22 |
| 930.73 | 1010.34 | 939.49 | 1010.75 | 950.69 | 1011.58 | 953.32 | 1011.8 | 970.31 | 1013.17 |
| 973.09 | 1013.39 | 975.91 | 1013.56 | 984.29 | 1014.08 | 992.52 | 1014.47 | 995.49 | 1014.6 |
| 998.51 | 1014.71 | 1006.69 | 1015.03 | 1014.73 | 1015.28 | 1017.89 | 1015.37 | 1021.1 | 1015.47 |
| 1029.09 | 1015.69 | 1036.94 | 1015.93 | 1037.25 | 1015.93 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 17.63 | .035 | 578.79 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 413.12 | 558.71 | 198.77 | 200 | 203.24 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1008.17 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.035 | 0.035 | 0.032 |
| W.S. Elev (ft) | 1007.99 | Reach Len. (ft) | 198.77 | 200.00 | 203.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 132.19 | 42.15 | 42.11 |
| E.G. Slope (ft/ft) | 0.006280 | Area (sq ft) | 132.19 | 42.15 | 42.11 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 495.69 | 113.54 | 103.77 |
| Top Width (ft) | 247.84 | Top Width (ft) | 112.25 | 58.77 | 76.82 |
| Vel Total (ft/s) | 3.29 | Avg. Vel. (ft/s) | 3.75 | 2.69 | 2.46 |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | 1.18 | 0.72 | 0.55 |
| Conv. Total (cfs) | 8997.4 | Conv. (cfs) | 6255.2 | 1432.7 | 1309.5 |
| Length Wtd. (ft) | 199.37 | Wetted Per. (ft) | 112.34 | 58.83 | 76.86 |
| Min Ch El (ft) | 1006.80 | Shear (lb/sq ft) | 0.46 | 0.28 | 0.21 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 1.73 | 0.76 | 0.53 |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | 9.45 | 17.23 | 1.04 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.31 | 12.69 | 2.20 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.24 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1009.10 | Reach Len. (ft) | 198.77 | 200.00 | 203.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 93.64 | 138.64 | |
| E.G. Slope (ft/ft) | 0.004975 | Area (sq ft) | 93.64 | 138.64 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 277.22 | 435.78 | |
| Top Width (ft) | 221.45 | Top Width (ft) | 92.69 | 128.76 | |
| Vel Total (ft/s) | 3.07 | Avg. Vel. (ft/s) | 2.96 | 3.14 | |
| Max Chl Dpth (ft) | 3.07 | Hydr. Depth (ft) | 1.01 | 1.08 | |
| Conv. Total (cfs) | 10108.3 | Conv. (cfs) | 3930.2 | 6178.1 | |
| Length Wtd. (ft) | 199.76 | Wetted Per. (ft) | 95.27 | 128.93 | |
| Min Ch El (ft) | 1006.80 | Shear (lb/sq ft) | 0.31 | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.90 | 1.05 | |
| Frctn Loss (ft) | 1.23 | Cum Volume (acre-ft) | 0.77 | 21.91 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.86 | 13.56 | |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1008.29 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1008.05 | Reach Len. (ft) | 198.77 | 200.00 | 203.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 139.13 | 45.81 | |
| E.G. Slope (ft/ft) | 0.007371 | Area (sq ft) | 139.13 | 45.81 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 575.34 | 137.66 | |

| | | | | |
|---|---|---|---|---|
| Top Width (ft) | 176.15 | Top Width (ft) | 115.03 | 61.12 |
| Vel Total (ft/s) | 3.86 | Avg. Vel. (ft/s) | 4.14 | 3.01 |
| Max Chl Dpth (ft) | 2.02 | Hydr. Depth (ft) | 1.21 | 0.75 |
| Conv. Total (cfs) | 8304.9 | Conv. (cfs) | 6701.5 | 1603.5 |
| Length Wtd. (ft) | 199.07 | Wetted Per. (ft) | 115.12 | 61.19 |
| Min Ch El (ft) | 1006.80 | Shear (lb/sq ft) | 0.56 | 0.34 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 2.30 | 1.04 |
| Frctn Loss (ft) | 1.47 | Cum Volume (acre-ft) | 2.91 | 20.56 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.42 | 13.06 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.986

INPUT
Description: Thalweg Sta. 588.90
Station Elevation Data num= 164

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1010.09 | 7.46 | 1009.91 | 8.58 | 1009.89 | 9.53 | 1009.87 | 19.57 | 1009.67 |
| 29.6 | 1009.51 | 30.54 | 1009.49 | 31.68 | 1009.47 | 52.2 | 1009.23 | 52.5 | 1009.23 |
| 55.91 | 1009.19 | 63.48 | 1009.13 | 74.46 | 1009.07 | 76.23 | 1009.07 | 80.14 | 1009.08 |
| 85.44 | 1009.08 | 96.42 | 1009.11 | 140.33 | 1009.13 | 150.07 | 1009.11 | 151.31 | 1009.11 |
| 152.82 | 1009.1 | 162.29 | 1009.06 | 173.27 | 1008.99 | 206.21 | 1008.6 | 210.3 | 1008.53 |
| 217.19 | 1008.43 | 225.5 | 1008.26 | 239.14 | 1008.06 | 249.72 | 1007.53 | 250 | 1007.51 |
| 250.12 | 1007.51 | 250.45 | 1007.49 | 255.54 | 1007.27 | 261.1 | 1007.03 | 270.53 | 1006.8 |
| 273.95 | 1006.71 | 280.21 | 1006.57 | 287.77 | 1006.38 | 294.04 | 1006.21 | 295.32 | 1006.17 |
| 310.69 | 1005.75 | 326.97 | 1005.25 | 337.96 | 1004.85 | 346.63 | 1004.49 | 348.93 | 1004.39 |
| 350.84 | 1004.46 | 359.91 | 1004.59 | 370.86 | 1005.05 | 370.92 | 1005.06 | 381.87 | 1005.85 |
| 392.85 | 1006.73 | 395.08 | 1006.85 | 403.83 | 1007.25 | 414.81 | 1007.69 | 425.79 | 1008.45 |
| 431.16 | 1008.64 | 436.76 | 1008.82 | 443.54 | 1008.82 | 458.72 | 1008.74 | 467.76 | 1008.6 |
| 469.7 | 1008.56 | 471.3 | 1008.49 | 480.68 | 1008.04 | 491.39 | 1007.94 | 491.66 | 1007.93 |
| 491.99 | 1007.94 | 502.64 | 1008.11 | 511.46 | 1008.3 | 513.61 | 1008.35 | 521.98 | 1008.48 |
| 524.6 | 1008.54 | 529.54 | 1008.57 | 535.58 | 1008.64 | 540.44 | 1008.67 | 546.55 | 1008.68 |
| 551.62 | 1008.59 | 557.53 | 1008.52 | 564.67 | 1008.22 | 567.32 | 1008.1 | 568.51 | 1008.02 |
| 579.49 | 1006.84 | 588.9 | 1005.85 | 590.47 | 1005.7 | 591.77 | 1005.66 | 601.45 | 1005.35 |
| 611.85 | 1005.38 | 613.12 | 1005.38 | 623.41 | 1005.31 | 634.38 | 1005.54 | 637.35 | 1005.84 |
| 642.86 | 1006.41 | 645.36 | 1006.51 | 650.42 | 1006.57 | 656.34 | 1006.85 | 657.98 | 1006.84 |
| 661.58 | 1006.89 | 666.57 | 1006.97 | 667.32 | 1006.98 | 672.08 | 1007.05 | 678.3 | 1007.12 |
| 688.19 | 1007.32 | 710.03 | 1007.92 | 711.24 | 1007.96 | 712.24 | 1007.98 | 722.22 | 1008.25 |
| 732.31 | 1008.44 | 733.2 | 1008.46 | 734.26 | 1008.47 | 744.17 | 1008.53 | 749.22 | 1008.54 |
| 755.15 | 1008.54 | 758.49 | 1008.55 | 777.11 | 1008.51 | 786.41 | 1008.54 | 788.09 | 1008.54 |
| 793.96 | 1008.57 | 799.07 | 1008.64 | 806.94 | 1008.73 | 810.05 | 1008.76 | 812.63 | 1008.79 |
| 821.03 | 1008.85 | 831.17 | 1008.9 | 832 | 1008.91 | 839.29 | 1008.89 | 842.98 | 1008.89 |
| 852.78 | 1008.76 | 853.96 | 1008.74 | 855.39 | 1008.71 | 864.94 | 1008.38 | 872.86 | 1008.29 |
| 875.92 | 1008.18 | 879.62 | 1008.22 | 886.9 | 1008.23 | 892.94 | 1008.46 | 903.85 | 1008.93 |
| 908.86 | 1009.13 | 913.01 | 1009.27 | 919.84 | 1009.54 | 928.07 | 1010 | 930.82 | 1010.14 |
| 933.09 | 1010.24 | 941.79 | 1010.7 | 952.3 | 1011.01 | 952.77 | 1011.02 | 953.17 | 1011.03 |
| 963.75 | 1011.14 | 973.24 | 1011.13 | 974.73 | 1011.14 | 976.53 | 1011.14 | 985.71 | 1011.47 |
| 996.69 | 1011.82 | 1000.75 | 1011.97 | 1007.67 | 1012.45 | 1018.65 | 1013.32 | 1024.98 | 1013.76 |
| 1029.62 | 1013.99 | 1033.48 | 1014.13 | 1040.61 | 1014.4 | 1043.28 | 1014.51 | 1062.56 | 1015.1 |
| 1073.43 | 1015.46 | 1073.63 | 1015.46 | 1084.52 | 1015.83 | 1087.4 | 1015.92 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 52.2 | .035 | 666.57 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 540.44 | 656.34 | 196.6 | 199.99 | 205.75 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.81 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1006.59 | Reach Len. (ft) | 196.60 | 199.99 | 205.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 127.10 | 61.09 | |
| E.G. Slope (ft/ft) | 0.007432 | Area (sq ft) | 127.10 | 61.09 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 506.85 | 206.15 | |
| Top Width (ft) | 180.56 | Top Width (ft) | 111.65 | 68.90 | |
| Vel Total (ft/s) | 3.79 | Avg. Vel. (ft/s) | 3.99 | 3.37 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | 1.14 | 0.89 | |
| Conv. Total (cfs) | 8270.8 | Conv. (cfs) | 5879.5 | 2391.3 | |
| Length Wtd. (ft) | 197.54 | Wetted Per. (ft) | 111.76 | 69.01 | |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 1005.31 | Shear (lb/sq ft) | 0.53 | 0.41 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 2.10 | 1.39 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 8.86 | 16.99 | 0.94 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 12.80 | 12.39 | 2.02 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1007.98 | Element | | | |
| Vel Head (ft) | 0.42 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1007.56 | Reach Len. (ft) | 196.60 | 199.99 | 205.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 137.22 | |
| E.G. Slope (ft/ft) | 0.007837 | Area (sq ft) | | 137.22 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 83.55 | Top Width (ft) | | 83.55 | |
| Vel Total (ft/s) | 5.20 | Avg. Vel. (ft/s) | | 5.20 | |
| Max Chl Dpth (ft) | 3.17 | Hydr. Depth (ft) | | 1.64 | |
| Conv. Total (cfs) | 8053.8 | Conv. (cfs) | | 8053.8 | |
| Length Wtd. (ft) | 199.84 | Wetted Per. (ft) | | 84.42 | |
| Min Ch El (ft) | 1005.31 | Shear (lb/sq ft) | | 0.80 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.13 | |
| Frctn Loss (ft) | 1.33 | Cum Volume (acre-ft) | 0.55 | 21.27 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.65 | 13.08 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.81 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1006.59 | Reach Len. (ft) | 196.60 | 199.99 | 205.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 127.04 | 61.05 | |
| E.G. Slope (ft/ft) | 0.007442 | Area (sq ft) | 127.04 | 61.05 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 506.89 | 206.11 | |
| Top Width (ft) | 180.51 | Top Width (ft) | 111.62 | 68.89 | |
| Vel Total (ft/s) | 3.79 | Avg. Vel. (ft/s) | 3.99 | 3.38 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | 1.14 | 0.89 | |
| Conv. Total (cfs) | 8265.1 | Conv. (cfs) | 5875.9 | 2389.2 | |
| Length Wtd. (ft) | 197.54 | Wetted Per. (ft) | 111.73 | 68.99 | |
| Min Ch El (ft) | 1005.31 | Shear (lb/sq ft) | 0.53 | 0.41 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 2.11 | 1.39 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 2.31 | 20.32 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.90 | 12.77 | |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.949

INPUT
Description: Thalweg Sta. 409.93
Station Elevation Data num= 150

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1008.05 | 7.07 | 1007.98 | 17.74 | 1007.85 | 18.23 | 1007.85 | 28.42 | 1007.74 |
| 39.09 | 1007.68 | 69.32 | 1007.77 | 71.11 | 1007.78 | 74.12 | 1007.77 | 81.78 | 1007.76 |
| 86.35 | 1007.72 | 92.46 | 1007.68 | 102.72 | 1007.52 | 103.13 | 1007.51 | 103.38 | 1007.51 |
| 113.81 | 1007.26 | 120.41 | 1006.92 | 124.48 | 1006.73 | 131.31 | 1006.29 | 135.15 | 1006.05 |
| 137.44 | 1006.03 | 142.69 | 1005.92 | 145.83 | 1005.86 | 154.47 | 1006.01 | 156.5 | 1006.05 |
| 159.91 | 1006.03 | 167.17 | 1005.85 | 171.51 | 1005.55 | 177.85 | 1004.98 | 188.5 | 1004.4 |
| 199.2 | 1003.68 | 205.57 | 1003.41 | 209.87 | 1003.18 | 217.1 | 1003.24 | 220.55 | 1003.31 |
| 222.6 | 1003.37 | 231.22 | 1003.65 | 239.63 | 1003.84 | 241.9 | 1003.9 | 245.7 | 1003.92 |
| 252.57 | 1003.94 | 256.66 | 1003.98 | 263.24 | 1004.01 | 273.69 | 1005.64 | 273.91 | 1005.66 |
| 274.3 | 1005.72 | 284.59 | 1007.07 | 290.72 | 1007.14 | 295.26 | 1007.25 | 302.9 | 1007.17 |
| 305.94 | 1007.12 | 307.75 | 1007.04 | 316.61 | 1006.68 | 324.78 | 1006.21 | 327.29 | 1006.06 |
| 331.49 | 1005.93 | 337.96 | 1005.75 | 341.81 | 1005.89 | 348.63 | 1006.11 | 358.84 | 1006.47 |
| 359.31 | 1006.49 | 360.09 | 1006.49 | 369.98 | 1006.62 | 380.66 | 1006.8 | 388.68 | 1007.05 |
| 391.33 | 1007.12 | 392.91 | 1007.12 | 402 | 1007.14 | 409.93 | 1006.69 | 412.68 | 1006.58 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 417.28 | 1006.06 | 421.7 | 1005.49 | 423.35 | 1005.3 | 429.48 | 1004.76 | 434.02 | 1004.58 |
| 437.25 | 1004.47 | 444.7 | 1004.3 | 445.02 | 1004.29 | 455.37 | 1004.05 | 461.03 | 1004.03 |
| 466.05 | 1003.97 | 474.48 | 1004.1 | 476.11 | 1004.12 | 476.72 | 1004.14 | 478.05 | 1004.25 |
| 487.39 | 1004.83 | 495.09 | 1005.34 | 498.07 | 1005.53 | 503.07 | 1005.52 | 512.11 | 1005.39 |
| 519.41 | 1005.36 | 522.75 | 1005.47 | 530.09 | 1005.65 | 531.67 | 1005.7 | 532.07 | 1005.72 |
| 540.76 | 1006.14 | 546.17 | 1005.18 | 551.44 | 1004.55 | 560.27 | 1005 | 562.11 | 1005.15 |
| 569.38 | 1005.98 | 572.78 | 1006.26 | 577.15 | 1006.34 | 579.35 | 1006.36 | 583.46 | 1006.39 |
| 588.86 | 1006.26 | 594.13 | 1006.06 | 604.81 | 1006.27 | 608.24 | 1006.55 | 615.48 | 1007.13 |
| 626.16 | 1007.94 | 631.33 | 1008.26 | 636.83 | 1008.58 | 647.5 | 1009.18 | 654.88 | 1009.57 |
| 658.17 | 1009.75 | 665.39 | 1010.09 | 668.85 | 1010.26 | 679.52 | 1010.54 | 682.43 | 1010.53 |
| 690.2 | 1010.52 | 700.87 | 1010.38 | 703.25 | 1010.36 | 709.29 | 1010.32 | 711.55 | 1010.29 |
| 716.49 | 1010.25 | 722.22 | 1010.24 | 731.85 | 1010.31 | 732.6 | 1010.32 | 732.89 | 1010.32 |
| 743.57 | 1010.63 | 748.16 | 1010.77 | 754.24 | 1010.99 | 755.93 | 1011.04 | 760.44 | 1011.2 |
| 764.91 | 1011.39 | 767.57 | 1011.51 | 775.59 | 1011.84 | 784.61 | 1012.17 | 796.94 | 1012.53 |
| 801.64 | 1012.65 | 817.63 | 1013.1 | 818.28 | 1013.11 | 818.67 | 1013.12 | 828.96 | 1013.41 |
| 839.63 | 1013.66 | 846.24 | 1013.76 | 850.31 | 1013.83 | 852.73 | 1013.88 | 859.57 | 1013.99 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 532.07 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 402 | 498.07 | 190.2 | 199.97 | 208.83 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 540.76 | 859.57 | 1006.14 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.52 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1005.30 | Reach Len. (ft) | 190.20 | 199.97 | 208.83 |
| Crit W.S. (ft) | 1004.94 | Flow Area (sq ft) | 132.25 | 63.02 | |
| E.G. Slope (ft/ft) | 0.005812 | Area (sq ft) | 132.25 | 63.02 | 7.47 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 524.95 | 188.05 | |
| Top Width (ft) | 186.25 | Top Width (ft) | 97.21 | 71.12 | 17.92 |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | 3.97 | 2.98 | |
| Max Chl Dpth (ft) | 2.12 | Hydr. Depth (ft) | 1.36 | 0.89 | |
| Conv. Total (cfs) | 9352.1 | Conv. (cfs) | 6885.6 | 2466.5 | |
| Length Wtd. (ft) | 192.98 | Wetted Per. (ft) | 97.38 | 71.19 | |
| Min Ch El (ft) | 1003.97 | Shear (lb/sq ft) | 0.49 | 0.32 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.96 | 0.96 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 8.28 | 16.71 | 0.92 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 12.33 | 12.07 | 1.98 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.62 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1006.32 | Reach Len. (ft) | 190.20 | 199.97 | 208.83 |
| Crit W.S. (ft) | 1005.83 | Flow Area (sq ft) | 25.50 | 142.77 | |
| E.G. Slope (ft/ft) | 0.005687 | Area (sq ft) | 25.50 | 142.77 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 61.88 | 651.12 | |
| Top Width (ft) | 129.55 | Top Width (ft) | 46.49 | 83.06 | |
| Vel Total (ft/s) | 4.24 | Avg. Vel. (ft/s) | 2.43 | 4.56 | |
| Max Chl Dpth (ft) | 3.14 | Hydr. Depth (ft) | 0.55 | 1.72 | |
| Conv. Total (cfs) | 9454.4 | Conv. (cfs) | 820.6 | 8633.9 | |
| Length Wtd. (ft) | 198.32 | Wetted Per. (ft) | 48.88 | 83.98 | |
| Min Ch El (ft) | 1003.97 | Shear (lb/sq ft) | 0.19 | 0.60 | |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.45 | 2.75 | |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 0.49 | 20.63 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.55 | 12.69 | |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.52 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1005.30 | Reach Len. (ft) | 190.20 | 199.97 | 208.83 |
| Crit W.S. (ft) | 1004.94 | Flow Area (sq ft) | 132.44 | 63.16 | |
| E.G. Slope (ft/ft) | 0.005784 | Area (sq ft) | 132.44 | 63.16 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 524.81 | 188.19 | |
| Top Width (ft) | 168.41 | Top Width (ft) | 97.24 | 71.17 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | 3.96 | 2.98 | |
| Max Chl Dpth (ft) | 2.12 | Hydr. Depth (ft) | 1.36 | 0.89 | |
| Conv. Total (cfs) | 9374.9 | Conv. (cfs) | 6900.4 | 2474.5 | |
| Length Wtd. (ft) | 192.99 | Wetted Per. (ft) | 97.42 | 71.24 | |
| Min Ch El (ft) | 1003.97 | Shear (lb/sq ft) | 0.49 | 0.32 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.95 | 0.95 | |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | 1.72 | 20.03 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.43 | 12.44 | |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.911

INPUT
Description: Thalweg Sta. 600.20
Station Elevation Data num= 182

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1008.02 | 7.29 | 1007.95 | 7.35 | 1007.95 | 17.49 | 1007.87 | 19.7 | 1007.84 |
| 44.4 | 1007.56 | 47.96 | 1007.51 | 48.84 | 1007.5 | 68.28 | 1007.23 | 69.1 | 1007.22 |
| 81.45 | 1007.05 | 93.8 | 1006.91 | 106.15 | 1006.82 | 118.5 | 1006.77 | 121.63 | 1006.77 |
| 128.07 | 1006.76 | 139.37 | 1006.77 | 143.21 | 1006.78 | 167.91 | 1006.89 | 169.84 | 1006.89 |
| 178.79 | 1006.91 | 180 | 1006.92 | 190.15 | 1006.93 | 192.61 | 1006.91 | 200.31 | 1006.9 |
| 204.96 | 1006.84 | 210.47 | 1006.79 | 217.32 | 1006.66 | 220.62 | 1006.61 | 229.67 | 1006.43 |
| 235.95 | 1006.32 | 240.94 | 1006.25 | 242.02 | 1006.25 | 251.09 | 1006.15 | 254.37 | 1005.99 |
| 261.25 | 1005.78 | 266.72 | 1005.21 | 271.41 | 1004.9 | 279.07 | 1003.96 | 281.56 | 1003.71 |
| 291.42 | 1002.95 | 291.72 | 1002.91 | 293.12 | 1002.91 | 301.88 | 1002.97 | 303.77 | 1003.14 |
| 312.04 | 1003.62 | 322.19 | 1004.36 | 328.47 | 1004.6 | 332.35 | 1004.84 | 340.82 | 1004.99 |
| 342.51 | 1005.03 | 352.28 | 1005.18 | 352.66 | 1005.18 | 353.18 | 1005.16 | 362.82 | 1005.11 |
| 365.53 | 1005.01 | 372.98 | 1004.84 | 377.88 | 1004.64 | 383.13 | 1004.46 | 390.23 | 1003.92 |
| 393.29 | 1003.74 | 402.58 | 1002.81 | 403.45 | 1002.73 | 407.46 | 1002.46 | 413.6 | 1002.08 |
| 414.93 | 1002.11 | 423.76 | 1002.07 | 427.28 | 1002.23 | 433.92 | 1002.46 | 439.63 | 1002.67 |
| 444.07 | 1002.88 | 451.98 | 1003.13 | 454.23 | 1003.21 | 464.33 | 1003.5 | 464.38 | 1003.5 |
| 464.62 | 1003.51 | 474.54 | 1003.75 | 484.7 | 1003.89 | 489.03 | 1004.03 | 494.85 | 1004.2 |
| 501.38 | 1004.37 | 505.01 | 1004.48 | 513.74 | 1004.62 | 515.17 | 1004.65 | 521.78 | 1004.85 |
| 525.32 | 1004.95 | 533.42 | 1005.2 | 535.48 | 1005.27 | 545.64 | 1005.36 | 550.79 | 1005.37 |
| 555.79 | 1005.35 | 563.15 | 1005.25 | 565.95 | 1005.25 | 575.5 | 1005.07 | 576.11 | 1005.07 |
| 586.26 | 1004.39 | 587.85 | 1004.25 | 596.42 | 1003.31 | 600.2 | 1003.16 | 606.58 | 1002.86 |
| 612.55 | 1002.84 | 616.73 | 1002.8 | 624.9 | 1002.86 | 626.89 | 1002.88 | 636.11 | 1002.64 |
| 637.05 | 1002.62 | 637.25 | 1002.64 | 647.2 | 1004.89 | 649.6 | 1005.01 | 657.36 | 1004.76 |
| 661.95 | 1004.7 | 667.52 | 1004.5 | 671.32 | 1004.43 | 674.3 | 1004.37 | 674.43 | 1004.37 |
| 677.67 | 1004.31 | 686.65 | 1004.3 | 687.83 | 1004.38 | 693.27 | 1004.86 | 697.99 | 1005.34 |
| 699 | 1005.29 | 708.14 | 1006.32 | 711.35 | 1006.6 | 718.3 | 1006.66 | 723.7 | 1007 |
| 728.46 | 1007.13 | 736.05 | 1007.45 | 738.61 | 1007.52 | 748.4 | 1007.59 | 748.77 | 1007.59 |
| 750.45 | 1007.57 | 760.75 | 1007.34 | 769.08 | 1007.1 | 773.1 | 1007.1 | 779.24 | 1006.97 |
| 789.4 | 1006.82 | 797.82 | 1006.64 | 799.55 | 1006.61 | 807.61 | 1006.57 | 809.71 | 1006.54 |
| 810.17 | 1006.61 | 819.87 | 1006.69 | 822.52 | 1006.89 | 830.02 | 1006.77 | 834.87 | 1007.13 |
| 840.18 | 1007.73 | 847.22 | 1008.03 | 850.34 | 1008.14 | 859.57 | 1008.34 | 860.49 | 1008.37 |
| 864.78 | 1008.37 | 870.65 | 1008.33 | 871.92 | 1008.29 | 880.81 | 1008.04 | 884.27 | 1007.89 |
| 890.96 | 1007.68 | 896.62 | 1007.43 | 901.12 | 1007.27 | 908.97 | 1007.08 | 911.28 | 1007.03 |
| 921.32 | 1007.12 | 921.43 | 1007.12 | 921.94 | 1007.14 | 933.67 | 1007.64 | 941.74 | 1008.18 |
| 946.02 | 1008.48 | 951.9 | 1008.82 | 958.37 | 1009.23 | 962.06 | 1009.42 | 970.72 | 1009.83 |
| 972.21 | 1009.89 | 979.1 | 1010.09 | 982.37 | 1010.19 | 983.07 | 1010.2 | 992.53 | 1010.38 |
| 995.43 | 1010.42 | 1002.68 | 1010.54 | 1007.78 | 1010.64 | 1012.84 | 1010.76 | 1020.13 | 1010.99 |
| 1023 | 1011.09 | 1039.19 | 1011.8 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 48.84 | .035 | 674.43 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 545.64 | 649.6 | 194.89 | 199.98 | 208.97 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.35 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1004.17 | Reach Len. (ft) | 194.89 | 199.98 | 208.97 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 148.31 | 61.54 | |
| E.G. Slope (ft/ft) | 0.006120 | Area (sq ft) | 148.31 | 61.54 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 494.62 | 218.38 | |
| Top Width (ft) | 204.91 | Top Width (ft) | 149.41 | 55.50 | |
| Vel Total (ft/s) | 3.40 | Avg. Vel. (ft/s) | 3.34 | 3.55 | |
| Max Chl Dpth (ft) | 2.10 | Hydr. Depth (ft) | 0.99 | 1.11 | |
| Conv. Total (cfs) | 9113.9 | Conv. (cfs) | 6322.5 | 2791.4 | |
| Length Wtd. (ft) | 196.50 | Wetted Per. (ft) | 149.63 | 55.73 | |
| Min Ch El (ft) | 1002.62 | Shear (lb/sq ft) | 0.38 | 0.42 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.26 | 1.50 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 7.66 | 16.42 | 0.91 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 11.79 | 11.78 | 1.94 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.62 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1005.46 | Reach Len. (ft) | 194.89 | 199.98 | 208.97 |
| Crit W.S. (ft) | 1004.79 | Flow Area (sq ft) | 69.71 | 152.49 | |
| E.G. Slope (ft/ft) | 0.004134 | Area (sq ft) | 69.71 | 152.49 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 178.39 | 534.61 | |
| Top Width (ft) | 178.93 | Top Width (ft) | 74.97 | 103.96 | |
| Vel Total (ft/s) | 3.21 | Avg. Vel. (ft/s) | 2.56 | 3.51 | |
| Max Chl Dpth (ft) | 3.39 | Hydr. Depth (ft) | 0.93 | 1.47 | |
| Conv. Total (cfs) | 11089.6 | Conv. (cfs) | 2774.6 | 8315.0 | |
| Length Wtd. (ft) | 198.77 | Wetted Per. (ft) | 76.79 | 104.76 | |
| Min Ch El (ft) | 1002.62 | Shear (lb/sq ft) | 0.23 | 0.38 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.60 | 1.32 | |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | 0.29 | 19.95 | |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 0.28 | 12.26 | |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.35 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1004.17 | Reach Len. (ft) | 194.89 | 199.98 | 208.97 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 147.48 | 61.23 | |
| E.G. Slope (ft/ft) | 0.006213 | Area (sq ft) | 147.48 | 61.23 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 494.61 | 218.39 | |
| Top Width (ft) | 204.45 | Top Width (ft) | 149.03 | 55.42 | |
| Vel Total (ft/s) | 3.42 | Avg. Vel. (ft/s) | 3.35 | 3.57 | |
| Max Chl Dpth (ft) | 2.10 | Hydr. Depth (ft) | 0.99 | 1.10 | |
| Conv. Total (cfs) | 9045.7 | Conv. (cfs) | 6275.0 | 2770.7 | |
| Length Wtd. (ft) | 196.50 | Wetted Per. (ft) | 149.25 | 55.65 | |
| Min Ch El (ft) | 1002.62 | Shear (lb/sq ft) | 0.38 | 0.43 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.29 | 1.52 | |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 1.11 | 19.75 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.89 | 12.15 | |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.873

INPUT
Description: Thalweg Sta. 611.56
Station Elevation Data num= 150

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1008.03 | 11.56 | 1007.8 | 41.56 | 1007.12 | 44.27 | 1007.07 | 64.29 | 1006.62 |
| 81.56 | 1006.19 | 91.56 | 1005.97 | 101.56 | 1005.83 | 101.69 | 1005.83 | 104.35 | 1005.83 |
| 111.56 | 1005.81 | 121.56 | 1005.84 | 141.56 | 1005.85 | 151.56 | 1005.82 | 154.41 | 1005.82 |
| 164.43 | 1005.78 | 171.56 | 1005.77 | 174.44 | 1005.76 | 191.56 | 1005.75 | 201.56 | 1005.82 |
| 204.48 | 1005.86 | 211.56 | 1005.97 | 221.56 | 1006.17 | 224.51 | 1006.22 | 231.56 | 1006.37 |
| 234.52 | 1006.42 | 241.56 | 1006.56 | 244.53 | 1006.59 | 251.56 | 1006.7 | 254.55 | 1006.7 |
| 261.56 | 1006.77 | 264.56 | 1006.77 | 271.56 | 1006.8 | 274.57 | 1006.82 | 284.59 | 1006.85 |
| 291.56 | 1006.85 | 294.6 | 1006.83 | 301.56 | 1006.75 | 308.5 | 1006.5 | 311.56 | 1006.45 |
| 318.49 | 1006.12 | 321.56 | 1006.03 | 328.47 | 1005.71 | 331.56 | 1005.55 | 338.46 | 1005.32 |
| 341.56 | 1005.18 | 344.67 | 1005.01 | 351.56 | 1004.68 | 354.68 | 1004.45 | 361.56 | 1004.07 |
| 364.69 | 1003.91 | 365.2 | 1003.89 | 371.56 | 1003.64 | 374.71 | 1003.56 | 381.56 | 1003.36 |
| 384.72 | 1003.31 | 391.56 | 1003.15 | 394.73 | 1003.11 | 401.56 | 1002.98 | 411.56 | 1002.88 |
| 421.56 | 1002.84 | 424.77 | 1002.87 | 431.56 | 1002.87 | 434.79 | 1002.95 | 441.56 | 1003.06 |
| 444.8 | 1003.13 | 451.56 | 1003.3 | 458.3 | 1003.37 | 461.56 | 1003.31 | 468.29 | 1002.98 |
| 471.56 | 1002.78 | 478.28 | 1002.52 | 481.56 | 1002.42 | 488.26 | 1002.43 | 491.56 | 1002.46 |
| 494.87 | 1002.36 | 501.56 | 1002.28 | 504.88 | 1002.14 | 511.56 | 1001.88 | 514.89 | 1001.78 |
| 521.56 | 1001.52 | 524.91 | 1001.46 | 531.56 | 1001.32 | 534.92 | 1001.29 | 541.56 | 1001.19 |
| 544.93 | 1001.2 | 551.56 | 1001.05 | 554.95 | 1001.23 | 561.56 | 1001.45 | 564.96 | 1001.75 |
| 571.56 | 1002.24 | 574.97 | 1002.6 | 581.56 | 1003.31 | 584.99 | 1003.48 | 591.56 | 1004.28 |
| 595 | 1004.08 | 601.56 | 1003.54 | 608.1 | 1002.65 | 611.56 | 1002.21 | 621.56 | 1001.29 |
| 631.56 | 1001.14 | 638.06 | 1001.38 | 641.56 | 1001.47 | 645.07 | 1001.92 | 651.56 | 1002.81 |
| 655.08 | 1003.41 | 657.88 | 1003.92 | 661.56 | 1004.58 | 665.09 | 1004.99 | 671.56 | 1005.58 |
| 675.11 | 1005.83 | 681.56 | 1006.26 | 685.12 | 1006.52 | 687.95 | 1006.74 | 691.56 | 1007.03 |
| 701.56 | 1007.62 | 705.15 | 1007.73 | 711.56 | 1007.89 | 715.16 | 1007.96 | 721.56 | 1008.05 |
| 725.17 | 1008.11 | 735.19 | 1008.23 | 741.56 | 1008.28 | 745.2 | 1008.3 | 751.56 | 1008.3 |
| 757.9 | 1007.97 | 761.56 | 1007.85 | 767.89 | 1008.11 | 771.56 | 1008.23 | 777.88 | 1008.69 |
| 781.56 | 1008.89 | 787.86 | 1009.01 | 791.56 | 1009.07 | 795.26 | 1009.03 | 801.56 | 1008.91 |
| 805.28 | 1008.79 | 815.29 | 1008.37 | 821.56 | 1008.09 | 825.3 | 1008.09 | 831.56 | 1008.19 |
| 835.32 | 1008.38 | 841.56 | 1008.71 | 845.33 | 1008.83 | 851.56 | 1009.08 | 855.34 | 1009.17 |
| 861.56 | 1009.34 | 865.36 | 1009.43 | 875.37 | 1009.69 | 881.56 | 1009.84 | 884.25 | 1009.91 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 101.69 | .035 | 687.95 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 591.56 | 661.56 | 205.68 | 200 | 201.72 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.37 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1003.22 | Reach Len. (ft) | 205.68 | 200.00 | 201.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 161.88 | 69.17 | |
| E.G. Slope (ft/ft) | 0.004102 | Area (sq ft) | 161.88 | 69.17 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 480.48 | 232.53 | |
| Top Width (ft) | 227.38 | Top Width (ft) | 177.31 | 50.07 | |
| Vel Total (ft/s) | 3.09 | Avg. Vel. (ft/s) | 2.97 | 3.36 | |
| Max Chl Dpth (ft) | 2.17 | Hydr. Depth (ft) | 0.91 | 1.38 | |
| Conv. Total (cfs) | 11133.0 | Conv. (cfs) | 7502.3 | 3630.7 | |
| Length Wtd. (ft) | 202.12 | Wetted Per. (ft) | 177.45 | 50.31 | |
| Min Ch El (ft) | 1001.14 | Shear (lb/sq ft) | 0.23 | 0.35 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.69 | 1.18 | |
| Frctn Loss (ft) | 0.78 | Cum Volume (acre-ft) | 6.97 | 16.12 | 0.91 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 11.06 | 11.54 | 1.94 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.11 | Element | | | |
| Vel Head (ft) | 0.72 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1003.39 | Reach Len. (ft) | 205.68 | 200.00 | 201.72 |
| Crit W.S. (ft) | 1003.39 | Flow Area (sq ft) | 28.48 | 77.73 | |
| E.G. Slope (ft/ft) | 0.016622 | Area (sq ft) | 28.48 | 77.73 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 160.61 | 552.39 | |
| Top Width (ft) | 77.37 | Top Width (ft) | 25.08 | 52.29 | |
| Vel Total (ft/s) | 6.71 | Avg. Vel. (ft/s) | 5.64 | 7.11 | |
| Max Chl Dpth (ft) | 2.34 | Hydr. Depth (ft) | 1.14 | 1.49 | |
| Conv. Total (cfs) | 5530.2 | Conv. (cfs) | 1245.7 | 4284.5 | |
| Length Wtd. (ft) | 200.64 | Wetted Per. (ft) | 27.23 | 52.55 | |
| Min Ch El (ft) | 1001.14 | Shear (lb/sq ft) | 1.09 | 1.54 | |
| Alpha | 1.03 | Stream Power (lb/ft s) | 6.12 | 10.91 | |
| Frctn Loss (ft) | 0.74 | Cum Volume (acre-ft) | 0.07 | 19.42 | |
| C & E Loss (ft) | 0.18 | Cum SA (acres) | 0.06 | 11.91 | |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.54 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1003.41 | Reach Len. (ft) | 205.68 | 200.00 | 201.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 169.70 | 78.83 | |
| E.G. Slope (ft/ft) | 0.002859 | Area (sq ft) | 169.70 | 78.83 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 479.35 | 233.65 | |
| Top Width (ft) | 174.57 | Top Width (ft) | 122.01 | 52.56 | |
| Vel Total (ft/s) | 2.87 | Avg. Vel. (ft/s) | 2.82 | 2.96 | |
| Max Chl Dpth (ft) | 2.36 | Hydr. Depth (ft) | 1.39 | 1.50 | |
| Conv. Total (cfs) | 13334.6 | Conv. (cfs) | 8964.8 | 4369.8 | |
| Length Wtd. (ft) | 201.91 | Wetted Per. (ft) | 122.25 | 52.83 | |
| Min Ch El (ft) | 1001.14 | Shear (lb/sq ft) | 0.25 | 0.27 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.70 | 0.79 | |
| Frctn Loss (ft) | 0.42 | Cum Volume (acre-ft) | 0.40 | 19.43 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.29 | 11.91 | |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.835

INPUT
Description: Thalweg Sta. 396.26
Station Elevation Data num= 145

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1003.83 | 3.44 | 1003.95 | 6.01 | 1004.06 | 13.11 | 1004.35 | 16.02 | 1004.49 |
| 22.76 | 1004.76 | 26.03 | 1004.9 | 32.43 | 1005.1 | 36.03 | 1005.22 | 42.09 | 1005.36 |
| 46.04 | 1005.43 | 51.75 | 1005.5 | 61.41 | 1005.56 | 66.05 | 1005.57 | 71.08 | 1005.57 |
| 76.06 | 1005.56 | 86.06 | 1005.44 | 91.79 | 1005.31 | 96.07 | 1005.19 | 102.17 | 1005.04 |
| 106.08 | 1004.92 | 116.08 | 1004.68 | 119.38 | 1004.59 | 126.09 | 1004.43 | 136.1 | 1004.13 |
| 138.7 | 1004.03 | 146.1 | 1003.77 | 148.36 | 1003.7 | 156.11 | 1003.43 | 158.02 | 1003.4 |
| 166.12 | 1003.21 | 167.69 | 1003.19 | 186.13 | 1002.89 | 187 | 1002.87 | 196.14 | 1002.72 |
| 196.67 | 1002.71 | 206.14 | 1002.55 | 206.32 | 1002.55 | 215.99 | 1002.39 | 216.15 | 1002.39 |
| 225.64 | 1002.24 | 226.15 | 1002.24 | 236.16 | 1002.12 | 244.97 | 1002.07 | 254.63 | 1002.07 |
| 256.17 | 1002.08 | 276.19 | 1002.09 | 283.61 | 1002.02 | 286.19 | 1001.99 | 296.2 | 1001.78 |
| 302.93 | 1001.75 | 306.21 | 1001.7 | 312.6 | 1001.72 | 316.21 | 1001.7 | 318.1 | 1001.65 |
| 322.26 | 1001.55 | 326.22 | 1001.48 | 331.92 | 1001.27 | 336.22 | 1001.13 | 341.58 | 1000.83 |
| 346.23 | 1000.56 | 351.24 | 1000.25 | 356.24 | 999.98 | 360.9 | 999.96 | 366.24 | 999.96 |
| 370.57 | 1000.16 | 376.25 | 1000.5 | 380.22 | 1000.72 | 386.26 | 1001 | 389.89 | 1000.87 |
| 396.26 | 1000.57 | 399.55 | 1000.48 | 406.27 | 1000.27 | 409.21 | 1000.36 | 416.28 | 1000.63 |
| 418.87 | 1001 | 426.28 | 1002.07 | 428.53 | 1002.44 | 436.29 | 1003.67 | 440.63 | 1003.83 |
| 446.3 | 1004.03 | 447.86 | 1004.01 | 456.3 | 1003.95 | 466.31 | 1004.04 | 467.18 | 1004.09 |
| 476.31 | 1004.53 | 476.83 | 1004.57 | 480.68 | 1004.86 | 486.32 | 1005.29 | 486.5 | 1005.31 |
| 496.16 | 1006.08 | 496.33 | 1006.1 | 505.82 | 1006.62 | 506.33 | 1006.65 | 515.48 | 1006.99 |
| 516.34 | 1007.03 | 526.35 | 1007.36 | 534.8 | 1007.57 | 536.35 | 1007.6 | 544.46 | 1007.66 |
| 546.36 | 1007.67 | 554.12 | 1007.67 | 556.37 | 1007.66 | 576.38 | 1007.65 | 583.1 | 1007.63 |
| 586.38 | 1007.64 | 592.77 | 1007.57 | 596.39 | 1007.56 | 602.42 | 1007.46 | 606.4 | 1007.41 |
| 612.09 | 1007.29 | 616.4 | 1007.21 | 626.41 | 1006.85 | 636.42 | 1006.34 | 641.07 | 1006.14 |
| 646.42 | 1005.87 | 650.74 | 1005.84 | 656.43 | 1005.75 | 660.39 | 1005.79 | 666.44 | 1005.79 |
| 670.06 | 1005.82 | 676.44 | 1005.86 | 679.71 | 1005.87 | 686.45 | 1005.95 | 689.38 | 1005.94 |
| 696.46 | 1005.99 | 699.04 | 1005.97 | 706.46 | 1005.98 | 708.7 | 1005.96 | 716.47 | 1005.83 |
| 718.36 | 1005.86 | 726.47 | 1006.1 | 728.03 | 1006.18 | 736.48 | 1006.57 | 737.68 | 1006.61 |
| 746.49 | 1006.89 | 747.35 | 1006.91 | 756.49 | 1007.17 | 757 | 1007.18 | 766.5 | 1007.49 |
| 766.67 | 1007.49 | 771.31 | 1007.63 | 776.33 | 1007.77 | 776.51 | 1007.78 | 785.43 | 1007.98 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 480.68 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 318.1 | 426.28 | 202.76 | 200 | 200.46 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.58 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.035 | 0.035 | 0.035 |
| W.S. Elev (ft) | 1002.39 | Reach Len. (ft) | 202.76 | 200.00 | 200.46 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 37.98 | 182.00 | 0.31 |
| E.G. Slope (ft/ft) | 0.003678 | Area (sq ft) | 37.98 | 182.00 | 0.31 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 50.69 | 662.08 | 0.23 |
| Top Width (ft) | 211.90 | Top Width (ft) | 101.79 | 108.18 | 1.93 |
| Vel Total (ft/s) | 3.24 | Avg. Vel. (ft/s) | 1.33 | 3.64 | 0.75 |
| Max Chl Dpth (ft) | 2.43 | Hydr. Depth (ft) | 0.37 | 1.68 | 0.16 |
| Conv. Total (cfs) | 11756.3 | Conv. (cfs) | 835.8 | 10916.7 | 3.8 |
| Length Wtd. (ft) | 200.61 | Wetted Per. (ft) | 101.79 | 108.37 | 1.96 |
| Min Ch El (ft) | 999.96 | Shear (lb/sq ft) | 0.09 | 0.39 | 0.04 |
| Alpha | 1.19 | Stream Power (lb/ft s) | 0.11 | 1.40 | 0.03 |
| Frctn Loss (ft) | 0.66 | Cum Volume (acre-ft) | 6.50 | 15.55 | 0.91 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 10.40 | 11.17 | 1.93 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.12 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1002.99 | Reach Len. (ft) | 202.76 | 200.00 | 200.46 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 246.79 | |
| E.G. Slope (ft/ft) | 0.001589 | Area (sq ft) | | 246.79 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 108.18 | Top Width (ft) | | 108.18 | |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | | 2.89 | |
| Max Chl Dpth (ft) | 3.03 | Hydr. Depth (ft) | | 2.28 | |
| Conv. Total (cfs) | 17888.5 | Conv. (cfs) | | 17888.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 110.62 | |
| Min Ch El (ft) | 999.96 | Shear (lb/sq ft) | | 0.22 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.64 | |
| Frctn Loss (ft) | 0.38 | Cum Volume (acre-ft) | | 18.68 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 11.54 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.12 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1002.99 | Reach Len. (ft) | 202.76 | 200.00 | 200.46 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 246.79 | |
| E.G. Slope (ft/ft) | 0.001589 | Area (sq ft) | | 246.79 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 108.18 | Top Width (ft) | | 108.18 | |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | | 2.89 | |
| Max Chl Dpth (ft) | 3.03 | Hydr. Depth (ft) | | 2.28 | |
| Conv. Total (cfs) | 17888.5 | Conv. (cfs) | | 17888.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 110.62 | |
| Min Ch El (ft) | 999.96 | Shear (lb/sq ft) | | 0.22 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.64 | |
| Frctn Loss (ft) | 0.38 | Cum Volume (acre-ft) | | 18.68 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 11.54 | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.797

INPUT
Description: Thalweg Sta. 315.66
Station Elevation Data num= 131

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1003.88 | 5.35 | 1003.97 | 15.36 | 1003.98 | 25.37 | 1003.75 | 31.79 | 1003.55 |
| 35.38 | 1003.46 | 55.4 | 1002.91 | 60.53 | 1002.74 | 65.41 | 1002.59 | 75.42 | 1002.23 |
| 79.68 | 1002.12 | 85.43 | 1001.95 | 89.26 | 1001.91 | 95.44 | 1001.86 | 117.99 | 1001.87 |
| 127.57 | 1001.83 | 135.48 | 1001.75 | 145.49 | 1001.62 | 155.5 | 1001.46 | 156.31 | 1001.44 |
| 165.51 | 1001.19 | 165.88 | 1001.17 | 174.16 | 1000.84 | 175.46 | 1000.78 | 175.52 | 1000.78 |
| 185.04 | 1000.45 | 185.53 | 1000.43 | 194.62 | 1000.38 | 195.54 | 1000.38 | 205.55 | 1000.45 |
| 213.77 | 1000.53 | 215.56 | 1000.55 | 225.57 | 1000.64 | 232.93 | 1000.68 | 235.58 | 1000.7 |
| 245.59 | 1000.7 | 252.08 | 1000.73 | 255.6 | 1000.79 | 261.66 | 1000.88 | 265.61 | 1001.11 |
| 271.24 | 1001.25 | 275.62 | 1001.75 | 275.81 | 1001.74 | 280.82 | 1001.51 | 285.63 | 1001.55 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 290.4 | 1000.87 | 295.64 | 999.73 | 299.97 | 999.75 | 305.65 | 999.04 | 309.55 | 999.04 |
| 315.66 | 998.94 | 319.13 | 998.95 | 325.67 | 999.02 | 328.71 | 999.2 | 335.68 | 999.54 |
| 338.29 | 999.89 | 345.69 | 1000.73 | 347.85 | 1001 | 355.7 | 1001.89 | 357.43 | 1001.98 |
| 363.53 | 1002.45 | 365.71 | 1002.62 | 367.01 | 1002.62 | 375.72 | 1002.76 | 376.59 | 1002.74 |
| 385.73 | 1002.8 | 386.17 | 1002.81 | 395.74 | 1002.98 | 395.83 | 1002.98 | 405.32 | 1003.1 |
| 405.75 | 1003.1 | 414.9 | 1003.14 | 415.76 | 1003.14 | 418.85 | 1003.07 | 424.48 | 1002.95 |
| 425.77 | 1002.92 | 434.06 | 1003.04 | 435.78 | 1003.05 | 443.63 | 1003.47 | 445.79 | 1003.58 |
| 453.21 | 1003.97 | 455.8 | 1004.11 | 462.79 | 1004.4 | 465.81 | 1004.51 | 475.82 | 1004.85 |
| 491.52 | 1005.32 | 495.85 | 1005.46 | 505.86 | 1005.74 | 515.87 | 1005.99 | 525.88 | 1006.18 |
| 529.84 | 1006.24 | 535.89 | 1006.35 | 555.91 | 1006.63 | 565.92 | 1006.66 | 575.93 | 1006.57 |
| 577.73 | 1006.54 | 595.95 | 1006.28 | 596.88 | 1006.27 | 605.96 | 1006.16 | 606.46 | 1006.15 |
| 615.97 | 1006.07 | 617.52 | 1006.07 | 625.61 | 1006.03 | 625.98 | 1006.03 | 635.19 | 1006.05 |
| 635.99 | 1006.05 | 654.35 | 1006.25 | 656.01 | 1006.26 | 663.93 | 1006.36 | 666.02 | 1006.38 |
| 673.5 | 1006.48 | 676.03 | 1006.52 | 683.08 | 1006.61 | 686.04 | 1006.66 | 702.24 | 1006.89 |
| 706.06 | 1006.95 | 716.07 | 1007.02 | 721.39 | 1007 | 726.08 | 1006.97 | 731.22 | 1006.92 |
| 736.09 | 1006.89 | 740.54 | 1006.88 | 750.12 | 1006.83 | 756.11 | 1006.81 | 759.7 | 1006.77 |
| 766.12 | 1006.72 | 769.27 | 1006.65 | 776.13 | 1006.54 | 778.85 | 1006.46 | 786.14 | 1006.28 |
| 790.29 | 1006.15 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 418.85 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 275.81 | 355.7 | 200.01 | 200 | 200.04 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 275.81 | 1001.74 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1001.91 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1001.78 | Reach Len. (ft) | 200.01 | 200.00 | 200.04 |
| Crit W.S. (ft) | 1001.26 | Flow Area (sq ft) | 125.42 | 136.39 | |
| E.G. Slope (ft/ft) | 0.002923 | Area (sq ft) | 125.42 | 136.39 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 263.53 | 449.47 | |
| Top Width (ft) | 222.03 | Top Width (ft) | 143.12 | 78.90 | |
| Vel Total (ft/s) | 2.72 | Avg. Vel. (ft/s) | 2.10 | 3.30 | |
| Max Chl Dpth (ft) | 2.84 | Hydr. Depth (ft) | 0.88 | 1.73 | |
| Conv. Total (cfs) | 13188.5 | Conv. (cfs) | 4874.6 | 8313.9 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | 143.18 | 79.27 | |
| Min Ch El (ft) | 998.94 | Shear (lb/sq ft) | 0.16 | 0.31 | |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.34 | 1.03 | |
| Frctn Loss (ft) | 0.65 | Cum Volume (acre-ft) | 6.12 | 14.82 | 0.91 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 9.83 | 10.75 | 1.93 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.73 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1002.52 | Reach Len. (ft) | 200.01 | 200.00 | 200.04 |
| Crit W.S. (ft) | 1001.26 | Flow Area (sq ft) | | 195.90 | |
| E.G. Slope (ft/ft) | 0.002289 | Area (sq ft) | | 195.90 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 79.89 | Top Width (ft) | | 79.89 | |
| Vel Total (ft/s) | 3.64 | Avg. Vel. (ft/s) | | 3.64 | |
| Max Chl Dpth (ft) | 3.58 | Hydr. Depth (ft) | | 2.45 | |
| Conv. Total (cfs) | 14901.6 | Conv. (cfs) | | 14901.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 81.68 | |
| Min Ch El (ft) | 998.94 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.25 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | | 17.66 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 11.11 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.73 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1002.52 | Reach Len. (ft) | 200.01 | 200.00 | 200.04 |
| Crit W.S. (ft) | 1001.25 | Flow Area (sq ft) | | 195.90 | |
| E.G. Slope (ft/ft) | 0.002289 | Area (sq ft) | | 195.90 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 79.89 | Top Width (ft) | | 79.89 | |
| Vel Total (ft/s) | 3.64 | Avg. Vel. (ft/s) | | 3.64 | |
| Max Chl Dpth (ft) | 3.58 | Hydr. Depth (ft) | | 2.45 | |
| Conv. Total (cfs) | 14901.6 | Conv. (cfs) | | 14901.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 81.68 | |
| Min Ch El (ft) | 998.94 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.25 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | | 17.66 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 11.11 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.759

INPUT
Description: Thalweg Sta. 429.97
Station Elevation Data num= 153

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1002.06 | 2.66 | 1001.98 | 9.54 | 1001.74 | 19.55 | 1001.44 | 21.82 | 1001.39 |
| 29.56 | 1001.23 | 39.57 | 1001.24 | 40.98 | 1001.26 | 49.58 | 1001.32 | 50.55 | 1001.33 |
| 69.71 | 1001.33 | 72.17 | 1001.34 | 79.61 | 1001.34 | 88.87 | 1001.38 | 89.62 | 1001.39 |
| 99.63 | 1001.48 | 117.6 | 1001.7 | 127.18 | 1001.8 | 129.66 | 1001.82 | 136.76 | 1001.84 |
| 139.67 | 1001.84 | 149.68 | 1001.7 | 155.91 | 1001.59 | 159.69 | 1001.5 | 165.49 | 1001.38 |
| 169.7 | 1001.28 | 175.07 | 1001.14 | 179.71 | 1001.01 | 184.65 | 1000.92 | 189.72 | 1000.81 |
| 203.8 | 1000.66 | 209.74 | 1000.62 | 213.38 | 1000.57 | 219.75 | 1000.51 | 229.76 | 1000.39 |
| 232.54 | 1000.35 | 249.78 | 1000.14 | 251.69 | 1000.12 | 259.79 | 1000.02 | 261.27 | 1000.01 |
| 269.8 | 999.91 | 270.85 | 999.9 | 279.82 | 999.83 | 280.43 | 999.82 | 289.83 | 999.81 |
| 290.01 | 999.81 | 299.58 | 999.88 | 299.84 | 999.88 | 309.15 | 999.99 | 309.85 | 1000 |
| 318.73 | 1000.11 | 319.86 | 1000.12 | 328.31 | 1000.25 | 329.87 | 1000.27 | 337.89 | 1000.49 |
| 339.88 | 1000.53 | 347.46 | 1000.82 | 349.89 | 1000.9 | 359.9 | 1001.33 | 366.62 | 1001.69 |
| 369.91 | 1001.9 | 376.2 | 1002.1 | 379.92 | 1002.24 | 385.78 | 1002.2 | 389.93 | 1002.16 |
| 392.53 | 1002.08 | 395.36 | 1001.99 | 399.94 | 1001.92 | 404.93 | 1001.34 | 409.95 | 1000.59 |
| 419.96 | 998.9 | 424.09 | 998.62 | 429.97 | 998.27 | 433.67 | 998.24 | 439.98 | 998.27 |
| 443.25 | 998.46 | 449.99 | 999 | 460 | 1000.69 | 462.4 | 1001.08 | 470.01 | 1002.01 |
| 471.98 | 1002.11 | 474.38 | 1002.21 | 480.02 | 1002.43 | 481.56 | 1002.44 | 490.03 | 1002.59 |
| 500.04 | 1002.68 | 500.71 | 1002.68 | 510.05 | 1002.72 | 510.29 | 1002.72 | 519.87 | 1002.74 |
| 520.27 | 1002.74 | 530.07 | 1002.7 | 530.75 | 1002.68 | 540.08 | 1002.49 | 548.6 | 1002.19 |
| 556.23 | 1001.94 | 558.18 | 1001.88 | 560.1 | 1001.81 | 567.76 | 1001.7 | 570.11 | 1001.66 |
| 577.34 | 1001.72 | 580.12 | 1001.73 | 590.13 | 1001.95 | 593.65 | 1002.08 | 600.14 | 1002.34 |
| 604.13 | 1002.59 | 614.62 | 1003.36 | 620.16 | 1003.81 | 625.23 | 1004.08 | 630.17 | 1004.38 |
| 635.59 | 1004.57 | 646.07 | 1004.79 | 663.54 | 1005.05 | 677.52 | 1005.29 | 680.22 | 1005.32 |
| 688 | 1005.29 | 690.23 | 1005.3 | 692.27 | 1005.23 | 700.24 | 1004.98 | 710.25 | 1004.55 |
| 711.42 | 1004.53 | 720.26 | 1004.24 | 721 | 1004.23 | 730.27 | 1004.07 | 730.58 | 1004.07 |
| 737.4 | 1003.99 | 740.16 | 1003.97 | 740.28 | 1003.96 | 749.73 | 1003.84 | 750.29 | 1003.83 |
| 759.31 | 1003.71 | 760.3 | 1003.69 | 768.89 | 1003.61 | 770.31 | 1003.6 | 778.47 | 1003.57 |
| 780.32 | 1003.57 | 788.05 | 1003.6 | 790.33 | 1003.65 | 797.62 | 1003.88 | 800.34 | 1003.94 |
| 807.2 | 1004.12 | 810.36 | 1004.16 | 816.78 | 1004.28 | 820.37 | 1004.33 | 830.38 | 1004.51 |
| 835.94 | 1004.63 | 845.51 | 1004.86 | 850.4 | 1004.99 | 855.09 | 1005.1 | 860.41 | 1005.25 |
| 864.67 | 1005.35 | 874.25 | 1005.63 | 880.11 | 1005.84 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 556.23 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 392.53 | 474.38 | 202.36 | 201.6 | 201.74 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1001.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1001.09 | Reach Len. (ft) | 202.36 | 201.60 | 201.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 139.09 | 105.87 | |

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.003615 | Area (sq ft) | 139.09 | 105.87 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 301.51 | 411.49 | |
| Top Width (ft) | 233.65 | Top Width (ft) | 177.71 | 55.94 | |
| Vel Total (ft/s) | 2.91 | Avg. Vel. (ft/s) | 2.17 | 3.89 | |
| Max Chl Dpth (ft) | 2.85 | Hydr. Depth (ft) | 0.78 | 1.89 | |
| Conv. Total (cfs) | 11858.3 | Conv. (cfs) | 5014.6 | 6843.8 | |
| Length Wtd. (ft) | 201.85 | Wetted Per. (ft) | 177.74 | 56.34 | |
| Min Ch El (ft) | 998.24 | Shear (lb/sq ft) | 0.18 | 0.42 | |
| Alpha | 1.26 | Stream Power (lb/ft s) | 0.38 | 1.65 | |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | 5.51 | 14.26 | 0.91 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 9.10 | 10.44 | 1.93 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.02 | Wt. n-Val. | | 0.035 | |
| Vel Head (ft) | 0.43 | Reach Len. (ft) | 202.36 | 201.60 | 201.74 |
| W.S. Elev (ft) | 1001.60 | Flow Area (sq ft) | | 135.85 | |
| Crit W.S. (ft) | | Area (sq ft) | | 135.85 | |
| E.G. Slope (ft/ft) | 0.005644 | Flow (cfs) | | 713.00 | |
| Q Total (cfs) | 713.00 | Top Width (ft) | | 63.89 | |
| Top Width (ft) | 63.89 | Avg. Vel. (ft/s) | | 5.25 | |
| Vel Total (ft/s) | 5.25 | Hydr. Depth (ft) | | 2.13 | |
| Max Chl Dpth (ft) | 3.36 | Conv. (cfs) | | 9490.7 | |
| Conv. Total (cfs) | 9490.7 | Wetted Per. (ft) | | 64.35 | |
| Length Wtd. (ft) | 201.60 | Shear (lb/sq ft) | | 0.74 | |
| Min Ch El (ft) | 998.24 | Stream Power (lb/ft s) | | 3.90 | |
| Alpha | 1.00 | Cum Volume (acre-ft) | | 16.90 | |
| Frctn Loss (ft) | 1.24 | Cum SA (acres) | | 10.78 | |
| C & E Loss (ft) | 0.00 | | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.02 | Wt. n-Val. | | 0.035 | |
| Vel Head (ft) | 0.43 | Reach Len. (ft) | 202.36 | 201.60 | 201.74 |
| W.S. Elev (ft) | 1001.60 | Flow Area (sq ft) | | 135.85 | |
| Crit W.S. (ft) | | Area (sq ft) | | 135.85 | |
| E.G. Slope (ft/ft) | 0.005644 | Flow (cfs) | | 713.00 | |
| Q Total (cfs) | 713.00 | Top Width (ft) | | 63.89 | |
| Top Width (ft) | 63.89 | Avg. Vel. (ft/s) | | 5.25 | |
| Vel Total (ft/s) | 5.25 | Hydr. Depth (ft) | | 2.13 | |
| Max Chl Dpth (ft) | 3.36 | Conv. (cfs) | | 9490.7 | |
| Conv. Total (cfs) | 9490.7 | Wetted Per. (ft) | | 64.35 | |
| Length Wtd. (ft) | 201.60 | Shear (lb/sq ft) | | 0.74 | |
| Min Ch El (ft) | 998.24 | Stream Power (lb/ft s) | | 3.90 | |
| Alpha | 1.00 | Cum Volume (acre-ft) | | 16.90 | |
| Frctn Loss (ft) | 1.24 | Cum SA (acres) | | 10.78 | |
| C & E Loss (ft) | 0.00 | | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.721

INPUT
Description: Thalweg Sta. 482.18
Station Elevation Data num= 200

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1000.99 | 1.63 | 1000.98 | 2.8 | 1000.98 | 6.83 | 1000.99 | 11.64 | 1001 |
| 16.38 | 1001.02 | 21.65 | 1001.05 | 25.94 | 1001.07 | 31.67 | 1001.09 | 37.97 | 1001.09 |
| 41.68 | 1001.09 | 45.05 | 1001.07 | 51.69 | 1001.01 | 59 | 1000.77 | 61.7 | 1000.7 |
| 64.15 | 1000.59 | 71.71 | 1000.23 | 73.71 | 1000.16 | 81.72 | 999.93 | 83.26 | 999.92 |
| 91.73 | 999.91 | 92.83 | 999.92 | 101.75 | 999.97 | 102.38 | 999.97 | 111.76 | 999.97 |
| 111.93 | 999.97 | 115.59 | 999.95 | 121.49 | 999.93 | 121.77 | 999.93 | 131.04 | 999.9 |
| 131.78 | 999.9 | 140.6 | 999.89 | 141.79 | 999.89 | 150.15 | 999.88 | 151.8 | 999.89 |
| 159.7 | 999.87 | 161.81 | 999.86 | 169.26 | 999.78 | 171.83 | 999.73 | 178.81 | 999.66 |
| 181.84 | 999.63 | 188.37 | 999.59 | 191.85 | 999.57 | 197.93 | 999.53 | 201.86 | 999.52 |
| 207.48 | 999.5 | 211.87 | 999.49 | 217.04 | 999.49 | 221.88 | 999.5 | 226.59 | 999.51 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 231.89 | 999.52 | 236.15 | 999.53 | 241.91 | 999.55 | 245.7 | 999.56 | 251.92 | 999.57 |
| 255.26 | 999.58 | 261.93 | 999.6 | 269.27 | 999.62 | 271.94 | 999.62 | 274.36 | 999.63 |
| 281.95 | 999.64 | 283.92 | 999.65 | 291.96 | 999.66 | 293.47 | 999.67 | 301.97 | 999.69 |
| 303.04 | 999.7 | 311.99 | 999.74 | 312.59 | 999.75 | 322 | 999.8 | 322.14 | 999.8 |
| 325.14 | 999.81 | 331.7 | 999.85 | 332.01 | 999.85 | 341.25 | 999.89 | 342.02 | 999.89 |
| 350.81 | 999.91 | 352.03 | 999.92 | 353.38 | 999.92 | 362.04 | 999.93 | 363.89 | 999.93 |
| 372.05 | 999.93 | 374.41 | 999.93 | 382.07 | 999.93 | 384.92 | 999.94 | 392.08 | 999.97 |
| 398.58 | 1000.06 | 402.09 | 1000.14 | 408.13 | 1000.39 | 412.1 | 1000.55 | 417.69 | 1000.76 |
| 422.11 | 1000.89 | 426.28 | 1000.91 | 427.25 | 1000.91 | 432.12 | 1000.88 | 436.8 | 1000.76 |
| 442.13 | 1000.43 | 446.36 | 999.63 | 452.15 | 998.6 | 455.91 | 997.97 | 462.16 | 997.16 |
| 465.46 | 997.12 | 472.17 | 997.08 | 475.02 | 997.21 | 482.18 | 997.5 | 484.57 | 997.75 |
| 492.19 | 998.52 | 494.13 | 998.83 | 502.2 | 1000 | 511.08 | 1000.69 | 512.21 | 1000.77 |
| 521.59 | 1001.01 | 522.23 | 1001.03 | 524.22 | 1001.05 | 532.12 | 1001.15 | 532.24 | 1001.16 |
| 534.7 | 1001.19 | 541.91 | 1001.3 | 542.25 | 1001.3 | 551.46 | 1001.43 | 552.26 | 1001.44 |
| 561.01 | 1001.53 | 562.27 | 1001.54 | 570.57 | 1001.61 | 572.28 | 1001.62 | 580.12 | 1001.67 |
| 582.29 | 1001.68 | 589.68 | 1001.71 | 592.3 | 1001.71 | 599.23 | 1001.68 | 602.32 | 1001.67 |
| 608.78 | 1001.61 | 612.33 | 1001.56 | 618.34 | 1001.5 | 622.34 | 1001.44 | 627.9 | 1001.37 |
| 631.49 | 1001.31 | 632.35 | 1001.3 | 637.46 | 1001.16 | 642.36 | 1001.06 | 647.01 | 1001.07 |
| 652.37 | 1001.08 | 656.56 | 1001.16 | 662.39 | 1001.27 | 666.12 | 1001.37 | 672.4 | 1001.54 |
| 675.67 | 1001.62 | 682.41 | 1001.87 | 685.23 | 1001.93 | 692.42 | 1002.13 | 694.78 | 1002.17 |
| 702.43 | 1002.28 | 704.33 | 1002.29 | 712.44 | 1002.36 | 713.89 | 1002.36 | 722.45 | 1002.39 |
| 723.44 | 1002.38 | 732.46 | 1002.32 | 733.01 | 1002.31 | 742.48 | 1002.24 | 742.56 | 1002.24 |
| 744.25 | 1002.23 | 752.11 | 1002.19 | 752.49 | 1002.19 | 761.67 | 1002.2 | 762.5 | 1002.2 |
| 771.22 | 1002.22 | 772.51 | 1002.23 | 780.78 | 1002.23 | 782.52 | 1002.24 | 790.33 | 1002.26 |
| 792.53 | 1002.28 | 799.89 | 1002.35 | 802.54 | 1002.38 | 809.44 | 1002.42 | 812.56 | 1002.43 |
| 818.99 | 1002.46 | 822.57 | 1002.46 | 828.55 | 1002.49 | 832.58 | 1002.51 | 838.11 | 1002.54 |
| 842.59 | 1002.56 | 847.67 | 1002.59 | 852.6 | 1002.61 | 857.22 | 1002.63 | 862.61 | 1002.65 |
| 866.77 | 1002.69 | 872.62 | 1002.72 | 876.33 | 1002.78 | 882.64 | 1002.84 | 885.88 | 1002.9 |
| 892.65 | 1003.03 | 895.44 | 1003.09 | 902.66 | 1003.24 | 904.99 | 1003.29 | 912.67 | 1003.46 |
| 921.12 | 1003.71 | 922.68 | 1003.74 | 924.1 | 1003.77 | 932.69 | 1003.95 | 932.77 | 1003.95 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 2.8 | .035 | 631.49 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 426.28 | 524.22 | 198.04 | 198.4 | 198.8 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.39 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 1000.11 | Reach Len. (ft) | 198.04 | 198.40 | 198.80 |
| Crit W.S. (ft) | 1000.11 | Flow Area (sq ft) | 108.84 | 116.57 | |
| E.G. Slope (ft/ft) | 0.005165 | Area (sq ft) | 108.84 | 116.57 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 160.12 | 552.88 | |
| Top Width (ft) | 384.78 | Top Width (ft) | 325.05 | 59.73 | |
| Vel Total (ft/s) | 3.16 | Avg. Vel. (ft/s) | 1.47 | 4.74 | |
| Max Chl Dpth (ft) | 3.03 | Hydr. Depth (ft) | 0.33 | 1.95 | |
| Conv. Total (cfs) | 9920.6 | Conv. (cfs) | 2227.9 | 7692.7 | |
| Length Wtd. (ft) | 198.34 | Wetted Per. (ft) | 325.06 | 60.15 | |
| Min Ch El (ft) | 997.08 | Shear (lb/sq ft) | 0.11 | 0.62 | |
| Alpha | 1.79 | Stream Power (lb/ft s) | 0.16 | 2.96 | |
| Frctn Loss (ft) | 1.08 | Cum Volume (acre-ft) | 4.93 | 13.75 | 0.91 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.93 | 10.17 | 1.93 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.78 | Element | | | |
| Vel Head (ft) | 0.48 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1000.30 | Reach Len. (ft) | 198.04 | 198.40 | 198.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 128.66 | |
| E.G. Slope (ft/ft) | 0.006679 | Area (sq ft) | | 128.66 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 63.30 | Top Width (ft) | | 63.30 | |
| Vel Total (ft/s) | 5.54 | Avg. Vel. (ft/s) | | 5.54 | |

| | | | |
|---|---|---|---|
| Max Chl Dpth (ft) | 3.22 | Hydr. Depth (ft) | 2.03 |
| Conv. Total (cfs) | 8724.1 | Conv. (cfs) | 8724.1 |
| Length Wtd. (ft) | 198.40 | Wetted Per. (ft) | 63.74 |
| Min Ch El (ft) | 997.08 | Shear (lb/sq ft) | 0.84 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 4.66 |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 16.29 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 10.48 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.78 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.48 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 1000.30 | Reach Len. (ft) | 198.04 | 198.40 | 198.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 128.66 | |
| E.G. Slope (ft/ft) | 0.006679 | Area (sq ft) | | 128.66 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 63.30 | Top Width (ft) | | 63.30 | |
| Vel Total (ft/s) | 5.54 | Avg. Vel. (ft/s) | | 5.54 | |
| Max Chl Dpth (ft) | 3.22 | Hydr. Depth (ft) | | 2.03 | |
| Conv. Total (cfs) | 8724.1 | Conv. (cfs) | | 8724.1 | |
| Length Wtd. (ft) | 198.40 | Wetted Per. (ft) | | 63.74 | |
| Min Ch El (ft) | 997.08 | Shear (lb/sq ft) | | 0.84 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.66 | |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | | 16.29 | |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | | 10.48 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.683

INPUT
Description: Thalweg Sta. 530.84
Station Elevation Data num= 209

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 999.73 | .07 | 999.73 | 4.53 | 999.61 | 10.32 | 999.36 | 12.9 | 999.25 |
| 20.57 | 998.97 | 21.27 | 998.95 | 24.4 | 998.91 | 29.64 | 998.85 | 30.81 | 998.85 |
| 38.01 | 998.81 | 41.06 | 998.8 | 46.38 | 998.76 | 51.31 | 998.71 | 54.75 | 998.66 |
| 61.56 | 998.54 | 63.13 | 998.51 | 70.16 | 998.35 | 71.5 | 998.32 | 71.81 | 998.31 |
| 79.87 | 998.2 | 82.05 | 998.2 | 88.24 | 998.23 | 92.3 | 998.24 | 96.62 | 998.29 |
| 102.55 | 998.32 | 104.99 | 998.35 | 112.8 | 998.55 | 113.36 | 998.56 | 115.9 | 998.65 |
| 121.73 | 998.85 | 123.04 | 998.9 | 130.11 | 999.11 | 133.29 | 999.23 | 138.48 | 999.33 |
| 143.54 | 999.46 | 146.85 | 999.57 | 153.79 | 999.65 | 155.22 | 999.66 | 161.66 | 999.61 |
| 163.6 | 999.6 | 164.04 | 999.59 | 171.97 | 999.47 | 174.28 | 999.43 | 180.34 | 999.33 |
| 184.53 | 999.27 | 188.71 | 999.21 | 194.78 | 999.16 | 197.09 | 999.15 | 205.03 | 999.16 |
| 205.46 | 999.16 | 207.4 | 999.17 | 213.83 | 999.2 | 215.28 | 999.21 | 222.2 | 999.26 |
| 225.52 | 999.28 | 230.58 | 999.31 | 235.77 | 999.34 | 238.95 | 999.36 | 246.02 | 999.39 |
| 247.32 | 999.39 | 253.16 | 999.39 | 255.69 | 999.39 | 256.27 | 999.38 | 257.17 | 999.37 |
| 258.13 | 999.36 | 266.32 | 999.27 | 267.95 | 999.24 | 276.34 | 999.07 | 283.87 | 998.95 |
| 286.35 | 998.93 | 293.36 | 998.96 | 296.37 | 998.98 | 302.87 | 999.06 | 306.38 | 999.1 |
| 312.36 | 999.15 | 316.4 | 999.2 | 321.87 | 999.24 | 326.41 | 999.3 | 331.36 | 999.35 |
| 336.43 | 999.42 | 340.86 | 999.48 | 346.44 | 999.54 | 350.36 | 999.57 | 356.46 | 999.61 |
| 359.86 | 999.62 | 366.47 | 999.61 | 369.36 | 999.6 | 376.49 | 999.57 | 378.86 | 999.56 |
| 386.5 | 999.51 | 388.36 | 999.51 | 396.52 | 999.47 | 397.86 | 999.46 | 406.53 | 999.47 |
| 416.19 | 999.35 | 416.55 | 999.34 | 422.59 | 999.21 | 426.36 | 999.12 | 426.56 | 999.12 |
| 435.85 | 999.26 | 436.57 | 999.26 | 445.36 | 999.67 | 446.59 | 999.71 | 454.85 | 999.97 |
| 456.6 | 1000.04 | 464.36 | 999.91 | 466.62 | 999.9 | 469.25 | 999.68 | 473.85 | 999.3 |
| 476.63 | 999.07 | 483.35 | 998.27 | 486.65 | 997.86 | 492.85 | 997.13 | 496.66 | 996.69 |
| 502.35 | 996.4 | 506.68 | 996.21 | 511.85 | 996.21 | 516.69 | 996.22 | 521.35 | 996.36 |
| 526.71 | 996.52 | 530.84 | 996.85 | 536.72 | 997.31 | 540.35 | 997.77 | 546.74 | 998.56 |
| 549.84 | 999 | 556.75 | 999.94 | 559.34 | 1000.21 | 566.77 | 1001.04 | 568.84 | 1001.16 |
| 574.88 | 1001.64 | 576.78 | 1001.79 | 578.34 | 1001.81 | 586.8 | 1001.76 | 587.84 | 1001.73 |
| 596.81 | 1001.32 | 597.34 | 1001.3 | 606.82 | 1000.95 | 606.84 | 1000.95 | 607.12 | 1000.95 |
| 616.34 | 1000.91 | 616.84 | 1000.9 | 625.84 | 1000.96 | 626.85 | 1000.97 | 635.34 | 1001.02 |
| 636.87 | 1001.03 | 644.84 | 1001.07 | 646.88 | 1001.08 | 654.33 | 1001.12 | 656.9 | 1001.13 |
| 663.84 | 1001.13 | 666.91 | 1001.13 | 673.33 | 1001.09 | 676.93 | 1001.1 | 682.84 | 1000.94 |
| 686.94 | 1000.89 | 692.33 | 1000.67 | 696.96 | 1000.38 | 699.21 | 1000.41 | 701.83 | 1000.45 |
| 706.97 | 1000.49 | 711.33 | 1000.67 | 716.99 | 1000.99 | 720.83 | 1001.23 | 727 | 1001.61 |
| 730.33 | 1001.7 | 737.02 | 1001.88 | 739.83 | 1001.88 | 747.03 | 1001.9 | 749.32 | 1001.93 |
| 757.05 | 1001.86 | 758.83 | 1001.86 | 767.06 | 1001.72 | 768.32 | 1001.7 | 777.08 | 1001.58 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 777.83 | 1001.57 | 787.09 | 1001.54 | 787.32 | 1001.53 | 791.65 | 1001.54 | 796.82 | 1001.54 |
| 797.1 | 1001.55 | 806.32 | 1001.62 | 807.12 | 1001.64 | 815.82 | 1001.91 | 817.13 | 1001.93 |
| 825.32 | 1002.12 | 827.15 | 1002.14 | 834.82 | 1002.22 | 837.16 | 1002.24 | 844.32 | 1002.3 |
| 847.18 | 1002.32 | 853.82 | 1002.33 | 857.19 | 1002.36 | 863.32 | 1002.39 | 867.21 | 1002.41 |
| 872.82 | 1002.44 | 877.22 | 1002.46 | 882.32 | 1002.49 | 887.24 | 1002.51 | 891.81 | 1002.53 |
| 897.25 | 1002.56 | 901.32 | 1002.54 | 907.27 | 1002.52 | 910.81 | 1002.46 | 917.28 | 1002.37 |
| 920.32 | 1002.31 | 927.3 | 1002.17 | 929.81 | 1002.12 | 934.77 | 1002.04 | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 699.21 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 456.6 | 574.88 | 199.95 | 200 | 200.19 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.29 | Element | | | |
| Vel Head (ft) | 0.32 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 998.97 | Reach Len. (ft) | 199.95 | 200.00 | 200.19 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 43.67 | 132.24 | |
| E.G. Slope (ft/ft) | 0.005732 | Area (sq ft) | 43.67 | 132.24 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 77.78 | 635.22 | |
| Top Width (ft) | 188.15 | Top Width (ft) | 116.05 | 72.10 | |
| Vel Total (ft/s) | 4.05 | Avg. Vel. (ft/s) | 1.78 | 4.80 | |
| Max Chl Dpth (ft) | 2.76 | Hydr. Depth (ft) | 0.38 | 1.83 | |
| Conv. Total (cfs) | 9417.4 | Conv. (cfs) | 1027.4 | 8390.0 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | 116.07 | 72.39 | |
| Min Ch El (ft) | 996.21 | Shear (lb/sq ft) | 0.13 | 0.65 | |
| Alpha | 1.27 | Stream Power (lb/ft s) | 0.24 | 3.14 | |
| Frctn Loss (ft) | 0.94 | Cum Volume (acre-ft) | 4.59 | 13.18 | 0.91 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 6.93 | 9.87 | 1.93 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.85 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 999.61 | Reach Len. (ft) | 199.95 | 200.00 | 200.19 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 182.68 | |
| E.G. Slope (ft/ft) | 0.003030 | Area (sq ft) | | 182.68 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 84.28 | Top Width (ft) | | 84.28 | |
| Vel Total (ft/s) | 3.90 | Avg. Vel. (ft/s) | | 3.90 | |
| Max Chl Dpth (ft) | 3.40 | Hydr. Depth (ft) | | 2.17 | |
| Conv. Total (cfs) | 12952.2 | Conv. (cfs) | | 12952.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 84.64 | |
| Min Ch El (ft) | 996.21 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.59 | |
| Frctn Loss (ft) | 0.70 | Cum Volume (acre-ft) | | 15.58 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 10.15 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.85 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 999.61 | Reach Len. (ft) | 199.95 | 200.00 | 200.19 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 182.68 | |
| E.G. Slope (ft/ft) | 0.003030 | Area (sq ft) | | 182.68 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 84.28 | Top Width (ft) | | 84.28 | |
| Vel Total (ft/s) | 3.90 | Avg. Vel. (ft/s) | | 3.90 | |
| Max Chl Dpth (ft) | 3.40 | Hydr. Depth (ft) | | 2.17 | |
| Conv. Total (cfs) | 12952.2 | Conv. (cfs) | | 12952.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 84.64 | |
| Min Ch El (ft) | 996.21 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.59 | |
| Frctn Loss (ft) | 0.70 | Cum Volume (acre-ft) | | 15.58 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 10.15 | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.646

INPUT
Description: Thalweg Sta. 658.11
Station Elevation Data num= 246

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1000 | 60 | 997.78 | 60.44 | 997.78 | 63.49 | 997.81 | 68.3 | 997.87 |
| 74.08 | 998 | 76.15 | 998.01 | 82.13 | 998.02 | 84.01 | 998.02 | 84.67 | 998.02 |
| 91.87 | 998 | 95.25 | 997.97 | 99.72 | 997.94 | 105.84 | 997.84 | 107.58 | 997.79 |
| 112.58 | 997.66 | 115.43 | 997.58 | 116.43 | 997.58 | 123.3 | 997.58 | 127.01 | 997.7 |
| 131.15 | 997.83 | 137.6 | 997.93 | 139.01 | 997.95 | 143.04 | 997.98 | 146.87 | 998.01 |
| 148.19 | 998.01 | 154.72 | 998.05 | 158.78 | 998.02 | 162.57 | 997.97 | 169.36 | 997.69 |
| 170.43 | 997.64 | 173.5 | 997.46 | 178.29 | 997.16 | 179.95 | 997.07 | 186.14 | 996.78 |
| 190.53 | 996.75 | 194 | 996.73 | 201.12 | 996.93 | 201.85 | 996.97 | 203.97 | 997.01 |
| 209.71 | 997.2 | 211.71 | 997.21 | 217.56 | 997.37 | 222.3 | 997.38 | 232.06 | 997.52 |
| 232.88 | 997.53 | 234.43 | 997.55 | 241.14 | 997.63 | 243.47 | 997.65 | 249 | 997.69 |
| 254.06 | 997.71 | 256.85 | 997.71 | 264.64 | 997.7 | 264.7 | 997.7 | 264.88 | 997.7 |
| 272.56 | 997.71 | 275.23 | 997.74 | 280.42 | 997.83 | 285.82 | 997.95 | 288.27 | 998.02 |
| 295.34 | 998.2 | 296.13 | 998.23 | 296.4 | 998.23 | 303.98 | 998.43 | 306.99 | 998.46 |
| 311.84 | 998.51 | 317.58 | 998.5 | 319.69 | 998.49 | 325.8 | 998.45 | 327.55 | 998.45 |
| 328.16 | 998.45 | 335.42 | 998.44 | 338.75 | 998.45 | 343.27 | 998.47 | 349.34 | 998.51 |
| 351.13 | 998.51 | 356.26 | 998.53 | 358.98 | 998.54 | 359.93 | 998.54 | 361.87 | 998.54 |
| 370.51 | 998.52 | 378.1 | 998.48 | 381.1 | 998.46 | 382.55 | 998.45 | 386.72 | 998.39 |
| 390.4 | 998.34 | 391.68 | 998.3 | 398.26 | 998.15 | 402.27 | 998.11 | 406.11 | 998.01 |
| 410.57 | 997.95 | 412.73 | 997.93 | 414.68 | 997.87 | 422.75 | 997.61 | 424.16 | 997.57 |
| 432.77 | 997.27 | 433.64 | 997.27 | 442.78 | 997 | 443.12 | 997.02 | 449.18 | 997.6 |
| 452.61 | 997.92 | 452.8 | 997.95 | 462.08 | 998.62 | 462.81 | 998.64 | 471.57 | 998.67 |
| 472.83 | 998.65 | 481.05 | 998.56 | 482.84 | 998.54 | 490.54 | 998.47 | 492.86 | 998.48 |
| 500.01 | 998.43 | 502.88 | 998.45 | 509.5 | 998.39 | 512.89 | 998.34 | 518.98 | 998.31 |
| 522.91 | 998.21 | 528.47 | 998.15 | 532.92 | 997.99 | 537.94 | 997.82 | 542.94 | 997.64 |
| 547.43 | 997.46 | 552.96 | 997.38 | 556.91 | 997.34 | 562.97 | 997.38 | 566.39 | 997.45 |
| 572.99 | 997.73 | 575.87 | 997.86 | 583 | 998.23 | 585.36 | 998.33 | 593.02 | 998.43 |
| 594.84 | 998.44 | 603.03 | 998.44 | 604.32 | 998.44 | 613.05 | 998.6 | 613.8 | 998.61 |
| 623.07 | 998.81 | 623.29 | 998.82 | 627.15 | 998.88 | 632.76 | 998.96 | 633.08 | 998.96 |
| 642.25 | 999.02 | 643.1 | 999.04 | 651.73 | 999.03 | 653.11 | 999.03 | 661.22 | 999.01 |
| 663.13 | 999 | 668.63 | 998.88 | 670.69 | 998.84 | 673.15 | 998.73 | 680.18 | 998.2 |
| 683.16 | 997.96 | 689.66 | 997.52 | 693.18 | 997.32 | 699.15 | 996.55 | 703.19 | 996.1 |
| 708.62 | 995.59 | 713.21 | 995.13 | 718.11 | 995.28 | 723.22 | 995.33 | 727.59 | 995.78 |
| 733.24 | 996.26 | 737.07 | 996.7 | 743.26 | 997.38 | 746.55 | 997.75 | 753.27 | 998.52 |
| 756.04 | 998.76 | 763.29 | 999.56 | 765.52 | 999.62 | 773.3 | 999.94 | 775 | 999.92 |
| 776.85 | 999.92 | 783.32 | 999.9 | 784.48 | 999.89 | 793.34 | 999.86 | 793.97 | 999.86 |
| 803.35 | 999.84 | 803.44 | 999.84 | 805.12 | 999.82 | 812.93 | 999.75 | 813.37 | 999.74 |
| 822.41 | 999.65 | 823.38 | 999.64 | 831.9 | 999.58 | 833.4 | 999.56 | 841.37 | 999.44 |
| 843.41 | 999.43 | 850.86 | 998.98 | 853.43 | 998.88 | 860.34 | 999.31 | 863.45 | 999.45 |
| 869.83 | 999.73 | 873.46 | 999.83 | 878.65 | 999.9 | 879.3 | 999.91 | 883.48 | 999.94 |
| 888.79 | 999.98 | 893.49 | 1000.02 | 898.27 | 1000.08 | 903.51 | 1000.16 | 907.75 | 1000.24 |
| 913.53 | 1000.38 | 917.23 | 1000.49 | 923.54 | 1000.71 | 926.72 | 1000.81 | 933.56 | 1001.05 |
| 936.2 | 1001.14 | 943.57 | 1001.41 | 945.68 | 1001.5 | 953.59 | 1001.82 | 955.16 | 1001.88 |
| 963.61 | 1002.14 | 964.65 | 1002.17 | 973.62 | 1002.38 | 974.12 | 1002.4 | 983.11 | 1002.63 |
| 983.64 | 1002.64 | 983.67 | 1002.64 | 993.65 | 1002.89 | 994.28 | 1002.9 | 1003.67 | 1003.12 |
| 1004.89 | 1003.13 | 1013.69 | 1003.25 | 1015.51 | 1003.25 | 1023.7 | 1003.25 | 1026.13 | 1003.24 |
| 1033.72 | 1003.18 | 1036.73 | 1003.16 | 1043.73 | 1003.11 | 1047.35 | 1003.07 | 1053.75 | 1003.02 |
| 1059.47 | 1002.96 | 1063.76 | 1002.91 | 1068.95 | 1002.84 | 1073.78 | 1002.78 | 1078.43 | 1002.73 |
| 1083.8 | 1002.65 | 1087.91 | 1002.61 | 1093.81 | 1002.54 | 1097.4 | 1002.5 | 1103.83 | 1002.43 |
| 1111.03 | 1002.32 | 1113.84 | 1002.28 | 1116.36 | 1002.25 | 1123.86 | 1002.12 | 1125.84 | 1002.09 |
| 1131.53 | 1001.97 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 60 | .035 | 878.65 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 668.63 | 776.85 | 368.32 | 406.03 | 427.87 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 998.29 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 998.15 | Reach Len. (ft) | 368.32 | 406.03 | 427.87 |
| Crit W.S. (ft) | 997.89 | Flow Area (sq ft) | 174.36 | 113.58 | |
| E.G. Slope (ft/ft) | 0.003953 | Area (sq ft) | 174.36 | 113.58 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 292.47 | 420.53 | |
| Top Width (ft) | 422.70 | Top Width (ft) | 353.48 | 69.22 | |
| Vel Total (ft/s) | 2.48 | Avg. Vel. (ft/s) | 1.68 | 3.70 | |
| Max Chl Dpth (ft) | 3.02 | Hydr. Depth (ft) | 0.49 | 1.64 | |
| Conv. Total (cfs) | 11340.8 | Conv. (cfs) | 4651.9 | 6688.9 | |
| Length Wtd. (ft) | 392.32 | Wetted Per. (ft) | 353.65 | 69.52 | |
| Min Ch El (ft) | 995.13 | Shear (lb/sq ft) | 0.12 | 0.40 | |
| Alpha | 1.51 | Stream Power (lb/ft s) | 0.20 | 1.49 | |
| Frctn Loss (ft) | 1.62 | Cum Volume (acre-ft) | 4.09 | 12.61 | 0.91 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.85 | 9.54 | 1.93 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.14 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 998.86 | Reach Len. (ft) | 368.32 | 406.03 | 427.87 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 168.80 | |
| E.G. Slope (ft/ft) | 0.004142 | Area (sq ft) | | 168.80 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 87.46 | Top Width (ft) | | 87.46 | |
| Vel Total (ft/s) | 4.22 | Avg. Vel. (ft/s) | | 4.22 | |
| Max Chl Dpth (ft) | 3.73 | Hydr. Depth (ft) | | 1.93 | |
| Conv. Total (cfs) | 11078.4 | Conv. (cfs) | | 11078.4 | |
| Length Wtd. (ft) | 406.03 | Wetted Per. (ft) | | 87.83 | |
| Min Ch El (ft) | 995.13 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.10 | |
| Frctn Loss (ft) | 1.92 | Cum Volume (acre-ft) | | 14.77 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 9.75 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.14 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 998.86 | Reach Len. (ft) | 368.32 | 406.03 | 427.87 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 168.80 | |
| E.G. Slope (ft/ft) | 0.004142 | Area (sq ft) | | 168.80 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 87.46 | Top Width (ft) | | 87.46 | |
| Vel Total (ft/s) | 4.22 | Avg. Vel. (ft/s) | | 4.22 | |
| Max Chl Dpth (ft) | 3.73 | Hydr. Depth (ft) | | 1.93 | |
| Conv. Total (cfs) | 11078.4 | Conv. (cfs) | | 11078.4 | |
| Length Wtd. (ft) | 406.03 | Wetted Per. (ft) | | 87.83 | |
| Min Ch El (ft) | 995.13 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.10 | |
| Frctn Loss (ft) | 1.92 | Cum Volume (acre-ft) | | 14.77 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 9.75 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.569

INPUT
Description: Thalweg Sta. 699.99
Station Elevation Data num= 266

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 997.31 | 6.15 | 996.94 | 6.97 | 996.88 | 7.4 | 996.87 | 14.41 | 996.78 |
| 18.63 | 996.71 | 21.84 | 996.63 | 28.14 | 996.79 | 29.27 | 996.82 | 29.85 | 996.86 |
| 36.7 | 997.19 | 41.08 | 997.25 | 44.15 | 997.28 | 50.13 | 997.22 | 51.58 | 997.21 |
| 52.31 | 997.2 | 59.01 | 997.01 | 63.54 | 996.82 | 66.44 | 996.69 | 72.12 | 996.55 |
| 73.88 | 996.5 | 74.76 | 996.52 | 81.31 | 996.73 | 85.99 | 996.83 | 88.74 | 996.83 |
| 94.12 | 996.58 | 96.18 | 996.48 | 97.22 | 996.4 | 103.61 | 995.99 | 108.45 | 995.75 |
| 111.04 | 995.62 | 116.11 | 995.71 | 118.48 | 995.74 | 119.67 | 995.82 | 125.91 | 996.13 |
| 130.9 | 996.36 | 133.34 | 996.44 | 138.1 | 996.57 | 140.77 | 996.62 | 142.13 | 996.64 |
| 148.21 | 996.77 | 153.36 | 996.86 | 155.64 | 996.93 | 160.09 | 997.04 | 163.07 | 997.11 |
| 164.59 | 997.12 | 170.5 | 997.15 | 175.81 | 997.14 | 177.93 | 997.14 | 182.09 | 997.16 |
| 185.37 | 997.17 | 187.04 | 997.2 | 192.8 | 997.3 | 198.27 | 997.45 | 200.23 | 997.49 |
| 204.08 | 997.61 | 207.67 | 997.74 | 209.5 | 997.78 | 215.1 | 997.92 | 220.73 | 997.97 |
| 222.53 | 998 | 226.07 | 998 | 229.97 | 997.99 | 231.96 | 997.98 | 237.4 | 997.95 |
| 243.18 | 997.91 | 244.83 | 997.9 | 248.06 | 997.87 | 252.26 | 997.84 | 254.41 | 997.82 |
| 259.7 | 997.77 | 265.64 | 997.7 | 267.13 | 997.7 | 270.06 | 997.69 | 274.56 | 997.68 |
| 276.87 | 997.7 | 282 | 997.75 | 288.09 | 997.84 | 289.43 | 997.84 | 292.05 | 997.84 |
| 296.86 | 997.83 | 299.32 | 997.8 | 304.3 | 997.75 | 310.55 | 997.65 | 311.73 | 997.65 |
| 314.04 | 997.65 | 319.16 | 997.67 | 321.78 | 997.63 | 326.59 | 997.64 | 333 | 997.44 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 334.03 | 997.39 | 336.03 | 997.32 | 341.46 | 997.14 | 344.23 | 997.13 | 348.89 | 997.12 |
| 355.46 | 997.22 | 356.33 | 997.23 | 358.03 | 997.22 | 363.76 | 997.19 | 366.69 | 997.13 |
| 371.19 | 997.08 | 377.91 | 997.04 | 378.62 | 997.03 | 380.02 | 997.02 | 386.06 | 996.96 |
| 389.14 | 996.95 | 393.49 | 996.85 | 400.37 | 996.65 | 400.93 | 996.62 | 402.02 | 996.55 |
| 408.37 | 996.19 | 411.6 | 995.99 | 415.8 | 995.91 | 422.83 | 995.83 | 423.23 | 995.84 |
| 424.01 | 995.86 | 434.05 | 996.13 | 444.53 | 995.86 | 445.28 | 995.84 | 446 | 995.81 |
| 452.96 | 995.55 | 456.51 | 995.55 | 460.4 | 995.61 | 467.74 | 995.56 | 467.83 | 995.56 |
| 467.99 | 995.55 | 475.26 | 995.42 | 478.97 | 995.35 | 482.7 | 995.36 | 489.99 | 995.43 |
| 490.13 | 995.43 | 490.2 | 995.44 | 497.56 | 995.62 | 501.42 | 995.78 | 504.99 | 995.95 |
| 511.98 | 996.28 | 512.43 | 996.3 | 512.65 | 996.31 | 516.75 | 996.5 | 519.76 | 996.63 |
| 526.16 | 996.82 | 528.17 | 996.84 | 534.18 | 996.88 | 538.2 | 996.86 | 541.4 | 996.83 |
| 546.16 | 996.74 | 548.6 | 996.7 | 550.23 | 996.66 | 555.81 | 996.55 | 562.26 | 996.34 |
| 563.02 | 996.32 | 564.16 | 996.27 | 570.23 | 996 | 574.29 | 995.82 | 577.44 | 995.7 |
| 582.14 | 995.84 | 584.64 | 995.89 | 586.32 | 996.02 | 591.85 | 996.45 | 598.35 | 996.9 |
| 599.07 | 996.95 | 600.13 | 997 | 606.28 | 997.28 | 610.38 | 997.34 | 613.48 | 997.36 |
| 618.11 | 997.22 | 620.69 | 997.15 | 622.41 | 997.08 | 623.52 | 997.04 | 627.9 | 996.88 |
| 634.44 | 996.75 | 635.11 | 996.74 | 636.11 | 996.73 | 642.32 | 996.78 | 646.47 | 996.76 |
| 649.52 | 996.75 | 654.09 | 996.62 | 656.73 | 996.54 | 658.5 | 996.45 | 663.95 | 996.18 |
| 670.53 | 995.75 | 671.15 | 995.7 | 672.08 | 995.62 | 678.36 | 995.11 | 682.56 | 994.55 |
| 685.57 | 994.21 | 690.07 | 994.02 | 692.78 | 993.93 | 694.59 | 993.9 | 699.99 | 993.84 |
| 706.62 | 993.77 | 707.2 | 993.77 | 708.05 | 993.8 | 714.13 | 993.92 | 714.4 | 993.93 |
| 718.65 | 994.28 | 721.62 | 994.83 | 726.05 | 995.85 | 728.83 | 996.48 | 730.68 | 996.9 |
| 736.03 | 998.14 | 742.71 | 999.66 | 743.24 | 999.72 | 744.03 | 999.74 | 750.46 | 999.77 |
| 754.74 | 999.97 | 760.89 | 1000.09 | 762.02 | 1000.11 | 766.77 | 1000.23 | 772.08 | 1000.32 |
| 778.8 | 1000.42 | 779.28 | 1000.42 | 780.01 | 1000.43 | 786.5 | 1000.51 | 790.83 | 1000.53 |
| 793.7 | 1000.58 | 798 | 1000.6 | 800.91 | 1000.63 | 802.87 | 1000.63 | 808.12 | 1000.7 |
| 814.89 | 1000.72 | 815.34 | 1000.72 | 815.99 | 1000.72 | 822.54 | 1000.76 | 826.92 | 1000.74 |
| 829.75 | 1000.74 | 833.97 | 1000.72 | 836.96 | 1000.7 | 838.95 | 1000.69 | 844.17 | 1000.66 |
| 850.99 | 1000.61 | 851.38 | 1000.61 | 851.96 | 1000.6 | 858.58 | 1000.55 | 863.02 | 1000.49 |
| 865.79 | 1000.46 | 869.95 | 1000.39 | 873.01 | 1000.34 | 875.04 | 1000.3 | 880.22 | 1000.21 |
| 887.07 | 1000.08 | 887.42 | 1000.07 | 887.94 | 1000.06 | 894.63 | 999.92 | 899.11 | 999.83 |
| 901.84 | 999.77 | 905.93 | 999.69 | 909.05 | 999.62 | 911.14 | 999.58 | 916.26 | 999.48 |
| 923.17 | 999.34 | 923.91 | 999.33 | 930.67 | 999.17 | 935.19 | 999.05 | 937.89 | 998.99 |
| 941.91 | 998.9 | 945.09 | 998.81 | 947.23 | 998.76 | 952.3 | 998.64 | 959.26 | 998.5 |
| 959.51 | 998.5 | 959.89 | 998.49 | 966.73 | 998.34 | 971.29 | 998.22 | 973.93 | 998.16 |
| 974.25 | 998.15 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 760.89 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 646.47 | 728.83 | 314.06 | 331.92 | 320.31 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 996.67 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 996.49 | Reach Len. (ft) | 314.06 | 331.92 | 320.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 111.84 | 122.32 | |
| E.G. Slope (ft/ft) | 0.004291 | Area (sq ft) | 111.84 | 122.32 | 0.00 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 225.93 | 487.07 | |
| Top Width (ft) | 257.91 | Top Width (ft) | 186.85 | 71.04 | 0.03 |
| Vel Total (ft/s) | 3.04 | Avg. Vel. (ft/s) | 2.02 | 3.98 | |
| Max Chl Dpth (ft) | 2.72 | Hydr. Depth (ft) | 0.60 | 1.72 | |
| Conv. Total (cfs) | 10884.1 | Conv. (cfs) | 3448.8 | 7435.3 | |
| Length Wtd. (ft) | 329.09 | Wetted Per. (ft) | 186.99 | 71.40 | |
| Min Ch El (ft) | 993.77 | Shear (lb/sq ft) | 0.16 | 0.46 | |
| Alpha | 1.31 | Stream Power (lb/ft s) | 0.32 | 1.83 | |
| Frctn Loss (ft) | 2.26 | Cum Volume (acre-ft) | 2.88 | 11.51 | 0.91 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.56 | 8.89 | 1.93 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.21 | Element | | | |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 996.87 | Reach Len. (ft) | 314.06 | 331.92 | 320.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 152.11 | |
| E.G. Slope (ft/ft) | 0.005456 | Area (sq ft) | | 152.11 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 82.36 | Top Width (ft) | | 82.36 | |
| Vel Total (ft/s) | 4.69 | Avg. Vel. (ft/s) | | 4.69 | |

| | | | |
|---|---|---|---|
| Max Chl Dpth (ft) | 3.10 | Hydr. Depth (ft) | 1.85 |
| Conv. Total (cfs) | 9652.8 | Conv. (cfs) | 9652.8 |
| Length Wtd. (ft) | 331.92 | Wetted Per. (ft) | 83.23 |
| Min Ch El (ft) | 993.77 | Shear (lb/sq ft) | 0.62 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 2.92 |
| Frctn Loss (ft) | 2.82 | Cum Volume (acre-ft) | 13.28 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 8.96 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.21 | Element | | | |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 996.87 | Reach Len. (ft) | 314.06 | 331.92 | 320.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 152.11 | |
| E.G. Slope (ft/ft) | 0.005456 | Area (sq ft) | | 152.11 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 82.36 | Top Width (ft) | | 82.36 | |
| Vel Total (ft/s) | 4.69 | Avg. Vel. (ft/s) | | 4.69 | |
| Max Chl Dpth (ft) | 3.10 | Hydr. Depth (ft) | | 1.85 | |
| Conv. Total (cfs) | 9652.8 | Conv. (cfs) | | 9652.8 | |
| Length Wtd. (ft) | 331.92 | Wetted Per. (ft) | | 83.23 | |
| Min Ch El (ft) | 993.77 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.92 | |
| Frctn Loss (ft) | 2.82 | Cum Volume (acre-ft) | | 13.28 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 8.96 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.506

INPUT
Description: Thalweg Sta. 492.37
Station Elevation Data num= 281

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 998.87 | .92 | 998.83 | 2.63 | 998.78 | 5.04 | 998.67 | 9.8 | 998.5 |
| 13.19 | 998.35 | 16.97 | 998.18 | 22.29 | 997.84 | 24.15 | 997.72 | 25.46 | 997.61 |
| 31.32 | 997.09 | 37.74 | 996.46 | 38.49 | 996.39 | 39.54 | 996.3 | 45.66 | 995.76 |
| 50.02 | 995.48 | 52.83 | 995.32 | 55.11 | 995.26 | 56.79 | 995.21 | 60 | 995.12 |
| 62.29 | 995.08 | 67.18 | 995.04 | 74.03 | 995.07 | 74.34 | 995.07 | 74.56 | 995.07 |
| 81.51 | 995.2 | 86.84 | 995.25 | 91.28 | 995.24 | 95.86 | 995.21 | 99.11 | 995.13 |
| 103.02 | 995.03 | 108.52 | 994.74 | 110.19 | 994.66 | 111.38 | 994.61 | 117.36 | 994.34 |
| 123.66 | 994.15 | 124.53 | 994.13 | 125.77 | 994.1 | 131.71 | 994.11 | 135.93 | 994.04 |
| 138.88 | 994.11 | 143.01 | 994.26 | 146.05 | 994.32 | 148.2 | 994.46 | 153.22 | 994.84 |
| 160.26 | 995.23 | 160.39 | 995.24 | 160.48 | 995.25 | 167.56 | 995.42 | 172.76 | 995.52 |
| 174.73 | 995.56 | 177.5 | 995.61 | 181.9 | 995.7 | 185.03 | 995.76 | 189.07 | 995.83 |
| 194.75 | 995.92 | 196.25 | 995.94 | 197.3 | 995.96 | 203.41 | 996.06 | 209.58 | 996.15 |
| 210.58 | 996.16 | 211.99 | 996.18 | 217.75 | 996.25 | 221.85 | 996.29 | 224.92 | 996.31 |
| 229.24 | 996.3 | 232.1 | 996.3 | 234.12 | 996.29 | 239.26 | 996.23 | 246.4 | 996.1 |
| 246.44 | 996.1 | 246.49 | 996.1 | 253.61 | 995.99 | 258.67 | 995.93 | 260.78 | 995.9 |
| 263.74 | 995.88 | 267.95 | 995.84 | 270.94 | 995.84 | 275.12 | 995.85 | 280.98 | 995.88 |
| 282.29 | 995.88 | 283.22 | 995.89 | 289.46 | 995.93 | 295.5 | 995.97 | 296.64 | 995.98 |
| 298.23 | 995.99 | 303.81 | 996.01 | 307.77 | 996.06 | 310.97 | 996.1 | 315.47 | 996.19 |
| 320.04 | 996.28 | 325.31 | 996.25 | 332.32 | 995.81 | 332.49 | 995.8 | 332.72 | 995.79 |
| 339.65 | 995.39 | 344.59 | 995.2 | 346.82 | 995.21 | 349.97 | 995.26 | 353.99 | 995.32 |
| 356.86 | 995.36 | 361.17 | 995.33 | 366.41 | 995.23 | 366.94 | 995.22 | 368.39 | 995.2 |
| 371.03 | 995.15 | 375.75 | 995.07 | 378.34 | 995.03 | 387.2 | 994.91 | 389.74 | 994.87 |
| 390.5 | 994.86 | 391.85 | 994.84 | 397.86 | 994.83 | 401.15 | 994.82 | 405.23 | 994.79 |
| 412.55 | 994.71 | 412.6 | 994.7 | 412.66 | 994.7 | 419.96 | 994.45 | 423.82 | 994.31 |
| 423.95 | 994.31 | 427.33 | 994.17 | 433.47 | 993.87 | 434.69 | 993.81 | 435.35 | 993.78 |
| 442.06 | 993.58 | 446.76 | 993.44 | 449.42 | 993.39 | 454.29 | 993.2 | 456.79 | 993.11 |
| 458.16 | 993.04 | 464.16 | 992.74 | 469.56 | 992.59 | 471.52 | 992.56 | 475.1 | 992.64 |
| 478.89 | 992.69 | 480.96 | 992.77 | 486.25 | 992.94 | 492.37 | 993.11 | 493.62 | 993.14 |
| 495.91 | 993.16 | 500.99 | 993.21 | 503.77 | 993.22 | 508.35 | 993.25 | 515.17 | 993.22 |
| 515.72 | 993.22 | 516.72 | 993.21 | 523.09 | 993.17 | 526.57 | 993.15 | 530.46 | 993.1 |
| 537.54 | 993.03 | 537.83 | 993.03 | 537.98 | 993.03 | 545.19 | 992.93 | 549.38 | 992.89 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 552.56 | 992.87 | 558.35 | 992.88 | 559.93 | 992.89 | 560.78 | 992.91 | 566.1 | 993.02 |
| 567.29 | 993.05 | 572.18 | 993.22 | 574.65 | 993.3 | 579.16 | 993.44 | 582.02 | 993.54 |
| 583.59 | 993.57 | 589.39 | 993.71 | 594.99 | 993.76 | 596.75 | 993.79 | 599.98 | 993.82 |
| 604.12 | 993.86 | 606.39 | 993.88 | 611.49 | 993.94 | 615.61 | 993.97 | 618.59 | 994.01 |
| 618.79 | 994.01 | 619.09 | 994.02 | 619.2 | 994.02 | 626.01 | 994.11 | 630.59 | 994.14 |
| 633.22 | 994.18 | 637.19 | 994.22 | 640.44 | 994.26 | 642.59 | 994.27 | 647.65 | 994.37 |
| 654.58 | 994.52 | 654.86 | 994.53 | 655.29 | 994.54 | 662.08 | 994.72 | 666.58 | 994.84 |
| 669.29 | 994.91 | 673.39 | 995.05 | 678.58 | 995.25 | 688.76 | 995.73 | 690.57 | 995.81 |
| 691.5 | 995.85 | 698.16 | 996.05 | 702.57 | 996.05 | 705.38 | 996.1 | 709.6 | 996.16 |
| 712.59 | 996.2 | 714.57 | 996.26 | 719.8 | 996.42 | 726.56 | 996.7 | 727.02 | 996.71 |
| 727.7 | 996.73 | 734.23 | 996.99 | 738.56 | 997.1 | 741.45 | 997.17 | 745.8 | 997.25 |
| 748.66 | 997.32 | 750.56 | 997.35 | 755.88 | 997.47 | 762.55 | 997.6 | 763.09 | 997.61 |
| 763.91 | 997.63 | 770.31 | 997.76 | 774.55 | 997.84 | 777.52 | 997.9 | 782.01 | 997.99 |
| 784.74 | 998.04 | 786.55 | 998.07 | 791.95 | 998.16 | 798.54 | 998.28 | 799.17 | 998.29 |
| 800.12 | 998.3 | 806.38 | 998.39 | 810.54 | 998.44 | 813.6 | 998.48 | 818.22 | 998.51 |
| 820.82 | 998.52 | 822.53 | 998.52 | 828.03 | 998.55 | 834.53 | 998.58 | 835.25 | 998.59 |
| 836.33 | 998.6 | 842.46 | 998.64 | 846.53 | 998.67 | 849.68 | 998.69 | 854.43 | 998.72 |
| 856.89 | 998.74 | 858.52 | 998.75 | 864.1 | 998.77 | 870.52 | 998.8 | 871.32 | 998.8 |
| 872.53 | 998.81 | 878.53 | 998.82 | 882.52 | 998.82 | 885.76 | 998.82 | 890.63 | 998.8 |
| 892.96 | 998.8 | 894.51 | 998.79 | 900.19 | 998.77 | 906.51 | 998.73 | 907.39 | 998.73 |
| 908.74 | 998.72 | 914.62 | 998.69 | 918.51 | 998.66 | 921.83 | 998.64 | 926.84 | 998.61 |
| 930.5 | 998.59 | 936.26 | 998.54 | 942.5 | 998.5 | 943.47 | 998.48 | 944.94 | 998.47 |
| 950.69 | 998.4 | 954.49 | 998.36 | 957.9 | 998.31 | 963.05 | 998.25 | 965.12 | 998.23 |
| 966.49 | 998.23 | 972.33 | 998.14 | 978.49 | 998.09 | 979.55 | 998.05 | 981.16 | 998.04 |
| 986.76 | 997.95 | 990.48 | 997.95 | 993.98 | 997.83 | 999.26 | 997.81 | 1001.19 | 997.77 |
| 1001.95 | 997.77 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 55.11 | .035 | 566.1 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 423.82 | 619.2 | 386.51 | 297.06 | 143.43 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 994.41 | Element | | | |
| Vel Head (ft) | 0.31 | Wt. n-Val. | 0.035 | 0.035 | 0.032 |
| W.S. Elev (ft) | 994.09 | Reach Len. (ft) | 386.51 | 297.06 | 143.43 |
| Crit W.S. (ft) | 994.00 | Flow Area (sq ft) | 0.13 | 158.42 | 0.19 |
| E.G. Slope (ft/ft) | 0.012787 | Area (sq ft) | 0.13 | 158.42 | 0.19 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 0.06 | 712.84 | 0.11 |
| Top Width (ft) | 200.88 | Top Width (ft) | 5.24 | 190.26 | 5.38 |
| Vel Total (ft/s) | 4.49 | Avg. Vel. (ft/s) | 0.42 | 4.50 | 0.57 |
| Max Chl Dpth (ft) | 1.53 | Hydr. Depth (ft) | 0.03 | 0.83 | 0.04 |
| Conv. Total (cfs) | 6305.3 | Conv. (cfs) | 0.5 | 6303.8 | 1.0 |
| Length Wtd. (ft) | 298.92 | Wetted Per. (ft) | 5.24 | 190.31 | 5.38 |
| Min Ch El (ft) | 992.56 | Shear (lb/sq ft) | 0.02 | 0.66 | 0.03 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.01 | 2.99 | 0.02 |
| Frctn Loss (ft) | 2.13 | Cum Volume (acre-ft) | 2.47 | 10.45 | 0.90 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 2.87 | 7.89 | 1.91 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 994.40 | Element | | | |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 994.05 | Reach Len. (ft) | 386.51 | 297.06 | 143.43 |
| Crit W.S. (ft) | 994.00 | Flow Area (sq ft) | | 150.28 | |
| E.G. Slope (ft/ft) | 0.014990 | Area (sq ft) | | 150.28 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 189.38 | Top Width (ft) | | 189.38 | |
| Vel Total (ft/s) | 4.74 | Avg. Vel. (ft/s) | | 4.74 | |
| Max Chl Dpth (ft) | 1.49 | Hydr. Depth (ft) | | 0.79 | |
| Conv. Total (cfs) | 5823.6 | Conv. (cfs) | | 5823.6 | |
| Length Wtd. (ft) | 297.06 | Wetted Per. (ft) | | 189.46 | |
| Min Ch El (ft) | 992.56 | Shear (lb/sq ft) | | 0.74 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.52 | |
| Frctn Loss (ft) | 2.04 | Cum Volume (acre-ft) | | 12.13 | |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | | 7.92 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 994.40 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 994.05 | Reach Len. (ft) | 386.51 | 297.06 | 143.43 |
| Crit W.S. (ft) | 994.00 | Flow Area (sq ft) | | 150.28 | |
| E.G. Slope (ft/ft) | 0.014990 | Area (sq ft) | | 150.28 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 189.38 | Top Width (ft) | | 189.38 | |
| Vel Total (ft/s) | 4.74 | Avg. Vel. (ft/s) | | 4.74 | |
| Max Chl Dpth (ft) | 1.49 | Hydr. Depth (ft) | | 0.79 | |
| Conv. Total (cfs) | 5823.6 | Conv. (cfs) | | 5823.6 | |
| Length Wtd. (ft) | 297.06 | Wetted Per. (ft) | | 189.46 | |
| Min Ch El (ft) | 992.56 | Shear (lb/sq ft) | | 0.74 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.52 | |
| Frctn Loss (ft) | 2.04 | Cum Volume (acre-ft) | | 12.13 | |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | | 7.92 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.450

INPUT
Description: Thalweg Sta. 517.10
Station Elevation Data num= 241

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 996.96 | 1.87 | 996.92 | 5.66 | 996.82 | 11.19 | 996.53 | 15.68 | 996.38 |
| 20.52 | 996.15 | 25.71 | 995.95 | 29.84 | 995.76 | 35.74 | 995.47 | 39.17 | 995.35 |
| 45.77 | 995.14 | 48.5 | 995.09 | 55.8 | 994.98 | 57.81 | 994.93 | 65.83 | 994.71 |
| 67.14 | 994.67 | 75.85 | 994.38 | 76.47 | 994.37 | 84.65 | 994.12 | 85.79 | 994.09 |
| 85.88 | 994.09 | 95.12 | 993.84 | 95.91 | 993.82 | 104.44 | 993.64 | 105.94 | 993.61 |
| 107.67 | 993.59 | 115.97 | 993.49 | 123.1 | 993.43 | 126 | 993.4 | 132.42 | 993.34 |
| 136.02 | 993.3 | 141.75 | 993.22 | 146.05 | 993.17 | 151.08 | 993.08 | 156.08 | 993.03 |
| 160.4 | 992.96 | 166.11 | 992.89 | 169.73 | 992.85 | 176.14 | 992.77 | 177.4 | 992.75 |
| 179.06 | 992.73 | 186.17 | 992.64 | 188.38 | 992.62 | 196.19 | 992.55 | 197.71 | 992.53 |
| 206.22 | 992.46 | 207.04 | 992.47 | 216.25 | 992.48 | 216.36 | 992.48 | 217.79 | 992.47 |
| 225.69 | 992.43 | 226.28 | 992.42 | 235.01 | 992.1 | 236.31 | 992.03 | 244.34 | 991.8 |
| 246.34 | 991.72 | 253.67 | 991.65 | 256.36 | 991.66 | 259.5 | 991.69 | 266.39 | 991.66 |
| 272.32 | 991.65 | 276.42 | 991.62 | 281.65 | 991.72 | 286.45 | 991.67 | 290.96 | 991.87 |
| 296.48 | 992.1 | 302.89 | 992.24 | 306.51 | 992.32 | 309.61 | 992.27 | 316.53 | 992.19 |
| 318.94 | 992.17 | 326.56 | 992.26 | 328.27 | 992.27 | 336.59 | 992.35 | 337.59 | 992.36 |
| 346.62 | 992.32 | 346.92 | 992.32 | 350.95 | 992.33 | 356.25 | 992.35 | 356.65 | 992.34 |
| 365.57 | 992.4 | 366.68 | 992.41 | 374.9 | 992.45 | 376.7 | 992.44 | 384.23 | 992.39 |
| 386.73 | 992.32 | 389.26 | 992.21 | 393.55 | 992.03 | 396.76 | 991.82 | 402.88 | 991.22 |
| 406.79 | 991.04 | 412.2 | 990.96 | 416.82 | 991.06 | 421.53 | 991.14 | 426.85 | 991.31 |
| 430.86 | 991.4 | 436.87 | 991.43 | 440.18 | 991.44 | 446.9 | 991.35 | 449.51 | 991.32 |
| 456.93 | 991.21 | 458.84 | 991.18 | 466.96 | 991.12 | 468.16 | 991.1 | 476.99 | 991 |
| 477.49 | 991 | 484.1 | 990.97 | 486.82 | 990.96 | 487.02 | 990.96 | 496.14 | 990.99 |
| 497.04 | 991 | 505.47 | 991.07 | 507.07 | 991.09 | 514.78 | 991.11 | 517.1 | 991.1 |
| 524.11 | 990.84 | 527.13 | 990.72 | 533.44 | 990.84 | 537.16 | 990.88 | 542.76 | 990.92 |
| 547.19 | 990.94 | 552.09 | 990.86 | 557.21 | 990.76 | 561.42 | 990.78 | 567.24 | 990.82 |
| 570.74 | 990.87 | 577.27 | 990.99 | 580.07 | 991.02 | 587.3 | 991.11 | 589.39 | 991.09 |
| 597.33 | 991.05 | 598.72 | 991.04 | 607.36 | 990.97 | 608.05 | 990.98 | 617.24 | 991.14 |
| 617.37 | 991.14 | 617.38 | 991.14 | 626.7 | 991.5 | 627.41 | 991.53 | 629.5 | 991.6 |
| 636.03 | 991.83 | 637.44 | 991.89 | 638.27 | 991.91 | 644.18 | 992.1 | 648.06 | 992.25 |
| 651.95 | 992.38 | 658.74 | 992.66 | 659.72 | 992.72 | 661.94 | 992.82 | 662.36 | 992.84 |
| 667.5 | 993.08 | 669.41 | 993.15 | 675.27 | 993.39 | 680.08 | 993.5 | 683.04 | 993.51 |
| 690.76 | 993.46 | 690.82 | 993.46 | 690.97 | 993.45 | 698.59 | 993.4 | 701.43 | 993.37 |
| 706.36 | 993.37 | 712.1 | 993.36 | 714.13 | 993.37 | 719.58 | 993.39 | 721.91 | 993.4 |
| 722.77 | 993.41 | 729.68 | 993.46 | 733.45 | 993.49 | 737.45 | 993.52 | 744.12 | 993.58 |
| 745.23 | 993.59 | 748.19 | 993.61 | 753 | 993.66 | 754.79 | 993.68 | 760.77 | 993.74 |
| 765.47 | 993.8 | 768.55 | 993.82 | 776.14 | 993.93 | 776.32 | 993.93 | 776.8 | 993.94 |
| 784.09 | 994.04 | 786.81 | 994.09 | 791.86 | 994.15 | 797.49 | 994.25 | 799.64 | 994.28 |
| 805.41 | 994.41 | 807.41 | 994.45 | 808.16 | 994.46 | 815.18 | 994.62 | 818.84 | 994.71 |
| 822.96 | 994.89 | 829.51 | 995.23 | 830.73 | 995.29 | 834.02 | 995.53 | 838.5 | 995.82 |
| 840.18 | 995.94 | 846.28 | 996.29 | 850.85 | 996.6 | 854.06 | 996.75 | 861.53 | 997.05 |
| 861.82 | 997.06 | 862.62 | 997.07 | 869.6 | 997.17 | 872.2 | 997.21 | 877.38 | 997.28 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 882.87 | 997.4 | 885.14 | 997.44 | 891.24 | 997.58 | 892.92 | 997.62 | 893.55 | 997.63 |
| 900.7 | 997.68 | 904.22 | 997.7 | 908.47 | 997.69 | 914.89 | 997.67 | 916.24 | 997.66 |
| 919.84 | 997.63 | 924.01 | 997.59 | 925.57 | 997.58 | 931.79 | 997.52 | 936.24 | 997.46 |
| 939.56 | 997.45 | 946.91 | 997.42 | 947.33 | 997.42 | 948.46 | 997.43 | 955.11 | 997.46 |
| 957.58 | 997.49 | 962.88 | 997.54 | 968.26 | 997.62 | 970.65 | 997.62 | 977.06 | 997.64 |
| 978.43 | 997.65 | 978.93 | 997.65 | 986.2 | 997.57 | 989.61 | 997.52 | 993.97 | 997.43 |
| 1000.28 | 997.24 | 1001.74 | 997.19 | 1005.68 | 996.98 | 1009.52 | 996.77 | 1010.95 | 996.68 |
| 1013.69 | 996.51 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 177.4 | .035 | 629.5 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 376.7 | 651.95 | 212.83 | 208.3 | 218.67 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.21 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 992.09 | Reach Len. (ft) | 212.83 | 208.30 | 218.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 21.16 | 240.89 | |
| E.G. Slope (ft/ft) | 0.004541 | Area (sq ft) | 21.16 | 240.89 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 29.82 | 683.18 | |
| Top Width (ft) | 313.11 | Top Width (ft) | 61.18 | 251.92 | |
| Vel Total (ft/s) | 2.72 | Avg. Vel. (ft/s) | 1.41 | 2.84 | |
| Max Chl Dpth (ft) | 1.37 | Hydr. Depth (ft) | 0.35 | 0.96 | |
| Conv. Total (cfs) | 10580.5 | Conv. (cfs) | 442.5 | 10138.0 | |
| Length Wtd. (ft) | 208.61 | Wetted Per. (ft) | 61.20 | 252.01 | |
| Min Ch El (ft) | 990.72 | Shear (lb/sq ft) | 0.10 | 0.27 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.14 | 0.77 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 2.38 | 9.08 | 0.90 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.58 | 6.39 | 1.90 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.28 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 992.17 | Reach Len. (ft) | 212.83 | 208.30 | 218.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 259.33 | |
| E.G. Slope (ft/ft) | 0.003934 | Area (sq ft) | | 259.33 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 255.57 | Top Width (ft) | | 255.57 | |
| Vel Total (ft/s) | 2.75 | Avg. Vel. (ft/s) | | 2.75 | |
| Max Chl Dpth (ft) | 1.45 | Hydr. Depth (ft) | | 1.01 | |
| Conv. Total (cfs) | 11367.4 | Conv. (cfs) | | 11367.4 | |
| Length Wtd. (ft) | 208.30 | Wetted Per. (ft) | | 255.66 | |
| Min Ch El (ft) | 990.72 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.68 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | | 10.73 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 6.41 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.28 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 992.17 | Reach Len. (ft) | 212.83 | 208.30 | 218.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 259.33 | |
| E.G. Slope (ft/ft) | 0.003934 | Area (sq ft) | | 259.33 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 255.57 | Top Width (ft) | | 255.57 | |
| Vel Total (ft/s) | 2.75 | Avg. Vel. (ft/s) | | 2.75 | |
| Max Chl Dpth (ft) | 1.45 | Hydr. Depth (ft) | | 1.01 | |
| Conv. Total (cfs) | 11367.4 | Conv. (cfs) | | 11367.4 | |
| Length Wtd. (ft) | 208.30 | Wetted Per. (ft) | | 255.66 | |
| Min Ch El (ft) | 990.72 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.68 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | | 10.73 | |

C & E Loss (ft) 0.02 Cum SA (acres) 6.41

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.410

INPUT
Description: Thalweg Sta. 526.60
Station Elevation Data num= 184

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 994.12 | 5.17 | 993.79 | 11.37 | 993.34 | 14.01 | 993.19 | 21.48 | 992.62 |
| 22.84 | 992.59 | 31.58 | 992.07 | 31.68 | 992.07 | 32.36 | 992.04 | 40.51 | 991.8 |
| 41.68 | 991.75 | 49.35 | 991.62 | 51.78 | 991.55 | 59.55 | 991.38 | 61.89 | 991.32 |
| 67.02 | 991.17 | 71.99 | 991.05 | 75.86 | 990.99 | 82.09 | 990.94 | 84.69 | 991.04 |
| 92.19 | 991.43 | 102.3 | 992.04 | 102.36 | 992.05 | 102.8 | 992.06 | 111.2 | 992.22 |
| 112.4 | 992.24 | 120.03 | 992.27 | 122.5 | 992.29 | 132.6 | 992.34 | 137.71 | 992.35 |
| 152.81 | 992.4 | 155.37 | 992.4 | 162.91 | 992.42 | 181.87 | 992.39 | 183.12 | 992.38 |
| 190.71 | 992.34 | 193.22 | 992.31 | 199.54 | 992.17 | 203.32 | 992.06 | 208.38 | 991.68 |
| 213.42 | 991.27 | 223.52 | 990.42 | 226.05 | 990.43 | 233.63 | 990.59 | 234.89 | 990.66 |
| 243.67 | 991.12 | 243.74 | 991.12 | 253.83 | 991.06 | 261.39 | 990.73 | 263.93 | 990.65 |
| 270.23 | 990.51 | 274.04 | 990.41 | 279.07 | 990.32 | 284.14 | 990.15 | 287.9 | 990.04 |
| 294.24 | 989.89 | 296.74 | 989.86 | 305.57 | 990.14 | 314.11 | 990.58 | 314.41 | 990.59 |
| 323.24 | 990.93 | 324.55 | 990.99 | 332.07 | 991.12 | 334.65 | 991.18 | 340.91 | 991.26 |
| 344.75 | 991.35 | 349.74 | 991.42 | 354.86 | 991.48 | 358.58 | 991.53 | 364.96 | 991.53 |
| 367.41 | 991.58 | 375.06 | 991.62 | 384.55 | 991.73 | 385.08 | 991.74 | 385.16 | 991.74 |
| 393.92 | 991.72 | 395.27 | 991.76 | 402.75 | 991.52 | 405.37 | 991.35 | 411.59 | 990.92 |
| 415.47 | 990.52 | 420.43 | 990.26 | 425.57 | 989.98 | 429.26 | 989.95 | 435.67 | 989.92 |
| 438.1 | 989.93 | 445.78 | 989.98 | 446.93 | 989.98 | 454.98 | 990.02 | 455.77 | 990.03 |
| 456.58 | 990.03 | 464.6 | 990.03 | 465.98 | 990.04 | 473.44 | 989.95 | 476.08 | 989.94 |
| 482.28 | 989.9 | 486.19 | 989.84 | 491.11 | 989.72 | 496.29 | 989.54 | 499.95 | 989.44 |
| 506.39 | 989.33 | 508.78 | 989.3 | 516.49 | 989.31 | 517.61 | 989.31 | 525.42 | 989.35 |
| 526.44 | 989.36 | 526.6 | 989.36 | 535.28 | 989.4 | 536.7 | 989.41 | 544.12 | 989.37 |
| 546.8 | 989.34 | 552.95 | 989.24 | 556.9 | 989.24 | 561.79 | 989.42 | 567.01 | 989.75 |
| 577.11 | 990.5 | 579.46 | 990.63 | 587.21 | 990.89 | 588.29 | 990.91 | 591.56 | 990.94 |
| 595.86 | 990.99 | 597.13 | 991 | 597.31 | 991 | 617.37 | 991.14 | 617.52 | 991.14 |
| 627.62 | 991.25 | 637.72 | 991.39 | 641.31 | 991.45 | 650.14 | 991.57 | 657.93 | 991.66 |
| 658.98 | 991.68 | 666.29 | 991.75 | 667.81 | 991.77 | 668.03 | 991.77 | 685.49 | 991.9 |
| 718.54 | 992.07 | 720.82 | 992.09 | 728.64 | 992.13 | 729.65 | 992.13 | 736.73 | 992.16 |
| 738.49 | 992.17 | 738.75 | 992.17 | 747.33 | 992.21 | 748.85 | 992.22 | 782.67 | 992.38 |
| 789.26 | 992.43 | 791.5 | 992.45 | 799.36 | 992.54 | 800.34 | 992.55 | 807.17 | 992.64 |
| 809.18 | 992.66 | 809.46 | 992.67 | 818.01 | 992.79 | 819.56 | 992.82 | 826.85 | 992.93 |
| 829.67 | 992.99 | 835.68 | 993.08 | 844.52 | 993.26 | 849.87 | 993.44 | 853.35 | 993.58 |
| 859.97 | 993.93 | 870.07 | 994.62 | 871.03 | 994.7 | 877.6 | 995.17 | 879.85 | 995.34 |
| 880.18 | 995.36 | 888.69 | 995.91 | 890.28 | 995.99 | 897.52 | 996.25 | 900.38 | 996.33 |
| 910.48 | 996.58 | 920.59 | 996.8 | 924.03 | 996.86 | 930.69 | 996.96 | 940.79 | 997.06 |
| 941.7 | 997.07 | 950.54 | 997.14 | 950.89 | 997.14 | 961 | 997.21 | 971.1 | 997.21 |
| 981.2 | 996.95 | 985.88 | 996.7 | 991.3 | 996.37 | 992.56 | 996.3 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 59.55 | .035 | 617.37 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 393.92 | 591.56 | 206.45 | 200.01 | 203.5 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 990.97 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 990.75 | Reach Len. (ft) | 206.45 | 200.01 | 203.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 30.53 | 168.54 | |
| E.G. Slope (ft/ft) | 0.008235 | Area (sq ft) | 30.53 | 168.54 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 67.36 | 645.64 | |
| Top Width (ft) | 244.71 | Top Width (ft) | 74.82 | 169.89 | |
| Vel Total (ft/s) | 3.58 | Avg. Vel. (ft/s) | 2.21 | 3.83 | |
| Max Chl Dpth (ft) | 1.51 | Hydr. Depth (ft) | 0.41 | 0.99 | |
| Conv. Total (cfs) | 7857.2 | Conv. (cfs) | 742.3 | 7114.9 | |
| Length Wtd. (ft) | 200.36 | Wetted Per. (ft) | 74.87 | 169.97 | |
| Min Ch El (ft) | 989.24 | Shear (lb/sq ft) | 0.21 | 0.51 | |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.46 | 1.95 | |
| Frctn Loss (ft) | 1.33 | Cum Volume (acre-ft) | 2.25 | 8.10 | 0.90 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.24 | 5.38 | 1.90 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.03 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 990.75 | Reach Len. (ft) | 206.45 | 200.01 | 203.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 168.23 | |
| E.G. Slope (ft/ft) | 0.010099 | Area (sq ft) | | 168.23 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 169.81 | Top Width (ft) | | 169.81 | |
| Vel Total (ft/s) | 4.24 | Avg. Vel. (ft/s) | | 4.24 | |
| Max Chl Dpth (ft) | 1.51 | Hydr. Depth (ft) | | 0.99 | |
| Conv. Total (cfs) | 7095.0 | Conv. (cfs) | | 7095.0 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 169.90 | |
| Min Ch El (ft) | 989.24 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.65 | |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | | 9.71 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 5.39 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.03 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 990.75 | Reach Len. (ft) | 206.45 | 200.01 | 203.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 168.23 | |
| E.G. Slope (ft/ft) | 0.010099 | Area (sq ft) | | 168.23 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 169.81 | Top Width (ft) | | 169.81 | |
| Vel Total (ft/s) | 4.24 | Avg. Vel. (ft/s) | | 4.24 | |
| Max Chl Dpth (ft) | 1.51 | Hydr. Depth (ft) | | 0.99 | |
| Conv. Total (cfs) | 7095.0 | Conv. (cfs) | | 7095.0 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 169.90 | |
| Min Ch El (ft) | 989.24 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.65 | |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | | 9.71 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 5.39 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.372

INPUT
Description: Thalweg Sta. 503.37
Station Elevation Data num= 187

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 994.28 | .06 | 994.28 | .55 | 994.24 | .64 | 994.24 | 9.07 | 993.26 |
| 10.83 | 993.04 | 17.59 | 992.29 | 21.02 | 991.9 | 31.21 | 991.49 | 40.32 | 991.46 |
| 41.4 | 991.46 | 43.16 | 991.42 | 51.59 | 991.26 | 51.68 | 991.26 | 52.15 | 991.25 |
| 60.2 | 991.02 | 61.78 | 990.98 | 68.73 | 990.76 | 71.97 | 990.68 | 77.25 | 990.41 |
| 82.16 | 990.13 | 85.77 | 990.06 | 92.35 | 989.64 | 94.29 | 989.74 | 102.54 | 990.21 |
| 102.81 | 990.23 | 104.23 | 990.34 | 111.34 | 990.87 | 112.73 | 990.97 | 122.92 | 991.3 |
| 128.38 | 991.3 | 133.11 | 991.29 | 136.91 | 991.24 | 143.3 | 991.19 | 145.43 | 991.16 |
| 153.49 | 991.13 | 156.32 | 991.14 | 162.47 | 991.15 | 163.68 | 991.15 | 170.99 | 991.16 |
| 173.87 | 991.17 | 184.06 | 991.08 | 194.25 | 990.88 | 204.43 | 990.74 | 205.09 | 990.72 |
| 208.4 | 990.63 | 213.6 | 990.5 | 214.62 | 990.47 | 222.12 | 989.96 | 224.81 | 989.76 |
| 230.65 | 989.36 | 235 | 989.02 | 245.19 | 989.09 | 247.7 | 989.16 | 255.38 | 989.42 |
| 256.22 | 989.42 | 264.74 | 989.5 | 265.57 | 989.51 | 273.27 | 989.81 | 275.76 | 989.9 |
| 281.78 | 990.14 | 285.95 | 990.29 | 296.14 | 990.4 | 306.33 | 990.4 | 307.35 | 990.41 |
| 315.88 | 990.43 | 316.52 | 990.43 | 324.4 | 990.45 | 326.71 | 990.46 | 336.9 | 990.44 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 341.44 | 990.41 | 347.09 | 990.35 | 355.48 | 990.21 | 357.28 | 990.2 | 364.65 | 989.99 |
| 367.01 | 989.94 | 367.47 | 989.91 | 367.71 | 989.9 | 375.53 | 989.42 | 377.66 | 989.25 |
| 384.06 | 988.83 | 387.85 | 988.6 | 392.57 | 988.43 | 398.04 | 988.34 | 401.09 | 988.33 |
| 408.23 | 988.36 | 416.74 | 988.42 | 428.6 | 988.43 | 443.71 | 988.39 | 448.98 | 988.36 |
| 459.17 | 988.32 | 468.82 | 988.26 | 469.36 | 988.26 | 477.8 | 988.2 | 479.55 | 988.18 |
| 489.74 | 988.12 | 494.84 | 988.02 | 499.93 | 987.97 | 503.37 | 987.96 | 510.12 | 987.92 |
| 511.88 | 988 | 520.31 | 988.08 | 520.41 | 988.08 | 520.91 | 988.06 | 528.93 | 987.79 |
| 530.5 | 987.79 | 537.45 | 987.94 | 540.69 | 988.06 | 550.88 | 988.71 | 554.5 | 988.96 |
| 561.07 | 989.3 | 563.02 | 989.36 | 571.26 | 989.55 | 571.55 | 989.55 | 572.99 | 989.57 |
| 578.55 | 989.62 | 578.92 | 989.62 | 581.4 | 989.66 | 591.43 | 989.71 | 601.45 | 989.71 |
| 608.28 | 989.69 | 611.48 | 989.69 | 621.5 | 989.71 | 623.08 | 989.72 | 631.53 | 989.78 |
| 641.56 | 990.01 | 645.71 | 990.15 | 651.58 | 990.39 | 655.06 | 990.52 | 661.61 | 990.78 |
| 671.63 | 991.1 | 673.78 | 991.14 | 681.66 | 991.26 | 683.13 | 991.26 | 691.68 | 991.24 |
| 692.5 | 991.24 | 701.71 | 991.16 | 701.85 | 991.15 | 711.2 | 991.05 | 711.73 | 991.04 |
| 720.56 | 990.92 | 729.92 | 990.77 | 731.79 | 990.75 | 748.63 | 990.41 | 751.84 | 990.34 |
| 757.98 | 990.25 | 761.86 | 990.17 | 771.89 | 990.12 | 776.7 | 990.15 | 781.91 | 990.2 |
| 786.05 | 990.26 | 791.94 | 990.36 | 795.41 | 990.47 | 801.96 | 990.66 | 804.77 | 990.84 |
| 811.99 | 991.29 | 814.12 | 991.45 | 822.02 | 992.06 | 823.48 | 992.15 | 832.04 | 992.76 |
| 832.83 | 992.8 | 842.07 | 993.24 | 842.2 | 993.24 | 843.97 | 993.3 | 851.55 | 993.54 |
| 852.09 | 993.56 | 860.9 | 993.8 | 862.12 | 993.83 | 870.26 | 993.97 | 879.62 | 993.92 |
| 882.17 | 993.86 | 888.98 | 993.77 | 892.19 | 993.67 | 898.33 | 993.68 | 902.22 | 993.93 |
| 907.69 | 994.13 | 912.24 | 994.48 | 917.05 | 994.71 | 922.27 | 995 | 926.4 | 995.22 |
| 932.3 | 995.43 | 935.76 | 995.53 | 942.32 | 995.69 | 945.12 | 995.73 | 952.35 | 995.85 |
| 954.47 | 995.87 | 960.07 | 995.94 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 40.32 | .035 | 623.08 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 336.9 | 578.92 | 233.34 | 199.95 | 179.31 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.63 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 989.46 | Reach Len. (ft) | 233.34 | 199.95 | 179.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 7.56 | 211.28 | |
| E.G. Slope (ft/ft) | 0.005434 | Area (sq ft) | 7.56 | 211.28 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 9.23 | 703.77 | |
| Top Width (ft) | 223.29 | Top Width (ft) | 30.97 | 192.32 | |
| Vel Total (ft/s) | 3.26 | Avg. Vel. (ft/s) | 1.22 | 3.33 | |
| Max Chl Dpth (ft) | 1.67 | Hydr. Depth (ft) | 0.24 | 1.10 | |
| Conv. Total (cfs) | 9672.1 | Conv. (cfs) | 125.2 | 9546.9 | |
| Length Wtd. (ft) | 201.88 | Wetted Per. (ft) | 30.99 | 192.41 | |
| Min Ch El (ft) | 987.79 | Shear (lb/sq ft) | 0.08 | 0.37 | |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.10 | 1.24 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 2.16 | 7.23 | 0.90 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.99 | 4.55 | 1.90 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.69 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.54 | Reach Len. (ft) | 233.34 | 199.95 | 179.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 227.12 | |
| E.G. Slope (ft/ft) | 0.004531 | Area (sq ft) | | 227.12 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 197.17 | Top Width (ft) | | 197.17 | |
| Vel Total (ft/s) | 3.14 | Avg. Vel. (ft/s) | | 3.14 | |
| Max Chl Dpth (ft) | 1.75 | Hydr. Depth (ft) | | 1.15 | |
| Conv. Total (cfs) | 10592.2 | Conv. (cfs) | | 10592.2 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 197.26 | |
| Min Ch El (ft) | 987.79 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.02 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | | 8.80 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 4.55 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.69 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.54 | Reach Len. (ft) | 233.34 | 199.95 | 179.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 227.12 | |
| E.G. Slope (ft/ft) | 0.004531 | Area (sq ft) | | 227.12 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 197.17 | Top Width (ft) | | 197.17 | |
| Vel Total (ft/s) | 3.14 | Avg. Vel. (ft/s) | | 3.14 | |
| Max Chl Dpth (ft) | 1.75 | Hydr. Depth (ft) | | 1.15 | |
| Conv. Total (cfs) | 10592.2 | Conv. (cfs) | | 10592.2 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 197.26 | |
| Min Ch El (ft) | 987.79 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.02 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | | 8.80 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 4.55 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.334

INPUT
Description: Thalweg Sta. 353.87
Station Elevation Data num= 132

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 993.83 | 3.38 | 993.68 | 10.06 | 993.03 | 13.4 | 992.75 | 20.64 | 991.79 |
| 31.2 | 990.54 | 33.43 | 990.28 | 41.78 | 989.47 | 43.44 | 989.33 | 49.9 | 988.82 |
| 52.35 | 988.63 | 53.45 | 988.55 | 62.93 | 987.96 | 63.47 | 987.93 | 73.26 | 987.55 |
| 73.48 | 987.54 | 83.5 | 987.42 | 84.07 | 987.43 | 93.51 | 987.45 | 94.64 | 987.48 |
| 103.52 | 987.58 | 105.21 | 987.64 | 113.54 | 987.85 | 115.78 | 987.92 | 123.55 | 988.19 |
| 126.36 | 988.27 | 133.57 | 988.55 | 136.93 | 988.61 | 143.58 | 988.81 | 147.5 | 988.86 |
| 153.59 | 988.96 | 158.07 | 989 | 163.61 | 989.06 | 173.62 | 989.14 | 179.22 | 989.14 |
| 183.64 | 989.17 | 189.78 | 989.1 | 193.65 | 989.09 | 200.36 | 988.95 | 203.66 | 988.87 |
| 210.19 | 988.65 | 210.93 | 988.62 | 213.68 | 988.52 | 221.5 | 988.12 | 223.69 | 988 |
| 233.71 | 987.32 | 242.65 | 986.83 | 243.72 | 986.77 | 244.68 | 986.8 | 253.73 | 987.05 |
| 254.19 | 987.07 | 263.75 | 987.56 | 273.76 | 987.59 | 274.36 | 987.58 | 283.77 | 987.36 |
| 284.94 | 987.32 | 293.79 | 987.08 | 295.51 | 987.03 | 303.8 | 986.83 | 306.08 | 986.77 |
| 313.82 | 986.62 | 316.65 | 986.57 | 323.83 | 986.47 | 327.23 | 986.47 | 333.84 | 986.49 |
| 339.8 | 986.62 | 343.86 | 986.7 | 353.87 | 986.95 | 380.08 | 987.54 | 390.65 | 987.76 |
| 401.23 | 987.92 | 411.8 | 988.03 | 413.96 | 988.04 | 422.37 | 988.13 | 423.97 | 988.14 |
| 443.52 | 988.34 | 444 | 988.34 | 452.65 | 988.4 | 453.66 | 988.41 | 454.09 | 988.41 |
| 464.03 | 988.45 | 464.66 | 988.45 | 474.04 | 988.48 | 475.23 | 988.48 | 484.05 | 988.51 |
| 485.81 | 988.51 | 494.07 | 988.53 | 504.08 | 988.53 | 514.1 | 988.49 | 517.52 | 988.53 |
| 524.11 | 988.56 | 528.09 | 988.69 | 534.12 | 988.83 | 536.07 | 988.91 | 538.66 | 989.01 |
| 544.14 | 989.2 | 549.23 | 989.36 | 554.15 | 989.55 | 564.17 | 989.68 | 570.38 | 989.69 |
| 574.18 | 989.68 | 580.95 | 989.69 | 584.19 | 989.68 | 594.21 | 989.68 | 602.1 | 989.65 |
| 604.22 | 989.66 | 612.67 | 989.42 | 614.23 | 989.37 | 623.24 | 988.97 | 624.25 | 988.92 |
| 633.81 | 988.57 | 634.26 | 988.55 | 644.28 | 988.45 | 644.39 | 988.45 | 654.29 | 988.64 |
| 654.95 | 988.66 | 664.3 | 989.01 | 665.53 | 989.05 | 674.32 | 989.43 | 676.1 | 989.5 |
| 686.68 | 989.95 | 694.35 | 990.29 | 697.24 | 990.45 | 704.36 | 990.87 | 714.37 | 991.65 |
| 724.39 | 992.48 | 728.96 | 992.76 | 734.4 | 993.11 | 744.42 | 993.51 | 750.1 | 993.7 |
| 754.43 | 993.8 | 756.09 | 993.87 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 49.9 | .035 | 536.07 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 179.22 | 453.66 | 210.97 | 200.01 | 194.23 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.34 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 988.17 | Reach Len. (ft) | 210.97 | 200.01 | 194.23 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 31.49 | 185.76 | |
| E.G. Slope (ft/ft) | 0.007577 | Area (sq ft) | 31.49 | 185.76 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | 72.99 | 640.01 | |
| Top Width (ft) | 269.63 | Top Width (ft) | 63.37 | 206.25 | |
| Vel Total (ft/s) | 3.28 | Avg. Vel. (ft/s) | 2.32 | 3.45 | |

| | | | | | |
|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 1.70 | Hydr. Depth (ft) | 0.50 | 0.90 | |
| Conv. Total (cfs) | 8191.0 | Conv. (cfs) | 838.5 | 7352.5 | |
| Length Wtd. (ft) | 200.50 | Wetted Per. (ft) | 63.40 | 206.34 | |
| Min Ch El (ft) | 986.47 | Shear (lb/sq ft) | 0.23 | 0.43 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.54 | 1.47 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 2.06 | 6.32 | 0.90 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.74 | 3.63 | 1.90 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.39 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 988.15 | Reach Len. (ft) | 210.97 | 200.01 | 194.23 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 181.84 | |
| E.G. Slope (ft/ft) | 0.009951 | Area (sq ft) | | 181.84 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 204.01 | Top Width (ft) | | 204.01 | |
| Vel Total (ft/s) | 3.92 | Avg. Vel. (ft/s) | | 3.92 | |
| Max Chl Dpth (ft) | 1.68 | Hydr. Depth (ft) | | 0.89 | |
| Conv. Total (cfs) | 7147.6 | Conv. (cfs) | | 7147.6 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 204.10 | |
| Min Ch El (ft) | 986.47 | Shear (lb/sq ft) | | 0.55 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.17 | |
| Frctn Loss (ft) | 0.60 | Cum Volume (acre-ft) | | 7.86 | |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | | 3.63 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.39 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 988.15 | Reach Len. (ft) | 210.97 | 200.01 | 194.23 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 181.84 | |
| E.G. Slope (ft/ft) | 0.009951 | Area (sq ft) | | 181.84 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 204.01 | Top Width (ft) | | 204.01 | |
| Vel Total (ft/s) | 3.92 | Avg. Vel. (ft/s) | | 3.92 | |
| Max Chl Dpth (ft) | 1.68 | Hydr. Depth (ft) | | 0.89 | |
| Conv. Total (cfs) | 7147.6 | Conv. (cfs) | | 7147.6 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 204.10 | |
| Min Ch El (ft) | 986.47 | Shear (lb/sq ft) | | 0.55 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.17 | |
| Frctn Loss (ft) | 0.60 | Cum Volume (acre-ft) | | 7.86 | |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | | 3.63 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.296

INPUT
Description: Thalweg Sta. 455.03
Station Elevation Data num= 150

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 994 | .36 | 993.99 | 7.05 | 993.93 | 17.39 | 993.75 | 27.74 | 993.66 |
| 28.56 | 993.65 | 38.09 | 993.55 | 56.76 | 993.22 | 58.79 | 993.18 | 69.14 | 993.04 |
| 70.87 | 993.04 | 79.48 | 992.99 | 89.83 | 993.01 | 99.06 | 993.09 | 100.18 | 993.11 |
| 103.25 | 993.13 | 110.53 | 993.16 | 113.17 | 993.16 | 120.88 | 993.12 | 131.22 | 993.13 |
| 141.38 | 993.27 | 141.57 | 993.28 | 151.92 | 993.47 | 155.47 | 993.5 | 162.27 | 993.59 |
| 169.58 | 993.57 | 172.62 | 993.57 | 181.01 | 993.45 | 182.97 | 993.41 | 193.31 | 992.98 |
| 203.66 | 992.22 | 211.88 | 991.48 | 214.01 | 991.28 | 219.89 | 990.7 | 224.36 | 990.23 |
| 225.98 | 990.08 | 234.71 | 989.32 | 240.08 | 989.38 | 245.05 | 989.38 | 254.18 | 990.01 |
| 255.4 | 990.1 | 258.77 | 990.32 | 265.75 | 990.7 | 268.28 | 990.71 | 276.1 | 990.83 |
| 282.39 | 990.68 | 286.45 | 990.62 | 296.49 | 990.26 | 296.8 | 990.24 | 297.65 | 990.22 |
| 307.14 | 989.89 | 310.59 | 989.86 | 317.49 | 989.73 | 327.84 | 989.67 | 331.79 | 989.56 |
| 338.19 | 989.37 | 338.79 | 989.33 | 348.54 | 988.67 | 352.62 | 988.32 | 352.7 | 988.31 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 352.85 | 988.3 | 364.2 | 987.46 | 368.78 | 987.06 | 375.55 | 986.58 | 378.84 | 986.29 |
| 386.9 | 985.89 | 388.91 | 985.75 | 398.26 | 985.47 | 398.97 | 985.43 | 404.55 | 985.32 |
| 409.03 | 985.26 | 409.61 | 985.28 | 419.1 | 985.5 | 420.96 | 985.53 | 429.16 | 985.83 |
| 432.31 | 985.82 | 439.23 | 985.9 | 443.67 | 985.85 | 449.29 | 985.84 | 455.03 | 985.76 |
| 466.38 | 985.65 | 469.42 | 985.61 | 477.73 | 985.64 | 479.48 | 985.62 | 489.09 | 985.89 |
| 489.55 | 985.89 | 493.18 | 985.92 | 499.61 | 985.96 | 500.44 | 985.96 | 509.68 | 985.9 |
| 511.79 | 985.92 | 519.74 | 985.98 | 534.5 | 986.62 | 539.87 | 986.87 | 545.85 | 986.96 |
| 549.93 | 987.04 | 557.2 | 987.07 | 560 | 987.09 | 568.56 | 987.13 | 570.06 | 987.13 |
| 576.84 | 987.16 | 577.23 | 987.16 | 579.6 | 987.18 | 580.33 | 987.18 | 590.39 | 987.2 |
| 593.21 | 987.19 | 600.6 | 987.19 | 606.07 | 987.17 | 610.81 | 987.19 | 618.95 | 987.2 |
| 631.23 | 987.26 | 631.83 | 987.26 | 644.7 | 987.34 | 651.66 | 987.36 | 657.58 | 987.39 |
| 661.87 | 987.39 | 670.46 | 987.49 | 672.08 | 987.5 | 682.29 | 987.47 | 692.5 | 987.18 |
| 698.13 | 987.06 | 702.72 | 986.97 | 712.93 | 987.02 | 721.97 | 987.13 | 723.14 | 987.15 |
| 743.56 | 987.4 | 753.78 | 987.5 | 763.99 | 987.81 | 773.47 | 988.39 | 774.2 | 988.43 |
| 794.62 | 989.88 | 799.22 | 990.19 | 804.83 | 990.51 | 812.1 | 990.88 | 815.05 | 990.99 |
| 825.26 | 991.35 | 826.36 | 991.38 | 835.47 | 991.65 | 837.85 | 991.71 | 850.73 | 992.05 |
| 855.9 | 992.16 | 863.6 | 992.55 | 866.11 | 992.76 | 875.72 | 993.21 | 876.32 | 993.24 |
| 876.47 | 993.24 | 886.53 | 993.5 | 902.23 | 993.8 | 906.95 | 993.87 | 909.02 | 993.91 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 331.79 | .035 | 698.13 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 368.78 | 577.23 | 256.29 | 199.58 | 146.96 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.47 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.035 | 0.035 | 0.033 |
| W.S. Elev (ft) | 987.37 | Reach Len. (ft) | 256.29 | 199.58 | 146.96 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.55 | 267.04 | 22.68 |
| E.G. Slope (ft/ft) | 0.002707 | Area (sq ft) | 0.55 | 267.04 | 22.68 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 0.35 | 695.63 | 17.02 |
| Top Width (ft) | 343.26 | Top Width (ft) | 3.53 | 208.45 | 131.28 |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | 0.63 | 2.60 | 0.75 |
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | 0.15 | 1.28 | 0.17 |
| Conv. Total (cfs) | 13702.8 | Conv. (cfs) | 6.6 | 13369.0 | 327.2 |
| Length Wtd. (ft) | 203.05 | Wetted Per. (ft) | 3.55 | 208.54 | 131.29 |
| Min Ch El (ft) | 985.26 | Shear (lb/sq ft) | 0.03 | 0.22 | 0.03 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.02 | 0.56 | 0.02 |
| Frctn Loss (ft) | 0.73 | Cum Volume (acre-ft) | 1.98 | 5.28 | 0.85 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.58 | 2.68 | 1.60 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.74 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 987.66 | Reach Len. (ft) | 256.29 | 199.58 | 146.96 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 328.25 | |
| E.G. Slope (ft/ft) | 0.001440 | Area (sq ft) | | 328.25 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 208.45 | Top Width (ft) | | 208.45 | |
| Vel Total (ft/s) | 2.17 | Avg. Vel. (ft/s) | | 2.17 | |
| Max Chl Dpth (ft) | 2.40 | Hydr. Depth (ft) | | 1.57 | |
| Conv. Total (cfs) | 18790.9 | Conv. (cfs) | | 18790.9 | |
| Length Wtd. (ft) | 199.58 | Wetted Per. (ft) | | 209.64 | |
| Min Ch El (ft) | 985.26 | Shear (lb/sq ft) | | 0.14 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.31 | |
| Frctn Loss (ft) | 0.45 | Cum Volume (acre-ft) | | 6.69 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 2.68 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.74 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 987.66 | Reach Len. (ft) | 256.29 | 199.58 | 146.96 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 328.25 | |
| E.G. Slope (ft/ft) | 0.001440 | Area (sq ft) | | 328.25 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 208.45 | Top Width (ft) | | 208.45 | |
| Vel Total (ft/s) | 2.17 | Avg. Vel. (ft/s) | | 2.17 | |

| | | | |
|---|---|---|---|
| Max Chl Dpth (ft) | 2.40 | Hydr. Depth (ft) | 1.57 |
| Conv. Total (cfs) | 18790.9 | Conv. (cfs) | 18790.9 |
| Length Wtd. (ft) | 199.58 | Wetted Per. (ft) | 209.64 |
| Min Ch El (ft) | 985.26 | Shear (lb/sq ft) | 0.14 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.31 |
| Frctn Loss (ft) | 0.45 | Cum Volume (acre-ft) | 6.69 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.68 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.259

INPUT
Description: Thalweg Sta. 272.89
Station Elevation Data num= 92

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 989.9 | 1.44 | 989.96 | 1.5 | 989.96 | 12.24 | 990.38 | 23.01 | 990.71 |
| 33.78 | 991 | 44.55 | 991.22 | 55.28 | 991.26 | 55.37 | 991.26 | 66.08 | 991.04 |
| 76.85 | 990.71 | 82.33 | 990.49 | 87.62 | 990.25 | 93.8 | 989.9 | 101.5 | 989.4 |
| 119.93 | 988.16 | 126.99 | 987.76 | 130.69 | 987.54 | 136.26 | 987.28 | 138.23 | 987.2 |
| 152.23 | 986.59 | 162.85 | 986.09 | 163 | 986.08 | 163.22 | 986.07 | 173.77 | 985.48 |
| 178.45 | 985.29 | 184.53 | 985.09 | 190.19 | 985.22 | 195.3 | 985.36 | 206.07 | 985.78 |
| 216.62 | 986.06 | 216.84 | 986.07 | 217.15 | 986.08 | 227.6 | 986.26 | 234.55 | 986.26 |
| 238.12 | 986.27 | 238.37 | 986.27 | 250.69 | 986.06 | 259.15 | 985.84 | 263.01 | 985.73 |
| 272.89 | 985.27 | 275.32 | 985.17 | 276.27 | 985.09 | 287.64 | 984.22 | 293.41 | 984.2 |
| 299.96 | 984.41 | 310.53 | 985.05 | 312.28 | 985.14 | 324.59 | 985.56 | 327.66 | 985.63 |
| 336.91 | 985.79 | 344.78 | 985.85 | 348.96 | 985.9 | 349.05 | 985.9 | 349.2 | 985.9 |
| 354.06 | 985.92 | 360.09 | 985.93 | 370.99 | 986.01 | 373.25 | 986.04 | 392.45 | 986.27 |
| 392.78 | 986.27 | 393.2 | 986.28 | 403.67 | 986.37 | 414.57 | 986.38 | 430.85 | 986.24 |
| 436.36 | 986.18 | 443.58 | 986.16 | 447.25 | 986.16 | 450.05 | 986.21 | 458.15 | 986.38 |
| 468.77 | 986.64 | 469.04 | 986.64 | 469.25 | 986.65 | 473.92 | 986.72 | 488.45 | 986.93 |
| 493.97 | 987 | 512.62 | 987.29 | 519.16 | 987.41 | 522.2 | 987.46 | 523.52 | 987.49 |
| 529.8 | 987.62 | 534.41 | 987.75 | 537.41 | 987.8 | 544.35 | 988.01 | 545.31 | 988.05 |
| 546.04 | 988.09 | 556.2 | 988.5 | 565.24 | 988.99 | 567.1 | 989.08 | 569.54 | 989.22 |
| 577.99 | 989.77 | 580.78 | 989.96 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 138.23 | .035 | 473.92 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 238.12 | 349.05 | 192.32 | 199.93 | 219.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 986.74 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.035 | 0.035 | 0.035 |
| W.S. Elev (ft) | 986.59 | Reach Len. (ft) | 192.32 | 199.93 | 219.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 66.17 | 137.40 | 44.35 |
| E.G. Slope (ft/ft) | 0.005015 | Area (sq ft) | 66.17 | 137.40 | 44.35 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 167.21 | 476.16 | 69.63 |
| Top Width (ft) | 314.23 | Top Width (ft) | 85.80 | 110.93 | 117.50 |
| Vel Total (ft/s) | 2.88 | Avg. Vel. (ft/s) | 2.53 | 3.47 | 1.57 |
| Max Chl Dpth (ft) | 2.39 | Hydr. Depth (ft) | 0.77 | 1.24 | 0.38 |
| Conv. Total (cfs) | 10068.6 | Conv. (cfs) | 2361.3 | 6724.0 | 983.3 |
| Length Wtd. (ft) | 199.15 | Wetted Per. (ft) | 85.85 | 111.02 | 117.51 |
| Min Ch El (ft) | 984.20 | Shear (lb/sq ft) | 0.24 | 0.39 | 0.12 |
| Alpha | 1.18 | Stream Power (lb/ft s) | 0.61 | 1.34 | 0.19 |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 1.78 | 4.36 | 0.74 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.32 | 1.95 | 1.19 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.27 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 987.05 | Reach Len. (ft) | 192.32 | 199.93 | 219.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 189.28 | |
| E.G. Slope (ft/ft) | 0.003956 | Area (sq ft) | | 189.28 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |

| | | | |
|---|---|---|---|
| Top Width (ft) | 110.93 | Top Width (ft) | 110.93 |
| Vel Total (ft/s) | 3.77 | Avg. Vel. (ft/s) | 3.77 |
| Max Chl Dpth (ft) | 2.85 | Hydr. Depth (ft) | 1.71 |
| Conv. Total (cfs) | 11336.4 | Conv. (cfs) | 11336.4 |
| Length Wtd. (ft) | 199.93 | Wetted Per. (ft) | 112.96 |
| Min Ch El (ft) | 984.20 | Shear (lb/sq ft) | 0.41 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.56 |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 5.50 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.95 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.27 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 987.05 | Reach Len. (ft) | 192.32 | 199.93 | 219.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 189.28 | |
| E.G. Slope (ft/ft) | 0.003956 | Area (sq ft) | | 189.28 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 110.93 | Top Width (ft) | | 110.93 | |
| Vel Total (ft/s) | 3.77 | Avg. Vel. (ft/s) | | 3.77 | |
| Max Chl Dpth (ft) | 2.85 | Hydr. Depth (ft) | | 1.71 | |
| Conv. Total (cfs) | 11336.4 | Conv. (cfs) | | 11336.4 | |
| Length Wtd. (ft) | 199.93 | Wetted Per. (ft) | | 112.96 | |
| Min Ch El (ft) | 984.20 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.56 | |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | | 5.50 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 1.95 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.221

INPUT
Description: Thalweg Sta. 428.32
Station Elevation Data num= 128

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 990.05 | 1 | 990.05 | 3.68 | 990.08 | 11.69 | 990.15 | 22.37 | 990.29 |
| 24.99 | 990.31 | 33.05 | 990.36 | 37.91 | 990.27 | 43.73 | 990.21 | 53.4 | 989.87 |
| 54.42 | 989.82 | 55.03 | 989.8 | 65.1 | 989.35 | 72.14 | 989.08 | 75.78 | 988.95 |
| 81.83 | 988.85 | 86.47 | 988.76 | 89.26 | 988.78 | 97.15 | 988.88 | 106.37 | 989.09 |
| 107.83 | 989.12 | 110.26 | 989.18 | 118.51 | 989.35 | 129.2 | 989.49 | 138.69 | 989.49 |
| 139.88 | 989.48 | 140.6 | 989.46 | 157.72 | 989.06 | 161.25 | 988.97 | 167.11 | 988.8 |
| 171.93 | 988.65 | 182.61 | 988.25 | 193.3 | 987.7 | 195.54 | 987.52 | 203.98 | 986.89 |
| 209.06 | 986.68 | 214.66 | 986.33 | 223.96 | 986.31 | 225.34 | 986.32 | 226.18 | 986.32 |
| 236.03 | 986.42 | 243.29 | 986.38 | 246.71 | 986.37 | 257.39 | 986.16 | 260.41 | 986.09 |
| 268.08 | 985.9 | 271.56 | 985.82 | 278.76 | 985.64 | 280.81 | 985.58 | 289.44 | 985.34 |
| 294.85 | 985.13 | 300.12 | 984.89 | 303.58 | 984.78 | 309.24 | 984.6 | 310.81 | 984.54 |
| 311.76 | 984.52 | 321.49 | 984.26 | 328.87 | 984.41 | 332.17 | 984.41 | 337.67 | 984.53 |
| 342.85 | 984.63 | 345.99 | 984.62 | 353.54 | 984.62 | 363.1 | 984.55 | 364.22 | 984.54 |
| 366.08 | 984.53 | 394.51 | 984.46 | 396.27 | 984.45 | 406.95 | 984.44 | 410.68 | 984.46 |
| 414.44 | 984.48 | 417.64 | 984.46 | 422.94 | 984.49 | 428.32 | 984.49 | 431.57 | 984.43 |
| 439 | 984.36 | 448.68 | 983.92 | 449.69 | 983.87 | 451.36 | 983.78 | 460.37 | 983.28 |
| 465.79 | 983.49 | 471.05 | 983.58 | 479.79 | 984.17 | 481.73 | 984.29 | 482.91 | 984.32 |
| 492.42 | 984.61 | 500.02 | 984.72 | 512.61 | 984.87 | 534.25 | 985.04 | 535.15 | 985.04 |
| 536.64 | 985.05 | 545.83 | 985.1 | 556.51 | 985.11 | 567.2 | 984.96 | 568.48 | 984.91 |
| 577.88 | 984.57 | 585.6 | 984.88 | 588.57 | 984.94 | 589.91 | 985.03 | 593.49 | 985.26 |
| 599.25 | 985.62 | 602.72 | 985.72 | 609.93 | 985.99 | 610.11 | 985.99 | 619.83 | 986.19 |
| 620.61 | 986.21 | 621.92 | 986.24 | 631.3 | 986.43 | 636.95 | 986.52 | 641.98 | 986.61 |
| 650.33 | 986.64 | 652.66 | 986.64 | 654.06 | 986.61 | 671.18 | 986.34 | 674.03 | 986.29 |
| 678.76 | 986.35 | 684.71 | 986.45 | 688.29 | 986.56 | 695.39 | 986.76 | 705.4 | 987.11 |
| 706.08 | 987.13 | 707.19 | 987.18 | 716.76 | 987.69 | 722.53 | 988.14 | 727.44 | 988.51 |
| 735.61 | 989.26 | 738.12 | 989.48 | 738.63 | 989.51 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|

0 .032 303.58 .035 610.11 .032

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 410.68 | 512.61 | 200.59 | 199.97 | 211.33 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.45 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.035 | 0.035 | 0.035 |
| W.S. Elev (ft) | 985.24 | Reach Len. (ft) | 200.59 | 199.97 | 211.33 |
| Crit W.S. (ft) | 985.12 | Flow Area (sq ft) | 82.29 | 103.72 | 22.77 |
| E.G. Slope (ft/ft) | 0.008607 | Area (sq ft) | 82.29 | 103.72 | 22.77 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 261.27 | 413.12 | 38.61 |
| Top Width (ft) | 301.29 | Top Width (ft) | 118.74 | 101.93 | 80.62 |
| Vel Total (ft/s) | 3.42 | Avg. Vel. (ft/s) | 3.18 | 3.98 | 1.70 |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | 0.69 | 1.02 | 0.28 |
| Conv. Total (cfs) | 7685.4 | Conv. (cfs) | 2816.2 | 4452.9 | 416.2 |
| Length Wtd. (ft) | 200.86 | Wetted Per. (ft) | 118.77 | 101.99 | 80.64 |
| Min Ch El (ft) | 983.28 | Shear (lb/sq ft) | 0.37 | 0.55 | 0.15 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 1.18 | 2.18 | 0.26 |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 1.46 | 3.80 | 0.57 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.86 | 1.46 | 0.69 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.97 | Element | | | |
| Vel Head (ft) | 0.46 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 985.51 | Reach Len. (ft) | 200.59 | 199.97 | 211.33 |
| Crit W.S. (ft) | 985.37 | Flow Area (sq ft) | | 130.82 | |
| E.G. Slope (ft/ft) | 0.012088 | Area (sq ft) | | 130.82 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 101.93 | Top Width (ft) | | 101.93 | |
| Vel Total (ft/s) | 5.45 | Avg. Vel. (ft/s) | | 5.45 | |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 6485.1 | Conv. (cfs) | | 6485.1 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 103.68 | |
| Min Ch El (ft) | 983.28 | Shear (lb/sq ft) | | 0.95 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.19 | |
| Frctn Loss (ft) | 1.58 | Cum Volume (acre-ft) | | 4.77 | |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | | 1.46 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.97 | Element | | | |
| Vel Head (ft) | 0.46 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 985.51 | Reach Len. (ft) | 200.59 | 199.97 | 211.33 |
| Crit W.S. (ft) | 985.37 | Flow Area (sq ft) | | 130.82 | |
| E.G. Slope (ft/ft) | 0.012088 | Area (sq ft) | | 130.82 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 101.93 | Top Width (ft) | | 101.93 | |
| Vel Total (ft/s) | 5.45 | Avg. Vel. (ft/s) | | 5.45 | |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 6485.1 | Conv. (cfs) | | 6485.1 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 103.68 | |
| Min Ch El (ft) | 983.28 | Shear (lb/sq ft) | | 0.95 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.19 | |
| Frctn Loss (ft) | 1.58 | Cum Volume (acre-ft) | | 4.77 | |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | | 1.46 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.183

INPUT
Description: Thalweg Sta. 349.91
Station Elevation Data num= 91

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 989.95 | 8.46 | 990.04 | 13.99 | 990.05 | 18.8 | 990.08 | 28.08 | 989.99 |
| 29.15 | 989.99 | 39.5 | 989.77 | 49.84 | 989.47 | 56.27 | 989.19 | 60.19 | 989 |
| 70.36 | 988.41 | 70.54 | 988.4 | 71.02 | 988.37 | 80.88 | 987.78 | 84.46 | 987.59 |
| 91.23 | 987.22 | 98.55 | 986.87 | 101.58 | 986.74 | 109.94 | 986.46 | 111.93 | 986.4 |
| 112.64 | 986.38 | 122.27 | 986.19 | 132.62 | 986.01 | 140.84 | 985.84 | 163.66 | 985.41 |
| 194.7 | 984.89 | 197.21 | 984.83 | 205.05 | 984.66 | 211.3 | 984.39 | 215.4 | 984.23 |
| 225.39 | 983.63 | 225.75 | 983.6 | 226.72 | 983.58 | 236.09 | 983.33 | 246.44 | 983.33 |
| 253.58 | 983.35 | 256.79 | 983.35 | 265.66 | 983.4 | 267.14 | 983.4 | 267.68 | 983.41 |
| 277.48 | 983.48 | 281.77 | 983.47 | 282.74 | 983.47 | 287.78 | 983.5 | 295.86 | 983.39 |
| 298.18 | 983.38 | 304.58 | 983.21 | 308.53 | 983.09 | 309.95 | 983.07 | 318.87 | 982.72 |
| 324.05 | 982.67 | 329.22 | 982.53 | 339.57 | 982.46 | 343.51 | 982.51 | 349.91 | 982.55 |
| 352.23 | 982.61 | 360.26 | 982.87 | 366.33 | 982.84 | 370.61 | 982.83 | 380.42 | 982.58 |
| 380.96 | 982.56 | 391.3 | 982.84 | 394.51 | 982.92 | 401.65 | 983.14 | 408.6 | 983.1 |
| 421.36 | 982.99 | 432.69 | 982.99 | 436.79 | 983.04 | 443.04 | 983.16 | 450.89 | 983.41 |
| 453.39 | 983.5 | 460.29 | 983.63 | 463.58 | 983.7 | 463.73 | 983.7 | 464.98 | 983.71 |
| 474.08 | 983.77 | 493.17 | 983.85 | 494.78 | 983.85 | 499.22 | 983.87 | 505.12 | 983.88 |
| 515.47 | 983.84 | 521.36 | 983.69 | 525.82 | 983.59 | 536.16 | 983.16 | 538.14 | 983.13 |
| 546.51 | 983.16 | 549.54 | 983.35 | 549.8 | 983.36 | 552.6 | 983.51 | 556.86 | 983.73 |
| 559.88 | 983.86 | | | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 282.74 | .035 | 549.8 | .032 | 552.6 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 287.78 | 463.58 | 222.27 | 199.85 | 166.33 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 984.14 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.032 | 0.035 | 0.035 |
| W.S. Elev (ft) | 984.01 | Reach Len. (ft) | 222.27 | 199.85 | 166.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 39.01 | 185.57 | 35.32 |
| E.G. Slope (ft/ft) | 0.004908 | Area (sq ft) | 39.01 | 185.57 | 35.32 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 86.47 | 572.14 | 54.39 |
| Top Width (ft) | 340.88 | Top Width (ft) | 68.78 | 175.80 | 96.30 |
| Vel Total (ft/s) | 2.74 | Avg. Vel. (ft/s) | 2.22 | 3.08 | 1.54 |
| Max Chl Dpth (ft) | 1.55 | Hydr. Depth (ft) | 0.57 | 1.06 | 0.37 |
| Conv. Total (cfs) | 10177.3 | Conv. (cfs) | 1234.2 | 8166.6 | 776.4 |
| Length Wtd. (ft) | 199.88 | Wetted Per. (ft) | 68.80 | 175.84 | 96.49 |
| Min Ch El (ft) | 982.46 | Shear (lb/sq ft) | 0.17 | 0.32 | 0.11 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.39 | 1.00 | 0.17 |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | 1.18 | 3.14 | 0.43 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.43 | 0.82 | 0.26 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 984.31 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 984.12 | Reach Len. (ft) | 222.27 | 199.85 | 166.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 204.52 | |
| E.G. Slope (ft/ft) | 0.005556 | Area (sq ft) | | 204.52 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 175.80 | Top Width (ft) | | 175.80 | |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.49 | |
| Max Chl Dpth (ft) | 1.66 | Hydr. Depth (ft) | | 1.16 | |
| Conv. Total (cfs) | 9565.5 | Conv. (cfs) | | 9565.5 | |
| Length Wtd. (ft) | 199.85 | Wetted Per. (ft) | | 176.88 | |
| Min Ch El (ft) | 982.46 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.40 | |
| Frctn Loss (ft) | 0.72 | Cum Volume (acre-ft) | | 4.00 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 0.82 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 984.31 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 984.12 | Reach Len. (ft) | 222.27 | 199.85 | 166.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 204.52 | |
| E.G. Slope (ft/ft) | 0.005556 | Area (sq ft) | | 204.52 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 175.80 | Top Width (ft) | | 175.80 | |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.49 | |
| Max Chl Dpth (ft) | 1.66 | Hydr. Depth (ft) | | 1.16 | |
| Conv. Total (cfs) | 9565.5 | Conv. (cfs) | | 9565.5 | |
| Length Wtd. (ft) | 199.85 | Wetted Per. (ft) | | 176.88 | |
| Min Ch El (ft) | 982.46 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.40 | |
| Frctn Loss (ft) | 0.72 | Cum Volume (acre-ft) | | 4.00 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 0.82 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 2 RS: 4.145

INPUT
Description: Thalweg Sta. 325.29
Station Elevation Data num= 65

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 985.93 | 2.84 | 985.93 | 15.69 | 985.85 | 15.91 | 985.84 | 28.63 | 985.36 |
| 31.52 | 985.19 | 41.53 | 984.49 | 47.36 | 984.07 | 54.43 | 983.77 | 63.19 | 983.43 |
| 67.33 | 983.36 | 79.03 | 983.7 | 80.22 | 983.74 | 93.12 | 984.03 | 94.86 | 984.02 |
| 106.02 | 983.86 | 110.69 | 983.66 | 118.92 | 983.21 | 131.82 | 982.3 | 142.36 | 982.09 |
| 144.72 | 982.07 | 157.61 | 982.37 | 157.87 | 982.38 | 158.19 | 982.39 | 170.51 | 982.64 |
| 174.02 | 982.69 | 183.41 | 982.8 | 189.86 | 982.85 | 196.31 | 982.88 | 205.69 | 982.9 |
| 222.1 | 982.89 | 235 | 982.84 | 237.36 | 982.82 | 247.9 | 982.76 | 273.7 | 982.56 |
| 277.85 | 982.46 | 284.86 | 982.29 | 286.59 | 982.2 | 287 | 982.16 | 294.23 | 981.41 |
| 299.49 | 980.88 | 300.69 | 980.83 | 312.39 | 980.96 | 316.52 | 981.02 | 325.29 | 981.19 |
| 332.36 | 981.48 | 338.19 | 981.83 | 348.19 | 982.31 | 351.09 | 982.37 | 363.82 | 982.22 |
| 364.02 | 982.22 | 376.88 | 981.34 | 379.85 | 981.4 | 389.78 | 982.28 | 395.69 | 982.58 |
| 402.68 | 982.64 | 404.64 | 982.57 | 411.53 | 982.31 | 415.58 | 982.15 | 427.35 | 982.14 |
| 428.47 | 982.18 | 441.37 | 983 | 443.19 | 983.08 | 454.27 | 983.31 | 457.74 | 983.34 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .032 | 287 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 222.1 | 404.64 | 0 | 0 | 10036.89 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.032 | 0.035 | 0.035 |
| W.S. Elev (ft) | 983.05 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 43.80 | 179.73 | 25.11 |
| E.G. Slope (ft/ft) | 0.004615 | Area (sq ft) | 43.80 | 179.73 | 25.11 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 79.19 | 578.76 | 55.05 |
| Top Width (ft) | 321.29 | Top Width (ft) | 100.90 | 182.54 | 37.85 |
| Vel Total (ft/s) | 2.87 | Avg. Vel. (ft/s) | 1.81 | 3.22 | 2.19 |
| Max Chl Dpth (ft) | 2.22 | Hydr. Depth (ft) | 0.43 | 0.98 | 0.66 |
| Conv. Total (cfs) | 10495.5 | Conv. (cfs) | 1165.8 | 8519.4 | 810.3 |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | 100.94 | 182.73 | 37.89 |
| Min Ch El (ft) | 980.83 | Shear (lb/sq ft) | 0.13 | 0.28 | 0.19 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 0.23 | 0.91 | 0.42 |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 0.97 | 2.30 | 0.32 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.57 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 983.45 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |

| | | | |
|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | 253.16 |
| E.G. Slope (ft/ft) | 0.002499 | Area (sq ft) | 253.16 |
| Q Total (cfs) | 713.00 | Flow (cfs) | 713.00 |
| Top Width (ft) | 182.54 | Top Width (ft) | 182.54 |
| Vel Total (ft/s) | 2.82 | Avg. Vel. (ft/s) | 2.82 |
| Max Chl Dpth (ft) | 2.62 | Hydr. Depth (ft) | 1.39 |
| Conv. Total (cfs) | 14263.1 | Conv. (cfs) | 14263.1 |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | 184.17 |
| Min Ch El (ft) | 980.83 | Shear (lb/sq ft) | 0.21 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.60 |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 2.95 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.57 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 983.45 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 253.15 | |
| E.G. Slope (ft/ft) | 0.002499 | Area (sq ft) | | 253.15 | |
| Q Total (cfs) | 713.00 | Flow (cfs) | | 713.00 | |
| Top Width (ft) | 182.54 | Top Width (ft) | | 182.54 | |
| Vel Total (ft/s) | 2.82 | Avg. Vel. (ft/s) | | 2.82 | |
| Max Chl Dpth (ft) | 2.62 | Hydr. Depth (ft) | | 1.39 | |
| Conv. Total (cfs) | 14262.2 | Conv. (cfs) | | 14262.2 | |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | | 184.17 | |
| Min Ch El (ft) | 980.83 | Shear (lb/sq ft) | | 0.21 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.60 | |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | | 2.95 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 4.072

INPUT
Description: Thalweg Sta. 586.26 - Discharge from A2-100y6hr.out HEC-1 model -
Combination of Sta. E2&E1 - 1485 CFS
Station Elevation Data num= 147

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 986.16 | 6.19 | 985.94 | 13.09 | 985.69 | 18.08 | 985.54 | 19.61 | 985.52 |
| 28.35 | 985.35 | 33.02 | 985.35 | 38.62 | 985.32 | 48.89 | 985.41 | 56.88 | 985.5 |
| 59.16 | 985.52 | 59.86 | 985.51 | 69.43 | 985.5 | 73.28 | 985.42 | 79.71 | 985.34 |
| 86.7 | 985.12 | 89.98 | 985.05 | 100.11 | 984.57 | 100.25 | 984.56 | 100.68 | 984.54 |
| 110.52 | 984.01 | 113.53 | 983.91 | 120.79 | 983.63 | 126.95 | 983.52 | 131.06 | 983.43 |
| 133.61 | 983.41 | 141.33 | 983.47 | 141.93 | 983.48 | 144.48 | 983.53 | 151.6 | 983.7 |
| 161.88 | 983.84 | 167.21 | 983.87 | 180.62 | 983.9 | 182.42 | 983.88 | 188.28 | 983.87 |
| 192.69 | 983.85 | 194.04 | 983.82 | 202.96 | 983.67 | 207.46 | 983.52 | 213.23 | 983.34 |
| 220.87 | 983 | 223.5 | 982.89 | 232.08 | 982.37 | 233.77 | 982.25 | 234.3 | 982.19 |
| 244.05 | 981.2 | 247.71 | 980.82 | 254.32 | 980.1 | 261.13 | 979.87 | 264.59 | 979.63 |
| 274.55 | 980.12 | 274.86 | 980.14 | 275.88 | 980.19 | 285.13 | 980.67 | 287.97 | 980.75 |
| 295.4 | 981.02 | 305.67 | 981.26 | 315.94 | 981.36 | 319.67 | 981.38 | 326.22 | 981.43 |
| 328.22 | 981.46 | 336.49 | 981.55 | 346.76 | 981.69 | 355.06 | 981.78 | 357.03 | 981.81 |
| 363.48 | 981.86 | 367.3 | 981.88 | 368.47 | 981.89 | 377.57 | 981.93 | 395.31 | 981.97 |
| 398.12 | 981.98 | 408.73 | 981.97 | 439.2 | 981.81 | 448.98 | 981.79 | 449.54 | 981.79 |
| 459.74 | 981.78 | 462.4 | 981.75 | 470.01 | 981.68 | 475.82 | 981.58 | 490.58 | 981.39 |
| 490.8 | 981.38 | 491.2 | 981.38 | 501.4 | 981.3 | 506.58 | 981.27 | 512.01 | 981.33 |
| 514.41 | 981.32 | 521.21 | 981.49 | 522.62 | 981.51 | 533.22 | 981.52 | 534.15 | 981.5 |
| 539.8 | 981.39 | 543.83 | 981.34 | 551.2 | 981.12 | 554.43 | 981 | 556.21 | 980.87 |
| 565.04 | 980.25 | 586.26 | 978.3 | 589.02 | 978.18 | 596.86 | 977.73 | 605.42 | 977.74 |
| 611.2 | 977.71 | 618.08 | 977.74 | 621.83 | 978.01 | 628.68 | 978.83 | 638.24 | 979.85 |
| 639.29 | 979.96 | 641.2 | 980.07 | 649.89 | 980.52 | 654.65 | 980.59 | 660.5 | 980.81 |
| 663.2 | 980.85 | 667.48 | 980.92 | 671.06 | 980.97 | 671.21 | 980.97 | 681.72 | 981.54 |
| 687.47 | 980.99 | 692.32 | 980.99 | 701.2 | 980.94 | 702.93 | 981.07 | 703.87 | 981.04 |
| 713.54 | 981.63 | 720.28 | 982.23 | 724.14 | 982.56 | 731.21 | 983.08 | 734.75 | 983.33 |
| 736.69 | 983.41 | 745.35 | 983.87 | 753.1 | 984.16 | 755.96 | 984.26 | 761.2 | 984.35 |
| 769.51 | 984.55 | 777.18 | 984.76 | 787.78 | 985.26 | 791.21 | 985.51 | 798.39 | 986.18 |
| 802.31 | 986.59 | 809 | 987.24 | 818.72 | 987.88 | 819.6 | 987.92 | 821.21 | 987.93 |
| 830.21 | 988.08 | 835.13 | 987.93 | 840.81 | 987.83 | 851.21 | 987.16 | 851.42 | 987.14 |
| 851.54 | 987.12 | 854.65 | 986.48 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 449.54 | .035 | 667.48 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 533.22 | 663.2 | 177.48 | 199.89 | 232.13 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 982.14 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.033 | 0.035 | 0.032 |
| W.S. Elev (ft) | 981.98 | Reach Len. (ft) | 177.48 | 199.89 | 232.13 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 166.51 | 321.29 | 43.57 |
| E.G. Slope (ft/ft) | 0.002098 | Area (sq ft) | 166.51 | 321.29 | 43.57 |
| Q Total (cfs) | 1485.00 | Flow (cfs) | 264.79 | 1140.65 | 79.56 |
| Top Width (ft) | 481.10 | Top Width (ft) | 296.85 | 129.98 | 54.27 |
| Vel Total (ft/s) | 2.79 | Avg. Vel. (ft/s) | 1.59 | 3.55 | 1.83 |
| Max Chl Dpth (ft) | 4.27 | Hydr. Depth (ft) | 0.56 | 2.47 | 0.80 |
| Conv. Total (cfs) | 32418.0 | Conv. (cfs) | 5780.4 | 24900.8 | 1736.8 |
| Length Wtd. (ft) | 195.89 | Wetted Per. (ft) | 297.01 | 130.26 | 54.35 |
| Min Ch El (ft) | 977.71 | Shear (lb/sq ft) | 0.07 | 0.32 | 0.11 |
| Alpha | 1.32 | Stream Power (lb/ft s) | 0.12 | 1.15 | 0.19 |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 107.97 | 171.70 | 107.51 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 110.81 | 85.62 | 129.76 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 982.73 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 982.50 | Reach Len. (ft) | 177.48 | 199.89 | 232.13 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 389.27 | |
| E.G. Slope (ft/ft) | 0.001927 | Area (sq ft) | | 389.27 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 129.98 | Top Width (ft) | | 129.98 | |
| Vel Total (ft/s) | 3.81 | Avg. Vel. (ft/s) | | 3.81 | |
| Max Chl Dpth (ft) | 4.79 | Hydr. Depth (ft) | | 2.99 | |
| Conv. Total (cfs) | 33832.8 | Conv. (cfs) | | 33832.8 | |
| Length Wtd. (ft) | 199.89 | Wetted Per. (ft) | | 132.89 | |
| Min Ch El (ft) | 977.71 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.34 | |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 14.87 | 224.72 | 18.58 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 7.32 | 90.31 | 9.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 982.73 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 982.50 | Reach Len. (ft) | 177.48 | 199.89 | 232.13 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 389.20 | |
| E.G. Slope (ft/ft) | 0.001928 | Area (sq ft) | | 389.20 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 129.98 | Top Width (ft) | | 129.98 | |
| Vel Total (ft/s) | 3.82 | Avg. Vel. (ft/s) | | 3.82 | |
| Max Chl Dpth (ft) | 4.79 | Hydr. Depth (ft) | | 2.99 | |
| Conv. Total (cfs) | 33823.8 | Conv. (cfs) | | 33823.8 | |
| Length Wtd. (ft) | 199.89 | Wetted Per. (ft) | | 132.89 | |
| Min Ch El (ft) | 977.71 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.34 | |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 38.96 | 201.31 | 37.28 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 24.58 | 88.53 | 27.72 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 4.034

INPUT
Description: Thalweg Sta. 580.06
Station Elevation Data num= 203

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 986.13 | 6.43 | 985.89 | 7.05 | 985.87 | 16.2 | 985.56 | 16.44 | 985.55 |
| 25.84 | 985.34 | 26.48 | 985.33 | 35.23 | 985.22 | 36.5 | 985.21 | 44.62 | 985.12 |
| 46.52 | 985.09 | 54.01 | 984.99 | 63.41 | 984.84 | 66.57 | 984.8 | 76.59 | 984.65 |
| 82.19 | 984.53 | 91.66 | 984.25 | 100.99 | 984.05 | 106.66 | 983.88 | 110.38 | 983.79 |
| 126.7 | 983.36 | 129.16 | 983.29 | 136.73 | 983.13 | 138.56 | 983.11 | 146.75 | 982.96 |
| 147.95 | 982.97 | 156.77 | 982.94 | 157.34 | 982.96 | 165.91 | 983.13 | 166.73 | 983.15 |
| 166.79 | 983.15 | 176.13 | 983.41 | 176.82 | 983.42 | 185.52 | 983.58 | 186.84 | 983.6 |
| 194.92 | 983.54 | 196.86 | 983.54 | 204.32 | 983.34 | 206.88 | 983.28 | 213.71 | 982.99 |
| 216.9 | 982.87 | 226.93 | 982.21 | 232.49 | 981.72 | 236.95 | 981.37 | 241.89 | 980.97 |
| 246.97 | 980.59 | 256.99 | 979.94 | 260.67 | 979.74 | 267.02 | 979.38 | 270.06 | 979.29 |
| 277.04 | 979.03 | 279.46 | 979.14 | 287.06 | 979.35 | 288.86 | 979.47 | 297.08 | 980.06 |
| 298.25 | 980.11 | 307.11 | 980.6 | 315.63 | 980.76 | 317.04 | 980.78 | 317.13 | 980.78 |
| 327.15 | 980.77 | 335.82 | 980.7 | 337.17 | 980.68 | 345.21 | 980.64 | 347.2 | 980.62 |
| 354.61 | 980.65 | 357.22 | 980.67 | 364 | 980.74 | 367.24 | 980.79 | 387.29 | 981.01 |
| 392.19 | 981.07 | 397.31 | 981.12 | 401.58 | 981.17 | 403.75 | 981.19 | 407.33 | 981.23 |
| 410.97 | 981.26 | 417.35 | 981.33 | 420.36 | 981.34 | 427.38 | 981.4 | 429.76 | 981.4 |
| 437.4 | 981.43 | 447.42 | 981.43 | 448.54 | 981.42 | 457.44 | 981.39 | 457.93 | 981.39 |
| 465.34 | 981.34 | 467.33 | 981.32 | 467.47 | 981.32 | 476.73 | 981.24 | 477.49 | 981.24 |
| 486.12 | 981.16 | 495.51 | 981.09 | 497.53 | 981.08 | 504.91 | 981.06 | 507.55 | 981.06 |
| 510.62 | 981.05 | 517.58 | 981.03 | 523.69 | 980.96 | 527.6 | 980.93 | 533.08 | 980.8 |
| 537.62 | 980.72 | 547.64 | 980.37 | 551.87 | 980.09 | 557.67 | 979.68 | 567.69 | 978.34 |
| 570.66 | 978.03 | 577.71 | 977.34 | 580.06 | 977.29 | 587.73 | 977.17 | 589.45 | 977.22 |
| 597.76 | 977.49 | 598.84 | 977.59 | 607.78 | 978.43 | 608.24 | 978.48 | 617.63 | 979.54 |
| 617.8 | 979.56 | 627.02 | 980.4 | 627.82 | 980.47 | 636.41 | 981.02 | 637.85 | 981.1 |
| 645.81 | 981.44 | 647.87 | 981.51 | 648.8 | 981.53 | 655.2 | 981.7 | 657.89 | 981.75 |
| 664.59 | 981.82 | 666.07 | 981.83 | 667.91 | 981.85 | 673.99 | 981.79 | 677.93 | 981.78 |
| 683.39 | 981.7 | 687.96 | 981.69 | 692.78 | 981.67 | 697.98 | 981.68 | 702.17 | 981.78 |
| 708 | 981.83 | 711.56 | 981.98 | 718.02 | 982.14 | 720.96 | 982.27 | 730.35 | 982.59 |
| 738.07 | 982.53 | 739.74 | 982.47 | 749.13 | 981.65 | 758.11 | 981.66 | 758.54 | 981.6 |
| 767.93 | 981.51 | 768.14 | 981.52 | 777.32 | 981.85 | 778.16 | 981.89 | 786.71 | 982.72 |
| 788.18 | 982.8 | 796.11 | 983.3 | 798.2 | 983.37 | 805.5 | 983.78 | 808.23 | 983.83 |
| 814.89 | 984.02 | 824.28 | 984.05 | 828.27 | 984 | 833.68 | 983.97 | 843.07 | 983.89 |
| 848.32 | 983.83 | 852.46 | 983.77 | 868.36 | 983.46 | 878.38 | 983.39 | 888.41 | 983.47 |
| 890.04 | 983.53 | 898.43 | 983.85 | 899.43 | 983.94 | 908.45 | 986.06 | 908.83 | 986.2 |
| 914.47 | 988.35 | 918.47 | 989.86 | 927.61 | 991.27 | 928.49 | 991.35 | 937 | 991.88 |
| 938.52 | 991.93 | 946.4 | 992.06 | 948.54 | 992.09 | 955.8 | 991.97 | 965.19 | 991.77 |
| 968.58 | 991.68 | 974.58 | 991.65 | 978.61 | 991.64 | 988.63 | 991.92 | 998.65 | 992.11 |
| 1002.76 | 992.05 | 1008.67 | 991.99 | 1012.16 | 991.91 | 1021.55 | 991.75 | 1028.72 | 991.67 |
| 1030.94 | 991.63 | 1038.74 | 991.57 | 1040.33 | 991.52 | 1048.76 | 991.43 | 1049.74 | 991.38 |
| 1058.79 | 991.18 | 1059.13 | 991.15 | 1064.19 | 991 | 1068.52 | 990.85 | 1068.81 | 990.85 |
| 1077.91 | 990.41 | 1078.83 | 990.4 | 1079.53 | 990.36 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 403.75 | .035 | 648.8 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 537.62 | 666.07 | 199.58 | 200 | 201.88 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 981.53 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.032 | 0.035 | |
| W.S. Elev (ft) | 981.23 | Reach Len. (ft) | 199.58 | 200.00 | 201.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 145.79 | 226.42 | |
| E.G. Slope (ft/ft) | 0.004660 | Area (sq ft) | 145.79 | 226.42 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | 380.44 | 1104.56 | |
| Top Width (ft) | 331.69 | Top Width (ft) | 228.35 | 103.34 | |
| Vel Total (ft/s) | 3.99 | Avg. Vel. (ft/s) | 2.61 | 4.88 | |
| Max Chl Dpth (ft) | 4.06 | Hydr. Depth (ft) | 0.64 | 2.19 | |
| Conv. Total (cfs) | 21753.2 | Conv. (cfs) | 5572.9 | 16180.3 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | 228.47 | 103.68 | |
| Min Ch El (ft) | 977.17 | Shear (lb/sq ft) | 0.19 | 0.64 | |
| Alpha | 1.22 | Stream Power (lb/ft s) | 0.48 | 3.10 | |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 107.34 | 170.44 | 107.40 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 109.74 | 85.09 | 129.62 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 982.11 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.47 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 981.65 | Reach Len. (ft) | 199.58 | 200.00 | 201.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 271.34 | |

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.005150 | Area (sq ft) | | 271.34 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 115.54 | Top Width (ft) | | 115.54 | |
| Vel Total (ft/s) | 5.47 | Avg. Vel. (ft/s) | | 5.47 | |
| Max Chl Dpth (ft) | 4.48 | Hydr. Depth (ft) | | 2.35 | |
| Conv. Total (cfs) | 20692.6 | Conv. (cfs) | | 20692.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 116.82 | |
| Min Ch El (ft) | 977.17 | Shear (lb/sq ft) | | 0.75 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.09 | |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 14.87 | 223.21 | 18.58 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 7.32 | 89.75 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 982.11 | Element | | | |
| Vel Head (ft) | 0.47 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 981.64 | Reach Len. (ft) | 199.58 | 200.00 | 201.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 271.22 | |
| E.G. Slope (ft/ft) | 0.005157 | Area (sq ft) | | 271.22 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 115.50 | Top Width (ft) | | 115.50 | |
| Vel Total (ft/s) | 5.48 | Avg. Vel. (ft/s) | | 5.48 | |
| Max Chl Dpth (ft) | 4.47 | Hydr. Depth (ft) | | 2.35 | |
| Conv. Total (cfs) | 20678.0 | Conv. (cfs) | | 20678.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 116.78 | |
| Min Ch El (ft) | 977.17 | Shear (lb/sq ft) | | 0.75 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.09 | |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 38.96 | 199.79 | 37.28 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 24.58 | 87.97 | 27.72 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.996

INPUT
Description: Thalweg Sta. 570.86
Station Elevation Data num= 174

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 984.07 | .93 | 984.03 | 6.15 | 983.84 | 10.28 | 983.66 | 16.17 | 983.42 |
| 26.2 | 983.19 | 28.97 | 983.17 | 36.23 | 983.18 | 46.25 | 983.13 | 47.65 | 983.12 |
| 56.28 | 982.99 | 56.99 | 982.99 | 66.31 | 982.84 | 66.72 | 982.84 | 75.68 | 982.77 |
| 76.33 | 982.76 | 85.02 | 982.75 | 86.36 | 982.73 | 94.36 | 982.71 | 96.39 | 982.69 |
| 103.71 | 982.67 | 106.41 | 982.64 | 113.05 | 982.63 | 116.44 | 982.61 | 126.47 | 982.53 |
| 131.74 | 982.43 | 136.49 | 982.38 | 141.08 | 982.31 | 156.55 | 982.2 | 166.57 | 982.1 |
| 169.11 | 982.09 | 176.6 | 982.01 | 178.46 | 982.01 | 186.63 | 981.99 | 187.79 | 982 |
| 196.66 | 982.03 | 197.14 | 982.04 | 206.48 | 982.07 | 206.68 | 982.07 | 215.83 | 982.06 |
| 216.71 | 982.05 | 225.17 | 982.01 | 226.74 | 981.99 | 234.51 | 981.94 | 236.76 | 981.92 |
| 243.85 | 981.83 | 246.79 | 981.8 | 253.2 | 981.64 | 256.82 | 981.56 | 262.54 | 981.2 |
| 266.84 | 980.97 | 271.89 | 980.57 | 281.22 | 979.87 | 286.9 | 979.43 | 290.57 | 979.21 |
| 296.92 | 978.79 | 299.91 | 978.69 | 306.95 | 978.41 | 316.98 | 978.63 | 318.6 | 978.72 |
| 327 | 979.21 | 337.03 | 979.63 | 337.28 | 979.64 | 346.62 | 979.83 | 347.06 | 979.84 |
| 355.97 | 979.9 | 357.08 | 979.91 | 365.32 | 979.9 | 367.11 | 979.89 | 367.5 | 979.89 |
| 387.16 | 979.83 | 397.19 | 979.83 | 402.68 | 979.88 | 407.22 | 979.93 | 412.03 | 980.03 |
| 427.27 | 980.37 | 430.71 | 980.36 | 437.3 | 980.38 | 447.32 | 980.2 | 449.4 | 980.24 |
| 457.35 | 980.3 | 458.74 | 980.34 | 467.38 | 980.63 | 468.09 | 980.63 | 477.4 | 980.7 |
| 477.77 | 980.69 | 486.77 | 980.57 | 496.11 | 980.42 | 497.46 | 980.41 | 504.61 | 980.27 |
| 505.46 | 980.25 | 507.48 | 980.21 | 517.51 | 979.99 | 520.65 | 979.9 | 537.56 | 979.51 |
| 547.59 | 979.2 | 553.11 | 978.78 | 557.62 | 978.47 | 563.92 | 977.72 | 567.64 | 977.26 |
| 570.86 | 977.11 | 577.67 | 976.75 | 580.2 | 976.78 | 587.7 | 976.84 | 589.54 | 976.93 |
| 597.73 | 977.32 | 598.89 | 977.37 | 607.75 | 977.83 | 608.23 | 977.85 | 614.79 | 978.01 |
| 617.58 | 978.07 | 617.78 | 978.08 | 626.91 | 978.5 | 627.81 | 978.55 | 636.26 | 979.16 |
| 637.83 | 979.27 | 645.45 | 979.52 | 645.6 | 979.53 | 647.86 | 979.6 | 654.95 | 979.51 |
| 657.89 | 979.49 | 667.91 | 979.33 | 673.64 | 979.41 | 677.94 | 979.42 | 682.97 | 979.64 |
| 684.62 | 979.7 | 687.97 | 979.81 | 697.99 | 980.29 | 701.66 | 980.42 | 708.02 | 980.67 |
| 711.01 | 980.71 | 718.05 | 980.9 | 720.35 | 980.92 | 728.07 | 981.04 | 729.69 | 981.07 |
| 738.1 | 981.24 | 739.03 | 981.27 | 748.13 | 981.52 | 748.38 | 981.53 | 757.72 | 981.67 |
| 758.15 | 981.68 | 758.65 | 981.67 | 768.18 | 981.6 | 769.47 | 981.61 | 778.21 | 981.61 |
| 780.29 | 981.65 | 788.23 | 981.78 | 795.09 | 981.93 | 798.26 | 982.01 | 804.44 | 982.09 |
| 808.29 | 982.13 | 813.78 | 982.2 | 818.31 | 982.27 | 828.34 | 982.54 | 832.46 | 982.6 |
| 838.37 | 982.64 | 841.81 | 982.52 | 848.39 | 982.27 | 851.15 | 982.18 | 858.42 | 981.97 |
| 860.5 | 981.93 | 868.45 | 981.83 | 877.66 | 981.78 | 878.47 | 981.77 | 888.47 | 981.88 |
| 888.82 | 981.88 | 898.53 | 982.03 | 907.21 | 982.04 | 908.55 | 982.05 | 916.56 | 981.85 |
| 918.58 | 981.83 | 925.89 | 982.59 | 928.61 | 983.33 | 932.73 | 985.53 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 367.5 | .035 | 645.45 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 477.4 | 647.86 | 201.85 | 200 | 199.82 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 980.48 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.032 | 0.035 | 0.032 |
| W.S. Elev (ft) | 980.19 | Reach Len. (ft) | 201.85 | 200.00 | 199.82 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 92.73 | 239.72 | 29.39 |
| E.G. Slope (ft/ft) | 0.005981 | Area (sq ft) | 92.73 | 239.72 | 29.39 |
| Q Total (cfs) | 1485.00 | Flow (cfs) | 274.64 | 1134.27 | 76.09 |
| Top Width (ft) | 329.41 | Top Width (ft) | 142.09 | 139.34 | 47.99 |
| Vel Total (ft/s) | 4.10 | Avg. Vel. (ft/s) | 2.96 | 4.73 | 2.59 |
| Max Chl Dpth (ft) | 3.44 | Hydr. Depth (ft) | 0.65 | 1.72 | 0.61 |
| Conv. Total (cfs) | 19201.4 | Conv. (cfs) | 3551.2 | 14666.3 | 983.9 |
| Length Wtd. (ft) | 200.58 | Wetted Per. (ft) | 142.18 | 139.54 | 48.00 |
| Min Ch El (ft) | 976.75 | Shear (lb/sq ft) | 0.24 | 0.64 | 0.23 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.72 | 3.04 | 0.59 |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 106.79 | 169.37 | 107.33 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 108.89 | 84.53 | 129.51 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 981.22 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 980.96 | Reach Len. (ft) | 201.85 | 200.00 | 199.82 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 362.82 | |
| E.G. Slope (ft/ft) | 0.003409 | Area (sq ft) | | 362.82 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 170.46 | Top Width (ft) | | 170.46 | |
| Vel Total (ft/s) | 4.09 | Avg. Vel. (ft/s) | | 4.09 | |
| Max Chl Dpth (ft) | 4.21 | Hydr. Depth (ft) | | 2.13 | |
| Conv. Total (cfs) | 25433.3 | Conv. (cfs) | | 25433.3 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 172.28 | |
| Min Ch El (ft) | 976.75 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.83 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 14.87 | 221.75 | 18.58 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 7.32 | 89.09 | 9.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 981.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 980.95 | Reach Len. (ft) | 201.85 | 200.00 | 199.82 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 360.84 | |
| E.G. Slope (ft/ft) | 0.003472 | Area (sq ft) | | 360.84 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 170.46 | Top Width (ft) | | 170.46 | |
| Vel Total (ft/s) | 4.12 | Avg. Vel. (ft/s) | | 4.12 | |
| Max Chl Dpth (ft) | 4.20 | Hydr. Depth (ft) | | 2.12 | |
| Conv. Total (cfs) | 25203.5 | Conv. (cfs) | | 25203.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 172.26 | |
| Min Ch El (ft) | 976.75 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.87 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 38.96 | 198.34 | 37.28 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 24.58 | 87.31 | 27.72 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.958

INPUT
Description: Thalweg Sta. 511.69
Station Elevation Data num= 164

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 982.1 | 1.12 | 982.08 | 11.13 | 981.93 | 27.56 | 981.84 | 31.15 | 981.83 |
| 37.12 | 981.79 | 41.17 | 981.79 | 46.68 | 981.8 | 56.24 | 981.87 | 65.8 | 981.99 |
| 71.2 | 982.07 | 81.21 | 982.2 | 91.22 | 982.29 | 94.48 | 982.31 | 101.23 | 982.33 |
| 104.04 | 982.33 | 111.24 | 982.25 | 113.6 | 982.26 | 121.26 | 982.31 | 123.16 | 982.3 |
| 132.72 | 982.36 | 141.28 | 982.39 | 142.28 | 982.39 | 151.29 | 982.44 | 151.84 | 982.45 |
| 161.3 | 982.5 | 163.44 | 982.5 | 170.96 | 982.49 | 171.31 | 982.49 | 180.51 | 982.4 |
| 181.32 | 982.39 | 190.07 | 982.23 | 191.33 | 982.21 | 199.63 | 982.03 | 201.34 | 981.99 |
| 203.23 | 981.96 | 221.37 | 981.59 | 228.31 | 981.42 | 231.38 | 981.35 | 237.88 | 981.04 |
| 241.39 | 980.89 | 247.44 | 980.38 | 257 | 979.6 | 261.41 | 979.2 | 266.56 | 978.99 |
| 271.42 | 978.73 | 274.49 | 978.68 | 276.12 | 978.65 | 281.43 | 978.51 | 285.67 | 978.37 |
| 291.44 | 978.31 | 295.23 | 978.1 | 301.46 | 977.91 | 304.79 | 977.82 | 311.47 | 977.31 |
| 314.35 | 977.33 | 321.48 | 977.42 | 331.49 | 977.58 | 333.47 | 977.59 | 341.5 | 977.73 |
| 343.03 | 977.74 | 351.51 | 977.88 | 361.52 | 977.98 | 362.15 | 977.98 | 371.53 | 977.95 |
| 371.71 | 977.95 | 381.28 | 977.83 | 381.55 | 977.83 | 390.83 | 977.75 | 391.56 | 977.74 |
| 400.39 | 977.69 | 401.57 | 977.68 | 409.95 | 977.75 | 411.58 | 977.74 | 419.51 | 977.81 |
| 421.59 | 977.82 | 429.07 | 977.97 | 431.6 | 977.99 | 438.63 | 978.3 | 441.61 | 978.38 |
| 442.47 | 978.42 | 448.19 | 978.65 | 451.62 | 978.78 | 457.75 | 978.86 | 461.63 | 978.97 |
| 467.31 | 978.9 | 471.65 | 978.9 | 476.87 | 978.63 | 481.66 | 978.42 | 486.43 | 978.01 |
| 491.67 | 977.61 | 501.68 | 976.73 | 505.54 | 976.57 | 511.69 | 976.36 | 521.7 | 976.51 |
| 524.66 | 976.59 | 531.71 | 976.77 | 534.23 | 976.86 | 541.72 | 977.11 | 543.79 | 977.15 |
| 551.73 | 977.34 | 553.35 | 977.37 | 561.75 | 977.58 | 562.91 | 977.64 | 571.76 | 978.13 |
| 572.47 | 978.16 | 581.77 | 978.5 | 582.03 | 978.5 | 586.2 | 978.58 | 587.44 | 978.6 |
| 591.58 | 978.68 | 591.78 | 978.68 | 596.59 | 978.75 | 601.14 | 978.81 | 601.79 | 978.82 |
| 611.8 | 978.81 | 620.26 | 978.7 | 629.82 | 978.64 | 631.82 | 978.64 | 639.38 | 978.66 |
| 641.84 | 978.67 | 644.53 | 978.69 | 651.85 | 978.72 | 655.04 | 978.75 | 661.86 | 978.8 |
| 668.06 | 978.87 | 671.87 | 978.92 | 677.63 | 979.1 | 681.88 | 979.21 | 686.57 | 979.4 |
| 691.89 | 979.64 | 697.07 | 979.86 | 706.3 | 980.3 | 711.91 | 980.53 | 715.86 | 980.58 |
| 721.92 | 980.73 | 728.59 | 980.71 | 731.94 | 980.69 | 739.09 | 980.56 | 741.95 | 980.52 |
| 744.54 | 980.5 | 751.96 | 980.42 | 754.1 | 980.44 | 761.97 | 980.46 | 763.66 | 980.44 |
| 771.98 | 980.38 | 773.22 | 980.36 | 781.99 | 980.2 | 782.78 | 980.18 | 792 | 980 |
| 799.45 | 979.97 | 802.01 | 979.97 | 811.45 | 980.04 | 821.01 | 980.21 | 822.04 | 980.23 |
| 830.58 | 980.49 | 832.05 | 980.54 | 840.14 | 980.94 | 842.06 | 981.04 | 849.7 | 981.71 |
| 852.07 | 981.9 | 859.26 | 985.01 | 862.08 | 986.27 | 865.89 | 986.79 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 274.49 | .035 | 586.2 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 461.63 | 611.8 | 189.16 | 199.97 | 208.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.22 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.035 | 0.035 | 0.032 |
| W.S. Elev (ft) | 978.99 | Reach Len. (ft) | 189.16 | 199.97 | 208.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 194.96 | 185.80 | 15.76 |
| E.G. Slope (ft/ft) | 0.006410 | Area (sq ft) | 194.96 | 185.80 | 15.76 |
| Q Total (cfs) | 1485.00 | Flow (cfs) | 673.95 | 787.63 | 23.43 |
| Top Width (ft) | 407.59 | Top Width (ft) | 195.09 | 150.17 | 62.33 |
| Vel Total (ft/s) | 3.75 | Avg. Vel. (ft/s) | 3.46 | 4.24 | 1.49 |
| Max Chl Dpth (ft) | 2.63 | Hydr. Depth (ft) | 1.00 | 1.24 | 0.25 |
| Conv. Total (cfs) | 18548.7 | Conv. (cfs) | 8418.1 | 9838.0 | 292.6 |
| Length Wtd. (ft) | 197.67 | Wetted Per. (ft) | 195.15 | 150.30 | 62.34 |
| Min Ch El (ft) | 976.36 | Shear (lb/sq ft) | 0.40 | 0.49 | 0.10 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 1.38 | 2.10 | 0.15 |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 106.12 | 168.40 | 107.22 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 108.11 | 83.87 | 129.26 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.93 | Element | | | |
| Vel Head (ft) | 0.74 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 979.18 | Reach Len. (ft) | 189.16 | 199.97 | 208.54 |
| Crit W.S. (ft) | 979.18 | Flow Area (sq ft) | | 214.94 | |
| E.G. Slope (ft/ft) | 0.014609 | Area (sq ft) | | 214.94 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |

| | | | | | |
|---|---|---|---|---|---|
| Top Width (ft) | 150.17 | Top Width (ft) | | 150.17 | |
| Vel Total (ft/s) | 6.91 | Avg. Vel. (ft/s) | | 6.91 | |
| Max Chl Dpth (ft) | 2.82 | Hydr. Depth (ft) | | 1.43 | |
| Conv. Total (cfs) | 12286.0 | Conv. (cfs) | | 12286.0 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 150.89 | |
| Min Ch El (ft) | 976.36 | Shear (lb/sq ft) | | 1.30 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 8.98 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 14.87 | 220.43 | 18.58 |
| C & E Loss (ft) | 0.17 | Cum SA (acres) | 7.32 | 88.35 | 9.44 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.93 | Element | | | |
| Vel Head (ft) | 0.72 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 979.20 | Reach Len. (ft) | 189.16 | 199.97 | 208.54 |
| Crit W.S. (ft) | 979.20 | Flow Area (sq ft) | | 217.78 | |
| E.G. Slope (ft/ft) | 0.014029 | Area (sq ft) | | 217.78 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 150.17 | Top Width (ft) | | 150.17 | |
| Vel Total (ft/s) | 6.82 | Avg. Vel. (ft/s) | | 6.82 | |
| Max Chl Dpth (ft) | 2.84 | Hydr. Depth (ft) | | 1.45 | |
| Conv. Total (cfs) | 12537.4 | Conv. (cfs) | | 12537.4 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 150.93 | |
| Min Ch El (ft) | 976.36 | Shear (lb/sq ft) | | 1.26 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 8.62 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 38.96 | 197.01 | 37.28 |
| C & E Loss (ft) | 0.14 | Cum SA (acres) | 24.58 | 86.57 | 27.72 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.920

INPUT
Description: Thalweg Sta. 501.19
Station Elevation Data num= 194

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 982.15 | .19 | 982.15 | 2.54 | 982.12 | 8.83 | 982.03 | 17.47 | 981.87 |
| 20.09 | 981.83 | 30.25 | 981.7 | 43.38 | 981.61 | 50.55 | 981.58 | 52.02 | 981.58 |
| 60.43 | 981.54 | 60.7 | 981.54 | 86.57 | 981.56 | 101.31 | 981.52 | 111.47 | 981.48 |
| 112.49 | 981.48 | 118.32 | 981.45 | 121.12 | 981.44 | 121.62 | 981.44 | 129.76 | 981.42 |
| 131.77 | 981.41 | 152.08 | 981.35 | 172.38 | 981.26 | 172.95 | 981.25 | 176.2 | 981.23 |
| 181.59 | 981.18 | 182.54 | 981.19 | 190.23 | 981.12 | 192.69 | 981.13 | 198.87 | 981.1 |
| 202.84 | 981.13 | 207.5 | 981.12 | 212.99 | 981.17 | 216.14 | 981.17 | 223.15 | 981.21 |
| 233.42 | 981.2 | 234.09 | 981.19 | 242.05 | 981.19 | 243.45 | 981.17 | 250.69 | 981.17 |
| 253.6 | 981.14 | 259.33 | 981.16 | 261.1 | 981.14 | 263.76 | 981.11 | 267.97 | 981.13 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 273.91 | 981.1 | 276.61 | 981.11 | 284.06 | 981.06 | 291.98 | 981.06 | 293.88 | 980.98 |
| 294.21 | 980.96 | 302.52 | 980.55 | 304.37 | 980.49 | 311.16 | 980.17 | 314.52 | 980.1 |
| 319.8 | 979.87 | 324.67 | 979.97 | 328.43 | 979.87 | 334.82 | 980.05 | 337.07 | 980.03 |
| 344.98 | 980.64 | 345.71 | 980.63 | 349.87 | 980.86 | 354.35 | 980.77 | 355.13 | 980.78 |
| 362.99 | 980.11 | 365.28 | 980.23 | 371.62 | 979.79 | 375.44 | 979.99 | 380.26 | 979.83 |
| 385.59 | 980.54 | 388.9 | 980.54 | 395.74 | 980.95 | 397.54 | 980.94 | 399.11 | 980.92 |
| 405.89 | 980.81 | 406.17 | 980.81 | 407.76 | 980.83 | 414.81 | 980.64 | 416.05 | 980.98 |
| 423.45 | 980.95 | 426.2 | 980.77 | 432.09 | 980.56 | 436.35 | 979.9 | 440.73 | 979.78 |
| 446.5 | 979.43 | 449.36 | 979.36 | 456.66 | 980.47 | 458 | 980.45 | 465.65 | 980.21 |
| 466.64 | 980.13 | 466.81 | 980.17 | 475.28 | 979.93 | 476.96 | 979.88 | 483.92 | 979.31 |
| 487.11 | 979.09 | 492.55 | 978.05 | 497.27 | 977.35 | 501.19 | 976.8 | 507.42 | 975.81 |
| 509.83 | 975.72 | 517.57 | 975.2 | 518.47 | 975.21 | 523.54 | 975.21 | 527.11 | 975.18 |
| 527.73 | 975.17 | 535.74 | 975.21 | 537.88 | 975.21 | 544.37 | 975.23 | 548.03 | 975.23 |
| 553.01 | 975.19 | 558.18 | 975.2 | 561.66 | 975.11 | 563.23 | 975.1 | 568.34 | 975.06 |
| 570.29 | 974.98 | 578.49 | 974.82 | 578.92 | 974.81 | 581.43 | 974.76 | 588.64 | 974.65 |
| 596.2 | 974.9 | 598.79 | 974.91 | 604.84 | 975.26 | 608.95 | 975.4 | 613.47 | 975.73 |
| 619.1 | 976.07 | 622.11 | 976.33 | 629.25 | 976.81 | 630.75 | 976.94 | 639.32 | 977.42 |
| 639.39 | 977.43 | 648.03 | 978.02 | 649.56 | 978.06 | 656.66 | 978.41 | 659.71 | 978.47 |
| 665.3 | 978.45 | 669.86 | 978.45 | 673.94 | 978.24 | 680.01 | 978.04 | 682.58 | 977.88 |
| 690.17 | 977.66 | 691.22 | 977.62 | 697.21 | 977.57 | 699.85 | 977.56 | 700.32 | 977.56 |
| 710.47 | 977.36 | 717.13 | 977.27 | 720.63 | 977.25 | 725.77 | 977.38 | 730.78 | 977.49 |
| 740.93 | 977.99 | 751.08 | 978.67 | 751.68 | 978.73 | 755.1 | 978.95 | 760.32 | 979.3 |
| 761.24 | 979.33 | 768.96 | 980 | 771.39 | 980.16 | 777.59 | 980.7 | 781.54 | 980.95 |
| 786.23 | 981.21 | 791.69 | 981.47 | 794.87 | 981.51 | 801.85 | 981.54 | 803.51 | 981.49 |
| 812 | 981.21 | 812.15 | 981.21 | 812.99 | 981.17 | 820.78 | 980.86 | 822.15 | 980.81 |
| 829.42 | 980.71 | 832.3 | 980.73 | 838.06 | 981.11 | 842.46 | 981.42 | 846.7 | 981.82 |
| 852.61 | 982.4 | 855.34 | 982.52 | 862.76 | 982.92 | 863.97 | 982.88 | 870.88 | 982.8 |
| 872.91 | 982.8 | 881.25 | 982.34 | 883.07 | 982.52 | 889.89 | 982.47 | 893.22 | 982.81 |
| 898.53 | 983.59 | 903.37 | 984 | 907.16 | 984.51 | 913.53 | 985.15 | 915.8 | 985.51 |
| 923.68 | 986.54 | 924.44 | 986.66 | 928.77 | 987.15 | 932.5 | 987.6 | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .032 | 261.1 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 456.66 | 656.66 | | 217.48 | 199.99 | 192.14 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.17 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.27 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 977.90 | Reach Len. (ft) | 217.48 | 199.99 | 192.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 343.13 | 21.77 |
| E.G. Slope (ft/ft) | 0.004448 | Area (sq ft) | | 343.13 | 21.77 |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1456.56 | 28.44 |
| Top Width (ft) | 209.55 | Top Width (ft) | | 152.71 | 56.84 |
| Vel Total (ft/s) | 4.07 | Avg. Vel. (ft/s) | | 4.24 | 1.31 |
| Max Chl Dpth (ft) | 3.25 | Hydr. Depth (ft) | | 2.25 | 0.38 |
| Conv. Total (cfs) | 22266.1 | Conv. (cfs) | | 21839.7 | 426.4 |
| Length Wtd. (ft) | 200.45 | Wetted Per. (ft) | | 152.99 | 56.86 |
| Min Ch El (ft) | 974.65 | Shear (lb/sq ft) | | 0.62 | 0.11 |
| Alpha | 1.07 | Stream Power (lb/ft s) | | 2.64 | 0.14 |
| Frctn Loss (ft) | 0.76 | Cum Volume (acre-ft) | 105.70 | 167.18 | 107.13 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 107.68 | 83.17 | 128.97 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 978.45 | Reach Len. (ft) | 217.48 | 199.99 | 192.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 430.28 | |
| E.G. Slope (ft/ft) | 0.002435 | Area (sq ft) | | 430.28 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 166.18 | Top Width (ft) | | 166.18 | |
| Vel Total (ft/s) | 3.45 | Avg. Vel. (ft/s) | | 3.45 | |
| Max Chl Dpth (ft) | 3.80 | Hydr. Depth (ft) | | 2.59 | |
| Conv. Total (cfs) | 30093.3 | Conv. (cfs) | | 30093.3 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 166.56 | |
| Min Ch El (ft) | 974.65 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.36 | |
| Frctn Loss (ft) | 0.42 | Cum Volume (acre-ft) | 14.87 | 218.94 | 18.58 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 7.32 | 87.63 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.34 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 978.09 | Reach Len. (ft) | 217.48 | 199.99 | 192.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 372.49 | |
| E.G. Slope (ft/ft) | 0.003674 | Area (sq ft) | | 372.49 | |
| Q Total (cfs) | 1485.00 | Flow (cfs) | | 1485.00 | |
| Top Width (ft) | 157.81 | Top Width (ft) | | 157.81 | |
| Vel Total (ft/s) | 3.99 | Avg. Vel. (ft/s) | | 3.99 | |
| Max Chl Dpth (ft) | 3.44 | Hydr. Depth (ft) | | 2.36 | |
| Conv. Total (cfs) | 24498.8 | Conv. (cfs) | | 24498.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 158.12 | |
| Min Ch El (ft) | 974.65 | Shear (lb/sq ft) | | 0.54 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.15 | |
| Frctn Loss (ft) | 0.72 | Cum Volume (acre-ft) | 38.96 | 195.66 | 37.28 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 24.58 | 85.87 | 27.72 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.883

INPUT
Description: Thalweg Sta. 645.93 - Discharge from A2-100y6hr.out HEC-1 model - Sta. 2E - 1840 CFS - (HEC-RAS XS has been trimmed and does not reflect the XS's full length as shown on the work map.)

Station Elevation Data num= 116

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 385.49 | 978.56 | 385.54 | 978.56 | 394.98 | 978.42 | 395.56 | 978.41 | 404.48 | 978.14 |
| 405.57 | 978.11 | 413.97 | 977.78 | 415.59 | 977.72 | 425.6 | 977.3 | 432.96 | 976.87 |
| 435.62 | 976.73 | 442.46 | 976.28 | 445.63 | 976.09 | 451.95 | 975.82 | 455.65 | 975.68 |
| 456.15 | 975.68 | 465.66 | 975.7 | 475.68 | 975.9 | 480.43 | 975.98 | 485.69 | 976.04 |
| 495.71 | 976.11 | 505.46 | 976.16 | 505.72 | 976.16 | 515.74 | 976.12 | 518.41 | 976.06 |
| 525.75 | 975.83 | 527.9 | 975.73 | 537.4 | 975.33 | 545.78 | 975.02 | 546.89 | 974.97 |
| 555.8 | 974.72 | 556.39 | 974.7 | 565.81 | 974.48 | 565.87 | 974.48 | 567.05 | 974.45 |
| 575.37 | 974.28 | 594.35 | 973.88 | 625.9 | 973.24 | 632.33 | 973.13 | 635.92 | 973.06 |
| 641.83 | 973 | 645.93 | 972.93 | 651.32 | 972.93 | 655.95 | 972.89 | 660.81 | 973 |
| 665.96 | 973.07 | 670.31 | 973.32 | 675.98 | 973.63 | 679.8 | 973.88 | 685.99 | 974.32 |
| 689.3 | 974.42 | 690.38 | 974.48 | 696.01 | 974.78 | 698.79 | 974.8 | 706.02 | 974.92 |
| 708.29 | 975.12 | 716.04 | 975.55 | 726.05 | 976.42 | 727.27 | 976.46 | 731.48 | 976.64 |
| 736.07 | 976.83 | 736.77 | 976.83 | 746.08 | 976.81 | 746.26 | 976.81 | 749.46 | 976.79 |
| 755.75 | 976.74 | 756.1 | 976.74 | 765.24 | 976.65 | 766.11 | 976.63 | 774.74 | 976.47 |
| 786.14 | 976.22 | 793.72 | 976.27 | 796.16 | 976.3 | 803.22 | 976.58 | 806.17 | 976.72 |
| 816.19 | 977.3 | 826.2 | 977.9 | 836.22 | 978.6 | 841.2 | 979.05 | 846.23 | 979.54 |
| 850.69 | 980.06 | 856.25 | 980.82 | 860.18 | 981.32 | 865.03 | 982.04 | 866.26 | 982.22 |
| 869.68 | 982.66 | 876.28 | 983.49 | 879.17 | 983.84 | 886.29 | 984.51 | 888.67 | 984.74 |
| 898.16 | 985.46 | 906.32 | 986.02 | 907.66 | 986.07 | 916.34 | 986.58 | 917.15 | 986.59 |
| 926.35 | 986.78 | 926.64 | 986.79 | 936.14 | 986.88 | 936.37 | 986.88 | 945.63 | 987.12 |
| 946.38 | 987.13 | 956.4 | 987.52 | 964.61 | 987.87 | 966.41 | 987.93 | 976.43 | 988.23 |
| 983.6 | 988.29 | 986.44 | 988.34 | 993.09 | 988.42 | 996.46 | 988.49 | 1002.59 | 988.65 |
| 1006.47 | 988.74 | 1012.08 | 988.95 | 1016.49 | 989.06 | 1021.58 | 989.38 | 1026.5 | 989.63 |
| 1027.36 | 989.67 | | | | | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 385.49 | .04 | 456.15 | .077 | 690.38 | .04 | 865.03 | .032 | 1027.36 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 505.46 | 731.48 | 214.98 | 199.99 | 191.18 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 977.36 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.064 | 0.071 | 0.040 |
| W.S. Elev (ft) | 977.27 | Reach Len. (ft) | 214.98 | 199.99 | 191.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 91.91 | 649.84 | 55.10 |
| E.G. Slope (ft/ft) | 0.003354 | Area (sq ft) | 91.91 | 649.84 | 55.10 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 140.19 | 1610.50 | 89.31 |
| Top Width (ft) | 389.62 | Top Width (ft) | 79.38 | 226.02 | 84.22 |
| Vel Total (ft/s) | 2.31 | Avg. Vel. (ft/s) | 1.53 | 2.48 | 1.62 |
| Max Chl Dpth (ft) | 4.38 | Hydr. Depth (ft) | 1.16 | 2.88 | 0.65 |
| Conv. Total (cfs) | 31770.1 | Conv. (cfs) | 2420.5 | 27807.4 | 1542.1 |
| Length Wtd. (ft) | 203.43 | Wetted Per. (ft) | 79.43 | 226.18 | 84.26 |
| Min Ch El (ft) | 972.89 | Shear (lb/sq ft) | 0.24 | 0.60 | 0.14 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.37 | 1.49 | 0.22 |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 105.47 | 164.90 | 106.97 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 107.48 | 82.30 | 128.66 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.18 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.070 | |
| W.S. Elev (ft) | 978.10 | Reach Len. (ft) | 214.98 | 199.99 | 191.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 837.13 | |
| E.G. Slope (ft/ft) | 0.001883 | Area (sq ft) | | 837.13 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 226.02 | Top Width (ft) | | 226.02 | |
| Vel Total (ft/s) | 2.20 | Avg. Vel. (ft/s) | | 2.20 | |
| Max Chl Dpth (ft) | 5.21 | Hydr. Depth (ft) | | 3.70 | |
| Conv. Total (cfs) | 42402.7 | Conv. (cfs) | | 42402.7 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 229.58 | |
| Min Ch El (ft) | 972.89 | Shear (lb/sq ft) | | 0.43 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.94 | |
| Frctn Loss (ft) | 0.56 | Cum Volume (acre-ft) | 14.87 | 216.04 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.32 | 86.73 | 9.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 977.57 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.071 | |
| W.S. Elev (ft) | 977.46 | Reach Len. (ft) | 214.98 | 199.99 | 191.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 692.97 | |
| E.G. Slope (ft/ft) | 0.003560 | Area (sq ft) | | 692.97 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 226.02 | Top Width (ft) | | 226.02 | |
| Vel Total (ft/s) | 2.66 | Avg. Vel. (ft/s) | | 2.66 | |
| Max Chl Dpth (ft) | 4.57 | Hydr. Depth (ft) | | 3.07 | |
| Conv. Total (cfs) | 30839.2 | Conv. (cfs) | | 30839.2 | |
| Length Wtd. (ft) | 203.26 | Wetted Per. (ft) | | 228.31 | |
| Min Ch El (ft) | 972.89 | Shear (lb/sq ft) | | 0.67 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.79 | |
| Frctn Loss (ft) | 0.93 | Cum Volume (acre-ft) | 38.96 | 193.21 | 37.28 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 24.58 | 84.99 | 27.72 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.845

INPUT
Description: Thalweg Sta. 490.18
Station Elevation Data num= 122

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 977.12 | 4.29 | 977.33 | 14.3 | 977.7 | 19.47 | 977.81 | 24.31 | 977.9 |
| 34.32 | 977.96 | 40.39 | 977.88 | 44.33 | 977.84 | 50.85 | 977.72 | 61.31 | 977.56 |
| 64.35 | 977.52 | 71.77 | 977.39 | 74.36 | 977.36 | 82.23 | 977.11 | 84.37 | 977.06 |
| 92.7 | 976.67 | 94.38 | 976.61 | 103.16 | 976.35 | 104.39 | 976.3 | 113.62 | 976.3 |
| 114.4 | 976.29 | 124.41 | 976.28 | 131.82 | 976.12 | 134.3 | 976.07 | 134.41 | 976.07 |
| 143.9 | 975.68 | 144.42 | 975.66 | 153.5 | 975.22 | 154.43 | 975.18 | 163.09 | 975.06 |
| 164.44 | 975.02 | 172.69 | 975.07 | 174.45 | 975.07 | 176.37 | 975.06 | 184.46 | 975.08 |
| 191.88 | 975.03 | 194.47 | 975.03 | 201.48 | 974.94 | 204.48 | 974.92 | 211.08 | 974.86 |
| 224.5 | 974.68 | 228.67 | 974.57 | 230.15 | 974.52 | 234.51 | 974.38 | 239.13 | 974.16 |
| 244.52 | 973.97 | 249.59 | 973.88 | 254.53 | 973.88 | 264.54 | 974.04 | 270.51 | 974.17 |
| 274.54 | 974.23 | 280.97 | 974.35 | 284.55 | 974.4 | 291.43 | 974.53 | 294.56 | 974.57 |
| 301.89 | 974.71 | 304.57 | 974.75 | 312.35 | 974.9 | 314.58 | 974.94 | 324.59 | 975.1 |
| 334.6 | 975.23 | 335.82 | 975.24 | 344.61 | 975.29 | 345.41 | 975.3 | 345.96 | 975.3 |
| 394.66 | 975.28 | 396.04 | 975.27 | 404.67 | 975.26 | 406.5 | 975.25 | 414.68 | 975.23 |
| 416.96 | 975.21 | 424.68 | 975.18 | 427.42 | 975.15 | 434.69 | 975.1 | 437.88 | 975.06 |
| 444.7 | 975 | 448.34 | 974.95 | 454.71 | 974.89 | 490.18 | 974.47 | 514.77 | 974.16 |
| 524.78 | 974.02 | 534.79 | 973.85 | 537.33 | 973.76 | 544.8 | 973.56 | 552.94 | 973.26 |
| 554.81 | 973.18 | 563.4 | 973.23 | 564.81 | 973.2 | 573.86 | 974.31 | 574.82 | 974.43 |
| 584.32 | 975.86 | 584.83 | 975.93 | 589.94 | 976.17 | 594.78 | 976.39 | 594.84 | 976.4 |
| 603.05 | 976.28 | 604.85 | 976.25 | 605.24 | 976.25 | 614.86 | 976.12 | 615.7 | 976.11 |
| 624.87 | 976.11 | 626.16 | 976.03 | 634.88 | 975.44 | 636.62 | 975.32 | 644.89 | 974.57 |
| 647.08 | 974.58 | 654.9 | 974.88 | 657.54 | 975.13 | 664.91 | 975.9 | 668 | 976.35 |
| 674.92 | 977.23 | 678.46 | 977.8 | 688.92 | 979.55 | 694.94 | 980.7 | 699.38 | 981.46 |
| 704.95 | 982.52 | 709.84 | 983.28 | 714.95 | 984.1 | 720.3 | 984.71 | 721.77 | 984.87 |
| 724.96 | 985.23 | 728.33 | 985.49 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 230.15 | .077 | 589.94 | .04 | 721.77 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 345.96 | 603.05 | 155.97 | 199.94 | 231.35 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 976.53 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.061 | 0.077 | 0.040 |
| W.S. Elev (ft) | 976.45 | Reach Len. (ft) | 155.97 | 199.94 | 231.35 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 357.46 | 433.98 | 56.96 |
| E.G. Slope (ft/ft) | 0.005039 | Area (sq ft) | 357.46 | 433.98 | 56.96 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 836.24 | 867.50 | 136.27 |
| Top Width (ft) | 569.17 | Top Width (ft) | 246.31 | 257.09 | 65.77 |
| Vel Total (ft/s) | 2.17 | Avg. Vel. (ft/s) | 2.34 | 2.00 | 2.39 |
| Max Chl Dpth (ft) | 3.27 | Hydr. Depth (ft) | 1.45 | 1.69 | 0.87 |
| Conv. Total (cfs) | 25921.6 | Conv. (cfs) | 11780.7 | 12221.2 | 1919.7 |
| Length Wtd. (ft) | 179.61 | Wetted Per. (ft) | 246.37 | 257.31 | 65.93 |
| Min Ch El (ft) | 973.18 | Shear (lb/sq ft) | 0.46 | 0.53 | 0.27 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 1.07 | 1.06 | 0.65 |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 104.36 | 162.42 | 106.72 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 106.68 | 81.19 | 128.33 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 977.61 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.076 | |
| W.S. Elev (ft) | 977.50 | Reach Len. (ft) | 155.97 | 199.94 | 231.35 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 703.58 | |
| E.G. Slope (ft/ft) | 0.004666 | Area (sq ft) | | 703.58 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 257.09 | Top Width (ft) | | 257.09 | |
| Vel Total (ft/s) | 2.62 | Avg. Vel. (ft/s) | | 2.62 | |
| Max Chl Dpth (ft) | 4.32 | Hydr. Depth (ft) | | 2.74 | |
| Conv. Total (cfs) | 26938.2 | Conv. (cfs) | | 26938.2 | |
| Length Wtd. (ft) | 198.28 | Wetted Per. (ft) | | 260.74 | |
| Min Ch El (ft) | 973.18 | Shear (lb/sq ft) | | 0.79 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.06 | |
| Frctn Loss (ft) | 0.92 | Cum Volume (acre-ft) | 14.87 | 212.50 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.32 | 85.62 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 976.63 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.066 | 0.077 | |
| W.S. Elev (ft) | 976.54 | Reach Len. (ft) | 155.97 | 199.94 | 231.35 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 291.90 | 455.31 | |
| E.G. Slope (ft/ft) | 0.006170 | Area (sq ft) | 291.90 | 455.31 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 802.47 | 1037.53 | |
| Top Width (ft) | 408.58 | Top Width (ft) | 151.49 | 257.09 | |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | 2.75 | 2.28 | |
| Max Chl Dpth (ft) | 3.36 | Hydr. Depth (ft) | 1.93 | 1.77 | |
| Conv. Total (cfs) | 23425.4 | Conv. (cfs) | 10216.3 | 13209.0 | |
| Length Wtd. (ft) | 178.97 | Wetted Per. (ft) | 153.02 | 257.57 | |
| Min Ch El (ft) | 973.18 | Shear (lb/sq ft) | 0.73 | 0.68 | |
| Alpha | 1.03 | Stream Power (lb/ft s) | 2.02 | 1.55 | |
| Frctn Loss (ft) | 0.93 | Cum Volume (acre-ft) | 38.24 | 190.58 | 37.28 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 24.21 | 83.88 | 27.72 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.807

INPUT
Description: Thalweg Sta. 579.64
Station Elevation Data num= 188

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.34 | 1.74 | 976.27 | 2.37 | 976.25 | 4.84 | 976.17 | 10.6 | 976.03 |
| 12.06 | 976 | 18.82 | 975.94 | 22.38 | 975.89 | 27.05 | 975.89 | 32.7 | 975.82 |
| 35.27 | 975.8 | 43.02 | 975.71 | 43.5 | 975.7 | 45.34 | 975.68 | 51.72 | 975.66 |
| 53.34 | 975.66 | 59.95 | 975.65 | 63.66 | 975.64 | 68.17 | 975.65 | 73.98 | 975.63 |
| 76.39 | 975.65 | 84.3 | 975.61 | 84.61 | 975.61 | 85.85 | 975.59 | 92.83 | 975.48 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 94.62 | 975.43 | 101.06 | 975.33 | 104.94 | 975.2 | 109.28 | 975.24 | 115.26 | 975.2 |
| 117.51 | 975.27 | 125.58 | 975.36 | 125.73 | 975.36 | 126.34 | 975.36 | 133.96 | 975.47 |
| 135.9 | 975.46 | 142.18 | 975.44 | 146.22 | 975.43 | 150.41 | 975.39 | 156.54 | 975.38 |
| 158.63 | 975.38 | 166.84 | 975.37 | 166.86 | 975.37 | 175.08 | 975.3 | 177.18 | 975.29 |
| 183.31 | 975.21 | 187.5 | 975.15 | 191.07 | 975.08 | 191.53 | 975.07 | 197.82 | 974.9 |
| 199.76 | 974.83 | 207.35 | 974.55 | 207.98 | 974.53 | 208.14 | 974.53 | 216.2 | 974.27 |
| 218.46 | 974.2 | 222.25 | 974.12 | 228.77 | 973.99 | 232.64 | 973.94 | 239.09 | 973.85 |
| 240.87 | 973.83 | 247.84 | 973.75 | 249.09 | 973.73 | 249.41 | 973.73 | 257.32 | 973.66 |
| 259.73 | 973.63 | 265.54 | 973.59 | 270.05 | 973.55 | 273.77 | 973.51 | 280.37 | 973.46 |
| 281.99 | 973.44 | 288.35 | 973.37 | 290.22 | 973.36 | 290.69 | 973.35 | 298.44 | 973.27 |
| 301.01 | 973.26 | 306.67 | 973.21 | 311.33 | 973.2 | 314.89 | 973.19 | 321.65 | 973.22 |
| 323.12 | 973.22 | 328.85 | 973.27 | 331.34 | 973.29 | 331.97 | 973.29 | 339.57 | 973.32 |
| 342.29 | 973.35 | 347.78 | 973.36 | 352.61 | 973.38 | 356 | 973.4 | 362.93 | 973.4 |
| 364.23 | 973.42 | 369.35 | 973.43 | 372.45 | 973.45 | 373.25 | 973.45 | 380.68 | 973.53 |
| 383.57 | 973.54 | 388.9 | 973.61 | 393.89 | 973.65 | 402.28 | 973.75 | 404.21 | 973.77 |
| 405.35 | 973.78 | 409.85 | 973.84 | 413.58 | 973.89 | 414.53 | 973.9 | 421.8 | 973.96 |
| 424.85 | 974 | 430.02 | 974.01 | 435.16 | 974.06 | 437.49 | 974.02 | 438.25 | 974.01 |
| 445.48 | 974.04 | 446.48 | 974.02 | 450.35 | 973.95 | 454.7 | 973.86 | 455.8 | 973.86 |
| 462.93 | 973.7 | 466.12 | 973.62 | 471.15 | 973.64 | 476.44 | 973.49 | 479.37 | 973.54 |
| 486.76 | 973.51 | 487.59 | 973.53 | 490.85 | 973.57 | 495.81 | 973.66 | 497.08 | 973.66 |
| 504.04 | 973.79 | 507.4 | 973.85 | 512.26 | 973.93 | 517.72 | 974.04 | 520.49 | 974.05 |
| 528.04 | 974.09 | 528.71 | 974.05 | 531.35 | 973.9 | 536.94 | 973.6 | 538.36 | 973.52 |
| 545.16 | 973.45 | 548.68 | 973.37 | 553.38 | 973.88 | 559 | 974.5 | 561.61 | 974.81 |
| 569.32 | 975.73 | 569.83 | 975.75 | 571.86 | 975.81 | 579.64 | 976.02 | 586.29 | 975.89 |
| 589.96 | 975.8 | 594.51 | 975.65 | 600.28 | 975.43 | 602.73 | 975.31 | 610.6 | 974.84 |
| 610.96 | 974.81 | 612.35 | 974.66 | 619.18 | 973.95 | 620.92 | 973.76 | 627.4 | 973.06 |
| 631.24 | 972.69 | 635.62 | 972.45 | 641.55 | 972.24 | 643.85 | 972.21 | 651.87 | 972.15 |
| 652.07 | 972.15 | 652.85 | 972.15 | 660.3 | 972.2 | 662.19 | 972.23 | 668.52 | 972.47 |
| 672.51 | 972.73 | 676.74 | 973.24 | 682.83 | 974.19 | 684.97 | 974.64 | 693.15 | 976.88 |
| 693.19 | 976.89 | 693.36 | 976.95 | 697.55 | 978.32 | 703.47 | 980.26 | 706.93 | 979.75 |
| 713.79 | 979.22 | 717.87 | 978.54 | 720.3 | 978.66 | 724.11 | 978.84 | 726.09 | 979.51 |
| 733.85 | 982 | 734.32 | 982.15 | 734.43 | 982.18 | 742.54 | 984.49 | 744.75 | 984.81 |
| 750.77 | 985.38 | 755.07 | 985.67 | 758.21 | 985.83 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 191.07 | .077 | 720.3 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 435.16 | 693.15 | 156.21 | 199.89 | 237.24 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 975.68 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.076 | 0.077 | |
| W.S. Elev (ft) | 975.62 | Reach Len. (ft) | 156.21 | 199.89 | 237.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 500.00 | 441.09 | |
| E.G. Slope (ft/ft) | 0.004391 | Area (sq ft) | 500.00 | 441.09 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 962.30 | 877.70 | |
| Top Width (ft) | 580.19 | Top Width (ft) | 353.56 | 226.63 | |
| Vel Total (ft/s) | 1.96 | Avg. Vel. (ft/s) | 1.92 | 1.99 | |
| Max Chl Dpth (ft) | 3.47 | Hydr. Depth (ft) | 1.41 | 1.95 | |
| Conv. Total (cfs) | 27768.1 | Conv. (cfs) | 14522.3 | 13245.8 | |
| Length Wtd. (ft) | 178.15 | Wetted Per. (ft) | 353.60 | 227.23 | |
| Min Ch El (ft) | 972.15 | Shear (lb/sq ft) | 0.39 | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.75 | 1.06 | |
| Frctn Loss (ft) | 0.66 | Cum Volume (acre-ft) | 102.83 | 160.41 | 106.57 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 105.61 | 80.08 | 128.15 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 976.69 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.077 | 0.077 | |
| W.S. Elev (ft) | 976.59 | Reach Len. (ft) | 156.21 | 199.89 | 237.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 60.26 | 681.94 | |
| E.G. Slope (ft/ft) | 0.004566 | Area (sq ft) | 60.26 | 681.94 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 138.60 | 1701.40 | |
| Top Width (ft) | 279.94 | Top Width (ft) | 23.01 | 256.94 | |
| Vel Total (ft/s) | 2.48 | Avg. Vel. (ft/s) | 2.30 | 2.49 | |
| Max Chl Dpth (ft) | 4.44 | Hydr. Depth (ft) | 2.62 | 2.65 | |
| Conv. Total (cfs) | 27229.2 | Conv. (cfs) | 2051.0 | 25178.1 | |
| Length Wtd. (ft) | 195.61 | Wetted Per. (ft) | 25.73 | 257.68 | |
| Min Ch El (ft) | 972.15 | Shear (lb/sq ft) | 0.67 | 0.75 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.54 | 1.88 | |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 14.77 | 209.32 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.27 | 84.44 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 975.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.077 | 0.077 | |
| W.S. Elev (ft) | 975.63 | Reach Len. (ft) | 156.21 | 199.89 | 237.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 480.11 | 443.54 | |
| E.G. Slope (ft/ft) | 0.004414 | Area (sq ft) | 480.11 | 443.54 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 952.89 | 887.11 | |
| Top Width (ft) | 487.12 | Top Width (ft) | 260.08 | 227.04 | |
| Vel Total (ft/s) | 1.99 | Avg. Vel. (ft/s) | 1.98 | 2.00 | |
| Max Chl Dpth (ft) | 3.48 | Hydr. Depth (ft) | 1.85 | 1.95 | |
| Conv. Total (cfs) | 27694.7 | Conv. (cfs) | 14342.3 | 13352.4 | |
| Length Wtd. (ft) | 178.34 | Wetted Per. (ft) | 260.44 | 227.64 | |
| Min Ch El (ft) | 972.15 | Shear (lb/sq ft) | 0.51 | 0.54 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.01 | 1.07 | |
| Frctn Loss (ft) | 0.67 | Cum Volume (acre-ft) | 36.86 | 188.51 | 37.28 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 23.47 | 82.77 | 27.72 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.769

INPUT
Description: Thalweg Sta. 501.66
Station Elevation Data num= 135

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.03 | 3.96 | 975.99 | 7.02 | 975.94 | 11.38 | 975.84 | 16.2 | 975.72 |
| 28.43 | 975.39 | 28.73 | 975.39 | 40.67 | 975.29 | 42.91 | 975.3 | 46.09 | 975.26 |
| 52.9 | 975.21 | 63.45 | 975.09 | 64.44 | 975.07 | 65.14 | 975.06 | 71.61 | 974.85 |
| 76.03 | 974.59 | 77.37 | 974.51 | 78.79 | 974.47 | 80.81 | 974.38 | 85.97 | 974.16 |
| 89.6 | 974.07 | 93.14 | 974.02 | 100.32 | 973.95 | 101.84 | 973.94 | 107.49 | 973.91 |
| 114.07 | 973.85 | 114.67 | 973.84 | 129.02 | 973.67 | 132.88 | 973.61 | 136.21 | 973.57 |
| 138.54 | 973.53 | 150.24 | 973.38 | 150.56 | 973.37 | 150.78 | 973.37 | 163.01 | 973.2 |
| 167.59 | 973.13 | 172.08 | 973.05 | 175.24 | 973.01 | 186.43 | 972.85 | 187.48 | 972.84 |
| 199.72 | 972.67 | 200.79 | 972.66 | 202.31 | 972.65 | 211.95 | 972.55 | 222.31 | 972.51 |
| 224.19 | 972.5 | 236.42 | 972.59 | 236.67 | 972.59 | 237.02 | 972.6 | 243.84 | 972.66 |
| 248.65 | 972.73 | 258.19 | 972.81 | 260.89 | 972.84 | 271.74 | 972.91 | 272.55 | 972.91 |
| 273.12 | 972.92 | 286.9 | 973.01 | 289.1 | 973.02 | 308.43 | 973.13 | 309.83 | 973.14 |
| 315.61 | 973.15 | 322.06 | 973.19 | 322.78 | 973.19 | 323.81 | 973.2 | 329.96 | 973.2 |
| 334.29 | 973.22 | 337.13 | 973.22 | 341.17 | 973.23 | 344.32 | 973.23 | 346.53 | 973.24 |
| 351.49 | 973.25 | 358.52 | 973.32 | 358.76 | 973.32 | 371 | 973.49 | 375.88 | 973.59 |
| 380.2 | 973.65 | 387.37 | 973.77 | 393.24 | 973.79 | 395.71 | 973.79 | 401.72 | 973.75 |
| 402.92 | 973.75 | 407.82 | 973.73 | 408.86 | 973.72 | 416 | 973.72 | 420.36 | 973.68 |
| 423.14 | 973.6 | 426.81 | 973.45 | 430.28 | 973.36 | 432.91 | 973.3 | 437.42 | 973.1 |
| 443.37 | 972.82 | 444.56 | 972.76 | 445.45 | 972.69 | 451.7 | 972.27 | 458 | 971.83 |
| 458.84 | 971.78 | 459.94 | 971.72 | 465.98 | 971.31 | 470.54 | 971.03 | 473.11 | 970.92 |
| 476.5 | 970.84 | 480.25 | 970.73 | 483.09 | 970.67 | 487.39 | 970.63 | 493.07 | 970.61 |
| 494.52 | 970.6 | 495.63 | 970.6 | 501.66 | 970.62 | 508.18 | 970.69 | 508.8 | 970.69 |
| 509.63 | 970.71 | 515.94 | 970.83 | 523.08 | 971.01 | 526.19 | 971.17 | 530.21 | 971.36 |
| 533.26 | 971.57 | 537.35 | 972.01 | 542.76 | 973.03 | 545.8 | 973.52 | 551.63 | 974.76 |
| 556.15 | 975.15 | 558.35 | 975.34 | 558.77 | 975.36 | 559.32 | 975.35 | 562.14 | 975.35 |
| 565.9 | 975.36 | 570.89 | 976.17 | 573.04 | 976.18 | 575.88 | 976.99 | 580.18 | 978.33 |
| 583.44 | 979.44 | 592.44 | 982.3 | 594.46 | 982.89 | 595.98 | 983.01 | 598.65 | 983.27 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 76.03 | .077 | 556.15 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 395.71 | 562.14 | 171.73 | 200.24 | 214.85 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 975.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.077 | 0.077 | |
| W.S. Elev (ft) | 974.96 | Reach Len. (ft) | 171.73 | 200.24 | 214.85 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 556.01 | 447.88 | |
| E.G. Slope (ft/ft) | 0.003160 | Area (sq ft) | 556.01 | 447.88 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 869.70 | 970.30 | |
| Top Width (ft) | 485.93 | Top Width (ft) | 327.63 | 158.29 | |
| Vel Total (ft/s) | 1.83 | Avg. Vel. (ft/s) | 1.56 | 2.17 | |
| Max Chl Dpth (ft) | 4.36 | Hydr. Depth (ft) | 1.70 | 2.83 | |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 32732.2 | Conv. (cfs) | 15471.3 | 17260.9 | |
| Length Wtd. (ft) | 188.42 | Wetted Per. (ft) | 327.67 | 158.69 | |
| Min Ch El (ft) | 970.60 | Shear (lb/sq ft) | 0.33 | 0.56 | |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.52 | 1.21 | |
| Frctn Loss (ft) | 0.52 | Cum Volume (acre-ft) | 100.93 | 158.37 | 106.57 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 104.39 | 79.20 | 128.15 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 975.86 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.077 | 0.077 | |
| W.S. Elev (ft) | 975.74 | Reach Len. (ft) | 171.73 | 200.24 | 214.85 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 110.91 | 574.48 | |
| E.G. Slope (ft/ft) | 0.003944 | Area (sq ft) | 110.91 | 574.48 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 222.03 | 1617.97 | |
| Top Width (ft) | 216.16 | Top Width (ft) | 49.73 | 166.43 | |
| Vel Total (ft/s) | 2.68 | Avg. Vel. (ft/s) | 2.00 | 2.82 | |
| Max Chl Dpth (ft) | 5.14 | Hydr. Depth (ft) | 2.23 | 3.45 | |
| Conv. Total (cfs) | 29298.3 | Conv. (cfs) | 3535.3 | 25763.0 | |
| Length Wtd. (ft) | 198.52 | Wetted Per. (ft) | 52.24 | 167.24 | |
| Min Ch El (ft) | 970.60 | Shear (lb/sq ft) | 0.52 | 0.85 | |
| Alpha | 1.03 | Stream Power (lb/ft s) | 1.05 | 2.38 | |
| Frctn Loss (ft) | 0.74 | Cum Volume (acre-ft) | 14.46 | 206.44 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.14 | 83.47 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 975.03 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.077 | 0.077 | |
| W.S. Elev (ft) | 974.97 | Reach Len. (ft) | 171.73 | 200.24 | 214.85 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 528.51 | 448.15 | |
| E.G. Slope (ft/ft) | 0.003202 | Area (sq ft) | 528.51 | 448.15 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 862.43 | 977.57 | |
| Top Width (ft) | 446.53 | Top Width (ft) | 288.22 | 158.31 | |
| Vel Total (ft/s) | 1.88 | Avg. Vel. (ft/s) | 1.63 | 2.18 | |
| Max Chl Dpth (ft) | 4.37 | Hydr. Depth (ft) | 1.83 | 2.83 | |
| Conv. Total (cfs) | 32518.7 | Conv. (cfs) | 15241.9 | 17276.8 | |
| Length Wtd. (ft) | 188.48 | Wetted Per. (ft) | 289.29 | 158.71 | |
| Min Ch El (ft) | 970.60 | Shear (lb/sq ft) | 0.37 | 0.56 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.60 | 1.23 | |
| Frctn Loss (ft) | 0.52 | Cum Volume (acre-ft) | 35.05 | 186.47 | 37.28 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 22.49 | 81.88 | 27.72 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.731

INPUT
Description: Thalweg Sta. 503.57
Station Elevation Data num= 142

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.18 | 3.73 | 976.09 | 7.34 | 975.92 | 10.85 | 975.86 | 15.36 | 975.67 |
| 17.98 | 975.61 | 20.02 | 975.53 | 25.11 | 975.52 | 31.64 | 975.34 | 32.69 | 975.32 |
| 39.36 | 975.31 | 45.37 | 975.14 | 46.48 | 975.12 | 47.9 | 975.06 | 53.6 | 974.9 |
| 59.21 | 974.66 | 60.73 | 974.59 | 64.18 | 974.44 | 67.86 | 974.33 | 74.99 | 974.13 |
| 80.45 | 974.01 | 82.11 | 973.98 | 83.4 | 973.96 | 89.23 | 973.86 | 96.07 | 973.76 |
| 96.36 | 973.75 | 96.73 | 973.75 | 121.42 | 973.36 | 131.99 | 973.2 | 134.09 | 973.16 |
| 146.24 | 972.98 | 146.77 | 972.97 | 159.45 | 972.77 | 160.49 | 972.76 | 172.12 | 972.58 |
| 174.75 | 972.55 | 178.1 | 972.49 | 181.87 | 972.43 | 184.8 | 972.39 | 188.99 | 972.34 |
| 196.11 | 972.22 | 197.48 | 972.2 | 203.24 | 972.14 | 210.15 | 972.02 | 210.37 | 972.02 |
| 210.64 | 972.01 | 217.5 | 971.96 | 222.83 | 971.86 | 224.62 | 971.87 | 226.92 | 971.83 |
| 231.74 | 971.8 | 235.5 | 971.73 | 238.87 | 971.75 | 243.19 | 971.67 | 245.99 | 971.66 |
| 248.17 | 971.62 | 253.12 | 971.68 | 259.47 | 971.59 | 260.85 | 971.59 | 267.38 | 971.68 |
| 273.53 | 971.66 | 275.74 | 971.69 | 281.62 | 971.86 | 286.2 | 972.02 | 288.75 | 972.12 |
| 292.02 | 972.43 | 295.87 | 972.97 | 298.88 | 973.15 | 303 | 973.38 | 308.29 | 973.46 |
| 310.13 | 973.51 | 311.55 | 973.5 | 317.26 | 973.5 | 324.23 | 973.45 | 324.57 | 973.45 |
| 331.5 | 973.44 | 336.9 | 973.4 | 338.62 | 973.4 | 340.83 | 973.39 | 345.75 | 973.36 |
| 349.58 | 973.32 | 352.88 | 973.31 | 357.11 | 973.28 | 373.38 | 973.11 | 374.25 | 973.1 |
| 374.93 | 973.09 | 381.38 | 973.01 | 387.6 | 972.87 | 389.66 | 972.83 | 395.63 | 972.67 |
| 400.84 | 972.48 | 405.93 | 972.29 | 409.89 | 972.1 | 412.96 | 971.93 | 417.01 | 971.73 |
| 422.21 | 971.54 | 424.13 | 971.51 | 425.63 | 971.46 | 431.26 | 971.31 | 438.31 | 971.06 |
| 438.38 | 971.06 | 438.48 | 971.05 | 445.51 | 971.01 | 450.98 | 970.91 | 452.64 | 970.89 |
| 454.76 | 970.84 | 459.77 | 970.78 | 463.66 | 970.7 | 466.89 | 970.67 | 471.03 | 970.58 |
| 474.01 | 970.53 | 476.33 | 970.48 | 481.13 | 970.42 | 487.3 | 970.3 | 488.26 | 970.28 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 489.01 | 970.27 | 501.68 | 970.06 | 502.52 | 970.04 | 503.57 | 970.03 | 509.64 | 969.95 |
| 514.36 | 969.91 | 516.76 | 969.91 | 519.85 | 969.99 | 523.89 | 970.06 | 527.04 | 970.21 |
| 531.01 | 970.46 | 536.12 | 970.95 | 538.14 | 971.13 | 539.71 | 971.32 | 545.26 | 972.23 |
| 552.39 | 974.01 | 557.75 | 975.55 | 564.85 | 977.6 | 565.06 | 977.66 | 568.67 | 978.65 |
| 573.77 | 980.11 | 577.74 | 981.13 | 580.89 | 981.91 | 584.95 | 982.66 | 588.02 | 983.27 |
| 590.41 | 983.46 | 592.09 | 983.6 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 59.21 | .077 | 557.75 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 373.38 | 552.39 | 212.21 | 208.08 | 203.32 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.50 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.077 | 0.077 | 0.077 |
| W.S. Elev (ft) | 974.45 | Reach Len. (ft) | 212.21 | 208.08 | 203.32 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 502.21 | 575.65 | 0.34 |
| E.G. Slope (ft/ft) | 0.002401 | Area (sq ft) | 502.21 | 575.65 | 0.34 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 655.69 | 1184.20 | 0.11 |
| Top Width (ft) | 490.00 | Top Width (ft) | 309.45 | 179.01 | 1.53 |
| Vel Total (ft/s) | 1.71 | Avg. Vel. (ft/s) | 1.31 | 2.06 | 0.34 |
| Max Chl Dpth (ft) | 4.54 | Hydr. Depth (ft) | 1.62 | 3.22 | 0.22 |
| Conv. Total (cfs) | 37549.4 | Conv. (cfs) | 13380.9 | 24166.2 | 2.3 |
| Length Wtd. (ft) | 209.20 | Wetted Per. (ft) | 309.55 | 179.41 | 1.60 |
| Min Ch El (ft) | 969.91 | Shear (lb/sq ft) | 0.24 | 0.48 | 0.03 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.32 | 0.99 | 0.01 |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | 98.85 | 156.02 | 106.57 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 103.13 | 78.42 | 128.15 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 975.12 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 975.00 | Reach Len. (ft) | 212.21 | 208.08 | 203.32 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 674.40 | |
| E.G. Slope (ft/ft) | 0.003494 | Area (sq ft) | | 674.40 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 179.01 | Top Width (ft) | | 179.01 | |
| Vel Total (ft/s) | 2.73 | Avg. Vel. (ft/s) | | 2.73 | |
| Max Chl Dpth (ft) | 5.09 | Hydr. Depth (ft) | | 3.77 | |
| Conv. Total (cfs) | 31130.5 | Conv. (cfs) | | 31130.5 | |
| Length Wtd. (ft) | 208.08 | Wetted Per. (ft) | | 182.29 | |
| Min Ch El (ft) | 969.91 | Shear (lb/sq ft) | | 0.81 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.20 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 14.24 | 203.57 | 18.58 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 7.05 | 82.67 | 9.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.50 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.077 | 0.077 | 0.077 |
| W.S. Elev (ft) | 974.45 | Reach Len. (ft) | 212.21 | 208.08 | 203.32 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 502.23 | 575.66 | 0.34 |
| E.G. Slope (ft/ft) | 0.002401 | Area (sq ft) | 502.23 | 575.66 | 0.34 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 655.70 | 1184.18 | 0.11 |
| Top Width (ft) | 490.00 | Top Width (ft) | 309.45 | 179.01 | 1.54 |
| Vel Total (ft/s) | 1.71 | Avg. Vel. (ft/s) | 1.31 | 2.06 | 0.34 |
| Max Chl Dpth (ft) | 4.54 | Hydr. Depth (ft) | 1.62 | 3.22 | 0.22 |
| Conv. Total (cfs) | 37551.0 | Conv. (cfs) | 13381.7 | 24167.0 | 2.3 |
| Length Wtd. (ft) | 209.20 | Wetted Per. (ft) | 309.56 | 179.41 | 1.60 |
| Min Ch El (ft) | 969.91 | Shear (lb/sq ft) | 0.24 | 0.48 | 0.03 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.32 | 0.99 | 0.01 |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | 33.02 | 184.11 | 37.28 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 21.31 | 81.11 | 27.72 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.692

INPUT
Description: Thalweg Sta. 421.95
Station Elevation Data num= 166

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.05 | 2.75 | 975.96 | 5.48 | 975.83 | 9.37 | 975.69 | 12.65 | 975.54 |
| 14.95 | 975.47 | 19.83 | 975.2 | 26.81 | 974.91 | 27.02 | 974.9 | 27.16 | 974.9 |
| 34.19 | 974.61 | 39.36 | 974.41 | 40.58 | 974.36 | 41.38 | 974.33 | 44.26 | 974.23 |
| 48.56 | 974.03 | 51.56 | 973.91 | 55.74 | 973.73 | 61.7 | 973.54 | 62.92 | 973.49 |
| 63.76 | 973.48 | 70.1 | 973.34 | 75.97 | 973.29 | 77.28 | 973.27 | 79.15 | 973.26 |
| 84.46 | 973.22 | 96.59 | 973.15 | 98.83 | 973.13 | 100.38 | 973.13 | 112.59 | 973.05 |
| 113.18 | 973.05 | 114.04 | 973.04 | 124.79 | 972.97 | 127.54 | 972.96 | 134.73 | 972.91 |
| 136.99 | 972.9 | 148.94 | 972.83 | 149.09 | 972.82 | 149.19 | 972.82 | 163.45 | 972.74 |
| 170.64 | 972.69 | 173.6 | 972.68 | 183.83 | 972.61 | 184.99 | 972.61 | 185.81 | 972.6 |
| 192.18 | 972.57 | 199.35 | 972.52 | 206.54 | 972.48 | 210.22 | 972.45 | 218.72 | 972.4 |
| 220.89 | 972.39 | 228.08 | 972.35 | 234.62 | 972.3 | 235.26 | 972.3 | 236.16 | 972.29 |
| 242.43 | 972.26 | 246.83 | 972.23 | 249.62 | 972.22 | 256.8 | 972.17 | 263.98 | 972.14 |
| 271.05 | 972.09 | 271.24 | 972.09 | 283.44 | 972.04 | 286.89 | 972.04 | 288.49 | 972.03 |
| 292.7 | 972.03 | 295.64 | 972.05 | 299.89 | 972.09 | 307.06 | 972.22 | 307.85 | 972.24 |
| 314.24 | 972.32 | 320.05 | 972.33 | 321.43 | 972.33 | 323.38 | 972.3 | 328.6 | 972.23 |
| 332.26 | 972.17 | 335.79 | 972.12 | 340.83 | 972.04 | 342.97 | 971.99 | 344.46 | 971.97 |
| 350.15 | 971.86 | 356.67 | 971.75 | 357.33 | 971.73 | 358.27 | 971.71 | 368.87 | 971.44 |
| 371.69 | 971.35 | 375.72 | 971.19 | 381.07 | 970.95 | 393.17 | 970.21 | 393.27 | 970.21 |
| 400.41 | 969.73 | 405.48 | 969.41 | 407.59 | 969.26 | 410.62 | 969.09 | 414.78 | 968.84 |
| 417.68 | 968.7 | 421.95 | 968.58 | 428.06 | 968.53 | 429.14 | 968.51 | 429.89 | 968.52 |
| 436.32 | 968.9 | 442.09 | 969.39 | 443.5 | 969.55 | 450.68 | 970.48 | 454.3 | 970.98 |
| 457.86 | 971.42 | 462.95 | 972.11 | 465.05 | 972.37 | 466.5 | 972.53 | 472.22 | 972.77 |
| 478.7 | 973.01 | 479.4 | 973.02 | 480.4 | 973.02 | 486.59 | 973.07 | 489.11 | 973.13 |
| 493.76 | 973.26 | 500.95 | 973.61 | 503.11 | 973.79 | 515.29 | 974.92 | 522.49 | 975.77 |
| 523.4 | 975.83 | 527.52 | 976.1 | 529.67 | 976.27 | 532.73 | 976.45 | 536.84 | 976.7 |
| 539.72 | 976.82 | 544.03 | 977.21 | 550.18 | 977.49 | 551.21 | 977.55 | 551.93 | 977.59 |
| 558.39 | 978.35 | 564.13 | 978.89 | 565.57 | 979.05 | 567.62 | 979.24 | 572.75 | 979.73 |
| 576.34 | 979.99 | 585.07 | 980.57 | 587.11 | 980.71 | 588.54 | 980.8 | 594.3 | 981.13 |
| 600.75 | 981.43 | 601.47 | 981.46 | 602.51 | 981.49 | 608.65 | 981.62 | 612.95 | 981.62 |
| 615.84 | 981.58 | 623.01 | 981.51 | 625.15 | 981.47 | 630.2 | 981.27 | 637.35 | 981.01 |
| 637.4 | 981 | 644.56 | 980.15 | 649.56 | 979.43 | 651.74 | 979.08 | 654.85 | 978.63 |
| 658.92 | 977.96 | 661.76 | 977.42 | 666.11 | 976.92 | 672.3 | 977.71 | 673.28 | 977.81 |
| 673.97 | 977.9 | 680.46 | 978.91 | 686.17 | 979.9 | 689.75 | 980.44 | 698.38 | 981.47 |
| 699.73 | 981.56 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 40.58 | .077 | 489.11 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 320.05 | 472.22 | 226.09 | 205.51 | 199.93 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.62 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.077 | 0.077 | 0.070 |
| W.S. Elev (ft) | 973.46 | Reach Len. (ft) | 226.09 | 205.51 | 199.93 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 217.89 | 415.28 | 9.49 |
| E.G. Slope (ft/ft) | 0.008883 | Area (sq ft) | 217.89 | 415.28 | 9.49 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 356.60 | 1472.95 | 10.45 |
| Top Width (ft) | 433.02 | Top Width (ft) | 255.26 | 152.17 | 25.59 |
| Vel Total (ft/s) | 2.86 | Avg. Vel. (ft/s) | 1.64 | 3.55 | 1.10 |
| Max Chl Dpth (ft) | 4.95 | Hydr. Depth (ft) | 0.85 | 2.73 | 0.37 |
| Conv. Total (cfs) | 19522.4 | Conv. (cfs) | 3783.6 | 15627.9 | 110.9 |
| Length Wtd. (ft) | 207.49 | Wetted Per. (ft) | 255.26 | 152.50 | 25.60 |
| Min Ch El (ft) | 968.51 | Shear (lb/sq ft) | 0.47 | 1.51 | 0.21 |
| Alpha | 1.29 | Stream Power (lb/ft s) | 0.77 | 5.36 | 0.23 |
| Frctn Loss (ft) | 1.85 | Cum Volume (acre-ft) | 97.09 | 153.65 | 106.54 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 101.75 | 77.63 | 128.09 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.89 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.27 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 973.62 | Reach Len. (ft) | 226.09 | 205.51 | 199.93 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 440.07 | |
| E.G. Slope (ft/ft) | 0.011640 | Area (sq ft) | | 440.07 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 152.17 | Top Width (ft) | | 152.17 | |
| Vel Total (ft/s) | 4.18 | Avg. Vel. (ft/s) | | 4.18 | |
| Max Chl Dpth (ft) | 5.11 | Hydr. Depth (ft) | | 2.89 | |
| Conv. Total (cfs) | 17054.2 | Conv. (cfs) | | 17054.2 | |
| Length Wtd. (ft) | 205.51 | Wetted Per. (ft) | | 154.64 | |
| Min Ch El (ft) | 968.51 | Shear (lb/sq ft) | | 2.07 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 8.65 | |
| Frctn Loss (ft) | 2.09 | Cum Volume (acre-ft) | 14.24 | 200.90 | 18.58 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 7.05 | 81.88 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.62 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.077 | 0.077 | 0.070 |
| W.S. Elev (ft) | 973.46 | Reach Len. (ft) | 226.09 | 205.51 | 199.93 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 218.00 | 415.35 | 9.50 |
| E.G. Slope (ft/ft) | 0.008877 | Area (sq ft) | 218.00 | 415.35 | 9.50 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 356.75 | 1472.78 | 10.47 |
| Top Width (ft) | 433.04 | Top Width (ft) | 255.28 | 152.17 | 25.60 |
| Vel Total (ft/s) | 2.86 | Avg. Vel. (ft/s) | 1.64 | 3.55 | 1.10 |
| Max Chl Dpth (ft) | 4.95 | Hydr. Depth (ft) | 0.85 | 2.73 | 0.37 |
| Conv. Total (cfs) | 19529.6 | Conv. (cfs) | 3786.5 | 15632.0 | 111.1 |
| Length Wtd. (ft) | 207.49 | Wetted Per. (ft) | 255.28 | 152.50 | 25.61 |
| Min Ch El (ft) | 968.51 | Shear (lb/sq ft) | 0.47 | 1.51 | 0.21 |
| Alpha | 1.29 | Stream Power (lb/ft s) | 0.77 | 5.35 | 0.23 |
| Frctn Loss (ft) | 1.85 | Cum Volume (acre-ft) | 31.26 | 181.75 | 37.26 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 19.93 | 80.31 | 27.66 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.653

INPUT
Description: Thalweg Sta. 431.67
Station Elevation Data num= 182

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.17 | 4.99 | 975.92 | 9.03 | 975.68 | 14.75 | 975.37 | 17.22 | 975.25 |
| 23.37 | 974.93 | 29.45 | 974.63 | 30.55 | 974.59 | 32.12 | 974.52 | 37.73 | 974.31 |
| 41.68 | 974.14 | 44.91 | 974.05 | 49.49 | 973.91 | 52.08 | 973.86 | 53.91 | 973.81 |
| 59.27 | 973.78 | 61.49 | 973.71 | 66.14 | 973.55 | 66.44 | 973.55 | 66.86 | 973.54 |
| 78.37 | 973.37 | 80.79 | 973.37 | 84.24 | 973.36 | 87.97 | 973.4 | 90.6 | 973.38 |
| 95.15 | 973.41 | 101.6 | 973.42 | 102.32 | 973.43 | 102.83 | 973.43 | 109.51 | 973.33 |
| 115.05 | 973.26 | 123.86 | 973.11 | 127.28 | 973.07 | 131.03 | 973.01 | 136.35 | 972.94 |
| 138.21 | 972.91 | 139.51 | 972.9 | 151.74 | 972.72 | 152.56 | 972.71 | 153.72 | 972.7 |
| 179.54 | 972.33 | 181.28 | 972.3 | 188.43 | 972.2 | 200.66 | 972.03 | 202.8 | 971.99 |
| 209.98 | 971.89 | 224.34 | 971.65 | 225.12 | 971.64 | 237.35 | 971.42 | 240.58 | 971.37 |
| 249.58 | 971.2 | 261.81 | 970.98 | 274.58 | 970.74 | 275.32 | 970.73 | 296.1 | 970.35 |
| 298.5 | 970.3 | 303.28 | 970.22 | 310.08 | 970.09 | 310.46 | 970.09 | 310.73 | 970.08 |
| 317.63 | 969.95 | 322.96 | 969.86 | 324.82 | 969.82 | 335.19 | 969.63 | 346.34 | 969.41 |
| 347.42 | 969.39 | 359.65 | 969.14 | 371.88 | 968.9 | 375.05 | 968.83 | 379.56 | 968.74 |
| 382.23 | 968.68 | 384.1 | 968.65 | 396.33 | 968.37 | 396.59 | 968.36 | 396.93 | 968.35 |
| 408.56 | 968.08 | 410.93 | 968.02 | 418.11 | 967.87 | 425.29 | 967.76 | 431.67 | 967.72 |
| 432.47 | 967.71 | 433.02 | 967.71 | 439.65 | 967.7 | 445.25 | 967.71 | 446.83 | 967.72 |
| 449.05 | 967.72 | 453.99 | 967.78 | 457.48 | 967.87 | 461.17 | 967.95 | 466.42 | 968.15 |
| 468.35 | 968.25 | 469.71 | 968.33 | 475.53 | 968.75 | 481.94 | 969.28 | 483.79 | 969.45 |
| 489.89 | 970.04 | 497.06 | 970.76 | 501.16 | 971.18 | 504.24 | 971.51 | 515.67 | 972.79 |
| 518.54 | 973.11 | 518.62 | 973.11 | 519.77 | 973.23 | 525.77 | 973.86 | 530.85 | 973.25 |
| 532.94 | 973.03 | 535.91 | 973.2 | 540.12 | 973.73 | 543.08 | 973.87 | 547.3 | 974.21 |
| 553.28 | 974.29 | 555.31 | 974.28 | 561.65 | 974.26 | 567.54 | 974.31 | 568.83 | 974.3 |
| 570.65 | 974.27 | 576 | 974.11 | 579.77 | 974.02 | 583.18 | 973.93 | 588.03 | 973.91 |
| 590.36 | 973.88 | 592 | 973.89 | 597.54 | 973.85 | 604.23 | 973.89 | 604.72 | 973.88 |
| 605.39 | 973.88 | 611.9 | 973.79 | 616.46 | 973.91 | 619.07 | 973.91 | 626.24 | 974.37 |
| 628.69 | 974.66 | 633.42 | 975.14 | 640.15 | 975.97 | 640.6 | 976.02 | 640.92 | 976.05 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 647.77 | 976.76 | 653.15 | 977.26 | 654.96 | 977.42 | 657.51 | 977.61 | 662.14 | 977.89 |
| 665.38 | 978.08 | 669.3 | 978.24 | 674.89 | 978.48 | 676.48 | 978.54 | 677.61 | 978.6 |
| 683.66 | 978.81 | 689.84 | 979.16 | 690.84 | 979.2 | 692.26 | 979.29 | 696.03 | 979.47 |
| 698.01 | 979.57 | 702.07 | 979.81 | 705.2 | 979.94 | 709.63 | 980.14 | 712.37 | 980.21 |
| 714.3 | 980.25 | 719.55 | 980.16 | 726.53 | 980.14 | 726.72 | 980.14 | 727 | 980.13 |
| 733.9 | 979.85 | 738.76 | 979.7 | 744.38 | 979.7 | 748.25 | 979.69 | 750.99 | 979.71 |
| 755.43 | 979.92 | 761.74 | 980.18 | 762.61 | 980.22 | 763.22 | 980.24 | 769.79 | 980.7 |
| 775.44 | 980.93 | 776.96 | 981.01 | 779.12 | 981.1 | 784.14 | 981.33 | 787.67 | 981.44 |
| 796.49 | 981.64 | 798.49 | 981.68 | 799.9 | 981.7 | 812.13 | 981.89 | 812.85 | 981.9 |
| 813.86 | 981.92 | 819.82 | 982.05 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 61.49 | .077 | 519.77 | .04 | 696.03 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 179.54 | 515.67 | 223.96 | 203.94 | 201.58 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.77 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 971.62 | Reach Len. (ft) | 223.96 | 203.94 | 201.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 602.96 | |
| E.G. Slope (ft/ft) | 0.008967 | Area (sq ft) | | 602.96 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 279.19 | Top Width (ft) | | 279.19 | |
| Vel Total (ft/s) | 3.05 | Avg. Vel. (ft/s) | | 3.05 | |
| Max Chl Dpth (ft) | 3.92 | Hydr. Depth (ft) | | 2.16 | |
| Conv. Total (cfs) | 19431.3 | Conv. (cfs) | | 19431.3 | |
| Length Wtd. (ft) | 203.94 | Wetted Per. (ft) | | 279.40 | |
| Min Ch El (ft) | 967.70 | Shear (lb/sq ft) | | 1.21 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.69 | |
| Frctn Loss (ft) | 1.73 | Cum Volume (acre-ft) | 96.53 | 151.25 | 106.52 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 101.09 | 76.62 | 128.03 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.77 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 971.62 | Reach Len. (ft) | 223.96 | 203.94 | 201.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 603.27 | |
| E.G. Slope (ft/ft) | 0.008954 | Area (sq ft) | | 603.27 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 279.27 | Top Width (ft) | | 279.27 | |
| Vel Total (ft/s) | 3.05 | Avg. Vel. (ft/s) | | 3.05 | |
| Max Chl Dpth (ft) | 3.92 | Hydr. Depth (ft) | | 2.16 | |
| Conv. Total (cfs) | 19444.5 | Conv. (cfs) | | 19444.5 | |
| Length Wtd. (ft) | 203.94 | Wetted Per. (ft) | | 279.47 | |
| Min Ch El (ft) | 967.70 | Shear (lb/sq ft) | | 1.21 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.68 | |
| Frctn Loss (ft) | 1.78 | Cum Volume (acre-ft) | 14.24 | 198.44 | 18.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 7.05 | 80.86 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.77 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 971.63 | Reach Len. (ft) | 223.96 | 203.94 | 201.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 603.62 | |
| E.G. Slope (ft/ft) | 0.008940 | Area (sq ft) | | 603.62 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 279.35 | Top Width (ft) | | 279.35 | |
| Vel Total (ft/s) | 3.05 | Avg. Vel. (ft/s) | | 3.05 | |
| Max Chl Dpth (ft) | 3.93 | Hydr. Depth (ft) | | 2.16 | |
| Conv. Total (cfs) | 19459.9 | Conv. (cfs) | | 19459.9 | |
| Length Wtd. (ft) | 203.94 | Wetted Per. (ft) | | 279.55 | |
| Min Ch El (ft) | 967.70 | Shear (lb/sq ft) | | 1.21 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.67 | |
| Frctn Loss (ft) | 1.75 | Cum Volume (acre-ft) | 30.70 | 179.34 | 37.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 19.27 | 79.30 | 27.60 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.614

INPUT
Description: Thalweg Sta. 491.88
Station Elevation Data num= 172

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 974.98 | 1.39 | 975.04 | 5.89 | 975.17 | 8.49 | 975.23 | 10.61 | 975.26 |
| 15.61 | 975.34 | 22.71 | 975.41 | 23.49 | 975.42 | 29.82 | 975.47 | 36.38 | 975.48 |
| 36.94 | 975.48 | 37.6 | 975.47 | 44.04 | 975.39 | 49.27 | 975.23 | 51.15 | 975.19 |
| 53.46 | 975.11 | 58.25 | 974.96 | 62.16 | 974.82 | 65.36 | 974.72 | 69.31 | 974.58 |
| 72.47 | 974.48 | 75.05 | 974.39 | 85.16 | 974.05 | 86.7 | 974.01 | 93.8 | 973.78 |
| 100.82 | 973.59 | 101.01 | 973.59 | 108.01 | 973.45 | 113.71 | 973.38 | 115.12 | 973.36 |
| 116.87 | 973.35 | 120.97 | 973.3 | 122.24 | 973.28 | 126.6 | 973.24 | 129.34 | 973.19 |
| 132.72 | 973.16 | 136.46 | 973.09 | 139.48 | 973 | 148.57 | 972.63 | 150.67 | 972.54 |
| 152.37 | 972.48 | 164.42 | 972 | 165.26 | 971.98 | 172 | 971.79 | 178.15 | 971.66 |
| 179.1 | 971.63 | 191.04 | 971.43 | 193.32 | 971.38 | 196.13 | 971.34 | 207.54 | 971.13 |
| 211.98 | 971.06 | 214.64 | 971.01 | 216.81 | 970.98 | 221.76 | 970.88 | 227.83 | 970.78 |
| 228.86 | 970.76 | 229.7 | 970.75 | 242.59 | 970.51 | 243.08 | 970.5 | 243.68 | 970.49 |
| 255.48 | 970.27 | 261.29 | 970.17 | 275.39 | 969.91 | 278.62 | 969.86 | 281.25 | 969.81 |
| 285.73 | 969.75 | 291.25 | 969.65 | 292.85 | 969.63 | 294.14 | 969.6 | 299.95 | 969.53 |
| 307.03 | 969.42 | 307.1 | 969.42 | 314.16 | 969.35 | 319.92 | 969.27 | 321.27 | 969.26 |
| 332.8 | 969.13 | 335.49 | 969.11 | 338.8 | 969.07 | 342.61 | 969.04 | 345.69 | 969 |
| 356.82 | 968.89 | 370.51 | 968.73 | 371.03 | 968.72 | 371.46 | 968.72 | 378.15 | 968.6 |
| 385.25 | 968.44 | 386.36 | 968.41 | 397.24 | 968.15 | 406.58 | 967.91 | 410.12 | 967.83 |
| 420.79 | 967.56 | 423.01 | 967.51 | 433.92 | 967.24 | 435.01 | 967.21 | 435.9 | 967.19 |
| 448.79 | 966.87 | 449.23 | 966.86 | 449.77 | 966.85 | 461.68 | 966.55 | 474.56 | 966.25 |
| 481.47 | 966.11 | 484.77 | 966.05 | 491.88 | 965.95 | 497.33 | 965.97 | 498.99 | 965.98 |
| 500.34 | 966 | 506.1 | 966.11 | 513.18 | 966.26 | 527.43 | 966.58 | 529.04 | 966.61 |
| 534.53 | 966.72 | 539 | 966.82 | 541.64 | 966.87 | 555.86 | 967.18 | 560.74 | 967.32 |
| 562.97 | 967.39 | 570.07 | 967.7 | 576.59 | 968.22 | 577.18 | 968.27 | 577.67 | 968.33 |
| 584.29 | 969.08 | 590.55 | 969.81 | 591.4 | 969.92 | 592.45 | 970.04 | 593.54 | 970.17 |
| 597.57 | 970.65 | 598.52 | 970.76 | 603.44 | 971.29 | 605.62 | 971.53 | 612.73 | 972.08 |
| 616.33 | 972.22 | 619.83 | 972.37 | 629.22 | 972.58 | 634.06 | 972.73 | 641.16 | 972.92 |
| 642.11 | 972.95 | 654.99 | 973.5 | 655.38 | 973.52 | 662.49 | 973.98 | 667.88 | 974.35 |
| 669.59 | 974.51 | 676.7 | 975.28 | 680.77 | 975.76 | 683.82 | 976.09 | 690.92 | 976.91 |
| 693.66 | 977.22 | 697.57 | 977.6 | 698.04 | 977.65 | 705.14 | 978.3 | 706.54 | 978.42 |
| 719.26 | 979.38 | 719.43 | 979.39 | 726.46 | 979.87 | 733.58 | 979.98 | 735.12 | 980.04 |
| 740.68 | 980.35 | 745.2 | 980.55 | 747.79 | 980.61 | 750.97 | 980.69 | 758.09 | 980.78 |
| 762.01 | 980.76 | 766.83 | 980.78 | 769.12 | 980.78 | 770.98 | 980.79 | 776.22 | 980.72 |
| 782.68 | 980.59 | 783.34 | 980.58 | 783.87 | 980.57 | 796.75 | 980.27 | 797.55 | 980.26 |
| 804.67 | 980.12 | 806.44 | 980.08 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 120.97 | .077 | 593.54 | .04 | 697.57 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 261.29 | 597.57 | 224.19 | 200.79 | 196.31 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 970.03 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 969.91 | Reach Len. (ft) | 224.19 | 200.79 | 196.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 654.65 | |
| E.G. Slope (ft/ft) | 0.008034 | Area (sq ft) | | 654.65 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 315.88 | Top Width (ft) | | 315.88 | |
| Vel Total (ft/s) | 2.81 | Avg. Vel. (ft/s) | | 2.81 | |
| Max Chl Dpth (ft) | 3.96 | Hydr. Depth (ft) | | 2.07 | |
| Conv. Total (cfs) | 20527.7 | Conv. (cfs) | | 20527.7 | |
| Length Wtd. (ft) | 200.84 | Wetted Per. (ft) | | 316.06 | |
| Min Ch El (ft) | 965.95 | Shear (lb/sq ft) | | 1.04 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.92 | |
| Frctn Loss (ft) | 1.69 | Cum Volume (acre-ft) | 96.53 | 148.30 | 106.52 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 101.09 | 75.22 | 128.03 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 969.99 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 969.87 | Reach Len. (ft) | 224.19 | 200.79 | 196.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 641.45 | |
| E.G. Slope (ft/ft) | 0.008489 | Area (sq ft) | | 641.45 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 312.84 | Top Width (ft) | | 312.84 | |
| Vel Total (ft/s) | 2.87 | Avg. Vel. (ft/s) | | 2.87 | |
| Max Chl Dpth (ft) | 3.92 | Hydr. Depth (ft) | | 2.05 | |
| Conv. Total (cfs) | 19970.7 | Conv. (cfs) | | 19970.7 | |
| Length Wtd. (ft) | 200.79 | Wetted Per. (ft) | | 313.02 | |
| Min Ch El (ft) | 965.95 | Shear (lb/sq ft) | | 1.09 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.12 | |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | 14.24 | 195.53 | 18.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 7.05 | 79.48 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 970.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 969.89 | Reach Len. (ft) | 224.19 | 200.79 | 196.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 649.16 | |
| E.G. Slope (ft/ft) | 0.008219 | Area (sq ft) | | 649.16 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 314.62 | Top Width (ft) | | 314.62 | |
| Vel Total (ft/s) | 2.83 | Avg. Vel. (ft/s) | | 2.83 | |
| Max Chl Dpth (ft) | 3.94 | Hydr. Depth (ft) | | 2.06 | |
| Conv. Total (cfs) | 20295.8 | Conv. (cfs) | | 20295.8 | |
| Length Wtd. (ft) | 200.86 | Wetted Per. (ft) | | 314.80 | |
| Min Ch El (ft) | 965.95 | Shear (lb/sq ft) | | 1.06 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.00 | |
| Frctn Loss (ft) | 1.62 | Cum Volume (acre-ft) | 30.70 | 176.41 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 19.27 | 77.91 | 27.60 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.576

INPUT
Description: Thalweg Sta. 415.95
Station Elevation Data num= 203

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 969.91 | 5.43 | 970 | 12.5 | 970.08 | 13.49 | 970.09 | 19.58 | 970.12 |
| 25.48 | 970.13 | 26.65 | 970.14 | 34.12 | 970.14 | 39.4 | 970.16 | 47.86 | 970.16 |
| 53.32 | 970.18 | 54.94 | 970.17 | 56.6 | 970.17 | 62.01 | 970.15 | 67.24 | 970.16 |
| 69.08 | 970.14 | 70.98 | 970.14 | 76.15 | 970.08 | 83.22 | 969.97 | 85.35 | 969.93 |
| 95.08 | 969.7 | 97.37 | 969.64 | 99.73 | 969.59 | 111.51 | 969.27 | 114.1 | 969.21 |
| 125.65 | 968.91 | 132.73 | 968.73 | 136.85 | 968.64 | 139.8 | 968.57 | 142.85 | 968.51 |
| 146.87 | 968.45 | 150.77 | 968.41 | 153.94 | 968.37 | 157.22 | 968.35 | 161.01 | 968.31 |
| 164.69 | 968.28 | 168.09 | 968.26 | 182.23 | 968.14 | 185.97 | 968.12 | 200.34 | 968 |
| 203.45 | 967.98 | 206.45 | 967.95 | 220.38 | 967.84 | 224.66 | 967.79 | 228.98 | 967.76 |
| 229.09 | 967.76 | 231.73 | 967.73 | 234.29 | 967.71 | 238.81 | 967.65 | 243.47 | 967.6 |
| 245.88 | 967.57 | 248.22 | 967.55 | 252.95 | 967.48 | 257.84 | 967.42 | 260.02 | 967.39 |
| 262.14 | 967.37 | 272.21 | 967.23 | 274.17 | 967.21 | 276.06 | 967.18 | 286.58 | 967.03 |
| 289.98 | 966.99 | 300.96 | 966.8 | 302.45 | 966.78 | 315.34 | 966.53 | 316.6 | 966.5 |
| 317.82 | 966.48 | 323.67 | 966.37 | 329.71 | 966.24 | 331.75 | 966.2 | 344.09 | 965.97 |
| 344.89 | 965.95 | 345.66 | 965.94 | 358.46 | 965.7 | 372.83 | 965.44 | 373.17 | 965.43 |
| 373.51 | 965.43 | 387.2 | 965.22 | 387.32 | 965.22 | 387.43 | 965.21 | 401.35 | 965.09 |
| 401.58 | 965.09 | 415.27 | 965.04 | 415.95 | 965.04 | 429.75 | 965.03 | 430.33 | 965.04 |
| 436.82 | 965.09 | 450.97 | 965.27 | 457.03 | 965.36 | 459.08 | 965.38 | 470.96 | 965.55 |
| 473.45 | 965.59 | 479.25 | 965.67 | 484.88 | 965.76 | 487.83 | 965.8 | 493.4 | 965.9 |
| 498.8 | 966.01 | 500.47 | 966.04 | 502.2 | 966.08 | 507.54 | 966.26 | 512.72 | 966.5 |
| 514.61 | 966.58 | 516.57 | 966.68 | 521.69 | 967.2 | 526.64 | 967.97 | 528.76 | 968.27 |
| 530.94 | 968.63 | 535.83 | 969.55 | 540.56 | 970.47 | 542.9 | 970.9 | 549.97 | 972.13 |
| 554.49 | 972.85 | 559.69 | 973.62 | 568.4 | 974.27 | 568.42 | 974.27 | 571.19 | 974.44 |
| 574.07 | 974.19 | 578.26 | 973.9 | 582.33 | 973.46 | 585.33 | 973.1 | 588.18 | 972.72 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 588.44 | 972.69 | 596.25 | 971.72 | 599.48 | 971.37 | 602.82 | 971.04 | 606.55 | 970.6 |
| 610.17 | 970.27 | 613.62 | 970.11 | 617.19 | 970.04 | 620.69 | 969.95 | 624.09 | 969.95 |
| 627.77 | 970.07 | 631.56 | 970.18 | 634.84 | 970.3 | 638.01 | 970.38 | 641.91 | 970.7 |
| 645.94 | 970.86 | 648.98 | 971.03 | 651.93 | 971 | 656.05 | 971.27 | 660.31 | 971.41 |
| 663.13 | 971.59 | 665.86 | 971.6 | 670.2 | 971.83 | 671.69 | 971.87 | 674.69 | 971.94 |
| 677.27 | 972.1 | 679.77 | 972.11 | 684.34 | 972.37 | 689.06 | 972.52 | 691.41 | 972.67 |
| 693.7 | 972.69 | 703.44 | 973.21 | 705.56 | 973.35 | 707.62 | 973.42 | 712.63 | 973.7 |
| 717.81 | 973.93 | 719.7 | 974.08 | 721.54 | 974.12 | 726.77 | 974.31 | 732.18 | 974.29 |
| 733.85 | 974.3 | 735.46 | 974.26 | 740.92 | 974.15 | 746.55 | 973.93 | 747.99 | 973.92 |
| 755.06 | 973.66 | 760.93 | 973.91 | 762.13 | 974.02 | 763.3 | 974.15 | 769.21 | 974.75 |
| 775.3 | 975.59 | 776.28 | 975.7 | 777.22 | 975.83 | 783.35 | 976.56 | 789.68 | 977.38 |
| 790.42 | 977.47 | 791.14 | 977.55 | 797.49 | 978.11 | 804.05 | 978.62 | 804.56 | 978.65 |
| 805.07 | 978.67 | 811.64 | 978.82 | 818.43 | 978.93 | 818.98 | 978.93 | 825.78 | 978.87 |
| 832.8 | 978.78 | 832.91 | 978.78 | 839.92 | 978.74 | 846.83 | 978.79 | 847 | 978.79 |
| 847.17 | 978.8 | 854.07 | 978.92 | 860.75 | 979.05 | 861.54 | 979.07 | 868.21 | 979.22 |
| 874.67 | 979.38 | 875.92 | 979.4 | 882.36 | 979.56 | 888.59 | 979.68 | 889.43 | 979.7 |
| 890.29 | 979.71 | 896.5 | 979.85 | 897.98 | 979.9 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 34.12 | .077 | 588.18 | .04 | 671.69 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 228.98 | 526.64 | 207.87 | 200 | 210.88 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.34 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.077 | 0.077 | 0.077 |
| W.S. Elev (ft) | 968.20 | Reach Len. (ft) | 207.87 | 200.00 | 210.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 11.55 | 619.12 | 0.19 |
| E.G. Slope (ft/ft) | 0.008864 | Area (sq ft) | 11.55 | 619.12 | 0.19 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 7.53 | 1832.39 | 0.08 |
| Top Width (ft) | 353.04 | Top Width (ft) | 53.76 | 297.66 | 1.62 |
| Vel Total (ft/s) | 2.92 | Avg. Vel. (ft/s) | 0.65 | 2.96 | 0.43 |
| Max Chl Dpth (ft) | 3.17 | Hydr. Depth (ft) | 0.21 | 2.08 | 0.11 |
| Conv. Total (cfs) | 19543.1 | Conv. (cfs) | 80.0 | 19462.3 | 0.8 |
| Length Wtd. (ft) | 202.24 | Wetted Per. (ft) | 53.76 | 297.79 | 1.64 |
| Min Ch El (ft) | 965.03 | Shear (lb/sq ft) | 0.12 | 1.15 | 0.06 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.08 | 3.41 | 0.03 |
| Frctn Loss (ft) | 0.49 | Cum Volume (acre-ft) | 96.50 | 145.37 | 106.52 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 100.95 | 73.81 | 128.03 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.81 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 968.72 | Reach Len. (ft) | 207.87 | 200.00 | 210.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 775.27 | |
| E.G. Slope (ft/ft) | 0.004256 | Area (sq ft) | | 775.27 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 297.66 | Top Width (ft) | | 297.66 | |
| Vel Total (ft/s) | 2.37 | Avg. Vel. (ft/s) | | 2.37 | |
| Max Chl Dpth (ft) | 3.69 | Hydr. Depth (ft) | | 2.60 | |
| Conv. Total (cfs) | 28204.9 | Conv. (cfs) | | 28204.9 | |
| Length Wtd. (ft) | 200.79 | Wetted Per. (ft) | | 299.51 | |
| Min Ch El (ft) | 965.03 | Shear (lb/sq ft) | | 0.69 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.63 | |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 14.24 | 192.26 | 18.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 7.05 | 78.07 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.39 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.077 | 0.077 | 0.077 |
| W.S. Elev (ft) | 968.27 | Reach Len. (ft) | 207.87 | 200.00 | 210.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 15.51 | 639.49 | 0.31 |
| E.G. Slope (ft/ft) | 0.007931 | Area (sq ft) | 15.51 | 639.49 | 0.31 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 10.55 | 1829.30 | 0.15 |
| Top Width (ft) | 362.00 | Top Width (ft) | 62.24 | 297.66 | 2.11 |
| Vel Total (ft/s) | 2.81 | Avg. Vel. (ft/s) | 0.68 | 2.86 | 0.48 |
| Max Chl Dpth (ft) | 3.24 | Hydr. Depth (ft) | 0.25 | 2.15 | 0.15 |
| Conv. Total (cfs) | 20661.1 | Conv. (cfs) | 118.5 | 20540.9 | 1.7 |
| Length Wtd. (ft) | 202.22 | Wetted Per. (ft) | 62.24 | 297.79 | 2.13 |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 965.03 | Shear (lb/sq ft) | 0.12 | 1.06 | 0.07 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.08 | 3.04 | 0.04 |
| Frctn Loss (ft) | 0.42 | Cum Volume (acre-ft) | 30.66 | 173.44 | 37.24 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 19.11 | 76.50 | 27.59 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.538

INPUT
Description: Thalweg Sta. 328.97
Station Elevation Data num= 136

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 968.35 | 3.67 | 967.8 | 8.72 | 966.9 | 10.74 | 966.55 | 12.69 | 966.23 |
| 17.81 | 965.41 | 24.88 | 964.87 | 26.64 | 964.82 | 31.95 | 964.69 | 39.02 | 964.64 |
| 40.59 | 964.66 | 46.09 | 964.7 | 51.76 | 964.76 | 53.17 | 964.79 | 54.54 | 964.79 |
| 66.1 | 964.65 | 67.31 | 964.62 | 74.38 | 964.32 | 77.56 | 964.19 | 80.45 | 964.07 |
| 81.45 | 964.02 | 82.43 | 963.99 | 88.52 | 963.82 | 94.79 | 963.72 | 95.6 | 963.7 |
| 96.38 | 963.69 | 101.96 | 963.65 | 102.67 | 963.64 | 109.14 | 963.64 | 109.74 | 963.63 |
| 110.33 | 963.64 | 116.81 | 963.72 | 123.49 | 964.04 | 123.88 | 964.06 | 124.27 | 964.09 |
| 130.96 | 964.68 | 137.83 | 966.41 | 138.03 | 966.45 | 138.22 | 966.48 | 152.04 | 968.58 |
| 152.17 | 968.6 | 159.25 | 967.79 | 166.12 | 966.99 | 166.32 | 966.96 | 166.52 | 966.94 |
| 173.4 | 966.1 | 180.06 | 965.5 | 180.47 | 965.47 | 180.87 | 965.45 | 187.54 | 965.11 |
| 195.21 | 964.98 | 209.56 | 964.98 | 249.81 | 965 | 251.18 | 965.01 | 277.7 | 965.01 |
| 279.47 | 965.02 | 281.28 | 965.01 | 286.54 | 965 | 291.64 | 965.01 | 293.61 | 965.02 |
| 295.63 | 965.01 | 300.68 | 965 | 305.6 | 965.01 | 309.98 | 965.01 | 314.82 | 964.99 |
| 319.54 | 965 | 324.32 | 965 | 328.97 | 964.99 | 333.49 | 964.99 | 336.04 | 965 |
| 343.11 | 965 | 350.18 | 965.03 | 353.01 | 965.05 | 364.33 | 965.16 | 367.36 | 965.21 |
| 378.48 | 965.35 | 381.7 | 965.4 | 385.55 | 965.45 | 389.28 | 965.52 | 392.62 | 965.56 |
| 396.05 | 965.61 | 399.69 | 965.65 | 403.22 | 965.72 | 406.76 | 965.76 | 410.39 | 965.82 |
| 413.84 | 965.86 | 417.17 | 965.92 | 420.91 | 965.97 | 424.74 | 966.03 | 427.98 | 966.06 |
| 431.12 | 966.12 | 435.05 | 966.17 | 439.08 | 966.23 | 442.12 | 966.26 | 445.07 | 966.32 |
| 449.19 | 966.37 | 467.77 | 966.63 | 472.96 | 966.71 | 482.12 | 966.84 | 484.55 | 966.87 |
| 486.91 | 966.91 | 496.46 | 967.06 | 498.69 | 967.09 | 500.85 | 967.14 | 505.76 | 967.23 |
| 512.83 | 967.41 | 514.8 | 967.49 | 519.91 | 967.69 | 525.16 | 968.08 | 526.98 | 968.24 |
| 534.05 | 969.16 | 539.5 | 970.03 | 539.81 | 970.08 | 541.12 | 970.31 | 542.7 | 970.6 |
| 548.19 | 971.63 | 553.85 | 973.04 | 555.26 | 973.38 | 556.64 | 973.64 | 562.34 | 974.96 |
| 568.19 | 976.03 | 569.41 | 976.29 | 569.83 | 976.36 | 570.59 | 976.49 | 576.48 | 977.43 |
| 582.54 | 978.01 | 584.54 | 978.12 | 590.63 | 978.32 | 596.88 | 978.37 | 598.49 | 978.37 |
| 604.77 | 978.36 | 611.23 | 978.3 | 611.85 | 978.3 | 612.43 | 978.29 | 618.92 | 978.21 |
| 625.5 | 978.06 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 101.96 | .077 | 569.83 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 152.04 | 539.81 | 205.18 | 199.99 | 198.37 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 967.83 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.042 | 0.077 | |
| W.S. Elev (ft) | 967.77 | Reach Len. (ft) | 205.18 | 199.99 | 198.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 429.03 | 761.52 | |
| E.G. Slope (ft/ft) | 0.001097 | Area (sq ft) | 429.03 | 761.52 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1040.50 | 799.51 | |
| Top Width (ft) | 504.35 | Top Width (ft) | 142.84 | 361.51 | |
| Vel Total (ft/s) | 1.55 | Avg. Vel. (ft/s) | 2.43 | 1.05 | |
| Max Chl Dpth (ft) | 4.14 | Hydr. Depth (ft) | 3.00 | 2.11 | |
| Conv. Total (cfs) | 55559.4 | Conv. (cfs) | 31418.1 | 24141.3 | |
| Length Wtd. (ft) | 201.46 | Wetted Per. (ft) | 143.44 | 361.68 | |
| Min Ch El (ft) | 964.98 | Shear (lb/sq ft) | 0.20 | 0.14 | |
| Alpha | 1.59 | Stream Power (lb/ft s) | 0.50 | 0.15 | |
| Frctn Loss (ft) | 0.43 | Cum Volume (acre-ft) | 95.45 | 142.20 | 106.52 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 100.48 | 72.30 | 128.02 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.068 | 0.077 | |
| W.S. Elev (ft) | 968.16 | Reach Len. (ft) | 205.18 | 199.99 | 198.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 174.10 | 905.87 | |
| E.G. Slope (ft/ft) | 0.002143 | Area (sq ft) | 174.10 | 905.87 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 370.88 | 1469.12 | |
| Top Width (ft) | 422.36 | Top Width (ft) | 52.26 | 370.10 | |
| Vel Total (ft/s) | 1.70 | Avg. Vel. (ft/s) | 2.13 | 1.62 | |
| Max Chl Dpth (ft) | 4.53 | Hydr. Depth (ft) | 3.33 | 2.45 | |
| Conv. Total (cfs) | 39750.1 | Conv. (cfs) | 8012.2 | 31737.9 | |
| Length Wtd. (ft) | 200.51 | Wetted Per. (ft) | 57.12 | 370.30 | |
| Min Ch El (ft) | 964.98 | Shear (lb/sq ft) | 0.41 | 0.33 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.87 | 0.53 | |
| Frctn Loss (ft) | 0.55 | Cum Volume (acre-ft) | 13.83 | 188.40 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.92 | 76.54 | 9.44 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 967.95 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.042 | 0.077 | |
| W.S. Elev (ft) | 967.90 | Reach Len. (ft) | 205.18 | 199.99 | 198.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 448.15 | 809.80 | |
| E.G. Slope (ft/ft) | 0.000936 | Area (sq ft) | 448.15 | 809.80 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1026.21 | 813.79 | |
| Top Width (ft) | 509.03 | Top Width (ft) | 144.57 | 364.46 | |
| Vel Total (ft/s) | 1.46 | Avg. Vel. (ft/s) | 2.29 | 1.00 | |
| Max Chl Dpth (ft) | 4.27 | Hydr. Depth (ft) | 3.10 | 2.22 | |
| Conv. Total (cfs) | 60144.5 | Conv. (cfs) | 33544.0 | 26600.5 | |
| Length Wtd. (ft) | 201.44 | Wetted Per. (ft) | 145.18 | 364.64 | |
| Min Ch El (ft) | 964.98 | Shear (lb/sq ft) | 0.18 | 0.13 | |
| Alpha | 1.58 | Stream Power (lb/ft s) | 0.41 | 0.13 | |
| Frctn Loss (ft) | 0.34 | Cum Volume (acre-ft) | 29.55 | 170.11 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 18.62 | 74.98 | 27.59 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.500

INPUT
Description: Thalweg Sta. 629.12
Station Elevation Data num= 254

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.48 | 3.98 | 970.22 | 6.86 | 970.05 | 9.75 | 969.85 | 13.94 | 969.63 |
| 18.09 | 969.39 | 21.01 | 969.24 | 23.93 | 969.06 | 28.07 | 968.95 | 32.19 | 968.83 |
| 35.14 | 968.74 | 38.11 | 968.65 | 46.3 | 968.39 | 49.29 | 968.3 | 52.28 | 968.21 |
| 56.36 | 968.09 | 60.41 | 967.96 | 63.43 | 967.94 | 66.46 | 967.88 | 70.5 | 967.86 |
| 74.52 | 967.7 | 77.58 | 967.69 | 80.64 | 967.59 | 84.64 | 967.58 | 88.62 | 967.53 |
| 91.71 | 967.5 | 94.82 | 967.46 | 98.78 | 967.54 | 102.74 | 967.61 | 105.86 | 967.67 |
| 108.99 | 967.38 | 112.93 | 967.2 | 116.84 | 967.83 | 120 | 968.31 | 123.17 | 968.28 |
| 127.07 | 967.99 | 130.95 | 967.79 | 134.15 | 967.67 | 137.35 | 967.46 | 141.22 | 967.24 |
| 145.06 | 967.12 | 148.28 | 967.01 | 151.53 | 966.94 | 155.35 | 966.87 | 159.16 | 966.82 |
| 162.43 | 966.77 | 165.7 | 966.74 | 169.5 | 966.72 | 173.27 | 966.72 | 176.57 | 966.72 |
| 179.88 | 966.73 | 183.64 | 966.73 | 187.38 | 966.74 | 194.06 | 966.77 | 197.79 | 966.78 |
| 201.48 | 966.79 | 204.85 | 966.82 | 208.24 | 966.85 | 211.92 | 966.87 | 215.59 | 966.89 |
| 218.99 | 966.89 | 222.41 | 966.89 | 226.07 | 966.88 | 229.7 | 966.89 | 233.13 | 966.82 |
| 236.59 | 966.78 | 243.8 | 966.69 | 247.28 | 966.61 | 250.77 | 966.54 | 254.35 | 966.47 |
| 257.91 | 966.41 | 261.42 | 966.36 | 264.95 | 966.3 | 272.02 | 966.18 | 275.56 | 966.16 |
| 279.12 | 966.13 | 282.64 | 966.1 | 286.12 | 966.08 | 289.7 | 966.08 | 293.3 | 966.07 |
| 296.77 | 966.11 | 300.23 | 966.15 | 303.84 | 966.21 | 307.48 | 966.24 | 310.92 | 966.37 |
| 314.34 | 966.53 | 317.99 | 966.71 | 321.66 | 966.9 | 325.06 | 967.13 | 328.45 | 967.36 |
| 332.13 | 967.62 | 335.83 | 967.81 | 337.39 | 967.9 | 339.21 | 968.01 | 342.55 | 968.15 |
| 346.28 | 968.3 | 350.01 | 968.22 | 352.97 | 968.17 | 356.66 | 968.1 | 360.41 | 967.95 |
| 364.18 | 967.66 | 367.48 | 967.48 | 370.77 | 967.25 | 374.56 | 967.13 | 378.36 | 966.9 |
| 381.63 | 966.78 | 384.88 | 966.53 | 388.7 | 966.48 | 392.54 | 966.33 | 395.77 | 966.24 |
| 398.99 | 966.12 | 406.72 | 966.04 | 409.91 | 966.03 | 413.09 | 965.97 | 416.98 | 965.95 |
| 420.89 | 965.91 | 424.05 | 965.89 | 427.2 | 965.85 | 431.13 | 965.83 | 435.07 | 965.79 |
| 438.2 | 965.78 | 441.31 | 965.75 | 445.27 | 965.73 | 449.25 | 965.69 | 452.34 | 965.67 |
| 455.41 | 965.64 | 463.43 | 965.58 | 466.48 | 965.56 | 469.52 | 965.53 | 473.55 | 965.51 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 477.6 | 965.47 | 480.62 | 965.45 | 483.63 | 965.43 | 487.7 | 965.4 | 491.78 | 965.37 |
| 494.77 | 965.34 | 497.73 | 965.32 | 501.84 | 965.29 | 505.96 | 965.25 | 508.91 | 965.23 |
| 511.84 | 965.2 | 520.14 | 965.14 | 523.06 | 965.11 | 525.95 | 965.08 | 530.12 | 965.06 |
| 534.31 | 965.03 | 537.19 | 965 | 540.05 | 964.99 | 544.26 | 964.98 | 548.49 | 964.98 |
| 551.34 | 964.98 | 554.16 | 964.98 | 558.4 | 964.98 | 562.67 | 964.98 | 565.48 | 964.98 |
| 568.27 | 964.98 | 572.55 | 964.98 | 576.85 | 964.98 | 579.62 | 964.98 | 582.38 | 964.98 |
| 586.69 | 964.98 | 591.02 | 964.98 | 593.76 | 964.98 | 596.48 | 964.98 | 600.83 | 964.98 |
| 605.2 | 964.98 | 607.91 | 964.98 | 610.59 | 964.98 | 614.97 | 964.98 | 619.38 | 964.98 |
| 622.04 | 964.98 | 624.7 | 964.98 | 629.12 | 964.98 | 633.56 | 964.98 | 636.19 | 964.98 |
| 638.81 | 964.98 | 643.26 | 964.98 | 647.73 | 964.98 | 650.33 | 964.98 | 652.92 | 964.98 |
| 657.4 | 964.99 | 661.91 | 964.99 | 664.48 | 964.99 | 667.02 | 965 | 671.55 | 965.01 |
| 676.09 | 965.03 | 678.61 | 965.05 | 681.13 | 965.06 | 685.68 | 965.09 | 690.27 | 965.11 |
| 692.76 | 965.13 | 695.24 | 965.14 | 704.44 | 965.2 | 706.9 | 965.22 | 709.34 | 965.23 |
| 713.97 | 965.27 | 718.62 | 965.29 | 721.04 | 965.32 | 723.45 | 965.34 | 728.12 | 965.38 |
| 732.8 | 965.41 | 737.56 | 965.46 | 742.25 | 965.5 | 746.98 | 965.54 | 749.32 | 965.57 |
| 751.66 | 965.59 | 756.4 | 965.64 | 761.15 | 965.68 | 763.47 | 965.71 | 765.77 | 965.73 |
| 770.54 | 965.79 | 775.33 | 965.83 | 777.61 | 965.86 | 779.88 | 965.88 | 784.69 | 965.94 |
| 789.51 | 965.99 | 791.75 | 966.01 | 793.98 | 966.04 | 798.82 | 966.1 | 803.69 | 966.16 |
| 805.89 | 966.19 | 808.09 | 966.22 | 812.97 | 966.3 | 817.86 | 966.4 | 820.04 | 966.45 |
| 822.2 | 966.52 | 827.11 | 966.7 | 832.04 | 966.97 | 834.18 | 967.08 | 836.31 | 967.48 |
| 841.25 | 968.49 | 846.21 | 969.7 | 848.33 | 970.17 | 850.41 | 970.72 | 855.39 | 972.07 |
| 859.97 | 973.76 | 860.39 | 973.91 | 862.46 | 974.68 | 864.52 | 974.66 | 865.47 | 974.61 |
| 869.54 | 974.42 | 874.57 | 974.42 | 876.61 | 974.39 | 878.63 | 974.91 | 883.67 | 976.07 |
| 888.74 | 976.32 | 890.75 | 976.42 | 892.74 | 976.49 | 897.82 | 976.61 | 902.92 | 976.54 |
| 904.89 | 976.51 | 906.85 | 976.45 | 911.96 | 976.3 | 916.82 | 976.12 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 337.39 | .077 | 859.97 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 352.97 | 841.25 | 283.31 | 199.99 | 170.07 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 346.28 | 968.3 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 967.40 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 967.32 | Reach Len. (ft) | 283.31 | 199.99 | 170.07 |
| Crit W.S. (ft) | 966.21 | Flow Area (sq ft) | | 845.37 | |
| E.G. Slope (ft/ft) | 0.005747 | Area (sq ft) | 131.23 | 845.37 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 657.40 | Top Width (ft) | 191.64 | 465.76 | |
| Vel Total (ft/s) | 2.18 | Avg. Vel. (ft/s) | | 2.18 | |
| Max Chl Dpth (ft) | 2.34 | Hydr. Depth (ft) | | 1.82 | |
| Conv. Total (cfs) | 24271.3 | Conv. (cfs) | | 24271.3 | |
| Length Wtd. (ft) | 224.49 | Wetted Per. (ft) | | 465.84 | |
| Min Ch El (ft) | 964.98 | Shear (lb/sq ft) | | 0.65 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.42 | |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 94.13 | 138.51 | 106.52 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 99.70 | 70.40 | 128.02 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 967.66 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 967.60 | Reach Len. (ft) | 283.31 | 199.99 | 170.07 |
| Crit W.S. (ft) | 966.21 | Flow Area (sq ft) | | 976.60 | |
| E.G. Slope (ft/ft) | 0.003614 | Area (sq ft) | | 976.60 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 471.70 | Top Width (ft) | | 471.70 | |
| Vel Total (ft/s) | 1.88 | Avg. Vel. (ft/s) | | 1.88 | |
| Max Chl Dpth (ft) | 2.62 | Hydr. Depth (ft) | | 2.07 | |
| Conv. Total (cfs) | 30608.8 | Conv. (cfs) | | 30608.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 471.82 | |
| Min Ch El (ft) | 964.98 | Shear (lb/sq ft) | | 0.47 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.88 | |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 13.42 | 184.08 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 74.61 | 9.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 967.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.06 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 967.55 | Reach Len. (ft) | 283.31 | 199.99 | 170.07 |
| Crit W.S. (ft) | 966.22 | Flow Area (sq ft) | | 952.59 | |
| E.G. Slope (ft/ft) | 0.003913 | Area (sq ft) | | 952.59 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 470.52 | Top Width (ft) | | 470.52 | |
| Vel Total (ft/s) | 1.93 | Avg. Vel. (ft/s) | | 1.93 | |
| Max Chl Dpth (ft) | 2.57 | Hydr. Depth (ft) | | 2.02 | |
| Conv. Total (cfs) | 29414.4 | Conv. (cfs) | | 29414.4 | |
| Length Wtd. (ft) | 204.38 | Wetted Per. (ft) | | 470.63 | |
| Min Ch El (ft) | 964.98 | Shear (lb/sq ft) | | 0.49 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.96 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 28.50 | 166.07 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 18.28 | 73.06 | 27.59 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.462

INPUT
Description: Thalweg Sta. 661.55
Station Elevation Data num= 205

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 971.78 | .06 | 971.78 | 3.76 | 971.77 | 7.18 | 971.67 | 11.61 | 971.55 |
| 14.32 | 971.4 | 16.41 | 971.35 | 21.44 | 971.1 | 27.94 | 970.89 | 28.58 | 970.86 |
| 29.06 | 970.84 | 35.7 | 970.48 | 42.82 | 969.97 | 44.27 | 969.85 | 49.95 | 969.36 |
| 54.36 | 969 | 64.21 | 968.31 | 67.01 | 968.14 | 76.92 | 967.65 | 79.65 | 967.51 |
| 85.59 | 967.3 | 92.31 | 967.02 | 92.73 | 967.02 | 93.25 | 967.01 | 104.96 | 966.95 |
| 109.58 | 966.94 | 114.1 | 966.92 | 117.61 | 966.87 | 121.24 | 966.86 | 125.91 | 966.78 |
| 128.36 | 966.75 | 130.25 | 966.71 | 135.49 | 966.71 | 142.24 | 966.62 | 142.61 | 966.61 |
| 142.91 | 966.61 | 149.75 | 966.53 | 155.56 | 966.37 | 156.87 | 966.34 | 164 | 966 |
| 168.2 | 965.34 | 171.13 | 964.92 | 174.9 | 965.66 | 178.25 | 966.35 | 180.85 | 965.96 |
| 185.38 | 965.3 | 191.23 | 964.87 | 192.51 | 964.78 | 193.51 | 964.74 | 199.64 | 964.54 |
| 206.16 | 964.5 | 206.76 | 964.49 | 207.56 | 964.49 | 213.9 | 964.44 | 218.8 | 964.42 |
| 221.02 | 964.4 | 231.45 | 964.33 | 235.28 | 964.31 | 236.2 | 964.3 | 240.21 | 964.28 |
| 242.41 | 964.26 | 244.11 | 964.26 | 249.53 | 964.24 | 256.54 | 964.25 | 256.75 | 964.25 |
| 269.4 | 964.27 | 270.92 | 964.28 | 272.87 | 964.28 | 282.05 | 964.3 | 289.2 | 964.33 |
| 292.3 | 964.33 | 305.53 | 964.38 | 307.35 | 964.38 | 320 | 964.43 | 320.81 | 964.44 |
| 321.85 | 964.44 | 326.38 | 964.47 | 327.94 | 964.48 | 332.66 | 964.52 | 335.07 | 964.55 |
| 338.18 | 964.61 | 342.19 | 964.7 | 345.3 | 964.78 | 349.33 | 964.87 | 356.45 | 964.95 |
| 357.95 | 964.96 | 387.17 | 964.98 | 392.09 | 964.99 | 399.22 | 964.99 | 403.49 | 965 |
| 434.85 | 965.01 | 436.15 | 965.02 | 449.11 | 965.02 | 452.48 | 965.03 | 477.62 | 965.03 |
| 484.45 | 965.04 | 485.13 | 965.04 | 497.1 | 965.03 | 501.46 | 965.04 | 506.13 | 965.03 |
| 509.75 | 965.03 | 513.27 | 965.02 | 517.79 | 965.02 | 520.39 | 965.01 | 535.05 | 965 |
| 547.7 | 964.97 | 548.9 | 964.97 | 550.45 | 964.96 | 570.28 | 964.92 | 583.11 | 964.89 |
| 584.54 | 964.88 | 585.65 | 964.88 | 598.3 | 964.85 | 598.79 | 964.85 | 599.44 | 964.84 |
| 610.95 | 964.8 | 623.6 | 964.75 | 632.1 | 964.71 | 634.44 | 964.71 | 641.56 | 964.67 |
| 648.42 | 964.65 | 648.9 | 964.64 | 655.82 | 964.62 | 661.55 | 964.59 | 686.85 | 964.5 |
| 699.5 | 964.49 | 741.36 | 964.51 | 746.39 | 964.5 | 750.1 | 964.5 | 762.72 | 964.48 |
| 775.4 | 964.44 | 779.05 | 964.44 | 791.25 | 964.41 | 795.38 | 964.41 | 798.38 | 964.4 |
| 813.35 | 964.39 | 825.99 | 964.43 | 826.88 | 964.44 | 828.03 | 964.46 | 838.65 | 964.7 |
| 841.14 | 964.79 | 844.36 | 965.02 | 848.27 | 965.29 | 851.3 | 965.56 | 855.4 | 966.02 |
| 859.98 | 966.68 | 860.69 | 966.78 | 863.94 | 967.2 | 875.13 | 968.77 | 876.59 | 968.99 |
| 876.79 | 969.01 | 877.02 | 969.03 | 883.91 | 969.37 | 889.25 | 968.93 | 891.04 | 968.83 |
| 892.19 | 968.86 | 893.35 | 968.9 | 898.16 | 968.97 | 901.9 | 969.48 | 905.3 | 969.83 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 909.67 | 970.63 | 912.42 | 971.15 | 914.54 | 971.44 | 919.55 | 971.73 | 926 | 971.93 |
| 927.19 | 971.99 | 933.81 | 972.18 | 939.85 | 970.9 | 942.33 | 970.31 | 948.06 | 969.23 |
| 952.49 | 968.14 | 955.19 | 967.68 | 958.66 | 967.5 | 965.14 | 967.34 | 969.44 | 967.32 |
| 974.99 | 967.45 | 976.57 | 967.5 | 977.79 | 967.6 | 983.7 | 967.93 | 990.45 | 968.87 |
| 990.82 | 968.92 | 991.32 | 968.99 | 997.96 | 970.07 | 1003.09 | 970.98 | 1005.08 | 971.32 |
| 1007.65 | 971.75 | 1012.22 | 972.36 | 1015.74 | 972.76 | 1019.34 | 973.22 | 1023.98 | 973.68 |
| 1026.47 | 973.88 | 1028.4 | 974.02 | 1033.59 | 974.38 | 1040.31 | 974.83 | 1040.73 | 974.86 |
| 1041.04 | 974.88 | 1047.85 | 975.23 | 1053.69 | 975.45 | 1054.98 | 975.49 | 1056.64 | 975.53 |
| 1062.1 | 975.67 | 1066.34 | 975.76 | 1069.23 | 975.83 | 1072.96 | 975.9 | 1073.63 | 975.92 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 326.38 | .077 | 859.98 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 452.48 | 855.4 | 213.63 | 200 | 207.48 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.94 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.042 | 0.077 | |
| W.S. Elev (ft) | 965.81 | Reach Len. (ft) | 213.63 | 200.00 | 207.48 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 317.08 | 435.41 | |
| E.G. Slope (ft/ft) | 0.007291 | Area (sq ft) | 317.08 | 435.41 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1082.23 | 757.77 | |
| Top Width (ft) | 682.14 | Top Width (ft) | 281.07 | 401.07 | |
| Vel Total (ft/s) | 2.45 | Avg. Vel. (ft/s) | 3.41 | 1.74 | |
| Max Chl Dpth (ft) | 1.57 | Hydr. Depth (ft) | 1.13 | 1.09 | |
| Conv. Total (cfs) | 21549.1 | Conv. (cfs) | 12674.5 | 8874.6 | |
| Length Wtd. (ft) | 207.00 | Wetted Per. (ft) | 281.29 | 401.12 | |
| Min Ch El (ft) | 964.39 | Shear (lb/sq ft) | 0.51 | 0.49 | |
| Alpha | 1.35 | Stream Power (lb/ft s) | 1.75 | 0.86 | |
| Frctn Loss (ft) | 1.19 | Cum Volume (acre-ft) | 92.67 | 135.57 | 106.52 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 98.16 | 68.41 | 128.02 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.61 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 966.51 | Reach Len. (ft) | 213.63 | 200.00 | 207.48 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 716.75 | |
| E.G. Slope (ft/ft) | 0.008266 | Area (sq ft) | | 716.75 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 402.92 | Top Width (ft) | | 402.92 | |
| Vel Total (ft/s) | 2.57 | Avg. Vel. (ft/s) | | 2.57 | |
| Max Chl Dpth (ft) | 2.27 | Hydr. Depth (ft) | | 1.78 | |
| Conv. Total (cfs) | 20238.5 | Conv. (cfs) | | 20238.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 404.95 | |
| Min Ch El (ft) | 964.39 | Shear (lb/sq ft) | | 0.91 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.34 | |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | 13.42 | 180.20 | 18.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.80 | 72.60 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.46 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.077 | 0.077 | |
| W.S. Elev (ft) | 966.37 | Reach Len. (ft) | 213.63 | 200.00 | 207.48 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 88.85 | 658.12 | |
| E.G. Slope (ft/ft) | 0.008743 | Area (sq ft) | 88.85 | 658.12 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 194.10 | 1645.90 | |
| Top Width (ft) | 468.23 | Top Width (ft) | 65.31 | 402.92 | |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | 2.18 | 2.50 | |
| Max Chl Dpth (ft) | 1.98 | Hydr. Depth (ft) | 1.36 | 1.63 | |
| Conv. Total (cfs) | 19678.4 | Conv. (cfs) | 2075.9 | 17602.5 | |
| Length Wtd. (ft) | 201.58 | Wetted Per. (ft) | 66.70 | 403.33 | |
| Min Ch El (ft) | 964.39 | Shear (lb/sq ft) | 0.73 | 0.89 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 1.59 | 2.23 | |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | 28.21 | 162.37 | 37.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 18.06 | 71.05 | 27.59 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.425

INPUT
Description: Thalweg Sta. 671.32
Station Elevation Data num= 187

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 972.26 | 4.94 | 971.78 | 9.73 | 971.33 | 12.04 | 971.1 | 14.84 | 970.81 |
| 19.15 | 970.38 | 22.7 | 970.04 | 26.25 | 969.71 | 33.35 | 969.1 | 35.67 | 968.92 |
| 46.23 | 968.09 | 47.55 | 967.98 | 48.65 | 967.9 | 61.62 | 967.09 | 61.76 | 967.09 |
| 61.94 | 967.08 | 74.59 | 966.65 | 77.64 | 966.75 | 83.08 | 966.91 | 87.57 | 966.89 |
| 90.17 | 967.04 | 93.33 | 967.11 | 97.28 | 967.26 | 100.54 | 967.21 | 104.38 | 967.26 |
| 109.03 | 967.16 | 111.48 | 967.14 | 113.51 | 967.07 | 118.58 | 966.96 | 124.73 | 966.78 |
| 126.48 | 966.74 | 132.8 | 966.45 | 139.45 | 965.93 | 139.89 | 965.89 | 140.43 | 965.83 |
| 147 | 965.17 | 152.42 | 963.68 | 154.1 | 963.21 | 156.13 | 963.82 | 165.4 | 964.97 |
| 168.3 | 964.68 | 175.41 | 963.95 | 178.37 | 963.77 | 182.51 | 963.5 | 189.61 | 963.36 |
| 191.34 | 963.36 | 196.72 | 963.34 | 203.22 | 963.33 | 204.32 | 963.33 | 217.29 | 963.31 |
| 218.92 | 963.31 | 243.23 | 963.3 | 250.32 | 963.32 | 253.55 | 963.32 | 266.02 | 963.35 |
| 269.17 | 963.35 | 281.72 | 963.37 | 297.42 | 963.37 | 308.09 | 963.39 | 313.11 | 963.41 |
| 313.28 | 963.41 | 317.47 | 963.43 | 321.07 | 963.46 | 324.57 | 963.5 | 331.68 | 963.65 |
| 334.04 | 963.68 | 341.11 | 963.73 | 344.51 | 963.76 | 347.01 | 963.76 | 359.99 | 963.72 |
| 360.21 | 963.72 | 372.96 | 963.68 | 374.29 | 963.67 | 375.91 | 963.67 | 398.9 | 963.6 |
| 402.7 | 963.58 | 407.31 | 963.57 | 411.87 | 963.55 | 423 | 963.52 | 424.01 | 963.51 |
| 424.84 | 963.51 | 437.82 | 963.47 | 438.7 | 963.47 | 450.79 | 963.43 | 452.42 | 963.42 |
| 454.41 | 963.42 | 501.5 | 963.27 | 502.68 | 963.27 | 515.65 | 963.23 | 517.2 | 963.23 |
| 528.62 | 963.2 | 530.56 | 963.2 | 532.89 | 963.19 | 537.67 | 963.18 | 541.59 | 963.16 |
| 544.76 | 963.16 | 564.3 | 963.11 | 566.08 | 963.1 | 567.54 | 963.1 | 579.99 | 963.06 |
| 580.51 | 963.06 | 593.49 | 963.02 | 595.69 | 963.02 | 606.46 | 962.99 | 622.9 | 962.94 |
| 627.09 | 962.92 | 630.01 | 962.92 | 632.41 | 962.91 | 642.79 | 962.88 | 645.38 | 962.88 |
| 658.35 | 962.85 | 658.49 | 962.85 | 665.51 | 962.84 | 671.32 | 962.85 | 672.62 | 962.86 |
| 674.19 | 962.86 | 684.29 | 962.92 | 689.88 | 962.96 | 693.93 | 962.98 | 697.26 | 963.01 |
| 701.03 | 963.01 | 705.58 | 963.04 | 710.24 | 963.06 | 721.28 | 963.09 | 743.65 | 963.1 |
| 749.16 | 963.09 | 775.1 | 963.09 | 779.16 | 963.1 | 786.27 | 963.1 | 793.37 | 963.14 |
| 799.77 | 963.2 | 801.04 | 963.22 | 807.08 | 963.47 | 811.04 | 963.62 | 814.01 | 963.74 |
| 814.68 | 963.78 | 815.47 | 963.84 | 826.99 | 964.6 | 828.88 | 964.69 | 831.18 | 964.81 |
| 835.99 | 965.03 | 839.96 | 965.16 | 843.09 | 965.21 | 850.2 | 965.34 | 852.93 | 965.38 |
| 862.57 | 965.5 | 864.4 | 965.52 | 878.27 | 965.63 | 878.88 | 965.63 | 881.11 | 965.64 |
| 885.7 | 965.67 | 892.81 | 965.74 | 893.97 | 965.76 | 899.91 | 965.73 | 904.83 | 965.79 |
| 907.01 | 965.81 | 909.66 | 965.84 | 914.12 | 965.79 | 917.8 | 965.76 | 921.22 | 965.76 |
| 925.37 | 965.74 | 928.33 | 965.71 | 930.77 | 965.71 | 935.43 | 965.72 | 941.07 | 965.84 |
| 942.54 | 965.89 | 943.74 | 965.97 | 949.63 | 966.31 | 956.71 | 966.87 | 963.84 | 967.08 |
| 969.68 | 967.06 | 970.94 | 967.05 | 972.46 | 966.98 | 982.66 | 966.07 | 988.16 | 966.29 |
| 992.26 | 966.56 | 995.63 | 967.04 | 999.35 | 967.76 | 1003.86 | 968.89 | 1006.46 | 969.5 |
| 1008.6 | 969.74 | 1013.56 | 969.53 | 1019.56 | 969.91 | 1020.67 | 970.1 | 1021.58 | 970.1 |
| 1027.77 | 970.23 | 1030.54 | 970.01 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 313.28 | .077 | 811.04 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 437.82 | 839.96 | 178.18 | 200 | 220.31 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.73 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.044 | 0.076 | |
| W.S. Elev (ft) | 964.66 | Reach Len. (ft) | 178.18 | 200.00 | 220.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 321.34 | 587.05 | |
| E.G. Slope (ft/ft) | 0.004649 | Area (sq ft) | 321.34 | 587.05 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 807.15 | 1032.85 | |
| Top Width (ft) | 673.91 | Top Width (ft) | 283.43 | 390.48 | |
| Vel Total (ft/s) | 2.03 | Avg. Vel. (ft/s) | 2.51 | 1.76 | |
| Max Chl Dpth (ft) | 1.82 | Hydr. Depth (ft) | 1.13 | 1.50 | |
| Conv. Total (cfs) | 26985.9 | Conv. (cfs) | 11837.9 | 15148.0 | |
| Length Wtd. (ft) | 192.15 | Wetted Per. (ft) | 283.82 | 390.53 | |
| Min Ch El (ft) | 962.84 | Shear (lb/sq ft) | 0.33 | 0.44 | |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.83 | 0.77 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 91.10 | 133.22 | 106.52 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 96.78 | 66.59 | 128.02 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.25 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.076 | |
| W.S. Elev (ft) | 965.17 | Reach Len. (ft) | 178.18 | 200.00 | 220.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 787.98 | |
| E.G. Slope (ft/ft) | 0.005649 | Area (sq ft) | | 787.98 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 402.14 | Top Width (ft) | | 402.14 | |
| Vel Total (ft/s) | 2.34 | Avg. Vel. (ft/s) | | 2.34 | |
| Max Chl Dpth (ft) | 2.33 | Hydr. Depth (ft) | | 1.96 | |
| Conv. Total (cfs) | 24481.0 | Conv. (cfs) | | 24481.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 403.90 | |
| Min Ch El (ft) | 962.84 | Shear (lb/sq ft) | | 0.69 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.61 | |
| Frctn Loss (ft) | 1.31 | Cum Volume (acre-ft) | 13.42 | 176.74 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 70.75 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.15 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.077 | 0.076 | |
| W.S. Elev (ft) | 965.09 | Reach Len. (ft) | 178.18 | 200.00 | 220.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 133.53 | 754.56 | |
| E.G. Slope (ft/ft) | 0.004941 | Area (sq ft) | 133.53 | 754.56 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 231.97 | 1608.04 | |
| Top Width (ft) | 490.71 | Top Width (ft) | 90.81 | 399.90 | |
| Vel Total (ft/s) | 2.07 | Avg. Vel. (ft/s) | 1.74 | 2.13 | |
| Max Chl Dpth (ft) | 2.25 | Hydr. Depth (ft) | 1.47 | 1.89 | |
| Conv. Total (cfs) | 26175.4 | Conv. (cfs) | 3299.9 | 22875.5 | |
| Length Wtd. (ft) | 198.62 | Wetted Per. (ft) | 92.14 | 399.96 | |
| Min Ch El (ft) | 962.84 | Shear (lb/sq ft) | 0.45 | 0.58 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.78 | 1.24 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 27.66 | 159.13 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.68 | 69.21 | 27.59 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.387

INPUT
Description: Thalweg Sta. 848.32
Station Elevation Data num= 242

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.02 | 8.14 | 969.94 | 32.4 | 969.72 | 36.14 | 969.7 | 41.37 | 969.65 |
| 46.69 | 969.61 | 50.14 | 969.59 | 60.97 | 969.51 | 75.26 | 969.42 | 78.15 | 969.42 |
| 89.55 | 969.38 | 92.15 | 969.38 | 103.83 | 969.36 | 106.16 | 969.36 | 118.11 | 969.34 |
| 120.16 | 969.34 | 132.4 | 969.32 | 134.17 | 969.32 | 146.68 | 969.3 | 148.17 | 969.3 |
| 160.97 | 969.27 | 162.17 | 969.27 | 175.26 | 969.24 | 176.17 | 969.24 | 189.54 | 969.18 |
| 189.87 | 969.17 | 190.18 | 969.17 | 196.94 | 969.09 | 203.83 | 968.98 | 204.01 | 968.97 |
| 204.18 | 968.97 | 218.11 | 968.72 | 218.18 | 968.72 | 225.22 | 968.73 | 232.18 | 968.77 |
| 232.4 | 968.77 | 239.37 | 968.83 | 246.18 | 968.87 | 246.69 | 968.87 | 260.19 | 968.68 |
| 260.97 | 968.66 | 267.65 | 968.47 | 274.73 | 968.21 | 275.26 | 968.18 | 288.2 | 967.66 |
| 302.2 | 967.03 | 303.01 | 967 | 303.82 | 966.96 | 316.21 | 966.22 | 324.22 | 965.71 |
| 331.3 | 965.19 | 332.4 | 965.12 | 338.37 | 964.72 | 344.21 | 963.02 | 345.44 | 962.72 |
| 346.68 | 963 | 352.51 | 964.14 | 358.21 | 963.74 | 359.58 | 963.57 | 360.97 | 963.47 |
| 372.21 | 962.81 | 373.72 | 962.75 | 375.25 | 962.73 | 380.8 | 962.65 | 386.22 | 962.6 |
| 389.54 | 962.58 | 394.94 | 962.53 | 400.22 | 962.5 | 402 | 962.48 | 403.83 | 962.47 |
| 414.22 | 962.4 | 416.15 | 962.38 | 418.11 | 962.38 | 423.22 | 962.36 | 428.22 | 962.37 |
| 430.29 | 962.37 | 437.36 | 962.4 | 472.72 | 962.69 | 474.03 | 962.71 | 475.25 | 962.72 |
| 484.24 | 962.82 | 486.86 | 962.86 | 489.54 | 962.91 | 501 | 963.07 | 508.07 | 963.12 |
| 515.15 | 963.12 | 518.11 | 963.11 | 522.22 | 963.11 | 526.25 | 963.1 | 532.39 | 963.1 |
| 536.36 | 963.09 | 540.25 | 963.09 | 543.43 | 963.08 | 546.68 | 963.08 | 550.5 | 963.07 |
| 554.25 | 963.07 | 557.58 | 963.05 | 560.96 | 963.05 | 565 | 963.04 | 568.26 | 963.04 |
| 571.72 | 963.03 | 575.25 | 963.03 | 578.79 | 963.02 | 582.26 | 963.02 | 585.86 | 963 |
| 589.54 | 963 | 592.93 | 962.99 | 596.26 | 962.99 | 600 | 962.96 | 603.82 | 962.97 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 607.08 | 962.95 | 610.26 | 962.95 | 614.15 | 962.92 | 618.11 | 962.92 | 621.22 | 962.9 |
| 624.27 | 962.91 | 628.29 | 962.88 | 632.39 | 962.87 | 635.36 | 962.85 | 638.27 | 962.85 |
| 642.43 | 962.83 | 646.68 | 962.82 | 656.58 | 962.76 | 660.97 | 962.75 | 663.65 | 962.73 |
| 675.25 | 962.68 | 677.79 | 962.66 | 680.28 | 962.65 | 684.86 | 962.62 | 689.54 | 962.6 |
| 691.93 | 962.58 | 694.29 | 962.58 | 703.82 | 962.52 | 755.58 | 962.23 | 760.96 | 962.21 |
| 762.65 | 962.2 | 764.3 | 962.18 | 769.72 | 962.16 | 775.25 | 962.32 | 776.79 | 962.36 |
| 778.3 | 962.37 | 789.53 | 962.28 | 790.93 | 962.24 | 792.3 | 962.19 | 798 | 962.02 |
| 803.82 | 961.94 | 806.31 | 961.9 | 812.15 | 961.82 | 820.31 | 961.75 | 826.29 | 961.68 |
| 832.39 | 961.64 | 833.36 | 961.63 | 834.32 | 961.63 | 840.43 | 961.58 | 846.68 | 961.59 |
| 847.5 | 961.59 | 848.32 | 961.6 | 854.58 | 961.63 | 860.96 | 961.69 | 862.32 | 961.7 |
| 875.24 | 961.75 | 875.79 | 961.76 | 876.33 | 961.76 | 882.86 | 961.77 | 889.53 | 961.8 |
| 889.93 | 961.81 | 890.33 | 961.81 | 897 | 961.82 | 903.82 | 961.85 | 904.33 | 961.85 |
| 918.11 | 961.89 | 918.33 | 961.89 | 932.33 | 961.94 | 932.39 | 961.94 | 946.34 | 961.97 |
| 946.5 | 961.98 | 946.67 | 961.98 | 960.34 | 962 | 996 | 962.01 | 1002.35 | 962.02 |
| 1003.82 | 962.02 | 1017.22 | 962.01 | 1018.1 | 962 | 1024.29 | 961.98 | 1024.94 | 961.98 |
| 1032.39 | 961.98 | 1038.43 | 962.03 | 1044.36 | 962.16 | 1045.5 | 962.18 | 1046.67 | 962.25 |
| 1046.72 | 962.25 | 1052.58 | 962.6 | 1058.36 | 963.19 | 1060.96 | 963.39 | 1066.72 | 963.63 |
| 1072.37 | 963.82 | 1075.25 | 963.88 | 1080.86 | 963.89 | 1086.37 | 963.95 | 1089.53 | 963.95 |
| 1100.37 | 963.91 | 1102.08 | 963.9 | 1114.37 | 963.76 | 1116.23 | 963.73 | 1123.3 | 963.58 |
| 1128.38 | 963.49 | 1130.37 | 963.46 | 1132.38 | 963.45 | 1137.44 | 963.44 | 1142.38 | 963.52 |
| 1144.51 | 963.55 | 1146.67 | 963.61 | 1156.38 | 963.98 | 1158.65 | 964.08 | 1160.96 | 964.17 |
| 1165.73 | 964.34 | 1170.39 | 964.49 | 1179.87 | 964.85 | 1184.39 | 965.01 | 1189.53 | 965.21 |
| 1198.4 | 965.59 | 1201.08 | 965.72 | 1203.81 | 965.86 | 1208.15 | 966.1 | 1212.4 | 966.32 |
| 1215.23 | 966.48 | 1218.1 | 966.67 | 1222.3 | 966.96 | 1229.37 | 967.48 | 1232.39 | 967.77 |
| 1240.4 | 968.71 | 1246.67 | 969.31 | 1250.58 | 969.72 | 1254.41 | 970.03 | 1257.65 | 970.33 |
| 1260.96 | 970.54 | 1264.72 | 970.82 | 1268.41 | 971.05 | 1271.8 | 971.32 | 1275.24 | 971.54 |
| 1278.87 | 971.73 | 1281.17 | 971.83 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 474.03 | .077 | 1046.72 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 596.26 | 1072.37 | | 234.84 | 200 195.16 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.74 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.042 | 0.076 | 0.040 |
| W.S. Elev (ft) | 963.67 | Reach Len. (ft) | 234.84 | 200.00 | 195.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 207.59 | 684.10 | 4.41 |
| E.G. Slope (ft/ft) | 0.005836 | Area (sq ft) | 207.59 | 684.10 | 4.41 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 519.23 | 1317.24 | 3.53 |
| Top Width (ft) | 746.89 | Top Width (ft) | 245.68 | 471.76 | 29.45 |
| Vel Total (ft/s) | 2.05 | Avg. Vel. (ft/s) | 2.50 | 1.93 | 0.80 |
| Max Chl Dpth (ft) | 2.09 | Hydr. Depth (ft) | 0.84 | 1.45 | 0.15 |
| Conv. Total (cfs) | 24085.1 | Conv. (cfs) | 6796.6 | 17242.3 | 46.2 |
| Length Wtd. (ft) | 205.91 | Wetted Per. (ft) | 245.94 | 471.83 | 29.46 |
| Min Ch El (ft) | 961.58 | Shear (lb/sq ft) | 0.31 | 0.53 | 0.05 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.77 | 1.02 | 0.04 |
| Frctn Loss (ft) | 1.75 | Cum Volume (acre-ft) | 90.02 | 130.30 | 106.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 95.69 | 64.61 | 127.95 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.95 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.076 | |
| W.S. Elev (ft) | 963.86 | Reach Len. (ft) | 234.84 | 200.00 | 195.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 771.48 | |
| E.G. Slope (ft/ft) | 0.007685 | Area (sq ft) | | 771.48 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 476.11 | Top Width (ft) | | 476.11 | |
| Vel Total (ft/s) | 2.39 | Avg. Vel. (ft/s) | | 2.39 | |
| Max Chl Dpth (ft) | 2.28 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 20989.6 | Conv. (cfs) | | 20989.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 477.09 | |
| Min Ch El (ft) | 961.58 | Shear (lb/sq ft) | | 0.78 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.85 | |
| Frctn Loss (ft) | 1.81 | Cum Volume (acre-ft) | 13.42 | 173.16 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 68.73 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.95 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.076 | |
| W.S. Elev (ft) | 963.86 | Reach Len. (ft) | 234.84 | 200.00 | 195.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 771.48 | |
| E.G. Slope (ft/ft) | 0.007685 | Area (sq ft) | | 771.48 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 476.11 | Top Width (ft) | | 476.11 | |
| Vel Total (ft/s) | 2.39 | Avg. Vel. (ft/s) | | 2.39 | |
| Max Chl Dpth (ft) | 2.28 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 20989.6 | Conv. (cfs) | | 20989.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 477.09 | |
| Min Ch El (ft) | 961.58 | Shear (lb/sq ft) | | 0.78 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.85 | |
| Frctn Loss (ft) | 1.81 | Cum Volume (acre-ft) | 27.39 | 155.62 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.50 | 67.20 | 27.59 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.349

INPUT
Description: Thalweg Sta. 1015.57
Station Elevation Data num= 294

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.03 | 6.79 | 969.98 | 8.61 | 969.96 | 21.53 | 969.85 | 22.22 | 969.85 |
| 35.83 | 969.73 | 36.28 | 969.73 | 49.43 | 969.62 | 50.2 | 969.61 | 51.02 | 969.61 |
| 64.35 | 969.5 | 65.77 | 969.49 | 76.65 | 969.39 | 103.87 | 969.17 | 106.82 | 969.14 |
| 110 | 969.12 | 117.47 | 969.05 | 124.75 | 969 | 128.04 | 968.97 | 131.08 | 968.95 |
| 135.12 | 968.91 | 142.19 | 968.86 | 144.68 | 968.85 | 154.24 | 968.79 | 168.99 | 968.72 |
| 183.73 | 968.66 | 184.65 | 968.65 | 185.51 | 968.65 | 198.48 | 968.59 | 199.12 | 968.59 |
| 212.72 | 968.53 | 213.22 | 968.52 | 226.33 | 968.47 | 227.12 | 968.46 | 227.96 | 968.46 |
| 253.55 | 968.36 | 272.2 | 968.28 | 276.65 | 968.27 | 312.04 | 968.13 | 331.19 | 968.06 |
| 360.67 | 967.94 | 361.57 | 967.93 | 362.41 | 967.93 | 375.42 | 967.85 | 376.02 | 967.85 |
| 389.62 | 967.74 | 390.16 | 967.74 | 403.23 | 967.63 | 404.03 | 967.63 | 404.91 | 967.62 |
| 416.84 | 967.52 | 419.65 | 967.49 | 425.26 | 967.44 | 430.44 | 967.37 | 432.35 | 967.35 |
| 434.4 | 967.31 | 439.42 | 967.24 | 444.05 | 967.19 | 446.5 | 967.17 | 449.14 | 967.24 |
| 453.58 | 967.34 | 460.66 | 967.41 | 463.89 | 967.19 | 471.27 | 966.5 | 474.8 | 966.06 |
| 481.88 | 965.03 | 484.87 | 964.63 | 488.96 | 964.09 | 496.03 | 963.39 | 498.48 | 963.19 |
| 508.13 | 962.56 | 510.19 | 962.44 | 512.09 | 962.17 | 517.26 | 961.37 | 522.87 | 962.89 |
| 524.34 | 963.23 | 525.7 | 963.14 | 531.42 | 962.55 | 537.61 | 962.19 | 538.5 | 962.15 |
| 539.31 | 962.11 | 545.58 | 961.85 | 552.36 | 961.76 | 552.65 | 961.75 | 552.91 | 961.75 |
| 566.52 | 961.63 | 566.81 | 961.63 | 567.1 | 961.62 | 580.13 | 961.5 | 580.95 | 961.5 |
| 581.85 | 961.49 | 588.03 | 961.43 | 593.73 | 961.36 | 595.11 | 961.35 | 607.34 | 961.2 |
| 609.26 | 961.19 | 610.02 | 961.19 | 611.34 | 961.18 | 620.95 | 961.18 | 623.41 | 961.2 |
| 626.09 | 961.21 | 630.49 | 961.26 | 640.83 | 961.33 | 644.64 | 961.37 | 658.8 | 961.49 |
| 672.96 | 961.59 | 680.03 | 961.65 | 685.07 | 961.67 | 687.11 | 961.69 | 688.99 | 961.69 |
| 694.18 | 961.73 | 699.81 | 961.74 | 716.2 | 961.74 | 722.49 | 961.73 | 729.3 | 961.74 |
| 758.79 | 961.74 | 773.54 | 961.75 | 811.46 | 961.69 | 838.67 | 961.61 | 842.79 | 961.59 |
| 846.26 | 961.58 | 847.27 | 961.58 | 849.87 | 961.57 | 852.28 | 961.57 | 862.01 | 961.53 |
| 864.02 | 961.53 | 865.88 | 961.52 | 871.1 | 961.5 | 876.75 | 961.49 | 879.49 | 961.47 |
| 891.5 | 961.43 | 899.41 | 961.38 | 906.24 | 961.36 | 906.71 | 961.36 | 920.31 | 961.28 |
| 920.99 | 961.27 | 927.71 | 961.2 | 933.92 | 961.16 | 934.79 | 961.16 | 941.87 | 961.09 |
| 947.53 | 961.05 | 948.94 | 961.03 | 950.48 | 961.02 | 956.02 | 960.96 | 961.14 | 960.92 |
| 974.75 | 960.79 | 988.36 | 960.68 | 998.49 | 960.62 | 1001.96 | 960.65 | 1005.57 | 960.66 |
| 1009.46 | 960.64 | 1012.64 | 960.63 | 1015.57 | 960.61 | 1038.95 | 960.24 | 1040.94 | 960.2 |
| 1053.7 | 960 | 1062.17 | 959.88 | 1068.44 | 959.78 | 1070 | 959.76 | 1083.19 | 959.58 |
| 1083.6 | 959.58 | 1090.48 | 959.48 | 1097.21 | 959.4 | 1097.93 | 959.4 | 1104.64 | 959.3 |
| 1110.82 | 959.24 | 1112.68 | 959.22 | 1118.79 | 959.14 | 1124.43 | 959.08 | 1125.87 | 959.06 |
| 1127.42 | 959.05 | 1138.04 | 958.93 | 1140.02 | 958.9 | 1142.17 | 958.89 | 1147.09 | 958.83 |
| 1151.64 | 958.79 | 1154.17 | 958.75 | 1156.92 | 958.73 | 1161.25 | 958.67 | 1165.25 | 958.66 |
| 1168.32 | 958.6 | 1171.66 | 958.58 | 1175.4 | 958.54 | 1178.86 | 958.57 | 1182.48 | 958.53 |
| 1186.41 | 958.58 | 1189.56 | 958.63 | 1192.46 | 958.86 | 1196.63 | 959.02 | 1201.15 | 959.62 |
| 1203.71 | 959.98 | 1206.07 | 960.38 | 1210.33 | 961.11 | 1210.79 | 961.19 | 1213.57 | 961.65 |
| 1215.9 | 962.04 | 1219.68 | 962.56 | 1230.64 | 963.63 | 1232.02 | 963.7 | 1233.29 | 963.69 |
| 1239.1 | 963.75 | 1245.38 | 963.65 | 1246.9 | 963.63 | 1260.13 | 963.43 | 1260.5 | 963.43 |
| 1267.4 | 963.5 | 1274.11 | 963.6 | 1274.48 | 963.6 | 1274.87 | 963.61 | 1281.55 | 963.67 |
| 1287.72 | 963.7 | 1288.63 | 963.71 | 1289.62 | 963.71 | 1295.71 | 963.72 | 1301.33 | 963.74 |
| 1302.78 | 963.74 | 1304.37 | 963.75 | 1314.93 | 963.77 | 1316.94 | 963.77 | 1319.11 | 963.78 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1324.02 | 963.79 | 1331.1 | 963.82 | 1338.17 | 963.87 | 1342.14 | 963.92 | 1348.6 | 964.04 |
| 1352.33 | 964.13 | 1355.75 | 964.19 | 1359.4 | 964.33 | 1363.35 | 964.39 | 1366.47 | 964.49 |
| 1369.36 | 964.5 | 1373.55 | 964.63 | 1378.09 | 964.66 | 1382.97 | 964.74 | 1392.83 | 964.79 |
| 1394.78 | 964.86 | 1396.58 | 964.87 | 1401.86 | 964.99 | 1407.58 | 965.06 | 1408.93 | 965.13 |
| 1410.19 | 965.16 | 1416.01 | 965.54 | 1422.32 | 966 | 1423.09 | 966.06 | 1423.8 | 966.07 |
| 1430.16 | 966.6 | 1437.07 | 967.1 | 1437.25 | 967.11 | 1437.4 | 967.12 | 1444.33 | 967.45 |
| 1451.4 | 967.81 | 1451.82 | 967.83 | 1458.48 | 968.21 | 1464.61 | 968.65 | 1465.56 | 968.71 |
| 1466.56 | 968.74 | 1472.63 | 969.21 | 1478.22 | 969.63 | 1479.7 | 969.76 | 1481.31 | 969.84 |
| 1486.78 | 970.12 | 1491.83 | 970.42 | 1493.86 | 970.53 | 1496.06 | 970.64 | 1496.73 | 970.66 |
| 1500.93 | 970.81 | 1505.44 | 971.01 | 1508.01 | 971.13 | 1510.8 | 971.25 | 1515.09 | 971.34 |
| 1519.04 | 971.46 | 1522.16 | 971.52 | 1525.55 | 971.61 | 1529.24 | 971.66 | 1532.65 | 971.78 |
| 1536.32 | 971.87 | 1540.29 | 972.01 | 1543.39 | 972.1 | 1546.26 | 972.24 | 1550.48 | 972.36 |
| 1555.03 | 972.51 | 1557.55 | 972.58 | 1559.87 | 972.67 | 1569.78 | 972.9 | 1571.71 | 972.95 |
| 1584.52 | 973.23 | 1585.85 | 973.25 | 1587.08 | 973.28 | 1599.27 | 973.53 | 1600.01 | 973.55 |
| 1600.69 | 973.57 | 1614.01 | 973.86 | 1614.3 | 973.86 | 1618.09 | 973.96 | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 610.02 | .077 | 1213.57 | .04 | 1496.73 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 773.54 | 1230.64 | 210.36 | 200 | 197.94 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 961.99 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.054 | 0.077 | |
| W.S. Elev (ft) | 961.87 | Reach Len. (ft) | 210.36 | 200.00 | 197.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 71.88 | 617.69 | |
| E.G. Slope (ft/ft) | 0.013483 | Area (sq ft) | 71.88 | 617.69 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 105.94 | 1734.06 | |
| Top Width (ft) | 674.94 | Top Width (ft) | 233.59 | 441.36 | |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | 1.47 | 2.81 | |
| Max Chl Dpth (ft) | 3.34 | Hydr. Depth (ft) | 0.31 | 1.40 | |
| Conv. Total (cfs) | 15846.4 | Conv. (cfs) | 912.3 | 14934.0 | |
| Length Wtd. (ft) | 201.21 | Wetted Per. (ft) | 233.70 | 441.61 | |
| Min Ch El (ft) | 958.53 | Shear (lb/sq ft) | 0.26 | 1.18 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.38 | 3.31 | |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | 89.27 | 127.31 | 106.50 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 94.40 | 62.51 | 127.88 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 962.14 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 962.02 | Reach Len. (ft) | 210.36 | 200.00 | 197.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 684.54 | |
| E.G. Slope (ft/ft) | 0.010796 | Area (sq ft) | | 684.54 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 442.26 | Top Width (ft) | | 442.26 | |
| Vel Total (ft/s) | 2.69 | Avg. Vel. (ft/s) | | 2.69 | |
| Max Chl Dpth (ft) | 3.49 | Hydr. Depth (ft) | | 1.55 | |
| Conv. Total (cfs) | 17709.0 | Conv. (cfs) | | 17709.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 442.80 | |
| Min Ch El (ft) | 958.53 | Shear (lb/sq ft) | | 1.04 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.80 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 13.42 | 169.82 | 18.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.80 | 66.63 | 9.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 962.14 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 962.02 | Reach Len. (ft) | 210.36 | 200.00 | 197.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 684.54 | |
| E.G. Slope (ft/ft) | 0.010796 | Area (sq ft) | | 684.54 | |

| | | | | | |
|---|---|---|---|---|---|
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 442.26 | Top Width (ft) | | 442.26 | |
| Vel Total (ft/s) | 2.69 | Avg. Vel. (ft/s) | | 2.69 | |
| Max Chl Dpth (ft) | 3.49 | Hydr. Depth (ft) | | 1.55 | |
| Conv. Total (cfs) | 17709.0 | Conv. (cfs) | | 17709.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 442.80 | |
| Min Ch El (ft) | 958.53 | Shear (lb/sq ft) | | 1.04 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.80 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 27.39 | 152.28 | 37.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 17.50 | 65.09 | 27.59 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.311

INPUT
Description: Thalweg Sta. 1203.96
Station Elevation Data num= 300

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.02 | 1.47 | 970.01 | 7.9 | 969.93 | 16.92 | 969.84 | 32.38 | 969.66 |
| 33.33 | 969.65 | 34.13 | 969.64 | 43.93 | 969.53 | 47.24 | 969.5 | 47.52 | 969.49 |
| 47.83 | 969.49 | 60.36 | 969.35 | 61.71 | 969.33 | 63.29 | 969.31 | 73.47 | 969.2 |
| 75.9 | 969.18 | 78.74 | 969.15 | 86.59 | 969.08 | 97.18 | 969.01 | 99.7 | 969 |
| 104.27 | 968.97 | 109.66 | 968.95 | 125.12 | 968.87 | 125.93 | 968.87 | 139.05 | 968.8 |
| 139.75 | 968.8 | 140.57 | 968.79 | 156.03 | 968.72 | 165.28 | 968.67 | 168.12 | 968.66 |
| 171.48 | 968.64 | 182.31 | 968.59 | 186.94 | 968.56 | 217.74 | 968.41 | 217.85 | 968.41 |
| 230.86 | 968.35 | 233.3 | 968.33 | 248.76 | 968.26 | 257.09 | 968.21 | 260.36 | 968.2 |
| 264.22 | 968.17 | 295.13 | 968.01 | 296.43 | 968 | 309.54 | 967.93 | 310.03 | 967.93 |
| 310.59 | 967.92 | 322.66 | 967.86 | 326.04 | 967.84 | 331.3 | 967.82 | 335.77 | 967.79 |
| 345.49 | 967.75 | 348.89 | 967.73 | 352.59 | 967.72 | 372.41 | 967.63 | 373.87 | 967.62 |
| 375.12 | 967.62 | 387.86 | 967.56 | 388.23 | 967.56 | 427.58 | 967.37 | 430.63 | 967.36 |
| 444.82 | 967.28 | 459.02 | 967.22 | 473.21 | 967.23 | 480.04 | 967.25 | 480.6 | 967.25 |
| 496.06 | 967.26 | 506.27 | 967.22 | 511.51 | 967.19 | 522.87 | 967.07 | 526.97 | 967.01 |
| 529.97 | 966.95 | 532.5 | 966.88 | 537.05 | 966.77 | 542.42 | 966.6 | 544.15 | 966.55 |
| 545.62 | 966.5 | 557.88 | 966.14 | 558.34 | 966.13 | 558.73 | 966.12 | 565.43 | 966.05 |
| 571.85 | 966.04 | 573.34 | 966.04 | 579.62 | 966.13 | 588.79 | 966.28 | 593.81 | 966.45 |
| 598.07 | 966.61 | 604.25 | 966.83 | 608 | 966.9 | 611.19 | 966.89 | 615.1 | 966.9 |
| 619.7 | 966.83 | 624.3 | 966.64 | 635.16 | 966.22 | 636.38 | 966.17 | 637.42 | 966.13 |
| 643.47 | 965.84 | 650.53 | 965.39 | 650.61 | 965.38 | 663.65 | 964.02 | 664.76 | 963.9 |
| 666.07 | 963.73 | 671.85 | 963.06 | 678.96 | 962.35 | 681.52 | 962.12 | 689.87 | 961.25 |
| 693.14 | 960.93 | 696.98 | 960.89 | 700.24 | 961.3 | 702.99 | 961.33 | 707.33 | 961.86 |
| 712.44 | 961.37 | 714.43 | 961.22 | 716.11 | 961.13 | 727.9 | 960.75 | 729.22 | 960.71 |
| 743.35 | 960.43 | 749.9 | 960.01 | 755.45 | 959.94 | 756.99 | 959.84 | 758.81 | 959.81 |
| 768.57 | 959.72 | 771.18 | 959.67 | 774.26 | 959.74 | 778.27 | 959.78 | 781.68 | 959.83 |
| 785.37 | 959.92 | 789.72 | 959.97 | 792.46 | 960.01 | 794.8 | 960.03 | 799.56 | 960.02 |
| 805.17 | 959.99 | 807.91 | 959.98 | 820.63 | 959.85 | 820.84 | 959.84 | 821.03 | 959.84 |
| 834.14 | 959.72 | 835.03 | 959.72 | 836.08 | 959.71 | 847.26 | 959.63 | 849.22 | 959.63 |
| 851.54 | 959.61 | 856.32 | 959.6 | 867 | 959.56 | 870.51 | 959.56 | 873.49 | 959.55 |
| 877.6 | 959.56 | 882.45 | 959.55 | 899.72 | 959.54 | 905.99 | 959.56 | 909.9 | 959.55 |
| 920.18 | 959.56 | 925.95 | 959.54 | 934.37 | 959.54 | 939.06 | 959.52 | 959.73 | 959.51 |
| 962.75 | 959.52 | 965.29 | 959.52 | 969.84 | 959.51 | 976.93 | 959.51 | 978.4 | 959.5 |
| 984.02 | 959.48 | 990.64 | 959.49 | 991.52 | 959.49 | 996.31 | 959.48 | 998.21 | 959.48 |
| 1004.63 | 959.45 | 1005.31 | 959.45 | 1006.1 | 959.44 | 1017.75 | 959.33 | 1037.01 | 959.14 |
| 1040.78 | 959.11 | 1043.98 | 959.07 | 1047.88 | 959.04 | 1052.47 | 958.99 | 1083.33 | 958.69 |
| 1083.38 | 958.69 | 1096.44 | 958.57 | 1097.54 | 958.55 | 1104.64 | 958.49 | 1111.73 | 958.42 |
| 1114.29 | 958.39 | 1125.93 | 958.28 | 1133.02 | 958.22 | 1145.2 | 958.1 | 1160.66 | 957.96 |
| 1161.4 | 957.96 | 1162.02 | 957.95 | 1175.13 | 957.84 | 1175.59 | 957.84 | 1176.11 | 957.83 |
| 1188.25 | 957.73 | 1196.87 | 957.67 | 1203.96 | 957.61 | 1211.06 | 957.56 | 1222.49 | 957.47 |
| 1225.25 | 957.44 | 1237.94 | 957.34 | 1239.44 | 957.32 | 1240.71 | 957.31 | 1253.4 | 957.15 |
| 1253.82 | 957.15 | 1260.72 | 957.01 | 1266.93 | 956.93 | 1267.81 | 956.92 | 1268.85 | 956.92 |
| 1274.91 | 957.02 | 1280.05 | 957.28 | 1282 | 957.35 | 1289.1 | 957.9 | 1293.16 | 958.27 |
| 1296.19 | 958.53 | 1299.76 | 958.93 | 1310.38 | 959.93 | 1315.22 | 960.45 | 1317.48 | 960.65 |
| 1324.57 | 961.25 | 1331.67 | 961.6 | 1332.51 | 961.61 | 1338.76 | 961.62 | 1345.62 | 961.52 |
| 1346.13 | 961.51 | 1348.75 | 961.48 | 1360.05 | 961.31 | 1361.59 | 961.29 | 1381.34 | 961.02 |
| 1384.33 | 960.99 | 1384.97 | 960.98 | 1392.5 | 960.89 | 1395.53 | 960.87 | 1398.09 | 960.86 |
| 1402.62 | 960.83 | 1407.96 | 960.83 | 1409.72 | 960.85 | 1416.8 | 960.99 | 1423.41 | 961.09 |
| 1423.9 | 961.11 | 1424.32 | 961.11 | 1429.36 | 961.18 | 1437.43 | 961.32 | 1438.09 | 961.33 |
| 1438.87 | 961.34 | 1445.18 | 961.5 | 1450.55 | 961.55 | 1452.28 | 961.57 | 1454.32 | 961.56 |
| 1459.37 | 961.55 | 1463.66 | 961.53 | 1466.47 | 961.55 | 1473.56 | 961.63 | 1476.78 | 961.68 |
| 1501.94 | 962.28 | 1502.94 | 962.3 | 1503.01 | 962.3 | 1516.12 | 962.61 | 1523.23 | 962.79 |
| 1529.24 | 962.97 | 1530.32 | 963.01 | 1531.61 | 963.05 | 1537.42 | 963.29 | 1542.35 | 963.59 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1544.51 | 963.7 | 1547.06 | 963.85 | 1551.61 | 964.19 | 1555.46 | 964.55 | 1558.7 | 964.84 |
| 1562.52 | 965.17 | 1565.8 | 965.4 | 1568.58 | 965.57 | 1572.9 | 965.79 | 1577.97 | 966.08 |
| 1587.09 | 966.37 | 1593.43 | 966.64 | 1594.18 | 966.65 | 1594.81 | 966.67 | 1601.28 | 966.77 |
| 1607.92 | 966.96 | 1608.37 | 966.97 | 1608.88 | 966.99 | 1615.47 | 967.13 | 1621.04 | 967.32 |
| 1622.56 | 967.38 | 1624.34 | 967.47 | 1634.15 | 967.98 | 1636.74 | 968.12 | 1639.79 | 968.32 |
| 1643.84 | 968.64 | 1647.27 | 968.92 | 1650.93 | 969.21 | 1655.25 | 969.52 | 1658.03 | 969.75 |
| 1660.38 | 969.88 | 1665.12 | 970.16 | 1670.71 | 970.41 | 1673.5 | 970.52 | 1679.31 | 970.84 |
| 1686.17 | 971.24 | 1686.41 | 971.25 | 1686.61 | 971.26 | 1693.5 | 971.62 | 1694.41 | 971.66 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 909.9 | .077 | 1384.33 | .04 | 1502.94 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 990.64 | 1338.76 | 198.95 | 200 | 202.33 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.47 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.046 | 0.077 | |
| W.S. Elev (ft) | 960.40 | Reach Len. (ft) | 198.95 | 200.00 | 202.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 179.40 | 688.80 | |
| E.G. Slope (ft/ft) | 0.004758 | Area (sq ft) | 179.40 | 688.80 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 325.13 | 1514.88 | |
| Top Width (ft) | 571.03 | Top Width (ft) | 246.88 | 324.15 | |
| Vel Total (ft/s) | 2.12 | Avg. Vel. (ft/s) | 1.81 | 2.20 | |
| Max Chl Dpth (ft) | 3.48 | Hydr. Depth (ft) | 0.73 | 2.12 | |
| Conv. Total (cfs) | 26676.1 | Conv. (cfs) | 4713.6 | 21962.4 | |
| Length Wtd. (ft) | 199.71 | Wetted Per. (ft) | 246.90 | 324.32 | |
| Min Ch El (ft) | 956.92 | Shear (lb/sq ft) | 0.22 | 0.63 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.39 | 1.39 | |
| Frctn Loss (ft) | 0.79 | Cum Volume (acre-ft) | 88.66 | 124.32 | 106.50 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 93.24 | 60.76 | 127.88 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.97 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 960.90 | Reach Len. (ft) | 198.95 | 200.00 | 202.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 850.89 | |
| E.G. Slope (ft/ft) | 0.003571 | Area (sq ft) | | 850.89 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 329.79 | Top Width (ft) | | 329.79 | |
| Vel Total (ft/s) | 2.16 | Avg. Vel. (ft/s) | | 2.16 | |
| Max Chl Dpth (ft) | 3.98 | Hydr. Depth (ft) | | 2.58 | |
| Conv. Total (cfs) | 30789.6 | Conv. (cfs) | | 30789.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 331.39 | |
| Min Ch El (ft) | 956.92 | Shear (lb/sq ft) | | 0.57 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.24 | |
| Frctn Loss (ft) | 0.56 | Cum Volume (acre-ft) | 13.42 | 166.29 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 64.85 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.97 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.077 | |
| W.S. Elev (ft) | 960.90 | Reach Len. (ft) | 198.95 | 200.00 | 202.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 850.89 | |
| E.G. Slope (ft/ft) | 0.003571 | Area (sq ft) | | 850.89 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 329.79 | Top Width (ft) | | 329.79 | |
| Vel Total (ft/s) | 2.16 | Avg. Vel. (ft/s) | | 2.16 | |
| Max Chl Dpth (ft) | 3.98 | Hydr. Depth (ft) | | 2.58 | |
| Conv. Total (cfs) | 30789.6 | Conv. (cfs) | | 30789.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 331.39 | |
| Min Ch El (ft) | 956.92 | Shear (lb/sq ft) | | 0.57 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.24 | |
| Frctn Loss (ft) | 0.56 | Cum Volume (acre-ft) | 27.39 | 148.76 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.50 | 63.32 | 27.59 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.273

INPUT
Description: Thalweg Sta. 1179.98
Station Elevation Data num= 330

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.04 | 3.66 | 970.01 | 8.34 | 969.96 | 39.09 | 969.61 | 43.81 | 969.55 |
| 46.17 | 969.53 | 48.24 | 969.5 | 74.14 | 969.2 | 74.52 | 969.2 | 74.84 | 969.19 |
| 88.14 | 969.04 | 88.68 | 969.03 | 89.31 | 969.03 | 101.44 | 968.89 | 104.48 | 968.85 |
| 114.74 | 968.73 | 117.04 | 968.71 | 128.04 | 968.59 | 134.82 | 968.51 | 141.34 | 968.45 |
| 145.38 | 968.4 | 149.98 | 968.36 | 165.15 | 968.2 | 167.94 | 968.16 | 180.32 | 967.94 |
| 180.81 | 967.93 | 181.24 | 967.92 | 194.98 | 967.62 | 195.48 | 967.61 | 202.07 | 967.5 |
| 207.84 | 967.39 | 210.65 | 967.37 | 221.14 | 967.32 | 223.33 | 967.32 | 225.82 | 967.31 |
| 234.44 | 967.34 | 237.5 | 967.36 | 240.99 | 967.34 | 251.68 | 967.39 | 258.76 | 967.39 |
| 261.04 | 967.41 | 265.84 | 967.42 | 274.34 | 967.42 | 280.01 | 967.4 | 286.49 | 967.39 |
| 287.11 | 967.38 | 287.64 | 967.37 | 294.19 | 967.27 | 300.94 | 967.19 | 301.66 | 967.19 |
| 308.36 | 967.12 | 314.24 | 967.1 | 315.45 | 967.09 | 316.83 | 967.09 | 322.54 | 967.1 |
| 327.53 | 967.14 | 329.63 | 967.15 | 331.99 | 967.22 | 340.84 | 967.1 | 343.79 | 967.02 |
| 347.16 | 966.76 | 350.88 | 966.44 | 354.14 | 966.13 | 362.33 | 965.41 | 365.06 | 965.19 |
| 367.44 | 965.02 | 377.49 | 964.38 | 379.22 | 964.29 | 380.74 | 964.23 | 386.31 | 964.02 |
| 392.66 | 963.83 | 394.04 | 963.8 | 403.81 | 963.6 | 407.34 | 963.52 | 407.83 | 963.51 |
| 414.65 | 963.4 | 421.74 | 963.27 | 423 | 963.25 | 433.94 | 963.12 | 438.17 | 963.06 |
| 443 | 963.04 | 447.24 | 963 | 450.08 | 962.98 | 460.54 | 962.81 | 468.5 | 962.63 |
| 473.84 | 962.5 | 478.43 | 962.41 | 485.52 | 962.25 | 487.14 | 962.22 | 498.84 | 961.98 |
| 499.7 | 961.96 | 500.44 | 961.94 | 506.78 | 961.8 | 513.74 | 961.63 | 514 | 961.63 |
| 520.95 | 961.44 | 528.03 | 961.23 | 529.17 | 961.2 | 535.13 | 961 | 540.34 | 960.8 |
| 553.64 | 960.2 | 559.5 | 960.06 | 563.47 | 959.82 | 566.94 | 959.74 | 570.55 | 959.48 |
| 574.68 | 959.47 | 577.64 | 959.43 | 580.24 | 959.32 | 589.84 | 958.99 | 591.81 | 958.95 |
| 593.54 | 958.92 | 598.9 | 958.81 | 605.01 | 958.76 | 606.84 | 958.77 | 619.84 | 958.82 |
| 620.18 | 958.82 | 633.44 | 958.88 | 635.35 | 958.88 | 646.74 | 958.93 | 665.68 | 958.98 |
| 673.34 | 958.98 | 676.85 | 958.97 | 680.85 | 958.97 | 696.01 | 958.93 | 698.1 | 958.93 |
| 699.94 | 958.92 | 711.19 | 958.9 | 713.24 | 958.89 | 726.35 | 958.87 | 726.46 | 958.86 |
| 726.54 | 958.86 | 739.84 | 958.83 | 741.52 | 958.83 | 766.44 | 958.8 | 779.74 | 958.76 |
| 787.02 | 958.75 | 802.19 | 958.7 | 804.4 | 958.69 | 806.34 | 958.69 | 817.36 | 958.63 |
| 819.64 | 958.63 | 832.52 | 958.56 | 832.94 | 958.56 | 846.24 | 958.51 | 846.92 | 958.51 |
| 847.69 | 958.5 | 854 | 958.49 | 859.54 | 958.46 | 862.86 | 958.46 | 872.84 | 958.44 |
| 875.26 | 958.44 | 893.2 | 958.49 | 896.53 | 958.51 | 899.44 | 958.52 | 903.61 | 958.55 |
| 912.74 | 958.59 | 917.78 | 958.62 | 923.53 | 958.64 | 924.87 | 958.65 | 926.04 | 958.65 |
| 938.7 | 958.67 | 939.34 | 958.67 | 952.64 | 958.63 | 953.86 | 958.63 | 965.94 | 958.57 |
| 967.39 | 958.57 | 992.54 | 958.45 | 1002.31 | 958.39 | 1002.82 | 958.39 | 1005.84 | 958.38 |
| 1009.91 | 958.35 | 1014.54 | 958.33 | 1016.99 | 958.31 | 1029.71 | 958.24 | 1032.44 | 958.22 |
| 1044.87 | 958.17 | 1060.04 | 958.16 | 1072.34 | 958.19 | 1075.21 | 958.19 | 1080.77 | 958.22 |
| 1085.64 | 958.23 | 1087.85 | 958.24 | 1090.37 | 958.24 | 1093.43 | 958.25 | 1094.94 | 958.26 |
| 1098.94 | 958.25 | 1102.02 | 958.26 | 1105.54 | 958.24 | 1109.12 | 958.23 | 1120.71 | 958.15 |
| 1123.28 | 958.12 | 1125.54 | 958.1 | 1130.37 | 958.05 | 1137.45 | 958 | 1138.84 | 957.98 |
| 1144.55 | 957.92 | 1151.05 | 957.87 | 1151.63 | 957.86 | 1152.14 | 957.86 | 1158.71 | 957.78 |
| 1165.44 | 957.72 | 1165.8 | 957.72 | 1166.21 | 957.71 | 1178.74 | 957.57 | 1179.98 | 957.55 |
| 1181.38 | 957.54 | 1192.04 | 957.41 | 1211.72 | 957.16 | 1215.4 | 957.13 | 1218.64 | 957.09 |
| 1226.88 | 957.01 | 1231.94 | 956.99 | 1236.66 | 957.01 | 1242.05 | 957.1 | 1243.75 | 957.14 |
| 1245.24 | 957.19 | 1257.22 | 957.63 | 1257.93 | 957.66 | 1258.54 | 957.69 | 1265.01 | 957.96 |
| 1271.84 | 958.22 | 1272.09 | 958.23 | 1272.38 | 958.24 | 1285.14 | 958.75 | 1286.27 | 958.79 |
| 1287.56 | 958.84 | 1293.36 | 959.08 | 1298.44 | 959.27 | 1300.44 | 959.35 | 1302.72 | 959.42 |
| 1311.74 | 959.72 | 1317.88 | 959.86 | 1321.7 | 959.91 | 1322.98 | 959.91 | 1325.04 | 959.91 |
| 1328.79 | 959.92 | 1333.06 | 959.89 | 1335.87 | 959.89 | 1338.34 | 959.88 | 1342.96 | 959.88 |
| 1347.51 | 959.86 | 1351.64 | 959.86 | 1364.94 | 959.87 | 1371.3 | 959.89 | 1378.24 | 959.88 |
| 1392.56 | 959.89 | 1393.73 | 959.9 | 1404.84 | 960.21 | 1406.74 | 960.25 | 1408.89 | 960.27 |
| 1413.82 | 960.3 | 1418.14 | 960.25 | 1420.9 | 960.23 | 1424.06 | 960.23 | 1427.99 | 960.2 |
| 1431.44 | 960.21 | 1435.08 | 960.23 | 1439.23 | 960.23 | 1449.25 | 960.16 | 1454.39 | 960.16 |
| 1456.34 | 960.17 | 1463.42 | 960.29 | 1469.57 | 960.45 | 1470.52 | 960.48 | 1471.34 | 960.5 |
| 1477.6 | 960.69 | 1484.64 | 960.78 | 1484.73 | 960.78 | 1497.94 | 960.73 | 1499.9 | 960.74 |
| 1505.95 | 960.71 | 1511.24 | 960.65 | 1513.03 | 960.64 | 1515.07 | 960.6 | 1520.11 | 960.46 |
| 1524.54 | 960.31 | 1534.29 | 960 | 1537.84 | 959.91 | 1541.38 | 959.86 | 1545.4 | 959.83 |
| 1548.47 | 959.8 | 1551.14 | 959.81 | 1555.54 | 959.84 | 1561.29 | 959.92 | 1564.44 | 959.97 |
| 1569.72 | 960.04 | 1575.74 | 960.16 | 1576.81 | 960.19 | 1577.74 | 960.21 | 1590.9 | 960.59 |
| 1591.04 | 960.59 | 1598.06 | 960.78 | 1604.34 | 960.82 | 1605.15 | 960.83 | 1606.07 | 960.82 |
| 1617.64 | 960.71 | 1619.33 | 960.69 | 1621.24 | 960.62 | 1626.41 | 960.59 | 1630.94 | 960.54 |
| 1636.41 | 960.5 | 1640.58 | 960.59 | 1644.24 | 960.68 | 1647.67 | 960.74 | 1651.58 | 960.84 |
| 1654.76 | 961.04 | 1657.54 | 961.29 | 1661.84 | 961.63 | 1666.74 | 962.03 | 1670.84 | 962.53 |
| 1676.01 | 963.06 | 1681.91 | 963.5 | 1683.1 | 963.6 | 1684.14 | 963.69 | 1690.19 | 964.02 |
| 1697.08 | 964.28 | 1697.27 | 964.29 | 1697.44 | 964.3 | 1704.36 | 964.52 | 1711.44 | 964.93 |
| 1712.24 | 964.98 | 1718.54 | 965.39 | 1724.04 | 965.83 | 1725.62 | 965.98 | 1727.42 | 966.16 |
| 1737.34 | 967.28 | 1742.58 | 968.02 | 1746.87 | 968.49 | 1750.64 | 968.93 | 1752.29 | 969.12 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 1093.43 | .077 | 1347.51 | .04 | 1561.29 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 938.7 | 1322.98 | 208.91 | 199.99 | 209.65 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 959.68 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.035 | 0.057 | |
| W.S. Elev (ft) | 959.61 | Reach Len. (ft) | 208.91 | 199.99 | 209.65 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 310.97 | 568.57 | |
| E.G. Slope (ft/ft) | 0.003350 | Area (sq ft) | 310.97 | 568.57 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 680.50 | 1159.50 | |
| Top Width (ft) | 739.89 | Top Width (ft) | 370.02 | 369.87 | |
| Vel Total (ft/s) | 2.09 | Avg. Vel. (ft/s) | 2.19 | 2.04 | |
| Max Chl Dpth (ft) | 2.62 | Hydr. Depth (ft) | 0.84 | 1.54 | |
| Conv. Total (cfs) | 31790.3 | Conv. (cfs) | 11757.2 | 20033.1 | |
| Length Wtd. (ft) | 204.46 | Wetted Per. (ft) | 370.04 | 369.93 | |
| Min Ch El (ft) | 956.99 | Shear (lb/sq ft) | 0.18 | 0.32 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.38 | 0.66 | |
| Frctn Loss (ft) | 0.71 | Cum Volume (acre-ft) | 87.54 | 121.43 | 106.50 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 91.83 | 59.16 | 127.88 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.055 | |
| W.S. Elev (ft) | 960.33 | Reach Len. (ft) | 208.91 | 199.99 | 209.65 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 842.68 | |
| E.G. Slope (ft/ft) | 0.002283 | Area (sq ft) | | 842.68 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 384.28 | Top Width (ft) | | 384.28 | |
| Vel Total (ft/s) | 2.18 | Avg. Vel. (ft/s) | | 2.18 | |
| Max Chl Dpth (ft) | 3.34 | Hydr. Depth (ft) | | 2.19 | |
| Conv. Total (cfs) | 38506.1 | Conv. (cfs) | | 38506.1 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 386.43 | |
| Min Ch El (ft) | 956.99 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.68 | |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 13.42 | 162.41 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 63.21 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.055 | |
| W.S. Elev (ft) | 960.33 | Reach Len. (ft) | 208.91 | 199.99 | 209.65 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 842.68 | |
| E.G. Slope (ft/ft) | 0.002283 | Area (sq ft) | | 842.68 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 384.28 | Top Width (ft) | | 384.28 | |
| Vel Total (ft/s) | 2.18 | Avg. Vel. (ft/s) | | 2.18 | |
| Max Chl Dpth (ft) | 3.34 | Hydr. Depth (ft) | | 2.19 | |
| Conv. Total (cfs) | 38506.1 | Conv. (cfs) | | 38506.1 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 386.43 | |
| Min Ch El (ft) | 956.99 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.68 | |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 27.39 | 144.87 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.50 | 61.68 | 27.59 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.235

INPUT
Description: Thalweg Sta. 1160.65
Station Elevation Data num= 310

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970 | 9.88 | 969.93 | 21.48 | 969.86 | 23.93 | 969.84 | 35.72 | 969.77 |
| 37.97 | 969.76 | 49.97 | 969.68 | 64.2 | 969.6 | 65.14 | 969.59 | 66.07 | 969.59 |
| 78.44 | 969.54 | 79.28 | 969.54 | 80.12 | 969.53 | 92.68 | 969.49 | 94.16 | 969.49 |
| 106.92 | 969.44 | 108.21 | 969.43 | 121.16 | 969.36 | 121.71 | 969.36 | 122.25 | 969.35 |
| 135.4 | 969.24 | 135.85 | 969.24 | 136.31 | 969.23 | 149.64 | 969.1 | 150 | 969.09 |
| 150.35 | 969.09 | 163.88 | 968.97 | 164.14 | 968.97 | 164.4 | 968.96 | 178.12 | 968.84 |
| 178.44 | 968.84 | 192.36 | 968.67 | 192.49 | 968.67 | 206.54 | 968.41 | 206.6 | 968.41 |
| 220.58 | 968.15 | 220.84 | 968.15 | 234.63 | 967.99 | 235.08 | 967.98 | 248.68 | 967.87 |
| 249.32 | 967.87 | 262.73 | 967.75 | 263.14 | 967.75 | 263.55 | 967.74 | 276.77 | 967.61 |
| 277.28 | 967.61 | 277.8 | 967.6 | 298.5 | 967.41 | 304.86 | 967.38 | 305.56 | 967.37 |
| 306.28 | 967.37 | 312.64 | 967.36 | 318.91 | 967.49 | 319.71 | 967.51 | 320.51 | 967.49 |
| 332.96 | 967.11 | 334.75 | 966.95 | 340.92 | 966.43 | 347.01 | 965.93 | 349 | 965.79 |
| 355.07 | 965.39 | 361.05 | 964.97 | 363.23 | 964.87 | 369.21 | 964.64 | 375.1 | 964.43 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 377.47 | 964.37 | 383.35 | 964.29 | 389.15 | 964.19 | 390.43 | 964.18 | 391.71 | 964.16 |
| 403.19 | 963.93 | 404.57 | 963.89 | 405.95 | 963.82 | 411.63 | 963.59 | 417.24 | 963.3 |
| 420.19 | 963.19 | 431.28 | 962.75 | 434.43 | 962.66 | 445.33 | 962.41 | 446.99 | 962.39 |
| 448.67 | 962.34 | 454.06 | 962.22 | 459.38 | 962.05 | 462.91 | 961.93 | 468.2 | 961.74 |
| 473.43 | 961.51 | 482.34 | 961.07 | 487.47 | 960.86 | 489.42 | 960.79 | 491.39 | 960.71 |
| 501.52 | 960.25 | 503.56 | 960.16 | 505.63 | 959.93 | 515.57 | 959.18 | 517.7 | 959.1 |
| 524.78 | 958.74 | 529.62 | 958.68 | 531.84 | 958.62 | 534.11 | 958.63 | 543.66 | 958.66 |
| 548.35 | 958.66 | 557.71 | 958.6 | 567.2 | 958.49 | 574.27 | 958.4 | 576.82 | 958.38 |
| 585.8 | 958.34 | 591.06 | 958.33 | 595.49 | 958.34 | 599.85 | 958.34 | 602.56 | 958.35 |
| 605.31 | 958.35 | 613.89 | 958.38 | 616.71 | 958.4 | 619.54 | 958.41 | 633.78 | 958.51 |
| 637.91 | 958.55 | 648.02 | 958.62 | 662.26 | 958.67 | 676.5 | 958.69 | 680.34 | 958.68 |
| 690.74 | 958.68 | 698.17 | 958.64 | 701.56 | 958.63 | 708.62 | 958.59 | 712.22 | 958.56 |
| 747.7 | 958.36 | 751.05 | 958.35 | 761.93 | 958.29 | 776.18 | 958.26 | 779.34 | 958.26 |
| 782.46 | 958.25 | 800.55 | 958.25 | 804.66 | 958.26 | 833.13 | 958.26 | 847.38 | 958.23 |
| 857.13 | 958.19 | 864.19 | 958.14 | 871.26 | 958.06 | 880.78 | 957.94 | 890.09 | 957.85 |
| 892.48 | 957.83 | 894.83 | 957.82 | 899.55 | 957.82 | 904.33 | 957.83 | 906.62 | 957.85 |
| 908.87 | 957.86 | 922.93 | 957.98 | 927.84 | 958.03 | 932.81 | 958.07 | 936.97 | 958.11 |
| 947.05 | 958.19 | 949.05 | 958.21 | 961.29 | 958.28 | 970.26 | 958.28 | 975.53 | 958.26 |
| 979.11 | 958.24 | 984.4 | 958.19 | 993.16 | 958.12 | 998.55 | 958.06 | 1004.01 | 958.02 |
| 1005.62 | 958 | 1007.21 | 957.99 | 1018.25 | 957.9 | 1021.25 | 957.88 | 1032.49 | 957.83 |
| 1033.91 | 957.82 | 1035.3 | 957.82 | 1046.73 | 957.8 | 1049.34 | 957.8 | 1060.97 | 957.83 |
| 1063.39 | 957.83 | 1072.22 | 957.86 | 1075.2 | 957.87 | 1077.44 | 957.87 | 1089.45 | 957.9 |
| 1098.63 | 957.9 | 1103.69 | 957.89 | 1104.62 | 957.89 | 1105.53 | 957.88 | 1117.92 | 957.81 |
| 1119.58 | 957.79 | 1132.16 | 957.66 | 1132.9 | 957.66 | 1133.63 | 957.65 | 1146.4 | 957.51 |
| 1147.67 | 957.49 | 1154.12 | 957.41 | 1160.65 | 957.35 | 1161.72 | 957.33 | 1168.25 | 957.28 |
| 1174.88 | 957.29 | 1175.33 | 957.29 | 1175.76 | 957.28 | 1182.4 | 957.26 | 1189.12 | 957.26 |
| 1189.81 | 957.25 | 1196.54 | 957.22 | 1203.36 | 957.21 | 1203.86 | 957.21 | 1217.6 | 957.19 |
| 1217.75 | 957.2 | 1217.91 | 957.2 | 1224.83 | 957.24 | 1231.84 | 957.26 | 1231.95 | 957.26 |
| 1246 | 957.41 | 1246.08 | 957.41 | 1260.05 | 957.59 | 1260.32 | 957.59 | 1274.09 | 957.76 |
| 1274.33 | 957.77 | 1274.56 | 957.77 | 1288.14 | 957.94 | 1288.47 | 957.95 | 1288.8 | 957.95 |
| 1302.18 | 958.12 | 1302.61 | 958.13 | 1303.04 | 958.13 | 1316.24 | 958.29 | 1317.27 | 958.31 |
| 1329.27 | 958.43 | 1329.83 | 958.44 | 1330.21 | 958.45 | 1330.91 | 958.45 | 1331.96 | 958.46 |
| 1338.13 | 958.5 | 1342.26 | 958.5 | 1349.91 | 958.35 | 1354.3 | 958.25 | 1359.74 | 958.14 |
| 1366.34 | 958.05 | 1367.86 | 958.05 | 1378.38 | 958.03 | 1403.76 | 958.03 | 1410.2 | 958.02 |
| 1417.4 | 957.99 | 1424.61 | 957.94 | 1426.55 | 957.92 | 1438.59 | 957.82 | 1439.03 | 957.82 |
| 1439.66 | 957.81 | 1457.61 | 957.67 | 1460.64 | 957.64 | 1462.67 | 957.63 | 1474.71 | 957.54 |
| 1475.05 | 957.54 | 1475.57 | 957.53 | 1486.76 | 957.47 | 1493.51 | 957.46 | 1496.68 | 957.45 |
| 1498.8 | 957.45 | 1510.84 | 957.47 | 1511.46 | 957.47 | 1522.88 | 957.53 | 1525.5 | 957.54 |
| 1532.71 | 957.59 | 1534.92 | 957.6 | 1546.97 | 957.69 | 1547.13 | 957.69 | 1547.37 | 957.7 |
| 1554.33 | 957.76 | 1561.55 | 957.84 | 1568.75 | 957.93 | 1571.04 | 957.95 | 1575.96 | 958.01 |
| 1583.09 | 958.06 | 1583.27 | 958.06 | 1590.37 | 958.09 | 1595.13 | 958.12 | 1604.79 | 958.2 |
| 1607.17 | 958.25 | 1611.99 | 958.34 | 1619.17 | 958.53 | 1626.4 | 958.73 | 1631.25 | 958.84 |
| 1637.12 | 958.96 | 1640.82 | 959.05 | 1643.3 | 959.08 | 1648.03 | 959.2 | 1655.07 | 959.26 |
| 1655.34 | 959.26 | 1662.44 | 959.47 | 1667.38 | 959.58 | 1669.64 | 959.72 | 1673.02 | 960 |
| 1676.86 | 960.29 | 1679.42 | 960.49 | 1684.06 | 961.01 | 1690.97 | 962.01 | 1691.27 | 962.05 |
| 1691.47 | 962.08 | 1698.47 | 963 | 1699 | 963.08 | 1703.5 | 963.79 | 1705.69 | 964.07 |
| 1708.92 | 964.46 | 1712.89 | 964.83 | 1715.55 | 965.11 | 1720.1 | 965.43 | 1726.88 | 966.03 |
| 1727.3 | 966.05 | 1727.59 | 966.08 | 1734.51 | 966.28 | 1739.63 | 966.51 | 1741.71 | 966.59 |
| 1744.83 | 966.73 | 1748.93 | 966.77 | 1751.67 | 966.99 | 1756.13 | 967.22 | 1760.62 | 967.61 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 1098.63 | .077 | 1329.27 | .04 | 1699 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 970.26 | 1329.27 | 306.77 | 199.98 | 165.9 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.97 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.035 | 0.059 | 0.040 |
| W.S. Elev (ft) | 958.92 | Reach Len. (ft) | 306.77 | 199.98 | 165.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 256.83 | 426.02 | 299.77 |
| E.G. Slope (ft/ft) | 0.003603 | Area (sq ft) | 256.83 | 426.02 | 299.77 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 451.02 | 729.35 | 659.63 |
| Top Width (ft) | 1113.78 | Top Width (ft) | 448.98 | 359.01 | 305.79 |
| Vel Total (ft/s) | 1.87 | Avg. Vel. (ft/s) | 1.76 | 1.71 | 2.20 |
| Max Chl Dpth (ft) | 1.73 | Hydr. Depth (ft) | 0.57 | 1.19 | 0.98 |
| Conv. Total (cfs) | 30652.6 | Conv. (cfs) | 7513.6 | 12150.2 | 10988.7 |
| Length Wtd. (ft) | 204.68 | Wetted Per. (ft) | 448.99 | 359.02 | 305.81 |
| Min Ch El (ft) | 957.19 | Shear (lb/sq ft) | 0.13 | 0.27 | 0.22 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.23 | 0.46 | 0.49 |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 86.18 | 119.15 | 105.78 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 89.87 | 57.49 | 127.15 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 959.82 | Element | | | |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.057 | |
| W.S. Elev (ft) | 959.72 | Reach Len. (ft) | 306.77 | 199.98 | 165.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 713.73 | |
| E.G. Slope (ft/ft) | 0.003910 | Area (sq ft) | | 713.73 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 359.01 | Top Width (ft) | | 359.01 | |
| Vel Total (ft/s) | 2.58 | Avg. Vel. (ft/s) | | 2.58 | |
| Max Chl Dpth (ft) | 2.53 | Hydr. Depth (ft) | | 1.99 | |
| Conv. Total (cfs) | 29426.7 | Conv. (cfs) | | 29426.7 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 361.75 | |
| Min Ch El (ft) | 957.19 | Shear (lb/sq ft) | | 0.48 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.24 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 13.42 | 158.83 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 61.51 | 9.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 959.82 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.057 | |
| W.S. Elev (ft) | 959.72 | Reach Len. (ft) | 306.77 | 199.98 | 165.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 713.79 | |
| E.G. Slope (ft/ft) | 0.003909 | Area (sq ft) | | 713.79 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 359.01 | Top Width (ft) | | 359.01 | |
| Vel Total (ft/s) | 2.58 | Avg. Vel. (ft/s) | | 2.58 | |
| Max Chl Dpth (ft) | 2.53 | Hydr. Depth (ft) | | 1.99 | |
| Conv. Total (cfs) | 29431.3 | Conv. (cfs) | | 29431.3 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 361.75 | |
| Min Ch El (ft) | 957.19 | Shear (lb/sq ft) | | 0.48 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.24 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 27.39 | 141.30 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.50 | 59.97 | 27.59 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.197

INPUT
Description: Thalweg Sta. 1233.26
Station Elevation Data num= 304

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 969.99 | 7.71 | 969.91 | 8.24 | 969.9 | 8.57 | 969.9 | 15.49 | 969.83 |
| 22.75 | 969.77 | 41.5 | 969.57 | 43.96 | 969.55 | 44.52 | 969.54 | 59.03 | 969.37 |
| 64.28 | 969.32 | 66.28 | 969.29 | 67.55 | 969.28 | 73.54 | 969.2 | 79.34 | 969.14 |
| 83.13 | 969.09 | 91.14 | 969 | 101.99 | 968.91 | 102.57 | 968.91 | 102.93 | 968.9 |
| 120.84 | 968.76 | 124.33 | 968.74 | 126.52 | 968.72 | 138.32 | 968.64 | 139.69 | 968.64 |
| 150.11 | 968.62 | 160.61 | 968.72 | 161.91 | 968.73 | 173.71 | 968.91 | 177.4 | 968.96 |
| 182.39 | 969.04 | 196.26 | 969.21 | 196.9 | 969.22 | 197.3 | 969.23 | 209.09 | 969.29 |
| 211.41 | 969.29 | 215.11 | 969.28 | 220.89 | 969.28 | 230.55 | 969.25 | 232.68 | 969.24 |
| 233.97 | 969.24 | 240.43 | 969.21 | 252.82 | 969.17 | 254.94 | 969.16 | 268.07 | 969.07 |
| 269.46 | 969.05 | 271.67 | 969.03 | 283.98 | 968.88 | 290.53 | 968.79 | 291.67 | 968.77 |
| 312.99 | 968.48 | 315.26 | 968.44 | 320.26 | 968.38 | 327.05 | 968.28 | 327.51 | 968.28 |
| 328.24 | 968.27 | 338.85 | 968.15 | 349.27 | 968.05 | 350.65 | 968.03 | 362.44 | 967.91 |
| 363.79 | 967.9 | 365.95 | 967.88 | 384.8 | 967.66 | 385.56 | 967.65 | 386.03 | 967.64 |
| 397.83 | 967.46 | 400.07 | 967.42 | 403.65 | 967.35 | 407.32 | 967.29 | 409.62 | 967.26 |
| 419.59 | 967.1 | 421.42 | 967.08 | 421.84 | 967.07 | 433.21 | 966.91 | 443.61 | 966.81 |
| 451.09 | 966.76 | 456.8 | 966.74 | 468.6 | 966.67 | 472.64 | 966.63 | 479.07 | 966.58 |
| 479.89 | 966.57 | 480.39 | 966.57 | 497.93 | 966.39 | 515.78 | 966.16 | 516.17 | 966.16 |
| 516.78 | 966.15 | 530.68 | 965.96 | 535.64 | 965.88 | 539.37 | 965.83 | 552.45 | 965.63 |
| 554.5 | 965.61 | 562.97 | 965.5 | 566.97 | 965.46 | 573.35 | 965.41 | 574.22 | 965.4 |
| 574.76 | 965.4 | 581.47 | 965.37 | 586.56 | 965.36 | 588.73 | 965.35 | 603.25 | 965.35 |
| 610.15 | 965.39 | 610.5 | 965.38 | 611.06 | 965.37 | 617.76 | 965.22 | 621.95 | 965.1 |
| 629.92 | 964.42 | 633.74 | 964.07 | 640.14 | 963.04 | 648.77 | 961.63 | 654.04 | 960.75 |
| 657.34 | 960.22 | 667.62 | 958.93 | 668.55 | 958.82 | 669.13 | 958.75 | 675.8 | 958.32 |
| 680.93 | 958.02 | 690.31 | 957.89 | 692.72 | 957.86 | 704.52 | 957.79 | 705.33 | 957.79 |
| 739.9 | 957.53 | 741.11 | 957.53 | 743.04 | 957.51 | 751.7 | 957.44 | 761.9 | 957.33 |
| 766.16 | 957.28 | 780.75 | 957.13 | 787.08 | 957.1 | 798.88 | 957.07 | 799.16 | 957.08 |
| 799.6 | 957.08 | 810.68 | 957.12 | 813.67 | 957.14 | 820.93 | 957.17 | 856.17 | 957.37 |
| 857.21 | 957.37 | 857.86 | 957.38 | 871.72 | 957.44 | 892.2 | 957.53 | 893.25 | 957.54 |
| 893.88 | 957.54 | 900.75 | 957.57 | 905.04 | 957.58 | 908 | 957.58 | 912.73 | 957.59 |
| 915.26 | 957.6 | 916.84 | 957.6 | 940.43 | 957.62 | 950.44 | 957.64 | 951.25 | 957.64 |
| 966.05 | 957.64 | 986.72 | 957.56 | 987.61 | 957.55 | 988.15 | 957.55 | 1007 | 957.46 |
| 1011.21 | 957.46 | 1018.22 | 957.49 | 1025.86 | 957.51 | 1031.35 | 957.54 | 1038.62 | 957.56 |
| 1044.71 | 957.54 | 1046.59 | 957.54 | 1060.38 | 957.41 | 1063.57 | 957.37 | 1067.64 | 957.33 |
| 1070.18 | 957.3 | 1081.23 | 957.2 | 1081.98 | 957.19 | 1082.43 | 957.19 | 1093.77 | 957.11 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1101.28 | 957.09 | 1117.37 | 957.1 | 1118.43 | 957.11 | 1125.68 | 957.15 | 1129.16 | 957.18 |
| 1138.99 | 957.25 | 1140.2 | 957.26 | 1140.96 | 957.26 | 1144.25 | 957.27 | 1152.75 | 957.31 |
| 1161.97 | 957.28 | 1164.55 | 957.28 | 1176.35 | 957.24 | 1176.7 | 957.24 | 1183.74 | 957.23 |
| 1183.99 | 957.23 | 1199.94 | 957.23 | 1205.5 | 957.25 | 1211.73 | 957.26 | 1212.76 | 957.27 |
| 1227.28 | 957.36 | 1233.26 | 957.38 | 1235.33 | 957.39 | 1247.12 | 957.42 | 1249.04 | 957.42 |
| 1270.71 | 957.48 | 1270.97 | 957.48 | 1282.51 | 957.5 | 1289.83 | 957.53 | 1292.58 | 957.53 |
| 1294.3 | 957.54 | 1306.1 | 957.57 | 1307.09 | 957.57 | 1308.68 | 957.58 | 1327.53 | 957.63 |
| 1329.69 | 957.63 | 1336.12 | 957.64 | 1341.49 | 957.66 | 1343.37 | 957.67 | 1365.08 | 957.74 |
| 1365.24 | 957.74 | 1372.4 | 957.75 | 1386.91 | 957.81 | 1388.67 | 957.82 | 1394.17 | 957.83 |
| 1400.46 | 957.87 | 1401.42 | 957.87 | 1402.95 | 957.88 | 1408.68 | 957.9 | 1412.26 | 957.92 |
| 1415.94 | 957.93 | 1421.81 | 957.97 | 1423.2 | 957.97 | 1424.06 | 957.98 | 1435.85 | 958.02 |
| 1437.7 | 958.02 | 1440.66 | 958.01 | 1444.96 | 958.01 | 1446.27 | 958 | 1447.63 | 958 |
| 1459.75 | 957.86 | 1461.05 | 957.84 | 1461.38 | 957.83 | 1467.17 | 957.75 | 1474.58 | 957.67 |
| 1481.43 | 957.63 | 1483.08 | 957.63 | 1489.41 | 957.64 | 1492.7 | 957.66 | 1504.25 | 957.66 |
| 1504.79 | 957.65 | 1519.08 | 957.54 | 1526.48 | 957.46 | 1537.77 | 957.32 | 1541.33 | 957.29 |
| 1548.18 | 957.19 | 1548.75 | 957.18 | 1549.04 | 957.17 | 1549.96 | 957.16 | 1563.59 | 956.98 |
| 1569.88 | 956.94 | 1571 | 956.93 | 1571.57 | 956.93 | 1578.41 | 956.88 | 1582.84 | 956.87 |
| 1585.83 | 956.84 | 1591.58 | 956.82 | 1594.11 | 956.8 | 1613.29 | 956.68 | 1615.5 | 956.67 |
| 1616.64 | 956.66 | 1627.91 | 956.59 | 1630.34 | 956.57 | 1637.75 | 956.52 | 1639.18 | 956.52 |
| 1650.45 | 956.44 | 1667.42 | 956.35 | 1672.98 | 956.33 | 1674.83 | 956.32 | 1678.38 | 956.32 |
| 1682.25 | 956.31 | 1689.66 | 956.31 | 1695.52 | 956.33 | 1697.08 | 956.34 | 1700.08 | 956.35 |
| 1704.5 | 956.38 | 1711.91 | 956.41 | 1718.05 | 956.45 | 1719.33 | 956.45 | 1721.78 | 956.47 |
| 1729.32 | 956.5 | 1740.59 | 956.56 | 1741.58 | 956.57 | 1765.19 | 956.68 | 1774.4 | 956.71 |
| 1778.66 | 956.74 | 1785.66 | 956.76 | 1786.08 | 956.76 | 1786.88 | 956.77 | 1796.93 | 956.86 |
| 1800.92 | 956.91 | 1808.2 | 957.02 | 1808.33 | 957.02 | 1808.58 | 957.03 | 1815.74 | 957.2 |
| 1819.47 | 957.31 | 1823.16 | 957.46 | 1830.28 | 957.83 | 1830.73 | 957.86 | 1832.32 | 958.02 |
| 1838 | 958.61 | 1842 | 959.06 | 1845.42 | 959.5 | 1847.09 | 959.7 | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 1183.99 | .072 | 1461.05 | .04 | 1832.32 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 951.25 | 1446.27 | 526.07 | 399.96 | 339.92 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.08 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.035 | 0.043 | 0.040 |
| W.S. Elev (ft) | 957.98 | Reach Len. (ft) | 526.07 | 399.96 | 339.92 |
| Crit W.S. (ft) | 957.74 | Flow Area (sq ft) | 141.85 | 242.63 | 402.45 |
| E.G. Slope (ft/ft) | 0.005325 | Area (sq ft) | 141.85 | 242.63 | 402.45 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 287.83 | 403.99 | 1148.18 |
| Top Width (ft) | 1123.88 | Top Width (ft) | 267.60 | 473.49 | 382.78 |
| Vel Total (ft/s) | 2.34 | Avg. Vel. (ft/s) | 2.03 | 1.67 | 2.85 |
| Max Chl Dpth (ft) | 1.67 | Hydr. Depth (ft) | 0.53 | 0.51 | 1.05 |
| Conv. Total (cfs) | 25216.1 | Conv. (cfs) | 3944.5 | 5536.5 | 15735.2 |
| Length Wtd. (ft) | 369.32 | Wetted Per. (ft) | 267.60 | 473.50 | 382.82 |
| Min Ch El (ft) | 957.09 | Shear (lb/sq ft) | 0.18 | 0.17 | 0.35 |
| Alpha | 1.16 | Stream Power (lb/ft s) | 0.36 | 0.28 | 1.00 |
| Frctn Loss (ft) | 2.39 | Cum Volume (acre-ft) | 84.78 | 117.61 | 104.44 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 87.34 | 55.58 | 125.83 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.97 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 958.86 | Reach Len. (ft) | 526.07 | 399.96 | 339.92 |
| Crit W.S. (ft) | 958.23 | Flow Area (sq ft) | | 675.09 | |
| E.G. Slope (ft/ft) | 0.004647 | Area (sq ft) | | 675.09 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 495.02 | Top Width (ft) | | 495.02 | |
| Vel Total (ft/s) | 2.73 | Avg. Vel. (ft/s) | | 2.73 | |
| Max Chl Dpth (ft) | 2.55 | Hydr. Depth (ft) | | 1.36 | |
| Conv. Total (cfs) | 26992.6 | Conv. (cfs) | | 26992.6 | |
| Length Wtd. (ft) | 399.96 | Wetted Per. (ft) | | 497.10 | |
| Min Ch El (ft) | 957.09 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.07 | |
| Frctn Loss (ft) | 2.43 | Cum Volume (acre-ft) | 13.42 | 155.65 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 59.55 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.97 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 958.85 | Reach Len. (ft) | 526.07 | 399.96 | 339.92 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 673.94 | |
| E.G. Slope (ft/ft) | 0.004672 | Area (sq ft) | | 673.94 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 495.02 | Top Width (ft) | | 495.02 | |
| Vel Total (ft/s) | 2.73 | Avg. Vel. (ft/s) | | 2.73 | |
| Max Chl Dpth (ft) | 1.76 | Hydr. Depth (ft) | | 1.36 | |
| Conv. Total (cfs) | 26918.9 | Conv. (cfs) | | 26918.9 | |
| Length Wtd. (ft) | 399.96 | Wetted Per. (ft) | | 497.09 | |
| Min Ch El (ft) | 957.09 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.08 | |
| Frctn Loss (ft) | 2.41 | Cum Volume (acre-ft) | 27.39 | 138.11 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.50 | 58.01 | 27.59 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.122

INPUT
Description: Thalweg Sta. 1234.77
Station Elevation Data num= 321

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 965.63 | 6.17 | 966.95 | 9.34 | 967.08 | 16.39 | 967.38 | 20.96 | 967.26 |
| 36.84 | 966.9 | 37.82 | 966.87 | 47.06 | 966.63 | 48.31 | 966.66 | 57.29 | 966.83 |
| 67.51 | 966.19 | 77.73 | 965.59 | 87.28 | 965.35 | 87.96 | 965.34 | 96.82 | 965.12 |
| 98.18 | 965.09 | 100.27 | 965.05 | 108.41 | 964.87 | 113.68 | 964.79 | 118.63 | 964.73 |
| 138.47 | 964.57 | 139.08 | 964.57 | 147.4 | 964.51 | 149.31 | 964.49 | 155.83 | 964.45 |
| 164.26 | 964.39 | 169.75 | 964.34 | 172.69 | 964.32 | 179.98 | 964.25 | 181.12 | 964.25 |
| 189.55 | 964.17 | 190.2 | 964.17 | 200.43 | 964.08 | 210.65 | 964.01 | 214.83 | 964 |
| 220.88 | 963.97 | 231.1 | 963.96 | 240.13 | 963.94 | 241.32 | 963.94 | 269.15 | 963.91 |
| 271.99 | 963.9 | 282.14 | 963.88 | 282.51 | 963.88 | 290.7 | 963.87 | 292.44 | 963.86 |
| 312.89 | 963.82 | 323.12 | 963.76 | 324.42 | 963.75 | 330.52 | 963.68 | 332.85 | 963.65 |
| 333.34 | 963.65 | 343.57 | 963.51 | 349.7 | 963.41 | 353.79 | 963.36 | 374.24 | 963.04 |
| 375 | 963.03 | 378.53 | 962.97 | 384.46 | 962.88 | 386.07 | 962.86 | 425.04 | 962.35 |
| 425.36 | 962.35 | 426.54 | 962.34 | 434 | 962.25 | 435.58 | 962.22 | 445.81 | 962.09 |
| 450.86 | 962.01 | 476.14 | 961.67 | 477 | 961.67 | 493 | 961.5 | 496.93 | 961.47 |
| 502.98 | 961.4 | 515.98 | 961.27 | 517.38 | 961.25 | 518.29 | 961.24 | 522.57 | 961.2 |
| 525.78 | 961.16 | 537.83 | 961.02 | 548.05 | 960.74 | 552.01 | 960.37 | 558.27 | 959.8 |
| 567.94 | 958.4 | 568.5 | 958.32 | 568.87 | 958.3 | 570.58 | 958.18 | 577.29 | 957.75 |
| 578.72 | 957.64 | 585.73 | 957.56 | 588.95 | 957.51 | 594.15 | 957.51 | 599.17 | 957.48 |
| 602.59 | 957.57 | 609.4 | 957.66 | 611.01 | 957.73 | 618.6 | 958.01 | 619.44 | 958.04 |
| 619.62 | 958.05 | 636.3 | 958.9 | 640.07 | 959.07 | 644.73 | 959.24 | 650.29 | 959.39 |
| 653.16 | 959.4 | 660.52 | 959.4 | 666.61 | 959.32 | 670.01 | 959.24 | 670.74 | 959.2 |
| 678.45 | 957.53 | 680.96 | 957.32 | 686.87 | 956.28 | 691.19 | 955.7 | 695.3 | 955.17 |
| 701.41 | 954.3 | 703.74 | 954.18 | 711.64 | 953.63 | 721.86 | 953.42 | 723.83 | 953.42 |
| 732.09 | 953.4 | 749 | 953.48 | 749.8 | 953.48 | 762.64 | 953.57 | 762.76 | 953.57 |
| 771.16 | 953.71 | 772.98 | 953.73 | 779.6 | 954.16 | 783.21 | 954.35 | 788.02 | 954.88 |
| 793.43 | 955.41 | 796.46 | 955.77 | 803.66 | 956.58 | 804.88 | 956.73 | 810.65 | 957.34 |
| 813.31 | 957.63 | 813.88 | 957.69 | 821.74 | 958.4 | 824.11 | 958.6 | 834.33 | 959.32 |
| 838.6 | 959.49 | 844.55 | 959.76 | 847.03 | 959.78 | 854.78 | 959.86 | 855.46 | 959.83 |
| 863.89 | 959.51 | 865 | 959.47 | 865.23 | 959.45 | 872.32 | 958.84 | 875.23 | 958.62 |
| 878.14 | 958.34 | 880.75 | 958.08 | 889.17 | 957.34 | 895.67 | 956.87 | 897.61 | 956.75 |
| 905.9 | 956.28 | 906.03 | 956.27 | 916.12 | 955.8 | 922.89 | 955.54 | 924.26 | 955.47 |
| 926.35 | 955.37 | 931.33 | 955.24 | 936.57 | 955.03 | 944.66 | 954.85 | 954.69 | 954.71 |
| 956.61 | 954.69 | 957.02 | 954.68 | 965.04 | 954.62 | 973.47 | 954.59 | 981.9 | 954.59 |
| 987.69 | 954.58 | 1002.7 | 954.57 | 1015.61 | 954.59 | 1018.37 | 954.58 | 1024.04 | 954.59 |
| 1035.59 | 954.57 | 1050.71 | 954.56 | 1057.76 | 954.57 | 1083.04 | 954.57 | 1089.93 | 954.56 |
| 1091.48 | 954.56 | 1098.73 | 954.55 | 1100.16 | 954.55 | 1120.61 | 954.57 | 1125.2 | 954.59 |
| 1130.83 | 954.6 | 1141.06 | 954.64 | 1142.06 | 954.64 | 1146.74 | 954.65 | 1150.48 | 954.67 |
| 1151.28 | 954.67 | 1158.91 | 954.71 | 1191.48 | 954.82 | 1192.18 | 954.82 | 1192.63 | 954.83 |
| 1194.75 | 954.84 | 1200.98 | 954.88 | 1201.06 | 954.88 | 1202.4 | 954.87 | 1209.49 | 954.89 |
| 1212.63 | 954.88 | 1217.91 | 954.84 | 1222.85 | 954.85 | 1230.46 | 954.96 | 1234.77 | 954.96 |
| 1242.77 | 954.94 | 1243.21 | 954.94 | 1243.3 | 954.93 | 1251.63 | 954.9 | 1253.52 | 954.89 |
| 1260.07 | 954.95 | 1263.75 | 955.01 | 1268.49 | 955.04 | 1273.97 | 955.11 | 1276.93 | 955.13 |
| 1285.35 | 955.2 | 1290.77 | 955.23 | 1294.42 | 955.26 | 1310.64 | 955.33 | 1314.87 | 955.32 |
| 1319.07 | 955.32 | 1327.49 | 955.25 | 1335.32 | 955.16 | 1335.93 | 955.15 | 1344.35 | 955.03 |
| 1345.54 | 955.02 | 1352.78 | 954.9 | 1355.77 | 954.86 | 1361.21 | 954.76 | 1365.99 | 954.69 |
| 1368.86 | 954.64 | 1376.21 | 954.51 | 1386.44 | 954.35 | 1386.8 | 954.35 | 1394.93 | 954.23 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1396.66 | 954.21 | 1403.36 | 954.16 | 1406.89 | 954.15 | 1411.3 | 954.15 | 1417.11 | 954.15 |
| 1420.22 | 954.16 | 1427.34 | 954.17 | 1428.64 | 954.18 | 1434.81 | 954.2 | 1437.56 | 954.2 |
| 1445.5 | 954.23 | 1447.78 | 954.23 | 1453.94 | 954.26 | 1458.01 | 954.27 | 1477.27 | 954.34 |
| 1478.45 | 954.35 | 1479.22 | 954.35 | 1482.82 | 954.37 | 1487.65 | 954.38 | 1488.68 | 954.39 |
| 1498.9 | 954.42 | 1504.51 | 954.45 | 1509.13 | 954.46 | 1512.94 | 954.48 | 1519.35 | 954.5 |
| 1529.58 | 954.55 | 1529.8 | 954.55 | 1530.83 | 954.56 | 1538.23 | 954.59 | 1539.8 | 954.6 |
| 1550.03 | 954.61 | 1560.25 | 954.58 | 1563.51 | 954.58 | 1570.47 | 954.55 | 1590.92 | 954.54 |
| 1597.23 | 954.52 | 1611.37 | 954.43 | 1614.09 | 954.4 | 1621.6 | 954.34 | 1621.61 | 954.34 |
| 1622.52 | 954.33 | 1630.95 | 954.27 | 1631.82 | 954.26 | 1642.04 | 954.22 | 1646.15 | 954.24 |
| 1652.27 | 954.25 | 1659.14 | 954.36 | 1662.49 | 954.39 | 1664.67 | 954.43 | 1672.72 | 954.63 |
| 1674.87 | 954.69 | 1681.53 | 954.86 | 1682.94 | 954.9 | 1689.95 | 955.08 | 1693.16 | 955.15 |
| 1698.38 | 955.28 | 1703.39 | 955.39 | 1706.81 | 955.44 | 1713.61 | 955.59 | 1715.24 | 955.61 |
| 1722.89 | 955.78 | 1723.67 | 955.79 | 1723.84 | 955.8 | 1732.1 | 955.96 | 1734.06 | 956.01 |
| 1740.53 | 956.14 | 1744.29 | 956.24 | 1748.96 | 956.41 | 1754.51 | 956.59 | 1757.38 | 956.76 |
| 1764.73 | 957.11 | 1765.82 | 957.16 | 1770.9 | 957.38 | 1774.24 | 957.5 | 1774.96 | 957.53 |
| 1782.68 | 957.75 | 1785.18 | 957.88 | 1791.1 | 958.04 | 1795.41 | 958.31 | 1799.54 | 958.58 |
| 1805.63 | 959.26 | 1807.96 | 959.54 | 1815.86 | 960.78 | 1816.4 | 960.89 | 1818.91 | 961.38 |
| 1824.82 | 962.51 | 1826.08 | 962.78 | 1833.25 | 964.41 | 1836.3 | 965.14 | 1841.68 | 966.29 |
| 1844.83 | 966.99 | | | | | | | | |

Manning's n Values num= 8

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 525.78 | .04 | 749 | .072 | 878.14 | .04 | 924.26 | .072 |
| 1200.98 | .052 | 1411.3 | .04 | 1621.61 | .032 | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 865.23 | 1310.64 | 178.94 | 199.76 | 260.08 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 854.78 | 959.86 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.68 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.068 | 0.040 |
| W.S. Elev (ft) | 955.54 | Reach Len. (ft) | 178.94 | 199.76 | 260.08 |
| Crit W.S. (ft) | 955.26 | Flow Area (sq ft) | | 299.73 | 396.31 |
| E.G. Slope (ft/ft) | 0.008032 | Area (sq ft) | 168.64 | 299.73 | 396.31 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 505.66 | 1334.34 |
| Top Width (ft) | 890.96 | Top Width (ft) | 102.17 | 387.87 | 400.92 |
| Vel Total (ft/s) | 2.64 | Avg. Vel. (ft/s) | | 1.69 | 3.37 |
| Max Chl Dpth (ft) | 2.14 | Hydr. Depth (ft) | | 0.77 | 0.99 |
| Conv. Total (cfs) | 20531.2 | Conv. (cfs) | | 5642.3 | 14888.9 |
| Length Wtd. (ft) | 247.83 | Wetted Per. (ft) | | 387.89 | 400.94 |
| Min Ch El (ft) | 954.55 | Shear (lb/sq ft) | | 0.39 | 0.50 |
| Alpha | 1.29 | Stream Power (lb/ft s) | | 0.65 | 1.67 |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | 82.90 | 115.12 | 101.33 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 85.11 | 51.62 | 122.78 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 956.55 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.066 | |
| W.S. Elev (ft) | 956.42 | Reach Len. (ft) | 178.94 | 199.76 | 260.08 |
| Crit W.S. (ft) | 955.66 | Flow Area (sq ft) | | 649.46 | |
| E.G. Slope (ft/ft) | 0.008245 | Area (sq ft) | | 649.46 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 407.26 | Top Width (ft) | | 407.26 | |
| Vel Total (ft/s) | 2.83 | Avg. Vel. (ft/s) | | 2.83 | |
| Max Chl Dpth (ft) | 3.02 | Hydr. Depth (ft) | | 1.59 | |
| Conv. Total (cfs) | 20264.3 | Conv. (cfs) | | 20264.3 | |
| Length Wtd. (ft) | 212.40 | Wetted Per. (ft) | | 408.39 | |
| Min Ch El (ft) | 954.55 | Shear (lb/sq ft) | | 0.82 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.32 | |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | 13.42 | 149.56 | 18.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 55.40 | 9.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest,

valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 956.55 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.066 | |
| W.S. Elev (ft) | 956.43 | Reach Len. (ft) | 178.94 | 199.76 | 260.08 |
| Crit W.S. (ft) | 955.66 | Flow Area (sq ft) | | 653.01 | |
| E.G. Slope (ft/ft) | 0.008097 | Area (sq ft) | | 653.01 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 407.41 | Top Width (ft) | | 407.41 | |
| Vel Total (ft/s) | 2.82 | Avg. Vel. (ft/s) | | 2.82 | |
| Max Chl Dpth (ft) | 1.88 | Hydr. Depth (ft) | | 1.60 | |
| Conv. Total (cfs) | 20447.7 | Conv. (cfs) | | 20447.7 | |
| Length Wtd. (ft) | 212.44 | Wetted Per. (ft) | | 408.55 | |
| Min Ch El (ft) | 954.55 | Shear (lb/sq ft) | | 0.81 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.28 | |
| Frctn Loss (ft) | 1.37 | Cum Volume (acre-ft) | 27.39 | 132.02 | 37.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.50 | 53.87 | 27.59 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.084

INPUT
Description: Thalweg Sta. 896.26
Station Elevation Data num= 325

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 966.04 | .24 | 966.02 | 4.89 | 965.68 | 6.05 | 965.6 | 16.35 | 964.85 |
| 26.66 | 964.48 | 36.96 | 964.14 | 37.9 | 964.12 | 47.27 | 963.87 | 54.41 | 963.79 |
| 57.57 | 963.75 | 78.18 | 963.67 | 79.17 | 963.67 | 87.42 | 963.63 | 88.48 | 963.63 |
| 95.67 | 963.59 | 98.79 | 963.58 | 119.4 | 963.42 | 124.57 | 963.37 | 128.68 | 963.34 |
| 129.7 | 963.33 | 136.94 | 963.27 | 150.31 | 963.19 | 161.69 | 963.2 | 178.19 | 963.25 |
| 181.22 | 963.25 | 186.45 | 963.26 | 191.53 | 963.25 | 199.97 | 963.21 | 201.83 | 963.21 |
| 202.95 | 963.2 | 211.21 | 963.14 | 219.46 | 963.05 | 222.44 | 963.03 | 227.72 | 962.95 |
| 232.74 | 962.9 | 235.96 | 962.84 | 243.05 | 962.75 | 244.21 | 962.73 | 260.72 | 962.47 |
| 273.96 | 962.28 | 277.23 | 962.24 | 284.27 | 962.14 | 285.48 | 962.12 | 290.36 | 962.06 |
| 293.74 | 962.01 | 294.57 | 962 | 301.98 | 961.89 | 304.88 | 961.86 | 315.18 | 961.72 |
| 343.25 | 961.38 | 346.09 | 961.34 | 356.4 | 961.22 | 366.7 | 961.12 | 368.01 | 961.11 |
| 373.25 | 961.06 | 376.26 | 961.04 | 377.01 | 961.03 | 387.31 | 960.96 | 397.62 | 960.86 |
| 401.02 | 960.82 | 428.53 | 960.42 | 438.83 | 960.28 | 446.82 | 960.15 | 449.14 | 960.12 |
| 459.44 | 959.96 | 467.04 | 959.87 | 467.32 | 959.87 | 469.75 | 959.85 | 475.29 | 959.82 |
| 483.54 | 959.8 | 490.36 | 959.83 | 491.8 | 959.83 | 497.59 | 959.84 | 500.66 | 959.84 |
| 508.31 | 959.72 | 510.97 | 959.66 | 516.55 | 959.5 | 521.27 | 959.35 | 524.8 | 959.32 |
| 531.57 | 959.36 | 533.06 | 959.39 | 539.03 | 959.48 | 541.88 | 959.51 | 549.56 | 959.5 |
| 552.18 | 959.49 | 556.53 | 959.57 | 562.49 | 959.65 | 566.07 | 959.75 | 572.79 | 960 |
| 574.33 | 960.04 | 580.48 | 960.29 | 582.57 | 960.36 | 583.1 | 960.38 | 583.96 | 960.41 |
| 593.4 | 960.67 | 599.08 | 960.51 | 603.71 | 960.5 | 607.33 | 960.26 | 614.01 | 960.08 |
| 615.59 | 959.98 | 621.92 | 959.75 | 624.31 | 959.63 | 632.09 | 959.18 | 634.62 | 959.24 |
| 638.82 | 959.01 | 644.92 | 958.71 | 652.53 | 958.38 | 655.23 | 958.27 | 656.85 | 958.21 |
| 663.38 | 957.96 | 665.1 | 957.9 | 665.53 | 957.88 | 673.35 | 957.59 | 675.84 | 957.48 |
| 681.61 | 957.21 | 686.14 | 956.93 | 689.86 | 956.73 | 696.44 | 956.31 | 698.12 | 956.21 |
| 704.82 | 955.77 | 706.37 | 955.66 | 706.75 | 955.64 | 714.62 | 955.06 | 717.06 | 954.93 |
| 722.87 | 954.58 | 727.36 | 954.28 | 731.12 | 954.18 | 737.66 | 953.73 | 739.37 | 953.72 |
| 741.08 | 953.69 | 746.27 | 953.59 | 747.63 | 953.59 | 747.97 | 953.58 | 755.88 | 953.66 |
| 758.27 | 953.63 | 764.13 | 953.75 | 772.39 | 954.14 | 777.7 | 954.57 | 778.96 | 954.68 |
| 780.4 | 954.85 | 788.16 | 955.49 | 789.67 | 955.48 | 795.9 | 955.47 | 800.37 | 955.32 |
| 803.65 | 955.2 | 811.08 | 955.01 | 811.39 | 955 | 812.2 | 954.99 | 819.14 | 954.89 |
| 821.78 | 954.88 | 826.88 | 954.82 | 832.49 | 954.79 | 834.63 | 954.77 | 840.22 | 954.74 |
| 842.37 | 954.72 | 843.19 | 954.71 | 850.12 | 954.64 | 853.89 | 954.62 | 857.86 | 954.58 |
| 864.6 | 954.54 | 865.61 | 954.53 | 896.26 | 954.26 | 896.72 | 954.26 | 904.34 | 954.18 |
| 907.42 | 954.16 | 918.13 | 954.06 | 919.83 | 954.05 | 950.24 | 953.77 | 950.81 | 953.77 |
| 952.29 | 953.75 | 958.55 | 953.7 | 960.95 | 953.67 | 966.3 | 953.64 | 971.65 | 953.58 |
| 974.04 | 953.58 | 980.3 | 953.5 | 981.79 | 953.49 | 982.36 | 953.49 | 989.53 | 953.45 |
| 993.06 | 953.42 | 997.28 | 953.43 | 1003.77 | 953.42 | 1005.03 | 953.43 | 1008.32 | 953.45 |
| 1012.77 | 953.5 | 1014.47 | 953.51 | 1025.18 | 953.61 | 1028.26 | 953.63 | 1035.88 | 953.66 |
| 1036.33 | 953.66 | 1042.75 | 953.62 | 1043.75 | 953.61 | 1046.59 | 953.57 | 1051.5 | 953.49 |
| 1057.29 | 953.44 | 1059.24 | 953.43 | 1064.35 | 953.43 | 1067 | 953.42 | 1074.73 | 953.35 |
| 1078.71 | 953.3 | 1082.49 | 953.26 | 1089.41 | 953.16 | 1090.22 | 953.15 | 1092.36 | 953.12 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1097.97 | 953.09 | 1100.12 | 953.09 | 1110.82 | 953.04 | 1113.46 | 953.02 | 1118.85 | 953.01 |
| 1131.52 | 953.02 | 1138.93 | 953.09 | 1141.65 | 953.1 | 1147.64 | 953.23 | 1151.78 | 953.29 |
| 1161.91 | 953.53 | 1165.06 | 953.56 | 1172.04 | 953.71 | 1173.78 | 953.71 | 1182.18 | 953.79 |
| 1182.48 | 953.78 | 1189.22 | 953.71 | 1191.19 | 953.69 | 1192.31 | 953.69 | 1199.91 | 953.47 |
| 1202.44 | 953.36 | 1204.91 | 953.31 | 1208.62 | 953.24 | 1212.57 | 953.12 | 1217.34 | 953.2 |
| 1222.7 | 953.17 | 1232.84 | 953.32 | 1234.75 | 953.32 | 1242.97 | 953.42 | 1243.46 | 953.4 |
| 1246.5 | 953.36 | 1253.1 | 953.25 | 1260.88 | 953.01 | 1263.23 | 952.95 | 1269.6 | 952.92 |
| 1273.37 | 952.88 | 1278.31 | 952.93 | 1283.5 | 952.96 | 1293.63 | 953.04 | 1295.74 | 953.05 |
| 1303.76 | 953.07 | 1313.15 | 953.03 | 1313.89 | 953.02 | 1321.87 | 952.96 | 1324.03 | 952.94 |
| 1327.03 | 952.92 | 1354.42 | 952.7 | 1356.71 | 952.67 | 1364.55 | 952.61 | 1365.43 | 952.6 |
| 1374.14 | 952.53 | 1374.69 | 952.52 | 1382.84 | 952.45 | 1384.82 | 952.44 | 1400.27 | 952.31 |
| 1408.98 | 952.26 | 1415.21 | 952.25 | 1425.35 | 952.3 | 1435.11 | 952.39 | 1435.48 | 952.39 |
| 1443.83 | 952.46 | 1445.61 | 952.47 | 1448.09 | 952.5 | 1455.74 | 952.57 | 1461.25 | 952.6 |
| 1465.88 | 952.61 | 1478.67 | 952.62 | 1486.14 | 952.64 | 1487.39 | 952.64 | 1494.99 | 952.68 |
| 1496.27 | 952.68 | 1506.4 | 952.74 | 1522.23 | 952.8 | 1526.67 | 952.81 | 1536.8 | 952.86 |
| 1539.65 | 952.87 | 1546.93 | 952.91 | 1548.36 | 952.93 | 1553.66 | 952.97 | 1557.06 | 952.99 |
| 1557.12 | 952.99 | 1565.79 | 953.02 | 1567.2 | 953.04 | 1574.5 | 953.08 | 1583.21 | 953.15 |
| 1587.46 | 953.17 | 1591.92 | 953.21 | 1600.64 | 953.26 | 1607.73 | 953.35 | 1617.86 | 953.53 |
| 1618.05 | 953.54 | 1619.25 | 953.56 | 1626.77 | 953.72 | 1627.99 | 953.74 | 1635.48 | 953.9 |
| 1638.12 | 953.96 | 1644.19 | 954.08 | 1648.26 | 954.15 | 1652.9 | 954.24 | 1658.39 | 954.38 |
| 1661.61 | 954.43 | 1668.52 | 954.56 | 1670.33 | 954.59 | 1678.65 | 954.67 | 1679.04 | 954.68 |
| 1681.37 | 954.71 | 1687.74 | 954.83 | 1688.79 | 954.84 | 1696.46 | 955 | 1698.92 | 955.08 |
| 1705.17 | 955.24 | 1709.05 | 955.36 | 1719.18 | 955.55 | 1722.59 | 955.65 | 1729.31 | 955.75 |
| 1731.3 | 955.83 | 1739.45 | 955.98 | 1740.01 | 956 | 1743.5 | 956.1 | 1743.72 | 956.11 |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 467.32 | .04 | 741.08 | .072 | 1042.75 | .052 | 1204.91 | .04 |
| 1553.66 | .032 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 788.16 | 1182.48 | 203.28 | 200.06 | 243.97 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 788.16 | 955.49 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 954.24 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.056 | 0.039 |
| W.S. Elev (ft) | 954.13 | Reach Len. (ft) | 203.28 | 200.06 | 243.97 |
| Crit W.S. (ft) | 953.70 | Flow Area (sq ft) | | 175.24 | 550.54 |
| E.G. Slope (ft/ft) | 0.004393 | Area (sq ft) | 15.24 | 175.24 | 550.54 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 241.49 | 1598.52 |
| Top Width (ft) | 776.25 | Top Width (ft) | 40.23 | 271.56 | 464.46 |
| Vel Total (ft/s) | 2.54 | Avg. Vel. (ft/s) | | 1.38 | 2.90 |
| Max Chl Dpth (ft) | 1.88 | Hydr. Depth (ft) | | 0.65 | 1.19 |
| Conv. Total (cfs) | 27761.9 | Conv. (cfs) | | 3643.5 | 24118.4 |
| Length Wtd. (ft) | 239.05 | Wetted Per. (ft) | | 271.57 | 464.49 |
| Min Ch El (ft) | 953.01 | Shear (lb/sq ft) | | 0.18 | 0.33 |
| Alpha | 1.18 | Stream Power (lb/ft s) | | 0.24 | 0.94 |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | 82.52 | 114.03 | 98.50 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 84.82 | 50.11 | 120.19 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.20 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.058 | 0.041 |
| W.S. Elev (ft) | 955.06 | Reach Len. (ft) | 203.28 | 200.06 | 243.97 |
| Crit W.S. (ft) | 954.37 | Flow Area (sq ft) | | 479.39 | 203.79 |
| E.G. Slope (ft/ft) | 0.005025 | Area (sq ft) | | 479.39 | 203.79 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1068.80 | 771.20 |
| Top Width (ft) | 484.82 | Top Width (ft) | | 373.41 | 111.41 |
| Vel Total (ft/s) | 2.69 | Avg. Vel. (ft/s) | | 2.23 | 3.78 |
| Max Chl Dpth (ft) | 2.81 | Hydr. Depth (ft) | | 1.28 | 1.83 |
| Conv. Total (cfs) | 25956.1 | Conv. (cfs) | | 15077.1 | 10879.0 |
| Length Wtd. (ft) | 219.02 | Wetted Per. (ft) | | 373.43 | 113.45 |
| Min Ch El (ft) | 953.01 | Shear (lb/sq ft) | | 0.40 | 0.56 |
| Alpha | 1.23 | Stream Power (lb/ft s) | | 0.90 | 2.13 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 13.42 | 146.98 | 17.97 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.80 | 53.61 | 9.10 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.18 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.058 | 0.041 |
| W.S. Elev (ft) | 955.04 | Reach Len. (ft) | 203.28 | 200.06 | 243.97 |
| Crit W.S. (ft) | 954.38 | Flow Area (sq ft) | | 470.85 | 201.23 |
| E.G. Slope (ft/ft) | 0.005271 | Area (sq ft) | | 470.85 | 201.23 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1066.23 | 773.77 |
| Top Width (ft) | 483.92 | Top Width (ft) | | 372.51 | 111.41 |
| Vel Total (ft/s) | 2.74 | Avg. Vel. (ft/s) | | 2.26 | 3.85 |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 1.26 | 1.81 |
| Conv. Total (cfs) | 25343.3 | Conv. (cfs) | | 14685.8 | 10657.5 |
| Length Wtd. (ft) | 221.55 | Wetted Per. (ft) | | 372.53 | 113.43 |
| Min Ch El (ft) | 953.01 | Shear (lb/sq ft) | | 0.42 | 0.58 |
| Alpha | 1.23 | Stream Power (lb/ft s) | | 0.94 | 2.24 |
| Frctn Loss (ft) | 1.63 | Cum Volume (acre-ft) | 27.39 | 129.44 | 36.64 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 17.50 | 52.08 | 27.26 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 3.046

INPUT
Description: Thalweg Sta. 729.39
Station Elevation Data num= 301

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 964.64 | 3.53 | 964.36 | 9.22 | 963.93 | 19.57 | 963.51 | 19.9 | 963.51 |
| 21.17 | 963.47 | 28.09 | 963.3 | 29.91 | 963.26 | 40.25 | 963.05 | 50.59 | 962.9 |
| 52.64 | 962.88 | 60.41 | 962.79 | 60.93 | 962.79 | 69.01 | 962.7 | 71.27 | 962.67 |
| 77.2 | 962.62 | 81.61 | 962.57 | 89.19 | 962.5 | 91.96 | 962.47 | 99.66 | 962.41 |
| 101.75 | 962.39 | 102.3 | 962.39 | 109.93 | 962.33 | 112.64 | 962.32 | 122.98 | 962.24 |
| 133.32 | 962.17 | 134.49 | 962.17 | 138.91 | 962.15 | 142.67 | 962.14 | 143.66 | 962.13 |
| 154 | 962.13 | 159.04 | 962.14 | 164.34 | 962.14 | 167.23 | 962.15 | 175.41 | 962.15 |
| 178.16 | 962.14 | 183.6 | 962.13 | 191.78 | 962.07 | 195.37 | 962.03 | 205.71 | 961.93 |
| 208.15 | 961.9 | 216.05 | 961.82 | 216.33 | 961.82 | 217.4 | 961.8 | 249.07 | 961.47 |
| 256.65 | 961.38 | 285.77 | 960.99 | 288.44 | 960.95 | 289.99 | 960.93 | 295.91 | 960.84 |
| 298.18 | 960.8 | 298.78 | 960.8 | 306.36 | 960.67 | 309.12 | 960.63 | 339.1 | 960.09 |
| 340.15 | 960.07 | 347.29 | 959.96 | 350.49 | 959.9 | 360.83 | 959.75 | 370.01 | 959.65 |
| 380.03 | 959.56 | 381.51 | 959.55 | 391.85 | 959.46 | 402.2 | 959.39 | 412.54 | 959.31 |
| 412.76 | 959.31 | 413.64 | 959.3 | 433.22 | 959.11 | 443.56 | 958.99 | 445.5 | 958.98 |
| 452.9 | 958.9 | 453.69 | 958.89 | 453.9 | 958.89 | 460.01 | 958.86 | 461.87 | 958.85 |
| 464.24 | 958.83 | 470.06 | 958.83 | 474.58 | 958.82 | 478.24 | 958.83 | 484.92 | 958.8 |
| 486.43 | 958.79 | 492.14 | 958.73 | 494.61 | 958.7 | 495.27 | 958.7 | 496.38 | 958.67 |
| 505.61 | 958.46 | 515.95 | 958.03 | 526.29 | 957.87 | 527.36 | 957.88 | 536.63 | 957.88 |
| 538.5 | 957.86 | 546.97 | 957.8 | 552.55 | 957.71 | 557.31 | 957.65 | 566.59 | 957.4 |
| 567.65 | 957.37 | 576.47 | 957.1 | 584.65 | 956.84 | 592.84 | 956.66 | 598.68 | 956.55 |
| 608.71 | 956.3 | 609.02 | 956.29 | 609.89 | 956.27 | 617.39 | 956.07 | 619.36 | 956.03 |
| 622.27 | 955.96 | 625.57 | 955.87 | 629.7 | 955.8 | 633.76 | 955.7 | 640.05 | 955.48 |
| 641.94 | 955.41 | 649.13 | 955.07 | 650.13 | 955.02 | 650.39 | 955 | 658.31 | 954.41 |
| 660.73 | 954.2 | 666.5 | 953.82 | 671.07 | 953.57 | 678.92 | 953.29 | 681.41 | 953.19 |
| 682.87 | 953.15 | 683.69 | 953.14 | 684.16 | 953.13 | 690.65 | 953.04 | 692.03 | 953.03 |
| 702.74 | 953 | 715.08 | 952.99 | 721.64 | 952.97 | 729.39 | 952.97 | 734.85 | 952.96 |
| 737.13 | 952.96 | 743.11 | 952.95 | 744.88 | 952.94 | 745.55 | 952.94 | 760.38 | 952.93 |
| 766.96 | 952.91 | 777.67 | 952.9 | 783.62 | 952.88 | 788.37 | 952.88 | 791.36 | 952.86 |
| 799.19 | 952.86 | 809.78 | 952.82 | 814.6 | 952.78 | 820.48 | 952.79 | 822.34 | 952.76 |
| 827.23 | 952.76 | 830.09 | 952.74 | 831.18 | 952.74 | 837.84 | 952.65 | 841.89 | 952.66 |
| 845.58 | 952.6 | 852.59 | 952.61 | 853.33 | 952.6 | 855.27 | 952.58 | 861.08 | 952.48 |
| 863.3 | 952.48 | 868.83 | 952.4 | 874 | 952.38 | 876.57 | 952.35 | 883.31 | 952.26 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 884.32 | 952.25 | 884.7 | 952.25 | 892.07 | 952.16 | 899.81 | 952.09 | 906.11 | 951.99 |
| 907.56 | 951.98 | 911.35 | 951.91 | 920.2 | 951.8 | 927.52 | 951.73 | 937.51 | 951.57 |
| 938.22 | 951.56 | 939.38 | 951.55 | 946.3 | 951.52 | 948.93 | 951.47 | 954.03 | 951.46 |
| 959.63 | 951.34 | 961.78 | 951.35 | 967.42 | 951.31 | 969.53 | 951.31 | 970.34 | 951.29 |
| 977.28 | 951.48 | 981.04 | 951.53 | 983.59 | 951.67 | 985.02 | 951.75 | 991.74 | 952.16 |
| 992.77 | 952.2 | 995.46 | 952.32 | 1002.45 | 952.57 | 1008.26 | 952.58 | 1010.35 | 952.59 |
| 1013.15 | 952.61 | 1016.01 | 952.57 | 1023.5 | 952.49 | 1023.86 | 952.49 | 1031.51 | 952.32 |
| 1034.56 | 952.31 | 1039.25 | 952.27 | 1045.27 | 952.31 | 1047 | 952.34 | 1051.54 | 952.43 |
| 1053.42 | 952.47 | 1053.85 | 952.48 | 1054.97 | 952.51 | 1055.81 | 952.52 | 1064.04 | 952.73 |
| 1065.87 | 952.79 | 1073.11 | 952.89 | 1075.93 | 952.95 | 1082.19 | 952.78 | 1085.99 | 952.64 |
| 1090.72 | 952.39 | 1096.05 | 952.14 | 1100.33 | 952.05 | 1106.11 | 951.96 | 1109.41 | 951.99 |
| 1116.17 | 951.97 | 1124.59 | 951.9 | 1126.23 | 951.9 | 1127.54 | 951.89 | 1136.28 | 951.8 |
| 1139.69 | 951.8 | 1145.69 | 951.81 | 1146.34 | 951.82 | 1154.76 | 951.97 | 1156.4 | 952.03 |
| 1166.46 | 952.1 | 1172.91 | 952 | 1176.52 | 951.9 | 1181.98 | 951.82 | 1186.58 | 951.71 |
| 1196.64 | 951.56 | 1200.13 | 951.54 | 1206.7 | 951.47 | 1209.2 | 951.54 | 1216.76 | 951.63 |
| 1218.27 | 951.67 | 1226.82 | 951.96 | 1227.34 | 951.96 | 1236.41 | 952.06 | 1236.88 | 952.07 |
| 1237.45 | 952.07 | 1254.56 | 951.96 | 1307.29 | 951.6 | 1309 | 951.58 | 1317.35 | 951.52 |
| 1318.06 | 951.51 | 1324.68 | 951.46 | 1327.13 | 951.45 | 1327.41 | 951.44 | 1345.28 | 951.3 |
| 1347.52 | 951.27 | 1354.35 | 951.24 | 1357.58 | 951.21 | 1363.43 | 951.19 | 1367.64 | 951.16 |
| 1387.76 | 951.1 | 1390.65 | 951.1 | 1397.82 | 951.08 | 1417.94 | 951.09 | 1426.93 | 951.12 |
| 1427.99 | 951.13 | 1436 | 951.18 | 1438.05 | 951.21 | 1445.08 | 951.28 | 1448.11 | 951.32 |
| 1463.22 | 951.42 | 1472.29 | 951.46 | 1478.29 | 951.46 | 1481.37 | 951.47 | 1488.35 | 951.44 |
| 1499.52 | 951.43 | 1508.47 | 951.48 | 1508.59 | 951.48 | 1518.53 | 951.58 | 1526.72 | 951.71 |
| 1528.59 | 951.73 | 1528.91 | 951.74 | 1538.64 | 951.92 | 1544.87 | 951.95 | 1548.7 | 951.98 |
| 1553.94 | 952.01 | 1578.88 | 952.3 | 1581.16 | 952.34 | 1588.94 | 952.45 | 1599 | 952.68 |
| 1599.31 | 952.69 | 1602.14 | 952.79 | 1608.38 | 953 | 1609.06 | 953.02 | 1617.45 | 953.36 |
| 1619.12 | 953.41 | 1626.52 | 953.71 | 1629.18 | 953.8 | 1635.59 | 954.2 | 1639.23 | 954.42 |
| 1649.29 | 955.5 | 1659.35 | 957 | 1662.81 | 957.65 | 1669.41 | 958.76 | 1671.89 | 959.28 |
| 1672.77 | 959.44 | | | | | | | | |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 460.01 | .04 | 622.27 | .072 | 983.59 | .052 | 1010.35 | .04 |
| 1528.91 | .032 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 852.59 | 1075.93 | 492.22 | 387.47 | 267.36 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 952.78 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.069 | 0.040 |
| W.S. Elev (ft) | 952.60 | Reach Len. (ft) | 492.22 | 387.47 | 267.36 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 111.53 | 476.06 |
| E.G. Slope (ft/ft) | 0.009127 | Area (sq ft) | 0.00 | 111.53 | 476.06 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 171.24 | 1668.76 |
| Top Width (ft) | 712.53 | Top Width (ft) | 0.19 | 203.57 | 508.77 |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | | 1.54 | 3.51 |
| Max Chl Dpth (ft) | 1.52 | Hydr. Depth (ft) | | 0.55 | 0.94 |
| Conv. Total (cfs) | 19260.2 | Conv. (cfs) | | 1792.4 | 17467.7 |
| Length Wtd. (ft) | 300.68 | Wetted Per. (ft) | | 203.62 | 508.81 |
| Min Ch El (ft) | 951.29 | Shear (lb/sq ft) | | 0.31 | 0.53 |
| Alpha | 1.16 | Stream Power (lb/ft s) | | 0.48 | 1.87 |
| Frctn Loss (ft) | 1.49 | Cum Volume (acre-ft) | 82.49 | 113.37 | 95.62 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 84.73 | 49.02 | 117.47 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 953.95 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.061 | 0.040 |
| W.S. Elev (ft) | 953.76 | Reach Len. (ft) | 492.22 | 387.47 | 267.36 |
| Crit W.S. (ft) | 953.13 | Flow Area (sq ft) | | 367.08 | 192.60 |
| E.G. Slope (ft/ft) | 0.006544 | Area (sq ft) | | 367.08 | 192.60 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1022.36 | 817.64 |
| Top Width (ft) | 335.94 | Top Width (ft) | | 223.34 | 112.60 |
| Vel Total (ft/s) | 3.29 | Avg. Vel. (ft/s) | | 2.79 | 4.25 |
| Max Chl Dpth (ft) | 2.68 | Hydr. Depth (ft) | | 1.64 | 1.71 |
| Conv. Total (cfs) | 22745.9 | Conv. (cfs) | | 12638.3 | 10107.6 |
| Length Wtd. (ft) | 360.78 | Wetted Per. (ft) | | 224.54 | 114.71 |
| Min Ch El (ft) | 951.29 | Shear (lb/sq ft) | | 0.67 | 0.69 |
| Alpha | 1.14 | Stream Power (lb/ft s) | | 1.86 | 2.91 |
| Frctn Loss (ft) | 1.90 | Cum Volume (acre-ft) | 13.42 | 145.03 | 16.86 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 6.80 | 52.24 | 8.48 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 953.54 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | 0.072 | 0.063 | 0.040 |
| W.S. Elev (ft) | 953.29 | Reach Len. (ft) | 492.22 | 387.47 | 267.36 |
| Crit W.S. (ft) | 953.02 | Flow Area (sq ft) | 48.84 | 263.42 | 216.65 |
| E.G. Slope (ft/ft) | 0.010936 | Area (sq ft) | 48.84 | 263.42 | 216.65 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 64.63 | 752.70 | 1022.68 |
| Top Width (ft) | 485.19 | Top Width (ft) | 101.37 | 223.34 | 160.48 |
| Vel Total (ft/s) | 3.48 | Avg. Vel. (ft/s) | 1.32 | 2.86 | 4.72 |
| Max Chl Dpth (ft) | 2.00 | Hydr. Depth (ft) | 0.48 | 1.18 | 1.35 |
| Conv. Total (cfs) | 17594.6 | Conv. (cfs) | 618.0 | 7197.5 | 9779.1 |
| Length Wtd. (ft) | 337.36 | Wetted Per. (ft) | 101.73 | 223.39 | 161.75 |
| Min Ch El (ft) | 951.29 | Shear (lb/sq ft) | 0.33 | 0.81 | 0.91 |
| Alpha | 1.30 | Stream Power (lb/ft s) | 0.43 | 2.30 | 4.32 |
| Frctn Loss (ft) | 1.74 | Cum Volume (acre-ft) | 27.28 | 127.76 | 35.46 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 17.26 | 50.71 | 26.49 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.972

INPUT
Description: Thalweg Sta. 860.25
Station Elevation Data num= 281

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 957.53 | 1.99 | 957.88 | 5.09 | 958.42 | 10.54 | 959.13 | 15.27 | 959.78 |
| 15.75 | 959.8 | 25.45 | 960.1 | 35.63 | 960.11 | 45.81 | 959.96 | 55.99 | 959.85 |
| 66.17 | 959.96 | 76.35 | 959.96 | 85.15 | 959.87 | 96.71 | 959.79 | 110.32 | 959.78 |
| 122.9 | 959.79 | 127.26 | 959.8 | 135.47 | 959.77 | 148.06 | 959.76 | 157.8 | 959.83 |
| 185.81 | 960.11 | 188.34 | 960.13 | 198.39 | 960.25 | 198.52 | 960.25 | 208.7 | 960.43 |
| 210.97 | 960.42 | 218.88 | 960.42 | 223.55 | 960.22 | 229.06 | 960.02 | 239.24 | 959.72 |
| 248.71 | 959.75 | 249.42 | 959.75 | 258.45 | 959.87 | 259.6 | 959.88 | 267.01 | 959.93 |
| 269.78 | 959.92 | 275.55 | 959.97 | 279.96 | 959.99 | 300.33 | 960.16 | 301.2 | 960.16 |
| 310.51 | 960.2 | 320.69 | 960.11 | 324.21 | 960.04 | 330.87 | 959.95 | 341.05 | 959.8 |
| 343.94 | 959.77 | 352.49 | 959.71 | 359.11 | 959.7 | 361.41 | 959.69 | 361.95 | 959.68 |
| 371.59 | 959.61 | 381.77 | 959.41 | 391.95 | 959.15 | 399.7 | 959.09 | 402.13 | 959.05 |
| 412.28 | 959.14 | 412.45 | 959.14 | 422.49 | 959.2 | 424.86 | 959.21 | 432.67 | 959.21 |
| 437.98 | 959.18 | 442.85 | 959.25 | 450.02 | 959.32 | 453.03 | 959.31 | 462.6 | 959.38 |
| 463.21 | 959.38 | 473.39 | 959.31 | 475.19 | 959.26 | 483.58 | 959.05 | 487.77 | 958.89 |
| 493.76 | 958.68 | 503.94 | 958.39 | 514.12 | 958.13 | 519.14 | 957.92 | 534.48 | 957.19 |
| 538.1 | 957.06 | 544.66 | 956.87 | 550.67 | 956.53 | 554.84 | 956.39 | 557.67 | 956.31 |
| 565.02 | 954.92 | 566.21 | 954.78 | 572.47 | 954.02 | 575.2 | 953.66 | 575.84 | 953.53 |
| 579.38 | 952.72 | 585.38 | 951.34 | 588.42 | 950.68 | 595.56 | 948.95 | 605.74 | 946.92 |
| 613.59 | 946.35 | 615.92 | 946.03 | 625.82 | 945.53 | 626.1 | 945.52 | 626.17 | 945.52 |
| 636.28 | 945.37 | 646.46 | 945.32 | 651.33 | 945.31 | 656.39 | 945.31 | 677 | 945.32 |
| 685.9 | 945.36 | 687.19 | 945.37 | 689.08 | 945.44 | 697.37 | 945.58 | 701.66 | 946.01 |
| 707.55 | 946.31 | 714.24 | 947.26 | 717.73 | 947.68 | 726.83 | 949.17 | 727.91 | 949.33 |
| 728.64 | 949.44 | 732.5 | 950.1 | 738.09 | 951.01 | 739.41 | 951.24 | 748.27 | 952.53 |
| 751.98 | 952 | 758.45 | 951.43 | 764.57 | 950.62 | 768.63 | 950.13 | 777.15 | 949.14 |
| 778.81 | 948.97 | 785.84 | 948.42 | 788.99 | 948.15 | 789.73 | 948.15 | 799.17 | 947.98 |
| 809.35 | 948.11 | 827.48 | 948.37 | 829.71 | 948.41 | 839.18 | 948.54 | 839.89 | 948.54 |
| 840.07 | 948.55 | 850.07 | 948.69 | 852.64 | 948.73 | 860.25 | 948.86 | 865.43 | 948.96 |
| 870.44 | 949.01 | 873.98 | 949.08 | 880.61 | 949.16 | 882.52 | 949.2 | 890.8 | 949.32 |
| 891.07 | 949.33 | 892.52 | 949.35 | 899.7 | 949.48 | 900.98 | 949.5 | 902.97 | 949.52 |
| 916.71 | 949.73 | 925.27 | 949.8 | 931.52 | 949.82 | 940.72 | 949.8 | 941.7 | 949.8 |
| 950.91 | 949.97 | 951.88 | 950 | 959.46 | 950.31 | 962.06 | 950.42 | 965.88 | 950.44 |
| 972.24 | 950.53 | 978.46 | 950.53 | 982.42 | 950.54 | 991.04 | 950.61 | 1002.78 | 950.68 |
| 1003.63 | 950.69 | 1012.96 | 950.75 | 1016.21 | 950.78 | 1041.38 | 950.95 | 1043.5 | 950.96 |
| 1052.54 | 951.02 | 1053.68 | 951.03 | 1053.95 | 951.03 | 1063.86 | 951.09 | 1074.05 | 951.12 |
| 1084.23 | 951.06 | 1091.7 | 950.83 | 1093.99 | 950.78 | 1094.41 | 950.77 | 1104.28 | 950.18 |
| 1104.59 | 950.17 | 1105.88 | 950.08 | 1114.77 | 949.57 | 1121.89 | 950.1 | 1124.95 | 950.37 |
| 1129.45 | 950.48 | 1135.13 | 950.79 | 1142.03 | 950.7 | 1145.31 | 950.7 | 1147.54 | 950.65 |
| 1155.25 | 950.49 | 1155.49 | 950.48 | 1165.67 | 950.35 | 1167.19 | 950.35 | 1175.85 | 950.3 |
| 1179.77 | 950.29 | 1186.03 | 950.26 | 1192.35 | 950.2 | 1196.21 | 950.18 | 1204.94 | 950.15 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1206.39 | 950.15 | 1212.56 | 950.18 | 1216.57 | 950.19 | 1217.52 | 950.2 | 1226.75 | 950.24 |
| 1230.1 | 950.26 | 1242.68 | 950.29 | 1257.29 | 950.29 | 1267.47 | 950.23 | 1267.84 | 950.22 |
| 1277.66 | 950.06 | 1287.84 | 949.94 | 1293.01 | 949.93 | 1298.02 | 949.9 | 1305.59 | 949.92 |
| 1308.2 | 949.9 | 1318.17 | 949.96 | 1319.24 | 949.96 | 1328.56 | 950.01 | 1338.74 | 950.02 |
| 1343.34 | 949.99 | 1348.92 | 949.97 | 1359.1 | 949.98 | 1368.5 | 950.36 | 1369.28 | 950.38 |
| 1379.46 | 950.51 | 1381.08 | 950.5 | 1389.64 | 950.53 | 1393.66 | 950.63 | 1399.82 | 950.76 |
| 1406.25 | 950.76 | 1410 | 950.74 | 1418.83 | 950.22 | 1420.18 | 950.15 | 1421.1 | 950.13 |
| 1430.36 | 949.81 | 1440.54 | 949.82 | 1460.9 | 949.92 | 1463.85 | 949.93 | 1471.08 | 949.97 |
| 1472.4 | 949.97 | 1481.27 | 950.01 | 1481.73 | 950.01 | 1491.45 | 950.05 | 1494.32 | 950.05 |
| 1501.63 | 950.08 | 1511.81 | 950.1 | 1532.07 | 950.18 | 1532.17 | 950.18 | 1532.61 | 950.19 |
| 1540.79 | 950.27 | 1542.35 | 950.29 | 1552.53 | 950.47 | 1561.34 | 950.65 | 1569.81 | 950.83 |
| 1572.89 | 950.9 | 1582.39 | 951.1 | 1583.07 | 951.12 | 1593.25 | 951.33 | 1594.97 | 951.36 |
| 1603.43 | 951.55 | 1607.56 | 951.65 | 1620.14 | 952.02 | 1632.72 | 952.61 | 1633.97 | 952.7 |
| 1639.29 | 953.04 | 1644.15 | 953.37 | 1645.3 | 953.42 | 1654.33 | 953.95 | 1657.89 | 954.08 |
| 1664.52 | 954.46 | 1670.46 | 954.73 | 1674.69 | 954.98 | 1683.04 | 955.27 | 1684.88 | 955.36 |
| 1692.63 | 955.5 | 1695.06 | 955.56 | 1705.24 | 955.55 | 1708.21 | 955.54 | 1715.42 | 955.49 |
| 1720.79 | 955.47 | 1725.6 | 955.52 | 1733.37 | 956.43 | 1735.78 | 956.65 | 1745.96 | 958.45 |
| 1750.38 | 959.37 | | | | | | | | |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 15.75 | .04 | 579.38 | .072 | 899.7 | .052 | 1093.99 | .04 |
| 1561.34 | .032 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 748.27 | 1084.23 | 249.46 | 199.47 | 149.03 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 748.27 | 952.53 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 951.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.06 | Wt. n-Val. | | 0.068 | 0.040 |
| W.S. Elev (ft) | 951.20 | Reach Len. (ft) | 249.46 | 199.47 | 149.03 |
| Crit W.S. (ft) | 950.49 | Flow Area (sq ft) | | 465.33 | 481.45 |
| E.G. Slope (ft/ft) | 0.003099 | Area (sq ft) | 696.21 | 465.33 | 481.45 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 849.68 | 990.32 |
| Top Width (ft) | 980.19 | Top Width (ft) | 153.20 | 324.07 | 502.92 |
| Vel Total (ft/s) | 1.94 | Avg. Vel. (ft/s) | | 1.83 | 2.06 |
| Max Chl Dpth (ft) | 5.89 | Hydr. Depth (ft) | | 1.44 | 0.96 |
| Conv. Total (cfs) | 33052.3 | Conv. (cfs) | | 15262.9 | 17789.4 |
| Length Wtd. (ft) | 177.17 | Wetted Per. (ft) | | 324.27 | 503.05 |
| Min Ch El (ft) | 947.98 | Shear (lb/sq ft) | | 0.28 | 0.19 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 0.51 | 0.38 |
| Frctn Loss (ft) | 0.76 | Cum Volume (acre-ft) | 78.56 | 110.81 | 92.69 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 83.86 | 46.68 | 114.36 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 952.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.065 | |
| W.S. Elev (ft) | 951.91 | Reach Len. (ft) | 249.46 | 199.47 | 149.03 |
| Crit W.S. (ft) | 950.50 | Flow Area (sq ft) | | 696.87 | |
| E.G. Slope (ft/ft) | 0.004347 | Area (sq ft) | | 696.87 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 331.24 | Top Width (ft) | | 331.24 | |
| Vel Total (ft/s) | 2.64 | Avg. Vel. (ft/s) | | 2.64 | |
| Max Chl Dpth (ft) | 6.60 | Hydr. Depth (ft) | | 2.10 | |
| Conv. Total (cfs) | 27906.5 | Conv. (cfs) | | 27906.5 | |
| Length Wtd. (ft) | 199.47 | Wetted Per. (ft) | | 332.33 | |
| Min Ch El (ft) | 947.98 | Shear (lb/sq ft) | | 0.57 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.50 | |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | 13.42 | 140.30 | 16.27 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.80 | 49.78 | 8.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,

water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 951.75 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.066 | 0.040 |
| W.S. Elev (ft) | 951.67 | Reach Len. (ft) | 249.46 | 199.47 | 149.03 |
| Crit W.S. (ft) | 950.59 | Flow Area (sq ft) | | 618.40 | 231.72 |
| E.G. Slope (ft/ft) | 0.002987 | Area (sq ft) | | 618.40 | 231.72 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1270.95 | 569.05 |
| Top Width (ft) | 501.60 | Top Width (ft) | | 328.54 | 173.06 |
| Vel Total (ft/s) | 2.16 | Avg. Vel. (ft/s) | | 2.06 | 2.46 |
| Max Chl Dpth (ft) | 3.69 | Hydr. Depth (ft) | | 1.88 | 1.34 |
| Conv. Total (cfs) | 33664.0 | Conv. (cfs) | | 23252.9 | 10411.2 |
| Length Wtd. (ft) | 191.67 | Wetted Per. (ft) | | 328.77 | 174.53 |
| Min Ch El (ft) | 947.98 | Shear (lb/sq ft) | | 0.35 | 0.25 |
| Alpha | 1.02 | Stream Power (lb/ft s) | | 0.72 | 0.61 |
| Frctn Loss (ft) | 0.90 | Cum Volume (acre-ft) | 27.00 | 123.83 | 34.09 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 16.69 | 48.26 | 25.47 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.935

INPUT
Description: Thalweg Sta. 893.58
Station Elevation Data num= 270

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 958.01 | 2 | 958.03 | 7.57 | 958.1 | 13.07 | 958.2 | 30.89 | 958.49 |
| 46.28 | 958.69 | 54.2 | 958.78 | 57.35 | 958.8 | 60.2 | 958.8 | 77.52 | 958.85 |
| 79.49 | 958.85 | 81.28 | 958.86 | 100.84 | 959.04 | 101.63 | 959.04 | 102.35 | 959.05 |
| 112.7 | 959.11 | 116.39 | 959.12 | 123.77 | 959.16 | 124.15 | 959.16 | 134.84 | 959.25 |
| 144.51 | 959.28 | 156.98 | 959.27 | 168.05 | 959.23 | 170.79 | 959.24 | 179.12 | 959.32 |
| 186.66 | 959.36 | 190.19 | 959.39 | 201.26 | 959.37 | 212.33 | 959.3 | 223.4 | 959.27 |
| 234.47 | 959.29 | 236.49 | 959.29 | 245.54 | 959.26 | 249.89 | 959.23 | 256.61 | 959.17 |
| 264.05 | 959.15 | 266.51 | 959.14 | 267.68 | 959.12 | 270.97 | 959.08 | 278.75 | 959.03 |
| 287.36 | 958.89 | 289.82 | 958.84 | 292.04 | 958.78 | 300.89 | 958.57 | 310.68 | 958.36 |
| 311.96 | 958.33 | 313.12 | 958.3 | 323.03 | 958.08 | 334 | 957.89 | 334.2 | 957.89 |
| 345.17 | 957.77 | 355.26 | 957.42 | 356.24 | 957.39 | 357.31 | 957.35 | 364.09 | 957.07 |
| 367.31 | 956.9 | 376.34 | 956.57 | 378.38 | 956.5 | 380.63 | 956.45 | 389.45 | 956.22 |
| 397.42 | 956.26 | 400.52 | 956.26 | 401.62 | 956.28 | 403.94 | 956.34 | 418.5 | 956.61 |
| 422.66 | 956.68 | 427.26 | 956.7 | 433.73 | 956.62 | 444.8 | 956.12 | 455.87 | 955.55 |
| 460.65 | 955.51 | 466.93 | 955.38 | 476.68 | 955.69 | 478.01 | 955.73 | 484.18 | 955.74 |
| 489.08 | 955.86 | 491.69 | 955.74 | 497.21 | 955.57 | 500.15 | 955.41 | 502.8 | 955.16 |
| 511.21 | 954.42 | 520.53 | 953.42 | 522.28 | 953.23 | 529.23 | 952.42 | 533.36 | 952.02 |
| 543.84 | 951.18 | 544.43 | 951.16 | 544.95 | 951.15 | 555.5 | 950.92 | 567.15 | 950.93 |
| 574.26 | 951.08 | 577.63 | 951.19 | 587.11 | 951.41 | 588.71 | 951.44 | 590.48 | 951.48 |
| 599.78 | 951.78 | 608.19 | 952.1 | 610.84 | 952.21 | 613.79 | 952.35 | 621.91 | 952.68 |
| 629.26 | 952.93 | 632.98 | 953.09 | 637.1 | 953.22 | 644.05 | 953.27 | 650.33 | 953.24 |
| 655.12 | 953.25 | 660.43 | 953.14 | 666.19 | 952.86 | 671.41 | 952.42 | 677.26 | 952.01 |
| 687.42 | 950.97 | 688.33 | 950.88 | 692.48 | 950.51 | 695.64 | 950.19 | 699.4 | 949.81 |
| 707.05 | 949.34 | 710.47 | 949.27 | 713.56 | 949.32 | 721.54 | 949.35 | 730.37 | 949.66 |
| 732.61 | 949.79 | 743.68 | 950.38 | 753.69 | 950.68 | 754.75 | 950.71 | 755.72 | 950.72 |
| 765.82 | 950.9 | 776.79 | 951.05 | 777 | 951.05 | 787.96 | 950.9 | 797.87 | 950.84 |
| 800.32 | 950.82 | 810.1 | 950.55 | 818.95 | 950.36 | 821.17 | 950.3 | 821.97 | 950.28 |
| 823.63 | 950.26 | 832.24 | 949.9 | 840.02 | 949.77 | 843.31 | 949.67 | 844.48 | 949.63 |
| 846.95 | 949.57 | 854.38 | 949.13 | 861.1 | 948.89 | 865.45 | 948.68 | 870.27 | 948.54 |
| 876.52 | 948.32 | 882.17 | 948.16 | 887.59 | 947.97 | 893.58 | 947.82 | 897.02 | 947.79 |
| 903.25 | 947.79 | 909.73 | 947.76 | 916.9 | 947.8 | 920.8 | 947.86 | 920.94 | 947.86 |
| 924.33 | 947.96 | 931.87 | 948.13 | 954.01 | 949.18 | 957.08 | 949.22 | 965.08 | 949.17 |
| 966.47 | 949.1 | 976.15 | 948.69 | 987.22 | 948.68 | 994.6 | 948.89 | 998.29 | 949.07 |
| 1002.11 | 949.13 | 1009.36 | 949.28 | 1010.17 | 949.28 | 1020.43 | 949.26 | 1029.71 | 949.22 |
| 1033.48 | 949.2 | 1053.64 | 949.13 | 1056.79 | 949.13 | 1071.86 | 949.1 | 1075.78 | 949.11 |
| 1092.94 | 949.18 | 1100.2 | 949.24 | 1100.57 | 949.24 | 1108.47 | 949.31 | 1109.79 | 949.33 |
| 1118.86 | 949.42 | 1124.24 | 949.51 | 1129.24 | 949.58 | 1134.73 | 949.7 | 1138.69 | 949.79 |
| 1139.63 | 949.81 | 1142.05 | 949.89 | 1150.02 | 950.19 | 1156.37 | 950.32 | 1160.4 | 950.38 |
| 1164.49 | 950.38 | 1170.79 | 950.33 | 1179 | 950.24 | 1181.18 | 950.21 | 1182.03 | 950.2 |
| 1191.57 | 950.05 | 1201.96 | 949.83 | 1210.93 | 949.62 | 1222.73 | 949.37 | 1225.38 | 949.35 |
| 1233.12 | 949.24 | 1239.83 | 949.26 | 1243.51 | 949.26 | 1252.9 | 949.4 | 1253.9 | 949.41 |
| 1254.28 | 949.42 | 1264.28 | 949.57 | 1268.73 | 949.61 | 1274.67 | 949.68 | 1283.18 | 949.69 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1285.06 | 949.7 | 1289.86 | 949.67 | 1295.44 | 949.59 | 1297.63 | 949.58 | 1305.83 | 949.52 |
| 1312.08 | 949.44 | 1316.22 | 949.36 | 1326.53 | 949.09 | 1326.61 | 949.09 | 1326.81 | 949.08 |
| 1336.99 | 948.98 | 1340.98 | 949.26 | 1347.38 | 949.56 | 1355.43 | 949.96 | 1357.77 | 950.09 |
| 1367.19 | 950.07 | 1368.16 | 950.04 | 1369.88 | 950.05 | 1378.55 | 950.22 | 1384.33 | 950.19 |
| 1388.93 | 950.19 | 1398.78 | 949.59 | 1399.32 | 949.56 | 1400.71 | 949.51 | 1407.74 | 949.27 |
| 1409.71 | 949.22 | 1415.84 | 949.25 | 1420.1 | 949.28 | 1440.87 | 949.48 | 1442.13 | 949.49 |
| 1461.65 | 949.69 | 1471.03 | 949.76 | 1472.03 | 949.77 | 1482.42 | 949.8 | 1486.67 | 949.8 |
| 1492.81 | 949.82 | 1503.2 | 949.88 | 1511.56 | 950.02 | 1513.58 | 950.06 | 1514.37 | 950.08 |
| 1523.97 | 950.29 | 1543.27 | 950.74 | 1544.75 | 950.77 | 1548.52 | 950.84 | 1557.72 | 950.99 |
| 1565.52 | 951.08 | 1575.91 | 951.25 | 1586.3 | 951.63 | 1586.62 | 951.67 | 1596.68 | 952.59 |
| 1601.07 | 953.14 | 1607.07 | 953.87 | 1615.52 | 954.93 | 1617.46 | 955.15 | 1622.42 | 955.65 |
| 1627.85 | 956.3 | 1629.97 | 956.5 | 1638.24 | 957.34 | 1644.42 | 957.78 | 1644.54 | 957.79 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .04 | 687.42 | .072 | 920.94 | .052 | 1134.73 | .04 | 1486.67 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 776.79 | 1160.4 | 228.14 | 199.94 | 257.72 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 776.79 | 951.05 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 950.50 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.058 | 0.040 |
| W.S. Elev (ft) | 950.40 | Reach Len. (ft) | 228.14 | 199.94 | 257.72 |
| Crit W.S. (ft) | 949.88 | Flow Area (sq ft) | | 466.75 | 262.46 |
| E.G. Slope (ft/ft) | 0.006366 | Area (sq ft) | 36.62 | 466.75 | 262.46 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1203.41 | 636.59 |
| Top Width (ft) | 762.44 | Top Width (ft) | 50.80 | 343.33 | 368.31 |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | | 2.58 | 2.43 |
| Max Chl Dpth (ft) | 2.64 | Hydr. Depth (ft) | | 1.36 | 0.71 |
| Conv. Total (cfs) | 23060.6 | Conv. (cfs) | | 15082.2 | 7978.3 |
| Length Wtd. (ft) | 215.08 | Wetted Per. (ft) | | 343.45 | 368.39 |
| Min Ch El (ft) | 947.76 | Shear (lb/sq ft) | | 0.54 | 0.28 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.39 | 0.69 |
| Frctn Loss (ft) | 1.99 | Cum Volume (acre-ft) | 76.46 | 108.67 | 91.41 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 83.27 | 45.15 | 112.87 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 950.84 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.058 | |
| W.S. Elev (ft) | 950.67 | Reach Len. (ft) | 228.14 | 199.94 | 257.72 |
| Crit W.S. (ft) | 949.94 | Flow Area (sq ft) | | 562.07 | |
| E.G. Slope (ft/ft) | 0.008427 | Area (sq ft) | | 562.07 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 354.77 | Top Width (ft) | | 354.77 | |
| Vel Total (ft/s) | 3.27 | Avg. Vel. (ft/s) | | 3.27 | |
| Max Chl Dpth (ft) | 2.91 | Hydr. Depth (ft) | | 1.58 | |
| Conv. Total (cfs) | 20043.7 | Conv. (cfs) | | 20043.7 | |
| Length Wtd. (ft) | 199.94 | Wetted Per. (ft) | | 355.17 | |
| Min Ch El (ft) | 947.76 | Shear (lb/sq ft) | | 0.83 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.73 | |
| Frctn Loss (ft) | 2.13 | Cum Volume (acre-ft) | 13.42 | 137.42 | 16.27 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 48.21 | 8.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 950.84 | Element | | | |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.058 | |
| W.S. Elev (ft) | 950.67 | Reach Len. (ft) | 228.14 | 199.94 | 257.72 |
| Crit W.S. (ft) | 949.94 | Flow Area (sq ft) | | 562.03 | |
| E.G. Slope (ft/ft) | 0.008429 | Area (sq ft) | | 562.03 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 354.76 | Top Width (ft) | | 354.76 | |
| Vel Total (ft/s) | 3.27 | Avg. Vel. (ft/s) | | 3.27 | |
| Max Chl Dpth (ft) | 2.91 | Hydr. Depth (ft) | | 1.58 | |
| Conv. Total (cfs) | 20041.3 | Conv. (cfs) | | 20041.3 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 355.17 | |
| Min Ch El (ft) | 947.76 | Shear (lb/sq ft) | | 0.83 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.73 | |
| Frctn Loss (ft) | 2.13 | Cum Volume (acre-ft) | 27.00 | 121.13 | 33.69 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.69 | 46.69 | 25.17 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.897

INPUT
Description: Thalweg Sta. 289.46 (HEC-RAS XS has been trimmed and does not reflect the XS's full length as shown on the work map.)
Station Elevation Data num= 169

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 955.42 | 2.72 | 955.38 | 4.31 | 955.32 | 8.78 | 955.03 | 13.34 | 954.71 |
| 15.88 | 954.58 | 23.96 | 954.12 | 32.4 | 953.96 | 34.58 | 953.9 | 38.49 | 953.74 |
| 45.02 | 953.52 | 45.2 | 953.51 | 48.94 | 953.27 | 55.82 | 952.72 | 65.47 | 951.8 |
| 66.44 | 951.69 | 66.89 | 951.62 | 68.18 | 951.48 | 77.06 | 950.45 | 82 | 950.03 |
| 87.68 | 949.48 | 97.89 | 948.9 | 98.3 | 948.88 | 98.53 | 948.87 | 119.54 | 947.89 |
| 127.58 | 947.53 | 130.16 | 947.41 | 131.59 | 947.34 | 140.78 | 946.93 | 148.13 | 946.68 |
| 151.4 | 946.55 | 152.95 | 946.53 | 157.28 | 946.51 | 162.02 | 946.47 | 172.64 | 946.59 |
| 214.25 | 947.17 | 216.67 | 947.2 | 223.58 | 947.3 | 236.36 | 947.47 | 246.38 | 947.56 |
| 246.98 | 947.57 | 247.32 | 947.57 | 257.6 | 947.54 | 268.22 | 946.98 | 278.84 | 946.09 |
| 280.38 | 945.97 | 289.46 | 945.29 | 296.92 | 945.18 | 300.08 | 945.11 | 305.78 | 945.56 |
| 310.7 | 946 | 313.44 | 946.4 | 321.32 | 947.42 | 329.98 | 947.8 | 331.94 | 947.93 |
| 335.47 | 947.98 | 340.7 | 947.99 | 342.56 | 947.99 | 346.51 | 947.95 | 352.63 | 947.87 |
| 353.18 | 947.86 | 357.13 | 947.71 | 363.8 | 947.45 | 365.17 | 947.43 | 374.42 | 947.26 |
| 379.58 | 947.24 | 385.04 | 947.25 | 388.64 | 947.24 | 394.87 | 947.21 | 396.11 | 947.21 |
| 424.57 | 947.27 | 438.15 | 947.36 | 445.7 | 947.44 | 448.76 | 947.46 | 459.38 | 947.55 |
| 465.86 | 947.72 | 470.01 | 947.76 | 480.62 | 947.96 | 483.96 | 947.96 | 491.25 | 947.98 |
| 495.3 | 948.03 | 501.86 | 948.09 | 512.49 | 948.26 | 513.67 | 948.27 | 520.62 | 948.32 |
| 523.11 | 948.32 | 533.73 | 948.29 | 543.36 | 948.22 | 544.35 | 948.21 | 544.9 | 948.21 |
| 576.21 | 947.91 | 586.83 | 947.79 | 597.45 | 947.75 | 608.07 | 948 | 611.02 | 948.02 |
| 618.69 | 948.18 | 627.56 | 947.94 | 629.31 | 947.88 | 639.93 | 947.58 | 644.09 | 947.53 |
| 650.55 | 947.44 | 660.62 | 947.38 | 661.17 | 947.38 | 662.16 | 947.39 | 671.79 | 947.52 |
| 682.41 | 947.73 | 684.89 | 947.77 | 691.85 | 947.81 | 693.03 | 947.83 | 693.69 | 947.83 |
| 703.65 | 947.93 | 710.21 | 947.92 | 714.27 | 947.96 | 724.89 | 947.99 | 732.26 | 947.95 |
| 735.51 | 947.94 | 746.13 | 947.86 | 751.25 | 947.85 | 756.75 | 947.85 | 767.37 | 947.95 |
| 776.34 | 948.14 | 777.99 | 948.17 | 780.95 | 948.25 | 799.23 | 948.71 | 809.85 | 948.95 |
| 810.65 | 948.96 | 820.47 | 949.07 | 840.35 | 949.18 | 841.71 | 949.2 | 842.46 | 949.2 |
| 852.33 | 949.24 | 859 | 949.22 | 873.57 | 949.22 | 875.53 | 949.23 | 892.06 | 949.35 |
| 894.81 | 949.38 | 905.43 | 949.47 | 908.6 | 949.49 | 925.13 | 949.63 | 947.91 | 949.79 |
| 958.19 | 949.88 | 958.53 | 949.88 | 959.14 | 949.89 | 969.15 | 949.99 | 974.73 | 950.06 |
| 979.77 | 950.11 | 990.39 | 950.25 | 991.25 | 950.25 | 1007.79 | 950.42 | 1021.28 | 950.53 |
| 1022.25 | 950.54 | 1032.87 | 950.6 | 1043.49 | 950.63 | 1054.11 | 950.63 | 1057.39 | 950.65 |
| 1064.73 | 950.66 | 1077.94 | 950.76 | 1106.98 | 951.05 | 1107.21 | 951.06 | 1107.64 | 951.06 |
| 1139.07 | 951.4 | 1140.04 | 951.42 | 1160.31 | 951.65 | 1167.04 | 951.74 | 1170.94 | 951.78 |
| 1173.11 | 951.81 | 1181.56 | 951.91 | 1192.18 | 952.07 | 1202.8 | 952.26 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .04 | 45.02 | .072 | 352.63 | .052 | 388.64 | .04 | 732.26 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 119.54 | 520.62 | 278.77 | 238.16 | 269.33 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 948.51 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.072 | 0.063 | 0.039 |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 948.35 | Reach Len. (ft) | 278.77 | 238.16 | 269.33 |
| Crit W.S. (ft) | 948.05 | Flow Area (sq ft) | 2.28 | 461.72 | 118.82 |
| E.G. Slope (ft/ft) | 0.014688 | Area (sq ft) | 2.28 | 461.72 | 118.82 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 2.15 | 1511.18 | 326.67 |
| Top Width (ft) | 675.34 | Top Width (ft) | 9.90 | 401.08 | 264.37 |
| Vel Total (ft/s) | 3.16 | Avg. Vel. (ft/s) | 0.94 | 3.27 | 2.75 |
| Max Chl Dpth (ft) | 3.24 | Hydr. Depth (ft) | 0.23 | 1.15 | 0.45 |
| Conv. Total (cfs) | 15182.4 | Conv. (cfs) | 17.7 | 12469.2 | 2695.5 |
| Length Wtd. (ft) | 243.08 | Wetted Per. (ft) | 9.91 | 401.36 | 264.40 |
| Min Ch El (ft) | 945.11 | Shear (lb/sq ft) | 0.21 | 1.05 | 0.41 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.20 | 3.45 | 1.13 |
| Frctn Loss (ft) | 1.57 | Cum Volume (acre-ft) | 76.36 | 106.54 | 90.28 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 83.12 | 43.44 | 111.00 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 948.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.062 | |
| W.S. Elev (ft) | 948.51 | Reach Len. (ft) | 278.77 | 238.16 | 269.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 527.15 | |
| E.G. Slope (ft/ft) | 0.013910 | Area (sq ft) | | 527.15 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 401.08 | Top Width (ft) | | 401.08 | |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.49 | |
| Max Chl Dpth (ft) | 3.40 | Hydr. Depth (ft) | | 1.31 | |
| Conv. Total (cfs) | 15601.1 | Conv. (cfs) | | 15601.1 | |
| Length Wtd. (ft) | 238.16 | Wetted Per. (ft) | | 402.18 | |
| Min Ch El (ft) | 945.11 | Shear (lb/sq ft) | | 1.14 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.97 | |
| Frctn Loss (ft) | 1.61 | Cum Volume (acre-ft) | 13.42 | 134.92 | 16.27 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 6.80 | 46.47 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 948.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.062 | 0.040 |
| W.S. Elev (ft) | 948.51 | Reach Len. (ft) | 278.77 | 238.16 | 269.33 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 527.01 | 0.48 |
| E.G. Slope (ft/ft) | 0.013906 | Area (sq ft) | | 527.01 | 0.48 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1839.32 | 0.68 |
| Top Width (ft) | 403.57 | Top Width (ft) | | 401.08 | 2.49 |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.49 | 1.40 |
| Max Chl Dpth (ft) | 3.40 | Hydr. Depth (ft) | | 1.31 | 0.19 |
| Conv. Total (cfs) | 15603.4 | Conv. (cfs) | | 15597.6 | 5.7 |
| Length Wtd. (ft) | 238.17 | Wetted Per. (ft) | | 401.99 | 2.68 |
| Min Ch El (ft) | 945.11 | Shear (lb/sq ft) | | 1.14 | 0.16 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.97 | 0.22 |
| Frctn Loss (ft) | 1.61 | Cum Volume (acre-ft) | 27.00 | 118.63 | 33.69 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 16.69 | 44.96 | 25.17 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.852

INPUT
Description: Thalweg Sta. 452.98
Station Elevation Data num= 172

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 957.96 | .8 | 957.97 | 11.82 | 958.16 | 15.31 | 958.21 | 22.85 | 958.23 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 29.42 | 958.16 | 33.88 | 958.13 | 39.01 | 958.02 | 44.91 | 957.87 | 55.94 | 957.43 |
| 62.72 | 957.06 | 66.97 | 956.81 | 70.66 | 956.51 | 78 | 955.97 | 86.44 | 954.95 |
| 89.03 | 954.59 | 100.05 | 952.98 | 110.15 | 951.82 | 111.08 | 951.71 | 111.9 | 951.66 |
| 122.11 | 951.09 | 132.53 | 950.67 | 133.14 | 950.65 | 133.85 | 950.62 | 144.17 | 950.27 |
| 155.2 | 949.79 | 157.56 | 949.67 | 166.23 | 949.39 | 173.76 | 949.24 | 177.26 | 949.15 |
| 188.29 | 949.05 | 204.99 | 948.95 | 210.35 | 948.9 | 215.01 | 948.81 | 221.37 | 948.72 |
| 228.69 | 948.58 | 232.4 | 948.52 | 243.43 | 948.49 | 254.46 | 948.54 | 256.25 | 948.54 |
| 265.49 | 948.58 | 276.11 | 948.54 | 276.52 | 948.54 | 276.87 | 948.53 | 287.55 | 948.19 |
| 296.6 | 947.62 | 297.5 | 947.56 | 299.82 | 947.43 | 305.29 | 947.06 | 309.6 | 946.76 |
| 314.03 | 946.54 | 320.64 | 946.09 | 323.54 | 945.95 | 331.67 | 945.57 | 338.73 | 945.26 |
| 342.69 | 945.11 | 347.24 | 944.92 | 351.66 | 944.84 | 359.36 | 944.62 | 364.75 | 944.48 |
| 370.95 | 944.26 | 386.81 | 944.11 | 394.66 | 943.88 | 397.84 | 943.81 | 400.6 | 943.73 |
| 408.87 | 943.55 | 418.37 | 943.44 | 419.41 | 943.43 | 426.94 | 943.28 | 430.92 | 943.28 |
| 434.47 | 943.2 | 441.95 | 943.09 | 442.08 | 943.09 | 452.98 | 942.97 | 464.01 | 943.11 |
| 464.58 | 943.13 | 465.79 | 943.15 | 483.09 | 943.68 | 486.07 | 943.79 | 489.5 | 943.89 |
| 497.1 | 944.13 | 503.71 | 944.32 | 508.13 | 944.47 | 513.21 | 944.61 | 519.16 | 944.76 |
| 524.33 | 944.84 | 530.19 | 944.97 | 536.92 | 944.98 | 537.79 | 944.97 | 541.22 | 944.92 |
| 544.96 | 944.99 | 547.46 | 945.03 | 551.94 | 945.12 | 559.78 | 945.56 | 562.29 | 945.67 |
| 569.28 | 945.87 | 572.63 | 945.96 | 573.82 | 945.96 | 582.97 | 946 | 601.9 | 946.07 |
| 603.65 | 946.08 | 613.99 | 946.18 | 621.04 | 946.39 | 624.33 | 946.54 | 629.23 | 946.72 |
| 633.4 | 946.86 | 634.67 | 946.9 | 644.01 | 946.86 | 645.01 | 946.87 | 655.35 | 946.8 |
| 661.97 | 946.82 | 665.69 | 946.85 | 672.08 | 946.86 | 676.03 | 946.85 | 686.12 | 946.74 |
| 686.37 | 946.73 | 696.72 | 946.45 | 700.15 | 946.34 | 707.06 | 946.13 | 717.4 | 945.94 |
| 727.74 | 945.94 | 728.23 | 945.95 | 748.42 | 946.1 | 756.3 | 946.14 | 758.76 | 946.16 |
| 770.33 | 946.17 | 784.37 | 946.09 | 798.41 | 946.03 | 800.12 | 946.03 | 801.13 | 946.04 |
| 820.81 | 946.05 | 831.15 | 946.03 | 854.56 | 946.02 | 862.17 | 946.04 | 872.51 | 946.11 |
| 882.63 | 946.26 | 882.85 | 946.27 | 883.47 | 946.28 | 893.19 | 946.48 | 896.67 | 946.56 |
| 913.87 | 946.9 | 924.21 | 947.04 | 924.74 | 947.04 | 934.55 | 947.08 | 938.77 | 947.09 |
| 952.82 | 947.09 | 955.24 | 947.1 | 966.85 | 947.1 | 972.37 | 947.11 | 975.92 | 947.11 |
| 980.88 | 947.12 | 986.26 | 947.12 | 994.92 | 947.14 | 996.6 | 947.14 | 1001.3 | 947.16 |
| 1006.94 | 947.2 | 1008.96 | 947.28 | 1017.28 | 947.48 | 1023 | 947.9 | 1027.62 | 948.21 |
| 1037.03 | 949.04 | 1037.96 | 949.12 | 1040.57 | 949.4 | 1048.31 | 950.28 | 1051.07 | 950.73 |
| 1058.65 | 951.83 | 1065.11 | 952.97 | 1068.99 | 953.62 | 1079.14 | 955.62 | 1079.33 | 955.65 |
| 1079.84 | 955.76 | 1086.44 | 957.14 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 296.6 | .072 | 537.79 | .04 | 972.37 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 305.29 | 633.4 | 197.8 | 199.97 | 209.22 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 946.91 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.068 | 0.040 |
| W.S. Elev (ft) | 946.83 | Reach Len. (ft) | 197.80 | 199.97 | 209.22 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 684.09 | 150.55 |
| E.G. Slope (ft/ft) | 0.003628 | Area (sq ft) | | 684.09 | 150.55 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1588.05 | 251.95 |
| Top Width (ft) | 567.42 | Top Width (ft) | | 323.79 | 243.63 |
| Vel Total (ft/s) | 2.20 | Avg. Vel. (ft/s) | | 2.32 | 1.67 |
| Max Chl Dpth (ft) | 3.86 | Hydr. Depth (ft) | | 2.11 | 0.62 |
| Conv. Total (cfs) | 30549.7 | Conv. (cfs) | | 26366.5 | 4183.2 |
| Length Wtd. (ft) | 200.70 | Wetted Per. (ft) | | 323.92 | 243.65 |
| Min Ch El (ft) | 942.97 | Shear (lb/sq ft) | | 0.48 | 0.14 |
| Alpha | 1.04 | Stream Power (lb/ft s) | | 1.11 | 0.23 |
| Frctn Loss (ft) | 1.57 | Cum Volume (acre-ft) | 76.35 | 103.41 | 89.45 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 83.08 | 41.46 | 109.43 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 947.06 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.068 | |
| W.S. Elev (ft) | 946.96 | Reach Len. (ft) | 197.80 | 199.97 | 209.22 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 728.67 | |
| E.G. Slope (ft/ft) | 0.004001 | Area (sq ft) | | 728.67 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 326.73 | Top Width (ft) | | 326.73 | |
| Vel Total (ft/s) | 2.53 | Avg. Vel. (ft/s) | | 2.53 | |
| Max Chl Dpth (ft) | 3.99 | Hydr. Depth (ft) | | 2.23 | |
| Conv. Total (cfs) | 29091.1 | Conv. (cfs) | | 29091.1 | |

| | | | | | |
|---|---|---|---|---|---|
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 326.98 | |
| Min Ch El (ft) | 942.97 | Shear (lb/sq ft) | | 0.56 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.41 | |
| Frctn Loss (ft) | 1.68 | Cum Volume (acre-ft) | 13.42 | 131.49 | 16.27 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 6.80 | 44.48 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 947.06 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.068 | |
| W.S. Elev (ft) | 946.96 | Reach Len. (ft) | 197.80 | 199.97 | 209.22 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 728.87 | |
| E.G. Slope (ft/ft) | 0.003997 | Area (sq ft) | | 728.87 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 326.74 | Top Width (ft) | | 326.74 | |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | | 2.52 | |
| Max Chl Dpth (ft) | 3.99 | Hydr. Depth (ft) | | 2.23 | |
| Conv. Total (cfs) | 29103.6 | Conv. (cfs) | | 29103.6 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 326.98 | |
| Min Ch El (ft) | 942.97 | Shear (lb/sq ft) | | 0.56 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.40 | |
| Frctn Loss (ft) | 1.68 | Cum Volume (acre-ft) | 27.00 | 115.20 | 33.69 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 16.69 | 42.97 | 25.16 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.814

INPUT
Description: Thalweg Sta. 378.44
Station Elevation Data num= 173

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 950.21 | 3.28 | 950.05 | 12.52 | 949.48 | 14 | 949.44 | 14.92 | 949.43 |
| 24.72 | 949.27 | 32.38 | 949.07 | 35.44 | 949.09 | 40.3 | 948.91 | 44.53 | 948.8 |
| 46.15 | 948.7 | 49.83 | 948.6 | 56.87 | 948.42 | 67.29 | 947.89 | 67.59 | 947.88 |
| 68.08 | 947.87 | 78.31 | 948.44 | 83.2 | 948.72 | 89.03 | 948.87 | 95.85 | 949.01 |
| 102.2 | 949.16 | 121.19 | 949.66 | 123.62 | 949.7 | 131.91 | 949.82 | 142.62 | 949.82 |
| 151.4 | 949.62 | 153.34 | 949.53 | 154.57 | 949.43 | 164.06 | 948.8 | 172.02 | 948.11 |
| 174.78 | 947.88 | 183.74 | 947.16 | 185.5 | 947.04 | 191.47 | 946.86 | 196.22 | 946.69 |
| 199.21 | 946.7 | 206.94 | 946.6 | 217.66 | 946.45 | 224.39 | 946.45 | 228.38 | 946.44 |
| 234.72 | 946.78 | 239.09 | 947.06 | 241.84 | 947.3 | 254.5 | 948.44 | 259.3 | 948.86 |
| 260.53 | 948.98 | 262.5 | 949.16 | 271.25 | 949.92 | 276.75 | 950.2 | 278.23 | 950.3 |
| 281.97 | 950.55 | 284.28 | 950.62 | 290.28 | 950.63 | 292.69 | 950.62 | 294.21 | 950.55 |
| 303.41 | 950.15 | 311.66 | 949.07 | 314.12 | 948.78 | 324.84 | 946.47 | 329.11 | 945.5 |
| 335.56 | 943.99 | 345.82 | 942.2 | 346.28 | 942.13 | 346.57 | 942.12 | 357 | 941.31 |
| 367.72 | 940.88 | 378.44 | 940.58 | 381.48 | 940.64 | 389.16 | 940.72 | 398.93 | 941.35 |
| 399.88 | 941.4 | 410.6 | 942.25 | 421.32 | 943.08 | 429.15 | 943.61 | 432.03 | 943.78 |
| 442.75 | 944.25 | 451.3 | 944.47 | 453.47 | 944.53 | 455.09 | 944.55 | 464.19 | 944.65 |
| 468.76 | 944.67 | 474.91 | 944.68 | 476.66 | 944.67 | 484.7 | 944.65 | 485.63 | 944.64 |
| 486.21 | 944.64 | 503.67 | 944.36 | 507.07 | 944.32 | 508.58 | 944.32 | 517.78 | 944.34 |
| 539.22 | 944.59 | 539.51 | 944.59 | 540.25 | 944.6 | 549.94 | 944.67 | 556.03 | 944.65 |
| 560.66 | 944.65 | 568.02 | 944.62 | 570.45 | 944.6 | 571.38 | 944.6 | 573.49 | 944.59 |
| 582.1 | 944.57 | 590.94 | 944.61 | 592.82 | 944.61 | 595.8 | 944.63 | 603.53 | 944.71 |
| 614.25 | 944.85 | 616.85 | 944.89 | 623.58 | 945.02 | 624.97 | 945.04 | 625.85 | 945.06 |
| 651.35 | 945.54 | 663.25 | 945.72 | 667.85 | 945.8 | 670.99 | 945.84 | 679.13 | 945.98 |
| 695.67 | 946.16 | 706.9 | 946.27 | 710.72 | 946.3 | 721.44 | 946.3 | 730.58 | 946.17 |
| 732.16 | 946.15 | 734.68 | 946.1 | 740.6 | 946 | 742.88 | 945.97 | 753.6 | 945.86 |
| 762.45 | 945.83 | 764.32 | 945.82 | 785.76 | 945.83 | 817.86 | 945.92 | 818 | 945.92 |
| 828.63 | 945.99 | 835.31 | 946.01 | 852.77 | 946.09 | 860.79 | 946.14 | 861.65 | 946.15 |
| 871.51 | 946.22 | 873.55 | 946.24 | 882.22 | 946.35 | 892.94 | 946.57 | 901.33 | 946.76 |
| 903.01 | 946.79 | 903.66 | 946.81 | 905.13 | 946.84 | 914.38 | 947.04 | 922.58 | 947.26 |
| 925.1 | 947.32 | 935.82 | 947.75 | 940.04 | 948.09 | 946.54 | 948.56 | 956.87 | 949.72 |
| 957.25 | 949.76 | 957.49 | 949.79 | 967.97 | 951.35 | 974.95 | 952.75 | 978.69 | 953.46 |
| 984.65 | 954.77 | 989.41 | 955.64 | 992.4 | 955.89 | 1000.13 | 956.46 | 1009.86 | 957.45 |
| 1010.85 | 957.56 | 1012.43 | 957.78 | 1021.57 | 958.41 | 1027.32 | 958.24 | 1040.2 | 957.83 |

1043.01 957.75 1044.77 957.85 1053.73 958.13 1062.23 959.02 1064.45 959.2
1067.97 959.59 1075.16 960.44 1078.41 960.85

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 254.5 | .072 | 455.09 | .04 | 861.65 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 329.11 | 476.66 | 207.13 | 199.99 | 193.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 945.28 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.57 | Wt. n-Val. | | 0.072 | 0.040 |
| W.S. Elev (ft) | 944.72 | Reach Len. (ft) | 207.13 | 199.99 | 193.54 |
| Crit W.S. (ft) | 944.09 | Flow Area (sq ft) | | 294.88 | 21.16 |
| E.G. Slope (ft/ft) | 0.027753 | Area (sq ft) | | 294.88 | 21.16 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1800.44 | 39.56 |
| Top Width (ft) | 271.60 | Top Width (ft) | | 144.21 | 127.40 |
| Vel Total (ft/s) | 5.82 | Avg. Vel. (ft/s) | | 6.11 | 1.87 |
| Max Chl Dpth (ft) | 4.14 | Hydr. Depth (ft) | | 2.04 | 0.17 |
| Conv. Total (cfs) | 11044.9 | Conv. (cfs) | | 10807.5 | 237.5 |
| Length Wtd. (ft) | 199.92 | Wetted Per. (ft) | | 144.62 | 127.40 |
| Min Ch El (ft) | 940.58 | Shear (lb/sq ft) | | 3.53 | 0.29 |
| Alpha | 1.08 | Stream Power (lb/ft s) | | 21.57 | 0.54 |
| Frctn Loss (ft) | 2.13 | Cum Volume (acre-ft) | 76.35 | 101.16 | 89.04 |
| C & E Loss (ft) | 0.11 | Cum SA (acres) | 83.08 | 40.38 | 108.54 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 945.33 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.59 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 944.75 | Reach Len. (ft) | 207.13 | 199.99 | 193.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 299.46 | |
| E.G. Slope (ft/ft) | 0.027739 | Area (sq ft) | | 299.46 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 144.34 | Top Width (ft) | | 144.34 | |
| Vel Total (ft/s) | 6.14 | Avg. Vel. (ft/s) | | 6.14 | |
| Max Chl Dpth (ft) | 4.17 | Hydr. Depth (ft) | | 2.07 | |
| Conv. Total (cfs) | 11047.8 | Conv. (cfs) | | 11047.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 144.84 | |
| Min Ch El (ft) | 940.58 | Shear (lb/sq ft) | | 3.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 22.00 | |
| Frctn Loss (ft) | 1.93 | Cum Volume (acre-ft) | 13.42 | 129.13 | 16.27 |
| C & E Loss (ft) | 0.12 | Cum SA (acres) | 6.80 | 43.40 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 945.33 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.59 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 944.74 | Reach Len. (ft) | 207.13 | 199.99 | 193.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 298.62 | |
| E.G. Slope (ft/ft) | 0.027962 | Area (sq ft) | | 298.62 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 144.32 | Top Width (ft) | | 144.32 | |
| Vel Total (ft/s) | 6.16 | Avg. Vel. (ft/s) | | 6.16 | |
| Max Chl Dpth (ft) | 4.16 | Hydr. Depth (ft) | | 2.07 | |
| Conv. Total (cfs) | 11003.6 | Conv. (cfs) | | 11003.6 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 144.81 | |
| Min Ch El (ft) | 940.58 | Shear (lb/sq ft) | | 3.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 22.18 | |
| Frctn Loss (ft) | 1.96 | Cum Volume (acre-ft) | 27.00 | 112.84 | 33.69 |
| C & E Loss (ft) | 0.12 | Cum SA (acres) | 16.69 | 41.89 | 25.16 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.776

INPUT
Description: Thalweg Sta. 470.27
Station Elevation Data num= 171

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 951.75 | .25 | 951.77 | 7.03 | 952.22 | 12.93 | 952.55 | 18.06 | 952.85 |
| 29.08 | 953.25 | 33.55 | 953.32 | 40.12 | 953.44 | 47.65 | 953.43 | 51.15 | 953.39 |
| 57.57 | 953.24 | 62.17 | 953.1 | 71.35 | 952.67 | 73.21 | 952.55 | 74.82 | 952.37 |
| 84.23 | 951.47 | 95.06 | 950.6 | 95.2 | 950.58 | 95.27 | 950.58 | 95.45 | 950.56 |
| 106.3 | 949.89 | 116.08 | 949.21 | 117.32 | 949.12 | 118.76 | 949.01 | 128.36 | 948.24 |
| 136.7 | 947.6 | 139.38 | 947.42 | 142.46 | 947.2 | 150.41 | 946.68 | 157.34 | 946.3 |
| 166.17 | 945.78 | 172.47 | 945.65 | 177.97 | 945.4 | 183.5 | 945.19 | 189.87 | 944.87 |
| 194.53 | 944.81 | 200.58 | 944.7 | 205.56 | 944.65 | 208.1 | 944.61 | 213.57 | 944.59 |
| 216.59 | 944.56 | 237.27 | 944.42 | 238.65 | 944.4 | 260.49 | 944.22 | 260.71 | 944.21 |
| 260.97 | 944.21 | 281.12 | 944.01 | 284.67 | 943.97 | 293.8 | 943.88 | 304.83 | 943.84 |
| 308.37 | 943.88 | 315.86 | 944.04 | 322.38 | 944.45 | 326.89 | 944.7 | 332.08 | 945.13 |
| 337.92 | 945.57 | 343.59 | 945.93 | 348.95 | 946.2 | 351.12 | 946.27 | 359.98 | 946.41 |
| 363.27 | 946.36 | 363.63 | 946.36 | 365.49 | 946.34 | 371.01 | 946.3 | 379.48 | 945.83 |
| 382.04 | 945.67 | 384.27 | 945.4 | 393.07 | 944.42 | 403.18 | 943.35 | 403.81 | 943.28 |
| 404.1 | 943.26 | 404.89 | 943.22 | 415.13 | 942.53 | 425.53 | 941.28 | 426.16 | 941.21 |
| 426.89 | 941.11 | 437.19 | 939.5 | 446.16 | 938.26 | 448.22 | 937.98 | 450.59 | 937.72 |
| 456.5 | 937.05 | 459.25 | 936.77 | 464.02 | 936.41 | 470.27 | 936.03 | 474.29 | 935.94 |
| 481.31 | 935.88 | 486.6 | 936.24 | 492.34 | 936.83 | 494.13 | 937.05 | 503.36 | 938.37 |
| 514.4 | 939.97 | 521.7 | 940.98 | 525.42 | 941.48 | 528.68 | 941.77 | 536.45 | 942.52 |
| 545.4 | 943 | 547.49 | 943.09 | 549.31 | 943.15 | 558.51 | 943.48 | 567.67 | 943.67 |
| 569.55 | 943.71 | 569.93 | 943.71 | 580.57 | 943.68 | 591.6 | 943.58 | 594.33 | 943.58 |
| 602.64 | 943.61 | 607.03 | 943.61 | 613.66 | 943.51 | 616.5 | 943.49 | 624.69 | 943.41 |
| 631.82 | 943.47 | 635.72 | 943.48 | 646.75 | 943.61 | 668.81 | 943.9 | 679.84 | 944.01 |
| 690.87 | 944.04 | 693.71 | 944.04 | 701.9 | 944.08 | 711.31 | 944.21 | 712.93 | 944.23 |
| 714.34 | 944.24 | 723.96 | 944.39 | 734.97 | 944.37 | 742.53 | 944.35 | 746.02 | 944.37 |
| 750.05 | 944.42 | 757.05 | 944.55 | 757.58 | 944.57 | 776.23 | 945.04 | 777.63 | 945.08 |
| 779.11 | 945.13 | 782.42 | 945.19 | 790.14 | 945.31 | 801.17 | 945.28 | 812.2 | 945.17 |
| 829.82 | 945.03 | 834.26 | 945.01 | 845.29 | 945 | 877.23 | 945.17 | 878.38 | 945.17 |
| 879.38 | 945.18 | 889.41 | 945.23 | 900.92 | 945.24 | 920.64 | 945.19 | 922.5 | 945.19 |
| 924.63 | 945.18 | 944.55 | 945.18 | 955.59 | 945.26 | 966.61 | 945.41 | 977.64 | 945.59 |
| 982.53 | 945.64 | 999.7 | 945.85 | 1010.73 | 946.1 | 1019.44 | 946.45 | 1021.76 | 946.55 |
| 1032.79 | 947.14 | 1043.14 | 947.76 | 1043.82 | 947.8 | 1044.42 | 947.83 | 1054.85 | 948.49 |
| 1065.04 | 949.38 | 1065.88 | 949.45 | 1066.84 | 949.58 | 1076.91 | 950.99 | 1085.68 | 952.75 |
| 1087.94 | 953.2 | 1090.55 | 953.88 | 1098.97 | 956.22 | 1106.31 | 958.33 | 1110 | 959.48 |
| 1110.91 | 959.54 | | | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 365.49 | .072 | 594.33 | .04 | 777.63 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 363.27 | 567.67 | 220.05 | 199.96 | 197.59 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 943.05 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 942.83 | Reach Len. (ft) | 220.05 | 199.96 | 197.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 494.84 | |
| E.G. Slope (ft/ft) | 0.005601 | Area (sq ft) | | 494.84 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 131.63 | Top Width (ft) | | 131.63 | |
| Vel Total (ft/s) | 3.72 | Avg. Vel. (ft/s) | | 3.72 | |
| Max Chl Dpth (ft) | 6.95 | Hydr. Depth (ft) | | 3.76 | |
| Conv. Total (cfs) | 24585.7 | Conv. (cfs) | | 24585.7 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 132.48 | |
| Min Ch El (ft) | 935.88 | Shear (lb/sq ft) | | 1.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.86 | |
| Frctn Loss (ft) | 0.78 | Cum Volume (acre-ft) | 76.35 | 99.35 | 88.99 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 83.08 | 39.75 | 108.26 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 943.29 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.072 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 943.10 | Reach Len. (ft) | 220.05 | 199.96 | 197.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 531.31 | |
| E.G. Slope (ft/ft) | 0.004847 | Area (sq ft) | | 531.31 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 141.13 | Top Width (ft) | | 141.13 | |
| Vel Total (ft/s) | 3.46 | Avg. Vel. (ft/s) | | 3.46 | |
| Max Chl Dpth (ft) | 7.22 | Hydr. Depth (ft) | | 3.76 | |
| Conv. Total (cfs) | 26428.8 | Conv. (cfs) | | 26428.8 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 141.99 | |
| Min Ch El (ft) | 935.88 | Shear (lb/sq ft) | | 1.13 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.92 | |
| Frctn Loss (ft) | 0.63 | Cum Volume (acre-ft) | 13.42 | 127.22 | 16.27 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 6.80 | 42.75 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 943.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 943.07 | Reach Len. (ft) | 220.05 | 199.96 | 197.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 526.55 | |
| E.G. Slope (ft/ft) | 0.004931 | Area (sq ft) | | 526.55 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 139.77 | Top Width (ft) | | 139.77 | |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.49 | |
| Max Chl Dpth (ft) | 7.19 | Hydr. Depth (ft) | | 3.77 | |
| Conv. Total (cfs) | 26203.6 | Conv. (cfs) | | 26203.6 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 140.62 | |
| Min Ch El (ft) | 935.88 | Shear (lb/sq ft) | | 1.15 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.03 | |
| Frctn Loss (ft) | 0.64 | Cum Volume (acre-ft) | 27.00 | 110.95 | 33.69 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 16.69 | 41.24 | 25.16 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.738

INPUT
Description: Thalweg Sta. 479.79
Station Elevation Data num= 222

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 949.77 | 4.21 | 949.91 | 8.79 | 950.02 | 13.3 | 950.19 | 19.99 | 950.46 |
| 26.79 | 950.72 | 35.51 | 951.03 | 42.39 | 951.15 | 49.38 | 950.99 | 53.59 | 950.93 |
| 57.73 | 950.76 | 64.78 | 950.29 | 71.97 | 949.76 | 75.99 | 949.5 | 79.94 | 949.42 |
| 87.18 | 949.2 | 94.55 | 948.72 | 98.38 | 948.51 | 102.16 | 948.04 | 107.09 | 947.34 |
| 109.58 | 946.96 | 114.54 | 946.29 | 120.78 | 945.4 | 121.98 | 945.27 | 124.37 | 945.02 |
| 131.98 | 944.69 | 143.18 | 944.34 | 146.58 | 944.25 | 154.38 | 944.31 | 159.2 | 944.31 |
| 165.58 | 944.16 | 168.79 | 944.07 | 176.78 | 943.91 | 184.89 | 943.59 | 187.97 | 943.52 |
| 191.01 | 943.47 | 199.17 | 943.29 | 213.22 | 943.14 | 226.22 | 943.08 | 232.77 | 943.09 |
| 252.65 | 943.15 | 255.17 | 943.15 | 257.65 | 943.16 | 275.23 | 943.2 | 277.56 | 943.21 |
| 279.86 | 943.21 | 287.98 | 943.24 | 288.76 | 943.24 | 299.97 | 943.23 | 302.07 | 943.21 |
| 311.16 | 943.09 | 320.4 | 942.83 | 322.36 | 942.77 | 333.56 | 942.37 | 342.99 | 941.97 |
| 344.76 | 941.9 | 365.58 | 940.94 | 367.16 | 940.87 | 368.72 | 940.82 | 388.16 | 940.13 |
| 389.56 | 940.09 | 390.93 | 940.04 | 393.92 | 939.94 | 400.75 | 939.71 | 410.75 | 939.33 |
| 411.95 | 939.29 | 412.36 | 939.27 | 413.14 | 939.23 | 423.15 | 938.74 | 433.33 | 938.18 |
| 435.36 | 938.08 | 455.92 | 936.99 | 457.57 | 936.91 | 478.5 | 935.84 | 479.79 | 935.78 |
| 486.81 | 935.47 | 494.25 | 935.33 | 501.54 | 935.99 | 502 | 936.06 | 512.74 | 937.63 |
| 523.67 | 939.4 | 523.95 | 939.45 | 524.21 | 939.49 | 531.48 | 940.44 | 535.14 | 940.88 |
| 546.26 | 941.7 | 546.34 | 941.7 | 546.42 | 941.71 | 557.54 | 942.04 | 568.64 | 942.29 |
| 568.84 | 942.29 | 579.94 | 942.51 | 590.85 | 942.65 | 592.38 | 942.65 | 602.34 | 942.7 |
| 613.07 | 942.72 | 613.54 | 942.72 | 620.83 | 942.74 | 624.73 | 942.74 | 628.19 | 942.76 |
| 628.27 | 942.76 | 635.28 | 942.78 | 635.93 | 942.79 | 636.6 | 942.79 | 647.13 | 942.95 |
| 657.49 | 943.24 | 658.33 | 943.26 | 659.18 | 943.29 | 669.53 | 943.69 | 672.94 | 943.83 |
| 679.71 | 944 | 680.73 | 944.03 | 681.77 | 944.07 | 691.93 | 944.37 | 701.92 | 944.51 |
| 703.13 | 944.53 | 714.33 | 944.54 | 724.14 | 944.43 | 726.94 | 944.39 | 736.73 | 944.21 |
| 746.35 | 943.9 | 747.93 | 943.84 | 749.53 | 943.77 | 759.12 | 943.33 | 768.56 | 943.25 |
| 770.32 | 943.25 | 772.11 | 943.28 | 790.77 | 943.63 | 792.72 | 943.67 | 794.7 | 943.7 |
| 803.92 | 943.87 | 812.99 | 943.97 | 815.12 | 943.99 | 817.28 | 944 | 826.32 | 944.01 |
| 835.2 | 944 | 837.52 | 943.99 | 848.71 | 943.98 | 859.91 | 943.99 | 871.11 | 944.08 |
| 879.63 | 944.21 | 881.41 | 944.24 | 882.31 | 944.25 | 885.04 | 944.3 | 893.51 | 944.47 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 901.84 | 944.6 | 907.62 | 944.66 | 927.11 | 944.84 | 938.3 | 944.99 | 968.48 | 945.48 |
| 971.9 | 945.53 | 975.38 | 945.59 | 1016.7 | 946.26 | 1020.55 | 946.31 | 1039.1 | 946.58 |
| 1043.14 | 946.63 | 1061.5 | 946.9 | 1082.44 | 947.25 | 1083.89 | 947.28 | 1095.09 | 947.45 |
| 1110.89 | 947.66 | 1123.98 | 947.85 | 1128.69 | 947.91 | 1133.48 | 947.99 | 1139.89 | 948.08 |
| 1151.09 | 948.29 | 1162.28 | 948.47 | 1168.4 | 948.53 | 1173.48 | 948.59 | 1178.65 | 948.64 |
| 1190.62 | 948.77 | 1195.88 | 948.84 | 1201.24 | 948.96 | 1207.08 | 949.07 | 1212.83 | 949.36 |
| 1218.28 | 949.8 | 1223.82 | 950.59 | 1229.48 | 951.26 | 1235.05 | 951.89 | 1240.68 | 952.62 |
| 1246.41 | 953.01 | 1251.88 | 953.35 | 1257.26 | 953.34 | 1263.08 | 953.35 | 1268.99 | 953.12 |
| 1274.28 | 952.95 | 1279.47 | 952.74 | 1285.47 | 952.53 | 1291.58 | 952.42 | 1301.68 | 952.32 |
| 1307.87 | 952.28 | 1314.16 | 952.19 | 1319.07 | 952.2 | 1323.9 | 952.1 | 1330.27 | 951.95 |
| 1336.74 | 951.46 | 1341.47 | 951.25 | 1346.12 | 951.03 | 1352.67 | 950.54 | 1359.33 | 950.6 |
| 1363.87 | 950.65 | 1368.33 | 950.85 | 1375.07 | 951.12 | 1381.92 | 951.43 | 1390.54 | 952 |
| 1397.46 | 952.33 | 1404.51 | 952.27 | 1408.67 | 952.35 | 1412.75 | 952.12 | 1419.86 | 952.05 |
| 1427.09 | 952.05 | 1431.06 | 952.06 | 1434.97 | 952.09 | 1442.26 | 952.26 | 1449.67 | 952.64 |
| 1453.46 | 952.79 | 1464.66 | 953.93 | 1472.26 | 954.9 | 1475.85 | 955.33 | 1479.4 | 955.82 |
| 1487.06 | 956.6 | 1492.13 | 957.17 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 393.92 | .072 | 628.19 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 287.98 | 592.38 | 204.79 | 200 | 202.74 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.23 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.070 | |
| W.S. Elev (ft) | 942.13 | Reach Len. (ft) | 204.79 | 200.00 | 202.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 696.71 | |
| E.G. Slope (ft/ft) | 0.002883 | Area (sq ft) | | 696.71 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 221.98 | Top Width (ft) | | 221.98 | |
| Vel Total (ft/s) | 2.64 | Avg. Vel. (ft/s) | | 2.64 | |
| Max Chl Dpth (ft) | 6.80 | Hydr. Depth (ft) | | 3.14 | |
| Conv. Total (cfs) | 34268.2 | Conv. (cfs) | | 34268.2 | |
| Length Wtd. (ft) | 200.02 | Wetted Per. (ft) | | 222.56 | |
| Min Ch El (ft) | 935.33 | Shear (lb/sq ft) | | 0.56 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.49 | |
| Frctn Loss (ft) | 0.62 | Cum Volume (acre-ft) | 76.35 | 96.62 | 88.99 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 83.08 | 38.94 | 108.26 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.069 | |
| W.S. Elev (ft) | 942.54 | Reach Len. (ft) | 204.79 | 200.00 | 202.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 795.83 | |
| E.G. Slope (ft/ft) | 0.002204 | Area (sq ft) | | 795.83 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 253.83 | Top Width (ft) | | 253.83 | |
| Vel Total (ft/s) | 2.31 | Avg. Vel. (ft/s) | | 2.31 | |
| Max Chl Dpth (ft) | 7.21 | Hydr. Depth (ft) | | 3.14 | |
| Conv. Total (cfs) | 39197.5 | Conv. (cfs) | | 39197.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 254.42 | |
| Min Ch El (ft) | 935.33 | Shear (lb/sq ft) | | 0.43 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.99 | |
| Frctn Loss (ft) | 0.45 | Cum Volume (acre-ft) | 13.42 | 124.17 | 16.27 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.80 | 41.84 | 8.13 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.58 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.069 | |
| W.S. Elev (ft) | 942.50 | Reach Len. (ft) | 204.79 | 200.00 | 202.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 783.89 | |
| E.G. Slope (ft/ft) | 0.002261 | Area (sq ft) | | 783.89 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 249.19 | Top Width (ft) | | 249.19 | |
| Vel Total (ft/s) | 2.35 | Avg. Vel. (ft/s) | | 2.35 | |
| Max Chl Dpth (ft) | 7.17 | Hydr. Depth (ft) | | 3.15 | |
| Conv. Total (cfs) | 38696.2 | Conv. (cfs) | | 38696.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 249.78 | |
| Min Ch El (ft) | 935.33 | Shear (lb/sq ft) | | 0.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.04 | |
| Frctn Loss (ft) | 0.47 | Cum Volume (acre-ft) | 27.00 | 107.94 | 33.69 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.69 | 40.34 | 25.16 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.700

INPUT
Description: Thalweg Sta. 477.21
Station Elevation Data num= 161

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 944.73 | 8.86 | 943.99 | 9.29 | 943.94 | 19.94 | 942.95 | 30.56 | 942.46 |
| 31.03 | 942.45 | 31.54 | 942.45 | 42.12 | 942.32 | 51.83 | 942.34 | 53.2 | 942.34 |
| 54.7 | 942.35 | 64.29 | 942.44 | 73.1 | 942.66 | 75.38 | 942.71 | 76.18 | 942.74 |
| 77.86 | 942.79 | 86.46 | 943.17 | 94.37 | 943.41 | 97.55 | 943.53 | 101.02 | 943.52 |
| 108.64 | 943.4 | 115.64 | 943.16 | 119.72 | 943.04 | 124.17 | 942.98 | 130.81 | 943.04 |
| 136.91 | 943.16 | 141.9 | 943.24 | 147.33 | 943.08 | 152.99 | 942.84 | 158.18 | 942.3 |
| 164.07 | 941.78 | 170.49 | 941.49 | 175.16 | 941.26 | 179.44 | 941.26 | 186.25 | 941.3 |
| 197.34 | 941.43 | 208.42 | 941.5 | 230.6 | 941.47 | 239.97 | 941.44 | 248.62 | 941.44 |
| 263.13 | 941.41 | 263.85 | 941.41 | 264.52 | 941.4 | 285.79 | 941.3 | 286.3 | 941.3 |
| 307.06 | 941.22 | 309.45 | 941.2 | 319.29 | 941.16 | 328.33 | 941.09 | 330.37 | 941.08 |
| 338.59 | 941 | 338.85 | 941 | 352.55 | 940.85 | 355.77 | 940.8 | 363.63 | 940.69 |
| 370.86 | 940.52 | 374.72 | 940.42 | 385.81 | 940.02 | 400.36 | 939.43 | 402.09 | 939.36 |
| 407.98 | 939.1 | 413.4 | 938.85 | 425.25 | 938.32 | 430.16 | 938.07 | 434.67 | 937.87 |
| 441.25 | 937.6 | 448.41 | 937.38 | 452.33 | 937.27 | 455.93 | 937.25 | 463.42 | 937.17 |
| 466.06 | 936.91 | 471.57 | 936.2 | 474.51 | 935.8 | 477.21 | 935.49 | 485.59 | 934.43 |
| 494.72 | 934.02 | 496.05 | 933.98 | 496.68 | 933.97 | 498.48 | 934.36 | 507.77 | 935.94 |
| 517.88 | 938.47 | 518.85 | 938.73 | 519.75 | 938.86 | 529.94 | 940.84 | 541.02 | 941.51 |
| 552.12 | 941.72 | 563.2 | 941.83 | 564.2 | 941.83 | 568.11 | 941.84 | 582.65 | 941.9 |
| 585.37 | 941.9 | 587.36 | 941.89 | 596.46 | 941.88 | 604.82 | 941.91 | 607.55 | 941.9 |
| 610.52 | 941.9 | 626.09 | 941.76 | 629.72 | 941.74 | 640.81 | 941.75 | 651.89 | 941.7 |
| 653.49 | 941.7 | 656.84 | 941.69 | 668.63 | 941.7 | 685.16 | 941.78 | 703.15 | 941.93 |
| 711.17 | 942.02 | 729.5 | 942.29 | 732.43 | 942.34 | 749.47 | 942.6 | 772.63 | 942.93 |
| 773.85 | 942.95 | 774.97 | 942.96 | 795.79 | 943.24 | 796.03 | 943.25 | 796.24 | 943.25 |
| 817.51 | 943.6 | 818.2 | 943.62 | 818.95 | 943.63 | 829.29 | 943.87 | 840.37 | 944.15 |
| 851.46 | 944.4 | 860.05 | 944.56 | 862.55 | 944.61 | 865.26 | 944.67 | 873.63 | 944.83 |
| 878.42 | 944.95 | 884.72 | 945.08 | 906.89 | 945.51 | 911.59 | 945.59 | 923.85 | 945.82 |
| 929.07 | 945.91 | 945.12 | 946.25 | 951.24 | 946.41 | 957.91 | 946.66 | 962.33 | 946.8 |
| 966.39 | 946.9 | 973.41 | 947.19 | 981.07 | 947.32 | 984.5 | 947.43 | 987.66 | 947.48 |
| 995.59 | 947.75 | 1004.23 | 947.86 | 1006.68 | 947.94 | 1008.93 | 948.15 | 1017.76 | 949.3 |
| 1028.85 | 950.89 | 1030.2 | 951.1 | 1039.94 | 952.67 | 1050.54 | 954.21 | 1051.02 | 954.26 |
| 1062.11 | 955 | 1072.73 | 954.94 | 1073.7 | 954.92 | 1084.28 | 954.77 | 1094 | 954.83 |
| 1095.37 | 954.82 | 1096.86 | 954.79 | 1106.46 | 954.61 | 1115.27 | 954.01 | 1117.54 | 953.84 |
| 1118.33 | 953.77 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 400.36 | .072 | 582.65 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 338.85 | 568.11 | 191.75 | 200 | 206.08 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 941.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.040 | 0.069 | |
| W.S. Elev (ft) | 941.48 | Reach Len. (ft) | 191.75 | 200.00 | 206.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 24.32 | 624.95 | |
| E.G. Slope (ft/ft) | 0.003361 | Area (sq ft) | 24.32 | 624.95 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 15.83 | 1824.17 | |
| Top Width (ft) | 350.39 | Top Width (ft) | 148.75 | 201.65 | |
| Vel Total (ft/s) | 2.83 | Avg. Vel. (ft/s) | 0.65 | 2.92 | |
| Max Chl Dpth (ft) | 7.51 | Hydr. Depth (ft) | 0.16 | 3.10 | |
| Conv. Total (cfs) | 31740.5 | Conv. (cfs) | 273.0 | 31467.5 | |
| Length Wtd. (ft) | 199.47 | Wetted Per. (ft) | 148.75 | 202.64 | |
| Min Ch El (ft) | 933.97 | Shear (lb/sq ft) | 0.03 | 0.65 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.02 | 1.89 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 76.29 | 93.58 | 88.99 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 82.73 | 37.97 | 108.26 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.18 | Element | Left OB | Channel | Right OB |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.068 | |
| W.S. Elev (ft) | 942.09 | Reach Len. (ft) | 191.75 | 200.00 | 206.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 758.18 | |
| E.G. Slope (ft/ft) | 0.002260 | Area (sq ft) | | 758.18 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 229.26 | Top Width (ft) | | 229.26 | |
| Vel Total (ft/s) | 2.43 | Avg. Vel. (ft/s) | | 2.43 | |
| Max Chl Dpth (ft) | 8.12 | Hydr. Depth (ft) | | 3.31 | |
| Conv. Total (cfs) | 38704.1 | Conv. (cfs) | | 38704.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 231.59 | |
| Min Ch El (ft) | 933.97 | Shear (lb/sq ft) | | 0.46 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.12 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | 13.42 | 120.60 | 16.27 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.80 | 40.73 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.11 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.068 | |
| W.S. Elev (ft) | 942.02 | Reach Len. (ft) | 191.75 | 200.00 | 206.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 741.66 | |
| E.G. Slope (ft/ft) | 0.002431 | Area (sq ft) | | 741.66 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 229.26 | Top Width (ft) | | 229.26 | |
| Vel Total (ft/s) | 2.48 | Avg. Vel. (ft/s) | | 2.48 | |
| Max Chl Dpth (ft) | 8.05 | Hydr. Depth (ft) | | 3.24 | |
| Conv. Total (cfs) | 37320.4 | Conv. (cfs) | | 37320.4 | |
| Length Wtd. (ft) | 199.32 | Wetted Per. (ft) | | 231.45 | |
| Min Ch El (ft) | 933.97 | Shear (lb/sq ft) | | 0.49 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.21 | |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 27.00 | 104.44 | 33.69 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.69 | 39.25 | 25.16 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.662

INPUT
Description: Thalweg Sta. 585.53
Station Elevation Data num= 207

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 945.96 | 11.08 | 944.94 | 13.93 | 944.62 | 18.15 | 944.46 | 24.72 | 944.16 |
| 29.16 | 944.22 | 35.5 | 944.16 | 44.85 | 944.59 | 45.88 | 944.61 | 46.29 | 944.62 |
| 47.26 | 944.6 | 57.07 | 944.31 | 65.34 | 943.78 | 67.86 | 943.58 | 71.56 | 943.23 |
| 78.64 | 942.47 | 89.43 | 941.26 | 98.26 | 940.59 | 100.21 | 940.43 | 101.53 | 940.37 |
| 111 | 939.9 | 119.63 | 939.66 | 121.78 | 939.59 | 132.56 | 939.48 | 143.35 | 939.54 |
| 151.67 | 939.67 | 154.14 | 939.72 | 161.1 | 939.92 | 164.92 | 940.05 | 173.9 | 940.37 |
| 186.49 | 940.79 | 197.28 | 941.06 | 205.07 | 941.19 | 208.06 | 941.25 | 218.84 | 941.3 |
| 228.17 | 941.11 | 229.63 | 941.07 | 240.41 | 940.86 | 245.61 | 940.92 | 251.2 | 940.93 |
| 258.48 | 941.01 | 261.98 | 941.06 | 264.36 | 941.05 | 272.77 | 941.1 | 282.45 | 940.97 |
| 283.55 | 940.96 | 291.71 | 940.76 | 305.12 | 940.4 | 311.89 | 940.25 | 315.91 | 940.17 |
| 326.69 | 940.13 | 336.72 | 940.28 | 337.48 | 940.29 | 348.26 | 940.38 | 353.16 | 940.36 |
| 365.29 | 940.24 | 369.83 | 940.21 | 372.91 | 940.21 | 380.61 | 940.13 | 391 | 939.94 |
| 391.4 | 939.93 | 392 | 939.91 | 402.19 | 939.5 | 409.09 | 939.45 | 412.97 | 939.43 |
| 418.7 | 939.67 | 422.3 | 939.83 | 423.76 | 939.85 | 429.98 | 939.98 | 434.54 | 940.1 |
| 437.67 | 940.14 | 445.33 | 940.29 | 445.4 | 940.29 | 450.62 | 940.31 | 456.11 | 940.34 |
| 463.37 | 940.24 | 466.9 | 940.2 | 472.11 | 940.11 | 477.68 | 940.03 | 481.46 | 939.96 |
| 488.46 | 939.85 | 499.25 | 939.6 | 499.55 | 939.59 | 507.25 | 939.28 | 510.03 | 939.17 |
| 517.64 | 939.35 | 520.82 | 939.28 | 525.51 | 939.7 | 531.6 | 940.07 | 535.73 | 939.94 |
| 542.39 | 939.87 | 552.22 | 938.72 | 553.18 | 938.59 | 553.82 | 938.47 | 563.96 | 936.61 |
| 571.92 | 935.03 | 574.74 | 934.46 | 578.92 | 933.71 | 585.53 | 932.7 | 590 | 932.99 |
| 596.31 | 932.99 | 605.62 | 935.22 | 606.68 | 935.47 | 607.1 | 935.57 | 608.1 | 935.83 |
| 617.88 | 938.4 | 626.19 | 939.63 | 628.67 | 940.11 | 632.32 | 940.22 | 639.45 | 940.41 |
| 644.28 | 940.39 | 645.26 | 940.39 | 650.23 | 940.36 | 653.52 | 940.33 | 659.03 | 940.27 |
| 661.02 | 940.26 | 662.37 | 940.23 | 671.81 | 940.07 | 680.46 | 939.79 | 682.59 | 939.71 |
| 685.73 | 939.67 | 693.38 | 939.62 | 698.55 | 939.68 | 704.16 | 939.71 | 712.43 | 940.07 |
| 714.95 | 940.15 | 716.65 | 940.24 | 725.73 | 940.77 | 734.74 | 941.19 | 736.51 | 941.28 |
| 747.3 | 941.44 | 752.83 | 941.34 | 767.99 | 941.14 | 768.87 | 941.12 | 779.65 | 941.15 |
| 789.01 | 941.26 | 790.44 | 941.27 | 792.54 | 941.3 | 801.22 | 941.45 | 807.1 | 941.6 |
| 812.01 | 941.71 | 822.79 | 942.25 | 825.2 | 942.44 | 833.58 | 943.07 | 843.28 | 943.86 |
| 844.36 | 943.95 | 845.95 | 944.12 | 855.15 | 945.08 | 861.38 | 945.84 | 865.93 | 946.41 |
| 872.65 | 947.06 | 876.72 | 947.44 | 879.47 | 947.6 | 887.5 | 947.93 | 897.56 | 948.13 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 898.29 | 948.13 | 899.36 | 948.11 | 909.07 | 948.06 | 915.65 | 947.93 | 919.85 | 947.79 |
| 930.64 | 947.29 | 933.75 | 947.19 | 941.43 | 946.83 | 951.83 | 947.18 | 952.21 | 947.21 |
| 952.76 | 947.28 | 963 | 948.35 | 969.93 | 949.33 | 973.78 | 949.9 | 979.47 | 950.64 |
| 984.57 | 951.38 | 988.02 | 951.82 | 995.35 | 952.8 | 1006.11 | 954.22 | 1006.17 | 954.22 |
| 1016.92 | 955.65 | 1024.2 | 956.14 | 1027.71 | 956.35 | 1032.87 | 956.48 | 1036.88 | 956.56 |
| 1038.49 | 956.63 | 1042.3 | 956.77 | 1049.28 | 956.96 | 1059.58 | 957.41 | 1060.06 | 957.43 |
| 1060.38 | 957.43 | 1070.85 | 957.72 | 1078.48 | 957.91 | 1081.63 | 958 | 1086.28 | 958.07 |
| 1092.41 | 958.13 | 1096.57 | 958.12 | 1103.2 | 958.05 | 1112.98 | 958.03 | 1113.98 | 958.03 |
| 1114.67 | 958.04 | 1124.77 | 958.14 | 1132.75 | 958.29 | 1135.55 | 958.32 | 1139.69 | 958.44 |
| 1146.34 | 958.65 | 1157.12 | 958.97 | 1166.39 | 959.32 | 1167.91 | 959.37 | 1168.93 | 959.41 |
| 1178.69 | 959.84 | 1179.64 | 959.88 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 507.25 | .072 | 653.52 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 531.6 | 645.26 | 204.27 | 199.99 | 203.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 940.63 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.045 | 0.072 | 0.032 |
| W.S. Elev (ft) | 940.42 | Reach Len. (ft) | 204.27 | 199.99 | 203.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 144.84 | 373.50 | 31.68 |
| E.G. Slope (ft/ft) | 0.007733 | Area (sq ft) | 144.84 | 373.50 | 31.68 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 276.75 | 1485.78 | 77.47 |
| Top Width (ft) | 489.89 | Top Width (ft) | 301.83 | 113.66 | 74.40 |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 1.91 | 3.98 | 2.45 |
| Max Chl Dpth (ft) | 7.72 | Hydr. Depth (ft) | 0.48 | 3.29 | 0.43 |
| Conv. Total (cfs) | 20923.5 | Conv. (cfs) | 3147.1 | 16895.5 | 880.9 |
| Length Wtd. (ft) | 201.39 | Wetted Per. (ft) | 301.94 | 115.09 | 74.43 |
| Min Ch El (ft) | 932.70 | Shear (lb/sq ft) | 0.23 | 1.57 | 0.21 |
| Alpha | 1.21 | Stream Power (lb/ft s) | 0.44 | 6.23 | 0.50 |
| Frctn Loss (ft) | 1.34 | Cum Volume (acre-ft) | 75.92 | 91.29 | 88.92 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 81.74 | 37.24 | 108.08 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 941.48 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 941.24 | Reach Len. (ft) | 204.27 | 199.99 | 203.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 467.12 | |
| E.G. Slope (ft/ft) | 0.005759 | Area (sq ft) | | 467.12 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 113.66 | Top Width (ft) | | 113.66 | |
| Vel Total (ft/s) | 3.94 | Avg. Vel. (ft/s) | | 3.94 | |
| Max Chl Dpth (ft) | 8.54 | Hydr. Depth (ft) | | 4.11 | |
| Conv. Total (cfs) | 24246.1 | Conv. (cfs) | | 24246.1 | |
| Length Wtd. (ft) | 200.53 | Wetted Per. (ft) | | 117.11 | |
| Min Ch El (ft) | 932.70 | Shear (lb/sq ft) | | 1.43 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.65 | |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | 13.42 | 117.79 | 16.27 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 6.80 | 39.94 | 8.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 941.53 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.049 | 0.072 | 0.072 |
| W.S. Elev (ft) | 941.39 | Reach Len. (ft) | 204.27 | 199.99 | 203.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 128.04 | 484.44 | 5.05 |
| E.G. Slope (ft/ft) | 0.003426 | Area (sq ft) | 128.04 | 484.44 | 5.05 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 308.94 | 1525.62 | 5.44 |
| Top Width (ft) | 199.61 | Top Width (ft) | 80.98 | 113.66 | 4.97 |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | 2.41 | 3.15 | 1.08 |
| Max Chl Dpth (ft) | 8.69 | Hydr. Depth (ft) | 1.58 | 4.26 | 1.02 |
| Conv. Total (cfs) | 31433.6 | Conv. (cfs) | 5277.7 | 26062.9 | 93.0 |
| Length Wtd. (ft) | 200.38 | Wetted Per. (ft) | 82.11 | 115.09 | 6.00 |
| Min Ch El (ft) | 932.70 | Shear (lb/sq ft) | 0.33 | 0.90 | 0.18 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.80 | 2.84 | 0.19 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.10 | Cum Volume (acre-ft) | 26.72 | 101.62 | 33.68 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 16.51 | 38.46 | 25.15 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.624

INPUT
Description: Thalweg Sta. 776.86
Station Elevation Data num= 225

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 945.84 | .99 | 945.8 | 1.37 | 945.79 | 2.05 | 945.76 | 17.55 | 945.17 |
| 22.62 | 944.99 | 31.69 | 944.53 | 33.24 | 944.43 | 34.11 | 944.36 | 43.86 | 943.56 |
| 50.66 | 942.97 | 54.49 | 942.62 | 61.33 | 941.97 | 65.11 | 941.64 | 67.23 | 941.47 |
| 75.73 | 940.65 | 83.79 | 940.16 | 86.36 | 939.94 | 90.96 | 939.75 | 100.35 | 939.52 |
| 107.6 | 939.32 | 116.9 | 939.04 | 118.23 | 938.99 | 120.6 | 938.91 | 128.85 | 938.62 |
| 139.47 | 938.21 | 150.02 | 937.91 | 150.23 | 937.91 | 157.95 | 937.76 | 160.72 | 937.68 |
| 171.34 | 937.51 | 179.86 | 937.53 | 181.97 | 937.53 | 183.14 | 937.57 | 192.59 | 937.87 |
| 203.21 | 938.23 | 209.5 | 938.37 | 213.83 | 938.48 | 216.26 | 938.53 | 232.82 | 938.97 |
| 235.08 | 939.04 | 239.14 | 939.08 | 245.7 | 939.13 | 256.33 | 938.98 | 265.93 | 938.78 |
| 266.95 | 938.76 | 268.77 | 938.72 | 277.57 | 938.5 | 288.19 | 938.05 | 298.4 | 937.78 |
| 298.71 | 937.77 | 299.05 | 937.77 | 309.44 | 937.81 | 315.61 | 937.89 | 320.07 | 937.96 |
| 322.17 | 938 | 328.04 | 938.1 | 341.31 | 938.3 | 348.73 | 938.28 | 351.93 | 938.3 |
| 357.67 | 938.32 | 361.27 | 938.36 | 362.56 | 938.34 | 365.29 | 938.36 | 373.18 | 938.45 |
| 383.8 | 938.46 | 384.73 | 938.43 | 387.31 | 938.33 | 394.43 | 938.04 | 398.4 | 937.99 |
| 405.05 | 937.86 | 414.96 | 938.11 | 415.67 | 938.13 | 416.95 | 938.16 | 426.29 | 938.4 |
| 447.54 | 938.85 | 458.17 | 939.05 | 464.63 | 939.08 | 468.79 | 939.13 | 470.74 | 939.12 |
| 479.41 | 938.91 | 481.2 | 938.86 | 490.03 | 938.59 | 497.76 | 938.37 | 505.85 | 938.12 |
| 511.28 | 937.97 | 514.32 | 937.91 | 521.9 | 937.73 | 530.88 | 937.78 | 532.53 | 937.78 |
| 535.48 | 937.92 | 543.15 | 938.27 | 553.77 | 938.9 | 556.77 | 939.06 | 564.39 | 939.43 |
| 565.12 | 939.45 | 575.02 | 939.69 | 580.55 | 939.74 | 585.64 | 939.77 | 594.76 | 939.84 |
| 613.67 | 940.08 | 617.51 | 940.12 | 628.13 | 940.2 | 638.76 | 940.21 | 654.02 | 940.2 |
| 658.42 | 940.19 | 660 | 940.18 | 663.35 | 940.17 | 670.63 | 940.17 | 679.9 | 940.14 |
| 681.89 | 940.14 | 690.91 | 940.09 | 691.87 | 940.09 | 711.85 | 939.99 | 713.02 | 939.98 |
| 713.12 | 939.98 | 713.29 | 939.97 | 723.74 | 939.83 | 729.58 | 939.62 | 734.37 | 939.46 |
| 744.99 | 938.69 | 746.14 | 938.51 | 755.61 | 937.33 | 762.7 | 935.58 | 766.23 | 934.7 |
| 772.57 | 933.26 | 776.86 | 932.37 | 779.26 | 932.57 | 787.48 | 933.06 | 795.82 | 934.38 |
| 798.1 | 934.72 | 802.19 | 935.44 | 808.73 | 936.55 | 819.35 | 938.2 | 828.93 | 939.06 |
| 829.97 | 939.16 | 831.83 | 939.22 | 838.86 | 939.43 | 840.59 | 939.48 | 845.49 | 939.53 |
| 851.22 | 939.6 | 861.47 | 939.68 | 861.84 | 939.69 | 862.05 | 939.69 | 865.38 | 939.71 |
| 883.09 | 939.83 | 891.1 | 939.85 | 893.71 | 939.86 | 904.33 | 939.87 | 911.73 | 940.02 |
| 914.96 | 940.11 | 920.74 | 940.26 | 925.58 | 940.4 | 928.29 | 940.45 | 946.83 | 940.74 |
| 977.96 | 941.29 | 978.69 | 941.3 | 980 | 941.32 | 999.94 | 941.66 | 1002.5 | 941.7 |
| 1009.64 | 941.8 | 1010.57 | 941.82 | 1011.08 | 941.83 | 1027.64 | 942.08 | 1060.76 | 942.61 |
| 1063.68 | 942.66 | 1074.3 | 942.87 | 1077.32 | 942.92 | 1084.93 | 943.09 | 1095.55 | 943.35 |
| 1098.55 | 943.4 | 1106.17 | 943.57 | 1110.43 | 943.54 | 1116.8 | 943.51 | 1127 | 943.41 |
| 1127.42 | 943.41 | 1128.18 | 943.42 | 1138.04 | 943.63 | 1143.55 | 943.86 | 1148.67 | 944.04 |
| 1157.81 | 944.72 | 1159.29 | 944.88 | 1160.12 | 944.98 | 1169.91 | 946.13 | 1176.67 | 946.68 |
| 1180.53 | 946.97 | 1187.45 | 947.29 | 1191.16 | 947.48 | 1193.23 | 947.58 | 1201.78 | 947.94 |
| 1209.79 | 948.55 | 1212.4 | 948.74 | 1217.09 | 949.29 | 1223.03 | 950 | 1229.28 | 950.7 |
| 1233.65 | 951.25 | 1242.9 | 951.92 | 1244.27 | 952.01 | 1246.72 | 952.12 | 1254.9 | 952.41 |
| 1265.52 | 952.38 | 1276.03 | 951.98 | 1276.14 | 951.98 | 1276.36 | 951.99 | 1286.77 | 952.39 |
| 1292.59 | 953.19 | 1297.39 | 953.77 | 1305.99 | 954.43 | 1308.01 | 954.5 | 1309.14 | 954.48 |
| 1318.63 | 954.11 | 1325.7 | 953.8 | 1329.26 | 953.65 | 1339.88 | 953.56 | 1342.26 | 953.75 |
| 1350.5 | 954.42 | 1358.82 | 955.12 | 1361.13 | 955.31 | 1365.26 | 955.5 | 1371.75 | 955.72 |
| 1382.37 | 955.78 | 1391.93 | 955.78 | 1393 | 955.81 | 1394.9 | 955.9 | 1395.78 | 955.93 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 690.91 | .072 | 838.86 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 711.85 | 865.38 | 181.92 | 199.93 | 220.91 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 939.27 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.040 | 0.072 | |
| W.S. Elev (ft) | 939.14 | Reach Len. (ft) | 181.92 | 199.93 | 220.91 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 354.25 | 290.83 | |
| E.G. Slope (ft/ft) | 0.005768 | Area (sq ft) | 354.25 | 290.83 | |

| | | | | | |
|---|---|---|---|---|---|
| Q Total (cfs) | 1840.00 | Flow (cfs) | 858.64 | 981.36 | |
| Top Width (ft) | 535.60 | Top Width (ft) | 444.69 | 90.91 | |
| Vel Total (ft/s) | 2.85 | Avg. Vel. (ft/s) | 2.42 | 3.37 | |
| Max Chl Dpth (ft) | 6.77 | Hydr. Depth (ft) | 0.80 | 3.20 | |
| Conv. Total (cfs) | 24228.1 | Conv. (cfs) | 11306.1 | 12922.0 | |
| Length Wtd. (ft) | 193.11 | Wetted Per. (ft) | 444.84 | 92.07 | |
| Min Ch El (ft) | 932.37 | Shear (lb/sq ft) | 0.29 | 1.14 | |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.70 | 3.84 | |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 74.75 | 89.76 | 88.84 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 79.99 | 36.77 | 107.91 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 940.29 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.040 | 0.071 | |
| W.S. Elev (ft) | 940.12 | Reach Len. (ft) | 181.92 | 199.93 | 220.91 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 146.69 | 412.43 | |
| E.G. Slope (ft/ft) | 0.005918 | Area (sq ft) | 146.69 | 412.43 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 460.11 | 1379.89 | |
| Top Width (ft) | 301.87 | Top Width (ft) | 148.34 | 153.53 | |
| Vel Total (ft/s) | 3.29 | Avg. Vel. (ft/s) | 3.14 | 3.35 | |
| Max Chl Dpth (ft) | 7.75 | Hydr. Depth (ft) | 0.99 | 2.69 | |
| Conv. Total (cfs) | 23917.5 | Conv. (cfs) | 5980.8 | 17936.8 | |
| Length Wtd. (ft) | 197.68 | Wetted Per. (ft) | 150.06 | 155.12 | |
| Min Ch El (ft) | 932.37 | Shear (lb/sq ft) | 0.36 | 0.98 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.13 | 3.29 | |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 13.07 | 115.77 | 16.27 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.45 | 39.33 | 8.13 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 940.42 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.043 | 0.071 | 0.032 |
| W.S. Elev (ft) | 940.13 | Reach Len. (ft) | 181.92 | 199.93 | 220.91 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 8.06 | 413.85 | 6.31 |
| E.G. Slope (ft/ft) | 0.010146 | Area (sq ft) | 8.06 | 413.85 | 6.31 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 8.29 | 1817.04 | 14.67 |
| Top Width (ft) | 231.45 | Top Width (ft) | 60.21 | 153.53 | 17.71 |
| Vel Total (ft/s) | 4.30 | Avg. Vel. (ft/s) | 1.03 | 4.39 | 2.32 |
| Max Chl Dpth (ft) | 7.76 | Hydr. Depth (ft) | 0.13 | 2.70 | 0.36 |
| Conv. Total (cfs) | 18267.1 | Conv. (cfs) | 82.3 | 18039.2 | 145.7 |
| Length Wtd. (ft) | 199.43 | Wetted Per. (ft) | 60.56 | 154.71 | 18.01 |
| Min Ch El (ft) | 932.37 | Shear (lb/sq ft) | 0.08 | 1.69 | 0.22 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.09 | 7.44 | 0.52 |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 26.40 | 99.56 | 33.65 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 16.18 | 37.84 | 25.09 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.587

INPUT
Description: Thalweg Sta. 745.19
Station Elevation Data num= 234

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 945.87 | .78 | 945.86 | 9.77 | 945.58 | 10.83 | 945.57 | 19.53 | 945.33 |
| 20.89 | 945.28 | 21.07 | 945.27 | 30.95 | 944.68 | 41.01 | 943.38 | 43.65 | 942.97 |
| 51.07 | 941.77 | 54.95 | 941.23 | 61.13 | 940.17 | 66.24 | 939.62 | 71.19 | 938.88 |
| 77.54 | 938.38 | 81.25 | 937.98 | 91.31 | 937.57 | 100.12 | 937.39 | 101.37 | 937.37 |
| 111.42 | 937.17 | 111.52 | 937.17 | 121.49 | 937.07 | 131.55 | 937.15 | 134 | 937.29 |
| 141.61 | 937.63 | 145.3 | 937.88 | 156.6 | 938.63 | 161.73 | 938.98 | 167.9 | 939.33 |
| 171.79 | 939.58 | 179.18 | 939.93 | 190.48 | 940.39 | 191.91 | 940.41 | 201.78 | 940.07 |
| 201.97 | 940.06 | 203.53 | 939.91 | 212.03 | 939.06 | 213.07 | 938.92 | 222.09 | 937.82 |
| 224.37 | 937.63 | 232.15 | 937.06 | 235.66 | 936.97 | 242.21 | 936.87 | 246.95 | 936.77 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 252.27 | 936.68 | 262.33 | 936.81 | 269.55 | 937.12 | 272.38 | 937.26 | 280.83 | 937.62 |
| 282.44 | 937.7 | 292.13 | 938.02 | 292.5 | 938.03 | 295.52 | 938.05 | 302.56 | 938.12 |
| 312.62 | 938.01 | 314.73 | 937.95 | 322.68 | 937.62 | 326.01 | 937.4 | 332.74 | 937.05 |
| 337.31 | 936.92 | 342.8 | 936.84 | 352.86 | 936.93 | 359.9 | 937.07 | 371.2 | 937.34 |
| 382.49 | 937.59 | 393.1 | 937.79 | 393.78 | 937.8 | 403.16 | 937.89 | 405.08 | 937.9 |
| 413.22 | 937.93 | 416.38 | 937.93 | 423.28 | 937.95 | 427.66 | 937.95 | 433.34 | 937.97 |
| 438.96 | 937.94 | 443.4 | 937.94 | 450.26 | 937.86 | 453.46 | 937.84 | 463.52 | 937.69 |
| 472.84 | 937.52 | 473.58 | 937.5 | 479.52 | 937.41 | 483.64 | 937.36 | 484.14 | 937.37 |
| 493.7 | 937.47 | 495.44 | 937.62 | 503.76 | 938.29 | 506.73 | 938.47 | 513.81 | 938.99 |
| 518.02 | 939.02 | 523.88 | 939.11 | 529.32 | 938.9 | 533.93 | 938.75 | 540.61 | 938.71 |
| 543.99 | 938.68 | 551.91 | 938.74 | 554.05 | 938.75 | 564.11 | 938.75 | 571.53 | 938.72 |
| 573.91 | 938.72 | 574.17 | 938.71 | 582.98 | 938.67 | 585.79 | 938.65 | 594.29 | 938.61 |
| 597.09 | 938.59 | 608.39 | 938.54 | 619.67 | 938.52 | 624.47 | 938.53 | 630.97 | 938.53 |
| 634.53 | 938.55 | 642.27 | 938.56 | 642.81 | 938.56 | 644.1 | 938.57 | 644.59 | 938.57 |
| 654.65 | 938.48 | 663.52 | 938.24 | 664.71 | 938.21 | 664.85 | 938.2 | 674.77 | 937.88 |
| 676.15 | 937.81 | 684.83 | 937.52 | 687.44 | 937.38 | 694.89 | 937.06 | 698.74 | 936.62 |
| 704.95 | 936.14 | 710.04 | 935.34 | 715.01 | 934.65 | 721.33 | 933.59 | 725.07 | 932.93 |
| 732.62 | 931.98 | 735.13 | 931.56 | 743.92 | 931.2 | 745.19 | 931.08 | 755.22 | 931.53 |
| 755.53 | 931.57 | 765.31 | 932.77 | 766.5 | 932.95 | 777.8 | 934.63 | 785.43 | 935.75 |
| 789.1 | 936.28 | 795.49 | 937.15 | 800.39 | 937.66 | 805.54 | 938.18 | 810.62 | 938.57 |
| 811.68 | 938.65 | 815.6 | 938.96 | 825.66 | 939.67 | 834.28 | 940.12 | 835.72 | 940.18 |
| 841.6 | 940.18 | 845.78 | 940.18 | 847.52 | 940.14 | 855.84 | 939.92 | 856.87 | 939.91 |
| 865.9 | 939.89 | 868.16 | 939.93 | 875.96 | 940.09 | 886.02 | 940.32 | 896.08 | 940.57 |
| 902.05 | 940.82 | 906.14 | 940.95 | 913.33 | 941.49 | 916.2 | 941.66 | 924.63 | 942.43 |
| 926.26 | 942.54 | 935.93 | 943.35 | 936.32 | 943.37 | 939.53 | 943.62 | 946.38 | 944.14 |
| 947.22 | 944.21 | 956.44 | 944.84 | 958.51 | 945.06 | 966.5 | 945.57 | 969.81 | 946.02 |
| 976.56 | 946.63 | 981.11 | 947.23 | 986.62 | 947.76 | 992.4 | 948.21 | 996.68 | 948.51 |
| 1003.69 | 948.48 | 1006.74 | 948.52 | 1014.99 | 948.04 | 1016.8 | 947.99 | 1026.28 | 946.79 |
| 1026.86 | 946.74 | 1036.92 | 945.16 | 1037.58 | 945.06 | 1046.98 | 943.94 | 1048.88 | 944 |
| 1057.04 | 944.09 | 1060.16 | 944.6 | 1067.09 | 945.16 | 1071.46 | 945.7 | 1077.15 | 946.16 |
| 1082.76 | 946.44 | 1087.21 | 946.63 | 1094.05 | 946.51 | 1097.27 | 946.48 | 1105.34 | 946.17 |
| 1107.33 | 946.13 | 1116.64 | 945.7 | 1117.39 | 945.69 | 1123.53 | 945.26 | 1127.45 | 944.97 |
| 1127.94 | 944.94 | 1137.51 | 945.14 | 1139.23 | 945.18 | 1147.57 | 945.59 | 1150.52 | 945.89 |
| 1157.63 | 946.5 | 1161.82 | 947.27 | 1167.69 | 948.36 | 1173.11 | 949.47 | 1177.75 | 950.45 |
| 1184.41 | 951.33 | 1187.81 | 951.81 | 1195.71 | 952.38 | 1197.87 | 952.55 | 1207.93 | 953.08 |
| 1215.52 | 953.43 | 1226.81 | 953.93 | 1228.05 | 953.99 | 1235.88 | 954.33 | 1238.11 | 954.43 |
| 1248.17 | 954.86 | 1252.17 | 955.01 | 1258.23 | 955.21 | 1263.47 | 955.34 | 1274.77 | 955.59 |
| 1278.35 | 955.66 | 1286.06 | 955.83 | 1288.41 | 955.89 | 1290.79 | 955.94 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 642.81 | .072 | 810.62 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 644.1 | 841.6 | 180.6 | 199.97 | 217.26 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 938.40 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.040 | 0.072 | |
| W.S. Elev (ft) | 938.30 | Reach Len. (ft) | 180.60 | 199.97 | 217.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 282.89 | 480.20 | |
| E.G. Slope (ft/ft) | 0.003566 | Area (sq ft) | 282.89 | 480.20 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 535.24 | 1304.76 | |
| Top Width (ft) | 504.93 | Top Width (ft) | 359.12 | 145.81 | |
| Vel Total (ft/s) | 2.41 | Avg. Vel. (ft/s) | 1.89 | 2.72 | |
| Max Chl Dpth (ft) | 7.22 | Hydr. Depth (ft) | 0.79 | 3.29 | |
| Conv. Total (cfs) | 30810.5 | Conv. (cfs) | 8962.6 | 21847.9 | |
| Length Wtd. (ft) | 191.56 | Wetted Per. (ft) | 359.35 | 146.70 | |
| Min Ch El (ft) | 931.08 | Shear (lb/sq ft) | 0.18 | 0.73 | |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.33 | 1.98 | |
| Frctn Loss (ft) | 0.99 | Cum Volume (acre-ft) | 73.42 | 87.99 | 88.84 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 78.31 | 36.23 | 107.91 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 939.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 939.31 | Reach Len. (ft) | 180.60 | 199.97 | 217.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 649.30 | |
| E.G. Slope (ft/ft) | 0.003155 | Area (sq ft) | | 649.30 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 176.52 | Top Width (ft) | | 176.52 | |
| Vel Total (ft/s) | 2.83 | Avg. Vel. (ft/s) | | 2.83 | |

| | | | | | |
|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 8.23 | Hydr. Depth (ft) | | 3.68 | |
| Conv. Total (cfs) | 32758.1 | Conv. (cfs) | | 32758.1 | |
| Length Wtd. (ft) | 197.91 | Wetted Per. (ft) | | 178.20 | |
| Min Ch El (ft) | 931.08 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.03 | |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | 12.77 | 113.34 | 16.27 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 6.14 | 38.57 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 939.40 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.040 | 0.072 | |
| W.S. Elev (ft) | 939.30 | Reach Len. (ft) | 180.60 | 199.97 | 217.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 78.13 | 646.19 | |
| E.G. Slope (ft/ft) | 0.002812 | Area (sq ft) | 78.13 | 646.19 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 111.05 | 1728.95 | |
| Top Width (ft) | 302.35 | Top Width (ft) | 126.08 | 176.27 | |
| Vel Total (ft/s) | 2.54 | Avg. Vel. (ft/s) | 1.42 | 2.68 | |
| Max Chl Dpth (ft) | 8.22 | Hydr. Depth (ft) | 0.62 | 3.67 | |
| Conv. Total (cfs) | 34695.5 | Conv. (cfs) | 2094.0 | 32601.5 | |
| Length Wtd. (ft) | 197.61 | Wetted Per. (ft) | 126.37 | 177.21 | |
| Min Ch El (ft) | 931.08 | Shear (lb/sq ft) | 0.11 | 0.64 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.15 | 1.71 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 26.22 | 97.13 | 33.64 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 15.79 | 37.09 | 25.05 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.549

INPUT
Description: Thalweg Sta. 824.03
Station Elevation Data num= 261

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 946.39 | 1.78 | 946.25 | 11.82 | 945.54 | 12.72 | 945.48 | 21.86 | 944.92 |
| 21.94 | 944.91 | 22.82 | 944.87 | 31.15 | 944.44 | 31.9 | 944.4 | 40.38 | 943.85 |
| 41.94 | 943.71 | 49.6 | 942.66 | 51.98 | 942.25 | 58.81 | 941.73 | 62.01 | 941.36 |
| 68.03 | 941.6 | 72.05 | 941.79 | 76.86 | 942.17 | 82.09 | 942.64 | 86.47 | 943.01 |
| 92.13 | 943.58 | 95.69 | 943.84 | 102.17 | 944.39 | 104.91 | 944.49 | 112.21 | 944.74 |
| 114.13 | 944.51 | 122.25 | 943.86 | 123.35 | 943.68 | 132.29 | 942.5 | 132.57 | 942.45 |
| 135.7 | 941.91 | 142.33 | 940.75 | 142.97 | 940.63 | 152.37 | 938.82 | 154 | 938.66 |
| 162.41 | 937.28 | 165.02 | 937.14 | 172.45 | 936.58 | 182.49 | 936.36 | 187.06 | 936.3 |
| 198.08 | 936.2 | 202.57 | 936.17 | 212.61 | 936.19 | 215.55 | 936.24 | 222.65 | 936.35 |
| 231.13 | 936.5 | 232.69 | 936.53 | 242.15 | 936.59 | 242.72 | 936.6 | 248.58 | 936.59 |
| 252.76 | 936.59 | 261.64 | 936.53 | 262.8 | 936.52 | 270.87 | 936.26 | 272.84 | 936.23 |
| 280.08 | 936.06 | 282.88 | 936.04 | 292.92 | 936.01 | 298.52 | 936.03 | 302.96 | 936.03 |
| 333.08 | 936.1 | 343.12 | 936.11 | 344.62 | 936.09 | 353.16 | 936.05 | 353.84 | 936.04 |
| 361.46 | 935.97 | 363.06 | 935.95 | 363.2 | 935.95 | 373.24 | 935.84 | 381.5 | 935.79 |
| 383.28 | 935.77 | 390.72 | 935.82 | 393.32 | 935.81 | 399.93 | 935.91 | 403.36 | 935.93 |
| 409.15 | 936.04 | 413.4 | 936.1 | 418.38 | 936.19 | 423.44 | 936.26 | 427.59 | 936.33 |
| 433.47 | 936.41 | 443.51 | 936.54 | 446.04 | 936.55 | 453.55 | 936.63 | 455.25 | 936.63 |
| 463.59 | 936.67 | 473.69 | 936.68 | 474.35 | 936.69 | 482.91 | 936.75 | 483.67 | 936.75 |
| 492.13 | 936.84 | 493.71 | 936.84 | 501.35 | 936.89 | 503.75 | 936.91 | 510.57 | 936.92 |
| 513.79 | 936.93 | 519.78 | 936.91 | 523.83 | 936.91 | 529.01 | 936.85 | 538.23 | 936.72 |
| 543.91 | 936.61 | 547.44 | 936.64 | 553.95 | 936.78 | 556.67 | 936.9 | 563.99 | 937.3 |
| 565.89 | 937.34 | 574.03 | 937.47 | 584.07 | 937.37 | 584.33 | 937.37 | 587.22 | 937.35 |
| 593.54 | 937.29 | 594.11 | 937.28 | 594.78 | 937.28 | 604.15 | 937.22 | 611.99 | 937.22 |
| 614.19 | 937.21 | 621.2 | 937.29 | 624.23 | 937.32 | 634.26 | 937.51 | 639.65 | 937.59 |
| 644.3 | 937.67 | 648.86 | 937.68 | 654.34 | 937.71 | 658.08 | 937.67 | 664.38 | 937.63 |
| 671.3 | 937.56 | 674.42 | 937.52 | 684.46 | 937.43 | 685.74 | 937.42 | 694.5 | 937.37 |
| 694.96 | 937.37 | 704.18 | 937.34 | 704.54 | 937.34 | 713.4 | 937.35 | 714.12 | 937.35 |
| 714.58 | 937.35 | 716 | 937.34 | 724.62 | 937.36 | 741.05 | 937.35 | 744.7 | 937.34 |
| 754.74 | 937.19 | 764.78 | 936.93 | 768.71 | 936.82 | 774.82 | 936.63 | 784.86 | 936.28 |
| 787.16 | 936.15 | 794.9 | 935.7 | 796.37 | 935.47 | 804.94 | 934 | 805.59 | 933.87 |
| 814.82 | 932.01 | 814.98 | 931.98 | 824.03 | 930.73 | 825.02 | 930.62 | 835.05 | 933.12 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 842.47 | 935.59 | 845.09 | 936.44 | 847.5 | 937.273 | 851.69 | 938.72 | 860.91 | 941.69 |
| 865.17 | 942.94 | 870.13 | 943.76 | 875.21 | 944.14 | 882.63 | 944.12 | 885.25 | 944.11 |
| 888.57 | 943.99 | 895.29 | 943.8 | 896.45 | 943.74 | 897.79 | 943.66 | 905.33 | 943.51 |
| 907.01 | 943.44 | 915.37 | 943.57 | 916.22 | 943.6 | 925.41 | 944.14 | 925.86 | 944.16 |
| 934.67 | 944.61 | 935.45 | 944.64 | 943.88 | 945.01 | 945.49 | 945.07 | 955.53 | 945.48 |
| 962.33 | 945.7 | 965.57 | 945.82 | 971.54 | 946.11 | 975.61 | 946.24 | 980.77 | 946.36 |
| 985.65 | 946.42 | 989.98 | 946.6 | 995.69 | 946.56 | 999.2 | 946.43 | 1005.73 | 946.21 |
| 1008.43 | 946.11 | 1015.77 | 945.73 | 1017.64 | 945.61 | 1025.81 | 945.28 | 1026.86 | 945.21 |
| 1035.85 | 944.77 | 1036.09 | 944.76 | 1038.74 | 944.55 | 1045.3 | 944.09 | 1045.88 | 944.07 |
| 1054.52 | 944.04 | 1055.92 | 943.99 | 1063.74 | 944.49 | 1065.96 | 944.57 | 1068.62 | 944.76 |
| 1076 | 945.21 | 1082.18 | 945.13 | 1086.04 | 945.44 | 1091.4 | 945.31 | 1096.08 | 945.95 |
| 1100.62 | 947 | 1106.12 | 948.1 | 1112.7 | 949.48 | 1119.05 | 950.88 | 1126.2 | 951.94 |
| 1128.28 | 952.14 | 1136.24 | 952.66 | 1137.49 | 952.73 | 1146.28 | 953.11 | 1155.94 | 953.43 |
| 1156.32 | 953.45 | 1165.15 | 953.6 | 1166.36 | 953.63 | 1174.37 | 953.53 | 1176.4 | 953.57 |
| 1183.6 | 953.44 | 1186.44 | 953.41 | 1192.81 | 953.36 | 1196.48 | 953.26 | 1202.03 | 953.24 |
| 1206.52 | 953.14 | 1220.47 | 953.06 | 1226.6 | 953.04 | 1236.63 | 953.03 | 1238.91 | 953.04 |
| 1246.67 | 953.03 | 1248.13 | 953.04 | 1256.71 | 953.06 | 1257.35 | 953.07 | 1264.5 | 953.12 |
| 1266.57 | 953.13 | 1266.75 | 953.13 | 1276.79 | 953.23 | 1285.01 | 953.33 | 1286.83 | 953.36 |
| 1294.23 | 953.45 | 1296.87 | 953.49 | 1306.91 | 953.6 | 1312.66 | 953.64 | 1316.95 | 953.68 |
| 1326.99 | 953.7 | 1337.03 | 953.65 | 1340.32 | 953.62 | 1347.07 | 953.59 | 1349.55 | 953.57 |
| 1357.11 | 953.55 | 1367.15 | 953.56 | 1367.98 | 953.57 | 1377.19 | 953.67 | 1377.38 | 953.68 |
| 1381.27 | 953.83 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 714.12 | .072 | 896.45 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 744.7 | 847.5 | 205.16 | 199.99 | 208.74 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 937.40 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.040 | 0.072 | |
| W.S. Elev (ft) | 937.24 | Reach Len. (ft) | 205.16 | 199.99 | 208.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 347.30 | 233.07 | |
| E.G. Slope (ft/ft) | 0.008210 | Area (sq ft) | 347.30 | 233.07 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1062.28 | 777.72 | |
| Top Width (ft) | 513.14 | Top Width (ft) | 416.81 | 96.33 | |
| Vel Total (ft/s) | 3.17 | Avg. Vel. (ft/s) | 3.06 | 3.34 | |
| Max Chl Dpth (ft) | 6.62 | Hydr. Depth (ft) | 0.83 | 2.42 | |
| Conv. Total (cfs) | 20306.9 | Conv. (cfs) | 11723.7 | 8583.2 | |
| Length Wtd. (ft) | 202.24 | Wetted Per. (ft) | 416.87 | 97.77 | |
| Min Ch El (ft) | 930.62 | Shear (lb/sq ft) | 0.43 | 1.22 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 1.31 | 4.08 | |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | 72.11 | 86.36 | 88.84 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 76.71 | 35.67 | 107.91 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 938.37 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | 0.043 | 0.072 | |
| W.S. Elev (ft) | 938.09 | Reach Len. (ft) | 205.16 | 199.99 | 208.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 137.78 | 319.64 | |
| E.G. Slope (ft/ft) | 0.010935 | Area (sq ft) | 137.78 | 319.64 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 391.73 | 1448.27 | |
| Top Width (ft) | 297.18 | Top Width (ft) | 194.38 | 102.80 | |
| Vel Total (ft/s) | 4.02 | Avg. Vel. (ft/s) | 2.84 | 4.53 | |
| Max Chl Dpth (ft) | 7.47 | Hydr. Depth (ft) | 0.71 | 3.11 | |
| Conv. Total (cfs) | 17596.1 | Conv. (cfs) | 3746.2 | 13849.9 | |
| Length Wtd. (ft) | 200.54 | Wetted Per. (ft) | 195.79 | 105.07 | |
| Min Ch El (ft) | 930.62 | Shear (lb/sq ft) | 0.48 | 2.08 | |
| Alpha | 1.10 | Stream Power (lb/ft s) | 1.37 | 9.41 | |
| Frctn Loss (ft) | 1.57 | Cum Volume (acre-ft) | 12.48 | 111.11 | 16.27 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.74 | 37.93 | 8.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 938.38 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.044 | 0.072 | 0.072 |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 938.08 | Reach Len. (ft) | 205.16 | 199.99 | 208.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 120.56 | 318.68 | 0.94 |
| E.G. Slope (ft/ft) | 0.011745 | Area (sq ft) | 120.56 | 318.68 | 0.94 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 337.61 | 1501.28 | 1.11 |
| Top Width (ft) | 285.85 | Top Width (ft) | 180.71 | 102.80 | 2.34 |
| Vel Total (ft/s) | 4.18 | Avg. Vel. (ft/s) | 2.80 | 4.71 | 1.18 |
| Max Chl Dpth (ft) | 7.46 | Hydr. Depth (ft) | 0.67 | 3.10 | 0.40 |
| Conv. Total (cfs) | 16978.6 | Conv. (cfs) | 3115.3 | 13853.0 | 10.2 |
| Length Wtd. (ft) | 200.50 | Wetted Per. (ft) | 181.50 | 104.25 | 2.47 |
| Min Ch El (ft) | 930.62 | Shear (lb/sq ft) | 0.49 | 2.24 | 0.28 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 1.36 | 10.56 | 0.33 |
| Frctn Loss (ft) | 1.59 | Cum Volume (acre-ft) | 25.81 | 94.91 | 33.63 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 15.15 | 36.45 | 25.04 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.511

INPUT
Description: Thalweg Sta. 648.12
Station Elevation Data num= 243

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 941.66 | .66 | 941.65 | 2.23 | 941.59 | 9.35 | 941.21 | 10.62 | 941.13 |
| 19.01 | 940.53 | 21.14 | 940.32 | 27.4 | 939.57 | 31.38 | 939.08 | 35.78 | 938.51 |
| 41.62 | 937.67 | 50.77 | 936.41 | 51.86 | 936.28 | 55.71 | 935.88 | 60.94 | 935.31 |
| 62.1 | 935.19 | 69.33 | 934.7 | 72.34 | 934.47 | 77.72 | 934.45 | 82.58 | 934.42 |
| 86.11 | 934.59 | 92.82 | 934.93 | 102.88 | 935.17 | 103.07 | 935.17 | 119.67 | 935.19 |
| 123.55 | 935.22 | 128.05 | 935.23 | 133.79 | 935.27 | 136.44 | 935.28 | 144.03 | 935.32 |
| 144.83 | 935.32 | 153.22 | 935.29 | 154.27 | 935.28 | 169.99 | 935.1 | 184.99 | 935.01 |
| 186.77 | 935.01 | 194.79 | 934.96 | 195.24 | 934.96 | 205.48 | 934.8 | 211.93 | 934.68 |
| 220.32 | 934.57 | 225.96 | 934.55 | 236.2 | 934.67 | 237.1 | 934.69 | 246.44 | 934.87 |
| 247.94 | 934.91 | 256.68 | 935.12 | 266.92 | 935.4 | 270.65 | 935.51 | 287.37 | 935.96 |
| 287.52 | 935.97 | 295.81 | 936.12 | 297.65 | 936.15 | 307.89 | 936.17 | 318.13 | 936.1 |
| 326.8 | 936 | 328.37 | 935.99 | 329.36 | 935.98 | 337.75 | 935.87 | 338.61 | 935.87 |
| 346.14 | 935.8 | 348.85 | 935.78 | 354.54 | 935.78 | 359.09 | 935.77 | 362.92 | 935.8 |
| 369.33 | 935.82 | 371.31 | 935.85 | 379.57 | 935.88 | 380.24 | 935.88 | 388.09 | 935.9 |
| 413.25 | 935.9 | 420.54 | 935.91 | 421.63 | 935.91 | 426.6 | 935.92 | 451.26 | 935.94 |
| 461.5 | 936.01 | 463.57 | 936.05 | 471.74 | 936.23 | 472.96 | 936.31 | 480.36 | 936.78 |
| 481.99 | 936.89 | 488.75 | 937.53 | 492.23 | 937.85 | 505.52 | 939.12 | 512.71 | 939.9 |
| 522.29 | 940.73 | 522.95 | 940.79 | 530.68 | 940.86 | 533.19 | 940.84 | 539.07 | 939.81 |
| 543.43 | 939.11 | 553.67 | 936.89 | 555.84 | 936.8 | 555.89 | 936.8 | 563.91 | 936.29 |
| 564.23 | 936.29 | 565.69 | 936.28 | 574.16 | 936.21 | 584.4 | 936.08 | 587.93 | 936 |
| 589.39 | 935.97 | 594.64 | 935.85 | 597.79 | 935.73 | 604.88 | 935.43 | 606.18 | 935.32 |
| 612.05 | 934.76 | 614.57 | 934.51 | 615.12 | 934.45 | 622.96 | 933.46 | 625.36 | 933.14 |
| 631.34 | 932.29 | 635.6 | 931.65 | 639.73 | 930.84 | 645.84 | 929.66 | 648.12 | 929.6 |
| 656.08 | 929.97 | 656.5 | 930.01 | 658.41 | 930.23 | 664.89 | 930.94 | 666.32 | 931.11 |
| 673.28 | 931.52 | 676.57 | 931.72 | 686.81 | 932.01 | 697.05 | 932.68 | 698.44 | 932.88 |
| 706.83 | 934.02 | 715.23 | 935.12 | 717.53 | 935.37 | 721.05 | 935.58 | 723.61 | 935.74 |
| 727.77 | 935.94 | 728.45 | 935.97 | 732 | 936.1 | 738.01 | 936.31 | 740.39 | 936.4 |
| 748.25 | 936.67 | 748.78 | 936.68 | 751.13 | 936.76 | 757.16 | 936.95 | 758.49 | 936.99 |
| 765.55 | 937.17 | 768.74 | 937.26 | 778.98 | 937.5 | 782.33 | 937.57 | 789.22 | 937.73 |
| 790.71 | 937.76 | 797.49 | 937.94 | 799.1 | 937.99 | 799.46 | 938 | 807.49 | 938.33 |
| 809.7 | 938.46 | 815.88 | 938.91 | 819.94 | 939.27 | 824.26 | 939.58 | 830.18 | 940.05 |
| 832.66 | 940.14 | 840.42 | 940.49 | 841.05 | 940.5 | 843.85 | 940.37 | 849.44 | 939.99 |
| 850.66 | 939.85 | 857.82 | 939.38 | 860.91 | 939.07 | 866.21 | 939.06 | 871.15 | 938.89 |
| 874.6 | 939.46 | 881.39 | 940.22 | 882.98 | 940.72 | 890.21 | 942.63 | 891.37 | 942.96 |
| 891.63 | 943 | 899.76 | 944.9 | 901.87 | 945.39 | 908.15 | 946.68 | 912.11 | 947.63 |
| 916.54 | 947.97 | 922.35 | 949.6 | 924.92 | 949.67 | 932.59 | 949.92 | 936.58 | 949.81 |
| 941.7 | 949.65 | 942.83 | 949.55 | 950.1 | 949.09 | 953.07 | 948.76 | 958.48 | 948.45 |
| 963.32 | 948.05 | 966.87 | 947.84 | 973.56 | 947.38 | 975.26 | 947.28 | 982.94 | 946.72 |
| 983.65 | 946.67 | 983.8 | 946.66 | 992.03 | 945.79 | 994.04 | 945.56 | 1000.42 | 944.72 |
| 1004.28 | 945.16 | 1008.81 | 945.78 | 1014.52 | 946.52 | 1017.19 | 946.95 | 1024.76 | 948.21 |
| 1025.58 | 948.34 | 1029.3 | 948.95 | 1033.97 | 949.74 | 1035 | 949.9 | 1042.36 | 950.63 |
| 1045.24 | 950.9 | 1050.74 | 951.07 | 1055.49 | 951.18 | 1059.13 | 951.24 | 1065.73 | 951.28 |
| 1067.52 | 951.32 | 1075.66 | 951.41 | 1075.92 | 951.42 | 1084.31 | 951.55 | 1086.21 | 951.57 |
| 1092.69 | 951.6 | 1096.45 | 951.6 | 1101.08 | 951.56 | 1106.69 | 951.5 | 1109.47 | 951.48 |
| 1116.93 | 951.38 | 1117.85 | 951.38 | 1122.02 | 951.33 | 1127.17 | 951.28 | 1128.64 | 951.26 |
| 1141.78 | 951.22 | 1157.9 | 951.26 | 1159.79 | 951.27 | 1168.14 | 951.33 | 1168.38 | 951.34 |
| 1176.57 | 951.4 | 1178.38 | 951.42 | 1184.95 | 951.46 | 1188.62 | 951.47 | 1193.35 | 951.51 |
| 1198.86 | 951.51 | 1201.74 | 951.54 | 1209.1 | 951.59 | 1210.13 | 951.61 | 1219.34 | 951.73 |
| 1226.9 | 951.81 | 1229.58 | 951.85 | 1232.57 | 951.84 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 555.89 | .072 | 728.45 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 587.93 | 721.05 | 195.2 | 200 | 206.28 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 936.10 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.040 | 0.072 | 0.072 |
| W.S. Elev (ft) | 935.96 | Reach Len. (ft) | 195.20 | 200.00 | 206.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 221.94 | 412.13 | 1.29 |
| E.G. Slope (ft/ft) | 0.005151 | Area (sq ft) | 221.94 | 412.13 | 1.29 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 535.68 | 1303.72 | 0.60 |
| Top Width (ft) | 494.75 | Top Width (ft) | 356.22 | 131.31 | 7.22 |
| Vel Total (ft/s) | 2.90 | Avg. Vel. (ft/s) | 2.41 | 3.16 | 0.47 |
| Max Chl Dpth (ft) | 6.36 | Hydr. Depth (ft) | 0.62 | 3.14 | 0.18 |
| Conv. Total (cfs) | 25637.1 | Conv. (cfs) | 7463.7 | 18165.0 | 8.4 |
| Length Wtd. (ft) | 199.34 | Wetted Per. (ft) | 356.33 | 132.05 | 7.23 |
| Min Ch El (ft) | 929.60 | Shear (lb/sq ft) | 0.20 | 1.00 | 0.06 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.48 | 3.17 | 0.03 |
| Frctn Loss (ft) | 1.59 | Cum Volume (acre-ft) | 70.77 | 84.88 | 88.84 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 74.88 | 35.15 | 107.89 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 936.78 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 936.56 | Reach Len. (ft) | 195.20 | 200.00 | 206.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 492.24 | |
| E.G. Slope (ft/ft) | 0.005869 | Area (sq ft) | | 492.24 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 133.12 | Top Width (ft) | | 133.12 | |
| Vel Total (ft/s) | 3.74 | Avg. Vel. (ft/s) | | 3.74 | |
| Max Chl Dpth (ft) | 6.96 | Hydr. Depth (ft) | | 3.70 | |
| Conv. Total (cfs) | 24017.2 | Conv. (cfs) | | 24017.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 135.41 | |
| Min Ch El (ft) | 929.60 | Shear (lb/sq ft) | | 1.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.98 | |
| Frctn Loss (ft) | 1.65 | Cum Volume (acre-ft) | 12.16 | 109.25 | 16.27 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.28 | 37.39 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 936.76 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.072 | 0.072 | 0.058 |
| W.S. Elev (ft) | 936.55 | Reach Len. (ft) | 195.20 | 200.00 | 206.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 9.54 | 490.41 | 7.47 |
| E.G. Slope (ft/ft) | 0.005736 | Area (sq ft) | 9.54 | 490.41 | 7.47 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 7.25 | 1821.59 | 11.16 |
| Top Width (ft) | 172.18 | Top Width (ft) | 28.11 | 133.12 | 10.95 |
| Vel Total (ft/s) | 3.63 | Avg. Vel. (ft/s) | 0.76 | 3.71 | 1.49 |
| Max Chl Dpth (ft) | 6.95 | Hydr. Depth (ft) | 0.34 | 3.68 | 0.68 |
| Conv. Total (cfs) | 24295.5 | Conv. (cfs) | 95.7 | 24052.3 | 147.4 |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | 28.12 | 133.86 | 11.41 |
| Min Ch El (ft) | 929.60 | Shear (lb/sq ft) | 0.12 | 1.31 | 0.23 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.09 | 4.87 | 0.35 |
| Frctn Loss (ft) | 1.60 | Cum Volume (acre-ft) | 25.50 | 93.05 | 33.61 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.66 | 35.91 | 25.01 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.473

INPUT
Description: Thalweg Sta. 766.41
Station Elevation Data num= 259

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 942.12 | 2.22 | 941.86 | 8.75 | 940.84 | 12.69 | 940.41 | 16.74 | 939.88 |
| 23.15 | 939.3 | 32.73 | 939.07 | 33.62 | 939.03 | 40.72 | 939.16 | 44.09 | 939.12 |
| 48.72 | 939.38 | 54.56 | 939.48 | 56.71 | 939.63 | 63.66 | 939.81 | 65.03 | 939.85 |
| 65.65 | 939.82 | 75.49 | 939.52 | 80.8 | 939.02 | 85.96 | 938.49 | 95.97 | 937.41 |
| 96.43 | 937.34 | 97.47 | 937.25 | 104.67 | 936.66 | 106.9 | 936.55 | 112.67 | 936.14 |
| 117.37 | 935.9 | 126.29 | 935.6 | 127.84 | 935.53 | 136.64 | 935.46 | 138.31 | 935.46 |
| 148.78 | 935.48 | 159.24 | 935.47 | 168.62 | 935.41 | 169.71 | 935.41 | 180.18 | 935.32 |
| 184.61 | 935.21 | 190.65 | 935 | 192.61 | 934.88 | 198.91 | 934.54 | 200.59 | 934.44 |
| 208.59 | 934.13 | 211.58 | 934.03 | 216.58 | 934.15 | 222.05 | 934.22 | 224.57 | 934.29 |
| 232.52 | 934.44 | 232.72 | 934.44 | 240.56 | 934.52 | 248.56 | 934.59 | 256.55 | 934.64 |
| 264.54 | 934.64 | 266.53 | 934.62 | 274.4 | 934.57 | 284.86 | 934.47 | 295.33 | 934.42 |
| 296.51 | 934.42 | 304.51 | 934.4 | 305.8 | 934.4 | 312.5 | 934.35 | 316.27 | 934.31 |
| 320.5 | 934.18 | 326.74 | 933.94 | 328.5 | 933.83 | 334.16 | 933.45 | 337.2 | 933.24 |
| 344.48 | 932.9 | 347.67 | 932.79 | 352.47 | 932.84 | 358.14 | 932.94 | 360.46 | 933.02 |
| 367.97 | 933.3 | 368.61 | 933.33 | 376.45 | 933.55 | 384.45 | 933.74 | 389.54 | 933.82 |
| 392.44 | 933.93 | 400.01 | 934.14 | 400.43 | 934.15 | 410.48 | 934.45 | 420.95 | 934.66 |
| 429.54 | 934.78 | 431.42 | 934.81 | 432.4 | 934.82 | 435.6 | 934.83 | 441.89 | 934.87 |
| 448.39 | 934.88 | 456.39 | 934.86 | 480.37 | 934.85 | 483.76 | 934.84 | 503.22 | 934.83 |
| 504.35 | 934.82 | 504.7 | 934.82 | 515.17 | 934.79 | 520.34 | 934.74 | 525.63 | 934.71 |
| 528.32 | 934.71 | 536.1 | 934.73 | 536.32 | 934.73 | 537.03 | 934.74 | 544.32 | 934.87 |
| 546.57 | 934.92 | 552.31 | 935.08 | 557.04 | 935.2 | 560.31 | 935.29 | 568.29 | 935.49 |
| 576.29 | 935.59 | 577.97 | 935.62 | 588.44 | 935.64 | 592.27 | 935.63 | 598.91 | 935.58 |
| 600.27 | 935.58 | 608.26 | 935.51 | 609.38 | 935.49 | 616.26 | 935.43 | 619.85 | 935.39 |
| 630.32 | 935.32 | 632.24 | 935.31 | 640.79 | 935.31 | 656.22 | 935.36 | 664.21 | 935.43 |
| 672.19 | 935.54 | 672.28 | 935.54 | 682.66 | 935.66 | 693.13 | 935.73 | 694.95 | 935.73 |
| 696.19 | 935.73 | 700.2 | 935.72 | 703.59 | 935.71 | 704.18 | 935.7 | 706.1 | 935.65 |
| 712.18 | 935.5 | 714.06 | 935.42 | 720.18 | 935.04 | 724.53 | 934.71 | 728.16 | 934.39 |
| 735 | 933.72 | 736.16 | 933.58 | 739.91 | 933.1 | 744.15 | 932.57 | 745.47 | 932.41 |
| 752.15 | 931.16 | 755.94 | 930.49 | 760.15 | 929.87 | 766.41 | 928.97 | 768.13 | 929.06 |
| 776.13 | 929.55 | 776.88 | 929.59 | 784.12 | 930.3 | 787.34 | 930.65 | 797.81 | 931.43 |
| 800.11 | 931.52 | 807.53 | 931.74 | 808.28 | 931.76 | 818.75 | 932.07 | 824.09 | 932.29 |
| 829.22 | 932.48 | 832.08 | 932.62 | 839.68 | 932.96 | 841.35 | 933.02 | 848.07 | 933.31 |
| 850.15 | 933.34 | 853.61 | 933.36 | 856.07 | 933.38 | 860.62 | 933.35 | 864.05 | 933.32 |
| 871.09 | 933.24 | 872.05 | 933.24 | 880.54 | 933.18 | 882.46 | 933.18 | 889.24 | 933.2 |
| 891.46 | 933.22 | 897.94 | 933.34 | 901.6 | 933.4 | 906.64 | 933.53 | 911.74 | 933.65 |
| 915.33 | 933.75 | 921.87 | 933.95 | 924.03 | 934.02 | 932.01 | 934.3 | 932.73 | 934.33 |
| 941.42 | 934.65 | 942.14 | 934.68 | 952.28 | 935.01 | 958.82 | 935.16 | 962.42 | 935.23 |
| 972.55 | 935.39 | 976.22 | 935.44 | 982.69 | 935.56 | 984.92 | 935.59 | 992.82 | 935.8 |
| 993.61 | 935.82 | 1002.31 | 936.09 | 1002.96 | 936.12 | 1011.01 | 936.36 | 1013.09 | 936.43 |
| 1023.23 | 936.8 | 1028.4 | 937.07 | 1033.37 | 937.3 | 1037.1 | 937.52 | 1043.5 | 937.87 |
| 1045.8 | 938.03 | 1053.64 | 938.6 | 1054.5 | 938.71 | 1059.68 | 939.3 | 1063.2 | 939.69 |
| 1063.77 | 939.75 | 1071.89 | 940.73 | 1073.91 | 940.92 | 1080.59 | 941.86 | 1084.05 | 942.27 |
| 1089.28 | 943.22 | 1094.18 | 943.98 | 1097.98 | 944.53 | 1104.32 | 945.4 | 1106.68 | 945.59 |
| 1114.45 | 946.6 | 1115.37 | 946.69 | 1120.98 | 947.21 | 1124.07 | 947.48 | 1124.59 | 947.53 |
| 1132.78 | 947.95 | 1134.72 | 948.06 | 1141.47 | 948.3 | 1144.86 | 948.47 | 1150.17 | 948.65 |
| 1154.99 | 948.87 | 1158.87 | 949.01 | 1165.13 | 949.31 | 1167.56 | 949.36 | 1175.27 | 949.68 |
| 1176.26 | 949.7 | 1184.96 | 949.86 | 1185.4 | 949.88 | 1193.65 | 949.93 | 1195.54 | 949.95 |
| 1202.35 | 949.95 | 1205.67 | 949.93 | 1211.06 | 949.82 | 1215.81 | 949.65 | 1219.75 | 949.47 |
| 1225.95 | 949.17 | 1228.45 | 949.11 | 1236.08 | 948.85 | 1237.15 | 948.85 | 1243.57 | 948.79 |
| 1246.22 | 948.76 | 1256.35 | 948.76 | 1263.24 | 948.69 | 1266.49 | 948.69 | 1271.93 | 948.56 |
| 1276.62 | 948.49 | 1280.63 | 948.33 | 1286.76 | 948.14 | 1289.34 | 947.94 | 1296.9 | 947.48 |
| 1298.03 | 947.38 | 1304.87 | 946.83 | 1307.03 | 946.66 | 1311.23 | 946.36 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 694.95 | .072 | 882.46 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 700.2 | 853.61 | 181.63 | 147 | 118.72 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 934.49 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | 0.040 | 0.072 | 0.045 |
| W.S. Elev (ft) | 934.20 | Reach Len. (ft) | 181.63 | 147.00 | 118.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 61.13 | 316.95 | 56.62 |
| E.G. Slope (ft/ft) | 0.013925 | Area (sq ft) | 61.13 | 316.95 | 56.62 |

| | | | | | |
|---|---|---|---|---|---|
| Q Total (cfs) | 1840.00 | Flow (cfs) | 213.79 | 1442.57 | 183.64 |
| Top Width (ft) | 295.52 | Top Width (ft) | 96.37 | 123.53 | 75.62 |
| Vel Total (ft/s) | 4.23 | Avg. Vel. (ft/s) | 3.50 | 4.55 | 3.24 |
| Max Chl Dpth (ft) | 5.23 | Hydr. Depth (ft) | 0.63 | 2.57 | 0.75 |
| Conv. Total (cfs) | 15592.4 | Conv. (cfs) | 1811.7 | 12224.5 | 1556.2 |
| Length Wtd. (ft) | 153.57 | Wetted Per. (ft) | 96.43 | 124.06 | 75.63 |
| Min Ch El (ft) | 928.97 | Shear (lb/sq ft) | 0.55 | 2.22 | 0.65 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 1.93 | 10.11 | 2.11 |
| Frctn Loss (ft) | 0.99 | Cum Volume (acre-ft) | 70.14 | 83.20 | 88.70 |
| C & E Loss (ft) | 0.10 | Cum SA (acres) | 73.87 | 34.57 | 107.69 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 935.12 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 934.77 | Reach Len. (ft) | 181.63 | 147.00 | 118.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 389.42 | |
| E.G. Slope (ft/ft) | 0.012376 | Area (sq ft) | | 389.42 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 129.93 | Top Width (ft) | | 129.93 | |
| Vel Total (ft/s) | 4.73 | Avg. Vel. (ft/s) | | 4.73 | |
| Max Chl Dpth (ft) | 5.80 | Hydr. Depth (ft) | | 3.00 | |
| Conv. Total (cfs) | 16539.5 | Conv. (cfs) | | 16539.5 | |
| Length Wtd. (ft) | 146.80 | Wetted Per. (ft) | | 131.90 | |
| Min Ch El (ft) | 928.97 | Shear (lb/sq ft) | | 2.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 10.78 | |
| Frctn Loss (ft) | 1.34 | Cum Volume (acre-ft) | 12.16 | 107.22 | 16.27 |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 5.28 | 36.79 | 8.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 935.15 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 934.81 | Reach Len. (ft) | 181.63 | 147.00 | 118.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 393.43 | |
| E.G. Slope (ft/ft) | 0.012014 | Area (sq ft) | | 393.43 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 130.34 | Top Width (ft) | | 130.34 | |
| Vel Total (ft/s) | 4.68 | Avg. Vel. (ft/s) | | 4.68 | |
| Max Chl Dpth (ft) | 5.84 | Hydr. Depth (ft) | | 3.02 | |
| Conv. Total (cfs) | 16787.2 | Conv. (cfs) | | 16787.2 | |
| Length Wtd. (ft) | 147.00 | Wetted Per. (ft) | | 132.34 | |
| Min Ch El (ft) | 928.97 | Shear (lb/sq ft) | | 2.23 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 10.43 | |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | 25.48 | 91.03 | 33.59 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 14.60 | 35.30 | 24.99 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.445

INPUT
Description: Thalweg Sta. 1281.82 - Upstream of Culver @ Sta. 2.438
Station Elevation Data num= 312

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 943.79 | .63 | 943.77 | 7.32 | 943.61 | 17.44 | 943.34 | 20.63 | 943.25 |
| 30.63 | 942.99 | 37.67 | 942.83 | 40.63 | 942.75 | 47.78 | 942.59 | 50.63 | 942.49 |
| 57.89 | 942.32 | 60.63 | 942.22 | 68.01 | 942.05 | 70.63 | 941.97 | 78.13 | 941.78 |
| 80.64 | 941.69 | 88.25 | 941.45 | 90.64 | 941.34 | 98.36 | 940.97 | 100.64 | 940.85 |
| 108.48 | 940.2 | 110.64 | 940.05 | 118.59 | 939.27 | 120.64 | 939.17 | 122.64 | 939.06 |
| 130.64 | 938.43 | 138.82 | 937.92 | 140.64 | 937.81 | 148.93 | 937.45 | 150.64 | 937.38 |
| 159.05 | 937.13 | 160.64 | 937.08 | 169.16 | 936.96 | 170.64 | 936.93 | 179.28 | 936.95 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 180.64 | 936.93 | 189.39 | 937.09 | 191.86 | 937.09 | 200.64 | 937.41 | 201.75 | 937.4 |
| 210.64 | 937.39 | 220.64 | 937.06 | 229.85 | 936.55 | 230.64 | 936.52 | 239.97 | 935.89 |
| 240.65 | 935.87 | 250.09 | 935.33 | 251.2 | 935.29 | 260.65 | 934.91 | 261.09 | 934.9 |
| 270.65 | 934.63 | 280.43 | 934.55 | 280.65 | 934.55 | 290.55 | 934.57 | 290.65 | 934.57 |
| 299.67 | 934.6 | 300.66 | 934.6 | 310.65 | 934.63 | 341.12 | 934.65 | 350.65 | 934.62 |
| 351.23 | 934.62 | 360.65 | 934.52 | 370.65 | 934.38 | 371.46 | 934.37 | 380.65 | 934.24 |
| 381.58 | 934.22 | 390.66 | 934.1 | 391.7 | 934.08 | 409.42 | 933.82 | 410.66 | 933.8 |
| 420.66 | 933.66 | 429.19 | 933.56 | 430.66 | 933.54 | 440.66 | 933.47 | 452.39 | 933.46 |
| 460.66 | 933.48 | 462.5 | 933.48 | 470.66 | 933.51 | 478.64 | 933.52 | 480.66 | 933.53 |
| 490.66 | 933.54 | 492.85 | 933.55 | 508.3 | 933.6 | 510.66 | 933.6 | 518.19 | 933.62 |
| 520.66 | 933.63 | 523.19 | 933.62 | 530.66 | 933.63 | 533.3 | 933.62 | 560.67 | 933.65 |
| 563.66 | 933.64 | 570.67 | 933.64 | 580.67 | 933.61 | 610.67 | 933.61 | 624.34 | 933.57 |
| 630.67 | 933.53 | 634.46 | 933.52 | 660.67 | 933.38 | 664.8 | 933.37 | 670.67 | 933.34 |
| 674.92 | 933.33 | 680.67 | 933.29 | 690.67 | 933.24 | 695.15 | 933.23 | 700.68 | 933.2 |
| 705.27 | 933.21 | 710.68 | 933.19 | 715.38 | 933.19 | 720.68 | 933.17 | 730.68 | 933.1 |
| 735.61 | 933.04 | 740.68 | 932.99 | 750.68 | 932.87 | 755.84 | 932.8 | 760.68 | 932.75 |
| 765.96 | 932.67 | 770.68 | 932.62 | 776.07 | 932.55 | 790.68 | 932.39 | 806.41 | 932.28 |
| 816.53 | 932.23 | 820.68 | 932.22 | 826.64 | 932.19 | 830.68 | 932.18 | 836.76 | 932.15 |
| 840.68 | 932.15 | 846.87 | 932.12 | 850.68 | 932.11 | 856.99 | 932.08 | 860.69 | 932.08 |
| 867.11 | 932.06 | 870.69 | 932.06 | 877.22 | 932.04 | 884.08 | 932.04 | 890.69 | 932.02 |
| 893.97 | 932.02 | 910.69 | 931.98 | 917.68 | 931.99 | 920.69 | 931.99 | 927.8 | 932.04 |
| 930.69 | 932.04 | 937.91 | 932.08 | 953.3 | 932.14 | 960.69 | 932.19 | 978.37 | 932.27 |
| 980.69 | 932.27 | 1000.69 | 932.38 | 1008.72 | 932.44 | 1010.7 | 932.45 | 1018.84 | 932.51 |
| 1020.7 | 932.52 | 1028.95 | 932.6 | 1030.7 | 932.61 | 1040.7 | 932.74 | 1049.18 | 932.89 |
| 1050.7 | 932.91 | 1059.29 | 933.06 | 1060.7 | 933.09 | 1069.41 | 933.24 | 1080.7 | 933.42 |
| 1089.64 | 933.54 | 1091.74 | 933.56 | 1100.7 | 933.67 | 1101.63 | 933.68 | 1110.7 | 933.81 |
| 1111.52 | 933.82 | 1121.4 | 933.97 | 1130.7 | 934.07 | 1140.21 | 934.08 | 1140.7 | 934.08 |
| 1150.32 | 934.05 | 1150.7 | 934.05 | 1160.44 | 934.01 | 1160.71 | 934.01 | 1170.56 | 933.93 |
| 1170.71 | 933.93 | 1170.85 | 933.92 | 1175.23 | 933.8 | 1180.71 | 933.66 | 1183.61 | 933.55 |
| 1190.71 | 933.3 | 1190.79 | 933.3 | 1200.71 | 933.05 | 1200.91 | 933.05 | 1203.03 | 933.01 |
| 1206.74 | 932.93 | 1210.71 | 932.85 | 1211.02 | 932.84 | 1220.71 | 932.55 | 1221.13 | 932.53 |
| 1230.71 | 932.03 | 1231.25 | 932 | 1241.36 | 931.53 | 1250.71 | 931.22 | 1251.48 | 931.19 |
| 1260.71 | 930.94 | 1270.71 | 930.26 | 1271.71 | 930.15 | 1276 | 928.48 | 1281.82 | 925.8 |
| 1290.71 | 925.8 | 1295 | 928.33 | 1300.71 | 929.55 | 1302.05 | 929.64 | 1310.72 | 930.16 |
| 1312.17 | 930.21 | 1340.72 | 930.54 | 1342.52 | 930.59 | 1350.72 | 930.75 | 1352.63 | 930.87 |
| 1360.72 | 931.26 | 1362.75 | 931.41 | 1370.72 | 931.87 | 1371.72 | 931.94 | 1372.86 | 932.01 |
| 1380.72 | 932.42 | 1382.98 | 932.53 | 1390.72 | 932.87 | 1393.09 | 932.91 | 1400.72 | 933.15 |
| 1403.2 | 933.15 | 1410.72 | 933.34 | 1413.32 | 933.33 | 1416.2 | 933.39 | 1420.72 | 933.48 |
| 1423.43 | 933.46 | 1430.72 | 933.55 | 1433.55 | 933.6 | 1440.72 | 933.77 | 1443.66 | 933.86 |
| 1453.78 | 934.22 | 1460.72 | 934.52 | 1463.9 | 934.7 | 1470.73 | 935.04 | 1474.02 | 935.21 |
| 1480.73 | 935.54 | 1484.13 | 935.65 | 1490.73 | 935.91 | 1494.24 | 935.99 | 1500.73 | 936.22 |
| 1504.36 | 936.3 | 1510.73 | 936.54 | 1514.47 | 936.69 | 1520.73 | 936.96 | 1524.59 | 937.12 |
| 1530.73 | 937.4 | 1534.7 | 937.59 | 1540.73 | 937.92 | 1544.82 | 938.25 | 1550.73 | 938.68 |
| 1554.93 | 939.16 | 1560.73 | 939.69 | 1565.05 | 940.32 | 1570.73 | 940.94 | 1575.16 | 941.51 |
| 1580.73 | 942.1 | 1585.27 | 942.57 | 1590.73 | 943.07 | 1595.39 | 943.61 | 1600.73 | 944.03 |
| 1610.73 | 944.63 | 1615.62 | 945.08 | 1620.74 | 945.35 | 1625.74 | 945.75 | 1630.74 | 946 |
| 1635.86 | 946.39 | 1640.5 | 946.54 | 1640.74 | 946.55 | 1645.97 | 946.44 | 1650.74 | 946.35 |
| 1656.09 | 945.66 | 1660.74 | 945.53 | 1666.2 | 945.4 | 1670.74 | 945.38 | 1676.31 | 945.54 |
| 1680.74 | 945.63 | 1686.43 | 945.93 | 1688.69 | 945.99 | 1690.74 | 946.05 | 1696.54 | 946.33 |
| 1700.74 | 946.45 | 1706.66 | 946.87 | 1710.74 | 947.02 | 1716.77 | 947.48 | 1720.74 | 947.68 |
| 1726.89 | 947.94 | 1730.74 | 948.03 | 1737 | 947.79 | 1740.74 | 947.77 | 1747.11 | 947.51 |
| 1750.74 | 947.44 | 1757.23 | 947.17 | 1760.74 | 947.11 | 1767.34 | 946.88 | 1770.74 | 946.86 |
| 1777.47 | 946.78 | 1780.75 | 946.8 | 1787.58 | 946.74 | 1790.75 | 946.77 | 1797.7 | 946.8 |
| 1800.75 | 946.85 | 1807.81 | 946.88 | 1810.75 | 946.88 | 1817.93 | 946.82 | 1820.75 | 946.81 |
| 1828.04 | 946.77 | 1830.75 | 946.76 | 1838.15 | 946.62 | 1840.75 | 946.61 | 1848.27 | 946.38 |
| 1850.75 | 946.36 | 1853.67 | 946.27 | | | | | | |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .04 | 1203.03 | .052 | 1206.74 | .072 | 1416.2 | .032 | 1640.5 | .04 |
| 1688.69 | .032 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1175.23 | 1371.72 | 67.66 | 68.25 | 62.48 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.40 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.040 | 0.072 | 0.072 |
| W.S. Elev (ft) | 933.32 | Reach Len. (ft) | 67.66 | 68.25 | 62.48 |
| Crit W.S. (ft) | 931.82 | Flow Area (sq ft) | 326.89 | 472.08 | 21.03 |
| E.G. Slope (ft/ft) | 0.003699 | Area (sq ft) | 326.89 | 472.08 | 21.03 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 648.33 | 1173.91 | 17.76 |
| Top Width (ft) | 616.99 | Top Width (ft) | 397.42 | 181.49 | 38.08 |
| Vel Total (ft/s) | 2.24 | Avg. Vel. (ft/s) | 1.98 | 2.49 | 0.84 |
| Max Chl Dpth (ft) | 7.52 | Hydr. Depth (ft) | 0.82 | 2.60 | 0.55 |
| Conv. Total (cfs) | 30254.1 | Conv. (cfs) | 10660.1 | 19301.9 | 292.0 |
| Length Wtd. (ft) | 68.25 | Wetted Per. (ft) | 397.43 | 183.34 | 38.11 |
| Min Ch El (ft) | 925.80 | Shear (lb/sq ft) | 0.19 | 0.59 | 0.13 |

| | | | | | |
|---|---|---|---|---|---|
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.38 | 1.48 | 0.11 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 69.33 | 81.87 | 88.60 |
| C & E Loss (ft) | | Cum SA (acres) | 72.84 | 34.05 | 107.54 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.70 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.040 | 0.072 | 0.072 |
| W.S. Elev (ft) | 933.51 | Reach Len. (ft) | 67.66 | 68.25 | 62.48 |
| Crit W.S. (ft) | 931.81 | Flow Area (sq ft) | 2.32 | 507.28 | 14.73 |
| E.G. Slope (ft/ft) | 0.007032 | Area (sq ft) | 2.32 | 507.28 | 14.73 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1.83 | 1810.08 | 28.09 |
| Top Width (ft) | 216.60 | Top Width (ft) | 17.93 | 186.92 | 11.76 |
| Vel Total (ft/s) | 3.51 | Avg. Vel. (ft/s) | 0.79 | 3.57 | 1.91 |
| Max Chl Dpth (ft) | 7.71 | Hydr. Depth (ft) | 0.13 | 2.71 | 1.25 |
| Conv. Total (cfs) | 21942.1 | Conv. (cfs) | 21.8 | 21585.3 | 334.9 |
| Length Wtd. (ft) | 68.25 | Wetted Per. (ft) | 18.20 | 188.77 | 12.73 |
| Min Ch El (ft) | 925.80 | Shear (lb/sq ft) | 0.06 | 1.18 | 0.51 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.04 | 4.21 | 0.97 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 12.15 | 105.71 | 16.25 |
| C & E Loss (ft) | | Cum SA (acres) | 5.24 | 36.25 | 8.11 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.76 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 933.56 | Reach Len. (ft) | 67.66 | 68.25 | 62.48 |
| Crit W.S. (ft) | 931.81 | Flow Area (sq ft) | | 517.13 | |
| E.G. Slope (ft/ft) | 0.006935 | Area (sq ft) | | 517.13 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 188.39 | Top Width (ft) | | 188.39 | |
| Vel Total (ft/s) | 3.56 | Avg. Vel. (ft/s) | | 3.56 | |
| Max Chl Dpth (ft) | 7.76 | Hydr. Depth (ft) | | 2.75 | |
| Conv. Total (cfs) | 22095.2 | Conv. (cfs) | | 22095.2 | |
| Length Wtd. (ft) | 68.25 | Wetted Per. (ft) | | 191.86 | |
| Min Ch El (ft) | 925.80 | Shear (lb/sq ft) | | 1.17 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.15 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 25.48 | 89.49 | 33.59 |
| C & E Loss (ft) | | Cum SA (acres) | 14.60 | 34.76 | 24.99 |

CULVERT

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.438

INPUT
Description:
Distance from Upstream XS = 12
Deck/Roadway Width = 50.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 258

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 942.92 | | .29 | 942.91 | | 6.98 | 942.7 | |
| 17.1 | 942.37 | | 20.29 | 942.26 | | 37.32 | 941.72 | |
| 47.44 | 941.38 | | 50.29 | 941.28 | | 57.55 | 941 | |
| 60.29 | 940.9 | | 67.67 | 940.6 | | 70.29 | 940.51 | |
| 77.79 | 940.21 | | 80.3 | 940.12 | | 87.91 | 939.81 | |
| 90.3 | 939.72 | | 98.02 | 939.39 | | 108.14 | 938.99 | |
| 110.3 | 938.9 | | 128.36 | 938.17 | | 130.3 | 938.1 | |
| 138.48 | 937.77 | | 148.59 | 937.38 | | 158.71 | 937.02 | |
| 168.82 | 936.71 | | 170.3 | 936.65 | | 178.94 | 936.42 | |
| 180.3 | 936.38 | | 189.05 | 936.14 | | 190.3 | 936.1 | |
| 200.3 | 935.83 | | 209.28 | 935.63 | | 210.3 | 935.61 | |
| 219.39 | 935.45 | | 220.3 | 935.43 | | 221.19 | 935.42 | |
| 249.75 | 935 | | 250.31 | 934.99 | | 259.86 | 934.86 | |
| 260.31 | 934.86 | | 269.98 | 934.74 | | 270.31 | 934.74 | |
| 280.09 | 934.63 | | 280.31 | 934.62 | | 290.2 | 934.51 | |
| 290.31 | 934.51 | | 300.31 | 934.39 | | 310.31 | 934.28 | |
| 310.43 | 934.27 | | 320.31 | 934.17 | | 320.55 | 934.17 | |
| 330.31 | 934.08 | | 330.66 | 934.08 | | 340.31 | 934.02 | |
| 340.78 | 934.02 | | 350.31 | 933.96 | | 350.89 | 933.96 | |
| 360.31 | 933.9 | | 361.01 | 933.9 | | 370.31 | 933.84 | |
| 371.12 | 933.84 | | 380.31 | 933.78 | | 381.23 | 933.77 | |
| 390.32 | 933.72 | | 391.36 | 933.71 | | 400.32 | 933.66 | |

| | | | | | |
|---|---|---|---|---|---|
| 401.47 | 933.66 | 410.32 | 933.61 | 411.59 | 933.6 |
| 420.32 | 933.56 | 421.7 | 933.55 | 438.74 | 933.46 |
| 440.32 | 933.46 | 441.93 | 933.45 | 450.32 | 933.41 |
| 452.05 | 933.41 | 460.32 | 933.38 | 462.16 | 933.38 |
| 470.32 | 933.35 | 472.27 | 933.35 | 480.32 | 933.33 |
| 482.39 | 933.33 | 490.32 | 933.31 | 492.5 | 933.31 |
| 527.74 | 933.27 | 530.32 | 933.27 | 532.96 | 933.26 |
| 543.09 | 933.25 | 550.33 | 933.23 | 553.2 | 933.23 |
| 563.31 | 933.22 | 583.54 | 933.15 | 650.33 | 932.77 |
| 654.34 | 932.74 | 660.33 | 932.71 | 664.46 | 932.68 |
| 670.33 | 932.65 | 674.57 | 932.62 | 694.8 | 932.52 |
| 704.93 | 932.49 | 710.34 | 932.46 | 730.34 | 932.39 |
| 810.34 | 932.15 | 820.34 | 932.13 | 826.3 | 932.13 |
| 830.34 | 932.12 | 834.29 | 932.12 | 846.53 | 932.14 |
| 856.65 | 932.15 | 860.35 | 932.16 | 863.96 | 932.16 |
| 876.88 | 932.18 | 887 | 932.2 | 897.11 | 932.21 |
| 900.35 | 932.22 | 907.23 | 932.23 | 910.35 | 932.24 |
| 917.34 | 932.25 | 937.57 | 932.27 | 940.35 | 932.28 |
| 957.8 | 932.31 | 967.91 | 932.34 | 970.35 | 932.34 |
| 988.14 | 932.4 | 998.26 | 932.44 | 1000.35 | 932.44 |
| 1008.38 | 932.47 | 1010.36 | 932.47 | 1018.49 | 932.5 |
| 1020.36 | 932.5 | 1028.61 | 932.54 | 1030.36 | 932.54 |
| 1038.72 | 932.58 | 1040.36 | 932.58 | 1048.84 | 932.63 |
| 1050.36 | 932.63 | 1058.95 | 932.68 | 1060.36 | 932.68 |
| 1069.07 | 932.7 | 1080.36 | 932.69 | 1081.51 | 932.68 |
| 1099.41 | 932.59 | 1100.36 | 932.59 | 1109.52 | 932.54 |
| 1110.36 | 932.54 | 1119.64 | 932.49 | 1120.36 | 932.49 |
| 1129.75 | 932.46 | 1130.36 | 932.46 | 1139.87 | 932.44 |
| 1140.36 | 932.43 | 1149.98 | 932.42 | 1150.36 | 932.41 |
| 1160.11 | 932.38 | 1160.4 | 932.38 | 1170.22 | 932.34 |
| 1170.37 | 932.34 | 1180.33 | 932.28 | 1180.4 | 932.28 |
| 1190.37 | 932.18 | 1190.45 | 932.18 | 1200.37 | 932.02 |
| 1200.56 | 932.02 | 1210.37 | 931.82 | 1210.68 | 931.81 |
| 1220.37 | 931.59 | 1220.79 | 931.57 | 1230.37 | 931.35 |
| 1230.91 | 931.34 | 1240.37 | 931.11 | 1241.02 | 931.09 |
| 1250.37 | 930.82 | 1251.14 | 930.79 | 1260.37 | 930.53 |
| 1261.25 | 930.5 | 1270.37 | 930.28 | 1271.36 | 930.27 |
| 1280.37 | 930.15 | 1281.48 | 930.15 | 1290.37 | 930.08 |
| 1291.59 | 930.08 | 1300.38 | 930.04 | 1301.72 | 930.05 |
| 1310.38 | 930.05 | 1311.83 | 930.06 | 1320.38 | 930.1 |
| 1330.38 | 930.17 | 1332.06 | 930.2 | 1340.38 | 930.4 |
| 1342.18 | 930.45 | 1358.4 | 931.01 | 1360.38 | 931.06 |
| 1362.45 | 931.13 | 1368.29 | 931.32 | 1370.38 | 931.38 |
| 1380.38 | 931.78 | 1390.38 | 932.25 | 1392.75 | 932.37 |
| 1407.84 | 933.11 | 1410.38 | 933.24 | 1420.38 | 933.73 |
| 1427.62 | 934.07 | 1430.38 | 934.19 | 1447.39 | 934.97 |
| 1450.38 | 935.1 | 1457.29 | 935.43 | 1460.39 | 935.57 |
| 1463.56 | 935.72 | 1470.39 | 936.03 | 1473.67 | 936.19 |
| 1480.39 | 936.5 | 1483.79 | 936.67 | 1504.02 | 937.62 |
| 1510.39 | 937.91 | 1514.13 | 938.09 | 1520.39 | 938.37 |
| 1524.25 | 938.55 | 1530.39 | 938.82 | 1534.36 | 939.02 |
| 1540.39 | 939.28 | 1544.47 | 939.49 | 1550.39 | 939.75 |
| 1554.59 | 939.95 | 1560.39 | 940.2 | 1564.7 | 940.42 |
| 1570.39 | 940.65 | 1575.95 | 940.86 | 1580.39 | 941.06 |
| 1600.39 | 941.84 | 1610.4 | 942.22 | 1620.4 | 942.58 |
| 1630.4 | 942.88 | 1635.51 | 943 | 1640.4 | 943.1 |
| 1655.06 | 943.37 | 1675.97 | 943.72 | 1680.4 | 943.81 |
| 1686.09 | 943.9 | 1690.4 | 943.99 | 1704.51 | 944.22 |
| 1716.43 | 944.39 | 1720.4 | 944.44 | 1726.54 | 944.53 |
| 1730.4 | 944.58 | 1734.17 | 944.62 | 1756.89 | 944.92 |
| 1760.4 | 944.96 | 1767.01 | 945.05 | 1783.62 | 945.26 |
| 1797.36 | 945.46 | 1800.41 | 945.5 | 1807.47 | 945.62 |
| 1810.41 | 945.66 | 1830.41 | 945.96 | 1837.81 | 946.06 |
| 1847.93 | 946.21 | 1850.41 | 946.24 | 1853.67 | 946.29 |

Upstream Bridge Cross Section Data
Station Elevation Data num= 312

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 943.79 | .63 | 943.77 | 7.32 | 943.61 | 17.44 | 943.34 | 20.63 | 943.25 |
| 30.63 | 942.99 | 37.67 | 942.83 | 40.63 | 942.75 | 47.78 | 942.59 | 50.63 | 942.49 |
| 57.89 | 942.32 | 60.63 | 942.22 | 68.01 | 942.05 | 70.63 | 941.97 | 78.13 | 941.78 |
| 80.64 | 941.69 | 88.25 | 941.45 | 90.64 | 941.34 | 98.36 | 940.97 | 100.64 | 940.85 |
| 108.48 | 940.2 | 110.64 | 940.05 | 118.59 | 939.27 | 120.64 | 939.17 | 122.64 | 939.06 |
| 130.64 | 938.43 | 138.82 | 937.92 | 140.64 | 937.81 | 148.93 | 937.45 | 150.64 | 937.38 |
| 159.05 | 937.13 | 160.64 | 937.08 | 169.16 | 936.96 | 170.64 | 936.93 | 179.28 | 936.95 |
| 180.64 | 936.93 | 189.39 | 937.09 | 191.86 | 937.09 | 200.64 | 937.41 | 201.75 | 937.4 |
| 210.64 | 937.39 | 220.64 | 937.06 | 229.85 | 936.55 | 230.64 | 936.52 | 239.97 | 935.89 |
| 240.65 | 935.87 | 250.09 | 935.33 | 251.2 | 935.29 | 260.65 | 934.91 | 261.09 | 934.9 |
| 270.65 | 934.63 | 280.43 | 934.55 | 280.65 | 934.55 | 290.55 | 934.57 | 290.65 | 934.57 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 299.67 | 934.6 | 300.66 | 934.6 | 310.65 | 934.63 | 341.12 | 934.65 | 350.65 | 934.62 |
| 351.23 | 934.62 | 360.65 | 934.52 | 370.65 | 934.38 | 371.46 | 934.37 | 380.65 | 934.24 |
| 381.58 | 934.22 | 390.66 | 934.1 | 391.7 | 934.08 | 409.42 | 933.82 | 410.66 | 933.8 |
| 420.66 | 933.66 | 429.19 | 933.56 | 430.66 | 933.54 | 440.66 | 933.47 | 452.39 | 933.46 |
| 460.66 | 933.48 | 462.5 | 933.48 | 470.66 | 933.51 | 478.64 | 933.52 | 480.66 | 933.53 |
| 490.66 | 933.54 | 492.85 | 933.55 | 508.3 | 933.6 | 510.66 | 933.6 | 518.19 | 933.62 |
| 520.66 | 933.63 | 523.19 | 933.62 | 530.66 | 933.63 | 533.3 | 933.62 | 560.67 | 933.65 |
| 563.66 | 933.64 | 570.67 | 933.64 | 580.67 | 933.61 | 610.67 | 933.61 | 624.34 | 933.57 |
| 630.67 | 933.53 | 634.46 | 933.52 | 660.67 | 933.38 | 664.8 | 933.37 | 670.67 | 933.34 |
| 674.92 | 933.33 | 680.67 | 933.29 | 690.67 | 933.24 | 695.15 | 933.23 | 700.68 | 933.2 |
| 705.27 | 933.21 | 710.68 | 933.19 | 715.38 | 933.19 | 720.68 | 933.17 | 730.68 | 933.1 |
| 735.61 | 933.04 | 740.68 | 932.99 | 750.68 | 932.87 | 755.84 | 932.8 | 760.68 | 932.75 |
| 765.96 | 932.67 | 770.68 | 932.62 | 776.07 | 932.55 | 790.68 | 932.39 | 806.41 | 932.28 |
| 816.53 | 932.23 | 820.68 | 932.22 | 826.64 | 932.19 | 830.68 | 932.18 | 836.76 | 932.15 |
| 840.68 | 932.15 | 846.87 | 932.12 | 850.68 | 932.11 | 856.99 | 932.08 | 860.69 | 932.08 |
| 867.11 | 932.06 | 870.69 | 932.06 | 877.22 | 932.04 | 884.08 | 932.04 | 890.69 | 932.02 |
| 893.97 | 932.02 | 910.69 | 931.98 | 917.68 | 931.99 | 920.69 | 931.99 | 927.8 | 932.04 |
| 930.69 | 932.04 | 937.91 | 932.08 | 953.3 | 932.14 | 960.69 | 932.19 | 978.37 | 932.27 |
| 980.69 | 932.27 | 1000.69 | 932.38 | 1008.72 | 932.44 | 1010.7 | 932.45 | 1018.84 | 932.51 |
| 1020.7 | 932.52 | 1028.95 | 932.6 | 1030.7 | 932.61 | 1040.7 | 932.74 | 1049.18 | 932.89 |
| 1050.7 | 932.91 | 1059.29 | 933.06 | 1060.7 | 933.09 | 1069.41 | 933.24 | 1080.7 | 933.42 |
| 1089.64 | 933.54 | 1091.74 | 933.56 | 1100.7 | 933.67 | 1101.63 | 933.68 | 1110.7 | 933.81 |
| 1111.52 | 933.82 | 1121.4 | 933.97 | 1130.7 | 934.07 | 1140.21 | 934.08 | 1140.7 | 934.08 |
| 1150.32 | 934.05 | 1150.7 | 934.05 | 1160.44 | 934.01 | 1160.71 | 934.01 | 1170.56 | 933.93 |
| 1170.71 | 933.93 | 1170.85 | 933.92 | 1175.23 | 933.8 | 1180.71 | 933.66 | 1183.61 | 933.55 |
| 1190.71 | 933.3 | 1190.79 | 933.3 | 1200.71 | 933.05 | 1200.91 | 933.05 | 1203.03 | 933.01 |
| 1206.74 | 932.93 | 1210.71 | 932.85 | 1211.02 | 932.84 | 1220.71 | 932.55 | 1221.13 | 932.53 |
| 1230.71 | 932.03 | 1231.25 | 932 | 1241.36 | 931.53 | 1250.71 | 931.22 | 1251.48 | 931.19 |
| 1260.71 | 930.94 | 1270.71 | 930.26 | 1271.71 | 930.15 | 1276 | 928.48 | 1281.82 | 925.8 |
| 1290.71 | 925.8 | 1295 | 928.33 | 1300.71 | 929.55 | 1302.05 | 929.64 | 1310.72 | 930.16 |
| 1312.17 | 930.21 | 1340.72 | 930.54 | 1342.52 | 930.59 | 1350.72 | 930.75 | 1352.63 | 930.87 |
| 1360.72 | 931.26 | 1362.75 | 931.41 | 1370.72 | 931.87 | 1371.72 | 931.94 | 1372.86 | 932.01 |
| 1380.72 | 932.42 | 1382.98 | 932.53 | 1390.72 | 932.87 | 1393.09 | 932.91 | 1400.72 | 933.15 |
| 1403.2 | 933.15 | 1410.72 | 933.34 | 1413.32 | 933.33 | 1416.2 | 933.39 | 1420.72 | 933.48 |
| 1423.43 | 933.46 | 1430.72 | 933.55 | 1433.55 | 933.6 | 1440.72 | 933.77 | 1443.66 | 933.86 |
| 1453.78 | 934.22 | 1460.72 | 934.52 | 1463.9 | 934.7 | 1470.73 | 935.04 | 1474.02 | 935.21 |
| 1480.73 | 935.54 | 1484.13 | 935.65 | 1490.73 | 935.91 | 1494.24 | 935.99 | 1500.73 | 936.22 |
| 1504.36 | 936.3 | 1510.73 | 936.54 | 1514.47 | 936.69 | 1520.73 | 936.96 | 1524.59 | 937.12 |
| 1530.73 | 937.4 | 1534.7 | 937.59 | 1540.73 | 937.92 | 1544.82 | 938.25 | 1550.73 | 938.68 |
| 1554.93 | 939.16 | 1560.73 | 939.69 | 1565.05 | 940.32 | 1570.73 | 940.94 | 1575.16 | 941.51 |
| 1580.73 | 942.1 | 1585.27 | 942.57 | 1590.73 | 943.07 | 1595.39 | 943.61 | 1600.73 | 944.03 |
| 1610.73 | 944.63 | 1615.62 | 945.08 | 1620.74 | 945.35 | 1625.74 | 945.75 | 1630.74 | 946 |
| 1635.86 | 946.39 | 1640.5 | 946.54 | 1640.74 | 946.55 | 1645.97 | 946.44 | 1650.74 | 946.35 |
| 1656.09 | 945.66 | 1660.74 | 945.53 | 1666.2 | 945.4 | 1670.74 | 945.38 | 1676.31 | 945.54 |
| 1680.74 | 945.63 | 1686.43 | 945.93 | 1688.69 | 945.99 | 1690.74 | 946.05 | 1696.54 | 946.33 |
| 1700.74 | 946.45 | 1706.66 | 946.87 | 1710.74 | 947.02 | 1716.77 | 947.48 | 1720.74 | 947.68 |
| 1726.89 | 947.94 | 1730.74 | 948.03 | 1737 | 947.79 | 1740.74 | 947.77 | 1747.11 | 947.51 |
| 1750.74 | 947.44 | 1757.23 | 947.17 | 1760.74 | 947.11 | 1767.34 | 946.88 | 1770.74 | 946.86 |
| 1777.47 | 946.78 | 1780.75 | 946.8 | 1787.58 | 946.74 | 1790.75 | 946.77 | 1797.7 | 946.8 |
| 1800.75 | 946.85 | 1807.81 | 946.88 | 1810.75 | 946.88 | 1817.93 | 946.82 | 1820.75 | 946.81 |
| 1828.04 | 946.77 | 1830.75 | 946.76 | 1838.15 | 946.62 | 1840.75 | 946.61 | 1848.27 | 946.38 |
| 1850.75 | 946.36 | 1853.67 | 946.27 | | | | | | |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .04 | 1203.03 | .052 | 1206.74 | .072 | 1416.2 | .032 | 1640.5 | .04 |
| 1688.69 | .032 | | | | | | | | |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 1175.23 | 1371.72 | .3 | .5 |

Downstream Deck/Roadway Coordinates
num= 258

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 942.92 | | .29 | 942.91 | | 6.98 | 942.7 | |
| 17.1 | 942.37 | | 20.29 | 942.26 | | 37.32 | 941.72 | |
| 47.44 | 941.38 | | 50.29 | 941.28 | | 57.55 | 941 | |
| 60.29 | 940.9 | | 67.67 | 940.6 | | 70.29 | 940.51 | |
| 77.79 | 940.21 | | 80.3 | 940.12 | | 87.91 | 939.81 | |
| 90.3 | 939.72 | | 98.02 | 939.39 | | 108.14 | 938.99 | |
| 110.3 | 938.9 | | 128.36 | 938.17 | | 130.3 | 938.1 | |
| 138.48 | 937.77 | | 148.59 | 937.38 | | 158.71 | 937.02 | |
| 168.82 | 936.71 | | 170.3 | 936.65 | | 178.94 | 936.42 | |
| 180.3 | 936.38 | | 189.05 | 936.14 | | 190.3 | 936.1 | |
| 200.3 | 935.83 | | 209.28 | 935.63 | | 210.3 | 935.61 | |
| 219.39 | 935.45 | | 220.3 | 935.43 | | 221.19 | 935.42 | |
| 249.75 | 935 | | 250.31 | 934.99 | | 259.86 | 934.86 | |
| 260.31 | 934.86 | | 269.98 | 934.74 | | 270.31 | 934.74 | |
| 280.09 | 934.63 | | 280.31 | 934.62 | | 290.2 | 934.51 | |

| | | | | | |
|---|---|---|---|---|---|
| 290.31 | 934.51 | 300.31 | 934.39 | 310.31 | 934.28 |
| 310.43 | 934.27 | 320.31 | 934.17 | 320.55 | 934.17 |
| 330.31 | 934.08 | 330.66 | 934.08 | 340.31 | 934.02 |
| 340.78 | 934.02 | 350.31 | 933.96 | 350.89 | 933.96 |
| 360.31 | 933.9 | 361.01 | 933.9 | 370.31 | 933.84 |
| 371.12 | 933.84 | 380.31 | 933.78 | 381.23 | 933.77 |
| 390.32 | 933.72 | 391.36 | 933.71 | 400.32 | 933.66 |
| 401.47 | 933.66 | 410.32 | 933.61 | 411.59 | 933.6 |
| 420.32 | 933.56 | 421.7 | 933.55 | 438.74 | 933.46 |
| 440.32 | 933.46 | 441.93 | 933.45 | 450.32 | 933.41 |
| 452.05 | 933.41 | 460.32 | 933.38 | 462.16 | 933.38 |
| 470.32 | 933.35 | 472.27 | 933.35 | 480.32 | 933.33 |
| 482.39 | 933.33 | 490.32 | 933.31 | 492.5 | 933.31 |
| 527.74 | 933.27 | 530.32 | 933.27 | 532.96 | 933.26 |
| 543.09 | 933.25 | 550.33 | 933.23 | 553.2 | 933.23 |
| 563.31 | 933.22 | 583.54 | 933.15 | 650.33 | 932.77 |
| 654.34 | 932.74 | 660.33 | 932.71 | 664.46 | 932.68 |
| 670.33 | 932.65 | 674.57 | 932.62 | 694.8 | 932.52 |
| 704.93 | 932.49 | 710.34 | 932.46 | 730.34 | 932.39 |
| 810.34 | 932.15 | 820.34 | 932.13 | 826.3 | 932.13 |
| 830.34 | 932.12 | 834.29 | 932.12 | 846.53 | 932.14 |
| 856.65 | 932.15 | 860.35 | 932.16 | 863.96 | 932.16 |
| 876.88 | 932.18 | 887 | 932.2 | 897.11 | 932.21 |
| 900.35 | 932.22 | 907.23 | 932.23 | 910.35 | 932.24 |
| 917.34 | 932.25 | 937.57 | 932.27 | 940.35 | 932.28 |
| 957.8 | 932.31 | 967.91 | 932.34 | 970.35 | 932.34 |
| 988.14 | 932.4 | 998.26 | 932.44 | 1000.35 | 932.44 |
| 1008.38 | 932.47 | 1010.36 | 932.47 | 1018.49 | 932.5 |
| 1020.36 | 932.5 | 1028.61 | 932.54 | 1030.36 | 932.54 |
| 1038.72 | 932.58 | 1040.36 | 932.58 | 1048.84 | 932.63 |
| 1050.36 | 932.63 | 1058.95 | 932.68 | 1060.36 | 932.68 |
| 1069.07 | 932.7 | 1080.36 | 932.69 | 1081.51 | 932.68 |
| 1099.41 | 932.59 | 1100.36 | 932.59 | 1109.52 | 932.54 |
| 1110.36 | 932.54 | 1119.64 | 932.49 | 1120.36 | 932.49 |
| 1129.75 | 932.46 | 1130.36 | 932.46 | 1139.87 | 932.44 |
| 1140.36 | 932.43 | 1149.98 | 932.42 | 1150.36 | 932.41 |
| 1160.11 | 932.38 | 1160.4 | 932.38 | 1170.22 | 932.34 |
| 1170.37 | 932.34 | 1180.33 | 932.28 | 1180.4 | 932.28 |
| 1190.37 | 932.18 | 1190.45 | 932.18 | 1200.37 | 932.02 |
| 1200.56 | 932.02 | 1210.37 | 931.82 | 1210.68 | 931.81 |
| 1220.37 | 931.59 | 1220.79 | 931.57 | 1230.37 | 931.35 |
| 1230.91 | 931.34 | 1240.37 | 931.11 | 1241.02 | 931.09 |
| 1250.37 | 930.82 | 1251.14 | 930.79 | 1260.37 | 930.53 |
| 1261.25 | 930.5 | 1270.37 | 930.28 | 1271.36 | 930.27 |
| 1280.37 | 930.15 | 1281.48 | 930.15 | 1290.37 | 930.08 |
| 1291.59 | 930.08 | 1300.38 | 930.04 | 1301.72 | 930.05 |
| 1310.38 | 930.05 | 1311.83 | 930.06 | 1320.38 | 930.1 |
| 1330.38 | 930.17 | 1332.06 | 930.2 | 1340.38 | 930.4 |
| 1342.18 | 930.45 | 1358.4 | 931.01 | 1360.38 | 931.06 |
| 1362.45 | 931.13 | 1368.29 | 931.32 | 1370.38 | 931.38 |
| 1380.38 | 931.78 | 1390.38 | 932.25 | 1392.75 | 932.37 |
| 1407.84 | 933.11 | 1410.38 | 933.24 | 1420.38 | 933.73 |
| 1427.62 | 934.07 | 1430.38 | 934.19 | 1447.39 | 934.97 |
| 1450.38 | 935.1 | 1457.29 | 935.43 | 1460.39 | 935.57 |
| 1463.56 | 935.72 | 1470.39 | 936.03 | 1473.67 | 936.19 |
| 1480.39 | 936.5 | 1483.79 | 936.67 | 1504.02 | 937.62 |
| 1510.39 | 937.91 | 1514.13 | 938.09 | 1520.39 | 938.37 |
| 1524.25 | 938.55 | 1530.39 | 938.82 | 1534.36 | 939.02 |
| 1540.39 | 939.28 | 1544.47 | 939.49 | 1550.39 | 939.75 |
| 1554.59 | 939.95 | 1560.39 | 940.2 | 1564.7 | 940.42 |
| 1570.39 | 940.65 | 1575.95 | 940.86 | 1580.39 | 941.06 |
| 1600.39 | 941.84 | 1610.4 | 942.22 | 1620.4 | 942.58 |
| 1630.4 | 942.88 | 1635.51 | 943 | 1640.4 | 943.1 |
| 1655.06 | 943.37 | 1675.97 | 943.72 | 1680.4 | 943.81 |
| 1686.09 | 943.9 | 1690.4 | 943.99 | 1704.51 | 944.22 |
| 1716.43 | 944.39 | 1720.4 | 944.44 | 1726.54 | 944.53 |
| 1730.4 | 944.58 | 1734.17 | 944.62 | 1756.89 | 944.92 |
| 1760.4 | 944.96 | 1767.01 | 945.05 | 1783.62 | 945.26 |
| 1797.36 | 945.46 | 1800.41 | 945.5 | 1807.47 | 945.62 |
| 1810.41 | 945.66 | 1830.41 | 945.96 | 1837.81 | 946.06 |
| 1847.93 | 946.21 | 1850.41 | 946.24 | 1853.67 | 946.29 |

Downstream Bridge Cross Section Data
Station Elevation Data num= 294

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 940.86 | 6.64 | 940.64 | 9.95 | 940.66 | 16.75 | 940.44 | 19.95 | 940.43 |
| 26.87 | 940.18 | 29.95 | 940.11 | 36.98 | 939.79 | 39.95 | 939.63 | 47.1 | 939.34 |
| 49.95 | 938.88 | 57.21 | 938.68 | 59.95 | 938.97 | 67.33 | 938.73 | 69.95 | 938.49 |
| 77.45 | 938.13 | 79.96 | 937.95 | 87.56 | 937.63 | 89.96 | 937.48 | 97.68 | 937.18 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 99.96 | 937.08 | 107.79 | 936.82 | 109.96 | 936.76 | 117.91 | 936.51 | 119.96 | 936.46 |
| 128.02 | 936.24 | 129.96 | 936.2 | 138.14 | 936.01 | 139.96 | 935.98 | 144.59 | 935.87 |
| 148.25 | 935.78 | 149.96 | 935.76 | 158.37 | 935.57 | 159.96 | 935.55 | 168.48 | 935.35 |
| 169.96 | 935.33 | 178.59 | 935.14 | 179.96 | 935.12 | 188.71 | 934.94 | 191.18 | 934.9 |
| 199.96 | 934.74 | 201.07 | 934.73 | 209.96 | 934.63 | 219.05 | 934.55 | 219.96 | 934.54 |
| 220.85 | 934.54 | 239.29 | 934.38 | 239.97 | 934.38 | 249.41 | 934.3 | 250.52 | 934.3 |
| 259.97 | 934.23 | 260.41 | 934.22 | 279.75 | 934.08 | 280.19 | 934.08 | 299.33 | 933.93 |
| 299.98 | 933.93 | 319.74 | 933.76 | 320.21 | 933.76 | 329.97 | 933.68 | 330.32 | 933.68 |
| 349.4 | 933.55 | 349.97 | 933.55 | 359.29 | 933.47 | 360.66 | 933.47 | 369.97 | 933.4 |
| 379.07 | 933.35 | 379.97 | 933.34 | 380.89 | 933.34 | 389.98 | 933.28 | 391.02 | 933.27 |
| 399.98 | 933.22 | 401.13 | 933.21 | 409.98 | 933.16 | 411.25 | 933.15 | 428.52 | 933.06 |
| 431.47 | 933.04 | 439.98 | 933 | 441.59 | 933 | 492.16 | 932.78 | 507.62 | 932.74 |
| 509.98 | 932.73 | 512.39 | 932.73 | 519.98 | 932.71 | 537.29 | 932.66 | 539.99 | 932.66 |
| 547.19 | 932.64 | 549.99 | 932.64 | 579.99 | 932.55 | 583.2 | 932.53 | 589.99 | 932.51 |
| 593.32 | 932.49 | 599.99 | 932.47 | 603.43 | 932.45 | 609.99 | 932.43 | 623.66 | 932.36 |
| 629.99 | 932.34 | 633.77 | 932.32 | 639.99 | 932.3 | 643.89 | 932.28 | 649.99 | 932.26 |
| 694.47 | 932.08 | 700 | 932.07 | 704.58 | 932.05 | 710 | 932.04 | 714.7 | 932.02 |
| 724.81 | 932 | 795.61 | 931.85 | 815.84 | 931.83 | 836.07 | 931.79 | 846.19 | 931.78 |
| 850 | 931.77 | 856.31 | 931.77 | 860.01 | 931.76 | 866.43 | 931.76 | 870.01 | 931.75 |
| 876.54 | 931.75 | 880.01 | 931.74 | 920.01 | 931.74 | 927.11 | 931.72 | 930.01 | 931.7 |
| 937.23 | 931.67 | 940.01 | 931.65 | 947.34 | 931.61 | 952.62 | 931.57 | 960.01 | 931.55 |
| 967.57 | 931.56 | 970.01 | 931.57 | 980.01 | 931.69 | 982.28 | 931.76 | 990.01 | 931.92 |
| 992.17 | 931.98 | 1000.01 | 932.07 | 1008.04 | 932.1 | 1010.02 | 932.12 | 1020.02 | 932.06 |
| 1028.27 | 931.83 | 1030.02 | 931.82 | 1038.38 | 931.71 | 1040.02 | 931.75 | 1048.5 | 931.63 |
| 1050.02 | 931.68 | 1058.61 | 931.57 | 1060.02 | 931.63 | 1068.72 | 931.53 | 1070.02 | 931.56 |
| 1071.29 | 931.55 | 1088.95 | 931.49 | 1090.02 | 931.49 | 1099.07 | 931.47 | 1100.02 | 931.47 |
| 1100.95 | 931.48 | 1110.02 | 931.45 | 1110.84 | 931.46 | 1120.02 | 931.42 | 1129.41 | 931.45 |
| 1130.02 | 931.42 | 1139.53 | 931.57 | 1140.02 | 931.57 | 1143.71 | 931.63 | 1149.64 | 931.72 |
| 1150.02 | 931.74 | 1159.76 | 932.16 | 1160.03 | 932.18 | 1169.88 | 932.68 | 1170.03 | 932.67 |
| 1179.99 | 932.77 | 1180.07 | 932.77 | 1182.64 | 932.78 | 1183.27 | 932.78 | 1190.03 | 932.81 |
| 1190.11 | 932.81 | 1200.03 | 932.6 | 1200.22 | 932.59 | 1210.03 | 932.12 | 1210.34 | 932.1 |
| 1220.03 | 931.34 | 1220.45 | 931.32 | 1230.03 | 930.24 | 1230.57 | 930.2 | 1240.03 | 928.53 |
| 1240.68 | 928.47 | 1250.03 | 925.1 | 1250.79 | 925.1 | 1260.03 | 927.2 | 1260.91 | 927.24 |
| 1270.03 | 928.65 | 1271.02 | 928.68 | 1280.03 | 929.22 | 1281.14 | 929.22 | 1290.03 | 929.32 |
| 1291.25 | 929.32 | 1300.03 | 929.39 | 1301.37 | 929.39 | 1310.04 | 929.46 | 1311.49 | 929.47 |
| 1320.04 | 929.61 | 1321.6 | 929.63 | 1330.04 | 929.87 | 1340.04 | 930.1 | 1341.83 | 930.15 |
| 1350.04 | 930.67 | 1355.03 | 930.83 | 1360.04 | 930.99 | 1362.06 | 931.06 | 1372.18 | 931.44 |
| 1382.29 | 931.84 | 1390.04 | 932.04 | 1392.41 | 932.14 | 1400.04 | 932.35 | 1402.52 | 932.46 |
| 1403.23 | 932.49 | 1410.04 | 932.74 | 1417.39 | 933.08 | 1422.75 | 933.3 | 1430.04 | 933.66 |
| 1437.17 | 933.96 | 1440.04 | 934.07 | 1442.98 | 934.2 | 1456.94 | 934.8 | 1460.04 | 934.91 |
| 1463.21 | 935.05 | 1470.05 | 935.34 | 1476.73 | 935.59 | 1480.05 | 935.7 | 1483.45 | 935.78 |
| 1490.05 | 936.06 | 1493.56 | 936.16 | 1500.05 | 936.51 | 1503.67 | 936.63 | 1510.05 | 936.98 |
| 1516.28 | 937.25 | 1520.05 | 937.34 | 1523.9 | 937.45 | 1530.05 | 937.53 | 1536.06 | 937.71 |
| 1540.05 | 937.91 | 1544.13 | 938.15 | 1550.05 | 938.41 | 1555.84 | 938.77 | 1564.36 | 939.25 |
| 1575.61 | 939.94 | 1584.59 | 940.28 | 1590.05 | 940.58 | 1595.39 | 941.06 | 1600.05 | 941.23 |
| 1604.82 | 941.42 | 1615.16 | 942.24 | 1620.06 | 942.4 | 1625.06 | 942.54 | 1630.06 | 943.41 |
| 1634.95 | 944.5 | 1640.06 | 944.62 | 1645.29 | 944.78 | 1650.06 | 945.2 | 1655.4 | 945.43 |
| 1660.06 | 945.51 | 1665.52 | 945.73 | 1670.06 | 945.68 | 1674.5 | 945.66 | 1680.06 | 945.9 |
| 1685.74 | 946.09 | 1686.84 | 946.08 | 1690.06 | 946.04 | 1694.28 | 945.97 | 1700.06 | 946.22 |
| 1705.97 | 946.41 | 1710.06 | 946.25 | 1714.06 | 946.04 | 1720.06 | 946.2 | 1726.2 | 946.23 |
| 1733.83 | 945.81 | 1740.06 | 945.84 | 1746.43 | 945.84 | 1750.06 | 945.72 | 1753.61 | 945.59 |
| 1766.66 | 945.5 | 1770.06 | 945.31 | 1773.39 | 945.18 | 1780.07 | 945.12 | 1786.9 | 945.03 |
| 1790.07 | 944.83 | 1793.17 | 944.59 | 1807.13 | 944.4 | 1810.07 | 944.27 | 1817.24 | 944.22 |
| 1820.07 | 944.11 | 1827.36 | 943.94 | 1830.07 | 943.82 | 1837.47 | 943.77 | 1840.07 | 943.52 |
| 1847.59 | 943.67 | 1850.07 | 943.96 | 1852.5 | 944.13 | 1853.67 | 944.16 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 144.59 | .04 | 1182.64 | .052 | 1403.23 | .04 | 1686.84 | .032 |

Bank Sta: Left Right Coeff Contr. Expan.
1190.03 1410.04 .3 .5

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1190.03 | 932.81 | F |

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
Downstream Embankment side slope = 2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

| Culvert Name | Shape | Rise | Span |
|---|---|---|---|
| Culvert #1 | Circular | 2 | |

FHWA Chart # 1 - Concrete Pipe Culvert

FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

| Culvert | Upstrm Dist | Length | Top n | Bottom n | Depth Blocked | Entrance Loss Coef | Exit Loss Coef |
|---|---|---|---|---|---|---|---|
| | 12 | 50.5 | .013 | .013 | 0 | .5 | 1 |

Upstream Elevation = 925.8
Centerline Station = 1282.8
Downstream Elevation = 925.1
Centerline Station = 1250.7

CULVERT OUTPUT Profile #100-Year Culv Group: Culvert #1

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 5.07 | Culv Full Len (ft) | 50.50 |
| # Barrels | 1 | Culv Vel US (ft/s) | 1.61 |
| Q Barrel (cfs) | 5.07 | Culv Vel DS (ft/s) | 1.61 |
| E.G. US. (ft) | 933.41 | Culv Inv El Up (ft) | 925.80 |
| W.S. US. (ft) | 933.32 | Culv Inv El Dn (ft) | 925.10 |
| E.G. DS (ft) | 933.34 | Culv Frctn Ls (ft) | 0.03 |
| W.S. DS (ft) | 933.32 | Culv Exit Loss (ft) | 0.02 |
| Delta EG (ft) | 0.06 | Culv Entr Loss (ft) | 0.02 |
| Delta WS (ft) | 0.00 | Q Weir (cfs) | 1834.93 |
| E.G. IC (ft) | 933.40 | Weir Sta Lft (ft) | 656.92 |
| E.G. OC (ft) | 933.41 | Weir Sta Rgt (ft) | 1413.65 |
| Culvert Control | Outlet | Weir Submerg | 0.95 |
| Culv WS Inlet (ft) | 927.80 | Weir Max Depth (ft) | 3.36 |
| Culv WS Outlet (ft) | 927.10 | Weir Avg Depth (ft) | 1.18 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 767.74 |
| Culv Crt Depth (ft) | 0.79 | Min El Weir Flow (ft) | 930.05 |

CULVERT OUTPUT Profile #Method 4 Culv Group: Culvert #1

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 8.34 | Culv Full Len (ft) | 50.50 |
| # Barrels | 1 | Culv Vel US (ft/s) | 2.66 |
| Q Barrel (cfs) | 8.34 | Culv Vel DS (ft/s) | 2.66 |
| E.G. US. (ft) | 933.70 | Culv Inv El Up (ft) | 925.80 |
| W.S. US. (ft) | 933.51 | Culv Inv El Dn (ft) | 925.10 |
| E.G. DS (ft) | 933.54 | Culv Frctn Ls (ft) | 0.07 |
| W.S. DS (ft) | 933.47 | Culv Exit Loss (ft) | 0.04 |
| Delta EG (ft) | 0.16 | Culv Entr Loss (ft) | 0.05 |
| Delta WS (ft) | 0.04 | Q Weir (cfs) | 1830.67 |
| E.G. IC (ft) | 933.69 | Weir Sta Lft (ft) | 1069.33 |
| E.G. OC (ft) | 933.70 | Weir Sta Rgt (ft) | 1383.48 |
| Culvert Control | Outlet | Weir Submerg | 0.91 |
| Culv WS Inlet (ft) | 927.80 | Weir Max Depth (ft) | 3.66 |
| Culv WS Outlet (ft) | 927.10 | Weir Avg Depth (ft) | 2.04 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 487.50 |
| Culv Crt Depth (ft) | 1.03 | Min El Weir Flow (ft) | 930.05 |

CULVERT OUTPUT Profile #Method 1 Culv Group: Culvert #1

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 8.63 | Culv Full Len (ft) | 50.50 |
| # Barrels | 1 | Culv Vel US (ft/s) | 2.75 |
| Q Barrel (cfs) | 8.63 | Culv Vel DS (ft/s) | 2.75 |
| E.G. US. (ft) | 933.77 | Culv Inv El Up (ft) | 925.80 |
| W.S. US. (ft) | 933.56 | Culv Inv El Dn (ft) | 925.10 |
| E.G. DS (ft) | 933.62 | Culv Frctn Ls (ft) | 0.07 |
| W.S. DS (ft) | 933.52 | Culv Exit Loss (ft) | 0.02 |
| Delta EG (ft) | 0.15 | Culv Entr Loss (ft) | 0.06 |
| Delta WS (ft) | 0.04 | Q Weir (cfs) | 1839.29 |
| E.G. IC (ft) | 933.75 | Weir Sta Lft (ft) | 1176.53 |
| E.G. OC (ft) | 933.77 | Weir Sta Rgt (ft) | 1371.72 |
| Culvert Control | Outlet | Weir Submerg | 0.91 |
| Culv WS Inlet (ft) | 927.80 | Weir Max Depth (ft) | 3.73 |
| Culv WS Outlet (ft) | 927.10 | Weir Avg Depth (ft) | 2.44 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 475.38 |
| Culv Crt Depth (ft) | 1.05 | Min El Weir Flow (ft) | 930.05 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.432

INPUT
Description: Thalweg Sta. 1250.03 - Downstream of Culver @ Sta. 2.438
Station Elevation Data num= 294

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 940.86 | 6.64 | 940.64 | 9.95 | 940.66 | 16.75 | 940.44 | 19.95 | 940.43 |
| 26.87 | 940.18 | 29.95 | 940.11 | 36.98 | 939.79 | 39.95 | 939.63 | 47.1 | 939.34 |
| 49.95 | 938.88 | 57.21 | 938.68 | 59.95 | 938.97 | 67.33 | 938.73 | 69.95 | 938.49 |
| 77.45 | 938.13 | 79.96 | 937.95 | 87.56 | 937.63 | 89.96 | 937.48 | 97.68 | 937.18 |
| 99.96 | 937.08 | 107.79 | 936.82 | 109.96 | 936.76 | 117.91 | 936.51 | 119.96 | 936.46 |
| 128.02 | 936.24 | 129.96 | 936.2 | 138.14 | 936.01 | 139.96 | 935.98 | 144.59 | 935.87 |
| 148.25 | 935.78 | 149.96 | 935.76 | 158.37 | 935.57 | 159.96 | 935.55 | 168.48 | 935.35 |
| 169.96 | 935.33 | 178.59 | 935.14 | 179.96 | 935.12 | 188.71 | 934.94 | 191.18 | 934.9 |
| 199.96 | 934.74 | 201.07 | 934.73 | 209.96 | 934.63 | 219.05 | 934.55 | 219.96 | 934.54 |
| 220.85 | 934.54 | 239.29 | 934.38 | 239.97 | 934.38 | 249.41 | 934.3 | 250.52 | 934.3 |
| 259.97 | 934.23 | 260.41 | 934.22 | 279.75 | 934.08 | 280.19 | 934.08 | 299.33 | 933.93 |
| 299.98 | 933.93 | 319.74 | 933.76 | 320.21 | 933.76 | 329.97 | 933.68 | 330.32 | 933.68 |
| 349.4 | 933.55 | 349.97 | 933.55 | 359.29 | 933.47 | 360.66 | 933.47 | 369.97 | 933.4 |
| 379.07 | 933.35 | 379.97 | 933.34 | 380.89 | 933.34 | 389.98 | 933.28 | 391.02 | 933.27 |
| 399.98 | 933.22 | 401.13 | 933.21 | 409.98 | 933.16 | 411.25 | 933.15 | 428.52 | 933.06 |
| 431.47 | 933.04 | 439.98 | 933 | 441.59 | 933 | 492.16 | 932.78 | 507.62 | 932.74 |
| 509.98 | 932.73 | 512.39 | 932.73 | 519.98 | 932.71 | 537.29 | 932.66 | 539.99 | 932.66 |
| 547.19 | 932.64 | 549.99 | 932.64 | 579.99 | 932.55 | 583.2 | 932.53 | 589.99 | 932.51 |
| 593.32 | 932.49 | 599.99 | 932.47 | 603.43 | 932.45 | 609.99 | 932.43 | 623.66 | 932.36 |
| 629.99 | 932.34 | 633.77 | 932.32 | 639.99 | 932.3 | 643.89 | 932.28 | 649.99 | 932.26 |
| 694.47 | 932.08 | 700 | 932.07 | 704.58 | 932.05 | 710 | 932.04 | 714.7 | 932.02 |
| 724.81 | 932 | 795.61 | 931.85 | 815.84 | 931.83 | 836.07 | 931.79 | 846.19 | 931.78 |
| 850 | 931.77 | 856.31 | 931.77 | 860.01 | 931.76 | 866.43 | 931.76 | 870.01 | 931.75 |
| 876.54 | 931.75 | 880.01 | 931.74 | 920.01 | 931.74 | 927.11 | 931.72 | 930.01 | 931.7 |
| 937.23 | 931.67 | 940.01 | 931.65 | 947.34 | 931.61 | 952.62 | 931.57 | 960.01 | 931.55 |
| 967.57 | 931.56 | 970.01 | 931.57 | 980.01 | 931.69 | 982.28 | 931.76 | 990.01 | 931.92 |
| 992.17 | 931.98 | 1000.01 | 932.07 | 1008.04 | 932.1 | 1010.02 | 932.12 | 1020.02 | 932.06 |
| 1028.27 | 931.83 | 1030.02 | 931.82 | 1038.38 | 931.71 | 1040.02 | 931.75 | 1048.5 | 931.63 |
| 1050.02 | 931.68 | 1058.61 | 931.57 | 1060.02 | 931.63 | 1068.72 | 931.53 | 1070.02 | 931.56 |
| 1071.29 | 931.55 | 1088.95 | 931.49 | 1090.02 | 931.49 | 1099.07 | 931.47 | 1100.02 | 931.47 |
| 1100.95 | 931.48 | 1110.02 | 931.45 | 1110.84 | 931.46 | 1120.02 | 931.42 | 1129.41 | 931.45 |
| 1130.02 | 931.42 | 1139.53 | 931.57 | 1140.02 | 931.57 | 1143.71 | 931.63 | 1149.64 | 931.72 |
| 1150.02 | 931.74 | 1159.76 | 932.16 | 1160.03 | 932.18 | 1169.88 | 932.68 | 1170.03 | 932.67 |
| 1179.99 | 932.77 | 1180.07 | 932.77 | 1182.64 | 932.78 | 1183.27 | 932.78 | 1190.03 | 932.81 |
| 1190.11 | 932.81 | 1200.03 | 932.6 | 1200.22 | 932.59 | 1210.03 | 932.12 | 1210.34 | 932.1 |
| 1220.03 | 931.34 | 1220.45 | 931.32 | 1230.03 | 930.24 | 1230.57 | 930.2 | 1240.03 | 928.53 |
| 1240.68 | 928.47 | 1250.03 | 925.1 | 1250.79 | 925.1 | 1260.03 | 927.2 | 1260.91 | 927.24 |
| 1270.03 | 928.65 | 1271.02 | 928.68 | 1280.03 | 929.22 | 1281.14 | 929.22 | 1290.03 | 929.32 |
| 1291.25 | 929.32 | 1300.03 | 929.39 | 1301.37 | 929.39 | 1310.04 | 929.46 | 1311.49 | 929.47 |
| 1320.04 | 929.61 | 1321.6 | 929.63 | 1330.04 | 929.87 | 1340.04 | 930.1 | 1341.83 | 930.15 |
| 1350.04 | 930.67 | 1355.03 | 930.83 | 1360.04 | 930.99 | 1362.06 | 931.06 | 1372.18 | 931.44 |
| 1382.29 | 931.84 | 1390.04 | 932.04 | 1392.41 | 932.14 | 1400.04 | 932.35 | 1402.52 | 932.46 |
| 1403.23 | 932.49 | 1410.04 | 932.74 | 1417.39 | 933.08 | 1422.75 | 933.3 | 1430.04 | 933.66 |
| 1437.17 | 933.96 | 1440.04 | 934.07 | 1442.98 | 934.2 | 1456.94 | 934.8 | 1460.04 | 934.91 |
| 1463.21 | 935.05 | 1470.05 | 935.34 | 1476.73 | 935.59 | 1480.05 | 935.7 | 1483.45 | 935.78 |
| 1490.05 | 936.06 | 1493.56 | 936.16 | 1500.05 | 936.51 | 1503.67 | 936.63 | 1510.05 | 936.98 |
| 1516.28 | 937.25 | 1520.05 | 937.34 | 1523.9 | 937.45 | 1530.05 | 937.53 | 1536.06 | 937.71 |
| 1540.05 | 937.91 | 1544.13 | 938.15 | 1550.05 | 938.41 | 1555.84 | 938.77 | 1564.36 | 939.25 |
| 1575.61 | 939.94 | 1584.59 | 940.28 | 1590.05 | 940.58 | 1595.39 | 941.06 | 1600.05 | 941.23 |
| 1604.82 | 941.42 | 1615.16 | 942.24 | 1620.06 | 942.4 | 1625.06 | 942.54 | 1630.06 | 943.41 |
| 1634.95 | 944.5 | 1640.06 | 944.62 | 1645.29 | 944.78 | 1650.06 | 945.2 | 1655.4 | 945.43 |
| 1660.06 | 945.51 | 1665.52 | 945.73 | 1670.06 | 945.68 | 1674.5 | 945.66 | 1680.06 | 945.9 |
| 1685.74 | 946.09 | 1686.84 | 946.08 | 1690.06 | 946.04 | 1694.28 | 945.97 | 1700.06 | 946.22 |
| 1705.97 | 946.41 | 1710.06 | 946.25 | 1714.06 | 946.04 | 1720.06 | 946.2 | 1726.2 | 946.23 |
| 1733.83 | 945.81 | 1740.06 | 945.84 | 1746.43 | 945.84 | 1750.06 | 945.72 | 1753.61 | 945.59 |
| 1766.66 | 945.5 | 1770.06 | 945.31 | 1773.39 | 945.18 | 1780.07 | 945.12 | 1786.9 | 945.03 |
| 1790.07 | 944.83 | 1793.17 | 944.59 | 1807.13 | 944.4 | 1810.07 | 944.27 | 1817.24 | 944.22 |
| 1820.07 | 944.11 | 1827.36 | 943.94 | 1830.07 | 943.82 | 1837.47 | 943.77 | 1840.07 | 943.52 |
| 1847.59 | 943.67 | 1850.07 | 943.96 | 1852.5 | 944.13 | 1853.67 | 944.16 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 144.59 | .04 | 1182.64 | .052 | 1403.23 | .04 | 1686.84 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1190.03 | 1410.04 | 139.55 | 185.93 | 233.21 | .3 | .5 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1190.03 | 932.81 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.34 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.040 | 0.052 | 0.040 |
| W.S. Elev (ft) | 933.32 | Reach Len. (ft) | 139.55 | 185.93 | 233.21 |
| Crit W.S. (ft) | 930.89 | Flow Area (sq ft) | 948.93 | 684.29 | 3.73 |
| E.G. Slope (ft/ft) | 0.000511 | Area (sq ft) | 948.93 | 684.29 | 3.73 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 888.94 | 949.71 | 1.35 |
| Top Width (ft) | 1039.46 | Top Width (ft) | 806.31 | 220.01 | 13.14 |

| | | | | | |
|---|---|---|---|---|---|
| Vel Total (ft/s) | 1.12 | Avg. Vel. (ft/s) | 0.94 | 1.39 | 0.36 |
| Max Chl Dpth (ft) | 8.22 | Hydr. Depth (ft) | 1.18 | 3.11 | 0.28 |
| Conv. Total (cfs) | 81422.5 | Conv. (cfs) | 39336.9 | 42025.8 | 59.9 |
| Length Wtd. (ft) | 174.74 | Wetted Per. (ft) | 806.36 | 221.28 | 13.16 |
| Min Ch El (ft) | 925.10 | Shear (lb/sq ft) | 0.04 | 0.10 | 0.01 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.04 | 0.14 | 0.00 |
| Frctn Loss (ft) | 0.21 | Cum Volume (acre-ft) | 68.34 | 80.97 | 88.58 |
| C & E Loss (ft) | 0.10 | Cum SA (acres) | 71.91 | 33.74 | 107.50 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.54 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.040 | 0.052 | |
| W.S. Elev (ft) | 933.47 | Reach Len. (ft) | 139.55 | 185.93 | 233.21 |
| Crit W.S. (ft) | 930.89 | Flow Area (sq ft) | 146.72 | 717.08 | |
| E.G. Slope (ft/ft) | 0.001220 | Area (sq ft) | 146.72 | 717.08 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 255.01 | 1585.00 | |
| Top Width (ft) | 314.15 | Top Width (ft) | 94.14 | 220.01 | |
| Vel Total (ft/s) | 2.13 | Avg. Vel. (ft/s) | 1.74 | 2.21 | |
| Max Chl Dpth (ft) | 8.37 | Hydr. Depth (ft) | 1.56 | 3.26 | |
| Conv. Total (cfs) | 52682.8 | Conv. (cfs) | 7301.3 | 45381.5 | |
| Length Wtd. (ft) | 182.72 | Wetted Per. (ft) | 96.17 | 222.01 | |
| Min Ch El (ft) | 925.10 | Shear (lb/sq ft) | 0.12 | 0.25 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.20 | 0.54 | |
| Frctn Loss (ft) | 0.41 | Cum Volume (acre-ft) | 12.03 | 104.75 | 16.24 |
| C & E Loss (ft) | 0.09 | Cum SA (acres) | 5.16 | 35.93 | 8.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.62 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 933.52 | Reach Len. (ft) | 139.55 | 185.93 | 233.21 |
| Crit W.S. (ft) | 930.89 | Flow Area (sq ft) | | 727.46 | |
| E.G. Slope (ft/ft) | 0.001575 | Area (sq ft) | | 727.46 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 220.01 | Top Width (ft) | | 220.01 | |
| Vel Total (ft/s) | 2.53 | Avg. Vel. (ft/s) | | 2.53 | |
| Max Chl Dpth (ft) | 8.42 | Hydr. Depth (ft) | | 3.31 | |
| Conv. Total (cfs) | 46366.6 | Conv. (cfs) | | 46366.6 | |
| Length Wtd. (ft) | 185.93 | Wetted Per. (ft) | | 222.76 | |
| Min Ch El (ft) | 925.10 | Shear (lb/sq ft) | | 0.32 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.81 | |
| Frctn Loss (ft) | 0.49 | Cum Volume (acre-ft) | 25.48 | 88.51 | 33.59 |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 14.60 | 34.44 | 24.99 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.397

INPUT
Description: Thalweg Sta. 1211.37
Station Elevation Data num= 294

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 941.97 | 2.21 | 941.91 | 3.94 | 941.88 | 13.97 | 941.64 | 20.87 | 941.44 |
| 24 | 941.34 | 30.19 | 941.13 | 34.02 | 940.97 | 39.53 | 940.78 | 44.05 | 940.6 |
| 48.86 | 940.47 | 54.08 | 940.34 | 58.18 | 940.28 | 64.11 | 940.29 | 67.52 | 940.15 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 74.14 | 940.27 | 76.84 | 939.57 | 84.16 | 937.02 | 86.18 | 936.73 | 94.19 | 935.45 |
| 95.51 | 935.32 | 104.22 | 934.6 | 104.83 | 934.56 | 114.25 | 934.24 | 114.35 | 934.24 |
| 124.28 | 934.08 | 125.18 | 934.07 | 134.3 | 933.98 | 136.02 | 933.97 | 144.33 | 933.94 |
| 154.36 | 933.93 | 157.7 | 933.92 | 168.54 | 933.9 | 184.44 | 933.85 | 204.5 | 933.75 |
| 214.53 | 933.68 | 224.56 | 933.6 | 244.41 | 933.46 | 247.12 | 933.46 | 254.12 | 933.44 |
| 254.64 | 933.43 | 282.11 | 933.43 | 284.72 | 933.42 | 294.75 | 933.42 | 300.77 | 933.4 |
| 314.81 | 933.34 | 319.43 | 933.31 | 334.86 | 933.24 | 338.08 | 933.22 | 344.89 | 933.19 |
| 352.79 | 933.14 | 354.92 | 933.14 | 363.63 | 933.09 | 364.95 | 933.08 | 374.47 | 933.03 |
| 374.97 | 933.02 | 384.73 | 932.97 | 385 | 932.97 | 394.07 | 932.93 | 395.03 | 932.93 |
| 403.39 | 932.91 | 405.06 | 932.91 | 422.06 | 932.92 | 425.11 | 932.93 | 431.38 | 932.93 |
| 440.72 | 932.95 | 445.17 | 932.95 | 455.2 | 932.97 | 459.38 | 932.96 | 465.23 | 932.97 |
| 475.25 | 932.95 | 493.7 | 932.88 | 504.54 | 932.82 | 505.34 | 932.82 | 515.24 | 932.77 |
| 515.36 | 932.76 | 524.69 | 932.73 | 525.39 | 932.73 | 534.02 | 932.7 | 535.42 | 932.69 |
| 543.34 | 932.67 | 545.45 | 932.66 | 562.01 | 932.62 | 565.51 | 932.6 | 571.34 | 932.6 |
| 575.53 | 932.59 | 580.67 | 932.59 | 585.56 | 932.58 | 595.59 | 932.58 | 599.33 | 932.57 |
| 605.62 | 932.57 | 608.66 | 932.56 | 615.65 | 932.55 | 617.99 | 932.54 | 625.67 | 932.52 |
| 627.32 | 932.51 | 635.7 | 932.48 | 636.64 | 932.47 | 645.73 | 932.43 | 645.98 | 932.43 |
| 649.3 | 932.42 | 655.31 | 932.39 | 655.76 | 932.39 | 664.64 | 932.36 | 665.79 | 932.35 |
| 673.97 | 932.32 | 683.29 | 932.27 | 685.84 | 932.26 | 705.9 | 932.11 | 715.93 | 932.02 |
| 720.62 | 931.99 | 725.95 | 931.94 | 729.94 | 931.92 | 735.98 | 931.87 | 756.04 | 931.8 |
| 757.94 | 931.79 | 766.06 | 931.77 | 767.27 | 931.77 | 776.09 | 931.74 | 776.59 | 931.74 |
| 785.93 | 931.7 | 786.12 | 931.7 | 795.26 | 931.66 | 796.15 | 931.65 | 804.59 | 931.61 |
| 813.92 | 931.56 | 816.2 | 931.54 | 823.24 | 931.51 | 826.23 | 931.49 | 832.58 | 931.47 |
| 856.32 | 931.34 | 876.37 | 931.21 | 879.23 | 931.2 | 886.4 | 931.15 | 888.56 | 931.15 |
| 905.57 | 931.12 | 926.51 | 931.13 | 936.54 | 931.12 | 944.54 | 931.07 | 946.57 | 931.06 |
| 953.87 | 930.98 | 956.6 | 930.96 | 972.53 | 930.76 | 976.65 | 930.72 | 986.68 | 930.6 |
| 996.71 | 930.52 | 1000.52 | 930.5 | 1006.74 | 930.49 | 1016.76 | 930.53 | 1019.18 | 930.59 |
| 1026.79 | 930.79 | 1028.51 | 930.86 | 1028.94 | 930.88 | 1036.82 | 931.19 | 1037.84 | 931.22 |
| 1046.85 | 931.56 | 1047.17 | 931.57 | 1051.48 | 931.79 | 1056.5 | 932.03 | 1056.88 | 932.05 |
| 1065.83 | 932.49 | 1066.9 | 932.54 | 1076.93 | 932.82 | 1084.49 | 932.96 | 1086.96 | 933.02 |
| 1096.99 | 933.17 | 1107.02 | 933.29 | 1116.98 | 933.36 | 1117.44 | 933.36 | 1120.97 | 933.35 |
| 1128.02 | 933.31 | 1128.51 | 933.3 | 1129.54 | 933.29 | 1150.06 | 933.02 | 1153.35 | 932.96 |
| 1161.08 | 932.84 | 1166.17 | 932.71 | 1172.1 | 932.51 | 1173.71 | 932.43 | 1177.17 | 932.04 |
| 1179.13 | 931.86 | 1181.23 | 931.67 | 1183.12 | 931.34 | 1188.77 | 930.29 | 1194.14 | 929.13 |
| 1196.3 | 928.69 | 1200.98 | 927.75 | 1205.16 | 926.92 | 1211.37 | 925.82 | 1216.17 | 925.25 |
| 1218.9 | 925.18 | 1224.79 | 925.91 | 1226.43 | 926.11 | 1227.19 | 926.22 | 1233.97 | 927.45 |
| 1238.21 | 928.18 | 1241.5 | 928.77 | 1248.6 | 929.74 | 1249.03 | 929.8 | 1249.23 | 929.83 |
| 1256.57 | 930.61 | 1260.25 | 930.97 | 1264.09 | 931.31 | 1271.27 | 931.9 | 1271.63 | 931.93 |
| 1272.41 | 931.98 | 1279.17 | 932.43 | 1282.29 | 932.63 | 1286.69 | 932.88 | 1293.31 | 933.23 |
| 1294.23 | 933.26 | 1296.22 | 933.31 | 1301.76 | 933.46 | 1304.32 | 933.49 | 1309.29 | 933.56 |
| 1315.34 | 933.61 | 1316.83 | 933.63 | 1317.25 | 933.63 | 1326.36 | 933.73 | 1331.89 | 933.8 |
| 1346.96 | 933.94 | 1348.4 | 933.95 | 1350.05 | 933.95 | 1350.36 | 933.95 | 1355.1 | 933.98 |
| 1358.71 | 933.99 | 1368.87 | 933.96 | 1376.24 | 933.89 | 1379.02 | 933.87 | 1380.96 | 933.84 |
| 1389.18 | 933.74 | 1389.59 | 933.73 | 1398.22 | 933.62 | 1399.34 | 933.61 | 1406.84 | 933.5 |
| 1409.49 | 933.48 | 1415.46 | 933.4 | 1419.65 | 933.37 | 1424.09 | 933.32 | 1429.81 | 933.27 |
| 1432.71 | 933.25 | 1439.96 | 933.17 | 1441.34 | 933.16 | 1449.97 | 933.07 | 1450.12 | 933.07 |
| 1458.59 | 932.98 | 1460.28 | 932.97 | 1467.21 | 932.9 | 1475.84 | 932.85 | 1480.59 | 932.85 |
| 1500.9 | 932.95 | 1501.71 | 932.96 | 1510.34 | 933 | 1511.06 | 933 | 1518.96 | 933.06 |
| 1521.21 | 933.07 | 1527.59 | 933.15 | 1531.37 | 933.19 | 1536.22 | 933.27 | 1541.53 | 933.37 |
| 1551.68 | 933.53 | 1561.84 | 933.64 | 1562.08 | 933.64 | 1570.72 | 933.71 | 1572 | 933.73 |
| 1579.34 | 933.78 | 1582.15 | 933.81 | 1592.31 | 933.88 | 1596.59 | 933.9 | 1602.47 | 933.94 |
| 1609.01 | 933.97 | 1612.62 | 933.98 | 1613.84 | 933.98 | 1620.68 | 934 | 1622.78 | 934.01 |
| 1623.24 | 934.01 | 1632.94 | 934.04 | 1635.59 | 934.06 | 1643.09 | 934.1 | 1647.94 | 934.16 |
| 1653.25 | 934.21 | 1672.63 | 934.48 | 1673.56 | 934.49 | 1677.87 | 934.52 | 1683.72 | 934.59 |
| 1691.46 | 934.64 | 1693.87 | 934.65 | 1700.09 | 934.74 | 1708.71 | 934.91 | 1714.19 | 935.2 |
| 1717.33 | 935.28 | 1724.34 | 935.75 | 1725.96 | 935.79 | 1726.41 | 935.81 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1028.94 | .04 | 1179.13 | .052 | 1317.25 | .04 | 1609.01 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1116.98 | 1350.05 | 222.47 | 199.97 | 168.15 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1120.97 | 933.35 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.03 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.37 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 932.67 | Reach Len. (ft) | 222.47 | 199.97 | 168.15 |
| Crit W.S. (ft) | 930.56 | Flow Area (sq ft) | | 379.33 | |
| E.G. Slope (ft/ft) | 0.005332 | Area (sq ft) | 513.56 | 379.33 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 642.78 | Top Width (ft) | 527.31 | 115.46 | |
| Vel Total (ft/s) | 4.85 | Avg. Vel. (ft/s) | | 4.85 | |
| Max Chl Dpth (ft) | 7.49 | Hydr. Depth (ft) | | 3.29 | |
| Conv. Total (cfs) | 25198.9 | Conv. (cfs) | | 25198.9 | |

| | | | | | |
|---|---|---|---|---|---|
| Length Wtd. (ft) | 199.93 | Wetted Per. (ft) | | 116.59 | |
| Min Ch El (ft) | 925.18 | Shear (lb/sq ft) | | 1.08 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.25 | |
| Frctn Loss (ft) | 1.02 | Cum Volume (acre-ft) | 65.99 | 78.70 | 88.57 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 69.77 | 33.02 | 107.47 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.36 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 932.69 | Reach Len. (ft) | 222.47 | 199.97 | 168.15 |
| Crit W.S. (ft) | 930.56 | Flow Area (sq ft) | | 382.05 | |
| E.G. Slope (ft/ft) | 0.005243 | Area (sq ft) | | 382.05 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 116.57 | Top Width (ft) | | 116.57 | |
| Vel Total (ft/s) | 4.82 | Avg. Vel. (ft/s) | | 4.82 | |
| Max Chl Dpth (ft) | 7.51 | Hydr. Depth (ft) | | 3.28 | |
| Conv. Total (cfs) | 25410.3 | Conv. (cfs) | | 25410.3 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 117.70 | |
| Min Ch El (ft) | 925.18 | Shear (lb/sq ft) | | 1.06 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.12 | |
| Frctn Loss (ft) | 0.99 | Cum Volume (acre-ft) | 11.80 | 102.41 | 16.24 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.00 | 35.21 | 8.11 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.36 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 932.69 | Reach Len. (ft) | 222.47 | 199.97 | 168.15 |
| Crit W.S. (ft) | 930.55 | Flow Area (sq ft) | | 382.05 | |
| E.G. Slope (ft/ft) | 0.005243 | Area (sq ft) | | 382.05 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 116.57 | Top Width (ft) | | 116.57 | |
| Vel Total (ft/s) | 4.82 | Avg. Vel. (ft/s) | | 4.82 | |
| Max Chl Dpth (ft) | 7.51 | Hydr. Depth (ft) | | 3.28 | |
| Conv. Total (cfs) | 25410.3 | Conv. (cfs) | | 25410.3 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 117.70 | |
| Min Ch El (ft) | 925.18 | Shear (lb/sq ft) | | 1.06 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.12 | |
| Frctn Loss (ft) | 0.99 | Cum Volume (acre-ft) | 25.48 | 86.15 | 33.59 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.60 | 33.72 | 24.99 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.359

INPUT
Description: Thalweg Sta. 1253.79
Station Elevation Data num= 348

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 944.26 | 7.88 | 943.56 | 9.26 | 943.44 | 16.37 | 942.89 | 19.46 | 942.67 |
| 24.86 | 942.43 | 29.66 | 942.23 | 49.67 | 941.59 | 50.07 | 941.58 | 50.33 | 941.57 |
| 58.82 | 941.31 | 67.31 | 941.08 | 70.47 | 940.99 | 75.81 | 940.88 | 80.67 | 940.77 |
| 90.87 | 940.58 | 92.78 | 940.55 | 101.07 | 940.44 | 101.27 | 940.44 | 102.26 | 940.42 |
| 109.76 | 940.32 | 111.27 | 940.29 | 118.25 | 940.11 | 121.47 | 939.99 | 126.74 | 939.6 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 131.68 | 939.13 | 135.24 | 938.48 | 141.88 | 937.3 | 143.72 | 937.19 | 152.08 | 936.77 |
| 152.21 | 936.77 | 152.87 | 936.73 | 160.7 | 936.31 | 162.28 | 936.2 | 169.2 | 935.43 |
| 172.48 | 935.12 | 177.68 | 934.64 | 182.68 | 934.25 | 192.88 | 933.85 | 194.66 | 933.83 |
| 203.08 | 933.7 | 203.16 | 933.7 | 203.49 | 933.69 | 211.64 | 933.52 | 213.29 | 933.49 |
| 220.13 | 933.35 | 223.49 | 933.27 | 233.69 | 933.15 | 254.09 | 933.05 | 271.07 | 932.96 |
| 288.06 | 932.91 | 294.89 | 932.9 | 296.55 | 932.9 | 304.74 | 932.88 | 305.09 | 932.88 |
| 313.52 | 932.86 | 315.3 | 932.86 | 325.5 | 932.83 | 330.5 | 932.8 | 335.7 | 932.78 |
| 355.35 | 932.66 | 355.98 | 932.65 | 356.1 | 932.65 | 364.46 | 932.59 | 376.5 | 932.52 |
| 381.45 | 932.5 | 396.9 | 932.46 | 398.42 | 932.46 | 405.98 | 932.43 | 407.39 | 932.43 |
| 447.91 | 932.29 | 449.37 | 932.29 | 456.6 | 932.26 | 457.85 | 932.25 | 458.11 | 932.25 |
| 466.34 | 932.23 | 468.31 | 932.22 | 474.84 | 932.21 | 478.51 | 932.19 | 498.91 | 932.13 |
| 500.31 | 932.13 | 507.22 | 932.1 | 509.12 | 932.1 | 517.29 | 932.07 | 519.32 | 932.07 |
| 525.77 | 932.04 | 534.27 | 932.01 | 539.72 | 931.98 | 542.76 | 931.97 | 549.92 | 931.93 |
| 551.25 | 931.92 | 559.74 | 931.88 | 560.12 | 931.88 | 568.23 | 931.83 | 590.72 | 931.72 |
| 600.92 | 931.69 | 602.19 | 931.68 | 608.46 | 931.67 | 610.68 | 931.66 | 611.13 | 931.66 |
| 619.16 | 931.65 | 621.33 | 931.64 | 627.66 | 931.62 | 650.12 | 931.51 | 651.93 | 931.51 |
| 653.13 | 931.5 | 661.62 | 931.46 | 662.13 | 931.46 | 687.09 | 931.33 | 701.23 | 931.23 |
| 702.94 | 931.22 | 704.07 | 931.21 | 709.7 | 931.18 | 712.57 | 931.16 | 713.14 | 931.16 |
| 721.05 | 931.12 | 723.34 | 931.1 | 743.74 | 931.05 | 746.52 | 931.05 | 753.94 | 931.03 |
| 755.01 | 931.03 | 760.33 | 931.02 | 764.14 | 931.02 | 772 | 931 | 825.35 | 931 |
| 835.55 | 930.98 | 839.92 | 930.98 | 845.75 | 930.96 | 848.4 | 930.96 | 855.95 | 930.94 |
| 856.89 | 930.94 | 865.39 | 930.92 | 867.3 | 930.92 | 882.36 | 930.87 | 896.76 | 930.8 |
| 899.35 | 930.78 | 906.96 | 930.74 | 907.83 | 930.74 | 916.32 | 930.68 | 917.16 | 930.68 |
| 918.41 | 930.67 | 956.74 | 930.44 | 957.96 | 930.43 | 967.26 | 930.38 | 968.16 | 930.37 |
| 978.36 | 930.3 | 998.77 | 930.1 | 1001.22 | 930.08 | 1008.97 | 930 | 1009.71 | 929.99 |
| 1013.42 | 929.96 | 1026.69 | 929.83 | 1029.37 | 929.8 | 1039.57 | 929.71 | 1043.67 | 929.68 |
| 1049.77 | 929.62 | 1059.97 | 929.53 | 1060.65 | 929.52 | 1069.14 | 929.42 | 1070.17 | 929.41 |
| 1080.37 | 929.23 | 1090.57 | 929.02 | 1094.61 | 929 | 1100.78 | 928.99 | 1103.1 | 929.13 |
| 1110.98 | 929.66 | 1111.6 | 929.69 | 1114.67 | 929.83 | 1120.09 | 930.09 | 1121.18 | 930.14 |
| 1124.79 | 930.26 | 1128.57 | 930.38 | 1131.38 | 930.49 | 1135.59 | 930.71 | 1141.58 | 931.01 |
| 1151.78 | 931.36 | 1154.05 | 931.43 | 1161.98 | 931.66 | 1162.53 | 931.68 | 1165.29 | 931.75 |
| 1171.03 | 931.92 | 1172.18 | 931.96 | 1179.52 | 932.09 | 1182.38 | 932.1 | 1188 | 932.13 |
| 1191.88 | 932.11 | 1196.49 | 932.11 | 1202.79 | 932.08 | 1204.99 | 932.06 | 1212.99 | 931.95 |
| 1213.48 | 931.93 | 1215.91 | 931.82 | 1217.53 | 931.75 | 1221.96 | 931.55 | 1223.19 | 931.5 |
| 1230.46 | 930.3 | 1233.39 | 929.66 | 1237.8 | 928.33 | 1243.59 | 926.65 | 1247.44 | 925.63 |
| 1253.79 | 924.16 | 1255.92 | 924.38 | 1263.99 | 925.64 | 1264.42 | 925.73 | 1266.53 | 926.13 |
| 1272.91 | 927.35 | 1274.19 | 927.57 | 1281.4 | 928.14 | 1284.39 | 928.33 | 1289.89 | 928.49 |
| 1298.38 | 928.76 | 1304.8 | 928.99 | 1306.87 | 929.06 | 1314.23 | 929.39 | 1315 | 929.43 |
| 1315.35 | 929.45 | 1317.15 | 929.54 | 1323.85 | 929.9 | 1325.2 | 929.98 | 1340.83 | 930.8 |
| 1345.6 | 931 | 1349.32 | 931.18 | 1355.8 | 931.44 | 1366 | 931.74 | 1366.3 | 931.74 |
| 1367.77 | 931.77 | 1374.79 | 931.9 | 1376.2 | 931.93 | 1386.4 | 932.07 | 1396.61 | 932.09 |
| 1399.08 | 932.08 | 1403.88 | 932.05 | 1406.81 | 932.04 | 1416.66 | 931.97 | 1418.39 | 931.97 |
| 1425.73 | 931.96 | 1427.21 | 931.96 | 1437.41 | 931.97 | 1447.61 | 931.93 | 1457.81 | 931.76 |
| 1459.69 | 931.71 | 1468.01 | 931.53 | 1468.18 | 931.53 | 1469.01 | 931.52 | 1476.67 | 931.45 |
| 1478.21 | 931.45 | 1485.16 | 931.5 | 1488.42 | 931.51 | 1493.65 | 931.59 | 1498.62 | 931.64 |
| 1508.82 | 931.78 | 1510.63 | 931.8 | 1519.02 | 931.88 | 1519.12 | 931.88 | 1519.63 | 931.89 |
| 1527.61 | 931.98 | 1529.22 | 932.02 | 1539.42 | 932.24 | 1549.62 | 932.39 | 1553.08 | 932.4 |
| 1559.82 | 932.47 | 1561.58 | 932.47 | 1570.02 | 932.54 | 1570.26 | 932.54 | 1578.55 | 932.56 |
| 1580.22 | 932.58 | 1590.43 | 932.67 | 1595.54 | 932.73 | 1604.02 | 932.8 | 1610.83 | 932.83 |
| 1612.51 | 932.84 | 1620.88 | 932.86 | 1621.03 | 932.86 | 1637.98 | 932.94 | 1641.43 | 932.95 |
| 1651.63 | 932.96 | 1661.83 | 932.99 | 1663.45 | 933 | 1665.48 | 933.02 | 1671.49 | 933.06 |
| 1672.03 | 933.06 | 1680.43 | 933.19 | 1682.23 | 933.21 | 1688.93 | 933.51 | 1692.44 | 933.56 |
| 1697.41 | 934.02 | 1702.64 | 934.29 | 1705.9 | 934.61 | 1712.84 | 934.99 | 1714.4 | 935.07 |
| 1722.12 | 935.14 | 1722.89 | 935.15 | 1723.04 | 935.15 | 1731.37 | 934.97 | 1733.24 | 934.92 |
| 1739.86 | 934.6 | 1743.44 | 934.51 | 1748.36 | 934.15 | 1753.64 | 934.01 | 1756.85 | 933.88 |
| 1763.84 | 933.82 | 1765.33 | 933.8 | 1772.74 | 933.82 | 1774.04 | 933.83 | 1774.37 | 933.83 |
| 1784.25 | 933.92 | 1790.8 | 934.03 | 1794.45 | 934.12 | 1799.29 | 934.35 | 1804.65 | 934.77 |
| 1807.79 | 935.03 | 1814.85 | 935.71 | 1823.36 | 936.45 | 1824.76 | 936.55 | 1825.05 | 936.58 |
| 1833.25 | 937.23 | 1835.25 | 937.41 | 1841.75 | 938.01 | 1845.45 | 938.37 | 1850.24 | 938.98 |
| 1855.65 | 939.54 | 1858.72 | 939.9 | 1865.85 | 940.51 | 1867.22 | 940.63 | 1873.98 | 941.05 |
| 1875.71 | 941.15 | 1876.05 | 941.16 | 1884.2 | 941.49 | 1886.26 | 941.52 | 1892.68 | 941.51 |
| 1896.46 | 941.46 | 1901.18 | 941.38 | 1909.67 | 941.07 | 1916.86 | 940.77 | 1918.16 | 940.71 |
| 1924.6 | 940.45 | 1926.65 | 940.37 | 1927.06 | 940.38 | 1935.14 | 940.34 | 1937.26 | 940.64 |
| 1943.63 | 940.61 | 1947.46 | 941.09 | 1952.11 | 941.86 | 1957.66 | 942.28 | 1960.61 | 943.03 |
| 1967.86 | 944.19 | 1969.1 | 944.39 | 1973.31 | 945.15 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1124.79 | .04 | 1217.53 | .052 | 1314.23 | .04 | 1665.48 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1191.88 | 1399.08 | 202.68 | 200 | 198.4 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1188 | 932.13 | F |

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft) 932.00 Element Left OB Channel Right OB

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.051 | 0.040 |
| W.S. Elev (ft) | 931.69 | Reach Len. (ft) | 202.68 | 200.00 | 198.40 |
| Crit W.S. (ft) | 930.02 | Flow Area (sq ft) | | 408.80 | 5.93 |
| E.G. Slope (ft/ft) | 0.004852 | Area (sq ft) | 564.81 | 408.80 | 5.93 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1835.81 | 4.19 |
| Top Width (ft) | 748.59 | Top Width (ft) | 561.76 | 145.36 | 41.47 |
| Vel Total (ft/s) | 4.44 | Avg. Vel. (ft/s) | | 4.49 | 0.71 |
| Max Chl Dpth (ft) | 7.53 | Hydr. Depth (ft) | | 2.81 | 0.14 |
| Conv. Total (cfs) | 26414.3 | Conv. (cfs) | | 26354.1 | 60.2 |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 146.66 | 41.48 |
| Min Ch El (ft) | 924.16 | Shear (lb/sq ft) | | 0.84 | 0.04 |
| Alpha | 1.02 | Stream Power (lb/ft s) | | 3.79 | 0.03 |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 63.24 | 76.89 | 88.56 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 66.99 | 32.42 | 107.39 |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 932.04 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 931.74 | Reach Len. (ft) | 202.68 | 200.00 | 198.40 |
| Crit W.S. (ft) | 930.02 | Flow Area (sq ft) | | 415.67 | |
| E.G. Slope (ft/ft) | 0.004714 | Area (sq ft) | | 415.67 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 147.99 | Top Width (ft) | | 147.99 | |
| Vel Total (ft/s) | 4.43 | Avg. Vel. (ft/s) | | 4.43 | |
| Max Chl Dpth (ft) | 7.58 | Hydr. Depth (ft) | | 2.81 | |
| Conv. Total (cfs) | 26800.0 | Conv. (cfs) | | 26800.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 149.29 | |
| Min Ch El (ft) | 924.16 | Shear (lb/sq ft) | | 0.82 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.63 | |
| Frctn Loss (ft) | 0.81 | Cum Volume (acre-ft) | 11.80 | 100.58 | 16.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 34.61 | 8.11 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 932.04 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 931.74 | Reach Len. (ft) | 202.68 | 200.00 | 198.40 |
| Crit W.S. (ft) | 930.01 | Flow Area (sq ft) | | 415.67 | |
| E.G. Slope (ft/ft) | 0.004714 | Area (sq ft) | | 415.67 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 147.99 | Top Width (ft) | | 147.99 | |
| Vel Total (ft/s) | 4.43 | Avg. Vel. (ft/s) | | 4.43 | |
| Max Chl Dpth (ft) | 7.58 | Hydr. Depth (ft) | | 2.81 | |
| Conv. Total (cfs) | 26800.0 | Conv. (cfs) | | 26800.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 149.29 | |
| Min Ch El (ft) | 924.16 | Shear (lb/sq ft) | | 0.82 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.63 | |
| Frctn Loss (ft) | 0.81 | Cum Volume (acre-ft) | 25.48 | 84.31 | 33.59 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.60 | 33.12 | 24.99 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.321

INPUT
Description: Thalweg Sta. 1258.88
Station Elevation Data num= 330

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 943.98 | 6.98 | 943.83 | 17.16 | 943.38 | 22.14 | 942.92 | 30.7 | 942.15 |
| 37.52 | 941.55 | 39.25 | 941.45 | 47.69 | 940.91 | 47.81 | 940.9 | 48.39 | 940.87 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 64.92 | 939.86 | 68.05 | 939.66 | 78.23 | 939.1 | 82.04 | 938.94 | 88.41 | 938.66 |
| 90.58 | 938.57 | 98.58 | 938.22 | 99.15 | 938.19 | 102.09 | 938 | 107.69 | 937.65 |
| 108.76 | 937.57 | 116.25 | 936.92 | 118.94 | 936.65 | 129.12 | 935.72 | 133.36 | 935.37 |
| 139.3 | 934.94 | 141.92 | 934.78 | 149.48 | 934.42 | 150.48 | 934.38 | 160.56 | 934.15 |
| 169.83 | 934.11 | 176.15 | 933.49 | 180.01 | 932.89 | 185.68 | 932.79 | 190.19 | 932.56 |
| 198.23 | 932.5 | 200.37 | 932.46 | 209.48 | 932.33 | 210.37 | 932.31 | 210.79 | 932.31 |
| 230.9 | 932.03 | 244.6 | 931.87 | 251.26 | 931.81 | 253.16 | 931.8 | 261.43 | 931.73 |
| 261.71 | 931.73 | 263.18 | 931.72 | 281.79 | 931.58 | 291.97 | 931.52 | 302.15 | 931.5 |
| 313.05 | 931.49 | 316.88 | 931.48 | 322.5 | 931.48 | 330.17 | 931.46 | 332.68 | 931.46 |
| 342.86 | 931.43 | 363.21 | 931.3 | 364.38 | 931.29 | 370.58 | 931.26 | 372.94 | 931.24 |
| 373.39 | 931.24 | 390.05 | 931.17 | 414.1 | 931.09 | 415.72 | 931.09 | 424.27 | 931.06 |
| 432.84 | 931.04 | 434.46 | 931.04 | 441.39 | 931.03 | 465 | 930.98 | 467.06 | 930.97 |
| 475.17 | 930.96 | 475.62 | 930.95 | 477.97 | 930.95 | 485.35 | 930.93 | 487.07 | 930.92 |
| 499.63 | 930.87 | 515.88 | 930.83 | 518.4 | 930.82 | 526.06 | 930.81 | 526.96 | 930.81 |
| 535.51 | 930.79 | 536.24 | 930.79 | 544.07 | 930.77 | 546.42 | 930.77 | 576.95 | 930.7 |
| 578.3 | 930.7 | 585.37 | 930.68 | 586.85 | 930.68 | 587.13 | 930.67 | 595.41 | 930.66 |
| 597.31 | 930.65 | 612.52 | 930.62 | 617.67 | 930.6 | 621.08 | 930.6 | 627.84 | 930.58 |
| 629.64 | 930.58 | 638.02 | 930.56 | 638.19 | 930.56 | 639.07 | 930.55 | 646.74 | 930.54 |
| 648.2 | 930.53 | 655.3 | 930.52 | 678.73 | 930.45 | 680.97 | 930.45 | 688.91 | 930.42 |
| 689.52 | 930.42 | 698.08 | 930.4 | 699.09 | 930.4 | 706.64 | 930.38 | 709.27 | 930.38 |
| 738.24 | 930.29 | 739.8 | 930.28 | 749.42 | 930.24 | 749.98 | 930.23 | 770.34 | 930.13 |
| 780.51 | 930.07 | 783.65 | 930.06 | 800.17 | 929.97 | 800.76 | 929.96 | 800.87 | 929.96 |
| 851.76 | 929.68 | 852.1 | 929.68 | 860.66 | 929.63 | 861.94 | 929.62 | 869.21 | 929.58 |
| 872.12 | 929.57 | 892.47 | 929.47 | 894.88 | 929.47 | 902.65 | 929.44 | 903.43 | 929.44 |
| 920.54 | 929.4 | 933.19 | 929.36 | 946.21 | 929.28 | 963.32 | 929.13 | 963.72 | 929.13 |
| 971.88 | 929.06 | 973.9 | 929.04 | 980.44 | 929 | 984.08 | 928.97 | 994.25 | 928.92 |
| 1014.53 | 928.85 | 1014.96 | 928.85 | 1023.22 | 928.82 | 1031.78 | 928.77 | 1034.97 | 928.76 |
| 1045.15 | 928.66 | 1055.32 | 928.53 | 1065.5 | 928.38 | 1066 | 928.37 | 1068.66 | 928.34 |
| 1074.56 | 928.25 | 1075.68 | 928.23 | 1085.86 | 928.09 | 1096.03 | 927.94 | 1106.21 | 927.82 |
| 1108.79 | 927.82 | 1116.39 | 927.84 | 1117.34 | 927.88 | 1122.35 | 928.13 | 1125.9 | 928.3 |
| 1126.57 | 928.34 | 1134.46 | 928.98 | 1136.75 | 929.15 | 1143.01 | 929.42 | 1146.93 | 929.57 |
| 1151.57 | 929.72 | 1152.77 | 929.75 | 1157.1 | 929.87 | 1160.13 | 929.94 | 1167.28 | 930.06 |
| 1168.68 | 930.07 | 1176.05 | 930.18 | 1177.23 | 930.19 | 1177.46 | 930.2 | 1185.8 | 930.4 |
| 1187.64 | 930.46 | 1191.78 | 930.58 | 1194.34 | 930.65 | 1197.82 | 930.76 | 1202.9 | 930.88 |
| 1207.99 | 930.98 | 1211.46 | 930.93 | 1217.14 | 930.79 | 1218.17 | 930.77 | 1220.01 | 930.64 |
| 1228.35 | 929.79 | 1228.57 | 929.74 | 1229.75 | 929.5 | 1237.13 | 927.99 | 1238.53 | 927.67 |
| 1245.68 | 925.93 | 1248.71 | 925.12 | 1254.24 | 924.05 | 1258.88 | 923.1 | 1262.8 | 923.13 |
| 1269.06 | 923.79 | 1271.35 | 924.15 | 1279.24 | 925.57 | 1279.91 | 925.68 | 1288.47 | 926.93 |
| 1289.42 | 927.04 | 1290.81 | 927.15 | 1299.6 | 928.01 | 1301.01 | 928.11 | 1305.58 | 928.45 |
| 1309.77 | 928.72 | 1319.95 | 929.33 | 1322.69 | 929.48 | 1330.13 | 929.9 | 1337.14 | 930.28 |
| 1339.81 | 930.42 | 1340.31 | 930.45 | 1341.05 | 930.47 | 1350.49 | 930.76 | 1356.92 | 930.87 |
| 1360.66 | 930.9 | 1365.47 | 930.97 | 1370.84 | 931.02 | 1381.02 | 931.09 | 1382.59 | 931.09 |
| 1390.84 | 931.13 | 1394.64 | 931.13 | 1399.7 | 931.12 | 1401.38 | 931.13 | 1408.26 | 931.08 |
| 1411.55 | 931.07 | 1416.81 | 930.95 | 1421.73 | 930.9 | 1431.91 | 930.53 | 1433.93 | 930.45 |
| 1442.48 | 930.02 | 1444.54 | 929.92 | 1452.27 | 929.56 | 1462.45 | 929.45 | 1466.63 | 929.48 |
| 1472.62 | 929.58 | 1479.19 | 929.71 | 1491.75 | 930.05 | 1492.98 | 930.1 | 1502.37 | 930.14 |
| 1503.16 | 930.15 | 1510.93 | 930.01 | 1513.33 | 930 | 1523.51 | 929.74 | 1528.04 | 929.74 |
| 1533.69 | 929.65 | 1536.6 | 929.77 | 1543.87 | 929.99 | 1551.94 | 930.43 | 1553.71 | 930.53 |
| 1554.05 | 930.55 | 1564.22 | 931.12 | 1570.82 | 931.35 | 1574.4 | 931.52 | 1579.38 | 931.62 |
| 1584.58 | 931.76 | 1594.76 | 931.91 | 1596.49 | 931.94 | 1604.94 | 932.06 | 1605.05 | 932.06 |
| 1613.61 | 932.2 | 1615.12 | 932.24 | 1622.16 | 932.27 | 1625.29 | 932.3 | 1639.28 | 932.24 |
| 1645.65 | 932.16 | 1647.83 | 932.15 | 1655.83 | 932 | 1656.39 | 932 | 1659.34 | 931.96 |
| 1664.95 | 931.9 | 1666.01 | 931.89 | 1673.5 | 931.9 | 1676.18 | 931.91 | 1682.06 | 931.99 |
| 1690.62 | 932.23 | 1696.54 | 932.43 | 1707.72 | 932.76 | 1708.68 | 932.78 | 1713.04 | 932.88 |
| 1716.29 | 932.98 | 1716.9 | 933 | 1724.83 | 933.34 | 1727.07 | 933.42 | 1730.36 | 933.56 |
| 1742.91 | 934.17 | 1750.5 | 934.47 | 1757.61 | 934.92 | 1759.06 | 934.99 | 1766.73 | 935.42 |
| 1767.79 | 935.47 | 1768.03 | 935.48 | 1777.97 | 935.88 | 1780.59 | 935.93 | 1798.32 | 936.54 |
| 1801.84 | 936.68 | 1808.5 | 936.92 | 1810.4 | 937.01 | 1818.68 | 937.3 | 1818.95 | 937.31 |
| 1820.43 | 937.38 | 1827.51 | 937.63 | 1828.85 | 937.66 | 1839.03 | 938.03 | 1844.62 | 938.22 |
| 1849.21 | 938.35 | 1853.18 | 938.42 | 1859.39 | 938.41 | 1861.74 | 938.39 | 1869.57 | 938.25 |
| 1870.29 | 938.23 | 1874.13 | 938.11 | 1878.85 | 937.91 | 1879.74 | 938.03 | 1887.41 | 937.89 |
| 1889.92 | 938.22 | 1895.96 | 939.14 | 1900.1 | 939.6 | 1904.52 | 939.58 | 1910.28 | 940.2 |
| 1913.08 | 940.35 | 1920.46 | 940.69 | 1921.63 | 940.79 | 1927.83 | 941.25 | 1930.19 | 941.42 |
| 1930.64 | 941.45 | 1938.75 | 942.27 | 1940.81 | 942.45 | 1947.3 | 943.25 | 1950.54 | 943.53 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1152.77 | .04 | 1191.78 | .052 | 1301.01 | .04 | 1708.68 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1217.14 | 1394.64 | 202.06 | 200 | 206.6 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1207.99 | 930.98 | F |
| 1401.38 | 1950.54 | 931.13 | F |

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft) 931.14 Element Left OB Channel Right OB

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.29 | Wt. n-Val. | 0.052 | 0.051 | |
| W.S. Elev (ft) | 930.85 | Reach Len. (ft) | 202.06 | 200.00 | 206.60 |
| Crit W.S. (ft) | 928.56 | Flow Area (sq ft) | 0.08 | 426.78 | |
| E.G. Slope (ft/ft) | 0.003760 | Area (sq ft) | 770.90 | 426.78 | 120.87 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 0.01 | 1839.99 | |
| Top Width (ft) | 973.81 | Top Width (ft) | 698.45 | 138.87 | 136.49 |
| Vel Total (ft/s) | 4.31 | Avg. Vel. (ft/s) | 0.18 | 4.31 | |
| Max Chl Dpth (ft) | 7.75 | Hydr. Depth (ft) | 0.03 | 3.07 | |
| Conv. Total (cfs) | 30005.6 | Conv. (cfs) | 0.2 | 30005.4 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | 2.61 | 140.07 | |
| Min Ch El (ft) | 923.10 | Shear (lb/sq ft) | 0.01 | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 3.08 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 60.13 | 74.97 | 88.27 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 64.06 | 31.77 | 106.98 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 931.22 | Element | | | |
| Vel Head (ft) | 0.27 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 930.95 | Reach Len. (ft) | 202.06 | 200.00 | 206.60 |
| Crit W.S. (ft) | 928.56 | Flow Area (sq ft) | | 440.86 | |
| E.G. Slope (ft/ft) | 0.003487 | Area (sq ft) | | 440.86 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 147.14 | Top Width (ft) | | 147.14 | |
| Vel Total (ft/s) | 4.17 | Avg. Vel. (ft/s) | | 4.17 | |
| Max Chl Dpth (ft) | 7.85 | Hydr. Depth (ft) | | 3.00 | |
| Conv. Total (cfs) | 31158.3 | Conv. (cfs) | | 31158.3 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 148.51 | |
| Min Ch El (ft) | 923.10 | Shear (lb/sq ft) | | 0.65 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.70 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 11.80 | 98.61 | 16.24 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.00 | 33.93 | 8.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 931.22 | Element | | | |
| Vel Head (ft) | 0.27 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 930.95 | Reach Len. (ft) | 202.06 | 200.00 | 206.60 |
| Crit W.S. (ft) | 928.56 | Flow Area (sq ft) | | 440.86 | |
| E.G. Slope (ft/ft) | 0.003487 | Area (sq ft) | | 440.86 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 147.14 | Top Width (ft) | | 147.14 | |
| Vel Total (ft/s) | 4.17 | Avg. Vel. (ft/s) | | 4.17 | |
| Max Chl Dpth (ft) | 7.85 | Hydr. Depth (ft) | | 3.00 | |
| Conv. Total (cfs) | 31158.3 | Conv. (cfs) | | 31158.3 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 148.51 | |
| Min Ch El (ft) | 923.10 | Shear (lb/sq ft) | | 0.65 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.70 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 25.48 | 82.35 | 33.59 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.60 | 32.44 | 24.99 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E

REACH: Reach 1 RS: 2.283

INPUT
Description: Thalweg Sta. 1213.05
Station Elevation Data num= 308

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 942.05 | 4.42 | 941.9 | 5.94 | 941.8 | 14.51 | 941.27 | 14.82 | 941.25 |
| 23.69 | 940.61 | 24.61 | 940.54 | 32.57 | 939.77 | 34.7 | 939.56 | 41.44 | 938.78 |
| 44.8 | 938.41 | 50.32 | 937.77 | 54.89 | 937.26 | 64.98 | 936.15 | 68.07 | 935.85 |
| 75.08 | 935.14 | 84.31 | 934.24 | 85.17 | 934.16 | 85.83 | 934.11 | 94.7 | 933.36 |
| 95.26 | 933.32 | 103.57 | 932.99 | 105.36 | 932.93 | 112.45 | 932.79 | 115.45 | 932.75 |
| 121.33 | 932.61 | 125.55 | 932.59 | 130.2 | 932.61 | 135.64 | 932.52 | 139.08 | 932.35 |
| 145.73 | 931.49 | 147.95 | 931.36 | 155.83 | 931.32 | 156.83 | 931.29 | 164.13 | 931.22 |
| 165.71 | 931.21 | 165.92 | 931.21 | 176.01 | 930.99 | 183.45 | 930.88 | 186.11 | 930.83 |
| 189.6 | 930.8 | 201.3 | 930.68 | 206.3 | 930.64 | 213 | 930.6 | 224.7 | 930.56 |
| 226.48 | 930.55 | 227.84 | 930.55 | 236.58 | 930.52 | 237.69 | 930.52 | 254.46 | 930.47 |
| 272.22 | 930.42 | 281.09 | 930.39 | 287.04 | 930.38 | 297.14 | 930.35 | 298.85 | 930.34 |
| 307.23 | 930.32 | 316.59 | 930.28 | 317.33 | 930.28 | 325.47 | 930.25 | 347.61 | 930.16 |
| 367.79 | 930.1 | 369.84 | 930.1 | 377.89 | 930.07 | 378.73 | 930.07 | 384.8 | 930.05 |
| 387.6 | 930.05 | 387.98 | 930.04 | 396.47 | 930.02 | 398.08 | 930.02 | 423.1 | 929.94 |
| 428.36 | 929.93 | 431.98 | 929.91 | 448.54 | 929.86 | 449.73 | 929.85 | 458.37 | 929.82 |
| 458.64 | 929.82 | 467.48 | 929.79 | 468.73 | 929.79 | 476.35 | 929.77 | 511.86 | 929.67 |
| 519.2 | 929.64 | 520.73 | 929.63 | 529.3 | 929.6 | 529.61 | 929.6 | 538.49 | 929.56 |
| 540.58 | 929.56 | 559.58 | 929.49 | 600.62 | 929.46 | 610.04 | 929.44 | 610.77 | 929.44 |
| 620.14 | 929.41 | 627.24 | 929.4 | 630.23 | 929.38 | 636.13 | 929.38 | 657.57 | 929.34 |
| 670.61 | 929.3 | 671.63 | 929.29 | 679.04 | 929.27 | 680.5 | 929.26 | 680.7 | 929.26 |
| 689.38 | 929.23 | 690.79 | 929.22 | 710.98 | 929.17 | 721.08 | 929.19 | 724.88 | 929.18 |
| 731.17 | 929.2 | 733.75 | 929.19 | 741.26 | 929.18 | 742.64 | 929.17 | 751.36 | 929.14 |
| 752.61 | 929.14 | 760.38 | 929.1 | 761.45 | 929.1 | 771.54 | 929.05 | 774.55 | 929.03 |
| 801.82 | 928.9 | 804.76 | 928.88 | 811.92 | 928.85 | 822.01 | 928.8 | 822.52 | 928.8 |
| 831.39 | 928.75 | 832.11 | 928.75 | 840.26 | 928.72 | 842.2 | 928.71 | 849.14 | 928.7 |
| 852.29 | 928.68 | 882.57 | 928.61 | 884.64 | 928.6 | 892.67 | 928.58 | 893.52 | 928.57 |
| 902.4 | 928.53 | 902.76 | 928.53 | 911.27 | 928.46 | 912.86 | 928.45 | 920.14 | 928.36 |
| 943.14 | 928.06 | 946.77 | 928.02 | 953.23 | 927.93 | 955.65 | 927.91 | 963.32 | 927.83 |
| 973.28 | 927.75 | 973.42 | 927.75 | 982.28 | 927.7 | 983.51 | 927.69 | 1003.7 | 927.58 |
| 1013.79 | 927.47 | 1023.89 | 927.33 | 1026.65 | 927.28 | 1033.98 | 927.16 | 1035.53 | 927.13 |
| 1044.07 | 926.99 | 1044.41 | 926.99 | 1053.28 | 926.85 | 1054.17 | 926.84 | 1064.26 | 926.74 |
| 1071.03 | 926.73 | 1074.35 | 926.72 | 1084.45 | 926.87 | 1088.79 | 927.16 | 1094.54 | 927.57 |
| 1097.66 | 927.74 | 1104.64 | 928.09 | 1106.53 | 928.19 | 1114.73 | 928.57 | 1115.42 | 928.61 |
| 1123.82 | 929 | 1124.29 | 929.02 | 1124.82 | 929.04 | 1133.16 | 929.15 | 1134.92 | 929.17 |
| 1142.04 | 929.21 | 1145.01 | 929.22 | 1155.1 | 929.34 | 1159.79 | 929.37 | 1165.2 | 929.45 |
| 1168.33 | 929.34 | 1168.67 | 929.33 | 1175.29 | 929.17 | 1177.54 | 928.86 | 1185.39 | 927.74 |
| 1193.95 | 926.07 | 1195.3 | 925.8 | 1195.48 | 925.76 | 1204.17 | 923.99 | 1205.57 | 923.7 |
| 1213.05 | 922.48 | 1215.67 | 922.06 | 1221.93 | 923.51 | 1225.76 | 924.48 | 1230.8 | 925.32 |
| 1235.85 | 926.27 | 1239.68 | 926.75 | 1245.95 | 927.6 | 1255.49 | 928.7 | 1256.04 | 928.76 |
| 1257.42 | 928.89 | 1266.14 | 929.5 | 1266.31 | 929.51 | 1267.52 | 929.52 | 1276.23 | 929.63 |
| 1279.6 | 929.61 | 1284.05 | 929.59 | 1286.32 | 929.57 | 1292.93 | 929.47 | 1296.42 | 929.41 |
| 1301.81 | 929.22 | 1306.51 | 929.04 | 1316.6 | 928.55 | 1319.56 | 928.51 | 1326.7 | 928.52 |
| 1328.43 | 928.58 | 1336.79 | 928.93 | 1337.31 | 928.95 | 1346.19 | 929.32 | 1346.88 | 929.35 |
| 1355.06 | 929.62 | 1356.98 | 929.69 | 1363.93 | 929.77 | 1367.07 | 929.8 | 1377.17 | 929.68 |
| 1387.26 | 929.47 | 1397.35 | 929.19 | 1399.44 | 929.09 | 1407.45 | 928.69 | 1408.31 | 928.66 |
| 1417.54 | 928.21 | 1426.07 | 928.47 | 1427.63 | 928.52 | 1434.94 | 928.97 | 1437.73 | 929.15 |
| 1443.82 | 929.28 | 1447.82 | 929.39 | 1464.8 | 929.48 | 1478.1 | 929.54 | 1479.33 | 929.53 |
| 1488.2 | 929.54 | 1497.07 | 929.4 | 1498.29 | 929.39 | 1505.95 | 929.17 | 1508.39 | 929.11 |
| 1514.82 | 928.76 | 1518.48 | 928.57 | 1523.7 | 928.19 | 1528.57 | 927.81 | 1532.58 | 927.65 |
| 1538.67 | 927.18 | 1541.45 | 927.34 | 1548.76 | 927.87 | 1550.32 | 928.03 | 1559.21 | 929.01 |
| 1568.08 | 929.95 | 1568.95 | 930.05 | 1576.95 | 930.73 | 1579.04 | 930.93 | 1585.83 | 931.25 |
| 1589.14 | 931.4 | 1594.71 | 931.2 | 1603.58 | 930.8 | 1609.32 | 930.47 | 1612.46 | 930.43 |
| 1619.42 | 930.31 | 1630.21 | 930.31 | 1639.09 | 930.38 | 1639.6 | 930.39 | 1647.96 | 930.5 |
| 1649.7 | 930.53 | 1656.83 | 930.64 | 1659.79 | 930.7 | 1665.72 | 930.79 | 1669.88 | 930.87 |
| 1674.59 | 930.94 | 1679.98 | 930.99 | 1683.46 | 931.05 | 1690.07 | 931.14 | 1692.34 | 931.19 |
| 1708.88 | 931.51 | 1710.09 | 931.53 | 1710.26 | 931.54 | 1718.97 | 931.71 | 1720.35 | 931.74 |
| 1727.84 | 931.8 | 1730.24 | 931.84 | 1730.45 | 931.84 | 1736.71 | 931.82 | 1740.54 | 931.82 |
| 1745.6 | 931.89 | 1750.63 | 932.02 | 1754.47 | 932.18 | 1760.73 | 932.69 | 1763.34 | 932.93 |
| 1772.22 | 934.01 | 1780.92 | 934.96 | 1781.1 | 934.98 | 1782.43 | 935.11 | 1789.97 | 935.8 |
| 1791.01 | 935.88 | 1792.37 | 935.98 | 1801.1 | 936.65 | 1811.2 | 937.4 | 1816.61 | 937.9 |
| 1821.29 | 938.36 | 1825.48 | 938.72 | 1831.38 | 939.31 | 1834.35 | 939.56 | 1843.23 | 940.43 |
| 1851.57 | 941.32 | 1852.11 | 941.37 | 1854.49 | 941.6 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 1123.82 | .052 | 1255.49 | .04 | 1730.24 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1168.33 | 1279.6 | 203.74 | 200 | 193.07 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1165.2 | 929.45 | F |
| 1279.6 | 1854.49 | 929.61 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 929.89 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.70 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 929.19 | Reach Len. (ft) | 203.74 | 200.00 | 193.07 |
| Crit W.S. (ft) | 928.14 | Flow Area (sq ft) | | 273.88 | |
| E.G. Slope (ft/ft) | 0.011304 | Area (sq ft) | 399.62 | 273.88 | 94.23 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 658.79 | Top Width (ft) | 432.61 | 87.38 | 138.81 |
| Vel Total (ft/s) | 6.72 | Avg. Vel. (ft/s) | | 6.72 | |
| Max Chl Dpth (ft) | 7.13 | Hydr. Depth (ft) | | 3.13 | |
| Conv. Total (cfs) | 17306.4 | Conv. (cfs) | | 17306.4 | |
| Length Wtd. (ft) | 201.01 | Wetted Per. (ft) | | 88.63 | |
| Min Ch El (ft) | 922.06 | Shear (lb/sq ft) | | 2.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 14.65 | |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 57.42 | 73.36 | 87.76 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 61.43 | 31.25 | 106.33 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 930.23 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.48 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 929.75 | Reach Len. (ft) | 203.74 | 200.00 | 193.07 |
| Crit W.S. (ft) | 928.14 | Flow Area (sq ft) | | 329.40 | |
| E.G. Slope (ft/ft) | 0.007179 | Area (sq ft) | | 329.40 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 111.27 | Top Width (ft) | | 111.27 | |
| Vel Total (ft/s) | 5.59 | Avg. Vel. (ft/s) | | 5.59 | |
| Max Chl Dpth (ft) | 7.69 | Hydr. Depth (ft) | | 2.96 | |
| Conv. Total (cfs) | 21716.4 | Conv. (cfs) | | 21716.4 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 113.08 | |
| Min Ch El (ft) | 922.06 | Shear (lb/sq ft) | | 1.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.29 | |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 11.80 | 96.84 | 16.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 33.34 | 8.11 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 930.23 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.48 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 929.75 | Reach Len. (ft) | 203.74 | 200.00 | 193.07 |
| Crit W.S. (ft) | 928.14 | Flow Area (sq ft) | | 329.40 | |
| E.G. Slope (ft/ft) | 0.007179 | Area (sq ft) | | 329.40 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 111.27 | Top Width (ft) | | 111.27 | |
| Vel Total (ft/s) | 5.59 | Avg. Vel. (ft/s) | | 5.59 | |
| Max Chl Dpth (ft) | 7.69 | Hydr. Depth (ft) | | 2.96 | |
| Conv. Total (cfs) | 21716.4 | Conv. (cfs) | | 21716.4 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 113.08 | |
| Min Ch El (ft) | 922.06 | Shear (lb/sq ft) | | 1.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.29 | |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 25.48 | 80.58 | 33.59 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.60 | 31.85 | 24.99 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.245

INPUT
Description: Thalweg Sta. 1194.59
Station Elevation Data num= 301

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 940.25 | .95 | 940.23 | 4.73 | 940.13 | 14.74 | 939.74 | 24.75 | 939.47 |
| 29.82 | 939.17 | 34.76 | 938.89 | 39.45 | 938.39 | 44.77 | 937.81 | 49.08 | 937.22 |
| 54.77 | 936.41 | 58.71 | 935.87 | 64.78 | 934.98 | 74.79 | 933.66 | 81.77 | 932.93 |
| 84.8 | 932.6 | 87.59 | 932.37 | 94.8 | 931.83 | 102.62 | 931.6 | 104.81 | 931.51 |
| 106.83 | 931.57 | 114.82 | 931.79 | 116.46 | 931.78 | 124.83 | 931.67 | 126.09 | 931.57 |
| 134.84 | 930.97 | 135.72 | 930.9 | 144.84 | 930.1 | 145.34 | 930.08 | 154.85 | 929.65 |
| 154.97 | 929.65 | 157.89 | 929.6 | 164.59 | 929.5 | 164.86 | 929.49 | 174.22 | 929.38 |
| 174.87 | 929.37 | 183.84 | 929.3 | 184.88 | 929.3 | 194.88 | 929.23 | 196.41 | 929.23 |
| 212.73 | 929.16 | 214.9 | 929.16 | 238.1 | 929.07 | 260.85 | 928.93 | 264.94 | 928.91 |
| 290.2 | 928.72 | 299.36 | 928.66 | 314.98 | 928.53 | 318.61 | 928.51 | 324.99 | 928.46 |
| 334.99 | 928.39 | 337.87 | 928.38 | 345 | 928.33 | 383.99 | 928.14 | 385.03 | 928.13 |
| 385.99 | 928.13 | 395.04 | 928.09 | 395.62 | 928.09 | 405.05 | 928.06 | 405.25 | 928.06 |
| 410.25 | 928.05 | 414.88 | 928.03 | 415.06 | 928.03 | 424.5 | 928 | 425.06 | 928 |
| 434.12 | 927.97 | 435.07 | 927.97 | 443.75 | 927.94 | 445.08 | 927.93 | 453.38 | 927.92 |
| 455.09 | 927.91 | 525.14 | 927.89 | 559.27 | 927.86 | 565.17 | 927.84 | 568.89 | 927.85 |
| 575.18 | 927.84 | 585.19 | 927.85 | 588.14 | 927.84 | 595.2 | 927.83 | 597.77 | 927.82 |
| 625.22 | 927.66 | 626.65 | 927.65 | 635.23 | 927.61 | 636.27 | 927.6 | 645.24 | 927.57 |
| 645.9 | 927.57 | 655.25 | 927.55 | 655.53 | 927.55 | 662.61 | 927.54 | 665.36 | 927.54 |
| 684.41 | 927.46 | 685.27 | 927.45 | 694.03 | 927.42 | 695.28 | 927.42 | 703.65 | 927.41 |
| 705.28 | 927.41 | 735.31 | 927.4 | 751.79 | 927.41 | 755.32 | 927.42 | 761.41 | 927.42 |
| 765.33 | 927.43 | 785.35 | 927.43 | 795.36 | 927.41 | 805.36 | 927.37 | 809.55 | 927.36 |
| 815.37 | 927.33 | 838.42 | 927.26 | 845.39 | 927.21 | 848.05 | 927.17 | 855.4 | 927.07 |
| 857.67 | 927.03 | 875.42 | 926.76 | 885.43 | 926.63 | 886.56 | 926.62 | 895.43 | 926.51 |
| 896.17 | 926.5 | 905.44 | 926.4 | 905.8 | 926.39 | 914.97 | 926.29 | 915.45 | 926.29 |
| 925.06 | 926.19 | 925.46 | 926.19 | 934.68 | 926.11 | 935.47 | 926.1 | 944.31 | 926.04 |
| 945.47 | 926.04 | 953.94 | 926.02 | 955.48 | 926.02 | 963.56 | 926 | 965.49 | 926 |
| 973.19 | 925.98 | 982.81 | 925.93 | 985.51 | 925.92 | 995.51 | 925.85 | 1002.07 | 925.78 |
| 1005.52 | 925.75 | 1015.53 | 925.64 | 1021.32 | 925.56 | 1030.94 | 925.44 | 1035.54 | 925.39 |
| 1045.55 | 925.33 | 1055.56 | 925.38 | 1059.82 | 925.43 | 1065.57 | 925.51 | 1069.45 | 925.62 |
| 1075.58 | 925.82 | 1079.08 | 925.95 | 1085.58 | 926.14 | 1088.71 | 926.13 | 1092.27 | 926.1 |
| 1095.59 | 926.08 | 1098.32 | 926.02 | 1105.6 | 925.77 | 1115.61 | 925.35 | 1117.58 | 925.29 |
| 1125.61 | 925.29 | 1127.21 | 925.33 | 1135.62 | 925.67 | 1136.83 | 925.76 | 1145.63 | 926.53 |
| 1146.46 | 926.66 | 1155.64 | 928.05 | 1156.09 | 928.13 | 1165.65 | 929.46 | 1165.71 | 929.47 |
| 1167.33 | 929.63 | 1175.65 | 930.43 | 1175.72 | 930.41 | 1175.99 | 930.32 | 1185.66 | 927.16 |
| 1194.59 | 923.83 | 1195.67 | 923.46 | 1204.22 | 921.35 | 1205.68 | 921.09 | 1213.84 | 920.93 |
| 1215.69 | 920.8 | 1217.69 | 921.26 | 1225.69 | 923.03 | 1228.11 | 923.53 | 1235.7 | 925.13 |
| 1242.72 | 926.16 | 1245.71 | 926.58 | 1252.34 | 927.34 | 1255.72 | 927.72 | 1257.32 | 927.8 |
| 1261.97 | 928.02 | 1265.73 | 928.18 | 1275.73 | 928.26 | 1275.86 | 928.26 | 1280.21 | 928.27 |
| 1285.74 | 928.27 | 1290.86 | 928.23 | 1295.75 | 928.18 | 1300.47 | 928.11 | 1311.47 | 927.98 |
| 1315.76 | 927.91 | 1319.73 | 927.83 | 1325.77 | 927.72 | 1329.36 | 927.55 | 1335.78 | 927.3 |
| 1342.74 | 926.93 | 1345.79 | 926.75 | 1348.61 | 926.67 | 1358.23 | 926.51 | 1365.8 | 926.45 |
| 1367.86 | 926.42 | 1375.81 | 925.93 | 1377.48 | 926.08 | 1385.82 | 926.65 | 1387.11 | 926.73 |
| 1395.83 | 927.38 | 1396.74 | 927.39 | 1405.84 | 927.61 | 1406.37 | 927.6 | 1415.84 | 927.48 |
| 1419.69 | 927.28 | 1425.61 | 926.96 | 1425.85 | 926.95 | 1435.24 | 926.38 | 1435.86 | 926.35 |
| 1444.87 | 926.54 | 1445.87 | 926.58 | 1454.49 | 927.07 | 1455.88 | 927.14 | 1465.88 | 927.37 |
| 1473.75 | 927.34 | 1475.89 | 927.34 | 1485.9 | 927.22 | 1492.99 | 927.04 | 1495.91 | 926.96 |
| 1502.62 | 926.53 | 1505.91 | 926.31 | 1512.25 | 925.92 | 1515.92 | 925.68 | 1521.88 | 925.88 |
| 1525.93 | 926.1 | 1531.5 | 926.7 | 1535.94 | 927.19 | 1541.13 | 927.81 | 1545.95 | 928.36 |
| 1550.76 | 928.89 | 1555.95 | 929.44 | 1560.38 | 929.8 | 1565.96 | 930.27 | 1570 | 930.47 |
| 1575.97 | 930.71 | 1579.63 | 930.78 | 1585.98 | 930.86 | 1589.26 | 930.87 | 1595.99 | 930.92 |
| 1598.89 | 930.89 | 1605.99 | 930.91 | 1608.52 | 930.84 | 1616 | 930.73 | 1618.14 | 930.65 |
| 1626.01 | 930.41 | 1636.02 | 930 | 1637.39 | 929.94 | 1646.02 | 929.49 | 1647.02 | 929.45 |
| 1656.03 | 928.97 | 1656.64 | 928.96 | 1666.04 | 928.56 | 1666.27 | 928.56 | 1672.04 | 928.46 |
| 1675.9 | 928.41 | 1676.05 | 928.4 | 1685.53 | 928.5 | 1686.06 | 928.5 | 1695.14 | 928.75 |
| 1696.06 | 928.77 | 1704.77 | 929.04 | 1706.07 | 929.07 | 1716.08 | 929.37 | 1726.09 | 929.47 |
| 1733.65 | 929.46 | 1743.28 | 929.5 | 1746.1 | 929.52 | 1752.91 | 929.66 | 1756.11 | 929.76 |
| 1762.53 | 930 | 1766.12 | 930.24 | 1772.15 | 930.52 | 1772.85 | 930.57 | 1776.13 | 930.82 |
| 1781.78 | 931.07 | 1786.14 | 931.32 | 1791.41 | 931.94 | 1796.14 | 932.31 | 1801.04 | 932.84 |
| 1806.15 | 933.45 | 1810.66 | 933.97 | 1816.16 | 934.73 | 1820.29 | 935.42 | 1826.17 | 936.36 |
| 1829.91 | 936.92 | 1836.17 | 937.77 | 1839.54 | 938.16 | 1846.18 | 938.82 | 1849.16 | 939.14 |
| 1854.45 | 939.64 | | | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 1092.27 | .052 | 1257.32 | .04 | 1772.85 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1175.72 | 1275.86 | 208.91 | 199.97 | 180.49 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1175.65 | 930.43 | F |
| 1280.21 | 1854.45 | 928.27 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 928.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.78 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 927.63 | Reach Len. (ft) | 208.91 | 199.97 | 180.49 |
| Crit W.S. (ft) | 926.41 | Flow Area (sq ft) | | 259.21 | |
| E.G. Slope (ft/ft) | 0.011248 | Area (sq ft) | 534.33 | 259.21 | 167.20 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 803.70 | Top Width (ft) | 521.18 | 70.66 | 211.85 |
| Vel Total (ft/s) | 7.10 | Avg. Vel. (ft/s) | | 7.10 | |
| Max Chl Dpth (ft) | 6.83 | Hydr. Depth (ft) | | 3.67 | |
| Conv. Total (cfs) | 17349.4 | Conv. (cfs) | | 17349.4 | |
| Length Wtd. (ft) | 197.39 | Wetted Per. (ft) | | 72.31 | |
| Min Ch El (ft) | 920.80 | Shear (lb/sq ft) | | 2.52 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 17.87 | |
| Frctn Loss (ft) | 1.72 | Cum Volume (acre-ft) | 55.23 | 72.14 | 87.18 |
| C & E Loss (ft) | 0.15 | Cum SA (acres) | 59.20 | 30.89 | 105.55 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 928.78 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.57 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 928.21 | Reach Len. (ft) | 208.91 | 199.97 | 180.49 |
| Crit W.S. (ft) | 926.41 | Flow Area (sq ft) | | 303.56 | |
| E.G. Slope (ft/ft) | 0.007307 | Area (sq ft) | | 303.56 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 86.41 | Top Width (ft) | | 86.41 | |
| Vel Total (ft/s) | 6.06 | Avg. Vel. (ft/s) | | 6.06 | |
| Max Chl Dpth (ft) | 7.41 | Hydr. Depth (ft) | | 3.51 | |
| Conv. Total (cfs) | 21525.3 | Conv. (cfs) | | 21525.3 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 88.17 | |
| Min Ch El (ft) | 920.80 | Shear (lb/sq ft) | | 1.57 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 9.52 | |
| Frctn Loss (ft) | 1.86 | Cum Volume (acre-ft) | 11.80 | 95.39 | 16.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.00 | 32.88 | 8.11 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 928.78 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.57 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 928.21 | Reach Len. (ft) | 208.91 | 199.97 | 180.49 |
| Crit W.S. (ft) | 926.40 | Flow Area (sq ft) | | 303.56 | |
| E.G. Slope (ft/ft) | 0.007307 | Area (sq ft) | | 303.56 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 86.41 | Top Width (ft) | | 86.41 | |
| Vel Total (ft/s) | 6.06 | Avg. Vel. (ft/s) | | 6.06 | |
| Max Chl Dpth (ft) | 7.41 | Hydr. Depth (ft) | | 3.51 | |
| Conv. Total (cfs) | 21525.3 | Conv. (cfs) | | 21525.3 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 88.17 | |
| Min Ch El (ft) | 920.80 | Shear (lb/sq ft) | | 1.57 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 9.52 | |
| Frctn Loss (ft) | 1.86 | Cum Volume (acre-ft) | 25.48 | 79.13 | 33.59 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.60 | 31.39 | 24.99 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,

water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.208

INPUT
Description: Thalweg Sta. 1194.55
Station Elevation Data num= 273

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 938.11 | 1.44 | 938.06 | 2.75 | 938.03 | 11.17 | 937.38 | 12.75 | 937.28 |
| 20.91 | 936.01 | 22.76 | 935.71 | 30.64 | 934.2 | 32.76 | 933.75 | 40.38 | 932.51 |
| 42.77 | 932.1 | 50.11 | 931.47 | 52.77 | 931.19 | 59.84 | 931.29 | 62.77 | 931.38 |
| 69.58 | 931.11 | 72.78 | 931.02 | 79.31 | 930.09 | 82.78 | 929.69 | 89.04 | 929.31 |
| 92.79 | 929.01 | 98.78 | 928.89 | 102.79 | 928.75 | 108.5 | 928.63 | 112.79 | 928.53 |
| 122.8 | 928.36 | 127.97 | 928.3 | 132.8 | 928.23 | 137.7 | 928.18 | 142.81 | 928.14 |
| 152.81 | 928.14 | 162.81 | 928.16 | 172.82 | 928.17 | 176.64 | 928.16 | 182.82 | 928.16 |
| 192.82 | 928.14 | 212.83 | 928.13 | 232.84 | 928.06 | 242.84 | 927.97 | 244.76 | 927.95 |
| 262.85 | 927.73 | 264.23 | 927.72 | 272.86 | 927.63 | 273.97 | 927.62 | 282.86 | 927.57 |
| 283.7 | 927.57 | 292.86 | 927.55 | 322.88 | 927.57 | 332.37 | 927.54 | 332.88 | 927.54 |
| 342.09 | 927.52 | 342.88 | 927.52 | 362.89 | 927.51 | 371.29 | 927.49 | 372.89 | 927.49 |
| 381.03 | 927.46 | 382.9 | 927.46 | 390.76 | 927.41 | 410.23 | 927.23 | 412.91 | 927.2 |
| 419.96 | 927.14 | 422.91 | 927.11 | 429.7 | 927.07 | 432.92 | 927.04 | 462.93 | 926.89 |
| 472.93 | 926.85 | 478.36 | 926.84 | 482.94 | 926.82 | 488.09 | 926.82 | 492.94 | 926.8 |
| 507.56 | 926.8 | 512.95 | 926.79 | 522.95 | 926.79 | 542.96 | 926.74 | 562.97 | 926.63 |
| 565.96 | 926.62 | 572.97 | 926.58 | 575.68 | 926.56 | 582.98 | 926.52 | 612.99 | 926.39 |
| 614.62 | 926.39 | 622.99 | 926.36 | 624.35 | 926.35 | 633 | 926.31 | 634.09 | 926.31 |
| 643 | 926.27 | 643.82 | 926.27 | 653 | 926.25 | 653.55 | 926.25 | 663.01 | 926.22 |
| 663.29 | 926.22 | 673.01 | 926.2 | 673.24 | 926.2 | 682.75 | 926.17 | 683.01 | 926.17 |
| 692.48 | 926.13 | 693.02 | 926.13 | 702.21 | 926.08 | 703.02 | 926.07 | 711.95 | 926.02 |
| 713.03 | 926.02 | 721.68 | 925.98 | 723.03 | 925.97 | 731.41 | 925.93 | 733.03 | 925.92 |
| 741.15 | 925.89 | 743.04 | 925.88 | 750.88 | 925.86 | 783.05 | 925.73 | 799.55 | 925.61 |
| 823.07 | 925.4 | 828.74 | 925.36 | 833.07 | 925.32 | 848.21 | 925.23 | 853.08 | 925.21 |
| 857.94 | 925.18 | 863.08 | 925.16 | 867.68 | 925.13 | 873.09 | 925.11 | 893.1 | 924.97 |
| 896.88 | 924.93 | 923.11 | 924.7 | 933.11 | 924.6 | 935.8 | 924.56 | 943.12 | 924.48 |
| 945.54 | 924.44 | 963.12 | 924.19 | 973.13 | 924.04 | 983.13 | 923.92 | 984.47 | 923.92 |
| 993.13 | 923.88 | 994.21 | 923.89 | 1003.14 | 923.95 | 1003.94 | 923.97 | 1013.14 | 924.21 |
| 1013.67 | 924.25 | 1023.15 | 925.12 | 1023.41 | 925.16 | 1032.61 | 926.39 | 1033.14 | 926.46 |
| 1039.72 | 926.87 | 1042.86 | 927.06 | 1043.15 | 927.07 | 1052.6 | 927.15 | 1053.16 | 927.16 |
| 1053.75 | 927.13 | 1063.16 | 926.68 | 1072.07 | 925.94 | 1073.17 | 925.85 | 1074.33 | 925.8 |
| 1083.17 | 925.37 | 1093.17 | 925.51 | 1098.06 | 925.71 | 1103.3 | 925.94 | 1103.87 | 925.96 |
| 1106.47 | 926.07 | 1113.54 | 926.35 | 1115.56 | 926.41 | 1122.9 | 926.64 | 1123.79 | 926.67 |
| 1128.72 | 926.9 | 1134.03 | 927.16 | 1137.41 | 927.61 | 1144.27 | 928.44 | 1145.79 | 928.58 |
| 1152.63 | 929.3 | 1154.51 | 929.52 | 1155.05 | 929.38 | 1155.45 | 929.3 | 1164.76 | 927.32 |
| 1168.22 | 926.25 | 1175 | 924.38 | 1181.38 | 923.53 | 1185.24 | 923 | 1194.55 | 922.17 |
| 1195.49 | 922.08 | 1212.85 | 920.12 | 1215.97 | 919.91 | 1220.87 | 921.02 | 1226.22 | 922.17 |
| 1236.46 | 924.19 | 1244.95 | 925.28 | 1246.7 | 925.5 | 1247.21 | 925.52 | 1256.95 | 925.96 |
| 1271.17 | 926 | 1297.31 | 926.01 | 1312.76 | 925.94 | 1317.33 | 925.92 | 1325.34 | 925.86 |
| 1327.34 | 925.85 | 1335.79 | 925.68 | 1337.35 | 925.66 | 1347.36 | 925.03 | 1356.7 | 924.23 |
| 1357.37 | 924.17 | 1367.14 | 924.21 | 1367.38 | 924.21 | 1377.38 | 924.55 | 1387.39 | 924.56 |
| 1388.04 | 924.57 | 1397.4 | 925.03 | 1398.49 | 925.12 | 1407.41 | 925.77 | 1408.94 | 925.85 |
| 1417.42 | 926.04 | 1419.39 | 926.04 | 1427.43 | 925.78 | 1429.84 | 925.67 | 1437.44 | 924.99 |
| 1440.3 | 924.77 | 1447.45 | 925.09 | 1450.75 | 925.31 | 1457.46 | 926.13 | 1463.62 | 926.96 |
| 1467.46 | 927.45 | 1473.23 | 927.8 | 1477.47 | 928.32 | 1482.1 | 928.49 | 1487.48 | 928.57 |
| 1492.55 | 928.47 | 1497.49 | 928.36 | 1503 | 928.16 | 1507.5 | 927.98 | 1513.45 | 927.8 |
| 1517.51 | 927.65 | 1523.9 | 927.49 | 1527.52 | 927.36 | 1537.53 | 927.15 | 1547.54 | 927.18 |
| 1565.7 | 927.4 | 1576.15 | 927.46 | 1577.56 | 927.46 | 1586.6 | 927.41 | 1587.57 | 927.4 |
| 1597.05 | 927.35 | 1597.58 | 927.34 | 1607.5 | 927.31 | 1607.59 | 927.31 | 1609.58 | 927.3 |
| 1617.6 | 927.28 | 1617.95 | 927.28 | 1627.61 | 927.25 | 1628.4 | 927.24 | 1637.62 | 927.21 |
| 1647.63 | 927.2 | 1657.63 | 927.26 | 1659.76 | 927.28 | 1677.65 | 927.51 | 1680.66 | 927.54 |
| 1687.66 | 927.62 | 1697.67 | 927.68 | 1707.68 | 927.76 | 1712 | 927.85 | 1717.69 | 927.98 |
| 1722.45 | 928.27 | 1727.7 | 928.67 | 1732.91 | 929.19 | 1737.71 | 929.73 | 1743.36 | 930.39 |
| 1747.71 | 930.91 | 1753.81 | 931.93 | 1767.73 | 933.54 | 1774.71 | 934.36 | 1777.74 | 934.73 |
| 1785.16 | 935.51 | 1787.75 | 935.81 | 1790.13 | 936.01 | 1795.61 | 936.48 | 1797.76 | 936.7 |
| 1806.06 | 937.41 | 1807.77 | 937.54 | 1808.21 | 937.57 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1039.72 | .04 | 1122.9 | .052 | 1312.76 | .04 | 1790.13 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1155.45 | 1271.17 | 187.8 | 199.97 | 242.88 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1154.51 | 929.52 | F |
| 1297.31 | 1808.21 | 926.01 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 926.54 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.052 | 0.040 |
| W.S. Elev (ft) | 926.26 | Reach Len. (ft) | 187.80 | 199.97 | 242.88 |
| Crit W.S. (ft) | 925.17 | Flow Area (sq ft) | | 288.12 | 161.81 |
| E.G. Slope (ft/ft) | 0.006930 | Area (sq ft) | 405.71 | 288.12 | 161.81 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1351.85 | 488.15 |
| Top Width (ft) | 713.98 | Top Width (ft) | 423.79 | 102.97 | 187.22 |
| Vel Total (ft/s) | 4.09 | Avg. Vel. (ft/s) | | 4.69 | 3.02 |
| Max Chl Dpth (ft) | 6.35 | Hydr. Depth (ft) | | 2.80 | 0.86 |
| Conv. Total (cfs) | 22103.2 | Conv. (cfs) | | 16239.2 | 5864.0 |
| Length Wtd. (ft) | 206.02 | Wetted Per. (ft) | | 104.01 | 187.44 |
| Min Ch El (ft) | 919.91 | Shear (lb/sq ft) | | 1.20 | 0.37 |
| Alpha | 1.11 | Stream Power (lb/ft s) | | 5.62 | 1.13 |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | 52.98 | 70.88 | 86.50 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 56.94 | 30.49 | 104.72 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 926.91 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.61 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 926.30 | Reach Len. (ft) | 187.80 | 199.97 | 242.88 |
| Crit W.S. (ft) | 925.17 | Flow Area (sq ft) | | 292.75 | |
| E.G. Slope (ft/ft) | 0.012245 | Area (sq ft) | | 292.75 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 103.11 | Top Width (ft) | | 103.11 | |
| Vel Total (ft/s) | 6.29 | Avg. Vel. (ft/s) | | 6.29 | |
| Max Chl Dpth (ft) | 6.39 | Hydr. Depth (ft) | | 2.84 | |
| Conv. Total (cfs) | 16628.2 | Conv. (cfs) | | 16628.2 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 104.46 | |
| Min Ch El (ft) | 919.91 | Shear (lb/sq ft) | | 2.14 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 13.46 | |
| Frctn Loss (ft) | 1.19 | Cum Volume (acre-ft) | 11.80 | 94.02 | 16.24 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 5.00 | 32.45 | 8.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 926.91 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.61 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 926.30 | Reach Len. (ft) | 187.80 | 199.97 | 242.88 |
| Crit W.S. (ft) | 925.17 | Flow Area (sq ft) | | 292.75 | |
| E.G. Slope (ft/ft) | 0.012245 | Area (sq ft) | | 292.75 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 103.11 | Top Width (ft) | | 103.11 | |
| Vel Total (ft/s) | 6.29 | Avg. Vel. (ft/s) | | 6.29 | |
| Max Chl Dpth (ft) | 6.39 | Hydr. Depth (ft) | | 2.84 | |
| Conv. Total (cfs) | 16628.2 | Conv. (cfs) | | 16628.2 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 104.46 | |
| Min Ch El (ft) | 919.91 | Shear (lb/sq ft) | | 2.14 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 13.46 | |
| Frctn Loss (ft) | 1.19 | Cum Volume (acre-ft) | 25.48 | 77.76 | 33.59 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 14.60 | 30.96 | 24.99 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.170

INPUT
Description: Thalweg Sta. 1096.24
Station Elevation Data num= 350

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 938.42 | 9.11 | 937.71 | 9.71 | 937.66 | 19.72 | 937.21 | 20.68 | 937.22 |
| 29.72 | 937.28 | 38.23 | 938.6 | 39.73 | 938.84 | 47.94 | 934.45 | 49.73 | 933.5 |
| 57.65 | 931.51 | 59.74 | 930.9 | 67.35 | 930.83 | 69.74 | 930.86 | 77.06 | 930.51 |
| 79.75 | 930.41 | 86.76 | 929.47 | 89.75 | 929.15 | 96.47 | 928.5 | 99.76 | 928.14 |
| 106.18 | 927.9 | 109.76 | 927.69 | 115.88 | 927.61 | 119.77 | 927.55 | 129.77 | 927.44 |
| 135.29 | 927.39 | 149.78 | 927.28 | 199.8 | 927.01 | 203.25 | 927 | 249.83 | 926.82 |
| 251.78 | 926.82 | 278.72 | 926.71 | 279.84 | 926.7 | 289.05 | 926.67 | 289.85 | 926.66 |
| 290.6 | 926.66 | 299.85 | 926.63 | 300.31 | 926.63 | 309.86 | 926.59 | 310.02 | 926.59 |
| 319.72 | 926.57 | 319.86 | 926.57 | 329.43 | 926.55 | 329.87 | 926.54 | 339.13 | 926.52 |
| 339.87 | 926.52 | 348.83 | 926.5 | 349.88 | 926.49 | 358.55 | 926.45 | 359.88 | 926.44 |
| 368.25 | 926.4 | 369.88 | 926.4 | 377.96 | 926.37 | 379.89 | 926.36 | 409.9 | 926.24 |
| 416.79 | 926.2 | 419.91 | 926.19 | 426.49 | 926.14 | 429.91 | 926.12 | 436.2 | 926.07 |
| 455.62 | 925.95 | 479.94 | 925.83 | 484.73 | 925.8 | 504.15 | 925.72 | 519.96 | 925.69 |
| 529.96 | 925.69 | 533.26 | 925.68 | 539.97 | 925.67 | 542.97 | 925.67 | 569.98 | 925.56 |
| 572.09 | 925.56 | 579.98 | 925.54 | 581.79 | 925.53 | 589.99 | 925.52 | 591.5 | 925.51 |
| 599.99 | 925.5 | 601.2 | 925.5 | 610 | 925.48 | 610.92 | 925.48 | 620 | 925.45 |
| 620.62 | 925.45 | 630.01 | 925.41 | 630.33 | 925.41 | 640.01 | 925.37 | 640.76 | 925.37 |
| 649.74 | 925.35 | 650.31 | 925.35 | 660.02 | 925.32 | 669.16 | 925.25 | 670.03 | 925.25 |
| 670.96 | 925.24 | 688.57 | 925.09 | 690.04 | 925.08 | 698.27 | 925.04 | 700.04 | 925.04 |
| 727.39 | 925.02 | 730.05 | 925.01 | 737.1 | 925 | 746.8 | 924.96 | 750.06 | 924.93 |
| 756.52 | 924.89 | 760.07 | 924.86 | 785.63 | 924.73 | 800.09 | 924.62 | 814.75 | 924.48 |
| 840.11 | 924.3 | 880.13 | 924.05 | 882.7 | 924.03 | 890.13 | 924 | 892.4 | 923.98 |
| 910.14 | 923.91 | 920.14 | 923.86 | 930.15 | 923.79 | 940.15 | 923.7 | 940.93 | 923.69 |
| 950.16 | 923.59 | 950.64 | 923.58 | 960.16 | 923.47 | 960.35 | 923.46 | 966.41 | 923.38 |
| 970.06 | 923.34 | 970.17 | 923.33 | 979.76 | 923.21 | 980.17 | 923.2 | 989.47 | 923.09 |
| 990.18 | 923.08 | 999.17 | 922.98 | 1008.89 | 922.88 | 1020.19 | 922.8 | 1028.3 | 922.81 |
| 1030.2 | 922.82 | 1038 | 923.02 | 1040.2 | 923.08 | 1042.54 | 923.33 | 1060.21 | 925.18 |
| 1064.45 | 925.3 | 1070.22 | 925.45 | 1076.83 | 925.42 | 1080.22 | 925.41 | 1086.53 | 925.37 |
| 1096.24 | 925.27 | 1100.23 | 925.2 | 1110.23 | 924.99 | 1115.66 | 924.69 | 1120.24 | 924.46 |
| 1125.36 | 924.13 | 1130.24 | 923.83 | 1135.07 | 923.74 | 1140.25 | 923.59 | 1144.77 | 923.66 |
| 1150.25 | 923.72 | 1157.01 | 923.94 | 1160.26 | 924.06 | 1170.26 | 924.67 | 1173.89 | 925.25 |
| 1180.27 | 926.19 | 1183.6 | 926.86 | 1190.07 | 928.3 | 1190.27 | 928.35 | 1193.3 | 927.9 |
| 1200.28 | 926.9 | 1203.01 | 926.38 | 1210.28 | 924.97 | 1212.72 | 924.5 | 1220.29 | 922.99 |
| 1230.29 | 921.07 | 1232.13 | 920.73 | 1240.3 | 919.29 | 1241.84 | 919.28 | 1250.3 | 919.35 |
| 1251.54 | 919.55 | 1260.31 | 920.92 | 1261.26 | 921.03 | 1270.31 | 921.98 | 1270.96 | 922.04 |
| 1280.31 | 922.92 | 1280.66 | 922.95 | 1290.32 | 923.68 | 1290.37 | 923.68 | 1292.04 | 923.66 |
| 1300.07 | 923.58 | 1300.32 | 923.57 | 1309.79 | 923.42 | 1310.33 | 923.41 | 1310.91 | 923.42 |
| 1329.2 | 923.93 | 1330.34 | 923.97 | 1338.9 | 923.77 | 1340.34 | 923.73 | 1348.61 | 922.79 |
| 1350.35 | 922.58 | 1355.36 | 922.05 | 1358.31 | 921.73 | 1360.35 | 921.62 | 1362.51 | 921.81 |
| 1370.36 | 922.59 | 1377.73 | 923.48 | 1380.36 | 923.74 | 1387.44 | 924.07 | 1390.37 | 924.19 |
| 1397.14 | 924.29 | 1399.43 | 924.33 | 1400.37 | 924.35 | 1410.38 | 924.51 | 1416.56 | 924.63 |
| 1420.38 | 924.69 | 1426.26 | 924.8 | 1430.39 | 924.86 | 1435.97 | 924.96 | 1450.4 | 925.2 |
| 1455.38 | 925.33 | 1460.4 | 925.45 | 1470.4 | 925.81 | 1474.8 | 926 | 1480.41 | 926.23 |
| 1490.41 | 926.68 | 1494.21 | 926.84 | 1503.91 | 927.23 | 1510.42 | 927.45 | 1520.43 | 927.74 |
| 1523.33 | 927.78 | 1530.43 | 927.96 | 1533.03 | 927.97 | 1540.44 | 928.07 | 1550.44 | 928.12 |
| 1562.15 | 928.13 | 1570.45 | 928.12 | 1571.86 | 928.11 | 1580.46 | 928.08 | 1581.57 | 928.05 |
| 1590.46 | 927.96 | 1591.27 | 927.92 | 1600.47 | 927.59 | 1600.98 | 927.55 | 1610.47 | 927.01 |
| 1610.68 | 926.99 | 1617.67 | 926.54 | 1620.4 | 926.37 | 1620.48 | 926.36 | 1630.1 | 925.77 |
| 1630.48 | 925.75 | 1639.8 | 925.31 | 1640.48 | 925.27 | 1649.51 | 925.11 | 1650.49 | 925.08 |
| 1659.21 | 925.05 | 1660.49 | 925.04 | 1668.93 | 925.02 | 1670.5 | 925.01 | 1678.63 | 924.99 |
| 1690.51 | 924.99 | 1698.04 | 925.09 | 1700.51 | 925.11 | 1710.52 | 925.33 | 1717.46 | 925.46 |
| 1720.52 | 925.54 | 1727.17 | 925.62 | 1730.53 | 925.68 | 1736.87 | 925.72 | 1740.53 | 925.75 |
| 1750.54 | 925.73 | 1756.28 | 925.7 | 1760.54 | 925.66 | 1765.99 | 925.62 | 1770.55 | 925.57 |
| 1780.55 | 925.49 | 1790.56 | 925.47 | 1800.56 | 925.47 | 1804.81 | 925.46 | 1810.56 | 925.47 |
| 1814.52 | 925.46 | 1820.57 | 925.46 | 1824.23 | 925.47 | 1824.77 | 925.47 | 1830.57 | 925.48 |
| 1833.94 | 925.5 | 1840.58 | 925.51 | 1843.64 | 925.53 | 1850.58 | 925.56 | 1853.34 | 925.59 |
| 1860.59 | 925.64 | 1870.59 | 925.8 | 1872.76 | 925.85 | 1880.6 | 926.08 | 1882.47 | 926.11 |
| 1890.6 | 926.23 | 1892.17 | 926.27 | 1900.61 | 926.47 | 1901.88 | 926.54 | 1910.61 | 927.01 |
| 1911.58 | 927.06 | 1920.62 | 927.49 | 1921.3 | 927.53 | 1930.62 | 927.87 | 1931 | 927.89 |
| 1940.63 | 928.18 | 1940.71 | 928.18 | 1943.31 | 928.22 | 1950.41 | 928.34 | 1950.63 | 928.35 |
| 1960.12 | 928.37 | 1960.64 | 928.38 | 1969.83 | 928.45 | 1970.64 | 928.47 | 1979.53 | 928.57 |
| 1980.64 | 928.59 | 1989.24 | 928.67 | 1990.65 | 928.69 | 1998.94 | 928.72 | 2000.65 | 928.74 |
| 2008.65 | 928.78 | 2010.66 | 928.81 | 2018.36 | 929.02 | 2020.66 | 929.07 | 2030.67 | 929.33 |
| 2037.77 | 929.44 | 2040.67 | 929.51 | 2047.48 | 929.61 | 2050.68 | 929.7 | 2057.18 | 929.85 |
| 2060.68 | 930.07 | 2066.89 | 930.35 | 2070.69 | 930.62 | 2076.6 | 931.03 | 2080.69 | 931.34 |
| 2086.3 | 931.78 | 2090.7 | 932.17 | 2096.01 | 932.62 | 2100.7 | 933.08 | 2105.71 | 933.51 |
| 2110.71 | 934.02 | 2115.42 | 934.39 | 2120.71 | 934.99 | 2125.13 | 935.3 | 2130.72 | 935.67 |
| 2134.84 | 935.95 | 2140.72 | 936.18 | 2144.54 | 936.55 | 2150.73 | 937.07 | 2160.73 | 938.32 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2163.95 | 938.57 | 2170.73 | 939.01 | 2173.67 | 938.93 | 2180.74 | 938.95 | 2183.37 | 938.89 |
| 2190.74 | 938.86 | 2193.07 | 939.16 | 2200.75 | 939.26 | 2202.78 | 939.49 | 2203.83 | 939.58 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1064.45 | .04 | 1157.01 | .052 | 1355.36 | .04 | 1824.77 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1190.07 | 1399.43 | 202.29 | 200 | 193.06 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1190.27 | 928.35 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 925.36 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.050 | 0.040 |
| W.S. Elev (ft) | 925.15 | Reach Len. (ft) | 202.29 | 200.00 | 193.06 |
| Crit W.S. (ft) | 923.97 | Flow Area (sq ft) | | 478.04 | 25.41 |
| E.G. Slope (ft/ft) | 0.004651 | Area (sq ft) | 452.85 | 478.04 | 25.41 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1809.60 | 30.40 |
| Top Width (ft) | 740.65 | Top Width (ft) | 448.26 | 190.06 | 102.33 |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.79 | 1.20 |
| Max Chl Dpth (ft) | 5.87 | Hydr. Depth (ft) | | 2.52 | 0.25 |
| Conv. Total (cfs) | 26981.0 | Conv. (cfs) | | 26535.3 | 445.7 |
| Length Wtd. (ft) | 199.28 | Wetted Per. (ft) | | 191.11 | 102.34 |
| Min Ch El (ft) | 919.28 | Shear (lb/sq ft) | | 0.73 | 0.07 |
| Alpha | 1.06 | Stream Power (lb/ft s) | | 2.75 | 0.09 |
| Frctn Loss (ft) | 1.23 | Cum Volume (acre-ft) | 51.13 | 69.12 | 85.98 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 55.06 | 29.82 | 103.92 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 925.60 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 925.41 | Reach Len. (ft) | 202.29 | 200.00 | 193.06 |
| Crit W.S. (ft) | 923.97 | Flow Area (sq ft) | | 528.00 | |
| E.G. Slope (ft/ft) | 0.003505 | Area (sq ft) | | 528.00 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 191.41 | Top Width (ft) | | 191.41 | |
| Vel Total (ft/s) | 3.48 | Avg. Vel. (ft/s) | | 3.48 | |
| Max Chl Dpth (ft) | 6.13 | Hydr. Depth (ft) | | 2.76 | |
| Conv. Total (cfs) | 31079.6 | Conv. (cfs) | | 31079.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 193.56 | |
| Min Ch El (ft) | 919.28 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.08 | |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 11.80 | 92.13 | 16.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 31.77 | 8.11 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 925.59 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 925.41 | Reach Len. (ft) | 202.29 | 200.00 | 193.06 |
| Crit W.S. (ft) | 923.97 | Flow Area (sq ft) | | 527.69 | |
| E.G. Slope (ft/ft) | 0.003512 | Area (sq ft) | | 527.69 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 191.40 | Top Width (ft) | | 191.40 | |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.49 | |
| Max Chl Dpth (ft) | 6.13 | Hydr. Depth (ft) | | 2.76 | |
| Conv. Total (cfs) | 31049.6 | Conv. (cfs) | | 31049.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 193.55 | |
| Min Ch El (ft) | 919.28 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.08 | |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 25.48 | 75.88 | 33.59 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.60 | 30.28 | 24.99 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.132

INPUT
Description: Thalweg Sta. 1234.69
Station Elevation Data num= 312

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 934.79 | 4.55 | 934.39 | 7.85 | 934.24 | 14.55 | 933.96 | 24.55 | 933.97 |
| 28.16 | 935.25 | 34.55 | 937.53 | 38.31 | 934.9 | 44.56 | 930.54 | 54.56 | 930.16 |
| 64.56 | 929.6 | 74.56 | 928.25 | 84.56 | 927.08 | 94.56 | 926.62 | 104.56 | 926.49 |
| 114.56 | 926.43 | 139.84 | 926.43 | 144.57 | 926.42 | 154.57 | 926.42 | 174.57 | 926.38 |
| 180.45 | 926.36 | 184.57 | 926.33 | 244.58 | 925.99 | 251.52 | 925.96 | 261.67 | 925.9 |
| 264.58 | 925.89 | 271.82 | 925.85 | 274.58 | 925.84 | 281.97 | 925.79 | 284.58 | 925.78 |
| 292.12 | 925.73 | 294.58 | 925.71 | 302.27 | 925.66 | 304.58 | 925.65 | 312.42 | 925.6 |
| 314.59 | 925.58 | 322.58 | 925.54 | 324.59 | 925.52 | 332.74 | 925.49 | 353.04 | 925.39 |
| 354.59 | 925.38 | 363.19 | 925.34 | 364.59 | 925.34 | 373.34 | 925.3 | 374.59 | 925.29 |
| 375.8 | 925.29 | 384.59 | 925.27 | 414.6 | 925.26 | 424.11 | 925.24 | 424.6 | 925.23 |
| 434.26 | 925.17 | 434.93 | 925.17 | 444.6 | 925.09 | 444.78 | 925.09 | 454.6 | 925.01 |
| 457.11 | 924.99 | 464.6 | 924.92 | 464.71 | 924.92 | 474.6 | 924.85 | 474.86 | 924.85 |
| 484.6 | 924.79 | 485.02 | 924.79 | 494.61 | 924.74 | 495.18 | 924.74 | 504.61 | 924.69 |
| 505.33 | 924.68 | 514.61 | 924.64 | 515.48 | 924.63 | 524.61 | 924.58 | 525.63 | 924.58 |
| 534.61 | 924.53 | 535.78 | 924.52 | 544.61 | 924.48 | 545.93 | 924.47 | 554.61 | 924.43 |
| 556.09 | 924.42 | 564.61 | 924.38 | 566.24 | 924.38 | 584.62 | 924.29 | 586.55 | 924.27 |
| 594.62 | 924.22 | 596.7 | 924.21 | 604.62 | 924.15 | 606.85 | 924.14 | 614.62 | 924.09 |
| 617 | 924.07 | 624.62 | 924.02 | 710.85 | 923.72 | 714.63 | 923.7 | 754.63 | 923.62 |
| 759.14 | 923.62 | 784.64 | 923.53 | 794.64 | 923.47 | 799.75 | 923.45 | 809.9 | 923.39 |
| 814.64 | 923.37 | 874.65 | 922.94 | 884.65 | 922.85 | 901.27 | 922.66 | 904.65 | 922.63 |
| 911.42 | 922.55 | 924.65 | 922.43 | 931.72 | 922.39 | 944.66 | 922.35 | 952.04 | 922.34 |
| 967.06 | 922.29 | 974.66 | 922.24 | 976.91 | 922.21 | 984.66 | 922.12 | 1002.79 | 921.87 |
| 1004.66 | 921.85 | 1016.32 | 921.71 | 1024.66 | 921.65 | 1026.18 | 921.65 | 1034.67 | 921.67 |
| 1043.41 | 921.78 | 1044.67 | 921.79 | 1053.56 | 922.13 | 1054.67 | 922.16 | 1063.71 | 923.18 |
| 1064.67 | 923.27 | 1065.6 | 923.42 | 1074.58 | 924.43 | 1074.67 | 924.44 | 1075.45 | 924.47 |
| 1078.8 | 924.59 | 1084.67 | 924.79 | 1094.17 | 924.68 | 1094.67 | 924.67 | 1104.32 | 923.74 |
| 1104.67 | 923.71 | 1114.47 | 923.38 | 1114.67 | 923.37 | 1124.63 | 923.44 | 1124.68 | 923.44 |
| 1128 | 923.47 | 1134.68 | 923.52 | 1134.78 | 923.52 | 1144.68 | 923.59 | 1144.93 | 923.59 |
| 1154.68 | 923.67 | 1155.08 | 923.67 | 1164.68 | 923.84 | 1165.24 | 923.88 | 1174.68 | 924.76 |
| 1183.85 | 925.29 | 1184.15 | 925.33 | 1184.68 | 925.39 | 1193.7 | 924.1 | 1194.68 | 923.94 |
| 1195.69 | 923.73 | 1204.68 | 922 | 1205.84 | 921.85 | 1214.69 | 920.67 | 1216 | 920.49 |
| 1224.69 | 919.48 | 1226.15 | 919.5 | 1234.69 | 919.47 | 1236.3 | 919.67 | 1244.69 | 920.64 |
| 1246.46 | 920.83 | 1254.69 | 921.69 | 1256.61 | 921.81 | 1264.69 | 922.24 | 1266.76 | 922.32 |
| 1274.69 | 922.68 | 1276.91 | 922.74 | 1284.69 | 923.01 | 1287.06 | 923.03 | 1294.69 | 923.14 |
| 1297.21 | 923.05 | 1297.93 | 923.03 | 1304.7 | 922.87 | 1307.37 | 922.67 | 1317.53 | 921.95 |
| 1324.7 | 921.46 | 1334.7 | 921.6 | 1337.83 | 921.91 | 1344.7 | 922.55 | 1347.98 | 922.76 |
| 1354.7 | 923.17 | 1364.7 | 923.4 | 1374.7 | 923.57 | 1384.32 | 923.6 | 1384.7 | 923.6 |
| 1388.59 | 923.52 | 1394.71 | 923.42 | 1398.75 | 923.29 | 1408.9 | 923 | 1414.71 | 922.82 |
| 1419.05 | 922.74 | 1424.71 | 922.62 | 1429.2 | 922.56 | 1434.71 | 922.46 | 1439.35 | 922.43 |
| 1444.71 | 922.32 | 1449.5 | 922.44 | 1454.71 | 922.47 | 1459.65 | 922.72 | 1469.8 | 923.21 |
| 1474.71 | 923.5 | 1479.97 | 923.62 | 1484.72 | 923.79 | 1490.12 | 923.84 | 1494.72 | 923.9 |
| 1504.72 | 923.98 | 1514.72 | 924.04 | 1524.72 | 924.12 | 1530.72 | 924.19 | 1534.72 | 924.23 |
| 1540.87 | 924.37 | 1544.72 | 924.44 | 1551.03 | 924.64 | 1554.72 | 924.74 | 1561.18 | 924.93 |
| 1564.72 | 925.04 | 1571.34 | 925.26 | 1574.73 | 925.39 | 1581.49 | 925.59 | 1584.73 | 925.68 |
| 1591.64 | 925.59 | 1594.73 | 925.51 | 1604.73 | 924.96 | 1611.94 | 924.51 | 1614.73 | 924.35 |
| 1622.09 | 923.94 | 1624.73 | 923.81 | 1632.25 | 923.61 | 1634.73 | 923.57 | 1644.73 | 923.53 |
| 1652.55 | 923.53 | 1654.73 | 923.52 | 1662.71 | 923.55 | 1664.74 | 923.55 | 1672.86 | 923.59 |
| 1683.01 | 923.6 | 1684.74 | 923.59 | 1693.16 | 923.51 | 1694.74 | 923.5 | 1703.32 | 923.41 |
| 1704.74 | 923.4 | 1713.47 | 923.4 | 1714.74 | 923.41 | 1723.62 | 923.5 | 1724.74 | 923.51 |
| 1733.77 | 923.63 | 1734.74 | 923.64 | 1744.74 | 923.76 | 1754.08 | 923.83 | 1754.75 | 923.84 |
| 1764.75 | 923.84 | 1774.38 | 923.82 | 1784.75 | 923.82 | 1794.69 | 923.84 | 1795.19 | 923.84 |
| 1804.75 | 923.87 | 1804.84 | 923.87 | 1814.75 | 923.85 | 1814.99 | 923.86 | 1824.76 | 924.01 |
| 1825.15 | 924.02 | 1834.76 | 924.36 | 1835.3 | 924.39 | 1844.76 | 924.89 | 1845.45 | 924.95 |
| 1854.76 | 925.62 | 1855.61 | 925.7 | 1864.76 | 926.51 | 1874.76 | 927.5 | 1875.91 | 927.62 |
| 1884.76 | 928.57 | 1886.06 | 928.73 | 1894.76 | 929.74 | 1896.21 | 929.95 | 1904.76 | 931.08 |
| 1906.36 | 931.31 | 1914.77 | 932.46 | 1916.52 | 932.57 | 1924.77 | 933.42 | 1926.67 | 933.49 |
| 1936.83 | 933.78 | 1944.77 | 933.92 | 1946.98 | 934.03 | 1954.77 | 934.24 | 1957.13 | 934.36 |
| 1964.77 | 934.63 | 1967.28 | 934.75 | 1974.77 | 934.99 | 1977.43 | 935.13 | 1984.77 | 935.45 |
| 1994.77 | 936.17 | 1997.73 | 936.39 | 2004.78 | 936.94 | 2007.9 | 937.13 | 2014.78 | 937.64 |
| 2018.05 | 937.75 | 2024.78 | 938.22 | 2028.2 | 938.29 | 2034.78 | 938.59 | 2038.35 | 938.71 |
| 2048.5 | 939.15 | 2054.78 | 939.41 | 2058.65 | 939.52 | 2064.78 | 939.65 | 2068.8 | 939.69 |
| 2074.78 | 939.71 | 2078.95 | 939.75 | 2084.78 | 939.75 | 2089.11 | 939.81 | 2094.79 | 939.85 |
| 2099.27 | 939.92 | 2107.03 | 940.02 | | | | | | |

```
Manning's n Values          num=       5
     Sta   n Val     Sta    n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035 1074.58     .04  1078.8    .052 1297.93     .04 1795.19    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1184.15 1384.32          201.54     200  200.86              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0 1184.68  925.39       F
```

CROSS SECTION OUTPUT  Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 924.14 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.049 | 0.040 |
| W.S. Elev (ft) | 923.88 | Reach Len. (ft) | 201.54 | 200.00 | 200.86 |
| Crit W.S. (ft) | 923.39 | Flow Area (sq ft) | | 341.10 | 136.50 |
| E.G. Slope (ft/ft) | 0.008530 | Area (sq ft) | 406.82 | 341.10 | 136.50 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1490.17 | 349.83 |
| Top Width (ft) | 956.86 | Top Width (ft) | 466.19 | 189.34 | 301.34 |
| Vel Total (ft/s) | 3.85 | Avg. Vel. (ft/s) | | 4.37 | 2.56 |
| Max Chl Dpth (ft) | 4.41 | Hydr. Depth (ft) | | 1.80 | 0.45 |
| Conv. Total (cfs) | 19922.6 | Conv. (cfs) | | 16134.9 | 3787.7 |
| Length Wtd. (ft) | 200.29 | Wetted Per. (ft) | | 189.95 | 301.39 |
| Min Ch El (ft) | 919.47 | Shear (lb/sq ft) | | 0.96 | 0.24 |
| Alpha | 1.13 | Stream Power (lb/ft s) | | 4.18 | 0.62 |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 49.13 | 67.24 | 85.62 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 52.93 | 28.94 | 103.02 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT  Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 924.77 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.048 | |
| W.S. Elev (ft) | 924.53 | Reach Len. (ft) | 201.54 | 200.00 | 200.86 |
| Crit W.S. (ft) | 923.45 | Flow Area (sq ft) | | 465.67 | |
| E.G. Slope (ft/ft) | 0.004861 | Area (sq ft) | | 465.67 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 193.61 | Top Width (ft) | | 193.61 | |
| Vel Total (ft/s) | 3.95 | Avg. Vel. (ft/s) | | 3.95 | |
| Max Chl Dpth (ft) | 5.06 | Hydr. Depth (ft) | | 2.41 | |
| Conv. Total (cfs) | 26391.7 | Conv. (cfs) | | 26391.7 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 195.21 | |
| Min Ch El (ft) | 919.47 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.86 | |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | 11.80 | 89.85 | 16.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 30.89 | 8.11 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT  Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 924.76 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.048 | |
| W.S. Elev (ft) | 924.52 | Reach Len. (ft) | 201.54 | 200.00 | 200.86 |
| Crit W.S. (ft) | 923.45 | Flow Area (sq ft) | | 464.22 | |
| E.G. Slope (ft/ft) | 0.004909 | Area (sq ft) | | 464.22 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 193.56 | Top Width (ft) | | 193.56 | |
| Vel Total (ft/s) | 3.96 | Avg. Vel. (ft/s) | | 3.96 | |
| Max Chl Dpth (ft) | 5.05 | Hydr. Depth (ft) | | 2.40 | |
| Conv. Total (cfs) | 26261.1 | Conv. (cfs) | | 26261.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 195.14 | |
| Min Ch El (ft) | 919.47 | Shear (lb/sq ft) | | 0.73 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.89 | |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 25.48 | 73.60 | 33.59 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.60 | 29.40 | 24.99 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.094

INPUT
Description: Thalweg Sta. 1258.02
Station Elevation Data num= 304

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 933.88 | 5.49 | 933.53 | 7.79 | 933.38 | 15.69 | 932.72 | 17.79 | 932.54 |
| 25.88 | 932.31 | 27.8 | 932.26 | 36.09 | 932.32 | 37.8 | 932.33 | 47.8 | 936.48 |
| 56.48 | 930.6 | 57.8 | 929.71 | 66.67 | 929.35 | 67.8 | 929.3 | 77.8 | 928.77 |
| 87.08 | 927.36 | 87.81 | 927.25 | 97.27 | 926.27 | 97.81 | 926.22 | 107.81 | 925.93 |
| 117.66 | 925.8 | 117.81 | 925.8 | 125.3 | 925.76 | 127.81 | 925.74 | 127.86 | 925.74 |
| 137.82 | 925.72 | 138.06 | 925.72 | 147.82 | 925.69 | 148.26 | 925.69 | 157.82 | 925.66 |
| 158.46 | 925.66 | 167.82 | 925.62 | 168.65 | 925.62 | 177.82 | 925.57 | 178.85 | 925.57 |
| 187.83 | 925.52 | 189.05 | 925.51 | 197.83 | 925.47 | 199.25 | 925.46 | 255.34 | 925.16 |
| 267.84 | 925.12 | 270.63 | 925.12 | 277.84 | 925.1 | 280.83 | 925.1 | 301.23 | 925.05 |
| 311.42 | 925 | 337.85 | 924.79 | 342.01 | 924.75 | 347.86 | 924.71 | 357.86 | 924.62 |
| 362.41 | 924.59 | 392.73 | 924.34 | 397.86 | 924.29 | 454.18 | 923.89 | 461.43 | 923.85 |
| 497.88 | 923.6 | 505.17 | 923.56 | 507.88 | 923.54 | 515.38 | 923.51 | 517.89 | 923.49 |
| 525.57 | 923.47 | 527.89 | 923.47 | 535.77 | 923.45 | 537.89 | 923.45 | 545.97 | 923.43 |
| 547.89 | 923.43 | 556.16 | 923.41 | 557.89 | 923.41 | 566.37 | 923.38 | 567.9 | 923.37 |
| 576.56 | 923.33 | 577.9 | 923.32 | 586.76 | 923.28 | 587.9 | 923.27 | 596.95 | 923.23 |
| 597.9 | 923.22 | 607.15 | 923.18 | 607.9 | 923.17 | 617.35 | 923.13 | 617.91 | 923.13 |
| 627.55 | 923.09 | 627.91 | 923.09 | 637.75 | 923.04 | 637.91 | 923.03 | 646.2 | 922.99 |
| 647.91 | 922.99 | 657.69 | 922.94 | 658.14 | 922.94 | 667.91 | 922.91 | 677.32 | 922.9 |
| 677.92 | 922.89 | 678.54 | 922.89 | 687.92 | 922.88 | 688.74 | 922.87 | 697.92 | 922.85 |
| 698.93 | 922.85 | 707.92 | 922.83 | 716.57 | 922.79 | 717.92 | 922.78 | 736.2 | 922.67 |
| 737.93 | 922.65 | 755.83 | 922.54 | 757.93 | 922.52 | 765.64 | 922.48 | 767.93 | 922.46 |
| 775.45 | 922.41 | 777.94 | 922.4 | 785.27 | 922.36 | 787.94 | 922.34 | 790.71 | 922.33 |
| 797.94 | 922.29 | 800.91 | 922.28 | 807.94 | 922.24 | 817.94 | 922.2 | 857.95 | 922 |
| 862.09 | 922 | 883.4 | 921.95 | 887.96 | 921.95 | 892.69 | 921.93 | 912.84 | 921.89 |
| 917.96 | 921.86 | 922.65 | 921.86 | 927.96 | 921.84 | 933.48 | 921.84 | 937.96 | 921.83 |
| 947.97 | 921.83 | 953.88 | 921.82 | 957.97 | 921.82 | 984.46 | 921.67 | 987.97 | 921.64 |
| 1017.98 | 921.45 | 1057.99 | 921.28 | 1066.05 | 921.22 | 1077.99 | 921.09 | 1096.64 | 920.85 |
| 1097.99 | 920.83 | 1106.84 | 920.74 | 1109.11 | 920.72 | 1118 | 920.7 | 1118.92 | 920.71 |
| 1128 | 920.78 | 1128.74 | 920.79 | 1138 | 921.04 | 1138.55 | 921.07 | 1148 | 921.93 |
| 1148.36 | 921.99 | 1158.01 | 923.65 | 1158.18 | 923.68 | 1167.09 | 924.96 | 1168.01 | 925.1 |
| 1176.05 | 925.36 | 1178.01 | 925.42 | 1178.12 | 925.41 | 1178.22 | 925.4 | 1188.01 | 924.63 |
| 1188.42 | 924.61 | 1198.01 | 923.11 | 1198.62 | 923.2 | 1208.02 | 924.65 | 1208.82 | 924.57 |
| 1218.02 | 923.93 | 1219.02 | 923.78 | 1228.02 | 922.51 | 1229.21 | 922.32 | 1238.02 | 920.88 |
| 1248.02 | 919.23 | 1249.6 | 919.07 | 1258.02 | 918.12 | 1259.8 | 918.34 | 1268.03 | 919.37 |
| 1278.03 | 920.79 | 1280.2 | 920.98 | 1288.03 | 921.7 | 1290.4 | 921.79 | 1295.72 | 922.01 |
| 1298.03 | 922.11 | 1308.03 | 922.22 | 1318.04 | 922.18 | 1320.99 | 922.07 | 1328.04 | 921.83 |
| 1331.19 | 921.66 | 1338.04 | 921.31 | 1341.39 | 921.17 | 1348.04 | 920.87 | 1354.44 | 920.71 |
| 1358.04 | 920.63 | 1361.78 | 920.57 | 1368.04 | 920.49 | 1378.05 | 920.44 | 1382.18 | 920.59 |
| 1388.05 | 920.71 | 1392.38 | 921.05 | 1398.05 | 921.47 | 1403.51 | 921.92 | 1408.05 | 922.24 |
| 1412.77 | 922.36 | 1418.05 | 922.52 | 1427.77 | 922.54 | 1448.06 | 922.54 | 1458.06 | 922.52 |
| 1463.76 | 922.47 | 1468.06 | 922.44 | 1473.95 | 922.23 | 1478.06 | 922.11 | 1484.16 | 921.84 |
| 1488.07 | 921.68 | 1498.07 | 921.44 | 1508.07 | 921.33 | 1514.74 | 921.27 | 1518.07 | 921.23 |
| 1524.94 | 921.19 | 1528.07 | 921.16 | 1538.08 | 921.17 | 1558.08 | 921.33 | 1565.73 | 921.38 |
| 1575.93 | 921.46 | 1578.08 | 921.47 | 1586.12 | 921.53 | 1588.09 | 921.55 | 1596.33 | 921.62 |
| 1598.09 | 921.63 | 1606.53 | 921.71 | 1608.09 | 921.72 | 1616.72 | 921.81 | 1618.09 | 921.83 |
| 1626.92 | 921.92 | 1628.09 | 921.94 | 1638.09 | 922.04 | 1648.1 | 922.04 | 1657.52 | 921.96 |
| 1658.1 | 921.95 | 1667.71 | 921.86 | 1668.1 | 921.86 | 1677.91 | 921.81 | 1678.1 | 921.81 |
| 1687.97 | 921.86 | 1688.1 | 921.86 | 1698.11 | 921.95 | 1698.31 | 921.95 | 1708.11 | 921.98 |
| 1708.5 | 921.98 | 1728.11 | 921.97 | 1737.17 | 921.98 | 1739.09 | 921.98 | 1748.12 | 922.03 |
| 1749.3 | 922.04 | 1758.12 | 922.15 | 1759.49 | 922.17 | 1768.12 | 922.32 | 1768.21 | 922.32 |
| 1769.69 | 922.36 | 1778.12 | 922.56 | 1779.88 | 922.61 | 1788.12 | 922.88 | 1790.08 | 922.94 |
| 1798.12 | 923.21 | 1808.13 | 923.49 | 1810.48 | 923.57 | 1818.13 | 923.71 | 1820.68 | 923.75 |
| 1828.13 | 923.79 | 1830.87 | 923.81 | 1838.13 | 923.85 | 1848.13 | 923.95 | 1854.93 | 924.03 |
| 1858.14 | 924.08 | 1861.47 | 924.17 | 1868.14 | 924.26 | 1871.67 | 924.4 | 1878.14 | 924.57 |
| 1881.86 | 924.86 | 1888.14 | 925.15 | 1894.18 | 925.65 | 1898.14 | 926.07 | 1902.25 | 926.58 |
| 1908.14 | 927.28 | 1918.15 | 928.61 | 1922.66 | 929.03 | 1928.15 | 929.67 | 1933.44 | 930.16 |
| 1938.15 | 930.47 | 1943.05 | 930.71 | 1948.15 | 931.01 | 1953.24 | 931.21 | 1958.15 | 931.43 |
| 1963.44 | 931.72 | 1968.16 | 932.03 | 1973.64 | 932.45 | 1978.16 | 932.88 | 1983.84 | 933.38 |
| 1988.16 | 933.81 | 1994.04 | 934.3 | 1998.16 | 934.67 | 2004.23 | 935.16 | 2008.16 | 935.5 |

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 2018.17   936.3 2024.63  936.75 2028.17  936.96 2034.83  937.23 2038.17  937.35
 2045.02  937.51 2048.17  937.59 2058.17  937.79 2063.25  937.86

Manning's n Values          num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035 1176.05    .072 1295.72     .04 1768.21    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1208.02 1427.77           202.93     200  233.69             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0 1178.01  925.42       F
 1448.06 2063.25  922.54       F
```

CROSS SECTION OUTPUT  Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 923.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.054 | 0.040 |
| W.S. Elev (ft) | 922.92 | Reach Len. (ft) | 202.93 | 200.00 | 233.69 |
| Crit W.S. (ft) | 922.54 | Flow Area (sq ft) | | 368.05 | 377.07 |
| E.G. Slope (ft/ft) | 0.003654 | Area (sq ft) | 498.46 | 368.05 | 377.07 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 951.79 | 888.21 |
| Top Width (ft) | 1053.56 | Top Width (ft) | 489.23 | 202.66 | 361.67 |
| Vel Total (ft/s) | 2.47 | Avg. Vel. (ft/s) | | 2.59 | 2.36 |
| Max Chl Dpth (ft) | 4.80 | Hydr. Depth (ft) | | 1.82 | 1.04 |
| Conv. Total (cfs) | 30439.2 | Conv. (cfs) | | 15745.4 | 14693.8 |
| Length Wtd. (ft) | 208.13 | Wetted Per. (ft) | | 203.34 | 361.70 |
| Min Ch El (ft) | 918.12 | Shear (lb/sq ft) | | 0.41 | 0.24 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 1.07 | 0.56 |
| Frctn Loss (ft) | 1.31 | Cum Volume (acre-ft) | 47.04 | 65.61 | 84.43 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 50.72 | 28.04 | 101.49 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT  Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 923.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.053 | |
| W.S. Elev (ft) | 923.13 | Reach Len. (ft) | 202.93 | 200.00 | 233.69 |
| Crit W.S. (ft) | 922.55 | Flow Area (sq ft) | | 411.40 | |
| E.G. Slope (ft/ft) | 0.009461 | Area (sq ft) | | 411.40 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 204.17 | Top Width (ft) | | 204.17 | |
| Vel Total (ft/s) | 4.47 | Avg. Vel. (ft/s) | | 4.47 | |
| Max Chl Dpth (ft) | 5.01 | Hydr. Depth (ft) | | 2.02 | |
| Conv. Total (cfs) | 18916.5 | Conv. (cfs) | | 18916.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 205.46 | |
| Min Ch El (ft) | 918.12 | Shear (lb/sq ft) | | 1.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.29 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 11.80 | 87.84 | 16.24 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 5.00 | 29.97 | 8.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT  Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 923.48 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.053 | |
| W.S. Elev (ft) | 923.19 | Reach Len. (ft) | 202.93 | 200.00 | 233.69 |
| Crit W.S. (ft) | 922.42 | Flow Area (sq ft) | | 422.83 | |
| E.G. Slope (ft/ft) | 0.008640 | Area (sq ft) | | 422.83 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 204.56 | Top Width (ft) | | 204.56 | |
| Vel Total (ft/s) | 4.35 | Avg. Vel. (ft/s) | | 4.35 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 5.07 | Hydr. Depth (ft) | | 2.07 | | |
| Conv. Total (cfs) | 19795.3 | Conv. (cfs) | | 19795.3 | | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 205.92 | | |
| Min Ch El (ft) | 918.12 | Shear (lb/sq ft) | | 1.11 | | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.82 | | |
| Frctn Loss (ft) | 1.50 | Cum Volume (acre-ft) | 25.48 | 71.56 | 33.59 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.60 | 28.48 | 24.99 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.056

INPUT
Description: Thalweg Sta. 1257.99
Station Elevation Data num= 304

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 932.43 | 3.38 | 932.26 | 7.71 | 932.06 | 17.71 | 931.93 | 27.72 | 932.05 |
| 34.03 | 934.23 | 37.72 | 935.48 | 47.72 | 929.63 | 57.72 | 928.91 | 67.72 | 928.32 |
| 74.9 | 927.18 | 77.73 | 926.74 | 87.73 | 926.16 | 95.32 | 925.95 | 105.54 | 925.65 |
| 107.73 | 925.59 | 117.74 | 925.49 | 119.64 | 925.49 | 136.19 | 925.45 | 137.74 | 925.45 |
| 146.4 | 925.43 | 147.74 | 925.43 | 156.62 | 925.4 | 157.74 | 925.4 | 166.84 | 925.37 |
| 167.75 | 925.37 | 177.05 | 925.32 | 177.75 | 925.32 | 187.27 | 925.27 | 187.75 | 925.27 |
| 197.48 | 925.22 | 197.75 | 925.22 | 207.71 | 925.17 | 210.29 | 925.15 | 217.76 | 925.12 |
| 217.92 | 925.12 | 227.76 | 925.07 | 228.13 | 925.07 | 237.76 | 925.01 | 238.35 | 925.01 |
| 247.76 | 924.95 | 248.56 | 924.95 | 257.77 | 924.88 | 277.77 | 924.69 | 279.21 | 924.68 |
| 287.77 | 924.59 | 289.43 | 924.57 | 309.86 | 924.36 | 330.29 | 924.19 | 360.94 | 923.98 |
| 367.79 | 923.92 | 371.16 | 923.9 | 377.79 | 923.85 | 381.37 | 923.83 | 387.8 | 923.78 |
| 403.75 | 923.69 | 412.02 | 923.63 | 422.24 | 923.58 | 447.81 | 923.41 | 463.1 | 923.31 |
| 483.54 | 923.22 | 493.75 | 923.19 | 497.82 | 923.17 | 503.97 | 923.15 | 537.83 | 922.97 |
| 555.04 | 922.87 | 565.26 | 922.8 | 567.83 | 922.79 | 595.91 | 922.55 | 597.84 | 922.54 |
| 606.12 | 922.47 | 617.85 | 922.39 | 626.56 | 922.35 | 627.85 | 922.34 | 636.77 | 922.31 |
| 637.85 | 922.3 | 646.99 | 922.27 | 647.85 | 922.27 | 657.2 | 922.23 | 657.85 | 922.23 |
| 667.43 | 922.19 | 667.86 | 922.19 | 677.64 | 922.14 | 677.86 | 922.14 | 687.85 | 922.09 |
| 688.19 | 922.09 | 697.86 | 922.03 | 698.07 | 922.03 | 707.87 | 921.98 | 708.29 | 921.98 |
| 717.87 | 921.93 | 718.5 | 921.93 | 727.87 | 921.89 | 728.72 | 921.88 | 737.87 | 921.84 |
| 738.93 | 921.83 | 747.87 | 921.78 | 749.15 | 921.78 | 757.88 | 921.73 | 759.37 | 921.73 |
| 787.88 | 921.61 | 790.01 | 921.61 | 827.89 | 921.46 | 837.89 | 921.4 | 841.09 | 921.39 |
| 847.9 | 921.35 | 851.31 | 921.34 | 857.9 | 921.3 | 861.53 | 921.29 | 867.9 | 921.26 |
| 871.74 | 921.25 | 877.9 | 921.22 | 881.95 | 921.21 | 887.91 | 921.18 | 912.61 | 921.09 |
| 917.91 | 921.08 | 922.82 | 921.06 | 957.92 | 920.99 | 967.92 | 920.96 | 984.12 | 920.88 |
| 987.93 | 920.87 | 994.34 | 920.84 | 997.93 | 920.83 | 1004.55 | 920.8 | 1024.98 | 920.72 |
| 1035.2 | 920.66 | 1037.94 | 920.65 | 1045.41 | 920.61 | 1057.94 | 920.55 | 1065.84 | 920.53 |
| 1067.94 | 920.52 | 1107.95 | 920.51 | 1116.93 | 920.48 | 1117.96 | 920.47 | 1127.14 | 920.43 |
| 1127.96 | 920.42 | 1137.36 | 920.43 | 1137.96 | 920.43 | 1147.57 | 920.69 | 1147.96 | 920.7 |
| 1157.79 | 922.28 | 1157.96 | 922.31 | 1166.11 | 923.98 | 1167.93 | 924.35 | 1168.01 | 924.36 |
| 1172.77 | 924.62 | 1177.97 | 924.9 | 1178.22 | 924.89 | 1187.97 | 924.85 | 1188.44 | 924.73 |
| 1197.97 | 922.15 | 1198.65 | 922.22 | 1207.02 | 922.88 | 1207.98 | 922.96 | 1208.87 | 922.78 |
| 1217.98 | 920.95 | 1219.09 | 920.74 | 1227.98 | 919.08 | 1237.98 | 918.01 | 1239.52 | 917.99 |
| 1247.98 | 917.85 | 1249.74 | 918 | 1257.99 | 918.66 | 1267.99 | 919.52 | 1270.17 | 919.6 |
| 1277.99 | 919.92 | 1280.38 | 919.95 | 1283.6 | 920.01 | 1287.99 | 920.09 | 1290.59 | 920.11 |
| 1298 | 920.18 | 1299.72 | 920.19 | 1300.82 | 920.2 | 1308 | 920.25 | 1314.89 | 920.23 |
| 1318 | 920.19 | 1321.25 | 920.09 | 1328 | 919.9 | 1338 | 919.53 | 1341.68 | 919.45 |
| 1348.01 | 919.3 | 1351.9 | 919.35 | 1358.01 | 919.39 | 1362.11 | 919.49 | 1368.01 | 919.61 |
| 1372.33 | 919.66 | 1378.01 | 919.71 | 1382.54 | 919.67 | 1388.02 | 919.61 | 1398.02 | 919.45 |
| 1403.06 | 919.45 | 1408.02 | 919.43 | 1413.19 | 919.64 | 1418.02 | 919.9 | 1423.4 | 920.33 |
| 1428.02 | 920.71 | 1433.63 | 921.07 | 1438.03 | 921.32 | 1443.84 | 921.5 | 1448.03 | 921.61 |
| 1454.06 | 921.6 | 1458.03 | 921.57 | 1464.27 | 921.4 | 1468.03 | 921.29 | 1478.04 | 920.96 |
| 1488.04 | 920.66 | 1494.92 | 920.57 | 1498.04 | 920.52 | 1505.13 | 920.53 | 1508.04 | 920.53 |
| 1528.05 | 920.61 | 1535.79 | 920.63 | 1538.05 | 920.64 | 1546 | 920.66 | 1548.05 | 920.66 |
| 1556.21 | 920.64 | 1558.05 | 920.64 | 1566.43 | 920.58 | 1568.06 | 920.58 | 1576.65 | 920.49 |
| 1578.06 | 920.48 | 1586.86 | 920.38 | 1597.08 | 920.3 | 1598.06 | 920.29 | 1607.29 | 920.31 |
| 1608.06 | 920.31 | 1617.52 | 920.41 | 1618.07 | 920.41 | 1627.73 | 920.51 | 1628.07 | 920.52 |
| 1638.07 | 920.52 | 1648.07 | 920.47 | 1648.16 | 920.47 | 1658.07 | 920.45 | 1658.38 | 920.45 |
| 1668.08 | 920.72 | 1668.59 | 920.74 | 1678.08 | 921.26 | 1678.55 | 921.3 | 1678.81 | 921.32 |
| 1688.08 | 922.06 | 1689.02 | 922.17 | 1698.08 | 923.21 | 1699.24 | 923.37 | 1708.09 | 924.64 |
| 1709.46 | 924.87 | 1718.09 | 926.41 | 1719.67 | 926.59 | 1728.09 | 927.33 | 1729.89 | 927.4 |
| 1738.09 | 927.69 | 1740.1 | 927.69 | 1748.09 | 927.68 | 1750.32 | 927.63 | 1758.1 | 927.57 |
| 1760.54 | 927.51 | 1768.1 | 927.42 | 1778.1 | 927.16 | 1780.97 | 927.06 | 1788.1 | 926.78 |
| 1791.18 | 926.67 | 1798.11 | 926.3 | 1801.4 | 926.2 | 1808.11 | 925.94 | 1811.62 | 925.87 |
| 1818.11 | 925.69 | 1821.83 | 925.61 | 1828.11 | 925.39 | 1832.04 | 925.29 | 1838.11 | 925.05 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1842.27 | 924.91 | 1848.12 | 924.65 | 1852.48 | 924.48 | 1858.12 | 924.21 | 1862.7 | 924.07 |
| 1868.12 | 923.88 | 1872.91 | 923.83 | 1878.12 | 923.83 | 1883.12 | 923.97 | 1888.13 | 924.27 |
| 1893.35 | 924.56 | 1898.13 | 924.85 | 1903.56 | 925.13 | 1908.13 | 925.32 | 1913.77 | 925.67 |
| 1918.13 | 925.89 | 1923.99 | 926.35 | 1928.13 | 926.62 | 1934.21 | 927.15 | 1938.14 | 927.43 |
| 1944.43 | 928.02 | 1948.14 | 928.35 | 1954.64 | 929 | 1958.14 | 929.31 | 1964.85 | 929.84 |
| 1968.14 | 930.05 | 1975.07 | 930.45 | 1978.15 | 930.6 | 1985.29 | 931.11 | 1988.15 | 931.27 |
| 1995.5 | 932.24 | 2005.72 | 933.94 | 2008.15 | 934.41 | 2015.06 | 935.26 | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 1172.77 | .072 | 1283.6 | .04 | 1678.55 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1207.02 | 1448.03 | 201.93 | 200 | 203 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1177.97 | 924.9 | F |
| 1448.03 | 2015.06 | 921.61 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 921.69 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.37 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 921.31 | Reach Len. (ft) | 201.93 | 200.00 | 203.00 |
| Crit W.S. (ft) | 920.89 | Flow Area (sq ft) | | 375.19 | |
| E.G. Slope (ft/ft) | 0.013244 | Area (sq ft) | 146.69 | 375.19 | 154.39 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 729.60 | Top Width (ft) | 296.28 | 221.77 | 211.55 |
| Vel Total (ft/s) | 4.90 | Avg. Vel. (ft/s) | | 4.90 | |
| Max Chl Dpth (ft) | 3.46 | Hydr. Depth (ft) | | 1.69 | |
| Conv. Total (cfs) | 15988.4 | Conv. (cfs) | | 15988.4 | |
| Length Wtd. (ft) | 200.67 | Wetted Per. (ft) | | 222.20 | |
| Min Ch El (ft) | 917.85 | Shear (lb/sq ft) | | 1.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 6.85 | |
| Frctn Loss (ft) | 2.48 | Cum Volume (acre-ft) | 45.54 | 63.91 | 83.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 48.89 | 27.07 | 99.96 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 922.20 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 922.02 | Reach Len. (ft) | 201.93 | 200.00 | 203.00 |
| Crit W.S. (ft) | 920.89 | Flow Area (sq ft) | | 538.24 | |
| E.G. Slope (ft/ft) | 0.004172 | Area (sq ft) | | 538.24 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 235.37 | Top Width (ft) | | 235.37 | |
| Vel Total (ft/s) | 3.42 | Avg. Vel. (ft/s) | | 3.42 | |
| Max Chl Dpth (ft) | 4.17 | Hydr. Depth (ft) | | 2.29 | |
| Conv. Total (cfs) | 28486.3 | Conv. (cfs) | | 28486.3 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 236.29 | |
| Min Ch El (ft) | 917.85 | Shear (lb/sq ft) | | 0.59 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.03 | |
| Frctn Loss (ft) | 1.49 | Cum Volume (acre-ft) | 11.80 | 85.66 | 16.24 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 5.00 | 28.97 | 8.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 921.96 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.050 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 921.73 | Reach Len. (ft) | 201.93 | 200.00 | 203.00 |
| Crit W.S. (ft) | 920.88 | Flow Area (sq ft) | | 469.39 | |
| E.G. Slope (ft/ft) | 0.006597 | Area (sq ft) | | 469.39 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 233.91 | Top Width (ft) | | 233.91 | |
| Vel Total (ft/s) | 3.92 | Avg. Vel. (ft/s) | | 3.92 | |
| Max Chl Dpth (ft) | 3.88 | Hydr. Depth (ft) | | 2.01 | |
| Conv. Total (cfs) | 22654.0 | Conv. (cfs) | | 22654.0 | |
| Length Wtd. (ft) | 200.67 | Wetted Per. (ft) | | 234.50 | |
| Min Ch El (ft) | 917.85 | Shear (lb/sq ft) | | 0.82 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.23 | |
| Frctn Loss (ft) | 2.16 | Cum Volume (acre-ft) | 25.48 | 69.51 | 33.59 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.60 | 27.48 | 24.99 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 2.018

INPUT
Description: Thalweg Sta. 1215.62
Station Elevation Data num= 307

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 933.4 | 5.32 | 933.8 | 10.1 | 932.24 | 15.32 | 930.59 | 20.34 | 928.95 |
| 25.33 | 927.36 | 30.57 | 927.76 | 35.33 | 928.09 | 40.8 | 927.87 | 45.33 | 927.7 |
| 55.33 | 926.75 | 61.26 | 926.27 | 65.34 | 925.91 | 71.49 | 925.68 | 75.34 | 925.55 |
| 81.72 | 925.49 | 85.34 | 925.45 | 91.95 | 925.41 | 95.34 | 925.38 | 102.18 | 925.35 |
| 122.64 | 925.23 | 125.35 | 925.21 | 132.87 | 925.17 | 135.35 | 925.15 | 143.11 | 925.1 |
| 145.36 | 925.08 | 153.34 | 925.02 | 155.36 | 925.01 | 157.3 | 924.99 | 173.79 | 924.85 |
| 175.36 | 924.84 | 185.37 | 924.76 | 194.26 | 924.71 | 195.37 | 924.7 | 204.49 | 924.67 |
| 205.37 | 924.67 | 214.71 | 924.65 | 215.37 | 924.65 | 224.95 | 924.63 | 225.38 | 924.62 |
| 235.18 | 924.59 | 235.38 | 924.59 | 244.11 | 924.53 | 245.41 | 924.53 | 255.39 | 924.46 |
| 255.65 | 924.46 | 265.39 | 924.38 | 265.88 | 924.38 | 275.39 | 924.3 | 276.1 | 924.3 |
| 285.39 | 924.22 | 286.33 | 924.21 | 295.4 | 924.1 | 296.57 | 924.08 | 315.4 | 923.82 |
| 317.03 | 923.79 | 325.4 | 923.68 | 335.41 | 923.57 | 343.2 | 923.53 | 345.41 | 923.51 |
| 347.72 | 923.5 | 355.41 | 923.48 | 357.95 | 923.47 | 365.41 | 923.46 | 375.42 | 923.43 |
| 378.42 | 923.43 | 395.42 | 923.37 | 431.26 | 923.19 | 435.43 | 923.16 | 439.79 | 923.14 |
| 465.44 | 922.97 | 490.94 | 922.79 | 495.45 | 922.77 | 531.87 | 922.42 | 535.45 | 922.38 |
| 545.46 | 922.3 | 583.03 | 922.03 | 585.47 | 922.02 | 593.26 | 921.97 | 595.47 | 921.95 |
| 634.18 | 921.73 | 644.41 | 921.66 | 645.48 | 921.65 | 654.64 | 921.59 | 655.48 | 921.58 |
| 664.87 | 921.52 | 665.49 | 921.52 | 675.1 | 921.45 | 675.49 | 921.45 | 685.33 | 921.38 |
| 685.49 | 921.37 | 692.49 | 921.31 | 695.42 | 921.28 | 695.56 | 921.28 | 705.5 | 921.16 |
| 705.8 | 921.15 | 715.5 | 921.01 | 716.02 | 921.01 | 735.5 | 920.76 | 736.49 | 920.75 |
| 745.51 | 920.69 | 746.72 | 920.69 | 756.95 | 920.7 | 765.51 | 920.74 | 785.52 | 920.83 |
| 787.64 | 920.83 | 795.52 | 920.85 | 835.53 | 920.82 | 845.53 | 920.78 | 859.26 | 920.7 |
| 865.54 | 920.65 | 869.49 | 920.63 | 875.54 | 920.58 | 879.72 | 920.56 | 885.54 | 920.52 |
| 895.54 | 920.47 | 920.64 | 920.38 | 925.55 | 920.37 | 945.56 | 920.27 | 951.33 | 920.23 |
| 961.56 | 920.13 | 965.56 | 920.1 | 975.56 | 920 | 985.57 | 919.92 | 992.26 | 919.89 |
| 995.57 | 919.87 | 1012.71 | 919.88 | 1015.57 | 919.89 | 1022.95 | 919.89 | 1025.58 | 919.9 |
| 1035.58 | 919.9 | 1045.58 | 919.86 | 1053.63 | 919.8 | 1055.58 | 919.79 | 1057.45 | 919.77 |
| 1074.1 | 919.63 | 1075.59 | 919.62 | 1084.33 | 919.55 | 1085.59 | 919.55 | 1094.56 | 919.5 |
| 1105.6 | 919.49 | 1115.02 | 919.57 | 1115.6 | 919.57 | 1125.25 | 919.89 | 1125.6 | 919.9 |
| 1135.48 | 921.58 | 1135.6 | 921.6 | 1145.51 | 923.29 | 1145.61 | 923.3 | 1147.57 | 923.34 |
| 1151.54 | 923.43 | 1155.29 | 923.51 | 1155.61 | 923.52 | 1165.61 | 922.94 | 1166.17 | 922.86 |
| 1175.61 | 921.46 | 1176.41 | 921.37 | 1185.62 | 920.26 | 1186.64 | 920.18 | 1195.62 | 919.49 |
| 1196.87 | 919.37 | 1205.62 | 918.45 | 1207.1 | 918.29 | 1215.62 | 917.34 | 1217.33 | 917.41 |
| 1225.63 | 917.84 | 1235.63 | 918.25 | 1236.91 | 918.24 | 1237.79 | 918.24 | 1245.63 | 918.21 |
| 1248.83 | 918.17 | 1255.63 | 918.11 | 1258.26 | 918.07 | 1265.64 | 918.01 | 1272.7 | 917.87 |
| 1275.64 | 917.76 | 1278.71 | 917.68 | 1285.64 | 917.42 | 1288.94 | 917.52 | 1295.64 | 917.39 |
| 1299.18 | 917.6 | 1305.65 | 917.8 | 1309.41 | 917.99 | 1315.65 | 918.33 | 1319.64 | 918.42 |
| 1325.65 | 918.7 | 1329.86 | 918.72 | 1335.65 | 918.83 | 1340.1 | 918.81 | 1345.6 | 918.83 |
| 1345.66 | 918.83 | 1350.33 | 918.76 | 1355.66 | 918.72 | 1360.56 | 918.54 | 1365.66 | 918.42 |
| 1375.66 | 918.07 | 1381.03 | 918.16 | 1385.67 | 918.16 | 1391.25 | 918.48 | 1395.67 | 918.68 |
| 1399.89 | 918.84 | 1405.67 | 919.04 | 1409.68 | 919.07 | 1415.67 | 919.1 | 1421.95 | 919.1 |
| 1435.68 | 919.07 | 1445.68 | 919.01 | 1452.63 | 918.9 | 1455.68 | 918.86 | 1462.87 | 918.67 |
| 1473.1 | 918.37 | 1475.69 | 918.29 | 1483.33 | 918.11 | 1485.69 | 918.06 | 1493.56 | 918.07 |
| 1495.69 | 918.08 | 1503.79 | 918.1 | 1505.7 | 918.12 | 1515.7 | 917.82 | 1524.25 | 917.74 |
| 1525.7 | 917.74 | 1534.48 | 918.44 | 1535.7 | 918.53 | 1544.72 | 919.21 | 1545.71 | 919.28 |
| 1554.94 | 919.77 | 1555.71 | 919.81 | 1565.17 | 920.42 | 1565.71 | 920.46 | 1566.49 | 920.52 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1575.4 | 921.24 | 1575.71 | 921.26 | 1585.64 | 921.84 | 1585.72 | 921.85 | 1595.72 | 922.05 |
| 1595.87 | 922.05 | 1605.72 | 922.06 | 1606.1 | 922.05 | 1615.72 | 921.87 | 1616.32 | 921.84 |
| 1625.73 | 921.51 | 1626.56 | 921.47 | 1635.73 | 920.91 | 1636.79 | 920.84 | 1645.73 | 920.22 |
| 1647.02 | 920.16 | 1655.73 | 919.69 | 1657.25 | 919.7 | 1665.74 | 919.72 | 1675.74 | 920.24 |
| 1677.71 | 920.38 | 1685.74 | 920.92 | 1695.74 | 921.69 | 1698.17 | 921.96 | 1705.75 | 922.71 |
| 1708.41 | 923 | 1715.75 | 923.73 | 1718.64 | 923.92 | 1725.75 | 924.42 | 1728.86 | 924.35 |
| 1735.75 | 924.14 | 1739.09 | 923.76 | 1745.76 | 923.09 | 1749.33 | 922.62 | 1759.56 | 921.49 |
| 1765.76 | 920.88 | 1769.79 | 920.6 | 1775.76 | 920.15 | 1780.02 | 920.09 | 1785.77 | 919.98 |
| 1790.25 | 920.06 | 1795.77 | 920.12 | 1800.48 | 920.28 | 1805.77 | 920.4 | 1810.71 | 920.53 |
| 1815.77 | 920.6 | 1825.78 | 920.37 | 1831.18 | 920.2 | 1835.78 | 920.15 | 1841.4 | 920.2 |
| 1845.78 | 920.26 | 1851.63 | 920.45 | 1855.78 | 920.57 | 1861.87 | 920.89 | 1865.79 | 921.06 |
| 1875.79 | 921.71 | 1882.33 | 922.19 | 1885.79 | 922.48 | 1892.55 | 922.93 | 1895.79 | 923.22 |
| 1902.79 | 923.69 | 1905.8 | 924.03 | 1913.02 | 925.04 | 1915.8 | 925.41 | 1923.25 | 925.81 |
| 1925.8 | 926.08 | 1933.48 | 927.42 | 1935.8 | 927.66 | 1943.71 | 929.28 | 1945.81 | 929.63 |
| 1953.94 | 931.11 | 1964.17 | 933.03 | 1965.81 | 933.36 | 1974.4 | 934.6 | 1975.81 | 934.79 |
| 1984.64 | 935.64 | 1985.42 | 935.71 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 1147.57 | .072 | 1248.83 | .04 | 1566.49 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1151.54 | 1345.66 | 200.25 | 200 | 201.01 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1155.29 | 923.51 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 919.78 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.41 | Wt. n-Val. | | 0.047 | 0.040 |
| W.S. Elev (ft) | 919.37 | Reach Len. (ft) | 200.25 | 200.00 | 201.01 |
| Crit W.S. (ft) | 919.30 | Flow Area (sq ft) | | 189.15 | 168.93 |
| E.G. Slope (ft/ft) | 0.021439 | Area (sq ft) | | 189.15 | 168.93 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1023.99 | 816.01 |
| Top Width (ft) | 350.53 | Top Width (ft) | | 148.79 | 201.74 |
| Vel Total (ft/s) | 5.14 | Avg. Vel. (ft/s) | | 5.41 | 4.83 |
| Max Chl Dpth (ft) | 2.03 | Hydr. Depth (ft) | | 1.27 | 0.84 |
| Conv. Total (cfs) | 12566.6 | Conv. (cfs) | | 6993.5 | 5573.1 |
| Length Wtd. (ft) | 200.71 | Wetted Per. (ft) | | 148.96 | 201.85 |
| Min Ch El (ft) | 917.34 | Shear (lb/sq ft) | | 1.70 | 1.12 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 9.20 | 5.41 |
| Frctn Loss (ft) | 1.70 | Cum Volume (acre-ft) | 45.20 | 62.61 | 82.25 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 48.21 | 26.22 | 98.99 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 920.66 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.61 | Wt. n-Val. | | 0.047 | |
| W.S. Elev (ft) | 920.06 | Reach Len. (ft) | 200.25 | 200.00 | 201.01 |
| Crit W.S. (ft) | 919.79 | Flow Area (sq ft) | | 294.37 | |
| E.G. Slope (ft/ft) | 0.017057 | Area (sq ft) | | 294.37 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 157.43 | Top Width (ft) | | 157.43 | |
| Vel Total (ft/s) | 6.25 | Avg. Vel. (ft/s) | | 6.25 | |
| Max Chl Dpth (ft) | 2.72 | Hydr. Depth (ft) | | 1.87 | |
| Conv. Total (cfs) | 14088.4 | Conv. (cfs) | | 14088.4 | |
| Length Wtd. (ft) | 200.43 | Wetted Per. (ft) | | 158.86 | |
| Min Ch El (ft) | 917.34 | Shear (lb/sq ft) | | 1.97 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 12.33 | |
| Frctn Loss (ft) | 1.50 | Cum Volume (acre-ft) | 11.80 | 83.75 | 16.24 |
| C & E Loss (ft) | 0.14 | Cum SA (acres) | 5.00 | 28.06 | 8.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,

water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 919.79 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.41 | Wt. n-Val. | | 0.047 | 0.040 |
| W.S. Elev (ft) | 919.38 | Reach Len. (ft) | 200.25 | 200.00 | 201.01 |
| Crit W.S. (ft) | 919.30 | Flow Area (sq ft) | | 190.75 | 171.10 |
| E.G. Slope (ft/ft) | 0.020733 | Area (sq ft) | | 190.75 | 171.10 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1020.85 | 819.15 |
| Top Width (ft) | 350.84 | Top Width (ft) | | 148.90 | 201.94 |
| Vel Total (ft/s) | 5.09 | Avg. Vel. (ft/s) | | 5.35 | 4.79 |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.28 | 0.85 |
| Conv. Total (cfs) | 12778.7 | Conv. (cfs) | | 7089.7 | 5689.0 |
| Length Wtd. (ft) | 200.71 | Wetted Per. (ft) | | 149.08 | 202.05 |
| Min Ch El (ft) | 917.34 | Shear (lb/sq ft) | | 1.66 | 1.10 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 8.86 | 5.25 |
| Frctn Loss (ft) | 1.70 | Cum Volume (acre-ft) | 25.48 | 68.00 | 33.20 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 14.60 | 26.60 | 24.52 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.980

INPUT
Description: Thalweg Sta. 1199.10
Station Elevation Data num= 303

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 932.06 | 1.34 | 932.01 | 8.74 | 931.75 | 15.79 | 931.46 | 18.75 | 931.32 |
| 21.85 | 931.16 | 28.75 | 930.84 | 38.75 | 930.31 | 42.35 | 930.11 | 48.75 | 929.79 |
| 52.61 | 929.58 | 58.76 | 929.27 | 62.86 | 929.01 | 68.76 | 928.67 | 73.11 | 928.3 |
| 78.76 | 927.85 | 83.36 | 926.95 | 88.77 | 926.45 | 93.62 | 927.02 | 98.77 | 926.78 |
| 103.87 | 926.69 | 108.77 | 926.73 | 114.12 | 926.2 | 118.78 | 925.96 | 124.38 | 925.58 |
| 128.78 | 925.23 | 134.64 | 925.01 | 138.78 | 924.72 | 144.89 | 924.6 | 148.78 | 924.48 |
| 155.15 | 924.44 | 158.79 | 924.41 | 178.79 | 924.36 | 181.78 | 924.37 | 188.8 | 924.35 |
| 191.55 | 924.35 | 198.8 | 924.33 | 218.81 | 924.22 | 226.92 | 924.16 | 228.81 | 924.15 |
| 237.17 | 924.08 | 238.81 | 924.06 | 240.37 | 924.05 | 248.81 | 923.97 | 250.13 | 923.96 |
| 267.93 | 923.81 | 269.67 | 923.79 | 278.82 | 923.71 | 279.43 | 923.71 | 288.83 | 923.63 |
| 289.2 | 923.63 | 298.83 | 923.56 | 298.96 | 923.56 | 308.83 | 923.49 | 308.94 | 923.49 |
| 318.84 | 923.42 | 319.2 | 923.41 | 328.84 | 923.34 | 329.45 | 923.33 | 338.84 | 923.24 |
| 339.7 | 923.23 | 348.84 | 923.11 | 349.95 | 923.09 | 367.31 | 922.83 | 368.85 | 922.81 |
| 377.07 | 922.69 | 378.85 | 922.67 | 380.71 | 922.66 | 388.86 | 922.58 | 390.97 | 922.57 |
| 398.86 | 922.52 | 401.22 | 922.51 | 421.74 | 922.45 | 428.87 | 922.45 | 431.99 | 922.43 |
| 438.87 | 922.43 | 452.5 | 922.39 | 458.88 | 922.36 | 462.75 | 922.35 | 478.88 | 922.27 |
| 484.48 | 922.22 | 508.89 | 922.04 | 524.27 | 921.94 | 538.9 | 921.82 | 543.07 | 921.77 |
| 548.9 | 921.72 | 568.91 | 921.51 | 575.53 | 921.46 | 578.91 | 921.42 | 585.79 | 921.38 |
| 588.92 | 921.35 | 596.04 | 921.31 | 598.92 | 921.3 | 601.66 | 921.28 | 616.54 | 921.21 |
| 618.93 | 921.19 | 628.93 | 921.14 | 637.05 | 921.08 | 638.93 | 921.07 | 657.56 | 920.95 |
| 658.94 | 920.93 | 667.81 | 920.88 | 668.94 | 920.87 | 678.06 | 920.82 | 678.94 | 920.81 |
| 688.33 | 920.77 | 688.95 | 920.77 | 698.58 | 920.75 | 698.95 | 920.75 | 708.83 | 920.73 |
| 708.95 | 920.73 | 713.9 | 920.71 | 718.96 | 920.7 | 719.09 | 920.7 | 728.96 | 920.67 |
| 729.34 | 920.67 | 738.96 | 920.63 | 739.59 | 920.63 | 748.96 | 920.59 | 749.84 | 920.59 |
| 758.97 | 920.56 | 760.1 | 920.55 | 768.97 | 920.52 | 770.35 | 920.51 | 778.97 | 920.47 |
| 788.98 | 920.4 | 790.86 | 920.39 | 798.98 | 920.33 | 801.11 | 920.32 | 808.98 | 920.27 |
| 811.36 | 920.25 | 831.87 | 920.1 | 842.12 | 920 | 848.99 | 919.92 | 852.38 | 919.87 |
| 859 | 919.79 | 862.63 | 919.74 | 879 | 919.57 | 883.13 | 919.54 | 893.39 | 919.53 |
| 924.15 | 919.59 | 934.4 | 919.59 | 939.02 | 919.58 | 944.65 | 919.58 | 949.02 | 919.57 |
| 959.03 | 919.57 | 965.17 | 919.56 | 969.03 | 919.56 | 975.01 | 919.55 | 975.42 | 919.55 |
| 985.67 | 919.53 | 995.93 | 919.44 | 999.04 | 919.4 | 1006.18 | 919.32 | 1016.43 | 919.18 |
| 1026.69 | 919.07 | 1029.05 | 919.05 | 1036.94 | 919 | 1039.05 | 918.99 | 1047.19 | 918.98 |
| 1079.06 | 918.99 | 1089.07 | 918.98 | 1098.46 | 919.01 | 1099.07 | 919.01 | 1108.71 | 919.29 |
| 1109.07 | 919.29 | 1109.41 | 919.33 | 1119.07 | 920.51 | 1126.3 | 921.45 | 1129.08 | 921.81 |
| 1129.22 | 921.81 | 1135.64 | 922.02 | 1139.08 | 922.14 | 1139.47 | 922.09 | 1149.08 | 920.91 |
| 1149.72 | 920.8 | 1159.09 | 919.24 | 1168 | 918 | 1169.09 | 917.84 | 1177.76 | 916.81 |
| 1179.09 | 916.65 | 1187.53 | 915.86 | 1189.1 | 915.76 | 1197.3 | 916.12 | 1199.1 | 916.23 |
| 1207.06 | 916.98 | 1209.1 | 917.16 | 1216.82 | 917.69 | 1219.1 | 917.79 | 1226.59 | 917.94 |
| 1229.11 | 917.95 | 1234.63 | 917.95 | 1242.01 | 917.93 | 1249.11 | 917.93 | 1252.26 | 917.92 |
| 1269.12 | 917.92 | 1272.77 | 917.91 | 1279.12 | 917.91 | 1283.02 | 917.89 | 1289.13 | 917.88 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1293.28 | 917.82 | 1299.13 | 917.77 | 1303.53 | 917.66 | 1309.13 | 917.54 | 1319.13 | 917.22 |
| 1324.04 | 917.1 | 1328.03 | 916.96 | 1329.14 | 916.92 | 1334.29 | 916.97 | 1339.14 | 916.93 |
| 1344.54 | 917.17 | 1349.14 | 917.34 | 1359.15 | 917.84 | 1365.05 | 917.94 | 1369.15 | 918.05 |
| 1375.3 | 917.97 | 1379.15 | 917.94 | 1385.55 | 917.76 | 1389.16 | 917.64 | 1395.81 | 917.3 |
| 1406.06 | 916.72 | 1409.16 | 916.58 | 1416.31 | 916.78 | 1419.16 | 916.93 | 1429.17 | 917.41 |
| 1431.64 | 917.4 | 1439.17 | 917.41 | 1447.07 | 917.28 | 1449.17 | 917.25 | 1457.33 | 917.1 |
| 1467.58 | 916.87 | 1469.18 | 916.84 | 1477.83 | 916.56 | 1479.18 | 916.53 | 1488.09 | 916.23 |
| 1498.34 | 916.04 | 1499.19 | 916.03 | 1508.6 | 915.98 | 1509.19 | 915.98 | 1518.85 | 915.94 |
| 1519.19 | 915.94 | 1529.11 | 915.85 | 1529.2 | 915.85 | 1532.96 | 915.81 | 1539.2 | 915.76 |
| 1539.36 | 915.76 | 1549.2 | 915.62 | 1549.61 | 915.62 | 1559.21 | 915.48 | 1559.87 | 915.48 |
| 1569.21 | 915.39 | 1570.12 | 915.4 | 1580.37 | 915.39 | 1589.22 | 915.4 | 1590.63 | 915.33 |
| 1599.22 | 915.13 | 1600.88 | 914.99 | 1609.22 | 914.43 | 1611.13 | 914.43 | 1619.22 | 913.89 |
| 1621.39 | 914.13 | 1628.75 | 914.61 | 1629.23 | 914.64 | 1631.64 | 914.89 | 1639.23 | 915.77 |
| 1641.89 | 916.01 | 1649.23 | 916.88 | 1652.14 | 917.13 | 1659.24 | 917.84 | 1662.4 | 918.07 |
| 1669.24 | 918.58 | 1672.65 | 918.72 | 1679.24 | 918.93 | 1682.9 | 918.88 | 1689.25 | 918.74 |
| 1699.25 | 918.35 | 1703.41 | 918.17 | 1709.25 | 917.96 | 1713.66 | 917.79 | 1719.25 | 917.61 |
| 1723.92 | 917.5 | 1729.26 | 917.47 | 1734.17 | 917.51 | 1739.26 | 917.58 | 1749.26 | 917.67 |
| 1754.67 | 917.7 | 1775.18 | 917.76 | 1789.28 | 917.84 | 1795.7 | 917.96 | 1799.28 | 918.02 |
| 1809.28 | 918.32 | 1816.2 | 918.55 | 1819.28 | 918.66 | 1826.46 | 918.99 | 1829.29 | 919.15 |
| 1836.71 | 919.91 | 1839.29 | 920.22 | 1846.96 | 921.45 | 1849.29 | 921.84 | 1857.22 | 923.19 |
| 1859.3 | 923.58 | 1867.47 | 924.85 | 1867.83 | 924.9 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 975.01 | .04 | 1126.3 | .072 | 1328.03 | .04 | 1628.75 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1135.64 | 1272.77 | 201.22 | 200 | 199.79 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 918.01 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.072 | 0.039 |
| W.S. Elev (ft) | 917.83 | Reach Len. (ft) | 201.22 | 200.00 | 199.79 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 55.55 | 513.77 |
| E.G. Slope (ft/ft) | 0.004499 | Area (sq ft) | | 55.55 | 513.77 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 80.14 | 1759.86 |
| Top Width (ft) | 469.94 | Top Width (ft) | | 52.02 | 417.91 |
| Vel Total (ft/s) | 3.23 | Avg. Vel. (ft/s) | | 1.44 | 3.43 |
| Max Chl Dpth (ft) | 3.94 | Hydr. Depth (ft) | | 1.07 | 1.23 |
| Conv. Total (cfs) | 27430.7 | Conv. (cfs) | | 1194.7 | 26236.0 |
| Length Wtd. (ft) | 199.81 | Wetted Per. (ft) | | 52.21 | 418.27 |
| Min Ch El (ft) | 915.76 | Shear (lb/sq ft) | | 0.30 | 0.35 |
| Alpha | 1.08 | Stream Power (lb/ft s) | | 0.43 | 1.18 |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | 45.20 | 62.05 | 80.68 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 48.21 | 25.76 | 97.56 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 919.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.072 | 0.042 |
| W.S. Elev (ft) | 918.87 | Reach Len. (ft) | 201.22 | 200.00 | 199.79 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 161.97 | 463.80 |
| E.G. Slope (ft/ft) | 0.004200 | Area (sq ft) | | 161.97 | 463.80 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 278.25 | 1561.75 |
| Top Width (ft) | 371.51 | Top Width (ft) | | 111.01 | 260.50 |
| Vel Total (ft/s) | 2.94 | Avg. Vel. (ft/s) | | 1.72 | 3.37 |
| Max Chl Dpth (ft) | 4.98 | Hydr. Depth (ft) | | 1.46 | 1.78 |
| Conv. Total (cfs) | 28390.4 | Conv. (cfs) | | 4293.2 | 24097.1 |
| Length Wtd. (ft) | 199.83 | Wetted Per. (ft) | | 111.27 | 263.66 |
| Min Ch El (ft) | 915.76 | Shear (lb/sq ft) | | 0.38 | 0.46 |
| Alpha | 1.16 | Stream Power (lb/ft s) | | 0.66 | 1.55 |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 11.80 | 82.70 | 15.17 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 27.45 | 7.51 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 918.01 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.072 | 0.039 |
| W.S. Elev (ft) | 917.83 | Reach Len. (ft) | 201.22 | 200.00 | 199.79 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | | 55.47 | 500.83 |
| E.G. Slope (ft/ft) | 0.004569 | Area (sq ft) | | 55.47 | 500.83 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 80.66 | 1759.34 |
| Top Width (ft) | 394.41 | Top Width (ft) | | 51.94 | 342.47 |
| Vel Total (ft/s) | 3.31 | Avg. Vel. (ft/s) | | 1.45 | 3.51 |
| Max Chl Dpth (ft) | 3.94 | Hydr. Depth (ft) | | 1.07 | 1.46 |
| Conv. Total (cfs) | 27220.5 | Conv. (cfs) | | 1193.3 | 26027.2 |
| Length Wtd. (ft) | 199.81 | Wetted Per. (ft) | | 52.12 | 342.83 |
| Min Ch El (ft) | 915.76 | Shear (lb/sq ft) | | 0.30 | 0.42 |
| Alpha | 1.09 | Stream Power (lb/ft s) | | 0.44 | 1.46 |
| Frctn Loss (ft) | 1.13 | Cum Volume (acre-ft) | 25.48 | 67.43 | 31.65 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.60 | 26.14 | 23.26 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.942

INPUT
Description: Thalweg Sta. 658.41
Station Elevation Data num= 230

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 931.52 | 6.27 | 932.17 | 8.11 | 932.38 | 16.28 | 933.08 | 18.43 | 933.25 |
| 23.11 | 933.37 | 26.28 | 933.45 | 28.75 | 933.49 | 39.08 | 933.26 | 46.29 | 932.87 |
| 49.4 | 932.69 | 56.3 | 931.84 | 59.72 | 931.13 | 66.3 | 929.83 | 70.04 | 928.82 |
| 76.31 | 927.27 | 80.37 | 926.18 | 86.31 | 924.41 | 90.69 | 923.52 | 96.32 | 922.87 |
| 101.01 | 922.27 | 106.32 | 921.79 | 111.33 | 921.48 | 116.33 | 921.23 | 126.33 | 920.97 |
| 142.3 | 920.65 | 146.34 | 920.55 | 162.95 | 920.19 | 166.35 | 920.13 | 173.27 | 919.99 |
| 176.35 | 919.94 | 214.55 | 919.21 | 216.37 | 919.17 | 226.38 | 919.03 | 235.2 | 918.93 |
| 245.53 | 918.84 | 246.39 | 918.83 | 255.84 | 918.75 | 256.39 | 918.74 | 266.17 | 918.7 |
| 266.4 | 918.69 | 273.59 | 918.73 | 276.4 | 918.75 | 276.49 | 918.75 | 286.41 | 918.93 |
| 296.41 | 919.17 | 297.13 | 919.18 | 306.42 | 919.32 | 307.46 | 919.31 | 316.42 | 919.31 |
| 317.78 | 919.26 | 326.42 | 919.01 | 336.43 | 918.53 | 338.42 | 918.48 | 346.43 | 918.21 |
| 348.75 | 918.19 | 356.44 | 918.08 | 359.07 | 918.05 | 366.44 | 917.99 | 376.45 | 917.89 |
| 379.71 | 917.85 | 386.45 | 917.78 | 390.04 | 917.71 | 396.46 | 917.61 | 400.36 | 917.5 |
| 406.46 | 917.36 | 410.68 | 917.23 | 416.47 | 917.08 | 421 | 916.95 | 426.47 | 916.78 |
| 431.32 | 916.67 | 436.48 | 916.52 | 441.32 | 916.47 | 446.48 | 916.48 | 451.96 | 916.63 |
| 456.49 | 916.72 | 476.5 | 917.4 | 486.5 | 917.7 | 493.25 | 917.8 | 496.51 | 917.87 |
| 503.58 | 917.79 | 506.51 | 917.78 | 513.9 | 917.65 | 516.52 | 917.61 | 524.23 | 917.46 |
| 526.52 | 917.41 | 536.52 | 917.21 | 544.87 | 917.06 | 546.53 | 917.04 | 555.19 | 916.95 |
| 556.53 | 916.94 | 565.52 | 916.91 | 566.54 | 916.9 | 575.83 | 916.96 | 576.54 | 916.96 |
| 586.16 | 917 | 588.5 | 917 | 596.48 | 916.99 | 596.55 | 916.99 | 598.8 | 916.97 |
| 606.33 | 916.93 | 606.56 | 916.93 | 606.81 | 916.92 | 616.56 | 916.72 | 617.12 | 916.67 |
| 618.4 | 916.57 | 626.57 | 915.96 | 636.57 | 914.93 | 646.58 | 914.02 | 648.1 | 913.99 |
| 656.58 | 913.68 | 658.41 | 913.93 | 666.59 | 915.18 | 668.74 | 915.55 | 676.59 | 916.98 |
| 679.06 | 917.16 | 686.6 | 917.64 | 696.6 | 917.64 | 704.02 | 917.55 | 706.61 | 917.52 |
| 710.03 | 917.47 | 716.61 | 917.4 | 720.35 | 917.34 | 726.62 | 917.26 | 740.99 | 917.05 |
| 746.62 | 916.93 | 751.32 | 916.84 | 758.57 | 916.65 | 767.16 | 916.45 | 773.3 | 916.35 |
| 773.34 | 916.35 | 777.82 | 916.27 | 780.45 | 916.25 | 788.47 | 916.17 | 797.31 | 916.11 |
| 799.13 | 916.1 | 802.24 | 916.07 | 820.44 | 915.92 | 831.04 | 915.88 | 831.19 | 915.88 |
| 841.75 | 915.97 | 847.91 | 915.97 | 852.41 | 915.99 | 860.14 | 915.9 | 870.07 | 915.83 |
| 873.72 | 915.86 | 881.64 | 915.9 | 884.38 | 915.93 | 889.08 | 915.81 | 893.43 | 915.69 |
| 895.03 | 915.62 | 901.22 | 915.37 | 905.69 | 915.24 | 915.37 | 915.42 | 916.35 | 915.42 |
| 918.02 | 915.48 | 927 | 915.77 | 932.24 | 915.82 | 937.66 | 915.93 | 946.97 | 915.98 |
| 948.31 | 915.99 | 949.1 | 915.99 | 958.97 | 915.97 | 969.63 | 915.89 | 975.91 | 915.87 |
| 980.28 | 915.87 | 982.83 | 915.86 | 990.94 | 915.87 | 1001.6 | 915.86 | 1004.86 | 915.85 |
| 1012.25 | 915.85 | 1022.91 | 915.87 | 1033.43 | 915.92 | 1033.56 | 915.93 | 1033.8 | 915.93 |
| 1044.22 | 916 | 1050.29 | 916.03 | 1054.88 | 916.07 | 1062.74 | 916.02 | 1065.53 | 915.99 |
| 1067.15 | 915.96 | 1076.19 | 915.78 | 1086.84 | 915.52 | 1097.5 | 915.24 | 1100.89 | 915.11 |
| 1117.75 | 914.57 | 1118.81 | 914.54 | 1120.64 | 914.46 | 1129.47 | 913.99 | 1134.62 | 913.66 |
| 1140.13 | 913.26 | 1149.58 | 913.62 | 1150.78 | 913.71 | 1151.48 | 913.78 | 1155.25 | 914.14 |
| 1161.44 | 914.73 | 1168.34 | 915.31 | 1172.09 | 915.66 | 1178.52 | 915.94 | 1182.75 | 916.06 |
| 1185.21 | 916.08 | 1193.41 | 916.17 | 1202.08 | 916.24 | 1204.06 | 916.26 | 1207.47 | 916.33 |
| 1220.56 | 916.62 | 1225.37 | 916.79 | 1228.35 | 916.96 | 1236.03 | 917.21 | 1236.42 | 917.22 |
| 1246.69 | 917.42 | 1257.34 | 917.44 | 1265.36 | 917.44 | 1268 | 917.45 | 1278.66 | 917.53 |
| 1289.31 | 917.72 | 1294.3 | 917.85 | 1299.97 | 918.01 | 1303.27 | 918.13 | 1310.63 | 918.36 |
| 1320.13 | 918.9 | 1321.28 | 918.95 | 1323.25 | 919.16 | 1331.94 | 920.12 | 1337 | 920.98 |
| 1342.59 | 921.86 | 1352.19 | 923.74 | 1353.25 | 923.91 | 1353.87 | 923.99 | 1359.12 | 924.61 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 23.11 | .04 | 588.5 | .072 | 773.34 | .04 | 1155.25 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 586.16 | 686.6 | 214.4 | 199.79 | 175.9 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 916.87 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.040 | 0.072 | 0.039 |
| W.S. Elev (ft) | 916.70 | Reach Len. (ft) | 214.40 | 199.79 | 175.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 3.73 | 96.43 | 473.69 |
| E.G. Slope (ft/ft) | 0.007411 | Area (sq ft) | 3.73 | 96.43 | 473.69 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 3.28 | 238.52 | 1598.20 |
| Top Width (ft) | 550.57 | Top Width (ft) | 25.83 | 58.33 | 466.41 |
| Vel Total (ft/s) | 3.21 | Avg. Vel. (ft/s) | 0.88 | 2.47 | 3.37 |
| Max Chl Dpth (ft) | 3.44 | Hydr. Depth (ft) | 0.14 | 1.65 | 1.02 |
| Conv. Total (cfs) | 21373.2 | Conv. (cfs) | 38.1 | 2770.7 | 18564.4 |
| Length Wtd. (ft) | 181.73 | Wetted Per. (ft) | 25.84 | 58.71 | 466.61 |
| Min Ch El (ft) | 913.68 | Shear (lb/sq ft) | 0.07 | 0.76 | 0.47 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.06 | 1.88 | 1.58 |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 45.19 | 61.70 | 78.42 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 48.15 | 25.51 | 95.54 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 917.96 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.072 | 0.041 |
| W.S. Elev (ft) | 917.73 | Reach Len. (ft) | 214.40 | 199.79 | 175.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 186.79 | 328.08 |
| E.G. Slope (ft/ft) | 0.006996 | Area (sq ft) | | 186.79 | 328.08 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 489.97 | 1350.03 |
| Top Width (ft) | 335.99 | Top Width (ft) | | 100.44 | 235.55 |
| Vel Total (ft/s) | 3.57 | Avg. Vel. (ft/s) | | 2.62 | 4.11 |
| Max Chl Dpth (ft) | 4.47 | Hydr. Depth (ft) | | 1.86 | 1.39 |
| Conv. Total (cfs) | 21998.0 | Conv. (cfs) | | 5857.8 | 16140.1 |
| Length Wtd. (ft) | 185.99 | Wetted Per. (ft) | | 101.60 | 237.71 |
| Min Ch El (ft) | 913.68 | Shear (lb/sq ft) | | 0.80 | 0.60 |
| Alpha | 1.12 | Stream Power (lb/ft s) | | 2.11 | 2.48 |
| Frctn Loss (ft) | 0.94 | Cum Volume (acre-ft) | 11.80 | 81.90 | 13.35 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.00 | 26.96 | 6.37 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 916.88 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.072 | 0.039 |
| W.S. Elev (ft) | 916.72 | Reach Len. (ft) | 214.40 | 199.79 | 175.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 97.11 | 479.10 |
| E.G. Slope (ft/ft) | 0.007190 | Area (sq ft) | | 97.11 | 479.10 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 237.16 | 1602.84 |
| Top Width (ft) | 525.70 | Top Width (ft) | | 58.52 | 467.18 |
| Vel Total (ft/s) | 3.19 | Avg. Vel. (ft/s) | | 2.44 | 3.35 |
| Max Chl Dpth (ft) | 3.46 | Hydr. Depth (ft) | | 1.66 | 1.03 |
| Conv. Total (cfs) | 21700.2 | Conv. (cfs) | | 2797.0 | 18903.2 |
| Length Wtd. (ft) | 181.38 | Wetted Per. (ft) | | 58.90 | 467.38 |
| Min Ch El (ft) | 913.68 | Shear (lb/sq ft) | | 0.74 | 0.46 |
| Alpha | 1.03 | Stream Power (lb/ft s) | | 1.81 | 1.54 |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 25.48 | 67.08 | 29.40 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.60 | 25.88 | 21.40 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.905

INPUT
Description: Thalweg Sta. 398.14
Station Elevation Data num= 193

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 925.95 | 3.96 | 925.95 | 5.74 | 925.93 | 25.5 | 925.69 | 26.31 | 925.69 |
| 36.81 | 925.76 | 45.27 | 925.89 | 50.86 | 925.96 | 58.71 | 926.04 | 65.03 | 926.09 |
| 69.66 | 926.1 | 75.42 | 926.06 | 80.61 | 925.99 | 84.79 | 925.82 | 91.56 | 925.56 |
| 99.97 | 924.92 | 102.51 | 924.67 | 113.46 | 923.49 | 124.31 | 922.54 | 124.41 | 922.53 |
| 124.53 | 922.53 | 132.02 | 922.06 | 139.59 | 921.68 | 146.31 | 921.41 | 149.08 | 921.31 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 157.26 | 920.99 | 163.84 | 920.76 | 168.2 | 920.63 | 173.63 | 920.55 | 179.15 | 920.39 |
| 183.6 | 920.51 | 190.1 | 920.72 | 198.18 | 921.62 | 201.05 | 921.92 | 203.36 | 922.17 |
| 212 | 923.16 | 222.74 | 922.23 | 222.95 | 922.21 | 230.46 | 920.71 | 233.9 | 920.31 |
| 238.02 | 920.45 | 244.85 | 920.29 | 247.29 | 920.22 | 255.8 | 919.83 | 262.64 | 918.98 |
| 266.75 | 918.56 | 271.85 | 917.88 | 277.7 | 917.27 | 282.4 | 916.89 | 288.65 | 916.28 |
| 296.4 | 915.78 | 299.59 | 915.7 | 306.96 | 915.61 | 310.54 | 915.56 | 320.95 | 915.44 |
| 321.49 | 915.44 | 321.93 | 915.43 | 332.44 | 915.29 | 341.69 | 915.14 | 343.39 | 915.11 |
| 345.51 | 915.08 | 354.34 | 914.92 | 361.46 | 914.75 | 365.29 | 914.67 | 365.54 | 914.66 |
| 370.05 | 914.49 | 376.24 | 914.22 | 387.19 | 913.65 | 394.61 | 913.22 | 398.14 | 913.01 |
| 409.09 | 912.31 | 419.16 | 912.11 | 420.04 | 912.12 | 420.74 | 912.17 | 430.98 | 912.88 |
| 440.5 | 913.52 | 441.93 | 913.62 | 443.72 | 913.69 | 452.88 | 913.93 | 460.27 | 914.02 |
| 463.83 | 914.08 | 474.5 | 914.2 | 474.78 | 914.2 | 485.73 | 914.31 | 492.83 | 914.36 |
| 504.96 | 914.43 | 507.63 | 914.44 | 509.02 | 914.45 | 515.19 | 914.48 | 519.48 | 914.52 |
| 531.46 | 914.58 | 551.49 | 914.57 | 555.43 | 914.56 | 563.09 | 914.56 | 567.41 | 914.57 |
| 569.64 | 914.58 | 579.4 | 914.76 | 587.79 | 915.03 | 591.38 | 915.16 | 598.36 | 915.33 |
| 603.37 | 915.47 | 605.94 | 915.48 | 615.35 | 915.43 | 624.09 | 915.31 | 627.33 | 915.26 |
| 633.64 | 915.18 | 639.32 | 915.09 | 642.24 | 915.06 | 647.69 | 914.98 | 651.3 | 914.94 |
| 663.28 | 914.97 | 675.27 | 914.93 | 676.56 | 914.92 | 678.53 | 914.91 | 687.25 | 914.96 |
| 696.68 | 915.11 | 714.82 | 915.58 | 732.98 | 916 | 734.31 | 916.01 | 735.18 | 916 |
| 741.52 | 915.98 | 747.17 | 915.82 | 748.73 | 915.79 | 751.12 | 915.69 | 759.15 | 915.18 |
| 769.27 | 914.6 | 771.13 | 914.55 | 774.75 | 914.49 | 783.12 | 914.32 | 787.42 | 914.29 |
| 795.1 | 914.48 | 805.56 | 914.76 | 807.08 | 914.78 | 810.03 | 914.79 | 823.72 | 914.86 |
| 831.05 | 914.85 | 841.86 | 914.87 | 843.03 | 914.88 | 845.31 | 914.89 | 855.01 | 914.95 |
| 860.01 | 914.99 | 878.16 | 915.09 | 878.98 | 915.1 | 880.58 | 915.09 | 890.96 | 915.08 |
| 902.95 | 914.96 | 914.46 | 914.78 | 914.93 | 914.78 | 915.86 | 914.76 | 926.91 | 914.57 |
| 932.61 | 914.45 | 938.9 | 914.27 | 950.75 | 913.69 | 950.88 | 913.68 | 951.14 | 913.67 |
| 962.86 | 913.16 | 965.4 | 913.26 | 968.9 | 913.4 | 974.85 | 913.84 | 986.83 | 914.99 |
| 987.05 | 915 | 998.81 | 915.73 | 1005.19 | 915.97 | 1010.8 | 916.11 | 1021.69 | 916.43 |
| 1022.78 | 916.47 | 1023.35 | 916.51 | 1034.77 | 917.42 | 1041.49 | 917.76 | 1046.75 | 917.96 |
| 1056.97 | 917.91 | 1058.73 | 917.91 | 1059.64 | 917.89 | 1070.72 | 917.72 | 1077.79 | 917.65 |
| 1082.7 | 917.63 | 1092.25 | 917.73 | 1094.68 | 917.75 | 1095.18 | 917.76 | 1095.94 | 917.77 |
| 1106.67 | 917.99 | 1114.09 | 918.18 | 1118.65 | 918.37 | 1127.53 | 919.07 | 1130.64 | 919.3 |
| 1132.23 | 919.47 | 1142.62 | 920.91 | 1150.38 | 922.23 | 1154.6 | 922.96 | 1162.81 | 924.43 |
| 1166.59 | 925.05 | 1168.53 | 925.3 | 1171.6 | 925.58 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 306.96 | .072 | 504.96 | .04 | 965.4 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 365.54 | 474.5 | 238.12 | 199.78 | 152.95 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 915.89 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.071 | 0.072 | 0.041 |
| W.S. Elev (ft) | 915.80 | Reach Len. (ft) | 238.12 | 199.78 | 152.95 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 36.87 | 259.67 | 513.99 |
| E.G. Slope (ft/ft) | 0.003937 | Area (sq ft) | 36.87 | 259.67 | 513.99 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 33.75 | 599.47 | 1206.78 |
| Top Width (ft) | 681.26 | Top Width (ft) | 69.51 | 108.96 | 502.79 |
| Vel Total (ft/s) | 2.27 | Avg. Vel. (ft/s) | 0.92 | 2.31 | 2.35 |
| Max Chl Dpth (ft) | 3.69 | Hydr. Depth (ft) | 0.53 | 2.38 | 1.02 |
| Conv. Total (cfs) | 29325.2 | Conv. (cfs) | 537.8 | 9554.2 | 19233.2 |
| Length Wtd. (ft) | 169.06 | Wetted Per. (ft) | 69.52 | 109.08 | 503.00 |
| Min Ch El (ft) | 912.11 | Shear (lb/sq ft) | 0.13 | 0.59 | 0.25 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.12 | 1.35 | 0.59 |
| Frctn Loss (ft) | 0.77 | Cum Volume (acre-ft) | 45.09 | 60.88 | 76.42 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 47.91 | 25.12 | 93.58 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 917.00 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.072 | 0.047 |
| W.S. Elev (ft) | 916.85 | Reach Len. (ft) | 238.12 | 199.78 | 152.95 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 373.64 | 229.16 |
| E.G. Slope (ft/ft) | 0.003790 | Area (sq ft) | | 373.64 | 229.16 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1064.50 | 775.50 |
| Top Width (ft) | 205.50 | Top Width (ft) | | 108.96 | 96.54 |
| Vel Total (ft/s) | 3.05 | Avg. Vel. (ft/s) | | 2.85 | 3.38 |
| Max Chl Dpth (ft) | 4.74 | Hydr. Depth (ft) | | 3.43 | 2.37 |
| Conv. Total (cfs) | 29887.6 | Conv. (cfs) | | 17290.9 | 12596.7 |
| Length Wtd. (ft) | 179.21 | Wetted Per. (ft) | | 111.27 | 98.79 |
| Min Ch El (ft) | 912.11 | Shear (lb/sq ft) | | 0.79 | 0.55 |
| Alpha | 1.02 | Stream Power (lb/ft s) | | 2.26 | 1.86 |
| Frctn Loss (ft) | 0.81 | Cum Volume (acre-ft) | 11.80 | 80.62 | 12.23 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.00 | 26.48 | 5.70 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 915.90 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.072 | 0.041 |
| W.S. Elev (ft) | 915.81 | Reach Len. (ft) | 238.12 | 199.78 | 152.95 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 260.22 | 516.53 |
| E.G. Slope (ft/ft) | 0.004055 | Area (sq ft) | | 260.22 | 516.53 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 606.32 | 1233.68 |
| Top Width (ft) | 612.37 | Top Width (ft) | | 108.96 | 503.41 |
| Vel Total (ft/s) | 2.37 | Avg. Vel. (ft/s) | | 2.33 | 2.39 |
| Max Chl Dpth (ft) | 3.70 | Hydr. Depth (ft) | | 2.39 | 1.03 |
| Conv. Total (cfs) | 28894.1 | Conv. (cfs) | | 9521.3 | 19372.8 |
| Length Wtd. (ft) | 168.37 | Wetted Per. (ft) | | 110.23 | 503.61 |
| Min Ch El (ft) | 912.11 | Shear (lb/sq ft) | | 0.60 | 0.26 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.39 | 0.62 |
| Frctn Loss (ft) | 0.78 | Cum Volume (acre-ft) | 25.48 | 66.26 | 27.39 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.60 | 25.50 | 19.44 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.867

INPUT
Description: Thalweg Sta. 497.21
Station Elevation Data num= 175

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 922.41 | .95 | 922.42 | 23.07 | 922.5 | 38.63 | 922.51 | 59.6 | 922.5 |
| 67.31 | 922.51 | 78.37 | 922.55 | 80.57 | 922.55 | 89.43 | 922.59 | 101.54 | 922.6 |
| 122.51 | 922.51 | 122.72 | 922.51 | 143.48 | 922.47 | 164.45 | 922.5 | 166.85 | 922.5 |
| 169.53 | 922.51 | 177.91 | 922.53 | 200.03 | 922.66 | 211.1 | 922.64 | 216.34 | 922.57 |
| 222.15 | 922.51 | 227.36 | 922.53 | 233.22 | 922.52 | 244.27 | 922.67 | 248.32 | 922.75 |
| 255.34 | 922.9 | 263.16 | 923.11 | 266.4 | 923.21 | 269.29 | 923.34 | 270.55 | 923.39 |
| 277.46 | 923.66 | 286.56 | 924.13 | 288.52 | 924.26 | 290.26 | 924.36 | 299.58 | 924.94 |
| 309.96 | 925.31 | 310.64 | 925.32 | 311.23 | 925.3 | 321.7 | 925.1 | 332.21 | 924.67 |
| 333.37 | 924.65 | 343.82 | 924.61 | 347.98 | 924.7 | 354.88 | 924.98 | 356.78 | 925.06 |
| 365.94 | 925.55 | 374.14 | 925.76 | 377 | 925.82 | 380.19 | 925.63 | 388.06 | 925.44 |
| 395.11 | 924.87 | 399.12 | 924.47 | 403.59 | 924 | 410.18 | 923.24 | 416.08 | 922.41 |
| 416.32 | 922.38 | 420.03 | 921.89 | 421.24 | 921.73 | 426.99 | 920.9 | 432.3 | 920.01 |
| 437.05 | 919.23 | 443.36 | 918.26 | 450.4 | 917.24 | 454.42 | 916.62 | 458.02 | 916.12 |
| 465.48 | 915.19 | 473.81 | 914.34 | 476.54 | 914.07 | 478.99 | 913.88 | 497.21 | 912.45 |
| 498.66 | 912.34 | 509.72 | 911.4 | 520.62 | 910.82 | 520.78 | 910.82 | 520.93 | 910.84 |
| 531.84 | 911.99 | 541.9 | 912.93 | 542.9 | 913.04 | 544.02 | 913.08 | 553.97 | 913.39 |
| 555.92 | 913.41 | 562.87 | 913.49 | 565.02 | 913.52 | 567.43 | 913.54 | 576.09 | 913.6 |
| 583.83 | 913.67 | 587.14 | 913.69 | 596.69 | 913.79 | 598.21 | 913.8 | 600 | 913.83 |
| 608.43 | 913.95 | 626.58 | 914.16 | 636.11 | 914.29 | 641.04 | 914.38 | 655.5 | 914.77 |
| 663.8 | 914.71 | 669.96 | 914.49 | 684.42 | 913.71 | 691.49 | 913.55 | 698.88 | 913.53 |
| 705.33 | 913.6 | 719.17 | 913.87 | 727.8 | 914.06 | 733.01 | 914.16 | 742.26 | 914.29 |
| 746.86 | 914.38 | 756.72 | 914.52 | 760.7 | 914.63 | 771.18 | 914.9 | 774.54 | 914.96 |
| 785.64 | 915.05 | 788.39 | 915 | 800.11 | 914.72 | 814.57 | 914.31 | 816.08 | 914.29 |
| 829.03 | 914.14 | 829.92 | 914.14 | 843.49 | 914.19 | 857.95 | 914.2 | 871.46 | 913.87 |
| 872.41 | 913.85 | 885.3 | 913.37 | 886.87 | 913.32 | 893.13 | 913.3 | 899.14 | 913.37 |
| 900.21 | 913.38 | 901.33 | 913.4 | 915.79 | 913.93 | 926.83 | 914.19 | 930.25 | 914.26 |
| 940.67 | 914.39 | 944.72 | 914.39 | 954.52 | 914.29 | 959.17 | 914.21 | 968.36 | 913.96 |
| 973.64 | 913.79 | 982.2 | 913.47 | 988.09 | 913.12 | 996.05 | 912.7 | 1002.56 | 912.63 |
| 1009.89 | 912.78 | 1017.02 | 913.28 | 1017.95 | 913.35 | 1023.73 | 913.81 | 1031.48 | 914.48 |
| 1037.58 | 914.99 | 1045.94 | 915.85 | 1051.42 | 916.35 | 1060.4 | 917.26 | 1074.86 | 918.48 |
| 1079.11 | 918.86 | 1089.32 | 919.64 | 1092.95 | 919.9 | 1103.78 | 919.84 | 1106.79 | 919.66 |
| 1118.24 | 918.64 | 1120.64 | 918.46 | 1132.7 | 917.92 | 1134.48 | 917.89 | 1147.17 | 917.96 |
| 1148.33 | 917.97 | 1161.62 | 918.15 | 1161.91 | 918.16 | 1162.17 | 918.16 | 1176.02 | 918.44 |
| 1176.09 | 918.44 | 1189.86 | 919.13 | 1190.54 | 919.17 | 1203.7 | 920.86 | 1205.01 | 921.05 |
| 1217.55 | 923.23 | 1219.47 | 923.53 | 1231.39 | 925.26 | 1233.93 | 925.61 | 1235.38 | 925.79 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 270.55 | .03 | 416.32 | .072 | 596.69 | .04 | 1017.95 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 478.99 | 555.92 | 201.89 | 200 | 199.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 915.12 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.072 | 0.072 | 0.042 |
| W.S. Elev (ft) | 915.01 | Reach Len. (ft) | 201.89 | 200.00 | 199.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 6.89 | 205.54 | 476.72 |
| E.G. Slope (ft/ft) | 0.005276 | Area (sq ft) | 6.89 | 205.54 | 476.72 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 7.23 | 592.06 | 1240.71 |
| Top Width (ft) | 562.66 | Top Width (ft) | 11.71 | 76.93 | 474.02 |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | 1.05 | 2.88 | 2.60 |
| Max Chl Dpth (ft) | 4.19 | Hydr. Depth (ft) | 0.59 | 2.67 | 1.01 |
| Conv. Total (cfs) | 25332.3 | Conv. (cfs) | 99.5 | 8151.2 | 17081.6 |
| Length Wtd. (ft) | 199.69 | Wetted Per. (ft) | 11.76 | 77.16 | 474.24 |
| Min Ch El (ft) | 910.82 | Shear (lb/sq ft) | 0.19 | 0.88 | 0.33 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.20 | 2.53 | 0.86 |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 44.97 | 59.82 | 74.68 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 47.69 | 24.70 | 91.86 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 916.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.072 | 0.050 |
| W.S. Elev (ft) | 916.00 | Reach Len. (ft) | 201.89 | 200.00 | 199.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 281.72 | 245.80 |
| E.G. Slope (ft/ft) | 0.005447 | Area (sq ft) | | 281.72 | 245.80 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 999.27 | 840.73 |
| Top Width (ft) | 203.62 | Top Width (ft) | | 76.93 | 126.69 |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.55 | 3.42 |
| Max Chl Dpth (ft) | 5.18 | Hydr. Depth (ft) | | 3.66 | 1.94 |
| Conv. Total (cfs) | 24929.9 | Conv. (cfs) | | 13539.0 | 11390.9 |
| Length Wtd. (ft) | 199.78 | Wetted Per. (ft) | | 79.28 | 128.92 |
| Min Ch El (ft) | 910.82 | Shear (lb/sq ft) | | 1.21 | 0.65 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.29 | 2.22 |
| Frctn Loss (ft) | 0.90 | Cum Volume (acre-ft) | 11.80 | 79.11 | 11.39 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 26.06 | 5.31 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 915.12 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.072 | 0.072 | 0.042 |
| W.S. Elev (ft) | 915.00 | Reach Len. (ft) | 201.89 | 200.00 | 199.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 6.87 | 205.43 | 476.03 |
| E.G. Slope (ft/ft) | 0.005294 | Area (sq ft) | 6.87 | 205.43 | 476.03 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 7.22 | 592.53 | 1240.25 |
| Top Width (ft) | 562.37 | Top Width (ft) | 11.70 | 76.93 | 473.75 |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | 1.05 | 2.88 | 2.61 |
| Max Chl Dpth (ft) | 4.18 | Hydr. Depth (ft) | 0.59 | 2.67 | 1.00 |
| Conv. Total (cfs) | 25289.0 | Conv. (cfs) | 99.2 | 8143.8 | 17046.1 |
| Length Wtd. (ft) | 199.69 | Wetted Per. (ft) | 11.75 | 77.16 | 473.96 |
| Min Ch El (ft) | 910.82 | Shear (lb/sq ft) | 0.19 | 0.88 | 0.33 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.20 | 2.54 | 0.86 |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 25.46 | 65.20 | 25.65 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.57 | 25.07 | 17.73 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.829

INPUT
Description: Thalweg Sta. 514.36
Station Elevation Data num= 199

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 921.79 | .07 | 921.8 | 10.14 | 922.35 | 11.01 | 922.39 | 12.09 | 922.45 |
| 29.83 | 923.45 | 32.9 | 923.63 | 36.72 | 923.84 | 43.84 | 924.19 | 49.52 | 924.42 |
| 54.78 | 924.65 | 56.79 | 924.72 | 61.35 | 924.85 | 64.38 | 924.91 | 65.72 | 924.92 |
| 69.21 | 924.93 | 76.66 | 924.98 | 85.98 | 924.94 | 88.9 | 924.87 | 108.59 | 924.46 |
| 109.49 | 924.44 | 110.61 | 924.42 | 120.43 | 924.23 | 128.28 | 924.21 | 131.38 | 924.17 |
| 135.24 | 924.23 | 142.32 | 924.52 | 147.98 | 924.81 | 153.26 | 925.1 | 164.2 | 925.48 |
| 167.66 | 925.46 | 175.15 | 925.48 | 186.09 | 925.34 | 187.36 | 925.31 | 207.04 | 924.95 |
| 207.97 | 924.93 | 209.13 | 924.93 | 226.73 | 924.85 | 229.86 | 924.84 | 233.76 | 924.75 |
| 240.8 | 924.56 | 246.42 | 924.03 | 251.74 | 923.65 | 258.39 | 922.84 | 262.68 | 922.34 |
| 266.11 | 922.55 | 273.63 | 923.05 | 283.02 | 923.39 | 284.57 | 923.48 | 285.81 | 923.46 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 295.51 | 923.23 | 306.45 | 922.19 | 307.65 | 922.03 | 317.4 | 920.63 | 325.19 | 919.44 |
| 328.34 | 918.97 | 339.28 | 917.47 | 344.88 | 916.88 | 350.23 | 916.3 | 356.91 | 916.11 |
| 361.17 | 916.04 | 367.43 | 916.31 | 372.11 | 916.57 | 381.54 | 917.39 | 383.05 | 917.53 |
| 384.26 | 917.69 | 403.95 | 920.36 | 404.94 | 920.5 | 406.17 | 920.64 | 415.88 | 921.87 |
| 423.64 | 922.66 | 426.82 | 922.99 | 430.8 | 923.12 | 437.77 | 923.17 | 438.96 | 922.84 |
| 443.33 | 921.64 | 448.64 | 920.3 | 448.71 | 920.28 | 455.43 | 918.11 | 459.65 | 916.74 |
| 463.02 | 915.7 | 470.6 | 913.3 | 480.06 | 911.09 | 481.54 | 910.77 | 482.71 | 910.7 |
| 492.48 | 909.8 | 502.4 | 910.35 | 503.42 | 910.4 | 504.69 | 910.5 | 514.36 | 911.25 |
| 522.09 | 911.6 | 525.31 | 911.77 | 529.32 | 911.87 | 536.25 | 912.03 | 547.19 | 912.21 |
| 551.42 | 912.27 | 553.94 | 912.3 | 578.58 | 912.52 | 580.02 | 912.54 | 590.96 | 912.63 |
| 594.96 | 912.67 | 603.21 | 912.74 | 612.85 | 912.86 | 621.52 | 913.01 | 624.08 | 913.05 |
| 626.14 | 913.09 | 646.83 | 913.54 | 646.92 | 913.55 | 654.25 | 913.71 | 658.35 | 913.78 |
| 667.52 | 913.9 | 669.77 | 913.91 | 681.19 | 913.74 | 692.61 | 913.18 | 698.05 | 912.99 |
| 704.04 | 912.75 | 708.88 | 912.83 | 715.46 | 913 | 723.56 | 913.31 | 726.89 | 913.45 |
| 729.57 | 913.49 | 738.31 | 913.51 | 749.07 | 913.38 | 749.73 | 913.37 | 750.26 | 913.36 |
| 761.15 | 913.19 | 772.58 | 913.04 | 784 | 912.99 | 795.43 | 912.99 | 806.85 | 913.02 |
| 812.32 | 913.06 | 829.7 | 913.15 | 841.12 | 913.18 | 851.11 | 913.13 | 853.7 | 913.11 |
| 863.96 | 912.93 | 874.38 | 912.71 | 875.02 | 912.69 | 875.39 | 912.68 | 876.62 | 912.66 |
| 886.81 | 912.44 | 889.75 | 912.36 | 895.07 | 912.26 | 898.24 | 912.21 | 902.13 | 912.12 |
| 915.76 | 911.84 | 921.08 | 911.74 | 927.64 | 911.69 | 932.51 | 911.64 | 933.9 | 911.63 |
| 941.27 | 911.78 | 943.93 | 911.93 | 953.15 | 912.57 | 955.32 | 912.7 | 957.13 | 912.85 |
| 966.78 | 913.68 | 977.81 | 914.69 | 978.2 | 914.73 | 978.67 | 914.79 | 989.63 | 916.12 |
| 998.5 | 917.54 | 1001.05 | 917.84 | 1004.18 | 918.1 | 1012.47 | 918.77 | 1019.19 | 919.29 |
| 1023.89 | 919.49 | 1029.68 | 919.68 | 1035.31 | 919.85 | 1039.88 | 919.92 | 1046.74 | 919.99 |
| 1055.19 | 919.92 | 1058.16 | 919.88 | 1060.56 | 919.81 | 1069.59 | 919.69 | 1080.71 | 919.59 |
| 1081.01 | 919.59 | 1081.25 | 919.58 | 1092.43 | 919.62 | 1101.94 | 919.63 | 1103.86 | 919.69 |
| 1106.21 | 919.77 | 1115.28 | 919.98 | 1126.7 | 919.97 | 1131.73 | 919.8 | 1138.13 | 919.67 |
| 1143.31 | 919.54 | 1149.55 | 919.28 | 1154.69 | 919.3 | 1160.98 | 919.25 | 1164 | 919.49 |
| 1172.4 | 920.13 | 1182.75 | 921.7 | 1183.82 | 921.86 | 1184.69 | 922.02 | 1195.24 | 923.75 |
| 1205.38 | 925.57 | 1206.66 | 925.82 | 1208.25 | 926.11 | 1209.26 | 926.28 | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 448.64 | .072 | 594.96 | .04 | 955.32 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 470.6 | 551.42 | 196.42 | 199.99 | 204.4 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 914.25 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.072 | 0.072 | 0.043 |
| W.S. Elev (ft) | 914.16 | Reach Len. (ft) | 196.42 | 199.99 | 204.40 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.16 | 230.54 | 523.02 |
| E.G. Slope (ft/ft) | 0.003606 | Area (sq ft) | 1.16 | 230.54 | 523.02 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 0.79 | 572.76 | 1266.44 |
| Top Width (ft) | 504.11 | Top Width (ft) | 2.71 | 80.82 | 420.58 |
| Vel Total (ft/s) | 2.44 | Avg. Vel. (ft/s) | 0.68 | 2.48 | 2.42 |
| Max Chl Dpth (ft) | 4.36 | Hydr. Depth (ft) | 0.43 | 2.85 | 1.24 |
| Conv. Total (cfs) | 30642.1 | Conv. (cfs) | 13.2 | 9538.4 | 21090.5 |
| Length Wtd. (ft) | 202.95 | Wetted Per. (ft) | 2.84 | 81.22 | 420.75 |
| Min Ch El (ft) | 909.80 | Shear (lb/sq ft) | 0.09 | 0.64 | 0.28 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.06 | 1.59 | 0.68 |
| Frctn Loss (ft) | 0.81 | Cum Volume (acre-ft) | 44.95 | 58.82 | 72.39 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 47.66 | 24.33 | 89.81 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 915.27 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.072 | 0.050 |
| W.S. Elev (ft) | 915.13 | Reach Len. (ft) | 196.42 | 199.99 | 204.40 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 309.19 | 300.30 |
| E.G. Slope (ft/ft) | 0.003786 | Area (sq ft) | | 309.19 | 300.30 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 943.14 | 896.86 |
| Top Width (ft) | 227.10 | Top Width (ft) | | 80.82 | 146.28 |
| Vel Total (ft/s) | 3.02 | Avg. Vel. (ft/s) | | 3.05 | 2.99 |
| Max Chl Dpth (ft) | 5.33 | Hydr. Depth (ft) | | 3.83 | 2.05 |
| Conv. Total (cfs) | 29902.8 | Conv. (cfs) | | 15327.4 | 14575.4 |
| Length Wtd. (ft) | 202.07 | Wetted Per. (ft) | | 83.05 | 148.44 |
| Min Ch El (ft) | 909.80 | Shear (lb/sq ft) | | 0.88 | 0.48 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.68 | 1.43 |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 11.80 | 77.76 | 10.14 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.00 | 25.69 | 4.68 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 914.27 | Element | | | |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.072 | 0.072 | 0.043 |
| W.S. Elev (ft) | 914.18 | Reach Len. (ft) | 196.42 | 199.99 | 204.40 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.22 | 232.32 | 532.27 |
| E.G. Slope (ft/ft) | 0.003435 | Area (sq ft) | 1.22 | 232.32 | 532.27 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 0.83 | 566.27 | 1272.90 |
| Top Width (ft) | 504.42 | Top Width (ft) | 2.78 | 80.82 | 420.82 |
| Vel Total (ft/s) | 2.40 | Avg. Vel. (ft/s) | 0.68 | 2.44 | 2.39 |
| Max Chl Dpth (ft) | 4.38 | Hydr. Depth (ft) | 0.44 | 2.87 | 1.26 |
| Conv. Total (cfs) | 31392.4 | Conv. (cfs) | 14.2 | 9661.1 | 21717.1 |
| Length Wtd. (ft) | 203.03 | Wetted Per. (ft) | 2.92 | 81.22 | 420.99 |
| Min Ch El (ft) | 909.80 | Shear (lb/sq ft) | 0.09 | 0.61 | 0.27 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.06 | 1.50 | 0.65 |
| Frctn Loss (ft) | 0.78 | Cum Volume (acre-ft) | 25.44 | 64.19 | 23.34 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.53 | 24.71 | 15.68 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.791

INPUT
Description: Thalweg Sta. 427.85
Station Elevation Data num= 133

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 924.06 | 5.33 | 924.35 | 11.47 | 924.67 | 19.98 | 924.98 | 23.04 | 925.1 |
| 25.24 | 925.13 | 34.61 | 925.17 | 47.61 | 924.91 | 57.74 | 924.68 | 65.04 | 924.55 |
| 75.21 | 924.41 | 80.87 | 924.31 | 84.94 | 924.16 | 92.43 | 923.92 | 104 | 923.13 |
| 104.85 | 923.05 | 115.57 | 922.18 | 124.74 | 921.49 | 127.13 | 921.34 | 138.7 | 920.57 |
| 144.65 | 920.07 | 150.26 | 919.53 | 161.83 | 918.55 | 164.55 | 918.53 | 173.4 | 918.75 |
| 184.45 | 919.76 | 184.77 | 919.8 | 184.97 | 919.82 | 185.67 | 919.88 | 196.53 | 920.68 |
| 204.35 | 920.88 | 208.1 | 920.94 | 214.03 | 921.05 | 219.66 | 920.93 | 224.25 | 921 |
| 231.23 | 920.96 | 240.9 | 920.86 | 242.79 | 920.85 | 244.16 | 920.8 | 254.36 | 920.32 |
| 264.06 | 919.81 | 265.93 | 919.67 | 268.5 | 919.42 | 277.49 | 918.53 | 283.96 | 917.82 |
| 289.06 | 917.13 | 296.12 | 916.12 | 300.62 | 915.45 | 303.86 | 915 | 312.19 | 913.96 |
| 323.73 | 913.47 | 335.32 | 913.24 | 337.55 | 913.2 | 343.67 | 913.09 | 358.46 | 912.76 |
| 360.33 | 912.7 | 363.57 | 912.62 | 367.65 | 912.51 | 370.02 | 912.44 | 378.96 | 912.15 |
| 381.59 | 912.07 | 386.24 | 911.9 | 393.15 | 911.65 | 403.38 | 911.18 | 404.72 | 911.11 |
| 406.57 | 910.95 | 416.28 | 910.16 | 427.85 | 909.27 | 433.49 | 909.24 | 439.42 | 909.86 |
| 450.98 | 910.9 | 461.8 | 911.53 | 462.55 | 911.58 | 463.08 | 911.59 | 472.9 | 911.87 |
| 474.11 | 911.9 | 485.68 | 912.15 | 489.41 | 912.22 | 497.24 | 912.38 | 502.61 | 912.48 |
| 502.89 | 912.49 | 520.38 | 912.82 | 522.79 | 912.86 | 542.69 | 913.23 | 543.51 | 913.24 |
| 544.64 | 913.25 | 555.08 | 913.39 | 557.84 | 913.41 | 562.6 | 913.37 | 566.64 | 913.29 |
| 572.25 | 913.08 | 578.21 | 912.87 | 582.5 | 912.69 | 589.77 | 912.36 | 601.34 | 911.96 |
| 602.4 | 911.93 | 612.91 | 911.6 | 622.3 | 911.28 | 623.68 | 911.23 | 624.47 | 911.21 |
| 627.48 | 911.18 | 636.04 | 911.02 | 642.2 | 911.07 | 655.09 | 911.22 | 659.17 | 911.28 |
| 660.25 | 911.29 | 662.11 | 911.29 | 667.57 | 911.31 | 670.73 | 911.3 | 682.01 | 911.24 |
| 682.7 | 911.24 | 701.91 | 911.08 | 717 | 910.99 | 721.81 | 910.97 | 728.57 | 911.04 |
| 733.4 | 911.12 | 740.13 | 911.39 | 741.72 | 911.56 | 750.2 | 913.18 | 751.7 | 913.46 |
| 761.62 | 915.66 | 763.27 | 916.07 | 765.54 | 916.66 | 774.83 | 918.96 | 781.52 | 920.56 |
| 786.4 | 921.78 | 793.15 | 923.38 | 797.96 | 924.5 | 801.42 | 925.06 | 813.87 | 926.76 |
| 821.09 | 927.85 | 821.33 | 927.88 | 825.31 | 928.52 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 337.55 | .072 | 502.61 | .04 | 750.2 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 386.24 | 472.9 | 177.85 | 199.83 | 217.28 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 913.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.072 | 0.072 | 0.041 |
| W.S. Elev (ft) | 913.29 | Reach Len. (ft) | 177.85 | 199.83 | 217.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 32.63 | 223.30 | 371.88 |
| E.G. Slope (ft/ft) | 0.004456 | Area (sq ft) | 32.63 | 223.30 | 371.88 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 34.11 | 577.35 | 1228.55 |
| Top Width (ft) | 399.23 | Top Width (ft) | 53.51 | 86.66 | 259.06 |
| Vel Total (ft/s) | 2.93 | Avg. Vel. (ft/s) | 1.05 | 2.59 | 3.30 |
| Max Chl Dpth (ft) | 4.05 | Hydr. Depth (ft) | 0.61 | 2.58 | 1.44 |
| Conv. Total (cfs) | 27563.5 | Conv. (cfs) | 510.9 | 8648.7 | 18403.9 |
| Length Wtd. (ft) | 209.42 | Wetted Per. (ft) | 53.53 | 86.85 | 259.30 |
| Min Ch El (ft) | 909.24 | Shear (lb/sq ft) | 0.17 | 0.72 | 0.40 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.18 | 1.85 | 1.32 |
| Frctn Loss (ft) | 0.73 | Cum Volume (acre-ft) | 44.87 | 57.77 | 70.29 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 47.53 | 23.95 | 88.22 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 914.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.072 | 0.045 |
| W.S. Elev (ft) | 914.25 | Reach Len. (ft) | 177.85 | 199.83 | 217.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 306.18 | 260.76 |
| E.G. Slope (ft/ft) | 0.004829 | Area (sq ft) | | 306.18 | 260.76 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 999.20 | 840.80 |
| Top Width (ft) | 239.56 | Top Width (ft) | | 86.66 | 152.90 |
| Vel Total (ft/s) | 3.25 | Avg. Vel. (ft/s) | | 3.26 | 3.22 |
| Max Chl Dpth (ft) | 5.01 | Hydr. Depth (ft) | | 3.53 | 1.71 |
| Conv. Total (cfs) | 26477.2 | Conv. (cfs) | | 14378.3 | 12098.9 |
| Length Wtd. (ft) | 205.55 | Wetted Per. (ft) | | 89.20 | 156.01 |
| Min Ch El (ft) | 909.24 | Shear (lb/sq ft) | | 1.03 | 0.50 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.38 | 1.62 |
| Frctn Loss (ft) | 0.81 | Cum Volume (acre-ft) | 11.80 | 76.34 | 8.83 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 25.31 | 3.98 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 913.49 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.072 | 0.041 |
| W.S. Elev (ft) | 913.35 | Reach Len. (ft) | 177.85 | 199.83 | 217.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 228.13 | 386.53 |
| E.G. Slope (ft/ft) | 0.004272 | Area (sq ft) | | 228.13 | 386.53 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 579.43 | 1260.57 |
| Top Width (ft) | 353.00 | Top Width (ft) | | 86.66 | 266.34 |
| Vel Total (ft/s) | 2.99 | Avg. Vel. (ft/s) | | 2.54 | 3.26 |
| Max Chl Dpth (ft) | 4.11 | Hydr. Depth (ft) | | 2.63 | 1.45 |
| Conv. Total (cfs) | 28150.5 | Conv. (cfs) | | 8864.9 | 19285.6 |
| Length Wtd. (ft) | 210.30 | Wetted Per. (ft) | | 88.30 | 266.58 |
| Min Ch El (ft) | 909.24 | Shear (lb/sq ft) | | 0.69 | 0.39 |
| Alpha | 1.04 | Stream Power (lb/ft s) | | 1.75 | 1.26 |
| Frctn Loss (ft) | 0.69 | Cum Volume (acre-ft) | 25.44 | 63.13 | 21.18 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.53 | 24.33 | 14.07 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.753

INPUT
Description: Thalweg Sta. 242.45
Station Elevation Data num= 120

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 929.78 | 5.89 | 930.05 | 10.32 | 930.2 | 21.66 | 930.06 | 23.26 | 929.96 |
| 30.52 | 928.5 | 36.19 | 927.37 | 37.43 | 927.08 | 49.12 | 924.27 | 53.21 | 923.3 |
| 74.98 | 918.06 | 81.99 | 916.44 | 84.75 | 915.8 | 87.92 | 915.08 | 93.59 | 913.88 |
| 100.51 | 912.92 | 100.85 | 912.88 | 102.38 | 912.8 | 113.78 | 912.12 | 116.29 | 912.05 |
| 126.71 | 911.81 | 132.06 | 911.7 | 139.65 | 911.53 | 147.82 | 911.37 | 162.46 | 911.03 |
| 163.6 | 911 | 164.64 | 910.97 | 171.76 | 910.72 | 179.36 | 910.39 | 195.14 | 909.59 |
| 204.31 | 909.14 | 210.91 | 908.8 | 226.68 | 908.09 | 230.17 | 907.97 | 242.45 | 907.65 |
| 243.1 | 907.67 | 246.09 | 907.99 | 256.03 | 909.12 | 258.22 | 909.32 | 268.97 | 910.19 |
| 273.99 | 910.57 | 281.9 | 911.15 | 289.76 | 911.79 | 294.83 | 912.05 | 301.16 | 912.22 |
| 302.69 | 912.26 | 305.53 | 912.34 | 307.76 | 912.32 | 320.7 | 911.95 | 321.31 | 911.93 |
| 333.63 | 911.57 | 337.07 | 911.48 | 342.28 | 911.41 | 346.56 | 911.39 | 349.39 | 911.34 |
| 352.85 | 911.27 | 359.49 | 911.17 | 368.61 | 910.96 | 372.42 | 910.88 | 384.39 | 910.6 |
| 385.36 | 910.58 | 400.16 | 910.25 | 411.22 | 910.03 | 415.93 | 909.95 | 424.16 | 909.83 |
| 437.09 | 909.72 | 447.47 | 909.72 | 450.02 | 909.76 | 461.66 | 910.42 | 462.96 | 910.5 |
| 463.24 | 910.52 | 475.89 | 911.72 | 479.01 | 911.97 | 488.82 | 912.78 | 494.78 | 913.12 |
| 501.75 | 913.58 | 510.55 | 913.74 | 514.68 | 913.76 | 526.32 | 913.51 | 527.62 | 913.44 |
| 533.35 | 913.34 | 533.51 | 913.34 | 540.55 | 913.23 | 542.09 | 913.23 | 548.34 | 913.27 |
| 553.48 | 913.35 | 569.67 | 913.54 | 573.63 | 913.62 | 589.41 | 913.81 | 592.28 | 913.83 |
| 605.17 | 913.79 | 605.36 | 913.79 | 618.14 | 913.61 | 619.41 | 913.68 | 620.95 | 913.72 |
| 631.07 | 913.8 | 636.71 | 913.82 | 644.01 | 913.87 | 652.49 | 913.81 | 656.94 | 913.84 |
| 668.26 | 913.4 | 669.14 | 913.36 | 669.87 | 913.4 | 677.22 | 914.02 | 682.8 | 914.55 |
| 684.03 | 914.63 | 695.73 | 915.16 | 699.8 | 915.41 | 708.67 | 915.99 | 715.57 | 917.19 |
| 721.6 | 918.49 | 733.09 | 921.52 | 734.53 | 921.92 | 740.19 | 923.56 | 747.11 | 925.5 |
| 747.46 | 925.59 | 749.08 | 925.93 | 760.39 | 928.36 | 761.52 | 928.49 | 766.31 | 929.05 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 81.99 | .072 | 302.69 | .04 | 533.35 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 162.46 | 305.53 | 235.15 | 200 | 266.02 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 912.69 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.072 | 0.072 | 0.040 |
| W.S. Elev (ft) | 912.60 | Reach Len. (ft) | 235.15 | 200.00 | 266.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 51.92 | 403.44 | 317.46 |
| E.G. Slope (ft/ft) | 0.002776 | Area (sq ft) | 51.92 | 403.44 | 317.46 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 53.23 | 883.84 | 902.92 |
| Top Width (ft) | 380.82 | Top Width (ft) | 56.68 | 143.07 | 181.07 |
| Vel Total (ft/s) | 2.38 | Avg. Vel. (ft/s) | 1.03 | 2.19 | 2.84 |
| Max Chl Dpth (ft) | 4.95 | Hydr. Depth (ft) | 0.92 | 2.82 | 1.75 |
| Conv. Total (cfs) | 34924.0 | Conv. (cfs) | 1010.4 | 16775.8 | 17137.9 |
| Length Wtd. (ft) | 223.60 | Wetted Per. (ft) | 56.70 | 143.34 | 181.22 |
| Min Ch El (ft) | 907.65 | Shear (lb/sq ft) | 0.16 | 0.49 | 0.30 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 0.16 | 1.07 | 0.86 |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 44.70 | 56.34 | 68.57 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 47.31 | 23.42 | 87.12 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 913.59 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.072 | 0.040 |
| W.S. Elev (ft) | 913.46 | Reach Len. (ft) | 235.15 | 200.00 | 266.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 527.44 | 116.83 |
| E.G. Slope (ft/ft) | 0.003252 | Area (sq ft) | | 527.44 | 116.83 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1474.63 | 365.37 |
| Top Width (ft) | 205.70 | Top Width (ft) | | 143.07 | 62.63 |
| Vel Total (ft/s) | 2.86 | Avg. Vel. (ft/s) | | 2.80 | 3.13 |
| Max Chl Dpth (ft) | 5.81 | Hydr. Depth (ft) | | 3.69 | 1.87 |
| Conv. Total (cfs) | 32264.5 | Conv. (cfs) | | 25857.7 | 6406.7 |
| Length Wtd. (ft) | 206.55 | Wetted Per. (ft) | | 145.78 | 65.14 |
| Min Ch El (ft) | 907.65 | Shear (lb/sq ft) | | 0.73 | 0.36 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 2.05 | 1.14 |
| Frctn Loss (ft) | 0.77 | Cum Volume (acre-ft) | 11.80 | 74.43 | 7.88 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.00 | 24.78 | 3.44 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 912.79 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.072 | 0.040 |
| W.S. Elev (ft) | 912.69 | Reach Len. (ft) | 235.15 | 200.00 | 266.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 417.16 | 334.88 |
| E.G. Slope (ft/ft) | 0.002577 | Area (sq ft) | | 417.16 | 334.88 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 892.98 | 947.02 |
| Top Width (ft) | 325.30 | Top Width (ft) | | 143.07 | 182.23 |
| Vel Total (ft/s) | 2.45 | Avg. Vel. (ft/s) | | 2.14 | 2.83 |
| Max Chl Dpth (ft) | 5.04 | Hydr. Depth (ft) | | 2.92 | 1.84 |
| Conv. Total (cfs) | 36242.8 | Conv. (cfs) | | 17589.1 | 18653.7 |
| Length Wtd. (ft) | 222.72 | Wetted Per. (ft) | | 145.01 | 182.38 |
| Min Ch El (ft) | 907.65 | Shear (lb/sq ft) | | 0.46 | 0.30 |
| Alpha | 1.06 | Stream Power (lb/ft s) | | 0.99 | 0.84 |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 25.44 | 61.65 | 19.38 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.53 | 23.80 | 12.95 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.715

INPUT
Description: Thalweg Sta. 509.54
Station Elevation Data num= 133

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 921.33 | 1.88 | 921.66 | 5.24 | 921.91 | 9.1 | 922.16 | 14.89 | 922.38 |
| 17.25 | 922.43 | 21.94 | 922.35 | 29.26 | 922.25 | 32.96 | 921.98 | 51.02 | 919.66 |
| 53.27 | 919.33 | 65.28 | 918.46 | 69.09 | 918.24 | 77.28 | 917.83 | 87.16 | 917.02 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 89.29 | 916.87 | 93.53 | 916.46 | 105.23 | 915.26 | 113.31 | 914.76 | 123.29 | 914.51 |
| 125.32 | 914.51 | 137.32 | 914.59 | 141.36 | 914.57 | 149.33 | 914.55 | 159.43 | 914.43 |
| 161.34 | 914.39 | 172.63 | 914.32 | 196.64 | 914.32 | 197.35 | 914.33 | 200.92 | 914.37 |
| 209.36 | 914.45 | 213.63 | 914.46 | 221.37 | 914.76 | 231.69 | 914.85 | 233.38 | 914.86 |
| 236.72 | 914.7 | 245.39 | 914.34 | 249.76 | 914.09 | 257.39 | 913.53 | 261.56 | 913.46 |
| 267.83 | 913.02 | 269.4 | 912.92 | 272.52 | 912.81 | 281.4 | 912.54 | 293.41 | 912.22 |
| 293.64 | 912.21 | 303.96 | 911.76 | 305.42 | 911.7 | 312.05 | 911.06 | 317.42 | 910.6 |
| 322.03 | 910.41 | 329.43 | 910.12 | 340.1 | 910.15 | 353.45 | 910.15 | 358.16 | 910.14 |
| 372.35 | 910.07 | 376.23 | 910.04 | 377.46 | 910.02 | 384.18 | 909.95 | 412.36 | 909.56 |
| 415.71 | 909.53 | 425.49 | 909.42 | 430.43 | 909.41 | 437.5 | 909.43 | 448.5 | 909.54 |
| 449.09 | 909.55 | 449.5 | 909.56 | 456.31 | 909.7 | 461.51 | 909.84 | 463.53 | 909.94 |
| 466.56 | 910.15 | 473.52 | 910.66 | 484.63 | 911.7 | 485.52 | 911.79 | 487.31 | 911.92 |
| 497.53 | 912.7 | 502.7 | 912.83 | 509.54 | 912.9 | 523.11 | 912.72 | 533.55 | 912.56 |
| 542.87 | 912.4 | 545.56 | 912.36 | 556.89 | 912.17 | 557.57 | 912.16 | 558.9 | 912.13 |
| 569.58 | 911.91 | 574.96 | 911.74 | 581.58 | 911.48 | 593.03 | 910.85 | 594.7 | 910.76 |
| 595.75 | 910.7 | 605.59 | 910.11 | 611.09 | 909.79 | 617.6 | 909.45 | 629.16 | 909 |
| 629.61 | 908.98 | 630.5 | 908.99 | 641.61 | 909.03 | 653.62 | 909.26 | 665.29 | 909.44 |
| 665.63 | 909.45 | 666.3 | 909.46 | 677.64 | 909.61 | 683.36 | 909.64 | 687.14 | 909.67 |
| 694.35 | 909.67 | 701.43 | 909.7 | 701.65 | 909.7 | 702.1 | 909.71 | 713.66 | 910 |
| 715.99 | 910.12 | 719.49 | 910.46 | 725.66 | 911.07 | 737.07 | 912.69 | 737.56 | 912.76 |
| 737.62 | 912.77 | 737.9 | 912.82 | 755.63 | 915.95 | 759.27 | 916.56 | 761.69 | 916.95 |
| 773.69 | 918.4 | 785.7 | 919.13 | 791.76 | 919.46 | 797.71 | 919.63 | 809.49 | 919.71 |
| 809.83 | 919.71 | 821.72 | 919.03 | 827.89 | 918.42 | 833.73 | 917.76 | 845.29 | 916.4 |
| 845.73 | 916.35 | 845.96 | 916.32 | 846.24 | 916.3 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 172.63 | .04 | 372.35 | .072 | 595.75 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 509.54 | 737.07 | 215.88 | 199.98 | 200.87 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 911.87 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.059 | 0.040 | |
| W.S. Elev (ft) | 911.67 | Reach Len. (ft) | 215.88 | 199.98 | 200.87 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 290.99 | 275.41 | |
| E.G. Slope (ft/ft) | 0.005038 | Area (sq ft) | 290.99 | 275.41 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 721.78 | 1118.22 | |
| Top Width (ft) | 331.97 | Top Width (ft) | 178.67 | 153.29 | |
| Vel Total (ft/s) | 3.25 | Avg. Vel. (ft/s) | 2.48 | 4.06 | |
| Max Chl Dpth (ft) | 2.69 | Hydr. Depth (ft) | 1.63 | 1.80 | |
| Conv. Total (cfs) | 25922.4 | Conv. (cfs) | 10168.6 | 15753.8 | |
| Length Wtd. (ft) | 208.64 | Wetted Per. (ft) | 178.82 | 153.46 | |
| Min Ch El (ft) | 908.98 | Shear (lb/sq ft) | 0.51 | 0.56 | |
| Alpha | 1.18 | Stream Power (lb/ft s) | 1.27 | 2.29 | |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 43.77 | 54.78 | 67.60 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 46.67 | 22.74 | 86.57 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 912.81 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.041 | |
| W.S. Elev (ft) | 912.51 | Reach Len. (ft) | 215.88 | 199.98 | 200.87 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 419.91 | |
| E.G. Slope (ft/ft) | 0.004272 | Area (sq ft) | | 419.91 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 199.18 | Top Width (ft) | | 199.18 | |
| Vel Total (ft/s) | 4.38 | Avg. Vel. (ft/s) | | 4.38 | |
| Max Chl Dpth (ft) | 3.53 | Hydr. Depth (ft) | | 2.11 | |
| Conv. Total (cfs) | 28151.0 | Conv. (cfs) | | 28151.0 | |
| Length Wtd. (ft) | 201.79 | Wetted Per. (ft) | | 199.42 | |
| Min Ch El (ft) | 908.98 | Shear (lb/sq ft) | | 0.56 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.46 | |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 11.80 | 72.26 | 7.53 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 5.00 | 24.00 | 3.25 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 911.95 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.066 | 0.040 | |
| W.S. Elev (ft) | 911.72 | Reach Len. (ft) | 215.88 | 199.98 | 200.87 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | 237.55 | 282.05 | |
| E.G. Slope (ft/ft) | 0.005780 | Area (sq ft) | 237.55 | 282.05 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 599.71 | 1240.29 | |
| Top Width (ft) | 286.05 | Top Width (ft) | 131.36 | 154.69 | |
| Vel Total (ft/s) | 3.54 | Avg. Vel. (ft/s) | 2.52 | 4.40 | |
| Max Chl Dpth (ft) | 2.74 | Hydr. Depth (ft) | 1.81 | 1.82 | |
| Conv. Total (cfs) | 24201.3 | Conv. (cfs) | 7887.9 | 16313.4 | |
| Length Wtd. (ft) | 208.11 | Wetted Per. (ft) | 133.01 | 154.87 | |
| Min Ch El (ft) | 908.98 | Shear (lb/sq ft) | 0.64 | 0.66 | |
| Alpha | 1.21 | Stream Power (lb/ft s) | 1.63 | 2.89 | |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | 24.80 | 60.05 | 18.36 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.17 | 23.12 | 12.39 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.677

INPUT
Description: Thalweg Sta. 436.39
Station Elevation Data num= 124

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 919.47 | .19 | 919.49 | 7.02 | 920.29 | 11.52 | 920.7 | 14.24 | 920.88 |
| 18.37 | 921.04 | 23.5 | 921.16 | 33.4 | 921.15 | 35.47 | 921.14 | 36.54 | 921.13 |
| 47.45 | 920.88 | 59.43 | 919.69 | 68.51 | 918.3 | 71.4 | 917.83 | 72.9 | 917.57 |
| 83.37 | 916.59 | 91.07 | 916.48 | 95.35 | 916.47 | 103.63 | 916.12 | 107.33 | 916.03 |
| 109.24 | 915.88 | 119.3 | 914.43 | 119.35 | 914.42 | 122.52 | 913.94 | 127.42 | 913.06 |
| 130.72 | 912.4 | 143.25 | 909.93 | 145.59 | 909.69 | 155.23 | 908.97 | 163.77 | 908.85 |
| 167.21 | 908.82 | 181.95 | 908.82 | 191.16 | 908.78 | 200.12 | 908.76 | 201.94 | 908.76 |
| 203.13 | 908.75 | 215.1 | 908.69 | 216.38 | 908.68 | 218.29 | 908.68 | 227.08 | 908.66 |
| 236.47 | 908.66 | 238.03 | 908.67 | 239.06 | 908.67 | 251.03 | 908.72 | 272.82 | 908.79 |
| 286.96 | 908.85 | 291 | 908.86 | 298.94 | 908.9 | 310.22 | 909 | 310.91 | 909.01 |
| 314.28 | 909.1 | 322.89 | 909.3 | 324.66 | 909.33 | 334.86 | 909.64 | 336.95 | 909.7 |
| 346.84 | 909.99 | 349.39 | 910.07 | 358.81 | 910.31 | 363.69 | 910.46 | 370.79 | 910.66 |
| 384.5 | 911.13 | 394.74 | 911.41 | 400.05 | 911.57 | 406.72 | 911.73 | 418.22 | 911.98 |
| 418.69 | 911.98 | 419.61 | 911.97 | 430.67 | 911.73 | 436.39 | 911.58 | 442.65 | 911.36 |
| 454.57 | 910.98 | 454.72 | 910.98 | 466.59 | 910.55 | 472.74 | 910.36 | 478.57 | 910.15 |
| 489.83 | 909.79 | 490.92 | 909.76 | 502.52 | 909.41 | 509.1 | 909.31 | 514.5 | 909.25 |
| 526.47 | 909.26 | 527.27 | 909.27 | 528.57 | 909.28 | 562.4 | 909.41 | 574.38 | 909.41 |
| 581.79 | 909.31 | 586.36 | 909.23 | 598.33 | 908.88 | 599.97 | 908.84 | 610.3 | 908.63 |
| 618.15 | 908.8 | 622.28 | 909.04 | 630.27 | 910.33 | 634.25 | 910.95 | 636.32 | 911.35 |
| 640 | 912.134 | 646.23 | 913.46 | 654.5 | 915.1 | 658.21 | 915.85 | 662.54 | 916.49 |
| 665.38 | 916.91 | 670.18 | 917.66 | 672.67 | 917.87 | 678.38 | 918.24 | 682.16 | 918.37 |
| 685.61 | 918.48 | 694.14 | 918.63 | 709.02 | 918.83 | 718.08 | 918.93 | 727.2 | 919.01 |
| 730.06 | 919.03 | 742.03 | 919.14 | 745.37 | 919.19 | 754.01 | 919.3 | 763.55 | 919.46 |
| 765.99 | 919.49 | 770.71 | 919.48 | 777.96 | 919.52 | 781.72 | 919.45 | 789.94 | 919.16 |
| 799.89 | 918.74 | 801.92 | 918.62 | 805.82 | 918.32 | 811.94 | 917.87 | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 119.35 | .04 | 336.95 | .072 | 528.57 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 418.22 | 640 | 109.96 | 199.94 | 267.48 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 910.80 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.040 | 0.045 | |
| W.S. Elev (ft) | 910.61 | Reach Len. (ft) | 109.96 | 199.94 | 267.48 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 348.15 | 201.11 | |
| E.G. Slope (ft/ft) | 0.005213 | Area (sq ft) | 348.15 | 201.11 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1282.30 | 557.70 | |
| Top Width (ft) | 396.65 | Top Width (ft) | 229.38 | 167.27 | |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 3.68 | 2.77 | |
| Max Chl Dpth (ft) | 1.98 | Hydr. Depth (ft) | 1.52 | 1.20 | |
| Conv. Total (cfs) | 25485.1 | Conv. (cfs) | 17760.7 | 7724.4 | |
| Length Wtd. (ft) | 132.55 | Wetted Per. (ft) | 229.51 | 167.44 | |
| Min Ch El (ft) | 908.63 | Shear (lb/sq ft) | 0.49 | 0.39 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.82 | 1.08 | |
| Frctn Loss (ft) | 0.60 | Cum Volume (acre-ft) | 42.19 | 53.68 | 67.60 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 45.66 | 22.01 | 86.57 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 911.88 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.047 | 0.046 | |
| W.S. Elev (ft) | 911.70 | Reach Len. (ft) | 109.96 | 199.94 | 267.48 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 144.15 | 403.97 | |
| E.G. Slope (ft/ft) | 0.004572 | Area (sq ft) | 144.15 | 403.97 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 419.60 | 1420.40 | |
| Top Width (ft) | 306.14 | Top Width (ft) | 99.87 | 206.27 | |
| Vel Total (ft/s) | 3.36 | Avg. Vel. (ft/s) | 2.91 | 3.52 | |
| Max Chl Dpth (ft) | 3.07 | Hydr. Depth (ft) | 1.44 | 1.96 | |
| Conv. Total (cfs) | 27213.4 | Conv. (cfs) | 6205.9 | 21007.5 | |
| Length Wtd. (ft) | 166.02 | Wetted Per. (ft) | 102.66 | 206.55 | |
| Min Ch El (ft) | 908.63 | Shear (lb/sq ft) | 0.40 | 0.56 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 1.17 | 1.96 | |
| Frctn Loss (ft) | 0.75 | Cum Volume (acre-ft) | 11.44 | 70.37 | 7.53 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 4.76 | 23.07 | 3.25 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 910.80 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.040 | 0.045 | |
| W.S. Elev (ft) | 910.61 | Reach Len. (ft) | 109.96 | 199.94 | 267.48 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 348.29 | 201.21 | |
| E.G. Slope (ft/ft) | 0.005206 | Area (sq ft) | 348.29 | 201.21 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1282.25 | 557.75 | |
| Top Width (ft) | 396.70 | Top Width (ft) | 229.41 | 167.29 | |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 3.68 | 2.77 | |
| Max Chl Dpth (ft) | 1.98 | Hydr. Depth (ft) | 1.52 | 1.20 | |
| Conv. Total (cfs) | 25501.5 | Conv. (cfs) | 17771.4 | 7730.1 | |
| Length Wtd. (ft) | 132.56 | Wetted Per. (ft) | 229.54 | 167.46 | |
| Min Ch El (ft) | 908.63 | Shear (lb/sq ft) | 0.49 | 0.39 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.82 | 1.08 | |
| Frctn Loss (ft) | 0.60 | Cum Volume (acre-ft) | 23.35 | 58.94 | 18.36 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 13.28 | 22.38 | 12.39 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.640

INPUT
Description: Thalweg Sta. 410.30
Station Elevation Data num= 124

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 919.77 | 1.39 | 919.89 | 5.22 | 920.12 | 12.22 | 920.3 | 15.64 | 920.42 |
| 23.88 | 920.5 | 26.06 | 920.51 | 26.97 | 920.51 | 36.49 | 920.57 | 41.72 | 920.49 |
| 46.91 | 920.47 | 56.46 | 919.99 | 57.33 | 919.96 | 59.42 | 919.66 | 67.75 | 918.24 |
| 71.21 | 917.61 | 78.01 | 916.34 | 78.17 | 916.31 | 85.94 | 914.77 | 88.59 | 914.22 |
| 94.96 | 912.88 | 99.01 | 912.05 | 100.69 | 911.73 | 109.36 | 910.01 | 109.43 | 910 |
| 115.43 | 909.23 | 119.85 | 908.52 | 130.18 | 908 | 130.27 | 908 | 130.5 | 907.99 |
| 140.69 | 907.97 | 144.92 | 907.98 | 151.11 | 907.98 | 159.66 | 908.01 | 162.56 | 908.01 |
| 171.96 | 908.03 | 174.41 | 908.04 | 192.8 | 908.08 | 194.79 | 908.09 | 201.59 | 908.1 |
| 203.22 | 908.11 | 203.89 | 908.11 | 213.64 | 908.13 | 224.06 | 908.14 | 234.48 | 908.13 |
| 237.14 | 908.12 | 244.9 | 908.11 | 248.12 | 908.1 | 262.87 | 908.07 | 265.74 | 908.06 |
| 267.32 | 908.06 | 272.69 | 908.05 | 286.59 | 908.05 | 291.49 | 908.08 | 297.01 | 908.15 |
| 307.09 | 908.33 | 307.43 | 908.33 | 308.23 | 908.35 | 335.36 | 908.92 | 338.69 | 909 |
| 349.11 | 909.23 | 351.32 | 909.27 | 359.53 | 909.44 | 366.07 | 909.56 | 369.95 | 909.64 |
| 379.32 | 909.76 | 380.37 | 909.78 | 380.81 | 909.77 | 390.8 | 909.69 | 410.3 | 909.29 |
| 411.64 | 909.26 | 422.06 | 909.07 | 439.78 | 908.76 | 442.9 | 908.7 | 450.4 | 908.57 |
| 453.32 | 908.53 | 463.74 | 908.35 | 484.02 | 907.93 | 484.58 | 907.92 | 495 | 907.69 |
| 498.76 | 907.62 | 505.42 | 907.51 | 515.85 | 907.59 | 521.5 | 908.08 | 526.27 | 908.48 |
| 530 | 909.364 | 536.69 | 910.95 | 542.99 | 912.63 | 547.11 | 913.67 | 549.69 | 913.84 |
| 552.61 | 914.02 | 557.04 | 914.31 | 557.53 | 914.34 | 557.73 | 914.35 | 567.95 | 914.57 |
| 572.47 | 914.63 | 578.37 | 914.69 | 587.22 | 914.42 | 588.79 | 914.38 | 592.59 | 914.23 |
| 599.21 | 914.01 | 601.96 | 914.01 | 609.63 | 913.9 | 616.71 | 913.95 | 620.05 | 913.96 |
| 628.13 | 914.29 | 630.48 | 914.38 | 631.45 | 914.42 | 640.9 | 915 | 646.19 | 915.19 |
| 651.32 | 915.44 | 660.94 | 915.59 | 661.74 | 915.61 | 663.68 | 915.61 | 672.16 | 915.63 |
| 682.58 | 915.6 | 690.42 | 915.52 | 693 | 915.51 | 699.22 | 915.37 | 703.42 | 915.24 |

705.16 915.14 713.84 914.75 719.91 914.44 729.04 914.02

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 78.01 | .04 | 335.36 | .072 | 549.69 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 379.32 | 530 | 301.6 | 199.98 | 229.77 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 910.18 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.041 | 0.072 | 0.072 |
| W.S. Elev (ft) | 910.03 | Reach Len. (ft) | 301.60 | 199.98 | 229.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 440.26 | 218.07 | 0.94 |
| E.G. Slope (ft/ft) | 0.004027 | Area (sq ft) | 440.26 | 218.07 | 0.94 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1474.29 | 365.13 | 0.58 |
| Top Width (ft) | 423.56 | Top Width (ft) | 270.07 | 150.68 | 2.81 |
| Vel Total (ft/s) | 2.79 | Avg. Vel. (ft/s) | 3.35 | 1.67 | 0.62 |
| Max Chl Dpth (ft) | 2.52 | Hydr. Depth (ft) | 1.63 | 1.45 | 0.33 |
| Conv. Total (cfs) | 28996.2 | Conv. (cfs) | 23233.1 | 5754.0 | 9.2 |
| Length Wtd. (ft) | 269.06 | Wetted Per. (ft) | 270.21 | 150.84 | 2.89 |
| Min Ch El (ft) | 907.51 | Shear (lb/sq ft) | 0.41 | 0.36 | 0.08 |
| Alpha | 1.22 | Stream Power (lb/ft s) | 1.37 | 0.61 | 0.05 |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | 41.20 | 52.72 | 67.60 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 45.03 | 21.28 | 86.56 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 911.13 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.044 | 0.072 | |
| W.S. Elev (ft) | 910.96 | Reach Len. (ft) | 301.60 | 199.98 | 229.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 251.44 | 358.36 | |
| E.G. Slope (ft/ft) | 0.004449 | Area (sq ft) | 251.44 | 358.36 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 967.86 | 872.14 | |
| Top Width (ft) | 263.47 | Top Width (ft) | 112.79 | 150.68 | |
| Vel Total (ft/s) | 3.02 | Avg. Vel. (ft/s) | 3.85 | 2.43 | |
| Max Chl Dpth (ft) | 3.45 | Hydr. Depth (ft) | 2.23 | 2.38 | |
| Conv. Total (cfs) | 27585.8 | Conv. (cfs) | 14510.4 | 13075.4 | |
| Length Wtd. (ft) | 233.76 | Wetted Per. (ft) | 115.71 | 152.44 | |
| Min Ch El (ft) | 907.51 | Shear (lb/sq ft) | 0.60 | 0.65 | |
| Alpha | 1.16 | Stream Power (lb/ft s) | 2.32 | 1.59 | |
| Frctn Loss (ft) | 1.42 | Cum Volume (acre-ft) | 10.94 | 68.62 | 7.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 4.49 | 22.25 | 3.25 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 910.18 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.041 | 0.072 | 0.072 |
| W.S. Elev (ft) | 910.03 | Reach Len. (ft) | 301.60 | 199.98 | 229.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 441.07 | 218.52 | 0.95 |
| E.G. Slope (ft/ft) | 0.004003 | Area (sq ft) | 441.07 | 218.52 | 0.95 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1474.09 | 365.32 | 0.59 |
| Top Width (ft) | 423.59 | Top Width (ft) | 270.08 | 150.68 | 2.83 |
| Vel Total (ft/s) | 2.79 | Avg. Vel. (ft/s) | 3.34 | 1.67 | 0.62 |
| Max Chl Dpth (ft) | 2.52 | Hydr. Depth (ft) | 1.63 | 1.45 | 0.34 |
| Conv. Total (cfs) | 29081.0 | Conv. (cfs) | 23297.9 | 5773.8 | 9.3 |
| Length Wtd. (ft) | 268.98 | Wetted Per. (ft) | 270.22 | 150.84 | 2.91 |
| Min Ch El (ft) | 907.51 | Shear (lb/sq ft) | 0.41 | 0.36 | 0.08 |
| Alpha | 1.22 | Stream Power (lb/ft s) | 1.36 | 0.61 | 0.05 |
| Frctn Loss (ft) | 1.52 | Cum Volume (acre-ft) | 22.35 | 57.98 | 18.36 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 12.65 | 21.65 | 12.38 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.602

INPUT
Description: Thalweg Sta. 392.99
Station Elevation Data num= 92

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 917.36 | 7.95 | 918.44 | 10.38 | 918.62 | 17.98 | 918.95 | 24.42 | 918.77 |
| 28.01 | 918.72 | 32.25 | 918.22 | 36.36 | 917.59 | 38.05 | 917.33 | 43.17 | 916.28 |
| 54.11 | 913.85 | 58.11 | 912.97 | 65.04 | 911.56 | 68.15 | 911.01 | 75.98 | 909.6 |
| 78.18 | 909.28 | 86.9 | 907.95 | 88.22 | 907.78 | 97.84 | 907.16 | 98.25 | 907.13 |
| 102.86 | 907.09 | 108.28 | 907.06 | 108.76 | 907.06 | 118.32 | 907.1 | 119.7 | 907.11 |
| 138.38 | 907.2 | 163.43 | 907.35 | 178.52 | 907.42 | 185.29 | 907.42 | 188.55 | 907.43 |
| 207.15 | 907.33 | 218.08 | 907.26 | 218.65 | 907.26 | 228.69 | 907.21 | 229.02 | 907.2 |
| 238.72 | 907.15 | 239.95 | 907.15 | 250.88 | 907.09 | 268.82 | 907.05 | 278.86 | 907.07 |
| 283.67 | 907.15 | 288.89 | 907.2 | 289.7 | 907.22 | 294.61 | 907.34 | 298.92 | 907.4 |
| 306.43 | 907.48 | 308.96 | 907.51 | 318.99 | 907.39 | 327.4 | 907.2 | 338.34 | 906.94 |
| 339.06 | 906.92 | 348.94 | 906.69 | 349.09 | 906.68 | 359.13 | 906.46 | 367.49 | 906.26 |
| 369.16 | 906.23 | 371.13 | 906.18 | 389.23 | 905.76 | 392.99 | 905.68 | 399.26 | 905.56 |
| 409.29 | 905.46 | 413.85 | 905.62 | 419.33 | 905.75 | 429.36 | 906.64 | 436.72 | 907.49 |
| 439.4 | 907.78 | 447.65 | 908.71 | 448.4 | 908.79 | 449.43 | 908.9 | 457.63 | 909.7 |
| 458.58 | 909.79 | 459.46 | 909.88 | 469.32 | 910.31 | 469.5 | 910.32 | 479.53 | 910.46 |
| 480.44 | 910.48 | 489.56 | 910.61 | 491.38 | 910.65 | 499.6 | 910.78 | 502.31 | 910.85 |
| 509.63 | 911.01 | 515.84 | 911.17 | 519.66 | 911.28 | 524.17 | 911.39 | 529.7 | 911.51 |
| 539.73 | 911.69 | 546.03 | 911.79 | 549.77 | 911.86 | 559.8 | 911.99 | 567.9 | 912 |
| 569.83 | 912.02 | 577.09 | 911.86 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 36.36 | .04 | 289.7 | .072 | 448.4 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 306.43 | 439.4 | 204.85 | 199.97 | 182.1 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 908.66 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.041 | 0.072 | 0.072 |
| W.S. Elev (ft) | 908.48 | Reach Len. (ft) | 204.85 | 199.97 | 182.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 271.92 | 268.70 | 2.15 |
| E.G. Slope (ft/ft) | 0.008391 | Area (sq ft) | 271.92 | 268.70 | 2.15 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1026.63 | 811.36 | 2.01 |
| Top Width (ft) | 362.14 | Top Width (ft) | 222.98 | 132.97 | 6.18 |
| Vel Total (ft/s) | 3.39 | Avg. Vel. (ft/s) | 3.78 | 3.02 | 0.93 |
| Max Chl Dpth (ft) | 3.02 | Hydr. Depth (ft) | 1.22 | 2.02 | 0.35 |
| Conv. Total (cfs) | 20086.9 | Conv. (cfs) | 11207.5 | 8857.5 | 21.9 |
| Length Wtd. (ft) | 202.55 | Wetted Per. (ft) | 223.06 | 133.10 | 6.22 |
| Min Ch El (ft) | 905.46 | Shear (lb/sq ft) | 0.64 | 1.06 | 0.18 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 2.41 | 3.19 | 0.17 |
| Frctn Loss (ft) | 1.22 | Cum Volume (acre-ft) | 38.73 | 51.60 | 67.59 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 43.32 | 20.62 | 86.54 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 909.70 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | 0.054 | 0.072 | |
| W.S. Elev (ft) | 909.46 | Reach Len. (ft) | 204.85 | 199.97 | 182.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 62.04 | 399.00 | |
| E.G. Slope (ft/ft) | 0.008713 | Area (sq ft) | 62.04 | 399.00 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 255.28 | 1584.72 | |
| Top Width (ft) | 161.46 | Top Width (ft) | 28.49 | 132.97 | |
| Vel Total (ft/s) | 3.99 | Avg. Vel. (ft/s) | 4.12 | 3.97 | |
| Max Chl Dpth (ft) | 4.00 | Hydr. Depth (ft) | 2.18 | 3.00 | |
| Conv. Total (cfs) | 19712.6 | Conv. (cfs) | 2734.9 | 16977.7 | |
| Length Wtd. (ft) | 200.47 | Wetted Per. (ft) | 30.88 | 134.78 | |
| Min Ch El (ft) | 905.46 | Shear (lb/sq ft) | 1.09 | 1.61 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 4.50 | 6.40 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 9.86 | 66.88 | 7.53 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 4.00 | 21.60 | 3.25 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 908.65 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.041 | 0.072 | 0.072 |
| W.S. Elev (ft) | 908.46 | Reach Len. (ft) | 204.85 | 199.97 | 182.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 269.21 | 267.08 | 2.08 |
| E.G. Slope (ft/ft) | 0.008622 | Area (sq ft) | 269.21 | 267.08 | 2.08 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1023.80 | 814.26 | 1.94 |
| Top Width (ft) | 361.95 | Top Width (ft) | 222.90 | 132.97 | 6.07 |
| Vel Total (ft/s) | 3.42 | Avg. Vel. (ft/s) | 3.80 | 3.05 | 0.93 |
| Max Chl Dpth (ft) | 3.00 | Hydr. Depth (ft) | 1.21 | 2.01 | 0.34 |
| Conv. Total (cfs) | 19815.4 | Conv. (cfs) | 11025.5 | 8768.9 | 20.9 |
| Length Wtd. (ft) | 202.56 | Wetted Per. (ft) | 222.98 | 133.10 | 6.11 |
| Min Ch El (ft) | 905.46 | Shear (lb/sq ft) | 0.65 | 1.08 | 0.18 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 2.47 | 3.29 | 0.17 |
| Frctn Loss (ft) | 1.13 | Cum Volume (acre-ft) | 19.89 | 56.86 | 18.35 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 10.94 | 21.00 | 12.36 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.564

INPUT
Description: Thalweg Sta. 205.65
Station Elevation Data num= 97

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 915.55 | 3.78 | 915.79 | 7.51 | 915.51 | 14.05 | 915.68 | 20.94 | 914.01 |
| 24.32 | 913.16 | 34.37 | 910.32 | 34.6 | 910.26 | 35.35 | 910.03 | 43.06 | 907.75 |
| 44.87 | 907.44 | 51.37 | 906.85 | 55.14 | 906.53 | 59.69 | 906.29 | 65.42 | 906.07 |
| 68.01 | 905.99 | 75.69 | 905.78 | 76.32 | 905.76 | 79.05 | 905.7 | 85.96 | 905.57 |
| 96.23 | 905.42 | 116.78 | 905.19 | 127.05 | 905.16 | 134.55 | 905.21 | 141.8 | 905.29 |
| 155.23 | 905.47 | 157.87 | 905.5 | 168.14 | 905.63 | 168.66 | 905.64 | 205.65 | 906.1 |
| 208.94 | 906.14 | 209.23 | 906.14 | 219.5 | 906.26 | 228.85 | 906.33 | 229.78 | 906.34 |
| 234.36 | 906.28 | 240.05 | 906.18 | 250.32 | 905.82 | 260.59 | 905.41 | 262.67 | 905.33 |
| 281.14 | 904.59 | 289.52 | 904.27 | 291.41 | 904.19 | 297.56 | 904 | 301.68 | 903.86 |
| 302.96 | 903.86 | 311.96 | 903.79 | 316.39 | 903.89 | 322.23 | 904.01 | 329.81 | 904.25 |
| 332.5 | 904.34 | 341.26 | 904.61 | 342.49 | 904.65 | 342.77 | 904.66 | 343.25 | 904.68 |
| 356.67 | 905.1 | 363.32 | 905.32 | 370.1 | 905.58 | 373.59 | 905.7 | 377.45 | 905.92 |
| 383.53 | 906.26 | 383.87 | 906.27 | 384.95 | 906.35 | 394.14 | 907 | 396.96 | 907.13 |
| 404.41 | 907.55 | 409.02 | 907.59 | 414.68 | 907.57 | 423.82 | 907.36 | 424.96 | 907.34 |
| 428.65 | 907.27 | 435.23 | 907.17 | 437.25 | 907.2 | 445.5 | 907.22 | 450.68 | 907.33 |
| 455.77 | 907.41 | 464.1 | 907.62 | 466.05 | 907.66 | 483.88 | 908.1 | 516.05 | 908.88 |
| 517.41 | 908.91 | 517.82 | 908.92 | 537.95 | 909.35 | 544.68 | 909.47 | 548.23 | 909.54 |
| 558.11 | 909.71 | 558.5 | 909.72 | 559.76 | 909.75 | 584.97 | 910.2 | 589.32 | 910.27 |
| 598.4 | 910.4 | 603.46 | 910.44 | 609.86 | 910.46 | 611.83 | 910.41 | 620.13 | 910.25 |
| 625.26 | 910.08 | 626.99 | 910.02 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 205.65 | .072 | 377.45 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 228.85 | 404.41 | 213.14 | 199.97 | 171.74 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 907.42 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.041 | 0.071 | 0.040 |
| W.S. Elev (ft) | 907.29 | Reach Len. (ft) | 213.14 | 199.97 | 171.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 282.51 | 369.99 | 1.50 |
| E.G. Slope (ft/ft) | 0.004557 | Area (sq ft) | 282.51 | 369.99 | 1.50 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 927.32 | 912.04 | 0.64 |
| Top Width (ft) | 374.75 | Top Width (ft) | 182.35 | 170.99 | 21.41 |
| Vel Total (ft/s) | 2.81 | Avg. Vel. (ft/s) | 3.28 | 2.47 | 0.43 |
| Max Chl Dpth (ft) | 3.50 | Hydr. Depth (ft) | 1.55 | 2.16 | 0.07 |
| Conv. Total (cfs) | 27256.1 | Conv. (cfs) | 13736.5 | 13510.1 | 9.5 |
| Length Wtd. (ft) | 206.74 | Wetted Per. (ft) | 182.41 | 171.11 | 21.41 |
| Min Ch El (ft) | 903.79 | Shear (lb/sq ft) | 0.44 | 0.62 | 0.02 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 1.45 | 1.52 | 0.01 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 0.92 | Cum Volume (acre-ft) | 37.43 | 50.14 | 67.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 42.37 | 19.93 | 86.48 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 908.43 | Wt. n-Val. | 0.069 | 0.069 | |
| Vel Head (ft) | 0.15 | Reach Len. (ft) | 213.14 | 199.97 | 171.74 |
| W.S. Elev (ft) | 908.28 | Flow Area (sq ft) | 51.96 | 542.49 | |
| Crit W.S. (ft) | | Area (sq ft) | 51.96 | 542.49 | |
| E.G. Slope (ft/ft) | 0.004642 | Flow (cfs) | 119.38 | 1720.63 | |
| Q Total (cfs) | 1840.00 | Top Width (ft) | 25.19 | 175.56 | |
| Top Width (ft) | 200.75 | Avg. Vel. (ft/s) | 2.30 | 3.17 | |
| Vel Total (ft/s) | 3.10 | Hydr. Depth (ft) | 2.06 | 3.09 | |
| Max Chl Dpth (ft) | 4.49 | Conv. (cfs) | 1752.1 | 25254.1 | |
| Conv. Total (cfs) | 27006.1 | Wetted Per. (ft) | 27.39 | 176.42 | |
| Length Wtd. (ft) | 201.62 | Shear (lb/sq ft) | 0.55 | 0.89 | |
| Min Ch El (ft) | 903.79 | Stream Power (lb/ft s) | 1.26 | 2.83 | |
| Alpha | 1.02 | Cum Volume (acre-ft) | 9.59 | 64.72 | 7.53 |
| Frctn Loss (ft) | 0.93 | Cum SA (acres) | 3.87 | 20.89 | 3.25 |
| C & E Loss (ft) | 0.00 | | | | |

CROSS SECTION OUTPUT Profile #Method 1

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 907.50 | Wt. n-Val. | 0.041 | 0.071 | |
| Vel Head (ft) | 0.12 | Reach Len. (ft) | 213.14 | 199.97 | 171.74 |
| W.S. Elev (ft) | 907.38 | Flow Area (sq ft) | 299.09 | 385.58 | |
| Crit W.S. (ft) | | Area (sq ft) | 299.09 | 385.58 | |
| E.G. Slope (ft/ft) | 0.003906 | Flow (cfs) | 938.25 | 901.75 | |
| Q Total (cfs) | 1840.00 | Top Width (ft) | 183.35 | 172.59 | |
| Top Width (ft) | 355.94 | Avg. Vel. (ft/s) | 3.14 | 2.34 | |
| Vel Total (ft/s) | 2.69 | Hydr. Depth (ft) | 1.63 | 2.23 | |
| Max Chl Dpth (ft) | 3.59 | Conv. (cfs) | 15012.8 | 14429.0 | |
| Conv. Total (cfs) | 29441.8 | Wetted Per. (ft) | 183.41 | 172.72 | |
| Length Wtd. (ft) | 206.66 | Shear (lb/sq ft) | 0.40 | 0.54 | |
| Min Ch El (ft) | 903.79 | Stream Power (lb/ft s) | 1.25 | 1.27 | |
| Alpha | 1.07 | Cum Volume (acre-ft) | 18.55 | 55.36 | 18.34 |
| Frctn Loss (ft) | 0.95 | Cum SA (acres) | 9.98 | 20.30 | 12.35 |
| C & E Loss (ft) | 0.00 | | | | |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.526

INPUT
Description: Thalweg Sta. 724.72
Station Elevation Data num= 145

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 919.78 | 1.57 | 919.65 | 10.14 | 918.4 | 11.88 | 918.16 | 12.74 | 918.01 |
| 15.29 | 917.58 | 32.63 | 914.78 | 35.07 | 914.4 | 37.47 | 914.1 | 46.23 | 912.97 |
| 55.12 | 912.19 | 59.64 | 911.87 | 68.56 | 911.27 | 77.61 | 910.39 | 79.73 | 910.25 |
| 81.81 | 910.1 | 90.89 | 909.36 | 100.1 | 908.81 | 102.05 | 908.75 | 103.97 | 908.7 |
| 116.33 | 908.41 | 126.79 | 908.24 | 135.55 | 908.09 | 146.71 | 907.95 | 157.87 | 907.87 |
| 167.58 | 907.84 | 168.55 | 907.83 | 190.06 | 907.8 | 192.65 | 907.8 | 199.72 | 907.79 |
| 202.53 | 907.79 | 212.55 | 907.77 | 236.02 | 907.75 | 236.99 | 907.74 | 280.02 | 907.68 |
| 281.33 | 907.68 | 302.51 | 907.64 | 303.5 | 907.64 | 325.01 | 907.57 | 325.34 | 907.57 |
| 347.49 | 907.5 | 347.84 | 907.5 | 369.99 | 907.41 | 392.18 | 907.31 | 392.47 | 907.31 |
| 403.49 | 907.26 | 414.35 | 907.12 | 414.66 | 907.12 | 414.97 | 907.11 | 422.21 | 906.9 |
| 425.82 | 906.66 | 429.68 | 906.54 | 436.99 | 906.1 | 437.14 | 906.09 | 437.46 | 906.08 |
| 448.15 | 905.68 | 458.69 | 905.38 | 459.32 | 905.37 | 459.95 | 905.35 | 470.48 | 905.05 |
| 480.86 | 904.82 | 481.64 | 904.8 | 482.48 | 904.8 | 489.37 | 904.76 | 503.03 | 905.27 |
| 504.93 | 905.31 | 515.14 | 905.54 | 525.19 | 904.81 | 526.3 | 904.75 | 527.42 | 904.59 |
| 537.46 | 903.5 | 547.37 | 904.13 | 548.63 | 904.24 | 549.91 | 904.27 | 556.51 | 904.53 |
| 559.79 | 904.44 | 569.54 | 904.44 | 570.96 | 904.45 | 571.44 | 904.45 | 591.71 | 904.67 |
| 604.45 | 904.76 | 613.87 | 904.79 | 615.61 | 904.8 | 617.38 | 904.8 | 626.78 | 904.92 |
| 637.32 | 905 | 637.94 | 905.01 | 639.86 | 905.03 | 649.1 | 905.11 | 653.03 | 905.09 |
| 658.21 | 905.06 | 660.27 | 905.06 | 662.36 | 905.03 | 671.43 | 904.75 | 680.38 | 904.57 |
| 682.6 | 904.52 | 684.85 | 904.48 | 693.76 | 904.3 | 702.55 | 904.1 | 704.93 | 904.05 |
| 705.73 | 904.02 | 707.34 | 904 | 724.72 | 903.61 | 727.26 | 903.54 | 738.42 | 903.29 |
| 746.89 | 903.19 | 749.58 | 903.14 | 752.32 | 903.17 | 757.95 | 903.26 | 760.75 | 903.34 |
| 769.06 | 903.68 | 771.91 | 903.79 | 791.23 | 904.65 | 794.24 | 904.78 | 797.3 | 904.92 |
| 805.41 | 905.27 | 816.57 | 905.72 | 819.79 | 905.82 | 826.95 | 906.03 | 827.74 | 906.05 |
| 834.8 | 906.19 | 835.57 | 906.21 | 838.9 | 906.28 | 842.28 | 906.34 | 883.56 | 907.17 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 887.26 | 907.24 | 894.72 | 907.36 | 905.89 | 907.51 | 909.75 | 907.54 | 917.05 | 907.58 |
| 928.22 | 907.6 | 999.71 | 907.6 | 1006.37 | 907.61 | 1012.93 | 907.64 | 1017.53 | 907.65 |
| 1022.2 | 907.68 | 1057.26 | 908.05 | 1062.19 | 908.11 | 1086.22 | 908.38 | 1095.68 | 908.47 |
| 1101.6 | 908.49 | 1106.84 | 908.52 | 1112.16 | 908.48 | 1118.01 | 908.4 | 1122.05 | 908.32 |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .052 | 126.79 | .04 | 199.72 | .072 | 482.48 | .04 | 637.32 | .072 |
| 826.95 | .04 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 653.03 | 805.41 | 306.01 | 199.97 | 205.26 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 906.50 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.043 | 0.072 | 0.068 |
| W.S. Elev (ft) | 906.38 | Reach Len. (ft) | 306.01 | 199.97 | 205.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 328.87 | 346.54 | 18.13 |
| E.G. Slope (ft/ft) | 0.004362 | Area (sq ft) | 328.87 | 346.54 | 18.13 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1004.85 | 816.58 | 18.58 |
| Top Width (ft) | 412.04 | Top Width (ft) | 220.72 | 152.38 | 38.94 |
| Vel Total (ft/s) | 2.65 | Avg. Vel. (ft/s) | 3.06 | 2.36 | 1.02 |
| Max Chl Dpth (ft) | 3.24 | Hydr. Depth (ft) | 1.49 | 2.27 | 0.47 |
| Conv. Total (cfs) | 27860.6 | Conv. (cfs) | 15215.0 | 12364.4 | 281.3 |
| Length Wtd. (ft) | 266.05 | Wetted Per. (ft) | 220.89 | 152.45 | 38.96 |
| Min Ch El (ft) | 903.14 | Shear (lb/sq ft) | 0.41 | 0.62 | 0.13 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 1.24 | 1.46 | 0.13 |
| Frctn Loss (ft) | 0.94 | Cum Volume (acre-ft) | 35.93 | 48.49 | 67.55 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 41.38 | 19.19 | 86.36 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 907.50 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.048 | 0.072 | |
| W.S. Elev (ft) | 907.35 | Reach Len. (ft) | 306.01 | 199.97 | 205.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 95.46 | 494.04 | |
| E.G. Slope (ft/ft) | 0.004582 | Area (sq ft) | 95.46 | 494.04 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 342.13 | 1497.87 | |
| Top Width (ft) | 192.35 | Top Width (ft) | 39.97 | 152.38 | |
| Vel Total (ft/s) | 3.12 | Avg. Vel. (ft/s) | 3.58 | 3.03 | |
| Max Chl Dpth (ft) | 4.21 | Hydr. Depth (ft) | 2.39 | 3.24 | |
| Conv. Total (cfs) | 27181.4 | Conv. (cfs) | 5054.2 | 22127.2 | |
| Length Wtd. (ft) | 234.16 | Wetted Per. (ft) | 42.54 | 154.53 | |
| Min Ch El (ft) | 903.14 | Shear (lb/sq ft) | 0.64 | 0.91 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 2.30 | 2.77 | |
| Frctn Loss (ft) | 0.81 | Cum Volume (acre-ft) | 9.23 | 62.34 | 7.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.71 | 20.13 | 3.25 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 906.55 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.041 | 0.072 | |
| W.S. Elev (ft) | 906.39 | Reach Len. (ft) | 306.01 | 199.97 | 205.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 241.34 | 347.04 | |
| E.G. Slope (ft/ft) | 0.005443 | Area (sq ft) | 241.34 | 347.04 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 930.00 | 910.00 | |
| Top Width (ft) | 290.27 | Top Width (ft) | 137.89 | 152.38 | |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | 3.85 | 2.62 | |
| Max Chl Dpth (ft) | 3.24 | Hydr. Depth (ft) | 1.75 | 2.28 | |
| Conv. Total (cfs) | 24939.3 | Conv. (cfs) | 12605.1 | 12334.2 | |
| Length Wtd. (ft) | 264.68 | Wetted Per. (ft) | 138.87 | 153.56 | |
| Min Ch El (ft) | 903.14 | Shear (lb/sq ft) | 0.59 | 0.77 | |
| Alpha | 1.12 | Stream Power (lb/ft s) | 2.28 | 2.01 | |
| Frctn Loss (ft) | 1.01 | Cum Volume (acre-ft) | 17.23 | 53.68 | 18.34 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 9.20 | 19.55 | 12.35 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.488

INPUT
Description: Thalweg Sta. 572.27
Station Elevation Data num= 144

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 913.92 | 6.15 | 913.24 | 6.5 | 913.2 | 7.49 | 913.07 | 17.59 | 911.82 |
| 28.52 | 910.14 | 28.69 | 910.11 | 28.83 | 910.09 | 39.78 | 908.49 | 50.18 | 907.42 |
| 50.87 | 907.32 | 51.63 | 907.27 | 61.96 | 906.84 | 71.53 | 906.7 | 73.06 | 906.63 |
| 74.73 | 906.71 | 84.15 | 906.97 | 92.87 | 907.1 | 95.25 | 907.12 | 97.82 | 907.13 |
| 103.58 | 907.05 | 106.34 | 907.03 | 111.07 | 906.94 | 118.57 | 906.8 | 120.92 | 906.76 |
| 135.56 | 906.48 | 161.81 | 906.04 | 172.9 | 905.91 | 184 | 905.8 | 190.21 | 905.75 |
| 213.31 | 905.54 | 236.41 | 905.35 | 238.48 | 905.34 | 239.46 | 905.33 | 259.51 | 905.17 |
| 261.65 | 905.16 | 263.63 | 905.14 | 272.75 | 905.06 | 272.96 | 905.06 | 283.84 | 904.89 |
| 294.93 | 904.51 | 305.7 | 903.97 | 306.03 | 903.96 | 306.32 | 903.94 | 317.12 | 903.41 |
| 328.21 | 902.99 | 328.8 | 902.97 | 339.3 | 902.69 | 349.01 | 902.49 | 350.4 | 902.45 |
| 351.9 | 902.43 | 361.49 | 902.24 | 370.36 | 902.14 | 372.59 | 902.11 | 380.5 | 902.17 |
| 383.68 | 902.19 | 391.7 | 902.33 | 413.05 | 902.73 | 421.2 | 902.89 | 439.15 | 903.2 |
| 444.3 | 903.27 | 450.24 | 903.33 | 461.33 | 903.41 | 463.21 | 903.42 | 467.39 | 903.43 |
| 472.43 | 903.46 | 477.09 | 903.45 | 483.52 | 903.45 | 494.61 | 903.42 | 505.71 | 903.45 |
| 513.59 | 903.49 | 516.8 | 903.5 | 527.9 | 903.5 | 536.68 | 903.29 | 538.99 | 903.26 |
| 541.12 | 903.18 | 550.08 | 902.87 | 559.78 | 902.45 | 561.18 | 902.38 | 562.47 | 902.36 |
| 572.27 | 902.09 | 582.89 | 902.43 | 583.37 | 902.45 | 583.81 | 902.48 | 594.46 | 903.17 |
| 605.15 | 903.92 | 605.55 | 903.95 | 605.98 | 903.98 | 616.64 | 904.7 | 627.74 | 905.41 |
| 629.08 | 905.48 | 638.1 | 905.86 | 638.83 | 905.89 | 647.55 | 906.03 | 647.84 | 906.03 |
| 649.92 | 906.07 | 652.18 | 906.08 | 690.54 | 906.33 | 694.3 | 906.35 | 698.37 | 906.38 |
| 721.47 | 906.52 | 725.59 | 906.55 | 744.58 | 906.65 | 749.77 | 906.67 | 760.86 | 906.68 |
| 771.95 | 906.67 | 775.92 | 906.68 | 790.77 | 906.69 | 794.14 | 906.7 | 816.33 | 906.72 |
| 818.6 | 906.73 | 827.42 | 906.73 | 836.96 | 906.75 | 882.64 | 906.8 | 903.99 | 906.81 |
| 905.08 | 906.82 | 929.36 | 906.84 | 946.67 | 906.89 | 949.45 | 906.89 | 952.46 | 906.9 |
| 982.73 | 907.04 | 1010.71 | 907.2 | 1016.01 | 907.24 | 1021.75 | 907.26 | 1038.2 | 907.34 |
| 1049.29 | 907.36 | 1060.38 | 907.26 | 1091.05 | 906.85 | 1093.67 | 906.81 | 1104.76 | 906.67 |
| 1114.15 | 906.58 | 1115.85 | 906.56 | 1117.44 | 906.59 | 1126.95 | 906.67 | 1137.24 | 907.31 |
| 1138.04 | 907.37 | 1138.78 | 907.44 | 1149.14 | 908.44 | 1160.13 | 909.57 | 1160.23 | 909.58 |
| 1160.34 | 909.6 | 1171.32 | 910.66 | 1181.47 | 911.56 | 1181.66 | 911.58 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .04 | 111.07 | .072 | 380.5 | .04 | 463.21 | .072 | 638.1 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 494.61 | 616.64 | 128.51 | 199.94 | 216.18 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 905.55 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.052 | 0.072 | 0.072 |
| W.S. Elev (ft) | 905.47 | Reach Len. (ft) | 128.51 | 199.94 | 216.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 520.72 | 282.51 | 4.61 |
| E.G. Slope (ft/ft) | 0.002909 | Area (sq ft) | 520.72 | 282.51 | 4.61 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1287.30 | 550.02 | 2.68 |
| Top Width (ft) | 406.74 | Top Width (ft) | 272.51 | 122.03 | 12.20 |
| Vel Total (ft/s) | 2.28 | Avg. Vel. (ft/s) | 2.47 | 1.95 | 0.58 |
| Max Chl Dpth (ft) | 3.38 | Hydr. Depth (ft) | 1.91 | 2.32 | 0.38 |
| Conv. Total (cfs) | 34114.5 | Conv. (cfs) | 23867.2 | 10197.6 | 49.7 |
| Length Wtd. (ft) | 149.10 | Wetted Per. (ft) | 272.57 | 122.14 | 12.23 |
| Min Ch El (ft) | 902.09 | Shear (lb/sq ft) | 0.35 | 0.42 | 0.07 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.86 | 0.82 | 0.04 |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 32.95 | 47.05 | 67.49 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 39.65 | 18.56 | 86.24 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 906.69 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.048 | 0.072 | |
| W.S. Elev (ft) | 906.56 | Reach Len. (ft) | 128.51 | 199.94 | 216.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 249.11 | 415.69 | |
| E.G. Slope (ft/ft) | 0.002685 | Area (sq ft) | 249.11 | 415.69 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 844.25 | 995.75 | |
| Top Width (ft) | 198.25 | Top Width (ft) | 76.22 | 122.03 | |
| Vel Total (ft/s) | 2.77 | Avg. Vel. (ft/s) | 3.39 | 2.40 | |
| Max Chl Dpth (ft) | 4.47 | Hydr. Depth (ft) | 3.27 | 3.41 | |
| Conv. Total (cfs) | 35508.7 | Conv. (cfs) | 16292.5 | 19216.2 | |
| Length Wtd. (ft) | 169.12 | Wetted Per. (ft) | 79.95 | 124.00 | |
| Min Ch El (ft) | 902.09 | Shear (lb/sq ft) | 0.52 | 0.56 | |
| Alpha | 1.09 | Stream Power (lb/ft s) | 1.77 | 1.35 | |
| Frctn Loss (ft) | 0.62 | Cum Volume (acre-ft) | 8.02 | 60.25 | 7.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.31 | 19.50 | 3.25 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 905.52 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.053 | 0.072 | |
| W.S. Elev (ft) | 905.43 | Reach Len. (ft) | 128.51 | 199.94 | 216.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 496.42 | 277.52 | |
| E.G. Slope (ft/ft) | 0.002828 | Area (sq ft) | 496.42 | 277.52 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1315.63 | 524.37 | |
| Top Width (ft) | 332.80 | Top Width (ft) | 210.77 | 122.03 | |
| Vel Total (ft/s) | 2.38 | Avg. Vel. (ft/s) | 2.65 | 1.89 | |
| Max Chl Dpth (ft) | 3.34 | Hydr. Depth (ft) | 2.36 | 2.27 | |
| Conv. Total (cfs) | 34597.3 | Conv. (cfs) | 24737.7 | 9859.6 | |
| Length Wtd. (ft) | 148.29 | Wetted Per. (ft) | 211.37 | 122.86 | |
| Min Ch El (ft) | 902.09 | Shear (lb/sq ft) | 0.41 | 0.40 | |
| Alpha | 1.07 | Stream Power (lb/ft s) | 1.10 | 0.75 | |
| Frctn Loss (ft) | 0.56 | Cum Volume (acre-ft) | 14.64 | 52.25 | 18.34 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.97 | 18.92 | 12.35 |

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.450

INPUT
Description: Thalweg Sta. 550.76 (HEC-RAS XS has been trimmed and does not reflect the XS's full length as shown on the work map.)

Station Elevation Data num= 135

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 914.08 | 1.49 | 913.99 | 9.53 | 913.66 | 14.37 | 913.28 | 19.74 | 912.97 |
| 27.25 | 912.22 | 29.95 | 912.01 | 31.73 | 911.83 | 40.16 | 910.58 | 50.38 | 908.53 |
| 53 | 908.12 | 60.59 | 906.71 | 65.88 | 906.3 | 70.8 | 905.78 | 74.03 | 905.83 |
| 81.01 | 905.62 | 89.64 | 905.7 | 91.64 | 905.7 | 101.44 | 905.78 | 104.52 | 905.8 |
| 111.65 | 905.88 | 117.4 | 905.88 | 121.86 | 905.94 | 130.27 | 905.84 | 132.07 | 905.84 |
| 138.98 | 905.76 | 142.28 | 905.74 | 143.15 | 905.73 | 145.37 | 905.73 | 152.5 | 905.71 |
| 162.71 | 905.66 | 168.9 | 905.6 | 172.92 | 905.57 | 181.78 | 905.45 | 183.13 | 905.43 |
| 188.3 | 905.36 | 213.77 | 904.98 | 223.54 | 904.82 | 233.29 | 904.59 | 234.19 | 904.57 |
| 244.4 | 904.1 | 246.17 | 903.97 | 254.62 | 903.37 | 259.05 | 903.02 | 264.83 | 902.59 |
| 271.93 | 902.24 | 275.04 | 902.05 | 284.8 | 901.92 | 285.25 | 901.91 | 286.97 | 901.91 |
| 295.46 | 901.96 | 297.68 | 901.98 | 305.68 | 902.03 | 310.56 | 902.07 | 315.89 | 902.1 |
| 326.1 | 902.13 | 336.31 | 902.13 | 346.52 | 902.09 | 349.19 | 902.09 | 356.74 | 902.07 |
| 366.95 | 902.08 | 368.91 | 902.09 | 377.16 | 902.12 | 385.64 | 902.23 | 387.37 | 902.26 |
| 387.82 | 902.27 | 397.58 | 902.62 | 400.71 | 902.75 | 407.8 | 903.12 | 418.01 | 903.58 |
| 426.46 | 903.89 | 428.22 | 903.94 | 434.96 | 904.14 | 438.43 | 904.25 | 439.34 | 904.28 |
| 448.64 | 904.55 | 452.22 | 904.64 | 453.94 | 904.69 | 458.86 | 904.82 | 463.22 | 904.84 |
| 469.07 | 904.78 | 471.68 | 904.72 | 479.28 | 904.48 | 480.14 | 904.45 | 503.73 | 903.58 |
| 516.61 | 903.05 | 520.13 | 902.89 | 530.34 | 902.45 | 530.9 | 902.43 | 540.55 | 902.01 |
| 542.36 | 901.95 | 550.76 | 901.62 | 555.24 | 901.55 | 560.98 | 901.42 | 568.11 | 901.81 |
| 571.19 | 901.94 | 581.4 | 902.94 | 582.96 | 903.11 | 591.61 | 904.02 | 593.87 | 904.25 |
| 601.82 | 905.07 | 606.75 | 905.53 | 612.04 | 906.05 | 613.02 | 906.12 | 617.13 | 906.39 |
| 619.62 | 906.56 | 622.25 | 906.75 | 632.3 | 906.91 | 632.5 | 906.91 | 652.88 | 906.68 |
| 658.26 | 906.63 | 671.13 | 906.48 | 673.31 | 906.45 | 683.52 | 906.34 | 684.01 | 906.33 |
| 693.73 | 906.22 | 696.89 | 906.19 | 709.77 | 906.04 | 722.65 | 905.91 | 735.53 | 905.77 |
| 755 | 905.61 | 761.28 | 905.61 | 765.22 | 905.59 | 774.16 | 905.72 | 775.43 | 905.73 |
| 785.64 | 905.87 | 787.04 | 905.88 | 795.85 | 905.97 | 799.92 | 905.99 | 806.06 | 906.04 |
| 825.67 | 906.15 | 827.03 | 906.15 | 829.62 | 906.17 | 846.91 | 906.24 | 857.12 | 906.24 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .04 | 145.37 | .072 | 368.91 | .04 | 453.94 | .072 | 613.02 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 458.86 | 601.82 | 248.33 | 199.99 | 194.16 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 904.98 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.060 | 0.072 | |
| W.S. Elev (ft) | 904.87 | Reach Len. (ft) | 248.33 | 199.99 | 194.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 464.48 | 239.12 | |
| E.G. Slope (ft/ft) | 0.005242 | Area (sq ft) | 464.48 | 239.12 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1332.36 | 507.64 | |
| Top Width (ft) | 379.08 | Top Width (ft) | 238.10 | 140.98 | |
| Vel Total (ft/s) | 2.62 | Avg. Vel. (ft/s) | 2.87 | 2.12 | |
| Max Chl Dpth (ft) | 3.45 | Hydr. Depth (ft) | 1.95 | 1.70 | |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 25413.4 | Conv. (cfs) | 18402.0 | 7011.4 | |
| Length Wtd. (ft) | 240.58 | Wetted Per. (ft) | 238.24 | 141.21 | |
| Min Ch El (ft) | 901.42 | Shear (lb/sq ft) | 0.64 | 0.55 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.83 | 1.18 | |
| Frctn Loss (ft) | 1.62 | Cum Volume (acre-ft) | 31.49 | 45.85 | 67.48 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 38.90 | 17.95 | 86.21 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 906.06 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.040 | 0.072 | |
| W.S. Elev (ft) | 905.85 | Reach Len. (ft) | 248.33 | 199.99 | 194.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 164.99 | 379.87 | |
| E.G. Slope (ft/ft) | 0.005364 | Area (sq ft) | 164.99 | 379.87 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 743.68 | 1096.32 | |
| Top Width (ft) | 216.67 | Top Width (ft) | 73.71 | 142.96 | |
| Vel Total (ft/s) | 3.38 | Avg. Vel. (ft/s) | 4.51 | 2.89 | |
| Max Chl Dpth (ft) | 4.43 | Hydr. Depth (ft) | 2.24 | 2.66 | |
| Conv. Total (cfs) | 25122.5 | Conv. (cfs) | 10153.9 | 14968.6 | |
| Length Wtd. (ft) | 229.65 | Wetted Per. (ft) | 77.38 | 143.98 | |
| Min Ch El (ft) | 901.42 | Shear (lb/sq ft) | 0.71 | 0.88 | |
| Alpha | 1.16 | Stream Power (lb/ft s) | 3.22 | 2.55 | |
| Frctn Loss (ft) | 1.85 | Cum Volume (acre-ft) | 7.41 | 58.42 | 7.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.08 | 18.90 | 3.25 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 904.96 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.060 | 0.072 | |
| W.S. Elev (ft) | 904.84 | Reach Len. (ft) | 248.33 | 199.99 | 194.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 457.74 | 236.07 | |
| E.G. Slope (ft/ft) | 0.005186 | Area (sq ft) | 457.74 | 236.07 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1345.30 | 494.70 | |
| Top Width (ft) | 365.49 | Top Width (ft) | 224.72 | 140.77 | |
| Vel Total (ft/s) | 2.65 | Avg. Vel. (ft/s) | 2.94 | 2.10 | |
| Max Chl Dpth (ft) | 3.42 | Hydr. Depth (ft) | 2.04 | 1.68 | |
| Conv. Total (cfs) | 25551.2 | Conv. (cfs) | 18681.5 | 6869.7 | |
| Length Wtd. (ft) | 240.70 | Wetted Per. (ft) | 225.12 | 140.99 | |
| Min Ch El (ft) | 901.42 | Shear (lb/sq ft) | 0.66 | 0.54 | |
| Alpha | 1.07 | Stream Power (lb/ft s) | 1.93 | 1.14 | |
| Frctn Loss (ft) | 1.57 | Cum Volume (acre-ft) | 13.23 | 51.07 | 18.34 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.33 | 18.32 | 12.35 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.412

INPUT
Description: Thalweg Sta. 956.66
Station Elevation Data num= 215

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 918.09 | 7.99 | 917.23 | 9.13 | 917.11 | 19.63 | 915.74 | 23.41 | 915.29 |
| 30.13 | 914.46 | 38.83 | 913.42 | 40.62 | 913.2 | 44.46 | 912.75 | 51.12 | 911.92 |
| 54.24 | 911.55 | 61.62 | 910.66 | 69.66 | 909.73 | 72.11 | 909.45 | 81.34 | 908.57 |
| 82.61 | 908.44 | 89.3 | 908.07 | 93.11 | 907.87 | 110.24 | 907.29 | 114.1 | 907.14 |
| 115.91 | 907.08 | 124.6 | 906.75 | 131.33 | 906.51 | 135.09 | 906.37 | 143.14 | 906.09 |
| 145.59 | 905.99 | 146.75 | 905.97 | 156.09 | 905.73 | 162.16 | 905.68 | 166.59 | 905.63 |
| 176.02 | 905.58 | 177.08 | 905.57 | 177.58 | 905.57 | 181.52 | 905.53 | 187.58 | 905.47 |
| 198.08 | 905.3 | 208.41 | 905.1 | 208.57 | 905.1 | 208.92 | 905.09 | 219.07 | 904.86 |
| 223.83 | 904.71 | 229.57 | 904.56 | 239.25 | 904.26 | 240.07 | 904.23 | 241.81 | 904.19 |
| 250.56 | 904.03 | 254.66 | 904.02 | 261.06 | 903.98 | 307.59 | 903.96 | 312.1 | 903.95 |
| 355.53 | 903.96 | 362.58 | 903.97 | 366.03 | 903.98 | 373.38 | 903.99 | 376.52 | 904 |
| 393.41 | 904.02 | 406.27 | 904.04 | 408.02 | 904.05 | 418.51 | 904.06 | 439.16 | 904.12 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 439.66 | 904.12 | 470.99 | 904.24 | 472.06 | 904.24 | 481.49 | 904.26 | 485.91 | 904.25 |
| 491.99 | 904.25 | 501.33 | 904.22 | 502.49 | 904.22 | 523.48 | 904.15 | 530.74 | 904.15 |
| 533.98 | 904.15 | 537.84 | 904.19 | 544.47 | 904.29 | 554.97 | 904.5 | 563 | 904.48 |
| 565.47 | 904.49 | 567.04 | 904.46 | 574.69 | 904.3 | 575.97 | 904.27 | 603.62 | 903.54 |
| 624.67 | 902.95 | 636.52 | 902.63 | 669.41 | 901.81 | 670.44 | 901.79 | 670.92 | 901.77 |
| 701.75 | 901.01 | 701.93 | 901 | 702.31 | 900.99 | 733.42 | 900.22 | 735.19 | 900.17 |
| 743.91 | 899.96 | 754.41 | 899.72 | 763.42 | 899.55 | 764.91 | 899.52 | 768.09 | 899.49 |
| 775.4 | 899.49 | 778.84 | 899.57 | 785.9 | 899.68 | 789.54 | 899.76 | 800.98 | 900.08 |
| 806.9 | 900.26 | 817.39 | 900.57 | 848.88 | 901.6 | 859.38 | 901.96 | 866.76 | 902.24 |
| 869.88 | 902.35 | 871.34 | 902.42 | 880.38 | 902.82 | 890.87 | 903.25 | 899.66 | 903.44 |
| 901.37 | 903.46 | 911.86 | 903.33 | 917.59 | 903.19 | 922.36 | 903.09 | 932.54 | 902.83 |
| 932.86 | 902.83 | 933.01 | 902.82 | 948.42 | 902.42 | 956.66 | 902.22 | 964.35 | 902.07 |
| 964.61 | 902.07 | 965.44 | 902.06 | 974.85 | 901.99 | 979.26 | 902.19 | 985.34 | 902.42 |
| 995.84 | 903.33 | 998.33 | 903.57 | 1006.34 | 904.31 | 1010.09 | 904.6 | 1016.83 | 905.16 |
| 1019.98 | 905.28 | 1025.5 | 905.49 | 1027.33 | 905.57 | 1031.23 | 905.54 | 1037.83 | 905.5 |
| 1040.93 | 905.45 | 1049.37 | 905.29 | 1064.11 | 905.05 | 1069.32 | 904.98 | 1071.75 | 904.96 |
| 1079.82 | 904.88 | 1102.59 | 904.76 | 1118.01 | 904.7 | 1132.3 | 904.63 | 1133.42 | 904.62 |
| 1148.84 | 904.55 | 1153.29 | 904.52 | 1162.79 | 904.48 | 1163.79 | 904.47 | 1164.26 | 904.47 |
| 1195.09 | 904.29 | 1205.78 | 904.28 | 1210.51 | 904.34 | 1216.28 | 904.4 | 1225.93 | 904.62 |
| 1226.77 | 904.63 | 1228.58 | 904.67 | 1272.18 | 905.84 | 1279.26 | 906.02 | 1289.75 | 906.25 |
| 1300.25 | 906.41 | 1303.01 | 906.43 | 1310.75 | 906.45 | 1318.43 | 906.36 | 1321.24 | 906.32 |
| 1331.74 | 906.11 | 1342.24 | 905.96 | 1352.73 | 905.9 | 1360.15 | 905.89 | 1363.23 | 905.88 |
| 1364.68 | 905.88 | 1393.03 | 905.82 | 1394.72 | 905.81 | 1395.51 | 905.81 | 1405.22 | 905.77 |
| 1410.93 | 905.76 | 1425.93 | 905.71 | 1426.35 | 905.71 | 1447.21 | 905.59 | 1457.18 | 905.48 |
| 1457.7 | 905.48 | 1458.82 | 905.47 | 1468.2 | 905.32 | 1488.02 | 904.95 | 1489.19 | 904.93 |
| 1520.69 | 904.3 | 1531.18 | 904.09 | 1534.27 | 904.04 | 1541.68 | 903.9 | 1549.68 | 903.83 |
| 1552.18 | 903.79 | 1557.5 | 903.78 | 1562.67 | 903.79 | 1590.39 | 903.9 | 1594.16 | 903.92 |
| 1595.94 | 903.92 | 1611.35 | 904 | 1615.16 | 904.01 | 1623.28 | 904.06 | 1626.77 | 904.09 |
| 1642.18 | 904.26 | 1656.17 | 904.45 | 1657.14 | 904.46 | 1657.6 | 904.47 | 1667.64 | 904.61 |
| 1678.14 | 904.8 | 1688.44 | 905.05 | 1688.64 | 905.06 | 1699.13 | 905.55 | 1703.85 | 906.32 |
| 1709.63 | 906.91 | 1719.27 | 909.78 | 1720.13 | 910.03 | 1721.95 | 910.62 | 1728.78 | 912.79 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .052 | 181.52 | .04 | 530.74 | .072 | 1049.37 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 901.37 | 1025.5 | 167.72 | 199.95 | 185.1 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 903.36 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.072 | 0.072 | |
| W.S. Elev (ft) | 903.21 | Reach Len. (ft) | 167.72 | 199.95 | 185.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 560.47 | 53.95 | |
| E.G. Slope (ft/ft) | 0.008912 | Area (sq ft) | 560.47 | 53.95 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1757.53 | 82.47 | |
| Top Width (ft) | 351.93 | Top Width (ft) | 274.37 | 77.57 | |
| Vel Total (ft/s) | 2.99 | Avg. Vel. (ft/s) | 3.14 | 1.53 | |
| Max Chl Dpth (ft) | 3.72 | Hydr. Depth (ft) | 2.04 | 0.70 | |
| Conv. Total (cfs) | 19490.5 | Conv. (cfs) | 18617.0 | 873.6 | |
| Length Wtd. (ft) | 170.02 | Wetted Per. (ft) | 274.48 | 77.62 | |
| Min Ch El (ft) | 901.99 | Shear (lb/sq ft) | 1.14 | 0.39 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 3.56 | 0.59 | |
| Frctn Loss (ft) | 0.62 | Cum Volume (acre-ft) | 28.57 | 45.18 | 67.48 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 37.44 | 17.45 | 86.21 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 904.20 | Element | | | |
| Vel Head (ft) | 0.27 | Wt. n-Val. | 0.072 | 0.072 | |
| W.S. Elev (ft) | 903.92 | Reach Len. (ft) | 167.72 | 199.95 | 185.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 340.84 | 121.04 | |
| E.G. Slope (ft/ft) | 0.013344 | Area (sq ft) | 340.84 | 121.04 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1514.17 | 325.83 | |
| Top Width (ft) | 230.28 | Top Width (ft) | 129.49 | 100.78 | |
| Vel Total (ft/s) | 3.98 | Avg. Vel. (ft/s) | 4.44 | 2.69 | |
| Max Chl Dpth (ft) | 4.43 | Hydr. Depth (ft) | 2.63 | 1.20 | |
| Conv. Total (cfs) | 15928.7 | Conv. (cfs) | 13108.1 | 2820.7 | |
| Length Wtd. (ft) | 172.91 | Wetted Per. (ft) | 133.99 | 100.88 | |
| Min Ch El (ft) | 901.99 | Shear (lb/sq ft) | 2.12 | 1.00 | |
| Alpha | 1.10 | Stream Power (lb/ft s) | 9.41 | 2.69 | |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 5.97 | 57.27 | 7.53 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 2.51 | 18.34 | 3.25 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 903.39 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.072 | 0.072 | |
| W.S. Elev (ft) | 903.25 | Reach Len. (ft) | 167.72 | 199.95 | 185.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 571.13 | 56.99 | |
| E.G. Slope (ft/ft) | 0.008427 | Area (sq ft) | 571.13 | 56.99 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1753.64 | 86.36 | |
| Top Width (ft) | 356.29 | Top Width (ft) | 276.69 | 79.60 | |
| Vel Total (ft/s) | 2.93 | Avg. Vel. (ft/s) | 3.07 | 1.52 | |
| Max Chl Dpth (ft) | 3.76 | Hydr. Depth (ft) | 2.06 | 0.72 | |
| Conv. Total (cfs) | 20044.0 | Conv. (cfs) | 19103.2 | 940.8 | |
| Length Wtd. (ft) | 169.90 | Wetted Per. (ft) | 276.80 | 79.66 | |
| Min Ch El (ft) | 901.99 | Shear (lb/sq ft) | 1.09 | 0.38 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 3.33 | 0.57 | |
| Frctn Loss (ft) | 0.61 | Cum Volume (acre-ft) | 10.30 | 50.40 | 18.34 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 5.90 | 17.81 | 12.35 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.374

INPUT
Description: Thalweg Sta. 1002.95
Station Elevation Data num= 268

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 913.97 | .54 | 913.93 | 8.92 | 912.84 | 10.64 | 912.66 | 20.72 | 911.29 |
| 20.85 | 911.27 | 29.58 | 910.14 | 30.85 | 909.99 | 32.53 | 909.86 | 40.95 | 909.15 |
| 44.33 | 909 | 51.05 | 908.66 | 56.14 | 908.44 | 61.16 | 908.21 | 67.95 | 907.82 |
| 71.26 | 907.61 | 79.76 | 907.14 | 81.36 | 907.04 | 91.47 | 906.67 | 91.56 | 906.67 |
| 101.57 | 906.39 | 103.37 | 906.37 | 111.67 | 906.2 | 117.89 | 906.24 | 121.78 | 906.4 |
| 126.72 | 906.66 | 131.88 | 907.07 | 135.09 | 907.3 | 135.55 | 907.33 | 141.99 | 908 |
| 150.59 | 908.76 | 152.09 | 908.84 | 160.98 | 908.56 | 162.04 | 908.5 | 162.19 | 908.49 |
| 170.87 | 907.46 | 172.29 | 907.31 | 174.2 | 907.09 | 182.4 | 906.1 | 186.01 | 905.84 |
| 192.5 | 905.39 | 197.82 | 905.26 | 202.61 | 905.18 | 209.62 | 905.09 | 212.71 | 905.06 |
| 231.05 | 904.79 | 232.68 | 904.77 | 232.91 | 904.77 | 283.43 | 904.08 | 292.26 | 903.98 |
| 293.54 | 903.97 | 301.1 | 903.9 | 312.15 | 903.86 | 313.74 | 903.85 | 327.68 | 903.85 |
| 333.95 | 903.87 | 338.64 | 903.9 | 344.05 | 903.92 | 351.29 | 903.96 | 354.16 | 903.98 |
| 363.1 | 904.02 | 364.26 | 904.02 | 374.9 | 904.03 | 384.47 | 903.96 | 386.71 | 903.93 |
| 404.67 | 903.75 | 410.32 | 903.72 | 414.78 | 903.68 | 418.11 | 903.67 | 424.88 | 903.68 |
| 433.93 | 903.71 | 434.98 | 903.71 | 445.09 | 903.76 | 445.73 | 903.76 | 455.19 | 903.79 |
| 457.54 | 903.79 | 469.35 | 903.83 | 481.16 | 903.85 | 495.61 | 903.86 | 504.77 | 903.84 |
| 505.71 | 903.84 | 515.81 | 903.82 | 525.91 | 903.81 | 528.38 | 903.83 | 536.02 | 903.86 |
| 540.18 | 903.96 | 545.64 | 904.07 | 546.12 | 904.08 | 556.23 | 904.59 | 563.18 | 904.73 |
| 563.79 | 904.74 | 566.33 | 904.8 | 575.6 | 904.26 | 576.43 | 904.21 | 586.54 | 903.29 |
| 587.41 | 903.23 | 596.64 | 902.52 | 599.22 | 902.37 | 606.74 | 901.95 | 611.02 | 901.73 |
| 616.85 | 901.49 | 622.83 | 901.2 | 626.95 | 901.02 | 634.63 | 900.65 | 637.05 | 900.55 |
| 646.44 | 900.13 | 657.26 | 899.68 | 665.35 | 899.42 | 667.36 | 899.33 | 674.18 | 899.05 |
| 677.47 | 898.91 | 683.01 | 898.66 | 687.57 | 898.48 | 691.84 | 898.34 | 697.67 | 898.12 |
| 705.46 | 897.94 | 707.78 | 897.89 | 709.51 | 897.86 | 717.88 | 897.79 | 718.34 | 897.79 |
| 727.98 | 897.88 | 738.09 | 898.07 | 748.19 | 898.29 | 752.69 | 898.38 | 758.29 | 898.51 |
| 764.5 | 898.64 | 788.11 | 899.18 | 788.61 | 899.19 | 806.64 | 899.63 | 808.81 | 899.68 |
| 811.72 | 899.73 | 824.3 | 899.99 | 835.33 | 900.16 | 839.12 | 900.24 | 847.14 | 900.39 |
| 858.95 | 900.68 | 859.33 | 900.69 | 869.43 | 901.13 | 870.76 | 901.2 | 879.54 | 901.78 |
| 889.64 | 902.54 | 894.37 | 902.93 | 899.74 | 903.3 | 904.49 | 903.58 | 909.4 | 903.75 |
| 910.82 | 903.78 | 911.58 | 903.8 | 922.77 | 903.98 | 929.86 | 904.03 | 934.72 | 904.04 |
| 943.91 | 903.97 | 946.67 | 903.94 | 948.13 | 903.91 | 958.61 | 903.41 | 966.4 | 902.91 |
| 970.56 | 902.49 | 982.51 | 901.3 | 984.67 | 901.08 | 994.46 | 900.28 | 1002.95 | 899.69 |
| 1006.41 | 899.74 | 1012.92 | 900.12 | 1018.35 | 900.37 | 1021.23 | 900.66 | 1030.3 | 901.6 |
| 1039.5 | 902.73 | 1042.25 | 903.01 | 1047.43 | 903.27 | 1054.19 | 903.72 | 1056.02 | 903.64 |
| 1056.19 | 903.63 | 1059.06 | 903.48 | 1064.95 | 903.11 | 1075.49 | 902.25 | 1086.03 | 901.75 |
| 1090.7 | 901.72 | 1096.57 | 901.71 | 1099.5 | 901.74 | 1119.35 | 901.99 | 1122.34 | 902.02 |
| 1128.19 | 902.09 | 1131.11 | 902.12 | 1138.73 | 902.21 | 1146.92 | 902.29 | 1149.27 | 902.32 |
| 1153.98 | 902.36 | 1159.81 | 902.43 | 1170.35 | 902.54 | 1178.53 | 902.6 | 1180.89 | 902.63 |
| 1185.62 | 902.66 | 1191.43 | 902.71 | 1201.97 | 902.81 | 1210.14 | 902.91 | 1212.51 | 902.93 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1225.95 | 903.08 | 1253.23 | 903.34 | 1254.67 | 903.35 | 1273.36 | 903.54 | 1275.75 | 903.57 |
| 1276.95 | 903.58 | 1280.54 | 903.62 | 1286.3 | 903.67 | 1289.17 | 903.69 | 1296.84 | 903.76 |
| 1304.97 | 903.78 | 1307.38 | 903.8 | 1317.92 | 903.76 | 1336.59 | 903.64 | 1339 | 903.62 |
| 1349.54 | 903.56 | 1360.08 | 903.52 | 1368.2 | 903.54 | 1370.62 | 903.55 | 1381.16 | 903.73 |
| 1399.81 | 904.18 | 1402.24 | 904.23 | 1412.78 | 904.39 | 1415.61 | 904.42 | 1423.32 | 904.46 |
| 1431.42 | 904.48 | 1433.86 | 904.49 | 1444.4 | 904.51 | 1454.94 | 904.52 | 1458.8 | 904.53 |
| 1465.48 | 904.51 | 1470.38 | 904.48 | 1476.02 | 904.42 | 1486.56 | 904.27 | 1490.42 | 904.23 |
| 1497.1 | 904.13 | 1507.64 | 904 | 1510.46 | 903.96 | 1526.26 | 903.77 | 1528.72 | 903.75 |
| 1542.07 | 903.6 | 1560.34 | 903.44 | 1565.3 | 903.39 | 1570.88 | 903.35 | 1591.96 | 903.11 |
| 1602.51 | 903.01 | 1605.29 | 903 | 1613.05 | 902.96 | 1621.09 | 902.94 | 1623.59 | 902.92 |
| 1634.13 | 902.94 | 1644.67 | 903.05 | 1652.71 | 903.25 | 1655.2 | 903.33 | 1660.21 | 903.54 |
| 1665.74 | 903.79 | 1668.51 | 903.95 | 1676.29 | 904.37 | 1684.32 | 904.84 | 1686.83 | 904.98 |
| 1691.86 | 905.18 | 1694.81 | 905.33 | 1697.37 | 905.46 | 1700.12 | 905.64 | 1707.91 | 906.07 |
| 1718.45 | 906.82 | 1723.5 | 907.17 | 1728.99 | 907.6 | 1731.73 | 907.84 | 1739.53 | 908.42 |
| 1747.54 | 909.28 | 1750.07 | 909.54 | 1754.46 | 910.04 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .052 | 135.09 | .04 | 545.64 | .072 | 1119.35 | .04 | 1694.81 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 934.72 | 1054.19 | 180.49 | 235.16 | 292.91 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 902.71 | Element | | | |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.072 | 0.072 | 0.060 |
| W.S. Elev (ft) | 902.66 | Reach Len. (ft) | 180.49 | 235.16 | 292.91 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 871.69 | 119.96 | 56.78 |
| E.G. Slope (ft/ft) | 0.001972 | Area (sq ft) | 871.69 | 119.96 | 56.78 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1640.08 | 157.08 | 42.84 |
| Top Width (ft) | 480.59 | Top Width (ft) | 296.17 | 69.98 | 114.44 |
| Vel Total (ft/s) | 1.75 | Avg. Vel. (ft/s) | 1.88 | 1.31 | 0.75 |
| Max Chl Dpth (ft) | 4.87 | Hydr. Depth (ft) | 2.94 | 1.71 | 0.50 |
| Conv. Total (cfs) | 41431.6 | Conv. (cfs) | 36930.0 | 3536.9 | 964.6 |
| Length Wtd. (ft) | 211.82 | Wetted Per. (ft) | 296.37 | 70.25 | 114.47 |
| Min Ch El (ft) | 899.69 | Shear (lb/sq ft) | 0.36 | 0.21 | 0.06 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.68 | 0.28 | 0.05 |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | 25.81 | 44.78 | 67.36 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 36.34 | 17.11 | 85.97 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 903.05 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.072 | 0.072 | |
| W.S. Elev (ft) | 902.95 | Reach Len. (ft) | 180.49 | 235.16 | 292.91 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 581.56 | 141.10 | |
| E.G. Slope (ft/ft) | 0.003677 | Area (sq ft) | 581.56 | 141.10 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1573.50 | 266.50 | |
| Top Width (ft) | 253.47 | Top Width (ft) | 177.68 | 75.79 | |
| Vel Total (ft/s) | 2.55 | Avg. Vel. (ft/s) | 2.71 | 1.89 | |
| Max Chl Dpth (ft) | 5.16 | Hydr. Depth (ft) | 3.27 | 1.86 | |
| Conv. Total (cfs) | 30344.4 | Conv. (cfs) | 25949.4 | 4395.0 | |
| Length Wtd. (ft) | 211.78 | Wetted Per. (ft) | 182.93 | 76.10 | |
| Min Ch El (ft) | 899.69 | Shear (lb/sq ft) | 0.73 | 0.43 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.97 | 0.80 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 4.19 | 56.67 | 7.53 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.91 | 17.93 | 3.25 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 902.75 | Element | | | |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.072 | 0.072 | |
| W.S. Elev (ft) | 902.70 | Reach Len. (ft) | 180.49 | 235.16 | 292.91 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 884.93 | 123.10 | |
| E.G. Slope (ft/ft) | 0.001972 | Area (sq ft) | 884.93 | 123.10 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1677.29 | 162.71 | |
| Top Width (ft) | 368.07 | Top Width (ft) | 297.29 | 70.78 | |
| Vel Total (ft/s) | 1.83 | Avg. Vel. (ft/s) | 1.90 | 1.32 | |
| Max Chl Dpth (ft) | 4.91 | Hydr. Depth (ft) | 2.98 | 1.74 | |
| Conv. Total (cfs) | 41438.5 | Conv. (cfs) | 37774.1 | 3664.4 | |

| | | | | | |
|---|---|---|---|---|---|
| Length Wtd. (ft) | 210.24 | Wetted Per. (ft) | 297.49 | 71.06 | |
| Min Ch El (ft) | 899.69 | Shear (lb/sq ft) | 0.37 | 0.21 | |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.69 | 0.28 | |
| Frctn Loss (ft) | 0.67 | Cum Volume (acre-ft) | 7.50 | 49.98 | 18.34 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 4.80 | 17.47 | 12.35 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.330

INPUT
Description: Thalweg Sta. 1000.12
Station Elevation Data num= 315

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 909.91 | 1.27 | 909.86 | 7.41 | 909.69 | 11.36 | 909.51 | 17.41 | 909.32 |
| 21.44 | 909.13 | 27.41 | 908.95 | 31.53 | 908.76 | 43.18 | 908.41 | 47.41 | 908.24 |
| 53.1 | 908.08 | 57.41 | 907.92 | 63.01 | 907.77 | 67.41 | 907.63 | 77.41 | 907.38 |
| 86.49 | 907.13 | 92.07 | 907.01 | 97.41 | 906.88 | 102.16 | 906.84 | 107.41 | 906.74 |
| 112.57 | 906.66 | 117.41 | 906.67 | 122.48 | 906.6 | 127.42 | 906.58 | 132.41 | 906.5 |
| 142.32 | 906.37 | 147.42 | 906.29 | 152.61 | 906.24 | 157.42 | 906.18 | 162.7 | 906.14 |
| 167.42 | 906.09 | 172.79 | 906.06 | 177.42 | 906.01 | 182.88 | 905.99 | 187.42 | 905.94 |
| 192.97 | 905.92 | 197.42 | 905.87 | 203.06 | 905.83 | 223.23 | 905.61 | 277.42 | 905.07 |
| 287.42 | 904.98 | 291.01 | 904.94 | 303.95 | 904.83 | 307.42 | 904.79 | 317.42 | 904.71 |
| 327.42 | 904.65 | 340.57 | 904.61 | 347.42 | 904.57 | 354.39 | 904.5 | 357.42 | 904.49 |
| 364.48 | 904.43 | 367.42 | 904.42 | 374.57 | 904.37 | 377.42 | 904.36 | 384.67 | 904.3 |
| 387.43 | 904.29 | 390.14 | 904.29 | 404.85 | 904.18 | 407.43 | 904.17 | 414.94 | 904.11 |
| 417.43 | 904.11 | 437.43 | 903.95 | 439.71 | 903.94 | 455.29 | 903.83 | 475.47 | 903.73 |
| 477.43 | 903.74 | 485.56 | 903.7 | 487.43 | 903.72 | 489.27 | 903.72 | 505.74 | 903.57 |
| 507.43 | 903.51 | 515.83 | 903.46 | 517.43 | 903.42 | 525.91 | 903.42 | 537.43 | 903.49 |
| 538.83 | 903.51 | 547.43 | 903.43 | 555.01 | 903.25 | 556.18 | 903.22 | 557.43 | 903.23 |
| 566.27 | 903.05 | 567.43 | 903.06 | 576.36 | 903.38 | 577.43 | 903.39 | 586.45 | 903.44 |
| 588.39 | 903.46 | 606.63 | 903.44 | 607.43 | 903.45 | 616.72 | 903.44 | 626.8 | 903.43 |
| 627.43 | 903.44 | 636.9 | 903.42 | 637.44 | 903.43 | 637.97 | 903.43 | 657.08 | 903.4 |
| 659.52 | 903.4 | 667.17 | 903.38 | 667.44 | 903.39 | 677.26 | 903.37 | 677.44 | 903.37 |
| 687.35 | 903.35 | 687.53 | 903.35 | 697.44 | 903.33 | 697.67 | 903.33 | 707.44 | 903.32 |
| 717.44 | 903.32 | 717.62 | 903.31 | 727.44 | 903.31 | 727.7 | 903.3 | 737.44 | 903.3 |
| 737.79 | 903.29 | 747.44 | 903.2 | 747.88 | 903.2 | 757.44 | 903.06 | 757.97 | 903.07 |
| 767.44 | 903.2 | 768.06 | 903.21 | 777.44 | 903.13 | 778.15 | 903.13 | 787.44 | 903.05 |
| 788.24 | 903.04 | 797.44 | 902.96 | 798.33 | 902.95 | 807.44 | 902.88 | 808.42 | 902.87 |
| 827.44 | 902.7 | 828.59 | 902.7 | 857.44 | 902.46 | 858.86 | 902.45 | 867.44 | 902.37 |
| 868.95 | 902.36 | 877.44 | 902.29 | 879.04 | 902.28 | 887.45 | 902.21 | 889.14 | 902.2 |
| 897.45 | 902.12 | 899.23 | 902.11 | 907.45 | 902.03 | 909.32 | 902 | 917.45 | 901.82 |
| 919.41 | 901.74 | 927.45 | 901.49 | 929.49 | 901.39 | 937.45 | 901.27 | 939.58 | 901.17 |
| 947.45 | 901.05 | 949.67 | 900.97 | 957.45 | 900.84 | 959.76 | 900.76 | 967.45 | 900.43 |
| 969.85 | 900.27 | 977.45 | 900.14 | 979.94 | 900 | 985 | 896 | 990.03 | 896 |
| 997.45 | 900.05 | 1000.12 | 900.11 | 1007.45 | 899.99 | 1010.21 | 899.96 | 1017.45 | 899.8 |
| 1020.3 | 899.76 | 1027.45 | 899.76 | 1030.38 | 899.74 | 1037.45 | 899.72 | 1040.47 | 899.72 |
| 1047.45 | 899.7 | 1050.56 | 899.7 | 1057.45 | 899.68 | 1060.65 | 899.57 | 1067.45 | 899.56 |
| 1070.74 | 899.54 | 1077.45 | 899.53 | 1080.83 | 899.56 | 1087.45 | 899.52 | 1090.92 | 899.53 |
| 1097.45 | 899.52 | 1101.01 | 899.49 | 1107.45 | 899.49 | 1111.1 | 899.47 | 1117.45 | 899.45 |
| 1121.19 | 899.45 | 1127.45 | 899.44 | 1131.28 | 899.47 | 1137.46 | 899.47 | 1141.37 | 899.48 |
| 1147.46 | 899.29 | 1151.46 | 899.31 | 1153.26 | 899.25 | 1157.46 | 899.1 | 1161.55 | 899.16 |
| 1167.46 | 899.27 | 1171.64 | 899.33 | 1177.46 | 899.44 | 1181.73 | 899.49 | 1187.46 | 899.66 |
| 1191.82 | 899.71 | 1197.46 | 899.88 | 1201.91 | 899.95 | 1207.46 | 900.11 | 1212 | 900.2 |
| 1217.46 | 900.36 | 1222.09 | 900.45 | 1227.46 | 900.61 | 1232.17 | 900.68 | 1237.46 | 900.84 |
| 1242.26 | 900.84 | 1247.46 | 900.97 | 1252.35 | 900.94 | 1257.46 | 901.05 | 1262.44 | 901.17 |
| 1267.46 | 901.27 | 1272.53 | 901.3 | 1277.46 | 901.4 | 1282.62 | 901.44 | 1287.46 | 901.54 |
| 1292.71 | 901.48 | 1297.46 | 901.57 | 1302.8 | 901.51 | 1307.46 | 901.6 | 1312.89 | 901.59 |
| 1317.46 | 901.68 | 1322.98 | 901.69 | 1327.46 | 901.78 | 1333.07 | 901.83 | 1337.46 | 901.83 |
| 1343.15 | 902.08 | 1347.46 | 902.06 | 1353.24 | 902.3 | 1357.46 | 902.29 | 1363.33 | 902.45 |
| 1367.46 | 902.44 | 1373.42 | 902.47 | 1377.46 | 902.46 | 1383.52 | 902.51 | 1387.47 | 902.5 |
| 1393.61 | 902.56 | 1397.47 | 902.55 | 1403.7 | 902.59 | 1407.47 | 902.58 | 1413.79 | 902.6 |
| 1417.47 | 902.59 | 1423.88 | 902.6 | 1427.47 | 902.59 | 1433.97 | 902.6 | 1434.37 | 902.6 |
| 1437.47 | 902.59 | 1444.05 | 902.6 | 1447.47 | 902.59 | 1454.14 | 902.62 | 1457.47 | 902.61 |
| 1464.23 | 902.68 | 1467.47 | 902.67 | 1474.32 | 902.85 | 1477.47 | 902.86 | 1484.41 | 903.17 |
| 1487.47 | 903.21 | 1494.5 | 903.54 | 1497.47 | 903.59 | 1504.59 | 903.73 | 1506.45 | 903.75 |
| 1507.47 | 903.76 | 1514.68 | 903.8 | 1517.47 | 903.82 | 1524.77 | 903.86 | 1527.47 | 903.87 |
| 1537.47 | 903.94 | 1544.94 | 904.06 | 1547.47 | 904.08 | 1555.03 | 904.17 | 1557.47 | 904.18 |
| 1565.12 | 904.23 | 1577.47 | 904.29 | 1587.47 | 904.29 | 1595.39 | 904.23 | 1597.47 | 904.21 |
| 1605.48 | 904.18 | 1607.47 | 904.17 | 1615.57 | 904.16 | 1617.47 | 904.15 | 1625.66 | 904.14 |
| 1627.47 | 904.13 | 1635.75 | 904.15 | 1637.47 | 904.15 | 1645.84 | 904.18 | 1647.48 | 904.18 |
| 1655.93 | 904.21 | 1657.48 | 904.21 | 1666.02 | 904.23 | 1676.11 | 904.24 | 1677.48 | 904.23 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1686.2 | 904.22 | 1687.48 | 904.21 | 1696.29 | 904.24 | 1697.48 | 904.26 | 1706.38 | 904.32 |
| 1707.48 | 904.33 | 1716.47 | 904.37 | 1717.48 | 904.37 | 1726.56 | 904.42 | 1727.48 | 904.41 |
| 1736.65 | 904.46 | 1737.48 | 904.45 | 1746.73 | 904.49 | 1747.48 | 904.49 | 1756.82 | 904.52 |
| 1757.48 | 904.52 | 1766.91 | 904.58 | 1767.48 | 904.58 | 1777 | 904.76 | 1777.48 | 904.75 |
| 1787.09 | 904.93 | 1787.48 | 904.93 | 1797.18 | 905.2 | 1797.48 | 905.25 | 1801.97 | 905.31 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .052 | 86.49 | .04 | 555.01 | .072 | 1434.37 | .04 | 1506.45 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 947.45 | 1247.66 | 143.7 | 96.2 | 107.46 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 902.01 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.072 | 0.072 | 0.072 |
| W.S. Elev (ft) | 901.90 | Reach Len. (ft) | 143.70 | 96.20 | 107.46 |
| Crit W.S. (ft) | 900.66 | Flow Area (sq ft) | 15.80 | 659.91 | 39.89 |
| E.G. Slope (ft/ft) | 0.006090 | Area (sq ft) | 15.80 | 659.91 | 39.89 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 15.38 | 1787.71 | 36.91 |
| Top Width (ft) | 425.18 | Top Width (ft) | 33.59 | 300.01 | 91.58 |
| Vel Total (ft/s) | 2.57 | Avg. Vel. (ft/s) | 0.97 | 2.71 | 0.93 |
| Max Chl Dpth (ft) | 5.90 | Hydr. Depth (ft) | 0.47 | 2.20 | 0.44 |
| Conv. Total (cfs) | 23578.5 | Conv. (cfs) | 197.1 | 22908.4 | 473.0 |
| Length Wtd. (ft) | 96.20 | Wetted Per. (ft) | 33.61 | 302.49 | 91.59 |
| Min Ch El (ft) | 896.00 | Shear (lb/sq ft) | 0.18 | 0.83 | 0.17 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.17 | 2.25 | 0.15 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 23.98 | 42.68 | 67.04 |
| C & E Loss (ft) | | Cum SA (acres) | 35.66 | 16.11 | 85.27 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 902.06 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 901.95 | Reach Len. (ft) | 143.70 | 96.20 | 107.46 |
| Crit W.S. (ft) | 900.66 | Flow Area (sq ft) | | 673.90 | |
| E.G. Slope (ft/ft) | 0.006065 | Area (sq ft) | | 673.90 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 300.01 | Top Width (ft) | | 300.01 | |
| Vel Total (ft/s) | 2.73 | Avg. Vel. (ft/s) | | 2.73 | |
| Max Chl Dpth (ft) | 5.95 | Hydr. Depth (ft) | | 2.25 | |
| Conv. Total (cfs) | 23626.1 | Conv. (cfs) | | 23626.1 | |
| Length Wtd. (ft) | 96.20 | Wetted Per. (ft) | | 304.36 | |
| Min Ch El (ft) | 896.00 | Shear (lb/sq ft) | | 0.84 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.29 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 2.99 | 54.47 | 7.53 |
| C & E Loss (ft) | | Cum SA (acres) | 1.55 | 16.92 | 3.25 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 902.06 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.072 | |
| W.S. Elev (ft) | 901.95 | Reach Len. (ft) | 143.70 | 96.20 | 107.46 |
| Crit W.S. (ft) | 900.66 | Flow Area (sq ft) | | 674.17 | |
| E.G. Slope (ft/ft) | 0.006057 | Area (sq ft) | | 674.17 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 300.01 | Top Width (ft) | | 300.01 | |
| Vel Total (ft/s) | 2.73 | Avg. Vel. (ft/s) | | 2.73 | |
| Max Chl Dpth (ft) | 5.95 | Hydr. Depth (ft) | | 2.25 | |
| Conv. Total (cfs) | 23642.1 | Conv. (cfs) | | 23642.1 | |
| Length Wtd. (ft) | 96.20 | Wetted Per. (ft) | | 304.36 | |
| Min Ch El (ft) | 896.00 | Shear (lb/sq ft) | | 0.84 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.29 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 5.66 | 47.83 | 18.34 |
| C & E Loss (ft) | | Cum SA (acres) | 4.18 | 16.46 | 12.35 |

CULVERT

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.323

INPUT
Description:
Distance from Upstream XS = 4

Deck/Roadway Width = 63
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 258

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 910.24 | | 1 | 910.23 | | 7.14 | 910.13 | |
| 11.08 | 910.08 | | 17.14 | 909.97 | | 21.17 | 909.91 | |
| 27.14 | 909.79 | | 31.26 | 909.73 | | 37.14 | 909.61 | |
| 41.35 | 909.55 | | 47.14 | 909.42 | | 51.44 | 909.36 | |
| 57.14 | 909.22 | | 61.53 | 909.16 | | 67.14 | 909.04 | |
| 71.62 | 908.98 | | 77.14 | 908.88 | | 81.71 | 908.81 | |
| 91.8 | 908.63 | | 147.15 | 907.53 | | 152.34 | 907.42 | |
| 162.43 | 907.23 | | 167.15 | 907.13 | | 177.15 | 906.95 | |
| 182.61 | 906.84 | | 192.7 | 906.66 | | 197.15 | 906.59 | |
| 202.79 | 906.49 | | 207.15 | 906.43 | | 253.23 | 905.65 | |
| 280.83 | 905.21 | | 293.59 | 905.04 | | 297.15 | 904.98 | |
| 303.68 | 904.91 | | 307.15 | 904.86 | | 323.85 | 904.68 | |
| 327.15 | 904.64 | | 354.12 | 904.37 | | 357.15 | 904.35 | |
| 364.21 | 904.27 | | 367.15 | 904.25 | | 374.3 | 904.17 | |
| 377.15 | 904.15 | | 397.16 | 903.92 | | 404.58 | 903.82 | |
| 407.16 | 903.79 | | 409.7 | 903.77 | | 417.16 | 903.7 | |
| 437.16 | 903.61 | | 444.93 | 903.59 | | 447.16 | 903.58 | |
| 455.02 | 903.56 | | 457.16 | 903.56 | | 465.11 | 903.54 | |
| 467.16 | 903.53 | | 475.2 | 903.51 | | 477.16 | 903.51 | |
| 485.29 | 903.49 | | 487.16 | 903.48 | | 495.38 | 903.46 | |
| 497.16 | 903.45 | | 505.47 | 903.43 | | 507.16 | 903.43 | |
| 515.55 | 903.41 | | 517.16 | 903.4 | | 525.64 | 903.38 | |
| 527.16 | 903.38 | | 535.73 | 903.36 | | 537.16 | 903.36 | |
| 545.82 | 903.33 | | 547.16 | 903.33 | | 555.91 | 903.31 | |
| 557.16 | 903.3 | | 566 | 903.28 | | 567.16 | 903.28 | |
| 576.09 | 903.25 | | 577.16 | 903.25 | | 586.18 | 903.22 | |
| 587.16 | 903.22 | | 596.27 | 903.19 | | 597.16 | 903.19 | |
| 606.36 | 903.16 | | 607.16 | 903.15 | | 616.44 | 903.12 | |
| 617.16 | 903.12 | | 626.53 | 903.09 | | 627.16 | 903.09 | |
| 636.62 | 903.05 | | 637.16 | 903.05 | | 646.72 | 903.02 | |
| 647.17 | 903.01 | | 656.81 | 902.97 | | 657.17 | 902.97 | |
| 666.9 | 902.9 | | 667.17 | 902.89 | | 676.99 | 902.81 | |
| 677.17 | 902.81 | | 687.08 | 902.72 | | 687.17 | 902.72 | |
| 691.95 | 902.68 | | 697.17 | 902.63 | | 697.53 | 902.63 | |
| 707.17 | 902.55 | | 707.26 | 902.55 | | 717.17 | 902.46 | |
| 717.34 | 902.46 | | 727.17 | 902.38 | | 727.43 | 902.38 | |
| 737.17 | 902.31 | | 737.52 | 902.31 | | 747.17 | 902.24 | |
| 747.61 | 902.24 | | 757.17 | 902.17 | | 757.7 | 902.16 | |
| 767.17 | 902.09 | | 767.79 | 902.08 | | 777.17 | 902.01 | |
| 777.88 | 902 | | 787.17 | 901.92 | | 787.97 | 901.92 | |
| 797.17 | 901.84 | | 798.06 | 901.83 | | 807.17 | 901.75 | |
| 808.15 | 901.75 | | 847.17 | 901.4 | | 848.5 | 901.39 | |
| 857.17 | 901.31 | | 858.59 | 901.3 | | 867.17 | 901.22 | |
| 868.68 | 901.21 | | 877.18 | 901.13 | | 878.78 | 901.12 | |
| 887.18 | 901.04 | | 888.87 | 901.03 | | 897.18 | 900.96 | |
| 898.96 | 900.94 | | 907.18 | 900.87 | | 917.18 | 900.77 | |
| 919.13 | 900.76 | | 947.18 | 900.48 | | 949.4 | 900.47 | |
| 957.18 | 900.39 | | 997.18 | 900.04 | | 999.85 | 900.02 | |
| 1007.18 | 899.95 | | 1009.94 | 899.93 | | 1017.18 | 899.9 | |
| 1020.02 | 899.92 | | 1027.18 | 899.94 | | 1030.11 | 899.96 | |
| 1037.18 | 899.98 | | 1040.2 | 899.98 | | 1047.18 | 899.99 | |
| 1050.29 | 899.97 | | 1057.18 | 899.95 | | 1060.38 | 899.93 | |
| 1067.18 | 899.92 | | 1070.47 | 899.89 | | 1077.18 | 899.88 | |
| 1080.56 | 899.85 | | 1087.18 | 899.81 | | 1090.65 | 899.78 | |
| 1097.18 | 899.74 | | 1100.74 | 899.74 | | 1107.18 | 899.75 | |
| 1110.83 | 899.78 | | 1120.92 | 899.89 | | 1127.19 | 899.98 | |
| 1131.01 | 900.05 | | 1137.19 | 900.14 | | 1141.1 | 900.21 | |
| 1147.19 | 900.28 | | 1151.19 | 900.21 | | 1161.28 | 900.39 | |
| 1167.19 | 900.51 | | 1171.37 | 900.58 | | 1174.88 | 900.65 | |
| 1181.46 | 900.76 | | 1191.55 | 900.9 | | 1197.19 | 900.96 | |
| 1201.64 | 901.03 | | 1207.19 | 901.08 | | 1211.73 | 901.15 | |
| 1252.08 | 901.52 | | 1287.19 | 901.8 | | 1317.19 | 902.07 | |
| 1322.7 | 902.13 | | 1327.19 | 902.16 | | 1342.88 | 902.3 | |
| 1347.19 | 902.33 | | 1352.97 | 902.39 | | 1357.19 | 902.42 | |
| 1367.19 | 902.52 | | 1373.15 | 902.59 | | 1383.25 | 902.69 | |
| 1387.2 | 902.74 | | 1407.2 | 902.94 | | 1413.52 | 903.02 | |
| 1433.69 | 903.22 | | 1437.2 | 903.25 | | 1443.78 | 903.32 | |
| 1447.2 | 903.35 | | 1487.2 | 903.75 | | 1494.23 | 903.81 | |
| 1507.2 | 903.94 | | 1527.2 | 904.07 | | 1544.67 | 904.13 | |
| 1547.2 | 904.15 | | 1554.76 | 904.17 | | 1557.2 | 904.18 | |
| 1564.85 | 904.2 | | 1567.2 | 904.21 | | 1574.94 | 904.23 | |
| 1577.2 | 904.24 | | 1585.03 | 904.26 | | 1587.2 | 904.27 | |
| 1595.12 | 904.29 | | 1597.2 | 904.3 | | 1605.21 | 904.32 | |
| 1607.2 | 904.33 | | 1615.3 | 904.36 | | 1617.2 | 904.36 | |

| | | | | | |
|---|---|---|---|---|---|
| 1625.38 | 904.39 | 1627.2 | 904.39 | 1635.47 | 904.42 |
| 1637.21 | 904.43 | 1645.57 | 904.45 | 1647.21 | 904.46 |
| 1655.66 | 904.47 | 1657.21 | 904.48 | 1665.75 | 904.5 |
| 1667.21 | 904.5 | 1675.84 | 904.52 | 1677.21 | 904.52 |
| 1685.93 | 904.54 | 1687.21 | 904.54 | 1696.02 | 904.56 |
| 1706.11 | 904.57 | 1707.21 | 904.56 | 1716.2 | 904.58 |
| 1717.21 | 904.58 | 1726.28 | 904.6 | 1727.21 | 904.61 |
| 1736.37 | 904.63 | 1737.21 | 904.63 | 1746.46 | 904.65 |
| 1747.21 | 904.65 | 1756.55 | 904.67 | 1757.21 | 904.67 |
| 1766.64 | 904.7 | 1767.21 | 904.7 | 1776.73 | 904.73 |
| 1777.21 | 904.73 | 1786.82 | 904.76 | 1787.21 | 904.76 |
| 1796.91 | 904.79 | 1797.21 | 904.79 | 1801.96 | 904.8 |

Upstream Bridge Cross Section Data
Station Elevation Data num= 315

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 909.91 | 1.27 | 909.86 | 7.41 | 909.69 | 11.36 | 909.51 | 17.41 | 909.32 |
| 21.44 | 909.13 | 27.41 | 908.95 | 31.53 | 908.76 | 43.18 | 908.41 | 47.41 | 908.24 |
| 53.1 | 908.08 | 57.41 | 907.92 | 63.01 | 907.77 | 67.41 | 907.63 | 77.41 | 907.38 |
| 86.49 | 907.13 | 92.07 | 907.01 | 97.41 | 906.88 | 102.16 | 906.84 | 107.41 | 906.74 |
| 112.57 | 906.66 | 117.41 | 906.67 | 122.48 | 906.6 | 127.42 | 906.58 | 132.41 | 906.5 |
| 142.32 | 906.37 | 147.42 | 906.29 | 152.61 | 906.24 | 157.42 | 906.18 | 162.7 | 906.14 |
| 167.42 | 906.09 | 172.79 | 906.06 | 177.42 | 906.01 | 182.88 | 905.99 | 187.42 | 905.94 |
| 192.97 | 905.92 | 197.42 | 905.87 | 203.06 | 905.83 | 223.23 | 905.61 | 277.42 | 905.07 |
| 287.42 | 904.98 | 291.01 | 904.94 | 303.95 | 904.83 | 307.42 | 904.79 | 317.42 | 904.71 |
| 327.42 | 904.65 | 340.57 | 904.61 | 347.42 | 904.57 | 354.39 | 904.5 | 357.42 | 904.49 |
| 364.48 | 904.43 | 367.42 | 904.42 | 374.57 | 904.37 | 377.42 | 904.36 | 384.67 | 904.3 |
| 387.43 | 904.29 | 390.14 | 904.29 | 404.85 | 904.18 | 407.43 | 904.17 | 414.94 | 904.11 |
| 417.43 | 904.11 | 437.43 | 903.95 | 439.71 | 903.94 | 455.29 | 903.83 | 475.47 | 903.73 |
| 477.43 | 903.74 | 485.56 | 903.7 | 487.43 | 903.72 | 489.27 | 903.72 | 505.74 | 903.57 |
| 507.43 | 903.51 | 515.83 | 903.46 | 517.43 | 903.42 | 525.91 | 903.42 | 537.43 | 903.49 |
| 538.83 | 903.51 | 547.43 | 903.43 | 555.01 | 903.25 | 556.18 | 903.22 | 557.43 | 903.23 |
| 566.27 | 903.05 | 567.43 | 903.06 | 576.36 | 903.38 | 577.43 | 903.39 | 586.45 | 903.44 |
| 588.39 | 903.46 | 606.63 | 903.44 | 607.43 | 903.45 | 616.72 | 903.44 | 626.8 | 903.43 |
| 627.43 | 903.44 | 636.9 | 903.42 | 637.44 | 903.43 | 637.97 | 903.43 | 657.08 | 903.4 |
| 659.52 | 903.4 | 667.17 | 903.38 | 667.44 | 903.39 | 677.26 | 903.37 | 677.44 | 903.37 |
| 687.35 | 903.35 | 687.53 | 903.35 | 697.44 | 903.33 | 697.67 | 903.33 | 707.44 | 903.32 |
| 717.44 | 903.32 | 717.62 | 903.31 | 727.44 | 903.31 | 727.7 | 903.3 | 737.44 | 903.3 |
| 737.79 | 903.29 | 747.44 | 903.2 | 747.88 | 903.2 | 757.44 | 903.06 | 757.97 | 903.07 |
| 767.44 | 903.2 | 768.06 | 903.21 | 777.44 | 903.13 | 778.15 | 903.13 | 787.44 | 903.05 |
| 788.24 | 903.04 | 797.44 | 902.96 | 798.33 | 902.95 | 807.44 | 902.88 | 808.42 | 902.87 |
| 827.44 | 902.7 | 828.59 | 902.7 | 857.44 | 902.46 | 858.86 | 902.45 | 867.44 | 902.37 |
| 868.95 | 902.36 | 877.44 | 902.29 | 879.04 | 902.28 | 887.45 | 902.21 | 889.14 | 902.2 |
| 897.45 | 902.12 | 899.23 | 902.11 | 907.45 | 902.03 | 909.32 | 902 | 917.45 | 901.82 |
| 919.41 | 901.74 | 927.45 | 901.49 | 929.49 | 901.39 | 937.45 | 901.27 | 939.58 | 901.17 |
| 947.45 | 901.05 | 949.67 | 900.97 | 957.45 | 900.84 | 959.76 | 900.76 | 967.45 | 900.43 |
| 969.85 | 900.27 | 977.45 | 900.14 | 979.94 | 900 | 985 | 896 | 990.03 | 896 |
| 997.45 | 900.05 | 1000.12 | 900.11 | 1007.45 | 899.99 | 1010.21 | 899.96 | 1017.45 | 899.8 |
| 1020.3 | 899.76 | 1027.45 | 899.76 | 1030.38 | 899.74 | 1037.45 | 899.72 | 1040.47 | 899.72 |
| 1047.45 | 899.7 | 1050.56 | 899.7 | 1057.45 | 899.68 | 1060.65 | 899.57 | 1067.45 | 899.56 |
| 1070.74 | 899.54 | 1077.45 | 899.53 | 1080.83 | 899.56 | 1087.45 | 899.52 | 1090.92 | 899.53 |
| 1097.45 | 899.52 | 1101.01 | 899.49 | 1107.45 | 899.49 | 1111.1 | 899.47 | 1117.45 | 899.45 |
| 1121.19 | 899.45 | 1127.45 | 899.44 | 1131.28 | 899.47 | 1137.46 | 899.47 | 1141.37 | 899.48 |
| 1147.46 | 899.29 | 1151.46 | 899.31 | 1153.26 | 899.25 | 1157.46 | 899.1 | 1161.55 | 899.16 |
| 1167.46 | 899.27 | 1171.64 | 899.33 | 1177.46 | 899.44 | 1181.73 | 899.49 | 1187.46 | 899.66 |
| 1191.82 | 899.71 | 1197.46 | 899.88 | 1201.91 | 899.95 | 1207.46 | 900.11 | 1212 | 900.2 |
| 1217.46 | 900.36 | 1222.09 | 900.45 | 1227.46 | 900.61 | 1232.17 | 900.68 | 1237.46 | 900.84 |
| 1242.26 | 900.84 | 1247.46 | 900.97 | 1252.35 | 900.94 | 1257.46 | 901.05 | 1262.44 | 901.17 |
| 1267.46 | 901.27 | 1272.53 | 901.3 | 1277.46 | 901.4 | 1282.62 | 901.44 | 1287.46 | 901.54 |
| 1292.71 | 901.48 | 1297.46 | 901.57 | 1302.8 | 901.51 | 1307.46 | 901.6 | 1312.89 | 901.59 |
| 1317.46 | 901.68 | 1322.98 | 901.69 | 1327.46 | 901.78 | 1333.07 | 901.83 | 1337.46 | 901.83 |
| 1343.15 | 902.08 | 1347.46 | 902.06 | 1353.24 | 902.3 | 1357.46 | 902.29 | 1363.33 | 902.45 |
| 1367.46 | 902.44 | 1373.42 | 902.47 | 1377.46 | 902.46 | 1383.52 | 902.51 | 1387.47 | 902.5 |
| 1393.61 | 902.56 | 1397.47 | 902.55 | 1403.7 | 902.59 | 1407.47 | 902.58 | 1413.79 | 902.6 |
| 1417.47 | 902.59 | 1423.88 | 902.6 | 1427.47 | 902.59 | 1433.97 | 902.6 | 1434.37 | 902.6 |
| 1437.47 | 902.59 | 1444.05 | 902.6 | 1447.47 | 902.59 | 1454.14 | 902.62 | 1457.47 | 902.61 |
| 1464.23 | 902.68 | 1467.47 | 902.67 | 1474.32 | 902.85 | 1477.47 | 902.86 | 1484.41 | 903.17 |
| 1487.47 | 903.21 | 1494.5 | 903.54 | 1497.47 | 903.59 | 1504.59 | 903.73 | 1506.45 | 903.75 |
| 1507.47 | 903.76 | 1514.68 | 903.8 | 1517.47 | 903.82 | 1524.77 | 903.86 | 1527.47 | 903.87 |
| 1537.47 | 903.94 | 1544.94 | 904.06 | 1547.47 | 904.08 | 1555.03 | 904.17 | 1557.47 | 904.18 |
| 1565.12 | 904.23 | 1577.47 | 904.29 | 1587.47 | 904.29 | 1595.39 | 904.23 | 1597.47 | 904.21 |
| 1605.48 | 904.18 | 1607.47 | 904.17 | 1615.57 | 904.16 | 1617.47 | 904.15 | 1625.66 | 904.14 |
| 1627.47 | 904.13 | 1635.75 | 904.15 | 1637.47 | 904.15 | 1645.84 | 904.18 | 1647.48 | 904.18 |
| 1655.93 | 904.21 | 1657.48 | 904.21 | 1666.02 | 904.23 | 1676.11 | 904.24 | 1677.48 | 904.23 |
| 1686.2 | 904.22 | 1687.48 | 904.21 | 1696.29 | 904.24 | 1697.48 | 904.26 | 1706.38 | 904.32 |
| 1707.48 | 904.33 | 1716.47 | 904.37 | 1717.48 | 904.37 | 1726.56 | 904.42 | 1727.48 | 904.41 |
| 1736.65 | 904.46 | 1737.48 | 904.45 | 1746.73 | 904.49 | 1747.48 | 904.49 | 1756.82 | 904.52 |
| 1757.48 | 904.52 | 1766.91 | 904.58 | 1767.48 | 904.58 | 1777 | 904.76 | 1777.48 | 904.75 |
| 1787.09 | 904.93 | 1787.48 | 904.93 | 1797.18 | 905.2 | 1797.48 | 905.25 | 1801.97 | 905.31 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .052 | 86.49 | .04 | 555.01 | .072 | 1434.37 | .04 | 1506.45 | .032 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 947.45 | 1247.46 | .3 | .5 |

Downstream Deck/Roadway Coordinates
num= 258

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 910.24 | | 1 | 910.23 | | 7.14 | 910.13 | |
| 11.08 | 910.08 | | 17.14 | 909.97 | | 21.17 | 909.91 | |
| 27.14 | 909.79 | | 31.26 | 909.73 | | 37.14 | 909.61 | |
| 41.35 | 909.55 | | 47.14 | 909.42 | | 51.44 | 909.36 | |
| 57.14 | 909.22 | | 61.53 | 909.16 | | 67.14 | 909.04 | |
| 71.62 | 908.98 | | 77.14 | 908.88 | | 81.71 | 908.81 | |
| 91.8 | 908.63 | | 147.15 | 907.53 | | 152.34 | 907.42 | |
| 162.43 | 907.23 | | 167.15 | 907.13 | | 177.15 | 906.95 | |
| 182.61 | 906.84 | | 192.7 | 906.66 | | 197.15 | 906.59 | |
| 202.79 | 906.49 | | 207.15 | 906.43 | | 253.23 | 905.65 | |
| 280.83 | 905.21 | | 293.59 | 905.04 | | 297.15 | 904.98 | |
| 303.68 | 904.91 | | 307.15 | 904.86 | | 323.85 | 904.68 | |
| 327.15 | 904.64 | | 354.12 | 904.37 | | 357.15 | 904.35 | |
| 364.21 | 904.27 | | 367.15 | 904.25 | | 374.3 | 904.17 | |
| 377.15 | 904.15 | | 397.16 | 903.92 | | 404.58 | 903.82 | |
| 407.16 | 903.79 | | 409.7 | 903.77 | | 417.16 | 903.7 | |
| 437.16 | 903.61 | | 444.93 | 903.59 | | 447.16 | 903.58 | |
| 455.02 | 903.56 | | 457.16 | 903.56 | | 465.11 | 903.54 | |
| 467.16 | 903.53 | | 475.2 | 903.51 | | 477.16 | 903.51 | |
| 485.29 | 903.49 | | 487.16 | 903.48 | | 495.38 | 903.46 | |
| 497.16 | 903.45 | | 505.47 | 903.43 | | 507.16 | 903.43 | |
| 515.55 | 903.41 | | 517.16 | 903.4 | | 525.64 | 903.38 | |
| 527.16 | 903.38 | | 535.73 | 903.36 | | 537.16 | 903.36 | |
| 545.82 | 903.33 | | 547.16 | 903.33 | | 555.91 | 903.31 | |
| 557.16 | 903.3 | | 566 | 903.28 | | 567.16 | 903.28 | |
| 576.09 | 903.25 | | 577.16 | 903.25 | | 586.18 | 903.22 | |
| 587.16 | 903.22 | | 596.27 | 903.19 | | 597.16 | 903.19 | |
| 606.36 | 903.16 | | 607.16 | 903.15 | | 616.44 | 903.12 | |
| 617.16 | 903.12 | | 626.53 | 903.09 | | 627.16 | 903.09 | |
| 636.62 | 903.05 | | 637.16 | 903.05 | | 646.72 | 903.02 | |
| 647.17 | 903.01 | | 656.81 | 902.97 | | 657.17 | 902.97 | |
| 666.9 | 902.9 | | 667.17 | 902.89 | | 676.99 | 902.81 | |
| 677.17 | 902.81 | | 687.08 | 902.72 | | 687.17 | 902.72 | |
| 691.95 | 902.68 | | 697.17 | 902.63 | | 697.53 | 902.63 | |
| 707.17 | 902.55 | | 707.26 | 902.55 | | 717.17 | 902.46 | |
| 717.34 | 902.46 | | 727.17 | 902.38 | | 727.43 | 902.38 | |
| 737.17 | 902.31 | | 737.52 | 902.31 | | 747.17 | 902.24 | |
| 747.61 | 902.24 | | 757.17 | 902.17 | | 757.7 | 902.16 | |
| 767.17 | 902.09 | | 767.79 | 902.08 | | 777.17 | 902.01 | |
| 777.88 | 902 | | 787.17 | 901.92 | | 787.97 | 901.92 | |
| 797.17 | 901.84 | | 798.06 | 901.83 | | 807.17 | 901.75 | |
| 808.15 | 901.75 | | 847.17 | 901.4 | | 848.5 | 901.39 | |
| 857.17 | 901.31 | | 858.59 | 901.3 | | 867.17 | 901.22 | |
| 868.68 | 901.21 | | 877.18 | 901.13 | | 878.78 | 901.12 | |
| 887.18 | 901.04 | | 888.87 | 901.03 | | 897.18 | 900.96 | |
| 898.96 | 900.94 | | 907.18 | 900.87 | | 917.18 | 900.77 | |
| 919.13 | 900.76 | | 947.18 | 900.48 | | 949.4 | 900.47 | |
| 957.18 | 900.39 | | 997.18 | 900.04 | | 999.85 | 900.02 | |
| 1007.18 | 899.95 | | 1009.94 | 899.93 | | 1017.18 | 899.9 | |
| 1020.02 | 899.92 | | 1027.18 | 899.94 | | 1030.11 | 899.96 | |
| 1037.18 | 899.98 | | 1040.2 | 899.98 | | 1047.18 | 899.99 | |
| 1050.29 | 899.97 | | 1057.18 | 899.95 | | 1060.38 | 899.93 | |
| 1067.18 | 899.92 | | 1070.47 | 899.89 | | 1077.18 | 899.88 | |
| 1080.56 | 899.85 | | 1087.18 | 899.81 | | 1090.65 | 899.78 | |
| 1097.18 | 899.74 | | 1100.74 | 899.74 | | 1107.18 | 899.75 | |
| 1110.83 | 899.78 | | 1120.92 | 899.89 | | 1127.19 | 899.98 | |
| 1131.01 | 900.05 | | 1137.19 | 900.14 | | 1141.1 | 900.21 | |
| 1147.19 | 900.28 | | 1151.19 | 900.21 | | 1161.28 | 900.39 | |
| 1167.19 | 900.51 | | 1171.37 | 900.58 | | 1174.88 | 900.65 | |
| 1181.46 | 900.76 | | 1191.55 | 900.9 | | 1197.19 | 900.96 | |
| 1201.64 | 901.03 | | 1207.19 | 901.08 | | 1211.73 | 901.15 | |
| 1252.08 | 901.52 | | 1287.19 | 901.8 | | 1317.19 | 902.07 | |
| 1322.7 | 902.13 | | 1327.19 | 902.16 | | 1342.88 | 902.3 | |
| 1347.19 | 902.33 | | 1352.97 | 902.39 | | 1357.19 | 902.42 | |
| 1367.19 | 902.52 | | 1373.15 | 902.59 | | 1383.25 | 902.69 | |
| 1387.2 | 902.74 | | 1407.2 | 902.94 | | 1413.52 | 903.02 | |
| 1433.69 | 903.22 | | 1437.2 | 903.25 | | 1443.78 | 903.32 | |
| 1447.2 | 903.35 | | 1487.2 | 903.75 | | 1494.23 | 903.81 | |

| | | | | | |
|---|---|---|---|---|---|
| 1507.2 | 903.94 | 1527.2 | 904.07 | 1544.67 | 904.13 |
| 1547.2 | 904.15 | 1554.76 | 904.17 | 1557.2 | 904.18 |
| 1564.85 | 904.2 | 1567.2 | 904.21 | 1574.94 | 904.23 |
| 1577.2 | 904.24 | 1585.03 | 904.26 | 1587.2 | 904.27 |
| 1595.12 | 904.29 | 1597.2 | 904.3 | 1605.21 | 904.32 |
| 1607.2 | 904.33 | 1615.3 | 904.36 | 1617.2 | 904.36 |
| 1625.38 | 904.39 | 1627.2 | 904.39 | 1635.47 | 904.42 |
| 1637.21 | 904.43 | 1645.57 | 904.45 | 1647.21 | 904.46 |
| 1655.66 | 904.47 | 1657.21 | 904.48 | 1665.75 | 904.5 |
| 1667.21 | 904.5 | 1675.84 | 904.52 | 1677.21 | 904.52 |
| 1685.93 | 904.54 | 1687.21 | 904.54 | 1696.02 | 904.56 |
| 1706.11 | 904.57 | 1707.21 | 904.56 | 1716.2 | 904.58 |
| 1717.21 | 904.58 | 1726.28 | 904.6 | 1727.21 | 904.61 |
| 1736.37 | 904.63 | 1737.21 | 904.63 | 1746.46 | 904.65 |
| 1747.21 | 904.65 | 1756.55 | 904.67 | 1757.21 | 904.67 |
| 1766.64 | 904.7 | 1767.21 | 904.7 | 1776.73 | 904.73 |
| 1777.21 | 904.73 | 1786.82 | 904.76 | 1787.21 | 904.76 |
| 1796.91 | 904.79 | 1797.21 | 904.79 | 1801.96 | 904.8 |

Downstream Bridge Cross Section Data
Station Elevation Data num= 285

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 912.05 | 3.74 | 911.71 | 6.64 | 911.46 | 13.83 | 910.8 | 16.64 | 910.5 |
| 23.92 | 910.2 | 26.64 | 910.06 | 34.01 | 909.91 | 36.64 | 909.87 | 44.1 | 909.66 |
| 46.64 | 909.6 | 54.19 | 909.39 | 64.28 | 909.18 | 66.64 | 909.14 | 74.37 | 909.05 |
| 76.64 | 909.03 | 84.46 | 908.98 | 116.64 | 908.81 | 124.81 | 908.75 | 129.74 | 908.72 |
| 134.91 | 908.69 | 136.65 | 908.69 | 145 | 908.73 | 146.65 | 908.74 | 156.65 | 908.87 |
| 166.65 | 908.94 | 175.27 | 908.75 | 176.65 | 908.73 | 185.36 | 907.22 | 195.44 | 905.35 |
| 196.65 | 905.08 | 205.53 | 904.47 | 206.65 | 904.39 | 215.62 | 904.23 | 217.66 | 904.19 |
| 235.8 | 903.88 | 245.89 | 903.77 | 246.65 | 903.76 | 255.98 | 903.69 | 256.65 | 903.69 |
| 266.07 | 903.65 | 286.65 | 903.63 | 287.05 | 903.62 | 296.65 | 903.57 | 306.42 | 903.47 |
| 306.65 | 903.46 | 306.87 | 903.46 | 326.6 | 903.27 | 336.65 | 903.18 | 346.65 | 903.15 |
| 346.78 | 903.15 | 356.65 | 903.1 | 356.87 | 903.1 | 366.66 | 903 | 376.27 | 902.93 |
| 377.06 | 902.93 | 386.66 | 902.88 | 387.15 | 902.88 | 396.66 | 902.84 | 397.23 | 902.84 |
| 406.66 | 902.8 | 407.32 | 902.79 | 416.66 | 902.73 | 425.83 | 902.65 | 426.66 | 902.65 |
| 427.5 | 902.64 | 436.66 | 902.57 | 437.59 | 902.57 | 446.66 | 902.54 | 457.77 | 902.53 |
| 466.66 | 902.56 | 476.66 | 902.64 | 477.95 | 902.66 | 486.66 | 902.75 | 488.04 | 902.76 |
| 496.66 | 902.85 | 498.12 | 902.86 | 506.66 | 902.95 | 526.66 | 903.08 | 528.39 | 903.08 |
| 536.66 | 903.09 | 538.48 | 903.08 | 548.57 | 903.08 | 556.66 | 903.12 | 558.66 | 903.14 |
| 574.52 | 903.39 | 576.66 | 903.43 | 586.66 | 903.56 | 588.93 | 903.57 | 596.66 | 903.59 |
| 599.01 | 903.55 | 606.66 | 903.33 | 609.1 | 903.22 | 616.66 | 902.7 | 624.09 | 902.08 |
| 626.67 | 901.91 | 629.29 | 901.78 | 636.67 | 901.34 | 646.67 | 901.01 | 649.47 | 900.95 |
| 656.67 | 900.85 | 686.67 | 900.56 | 689.83 | 900.52 | 696.67 | 900.45 | 699.91 | 900.4 |
| 706.67 | 900.33 | 716.67 | 900.21 | 726.67 | 900.16 | 730.18 | 900.17 | 736.67 | 900.2 |
| 740.27 | 900.23 | 756.67 | 900.41 | 760.45 | 900.43 | 766.67 | 900.48 | 770.54 | 900.5 |
| 773.04 | 900.52 | 786.67 | 900.63 | 790.72 | 900.67 | 800.8 | 900.79 | 810.89 | 900.94 |
| 816.67 | 901.01 | 826.67 | 901.07 | 831.07 | 901.07 | 836.67 | 901.08 | 841.16 | 901.04 |
| 846.67 | 901.03 | 851.25 | 901 | 856.67 | 900.99 | 861.34 | 900.97 | 876.68 | 900.97 |
| 881.53 | 900.98 | 886.68 | 900.98 | 891.62 | 900.99 | 896.68 | 900.99 | 901.7 | 900.98 |
| 906.68 | 900.99 | 911.79 | 900.96 | 923.123 | 900.764 | 926.862 | 900.757 | 933.213 | 900.734 |
| 936.862 | 900.761 | 943.302 | 900.714 | 946.862 | 900.721 | 953.392 | 900.668 | 956.863 | 900.675 |
| 963.481 | 900.704 | 966.863 | 900.757 | 973.57 | 900.8 | 976.864 | 900.854 | 981.865 | 900.783 |
| 988.928 | 900.183 | 991.865 | 900.137 | 994.751 | 899.954 | 1001.866 | 899.625 | 1004.664 | 899.451 |
| 1011.866 | 899.151 | 1019.196 | 898.667 | 1021.866 | 898.502 | 1029.286 | 898.059 | 1031.867 | 897.834 |
| 1039.375 | 896.637 | 1041.867 | 896 | 1045 | 895.51 | 1051.868 | 895.51 | 1059.554 | 895.5 |
| 1069.643 | 896.275 | 1071.868 | 896.24 | 1079.733 | 896.467 | 1081.869 | 896.453 | 1089.822 | 896.632 |
| 1091.869 | 896.644 | 1099.911 | 896.862 | 1101.869 | 896.876 | 1110.001 | 897.191 | 1111.87 | 897.235 |
| 1120.09 | 897.912 | 1121.87 | 898.101 | 1130.18 | 898.63 | 1131.871 | 898.78 | 1140.269 | 899.132 |
| 1141.871 | 899.249 | 1150.358 | 899.593 | 1151.871 | 899.672 | 1160.448 | 899.977 | 1161.872 | 900.009 |
| 1170.537 | 900.183 | 1171.872 | 900.201 | 1173.184 | 900.213 | 1181.873 | 900.328 | 1183.097 | 900.33 |
| 1191.873 | 900.435 | 1200.805 | 900.573 | 1201.873 | 900.58 | 1209.65 | 900.46 | 1211.69 | 900.44 |
| 1219.74 | 900.54 | 1221.69 | 900.54 | 1239.92 | 900.74 | 1241.69 | 900.77 | 1250.01 | 900.85 |
| 1251.69 | 900.87 | 1260.1 | 900.93 | 1261.69 | 900.95 | 1271.69 | 901.01 | 1280.27 | 901.03 |
| 1281.69 | 901.04 | 1291.69 | 901.04 | 1325.45 | 901.02 | 1326.69 | 901.02 | 1335.54 | 900.99 |
| 1336.69 | 900.98 | 1345.63 | 900.92 | 1346.69 | 900.91 | 1355.72 | 900.75 | 1356.69 | 900.73 |
| 1365.81 | 900.73 | 1366.69 | 900.74 | 1375.9 | 901.07 | 1376.69 | 901.13 | 1386 | 902.04 |
| 1386.7 | 902.13 | 1396.7 | 903.28 | 1406.17 | 903.84 | 1406.7 | 903.87 | 1416.26 | 904.17 |
| 1416.7 | 904.18 | 1426.35 | 904.35 | 1426.7 | 904.35 | 1436.44 | 904.48 | 1436.7 | 904.49 |
| 1446.53 | 904.5 | 1446.7 | 904.5 | 1456.62 | 904.46 | 1456.7 | 904.46 | 1461.39 | 904.41 |
| 1466.7 | 904.36 | 1476.7 | 904.23 | 1486.89 | 904.23 | 1496.7 | 904.3 | 1496.98 | 904.31 |
| 1506.7 | 904.42 | 1507.06 | 904.43 | 1516.7 | 904.56 | 1517.15 | 904.57 | 1526.7 | 904.77 |
| 1527.24 | 904.79 | 1546.7 | 905.41 | 1547.42 | 905.42 | 1556.7 | 905.64 | 1557.51 | 905.65 |
| 1566.7 | 905.84 | 1576.7 | 906.07 | 1586.7 | 906.27 | 1587.78 | 906.29 | 1606.7 | 906.45 |
| 1618.04 | 906.63 | 1626.7 | 906.79 | 1628.14 | 906.81 | 1636.71 | 907.01 | 1638.23 | 907.03 |
| 1646.71 | 907.21 | 1656.71 | 907.22 | 1658.41 | 907.21 | 1666.71 | 907.07 | 1668.5 | 907.06 |
| 1676.71 | 906.88 | 1678.59 | 906.88 | 1686.71 | 906.73 | 1688.68 | 906.73 | 1696.71 | 906.64 |
| 1698.77 | 906.64 | 1708.85 | 906.63 | 1716.71 | 906.66 | 1726.71 | 906.61 | 1739.12 | 906.46 |
| 1746.71 | 906.35 | 1756.71 | 906.2 | 1766.71 | 906.09 | 1769.39 | 906.05 | 1776.71 | 905.96 |
| 1779.48 | 905.92 | 1789.57 | 905.75 | 1796.71 | 905.59 | 1799.66 | 905.55 | 1801.96 | 905.51 |

```
Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .032  129.74     .041019.196    .0721191.873     .04  1496.7    .032

Bank Sta: Left   Right    Coeff Contr.   Expan.
       976.8641200.805             .3       .5

Upstream Embankment side slope                =      2 horiz. to 1.0 vertical
Downstream Embankment side slope              =      2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts = 1

Culvert Name     Shape      Rise    Span
Culvert #2      Circular      2
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  4      88     .013     .013        0                .5                 1
Upstream   Elevation = 896
           Centerline Station = 987.1
Downstream Elevation = 895.5
           Centerline Station = 1048.5

CULVERT OUTPUT  Profile #100-Year  Culv Group:  Culvert #2

  Q Culv Group (cfs)         16.44    Culv Full Len (ft)         88.00
  # Barrels                      1    Culv Vel US (ft/s)          5.23
  Q Barrel (cfs)             16.44    Culv Vel DS (ft/s)          5.23
  E.G. US. (ft)             902.02    Culv Inv El Up (ft)       896.00
  W.S. US. (ft)             901.90    Culv Inv El Dn (ft)       895.50
  E.G. DS (ft)              901.05    Culv Frctn Ls (ft)          0.46
  W.S. DS (ft)              900.91    Culv Exit Loss (ft)         0.29
  Delta EG (ft)               0.97    Culv Entr Loss (ft)         0.21
  Delta WS (ft)               0.99    Q Weir (cfs)             1820.44
  E.G. IC (ft)              902.01    Weir Sta Lft (ft)         908.34
  E.G. OC (ft)              902.02    Weir Sta Rgt (ft)        1311.16
  Culvert Control           Outlet    Weir Submerg                0.38
  Culv WS Inlet (ft)        898.00    Weir Max Depth (ft)         2.28
  Culv WS Outlet (ft)       897.50    Weir Avg Depth (ft)         1.34
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)    539.62
  Culv Crt Depth (ft)         1.46    Min El Weir Flow (ft)     899.75


CULVERT OUTPUT  Profile #Method 4  Culv Group:  Culvert #2

  Q Culv Group (cfs)         12.76    Culv Full Len (ft)         88.00
  # Barrels                      1    Culv Vel US (ft/s)          4.06
  Q Barrel (cfs)             12.76    Culv Vel DS (ft/s)          4.06
  E.G. US. (ft)             902.07    Culv Inv El Up (ft)       896.00
  W.S. US. (ft)             901.95    Culv Inv El Dn (ft)       895.50
  E.G. DS (ft)              901.52    Culv Frctn Ls (ft)          0.28
  W.S. DS (ft)              901.40    Culv Exit Loss (ft)         0.14
  Delta EG (ft)               0.55    Culv Entr Loss (ft)         0.13
  Delta WS (ft)               0.54    Q Weir (cfs)             1828.43
  E.G. IC (ft)              902.08    Weir Sta Lft (ft)         947.45
  E.G. OC (ft)              902.07    Weir Sta Rgt (ft)        1247.46
  Culvert Control           Outlet    Weir Submerg                0.63
  Culv WS Inlet (ft)        898.00    Weir Max Depth (ft)         2.33
  Culv WS Outlet (ft)       897.50    Weir Avg Depth (ft)         1.72
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)    517.34
  Culv Crt Depth (ft)         1.28    Min El Weir Flow (ft)     899.75


Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.
         The reported inlet energy grade answer may not be valid.

CULVERT OUTPUT  Profile #Method 1  Culv Group:  Culvert #2

  Q Culv Group (cfs)         12.03    Culv Full Len (ft)         88.00
  # Barrels                      1    Culv Vel US (ft/s)          3.83
  Q Barrel (cfs)             12.03    Culv Vel DS (ft/s)          3.83
  E.G. US. (ft)             902.07    Culv Inv El Up (ft)       896.00
```

| | | | |
|---|---|---|---|
| W.S. US. (ft) | 901.95 | Culv Inv El Dn (ft) | 895.50 |
| E.G. DS (ft) | 901.59 | Culv Frctn Ls (ft) | 0.25 |
| W.S. DS (ft) | 901.48 | Culv Exit Loss (ft) | 0.12 |
| Delta EG (ft) | 0.48 | Culv Entr Loss (ft) | 0.11 |
| Delta WS (ft) | 0.47 | Q Weir (cfs) | 1829.73 |
| E.G. IC (ft) | 902.04 | Weir Sta Lft (ft) | 947.45 |
| E.G. OC (ft) | 902.07 | Weir Sta Rgt (ft) | 1247.46 |
| Culvert Control | Outlet | Weir Submerg | 0.67 |
| Culv WS Inlet (ft) | 898.00 | Weir Max Depth (ft) | 2.33 |
| Culv WS Outlet (ft) | 897.50 | Weir Avg Depth (ft) | 1.73 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 517.59 |
| Culv Crt Depth (ft) | 1.25 | Min El Weir Flow (ft) | 899.75 |

Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.
The reported inlet energy grade answer may not be valid.
Warning: During the culvert outlet computations, the program could not balance the culvert/weir flow.

The reported outlet energy grade answer may not be valid.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.312

INPUT
Description: Thalweg Sta. 1079.73 - Upstream of Culver @ Sta. 1.232
Station Elevation Data num= 285

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 912.05 | 3.74 | 911.71 | 6.64 | 911.46 | 13.83 | 910.8 | 16.64 | 910.5 |
| 23.92 | 910.2 | 26.64 | 910.06 | 34.01 | 909.91 | 36.64 | 909.87 | 44.1 | 909.66 |
| 46.64 | 909.6 | 54.19 | 909.39 | 64.28 | 909.18 | 66.64 | 909.14 | 74.37 | 909.05 |
| 76.64 | 909.03 | 84.46 | 908.98 | 116.64 | 908.81 | 124.81 | 908.75 | 129.74 | 908.72 |
| 134.91 | 908.69 | 136.65 | 908.69 | 145 | 908.73 | 146.65 | 908.74 | 156.65 | 908.87 |
| 166.65 | 908.94 | 175.27 | 908.75 | 176.65 | 908.73 | 185.36 | 907.22 | 195.44 | 905.35 |
| 196.65 | 905.08 | 205.53 | 904.47 | 206.65 | 904.39 | 215.62 | 904.23 | 217.66 | 904.19 |
| 235.8 | 903.88 | 245.89 | 903.77 | 246.65 | 903.76 | 255.98 | 903.69 | 256.65 | 903.69 |
| 266.07 | 903.65 | 286.65 | 903.63 | 287.05 | 903.62 | 296.65 | 903.57 | 306.42 | 903.47 |
| 306.65 | 903.46 | 306.87 | 903.46 | 326.6 | 903.27 | 336.65 | 903.18 | 346.65 | 903.15 |
| 346.78 | 903.15 | 356.65 | 903.1 | 356.87 | 903.1 | 366.66 | 903 | 376.27 | 902.93 |
| 377.06 | 902.93 | 386.66 | 902.88 | 387.15 | 902.88 | 396.66 | 902.84 | 397.23 | 902.84 |
| 406.66 | 902.8 | 407.32 | 902.79 | 416.66 | 902.73 | 425.83 | 902.65 | 426.66 | 902.65 |
| 427.5 | 902.64 | 436.66 | 902.57 | 437.59 | 902.57 | 446.66 | 902.54 | 457.77 | 902.53 |
| 466.66 | 902.56 | 476.66 | 902.64 | 477.95 | 902.66 | 486.66 | 902.75 | 488.04 | 902.76 |
| 496.66 | 902.85 | 498.12 | 902.86 | 506.66 | 902.95 | 526.66 | 903.08 | 528.39 | 903.08 |
| 536.66 | 903.09 | 538.48 | 903.08 | 548.57 | 903.08 | 556.66 | 903.12 | 558.66 | 903.14 |
| 574.52 | 903.39 | 576.66 | 903.43 | 586.66 | 903.56 | 588.93 | 903.57 | 596.66 | 903.59 |
| 599.01 | 903.55 | 606.66 | 903.33 | 609.1 | 903.22 | 616.66 | 902.7 | 624.09 | 902.08 |
| 626.67 | 901.91 | 629.29 | 901.78 | 636.67 | 901.34 | 646.67 | 901.01 | 649.47 | 900.95 |
| 656.67 | 900.85 | 686.67 | 900.56 | 689.83 | 900.52 | 696.67 | 900.45 | 699.91 | 900.4 |
| 706.67 | 900.33 | 716.67 | 900.21 | 726.67 | 900.16 | 730.18 | 900.17 | 736.67 | 900.2 |
| 740.27 | 900.23 | 756.67 | 900.41 | 760.45 | 900.43 | 766.67 | 900.48 | 770.54 | 900.5 |
| 773.04 | 900.52 | 786.67 | 900.63 | 790.72 | 900.67 | 800.8 | 900.79 | 810.89 | 900.94 |
| 816.67 | 901.01 | 826.67 | 901.07 | 831.07 | 901.07 | 836.67 | 901.08 | 841.16 | 901.04 |
| 846.67 | 901.03 | 851.25 | 901 | 856.67 | 900.99 | 861.34 | 900.97 | 876.68 | 900.97 |
| 881.53 | 900.98 | 886.68 | 900.98 | 891.62 | 900.99 | 896.68 | 900.99 | 901.7 | 900.98 |
| 906.68 | 900.99 | 911.79 | 900.96 | 923.123 | 900.764 | 926.862 | 900.757 | 933.213 | 900.734 |
| 936.862 | 900.761 | 943.302 | 900.714 | 946.862 | 900.721 | 953.392 | 900.668 | 956.863 | 900.675 |
| 963.481 | 900.704 | 966.863 | 900.757 | 973.57 | 900.8 | 976.864 | 900.854 | 981.865 | 900.783 |
| 988.928 | 900.183 | 991.865 | 900.137 | 994.751 | 899.954 | 1001.866 | 899.625 | 1004.664 | 899.451 |
| 1011.866 | 899.151 | 1019.196 | 898.667 | 1021.866 | 898.502 | 1029.286 | 898.059 | 1031.867 | 897.834 |
| 1039.375 | 896.637 | 1041.867 | 896 | 1045 | 895.5 | 1051.868 | 895.5 | 1059.554 | 895.5 |
| 1069.643 | 896.275 | 1071.868 | 896.24 | 1079.733 | 896.467 | 1081.869 | 896.453 | 1089.822 | 896.632 |
| 1091.869 | 896.644 | 1099.911 | 896.862 | 1101.869 | 896.876 | 1110.001 | 897.191 | 1111.87 | 897.235 |
| 1120.09 | 897.912 | 1121.87 | 898.101 | 1130.18 | 898.631 | 1131.871 | 898.781 | 1140.269 | 899.132 |
| 1141.871 | 899.249 | 1150.358 | 899.593 | 1151.871 | 899.672 | 1160.448 | 899.977 | 1161.872 | 900.009 |
| 1170.537 | 900.183 | 1171.872 | 900.201 | 1173.184 | 900.213 | 1181.873 | 900.328 | 1183.097 | 900.33 |
| 1191.873 | 900.435 | 1200.805 | 900.573 | 1201.873 | 900.58 | 1209.65 | 900.46 | 1211.69 | 900.44 |
| 1219.74 | 900.54 | 1221.69 | 900.54 | 1239.92 | 900.74 | 1241.69 | 900.77 | 1250.01 | 900.85 |
| 1251.69 | 900.87 | 1260.1 | 900.93 | 1261.69 | 900.95 | 1271.69 | 901.01 | 1280.27 | 901.03 |
| 1281.69 | 901.04 | 1291.69 | 901.04 | 1325.45 | 901.02 | 1326.69 | 901.02 | 1335.54 | 900.99 |
| 1336.69 | 900.98 | 1345.63 | 900.92 | 1346.69 | 900.91 | 1355.72 | 900.75 | 1356.69 | 900.73 |
| 1365.81 | 900.73 | 1366.69 | 900.74 | 1375.9 | 901.07 | 1376.69 | 901.13 | 1386 | 902.04 |
| 1386.7 | 902.13 | 1396.7 | 903.28 | 1406.17 | 903.84 | 1406.7 | 903.87 | 1416.26 | 904.17 |
| 1416.7 | 904.18 | 1426.35 | 904.35 | 1426.7 | 904.35 | 1436.44 | 904.48 | 1436.7 | 904.49 |
| 1446.53 | 904.5 | 1446.7 | 904.5 | 1456.62 | 904.46 | 1456.7 | 904.46 | 1461.39 | 904.41 |
| 1466.7 | 904.36 | 1476.7 | 904.23 | 1486.89 | 904.23 | 1496.7 | 904.3 | 1496.98 | 904.31 |
| 1506.7 | 904.42 | 1507.06 | 904.43 | 1516.7 | 904.56 | 1517.15 | 904.57 | 1526.7 | 904.77 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1527.24 | 904.79 | 1546.7 | 905.41 | 1547.42 | 905.42 | 1556.7 | 905.64 | 1557.51 | 905.65 |
| 1566.7 | 905.84 | 1576.7 | 906.07 | 1586.7 | 906.27 | 1587.78 | 906.29 | 1606.7 | 906.45 |
| 1618.04 | 906.63 | 1626.7 | 906.79 | 1628.14 | 906.81 | 1636.71 | 907.01 | 1638.23 | 907.03 |
| 1646.71 | 907.21 | 1656.71 | 907.22 | 1658.41 | 907.21 | 1666.71 | 907.07 | 1668.5 | 907.06 |
| 1676.71 | 906.88 | 1678.59 | 906.88 | 1686.71 | 906.73 | 1688.68 | 906.73 | 1696.71 | 906.64 |
| 1698.77 | 906.64 | 1708.85 | 906.63 | 1716.71 | 906.66 | 1726.71 | 906.61 | 1739.12 | 906.46 |
| 1746.71 | 906.35 | 1756.71 | 906.2 | 1766.71 | 906.09 | 1769.39 | 906.05 | 1776.71 | 905.96 |
| 1779.48 | 905.92 | 1789.57 | 905.75 | 1796.71 | 905.59 | 1799.66 | 905.55 | 1801.96 | 905.51 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 129.74 | .041 | 019.196 | .072 | 1191.873 | .04 | 1496.7 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 976.864 | 1200.805 | 639.02 | 468.39 | 440.05 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 901.05 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.040 | 0.069 | 0.040 |
| W.S. Elev (ft) | 900.91 | Reach Len. (ft) | 639.02 | 468.39 | 440.05 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 74.74 | 569.15 | 18.00 |
| E.G. Slope (ft/ft) | 0.005055 | Area (sq ft) | 74.74 | 569.15 | 18.00 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 102.25 | 1719.68 | 18.08 |
| Top Width (ft) | 525.37 | Top Width (ft) | 219.32 | 223.94 | 82.10 |
| Vel Total (ft/s) | 2.78 | Avg. Vel. (ft/s) | 1.37 | 3.02 | 1.00 |
| Max Chl Dpth (ft) | 5.41 | Hydr. Depth (ft) | 0.34 | 2.54 | 0.22 |
| Conv. Total (cfs) | 25879.5 | Conv. (cfs) | 1438.1 | 24187.2 | 254.3 |
| Length Wtd. (ft) | 532.71 | Wetted Per. (ft) | 219.34 | 224.39 | 82.11 |
| Min Ch El (ft) | 895.50 | Shear (lb/sq ft) | 0.11 | 0.80 | 0.07 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.15 | 2.42 | 0.07 |
| Frctn Loss (ft) | 2.58 | Cum Volume (acre-ft) | 23.83 | 41.32 | 66.96 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 35.24 | 15.53 | 85.06 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 901.52 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.068 | |
| W.S. Elev (ft) | 901.40 | Reach Len. (ft) | 639.02 | 468.39 | 440.05 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 678.52 | |
| E.G. Slope (ft/ft) | 0.003255 | Area (sq ft) | | 678.52 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 223.94 | Top Width (ft) | | 223.94 | |
| Vel Total (ft/s) | 2.71 | Avg. Vel. (ft/s) | | 2.71 | |
| Max Chl Dpth (ft) | 5.90 | Hydr. Depth (ft) | | 3.03 | |
| Conv. Total (cfs) | 32251.6 | Conv. (cfs) | | 32251.6 | |
| Length Wtd. (ft) | 499.78 | Wetted Per. (ft) | | 225.76 | |
| Min Ch El (ft) | 895.50 | Shear (lb/sq ft) | | 0.61 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.66 | |
| Frctn Loss (ft) | 2.08 | Cum Volume (acre-ft) | 2.99 | 52.98 | 7.53 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.55 | 16.34 | 3.25 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 901.59 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.000 | 0.068 | 0.000 |
| W.S. Elev (ft) | 901.48 | Reach Len. (ft) | 639.02 | 468.39 | 440.05 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.00 | 695.25 | 0.00 |
| E.G. Slope (ft/ft) | 0.002993 | Area (sq ft) | 0.00 | 695.25 | 0.00 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 0.00 | 1840.00 | 0.00 |
| Top Width (ft) | 223.95 | Top Width (ft) | | 223.94 | |
| Vel Total (ft/s) | 2.65 | Avg. Vel. (ft/s) | 0.05 | 2.65 | 0.06 |
| Max Chl Dpth (ft) | 5.98 | Hydr. Depth (ft) | 0.62 | 3.10 | 0.90 |
| Conv. Total (cfs) | 33633.3 | Conv. (cfs) | 0.0 | 33633.3 | 0.0 |
| Length Wtd. (ft) | 494.03 | Wetted Per. (ft) | 0.63 | 224.39 | 0.91 |
| Min Ch El (ft) | 895.50 | Shear (lb/sq ft) | | 0.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.53 | |
| Frctn Loss (ft) | 2.05 | Cum Volume (acre-ft) | 5.66 | 46.32 | 18.34 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 4.18 | 15.89 | 12.35 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.223

INPUT
Description: Thalweg Sta. 954.55 - Downstream of Culver @ Sta. 1.232
Station Elevation Data num= 200

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 910.47 | 1.35 | 910.4 | 9.45 | 909.93 | 11.71 | 909.81 | 23.66 | 909.2 |
| 32.43 | 908.8 | 37.88 | 908.6 | 42.79 | 908.39 | 52.09 | 908.08 | 53.15 | 908.03 |
| 56 | 907.96 | 63.51 | 907.84 | 66.31 | 907.78 | 73.87 | 907.66 | 80.52 | 907.49 |
| 84.23 | 907.44 | 94.22 | 907.27 | 94.59 | 907.26 | 94.73 | 907.26 | 110.82 | 906.92 |
| 115.32 | 906.76 | 123.16 | 906.51 | 125.68 | 906.42 | 132.44 | 906.2 | 136.04 | 906.09 |
| 137.37 | 906.06 | 146.4 | 905.84 | 151.59 | 905.77 | 156.76 | 905.67 | 165.81 | 905.66 |
| 167.12 | 905.65 | 170.66 | 905.66 | 177.48 | 905.73 | 180.02 | 905.76 | 187.84 | 905.84 |
| 208.45 | 906.16 | 208.88 | 906.16 | 229.29 | 906.44 | 239.65 | 906.56 | 247.1 | 906.79 |
| 250.01 | 906.87 | 270.73 | 907.8 | 279.52 | 908.06 | 281.09 | 908.11 | 281.99 | 908.08 |
| 285.32 | 908.01 | 291.45 | 907.85 | 293.73 | 907.64 | 301.81 | 906.93 | 307.95 | 906.24 |
| 312.17 | 905.79 | 322.16 | 904.65 | 323.54 | 904.5 | 332.89 | 903.37 | 343.26 | 902.21 |
| 353.62 | 901.43 | 363.98 | 901.1 | 364.81 | 901.08 | 384.7 | 900.77 | 387.96 | 900.74 |
| 395.06 | 900.63 | 405.42 | 900.52 | 407.44 | 900.51 | 426.14 | 900.37 | 435.87 | 900.27 |
| 436.5 | 900.26 | 436.87 | 900.26 | 438.2 | 900.23 | 446.86 | 900.02 | 450.09 | 899.83 |
| 457.23 | 899.54 | 464.3 | 899.06 | 476.43 | 898.43 | 477.95 | 898.36 | 485.77 | 898.17 |
| 488.31 | 898.29 | 498.67 | 898.33 | 498.98 | 898.32 | 506.95 | 898.08 | 509.03 | 898.08 |
| 514.65 | 897.8 | 521.15 | 897.76 | 529.75 | 897.98 | 535.37 | 897.79 | 540.11 | 897.83 |
| 549.58 | 897.18 | 550.47 | 897.16 | 552.87 | 897.06 | 560.83 | 896.81 | 563.8 | 896.75 |
| 571.2 | 896.62 | 578.01 | 896.59 | 581.56 | 896.56 | 599.9 | 896.57 | 602.28 | 896.59 |
| 620.66 | 896.62 | 623 | 896.63 | 633.36 | 896.65 | 634.87 | 896.66 | 663.29 | 896.75 |
| 664.44 | 896.75 | 705.74 | 896.89 | 705.94 | 896.89 | 716.25 | 896.96 | 720.16 | 896.98 |
| 743.97 | 897.16 | 762.8 | 897.31 | 768.05 | 897.36 | 777.02 | 897.43 | 778.42 | 897.45 |
| 787.37 | 897.52 | 788.78 | 897.54 | 809.5 | 897.71 | 819.65 | 897.77 | 819.86 | 897.77 |
| 820.41 | 897.76 | 830.22 | 897.7 | 833.87 | 897.6 | 848.08 | 897.23 | 850.94 | 897.15 |
| 858.63 | 897.15 | 861.3 | 897.17 | 862.3 | 897.2 | 871.66 | 897.47 | 876.51 | 897.63 |
| 880.79 | 897.78 | 882.03 | 897.82 | 892.39 | 898.14 | 896.85 | 898.27 | 902.75 | 898.46 |
| 904.94 | 898.47 | 907.12 | 898.51 | 913.11 | 898.62 | 919.16 | 898.34 | 923.47 | 898.23 |
| 933.36 | 897.15 | 933.83 | 897.11 | 944.19 | 895.78 | 947.58 | 895.53 | 954.55 | 894.9 |
| 961.79 | 894.92 | 964.91 | 894.87 | 973.29 | 895.24 | 975.27 | 895.33 | 985.63 | 895.89 |
| 994.01 | 896.33 | 996 | 896.43 | 1004.44 | 896.84 | 1006.36 | 896.94 | 1011.52 | 897.16 |
| 1016.72 | 897.37 | 1047.08 | 898.47 | 1047.8 | 898.49 | 1049.74 | 898.55 | 1058.16 | 898.75 |
| 1062.47 | 898.71 | 1068.52 | 898.67 | 1075.5 | 898.49 | 1078.88 | 898.39 | 1087.95 | 898.26 |
| 1089.24 | 898.24 | 1089.72 | 898.24 | 1099.6 | 898.19 | 1103.94 | 898.18 | 1109.97 | 898.15 |
| 1118.15 | 898.13 | 1120.33 | 898.12 | 1126.17 | 898.12 | 1130.69 | 898.13 | 1132.37 | 898.16 |
| 1141.05 | 898.29 | 1146.58 | 898.66 | 1151.41 | 898.92 | 1160.79 | 899.79 | 1161.77 | 899.86 |
| 1164.39 | 900.08 | 1172.13 | 900.76 | 1175.01 | 900.98 | 1182.49 | 901.45 | 1189.23 | 901.79 |
| 1192.85 | 901.95 | 1202.61 | 902.24 | 1203.21 | 902.25 | 1203.43 | 902.26 | 1213.57 | 902.55 |
| 1217.65 | 902.77 | 1223.93 | 903.21 | 1231.86 | 903.61 | 1234.3 | 903.77 | 1238.89 | 903.96 |
| 1240.83 | 904.04 | 1244.66 | 904.19 | 1255.02 | 904.55 | 1265.38 | 904.71 | 1279.06 | 904.72 |
| 1286.1 | 904.71 | 1288.72 | 904.69 | 1296.46 | 904.66 | 1306.82 | 904.55 | 1316.57 | 904.26 |

Manning's n Values num= 5

| sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 498.98 | .04 | 880.79 | .072 | 994.01 | .04 | 1238.89 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 913.11 | 1062.47 | 209.78 | 199.99 | 208.21 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 898.46 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.040 | 0.065 | 0.040 |
| W.S. Elev (ft) | 898.35 | Reach Len. (ft) | 209.78 | 199.99 | 208.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 460.10 | 221.51 | 9.69 |
| E.G. Slope (ft/ft) | 0.004631 | Area (sq ft) | 460.10 | 221.51 | 9.69 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1289.23 | 543.53 | 7.24 |
| Top Width (ft) | 606.21 | Top Width (ft) | 421.02 | 124.86 | 60.33 |
| Vel Total (ft/s) | 2.66 | Avg. Vel. (ft/s) | 2.80 | 2.45 | 0.75 |
| Max Chl Dpth (ft) | 3.48 | Hydr. Depth (ft) | 1.09 | 1.77 | 0.16 |
| Conv. Total (cfs) | 27037.4 | Conv. (cfs) | 18944.3 | 7986.7 | 106.4 |
| Length Wtd. (ft) | 205.38 | Wetted Per. (ft) | 421.10 | 125.12 | 60.33 |
| Min Ch El (ft) | 894.87 | Shear (lb/sq ft) | 0.32 | 0.51 | 0.05 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.89 | 1.26 | 0.03 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 19.90 | 37.07 | 66.82 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 30.54 | 13.66 | 84.34 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 899.43 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.042 | 0.062 | |
| W.S. Elev (ft) | 899.25 | Reach Len. (ft) | 209.78 | 199.99 | 208.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 192.40 | 349.63 | |
| E.G. Slope (ft/ft) | 0.005501 | Area (sq ft) | 192.40 | 349.63 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 677.03 | 1162.97 | |
| Top Width (ft) | 274.40 | Top Width (ft) | 125.04 | 149.36 | |
| Vel Total (ft/s) | 3.39 | Avg. Vel. (ft/s) | 3.52 | 3.33 | |
| Max Chl Dpth (ft) | 4.38 | Hydr. Depth (ft) | 1.54 | 2.34 | |
| Conv. Total (cfs) | 24808.2 | Conv. (cfs) | 9128.2 | 15680.0 | |
| Length Wtd. (ft) | 201.79 | Wetted Per. (ft) | 126.78 | 150.17 | |
| Min Ch El (ft) | 894.87 | Shear (lb/sq ft) | 0.52 | 0.80 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.83 | 2.66 | |
| Frctn Loss (ft) | 1.37 | Cum Volume (acre-ft) | 1.57 | 47.45 | 7.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.63 | 14.33 | 3.25 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 899.51 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.043 | 0.062 | |
| W.S. Elev (ft) | 899.31 | Reach Len. (ft) | 209.78 | 199.99 | 208.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 148.41 | 359.34 | |
| E.G. Slope (ft/ft) | 0.006141 | Area (sq ft) | 148.41 | 359.34 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 552.95 | 1287.05 | |
| Top Width (ft) | 242.82 | Top Width (ft) | 93.46 | 149.36 | |
| Vel Total (ft/s) | 3.62 | Avg. Vel. (ft/s) | 3.73 | 3.58 | |
| Max Chl Dpth (ft) | 4.44 | Hydr. Depth (ft) | 1.59 | 2.41 | |
| Conv. Total (cfs) | 23480.5 | Conv. (cfs) | 7056.3 | 16424.2 | |
| Length Wtd. (ft) | 201.46 | Wetted Per. (ft) | 95.03 | 150.24 | |
| Min Ch El (ft) | 894.87 | Shear (lb/sq ft) | 0.60 | 0.92 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 2.23 | 3.28 | |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 4.58 | 40.65 | 18.34 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.50 | 13.88 | 12.35 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.185

INPUT
Description: Thalweg Sta. 333.21
Station Elevation Data num= 135

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 911.62 | 4.98 | 911.85 | 18.97 | 912.43 | 29.44 | 912.77 | 35.41 | 912.85 |
| 39.92 | 912.9 | 42.28 | 912.83 | 49.86 | 912.25 | 50.39 | 912.19 | 50.63 | 912.11 |
| 53.62 | 911.19 | 60.87 | 908.97 | 71.34 | 905.63 | 81.07 | 902.67 | 81.82 | 902.44 |
| 83.45 | 901.96 | 92.29 | 899.28 | 96.29 | 898.28 | 102.77 | 896.55 | 111.51 | 895.88 |
| 113.24 | 895.62 | 117.05 | 895.52 | 123.72 | 895.4 | 126.73 | 895.39 | 141.95 | 895.26 |
| 144.67 | 895.24 | 150.65 | 895.22 | 155.14 | 895.23 | 157.17 | 895.25 | 165.61 | 895.35 |
| 176.09 | 895.55 | 184.24 | 895.74 | 186.57 | 895.79 | 202.83 | 896.11 | 217.84 | 896.43 |
| 218.05 | 896.43 | 228.46 | 896.55 | 228.48 | 896.55 | 238.94 | 896.45 | 249.41 | 896.23 |
| 251.44 | 896.19 | 259.89 | 896 | 261.12 | 895.97 | 263.72 | 895.9 | 270.36 | 895.75 |
| 280.84 | 895.47 | 285.04 | 895.34 | 291.31 | 895.13 | 294.16 | 894.97 | 301.79 | 894.57 |
| 312.26 | 893.74 | 313.78 | 893.6 | 318.63 | 893.19 | 322.74 | 892.86 | 324.6 | 892.73 |
| 333.21 | 892.09 | 339.82 | 891.86 | 343.69 | 891.67 | 352.22 | 893.61 | 354.16 | 894.08 |
| 355.04 | 894.31 | 364.64 | 896.79 | 369.92 | 897.14 | 370.26 | 897.16 | 373.03 | 897.45 |
| 375.11 | 897.66 | 385.48 | 897.9 | 396.06 | 897.9 | 400.7 | 897.92 | 406.54 | 897.91 |
| 419.42 | 897.92 | 446.36 | 897.89 | 448.43 | 897.89 | 453.02 | 897.88 | 458.91 | 897.85 |
| 469.38 | 897.73 | 479.86 | 897.52 | 486.62 | 897.36 | 489.45 | 897.3 | 490.33 | 897.27 |
| 497.44 | 897.11 | 505.42 | 896.95 | 511.28 | 896.85 | 513.41 | 896.83 | 520.22 | 896.75 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 521.76 | 896.74 | 522.46 | 896.73 | 532.23 | 896.65 | 537.68 | 896.62 | 542.71 | 896.58 |
| 553.18 | 896.58 | 553.81 | 896.59 | 563.66 | 896.79 | 568.12 | 896.96 | 574.13 | 897.15 |
| 583.34 | 897.46 | 584.61 | 897.5 | 587.4 | 897.57 | 595.08 | 897.73 | 598.56 | 897.78 |
| 605.56 | 897.91 | 613.78 | 898.09 | 616.03 | 898.13 | 621.01 | 898.36 | 626.5 | 898.64 |
| 629 | 898.86 | 636.98 | 899.48 | 644.22 | 900.07 | 647.46 | 900.32 | 654.6 | 900.71 |
| 657.13 | 900.83 | 657.93 | 900.86 | 659.44 | 900.87 | 668.4 | 901.03 | 674.66 | 901.05 |
| 678.88 | 901.1 | 680.01 | 901.14 | 681.09 | 901.17 | 688.2 | 901.2 | 689.35 | 901.21 |
| 689.88 | 901.21 | 699.83 | 901.28 | 705.1 | 901.07 | 710.3 | 900.9 | 720.32 | 900.14 |
| 731.25 | 899.19 | 735.54 | 898.91 | 741.73 | 898.45 | 750.76 | 898.19 | 752.2 | 898.13 |
| 755.4 | 898.15 | 762.68 | 898.37 | 765.98 | 898.63 | 773.15 | 899.12 | 777.15 | 899.43 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 53.62 | .04 | 261.12 | .072 | 373.03 | .04 | 680.01 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 228.48 | 369.92 | 215.15 | 199.99 | 202.61 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 897.38 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.040 | 0.070 | 0.040 |
| W.S. Elev (ft) | 897.21 | Reach Len. (ft) | 215.15 | 199.99 | 202.61 |
| Crit W.S. (ft) | 896.22 | Flow Area (sq ft) | 186.71 | 346.70 | 33.79 |
| E.G. Slope (ft/ft) | 0.005917 | Area (sq ft) | 186.71 | 346.70 | 33.79 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 685.09 | 1101.81 | 53.10 |
| Top Width (ft) | 353.05 | Top Width (ft) | 128.17 | 141.44 | 83.44 |
| Vel Total (ft/s) | 3.24 | Avg. Vel. (ft/s) | 3.67 | 3.18 | 1.57 |
| Max Chl Dpth (ft) | 5.54 | Hydr. Depth (ft) | 1.46 | 2.45 | 0.40 |
| Conv. Total (cfs) | 23919.8 | Conv. (cfs) | 8906.1 | 14323.4 | 690.3 |
| Length Wtd. (ft) | 204.00 | Wetted Per. (ft) | 128.32 | 142.21 | 83.46 |
| Min Ch El (ft) | 891.67 | Shear (lb/sq ft) | 0.54 | 0.90 | 0.15 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 1.97 | 2.86 | 0.24 |
| Frctn Loss (ft) | 2.10 | Cum Volume (acre-ft) | 18.35 | 35.76 | 66.72 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 29.22 | 13.05 | 84.00 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 898.04 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.068 | |
| W.S. Elev (ft) | 897.75 | Reach Len. (ft) | 215.15 | 199.99 | 202.61 |
| Crit W.S. (ft) | 896.37 | Flow Area (sq ft) | | 423.57 | |
| E.G. Slope (ft/ft) | 0.008630 | Area (sq ft) | | 423.57 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 141.44 | Top Width (ft) | | 141.44 | |
| Vel Total (ft/s) | 4.34 | Avg. Vel. (ft/s) | | 4.34 | |
| Max Chl Dpth (ft) | 6.08 | Hydr. Depth (ft) | | 2.99 | |
| Conv. Total (cfs) | 19807.0 | Conv. (cfs) | | 19807.0 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 144.02 | |
| Min Ch El (ft) | 891.67 | Shear (lb/sq ft) | | 1.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 6.88 | |
| Frctn Loss (ft) | 1.97 | Cum Volume (acre-ft) | 1.11 | 45.68 | 7.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.33 | 13.66 | 3.25 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 898.12 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.068 | |
| W.S. Elev (ft) | 897.84 | Reach Len. (ft) | 215.15 | 199.99 | 202.61 |
| Crit W.S. (ft) | 896.37 | Flow Area (sq ft) | | 436.50 | |
| E.G. Slope (ft/ft) | 0.007817 | Area (sq ft) | | 436.50 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 141.44 | Top Width (ft) | | 141.44 | |
| Vel Total (ft/s) | 4.22 | Avg. Vel. (ft/s) | | 4.22 | |
| Max Chl Dpth (ft) | 6.17 | Hydr. Depth (ft) | | 3.09 | |
| Conv. Total (cfs) | 20810.7 | Conv. (cfs) | | 20810.7 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 144.20 | |
| Min Ch El (ft) | 891.67 | Shear (lb/sq ft) | | 1.48 | |

| | | | | | |
|---|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 6.23 | |
| Frctn Loss (ft) | 2.44 | Cum Volume (acre-ft) | 4.22 | 38.82 | 18.34 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 3.27 | 13.21 | 12.35 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.147

INPUT
Description: Thalweg Sta. 378.63
Station Elevation Data num= 160

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 909.33 | 1.67 | 909.46 | 9.72 | 909.95 | 12.44 | 910.13 | 14.26 | 910.09 |
| 23.21 | 910.02 | 32.2 | 908.5 | 33.98 | 908.21 | 36.64 | 907.6 | 44.75 | 905.84 |
| 50.16 | 904.65 | 55.52 | 903.49 | 63.57 | 901.79 | 65.52 | 901.41 | 66.29 | 901.25 |
| 68.1 | 900.91 | 77.06 | 899.37 | 86.05 | 898.83 | 87.83 | 898.72 | 96.29 | 898.57 |
| 98.6 | 898.5 | 109.37 | 898.29 | 111.68 | 898.25 | 117.43 | 898.11 | 120.14 | 898.05 |
| 121.95 | 897.98 | 130.91 | 897.7 | 138.25 | 897.34 | 139.9 | 897.26 | 141.68 | 897.18 |
| 144.35 | 897.04 | 163.22 | 896.02 | 171.28 | 895.61 | 173.99 | 895.48 | 175.8 | 895.41 |
| 184.76 | 895.04 | 193.75 | 894.82 | 195.53 | 894.77 | 227.84 | 894.17 | 249.38 | 893.79 |
| 260.15 | 893.63 | 265.55 | 893.64 | 270.92 | 893.62 | 278.99 | 893.9 | 281.69 | 894.01 |
| 283.49 | 894.11 | 292.46 | 894.55 | 297.06 | 894.73 | 301.44 | 894.9 | 303.23 | 894.98 |
| 305.92 | 895.07 | 314.01 | 895.31 | 319.39 | 895.42 | 324.78 | 895.55 | 332.85 | 895.63 |
| 333.49 | 895.61 | 335.55 | 895.56 | 337.35 | 895.22 | 346.32 | 893.54 | 355.29 | 892.12 |
| 357.09 | 891.8 | 359.78 | 891.69 | 365.55 | 891.54 | 367.86 | 891.55 | 373.24 | 891.65 |
| 378.63 | 891.73 | 386.71 | 891.79 | 389.4 | 891.8 | 400.17 | 891.74 | 409.14 | 891.72 |
| 410.94 | 891.71 | 413.63 | 891.74 | 421.7 | 891.99 | 427.09 | 892.42 | 428.77 | 892.54 |
| 432.48 | 892.79 | 440.57 | 893.6 | 445.04 | 894.07 | 454.02 | 895.07 | 462.99 | 895.97 |
| 464.79 | 896.16 | 466.14 | 896.25 | 467.49 | 896.34 | 471.74 | 896.53 | 475.56 | 896.7 |
| 480.93 | 896.73 | 486.33 | 896.8 | 494.42 | 896.77 | 497.1 | 896.75 | 498.89 | 896.75 |
| 518.64 | 896.64 | 521.34 | 896.63 | 534.78 | 896.55 | 548.28 | 896.45 | 550.95 | 896.42 |
| 561.72 | 896.23 | 570.68 | 896 | 575.2 | 895.9 | 583.26 | 895.69 | 588.63 | 895.62 |
| 594.03 | 895.53 | 602.13 | 895.5 | 604.8 | 895.5 | 606.58 | 895.51 | 615.57 | 895.54 |
| 626.34 | 895.72 | 629.06 | 895.77 | 637.11 | 895.98 | 650.2 | 896.27 | 658.65 | 896.39 |
| 660.43 | 896.42 | 669.42 | 896.55 | 678.38 | 896.71 | 680.19 | 896.74 | 682.92 | 896.81 |
| 690.96 | 897.14 | 696.33 | 897.44 | 701.73 | 897.73 | 709.84 | 898.13 | 712.5 | 898.28 |
| 714.28 | 898.35 | 723.27 | 898.72 | 732.22 | 899.01 | 734.04 | 899.08 | 736.77 | 899.17 |
| 744.81 | 899.4 | 750.17 | 899.33 | 752.92 | 899.32 | 755.58 | 899.32 | 763.69 | 898.98 |
| 766.35 | 898.89 | 768.12 | 898.79 | 786.07 | 897.88 | 787.89 | 897.79 | 790.63 | 897.75 |
| 798.66 | 897.73 | 804.02 | 897.93 | 809.43 | 898.09 | 817.56 | 898.51 | 820.2 | 898.66 |
| 821.97 | 898.75 | 830.97 | 899.26 | 839.92 | 899.62 | 841.74 | 899.7 | 844.48 | 899.8 |
| 852.51 | 900.04 | 857.87 | 900.19 | 863.28 | 900.37 | 871.41 | 900.57 | 874.06 | 900.6 |
| 884.83 | 900.67 | 893.76 | 900.7 | 895.6 | 900.71 | 898.34 | 900.72 | 906.37 | 900.85 |
| 917.14 | 901.05 | 925.27 | 901.22 | 927.91 | 901.29 | 929.66 | 901.35 | 934.14 | 901.48 |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 138.25 | .04 | 297.06 | .072 | 428.77 | .052 | 471.74 | .04 |
| 752.92 | .032 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 333.49 | 466.14 | 246.36 | 199.72 | 185.66 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 895.26 | Element | | | |
| Vel Head (ft) | 0.49 | Wt. n-Val. | 0.040 | 0.070 | |
| W.S. Elev (ft) | 894.77 | Reach Len. (ft) | 246.36 | 199.72 | 185.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 66.94 | 267.99 | |
| E.G. Slope (ft/ft) | 0.022071 | Area (sq ft) | 66.94 | 267.99 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 279.41 | 1560.59 | |
| Top Width (ft) | 214.41 | Top Width (ft) | 102.78 | 111.63 | |
| Vel Total (ft/s) | 5.49 | Avg. Vel. (ft/s) | 4.17 | 5.82 | |
| Max Chl Dpth (ft) | 3.23 | Hydr. Depth (ft) | 0.65 | 2.40 | |
| Conv. Total (cfs) | 12385.4 | Conv. (cfs) | 1880.8 | 10504.7 | |
| Length Wtd. (ft) | 205.61 | Wetted Per. (ft) | 102.82 | 112.02 | |
| Min Ch El (ft) | 891.54 | Shear (lb/sq ft) | 0.90 | 3.30 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 3.74 | 19.19 | |
| Frctn Loss (ft) | 0.65 | Cum Volume (acre-ft) | 17.72 | 34.35 | 66.64 |
| C & E Loss (ft) | 0.11 | Cum SA (acres) | 28.65 | 12.47 | 83.80 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 896.07 | Element | | | |
| Vel Head (ft) | 0.37 | Wt. n-Val. | | 0.070 | |
| W.S. Elev (ft) | 895.70 | Reach Len. (ft) | 246.36 | 199.72 | 185.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 377.78 | |
| E.G. Slope (ft/ft) | 0.011339 | Area (sq ft) | | 377.78 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 126.80 | Top Width (ft) | | 126.80 | |
| Vel Total (ft/s) | 4.87 | Avg. Vel. (ft/s) | | 4.87 | |
| Max Chl Dpth (ft) | 4.16 | Hydr. Depth (ft) | | 2.98 | |
| Conv. Total (cfs) | 17279.8 | Conv. (cfs) | | 17279.8 | |
| Length Wtd. (ft) | 199.72 | Wetted Per. (ft) | | 127.41 | |
| Min Ch El (ft) | 891.54 | Shear (lb/sq ft) | | 2.10 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 10.22 | |
| Frctn Loss (ft) | 0.31 | Cum Volume (acre-ft) | 1.11 | 43.84 | 7.53 |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 0.33 | 13.05 | 3.25 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 895.64 | Element | | | |
| Vel Head (ft) | 0.58 | Wt. n-Val. | | 0.070 | |
| W.S. Elev (ft) | 895.06 | Reach Len. (ft) | 246.36 | 199.72 | 185.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 300.92 | |
| E.G. Slope (ft/ft) | 0.021739 | Area (sq ft) | | 300.92 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 115.77 | Top Width (ft) | | 115.77 | |
| Vel Total (ft/s) | 6.11 | Avg. Vel. (ft/s) | | 6.11 | |
| Max Chl Dpth (ft) | 3.52 | Hydr. Depth (ft) | | 2.60 | |
| Conv. Total (cfs) | 12479.6 | Conv. (cfs) | | 12479.6 | |
| Length Wtd. (ft) | 199.72 | Wetted Per. (ft) | | 116.21 | |
| Min Ch El (ft) | 891.54 | Shear (lb/sq ft) | | 3.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 21.49 | |
| Frctn Loss (ft) | 0.56 | Cum Volume (acre-ft) | 4.22 | 37.13 | 18.34 |
| C & E Loss (ft) | 0.14 | Cum SA (acres) | 3.27 | 12.62 | 12.35 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.109

INPUT
Description: Thalweg Sta. 220.46
Station Elevation Data num= 134

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 905.56 | 3.3 | 905.74 | 15.12 | 906.33 | 16.82 | 906.37 | 26.94 | 906.64 |
| 32.87 | 906.44 | 34.2 | 906.3 | 38.76 | 905.81 | 48.78 | 903.63 | 50.57 | 903.25 |
| 51.63 | 903 | 62.39 | 900.33 | 74.21 | 897.42 | 77.8 | 896.64 | 80.73 | 896.01 |
| 86.04 | 894.83 | 89.16 | 894.45 | 97.86 | 893.83 | 107.91 | 893.58 | 109.68 | 893.55 |
| 116.25 | 893.49 | 123.12 | 893.41 | 126.67 | 893.38 | 133.31 | 893.29 | 145.13 | 893.05 |
| 145.43 | 893.04 | 156.95 | 892.35 | 164.19 | 891.81 | 168.77 | 891.55 | 176.59 | 891.48 |
| 180.59 | 891.42 | 182.95 | 891.45 | 192.41 | 891.53 | 201.7 | 891.44 | 204.23 | 891.39 |
| 208.54 | 890.95 | 216.05 | 890.25 | 220.46 | 890.15 | 227.87 | 890.19 | 239.22 | 890.54 |
| 239.69 | 890.56 | 251.51 | 890.71 | 254.01 | 890.73 | 257.35 | 890.75 | 257.98 | 890.75 |
| 263.33 | 890.79 | 272.44 | 890.84 | 276.73 | 890.87 | 286.97 | 890.92 | 295.49 | 890.94 |
| 298.79 | 890.93 | 304.4 | 890.89 | 310.6 | 890.86 | 314.25 | 890.82 | 322.42 | 890.76 |
| 333.01 | 890.72 | 334.25 | 890.73 | 336.35 | 890.8 | 346.07 | 891.08 | 351.77 | 891.94 |
| 357.89 | 893.14 | 368.3 | 895.64 | 369.71 | 895.97 | 370.53 | 896.05 | 381.52 | 896.21 |
| 383.03 | 896.22 | 393.34 | 896.3 | 400.26 | 896.27 | 405.16 | 896.23 | 408.05 | 896.16 |
| 416.98 | 895.81 | 426.81 | 895.29 | 428.8 | 895.19 | 432.21 | 895.14 | 440.62 | 894.96 |
| 445.56 | 894.99 | 464.16 | 895.28 | 464.32 | 895.28 | 476.08 | 895.43 | 483.08 | 895.48 |
| 487.9 | 895.46 | 496.12 | 895.19 | 499.72 | 895.1 | 501.84 | 895.01 | 511.54 | 894.72 |
| 520.6 | 894.93 | 523.36 | 895.05 | 528.06 | 895.22 | 535.18 | 895.51 | 539.35 | 895.59 |
| 547 | 895.64 | 570.64 | 895.61 | 576.87 | 895.59 | 594.28 | 895.59 | 595.63 | 895.58 |
| 606.1 | 895.58 | 614.38 | 895.51 | 617.92 | 895.49 | 619.85 | 895.46 | 629.74 | 895.32 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 633.14 | 895.29 | 641.55 | 895.16 | 651.91 | 895.2 | 653.37 | 895.2 | 655.88 | 895.31 |
| 665.19 | 895.67 | 670.67 | 895.97 | 687.83 | 896.97 | 688.83 | 897.02 | 689.42 | 897.06 |
| 700.65 | 897.76 | 708.18 | 898.25 | 712.47 | 898.51 | 719.79 | 898.98 | 724.29 | 899.25 |
| 725.32 | 899.3 | 726.94 | 899.41 | 736.11 | 899.87 | 745.7 | 900.22 | 747.93 | 900.28 |
| 759.75 | 900.62 | 771.57 | 900.9 | 783.21 | 901.13 | 783.39 | 901.14 | 783.69 | 901.15 |
| 795.21 | 901.41 | 807.03 | 901.61 | 818.85 | 901.65 | 820.73 | 901.61 | 830.67 | 901.42 |
| 839.49 | 901.01 | 847.59 | 900.66 | 854.31 | 900.34 | 854.97 | 900.32 | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 34.2 | .04 | 123.12 | .072 | 257.35 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 192.41 | 357.89 | 268.31 | 198 | 168.17 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 894.50 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.068 | 0.042 | 0.032 |
| W.S. Elev (ft) | 894.38 | Reach Len. (ft) | 268.31 | 198.00 | 168.17 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 164.43 | 580.12 | 3.20 |
| E.G. Slope (ft/ft) | 0.001209 | Area (sq ft) | 164.43 | 580.12 | 3.20 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 186.70 | 1649.61 | 3.69 |
| Top Width (ft) | 272.92 | Top Width (ft) | 102.28 | 165.48 | 5.17 |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | 1.14 | 2.84 | 1.15 |
| Max Chl Dpth (ft) | 4.23 | Hydr. Depth (ft) | 1.61 | 3.51 | 0.62 |
| Conv. Total (cfs) | 52925.8 | Conv. (cfs) | 5370.1 | 47449.4 | 106.2 |
| Length Wtd. (ft) | 214.54 | Wetted Per. (ft) | 102.35 | 165.73 | 5.31 |
| Min Ch El (ft) | 890.15 | Shear (lb/sq ft) | 0.12 | 0.26 | 0.05 |
| Alpha | 1.22 | Stream Power (lb/ft s) | 0.14 | 0.75 | 0.05 |
| Frctn Loss (ft) | 0.66 | Cum Volume (acre-ft) | 17.07 | 32.41 | 66.63 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 28.07 | 11.83 | 83.79 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 895.68 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.041 | |
| W.S. Elev (ft) | 895.59 | Reach Len. (ft) | 268.31 | 198.00 | 168.17 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 780.01 | |
| E.G. Slope (ft/ft) | 0.000579 | Area (sq ft) | | 780.01 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 165.48 | Top Width (ft) | | 165.48 | |
| Vel Total (ft/s) | 2.36 | Avg. Vel. (ft/s) | | 2.36 | |
| Max Chl Dpth (ft) | 5.44 | Hydr. Depth (ft) | | 4.71 | |
| Conv. Total (cfs) | 76484.9 | Conv. (cfs) | | 76484.9 | |
| Length Wtd. (ft) | 198.00 | Wetted Per. (ft) | | 172.24 | |
| Min Ch El (ft) | 890.15 | Shear (lb/sq ft) | | 0.16 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.39 | |
| Frctn Loss (ft) | 0.35 | Cum Volume (acre-ft) | 1.11 | 41.18 | 7.53 |
| C & E Loss (ft) | 0.14 | Cum SA (acres) | 0.33 | 12.38 | 3.25 |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 894.95 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.042 | |
| W.S. Elev (ft) | 894.82 | Reach Len. (ft) | 268.31 | 198.00 | 168.17 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 653.47 | |
| E.G. Slope (ft/ft) | 0.001040 | Area (sq ft) | | 653.47 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 165.48 | Top Width (ft) | | 165.48 | |
| Vel Total (ft/s) | 2.82 | Avg. Vel. (ft/s) | | 2.82 | |
| Max Chl Dpth (ft) | 4.67 | Hydr. Depth (ft) | | 3.95 | |
| Conv. Total (cfs) | 57068.6 | Conv. (cfs) | | 57068.6 | |
| Length Wtd. (ft) | 206.72 | Wetted Per. (ft) | | 170.71 | |
| Min Ch El (ft) | 890.15 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.70 | |
| Frctn Loss (ft) | 0.58 | Cum Volume (acre-ft) | 4.22 | 34.94 | 18.34 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 3.27 | 11.98 | 12.35 |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.072

INPUT
Description: Thalweg Sta. 283.56 (HEC-RAS XS has been trimmed and does not reflect the XS's full length as shown on the work map.)
Station Elevation Data num= 90

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 900.68 | 1.86 | 900.56 | 2.87 | 900.45 | 14.11 | 899.02 | 17.6 | 898.55 |
| 20.19 | 898.2 | 26.36 | 897.29 | 37.51 | 895.7 | 38.61 | 895.54 | 41.25 | 895.23 |
| 50.85 | 894.08 | 54.83 | 893.87 | 63.1 | 893.63 | 72.15 | 893.49 | 75.35 | 893.38 |
| 87.6 | 892.61 | 89.47 | 892.47 | 99.85 | 891.8 | 106.79 | 891.63 | 112.09 | 891.65 |
| 124.11 | 891.91 | 124.34 | 891.92 | 124.9 | 891.93 | 136.59 | 892.27 | 141.43 | 892.4 |
| 148.83 | 892.57 | 158.75 | 892.67 | 161.08 | 892.67 | 165.09 | 892.61 | 166.72 | 892.59 |
| 173.33 | 892.5 | 185.58 | 892.27 | 193.39 | 892.18 | 197.83 | 892.15 | 208.54 | 892.18 |
| 210.07 | 892.19 | 210.71 | 892.19 | 234.57 | 892.32 | 245.21 | 892.32 | 245.35 | 892.32 |
| 246.81 | 892.31 | 250.36 | 892.16 | 259.06 | 891.86 | 262.67 | 891.55 | 271.31 | 890.67 |
| 279.99 | 889.72 | 283.56 | 889.38 | 292.18 | 889.46 | 295.81 | 889.39 | 297.31 | 889.69 |
| 308.05 | 892.14 | 310.16 | 892.61 | 310.77 | 892.75 | 314.63 | 893.32 | 319.87 | 894 |
| 320.3 | 894.06 | 331.95 | 894.55 | 332.55 | 894.56 | 334 | 894.58 | 357.05 | 894.83 |
| 369.29 | 894.92 | 383.91 | 894.99 | 401.23 | 895.04 | 406.03 | 895.04 | 417.63 | 894.99 |
| 418.28 | 894.99 | 418.55 | 894.98 | 430.53 | 894.42 | 435.87 | 894.09 | 442.77 | 893.78 |
| 453.19 | 893.66 | 455.03 | 893.67 | 467.27 | 893.83 | 487.83 | 894.17 | 504.01 | 894.42 |
| 505.15 | 894.44 | 516.26 | 894.55 | 522.47 | 894.46 | 528.51 | 894.24 | 539.79 | 893.34 |
| 540.76 | 893.29 | 553.01 | 892.71 | 565.25 | 892.41 | 570.54 | 893.18 | 574.43 | 893.74 |
| 577.5 | 894.28 | 589.75 | 896.88 | 591.75 | 897.15 | 601.99 | 898.21 | 606.96 | 897.59 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 17.6 | .04 | 165.09 | .052 | 310.16 | .04 | 570.54 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 245.21 | 310.16 | 181.83 | 199.7 | 243.69 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 893.79 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.57 | Wt. n-Val. | 0.045 | 0.052 | 0.040 |
| W.S. Elev (ft) | 893.22 | Reach Len. (ft) | 181.83 | 199.70 | 243.69 |
| Crit W.S. (ft) | 893.22 | Flow Area (sq ft) | 158.98 | 156.99 | 14.09 |
| E.G. Slope (ft/ft) | 0.018717 | Area (sq ft) | 158.98 | 156.99 | 14.09 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 698.50 | 1099.79 | 41.71 |
| Top Width (ft) | 264.53 | Top Width (ft) | 167.28 | 64.95 | 32.30 |
| Vel Total (ft/s) | 5.57 | Avg. Vel. (ft/s) | 4.39 | 7.01 | 2.96 |
| Max Chl Dpth (ft) | 3.84 | Hydr. Depth (ft) | 0.95 | 2.42 | 0.44 |
| Conv. Total (cfs) | 13449.4 | Conv. (cfs) | 5105.7 | 8038.8 | 304.9 |
| Length Wtd. (ft) | 196.90 | Wetted Per. (ft) | 167.35 | 65.44 | 32.43 |
| Min Ch El (ft) | 889.38 | Shear (lb/sq ft) | 1.11 | 2.80 | 0.51 |
| Alpha | 1.19 | Stream Power (lb/ft s) | 4.88 | 19.64 | 1.50 |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | 16.07 | 30.73 | 66.60 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 27.24 | 11.31 | 83.72 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 895.18 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 1.48 | Wt. n-Val. | | 0.052 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 893.71 | Reach Len. (ft) | 181.83 | 199.70 | 243.69 |
| Crit W.S. (ft) | 893.71 | Flow Area (sq ft) | | 188.62 | |
| E.G. Slope (ft/ft) | 0.029858 | Area (sq ft) | | 188.62 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 64.95 | Top Width (ft) | | 64.95 | |
| Vel Total (ft/s) | 9.76 | Avg. Vel. (ft/s) | | 9.76 | |
| Max Chl Dpth (ft) | 4.32 | Hydr. Depth (ft) | | 2.90 | |
| Conv. Total (cfs) | 10648.5 | Conv. (cfs) | | 10648.5 | |
| Length Wtd. (ft) | 199.70 | Wetted Per. (ft) | | 67.92 | |
| Min Ch El (ft) | 889.38 | Shear (lb/sq ft) | | 5.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 50.50 | |
| Frctn Loss (ft) | 0.54 | Cum Volume (acre-ft) | 1.11 | 38.98 | 7.53 |
| C & E Loss (ft) | 0.42 | Cum SA (acres) | 0.33 | 11.85 | 3.25 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 894.30 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.83 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 893.47 | Reach Len. (ft) | 181.83 | 199.70 | 243.69 |
| Crit W.S. (ft) | 893.47 | Flow Area (sq ft) | 97.59 | 173.31 | |
| E.G. Slope (ft/ft) | 0.021682 | Area (sq ft) | 97.59 | 173.31 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 456.27 | 1383.74 | |
| Top Width (ft) | 149.08 | Top Width (ft) | 84.13 | 64.95 | |
| Vel Total (ft/s) | 6.79 | Avg. Vel. (ft/s) | 4.68 | 7.98 | |
| Max Chl Dpth (ft) | 4.09 | Hydr. Depth (ft) | 1.16 | 2.67 | |
| Conv. Total (cfs) | 12496.0 | Conv. (cfs) | 3098.6 | 9397.4 | |
| Length Wtd. (ft) | 197.48 | Wetted Per. (ft) | 84.93 | 66.30 | |
| Min Ch El (ft) | 889.38 | Shear (lb/sq ft) | 1.56 | 3.54 | |
| Alpha | 1.16 | Stream Power (lb/ft s) | 7.27 | 28.25 | |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 3.92 | 33.06 | 18.34 |
| C & E Loss (ft) | 0.21 | Cum SA (acres) | 3.01 | 11.45 | 12.35 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: 1.035

INPUT
Description: Thalweg Sta. 315.49
Station Elevation Data num= 143

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 900.22 | .4 | 900.2 | 7.6 | 899.71 | 11.04 | 899.47 | 12.99 | 899.33 |
| 21.67 | 898.73 | 29.65 | 898.16 | 32.31 | 897.98 | 41.36 | 897.33 | 42.94 | 897.21 |
| 46.31 | 896.96 | 64.21 | 895.68 | 64.79 | 895.64 | 66.37 | 895.54 | 68.13 | 895.42 |
| 79.66 | 894.66 | 85.48 | 894.3 | 95.76 | 893.69 | 96.12 | 893.67 | 96.32 | 893.66 |
| 106.75 | 893.12 | 112.98 | 893.05 | 117.39 | 892.95 | 125.14 | 892.99 | 128.02 | 893.02 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 135.06 | 892.93 | 138.66 | 892.84 | 146.31 | 892.59 | 150.68 | 892.43 | 154.52 | 892.31 |
| 159.92 | 892.09 | 162.99 | 891.99 | 170.56 | 891.7 | 178.31 | 891.46 | 179.65 | 891.42 |
| 181.19 | 891.36 | 183.91 | 891.29 | 191.83 | 891.07 | 196.32 | 891.03 | 202.46 | 890.91 |
| 208.75 | 890.84 | 212.98 | 890.8 | 213.29 | 890.8 | 223.73 | 890.85 | 229.65 | 890.76 |
| 234.37 | 890.75 | 242.68 | 890.55 | 244.39 | 890.52 | 245 | 890.5 | 253.06 | 890.13 |
| 255.17 | 890.07 | 262.15 | 889.65 | 265.22 | 889.49 | 271.25 | 889.23 | 275.28 | 889.02 |
| 280.35 | 888.54 | 285.33 | 887.8 | 289.45 | 887.56 | 295.39 | 887.57 | 298.56 | 887.68 |
| 305.44 | 888.05 | 313.93 | 888.49 | 315.49 | 888.59 | 325.16 | 889.06 | 325.55 | 889.09 |
| 330.52 | 889.36 | 335.6 | 889.64 | 336.39 | 889.69 | 345.66 | 890.18 | 347.62 | 890.25 |
| 355.71 | 890.56 | 358.85 | 890.46 | 365.77 | 890.31 | 370.08 | 889.28 | 375.82 | 888.05 |
| 381.31 | 887.88 | 385.88 | 887.45 | 392.54 | 887.67 | 395.93 | 887.74 | 403.78 | 888.89 |
| 404.49 | 889.02 | 406.13 | 889.29 | 409.55 | 889.61 | 417.14 | 890.38 | 423.65 | 890.84 |
| 428.15 | 891.09 | 429.81 | 891.23 | 433.41 | 891.63 | 433.45 | 891.63 | 439.17 | 892.25 |
| 444.11 | 892.63 | 450.19 | 893.21 | 457.27 | 893.16 | 461.2 | 893.04 | 464.56 | 892.98 |
| 472.21 | 892.76 | 481.13 | 892.84 | 483.23 | 892.87 | 485.02 | 892.87 | 494.24 | 892.94 |
| 504.99 | 892.2 | 505.17 | 892.19 | 505.26 | 892.18 | 505.48 | 892.16 | 516.27 | 890.91 |
| 525.94 | 891.34 | 527.28 | 891.39 | 528.85 | 891.54 | 535.31 | 892.17 | 538.3 | 892.49 |
| 542.84 | 893.03 | 549.31 | 893.93 | 550.38 | 894.12 | 552.71 | 894.58 | 560.33 | 896.12 |
| 566.86 | 893.58 | 571.34 | 892.97 | 575.56 | 893.02 | 576.28 | 892.96 | 583.18 | 894.17 |
| 593.3 | 892.52 | 595.53 | 892.1 | 601.75 | 891.66 | 607.89 | 891.87 | 610.34 | 892 |
| 620.24 | 892.57 | 627.37 | 892.79 | 630.4 | 892.87 | 632.6 | 892.89 | 640.75 | 893.39 |
| 644.4 | 893.61 | 644.95 | 893.63 | 651.87 | 893.89 | 657.31 | 894.18 | 659.04 | 894.2 |
| 661.43 | 894.26 | 669.66 | 894.49 | 678.45 | 894.57 | 682.02 | 894.61 | 694.37 | 894.53 |
| 706.73 | 894.41 | 712.51 | 894.34 | 724.83 | 894.22 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 68.13 | .04 | 178.31 | .052 | 330.52 | .04 | 640.75 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 208.75 | 433.45 | 216.82 | 199.57 | 199.91 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 560.33 | 724.83 | 896.12 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 892.27 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.051 | 0.046 | 0.040 |
| W.S. Elev (ft) | 892.14 | Reach Len. (ft) | 216.82 | 199.57 | 199.91 |
| Crit W.S. (ft) | 890.56 | Flow Area (sq ft) | 38.78 | 605.93 | 21.44 |
| E.G. Slope (ft/ft) | 0.002160 | Area (sq ft) | 38.78 | 605.93 | 26.01 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 49.62 | 1762.33 | 28.05 |
| Top Width (ft) | 326.15 | Top Width (ft) | 50.02 | 224.70 | 51.43 |
| Vel Total (ft/s) | 2.76 | Avg. Vel. (ft/s) | 1.28 | 2.91 | 1.31 |
| Max Chl Dpth (ft) | 4.69 | Hydr. Depth (ft) | 0.78 | 2.70 | 0.63 |
| Conv. Total (cfs) | 39590.3 | Conv. (cfs) | 1067.7 | 37919.0 | 603.6 |
| Length Wtd. (ft) | 199.94 | Wetted Per. (ft) | 50.04 | 225.41 | 34.16 |
| Min Ch El (ft) | 887.45 | Shear (lb/sq ft) | 0.10 | 0.36 | 0.08 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.13 | 1.05 | 0.11 |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 15.66 | 28.98 | 66.49 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 26.79 | 10.64 | 83.48 |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 893.11 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 893.03 | Reach Len. (ft) | 216.82 | 199.57 | 199.91 |
| Crit W.S. (ft) | 890.56 | Flow Area (sq ft) | | 805.92 | |
| E.G. Slope (ft/ft) | 0.000927 | Area (sq ft) | | 805.92 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 224.70 | Top Width (ft) | | 224.70 | |
| Vel Total (ft/s) | 2.28 | Avg. Vel. (ft/s) | | 2.28 | |
| Max Chl Dpth (ft) | 5.58 | Hydr. Depth (ft) | | 3.59 | |
| Conv. Total (cfs) | 60423.7 | Conv. (cfs) | | 60423.7 | |
| Length Wtd. (ft) | 199.58 | Wetted Per. (ft) | | 228.99 | |
| Min Ch El (ft) | 887.45 | Shear (lb/sq ft) | | 0.20 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.47 | |
| Frctn Loss (ft) | 0.35 | Cum Volume (acre-ft) | 1.11 | 36.70 | 7.53 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.33 | 11.19 | 3.25 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 892.29 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 892.15 | Reach Len. (ft) | 216.82 | 199.57 | 199.91 |
| Crit W.S. (ft) | 890.56 | Flow Area (sq ft) | | 608.22 | |
| E.G. Slope (ft/ft) | 0.002349 | Area (sq ft) | | 608.22 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 224.70 | Top Width (ft) | | 224.70 | |
| Vel Total (ft/s) | 3.03 | Avg. Vel. (ft/s) | | 3.03 | |
| Max Chl Dpth (ft) | 4.70 | Hydr. Depth (ft) | | 2.71 | |
| Conv. Total (cfs) | 37961.0 | Conv. (cfs) | | 37961.0 | |
| Length Wtd. (ft) | 199.71 | Wetted Per. (ft) | | 227.23 | |
| Min Ch El (ft) | 887.45 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.19 | |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 3.71 | 31.27 | 18.34 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.84 | 10.79 | 12.35 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .997

INPUT
Description: Thalweg Sta. 345.20
Station Elevation Data num= 151

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 896.41 | 2.72 | 896.19 | 6.9 | 895.89 | 10.31 | 895.67 | 17.81 | 895.6 |
| 17.91 | 895.6 | 18.15 | 895.61 | 28.72 | 896.25 | 36.93 | 896.8 | 39.64 | 897 |
| 43.12 | 897.17 | 50.55 | 897.44 | 56.31 | 897.56 | 61.46 | 897.69 | 68.1 | 897.83 |
| 72.38 | 897.89 | 75.69 | 897.85 | 83.29 | 897.84 | 86.26 | 897.77 | 93.07 | 897.45 |
| 94.2 | 897.39 | 95.07 | 897.31 | 114.46 | 895.78 | 116.03 | 895.66 | 126.94 | 895.01 |
| 137.85 | 894.58 | 143.02 | 894.39 | 147.02 | 894.34 | 148.77 | 894.24 | 154.61 | 894.17 |
| 159.68 | 894.05 | 160.24 | 894.04 | 167.99 | 893.86 | 170.59 | 893.81 | 177.39 | 893.44 |
| 181.51 | 893.24 | 184.99 | 893 | 192.42 | 892.56 | 192.58 | 892.55 | 192.97 | 892.54 |
| 203.33 | 892.3 | 211.38 | 892.6 | 214.25 | 892.68 | 217.94 | 892.87 | 225.16 | 893.28 |
| 230.76 | 893.45 | 236.07 | 893.64 | 246.99 | 893.66 | 249.84 | 893.62 | 250.14 | 893.62 |
| 251.56 | 893.61 | 257.9 | 893.57 | 267.89 | 893.33 | 268.81 | 893.3 | 269.52 | 893.25 |
| 279.73 | 892.63 | 288.91 | 891.87 | 290.64 | 891.73 | 292.86 | 891.59 | 301.55 | 891.03 |
| 308.3 | 890.62 | 312.46 | 890.39 | 317.83 | 889.72 | 323.38 | 889 | 327.68 | 888.36 |
| 334.29 | 887.34 | 342.8 | 886.71 | 345.2 | 886.6 | 352.07 | 887.16 | 356.12 | 887.58 |
| 359.66 | 887.98 | 367.03 | 888.69 | 367.26 | 888.71 | 367.78 | 888.74 | 377.94 | 889.36 |
| 385.82 | 889.76 | 388.86 | 889.91 | 389.41 | 889.93 | 392.75 | 890.06 | 399.77 | 890.28 |
| 405.22 | 890.34 | 410.68 | 890.42 | 415.25 | 890.44 | 417.72 | 890.45 | 420.41 | 890.45 |
| 421.59 | 890.46 | 428.01 | 890.47 | 432.51 | 890.49 | 442.7 | 890.49 | 443.42 | 890.48 |
| 443.98 | 890.48 | 454.33 | 890.42 | 463.36 | 890.35 | 465.25 | 890.33 | 467.67 | 890.32 |
| 517.62 | 889.92 | 519.15 | 889.91 | 519.81 | 889.91 | 521.5 | 889.89 | 540.9 | 889.69 |
| 541.64 | 889.68 | 552.55 | 889.56 | 560.28 | 889.5 | 563.46 | 889.46 | 574.38 | 889.39 |
| 579.66 | 889.46 | 585.29 | 889.51 | 587.5 | 889.62 | 592.54 | 890.03 | 596.2 | 890.32 |
| 599.04 | 890.99 | 607.12 | 892.88 | 617.52 | 895.64 | 618.03 | 895.78 | 618.42 | 895.82 |
| 628.94 | 896.98 | 637.8 | 894.95 | 642.49 | 894.04 | 648.25 | 892.79 | 650.77 | 892.5 |
| 655.84 | 892.14 | 661.68 | 891.93 | 667.46 | 891.88 | 678.63 | 891.84 | 683.51 | 891.83 |
| 686.88 | 891.83 | 707.43 | 891.89 | 707.92 | 891.89 | 709.33 | 891.88 | 720.37 | 891.83 |
| 722.01 | 891.81 | 729.16 | 891.52 | 732.81 | 891.28 | 741.04 | 890.77 | 745.25 | 890.57 |
| 757.26 | 890.9 | 757.69 | 890.91 | 757.84 | 890.92 | 770.13 | 891.97 | 774.65 | 892.26 |
| 782.57 | 892.68 | 786.35 | 892.82 | 807.46 | 893.48 | 808.26 | 893.51 | 819.91 | 893.93 |
| 841.87 | 894.76 | 844.79 | 894.85 | 847.73 | 894.92 | 857.23 | 895.15 | 858.68 | 895.15 |
| 861.52 | 895.09 | | | | | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 160.24 | .04 | 249.84 | .052 | 389.41 | .04 | 847.73 | 0 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 312.46 | 415.25 | 229.95 | 199.9 | 175.93 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 628.94 | 861.52 | 896.98 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 891.69 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.052 | 0.051 | 0.040 |
| W.S. Elev (ft) | 891.52 | Reach Len. (ft) | 229.95 | 199.90 | 175.93 |
| Crit W.S. (ft) | 890.79 | Flow Area (sq ft) | 10.73 | 272.42 | 276.01 |
| E.G. Slope (ft/ft) | 0.003880 | Area (sq ft) | 10.73 | 272.42 | 295.90 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 13.28 | 996.45 | 830.27 |
| Top Width (ft) | 342.95 | Top Width (ft) | 18.48 | 102.79 | 221.68 |
| Vel Total (ft/s) | 3.29 | Avg. Vel. (ft/s) | 1.24 | 3.66 | 3.01 |
| Max Chl Dpth (ft) | 4.92 | Hydr. Depth (ft) | 0.58 | 2.65 | 1.48 |
| Conv. Total (cfs) | 29537.9 | Conv. (cfs) | 213.2 | 15996.3 | 13328.5 |
| Length Wtd. (ft) | 192.65 | Wetted Per. (ft) | 18.51 | 103.17 | 186.22 |
| Min Ch El (ft) | 886.60 | Shear (lb/sq ft) | 0.14 | 0.64 | 0.36 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.17 | 2.34 | 1.08 |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 15.53 | 26.97 | 65.75 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 26.61 | 9.89 | 82.86 |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 892.74 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.050 | 0.040 |
| W.S. Elev (ft) | 892.42 | Reach Len. (ft) | 229.95 | 199.90 | 175.93 |
| Crit W.S. (ft) | 891.07 | Flow Area (sq ft) | | 365.16 | 44.08 |
| E.G. Slope (ft/ft) | 0.004386 | Area (sq ft) | | 365.16 | 44.08 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1679.69 | 160.31 |
| Top Width (ft) | 125.39 | Top Width (ft) | | 102.79 | 22.60 |
| Vel Total (ft/s) | 4.50 | Avg. Vel. (ft/s) | | 4.60 | 3.64 |
| Max Chl Dpth (ft) | 5.82 | Hydr. Depth (ft) | | 3.55 | 1.95 |
| Conv. Total (cfs) | 27782.8 | Conv. (cfs) | | 25362.3 | 2420.5 |
| Length Wtd. (ft) | 198.86 | Wetted Per. (ft) | | 105.20 | 24.53 |
| Min Ch El (ft) | 886.60 | Shear (lb/sq ft) | | 0.95 | 0.49 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 4.37 | 1.79 |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 1.11 | 34.02 | 7.43 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.33 | 10.44 | 3.20 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 891.69 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.052 | 0.051 | 0.040 |
| W.S. Elev (ft) | 891.52 | Reach Len. (ft) | 229.95 | 199.90 | 175.93 |
| Crit W.S. (ft) | 890.79 | Flow Area (sq ft) | 10.73 | 272.42 | 276.01 |
| E.G. Slope (ft/ft) | 0.003880 | Area (sq ft) | 10.73 | 272.42 | 276.01 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 13.28 | 996.45 | 830.27 |
| Top Width (ft) | 307.31 | Top Width (ft) | 18.48 | 102.79 | 186.05 |
| Vel Total (ft/s) | 3.29 | Avg. Vel. (ft/s) | 1.24 | 3.66 | 3.01 |
| Max Chl Dpth (ft) | 4.92 | Hydr. Depth (ft) | 0.58 | 2.65 | 1.48 |
| Conv. Total (cfs) | 29537.9 | Conv. (cfs) | 213.2 | 15996.3 | 13328.5 |
| Length Wtd. (ft) | 192.65 | Wetted Per. (ft) | 18.51 | 103.17 | 186.22 |
| Min Ch El (ft) | 886.60 | Shear (lb/sq ft) | 0.14 | 0.64 | 0.36 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.17 | 2.34 | 1.08 |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 3.69 | 29.25 | 17.71 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.79 | 10.04 | 11.92 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E

REACH: Reach 1 RS: .959

INPUT
Description: Thalweg Sta. 410.10
Station Elevation Data num= 134

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 893.97 | 4.38 | 893.89 | 11.86 | 893.54 | 15.27 | 893.39 | 26.16 | 892.84 |
| 37.05 | 892.41 | 44.99 | 892.21 | 47.94 | 892.13 | 54.66 | 891.97 | 69.72 | 891.64 |
| 70.23 | 891.64 | 71.17 | 891.63 | 80.62 | 891.49 | 88.49 | 891.5 | 91.51 | 891.49 |
| 102.4 | 891.57 | 120.71 | 891.66 | 124.18 | 891.67 | 130.74 | 891.66 | 135.08 | 891.67 |
| 145.98 | 891.66 | 156.86 | 891.61 | 165.14 | 891.47 | 167.75 | 891.41 | 171.19 | 891.18 |
| 178.64 | 890.66 | 184.3 | 890.17 | 189.53 | 889.7 | 196.43 | 889.41 | 200.43 | 889.22 |
| 206.83 | 889.3 | 211.32 | 889.3 | 221.68 | 889.6 | 222.21 | 889.61 | 233.1 | 889.89 |
| 237.26 | 889.93 | 243.99 | 890.04 | 260.93 | 890.17 | 265.77 | 890.22 | 272.15 | 890.32 |
| 276.66 | 890.38 | 280.08 | 890.53 | 287.56 | 890.84 | 297.39 | 891.44 | 298.45 | 891.5 |
| 309.34 | 892.05 | 320.32 | 892.06 | 333.91 | 891.71 | 340.53 | 891.51 | 351.02 | 891.19 |
| 361.08 | 890.81 | 365.79 | 890.58 | 374.67 | 889.94 | 377.47 | 889.61 | 380.56 | 889.25 |
| 388.26 | 888.07 | 395.33 | 887.01 | 401.85 | 886.14 | 410.1 | 886.08 | 415.44 | 886.45 |
| 424.87 | 887.15 | 429.03 | 887.44 | 439.64 | 888.08 | 441.19 | 888.17 | 442.61 | 888.24 |
| 448.27 | 888.53 | 456.2 | 888.8 | 459.45 | 888.83 | 469.18 | 888.94 | 469.79 | 888.95 |
| 475.42 | 888.96 | 475.66 | 888.96 | 499.16 | 888.96 | 504.03 | 888.97 | 515.1 | 889.01 |
| 517.64 | 889.03 | 535.63 | 889.1 | 537.23 | 889.1 | 538.67 | 889.09 | 548.29 | 889.06 |
| 559.36 | 889.06 | 559.69 | 889.08 | 570.42 | 889.67 | 580.7 | 891.81 | 581.49 | 891.98 |
| 582.35 | 892.16 | 589.27 | 893.67 | 592.55 | 894.43 | 596.78 | 894.94 | 603.62 | 895.51 |
| 604.29 | 895.39 | 605.71 | 895.07 | 614.68 | 893 | 622.75 | 890.5 | 625.75 | 889.64 |
| 629.07 | 889.36 | 636.81 | 888.87 | 643.77 | 888.76 | 647.88 | 888.68 | 656.85 | 888.6 |
| 670.01 | 888.53 | 681.07 | 888.53 | 685.82 | 888.63 | 692.14 | 888.72 | 699.15 | 889.21 |
| 703.2 | 889.55 | 706.84 | 889.78 | 714.27 | 890.35 | 722.51 | 890.38 | 725.33 | 890.34 |
| 726.52 | 890.31 | 737.94 | 890.05 | 738.69 | 890.03 | 739.49 | 890.02 | 751.73 | 890.17 |
| 754.02 | 890.24 | 765.51 | 890.69 | 768.55 | 890.78 | 779.29 | 890.77 | 783.08 | 890.68 |
| 788.21 | 890.5 | 793.08 | 890.29 | 797.61 | 890.11 | 806.87 | 889.86 | 812.14 | 889.87 |
| 820.64 | 890.25 | 834.43 | 891.16 | 841.2 | 891.48 | 848.22 | 891.67 | 855.73 | 891.81 |
| 870.26 | 892.02 | 884.79 | 892.17 | 898.17 | 892.16 | 900.87 | 892.16 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 71.17 | .04 | 340.53 | .052 | 459.45 | .04 | 898.17 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 377.47 | 475.66 | 187.22 | 199.87 | 219.88 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 603.62 | 900.87 | 895.51 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 890.87 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | 0.040 | 0.051 | 0.040 |
| W.S. Elev (ft) | 890.65 | Reach Len. (ft) | 187.22 | 199.87 | 219.88 |
| Crit W.S. (ft) | 889.91 | Flow Area (sq ft) | 85.58 | 279.77 | 153.18 |
| E.G. Slope (ft/ft) | 0.004712 | Area (sq ft) | 85.58 | 279.77 | 347.91 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 176.31 | 1143.23 | 520.47 |
| Top Width (ft) | 500.32 | Top Width (ft) | 117.47 | 98.19 | 284.65 |
| Vel Total (ft/s) | 3.55 | Avg. Vel. (ft/s) | 2.06 | 4.09 | 3.40 |
| Max Chl Dpth (ft) | 4.57 | Hydr. Depth (ft) | 0.73 | 2.85 | 1.54 |
| Conv. Total (cfs) | 26804.7 | Conv. (cfs) | 2568.4 | 16654.3 | 7582.0 |
| Length Wtd. (ft) | 201.78 | Wetted Per. (ft) | 117.59 | 98.52 | 99.60 |
| Min Ch El (ft) | 886.08 | Shear (lb/sq ft) | 0.21 | 0.84 | 0.45 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.44 | 3.41 | 1.54 |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | 15.28 | 25.71 | 64.45 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 26.26 | 9.43 | 81.84 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 891.50 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.55 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 890.96 | Reach Len. (ft) | 187.22 | 199.87 | 219.88 |
| Crit W.S. (ft) | 890.02 | Flow Area (sq ft) | | 309.53 | |
| E.G. Slope (ft/ft) | 0.009038 | Area (sq ft) | | 309.53 | |

| | | | | | |
|---|---|---|---|---|---|
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 98.19 | Top Width (ft) | | 98.19 | |
| Vel Total (ft/s) | 5.94 | Avg. Vel. (ft/s) | | 5.94 | |
| Max Chl Dpth (ft) | 4.88 | Hydr. Depth (ft) | | 3.15 | |
| Conv. Total (cfs) | 19354.8 | Conv. (cfs) | | 19354.8 | |
| Length Wtd. (ft) | 199.87 | Wetted Per. (ft) | | 101.86 | |
| Min Ch El (ft) | 886.08 | Shear (lb/sq ft) | | 1.71 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 10.19 | |
| Frctn Loss (ft) | 1.41 | Cum Volume (acre-ft) | 1.11 | 32.47 | 7.34 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 0.33 | 9.98 | 3.15 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 890.87 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | 0.040 | 0.051 | 0.040 |
| W.S. Elev (ft) | 890.65 | Reach Len. (ft) | 187.22 | 199.87 | 219.88 |
| Crit W.S. (ft) | 889.91 | Flow Area (sq ft) | 85.58 | 279.77 | 153.18 |
| E.G. Slope (ft/ft) | 0.004712 | Area (sq ft) | 85.58 | 279.77 | 153.18 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 176.31 | 1143.23 | 520.47 |
| Top Width (ft) | 315.14 | Top Width (ft) | 117.47 | 98.19 | 99.48 |
| Vel Total (ft/s) | 3.55 | Avg. Vel. (ft/s) | 2.06 | 4.09 | 3.40 |
| Max Chl Dpth (ft) | 4.57 | Hydr. Depth (ft) | 0.73 | 2.85 | 1.54 |
| Conv. Total (cfs) | 26804.7 | Conv. (cfs) | 2568.4 | 16654.3 | 7582.0 |
| Length Wtd. (ft) | 201.78 | Wetted Per. (ft) | 117.59 | 98.52 | 99.60 |
| Min Ch El (ft) | 886.08 | Shear (lb/sq ft) | 0.21 | 0.84 | 0.45 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.44 | 3.41 | 1.54 |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | 3.43 | 27.99 | 16.84 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 2.43 | 9.58 | 11.34 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .921

INPUT
Description: Thalweg Sta. 491.45
Station Elevation Data num= 169

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 892.15 | 2.9 | 892.05 | 8.24 | 891.89 | 11.29 | 891.82 | 18.61 | 891.62 |
| 28.97 | 891.52 | 31.41 | 891.52 | 39.34 | 891.64 | 45.66 | 891.75 | 59.91 | 892.23 |
| 60.07 | 892.23 | 60.48 | 892.25 | 68.3 | 892.53 | 70.43 | 892.6 | 80.8 | 892.9 |
| 84.58 | 892.95 | 91.16 | 893.07 | 98.48 | 893.08 | 101.53 | 893.07 | 102.96 | 893.05 |
| 109.02 | 892.99 | 111.89 | 892.97 | 117.16 | 892.85 | 122.26 | 892.76 | 125.31 | 892.62 |
| 132.62 | 892.33 | 142.99 | 891.85 | 153.35 | 891.29 | 159.68 | 890.65 | 163.72 | 890.29 |
| 173.93 | 888.67 | 174.09 | 888.64 | 174.5 | 888.61 | 182.31 | 888.05 | 184.45 | 887.94 |
| 188.18 | 887.96 | 194.81 | 887.89 | 205.18 | 888.36 | 212.51 | 888.76 | 212.84 | 888.78 |
| 215.55 | 888.91 | 216.68 | 888.95 | 225.91 | 889.35 | 230.93 | 889.49 | 236.28 | 889.66 |
| 245.18 | 889.82 | 246.64 | 889.85 | 257.01 | 889.78 | 259.43 | 889.74 | 267.37 | 889.57 |
| 273.68 | 889.53 | 277.74 | 889.49 | 286.1 | 889.65 | 287.94 | 889.69 | 288.1 | 889.69 |
| 288.52 | 889.7 | 304.48 | 890.22 | 319.2 | 890.67 | 326.53 | 890.67 | 329.56 | 890.66 |
| 330.69 | 890.64 | 339.93 | 890.44 | 345.19 | 890.34 | 360.66 | 890.01 | 360.89 | 890 |
| 361.44 | 889.99 | 382.45 | 889.54 | 388.42 | 889.38 | 393.35 | 889.26 | 397.97 | 889.1 |
| 404.25 | 888.89 | 409.85 | 888.67 | 415.15 | 888.47 | 416.37 | 888.42 | 435.62 | 887.67 |
| 436.95 | 887.62 | 438.67 | 887.55 | 447.85 | 887.14 | 454.87 | 886.72 | 458.75 | 886.5 |
| 463.8 | 886.16 | 467.88 | 885.85 | 469.65 | 885.82 | 475.49 | 886.14 | 480.55 | 886.44 |
| 483.08 | 885.97 | 488.93 | 884.23 | 491.45 | 883.54 | 493.38 | 883.7 | 512.63 | 885.16 |
| 513.25 | 885.2 | 514.05 | 885.29 | 524.16 | 886.75 | 531.9 | 888.25 | 535.05 | 888.96 |
| 539.18 | 889.46 | 541.51 | 889.71 | 545.95 | 890.19 | 551.14 | 890.64 | 555.37 | 891.03 |
| 556.86 | 891.16 | 567.76 | 892.82 | 570.39 | 893.14 | 578.66 | 894.16 | 582.82 | 893.57 |
| 587.91 | 892.9 | 593.28 | 892.12 | 601.72 | 890.86 | 607.26 | 890.56 | 613.4 | 890.24 |
| 626.6 | 890.07 | 636.77 | 889.91 | 645.95 | 889.69 | 648.45 | 889.58 | 652.24 | 889.33 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 660.13 | 888.83 | 665.29 | 888.49 | 671.81 | 888.2 | 681.73 | 888.16 | 683.49 | 888.13 |
| 683.93 | 888.13 | 684.64 | 888.14 | 695.17 | 888.38 | 703.99 | 888.55 | 706.86 | 888.56 |
| 711.22 | 888.44 | 718.54 | 888.29 | 723.34 | 888.06 | 730.22 | 887.68 | 740.71 | 887.36 |
| 741.9 | 887.32 | 742.68 | 887.3 | 760.81 | 887.21 | 761.59 | 887.21 | 773.97 | 887.23 |
| 784.22 | 887.29 | 786.36 | 887.33 | 792.13 | 887.42 | 798.74 | 887.54 | 801.18 | 887.57 |
| 811.12 | 887.82 | 818.14 | 887.97 | 823.5 | 888.22 | 831.57 | 888.62 | 835.09 | 888.79 |
| 835.89 | 888.82 | 838.05 | 888.91 | 848.27 | 889.36 | 852.05 | 889.51 | 860.65 | 889.63 |
| 869 | 889.72 | 883.95 | 889.67 | 885.42 | 889.67 | 885.96 | 889.66 | 897.8 | 889.4 |
| 902.92 | 889.28 | 919.87 | 889.07 | 922.57 | 889.08 | 934.95 | 889.1 | 936.83 | 889.1 |
| 947.33 | 889.12 | 950.06 | 889.12 | 953.79 | 889.13 | 957.21 | 889.13 | 959.72 | 889.14 |
| 970.74 | 889.17 | 984.48 | 889.18 | 987.69 | 889.19 | 989.97 | 889.19 | | |

Manning's n Values num= 7

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 102.96 | .04 | 212.84 | .052 | 286.1 | .04 | 397.97 | .052 |
| 541.51 | .04 | 831.57 | .035 | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 409.85 | 578.66 | 163.95 | 199.88 | 218.71 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 578.66 | 989.97 | 894.16 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 889.41 | Element | | | |
| Vel Head (ft) | 0.49 | Wt. n-Val. | 0.040 | 0.052 | |
| W.S. Elev (ft) | 888.92 | Reach Len. (ft) | 163.95 | 199.88 | 218.71 |
| Crit W.S. (ft) | 888.35 | Flow Area (sq ft) | 29.29 | 307.17 | |
| E.G. Slope (ft/ft) | 0.012084 | Area (sq ft) | 29.29 | 307.17 | 185.56 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 91.36 | 1748.64 | |
| Top Width (ft) | 354.97 | Top Width (ft) | 50.22 | 125.04 | 179.71 |
| Vel Total (ft/s) | 5.47 | Avg. Vel. (ft/s) | 3.12 | 5.69 | |
| Max Chl Dpth (ft) | 5.38 | Hydr. Depth (ft) | 0.58 | 2.46 | |
| Conv. Total (cfs) | 16738.2 | Conv. (cfs) | 831.1 | 15907.0 | |
| Length Wtd. (ft) | 187.91 | Wetted Per. (ft) | 50.30 | 125.91 | |
| Min Ch El (ft) | 883.54 | Shear (lb/sq ft) | 0.44 | 1.84 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.37 | 10.48 | |
| Frctn Loss (ft) | 0.60 | Cum Volume (acre-ft) | 15.03 | 24.36 | 63.10 |
| C & E Loss (ft) | 0.12 | Cum SA (acres) | 25.90 | 8.92 | 80.66 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 890.02 | Element | | | |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 889.71 | Reach Len. (ft) | 163.95 | 199.88 | 218.71 |
| Crit W.S. (ft) | 888.27 | Flow Area (sq ft) | | 407.48 | |
| E.G. Slope (ft/ft) | 0.005644 | Area (sq ft) | | 407.48 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 131.63 | Top Width (ft) | | 131.63 | |
| Vel Total (ft/s) | 4.52 | Avg. Vel. (ft/s) | | 4.52 | |
| Max Chl Dpth (ft) | 6.17 | Hydr. Depth (ft) | | 3.10 | |
| Conv. Total (cfs) | 24491.3 | Conv. (cfs) | | 24491.3 | |
| Length Wtd. (ft) | 192.88 | Wetted Per. (ft) | | 133.58 | |
| Min Ch El (ft) | 883.54 | Shear (lb/sq ft) | | 1.07 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.85 | |
| Frctn Loss (ft) | 0.60 | Cum Volume (acre-ft) | 1.11 | 30.83 | 7.34 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 0.33 | 9.45 | 3.15 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 889.41 | Element | | | |
| Vel Head (ft) | 0.49 | Wt. n-Val. | 0.040 | 0.052 | |
| W.S. Elev (ft) | 888.92 | Reach Len. (ft) | 163.95 | 199.88 | 218.71 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Crit W.S. (ft) | 888.35 | Flow Area (sq ft) | 29.29 | 307.17 | | |
| E.G. Slope (ft/ft) | 0.012084 | Area (sq ft) | 29.29 | 307.17 | | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 91.36 | 1748.64 | | |
| Top Width (ft) | 175.26 | Top Width (ft) | 50.22 | 125.04 | | |
| Vel Total (ft/s) | 5.47 | Avg. Vel. (ft/s) | 3.12 | 5.69 | | |
| Max Chl Dpth (ft) | 5.38 | Hydr. Depth (ft) | 0.58 | 2.46 | | |
| Conv. Total (cfs) | 16738.2 | Conv. (cfs) | 831.1 | 15907.0 | | |
| Length Wtd. (ft) | 187.91 | Wetted Per. (ft) | 50.30 | 125.91 | | |
| Min Ch El (ft) | 883.54 | Shear (lb/sq ft) | 0.44 | 1.84 | | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.37 | 10.48 | | |
| Frctn Loss (ft) | 0.60 | Cum Volume (acre-ft) | 3.19 | 26.64 | 16.46 | |
| C & E Loss (ft) | 0.12 | Cum SA (acres) | 2.07 | 9.07 | 11.09 | |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .883

INPUT
Description: Thalweg Sta. 466.74
Station Elevation Data num= 153

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 893.39 | 2.54 | 893.41 | 7.93 | 893.44 | 9.25 | 893.43 | 24.47 | 893.38 |
| 32.75 | 893.29 | 40.13 | 893.16 | 41.02 | 893.14 | 44.69 | 893 | 50.42 | 892.73 |
| 52.27 | 892.61 | 60.71 | 892.1 | 71.01 | 891.43 | 79.51 | 890.93 | 80.5 | 890.88 |
| 81.3 | 890.83 | 86.83 | 890.57 | 91.6 | 890.36 | 93.13 | 890.33 | 101.89 | 890.05 |
| 106.76 | 889.93 | 112.18 | 889.76 | 120.38 | 889.55 | 122.48 | 889.49 | 128.97 | 889.34 |
| 132.77 | 889.27 | 134 | 889.25 | 143.07 | 889.08 | 148.57 | 889.01 | 153.36 | 888.98 |
| 161.24 | 888.7 | 163.66 | 888.62 | 165.12 | 888.51 | 173.95 | 887.58 | 174.87 | 887.48 |
| 184.24 | 886.35 | 188.48 | 886.07 | 194.54 | 885.62 | 204.83 | 885.28 | 206.68 | 885.23 |
| 215.13 | 885.01 | 215.72 | 885 | 225.42 | 884.77 | 229.35 | 884.69 | 242.97 | 884.4 |
| 246.01 | 884.34 | 255.4 | 884.18 | 256.13 | 884.17 | 256.59 | 884.17 | 266.59 | 884.13 |
| 270.21 | 884.49 | 276.7 | 884.51 | 280.42 | 884.9 | 286.7 | 884.94 | 290.63 | 885.28 |
| 296.71 | 886.19 | 300.84 | 886.53 | 306.71 | 887.39 | 311.05 | 887.71 | 316.71 | 888.62 |
| 321.25 | 888.89 | 326.71 | 889.29 | 331.46 | 889.29 | 336.71 | 889.32 | 338.31 | 889.27 |
| 346.72 | 888.98 | 351.56 | 888.8 | 356.72 | 888.59 | 361.37 | 888.35 | 366.72 | 888.05 |
| 372.29 | 887.69 | 376.72 | 887.39 | 382.49 | 887.13 | 386.72 | 886.91 | 392.71 | 886.75 |
| 396.73 | 886.62 | 402.91 | 886.45 | 406.73 | 886.37 | 413.11 | 886.17 | 416.73 | 886.07 |
| 426.73 | 885.75 | 436.73 | 885.41 | 443.74 | 885.14 | 446.74 | 885.01 | 453.94 | 884.57 |
| 456.74 | 884.39 | 464.15 | 883.79 | 466.74 | 883.53 | 469.22 | 883.81 | 476.74 | 884.31 |
| 479.03 | 884.84 | 486.74 | 886.77 | 488.83 | 887.29 | 496.04 | 889.26 | 496.75 | 889.45 |
| 498.64 | 889.91 | 500.39 | 890.45 | 506.75 | 892.4 | 515.18 | 893.34 | 516.75 | 893.63 |
| 517.3 | 893.56 | 517.99 | 893.5 | 519.66 | 893.33 | 529.67 | 892.23 | 542.76 | 890.25 |
| 550.64 | 889.6 | 555.86 | 889.15 | 560.56 | 888.92 | 566.13 | 888.62 | 568.95 | 888.44 |
| 581.62 | 887.75 | 582.04 | 887.72 | 595.14 | 887.11 | 597.11 | 887.05 | 608.23 | 887.17 |
| 612.6 | 887.3 | 617.32 | 887.46 | 643.58 | 888.19 | 659.07 | 888.58 | 659.91 | 888.6 |
| 660.61 | 888.61 | 669.05 | 888.79 | 673.71 | 888.88 | 674.56 | 888.89 | 686.8 | 889.01 |
| 699.89 | 888.9 | 705.54 | 888.79 | 726.08 | 888.34 | 736.52 | 888.16 | 739.17 | 888.12 |
| 749.49 | 888.05 | 752.01 | 888.03 | 765.37 | 888.03 | 791.56 | 888.29 | 808.45 | 888.3 |
| 809.56 | 888.29 | 825.9 | 888.1 | 843.34 | 888.01 | 858.38 | 888.06 | 860.79 | 888.06 |
| 880.91 | 888.12 | 882.79 | 888.12 | 893.4 | 888.14 | 931.6 | 888.14 | 934.01 | 888.13 |
| 943.81 | 888.13 | 945.54 | 888.12 | 1035.24 | 888.05 | 1052.68 | 888.09 | 1053.64 | 888.09 |
| 1055.87 | 888.1 | 1087.58 | 888.2 | 1087.8 | 888.21 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 80.5 | .04 | 206.68 | .052 | 496.04 | .04 | 749.49 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 338.31 | 516.75 | 205.18 | 199.95 | 194.33 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 516.75 | 1087.8 | 893.63 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | | |
|---|---|---|---|---|---|---|
| E.G. Elev (ft) | 888.69 | Element | Left OB | Channel | Right OB | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.050 | 0.052 | | |
| W.S. Elev (ft) | 888.61 | Reach Len. (ft) | 205.18 | 199.95 | 194.33 | |
| Crit W.S. (ft) | 886.40 | Flow Area (sq ft) | 466.71 | 350.18 | | |

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.001439 | Area (sq ft) | 466.71 | 350.18 | 257.14 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1134.32 | 705.68 | |
| Top Width (ft) | 758.51 | Top Width (ft) | 152.84 | 137.41 | 468.26 |
| Vel Total (ft/s) | 2.25 | Avg. Vel. (ft/s) | 2.43 | 2.02 | |
| Max Chl Dpth (ft) | 5.08 | Hydr. Depth (ft) | 3.05 | 2.55 | |
| Conv. Total (cfs) | 48512.3 | Conv. (cfs) | 29906.9 | 18605.5 | |
| Length Wtd. (ft) | 201.99 | Wetted Per. (ft) | 153.29 | 138.12 | |
| Min Ch El (ft) | 883.53 | Shear (lb/sq ft) | 0.27 | 0.23 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.66 | 0.46 | |
| Frctn Loss (ft) | 0.55 | Cum Volume (acre-ft) | 14.10 | 22.85 | 61.99 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 25.51 | 8.32 | 79.04 |

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The composite Mannings n value for the channel was larger than the largest entered n value or smaller than the smallest entered n value.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 889.36 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 889.26 | Reach Len. (ft) | 205.18 | 199.95 | 194.33 |
| Crit W.S. (ft) | 886.88 | Flow Area (sq ft) | 262.30 | 445.21 | |
| E.G. Slope (ft/ft) | 0.001959 | Area (sq ft) | 262.30 | 445.21 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 717.02 | 1122.98 | |
| Top Width (ft) | 234.58 | Top Width (ft) | 77.29 | 157.29 | |
| Vel Total (ft/s) | 2.60 | Avg. Vel. (ft/s) | 2.73 | 2.52 | |
| Max Chl Dpth (ft) | 5.73 | Hydr. Depth (ft) | 3.39 | 2.83 | |
| Conv. Total (cfs) | 41568.1 | Conv. (cfs) | 16198.5 | 25369.6 | |
| Length Wtd. (ft) | 200.97 | Wetted Per. (ft) | 82.56 | 158.10 | |
| Min Ch El (ft) | 883.53 | Shear (lb/sq ft) | 0.39 | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.06 | 0.87 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | 0.62 | 28.87 | 7.34 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.18 | 8.79 | 3.15 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 888.69 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.050 | 0.052 | |
| W.S. Elev (ft) | 888.61 | Reach Len. (ft) | 205.18 | 199.95 | 194.33 |
| Crit W.S. (ft) | 886.40 | Flow Area (sq ft) | 466.72 | 350.18 | |
| E.G. Slope (ft/ft) | 0.001438 | Area (sq ft) | 466.72 | 350.18 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1134.32 | 705.68 | |
| Top Width (ft) | 290.25 | Top Width (ft) | 152.84 | 137.41 | |
| Vel Total (ft/s) | 2.25 | Avg. Vel. (ft/s) | 2.43 | 2.02 | |
| Max Chl Dpth (ft) | 5.08 | Hydr. Depth (ft) | 3.05 | 2.55 | |
| Conv. Total (cfs) | 48513.8 | Conv. (cfs) | 29907.8 | 18606.0 | |
| Length Wtd. (ft) | 201.99 | Wetted Per. (ft) | 153.29 | 138.12 | |
| Min Ch El (ft) | 883.53 | Shear (lb/sq ft) | 0.27 | 0.23 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.66 | 0.46 | |
| Frctn Loss (ft) | 0.55 | Cum Volume (acre-ft) | 2.25 | 25.13 | 16.46 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.69 | 8.46 | 11.09 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .845

INPUT
Description: Thalweg Sta. 400.20
Station Elevation Data num= 189

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 890.32 | .91 | 890.28 | 8.78 | 889.95 | 12.01 | 889.84 | 18.82 | 889.57 |
| 34.19 | 889.11 | 38.91 | 889 | 45.28 | 888.78 | 48.96 | 888.64 | 56.37 | 888.31 |
| 59 | 888.15 | 64.14 | 887.88 | 67.47 | 887.71 | 69.04 | 887.61 | 78.56 | 887.2 |
| 79.09 | 887.19 | 79.52 | 887.2 | 84.18 | 887.25 | 89.13 | 887.29 | 89.65 | 887.3 |
| 99.18 | 887.27 | 107.06 | 887.23 | 109.22 | 887.19 | 111.83 | 887.26 | 119.27 | 887.54 |
| 122.92 | 887.64 | 134.01 | 887.85 | 139.36 | 887.88 | 145.1 | 888.1 | 149.4 | 888.3 |
| 152.95 | 888.43 | 159.45 | 888.69 | 169.49 | 888.41 | 179.53 | 887.72 | 189.47 | 887.19 |
| 189.58 | 887.19 | 199.62 | 886.89 | 200.56 | 886.86 | 209.67 | 886.63 | 211.66 | 886.59 |
| 219.71 | 886.41 | 222.75 | 886.38 | 229.76 | 886.28 | 233.83 | 886.37 | 239.8 | 886.43 |
| 244.92 | 886.61 | 249.84 | 886.77 | 256.01 | 886.79 | 259.89 | 886.94 | 267.11 | 886.92 |
| 269.93 | 887.01 | 278.2 | 887.29 | 289.29 | 887.42 | 290.02 | 887.42 | 297.01 | 887.38 |
| 297.13 | 887.38 | 300.07 | 887.37 | 300.38 | 887.37 | 310.11 | 887.35 | 311.48 | 887.35 |
| 320.16 | 887.4 | 322.57 | 887.46 | 330.2 | 887.7 | 333.66 | 887.76 | 340.25 | 887.89 |
| 344.75 | 887.78 | 346.87 | 887.7 | 350.29 | 887.58 | 355.83 | 887.06 | 360.33 | 886.56 |
| 366.93 | 884.76 | 370.38 | 883.81 | 378.02 | 882.6 | 380.42 | 882.26 | 389.11 | 882.58 |
| 390.47 | 882.65 | 400.2 | 883.13 | 400.51 | 883.14 | 403.44 | 883.23 | 410.56 | 883.43 |
| 411.3 | 883.49 | 420.6 | 884.22 | 422.39 | 884.59 | 430.64 | 886.08 | 433.48 | 886.47 |
| 440.69 | 887.57 | 444.57 | 887.81 | 450.27 | 888.22 | 450.73 | 888.25 | 460.78 | 888.73 |
| 463.36 | 888.98 | 465.01 | 889.14 | 470.82 | 889.76 | 474.19 | 890.46 | 480.87 | 891.74 |
| 483.37 | 891.69 | 490.91 | 891.42 | 492.54 | 891.07 | 500.96 | 889.35 | 501.72 | 889.24 |
| 509.86 | 888.11 | 510.9 | 887.96 | 511 | 887.95 | 511.12 | 887.94 | 521.05 | 887.69 |
| 522.21 | 887.7 | 527.28 | 887.73 | 532.35 | 887.78 | 539.87 | 887.81 | 545.74 | 887.81 |
| 554.91 | 887.77 | 569.96 | 887.67 | 572.51 | 887.66 | 585.01 | 887.57 | 585.89 | 887.57 |
| 599.28 | 887.47 | 600.05 | 887.46 | 612.66 | 887.25 | 620.89 | 887.05 | 626.04 | 886.98 |
| 627.98 | 887 | 630.14 | 887.05 | 635.05 | 887.15 | 639.43 | 887.26 | 645.19 | 887.38 |
| 652.82 | 887.49 | 666.2 | 887.46 | 679.58 | 887.24 | 689.8 | 886.93 | 690.32 | 886.91 |
| 692.96 | 886.86 | 705.37 | 886.56 | 705.88 | 886.54 | 706.35 | 886.53 | 712.97 | 886.36 |
| 720.06 | 886.14 | 720.41 | 886.14 | 733.12 | 886.08 | 735.46 | 886.13 | 746.51 | 886.38 |
| 748.38 | 886.42 | 759.89 | 886.7 | 773.27 | 886.57 | 786.66 | 886.4 | 790.89 | 886.43 |
| 795.64 | 886.45 | 800.04 | 886.48 | 825.73 | 886.75 | 826.3 | 886.75 | 826.81 | 886.76 |
| 840.19 | 886.8 | 840.46 | 886.8 | 840.77 | 886.79 | 853.58 | 886.73 | 866.96 | 886.72 |
| 907.63 | 886.88 | 911.05 | 886.9 | 911.91 | 886.9 | 923.84 | 886.92 | 971.09 | 886.93 |
| 975.03 | 886.94 | 976.02 | 886.94 | 987.82 | 886.95 | 1024.1 | 887.01 | 1026.21 | 887.02 |
| 1034.54 | 887.04 | 1039 | 887.06 | 1040.14 | 887.06 | 1051.8 | 887.11 | 1088.21 | 887.25 |
| 1090.19 | 887.25 | 1102.99 | 887.3 | 1104.24 | 887.31 | 1136.3 | 887.44 | 1166.97 | 887.61 |
| 1168.35 | 887.61 | 1216.44 | 887.83 | 1217.39 | 887.84 | 1218.15 | 887.84 | 1230.95 | 887.9 |
| 1232.47 | 887.9 | 1264.53 | 888.04 | 1269.34 | 888.07 | 1280.55 | 888.11 | 1282.13 | 888.12 |
| 1294.93 | 888.17 | 1296.58 | 888.17 | 1307.72 | 888.22 | 1308.93 | 888.22 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 64.14 | .04 | 297.13 | .052 | 463.36 | .04 | 689.8 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 340.25 | 480.87 | 202.23 | 199.86 | 190.54 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 159.45 | 888.69 | F |
| 480.87 | 1308.93 | 891.74 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 888.11 | Element | | | |
| Vel Head (ft) | 0.35 | Wt. n-Val. | 0.040 | 0.052 | |
| W.S. Elev (ft) | 887.76 | Reach Len. (ft) | 202.23 | 199.86 | 190.54 |
| Crit W.S. (ft) | 886.70 | Flow Area (sq ft) | 113.43 | 302.76 | |
| E.G. Slope (ft/ft) | 0.007126 | Area (sq ft) | 137.27 | 302.76 | 468.51 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 303.43 | 1536.57 | |
| Top Width (ft) | 970.10 | Top Width (ft) | 216.93 | 98.32 | 654.85 |
| Vel Total (ft/s) | 4.42 | Avg. Vel. (ft/s) | 2.68 | 5.08 | |
| Max Chl Dpth (ft) | 5.50 | Hydr. Depth (ft) | 0.73 | 3.08 | |
| Conv. Total (cfs) | 21797.3 | Conv. (cfs) | 3594.6 | 18202.7 | |
| Length Wtd. (ft) | 200.28 | Wetted Per. (ft) | 154.49 | 99.21 | |
| Min Ch El (ft) | 882.26 | Shear (lb/sq ft) | 0.33 | 1.36 | |
| Alpha | 1.16 | Stream Power (lb/ft s) | 0.87 | 6.89 | |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | 12.68 | 21.35 | 60.37 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 24.64 | 7.78 | 76.53 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 888.65 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.42 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 888.22 | Reach Len. (ft) | 202.23 | 199.86 | 190.54 |
| Crit W.S. (ft) | 886.47 | Flow Area (sq ft) | | 352.22 | |
| E.G. Slope (ft/ft) | 0.007193 | Area (sq ft) | | 352.22 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 110.06 | Top Width (ft) | | 110.06 | |
| Vel Total (ft/s) | 5.22 | Avg. Vel. (ft/s) | | 5.22 | |
| Max Chl Dpth (ft) | 5.96 | Hydr. Depth (ft) | | 3.20 | |
| Conv. Total (cfs) | 21694.7 | Conv. (cfs) | | 21694.7 | |
| Length Wtd. (ft) | 199.86 | Wetted Per. (ft) | | 111.30 | |
| Min Ch El (ft) | 882.26 | Shear (lb/sq ft) | | 1.42 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.42 | |
| Frctn Loss (ft) | 1.62 | Cum Volume (acre-ft) | | 27.04 | 7.34 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 8.18 | 3.15 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 888.11 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | 0.040 | 0.052 | |
| W.S. Elev (ft) | 887.76 | Reach Len. (ft) | 202.23 | 199.86 | 190.54 |
| Crit W.S. (ft) | 886.70 | Flow Area (sq ft) | 113.46 | 302.78 | |
| E.G. Slope (ft/ft) | 0.007124 | Area (sq ft) | 113.46 | 302.78 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 303.51 | 1536.49 | |
| Top Width (ft) | 252.78 | Top Width (ft) | 154.45 | 98.33 | |
| Vel Total (ft/s) | 4.42 | Avg. Vel. (ft/s) | 2.68 | 5.07 | |
| Max Chl Dpth (ft) | 5.50 | Hydr. Depth (ft) | 0.73 | 3.08 | |
| Conv. Total (cfs) | 21799.4 | Conv. (cfs) | 3595.8 | 18203.5 | |
| Length Wtd. (ft) | 200.28 | Wetted Per. (ft) | 154.50 | 99.21 | |
| Min Ch El (ft) | 882.26 | Shear (lb/sq ft) | 0.33 | 1.36 | |
| Alpha | 1.16 | Stream Power (lb/ft s) | 0.87 | 6.89 | |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | 0.89 | 23.63 | 16.46 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.97 | 7.92 | 11.09 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .807

INPUT
Description: Thalweg Sta. 451.59
Station Elevation Data num= 209

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 887.88 | 5.12 | 887.64 | 8.54 | 887.47 | 14.15 | 887.18 | 23.19 | 886.7 |
| 28.66 | 886.46 | 32.23 | 886.33 | 38.73 | 886.14 | 41.26 | 886.04 | 48.79 | 885.8 |
| 50.29 | 885.82 | 58.86 | 885.88 | 59.32 | 885.89 | 68.93 | 886.06 | 77.39 | 885.75 |
| 78.99 | 885.73 | 86.43 | 886.14 | 89.04 | 886.27 | 95.46 | 886.55 | 99.12 | 886.65 |
| 115.08 | 886.53 | 122.56 | 886.44 | 129.31 | 886.4 | 137.8 | 886.38 | 139.38 | 886.37 |
| 140.63 | 886.37 | 149.44 | 886.47 | 149.67 | 886.47 | 151.6 | 886.51 | 158.69 | 886.67 |
| 159.51 | 886.68 | 167.73 | 886.84 | 169.57 | 886.87 | 171.89 | 886.89 | 179.64 | 887 |
| 189.7 | 887.06 | 199.77 | 886.92 | 203.87 | 886.67 | 209.83 | 886.23 | 212.89 | 886.07 |
| 219.9 | 885.84 | 221.93 | 885.91 | 229.96 | 886.24 | 230.97 | 886.31 | 239.77 | 886.93 |
| 240.03 | 886.95 | 247.38 | 887.61 | 250.13 | 887.89 | 250.4 | 887.91 | 260.34 | 888.92 |
| 262.56 | 888.75 | 270.55 | 888.42 | 275.82 | 887.73 | 280.75 | 886.98 | 288.21 | 885.96 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 290.96 | 885.58 | 301.03 | 884.88 | 301.17 | 884.87 | 301.67 | 884.85 | 311.37 | 884.52 |
| 313.86 | 884.48 | 316.91 | 884.41 | 321.58 | 884.3 | 326.68 | 884.35 | 331.78 | 884.37 |
| 339.51 | 884.66 | 341.99 | 884.74 | 343.62 | 884.82 | 351.64 | 885.29 | 352.2 | 885.32 |
| 352.34 | 885.33 | 362.4 | 885.94 | 372.61 | 886.45 | 377.99 | 886.35 | 382.82 | 886.4 |
| 390.82 | 886.18 | 393.02 | 886.11 | 401.62 | 886.08 | 403.64 | 886.08 | 413.44 | 886.19 |
| 416.47 | 885.91 | 418.02 | 885.84 | 423.64 | 885.59 | 429.3 | 884.48 | 433.85 | 883.65 |
| 442.12 | 881.81 | 444.06 | 881.36 | 451.59 | 881.44 | 454.26 | 881.51 | 454.95 | 881.56 |
| 464.47 | 882.13 | 467.76 | 882.28 | 474.67 | 882.66 | 480.59 | 882.85 | 484.88 | 883 |
| 493.42 | 883.34 | 495.09 | 883.4 | 505.29 | 884.5 | 513.13 | 885.71 | 515.5 | 886.08 |
| 520.64 | 886.89 | 521.61 | 887.04 | 525.71 | 887.69 | 531.9 | 888.55 | 532.72 | 888.66 |
| 535.91 | 889.09 | 546.12 | 889.63 | 546.63 | 889.59 | 546.98 | 889.57 | 548.13 | 889.46 |
| 559.22 | 888.2 | 572.48 | 886.19 | 578.6 | 885.82 | 585.73 | 885.48 | 593.84 | 885.23 |
| 598.99 | 885.09 | 609.07 | 884.95 | 612.24 | 884.94 | 624.31 | 885.32 | 624.94 | 885.35 |
| 625.5 | 885.37 | 632.03 | 885.71 | 638.75 | 885.98 | 639.12 | 885.99 | 639.54 | 886.01 |
| 652.01 | 886.43 | 654.78 | 886.48 | 665.26 | 886.69 | 674.56 | 886.8 | 678.52 | 886.86 |
| 691.77 | 887.03 | 700.48 | 887.1 | 705.03 | 887.11 | 715.72 | 886.96 | 718.28 | 886.92 |
| 724.18 | 886.74 | 730.96 | 886.66 | 731.54 | 886.65 | 743.99 | 886.3 | 744.79 | 886.28 |
| 746.19 | 886.24 | 758.05 | 885.82 | 761.43 | 885.71 | 766.7 | 885.56 | 771.3 | 885.42 |
| 784.56 | 885.21 | 791.9 | 885.23 | 797.81 | 885.23 | 811.07 | 885.64 | 822.36 | 885.7 |
| 823.41 | 885.71 | 824.32 | 885.71 | 830.5 | 885.65 | 837.58 | 885.54 | 850.83 | 885.52 |
| 864.09 | 885.53 | 868.08 | 885.54 | 883.31 | 885.63 | 903.85 | 885.79 | 929.01 | 885.88 |
| 930.36 | 885.89 | 943.61 | 885.93 | 944.25 | 885.93 | 974.72 | 886.06 | 983.38 | 886.12 |
| 1005.2 | 886.23 | 1035.66 | 886.43 | 1036.05 | 886.44 | 1036.4 | 886.44 | 1049.65 | 886.49 |
| 1050.9 | 886.5 | 1058.39 | 886.51 | 1063.57 | 886.53 | 1065.14 | 886.53 | 1075.86 | 886.55 |
| 1124.41 | 886.51 | 1139.61 | 886.43 | 1149.45 | 886.36 | 1156.54 | 886.36 | 1158.05 | 886.37 |
| 1170.03 | 886.49 | 1171.32 | 886.51 | 1184.59 | 886.57 | 1185.24 | 886.57 | 1197.87 | 886.62 |
| 1200.45 | 886.64 | 1211.14 | 886.7 | 1215.66 | 886.74 | 1227.41 | 886.79 | 1246.07 | 886.89 |
| 1276.49 | 887.01 | 1277.5 | 887.01 | 1290.77 | 887.06 | 1291.2 | 887.07 | 1291.7 | 887.07 |
| 1382.95 | 887.44 | 1383.68 | 887.44 | 1396.96 | 887.49 | 1398.16 | 887.5 | 1428.57 | 887.61 |
| 1432.95 | 887.62 | 1436.77 | 887.64 | 1443.78 | 887.66 | 1458.99 | 887.72 | 1489.41 | 887.82 |
| 1489.87 | 887.82 | 1503.14 | 887.86 | 1504.61 | 887.86 | 1509.12 | 887.88 | | |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 28.66 | .032 | 89.04 | .04 | 316.91 | .052 | 520.64 | .04 |
| 743.99 | .035 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 418.02 | 546.12 | 193.21 | 199.98 | 211.22 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 260.34 | 888.92 | F |
| 546.12 | 1509.12 | 889.63 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 886.79 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.046 | 0.052 | |
| W.S. Elev (ft) | 886.49 | Reach Len. (ft) | 193.21 | 199.98 | 211.22 |
| Crit W.S. (ft) | 885.43 | Flow Area (sq ft) | 137.62 | 315.50 | |
| E.G. Slope (ft/ft) | 0.005942 | Area (sq ft) | 181.34 | 315.50 | 283.60 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 353.11 | 1486.89 | |
| Top Width (ft) | 800.78 | Top Width (ft) | 259.99 | 100.10 | 440.68 |
| Vel Total (ft/s) | 4.06 | Avg. Vel. (ft/s) | 2.57 | 4.71 | |
| Max Chl Dpth (ft) | 5.13 | Hydr. Depth (ft) | 1.03 | 3.15 | |
| Conv. Total (cfs) | 23870.8 | Conv. (cfs) | 4581.0 | 19289.9 | |
| Length Wtd. (ft) | 199.33 | Wetted Per. (ft) | 133.88 | 100.81 | |
| Min Ch El (ft) | 881.36 | Shear (lb/sq ft) | 0.38 | 1.16 | |
| Alpha | 1.17 | Stream Power (lb/ft s) | 0.98 | 5.47 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 11.94 | 19.93 | 58.73 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 23.54 | 7.32 | 74.14 |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 887.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.53 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 886.50 | Reach Len. (ft) | 193.21 | 199.98 | 211.22 |
| Crit W.S. (ft) | 885.36 | Flow Area (sq ft) | | 315.68 | |
| E.G. Slope (ft/ft) | 0.009161 | Area (sq ft) | | 315.68 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 100.12 | Top Width (ft) | | 100.12 | |
| Vel Total (ft/s) | 5.83 | Avg. Vel. (ft/s) | | 5.83 | |
| Max Chl Dpth (ft) | 5.14 | Hydr. Depth (ft) | | 3.15 | |

| | | | | |
|---|---|---|---|---|
| Conv. Total (cfs) | 19223.8 | Conv. (cfs) | 19223.8 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | 101.47 | |
| Min Ch El (ft) | 881.36 | Shear (lb/sq ft) | 1.78 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 10.37 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 25.51 | 7.34 |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 7.69 | 3.15 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 886.79 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.046 | 0.052 | |
| W.S. Elev (ft) | 886.49 | Reach Len. (ft) | 193.21 | 199.98 | 211.22 |
| Crit W.S. (ft) | 885.43 | Flow Area (sq ft) | 137.35 | 315.30 | |
| E.G. Slope (ft/ft) | 0.005957 | Area (sq ft) | 137.35 | 315.30 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | 352.56 | 1487.44 | |
| Top Width (ft) | 233.79 | Top Width (ft) | 133.70 | 100.09 | |
| Vel Total (ft/s) | 4.06 | Avg. Vel. (ft/s) | 2.57 | 4.72 | |
| Max Chl Dpth (ft) | 5.13 | Hydr. Depth (ft) | 1.03 | 3.15 | |
| Conv. Total (cfs) | 23839.4 | Conv. (cfs) | 4567.8 | 19271.6 | |
| Length Wtd. (ft) | 199.33 | Wetted Per. (ft) | 133.87 | 100.79 | |
| Min Ch El (ft) | 881.36 | Shear (lb/sq ft) | 0.38 | 1.16 | |
| Alpha | 1.17 | Stream Power (lb/ft s) | 0.98 | 5.49 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 0.30 | 22.21 | 16.46 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.30 | 7.47 | 11.09 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .770

INPUT
Description: Thalweg Sta. 549.49
Station Elevation Data num= 235

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 887.63 | 6.17 | 887.52 | 15.15 | 887.38 | 16.25 | 887.35 | 17.1 | 887.34 |
| 24.23 | 887.22 | 35.08 | 886.95 | 36.39 | 886.95 | 44.07 | 886.71 | 46.47 | 886.68 |
| 53.05 | 886.43 | 56.54 | 886.38 | 58.94 | 886.34 | 60.97 | 886.31 | 66.61 | 886.13 |
| 71.03 | 886 | 76.68 | 885.96 | 80.02 | 885.85 | 89.01 | 885.81 | 96.83 | 885.84 |
| 98 | 885.85 | 106.9 | 885.9 | 107.72 | 885.9 | 115.97 | 885.95 | 116.97 | 885.95 |
| 124.96 | 886.03 | 127.05 | 886.04 | 133.95 | 886.12 | 137.12 | 886.13 | 142.94 | 886.18 |
| 147.19 | 886.19 | 151.92 | 886.22 | 157.26 | 886.22 | 160.92 | 886.23 | 167.33 | 886.22 |
| 169.9 | 886.23 | 177.41 | 886.21 | 178.89 | 886.21 | 191.2 | 886.17 | 195.33 | 886.13 |
| 197.55 | 886.11 | 198.42 | 886.09 | 207.62 | 885.98 | 209.87 | 885.95 | 217.7 | 885.86 |
| 221.33 | 885.84 | 227.77 | 885.78 | 237.84 | 885.71 | 257.99 | 885.52 | 267.14 | 885.41 |
| 268.06 | 885.4 | 277.76 | 885.28 | 278.13 | 885.28 | 286.75 | 885.18 | 288.2 | 885.17 |
| 295.74 | 885.09 | 298.28 | 885.08 | 304.72 | 885.02 | 308.35 | 885.01 | 313.71 | 884.97 |
| 318.42 | 884.96 | 322.7 | 884.92 | 328.5 | 884.91 | 331.69 | 884.88 | 338.57 | 884.87 |
| 340.67 | 884.84 | 348.64 | 884.81 | 349.67 | 884.8 | 358.17 | 884.76 | 358.71 | 884.76 |
| 367.64 | 884.73 | 368.79 | 884.73 | 376.63 | 884.71 | 378.86 | 884.71 | 409.08 | 884.76 |
| 419.15 | 884.74 | 421.57 | 884.75 | 429.22 | 884.66 | 430.56 | 884.7 | 439.29 | 884.66 |
| 439.55 | 884.67 | 441.65 | 884.78 | 448.53 | 885.17 | 449.37 | 885.2 | 451.29 | 885.38 |
| 453.19 | 885.56 | 458.24 | 886.06 | 459.4 | 886.16 | 468.73 | 886.82 | 469.41 | 886.87 |
| 479.22 | 887.05 | 479.42 | 887.05 | 483.28 | 886.31 | 483.51 | 886.27 | 489.43 | 885.13 |
| 489.71 | 885.06 | 499.44 | 882.53 | 500.2 | 882.47 | 509.45 | 881.39 | 510.69 | 881.37 |
| 519.46 | 881.14 | 529.47 | 881.03 | 531.67 | 880.96 | 539.48 | 880.68 | 542.16 | 880.44 |
| 549.49 | 879.87 | 559.5 | 881.13 | 563.14 | 881.38 | 569.52 | 881.64 | 573.63 | 881.72 |
| 579.53 | 881.77 | 584.12 | 881.99 | 589.54 | 882.26 | 594.42 | 882.91 | 594.6 | 882.93 |
| 599.55 | 883.57 | 605.09 | 884.49 | 609.56 | 885.21 | 615.58 | 886.06 | 619.57 | 886.6 |
| 619.68 | 886.6 | 623.79 | 886.69 | 628.92 | 886.91 | 631.93 | 886.96 | 643.12 | 886.11 |
| 644.57 | 886.01 | 646 | 885.9 | 651.64 | 885.43 | 657.33 | 884.97 | 660.08 | 884.76 |
| 671.54 | 884.63 | 674.16 | 884.58 | 685.75 | 884.66 | 688.24 | 884.64 | 699.96 | 884.5 |
| 702.31 | 884.49 | 714.17 | 884.34 | 716.39 | 884.33 | 728.37 | 884.22 | 730.47 | 884.22 |
| 736.49 | 884.24 | 742.59 | 884.29 | 744.54 | 884.31 | 756.79 | 884.54 | 758.62 | 884.57 |
| 771.01 | 884.63 | 772.7 | 884.63 | 785.21 | 884.51 | 800.85 | 884.41 | 801.54 | 884.41 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 813.63 | 884.37 | 814.27 | 884.36 | 821.35 | 884.36 | 827.84 | 884.33 | 829 | 884.32 |
| 842.05 | 884.36 | 843.07 | 884.36 | 856.26 | 884.41 | 857.15 | 884.43 | 863.77 | 884.56 |
| 870.47 | 884.59 | 871.23 | 884.6 | 884.67 | 884.87 | 885.3 | 884.88 | 899.38 | 884.87 |
| 913.09 | 884.69 | 913.28 | 884.68 | 913.45 | 884.68 | 927.3 | 884.58 | 927.53 | 884.58 |
| 941.51 | 884.46 | 941.61 | 884.46 | 955.68 | 884.33 | 969.76 | 884.37 | 969.93 | 884.37 |
| 983.84 | 884.5 | 984.14 | 884.5 | 997.91 | 884.67 | 998.13 | 884.67 | 998.34 | 884.68 |
| 1011.99 | 884.84 | 1012.56 | 884.85 | 1026.07 | 884.95 | 1026.76 | 884.95 | 1040.14 | 885.04 |
| 1040.97 | 885.04 | 1054.22 | 885.13 | 1055.18 | 885.14 | 1068.3 | 885.24 | 1069.39 | 885.25 |
| 1082.37 | 885.34 | 1083.6 | 885.35 | 1096.45 | 885.42 | 1097.81 | 885.42 | 1110.53 | 885.47 |
| 1126.23 | 885.47 | 1138.68 | 885.44 | 1139.56 | 885.44 | 1140.43 | 885.43 | 1152.76 | 885.41 |
| 1168.85 | 885.41 | 1194.99 | 885.51 | 1209.07 | 885.51 | 1223.14 | 885.44 | 1251.29 | 885.24 |
| 1254.11 | 885.23 | 1265.37 | 885.17 | 1279.44 | 885.18 | 1293.52 | 885.23 | 1295.11 | 885.23 |
| 1296.73 | 885.24 | 1307.59 | 885.27 | 1310.94 | 885.29 | 1335.75 | 885.38 | 1349.82 | 885.47 |
| 1377.98 | 885.67 | 1392.05 | 885.74 | 1424.61 | 885.84 | 1434.28 | 885.9 | 1438.82 | 885.92 |
| 1448.36 | 885.99 | 1486.03 | 886.15 | 1504.67 | 886.2 | 1509.86 | 886.22 | 1538.28 | 886.3 |
| 1542.6 | 886.32 | 1546.9 | 886.33 | 1552.49 | 886.4 | 1575.05 | 886.82 | 1595.12 | 886.93 |
| 1599.17 | 886.94 | 1617.27 | 887.02 | 1620.39 | 887.02 | 1623.53 | 887.04 | 1683.91 | 887.24 |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 58.94 | .04 | 195.33 | .04 | 451.29 | .052 | 594.42 | .04 |
| 801.54 | .035 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 479.22 | 631.93 | 199.34 | 200 | 200.93 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 479.42 | 887.05 | F |
| 631.93 | 1683.91 | 886.96 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 885.93 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 885.68 | Reach Len. (ft) | 199.34 | 200.00 | 200.93 |
| Crit W.S. (ft) | 883.60 | Flow Area (sq ft) | | 461.50 | |
| E.G. Slope (ft/ft) | 0.003181 | Area (sq ft) | 150.17 | 461.50 | 543.27 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 1071.84 | Top Width (ft) | 213.65 | 126.34 | 731.85 |
| Vel Total (ft/s) | 3.99 | Avg. Vel. (ft/s) | | 3.99 | |
| Max Chl Dpth (ft) | 5.81 | Hydr. Depth (ft) | | 3.65 | |
| Conv. Total (cfs) | 32625.0 | Conv. (cfs) | | 32625.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 127.19 | |
| Min Ch El (ft) | 879.87 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.87 | |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 11.20 | 18.15 | 56.72 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 22.48 | 6.80 | 71.29 |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 885.93 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 885.69 | Reach Len. (ft) | 199.34 | 200.00 | 200.93 |
| Crit W.S. (ft) | 883.60 | Flow Area (sq ft) | | 462.32 | |
| E.G. Slope (ft/ft) | 0.003164 | Area (sq ft) | | 462.32 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 126.42 | Top Width (ft) | | 126.42 | |
| Vel Total (ft/s) | 3.98 | Avg. Vel. (ft/s) | | 3.98 | |
| Max Chl Dpth (ft) | 5.82 | Hydr. Depth (ft) | | 3.66 | |
| Conv. Total (cfs) | 32710.5 | Conv. (cfs) | | 32710.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 127.28 | |
| Min Ch El (ft) | 879.87 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.86 | |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | | 23.72 | 7.34 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 7.17 | 3.15 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 885.93 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 885.68 | Reach Len. (ft) | 199.34 | 200.00 | 200.93 |
| Crit W.S. (ft) | 883.61 | Flow Area (sq ft) | | 460.90 | |
| E.G. Slope (ft/ft) | 0.003193 | Area (sq ft) | | 460.90 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 126.29 | Top Width (ft) | | 126.29 | |
| Vel Total (ft/s) | 3.99 | Avg. Vel. (ft/s) | | 3.99 | |
| Max Chl Dpth (ft) | 5.81 | Hydr. Depth (ft) | | 3.65 | |
| Conv. Total (cfs) | 32563.6 | Conv. (cfs) | | 32563.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 127.14 | |
| Min Ch El (ft) | 879.87 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.88 | |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | | 20.43 | 16.46 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 6.95 | 11.09 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .732

INPUT
Description: Thalweg Sta. 629.66
Station Elevation Data num= 362

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 886.6 | 1.37 | 886.61 | 3.93 | 886.6 | 11.48 | 886.58 | 12.76 | 886.56 |
| 21.58 | 886.52 | 21.59 | 886.52 | 21.69 | 886.52 | 30.42 | 886.4 | 31.68 | 886.4 |
| 39.25 | 886.29 | 41.79 | 886.27 | 48.08 | 886.17 | 51.89 | 886.13 | 56.91 | 886.06 |
| 61.99 | 886.03 | 65.74 | 885.97 | 72.1 | 885.94 | 74.57 | 885.87 | 82.2 | 885.75 |
| 83.4 | 885.71 | 91.8 | 885.51 | 92.23 | 885.5 | 92.3 | 885.5 | 101.07 | 885.29 |
| 102.41 | 885.29 | 109.91 | 885.2 | 112.51 | 885.2 | 116 | 885.19 | 122.61 | 885.15 |
| 127.56 | 885.12 | 132.72 | 885.12 | 136.4 | 885.11 | 142.82 | 885.11 | 145.23 | 885.11 |
| 152.92 | 885.1 | 154.06 | 885.09 | 161.91 | 885.07 | 162.89 | 885.06 | 163.03 | 885.06 |
| 171.72 | 884.97 | 173.13 | 884.98 | 175.02 | 884.99 | 183.23 | 884.98 | 189.38 | 884.96 |
| 193.34 | 885 | 198.21 | 884.96 | 203.44 | 884.9 | 207.04 | 884.89 | 213.54 | 884.88 |
| 215.87 | 884.88 | 223.65 | 884.87 | 224.7 | 884.86 | 232.01 | 884.79 | 233.53 | 884.76 |
| 233.75 | 884.76 | 242.36 | 884.62 | 243.85 | 884.61 | 251.19 | 884.55 | 253.96 | 884.55 |
| 260.02 | 884.52 | 264.06 | 884.56 | 268.85 | 884.56 | 274.16 | 884.63 | 277.68 | 884.64 |
| 284.27 | 884.82 | 286.51 | 884.83 | 294.37 | 884.8 | 295.34 | 884.81 | 302.13 | 884.73 |
| 304.47 | 884.68 | 304.87 | 884.68 | 314.58 | 884.54 | 316.67 | 884.54 | 324.68 | 884.43 |
| 328.48 | 884.44 | 334.78 | 884.37 | 339.5 | 884.33 | 344.89 | 884.38 | 348.33 | 884.36 |
| 350.91 | 884.39 | 354.99 | 884.44 | 357.16 | 884.43 | 365.09 | 884.53 | 365.99 | 884.53 |
| 372.24 | 884.64 | 374.82 | 884.66 | 375.2 | 884.66 | 383.65 | 884.7 | 385.3 | 884.69 |
| 392.48 | 884.55 | 395.4 | 884.53 | 401.31 | 884.44 | 405.51 | 884.4 | 410.14 | 884.37 |
| 415.61 | 884.34 | 418.98 | 884.28 | 425.71 | 884.25 | 427.81 | 884.22 | 435.82 | 884.19 |
| 436.64 | 884.18 | 442.34 | 884.19 | 445.47 | 884.19 | 445.92 | 884.19 | 454.3 | 884.23 |
| 456.02 | 884.23 | 463.13 | 884.26 | 466.13 | 884.26 | 471.96 | 884.27 | 476.23 | 884.27 |
| 480.79 | 884.32 | 486.33 | 884.31 | 493.74 | 884.25 | 496.44 | 884.25 | 498.45 | 884.22 |
| 506.54 | 884.12 | 507.28 | 884.11 | 512.45 | 883.99 | 516.64 | 883.93 | 518.57 | 883.98 |
| 526.05 | 884.23 | 526.67 | 884.23 | 536.41 | 884.92 | 536.67 | 884.93 | 536.92 | 884.96 |
| 544.04 | 885.46 | 546.68 | 885.64 | 546.77 | 885.65 | 556.69 | 886.18 | 557.14 | 886.2 |
| 563.35 | 886.45 | 566.69 | 886.58 | 567.49 | 886.38 | 570.93 | 885.57 | 576.7 | 884.2 |
| 577.86 | 883.88 | 586.7 | 881.42 | 588.22 | 881.26 | 596.71 | 880.42 | 598.58 | 880.33 |
| 606.72 | 879.89 | 608.94 | 879.75 | 616.72 | 879.39 | 619.3 | 879.46 | 626.73 | 879.79 |
| 629.66 | 879.99 | 636.73 | 880.41 | 640.03 | 880.55 | 646.74 | 880.75 | 650.38 | 880.86 |
| 656.75 | 881.04 | 660.75 | 881.18 | 666.75 | 881.37 | 671.1 | 881.54 | 676.76 | 881.74 |
| 681.47 | 881.98 | 686.76 | 882.26 | 688.53 | 882.48 | 691.83 | 882.88 | 696.77 | 883.52 |
| 702.19 | 884.57 | 706.78 | 885.37 | 709.4 | 885.09 | 712.55 | 884.75 | 714.64 | 884.56 |
| 717.62 | 884.38 | 720.59 | 884.14 | 731.56 | 883.28 | 734.94 | 883.22 | 745.5 | 883.01 |
| 749.3 | 883.04 | 754.44 | 883.08 | 759.45 | 883.11 | 761.51 | 883.12 | 763.65 | 883.14 |
| 768.58 | 883.18 | 773.39 | 883.22 | 778 | 883.26 | 787.33 | 883.34 | 792.34 | 883.38 |
| 801.28 | 883.45 | 803.94 | 883.47 | 806.7 | 883.48 | 815.22 | 883.52 | 821.05 | 883.53 |
| 829.16 | 883.55 | 835.4 | 883.57 | 843.11 | 883.6 | 849.75 | 883.63 | 857.05 | 883.68 |
| 864.1 | 883.73 | 870.99 | 883.78 | 878.45 | 883.85 | 881.74 | 883.88 | 884.93 | 883.92 |
| 892.8 | 884.01 | 898.87 | 884.08 | 907.15 | 884.16 | 912.82 | 884.18 | 921.5 | 884.17 |
| 926.76 | 884.14 | 931.24 | 884.11 | 935.85 | 884.06 | 940.7 | 884.01 | 950.2 | 883.92 |
| 954.64 | 883.88 | 964.55 | 883.91 | 968.59 | 884.02 | 973.67 | 884.13 | 978.9 | 884.33 |
| 982.53 | 884.44 | 993.25 | 884.58 | 996.47 | 884.57 | 1001.5 | 884.52 | 1007.6 | 884.47 |
| 1009.03 | 884.42 | 1010.42 | 884.37 | 1021.95 | 883.99 | 1024.36 | 883.93 | 1036.3 | 883.72 |
| 1038.3 | 883.72 | 1050.65 | 883.71 | 1051.46 | 883.71 | 1052.25 | 883.71 | 1058.54 | 883.74 |
| 1065.01 | 883.77 | 1066.19 | 883.77 | 1079.35 | 883.87 | 1080.13 | 883.87 | 1093.7 | 883.95 |
| 1094.08 | 883.95 | 1106.78 | 883.94 | 1108.02 | 883.94 | 1108.05 | 883.94 | 1121.96 | 883.91 |
| 1122.41 | 883.91 | 1135.9 | 883.83 | 1136.76 | 883.82 | 1149.85 | 883.69 | 1151.11 | 883.69 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1163.79 | 883.76 | 1165.45 | 883.78 | 1177.73 | 883.92 | 1179.8 | 883.95 | 1191.68 | 884.14 |
| 1194.16 | 884.18 | 1205.62 | 884.34 | 1208.51 | 884.37 | 1214.11 | 884.42 | 1219.56 | 884.47 |
| 1222.86 | 884.49 | 1233.51 | 884.54 | 1237.2 | 884.54 | 1247.45 | 884.51 | 1251.56 | 884.49 |
| 1261.39 | 884.44 | 1265.91 | 884.4 | 1270.69 | 884.37 | 1275.33 | 884.36 | 1277.76 | 884.34 |
| 1280.26 | 884.32 | 1289.27 | 884.25 | 1294.61 | 884.2 | 1303.22 | 884.12 | 1308.96 | 884.07 |
| 1313.12 | 884.03 | 1317.16 | 884 | 1323.31 | 883.96 | 1331.1 | 883.91 | 1337.66 | 883.93 |
| 1345.04 | 883.96 | 1352.01 | 884.01 | 1355.42 | 884.03 | 1359.04 | 884.05 | 1366.2 | 884.07 |
| 1369.69 | 884.08 | 1373.18 | 884.09 | 1376.76 | 884.1 | 1380.34 | 884.11 | 1387.32 | 884.13 |
| 1394.49 | 884.17 | 1401.46 | 884.21 | 1408.63 | 884.26 | 1415.61 | 884.32 | 1422.77 | 884.37 |
| 1426.26 | 884.39 | 1429.75 | 884.41 | 1436.91 | 884.43 | 1443.89 | 884.46 | 1451.05 | 884.48 |
| 1458.03 | 884.52 | 1465.2 | 884.56 | 1472.17 | 884.61 | 1475.75 | 884.65 | 1479.34 | 884.68 |
| 1486.32 | 884.74 | 1493.48 | 884.8 | 1500.46 | 884.86 | 1507.62 | 884.89 | 1514.6 | 884.91 |
| 1521.76 | 884.94 | 1528.74 | 884.95 | 1535.91 | 884.97 | 1542.89 | 885 | 1550.05 | 885.03 |
| 1557.03 | 885.06 | 1564.19 | 885.09 | 1571.17 | 885.11 | 1578.33 | 885.14 | 1585.31 | 885.16 |
| 1592.47 | 885.18 | 1599.45 | 885.19 | 1606.62 | 885.2 | 1610.1 | 885.2 | 1613.6 | 885.2 |
| 1620.76 | 885.2 | 1627.74 | 885.19 | 1634.9 | 885.2 | 1641.88 | 885.21 | 1649.04 | 885.23 |
| 1656.02 | 885.26 | 1663.19 | 885.3 | 1666.67 | 885.33 | 1670.16 | 885.36 | 1673.74 | 885.38 |
| 1677.33 | 885.41 | 1684.31 | 885.46 | 1691.47 | 885.52 | 1698.45 | 885.57 | 1705.61 | 885.63 |
| 1712.59 | 885.68 | 1719.75 | 885.72 | 1726.73 | 885.76 | 1733.9 | 885.79 | 1740.88 | 885.83 |
| 1748.04 | 885.87 | 1755.02 | 885.9 | 1762.18 | 885.94 | 1769.16 | 885.98 | 1776.32 | 886.02 |
| 1783.3 | 886.05 | 1786.88 | 886.07 | 1790.46 | 886.09 | 1797.44 | 886.12 | 1804.61 | 886.14 |
| 1811.59 | 886.16 | 1818.75 | 886.18 | 1822.23 | 886.18 | 1825.73 | 886.19 | 1832.89 | 886.21 |
| 1839.87 | 886.23 | 1847.03 | 886.24 | 1854.01 | 886.25 | 1861.17 | 886.26 | 1868.15 | 886.28 |
| 1875.32 | 886.29 | 1878.8 | 886.3 | 1882.3 | 886.31 | 1885.87 | 886.32 | 1889.46 | 886.34 |
| 1896.44 | 886.38 | 1896.79 | 886.38 | | | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .04 | 350.91 | .04 | 563.35 | .052 | 688.53 | .035 | 1001.5 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 566.69 | 706.78 | 199.58 | 194.37 | 187.61 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 566.69 | 886.58 | F |
| 706.78 | 1896.79 | 885.37 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 885.35 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 885.14 | Reach Len. (ft) | 199.58 | 194.37 | 187.61 |
| Crit W.S. (ft) | 882.88 | Flow Area (sq ft) | | 502.44 | |
| E.G. Slope (ft/ft) | 0.002565 | Area (sq ft) | 231.10 | 502.44 | 901.77 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 1417.21 | Top Width (ft) | 415.17 | 132.72 | 869.32 |
| Vel Total (ft/s) | 3.66 | Avg. Vel. (ft/s) | | 3.66 | |
| Max Chl Dpth (ft) | 5.75 | Hydr. Depth (ft) | | 3.79 | |
| Conv. Total (cfs) | 36331.6 | Conv. (cfs) | | 36331.6 | |
| Length Wtd. (ft) | 194.37 | Wetted Per. (ft) | | 133.58 | |
| Min Ch El (ft) | 879.39 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.21 | |
| Frctn Loss (ft) | 0.70 | Cum Volume (acre-ft) | 10.33 | 15.94 | 53.39 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 21.05 | 6.21 | 67.60 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 885.36 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 885.15 | Reach Len. (ft) | 199.58 | 194.37 | 187.61 |
| Crit W.S. (ft) | 882.88 | Flow Area (sq ft) | | 503.87 | |
| E.G. Slope (ft/ft) | 0.002543 | Area (sq ft) | | 503.87 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 132.82 | Top Width (ft) | | 132.82 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.65 | |
| Max Chl Dpth (ft) | 5.76 | Hydr. Depth (ft) | | 3.79 | |
| Conv. Total (cfs) | 36487.4 | Conv. (cfs) | | 36487.4 | |
| Length Wtd. (ft) | 194.37 | Wetted Per. (ft) | | 133.68 | |
| Min Ch El (ft) | 879.39 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.19 | |
| Frctn Loss (ft) | 0.69 | Cum Volume (acre-ft) | | 21.50 | 7.34 |

| | | | | |
|---|---|---|---|---|
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.58 | 3.15 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 885.34 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 885.13 | Reach Len. (ft) | 199.58 | 194.37 | 187.61 |
| Crit W.S. (ft) | 882.88 | Flow Area (sq ft) | | 501.42 | |
| E.G. Slope (ft/ft) | 0.002581 | Area (sq ft) | | 501.42 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 132.64 | Top Width (ft) | | 132.64 | |
| Vel Total (ft/s) | 3.67 | Avg. Vel. (ft/s) | | 3.67 | |
| Max Chl Dpth (ft) | 5.74 | Hydr. Depth (ft) | | 3.78 | |
| Conv. Total (cfs) | 36219.3 | Conv. (cfs) | | 36219.3 | |
| Length Wtd. (ft) | 194.37 | Wetted Per. (ft) | | 133.50 | |
| Min Ch El (ft) | 879.39 | Shear (lb/sq ft) | | 0.61 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.22 | |
| Frctn Loss (ft) | 0.71 | Cum Volume (acre-ft) | | 18.22 | 16.46 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 6.35 | 11.09 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .695

INPUT
Description: Thalweg Sta. 1151.46
Station Elevation Data num= 500

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 884.72 | .32 | 884.69 | 3.88 | 884.11 | 8.88 | 883.52 | 14.05 | 883.52 |
| 17.44 | 883.79 | 24.23 | 884.15 | 26.01 | 884.12 | 34.4 | 883.69 | 34.57 | 883.67 |
| 35.46 | 883.61 | 43.13 | 883.05 | 44.58 | 883.01 | 46.69 | 883.07 | 54.76 | 883.2 |
| 59.22 | 883.28 | 64.93 | 883.4 | 71.76 | 883.42 | 75.11 | 883.42 | 77.39 | 883.42 |
| 85.28 | 883.42 | 85.95 | 883.42 | 89.51 | 883.42 | 94.51 | 883.41 | 95.46 | 883.41 |
| 103.08 | 883.39 | 105.63 | 883.38 | 111.64 | 883.37 | 115.81 | 883.36 | 120.21 | 883.35 |
| 125.99 | 883.34 | 128.76 | 883.33 | 136.16 | 883.32 | 137.33 | 883.32 | 143.56 | 883.3 |
| 145.89 | 883.3 | 146.34 | 883.3 | 154.46 | 883.28 | 156.51 | 883.28 | 163.03 | 883.28 |
| 166.69 | 883.29 | 171.58 | 883.29 | 176.86 | 883.3 | 180.15 | 883.3 | 187.04 | 883.32 |
| 188.71 | 883.32 | 197.22 | 883.32 | 197.28 | 883.32 | 197.6 | 883.32 | 205.84 | 883.31 |
| 207.39 | 883.31 | 214.4 | 883.3 | 217.57 | 883.3 | 222.96 | 883.29 | 227.74 | 883.29 |
| 231.53 | 883.28 | 237.92 | 883.27 | 240.09 | 883.27 | 248.1 | 883.26 | 248.65 | 883.26 |
| 251.65 | 883.25 | 257.22 | 883.24 | 258.27 | 883.24 | 259.81 | 883.23 | 268.45 | 883.21 |
| 272.34 | 883.2 | 278.62 | 883.17 | 284.88 | 883.15 | 288.8 | 883.14 | 297.41 | 883.11 |
| 298.97 | 883.11 | 300.03 | 883.1 | 305.69 | 883.09 | 308.6 | 883.08 | 309.15 | 883.08 |
| 317.16 | 883.06 | 319.33 | 883.06 | 325.72 | 883.05 | 329.5 | 883.05 | 334.29 | 883.05 |
| 339.68 | 883.04 | 342.85 | 883.04 | 349.85 | 883.03 | 351.42 | 883.03 | 359.73 | 883.02 |
| 360.03 | 883.02 | 360.09 | 883.02 | 370.2 | 883.02 | 377.1 | 883.02 | 380.38 | 883.03 |
| 385.67 | 883.02 | 390.56 | 883.03 | 394.23 | 883.03 | 400.73 | 883.03 | 402.8 | 883.02 |
| 410.91 | 883.02 | 411.36 | 883.03 | 413.78 | 883.03 | 419.92 | 883.03 | 421.08 | 883.03 |
| 428.49 | 883.04 | 431.26 | 883.05 | 437.05 | 883.05 | 441.43 | 883.06 | 445.61 | 883.06 |
| 451.61 | 883.06 | 454.17 | 883.06 | 461.78 | 883.06 | 462.74 | 883.06 | 467.83 | 883.05 |
| 471.3 | 883.05 | 471.96 | 883.05 | 472.92 | 883.05 | 482.14 | 883.03 | 488.43 | 883.02 |
| 492.31 | 883.01 | 496.99 | 883.01 | 502.49 | 883 | 505.56 | 883 | 512.66 | 882.99 |
| 514.12 | 882.99 | 521.87 | 882.97 | 522.69 | 882.97 | 522.84 | 882.97 | 531.24 | 882.95 |
| 533.01 | 882.94 | 539.81 | 882.92 | 543.19 | 882.91 | 548.37 | 882.89 | 553.37 | 882.88 |
| 556.94 | 882.87 | 563.54 | 882.85 | 565.5 | 882.85 | 573.72 | 882.84 | 574.06 | 882.84 |
| 575.91 | 882.83 | 583.89 | 882.83 | 591.19 | 882.83 | 594.07 | 882.82 | 599.76 | 882.82 |
| 604.24 | 882.82 | 608.32 | 882.82 | 614.42 | 882.81 | 616.88 | 882.81 | 624.6 | 882.81 |
| 625.44 | 882.81 | 629.96 | 882.8 | 634.01 | 882.8 | 634.77 | 882.8 | 642.57 | 882.8 |
| 644.95 | 882.8 | 651.13 | 882.79 | 655.12 | 882.79 | 659.7 | 882.79 | 665.3 | 882.79 |
| 668.26 | 882.79 | 675.47 | 882.79 | 676.83 | 882.79 | 684.01 | 882.79 | 685.39 | 882.79 |
| 685.65 | 882.79 | 686.03 | 882.79 | 695.83 | 882.79 | 702.51 | 882.8 | 706 | 882.8 |
| 711.08 | 882.81 | 716.18 | 882.81 | 723.64 | 882.81 | 726.35 | 882.81 | 728.2 | 882.81 |
| 736.53 | 882.8 | 736.76 | 882.8 | 738.05 | 882.8 | 745.33 | 882.79 | 746.7 | 882.79 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 753.9 | 882.79 | 756.88 | 882.79 | 761.24 | 882.78 | 767.06 | 882.78 | 771.02 | 882.79 |
| 777.23 | 882.79 | 779.58 | 882.79 | 787.41 | 882.8 | 788.15 | 882.81 | 792.1 | 882.81 |
| 796.71 | 882.82 | 797.58 | 882.82 | 805.28 | 882.83 | 807.76 | 882.84 | 813.83 | 882.85 |
| 817.93 | 882.85 | 822.4 | 882.86 | 828.11 | 882.87 | 836.46 | 882.88 | 838.29 | 882.88 |
| 839.53 | 882.88 | 846.14 | 882.89 | 848.46 | 882.89 | 856.65 | 882.9 | 858.64 | 882.9 |
| 865.22 | 882.91 | 868.81 | 882.91 | 873.78 | 882.92 | 878.99 | 882.91 | 882.35 | 882.91 |
| 889.16 | 882.91 | 899.14 | 882.91 | 899.34 | 882.91 | 900.18 | 882.91 | 908.04 | 882.92 |
| 909.52 | 882.92 | 916.6 | 882.92 | 919.69 | 882.92 | 925.17 | 882.92 | 929.87 | 882.93 |
| 933.72 | 882.92 | 940.04 | 882.92 | 942.29 | 882.92 | 950.22 | 882.92 | 950.85 | 882.92 |
| 954.23 | 882.91 | 959.42 | 882.91 | 960.39 | 882.9 | 967.98 | 882.89 | 970.57 | 882.89 |
| 976.54 | 882.87 | 980.75 | 882.86 | 985.1 | 882.85 | 990.92 | 882.82 | 993.67 | 882.82 |
| 1001.1 | 882.79 | 1002.24 | 882.79 | 1008.28 | 882.77 | 1011.27 | 882.77 | 1019.36 | 882.74 |
| 1021.45 | 882.74 | 1024.5 | 882.73 | 1031.43 | 882.69 | 1031.62 | 882.69 | 1036.49 | 882.66 |
| 1041.8 | 882.66 | 1049.57 | 882.68 | 1051.98 | 882.69 | 1053.61 | 882.71 | 1062.15 | 882.83 |
| 1062.17 | 882.84 | 1062.33 | 882.84 | 1072.33 | 883.34 | 1074.02 | 883.49 | 1081.25 | 884.15 |
| 1082.44 | 884.26 | 1089.91 | 884.7 | 1092.53 | 884.86 | 1092.95 | 884.82 | 1098.86 | 884.59 |
| 1102.63 | 884.44 | 1104.64 | 883.93 | 1108.85 | 882.86 | 1112.72 | 881.87 | 1116.35 | 881.28 |
| 1122.81 | 880.11 | 1128.05 | 879.69 | 1132.91 | 879.28 | 1139.75 | 879.28 | 1143 | 879.28 |
| 1151.46 | 879.7 | 1153.1 | 879.79 | 1163.16 | 880.25 | 1163.19 | 880.25 | 1163.36 | 880.26 |
| 1173.28 | 880.6 | 1174.86 | 880.63 | 1183.38 | 880.86 | 1186.57 | 880.94 | 1193.47 | 881.12 |
| 1198.27 | 881.37 | 1203.57 | 881.63 | 1209.96 | 882.8 | 1213.66 | 883.55 | 1221.24 | 885.12 |
| 1221.67 | 885.21 | 1223.73 | 885.64 | 1223.75 | 885.64 | 1233.37 | 885.06 | 1233.85 | 885.02 |
| 1236.81 | 884.55 | 1243.94 | 883.43 | 1245.07 | 883.3 | 1254.04 | 882.26 | 1256.78 | 882.19 |
| 1264.13 | 881.97 | 1268.48 | 882 | 1274.22 | 882.05 | 1280.18 | 882.1 | 1284.32 | 882.14 |
| 1291.89 | 882.16 | 1294.41 | 882.17 | 1299.53 | 882.18 | 1301.66 | 882.19 | 1306.29 | 882.2 |
| 1316.25 | 882.21 | 1318.19 | 882.22 | 1320.04 | 882.22 | 1325.27 | 882.23 | 1330.83 | 882.26 |
| 1333.78 | 882.28 | 1345.41 | 882.34 | 1347.51 | 882.35 | 1359.99 | 882.4 | 1361.25 | 882.4 |
| 1374.58 | 882.48 | 1374.99 | 882.48 | 1381.7 | 882.51 | 1388.73 | 882.55 | 1389.16 | 882.55 |
| 1402.47 | 882.57 | 1403.75 | 882.57 | 1416.21 | 882.54 | 1417.24 | 882.54 | 1418.33 | 882.54 |
| 1429.94 | 882.5 | 1432.91 | 882.5 | 1443.68 | 882.49 | 1447.49 | 882.49 | 1457.43 | 882.5 |
| 1462.07 | 882.5 | 1466.75 | 882.52 | 1471.16 | 882.54 | 1476.66 | 882.56 | 1484.9 | 882.6 |
| 1491.24 | 882.63 | 1495.05 | 882.65 | 1498.64 | 882.67 | 1502.12 | 882.69 | 1505.83 | 882.71 |
| 1512.38 | 882.76 | 1520.41 | 882.82 | 1526.12 | 882.86 | 1535 | 882.91 | 1539.86 | 882.91 |
| 1549.57 | 882.91 | 1553.59 | 882.89 | 1564.16 | 882.86 | 1567.33 | 882.85 | 1578.74 | 882.8 |
| 1581.07 | 882.79 | 1593.33 | 882.71 | 1594.81 | 882.71 | 1607.91 | 882.65 | 1608.55 | 882.65 |
| 1618.97 | 882.68 | 1622.29 | 882.69 | 1622.5 | 882.69 | 1636.03 | 882.76 | 1637.08 | 882.77 |
| 1643.61 | 882.81 | 1649.77 | 882.84 | 1651.66 | 882.84 | 1663.51 | 882.89 | 1666.24 | 882.9 |
| 1677.24 | 882.95 | 1680.82 | 882.97 | 1690.98 | 883.03 | 1695.41 | 883.06 | 1700.2 | 883.1 |
| 1704.72 | 883.13 | 1709.99 | 883.16 | 1718.46 | 883.18 | 1724.58 | 883.16 | 1732.2 | 883.11 |
| 1739.16 | 883.05 | 1745.94 | 883 | 1753.74 | 882.95 | 1756.79 | 882.93 | 1759.68 | 882.93 |
| 1768.32 | 882.92 | 1773.42 | 882.92 | 1782.91 | 882.94 | 1787.16 | 882.97 | 1797.49 | 883.07 |
| 1799.25 | 883.11 | 1800.89 | 883.16 | 1806.31 | 883.3 | 1812.08 | 883.47 | 1814.63 | 883.55 |
| 1826.66 | 883.96 | 1828.37 | 883.98 | 1840.6 | 884.18 | 1841.24 | 884.19 | 1842.11 | 884.19 |
| 1855.82 | 884.1 | 1855.84 | 884.1 | 1855.85 | 884.1 | 1856.24 | 884.09 | 1869.59 | 883.86 |
| 1869.99 | 883.85 | 1870.41 | 883.84 | 1883.33 | 883.58 | 1884.99 | 883.56 | 1897.07 | 883.51 |
| 1899.57 | 883.52 | 1910.81 | 883.55 | 1914.16 | 883.53 | 1919.5 | 883.51 | 1924.55 | 883.49 |
| 1926.58 | 883.47 | 1928.74 | 883.46 | 1938.28 | 883.42 | 1943.33 | 883.4 | 1952.02 | 883.4 |
| 1957.91 | 883.4 | 1965.76 | 883.41 | 1972.5 | 883.42 | 1979.5 | 883.45 | 1987.08 | 883.5 |
| 1993.24 | 883.56 | 2001.66 | 883.65 | 2006.98 | 883.71 | 2016.24 | 883.81 | 2020.71 | 883.85 |
| 2025.62 | 883.89 | 2030.82 | 883.92 | 2034.46 | 883.94 | 2045.41 | 884 | 2048.2 | 884.01 |
| 2059.99 | 884.07 | 2061.93 | 884.08 | 2068.06 | 884.11 | 2074.58 | 884.14 | 2075.67 | 884.15 |
| 2089.16 | 884.2 | 2089.41 | 884.2 | 2093.52 | 884.2 | 2103.15 | 884.22 | 2103.74 | 884.22 |
| 2110.51 | 884.22 | 2116.89 | 884.22 | 2118.32 | 884.22 | 2130.62 | 884.24 | 2131.73 | 884.25 |
| 2132.91 | 884.25 | 2144.36 | 884.28 | 2147.49 | 884.29 | 2158.1 | 884.32 | 2162.08 | 884.32 |
| 2171.85 | 884.32 | 2176.66 | 884.31 | 2185.58 | 884.29 | 2191.24 | 884.29 | 2199.32 | 884.29 |
| 2205.82 | 884.29 | 2213.06 | 884.3 | 2220.4 | 884.32 | 2223.69 | 884.33 | 2226.8 | 884.34 |
| 2230.77 | 884.35 | 2234.99 | 884.37 | 2240.54 | 884.4 | 2249.57 | 884.46 | 2254.28 | 884.5 |
| 2264.16 | 884.58 | 2266.14 | 884.59 | 2268.01 | 884.61 | 2278.74 | 884.7 | 2281.75 | 884.72 |
| 2293.33 | 884.82 | 2295.49 | 884.83 | 2307.91 | 884.91 | 2309.24 | 884.91 | 2322.49 | 884.94 |
| 2322.97 | 884.94 | 2330.79 | 884.95 | 2336.71 | 884.95 | 2337.07 | 884.95 | 2343.96 | 884.95 |
| 2350.45 | 884.95 | 2351.03 | 884.95 | 2351.66 | 884.95 | 2364.19 | 884.95 | 2366.24 | 884.95 |
| 2377.93 | 884.98 | 2379.33 | 884.98 | 2380.83 | 884.99 | 2391.66 | 885.03 | 2395.41 | 885.05 |
| 2405.4 | 885.1 | 2409.99 | 885.13 | 2419.14 | 885.2 | 2424.57 | 885.24 | 2432.88 | 885.31 |
| 2439.15 | 885.35 | 2446.62 | 885.4 | 2453.74 | 885.43 | 2457.14 | 885.45 | 2460.36 | 885.47 |
| 2468.32 | 885.5 | 2474.1 | 885.53 | 2482.91 | 885.57 | 2487.84 | 885.59 | 2497.42 | 885.61 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1031.43 | .04 | 1098.86 | .052 | 1221.24 | .035 | 1840.6 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1092.53 | 1223.73 | 205.92 | 205.62 | 205.53 | .1 | .3 |

*Ineffective Flow num=* 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1092.53 | 884.86 | F |
| 1223.75 | 2497.42 | 885.64 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 884.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 884.29 | Reach Len. (ft) | 205.92 | 205.62 | 205.53 |
| Crit W.S. (ft) | 882.70 | Flow Area (sq ft) | | 388.53 | |
| E.G. Slope (ft/ft) | 0.005403 | Area (sq ft) | 1356.53 | 388.53 | 1063.36 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 2101.77 | Top Width (ft) | 1080.08 | 113.98 | 907.71 |
| Vel Total (ft/s) | 4.74 | Avg. Vel. (ft/s) | | 4.74 | |
| Max Chl Dpth (ft) | 5.01 | Hydr. Depth (ft) | | 3.41 | |
| Conv. Total (cfs) | 25031.4 | Conv. (cfs) | | 25031.4 | |
| Length Wtd. (ft) | 205.62 | Wetted Per. (ft) | | 114.77 | |
| Min Ch El (ft) | 879.28 | Shear (lb/sq ft) | | 1.14 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.41 | |
| Frctn Loss (ft) | 1.72 | Cum Volume (acre-ft) | 6.69 | 13.95 | 49.16 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 17.62 | 5.66 | 63.77 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: The composite Mannings n value for the channel was larger than the largest entered n value or

smaller than the smallest entered n value.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,

water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 884.65 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 884.31 | Reach Len. (ft) | 205.92 | 205.62 | 205.53 |
| Crit W.S. (ft) | 882.70 | Flow Area (sq ft) | | 391.47 | |
| E.G. Slope (ft/ft) | 0.005284 | Area (sq ft) | | 391.47 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 114.20 | Top Width (ft) | | 114.20 | |
| Vel Total (ft/s) | 4.70 | Avg. Vel. (ft/s) | | 4.70 | |
| Max Chl Dpth (ft) | 5.03 | Hydr. Depth (ft) | | 3.43 | |
| Conv. Total (cfs) | 25313.0 | Conv. (cfs) | | 25313.0 | |
| Length Wtd. (ft) | 205.62 | Wetted Per. (ft) | | 115.00 | |
| Min Ch El (ft) | 879.28 | Shear (lb/sq ft) | | 1.12 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.28 | |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | | 19.50 | 7.34 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 6.03 | 3.15 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,

water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 884.62 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 884.27 | Reach Len. (ft) | 205.92 | 205.62 | 205.53 |
| Crit W.S. (ft) | 882.70 | Flow Area (sq ft) | | 386.51 | |
| E.G. Slope (ft/ft) | 0.005488 | Area (sq ft) | | 386.51 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 113.82 | Top Width (ft) | | 113.82 | |
| Vel Total (ft/s) | 4.76 | Avg. Vel. (ft/s) | | 4.76 | |
| Max Chl Dpth (ft) | 4.99 | Hydr. Depth (ft) | | 3.40 | |
| Conv. Total (cfs) | 24837.6 | Conv. (cfs) | | 24837.6 | |
| Length Wtd. (ft) | 205.62 | Wetted Per. (ft) | | 114.61 | |
| Min Ch El (ft) | 879.28 | Shear (lb/sq ft) | | 1.16 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.50 | |
| Frctn Loss (ft) | 1.65 | Cum Volume (acre-ft) | | 16.24 | 16.46 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 5.80 | 11.09 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .656

INPUT
Description: Thalweg Sta. 1243.90
Station Elevation Data num= 297

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 889.13 | .37 | 889.09 | 6.14 | 887.87 | 10.56 | 885.93 | 14.63 | 884.11 |
| 20.76 | 882.52 | 23.14 | 882.54 | 30.96 | 882.75 | 31.63 | 882.76 | 35.05 | 882.77 |
| 41.16 | 882.77 | 48.64 | 882.31 | 51.35 | 882.17 | 57.14 | 882.05 | 61.55 | 882.01 |
| 65.64 | 882.05 | 71.75 | 882.09 | 74.14 | 882.1 | 81.95 | 882.12 | 99.64 | 882.12 |
| 102.34 | 882.13 | 188.3 | 882.13 | 227.15 | 882.15 | 234.91 | 882.14 | 265.5 | 882.1 |
| 290.47 | 882.1 | 295.15 | 882.11 | 303.65 | 882.11 | 306.29 | 882.12 | 329.15 | 882.12 |
| 336.88 | 882.1 | 337.65 | 882.1 | 341.56 | 882.08 | 346.16 | 882.07 | 347.07 | 882.06 |
| 377.67 | 881.99 | 386.67 | 881.99 | 387.86 | 881.98 | 392.64 | 881.99 | 438.85 | 882 |
| 439.66 | 881.99 | 465.16 | 881.98 | 469.44 | 881.97 | 494.8 | 881.97 | 499.16 | 881.98 |
| 530.63 | 881.98 | 533.17 | 881.99 | 545.89 | 881.99 | 550.17 | 882 | 552.3 | 882 |
| 571.42 | 882.05 | 584.16 | 882.06 | 591.81 | 882.05 | 592.67 | 882.04 | 601.17 | 882.02 |
| 602.01 | 882.01 | 609.67 | 881.99 | 612.2 | 881.98 | 618.17 | 881.97 | 622.4 | 881.95 |
| 632.6 | 881.93 | 643.67 | 881.93 | 648.06 | 881.94 | 663.19 | 881.95 | 666.96 | 881.96 |
| 693.78 | 881.95 | 694.67 | 881.94 | 703.17 | 881.92 | 703.98 | 881.92 | 711.67 | 881.89 |
| 714.18 | 881.89 | 734.57 | 881.83 | 745.68 | 881.82 | 750.23 | 881.83 | 765.17 | 881.83 |
| 779.68 | 881.84 | 794.37 | 881.81 | 795.76 | 881.8 | 796.68 | 881.8 | 805.18 | 881.77 |
| 805.95 | 881.77 | 807.11 | 881.76 | 822.18 | 881.71 | 826.35 | 881.69 | 839.18 | 881.65 |
| 846.74 | 881.64 | 847.68 | 881.64 | 852.39 | 881.63 | 856.94 | 881.63 | 858.07 | 881.62 |
| 887.53 | 881.62 | 890.18 | 881.63 | 897.73 | 881.64 | 898.69 | 881.65 | 907.93 | 881.67 |
| 909.03 | 881.68 | 938.52 | 881.75 | 954.57 | 881.74 | 958.19 | 881.73 | 958.91 | 881.73 |
| 966.68 | 881.72 | 969.11 | 881.71 | 975.19 | 881.71 | 979.31 | 881.7 | 999.7 | 881.69 |
| 1000.69 | 881.7 | 1040.49 | 881.72 | 1043.19 | 881.71 | 1050.69 | 881.71 | 1051.69 | 881.7 |
| 1056.74 | 881.69 | 1060.89 | 881.69 | 1068.7 | 881.66 | 1071.08 | 881.66 | 1091.48 | 881.61 |
| 1094.19 | 881.6 | 1101.68 | 881.59 | 1102.7 | 881.59 | 1107.81 | 881.58 | 1122.07 | 881.57 |
| 1128.2 | 881.55 | 1132.27 | 881.55 | 1139.96 | 881.52 | 1142.47 | 881.51 | 1152.66 | 881.44 |
| 1153.7 | 881.46 | 1162.2 | 881.56 | 1162.86 | 881.57 | 1170.7 | 882.25 | 1173.06 | 882.42 |
| 1179.2 | 883.03 | 1183.25 | 883.45 | 1183.8 | 883.46 | 1189.24 | 883.65 | 1193.37 | 883.83 |
| 1196.43 | 883.63 | 1200.37 | 883.21 | 1203.47 | 882.88 | 1205.62 | 882.34 | 1212.94 | 880.49 |
| 1213.58 | 880.34 | 1217.32 | 879.75 | 1223.69 | 878.79 | 1224.78 | 878.69 | 1233.8 | 877.73 |
| 1236.63 | 877.87 | 1243.9 | 878.26 | 1248.47 | 878.48 | 1254.01 | 878.71 | 1260.32 | 878.82 |
| 1264.12 | 878.87 | 1274.23 | 879.12 | 1275.75 | 879.21 | 1284.33 | 879.64 | 1294.44 | 880.87 |
| 1295.87 | 881.1 | 1304.55 | 882.46 | 1307.71 | 882.77 | 1308.06 | 882.81 | 1312.35 | 883.3 |
| 1315.38 | 883.56 | 1321.78 | 882.94 | 1328.64 | 882.32 | 1341.9 | 881.02 | 1352.23 | 880.72 |
| 1355.16 | 880.63 | 1367.46 | 880.74 | 1368.42 | 880.75 | 1381.68 | 880.9 | 1382.68 | 880.92 |
| 1394.94 | 881.05 | 1397.91 | 881.09 | 1408.21 | 881.2 | 1410.49 | 881.22 | 1421.47 | 881.34 |
| 1428.36 | 881.39 | 1448 | 881.56 | 1458.81 | 881.62 | 1467.2 | 881.62 | 1474.03 | 881.59 |
| 1474.52 | 881.59 | 1477.84 | 881.57 | 1487.78 | 881.53 | 1489.26 | 881.52 | 1501.04 | 881.53 |
| 1504.48 | 881.54 | 1527.56 | 881.72 | 1534.93 | 881.76 | 1540.83 | 881.77 | 1567.36 | 881.78 |
| 1580.62 | 881.77 | 1580.73 | 881.76 | 1608.96 | 881.77 | 1611.05 | 881.78 | 1633.66 | 881.86 |
| 1656.72 | 881.96 | 1671.94 | 881.99 | 1713.24 | 881.95 | 1732.84 | 881.99 | 1739.76 | 882.02 |
| 1743.62 | 882.03 | 1763.29 | 882.13 | 1764.89 | 882.14 | 1766.28 | 882.14 | 1778.52 | 882.2 |
| 1779.55 | 882.2 | 1786.15 | 882.19 | 1792.81 | 882.16 | 1793.24 | 882.15 | 1793.74 | 882.15 |
| 1806.07 | 882.09 | 1808.97 | 882.07 | 1814.51 | 882.05 | 1819.34 | 882.05 | 1824.19 | 882.03 |
| 1832.6 | 882.02 | 1842.85 | 881.98 | 1845.86 | 881.96 | 1849.94 | 881.95 | 1869.86 | 881.81 |
| 1885.09 | 881.64 | 1885.64 | 881.63 | 1889.41 | 881.6 | 1898.9 | 881.51 | 1900.31 | 881.51 |
| 1915.54 | 881.46 | 1930.76 | 881.44 | 1949.17 | 881.49 | 1951.96 | 881.51 | 1991.66 | 881.72 |
| 1991.74 | 881.72 | 2022.1 | 881.87 | 2031.53 | 881.9 | 2058.05 | 882.01 | 2067.78 | 882.03 |
| 2071.32 | 882.03 | 2083 | 882.06 | 2084.58 | 882.06 | 2097.84 | 882.11 | 2098.23 | 882.11 |
| 2124.36 | 882.2 | 2137.62 | 882.19 | 2150.89 | 882.12 | 2159.13 | 882.09 | 2161.81 | 882.14 |
| 2164.15 | 882.21 | 2174.35 | 882.48 | 2177.41 | 882.68 | 2189.58 | 883.53 | 2190.68 | 883.56 |
| 2195.86 | 883.69 | 2198.1 | 883.74 | 2204.8 | 883.9 | 2217.2 | 883.84 | 2220.03 | 883.83 |
| 2225.6 | 883.76 | 2235.25 | 883.67 | 2250.48 | 883.59 | 2256.98 | 883.58 | 2265.7 | 883.55 |
| 2268.12 | 883.55 | 2275.21 | 883.52 | 2280.92 | 883.51 | 2283.51 | 883.51 | 2296.15 | 883.49 |
| 2296.77 | 883.49 | 2310.03 | 883.51 | 2311.37 | 883.52 | 2323.3 | 883.57 | 2341.82 | 883.68 |
| 2357.04 | 883.79 | 2363.08 | 883.82 | 2372.27 | 883.85 | 2395.71 | 883.84 | 2402.71 | 883.86 |
| 2403.89 | 883.86 | 2416.13 | 883.96 | 2417.94 | 883.97 | 2433.16 | 884.12 | 2448.39 | 884.23 |
| 2463.61 | 884.3 | 2469.18 | 884.3 | 2473.68 | 884.31 | 2495.7 | 884.31 | 2537.47 | 884.33 |
| 2539.74 | 884.34 | 2551.65 | 884.37 | 2554.96 | 884.37 | 2570.19 | 884.4 | 2579.99 | 884.4 |
| 2585.41 | 884.39 | 2588.54 | 884.39 | 2600.64 | 884.36 | 2601.8 | 884.35 | 2615.06 | 884.2 |
| 2615.86 | 884.15 | 2626.63 | 883.4 | | | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1139.96 | .04 | 1200.37 | .052 | 1308.06 | .035 | 2195.86 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1193.37 | 1315.38 | 193.97 | 199.98 | 206.81 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1193.37 | 883.83 | F |
| 1315.38 | 2626.63 | 883.56 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 882.88 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.73 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 882.15 | Reach Len. (ft) | 193.97 | 199.98 | 206.81 |
| Crit W.S. (ft) | 881.54 | Flow Area (sq ft) | | 269.18 | |
| E.G. Slope (ft/ft) | 0.014638 | Area (sq ft) | 278.39 | 269.18 | 333.72 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 1985.71 | Top Width (ft) | 1117.29 | 96.21 | 772.21 |
| Vel Total (ft/s) | 6.84 | Avg. Vel. (ft/s) | | 6.84 | |
| Max Chl Dpth (ft) | 4.42 | Hydr. Depth (ft) | | 2.80 | |
| Conv. Total (cfs) | 15208.1 | Conv. (cfs) | | 15208.1 | |
| Length Wtd. (ft) | 201.56 | Wetted Per. (ft) | | 96.82 | |
| Min Ch El (ft) | 877.73 | Shear (lb/sq ft) | | 2.54 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 17.37 | |
| Frctn Loss (ft) | 1.56 | Cum Volume (acre-ft) | 2.83 | 12.40 | 45.86 |
| C & E Loss (ft) | 0.17 | Cum SA (acres) | 12.43 | 5.16 | 59.81 |

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 883.47 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.40 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 883.08 | Reach Len. (ft) | 193.97 | 199.98 | 206.81 |
| Crit W.S. (ft) | 881.54 | Flow Area (sq ft) | | 363.44 | |
| E.G. Slope (ft/ft) | 0.006178 | Area (sq ft) | | 363.44 | |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 108.77 | Top Width (ft) | | 108.77 | |
| Vel Total (ft/s) | 5.06 | Avg. Vel. (ft/s) | | 5.06 | |
| Max Chl Dpth (ft) | 5.35 | Hydr. Depth (ft) | | 3.34 | |
| Conv. Total (cfs) | 23408.8 | Conv. (cfs) | | 23408.8 | |
| Length Wtd. (ft) | 200.36 | Wetted Per. (ft) | | 109.54 | |
| Min Ch El (ft) | 877.73 | Shear (lb/sq ft) | | 1.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 6.48 | |
| Frctn Loss (ft) | 1.02 | Cum Volume (acre-ft) | | 17.72 | 7.34 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 5.50 | 3.15 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 882.94 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.66 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 882.28 | Reach Len. (ft) | 193.97 | 199.98 | 206.81 |
| Crit W.S. (ft) | 881.52 | Flow Area (sq ft) | | 281.41 | |
| E.G. Slope (ft/ft) | 0.012855 | Area (sq ft) | | 281.41 | 142.91 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1840.00 | |
| Top Width (ft) | 227.25 | Top Width (ft) | | 97.51 | 129.73 |
| Vel Total (ft/s) | 6.54 | Avg. Vel. (ft/s) | | 6.54 | |
| Max Chl Dpth (ft) | 4.55 | Hydr. Depth (ft) | | 2.89 | |
| Conv. Total (cfs) | 16228.4 | Conv. (cfs) | | 16228.4 | |
| Length Wtd. (ft) | 201.44 | Wetted Per. (ft) | | 98.15 | |
| Min Ch El (ft) | 877.73 | Shear (lb/sq ft) | | 2.30 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 15.04 | |
| Frctn Loss (ft) | 1.56 | Cum Volume (acre-ft) | | 14.67 | 16.12 |

C & E Loss (ft) 0.13 Cum SA (acres) 5.30 10.79

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .618

INPUT
Description: Thalweg Sta. 1339.01
Station Elevation Data num= 298

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 886.72 | .25 | 886.73 | 3.47 | 886.7 | 10.45 | 885.19 | 11.96 | 884.36 |
| 19.57 | 881.83 | 20.47 | 881.51 | 20.65 | 881.47 | 20.92 | 881.48 | 30.85 | 881.54 |
| 33.66 | 881.62 | 41.05 | 881.9 | 46.4 | 881.7 | 51.24 | 881.56 | 59.14 | 881.27 |
| 61.44 | 881.17 | 71.64 | 880.96 | 79.97 | 880.85 | 81.84 | 880.82 | 92.03 | 880.79 |
| 112.43 | 880.83 | 113.97 | 880.84 | 121.71 | 880.85 | 122.47 | 880.86 | 122.85 | 880.86 |
| 132.82 | 880.88 | 139.47 | 880.88 | 143.02 | 880.89 | 186.56 | 880.9 | 204.2 | 880.87 |
| 263.01 | 880.86 | 265.39 | 880.87 | 285.78 | 880.88 | 316.37 | 880.82 | 317.98 | 880.81 |
| 325.99 | 880.8 | 326.47 | 880.79 | 343.47 | 880.78 | 346.97 | 880.77 | 367.36 | 880.76 |
| 368.97 | 880.75 | 387.76 | 880.75 | 408.15 | 880.78 | 411.48 | 880.79 | 418.35 | 880.8 |
| 419.97 | 880.8 | 428.13 | 880.82 | 428.55 | 880.82 | 453.98 | 880.83 | 459.14 | 880.82 |
| 496.47 | 880.81 | 499.93 | 880.8 | 520.32 | 880.8 | 521.98 | 880.79 | 547.48 | 880.79 |
| 550.92 | 880.78 | 606.98 | 880.8 | 619.77 | 880.82 | 622.3 | 880.83 | 632.4 | 880.85 |
| 632.5 | 880.85 | 640.98 | 880.86 | 642.69 | 880.87 | 663.09 | 880.9 | 683.47 | 880.94 |
| 691.98 | 880.94 | 693.68 | 880.95 | 714.07 | 880.93 | 724.27 | 880.91 | 725.98 | 880.9 |
| 734.47 | 880.88 | 734.55 | 880.88 | 744.67 | 880.85 | 793.98 | 880.85 | 795.66 | 880.84 |
| 802.48 | 880.83 | 826.25 | 880.77 | 827.98 | 880.77 | 836.45 | 880.75 | 836.69 | 880.75 |
| 844.98 | 880.72 | 846.64 | 880.72 | 877.24 | 880.62 | 878.99 | 880.62 | 887.43 | 880.59 |
| 887.76 | 880.59 | 895.99 | 880.57 | 912.99 | 880.57 | 918.03 | 880.58 | 958.82 | 880.61 |
| 963.8 | 880.62 | 1006.49 | 880.6 | 1009.8 | 880.59 | 1052.99 | 880.56 | 1065.99 | 880.58 |
| 1070.99 | 880.58 | 1074.49 | 880.59 | 1081.18 | 880.59 | 1082.99 | 880.6 | 1099.99 | 880.6 |
| 1101.58 | 880.59 | 1108.49 | 880.57 | 1111.78 | 880.57 | 1132.17 | 880.5 | 1133.99 | 880.49 |
| 1142.37 | 880.46 | 1143.11 | 880.46 | 1159.49 | 880.42 | 1162.76 | 880.42 | 1172.96 | 880.41 |
| 1183.16 | 880.39 | 1184.99 | 880.38 | 1193.36 | 880.36 | 1194.18 | 880.36 | 1201.99 | 880.33 |
| 1203.55 | 880.33 | 1213.75 | 880.29 | 1223.95 | 880.29 | 1227.49 | 880.34 | 1228.35 | 880.35 |
| 1234.15 | 880.41 | 1235.99 | 880.5 | 1244.34 | 880.85 | 1244.5 | 880.86 | 1245.25 | 880.94 |
| 1252.99 | 881.78 | 1254.54 | 881.94 | 1261.49 | 882.68 | 1264.74 | 883.07 | 1269.99 | 883.22 |
| 1270.72 | 883.27 | 1274.85 | 883.51 | 1279.97 | 882.2 | 1284.42 | 881 | 1284.85 | 880.88 |
| 1289.61 | 879.85 | 1289.76 | 879.82 | 1294.86 | 878.75 | 1300.23 | 878.24 | 1304.86 | 877.79 |
| 1310.35 | 877.49 | 1314.86 | 877.22 | 1320.48 | 876.93 | 1324.86 | 876.82 | 1330.6 | 877.16 |
| 1334.86 | 877.35 | 1339.01 | 877.52 | 1344.86 | 877.8 | 1354.86 | 878.2 | 1364.86 | 879.26 |
| 1369.87 | 880.02 | 1371.09 | 880.2 | 1374.86 | 880.77 | 1381.02 | 880.32 | 1386.04 | 880.04 |
| 1386.69 | 879.99 | 1399.11 | 879 | 1412.17 | 878.61 | 1425.24 | 878.83 | 1433.29 | 879.05 |
| 1448.83 | 879.45 | 1451.38 | 879.51 | 1464.37 | 879.79 | 1464.44 | 879.79 | 1464.86 | 879.8 |
| 1477.51 | 880 | 1490.58 | 880.11 | 1510.97 | 880.26 | 1516.71 | 880.28 | 1542.04 | 880.43 |
| 1542.47 | 880.43 | 1542.85 | 880.44 | 1555.91 | 880.49 | 1557.58 | 880.5 | 1568.98 | 880.52 |
| 1588.65 | 880.54 | 1619.71 | 880.61 | 1621.25 | 880.62 | 1634.31 | 880.65 | 1660.45 | 880.67 |
| 1666.32 | 880.69 | 1681.86 | 880.78 | 1684.42 | 880.81 | 1686.58 | 880.82 | 1691.52 | 880.87 |
| 1697.39 | 880.91 | 1699.65 | 880.93 | 1711.61 | 881 | 1712.72 | 881.01 | 1712.93 | 881.01 |
| 1725.78 | 881.04 | 1728.47 | 881.05 | 1738.86 | 881.07 | 1743.99 | 881.09 | 1759.53 | 881.12 |
| 1762.49 | 881.13 | 1778.05 | 881.14 | 1790.6 | 881.12 | 1793.87 | 881.12 | 1804.19 | 881.1 |
| 1806.14 | 881.1 | 1812.17 | 881.09 | 1817.25 | 881.1 | 1819.27 | 881.1 | 1821.68 | 881.11 |
| 1837.21 | 881.12 | 1852.75 | 881.09 | 1854.76 | 881.09 | 1868.28 | 881.01 | 1869.53 | 881 |
| 1882.59 | 880.85 | 1883.81 | 880.83 | 1890.25 | 880.75 | 1895.66 | 880.71 | 1897.35 | 880.69 |
| 1911.53 | 880.63 | 1934.86 | 880.57 | 1947.93 | 880.57 | 1958.37 | 880.59 | 1961 | 880.6 |
| 1961.49 | 880.6 | 1974.06 | 880.63 | 1975.41 | 880.63 | 1977.03 | 880.64 | 2008.09 | 880.65 |
| 2026.33 | 880.7 | 2039.17 | 880.76 | 2040.61 | 880.76 | 2052.47 | 880.79 | 2065.53 | 880.79 |
| 2074.77 | 880.77 | 2117.8 | 880.76 | 2130.86 | 880.78 | 2132.38 | 880.78 | 2143.94 | 880.8 |
| 2145.75 | 880.81 | 2147.91 | 880.81 | 2157 | 880.83 | 2163.45 | 880.83 | 2167.04 | 880.84 |
| 2194.52 | 880.85 | 2196.2 | 880.84 | 2209.27 | 880.82 | 2210.06 | 880.82 | 2235.4 | 880.75 |
| 2241.12 | 880.75 | 2245.12 | 880.74 | 2248.47 | 880.74 | 2252.21 | 880.73 | 2256.66 | 880.73 |
| 2261.54 | 880.72 | 2272.19 | 880.72 | 2274.61 | 880.73 | 2287.36 | 880.75 | 2300.74 | 880.76 |
| 2303.27 | 880.75 | 2334.34 | 880.73 | 2339.94 | 880.74 | 2349.87 | 880.78 | 2365.41 | 880.87 |
| 2366.08 | 880.87 | 2379.14 | 880.92 | 2380.94 | 880.93 | 2405.28 | 880.99 | 2408.35 | 880.99 |
| 2412.01 | 881.01 | 2474.16 | 881.02 | 2489.69 | 881 | 2514.81 | 880.92 | 2520.76 | 880.89 |
| 2521.91 | 880.89 | 2522.88 | 880.88 | 2535.95 | 880.82 | 2536.29 | 880.82 | 2549.02 | 880.74 |
| 2551.83 | 880.73 | 2567.37 | 880.45 | 2575.15 | 880.29 | 2582.9 | 880.16 | 2585.79 | 880.69 |
| 2588.22 | 881.12 | 2592.88 | 881.98 | 2595.55 | 882.45 | 2598.44 | 882.95 | 2613.97 | 883.62 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2614.35 | 883.62 | 2621.28 | 883.66 | 2627.42 | 883.77 | 2629.5 | 883.79 | 2635.47 | 883.73 |
| 2640.48 | 883.74 | 2642.56 | 883.7 | 2645.04 | 883.72 | 2649.66 | 883.72 | 2653.56 | 883.75 |
| 2660.57 | 883.53 | 2666.62 | 883.31 | 2670.32 | 882.63 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1228.35 | .04 | 1289.76 | .052 | 1369.87 | .035 | 2595.55 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1274.85 | 1374.86 | 204.33 | 199.95 | 194.91 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1274.85 | 883.51 | F |
| 1374.86 | 2670.32 | 880.77 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 881.15 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.050 | 0.035 |
| W.S. Elev (ft) | 880.99 | Reach Len. (ft) | 204.33 | 199.95 | 194.91 |
| Crit W.S. (ft) | 880.54 | Flow Area (sq ft) | | 248.82 | 417.62 |
| E.G. Slope (ft/ft) | 0.004775 | Area (sq ft) | 293.02 | 248.82 | 417.62 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 990.83 | 849.17 |
| Top Width (ft) | 2226.17 | Top Width (ft) | 1175.29 | 90.39 | 960.49 |
| Vel Total (ft/s) | 2.76 | Avg. Vel. (ft/s) | | 3.98 | 2.03 |
| Max Chl Dpth (ft) | 4.17 | Hydr. Depth (ft) | | 2.75 | 0.43 |
| Conv. Total (cfs) | 26628.1 | Conv. (cfs) | | 14339.1 | 12289.0 |
| Length Wtd. (ft) | 197.21 | Wetted Per. (ft) | | 90.90 | 960.66 |
| Min Ch El (ft) | 876.82 | Shear (lb/sq ft) | | 0.82 | 0.13 |
| Alpha | 1.37 | Stream Power (lb/ft s) | | 3.25 | 0.26 |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 1.56 | 11.21 | 44.08 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 7.32 | 4.73 | 55.70 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 882.43 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.33 | Wt. n-Val. | | 0.050 | 0.035 |
| W.S. Elev (ft) | 882.11 | Reach Len. (ft) | 204.33 | 199.95 | 194.91 |
| Crit W.S. (ft) | 880.54 | Flow Area (sq ft) | | 352.46 | 48.36 |
| E.G. Slope (ft/ft) | 0.004260 | Area (sq ft) | | 352.46 | 48.36 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1635.95 | 204.05 |
| Top Width (ft) | 117.24 | Top Width (ft) | | 94.54 | 22.70 |
| Vel Total (ft/s) | 4.59 | Avg. Vel. (ft/s) | | 4.64 | 4.22 |
| Max Chl Dpth (ft) | 5.29 | Hydr. Depth (ft) | | 3.73 | 2.13 |
| Conv. Total (cfs) | 28189.9 | Conv. (cfs) | | 25063.8 | 3126.1 |
| Length Wtd. (ft) | 198.95 | Wetted Per. (ft) | | 95.20 | 25.74 |
| Min Ch El (ft) | 876.82 | Shear (lb/sq ft) | | 0.98 | 0.50 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.57 | 2.11 |
| Frctn Loss (ft) | 1.34 | Cum Volume (acre-ft) | | 16.08 | 7.22 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 5.03 | 3.10 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 881.25 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.050 | 0.035 |
| W.S. Elev (ft) | 881.01 | Reach Len. (ft) | 204.33 | 199.95 | 194.91 |
| Crit W.S. (ft) | 880.55 | Flow Area (sq ft) | | 251.35 | 230.48 |
| E.G. Slope (ft/ft) | 0.005197 | Area (sq ft) | | 251.35 | 230.48 |

| | | | | |
|---|---|---|---|---|
| Q Total (cfs) | 1840.00 | Flow (cfs) | 1050.69 | 789.31 |
| Top Width (ft) | 284.61 | Top Width (ft) | 90.49 | 194.12 |
| Vel Total (ft/s) | 3.82 | Avg. Vel. (ft/s) | 4.18 | 3.42 |
| Max Chl Dpth (ft) | 4.19 | Hydr. Depth (ft) | 2.78 | 1.19 |
| Conv. Total (cfs) | 25524.7 | Conv. (cfs) | 14575.3 | 10949.4 |
| Length Wtd. (ft) | 197.30 | Wetted Per. (ft) | 91.01 | 194.70 |
| Min Ch El (ft) | 876.82 | Shear (lb/sq ft) | 0.90 | 0.38 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 3.75 | 1.32 |
| Frctn Loss (ft) | 1.47 | Cum Volume (acre-ft) | 13.44 | 15.23 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 4.87 | 10.02 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .580

INPUT
Description: Thalweg Sta. 1379.26
Station Elevation Data num= 349

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 879.92 | .18 | 879.86 | .84 | 879.78 | 3.97 | 879.87 | 9.28 | 879.99 |
| 10.4 | 880.06 | 17.72 | 880.5 | 20.62 | 880.57 | 26.16 | 880.38 | 30.84 | 880.09 |
| 34.6 | 879.89 | 41.07 | 879.66 | 43.04 | 879.63 | 51.29 | 879.57 | 52.39 | 879.57 |
| 59.91 | 879.56 | 61.51 | 879.54 | 81.95 | 879.73 | 85.23 | 879.74 | 100.81 | 879.83 |
| 102.39 | 879.83 | 112.61 | 879.88 | 128.72 | 879.93 | 161.19 | 879.95 | 163.71 | 879.96 |
| 178.06 | 879.96 | 184.15 | 879.97 | 220.26 | 879.97 | 225.03 | 879.96 | 246.08 | 879.95 |
| 254.02 | 879.96 | 279.33 | 879.96 | 286.35 | 879.95 | 287.77 | 879.95 | 294.5 | 879.93 |
| 306.79 | 879.92 | 310.08 | 879.91 | 323.04 | 879.89 | 342.92 | 879.87 | 346.85 | 879.86 |
| 347.67 | 879.86 | 391.35 | 879.83 | 397.48 | 879.84 | 405.92 | 879.84 | 409 | 879.85 |
| 414.36 | 879.85 | 419.22 | 879.86 | 439.66 | 879.89 | 439.77 | 879.89 | 448.11 | 879.9 |
| 449.88 | 879.91 | 480.54 | 879.93 | 488.19 | 879.91 | 498.75 | 879.9 | 500.98 | 879.89 |
| 507.19 | 879.89 | 511.2 | 879.88 | 532.51 | 879.89 | 540.94 | 879.91 | 541.86 | 879.91 |
| 549.38 | 879.93 | 552.08 | 879.93 | 562.3 | 879.95 | 585.03 | 879.96 | 591.58 | 879.95 |
| 592.96 | 879.95 | 608.46 | 879.94 | 613.4 | 879.93 | 633.46 | 879.9 | 633.85 | 879.9 |
| 642.22 | 879.88 | 644.07 | 879.88 | 674.73 | 879.79 | 675.97 | 879.79 | 681.88 | 879.78 |
| 684.41 | 879.77 | 709.73 | 879.76 | 724.62 | 879.74 | 730.3 | 879.74 | 735.05 | 879.73 |
| 736.05 | 879.73 | 766.71 | 879.66 | 768.8 | 879.66 | 776.93 | 879.64 | 778.73 | 879.64 |
| 787.15 | 879.62 | 789.4 | 879.61 | 815.31 | 879.53 | 817.81 | 879.53 | 827.15 | 879.5 |
| 828.03 | 879.5 | 836.31 | 879.49 | 838.25 | 879.48 | 858.69 | 879.46 | 861.64 | 879.45 |
| 875.57 | 879.43 | 909.79 | 879.43 | 912.27 | 879.44 | 923.99 | 879.44 | 929.14 | 879.45 |
| 946.03 | 879.45 | 950.68 | 879.44 | 971.12 | 879.43 | 971.34 | 879.44 | 996.68 | 879.44 |
| 1001.78 | 879.45 | 1042.66 | 879.45 | 1052.88 | 879.43 | 1055.73 | 879.42 | 1063.1 | 879.41 |
| 1064.17 | 879.41 | 1072.62 | 879.39 | 1073.32 | 879.39 | 1081.05 | 879.38 | 1083.54 | 879.37 |
| 1093.76 | 879.37 | 1103.98 | 879.39 | 1106.36 | 879.39 | 1114.2 | 879.41 | 1114.8 | 879.41 |
| 1117.69 | 879.42 | 1123.25 | 879.43 | 1131.69 | 879.43 | 1134.64 | 879.44 | 1148.56 | 879.43 |
| 1155.08 | 879.41 | 1157 | 879.41 | 1165.3 | 879.38 | 1166.1 | 879.38 | 1173.88 | 879.36 |
| 1175.52 | 879.35 | 1190.76 | 879.3 | 1214.52 | 879.17 | 1216.4 | 879.15 | 1216.9 | 879.15 |
| 1232.95 | 879.05 | 1236.85 | 879.02 | 1257.29 | 878.94 | 1258.27 | 878.94 | 1266.71 | 878.92 |
| 1267.51 | 878.92 | 1287.95 | 878.86 | 1298.17 | 878.79 | 1308.39 | 878.83 | 1308.91 | 878.86 |
| 1310.76 | 878.95 | 1311.37 | 878.98 | 1317.34 | 879.28 | 1318.61 | 879.34 | 1320.54 | 879.49 |
| 1321.02 | 879.52 | 1328.74 | 880.12 | 1329.52 | 880.14 | 1338.85 | 880.37 | 1339.5 | 880.24 |
| 1344.52 | 879.43 | 1347.59 | 878.94 | 1348.95 | 878.72 | 1351.32 | 878.36 | 1359.05 | 877.04 |
| 1369.16 | 876.71 | 1379.26 | 876.54 | 1389.37 | 876.74 | 1398.58 | 877.31 | 1399.47 | 877.36 |
| 1400.13 | 877.46 | 1404.69 | 878.34 | 1409.58 | 879.24 | 1410.41 | 879.22 | 1415.13 | 879.07 |
| 1419.68 | 878.93 | 1422.22 | 878.75 | 1427.41 | 878.41 | 1429.78 | 878.25 | 1434.03 | 877.98 |
| 1439.89 | 877.62 | 1445.85 | 877.42 | 1449.99 | 877.26 | 1457.66 | 877.25 | 1460.1 | 877.24 |
| 1469.47 | 877.4 | 1470.2 | 877.41 | 1480.31 | 877.64 | 1490.41 | 877.84 | 1493.11 | 877.88 |
| 1496.46 | 877.92 | 1501.57 | 878.01 | 1507.53 | 878.09 | 1539.75 | 878.39 | 1539.87 | 878.39 |
| 1552.47 | 878.52 | 1556.04 | 878.55 | 1565.2 | 878.65 | 1582.52 | 878.8 | 1588.37 | 878.84 |
| 1599.09 | 878.89 | 1603.38 | 878.92 | 1604.54 | 878.92 | 1620.7 | 878.99 | 1641.56 | 879.06 |
| 1646.61 | 879.07 | 1653.04 | 879.1 | 1654.29 | 879.11 | 1658.89 | 879.14 | 1667.01 | 879.18 |
| 1669.21 | 879.2 | 1679.74 | 879.27 | 1682.22 | 879.29 | 1685.38 | 879.3 | 1717.71 | 879.5 |
| 1718.68 | 879.5 | 1730.65 | 879.55 | 1733.88 | 879.57 | 1750.04 | 879.61 | 1756.1 | 879.64 |
| 1760.55 | 879.65 | 1766.22 | 879.69 | 1768.82 | 879.7 | 1781.55 | 879.79 | 1782.38 | 879.79 |
| 1789.03 | 879.83 | 1798.55 | 879.86 | 1817.52 | 879.87 | 1819.73 | 879.86 | 1832.46 | 879.85 |
| 1838.27 | 879.83 | 1845.18 | 879.82 | 1847.05 | 879.81 | 1857.91 | 879.8 | 1860.24 | 879.79 |
| 1863.22 | 879.79 | 1879.38 | 879.74 | 1895.56 | 879.65 | 1896.09 | 879.65 | 1898.06 | 879.64 |
| 1946.99 | 879.33 | 1957.85 | 879.3 | 1959.72 | 879.29 | 1960.22 | 879.29 | 1972.45 | 879.32 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1974.18 | 879.32 | 1981.31 | 879.35 | 1995.54 | 879.39 | 2002.66 | 879.39 | 2008.72 | 879.37 |
| 2010.62 | 879.37 | 2023.35 | 879.31 | 2024.89 | 879.31 | 2036.08 | 879.27 | 2041.06 | 879.26 |
| 2045.4 | 879.27 | 2057.23 | 879.28 | 2073.4 | 879.35 | 2074.26 | 879.35 | 2080.99 | 879.38 |
| 2086.98 | 879.42 | 2105.73 | 879.49 | 2109.49 | 879.51 | 2137.23 | 879.58 | 2137.89 | 879.59 |
| 2138.07 | 879.59 | 2150.62 | 879.57 | 2163.34 | 879.56 | 2166.45 | 879.55 | 2170.4 | 879.55 |
| 2173.58 | 879.54 | 2197.03 | 879.56 | 2201.52 | 879.57 | 2226.98 | 879.56 | 2251.24 | 879.51 |
| 2252.43 | 879.51 | 2265.15 | 879.48 | 2267.41 | 879.48 | 2277.88 | 879.46 | 2299.74 | 879.39 |
| 2348.25 | 879.38 | 2364.41 | 879.42 | 2379.69 | 879.48 | 2380.08 | 879.49 | 2380.58 | 879.49 |
| 2392.42 | 879.52 | 2396.75 | 879.54 | 2405.14 | 879.56 | 2408.57 | 879.58 | 2412.91 | 879.59 |
| 2415.68 | 879.61 | 2417.87 | 879.61 | 2429.08 | 879.66 | 2430.6 | 879.66 | 2443.33 | 879.69 |
| 2445.25 | 879.69 | 2456.05 | 879.71 | 2461.41 | 879.71 | 2477.59 | 879.74 | 2509.92 | 879.74 |
| 2526.09 | 879.7 | 2545.14 | 879.69 | 2570.59 | 879.7 | 2574.59 | 879.69 | 2583.31 | 879.65 |
| 2606.93 | 879.56 | 2607.95 | 879.55 | 2608.77 | 879.55 | 2621.5 | 879.51 | 2623.09 | 879.5 |
| 2634.22 | 879.48 | 2639.26 | 879.46 | 2675.38 | 879.44 | 2685.13 | 879.45 | 2687.77 | 879.46 |
| 2697.86 | 879.48 | 2700.53 | 879.48 | 2703.93 | 879.49 | 2736.27 | 879.49 | 2774.22 | 879.4 |
| 2778.86 | 879.38 | 2786.94 | 879.38 | 2799.67 | 879.41 | 2800.94 | 879.41 | 2817.11 | 879.48 |
| 2833.27 | 879.58 | 2835.83 | 879.6 | 2849.44 | 879.67 | 2850.57 | 879.68 | 2865.61 | 879.68 |
| 2888.75 | 879.58 | 2892.8 | 879.57 | 2899.92 | 879.57 | 2901.48 | 879.58 | 2914.11 | 879.6 |
| 2939.66 | 879.63 | 2952.38 | 879.66 | 2956.89 | 879.68 | 2962.61 | 879.69 | 2965.11 | 879.7 |
| 2977.84 | 879.73 | 2978.78 | 879.73 | 2990.56 | 879.75 | 2992.49 | 879.76 | 2994.95 | 879.76 |
| 3011.12 | 879.81 | 3027.28 | 880.04 | 3028.74 | 880.07 | 3041.47 | 880.38 | 3042.06 | 880.39 |
| 3043.45 | 880.43 | 3056.58 | 880.38 | 3059.62 | 880.36 | 3069.69 | 880.04 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 1310.76 | .04 | 1347.59 | .052 | 1427.41 | .035 | 3042.06 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1338.85 | 1409.58 | 207.74 | 199.97 | 191.01 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1338.85 | 880.37 | F |
| 1409.58 | 3069.69 | 879.24 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 879.74 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 879.43 | Reach Len. (ft) | 207.74 | 199.97 | 191.01 |
| Crit W.S. (ft) | 879.25 | Flow Area (sq ft) | | 135.19 | 289.20 |
| E.G. Slope (ft/ft) | 0.011433 | Area (sq ft) | 60.06 | 135.19 | 289.20 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 686.64 | 1153.36 |
| Top Width (ft) | 962.57 | Top Width (ft) | 309.71 | 65.09 | 587.78 |
| Vel Total (ft/s) | 4.34 | Avg. Vel. (ft/s) | | 5.08 | 3.99 |
| Max Chl Dpth (ft) | 2.89 | Hydr. Depth (ft) | | 2.08 | 0.49 |
| Conv. Total (cfs) | 17208.5 | Conv. (cfs) | | 6421.7 | 10786.8 |
| Length Wtd. (ft) | 193.75 | Wetted Per. (ft) | | 65.49 | 587.85 |
| Min Ch El (ft) | 876.54 | Shear (lb/sq ft) | | 1.47 | 0.35 |
| Alpha | 1.04 | Stream Power (lb/ft s) | | 7.48 | 1.40 |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 0.73 | 10.33 | 42.50 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 3.84 | 4.38 | 52.23 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 881.06 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.68 | Wt. n-Val. | | 0.052 | 0.039 |
| W.S. Elev (ft) | 880.39 | Reach Len. (ft) | 207.74 | 199.97 | 191.01 |
| Crit W.S. (ft) | 879.87 | Flow Area (sq ft) | | 199.82 | 78.42 |
| E.G. Slope (ft/ft) | 0.012142 | Area (sq ft) | | 199.82 | 78.42 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1315.97 | 524.03 |
| Top Width (ft) | 108.76 | Top Width (ft) | | 70.73 | 38.03 |
| Vel Total (ft/s) | 6.61 | Avg. Vel. (ft/s) | | 6.59 | 6.68 |
| Max Chl Dpth (ft) | 3.85 | Hydr. Depth (ft) | | 2.83 | 2.06 |
| Conv. Total (cfs) | 16698.3 | Conv. (cfs) | | 11942.7 | 4755.6 |
| Length Wtd. (ft) | 196.51 | Wetted Per. (ft) | | 71.22 | 41.11 |
| Min Ch El (ft) | 876.54 | Shear (lb/sq ft) | | 2.13 | 1.45 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 14.01 | 9.66 |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | | 14.81 | 6.94 |
| C & E Loss (ft) | 0.11 | Cum SA (acres) | | 4.65 | 2.96 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 879.77 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.33 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 879.44 | Reach Len. (ft) | 207.74 | 199.97 | 191.01 |
| Crit W.S. (ft) | 879.25 | Flow Area (sq ft) | | 135.27 | 268.80 |
| E.G. Slope (ft/ft) | 0.011625 | Area (sq ft) | | 135.27 | 268.80 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 693.05 | 1146.95 |
| Top Width (ft) | 362.90 | Top Width (ft) | | 65.10 | 297.80 |
| Vel Total (ft/s) | 4.55 | Avg. Vel. (ft/s) | | 5.12 | 4.27 |
| Max Chl Dpth (ft) | 2.90 | Hydr. Depth (ft) | | 2.08 | 0.90 |
| Conv. Total (cfs) | 17065.4 | Conv. (cfs) | | 6427.8 | 10637.6 |
| Length Wtd. (ft) | 193.76 | Wetted Per. (ft) | | 65.50 | 297.87 |
| Min Ch El (ft) | 876.54 | Shear (lb/sq ft) | | 1.50 | 0.65 |
| Alpha | 1.02 | Stream Power (lb/ft s) | | 7.68 | 2.79 |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | | 12.56 | 14.12 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | | 4.52 | 8.92 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .542

INPUT
Description: Thalweg Sta. 1500.81
Station Elevation Data num= 356

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 27.3 | 878.94 | 32.05 | 878.73 | 37.51 | 878.46 | 45.82 | 878.38 | 47.72 | 878.34 |
| 54.99 | 878.42 | 57.42 | 878.45 | 57.93 | 878.46 | 65.89 | 878.55 | 68.15 | 878.57 |
| 74.35 | 878.64 | 88.57 | 878.74 | 97.34 | 878.76 | 108.19 | 878.76 | 109 | 878.77 |
| 129.42 | 878.75 | 142.02 | 878.71 | 149.84 | 878.64 | 153.59 | 878.56 | 160.06 | 878.44 |
| 167.41 | 878.35 | 170.27 | 878.33 | 187.51 | 878.52 | 190.69 | 878.56 | 202.9 | 878.57 |
| 209.71 | 878.56 | 211.12 | 878.56 | 218.17 | 878.55 | 231.54 | 878.52 | 262.18 | 878.51 |
| 313.24 | 878.53 | 328.14 | 878.54 | 342.07 | 878.52 | 343.88 | 878.51 | 345.06 | 878.51 |
| 353.52 | 878.48 | 354.09 | 878.48 | 374.52 | 878.4 | 384.73 | 878.37 | 387.36 | 878.37 |
| 405.15 | 878.33 | 406.47 | 878.33 | 425.58 | 878.29 | 432.23 | 878.29 | 435.79 | 878.28 |
| 446 | 878.28 | 455.04 | 878.3 | 456.21 | 878.31 | 486.85 | 878.4 | 497.34 | 878.41 |
| 498.7 | 878.42 | 531.18 | 878.42 | 573.48 | 878.4 | 578.76 | 878.39 | 607.33 | 878.41 |
| 609.4 | 878.42 | 615.78 | 878.42 | 619.61 | 878.43 | 629.82 | 878.44 | 632.7 | 878.45 |
| 646.6 | 878.45 | 650.25 | 878.46 | 664.08 | 878.46 | 711.52 | 878.45 | 715.6 | 878.44 |
| 752.37 | 878.44 | 768.06 | 878.45 | 772.8 | 878.46 | 813.64 | 878.46 | 818.64 | 878.47 |
| 844.28 | 878.49 | 852.66 | 878.48 | 854.49 | 878.47 | 864.71 | 878.45 | 878.04 | 878.41 |
| 885.13 | 878.4 | 886.5 | 878.4 | 893.12 | 878.39 | 894.96 | 878.38 | 903.42 | 878.38 |
| 905.56 | 878.39 | 925.98 | 878.41 | 928.8 | 878.42 | 942.41 | 878.42 | 946.4 | 878.41 |
| 947.45 | 878.41 | 956.62 | 878.37 | 966.83 | 878.34 | 987.25 | 878.25 | 988.02 | 878.25 |
| 996.48 | 878.22 | 997.47 | 878.22 | 1013.4 | 878.21 | 1017.89 | 878.22 | 1028.1 | 878.23 |
| 1030.32 | 878.24 | 1038.32 | 878.25 | 1038.78 | 878.25 | 1047.24 | 878.29 | 1048.53 | 878.3 |
| 1058.74 | 878.34 | 1068.95 | 878.36 | 1072.62 | 878.35 | 1079.16 | 878.36 | 1150.65 | 878.32 |
| 1153.53 | 878.31 | 1160.86 | 878.3 | 1165.67 | 878.28 | 1181.29 | 878.24 | 1182.6 | 878.23 |
| 1188.92 | 878.21 | 1191.05 | 878.2 | 1191.5 | 878.2 | 1201.71 | 878.15 | 1207.97 | 878.13 |
| 1211.92 | 878.11 | 1222.14 | 878.09 | 1224.89 | 878.08 | 1232.35 | 878.07 | 1238.22 | 878.07 |
| 1241.82 | 878.06 | 1242.56 | 878.06 | 1250.27 | 878.08 | 1252.77 | 878.1 | 1258.74 | 878.13 |
| 1262.99 | 878.16 | 1275.65 | 878.17 | 1283.41 | 878.15 | 1284.12 | 878.15 | 1292.57 | 878.1 |
| 1293.62 | 878.09 | 1303.84 | 878.02 | 1314.05 | 877.97 | 1317.95 | 877.96 | 1351.79 | 877.94 |
| 1360.25 | 877.92 | 1372.49 | 877.86 | 1375.32 | 877.84 | 1377.17 | 877.82 | 1385.53 | 877.76 |
| 1386.13 | 877.76 | 1394.09 | 877.72 | 1402.55 | 877.72 | 1405.96 | 877.77 | 1411.01 | 877.89 |
| 1416.17 | 878.14 | 1419.47 | 878.43 | 1426.38 | 878.96 | 1427.93 | 879.1 | 1435.43 | 879.64 |
| 1435.7 | 879.67 | 1435.85 | 879.67 | 1436.64 | 879.72 | 1437.12 | 879.74 | 1447.33 | 880.13 |
| 1454.34 | 879.68 | 1458.03 | 879.53 | 1459.69 | 879.3 | 1460.69 | 879.1 | 1464.05 | 878.44 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1467.26 | 877.82 | 1468.72 | 877.54 | 1471.57 | 877.21 | 1473.82 | 876.84 | 1479.42 | 875.92 |
| 1488.8 | 876.05 | 1490.11 | 876.06 | 1492.25 | 876.11 | 1500.81 | 876.29 | 1511.5 | 876.09 |
| 1520.47 | 876.03 | 1521.72 | 876.02 | 1522.2 | 876.02 | 1529.47 | 876.23 | 1532.89 | 876.35 |
| 1540.48 | 876.89 | 1543.59 | 877.09 | 1552.73 | 878.06 | 1554.28 | 878.17 | 1559.17 | 878.31 |
| 1560.49 | 878.35 | 1562.45 | 878.31 | 1564.98 | 878.25 | 1565.81 | 878.17 | 1568.11 | 877.97 |
| 1573.62 | 877.41 | 1576.47 | 877.14 | 1580.4 | 876.82 | 1588.03 | 876.15 | 1593.54 | 875.98 |
| 1599.6 | 875.88 | 1607.97 | 876.02 | 1611.16 | 876.06 | 1622.72 | 876.37 | 1633.38 | 876.59 |
| 1634.28 | 876.61 | 1641.27 | 876.71 | 1645.85 | 876.76 | 1663.1 | 876.89 | 1668.97 | 876.92 |
| 1673.22 | 876.95 | 1690.65 | 877.01 | 1693.14 | 877.01 | 1713.05 | 877.05 | 1715.22 | 877.05 |
| 1726.79 | 877.1 | 1729.05 | 877.1 | 1745.79 | 877.17 | 1749.91 | 877.18 | 1751 | 877.19 |
| 1752.9 | 877.19 | 1772.81 | 877.26 | 1773.34 | 877.26 | 1792.73 | 877.34 | 1812.65 | 877.45 |
| 1816.85 | 877.48 | 1830.85 | 877.53 | 1842.42 | 877.52 | 1852.49 | 877.49 | 1872.41 | 877.5 |
| 1875.38 | 877.51 | 1877.1 | 877.52 | 1888.67 | 877.57 | 1892.33 | 877.58 | 1904.64 | 877.66 |
| 1911.79 | 877.72 | 1912.24 | 877.72 | 1923.35 | 877.78 | 1932.17 | 877.8 | 1933.9 | 877.81 |
| 1952.09 | 877.81 | 1981.17 | 877.66 | 1991.92 | 877.68 | 1993.84 | 877.68 | 2004.29 | 877.74 |
| 2014.38 | 877.77 | 2015.85 | 877.77 | 2027.42 | 877.79 | 2031.76 | 877.79 | 2038.98 | 877.81 |
| 2048.97 | 877.82 | 2050.55 | 877.83 | 2071.6 | 877.86 | 2073.67 | 877.86 | 2091.52 | 877.93 |
| 2104.09 | 877.99 | 2108.36 | 878.02 | 2124.12 | 878.06 | 2154.61 | 878.07 | 2159.21 | 878.08 |
| 2191.11 | 878.07 | 2209.84 | 878.02 | 2240.25 | 878.02 | 2270.66 | 878.02 | 2285.86 | 877.99 |
| 2306.3 | 877.99 | 2310.95 | 878 | 2332.85 | 877.99 | 2346.12 | 877.93 | 2346.68 | 877.93 |
| 2359.4 | 877.88 | 2377.09 | 877.88 | 2385.95 | 877.91 | 2388.9 | 877.93 | 2392.3 | 877.94 |
| 2407.5 | 878.03 | 2410.17 | 878.04 | 2412.5 | 878.06 | 2437.91 | 878.21 | 2438.52 | 878.21 |
| 2439.05 | 878.22 | 2452.33 | 878.28 | 2453.11 | 878.28 | 2465.6 | 878.3 | 2488.13 | 878.3 |
| 2492.15 | 878.29 | 2498.73 | 878.29 | 2502.3 | 878.28 | 2513.93 | 878.31 | 2544.34 | 878.44 |
| 2544.83 | 878.45 | 2559.54 | 878.46 | 2571.8 | 878.44 | 2574.75 | 878.43 | 2605.16 | 878.42 |
| 2608.62 | 878.41 | 2611.63 | 878.41 | 2615.7 | 878.4 | 2620.37 | 878.41 | 2644.05 | 878.41 |
| 2650.78 | 878.42 | 2651.45 | 878.42 | 2664.73 | 878.45 | 2681.18 | 878.46 | 2704.56 | 878.36 |
| 2711.59 | 878.32 | 2714.93 | 878.29 | 2744.38 | 878.17 | 2750.35 | 878.16 | 2757.21 | 878.13 |
| 2760.74 | 878.13 | 2770.93 | 878.1 | 2787.62 | 878.09 | 2797.48 | 878.11 | 2799.97 | 878.11 |
| 2818.02 | 878.17 | 2821.23 | 878.19 | 2824.03 | 878.2 | 2837.31 | 878.27 | 2848.44 | 878.32 |
| 2849.58 | 878.33 | 2850.58 | 878.33 | 2856.66 | 878.36 | 2863.64 | 878.38 | 2865.35 | 878.38 |
| 2877.13 | 878.4 | 2892.11 | 878.4 | 2894.05 | 878.39 | 2924.46 | 878.35 | 2954.87 | 878.35 |
| 2955.89 | 878.36 | 2956.79 | 878.36 | 2969.95 | 878.39 | 2970.08 | 878.39 | 2983.34 | 878.42 |
| 3009.88 | 878.41 | 3015.69 | 878.39 | 3030.89 | 878.36 | 3033.85 | 878.35 | 3036.43 | 878.35 |
| 3046.1 | 878.33 | 3062.98 | 878.33 | 3074.56 | 878.36 | 3076.51 | 878.36 | 3089.54 | 878.38 |
| 3091.71 | 878.39 | 3102.81 | 878.41 | 3122.12 | 878.39 | 3125.98 | 878.38 | 3129.36 | 878.36 |
| 3133.07 | 878.35 | 3142.64 | 878.31 | 3152.53 | 878.29 | 3155.91 | 878.29 | 3167.73 | 878.31 |
| 3169.19 | 878.31 | 3182.46 | 878.33 | 3182.94 | 878.33 | 3195.74 | 878.35 | 3198.14 | 878.35 |
| 3209.01 | 878.37 | 3211.03 | 878.38 | 3225.21 | 878.39 | 3228.56 | 878.38 | 3275.39 | 878.37 |
| 3282.45 | 878.38 | | | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 27.3 | .035 | 1467.26 | .04 | 1473.82 | .052 | 1562.45 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1447.33 | 1560.49 | 330.69 | 257.47 | 220.28 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 27.3 | 1447.33 | 880.13 | F |
| 1560.49 | 3282.45 | 878.35 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 878.43 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 878.35 | Reach Len. (ft) | 330.69 | 257.47 | 220.28 |
| Crit W.S. (ft) | 878.35 | Flow Area (sq ft) | | 163.19 | 683.09 |
| E.G. Slope (ft/ft) | 0.004090 | Area (sq ft) | 94.58 | 163.19 | 683.09 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 437.03 | 1402.97 |
| Top Width (ft) | 1841.36 | Top Width (ft) | 501.78 | 95.97 | 1243.61 |
| Vel Total (ft/s) | 2.17 | Avg. Vel. (ft/s) | | 2.68 | 2.05 |
| Max Chl Dpth (ft) | 2.47 | Hydr. Depth (ft) | | 1.70 | 0.55 |
| Conv. Total (cfs) | 28771.9 | Conv. (cfs) | | 6833.7 | 21938.2 |
| Length Wtd. (ft) | 228.65 | Wetted Per. (ft) | | 96.27 | 1243.73 |
| Min Ch El (ft) | 875.92 | Shear (lb/sq ft) | | 0.43 | 0.14 |
| Alpha | 1.04 | Stream Power (lb/ft s) | | 1.16 | 0.29 |
| Frctn Loss (ft) | 0.74 | Cum Volume (acre-ft) | 0.36 | 9.64 | 40.37 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.90 | 4.01 | 48.22 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there

is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 879.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 879.29 | Reach Len. (ft) | 330.69 | 257.47 | 220.28 |
| Crit W.S. (ft) | 878.36 | Flow Area (sq ft) | | 255.48 | 170.30 |
| E.G. Slope (ft/ft) | 0.004413 | Area (sq ft) | | 255.48 | 170.30 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 941.02 | 898.98 |
| Top Width (ft) | 164.77 | Top Width (ft) | | 100.74 | 64.03 |
| Vel Total (ft/s) | 4.32 | Avg. Vel. (ft/s) | | 3.68 | 5.28 |
| Max Chl Dpth (ft) | 3.41 | Hydr. Depth (ft) | | 2.54 | 2.66 |
| Conv. Total (cfs) | 27697.7 | Conv. (cfs) | | 14165.3 | 13532.5 |
| Length Wtd. (ft) | 237.74 | Wetted Per. (ft) | | 101.13 | 67.02 |
| Min Ch El (ft) | 875.92 | Shear (lb/sq ft) | | 0.70 | 0.70 |
| Alpha | 1.10 | Stream Power (lb/ft s) | | 2.56 | 3.70 |
| Frctn Loss (ft) | 0.77 | Cum Volume (acre-ft) | | 13.77 | 6.39 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 4.26 | 2.74 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 878.54 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 878.41 | Reach Len. (ft) | 330.69 | 257.47 | 220.28 |
| Crit W.S. (ft) | 878.35 | Flow Area (sq ft) | | 168.61 | 467.43 |
| E.G. Slope (ft/ft) | 0.003688 | Area (sq ft) | | 168.61 | 467.43 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 437.75 | 1402.25 |
| Top Width (ft) | 469.68 | Top Width (ft) | | 96.27 | 373.41 |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | | 2.60 | 3.00 |
| Max Chl Dpth (ft) | 2.53 | Hydr. Depth (ft) | | 1.75 | 1.25 |
| Conv. Total (cfs) | 30297.5 | Conv. (cfs) | | 7208.0 | 23089.6 |
| Length Wtd. (ft) | 228.67 | Wetted Per. (ft) | | 96.57 | 374.12 |
| Min Ch El (ft) | 875.92 | Shear (lb/sq ft) | | 0.40 | 0.29 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 1.04 | 0.86 |
| Frctn Loss (ft) | 0.51 | Cum Volume (acre-ft) | | 11.86 | 12.50 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 4.14 | 7.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .494

INPUT
Description: Thalweg Sta. 93.82
Station Elevation Data num= 206

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 881.93 | 2.9 | 882.53 | 6.67 | 882.55 | 13 | 882.51 | 14.96 | 882.43 |
| 21.45 | 882.17 | 23.1 | 882.14 | 24.34 | 882.07 | 32.99 | 881.48 | 33.18 | 881.46 |
| 33.24 | 881.46 | 43.31 | 880.13 | 50.85 | 878.69 | 59.69 | 876.96 | 63.51 | 876.19 |
| 68.52 | 875.7 | 73.62 | 875.41 | 77.36 | 875.37 | 93.82 | 875.29 | 95.02 | 875.33 |
| 103.43 | 875.51 | 103.92 | 875.53 | 112.69 | 875.51 | 114.03 | 875.51 | 115.79 | 875.5 |
| 124.13 | 875.41 | 127.59 | 875.52 | 134.23 | 875.72 | 136.07 | 875.91 | 142.2 | 876.22 |
| 152.98 | 876.68 | 153.63 | 876.67 | 165.05 | 876.52 | 168.31 | 876.49 | 172.05 | 876.46 |
| 173.66 | 876.44 | 176.48 | 876.4 | 182.83 | 876.3 | 187.9 | 876.24 | 194.34 | 876.15 |
| 197.55 | 876.12 | 210.75 | 876.03 | 215.02 | 876.01 | 222.18 | 875.99 | 235.7 | 875.99 |
| 256.38 | 876.04 | 256.45 | 876.04 | 263.79 | 876.07 | 267.87 | 876.08 | 277.06 | 876.12 |
| 278.5 | 876.12 | 279.3 | 876.13 | 307.59 | 876.21 | 313.57 | 876.21 | 315.3 | 876.2 |
| 336.42 | 876.12 | 339.1 | 876.1 | 359.27 | 876.03 | 359.78 | 876.03 | 380.45 | 876 |
| 382.12 | 876 | 393.54 | 876.05 | 401.13 | 876.1 | 404.97 | 876.11 | 439.24 | 876.26 |
| 440.4 | 876.27 | 442.5 | 876.28 | 462.09 | 876.41 | 463.18 | 876.42 | 483.86 | 876.56 |
| 486.28 | 876.58 | 507.79 | 876.71 | 513.99 | 876.73 | 519.21 | 876.73 | 521.35 | 876.74 |
| 553.49 | 876.74 | 558.14 | 876.75 | 576.34 | 876.76 | 587.25 | 876.79 | 587.76 | 876.79 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 607.94 | 876.91 | 613.91 | 876.95 | 622.03 | 876.99 | 644.88 | 877.05 | 649.3 | 877.05 |
| 656.31 | 877.07 | 663.04 | 877.07 | 668.18 | 877.08 | 683.54 | 877.09 | 729.6 | 877.23 |
| 744.95 | 877.29 | 747.53 | 877.29 | 760.3 | 877.33 | 760.71 | 877.33 | 775.66 | 877.34 |
| 787.07 | 877.32 | 791.01 | 877.32 | 837.07 | 877.21 | 839.79 | 877.21 | 852.42 | 877.24 |
| 852.96 | 877.24 | 866.14 | 877.26 | 867.77 | 877.27 | 909.44 | 877.36 | 932.04 | 877.45 |
| 944.54 | 877.47 | 944.9 | 877.47 | 945.22 | 877.46 | 958.39 | 877.43 | 959.89 | 877.43 |
| 971.58 | 877.38 | 975.24 | 877.37 | 984.75 | 877.36 | 987.45 | 877.35 | 1015.82 | 877.34 |
| 1021.3 | 877.35 | 1024.29 | 877.35 | 1037.47 | 877.34 | 1050.65 | 877.29 | 1063.83 | 877.2 |
| 1077.01 | 877.1 | 1082.71 | 877.04 | 1098.06 | 876.98 | 1100.92 | 876.99 | 1103.37 | 876.99 |
| 1113.41 | 877.01 | 1128.77 | 877.1 | 1129.73 | 877.1 | 1150.55 | 877.25 | 1159.47 | 877.28 |
| 1169.26 | 877.28 | 1174.83 | 877.27 | 1178.93 | 877.25 | 1205.53 | 877.2 | 1228.62 | 877.2 |
| 1235.16 | 877.19 | 1236.23 | 877.19 | 1248.34 | 877.21 | 1251.59 | 877.21 | 1261.52 | 877.24 |
| 1282.29 | 877.25 | 1285.29 | 877.26 | 1340.59 | 877.3 | 1343.71 | 877.31 | 1353.77 | 877.32 |
| 1356.21 | 877.33 | 1359.06 | 877.33 | 1363.3 | 877.34 | 1377.48 | 877.35 | 1380.13 | 877.36 |
| 1393.31 | 877.36 | 1405.12 | 877.33 | 1419.66 | 877.22 | 1420.47 | 877.21 | 1432.85 | 877.09 |
| 1446.02 | 877.01 | 1455.49 | 876.97 | 1459.21 | 876.96 | 1462.58 | 876.96 | 1466.52 | 876.95 |
| 1472.38 | 876.95 | 1481.88 | 876.97 | 1497.23 | 877.09 | 1498.74 | 877.1 | 1511.92 | 877.21 |
| 1512.58 | 877.22 | 1525.1 | 877.28 | 1527.94 | 877.3 | 1543.29 | 877.36 | 1551.46 | 877.38 |
| 1561.87 | 877.38 | 1564.64 | 877.37 | 1574 | 877.37 | 1577.82 | 877.36 | 1604.7 | 877.36 |
| 1630.53 | 877.38 | 1635.4 | 877.39 | 1643.71 | 877.39 | 1646.97 | 877.4 | 1681.46 | 877.4 |
| 1694.07 | 877.48 | 1696.43 | 877.5 | 1696.82 | 877.51 | 1703.69 | 877.57 | 1709.61 | 877.64 |
| 1710.79 | 877.65 | 1712.17 | 877.67 | 1722.79 | 877.72 | 1732.07 | 877.72 | 1735.97 | 877.71 |
| 1758.23 | 877.61 | 1762.33 | 877.6 | 1773.58 | 877.61 | 1775.5 | 877.62 | 1781.7 | 877.62 |
| 1788.68 | 877.64 | 1801.86 | 877.63 | 1802.98 | 877.62 | 1804.29 | 877.62 | 1810.08 | 877.61 |
| 1828.22 | 877.56 | 1850.34 | 877.59 | 1852.62 | 877.6 | 1854.58 | 877.6 | 1865.69 | 877.63 |
| 1870.06 | 877.63 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 168.31 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 14.96 | 152.98 | 401.41 | 400.29 | 369.49 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 877.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.04 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 877.59 | Reach Len. (ft) | 401.41 | 400.29 | 369.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 178.39 | 940.85 |
| E.G. Slope (ft/ft) | 0.002597 | Area (sq ft) | | 178.39 | 940.85 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 390.75 | 1449.25 |
| Top Width (ft) | 1678.23 | Top Width (ft) | | 96.49 | 1581.73 |
| Vel Total (ft/s) | 1.64 | Avg. Vel. (ft/s) | | 2.19 | 1.54 |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | 1.85 | 0.59 |
| Conv. Total (cfs) | 36107.8 | Conv. (cfs) | | 7668.0 | 28439.8 |
| Length Wtd. (ft) | 378.09 | Wetted Per. (ft) | | 96.70 | 1581.75 |
| Min Ch El (ft) | 875.29 | Shear (lb/sq ft) | | 0.30 | 0.10 |
| Alpha | 1.07 | Stream Power (lb/ft s) | | 0.66 | 0.15 |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | | 8.63 | 36.26 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 3.44 | 41.07 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 878.79 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.052 | 0.036 |
| W.S. Elev (ft) | 878.62 | Reach Len. (ft) | 401.41 | 400.29 | 369.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 280.40 | 285.87 |
| E.G. Slope (ft/ft) | 0.002503 | Area (sq ft) | | 280.40 | 285.87 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 786.40 | 1053.60 |
| Top Width (ft) | 218.67 | Top Width (ft) | | 101.75 | 116.91 |
| Vel Total (ft/s) | 3.25 | Avg. Vel. (ft/s) | | 2.80 | 3.69 |
| Max Chl Dpth (ft) | 3.33 | Hydr. Depth (ft) | | 2.76 | 2.45 |
| Conv. Total (cfs) | 36777.0 | Conv. (cfs) | | 15718.1 | 21058.8 |
| Length Wtd. (ft) | 384.95 | Wetted Per. (ft) | | 102.06 | 119.44 |
| Min Ch El (ft) | 875.29 | Shear (lb/sq ft) | | 0.43 | 0.37 |
| Alpha | 1.06 | Stream Power (lb/ft s) | | 1.20 | 1.38 |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | | 12.18 | 5.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 3.66 | 2.28 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 878.01 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 877.94 | Reach Len. (ft) | 401.41 | 400.29 | 369.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 212.41 | 620.72 |
| E.G. Slope (ft/ft) | 0.001497 | Area (sq ft) | | 212.41 | 620.72 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 391.96 | 1448.04 |
| Top Width (ft) | 459.29 | Top Width (ft) | | 98.28 | 361.01 |
| Vel Total (ft/s) | 2.21 | Avg. Vel. (ft/s) | | 1.85 | 2.33 |
| Max Chl Dpth (ft) | 2.65 | Hydr. Depth (ft) | | 2.16 | 1.72 |
| Conv. Total (cfs) | 47554.3 | Conv. (cfs) | | 10130.1 | 37424.2 |
| Length Wtd. (ft) | 379.87 | Wetted Per. (ft) | | 98.52 | 362.22 |
| Min Ch El (ft) | 875.29 | Shear (lb/sq ft) | | 0.20 | 0.16 |
| Alpha | 1.03 | Stream Power (lb/ft s) | | 0.37 | 0.37 |
| Frctn Loss (ft) | 0.81 | Cum Volume (acre-ft) | | 10.73 | 9.75 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 3.57 | 5.59 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .418

INPUT
Description: Thalweg Sta. 82.13
Station Elevation Data num= 190

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 879.85 | 1.53 | 879.91 | 4.6 | 879.96 | 6.67 | 879.98 | 11.61 | 880.02 |
| 13.58 | 879.97 | 21.68 | 879.73 | 22.57 | 879.67 | 31.75 | 878.99 | 32.02 | 878.96 |
| 41.83 | 878.05 | 43.49 | 877.83 | 51.9 | 876.82 | 58.48 | 875.64 | 61.98 | 874.98 |
| 66.44 | 874.33 | 72.05 | 873.32 | 76.43 | 873.11 | 82.13 | 872.82 | 89.39 | 872.78 |
| 92.2 | 872.76 | 100.86 | 873.01 | 102.27 | 873.04 | 103.37 | 873.12 | 112.35 | 873.86 |
| 112.4 | 873.86 | 122.42 | 874.68 | 123.81 | 874.73 | 126.68 | 874.84 | 130.01 | 874.96 |
| 132.5 | 875.05 | 135.29 | 875.1 | 142.57 | 875.2 | 143.96 | 875.2 | 147.46 | 875.21 |
| 151.14 | 875.23 | 154.76 | 875.24 | 160.88 | 875.29 | 162.76 | 875.3 | 186 | 875.31 |
| 191.26 | 875.3 | 197.62 | 875.31 | 198.56 | 875.32 | 209.24 | 875.39 | 220.86 | 875.5 |
| 222.41 | 875.51 | 232.48 | 875.6 | 239.43 | 875.63 | 255.72 | 875.66 | 279.32 | 875.68 |
| 298.34 | 875.73 | 302.2 | 875.75 | 313.81 | 875.78 | 315.36 | 875.78 | 336.23 | 875.83 |
| 348.67 | 875.83 | 371.91 | 875.76 | 373.76 | 875.75 | 383.53 | 875.72 | 418.38 | 875.72 |
| 455.45 | 875.7 | 461.37 | 875.71 | 464.86 | 875.71 | 474.35 | 875.74 | 474.9 | 875.74 |
| 476.87 | 875.75 | 489.49 | 875.78 | 490.6 | 875.79 | 518.68 | 875.8 | 531.79 | 875.78 |
| 533.27 | 875.78 | 562.46 | 875.67 | 572.98 | 875.61 | 586.71 | 875.52 | 589.1 | 875.51 |
| 591.65 | 875.49 | 600.44 | 875.47 | 606.25 | 875.47 | 620.84 | 875.55 | 635.44 | 875.64 |
| 652.78 | 875.69 | 655.36 | 875.69 | 679.22 | 875.74 | 688.14 | 875.74 | 693.81 | 875.75 |
| 696.54 | 875.74 | 710.28 | 875.73 | 723 | 875.69 | 724 | 875.69 | 737.6 | 875.67 |
| 737.73 | 875.67 | 739.95 | 875.68 | 751.46 | 875.7 | 752.19 | 875.7 | 765.19 | 875.76 |
| 766.78 | 875.76 | 778.92 | 875.79 | 780.11 | 875.8 | 781.37 | 875.8 | 806.38 | 875.78 |
| 808.4 | 875.77 | 810.56 | 875.77 | 815.49 | 875.78 | 839.75 | 875.79 | 854.34 | 875.82 |
| 857.92 | 875.82 | 861.3 | 875.83 | 865 | 875.83 | 875.03 | 875.85 | 879.15 | 875.85 |
| 886.22 | 875.87 | 888.76 | 875.87 | 912.72 | 875.92 | 914.52 | 875.93 | 916.22 | 875.93 |
| 941.91 | 875.95 | 942.82 | 875.94 | 971.7 | 875.92 | 984.87 | 875.87 | 985.7 | 875.87 |
| 998.6 | 875.83 | 1000.29 | 875.83 | 1012.32 | 875.81 | 1014.88 | 875.8 | 1026.05 | 875.78 |
| 1044.07 | 875.78 | 1053.52 | 875.83 | 1063.09 | 875.87 | 1067.24 | 875.9 | 1070.16 | 875.91 |
| 1084.31 | 875.99 | 1087.86 | 876 | 1091.38 | 876.02 | 1102.45 | 876.05 | 1119.68 | 876.05 |
| 1122.16 | 876.04 | 1162.13 | 876.02 | 1163.35 | 876.01 | 1175.42 | 875.99 | 1177.08 | 875.98 |
| 1190.02 | 875.95 | 1190.81 | 875.95 | 1203.46 | 875.97 | 1204.61 | 875.97 | 1218.27 | 876.05 |
| 1218.72 | 876.05 | 1219.21 | 876.06 | 1232 | 876.16 | 1245.73 | 876.24 | 1248.39 | 876.26 |
| 1259.46 | 876.3 | 1261.16 | 876.3 | 1262.99 | 876.31 | 1277.58 | 876.32 | 1300.65 | 876.26 |
| 1303.62 | 876.26 | 1314.38 | 876.2 | 1317.76 | 876.17 | 1335.95 | 876.07 | 1346.06 | 876.07 |
| 1355.56 | 876.11 | 1374.35 | 876.24 | 1379.74 | 876.26 | 1408.93 | 876.24 | 1410.48 | 876.23 |
| 1451.68 | 876.23 | 1452.71 | 876.24 | 1465.4 | 876.27 | 1467.3 | 876.28 | 1479.13 | 876.31 |
| 1480.47 | 876.32 | 1481.9 | 876.32 | 1492.86 | 876.37 | 1496.49 | 876.38 | 1506.59 | 876.43 |
| 1511.09 | 876.46 | 1540.28 | 876.6 | 1554.87 | 876.65 | 1572.44 | 876.64 | 1575.24 | 876.63 |
| 1598.65 | 876.6 | 1613.25 | 876.57 | 1616.43 | 876.57 | 1627.84 | 876.56 | 1630.16 | 876.57 |
| 1642.44 | 876.6 | 1643.89 | 876.6 | 1657.03 | 876.63 | 1657.62 | 876.63 | 1666.79 | 876.61 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 126.68 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 6.67 | 130.01 | 402.52 | 400.1 | 402.57 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 876.46 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 876.37 | Reach Len. (ft) | 402.52 | 400.10 | 402.57 |
| Crit W.S. (ft) | 876.17 | Flow Area (sq ft) | | 193.68 | 716.15 |
| E.G. Slope (ft/ft) | 0.003696 | Area (sq ft) | | 193.68 | 716.15 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 636.36 | 1203.64 |
| Top Width (ft) | 1438.42 | Top Width (ft) | | 75.60 | 1362.82 |
| Vel Total (ft/s) | 2.02 | Avg. Vel. (ft/s) | | 3.29 | 1.68 |
| Max Chl Dpth (ft) | 3.61 | Hydr. Depth (ft) | | 2.56 | 0.53 |
| Conv. Total (cfs) | 30266.3 | Conv. (cfs) | | 10467.6 | 19798.8 |
| Length Wtd. (ft) | 401.54 | Wetted Per. (ft) | | 75.95 | 1362.83 |
| Min Ch El (ft) | 872.76 | Shear (lb/sq ft) | | 0.59 | 0.12 |
| Alpha | 1.36 | Stream Power (lb/ft s) | | 1.93 | 0.20 |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | | 6.92 | 29.23 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 2.65 | 28.59 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 877.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 877.35 | Reach Len. (ft) | 402.52 | 400.10 | 402.57 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 271.18 | 186.61 |
| E.G. Slope (ft/ft) | 0.003765 | Area (sq ft) | | 271.18 | 186.61 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1061.33 | 778.67 |
| Top Width (ft) | 172.75 | Top Width (ft) | | 82.56 | 90.19 |
| Vel Total (ft/s) | 4.02 | Avg. Vel. (ft/s) | | 3.91 | 4.17 |
| Max Chl Dpth (ft) | 4.59 | Hydr. Depth (ft) | | 3.28 | 2.07 |
| Conv. Total (cfs) | 29986.4 | Conv. (cfs) | | 17296.5 | 12689.9 |
| Length Wtd. (ft) | 400.86 | Wetted Per. (ft) | | 82.98 | 92.05 |
| Min Ch El (ft) | 872.76 | Shear (lb/sq ft) | | 0.77 | 0.48 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.01 | 1.99 |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | | 9.65 | 3.24 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 2.82 | 1.40 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 877.20 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 877.03 | Reach Len. (ft) | 402.52 | 400.10 | 402.57 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 244.76 | 312.22 |
| E.G. Slope (ft/ft) | 0.003242 | Area (sq ft) | | 244.76 | 312.22 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 848.70 | 991.30 |
| Top Width (ft) | 286.07 | Top Width (ft) | | 79.85 | 206.22 |
| Vel Total (ft/s) | 3.30 | Avg. Vel. (ft/s) | | 3.47 | 3.17 |
| Max Chl Dpth (ft) | 4.27 | Hydr. Depth (ft) | | 3.07 | 1.51 |
| Conv. Total (cfs) | 32315.6 | Conv. (cfs) | | 14905.7 | 17410.0 |
| Length Wtd. (ft) | 401.09 | Wetted Per. (ft) | | 80.25 | 207.42 |
| Min Ch El (ft) | 872.76 | Shear (lb/sq ft) | | 0.62 | 0.30 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 2.14 | 0.97 |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | | 8.63 | 5.79 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 2.75 | 3.18 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .342

INPUT
Description: Thalweg Sta. 117.35
Station Elevation Data num= 183

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 879.96 | .9 | 880.09 | 5.06 | 880.65 | 6.07 | 880.78 | 7.16 | 880.71 |
| 16.22 | 880.21 | 22.59 | 879.92 | 26.37 | 879.73 | 31.74 | 879.51 | 36.52 | 879.33 |
| 44.05 | 879.09 | 46.67 | 879 | 56.34 | 878.57 | 56.82 | 878.55 | 59.13 | 878.27 |
| 66.97 | 877.27 | 74.45 | 875.82 | 77.13 | 875.33 | 80.92 | 874.57 | 87.28 | 873.25 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 93.22 | 872.3 | 97.43 | 871.59 | 105.51 | 871.1 | 107.58 | 870.95 | 109.03 | 870.94 |
| 117.35 | 870.9 | 117.8 | 870.9 | 127.88 | 871.04 | 134.96 | 871.27 | 138.03 | 871.39 |
| 142.4 | 871.74 | 148.18 | 872.16 | 158.33 | 873.05 | 166.98 | 873.47 | 168.48 | 873.56 |
| 169.53 | 873.57 | 175.41 | 873.64 | 175.58 | 873.64 | 178.63 | 873.67 | 180.47 | 873.67 |
| 198.94 | 873.75 | 204.02 | 873.78 | 204.1 | 873.78 | 210.93 | 873.8 | 211.45 | 873.8 |
| 251.45 | 874.04 | 264.97 | 874.1 | 285.82 | 874.14 | 291.98 | 874.14 | 296.13 | 874.15 |
| 389.94 | 874.12 | 413.55 | 874.16 | 427.06 | 874.2 | 430.63 | 874.22 | 458.95 | 874.31 |
| 479.19 | 874.34 | 494.6 | 874.34 | 508.11 | 874.32 | 508.5 | 874.31 | 508.95 | 874.31 |
| 521.61 | 874.28 | 523.82 | 874.27 | 535.13 | 874.24 | 562.14 | 874.28 | 575.65 | 874.31 |
| 598.2 | 874.3 | 600.53 | 874.29 | 602.66 | 874.29 | 613.07 | 874.26 | 614.69 | 874.25 |
| 616.17 | 874.25 | 627.94 | 874.2 | 628.86 | 874.19 | 629.68 | 874.19 | 642.82 | 874.14 |
| 657.7 | 874.15 | 683.71 | 874.27 | 710.73 | 874.35 | 727.97 | 874.38 | 737.74 | 874.38 |
| 746.95 | 874.4 | 749.2 | 874.4 | 764.76 | 874.46 | 776.69 | 874.53 | 778.26 | 874.53 |
| 791.57 | 874.58 | 791.77 | 874.58 | 798.76 | 874.59 | 805.29 | 874.58 | 806.45 | 874.58 |
| 818.79 | 874.55 | 821.32 | 874.55 | 832.3 | 874.53 | 862.47 | 874.51 | 880.82 | 874.46 |
| 910.57 | 874.46 | 913.34 | 874.47 | 925.44 | 874.49 | 926.18 | 874.5 | 926.85 | 874.5 |
| 953.87 | 874.53 | 955.2 | 874.53 | 984.94 | 874.67 | 999.82 | 874.76 | 1011.13 | 874.8 |
| 1014.7 | 874.82 | 1018.21 | 874.82 | 1059.32 | 874.91 | 1061.93 | 874.91 | 1074.19 | 874.93 |
| 1075.45 | 874.93 | 1087.77 | 874.95 | 1089.07 | 874.95 | 1103.95 | 874.96 | 1115.97 | 874.94 |
| 1129.47 | 874.9 | 1133.69 | 874.88 | 1148.57 | 874.85 | 1166.88 | 874.85 | 1173.95 | 874.87 |
| 1183.5 | 874.92 | 1208.07 | 875.12 | 1216.43 | 875.15 | 1224.03 | 875.15 | 1237.54 | 875.11 |
| 1237.82 | 875.11 | 1251.05 | 875.08 | 1251.83 | 875.07 | 1282.44 | 875.06 | 1291.57 | 875.07 |
| 1297.32 | 875.09 | 1312.2 | 875.11 | 1315.55 | 875.12 | 1327.07 | 875.12 | 1329.7 | 875.11 |
| 1356.82 | 875.1 | 1371.69 | 875.15 | 1372.62 | 875.16 | 1386.13 | 875.23 | 1386.57 | 875.23 |
| 1399.63 | 875.27 | 1401.45 | 875.28 | 1416.32 | 875.28 | 1431.19 | 875.25 | 1440.16 | 875.2 |
| 1442.97 | 875.18 | 1453.66 | 875.08 | 1475.82 | 874.78 | 1478.36 | 874.75 | 1480.68 | 874.71 |
| 1485.44 | 874.66 | 1490.69 | 874.59 | 1494.19 | 874.56 | 1505.57 | 874.56 | 1507.7 | 874.58 |
| 1520.44 | 874.97 | 1521.21 | 874.99 | 1534.71 | 875.5 | 1542.08 | 875.62 | 1548.22 | 874.55 |
| 1549.15 | 874.39 | 1550.2 | 874.26 | 1561.73 | 872.41 | 1565.07 | 871.63 | 1575.23 | 870.41 |
| 1577.48 | 870.3 | 1588.74 | 869.71 | 1594.82 | 869.64 | 1602.25 | 869.53 | 1609.7 | 869.54 |
| 1615.76 | 869.6 | 1624.57 | 870.45 | 1629.27 | 870.89 | 1634.11 | 871.66 | 1639.44 | 872.62 |
| 1642.78 | 873.23 | 1654.32 | 874.54 | 1656.29 | 874.73 | 1662.43 | 875 | 1669.19 | 875.25 |
| 1669.79 | 875.27 | 1683.3 | 875.38 | 1686.6 | 875.38 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 175.41 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 5.06 | 180.47 | 402.96 | 400.18 | 400.15 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 1542.08 | 1686.6 | 875.62 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 875.03 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 874.92 | Reach Len. (ft) | 402.96 | 400.18 | 400.15 |
| Crit W.S. (ft) | 874.67 | Flow Area (sq ft) | | 275.11 | 542.96 |
| E.G. Slope (ft/ft) | 0.003412 | Area (sq ft) | | 275.11 | 937.36 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 905.26 | 934.74 |
| Top Width (ft) | 1223.42 | Top Width (ft) | | 101.32 | 1122.10 |
| Vel Total (ft/s) | 2.25 | Avg. Vel. (ft/s) | | 3.29 | 1.72 |
| Max Chl Dpth (ft) | 5.39 | Hydr. Depth (ft) | | 2.72 | 0.54 |
| Conv. Total (cfs) | 31498.3 | Conv. (cfs) | | 15496.9 | 16001.5 |
| Length Wtd. (ft) | 400.16 | Wetted Per. (ft) | | 101.73 | 1007.46 |
| Min Ch El (ft) | 870.90 | Shear (lb/sq ft) | | 0.58 | 0.11 |
| Alpha | 1.35 | Stream Power (lb/ft s) | | 1.90 | 0.20 |
| Frctn Loss (ft) | 1.26 | Cum Volume (acre-ft) | | 4.77 | 21.59 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 1.83 | 17.10 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 876.17 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 875.92 | Reach Len. (ft) | 402.96 | 400.18 | 400.15 |
| Crit W.S. (ft) | 874.43 | Flow Area (sq ft) | | 378.98 | 86.95 |
| E.G. Slope (ft/ft) | 0.003413 | Area (sq ft) | | 378.98 | 86.95 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1490.89 | 349.11 |
| Top Width (ft) | 146.70 | Top Width (ft) | | 106.56 | 40.14 |

| | | | | |
|---|---|---|---|---|
| Vel Total (ft/s) | 3.95 | Avg. Vel. (ft/s) | 3.93 | 4.02 |
| Max Chl Dpth (ft) | 6.39 | Hydr. Depth (ft) | 3.56 | 2.17 |
| Conv. Total (cfs) | 31495.7 | Conv. (cfs) | 25519.9 | 5975.8 |
| Length Wtd. (ft) | 400.17 | Wetted Per. (ft) | 107.07 | 42.21 |
| Min Ch El (ft) | 870.90 | Shear (lb/sq ft) | 0.75 | 0.44 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 2.97 | 1.76 |
| Frctn Loss (ft) | 1.26 | Cum Volume (acre-ft) | 6.66 | 1.97 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.95 | 0.80 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 875.68 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 875.42 | Reach Len. (ft) | 402.96 | 400.18 | 400.15 |
| Crit W.S. (ft) | 874.49 | Flow Area (sq ft) | | 326.22 | 130.62 |
| E.G. Slope (ft/ft) | 0.004455 | Area (sq ft) | | 326.22 | 130.62 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1350.24 | 489.76 |
| Top Width (ft) | 188.35 | Top Width (ft) | | 103.85 | 84.50 |
| Vel Total (ft/s) | 4.03 | Avg. Vel. (ft/s) | | 4.14 | 3.75 |
| Max Chl Dpth (ft) | 4.52 | Hydr. Depth (ft) | | 3.14 | 1.55 |
| Conv. Total (cfs) | 27566.6 | Conv. (cfs) | | 20229.0 | 7337.5 |
| Length Wtd. (ft) | 400.17 | Wetted Per. (ft) | | 104.31 | 85.82 |
| Min Ch El (ft) | 870.90 | Shear (lb/sq ft) | | 0.87 | 0.42 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 3.60 | 1.59 |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | | 6.01 | 3.75 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 1.91 | 1.84 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .266

INPUT
Description: Thalweg Sta. 112.24
Station Elevation Data num= 154

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 882.29 | .21 | 882.32 | 1.02 | 882.46 | 5.19 | 882.42 | 5.6 | 882.42 |
| 11.13 | 882.36 | 12.09 | 882.24 | 21.24 | 881.25 | 23.98 | 880.8 | 31.35 | 879.6 |
| 41.46 | 877.81 | 47.74 | 877.49 | 51.57 | 877.24 | 61.68 | 876.35 | 71.5 | 875.15 |
| 71.8 | 875.12 | 73.42 | 874.9 | 81.91 | 873.78 | 83.39 | 873.59 | 92.02 | 872.44 |
| 95.27 | 872.04 | 102.13 | 871.17 | 107.15 | 870.77 | 112.24 | 870.32 | 119.03 | 870.2 |
| 122.35 | 870.13 | 130.91 | 870.16 | 132.46 | 870.17 | 141.24 | 870.4 | 142.57 | 870.43 |
| 142.8 | 870.45 | 162.79 | 871.75 | 172.9 | 872.08 | 173.89 | 872.09 | 178.44 | 872.12 |
| 181.86 | 872.15 | 184.27 | 872.15 | 185.5 | 872.15 | 197.26 | 872.1 | 211.08 | 872.01 |
| 224.9 | 871.96 | 231.13 | 871.98 | 238.72 | 871.99 | 249.16 | 872.04 | 252.54 | 872.05 |
| 294.01 | 872.28 | 318.06 | 872.41 | 321.65 | 872.42 | 332.54 | 872.47 | 334.03 | 872.48 |
| 335.47 | 872.48 | 347.03 | 872.51 | 349.29 | 872.51 | 361.51 | 872.54 | 363.11 | 872.55 |
| 376 | 872.58 | 376.48 | 872.59 | 376.93 | 872.59 | 390.48 | 872.63 | 390.75 | 872.63 |
| 404.57 | 872.7 | 404.98 | 872.7 | 418.39 | 872.79 | 419.46 | 872.8 | 432.21 | 872.86 |
| 433.06 | 872.87 | 448.43 | 872.88 | 459.86 | 872.86 | 487.5 | 872.87 | 501.32 | 872.9 |
| 506.38 | 872.92 | 560.37 | 873.02 | 564.32 | 873.02 | 567.44 | 873.03 | 570.43 | 873.03 |
| 611.89 | 873.15 | 639.53 | 873.16 | 651.24 | 873.13 | 665.73 | 873.06 | 667.17 | 873.06 |
| 680.22 | 873.01 | 680.99 | 873 | 694.81 | 873 | 708.64 | 873.04 | 709.19 | 873.04 |
| 722.46 | 873.12 | 723.68 | 873.12 | 736.28 | 873.21 | 738.16 | 873.22 | 750.1 | 873.3 |
| 751.35 | 873.31 | 752.65 | 873.31 | 763.92 | 873.37 | 777.75 | 873.41 | 791.57 | 873.42 |
| 796.11 | 873.43 | 810.6 | 873.43 | 825.09 | 873.4 | 833.03 | 873.4 | 836.23 | 873.39 |
| 854.06 | 873.38 | 857.44 | 873.37 | 883.03 | 873.38 | 906.95 | 873.42 | 912.01 | 873.42 |
| 914.02 | 873.43 | 926.49 | 873.43 | 929.77 | 873.44 | 985.06 | 873.43 | 998.88 | 873.46 |
| 1012.7 | 873.59 | 1013.41 | 873.59 | 1026.53 | 873.89 | 1027.9 | 873.91 | 1040.35 | 874.34 |
| 1041.34 | 874.34 | 1042.38 | 874.39 | 1048.42 | 873.97 | 1056.87 | 870.72 | 1067.99 | 868.11 |
| 1076.71 | 867.61 | 1081.81 | 867.35 | 1083.77 | 867.72 | 1085.85 | 867.07 | 1100.33 | 866.3 |
| 1109.45 | 866.03 | 1114.82 | 865.8 | 1123.27 | 865.7 | 1126.22 | 865.67 | 1129.3 | 865.67 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1133.29 | 865.78 | 1143.79 | 866.42 | 1150.91 | 868.35 | 1158.28 | 870.38 | 1161.58 | 870.94 |
| 1172.77 | 872.43 | 1178.55 | 872.72 | 1187.25 | 873.05 | 1192.37 | 873.06 | 1206.2 | 873.16 |
| 1216.22 | 873.34 | 1220.02 | 873.4 | 1230.71 | 873.66 | 1245.19 | 873.97 | 1247.66 | 874.03 |
| 1259.69 | 874.29 | 1261.48 | 874.35 | 1267.67 | 874.57 | 1274.17 | 874.76 | 1274.75 | 874.78 |
| 1275.3 | 874.79 | 1288.66 | 875.2 | 1289.13 | 875.2 | 1297.7 | 875.3 | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 173.89 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 5.19 | 184.27 | 404.62 | 400.51 | 397.22 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 1042.38 | 1297.7 | 874.39 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 873.76 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 873.68 | Reach Len. (ft) | 404.62 | 400.51 | 397.22 |
| Crit W.S. (ft) | 873.14 | Flow Area (sq ft) | | 246.79 | 607.44 |
| E.G. Slope (ft/ft) | 0.002925 | Area (sq ft) | | 246.79 | 1352.10 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 710.17 | 1129.83 |
| Top Width (ft) | 1117.04 | Top Width (ft) | | 101.57 | 1015.47 |
| Vel Total (ft/s) | 2.15 | Avg. Vel. (ft/s) | | 2.88 | 1.86 |
| Max Chl Dpth (ft) | 8.01 | Hydr. Depth (ft) | | 2.43 | 0.73 |
| Conv. Total (cfs) | 34024.2 | Conv. (cfs) | | 13132.0 | 20892.2 |
| Length Wtd. (ft) | 398.74 | Wetted Per. (ft) | | 101.83 | 833.04 |
| Min Ch El (ft) | 870.13 | Shear (lb/sq ft) | | 0.44 | 0.13 |
| Alpha | 1.15 | Stream Power (lb/ft s) | | 1.27 | 0.25 |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | | 2.37 | 11.08 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 0.90 | 7.29 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 874.90 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.050 | 0.035 |
| W.S. Elev (ft) | 874.68 | Reach Len. (ft) | 404.62 | 400.51 | 397.22 |
| Crit W.S. (ft) | 873.14 | Flow Area (sq ft) | | 352.45 | 144.54 |
| E.G. Slope (ft/ft) | 0.002917 | Area (sq ft) | | 352.45 | 144.54 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1225.85 | 614.15 |
| Top Width (ft) | 163.81 | Top Width (ft) | | 109.19 | 54.61 |
| Vel Total (ft/s) | 3.70 | Avg. Vel. (ft/s) | | 3.48 | 4.25 |
| Max Chl Dpth (ft) | 9.01 | Hydr. Depth (ft) | | 3.23 | 2.65 |
| Conv. Total (cfs) | 34068.7 | Conv. (cfs) | | 22697.4 | 11371.3 |
| Length Wtd. (ft) | 399.75 | Wetted Per. (ft) | | 109.51 | 57.30 |
| Min Ch El (ft) | 870.13 | Shear (lb/sq ft) | | 0.59 | 0.46 |
| Alpha | 1.03 | Stream Power (lb/ft s) | | 2.04 | 1.95 |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | | 3.30 | 0.91 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 0.96 | 0.37 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 874.48 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 874.34 | Reach Len. (ft) | 404.62 | 400.51 | 397.22 |
| Crit W.S. (ft) | 873.01 | Flow Area (sq ft) | | 315.56 | 302.59 |
| E.G. Slope (ft/ft) | 0.002042 | Area (sq ft) | | 315.56 | 302.59 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 866.26 | 973.74 |
| Top Width (ft) | 243.98 | Top Width (ft) | | 106.60 | 137.38 |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.75 | 3.22 |
| Max Chl Dpth (ft) | 4.21 | Hydr. Depth (ft) | | 2.96 | 2.20 |
| Conv. Total (cfs) | 40716.3 | Conv. (cfs) | | 19169.0 | 21547.2 |

| | | | | |
|---|---|---|---|---|
| Length Wtd. (ft) | 399.34 | Wetted Per. (ft) | 106.90 | 139.30 |
| Min Ch El (ft) | 870.13 | Shear (lb/sq ft) | 0.38 | 0.28 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 1.03 | 0.89 |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | 3.06 | 1.76 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.94 | 0.82 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E
REACH: Reach 1 RS: .190

INPUT
Description: Thalweg Sta. 136.21
Station Elevation Data num= 133

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 884.09 | 3.3 | 884.45 | 6.51 | 884.32 | 9.89 | 884.19 | 13.38 | 884.15 |
| 21.38 | 883.71 | 23.45 | 883.6 | 32.86 | 883.03 | 33.53 | 883 | 43.6 | 882.13 |
| 52 | 881.37 | 53.68 | 881.21 | 55.82 | 880.97 | 63.75 | 880.1 | 67.31 | 879.7 |
| 73.83 | 878.93 | 78.8 | 878.36 | 83.9 | 877.75 | 93.98 | 876.22 | 96.86 | 875.61 |
| 104.05 | 874.01 | 113.25 | 871.8 | 114.13 | 871.59 | 120.39 | 870.26 | 124.2 | 869.44 |
| 124.74 | 869.39 | 134.28 | 868.18 | 136.21 | 868.11 | 144.35 | 867.74 | 150.7 | 867.81 |
| 154.43 | 867.91 | 159.68 | 868.21 | 164.5 | 868.53 | 168.65 | 868.9 | 174.58 | 869.47 |
| 182.16 | 870.12 | 184.65 | 870.34 | 193.64 | 870.74 | 194.73 | 870.8 | 195.57 | 870.82 |
| 200.34 | 870.9 | 202.51 | 870.93 | 204.55 | 870.97 | 205.13 | 870.97 | 206.04 | 870.98 |
| 214.88 | 871.06 | 216.6 | 871.07 | 224.95 | 871.13 | 228.09 | 871.14 | 230.66 | 871.16 |
| 241.74 | 871.2 | 248.46 | 871.21 | 259.91 | 871.2 | 260.88 | 871.19 | 273.29 | 871.16 |
| 309.21 | 871.02 | 310.55 | 871.01 | 314.27 | 871.02 | 322.96 | 871.02 | 324.28 | 871.03 |
| 326.07 | 871.03 | 342.95 | 871.11 | 345.74 | 871.13 | 347.8 | 871.14 | 359.81 | 871.22 |
| 360.22 | 871.23 | 361.34 | 871.23 | 376.68 | 871.31 | 409.89 | 871.39 | 410.41 | 871.39 |
| 422.3 | 871.42 | 424.42 | 871.43 | 427.29 | 871.43 | 444.15 | 871.46 | 455.46 | 871.43 |
| 459.56 | 871.43 | 460.18 | 871.42 | 461.02 | 871.42 | 477.89 | 871.39 | 484.39 | 871.4 |
| 494.75 | 871.39 | 495.94 | 871.4 | 496.81 | 871.4 | 509.22 | 871.38 | 511.63 | 871.37 |
| 521.65 | 871.42 | 524.55 | 871.43 | 528.49 | 871.46 | 534.06 | 871.57 | 545.36 | 871.83 |
| 546.48 | 871.86 | 549.6 | 871.97 | 558.9 | 872.27 | 560.3 | 872.32 | 562.23 | 872.38 |
| 571.31 | 872.02 | 579.09 | 871.79 | 583.73 | 871.25 | 595.97 | 869.73 | 596.15 | 869.71 |
| 603.22 | 868.7 | 608.57 | 867.91 | 612.83 | 867.29 | 620.98 | 866.52 | 629.7 | 865.65 |
| 631.83 | 865.59 | 633.4 | 865.54 | 645.82 | 865.18 | 646.57 | 865.16 | 660.44 | 865.23 |
| 663.43 | 865.26 | 670.66 | 865.43 | 680.31 | 865.71 | 683.07 | 865.93 | 690.78 | 866.63 |
| 695.49 | 867.03 | 697.17 | 867.21 | 703.35 | 868.25 | 707.91 | 869.18 | 714.04 | 870.29 |
| 720.32 | 870.65 | 730.91 | 871.2 | 732.74 | 871.24 | 745.16 | 871.5 | 747.78 | 871.55 |
| 757.58 | 871.72 | 769.99 | 871.91 | 782.41 | 872.05 | 784.91 | 872.09 | 796.33 | 872.24 |
| 798.38 | 872.29 | 803.48 | 872.37 | 814.37 | 872.67 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 200.34 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 6.51 | 206.04 | 0 | 0 | 0 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 562.23 | 814.37 | 872.38 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 872.40 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.052 | 0.035 |
| W.S. Elev (ft) | 872.24 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 871.80 | Flow Area (sq ft) | | 269.24 | 329.35 |
| E.G. Slope (ft/ft) | 0.004007 | Area (sq ft) | | 269.24 | 1077.41 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 993.09 | 846.91 |
| Top Width (ft) | 676.93 | Top Width (ft) | | 94.62 | 582.31 |
| Vel Total (ft/s) | 3.07 | Avg. Vel. (ft/s) | | 3.69 | 2.57 |
| Max Chl Dpth (ft) | 7.08 | Hydr. Depth (ft) | | 2.85 | 0.94 |
| Conv. Total (cfs) | 29066.0 | Conv. (cfs) | | 15687.6 | 13378.4 |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 95.12 | 351.90 |
| Min Ch El (ft) | 867.74 | Shear (lb/sq ft) | | 0.71 | 0.23 |
| Alpha | 1.10 | Stream Power (lb/ft s) | | 2.61 | 0.60 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |

C & E Loss (ft) Cum SA (acres)

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 873.54 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 873.24 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 871.70 | Flow Area (sq ft) | | 366.13 | 54.98 |
| E.G. Slope (ft/ft) | 0.004000 | Area (sq ft) | | 366.13 | 54.98 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1605.96 | 234.04 |
| Top Width (ft) | 124.25 | Top Width (ft) | | 98.79 | 25.46 |
| Vel Total (ft/s) | 4.37 | Avg. Vel. (ft/s) | | 4.39 | 4.26 |
| Max Chl Dpth (ft) | 8.08 | Hydr. Depth (ft) | | 3.71 | 2.16 |
| Conv. Total (cfs) | 29092.4 | Conv. (cfs) | | 25392.0 | 3700.4 |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 99.41 | 27.54 |
| Min Ch El (ft) | 867.74 | Shear (lb/sq ft) | | 0.92 | 0.50 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.03 | 2.12 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 873.36 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.051 | 0.035 |
| W.S. Elev (ft) | 873.08 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 871.75 | Flow Area (sq ft) | | 350.49 | 83.00 |
| E.G. Slope (ft/ft) | 0.004005 | Area (sq ft) | | 350.49 | 83.00 |
| Q Total (cfs) | 1840.00 | Flow (cfs) | | 1501.04 | 338.96 |
| Top Width (ft) | 140.55 | Top Width (ft) | | 98.13 | 42.42 |
| Vel Total (ft/s) | 4.24 | Avg. Vel. (ft/s) | | 4.28 | 4.08 |
| Max Chl Dpth (ft) | 5.34 | Hydr. Depth (ft) | | 3.57 | 1.96 |
| Conv. Total (cfs) | 29075.1 | Conv. (cfs) | | 23718.9 | 5356.2 |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 98.73 | 44.29 |
| Min Ch El (ft) | 867.74 | Shear (lb/sq ft) | | 0.89 | 0.47 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.80 | 1.91 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.927

INPUT
Description: Thalweg Sta. 329.09 - Discharge from A2-100y6hr.out HEC-1 model -
Sta. El - 772 CFS
Station Elevation Data num= 147

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1043.99 | 5.4 | 1043.92 | 8.9 | 1043.89 | 38.91 | 1043.49 | 68.93 | 1042.94 |
| 73.12 | 1042.85 | 78.94 | 1042.74 | 82.8 | 1042.62 | 88.94 | 1042.48 | 92.47 | 1042.33 |
| 98.95 | 1042.12 | 102.15 | 1041.95 | 108.95 | 1041.71 | 111.83 | 1041.57 | 118.96 | 1041.35 |
| 121.49 | 1041.24 | 128.97 | 1041.02 | 131.17 | 1040.92 | 138.97 | 1040.55 | 140.84 | 1040.45 |
| 148.98 | 1039.97 | 150.52 | 1039.91 | 158.98 | 1039.46 | 160.19 | 1039.43 | 168.99 | 1039.23 |
| 169.87 | 1039.22 | 179 | 1039.21 | 179.55 | 1039.21 | 189 | 1039.17 | 189.21 | 1039.17 |
| 195.44 | 1039.09 | 199.01 | 1039.06 | 208.56 | 1038.88 | 209.01 | 1038.87 | 219.02 | 1038.61 |
| 219.86 | 1038.58 | 229.02 | 1038.32 | 237.59 | 1038.05 | 239.03 | 1037.97 | 247.26 | 1037.81 |
| 247.9 | 1037.77 | 249.04 | 1037.71 | 250.35 | 1037.67 | 256.93 | 1037.5 | 259.04 | 1037.39 |
| 261.3 | 1037.31 | 269.05 | 1037.11 | 276.28 | 1036.98 | 279.05 | 1036.9 | 285.96 | 1036.77 |
| 289.06 | 1036.69 | 305.3 | 1036.42 | 309.07 | 1036.38 | 313.1 | 1036.32 | 319.08 | 1036.21 |
| 329.08 | 1036.05 | 339.09 | 1035.97 | 349.1 | 1036.16 | 359.1 | 1036.47 | 363.34 | 1036.59 |
| 369.11 | 1036.77 | 373.02 | 1036.86 | 379.11 | 1037.04 | 386.99 | 1037.24 | 389.12 | 1037.3 |
| 392.37 | 1037.43 | 399.13 | 1037.58 | 402.05 | 1037.62 | 409.08 | 1037.67 | 409.13 | 1037.67 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 411.72 | 1037.66 | 419.14 | 1037.66 | 421.4 | 1037.64 | 429.14 | 1037.64 | 439.15 | 1037.69 |
| 440.74 | 1037.75 | 449.15 | 1038.05 | 450.41 | 1038.17 | 459.16 | 1038.99 | 460.09 | 1039.1 |
| 469.17 | 1040.13 | 469.77 | 1040.19 | 479.17 | 1040.99 | 479.44 | 1041 | 487.19 | 1041.27 |
| 489.11 | 1041.34 | 489.25 | 1041.34 | 499.18 | 1041.41 | 508.46 | 1041.44 | 509.19 | 1041.44 |
| 519.2 | 1041.54 | 520.34 | 1041.55 | 529.2 | 1041.66 | 530.69 | 1041.66 | 539.21 | 1041.71 |
| 549.21 | 1041.56 | 556.83 | 1041.33 | 559.22 | 1041.25 | 566.5 | 1040.97 | 569.23 | 1040.83 |
| 572.14 | 1040.57 | 579.23 | 1040.11 | 585.85 | 1039.53 | 589.24 | 1039.22 | 595.53 | 1038.76 |
| 599.24 | 1038.57 | 603.22 | 1038.5 | 609.25 | 1038.26 | 613.58 | 1038.28 | 619.25 | 1038.17 |
| 624.55 | 1038.32 | 629.26 | 1038.6 | 634.22 | 1038.79 | 639.27 | 1039.06 | 643.9 | 1039.22 |
| 649.27 | 1039.54 | 655.03 | 1039.86 | 659.28 | 1040.03 | 663.25 | 1040.15 | 669.28 | 1040.4 |
| 672.92 | 1040.46 | 679.29 | 1040.58 | 686.11 | 1040.68 | 689.3 | 1040.71 | 696.47 | 1040.94 |
| 699.3 | 1041 | 701.94 | 1041.16 | 709.31 | 1041.59 | 711.62 | 1041.78 | 719.31 | 1042.18 |
| 721.29 | 1042.31 | 729.32 | 1042.62 | 737.91 | 1042.84 | 739.33 | 1042.89 | 740.64 | 1042.91 |
| 749.33 | 1043.03 | 750.31 | 1043.03 | 769 | 1043.25 | 769.34 | 1043.26 | 778.93 | 1043.38 |
| 779.34 | 1043.39 | 789.72 | 1043.4 | 799.36 | 1043.46 | 808.36 | 1043.66 | 809.37 | 1043.66 |
| 818.03 | 1043.93 | 818.15 | 1043.93 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 247.9 | .052 | 386.99 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 250.35 | 409.08 | 195.31 | 200 | 205.38 | .1 | .3 |

Right Levee Station= 539.21 Elevation= 1041.71

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1038.34 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.037 | 0.051 | 0.032 |
| W.S. Elev (ft) | 1038.19 | Reach Len. (ft) | 195.31 | 200.00 | 205.38 |
| Crit W.S. (ft) | 1037.67 | Flow Area (sq ft) | 4.37 | 226.28 | 19.12 |
| E.G. Slope (ft/ft) | 0.007018 | Area (sq ft) | 4.37 | 226.28 | 19.12 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 6.24 | 721.39 | 44.37 |
| Top Width (ft) | 217.25 | Top Width (ft) | 17.04 | 158.73 | 41.49 |
| Vel Total (ft/s) | 3.09 | Avg. Vel. (ft/s) | 1.43 | 3.19 | 2.32 |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | 0.26 | 1.43 | 0.46 |
| Conv. Total (cfs) | 9215.1 | Conv. (cfs) | 74.5 | 8611.0 | 529.6 |
| Length Wtd. (ft) | 200.76 | Wetted Per. (ft) | 17.04 | 158.77 | 41.50 |
| Min Ch El (ft) | 1035.97 | Shear (lb/sq ft) | 0.11 | 0.62 | 0.20 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.16 | 1.99 | 0.47 |
| Frctn Loss (ft) | 1.54 | Cum Volume (acre-ft) | 1.23 | 55.42 | 1.45 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.14 | 40.62 | 2.53 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1038.52 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 1038.38 | Reach Len. (ft) | 195.31 | 200.00 | 205.38 |
| Crit W.S. (ft) | 1037.66 | Flow Area (sq ft) | | 257.17 | |
| E.G. Slope (ft/ft) | 0.005302 | Area (sq ft) | | 257.17 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 158.73 | Top Width (ft) | | 158.73 | |
| Vel Total (ft/s) | 3.00 | Avg. Vel. (ft/s) | | 3.00 | |
| Max Chl Dpth (ft) | 2.41 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 10602.5 | Conv. (cfs) | | 10602.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 160.19 | |
| Min Ch El (ft) | 1035.97 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.60 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | | 56.55 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 40.67 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1038.52 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.051 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 1038.38 | Reach Len. (ft) | 195.31 | 200.00 | 205.38 |
| Crit W.S. (ft) | 1037.66 | Flow Area (sq ft) | | 257.17 | |
| E.G. Slope (ft/ft) | 0.005302 | Area (sq ft) | | 257.17 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 158.73 | Top Width (ft) | | 158.73 | |
| Vel Total (ft/s) | 3.00 | Avg. Vel. (ft/s) | | 3.00 | |
| Max Chl Dpth (ft) | 2.41 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 10602.5 | Conv. (cfs) | | 10602.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 160.19 | |
| Min Ch El (ft) | 1035.97 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.60 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | 0.05 | 56.50 | 0.12 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.22 | 40.67 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.889

INPUT
Description: Thalweg Sta. 593.28
Station Elevation Data num= 182

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1044.02 | .52 | 1044.02 | .77 | 1044.01 | 9.96 | 1043.97 | 10.84 | 1043.97 |
| 37.56 | 1043.83 | 40.96 | 1043.82 | 61.05 | 1043.73 | 65.14 | 1043.7 | 71.09 | 1043.68 |
| 78.24 | 1043.64 | 81.13 | 1043.61 | 91.17 | 1043.53 | 92.73 | 1043.52 | 101.22 | 1043.44 |
| 101.93 | 1043.44 | 109.7 | 1043.37 | 111.13 | 1043.35 | 111.26 | 1043.35 | 120.33 | 1043.27 |
| 121.3 | 1043.26 | 129.52 | 1043.2 | 131.34 | 1043.18 | 151.43 | 1043.06 | 157.11 | 1043.01 |
| 161.47 | 1042.98 | 175.5 | 1042.83 | 181.55 | 1042.75 | 184.7 | 1042.73 | 191.6 | 1042.66 |
| 201.64 | 1042.61 | 203.09 | 1042.61 | 211.68 | 1042.59 | 212.28 | 1042.6 | 221.72 | 1042.63 |
| 222.01 | 1042.63 | 231.76 | 1042.68 | 239.88 | 1042.7 | 241.81 | 1042.71 | 249.08 | 1042.71 |
| 251.85 | 1042.72 | 261.89 | 1042.72 | 276.66 | 1042.75 | 281.98 | 1042.77 | 299.43 | 1042.79 |
| 302.06 | 1042.78 | 328.08 | 1042.76 | 331.85 | 1042.75 | 332.19 | 1042.75 | 350.23 | 1042.72 |
| 352.27 | 1042.72 | 359.43 | 1042.68 | 362.31 | 1042.67 | 396.22 | 1042.31 | 402.48 | 1042.23 |
| 412.52 | 1042.06 | 421.08 | 1041.86 | 422.57 | 1041.83 | 432.14 | 1041.58 | 432.61 | 1041.57 |
| 442.2 | 1041.32 | 442.65 | 1041.31 | 451.4 | 1041.08 | 452.69 | 1041.05 | 501.77 | 1039.72 |
| 502.9 | 1039.69 | 506.57 | 1039.56 | 511.37 | 1039.41 | 512.95 | 1039.36 | 515.77 | 1039.22 |
| 522.99 | 1038.91 | 524.97 | 1038.77 | 533.03 | 1038.25 | 542.73 | 1037.09 | 543.07 | 1037.05 |
| 546.46 | 1036.59 | 552.55 | 1035.74 | 553.11 | 1035.67 | 561.75 | 1035.06 | 563.16 | 1034.97 |
| 570.95 | 1034.84 | 573.2 | 1034.82 | 580.14 | 1034.77 | 583.24 | 1034.76 | 593.28 | 1034.7 |
| 613.37 | 1034.64 | 616.93 | 1034.65 | 623.41 | 1034.71 | 626.12 | 1034.81 | 633.45 | 1035.14 |
| 638.62 | 1035.28 | 642.26 | 1035.38 | 643.49 | 1035.43 | 644.62 | 1035.43 | 653.33 | 1035.46 |
| 653.72 | 1035.46 | 662.91 | 1035.5 | 663.58 | 1035.5 | 672.11 | 1035.57 | 673.62 | 1035.58 |
| 681.3 | 1035.7 | 683.66 | 1035.74 | 690.5 | 1036.03 | 693.71 | 1036.16 | 699.7 | 1036.58 |
| 703.75 | 1036.88 | 708.62 | 1037.26 | 713.79 | 1037.63 | 723.83 | 1038.12 | 727.29 | 1038.24 |
| 733.88 | 1038.49 | 736.49 | 1038.58 | 743.92 | 1038.85 | 745.67 | 1038.9 | 754.87 | 1039.21 |
| 764 | 1039.49 | 764.07 | 1039.49 | 764.82 | 1039.51 | 784.09 | 1040.09 | 791.66 | 1040.33 |
| 794.13 | 1040.4 | 800.86 | 1040.62 | 804.17 | 1040.71 | 814.21 | 1040.93 | 819.25 | 1041.01 |
| 824.26 | 1041.1 | 834.3 | 1041.25 | 837.64 | 1041.31 | 854.38 | 1041.59 | 856.04 | 1041.63 |
| 864.42 | 1041.81 | 874.01 | 1042.05 | 874.43 | 1042.06 | 883.62 | 1042.29 | 884.51 | 1042.31 |
| 892.82 | 1042.52 | 904.59 | 1042.79 | 914.63 | 1042.94 | 920.41 | 1042.97 | 924.68 | 1043 |
| 948 | 1043.05 | 954.8 | 1043.04 | 957.19 | 1043.04 | 964.85 | 1043 | 974.04 | 1042.92 |
| 975.59 | 1042.92 | 983.2 | 1042.86 | 984.79 | 1042.85 | 984.93 | 1042.85 | 993.98 | 1042.77 |
| 994.97 | 1042.77 | 1005.01 | 1042.66 | 1012.38 | 1042.55 | 1025.1 | 1042.26 | 1039.96 | 1041.87 |
| 1045.18 | 1041.69 | 1049.16 | 1041.58 | 1055.23 | 1041.31 | 1058.36 | 1041.2 | 1065.27 | 1040.88 |
| 1067.55 | 1040.79 | 1075.31 | 1040.47 | 1076.75 | 1040.39 | 1085.35 | 1040.62 | 1085.94 | 1040.64 |
| 1095.14 | 1041.18 | 1095.4 | 1041.19 | 1104.34 | 1041.64 | 1115.48 | 1042.05 | 1117.82 | 1042.14 |
| 1125.52 | 1042.41 | 1128.88 | 1042.51 | 1135.56 | 1042.75 | 1145.61 | 1043.01 | 1155.65 | 1043.18 |
| 1173.11 | 1043.43 | 1175.73 | 1043.46 | 1184.18 | 1043.61 | 1185.78 | 1043.63 | 1187.11 | 1043.66 |
| 1195.82 | 1043.83 | 1200.41 | 1043.93 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 511.37 | .052 | 638.62 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 553.11 | 644.62 | 183.96 | 200.01 | 211.62 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1036.79 | Element | Left OB | Channel | Right OB |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.052 | 0.051 | 0.032 |
| W.S. Elev (ft) | 1036.56 | Reach Len. (ft) | 183.96 | 200.01 | 211.62 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2.91 | 153.48 | 47.54 |
| E.G. Slope (ft/ft) | 0.008428 | Area (sq ft) | 2.91 | 153.48 | 47.54 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 4.47 | 583.39 | 184.14 |
| Top Width (ft) | 152.83 | Top Width (ft) | 6.47 | 91.51 | 54.86 |
| Vel Total (ft/s) | 3.79 | Avg. Vel. (ft/s) | 1.53 | 3.80 | 3.87 |
| Max Chl Dpth (ft) | 1.92 | Hydr. Depth (ft) | 0.45 | 1.68 | 0.87 |
| Conv. Total (cfs) | 8409.1 | Conv. (cfs) | 48.7 | 6354.6 | 2005.8 |
| Length Wtd. (ft) | 202.23 | Wetted Per. (ft) | 6.53 | 91.55 | 54.88 |
| Min Ch El (ft) | 1034.64 | Shear (lb/sq ft) | 0.23 | 0.88 | 0.46 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.36 | 3.35 | 1.77 |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 1.21 | 54.55 | 1.29 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.09 | 40.05 | 2.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1037.14 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 1036.85 | Reach Len. (ft) | 183.96 | 200.01 | 211.62 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 179.82 | |
| E.G. Slope (ft/ft) | 0.008986 | Area (sq ft) | | 179.82 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 91.51 | Top Width (ft) | | 91.51 | |
| Vel Total (ft/s) | 4.29 | Avg. Vel. (ft/s) | | 4.29 | |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | | 1.97 | |
| Conv. Total (cfs) | 8143.9 | Conv. (cfs) | | 8143.9 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 94.15 | |
| Min Ch El (ft) | 1034.64 | Shear (lb/sq ft) | | 1.07 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.60 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | | 55.55 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 40.10 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1037.14 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 1036.85 | Reach Len. (ft) | 183.96 | 200.01 | 211.62 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 179.82 | |
| E.G. Slope (ft/ft) | 0.008986 | Area (sq ft) | | 179.82 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 91.51 | Top Width (ft) | | 91.51 | |
| Vel Total (ft/s) | 4.29 | Avg. Vel. (ft/s) | | 4.29 | |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | | 1.97 | |
| Conv. Total (cfs) | 8143.9 | Conv. (cfs) | | 8143.9 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 94.15 | |
| Min Ch El (ft) | 1034.64 | Shear (lb/sq ft) | | 1.07 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.60 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 0.05 | 55.50 | 0.12 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.22 | 40.09 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.851

INPUT
Description: Thalweg Sta. 422.54
Station Elevation Data num= 190

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1042.04 | 8.44 | 1041.9 | 26.45 | 1041.55 | 28.9 | 1041.51 | 29.83 | 1041.49 |
| 36.66 | 1041.36 | 40.52 | 1041.28 | 44.41 | 1041.21 | 51.21 | 1041.06 | 52.16 | 1041.05 |
| 54.68 | 1041.01 | 59.92 | 1040.94 | 61.9 | 1040.9 | 67.68 | 1040.87 | 72.6 | 1040.82 |
| 75.43 | 1040.8 | 82.91 | 1040.77 | 83.29 | 1040.77 | 90.94 | 1040.75 | 98.7 | 1040.75 |
| 104.68 | 1040.78 | 106.45 | 1040.78 | 111.14 | 1040.8 | 115.37 | 1040.83 | 126.07 | 1040.84 |
| 158.14 | 1040.8 | 167.6 | 1040.77 | 168.84 | 1040.77 | 190.23 | 1040.67 | 191.76 | 1040.66 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 199.52 | 1040.62 | 200.92 | 1040.61 | 207.28 | 1040.55 | 211.61 | 1040.53 | 221.24 | 1040.4 |
| 222.31 | 1040.38 | 222.79 | 1040.37 | 224.07 | 1040.35 | 230.54 | 1040.22 | 233 | 1040.18 |
| 238.3 | 1040.06 | 243.69 | 1039.96 | 252.3 | 1039.78 | 254.38 | 1039.73 | 255.66 | 1039.71 |
| 265.08 | 1039.51 | 269.32 | 1039.41 | 280.53 | 1039.18 | 284.83 | 1039.08 | 286.47 | 1039.05 |
| 297.16 | 1038.76 | 300.34 | 1038.66 | 307.85 | 1038.48 | 308.1 | 1038.47 | 308.76 | 1038.45 |
| 315.86 | 1038.22 | 316.77 | 1038.2 | 317.08 | 1038.19 | 318.5 | 1038.15 | 323.99 | 1037.89 |
| 328.83 | 1037.73 | 332.17 | 1037.48 | 339.17 | 1037.1 | 340.37 | 1036.99 | 344.96 | 1036.65 |
| 348.57 | 1036.35 | 349.5 | 1036.28 | 351.12 | 1036.14 | 356.23 | 1035.68 | 359.84 | 1035.35 |
| 370.18 | 1034.51 | 379.11 | 1033.97 | 380.51 | 1033.9 | 384.48 | 1033.79 | 389.53 | 1033.63 |
| 390.85 | 1033.59 | 397.72 | 1033.47 | 411.52 | 1033.27 | 421.1 | 1033.18 | 424.01 | 1033.18 |
| 432.2 | 1033.23 | 442.53 | 1033.42 | 446.88 | 1033.51 | 452.87 | 1033.62 | 455.08 | 1033.67 |
| 463.2 | 1033.83 | 463.53 | 1033.83 | 476.75 | 1034.09 | 477.09 | 1034.1 | 487.86 | 1034.31 |
| 494.21 | 1034.4 | 496.04 | 1034.44 | 503.06 | 1034.48 | 504.24 | 1034.49 | 504.49 | 1034.5 |
| 525.22 | 1034.46 | 528.82 | 1034.47 | 535.56 | 1034.44 | 537.02 | 1034.44 | 542.59 | 1034.46 |
| 545.21 | 1034.48 | 545.89 | 1034.51 | 553.4 | 1034.72 | 556.23 | 1034.91 | 561.6 | 1035.18 |
| 566.57 | 1035.57 | 569.79 | 1035.75 | 576.9 | 1036.28 | 577.98 | 1036.32 | 582.11 | 1036.54 |
| 587.24 | 1036.8 | 589.06 | 1036.87 | 597.58 | 1037.18 | 607.91 | 1037.6 | 617.05 | 1038.08 |
| 618.25 | 1038.15 | 621.64 | 1038.3 | 627.15 | 1038.49 | 628.58 | 1038.53 | 635.34 | 1038.61 |
| 638.92 | 1038.68 | 643.53 | 1038.74 | 649.26 | 1038.87 | 651.73 | 1039 | 659.6 | 1039.29 |
| 659.92 | 1039.31 | 661.16 | 1039.36 | 668.11 | 1039.62 | 669.93 | 1039.66 | 676.31 | 1039.85 |
| 684.5 | 1040.04 | 692.69 | 1040.2 | 700.69 | 1040.32 | 700.94 | 1040.32 | 717.27 | 1040.55 |
| 721.61 | 1040.6 | 725.47 | 1040.67 | 740.22 | 1040.91 | 741.85 | 1040.94 | 742.29 | 1040.95 |
| 752.62 | 1041.11 | 757.01 | 1041.17 | 762.96 | 1041.27 | 771.01 | 1041.39 | 773.29 | 1041.43 |
| 774.63 | 1041.45 | 783.63 | 1041.56 | 793.97 | 1041.6 | 831.98 | 1041.6 | 840.18 | 1041.63 |
| 845.65 | 1041.66 | 848.38 | 1041.67 | 855.98 | 1041.72 | 856.56 | 1041.72 | 858.79 | 1041.74 |
| 864.76 | 1041.76 | 896.98 | 1041.98 | 897.54 | 1041.98 | 898.32 | 1041.99 | 905.73 | 1042.04 |
| 918 | 1042.16 | 922.11 | 1042.21 | 928.34 | 1042.24 | 930.31 | 1042.26 | 937.85 | 1042.3 |
| 938.67 | 1042.31 | 938.96 | 1042.31 | 954.89 | 1042.4 | 963.08 | 1042.47 | 969.68 | 1042.56 |
| 971.27 | 1042.57 | 977.37 | 1042.64 | 979.47 | 1042.68 | 980.02 | 1042.68 | 1000.69 | 1042.97 |
| 1004.05 | 1043 | 1011.03 | 1043.09 | 1012.25 | 1043.11 | 1016.9 | 1043.16 | 1020.43 | 1043.22 |
| 1021.36 | 1043.23 | 1028.63 | 1043.34 | 1031.7 | 1043.38 | 1036.83 | 1043.46 | 1042.04 | 1043.53 |
| 1045.02 | 1043.58 | 1052.37 | 1043.68 | 1053.21 | 1043.7 | 1062.71 | 1043.85 | 1066.57 | 1043.93 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 356.23 | .052 | 476.75 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 370.18 | 504.49 | 160.71 | 199.92 | 232.12 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1035.49 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.052 | 0.049 | 0.032 |
| W.S. Elev (ft) | 1035.35 | Reach Len. (ft) | 160.71 | 199.92 | 232.12 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 4.36 | 216.48 | 45.45 |
| E.G. Slope (ft/ft) | 0.004905 | Area (sq ft) | 4.36 | 216.48 | 45.45 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 4.89 | 643.34 | 123.77 |
| Top Width (ft) | 203.97 | Top Width (ft) | 10.36 | 134.31 | 59.30 |
| Vel Total (ft/s) | 2.90 | Avg. Vel. (ft/s) | 1.12 | 2.97 | 2.72 |
| Max Chl Dpth (ft) | 2.17 | Hydr. Depth (ft) | 0.42 | 1.61 | 0.77 |
| Conv. Total (cfs) | 11023.1 | Conv. (cfs) | 69.9 | 9186.0 | 1767.2 |
| Length Wtd. (ft) | 202.38 | Wetted Per. (ft) | 10.40 | 134.35 | 59.32 |
| Min Ch El (ft) | 1033.18 | Shear (lb/sq ft) | 0.13 | 0.49 | 0.23 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.14 | 1.47 | 0.64 |
| Frctn Loss (ft) | 0.71 | Cum Volume (acre-ft) | 1.19 | 53.70 | 1.06 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.05 | 39.53 | 2.03 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1035.58 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 1035.39 | Reach Len. (ft) | 160.71 | 199.92 | 232.12 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 222.09 | |
| E.G. Slope (ft/ft) | 0.006582 | Area (sq ft) | | 222.09 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 134.31 | Top Width (ft) | | 134.31 | |
| Vel Total (ft/s) | 3.48 | Avg. Vel. (ft/s) | | 3.48 | |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | | 1.65 | |
| Conv. Total (cfs) | 9515.3 | Conv. (cfs) | | 9515.3 | |
| Length Wtd. (ft) | 199.92 | Wetted Per. (ft) | | 136.13 | |
| Min Ch El (ft) | 1033.18 | Shear (lb/sq ft) | | 0.67 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.33 | |
| Frctn Loss (ft) | 0.79 | Cum Volume (acre-ft) | | 54.63 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 39.58 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1035.58 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 1035.39 | Reach Len. (ft) | 160.71 | 199.92 | 232.12 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 222.09 | |
| E.G. Slope (ft/ft) | 0.006582 | Area (sq ft) | | 222.09 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 134.31 | Top Width (ft) | | 134.31 | |
| Vel Total (ft/s) | 3.48 | Avg. Vel. (ft/s) | | 3.48 | |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | | 1.65 | |
| Conv. Total (cfs) | 9515.3 | Conv. (cfs) | | 9515.3 | |
| Length Wtd. (ft) | 199.92 | Wetted Per. (ft) | | 136.13 | |
| Min Ch El (ft) | 1033.18 | Shear (lb/sq ft) | | 0.67 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.33 | |
| Frctn Loss (ft) | 0.79 | Cum Volume (acre-ft) | 0.05 | 54.57 | 0.12 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.22 | 39.57 | 0.31 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.813

INPUT
Description: Thalweg Sta. 441.00
Station Elevation Data num= 162

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1042 | 13.91 | 1041.84 | 16.23 | 1041.81 | 37.46 | 1041.5 | 37.83 | 1041.49 |
| 38.08 | 1041.49 | 45.03 | 1041.38 | 73.82 | 1040.97 | 74.34 | 1040.96 | 86.42 | 1040.81 |
| 88.22 | 1040.78 | 90.88 | 1040.75 | 108.69 | 1040.51 | 109.82 | 1040.5 | 110.59 | 1040.49 |
| 122.68 | 1040.31 | 131.43 | 1040.13 | 134.76 | 1040.07 | 138.62 | 1039.93 | 146.85 | 1039.74 |
| 153.03 | 1039.34 | 158.94 | 1039.25 | 162.11 | 1038.93 | 167.42 | 1038.31 | 171.02 | 1038.06 |
| 174.62 | 1037.57 | 179.92 | 1036.96 | 183.1 | 1036.54 | 189.02 | 1036.39 | 195.19 | 1035.26 |
| 196.22 | 1035.3 | 197.73 | 1035.39 | 203.42 | 1036.05 | 207.27 | 1036.06 | 215.53 | 1036.62 |
| 217.81 | 1036.77 | 219.36 | 1036.85 | 225.02 | 1037.26 | 231.45 | 1037.79 | 232.21 | 1037.81 |
| 233.34 | 1037.88 | 239.41 | 1038.1 | 243.54 | 1038.36 | 246.61 | 1038.37 | 251.15 | 1038.53 |
| 253.82 | 1038.56 | 255.62 | 1038.65 | 261.01 | 1038.62 | 267.71 | 1038.75 | 268.96 | 1038.75 |
| 279.79 | 1038.7 | 286.76 | 1038.65 | 289.81 | 1038.58 | 291.87 | 1038.57 | 297.01 | 1038.44 |
| 303.96 | 1038.24 | 304.21 | 1038.23 | 304.57 | 1038.22 | 311.41 | 1037.82 | 316.05 | 1037.61 |
| 322.38 | 1037.28 | 325.81 | 1037.01 | 326.63 | 1036.97 | 328.13 | 1036.9 | 333 | 1036.54 |
| 340.19 | 1036.27 | 340.28 | 1036.27 | 352.31 | 1035.48 | 354.6 | 1035.28 | 357.99 | 1035.09 |
| 361.8 | 1034.8 | 364.39 | 1034.68 | 376.48 | 1033.78 | 377.89 | 1033.7 | 384.65 | 1033.24 |
| 388.56 | 1032.98 | 390.6 | 1032.85 | 397.81 | 1032.61 | 400.64 | 1032.58 | 405 | 1032.5 |
| 411.42 | 1032.47 | 419.4 | 1032.41 | 429.23 | 1032.36 | 433.8 | 1032.32 | 436.9 | 1032.31 |
| 441 | 1032.28 | 447.04 | 1032.25 | 448.2 | 1032.24 | 448.99 | 1032.24 | 461.08 | 1032.18 |
| 462.6 | 1032.17 | 464.84 | 1032.17 | 469.8 | 1032.16 | 477 | 1032.22 | 482.65 | 1032.32 |
| 484.19 | 1032.34 | 485.24 | 1032.37 | 491.39 | 1032.49 | 500.46 | 1032.72 | 505.79 | 1032.87 |
| 509.41 | 1033.04 | 511.01 | 1033.1 | 512.99 | 1033.17 | 518.26 | 1033.47 | 520.2 | 1033.6 |
| 521.5 | 1033.69 | 527.4 | 1034.14 | 533.59 | 1034.65 | 534.59 | 1034.73 | 536.07 | 1034.88 |
| 541.79 | 1035.37 | 545.67 | 1035.72 | 553.88 | 1036.33 | 556.19 | 1036.46 | 556.31 | 1036.47 |
| 557.76 | 1036.53 | 569.84 | 1036.91 | 571.69 | 1036.98 | 577.79 | 1037.17 | 581.93 | 1037.32 |
| 584.99 | 1037.42 | 589.49 | 1037.58 | 594.01 | 1037.73 | 606.1 | 1038.04 | 606.58 | 1038.04 |
| 607.3 | 1038.05 | 618.18 | 1038.06 | 620.99 | 1038.07 | 628.18 | 1038.05 | 630.27 | 1038.04 |
| 635.38 | 1038.09 | 642.36 | 1038.19 | 642.58 | 1038.2 | 642.92 | 1038.2 | 649.79 | 1038.34 |
| 654.44 | 1038.37 | 660.72 | 1038.39 | 666.53 | 1038.47 | 671.39 | 1038.52 | 678.54 | 1038.66 |
| 678.62 | 1038.66 | 685.78 | 1038.81 | 696.34 | 1039.06 | 702.78 | 1039.16 | 714.14 | 1039.36 |
| 714.58 | 1039.37 | 714.87 | 1039.37 | 726.95 | 1039.45 | 728.98 | 1039.47 | 731.96 | 1039.51 |
| 743.38 | 1039.64 | 749.76 | 1039.7 | 750.57 | 1039.71 | 751.13 | 1039.72 | 757.77 | 1039.76 |
| 763.21 | 1039.78 | 764.97 | 1039.79 | 767.57 | 1039.81 | 772.18 | 1039.83 | 785.38 | 1039.93 |
| 793.78 | 1039.98 | 794.73 | 1039.99 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 384.65 | .052 | 511.01 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 326.63 | 556.31 | 210.08 | 199.99 | 194.6 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.76 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.050 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 1034.67 | Reach Len. (ft) | 210.08 | 199.99 | 194.60 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 314.37 | |
| E.G. Slope (ft/ft) | 0.002657 | Area (sq ft) | | 314.37 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 169.23 | Top Width (ft) | | 169.23 | |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | | 2.46 | |
| Max Chl Dpth (ft) | 2.51 | Hydr. Depth (ft) | | 1.86 | |
| Conv. Total (cfs) | 14976.7 | Conv. (cfs) | | 14976.7 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 169.37 | |
| Min Ch El (ft) | 1032.16 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.76 | |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 1.19 | 52.48 | 0.94 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 1.03 | 38.83 | 1.87 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.76 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 1034.67 | Reach Len. (ft) | 210.08 | 199.99 | 194.60 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 314.37 | |
| E.G. Slope (ft/ft) | 0.002657 | Area (sq ft) | | 314.37 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 169.23 | Top Width (ft) | | 169.23 | |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | | 2.46 | |
| Max Chl Dpth (ft) | 2.51 | Hydr. Depth (ft) | | 1.86 | |
| Conv. Total (cfs) | 14976.7 | Conv. (cfs) | | 14976.7 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 169.37 | |
| Min Ch El (ft) | 1032.16 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.76 | |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | | 53.40 | |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | | 38.88 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.76 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 1034.67 | Reach Len. (ft) | 210.08 | 199.99 | 194.60 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 314.37 | |
| E.G. Slope (ft/ft) | 0.002657 | Area (sq ft) | | 314.37 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 169.23 | Top Width (ft) | | 169.23 | |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | | 2.46 | |
| Max Chl Dpth (ft) | 2.51 | Hydr. Depth (ft) | | 1.86 | |
| Conv. Total (cfs) | 14976.7 | Conv. (cfs) | | 14976.7 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 169.37 | |
| Min Ch El (ft) | 1032.16 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.76 | |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 0.05 | 53.34 | 0.12 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 0.22 | 38.88 | 0.31 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.775

INPUT
Description: Thalweg Sta. 672.67
Station Elevation Data num= 195

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1041.98 | 9.13 | 1041.98 | 19.13 | 1041.96 | 20.57 | 1041.96 | 27.41 | 1041.93 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 32.01 | 1041.92 | 42.11 | 1041.87 | 43.45 | 1041.87 | 49.47 | 1041.84 | 54.89 | 1041.83 |
| 56.82 | 1041.82 | 60.3 | 1041.81 | 64.18 | 1041.79 | 66.33 | 1041.79 | 86.24 | 1041.72 |
| 89.21 | 1041.72 | 100.65 | 1041.67 | 101.48 | 1041.67 | 122.06 | 1041.58 | 123.54 | 1041.58 |
| 145.07 | 1041.49 | 146.41 | 1041.49 | 152.42 | 1041.46 | 163.23 | 1041.43 | 167.14 | 1041.41 |
| 169.3 | 1041.41 | 174.49 | 1041.38 | 180.73 | 1041.37 | 181.84 | 1041.36 | 183.82 | 1041.36 |
| 189.19 | 1041.33 | 203.62 | 1041.27 | 203.9 | 1041.26 | 204.41 | 1041.26 | 215.05 | 1041.17 |
| 225.96 | 1041.05 | 226.5 | 1041.05 | 245.58 | 1040.84 | 248.03 | 1040.81 | 249.38 | 1040.79 |
| 270.08 | 1040.58 | 272.26 | 1040.55 | 277.44 | 1040.51 | 286.75 | 1040.42 | 292.14 | 1040.38 |
| 306.58 | 1040.24 | 307.34 | 1040.24 | 327.93 | 1040.06 | 328.91 | 1040.05 | 329.46 | 1040.05 |
| 348.52 | 1039.9 | 350.98 | 1039.89 | 363.78 | 1039.8 | 373.04 | 1039.7 | 375.22 | 1039.68 |
| 380.39 | 1039.56 | 386.66 | 1039.43 | 395.1 | 1039.21 | 398.1 | 1039.15 | 402.45 | 1039.04 |
| 409.54 | 1038.91 | 409.8 | 1038.91 | 417.16 | 1038.76 | 420.98 | 1038.69 | 430.87 | 1038.47 |
| 432.42 | 1038.43 | 439.22 | 1038.16 | 443.87 | 1037.99 | 451.45 | 1037.58 | 453.93 | 1037.43 |
| 455.31 | 1037.37 | 461.28 | 1036.84 | 466.74 | 1036.45 | 468.63 | 1036.27 | 472.04 | 1036 |
| 478.19 | 1035.53 | 485.87 | 1035.15 | 489.63 | 1034.95 | 492.62 | 1034.85 | 498.05 | 1034.68 |
| 501.06 | 1034.58 | 505.4 | 1034.47 | 512.51 | 1034.32 | 512.76 | 1034.32 | 513.21 | 1034.31 |
| 520.12 | 1034.21 | 533.8 | 1033.96 | 534.82 | 1033.93 | 535.39 | 1033.92 | 542.17 | 1033.79 |
| 546.83 | 1033.71 | 549.53 | 1033.68 | 553.74 | 1033.59 | 554.39 | 1033.58 | 558.27 | 1033.51 |
| 569.71 | 1033.38 | 574.97 | 1033.34 | 578.94 | 1033.3 | 581.15 | 1033.27 | 586.29 | 1033.23 |
| 592.59 | 1033.13 | 595.56 | 1033.1 | 604.03 | 1032.96 | 615.47 | 1032.8 | 615.71 | 1032.8 |
| 616.14 | 1032.79 | 623.06 | 1032.62 | 625.57 | 1032.55 | 626.91 | 1032.52 | 630.42 | 1032.42 |
| 636.73 | 1032.26 | 638.35 | 1032.2 | 640.37 | 1032.13 | 649.79 | 1031.79 | 657.32 | 1031.58 |
| 659.84 | 1031.5 | 661.23 | 1031.47 | 667.19 | 1031.36 | 672.67 | 1031.28 | 674.54 | 1031.26 |
| 684.11 | 1031.21 | 689.25 | 1031.24 | 695.55 | 1031.3 | 696.61 | 1031.32 | 698.49 | 1031.39 |
| 703.96 | 1031.56 | 706.99 | 1031.73 | 711.31 | 1032.13 | 718.43 | 1033 | 718.66 | 1033.02 |
| 719.07 | 1033.07 | 726.02 | 1033.86 | 729.88 | 1034.24 | 733.38 | 1034.54 | 739.66 | 1035.05 |
| 741.31 | 1035.16 | 742.57 | 1035.22 | 749.52 | 1035.56 | 752.75 | 1035.73 | 755.43 | 1035.82 |
| 760.25 | 1036.05 | 762.79 | 1036.15 | 764.2 | 1036.22 | 770.14 | 1036.41 | 775.64 | 1036.6 |
| 777.49 | 1036.62 | 780.84 | 1036.65 | 787.07 | 1036.73 | 792.2 | 1036.81 | 798.52 | 1036.96 |
| 799.55 | 1036.98 | 801.42 | 1037.03 | 806.91 | 1037.16 | 809.96 | 1037.24 | 821.39 | 1037.49 |
| 821.61 | 1037.49 | 822.01 | 1037.5 | 832.84 | 1037.64 | 842.59 | 1037.67 | 855.72 | 1037.68 |
| 858.38 | 1037.69 | 878.6 | 1037.7 | 887.8 | 1037.73 | 890.04 | 1037.73 | 895.15 | 1037.76 |
| 901.48 | 1037.77 | 935.8 | 1037.77 | 945.53 | 1037.79 | 946.64 | 1037.8 | 947.24 | 1037.8 |
| 953.98 | 1037.83 | 958.68 | 1037.87 | 961.34 | 1037.88 | 966.12 | 1037.91 | 1005.46 | 1038.27 |
| 1007.29 | 1038.29 | 1027.32 | 1038.48 | 1027.88 | 1038.48 | 1048.46 | 1038.68 | 1049.59 | 1038.7 |
| 1050.21 | 1038.7 | 1061.64 | 1038.84 | 1069.06 | 1038.95 | 1071.64 | 1038.98 | 1084.53 | 1039.16 |
| 1086.36 | 1039.18 | 1089.64 | 1039.23 | 1107.4 | 1039.46 | 1115.77 | 1039.55 | 1118.85 | 1039.59 |
| 1130.29 | 1039.7 | 1130.81 | 1039.7 | 1152.54 | 1039.91 | 1153.17 | 1039.92 | 1158.46 | 1039.96 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 625.57 | .04 | 742.57 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 553.74 | 749.52 | 216.89 | 199.99 | 188.9 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1033.60 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.54 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1033.06 | Reach Len. (ft) | 216.89 | 199.99 | 188.90 |
| Crit W.S. (ft) | 1033.06 | Flow Area (sq ft) | | 130.32 | |
| E.G. Slope (ft/ft) | 0.018468 | Area (sq ft) | | 130.32 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 120.80 | Top Width (ft) | | 120.80 | |
| Vel Total (ft/s) | 5.92 | Avg. Vel. (ft/s) | | 5.92 | |
| Max Chl Dpth (ft) | 1.85 | Hydr. Depth (ft) | | 1.08 | |
| Conv. Total (cfs) | 5680.8 | Conv. (cfs) | | 5680.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 120.90 | |
| Min Ch El (ft) | 1031.21 | Shear (lb/sq ft) | | 1.24 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.36 | |
| Frctn Loss (ft) | 2.01 | Cum Volume (acre-ft) | 1.19 | 51.46 | 0.94 |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 1.03 | 38.17 | 1.87 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1033.60 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.54 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1033.06 | Reach Len. (ft) | 216.89 | 199.99 | 188.90 |
| Crit W.S. (ft) | 1033.06 | Flow Area (sq ft) | | 130.32 | |
| E.G. Slope (ft/ft) | 0.018468 | Area (sq ft) | | 130.32 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 120.80 | Top Width (ft) | | 120.80 | |
| Vel Total (ft/s) | 5.92 | Avg. Vel. (ft/s) | | 5.92 | |
| Max Chl Dpth (ft) | 1.85 | Hydr. Depth (ft) | | 1.08 | |
| Conv. Total (cfs) | 5680.8 | Conv. (cfs) | | 5680.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 120.90 | |
| Min Ch El (ft) | 1031.21 | Shear (lb/sq ft) | | 1.24 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.36 | |
| Frctn Loss (ft) | 2.01 | Cum Volume (acre-ft) | | 52.38 | |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | | 38.22 | |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical

depth, the calculated water surface came back below critical depth. This indicates that
there
is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1033.60 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.54 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1033.06 | Reach Len. (ft) | 216.89 | 199.99 | 188.90 |
| Crit W.S. (ft) | 1033.06 | Flow Area (sq ft) | | 130.32 | |
| E.G. Slope (ft/ft) | 0.018468 | Area (sq ft) | | 130.32 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 120.80 | Top Width (ft) | | 120.80 | |
| Vel Total (ft/s) | 5.92 | Avg. Vel. (ft/s) | | 5.92 | |
| Max Chl Dpth (ft) | 1.85 | Hydr. Depth (ft) | | 1.08 | |
| Conv. Total (cfs) | 5680.8 | Conv. (cfs) | | 5680.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 120.90 | |
| Min Ch El (ft) | 1031.21 | Shear (lb/sq ft) | | 1.24 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.36 | |
| Frctn Loss (ft) | 2.01 | Cum Volume (acre-ft) | 0.05 | 52.32 | 0.12 |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 0.22 | 38.21 | 0.31 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical

depth, the calculated water surface came back below critical depth. This indicates that
there
is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.737

INPUT
Description: Thalweg Sta. 532.86
Station Elevation Data num= 145

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1039.88 | 15.19 | 1039.79 | 17.64 | 1039.77 | 29.3 | 1039.65 | 33.13 | 1039.62 |
| 40.02 | 1039.6 | 40.86 | 1039.59 | 43.06 | 1039.6 | 48.6 | 1039.6 | 50.73 | 1039.61 |
| 72.93 | 1039.63 | 82.87 | 1039.61 | 98.77 | 1039.55 | 102.77 | 1039.54 | 104.3 | 1039.53 |
| 125.73 | 1039.46 | 125.99 | 1039.46 | 126.64 | 1039.45 | 147.16 | 1039.38 | 154.49 | 1039.34 |
| 156.93 | 1039.33 | 157.87 | 1039.33 | 168.58 | 1039.28 | 172.41 | 1039.27 | 179.3 | 1039.24 |
| 180.14 | 1039.24 | 210.21 | 1039.13 | 211.44 | 1039.13 | 218.83 | 1039.11 | 222.15 | 1039.09 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 232.87 | 1039.06 | 234.31 | 1039.05 | 238.07 | 1039.04 | 264.43 | 1038.88 | 265.01 | 1038.87 |
| 265.93 | 1038.87 | 286.44 | 1038.72 | 288.49 | 1038.7 | 296.22 | 1038.64 | 297.15 | 1038.64 |
| 307.87 | 1038.55 | 311.69 | 1038.51 | 318.58 | 1038.45 | 319.44 | 1038.45 | 349.51 | 1038.15 |
| 350.72 | 1038.13 | 373.6 | 1037.81 | 381.34 | 1037.68 | 382.87 | 1037.66 | 393.58 | 1037.44 |
| 396.81 | 1037.34 | 404.29 | 1037.09 | 404.55 | 1037.08 | 405.22 | 1037.05 | 409.3 | 1036.84 |
| 415.01 | 1036.55 | 420.03 | 1036.22 | 425.72 | 1035.82 | 433.09 | 1035.24 | 435.5 | 1035.04 |
| 436.43 | 1034.96 | 447.15 | 1033.98 | 457.86 | 1032.82 | 460.95 | 1032.44 | 466.46 | 1031.78 |
| 474.19 | 1030.94 | 479.29 | 1030.42 | 481.94 | 1030.27 | 488.8 | 1029.8 | 490 | 1029.71 |
| 492.43 | 1029.64 | 497.41 | 1029.5 | 500.72 | 1029.39 | 511.43 | 1029.2 | 512.89 | 1029.17 |
| 516.67 | 1029.11 | 528.36 | 1028.97 | 532.86 | 1028.94 | 542.98 | 1029 | 543.57 | 1029 |
| 543.84 | 1029.01 | 544.53 | 1029.02 | 551.58 | 1029.17 | 565 | 1029.43 | 567.05 | 1029.52 |
| 574.8 | 1029.91 | 575.72 | 1029.97 | 582.53 | 1030.84 | 586.43 | 1031.36 | 595.2 | 1032.69 |
| 597.14 | 1032.99 | 600.24 | 1033.37 | 605.75 | 1034.02 | 607.86 | 1034.26 | 608.08 | 1034.27 |
| 610.79 | 1034.43 | 613.48 | 1034.58 | 618.57 | 1034.83 | 621.22 | 1034.9 | 628.96 | 1035.08 |
| 629.29 | 1035.09 | 636.7 | 1035.28 | 650.72 | 1035.54 | 652.17 | 1035.57 | 655.96 | 1035.61 |
| 659.91 | 1035.67 | 667.65 | 1035.62 | 672.14 | 1035.49 | 675.39 | 1035.44 | 682.86 | 1035.27 |
| 683.12 | 1035.26 | 683.82 | 1035.26 | 693.57 | 1034.98 | 699.66 | 1034.72 | 704.29 | 1034.55 |
| 711.69 | 1034.34 | 714.08 | 1034.24 | 715 | 1034.27 | 721.81 | 1034.69 | 725.71 | 1035.11 |
| 729.56 | 1035.55 | 736.42 | 1036.39 | 737.3 | 1036.41 | 745.03 | 1036.89 | 747.14 | 1037.01 |
| 752.77 | 1037.07 | 757.86 | 1037.1 | 767.4 | 1037.13 | 768.57 | 1037.14 | 769.3 | 1037.13 |
| 779.28 | 1037.06 | 800.71 | 1036.75 | 811.43 | 1036.63 | 821.53 | 1036.55 | 822.41 | 1036.55 |
| 823.12 | 1036.56 | 830.15 | 1036.62 | 832.85 | 1036.65 | 850.98 | 1036.99 | 864.99 | 1037.28 |
| 868.84 | 1037.35 | 875.71 | 1037.49 | 876.58 | 1037.5 | 897.14 | 1037.86 | 903.53 | 1037.96 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 492.43 | .04 | 608.08 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 409.3 | 610.79 | 211.95 | 200 | 193.31 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.43 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1031.16 | Reach Len. (ft) | 211.95 | 200.00 | 193.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 182.45 | |
| E.G. Slope (ft/ft) | 0.006285 | Area (sq ft) | | 182.45 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 112.69 | Top Width (ft) | | 112.69 | |
| Vel Total (ft/s) | 4.23 | Avg. Vel. (ft/s) | | 4.23 | |
| Max Chl Dpth (ft) | 2.22 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 9737.5 | Conv. (cfs) | | 9737.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 112.85 | |
| Min Ch El (ft) | 1028.94 | Shear (lb/sq ft) | | 0.63 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.68 | |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 1.19 | 50.74 | 0.94 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.03 | 37.63 | 1.87 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.43 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1031.16 | Reach Len. (ft) | 211.95 | 200.00 | 193.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 182.45 | |
| E.G. Slope (ft/ft) | 0.006285 | Area (sq ft) | | 182.45 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 112.69 | Top Width (ft) | | 112.69 | |
| Vel Total (ft/s) | 4.23 | Avg. Vel. (ft/s) | | 4.23 | |
| Max Chl Dpth (ft) | 2.22 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 9737.5 | Conv. (cfs) | | 9737.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 112.85 | |
| Min Ch El (ft) | 1028.94 | Shear (lb/sq ft) | | 0.63 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.68 | |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | | 51.66 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 37.68 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.43 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.039 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 1031.16 | Reach Len. (ft) | 211.95 | 200.00 | 193.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 182.45 | |
| E.G. Slope (ft/ft) | 0.006285 | Area (sq ft) | | 182.45 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 112.69 | Top Width (ft) | | 112.69 | |
| Vel Total (ft/s) | 4.23 | Avg. Vel. (ft/s) | | 4.23 | |
| Max Chl Dpth (ft) | 2.22 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 9737.5 | Conv. (cfs) | | 9737.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 112.85 | |
| Min Ch El (ft) | 1028.94 | Shear (lb/sq ft) | | 0.63 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.68 | |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 0.05 | 51.60 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 37.68 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.699

INPUT
Description: Thalweg Sta. 350.42
Station Elevation Data num= 161

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1035.97 | 7.29 | 1036.05 | 15.45 | 1036.12 | 17.69 | 1036.13 | 23.3 | 1036.18 |
| 27.02 | 1036.22 | 28.08 | 1036.23 | 35.11 | 1036.27 | 38.48 | 1036.31 | 43.2 | 1036.35 |
| 48.88 | 1036.44 | 51.3 | 1036.47 | 59.28 | 1036.59 | 59.8 | 1036.59 | 67.48 | 1036.63 |
| 69.68 | 1036.65 | 75.58 | 1036.64 | 90.47 | 1036.58 | 91.76 | 1036.58 | 99.85 | 1036.55 |
| 100.87 | 1036.54 | 107.95 | 1036.52 | 116.04 | 1036.47 | 132.07 | 1036.4 | 132.78 | 1036.4 |
| 156.5 | 1036.33 | 163.26 | 1036.29 | 164.59 | 1036.28 | 172.69 | 1036.18 | 173.66 | 1036.16 |
| 175.4 | 1036.13 | 184.05 | 1035.97 | 188.87 | 1035.89 | 194.45 | 1035.78 | 196.96 | 1035.74 |
| 204.85 | 1035.56 | 205.06 | 1035.56 | 213.15 | 1035.34 | 221.24 | 1034.95 | 229.33 | 1034.44 |
| 236.04 | 1033.93 | 237.43 | 1033.82 | 241.14 | 1033.51 | 242.26 | 1033.42 | 246.44 | 1033.02 |
| 253.61 | 1032.32 | 256.84 | 1032.04 | 261.7 | 1031.57 | 267.24 | 1031.14 | 269.8 | 1030.85 |
| 277.64 | 1030.25 | 277.88 | 1030.22 | 278.76 | 1030.14 | 284.33 | 1029.65 | 288.04 | 1029.32 |
| 294.07 | 1028.88 | 298.43 | 1028.64 | 308.83 | 1028.14 | 318.34 | 1027.76 | 319.23 | 1027.72 |
| 326.44 | 1027.6 | 329.63 | 1027.59 | 334.54 | 1027.64 | 340.02 | 1027.74 | 342.62 | 1027.78 |
| 350.42 | 1027.92 | 350.71 | 1027.92 | 351.74 | 1027.94 | 360.82 | 1028.08 | 366.9 | 1028.16 |
| 374.99 | 1028.29 | 383.08 | 1028.45 | 388.24 | 1028.59 | 388.7 | 1028.6 | 391.18 | 1028.67 |
| 392.02 | 1028.69 | 399.27 | 1028.91 | 402.41 | 1029.03 | 407.36 | 1029.18 | 412.81 | 1029.43 |
| 414.8 | 1029.5 | 415.45 | 1029.52 | 423.21 | 1029.84 | 423.55 | 1029.85 | 424.74 | 1029.9 |
| 433.61 | 1030.23 | 444 | 1030.64 | 451.68 | 1031.07 | 454.4 | 1031.23 | 461.22 | 1031.68 |
| 472.1 | 1032.37 | 475.2 | 1032.56 | 480.19 | 1032.79 | 485.6 | 1033.07 | 488.29 | 1033.17 |
| 495.99 | 1033.51 | 496.38 | 1033.52 | 497.72 | 1033.58 | 504.47 | 1033.81 | 506.39 | 1033.86 |
| 509.85 | 1033.94 | 516.79 | 1034.13 | 520.66 | 1034.25 | 527.19 | 1034.4 | 528.75 | 1034.44 |
| 536.84 | 1034.6 | 537.59 | 1034.62 | 547.99 | 1034.8 | 553.03 | 1034.9 | 568.78 | 1035.17 |
| 570.71 | 1035.21 | 585.4 | 1035.45 | 607.2 | 1035.76 | 609.67 | 1035.8 | 610.37 | 1035.8 |
| 625.85 | 1036.01 | 641.57 | 1036.18 | 642.04 | 1036.19 | 643.7 | 1036.2 | 658.22 | 1036.32 |
| 662.36 | 1036.33 | 666.31 | 1036.35 | 672.76 | 1036.37 | 674.4 | 1036.37 | 680.19 | 1036.38 |
| 682.5 | 1036.38 | 683.16 | 1036.39 | 713.43 | 1036.43 | 714.35 | 1036.43 | 722.96 | 1036.46 |
| 724.75 | 1036.46 | 731.05 | 1036.5 | 735.15 | 1036.51 | 745.55 | 1036.57 | 753.18 | 1036.63 |
| 755.33 | 1036.64 | 755.94 | 1036.65 | 763.42 | 1036.72 | 771.52 | 1036.86 | 776.74 | 1036.96 |
| 779.61 | 1037.01 | 787.14 | 1037.13 | 787.7 | 1037.13 | 789.67 | 1037.14 | 797.54 | 1037.17 |
| 807.94 | 1037.17 | 811.98 | 1037.16 | 818.33 | 1037.16 | 826.17 | 1037.18 | 828.16 | 1037.18 |
| 828.73 | 1037.19 | 849.53 | 1037.39 | 852.44 | 1037.41 | 859.92 | 1037.49 | 860.53 | 1037.49 |
| 862.66 | 1037.52 | 876.72 | 1037.69 | 880.72 | 1037.73 | 884.81 | 1037.79 | 899.16 | 1037.96 |
| 899.78 | 1037.97 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 284.33 | .04 | 388.7 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 241.14 | 495.99 | 192.15 | 199.8 | 202.16 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.99 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1029.70 | Reach Len. (ft) | 192.15 | 199.80 | 202.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 177.34 | |
| E.G. Slope (ft/ft) | 0.008415 | Area (sq ft) | | 177.34 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 135.97 | Top Width (ft) | | 135.97 | |
| Vel Total (ft/s) | 4.35 | Avg. Vel. (ft/s) | | 4.35 | |

| | | | | | |
|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 8415.7 | Conv. (cfs) | | 8415.7 | |
| Length Wtd. (ft) | 199.80 | Wetted Per. (ft) | | 136.06 | |
| Min Ch El (ft) | 1027.59 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.98 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 1.19 | 49.92 | 0.94 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.03 | 37.06 | 1.87 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.99 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1029.70 | Reach Len. (ft) | 192.15 | 199.80 | 202.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 177.34 | |
| E.G. Slope (ft/ft) | 0.008415 | Area (sq ft) | | 177.34 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 135.97 | Top Width (ft) | | 135.97 | |
| Vel Total (ft/s) | 4.35 | Avg. Vel. (ft/s) | | 4.35 | |
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 8415.7 | Conv. (cfs) | | 8415.7 | |
| Length Wtd. (ft) | 199.80 | Wetted Per. (ft) | | 136.06 | |
| Min Ch El (ft) | 1027.59 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.98 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | | 50.83 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 37.11 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.99 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1029.70 | Reach Len. (ft) | 192.15 | 199.80 | 202.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 177.34 | |
| E.G. Slope (ft/ft) | 0.008415 | Area (sq ft) | | 177.34 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 135.97 | Top Width (ft) | | 135.97 | |
| Vel Total (ft/s) | 4.35 | Avg. Vel. (ft/s) | | 4.35 | |
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 8415.7 | Conv. (cfs) | | 8415.7 | |
| Length Wtd. (ft) | 199.80 | Wetted Per. (ft) | | 136.06 | |
| Min Ch El (ft) | 1027.59 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.98 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 0.05 | 50.78 | 0.12 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.22 | 37.10 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.661

INPUT
Description: Thalweg Sta. 410.60
Station Elevation Data num= 200

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1036 | 7.66 | 1035.94 | 8.07 | 1035.94 | 15.66 | 1035.86 | 18.21 | 1035.84 |
| 23.56 | 1035.79 | 39.3 | 1035.62 | 39.53 | 1035.62 | 47.25 | 1035.52 | 60.39 | 1035.31 |
| 81.49 | 1034.92 | 92.03 | 1034.67 | 102.44 | 1034.27 | 102.58 | 1034.27 | 110.45 | 1033.7 |
| 113.13 | 1033.5 | 118.35 | 1033 | 123.67 | 1032.47 | 126.24 | 1032.16 | 133.9 | 1031.22 |
| 134.22 | 1031.18 | 134.38 | 1031.17 | 144.77 | 1030.04 | 150.25 | 1030.06 | 155.32 | 1030.37 |
| 157.84 | 1030.68 | 165.36 | 1031.52 | 165.74 | 1031.57 | 165.86 | 1031.58 | 173.64 | 1032.61 |
| 176.41 | 1033 | 181.54 | 1033.35 | 186.96 | 1033.84 | 189.44 | 1033.92 | 196.82 | 1034.26 |
| 197.34 | 1034.28 | 197.5 | 1034.29 | 197.85 | 1034.3 | 208.05 | 1034.56 | 213.72 | 1034.65 |
| 218.6 | 1034.71 | 221.03 | 1034.73 | 228.27 | 1034.8 | 228.93 | 1034.81 | 229.15 | 1034.81 |
| 250.24 | 1035.03 | 252.62 | 1035.04 | 259.73 | 1035.08 | 260.53 | 1035.08 | 260.79 | 1035.09 |
| 261.33 | 1035.08 | 271.33 | 1034.97 | 276.32 | 1034.87 | 281.88 | 1034.72 | 284.22 | 1034.67 |
| 291.18 | 1034.48 | 292.11 | 1034.46 | 300.01 | 1034.22 | 302.98 | 1034.12 | 308.92 | 1033.82 |
| 313.52 | 1033.6 | 315.81 | 1033.45 | 322.65 | 1032.91 | 323.71 | 1032.83 | 324.07 | 1032.79 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 331.61 | 1032.18 | 334.62 | 1031.83 | 335.21 | 1031.78 | 339.51 | 1031.39 | 345.16 | 1030.75 |
| 347.41 | 1030.51 | 354.11 | 1029.88 | 355.71 | 1029.72 | 363.21 | 1028.87 | 366.26 | 1028.64 |
| 371.11 | 1028.08 | 372.7 | 1027.94 | 376.81 | 1027.59 | 379 | 1027.38 | 385.56 | 1026.95 |
| 386.9 | 1026.85 | 387.35 | 1026.83 | 394.8 | 1026.61 | 397.9 | 1026.54 | 402.7 | 1026.46 |
| 408.45 | 1026.39 | 410.6 | 1026.38 | 417.02 | 1026.4 | 418.99 | 1026.41 | 419.99 | 1026.42 |
| 435.86 | 1026.65 | 440.09 | 1026.72 | 448.47 | 1026.84 | 450.1 | 1026.86 | 450.64 | 1026.87 |
| 452.24 | 1026.89 | 458 | 1026.98 | 471.73 | 1027.14 | 473.79 | 1027.16 | 479.94 | 1027.24 |
| 481.69 | 1027.28 | 482.28 | 1027.3 | 489.59 | 1027.57 | 492.82 | 1027.75 | 497.49 | 1027.97 |
| 503.37 | 1028.37 | 511.39 | 1028.9 | 513.28 | 1029.05 | 513.92 | 1029.1 | 521.19 | 1029.55 |
| 524.47 | 1029.74 | 529.09 | 1029.88 | 530.65 | 1029.9 | 535.01 | 1029.95 | 536.99 | 1030.02 |
| 542.85 | 1030.05 | 545.56 | 1030.09 | 552.78 | 1030.46 | 556.11 | 1030.61 | 562.79 | 1030.93 |
| 566.65 | 1031.14 | 568.57 | 1031.26 | 574.31 | 1031.49 | 576.47 | 1031.6 | 577.2 | 1031.62 |
| 584.37 | 1032.05 | 587.75 | 1032.22 | 592.27 | 1032.48 | 598.3 | 1032.76 | 600.17 | 1032.84 |
| 605.76 | 1033.04 | 608.84 | 1033.12 | 619.39 | 1033.33 | 631.76 | 1033.53 | 637.22 | 1033.63 |
| 639.66 | 1033.67 | 640.48 | 1033.68 | 661.58 | 1034.16 | 663.36 | 1034.21 | 672.13 | 1034.41 |
| 673.87 | 1034.44 | 682.67 | 1034.64 | 687.06 | 1034.72 | 700.14 | 1034.93 | 702.86 | 1034.97 |
| 703.77 | 1034.98 | 705.6 | 1035.01 | 721.46 | 1035.24 | 724.86 | 1035.28 | 726.55 | 1035.31 |
| 737.33 | 1035.43 | 745.96 | 1035.51 | 750.25 | 1035.56 | 756.5 | 1035.61 | 758.15 | 1035.63 |
| 763.05 | 1035.68 | 766.05 | 1035.72 | 788.14 | 1035.95 | 789.75 | 1035.96 | 797.64 | 1036.04 |
| 798.69 | 1036.04 | 816.66 | 1036.19 | 819.79 | 1036.21 | 837.13 | 1036.35 | 851.43 | 1036.51 |
| 852.93 | 1036.52 | 883.07 | 1036.85 | 884.52 | 1036.87 | 888.88 | 1036.9 | 892.42 | 1036.94 |
| 900.32 | 1037.01 | 904.16 | 1037.03 | 908.22 | 1037.07 | 935.8 | 1037.3 | 943.6 | 1037.33 |
| 946.35 | 1037.35 | 951.8 | 1037.35 | 955.62 | 1037.36 | 967.45 | 1037.36 | 971.41 | 1037.37 |
| 977.99 | 1037.36 | 979.31 | 1037.37 | 983.25 | 1037.36 | 995.11 | 1037.35 | 1009.63 | 1037.3 |
| 1014.72 | 1037.3 | 1018.81 | 1037.29 | 1030.73 | 1037.28 | 1041.28 | 1037.25 | 1051.82 | 1037.25 |
| 1082 | 1037.36 | 1089.9 | 1037.36 | 1097.79 | 1037.4 | 1104.56 | 1037.45 | 1105.69 | 1037.47 |
| 1113.6 | 1037.58 | 1115.11 | 1037.61 | 1129.4 | 1037.84 | 1136.2 | 1037.96 | 1136.29 | 1037.96 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 372.7 | .04 | 452.24 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 354.11 | 530.65 | 180.2 | 199.95 | 224.06 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1028.81 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1028.62 | Reach Len. (ft) | 180.20 | 199.95 | 224.06 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 217.14 | |
| E.G. Slope (ft/ft) | 0.004187 | Area (sq ft) | | 217.14 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 140.63 | Top Width (ft) | | 140.63 | |
| Vel Total (ft/s) | 3.56 | Avg. Vel. (ft/s) | | 3.56 | |
| Max Chl Dpth (ft) | 2.24 | Hydr. Depth (ft) | | 1.54 | |
| Conv. Total (cfs) | 11930.5 | Conv. (cfs) | | 11930.5 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 140.76 | |
| Min Ch El (ft) | 1026.38 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.43 | |
| Frctn Loss (ft) | 1.13 | Cum Volume (acre-ft) | 1.19 | 49.01 | 0.94 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.03 | 36.42 | 1.87 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1028.81 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1028.62 | Reach Len. (ft) | 180.20 | 199.95 | 224.06 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 217.14 | |
| E.G. Slope (ft/ft) | 0.004187 | Area (sq ft) | | 217.14 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 140.63 | Top Width (ft) | | 140.63 | |
| Vel Total (ft/s) | 3.56 | Avg. Vel. (ft/s) | | 3.56 | |
| Max Chl Dpth (ft) | 2.24 | Hydr. Depth (ft) | | 1.54 | |
| Conv. Total (cfs) | 11930.5 | Conv. (cfs) | | 11930.5 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 140.76 | |
| Min Ch El (ft) | 1026.38 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.43 | |
| Frctn Loss (ft) | 1.13 | Cum Volume (acre-ft) | | 49.93 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 36.47 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1028.81 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1028.62 | Reach Len. (ft) | 180.20 | 199.95 | 224.06 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 217.14 | |
| E.G. Slope (ft/ft) | 0.004187 | Area (sq ft) | | 217.14 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 140.63 | Top Width (ft) | | 140.63 | |
| Vel Total (ft/s) | 3.56 | Avg. Vel. (ft/s) | | 3.56 | |
| Max Chl Dpth (ft) | 2.24 | Hydr. Depth (ft) | | 1.54 | |
| Conv. Total (cfs) | 11930.5 | Conv. (cfs) | | 11930.5 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 140.76 | |
| Min Ch El (ft) | 1026.38 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.43 | |
| Frctn Loss (ft) | 1.13 | Cum Volume (acre-ft) | 0.05 | 49.87 | 0.12 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.22 | 36.47 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.624

INPUT
Description: Thalweg Sta. 260.26
Station Elevation Data num= 187

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1033.89 | 2.42 | 1033.8 | 6.16 | 1033.67 | 8.47 | 1033.53 | 14.31 | 1033.19 |
| 17.91 | 1032.99 | 21.57 | 1032.76 | 27.52 | 1032.46 | 28.84 | 1032.39 | 29.66 | 1032.34 |
| 41.41 | 1031.69 | 43.37 | 1031.54 | 46.56 | 1031.35 | 50.64 | 1031.08 | 53.16 | 1030.96 |
| 57.91 | 1030.57 | 64.92 | 1030.1 | 65.17 | 1030.08 | 65.59 | 1030.05 | 72.44 | 1029.51 |
| 76.67 | 1029.16 | 79.71 | 1028.97 | 86.97 | 1028.38 | 88.42 | 1028.24 | 94.25 | 1027.86 |
| 100.17 | 1027.41 | 101.51 | 1027.51 | 103.67 | 1027.52 | 108.77 | 1027.67 | 111.92 | 1027.59 |
| 116.05 | 1027.79 | 122.72 | 1027.83 | 123.31 | 1027.85 | 123.67 | 1027.85 | 125.21 | 1027.88 |
| 137.84 | 1028.2 | 141.75 | 1028.26 | 145.1 | 1028.35 | 147.17 | 1028.38 | 152.37 | 1028.49 |
| 158.93 | 1028.67 | 159.64 | 1028.68 | 160.79 | 1028.7 | 166.9 | 1028.93 | 170.24 | 1029.05 |
| 170.68 | 1029.06 | 174.17 | 1029.07 | 179.83 | 1029.07 | 181.44 | 1029.09 | 182.43 | 1029.08 |
| 188.7 | 1028.86 | 194.18 | 1028.57 | 195.97 | 1028.44 | 205.93 | 1027.45 | 210.5 | 1026.92 |
| 213.9 | 1026.59 | 217.68 | 1026.22 | 217.91 | 1026.2 | 225.04 | 1025.83 | 229.43 | 1025.68 |
| 236.95 | 1025.5 | 239.58 | 1025.45 | 241.19 | 1025.41 | 254.1 | 1025.18 | 255.99 | 1025.17 |
| 264.69 | 1025.17 | 268.63 | 1025.22 | 275.03 | 1025.35 | 275.9 | 1025.37 | 276.44 | 1025.38 |
| 283.17 | 1025.55 | 290.43 | 1025.78 | 290.72 | 1025.79 | 294.07 | 1025.93 | 297.7 | 1026.07 |
| 299.94 | 1026.19 | 304.97 | 1026.51 | 311.69 | 1027.07 | 313.11 | 1027.18 | 319.5 | 1027.77 |
| 323.44 | 1028.18 | 326.77 | 1028.49 | 334.03 | 1029.14 | 335.19 | 1029.26 | 341.3 | 1029.76 |
| 346.95 | 1030.26 | 348.34 | 1030.38 | 348.57 | 1030.4 | 351.19 | 1030.6 | 358.7 | 1031.12 |
| 363.11 | 1031.45 | 370.23 | 1031.82 | 370.37 | 1031.83 | 370.45 | 1031.83 | 377.63 | 1032.12 |
| 389.27 | 1032.53 | 392.16 | 1032.64 | 405.7 | 1033.08 | 408.31 | 1033.13 | 417.46 | 1033.29 |
| 427.35 | 1033.36 | 428.5 | 1033.36 | 429.21 | 1033.37 | 440.96 | 1033.4 | 443.03 | 1033.41 |
| 446.39 | 1033.41 | 450.3 | 1033.39 | 452.71 | 1033.37 | 457.56 | 1033.35 | 464.46 | 1033.29 |
| 465.42 | 1033.28 | 484.47 | 1032.87 | 486.63 | 1032.81 | 493.9 | 1032.64 | 501.16 | 1032.49 |
| 503.51 | 1032.46 | 508.43 | 1032.38 | 511.47 | 1032.35 | 515.69 | 1032.29 | 522.55 | 1032.16 |
| 523.22 | 1032.14 | 524.3 | 1032.07 | 534.97 | 1031.5 | 541.58 | 1030.88 | 544.76 | 1030.53 |
| 546.72 | 1030.35 | 552.03 | 1029.73 | 558.47 | 1029.42 | 560.62 | 1029.49 | 570.22 | 1029.78 |
| 573.83 | 1030 | 579.67 | 1030.11 | 581.09 | 1030.15 | 581.98 | 1030.14 | 588.36 | 1030.13 |
| 593.73 | 1029.99 | 598.71 | 1029.82 | 610.16 | 1029.55 | 617.23 | 1029.42 | 617.43 | 1029.42 |
| 617.74 | 1029.41 | 628.98 | 1029.63 | 631.96 | 1029.65 | 636.78 | 1029.81 | 640.73 | 1030.07 |
| 646.49 | 1030.47 | 652.48 | 1031.01 | 653.76 | 1031.12 | 655.82 | 1031.27 | 661.02 | 1031.71 |
| 664.23 | 1031.96 | 668.29 | 1032.25 | 674.87 | 1032.64 | 675.56 | 1032.67 | 675.99 | 1032.69 |
| 682.82 | 1032.92 | 690.09 | 1033.26 | 693.9 | 1033.46 | 699.49 | 1033.64 | 704.62 | 1033.83 |
| 711.89 | 1034.06 | 712.94 | 1034.09 | 722.99 | 1034.29 | 733.69 | 1034.54 | 734.74 | 1034.56 |
| 740.96 | 1034.69 | 746.49 | 1034.79 | 748.22 | 1034.83 | 751.03 | 1034.87 | 758.25 | 1034.95 |
| 770.07 | 1034.96 | 777.29 | 1034.94 | 781.75 | 1034.95 | 789.1 | 1035.01 | 791.82 | 1035.05 |
| 793.5 | 1035.07 | 799.09 | 1035.18 | 813.62 | 1035.43 | 820.89 | 1035.51 | 827.18 | 1035.56 |
| 828.15 | 1035.57 | 828.75 | 1035.57 | 835.42 | 1035.62 | 842.69 | 1035.69 | 846.23 | 1035.73 |
| 871.75 | 1035.96 | 873.04 | 1035.97 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 213.9 | .04 | 290.72 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 182.43 | 334.03 | 206.02 | 199.97 | 194.98 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.67 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1027.32 | Reach Len. (ft) | 206.02 | 199.97 | 194.98 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.75 | |
| E.G. Slope (ft/ft) | 0.008005 | Area (sq ft) | | 162.75 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 107.61 | Top Width (ft) | | 107.61 | |
| Vel Total (ft/s) | 4.74 | Avg. Vel. (ft/s) | | 4.74 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.51 | |
| Conv. Total (cfs) | 8628.4 | Conv. (cfs) | | 8628.4 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 107.74 | |
| Min Ch El (ft) | 1025.17 | Shear (lb/sq ft) | | 0.75 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.58 | |
| Frctn Loss (ft) | 1.22 | Cum Volume (acre-ft) | 1.19 | 48.14 | 0.94 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 1.03 | 35.86 | 1.87 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.67 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1027.32 | Reach Len. (ft) | 206.02 | 199.97 | 194.98 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.75 | |
| E.G. Slope (ft/ft) | 0.008005 | Area (sq ft) | | 162.75 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 107.61 | Top Width (ft) | | 107.61 | |
| Vel Total (ft/s) | 4.74 | Avg. Vel. (ft/s) | | 4.74 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.51 | |
| Conv. Total (cfs) | 8628.4 | Conv. (cfs) | | 8628.4 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 107.74 | |
| Min Ch El (ft) | 1025.17 | Shear (lb/sq ft) | | 0.75 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.58 | |
| Frctn Loss (ft) | 1.22 | Cum Volume (acre-ft) | | 49.06 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 35.90 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.67 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1027.32 | Reach Len. (ft) | 206.02 | 199.97 | 194.98 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.75 | |
| E.G. Slope (ft/ft) | 0.008005 | Area (sq ft) | | 162.75 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 107.61 | Top Width (ft) | | 107.61 | |
| Vel Total (ft/s) | 4.74 | Avg. Vel. (ft/s) | | 4.74 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.51 | |
| Conv. Total (cfs) | 8628.4 | Conv. (cfs) | | 8628.4 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 107.74 | |
| Min Ch El (ft) | 1025.17 | Shear (lb/sq ft) | | 0.75 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.58 | |
| Frctn Loss (ft) | 1.22 | Cum Volume (acre-ft) | 0.05 | 49.00 | 0.12 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.22 | 35.90 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.586

INPUT
Description: Thalweg Sta. 342.64
Station Elevation Data num= 195

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1030.93 | 2.13 | 1031.19 | 7.28 | 1031.9 | 9.98 | 1032.14 | 14.69 | 1032.31 |
| 21.27 | 1032.46 | 22.11 | 1032.45 | 32.56 | 1032.59 | 36.92 | 1032.64 | 43.85 | 1032.76 |
| 44.32 | 1032.77 | 45.23 | 1032.78 | 51.73 | 1032.89 | 55.14 | 1032.94 | 66.43 | 1033.08 |
| 66.79 | 1033.08 | 73.96 | 1033.14 | 77.71 | 1033.18 | 88.34 | 1033.18 | 88.78 | 1033.19 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 89 | 1033.19 | 103.59 | 1033.05 | 109.89 | 1032.98 | 111.58 | 1032.95 | 118.41 | 1032.88 |
| 122.87 | 1032.81 | 125.81 | 1032.78 | 133.22 | 1032.65 | 134.16 | 1032.63 | 137.15 | 1032.51 |
| 145.45 | 1032.25 | 152.99 | 1031.96 | 155.45 | 1031.87 | 156.74 | 1031.8 | 162.86 | 1031.7 |
| 168.03 | 1031.63 | 170.26 | 1031.62 | 174.54 | 1031.63 | 177.68 | 1031.63 | 185.09 | 1031.54 |
| 190.61 | 1031.53 | 192.49 | 1031.5 | 196.09 | 1031.49 | 199.9 | 1031.42 | 201.9 | 1031.41 |
| 207.31 | 1031.29 | 213.18 | 1031.27 | 214.72 | 1031.21 | 217.64 | 1031.15 | 222.12 | 1031.01 |
| 224.47 | 1030.97 | 229.53 | 1030.77 | 235.76 | 1030.57 | 236.94 | 1030.52 | 239.19 | 1030.44 |
| 244.35 | 1030.21 | 247.05 | 1030.11 | 251.76 | 1029.91 | 253.45 | 1029.85 | 260.74 | 1029.58 |
| 269.63 | 1029.2 | 279.4 | 1028.53 | 280.92 | 1028.43 | 281.39 | 1028.38 | 282.29 | 1028.27 |
| 288.8 | 1027.41 | 292.2 | 1026.95 | 303.11 | 1025.49 | 303.49 | 1025.44 | 303.84 | 1025.4 |
| 311.02 | 1024.7 | 312.97 | 1024.59 | 314.78 | 1024.49 | 318.43 | 1024.31 | 325.39 | 1024.13 |
| 325.84 | 1024.12 | 326.07 | 1024.12 | 337.36 | 1024.04 | 348.06 | 1024.04 | 348.65 | 1024.05 |
| 355.47 | 1024.13 | 359.94 | 1024.21 | 362.89 | 1024.28 | 370.29 | 1024.44 | 371.23 | 1024.45 |
| 382.52 | 1024.67 | 385.1 | 1024.69 | 392.51 | 1024.78 | 393.81 | 1024.8 | 399.93 | 1024.85 |
| 402.24 | 1024.88 | 407.33 | 1024.95 | 411.6 | 1025.02 | 414.74 | 1025.08 | 416.39 | 1025.12 |
| 422.14 | 1025.28 | 427.67 | 1025.48 | 429.56 | 1025.54 | 433.15 | 1025.69 | 444.37 | 1026.33 |
| 450.25 | 1026.73 | 451.78 | 1026.84 | 461.54 | 1027.62 | 466.59 | 1028.05 | 472.83 | 1028.57 |
| 474 | 1028.67 | 476.25 | 1028.87 | 484.12 | 1029.54 | 484.33 | 1029.56 | 495.4 | 1030.41 |
| 496.23 | 1030.46 | 497.8 | 1030.57 | 503.64 | 1030.91 | 506.69 | 1031.07 | 511.04 | 1031.26 |
| 517.98 | 1031.53 | 518.46 | 1031.55 | 519.35 | 1031.58 | 525.87 | 1031.72 | 529.27 | 1031.81 |
| 540.19 | 1032.06 | 540.56 | 1032.07 | 540.68 | 1032.08 | 540.9 | 1032.08 | 548.08 | 1032.18 |
| 551.85 | 1032.24 | 555.5 | 1032.28 | 563.9 | 1032.39 | 585.13 | 1032.59 | 585.72 | 1032.6 |
| 592.53 | 1032.66 | 608.3 | 1032.83 | 619.59 | 1032.99 | 622.17 | 1033.04 | 627.1 | 1033.12 |
| 629.58 | 1033.15 | 630.87 | 1033.16 | 642.16 | 1033.31 | 644.4 | 1033.33 | 648.65 | 1033.38 |
| 653.45 | 1033.42 | 664.74 | 1033.48 | 670.2 | 1033.48 | 674.03 | 1033.47 | 676.03 | 1033.47 |
| 681.44 | 1033.43 | 687.32 | 1033.44 | 688.84 | 1033.42 | 691.75 | 1033.41 | 696.25 | 1033.37 |
| 698.61 | 1033.38 | 706.15 | 1033.34 | 711.07 | 1033.3 | 713.3 | 1033.29 | 718.47 | 1033.25 |
| 725.88 | 1033.25 | 732.48 | 1033.29 | 733.29 | 1033.29 | 734.85 | 1033.31 | 755.05 | 1033.45 |
| 755.52 | 1033.46 | 756.41 | 1033.47 | 766.34 | 1033.52 | 777.63 | 1033.6 | 777.74 | 1033.61 |
| 777.96 | 1033.61 | 788.92 | 1033.72 | 799.51 | 1033.85 | 799.97 | 1033.86 | 800.21 | 1033.86 |
| 821.06 | 1034.1 | 822.19 | 1034.11 | 822.79 | 1034.12 | 834.07 | 1034.22 | 837.01 | 1034.23 |
| 844.41 | 1034.27 | 845.36 | 1034.28 | 866.65 | 1034.36 | 867.94 | 1034.37 | 872.11 | 1034.38 |
| 890.52 | 1034.49 | 901.81 | 1034.59 | 924.39 | 1034.83 | 925.91 | 1034.84 | 946.97 | 1035.07 |
| 948.13 | 1035.08 | 950.36 | 1035.11 | 980.83 | 1035.48 | 985.18 | 1035.54 | 992.12 | 1035.62 |
| 992.59 | 1035.62 | 1014.35 | 1035.86 | 1015.01 | 1035.86 | 1025.99 | 1035.97 | 1026.12 | 1035.97 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 312.97 | .04 | 402.24 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 253.45 | 484.33 | | 213.05 | 200 | 189.39 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1026.20 | Reach Len. (ft) | 213.05 | 200.00 | 189.39 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 211.68 | |
| E.G. Slope (ft/ft) | 0.004786 | Area (sq ft) | | 211.68 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 144.40 | Top Width (ft) | | 144.40 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.65 | |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 1.47 | |
| Conv. Total (cfs) | 11159.7 | Conv. (cfs) | | 11159.7 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 144.53 | |
| Min Ch El (ft) | 1024.04 | Shear (lb/sq ft) | | 0.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.60 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 1.19 | 47.28 | 0.94 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.03 | 35.28 | 1.87 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1026.20 | Reach Len. (ft) | 213.05 | 200.00 | 189.39 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 211.68 | |
| E.G. Slope (ft/ft) | 0.004786 | Area (sq ft) | | 211.68 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 144.40 | Top Width (ft) | | 144.40 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.65 | |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 1.47 | |
| Conv. Total (cfs) | 11159.7 | Conv. (cfs) | | 11159.7 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 144.53 | |
| Min Ch El (ft) | 1024.04 | Shear (lb/sq ft) | | 0.44 | |

| | | | |
|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.60 |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 48.20 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 35.33 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.41 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1026.20 | Reach Len. (ft) | 213.05 | 200.00 | 189.39 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 211.68 | |
| E.G. Slope (ft/ft) | 0.004786 | Area (sq ft) | | 211.68 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 144.40 | Top Width (ft) | | 144.40 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.65 | |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 1.47 | |
| Conv. Total (cfs) | 11159.7 | Conv. (cfs) | | 11159.7 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 144.53 | |
| Min Ch El (ft) | 1024.04 | Shear (lb/sq ft) | | 0.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.60 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 0.05 | 48.14 | 0.12 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.22 | 35.32 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.548

INPUT
Description: Thalweg Sta. 485.51
Station Elevation Data num= 269

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1030.12 | 1.93 | 1030.05 | 9.1 | 1029.71 | 9.73 | 1029.69 | 11.43 | 1029.61 |
| 17.52 | 1029.35 | 19.75 | 1029.23 | 25.32 | 1029.08 | 30.39 | 1028.84 | 33.13 | 1028.89 |
| 40.62 | 1028.9 | 41.04 | 1028.9 | 48.72 | 1029.11 | 51.68 | 1029.15 | 58.03 | 1029.21 |
| 62.32 | 1029.22 | 64.33 | 1029.18 | 69.81 | 1029.08 | 72.13 | 1029.02 | 72.97 | 1028.99 |
| 79.92 | 1028.59 | 83.61 | 1028.39 | 87.72 | 1028.14 | 94.26 | 1027.79 | 95.52 | 1027.73 |
| 98.99 | 1027.59 | 103.33 | 1027.4 | 104.9 | 1027.34 | 111.12 | 1027.31 | 115.55 | 1027.26 |
| 118.92 | 1027.34 | 126.19 | 1027.47 | 128.18 | 1027.54 | 134.53 | 1027.8 | 136.84 | 1027.87 |
| 142.32 | 1028.08 | 147.48 | 1028.3 | 150.12 | 1028.33 | 157.37 | 1028.54 | 157.92 | 1028.56 |
| 158.56 | 1028.56 | 168.77 | 1028.42 | 173.52 | 1028.14 | 179.41 | 1027.88 | 181.32 | 1027.7 |
| 186.55 | 1027.32 | 189.12 | 1027.11 | 190.05 | 1027.06 | 196.92 | 1026.56 | 200.7 | 1026.37 |
| 208.82 | 1026.05 | 211.35 | 1025.94 | 212.52 | 1025.92 | 220.32 | 1025.7 | 221.99 | 1025.66 |
| 228.12 | 1025.78 | 232.63 | 1025.81 | 235.92 | 1026.05 | 243.28 | 1026.42 | 243.71 | 1026.44 |
| 244.92 | 1026.52 | 251.52 | 1026.94 | 253.92 | 1027.08 | 259.09 | 1027.28 | 264.57 | 1027.47 |
| 274.1 | 1027.66 | 274.91 | 1027.67 | 275.21 | 1027.68 | 282.71 | 1027.76 | 290.52 | 1027.74 |
| 296.5 | 1027.67 | 298.32 | 1027.66 | 303.29 | 1027.71 | 306.11 | 1027.72 | 307.14 | 1027.76 |
| 313.91 | 1028 | 317.79 | 1028.16 | 321.72 | 1028.29 | 328.43 | 1028.4 | 329.52 | 1028.42 |
| 332.48 | 1028.46 | 337.31 | 1028.55 | 339.08 | 1028.55 | 345.11 | 1028.65 | 352.91 | 1028.73 |
| 360.37 | 1028.84 | 360.72 | 1028.84 | 361.66 | 1028.85 | 368.51 | 1028.87 | 371.01 | 1028.87 |
| 376.31 | 1028.82 | 380.64 | 1028.8 | 381.65 | 1028.8 | 384.11 | 1028.72 | 390.85 | 1028.54 |
| 391.92 | 1028.51 | 392.3 | 1028.5 | 399.71 | 1028.28 | 402.94 | 1028.2 | 407.51 | 1028.03 |
| 413.59 | 1027.84 | 415.31 | 1027.74 | 424.23 | 1027.31 | 430.91 | 1026.73 | 434.88 | 1026.46 |
| 438.71 | 1026.07 | 444.69 | 1025.52 | 445.52 | 1025.44 | 446.51 | 1025.34 | 451.31 | 1024.878 |
| 454.31 | 1024.59 | 456.16 | 1024.42 | 466.81 | 1023.5 | 469.91 | 1023.36 | 477.45 | 1022.99 |
| 477.71 | 1022.99 | 478.41 | 1022.97 | 485.51 | 1022.85 | 488.1 | 1022.82 | 493.66 | 1022.78 |
| 498.74 | 1022.73 | 507.6 | 1022.76 | 508.91 | 1022.77 | 509.39 | 1022.77 | 516.71 | 1022.91 |
| 520.03 | 1022.99 | 524.51 | 1023.09 | 530.67 | 1023.25 | 532.3 | 1023.29 | 535.85 | 1023.39 |
| 536.78 | 1023.42 | 541.32 | 1023.53 | 547.91 | 1023.77 | 551.96 | 1023.88 | 555.71 | 1024.1 |
| 562.61 | 1024.4 | 563.5 | 1024.45 | 571.3 | 1024.77 | 573.25 | 1024.79 | 578.96 | 1024.91 |
| 579.1 | 1024.91 | 586.91 | 1024.89 | 594.54 | 1024.74 | 594.7 | 1024.74 | 595.15 | 1024.73 |
| 602.5 | 1024.65 | 605.18 | 1024.64 | 610.3 | 1024.55 | 615.83 | 1024.47 | 624.33 | 1024.43 |
| 625.9 | 1024.45 | 626.47 | 1024.48 | 633.7 | 1024.78 | 637.12 | 1025.03 | 644.45 | 1025.66 |
| 647.76 | 1025.88 | 653.52 | 1026.35 | 657.1 | 1026.7 | 658.41 | 1026.86 | 664.9 | 1027.37 |
| 669.05 | 1027.73 | 672.7 | 1027.94 | 679.69 | 1028.36 | 680.5 | 1028.38 | 682.71 | 1028.4 |
| 688.3 | 1028.4 | 690.34 | 1028.48 | 696.1 | 1028.41 | 700.98 | 1028.29 | 703.9 | 1028.28 |
| 711.63 | 1028.05 | 711.89 | 1028.05 | 719.49 | 1027.94 | 722.27 | 1027.91 | 727.3 | 1027.94 |
| 732.92 | 1027.82 | 735.1 | 1027.78 | 741.08 | 1027.63 | 742.9 | 1027.59 | 743.56 | 1027.58 |
| 750.7 | 1027.43 | 754.21 | 1027.49 | 758.49 | 1028.05 | 764.85 | 1028.08 | 766.3 | 1028.18 |
| 770.27 | 1028.07 | 775.49 | 1028.13 | 781.9 | 1028.15 | 786.14 | 1028.19 | 789.69 | 1028.49 |
| 796.78 | 1028.68 | 797.49 | 1028.76 | 799.45 | 1028.8 | 805.3 | 1029.14 | 807.43 | 1029.21 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 813.1 | 1029.57 | 818.07 | 1029.69 | 820.89 | 1029.83 | 828.64 | 1030.06 | 828.76 | 1030.06 |
| 839.36 | 1030.41 | 845.51 | 1030.53 | 850 | 1030.67 | 857.83 | 1030.85 | 859.89 | 1030.91 |
| 860.65 | 1030.92 | 867.69 | 1031.19 | 871.29 | 1031.3 | 875.5 | 1031.45 | 881.94 | 1031.61 |
| 883.29 | 1031.65 | 887.01 | 1031.72 | 891.09 | 1031.82 | 892.58 | 1031.84 | 898.89 | 1032 |
| 903.23 | 1032.06 | 912.53 | 1032.29 | 913.87 | 1032.33 | 914.49 | 1032.34 | 922.29 | 1032.53 |
| 924.51 | 1032.57 | 930.09 | 1032.64 | 937.9 | 1032.72 | 945.39 | 1032.78 | 945.8 | 1032.78 |
| 946.05 | 1032.79 | 956.45 | 1033.03 | 961.29 | 1033.19 | 974.56 | 1033.55 | 976.89 | 1033.61 |
| 977.74 | 1033.63 | 988.38 | 1033.85 | 999.02 | 1034.04 | 1000.29 | 1034.06 | 1008.09 | 1034.2 |
| 1009.67 | 1034.22 | 1015.89 | 1034.33 | 1020.31 | 1034.4 | 1029.82 | 1034.51 | 1030.96 | 1034.52 |
| 1031.49 | 1034.52 | 1039.29 | 1034.58 | 1052.25 | 1034.65 | 1054.89 | 1034.67 | 1062.12 | 1034.7 |
| 1062.89 | 1034.7 | 1063.33 | 1034.71 | 1073.53 | 1034.76 | 1091.31 | 1034.9 | 1093.89 | 1034.91 |
| 1094.83 | 1034.92 | 1117.28 | 1035.09 | 1147.11 | 1035.37 | 1148.04 | 1035.38 | 1148.48 | 1035.39 |
| 1149.68 | 1035.4 | 1169.34 | 1035.62 | 1171.88 | 1035.64 | 1179.98 | 1035.72 | 1180.62 | 1035.73 |
| 1195.29 | 1035.83 | 1201.27 | 1035.86 | 1203.08 | 1035.86 | 1208.06 | 1035.88 | 1210.88 | 1035.9 |
| 1211.91 | 1035.9 | 1218.68 | 1035.92 | 1222.55 | 1035.94 | 1231.84 | 1035.96 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 444.69 | .04 | 535.85 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 451.31 | 578.96 | 208.53 | 199.99 | 189.65 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 579.1 | 1231.84 | 1024.91 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1024.88 | Reach Len. (ft) | 208.53 | 199.99 | 189.65 |
| Crit W.S. (ft) | 1024.48 | Flow Area (sq ft) | | 173.26 | |
| E.G. Slope (ft/ft) | 0.007945 | Area (sq ft) | 0.00 | 173.26 | 12.54 |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 173.79 | Top Width (ft) | 0.01 | 126.18 | 47.59 |
| Vel Total (ft/s) | 4.46 | Avg. Vel. (ft/s) | | 4.46 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.37 | |
| Conv. Total (cfs) | 8661.1 | Conv. (cfs) | | 8661.1 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 126.29 | |
| Min Ch El (ft) | 1022.73 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.03 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | 1.19 | 46.40 | 0.91 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.03 | 34.66 | 1.77 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1024.88 | Reach Len. (ft) | 208.53 | 199.99 | 189.65 |
| Crit W.S. (ft) | 1024.48 | Flow Area (sq ft) | | 173.24 | |
| E.G. Slope (ft/ft) | 0.007947 | Area (sq ft) | | 173.24 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 126.17 | Top Width (ft) | | 126.17 | |
| Vel Total (ft/s) | 4.46 | Avg. Vel. (ft/s) | | 4.46 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.37 | |
| Conv. Total (cfs) | 8660.0 | Conv. (cfs) | | 8660.0 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 126.29 | |
| Min Ch El (ft) | 1022.73 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.03 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | | 47.31 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 34.71 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1024.88 | Reach Len. (ft) | 208.53 | 199.99 | 189.65 |
| Crit W.S. (ft) | 1024.48 | Flow Area (sq ft) | | 173.24 | |
| E.G. Slope (ft/ft) | 0.007947 | Area (sq ft) | | 173.24 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 126.17 | Top Width (ft) | | 126.17 | |
| Vel Total (ft/s) | 4.46 | Avg. Vel. (ft/s) | | 4.46 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.37 | |
| Conv. Total (cfs) | 8660.0 | Conv. (cfs) | | 8660.0 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 126.29 | |
| Min Ch El (ft) | 1022.73 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.03 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | 0.05 | 47.26 | 0.12 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.22 | 34.70 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.510

INPUT
Description: Thalweg Sta. 574.26
Station Elevation Data num= 195

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1029.05 | 5.15 | 1029.59 | 8 | 1029.9 | 8.79 | 1029.97 | 16.12 | 1030.29 |
| 19.17 | 1030.39 | 24.24 | 1030.43 | 29.55 | 1030.51 | 32.37 | 1030.49 | 39.92 | 1030.47 |
| 40.5 | 1030.47 | 42.53 | 1030.46 | 48.61 | 1030.44 | 50.3 | 1030.43 | 60.68 | 1030.54 |
| 64.86 | 1030.61 | 71.06 | 1030.73 | 72.98 | 1030.76 | 81.44 | 1030.93 | 82.02 | 1030.94 |
| 91.82 | 1031.07 | 96.39 | 1031.15 | 102.19 | 1031.22 | 110.75 | 1031.47 | 112.57 | 1031.51 |
| 121.73 | 1031.69 | 122.95 | 1031.7 | 137.97 | 1031.73 | 143.71 | 1031.77 | 146.09 | 1031.77 |
| 154.08 | 1031.83 | 154.22 | 1031.83 | 154.69 | 1031.84 | 162.33 | 1031.87 | 164.46 | 1031.89 |
| 185.22 | 1031.94 | 186.71 | 1031.95 | 192.08 | 1031.94 | 194.83 | 1031.94 | 195.59 | 1031.93 |
| 202.95 | 1031.88 | 205.97 | 1031.87 | 211.08 | 1031.84 | 216.35 | 1031.82 | 219.2 | 1031.8 |
| 226.73 | 1031.77 | 227.32 | 1031.76 | 229.46 | 1031.75 | 237.11 | 1031.7 | 243.57 | 1031.64 |
| 247.49 | 1031.61 | 251.69 | 1031.56 | 257.86 | 1031.52 | 266.85 | 1031.49 | 267.94 | 1031.48 |
| 268.24 | 1031.48 | 276.07 | 1031.46 | 278.62 | 1031.46 | 299.38 | 1031.4 | 300.44 | 1031.39 |
| 308.55 | 1031.35 | 324.8 | 1031.22 | 340.89 | 1031.01 | 341.05 | 1031.01 | 341.62 | 1031 |
| 349.17 | 1030.84 | 372.03 | 1030.3 | 373.54 | 1030.26 | 381.66 | 1030.08 | 382.4 | 1030.06 |
| 392.78 | 1029.82 | 403.16 | 1029.49 | 413.54 | 1029.01 | 414.16 | 1028.97 | 422.29 | 1028.53 |
| 423.92 | 1028.45 | 430.4 | 1028.09 | 434.29 | 1027.9 | 438.53 | 1027.66 | 444.67 | 1027.34 |
| 455.05 | 1026.6 | 462.9 | 1025.89 | 465.43 | 1025.62 | 471.02 | 1025.32 | 475.8 | 1024.6 |
| 479.15 | 1024.56 | 486.18 | 1024.52 | 495.39 | 1024.45 | 495.85 | 1024.45 | 496.56 | 1024.44 |
| 503.52 | 1024.27 | 506.94 | 1024.13 | 511.63 | 1023.86 | 517.32 | 1023.57 | 519.76 | 1023.32 |
| 527.7 | 1022.79 | 527.88 | 1022.77 | 528.56 | 1022.74 | 534.17 | 1022.41 | 536.01 | 1022.3 |
| 538.08 | 1022.25 | 541.74 | 1022.14 | 548.45 | 1021.91 | 556.1 | 1021.75 | 558.83 | 1021.68 |
| 560.38 | 1021.68 | 568.5 | 1021.61 | 569.21 | 1021.6 | 579.59 | 1021.6 | 584.83 | 1021.63 |
| 589.97 | 1021.67 | 609.11 | 1021.97 | 610.72 | 1022 | 627.21 | 1022.25 | 627.93 | 1022.26 |
| 631.48 | 1022.32 | 640.71 | 1022.51 | 641.61 | 1022.53 | 641.86 | 1022.53 | 649.73 | 1022.79 |
| 652.24 | 1022.94 | 657.85 | 1023.26 | 662.61 | 1023.66 | 665.98 | 1023.9 | 672.99 | 1024.52 |
| 674.1 | 1024.61 | 677.75 | 1024.94 | 678.7 | 1025.02 | 682.79 | 1025.33 | 683.19 | 1025.37 |
| 691.94 | 1025.76 | 693.24 | 1025.85 | 701.1 | 1026.09 | 701.64 | 1026.11 | 703.28 | 1026.19 |
| 710.26 | 1026.43 | 713.33 | 1026.55 | 719.41 | 1026.7 | 728.56 | 1026.91 | 733.43 | 1026.94 |
| 737.72 | 1026.93 | 743.47 | 1026.97 | 746.87 | 1027.28 | 753.52 | 1027.44 | 756.03 | 1027.61 |
| 763.57 | 1027.87 | 765.19 | 1027.98 | 773.62 | 1028.28 | 774.34 | 1028.32 | 781.75 | 1028.67 |
| 783.49 | 1028.76 | 783.66 | 1028.76 | 792.65 | 1029.3 | 793.71 | 1029.36 | 801.81 | 1029.84 |
| 803.76 | 1029.94 | 810.96 | 1030.21 | 820.12 | 1030.5 | 823.85 | 1030.6 | 838.42 | 1031.05 |
| 843.95 | 1031.21 | 847.58 | 1031.3 | 854 | 1031.47 | 864.04 | 1031.69 | 865.89 | 1031.72 |
| 875.05 | 1031.91 | 884.14 | 1032.08 | 884.2 | 1032.08 | 893.35 | 1032.23 | 894.19 | 1032.24 |
| 902.51 | 1032.31 | 904.23 | 1032.33 | 906.33 | 1032.34 | 914.28 | 1032.36 | 917.47 | 1032.36 |
| 934.38 | 1032.4 | 939.13 | 1032.43 | 944.42 | 1032.44 | 984.26 | 1032.75 | 984.9 | 1032.75 |
| 994.06 | 1032.81 | 994.66 | 1032.82 | 1003.21 | 1032.86 | 1004.71 | 1032.88 | 1012.36 | 1032.92 |
| 1014.75 | 1032.94 | 1030.68 | 1033.04 | 1034.85 | 1033.06 | 1044.9 | 1033.14 | 1054.94 | 1033.26 |
| 1075.04 | 1033.59 | 1076.46 | 1033.62 | 1085.09 | 1033.77 | 1085.61 | 1033.78 | 1094.6 | 1033.93 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 534.17 | .04 | 627.21 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 495.85 | 672.99 | 220.58 | 199.95 | 162.31 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.80 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1023.57 | Reach Len. (ft) | 220.58 | 199.95 | 162.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 199.52 | |
| E.G. Slope (ft/ft) | 0.005876 | Area (sq ft) | | 199.52 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 144.28 | Top Width (ft) | | 144.28 | |
| Vel Total (ft/s) | 3.87 | Avg. Vel. (ft/s) | | 3.87 | |
| Max Chl Dpth (ft) | 1.97 | Hydr. Depth (ft) | | 1.38 | |
| Conv. Total (cfs) | 10071.4 | Conv. (cfs) | | 10071.4 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 144.37 | |
| Min Ch El (ft) | 1021.60 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.96 | |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | 1.19 | 45.54 | 0.89 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.03 | 34.03 | 1.67 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.80 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1023.57 | Reach Len. (ft) | 220.58 | 199.95 | 162.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 199.52 | |
| E.G. Slope (ft/ft) | 0.005876 | Area (sq ft) | | 199.52 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 144.28 | Top Width (ft) | | 144.28 | |
| Vel Total (ft/s) | 3.87 | Avg. Vel. (ft/s) | | 3.87 | |
| Max Chl Dpth (ft) | 1.97 | Hydr. Depth (ft) | | 1.38 | |
| Conv. Total (cfs) | 10071.4 | Conv. (cfs) | | 10071.4 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 144.37 | |
| Min Ch El (ft) | 1021.60 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.96 | |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | | 46.46 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 34.08 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.80 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1023.57 | Reach Len. (ft) | 220.58 | 199.95 | 162.31 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 199.52 | |
| E.G. Slope (ft/ft) | 0.005876 | Area (sq ft) | | 199.52 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 144.28 | Top Width (ft) | | 144.28 | |
| Vel Total (ft/s) | 3.87 | Avg. Vel. (ft/s) | | 3.87 | |
| Max Chl Dpth (ft) | 1.97 | Hydr. Depth (ft) | | 1.38 | |
| Conv. Total (cfs) | 10071.4 | Conv. (cfs) | | 10071.4 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 144.37 | |
| Min Ch El (ft) | 1021.60 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.96 | |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | 0.05 | 46.40 | 0.12 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.22 | 34.08 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.472

INPUT
Description: Thalweg Sta. 356.22
Station Elevation Data num= 163

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1026.09 | 5.96 | 1025.82 | 13.53 | 1025.46 | 15.97 | 1025.35 | 23.94 | 1025.04 |
| 25.98 | 1024.98 | 34.35 | 1024.76 | 35.99 | 1024.73 | 37.51 | 1024.71 | 45.99 | 1024.52 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 47.14 | 1024.5 | 56 | 1024.33 | 65.56 | 1024.18 | 66.43 | 1024.16 | 77.41 | 1024.01 |
| 86.02 | 1023.85 | 86.36 | 1023.84 | 96.03 | 1023.43 | 96.77 | 1023.4 | 106.04 | 1022.99 |
| 107.18 | 1022.98 | 116.04 | 1022.83 | 117.58 | 1022.85 | 126.05 | 1022.82 | 127.98 | 1022.86 |
| 136.06 | 1022.88 | 138.39 | 1022.91 | 153.18 | 1023.05 | 156.07 | 1023.06 | 159.2 | 1023.04 |
| 166.08 | 1023.06 | 169.6 | 1022.99 | 176.09 | 1022.91 | 182.1 | 1022.78 | 186.1 | 1022.67 |
| 191.74 | 1022.67 | 196.1 | 1022.71 | 200.82 | 1022.9 | 206.11 | 1023.06 | 211.21 | 1023.23 |
| 216.12 | 1023.37 | 221.62 | 1023.48 | 226.12 | 1023.56 | 232.03 | 1023.62 | 236.13 | 1023.63 |
| 242.44 | 1023.75 | 246.14 | 1023.78 | 252.83 | 1023.9 | 256.15 | 1023.9 | 263.24 | 1024 |
| 266.15 | 1024.01 | 273.65 | 1024.14 | 276.16 | 1024.18 | 284.05 | 1024.38 | 286.17 | 1024.47 |
| 294.45 | 1024.67 | 296.18 | 1024.76 | 298.12 | 1024.71 | 303.93 | 1024.55 | 304.86 | 1024.52 |
| 306.18 | 1024.58 | 315.26 | 1023.34 | 316.19 | 1023.22 | 325.67 | 1021.41 | 326.2 | 1021.32 |
| 336.07 | 1020.38 | 336.21 | 1020.37 | 339.54 | 1020.24 | 346.21 | 1019.99 | 346.47 | 1019.99 |
| 356.22 | 1019.84 | 356.88 | 1019.85 | 366.23 | 1019.96 | 367.29 | 1019.99 | 376.23 | 1020.2 |
| 388.09 | 1020.45 | 389.1 | 1020.47 | 396.25 | 1020.61 | 398.5 | 1020.66 | 406.26 | 1020.85 |
| 408.91 | 1020.92 | 416.26 | 1021.15 | 426.27 | 1021.61 | 429.71 | 1021.87 | 436.28 | 1022.24 |
| 440.12 | 1022.52 | 446.29 | 1022.87 | 456.29 | 1023.6 | 460.93 | 1023.99 | 466.3 | 1024.46 |
| 471.33 | 1024.91 | 476.31 | 1025.41 | 481.73 | 1025.89 | 486.31 | 1026.34 | 492.14 | 1026.79 |
| 493.64 | 1026.92 | 496.32 | 1027.14 | 506.33 | 1027.85 | 512.95 | 1028.24 | 516.34 | 1028.43 |
| 526.34 | 1028.87 | 536.35 | 1029.22 | 544.17 | 1029.42 | 546.36 | 1029.49 | 554.56 | 1029.64 |
| 556.37 | 1029.67 | 575.38 | 1029.95 | 576.38 | 1029.97 | 585.78 | 1030.1 | 586.39 | 1030.11 |
| 596.18 | 1030.21 | 596.39 | 1030.21 | 606.4 | 1030.17 | 606.59 | 1030.17 | 616.41 | 1030.03 |
| 616.99 | 1030.03 | 626.42 | 1029.92 | 627.4 | 1029.92 | 636.42 | 1029.85 | 637.81 | 1029.85 |
| 648.21 | 1029.79 | 656.44 | 1029.69 | 658.61 | 1029.69 | 666.45 | 1029.64 | 669.02 | 1029.63 |
| 676.45 | 1029.71 | 679.43 | 1029.72 | 686.46 | 1029.97 | 689.82 | 1030.08 | 696.47 | 1030.38 |
| 706.47 | 1030.85 | 710.64 | 1031.03 | 716.48 | 1031.21 | 721.04 | 1031.32 | 726.49 | 1031.43 |
| 741.85 | 1031.67 | 762.66 | 1031.93 | 766.52 | 1031.97 | 776.53 | 1032.11 | 783.47 | 1032.22 |
| 786.53 | 1032.26 | 796.54 | 1032.41 | 804.28 | 1032.51 | 825.08 | 1032.71 | 826.56 | 1032.72 |
| 845.9 | 1032.9 | 846.58 | 1032.91 | 856.29 | 1033 | 856.58 | 1033 | 866.59 | 1033.11 |
| 866.7 | 1033.11 | 876.6 | 1033.24 | 877.11 | 1033.24 | 886.61 | 1033.36 | 887.51 | 1033.38 |
| 896.61 | 1033.48 | 906.62 | 1033.56 | 936.64 | 1033.71 | 939.54 | 1033.72 | 946.65 | 1033.77 |
| 956.66 | 1033.86 | 966.66 | 1033.97 | 967.92 | 1033.98 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 303.93 | .04 | 389.1 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 298.12 | 471.33 | 185.27 | 199.97 | 230.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1022.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1022.10 | Reach Len. (ft) | 185.27 | 199.97 | 230.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 165.42 | |
| E.G. Slope (ft/ft) | 0.007882 | Area (sq ft) | | 165.42 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 111.82 | Top Width (ft) | | 111.82 | |
| Vel Total (ft/s) | 4.67 | Avg. Vel. (ft/s) | | 4.67 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.48 | |
| Conv. Total (cfs) | 8695.8 | Conv. (cfs) | | 8695.8 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 111.99 | |
| Min Ch El (ft) | 1019.84 | Shear (lb/sq ft) | | 0.73 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.39 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 1.19 | 44.70 | 0.89 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 1.03 | 33.45 | 1.67 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1022.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1022.10 | Reach Len. (ft) | 185.27 | 199.97 | 230.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 165.42 | |
| E.G. Slope (ft/ft) | 0.007882 | Area (sq ft) | | 165.42 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 111.82 | Top Width (ft) | | 111.82 | |
| Vel Total (ft/s) | 4.67 | Avg. Vel. (ft/s) | | 4.67 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.48 | |
| Conv. Total (cfs) | 8695.8 | Conv. (cfs) | | 8695.8 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 111.99 | |
| Min Ch El (ft) | 1019.84 | Shear (lb/sq ft) | | 0.73 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.39 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | | 45.62 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 33.50 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1022.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1022.10 | Reach Len. (ft) | 185.27 | 199.97 | 230.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 165.42 | |
| E.G. Slope (ft/ft) | 0.007882 | Area (sq ft) | | 165.42 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 111.82 | Top Width (ft) | | 111.82 | |
| Vel Total (ft/s) | 4.67 | Avg. Vel. (ft/s) | | 4.67 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.48 | |
| Conv. Total (cfs) | 8695.8 | Conv. (cfs) | | 8695.8 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 111.99 | |
| Min Ch El (ft) | 1019.84 | Shear (lb/sq ft) | | 0.73 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.39 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 0.05 | 45.56 | 0.12 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.22 | 33.49 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.434

INPUT
Description: Thalweg Sta. 241.76
Station Elevation Data num= 102

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1027.9 | 5.32 | 1027.93 | 7.25 | 1027.95 | 17.44 | 1028.07 | 22.87 | 1028.11 |
| 27.64 | 1028.17 | 35.59 | 1028.22 | 37.84 | 1028.24 | 39.34 | 1028.25 | 46.87 | 1028.29 |
| 48.03 | 1028.29 | 56.34 | 1028.31 | 64.85 | 1028.36 | 68.42 | 1028.39 | 73.35 | 1028.35 |
| 78.62 | 1028.33 | 81.85 | 1028.27 | 88.82 | 1028.11 | 90.36 | 1028.07 | 98.12 | 1027.85 |
| 98.86 | 1027.83 | 99.01 | 1027.82 | 107.36 | 1027.58 | 109.21 | 1027.53 | 115.88 | 1027.28 |
| 119.41 | 1027.13 | 124.38 | 1026.89 | 129.6 | 1026.62 | 132.88 | 1026.44 | 139.8 | 1026.03 |
| 141.39 | 1025.94 | 149.37 | 1025.38 | 149.99 | 1025.33 | 158.39 | 1024.49 | 160.19 | 1024.23 |
| 166.9 | 1023.24 | 170.38 | 1022.78 | 171.83 | 1022.54 | 175.4 | 1021.96 | 180.58 | 1021.22 |
| 181.03 | 1021.15 | 183.9 | 1020.73 | 190.78 | 1019.88 | 192.41 | 1019.77 | 200.62 | 1019.33 |
| 200.91 | 1019.31 | 200.97 | 1019.31 | 209.42 | 1019.13 | 221.36 | 1018.92 | 231.56 | 1018.8 |
| 234.93 | 1018.79 | 241.76 | 1018.82 | 251.87 | 1018.97 | 251.95 | 1018.97 | 262.15 | 1019.14 |
| 268.95 | 1019.27 | 272.35 | 1019.32 | 277.45 | 1019.44 | 279.77 | 1019.49 | 294.46 | 1019.76 |
| 302.93 | 1019.95 | 303.12 | 1019.96 | 311.47 | 1020.28 | 313.13 | 1020.4 | 319.97 | 1020.64 |
| 323.33 | 1020.8 | 328.47 | 1020.97 | 333.52 | 1021.17 | 336.98 | 1021.28 | 343.72 | 1021.45 |
| 345.48 | 1021.51 | 345.6 | 1021.51 | 353.91 | 1021.6 | 354.37 | 1021.6 | 362.49 | 1021.77 |
| 364.11 | 1021.75 | 371 | 1022.05 | 374.31 | 1022.03 | 379.51 | 1022.4 | 384.5 | 1022.58 |
| 394.7 | 1023.39 | 396.51 | 1023.54 | 404.89 | 1024.43 | 405.02 | 1024.44 | 405.62 | 1024.49 |
| 413.52 | 1025.21 | 415.09 | 1025.36 | 422.02 | 1025.86 | 425.29 | 1026.08 | 430.53 | 1026.37 |
| 435.48 | 1026.61 | 439.03 | 1026.76 | 445.68 | 1027.02 | 447.53 | 1027.09 | 455.87 | 1027.38 |
| 456.04 | 1027.39 | 464.54 | 1027.59 | 466.07 | 1027.63 | 473.04 | 1027.76 | 476.27 | 1027.81 |
| 481.55 | 1027.93 | 484.03 | 1027.97 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 181.03 | .04 | 279.77 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 171.83 | 345.6 | 195.97 | 200 | 206.51 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1020.99 | Reach Len. (ft) | 195.97 | 200.00 | 206.51 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 214.67 | |
| E.G. Slope (ft/ft) | 0.004821 | Area (sq ft) | | 214.67 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 146.71 | Top Width (ft) | | 146.71 | |
| Vel Total (ft/s) | 3.60 | Avg. Vel. (ft/s) | | 3.60 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | | 1.46 | |
| Conv. Total (cfs) | 11119.1 | Conv. (cfs) | | 11119.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 146.84 | |
| Min Ch El (ft) | 1018.79 | Shear (lb/sq ft) | | 0.44 | |

| | | | | | |
|---|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.58 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 1.19 | 43.83 | 0.89 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.03 | 32.85 | 1.67 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.19 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1020.99 | Reach Len. (ft) | 195.97 | 200.00 | 206.51 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 214.67 | |
| E.G. Slope (ft/ft) | 0.004821 | Area (sq ft) | | 214.67 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 146.71 | Top Width (ft) | | 146.71 | |
| Vel Total (ft/s) | 3.60 | Avg. Vel. (ft/s) | | 3.60 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | | 1.46 | |
| Conv. Total (cfs) | 11119.1 | Conv. (cfs) | | 11119.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 146.84 | |
| Min Ch El (ft) | 1018.79 | Shear (lb/sq ft) | | 0.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.58 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | | 44.75 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 32.90 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.19 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1020.99 | Reach Len. (ft) | 195.97 | 200.00 | 206.51 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 214.67 | |
| E.G. Slope (ft/ft) | 0.004821 | Area (sq ft) | | 214.67 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 146.71 | Top Width (ft) | | 146.71 | |
| Vel Total (ft/s) | 3.60 | Avg. Vel. (ft/s) | | 3.60 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | | 1.46 | |
| Conv. Total (cfs) | 11119.1 | Conv. (cfs) | | 11119.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 146.84 | |
| Min Ch El (ft) | 1018.79 | Shear (lb/sq ft) | | 0.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.58 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 0.05 | 44.69 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 32.90 | 0.31 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.396

INPUT
Description: Thalweg Sta. 272.95
Station Elevation Data num= 179

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1025.94 | 2.36 | 1026.02 | 7.77 | 1026.14 | 10.56 | 1026.18 | 18.1 | 1026.32 |
| 18.76 | 1026.32 | 21.3 | 1026.36 | 26.96 | 1026.46 | 30.95 | 1026.51 | 38.77 | 1026.62 |
| 44.92 | 1026.67 | 49.1 | 1026.72 | 59.44 | 1026.81 | 59.76 | 1026.81 | 61.01 | 1026.82 |
| 72.85 | 1026.94 | 84.36 | 1027.08 | 90.43 | 1027.12 | 92.55 | 1027.11 | 100.72 | 1027.12 |
| 108.95 | 1027 | 111.1 | 1026.98 | 117.16 | 1026.83 | 131.77 | 1026.41 | 133.56 | 1026.35 |
| 140.43 | 1026.13 | 141.75 | 1026.08 | 142.1 | 1026.07 | 149.95 | 1025.77 | 152.44 | 1025.67 |
| 158.15 | 1025.43 | 162.77 | 1025.22 | 166.35 | 1025.08 | 173.1 | 1024.8 | 174.55 | 1024.76 |
| 182.75 | 1024.48 | 183.44 | 1024.45 | 190.38 | 1024.18 | 190.96 | 1024.16 | 193.77 | 1024.02 |
| 199.15 | 1023.62 | 204.1 | 1023.23 | 207.36 | 1022.73 | 214.43 | 1021.7 | 215.55 | 1021.49 |
| 218.97 | 1020.9 | 219.84 | 1020.75 | 223.75 | 1020.05 | 224.77 | 1019.89 | 231.95 | 1018.86 |
| 235.1 | 1018.47 | 240.15 | 1018.12 | 245.43 | 1017.8 | 255.77 | 1017.62 | 256.55 | 1017.61 |
| 264.74 | 1017.58 | 266.1 | 1017.58 | 272.95 | 1017.61 | 281.14 | 1017.71 | 289.35 | 1017.83 |
| 297.1 | 1017.96 | 299.26 | 1018.01 | 305.75 | 1018.15 | 307.43 | 1018.18 | 313.94 | 1018.37 |
| 317.77 | 1018.49 | 322.15 | 1018.71 | 328.1 | 1019.05 | 335.81 | 1019.56 | 338.43 | 1019.73 |
| 338.54 | 1019.73 | 338.96 | 1019.75 | 346.74 | 1020.09 | 354.61 | 1020.21 | 354.94 | 1020.22 |
| 359.1 | 1020.18 | 363.14 | 1020.17 | 369.43 | 1019.96 | 371.34 | 1019.92 | 378.67 | 1019.6 |
| 379.53 | 1019.56 | 387.74 | 1019.2 | 390.1 | 1019.18 | 395.93 | 1019.08 | 400.43 | 1019.09 |
| 404.14 | 1019.11 | 410.76 | 1019.16 | 412.33 | 1019.19 | 418.38 | 1019.23 | 420.54 | 1019.27 |
| 421.1 | 1019.27 | 428.73 | 1019.36 | 431.43 | 1019.37 | 436.94 | 1019.45 | 441.76 | 1019.51 |
| 445.13 | 1019.57 | 452.09 | 1019.68 | 453.33 | 1019.69 | 458.09 | 1019.76 | 461.53 | 1019.82 |
| 462.43 | 1019.83 | 469.73 | 1019.9 | 472.76 | 1019.94 | 477.93 | 1019.97 | 483.09 | 1020.02 |
| 486.13 | 1020.04 | 493.42 | 1020.13 | 494.32 | 1020.15 | 497.79 | 1020.2 | 502.53 | 1020.29 |
| 503.76 | 1020.32 | 510.72 | 1020.46 | 514.09 | 1020.54 | 518.93 | 1020.63 | 524.42 | 1020.83 |
| 527.12 | 1020.89 | 534.76 | 1021.11 | 537.5 | 1021.16 | 545.09 | 1021.37 | 555.42 | 1021.6 |
| 561.73 | 1021.72 | 565.76 | 1021.83 | 575.7 | 1022.06 | 576.09 | 1022.07 | 576.32 | 1022.08 |
| 577.21 | 1022.1 | 584.52 | 1022.29 | 586.42 | 1022.27 | 592.72 | 1022.4 | 596.76 | 1022.43 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 600.92 | 1022.53 | 607.09 | 1022.72 | 609.12 | 1022.79 | 616.92 | 1023.31 | 617.42 | 1023.34 |
| 617.6 | 1023.36 | 627.75 | 1024.11 | 631.57 | 1024.38 | 638.09 | 1024.79 | 648.42 | 1025.19 |
| 656.62 | 1025.29 | 658.31 | 1025.3 | 658.75 | 1025.31 | 669.09 | 1025.39 | 679.42 | 1025.25 |
| 682.91 | 1025.19 | 689.75 | 1025.05 | 691.11 | 1025.07 | 696.33 | 1024.93 | 699.31 | 1024.88 |
| 700.09 | 1024.87 | 707.51 | 1024.8 | 710.42 | 1024.76 | 715.71 | 1025.17 | 720.75 | 1025.18 |
| 723.91 | 1025.36 | 731.09 | 1025.44 | 732.11 | 1025.49 | 736.03 | 1025.59 | 740.3 | 1025.82 |
| 741.42 | 1025.86 | 748.51 | 1026.44 | 751.75 | 1026.54 | 756.7 | 1026.83 | 762.08 | 1026.96 |
| 764.91 | 1027.06 | 772.42 | 1027.21 | 773.1 | 1027.23 | 775.74 | 1027.29 | 781.3 | 1027.49 |
| 782.75 | 1027.51 | 789.5 | 1027.7 | 793.08 | 1027.73 | 797.7 | 1027.84 | 803.42 | 1027.91 |
| 805.9 | 1027.97 | 813.75 | 1028.08 | 814.1 | 1028.09 | 817.07 | 1028.18 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 218.97 | .04 | 335.81 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 223.75 | 354.61 | 183.48 | 199.98 | 215.74 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 354.94 | 817.07 | 1020.22 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1020.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1019.98 | Reach Len. (ft) | 183.48 | 199.98 | 215.74 |
| Crit W.S. (ft) | 1019.28 | Flow Area (sq ft) | | 201.55 | |
| E.G. Slope (ft/ft) | 0.004953 | Area (sq ft) | | 201.55 | 54.32 |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 230.14 | Top Width (ft) | | 120.02 | 110.11 |
| Vel Total (ft/s) | 3.83 | Avg. Vel. (ft/s) | | 3.83 | |
| Max Chl Dpth (ft) | 2.40 | Hydr. Depth (ft) | | 1.68 | |
| Conv. Total (cfs) | 10969.5 | Conv. (cfs) | | 10969.5 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 120.20 | |
| Min Ch El (ft) | 1017.58 | Shear (lb/sq ft) | | 0.52 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.99 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 1.19 | 42.88 | 0.76 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.03 | 32.24 | 1.40 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1020.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1019.98 | Reach Len. (ft) | 183.48 | 199.98 | 215.74 |
| Crit W.S. (ft) | 1019.28 | Flow Area (sq ft) | | 201.55 | |
| E.G. Slope (ft/ft) | 0.004953 | Area (sq ft) | | 201.55 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 120.02 | Top Width (ft) | | 120.02 | |
| Vel Total (ft/s) | 3.83 | Avg. Vel. (ft/s) | | 3.83 | |
| Max Chl Dpth (ft) | 2.40 | Hydr. Depth (ft) | | 1.68 | |
| Conv. Total (cfs) | 10969.5 | Conv. (cfs) | | 10969.5 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 120.20 | |
| Min Ch El (ft) | 1017.58 | Shear (lb/sq ft) | | 0.52 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.99 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | | 43.79 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 32.29 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1020.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1019.98 | Reach Len. (ft) | 183.48 | 199.98 | 215.74 |
| Crit W.S. (ft) | 1019.28 | Flow Area (sq ft) | | 201.55 | |
| E.G. Slope (ft/ft) | 0.004953 | Area (sq ft) | | 201.55 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | | |
| Top Width (ft) | 120.02 | Top Width (ft) | | 120.02 | | |
| Vel Total (ft/s) | 3.83 | Avg. Vel. (ft/s) | | 3.83 | | |
| Max Chl Dpth (ft) | 2.40 | Hydr. Depth (ft) | | 1.68 | | |
| Conv. Total (cfs) | 10969.5 | Conv. (cfs) | | 10969.5 | | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 120.20 | | |
| Min Ch El (ft) | 1017.58 | Shear (lb/sq ft) | | 0.52 | | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.99 | | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 0.05 | 43.74 | 0.12 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.22 | 32.29 | 0.31 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.358

INPUT
Description: Thalweg Sta. 315.34
Station Elevation Data num= 189

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1023.36 | 4.18 | 1023.66 | 5.62 | 1023.78 | 6.13 | 1023.82 | 7.21 | 1023.9 |
| 13.64 | 1024.28 | 16.68 | 1024.4 | 21.15 | 1024.65 | 27.74 | 1024.89 | 28.66 | 1024.93 |
| 36.17 | 1025.09 | 43.68 | 1025.2 | 49.86 | 1025.27 | 51.19 | 1025.29 | 58.7 | 1025.37 |
| 60.93 | 1025.39 | 66.21 | 1025.46 | 71.99 | 1025.5 | 73.72 | 1025.52 | 77.4 | 1025.55 |
| 81.23 | 1025.57 | 83.05 | 1025.57 | 88.74 | 1025.59 | 94.11 | 1025.58 | 96.25 | 1025.59 |
| 103.77 | 1025.56 | 111.28 | 1025.51 | 116.23 | 1025.44 | 118.79 | 1025.42 | 127.29 | 1025.33 |
| 138.36 | 1025.19 | 141.32 | 1025.14 | 147.58 | 1025.02 | 149.42 | 1024.99 | 156.34 | 1024.85 |
| 160.48 | 1024.78 | 163.85 | 1024.69 | 170.98 | 1024.59 | 171.36 | 1024.58 | 171.54 | 1024.58 |
| 178.87 | 1024.42 | 182.6 | 1024.41 | 186.38 | 1024.32 | 193.66 | 1024.23 | 193.89 | 1024.23 |
| 194.36 | 1024.21 | 201.4 | 1023.96 | 204.73 | 1023.85 | 208.91 | 1023.63 | 215.79 | 1023.32 |
| 216.42 | 1023.28 | 217.76 | 1023.21 | 218.63 | 1023.16 | 223.93 | 1022.85 | 226.85 | 1022.7 |
| 231.44 | 1022.36 | 237.91 | 1022 | 238.95 | 1021.89 | 241.15 | 1021.73 | 246.46 | 1021.21 |
| 248.97 | 1020.95 | 253.97 | 1020.28 | 264.55 | 1018.9 | 268.02 | 1018.38 | 268.99 | 1018.24 |
| 271.1 | 1017.97 | 276.5 | 1017.37 | 282.16 | 1016.9 | 284.01 | 1016.79 | 287.94 | 1016.6 |
| 291.52 | 1016.42 | 293.22 | 1016.37 | 299.04 | 1016.31 | 306.55 | 1016.37 | 315.34 | 1016.48 |
| 321.57 | 1016.53 | 329.08 | 1016.61 | 334.73 | 1016.7 | 336.59 | 1016.72 | 344.1 | 1016.9 |
| 348.53 | 1017.05 | 351.61 | 1017.24 | 358.13 | 1017.88 | 359.12 | 1017.97 | 359.59 | 1018.02 |
| 366.63 | 1019.07 | 366.81 | 1019.1 | 370.65 | 1019.65 | 381.52 | 1020.63 | 381.65 | 1020.64 |
| 381.71 | 1020.64 | 389.16 | 1020.86 | 392.77 | 1020.99 | 396.67 | 1021.1 | 403.25 | 1021.35 |
| 403.83 | 1021.37 | 404.18 | 1021.38 | 404.91 | 1021.41 | 411.69 | 1021.56 | 414.9 | 1021.71 |
| 419.2 | 1021.83 | 425.96 | 1022.12 | 426.71 | 1022.14 | 428.3 | 1022.19 | 434.22 | 1022.36 |
| 437.02 | 1022.45 | 441.73 | 1022.53 | 448.08 | 1022.7 | 451.7 | 1022.81 | 456.75 | 1023.05 |
| 459.14 | 1023.21 | 464.26 | 1023.5 | 470.2 | 1023.87 | 471.77 | 1023.95 | 475.09 | 1024.09 |
| 479.28 | 1024.3 | 481.27 | 1024.37 | 492.33 | 1024.68 | 494.31 | 1024.71 | 503.39 | 1024.77 |
| 509.33 | 1024.77 | 514.45 | 1024.76 | 516.84 | 1024.77 | 521.88 | 1024.75 | 525.51 | 1024.72 |
| 528.77 | 1024.66 | 536.57 | 1024.54 | 539.37 | 1024.48 | 545.28 | 1024.34 | 546.88 | 1024.31 |
| 547.63 | 1024.29 | 554.38 | 1024.1 | 558.7 | 1023.97 | 561.89 | 1023.86 | 568.67 | 1023.6 |
| 569.41 | 1023.57 | 569.76 | 1023.55 | 576.92 | 1023.12 | 580.82 | 1022.79 | 584.43 | 1022.77 |
| 591.88 | 1023.07 | 591.94 | 1023.08 | 592.07 | 1023.08 | 599.45 | 1023.48 | 602.94 | 1023.66 |
| 606.96 | 1023.74 | 614 | 1023.91 | 615.45 | 1023.93 | 621.98 | 1024.01 | 625.07 | 1024.04 |
| 629.49 | 1024.04 | 636.13 | 1024.12 | 637 | 1024.12 | 638.85 | 1024.16 | 652.02 | 1024.59 |
| 658.25 | 1024.77 | 659.53 | 1024.81 | 662.24 | 1024.88 | 669.31 | 1025.02 | 680.37 | 1025.19 |
| 685.64 | 1025.28 | 689.58 | 1025.33 | 691.43 | 1025.36 | 702.5 | 1025.51 | 704.6 | 1025.52 |
| 709.03 | 1025.53 | 713.56 | 1025.53 | 719.62 | 1025.43 | 724.62 | 1025.32 | 727.13 | 1025.26 |
| 732.43 | 1025.08 | 734.64 | 1025 | 735.68 | 1024.95 | 742.15 | 1024.71 | 746.74 | 1024.43 |
| 749.65 | 1024.31 | 755.82 | 1024.01 | 757.16 | 1023.95 | 757.8 | 1023.96 | 764.67 | 1024.02 |
| 768.87 | 1024.21 | 779.22 | 1024.53 | 779.7 | 1024.55 | 779.93 | 1024.57 | 787.21 | 1024.9 |
| 802.05 | 1025.52 | 802.23 | 1025.53 | 802.6 | 1025.54 | 809.74 | 1025.84 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 268.02 | .04 | 366.81 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 246.46 | 403.25 | 206.3 | 199.97 | 194.59 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | | |
|---|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.95 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1018.59 | Reach Len. (ft) | 206.30 | 199.97 | 194.59 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.11 | |
| E.G. Slope (ft/ft) | 0.008149 | Area (sq ft) | | 162.11 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 96.83 | Top Width (ft) | | 96.83 | |
| Vel Total (ft/s) | 4.76 | Avg. Vel. (ft/s) | | 4.76 | |
| Max Chl Dpth (ft) | 2.28 | Hydr. Depth (ft) | | 1.67 | |
| Conv. Total (cfs) | 8552.0 | Conv. (cfs) | | 8552.0 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 97.04 | |
| Min Ch El (ft) | 1016.31 | Shear (lb/sq ft) | | 0.85 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.05 | |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | 1.19 | 42.04 | 0.62 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 1.03 | 31.74 | 1.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.95 | Element | | | |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1018.59 | Reach Len. (ft) | 206.30 | 199.97 | 194.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.11 | |
| E.G. Slope (ft/ft) | 0.008149 | Area (sq ft) | | 162.11 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 96.83 | Top Width (ft) | | 96.83 | |
| Vel Total (ft/s) | 4.76 | Avg. Vel. (ft/s) | | 4.76 | |
| Max Chl Dpth (ft) | 2.28 | Hydr. Depth (ft) | | 1.67 | |
| Conv. Total (cfs) | 8552.0 | Conv. (cfs) | | 8552.0 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 97.04 | |
| Min Ch El (ft) | 1016.31 | Shear (lb/sq ft) | | 0.85 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.05 | |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | | 42.96 | |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 31.79 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.95 | Element | | | |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1018.59 | Reach Len. (ft) | 206.30 | 199.97 | 194.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.11 | |
| E.G. Slope (ft/ft) | 0.008149 | Area (sq ft) | | 162.11 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 96.83 | Top Width (ft) | | 96.83 | |
| Vel Total (ft/s) | 4.76 | Avg. Vel. (ft/s) | | 4.76 | |
| Max Chl Dpth (ft) | 2.28 | Hydr. Depth (ft) | | 1.67 | |
| Conv. Total (cfs) | 8552.0 | Conv. (cfs) | | 8552.0 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 97.04 | |
| Min Ch El (ft) | 1016.31 | Shear (lb/sq ft) | | 0.85 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.05 | |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | 0.05 | 42.90 | 0.12 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.22 | 31.79 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.321

INPUT
Description: Thalweg Sta. 208.23
Station Elevation Data num= 110

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1021.79 | .2 | 1021.81 | 3.65 | 1022.11 | 7.9 | 1022.57 | 14.42 | 1022.93 |
| 15.6 | 1022.99 | 18.55 | 1023.07 | 23.29 | 1023.21 | 35.95 | 1023.49 | 38.69 | 1023.54 |
| 45.52 | 1023.68 | 46.37 | 1023.69 | 46.72 | 1023.7 | 54.07 | 1023.74 | 57.49 | 1023.72 |
| 61.77 | 1023.6 | 68.25 | 1023.4 | 77.16 | 1023.04 | 79.02 | 1022.97 | 89.79 | 1022.63 |
| 92.55 | 1022.56 | 99.47 | 1022.34 | 100.24 | 1022.32 | 100.56 | 1022.31 | 107.94 | 1021.99 |
| 111.32 | 1021.75 | 115.64 | 1021.43 | 122.09 | 1020.7 | 123.33 | 1020.53 | 126.44 | 1020.09 |
| 131.03 | 1019.47 | 132.86 | 1019.21 | 138.73 | 1018.39 | 143.63 | 1017.89 | 146.41 | 1017.69 |
| 150.49 | 1017.33 | 153.41 | 1017.07 | 155.05 | 1016.97 | 165.16 | 1016.45 | 172.71 | 1016.09 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 172.96 | 1016.08 | 186.69 | 1015.47 | 192.58 | 1015.23 | 197.46 | 1015.05 | 200.28 | 1014.98 |
| 207.36 | 1014.92 | 208.23 | 1014.92 | 215.67 | 1015.15 | 219 | 1015.27 | 223.37 | 1015.46 |
| 229.76 | 1015.7 | 231.06 | 1015.73 | 234.33 | 1015.82 | 238.77 | 1015.93 | 240.53 | 1015.97 |
| 246.45 | 1015.99 | 251.3 | 1016.02 | 254.15 | 1016.01 | 261.29 | 1016 | 262.58 | 1016 |
| 264.4 | 1016.01 | 272.83 | 1016.03 | 277.24 | 1016.09 | 284.94 | 1016.26 | 288.26 | 1016.38 |
| 294.37 | 1016.63 | 300.32 | 1016.79 | 305.14 | 1016.94 | 308.02 | 1017.01 | 315.23 | 1017.27 |
| 315.71 | 1017.29 | 315.9 | 1017.3 | 323.41 | 1017.75 | 326.67 | 1017.94 | 330.15 | 1018.19 |
| 331.11 | 1018.26 | 337.44 | 1018.64 | 338.8 | 1018.72 | 342.21 | 1018.89 | 346.49 | 1019.07 |
| 348.21 | 1019.13 | 354.19 | 1019.32 | 358.97 | 1019.52 | 361.89 | 1019.62 | 369.18 | 1020.01 |
| 369.58 | 1020.02 | 369.74 | 1020.03 | 377.28 | 1020.26 | 380.51 | 1020.38 | 384.98 | 1020.52 |
| 391.27 | 1020.77 | 392.66 | 1020.82 | 396.15 | 1021 | 400.36 | 1021.13 | 402.04 | 1021.2 |
| 408.06 | 1021.44 | 412.81 | 1021.68 | 415.75 | 1021.79 | 423.12 | 1022.15 | 423.45 | 1022.16 |
| 423.58 | 1022.17 | 431.15 | 1022.42 | 434.34 | 1022.56 | 438.84 | 1022.69 | 445.11 | 1022.97 |
| 446.53 | 1023.02 | 450.1 | 1023.2 | 455.88 | 1023.47 | 461.92 | 1023.73 | 463.04 | 1023.78 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 172.71 | .04 | 264.4 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 150.49 | 330.15 | 228.16 | 199.87 | 135.92 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1017.21 | Reach Len. (ft) | 228.16 | 199.87 | 135.92 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 198.87 | |
| E.G. Slope (ft/ft) | 0.006562 | Area (sq ft) | | 198.87 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 161.70 | Top Width (ft) | | 161.70 | |
| Vel Total (ft/s) | 3.88 | Avg. Vel. (ft/s) | | 3.88 | |
| Max Chl Dpth (ft) | 2.29 | Hydr. Depth (ft) | | 1.23 | |
| Conv. Total (cfs) | 9530.3 | Conv. (cfs) | | 9530.3 | |
| Length Wtd. (ft) | 199.87 | Wetted Per. (ft) | | 161.79 | |
| Min Ch El (ft) | 1014.92 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.95 | |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 1.19 | 41.21 | 0.62 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.03 | 31.15 | 1.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1017.21 | Reach Len. (ft) | 228.16 | 199.87 | 135.92 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 198.87 | |
| E.G. Slope (ft/ft) | 0.006562 | Area (sq ft) | | 198.87 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 161.70 | Top Width (ft) | | 161.70 | |
| Vel Total (ft/s) | 3.88 | Avg. Vel. (ft/s) | | 3.88 | |
| Max Chl Dpth (ft) | 2.29 | Hydr. Depth (ft) | | 1.23 | |
| Conv. Total (cfs) | 9530.3 | Conv. (cfs) | | 9530.3 | |
| Length Wtd. (ft) | 199.87 | Wetted Per. (ft) | | 161.79 | |
| Min Ch El (ft) | 1014.92 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.95 | |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | | 42.13 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 31.20 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.44 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1017.21 | Reach Len. (ft) | 228.16 | 199.87 | 135.92 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 198.87 | |
| E.G. Slope (ft/ft) | 0.006562 | Area (sq ft) | | 198.87 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 161.70 | Top Width (ft) | | 161.70 | |
| Vel Total (ft/s) | 3.88 | Avg. Vel. (ft/s) | | 3.88 | |
| Max Chl Dpth (ft) | 2.29 | Hydr. Depth (ft) | | 1.23 | |
| Conv. Total (cfs) | 9530.3 | Conv. (cfs) | | 9530.3 | |
| Length Wtd. (ft) | 199.87 | Wetted Per. (ft) | | 161.79 | |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 1014.92 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.95 | |
| Frctn Loss (ft) | 0.83 | Cum Volume (acre-ft) | 0.05 | 42.07 | 0.12 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.22 | 31.19 | 0.31 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.283

INPUT
Description: Thalweg Sta. 136.93
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1021.87 | 7.84 | 1022.09 | 9.38 | 1022.13 | 19.23 | 1022.32 | 19.45 | 1022.33 |
| 21.16 | 1022.33 | 29.52 | 1022.3 | 30.61 | 1022.28 | 39.58 | 1022.09 | 49.65 | 1021.75 |
| 59.71 | 1021.13 | 64.76 | 1020.23 | 65.36 | 1020.14 | 69.78 | 1019.45 | 73.77 | 1018.59 |
| 79.85 | 1017.23 | 84.97 | 1016.22 | 87.52 | 1015.71 | 89.91 | 1015.16 | 98.9 | 1014.54 |
| 99.98 | 1014.47 | 108.24 | 1014.3 | 109.86 | 1014.27 | 110.05 | 1014.27 | 110.29 | 1014.26 |
| 120.11 | 1014.08 | 121.66 | 1014.07 | 130.18 | 1013.95 | 136.93 | 1013.96 | 140.25 | 1013.97 |
| 145.96 | 1014.02 | 155.81 | 1014.13 | 167.2 | 1014.28 | 170.45 | 1014.33 | 178.58 | 1014.48 |
| 180.51 | 1014.52 | 182.62 | 1014.58 | 189.97 | 1014.8 | 190.58 | 1014.82 | 200.09 | 1015.23 |
| 200.65 | 1015.26 | 201.34 | 1015.31 | 210.71 | 1016.12 | 212.73 | 1016.33 | 220.78 | 1017.15 |
| 224.11 | 1017.4 | 230.85 | 1017.84 | 240.91 | 1018.28 | 246.87 | 1018.49 | 250.98 | 1018.65 |
| 258.26 | 1018.92 | 269.64 | 1019.37 | 281.02 | 1019.76 | 281.18 | 1019.77 | 282.39 | 1019.79 |
| 289.5 | 1019.93 | 291.25 | 1019.96 | 292.4 | 1020 | 301.31 | 1020.23 | 311.38 | 1020.63 |
| 315.17 | 1020.82 | 321.45 | 1021.11 | 326.55 | 1021.37 | 337.94 | 1021.91 | 360.7 | 1022.89 |
| 361.71 | 1022.93 | 371.78 | 1023.37 | 372.08 | 1023.38 | 381.85 | 1023.8 | 383.47 | 1023.86 |
| 384.46 | 1023.91 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 84.97 | .04 | 182.62 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 65.36 | 289.5 | 187.44 | 199.97 | 223.68 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1016.59 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1016.43 | Reach Len. (ft) | 187.44 | 199.97 | 223.68 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 241.60 | |
| E.G. Slope (ft/ft) | 0.002886 | Area (sq ft) | | 241.60 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 129.78 | Top Width (ft) | | 129.78 | |
| Vel Total (ft/s) | 3.20 | Avg. Vel. (ft/s) | | 3.20 | |
| Max Chl Dpth (ft) | 2.48 | Hydr. Depth (ft) | | 1.86 | |
| Conv. Total (cfs) | 14370.3 | Conv. (cfs) | | 14370.3 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 130.01 | |
| Min Ch El (ft) | 1013.95 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.07 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | 1.19 | 40.20 | 0.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.03 | 30.48 | 1.13 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1016.59 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1016.43 | Reach Len. (ft) | 187.44 | 199.97 | 223.68 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 241.62 | |
| E.G. Slope (ft/ft) | 0.002885 | Area (sq ft) | | 241.62 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 129.78 | Top Width (ft) | | 129.78 | |
| Vel Total (ft/s) | 3.20 | Avg. Vel. (ft/s) | | 3.20 | |
| Max Chl Dpth (ft) | 2.48 | Hydr. Depth (ft) | | 1.86 | |
| Conv. Total (cfs) | 14372.5 | Conv. (cfs) | | 14372.5 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 130.01 | |
| Min Ch El (ft) | 1013.95 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.07 | |
| Frctn Loss (ft) | 0.69 | Cum Volume (acre-ft) | | 41.12 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 30.53 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1016.59 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1016.43 | Reach Len. (ft) | 187.44 | 199.97 | 223.68 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 241.62 | |
| E.G. Slope (ft/ft) | 0.002885 | Area (sq ft) | | 241.62 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 129.78 | Top Width (ft) | | 129.78 | |
| Vel Total (ft/s) | 3.20 | Avg. Vel. (ft/s) | | 3.20 | |
| Max Chl Dpth (ft) | 2.48 | Hydr. Depth (ft) | | 1.86 | |
| Conv. Total (cfs) | 14372.5 | Conv. (cfs) | | 14372.5 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 130.01 | |
| Min Ch El (ft) | 1013.95 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.07 | |
| Frctn Loss (ft) | 0.69 | Cum Volume (acre-ft) | 0.05 | 41.06 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 30.53 | 0.31 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.245

INPUT
Description: Thalweg Sta. 116.71
Station Elevation Data num= 87

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1019.9 | 6.59 | 1020.15 | 7.63 | 1020.18 | 16.6 | 1020.46 | 17.18 | 1020.48 |
| 26.61 | 1020.75 | 26.74 | 1020.75 | 29.38 | 1020.82 | 36.29 | 1020.99 | 36.62 | 1020.99 |
| 45.85 | 1021.08 | 46.63 | 1021.09 | 55.4 | 1021.06 | 56.64 | 1021.05 | 66.66 | 1020.88 |
| 76.67 | 1020.34 | 78.82 | 1020.15 | 79.03 | 1020.13 | 86.68 | 1019.44 | 89.54 | 1019.17 |
| 96.69 | 1018.45 | 100.05 | 1018.15 | 100.56 | 1018.1 | 112.74 | 1016.85 | 116.71 | 1016.47 |
| 126.72 | 1015.45 | 131.6 | 1014.99 | 136.74 | 1014.52 | 142.11 | 1014.2 | 146.75 | 1013.94 |
| 156.76 | 1013.72 | 163.14 | 1013.66 | 179.63 | 1013.48 | 186.79 | 1013.42 | 189.18 | 1013.41 |
| 196.8 | 1013.4 | 198.75 | 1013.41 | 206.81 | 1013.44 | 208.3 | 1013.46 | 216.83 | 1013.55 |
| 217.86 | 1013.58 | 226.49 | 1013.77 | 226.84 | 1013.78 | 227.41 | 1013.83 | 236.85 | 1014.46 |
| 236.97 | 1014.48 | 239.44 | 1014.77 | 246.86 | 1015.66 | 256.08 | 1016.65 | 256.87 | 1016.7 |
| 265.63 | 1017.21 | 266.88 | 1017.27 | 276.89 | 1017.63 | 284.74 | 1017.81 | 286.91 | 1017.84 |
| 293.53 | 1017.97 | 294.3 | 1017.98 | 296.92 | 1018.01 | 299.79 | 1018.07 | 306.93 | 1018.28 |
| 313.42 | 1018.52 | 322.97 | 1018.85 | 326.95 | 1018.98 | 332.53 | 1019.12 | 336.96 | 1019.2 |
| 346.97 | 1019.29 | 356.99 | 1019.3 | 361.19 | 1019.26 | 367 | 1019.18 | 370.75 | 1018.96 |
| 377.01 | 1018.65 | 380.3 | 1018.15 | 387.02 | 1017.49 | 389.86 | 1017.13 | 397.03 | 1016.7 |
| 399.41 | 1016.8 | 407.04 | 1017.01 | 408.97 | 1017.22 | 417.05 | 1017.93 | 418.53 | 1018.1 |
| 427.07 | 1018.88 | 428.09 | 1018.95 | 437.08 | 1019.5 | 437.64 | 1019.51 | 447.09 | 1019.79 |
| 447.2 | 1019.79 | 452.98 | 1019.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 100.56 | .04 | 226.49 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 100.05 | 293.53 | 173.41 | 199.96 | 236.41 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.90 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1015.70 | Reach Len. (ft) | 173.41 | 199.96 | 236.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 215.14 | |
| E.G. Slope (ft/ft) | 0.004132 | Area (sq ft) | | 215.14 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 122.93 | Top Width (ft) | | 122.93 | |
| Vel Total (ft/s) | 3.59 | Avg. Vel. (ft/s) | | 3.59 | |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | 1.75 | |
| Conv. Total (cfs) | 12010.5 | Conv. (cfs) | | 12010.5 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 123.10 | |
| Min Ch El (ft) | 1013.40 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |
| Frctn Loss (ft) | 0.88 | Cum Volume (acre-ft) | 1.19 | 39.15 | 0.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.03 | 29.90 | 1.13 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.90 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.039 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 1015.70 | Reach Len. (ft) | 173.41 | 199.96 | 236.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 215.06 | |
| E.G. Slope (ft/ft) | 0.004136 | Area (sq ft) | | 215.06 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 122.91 | Top Width (ft) | | 122.91 | |
| Vel Total (ft/s) | 3.59 | Avg. Vel. (ft/s) | | 3.59 | |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | 1.75 | |
| Conv. Total (cfs) | 12003.6 | Conv. (cfs) | | 12003.6 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 123.09 | |
| Min Ch El (ft) | 1013.40 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | | 40.07 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 29.95 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.90 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1015.70 | Reach Len. (ft) | 173.41 | 199.96 | 236.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 215.06 | |
| E.G. Slope (ft/ft) | 0.004136 | Area (sq ft) | | 215.06 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 122.91 | Top Width (ft) | | 122.91 | |
| Vel Total (ft/s) | 3.59 | Avg. Vel. (ft/s) | | 3.59 | |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | 1.75 | |
| Conv. Total (cfs) | 12003.6 | Conv. (cfs) | | 12003.6 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 123.09 | |
| Min Ch El (ft) | 1013.40 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 0.05 | 40.01 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 29.95 | 0.31 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.207

INPUT
Description: Thalweg Sta. 140.43
Station Elevation Data num= 79

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1017.52 | 2.74 | 1017.82 | 7.2 | 1018.05 | 13.41 | 1018.44 | 14.98 | 1018.49 |
| 19.2 | 1018.66 | 22.75 | 1018.78 | 24.08 | 1018.83 | 30.54 | 1018.82 | 34.74 | 1018.79 |
| 38.31 | 1018.65 | 45.41 | 1018.34 | 46.09 | 1018.3 | 47.95 | 1018.17 | 53.88 | 1017.77 |
| 55.72 | 1017.63 | 56.07 | 1017.6 | 61.65 | 1017.08 | 66.74 | 1016.59 | 69.43 | 1016.32 |
| 76.68 | 1015.62 | 77.22 | 1015.57 | 77.41 | 1015.55 | 84.99 | 1014.87 | 85.28 | 1014.84 |
| 88.08 | 1014.6 | 98.74 | 1013.72 | 100.55 | 1013.58 | 108.33 | 1013.07 | 109.41 | 1013.02 |
| 116.11 | 1012.82 | 120.07 | 1012.74 | 123.89 | 1012.69 | 130.74 | 1012.62 | 131.67 | 1012.6 |
| 134.17 | 1012.59 | 139.44 | 1012.55 | 141.41 | 1012.55 | 147.23 | 1012.57 | 152.07 | 1012.6 |
| 162.74 | 1012.74 | 162.92 | 1012.74 | 169.94 | 1012.85 | 170.57 | 1012.86 | 184.07 | 1013.11 |
| 186.13 | 1013.17 | 191.65 | 1013.35 | 193.9 | 1013.42 | 194.74 | 1013.44 | 196.55 | 1013.54 |
| 205.41 | 1014.08 | 209.47 | 1014.49 | 216.07 | 1014.97 | 217.24 | 1015.11 | 220.4 | 1015.4 |
| 225.02 | 1015.84 | 226.74 | 1015.95 | 232.81 | 1016.6 | 237.4 | 1017.12 | 244.75 | 1018.01 |
| 247.43 | 1018.33 | 248.07 | 1018.41 | 248.36 | 1018.43 | 249.15 | 1018.5 | 256.14 | 1019.09 |
| 258.74 | 1019.26 | 263.92 | 1019.47 | 269.4 | 1019.78 | 271.7 | 1019.82 | 277.89 | 1020.12 |
| 279.48 | 1020.21 | 280.07 | 1020.25 | 287.26 | 1020.59 | 290.73 | 1020.8 | 298.32 | 1021.21 |
| 301.4 | 1021.36 | 302.82 | 1021.42 | 306.63 | 1021.63 | 307.86 | 1021.71 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 85.28 | .04 | 169.94 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 55.72 | 244.75 | 212.52 | 200 | 191.49 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1014.81 | Reach Len. (ft) | 212.52 | 200.00 | 191.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 206.97 | |
| E.G. Slope (ft/ft) | 0.004646 | Area (sq ft) | | 206.97 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 128.12 | Top Width (ft) | | 128.12 | |
| Vel Total (ft/s) | 3.73 | Avg. Vel. (ft/s) | | 3.73 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.62 | |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 11325.8 | Conv. (cfs) | | 11325.8 | |
| Length Wtd. (ft) | 200.25 | Wetted Per. (ft) | | 128.25 | |
| Min Ch El (ft) | 1012.55 | Shear (lb/sq ft) | | 0.47 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.75 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 1.19 | 38.19 | 0.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.03 | 29.32 | 1.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1014.84 | Reach Len. (ft) | 212.52 | 200.00 | 191.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 211.89 | |
| E.G. Slope (ft/ft) | 0.004335 | Area (sq ft) | | 211.89 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 129.08 | Top Width (ft) | | 129.08 | |
| Vel Total (ft/s) | 3.64 | Avg. Vel. (ft/s) | | 3.64 | |
| Max Chl Dpth (ft) | 2.29 | Hydr. Depth (ft) | | 1.64 | |
| Conv. Total (cfs) | 11725.2 | Conv. (cfs) | | 11725.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 129.22 | |
| Min Ch El (ft) | 1012.55 | Shear (lb/sq ft) | | 0.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |
| Frctn Loss (ft) | 1.22 | Cum Volume (acre-ft) | | 39.09 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 29.37 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1014.84 | Reach Len. (ft) | 212.52 | 200.00 | 191.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 211.88 | |
| E.G. Slope (ft/ft) | 0.004336 | Area (sq ft) | | 211.88 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 129.08 | Top Width (ft) | | 129.08 | |
| Vel Total (ft/s) | 3.64 | Avg. Vel. (ft/s) | | 3.64 | |
| Max Chl Dpth (ft) | 2.29 | Hydr. Depth (ft) | | 1.64 | |
| Conv. Total (cfs) | 11724.5 | Conv. (cfs) | | 11724.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 129.22 | |
| Min Ch El (ft) | 1012.55 | Shear (lb/sq ft) | | 0.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |
| Frctn Loss (ft) | 1.22 | Cum Volume (acre-ft) | 0.05 | 39.03 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 29.37 | 0.31 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.169

INPUT
Description: Thalweg Sta. 361.91
Station Elevation Data num= 119

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1017.88 | 3.44 | 1017.48 | 9.32 | 1016.83 | 11.58 | 1016.55 | 19.68 | 1015.65 |
| 19.88 | 1015.63 | 27.87 | 1014.92 | 30.05 | 1014.82 | 36.01 | 1014.63 | 40.42 | 1014.55 |
| 50.78 | 1014.38 | 57.88 | 1014.24 | 68.59 | 1014.08 | 71.51 | 1014.01 | 76.73 | 1013.92 |
| 81.88 | 1013.77 | 84.88 | 1013.73 | 92.24 | 1013.59 | 93.02 | 1013.59 | 95.89 | 1013.58 |
| 99.61 | 1013.59 | 101.17 | 1013.59 | 102.61 | 1013.58 | 109.31 | 1013.64 | 112.97 | 1013.66 |
| 117.45 | 1013.7 | 123.34 | 1013.73 | 125.6 | 1013.75 | 133.89 | 1013.78 | 141.89 | 1013.76 |
| 144.07 | 1013.74 | 174.46 | 1013.55 | 175.16 | 1013.55 | 206.26 | 1013.28 | 207.04 | 1013.27 |
| 209.89 | 1013.25 | 215.19 | 1013.2 | 223.32 | 1013.14 | 231.47 | 1013.11 | 237.36 | 1013.1 |
| 245.98 | 1013.07 | 247.72 | 1013.06 | 247.9 | 1013.06 | 255.9 | 1013 | 258.09 | 1012.99 |
| 264.05 | 1012.94 | 268.45 | 1012.92 | 278.82 | 1012.8 | 288.48 | 1012.54 | 289.18 | 1012.52 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 296.63 | 1011.87 | 299.55 | 1011.55 | 304.76 | 1011.93 | 309.91 | 1012.38 | 320.28 | 1012.76 |
| 321.06 | 1012.75 | 329.2 | 1012.69 | 330.65 | 1012.7 | 331.62 | 1012.69 | 332.23 | 1012.68 |
| 333.17 | 1012.67 | 341.01 | 1012.6 | 353.64 | 1012.43 | 361.74 | 1012.29 | 361.91 | 1012.28 |
| 372.11 | 1012.11 | 382.47 | 1011.98 | 392.84 | 1011.99 | 399.9 | 1012.18 | 402.5 | 1012.24 |
| 403.2 | 1012.26 | 410.64 | 1012.53 | 413.57 | 1012.62 | 413.62 | 1012.62 | 418.78 | 1012.87 |
| 423.93 | 1013.1 | 426.93 | 1013.29 | 434.3 | 1013.69 | 435.08 | 1013.74 | 443.21 | 1014.17 |
| 444.66 | 1014.22 | 451.36 | 1014.52 | 455.03 | 1014.59 | 459.51 | 1014.69 | 459.78 | 1014.69 |
| 465.39 | 1014.62 | 467.64 | 1014.62 | 475.76 | 1014.39 | 475.9 | 1014.39 | 483.94 | 1014.28 |
| 486.12 | 1014.27 | 492.08 | 1014.21 | 496.49 | 1014.22 | 500.22 | 1014.2 | 506.86 | 1014.2 |
| 508.37 | 1014.19 | 513.91 | 1014.19 | 516.52 | 1014.24 | 517.22 | 1014.28 | 524.65 | 1014.41 |
| 527.59 | 1014.55 | 532.8 | 1014.82 | 537.95 | 1015.03 | 540.95 | 1015.14 | 548.32 | 1015.33 |
| 549.08 | 1015.34 | 551.91 | 1015.39 | 558.68 | 1015.66 | 565.38 | 1015.96 | 569.05 | 1016.09 |
| 573.52 | 1016.32 | 579.41 | 1016.54 | 589.73 | 1016.98 | 589.81 | 1016.98 | 589.91 | 1016.99 |
| 597.96 | 1017.23 | 600.14 | 1017.22 | 606.09 | 1017.69 | 607.37 | 1017.75 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 99.61 | .04 | 331.62 | .032 | 332.23 | .04 | 413.62 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 245.98 | 423.93 | 226.96 | 201.9 | 178.81 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1013.79 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.040 | 0.040 | 0.032 |
| W.S. Elev (ft) | 1013.58 | Reach Len. (ft) | 226.96 | 201.90 | 178.81 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 22.09 | 195.67 | 1.90 |
| E.G. Slope (ft/ft) | 0.008621 | Area (sq ft) | 22.09 | 195.67 | 1.90 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 33.50 | 735.43 | 3.07 |
| Top Width (ft) | 261.97 | Top Width (ft) | 75.75 | 177.95 | 8.28 |
| Vel Total (ft/s) | 3.51 | Avg. Vel. (ft/s) | 1.52 | 3.76 | 1.61 |
| Max Chl Dpth (ft) | 2.03 | Hydr. Depth (ft) | 0.29 | 1.10 | 0.23 |
| Conv. Total (cfs) | 8314.7 | Conv. (cfs) | 360.8 | 7920.8 | 33.0 |
| Length Wtd. (ft) | 202.40 | Wetted Per. (ft) | 75.75 | 178.07 | 8.29 |
| Min Ch El (ft) | 1011.55 | Shear (lb/sq ft) | 0.16 | 0.59 | 0.12 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.24 | 2.22 | 0.20 |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | 1.13 | 37.26 | 0.62 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.85 | 28.62 | 1.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1013.82 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1013.59 | Reach Len. (ft) | 226.96 | 201.90 | 178.81 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 197.58 | |
| E.G. Slope (ft/ft) | 0.009248 | Area (sq ft) | | 197.58 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 177.95 | Top Width (ft) | | 177.95 | |
| Vel Total (ft/s) | 3.91 | Avg. Vel. (ft/s) | | 3.91 | |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.11 | |
| Conv. Total (cfs) | 8027.6 | Conv. (cfs) | | 8027.6 | |
| Length Wtd. (ft) | 201.90 | Wetted Per. (ft) | | 179.07 | |
| Min Ch El (ft) | 1011.55 | Shear (lb/sq ft) | | 0.64 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.49 | |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | | 38.15 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 28.67 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1013.82 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1013.59 | Reach Len. (ft) | 226.96 | 201.90 | 178.81 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 197.61 | |
| E.G. Slope (ft/ft) | 0.009245 | Area (sq ft) | | 197.61 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 177.95 | Top Width (ft) | | 177.95 | |

| | | | | | |
|---|---|---|---|---|---|
| Vel Total (ft/s) | 3.91 | Avg. Vel. (ft/s) | | 3.91 | |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.11 | |
| Conv. Total (cfs) | 8029.0 | Conv. (cfs) | | 8029.0 | |
| Length Wtd. (ft) | 201.90 | Wetted Per. (ft) | | 179.07 | |
| Min Ch El (ft) | 1011.55 | Shear (lb/sq ft) | | 0.64 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.49 | |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | 0.05 | 38.09 | 0.12 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.22 | 28.66 | 0.31 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.131

INPUT
Description: Thalweg Sta. 328.87
Station Elevation Data num= 89

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1017.97 | 1.14 | 1017.91 | 8.18 | 1017.61 | 10.54 | 1017.48 | 18.2 | 1017.16 |
| 19.94 | 1017.05 | 28.22 | 1016.63 | 29.35 | 1016.55 | 38.24 | 1015.99 | 46.51 | 1015.38 |
| 48.15 | 1015.25 | 48.26 | 1015.24 | 57.56 | 1014.61 | 58.29 | 1014.55 | 66.96 | 1014.05 |
| 68.31 | 1013.94 | 76.36 | 1013.57 | 78.33 | 1013.43 | 85.78 | 1013.11 | 88.35 | 1013.04 |
| 91.3 | 1013.1 | 98.37 | 1012.89 | 104.58 | 1012.98 | 108.39 | 1013.13 | 113.99 | 1013.21 |
| 118.42 | 1013.35 | 123.39 | 1013.44 | 128.44 | 1013.58 | 132.79 | 1013.66 | 138.46 | 1013.78 |
| 142.2 | 1013.83 | 151.54 | 1013.92 | 151.6 | 1013.92 | 158.5 | 1013.85 | 160.9 | 1013.8 |
| 161 | 1013.8 | 168.52 | 1013.48 | 170.41 | 1013.39 | 178.54 | 1012.8 | 179.81 | 1012.74 |
| 188.57 | 1012.09 | 189.21 | 1012.07 | 198.59 | 1011.62 | 199.02 | 1011.61 | 208.02 | 1011.36 |
| 208.61 | 1011.34 | 217.42 | 1011.2 | 218.63 | 1011.17 | 238.67 | 1010.98 | 245.63 | 1010.93 |
| 248.7 | 1010.89 | 255.04 | 1010.85 | 258.72 | 1010.81 | 268.74 | 1010.82 | 273.84 | 1010.89 |
| 278.76 | 1010.94 | 283.25 | 1011 | 288.78 | 1011.09 | 292.65 | 1011.09 | 298.8 | 1011.14 |
| 302.05 | 1011.02 | 308.82 | 1010.91 | 311.46 | 1010.97 | 318.85 | 1010.41 | 320.86 | 1010.42 |
| 328.87 | 1010.89 | 338 | 1010.72 | 338.89 | 1010.68 | 348.73 | 1010.89 | 348.91 | 1010.9 |
| 349.07 | 1010.9 | 365.94 | 1011.66 | 368.95 | 1011.8 | 377.28 | 1012.26 | 378.98 | 1012.37 |
| 386.68 | 1013.02 | 389 | 1013.22 | 391.63 | 1013.56 | 399.02 | 1014.54 | 405.49 | 1015.55 |
| 409.04 | 1016.07 | 414.89 | 1016.83 | 419.06 | 1017.33 | 419.42 | 1017.36 | 423.81 | 1017.78 |
| 429.08 | 1018.3 | 439.11 | 1019.21 | 445.27 | 1019.72 | 445.72 | 1019.76 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 160.9 | .04 | 365.94 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 151.54 | 399.02 | 205.53 | 202.09 | 196.41 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1012.50 | Reach Len. (ft) | 205.53 | 202.09 | 196.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 265.50 | |
| E.G. Slope (ft/ft) | 0.003937 | Area (sq ft) | | 265.50 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 197.41 | Top Width (ft) | | 197.41 | |
| Vel Total (ft/s) | 2.91 | Avg. Vel. (ft/s) | | 2.91 | |
| Max Chl Dpth (ft) | 2.09 | Hydr. Depth (ft) | | 1.34 | |
| Conv. Total (cfs) | 12303.0 | Conv. (cfs) | | 12303.0 | |
| Length Wtd. (ft) | 202.09 | Wetted Per. (ft) | | 197.53 | |
| Min Ch El (ft) | 1010.41 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.96 | |
| Frctn Loss (ft) | 0.92 | Cum Volume (acre-ft) | 1.07 | 36.19 | 0.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.65 | 27.75 | 1.10 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1012.50 | Reach Len. (ft) | 205.53 | 202.09 | 196.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 265.56 | |
| E.G. Slope (ft/ft) | 0.003935 | Area (sq ft) | | 265.56 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 197.42 | Top Width (ft) | | 197.42 | |

| | | | |
|---|---|---|---|
| Vel Total (ft/s) | 2.91 | Avg. Vel. (ft/s) | 2.91 |
| Max Chl Dpth (ft) | 2.09 | Hydr. Depth (ft) | 1.35 |
| Conv. Total (cfs) | 12307.4 | Conv. (cfs) | 12307.4 |
| Length Wtd. (ft) | 202.09 | Wetted Per. (ft) | 197.54 |
| Min Ch El (ft) | 1010.41 | Shear (lb/sq ft) | 0.33 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.96 |
| Frctn Loss (ft) | 0.92 | Cum Volume (acre-ft) | 37.08 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 27.80 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.63 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1012.50 | Reach Len. (ft) | 205.53 | 202.09 | 196.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 265.50 | |
| E.G. Slope (ft/ft) | 0.003937 | Area (sq ft) | | 265.50 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 197.41 | Top Width (ft) | | 197.41 | |
| Vel Total (ft/s) | 2.91 | Avg. Vel. (ft/s) | | 2.91 | |
| Max Chl Dpth (ft) | 2.09 | Hydr. Depth (ft) | | 1.34 | |
| Conv. Total (cfs) | 12303.0 | Conv. (cfs) | | 12303.0 | |
| Length Wtd. (ft) | 202.09 | Wetted Per. (ft) | | 197.53 | |
| Min Ch El (ft) | 1010.41 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.96 | |
| Frctn Loss (ft) | 0.92 | Cum Volume (acre-ft) | 0.05 | 37.02 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 27.79 | 0.31 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.093

INPUT
Description: Thalweg Sta. 218.14
Station Elevation Data num= 74

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1018.1 | 4.88 | 1017.91 | 5.34 | 1017.89 | 14.89 | 1017.45 | 15.02 | 1017.45 |
| 18.65 | 1017.31 | 24.68 | 1017.09 | 24.9 | 1017.09 | 34.36 | 1016.84 | 34.9 | 1016.82 |
| 44.04 | 1016.57 | 44.91 | 1016.55 | 53.7 | 1016.17 | 54.91 | 1016.13 | 56.2 | 1016.02 |
| 64.92 | 1015.05 | 72.98 | 1013.69 | 73.05 | 1013.68 | 81.3 | 1012.35 | 82.72 | 1012.12 |
| 84.93 | 1011.71 | 92.39 | 1011.06 | 94.94 | 1010.76 | 102.07 | 1010.49 | 104.94 | 1010.36 |
| 108.02 | 1010.3 | 114.95 | 1010.14 | 124.95 | 1010.02 | 134.96 | 1010.01 | 164.98 | 1010.07 |
| 169.77 | 1010.1 | 174.98 | 1010.12 | 179.45 | 1010.15 | 184.99 | 1010.2 | 189.12 | 1010.23 |
| 195 | 1010.29 | 198.79 | 1010.31 | 205 | 1010.36 | 208.46 | 1010.37 | 215.01 | 1010.37 |
| 218.14 | 1010.38 | 225.01 | 1010.27 | 227.81 | 1010.25 | 235.02 | 1010.35 | 237.48 | 1010.4 |
| 245.03 | 1010.57 | 247.16 | 1010.59 | 255.03 | 1010.59 | 256.83 | 1010.6 | 265.04 | 1010.6 |
| 266.5 | 1010.61 | 275.04 | 1010.62 | 280.95 | 1010.67 | 285.05 | 1010.71 | 294.56 | 1011.05 |
| 295.06 | 1011.07 | 295.52 | 1011.12 | 305.06 | 1011.98 | 305.19 | 1011.99 | 314.87 | 1013.1 |
| 315.07 | 1013.13 | 325.07 | 1014.24 | 331.25 | 1014.82 | 334.21 | 1015.1 | 335.08 | 1015.17 |
| 343.88 | 1015.62 | 345.09 | 1015.68 | 353.55 | 1015.93 | 355.09 | 1015.97 | 363.23 | 1016.15 |
| 365.1 | 1016.18 | 372.9 | 1016.19 | 375.1 | 1016.15 | 378.14 | 1016.02 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 81.3 | .04 | 280.95 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 72.98 | 331.25 | 208.61 | 214.86 | 189.24 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.71 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1011.56 | Reach Len. (ft) | 208.61 | 214.86 | 189.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 250.13 | |
| E.G. Slope (ft/ft) | 0.005367 | Area (sq ft) | | 250.13 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 213.77 | Top Width (ft) | | 213.77 | |
| Vel Total (ft/s) | 3.09 | Avg. Vel. (ft/s) | | 3.09 | |
| Max Chl Dpth (ft) | 1.55 | Hydr. Depth (ft) | | 1.17 | |
| Conv. Total (cfs) | 10537.8 | Conv. (cfs) | | 10537.8 | |
| Length Wtd. (ft) | 214.86 | Wetted Per. (ft) | | 213.86 | |
| Min Ch El (ft) | 1010.01 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.21 | |
| Frctn Loss (ft) | 1.20 | Cum Volume (acre-ft) | 1.07 | 35.00 | 0.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.65 | 26.80 | 1.10 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.71 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1011.56 | Reach Len. (ft) | 208.61 | 214.86 | 189.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 249.89 | |
| E.G. Slope (ft/ft) | 0.005383 | Area (sq ft) | | 249.89 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 213.75 | Top Width (ft) | | 213.75 | |
| Vel Total (ft/s) | 3.09 | Avg. Vel. (ft/s) | | 3.09 | |
| Max Chl Dpth (ft) | 1.55 | Hydr. Depth (ft) | | 1.17 | |
| Conv. Total (cfs) | 10522.1 | Conv. (cfs) | | 10522.1 | |
| Length Wtd. (ft) | 214.86 | Wetted Per. (ft) | | 213.83 | |
| Min Ch El (ft) | 1010.01 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.21 | |
| Frctn Loss (ft) | 1.20 | Cum Volume (acre-ft) | | 35.88 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 26.84 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.71 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1011.56 | Reach Len. (ft) | 208.61 | 214.86 | 189.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 250.13 | |
| E.G. Slope (ft/ft) | 0.005367 | Area (sq ft) | | 250.13 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 213.77 | Top Width (ft) | | 213.77 | |
| Vel Total (ft/s) | 3.09 | Avg. Vel. (ft/s) | | 3.09 | |
| Max Chl Dpth (ft) | 1.55 | Hydr. Depth (ft) | | 1.17 | |
| Conv. Total (cfs) | 10537.8 | Conv. (cfs) | | 10537.8 | |
| Length Wtd. (ft) | 214.86 | Wetted Per. (ft) | | 213.86 | |
| Min Ch El (ft) | 1010.01 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.21 | |
| Frctn Loss (ft) | 1.20 | Cum Volume (acre-ft) | 0.05 | 35.82 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 26.84 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.052

INPUT
Description: Thalweg Sta. 406.44
Station Elevation Data num= 130

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1015.85 | .08 | 1015.86 | 3.49 | 1016.03 | 10.5 | 1016.39 | 13.5 | 1016.53 |
| 20.93 | 1016.81 | 23.51 | 1016.89 | 31.34 | 1016.98 | 33.52 | 1017.01 | 52.18 | 1017 |
| 53.53 | 1016.99 | 62.6 | 1016.99 | 63.54 | 1016.98 | 73.02 | 1017.03 | 73.55 | 1017.02 |
| 83.44 | 1017.13 | 83.56 | 1017.13 | 93.56 | 1017.2 | 93.85 | 1017.2 | 103.57 | 1017.3 |
| 104.28 | 1017.3 | 113.58 | 1017.36 | 114.7 | 1017.36 | 123.59 | 1017.32 | 125.12 | 1017.32 |
| 133.59 | 1017.3 | 135.54 | 1017.32 | 145.95 | 1017.41 | 153.61 | 1017.5 | 156.37 | 1017.52 |
| 163.62 | 1017.59 | 166.79 | 1017.6 | 173.63 | 1017.65 | 177.21 | 1017.63 | 183.63 | 1017.64 |
| 187.63 | 1017.58 | 193.64 | 1017.5 | 198.05 | 1017.41 | 218.89 | 1016.91 | 223.66 | 1016.77 |
| 229.31 | 1016.59 | 233.67 | 1016.43 | 239.73 | 1016.22 | 243.68 | 1016.04 | 250.15 | 1015.88 |
| 253.69 | 1015.73 | 260.56 | 1015.55 | 263.7 | 1015.45 | 270.98 | 1015.04 | 273.7 | 1014.92 |
| 281.41 | 1014.83 | 283.71 | 1014.68 | 291.83 | 1015.03 | 293.72 | 1015.22 | 302.25 | 1015.47 |
| 303.73 | 1015.52 | 312.66 | 1015.5 | 313.73 | 1015.52 | 323.08 | 1015.45 | 323.74 | 1015.45 |
| 328.29 | 1015.37 | 333.5 | 1015.27 | 333.75 | 1015.27 | 339.8 | 1015.09 | 343.76 | 1014.96 |
| 343.92 | 1014.95 | 353.77 | 1014.35 | 354.34 | 1014.23 | 354.43 | 1014.21 | 363.77 | 1012.71 |
| 364.75 | 1012.51 | 373.78 | 1010.59 | 375.18 | 1010.47 | 383.79 | 1008.98 | 385.6 | 1009 |
| 393.8 | 1009.2 | 396.02 | 1009.23 | 403.8 | 1009.28 | 406.44 | 1009.1 | 413.81 | 1008.9 |
| 416.86 | 1009.03 | 423.82 | 1009.19 | 427.27 | 1009.22 | 433.83 | 1009.2 | 443.84 | 1009.1 |
| 479.37 | 1008.93 | 483.87 | 1008.92 | 493.88 | 1008.93 | 503.88 | 1008.96 | 513.89 | 1009.02 |
| 531.46 | 1009.18 | 533.91 | 1009.22 | 541.88 | 1009.3 | 543.91 | 1009.33 | 552.31 | 1009.41 |
| 553.92 | 1009.43 | 563.93 | 1009.52 | 570.87 | 1009.63 | 573.15 | 1009.67 | 573.94 | 1009.68 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 583.56 | 1010.08 | 583.95 | 1010.09 | 593.2 | 1010.93 | 593.95 | 1011 | 602.1 | 1011.98 |
| 603.96 | 1012.21 | 604.4 | 1012.27 | 614.82 | 1013.62 | 623.98 | 1014.7 | 625.24 | 1014.82 |
| 633.98 | 1015.83 | 635.67 | 1015.96 | 643.99 | 1016.74 | 646.08 | 1016.86 | 654 | 1017.42 |
| 656.5 | 1017.54 | 664.01 | 1017.96 | 666.92 | 1018.07 | 674.02 | 1018.39 | 677.34 | 1018.43 |
| 684.02 | 1018.54 | 687.76 | 1018.5 | 694.03 | 1018.42 | 698.17 | 1018.34 | 704.04 | 1018.24 |
| 708.59 | 1018.15 | 714.05 | 1018.08 | 719.02 | 1017.99 | 724.05 | 1017.92 | 726.3 | 1017.86 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 354.43 | .04 | 570.87 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 328.29 | 633.98 | 193.63 | 232.51 | 218.34 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1010.52 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1010.36 | Reach Len. (ft) | 193.63 | 232.51 | 218.34 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 242.65 | |
| E.G. Slope (ft/ft) | 0.005836 | Area (sq ft) | | 242.65 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 211.09 | Top Width (ft) | | 211.09 | |
| Vel Total (ft/s) | 3.18 | Avg. Vel. (ft/s) | | 3.18 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 1.15 | |
| Conv. Total (cfs) | 10105.7 | Conv. (cfs) | | 10105.7 | |
| Length Wtd. (ft) | 232.51 | Wetted Per. (ft) | | 211.25 | |
| Min Ch El (ft) | 1008.90 | Shear (lb/sq ft) | | 0.42 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.33 | |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 1.07 | 33.78 | 0.62 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.65 | 25.75 | 1.10 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1010.52 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1010.36 | Reach Len. (ft) | 193.63 | 232.51 | 218.34 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 243.27 | |
| E.G. Slope (ft/ft) | 0.005788 | Area (sq ft) | | 243.27 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 211.14 | Top Width (ft) | | 211.14 | |
| Vel Total (ft/s) | 3.17 | Avg. Vel. (ft/s) | | 3.17 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 1.15 | |
| Conv. Total (cfs) | 10147.1 | Conv. (cfs) | | 10147.1 | |
| Length Wtd. (ft) | 232.51 | Wetted Per. (ft) | | 211.30 | |
| Min Ch El (ft) | 1008.90 | Shear (lb/sq ft) | | 0.42 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.32 | |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | | 34.66 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 25.80 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1010.52 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1010.36 | Reach Len. (ft) | 193.63 | 232.51 | 218.34 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 242.65 | |
| E.G. Slope (ft/ft) | 0.005836 | Area (sq ft) | | 242.65 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 211.09 | Top Width (ft) | | 211.09 | |
| Vel Total (ft/s) | 3.18 | Avg. Vel. (ft/s) | | 3.18 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 1.15 | |
| Conv. Total (cfs) | 10105.7 | Conv. (cfs) | | 10105.7 | |
| Length Wtd. (ft) | 232.51 | Wetted Per. (ft) | | 211.25 | |
| Min Ch El (ft) | 1008.90 | Shear (lb/sq ft) | | 0.42 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.33 | |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 0.05 | 34.61 | 0.12 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.22 | 25.79 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 1.008

INPUT
Description: Thalweg Sta. 413.33
Station Elevation Data num= 127

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1016.13 | 5.07 | 1016.27 | 9.98 | 1016.43 | 14.8 | 1016.5 | 19.99 | 1016.59 |
| 29.99 | 1016.61 | 46.11 | 1016.56 | 50 | 1016.54 | 53.67 | 1016.49 | 60.01 | 1016.42 |
| 70.01 | 1016.18 | 80.01 | 1015.86 | 82.84 | 1015.73 | 90.02 | 1015.47 | 100.02 | 1014.96 |
| 102.27 | 1014.88 | 110.03 | 1014.51 | 118.24 | 1014.34 | 120.03 | 1014.3 | 121.71 | 1014.27 |
| 130.04 | 1014.05 | 131.44 | 1014.03 | 140.04 | 1013.65 | 141.16 | 1013.64 | 150.04 | 1013.13 |
| 160.05 | 1013 | 169.77 | 1013.01 | 170.05 | 1013.01 | 170.31 | 1013.02 | 179.39 | 1013.18 |
| 180.04 | 1013.2 | 189.76 | 1013.51 | 190.06 | 1013.52 | 199.48 | 1013.74 | 200.07 | 1013.77 |
| 209.2 | 1013.75 | 210.07 | 1013.76 | 218.92 | 1013.43 | 220.07 | 1013.4 | 221.57 | 1013.33 |
| 230.08 | 1012.92 | 238.36 | 1012.49 | 248.08 | 1011.86 | 250.09 | 1011.71 | 257.8 | 1011.08 |
| 260.09 | 1010.9 | 267.52 | 1010.16 | 270.1 | 1009.94 | 277.24 | 1009.24 | 279.34 | 1009.07 |
| 280.1 | 1009.01 | 286.96 | 1008.51 | 290.1 | 1008.33 | 293.44 | 1008.28 | 300.11 | 1008.03 |
| 303.74 | 1008.11 | 314.04 | 1008.27 | 320.12 | 1008.39 | 324.35 | 1008.39 | 330.12 | 1008.42 |
| 334.65 | 1008.36 | 340.13 | 1008.34 | 344.97 | 1008.2 | 350.13 | 1008.01 | 360.13 | 1008.19 |
| 365.58 | 1008.4 | 370.14 | 1008.54 | 375.88 | 1008.56 | 380.14 | 1008.53 | 386.18 | 1008.43 |
| 390.15 | 1008.33 | 396.49 | 1008.12 | 400.15 | 1008.02 | 410.16 | 1007.81 | 413.33 | 1007.79 |
| 420.16 | 1007.72 | 430.16 | 1007.69 | 432.76 | 1007.7 | 440.17 | 1007.69 | 442.49 | 1007.72 |
| 450.17 | 1007.78 | 452.2 | 1007.8 | 460.18 | 1007.89 | 468.63 | 1007.93 | 471.64 | 1007.95 |
| 480.19 | 1007.98 | 481.37 | 1007.98 | 490.19 | 1008.02 | 491.09 | 1008.03 | 496.14 | 1008.07 |
| 500.19 | 1008.11 | 500.8 | 1008.11 | 510.2 | 1008.27 | 510.53 | 1008.28 | 520.2 | 1008.53 |
| 521.8 | 1008.58 | 529.97 | 1008.81 | 530.21 | 1008.82 | 539.69 | 1009.08 | 540.21 | 1009.1 |
| 549.4 | 1009.37 | 550.22 | 1009.39 | 559.13 | 1009.73 | 560.22 | 1009.75 | 568.85 | 1010.11 |
| 570.22 | 1010.13 | 571.68 | 1010.16 | 580.23 | 1010.44 | 580.42 | 1010.45 | 581.99 | 1010.52 |
| 590.23 | 1010.69 | 592.29 | 1010.82 | 600.24 | 1011.06 | 602.6 | 1011.25 | 610.24 | 1011.72 |
| 612.9 | 1011.95 | 620.25 | 1012.65 | 623.21 | 1013.06 | 630.25 | 1014.15 | 633.51 | 1014.61 |
| 640.25 | 1015.75 | 646.62 | 1016.45 | 650.26 | 1016.88 | 656.33 | 1017.2 | 660.26 | 1017.42 |
| 675.77 | 1017.82 | 679.65 | 1017.93 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 279.34 | .04 | 496.14 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 260.09 | 580.42 | 185.29 | 210.17 | 226.47 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.45 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1009.35 | Reach Len. (ft) | 185.29 | 210.17 | 226.47 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 306.54 | |
| E.G. Slope (ft/ft) | 0.003584 | Area (sq ft) | | 306.54 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 272.67 | Top Width (ft) | | 272.67 | |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | | 2.52 | |
| Max Chl Dpth (ft) | 1.66 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 12895.1 | Conv. (cfs) | | 12895.1 | |
| Length Wtd. (ft) | 210.17 | Wetted Per. (ft) | | 272.76 | |
| Min Ch El (ft) | 1007.69 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.63 | |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 1.07 | 32.32 | 0.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.65 | 24.46 | 1.10 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.44 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1009.34 | Reach Len. (ft) | 185.29 | 210.17 | 226.47 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 304.38 | |
| E.G. Slope (ft/ft) | 0.003666 | Area (sq ft) | | 304.38 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 272.32 | Top Width (ft) | | 272.32 | |
| Vel Total (ft/s) | 2.54 | Avg. Vel. (ft/s) | | 2.54 | |
| Max Chl Dpth (ft) | 1.65 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 12751.2 | Conv. (cfs) | | 12751.2 | |
| Length Wtd. (ft) | 210.17 | Wetted Per. (ft) | | 272.40 | |
| Min Ch El (ft) | 1007.69 | Shear (lb/sq ft) | | 0.26 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.65 | |

| | | | |
|---|---|---|---|
| Frctn Loss (ft) | 0.93 | Cum Volume (acre-ft) | 33.20 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 24.51 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.45 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1009.35 | Reach Len. (ft) | 185.29 | 210.17 | 226.47 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 306.54 | |
| E.G. Slope (ft/ft) | 0.003584 | Area (sq ft) | | 306.54 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 272.67 | Top Width (ft) | | 272.67 | |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | | 2.52 | |
| Max Chl Dpth (ft) | 1.66 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 12895.1 | Conv. (cfs) | | 12895.1 | |
| Length Wtd. (ft) | 210.17 | Wetted Per. (ft) | | 272.76 | |
| Min Ch El (ft) | 1007.69 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.63 | |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 0.05 | 33.14 | 0.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.22 | 24.50 | 0.31 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.968

INPUT
Description: Thalweg Sta. 430.01
Station Elevation Data num= 114

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1015.86 | 4.34 | 1016.02 | 5.64 | 1016.07 | 13.18 | 1016.28 | 15.74 | 1016.37 |
| 22 | 1016.48 | 25.85 | 1016.54 | 35.95 | 1016.39 | 39.65 | 1016.27 | 46.06 | 1016.08 |
| 56.16 | 1015.75 | 57.31 | 1015.72 | 66.13 | 1015.42 | 66.26 | 1015.42 | 74.96 | 1015.1 |
| 76.37 | 1015.05 | 86.47 | 1014.67 | 92.61 | 1014.35 | 96.58 | 1014.17 | 101.45 | 1013.83 |
| 116.78 | 1012.93 | 119.1 | 1012.87 | 126.89 | 1012.51 | 135.06 | 1012.19 | 136.75 | 1012.13 |
| 136.99 | 1012.12 | 145.57 | 1011.89 | 147.1 | 1011.8 | 149.13 | 1011.64 | 157.2 | 1011.42 |
| 160.95 | 1011.28 | 167.3 | 1011.13 | 172.05 | 1011.05 | 177.41 | 1010.9 | 180.88 | 1010.81 |
| 187.51 | 1010.7 | 189.71 | 1010.59 | 197.62 | 1010.35 | 198.54 | 1010.29 | 204.89 | 1009.96 |
| 207.72 | 1009.82 | 216.19 | 1009.22 | 217.83 | 1009.15 | 225.02 | 1008.62 | 225.86 | 1008.58 |
| 227.93 | 1008.49 | 231.83 | 1008.38 | 238.03 | 1008.13 | 242.67 | 1008.02 | 248.14 | 1007.92 |
| 251.5 | 1007.84 | 258.24 | 1007.71 | 260.32 | 1007.66 | 268.35 | 1007.5 | 269.16 | 1007.49 |
| 277.98 | 1007.35 | 278.45 | 1007.34 | 286.81 | 1007.26 | 288.55 | 1007.24 | 318.87 | 1007.01 |
| 328.97 | 1006.98 | 339.77 | 1006.99 | 357.42 | 1007.06 | 359.28 | 1007.06 | 369.39 | 1007.09 |
| 379.49 | 1007.07 | 392.73 | 1006.98 | 399.7 | 1006.92 | 409.8 | 1006.87 | 410.38 | 1006.87 |
| 419.21 | 1006.9 | 419.91 | 1006.9 | 430.01 | 1007.01 | 436.86 | 1007.15 | 440.12 | 1007.21 |
| 445.69 | 1007.36 | 450.22 | 1007.51 | 456.28 | 1007.83 | 460.32 | 1008 | 463.35 | 1008.23 |
| 470.43 | 1009.1 | 472.17 | 1009.37 | 480.53 | 1010.8 | 481 | 1010.89 | 488.84 | 1012.04 |
| 489.83 | 1012.19 | 490.64 | 1012.26 | 498.65 | 1012.93 | 500.74 | 1013.05 | 516.3 | 1013.99 |
| 520.95 | 1014.28 | 525.13 | 1014.51 | 529.1 | 1014.74 | 531.05 | 1014.85 | 533.96 | 1014.96 |
| 541.16 | 1015.31 | 542.78 | 1015.36 | 551.26 | 1015.66 | 554.03 | 1015.73 | 560.44 | 1015.91 |
| 561.37 | 1015.94 | 569.27 | 1016.14 | 571.47 | 1016.21 | 578.09 | 1016.34 | 581.58 | 1016.4 |
| 586.92 | 1016.42 | 595.75 | 1016.39 | 601.78 | 1016.33 | 604.57 | 1016.32 | 611.89 | 1016.24 |
| 613.4 | 1016.23 | 621.99 | 1016.09 | 623.86 | 1016.01 | 629.14 | 1015.8 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 225.86 | .04 | 488.84 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 177.41 | 480.53 | 210.03 | 205.18 | 206.71 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1008.49 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1008.35 | Reach Len. (ft) | 210.03 | 205.18 | 206.71 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 253.18 | |
| E.G. Slope (ft/ft) | 0.005985 | Area (sq ft) | | 253.18 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 231.60 | Top Width (ft) | | 231.60 | |
| Vel Total (ft/s) | 3.05 | Avg. Vel. (ft/s) | | 3.05 | |
| Max Chl Dpth (ft) | 1.48 | Hydr. Depth (ft) | | 1.09 | |
| Conv. Total (cfs) | 9978.9 | Conv. (cfs) | | 9978.9 | |
| Length Wtd. (ft) | 205.25 | Wetted Per. (ft) | | 231.65 | |
| Min Ch El (ft) | 1006.87 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.25 | |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.03 | Cum Volume (acre-ft) | 1.07 | 30.97 | 0.62 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.65 | 23.24 | 1.10 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1008.52 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1008.38 | Reach Len. (ft) | 210.03 | 205.18 | 206.71 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 261.07 | |
| E.G. Slope (ft/ft) | 0.005438 | Area (sq ft) | | 261.07 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 232.72 | Top Width (ft) | | 232.72 | |
| Vel Total (ft/s) | 2.96 | Avg. Vel. (ft/s) | | 2.96 | |
| Max Chl Dpth (ft) | 1.51 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 10469.0 | Conv. (cfs) | | 10469.0 | |
| Length Wtd. (ft) | 205.18 | Wetted Per. (ft) | | 232.77 | |
| Min Ch El (ft) | 1006.87 | Shear (lb/sq ft) | | 0.38 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.13 | |
| Frctn Loss (ft) | 1.03 | Cum Volume (acre-ft) | | 31.84 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 23.29 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1008.49 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1008.35 | Reach Len. (ft) | 210.03 | 205.18 | 206.71 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 253.18 | |
| E.G. Slope (ft/ft) | 0.005985 | Area (sq ft) | | 253.18 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 231.60 | Top Width (ft) | | 231.60 | |
| Vel Total (ft/s) | 3.05 | Avg. Vel. (ft/s) | | 3.05 | |
| Max Chl Dpth (ft) | 1.48 | Hydr. Depth (ft) | | 1.09 | |
| Conv. Total (cfs) | 9978.9 | Conv. (cfs) | | 9978.9 | |
| Length Wtd. (ft) | 205.25 | Wetted Per. (ft) | | 231.65 | |
| Min Ch El (ft) | 1006.87 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.25 | |
| Frctn Loss (ft) | 1.03 | Cum Volume (acre-ft) | 0.05 | 31.79 | 0.12 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.22 | 23.28 | 0.31 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.929

INPUT
Description: Thalweg Sta. 310.07
Station Elevation Data num= 138

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1011.84 | 6.7 | 1012.26 | 9.15 | 1012.4 | 15.89 | 1012.7 | 19.19 | 1012.8 |
| 25.08 | 1012.91 | 29.23 | 1013 | 34.28 | 1013.1 | 49.32 | 1013.5 | 52.66 | 1013.58 |
| 59.36 | 1013.71 | 69.4 | 1013.62 | 79.45 | 1013.32 | 80.24 | 1013.29 | 88.79 | 1012.99 |
| 89.43 | 1012.97 | 89.49 | 1012.97 | 98.62 | 1012.69 | 99.53 | 1012.66 | 107.82 | 1012.44 |
| 109.58 | 1012.39 | 117.01 | 1012.26 | 119.62 | 1012.21 | 126.21 | 1012.07 | 129.66 | 1011.98 |
| 135.39 | 1011.82 | 144.89 | 1011.58 | 149.75 | 1011.43 | 153.78 | 1011.36 | 159.79 | 1011.28 |
| 162.97 | 1011.28 | 169.83 | 1011.3 | 172.17 | 1011.31 | 179.87 | 1011.33 | 181.36 | 1011.32 |
| 189.92 | 1011.28 | 190.55 | 1011.27 | 199.75 | 1011.15 | 199.96 | 1011.15 | 208.94 | 1010.92 |
| 210 | 1010.9 | 218.14 | 1010.44 | 220.04 | 1010.32 | 240.13 | 1008.71 | 250.17 | 1007.96 |
| 254.9 | 1007.73 | 260.21 | 1007.46 | 263.87 | 1007.36 | 264.1 | 1007.35 | 270.26 | 1007.2 |
| 273.29 | 1007.14 | 290.34 | 1006.85 | 291.68 | 1006.83 | 300.39 | 1006.68 | 300.87 | 1006.67 |
| 306.12 | 1006.58 | 310.07 | 1006.52 | 310.43 | 1006.51 | 328.44 | 1006.34 | 330.51 | 1006.33 |
| 337.64 | 1006.27 | 340.56 | 1006.25 | 341.09 | 1006.25 | 350.6 | 1006.17 | 356.03 | 1006.14 |
| 360.64 | 1006.1 | 380.73 | 1006 | 383.61 | 1005.99 | 400.81 | 1005.91 | 402 | 1005.91 |
| 410.85 | 1005.89 | 429.57 | 1005.9 | 430.94 | 1005.91 | 438.76 | 1005.91 | 440.98 | 1005.92 |
| 451.02 | 1005.93 | 454.71 | 1005.96 | 461.07 | 1006 | 466.34 | 1006.07 | 471.11 | 1006.12 |
| 481.15 | 1006.27 | 481.27 | 1006.27 | 484.73 | 1006.33 | 491.2 | 1006.43 | 493.93 | 1006.48 |
| 501.24 | 1006.59 | 510.05 | 1006.68 | 511.28 | 1006.7 | 512.01 | 1006.72 | 512.3 | 1006.73 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 521.32 | 1006.75 | 521.5 | 1006.75 | 523.44 | 1006.74 | 531.37 | 1006.73 | 541.41 | 1006.85 |
| 549.08 | 1007.03 | 551.45 | 1007.08 | 561.49 | 1007.33 | 567.47 | 1007.45 | 571.54 | 1007.57 |
| 576.66 | 1007.65 | 581.58 | 1007.79 | 585.86 | 1007.84 | 591.62 | 1007.98 | 595.05 | 1008.03 |
| 601.66 | 1008.22 | 604.24 | 1008.28 | 611.71 | 1008.63 | 613.43 | 1008.69 | 621.75 | 1009.17 |
| 622.62 | 1009.2 | 631.79 | 1009.45 | 632.11 | 1009.45 | 641.01 | 1009.46 | 641.83 | 1009.47 |
| 650.2 | 1009.49 | 651.88 | 1009.46 | 659.4 | 1009.54 | 661.92 | 1009.45 | 668.59 | 1009.91 |
| 671.96 | 1009.78 | 677.79 | 1010.63 | 682.01 | 1011.23 | 686.98 | 1012.09 | 692.05 | 1012.73 |
| 696.17 | 1013.02 | 702.09 | 1013.65 | 705.36 | 1013.84 | 712.13 | 1014.36 | 720.28 | 1014.76 |
| 722.18 | 1014.84 | 731.34 | 1015.17 | 732.22 | 1015.19 | 732.94 | 1015.22 | 740.77 | 1015.52 |
| 742.13 | 1015.57 | 742.26 | 1015.57 | 749.64 | 1015.83 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 341.09 | .04 | 481.27 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 291.68 | 512.01 | 222.55 | 206.68 | 203.43 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1007.45 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.032 | 0.038 | 0.032 |
| W.S. Elev (ft) | 1007.33 | Reach Len. (ft) | 222.55 | 206.68 | 203.43 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 7.26 | 252.91 | 21.88 |
| E.G. Slope (ft/ft) | 0.004262 | Area (sq ft) | 7.26 | 252.91 | 21.88 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 9.20 | 724.35 | 38.45 |
| Top Width (ft) | 296.77 | Top Width (ft) | 26.85 | 220.33 | 49.59 |
| Vel Total (ft/s) | 2.74 | Avg. Vel. (ft/s) | 1.27 | 2.86 | 1.76 |
| Max Chl Dpth (ft) | 1.44 | Hydr. Depth (ft) | 0.27 | 1.15 | 0.44 |
| Conv. Total (cfs) | 11825.8 | Conv. (cfs) | 140.9 | 11095.9 | 589.0 |
| Length Wtd. (ft) | 206.69 | Wetted Per. (ft) | 26.86 | 220.34 | 49.60 |
| Min Ch El (ft) | 1005.89 | Shear (lb/sq ft) | 0.07 | 0.31 | 0.12 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.09 | 0.87 | 0.21 |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 1.06 | 29.77 | 0.56 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.59 | 22.18 | 0.98 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1007.49 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1007.35 | Reach Len. (ft) | 222.55 | 206.68 | 203.43 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 256.81 | |
| E.G. Slope (ft/ft) | 0.004624 | Area (sq ft) | | 256.81 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 220.33 | Top Width (ft) | | 220.33 | |
| Vel Total (ft/s) | 3.01 | Avg. Vel. (ft/s) | | 3.01 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 1.17 | |
| Conv. Total (cfs) | 11353.4 | Conv. (cfs) | | 11353.4 | |
| Length Wtd. (ft) | 206.68 | Wetted Per. (ft) | | 221.49 | |
| Min Ch El (ft) | 1005.89 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.01 | |
| Frctn Loss (ft) | 0.93 | Cum Volume (acre-ft) | | 30.62 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 22.22 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1007.45 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.032 | 0.038 | 0.032 |
| W.S. Elev (ft) | 1007.33 | Reach Len. (ft) | 222.55 | 206.68 | 203.43 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 7.26 | 252.91 | 21.88 |
| E.G. Slope (ft/ft) | 0.004262 | Area (sq ft) | 7.26 | 252.91 | 21.88 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 9.20 | 724.35 | 38.45 |
| Top Width (ft) | 296.77 | Top Width (ft) | 26.85 | 220.33 | 49.59 |
| Vel Total (ft/s) | 2.74 | Avg. Vel. (ft/s) | 1.27 | 2.86 | 1.76 |
| Max Chl Dpth (ft) | 1.44 | Hydr. Depth (ft) | 0.27 | 1.15 | 0.44 |
| Conv. Total (cfs) | 11825.8 | Conv. (cfs) | 140.9 | 11095.9 | 589.0 |
| Length Wtd. (ft) | 206.69 | Wetted Per. (ft) | 26.86 | 220.34 | 49.60 |
| Min Ch El (ft) | 1005.89 | Shear (lb/sq ft) | 0.07 | 0.31 | 0.12 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.09 | 0.87 | 0.21 |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 0.03 | 30.60 | 0.07 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.15 | 22.22 | 0.19 |

CROSS SECTION

RIVER: Tributary 1E1

REACH: Reach 1 RS: 0.890

INPUT
Description: Thalweg Sta. 295.97
Station Elevation Data num= 145

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1012.08 | 5.75 | 1012.14 | 9.18 | 1012.2 | 15.75 | 1012.28 | 25.75 | 1012.31 |
| 35.75 | 1012.21 | 65.76 | 1011.7 | 68.44 | 1011.66 | 75.76 | 1011.54 | 78.31 | 1011.49 |
| 85.76 | 1011.37 | 88.19 | 1011.34 | 95.76 | 1011.21 | 98.06 | 1011.18 | 105.76 | 1011.04 |
| 107.94 | 1011.02 | 115.76 | 1010.88 | 117.81 | 1010.87 | 125.76 | 1010.77 | 127.69 | 1010.76 |
| 135.76 | 1010.73 | 137.56 | 1010.72 | 145.76 | 1010.71 | 147.44 | 1010.7 | 155.76 | 1010.73 |
| 157.31 | 1010.73 | 165.76 | 1010.79 | 167.19 | 1010.79 | 175.76 | 1010.86 | 177.06 | 1010.86 |
| 185.76 | 1010.85 | 195.77 | 1010.77 | 196.82 | 1010.76 | 205.77 | 1010.62 | 206.7 | 1010.6 |
| 215.77 | 1010.39 | 216.58 | 1010.35 | 223.1 | 1010.02 | 225.77 | 1009.89 | 226.45 | 1009.77 |
| 235.77 | 1008.35 | 236.33 | 1008.23 | 245.77 | 1006.41 | 246.2 | 1006.38 | 248.81 | 1006.09 |
| 255.77 | 1005.31 | 256.08 | 1005.3 | 265.77 | 1004.97 | 265.95 | 1004.97 | 275.77 | 1004.87 |
| 275.83 | 1004.87 | 285.7 | 1004.77 | 285.77 | 1004.77 | 295.58 | 1004.67 | 295.97 | 1004.67 |
| 305.77 | 1004.61 | 306.1 | 1004.61 | 315.78 | 1004.63 | 325.21 | 1004.69 | 325.78 | 1004.7 |
| 335.09 | 1004.76 | 336.49 | 1004.76 | 345.78 | 1004.82 | 346.62 | 1004.83 | 348.34 | 1004.84 |
| 364.71 | 1004.98 | 365.78 | 1005 | 374.59 | 1005.09 | 375.78 | 1005.11 | 377.01 | 1005.12 |
| 385.78 | 1005.21 | 387.13 | 1005.23 | 395.78 | 1005.34 | 405.78 | 1005.53 | 414.09 | 1005.76 |
| 415.78 | 1005.81 | 417.52 | 1005.87 | 425.78 | 1006.21 | 427.65 | 1006.33 | 435.79 | 1006.96 |
| 443.72 | 1007.69 | 445.79 | 1007.85 | 447.91 | 1007.99 | 455.79 | 1008.57 | 458.04 | 1008.63 |
| 465.79 | 1008.9 | 469.43 | 1008.86 | 473.35 | 1008.82 | 475.79 | 1008.74 | 483.22 | 1008.36 |
| 485.79 | 1008.22 | 488.42 | 1008.44 | 495.79 | 1008.9 | 505.79 | 1010.05 | 512.85 | 1010.45 |
| 515.79 | 1010.59 | 525.79 | 1010.72 | 528.94 | 1010.64 | 535.79 | 1010.62 | 539.07 | 1010.43 |
| 545.79 | 1010.12 | 552.35 | 1009.68 | 555.79 | 1009.51 | 562.23 | 1009.26 | 565.8 | 1009.35 |
| 569.46 | 1009.62 | 575.8 | 1009.76 | 579.59 | 1010.06 | 585.8 | 1010.43 | 591.86 | 1010.98 |
| 595.8 | 1011.17 | 601.73 | 1011.5 | 605.8 | 1011.58 | 609.97 | 1011.56 | 615.8 | 1011.64 |
| 620.1 | 1011.43 | 625.8 | 1011.32 | 631.36 | 1011.58 | 635.8 | 1012.07 | 641.23 | 1012.79 |
| 645.8 | 1013.47 | 651.11 | 1013.89 | 655.8 | 1014.21 | 660.98 | 1014.33 | 670.86 | 1014.5 |
| 675.8 | 1014.57 | 680.74 | 1014.66 | 695.81 | 1014.88 | 705.81 | 1014.96 | 710.37 | 1014.97 |
| 715.81 | 1015 | 720.24 | 1015.01 | 725.81 | 1015.04 | 730.12 | 1015.05 | 739.99 | 1015.1 |
| 749.87 | 1015.19 | 779.49 | 1015.57 | 789.37 | 1015.68 | 799.24 | 1015.74 | 805.82 | 1015.74 |
| 815.82 | 1015.7 | 819 | 1015.68 | 825.82 | 1015.66 | 828.88 | 1015.75 | 829.38 | 1015.77 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 248.81 | .04 | 348.34 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 223.1 | 469.43 | 202.85 | 200 | 199.64 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.56 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.037 | |
| W.S. Elev (ft) | 1006.39 | Reach Len. (ft) | 202.85 | 200.00 | 199.64 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 237.95 | |
| E.G. Slope (ft/ft) | 0.004397 | Area (sq ft) | | 237.95 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 182.46 | Top Width (ft) | | 182.46 | |
| Vel Total (ft/s) | 3.24 | Avg. Vel. (ft/s) | | 3.24 | |
| Max Chl Dpth (ft) | 1.78 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 11642.2 | Conv. (cfs) | | 11642.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 182.55 | |
| Min Ch El (ft) | 1004.61 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.16 | |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | 1.04 | 28.61 | 0.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.52 | 21.22 | 0.86 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.56 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.037 | |
| W.S. Elev (ft) | 1006.39 | Reach Len. (ft) | 202.85 | 200.00 | 199.64 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 237.95 | |
| E.G. Slope (ft/ft) | 0.004397 | Area (sq ft) | | 237.95 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 182.46 | Top Width (ft) | | 182.46 | |
| Vel Total (ft/s) | 3.24 | Avg. Vel. (ft/s) | | 3.24 | |
| Max Chl Dpth (ft) | 1.78 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 11642.2 | Conv. (cfs) | | 11642.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 182.55 | |
| Min Ch El (ft) | 1004.61 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.16 | |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | | 29.45 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 21.27 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.037 | |
| W.S. Elev (ft) | 1006.39 | Reach Len. (ft) | 202.85 | 200.00 | 199.64 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 237.95 | |
| E.G. Slope (ft/ft) | 0.004397 | Area (sq ft) | | 237.95 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 182.46 | Top Width (ft) | | 182.46 | |
| Vel Total (ft/s) | 3.24 | Avg. Vel. (ft/s) | | 3.24 | |
| Max Chl Dpth (ft) | 1.78 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 11642.2 | Conv. (cfs) | | 11642.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 182.55 | |
| Min Ch El (ft) | 1004.61 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.16 | |
| Frctn Loss (ft) | 0.95 | Cum Volume (acre-ft) | 0.01 | 29.44 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.08 | 21.26 | 0.08 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.852

INPUT
Description: Thalweg Sta. 319.17
Station Elevation Data num= 121

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1010 | 18.46 | 1010.39 | 18.78 | 1010.4 | 28.48 | 1010.58 | 28.78 | 1010.58 |
| 29.08 | 1010.59 | 38.78 | 1010.64 | 39.05 | 1010.64 | 58.55 | 1010.04 | 58.78 | 1010.03 |
| 68.58 | 1009.78 | 68.78 | 1009.78 | 68.98 | 1009.77 | 78.78 | 1009.52 | 78.96 | 1009.51 |
| 98.65 | 1008.97 | 98.78 | 1008.96 | 108.67 | 1008.67 | 108.78 | 1008.66 | 108.89 | 1008.66 |
| 118.78 | 1008.38 | 118.86 | 1008.38 | 128.78 | 1008.15 | 128.84 | 1008.15 | 138.78 | 1007.92 |
| 148.77 | 1007.49 | 158.77 | 1007.17 | 168.75 | 1007 | 178.72 | 1006.66 | 178.78 | 1006.66 |
| 187.2 | 1006.08 | 188.7 | 1005.98 | 188.78 | 1005.97 | 198.68 | 1005.27 | 198.78 | 1005.26 |
| 208.65 | 1004.87 | 208.78 | 1004.86 | 210.43 | 1004.83 | 218.63 | 1004.69 | 218.78 | 1004.68 |
| 228.61 | 1004.54 | 228.78 | 1004.53 | 238.58 | 1004.38 | 238.78 | 1004.38 | 248.56 | 1004.22 |
| 248.78 | 1004.22 | 258.53 | 1004.08 | 258.78 | 1004.08 | 268.51 | 1003.95 | 268.78 | 1003.95 |
| 278.49 | 1003.82 | 278.78 | 1003.82 | 288.46 | 1003.7 | 288.78 | 1003.7 | 298.44 | 1003.66 |
| 308.78 | 1003.65 | 318.39 | 1003.75 | 319.17 | 1003.75 | 338.35 | 1004.05 | 338.78 | 1004.05 |
| 348.32 | 1004.2 | 348.78 | 1004.21 | 358.3 | 1004.35 | 359.26 | 1004.37 | 362.1 | 1004.41 |
| 378.25 | 1004.65 | 378.78 | 1004.66 | 388.23 | 1004.81 | 398.21 | 1005 | 398.78 | 1005.01 |
| 408.18 | 1005.26 | 408.78 | 1005.27 | 418.16 | 1005.55 | 418.78 | 1005.56 | 428.14 | 1005.92 |
| 428.78 | 1005.94 | 438.11 | 1006.2 | 438.78 | 1006.21 | 439.31 | 1006.22 | 448.78 | 1006.35 |
| 458.06 | 1006.84 | 458.78 | 1006.86 | 468.04 | 1007.3 | 468.78 | 1007.32 | 478.02 | 1007.7 |
| 478.78 | 1007.71 | 487.99 | 1008.03 | 488.78 | 1008.03 | 497.97 | 1008.36 | 498.78 | 1008.39 |
| 507.95 | 1008.62 | 508.78 | 1008.63 | 517.92 | 1008.72 | 528.78 | 1008.85 | 537.88 | 1009.01 |
| 538.78 | 1009.03 | 547.85 | 1009.28 | 548.78 | 1009.31 | 557.83 | 1009.65 | 558.78 | 1009.74 |
| 567.81 | 1010.2 | 568.78 | 1010.22 | 577.78 | 1010.79 | 578.78 | 1010.84 | 587.76 | 1011.5 |
| 588.78 | 1011.62 | 597.74 | 1012.32 | 598.78 | 1012.44 | 607.71 | 1012.96 | 608.78 | 1013.03 |
| 617.69 | 1013.37 | 618.78 | 1013.43 | 627.67 | 1013.58 | 628.78 | 1013.61 | 629.9 | 1013.61 |
| 647.62 | 1013.71 | 648.78 | 1013.72 | 657.59 | 1013.77 | 659.97 | 1013.79 | 668.78 | 1013.84 |
| 683.21 | 1013.95 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 210.43 | .04 | 362.1 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 187.2 | 439.31 | | 170.59 | 199.92 | 240.94 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1005.46 | Reach Len. (ft) | 170.59 | 199.92 | 240.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 246.43 | |
| E.G. Slope (ft/ft) | 0.005092 | Area (sq ft) | | 246.43 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 219.06 | Top Width (ft) | | 219.06 | |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | | 3.13 | |
| Max Chl Dpth (ft) | 1.81 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 10818.3 | Conv. (cfs) | | 10818.3 | |
| Length Wtd. (ft) | 199.92 | Wetted Per. (ft) | | 219.10 | |
| Min Ch El (ft) | 1003.65 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.12 | |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.01 | Cum Volume (acre-ft) | 1.04 | 27.50 | 0.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.52 | 20.30 | 0.86 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.61 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1005.46 | Reach Len. (ft) | 170.59 | 199.92 | 240.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 246.43 | |
| E.G. Slope (ft/ft) | 0.005092 | Area (sq ft) | | 246.43 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 219.06 | Top Width (ft) | | 219.06 | |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | | 3.13 | |
| Max Chl Dpth (ft) | 1.81 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 10818.3 | Conv. (cfs) | | 10818.3 | |
| Length Wtd. (ft) | 199.92 | Wetted Per. (ft) | | 219.10 | |
| Min Ch El (ft) | 1003.65 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.12 | |
| Frctn Loss (ft) | 1.01 | Cum Volume (acre-ft) | | 28.33 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 20.34 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.61 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1005.46 | Reach Len. (ft) | 170.59 | 199.92 | 240.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 246.43 | |
| E.G. Slope (ft/ft) | 0.005092 | Area (sq ft) | | 246.43 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 219.06 | Top Width (ft) | | 219.06 | |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | | 3.13 | |
| Max Chl Dpth (ft) | 1.81 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 10818.3 | Conv. (cfs) | | 10818.3 | |
| Length Wtd. (ft) | 199.92 | Wetted Per. (ft) | | 219.10 | |
| Min Ch El (ft) | 1003.65 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.12 | |
| Frctn Loss (ft) | 1.01 | Cum Volume (acre-ft) | 0.01 | 28.32 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.08 | 20.34 | 0.08 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.814

INPUT
Description: Thalweg Sta. 314.90
Station Elevation Data num= 115

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1007.7 | 1.57 | 1007.78 | 4.59 | 1008.03 | 12.07 | 1008.67 | 12.54 | 1008.7 |
| 14.02 | 1008.78 | 20.5 | 1009.09 | 22.57 | 1009.16 | 43.56 | 1009.73 | 44.37 | 1009.75 |
| 46.9 | 1009.79 | 52.33 | 1009.89 | 54.06 | 1009.93 | 60.28 | 1009.96 | 64.56 | 1009.99 |
| 75.06 | 1009.93 | 76.2 | 1009.91 | 79.77 | 1009.84 | 85.55 | 1009.71 | 96.05 | 1009.37 |
| 106.55 | 1009 | 108.03 | 1008.94 | 112.65 | 1008.77 | 127.54 | 1008.19 | 138.04 | 1007.76 |
| 139.85 | 1007.66 | 148.54 | 1007.23 | 149.95 | 1007.11 | 153.62 | 1006.78 | 159.03 | 1006.29 |
| 165.38 | 1005.59 | 169.53 | 1005.17 | 178.39 | 1004.52 | 179.63 | 1004.42 | 180.03 | 1004.39 |
| 187.59 | 1004.07 | 190.53 | 1003.97 | 195.55 | 1003.79 | 201.03 | 1003.64 | 203.5 | 1003.58 |
| 203.65 | 1003.58 | 211.27 | 1003.44 | 211.46 | 1003.44 | 211.52 | 1003.43 | 211.64 | 1003.43 |
| 222.02 | 1003.35 | 227.37 | 1003.33 | 232.52 | 1003.3 | 235.33 | 1003.29 | 243.02 | 1003.25 |
| 244.14 | 1003.25 | 253.51 | 1003.2 | 267.16 | 1003.16 | 274.51 | 1003.15 | 275.12 | 1003.15 |
| 277.02 | 1003.14 | 306 | 1003.08 | 306.95 | 1003.07 | 309.88 | 1003.07 | 314.9 | 1003.05 |
| 354.68 | 1003.07 | 358.49 | 1003.09 | 362.64 | 1003.12 | 368.99 | 1003.2 | 370.59 | 1003.21 |
| 379.48 | 1003.38 | 383.17 | 1003.44 | 386.51 | 1003.49 | 389.98 | 1003.58 | 394.46 | 1003.66 |
| 402.42 | 1003.87 | 408.51 | 1004.11 | 410.38 | 1004.18 | 410.97 | 1004.21 | 418.33 | 1004.73 |
| 421.47 | 1005.12 | 426.29 | 1005.87 | 431.97 | 1007.01 | 434.25 | 1007.4 | 442.47 | 1008.61 |
| 442.98 | 1008.63 | 452.97 | 1009.21 | 457.92 | 1009.33 | 458.4 | 1009.34 | 463.46 | 1009.44 |
| 466.08 | 1009.31 | 473.96 | 1009.36 | 474.25 | 1009.36 | 481.99 | 1009.34 | 484.46 | 1009.46 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 489.95 | 1009.69 | 494.96 | 1009.92 | 497.91 | 1010.11 | 505.45 | 1010.39 | 505.86 | 1010.4 |
| 507.13 | 1010.42 | 513.82 | 1010.51 | 515.95 | 1010.56 | 521.78 | 1010.48 | 526.45 | 1010.56 |
| 529.72 | 1010.37 | 536.94 | 1010.3 | 540 | 1010.13 | 545.64 | 1009.74 | 547.44 | 1009.68 |
| 553.6 | 1009.28 | 557.94 | 1008.99 | 561.55 | 1009.02 | 568.44 | 1008.31 | 569.51 | 1008.47 |
| 572.88 | 1008.93 | 577.47 | 1009.79 | 578.94 | 1009.8 | 581.78 | 1010.19 | 588.58 | 1011.24 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 203.65 | .04 | 383.17 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 153.62 | 457.92 | 157.81 | 199.65 | 286.59 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.59 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1004.45 | Reach Len. (ft) | 157.81 | 199.65 | 286.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 258.84 | |
| E.G. Slope (ft/ft) | 0.005025 | Area (sq ft) | | 258.84 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 235.12 | Top Width (ft) | | 235.12 | |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.98 | |
| Max Chl Dpth (ft) | 1.40 | Hydr. Depth (ft) | | 1.10 | |
| Conv. Total (cfs) | 10891.0 | Conv. (cfs) | | 10891.0 | |
| Length Wtd. (ft) | 199.65 | Wetted Per. (ft) | | 235.16 | |
| Min Ch El (ft) | 1003.05 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.03 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | 1.04 | 26.34 | 0.51 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.52 | 19.26 | 0.86 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.59 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1004.45 | Reach Len. (ft) | 157.81 | 199.65 | 286.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 258.84 | |
| E.G. Slope (ft/ft) | 0.005025 | Area (sq ft) | | 258.84 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 235.12 | Top Width (ft) | | 235.12 | |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.98 | |
| Max Chl Dpth (ft) | 1.40 | Hydr. Depth (ft) | | 1.10 | |
| Conv. Total (cfs) | 10891.0 | Conv. (cfs) | | 10891.0 | |
| Length Wtd. (ft) | 199.65 | Wetted Per. (ft) | | 235.16 | |
| Min Ch El (ft) | 1003.05 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.03 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | | 27.17 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 19.30 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.59 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1004.45 | Reach Len. (ft) | 157.81 | 199.65 | 286.59 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 258.84 | |
| E.G. Slope (ft/ft) | 0.005025 | Area (sq ft) | | 258.84 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 235.12 | Top Width (ft) | | 235.12 | |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.98 | |
| Max Chl Dpth (ft) | 1.40 | Hydr. Depth (ft) | | 1.10 | |
| Conv. Total (cfs) | 10891.0 | Conv. (cfs) | | 10891.0 | |
| Length Wtd. (ft) | 199.65 | Wetted Per. (ft) | | 235.16 | |
| Min Ch El (ft) | 1003.05 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.03 | |
| Frctn Loss (ft) | 0.68 | Cum Volume (acre-ft) | 0.01 | 27.17 | 0.01 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.08 | 19.30 | 0.08 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.777

INPUT
Description: Thalweg Sta. 315.28
Station Elevation Data num= 121

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1007.71 | 1.82 | 1007.78 | 2.46 | 1007.8 | 3.3 | 1007.84 | 9.59 | 1008.2 |
| 14.42 | 1008.41 | 16.73 | 1008.52 | 19.72 | 1008.61 | 23.86 | 1008.69 | 27.03 | 1008.73 |
| 38.13 | 1008.89 | 39.64 | 1008.91 | 52.25 | 1009.05 | 52.38 | 1009.05 | 52.56 | 1009.06 |
| 64.86 | 1009.13 | 68.99 | 1009.11 | 73.78 | 1009.06 | 77.47 | 1009.04 | 80.92 | 1009 |
| 85.4 | 1008.97 | 90.07 | 1008.88 | 102.31 | 1008.62 | 102.68 | 1008.6 | 115.29 | 1008.24 |
| 118.25 | 1008.14 | 127.89 | 1007.83 | 130.83 | 1007.72 | 134.66 | 1007.59 | 137.96 | 1007.46 |
| 151.09 | 1007.1 | 152.23 | 1007.05 | 153.11 | 1006.99 | 159.36 | 1006.54 | 165.71 | 1005.83 |
| 166.5 | 1005.74 | 167.5 | 1005.61 | 178.32 | 1004.23 | 180.76 | 1003.93 | 183.92 | 1003.72 |
| 187.89 | 1003.43 | 190.93 | 1003.31 | 195.02 | 1003.18 | 196.38 | 1003.16 | 200.35 | 1003.1 |
| 202.15 | 1003.06 | 203.54 | 1003.04 | 214.12 | 1002.96 | 216.15 | 1002.95 | 216.42 | 1002.94 |
| 216.76 | 1002.94 | 223.55 | 1002.89 | 228.75 | 1002.87 | 230.69 | 1002.85 | 233.18 | 1002.85 |
| 241.36 | 1002.82 | 244.94 | 1002.79 | 249.61 | 1002.78 | 253.97 | 1002.76 | 254.14 | 1002.76 |
| 259.21 | 1002.69 | 266.02 | 1002.61 | 266.58 | 1002.61 | 280.61 | 1002.4 | 282.45 | 1002.38 |
| 291.8 | 1002.3 | 298.87 | 1002.26 | 304.4 | 1002.24 | 309.13 | 1002.24 | 315.28 | 1002.22 |
| 329.62 | 1002.22 | 330.52 | 1002.23 | 344.79 | 1002.24 | 348.12 | 1002.25 | 354.84 | 1002.25 |
| 364.55 | 1002.27 | 367.44 | 1002.27 | 373.31 | 1002.28 | 373.51 | 1002.28 | 380.05 | 1002.29 |
| 380.97 | 1002.29 | 392.66 | 1002.32 | 401.84 | 1002.36 | 405.26 | 1002.38 | 408.98 | 1002.41 |
| 413.81 | 1002.44 | 416.11 | 1002.46 | 430.23 | 1002.63 | 430.48 | 1002.63 | 437.5 | 1002.76 |
| 443.09 | 1002.89 | 444.63 | 1002.93 | 446.64 | 1003.01 | 455.69 | 1003.56 | 458.9 | 1003.81 |
| 463.07 | 1004.22 | 466.03 | 1004.61 | 468.3 | 1004.93 | 473.17 | 1005.54 | 479.49 | 1005.94 |
| 480.29 | 1006.03 | 480.91 | 1006.03 | 487.37 | 1006.11 | 487.42 | 1006.11 | 493.52 | 1005.5 |
| 494.56 | 1005.43 | 495.91 | 1005.23 | 501.69 | 1004.57 | 506.13 | 1004.21 | 508.82 | 1004.45 |
| 512.33 | 1005.03 | 518.73 | 1006.03 | 523.08 | 1006.76 | 528.74 | 1008.3 | 530.21 | 1008.61 |
| 531.34 | 1008.82 | 539.94 | 1009.4 | 543.95 | 1009.66 | 544.48 | 1009.68 | 545.17 | 1009.71 |
| 550.08 | 1009.83 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 196.38 | .04 | 373.51 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 165.71 | 487.37 | 206.41 | 200 | 209.99 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.89 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.037 | |
| W.S. Elev (ft) | 1003.81 | Reach Len. (ft) | 206.41 | 200.00 | 209.99 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 336.38 | |
| E.G. Slope (ft/ft) | 0.002462 | Area (sq ft) | | 336.38 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 276.34 | Top Width (ft) | | 276.34 | |
| Vel Total (ft/s) | 2.30 | Avg. Vel. (ft/s) | | 2.30 | |
| Max Chl Dpth (ft) | 1.59 | Hydr. Depth (ft) | | 1.22 | |
| Conv. Total (cfs) | 15557.5 | Conv. (cfs) | | 15557.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 276.39 | |
| Min Ch El (ft) | 1002.22 | Shear (lb/sq ft) | | 0.19 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.43 | |
| Frctn Loss (ft) | 0.71 | Cum Volume (acre-ft) | 1.04 | 24.97 | 0.51 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.52 | 18.09 | 0.86 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.89 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.037 | |
| W.S. Elev (ft) | 1003.81 | Reach Len. (ft) | 206.41 | 200.00 | 209.99 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 336.38 | |
| E.G. Slope (ft/ft) | 0.002462 | Area (sq ft) | | 336.38 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 276.34 | Top Width (ft) | | 276.34 | |
| Vel Total (ft/s) | 2.30 | Avg. Vel. (ft/s) | | 2.30 | |
| Max Chl Dpth (ft) | 1.59 | Hydr. Depth (ft) | | 1.22 | |
| Conv. Total (cfs) | 15557.5 | Conv. (cfs) | | 15557.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 276.39 | |
| Min Ch El (ft) | 1002.22 | Shear (lb/sq ft) | | 0.19 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.43 | |
| Frctn Loss (ft) | 0.71 | Cum Volume (acre-ft) | | 25.81 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 18.13 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.89 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.037 | |
| W.S. Elev (ft) | 1003.81 | Reach Len. (ft) | 206.41 | 200.00 | 209.99 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 336.38 | |
| E.G. Slope (ft/ft) | 0.002462 | Area (sq ft) | | 336.38 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 276.34 | Top Width (ft) | | 276.34 | |
| Vel Total (ft/s) | 2.30 | Avg. Vel. (ft/s) | | 2.30 | |
| Max Chl Dpth (ft) | 1.59 | Hydr. Depth (ft) | | 1.22 | |
| Conv. Total (cfs) | 15557.5 | Conv. (cfs) | | 15557.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 276.39 | |
| Min Ch El (ft) | 1002.22 | Shear (lb/sq ft) | | 0.19 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.43 | |
| Frctn Loss (ft) | 0.71 | Cum Volume (acre-ft) | 0.01 | 25.80 | 0.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.08 | 18.13 | 0.08 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.739

INPUT
Description: Thalweg Sta. 310.88
Station Elevation Data num= 123

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1007.55 | 3.81 | 1007.87 | 10.58 | 1008.48 | 10.95 | 1008.51 | 11.23 | 1008.53 |
| 18.09 | 1008.94 | 23.74 | 1009.21 | 25.23 | 1009.29 | 27.21 | 1009.34 | 32.37 | 1009.38 |
| 36.26 | 1009.38 | 39.51 | 1009.4 | 43.83 | 1009.41 | 46.66 | 1009.41 | 48.78 | 1009.42 |
| 60.46 | 1009.52 | 61.29 | 1009.52 | 68.08 | 1009.58 | 73.81 | 1009.59 | 75.22 | 1009.61 |
| 77.09 | 1009.61 | 82.36 | 1009.63 | 86.33 | 1009.56 | 89.51 | 1009.54 | 93.71 | 1009.45 |
| 96.64 | 1009.38 | 103.79 | 1009.18 | 110.34 | 1008.98 | 110.92 | 1008.97 | 111.36 | 1008.95 |
| 123.88 | 1008.54 | 125.2 | 1008.5 | 136.39 | 1008.12 | 139.49 | 1008.01 | 143.59 | 1007.85 |
| 148.91 | 1007.63 | 153.77 | 1007.41 | 160.22 | 1007.08 | 160.92 | 1007.05 | 161.43 | 1007.02 |
| 168.05 | 1006.72 | 173.95 | 1006.4 | 175.2 | 1006.35 | 176.85 | 1006.26 | 182.33 | 1005.9 |
| 186.46 | 1005.55 | 189.48 | 1005.32 | 193.47 | 1004.95 | 195.79 | 1004.69 | 196.61 | 1004.6 |
| 198.98 | 1004.37 | 203.76 | 1003.82 | 210.1 | 1003.34 | 210.9 | 1003.32 | 211.5 | 1003.26 |
| 218.04 | 1002.86 | 224.01 | 1002.48 | 225.18 | 1002.41 | 226.73 | 1002.34 | 232.32 | 1002.12 |
| 233.97 | 1002.07 | 236.53 | 1002 | 239.46 | 1001.91 | 243.35 | 1001.85 | 246.6 | 1001.78 |
| 259.98 | 1001.56 | 260.88 | 1001.55 | 274.08 | 1001.34 | 275.17 | 1001.32 | 276.61 | 1001.3 |
| 282.31 | 1001.2 | 286.6 | 1001.11 | 296.6 | 1000.94 | 303.73 | 1000.85 | 309.86 | 1000.81 |
| 310.88 | 1000.8 | 311.63 | 1000.8 | 318.01 | 1000.82 | 324.15 | 1000.86 | 325.16 | 1000.87 |
| 332.29 | 1000.93 | 339.44 | 1001.01 | 346.58 | 1001.11 | 349.18 | 1001.16 | 353.72 | 1001.26 |
| 359.74 | 1001.43 | 361.7 | 1001.5 | 368.01 | 1001.8 | 374.21 | 1002.45 | 375.14 | 1002.54 |
| 376.37 | 1002.72 | 378.66 | 1003.01 | 386.73 | 1004.04 | 393 | 1004.6 | 399.25 | 1005.03 |
| 403.7 | 1005.23 | 409.62 | 1005.46 | 410.85 | 1005.5 | 411.77 | 1005.54 | 417.99 | 1005.65 |
| 423.84 | 1005.72 | 425.13 | 1005.72 | 426.26 | 1005.71 | 436.8 | 1005.68 | 449.32 | 1005.3 |
| 453.69 | 1005.06 | 460.83 | 1004.74 | 461.83 | 1004.71 | 467.98 | 1004.7 | 474.35 | 1004.56 |
| 476.14 | 1004.65 | 482.26 | 1005.08 | 486.87 | 1004.7 | 489.41 | 1004.8 | 492.76 | 1005.11 |
| 496.54 | 1005.75 | 499.38 | 1005.76 | 511.9 | 1006.57 | 517.97 | 1006.88 | 524.42 | 1007.28 |
| 526.02 | 1007.35 | 536.94 | 1007.86 | 537.87 | 1007.89 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 233.97 | .052 | 378.66 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 195.79 | 423.84 | 234.04 | 199.8 | 164.26 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.18 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 1003.04 | Reach Len. (ft) | 234.04 | 199.80 | 164.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 257.31 | |
| E.G. Slope (ft/ft) | 0.005513 | Area (sq ft) | | 257.31 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 163.79 | Top Width (ft) | | 163.79 | |
| Vel Total (ft/s) | 3.00 | Avg. Vel. (ft/s) | | 3.00 | |
| Max Chl Dpth (ft) | 2.24 | Hydr. Depth (ft) | | 1.57 | |
| Conv. Total (cfs) | 10396.9 | Conv. (cfs) | | 10396.9 | |
| Length Wtd. (ft) | 199.80 | Wetted Per. (ft) | | 163.91 | |
| Min Ch El (ft) | 1000.80 | Shear (lb/sq ft) | | 0.54 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.04 | Cum Volume (acre-ft) | 1.04 | 23.61 | 0.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.52 | 17.08 | 0.86 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.18 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 1003.04 | Reach Len. (ft) | 234.04 | 199.80 | 164.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 257.31 | |
| E.G. Slope (ft/ft) | 0.005513 | Area (sq ft) | | 257.31 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 163.79 | Top Width (ft) | | 163.79 | |
| Vel Total (ft/s) | 3.00 | Avg. Vel. (ft/s) | | 3.00 | |
| Max Chl Dpth (ft) | 2.24 | Hydr. Depth (ft) | | 1.57 | |
| Conv. Total (cfs) | 10396.9 | Conv. (cfs) | | 10396.9 | |
| Length Wtd. (ft) | 199.80 | Wetted Per. (ft) | | 163.91 | |
| Min Ch El (ft) | 1000.80 | Shear (lb/sq ft) | | 0.54 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |
| Frctn Loss (ft) | 1.04 | Cum Volume (acre-ft) | | 24.45 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 17.12 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.18 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 1003.04 | Reach Len. (ft) | 234.04 | 199.80 | 164.26 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 257.31 | |
| E.G. Slope (ft/ft) | 0.005513 | Area (sq ft) | | 257.31 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 163.79 | Top Width (ft) | | 163.79 | |
| Vel Total (ft/s) | 3.00 | Avg. Vel. (ft/s) | | 3.00 | |
| Max Chl Dpth (ft) | 2.24 | Hydr. Depth (ft) | | 1.57 | |
| Conv. Total (cfs) | 10396.9 | Conv. (cfs) | | 10396.9 | |
| Length Wtd. (ft) | 199.80 | Wetted Per. (ft) | | 163.91 | |
| Min Ch El (ft) | 1000.80 | Shear (lb/sq ft) | | 0.54 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.62 | |
| Frctn Loss (ft) | 1.04 | Cum Volume (acre-ft) | 0.01 | 24.44 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.08 | 17.12 | 0.08 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.701

INPUT
Description: Thalweg Sta. 193.38
Station Elevation Data num= 134

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1003.35 | 3.09 | 1003.49 | 6.03 | 1003.6 | 8.13 | 1003.6 | 13.21 | 1003.46 |
| 20.38 | 1003.2 | 27.56 | 1002.73 | 32.63 | 1002.51 | 34.73 | 1002.4 | 37.68 | 1002.35 |
| 41.9 | 1002.29 | 44.89 | 1002.38 | 49.08 | 1002.63 | 54.98 | 1003.26 | 56.25 | 1003.39 |
| 63.42 | 1004.2 | 69.4 | 1004.82 | 70.6 | 1004.89 | 78.12 | 1005.11 | 81.65 | 1005.16 |
| 84.94 | 1005.12 | 89.58 | 1005 | 92.12 | 1004.92 | 93.91 | 1004.86 | 99.29 | 1004.34 |
| 106.17 | 1003.23 | 106.46 | 1003.17 | 106.88 | 1003.08 | 111.43 | 1002.21 | 113.64 | 1001.78 |
| 118.42 | 1001.11 | 120.81 | 1000.95 | 127.98 | 1000.52 | 130.68 | 1000.41 | 141.48 | 1000.24 |
| 142.33 | 1000.23 | 142.93 | 1000.22 | 156.68 | 1000.13 | 158.78 | 1000.11 | 163.85 | 1000.1 |
| 167.44 | 1000.1 | 171.02 | 1000.09 | 191.95 | 1000.1 | 192.55 | 1000.11 | 193.38 | 1000.11 |
| 204.2 | 1000.13 | 206.89 | 1000.13 | 214.07 | 1000.15 | 216.46 | 1000.17 | 221.23 | 1000.19 |
| 227.98 | 1000.23 | 228.41 | 1000.23 | 228.71 | 1000.24 | 230.49 | 1000.25 | 240.97 | 1000.34 |
| 242.75 | 1000.35 | 245.28 | 1000.38 | 249.93 | 1000.45 | 251.32 | 1000.48 | 253.22 | 1000.51 |
| 257.11 | 1000.6 | 262.58 | 1000.77 | 264.27 | 1000.82 | 265.48 | 1000.86 | 271.45 | 1001.29 |
| 277.73 | 1001.63 | 278.63 | 1001.72 | 279.88 | 1001.79 | 285.79 | 1002.21 | 289.98 | 1002.35 |
| 292.97 | 1002.5 | 297.18 | 1002.69 | 300.15 | 1002.93 | 302.24 | 1002.99 | 302.79 | 1003.02 |
| 307.31 | 1003.25 | 321.67 | 1003.68 | 326.76 | 1003.9 | 328.84 | 1003.95 | 331.78 | 1004.01 |
| 336.02 | 1004.26 | 339.01 | 1004.33 | 343.19 | 1004.51 | 349.08 | 1004.6 | 350.36 | 1004.67 |
| 351.26 | 1004.71 | 357.54 | 1005.19 | 363.52 | 1005.41 | 364.71 | 1005.48 | 366.39 | 1005.53 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 379.06 | 1006.02 | 386.23 | 1006.21 | 388.03 | 1006.24 | 393.4 | 1006.37 | 400.29 | 1006.48 |
| 400.58 | 1006.49 | 400.98 | 1006.49 | 407.75 | 1006.61 | 412.54 | 1006.68 | 418.28 | 1006.78 |
| 422.1 | 1006.84 | 424.8 | 1006.87 | 435.58 | 1006.96 | 436.44 | 1006.97 | 437.05 | 1006.97 |
| 440.61 | 1007 | 461.56 | 1007.08 | 465.14 | 1007.1 | 473.81 | 1007.1 | 479.48 | 1007.12 |
| 486.07 | 1007.11 | 487.48 | 1007.11 | 501.01 | 1006.97 | 504.78 | 1006.92 | 510.58 | 1006.75 |
| 515.35 | 1006.6 | 522.08 | 1006.34 | 522.84 | 1006.3 | 535.09 | 1005.63 | 539.38 | 1005.32 |
| 544.05 | 1005.18 | 551.21 | 1005.68 | 556.68 | 1006.16 | 558.39 | 1006.32 | 559.6 | 1006.42 |
| 565.57 | 1006.95 | 571.85 | 1007.34 | 572.73 | 1007.39 | 573.98 | 1007.44 | 584.11 | 1007.65 |
| 587.09 | 1007.7 | 591.28 | 1007.75 | 594.25 | 1007.8 | 605.58 | 1007.96 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 111.43 | .052 | 251.32 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 81.65 | 302.79 | 250.16 | 199.83 | 169.21 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.14 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 1002.01 | Reach Len. (ft) | 250.16 | 199.83 | 169.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 266.75 | |
| E.G. Slope (ft/ft) | 0.004934 | Area (sq ft) | | 266.75 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 170.46 | Top Width (ft) | | 170.46 | |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | | 2.89 | |
| Max Chl Dpth (ft) | 1.92 | Hydr. Depth (ft) | | 1.56 | |
| Conv. Total (cfs) | 10990.6 | Conv. (cfs) | | 10990.6 | |
| Length Wtd. (ft) | 199.83 | Wetted Per. (ft) | | 170.60 | |
| Min Ch El (ft) | 1000.09 | Shear (lb/sq ft) | | 0.48 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.39 | |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | 1.04 | 22.41 | 0.51 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.52 | 16.31 | 0.86 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.14 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 1002.01 | Reach Len. (ft) | 250.16 | 199.83 | 169.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 266.75 | |
| E.G. Slope (ft/ft) | 0.004934 | Area (sq ft) | | 266.75 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 170.46 | Top Width (ft) | | 170.46 | |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | | 2.89 | |
| Max Chl Dpth (ft) | 1.92 | Hydr. Depth (ft) | | 1.56 | |
| Conv. Total (cfs) | 10990.6 | Conv. (cfs) | | 10990.6 | |
| Length Wtd. (ft) | 199.83 | Wetted Per. (ft) | | 170.60 | |
| Min Ch El (ft) | 1000.09 | Shear (lb/sq ft) | | 0.48 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.39 | |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | | 23.24 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 16.35 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.14 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 1002.01 | Reach Len. (ft) | 250.16 | 199.83 | 169.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 266.75 | |
| E.G. Slope (ft/ft) | 0.004934 | Area (sq ft) | | 266.75 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 170.46 | Top Width (ft) | | 170.46 | |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | | 2.89 | |
| Max Chl Dpth (ft) | 1.92 | Hydr. Depth (ft) | | 1.56 | |
| Conv. Total (cfs) | 10990.6 | Conv. (cfs) | | 10990.6 | |
| Length Wtd. (ft) | 199.83 | Wetted Per. (ft) | | 170.60 | |
| Min Ch El (ft) | 1000.09 | Shear (lb/sq ft) | | 0.48 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.39 | |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | 0.01 | 23.24 | 0.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.08 | 16.35 | 0.08 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.663

INPUT
Description: Thalweg Sta. 276.82
Station Elevation Data num= 162

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1007.87 | .21 | 1007.87 | 1.79 | 1007.9 | 8.07 | 1008.06 | 12.37 | 1008.05 |
| 15.94 | 1008.07 | 22.94 | 1007.89 | 23.8 | 1007.87 | 26.3 | 1007.79 | 33.52 | 1007.54 |
| 39.53 | 1007.32 | 44.1 | 1007.17 | 47.4 | 1007.03 | 54.68 | 1006.79 | 55.26 | 1006.76 |
| 56.96 | 1006.71 | 63.13 | 1006.5 | 65.26 | 1006.47 | 70.99 | 1006.3 | 75.84 | 1006.21 |
| 78.86 | 1006.11 | 86.41 | 1006.07 | 86.58 | 1006.06 | 86.73 | 1006.05 | 87.63 | 1006.04 |
| 94.59 | 1005.84 | 96.99 | 1005.81 | 102.46 | 1005.52 | 107.57 | 1005.3 | 110.32 | 1005.06 |
| 118.15 | 1004.54 | 118.3 | 1004.52 | 128.72 | 1003.29 | 134.21 | 1002.55 | 139.3 | 1001.83 |
| 141.78 | 1001.59 | 148.97 | 1000.69 | 149.65 | 1000.61 | 149.88 | 1000.58 | 150.36 | 1000.55 |
| 160.46 | 1000.09 | 166.51 | 999.97 | 179.64 | 999.83 | 181.11 | 999.82 | 181.62 | 999.81 |
| 188.98 | 999.69 | 192.2 | 999.63 | 194.62 | 999.65 | 196.84 | 999.66 | 202.77 | 999.72 |
| 204.71 | 999.73 | 210.3 | 999.79 | 212.57 | 999.81 | 213.35 | 999.82 | 220.44 | 999.76 |
| 223.93 | 999.75 | 228.3 | 999.71 | 234.51 | 999.68 | 236.17 | 999.66 | 244.03 | 999.61 |
| 245.08 | 999.61 | 251.9 | 999.56 | 263.4 | 999.5 | 266.24 | 999.48 | 267.63 | 999.48 |
| 275.49 | 999.44 | 276.82 | 999.43 | 287.4 | 999.38 | 297.98 | 999.36 | 299.09 | 999.36 |
| 306.96 | 999.39 | 308.55 | 999.4 | 314.82 | 999.48 | 322.69 | 999.61 | 329.71 | 999.75 |
| 330.55 | 999.77 | 334.53 | 999.85 | 338.42 | 999.92 | 340.29 | 999.97 | 346.28 | 1000.14 |
| 350.87 | 1000.31 | 360.29 | 1000.63 | 361.45 | 1000.66 | 362.01 | 1000.68 | 363.64 | 1000.71 |
| 369.88 | 1000.86 | 372.02 | 1000.9 | 377.74 | 1001.1 | 382.6 | 1001.21 | 385.6 | 1001.43 |
| 393.18 | 1001.93 | 393.47 | 1001.96 | 394.31 | 1002.04 | 401.33 | 1002.72 | 403.76 | 1002.94 |
| 409.21 | 1003.3 | 414.34 | 1003.58 | 417.06 | 1003.64 | 422.5 | 1003.74 | 424.91 | 1003.78 |
| 424.98 | 1003.78 | 432.79 | 1003.83 | 435.49 | 1003.83 | 440.67 | 1003.86 | 448.52 | 1003.89 |
| 455.64 | 1003.88 | 456.4 | 1003.87 | 456.65 | 1003.87 | 464.26 | 1003.76 | 467.23 | 1003.71 |
| 472.13 | 1003.59 | 477.81 | 1003.51 | 479.99 | 1003.45 | 486.32 | 1003.35 | 487.85 | 1003.3 |
| 488.38 | 1003.29 | 495.72 | 1002.91 | 498.96 | 1002.78 | 503.58 | 1002.44 | 509.54 | 1002.2 |
| 511.45 | 1002.07 | 516.99 | 1002.16 | 519.31 | 1002.18 | 520.12 | 1002.23 | 527.18 | 1002.64 |
| 530.69 | 1002.9 | 535.04 | 1003.29 | 541.27 | 1003.75 | 542.91 | 1003.83 | 547.65 | 1004.21 |
| 550.77 | 1004.4 | 551.85 | 1004.47 | 558.64 | 1004.79 | 562.43 | 1005.04 | 566.5 | 1005.14 |
| 573.01 | 1005.39 | 574.37 | 1005.38 | 578.32 | 1005.41 | 582.23 | 1005.39 | 583.59 | 1005.43 |
| 594.17 | 1005.77 | 597.96 | 1005.98 | 604.74 | 1006.23 | 605.83 | 1006.29 | 608.98 | 1006.41 |
| 615.32 | 1006.64 | 618.66 | 1006.74 | 625.9 | 1006.97 | 636.48 | 1007.22 | 645.16 | 1007.39 |
| 647.06 | 1007.43 | 653.02 | 1007.53 | 657.64 | 1007.62 | 668.21 | 1007.79 | 668.75 | 1007.79 |
| 670.33 | 1007.8 | 676.62 | 1007.85 | 678.79 | 1007.86 | 684.48 | 1007.91 | 689.37 | 1007.93 |
| 692.35 | 1007.98 | 692.62 | 1007.98 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 194.62 | .052 | 334.53 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 86.58 | 422.5 | 211.79 | 199.99 | 200.27 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1001.25 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 1001.16 | Reach Len. (ft) | 211.79 | 199.99 | 200.27 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 305.85 | |
| E.G. Slope (ft/ft) | 0.003909 | Area (sq ft) | | 305.85 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 234.89 | Top Width (ft) | | 234.89 | |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | | 2.52 | |
| Max Chl Dpth (ft) | 1.79 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 12347.6 | Conv. (cfs) | | 12347.6 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 234.97 | |
| Min Ch El (ft) | 999.36 | Shear (lb/sq ft) | | 0.32 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.80 | |
| Frctn Loss (ft) | 0.79 | Cum Volume (acre-ft) | 1.04 | 21.10 | 0.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.52 | 15.38 | 0.86 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1001.25 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 1001.16 | Reach Len. (ft) | 211.79 | 199.99 | 200.27 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 305.85 | |
| E.G. Slope (ft/ft) | 0.003909 | Area (sq ft) | | 305.85 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 234.89 | Top Width (ft) | | 234.89 | |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | | 2.52 | |
| Max Chl Dpth (ft) | 1.79 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 12347.6 | Conv. (cfs) | | 12347.6 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 234.97 | |
| Min Ch El (ft) | 999.36 | Shear (lb/sq ft) | | 0.32 | |

| | | | |
|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.80 |
| Frctn Loss (ft) | 0.79 | Cum Volume (acre-ft) | 21.93 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 15.42 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1001.25 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 1001.16 | Reach Len. (ft) | 211.79 | 199.99 | 200.27 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 305.85 | |
| E.G. Slope (ft/ft) | 0.003909 | Area (sq ft) | | 305.85 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 234.89 | Top Width (ft) | | 234.89 | |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | | 2.52 | |
| Max Chl Dpth (ft) | 1.79 | Hydr. Depth (ft) | | 1.30 | |
| Conv. Total (cfs) | 12347.6 | Conv. (cfs) | | 12347.6 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 234.97 | |
| Min Ch El (ft) | 999.36 | Shear (lb/sq ft) | | 0.32 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.80 | |
| Frctn Loss (ft) | 0.79 | Cum Volume (acre-ft) | 0.01 | 21.92 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.08 | 15.42 | 0.08 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.625

INPUT
Description: Thalweg Sta. 359.34
Station Elevation Data num= 215

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1003.94 | 1 | 1003.98 | 5.91 | 1004.04 | 9.09 | 1004.09 | 16.31 | 1004.08 |
| 17.19 | 1004.06 | 25.29 | 1003.9 | 26.7 | 1003.86 | 33.39 | 1003.61 | 37.1 | 1003.48 |
| 41.48 | 1003.24 | 47.49 | 1002.93 | 56.94 | 1002.35 | 57.68 | 1002.31 | 57.89 | 1002.3 |
| 58.26 | 1002.29 | 68.28 | 1001.88 | 87.3 | 1001.45 | 89.07 | 1001.43 | 90.07 | 1001.45 |
| 93.57 | 1001.44 | 98.17 | 1001.51 | 99.47 | 1001.48 | 106.27 | 1001.83 | 109.86 | 1002 |
| 114.35 | 1002.28 | 120.26 | 1002.69 | 122.45 | 1002.74 | 130.19 | 1003.08 | 130.55 | 1003.09 |
| 130.65 | 1003.1 | 138.65 | 1003.16 | 141.05 | 1003.22 | 146.74 | 1003.18 | 151.44 | 1003.18 |
| 154.84 | 1003.12 | 161.84 | 1003.01 | 162.94 | 1002.97 | 166.83 | 1002.89 | 171.04 | 1002.77 |
| 172.23 | 1002.74 | 179.13 | 1002.49 | 182.63 | 1002.39 | 193.02 | 1002.03 | 195.33 | 1001.92 |
| 197.84 | 1001.84 | 203.42 | 1001.65 | 211.53 | 1001.46 | 213.81 | 1001.45 | 219.62 | 1001.36 |
| 224.21 | 1001.34 | 227.72 | 1001.25 | 234.6 | 1001.05 | 235.82 | 1000.97 | 240.08 | 1000.65 |
| 243.92 | 1000.35 | 245 | 1000.26 | 252 | 999.71 | 255.39 | 999.49 | 261.46 | 999.36 |
| 265.79 | 999.25 | 276.18 | 999.17 | 276.3 | 999.17 | 276.71 | 999.16 | 286.58 | 999.07 |
| 296.97 | 998.95 | 311.94 | 998.73 | 313.34 | 998.71 | 316.78 | 998.65 | 317.76 | 998.64 |
| 328.16 | 998.48 | 332.98 | 998.42 | 348.94 | 998.15 | 349.18 | 998.14 | 349.96 | 998.13 |
| 357.27 | 997.98 | 359.34 | 997.95 | 365.37 | 997.88 | 369.74 | 997.84 | 373.47 | 997.91 |
| 380.13 | 998 | 386.6 | 998.23 | 389.65 | 998.35 | 390.53 | 998.39 | 397.75 | 998.77 |
| 400.92 | 998.96 | 405.85 | 999.34 | 411.31 | 999.85 | 413.95 | 1000.16 | 421.71 | 1001.11 |
| 422.04 | 1001.14 | 423.22 | 1001.25 | 432.11 | 1002.02 | 433.36 | 1002.08 | 438.24 | 1002.3 |
| 442.5 | 1002.45 | 446.34 | 1002.5 | 452.89 | 1002.56 | 453.25 | 1002.56 | 462.53 | 1002.49 |
| 463.29 | 1002.48 | 470.63 | 1002.29 | 473.68 | 1002.23 | 478.73 | 1001.95 | 484.08 | 1001.72 |
| 486.82 | 1001.55 | 494.48 | 1001.17 | 494.92 | 1001.15 | 496.48 | 1001.11 | 503.02 | 1000.91 |
| 504.87 | 1000.88 | 515.26 | 1000.97 | 519.2 | 1001.09 | 525.66 | 1001.33 | 527.3 | 1001.38 |
| 535.4 | 1001.74 | 536.05 | 1001.76 | 543.5 | 1001.94 | 546.45 | 1002.04 | 551.59 | 1002.12 |
| 556.84 | 1002.27 | 559.69 | 1002.29 | 567.24 | 1002.41 | 567.79 | 1002.42 | 569.73 | 1002.45 |
| 575.89 | 1002.49 | 577.63 | 1002.55 | 583.98 | 1002.72 | 588.03 | 1002.86 | 592.08 | 1003.02 |
| 598.43 | 1003.23 | 600.18 | 1003.33 | 608.28 | 1003.59 | 608.82 | 1003.6 | 616.38 | 1003.88 |
| 619.21 | 1003.95 | 640 | 1004.71 | 642.99 | 1004.8 | 648.76 | 1004.96 | 650.4 | 1005.01 |
| 660.79 | 1005.15 | 664.95 | 1005.17 | 671.19 | 1005.22 | 681.15 | 1005.28 | 681.58 | 1005.29 |
| 691.98 | 1005.36 | 696.88 | 1005.37 | 702.37 | 1005.4 | 705.44 | 1005.39 | 712.77 | 1005.34 |
| 721.63 | 1005.11 | 723.16 | 1005.05 | 729.73 | 1004.76 | 737.83 | 1004.21 | 743.95 | 1003.61 |
| 745.93 | 1003.54 | 752.87 | 1003.22 | 754.35 | 1003.16 | 764.74 | 1002.99 | 769.44 | 1002.99 |
| 775.14 | 1002.9 | 783.96 | 1003 | 785.53 | 1003 | 789.5 | 1003.07 | 794.5 | 1003.2 |
| 795.93 | 1003.21 | 802.6 | 1003.3 | 806.32 | 1003.43 | 810.7 | 1003.47 | 816.72 | 1003.93 |
| 818.8 | 1004.1 | 826.13 | 1004.84 | 826.89 | 1004.92 | 827.11 | 1004.93 | 834.99 | 1005.51 |
| 837.51 | 1005.61 | 843.09 | 1005.78 | 847.9 | 1005.85 | 851.19 | 1005.88 | 858.3 | 1005.92 |
| 859.28 | 1005.93 | 862.76 | 1005.95 | 867.38 | 1005.95 | 868.69 | 1005.94 | 875.48 | 1005.94 |
| 879.09 | 1005.95 | 883.58 | 1005.99 | 889.48 | 1006.1 | 891.68 | 1006.1 | 899.39 | 1006.08 |
| 899.88 | 1006.08 | 910.27 | 1005.95 | 920.67 | 1005.88 | 924.06 | 1005.89 | 931.06 | 1005.9 |
| 932.15 | 1005.91 | 941.46 | 1005.95 | 948.35 | 1006 | 951.85 | 1006.04 | 962.25 | 1006.14 |
| 972.64 | 1006.27 | 980.74 | 1006.45 | 983.04 | 1006.53 | 988.84 | 1006.7 | 993.43 | 1006.9 |
| 1003.83 | 1007.16 | 1005.03 | 1007.18 | 1013.13 | 1007.34 | 1014.22 | 1007.35 | 1024.61 | 1007.57 |
| 1037.42 | 1007.79 | 1045.41 | 1007.89 | 1045.51 | 1007.89 | 1045.89 | 1007.9 | 1046.77 | 1007.91 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 311.94 | .052 | 433.36 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 197.84 | 453.25 | 206.39 | 200 | 198.77 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 453.25 | 1046.77 | 1002.56 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.46 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 1000.34 | Reach Len. (ft) | 206.39 | 200.00 | 198.77 |
| Crit W.S. (ft) | 999.55 | Flow Area (sq ft) | | 270.48 | |
| E.G. Slope (ft/ft) | 0.003966 | Area (sq ft) | | 270.48 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 171.32 | Top Width (ft) | | 171.32 | |
| Vel Total (ft/s) | 2.85 | Avg. Vel. (ft/s) | | 2.85 | |
| Max Chl Dpth (ft) | 2.50 | Hydr. Depth (ft) | | 1.58 | |
| Conv. Total (cfs) | 12259.1 | Conv. (cfs) | | 12259.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 171.46 | |
| Min Ch El (ft) | 997.84 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.11 | |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | 1.04 | 19.77 | 0.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.52 | 14.45 | 0.86 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.46 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 1000.34 | Reach Len. (ft) | 206.39 | 200.00 | 198.77 |
| Crit W.S. (ft) | 999.55 | Flow Area (sq ft) | | 270.48 | |
| E.G. Slope (ft/ft) | 0.003966 | Area (sq ft) | | 270.48 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 171.32 | Top Width (ft) | | 171.32 | |
| Vel Total (ft/s) | 2.85 | Avg. Vel. (ft/s) | | 2.85 | |
| Max Chl Dpth (ft) | 2.50 | Hydr. Depth (ft) | | 1.58 | |
| Conv. Total (cfs) | 12259.1 | Conv. (cfs) | | 12259.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 171.46 | |
| Min Ch El (ft) | 997.84 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.11 | |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | | 20.61 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 14.49 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.46 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.046 | |
| W.S. Elev (ft) | 1000.34 | Reach Len. (ft) | 206.39 | 200.00 | 198.77 |
| Crit W.S. (ft) | 999.55 | Flow Area (sq ft) | | 270.48 | |
| E.G. Slope (ft/ft) | 0.003966 | Area (sq ft) | | 270.48 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 171.32 | Top Width (ft) | | 171.32 | |
| Vel Total (ft/s) | 2.85 | Avg. Vel. (ft/s) | | 2.85 | |
| Max Chl Dpth (ft) | 2.50 | Hydr. Depth (ft) | | 1.58 | |
| Conv. Total (cfs) | 12259.1 | Conv. (cfs) | | 12259.1 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 171.46 | |
| Min Ch El (ft) | 997.84 | Shear (lb/sq ft) | | 0.39 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.11 | |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | 0.01 | 20.60 | 0.01 |

C & E Loss (ft) 0.00 Cum SA (acres) 0.08 14.49 0.08

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.587

INPUT
Description: Thalweg Sta. 453.19
Station Elevation Data num= 206

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1003.89 | .47 | 1003.91 | 1.72 | 1003.96 | 9 | 1004.27 | 10.76 | 1004.34 |
| 17.29 | 1004.62 | 21.05 | 1004.77 | 27.23 | 1004.97 | 31.34 | 1005.12 | 33.85 | 1005.18 |
| 42.13 | 1005.35 | 44.21 | 1005.38 | 50.41 | 1005.44 | 58.7 | 1005.49 | 72.5 | 1005.54 |
| 75.26 | 1005.54 | 82.78 | 1005.57 | 83.55 | 1005.57 | 91.83 | 1005.59 | 93.07 | 1005.6 |
| 100.11 | 1005.61 | 103.36 | 1005.62 | 108.4 | 1005.6 | 113.65 | 1005.6 | 123.94 | 1005.44 |
| 134.23 | 1005.23 | 141.54 | 1005.2 | 144.52 | 1005.16 | 149.82 | 1005.19 | 154.81 | 1005.19 |
| 158.1 | 1005.2 | 191.23 | 1005.19 | 199.51 | 1005.23 | 206.25 | 1005.29 | 207.8 | 1005.3 |
| 216.08 | 1005.43 | 216.54 | 1005.43 | 224.37 | 1005.54 | 226.83 | 1005.58 | 232.65 | 1005.59 |
| 237.12 | 1005.62 | 240.94 | 1005.6 | 247.41 | 1005.65 | 249.22 | 1005.65 | 256.69 | 1005.73 |
| 257.5 | 1005.74 | 257.7 | 1005.74 | 267.99 | 1005.78 | 274.07 | 1005.73 | 278.27 | 1005.72 |
| 282.35 | 1005.58 | 288.57 | 1005.43 | 290.63 | 1005.33 | 298.85 | 1005.07 | 298.91 | 1005.07 |
| 299.18 | 1005.06 | 300.68 | 1005.01 | 307.2 | 1004.79 | 309.14 | 1004.73 | 315.48 | 1004.51 |
| 323.76 | 1004.19 | 329.72 | 1003.85 | 332.05 | 1003.7 | 340.01 | 1003.06 | 340.34 | 1003.03 |
| 341.67 | 1002.92 | 348.62 | 1002.31 | 350.3 | 1002.16 | 356.9 | 1001.6 | 360.59 | 1001.27 |
| 365.19 | 1000.9 | 372.37 | 1000.22 | 373.47 | 1000.11 | 381.75 | 999.26 | 390.03 | 998.58 |
| 391.45 | 998.47 | 401.74 | 998.07 | 406.6 | 997.95 | 412.03 | 997.83 | 414.88 | 997.75 |
| 431.45 | 997.38 | 432.61 | 997.35 | 439.73 | 997.25 | 442.9 | 997.22 | 453.19 | 997.23 |
| 461.67 | 997.29 | 463.48 | 997.3 | 472.87 | 997.38 | 473.77 | 997.39 | 481.15 | 997.45 |
| 494.34 | 997.58 | 504.63 | 997.7 | 506 | 997.72 | 514.28 | 997.82 | 514.92 | 997.83 |
| 522.57 | 997.96 | 525.21 | 998 | 535.5 | 998.26 | 540.36 | 998.54 | 545.79 | 998.86 |
| 547.41 | 999.02 | 554.14 | 999.7 | 555.7 | 999.86 | 556.08 | 999.89 | 563.98 | 1000.47 |
| 566.37 | 1000.58 | 572.27 | 1000.73 | 576.65 | 1000.75 | 580.55 | 1000.8 | 581.02 | 1000.8 |
| 586.94 | 1000.74 | 588.84 | 1000.74 | 596.64 | 1000.54 | 597.12 | 1000.53 | 597.23 | 1000.53 |
| 605.4 | 1000.24 | 607.52 | 1000.17 | 613.68 | 999.93 | 617.81 | 999.8 | 621.97 | 999.63 |
| 628.1 | 999.47 | 630.25 | 999.39 | 638.39 | 999.16 | 638.53 | 999.15 | 639.13 | 999.13 |
| 648.68 | 998.9 | 651.72 | 998.86 | 658.97 | 998.7 | 663.38 | 998.64 | 669.26 | 998.67 |
| 671.66 | 998.66 | 679.54 | 998.74 | 679.95 | 998.74 | 681.62 | 998.76 | 688.24 | 998.81 |
| 689.83 | 998.84 | 696.52 | 998.93 | 700.12 | 999 | 704.81 | 999.14 | 710.41 | 999.33 |
| 713.09 | 999.43 | 720.7 | 999.76 | 721.37 | 999.79 | 724.13 | 999.95 | 729.65 | 1000.26 |
| 730.99 | 1000.39 | 737.93 | 1001.1 | 741.28 | 1001.58 | 746.22 | 1002.2 | 751.57 | 1003.1 |
| 754.5 | 1003.44 | 761.86 | 1003.98 | 762.78 | 1004.05 | 766.62 | 1004.18 | 772.14 | 1004.31 |
| 773.92 | 1004.32 | 782.44 | 1004.4 | 787.49 | 1004.46 | 792.72 | 1004.5 | 801.07 | 1004.6 |
| 803.01 | 1004.62 | 804.21 | 1004.63 | 809.11 | 1004.71 | 812.49 | 1004.75 | 813.3 | 1004.77 |
| 820.77 | 1004.89 | 823.59 | 1004.95 | 829.05 | 1005.04 | 845.62 | 1005.37 | 862.18 | 1005.77 |
| 864.75 | 1005.82 | 868.94 | 1005.88 | 875.04 | 1005.98 | 885.32 | 1006.06 | 887.03 | 1006.05 |
| 894.1 | 1006.11 | 895.61 | 1006.11 | 903.6 | 1006.17 | 905.9 | 1006.18 | 926.48 | 1006.43 |
| 928.46 | 1006.45 | 936.59 | 1006.55 | 936.77 | 1006.56 | 947.06 | 1006.68 | 950.4 | 1006.71 |
| 977.55 | 1006.88 | 977.93 | 1006.88 | 979.09 | 1006.89 | 986.43 | 1006.94 | 994.72 | 1007.03 |
| 998.5 | 1007.09 | 1008.79 | 1007.23 | 1011.28 | 1007.26 | 1019.08 | 1007.34 | 1019.57 | 1007.35 |
| 1027.85 | 1007.44 | 1036.14 | 1007.55 | 1039.66 | 1007.59 | 1044.42 | 1007.66 | 1049.95 | 1007.73 |
| 1052.71 | 1007.77 | 1060.24 | 1007.86 | 1060.99 | 1007.87 | 1064.07 | 1007.9 | 1069.27 | 1007.96 |
| 1070.02 | 1007.97 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 372.37 | .052 | 540.36 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 300.68 | 581.02 | 194.81 | 199.99 | 204.99 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 581.02 | 1070.02 | 1000.8 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.35 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 999.18 | Reach Len. (ft) | 194.81 | 199.99 | 204.99 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | 998.61 | Flow Area (sq ft) | | 232.56 | |
| E.G. Slope (ft/ft) | 0.008267 | Area (sq ft) | | 232.56 | 23.24 |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 234.70 | Top Width (ft) | | 166.30 | 68.40 |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 | |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | | 1.40 | |
| Conv. Total (cfs) | 8490.6 | Conv. (cfs) | | 8490.6 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 166.39 | |
| Min Ch El (ft) | 997.22 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.39 | |
| Frctn Loss (ft) | 1.42 | Cum Volume (acre-ft) | 1.04 | 18.62 | 0.46 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.52 | 13.67 | 0.71 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.35 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 999.18 | Reach Len. (ft) | 194.81 | 199.99 | 204.99 |
| Crit W.S. (ft) | 998.61 | Flow Area (sq ft) | | 232.55 | |
| E.G. Slope (ft/ft) | 0.008268 | Area (sq ft) | | 232.55 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 166.30 | Top Width (ft) | | 166.30 | |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 | |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | | 1.40 | |
| Conv. Total (cfs) | 8490.0 | Conv. (cfs) | | 8490.0 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 166.39 | |
| Min Ch El (ft) | 997.22 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.40 | |
| Frctn Loss (ft) | 1.42 | Cum Volume (acre-ft) | | 19.45 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 13.71 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.35 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 999.18 | Reach Len. (ft) | 194.81 | 199.99 | 204.99 |
| Crit W.S. (ft) | 998.60 | Flow Area (sq ft) | | 232.56 | |
| E.G. Slope (ft/ft) | 0.008267 | Area (sq ft) | | 232.56 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 166.30 | Top Width (ft) | | 166.30 | |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 | |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | | 1.40 | |
| Conv. Total (cfs) | 8490.6 | Conv. (cfs) | | 8490.6 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 166.39 | |
| Min Ch El (ft) | 997.22 | Shear (lb/sq ft) | | 0.72 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.39 | |
| Frctn Loss (ft) | 1.42 | Cum Volume (acre-ft) | 0.01 | 19.45 | 0.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.08 | 13.71 | 0.08 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.549

INPUT
Description: Thalweg Sta. 435.73

Station Elevation Data num= 217

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1001.8 | 3.25 | 1001.89 | 10.27 | 1002.1 | 11.37 | 1002.12 | 19.5 | 1002.29 |
| 27.62 | 1002.43 | 31.02 | 1002.48 | 35.75 | 1002.56 | 41.39 | 1002.67 | 51.77 | 1002.83 |
| 52 | 1002.83 | 52.81 | 1002.84 | 60.13 | 1002.89 | 68.25 | 1002.89 | 76.37 | 1002.83 |
| 82.9 | 1002.76 | 84.49 | 1002.75 | 92.62 | 1002.68 | 103.66 | 1002.67 | 114.04 | 1002.77 |
| 116.99 | 1002.82 | 124.41 | 1002.89 | 125.12 | 1002.9 | 127.66 | 1002.9 | 133.24 | 1002.91 |
| 134.79 | 1002.9 | 137.52 | 1002.89 | 145.17 | 1002.82 | 149.5 | 1002.8 | 155.55 | 1002.91 |
| 157.62 | 1002.94 | 165.09 | 1003.1 | 165.75 | 1003.11 | 165.92 | 1003.11 | 173.87 | 1003.13 |
| 176.3 | 1003.17 | 182 | 1003.06 | 186.68 | 1003.05 | 190.11 | 1002.94 | 197.05 | 1002.85 |
| 198.24 | 1002.78 | 202.52 | 1002.71 | 206.36 | 1002.61 | 207.43 | 1002.6 | 214.49 | 1002.38 |
| 217.81 | 1002.39 | 222.61 | 1002.27 | 228.19 | 1002.29 | 230.74 | 1002.23 | 238.56 | 1002.2 |
| 238.86 | 1002.19 | 239.95 | 1002.17 | 246.99 | 1001.89 | 248.94 | 1001.87 | 255.11 | 1001.56 |
| 259.32 | 1001.45 | 263.24 | 1001.23 | 269.7 | 1000.97 | 271.37 | 1000.9 | 277.37 | 1000.61 |
| 278.6 | 1000.53 | 279.49 | 1000.47 | 280.07 | 1000.44 | 287.62 | 1000.04 | 290.45 | 999.94 |
| 295.74 | 999.74 | 300.83 | 999.61 | 303.86 | 999.52 | 311.2 | 999.25 | 311.98 | 999.23 |
| 314.8 | 999.08 | 320.11 | 998.77 | 321.58 | 998.69 | 328.23 | 998.29 | 331.96 | 998.01 |
| 336.36 | 997.78 | 342.34 | 997.26 | 344.48 | 997.23 | 349.1 | 996.97 | 352.61 | 996.78 |
| 352.71 | 996.77 | 360.73 | 996.6 | 363.09 | 996.53 | 368.86 | 996.45 | 373.47 | 996.4 |
| 376.99 | 996.35 | 383.85 | 996.28 | 385.11 | 996.26 | 393.24 | 996.19 | 394.22 | 996.18 |
| 401.36 | 996.13 | 404.6 | 996.1 | 414.98 | 996.07 | 425.35 | 996.1 | 425.73 | 996.1 |
| 427.09 | 996.11 | 435.73 | 996.15 | 439.04 | 996.17 | 464.52 | 996.26 | 466.35 | 996.27 |
| 466.86 | 996.28 | 467.77 | 996.28 | 477.24 | 996.34 | 482.12 | 996.38 | 487.62 | 996.41 |
| 496.48 | 996.49 | 498 | 996.5 | 498.06 | 996.5 | 506.98 | 996.59 | 508.37 | 996.61 |
| 515.11 | 996.73 | 518.75 | 996.83 | 523.22 | 997 | 529.13 | 997.34 | 531.35 | 997.55 |
| 539.38 | 998.5 | 539.47 | 998.51 | 549.88 | 999.78 | 555.72 | 1000.19 | 560.26 | 1000.44 |
| 563.85 | 1000.53 | 570.63 | 1000.63 | 570.84 | 1000.63 | 571.97 | 1000.66 | 576.81 | 1000.78 |
| 581.01 | 1000.87 | 582.63 | 1000.92 | 591.39 | 1001.22 | 596.98 | 1001.4 | 601.77 | 1001.57 |
| 611.35 | 1001.87 | 612.15 | 1001.89 | 614.23 | 1001.96 | 620.73 | 1002.1 | 622.52 | 1002.15 |
| 628.85 | 1002.24 | 632.9 | 1002.36 | 636.97 | 1002.42 | 643.28 | 1002.59 | 645.09 | 1002.63 |
| 651.66 | 1002.85 | 653.22 | 1002.91 | 653.65 | 1002.93 | 661.34 | 1003.19 | 664.03 | 1003.27 |
| 669.47 | 1003.41 | 674.41 | 1003.55 | 677.59 | 1003.6 | 684.78 | 1003.76 | 685.72 | 1003.77 |
| 689.09 | 1003.84 | 693.84 | 1003.92 | 695.16 | 1003.95 | 710.09 | 1004.24 | 715.92 | 1004.34 |
| 718.22 | 1004.39 | 726.29 | 1004.52 | 726.52 | 1004.52 | 734.47 | 1004.65 | 736.67 | 1004.67 |
| 742.6 | 1004.78 | 747.05 | 1004.84 | 750.71 | 1004.91 | 757.43 | 1005.01 | 766.96 | 1005.17 |
| 775.09 | 1005.26 | 783.21 | 1005.32 | 788.56 | 1005.35 | 791.34 | 1005.38 | 798.94 | 1005.45 |
| 799.46 | 1005.45 | 807.59 | 1005.53 | 809.31 | 1005.55 | 815.71 | 1005.59 | 819.69 | 1005.63 |
| 823.84 | 1005.64 | 830.07 | 1005.67 | 831.97 | 1005.67 | 838.8 | 1005.69 | 840.09 | 1005.69 |
| 840.44 | 1005.7 | 848.22 | 1005.71 | 856.34 | 1005.74 | 861.2 | 1005.75 | 864.46 | 1005.77 |
| 871.58 | 1005.79 | 872.58 | 1005.8 | 880.71 | 1005.85 | 881.95 | 1005.85 | 896.96 | 1005.98 |
| 902.71 | 1006.04 | 905.08 | 1006.06 | 913.09 | 1006.14 | 913.21 | 1006.15 | 913.67 | 1006.15 |
| 953.84 | 1006.62 | 954.59 | 1006.63 | 961.96 | 1006.71 | 964.97 | 1006.75 | 978.2 | 1006.88 |
| 985.73 | 1006.94 | 986.33 | 1006.95 | 988.52 | 1006.97 | 994.45 | 1007.01 | 996.1 | 1007.03 |
| 1002.58 | 1007.08 | 1026.95 | 1007.32 | 1027.24 | 1007.32 | 1035.08 | 1007.4 | 1068.74 | 1007.67 |
| 1089.5 | 1007.79 | 1099.88 | 1007.83 | 1100.8 | 1007.83 | 1108.2 | 1007.85 | 1110.25 | 1007.86 |
| 1120.63 | 1007.89 | 1137.13 | 1007.99 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 349.1 | .052 | 498.06 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 278.6 | 570.84 | 164.12 | 199.95 | 231.72 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.92 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 997.78 | Reach Len. (ft) | 164.12 | 199.95 | 231.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 259.49 | |
| E.G. Slope (ft/ft) | 0.006192 | Area (sq ft) | | 259.49 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 196.93 | Top Width (ft) | | 196.93 | |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.98 | |
| Max Chl Dpth (ft) | 1.71 | Hydr. Depth (ft) | | 1.32 | |
| Conv. Total (cfs) | 9810.4 | Conv. (cfs) | | 9810.4 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 197.01 | |
| Min Ch El (ft) | 996.07 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.51 | |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | 1.04 | 17.49 | 0.41 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.52 | 12.84 | 0.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.92 | Element | Left OB | Channel | Right OB |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 997.78 | Reach Len. (ft) | 164.12 | 199.95 | 231.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 259.50 | |
| E.G. Slope (ft/ft) | 0.006191 | Area (sq ft) | | 259.50 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 196.93 | Top Width (ft) | | 196.93 | |
| Vel Total (ft/s) | 2.97 | Avg. Vel. (ft/s) | | 2.97 | |
| Max Chl Dpth (ft) | 1.71 | Hydr. Depth (ft) | | 1.32 | |
| Conv. Total (cfs) | 9811.2 | Conv. (cfs) | | 9811.2 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 197.01 | |
| Min Ch El (ft) | 996.07 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.51 | |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | | 18.32 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 12.88 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.92 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 997.78 | Reach Len. (ft) | 164.12 | 199.95 | 231.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 259.49 | |
| E.G. Slope (ft/ft) | 0.006192 | Area (sq ft) | | 259.49 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 196.93 | Top Width (ft) | | 196.93 | |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.98 | |
| Max Chl Dpth (ft) | 1.71 | Hydr. Depth (ft) | | 1.32 | |
| Conv. Total (cfs) | 9810.4 | Conv. (cfs) | | 9810.4 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | | 197.01 | |
| Min Ch El (ft) | 996.07 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.51 | |
| Frctn Loss (ft) | 1.11 | Cum Volume (acre-ft) | 0.01 | 18.32 | 0.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.08 | 12.88 | 0.08 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.511

INPUT
Description: Thalweg Sta. 324.10
Station Elevation Data num= 194

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1000.36 | 1.23 | 1000.26 | 8.56 | 999.75 | 10.04 | 999.64 | 15.9 | 999.54 |
| 21.53 | 999.67 | 23.24 | 999.75 | 30.58 | 1000.23 | 33.02 | 1000.4 | 37.91 | 1000.66 |
| 44.51 | 1000.95 | 45.25 | 1000.98 | 55.99 | 1001.3 | 59.93 | 1001.41 | 67.26 | 1001.6 |
| 67.48 | 1001.61 | 74.6 | 1001.76 | 78.97 | 1001.86 | 81.95 | 1001.89 | 87.19 | 1001.96 |
| 90.46 | 1001.99 | 96.62 | 1001.93 | 101.95 | 1001.83 | 103.96 | 1001.78 | 107.51 | 1001.66 |
| 113.44 | 1001.47 | 118.63 | 1001.29 | 124.93 | 1001.04 | 125.97 | 1000.99 | 127.83 | 1000.88 |
| 133.31 | 1000.61 | 136.41 | 1000.47 | 140.65 | 1000.22 | 147.9 | 999.86 | 147.98 | 999.86 |
| 148.14 | 999.85 | 159.39 | 999.64 | 168.45 | 999.5 | 170.01 | 999.47 | 170.88 | 999.43 |
| 177.34 | 999.03 | 182.37 | 998.73 | 183.47 | 998.66 | 184.68 | 998.58 | 192.02 | 997.93 |
| 193.86 | 997.78 | 199.36 | 997.43 | 205.35 | 996.88 | 206.69 | 996.84 | 209.08 | 996.68 |
| 214.03 | 996.43 | 216.83 | 996.26 | 228.32 | 995.94 | 228.71 | 995.93 | 229.39 | 995.92 |
| 232.4 | 995.86 | 243.38 | 995.65 | 249.7 | 995.54 | 250.72 | 995.52 | 251.3 | 995.51 |
| 258.07 | 995.38 | 262.79 | 995.3 | 265.4 | 995.26 | 274.28 | 995.14 | 285.76 | 995.04 |
| 294.75 | 994.98 | 297.25 | 994.97 | 308.74 | 994.88 | 309.43 | 994.88 | 316.77 | 994.82 |
| 320.23 | 994.78 | 324.1 | 994.75 | 330.96 | 994.68 | 331.44 | 994.67 | 331.72 | 994.67 |
| 338.78 | 994.62 | 343.21 | 994.6 | 346.13 | 994.58 | 353.46 | 994.61 | 354.7 | 994.63 |
| 360.8 | 994.71 | 366.18 | 994.81 | 368.14 | 994.85 | 377.67 | 995.07 | 382.81 | 995.22 |
| 389.16 | 995.46 | 390.15 | 995.5 | 391.89 | 995.62 | 397.49 | 995.96 | 398.4 | 996.05 |
| 400.65 | 996.28 | 404.83 | 996.82 | 412.14 | 998.13 | 412.21 | 998.14 | 419.5 | 998.65 |
| 423.63 | 998.85 | 426.85 | 998.92 | 432.53 | 999.01 | 434.18 | 999.02 | 435.12 | 999.04 |
| 441.52 | 999.03 | 446.6 | 999.04 | 448.85 | 999.05 | 450.82 | 999.05 | 452.84 | 999.05 |
| 456.2 | 998.98 | 458.09 | 998.95 | 470.87 | 998.85 | 473.15 | 998.85 | 478.21 | 998.71 |
| 481.07 | 998.61 | 491.38 | 998.11 | 492.56 | 998.06 | 492.89 | 998.04 | 493.46 | 998.01 |
| 500.22 | 997.7 | 504.05 | 997.47 | 507.56 | 997.32 | 513.78 | 996.92 | 514.9 | 996.96 |
| 515.54 | 997 | 517.82 | 997.09 | 527.02 | 997.51 | 529.57 | 997.71 | 534.09 | 997.67 |
| 536.91 | 997.86 | 538.51 | 997.9 | 544.26 | 998.15 | 550 | 998.32 | 551.59 | 998.5 |
| 554.4 | 998.58 | 558.93 | 998.93 | 561.49 | 999.11 | 572.98 | 1000.11 | 573.61 | 1000.17 |
| 574.71 | 1000.28 | 580.94 | 1000.83 | 584.47 | 1001.07 | 588.28 | 1001.44 | 595.03 | 1001.86 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 595.62 | 1001.88 | 595.96 | 1001.88 | 602.96 | 1002.08 | 607.44 | 1002.17 | 610.29 | 1002.22 |
| 615.35 | 1002.34 | 617.63 | 1002.37 | 618.93 | 1002.4 | 624.97 | 1002.5 | 630.42 | 1002.63 |
| 632.32 | 1002.66 | 635.66 | 1002.75 | 641.91 | 1002.88 | 646.99 | 1002.95 | 653.4 | 1003.09 |
| 654.33 | 1003.09 | 655.97 | 1003.11 | 661.67 | 1003.11 | 664.89 | 1003.14 | 669 | 1003.13 |
| 676.28 | 1003.15 | 676.38 | 1003.15 | 699.35 | 1003.23 | 733.82 | 1003.43 | 735.05 | 1003.44 |
| 737.22 | 1003.44 | 742.39 | 1003.46 | 745.31 | 1003.46 | 749.73 | 1003.47 | 768.28 | 1003.48 |
| 771.74 | 1003.49 | 786.41 | 1003.49 | 791.26 | 1003.48 | 793.75 | 1003.48 | 798.16 | 1003.47 |
| 801.1 | 1003.45 | 802.75 | 1003.43 | 808.44 | 1003.37 | 815.77 | 1003.13 | 823.11 | 1002.69 |
| 825.73 | 1002.52 | 830.45 | 1002.27 | 837.22 | 1002.1 | 837.79 | 1002.09 | 838.79 | 1002.11 |
| 845.12 | 1002.38 | 848.7 | 1002.68 | 852.46 | 1002.93 | 859.1 | 1003.42 | 859.8 | 1003.46 |
| 860.19 | 1003.48 | 867.14 | 1003.79 | 871.68 | 1003.88 | 873.68 | 1003.94 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 232.4 | .052 | 398.4 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 183.47 | 450.82 | 188.54 | 199.89 | 211.02 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 996.81 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 996.69 | Reach Len. (ft) | 188.54 | 199.89 | 211.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 281.93 | |
| E.G. Slope (ft/ft) | 0.004973 | Area (sq ft) | | 281.93 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 194.89 | Top Width (ft) | | 194.89 | |
| Vel Total (ft/s) | 2.74 | Avg. Vel. (ft/s) | | 2.74 | |
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | | 1.45 | |
| Conv. Total (cfs) | 10947.8 | Conv. (cfs) | | 10947.8 | |
| Length Wtd. (ft) | 199.89 | Wetted Per. (ft) | | 194.98 | |
| Min Ch El (ft) | 994.58 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.23 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 1.04 | 16.25 | 0.41 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.52 | 11.94 | 0.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 996.81 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 996.69 | Reach Len. (ft) | 188.54 | 199.89 | 211.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 281.88 | |
| E.G. Slope (ft/ft) | 0.004976 | Area (sq ft) | | 281.88 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 194.88 | Top Width (ft) | | 194.88 | |
| Vel Total (ft/s) | 2.74 | Avg. Vel. (ft/s) | | 2.74 | |
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | | 1.45 | |
| Conv. Total (cfs) | 10944.1 | Conv. (cfs) | | 10944.1 | |
| Length Wtd. (ft) | 199.89 | Wetted Per. (ft) | | 194.98 | |
| Min Ch El (ft) | 994.58 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.23 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | | 17.08 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 11.98 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 996.81 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 996.69 | Reach Len. (ft) | 188.54 | 199.89 | 211.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 281.93 | |
| E.G. Slope (ft/ft) | 0.004973 | Area (sq ft) | | 281.93 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 194.89 | Top Width (ft) | | 194.89 | |
| Vel Total (ft/s) | 2.74 | Avg. Vel. (ft/s) | | 2.74 | |
| Max Chl Dpth (ft) | 2.11 | Hydr. Depth (ft) | | 1.45 | |
| Conv. Total (cfs) | 10947.8 | Conv. (cfs) | | 10947.8 | |
| Length Wtd. (ft) | 199.89 | Wetted Per. (ft) | | 194.98 | |
| Min Ch El (ft) | 994.58 | Shear (lb/sq ft) | | 0.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.23 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 0.01 | 17.07 | 0.01 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.08 | 11.98 | 0.08 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.474

INPUT
Description: Thalweg Sta. 264.96
Station Elevation Data num= 132

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1000.12 | 12.23 | 999.59 | 13.25 | 999.54 | 19.43 | 999.26 | 23.59 | 999.09 |
| 26.63 | 998.96 | 31.11 | 998.86 | 33.83 | 998.76 | 35.67 | 998.71 | 41.03 | 998.4 |
| 47.73 | 998.09 | 48.24 | 998.04 | 48.98 | 997.97 | 55.44 | 997.24 | 59.8 | 996.84 |
| 62.64 | 996.53 | 66.85 | 996.16 | 69.84 | 995.84 | 71.87 | 995.72 | 77.04 | 995.55 |
| 83.94 | 995.4 | 84.25 | 995.41 | 84.71 | 995.41 | 91.46 | 995.48 | 96.01 | 995.48 |
| 98.65 | 995.62 | 105.85 | 995.89 | 108.07 | 995.92 | 119.53 | 996.21 | 120.14 | 996.23 |
| 120.63 | 996.23 | 127.47 | 996.21 | 132.21 | 996.12 | 134.66 | 996.03 | 138.3 | 995.89 |
| 141.86 | 995.77 | 144.28 | 995.7 | 149.07 | 995.43 | 156.16 | 995.08 | 156.35 | 995.08 |
| 163.48 | 994.71 | 168.41 | 994.55 | 170.67 | 994.45 | 173.34 | 994.39 | 174.02 | 994.38 |
| 177.88 | 994.31 | 180.48 | 994.28 | 191.89 | 994.2 | 192.55 | 994.2 | 199.49 | 994.16 |
| 204.62 | 994.12 | 206.69 | 994.11 | 227.62 | 993.95 | 228.29 | 993.94 | 228.76 | 993.94 |
| 240.83 | 993.84 | 242.71 | 993.83 | 245.48 | 993.81 | 252.89 | 993.8 | 263.34 | 993.87 |
| 264.31 | 993.88 | 264.96 | 993.89 | 277.03 | 994.06 | 285.91 | 994.16 | 289.1 | 994.19 |
| 293.12 | 994.22 | 299.06 | 994.24 | 300.32 | 994.24 | 301.17 | 994.25 | 307.53 | 994.24 |
| 313.23 | 994.26 | 314.73 | 994.26 | 316.93 | 994.27 | 321.92 | 994.28 | 329.13 | 994.32 |
| 334.8 | 994.37 | 336.33 | 994.38 | 337.37 | 994.4 | 343.54 | 994.54 | 349.44 | 994.77 |
| 350.74 | 994.83 | 351.02 | 994.86 | 352.66 | 995.02 | 357.94 | 995.49 | 361.51 | 995.94 |
| 365.14 | 996.38 | 370.52 | 997.1 | 372.34 | 997.33 | 373.57 | 997.47 | 379.55 | 998.1 |
| 385.64 | 998.57 | 386.75 | 998.64 | 388.38 | 998.73 | 393.95 | 998.97 | 397.71 | 999.12 |
| 406.24 | 999.35 | 408.35 | 999.39 | 409.78 | 999.43 | 415.56 | 999.48 | 417.31 | 999.5 |
| 421.85 | 999.56 | 422.77 | 999.57 | 424.11 | 999.6 | 429.96 | 999.7 | 433.91 | 999.78 |
| 437.16 | 999.88 | 441.97 | 1000 | 444.37 | 1000.07 | 445.99 | 1000.11 | 451.57 | 1000.28 |
| 458.05 | 1000.43 | 458.78 | 1000.45 | 459.84 | 1000.47 | 465.97 | 1000.6 | 470.12 | 1000.67 |
| 473.17 | 1000.73 | 477.7 | 1000.81 | 480.38 | 1000.83 | 482.19 | 1000.86 | 487.58 | 1000.91 |
| 494.26 | 1000.99 | 494.79 | 1001 | 501.98 | 1001.1 | 506.33 | 1001.21 | 509.19 | 1001.27 |
| 516.39 | 1001.47 | 518.39 | 1001.52 | 530.46 | 1001.76 | 531.29 | 1001.77 | 538 | 1001.84 |
| 542.53 | 1001.91 | 543.38 | 1001.93 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 173.34 | .052 | 351.02 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 120.63 | 361.51 | 180.21 | 199.98 | 220.79 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 120.63 | 996.23 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 995.66 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 995.53 | Reach Len. (ft) | 180.21 | 199.98 | 220.79 |
| Crit W.S. (ft) | 994.97 | Flow Area (sq ft) | | 266.47 | |
| E.G. Slope (ft/ft) | 0.006687 | Area (sq ft) | 1.37 | 266.47 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 230.26 | Top Width (ft) | 19.21 | 211.05 | |
| Vel Total (ft/s) | 2.90 | Avg. Vel. (ft/s) | | 2.90 | |
| Max Chl Dpth (ft) | 1.73 | Hydr. Depth (ft) | | 1.26 | |
| Conv. Total (cfs) | 9440.8 | Conv. (cfs) | | 9440.8 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 211.12 | |
| Min Ch El (ft) | 993.80 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.53 | |
| Frctn Loss (ft) | 1.73 | Cum Volume (acre-ft) | 1.04 | 14.99 | 0.41 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.48 | 11.01 | 0.55 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 995.66 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 995.53 | Reach Len. (ft) | 180.21 | 199.98 | 220.79 |
| Crit W.S. (ft) | 994.97 | Flow Area (sq ft) | | 266.69 | |
| E.G. Slope (ft/ft) | 0.006669 | Area (sq ft) | | 266.69 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 211.08 | Top Width (ft) | | 211.08 | |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | | 2.89 | |
| Max Chl Dpth (ft) | 1.73 | Hydr. Depth (ft) | | 1.26 | |
| Conv. Total (cfs) | 9453.3 | Conv. (cfs) | | 9453.3 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 211.15 | |
| Min Ch El (ft) | 993.80 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.52 | |
| Frctn Loss (ft) | 1.73 | Cum Volume (acre-ft) | | 15.82 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 11.05 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 995.66 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.051 | |
| W.S. Elev (ft) | 995.53 | Reach Len. (ft) | 180.21 | 199.98 | 220.79 |
| Crit W.S. (ft) | 994.97 | Flow Area (sq ft) | | 266.47 | |
| E.G. Slope (ft/ft) | 0.006687 | Area (sq ft) | | 266.47 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 211.05 | Top Width (ft) | | 211.05 | |
| Vel Total (ft/s) | 2.90 | Avg. Vel. (ft/s) | | 2.90 | |
| Max Chl Dpth (ft) | 1.73 | Hydr. Depth (ft) | | 1.26 | |
| Conv. Total (cfs) | 9440.8 | Conv. (cfs) | | 9440.8 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 211.12 | |
| Min Ch El (ft) | 993.80 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.53 | |
| Frctn Loss (ft) | 1.73 | Cum Volume (acre-ft) | 0.01 | 15.81 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.08 | 11.05 | 0.08 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.436

INPUT
Description: Thalweg Sta. 312.93
Station Elevation Data num= 140

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 997.49 | 2.58 | 997.65 | 6.72 | 997.88 | 9.66 | 997.98 | 12.95 | 998.15 |
| 16.74 | 998.32 | 20.13 | 998.5 | 23.82 | 998.6 | 27.95 | 998.73 | 30.91 | 998.79 |
| 33.55 | 998.85 | 38 | 998.88 | 42.95 | 998.94 | 45.07 | 998.95 | 46.97 | 999 |
| 52.15 | 999.07 | 59.23 | 999.23 | 60.39 | 999.25 | 66.32 | 999.37 | 72.95 | 999.48 |
| 73.41 | 999.49 | 73.81 | 999.49 | 87.22 | 999.62 | 87.94 | 999.62 | 94.64 | 999.54 |
| 100.64 | 999.5 | 101.73 | 999.46 | 102.94 | 999.42 | 108.81 | 999.18 | 114.06 | 998.99 |
| 115.9 | 998.9 | 117.94 | 998.81 | 122.98 | 998.56 | 127.48 | 998.36 | 130.05 | 998.23 |
| 137.14 | 997.93 | 140.89 | 997.83 | 144.22 | 997.7 | 147.94 | 997.59 | 154.31 | 997.36 |
| 154.59 | 997.34 | 162.94 | 996.7 | 165.47 | 996.5 | 167.72 | 996.35 | 177.94 | 995.32 |
| 179.63 | 995.12 | 181.14 | 994.96 | 186.71 | 994.41 | 192.94 | 993.75 | 193.79 | 993.63 |
| 194.56 | 993.55 | 195.64 | 993.46 | 200.87 | 993 | 207.94 | 992.65 | 215.05 | 992.55 |
| 221.39 | 992.51 | 222.12 | 992.5 | 222.94 | 992.5 | 234.81 | 992.45 | 237.94 | 992.43 |
| 250.46 | 992.38 | 282.93 | 992.37 | 285.86 | 992.38 | 292.95 | 992.38 | 312.93 | 992.44 |
| 314.19 | 992.44 | 315.31 | 992.45 | 327.93 | 992.51 | 328.73 | 992.51 | 342.15 | 992.6 |
| 342.93 | 992.61 | 356.68 | 992.74 | 357.93 | 992.76 | 368.98 | 992.92 | 370.84 | 992.95 |
| 372.93 | 993 | 382.4 | 993.2 | 385.01 | 993.26 | 387.93 | 993.35 | 388.54 | 993.36 |
| 392.09 | 993.45 | 399.17 | 993.66 | 402.92 | 993.83 | 406.25 | 993.96 | 409.23 | 994.2 |
| 413.34 | 994.51 | 417.92 | 995 | 420.42 | 995.25 | 422.65 | 995.5 | 427.51 | 996 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 432.92 | 996.48 | 435.05 | 996.64 | 436.07 | 996.72 | 447.92 | 997.39 | 448.75 | 997.43 |
| 449.48 | 997.46 | 455.83 | 997.74 | 462.9 | 998.1 | 470 | 998.41 | 476.32 | 998.75 |
| 477.93 | 998.83 | 484.16 | 999.21 | 489.74 | 999.48 | 491.24 | 999.56 | 492.93 | 999.62 |
| 503.15 | 999.94 | 505.41 | 1000 | 507.92 | 1000.09 | 512.49 | 1000.22 | 516.57 | 1000.36 |
| 519.57 | 1000.45 | 522.92 | 1000.52 | 526.65 | 1000.61 | 529.99 | 1000.65 | 537.92 | 1000.77 |
| 540.81 | 1000.82 | 543.41 | 1000.86 | 552.92 | 1000.99 | 554.99 | 1001.01 | 556.83 | 1001.04 |
| 562.07 | 1001.11 | 567.92 | 1001.17 | 570.24 | 1001.19 | 583.66 | 1001.19 | 597.07 | 1001.12 |
| 597.92 | 1001.12 | 610.49 | 1001.05 | 611.63 | 1001.04 | 612.92 | 1001.04 | 632.88 | 1000.93 |
| 639.97 | 1000.88 | 642.92 | 1000.87 | 647.05 | 1000.82 | 654.13 | 1000.78 | 657.92 | 1000.77 |
| 668.29 | 1000.67 | 672.91 | 1000.59 | 675.37 | 1000.54 | 682.46 | 1000.28 | 684.05 | 1000.18 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 195.64 | .052 | 388.54 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 154.59 | 435.05 | | 193.46 | 199.99 | 213.61 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 993.93 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 993.76 | Reach Len. (ft) | 193.46 | 199.99 | 213.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 227.97 | |
| E.G. Slope (ft/ft) | 0.011617 | Area (sq ft) | | 227.97 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 208.39 | Top Width (ft) | | 208.39 | |
| Vel Total (ft/s) | 3.39 | Avg. Vel. (ft/s) | | 3.39 | |
| Max Chl Dpth (ft) | 1.39 | Hydr. Depth (ft) | | 1.09 | |
| Conv. Total (cfs) | 7162.7 | Conv. (cfs) | | 7162.7 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 208.45 | |
| Min Ch El (ft) | 992.37 | Shear (lb/sq ft) | | 0.79 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.69 | |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | 1.03 | 13.85 | 0.41 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.44 | 10.05 | 0.55 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 993.93 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 993.75 | Reach Len. (ft) | 193.46 | 199.99 | 213.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 227.43 | |
| E.G. Slope (ft/ft) | 0.011704 | Area (sq ft) | | 227.43 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 208.31 | Top Width (ft) | | 208.31 | |
| Vel Total (ft/s) | 3.39 | Avg. Vel. (ft/s) | | 3.39 | |
| Max Chl Dpth (ft) | 1.38 | Hydr. Depth (ft) | | 1.09 | |
| Conv. Total (cfs) | 7135.8 | Conv. (cfs) | | 7135.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 208.37 | |
| Min Ch El (ft) | 992.37 | Shear (lb/sq ft) | | 0.80 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.71 | |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | | 14.69 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 10.09 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 993.93 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 993.76 | Reach Len. (ft) | 193.46 | 199.99 | 213.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 227.97 | |
| E.G. Slope (ft/ft) | 0.011617 | Area (sq ft) | | 227.97 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 208.39 | Top Width (ft) | | 208.39 | |
| Vel Total (ft/s) | 3.39 | Avg. Vel. (ft/s) | | 3.39 | |
| Max Chl Dpth (ft) | 1.39 | Hydr. Depth (ft) | | 1.09 | |
| Conv. Total (cfs) | 7162.7 | Conv. (cfs) | | 7162.7 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 208.45 | |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 992.37 | Shear (lb/sq ft) | | 0.79 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.69 | |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | 0.01 | 14.68 | 0.01 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.08 | 10.09 | 0.08 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.398

INPUT
Description: Thalweg Sta. 226.53
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 993.81 | 3.6 | 993.97 | 4.31 | 994.02 | 5.04 | 994.08 | 17.53 | 994.88 |
| 19.4 | 994.99 | 25.53 | 995.31 | 31.46 | 995.5 | 32.59 | 995.51 | 33.76 | 995.51 |
| 39.67 | 995.45 | 45.4 | 995.31 | 46.74 | 995.24 | 48.12 | 995.14 | 53.82 | 994.75 |
| 59.33 | 994.26 | 60.88 | 994.09 | 61.47 | 994.01 | 62.48 | 993.88 | 67.95 | 993.32 |
| 73.26 | 992.87 | 75.03 | 992.68 | 76.84 | 992.6 | 82.1 | 992.41 | 87.2 | 992.35 |
| 93.26 | 992.29 | 96.24 | 992.27 | 101.13 | 992.17 | 103.32 | 992.13 | 105.56 | 992.05 |
| 110.38 | 991.89 | 117.46 | 991.63 | 119.92 | 991.57 | 129 | 991.38 | 131.6 | 991.36 |
| 134.29 | 991.33 | 138.68 | 991.29 | 142.93 | 991.26 | 163.01 | 991.18 | 166.97 | 991.17 |
| 170.79 | 991.15 | 181.1 | 991.12 | 184.73 | 991.09 | 188.18 | 991.08 | 191.73 | 991.06 |
| 198.66 | 991 | 206.09 | 990.98 | 209.39 | 990.96 | 223.53 | 990.92 | 226.53 | 990.9 |
| 234.81 | 990.86 | 237.68 | 990.86 | 249.17 | 990.83 | 251.83 | 990.83 | 254.4 | 990.85 |
| 258.89 | 990.85 | 263.53 | 990.88 | 265.97 | 990.89 | 268.33 | 990.91 | 306.62 | 991.08 |
| 308.4 | 991.09 | 310.12 | 991.09 | 320.98 | 991.13 | 324.06 | 991.13 | 335.34 | 991.19 |
| 337.86 | 991.19 | 337.99 | 991.19 | 343.76 | 991.25 | 349.7 | 991.34 | 351.92 | 991.36 |
| 364.06 | 991.59 | 365.86 | 991.63 | 372.04 | 991.8 | 378.42 | 992.04 | 379.8 | 992.1 |
| 386.19 | 992.47 | 392.79 | 992.99 | 393.27 | 993.02 | 393.73 | 993.05 | 407.14 | 994.24 |
| 407.66 | 994.28 | 408.23 | 994.33 | 414.48 | 994.85 | 421.51 | 995.41 | 421.59 | 995.42 |
| 423.92 | 995.58 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 93.26 | .052 | 337.86 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 61.47 | 408.23 | 294.23 | 205.36 | 161.78 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.46 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 992.37 | Reach Len. (ft) | 294.23 | 205.36 | 161.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 332.31 | |
| E.G. Slope (ft/ft) | 0.004918 | Area (sq ft) | | 332.31 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 299.43 | Top Width (ft) | | 299.43 | |
| Vel Total (ft/s) | 2.32 | Avg. Vel. (ft/s) | | 2.32 | |
| Max Chl Dpth (ft) | 1.54 | Hydr. Depth (ft) | | 1.11 | |
| Conv. Total (cfs) | 11008.2 | Conv. (cfs) | | 11008.2 | |
| Length Wtd. (ft) | 205.31 | Wetted Per. (ft) | | 299.46 | |
| Min Ch El (ft) | 990.83 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.79 | |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 1.03 | 12.57 | 0.41 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.44 | 8.88 | 0.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.46 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 992.38 | Reach Len. (ft) | 294.23 | 205.36 | 161.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 332.86 | |
| E.G. Slope (ft/ft) | 0.004892 | Area (sq ft) | | 332.86 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 299.61 | Top Width (ft) | | 299.61 | |
| Vel Total (ft/s) | 2.32 | Avg. Vel. (ft/s) | | 2.32 | |

| | | | |
|---|---|---|---|
| Max Chl Dpth (ft) | 1.55 | Hydr. Depth (ft) | 1.11 |
| Conv. Total (cfs) | 11037.4 | Conv. (cfs) | 11037.4 |
| Length Wtd. (ft) | 205.36 | Wetted Per. (ft) | 299.65 |
| Min Ch El (ft) | 990.83 | Shear (lb/sq ft) | 0.34 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.79 |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 13.40 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 8.92 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.46 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 992.37 | Reach Len. (ft) | 294.23 | 205.36 | 161.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 332.31 | |
| E.G. Slope (ft/ft) | 0.004918 | Area (sq ft) | | 332.31 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 299.43 | Top Width (ft) | | 299.43 | |
| Vel Total (ft/s) | 2.32 | Avg. Vel. (ft/s) | | 2.32 | |
| Max Chl Dpth (ft) | 1.54 | Hydr. Depth (ft) | | 1.11 | |
| Conv. Total (cfs) | 11008.2 | Conv. (cfs) | | 11008.2 | |
| Length Wtd. (ft) | 205.31 | Wetted Per. (ft) | | 299.46 | |
| Min Ch El (ft) | 990.83 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.79 | |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 0.01 | 13.39 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.08 | 8.92 | 0.08 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.359

INPUT
Description: Thalweg Sta. 283.14
Station Elevation Data num= 90

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 996.3 | 2.11 | 996.25 | 3.46 | 996.2 | 11.04 | 996.02 | 13.54 | 995.86 |
| 19.96 | 995.69 | 23.63 | 995.47 | 28.9 | 995.36 | 33.71 | 995.24 | 46.76 | 995.02 |
| 55.68 | 994.72 | 63.96 | 994.38 | 64.61 | 994.36 | 69.68 | 994.26 | 73.55 | 994.15 |
| 74.04 | 994.15 | 82.47 | 994.06 | 84.12 | 994.05 | 91.4 | 993.73 | 94.21 | 993.62 |
| 100.33 | 993 | 104.29 | 992.71 | 109.26 | 992.11 | 118.19 | 991.41 | 124.46 | 991.1 |
| 127.12 | 991 | 134.54 | 990.77 | 144.98 | 990.49 | 147.67 | 990.45 | 153.9 | 990.34 |
| 154.71 | 990.33 | 164.79 | 990.27 | 184.96 | 990.21 | 195.04 | 990.16 | 197.97 | 990.14 |
| 198.55 | 990.14 | 205.12 | 990.09 | 213.65 | 990.07 | 216.41 | 990.07 | 225.29 | 990.11 |
| 225.66 | 990.11 | 234.26 | 990.15 | 235.37 | 990.15 | 243.19 | 990.2 | 245.46 | 990.21 |
| 252.11 | 990.23 | 255.54 | 990.23 | 283.14 | 990.04 | 294.71 | 990 | 295.87 | 990 |
| 303.66 | 990.02 | 305.69 | 990.02 | 305.96 | 990.03 | 314.62 | 990.11 | 316.04 | 990.12 |
| 323.55 | 990.19 | 326.12 | 990.23 | 332.47 | 990.26 | 336.21 | 990.3 | 341.41 | 990.31 |
| 346.29 | 990.34 | 359.27 | 990.38 | 359.32 | 990.38 | 366.46 | 990.39 | 368.2 | 990.4 |
| 407.62 | 990.38 | 410.52 | 990.37 | 433.68 | 990.32 | 437.04 | 990.32 | 445.27 | 990.39 |
| 447.12 | 990.4 | 448.55 | 990.45 | 457.2 | 990.74 | 457.49 | 990.76 | 466.41 | 991.21 |
| 467.29 | 991.26 | 475.34 | 991.9 | 477.37 | 992.1 | 484.27 | 993 | 487.45 | 993.45 |
| 493.2 | 994.22 | 497.54 | 994.81 | 502.12 | 995.26 | 507.62 | 995.66 | 511.06 | 995.82 |
| 517.7 | 995.96 | 519.98 | 995.99 | 527.79 | 995.97 | 528.92 | 995.96 | 530.75 | 995.94 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 197.97 | .052 | 407.62 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 127.12 | 457.2 | 252.69 | 208.33 | 230.12 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.27 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.032 | 0.044 | 0.032 |
| W.S. Elev (ft) | 991.17 | Reach Len. (ft) | 252.69 | 208.33 | 230.12 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.37 | 295.48 | 1.79 |
| E.G. Slope (ft/ft) | 0.006832 | Area (sq ft) | 0.37 | 295.48 | 1.79 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 0.28 | 769.28 | 2.44 |
| Top Width (ft) | 342.56 | Top Width (ft) | 4.07 | 330.08 | 8.41 |

| | | | | | |
|---|---|---|---|---|---|
| Vel Total (ft/s) | 2.59 | Avg. Vel. (ft/s) | 0.77 | 2.60 | 1.36 |
| Max Chl Dpth (ft) | 1.17 | Hydr. Depth (ft) | 0.09 | 0.90 | 0.21 |
| Conv. Total (cfs) | 9339.8 | Conv. (cfs) | 3.4 | 9306.9 | 29.5 |
| Length Wtd. (ft) | 208.37 | Wetted Per. (ft) | 4.07 | 330.10 | 8.42 |
| Min Ch El (ft) | 990.00 | Shear (lb/sq ft) | 0.04 | 0.38 | 0.09 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.03 | 0.99 | 0.12 |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 1.03 | 11.09 | 0.40 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.42 | 7.40 | 0.53 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.28 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.044 | |
| W.S. Elev (ft) | 991.17 | Reach Len. (ft) | 252.69 | 208.33 | 230.12 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 295.94 | |
| E.G. Slope (ft/ft) | 0.006862 | Area (sq ft) | | 295.94 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 330.08 | Top Width (ft) | | 330.08 | |
| Vel Total (ft/s) | 2.61 | Avg. Vel. (ft/s) | | 2.61 | |
| Max Chl Dpth (ft) | 1.17 | Hydr. Depth (ft) | | 0.90 | |
| Conv. Total (cfs) | 9319.4 | Conv. (cfs) | | 9319.4 | |
| Length Wtd. (ft) | 208.33 | Wetted Per. (ft) | | 330.70 | |
| Min Ch El (ft) | 990.00 | Shear (lb/sq ft) | | 0.38 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.00 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | | 11.92 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 7.44 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.27 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.032 | 0.044 | 0.032 |
| W.S. Elev (ft) | 991.17 | Reach Len. (ft) | 252.69 | 208.33 | 230.12 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.37 | 295.48 | 1.79 |
| E.G. Slope (ft/ft) | 0.006832 | Area (sq ft) | 0.37 | 295.48 | 1.79 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 0.28 | 769.28 | 2.44 |
| Top Width (ft) | 342.56 | Top Width (ft) | 4.07 | 330.08 | 8.41 |
| Vel Total (ft/s) | 2.59 | Avg. Vel. (ft/s) | 0.77 | 2.60 | 1.36 |
| Max Chl Dpth (ft) | 1.17 | Hydr. Depth (ft) | 0.09 | 0.90 | 0.21 |
| Conv. Total (cfs) | 9339.8 | Conv. (cfs) | 3.4 | 9306.9 | 29.5 |
| Length Wtd. (ft) | 208.37 | Wetted Per. (ft) | 4.07 | 330.10 | 8.42 |
| Min Ch El (ft) | 990.00 | Shear (lb/sq ft) | 0.04 | 0.38 | 0.09 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.03 | 0.99 | 0.12 |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 0.01 | 11.91 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.07 | 7.44 | 0.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.319

INPUT
Description: Thalweg Sta. 215.76
Station Elevation Data num= 132

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 996.06 | 2.51 | 995.98 | 6.33 | 995.85 | 7.45 | 995.82 | 14.41 | 995.57 |
| 17.86 | 995.44 | 22.47 | 995.2 | 28.28 | 994.82 | 30.53 | 994.63 | 38.27 | 994.07 |
| 38.6 | 994.05 | 38.69 | 994.04 | 46.66 | 993.71 | 54.73 | 993.44 | 62.8 | 993.15 |
| 69.74 | 992.78 | 69.94 | 992.77 | 70.86 | 992.72 | 74.01 | 992.52 | 78.93 | 992.27 |
| 80.36 | 992.22 | 90.77 | 991.73 | 97.67 | 991.39 | 101.19 | 991.26 | 103.13 | 991.23 |
| 109.76 | 990.77 | 111.19 | 990.69 | 111.61 | 990.66 | 119.25 | 990.46 | 122.02 | 990.28 |
| 127.32 | 990.26 | 132.44 | 990.08 | 135.38 | 990.03 | 142.85 | 989.88 | 143.46 | 989.85 |
| 145.51 | 989.8 | 151.52 | 989.63 | 153.27 | 989.61 | 159.58 | 989.28 | 163.69 | 989.13 |
| 174.1 | 988.81 | 181.26 | 988.76 | 183.78 | 988.75 | 184.52 | 988.74 | 191.85 | 988.77 |
| 191.95 | 988.77 | 194.93 | 988.8 | 205.35 | 988.73 | 207.98 | 988.62 | 215.76 | 988.19 |
| 216.04 | 988.2 | 217 | 988.19 | 224.52 | 988.16 | 225.98 | 988.16 | 233.05 | 988.28 |
| 236.16 | 988.35 | 241.58 | 988.45 | 246.35 | 988.47 | 250.11 | 988.6 | 256.54 | 988.78 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 258.65 | 988.81 | 266.73 | 988.97 | 267.17 | 988.97 | 275.7 | 989.01 | 276.91 | 989.01 |
| 287.1 | 989.04 | 292.76 | 989.02 | 297.28 | 989.02 | 301.3 | 989 | 307.47 | 988.98 |
| 309.82 | 988.98 | 317.66 | 988.96 | 327.85 | 988.96 | 338.03 | 989 | 368.59 | 989.26 |
| 369.54 | 989.27 | 374.41 | 989.29 | 378.07 | 989.32 | 378.78 | 989.32 | 386.6 | 989.34 |
| 399.15 | 989.34 | 403.66 | 989.4 | 404.27 | 989.41 | 409.34 | 989.49 | 412.19 | 989.55 |
| 419.53 | 989.77 | 420.72 | 989.78 | 426.87 | 989.92 | 429.26 | 989.97 | 429.71 | 989.98 |
| 437.78 | 990.09 | 439.9 | 990.13 | 450.09 | 990.29 | 454.84 | 990.4 | 460.27 | 990.55 |
| 462.29 | 990.6 | 463.37 | 990.62 | 470.46 | 990.93 | 471.91 | 990.97 | 479.33 | 991.32 |
| 480.43 | 991.38 | 480.65 | 991.41 | 480.96 | 991.41 | 490.83 | 991.72 | 497.5 | 991.8 |
| 501.02 | 991.56 | 506.02 | 991.64 | 511.21 | 991.5 | 514.56 | 991.84 | 521.39 | 991.72 |
| 523.08 | 991.9 | 531.58 | 992.57 | 531.79 | 992.59 | 540.15 | 993.32 | 541.77 | 993.42 |
| 548.67 | 994 | 551.96 | 994.22 | 562.14 | 995.09 | 565.74 | 995.37 | 572.33 | 996 |
| 574.26 | 996.12 | 582.51 | 996.86 | 582.8 | 996.87 | 584.26 | 996.95 | 591.33 | 997.3 |
| 592.7 | 997.4 | 599.86 | 997.5 | 602.89 | 997.65 | 608.39 | 997.68 | 613.08 | 997.82 |
| 616.92 | 997.86 | 617.21 | 997.87 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 191.95 | .035 | 404.27 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 109.76 | 462.29 | 42.81 | 140.97 | 288.38 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 990.06 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.93 | Reach Len. (ft) | 42.81 | 140.97 | 288.38 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 261.79 | |
| E.G. Slope (ft/ft) | 0.004973 | Area (sq ft) | | 261.79 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 286.58 | Top Width (ft) | | 286.58 | |
| Vel Total (ft/s) | 2.95 | Avg. Vel. (ft/s) | | 2.95 | |
| Max Chl Dpth (ft) | 1.77 | Hydr. Depth (ft) | | 0.91 | |
| Conv. Total (cfs) | 10947.8 | Conv. (cfs) | | 10947.8 | |
| Length Wtd. (ft) | 140.97 | Wetted Per. (ft) | | 286.63 | |
| Min Ch El (ft) | 988.16 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.84 | |
| Frctn Loss (ft) | 0.61 | Cum Volume (acre-ft) | 1.03 | 9.75 | 0.40 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 5.92 | 0.51 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 990.06 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.93 | Reach Len. (ft) | 42.81 | 140.97 | 288.38 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 261.81 | |
| E.G. Slope (ft/ft) | 0.004972 | Area (sq ft) | | 261.81 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 286.58 | Top Width (ft) | | 286.58 | |
| Vel Total (ft/s) | 2.95 | Avg. Vel. (ft/s) | | 2.95 | |
| Max Chl Dpth (ft) | 1.77 | Hydr. Depth (ft) | | 0.91 | |
| Conv. Total (cfs) | 10948.9 | Conv. (cfs) | | 10948.9 | |
| Length Wtd. (ft) | 140.97 | Wetted Per. (ft) | | 286.64 | |
| Min Ch El (ft) | 988.16 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.84 | |
| Frctn Loss (ft) | 0.62 | Cum Volume (acre-ft) | | 10.59 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 5.96 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 990.06 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.93 | Reach Len. (ft) | 42.81 | 140.97 | 288.38 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 261.81 | |
| E.G. Slope (ft/ft) | 0.004972 | Area (sq ft) | | 261.81 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 286.58 | Top Width (ft) | | 286.58 | |
| Vel Total (ft/s) | 2.95 | Avg. Vel. (ft/s) | | 2.95 | |
| Max Chl Dpth (ft) | 1.77 | Hydr. Depth (ft) | | 0.91 | |
| Conv. Total (cfs) | 10948.9 | Conv. (cfs) | | 10948.9 | |
| Length Wtd. (ft) | 140.97 | Wetted Per. (ft) | | 286.64 | |
| Min Ch El (ft) | 988.16 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.84 | |
| Frctn Loss (ft) | 0.61 | Cum Volume (acre-ft) | 0.01 | 10.58 | 0.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.06 | 5.96 | 0.04 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.293

INPUT
Description: Thalweg Sta. 230.90
Station Elevation Data num= 126

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 996.05 | 8.88 | 995.85 | 10.53 | 995.81 | 12.56 | 995.78 | 17.64 | 995.66 |
| 21.76 | 995.58 | 24.75 | 995.5 | 28.42 | 995.46 | 31.86 | 995.34 | 34.65 | 995.34 |
| 38.96 | 995.23 | 44.28 | 995.25 | 46.07 | 995.23 | 47.53 | 995.24 | 53.18 | 995.13 |
| 53.6 | 995.12 | 60.14 | 995 | 60.41 | 994.99 | 73.3 | 994.53 | 81.62 | 994.19 |
| 86.18 | 993.99 | 88.73 | 993.87 | 91.86 | 993.68 | 95.84 | 993.45 | 99.06 | 993.22 |
| 102.94 | 992.93 | 110.05 | 992.38 | 111.95 | 992.23 | 117.16 | 991.83 | 123.58 | 991.35 |
| 124.28 | 991.3 | 124.83 | 991.27 | 131.38 | 990.88 | 137.72 | 990.62 | 138.49 | 990.58 |
| 139.44 | 990.55 | 152.71 | 990.17 | 155.3 | 990.1 | 166.92 | 989.76 | 171.16 | 989.63 |
| 172.04 | 989.6 | 174.03 | 989.54 | 181.15 | 989.29 | 187.02 | 989.06 | 188.26 | 989 |
| 189.25 | 988.94 | 195.36 | 988.56 | 202.47 | 988.14 | 202.88 | 988.12 | 209.58 | 987.81 |
| 215.02 | 987.67 | 216.69 | 987.63 | 227.9 | 987.31 | 230.9 | 987.23 | 234.6 | 987.28 |
| 238.01 | 987.36 | 240.79 | 987.46 | 245.13 | 987.56 | 252.23 | 987.68 | 253.67 | 987.69 |
| 259.34 | 987.74 | 266.32 | 987.86 | 266.55 | 987.86 | 273.56 | 987.91 | 279.44 | 987.84 |
| 280.66 | 987.83 | 282.18 | 987.83 | 287.77 | 987.8 | 292.32 | 987.85 | 298.04 | 987.9 |
| 305.21 | 988 | 309.11 | 988.04 | 313.89 | 988.03 | 316.21 | 988.02 | 318.09 | 988.03 |
| 323.32 | 988.01 | 329.75 | 988.15 | 330.43 | 988.17 | 330.97 | 988.17 | 337.54 | 988.24 |
| 343.86 | 988.24 | 344.64 | 988.25 | 345.61 | 988.25 | 351.75 | 988.27 | 356.74 | 988.34 |
| 358.86 | 988.36 | 361.47 | 988.4 | 365.98 | 988.5 | 373.08 | 988.71 | 377.33 | 988.87 |
| 380.84 | 989.05 | 382.51 | 989.14 | 387.3 | 989.53 | 393.19 | 990.33 | 394.41 | 990.48 |
| 395.39 | 990.65 | 401.52 | 991.83 | 408.28 | 993.11 | 409.05 | 993.25 | 415.55 | 994.14 |
| 421.16 | 994.91 | 422.85 | 995.01 | 424.91 | 995.1 | 429.96 | 995.3 | 434.05 | 995.37 |
| 437.06 | 995.41 | 444.17 | 995.49 | 446.93 | 995.48 | 451.28 | 995.41 | 456.63 | 995.2 |
| 458.39 | 995.15 | 459.82 | 995.05 | 465.5 | 994.57 | 472.49 | 993.49 | 472.6 | 993.48 |
| 472.7 | 993.48 | 479.71 | 993.23 | 485.58 | 993.25 | 486.83 | 993.3 | 488.35 | 993.31 |
| 493.93 | 993.57 | 498.47 | 993.75 | 501.04 | 993.88 | 504.21 | 993.93 | 508.15 | 993.85 |
| 510.51 | 993.75 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 172.04 | .035 | 380.84 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 53.6 | 415.55 | 167.39 | 207.15 | 222.16 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.45 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.30 | Reach Len. (ft) | 167.39 | 207.15 | 222.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 252.00 | |
| E.G. Slope (ft/ft) | 0.003850 | Area (sq ft) | | 252.00 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 203.65 | Top Width (ft) | | 203.65 | |
| Vel Total (ft/s) | 3.06 | Avg. Vel. (ft/s) | | 3.06 | |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 12441.9 | Conv. (cfs) | | 12441.9 | |
| Length Wtd. (ft) | 207.15 | Wetted Per. (ft) | | 203.74 | |
| Min Ch El (ft) | 987.23 | Shear (lb/sq ft) | | 0.30 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.91 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 1.03 | 8.92 | 0.40 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.41 | 5.13 | 0.51 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.45 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.30 | Reach Len. (ft) | 167.39 | 207.15 | 222.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 251.78 | |
| E.G. Slope (ft/ft) | 0.003860 | Area (sq ft) | | 251.78 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 203.61 | Top Width (ft) | | 203.61 | |
| Vel Total (ft/s) | 3.07 | Avg. Vel. (ft/s) | | 3.07 | |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 12426.0 | Conv. (cfs) | | 12426.0 | |

| | | | |
|---|---|---|---|
| Length Wtd. (ft) | 207.15 | Wetted Per. (ft) | 203.69 |
| Min Ch El (ft) | 987.23 | Shear (lb/sq ft) | 0.30 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.91 |
| Frctn Loss (ft) | 0.99 | Cum Volume (acre-ft) | 9.76 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.17 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.45 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 989.30 | Reach Len. (ft) | 167.39 | 207.15 | 222.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 251.85 | |
| E.G. Slope (ft/ft) | 0.003857 | Area (sq ft) | | 251.85 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 203.62 | Top Width (ft) | | 203.62 | |
| Vel Total (ft/s) | 3.07 | Avg. Vel. (ft/s) | | 3.07 | |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 12430.7 | Conv. (cfs) | | 12430.7 | |
| Length Wtd. (ft) | 207.15 | Wetted Per. (ft) | | 203.71 | |
| Min Ch El (ft) | 987.23 | Shear (lb/sq ft) | | 0.30 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.91 | |
| Frctn Loss (ft) | 0.99 | Cum Volume (acre-ft) | 0.01 | 9.75 | 0.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.06 | 5.17 | 0.04 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.254

INPUT
Description: Thalweg Sta. 251.43
Station Elevation Data num= 120

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 993.85 | .79 | 993.88 | 5.7 | 994 | 8.56 | 994.03 | 13.03 | 994.13 |
| 20.13 | 994.19 | 20.33 | 994.19 | 20.69 | 994.2 | 27.66 | 994.31 | 31.69 | 994.29 |
| 34.37 | 994.27 | 34.97 | 994.26 | 40.6 | 994.11 | 43.26 | 994.03 | 54.82 | 993.52 |
| 56.91 | 993.42 | 64.23 | 993.05 | 66.39 | 992.95 | 71.54 | 992.67 | 77.95 | 992.28 |
| 78.86 | 992.22 | 80.42 | 992.05 | 89.52 | 991.2 | 93.49 | 990.77 | 100.33 | 990.17 |
| 100.8 | 990.12 | 101.08 | 990.11 | 108.13 | 989.68 | 112.65 | 989.46 | 120.23 | 989.16 |
| 124.21 | 988.97 | 130.06 | 988.74 | 135.78 | 988.5 | 137.38 | 988.45 | 138.49 | 988.4 |
| 140.14 | 988.32 | 144.69 | 988.09 | 147.34 | 987.99 | 152.01 | 987.84 | 158.91 | 987.69 |
| 159.32 | 987.68 | 160.05 | 987.67 | 166.64 | 987.63 | 170.47 | 987.58 | 173.96 | 987.51 |
| 179.95 | 987.31 | 181.27 | 987.27 | 182.04 | 987.24 | 193.6 | 986.83 | 199.87 | 986.7 |
| 203.22 | 986.64 | 205.17 | 986.61 | 216.73 | 986.5 | 217.85 | 986.5 | 219.77 | 986.48 |
| 239.68 | 986.37 | 239.86 | 986.37 | 251.43 | 986.34 | 254.43 | 986.34 | 259.59 | 986.35 |
| 261.74 | 986.36 | 262.99 | 986.37 | 274.56 | 986.52 | 279.49 | 986.6 | 283.69 | 986.68 |
| 286.12 | 986.72 | 291 | 986.81 | 298.32 | 986.93 | 305.63 | 987.07 | 309.25 | 987.13 |
| 312.95 | 987.2 | 315.96 | 987.25 | 319.31 | 987.31 | 320.26 | 987.33 | 320.82 | 987.34 |
| 332.38 | 987.58 | 339.22 | 987.75 | 342.21 | 987.83 | 343.95 | 987.88 | 349.53 | 988.08 |
| 355.51 | 988.36 | 359.13 | 988.62 | 364.16 | 988.93 | 367.07 | 989.12 | 371.47 | 989.46 |
| 378.64 | 990.06 | 378.79 | 990.07 | 379.03 | 990.09 | 386.1 | 990.55 | 390.2 | 990.78 |
| 391.87 | 990.84 | 393.42 | 990.9 | 398.94 | 991.17 | 400.73 | 991.23 | 401.77 | 991.25 |
| 408.05 | 991.29 | 413.33 | 991.45 | 415.36 | 991.46 | 418.85 | 991.63 | 422.68 | 991.72 |
| 424.9 | 991.84 | 430 | 991.99 | 436.47 | 992.45 | 437.31 | 992.47 | 438.75 | 992.56 |
| 444.63 | 992.79 | 448.03 | 993.05 | 451.94 | 993.16 | 458.67 | 993.49 | 459.26 | 993.51 |
| 459.6 | 993.54 | 466.57 | 993.83 | 471.16 | 994.14 | 473.89 | 994.31 | 478.57 | 994.59 |
| 481.2 | 994.74 | 482.73 | 994.8 | 488.52 | 995.06 | 495.83 | 995.34 | 512.92 | 995.91 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 138.49 | .052 | 315.96 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 93.49 | 391.87 | 206.87 | 200.58 | 205.25 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.44 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 988.32 | Reach Len. (ft) | 206.87 | 200.58 | 205.25 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 272.88 | |
| E.G. Slope (ft/ft) | 0.006233 | Area (sq ft) | | 272.88 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |

| | | | | | |
|---|---|---|---|---|---|
| Top Width (ft) | 214.35 | Top Width (ft) | | 214.35 | |
| Vel Total (ft/s) | 2.83 | Avg. Vel. (ft/s) | | 2.83 | |
| Max Chl Dpth (ft) | 1.98 | Hydr. Depth (ft) | | 1.27 | |
| Conv. Total (cfs) | 9778.2 | Conv. (cfs) | | 9778.2 | |
| Length Wtd. (ft) | 200.59 | Wetted Per. (ft) | | 214.40 | |
| Min Ch El (ft) | 986.34 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.40 | |
| Frctn Loss (ft) | 0.94 | Cum Volume (acre-ft) | 1.03 | 7.67 | 0.40 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.41 | 4.13 | 0.51 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.45 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 988.33 | Reach Len. (ft) | 206.87 | 200.58 | 205.25 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 274.88 | |
| E.G. Slope (ft/ft) | 0.006095 | Area (sq ft) | | 274.88 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 214.74 | Top Width (ft) | | 214.74 | |
| Vel Total (ft/s) | 2.81 | Avg. Vel. (ft/s) | | 2.81 | |
| Max Chl Dpth (ft) | 1.99 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 9888.1 | Conv. (cfs) | | 9888.1 | |
| Length Wtd. (ft) | 200.58 | Wetted Per. (ft) | | 214.79 | |
| Min Ch El (ft) | 986.34 | Shear (lb/sq ft) | | 0.49 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.37 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | | 8.50 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 4.17 | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.45 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 988.32 | Reach Len. (ft) | 206.87 | 200.58 | 205.25 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 274.25 | |
| E.G. Slope (ft/ft) | 0.006138 | Area (sq ft) | | 274.25 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 214.62 | Top Width (ft) | | 214.62 | |
| Vel Total (ft/s) | 2.81 | Avg. Vel. (ft/s) | | 2.81 | |
| Max Chl Dpth (ft) | 1.98 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 9853.6 | Conv. (cfs) | | 9853.6 | |
| Length Wtd. (ft) | 200.59 | Wetted Per. (ft) | | 214.67 | |
| Min Ch El (ft) | 986.34 | Shear (lb/sq ft) | | 0.49 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.38 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 0.01 | 8.50 | 0.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.06 | 4.17 | 0.04 |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.216

INPUT
Description: Thalweg Sta. 454.48
Station Elevation Data num= 165

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 994.14 | 3.66 | 993.65 | 10.16 | 993.26 | 11.05 | 993.16 | 12.71 | 993.07 |
| 18.44 | 992.65 | 21.5 | 992.64 | 25.83 | 992.66 | 32.83 | 992.94 | 33.22 | 992.95 |
| 33.94 | 992.96 | 40.61 | 992.98 | 44.17 | 992.97 | 55.17 | 992.63 | 55.39 | 992.62 |
| 55.51 | 992.62 | 62.78 | 992.36 | 66.84 | 992.28 | 70.17 | 992.07 | 76.41 | 991.73 |
| 77.56 | 991.65 | 78.17 | 991.62 | 84.95 | 991.01 | 89.51 | 990.65 | 97.65 | 990.24 |
| 99.73 | 990.14 | 100.85 | 990.09 | 107.12 | 990.09 | 112.18 | 989.94 | 114.52 | 989.98 |
| 118.88 | 989.87 | 121.91 | 989.88 | 123.52 | 989.85 | 129.3 | 989.82 | 134.86 | 989.66 |
| 136.69 | 989.62 | 140.11 | 989.53 | 144.08 | 989.49 | 151.47 | 989.39 | 157.52 | 989.32 |
| 158.86 | 989.3 | 161.35 | 989.27 | 168.86 | 989.21 | 173.63 | 989.18 | 180.2 | 989.11 |
| 181.03 | 989.11 | 182.58 | 989.1 | 188.42 | 989.09 | 191.53 | 989.06 | 195.81 | 989.19 |
| 202.87 | 989.16 | 203.81 | 989.19 | 214.21 | 989.5 | 217.98 | 989.69 | 225.05 | 989.96 |
| 225.37 | 989.98 | 225.54 | 989.98 | 232.76 | 990.29 | 236.88 | 990.5 | 240.15 | 990.6 |
| 246.28 | 990.89 | 247.54 | 990.93 | 248.21 | 990.95 | 254.93 | 990.88 | 259.55 | 990.9 |
| 267.52 | 990.76 | 270.89 | 990.64 | 277.11 | 990.04 | 282.22 | 989.78 | 284.5 | 989.53 |
| 288.75 | 989.17 | 291.89 | 988.83 | 293.56 | 988.69 | 299.28 | 987.97 | 304.89 | 987.52 |
| 306.67 | 987.35 | 309.98 | 987.22 | 314.06 | 987.05 | 316.23 | 987.02 | 316.65 | 987.01 |
| 321.44 | 986.92 | 326.52 | 986.85 | 327.56 | 986.84 | 331.21 | 986.78 | 351 | 986.5 |
| 352.45 | 986.47 | 358.4 | 986.38 | 361.57 | 986.34 | 372.02 | 986.15 | 372.9 | 986.14 |
| 373.18 | 986.13 | 373.69 | 986.13 | 380.57 | 986 | 394.92 | 985.76 | 395.35 | 985.75 |
| 395.58 | 985.75 | 406.91 | 985.58 | 416.15 | 985.49 | 417.52 | 985.48 | 418.25 | 985.47 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 429.59 | 985.49 | 440.92 | 985.56 | 452.25 | 985.66 | 454.48 | 985.67 | 461.87 | 985.74 |
| 463.59 | 985.76 | 474.93 | 985.84 | 479.86 | 985.84 | 484.03 | 985.85 | 486.26 | 985.85 |
| 497.6 | 985.83 | 498.81 | 985.83 | 501.09 | 985.82 | 506.2 | 985.81 | 508.94 | 985.81 |
| 520.27 | 985.83 | 520.98 | 985.84 | 522.32 | 985.85 | 527.52 | 985.92 | 528.38 | 985.93 |
| 531.61 | 985.96 | 542.25 | 986.33 | 542.94 | 986.35 | 543.16 | 986.36 | 550.55 | 986.74 |
| 554.28 | 986.88 | 557.94 | 987.08 | 564.79 | 987.3 | 565.61 | 987.33 | 572.72 | 987.52 |
| 580.11 | 987.7 | 586.02 | 988.01 | 587.5 | 988.08 | 588.29 | 988.12 | 594.9 | 988.6 |
| 595.92 | 988.69 | 599.62 | 989 | 602.29 | 989.18 | 607.25 | 989.54 | 609.68 | 989.69 |
| 610.96 | 989.76 | 617.07 | 989.89 | 622.29 | 990.04 | 624.45 | 990.05 | 628.49 | 990.1 |
| 631.84 | 990.11 | 633.63 | 990.15 | 639.23 | 990.23 | 646.62 | 990.45 | 649.73 | 990.58 |
| 654.01 | 990.75 | 656.3 | 990.86 | 661.4 | 991.04 | 667.64 | 991.17 | 668.79 | 991.18 |
| 670.96 | 991.15 | 676.18 | 991.12 | 678.97 | 991.07 | 683.57 | 990.97 | 690.31 | 990.78 |
| 690.96 | 990.76 | 692.19 | 990.7 | 698.35 | 990.47 | 701.64 | 990.34 | 705.24 | 990.18 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 326.52 | .052 | 527.52 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 316.65 | 557.94 | 228.78 | 199.92 | 178.87 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.49 | Wt. n-Val. | 0.032 | 0.050 | 0.032 |
| Vel Head (ft) | 0.08 | Reach Len. (ft) | 228.78 | 199.92 | 178.87 |
| W.S. Elev (ft) | 987.40 | Flow Area (sq ft) | 2.47 | 334.27 | 1.64 |
| Crit W.S. (ft) | | Area (sq ft) | 2.47 | 334.27 | 1.64 |
| E.G. Slope (ft/ft) | 0.003665 | Flow (cfs) | 2.64 | 768.02 | 1.34 |
| Q Total (cfs) | 772.00 | Top Width (ft) | 10.55 | 241.29 | 10.44 |
| Top Width (ft) | 262.28 | Avg. Vel. (ft/s) | 1.07 | 2.30 | 0.82 |
| Vel Total (ft/s) | 2.28 | Hydr. Depth (ft) | 0.23 | 1.39 | 0.16 |
| Max Chl Dpth (ft) | 1.93 | Conv. (cfs) | 43.6 | 12687.1 | 22.2 |
| Conv. Total (cfs) | 12752.9 | Wetted Per. (ft) | 10.56 | 241.33 | 10.45 |
| Length Wtd. (ft) | 199.95 | Shear (lb/sq ft) | 0.05 | 0.32 | 0.04 |
| Min Ch El (ft) | 985.47 | Stream Power (lb/ft s) | 0.06 | 0.73 | 0.03 |
| Alpha | 1.01 | Cum Volume (acre-ft) | 1.02 | 6.28 | 0.39 |
| Frctn Loss (ft) | 0.95 | Cum SA (acres) | 0.39 | 3.09 | 0.48 |
| C & E Loss (ft) | 0.01 | | | | |

CROSS SECTION OUTPUT Profile #Method 4

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.46 | Wt. n-Val. | | 0.050 | |
| Vel Head (ft) | 0.09 | Reach Len. (ft) | 228.78 | 199.92 | 178.87 |
| W.S. Elev (ft) | 987.38 | Flow Area (sq ft) | | 327.61 | |
| Crit W.S. (ft) | | Area (sq ft) | | 327.61 | |
| E.G. Slope (ft/ft) | 0.003967 | Flow (cfs) | | 772.00 | |
| Q Total (cfs) | 772.00 | Top Width (ft) | | 241.29 | |
| Top Width (ft) | 241.29 | Avg. Vel. (ft/s) | | 2.36 | |
| Vel Total (ft/s) | 2.36 | Hydr. Depth (ft) | | 1.36 | |
| Max Chl Dpth (ft) | 1.91 | Conv. (cfs) | | 12256.4 | |
| Conv. Total (cfs) | 12256.4 | Wetted Per. (ft) | | 241.99 | |
| Length Wtd. (ft) | 199.92 | Shear (lb/sq ft) | | 0.34 | |
| Min Ch El (ft) | 985.47 | Stream Power (lb/ft s) | | 0.79 | |
| Alpha | 1.00 | Cum Volume (acre-ft) | | 7.12 | |
| Frctn Loss (ft) | 0.81 | Cum SA (acres) | | 3.12 | |
| C & E Loss (ft) | 0.01 | | | | |

CROSS SECTION OUTPUT Profile #Method 1

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.46 | Wt. n-Val. | 0.032 | 0.050 | 0.032 |
| Vel Head (ft) | 0.09 | Reach Len. (ft) | 228.78 | 199.92 | 178.87 |
| W.S. Elev (ft) | 987.37 | Flow Area (sq ft) | 2.17 | 327.22 | 1.35 |
| Crit W.S. (ft) | | Area (sq ft) | 2.17 | 327.22 | 1.35 |
| E.G. Slope (ft/ft) | 0.003942 | Flow (cfs) | 2.24 | 768.67 | 1.09 |
| Q Total (cfs) | 772.00 | Top Width (ft) | 10.24 | 241.29 | 9.35 |
| Top Width (ft) | 260.88 | Avg. Vel. (ft/s) | 1.03 | 2.35 | 0.80 |
| Vel Total (ft/s) | 2.33 | Hydr. Depth (ft) | 0.21 | 1.36 | 0.14 |
| Max Chl Dpth (ft) | 1.90 | Conv. (cfs) | 35.7 | 12243.2 | 17.3 |
| Conv. Total (cfs) | 12296.2 | Wetted Per. (ft) | 10.25 | 241.33 | 9.35 |
| Length Wtd. (ft) | 199.95 | Shear (lb/sq ft) | 0.05 | 0.33 | 0.04 |
| Min Ch El (ft) | 985.47 | Stream Power (lb/ft s) | 0.05 | 0.78 | 0.03 |
| Alpha | 1.01 | Cum Volume (acre-ft) | 0.01 | 7.11 | 0.00 |
| Frctn Loss (ft) | 0.80 | Cum SA (acres) | 0.03 | 3.12 | 0.02 |
| C & E Loss (ft) | 0.01 | | | | |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.178

INPUT
Description: Thalweg Sta. 321.95
Station Elevation Data num= 162

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 991.46 | .54 | 991.52 | 3 | 991.83 | 10.1 | 992.51 | 13.81 | 992.76 |
| 17.18 | 992.89 | 21.06 | 993.02 | 24.27 | 993.11 | 27.07 | 993.17 | 36.27 | 993.34 |
| 40.34 | 993.34 | 45.54 | 993.36 | 51.49 | 993.34 | 52.62 | 993.31 | 53.6 | 993.27 |
| 59.71 | 993.09 | 66.71 | 992.86 | 66.87 | 992.84 | 73.89 | 992.3 | 80.14 | 992 |
| 80.98 | 991.95 | 81.92 | 991.9 | 88.06 | 991.38 | 93.41 | 991.03 | 95.14 | 990.86 |
| 97.14 | 990.63 | 102.23 | 990 | 106.68 | 989.47 | 109.33 | 989.08 | 112.35 | 988.77 |
| 116.41 | 988.28 | 119.94 | 987.92 | 123.49 | 987.73 | 127.57 | 987.53 | 130.58 | 987.47 |
| 133.21 | 987.37 | 137.68 | 987.42 | 141.52 | 987.26 | 142.79 | 987.21 | 144.76 | 987.22 |
| 146.48 | 987.14 | 158 | 986.66 | 159.75 | 986.59 | 164.56 | 986.32 | 166.02 | 986.24 |
| 173.01 | 985.68 | 173.11 | 985.67 | 173.22 | 985.67 | 180.2 | 985.27 | 186.28 | 984.99 |
| 187.28 | 984.94 | 188.44 | 984.89 | 194.37 | 984.74 | 201.46 | 984.63 | 203.66 | 984.62 |
| 208.55 | 984.61 | 212.81 | 984.61 | 222.72 | 984.71 | 226.08 | 984.75 | 229.81 | 984.82 |
| 234.09 | 984.92 | 236.9 | 984.98 | 243.99 | 985.09 | 251.07 | 985.17 | 252.62 | 985.19 |
| 264.52 | 985.27 | 265.25 | 985.28 | 265.88 | 985.28 | 272.34 | 985.26 | 279.15 | 985.2 |
| 279.43 | 985.19 | 279.73 | 985.19 | 286.51 | 985.08 | 292.42 | 985.02 | 293.6 | 985.01 |
| 294.95 | 985.01 | 300.68 | 984.99 | 305.69 | 985.05 | 307.78 | 985.05 | 310.17 | 985.1 |
| 314.86 | 985.16 | 318.95 | 985.28 | 321.95 | 985.33 | 325.39 | 985.52 | 329.04 | 985.67 |
| 332.22 | 985.91 | 335.04 | 986.13 | 336.13 | 986.21 | 340.6 | 986.65 | 343.22 | 986.88 |
| 345.49 | 987.1 | 350.3 | 987.58 | 355.82 | 988.02 | 357.39 | 988.14 | 358.75 | 988.23 |
| 363.35 | 988.48 | 364.47 | 988.54 | 371.04 | 988.9 | 371.57 | 988.93 | 385.29 | 989.53 |
| 386.25 | 989.55 | 398.56 | 989.66 | 399.91 | 989.65 | 401.46 | 989.62 | 407.01 | 989.53 |
| 411.83 | 989.41 | 416.68 | 989.3 | 421.17 | 989.22 | 425.09 | 989.08 | 428.26 | 988.99 |
| 431.9 | 988.82 | 435.35 | 988.68 | 438.36 | 988.51 | 442.44 | 988.34 | 447.11 | 988.07 |
| 449.52 | 987.96 | 451.63 | 987.84 | 456.61 | 987.63 | 462.33 | 987.33 | 463.7 | 987.28 |
| 464.89 | 987.24 | 470.79 | 987.07 | 477.55 | 987.01 | 478.16 | 987.01 | 484.96 | 987.09 |
| 491.43 | 987.15 | 492.05 | 987.16 | 492.77 | 987.17 | 499.14 | 987.2 | 504.69 | 987.19 |
| 506.23 | 987.2 | 507.98 | 987.2 | 517.96 | 987.22 | 527.49 | 987.26 | 538.42 | 987.26 |
| 541.67 | 987.29 | 544.5 | 987.33 | 548.75 | 987.38 | 557.77 | 987.42 | 562.93 | 987.6 |
| 568.84 | 987.89 | 570.02 | 987.94 | 571.03 | 988 | 584.06 | 989.09 | 584.19 | 989.1 |
| 584.3 | 989.11 | 591.28 | 989.46 | 597.57 | 989.65 | 599.28 | 989.67 | 605.46 | 989.73 |
| 610.83 | 989.84 | 612.55 | 989.85 | 619.63 | 990 | 624.1 | 990.14 | 629.71 | 990.27 |
| 633.8 | 990.38 | 637.37 | 990.53 | 640.9 | 990.64 | 644.93 | 990.9 | 647.98 | 991.09 |
| 655.07 | 991.59 | 658.24 | 991.78 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 164.56 | .035 | 335.04 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 141.52 | 350.3 | 228.6 | 194.63 | 181.8 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 986.53 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 986.31 | Reach Len. (ft) | 228.60 | 194.63 | 181.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 203.22 | |
| E.G. Slope (ft/ft) | 0.006348 | Area (sq ft) | | 203.22 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 172.39 | Top Width (ft) | | 172.39 | |
| Vel Total (ft/s) | 3.80 | Avg. Vel. (ft/s) | | 3.80 | |
| Max Chl Dpth (ft) | 1.70 | Hydr. Depth (ft) | | 1.18 | |
| Conv. Total (cfs) | 9689.5 | Conv. (cfs) | | 9689.5 | |
| Length Wtd. (ft) | 196.51 | Wetted Per. (ft) | | 172.48 | |
| Min Ch El (ft) | 984.61 | Shear (lb/sq ft) | | 0.47 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.77 | |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 1.02 | 5.04 | 0.39 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.36 | 2.14 | 0.46 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 986.65 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 986.48 | Reach Len. (ft) | 228.60 | 194.63 | 181.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 232.20 | |
| E.G. Slope (ft/ft) | 0.004110 | Area (sq ft) | | 232.20 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 177.04 | Top Width (ft) | | 177.04 | |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 | |

| | | | |
|---|---|---|---|
| Max Chl Dpth (ft) | 1.87 | Hydr. Depth (ft) | 1.31 |
| Conv. Total (cfs) | 12042.7 | Conv. (cfs) | 12042.7 |
| Length Wtd. (ft) | 194.63 | Wetted Per. (ft) | 177.14 |
| Min Ch El (ft) | 984.61 | Shear (lb/sq ft) | 0.34 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.12 |
| Frctn Loss (ft) | 0.90 | Cum Volume (acre-ft) | 5.83 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.16 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 986.65 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 986.48 | Reach Len. (ft) | 228.60 | 194.63 | 181.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 232.20 | |
| E.G. Slope (ft/ft) | 0.004110 | Area (sq ft) | | 232.20 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 177.04 | Top Width (ft) | | 177.04 | |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 | |
| Max Chl Dpth (ft) | 1.87 | Hydr. Depth (ft) | | 1.31 | |
| Conv. Total (cfs) | 12042.7 | Conv. (cfs) | | 12042.7 | |
| Length Wtd. (ft) | 194.63 | Wetted Per. (ft) | | 177.14 | |
| Min Ch El (ft) | 984.61 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.12 | |
| Frctn Loss (ft) | 0.90 | Cum Volume (acre-ft) | 0.00 | 5.83 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.01 | 2.16 | |

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.141

INPUT
Description: Thalweg Sta. 250.54
Station Elevation Data num= 137

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 991.9 | .23 | 991.89 | 6.97 | 991.14 | 12.55 | 990.46 | 14.13 | 990.23 |
| 16.32 | 989.93 | 21.29 | 989.26 | 28.46 | 988.38 | 33.43 | 987.85 | 35.62 | 987.62 |
| 37.2 | 987.49 | 49.52 | 986.63 | 49.95 | 986.61 | 50.54 | 986.57 | 57.11 | 986.34 |
| 61.85 | 986.04 | 64.27 | 985.96 | 67.65 | 985.77 | 71.45 | 985.65 | 74.17 | 985.49 |
| 78.6 | 985.41 | 84.76 | 985.2 | 85.77 | 985.16 | 86.49 | 985.13 | 92.94 | 984.98 |
| 98.82 | 984.88 | 100.09 | 984.88 | 101.87 | 984.82 | 107.26 | 984.69 | 111.14 | 984.56 |
| 114.42 | 984.57 | 118.98 | 984.52 | 121.59 | 984.51 | 123.46 | 984.49 | 124.99 | 984.47 |
| 128.75 | 984.41 | 135.79 | 984.42 | 136.09 | 984.42 | 148.11 | 984.46 | 148.21 | 984.46 |
| 157.41 | 984.38 | 160.44 | 984.33 | 164.58 | 984.28 | 170.32 | 984.13 | 171.73 | 984.1 |
| 172.76 | 984.07 | 178.9 | 983.9 | 185.08 | 983.82 | 186.07 | 983.8 | 193.23 | 983.9 |
| 197.41 | 983.98 | 200.39 | 984.03 | 207.55 | 984.1 | 209.73 | 984.11 | 214.72 | 984.1 |
| 221.65 | 984.07 | 222.05 | 984.07 | 229.05 | 984.05 | 243.37 | 983.96 | 246.7 | 983.88 |
| 250.54 | 983.81 | 255.87 | 983.83 | 257.71 | 983.84 | 259.03 | 983.89 | 264.87 | 984.1 |
| 272.03 | 984.31 | 272.98 | 984.33 | 279.2 | 984.44 | 283.68 | 984.48 | 286.36 | 984.53 |
| 290.08 | 984.57 | 290.9 | 984.58 | 293.52 | 984.61 | 293.66 | 984.61 | 296 | 984.62 |
| 300.69 | 984.66 | 307.2 | 984.69 | 307.86 | 984.69 | 308.32 | 984.7 | 320.64 | 984.81 |
| 322.18 | 984.82 | 324.31 | 984.84 | 329.35 | 984.9 | 332.97 | 984.95 | 336.51 | 984.98 |
| 341.42 | 985.04 | 343.67 | 985.06 | 345.29 | 985.09 | 357.62 | 985.22 | 358.53 | 985.22 |
| 372.33 | 985.11 | 375.63 | 985.1 | 379.49 | 985.19 | 382.27 | 985.18 | 386.65 | 985.26 |
| 392.75 | 985.32 | 393.82 | 985.37 | 394.59 | 985.36 | 400.99 | 985.51 | 406.91 | 985.45 |
| 408.14 | 985.46 | 409.86 | 985.46 | 415.31 | 985.56 | 419.23 | 985.54 | 422.48 | 985.59 |
| 426.97 | 985.63 | 429.64 | 985.69 | 431.56 | 985.71 | 436.8 | 985.82 | 443.89 | 985.83 |
| 444.08 | 985.83 | 456.21 | 986.06 | 458.29 | 986.12 | 461.19 | 986.18 | 465.46 | 986.33 |
| 468.53 | 986.41 | 472.62 | 986.57 | 478.3 | 986.82 | 479.78 | 986.88 | 480.86 | 986.94 |
| 486.96 | 987.26 | 493.18 | 987.62 | 495.41 | 987.74 | 501.28 | 987.98 | 505.5 | 988.13 |
| 508.44 | 988.24 | 512.52 | 988.4 | 515.61 | 988.49 | 517.83 | 988.57 | 522.77 | 988.74 |
| 530.15 | 989.03 | 537.1 | 989.27 | 542.48 | 989.47 | 544.26 | 989.53 | 546.74 | 989.62 |
| 551.42 | 989.76 | 553.04 | 989.82 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 124.99 | .035 | 293.66 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 148.21 | 290.9 | 218.93 | 205.31 | 193.14 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.54 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.034 | 0.035 | 0.032 |
| W.S. Elev (ft) | 985.41 | Reach Len. (ft) | 218.93 | 205.31 | 193.14 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | 49.38 | 186.07 | 44.08 |
| E.G. Slope (ft/ft) | 0.003888 | Area (sq ft) | 49.38 | 186.07 | 44.08 |
| Q Total (cfs) | 772.00 | Flow (cfs) | 112.58 | 587.85 | 71.57 |
| Top Width (ft) | 318.22 | Top Width (ft) | 69.67 | 142.69 | 105.87 |
| Vel Total (ft/s) | 2.76 | Avg. Vel. (ft/s) | 2.28 | 3.16 | 1.62 |
| Max Chl Dpth (ft) | 1.61 | Hydr. Depth (ft) | 0.71 | 1.30 | 0.42 |
| Conv. Total (cfs) | 12381.3 | Conv. (cfs) | 1805.6 | 9427.9 | 1147.8 |
| Length Wtd. (ft) | 205.74 | Wetted Per. (ft) | 69.68 | 142.71 | 105.87 |
| Min Ch El (ft) | 983.80 | Shear (lb/sq ft) | 0.17 | 0.32 | 0.10 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.39 | 1.00 | 0.16 |
| Frctn Loss (ft) | 1.02 | Cum Volume (acre-ft) | 0.89 | 4.17 | 0.30 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.18 | 1.43 | 0.24 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.74 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 985.52 | Reach Len. (ft) | 218.93 | 205.31 | 193.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 200.95 | |
| E.G. Slope (ft/ft) | 0.005285 | Area (sq ft) | | 200.95 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 142.69 | Top Width (ft) | | 142.69 | |
| Vel Total (ft/s) | 3.84 | Avg. Vel. (ft/s) | | 3.84 | |
| Max Chl Dpth (ft) | 1.72 | Hydr. Depth (ft) | | 1.41 | |
| Conv. Total (cfs) | 10619.5 | Conv. (cfs) | | 10619.5 | |
| Length Wtd. (ft) | 205.31 | Wetted Per. (ft) | | 144.70 | |
| Min Ch El (ft) | 983.80 | Shear (lb/sq ft) | | 0.46 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.76 | |
| Frctn Loss (ft) | 1.26 | Cum Volume (acre-ft) | | 4.86 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 1.45 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.74 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 985.52 | Reach Len. (ft) | 218.93 | 205.31 | 193.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 200.95 | |
| E.G. Slope (ft/ft) | 0.005285 | Area (sq ft) | | 200.95 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 142.69 | Top Width (ft) | | 142.69 | |
| Vel Total (ft/s) | 3.84 | Avg. Vel. (ft/s) | | 3.84 | |
| Max Chl Dpth (ft) | 1.72 | Hydr. Depth (ft) | | 1.41 | |
| Conv. Total (cfs) | 10619.5 | Conv. (cfs) | | 10619.5 | |
| Length Wtd. (ft) | 205.31 | Wetted Per. (ft) | | 144.70 | |
| Min Ch El (ft) | 983.80 | Shear (lb/sq ft) | | 0.46 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.76 | |
| Frctn Loss (ft) | 1.26 | Cum Volume (acre-ft) | 0.00 | 4.86 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.01 | 1.45 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.102

INPUT
Description: Thalweg Sta. 160.92
Station Elevation Data num= 148

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 986.1 | .89 | 986.06 | 6.03 | 985.88 | 8.54 | 985.78 | 9.58 | 985.75 |
| 16.21 | 985.5 | 20.39 | 985.32 | 23.87 | 985.23 | 31.2 | 984.97 | 31.53 | 984.96 |
| 32.36 | 984.95 | 42.01 | 984.77 | 46.86 | 984.72 | 52.82 | 984.67 | 54.53 | 984.65 |
| 69.85 | 984.53 | 71.49 | 984.52 | 74.44 | 984.5 | 77.52 | 984.47 | 84.73 | 984.41 |
| 85.02 | 984.41 | 85.18 | 984.4 | 85.25 | 984.4 | 92.85 | 984.29 | 96.06 | 984.25 |
| 106.87 | 984.01 | 111.35 | 983.88 | 115.84 | 983.74 | 123.51 | 983.45 | 128.49 | 983.24 |
| 131.17 | 983.12 | 138.83 | 982.72 | 139.3 | 982.7 | 146.5 | 982.14 | 150.11 | 981.93 |
| 154.16 | 981.98 | 160.92 | 981.95 | 161.83 | 981.98 | 164.02 | 982.2 | 169.49 | 982.68 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 171.73 | 982.86 | 177.14 | 982.78 | 182.54 | 982.9 | 184.81 | 983.01 | 190.35 | 983.26 |
| 192.47 | 983.36 | 193.35 | 983.39 | 199.91 | 983.41 | 200.14 | 983.41 | 204.16 | 983.33 |
| 214.97 | 982.88 | 216.68 | 982.88 | 225.78 | 982.86 | 232.11 | 982.86 | 236.59 | 982.9 |
| 238.46 | 982.85 | 243.02 | 983.03 | 246.12 | 983.1 | 247.4 | 983.19 | 250.89 | 983.5 |
| 253.78 | 983.76 | 258.21 | 984 | 261.45 | 984.24 | 269.02 | 984.43 | 269.11 | 984.44 |
| 269.35 | 984.44 | 276.78 | 984.68 | 279.83 | 984.69 | 284.44 | 984.8 | 290.64 | 984.84 |
| 292.11 | 984.87 | 295.67 | 984.87 | 299.77 | 984.91 | 301.44 | 984.9 | 307.44 | 984.9 |
| 315.1 | 984.82 | 322.01 | 984.66 | 323.06 | 984.65 | 330.43 | 984.52 | 333.88 | 984.45 |
| 338.08 | 984.38 | 345.75 | 984.31 | 348.34 | 984.3 | 355.5 | 984.33 | 361.07 | 984.38 |
| 366.31 | 984.5 | 368.74 | 984.54 | 374.67 | 984.86 | 376.4 | 984.96 | 377.12 | 985.01 |
| 384.07 | 985.44 | 387.93 | 985.7 | 391.73 | 985.87 | 398.73 | 986.14 | 399.39 | 986.16 |
| 401 | 986.19 | 407.06 | 986.25 | 409.55 | 986.28 | 414.72 | 986.3 | 420.35 | 986.43 |
| 422.39 | 986.45 | 427.34 | 986.57 | 430.05 | 986.6 | 437.71 | 986.74 | 441.97 | 986.83 |
| 445.38 | 986.93 | 452.79 | 987.12 | 453.05 | 987.12 | 453.67 | 987.14 | 460.71 | 987.29 |
| 468.37 | 987.51 | 476.04 | 987.79 | 480 | 987.96 | 483.7 | 988.11 | 485.21 | 988.16 |
| 491.37 | 988.44 | 496.02 | 988.67 | 506.33 | 989.22 | 506.68 | 989.24 | 506.83 | 989.24 |
| 514.35 | 989.62 | 517.64 | 989.78 | 528.45 | 990.2 | 529.68 | 990.22 | 539.26 | 990.41 |
| 560.33 | 990.73 | 560.88 | 990.73 | 571.69 | 990.87 | 575.66 | 990.9 | 582.5 | 990.94 |
| 585.32 | 990.94 | 590.99 | 990.93 | 593.31 | 990.94 | 598.65 | 990.93 | 604.12 | 990.94 |
| 606.32 | 990.94 | 613.98 | 990.98 | 614.93 | 990.98 | 621.65 | 991.08 | 625.74 | 991.16 |
| 629.31 | 991.26 | 636.55 | 991.43 | 636.98 | 991.45 | 647.36 | 991.65 | 652.3 | 991.76 |
| 658.17 | 991.87 | 659.97 | 991.9 | 661.97 | 991.94 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 71.49 | .035 | 250.89 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 84.73 | 261.45 | 226.5 | 211.86 | 189.37 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 984.51 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.035 | 0.032 |
| W.S. Elev (ft) | 984.28 | Reach Len. (ft) | 226.50 | 211.86 | 189.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 197.67 | 0.03 |
| E.G. Slope (ft/ft) | 0.006541 | Area (sq ft) | | 197.67 | 0.03 |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 771.99 | 0.01 |
| Top Width (ft) | 168.96 | Top Width (ft) | | 167.51 | 1.45 |
| Vel Total (ft/s) | 3.90 | Avg. Vel. (ft/s) | | 3.91 | 0.26 |
| Max Chl Dpth (ft) | 2.35 | Hydr. Depth (ft) | | 1.18 | 0.02 |
| Conv. Total (cfs) | 9545.6 | Conv. (cfs) | | 9545.5 | 0.1 |
| Length Wtd. (ft) | 211.86 | Wetted Per. (ft) | | 167.68 | 1.45 |
| Min Ch El (ft) | 981.93 | Shear (lb/sq ft) | | 0.48 | 0.01 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.88 | 0.00 |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 0.76 | 3.27 | 0.20 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 0.70 | 0.00 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 984.49 | Element | | | |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 984.23 | Reach Len. (ft) | 226.50 | 211.86 | 189.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 189.90 | |
| E.G. Slope (ft/ft) | 0.007263 | Area (sq ft) | | 189.90 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 164.32 | Top Width (ft) | | 164.32 | |
| Vel Total (ft/s) | 4.07 | Avg. Vel. (ft/s) | | 4.07 | |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | 1.16 | |
| Conv. Total (cfs) | 9058.6 | Conv. (cfs) | | 9058.6 | |
| Length Wtd. (ft) | 211.86 | Wetted Per. (ft) | | 164.49 | |
| Min Ch El (ft) | 981.93 | Shear (lb/sq ft) | | 0.52 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.13 | |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | | 3.94 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 0.73 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 984.49 | Element | | | |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 984.23 | Reach Len. (ft) | 226.50 | 211.86 | 189.37 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | | | 189.89 |
| E.G. Slope (ft/ft) | 0.007264 | Area (sq ft) | | | 189.89 |
| Q Total (cfs) | 772.00 | Flow (cfs) | | | 772.00 |
| Top Width (ft) | 164.32 | Top Width (ft) | | | 164.32 |
| Vel Total (ft/s) | 4.07 | Avg. Vel. (ft/s) | | | 4.07 |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | | | 1.16 |
| Conv. Total (cfs) | 9058.0 | Conv. (cfs) | | | 9058.0 |
| Length Wtd. (ft) | 211.86 | Wetted Per. (ft) | | | 164.49 |
| Min Ch El (ft) | 981.93 | Shear (lb/sq ft) | | | 0.52 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | | 2.13 |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | | 0.00 | 3.94 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 0.01 | 0.73 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 1E1
REACH: Reach 1 RS: 0.062

INPUT
Description: Thalweg Sta. 150.57
Station Elevation Data num= 122

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 983.75 | .46 | 983.75 | 8.06 | 983.84 | 18.08 | 983.78 | 19.22 | 983.77 |
| 35.88 | 983.57 | 37.99 | 983.54 | 38.13 | 983.54 | 47.24 | 983.38 | 47.37 | 983.38 |
| 48.15 | 983.37 | 56.75 | 983.06 | 58.17 | 983.03 | 66.13 | 982.5 | 68.2 | 982.38 |
| 75.52 | 982.16 | 78.22 | 981.93 | 84.9 | 982.1 | 88.24 | 982.14 | 94.28 | 982.09 |
| 98.27 | 982.05 | 103.66 | 981.68 | 113.04 | 981.19 | 118.31 | 980.86 | 122.42 | 980.87 |
| 128.34 | 981.23 | 131.81 | 981.26 | 138.36 | 981.33 | 141.19 | 981.17 | 148.38 | 980.57 |
| 150.57 | 980.57 | 158.41 | 979.57 | 159.95 | 979.62 | 168.43 | 980.97 | 169.33 | 981.1 |
| 178.46 | 982.87 | 178.72 | 982.92 | 188.1 | 984.44 | 188.48 | 984.49 | 197.48 | 985.22 |
| 198.5 | 985.28 | 203.01 | 985.5 | 206.86 | 985.68 | 208.53 | 985.75 | 216.24 | 985.99 |
| 218.55 | 986.08 | 219.61 | 986.1 | 225.63 | 986.2 | 228.57 | 986.29 | 235.01 | 986.36 |
| 238.6 | 986.41 | 244.39 | 986.45 | 253.77 | 986.47 | 258.64 | 986.46 | 263.15 | 986.5 |
| 268.67 | 986.52 | 272.53 | 986.6 | 278.69 | 986.68 | 281.92 | 986.76 | 288.71 | 986.88 |
| 291.3 | 986.92 | 298.74 | 987.02 | 300.68 | 987.04 | 308.76 | 987.14 | 310.06 | 987.17 |
| 318.78 | 987.36 | 319.44 | 987.37 | 328.81 | 987.64 | 329.19 | 987.65 | 338.83 | 987.79 |
| 347.59 | 987.74 | 348.85 | 987.76 | 356.98 | 987.79 | 358.88 | 987.83 | 366.36 | 988.01 |
| 375.74 | 988.26 | 378.92 | 988.34 | 388.95 | 988.56 | 394.51 | 988.65 | 398.97 | 988.75 |
| 408.99 | 988.94 | 413.27 | 989.05 | 422.65 | 989.31 | 429.04 | 989.51 | 439.06 | 989.77 |
| 449.09 | 989.94 | 450.8 | 989.96 | 459.11 | 990.08 | 460.18 | 990.09 | 469.13 | 990.19 |
| 469.56 | 990.19 | 475.84 | 990.2 | 478.95 | 990.21 | 479.16 | 990.21 | 488.33 | 990.3 |
| 489.18 | 990.3 | 497.71 | 990.46 | 499.2 | 990.48 | 507.09 | 990.69 | 509.23 | 990.73 |
| 516.47 | 990.92 | 519.25 | 990.96 | 525.85 | 990.99 | 529.27 | 990.99 | 544.62 | 990.86 |
| 549.32 | 990.79 | 554 | 990.75 | 559.34 | 990.63 | 563.38 | 990.58 | 569.37 | 990.45 |
| 572.76 | 990.44 | 579.39 | 990.45 | 582.15 | 990.52 | 589.41 | 990.74 | 591.53 | 990.81 |
| 599.44 | 991.09 | 600.91 | 991.12 | 610.29 | 991.34 | 619.48 | 991.52 | 619.67 | 991.52 |
| 629.51 | 991.73 | 638.4 | 991.95 | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .035 | 203.01 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 47.24 | 219.61 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.27 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 983.01 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 186.94 | |
| E.G. Slope (ft/ft) | 0.005310 | Area (sq ft) | | 186.94 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 120.73 | Top Width (ft) | | 120.73 | |
| Vel Total (ft/s) | 4.13 | Avg. Vel. (ft/s) | | 4.13 | |
| Max Chl Dpth (ft) | 3.44 | Hydr. Depth (ft) | | 1.55 | |
| Conv. Total (cfs) | 10594.7 | Conv. (cfs) | | 10594.7 | |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | | 121.21 | |
| Min Ch El (ft) | 979.57 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.11 | |
| Frctn Loss (ft) | 1.10 | Cum Volume (acre-ft) | 0.76 | 2.33 | 0.20 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.59 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 983.43 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 241.13 | |
| E.G. Slope (ft/ft) | 0.002629 | Area (sq ft) | | 241.13 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | | 772.00 | |
| Top Width (ft) | 134.62 | Top Width (ft) | | 134.62 | |
| Vel Total (ft/s) | 3.20 | Avg. Vel. (ft/s) | | 3.20 | |
| Max Chl Dpth (ft) | 3.86 | Hydr. Depth (ft) | | 1.79 | |
| Conv. Total (cfs) | 15056.4 | Conv. (cfs) | | 15056.4 | |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | | 135.19 | |
| Min Ch El (ft) | 979.57 | Shear (lb/sq ft) | | 0.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.94 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | | 2.89 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.59 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.035 | 0.035 | |
| W.S. Elev (ft) | 983.43 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.07 | 241.07 | |
| E.G. Slope (ft/ft) | 0.002630 | Area (sq ft) | 0.07 | 241.07 | |
| Q Total (cfs) | 772.00 | Flow (cfs) | 0.01 | 771.99 | |
| Top Width (ft) | 137.41 | Top Width (ft) | 2.79 | 134.62 | |
| Vel Total (ft/s) | 3.20 | Avg. Vel. (ft/s) | 0.18 | 3.20 | |
| Max Chl Dpth (ft) | 3.86 | Hydr. Depth (ft) | 0.02 | 1.79 | |
| Conv. Total (cfs) | 15053.8 | Conv. (cfs) | 0.2 | 15053.5 | |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | 2.79 | 135.14 | |
| Min Ch El (ft) | 979.57 | Shear (lb/sq ft) | 0.00 | 0.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.94 | |
| Frctn Loss (ft) | 0.85 | Cum Volume (acre-ft) | 0.00 | 2.89 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

SUMMARY OF MANNING'S N VALUES

River:Tributary 1E

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 | n6 | n7 | n8 |
|---|---|---|---|---|---|---|---|---|---|
| Reach 2 | 5.971 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.933 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.895 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.857 | .032 | .035 | | | | | | |
| Reach 2 | 5.820 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.782 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.744 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.706 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.668 | .035 | .032 | | | | | | |
| Reach 2 | 5.630 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.592 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.554 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.517 | .032 | .035 | .032 | | | | | |
| Reach 2 | 5.479 | .032 | .035 | .032 | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Reach 2 | 5.441 | .035 | .032 | | | |
| Reach 2 | 5.403 | .032 | .035 | .032 | | |
| Reach 2 | 5.365 | .032 | .032 | .032 | | |
| Reach 2 | 5.327 | .035 | .032 | | | |
| Reach 2 | 5.289 | .035 | .032 | | | |
| Reach 2 | 5.252 | .035 | .032 | | | |
| Reach 2 | 5.214 | .032 | .035 | .032 | | |
| Reach 2 | 5.176 | .032 | .035 | .032 | | |
| Reach 2 | 5.138 | .032 | .035 | .032 | | |
| Reach 2 | 5.100 | .032 | .035 | .032 | | |
| Reach 2 | 5.062 | .032 | .035 | .032 | | |
| Reach 2 | 5.024 | .032 | .035 | .032 | | |
| Reach 2 | 4.986 | .032 | .035 | .032 | | |
| Reach 2 | 4.949 | .035 | .032 | | | |
| Reach 2 | 4.911 | .032 | .035 | .032 | | |
| Reach 2 | 4.873 | .032 | .035 | .032 | | |
| Reach 2 | 4.835 | .035 | .032 | | | |
| Reach 2 | 4.797 | .035 | .032 | | | |
| Reach 2 | 4.759 | .035 | .032 | | | |
| Reach 2 | 4.721 | .032 | .035 | .032 | | |
| Reach 2 | 4.683 | .035 | .032 | | | |
| Reach 2 | 4.646 | .035 | .035 | .032 | | |
| Reach 2 | 4.569 | .035 | .032 | | | |
| Reach 2 | 4.506 | .032 | .035 | .032 | | |
| Reach 2 | 4.450 | .032 | .035 | .032 | | |
| Reach 2 | 4.410 | .032 | .035 | .032 | | |
| Reach 2 | 4.372 | .032 | .035 | .032 | | |
| Reach 2 | 4.334 | .032 | .035 | .032 | | |
| Reach 2 | 4.296 | .032 | .035 | .032 | | |
| Reach 2 | 4.259 | .032 | .035 | .032 | | |
| Reach 2 | 4.221 | .032 | .035 | .032 | | |
| Reach 2 | 4.183 | .032 | .035 | .032 | .035 | |
| Reach 2 | 4.145 | .032 | .035 | | | |
| Reach 1 | 4.072 | .032 | .035 | .032 | | |
| Reach 1 | 4.034 | .032 | .035 | .032 | | |
| Reach 1 | 3.996 | .032 | .035 | .032 | | |
| Reach 1 | 3.958 | .032 | .035 | .032 | | |
| Reach 1 | 3.920 | .032 | .04 | | | |
| Reach 1 | 3.883 | .04 | .077 | .04 | .032 | .04 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reach 1 | 3.845 | .04 | .077 | .04 | .032 | | | |
| Reach 1 | 3.807 | .04 | .077 | .04 | | | | |
| Reach 1 | 3.769 | .04 | .077 | .04 | | | | |
| Reach 1 | 3.731 | .04 | .077 | .04 | | | | |
| Reach 1 | 3.692 | .04 | .077 | .04 | | | | |
| Reach 1 | 3.653 | .04 | .077 | .04 | .032 | | | |
| Reach 1 | 3.614 | .04 | .077 | .04 | .032 | | | |
| Reach 1 | 3.576 | .04 | .077 | .04 | .032 | | | |
| Reach 1 | 3.538 | .035 | .077 | .04 | | | | |
| Reach 1 | 3.500 | .035 | .077 | .04 | | | | |
| Reach 1 | 3.462 | .035 | .077 | .04 | | | | |
| Reach 1 | 3.425 | .035 | .077 | .04 | | | | |
| Reach 1 | 3.387 | .035 | .077 | .04 | | | | |
| Reach 1 | 3.349 | .035 | .077 | .04 | .032 | | | |
| Reach 1 | 3.311 | .035 | .077 | .04 | .032 | | | |
| Reach 1 | 3.273 | .035 | .077 | .04 | .032 | | | |
| Reach 1 | 3.235 | .035 | .077 | .04 | .032 | | | |
| Reach 1 | 3.197 | .035 | .072 | .04 | .032 | | | |
| Reach 1 | 3.122 | .035 | .04 | .072 | .04 | .072 | .052 | .04 .032 |
| Reach 1 | 3.084 | .035 | .04 | .072 | .052 | .04 | .032 | |
| Reach 1 | 3.046 | .035 | .04 | .072 | .052 | .04 | .032 | |
| Reach 1 | 2.972 | .035 | .04 | .072 | .052 | .04 | .032 | |
| Reach 1 | 2.935 | .04 | .072 | .052 | .04 | .032 | | |
| Reach 1 | 2.897 | .04 | .072 | .052 | .04 | .032 | | |
| Reach 1 | 2.852 | .04 | .072 | .04 | .032 | | | |
| Reach 1 | 2.814 | .04 | .072 | .04 | .032 | | | |
| Reach 1 | 2.776 | .04 | .072 | .04 | .032 | | | |
| Reach 1 | 2.738 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.700 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.662 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.624 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.587 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.549 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.511 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.473 | .04 | .072 | .032 | | | | |
| Reach 1 | 2.445 | .04 | .052 | .072 | .032 | .04 | .032 | |
| Reach 1 | 2.438 | Culvert | | | | | | |
| Reach 1 | 2.432 | .035 | .04 | .052 | .04 | .032 | | |
| Reach 1 | 2.397 | .035 | .04 | .052 | .04 | .032 | | |
| Reach 1 | 2.359 | .035 | .04 | .052 | .04 | .032 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Reach 1 | 2.321 | .035 | .04 | .052 | .04 | .032 | |
| Reach 1 | 2.283 | .035 | .052 | .04 | .032 | | |
| Reach 1 | 2.245 | .035 | .052 | .04 | .032 | | |
| Reach 1 | 2.208 | .035 | .04 | .052 | .04 | .032 | |
| Reach 1 | 2.170 | .035 | .04 | .052 | .04 | .035 | |
| Reach 1 | 2.132 | .035 | .04 | .052 | .04 | .032 | |
| Reach 1 | 2.094 | .035 | .072 | .04 | .032 | | |
| Reach 1 | 2.056 | .035 | .072 | .04 | .032 | | |
| Reach 1 | 2.018 | .035 | .072 | .04 | .032 | | |
| Reach 1 | 1.980 | .035 | .04 | .072 | .04 | .032 | |
| Reach 1 | 1.942 | .035 | .04 | .072 | .04 | .032 | |
| Reach 1 | 1.905 | .04 | .072 | .04 | .032 | | |
| Reach 1 | 1.867 | .035 | .03 | .072 | .04 | .032 | |
| Reach 1 | 1.829 | .032 | .072 | .04 | .032 | | |
| Reach 1 | 1.791 | .032 | .072 | .04 | .032 | | |
| Reach 1 | 1.753 | .032 | .072 | .04 | .032 | | |
| Reach 1 | 1.715 | .032 | .04 | .072 | .04 | | |
| Reach 1 | 1.677 | .032 | .04 | .072 | .04 | | |
| Reach 1 | 1.640 | .032 | .04 | .072 | .04 | | |
| Reach 1 | 1.602 | .032 | .04 | .072 | .04 | | |
| Reach 1 | 1.564 | .04 | .072 | .04 | | | |
| Reach 1 | 1.526 | .052 | .04 | .072 | .04 | .072 | .04 |
| Reach 1 | 1.488 | .04 | .072 | .04 | .072 | .04 | |
| Reach 1 | 1.450 | .04 | .072 | .04 | .072 | .04 | |
| Reach 1 | 1.412 | .052 | .04 | .072 | .04 | | |
| Reach 1 | 1.374 | .052 | .04 | .072 | .04 | .032 | |
| Reach 1 | 1.330 | .052 | .04 | .072 | .04 | .032 | |
| Reach 1 | 1.323 | Culvert | | | | | |
| Reach 1 | 1.312 | .032 | .04 | .072 | .04 | .032 | |
| Reach 1 | 1.223 | .032 | .04 | .072 | .04 | .032 | |
| Reach 1 | 1.185 | .032 | .04 | .072 | .04 | .032 | |
| Reach 1 | 1.147 | .032 | .04 | .072 | .052 | .04 | .032 |
| Reach 1 | 1.109 | .032 | .04 | .072 | .032 | | |
| Reach 1 | 1.072 | .032 | .04 | .052 | .04 | .032 | |
| Reach 1 | 1.035 | .032 | .04 | .052 | .04 | .032 | |
| Reach 1 | .997 | .032 | .04 | .052 | .04 | 0 | |
| Reach 1 | .959 | .032 | .04 | .052 | .04 | .035 | |
| Reach 1 | .921 | .032 | .04 | .052 | .04 | .052 | .04 |
| .035 | | | | | | | |
| Reach 1 | .883 | .032 | .04 | .052 | .04 | .035 | |

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|---|---|---|---|---|---|---|---|
| Reach 1 | .845 | .032 | .04 | .052 | .04 | .035 | |
| Reach 1 | .807 | .032 | .032 | .04 | .052 | .04 | .035 |
| Reach 1 | .770 | .032 | .04 | .04 | .052 | .04 | .035 |
| Reach 1 | .732 | .04 | .04 | .052 | .035 | .035 | |
| Reach 1 | .695 | .035 | .04 | .052 | .035 | .035 | |
| Reach 1 | .656 | .035 | .04 | .052 | .035 | .035 | |
| Reach 1 | .618 | .035 | .04 | .052 | .035 | .035 | |
| Reach 1 | .580 | .035 | .04 | .052 | .035 | .035 | |
| Reach 1 | .542 | .035 | .04 | .052 | .035 | | |
| Reach 1 | .494 | .052 | .035 | | | | |
| Reach 1 | .418 | .052 | .035 | | | | |
| Reach 1 | .342 | .052 | .035 | | | | |
| Reach 1 | .266 | .052 | .035 | | | | |
| Reach 1 | .190 | .052 | .035 | | | | |

River:Tributary 1E1

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 |
|---|---|---|---|---|---|---|
| Reach 1 | 1.927 | .032 | .052 | .032 | | |
| Reach 1 | 1.889 | .032 | .052 | .032 | | |
| Reach 1 | 1.851 | .032 | .052 | .032 | | |
| Reach 1 | 1.813 | .032 | .052 | .032 | | |
| Reach 1 | 1.775 | .032 | .04 | .032 | | |
| Reach 1 | 1.737 | .032 | .04 | .032 | | |
| Reach 1 | 1.699 | .032 | .04 | .032 | | |
| Reach 1 | 1.661 | .032 | .04 | .032 | | |
| Reach 1 | 1.624 | .032 | .04 | .032 | | |
| Reach 1 | 1.586 | .032 | .04 | .032 | | |
| Reach 1 | 1.548 | .032 | .04 | .032 | | |
| Reach 1 | 1.510 | .032 | .04 | .032 | | |
| Reach 1 | 1.472 | .032 | .04 | .032 | | |
| Reach 1 | 1.434 | .032 | .04 | .032 | | |
| Reach 1 | 1.396 | .032 | .04 | .032 | | |
| Reach 1 | 1.358 | .032 | .04 | .032 | | |
| Reach 1 | 1.321 | .032 | .04 | .032 | | |
| Reach 1 | 1.283 | .032 | .04 | .032 | | |
| Reach 1 | 1.245 | .032 | .04 | .032 | | |
| Reach 1 | 1.207 | .032 | .04 | .032 | | |
| Reach 1 | 1.169 | .032 | .04 | .032 | .04 | .032 |
| Reach 1 | 1.131 | .032 | .04 | .032 | | |
| Reach 1 | 1.093 | .032 | .04 | .032 | | |
| Reach 1 | 1.052 | .032 | .04 | .032 | | |
| Reach 1 | 1.008 | .032 | .04 | .032 | | |
| Reach 1 | 0.968 | .032 | .04 | .032 | | |
| Reach 1 | 0.929 | .032 | .04 | .032 | | |
| Reach 1 | 0.890 | .032 | .04 | .032 | | |
| Reach 1 | 0.852 | .032 | .04 | .032 | | |
| Reach 1 | 0.814 | .032 | .04 | .032 | | |
| Reach 1 | 0.777 | .032 | .04 | .032 | | |
| Reach 1 | 0.739 | .032 | .052 | .032 | | |
| Reach 1 | 0.701 | .032 | .052 | .032 | | |
| Reach 1 | 0.663 | .032 | .052 | .032 | | |
| Reach 1 | 0.625 | .032 | .052 | .032 | | |
| Reach 1 | 0.587 | .032 | .052 | .032 | | |
| Reach 1 | 0.549 | .032 | .052 | .032 | | |
| Reach 1 | 0.511 | .032 | .052 | .032 | | |
| Reach 1 | 0.474 | .032 | .052 | .032 | | |
| Reach 1 | 0.436 | .032 | .052 | .032 | | |
| Reach 1 | 0.398 | .032 | .052 | .032 | | |
| Reach 1 | 0.359 | .032 | .052 | .032 | | |
| Reach 1 | 0.319 | .032 | .035 | .032 | | |
| Reach 1 | 0.293 | .032 | .035 | .032 | | |

| | | | | |
|---|---|---|---|---|
| Reach 1 | 0.254 | .032 | .052 | .032 |
| Reach 1 | 0.216 | .032 | .052 | .032 |
| Reach 1 | 0.178 | .032 | .035 | .032 |
| Reach 1 | 0.141 | .032 | .035 | .032 |
| Reach 1 | 0.102 | .032 | .035 | .032 |
| Reach 1 | 0.062 | .035 | .032 | |

SUMMARY OF REACH LENGTHS

River: Tributary 1E

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Reach 2 | 5.971 | 199.41 | 200 | 212.45 |
| Reach 2 | 5.933 | 199.17 | 200 | 202.81 |
| Reach 2 | 5.895 | 198.5 | 200 | 206.94 |
| Reach 2 | 5.857 | 237.26 | 199.71 | 112.1 |
| Reach 2 | 5.820 | 198.68 | 199.97 | 217.11 |
| Reach 2 | 5.782 | 188.74 | 199.97 | 228.54 |
| Reach 2 | 5.744 | 200.33 | 200 | 206.17 |
| Reach 2 | 5.706 | 208.06 | 199.97 | 192.58 |
| Reach 2 | 5.668 | 209.05 | 199.96 | 189.21 |
| Reach 2 | 5.630 | 206.26 | 199.98 | 198.81 |
| Reach 2 | 5.592 | 218.11 | 199.89 | 175.69 |
| Reach 2 | 5.554 | 196.7 | 199.99 | 204.61 |
| Reach 2 | 5.517 | 204.8 | 200 | 196.22 |
| Reach 2 | 5.479 | 210.34 | 199.99 | 193.14 |
| Reach 2 | 5.441 | 201.12 | 200 | 199.11 |
| Reach 2 | 5.403 | 211.17 | 200 | 199.25 |
| Reach 2 | 5.365 | 209.69 | 199.99 | 197.51 |
| Reach 2 | 5.327 | 161.38 | 199.6 | 212.73 |
| Reach 2 | 5.289 | 153.14 | 199.78 | 217.75 |
| Reach 2 | 5.252 | 222.52 | 199.97 | 190.53 |
| Reach 2 | 5.214 | 244.78 | 200 | 193.98 |
| Reach 2 | 5.176 | 234.24 | 200 | 197.74 |
| Reach 2 | 5.138 | 205.1 | 200 | 195.1 |
| Reach 2 | 5.100 | 280.85 | 199.96 | 176.08 |
| Reach 2 | 5.062 | 246.29 | 200 | 196.81 |
| Reach 2 | 5.024 | 198.77 | 200 | 203.24 |
| Reach 2 | 4.986 | 196.6 | 199.99 | 205.75 |
| Reach 2 | 4.949 | 190.2 | 199.97 | 208.83 |
| Reach 2 | 4.911 | 194.89 | 199.98 | 208.97 |
| Reach 2 | 4.873 | 205.68 | 200 | 201.72 |
| Reach 2 | 4.835 | 202.76 | 200 | 200.46 |
| Reach 2 | 4.797 | 200.01 | 200 | 200.04 |
| Reach 2 | 4.759 | 202.36 | 201.6 | 201.74 |
| Reach 2 | 4.721 | 198.04 | 198.4 | 198.8 |
| Reach 2 | 4.683 | 199.95 | 200 | 200.19 |
| Reach 2 | 4.646 | 368.32 | 406.03 | 427.87 |
| Reach 2 | 4.569 | 314.06 | 331.92 | 320.31 |
| Reach 2 | 4.506 | 386.51 | 297.06 | 143.43 |
| Reach 2 | 4.450 | 212.83 | 208.3 | 218.67 |
| Reach 2 | 4.410 | 206.45 | 200.01 | 203.5 |
| Reach 2 | 4.372 | 233.34 | 199.95 | 179.31 |
| Reach 2 | 4.334 | 210.97 | 200.01 | 194.23 |
| Reach 2 | 4.296 | 256.29 | 199.58 | 146.96 |
| Reach 2 | 4.259 | 192.32 | 199.93 | 219.84 |
| Reach 2 | 4.221 | 200.59 | 199.97 | 211.33 |
| Reach 2 | 4.183 | 222.27 | 199.85 | 166.33 |
| Reach 2 | 4.145 | 0 | 0 | 10036.89 |
| Reach 1 | 4.072 | 177.48 | 199.89 | 232.13 |
| Reach 1 | 4.034 | 199.58 | 200 | 201.88 |
| Reach 1 | 3.996 | 201.85 | 200 | 199.82 |
| Reach 1 | 3.958 | 189.16 | 199.97 | 208.54 |
| Reach 1 | 3.920 | 217.48 | 199.99 | 192.14 |
| Reach 1 | 3.883 | 214.98 | 199.99 | 191.18 |
| Reach 1 | 3.845 | 155.97 | 199.94 | 231.35 |
| Reach 1 | 3.807 | 156.21 | 199.89 | 237.24 |
| Reach 1 | 3.769 | 171.73 | 200.24 | 214.85 |
| Reach 1 | 3.731 | 212.21 | 208.08 | 203.32 |
| Reach 1 | 3.692 | 226.09 | 205.51 | 199.93 |
| Reach 1 | 3.653 | 223.96 | 203.94 | 201.58 |
| Reach 1 | 3.614 | 224.19 | 200.79 | 196.31 |
| Reach 1 | 3.576 | 207.87 | 200 | 210.88 |
| Reach 1 | 3.538 | 205.18 | 199.99 | 198.37 |
| Reach 1 | 3.500 | 283.31 | 199.99 | 170.07 |

| | | | | |
|---|---|---|---|---|
| Reach 1 | 3.462 | 213.63 | 200 | 207.48 |
| Reach 1 | 3.425 | 178.18 | 200 | 220.31 |
| Reach 1 | 3.387 | 234.84 | 200 | 195.16 |
| Reach 1 | 3.349 | 210.36 | 200 | 197.94 |
| Reach 1 | 3.311 | 198.95 | 200 | 202.33 |
| Reach 1 | 3.273 | 208.91 | 199.99 | 209.65 |
| Reach 1 | 3.235 | 306.77 | 199.98 | 165.9 |
| Reach 1 | 3.197 | 526.07 | 399.96 | 339.92 |
| Reach 1 | 3.122 | 178.94 | 199.76 | 260.08 |
| Reach 1 | 3.084 | 203.28 | 200.06 | 243.97 |
| Reach 1 | 3.046 | 492.22 | 387.47 | 267.36 |
| Reach 1 | 2.972 | 249.46 | 199.47 | 149.03 |
| Reach 1 | 2.935 | 228.14 | 199.94 | 257.72 |
| Reach 1 | 2.897 | 278.77 | 238.16 | 269.33 |
| Reach 1 | 2.852 | 197.8 | 199.97 | 209.22 |
| Reach 1 | 2.814 | 207.13 | 199.99 | 193.54 |
| Reach 1 | 2.776 | 220.05 | 199.96 | 197.59 |
| Reach 1 | 2.738 | 204.79 | 200 | 202.74 |
| Reach 1 | 2.700 | 191.75 | 200 | 206.08 |
| Reach 1 | 2.662 | 204.27 | 199.99 | 203.54 |
| Reach 1 | 2.624 | 181.92 | 199.93 | 220.91 |
| Reach 1 | 2.587 | 180.6 | 199.97 | 217.26 |
| Reach 1 | 2.549 | 205.16 | 199.99 | 208.74 |
| Reach 1 | 2.511 | 195.2 | 200 | 206.28 |
| Reach 1 | 2.473 | 181.63 | 147 | 118.72 |
| Reach 1 | 2.445 | 67.66 | 68.25 | 62.48 |
| Reach 1 | 2.438 | Culvert | | |
| Reach 1 | 2.432 | 139.55 | 185.93 | 233.21 |
| Reach 1 | 2.397 | 222.47 | 199.97 | 168.15 |
| Reach 1 | 2.359 | 202.68 | 200 | 198.4 |
| Reach 1 | 2.321 | 202.06 | 200 | 206.6 |
| Reach 1 | 2.283 | 203.74 | 200 | 193.07 |
| Reach 1 | 2.245 | 208.91 | 199.97 | 180.49 |
| Reach 1 | 2.208 | 187.8 | 199.97 | 242.88 |
| Reach 1 | 2.170 | 202.29 | 200 | 193.06 |
| Reach 1 | 2.132 | 201.54 | 200 | 200.86 |
| Reach 1 | 2.094 | 202.93 | 200 | 233.69 |
| Reach 1 | 2.056 | 201.93 | 200 | 203 |
| Reach 1 | 2.018 | 200.25 | 200 | 201.01 |
| Reach 1 | 1.980 | 201.22 | 200 | 199.79 |
| Reach 1 | 1.942 | 214.4 | 199.79 | 175.9 |
| Reach 1 | 1.905 | 238.12 | 199.78 | 152.95 |
| Reach 1 | 1.867 | 201.89 | 200 | 199.54 |
| Reach 1 | 1.829 | 196.42 | 199.99 | 204.4 |
| Reach 1 | 1.791 | 177.85 | 199.83 | 217.28 |
| Reach 1 | 1.753 | 235.15 | 200 | 266.02 |
| Reach 1 | 1.715 | 215.88 | 199.98 | 200.87 |
| Reach 1 | 1.677 | 109.96 | 199.94 | 267.48 |
| Reach 1 | 1.640 | 301.6 | 199.98 | 229.77 |
| Reach 1 | 1.602 | 204.85 | 199.97 | 182.1 |
| Reach 1 | 1.564 | 213.14 | 199.97 | 171.74 |
| Reach 1 | 1.526 | 306.01 | 199.97 | 205.26 |
| Reach 1 | 1.488 | 128.51 | 199.94 | 216.18 |
| Reach 1 | 1.450 | 248.33 | 199.99 | 194.16 |
| Reach 1 | 1.412 | 167.72 | 199.95 | 185.1 |
| Reach 1 | 1.374 | 180.49 | 235.16 | 292.91 |
| Reach 1 | 1.330 | 143.7 | 96.2 | 107.46 |
| Reach 1 | 1.323 | Culvert | | |
| Reach 1 | 1.312 | 639.02 | 468.39 | 440.05 |
| Reach 1 | 1.223 | 209.78 | 199.99 | 208.21 |
| Reach 1 | 1.185 | 215.15 | 199.99 | 202.61 |
| Reach 1 | 1.147 | 246.36 | 199.72 | 185.66 |
| Reach 1 | 1.109 | 268.31 | 198 | 168.17 |
| Reach 1 | 1.072 | 181.83 | 199.7 | 243.69 |
| Reach 1 | 1.035 | 216.82 | 199.57 | 199.91 |
| Reach 1 | .997 | 229.95 | 199.9 | 175.93 |
| Reach 1 | .959 | 187.22 | 199.87 | 219.88 |
| Reach 1 | .921 | 163.95 | 199.88 | 218.71 |
| Reach 1 | .883 | 205.18 | 199.95 | 194.33 |
| Reach 1 | .845 | 202.23 | 199.86 | 190.54 |
| Reach 1 | .807 | 193.21 | 199.98 | 211.22 |
| Reach 1 | .770 | 199.34 | 200 | 200.93 |
| Reach 1 | .732 | 199.58 | 194.37 | 187.61 |
| Reach 1 | .695 | 205.92 | 205.62 | 205.53 |
| Reach 1 | .656 | 193.97 | 199.98 | 206.81 |
| Reach 1 | .618 | 204.33 | 199.95 | 194.91 |
| Reach 1 | .580 | 207.74 | 199.97 | 191.01 |
| Reach 1 | .542 | 330.69 | 257.47 | 220.28 |
| Reach 1 | .494 | 401.41 | 400.29 | 369.49 |

| | | | | |
|---|---|---|---|---|
| Reach 1 | .418 | 402.52 | 400.1 | 402.57 |
| Reach 1 | .342 | 402.96 | 400.18 | 400.15 |
| Reach 1 | .266 | 404.62 | 400.51 | 397.22 |
| Reach 1 | .190 | 0 | 0 | 0 |

River: Tributary 1E1

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Reach 1 | 1.927 | 195.31 | 200 | 205.38 |
| Reach 1 | 1.889 | 183.96 | 200.01 | 211.62 |
| Reach 1 | 1.851 | 160.71 | 199.92 | 232.12 |
| Reach 1 | 1.813 | 210.08 | 199.99 | 194.6 |
| Reach 1 | 1.775 | 216.89 | 199.99 | 188.9 |
| Reach 1 | 1.737 | 211.95 | 200 | 193.31 |
| Reach 1 | 1.699 | 192.15 | 199.8 | 202.16 |
| Reach 1 | 1.661 | 180.2 | 199.95 | 224.06 |
| Reach 1 | 1.624 | 206.02 | 199.97 | 194.98 |
| Reach 1 | 1.586 | 213.05 | 200 | 189.39 |
| Reach 1 | 1.548 | 208.53 | 199.99 | 189.65 |
| Reach 1 | 1.510 | 220.58 | 199.95 | 162.31 |
| Reach 1 | 1.472 | 185.27 | 199.97 | 230.84 |
| Reach 1 | 1.434 | 195.97 | 200 | 206.51 |
| Reach 1 | 1.396 | 183.48 | 199.98 | 215.74 |
| Reach 1 | 1.358 | 206.3 | 199.97 | 194.59 |
| Reach 1 | 1.321 | 228.16 | 199.87 | 135.92 |
| Reach 1 | 1.283 | 187.44 | 199.97 | 223.68 |
| Reach 1 | 1.245 | 173.41 | 199.96 | 236.41 |
| Reach 1 | 1.207 | 212.52 | 200 | 191.49 |
| Reach 1 | 1.169 | 226.96 | 201.9 | 178.81 |
| Reach 1 | 1.131 | 205.53 | 202.09 | 196.41 |
| Reach 1 | 1.093 | 208.61 | 214.86 | 189.24 |
| Reach 1 | 1.052 | 193.63 | 232.51 | 218.34 |
| Reach 1 | 1.008 | 185.29 | 210.17 | 226.47 |
| Reach 1 | 0.968 | 210.03 | 205.18 | 206.71 |
| Reach 1 | 0.929 | 222.55 | 206.68 | 203.43 |
| Reach 1 | 0.890 | 202.85 | 200 | 199.64 |
| Reach 1 | 0.852 | 170.59 | 199.92 | 240.94 |
| Reach 1 | 0.814 | 157.81 | 199.65 | 286.59 |
| Reach 1 | 0.777 | 206.41 | 200 | 209.99 |
| Reach 1 | 0.739 | 234.04 | 199.8 | 164.26 |
| Reach 1 | 0.701 | 250.16 | 199.83 | 169.21 |
| Reach 1 | 0.663 | 211.79 | 199.99 | 200.27 |
| Reach 1 | 0.625 | 206.39 | 200 | 198.77 |
| Reach 1 | 0.587 | 194.81 | 199.99 | 204.99 |
| Reach 1 | 0.549 | 164.12 | 199.95 | 231.72 |
| Reach 1 | 0.511 | 188.54 | 199.89 | 211.02 |
| Reach 1 | 0.474 | 180.21 | 199.98 | 220.79 |
| Reach 1 | 0.436 | 193.46 | 199.99 | 213.61 |
| Reach 1 | 0.398 | 294.23 | 205.36 | 161.78 |
| Reach 1 | 0.359 | 252.69 | 208.33 | 230.12 |
| Reach 1 | 0.319 | 42.81 | 140.97 | 288.38 |
| Reach 1 | 0.293 | 167.39 | 207.15 | 222.16 |
| Reach 1 | 0.254 | 206.87 | 200.58 | 205.25 |
| Reach 1 | 0.216 | 228.78 | 199.92 | 178.87 |
| Reach 1 | 0.178 | 228.6 | 194.63 | 181.8 |
| Reach 1 | 0.141 | 218.93 | 205.31 | 193.14 |
| Reach 1 | 0.102 | 226.5 | 211.86 | 189.37 |
| Reach 1 | 0.062 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Tributary 1E

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| Reach 2 | 5.971 | .1 | .3 |
| Reach 2 | 5.933 | .1 | .3 |
| Reach 2 | 5.895 | .1 | .3 |
| Reach 2 | 5.857 | .1 | .3 |
| Reach 2 | 5.820 | .1 | .3 |
| Reach 2 | 5.782 | .1 | .3 |
| Reach 2 | 5.744 | .1 | .3 |
| Reach 2 | 5.706 | .1 | .3 |
| Reach 2 | 5.668 | .1 | .3 |

| | | | |
|---|---|---|---|
| Reach 2 | 5.630 | .1 | .3 |
| Reach 2 | 5.592 | .1 | .3 |
| Reach 2 | 5.554 | .1 | .3 |
| Reach 2 | 5.517 | .1 | .3 |
| Reach 2 | 5.479 | .1 | .3 |
| Reach 2 | 5.441 | .1 | .3 |
| Reach 2 | 5.403 | .1 | .3 |
| Reach 2 | 5.365 | .1 | .3 |
| Reach 2 | 5.327 | .1 | .3 |
| Reach 2 | 5.289 | .1 | .3 |
| Reach 2 | 5.252 | .1 | .3 |
| Reach 2 | 5.214 | .1 | .3 |
| Reach 2 | 5.176 | .1 | .3 |
| Reach 2 | 5.138 | .1 | .3 |
| Reach 2 | 5.100 | .1 | .3 |
| Reach 2 | 5.062 | .1 | .3 |
| Reach 2 | 5.024 | .1 | .3 |
| Reach 2 | 4.986 | .1 | .3 |
| Reach 2 | 4.949 | .1 | .3 |
| Reach 2 | 4.911 | .1 | .3 |
| Reach 2 | 4.873 | .1 | .3 |
| Reach 2 | 4.835 | .1 | .3 |
| Reach 2 | 4.797 | .1 | .3 |
| Reach 2 | 4.759 | .1 | .3 |
| Reach 2 | 4.721 | .1 | .3 |
| Reach 2 | 4.683 | .1 | .3 |
| Reach 2 | 4.646 | .1 | .3 |
| Reach 2 | 4.569 | .1 | .3 |
| Reach 2 | 4.506 | .1 | .3 |
| Reach 2 | 4.450 | .1 | .3 |
| Reach 2 | 4.410 | .1 | .3 |
| Reach 2 | 4.372 | .1 | .3 |
| Reach 2 | 4.334 | .1 | .3 |
| Reach 2 | 4.296 | .1 | .3 |
| Reach 2 | 4.259 | .1 | .3 |
| Reach 2 | 4.221 | .1 | .3 |
| Reach 2 | 4.183 | .1 | .3 |
| Reach 2 | 4.145 | .1 | .3 |
| Reach 1 | 4.072 | .1 | .3 |
| Reach 1 | 4.034 | .1 | .3 |
| Reach 1 | 3.996 | .1 | .3 |
| Reach 1 | 3.958 | .1 | .3 |
| Reach 1 | 3.920 | .1 | .3 |
| Reach 1 | 3.883 | .1 | .3 |
| Reach 1 | 3.845 | .1 | .3 |
| Reach 1 | 3.807 | .1 | .3 |
| Reach 1 | 3.769 | .1 | .3 |
| Reach 1 | 3.731 | .1 | .3 |
| Reach 1 | 3.692 | .1 | .3 |
| Reach 1 | 3.653 | .1 | .3 |
| Reach 1 | 3.614 | .1 | .3 |
| Reach 1 | 3.576 | .1 | .3 |
| Reach 1 | 3.538 | .1 | .3 |
| Reach 1 | 3.500 | .1 | .3 |
| Reach 1 | 3.462 | .1 | .3 |
| Reach 1 | 3.425 | .1 | .3 |
| Reach 1 | 3.387 | .1 | .3 |
| Reach 1 | 3.349 | .1 | .3 |
| Reach 1 | 3.311 | .1 | .3 |
| Reach 1 | 3.273 | .1 | .3 |
| Reach 1 | 3.235 | .1 | .3 |
| Reach 1 | 3.197 | .1 | .3 |
| Reach 1 | 3.122 | .1 | .3 |
| Reach 1 | 3.084 | .1 | .3 |
| Reach 1 | 3.046 | .1 | .3 |
| Reach 1 | 2.972 | .1 | .3 |
| Reach 1 | 2.935 | .1 | .3 |
| Reach 1 | 2.897 | .1 | .3 |
| Reach 1 | 2.852 | .1 | .3 |
| Reach 1 | 2.814 | .1 | .3 |
| Reach 1 | 2.776 | .1 | .3 |
| Reach 1 | 2.738 | .1 | .3 |
| Reach 1 | 2.700 | .1 | .3 |
| Reach 1 | 2.662 | .1 | .3 |
| Reach 1 | 2.624 | .1 | .3 |
| Reach 1 | 2.587 | .1 | .3 |
| Reach 1 | 2.549 | .1 | .3 |
| Reach 1 | 2.511 | .1 | .3 |
| Reach 1 | 2.473 | .3 | .5 |

| | | | |
|---|---|---|---|
| Reach 1 | 2.445 | .3 | .5 |
| Reach 1 | 2.438 | Culvert | |
| Reach 1 | 2.432 | .3 | .5 |
| Reach 1 | 2.397 | .1 | .3 |
| Reach 1 | 2.359 | .1 | .3 |
| Reach 1 | 2.321 | .1 | .3 |
| Reach 1 | 2.283 | .1 | .3 |
| Reach 1 | 2.245 | .1 | .3 |
| Reach 1 | 2.208 | .1 | .3 |
| Reach 1 | 2.170 | .1 | .3 |
| Reach 1 | 2.132 | .1 | .3 |
| Reach 1 | 2.094 | .1 | .3 |
| Reach 1 | 2.056 | .1 | .3 |
| Reach 1 | 2.018 | .1 | .3 |
| Reach 1 | 1.980 | .1 | .3 |
| Reach 1 | 1.942 | .1 | .3 |
| Reach 1 | 1.905 | .1 | .3 |
| Reach 1 | 1.867 | .1 | .3 |
| Reach 1 | 1.829 | .1 | .3 |
| Reach 1 | 1.791 | .1 | .3 |
| Reach 1 | 1.753 | .1 | .3 |
| Reach 1 | 1.715 | .1 | .3 |
| Reach 1 | 1.677 | .1 | .3 |
| Reach 1 | 1.640 | .1 | .3 |
| Reach 1 | 1.602 | .1 | .3 |
| Reach 1 | 1.564 | .1 | .3 |
| Reach 1 | 1.526 | .1 | .3 |
| Reach 1 | 1.488 | .1 | .3 |
| Reach 1 | 1.450 | .1 | .3 |
| Reach 1 | 1.412 | .1 | .3 |
| Reach 1 | 1.374 | .3 | .5 |
| Reach 1 | 1.330 | .3 | .5 |
| Reach 1 | 1.323 | Culvert | |
| Reach 1 | 1.312 | .3 | .5 |
| Reach 1 | 1.223 | .1 | .3 |
| Reach 1 | 1.185 | .1 | .3 |
| Reach 1 | 1.147 | .1 | .3 |
| Reach 1 | 1.109 | .1 | .3 |
| Reach 1 | 1.072 | .1 | .3 |
| Reach 1 | 1.035 | .1 | .3 |
| Reach 1 | .997 | .1 | .3 |
| Reach 1 | .959 | .1 | .3 |
| Reach 1 | .921 | .1 | .3 |
| Reach 1 | .883 | .1 | .3 |
| Reach 1 | .845 | .1 | .3 |
| Reach 1 | .807 | .1 | .3 |
| Reach 1 | .770 | .1 | .3 |
| Reach 1 | .732 | .1 | .3 |
| Reach 1 | .695 | .1 | .3 |
| Reach 1 | .656 | .1 | .3 |
| Reach 1 | .618 | .1 | .3 |
| Reach 1 | .580 | .1 | .3 |
| Reach 1 | .542 | .1 | .3 |
| Reach 1 | .494 | .1 | .3 |
| Reach 1 | .418 | .1 | .3 |
| Reach 1 | .342 | .1 | .3 |
| Reach 1 | .266 | .1 | .3 |
| Reach 1 | .190 | .1 | .3 |

River: Tributary 1E1

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| Reach 1 | 1.927 | .1 | .3 |
| Reach 1 | 1.889 | .1 | .3 |
| Reach 1 | 1.851 | .1 | .3 |
| Reach 1 | 1.813 | .1 | .3 |
| Reach 1 | 1.775 | .1 | .3 |
| Reach 1 | 1.737 | .1 | .3 |
| Reach 1 | 1.699 | .1 | .3 |
| Reach 1 | 1.661 | .1 | .3 |
| Reach 1 | 1.624 | .1 | .3 |
| Reach 1 | 1.586 | .1 | .3 |
| Reach 1 | 1.548 | .1 | .3 |
| Reach 1 | 1.510 | .1 | .3 |
| Reach 1 | 1.472 | .1 | .3 |
| Reach 1 | 1.434 | .1 | .3 |
| Reach 1 | 1.396 | .1 | .3 |

| | | | |
|---|---|---|---|
| Reach 1 | 1.358 | .1 | .3 |
| Reach 1 | 1.321 | .1 | .3 |
| Reach 1 | 1.283 | .1 | .3 |
| Reach 1 | 1.245 | .1 | .3 |
| Reach 1 | 1.207 | .1 | .3 |
| Reach 1 | 1.169 | .1 | .3 |
| Reach 1 | 1.131 | .1 | .3 |
| Reach 1 | 1.093 | .1 | .3 |
| Reach 1 | 1.052 | .1 | .3 |
| Reach 1 | 1.008 | .1 | .3 |
| Reach 1 | 0.968 | .1 | .3 |
| Reach 1 | 0.929 | .1 | .3 |
| Reach 1 | 0.890 | .1 | .3 |
| Reach 1 | 0.852 | .1 | .3 |
| Reach 1 | 0.814 | .1 | .3 |
| Reach 1 | 0.777 | .1 | .3 |
| Reach 1 | 0.739 | .1 | .3 |
| Reach 1 | 0.701 | .1 | .3 |
| Reach 1 | 0.663 | .1 | .3 |
| Reach 1 | 0.625 | .1 | .3 |
| Reach 1 | 0.587 | .1 | .3 |
| Reach 1 | 0.549 | .1 | .3 |
| Reach 1 | 0.511 | .1 | .3 |
| Reach 1 | 0.474 | .1 | .3 |
| Reach 1 | 0.436 | .1 | .3 |
| Reach 1 | 0.398 | .1 | .3 |
| Reach 1 | 0.359 | .1 | .3 |
| Reach 1 | 0.319 | .1 | .3 |
| Reach 1 | 0.293 | .1 | .3 |
| Reach 1 | 0.254 | .1 | .3 |
| Reach 1 | 0.216 | .1 | .3 |
| Reach 1 | 0.178 | .1 | .3 |
| Reach 1 | 0.141 | .1 | .3 |
| Reach 1 | 0.102 | .1 | .3 |
| Reach 1 | 0.062 | .1 | .3 |

### E.5.5 HEC-RAS Report for Tributary 3E – All Reaches, Existing 100-Year, 6-Hour Event

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: Hassayampa Trib 3E Floodplain Deli
Project File : trib3E.prj
Run Date and Time: 5/19/2005 10:10:59 AM

Project in English units

Project Description:
Hassayampa Tributary #3E Floodplain Delineation

Prepared by PBS&J for the
Flood Control District of Maricopa County
Consultant Address: 7310 N. 16th
St., Suite 310, Phoenix, AZ 85281
Contact: Burke Lokey, P.E., CFM
602-943-1003
Contract No. FCD 2002C027.

Topographic Mapping Source: Flown
and Mapped by Kenney Aerial Mapping, Flight Dates: 03/27/2002 and
04/08/2002
2' Contour Interval, Datum: NAVD88.
Study Limits: Hassayampa
River Floodplain downstream, upstream limits are just north of abandoned RID
tail water canal.
Discharge information obtained from the Buckeye/Sun Valley
Area Drainage Master Study Area 2 Hydrology Report, dated November
2004.
Discharge: 758 cfs for all cross sections.

HEC-RAS Version
3.1.1
Final Model Run: October 2004

PLAN DATA

Plan Title: Hassayampa Trib 3E FP/FW
Plan File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib3E\trib3E.p02

Geometry Title: Geometry Data for Hassayampa Trib
Geometry File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib3E\trib3E.g02

Flow Title : Flow rate for Trib 3E @ 100-year 6-hour storm event
Flow File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib3E\trib3E.f01

Plan Summary Information:

| | | | | | |
|---|---|---|---|---|---|
| Number of: | Cross Sections = | 37 | Multiple Openings = | 0 |
| | Culverts = | 0 | Inline Structures = | 1 |
| | Bridges = | 0 | Lateral Structures = | 0 |

Computational Information

| | | |
|---|---|---|
| Water surface calculation tolerance | = | 0.01 |
| Critical depth calculation tolerance | = | 0.01 |
| Maximum number of iterations | = | 20 |
| Maximum difference tolerance | = | 0.3 |
| Flow tolerance factor | = | 0.001 |

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Tributary 3E Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.553 | Method 4 | 4 | .99 | |
| 1.515 | Method 4 | 4 | .99 | |
| 1.478 | Method 4 | 4 | .99 | |
| 1.440 | Method 4 | 4 | .99 | |
| 1.421 | Method 4 | 4 | .99 | |
| 1.402 | Method 4 | 4 | .99 | |
| 1.378 | Method 4 | 4 | .99 | |
| 1.326 | Method 4 | 4 | .99 | |
| 1.288 | Method 4 | 4 | .99 | |
| 1.250 | Method 4 | 4 | .99 | |
| 1.213 | Method 4 | 4 | .99 | |
| 1.175 | Method 4 | 4 | .99 | |
| 1.137 | Method 4 | 4 | .99 | |
| 1.099 | Method 4 | 4 | .99 | |
| 1.061 | Method 4 | 4 | .99 | |
| 1.023 | Method 4 | 4 | .99 | |
| 0.985 | Method 4 | 4 | .99 | |
| 0.948 | Method 4 | 4 | .99 | |
| 0.910 | Method 4 | 4 | .99 | |
| 0.872 | Method 4 | 4 | .99 | |
| 0.834 | Method 4 | 4 | .99 | |
| 0.796 | Method 4 | 4 | .99 | |
| 0.758 | Method 4 | 4 | .99 | |
| 0.720 | Method 4 | 4 | .99 | |
| 0.682 | Method 4 | 4 | .99 | |
| 0.645 | Method 4 | 4 | .99 | |
| 0.607 | Method 4 | 4 | .99 | |
| 0.569 | Method 4 | 4 | .99 | |
| 0.531 | Method 4 | 4 | .99 | |
| 0.493 | Method 4 | 4 | .99 | |
| 0.455 | Method 4 | 4 | .99 | |
| 0.418 | Method 4 | 4 | .99 | |
| 0.379 | Method 4 | 4 | .99 | |
| 0.299 | Method 4 | 4 | .99 | |
| 0.229 | Method 4 | 4 | .99 | |
| 0.167 | Method 4 | 4 | .99 | |
| 0.089 | Method 4 | 4 | .99 | |

River = Tributary 3E Reach = Reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.553 | Method 1 | 1 | 0 | |
| 1.515 | Method 1 | 1 | 383.75 | 464.42 |
| 1.478 | Method 1 | 1 | 330.05 | 518.75 |
| 1.440 | Method 1 | 1 | 373.47 | 580.56 |
| 1.421 | Method 1 | 1 | 0 | |
| 1.402 | Method 1 | 1 | 0 | |
| 1.378 | Method 1 | 1 | 0 | |
| 1.326 | Method 1 | 1 | 366.91 | 501.84 |
| 1.288 | Method 1 | 1 | 297 | 373.49 |
| 1.250 | Method 1 | 1 | 369 | 436.64 |
| 1.213 | Method 1 | 1 | 345 | 424.37 |
| 1.175 | Method 1 | 1 | 258.86 | 365 |
| 1.137 | Method 1 | 1 | 300.66 | 367.95 |
| 1.099 | Method 1 | 1 | 296.79 | 353 |
| 1.061 | Method 1 | 1 | 453.02 | 523.48 |
| 1.023 | Method 1 | 1 | 289.26 | 430.15 |
| 0.985 | Method 1 | 1 | 239.12 | 328.98 |
| 0.948 | Method 1 | 1 | 228.72 | 316.3 |
| 0.910 | Method 1 | 1 | 123.58 | 278.68 |
| 0.872 | Method 1 | 1 | 151 | 241.04 |
| 0.834 | Method 1 | 1 | 272.76 | 333.36 |
| 0.796 | Method 1 | 1 | 271.66 | 403 |
| 0.758 | Method 1 | 1 | 319.75 | 393.05 |
| 0.720 | Method 1 | 1 | 580 | 712.8 |
| 0.682 | Method 1 | 1 | 588.88 | 648.99 |
| 0.645 | Method 1 | 1 | 395.08 | 476.27 |

| | | | | |
|---|---|---|---|---|
| 0.607 | Method 1 | 1 | 423.6 | 502.26 |
| 0.569 | Method 1 | 1 | 357.77 | 474.08 |
| 0.531 | Method 1 | 1 | 387.75 | 483.74 |
| 0.493 | Method 1 | 1 | 270 | 370.26 |
| 0.455 | Method 1 | 1 | 451.04 | 551.88 |
| 0.418 | Method 1 | 1 | 448.46 | 621.47 |
| 0.379 | Method 1 | 1 | 767.16 | 966.94 |
| 0.299 | Method 1 | 1 | 242 | 667.34 |
| 0.229 | Method 1 | 1 | 366.35 | 754.21 |
| 0.167 | Method 1 | 1 | 386.3 | 966.97 |
| 0.089 | Method 1 | 1 | 337.58 | 1028.08 |

FLOW DATA

Flow Title: Flow rate for Trib 3E @ 100-year 6-hour storm event
Flow File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib3E\trib3E.f01

Flow Data (cfs)

| River | Reach | RS | 100-Year | Method 4 | Method 1 |
|---|---|---|---|---|---|
| Tributary 3E | Reach 1 | 1.553 | 758 | 758 | 758 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| Tributary 3E | Reach 1 | 100-Year | | Normal S = 0.007 |
| Tributary 3E | Reach 1 | Method 4 | | Normal S = 0.007 |
| Tributary 3E | Reach 1 | Method 1 | | Normal S = 0.007 |

GEOMETRY DATA

Geometry Title: Geometry Data for Hassayampa Trib
Geometry File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib3E\trib3E.g02

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.553

INPUT
Description: Thalweg Sta. 346.61 - Discharge from A2 - 100y6h.out HEC-1 Model -
Sta. C1 Routed to Sta. 3R - 758 CFS
Station Elevation Data num= 133

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 991.77 | 1.26 | 991.82 | 3.07 | 991.87 | 13.07 | 992.19 | 13.18 | 992.2 |
| 13.75 | 992.21 | 23.28 | 992.5 | 24.89 | 992.54 | 33.38 | 992.79 | 36.7 | 992.84 |
| 43.49 | 993.01 | 48.56 | 993.12 | 53.59 | 993.14 | 57.39 | 993.18 | 72.13 | 993.19 |
| 73.8 | 993.2 | 83.65 | 993.14 | 83.94 | 993.14 | 94.01 | 992.97 | 95.76 | 992.91 |
| 104.11 | 992.7 | 107.57 | 992.55 | 114.22 | 992.35 | 119.38 | 992.09 | 124.32 | 991.88 |
| 131.19 | 991.48 | 134.42 | 991.3 | 143 | 990.72 | 144.53 | 990.61 | 153.55 | 990 |
| 154.63 | 989.94 | 154.81 | 989.94 | 164.74 | 989.62 | 166.62 | 989.61 | 174.84 | 989.51 |
| 190.25 | 989.38 | 195.05 | 989.38 | 202.06 | 989.33 | 205.15 | 989.34 | 213.87 | 989.23 |
| 215.26 | 989.23 | 223.45 | 989.13 | 225.36 | 989.1 | 225.68 | 989.09 | 235.46 | 988.88 |
| 237.49 | 988.82 | 245.57 | 988.62 | 249.31 | 988.48 | 255.67 | 988.28 | 261.12 | 987.98 |
| 265.78 | 987.76 | 272.93 | 987.26 | 275.88 | 987.07 | 278.08 | 986.88 | 285.98 | 986.18 |
| 286.91 | 986.09 | 296.09 | 985.12 | 296.55 | 985.05 | 303.48 | 984.12 | 304.17 | 984.02 |
| 306.19 | 983.75 | 316.29 | 981.65 | 320.17 | 980.7 | 326.4 | 979.13 | 331.99 | 977.69 |
| 336.5 | 976.44 | 343.8 | 976 | 346.61 | 975.75 | 355.61 | 976.14 | 356.71 | 976.19 |
| 363.24 | 976.85 | 366.81 | 977.2 | 367.42 | 977.27 | 376.92 | 978.95 | 379.23 | 979.35 |
| 387.02 | 981.26 | 391.04 | 981.96 | 395.7 | 982.69 | 397.13 | 982.92 | 398.45 | 983.16 |
| 402.86 | 983.94 | 407.23 | 984.42 | 414.67 | 985.33 | 417.33 | 985.59 | 426.48 | 986.35 |
| 427.44 | 986.42 | 428.16 | 986.46 | 433.14 | 986.81 | 437.54 | 987.1 | 438.29 | 987.16 |
| 447.65 | 987.77 | 450.1 | 987.97 | 457.75 | 988.46 | 461.91 | 988.76 | 467.85 | 989.07 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 473.72 | 989.41 | 485.54 | 989.89 | 488.06 | 989.98 | 497.35 | 990.29 | 498.17 | 990.32 |
| 503.03 | 990.47 | 508.27 | 990.62 | 509.16 | 990.64 | 518.37 | 990.79 | 520.97 | 990.82 |
| 528.48 | 990.83 | 532.78 | 990.89 | 538.58 | 990.93 | 548.69 | 991.26 | 556.41 | 991.61 |
| 558.79 | 991.74 | 568.22 | 992.22 | 568.89 | 992.26 | 572.92 | 992.47 | 579 | 992.77 |
| 580.03 | 992.8 | 589.1 | 993.19 | 591.84 | 993.29 | 603.65 | 993.75 | 609.31 | 993.96 |
| 615.46 | 994.21 | 619.41 | 994.34 | 627.26 | 994.54 | 629.52 | 994.58 | 639.07 | 994.66 |
| 639.62 | 994.67 | 649.73 | 994.68 | 650.89 | 994.67 | 659.83 | 994.65 | 669.93 | 994.5 |
| 674.51 | 994.39 | 680.04 | 994.23 | 688.17 | 993.96 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 304.17 | .045 | 395.7 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 303.48 | 402.86 | 198.73 | 199.82 | 201.02 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 980.55 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 980.26 | Reach Len. (ft) | 198.73 | 199.82 | 201.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 175.07 | |
| E.G. Slope (ft/ft) | 0.004300 | Area (sq ft) | | 175.07 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 61.04 | Top Width (ft) | | 61.04 | |
| Vel Total (ft/s) | 4.33 | Avg. Vel. (ft/s) | | 4.33 | |
| Max Chl Dpth (ft) | 4.51 | Hydr. Depth (ft) | | 2.87 | |
| Conv. Total (cfs) | 11558.9 | Conv. (cfs) | | 11558.9 | |
| Length Wtd. (ft) | 199.82 | Wetted Per. (ft) | | 61.92 | |
| Min Ch El (ft) | 975.75 | Shear (lb/sq ft) | | 0.76 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.29 | |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | 18.86 | 38.19 | 7.90 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 25.32 | 26.87 | 10.58 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 980.55 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 980.26 | Reach Len. (ft) | 198.73 | 199.82 | 201.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 175.07 | |
| E.G. Slope (ft/ft) | 0.004300 | Area (sq ft) | | 175.07 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 61.04 | Top Width (ft) | | 61.04 | |
| Vel Total (ft/s) | 4.33 | Avg. Vel. (ft/s) | | 4.33 | |
| Max Chl Dpth (ft) | 4.51 | Hydr. Depth (ft) | | 2.87 | |
| Conv. Total (cfs) | 11558.9 | Conv. (cfs) | | 11558.9 | |
| Length Wtd. (ft) | 199.82 | Wetted Per. (ft) | | 61.92 | |
| Min Ch El (ft) | 975.75 | Shear (lb/sq ft) | | 0.76 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.29 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 1.73 | 46.01 | 2.29 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.86 | 26.97 | 0.63 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 980.55 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 980.26 | Reach Len. (ft) | 198.73 | 199.82 | 201.02 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 175.07 | |
| E.G. Slope (ft/ft) | 0.004300 | Area (sq ft) | | 175.07 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 61.04 | Top Width (ft) | | 61.04 | |
| Vel Total (ft/s) | 4.33 | Avg. Vel. (ft/s) | | 4.33 | |
| Max Chl Dpth (ft) | 4.51 | Hydr. Depth (ft) | | 2.87 | |
| Conv. Total (cfs) | 11558.9 | Conv. (cfs) | | 11558.9 | |
| Length Wtd. (ft) | 199.82 | Wetted Per. (ft) | | 61.92 | |
| Min Ch El (ft) | 975.75 | Shear (lb/sq ft) | | 0.76 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.29 | |
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | 4.72 | 44.67 | 3.52 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 3.37 | 26.91 | 1.46 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.515

INPUT
Description: Thalweg Sta. 414.07
Station Elevation Data num= 117

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 992.13 | 1.21 | 992.1 | 1.73 | 992.08 | 11.28 | 991.78 | 13.15 | 991.71 |
| 21.35 | 991.38 | 24.57 | 991.24 | 31.42 | 990.93 | 35.99 | 990.68 | 41.49 | 990.4 |
| 47.42 | 990.06 | 51.56 | 989.84 | 70.26 | 988.68 | 71.7 | 988.57 | 81.67 | 987.98 |
| 81.77 | 987.98 | 82.42 | 988 | 90.84 | 988.28 | 91.84 | 988.3 | 93.11 | 988.37 |
| 99.38 | 988.74 | 101.91 | 988.89 | 108.84 | 988.86 | 111.97 | 988.87 | 115.94 | 988.68 |
| 122.05 | 988.42 | 127.36 | 987.92 | 132.11 | 987.54 | 138.78 | 986.47 | 142.18 | 985.96 |
| 150.21 | 984.37 | 152.25 | 983.97 | 153.87 | 983.61 | 162.32 | 981.9 | 162.88 | 981.78 |
| 172.39 | 980 | 173.05 | 980.02 | 182.46 | 978.95 | 184.47 | 978.97 | 195.89 | 978.8 |
| 202.6 | 978.73 | 207.32 | 978.65 | 212.67 | 978.59 | 222.74 | 978.46 | 230.15 | 978.3 |
| 232.81 | 978.28 | 241.57 | 978.01 | 242.88 | 977.99 | 252.62 | 977.54 | 252.95 | 977.52 |
| 263.02 | 977.45 | 264.42 | 977.48 | 273.09 | 977.54 | 275.84 | 977.63 | 283.16 | 977.63 |
| 288.93 | 977.91 | 293.23 | 978.15 | 297.93 | 978.55 | 303.3 | 978.91 | 306.95 | 979.22 |
| 313.37 | 979.66 | 315.95 | 979.88 | 323.44 | 980.28 | 324.95 | 980.38 | 333.95 | 980.79 |
| 337.5 | 980.96 | 343.58 | 981.24 | 344.37 | 981.27 | 353.65 | 981.66 | 355.78 | 981.72 |
| 363.72 | 981.92 | 366.88 | 981.96 | 367.21 | 981.96 | 373.79 | 982.01 | 378.63 | 981.9 |
| 383.75 | 981.74 | 383.86 | 981.74 | 390.05 | 980.52 | 393.93 | 979.96 | 401.47 | 978.16 |
| 404 | 977.62 | 412.89 | 975.76 | 414.07 | 975.53 | 422.82 | 975.29 | 424.14 | 975.25 |
| 424.32 | 975.26 | 434.21 | 975.63 | 435.74 | 975.79 | 444.28 | 976.81 | 454.35 | 979.05 |
| 458.58 | 980.11 | 464.42 | 981.52 | 472.5 | 983.07 | 473.13 | 983.19 | 474.49 | 983.45 |
| 481.43 | 984.47 | 484.56 | 984.92 | 492.84 | 985.89 | 494.63 | 986.09 | 504.26 | 987.05 |
| 504.7 | 987.1 | 514.77 | 988.04 | 524.84 | 988.93 | 527.11 | 989.12 | 534.91 | 989.76 |
| 538.53 | 990.05 | 549.95 | 990.93 | 555.05 | 991.29 | 561.37 | 991.7 | 565.11 | 991.92 |
| 575.18 | 992.18 | 585.25 | 992.17 | 595.32 | 992.12 | 595.64 | 992.12 | 607.06 | 992.06 |
| 615.46 | 992 | 625 | 991.9 | | | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 99.38 | .045 | 337.5 | .032 | 366.88 | .042 | 472.5 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 383.75 | 464.42 | 180.71 | 199.67 | 233.27 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 373.79 | 982.01 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.38 | Element | | | |
| Vel Head (ft) | 0.51 | Wt. n-Val. | | 0.042 | |
| W.S. Elev (ft) | 978.87 | Reach Len. (ft) | 180.71 | 199.67 | 233.27 |
| Crit W.S. (ft) | 978.15 | Flow Area (sq ft) | | 132.47 | |
| E.G. Slope (ft/ft) | 0.008237 | Area (sq ft) | 83.64 | 132.47 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 166.36 | Top Width (ft) | 111.34 | 55.03 | |
| Vel Total (ft/s) | 5.72 | Avg. Vel. (ft/s) | | 5.72 | |
| Max Chl Dpth (ft) | 3.62 | Hydr. Depth (ft) | | 2.41 | |
| Conv. Total (cfs) | 8351.9 | Conv. (cfs) | | 8351.9 | |
| Length Wtd. (ft) | 199.67 | Wetted Per. (ft) | | 55.69 | |
| Min Ch El (ft) | 975.25 | Shear (lb/sq ft) | | 1.22 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.00 | |
| Frctn Loss (ft) | 0.47 | Cum Volume (acre-ft) | 18.67 | 37.49 | 7.90 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 25.06 | 26.60 | 10.58 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.38 | Element | | | |
| Vel Head (ft) | 0.50 | Wt. n-Val. | | 0.042 | |
| W.S. Elev (ft) | 978.88 | Reach Len. (ft) | 180.71 | 199.67 | 233.27 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | 978.15 | Flow Area (sq ft) | | 133.09 | |
| E.G. Slope (ft/ft) | 0.008130 | Area (sq ft) | | 133.09 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 55.12 | Top Width (ft) | | 55.12 | |
| Vel Total (ft/s) | 5.70 | Avg. Vel. (ft/s) | | 5.70 | |
| Max Chl Dpth (ft) | 3.63 | Hydr. Depth (ft) | | 2.41 | |
| Conv. Total (cfs) | 8406.9 | Conv. (cfs) | | 8406.9 | |
| Length Wtd. (ft) | 199.67 | Wetted Per. (ft) | | 55.79 | |
| Min Ch El (ft) | 975.25 | Shear (lb/sq ft) | | 1.21 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 6.90 | |
| Frctn Loss (ft) | 0.46 | Cum Volume (acre-ft) | 1.73 | 45.31 | 2.29 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 0.86 | 26.71 | 0.63 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.38 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.51 | Wt. n-Val. | | 0.042 | |
| W.S. Elev (ft) | 978.87 | Reach Len. (ft) | 180.71 | 199.67 | 233.27 |
| Crit W.S. (ft) | 978.16 | Flow Area (sq ft) | | 132.47 | |
| E.G. Slope (ft/ft) | 0.008237 | Area (sq ft) | | 132.47 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 55.03 | Top Width (ft) | | 55.03 | |
| Vel Total (ft/s) | 5.72 | Avg. Vel. (ft/s) | | 5.72 | |
| Max Chl Dpth (ft) | 3.62 | Hydr. Depth (ft) | | 2.41 | |
| Conv. Total (cfs) | 8351.9 | Conv. (cfs) | | 8351.9 | |
| Length Wtd. (ft) | 199.67 | Wetted Per. (ft) | | 55.69 | |
| Min Ch El (ft) | 975.25 | Shear (lb/sq ft) | | 1.22 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.00 | |
| Frctn Loss (ft) | 0.47 | Cum Volume (acre-ft) | 4.72 | 43.96 | 3.52 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 3.37 | 26.64 | 1.46 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.478

INPUT
Description: Thalweg Sta. 418.11
Station Elevation Data num= 152

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 993.98 | 4.84 | 993.91 | 11.56 | 993.79 | 15.17 | 993.7 | 35.83 | 993.32 |
| 50.09 | 993.09 | 56.49 | 993.01 | 58.29 | 992.99 | 65.23 | 992.98 | 66.5 | 992.97 |
| 66.83 | 992.97 | 77.16 | 993.13 | 82.9 | 993.29 | 91.1 | 993.43 | 97.82 | 993.39 |
| 99.3 | 993.36 | 105 | 993.16 | 108.15 | 993.06 | 132.11 | 992.11 | 139.15 | 991.82 |
| 140.31 | 991.77 | 144.78 | 991.54 | 148.51 | 991.37 | 149.48 | 991.33 | 156.71 | 990.88 |
| 159.81 | 990.74 | 164.92 | 990.5 | 170.15 | 990.33 | 173.12 | 990.21 | 180.48 | 990.1 |
| 181.32 | 990.09 | 184.55 | 990.13 | 190.81 | 990.15 | 201.14 | 990.24 | 206.96 | 990.26 |
| 211.47 | 990.26 | 220.92 | 990.21 | 221.81 | 990.2 | 224.33 | 990.18 | 230.53 | 990.12 |
| 232.14 | 990.07 | 238.73 | 989.91 | 242.47 | 989.76 | 246.93 | 989.59 | 255.13 | 989.21 |
| 263.13 | 988.8 | 263.33 | 988.79 | 271.53 | 988.26 | 273.46 | 988.09 | 279.74 | 987.57 |
| 283.8 | 987.17 | 287.94 | 986.84 | 294.13 | 986.28 | 296.14 | 986.18 | 303.88 | 985.61 |
| 304.46 | 985.57 | 305.31 | 985.5 | 312.54 | 984.93 | 314.79 | 984.8 | 325.12 | 983.76 |
| 328.95 | 983.33 | 330.05 | 983.13 | 335.46 | 982.15 | 337.15 | 981.86 | 343.66 | 980.38 |
| 345.79 | 979.96 | 346.53 | 979.78 | 356.12 | 977.32 | 361.75 | 976.63 | 366.45 | 975.52 |
| 369.95 | 975.22 | 376.78 | 974.67 | 378.16 | 974.66 | 383.43 | 974.55 | 386.35 | 974.5 |
| 387.12 | 974.47 | 394.55 | 974.63 | 397.45 | 974.67 | 407.78 | 974.88 | 410.96 | 974.85 |
| 418.11 | 974.93 | 419.16 | 974.94 | 423.2 | 975.03 | 427.37 | 975.11 | 428.44 | 975.15 |
| 435.56 | 975.63 | 438.77 | 975.83 | 443.76 | 976.29 | 449.11 | 976.68 | 451.97 | 976.9 |
| 459.44 | 977.35 | 460.17 | 977.39 | 462.98 | 977.52 | 469.77 | 977.82 | 476.57 | 978.18 |
| 480.1 | 978.33 | 484.77 | 978.66 | 490.43 | 978.96 | 492.98 | 979.17 | 500.77 | 979.8 |
| 509.38 | 980.62 | 511.1 | 980.79 | 517.58 | 981.37 | 518.75 | 981.47 | 521.43 | 981.71 |
| 525.78 | 981.99 | 531.76 | 982.4 | 533.98 | 982.51 | 542.09 | 982.86 | 542.19 | 982.86 |
| 542.54 | 982.87 | 550.39 | 983.01 | 552.43 | 982.99 | 558.58 | 982.83 | 562.76 | 982.18 |
| 566.79 | 981.36 | 573.09 | 980.14 | 574.99 | 979.69 | 582.3 | 978.1 | 583.19 | 977.9 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 583.42 | 977.86 | 591.4 | 975.92 | 593.75 | 975.88 | 599.59 | 976.36 | 604.08 | 976.86 |
| 607.79 | 977.36 | 614.42 | 978.51 | 616 | 978.78 | 622.08 | 979.86 | 624.2 | 980.21 |
| 624.75 | 980.29 | 632.4 | 981.5 | 635.08 | 981.88 | 640.6 | 982.64 | 645.41 | 983.22 |
| 648.8 | 983.6 | 650.2 | 983.75 | 655.74 | 984.32 | 657 | 984.43 | 661.86 | 984.89 |
| 665.21 | 985.17 | 666.08 | 985.25 | 673.41 | 985.79 | 676.41 | 986.05 | 681.61 | 986.37 |
| 686.74 | 986.76 | 695.47 | 987.29 | 697.07 | 987.37 | 698.01 | 987.42 | 701.64 | 987.62 |
| 706.21 | 987.84 | 706.74 | 987.87 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 305.31 | .045 | 650.2 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 330.05 | 550.39 | 244.61 | 199.74 | 124.23 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 550.39 | 706.74 | 983.01 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.78 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 978.71 | Reach Len. (ft) | 244.61 | 199.74 | 124.23 |
| Crit W.S. (ft) | 976.45 | Flow Area (sq ft) | | 361.17 | |
| E.G. Slope (ft/ft) | 0.001093 | Area (sq ft) | | 361.17 | 58.44 |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 171.00 | Top Width (ft) | | 134.94 | 36.06 |
| Vel Total (ft/s) | 2.10 | Avg. Vel. (ft/s) | | 2.10 | |
| Max Chl Dpth (ft) | 4.24 | Hydr. Depth (ft) | | 2.68 | |
| Conv. Total (cfs) | 22932.8 | Conv. (cfs) | | 22932.8 | |
| Length Wtd. (ft) | 199.74 | Wetted Per. (ft) | | 135.45 | |
| Min Ch El (ft) | 974.47 | Shear (lb/sq ft) | | 0.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.38 | |
| Frctn Loss (ft) | 0.04 | Cum Volume (acre-ft) | 18.50 | 36.35 | 7.74 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 24.83 | 26.17 | 10.49 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.79 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 978.72 | Reach Len. (ft) | 244.61 | 199.74 | 124.23 |
| Crit W.S. (ft) | 976.45 | Flow Area (sq ft) | | 363.27 | |
| E.G. Slope (ft/ft) | 0.001075 | Area (sq ft) | | 363.27 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 135.29 | Top Width (ft) | | 135.29 | |
| Vel Total (ft/s) | 2.09 | Avg. Vel. (ft/s) | | 2.09 | |
| Max Chl Dpth (ft) | 4.25 | Hydr. Depth (ft) | | 2.69 | |
| Conv. Total (cfs) | 23114.5 | Conv. (cfs) | | 23114.5 | |
| Length Wtd. (ft) | 199.74 | Wetted Per. (ft) | | 135.80 | |
| Min Ch El (ft) | 974.47 | Shear (lb/sq ft) | | 0.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.37 | |
| Frctn Loss (ft) | 0.04 | Cum Volume (acre-ft) | 1.73 | 44.17 | 2.29 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.86 | 26.27 | 0.63 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.78 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 978.71 | Reach Len. (ft) | 244.61 | 199.74 | 124.23 |
| Crit W.S. (ft) | 976.44 | Flow Area (sq ft) | | 361.17 | |
| E.G. Slope (ft/ft) | 0.001093 | Area (sq ft) | | 361.17 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 134.94 | Top Width (ft) | | 134.94 | |
| Vel Total (ft/s) | 2.10 | Avg. Vel. (ft/s) | | 2.10 | |

| | | | | | |
|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 4.24 | Hydr. Depth (ft) | | 2.68 | |
| Conv. Total (cfs) | 22932.8 | Conv. (cfs) | | 22932.8 | |
| Length Wtd. (ft) | 199.74 | Wetted Per. (ft) | | 135.45 | |
| Min Ch El (ft) | 974.47 | Shear (lb/sq ft) | | 0.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.38 | |
| Frctn Loss (ft) | 0.04 | Cum Volume (acre-ft) | 4.72 | 42.83 | 3.52 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 3.37 | 26.20 | 1.46 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.440

INPUT
Description: Thalweg Sta. 437.64
Station Elevation Data num= 135

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 990.33 | .18 | 990.33 | 5.38 | 990.07 | 8.98 | 990 | 16.19 | 989.83 |
| 26.57 | 989.81 | 27.29 | 989.81 | 37.8 | 989.7 | 45.59 | 989.52 | 48.61 | 989.44 |
| 52.95 | 989.29 | 63.9 | 988.86 | 70.22 | 988.6 | 79.33 | 988.1 | 80.53 | 988.02 |
| 81.03 | 987.99 | 91.83 | 987.07 | 100.51 | 986.38 | 102.64 | 986.19 | 105.71 | 986.02 |
| 113.45 | 985.66 | 118.82 | 985.62 | 124.25 | 985.56 | 132.09 | 985.59 | 135.06 | 985.58 |
| 137.12 | 985.54 | 145.87 | 985.4 | 155.42 | 984.93 | 156.67 | 984.88 | 158.48 | 984.75 |
| 167.48 | 984.14 | 172.53 | 983.9 | 178.28 | 983.65 | 180.2 | 983.68 | 184.86 | 983.77 |
| 189.09 | 983.71 | 192.03 | 983.68 | 199.9 | 983.75 | 203.19 | 983.61 | 210.7 | 983.47 |
| 211.23 | 983.45 | 221.51 | 983.02 | 228.64 | 982.69 | 232.32 | 982.48 | 237.61 | 982.21 |
| 243.12 | 981.91 | 246.95 | 981.74 | 253.93 | 981.35 | 263.99 | 980.91 | 264.52 | 980.89 |
| 264.74 | 980.88 | 265.26 | 980.84 | 275.54 | 980.16 | 279.85 | 979.72 | 286.35 | 979.21 |
| 287.52 | 979.09 | 290.37 | 978.83 | 297.16 | 978.26 | 301.86 | 977.97 | 307.96 | 977.61 |
| 308.8 | 977.58 | 316.76 | 977.27 | 318.77 | 977.23 | 320.16 | 977.15 | 329.58 | 976.71 |
| 338.47 | 976.45 | 340.38 | 976.35 | 343.14 | 976.31 | 356.78 | 978.02 | 362 | 978.71 |
| 369.52 | 979.3 | 371.85 | 979.5 | 372.8 | 979.45 | 373.47 | 979.27 | 375.08 | 978.84 |
| 383.61 | 977.84 | 393.39 | 974.87 | 394.42 | 974.53 | 405.22 | 972.99 | 411.7 | 972.84 |
| 416.03 | 972.69 | 422.27 | 972.66 | 426.84 | 972.65 | 437.64 | 972.65 | 448.3 | 972.73 |
| 448.66 | 972.73 | 466.6 | 972.94 | 470.06 | 972.97 | 471.51 | 972.98 | 484.91 | 973.09 |
| 491.68 | 973.13 | 501.42 | 973.16 | 502.48 | 973.16 | 503.21 | 973.17 | 513.29 | 973.38 |
| 521.52 | 973.67 | 527.8 | 973.92 | 534.9 | 974.16 | 540.51 | 974.74 | 545.71 | 974.85 |
| 554.18 | 975.93 | 556.51 | 976.21 | 558.13 | 976.43 | 567.32 | 977.92 | 576.44 | 978.83 |
| 578.13 | 978.96 | 580.56 | 979.07 | 588.93 | 979.48 | 594.73 | 979.72 | 599.74 | 979.88 |
| 606.95 | 980.19 | 610.55 | 980.32 | 613.04 | 980.44 | 621.35 | 980.79 | 624.15 | 980.94 |
| 631.35 | 981.32 | 632.16 | 981.36 | 633.32 | 981.42 | 642.96 | 982.04 | 649.65 | 982.57 |
| 653.77 | 982.87 | 659.7 | 983.27 | 664.58 | 983.62 | 667.96 | 983.85 | 675.38 | 984.32 |
| 686.08 | 985.08 | 686.19 | 985.09 | 686.27 | 985.1 | 697 | 985.95 | 704.57 | 986.52 |
| 707.8 | 986.77 | 712.46 | 987.06 | 718.61 | 987.43 | 722.88 | 987.64 | 726.6 | 987.84 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 308.8 | .045 | 624.15 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 373.47 | 580.56 | 103.49 | 99.98 | 105.98 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 371.85 | 979.5 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.72 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 978.71 | Reach Len. (ft) | 103.49 | 99.98 | 105.98 |
| Crit W.S. (ft) | 974.05 | Flow Area (sq ft) | | 916.39 | |
| E.G. Slope (ft/ft) | 0.000082 | Area (sq ft) | 95.14 | 916.39 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 269.12 | Top Width (ft) | 70.13 | 198.98 | |
| Vel Total (ft/s) | 0.83 | Avg. Vel. (ft/s) | | 0.83 | |
| Max Chl Dpth (ft) | 6.06 | Hydr. Depth (ft) | | 4.61 | |
| Conv. Total (cfs) | 83489.5 | Conv. (cfs) | | 83489.5 | |
| Length Wtd. (ft) | 100.35 | Wetted Per. (ft) | | 199.95 | |
| Min Ch El (ft) | 972.65 | Shear (lb/sq ft) | | 0.02 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.02 | |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 18.23 | 33.43 | 7.66 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 24.64 | 25.40 | 10.43 |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.73 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 978.72 | Reach Len. (ft) | 103.49 | 99.98 | 105.98 |
| Crit W.S. (ft) | 974.05 | Flow Area (sq ft) | | 919.47 | |
| E.G. Slope (ft/ft) | 0.000082 | Area (sq ft) | | 919.47 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 199.27 | Top Width (ft) | | 199.27 | |
| Vel Total (ft/s) | 0.82 | Avg. Vel. (ft/s) | | 0.82 | |
| Max Chl Dpth (ft) | 6.07 | Hydr. Depth (ft) | | 4.61 | |
| Conv. Total (cfs) | 83876.3 | Conv. (cfs) | | 83876.3 | |
| Length Wtd. (ft) | 99.98 | Wetted Per. (ft) | | 200.24 | |
| Min Ch El (ft) | 972.65 | Shear (lb/sq ft) | | 0.02 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.02 | |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.73 | 41.23 | 2.29 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.86 | 25.50 | 0.63 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.72 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 978.71 | Reach Len. (ft) | 103.49 | 99.98 | 105.98 |
| Crit W.S. (ft) | 974.06 | Flow Area (sq ft) | | 916.39 | |
| E.G. Slope (ft/ft) | 0.000082 | Area (sq ft) | | 916.39 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 198.98 | Top Width (ft) | | 198.98 | |
| Vel Total (ft/s) | 0.83 | Avg. Vel. (ft/s) | | 0.83 | |
| Max Chl Dpth (ft) | 6.06 | Hydr. Depth (ft) | | 4.61 | |
| Conv. Total (cfs) | 83489.5 | Conv. (cfs) | | 83489.5 | |
| Length Wtd. (ft) | 100.35 | Wetted Per. (ft) | | 199.95 | |
| Min Ch El (ft) | 972.65 | Shear (lb/sq ft) | | 0.02 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.02 | |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 4.72 | 39.90 | 3.52 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.37 | 25.44 | 1.46 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
water surface was used.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.421

INPUT
Description: Thalweg Sta. 216.68
Station Elevation Data num= 83

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 990.08 | 6.48 | 989.79 | 6.9 | 989.77 | 7.38 | 989.75 | 14.58 | 989.4 |
| 17.94 | 989.3 | 22.1 | 989.1 | 28.98 | 988.88 | 29.62 | 988.84 | 30.97 | 988.79 |
| 40.03 | 988.35 | 47.98 | 987.92 | 51.07 | 987.74 | 54.56 | 987.51 | 62.11 | 986.96 |
| 68.74 | 986.37 | 73.15 | 985.97 | 78.15 | 985.42 | 84.19 | 984.72 | 91.89 | 983.69 |
| 95.23 | 983.24 | 101.74 | 982.26 | 104.83 | 981.78 | 106.27 | 981.46 | 112.35 | 979.9 |
| 117.31 | 978.38 | 125.33 | 975.96 | 128.35 | 975 | 131.01 | 974.62 | 139.39 | 972.76 |
| 148.92 | 972.46 | 150.44 | 972.45 | 151.43 | 972.56 | 151.77 | 972.6 | 161.48 | 973.68 |
| 172.52 | 973.21 | 183.56 | 971.93 | 193.27 | 971.45 | 194.6 | 971.38 | 196.1 | 971.34 |
| 202.6 | 971.27 | 205.64 | 971.25 | 214.03 | 971.23 | 216.68 | 971.21 | 227.72 | 971.31 |
| 238.76 | 971.55 | 243.28 | 971.67 | 255.55 | 971.97 | 260.84 | 972.11 | 266.87 | 972.32 |
| 271.89 | 972.48 | 276.29 | 972.93 | 282.93 | 973.52 | 292.85 | 975.61 | 293.97 | 975.87 |
| 297.05 | 976.67 | 300.04 | 977.44 | 305.01 | 978.71 | 314.05 | 980.64 | 316.05 | 981.04 |
| 327.09 | 981.92 | 327.23 | 981.93 | 337.65 | 982.4 | 338.14 | 982.41 | 338.56 | 982.43 |
| 349.18 | 982.85 | 359.32 | 983.28 | 360.22 | 983.31 | 361.23 | 983.36 | 380.08 | 984.1 |
| 384.83 | 984.27 | 404.38 | 984.92 | 408.42 | 985.08 | 413.19 | 985.28 | 415.42 | 985.4 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 420.71 | 985.67 | 426.46 | 985.99 | 437.5 | 986.55 | 448.54 | 986.99 | 455.6 | 987.25 |
| 459.59 | 987.38 | 463.1 | 987.53 | 468.81 | 987.76 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 91.89 | .045 | 327.23 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 161.48 | 282.93 | 83.27 | 99.67 | 127.41 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.71 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 978.70 | Reach Len. (ft) | 83.27 | 99.67 | 127.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 204.34 | 815.43 | 59.90 |
| E.G. Slope (ft/ft) | 0.000041 | Area (sq ft) | 204.34 | 815.43 | 59.90 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 117.25 | 616.40 | 24.35 |
| Top Width (ft) | 188.72 | Top Width (ft) | 45.22 | 121.45 | 22.05 |
| Vel Total (ft/s) | 0.70 | Avg. Vel. (ft/s) | 0.57 | 0.76 | 0.41 |
| Max Chl Dpth (ft) | 7.49 | Hydr. Depth (ft) | 4.52 | 6.71 | 2.72 |
| Conv. Total (cfs) | 117736.9 | Conv. (cfs) | 18212.5 | 95742.4 | 3781.9 |
| Length Wtd. (ft) | 100.08 | Wetted Per. (ft) | 46.08 | 121.61 | 22.66 |
| Min Ch El (ft) | 971.21 | Shear (lb/sq ft) | 0.01 | 0.02 | 0.01 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.01 | 0.01 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 17.88 | 31.44 | 7.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 24.50 | 25.03 | 10.41 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.72 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 978.71 | Reach Len. (ft) | 83.27 | 99.67 | 127.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 816.49 | |
| E.G. Slope (ft/ft) | 0.000070 | Area (sq ft) | | 816.49 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 121.45 | Top Width (ft) | | 121.45 | |
| Vel Total (ft/s) | 0.93 | Avg. Vel. (ft/s) | | 0.93 | |
| Max Chl Dpth (ft) | 7.50 | Hydr. Depth (ft) | | 6.72 | |
| Conv. Total (cfs) | 90923.5 | Conv. (cfs) | | 90923.5 | |
| Length Wtd. (ft) | 100.24 | Wetted Per. (ft) | | 131.84 | |
| Min Ch El (ft) | 971.21 | Shear (lb/sq ft) | | 0.03 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.02 | |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.73 | 39.23 | 2.29 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.86 | 25.14 | 0.63 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.71 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 978.70 | Reach Len. (ft) | 83.27 | 99.67 | 127.41 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 204.34 | 815.43 | 59.90 |
| E.G. Slope (ft/ft) | 0.000041 | Area (sq ft) | 204.34 | 815.43 | 59.90 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 117.25 | 616.40 | 24.35 |
| Top Width (ft) | 188.72 | Top Width (ft) | 45.22 | 121.45 | 22.05 |
| Vel Total (ft/s) | 0.70 | Avg. Vel. (ft/s) | 0.57 | 0.76 | 0.41 |
| Max Chl Dpth (ft) | 7.49 | Hydr. Depth (ft) | 4.52 | 6.71 | 2.72 |
| Conv. Total (cfs) | 117736.9 | Conv. (cfs) | 18212.5 | 95742.4 | 3781.9 |
| Length Wtd. (ft) | 100.08 | Wetted Per. (ft) | 46.08 | 121.61 | 22.66 |
| Min Ch El (ft) | 971.21 | Shear (lb/sq ft) | 0.01 | 0.02 | 0.01 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.01 | 0.01 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 4.48 | 37.92 | 3.45 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.32 | 25.07 | 1.43 |

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.402

INPUT
Description: Thalweg Sta. 217.26
Station Elevation Data num= 102

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 989.96 | 2.7 | 989.82 | 11.84 | 989.4 | 16.29 | 989.22 | 23.89 | 988.98 |
| 27.46 | 988.8 | 33.94 | 988.53 | 38.61 | 988.26 | 43.99 | 987.99 | 49.78 | 987.55 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 54.04 | 987.28 | 72.11 | 985.77 | 74.14 | 985.61 | 75.8 | 985.5 | 84.19 | 984.83 |
| 92.39 | 984.09 | 94.24 | 983.91 | 94.44 | 983.89 | 104.29 | 983.03 | 109.48 | 982.52 |
| 114.34 | 982.04 | 116.77 | 981.77 | 124.39 | 980.77 | 127.93 | 980.23 | 134.44 | 978.96 |
| 139.1 | 978.04 | 144.49 | 976.81 | 148.89 | 975.99 | 154.54 | 975.17 | 164.59 | 974.75 |
| 172.59 | 974.72 | 174.63 | 974.7 | 176.12 | 974.64 | 183.76 | 974.32 | 184.68 | 974.27 |
| 194.73 | 973.16 | 203.71 | 972.19 | 204.78 | 972.08 | 206.09 | 971.95 | 214.83 | 971.41 |
| 217.26 | 971.23 | 224.88 | 971.35 | 228.42 | 971.75 | 234.93 | 972.51 | 239.59 | 973.15 |
| 244.98 | 973.79 | 250.75 | 974.26 | 255.03 | 974.45 | 261.92 | 974.95 | 262.86 | 974.98 |
| 265.08 | 975.04 | 273.08 | 975.78 | 275.13 | 975.99 | 284.25 | 976.84 | 285.18 | 976.93 |
| 293.6 | 977.46 | 295.23 | 977.56 | 295.41 | 977.56 | 305.28 | 977.92 | 313.36 | 978.08 |
| 315.33 | 978.13 | 317.74 | 978.13 | 325.38 | 978.23 | 328.91 | 978.18 | 335.43 | 978.18 |
| 340.07 | 978.09 | 345.48 | 978.02 | 351.24 | 977.93 | 355.53 | 977.83 | 362.4 | 977.73 |
| 365.58 | 977.62 | 373.57 | 977.45 | 375.63 | 977.35 | 384.74 | 977.02 | 385.68 | 976.97 |
| 394.21 | 976.82 | 395.73 | 976.8 | 395.9 | 976.8 | 405.78 | 976.28 | 407.07 | 976.3 |
| 415.83 | 976.29 | 418.23 | 975.84 | 425.88 | 976.6 | 429.4 | 977.12 | 435.93 | 977.85 |
| 440.56 | 978.53 | 445.98 | 979.38 | 456.03 | 980.86 | 466.08 | 982.18 | 474.06 | 983.04 |
| 476.13 | 983.22 | 476.53 | 983.25 | 485.22 | 983.88 | 486.18 | 983.9 | 496.23 | 984.26 |
| 496.39 | 984.26 | 506.28 | 984.6 | 514.38 | 984.92 | 516.33 | 985.03 | 523.51 | 985.41 |
| 526.38 | 985.59 | 528.89 | 985.73 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 109.48 | .032 | 476.53 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 176.12 | 262.86 | 134.18 | 124.35 | 107.09 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.71 | Element | | | |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.032 | 0.032 | 0.032 |
| W.S. Elev (ft) | 978.69 | Reach Len. (ft) | 134.18 | 124.35 | 107.09 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 118.74 | 491.36 | 259.53 |
| E.G. Slope (ft/ft) | 0.000059 | Area (sq ft) | 118.74 | 491.36 | 259.53 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 86.25 | 553.60 | 118.15 |
| Top Width (ft) | 305.76 | Top Width (ft) | 40.31 | 86.74 | 178.72 |
| Vel Total (ft/s) | 0.87 | Avg. Vel. (ft/s) | 0.73 | 1.13 | 0.46 |
| Max Chl Dpth (ft) | 7.46 | Hydr. Depth (ft) | 2.95 | 5.66 | 1.45 |
| Conv. Total (cfs) | 99010.9 | Conv. (cfs) | 11265.8 | 72312.1 | 15433.0 |
| Length Wtd. (ft) | 121.93 | Wetted Per. (ft) | 40.66 | 87.09 | 179.09 |
| Min Ch El (ft) | 971.23 | Shear (lb/sq ft) | 0.01 | 0.02 | 0.01 |
| Alpha | 1.34 | Stream Power (lb/ft s) | 0.01 | 0.02 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 17.57 | 29.94 | 7.12 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 24.42 | 24.79 | 10.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.71 | Element | | | |
| Vel Head (ft) | 0.03 | Wt. n-Val. | | 0.032 | 0.032 |
| W.S. Elev (ft) | 978.68 | Reach Len. (ft) | 134.18 | 124.35 | 107.09 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 490.65 | 34.28 |
| E.G. Slope (ft/ft) | 0.000108 | Area (sq ft) | | 490.65 | 34.28 |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 726.68 | 31.32 |
| Top Width (ft) | 96.95 | Top Width (ft) | | 86.74 | 10.21 |
| Vel Total (ft/s) | 1.44 | Avg. Vel. (ft/s) | | 1.48 | 0.91 |
| Max Chl Dpth (ft) | 7.45 | Hydr. Depth (ft) | | 5.66 | 3.36 |
| Conv. Total (cfs) | 73005.6 | Conv. (cfs) | | 69989.5 | 3016.1 |
| Length Wtd. (ft) | 122.36 | Wetted Per. (ft) | | 91.13 | 13.14 |
| Min Ch El (ft) | 971.23 | Shear (lb/sq ft) | | 0.04 | 0.02 |
| Alpha | 1.03 | Stream Power (lb/ft s) | | 0.05 | 0.02 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 1.73 | 37.74 | 2.24 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.86 | 24.90 | 0.62 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.71 | Element | | | |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.032 | 0.032 | 0.032 |
| W.S. Elev (ft) | 978.69 | Reach Len. (ft) | 134.18 | 124.35 | 107.09 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 118.74 | 491.36 | 259.53 |
| E.G. Slope (ft/ft) | 0.000059 | Area (sq ft) | 118.74 | 491.36 | 259.53 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 86.25 | 553.60 | 118.15 |

| | | | | | |
|---|---|---|---|---|---|
| Top Width (ft) | 305.76 | Top Width (ft) | 40.31 | 86.74 | 178.72 |
| Vel Total (ft/s) | 0.87 | Avg. Vel. (ft/s) | 0.73 | 1.13 | 0.46 |
| Max Chl Dpth (ft) | 7.46 | Hydr. Depth (ft) | 2.95 | 5.66 | 1.45 |
| Conv. Total (cfs) | 99010.9 | Conv. (cfs) | 11265.8 | 72312.1 | 15433.0 |
| Length Wtd. (ft) | 121.93 | Wetted Per. (ft) | 40.66 | 87.09 | 179.09 |
| Min Ch El (ft) | 971.23 | Shear (lb/sq ft) | 0.01 | 0.02 | 0.01 |
| Alpha | 1.34 | Stream Power (lb/ft s) | 0.01 | 0.02 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 4.17 | 36.42 | 2.98 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.23 | 24.83 | 1.14 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.378

INPUT
Description: Thalweg Sta. 130.82 - Upstream of Inline weir
Station Elevation Data num= 83

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 980.65 | 1.93 | 980.95 | 7.88 | 981.94 | 10.52 | 983.08 | 17.36 | 983.08 |
| 21.46 | 983.16 | 26.63 | 982.3 | 32.39 | 981.21 | 36.98 | 979.9 | 43.33 | 978.12 |
| 45.78 | 977.37 | 51.32 | 975.81 | 54.27 | 974.95 | 56.59 | 974.41 | 65.2 | 972.16 |
| 76.03 | 970.98 | 76.14 | 970.97 | 83.69 | 970.68 | 87.07 | 970.58 | 91.26 | 970.53 |
| 98.01 | 970.37 | 98.84 | 970.38 | 100.73 | 970.31 | 107.36 | 970.17 | 108.94 | 970.14 |
| 115.48 | 969.98 | 119.88 | 969.89 | 125.44 | 969.76 | 130.82 | 969.69 | 135.1 | 969.69 |
| 141.76 | 969.71 | 150.14 | 969.94 | 151.91 | 970.01 | 152.69 | 970.03 | 159.49 | 970.39 |
| 163.63 | 970.64 | 174.35 | 971.23 | 174.56 | 971.24 | 174.84 | 971.25 | 185.5 | 971.74 |
| 193.96 | 971.91 | 196.44 | 971.93 | 199.54 | 972.05 | 205.32 | 972.26 | 207.37 | 972.34 |
| 213.6 | 972.51 | 218.31 | 972.63 | 224.25 | 972.87 | 227.71 | 973 | 229.24 | 973 |
| 235.29 | 973.47 | 240.18 | 973.56 | 242.87 | 973.77 | 248.95 | 974.05 | 250.45 | 974.15 |
| 251.12 | 974.16 | 252.85 | 974.22 | 262.06 | 974.72 | 272.46 | 974.99 | 272.99 | 975.01 |
| 273.65 | 975.03 | 283.93 | 975.25 | 288.35 | 975.61 | 294.86 | 975.16 | 298.35 | 974.81 |
| 305.8 | 975.46 | 311.71 | 976.27 | 318.67 | 977.24 | 323.06 | 977.74 | 327.67 | 978.17 |
| 331.33 | 978.37 | 338.61 | 978.78 | 347.76 | 979.51 | 349.54 | 979.6 | 356.58 | 980.4 |
| 360.48 | 980.7 | 370.58 | 981.71 | 371.42 | 981.79 | 372.46 | 981.88 | 378.11 | 982.4 |
| 382.35 | 982.79 | 386.9 | 983.15 | 391.82 | 983.56 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 378.11 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 65.2 | 205.32 | 288.09 | 275.12 | 263.53 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 978.69 | Reach Len. (ft) | 288.09 | 275.12 | 263.53 |
| Crit W.S. (ft) | 971.48 | Flow Area (sq ft) | 80.20 | 1122.58 | 500.02 |
| E.G. Slope (ft/ft) | 0.000012 | Area (sq ft) | 80.20 | 1122.58 | 500.02 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 22.60 | 578.86 | 156.53 |
| Top Width (ft) | 295.77 | Top Width (ft) | 23.91 | 140.12 | 131.74 |
| Vel Total (ft/s) | 0.45 | Avg. Vel. (ft/s) | 0.28 | 0.52 | 0.31 |
| Max Chl Dpth (ft) | 9.00 | Hydr. Depth (ft) | 3.35 | 8.01 | 3.80 |
| Conv. Total (cfs) | 218494.1 | Conv. (cfs) | 6515.7 | 166857.2 | 45121.1 |
| Length Wtd. (ft) | 275.12 | Wetted Per. (ft) | 24.79 | 140.26 | 132.07 |
| Min Ch El (ft) | 969.69 | Shear (lb/sq ft) | 0.00 | 0.01 | 0.00 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 17.26 | 27.64 | 6.18 |
| C & E Loss (ft) | | Cum SA (acres) | 24.32 | 24.47 | 9.73 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 978.69 | Reach Len. (ft) | 288.09 | 275.12 | 263.53 |
| Crit W.S. (ft) | 971.48 | Flow Area (sq ft) | 80.20 | 1122.58 | 500.02 |
| E.G. Slope (ft/ft) | 0.000012 | Area (sq ft) | 80.20 | 1122.58 | 500.02 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 22.60 | 578.86 | 156.53 |
| Top Width (ft) | 295.77 | Top Width (ft) | 23.91 | 140.12 | 131.74 |
| Vel Total (ft/s) | 0.45 | Avg. Vel. (ft/s) | 0.28 | 0.52 | 0.31 |
| Max Chl Dpth (ft) | 9.00 | Hydr. Depth (ft) | 3.35 | 8.01 | 3.80 |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 218494.1 | Conv. (cfs) | 6515.7 | 166857.2 | 45121.1 |
| Length Wtd. (ft) | 275.12 | Wetted Per. (ft) | 24.79 | 140.26 | 132.07 |
| Min Ch El (ft) | 969.69 | Shear (lb/sq ft) | 0.00 | 0.01 | 0.00 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 1.61 | 35.44 | 1.59 |
| C & E Loss (ft) | | Cum SA (acres) | 0.82 | 24.57 | 0.45 |

Warning: The encroachment was ignored because the encroachment was coded either outside of the cross section or inside of the channel.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.70 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 978.69 | Reach Len. (ft) | 288.09 | 275.12 | 263.53 |
| Crit W.S. (ft) | 971.48 | Flow Area (sq ft) | 80.20 | 1122.58 | 500.02 |
| E.G. Slope (ft/ft) | 0.000012 | Area (sq ft) | 80.20 | 1122.58 | 500.02 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 22.60 | 578.86 | 156.53 |
| Top Width (ft) | 295.77 | Top Width (ft) | 23.91 | 140.12 | 131.74 |
| Vel Total (ft/s) | 0.45 | Avg. Vel. (ft/s) | 0.28 | 0.52 | 0.31 |
| Max Chl Dpth (ft) | 9.00 | Hydr. Depth (ft) | 3.35 | 8.01 | 3.80 |
| Conv. Total (cfs) | 218494.1 | Conv. (cfs) | 6515.7 | 166857.2 | 45121.1 |
| Length Wtd. (ft) | 275.12 | Wetted Per. (ft) | 24.79 | 140.26 | 132.07 |
| Min Ch El (ft) | 969.69 | Shear (lb/sq ft) | 0.00 | 0.01 | 0.00 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 3.86 | 34.12 | 2.05 |
| C & E Loss (ft) | | Cum SA (acres) | 3.14 | 24.51 | 0.76 |

Warning: The encroachment was ignored because the encroachment was coded either outside of the cross section or inside of the channel.

INLINE STRUCTURE

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.359

INPUT
Description: Abandoned RID Wasteway
Distance from Upstream XS = 95
Deck/Roadway Width = 15
Weir Coefficient = 2.6
Weir Embankment Coordinates num = 37

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 3.79 | 980.85 | 6.22 | 980.62 | 17.52 | 979.5 | 25.28 | 979.21 | 28.82 | 978.82 |
| 32.74 | 978.59 | 46.78 | 978.04 | 56.54 | 977.96 | 104.16 | 977.97 | 132.77 | 977.98 |
| 218.76 | 978.13 | 223.18 | 978.15 | 257.17 | 978.21 | 261.76 | 978.22 | 266.05 | 978.24 |
| 270.79 | 977.44 | 277.34 | 976.62 | 283.25 | 975.36 | 288.64 | 974.58 | 299.94 | 975.93 |
| 304.76 | 976.62 | 311.23 | 977.59 | 316.41 | 978.29 | 322.53 | 979.13 | 326.26 | 979.55 |
| 333.83 | 980.37 | 342.21 | 981.07 | 345.12 | 981.33 | 356.42 | 982.2 | 367.71 | 983 |
| 368.25 | 983.02 | 369.25 | 983.07 | 379.01 | 983.52 | 389.82 | 983.87 | 390.31 | 983.88 |
| 390.75 | 983.89 | 394.37 | 984.02 | | | | | | |

Upstream Embankment side slope = .3 horiz. to 1.0 vertical
Downstream Embankment side slope = .3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Weir crest shape = Broad Crested

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.326

INPUT
Description: Thalweg Sta. 463.96 - Downstream of Inline Weir
Station Elevation Data num= 131

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 988.29 | 3.2 | 988.11 | 7.94 | 987.83 | 12.32 | 987.6 | 15.32 | 987.41 |
| 25.63 | 986.83 | 27.45 | 986.72 | 31.43 | 986.52 | 39.58 | 986.14 | 43.31 | 986.04 |
| 51.7 | 985.76 | 60.99 | 985.51 | 63.82 | 985.42 | 75.95 | 985.11 | 78.67 | 985.06 |
| 88.08 | 984.86 | 96.36 | 984.81 | 98.64 | 984.78 | 100.2 | 984.78 | 105.83 | 984.75 |
| 112.33 | 984.83 | 114.04 | 984.83 | 124.45 | 984.75 | 131.72 | 984.65 | 136.58 | 984.5 |
| 148.71 | 983.94 | 149.4 | 983.91 | 160.83 | 983.53 | 167.08 | 983.49 | 170.57 | 983.45 |
| 172.95 | 983.39 | 184.76 | 982.99 | 185.08 | 982.97 | 185.77 | 982.93 | 197.21 | 982.3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 202.44 | 982.02 | 209.33 | 981.62 | 213.72 | 981.28 | 220.12 | 980.64 | 221.46 | 980.52 |
| 224.35 | 980.18 | 231.3 | 979.25 | 233.58 | 978.94 | 235.3 | 978.78 | 237.81 | 978.5 |
| 245.71 | 977.69 | 255.49 | 976.65 | 257.83 | 976.15 | 262.94 | 975.02 | 269.96 | 973.43 |
| 273.17 | 972.88 | 282.08 | 971.61 | 290.85 | 970.55 | 294.21 | 970.24 | 301.52 | 969.54 |
| 306.33 | 969.09 | 308.54 | 968.87 | 314.42 | 968.44 | 318.46 | 968.17 | 321.62 | 967.94 |
| 326.22 | 967.64 | 328.81 | 967.53 | 330.59 | 967.44 | 340.12 | 967.28 | 342.71 | 967.21 |
| 343.19 | 967.21 | 343.9 | 967.23 | 350.39 | 967.4 | 354.83 | 967.61 | 361.58 | 967.85 |
| 366.91 | 968 | 371.97 | 967.99 | 379.09 | 967.84 | 379.16 | 967.83 | 379.27 | 967.82 |
| 391.21 | 966.38 | 396.95 | 966.1 | 403.34 | 965.87 | 414.63 | 965.78 | 415.46 | 965.78 |
| 422.32 | 965.76 | 427.59 | 965.92 | 429.51 | 965.95 | 432.32 | 965.97 | 439.72 | 966.04 |
| 449.99 | 965.93 | 451.84 | 965.87 | 455.86 | 965.45 | 463.96 | 964.75 | 467.67 | 964.83 |
| 476.09 | 965.62 | 479.86 | 965.89 | 488.22 | 966.7 | 500.34 | 967.84 | 501.84 | 967.93 |
| 503.04 | 968 | 512.47 | 968.53 | 520.72 | 968.88 | 523.02 | 968.95 | 524.59 | 969.01 |
| 530.21 | 969.2 | 537.4 | 969.41 | 538.4 | 969.42 | 544.6 | 969.53 | 548.84 | 969.53 |
| 556.08 | 969.64 | 560.97 | 969.69 | 566.17 | 969.88 | 573.09 | 970.17 | 573.77 | 970.21 |
| 585.22 | 970.6 | 587.75 | 970.68 | 591.45 | 970.86 | 597.34 | 971.39 | 609.13 | 972.71 |
| 609.47 | 972.76 | 621.6 | 974.23 | 626.81 | 974.71 | 630.91 | 974.98 | 633.72 | 975.22 |
| 638.1 | 975.62 | 644.5 | 976.11 | 645.84 | 976.19 | 648.79 | 976.38 | 662.18 | 977.31 |
| 670.1 | 977.55 | 674.07 | 977.71 | 679.86 | 977.99 | 682.22 | 977.82 | 687.37 | 977.44 |
| 688.4 | 977.37 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .032 | 231.3 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 366.91 | 501.84 | 210.23 | 199.98 | 196.07 | .3 | .5 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 967.85 | Reach Len. (ft) | 210.23 | 199.98 | 196.07 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 14.36 | 217.04 | |
| E.G. Slope (ft/ft) | 0.003915 | Area (sq ft) | 14.36 | 217.04 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 17.30 | 740.70 | |
| Top Width (ft) | 160.13 | Top Width (ft) | 38.44 | 121.68 | |
| Vel Total (ft/s) | 3.28 | Avg. Vel. (ft/s) | 1.20 | 3.41 | |
| Max Chl Dpth (ft) | 3.10 | Hydr. Depth (ft) | 0.37 | 1.78 | |
| Conv. Total (cfs) | 12114.9 | Conv. (cfs) | 276.4 | 11838.4 | |
| Length Wtd. (ft) | 200.10 | Wetted Per. (ft) | 38.47 | 121.98 | |
| Min Ch El (ft) | 964.75 | Shear (lb/sq ft) | 0.09 | 0.43 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.11 | 1.48 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 16.95 | 23.41 | 4.67 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 24.11 | 23.64 | 9.33 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 967.94 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 967.72 | Reach Len. (ft) | 210.23 | 199.98 | 196.07 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 202.32 | |
| E.G. Slope (ft/ft) | 0.005031 | Area (sq ft) | | 202.32 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 119.05 | Top Width (ft) | | 119.05 | |
| Vel Total (ft/s) | 3.75 | Avg. Vel. (ft/s) | | 3.75 | |
| Max Chl Dpth (ft) | 2.97 | Hydr. Depth (ft) | | 1.70 | |
| Conv. Total (cfs) | 10686.7 | Conv. (cfs) | | 10686.7 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 119.33 | |
| Min Ch El (ft) | 964.75 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.00 | |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 1.34 | 31.25 | 0.07 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 0.74 | 23.76 | 0.05 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.23 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 968.08 | Reach Len. (ft) | 210.23 | 199.98 | 196.07 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 247.48 | |
| E.G. Slope (ft/ft) | 0.003044 | Area (sq ft) | | 247.48 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 134.93 | Top Width (ft) | | 134.93 | |
| Vel Total (ft/s) | 3.06 | Avg. Vel. (ft/s) | | 3.06 | |
| Max Chl Dpth (ft) | 3.33 | Hydr. Depth (ft) | | 1.83 | |
| Conv. Total (cfs) | 13739.0 | Conv. (cfs) | | 13739.0 | |
| Length Wtd. (ft) | 199.98 | Wetted Per. (ft) | | 135.46 | |
| Min Ch El (ft) | 964.75 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.06 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 3.60 | 29.79 | 0.54 |
| C & E Loss (ft) | 0.18 | Cum SA (acres) | 3.06 | 23.64 | 0.36 |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.288

INPUT
Description: Thalweg Sta. 336.63
Station Elevation Data num= 108

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 986.06 | 2.98 | 986.01 | 18.29 | 985.69 | 18.99 | 985.67 | 19.6 | 985.66 |
| 26.08 | 985.51 | 32.81 | 985.37 | 33.17 | 985.36 | 46.01 | 985.06 | 48.89 | 984.97 |
| 59.22 | 984.69 | 64.2 | 984.47 | 72.43 | 984.14 | 79.5 | 983.79 | 85.64 | 983.5 |
| 94.81 | 983 | 96.98 | 982.9 | 98.85 | 982.81 | 104.07 | 982.5 | 110.11 | 982.16 |
| 112.07 | 982.07 | 124.37 | 981.62 | 125.28 | 981.59 | 125.42 | 981.59 | 138.48 | 981.67 |
| 140.72 | 981.68 | 151.69 | 981.63 | 156.03 | 981.59 | 164.9 | 981.49 | 167.88 | 981.44 |
| 171.33 | 981.37 | 178.11 | 981.2 | 186.63 | 980.74 | 191.32 | 980.46 | 201.93 | 979.64 |
| 203.33 | 979.53 | 210.42 | 978.94 | 217.24 | 978.32 | 217.51 | 978.29 | 217.74 | 978.27 |
| 218.94 | 978.13 | 220.91 | 977.89 | 230.95 | 976.7 | 232.55 | 976.32 | 238.78 | 974.19 |
| 244.16 | 972.44 | 247.85 | 971.21 | 257.37 | 967.82 | 258.24 | 967.57 | 263.16 | 966.18 |
| 270.58 | 964.69 | 278.46 | 964.16 | 281.32 | 964.02 | 283.8 | 964.3 | 288.41 | 964.79 |
| 293.77 | 965.57 | 297.01 | 965.65 | 309.07 | 964.6 | 310.21 | 964.52 | 317.44 | 964.16 |
| 330.95 | 963.46 | 336.63 | 963.35 | 339.67 | 963.53 | 349.84 | 964.67 | 363.05 | 965.88 |
| 369.89 | 966.34 | 370.28 | 966.37 | 373.49 | 966.53 | 376.27 | 966.5 | 385.59 | 966.34 |
| 389.47 | 966.36 | 400.9 | 966.71 | 402.68 | 966.83 | 415.89 | 967.79 | 416.2 | 967.82 |
| 429.1 | 968.7 | 430.21 | 968.8 | 442.31 | 969.46 | 446.81 | 969.76 | 455.52 | 970.36 |
| 462.11 | 971.06 | 468.73 | 971.82 | 472.19 | 972.28 | 472.76 | 972.35 | 477.41 | 972.99 |
| 481.94 | 973.59 | 492.72 | 974.99 | 495.15 | 975.28 | 508.02 | 976.69 | 508.36 | 976.72 |
| 521.57 | 978.03 | 523.33 | 978.2 | 538.64 | 979.7 | 548 | 980.64 | 553.94 | 981.22 |
| 561.2 | 981.9 | 569.24 | 982.41 | 572.02 | 982.57 | 574.41 | 982.7 | 584.55 | 982.95 |
| 587.62 | 983.04 | 593.29 | 982.96 | 599.85 | 982.92 | 600.38 | 982.91 | 600.83 | 982.91 |
| 614.04 | 982.44 | 615.15 | 982.39 | 623.76 | 982.08 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 218.94 | .04 | 472.19 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 258.24 | 373.49 | 212.53 | 200 | 200.01 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.37 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.61 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 965.76 | Reach Len. (ft) | 212.53 | 200.00 | 200.01 |
| Crit W.S. (ft) | 965.74 | Flow Area (sq ft) | | 121.03 | |
| E.G. Slope (ft/ft) | 0.021149 | Area (sq ft) | | 121.03 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 96.54 | Top Width (ft) | | 96.54 | |
| Vel Total (ft/s) | 6.26 | Avg. Vel. (ft/s) | | 6.26 | |
| Max Chl Dpth (ft) | 2.41 | Hydr. Depth (ft) | | 1.25 | |
| Conv. Total (cfs) | 5212.3 | Conv. (cfs) | | 5212.3 | |
| Length Wtd. (ft) | 201.50 | Wetted Per. (ft) | | 96.96 | |
| Min Ch El (ft) | 963.35 | Shear (lb/sq ft) | | 1.65 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 10.32 | |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.68 | Cum Volume (acre-ft) | 16.91 | 22.63 | 4.67 |
| C & E Loss (ft) | 0.12 | Cum SA (acres) | 24.02 | 23.14 | 9.33 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.46 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.39 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 966.06 | Reach Len. (ft) | 212.53 | 200.00 | 200.01 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 150.68 | |
| E.G. Slope (ft/ft) | 0.010968 | Area (sq ft) | | 150.68 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 102.01 | Top Width (ft) | | 102.01 | |
| Vel Total (ft/s) | 5.03 | Avg. Vel. (ft/s) | | 5.03 | |
| Max Chl Dpth (ft) | 2.71 | Hydr. Depth (ft) | | 1.48 | |
| Conv. Total (cfs) | 7237.8 | Conv. (cfs) | | 7237.8 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 102.47 | |
| Min Ch El (ft) | 963.35 | Shear (lb/sq ft) | | 1.01 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.07 | |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | 1.34 | 30.44 | 0.07 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.74 | 23.25 | 0.05 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.81 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.74 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 966.06 | Reach Len. (ft) | 212.53 | 200.00 | 200.01 |
| Crit W.S. (ft) | 966.01 | Flow Area (sq ft) | | 109.59 | |
| E.G. Slope (ft/ft) | 0.018848 | Area (sq ft) | | 109.59 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 68.76 | Top Width (ft) | | 68.76 | |
| Vel Total (ft/s) | 6.92 | Avg. Vel. (ft/s) | | 6.92 | |
| Max Chl Dpth (ft) | 2.71 | Hydr. Depth (ft) | | 1.59 | |
| Conv. Total (cfs) | 5521.2 | Conv. (cfs) | | 5521.2 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 69.38 | |
| Min Ch El (ft) | 963.35 | Shear (lb/sq ft) | | 1.86 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 12.85 | |
| Frctn Loss (ft) | 1.58 | Cum Volume (acre-ft) | 3.60 | 28.97 | 0.54 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 3.06 | 23.17 | 0.36 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.250

INPUT
Description: Thalweg Sta. 405.15
Station Elevation Data num= 141

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 984.09 | 2.03 | 984.06 | 6.03 | 984.01 | 9.1 | 983.93 | 12.29 | 983.84 |
| 16.17 | 983.74 | 19.92 | 983.63 | 26.7 | 983.42 | 33.81 | 983.18 | 41.1 | 982.9 |
| 44.46 | 982.78 | 69.92 | 981.78 | 75.48 | 981.52 | 84.33 | 981.09 | 86.9 | 980.93 |
| 89.37 | 980.75 | 93.97 | 980.44 | 98.74 | 980.13 | 103.26 | 979.86 | 108.11 | 979.58 |
| 113.15 | 979.33 | 117.15 | 979.28 | 122.26 | 979.23 | 127.56 | 979.23 | 129.33 | 979.25 |
| 131.04 | 979.28 | 141.96 | 979.39 | 143.47 | 979.39 | 144.93 | 979.37 | 150.55 | 979.28 |
| 156.37 | 979.1 | 158.82 | 979.02 | 170.77 | 978.55 | 185.19 | 977.95 | 186.61 | 977.88 |
| 192.98 | 977.58 | 200.5 | 977.09 | 214 | 975.9 | 214.2 | 975.88 | 214.39 | 975.87 |
| 228.28 | 974.4 | 228.41 | 974.38 | 235.41 | 973.41 | 242.17 | 972.4 | 242.49 | 972.35 |
| 242.82 | 972.29 | 250.44 | 971.01 | 256.06 | 970.06 | 257.22 | 969.88 | 269.77 | 967.81 |
| 269.95 | 967.78 | 270.78 | 967.67 | 271.63 | 967.55 | 283.84 | 965.6 | 286.04 | 965.31 |
| 297.73 | 964.11 | 300.44 | 963.96 | 306.14 | 963.7 | 311.62 | 963.54 | 314.86 | 963.46 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 325.51 | 963.22 | 329.26 | 963.16 | 339.4 | 963.07 | 343.67 | 963.05 | 353.29 | 963.16 |
| 362.71 | 963.34 | 367.18 | 963.36 | 369.79 | 963.35 | 372.49 | 963.26 | 381.07 | 962.84 |
| 386.89 | 962.49 | 394.96 | 962.03 | 401.3 | 961.25 | 405.15 | 960.53 | 412.22 | 961.68 |
| 415.71 | 961.89 | 430.12 | 962.82 | 436.64 | 963.33 | 450.53 | 964.97 | 454.65 | 965.5 |
| 458.93 | 965.98 | 464.42 | 966.45 | 467.87 | 966.62 | 473.34 | 966.89 | 478.31 | 967.04 |
| 487.74 | 967.16 | 490.02 | 967.2 | 492.2 | 967.25 | 497.09 | 967.3 | 502.16 | 967.42 |
| 506.09 | 967.5 | 516.56 | 967.65 | 519.98 | 967.69 | 530.97 | 967.68 | 533.87 | 967.64 |
| 539.52 | 967.48 | 545.38 | 967.23 | 547.77 | 967.14 | 559.79 | 966.62 | 561.66 | 966.59 |
| 574.2 | 966.51 | 581.95 | 966.68 | 588.6 | 966.84 | 589.44 | 966.87 | 603.01 | 967.17 |
| 603.33 | 967.18 | 611.83 | 967.27 | 617.22 | 967.34 | 617.41 | 967.34 | 631.11 | 966.73 |
| 631.83 | 966.69 | 645 | 965.88 | 646.23 | 965.87 | 652.68 | 965.84 | 658.89 | 965.86 |
| 660.64 | 965.91 | 672.78 | 966.22 | 675.05 | 966.32 | 686.67 | 967 | 689.46 | 967.43 |
| 695.11 | 968.13 | 700.56 | 968.76 | 703.87 | 969.26 | 714.45 | 970.72 | 718.27 | 971.24 |
| 728.34 | 972.58 | 730.47 | 972.87 | 732.68 | 973.16 | 742.23 | 974.38 | 747.08 | 974.99 |
| 756.12 | 976.08 | 761.5 | 976.71 | 765.83 | 977.16 | 770.01 | 977.68 | 772.91 | 977.98 |
| 777.1 | 978.57 | 783.9 | 979.52 | 790.31 | 980.15 | 797.8 | 980.81 | 804.72 | 981.35 |
| 805.28 | 981.4 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 250.44 | .04 | 777.1 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 369.79 | 436.64 | 199.75 | 200 | 200.76 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.57 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 964.36 | Reach Len. (ft) | 199.75 | 200.00 | 200.76 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 73.97 | 140.62 | 4.47 |
| E.G. Slope (ft/ft) | 0.004428 | Area (sq ft) | 73.97 | 140.62 | 4.47 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 181.97 | 568.97 | 7.06 |
| Top Width (ft) | 150.03 | Top Width (ft) | 74.47 | 66.85 | 8.70 |
| Vel Total (ft/s) | 3.46 | Avg. Vel. (ft/s) | 2.46 | 4.05 | 1.58 |
| Max Chl Dpth (ft) | 3.83 | Hydr. Depth (ft) | 0.99 | 2.10 | 0.51 |
| Conv. Total (cfs) | 11390.8 | Conv. (cfs) | 2734.5 | 8550.2 | 106.1 |
| Length Wtd. (ft) | 199.94 | Wetted Per. (ft) | 74.50 | 67.15 | 8.76 |
| Min Ch El (ft) | 960.53 | Shear (lb/sq ft) | 0.27 | 0.58 | 0.14 |
| Alpha | 1.15 | Stream Power (lb/ft s) | 0.68 | 2.34 | 0.22 |
| Frctn Loss (ft) | 1.55 | Cum Volume (acre-ft) | 16.73 | 22.03 | 4.66 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 23.84 | 22.77 | 9.31 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.12 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 964.82 | Reach Len. (ft) | 199.75 | 200.00 | 200.76 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 171.34 | |
| E.G. Slope (ft/ft) | 0.004308 | Area (sq ft) | | 171.34 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 66.85 | Top Width (ft) | | 66.85 | |
| Vel Total (ft/s) | 4.42 | Avg. Vel. (ft/s) | | 4.42 | |
| Max Chl Dpth (ft) | 4.29 | Hydr. Depth (ft) | | 2.56 | |
| Conv. Total (cfs) | 11548.6 | Conv. (cfs) | | 11548.6 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 70.10 | |
| Min Ch El (ft) | 960.53 | Shear (lb/sq ft) | | 0.66 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.91 | |
| Frctn Loss (ft) | 1.65 | Cum Volume (acre-ft) | 1.34 | 29.70 | 0.07 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.74 | 22.86 | 0.05 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.10 | Element | | | |
| Vel Head (ft) | 0.31 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 964.79 | Reach Len. (ft) | 199.75 | 200.00 | 200.76 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.14 | 169.73 | |

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.004299 | Area (sq ft) | 1.14 | 169.73 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 1.77 | 756.23 | |
| Top Width (ft) | 67.64 | Top Width (ft) | 0.79 | 66.85 | |
| Vel Total (ft/s) | 4.44 | Avg. Vel. (ft/s) | 1.56 | 4.46 | |
| Max Chl Dpth (ft) | 4.26 | Hydr. Depth (ft) | 1.44 | 2.54 | |
| Conv. Total (cfs) | 11560.2 | Conv. (cfs) | 27.0 | 11533.2 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | 2.23 | 68.61 | |
| Min Ch El (ft) | 960.53 | Shear (lb/sq ft) | 0.14 | 0.66 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.21 | 2.96 | |
| Frctn Loss (ft) | 1.63 | Cum Volume (acre-ft) | 3.59 | 28.33 | 0.54 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 3.05 | 22.86 | 0.36 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.213

INPUT
Description: Thalweg Sta. 393.22
Station Elevation Data num= 117

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 982.2 | 5.86 | 982.04 | 12.01 | 981.92 | 12.93 | 981.9 | 13.92 | 981.89 |
| 25.74 | 981.66 | 28.5 | 981.61 | 43.1 | 981.18 | 57.68 | 980.62 | 66.94 | 980.21 |
| 80.68 | 979.57 | 86.86 | 979.32 | 94.41 | 979 | 101.45 | 978.73 | 116.04 | 977.73 |
| 121.88 | 977.18 | 130.63 | 976.31 | 135.61 | 975.77 | 145.21 | 974.53 | 149.35 | 973.93 |
| 159.8 | 972.5 | 163.08 | 972.08 | 168.57 | 971.43 | 176.81 | 970.57 | 188.98 | 969.38 |
| 190.55 | 969.25 | 203.57 | 968.25 | 204.28 | 968.22 | 215.72 | 967.64 | 218.02 | 967.52 |
| 218.16 | 967.51 | 226.8 | 967.13 | 231.75 | 966.92 | 232.75 | 966.87 | 245.48 | 966.39 |
| 246.38 | 966.35 | 247.34 | 966.32 | 259.22 | 965.99 | 259.92 | 965.96 | 261.93 | 965.87 |
| 272.95 | 965.17 | 276.51 | 964.71 | 281.75 | 963.99 | 286.69 | 963.26 | 291.11 | 962.66 |
| 300.42 | 961.66 | 305.69 | 961.4 | 314.16 | 961.2 | 320.28 | 961.29 | 327.89 | 961.52 |
| 334.87 | 961.93 | 338.35 | 962.12 | 341.62 | 962.45 | 345.42 | 962.68 | 349.46 | 962.65 |
| 355.36 | 962.38 | 359.57 | 962.13 | 364.05 | 961.81 | 369.09 | 961.43 | 373.72 | 961.05 |
| 378.64 | 960.82 | 382.83 | 960.6 | 393.22 | 959.99 | 396.56 | 960 | 407.81 | 960.89 |
| 410.29 | 961.11 | 416.17 | 961.74 | 424.37 | 962.705 | 436.99 | 964.19 | 437.76 | 964.27 |
| 450.15 | 965.52 | 451.5 | 965.66 | 451.58 | 965.66 | 452.16 | 965.7 | 458.61 | 966.11 |
| 465.23 | 966.61 | 465.69 | 966.63 | 466.17 | 966.66 | 478.96 | 967.38 | 492.7 | 967.99 |
| 495.35 | 968.1 | 501.06 | 968.36 | 508.13 | 968.78 | 520.17 | 969.64 | 529.2 | 970.32 |
| 533.9 | 970.68 | 539.12 | 971.09 | 547.64 | 971.79 | 553.7 | 972.31 | 561.37 | 973.01 |
| 568.29 | 973.7 | 575.1 | 974.44 | 582.88 | 975.46 | 588.84 | 976.19 | 597.47 | 977.23 |
| 600.1 | 977.48 | 602.57 | 977.72 | 612.06 | 978.63 | 616.31 | 978.92 | 626.65 | 979.73 |
| 628.4 | 979.84 | 630.04 | 979.97 | 641.23 | 980.88 | 642.54 | 980.98 | 643.77 | 981.07 |
| 655.82 | 982 | 670.42 | 982.95 | 671.24 | 983.01 | 684.57 | 983.82 | 684.98 | 983.85 |
| 698.71 | 984.66 | 699.14 | 984.68 | 699.59 | 984.7 | 712.44 | 985.34 | 713.29 | 985.37 |
| 714.18 | 985.42 | 720 | 985.74 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 226.8 | .04 | 529.2 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 345.42 | 424.37 | 210.71 | 199.99 | 199.68 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 962.99 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.49 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 962.50 | Reach Len. (ft) | 210.71 | 199.99 | 199.68 |
| Crit W.S. (ft) | 962.44 | Flow Area (sq ft) | 42.54 | 96.17 | |
| E.G. Slope (ft/ft) | 0.016935 | Area (sq ft) | 42.54 | 96.17 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 184.55 | 573.45 | |
| Top Width (ft) | 119.94 | Top Width (ft) | 49.94 | 70.00 | |
| Vel Total (ft/s) | 5.46 | Avg. Vel. (ft/s) | 4.34 | 5.96 | |
| Max Chl Dpth (ft) | 2.51 | Hydr. Depth (ft) | 0.85 | 1.37 | |
| Conv. Total (cfs) | 5824.8 | Conv. (cfs) | 1418.1 | 4406.6 | |
| Length Wtd. (ft) | 203.30 | Wetted Per. (ft) | 50.03 | 70.20 | |
| Min Ch El (ft) | 959.99 | Shear (lb/sq ft) | 0.90 | 1.45 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 3.90 | 8.64 | |
| Frctn Loss (ft) | 2.43 | Cum Volume (acre-ft) | 16.47 | 21.49 | 4.65 |
| C & E Loss (ft) | 0.09 | Cum SA (acres) | 23.55 | 22.45 | 9.29 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.43 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.73 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 962.70 | Reach Len. (ft) | 210.71 | 199.99 | 199.68 |
| Crit W.S. (ft) | 962.70 | Flow Area (sq ft) | | 110.77 | |
| E.G. Slope (ft/ft) | 0.021681 | Area (sq ft) | | 110.77 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 78.92 | Top Width (ft) | | 78.92 | |
| Vel Total (ft/s) | 6.84 | Avg. Vel. (ft/s) | | 6.84 | |
| Max Chl Dpth (ft) | 2.71 | Hydr. Depth (ft) | | 1.40 | |
| Conv. Total (cfs) | 5147.9 | Conv. (cfs) | | 5147.9 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 79.16 | |
| Min Ch El (ft) | 959.99 | Shear (lb/sq ft) | | 1.89 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 12.96 | |
| Frctn Loss (ft) | 1.89 | Cum Volume (acre-ft) | 1.34 | 29.06 | 0.07 |
| C & E Loss (ft) | 0.15 | Cum SA (acres) | 0.74 | 22.53 | 0.05 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.43 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.71 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 962.72 | Reach Len. (ft) | 210.71 | 199.99 | 199.68 |
| Crit W.S. (ft) | 962.72 | Flow Area (sq ft) | 0.02 | 111.82 | |
| E.G. Slope (ft/ft) | 0.021017 | Area (sq ft) | 0.02 | 111.82 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 0.01 | 757.99 | |
| Top Width (ft) | 79.37 | Top Width (ft) | 0.42 | 78.95 | |
| Vel Total (ft/s) | 6.78 | Avg. Vel. (ft/s) | 0.65 | 6.78 | |
| Max Chl Dpth (ft) | 2.73 | Hydr. Depth (ft) | 0.05 | 1.42 | |
| Conv. Total (cfs) | 5228.6 | Conv. (cfs) | 0.1 | 5228.5 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | 0.48 | 79.18 | |
| Min Ch El (ft) | 959.99 | Shear (lb/sq ft) | 0.05 | 1.85 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.04 | 12.56 | |
| Frctn Loss (ft) | 1.87 | Cum Volume (acre-ft) | 3.59 | 27.68 | 0.54 |
| C & E Loss (ft) | 0.14 | Cum SA (acres) | 3.05 | 22.53 | 0.36 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.175

INPUT
Description: Thalweg Sta. 316.96

Station Elevation Data num= 104

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 980.06 | 11.87 | 979.4 | 12.87 | 979.32 | 13.81 | 979.25 | 19.94 | 978.7 |
| 26.4 | 978.1 | 27.59 | 977.95 | 35.89 | 976.85 | 40.93 | 976.18 | 41.38 | 976.11 |
| 55.17 | 974.12 | 55.46 | 974.08 | 68.95 | 971.85 | 69.99 | 971.66 | 76.53 | 970.16 |
| 82.74 | 968.88 | 84.51 | 968.47 | 99.04 | 965.04 | 110.3 | 962.74 | 113.57 | 962.12 |
| 124.09 | 961.06 | 128.1 | 960.79 | 137.88 | 960.35 | 142.62 | 960.15 | 157.15 | 959.63 |
| 165.45 | 959.36 | 171.68 | 959.2 | 179.24 | 959.06 | 186.21 | 959 | 193.02 | 959.01 |
| 200.74 | 959.07 | 206.8 | 959.15 | 215.27 | 959.24 | 220.59 | 959.32 | 229.8 | 959.52 |
| 234.37 | 959.65 | 244.33 | 960.01 | 248.16 | 960.1 | 256.29 | 960.22 | 258.86 | 960.26 |
| 261.95 | 960.26 | 273.38 | 959.75 | 275.73 | 959.61 | 287.91 | 958.98 | 289.52 | 958.93 |
| 302.43 | 958.81 | 303.3 | 958.78 | 316.96 | 957.5 | 317.08 | 957.5 | 319.35 | 957.72 |
| 330.87 | 958.86 | 331.49 | 958.89 | 344.66 | 959.43 | 358.44 | 959.94 | 360.55 | 960.03 |
| 365 | 960.205 | 372.23 | 960.49 | 375.08 | 960.61 | 384.75 | 960.98 | 386.02 | 961.03 |
| 389.61 | 961.12 | 399.8 | 961.35 | 404.14 | 961.42 | 413.58 | 961.63 | 418.66 | 961.73 |
| 420.01 | 961.77 | 427.37 | 961.96 | 433.19 | 962.07 | 441.15 | 962.33 | 447.72 | 962.56 |
| 454.94 | 962.95 | 462.25 | 963.49 | 468.73 | 964.27 | 476.78 | 965.34 | 479.72 | 965.79 |
| 482.51 | 966.23 | 486.79 | 966.94 | 491.3 | 967.65 | 496.3 | 968.47 | 505.83 | 969.95 |
| 510.08 | 970.6 | 520.36 | 972.1 | 523.86 | 972.57 | 529.23 | 973.35 | 534.89 | 973.97 |
| 537.65 | 974.23 | 543.38 | 974.75 | 549.42 | 975.15 | 550.45 | 975.23 | 551.44 | 975.28 |
| 557.53 | 975.63 | 563.94 | 975.95 | 565.22 | 976.01 | 571.67 | 976.26 | 578.47 | 976.48 |
| 579.01 | 976.49 | 592.79 | 976.55 | 593 | 976.54 | 599.97 | 976.52 | 606.57 | 976.54 |
| 620.36 | 976.54 | 622.06 | 976.51 | 628.26 | 976.3 | 629.7 | 976.23 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 35.89 | .04 | 420.01 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 258.86 | 365 | 200.29 | 200 | 204.61 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.49 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 960.29 | Reach Len. (ft) | 200.29 | 200.00 | 204.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 94.69 | 123.11 | 0.09 |
| E.G. Slope (ft/ft) | 0.008858 | Area (sq ft) | 94.69 | 123.11 | 0.09 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 283.33 | 474.63 | 0.04 |
| Top Width (ft) | 227.90 | Top Width (ft) | 119.58 | 106.14 | 2.18 |
| Vel Total (ft/s) | 3.48 | Avg. Vel. (ft/s) | 2.99 | 3.86 | 0.43 |
| Max Chl Dpth (ft) | 2.79 | Hydr. Depth (ft) | 0.79 | 1.16 | 0.04 |
| Conv. Total (cfs) | 8053.8 | Conv. (cfs) | 3010.4 | 5043.0 | 0.4 |
| Length Wtd. (ft) | 200.32 | Wetted Per. (ft) | 119.61 | 106.33 | 2.18 |
| Min Ch El (ft) | 957.50 | Shear (lb/sq ft) | 0.44 | 0.64 | 0.02 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.31 | 2.47 | 0.01 |
| Frctn Loss (ft) | 1.40 | Cum Volume (acre-ft) | 16.13 | 20.99 | 4.65 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 23.14 | 22.05 | 9.29 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 961.18 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 960.93 | Reach Len. (ft) | 200.29 | 200.00 | 204.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 191.47 | |
| E.G. Slope (ft/ft) | 0.005275 | Area (sq ft) | | 191.47 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 106.14 | Top Width (ft) | | 106.14 | |
| Vel Total (ft/s) | 3.96 | Avg. Vel. (ft/s) | | 3.96 | |
| Max Chl Dpth (ft) | 3.43 | Hydr. Depth (ft) | | 1.80 | |
| Conv. Total (cfs) | 10436.5 | Conv. (cfs) | | 10436.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 107.73 | |
| Min Ch El (ft) | 957.50 | Shear (lb/sq ft) | | 0.59 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.32 | |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 1.34 | 28.36 | 0.07 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.74 | 22.10 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 961.18 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.040 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 960.93 | Reach Len. (ft) | 200.29 | 200.00 | 204.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 191.47 | |
| E.G. Slope (ft/ft) | 0.005275 | Area (sq ft) | | 191.47 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 106.14 | Top Width (ft) | | 106.14 | |
| Vel Total (ft/s) | 3.96 | Avg. Vel. (ft/s) | | 3.96 | |
| Max Chl Dpth (ft) | 3.43 | Hydr. Depth (ft) | | 1.80 | |
| Conv. Total (cfs) | 10436.5 | Conv. (cfs) | | 10436.5 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 107.73 | |
| Min Ch El (ft) | 957.50 | Shear (lb/sq ft) | | 0.59 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.32 | |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 3.59 | 26.99 | 0.54 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.05 | 22.10 | 0.36 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.137

INPUT
Description: Thalweg Sta. 341.54
Station Elevation Data num= 121

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 977.84 | .38 | 977.81 | 6.64 | 977.09 | 15.4 | 975.85 | 17.86 | 975.42 |
| 20.04 | 975.13 | 24.94 | 974.24 | 30.43 | 973.52 | 33.44 | 973.04 | 45.46 | 971.17 |
| 46.83 | 970.95 | 58.07 | 969.24 | 60.22 | 968.9 | 60.49 | 968.86 | 73.62 | 967.05 |
| 75.52 | 966.81 | 90.55 | 964.88 | 100.41 | 963.77 | 105.58 | 963.32 | 113.81 | 962.86 |
| 120.6 | 962.56 | 127.21 | 962.39 | 135.63 | 962.27 | 140.6 | 962.21 | 150.66 | 962.2 |
| 154 | 962.19 | 157.57 | 962.17 | 165.69 | 962.11 | 167.39 | 962.08 | 180.72 | 961.66 |
| 180.79 | 961.66 | 194.19 | 960.69 | 195.75 | 960.54 | 207.58 | 959.45 | 210.78 | 959.22 |
| 216.17 | 958.79 | 220.97 | 958.49 | 225.81 | 958.32 | 234.37 | 957.8 | 240.84 | 957.44 |
| 247.77 | 957.24 | 255.87 | 957.13 | 261.16 | 957.22 | 270.89 | 957.52 | 274.56 | 957.65 |
| 285.92 | 958 | 287.96 | 958.02 | 300.66 | 957.94 | 300.95 | 957.94 | 301.36 | 957.93 |
| 315.98 | 957.7 | 328.14 | 957.2 | 331.01 | 956.8 | 341.54 | 956.46 | 346.04 | 956.96 |
| 354.94 | 957.52 | 361.07 | 957.76 | 367.95 | 957.92 | 368.33 | 957.93 | 381.73 | 958.11 |
| 391.13 | 958.2 | 395.12 | 958.26 | 406.16 | 958.4 | 408.52 | 958.44 | 435.31 | 958.81 |
| 436.21 | 958.83 | 451.24 | 959.07 | 462.11 | 959.1 | 464.07 | 959.1 | 466.27 | 959.12 |
| 475.5 | 959.22 | 496.33 | 959.77 | 502.29 | 959.9 | 511.36 | 960.05 | 515.69 | 960.09 |
| 526.39 | 960.15 | 529.08 | 960.16 | 541.42 | 960.18 | 542.48 | 960.18 | 555.87 | 960.2 |
| 556.45 | 960.2 | 582.67 | 960.3 | 596.06 | 960.47 | 609.45 | 960.83 | 616.56 | 961.06 |
| 622.86 | 961.24 | 631.59 | 961.51 | 649.64 | 961.94 | 661.65 | 962.26 | 674.45 | 962.53 |
| 676.44 | 962.58 | 676.68 | 962.58 | 689.83 | 962.8 | 691.71 | 962.87 | 703.23 | 963.28 |
| 704.88 | 963.44 | 706.74 | 963.52 | 716.62 | 964.15 | 721.77 | 964.55 | 730.02 | 965.06 |
| 732.49 | 965.24 | 736.8 | 965.54 | 740.29 | 965.85 | 743.42 | 965.99 | 751.83 | 966.63 |
| 756.81 | 967.11 | 766.85 | 968.59 | 770.2 | 969.11 | 781.88 | 971.19 | 783.6 | 971.34 |
| 796.91 | 971.26 | 797 | 971.26 | 797.74 | 971.2 | 810.39 | 970.27 | 811.94 | 970.15 |
| 823.79 | 970.57 | 826.97 | 970.88 | 837.19 | 973.47 | 842 | 974.73 | 850.58 | 976.88 |
| 851.73 | 977.12 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 157.57 | .04 | 732.49 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 300.66 | 367.95 | 175.44 | 199.7 | 213.08 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 959.08 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 958.91 | Reach Len. (ft) | 175.44 | 199.70 | 213.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 99.11 | 103.69 | 37.42 |
| E.G. Slope (ft/ft) | 0.005667 | Area (sq ft) | 99.11 | 103.69 | 37.42 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 304.58 | 386.48 | 66.94 |
| Top Width (ft) | 226.38 | Top Width (ft) | 85.97 | 67.29 | 73.13 |
| Vel Total (ft/s) | 3.16 | Avg. Vel. (ft/s) | 3.07 | 3.73 | 1.79 |
| Max Chl Dpth (ft) | 2.45 | Hydr. Depth (ft) | 1.15 | 1.54 | 0.51 |
| Conv. Total (cfs) | 10069.0 | Conv. (cfs) | 4045.9 | 5133.8 | 889.2 |
| Length Wtd. (ft) | 190.51 | Wetted Per. (ft) | 86.03 | 67.39 | 73.13 |
| Min Ch El (ft) | 956.46 | Shear (lb/sq ft) | 0.41 | 0.54 | 0.18 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 1.25 | 2.03 | 0.32 |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | 15.69 | 20.46 | 4.56 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 22.67 | 21.65 | 9.11 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | | |
|---|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.11 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 959.76 | Reach Len. (ft) | 175.44 | 199.70 | 213.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 161.19 | |
| E.G. Slope (ft/ft) | 0.005376 | Area (sq ft) | | 161.19 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 67.29 | Top Width (ft) | | 67.29 | |
| Vel Total (ft/s) | 4.70 | Avg. Vel. (ft/s) | | 4.70 | |
| Max Chl Dpth (ft) | 3.30 | Hydr. Depth (ft) | | 2.40 | |
| Conv. Total (cfs) | 10338.1 | Conv. (cfs) | | 10338.1 | |
| Length Wtd. (ft) | 199.70 | Wetted Per. (ft) | | 71.05 | |
| Min Ch El (ft) | 956.46 | Shear (lb/sq ft) | | 0.76 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.58 | |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | 1.34 | 27.55 | 0.07 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.74 | 21.70 | 0.05 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 960.10 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 959.76 | Reach Len. (ft) | 175.44 | 199.70 | 213.08 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 161.06 | |
| E.G. Slope (ft/ft) | 0.005390 | Area (sq ft) | | 161.06 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 67.29 | Top Width (ft) | | 67.29 | |
| Vel Total (ft/s) | 4.71 | Avg. Vel. (ft/s) | | 4.71 | |
| Max Chl Dpth (ft) | 3.30 | Hydr. Depth (ft) | | 2.39 | |
| Conv. Total (cfs) | 10324.8 | Conv. (cfs) | | 10324.8 | |
| Length Wtd. (ft) | 199.70 | Wetted Per. (ft) | | 71.05 | |
| Min Ch El (ft) | 956.46 | Shear (lb/sq ft) | | 0.76 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.59 | |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | 3.59 | 26.18 | 0.54 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 3.05 | 21.70 | 0.36 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.099

INPUT
Description: Thalweg Sta. 337.10
Station Elevation Data num= 127

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 977.71 | 3.25 | 977.44 | 9.18 | 976.55 | 13.37 | 975.95 | 21.12 | 974.56 |
| 23.48 | 974.15 | 33.07 | 972.4 | 33.6 | 972.3 | 36.51 | 971.8 | 43.71 | 970.55 |
| 45.02 | 970.36 | 53.83 | 969.14 | 56.97 | 968.77 | 68.92 | 967.39 | 74.06 | 966.78 |
| 80.85 | 966 | 84.18 | 965.58 | 92.8 | 964.55 | 94.3 | 964.36 | 102.55 | 963.39 |
| 104.17 | 963.19 | 104.41 | 963.17 | 104.75 | 963.14 | 114.53 | 962.2 | 134.76 | 960.61 |
| 140.59 | 960.16 | 144.88 | 959.82 | 152.54 | 959.25 | 154.52 | 959.09 | 155 | 959.05 |
| 164.49 | 958.37 | 165.11 | 958.32 | 175.23 | 957.66 | 176.44 | 957.62 | 185.35 | 957.47 |
| 205.58 | 957 | 224.22 | 956.63 | 225.81 | 956.59 | 234.65 | 956.44 | 235.93 | 956.42 |
| 236.16 | 956.42 | 246.05 | 956.37 | 248.11 | 956.38 | 256.16 | 956.5 | 260.06 | 956.47 |
| 266.28 | 956.5 | 272.01 | 956.06 | 276.4 | 955.71 | 283.94 | 956.05 | 286.51 | 956.16 |
| 295.89 | 956.43 | 296.63 | 956.47 | 296.79 | 956.46 | 300.7 | 956.33 | 306.75 | 956.15 |
| 307.84 | 956.11 | 316.86 | 955.74 | 319.79 | 955.68 | 326.98 | 955.51 | 331.74 | 955.47 |
| 337.1 | 955.19 | 343.68 | 955.64 | 347.21 | 955.96 | 353 | 956.572 | 357.33 | 957.03 |
| 362.14 | 957.47 | 366.75 | 957.9 | 367.45 | 957.97 | 367.58 | 957.97 | 377.56 | 958.52 |
| 379.52 | 958.61 | 387.68 | 958.89 | 391.46 | 959.12 | 397.8 | 959.39 | 403.41 | 959.84 |
| 407.91 | 960.09 | 415.36 | 960.59 | 416.59 | 960.66 | 418.03 | 960.74 | 427.31 | 961.04 |
| 428.15 | 961.06 | 432.79 | 961.09 | 438.26 | 961.05 | 439.25 | 961.04 | 448.38 | 960.97 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 451.2 | 961.04 | 458.5 | 961.26 | 463.15 | 961.55 | 468.61 | 961.84 | 475.09 | 962.29 |
| 478.73 | 962.51 | 487.04 | 963.15 | 488.85 | 963.28 | 498.84 | 964.35 | 498.96 | 964.37 |
| 509.08 | 965.6 | 510.93 | 965.83 | 519.2 | 966.79 | 522.88 | 967.21 | 529.31 | 967.58 |
| 539.43 | 967.09 | 549.55 | 966.22 | 558.72 | 965.32 | 559.66 | 965.32 | 564.89 | 966.27 |
| 569.78 | 967.22 | 570.66 | 967.38 | 579.9 | 969.32 | 582.61 | 969.81 | 590.01 | 971.31 |
| 594.55 | 971.79 | 600.13 | 972.3 | 606.5 | 972.5 | 610.25 | 972.63 | 618.45 | 972.65 |
| 620.36 | 972.67 | 630.4 | 972.31 | 630.48 | 972.31 | 630.93 | 972.26 | 640.6 | 971.3 |
| 642.35 | 971.33 | 650.71 | 971.16 | 654.29 | 971.49 | 666.23 | 972.53 | 670.95 | 972.93 |
| 678.18 | 973.38 | 680.71 | 973.52 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 154.52 | .04 | 416.59 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 296.79 | 353 | 196.19 | 199.99 | 204.7 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 957.71 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 957.42 | Reach Len. (ft) | 196.19 | 199.99 | 204.70 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 95.48 | 90.31 | 3.54 |
| E.G. Slope (ft/ft) | 0.009189 | Area (sq ft) | 95.48 | 90.31 | 3.54 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 310.41 | 440.67 | 6.92 |
| Top Width (ft) | 174.24 | Top Width (ft) | 109.41 | 56.21 | 8.62 |
| Vel Total (ft/s) | 4.00 | Avg. Vel. (ft/s) | 3.25 | 4.88 | 1.96 |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | 0.87 | 1.61 | 0.41 |
| Conv. Total (cfs) | 7907.5 | Conv. (cfs) | 3238.2 | 4597.0 | 72.2 |
| Length Wtd. (ft) | 198.75 | Wetted Per. (ft) | 109.46 | 56.30 | 8.67 |
| Min Ch El (ft) | 955.19 | Shear (lb/sq ft) | 0.50 | 0.92 | 0.23 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 1.63 | 4.49 | 0.46 |
| Frctn Loss (ft) | 1.23 | Cum Volume (acre-ft) | 15.30 | 20.02 | 4.46 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 22.28 | 21.37 | 8.91 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.57 | Element | | | |
| Vel Head (ft) | 0.63 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 957.94 | Reach Len. (ft) | 196.19 | 199.99 | 204.70 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 119.25 | |
| E.G. Slope (ft/ft) | 0.011492 | Area (sq ft) | | 119.25 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 56.21 | Top Width (ft) | | 56.21 | |
| Vel Total (ft/s) | 6.36 | Avg. Vel. (ft/s) | | 6.36 | |
| Max Chl Dpth (ft) | 2.75 | Hydr. Depth (ft) | | 2.12 | |
| Conv. Total (cfs) | 7070.9 | Conv. (cfs) | | 7070.9 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 59.14 | |
| Min Ch El (ft) | 955.19 | Shear (lb/sq ft) | | 1.45 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 9.20 | |
| Frctn Loss (ft) | 1.69 | Cum Volume (acre-ft) | 1.34 | 26.91 | 0.07 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 0.74 | 21.42 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.57 | Element | | | |
| Vel Head (ft) | 0.62 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 957.94 | Reach Len. (ft) | 196.19 | 199.99 | 204.70 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 119.64 | |
| E.G. Slope (ft/ft) | 0.011374 | Area (sq ft) | | 119.64 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 56.21 | Top Width (ft) | | 56.21 | |
| Vel Total (ft/s) | 6.34 | Avg. Vel. (ft/s) | | 6.34 | |
| Max Chl Dpth (ft) | 2.75 | Hydr. Depth (ft) | | 2.13 | |
| Conv. Total (cfs) | 7107.5 | Conv. (cfs) | | 7107.5 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 59.15 | |
| Min Ch El (ft) | 955.19 | Shear (lb/sq ft) | | 1.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 9.10 | |
| Frctn Loss (ft) | 1.70 | Cum Volume (acre-ft) | 3.59 | 25.53 | 0.54 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 3.05 | 21.42 | 0.36 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.061

INPUT
Description: Thalweg Sta. 493.44
Station Elevation Data num= 184

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 979.87 | 2.79 | 979.84 | 3.13 | 979.83 | 12.81 | 979.62 | 13.69 | 979.57 |
| 22.82 | 979.31 | 24.24 | 979.24 | 32.83 | 978.9 | 42.85 | 978.59 | 45.36 | 978.52 |
| 52.86 | 978.29 | 62.87 | 977.93 | 77.03 | 977.39 | 87.59 | 976.95 | 92.91 | 976.71 |
| 98.14 | 976.43 | 102.93 | 976.05 | 108.7 | 975.29 | 112.94 | 974.93 | 119.26 | 974.55 |
| 122.95 | 974.42 | 129.81 | 974.45 | 132.97 | 974.47 | 140.37 | 974.55 | 142.98 | 974.56 |
| 150.93 | 974.48 | 152.99 | 974.45 | 161.48 | 974.12 | 163.01 | 974.07 | 172.04 | 973.56 |
| 173.02 | 973.51 | 182.59 | 972.77 | 183.03 | 972.74 | 191.07 | 971.76 | 193.05 | 971.5 |
| 193.16 | 971.49 | 203.06 | 969.53 | 203.71 | 969.41 | 213.07 | 967.61 | 214.26 | 967.44 |
| 223.09 | 966.19 | 224.83 | 966 | 233.1 | 965.15 | 235.38 | 964.95 | 243.11 | 964.32 |
| 245.94 | 964.17 | 253.12 | 964.07 | 256.49 | 963.83 | 263.14 | 962.81 | 267.05 | 962.35 |
| 273.15 | 961.44 | 277.61 | 960.98 | 283.16 | 960.16 | 288.16 | 959.7 | 293.18 | 958.98 |
| 298.71 | 958.4 | 303.19 | 957.97 | 309.28 | 957.67 | 313.2 | 957.61 | 319.83 | 957.39 |
| 323.22 | 957.39 | 330.39 | 957.34 | 333.23 | 957.31 | 336.17 | 957.24 | 340.95 | 957.12 |
| 343.24 | 957.08 | 351.51 | 956.89 | 353.26 | 956.86 | 362.06 | 956.62 | 363.27 | 956.58 |
| 364.36 | 956.53 | 373.28 | 956.21 | 373.88 | 956.18 | 383.3 | 955.84 | 383.41 | 955.84 |
| 385.57 | 955.76 | 393.31 | 955.5 | 393.73 | 955.49 | 403.32 | 955.12 | 404.28 | 955.08 |
| 413.34 | 954.68 | 414.84 | 954.62 | 423.35 | 954.41 | 433.36 | 954.9 | 443.38 | 955.61 |
| 446.51 | 955.61 | 453.02 | 955.63 | 453.39 | 955.63 | 457.08 | 955.42 | 467.63 | 954.78 |
| 473.42 | 954.38 | 478.18 | 954.08 | 483.43 | 953.73 | 488.74 | 953.02 | 493.44 | 952.35 |
| 499.3 | 953.11 | 503.46 | 953.7 | 509.85 | 954.44 | 513.47 | 954.85 | 520.41 | 955.36 |
| 523.48 | 955.59 | 530.97 | 955.94 | 533.5 | 956.1 | 541.53 | 956.34 | 543.51 | 956.45 |
| 546.88 | 956.54 | 552.08 | 956.68 | 553.52 | 956.73 | 562.63 | 956.94 | 563.54 | 956.97 |
| 573.2 | 957.18 | 573.55 | 957.19 | 573.7 | 957.19 | 583.56 | 957.42 | 583.75 | 957.42 |
| 593.58 | 957.65 | 594.31 | 957.66 | 603.59 | 957.83 | 604.86 | 957.85 | 613.6 | 957.96 |
| 615.42 | 957.98 | 625.98 | 958.15 | 633.63 | 958.32 | 636.53 | 958.38 | 643.64 | 958.55 |
| 647.1 | 958.64 | 663.67 | 959.11 | 668.2 | 959.21 | 673.68 | 959.3 | 678.76 | 959.45 |
| 683.7 | 959.52 | 689.32 | 959.71 | 693.71 | 959.77 | 699.88 | 959.9 | 703.72 | 959.93 |
| 710.43 | 960.19 | 713.73 | 960.28 | 720.98 | 960.7 | 723.75 | 960.84 | 731.55 | 961.22 |
| 733.76 | 961.31 | 742.1 | 961.45 | 743.77 | 961.46 | 753.79 | 961.11 | 763.22 | 960.55 |
| 763.8 | 960.52 | 773.77 | 959.84 | 774.58 | 959.8 | 783.83 | 959.28 | 784.33 | 959.27 |
| 793.84 | 958.84 | 794.88 | 958.79 | 803.85 | 958.43 | 805.45 | 958.37 | 813.87 | 958.09 |
| 816 | 958.05 | 823.88 | 957.93 | 826.55 | 957.91 | 833.89 | 957.91 | 837.12 | 957.89 |
| 843.91 | 957.97 | 847.67 | 958.04 | 853.92 | 958.37 | 858.23 | 958.67 | 863.93 | 959.14 |
| 868.78 | 959.46 | 873.95 | 959.83 | 879.34 | 959.93 | 883.96 | 959.98 | 889.9 | 959.99 |
| 893.97 | 959.86 | 900.45 | 960.03 | 903.99 | 960.08 | 911.01 | 960.69 | 914 | 960.94 |
| 921.57 | 961.77 | 924.01 | 962.02 | 932.12 | 962.93 | 934.03 | 963.13 | 942.68 | 964.08 |
| 944.04 | 964.22 | 953.24 | 965.12 | 954.05 | 965.17 | 957.76 | 965.11 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 336.17 | .04 | 573.7 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 453.02 | 523.48 | 199.98 | 200 | 201.74 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 956.45 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 956.25 | Reach Len. (ft) | 199.98 | 200.00 | 201.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 80.40 | 141.33 | 4.62 |
| E.G. Slope (ft/ft) | 0.004442 | Area (sq ft) | 80.40 | 141.33 | 4.62 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 198.09 | 554.71 | 5.19 |
| Top Width (ft) | 166.48 | Top Width (ft) | 80.91 | 70.46 | 15.11 |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 2.46 | 3.92 | 1.12 |
| Max Chl Dpth (ft) | 3.90 | Hydr. Depth (ft) | 0.99 | 2.01 | 0.31 |
| Conv. Total (cfs) | 11373.8 | Conv. (cfs) | 2972.4 | 8323.5 | 77.9 |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | 80.98 | 70.80 | 15.12 |
| Min Ch El (ft) | 952.35 | Shear (lb/sq ft) | 0.28 | 0.55 | 0.08 |
| Alpha | 1.15 | Stream Power (lb/ft s) | 0.68 | 2.17 | 0.10 |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | 14.90 | 19.49 | 4.44 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 21.85 | 21.08 | 8.86 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 956.80 | Element | | | |
| Vel Head (ft) | 0.38 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 956.42 | Reach Len. (ft) | 199.98 | 200.00 | 201.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 153.41 | |
| E.G. Slope (ft/ft) | 0.006503 | Area (sq ft) | | 153.41 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 70.46 | Top Width (ft) | | 70.46 | |
| Vel Total (ft/s) | 4.94 | Avg. Vel. (ft/s) | | 4.94 | |
| Max Chl Dpth (ft) | 4.07 | Hydr. Depth (ft) | | 2.18 | |
| Conv. Total (cfs) | 9399.7 | Conv. (cfs) | | 9399.7 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 72.43 | |
| Min Ch El (ft) | 952.35 | Shear (lb/sq ft) | | 0.86 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.25 | |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | 1.34 | 26.28 | 0.07 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.74 | 21.13 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 956.80 | Element | | | |
| Vel Head (ft) | 0.38 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 956.42 | Reach Len. (ft) | 199.98 | 200.00 | 201.74 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 152.88 | |
| E.G. Slope (ft/ft) | 0.006576 | Area (sq ft) | | 152.88 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 70.46 | Top Width (ft) | | 70.46 | |
| Vel Total (ft/s) | 4.96 | Avg. Vel. (ft/s) | | 4.96 | |
| Max Chl Dpth (ft) | 4.07 | Hydr. Depth (ft) | | 2.17 | |
| Conv. Total (cfs) | 9347.0 | Conv. (cfs) | | 9347.0 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 72.41 | |
| Min Ch El (ft) | 952.35 | Shear (lb/sq ft) | | 0.87 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.30 | |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | 3.59 | 24.91 | 0.54 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 3.05 | 21.13 | 0.36 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 1.023

INPUT
Description: Thalweg Sta. 329.08
Station Elevation Data num= 173

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.14 | 8.13 | 975.38 | 8.66 | 975.32 | 18.58 | 974.39 | 18.67 | 974.38 |
| 28.69 | 973.53 | 29.23 | 973.5 | 38.7 | 972.83 | 39.78 | 972.78 | 48.71 | 972.29 |
| 50.34 | 972.26 | 58.73 | 972.14 | 60.88 | 972.25 | 71.43 | 973.04 | 78.75 | 973.71 |
| 81.99 | 973.92 | 88.77 | 974.44 | 92.53 | 974.68 | 98.78 | 975.13 | 103.08 | 975.32 |
| 108.79 | 975.56 | 118.8 | 975.29 | 124.18 | 974.75 | 128.82 | 974.31 | 134.73 | 973.55 |
| 138.83 | 973.06 | 145.29 | 972.2 | 148.84 | 971.76 | 155.83 | 970.84 | 158.86 | 970.46 |
| 166.39 | 969.53 | 168.87 | 969.22 | 176.94 | 967.85 | 178.88 | 967.54 | 187.48 | 965.55 |
| 188.9 | 965.26 | 198.04 | 963.26 | 198.91 | 963.1 | 208.59 | 961.47 | 208.92 | 961.42 |
| 215.13 | 960.45 | 218.93 | 959.85 | 219.13 | 959.82 | 228.88 | 958.23 | 228.95 | 958.22 |
| 229.69 | 958.1 | 238.96 | 956.58 | 240.24 | 956.4 | 248.97 | 955 | 250.79 | 954.89 |
| 258.99 | 954.07 | 261.34 | 954.09 | 269 | 953.96 | 271.89 | 954.2 | 279.01 | 954.7 |
| 282.44 | 954.77 | 289.02 | 955.27 | 289.26 | 955.25 | 292.99 | 954.99 | 299.04 | 954.48 |
| 303.54 | 954.01 | 309.05 | 953.39 | 319.06 | 952.58 | 324.64 | 951.92 | 329.08 | 951.49 |
| 335.19 | 951.92 | 339.09 | 952.09 | 345.75 | 952.57 | 349.1 | 952.78 | 356.29 | 953.35 |
| 359.12 | 953.59 | 366.85 | 954.5 | 369.13 | 954.79 | 377.4 | 955.82 | 379.14 | 956.05 |
| 387.94 | 957.07 | 389.15 | 957.22 | 398.5 | 958.08 | 399.17 | 958.14 | 409.05 | 958.59 |
| 409.18 | 958.6 | 415.88 | 958.73 | 419.19 | 958.79 | 419.59 | 958.8 | 429.21 | 958.91 |
| 430.15 | 958.9 | 439.22 | 958.86 | 440.7 | 958.84 | 451.25 | 958.68 | 461.8 | 958.47 |
| 469.26 | 958.21 | 472.35 | 958.08 | 479.27 | 957.74 | 482.9 | 957.55 | 489.28 | 957.2 |
| 493.45 | 956.99 | 499.3 | 956.63 | 504 | 956.38 | 509.31 | 956.06 | 514.55 | 955.79 |
| 519.32 | 955.53 | 529.34 | 955.12 | 535.65 | 954.92 | 539.35 | 954.89 | 546.2 | 954.89 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 549.36 | 954.95 | 567.31 | 955.63 | 569.39 | 955.72 | 577.85 | 955.99 | 588.4 | 956.26 |
| 608.22 | 956.66 | 609.44 | 956.69 | 609.51 | 956.69 | 619.45 | 956.97 | 620.05 | 956.99 |
| 629.47 | 957.32 | 630.61 | 957.32 | 639.48 | 957.42 | 641.16 | 957.4 | 649.49 | 957.21 |
| 651.71 | 957.2 | 659.51 | 956.91 | 662.26 | 956.99 | 669.52 | 956.8 | 672.81 | 956.89 |
| 679.53 | 956.89 | 683.36 | 956.85 | 689.54 | 956.76 | 693.91 | 956.53 | 699.56 | 956.4 |
| 704.46 | 956.2 | 709.57 | 956.17 | 715.01 | 956.12 | 725.56 | 956.19 | 729.6 | 956.25 |
| 736.11 | 956.29 | 739.61 | 956.35 | 746.66 | 956.44 | 778.31 | 957.08 | 779.66 | 957.12 |
| 788.86 | 957.48 | 789.67 | 957.54 | 799.42 | 958.29 | 799.69 | 958.32 | 809.7 | 959.29 |
| 809.96 | 959.31 | 819.71 | 960.2 | 820.51 | 960.23 | 829.73 | 960.7 | 841.61 | 960.88 |
| 849.75 | 960.94 | 852.16 | 961.01 | 859.77 | 961.22 | 862.72 | 961.46 | 869.78 | 962.02 |
| 873.27 | 962.56 | 879.79 | 963.6 | 883.82 | 964.39 | 889.8 | 965.59 | 894.37 | 966.49 |
| 899.82 | 967.59 | 909.83 | 969.44 | 915.47 | 970.35 | 919.84 | 971.02 | 926.02 | 971.76 |
| 929.86 | 972.13 | 939.87 | 972.91 | 947.12 | 973.26 | 949.88 | 973.43 | 959.89 | 973.79 |
| 968.23 | 974.05 | 969.91 | 974.1 | 973.95 | 974.24 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .032 | 228.88 | .04 | 415.88 | .032 | 649.49 | .052 | 862.72 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 289.26 | 369.13 | 201.07 | 200 | 199.63 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 430.15 | 973.95 | 958.9 | F |

Right Levee Station= 430.15 Elevation= 958.9

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.40 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.31 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 955.09 | Reach Len. (ft) | 201.07 | 200.00 | 199.63 |
| Crit W.S. (ft) | 954.50 | Flow Area (sq ft) | 25.02 | 152.70 | 0.35 |
| E.G. Slope (ft/ft) | 0.006243 | Area (sq ft) | 25.02 | 152.70 | 0.35 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 55.32 | 702.39 | 0.29 |
| Top Width (ft) | 118.04 | Top Width (ft) | 38.15 | 77.51 | 2.37 |
| Vel Total (ft/s) | 4.26 | Avg. Vel. (ft/s) | 2.21 | 4.60 | 0.82 |
| Max Chl Dpth (ft) | 3.60 | Hydr. Depth (ft) | 0.66 | 1.97 | 0.15 |
| Conv. Total (cfs) | 9593.4 | Conv. (cfs) | 700.2 | 8889.6 | 3.6 |
| Length Wtd. (ft) | 200.21 | Wetted Per. (ft) | 38.25 | 77.83 | 2.39 |
| Min Ch El (ft) | 951.49 | Shear (lb/sq ft) | 0.25 | 0.76 | 0.06 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.56 | 3.52 | 0.05 |
| Frctn Loss (ft) | 1.65 | Cum Volume (acre-ft) | 14.66 | 18.81 | 4.43 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 21.57 | 20.74 | 8.82 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.71 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 955.43 | Reach Len. (ft) | 201.07 | 200.00 | 199.63 |
| Crit W.S. (ft) | 954.45 | Flow Area (sq ft) | | 180.03 | |
| E.G. Slope (ft/ft) | 0.004431 | Area (sq ft) | | 180.03 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 79.87 | Top Width (ft) | | 79.87 | |
| Vel Total (ft/s) | 4.21 | Avg. Vel. (ft/s) | | 4.21 | |
| Max Chl Dpth (ft) | 3.94 | Hydr. Depth (ft) | | 2.25 | |
| Conv. Total (cfs) | 11387.8 | Conv. (cfs) | | 11387.8 | |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 81.02 | |
| Min Ch El (ft) | 951.49 | Shear (lb/sq ft) | | 0.61 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.59 | |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 1.34 | 25.52 | 0.07 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.74 | 20.78 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.70 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.27 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 955.43 | Reach Len. (ft) | 201.07 | 200.00 | 199.63 |
| Crit W.S. (ft) | 954.45 | Flow Area (sq ft) | | 179.95 | 1.64 |
| E.G. Slope (ft/ft) | 0.004368 | Area (sq ft) | | 179.95 | 1.64 |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 756.13 | 1.87 |
| Top Width (ft) | 85.00 | Top Width (ft) | | 79.87 | 5.13 |
| Vel Total (ft/s) | 4.17 | Avg. Vel. (ft/s) | | 4.20 | 1.14 |
| Max Chl Dpth (ft) | 3.94 | Hydr. Depth (ft) | | 2.25 | 0.32 |
| Conv. Total (cfs) | 11468.8 | Conv. (cfs) | | 11440.5 | 28.3 |
| Length Wtd. (ft) | 200.00 | Wetted Per. (ft) | | 80.38 | 5.17 |
| Min Ch El (ft) | 951.49 | Shear (lb/sq ft) | | 0.61 | 0.09 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 2.57 | 0.10 |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | 3.59 | 24.14 | 0.53 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.05 | 20.78 | 0.34 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.985

INPUT
Description: Thalweg Sta. 278.94
Station Elevation Data num= 144

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 963.24 | 4.17 | 963.78 | 8.17 | 964.25 | 15.02 | 964.79 | 18.2 | 964.97 |
| 25.87 | 965.18 | 28.23 | 965.23 | 38.26 | 965.29 | 47.56 | 965.26 | 48.29 | 965.26 |
| 57.09 | 965.02 | 58.32 | 964.99 | 58.42 | 964.98 | 68.34 | 964.41 | 69.27 | 964.34 |
| 78.37 | 963.77 | 86.2 | 963.23 | 88.4 | 963.09 | 90.96 | 962.87 | 98.43 | 962.19 |
| 101.81 | 961.79 | 108.46 | 961.09 | 112.66 | 960.52 | 118.49 | 959.95 | 123.5 | 959.28 |
| 128.52 | 958.75 | 134.35 | 958.02 | 138.54 | 957.56 | 145.2 | 956.88 | 158.6 | 955.58 |
| 166.89 | 954.7 | 177.75 | 953.46 | 178.66 | 953.35 | 182.01 | 953.02 | 188.6 | 952.38 |
| 188.69 | 952.37 | 198.72 | 951.94 | 199.44 | 951.93 | 208.74 | 951.91 | 210.29 | 951.93 |
| 218.77 | 952.08 | 221.14 | 952.16 | 228.8 | 952.44 | 231.98 | 952.52 | 238.83 | 953.01 |
| 239.12 | 953 | 242.83 | 952.84 | 248.86 | 952.47 | 253.68 | 952.14 | 258.89 | 951.69 |
| 264.53 | 951.33 | 268.91 | 951.03 | 275.37 | 950.39 | 278.94 | 950.08 | 286.22 | 950.97 |
| 288.97 | 951.26 | 297.07 | 952.38 | 299 | 952.62 | 309.03 | 954.05 | 318.77 | 955.47 |
| 319.06 | 955.51 | 328.98 | 956.35 | 329.09 | 956.36 | 329.62 | 956.37 | 339.11 | 956.43 |
| 340.47 | 956.4 | 351.31 | 956.1 | 359.17 | 955.78 | 362.16 | 955.63 | 369.2 | 955.05 |
| 373.01 | 954.64 | 379.23 | 953.81 | 383.85 | 953.36 | 389.26 | 953.1 | 394.7 | 952.98 |
| 399.29 | 952.97 | 405.55 | 953 | 409.31 | 953.03 | 416.4 | 953.07 | 419.34 | 953.08 |
| 429.37 | 953.13 | 438.1 | 953.2 | 439.4 | 953.24 | 448.95 | 953.5 | 449.43 | 953.53 |
| 459.17 | 953.81 | 459.46 | 953.81 | 459.79 | 953.82 | 469.48 | 953.99 | 470.64 | 954.03 |
| 479.51 | 954.19 | 487.14 | 953.96 | 492.34 | 953.94 | 498.8 | 953.83 | 499.57 | 953.82 |
| 509.6 | 954.12 | 514.03 | 954.3 | 519.63 | 954.51 | 524.88 | 954.65 | 529.66 | 954.76 |
| 535.72 | 954.88 | 539.68 | 954.94 | 546.57 | 955.11 | 549.71 | 955.25 | 557.42 | 955.55 |
| 559.74 | 955.68 | 568.28 | 956.03 | 569.77 | 956.12 | 579.12 | 956.48 | 579.8 | 956.52 |
| 588.11 | 956.73 | 589.83 | 956.78 | 589.97 | 956.78 | 599.85 | 956.93 | 600.82 | 956.92 |
| 609.88 | 957.01 | 611.66 | 957.08 | 619.91 | 957.06 | 622.51 | 957.3 | 629.94 | 958.12 |
| 639.97 | 958.98 | 644.21 | 959.27 | 650 | 959.72 | 660.03 | 960.82 | 665.9 | 961.62 |
| 670.05 | 962.14 | 676.75 | 963.18 | 680.08 | 963.68 | 687.59 | 964.98 | 690.11 | 965.43 |
| 698.45 | 966.82 | 700.14 | 967.14 | 709.3 | 968.46 | 710.17 | 968.61 | 720.15 | 969.87 |
| 720.87 | 969.95 | 730.23 | 970.87 | 730.99 | 970.9 | 740.25 | 971.28 | 741.84 | 971.29 |
| 750.28 | 971.42 | 752.69 | 971.44 | 760.31 | 971.7 | 761.53 | 971.71 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 182.01 | .052 | 498.8 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 239.12 | 328.98 | 211.92 | 199.9 | 182.24 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 339.11 | 761.53 | 956.43 | F |

Right Levee Station= 339.11 Elevation= 956.43

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 953.74 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.27 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 953.47 | Reach Len. (ft) | 211.92 | 199.90 | 182.24 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | 953.06 | Flow Area (sq ft) | 69.95 | 116.77 | |
| E.G. Slope (ft/ft) | 0.011327 | Area (sq ft) | 69.95 | 116.77 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 239.39 | 518.61 | |
| Top Width (ft) | 127.29 | Top Width (ft) | 61.45 | 65.84 | |
| Vel Total (ft/s) | 4.06 | Avg. Vel. (ft/s) | 3.42 | 4.44 | |
| Max Chl Dpth (ft) | 3.39 | Hydr. Depth (ft) | 1.14 | 1.77 | |
| Conv. Total (cfs) | 7122.1 | Conv. (cfs) | 2249.3 | 4872.8 | |
| Length Wtd. (ft) | 204.73 | Wetted Per. (ft) | 61.54 | 66.17 | |
| Min Ch El (ft) | 950.08 | Shear (lb/sq ft) | 0.80 | 1.25 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 2.75 | 5.54 | |
| Frctn Loss (ft) | 1.62 | Cum Volume (acre-ft) | 14.44 | 18.19 | 4.43 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 21.34 | 20.41 | 8.81 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 954.53 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 954.22 | Reach Len. (ft) | 211.92 | 199.90 | 182.24 |
| Crit W.S. (ft) | 953.29 | Flow Area (sq ft) | | 167.83 | |
| E.G. Slope (ft/ft) | 0.008179 | Area (sq ft) | | 167.83 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 71.04 | Top Width (ft) | | 71.04 | |
| Vel Total (ft/s) | 4.52 | Avg. Vel. (ft/s) | | 4.52 | |
| Max Chl Dpth (ft) | 4.14 | Hydr. Depth (ft) | | 2.36 | |
| Conv. Total (cfs) | 8381.4 | Conv. (cfs) | | 8381.4 | |
| Length Wtd. (ft) | 199.90 | Wetted Per. (ft) | | 72.65 | |
| Min Ch El (ft) | 950.08 | Shear (lb/sq ft) | | 1.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.33 | |
| Frctn Loss (ft) | 1.89 | Cum Volume (acre-ft) | 1.34 | 24.72 | 0.07 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.74 | 20.44 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 954.53 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 954.21 | Reach Len. (ft) | 211.92 | 199.90 | 182.24 |
| Crit W.S. (ft) | 953.29 | Flow Area (sq ft) | | 167.79 | |
| E.G. Slope (ft/ft) | 0.008185 | Area (sq ft) | | 167.79 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 71.04 | Top Width (ft) | | 71.04 | |
| Vel Total (ft/s) | 4.52 | Avg. Vel. (ft/s) | | 4.52 | |
| Max Chl Dpth (ft) | 4.13 | Hydr. Depth (ft) | | 2.36 | |
| Conv. Total (cfs) | 8378.4 | Conv. (cfs) | | 8378.4 | |
| Length Wtd. (ft) | 199.90 | Wetted Per. (ft) | | 72.64 | |
| Min Ch El (ft) | 950.08 | Shear (lb/sq ft) | | 1.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.33 | |
| Frctn Loss (ft) | 1.88 | Cum Volume (acre-ft) | 3.59 | 23.35 | 0.53 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.05 | 20.44 | 0.33 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.948

INPUT
Description: Thalweg Sta. 272.66
Station Elevation Data num= 128

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 969.56 | 5.04 | 969.54 | 10.33 | 969.59 | 17.03 | 969.14 | 19.97 | 968.89 |
| 21.26 | 968.75 | 32.19 | 967.51 | 35.13 | 967.17 | 41.8 | 966.32 | 43.12 | 966.14 |
| 44.16 | 965.86 | 54.05 | 963.92 | 63.73 | 961.78 | 64.98 | 961.47 | 66.58 | 961.17 |
| 70.21 | 960.44 | 75.91 | 959.29 | 83.28 | 957.66 | 86.84 | 956.73 | 97.77 | 954.26 |
| 102.84 | 953.49 | 108.7 | 952.47 | 116.12 | 951.6 | 119.63 | 951.2 | 122.41 | 951.08 |
| 130.56 | 950.61 | 140.89 | 950.47 | 141.49 | 950.46 | 141.96 | 950.46 | 152.42 | 950.38 |
| 161.53 | 950.36 | 163.35 | 950.35 | 165.67 | 950.36 | 185.21 | 950.4 | 196.14 | 950.45 |
| 207.08 | 950.61 | 215.21 | 951.11 | 217.15 | 951.24 | 218 | 951.3 | 220.21 | 951.34 |
| 228.72 | 951.88 | 228.93 | 951.89 | 239.76 | 950.86 | 239.86 | 950.85 | 239.98 | 950.84 |
| 250.79 | 950.14 | 261.73 | 949.82 | 264.75 | 949.68 | 272.66 | 949.22 | 278.9 | 949.55 |
| 283.58 | 949.66 | 289.53 | 950.06 | 292.99 | 950.3 | 294.51 | 950.43 | 298.45 | 950.76 |
| 305.45 | 951.31 | 308.16 | 951.5 | 314.3 | 951.92 | 316.3 | 952.05 | 316.38 | 952.06 |
| 318.01 | 952.03 | 327.31 | 951.92 | 337.58 | 951.39 | 338.23 | 951.37 | 349.16 | 951.12 |
| 360.1 | 951.19 | 371.03 | 951.37 | 376.7 | 951.44 | 392.88 | 951.68 | 403.82 | 952.04 |
| 411.84 | 952.48 | 414.75 | 952.65 | 425.68 | 953.46 | 435.38 | 954.02 | 436.61 | 954.1 |
| 438.16 | 954.17 | 447.53 | 954.73 | 454.94 | 955.2 | 458.47 | 955.45 | 469.4 | 956.19 |
| 474.5 | 956.48 | 480.33 | 956.87 | 487.71 | 957.33 | 491.26 | 957.49 | 494.07 | 957.49 |
| 502.19 | 957.75 | 512.48 | 957.37 | 513.12 | 957.36 | 513.62 | 957.38 | 534.05 | 957.72 |
| 533.19 | 958.41 | 534.98 | 958.54 | 537.25 | 958.76 | 545.91 | 959.52 | 552.74 | 960.28 |
| 556.84 | 960.77 | 562.02 | 961.41 | 566.01 | 961.82 | 567.77 | 961.98 | 573.59 | 962.54 |
| 578.7 | 963.07 | 581.18 | 963.32 | 586.8 | 963.93 | 589.63 | 964.23 | 591.87 | 964.46 |
| 600.56 | 965.32 | 611.42 | 966.15 | 611.49 | 966.15 | 611.57 | 966.16 | 622.42 | 966.36 |
| 630.99 | 966.13 | 633.35 | 966.13 | 636.34 | 966.04 | 644.28 | 965.96 | 650.54 | 966.31 |
| 655.21 | 966.41 | 661.11 | 966.9 | 666.14 | 967.54 | 670.11 | 967.95 | 677.07 | 968.84 |
| 685.89 | 969.71 | 688 | 969.85 | 698.93 | 971.28 | 702.52 | 971.79 | 709.86 | 972.96 |
| 710.66 | 973.08 | 720.79 | 974.73 | 723.79 | 975.09 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 70.21 | .052 | 411.84 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 228.72 | 316.3 | 191.62 | 199.88 | 208.84 | .1 | .3 |

Right Levee Station= 316.3 Elevation= 952.05

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 952.07 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 951.95 | Reach Len. (ft) | 191.62 | 199.88 | 208.84 |
| Crit W.S. (ft) | 951.27 | Flow Area (sq ft) | 145.28 | 133.11 | |
| E.G. Slope (ft/ft) | 0.005850 | Area (sq ft) | 145.28 | 133.11 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 369.54 | 388.46 | |
| Top Width (ft) | 201.69 | Top Width (ft) | 115.61 | 86.08 | |
| Vel Total (ft/s) | 2.72 | Avg. Vel. (ft/s) | 2.54 | 2.92 | |
| Max Chl Dpth (ft) | 2.73 | Hydr. Depth (ft) | 1.26 | 1.55 | |
| Conv. Total (cfs) | 9910.1 | Conv. (cfs) | 4831.3 | 5078.8 | |
| Length Wtd. (ft) | 198.49 | Wetted Per. (ft) | 115.71 | 86.27 | |
| Min Ch El (ft) | 949.22 | Shear (lb/sq ft) | 0.46 | 0.56 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 1.17 | 1.64 | |
| Frctn Loss (ft) | 1.47 | Cum Volume (acre-ft) | 13.92 | 17.62 | 4.43 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 20.91 | 20.06 | 8.81 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 952.65 | Element | | | |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 952.33 | Reach Len. (ft) | 191.62 | 199.88 | 208.84 |
| Crit W.S. (ft) | 951.72 | Flow Area (sq ft) | | 166.20 | |
| E.G. Slope (ft/ft) | 0.010994 | Area (sq ft) | | 166.20 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 87.58 | Top Width (ft) | | 87.58 | |
| Vel Total (ft/s) | 4.56 | Avg. Vel. (ft/s) | | 4.56 | |
| Max Chl Dpth (ft) | 3.11 | Hydr. Depth (ft) | | 1.90 | |
| Conv. Total (cfs) | 7229.1 | Conv. (cfs) | | 7229.1 | |
| Length Wtd. (ft) | 199.88 | Wetted Per. (ft) | | 88.50 | |
| Min Ch El (ft) | 949.22 | Shear (lb/sq ft) | | 1.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.88 | |
| Frctn Loss (ft) | 1.73 | Cum Volume (acre-ft) | 1.34 | 23.95 | 0.07 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 0.74 | 20.07 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 952.66 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 952.33 | Reach Len. (ft) | 191.62 | 199.88 | 208.84 |
| Crit W.S. (ft) | 951.70 | Flow Area (sq ft) | | 166.38 | |
| E.G. Slope (ft/ft) | 0.010957 | Area (sq ft) | | 166.38 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 87.58 | Top Width (ft) | | 87.58 | |
| Vel Total (ft/s) | 4.56 | Avg. Vel. (ft/s) | | 4.56 | |
| Max Chl Dpth (ft) | 3.11 | Hydr. Depth (ft) | | 1.90 | |
| Conv. Total (cfs) | 7241.3 | Conv. (cfs) | | 7241.3 | |
| Length Wtd. (ft) | 199.88 | Wetted Per. (ft) | | 88.51 | |
| Min Ch El (ft) | 949.22 | Shear (lb/sq ft) | | 1.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.86 | |
| Frctn Loss (ft) | 1.74 | Cum Volume (acre-ft) | 3.59 | 22.58 | 0.53 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 3.05 | 20.07 | 0.33 |

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.910

INPUT
Description: Thalweg Sta. 225.85
Station Elevation Data num= 126

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 957.53 | .85 | 957.53 | 1.41 | 957.5 | 11.08 | 957.34 | 14.43 | 957.07 |
| 21.3 | 956.61 | 27.45 | 956 | 40.47 | 954.85 | 41.76 | 954.74 | 51.99 | 954.09 |
| 53.49 | 954.02 | 62.21 | 953.52 | 72.44 | 953.02 | 79.53 | 952.69 | 82.67 | 952.56 |
| 92.55 | 952.08 | 92.9 | 952.07 | 93.38 | 952.04 | 94.18 | 952 | 103.12 | 951.51 |
| 105.56 | 951.32 | 113.08 | 950.91 | 113.35 | 950.89 | 118.58 | 950.58 | 123.58 | 950.39 |
| 131.59 | 950 | 133.81 | 949.95 | 141.88 | 949.54 | 144.03 | 949.47 | 144.61 | 949.47 |
| 154.26 | 949.23 | 157.63 | 949.22 | 164.49 | 949.16 | 174.71 | 949.11 | 183.67 | 948.99 |
| 195.17 | 948.89 | 205.4 | 948.88 | 225.85 | 949.1 | 235.75 | 948.87 | 236.08 | 948.86 |
| 237.26 | 948.82 | 246.31 | 948.55 | 248.77 | 948.58 | 256.53 | 948.7 | 261.79 | 948.97 |
| 266.76 | 949.1 | 274.81 | 950.25 | 276.99 | 950.51 | 278.68 | 950.49 | 284.95 | 950.42 |
| 287.21 | 950.36 | 295.23 | 949.9 | 297.44 | 949.82 | 307.67 | 949.57 | 313.87 | 949.6 |
| 317.9 | 949.61 | 326.89 | 949.66 | 332.65 | 949.71 | 338.35 | 949.73 | 339.91 | 949.74 |
| 348.58 | 949.81 | 358.81 | 949.92 | 365.94 | 950.05 | 369.03 | 950.1 | 378.96 | 950.28 |
| 379.26 | 950.29 | 380.35 | 950.3 | 385.2 | 950.38 | 389.49 | 950.45 | 391.98 | 950.51 |
| 399.72 | 950.67 | 409.94 | 950.95 | 413.13 | 951.06 | 438.4 | 951.67 | 440.63 | 951.74 |
| 446.82 | 951.96 | 450.85 | 952.09 | 457.08 | 952.26 | 461.08 | 952.39 | 470.1 | 952.59 |
| 471.31 | 952.62 | 475.74 | 952.64 | 481.54 | 952.7 | 483.12 | 952.7 | 491.76 | 952.86 |
| 496.14 | 952.99 | 501.99 | 953.19 | 509.16 | 953.63 | 512.22 | 953.78 | 522.18 | 954.36 |
| 522.44 | 954.38 | 523.43 | 954.41 | 532.67 | 954.73 | 535.2 | 954.79 | 542.9 | 954.94 |
| 563.35 | 955.44 | 573.58 | 955.64 | 574.26 | 955.66 | 583.81 | 955.9 | 587.28 | 956.06 |
| 594.04 | 956.33 | 600.29 | 956.67 | 604.26 | 956.86 | 613.31 | 957.07 | 614.49 | 957.1 |
| 624.72 | 957.02 | 626.33 | 956.98 | 634.94 | 956.82 | 639.35 | 956.76 | 645.17 | 956.66 |
| 652.37 | 956.92 | 655.4 | 957.21 | 665.39 | 958 | 665.63 | 958.02 | 675.85 | 959.06 |
| 678.41 | 959.21 | 686.08 | 959.93 | 691.43 | 960.1 | 696.31 | 960.46 | 704.45 | 960.49 |
| 706.54 | 960.55 | 714.2 | 961.47 | 716.76 | 961.81 | 717.47 | 961.89 | 726.99 | 963.38 |
| 729.54 | 963.61 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 93.38 | .052 | 385.2 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 123.58 | 278.68 | 165.2 | 199.87 | 216.77 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 950.60 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 950.44 | Reach Len. (ft) | 165.20 | 199.87 | 216.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.03 | 195.90 | 56.23 |
| E.G. Slope (ft/ft) | 0.009743 | Area (sq ft) | 0.03 | 195.90 | 56.23 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 0.01 | 651.68 | 106.31 |
| Top Width (ft) | 259.77 | Top Width (ft) | 1.30 | 152.82 | 105.65 |
| Vel Total (ft/s) | 3.01 | Avg. Vel. (ft/s) | 0.24 | 3.33 | 1.89 |
| Max Chl Dpth (ft) | 1.89 | Hydr. Depth (ft) | 0.02 | 1.28 | 0.53 |
| Conv. Total (cfs) | 7679.2 | Conv. (cfs) | 0.1 | 6602.1 | 1077.0 |
| Length Wtd. (ft) | 201.63 | Wetted Per. (ft) | 1.30 | 152.96 | 105.67 |
| Min Ch El (ft) | 948.55 | Shear (lb/sq ft) | 0.02 | 0.78 | 0.32 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 0.00 | 2.59 | 0.61 |
| Frctn Loss (ft) | 1.84 | Cum Volume (acre-ft) | 13.60 | 16.87 | 4.30 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 20.66 | 19.51 | 8.56 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 950.87 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 950.72 | Reach Len. (ft) | 165.20 | 199.87 | 216.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 238.59 | |
| E.G. Slope (ft/ft) | 0.007003 | Area (sq ft) | | 238.59 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 155.10 | Top Width (ft) | | 155.10 | |
| Vel Total (ft/s) | 3.18 | Avg. Vel. (ft/s) | | 3.18 | |
| Max Chl Dpth (ft) | 2.17 | Hydr. Depth (ft) | | 1.54 | |
| Conv. Total (cfs) | 9058.2 | Conv. (cfs) | | 9058.2 | |
| Length Wtd. (ft) | 199.87 | Wetted Per. (ft) | | 155.79 | |
| Min Ch El (ft) | 948.55 | Shear (lb/sq ft) | | 0.67 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.13 | |
| Frctn Loss (ft) | 1.31 | Cum Volume (acre-ft) | 1.34 | 23.02 | 0.07 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.74 | 19.52 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 950.87 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 950.71 | Reach Len. (ft) | 165.20 | 199.87 | 216.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 238.10 | |
| E.G. Slope (ft/ft) | 0.007051 | Area (sq ft) | | 238.10 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 155.10 | Top Width (ft) | | 155.10 | |
| Vel Total (ft/s) | 3.18 | Avg. Vel. (ft/s) | | 3.18 | |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 1.54 | |
| Conv. Total (cfs) | 9027.3 | Conv. (cfs) | | 9027.3 | |
| Length Wtd. (ft) | 199.87 | Wetted Per. (ft) | | 155.79 | |
| Min Ch El (ft) | 948.55 | Shear (lb/sq ft) | | 0.67 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.14 | |
| Frctn Loss (ft) | 1.27 | Cum Volume (acre-ft) | 3.59 | 21.65 | 0.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.05 | 19.52 | 0.33 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.872

INPUT
Description: Thalweg Sta. 213.34
Station Elevation Data num= 111

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 952.4 | 1.16 | 952.53 | 6.44 | 953.34 | 9.34 | 953.38 | 16.78 | 954.11 |
| 17.52 | 954.11 | 20.3 | 954.16 | 25.7 | 954.27 | 27.13 | 954.26 | 33.87 | 954.09 |
| 37.47 | 953.99 | 42.05 | 953.84 | 47.82 | 953.64 | 58.16 | 953.3 | 58.41 | 953.3 |
| 59.33 | 953.27 | 66.58 | 953.07 | 78.85 | 952.68 | 82.94 | 952.39 | 89.2 | 951.86 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 91.12 | 951.63 | 98.36 | 950.57 | 98.95 | 950.48 | 99.29 | 950.43 | 99.54 | 950.39 |
| 107.48 | 949.24 | 109.89 | 948.86 | 115.65 | 948.37 | 120.23 | 948.03 | 123.83 | 947.7 |
| 130.58 | 947.56 | 132.01 | 947.52 | 137.4 | 947.53 | 140.18 | 947.54 | 140.92 | 947.55 |
| 148.36 | 947.6 | 151 | 947.63 | 151.27 | 947.63 | 156.54 | 947.53 | 161.62 | 947.5 |
| 164.72 | 947.4 | 171.96 | 947.22 | 172.89 | 947.19 | 181.07 | 947.01 | 182.31 | 946.99 |
| 189.25 | 946.85 | 192.65 | 946.72 | 197.43 | 946.7 | 203 | 946.53 | 205.6 | 946.53 |
| 213.34 | 946.4 | 213.79 | 946.41 | 215.45 | 946.55 | 223.69 | 947.21 | 226.66 | 947.34 |
| 234.03 | 947.76 | 240.74 | 947.88 | 241.04 | 947.89 | 244.38 | 947.96 | 254.48 | 948.09 |
| 254.72 | 948.09 | 262.85 | 948.18 | 265.07 | 948.16 | 271.03 | 947.86 | 275.41 | 947.71 |
| 279.21 | 947.63 | 285.76 | 947.54 | 287.38 | 947.51 | 293.52 | 947.32 | 295.56 | 947.26 |
| 296.1 | 947.25 | 303.74 | 947.14 | 306.45 | 947.13 | 311.91 | 947.21 | 316.79 | 947.32 |
| 320.09 | 947.47 | 327.14 | 947.85 | 328.27 | 947.92 | 336.45 | 948.48 | 337.49 | 948.56 |
| 344.62 | 949.04 | 347.83 | 949.28 | 352.81 | 949.67 | 358.18 | 950.23 | 360.98 | 950.59 |
| 368.52 | 951.82 | 369.16 | 951.95 | 377.34 | 953.95 | 378.87 | 954.39 | 379.85 | 954.68 |
| 385.52 | 956.34 | 393.69 | 959.06 | 399.56 | 961.23 | 401.87 | 962.11 | 409.9 | 965.38 |
| 410.05 | 965.44 | 410.61 | 965.66 | 418.23 | 968.63 | 420.25 | 969.39 | 426.4 | 971.43 |
| 430.59 | 972.22 | 434.59 | 972.99 | 440.94 | 973.83 | 442.76 | 973.96 | 449.64 | 974.36 |
| 450.94 | 974.43 | 451.28 | 974.45 | 459.12 | 974.45 | 461.63 | 974.4 | 467.3 | 974.09 |
| 468.95 | 973.97 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 98.95 | .052 | 379.85 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 151 | 241.04 | 195.18 | 199.97 | 202.66 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 948.75 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 948.60 | Reach Len. (ft) | 195.18 | 199.97 | 202.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 32.57 | 135.14 | 86.31 |
| E.G. Slope (ft/ft) | 0.008590 | Area (sq ft) | 32.57 | 135.14 | 86.31 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 77.74 | 468.94 | 211.32 |
| Top Width (ft) | 225.11 | Top Width (ft) | 38.04 | 90.04 | 97.03 |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | 2.39 | 3.47 | 2.45 |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | 0.86 | 1.50 | 0.89 |
| Conv. Total (cfs) | 8178.6 | Conv. (cfs) | 838.7 | 5059.7 | 2280.1 |
| Length Wtd. (ft) | 198.97 | Wetted Per. (ft) | 38.08 | 90.10 | 97.09 |
| Min Ch El (ft) | 946.40 | Shear (lb/sq ft) | 0.46 | 0.80 | 0.48 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 1.09 | 2.79 | 1.17 |
| Frctn Loss (ft) | 1.73 | Cum Volume (acre-ft) | 13.53 | 16.11 | 3.94 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 20.58 | 18.95 | 8.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 949.56 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 949.34 | Reach Len. (ft) | 195.18 | 199.97 | 202.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 202.21 | |
| E.G. Slope (ft/ft) | 0.006133 | Area (sq ft) | | 202.21 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 90.04 | Top Width (ft) | | 90.04 | |
| Vel Total (ft/s) | 3.75 | Avg. Vel. (ft/s) | | 3.75 | |
| Max Chl Dpth (ft) | 2.94 | Hydr. Depth (ft) | | 2.25 | |
| Conv. Total (cfs) | 9678.8 | Conv. (cfs) | | 9678.8 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 93.27 | |
| Min Ch El (ft) | 946.40 | Shear (lb/sq ft) | | 0.83 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.11 | |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 1.34 | 22.01 | 0.07 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.74 | 18.95 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 949.60 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 949.39 | Reach Len. (ft) | 195.18 | 199.97 | 202.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 206.32 | |
| E.G. Slope (ft/ft) | 0.005742 | Area (sq ft) | | 206.32 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |

| | | | | | |
|---|---|---|---|---|---|
| Top Width (ft) | 90.04 | Top Width (ft) | | 90.04 | |
| Vel Total (ft/s) | 3.67 | Avg. Vel. (ft/s) | | 3.67 | |
| Max Chl Dpth (ft) | 2.99 | Hydr. Depth (ft) | | 2.29 | |
| Conv. Total (cfs) | 10002.8 | Conv. (cfs) | | 10002.8 | |
| Length Wtd. (ft) | 199.97 | Wetted Per. (ft) | | 93.36 | |
| Min Ch El (ft) | 946.40 | Shear (lb/sq ft) | | 0.79 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.91 | |
| Frctn Loss (ft) | 1.68 | Cum Volume (acre-ft) | 3.59 | 20.63 | 0.53 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 3.05 | 18.95 | 0.33 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.834

INPUT
Description: Thalweg Sta. 312.10
Station Elevation Data num= 142

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 967.24 | 3.94 | 967.48 | 4.49 | 967.5 | 6.04 | 967.58 | 12.31 | 967.85 |
| 14.57 | 967.93 | 20.13 | 967.96 | 25.19 | 967.95 | 27.95 | 967.87 | 35.61 | 967.73 |
| 35.82 | 967.73 | 43.58 | 967.45 | 46.45 | 967.4 | 51.4 | 967.04 | 57.07 | 966.71 |
| 59.22 | 966.45 | 65.17 | 965.89 | 67.03 | 965.7 | 67.7 | 965.63 | 74.85 | 964.61 |
| 78.33 | 964.22 | 82.66 | 963.54 | 88.95 | 962.54 | 90.48 | 962.27 | 94.73 | 961.12 |
| 98.3 | 960.21 | 99.58 | 959.76 | 106.11 | 957.48 | 110.2 | 955.96 | 113.93 | 954.62 |
| 119.37 | 952.68 | 120.83 | 952.16 | 121.75 | 951.85 | 124.3 | 951.02 | 129.57 | 949.29 |
| 131.46 | 948.86 | 137.38 | 947.74 | 142.08 | 947.25 | 145.2 | 946.91 | 152.71 | 946.4 |
| 153.02 | 946.38 | 153.87 | 946.34 | 160.83 | 945.94 | 163.33 | 945.86 | 168.65 | 945.76 |
| 173.96 | 945.75 | 176.47 | 945.75 | 183.43 | 945.72 | 184.59 | 945.72 | 192.1 | 945.68 |
| 195.22 | 945.64 | 199.91 | 945.65 | 205.84 | 945.55 | 207.73 | 945.56 | 212.99 | 945.53 |
| 215.55 | 945.52 | 216.47 | 945.51 | 227.09 | 945.52 | 231.18 | 945.54 | 237.72 | 945.63 |
| 239 | 945.64 | 242.57 | 945.71 | 246.82 | 945.78 | 248.35 | 945.81 | 258.97 | 946 |
| 262.45 | 946.05 | 269.6 | 946.08 | 270.27 | 946.07 | 272.13 | 946.03 | 272.76 | 946.02 |
| 278.08 | 945.92 | 280.23 | 945.9 | 285.9 | 945.7 | 290.85 | 945.4 | 293.72 | 945.26 |
| 301.48 | 944.8 | 301.69 | 944.78 | 309.35 | 944.36 | 312.1 | 944.2 | 317.17 | 944.36 |
| 322.73 | 944.92 | 324.98 | 945.12 | 331.25 | 945.8 | 332.8 | 945.96 | 333.36 | 946.02 |
| 343.98 | 946.74 | 348.44 | 946.95 | 354.61 | 947.18 | 354.75 | 947.18 | 356.25 | 947.23 |
| 360.82 | 947.35 | 364.07 | 947.41 | 365.24 | 947.45 | 371.89 | 947.75 | 375.86 | 948.01 |
| 379.7 | 948.22 | 386.49 | 948.65 | 387.52 | 948.73 | 390.39 | 948.84 | 395.34 | 949.05 |
| 397.12 | 949.08 | 403.15 | 949.31 | 407.74 | 949.35 | 408.3 | 949.34 | 418.37 | 949.18 |
| 418.78 | 949.17 | 419.95 | 949.13 | 426.6 | 948.92 | 428.99 | 948.87 | 434.42 | 948.72 |
| 439.62 | 948.59 | 442.24 | 948.51 | 450.05 | 948.22 | 450.25 | 948.21 | 457.87 | 947.41 |
| 460.87 | 947.05 | 465.69 | 949.1 | 471.5 | 950.96 | 473.51 | 951.65 | 479.08 | 953.19 |
| 481.32 | 953.85 | 482.13 | 954.03 | 489.14 | 954.14 | 492.75 | 954.34 | 496.95 | 954.49 |
| 498.1 | 954.57 | 503.38 | 954.91 | 504.77 | 955.05 | 508.65 | 955.5 | 512.59 | 955.98 |
| 514 | 956.14 | 520.4 | 956.85 | 524.63 | 957.25 | 528.22 | 957.46 | 535.26 | 957.75 |
| 536.04 | 957.77 | 538.21 | 957.75 | 543.85 | 957.68 | 545.89 | 957.57 | 551.67 | 957.35 |
| 556.51 | 957.07 | 557.78 | 957.02 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 119.37 | .052 | 408.3 | .045 | 498.1 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 272.76 | 333.36 | 213.72 | 199.9 | 188.81 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 407.74 | 557.78 | 949.35 | F |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 947.01 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 946.84 | Reach Len. (ft) | 213.72 | 199.90 | 188.81 |
| Crit W.S. (ft) | 946.43 | Flow Area (sq ft) | 131.67 | 102.11 | 5.00 |
| E.G. Slope (ft/ft) | 0.008834 | Area (sq ft) | 131.67 | 102.11 | 5.00 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 363.05 | 387.77 | 7.18 |
| Top Width (ft) | 199.90 | Top Width (ft) | 126.54 | 60.60 | 12.76 |
| Vel Total (ft/s) | 3.17 | Avg. Vel. (ft/s) | 2.76 | 3.80 | 1.44 |
| Max Chl Dpth (ft) | 2.64 | Hydr. Depth (ft) | 1.04 | 1.69 | 0.39 |
| Conv. Total (cfs) | 8064.9 | Conv. (cfs) | 3862.8 | 4125.7 | 76.4 |
| Length Wtd. (ft) | 204.60 | Wetted Per. (ft) | 126.58 | 60.74 | 12.79 |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 944.20 | Shear (lb/sq ft) | 0.57 | 0.93 | 0.22 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 1.58 | 3.52 | 0.31 |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | 13.17 | 15.56 | 3.73 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 20.21 | 18.61 | 7.80 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 948.16 | Element | | | |
| Vel Head (ft) | 0.34 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 947.82 | Reach Len. (ft) | 213.72 | 199.90 | 188.81 |
| Crit W.S. (ft) | 946.84 | Flow Area (sq ft) | | 161.21 | |
| E.G. Slope (ft/ft) | 0.007954 | Area (sq ft) | | 161.21 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 60.60 | Top Width (ft) | | 60.60 | |
| Vel Total (ft/s) | 4.70 | Avg. Vel. (ft/s) | | 4.70 | |
| Max Chl Dpth (ft) | 3.62 | Hydr. Depth (ft) | | 2.66 | |
| Conv. Total (cfs) | 8499.1 | Conv. (cfs) | | 8499.1 | |
| Length Wtd. (ft) | 201.71 | Wetted Per. (ft) | | 64.33 | |
| Min Ch El (ft) | 944.20 | Shear (lb/sq ft) | | 1.24 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.85 | |
| Frctn Loss (ft) | 1.64 | Cum Volume (acre-ft) | 1.34 | 21.18 | 0.07 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.74 | 18.61 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 947.89 | Element | | | |
| Vel Head (ft) | 0.48 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 947.41 | Reach Len. (ft) | 213.72 | 199.90 | 188.81 |
| Crit W.S. (ft) | 946.84 | Flow Area (sq ft) | | 136.86 | |
| E.G. Slope (ft/ft) | 0.013501 | Area (sq ft) | | 136.86 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 60.60 | Top Width (ft) | | 60.60 | |
| Vel Total (ft/s) | 5.54 | Avg. Vel. (ft/s) | | 5.54 | |
| Max Chl Dpth (ft) | 3.21 | Hydr. Depth (ft) | | 2.26 | |
| Conv. Total (cfs) | 6523.7 | Conv. (cfs) | | 6523.7 | |
| Length Wtd. (ft) | 199.41 | Wetted Per. (ft) | | 63.52 | |
| Min Ch El (ft) | 944.20 | Shear (lb/sq ft) | | 1.82 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 10.06 | |
| Frctn Loss (ft) | 1.60 | Cum Volume (acre-ft) | 3.59 | 19.84 | 0.53 |
| C & E Loss (ft) | 0.09 | Cum SA (acres) | 3.05 | 18.61 | 0.33 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.796

INPUT
Description: Thalweg Sta. 332.93
Station Elevation Data num= 127

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.03 | .52 | 969.99 | 2.93 | 969.75 | 10.47 | 968.95 | 12.93 | 968.66 |
| 20.42 | 967.83 | 22.93 | 967.5 | 30.37 | 966.63 | 32.93 | 966.12 | 40.32 | 964.46 |
| 42.93 | 963.71 | 50.27 | 962.09 | 52.93 | 961.31 | 60.22 | 960.16 | 62.93 | 959.67 |
| 70.17 | 958.82 | 72.93 | 958.43 | 80.12 | 957.59 | 82.93 | 957.28 | 86.27 | 956.79 |
| 90.07 | 956.24 | 92.93 | 955.92 | 100.02 | 954.75 | 102.93 | 954.37 | 109.97 | 952.43 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 112.93 | 951.93 | 119.92 | 950.06 | 122.93 | 949.44 | 129.87 | 947.84 | 132.93 | 947.26 |
| 139.82 | 946.19 | 142.93 | 945.8 | 149.77 | 945.31 | 152.93 | 945.12 | 159.72 | 944.86 |
| 162.93 | 944.73 | 169.67 | 944.52 | 172.93 | 944.41 | 179.62 | 944.3 | 182.93 | 944.26 |
| 192.93 | 944.29 | 199.52 | 944.33 | 209.47 | 944.35 | 222.93 | 944.32 | 229.37 | 944.23 |
| 232.93 | 944.19 | 242.93 | 944 | 249.27 | 944.16 | 252.93 | 944.26 | 259.22 | 944.41 |
| 262.93 | 944.51 | 272.93 | 944.46 | 279.12 | 944.55 | 282.93 | 944.59 | 289.07 | 944.7 |
| 292.93 | 944.78 | 299.02 | 944.82 | 302.93 | 944.88 | 308.97 | 944.93 | 311.86 | 944.92 |
| 312.93 | 944.92 | 318.92 | 944.5 | 322.93 | 944.23 | 328.87 | 943.43 | 332.93 | 942.92 |
| 342.93 | 943.34 | 352.93 | 943.86 | 358.72 | 943.96 | 362.07 | 944.01 | 362.93 | 944.02 |
| 402.94 | 944.4 | 428.38 | 944.59 | 432.94 | 944.61 | 442.94 | 944.7 | 448.28 | 944.78 |
| 452.94 | 944.84 | 458.23 | 945.01 | 462.94 | 945.14 | 463.9 | 945.23 | 468.18 | 945.62 |
| 472.94 | 946.02 | 478.13 | 946.61 | 482.94 | 947.24 | 488.08 | 947.33 | 492.94 | 947.48 |
| 498.03 | 947.06 | 502.94 | 946.8 | 507.98 | 947 | 512.94 | 947.05 | 517.92 | 946.95 |
| 522.94 | 946.83 | 532.94 | 946.36 | 537.82 | 946.34 | 542.94 | 946.33 | 547.77 | 946.4 |
| 552.94 | 946.49 | 562.94 | 946.72 | 567.67 | 946.92 | 572.94 | 947.16 | 577.62 | 947.71 |
| 582.94 | 948.35 | 587.57 | 949.3 | 592.94 | 950.36 | 597.52 | 951.4 | 602.94 | 952.57 |
| 607.47 | 953.47 | 612.94 | 954.58 | 617.42 | 954.99 | 622.94 | 956 | 627.37 | 956.35 |
| 632.94 | 957.18 | 637.32 | 957.55 | 642.94 | 958.23 | 647.27 | 958.61 | 652.94 | 959.12 |
| 662.94 | 959.96 | 667.17 | 960.27 | 672.94 | 960.72 | 677.12 | 960.96 | 682.94 | 961.32 |
| 687.07 | 961.35 | 692.94 | 961.47 | 697.02 | 961.3 | 700.09 | 961.2 | 702.94 | 961.1 |
| 706.97 | 960.71 | 707.16 | 960.7 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 86.27 | .052 | 463.9 | .045 | 700.09 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 311.86 | 362.07 | 208.44 | 199.81 | 189.24 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 945.48 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 945.39 | Reach Len. (ft) | 208.44 | 199.81 | 189.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 148.41 | 80.64 | 92.41 |
| E.G. Slope (ft/ft) | 0.006229 | Area (sq ft) | 148.41 | 80.64 | 92.41 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 314.12 | 248.98 | 194.89 |
| Top Width (ft) | 316.96 | Top Width (ft) | 163.18 | 50.21 | 103.57 |
| Vel Total (ft/s) | 2.36 | Avg. Vel. (ft/s) | 2.12 | 3.09 | 2.11 |
| Max Chl Dpth (ft) | 2.47 | Hydr. Depth (ft) | 0.91 | 1.61 | 0.89 |
| Conv. Total (cfs) | 9604.4 | Conv. (cfs) | 3980.2 | 3154.8 | 2469.5 |
| Length Wtd. (ft) | 200.21 | Wetted Per. (ft) | 163.22 | 50.34 | 103.59 |
| Min Ch El (ft) | 942.92 | Shear (lb/sq ft) | 0.35 | 0.62 | 0.35 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.75 | 1.92 | 0.73 |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 12.48 | 15.14 | 3.52 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 19.50 | 18.35 | 7.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 946.50 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 946.21 | Reach Len. (ft) | 208.44 | 199.81 | 189.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 59.96 | 122.10 | |
| E.G. Slope (ft/ft) | 0.008350 | Area (sq ft) | 59.96 | 122.10 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 198.67 | 559.33 | |
| Top Width (ft) | 90.40 | Top Width (ft) | 40.19 | 50.21 | |
| Vel Total (ft/s) | 4.16 | Avg. Vel. (ft/s) | 3.31 | 4.58 | |
| Max Chl Dpth (ft) | 3.29 | Hydr. Depth (ft) | 1.49 | 2.43 | |
| Conv. Total (cfs) | 8295.1 | Conv. (cfs) | 2174.1 | 6121.0 | |
| Length Wtd. (ft) | 200.94 | Wetted Per. (ft) | 41.94 | 52.55 | |
| Min Ch El (ft) | 942.92 | Shear (lb/sq ft) | 0.75 | 1.21 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 2.47 | 5.55 | |
| Frctn Loss (ft) | 1.48 | Cum Volume (acre-ft) | 1.20 | 20.53 | 0.07 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.64 | 18.35 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 946.20 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 946.03 | Reach Len. (ft) | 208.44 | 199.81 | 189.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 52.65 | 112.96 | 74.73 |

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.005317 | Area (sq ft) | 52.65 | 112.96 | 74.73 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 128.00 | 403.38 | 226.61 |
| Top Width (ft) | 131.34 | Top Width (ft) | 40.20 | 50.21 | 40.93 |
| Vel Total (ft/s) | 3.15 | Avg. Vel. (ft/s) | 2.43 | 3.57 | 3.03 |
| Max Chl Dpth (ft) | 3.11 | Hydr. Depth (ft) | 1.31 | 2.25 | 1.83 |
| Conv. Total (cfs) | 10395.2 | Conv. (cfs) | 1755.4 | 5532.0 | 3107.8 |
| Length Wtd. (ft) | 198.96 | Wetted Per. (ft) | 41.77 | 50.34 | 42.56 |
| Min Ch El (ft) | 942.92 | Shear (lb/sq ft) | 0.42 | 0.74 | 0.58 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 1.02 | 2.66 | 1.77 |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 3.46 | 19.27 | 0.37 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.95 | 18.35 | 0.24 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.758

INPUT
Description: Thalweg Sta. 350.95
Station Elevation Data num= 132

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 967.39 | .98 | 967.5 | 6.05 | 968.14 | 15.99 | 969 | 16.5 | 969.06 |
| 17.67 | 969.09 | 26.96 | 969.27 | 31 | 969.18 | 37.41 | 969.06 | 46.02 | 968.47 |
| 47.86 | 968.37 | 52.08 | 967.84 | 58.31 | 967.01 | 61.03 | 966.56 | 68.76 | 965.32 |
| 76.05 | 964.13 | 79.21 | 963.6 | 86.48 | 962.52 | 89.66 | 962.06 | 91.05 | 961.87 |
| 100.12 | 960.49 | 106.07 | 959.5 | 110.56 | 958.72 | 120.87 | 956.86 | 121.02 | 956.83 |
| 121.08 | 956.82 | 136.1 | 954.1 | 141.92 | 953.06 | 151.11 | 951.61 | 152.37 | 951.4 |
| 155.27 | 951.03 | 162.82 | 949.9 | 166.13 | 949.54 | 173.27 | 948.81 | 181.13 | 948.34 |
| 183.72 | 948.17 | 189.66 | 947.75 | 194.18 | 947.22 | 195.48 | 947.09 | 196.14 | 947.02 |
| 204.63 | 945.92 | 211.16 | 945.28 | 215.08 | 944.72 | 224.06 | 943.64 | 225.53 | 943.54 |
| 226.17 | 943.49 | 235.98 | 943.03 | 241.19 | 943.07 | 246.43 | 943.07 | 256.2 | 943.24 |
| 256.88 | 943.26 | 267.34 | 943.12 | 271.22 | 943.05 | 277.79 | 942.92 | 286.22 | 942.9 |
| 288.24 | 942.89 | 298.69 | 942.96 | 301.24 | 943 | 309.14 | 943.05 | 319.59 | 943.15 |
| 319.75 | 943.15 | 327.26 | 942.99 | 330.05 | 942.89 | 331.27 | 942.79 | 340.5 | 942.06 |
| 346.28 | 941.35 | 350.95 | 940.79 | 361.28 | 941.82 | 361.4 | 941.83 | 361.65 | 941.84 |
| 369.48 | 942.27 | 371.85 | 942.41 | 376.3 | 942.51 | 382.3 | 942.66 | 391.31 | 942.94 |
| 392.75 | 943 | 393.05 | 943 | 403.21 | 943.13 | 413.66 | 943.03 | 424.11 | 942.88 |
| 430.45 | 942.85 | 434.56 | 942.84 | 445.01 | 942.96 | 451.37 | 943.07 | 455.46 | 943.15 |
| 464.85 | 943.38 | 465.91 | 943.4 | 466.39 | 943.42 | 476.37 | 943.86 | 481.39 | 944.47 |
| 486.82 | 945.1 | 488.7 | 945.43 | 496.41 | 946.8 | 497.27 | 946.96 | 507.72 | 947.66 |
| 511.42 | 947.22 | 518.17 | 946.53 | 526.43 | 947.38 | 528.62 | 947.56 | 533.64 | 949.02 |
| 539.07 | 950.82 | 541.45 | 951.51 | 549.53 | 953.72 | 556.42 | 954.78 | 559.98 | 955.37 |
| 561.86 | 955.55 | 568.04 | 956.29 | 570.43 | 956.54 | 571.47 | 956.64 | 580.88 | 957.42 |
| 586.48 | 957.83 | 591.33 | 958.15 | 601.5 | 958.89 | 601.78 | 958.9 | 602.44 | 958.95 |
| 612.23 | 959.62 | 616.51 | 960.43 | 622.69 | 961.72 | 631.53 | 963.64 | 633.14 | 964.06 |
| 636.84 | 964.65 | 643.59 | 965.62 | 654.04 | 966.68 | 661.56 | 967.26 | 664.49 | 967.45 |
| 671.23 | 967.69 | 674.94 | 967.81 | 676.56 | 967.84 | 685.39 | 967.91 | 691.57 | 967.87 |
| 695.85 | 967.83 | 698.14 | 967.75 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 195.48 | .052 | 488.7 | .045 | 556.42 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 319.75 | 393.05 | 201.91 | 200.01 | 197.71 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 944.04 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 943.89 | Reach Len. (ft) | 201.91 | 200.01 | 197.71 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 78.00 | 120.76 | 65.91 |
| E.G. Slope (ft/ft) | 0.008282 | Area (sq ft) | 78.00 | 120.76 | 65.91 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 174.42 | 437.32 | 146.26 |
| Top Width (ft) | 254.69 | Top Width (ft) | 97.80 | 73.30 | 83.59 |
| Vel Total (ft/s) | 2.86 | Avg. Vel. (ft/s) | 2.24 | 3.62 | 2.22 |
| Max Chl Dpth (ft) | 3.10 | Hydr. Depth (ft) | 0.80 | 1.65 | 0.79 |
| Conv. Total (cfs) | 8329.0 | Conv. (cfs) | 1916.5 | 4805.3 | 1607.2 |
| Length Wtd. (ft) | 200.64 | Wetted Per. (ft) | 97.83 | 73.49 | 83.61 |
| Min Ch El (ft) | 940.79 | Shear (lb/sq ft) | 0.41 | 0.85 | 0.41 |
| Alpha | 1.18 | Stream Power (lb/ft s) | 0.92 | 3.08 | 0.90 |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 11.94 | 14.68 | 3.17 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 18.88 | 18.07 | 7.14 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 945.02 | Element | | | |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 944.75 | Reach Len. (ft) | 201.91 | 200.01 | 197.71 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 183.86 | |
| E.G. Slope (ft/ft) | 0.006505 | Area (sq ft) | | 183.86 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 73.30 | Top Width (ft) | | 73.30 | |
| Vel Total (ft/s) | 4.12 | Avg. Vel. (ft/s) | | 4.12 | |
| Max Chl Dpth (ft) | 3.96 | Hydr. Depth (ft) | | 2.51 | |
| Conv. Total (cfs) | 9398.4 | Conv. (cfs) | | 9398.4 | |
| Length Wtd. (ft) | 200.21 | Wetted Per. (ft) | | 76.85 | |
| Min Ch El (ft) | 940.79 | Shear (lb/sq ft) | | 0.97 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.01 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 1.05 | 19.83 | 0.07 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.55 | 18.07 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 944.89 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 944.59 | Reach Len. (ft) | 201.91 | 200.01 | 197.71 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 171.81 | |
| E.G. Slope (ft/ft) | 0.008108 | Area (sq ft) | | 171.81 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 73.30 | Top Width (ft) | | 73.30 | |
| Vel Total (ft/s) | 4.41 | Avg. Vel. (ft/s) | | 4.41 | |
| Max Chl Dpth (ft) | 3.80 | Hydr. Depth (ft) | | 2.34 | |
| Conv. Total (cfs) | 8418.2 | Conv. (cfs) | | 8418.2 | |
| Length Wtd. (ft) | 200.16 | Wetted Per. (ft) | | 76.52 | |
| Min Ch El (ft) | 940.79 | Shear (lb/sq ft) | | 1.14 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.01 | |
| Frctn Loss (ft) | 1.20 | Cum Volume (acre-ft) | 3.34 | 18.62 | 0.20 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 2.86 | 18.07 | 0.16 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.720

INPUT
Description: Thalweg Sta. 657.08
Station Elevation Data num= 171

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.02 | .07 | 970.02 | 4.98 | 969.66 | 10.71 | 969.15 | 13.98 | 968.78 |
| 21.35 | 967.99 | 30.67 | 966.13 | 31.98 | 965.95 | 34.29 | 965.78 | 42.62 | 964.96 |
| 45.6 | 964.86 | 48.21 | 964.78 | 53.26 | 964.15 | 63.9 | 963.02 | 64.06 | 962.99 |
| 74.54 | 961.38 | 80.75 | 960.39 | 85.17 | 959.63 | 92.94 | 958.33 | 95.81 | 957.86 |
| 97.44 | 957.59 | 106.45 | 955.98 | 114.14 | 954.69 | 122.27 | 953.25 | 127.72 | 952.31 |
| 130.83 | 951.82 | 138.36 | 950.56 | 147.52 | 949.32 | 149 | 949.1 | 151.6 | 948.79 |
| 159.64 | 947.92 | 164.22 | 947.49 | 170.27 | 946.9 | 180.91 | 946.27 | 191.55 | 946.43 |
| 197.6 | 945.8 | 202.19 | 945.35 | 210.24 | 944.13 | 212.83 | 943.8 | 214.29 | 943.73 |
| 223.46 | 942.79 | 231 | 942.71 | 234.1 | 942.62 | 239.57 | 942.59 | 247.69 | 942.57 |
| 255.38 | 942.51 | 266.01 | 942.45 | 276.65 | 942.42 | 281.07 | 942.38 | 287.29 | 942.34 |
| 297.77 | 942.15 | 298.21 | 942.15 | 319.2 | 941.75 | 327.54 | 941.62 | 329.84 | 941.59 |
| 340.48 | 941.51 | 351.12 | 941.5 | 356.86 | 941.52 | 361.75 | 941.55 | 364.54 | 941.56 |
| 372.39 | 941.6 | 404.3 | 941.54 | 414.94 | 941.55 | 415.51 | 941.56 | 444.83 | 941.67 |
| 464.69 | 941.68 | 468.13 | 941.69 | 489.4 | 941.67 | 498.09 | 941.68 | 500.04 | 941.69 |
| 521.32 | 941.73 | 531.46 | 941.65 | 531.96 | 941.65 | 532.81 | 941.63 | 553.23 | 941.25 |
| 562.13 | 941.47 | 564.86 | 941.55 | 574.51 | 941.92 | 581.55 | 942.03 | 585.14 | 942.05 |
| 595.78 | 942.03 | 598.25 | 942.01 | 606.42 | 941.97 | 617.06 | 941.86 | 620.78 | 941.85 |
| 627.74 | 941.85 | 631.63 | 941.65 | 638.33 | 941.39 | 648.32 | 940.58 | 648.97 | 940.53 |
| 650.11 | 940.49 | 657.08 | 940.27 | 659.61 | 940.3 | 670.25 | 941.05 | 672.69 | 941.21 |
| 679.43 | 941.6 | 680.88 | 941.68 | 681.71 | 941.7 | 691.52 | 942.01 | 692.42 | 942.03 |
| 698.4 | 942.17 | 702.16 | 942.27 | 708.75 | 942.39 | 712.8 | 942.44 | 715.09 | 942.48 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 723.43 | 942.61 | 731.79 | 942.77 | 734.07 | 942.81 | 738.08 | 942.94 | 744.71 | 943.22 |
| 748.48 | 943.67 | 755.35 | 944.33 | 759.23 | 944.93 | 765.17 | 945.84 | 765.98 | 945.96 |
| 767.4 | 946.05 | 776.62 | 946.41 | 781.86 | 946.45 | 787.26 | 946.28 | 796.73 | 947.14 |
| 797.9 | 947.23 | 798.57 | 947.16 | 808.53 | 946.52 | 815.26 | 945.87 | 819.17 | 945.48 |
| 826.04 | 945.11 | 829.81 | 944.95 | 831.95 | 944.93 | 840.45 | 944.93 | 848.65 | 945.07 |
| 851.09 | 945.13 | 855.37 | 945.22 | 861.72 | 945.33 | 865.34 | 945.42 | 872.36 | 945.62 |
| 882.03 | 946.1 | 883 | 946.15 | 884.7 | 946.23 | 893.64 | 946.78 | 898.72 | 947.06 |
| 904.27 | 947.32 | 914.02 | 947.71 | 914.91 | 947.74 | 915.42 | 947.75 | 925.55 | 948.03 |
| 932.11 | 948.2 | 936.19 | 948.4 | 943.35 | 948.7 | 946.82 | 948.78 | 948.8 | 948.76 |
| 957.46 | 948.86 | 965.49 | 948.68 | 968.1 | 948.59 | 972.67 | 948.54 | 978.74 | 948.7 |
| 982.19 | 949.19 | 989.38 | 950 | 998.88 | 952 | 1000.01 | 952.19 | 1001.99 | 952.59 |
| 1010.65 | 953.91 | 1015.57 | 954.39 | 1021.29 | 955.15 | 1031.32 | 955.68 | 1031.93 | 955.68 |
| 1032.28 | 955.69 | 1042.56 | 955.77 | 1048.97 | 955.56 | 1050.83 | 955.52 | 1053.2 | 955.46 |
| 1060.37 | 954.78 | | | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 45.6 | .052 | 759.23 | .045 | 1050.83 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 627.74 | 692.42 | 193.17 | 199.96 | 208.5 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.57 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 942.50 | Reach Len. (ft) | 193.17 | 199.96 | 208.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 274.13 | 87.21 | 4.96 |
| E.G. Slope (ft/ft) | 0.006367 | Area (sq ft) | 274.13 | 87.21 | 4.96 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 511.57 | 242.46 | 3.98 |
| Top Width (ft) | 458.71 | Top Width (ft) | 370.21 | 64.68 | 23.82 |
| Vel Total (ft/s) | 2.07 | Avg. Vel. (ft/s) | 1.87 | 2.78 | 0.80 |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | 0.74 | 1.35 | 0.21 |
| Conv. Total (cfs) | 9499.5 | Conv. (cfs) | 6411.1 | 3038.6 | 49.8 |
| Length Wtd. (ft) | 195.87 | Wetted Per. (ft) | 370.23 | 64.78 | 23.82 |
| Min Ch El (ft) | 940.27 | Shear (lb/sq ft) | 0.29 | 0.54 | 0.08 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.55 | 1.49 | 0.07 |
| Frctn Loss (ft) | 1.41 | Cum Volume (acre-ft) | 11.12 | 14.20 | 3.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.79 | 17.75 | 6.90 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 943.80 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 943.59 | Reach Len. (ft) | 193.17 | 199.96 | 208.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 53.89 | 157.82 | |
| E.G. Slope (ft/ft) | 0.005594 | Area (sq ft) | 53.89 | 157.82 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 156.93 | 601.07 | |
| Top Width (ft) | 97.01 | Top Width (ft) | 32.33 | 64.68 | |
| Vel Total (ft/s) | 3.58 | Avg. Vel. (ft/s) | 2.91 | 3.81 | |
| Max Chl Dpth (ft) | 3.32 | Hydr. Depth (ft) | 1.67 | 2.44 | |
| Conv. Total (cfs) | 10134.9 | Conv. (cfs) | 2098.3 | 8036.6 | |
| Length Wtd. (ft) | 199.26 | Wetted Per. (ft) | 33.89 | 66.34 | |
| Min Ch El (ft) | 940.27 | Shear (lb/sq ft) | 0.56 | 0.83 | |
| Alpha | 1.03 | Stream Power (lb/ft s) | 1.62 | 3.16 | |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | 0.93 | 19.04 | 0.07 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.47 | 17.75 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 943.65 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 943.49 | Reach Len. (ft) | 193.17 | 199.96 | 208.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 73.13 | 151.49 | 25.12 |
| E.G. Slope (ft/ft) | 0.004626 | Area (sq ft) | 73.13 | 151.49 | 25.12 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 185.05 | 518.69 | 54.26 |
| Top Width (ft) | 132.80 | Top Width (ft) | 47.74 | 64.68 | 20.38 |
| Vel Total (ft/s) | 3.04 | Avg. Vel. (ft/s) | 2.53 | 3.42 | 2.16 |
| Max Chl Dpth (ft) | 3.22 | Hydr. Depth (ft) | 1.53 | 2.34 | 1.23 |
| Conv. Total (cfs) | 11145.0 | Conv. (cfs) | 2720.8 | 7626.4 | 797.7 |
| Length Wtd. (ft) | 199.44 | Wetted Per. (ft) | 49.23 | 64.78 | 21.44 |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 940.27 | Shear (lb/sq ft) | 0.43 | 0.68 | 0.34 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 1.09 | 2.31 | 0.73 |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 3.17 | 17.88 | 0.15 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 2.75 | 17.75 | 0.11 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.682

INPUT
Description: Thalweg Sta. 623.26
Station Elevation Data num= 167

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.11 | 14.85 | 969.64 | 24.91 | 969.29 | 33.21 | 968.89 | 34.98 | 968.8 |
| 44.58 | 968.19 | 45.04 | 968.16 | 55.11 | 967.45 | 55.96 | 967.37 | 65.18 | 966.7 |
| 67.32 | 966.48 | 75.24 | 965.83 | 78.69 | 965.42 | 85.31 | 964.79 | 90.07 | 964.28 |
| 95.37 | 963.82 | 95.52 | 963.81 | 101.44 | 963.31 | 105.44 | 963.01 | 112.81 | 962.34 |
| 115.5 | 962.09 | 124.18 | 961.22 | 125.57 | 961.07 | 135.56 | 960.05 | 135.64 | 960.04 |
| 136.26 | 959.97 | 145.7 | 959 | 146.93 | 958.68 | 155.77 | 956.58 | 158.29 | 955.86 |
| 165.83 | 953.35 | 169.67 | 952.09 | 175.9 | 949.88 | 181.04 | 948.27 | 185.96 | 946.69 |
| 192.42 | 945.12 | 196.03 | 944.36 | 203.78 | 943.21 | 206.1 | 942.87 | 215.16 | 942.21 |
| 216.16 | 942.11 | 223.91 | 941.75 | 226.23 | 941.66 | 236.29 | 941.33 | 237.9 | 941.3 |
| 246.36 | 941.12 | 249.27 | 941.11 | 256.43 | 941.01 | 260.64 | 940.98 | 266.49 | 940.92 |
| 272.02 | 940.77 | 276.56 | 940.72 | 283.39 | 940.51 | 286.62 | 940.43 | 294.76 | 940.52 |
| 296.69 | 940.53 | 306.13 | 940.87 | 306.75 | 940.89 | 316.82 | 941.02 | 317.5 | 941.02 |
| 326.89 | 940.95 | 328.88 | 940.9 | 336.95 | 940.77 | 340.24 | 940.71 | 347.02 | 940.63 |
| 351.62 | 940.55 | 357.08 | 940.53 | 362.99 | 940.44 | 374.37 | 940.39 | 377.21 | 940.34 |
| 385.73 | 940.46 | 387.28 | 940.46 | 397.1 | 940.48 | 397.35 | 940.48 | 399.2 | 940.47 |
| 407.41 | 940.38 | 408.48 | 940.36 | 417.48 | 940.22 | 419.85 | 940.19 | 427.54 | 940.08 |
| 437.61 | 939.99 | 447.67 | 939.99 | 465.34 | 940.1 | 467.81 | 940.12 | 476.7 | 940.18 |
| 487.94 | 940.28 | 488.08 | 940.28 | 498 | 940.24 | 499.45 | 940.26 | 508.07 | 940.3 |
| 514.91 | 940.43 | 518.13 | 940.48 | 528.2 | 940.41 | 538.27 | 940.22 | 544.94 | 940.18 |
| 548.33 | 940.14 | 567.68 | 940.06 | 568.46 | 940.05 | 578.53 | 940.05 | 579.05 | 940.06 |
| 588.59 | 940.27 | 588.88 | 940.26 | 590.43 | 940.23 | 598.66 | 940.14 | 601.8 | 939.94 |
| 608.73 | 939.54 | 613.16 | 939.16 | 618.79 | 938.65 | 623.26 | 938.56 | 628.86 | 938.6 |
| 635.91 | 939.18 | 638.92 | 939.41 | 648.99 | 940.36 | 650.35 | 940.45 | 659.05 | 941.06 |
| 660.29 | 941.12 | 670.03 | 941.54 | 679.19 | 941.84 | 681.4 | 941.93 | 699.32 | 942.57 |
| 704.14 | 942.71 | 709.38 | 942.88 | 715.51 | 942.96 | 719.45 | 943.03 | 726.89 | 943.1 |
| 729.52 | 943.11 | 738.26 | 943.23 | 739.58 | 943.25 | 748.39 | 943.41 | 749.63 | 943.43 |
| 749.78 | 943.43 | 759.71 | 943.73 | 761 | 943.8 | 769.78 | 944.1 | 772.38 | 944.3 |
| 779.84 | 944.64 | 783.74 | 945.03 | 789.91 | 945.78 | 795.11 | 945.99 | 799.98 | 946.49 |
| 806.49 | 946.31 | 810.04 | 946.27 | 817.86 | 946.01 | 820.11 | 945.82 | 829.23 | 946.95 |
| 830.17 | 947.05 | 837.43 | 947.81 | 840.24 | 948.13 | 840.6 | 948.16 | 850.3 | 949.34 |
| 851.97 | 949.6 | 860.37 | 951.09 | 860.6 | 951.13 | 863.35 | 951.66 | 870.44 | 953.1 |
| 874.71 | 953.98 | 880.5 | 955.14 | 886.09 | 956.13 | 890.57 | 956.86 | 897.46 | 957.28 |
| 900.63 | 957.43 | 908.84 | 957.37 | 910.7 | 957.31 | 920.2 | 956.74 | 920.76 | 956.69 |
| 925.07 | 956.25 | 927.37 | 956.03 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 95.52 | .052 | 748.39 | .045 | 860.6 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 588.88 | 648.99 | 201.85 | 199.99 | 197.78 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 941.16 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 941.04 | Reach Len. (ft) | 201.85 | 199.99 | 197.78 |
| Crit W.S. (ft) | 940.75 | Flow Area (sq ft) | 214.02 | 96.49 | 3.32 |
| E.G. Slope (ft/ft) | 0.008217 | Area (sq ft) | 214.02 | 96.49 | 3.32 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 411.67 | 342.14 | 4.20 |
| Top Width (ft) | 404.29 | Top Width (ft) | 334.43 | 60.11 | 9.74 |
| Vel Total (ft/s) | 2.42 | Avg. Vel. (ft/s) | 1.92 | 3.55 | 1.26 |
| Max Chl Dpth (ft) | 2.48 | Hydr. Depth (ft) | 0.64 | 1.61 | 0.34 |
| Conv. Total (cfs) | 8362.0 | Conv. (cfs) | 4541.4 | 3774.3 | 46.3 |
| Length Wtd. (ft) | 200.98 | Wetted Per. (ft) | 334.47 | 60.25 | 9.77 |
| Min Ch El (ft) | 938.56 | Shear (lb/sq ft) | 0.33 | 0.82 | 0.17 |
| Alpha | 1.32 | Stream Power (lb/ft s) | 0.63 | 2.91 | 0.22 |
| Frctn Loss (ft) | 1.47 | Cum Volume (acre-ft) | 10.04 | 13.78 | 2.99 |

| | | | | | |
|---|---|---|---|---|---|
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 16.23 | 17.47 | 6.81 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.34 | Element | | | |
| Vel Head (ft) | 0.39 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 941.95 | Reach Len. (ft) | 201.85 | 199.99 | 197.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 151.14 | |
| E.G. Slope (ft/ft) | 0.009696 | Area (sq ft) | | 151.14 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 60.11 | Top Width (ft) | | 60.11 | |
| Vel Total (ft/s) | 5.02 | Avg. Vel. (ft/s) | | 5.02 | |
| Max Chl Dpth (ft) | 3.39 | Hydr. Depth (ft) | | 2.51 | |
| Conv. Total (cfs) | 7697.8 | Conv. (cfs) | | 7697.8 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 63.52 | |
| Min Ch El (ft) | 938.56 | Shear (lb/sq ft) | | 1.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.22 | |
| Frctn Loss (ft) | 1.52 | Cum Volume (acre-ft) | 0.81 | 18.33 | 0.07 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 0.40 | 17.47 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 942.34 | Element | | | |
| Vel Head (ft) | 0.39 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 941.94 | Reach Len. (ft) | 201.85 | 199.99 | 197.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 151.01 | |
| E.G. Slope (ft/ft) | 0.009724 | Area (sq ft) | | 151.01 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 60.11 | Top Width (ft) | | 60.11 | |
| Vel Total (ft/s) | 5.02 | Avg. Vel. (ft/s) | | 5.02 | |
| Max Chl Dpth (ft) | 3.38 | Hydr. Depth (ft) | | 2.51 | |
| Conv. Total (cfs) | 7687.0 | Conv. (cfs) | | 7687.0 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 63.52 | |
| Min Ch El (ft) | 938.56 | Shear (lb/sq ft) | | 1.44 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.24 | |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | 3.00 | 17.18 | 0.09 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 2.64 | 17.47 | 0.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.645

INPUT
Description: Thalweg Sta. 425.75
Station Elevation Data num= 172

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 957.19 | 4.89 | 957.41 | 9.64 | 957.6 | 17.17 | 957.73 | 19.79 | 957.77 |
| 29.94 | 957.76 | 32.28 | 957.67 | 38.93 | 957.38 | 40.09 | 957.32 | 41.72 | 957.17 |
| 50.24 | 956.56 | 54 | 956.07 | 60.39 | 955.46 | 66.28 | 954.74 | 78.55 | 953.44 |
| 80.69 | 953.21 | 90.83 | 952.05 | 100.98 | 950.46 | 103.1 | 949.99 | 111.13 | 948.46 |
| 115.38 | 947.61 | 121.28 | 946.41 | 127.67 | 945.39 | 131.43 | 944.84 | 139.93 | 943.65 |
| 141.58 | 943.43 | 149.4 | 942.25 | 151.73 | 941.89 | 152.22 | 941.84 | 161.88 | 940.54 |
| 164.5 | 940.39 | 172.03 | 939.8 | 176.77 | 939.62 | 179.5 | 939.49 | 182.18 | 939.37 |
| 189.05 | 939.19 | 192.32 | 939.08 | 201.33 | 938.88 | 207.96 | 938.76 | 212.62 | 938.69 |
| 213.6 | 938.68 | 222.77 | 938.57 | 232.92 | 938.47 | 250.43 | 938.26 | 253.22 | 938.22 |
| 262.71 | 938.26 | 263.37 | 938.25 | 273.52 | 938.45 | 274.98 | 938.47 | 283.67 | 938.68 |
| 293.82 | 938.83 | 299.54 | 938.88 | 303.96 | 938.9 | 311.81 | 938.92 | 314.11 | 938.93 |
| 324.09 | 938.92 | 324.26 | 938.91 | 325.08 | 938.91 | 334.41 | 938.87 | 336.37 | 938.85 |
| 344.56 | 938.79 | 348.64 | 938.71 | 354.71 | 938.63 | 360.92 | 938.5 | 364.86 | 938.41 |
| 373.2 | 938.49 | 375.01 | 938.48 | 383.64 | 938.77 | 384.93 | 938.81 | 385.16 | 938.82 |
| 393.58 | 938.77 | 395.08 | 938.74 | 395.31 | 938.73 | 397.75 | 938.59 | 405.45 | 938.24 |
| 410.88 | 937.9 | 415.6 | 937.56 | 419.53 | 937.23 | 425.75 | 936.61 | 434.58 | 937.42 |
| 435.9 | 937.49 | 442.21 | 938.02 | 445.48 | 938.3 | 446.05 | 938.34 | 454.13 | 938.7 |
| 456.2 | 938.77 | 459.13 | 938.86 | 466.35 | 939.07 | 471.41 | 939.2 | 476.27 | 939.29 |
| 476.5 | 939.29 | 483.68 | 939.33 | 486.65 | 939.34 | 495.96 | 939.32 | 496.8 | 939.34 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 506.95 | 939.56 | 508.25 | 939.57 | 517.1 | 939.74 | 527.24 | 939.8 | 532.8 | 939.76 |
| 537.39 | 939.74 | 545.07 | 939.69 | 547.54 | 939.69 | 557.35 | 939.88 | 557.69 | 939.88 |
| 559.34 | 939.9 | 567.84 | 940.02 | 569.63 | 940.04 | 573.68 | 940.06 | 577.99 | 940.08 |
| 581.9 | 940.15 | 588.14 | 940.23 | 594.18 | 940.34 | 598.29 | 940.36 | 606.46 | 940.48 |
| 608.44 | 940.53 | 617.9 | 940.8 | 618.59 | 940.83 | 618.73 | 940.83 | 628.73 | 941.21 |
| 631.01 | 941.32 | 638.88 | 941.68 | 643.29 | 942.16 | 649.03 | 942.58 | 655.56 | 943.99 |
| 659.18 | 944.63 | 667.84 | 945.4 | 669.33 | 945.65 | 676.46 | 945.44 | 679.48 | 945.31 |
| 680.11 | 945.32 | 689.63 | 945.06 | 692.39 | 944.99 | 699.78 | 945.03 | 704.67 | 944.57 |
| 709.93 | 944.14 | 716.94 | 943.62 | 720.08 | 943.37 | 729.22 | 943.39 | 730.23 | 943.37 |
| 735.02 | 943.67 | 740.37 | 944.02 | 741.5 | 944.15 | 750.52 | 945.69 | 753.77 | 946.05 |
| 760.67 | 947.13 | 766.05 | 947.59 | 770.82 | 947.7 | 778.33 | 948.66 | 780.97 | 948.87 |
| 790.6 | 949.81 | 801.27 | 950.64 | 802.88 | 950.78 | 811.42 | 951.29 | 815.15 | 951.55 |
| 821.57 | 951.8 | 826.08 | 951.95 | 830.76 | 952.18 | 831.72 | 952.23 | 839.71 | 952.74 |
| 841.87 | 952.86 | 851.98 | 953.82 | 852.14 | 953.84 | 862.16 | 954.97 | 864.26 | 955.23 |
| 872.31 | 956.19 | 876.55 | 956.77 | 882.46 | 957.71 | 888.81 | 958.48 | 892.61 | 959.02 |
| 901.1 | 959.61 | 902.02 | 959.68 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 179.5 | .052 | 573.68 | .045 | 830.76 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 395.08 | 476.27 | 200.27 | 200 | 199.78 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 939.68 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 939.58 | Reach Len. (ft) | 200.27 | 200.00 | 199.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 191.50 | 116.41 | 6.50 |
| E.G. Slope (ft/ft) | 0.006585 | Area (sq ft) | 191.50 | 116.41 | 6.50 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 410.07 | 342.75 | 5.18 |
| Top Width (ft) | 330.92 | Top Width (ft) | 217.40 | 81.19 | 32.33 |
| Vel Total (ft/s) | 2.41 | Avg. Vel. (ft/s) | 2.14 | 2.94 | 0.80 |
| Max Chl Dpth (ft) | 2.97 | Hydr. Depth (ft) | 0.88 | 1.43 | 0.20 |
| Conv. Total (cfs) | 9340.8 | Conv. (cfs) | 5053.3 | 4223.7 | 63.8 |
| Length Wtd. (ft) | 200.15 | Wetted Per. (ft) | 217.43 | 81.36 | 32.33 |
| Min Ch El (ft) | 936.61 | Shear (lb/sq ft) | 0.36 | 0.59 | 0.08 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.78 | 1.73 | 0.07 |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | 9.10 | 13.29 | 2.97 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.95 | 17.14 | 6.72 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 940.77 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 940.54 | Reach Len. (ft) | 200.27 | 200.00 | 199.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 194.41 | |
| E.G. Slope (ft/ft) | 0.006120 | Area (sq ft) | | 194.41 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 81.19 | Top Width (ft) | | 81.19 | |
| Vel Total (ft/s) | 3.90 | Avg. Vel. (ft/s) | | 3.90 | |
| Max Chl Dpth (ft) | 3.93 | Hydr. Depth (ft) | | 2.39 | |
| Conv. Total (cfs) | 9689.1 | Conv. (cfs) | | 9689.1 | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 84.41 | |
| Min Ch El (ft) | 936.61 | Shear (lb/sq ft) | | 0.88 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.43 | |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 0.81 | 17.54 | 0.07 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.40 | 17.14 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 940.78 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 940.55 | Reach Len. (ft) | 200.27 | 200.00 | 199.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 195.49 | |
| E.G. Slope (ft/ft) | 0.006011 | Area (sq ft) | | 195.49 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 81.19 | Top Width (ft) | | 81.19 | |
| Vel Total (ft/s) | 3.88 | Avg. Vel. (ft/s) | | 3.88 | |
| Max Chl Dpth (ft) | 3.94 | Hydr. Depth (ft) | | 2.41 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Conv. Total (cfs) | 9776.6 | Conv. (cfs) | | 9776.6 | | |
| Length Wtd. (ft) | 200.01 | Wetted Per. (ft) | | 84.43 | | |
| Min Ch El (ft) | 936.61 | Shear (lb/sq ft) | | 0.87 | | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.37 | | |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 3.00 | 16.39 | 0.09 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.64 | 17.14 | 0.06 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.607

INPUT
Description: Thalweg Sta. 471.78
Station Elevation Data num= 172

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 965.88 | 2.4 | 965.8 | 4.39 | 965.78 | 14.55 | 965.23 | 14.79 | 965.21 |
| 24.71 | 964.52 | 27.18 | 964.17 | 34.87 | 963.23 | 39.58 | 962.32 | 45.03 | 961.28 |
| 51.96 | 959.82 | 55.19 | 959.11 | 64.35 | 957.15 | 65.35 | 956.93 | 69.91 | 956.07 |
| 75.51 | 955 | 76.74 | 954.8 | 85.67 | 953.31 | 89.13 | 952.77 | 95.83 | 951.69 |
| 101.52 | 950.79 | 106 | 950.05 | 113.91 | 948.77 | 116.16 | 948.38 | 126.31 | 946.87 |
| 126.38 | 946.86 | 136.48 | 945.63 | 138.69 | 945.42 | 146.64 | 944.61 | 152.16 | 944.1 |
| 156.8 | 943.8 | 163.47 | 943.61 | 166.96 | 943.45 | 175.86 | 943.3 | 177.12 | 943.29 |
| 182.84 | 943.15 | 187.28 | 943.03 | 188.26 | 943 | 197.44 | 942.7 | 203.82 | 942.51 |
| 207.6 | 942.41 | 212.44 | 942.42 | 217.76 | 942.42 | 225.42 | 942.84 | 227.92 | 943 |
| 229.66 | 943.12 | 238.08 | 943.53 | 239.3 | 943.55 | 248.24 | 943.68 | 258.4 | 943.62 |
| 268.57 | 943.31 | 278.73 | 942.25 | 285.35 | 941.17 | 287.38 | 940.84 | 288.89 | 940.59 |
| 295.77 | 939.42 | 299.05 | 938.85 | 299.77 | 938.75 | 309.21 | 937.34 | 312.15 | 937.14 |
| 319.37 | 936.66 | 329.53 | 936.57 | 336.94 | 936.53 | 339.69 | 936.51 | 349.33 | 936.56 |
| 349.85 | 936.56 | 352.22 | 936.61 | 360.01 | 936.73 | 361.72 | 936.75 | 370.17 | 936.86 |
| 374.11 | 936.84 | 380.33 | 936.83 | 386.5 | 936.9 | 390.49 | 936.9 | 398.9 | 937.11 |
| 400.65 | 937.15 | 408.68 | 937.32 | 410.82 | 937.36 | 411.28 | 937.37 | 420.98 | 937.47 |
| 431.14 | 937.4 | 431.2 | 937.4 | 436.06 | 937.28 | 441.3 | 937.17 | 448.45 | 936.96 |
| 451.46 | 936.89 | 460.85 | 936.46 | 461.62 | 936.43 | 462.16 | 936.39 | 465.14 | 936.04 |
| 471.78 | 935.34 | 473.23 | 935.51 | 481.94 | 936.57 | 492.1 | 937.51 | 498.01 | 937.81 |
| 502.26 | 938.05 | 510.41 | 938.33 | 510.92 | 938.35 | 512.42 | 938.41 | 521.61 | 938.56 |
| 522.58 | 938.58 | 522.79 | 938.58 | 532.74 | 938.77 | 535.18 | 938.8 | 542.9 | 938.93 |
| 547.58 | 938.96 | 553.06 | 939.02 | 559.96 | 939.08 | 563.22 | 939.13 | 573.38 | 939.32 |
| 573.42 | 939.32 | 583.55 | 939.56 | 584.74 | 939.59 | 593.71 | 939.79 | 597.14 | 939.85 |
| 603.87 | 939.99 | 609.53 | 940.09 | 614.03 | 940.18 | 634.31 | 940.46 | 634.53 | 940.46 |
| 644.51 | 940.64 | 646.7 | 940.67 | 660.21 | 940.93 | 664.83 | 940.99 | 671.48 | 941.04 |
| 674.99 | 941.09 | 683.87 | 941.16 | 685.15 | 941.16 | 690.99 | 941.19 | 694.65 | 941.23 |
| 695.31 | 941.25 | 703.27 | 941.42 | 705.47 | 941.48 | 708.65 | 941.54 | 715.63 | 941.79 |
| 721.04 | 941.87 | 733.44 | 942.69 | 735.95 | 942.9 | 745.82 | 943.66 | 746.12 | 943.68 |
| 747.46 | 943.81 | 756.28 | 944.75 | 758.22 | 944.91 | 766.44 | 945.63 | 770.6 | 945.58 |
| 776.6 | 945.53 | 782.99 | 944.2 | 786.76 | 943.74 | 795.38 | 945.42 | 796.92 | 945.43 |
| 803.92 | 946.24 | 807.08 | 946.56 | 807.77 | 946.64 | 817.24 | 948.09 | 820.17 | 948.57 |
| 827.4 | 949.72 | 832.55 | 950.63 | 837.56 | 951.33 | 844.95 | 952.95 | 847.72 | 953.47 |
| 847.91 | 953.51 | 857.33 | 955.59 | 857.88 | 955.71 | 860.37 | 956.09 | 868.04 | 957.22 |
| 869.73 | 957.35 | 878.2 | 957.99 | 882.12 | 958.2 | 888.37 | 958.49 | 894.5 | 958.85 |
| 898.53 | 959.05 | 905.88 | 959.6 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .032 | 285.35 | .052 | 573.42 | .045 | 847.91 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 431.2 | 502.26 | 195.48 | 199.99 | 209.21 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 938.38 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 938.26 | Reach Len. (ft) | 195.48 | 199.99 | 209.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 166.98 | 103.81 | 0.65 |
| E.G. Slope (ft/ft) | 0.006360 | Area (sq ft) | 166.98 | 103.81 | 0.65 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 453.69 | 303.98 | 0.33 |
| Top Width (ft) | 205.38 | Top Width (ft) | 128.16 | 71.06 | 6.16 |
| Vel Total (ft/s) | 2.79 | Avg. Vel. (ft/s) | 2.72 | 2.93 | 0.51 |
| Max Chl Dpth (ft) | 2.92 | Hydr. Depth (ft) | 1.30 | 1.46 | 0.11 |
| Conv. Total (cfs) | 9504.9 | Conv. (cfs) | 5689.0 | 3811.7 | 4.2 |
| Length Wtd. (ft) | 197.35 | Wetted Per. (ft) | 128.26 | 71.27 | 6.17 |
| Min Ch El (ft) | 935.34 | Shear (lb/sq ft) | 0.52 | 0.58 | 0.04 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 1.40 | 1.69 | 0.02 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.13 | Cum Volume (acre-ft) | 8.28 | 12.79 | 2.95 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.16 | 16.79 | 6.63 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 939.53 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 939.28 | Reach Len. (ft) | 195.48 | 199.99 | 209.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 13.17 | 176.20 | |
| E.G. Slope (ft/ft) | 0.006249 | Area (sq ft) | 13.17 | 176.20 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 38.54 | 719.46 | |
| Top Width (ft) | 78.15 | Top Width (ft) | 7.09 | 71.06 | |
| Vel Total (ft/s) | 4.00 | Avg. Vel. (ft/s) | 2.93 | 4.08 | |
| Max Chl Dpth (ft) | 3.94 | Hydr. Depth (ft) | 1.86 | 2.48 | |
| Conv. Total (cfs) | 9589.1 | Conv. (cfs) | 487.5 | 9101.5 | |
| Length Wtd. (ft) | 199.62 | Wetted Per. (ft) | 8.92 | 72.50 | |
| Min Ch El (ft) | 935.34 | Shear (lb/sq ft) | 0.58 | 0.95 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 1.68 | 3.87 | |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 0.78 | 16.69 | 0.07 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.38 | 16.79 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 939.35 | Element | | | |
| Vel Head (ft) | 0.31 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 939.04 | Reach Len. (ft) | 195.48 | 199.99 | 209.21 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 12.28 | 159.24 | |
| E.G. Slope (ft/ft) | 0.008690 | Area (sq ft) | 12.28 | 159.24 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 39.69 | 718.31 | |
| Top Width (ft) | 78.66 | Top Width (ft) | 7.60 | 71.06 | |
| Vel Total (ft/s) | 4.42 | Avg. Vel. (ft/s) | 3.23 | 4.51 | |
| Max Chl Dpth (ft) | 3.70 | Hydr. Depth (ft) | 1.62 | 2.24 | |
| Conv. Total (cfs) | 8131.3 | Conv. (cfs) | 425.8 | 7705.5 | |
| Length Wtd. (ft) | 199.17 | Wetted Per. (ft) | 9.19 | 72.26 | |
| Min Ch El (ft) | 935.34 | Shear (lb/sq ft) | 0.73 | 1.20 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 2.34 | 5.39 | |
| Frctn Loss (ft) | 1.49 | Cum Volume (acre-ft) | 2.98 | 15.57 | 0.09 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 2.62 | 16.79 | 0.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.569

INPUT
Description: Thalweg Sta. 440.14
Station Elevation Data num= 148

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 955.72 | 7.42 | 954.99 | 10.35 | 954.62 | 17.43 | 953.76 | 20.84 | 953.27 |
| 27.44 | 952.41 | 31.32 | 951.85 | 37.45 | 951.02 | 41.8 | 950.39 | 47.46 | 949.62 |
| 52.28 | 948.89 | 57.47 | 948.14 | 62.76 | 947.36 | 73.24 | 946 | 77.49 | 945.49 |
| 83.73 | 944.77 | 87.5 | 944.41 | 94.22 | 943.8 | 97.51 | 943.53 | 104.7 | 943.04 |
| 107.52 | 942.84 | 115.18 | 942.6 | 117.53 | 942.47 | 125.66 | 942.32 | 127.54 | 942.23 |
| 136.15 | 942.11 | 137.55 | 942.07 | 146.63 | 942.03 | 147.56 | 942.03 | 157.11 | 942.15 |
| 157.57 | 942.16 | 167.32 | 942.33 | 167.59 | 942.33 | 177.59 | 942.46 | 178.07 | 942.47 |
| 187.6 | 942.53 | 188.56 | 942.52 | 197.61 | 942.52 | 199.04 | 942.49 | 207.62 | 942.44 |
| 209.52 | 942.37 | 217.63 | 942.18 | 227.64 | 941.76 | 234.62 | 941.34 | 237.65 | 941.14 |
| 240.97 | 940.79 | 247.66 | 940.24 | 251.46 | 939.74 | 252.54 | 939.61 | 257.67 | 939 |
| 261.94 | 938.41 | 267.68 | 937.6 | 272.42 | 936.96 | 277.69 | 936.12 | 282.9 | 935.78 |
| 287.7 | 935.27 | 293.39 | 935.26 | 297.71 | 935.21 | 303.87 | 935.26 | 307.72 | 935.33 |
| 314.35 | 935.36 | 317.73 | 935.41 | 324.83 | 935.58 | 327.74 | 935.61 | 337.75 | 935.88 |
| 347.76 | 936.02 | 357.77 | 936.02 | 366.76 | 935.9 | 367.78 | 935.88 | 377.24 | 935.92 |
| 377.79 | 935.93 | 387.72 | 936.17 | 387.8 | 936.17 | 389.45 | 936.18 | 397.45 | 936.25 |
| 407.03 | 936.25 | 407.67 | 936.24 | 407.82 | 936.24 | 416.61 | 936.01 | 417.83 | 935.98 |
| 426.19 | 935.56 | 427.84 | 935.48 | 429.66 | 935.4 | 437.85 | 935.09 | 440.14 | 935.05 |
| 447.86 | 934.96 | 450.62 | 935.03 | 461.11 | 935.42 | 467.88 | 935.88 | 474.08 | 936.38 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 477.89 | 936.51 | 483.66 | 937.02 | 487.91 | 937.22 | 492.35 | 937.62 | 493.24 | 937.7 |
| 497.92 | 938 | 502.82 | 938.3 | 507.93 | 938.56 | 508.09 | 938.56 | 512.39 | 938.56 |
| 517.94 | 938.6 | 521.97 | 938.43 | 527.95 | 938.26 | 531.55 | 938.12 | 537.96 | 938.01 |
| 544.96 | 937.97 | 547.97 | 937.9 | 555.44 | 937.74 | 557.98 | 937.69 | 565.93 | 937.97 |
| 567.99 | 937.98 | 576.42 | 938.58 | 578 | 938.64 | 579.45 | 938.7 | 588.01 | 939.22 |
| 589.03 | 939.24 | 598.02 | 939.94 | 598.6 | 939.94 | 608.03 | 940.02 | 608.18 | 940.02 |
| 611.57 | 939.9 | 618.04 | 939.71 | 618.34 | 939.69 | 628.05 | 939.92 | 628.83 | 939.96 |
| 638.06 | 940.23 | 639.31 | 940.29 | 648.07 | 940.65 | 649.79 | 940.74 | 658.08 | 941.12 |
| 660.27 | 941.2 | 668.09 | 941.68 | 670.75 | 941.87 | 681.24 | 942.87 | 688.11 | 943.74 |
| 691.72 | 944.12 | 698.12 | 944.97 | 702.2 | 945.59 | 708.13 | 946.32 | 712.68 | 947.1 |
| 718.14 | 947.79 | 723.16 | 948.69 | 728.15 | 949.37 | 733.65 | 950.37 | 738.16 | 951.08 |
| 744.14 | 952.11 | 748.17 | 952.84 | 749.39 | 953.04 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 252.54 | .052 | 492.35 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 407.67 | 474.08 | 189.23 | 199.87 | 219.4 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 937.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 937.15 | Reach Len. (ft) | 189.23 | 199.87 | 219.40 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 180.93 | 107.55 | 5.11 |
| E.G. Slope (ft/ft) | 0.005166 | Area (sq ft) | 180.93 | 107.55 | 5.11 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 447.77 | 304.42 | 5.81 |
| Top Width (ft) | 215.46 | Top Width (ft) | 136.67 | 66.41 | 12.38 |
| Vel Total (ft/s) | 2.58 | Avg. Vel. (ft/s) | 2.47 | 2.83 | 1.14 |
| Max Chl Dpth (ft) | 2.19 | Hydr. Depth (ft) | 1.32 | 1.62 | 0.41 |
| Conv. Total (cfs) | 10545.8 | Conv. (cfs) | 6229.7 | 4235.3 | 80.8 |
| Length Wtd. (ft) | 193.18 | Wetted Per. (ft) | 136.80 | 66.48 | 12.41 |
| Min Ch El (ft) | 934.96 | Shear (lb/sq ft) | 0.43 | 0.52 | 0.13 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 1.06 | 1.48 | 0.15 |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 7.50 | 12.30 | 2.94 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 13.56 | 16.48 | 6.59 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 938.43 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 938.22 | Reach Len. (ft) | 189.23 | 199.87 | 219.40 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 30.02 | 178.48 | |
| E.G. Slope (ft/ft) | 0.004820 | Area (sq ft) | 30.02 | 178.48 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 86.33 | 671.67 | |
| Top Width (ft) | 81.59 | Top Width (ft) | 15.18 | 66.41 | |
| Vel Total (ft/s) | 3.64 | Avg. Vel. (ft/s) | 2.88 | 3.76 | |
| Max Chl Dpth (ft) | 3.26 | Hydr. Depth (ft) | 1.98 | 2.69 | |
| Conv. Total (cfs) | 10917.6 | Conv. (cfs) | 1243.5 | 9674.1 | |
| Length Wtd. (ft) | 197.31 | Wetted Per. (ft) | 17.20 | 68.32 | |
| Min Ch El (ft) | 934.96 | Shear (lb/sq ft) | 0.53 | 0.79 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 1.51 | 2.96 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 0.68 | 15.88 | 0.07 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.33 | 16.48 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 937.83 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 937.63 | Reach Len. (ft) | 189.23 | 199.87 | 219.40 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 77.87 | 139.51 | |
| E.G. Slope (ft/ft) | 0.006524 | Area (sq ft) | 77.87 | 139.51 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 236.73 | 521.27 | |
| Top Width (ft) | 116.31 | Top Width (ft) | 49.90 | 66.41 | |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | 3.04 | 3.74 | |
| Max Chl Dpth (ft) | 2.67 | Hydr. Depth (ft) | 1.56 | 2.10 | |
| Conv. Total (cfs) | 9384.5 | Conv. (cfs) | 2930.8 | 6453.7 | |
| Length Wtd. (ft) | 195.06 | Wetted Per. (ft) | 51.52 | 67.73 | |
| Min Ch El (ft) | 934.96 | Shear (lb/sq ft) | 0.62 | 0.84 | |
| Alpha | 1.03 | Stream Power (lb/ft s) | 1.87 | 3.13 | |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.16 | Cum Volume (acre-ft) | 2.77 | 14.89 | 0.09 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.49 | 16.48 | 0.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.531

INPUT
Description: Thalweg Sta. 465.68
Station Elevation Data num= 156

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 955.58 | 1.17 | 955.51 | 5.87 | 955.09 | 11.82 | 954.5 | 18.67 | 953.75 |
| 21.45 | 953.44 | 22.47 | 953.33 | 29.25 | 952.5 | 37.04 | 951.57 | 43.78 | 950.72 |
| 44.83 | 950.57 | 47.72 | 950.4 | 52.63 | 949.87 | 54.43 | 949.78 | 58.32 | 949.46 |
| 65.08 | 948.56 | 68.21 | 948.13 | 75.73 | 947.55 | 76.01 | 947.52 | 76.76 | 947.46 |
| 83.8 | 946.74 | 86.38 | 946.55 | 91.59 | 946 | 97.03 | 945.51 | 99.39 | 945.26 |
| 105.81 | 944.56 | 107.18 | 944.39 | 107.68 | 944.34 | 118.33 | 943.13 | 122.77 | 942.76 |
| 128.99 | 942.21 | 130.56 | 942.13 | 134.86 | 941.96 | 138.36 | 941.81 | 139.64 | 941.78 |
| 146.15 | 941.92 | 150.29 | 942.14 | 153.94 | 942.15 | 160.94 | 942.34 | 161.74 | 942.32 |
| 163.91 | 942.29 | 169.53 | 942.2 | 171.59 | 942.2 | 177.32 | 942.06 | 182.24 | 942.01 |
| 185.12 | 941.93 | 192.89 | 941.81 | 192.96 | 941.81 | 200.7 | 941.52 | 203.55 | 941.45 |
| 208.5 | 940.98 | 214.2 | 940.59 | 216.29 | 940.33 | 224.08 | 939.39 | 224.85 | 939.3 |
| 231.88 | 938.52 | 235.5 | 937.98 | 239.67 | 937.76 | 246.15 | 936.67 | 247.46 | 936.74 |
| 251.05 | 936.82 | 255.26 | 937.06 | 256.8 | 936.97 | 260.13 | 937.21 | 267.45 | 937.77 |
| 270.85 | 938.1 | 278.1 | 938.82 | 278.64 | 938.85 | 280.09 | 939.03 | 286.43 | 939.64 |
| 288.75 | 939.84 | 294.23 | 939.84 | 299.41 | 940.11 | 302.02 | 940.05 | 303.96 | 940.03 |
| 309.15 | 939.98 | 309.81 | 939.97 | 310.05 | 939.98 | 317.61 | 939.41 | 320.71 | 939.04 |
| 325.4 | 938.15 | 331.36 | 937.12 | 333.19 | 936.72 | 338.2 | 935.83 | 340.99 | 935.29 |
| 342.01 | 935.15 | 348.78 | 934.42 | 352.66 | 934.21 | 361.03 | 934.34 | 363.31 | 934.36 |
| 364.37 | 934.38 | 372.16 | 934.46 | 373.96 | 934.47 | 384.61 | 934.38 | 387.75 | 934.37 |
| 395.27 | 934.3 | 395.54 | 934.3 | 396.29 | 934.29 | 403.33 | 934.26 | 411.12 | 934.2 |
| 416.57 | 934.17 | 418.92 | 934.15 | 426.72 | 934.15 | 427.22 | 934.16 | 434.5 | 934.4 |
| 437.87 | 934.58 | 442.3 | 934.72 | 448.52 | 934.69 | 448.82 | 934.67 | 450.09 | 934.61 |
| 457.88 | 934.08 | 459.17 | 933.98 | 465.68 | 933.64 | 469.82 | 933.65 | 473.47 | 933.82 |
| 480.47 | 934.29 | 481.26 | 934.4 | 483.43 | 934.9 | 483.74 | 934.97 | 489.06 | 936.17 |
| 491.12 | 936.7 | 493.44 | 937.24 | 496.85 | 938.03 | 501.78 | 939.02 | 504.65 | 939.42 |
| 512.43 | 940.36 | 520.24 | 940.73 | 523.08 | 940.84 | 528.03 | 940.87 | 533.73 | 940.88 |
| 541.53 | 940.81 | 543.61 | 940.77 | 544.38 | 940.76 | 551.41 | 940.65 | 555.03 | 940.58 |
| 559.2 | 940.56 | 565.68 | 940.47 | 566.99 | 940.47 | 570.57 | 940.48 | 574.79 | 940.47 |
| 576.33 | 940.46 | 586.99 | 940.44 | 596.49 | 940.63 | 597.64 | 940.65 | 598.17 | 940.67 |
| 599.62 | 940.72 | 605.96 | 940.95 | 608.29 | 941.03 | 618.94 | 941.37 | 628.66 | 941.56 |
| 629.34 | 941.57 | 629.59 | 941.58 | 637.13 | 941.6 | 640.24 | 941.59 | 644.93 | 941.52 |
| 646.72 | 941.51 | | | | | | | | |

Manning's n Values num= 3

| sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 303.96 | .052 | 493.44 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 448.82 | 483.74 | 207.18 | 199.02 | 177.2 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 936.05 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 935.87 | Reach Len. (ft) | 207.18 | 199.02 | 177.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 161.39 | 63.17 | 1.81 |
| E.G. Slope (ft/ft) | 0.007727 | Area (sq ft) | 161.39 | 63.17 | 1.81 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 520.34 | 235.04 | 2.63 |
| Top Width (ft) | 149.78 | Top Width (ft) | 110.86 | 34.92 | 4.00 |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 3.22 | 3.72 | 1.45 |
| Max Chl Dpth (ft) | 2.23 | Hydr. Depth (ft) | 1.46 | 1.81 | 0.45 |
| Conv. Total (cfs) | 8623.1 | Conv. (cfs) | 5919.4 | 2673.8 | 29.9 |
| Length Wtd. (ft) | 204.93 | Wetted Per. (ft) | 110.99 | 35.04 | 4.10 |
| Min Ch El (ft) | 933.64 | Shear (lb/sq ft) | 0.70 | 0.87 | 0.21 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 2.26 | 3.24 | 0.31 |
| Frctn Loss (ft) | 1.79 | Cum Volume (acre-ft) | 6.75 | 11.91 | 2.92 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 13.03 | 16.25 | 6.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 937.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.34 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 936.87 | Reach Len. (ft) | 207.18 | 199.02 | 177.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 64.23 | 97.91 | |
| E.G. Slope (ft/ft) | 0.008033 | Area (sq ft) | 64.23 | 97.91 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 277.74 | 480.26 | |
| Top Width (ft) | 61.47 | Top Width (ft) | 26.55 | 34.92 | |
| Vel Total (ft/s) | 4.67 | Avg. Vel. (ft/s) | 4.32 | 4.90 | |
| Max Chl Dpth (ft) | 3.23 | Hydr. Depth (ft) | 2.42 | 2.80 | |
| Conv. Total (cfs) | 8457.5 | Conv. (cfs) | 3098.9 | 5358.6 | |
| Length Wtd. (ft) | 202.01 | Wetted Per. (ft) | 29.28 | 36.94 | |
| Min Ch El (ft) | 933.64 | Shear (lb/sq ft) | 1.10 | 1.33 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 4.76 | 6.52 | |
| Frctn Loss (ft) | 1.76 | Cum Volume (acre-ft) | 0.48 | 15.24 | 0.07 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.24 | 16.25 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 936.67 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 936.48 | Reach Len. (ft) | 207.18 | 199.02 | 177.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 130.85 | 84.23 | |
| E.G. Slope (ft/ft) | 0.005443 | Area (sq ft) | 130.85 | 84.23 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 448.19 | 309.81 | |
| Top Width (ft) | 95.99 | Top Width (ft) | 61.07 | 34.92 | |
| Vel Total (ft/s) | 3.52 | Avg. Vel. (ft/s) | 3.43 | 3.68 | |
| Max Chl Dpth (ft) | 2.84 | Hydr. Depth (ft) | 2.14 | 2.41 | |
| Conv. Total (cfs) | 10274.0 | Conv. (cfs) | 6074.8 | 4199.2 | |
| Length Wtd. (ft) | 203.00 | Wetted Per. (ft) | 63.19 | 36.55 | |
| Min Ch El (ft) | 933.64 | Shear (lb/sq ft) | 0.70 | 0.78 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 2.41 | 2.88 | |
| Frctn Loss (ft) | 1.33 | Cum Volume (acre-ft) | 2.32 | 14.37 | 0.09 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.25 | 16.25 | 0.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.493

INPUT
Description: Thalweg Sta. 338.62
Station Elevation Data num= 97

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 960.21 | 1 | 960.14 | 1.08 | 960.13 | 1.22 | 960.1 | 11.62 | 957.6 |
| 16.88 | 956.44 | 22.17 | 955.15 | 32.65 | 953.37 | 32.72 | 953.36 | 43.27 | 951.98 |
| 48.64 | 951.26 | 53.82 | 950.54 | 64.08 | 948.45 | 64.37 | 948.39 | 64.51 | 948.36 |
| 74.91 | 945.69 | 85.46 | 943.03 | 95.5 | 940.61 | 96.01 | 940.48 | 96.26 | 940.42 |
| 106.56 | 937.9 | 109.82 | 937.19 | 112.14 | 936.69 | 117.11 | 935.58 | 126.94 | 934.11 |
| 127.66 | 934.01 | 128.01 | 933.98 | 138.2 | 933.23 | 143.89 | 933.07 | 148.75 | 932.92 |
| 158.37 | 932.9 | 159.77 | 932.9 | 169.85 | 933 | 180.4 | 933.08 | 191.52 | 933.07 |
| 221.23 | 932.8 | 222.59 | 932.79 | 223.27 | 932.79 | 233.14 | 932.77 | 252.65 | 932.86 |
| 254.23 | 932.87 | 255.04 | 932.88 | 275.33 | 933.02 | 284.08 | 933.11 | 285.42 | 933.13 |
| 285.88 | 933.13 | 286.78 | 933.15 | 296.43 | 933.29 | 306.97 | 933.53 | 315.52 | 933.7 |
| 317.52 | 933.73 | 318.2 | 933.7 | 318.53 | 933.68 | 328.07 | 933.21 | 334.41 | 932.79 |
| 338.62 | 932.49 | 346.94 | 932.53 | 349.17 | 932.56 | 350.28 | 932.63 | 359.71 | 933.15 |
| 366.17 | 933.63 | 367.2 | 933.7 | 370.26 | 933.89 | 378.37 | 934.53 | 380.81 | 934.76 |
| 381.84 | 934.83 | 382.05 | 934.84 | 391.36 | 935.51 | 397.92 | 935.76 | 401.91 | 935.93 |
| 412.45 | 935.98 | 423 | 935.99 | 429.67 | 935.93 | 433.55 | 936.07 | 441.23 | 935.8 |
| 444.1 | 935.77 | 445.54 | 935.79 | 454.65 | 936.6 | 461.43 | 937.18 | 465.19 | 937.55 |
| 472.66 | 938.17 | 475.74 | 938.44 | 477.31 | 938.54 | 486.29 | 938.97 | 493.18 | 939.18 |
| 496.84 | 939.27 | 504.09 | 939.38 | 506.56 | 939.41 | 509.06 | 939.47 | 517.94 | 939.59 |
| 524.93 | 939.73 | 539.03 | 939.93 | 546.05 | 939.78 | 549.58 | 939.76 | 556.68 | 939.74 |
| 560.13 | 939.72 | 563.19 | 939.82 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 109.82 | .052 | 381.84 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 318.2 | 367.2 | 193.16 | 199.79 | 205.37 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 934.25 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 934.11 | Reach Len. (ft) | 193.16 | 199.79 | 205.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 200.17 | 55.01 | 1.29 |
| E.G. Slope (ft/ft) | 0.009937 | Area (sq ft) | 200.17 | 55.01 | 1.29 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 587.58 | 169.08 | 1.34 |
| Top Width (ft) | 246.19 | Top Width (ft) | 191.29 | 49.00 | 5.90 |
| Vel Total (ft/s) | 2.96 | Avg. Vel. (ft/s) | 2.94 | 3.07 | 1.03 |
| Max Chl Dpth (ft) | 1.62 | Hydr. Depth (ft) | 1.05 | 1.12 | 0.22 |
| Conv. Total (cfs) | 7604.0 | Conv. (cfs) | 5894.4 | 1696.2 | 13.4 |
| Length Wtd. (ft) | 197.67 | Wetted Per. (ft) | 191.34 | 49.07 | 5.91 |
| Min Ch El (ft) | 932.49 | Shear (lb/sq ft) | 0.65 | 0.70 | 0.14 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 1.91 | 2.14 | 0.14 |
| Frctn Loss (ft) | 1.87 | Cum Volume (acre-ft) | 5.89 | 11.64 | 2.92 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 12.31 | 16.05 | 6.53 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 935.44 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 935.15 | Reach Len. (ft) | 193.16 | 199.79 | 205.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 70.25 | 105.62 | |
| E.G. Slope (ft/ft) | 0.009481 | Area (sq ft) | 70.25 | 105.62 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | 277.51 | 480.49 | |
| Top Width (ft) | 88.43 | Top Width (ft) | 39.43 | 49.00 | |
| Vel Total (ft/s) | 4.31 | Avg. Vel. (ft/s) | 3.95 | 4.55 | |
| Max Chl Dpth (ft) | 2.66 | Hydr. Depth (ft) | 1.78 | 2.16 | |
| Conv. Total (cfs) | 7784.8 | Conv. (cfs) | 2850.1 | 4934.7 | |
| Length Wtd. (ft) | 198.81 | Wetted Per. (ft) | 41.53 | 50.52 | |
| Min Ch El (ft) | 932.49 | Shear (lb/sq ft) | 1.00 | 1.24 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 3.96 | 5.63 | |
| Frctn Loss (ft) | 1.93 | Cum Volume (acre-ft) | 0.16 | 14.78 | 0.07 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.09 | 16.05 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 935.34 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 935.10 | Reach Len. (ft) | 193.16 | 199.79 | 205.37 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 86.45 | 103.09 | 3.98 |
| E.G. Slope (ft/ft) | 0.007983 | Area (sq ft) | 86.45 | 103.09 | 3.98 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 316.62 | 431.69 | 9.69 |
| Top Width (ft) | 100.26 | Top Width (ft) | 48.20 | 49.00 | 3.06 |
| Vel Total (ft/s) | 3.92 | Avg. Vel. (ft/s) | 3.66 | 4.19 | 2.44 |
| Max Chl Dpth (ft) | 2.61 | Hydr. Depth (ft) | 1.79 | 2.10 | 1.30 |
| Conv. Total (cfs) | 8483.9 | Conv. (cfs) | 3543.7 | 4831.7 | 108.5 |
| Length Wtd. (ft) | 198.68 | Wetted Per. (ft) | 50.32 | 49.07 | 4.27 |
| Min Ch El (ft) | 932.49 | Shear (lb/sq ft) | 0.86 | 1.05 | 0.46 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 3.14 | 4.38 | 1.13 |
| Frctn Loss (ft) | 1.87 | Cum Volume (acre-ft) | 1.80 | 13.94 | 0.08 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.99 | 16.05 | 0.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.455

INPUT
Description: Thalweg Sta. 490.25
Station Elevation Data num= 175

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 960.27 | 4.51 | 959.77 | 7.15 | 959.57 | 15.87 | 957.88 | 17.21 | 957.73 |
| 27.22 | 954.86 | 27.28 | 954.85 | 27.63 | 954.73 | 37.34 | 951.42 | 38.59 | 951.59 |
| 47.41 | 952.2 | 49.95 | 952.64 | 57.47 | 953.97 | 61.3 | 954.23 | 67.53 | 955.17 |
| 72.67 | 955.35 | 77.6 | 955.64 | 84.02 | 954.58 | 87.66 | 953.99 | 95.38 | 952.5 |
| 97.73 | 952.13 | 106.74 | 950.5 | 107.79 | 950.32 | 117.86 | 948.83 | 118.1 | 948.8 |
| 127.92 | 947.72 | 129.46 | 947.56 | 137.99 | 946.53 | 140.82 | 946.25 | 148.05 | 945.36 |
| 152.18 | 945.13 | 158.12 | 944.56 | 163.53 | 944.26 | 168.18 | 943.9 | 174.89 | 943.45 |
| 178.25 | 943.2 | 186.26 | 942.64 | 188.31 | 942.48 | 197.61 | 941.78 | 198.38 | 941.72 |
| 204.31 | 941.17 | 208.44 | 940.81 | 208.97 | 940.75 | 218.51 | 939.37 | 220.33 | 939.09 |
| 228.57 | 937.59 | 231.69 | 937.11 | 238.63 | 935.82 | 243.04 | 935.27 | 248.7 | 934.32 |
| 254.41 | 933.89 | 258.76 | 933.42 | 265.77 | 933.1 | 268.83 | 932.91 | 288.49 | 932.16 |
| 288.96 | 932.14 | 299.02 | 931.79 | 299.84 | 931.77 | 309.09 | 931.59 | 311.2 | 931.59 |
| 319.15 | 931.54 | 345.28 | 931.49 | 356.63 | 931.5 | 359.41 | 931.52 | 381.01 | 931.53 |
| 388.73 | 931.55 | 389.6 | 931.55 | 397.76 | 931.58 | 399.67 | 931.58 | 409.73 | 931.65 |
| 419.8 | 931.75 | 424.79 | 931.81 | 436.14 | 931.92 | 447.51 | 931.97 | 449.99 | 931.97 |
| 451.04 | 931.96 | 458.86 | 931.88 | 460.06 | 931.87 | 469.35 | 931.71 | 470.04 | 931.7 |
| 470.12 | 931.7 | 470.22 | 931.69 | 480.19 | 931.29 | 481.58 | 931.24 | 490.25 | 930.91 |
| 492.94 | 930.94 | 500.32 | 930.94 | 504.3 | 931.07 | 510.38 | 931.28 | 515.65 | 931.38 |
| 520.45 | 931.5 | 530.51 | 931.58 | 530.52 | 931.58 | 533.29 | 931.61 | 540.57 | 931.65 |
| 541.45 | 931.66 | 542.33 | 931.67 | 550.64 | 931.7 | 551.36 | 931.7 | 557.7 | 931.69 |
| 560.7 | 931.69 | 561.09 | 931.68 | 590.9 | 931.48 | 595.17 | 931.46 | 606.53 | 931.37 |
| 611.03 | 931.29 | 617.88 | 931.38 | 621.09 | 931.33 | 629.25 | 931.49 | 631.16 | 931.49 |
| 640.61 | 931.67 | 641.22 | 931.68 | 646.03 | 931.71 | 651.29 | 931.7 | 651.96 | 931.69 |
| 661.35 | 931.6 | 668.82 | 931.51 | 671.42 | 931.51 | 677.86 | 931.35 | 697.39 | 931.47 |
| 701.61 | 931.49 | 708.76 | 931.51 | 711.67 | 931.51 | 714 | 931.53 | 721.74 | 931.61 |
| 723.03 | 931.64 | 731.8 | 931.97 | 741.87 | 933.18 | 751.93 | 934.86 | 759.17 | 935.99 |
| 762 | 936.39 | 765.55 | 936.62 | 772.06 | 936.92 | 777.25 | 936.98 | 782.13 | 937.09 |
| 786.28 | 936.96 | 792.19 | 937.01 | 799.63 | 936.52 | 802.26 | 936.31 | 804.35 | 936.12 |
| 812.32 | 935.45 | 822.35 | 935.53 | 822.72 | 935.56 | 832.45 | 936.36 | 833.7 | 936.4 |
| 842.52 | 937.05 | 845.06 | 937.05 | 852.58 | 936.81 | 862.65 | 936.02 | 867.78 | 935.41 |
| 872.71 | 934.87 | 879.14 | 934.12 | 882.78 | 933.74 | 890.49 | 934.05 | 892.84 | 934.23 |
| 901.86 | 935.05 | 902.9 | 935.15 | 911.07 | 935.72 | 912.97 | 935.86 | 913.21 | 935.86 |
| 923.03 | 936.07 | 924.57 | 936.06 | 933.1 | 936.07 | 935.93 | 936.05 | 943.16 | 936.04 |
| 947.29 | 936.07 | 953.23 | 936.1 | 958.65 | 936.29 | 963.29 | 936.48 | 970.01 | 937.06 |
| 973.36 | 937.45 | 981.37 | 938.82 | 983.42 | 939.16 | 992.72 | 940.08 | 993.49 | 940.15 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 530.52 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 451.04 | 541.45 | 222.79 | 199.87 | 186.94 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 932.37 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.052 | 0.051 | 0.045 |
| W.S. Elev (ft) | 932.28 | Reach Len. (ft) | 222.79 | 199.87 | 186.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 102.74 | 77.47 | 141.85 |
| E.G. Slope (ft/ft) | 0.009027 | Area (sq ft) | 102.74 | 77.47 | 141.85 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 202.73 | 192.82 | 362.45 |
| Top Width (ft) | 449.19 | Top Width (ft) | 165.81 | 90.41 | 192.97 |
| Vel Total (ft/s) | 2.35 | Avg. Vel. (ft/s) | 1.97 | 2.49 | 2.56 |
| Max Chl Dpth (ft) | 1.37 | Hydr. Depth (ft) | 0.62 | 0.86 | 0.74 |
| Conv. Total (cfs) | 7978.0 | Conv. (cfs) | 2133.8 | 2029.4 | 3814.8 |
| Length Wtd. (ft) | 199.25 | Wetted Per. (ft) | 165.82 | 90.44 | 193.00 |
| Min Ch El (ft) | 930.91 | Shear (lb/sq ft) | 0.35 | 0.48 | 0.41 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.69 | 1.20 | 1.06 |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 5.22 | 11.34 | 2.58 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 11.52 | 15.74 | 6.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.51 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.051 | 0.045 |
| W.S. Elev (ft) | 933.23 | Reach Len. (ft) | 222.79 | 199.87 | 186.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.99 | 16.11 |
| E.G. Slope (ft/ft) | 0.009962 | Area (sq ft) | | 162.99 | 16.11 |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 693.23 | 64.77 |
| Top Width (ft) | 100.84 | Top Width (ft) | | 90.41 | 10.43 |
| Vel Total (ft/s) | 4.23 | Avg. Vel. (ft/s) | | 4.25 | 4.02 |
| Max Chl Dpth (ft) | 2.32 | Hydr. Depth (ft) | | 1.80 | 1.55 |
| Conv. Total (cfs) | 7594.6 | Conv. (cfs) | | 6945.6 | 649.0 |
| Length Wtd. (ft) | 199.32 | Wetted Per. (ft) | | 91.71 | 11.96 |
| Min Ch El (ft) | 930.91 | Shear (lb/sq ft) | | 1.11 | 0.84 |

| | | | | |
|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | 4.70 | 3.37 |
| Frctn Loss (ft) | 1.99 | Cum Volume (acre-ft) | 14.16 | 0.03 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 15.74 | 0.02 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 933.47 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.30 | Wt. n-Val. | | 0.051 | 0.045 |
| W.S. Elev (ft) | 933.17 | Reach Len. (ft) | 222.79 | 199.87 | 186.94 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 157.20 | 15.45 |
| E.G. Slope (ft/ft) | 0.011242 | Area (sq ft) | | 157.20 | 15.45 |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 693.63 | 64.37 |
| Top Width (ft) | 100.84 | Top Width (ft) | | 90.41 | 10.43 |
| Vel Total (ft/s) | 4.39 | Avg. Vel. (ft/s) | | 4.41 | 4.17 |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.74 | 1.48 |
| Conv. Total (cfs) | 7149.2 | Conv. (cfs) | | 6542.1 | 607.1 |
| Length Wtd. (ft) | 199.32 | Wetted Per. (ft) | | 91.64 | 11.90 |
| Min Ch El (ft) | 930.91 | Shear (lb/sq ft) | | 1.20 | 0.91 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.31 | 3.80 |
| Frctn Loss (ft) | 1.89 | Cum Volume (acre-ft) | 1.61 | 13.35 | 0.03 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 1.89 | 15.74 | 0.02 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.418

INPUT
Description: Thalweg Sta. 550.88
Station Elevation Data num= 137

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 956 | 2.75 | 955.77 | 3.48 | 955.72 | 4.2 | 955.62 | 14.68 | 953.99 |
| 25.34 | 952.27 | 25.88 | 952.18 | 37.08 | 950.53 | 47.93 | 949.2 | 48.28 | 949.15 |
| 48.63 | 949.11 | 59.48 | 947.65 | 70.52 | 945.83 | 70.68 | 945.8 | 70.83 | 945.77 |
| 81.88 | 943.08 | 93.08 | 940.27 | 104.28 | 937.62 | 115.48 | 935.59 | 115.7 | 935.58 |
| 126.67 | 934.56 | 137.47 | 934.04 | 137.87 | 934.02 | 138.29 | 934.01 | 149.07 | 933.64 |
| 159.68 | 933.3 | 160.27 | 933.29 | 160.88 | 933.27 | 171.47 | 932.95 | 193.87 | 932.37 |
| 204.11 | 932.14 | 205.07 | 932.11 | 206.06 | 932.09 | 216.27 | 931.85 | 248.52 | 931.3 |
| 251.23 | 931.26 | 270.74 | 930.91 | 272.27 | 930.88 | 283.46 | 930.69 | 294.66 | 930.57 |
| 300.3 | 930.55 | 301.53 | 930.55 | 305.86 | 930.54 | 339.46 | 930.53 | 350.66 | 930.48 |
| 364.18 | 930.35 | 384.26 | 930.11 | 386.77 | 930.09 | 395.46 | 930 | 405.77 | 929.95 |
| 406.65 | 929.95 | 426.22 | 930.03 | 435.55 | 930.09 | 448.43 | 930.14 | 448.46 | 930.14 |
| 451.45 | 930.14 | 454.53 | 930.15 | 462.65 | 930.16 | 473.85 | 930.15 | 477.12 | 930.14 |
| 492.86 | 930.12 | 496.25 | 930.12 | 515.06 | 930.08 | 518.65 | 930.08 | 550.88 | 929.99 |
| 552.25 | 929.99 | 559.48 | 930.02 | 562.12 | 930.02 | 563.44 | 930 | 567.48 | 929.99 |
| 574.65 | 929.94 | 581.7 | 929.91 | 619.44 | 930 | 621.47 | 930 | 626.12 | 929.99 |
| 629.13 | 929.99 | 630.64 | 929.98 | 636.57 | 929.96 | 653.04 | 929.86 | 657.83 | 929.85 |
| 670.54 | 929.8 | 675.44 | 929.8 | 680.42 | 929.79 | 686.64 | 929.79 | 688.69 | 929.78 |
| 692.75 | 929.77 | 703.01 | 929.77 | 709.04 | 929.76 | 714.96 | 929.78 | 725.91 | 929.85 |
| 742.63 | 930.01 | 753.83 | 930.16 | 765.03 | 930.38 | 770.78 | 930.51 | 776.23 | 930.6 |
| 781.6 | 930.65 | 785.47 | 930.7 | 787.43 | 930.75 | 792.92 | 930.84 | 798.63 | 930.97 |
| 800.37 | 931 | 803.81 | 931.07 | 809.83 | 931.17 | 815.96 | 931.18 | 821.03 | 931.22 |
| 826.02 | 931.23 | 832.23 | 931.14 | 838.54 | 931.18 | 843.43 | 931.18 | 848.23 | 931.27 |
| 854.63 | 931.58 | 861.13 | 931.75 | 865.82 | 931.83 | 870.44 | 931.93 | 877.02 | 932.27 |
| 883.72 | 932.78 | 888.22 | 933.1 | 892.66 | 933.39 | 899.42 | 933.82 | 906.31 | 934.08 |
| 910.62 | 934.28 | 914.87 | 934.36 | 919.49 | 934.38 | 921.82 | 934.42 | 926.94 | 934.5 |
| 933.02 | 934.58 | 934.38 | 934.65 | 937.08 | 934.74 | 944.22 | 934.96 | 951.49 | 935.1 |
| 955.42 | 935.2 | 966.62 | 935.45 | 974.08 | 936.04 | 977.82 | 936.29 | 981.5 | 936.58 |
| 989.02 | 937.41 | 994.36 | 937.31 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 300.3 | .052 | 550.88 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 448.46 | 621.47 | 235.06 | 203.24 | 168.11 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 930.92 | Element | Left OB | Channel | Right OB |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.051 | 0.048 | 0.045 |
| W.S. Elev (ft) | 930.86 | Reach Len. (ft) | 235.06 | 203.24 | 168.11 |
| Crit W.S. (ft) | 930.48 | Flow Area (sq ft) | 93.06 | 140.73 | 143.41 |
| E.G. Slope (ft/ft) | 0.005956 | Area (sq ft) | 93.06 | 140.73 | 143.41 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 143.11 | 291.43 | 323.46 |
| Top Width (ft) | 520.12 | Top Width (ft) | 174.88 | 173.01 | 172.23 |
| Vel Total (ft/s) | 2.01 | Avg. Vel. (ft/s) | 1.54 | 2.07 | 2.26 |
| Max Chl Dpth (ft) | 1.10 | Hydr. Depth (ft) | 0.53 | 0.81 | 0.83 |
| Conv. Total (cfs) | 9821.6 | Conv. (cfs) | 1854.3 | 3776.1 | 4191.2 |
| Length Wtd. (ft) | 197.98 | Wetted Per. (ft) | 174.89 | 173.01 | 172.24 |
| Min Ch El (ft) | 929.91 | Shear (lb/sq ft) | 0.20 | 0.30 | 0.31 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.30 | 0.63 | 0.70 |
| Frctn Loss (ft) | 1.48 | Cum Volume (acre-ft) | 4.72 | 10.84 | 1.97 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 10.64 | 15.13 | 5.27 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 931.48 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 931.29 | Reach Len. (ft) | 235.06 | 203.24 | 168.11 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 215.38 | |
| E.G. Slope (ft/ft) | 0.010053 | Area (sq ft) | | 215.38 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 173.01 | Top Width (ft) | | 173.01 | |
| Vel Total (ft/s) | 3.52 | Avg. Vel. (ft/s) | | 3.52 | |
| Max Chl Dpth (ft) | 1.53 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 7560.0 | Conv. (cfs) | | 7560.0 | |
| Length Wtd. (ft) | 203.24 | Wetted Per. (ft) | | 175.45 | |
| Min Ch El (ft) | 929.91 | Shear (lb/sq ft) | | 0.77 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.71 | |
| Frctn Loss (ft) | 1.71 | Cum Volume (acre-ft) | | 13.29 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 15.13 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 931.54 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 931.37 | Reach Len. (ft) | 235.06 | 203.24 | 168.11 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 230.08 | |
| E.G. Slope (ft/ft) | 0.008087 | Area (sq ft) | | 230.08 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 173.01 | Top Width (ft) | | 173.01 | |
| Vel Total (ft/s) | 3.29 | Avg. Vel. (ft/s) | | 3.29 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 1.33 | |
| Conv. Total (cfs) | 8428.8 | Conv. (cfs) | | 8428.8 | |
| Length Wtd. (ft) | 203.24 | Wetted Per. (ft) | | 175.62 | |
| Min Ch El (ft) | 929.91 | Shear (lb/sq ft) | | 0.66 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.18 | |
| Frctn Loss (ft) | 1.91 | Cum Volume (acre-ft) | 1.61 | 12.46 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.89 | 15.13 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.379

INPUT
Description: Thalweg Sta. 440.15
Station Elevation Data num= 155

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 317.37 | 935.45 | 325.72 | 935.3 | 331.02 | 935.18 | 344.66 | 934.66 | 349.7 | 934.52 |
| 355.12 | 934.34 | 356.77 | 934.29 | 358.3 | 934.24 | 369.83 | 934.15 | 371.94 | 934.12 |
| 384.53 | 934.02 | 385.59 | 934 | 392.15 | 933.92 | 399.23 | 933.77 | 412.87 | 933.83 |
| 426.51 | 934.35 | 427.53 | 934.39 | 428.64 | 934.41 | 434.61 | 934.54 | 440.15 | 934.54 |
| 443.34 | 934.51 | 453.79 | 934.28 | 458.04 | 934.12 | 467.43 | 933.87 | 472.74 | 933.67 |
| 484.14 | 933.42 | 494.72 | 933.23 | 502.15 | 933.11 | 508.36 | 933.03 | 516.85 | 932.99 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 522 | 932.99 | 526.6 | 933.02 | 533.67 | 933.12 | 535.64 | 933.14 | 546.25 | 933.27 |
| 549.28 | 933.32 | 560.96 | 933.43 | 569.05 | 933.55 | 575.66 | 933.59 | 590.21 | 933.74 |
| 590.36 | 933.74 | 603.85 | 933.76 | 604.43 | 933.76 | 605.06 | 933.75 | 611.51 | 933.68 |
| 617.5 | 933.58 | 619.76 | 933.51 | 631.13 | 933.06 | 634.46 | 932.81 | 644.77 | 931.92 |
| 649.17 | 931.48 | 658.42 | 930.51 | 661.04 | 930.28 | 663.87 | 930.07 | 672.06 | 929.5 |
| 678.57 | 929.28 | 685.7 | 929.11 | 687.25 | 929.09 | 699.34 | 928.96 | 710.57 | 928.88 |
| 712.99 | 928.87 | 737.38 | 928.74 | 740.26 | 928.72 | 752.08 | 928.69 | 753.03 | 928.68 |
| 753.91 | 928.68 | 766.79 | 928.63 | 767.16 | 928.63 | 767.55 | 928.62 | 781.19 | 928.55 |
| 781.49 | 928.55 | 794.83 | 928.49 | 795.49 | 928.48 | 796.19 | 928.48 | 802.56 | 928.45 |
| 808.48 | 928.41 | 810.89 | 928.39 | 835.76 | 928.23 | 837.94 | 928.22 | 840.3 | 928.2 |
| 863.04 | 928.05 | 876.68 | 927.99 | 887.47 | 928.02 | 890.33 | 928.04 | 903.97 | 928.18 |
| 913.8 | 928.3 | 917.61 | 928.34 | 922.85 | 928.38 | 928.51 | 928.4 | 931.25 | 928.4 |
| 943.21 | 928.43 | 944.89 | 928.43 | 957.91 | 928.54 | 958.53 | 928.54 | 966.53 | 928.62 |
| 966.94 | 928.62 | 972.17 | 928.68 | 972.61 | 928.68 | 985.82 | 928.61 | 986.54 | 928.6 |
| 987.32 | 928.58 | 990.92 | 928.51 | 993.61 | 928.46 | 999.46 | 928.49 | 1002.02 | 928.52 |
| 1013.1 | 928.75 | 1016.72 | 928.85 | 1026.74 | 929.02 | 1031.42 | 929.06 | 1040.38 | 929.11 |
| 1046.13 | 929.12 | 1054.02 | 929.15 | 1060.83 | 929.16 | 1071.45 | 929.14 | 1075.53 | 929.11 |
| 1078.53 | 929.1 | 1081.31 | 929.06 | 1090.23 | 929.05 | 1094.95 | 929.06 | 1104.93 | 929.12 |
| 1108.59 | 929.17 | 1119.64 | 929.34 | 1122.24 | 929.39 | 1128.06 | 929.55 | 1134.34 | 929.67 |
| 1135.88 | 929.69 | 1149.04 | 929.82 | 1149.51 | 929.82 | 1163.16 | 929.77 | 1163.44 | 929.76 |
| 1163.74 | 929.76 | 1176.8 | 929.79 | 1178.45 | 929.8 | 1190.44 | 929.99 | 1193.14 | 930.02 |
| 1204.08 | 930.33 | 1207.85 | 930.41 | 1217.73 | 930.74 | 1222.55 | 930.93 | 1231.37 | 931.11 |
| 1237.25 | 931.3 | 1245.01 | 931.46 | 1258.65 | 931.91 | 1266.66 | 932.22 | 1272.29 | 932.42 |
| 1273.27 | 932.46 | 1281.36 | 932.76 | 1285.93 | 932.91 | 1296.06 | 933.29 | 1299.57 | 933.4 |
| 1310.76 | 933.71 | 1313.22 | 933.66 | 1325.47 | 933.55 | 1326.86 | 933.49 | 1331.88 | 933.42 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 317.37 | .032 | 687.25 | .052 | 990.92 | .045 | 1273.27 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 767.16 | 966.94 | 454.6 | 420.72 | 430.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 929.44 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.052 | 0.052 | 0.048 |
| W.S. Elev (ft) | 929.33 | Reach Len. (ft) | 454.60 | 420.72 | 430.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 42.80 | 203.79 | 59.06 |
| E.G. Slope (ft/ft) | 0.009624 | Area (sq ft) | 42.80 | 203.79 | 59.06 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 76.60 | 578.87 | 102.53 |
| Top Width (ft) | 441.89 | Top Width (ft) | 90.07 | 199.78 | 152.04 |
| Vel Total (ft/s) | 2.48 | Avg. Vel. (ft/s) | 1.79 | 2.84 | 1.74 |
| Max Chl Dpth (ft) | 1.34 | Hydr. Depth (ft) | 0.48 | 1.02 | 0.39 |
| Conv. Total (cfs) | 7726.7 | Conv. (cfs) | 780.8 | 5900.7 | 1045.1 |
| Length Wtd. (ft) | 430.69 | Wetted Per. (ft) | 90.07 | 199.78 | 152.05 |
| Min Ch El (ft) | 927.99 | Shear (lb/sq ft) | 0.29 | 0.61 | 0.23 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.51 | 1.74 | 0.41 |
| Frctn Loss (ft) | 2.74 | Cum Volume (acre-ft) | 4.35 | 10.03 | 1.58 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 9.93 | 14.26 | 4.65 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 929.76 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 929.63 | Reach Len. (ft) | 454.60 | 420.72 | 430.84 |
| Crit W.S. (ft) | 929.07 | Flow Area (sq ft) | | 263.25 | |
| E.G. Slope (ft/ft) | 0.007123 | Area (sq ft) | | 263.25 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 199.78 | Top Width (ft) | | 199.78 | |
| Vel Total (ft/s) | 2.88 | Avg. Vel. (ft/s) | | 2.88 | |
| Max Chl Dpth (ft) | 1.64 | Hydr. Depth (ft) | | 1.32 | |
| Conv. Total (cfs) | 8981.5 | Conv. (cfs) | | 8981.5 | |
| Length Wtd. (ft) | 420.72 | Wetted Per. (ft) | | 201.79 | |
| Min Ch El (ft) | 927.99 | Shear (lb/sq ft) | | 0.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.67 | |
| Frctn Loss (ft) | 2.58 | Cum Volume (acre-ft) | | 12.18 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 14.26 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 929.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 929.46 | Reach Len. (ft) | 454.60 | 420.72 | 430.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 230.37 | |
| E.G. Slope (ft/ft) | 0.011088 | Area (sq ft) | | 230.37 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 199.78 | Top Width (ft) | | 199.78 | |
| Vel Total (ft/s) | 3.29 | Avg. Vel. (ft/s) | | 3.29 | |
| Max Chl Dpth (ft) | 1.47 | Hydr. Depth (ft) | | 1.15 | |
| Conv. Total (cfs) | 7198.4 | Conv. (cfs) | | 7198.4 | |
| Length Wtd. (ft) | 428.28 | Wetted Per. (ft) | | 201.46 | |
| Min Ch El (ft) | 927.99 | Shear (lb/sq ft) | | 0.79 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.60 | |
| Frctn Loss (ft) | 2.79 | Cum Volume (acre-ft) | 1.61 | 11.38 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.89 | 14.26 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.299

INPUT
Description: Thalweg Sta. 541.55
Station Elevation Data num= 109

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 927.29 | 2.15 | 927.24 | 13.02 | 926.68 | 14.96 | 926.64 | 22.65 | 926.8 |
| 27.76 | 926.95 | 29.04 | 926.91 | 40.56 | 926.82 | 45.05 | 926.91 | 53.36 | 926.91 |
| 61.07 | 926.81 | 66.16 | 926.76 | 77.08 | 926.61 | 78.96 | 926.61 | 91.77 | 926.48 |
| 92.36 | 926.46 | 93.1 | 926.47 | 99.47 | 926.51 | 109.11 | 926.48 | 117.37 | 926.5 |
| 125.14 | 926.46 | 130.17 | 926.47 | 141.15 | 926.44 | 142.97 | 926.44 | 168.58 | 926.28 |
| 173.18 | 926.24 | 194.18 | 926.11 | 205.22 | 926.07 | 214.04 | 926.07 | 219.79 | 926.08 |
| 221.23 | 926.08 | 237.25 | 926.11 | 241.77 | 926.11 | 245.39 | 926.1 | 253.26 | 926.09 |
| 269.28 | 926.04 | 283.8 | 925.96 | 296.6 | 925.87 | 298.69 | 925.86 | 305.81 | 925.81 |
| 317.32 | 925.78 | 376.96 | 925.82 | 381.39 | 925.83 | 386.21 | 925.83 | 397.4 | 925.85 |
| 399.01 | 925.85 | 411.82 | 925.88 | 413.42 | 925.89 | 424.62 | 925.92 | 445.45 | 925.98 |
| 445.84 | 925.98 | 450.22 | 925.99 | 463.02 | 926 | 475.82 | 925.95 | 476.56 | 925.95 |
| 477.48 | 925.94 | 509.52 | 925.76 | 525.54 | 925.69 | 526.37 | 925.69 | 527.04 | 925.68 |
| 533.03 | 925.67 | 539.84 | 925.64 | 541.55 | 925.64 | 557.57 | 925.61 | 573.58 | 925.62 |
| 589.6 | 925.66 | 591.04 | 925.67 | 605.61 | 925.74 | 629.45 | 925.91 | 637.65 | 925.98 |
| 637.72 | 925.98 | 642.18 | 926.01 | 644.21 | 926.03 | 647.35 | 926.06 | 654.12 | 926.11 |
| 654.76 | 926.12 | 656.82 | 926.12 | 667.34 | 926.17 | 687.08 | 926.17 | 690.15 | 926.16 |
| 692.5 | 926.16 | 703.55 | 926.14 | 705.09 | 926.14 | 710.03 | 926.13 | 742.83 | 926.13 |
| 747.23 | 926.12 | 780.57 | 926.11 | 793.16 | 926.15 | 800.15 | 926.19 | 805.27 | 926.23 |
| 808.38 | 926.26 | 816.78 | 926.32 | 826.41 | 926.4 | 828.3 | 926.41 | 835.2 | 926.47 |
| 862.84 | 926.64 | 863.44 | 926.64 | 908.9 | 926.88 | 914.37 | 926.93 | 920.42 | 926.96 |
| 923.94 | 926.99 | 942.57 | 927.12 | 943.45 | 927.13 | 944.11 | 927.13 | 951.02 | 927.19 |
| 964.28 | 927.26 | 966.48 | 927.28 | 980.34 | 927.39 | 982.03 | 927.4 | | |

Manning's n Values num= 1

| Sta | n Val |
|---|---|
| 0 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 445.84 | 667.34 | 351.15 | 374.43 | 400.22 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 926.68 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.04 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 926.64 | Reach Len. (ft) | 351.15 | 374.43 | 400.22 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 206.45 | 181.01 | 79.42 |
| E.G. Slope (ft/ft) | 0.004516 | Area (sq ft) | 206.45 | 181.01 | 79.42 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 310.09 | 351.08 | 96.82 |
| Top Width (ft) | 787.26 | Top Width (ft) | 370.73 | 221.50 | 195.02 |
| Vel Total (ft/s) | 1.62 | Avg. Vel. (ft/s) | 1.50 | 1.94 | 1.22 |
| Max Chl Dpth (ft) | 1.03 | Hydr. Depth (ft) | 0.56 | 0.82 | 0.41 |
| Conv. Total (cfs) | 11279.2 | Conv. (cfs) | 4614.3 | 5224.2 | 1440.8 |
| Length Wtd. (ft) | 368.70 | Wetted Per. (ft) | 370.74 | 221.50 | 195.03 |
| Min Ch El (ft) | 925.61 | Shear (lb/sq ft) | 0.16 | 0.23 | 0.11 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.24 | 0.45 | 0.14 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 2.35 | Cum Volume (acre-ft) | 3.05 | 8.17 | 0.89 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.53 | 12.23 | 2.93 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 927.18 | Wt. n-Val. | | 0.045 | |
| Vel Head (ft) | 0.12 | Reach Len. (ft) | 351.15 | 374.43 | 400.22 |
| W.S. Elev (ft) | 927.06 | Flow Area (sq ft) | | 274.07 | |
| Crit W.S. (ft) | 926.53 | Area (sq ft) | | 274.07 | |
| E.G. Slope (ft/ft) | 0.005344 | Flow (cfs) | | 758.00 | |
| Q Total (cfs) | 758.00 | Top Width (ft) | | 221.50 | |
| Top Width (ft) | 221.50 | Avg. Vel. (ft/s) | | 2.77 | |
| Vel Total (ft/s) | 2.77 | Hydr. Depth (ft) | | 1.24 | |
| Max Chl Dpth (ft) | 1.45 | Conv. (cfs) | | 10369.4 | |
| Conv. Total (cfs) | 10369.4 | Wetted Per. (ft) | | 223.47 | |
| Length Wtd. (ft) | 374.43 | Shear (lb/sq ft) | | 0.41 | |
| Min Ch El (ft) | 925.61 | Stream Power (lb/ft s) | | 1.13 | |
| Alpha | 1.00 | Cum Volume (acre-ft) | | 9.58 | |
| Frctn Loss (ft) | 2.69 | Cum SA (acres) | | 12.23 | |
| C & E Loss (ft) | 0.00 | | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | Element | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 926.81 | Wt. n-Val. | 0.045 | 0.045 | |
| Vel Head (ft) | 0.06 | Reach Len. (ft) | 351.15 | 374.43 | 400.22 |
| W.S. Elev (ft) | 926.75 | Flow Area (sq ft) | 174.20 | 204.91 | |
| Crit W.S. (ft) | | Area (sq ft) | 174.20 | 204.91 | |
| E.G. Slope (ft/ft) | 0.004283 | Flow (cfs) | 338.31 | 419.69 | |
| Q Total (cfs) | 758.00 | Top Width (ft) | 203.84 | 221.50 | |
| Top Width (ft) | 425.34 | Avg. Vel. (ft/s) | 1.94 | 2.05 | |
| Vel Total (ft/s) | 2.00 | Hydr. Depth (ft) | 0.85 | 0.93 | |
| Max Chl Dpth (ft) | 1.14 | Conv. (cfs) | 5169.4 | 6412.8 | |
| Conv. Total (cfs) | 11582.2 | Wetted Per. (ft) | 204.48 | 222.08 | |
| Length Wtd. (ft) | 369.23 | Shear (lb/sq ft) | 0.23 | 0.25 | |
| Min Ch El (ft) | 925.61 | Stream Power (lb/ft s) | 0.44 | 0.51 | |
| Alpha | 1.00 | Cum Volume (acre-ft) | 0.70 | 9.28 | |
| Frctn Loss (ft) | 2.33 | Cum SA (acres) | 0.82 | 12.23 | |
| C & E Loss (ft) | 0.01 | | | | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.229

INPUT
Description: Thalweg Sta. 555.98
Station Elevation Data num= 95

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 924.82 | 7.83 | 924.72 | 11.61 | 924.68 | 36.19 | 924.35 | 43.43 | 924.27 |
| 44.43 | 924.27 | 54.83 | 924.21 | 96.22 | 924.12 | 98.05 | 924.12 | 108.86 | 924.1 |
| 128.19 | 924.1 | 130.47 | 924.11 | 141.27 | 924.08 | 149 | 924.05 | 152.08 | 924.03 |
| 154.22 | 924.03 | 172.51 | 923.97 | 173.69 | 923.96 | 175.39 | 923.95 | 195.31 | 923.87 |
| 200.69 | 923.84 | 201.41 | 923.83 | 218.66 | 923.79 | 219.11 | 923.78 | 220.22 | 923.78 |
| 231.38 | 923.76 | 270.44 | 923.76 | 276.3 | 923.78 | 280.46 | 923.77 | 283.47 | 923.78 |
| 287.7 | 923.76 | 292.73 | 923.76 | 304.96 | 923.73 | 305.1 | 923.73 | 317.27 | 923.71 |
| 322.21 | 923.69 | 339.48 | 923.7 | 366.35 | 923.81 | 378.62 | 923.79 | 390.89 | 923.75 |
| 391.25 | 923.74 | 408.51 | 923.66 | 412.55 | 923.65 | 415.42 | 923.63 | 425.77 | 923.6 |
| 427.69 | 923.6 | 432.42 | 923.59 | 435.87 | 923.59 | 464.5 | 923.6 | 469.92 | 923.61 |
| 494.81 | 923.62 | 513.58 | 923.61 | 520.12 | 923.62 | 525.84 | 923.61 | 555.98 | 923.61 |
| 562.65 | 923.62 | 581.11 | 923.62 | 598.36 | 923.66 | 599.46 | 923.66 | 602.17 | 923.67 |
| 613.35 | 923.68 | 615.62 | 923.67 | 624 | 923.65 | 632.88 | 923.6 | 636.27 | 923.57 |
| 644.61 | 923.51 | 651.78 | 923.47 | 652.69 | 923.46 | 664.56 | 923.45 | 682.48 | 923.5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 687.05 | 923.53 | 711.14 | 923.73 | 714.04 | 923.74 | 721.25 | 923.79 | 735.24 | 923.86 |
| 736.29 | 923.86 | 754.21 | 923.94 | 769.81 | 924 | 771.38 | 924 | 772.14 | 924.01 |
| 783.43 | 924.07 | 786.1 | 924.09 | 790.08 | 924.11 | 806.52 | 924.22 | 807.52 | 924.23 |
| 808.01 | 924.23 | 819.57 | 924.31 | 820.09 | 924.31 | 822.15 | 924.32 | 829.44 | 924.37 |
| 831.27 | 924.38 | 845.75 | 924.49 | 865.11 | 924.58 | 866.31 | 924.59 | 884.45 | 924.58 |

Manning's n Values num= 1

| Sta | n Val |
|---|---|
| 0 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 366.35 | 754.21 | 318.44 | 327.42 | 342.72 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 924.33 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 924.26 | Reach Len. (ft) | 318.44 | 327.42 | 342.72 |
| Crit W.S. (ft) | 924.07 | Flow Area (sq ft) | 112.44 | 239.72 | 10.39 |
| E.G. Slope (ft/ft) | 0.009689 | Area (sq ft) | 112.44 | 239.72 | 10.39 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 181.91 | 565.36 | 10.72 |
| Top Width (ft) | 766.13 | Top Width (ft) | 320.15 | 387.86 | 58.11 |
| Vel Total (ft/s) | 2.09 | Avg. Vel. (ft/s) | 1.62 | 2.36 | 1.03 |
| Max Chl Dpth (ft) | 0.81 | Hydr. Depth (ft) | 0.35 | 0.62 | 0.18 |
| Conv. Total (cfs) | 7700.6 | Conv. (cfs) | 1848.1 | 5743.6 | 109.0 |
| Length Wtd. (ft) | 326.29 | Wetted Per. (ft) | 320.15 | 387.86 | 58.11 |
| Min Ch El (ft) | 923.45 | Shear (lb/sq ft) | 0.21 | 0.37 | 0.11 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.34 | 0.88 | 0.11 |
| Frctn Loss (ft) | 1.42 | Cum Volume (acre-ft) | 1.77 | 6.37 | 0.48 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 4.74 | 9.61 | 1.77 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 924.48 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 924.37 | Reach Len. (ft) | 318.44 | 327.42 | 342.72 |
| Crit W.S. (ft) | 924.13 | Flow Area (sq ft) | | 281.89 | |
| E.G. Slope (ft/ft) | 0.010184 | Area (sq ft) | | 281.89 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 387.86 | Top Width (ft) | | 387.86 | |
| Vel Total (ft/s) | 2.69 | Avg. Vel. (ft/s) | | 2.69 | |
| Max Chl Dpth (ft) | 0.92 | Hydr. Depth (ft) | | 0.73 | |
| Conv. Total (cfs) | 7511.3 | Conv. (cfs) | | 7511.3 | |
| Length Wtd. (ft) | 327.42 | Wetted Per. (ft) | | 388.85 | |
| Min Ch El (ft) | 923.45 | Shear (lb/sq ft) | | 0.46 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.24 | |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | | 7.19 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 9.61 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 924.48 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 924.37 | Reach Len. (ft) | 318.44 | 327.42 | 342.72 |
| Crit W.S. (ft) | 924.13 | Flow Area (sq ft) | | 281.91 | |
| E.G. Slope (ft/ft) | 0.010181 | Area (sq ft) | | 281.91 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 387.86 | Top Width (ft) | | 387.86 | |
| Vel Total (ft/s) | 2.69 | Avg. Vel. (ft/s) | | 2.69 | |
| Max Chl Dpth (ft) | 0.92 | Hydr. Depth (ft) | | 0.73 | |
| Conv. Total (cfs) | 7512.3 | Conv. (cfs) | | 7512.3 | |
| Length Wtd. (ft) | 327.42 | Wetted Per. (ft) | | 388.85 | |
| Min Ch El (ft) | 923.45 | Shear (lb/sq ft) | | 0.46 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.24 | |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | | 7.19 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 9.61 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.167

INPUT
Description: Thalweg Sta. 578.96
Station Elevation Data num= 115

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 923.92 | 14.23 | 923.91 | 24.56 | 923.87 | 25.27 | 923.86 | 62.79 | 923.55 |
| 65.23 | 923.52 | 65.85 | 923.52 | 94.65 | 923.22 | 107.14 | 923.06 | 108.53 | 923.05 |
| 117.46 | 922.94 | 127.78 | 922.84 | 138.11 | 922.79 | 139.19 | 922.79 | 143.4 | 922.77 |
| 148.43 | 922.76 | 150.17 | 922.75 | 177.91 | 922.67 | 179.4 | 922.66 | 189.72 | 922.63 |
| 220.69 | 922.62 | 224.01 | 922.61 | 231.01 | 922.6 | 233.42 | 922.6 | 261.18 | 922.52 |
| 261.98 | 922.52 | 270.45 | 922.49 | 272.58 | 922.49 | 283.56 | 922.44 | 314.27 | 922.24 |
| 318.32 | 922.22 | 327.46 | 922.16 | 338.37 | 922.12 | 349.41 | 922.13 | 360.39 | 922.18 |
| 362.77 | 922.2 | 382.34 | 922.27 | 386.3 | 922.27 | 393.32 | 922.27 | 404.3 | 922.22 |
| 438.62 | 921.98 | 458.66 | 921.89 | 459.8 | 921.89 | 478.72 | 921.86 | 481.13 | 921.85 |
| 503.08 | 921.82 | 538.87 | 921.81 | 556.82 | 921.87 | 557.96 | 921.87 | 558.91 | 921.88 |
| 578.96 | 922.04 | 581.08 | 922.06 | 595.39 | 922.16 | 601.87 | 922.22 | 602.95 | 922.22 |
| 612.85 | 922.27 | 619.06 | 922.27 | 623.82 | 922.28 | 634.8 | 922.28 | 645.77 | 922.26 |
| 678.1 | 922.13 | 678.7 | 922.12 | 700.66 | 922.02 | 701.18 | 922.02 | 702.36 | 922.01 |
| 711.63 | 921.98 | 719.3 | 921.97 | 726.89 | 921.97 | 735.47 | 921.99 | 738.03 | 921.99 |
| 759.2 | 922.04 | 772.02 | 922.05 | 773.94 | 922.06 | 776.71 | 922.06 | 784.2 | 922.08 |
| 794.21 | 922.14 | 817.05 | 922.27 | 829.22 | 922.31 | 832.94 | 922.31 | 841.47 | 922.29 |
| 845.13 | 922.29 | 845.78 | 922.28 | 846.72 | 922.28 | 852.96 | 922.27 | 857.31 | 922.25 |
| 881.57 | 922.15 | 881.73 | 922.15 | 899.23 | 922.11 | 906.05 | 922.12 | 916.73 | 922.16 |
| 918.24 | 922.16 | 924.8 | 922.21 | 954.79 | 922.38 | 966.97 | 922.43 | 991.34 | 922.44 |
| 1003.53 | 922.42 | 1021.75 | 922.42 | 1039.25 | 922.46 | 1040.08 | 922.46 | 1041.97 | 922.47 |
| 1052.26 | 922.51 | 1064.44 | 922.59 | 1074.26 | 922.64 | 1075.66 | 922.65 | 1076.63 | 922.66 |
| 1082.07 | 922.68 | 1088.82 | 922.72 | 1091.76 | 922.73 | 1104.39 | 922.8 | 1109.26 | 922.82 |
| 1113.19 | 922.85 | 1122.16 | 922.89 | 1126.77 | 922.92 | 1140.31 | 922.98 | 1142.91 | 922.98 |

Manning's n Values num= 1

| Sta | n Val |
|---|---|
| 0 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 386.3 | 966.97 | 410.07 | 409 | 416.49 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 922.90 | Element | | | |
| Vel Head (ft) | 0.03 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 922.87 | Reach Len. (ft) | 410.07 | 409.00 | 416.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 103.76 | 452.46 | 48.77 |
| E.G. Slope (ft/ft) | 0.002469 | Area (sq ft) | 103.76 | 452.46 | 48.77 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 91.80 | 628.66 | 37.55 |
| Top Width (ft) | 994.45 | Top Width (ft) | 262.07 | 580.67 | 151.70 |
| Vel Total (ft/s) | 1.25 | Avg. Vel. (ft/s) | 0.88 | 1.39 | 0.77 |
| Max Chl Dpth (ft) | 1.06 | Hydr. Depth (ft) | 0.40 | 0.78 | 0.32 |
| Conv. Total (cfs) | 15254.0 | Conv. (cfs) | 1847.3 | 12651.1 | 755.6 |
| Length Wtd. (ft) | 409.36 | Wetted Per. (ft) | 262.08 | 580.68 | 151.70 |
| Min Ch El (ft) | 921.81 | Shear (lb/sq ft) | 0.06 | 0.12 | 0.05 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.05 | 0.17 | 0.04 |
| Frctn Loss (ft) | 1.59 | Cum Volume (acre-ft) | 0.98 | 3.76 | 0.25 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.61 | 5.97 | 0.94 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 923.00 | Element | | | |
| Vel Head (ft) | 0.03 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 922.96 | Reach Len. (ft) | 410.07 | 409.00 | 416.49 |
| Crit W.S. (ft) | 922.47 | Flow Area (sq ft) | | 504.91 | |
| E.G. Slope (ft/ft) | 0.002498 | Area (sq ft) | | 504.91 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |

| | | | |
|---|---|---|---|
| Top Width (ft) | 580.67 | Top Width (ft) | 580.67 |
| Vel Total (ft/s) | 1.50 | Avg. Vel. (ft/s) | 1.50 |
| Max Chl Dpth (ft) | 1.15 | Hydr. Depth (ft) | 0.87 |
| Conv. Total (cfs) | 15167.4 | Conv. (cfs) | 15167.4 |
| Length Wtd. (ft) | 409.00 | Wetted Per. (ft) | 581.91 |
| Min Ch El (ft) | 921.81 | Shear (lb/sq ft) | 0.14 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.20 |
| Frctn Loss (ft) | 1.60 | Cum Volume (acre-ft) | 4.23 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.97 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 923.00 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.04 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 922.96 | Reach Len. (ft) | 410.07 | 409.00 | 416.49 |
| Crit W.S. (ft) | 922.47 | Flow Area (sq ft) | | 504.88 | |
| E.G. Slope (ft/ft) | 0.002498 | Area (sq ft) | | 504.88 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 580.67 | Top Width (ft) | | 580.67 | |
| Vel Total (ft/s) | 1.50 | Avg. Vel. (ft/s) | | 1.50 | |
| Max Chl Dpth (ft) | 1.15 | Hydr. Depth (ft) | | 0.87 | |
| Conv. Total (cfs) | 15165.6 | Conv. (cfs) | | 15165.6 | |
| Length Wtd. (ft) | 409.00 | Wetted Per. (ft) | | 581.91 | |
| Min Ch El (ft) | 921.81 | Shear (lb/sq ft) | | 0.14 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.20 | |
| Frctn Loss (ft) | 1.60 | Cum Volume (acre-ft) | | 4.23 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 5.97 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Tributary 3E
REACH: Reach 1 RS: 0.089

INPUT
Description: Thalweg Sta. 710.92
Station Elevation Data num= 169

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 921.85 | .75 | 921.84 | 1.85 | 921.83 | 10.78 | 921.71 | 12.67 | 921.68 |
| 20.81 | 921.57 | 30.83 | 921.43 | 34.33 | 921.39 | 40.86 | 921.3 | 55.99 | 921.15 |
| 60.92 | 921.09 | 66.82 | 921.04 | 70.94 | 920.99 | 74.49 | 920.96 | 80.97 | 920.93 |
| 88.48 | 920.92 | 91 | 920.91 | 171.22 | 920.97 | 175.13 | 920.96 | 181.25 | 920.96 |
| 185.96 | 920.95 | 211.33 | 920.95 | 218.45 | 920.89 | 231.38 | 920.84 | 241.41 | 920.83 |
| 250.94 | 920.9 | 251.44 | 920.9 | 257.7 | 920.89 | 261.47 | 920.87 | 261.77 | 920.87 |
| 271.49 | 920.79 | 272.6 | 920.79 | 281.52 | 920.76 | 301.58 | 920.77 | 305.08 | 920.78 |
| 311.6 | 920.78 | 326.74 | 920.81 | 337.58 | 920.81 | 351.71 | 920.77 | 361.74 | 920.72 |
| 370.07 | 920.66 | 380.9 | 920.59 | 381.79 | 920.59 | 391.73 | 920.52 | 391.82 | 920.52 |
| 392.98 | 920.51 | 397.75 | 920.48 | 403.39 | 920.48 | 423.7 | 920.54 | 445.24 | 920.56 |
| 450.65 | 920.58 | 456.01 | 920.57 | 477.54 | 920.61 | 509.86 | 920.6 | 520.63 | 920.61 |
| 531.39 | 920.65 | 552.94 | 920.76 | 563.72 | 920.81 | 574.49 | 920.84 | 592.96 | 920.84 |
| 603.2 | 920.87 | 606.8 | 920.87 | 616.03 | 920.9 | 617.57 | 920.91 | 628.34 | 920.93 |
| 666.04 | 920.85 | 671.42 | 920.83 | 703.73 | 920.67 | 710.92 | 920.65 | 714.5 | 920.63 |
| 725.27 | 920.61 | 757.97 | 920.59 | 763.82 | 920.6 | 765.86 | 920.6 | 767.01 | 920.6 |
| 783.42 | 920.66 | 795.64 | 920.74 | 801.48 | 920.79 | 816.22 | 920.89 | 816.85 | 920.9 |
| 817.99 | 920.9 | 827.45 | 920.95 | 848.01 | 920.96 | 848.67 | 920.95 | 864.17 | 920.93 |
| 869.88 | 920.94 | 878.02 | 920.94 | 880.49 | 920.95 | 881.83 | 920.95 | 908.03 | 920.88 |
| 912.3 | 920.88 | 914.64 | 920.87 | 944.12 | 920.83 | 954.73 | 920.8 | 958.21 | 920.8 |
| 965.33 | 920.78 | 968.06 | 920.78 | 975.94 | 920.76 | 986.55 | 920.78 | 989.56 | 920.79 |
| 997.15 | 920.85 | 998.07 | 920.86 | 1028.08 | 921.12 | 1028.97 | 921.12 | 1029.46 | 921.13 |
| 1045.85 | 921.19 | 1078.66 | 921.3 | 1082 | 921.32 | 1092.61 | 921.36 | 1095.07 | 921.35 |
| 1111.46 | 921.32 | 1124.42 | 921.27 | 1148.13 | 921.26 | 1160.68 | 921.29 | 1169.8 | 921.33 |
| 1177.46 | 921.34 | 1178.14 | 921.34 | 1186.8 | 921.35 | 1188.06 | 921.35 | 1193.48 | 921.34 |
| 1198.67 | 921.35 | 1208.15 | 921.35 | 1208.98 | 921.36 | 1209.89 | 921.36 | 1219.88 | 921.42 |
| 1230.49 | 921.46 | 1238.16 | 921.51 | 1241.09 | 921.54 | 1251.7 | 921.67 | 1256 | 921.7 |
| 1262.3 | 921.73 | 1263.84 | 921.74 | 1268.18 | 921.75 | 1272.91 | 921.8 | 1279.51 | 921.91 |
| 1283.52 | 921.94 | 1291.89 | 922.02 | 1294.12 | 922.05 | 1298.19 | 922.07 | 1310.86 | 922.21 |
| 1324.7 | 922.29 | 1325.94 | 922.31 | 1328.2 | 922.31 | 1336.55 | 922.34 | 1342.2 | 922.35 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1347.15 | 922.39 | 1357.52 | 922.43 | 1368.36 | 922.43 | 1373.91 | 922.47 | 1378.97 | 922.48 |
| 1381.39 | 922.49 | 1388.23 | 922.59 | 1389.58 | 922.63 | 1390.32 | 922.63 | 1400.18 | 922.78 |
| 1406.72 | 922.8 | 1410.79 | 922.84 | 1418.24 | 922.98 | 1420.57 | 922.98 | 1421.39 | 923.04 |
| 1423.12 | 923.1 | 1432 | 923.32 | 1439.52 | 923.27 | 1444.08 | 923.3 | 1448.25 | 923.28 |
| 1451.92 | 923.15 | 1453.21 | 923.16 | 1455.93 | 923.23 | 1461.57 | 923.24 | | |

Manning's n Values num= 1

| Sta | n Val |
|---|---|
| 0 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 337.58 | 1028.08 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 921.31 | Element | | | |
| Vel Head (ft) | 0.04 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 921.26 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 921.06 | Flow Area (sq ft) | 103.78 | 349.42 | 2.65 |
| E.G. Slope (ft/ft) | 0.007004 | Area (sq ft) | 103.78 | 349.42 | 2.65 |
| Q Total (cfs) | 758.00 | Flow (cfs) | 143.60 | 613.19 | 1.21 |
| Top Width (ft) | 1028.84 | Top Width (ft) | 292.91 | 690.50 | 45.43 |
| Vel Total (ft/s) | 1.66 | Avg. Vel. (ft/s) | 1.38 | 1.75 | 0.46 |
| Max Chl Dpth (ft) | 0.78 | Hydr. Depth (ft) | 0.35 | 0.51 | 0.06 |
| Conv. Total (cfs) | 9057.3 | Conv. (cfs) | 1715.8 | 7327.0 | 14.5 |
| Length Wtd. (ft) | | Wetted Per. (ft) | 292.91 | 690.51 | 45.43 |
| Min Ch El (ft) | 920.48 | Shear (lb/sq ft) | 0.15 | 0.22 | 0.03 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.21 | 0.39 | 0.01 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 921.39 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 921.33 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 921.09 | Flow Area (sq ft) | | 396.96 | |
| E.G. Slope (ft/ft) | 0.007006 | Area (sq ft) | | 396.96 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 690.50 | Top Width (ft) | | 690.50 | |
| Vel Total (ft/s) | 1.91 | Avg. Vel. (ft/s) | | 1.91 | |
| Max Chl Dpth (ft) | 0.85 | Hydr. Depth (ft) | | 0.57 | |
| Conv. Total (cfs) | 9056.3 | Conv. (cfs) | | 9056.3 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 691.24 | |
| Min Ch El (ft) | 920.48 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.48 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 921.39 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 921.33 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 921.09 | Flow Area (sq ft) | | 396.92 | |
| E.G. Slope (ft/ft) | 0.007008 | Area (sq ft) | | 396.92 | |
| Q Total (cfs) | 758.00 | Flow (cfs) | | 758.00 | |
| Top Width (ft) | 690.50 | Top Width (ft) | | 690.50 | |
| Vel Total (ft/s) | 1.91 | Avg. Vel. (ft/s) | | 1.91 | |
| Max Chl Dpth (ft) | 0.85 | Hydr. Depth (ft) | | 0.57 | |
| Conv. Total (cfs) | 9054.7 | Conv. (cfs) | | 9054.7 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 691.24 | |
| Min Ch El (ft) | 920.48 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.48 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

SUMMARY OF MANNING'S N VALUES

River:Tributary 3E

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Reach 1 | 1.553 | .032 | .045 | .032 | | |
| Reach 1 | 1.515 | .032 | .045 | .032 | .042 | .03 |
| Reach 1 | 1.478 | .032 | .045 | .032 | | |
| Reach 1 | 1.440 | .032 | .045 | .032 | | |
| Reach 1 | 1.421 | .032 | .045 | .032 | | |
| Reach 1 | 1.402 | .032 | .032 | .04 | | |
| Reach 1 | 1.378 | .04 | .032 | | | |
| Reach 1 | 1.359 | Inl Struct | | | | |
| Reach 1 | 1.326 | .032 | .04 | | | |
| Reach 1 | 1.288 | .032 | .04 | .032 | | |
| Reach 1 | 1.250 | .032 | .04 | .032 | | |
| Reach 1 | 1.213 | .032 | .04 | .032 | | |
| Reach 1 | 1.175 | .032 | .04 | .032 | | |
| Reach 1 | 1.137 | .032 | .04 | .032 | | |
| Reach 1 | 1.099 | .032 | .04 | .032 | | |
| Reach 1 | 1.061 | .032 | .04 | .032 | | |
| Reach 1 | 1.023 | .032 | .04 | .032 | .052 | .032 |
| Reach 1 | 0.985 | .032 | .052 | .032 | | |
| Reach 1 | 0.948 | .032 | .052 | .032 | | |
| Reach 1 | 0.910 | .032 | .052 | .032 | | |
| Reach 1 | 0.872 | .032 | .052 | .032 | | |
| Reach 1 | 0.834 | .032 | .052 | .045 | .032 | |
| Reach 1 | 0.796 | .032 | .052 | .045 | .032 | |
| Reach 1 | 0.758 | .032 | .052 | .045 | .032 | |
| Reach 1 | 0.720 | .032 | .052 | .045 | .032 | |
| Reach 1 | 0.682 | .032 | .052 | .045 | .032 | |
| Reach 1 | 0.645 | .032 | .052 | .045 | .032 | |
| Reach 1 | 0.607 | .032 | .052 | .045 | .032 | |
| Reach 1 | 0.569 | .032 | .052 | .045 | | |
| Reach 1 | 0.531 | .032 | .052 | .045 | | |
| Reach 1 | 0.493 | .032 | .052 | .045 | | |
| Reach 1 | 0.455 | .052 | .045 | | | |
| Reach 1 | 0.418 | .032 | .052 | .045 | | |
| Reach 1 | 0.379 | .032 | .052 | .045 | .045 | |
| Reach 1 | 0.299 | .045 | | | | |
| Reach 1 | 0.229 | .045 | | | | |
| Reach 1 | 0.167 | .045 | | | | |
| Reach 1 | 0.089 | .045 | | | | |

SUMMARY OF REACH LENGTHS

River: Tributary 3E

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Reach 1 | 1.553 | 198.73 | 199.82 | 201.02 |
| Reach 1 | 1.515 | 180.71 | 199.67 | 233.27 |
| Reach 1 | 1.478 | 244.61 | 199.74 | 124.23 |
| Reach 1 | 1.440 | 103.49 | 99.98 | 105.98 |
| Reach 1 | 1.421 | 83.27 | 99.67 | 127.41 |
| Reach 1 | 1.402 | 134.18 | 124.35 | 107.09 |
| Reach 1 | 1.378 | 288.09 | 275.12 | 263.53 |
| Reach 1 | 1.359 | Inl Struct | | |
| Reach 1 | 1.326 | 210.23 | 199.98 | 196.07 |
| Reach 1 | 1.288 | 212.53 | 200 | 200.01 |
| Reach 1 | 1.250 | 199.75 | 200 | 200.76 |
| Reach 1 | 1.213 | 210.71 | 199.99 | 199.68 |
| Reach 1 | 1.175 | 200.29 | 200 | 204.61 |
| Reach 1 | 1.137 | 175.44 | 199.7 | 213.08 |
| Reach 1 | 1.099 | 196.19 | 199.99 | 204.7 |
| Reach 1 | 1.061 | 199.98 | 200 | 201.74 |
| Reach 1 | 1.023 | 201.07 | 200 | 199.63 |
| Reach 1 | 0.985 | 211.92 | 199.9 | 182.24 |
| Reach 1 | 0.948 | 191.62 | 199.88 | 208.84 |
| Reach 1 | 0.910 | 165.2 | 199.87 | 216.77 |
| Reach 1 | 0.872 | 195.18 | 199.97 | 202.66 |
| Reach 1 | 0.834 | 213.72 | 199.9 | 188.81 |
| Reach 1 | 0.796 | 208.44 | 199.81 | 189.24 |
| Reach 1 | 0.758 | 201.91 | 200.01 | 197.71 |
| Reach 1 | 0.720 | 193.17 | 199.96 | 208.5 |
| Reach 1 | 0.682 | 201.85 | 199.99 | 197.78 |
| Reach 1 | 0.645 | 200.27 | 200 | 199.78 |
| Reach 1 | 0.607 | 195.48 | 199.99 | 209.21 |
| Reach 1 | 0.569 | 189.23 | 199.87 | 219.4 |
| Reach 1 | 0.531 | 207.18 | 199.02 | 177.2 |

| | | | | |
|---|---|---|---|---|
| Reach 1 | 0.493 | 193.16 | 199.79 | 205.37 |
| Reach 1 | 0.455 | 222.79 | 199.87 | 186.94 |
| Reach 1 | 0.418 | 235.06 | 203.24 | 168.11 |
| Reach 1 | 0.379 | 454.6 | 420.72 | 430.84 |
| Reach 1 | 0.299 | 351.15 | 374.43 | 400.22 |
| Reach 1 | 0.229 | 318.44 | 327.42 | 342.72 |
| Reach 1 | 0.167 | 410.07 | 409 | 416.49 |
| Reach 1 | 0.089 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Tributary 3E

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| Reach 1 | 1.553 | .1 | .3 |
| Reach 1 | 1.515 | .1 | .3 |
| Reach 1 | 1.478 | .1 | .3 |
| Reach 1 | 1.440 | .1 | .3 |
| Reach 1 | 1.421 | .1 | .3 |
| Reach 1 | 1.402 | .3 | .5 |
| Reach 1 | 1.378 | .3 | .5 |
| Reach 1 | 1.359 | Inl Struct | |
| Reach 1 | 1.326 | .3 | .5 |
| Reach 1 | 1.288 | .1 | .3 |
| Reach 1 | 1.250 | .1 | .3 |
| Reach 1 | 1.213 | .1 | .3 |
| Reach 1 | 1.175 | .1 | .3 |
| Reach 1 | 1.137 | .1 | .3 |
| Reach 1 | 1.099 | .1 | .3 |
| Reach 1 | 1.061 | .1 | .3 |
| Reach 1 | 1.023 | .1 | .3 |
| Reach 1 | 0.985 | .1 | .3 |
| Reach 1 | 0.948 | .1 | .3 |
| Reach 1 | 0.910 | .1 | .3 |
| Reach 1 | 0.872 | .1 | .3 |
| Reach 1 | 0.834 | .1 | .3 |
| Reach 1 | 0.796 | .1 | .3 |
| Reach 1 | 0.758 | .1 | .3 |
| Reach 1 | 0.720 | .1 | .3 |
| Reach 1 | 0.682 | .1 | .3 |
| Reach 1 | 0.645 | .1 | .3 |
| Reach 1 | 0.607 | .1 | .3 |
| Reach 1 | 0.569 | .1 | .3 |
| Reach 1 | 0.531 | .1 | .3 |
| Reach 1 | 0.493 | .1 | .3 |
| Reach 1 | 0.455 | .1 | .3 |
| Reach 1 | 0.418 | .1 | .3 |
| Reach 1 | 0.379 | .1 | .3 |
| Reach 1 | 0.299 | .1 | .3 |
| Reach 1 | 0.229 | .1 | .3 |
| Reach 1 | 0.167 | .1 | .3 |
| Reach 1 | 0.089 | .1 | .3 |

### E.5.6 HEC-RAS Report for Tributary 4E – All Reaches, Existing 100-Year, 6-Hour Event

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: Hassayampa Trib 4E Floodplain Deli
Project File : trib4E.prj
Run Date and Time: 5/24/2005 11:30:40 AM

Project in English units

Project Description:
Hassayampa Tributary #4E Floodplain Delineation

Prepared by PBS&J for the
Flood Control District of Maricopa County
Consultant Address: 7310 N. 16th
St., Suite 310, Phoenix, AZ 85281
Contact: Burke Lokey, P.E., CFM
602-943-1003
Contract No. FCD 2002C027.

Topographic Mapping Source: Flown
and Mapped by Kenney Aerial Mapping, Flight Dates: 03/27/2002 and
04/08/2002
2' Contour Interval, Datum: NAVD88.
Study Limits: Hassayampa
River Floodplain downstream, upstream limit just south of NE corner of Section
11 T1N R5W.
Discharge information obtained from the Buckeye/Sun Valley Area
Drainage Master Study Area 2 Hydrology Report, dated November
2004.

Discharge: 422 cfs @ R.S. 0.281,
500 cfs @ R.S. 3.710,
923 cfs @
R.S. 2.395,
1345 cfs @ R.S. 1.238,
626 cfs @ R.S. 0.647, and
1048 cfs @
R.S. 0.201.

HEC-RAS Version 3.1.1
Final Model Run: October 2004

PLAN DATA

Plan Title: Hassayampa Trib 4E FP/FW
Plan File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib4E\trib4E.p02

Geometry Title: Geometry data for Hassayampa Trib
Geometry File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib4E\trib4E.g02

Flow Title : Flow rate for Trib 4E @ 100-year 6-hour storm event
Flow File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib4E\trib4E.f01

Plan Summary Information:

| | | | | | |
|---|---|---|---|---|---|
| Number of: | Cross Sections = | 73 | Multiple Openings = | 0 |
| | Culverts = | 0 | Inline Structures = | 0 |
| | Bridges = | 0 | Lateral Structures = | 0 |

Computational Information
    Water surface calculation tolerance = 0.01
    Critical depth calculation tolerance = 0.01
    Maximum number of iterations = 20
    Maximum difference tolerance = 0.3
    Flow tolerance factor = 0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method: Average Conveyance
    Computational Flow Regime: Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset = 0
   Right Offset = 0

River = trib4E Reach = reach 3

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 3.710 | Method 4 | 4 | 1 | |
| 3.673 | Method 4 | 4 | 1 | |
| 3.635 | Method 4 | 4 | 1 | |
| 3.602 | Method 4 | 4 | 1 | |
| 3.560 | Method 4 | 4 | 1 | |
| 3.522 | Method 4 | 4 | 1 | |
| 3.485 | Method 4 | 4 | 1 | |
| 3.448 | Method 4 | 4 | 1 | |
| 3.410 | Method 4 | 4 | 1 | |
| 3.372 | Method 4 | 4 | 1 | |
| 3.335 | Method 4 | 4 | 1 | |
| 3.297 | Method 4 | 4 | 1 | |
| 3.260 | Method 4 | 4 | 1 | |
| 3.222 | Method 4 | 4 | 1 | |
| 3.184 | Method 4 | 4 | 1 | |
| 3.147 | Method 4 | 4 | 1 | |
| 3.110 | Method 4 | 4 | 1 | |
| 3.072 | Method 4 | 4 | 1 | |
| 3.036 | Method 4 | 4 | 1 | |
| 2.998 | Method 4 | 4 | 1 | |
| 2.960 | Method 4 | 4 | 1 | |
| 2.923 | Method 4 | 4 | 1 | |
| 2.886 | Method 4 | 4 | 1 | |
| 2.848 | Method 4 | 4 | 1 | |
| 2.810 | Method 4 | 4 | 1 | |
| 2.772 | Method 4 | 4 | 1 | |
| 2.735 | Method 4 | 4 | 1 | |
| 2.697 | Method 4 | 4 | 1 | |
| 2.659 | Method 4 | 4 | 1 | |
| 2.622 | Method 4 | 4 | 1 | |
| 2.584 | Method 4 | 4 | 1 | |
| 2.546 | Method 4 | 4 | 1 | |
| 2.508 | Method 4 | 4 | 1 | |
| 2.470 | Method 4 | 4 | 1 | |
| 2.433 | Method 4 | 4 | 1 | |
| 2.395 | Method 4 | 4 | 1 | |
| 2.362 | Method 4 | 4 | 1 | |
| 2.324 | Method 4 | 4 | 1 | |
| 2.287 | Method 4 | 4 | 1 | |
| 2.249 | Method 4 | 4 | 1 | |
| 2.211 | Method 4 | 4 | 1 | |
| 2.171 | Method 4 | 4 | 1 | |
| 2.132 | Method 4 | 4 | 1 | |
| 2.093 | Method 4 | 4 | 1 | |
| 2.055 | Method 4 | 4 | 1 | |
| 2.017 | Method 4 | 4 | 1 | |

River = trib4E Reach = reach 2

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.965 | Method 4 | 4 | 1 | |
| 1.927 | Method 4 | 4 | 1 | |
| 1.889 | Method 4 | 4 | 1 | |
| 1.855 | Method 4 | 4 | 1 | |
| 1.793 | Method 4 | 4 | 1 | |
| 1.751 | Method 4 | 4 | 1 | |
| 1.700 | Method 4 | 4 | 1 | |
| 1.662 | Method 4 | 4 | 1 | |
| 1.597 | Method 4 | 4 | 1 | |
| 1.521 | Method 4 | 4 | 1 | |

| | | | | |
|---|---|---|---|---|
| 1.452 | Method 4 | 4 | 1 | |

River = trib4E Reach = reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.238 | Method 4 | 4 | 1 | |
| 1.153 | Method 4 | 4 | 1 | |

River = trib4E1 Reach = reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 0.201 | Method 4 | 4 | 1 | |
| 0.125 | Method 4 | 4 | 1 | |
| 0.065 | Method 4 | 4 | 1 | |

River = trib4E1 Reach = reach 2

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 0.647 | Method 4 | 4 | 1 | |
| 0.606 | Method 4 | 4 | 1 | |
| 0.562 | Method 4 | 4 | 1 | |
| 0.513 | Method 4 | 4 | 1 | |
| 0.447 | Method 4 | 4 | 1 | |
| 0.379 | Method 4 | 4 | 1 | |
| 0.322 | Method 4 | 4 | 1 | |

River = trib4E2 Reach = reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 0.281 | Method 4 | 4 | 1 | |
| 0.229 | Method 4 | 4 | 1 | |
| 0.172 | Method 4 | 4 | 1 | |
| 0.132 | Method 4 | 4 | 1 | |

River = trib4E Reach = reach 3

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 3.710 | Method 1 | 1 | 0 | 348.65 |
| 3.673 | Method 1 | 1 | 0 | |
| 3.635 | Method 1 | 1 | 180.58 | |
| 3.602 | Method 1 | 1 | 0 | |
| 3.560 | Method 1 | 1 | 370.43 | |
| 3.522 | Method 1 | 1 | 0 | |
| 3.485 | Method 1 | 1 | 0 | 564.69 |
| 3.448 | Method 1 | 1 | 0 | |
| 3.410 | Method 1 | 1 | 362.79 | |
| 3.372 | Method 1 | 1 | 446.08 | |
| 3.335 | Method 1 | 1 | 399.64 | |
| 3.297 | Method 1 | 1 | 423.56 | 579.87 |
| 3.260 | Method 1 | 1 | 0 | 650.27 |
| 3.222 | Method 1 | 1 | 305.92 | 415.37 |
| 3.184 | Method 1 | 1 | 0 | 328.99 |
| 3.147 | Method 1 | 1 | 0 | 343.62 |
| 3.110 | Method 1 | 1 | 244.83 | |
| 3.072 | Method 1 | 1 | 195.42 | 309.09 |
| 3.036 | Method 1 | 1 | 0 | 240.83 |
| 2.998 | Method 1 | 1 | 0 | 182.12 |
| 2.960 | Method 1 | 1 | 0 | 398.14 |
| 2.923 | Method 1 | 1 | 250.21 | 360.36 |
| 2.886 | Method 1 | 1 | 280.23 | 464.98 |
| 2.848 | Method 1 | 1 | 409.23 | 607.93 |
| 2.810 | Method 1 | 1 | 220.73 | 334.05 |
| 2.772 | Method 1 | 1 | 0 | 247.02 |
| 2.735 | Method 1 | 1 | 394.4 | 504.86 |
| 2.697 | Method 1 | 1 | 421.75 | |
| 2.659 | Method 1 | 1 | 375.19 | |
| 2.622 | Method 1 | 1 | 363.99 | 424.66 |
| 2.584 | Method 1 | 1 | 257.96 | 309.88 |
| 2.546 | Method 1 | 1 | 326.43 | |
| 2.508 | Method 1 | 1 | 312.24 | 411.16 |
| 2.470 | Method 1 | 1 | 249.01 | 355.14 |
| 2.433 | Method 1 | 1 | 238.2 | 319.3 |
| 2.395 | Method 1 | 1 | 0 | 224.46 |
| 2.362 | Method 1 | 1 | 0 | 328.41 |
| 2.324 | Method 1 | 1 | 0 | 482.89 |
| 2.287 | Method 1 | 1 | 0 | |
| 2.249 | Method 1 | 1 | 0 | |
| 2.211 | Method 1 | 1 | 0 | 512.44 |
| 2.171 | Method 1 | 1 | 148.55 | 374.45 |
| 2.132 | Method 1 | 1 | 270.66 | 455.06 |
| 2.093 | Method 1 | 1 | 196.38 | 406.01 |
| 2.055 | Method 1 | 1 | 286.82 | 430.55 |
| 2.017 | Method 1 | 1 | 402.75 | 610.48 |

River = trib4E Reach = reach 2

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.965 | Method 1 | 1 | 101.77 | 219.74 |
| 1.927 | Method 1 | 1 | 105.33 | 185.07 |
| 1.889 | Method 1 | 1 | 80.31 | |
| 1.855 | Method 1 | 1 | 225 | |
| 1.793 | Method 1 | 1 | 198.1 | 259.7 |
| 1.751 | Method 1 | 1 | 226.49 | 356.5 |
| 1.700 | Method 1 | 1 | 94.64 | 272.19 |
| 1.662 | Method 1 | 1 | 0 | 152.38 |
| 1.597 | Method 1 | 1 | 0 | 243.97 |
| 1.521 | Method 1 | 1 | 214.09 | 398.1 |
| 1.452 | Method 1 | 1 | 259.55 | 389.83 |

River = trib4E Reach = reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1.238 | Method 1 | 1 | 370.99 | 845.58 |
| 1.153 | Method 1 | 1 | 532.57 | 933.79 |

River = trib4E1 Reach = reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 0.201 | Method 1 | 1 | 248 | 460 |
| 0.125 | Method 1 | 1 | 332 | 470 |
| 0.065 | Method 1 | 1 | 370 | 529.62 |

River = trib4E1 Reach = reach 2

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 0.647 | Method 1 | 1 | 250 | 486.75 |
| 0.606 | Method 1 | 1 | 251.21 | 544.38 |
| 0.562 | Method 1 | 1 | 334.06 | 494.79 |
| 0.513 | Method 1 | 1 | 333.19 | 494.66 |
| 0.447 | Method 1 | 1 | 286.53 | 482.24 |
| 0.379 | Method 1 | 1 | 242.81 | 446.24 |
| 0.322 | Method 1 | 1 | 372.72 | 546.47 |

River = trib4E2 Reach = reach 1

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 0.281 | Method 1 | 1 | 137.63 | 243.16 |
| 0.229 | Method 1 | 1 | 72.81 | 145.53 |
| 0.172 | Method 1 | 1 | 226.04 | 286.96 |
| 0.132 | Method 1 | 1 | 281.46 | 420.07 |

FLOW DATA

Flow Title: Flow rate for Trib 4E @ 100-year 6-hour storm event
Flow File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib4E\trib4E.f01

Flow Data (cfs)

| River | Reach | RS | 100-Year | Method 4 | Method 1 |
|---|---|---|---|---|---|
| trib4E | reach 3 | 3.710 | 500 | 500 | 500 |
| trib4E | reach 3 | 2.395 | 929 | 929 | 929 |
| trib4E | reach 2 | 1.965 | 299 | 299 | 299 |
| trib4E | reach 1 | 1.238 | 1351 | 1351 | 1351 |
| trib4E1 | reach 2 | 0.647 | 630 | 630 | 630 |
| trib4E1 | reach 1 | 0.201 | 1052 | 1052 | 1052 |
| trib4E2 | reach 1 | 0.281 | 422 | 422 | 422 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| trib4E | reach 1 | 100-Year | | Normal S = 0.002955 |
| trib4E | reach 1 | Method 4 | | Normal S = 0.002955 |
| trib4E | reach 1 | Method 1 | | Normal S = 0.002955 |

GEOMETRY DATA

Geometry Title: Geometry data for Hassayampa Trib
Geometry File : r:\540293 Buckeye ADMS\project\Floodplain\Area2\HEC-RAS\trib4E\trib4E.g02

Reach Connection Table

| River | Reach | Upstream Boundary | Downstream Boundary |
|---|---|---|---|
| trib4E | reach 3 | | 88191 |
| trib4E | reach 2 | 88191 | 88740 |
| trib4E | reach 1 | 88740 | |
| trib4E1 | reach 2 | 88191 | 88195 |
| trib4E1 | reach 1 | 88195 | 88740 |
| trib4E2 | reach 1 | | 88195 |

JUNCTION INFORMATION

Name: 88191
Description:
Energy computation Method

| Length across Junction River | Reach | Tributary River | Reach | Length | Angle |
|---|---|---|---|---|---|
| trib4E | reach 3 | to trib4E1 | reach 2 | 400 | |
| trib4E | reach 3 | to trib4E | reach 2 | 200 | |

Name: 88195
Description:
Energy computation Method

| Length across Junction River | Reach | Tributary River | Reach | Length | Angle |
|---|---|---|---|---|---|
| trib4E1 | reach 2 | to trib4E1 | reach 1 | 600 | |
| trib4E2 | reach 1 | to trib4E1 | reach 1 | 742 | |

Name: 88740
Description:
Energy computation Method

| Length across Junction River | Reach | Tributary River | Reach | Length | Angle |
|---|---|---|---|---|---|
| trib4E1 | reach 1 | to trib4E | reach 1 | 535 | |
| trib4E | reach 2 | to trib4E | reach 1 | 1050 | |

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.710

INPUT
Description: 19590.75 - Thalweg Sta. 285.58 - Discharge from A2-100y6h.out
HEC-1 Model Sta. 500 CFS (Calculated as a percentage of 929 CFS -
HEC-1 Sta. A1 to account for XS location within the basin)
Station Elevation Data num= 144

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1041.89 | .37 | 1041.9 | 2.66 | 1041.89 | 10.94 | 1041.87 | 18.68 | 1041.82 |
| 21.5 | 1041.79 | 26.96 | 1041.68 | 32.06 | 1041.49 | 34.69 | 1041.35 | 42.63 | 1040.98 |
| 53.19 | 1040.6 | 58 | 1040.49 | 62.29 | 1040.27 | 63.75 | 1040.21 | 65.47 | 1040.13 |
| 70.17 | 1039.91 | 74.32 | 1039.7 | 82.73 | 1039.23 | 84.88 | 1039.1 | 89.04 | 1038.71 |
| 93.81 | 1038.2 | 95.44 | 1038.06 | 101.69 | 1037.39 | 106 | 1036.99 | 109.58 | 1036.68 |
| 116.57 | 1036.11 | 117.46 | 1036.03 | 120.07 | 1035.78 | 127.13 | 1035.25 | 130.78 | 1035.06 |
| 137.69 | 1034.55 | 146.78 | 1034.21 | 148.26 | 1034.14 | 151.11 | 1034.08 | 158.82 | 1033.99 |
| 162.79 | 1033.96 | 169.38 | 1033.89 | 172.63 | 1033.84 | 190.51 | 1033.59 | 194.82 | 1033.57 |
| 201.07 | 1033.52 | 210.83 | 1033.49 | 211.64 | 1033.48 | 212.97 | 1033.48 | 213.19 | 1033.48 |
| 222.2 | 1033.32 | 226.85 | 1033.2 | 232.76 | 1033.07 | 242.86 | 1032.76 | 243.33 | 1032.75 |
| 244.22 | 1032.69 | 253.89 | 1032.39 | 258.88 | 1032.45 | 264.45 | 1032.65 | 274.89 | 1032.18 |
| 275.02 | 1032.18 | 275.27 | 1032.16 | 285.58 | 1031.71 | 290.9 | 1032.04 | 296.14 | 1032.31 |
| 298.72 | 1032.49 | 306.3 | 1033.03 | 306.71 | 1033.06 | 317.27 | 1033.56 | 327.83 | 1033.93 |
| 338.4 | 1034.14 | 338.95 | 1034.15 | 348.65 | 1034.22 | 348.96 | 1034.22 | 351.8 | 1034.21 |
| 354.95 | 1034.2 | 359.52 | 1034.2 | 368.37 | 1034.16 | 370.09 | 1034.15 | 370.96 | 1034.14 |
| 380.65 | 1034.08 | 386.98 | 1034 | 391.21 | 1033.96 | 402.99 | 1033.77 | 422.9 | 1033.4 |
| 433.47 | 1033.26 | 435.02 | 1033.29 | 444.03 | 1033.49 | 451.03 | 1033.67 | 454.59 | 1033.77 |
| 461.49 | 1033.85 | 465.16 | 1033.91 | 475.72 | 1034.03 | 483.06 | 1034.06 | 486.28 | 1034.08 |
| 492.53 | 1034.06 | 496.84 | 1034.06 | 499.07 | 1034.04 | 507.41 | 1033.92 | 515.09 | 1033.94 |
| 517.97 | 1033.99 | 528.53 | 1034.25 | 531.1 | 1034.32 | 539.1 | 1034.5 | 543.04 | 1034.56 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 549.66 | 1034.65 | 550.92 | 1034.67 | 554.61 | 1034.67 | 560.22 | 1034.69 | 563.12 | 1034.69 |
| 570.79 | 1034.72 | 579.13 | 1034.91 | 581.35 | 1034.95 | 602.48 | 1035.94 | 611.16 | 1036.29 |
| 613.04 | 1036.36 | 616.68 | 1036.52 | 623.6 | 1036.81 | 634.17 | 1037.49 | 643.19 | 1038.6 |
| 644.73 | 1038.81 | 647.72 | 1039.29 | 655.29 | 1040.43 | 665.86 | 1041.9 | 675.22 | 1042.98 |
| 676.42 | 1043.1 | 677.01 | 1043.13 | 678.76 | 1043.2 | 686.98 | 1043.41 | 691.23 | 1043.6 |
| 697.55 | 1043.76 | 707.24 | 1044.17 | 708.11 | 1044.19 | 709.79 | 1044.29 | 718.67 | 1044.89 |
| 723.26 | 1045.18 | 729.24 | 1045.57 | 732.18 | 1045.74 | 739.8 | 1046.21 | 740.84 | 1046.27 |
| 750.36 | 1046.85 | 755.29 | 1047.24 | 760.93 | 1047.65 | 771.29 | 1048.55 | 771.49 | 1048.57 |
| 771.87 | 1048.6 | 782.05 | 1049.38 | 787.3 | 1049.66 | 788.79 | 1049.75 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 65.47 | .04 | 351.8 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 212.97 | 348.65 | 178.08 | 199.5 | 231.47 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.00 | Element | | | |
| Vel Head (ft) | 0.26 | Wt. n-Val. | 0.040 | 0.040 | 0.035 |
| W.S. Elev (ft) | 1033.74 | Reach Len. (ft) | 178.08 | 199.50 | 231.47 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 5.60 | 110.92 | 12.58 |
| E.G. Slope (ft/ft) | 0.012721 | Area (sq ft) | 5.60 | 110.92 | 12.58 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 7.15 | 468.52 | 24.33 |
| Top Width (ft) | 191.77 | Top Width (ft) | 33.28 | 109.47 | 49.02 |
| Vel Total (ft/s) | 3.87 | Avg. Vel. (ft/s) | 1.28 | 4.22 | 1.93 |
| Max Chl Dpth (ft) | 2.03 | Hydr. Depth (ft) | 0.17 | 1.01 | 0.26 |
| Conv. Total (cfs) | 4433.2 | Conv. (cfs) | 63.4 | 4154.0 | 215.7 |
| Length Wtd. (ft) | 200.13 | Wetted Per. (ft) | 33.28 | 109.57 | 49.03 |
| Min Ch El (ft) | 1031.71 | Shear (lb/sq ft) | 0.13 | 0.80 | 0.20 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.17 | 3.40 | 0.39 |
| Frctn Loss (ft) | 1.35 | Cum Volume (acre-ft) | 11.92 | 27.04 | 10.00 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 16.87 | 24.15 | 14.58 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.06 | Element | | | |
| Vel Head (ft) | 0.31 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1033.75 | Reach Len. (ft) | 178.08 | 199.50 | 231.47 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 111.84 | |
| E.G. Slope (ft/ft) | 0.014181 | Area (sq ft) | | 111.84 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 109.71 | Top Width (ft) | | 109.71 | |
| Vel Total (ft/s) | 4.47 | Avg. Vel. (ft/s) | | 4.47 | |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.02 | |
| Conv. Total (cfs) | 4198.8 | Conv. (cfs) | | 4198.8 | |
| Length Wtd. (ft) | 199.50 | Wetted Per. (ft) | | 110.08 | |
| Min Ch El (ft) | 1031.71 | Shear (lb/sq ft) | | 0.90 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.02 | |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 0.24 | 36.28 | 0.47 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 0.12 | 24.38 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1034.05 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 1033.75 | Reach Len. (ft) | 178.08 | 199.50 | 231.47 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 5.75 | 111.42 | |
| E.G. Slope (ft/ft) | 0.013852 | Area (sq ft) | 5.75 | 111.42 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 7.76 | 492.24 | |
| Top Width (ft) | 143.21 | Top Width (ft) | 33.61 | 109.60 | |
| Vel Total (ft/s) | 4.27 | Avg. Vel. (ft/s) | 1.35 | 4.42 | |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | 0.17 | 1.02 | |
| Conv. Total (cfs) | 4248.3 | Conv. (cfs) | 65.9 | 4182.4 | |
| Length Wtd. (ft) | 199.34 | Wetted Per. (ft) | 33.61 | 109.70 | |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 1031.71 | Shear (lb/sq ft) | 0.15 | 0.88 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.20 | 3.88 | |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 6.31 | 33.24 | 1.25 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 6.54 | 24.32 | 1.62 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.673

INPUT
Description: 19391.25 - Thalweg Sta. 272.06
Station Elevation Data num= 147

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1039.72 | 2.06 | 1039.78 | 5.88 | 1039.93 | 12.06 | 1040.3 | 18.22 | 1040.43 |
| 22.06 | 1040.48 | 28.2 | 1040.51 | 32.06 | 1040.49 | 38.18 | 1040.54 | 42.06 | 1040.43 |
| 45.96 | 1040.33 | 52.06 | 1040.37 | 55.97 | 1040.36 | 65.99 | 1040.37 | 72.06 | 1040.34 |
| 76.01 | 1040.27 | 82.06 | 1040.11 | 86.03 | 1039.78 | 92.06 | 1039.41 | 96.05 | 1038.99 |
| 102.06 | 1038.46 | 108.04 | 1037.96 | 112.06 | 1037.55 | 118.02 | 1037.17 | 122.06 | 1036.87 |
| 128 | 1036.48 | 132.06 | 1036.27 | 137.99 | 1035.7 | 142.06 | 1035.46 | 147.97 | 1034.88 |
| 152.06 | 1034.67 | 156.17 | 1034.53 | 162.06 | 1034.11 | 166.19 | 1033.99 | 172.06 | 1033.77 |
| 182.06 | 1033.46 | 186.23 | 1033.32 | 192.06 | 1033.16 | 196.25 | 1033.01 | 206.27 | 1032.68 |
| 211.2 | 1032.54 | 212.02 | 1032.51 | 222.06 | 1032.28 | 232.06 | 1032.07 | 242.06 | 1031.81 |
| 247.77 | 1031.61 | 252.06 | 1031.44 | 256.37 | 1031 | 262.06 | 1030.65 | 266.38 | 1030.65 |
| 272.06 | 1030.46 | 276.4 | 1030.54 | 282.06 | 1030.63 | 292.06 | 1031.41 | 302.06 | 1031.8 |
| 306.46 | 1031.67 | 312.06 | 1031.61 | 316.48 | 1031.45 | 322.06 | 1031.22 | 326.5 | 1031.18 |
| 332.06 | 1031.01 | 336.52 | 1031.04 | 342.06 | 1031.01 | 346.54 | 1031 | 352.06 | 1031.02 |
| 356.56 | 1031.16 | 357.73 | 1031.21 | 362.06 | 1031.38 | 366.58 | 1031.51 | 372.06 | 1031.64 |
| 376.6 | 1031.69 | 382.06 | 1031.82 | 387.48 | 1032.1 | 391.29 | 1032.36 | 392.29 | 1032.43 |
| 401.03 | 1033.03 | 402.58 | 1033.16 | 407.42 | 1033.43 | 412.86 | 1033.72 | 414.59 | 1033.8 |
| 423.15 | 1034.21 | 428.15 | 1034.35 | 433.43 | 1034.51 | 441.71 | 1034.66 | 443.72 | 1034.69 |
| 450.07 | 1034.77 | 454.01 | 1034.87 | 455.26 | 1034.91 | 468.81 | 1035.38 | 474.58 | 1035.61 |
| 482.37 | 1035.87 | 484.87 | 1035.97 | 502.97 | 1036.65 | 505.44 | 1036.74 | 511.25 | 1036.79 |
| 515.73 | 1036.88 | 519.54 | 1036.8 | 526.02 | 1036.69 | 527.84 | 1036.62 | 535.38 | 1036.32 |
| 536.6 | 1036.28 | 552.7 | 1035.63 | 556.87 | 1035.47 | 560.99 | 1035.29 | 567.16 | 1035.07 |
| 569.27 | 1035.01 | 577.45 | 1034.74 | 577.56 | 1034.73 | 578.03 | 1034.73 | 587.74 | 1034.63 |
| 598.02 | 1034.66 | 604.38 | 1034.72 | 608.31 | 1034.75 | 617.93 | 1034.85 | 620.68 | 1034.89 |
| 628.88 | 1034.99 | 631.48 | 1035.07 | 639.17 | 1035.29 | 649.45 | 1035.89 | 658.6 | 1036.52 |
| 670.03 | 1037.21 | 672.16 | 1037.33 | 680.32 | 1037.69 | 685.7 | 1037.99 | 690.6 | 1038.19 |
| 699.26 | 1038.73 | 700.89 | 1038.79 | 711.17 | 1039.38 | 721.46 | 1039.76 | 731.75 | 1039.81 |
| 739.94 | 1039.89 | 742.04 | 1039.88 | 748.65 | 1039.76 | 752.32 | 1039.65 | 753.5 | 1039.56 |
| 762.61 | 1038.92 | 767.04 | 1038.64 | 772.89 | 1038.34 | 780.6 | 1038.23 | 783.18 | 1038.21 |
| 791.3 | 1038.4 | 793.47 | 1038.47 | 794.16 | 1038.51 | 803.76 | 1038.96 | 807.72 | 1039.2 |
| 814.04 | 1039.52 | 818.6 | 1039.78 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 211.2 | .04 | 357.73 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 212.02 | 391.29 | 209.89 | 198.46 | 181 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1032.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | 0.035 |
| W.S. Elev (ft) | 1032.50 | Reach Len. (ft) | 209.89 | 198.46 | 181.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 193.13 | 0.14 |
| E.G. Slope (ft/ft) | 0.004177 | Area (sq ft) | | 193.13 | 0.14 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 499.93 | 0.07 |
| Top Width (ft) | 180.92 | Top Width (ft) | | 178.88 | 2.03 |
| Vel Total (ft/s) | 2.59 | Avg. Vel. (ft/s) | | 2.59 | 0.47 |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.08 | 0.07 |
| Conv. Total (cfs) | 7736.8 | Conv. (cfs) | | 7735.7 | 1.0 |
| Length Wtd. (ft) | 198.50 | Wetted Per. (ft) | | 179.01 | 2.04 |
| Min Ch El (ft) | 1030.46 | Shear (lb/sq ft) | | 0.28 | 0.02 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.73 | 0.01 |
| Frctn Loss (ft) | 1.04 | Cum Volume (acre-ft) | 11.91 | 26.35 | 9.96 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 16.80 | 23.49 | 14.45 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1032.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1032.50 | Reach Len. (ft) | 209.89 | 198.46 | 181.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 193.61 | |
| E.G. Slope (ft/ft) | 0.004150 | Area (sq ft) | | 193.61 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 179.00 | Top Width (ft) | | 179.00 | |
| Vel Total (ft/s) | 2.58 | Avg. Vel. (ft/s) | | 2.58 | |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.08 | |
| Conv. Total (cfs) | 7761.2 | Conv. (cfs) | | 7761.2 | |
| Length Wtd. (ft) | 198.46 | Wetted Per. (ft) | | 179.27 | |
| Min Ch El (ft) | 1030.46 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.72 | |
| Frctn Loss (ft) | 1.03 | Cum Volume (acre-ft) | 0.24 | 35.58 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 23.72 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1032.61 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | 0.035 |
| W.S. Elev (ft) | 1032.50 | Reach Len. (ft) | 209.89 | 198.46 | 181.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 193.20 | 0.14 |
| E.G. Slope (ft/ft) | 0.004172 | Area (sq ft) | | 193.20 | 0.14 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 499.93 | 0.07 |
| Top Width (ft) | 180.94 | Top Width (ft) | | 178.90 | 2.04 |
| Vel Total (ft/s) | 2.59 | Avg. Vel. (ft/s) | | 2.59 | 0.47 |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.08 | 0.07 |
| Conv. Total (cfs) | 7740.6 | Conv. (cfs) | | 7739.6 | 1.0 |
| Length Wtd. (ft) | 198.50 | Wetted Per. (ft) | | 179.03 | 2.05 |
| Min Ch El (ft) | 1030.46 | Shear (lb/sq ft) | | 0.28 | 0.02 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.73 | 0.01 |
| Frctn Loss (ft) | 1.04 | Cum Volume (acre-ft) | 6.30 | 32.55 | 1.25 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.47 | 23.65 | 1.61 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.635

INPUT
Description: 19192.79 - Thalweg Sta. 251.73
Station Elevation Data num= 160

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1040.28 | .67 | 1040.23 | 8.77 | 1039.52 | 14.66 | 1038.99 | 18.89 | 1038.54 |
| 23.4 | 1038.12 | 29.01 | 1037.51 | 36.72 | 1036.87 | 39.14 | 1036.66 | 48.73 | 1035.99 |
| 49.26 | 1035.95 | 52.06 | 1035.75 | 69.51 | 1034.73 | 72.77 | 1034.48 | 79.63 | 1034.31 |
| 84.78 | 1033.93 | 96.8 | 1033.61 | 99.88 | 1033.55 | 102.11 | 1033.47 | 110 | 1033.27 |
| 116.32 | 1033.09 | 120.12 | 1032.99 | 120.83 | 1032.98 | 130.25 | 1032.74 | 137.1 | 1032.49 |
| 140.37 | 1032.4 | 144.86 | 1032.22 | 150.49 | 1031.96 | 156.88 | 1031.59 | 160.62 | 1031.38 |
| 168.9 | 1031.53 | 170.74 | 1031.55 | 180.58 | 1031.86 | 180.86 | 1031.87 | 180.91 | 1031.87 |
| 190.99 | 1031.79 | 192.93 | 1031.76 | 201.11 | 1031.58 | 204.95 | 1031.47 | 211.23 | 1031.32 |
| 216.96 | 1031.08 | 221.11 | 1030.95 | 221.36 | 1030.94 | 228.98 | 1030.42 | 231.48 | 1030.27 |
| 241 | 1029.55 | 241.6 | 1029.49 | 244.83 | 1029.41 | 251.73 | 1029.27 | 253.01 | 1029.42 |
| 261.85 | 1030.25 | 265.03 | 1030.41 | 271.97 | 1030.82 | 277.04 | 1030.83 | 282.1 | 1030.87 |
| 292.22 | 1030.83 | 301.08 | 1030.74 | 302.34 | 1030.73 | 312.47 | 1030.52 | 313.09 | 1030.49 |
| 322.59 | 1030.07 | 332.71 | 1030.19 | 342.84 | 1030.33 | 349.15 | 1030.3 | 351.89 | 1030.27 |
| 352.96 | 1030.26 | 361.17 | 1030.52 | 363.08 | 1030.55 | 373.19 | 1031.52 | 373.34 | 1031.54 |
| 373.39 | 1031.55 | 383.33 | 1032.9 | 385.2 | 1033.13 | 393.45 | 1034.26 | 397.22 | 1034.51 |
| 403.58 | 1035.08 | 409.24 | 1035.22 | 413.7 | 1035.38 | 421.25 | 1035.44 | 423.82 | 1035.47 |
| 433.27 | 1035.41 | 433.95 | 1035.4 | 444.07 | 1034.84 | 445.29 | 1034.73 | 457.3 | 1033.69 |
| 464.32 | 1033.04 | 469.32 | 1032.72 | 474.44 | 1032.36 | 481.34 | 1032.14 | 484.56 | 1032.03 |
| 504.81 | 1032.16 | 505.37 | 1032.15 | 514.93 | 1032.1 | 517.38 | 1032.15 | 525.06 | 1032.44 |
| 529.4 | 1032.65 | 535.18 | 1032.99 | 541.42 | 1033.28 | 545.3 | 1033.5 | 565.45 | 1034.4 |
| 565.55 | 1034.4 | 566.1 | 1034.43 | 575.67 | 1034.86 | 577.47 | 1034.96 | 585.8 | 1035.29 |
| 589.48 | 1035.5 | 595.92 | 1035.75 | 601.5 | 1036.09 | 606.05 | 1036.31 | 613.52 | 1036.81 |
| 616.17 | 1036.96 | 625.53 | 1037.59 | 630.36 | 1037.91 | 636.41 | 1038.24 | 637.55 | 1038.25 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 646.54 | 1038.52 | 649.57 | 1038.47 | 656.66 | 1038.43 | 661.58 | 1038.3 | 666.78 | 1038.13 |
| 673.6 | 1038.06 | 676.91 | 1037.97 | 685.61 | 1038.14 | 687.03 | 1038.13 | 694.61 | 1038.42 |
| 696.81 | 1038.49 | 697.16 | 1038.51 | 705.56 | 1038.95 | 707.28 | 1039.06 | 709.65 | 1039.25 |
| 717.4 | 1039.8 | 721.66 | 1040.21 | 727.52 | 1040.72 | 733.68 | 1041.33 | 737.65 | 1041.69 |
| 740.53 | 1041.97 | 747.77 | 1042.63 | 749.28 | 1042.76 | 757.9 | 1043.49 | 758.03 | 1043.5 |
| 758.87 | 1043.55 | 768.02 | 1044.05 | 769.73 | 1044.12 | 778.14 | 1044.4 | 781.75 | 1044.55 |
| 788.27 | 1044.85 | 798.39 | 1045.37 | 805.78 | 1045.81 | 808.51 | 1045.96 | 810.5 | 1046.1 |
| 818.63 | 1046.58 | 819.24 | 1046.61 | 823.12 | 1046.79 | 828.76 | 1047.01 | 829.81 | 1047.03 |
| 841.83 | 1047.24 | 849.01 | 1047.38 | 853.84 | 1047.6 | 859.13 | 1047.86 | 860.35 | 1047.98 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 351.89 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 221.11 | 373.39 | 174.5 | 174.9 | 164.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.57 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 1031.41 | Reach Len. (ft) | 174.50 | 174.90 | 164.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 3.03 | 156.61 | |
| E.G. Slope (ft/ft) | 0.006707 | Area (sq ft) | 3.03 | 156.61 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 3.34 | 496.66 | |
| Top Width (ft) | 166.69 | Top Width (ft) | 15.76 | 150.93 | |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | 1.10 | 3.17 | |
| Max Chl Dpth (ft) | 2.14 | Hydr. Depth (ft) | 0.19 | 1.04 | |
| Conv. Total (cfs) | 6105.4 | Conv. (cfs) | 40.8 | 6064.6 | |
| Length Wtd. (ft) | 174.90 | Wetted Per. (ft) | 15.77 | 151.11 | |
| Min Ch El (ft) | 1029.27 | Shear (lb/sq ft) | 0.08 | 0.43 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.09 | 1.38 | |
| Frctn Loss (ft) | 1.01 | Cum Volume (acre-ft) | 11.90 | 25.55 | 9.96 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.76 | 22.74 | 14.44 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.57 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1031.42 | Reach Len. (ft) | 174.50 | 174.90 | 164.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 157.62 | |
| E.G. Slope (ft/ft) | 0.006685 | Area (sq ft) | | 157.62 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 151.00 | Top Width (ft) | | 151.00 | |
| Vel Total (ft/s) | 3.17 | Avg. Vel. (ft/s) | | 3.17 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.04 | |
| Conv. Total (cfs) | 6115.4 | Conv. (cfs) | | 6115.4 | |
| Length Wtd. (ft) | 174.90 | Wetted Per. (ft) | | 151.64 | |
| Min Ch El (ft) | 1029.27 | Shear (lb/sq ft) | | 0.43 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.38 | |
| Frctn Loss (ft) | 1.03 | Cum Volume (acre-ft) | 0.24 | 34.78 | 0.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 22.96 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1031.56 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 1031.41 | Reach Len. (ft) | 174.50 | 174.90 | 164.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2.99 | 156.42 | |
| E.G. Slope (ft/ft) | 0.006733 | Area (sq ft) | 2.99 | 156.42 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 3.32 | 496.68 | |
| Top Width (ft) | 164.48 | Top Width (ft) | 13.57 | 150.91 | |
| Vel Total (ft/s) | 3.14 | Avg. Vel. (ft/s) | 1.11 | 3.18 | |
| Max Chl Dpth (ft) | 2.14 | Hydr. Depth (ft) | 0.22 | 1.04 | |
| Conv. Total (cfs) | 6093.4 | Conv. (cfs) | 40.4 | 6053.0 | |
| Length Wtd. (ft) | 174.90 | Wetted Per. (ft) | 13.58 | 151.09 | |
| Min Ch El (ft) | 1029.27 | Shear (lb/sq ft) | 0.09 | 0.44 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.10 | 1.38 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 6.29 | 31.75 | 1.25 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.44 | 22.90 | 1.61 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.602

INPUT
Description: 19017.90 - Thalweg Sta. 324.38
Station Elevation Data num= 156

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1039.99 | 3.29 | 1039.75 | 9.7 | 1039.22 | 13.67 | 1038.8 | 24.04 | 1038.22 |
| 34.41 | 1037.83 | 38.38 | 1037.77 | 44.79 | 1037.75 | 52.72 | 1037.57 | 55.16 | 1037.51 |
| 61.59 | 1037.2 | 64.68 | 1037.02 | 65.54 | 1036.98 | 75.92 | 1036.29 | 81.38 | 1035.89 |
| 86.29 | 1035.5 | 95.72 | 1034.8 | 96.66 | 1034.72 | 99.12 | 1034.58 | 107.04 | 1034.17 |
| 110.06 | 1034.08 | 117.41 | 1033.77 | 124.4 | 1033.51 | 127.79 | 1033.3 | 136.67 | 1033.15 |
| 138.73 | 1033.15 | 148.54 | 1033.25 | 153.07 | 1033.18 | 158.91 | 1033.13 | 167.41 | 1032.95 |
| 169.29 | 1032.93 | 174.22 | 1032.85 | 179.66 | 1032.75 | 181.75 | 1032.65 | 190.04 | 1032.39 |
| 196.07 | 1032.11 | 200.41 | 1031.95 | 210.41 | 1031.65 | 210.79 | 1031.64 | 211.75 | 1031.62 |
| 221.16 | 1031.41 | 224.75 | 1031.37 | 231.54 | 1031.27 | 241.91 | 1031.3 | 249.3 | 1031.61 |
| 252.29 | 1031.71 | 253.43 | 1031.74 | 262.66 | 1032.11 | 267.77 | 1032.11 | 272.12 | 1032.16 |
| 273.04 | 1032.17 | 282.1 | 1031.88 | 283.41 | 1031.84 | 293.79 | 1031.11 | 296.44 | 1030.88 |
| 304.16 | 1030.09 | 310.78 | 1029.45 | 314.54 | 1029.05 | 324.38 | 1028.37 | 324.91 | 1028.34 |
| 325.11 | 1028.34 | 335.28 | 1028.19 | 339.44 | 1028.41 | 345.66 | 1028.64 | 353.78 | 1029.04 |
| 356.03 | 1029.16 | 361.93 | 1029.27 | 366.41 | 1029.31 | 368.12 | 1029.31 | 376.78 | 1029.27 |
| 382.46 | 1029.31 | 387.16 | 1029.3 | 391.28 | 1029.32 | 396.8 | 1029.34 | 397.54 | 1029.35 |
| 399.46 | 1029.37 | 407.91 | 1029.47 | 428.66 | 1029.85 | 437.01 | 1029.99 | 439.03 | 1030.03 |
| 439.81 | 1030.07 | 449.41 | 1030.39 | 453.82 | 1030.66 | 454.14 | 1030.68 | 459.78 | 1031.02 |
| 468.48 | 1031.47 | 470.16 | 1031.57 | 474.55 | 1031.57 | 480.53 | 1031.49 | 482.81 | 1031.37 |
| 490.91 | 1030.96 | 497.15 | 1030.78 | 501.28 | 1030.62 | 511.49 | 1030.49 | 512.09 | 1030.49 |
| 522.03 | 1030.52 | 525.83 | 1030.63 | 540.17 | 1030.96 | 542.78 | 1031.01 | 553.16 | 1031.16 |
| 554.51 | 1031.22 | 563.53 | 1031.46 | 568.83 | 1031.76 | 573.9 | 1032 | 583.17 | 1032.47 |
| 584.28 | 1032.52 | 587.18 | 1032.56 | 594.66 | 1032.68 | 597.51 | 1032.6 | 605.03 | 1032.4 |
| 611.85 | 1032.19 | 615.41 | 1032.26 | 624.72 | 1032.73 | 625.78 | 1032.78 | 626.18 | 1032.8 |
| 636.16 | 1033.39 | 640.52 | 1033.48 | 646.53 | 1033.7 | 654.86 | 1033.84 | 656.9 | 1033.88 |
| 662.26 | 1034.03 | 667.28 | 1034.38 | 669.2 | 1034.46 | 677.65 | 1034.78 | 683.54 | 1035.15 |
| 688.03 | 1035.53 | 697.86 | 1036.49 | 698.41 | 1036.53 | 699.8 | 1036.72 | 708.78 | 1037.96 |
| 712.2 | 1038.47 | 719.15 | 1039.54 | 726.54 | 1040.62 | 729.53 | 1041.02 | 737.35 | 1041.86 |
| 739.9 | 1042.06 | 740.88 | 1042.13 | 750.28 | 1042.83 | 755.22 | 1043.14 | 760.65 | 1043.53 |
| 769.56 | 1044.07 | 771.03 | 1044.18 | 774.89 | 1044.38 | 781.4 | 1044.61 | 783.89 | 1044.78 |
| 791.78 | 1045.25 | 798.23 | 1045.65 | 802.15 | 1045.88 | 812.43 | 1046.34 | 812.56 | 1046.34 |
| 822.9 | 1046.79 | 826.9 | 1046.98 | 833.28 | 1047.27 | 841.24 | 1047.61 | 843.65 | 1047.72 |
| 845.1 | 1047.78 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 249.3 | .04 | 391.28 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 272.12 | 470.16 | 221.77 | 219.61 | 213.61 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1030.55 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1030.41 | Reach Len. (ft) | 221.77 | 219.61 | 213.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 164.49 | |
| E.G. Slope (ft/ft) | 0.005022 | Area (sq ft) | | 164.49 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 148.67 | Top Width (ft) | | 148.67 | |
| Vel Total (ft/s) | 3.04 | Avg. Vel. (ft/s) | | 3.04 | |
| Max Chl Dpth (ft) | 2.22 | Hydr. Depth (ft) | | 1.11 | |
| Conv. Total (cfs) | 7055.3 | Conv. (cfs) | | 7055.3 | |
| Length Wtd. (ft) | 219.61 | Wetted Per. (ft) | | 148.80 | |
| Min Ch El (ft) | 1028.19 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.05 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 11.89 | 24.91 | 9.96 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.73 | 22.14 | 14.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1030.54 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1030.40 | Reach Len. (ft) | 221.77 | 219.61 | 213.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 162.55 | |
| E.G. Slope (ft/ft) | 0.005202 | Area (sq ft) | | 162.55 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 148.33 | Top Width (ft) | | 148.33 | |
| Vel Total (ft/s) | 3.08 | Avg. Vel. (ft/s) | | 3.08 | |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | | 1.10 | |
| Conv. Total (cfs) | 6932.2 | Conv. (cfs) | | 6932.2 | |
| Length Wtd. (ft) | 219.61 | Wetted Per. (ft) | | 148.46 | |
| Min Ch El (ft) | 1028.19 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.09 | |
| Frctn Loss (ft) | 1.51 | Cum Volume (acre-ft) | 0.24 | 34.13 | 0.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 22.36 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1030.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1030.41 | Reach Len. (ft) | 221.77 | 219.61 | 213.61 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 165.18 | |
| E.G. Slope (ft/ft) | 0.004960 | Area (sq ft) | | 165.18 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 148.79 | Top Width (ft) | | 148.79 | |
| Vel Total (ft/s) | 3.03 | Avg. Vel. (ft/s) | | 3.03 | |
| Max Chl Dpth (ft) | 2.22 | Hydr. Depth (ft) | | 1.11 | |
| Conv. Total (cfs) | 7099.2 | Conv. (cfs) | | 7099.2 | |
| Length Wtd. (ft) | 219.61 | Wetted Per. (ft) | | 148.92 | |
| Min Ch El (ft) | 1028.19 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.04 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 6.28 | 31.10 | 1.25 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.41 | 22.30 | 1.61 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.560

INPUT
Description: 18798.28 - Thalweg Sta. 430.26
Station Elevation Data num= 151

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1045.87 | .75 | 1045.88 | 9.24 | 1046.08 | 16.73 | 1046.16 | 19.8 | 1046.21 |
| 25.77 | 1046.17 | 30.36 | 1046.11 | 32.71 | 1046.05 | 40.92 | 1045.86 | 48.7 | 1045.63 |
| 51.48 | 1045.54 | 62.04 | 1045.12 | 64.69 | 1044.97 | 72.6 | 1044.49 | 80.68 | 1043.7 |
| 83.16 | 1043.41 | 93.72 | 1041.94 | 96.66 | 1041.48 | 112.65 | 1039.04 | 114.84 | 1038.71 |
| 119.12 | 1038.08 | 123.81 | 1037.4 | 125.4 | 1037.18 | 128.63 | 1036.76 | 135.96 | 1035.79 |
| 139.58 | 1035.42 | 146.52 | 1034.69 | 147.46 | 1034.63 | 150.23 | 1034.44 | 157.08 | 1034.02 |
| 167.64 | 1033.5 | 176.59 | 1033.11 | 178.2 | 1033.05 | 179 | 1033.03 | 181.34 | 1032.95 |
| 188.76 | 1032.73 | 192.58 | 1032.68 | 199.32 | 1032.51 | 208.56 | 1032.42 | 209.88 | 1032.39 |
| 224.55 | 1032.15 | 231 | 1031.93 | 240.53 | 1031.86 | 241.56 | 1031.86 | 243.57 | 1031.85 |
| 252.13 | 1031.82 | 256.52 | 1031.83 | 262.68 | 1031.79 | 272.51 | 1031.56 | 273.25 | 1031.54 |
| 274.68 | 1031.46 | 283.81 | 1030.78 | 288.5 | 1030.39 | 294.37 | 1029.94 | 304.47 | 1029.39 |
| 304.93 | 1029.37 | 305.8 | 1029.34 | 315.49 | 1028.98 | 320.92 | 1028.82 | 326.05 | 1028.75 |
| 336.45 | 1029.18 | 336.61 | 1029.19 | 336.91 | 1029.21 | 347.17 | 1030.09 | 349.71 | 1030.32 |
| 357.73 | 1031.06 | 368.03 | 1031.86 | 368.29 | 1031.87 | 368.43 | 1031.88 | 370.43 | 1031.91 |
| 378.85 | 1032.04 | 384.4 | 1031.65 | 389.41 | 1031.35 | 399.15 | 1030.45 | 399.97 | 1030.37 |
| 400.39 | 1030.32 | 421.09 | 1028.35 | 430.26 | 1027.57 | 431.65 | 1027.46 | 432.37 | 1027.47 |
| 442.21 | 1027.4 | 448.35 | 1027.79 | 452.77 | 1028.06 | 463.33 | 1028.34 | 473.89 | 1028.23 |
| 480.32 | 1028.11 | 484.45 | 1028.04 | 492.49 | 1027.84 | 495.01 | 1027.76 | 496.31 | 1027.74 |
| 505.57 | 1027.53 | 516.13 | 1027.59 | 516.36 | 1027.59 | 523.61 | 1027.72 | 526.69 | 1027.79 |
| 528.28 | 1027.81 | 537.25 | 1027.96 | 547.81 | 1028.1 | 579.49 | 1028.48 | 581.1 | 1028.51 |
| 590.06 | 1028.66 | 595.8 | 1028.87 | 600.61 | 1029.04 | 608.21 | 1029.53 | 611.17 | 1029.74 |
| 616.95 | 1030.11 | 621.74 | 1030.39 | 624.2 | 1030.54 | 632.29 | 1031 | 640.18 | 1031.71 |
| 642.86 | 1031.89 | 653.42 | 1032.99 | 656.16 | 1033.29 | 663.97 | 1033.82 | 672.15 | 1034.58 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 674.54 | 1034.74 | 679.17 | 1035.18 | 685.1 | 1035.57 | 688.14 | 1035.73 | 695.66 | 1035.79 |
| 704.13 | 1036.24 | 706.22 | 1036.32 | 710.29 | 1036.54 | 716.78 | 1036.8 | 720.12 | 1036.95 |
| 727.34 | 1037.23 | 736.09 | 1037.55 | 737.9 | 1037.61 | 741.4 | 1037.74 | 748.46 | 1037.93 |
| 752.08 | 1038.11 | 759.02 | 1038.44 | 768.07 | 1038.97 | 769.58 | 1039.07 | 772.52 | 1039.26 |
| 780.14 | 1039.71 | 784.06 | 1039.98 | 790.7 | 1040.4 | 800.03 | 1041.11 | 801.26 | 1041.2 |
| 803.64 | 1041.39 | 811.82 | 1042 | 816.02 | 1042.21 | 822.38 | 1042.55 | 832.01 | 1042.93 |
| 832.94 | 1042.97 | 834.75 | 1043.04 | 843.5 | 1043.31 | 848 | 1043.47 | 854.06 | 1043.67 |
| 863.48 | 1043.92 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 349.71 | .04 | 516.36 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 370.43 | 640.18 | 210.94 | 199.53 | 213.82 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.02 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.035 | 0.038 | |
| W.S. Elev (ft) | 1028.83 | Reach Len. (ft) | 210.94 | 199.53 | 213.82 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.34 | 144.43 | |
| E.G. Slope (ft/ft) | 0.010273 | Area (sq ft) | 0.34 | 144.43 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 0.19 | 499.81 | |
| Top Width (ft) | 186.50 | Top Width (ft) | 7.67 | 178.83 | |
| Vel Total (ft/s) | 3.45 | Avg. Vel. (ft/s) | 0.54 | 3.46 | |
| Max Chl Dpth (ft) | 1.43 | Hydr. Depth (ft) | 0.04 | 0.81 | |
| Conv. Total (cfs) | 4933.1 | Conv. (cfs) | 1.8 | 4931.3 | |
| Length Wtd. (ft) | 199.53 | Wetted Per. (ft) | 7.67 | 178.94 | |
| Min Ch El (ft) | 1027.40 | Shear (lb/sq ft) | 0.03 | 0.52 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.02 | 1.79 | |
| Frctn Loss (ft) | 1.44 | Cum Volume (acre-ft) | 11.89 | 24.13 | 9.96 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 16.71 | 21.31 | 14.44 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.03 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1028.85 | Reach Len. (ft) | 210.94 | 199.53 | 213.82 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 147.86 | |
| E.G. Slope (ft/ft) | 0.009558 | Area (sq ft) | | 147.86 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 179.56 | Top Width (ft) | | 179.56 | |
| Vel Total (ft/s) | 3.38 | Avg. Vel. (ft/s) | | 3.38 | |
| Max Chl Dpth (ft) | 1.45 | Hydr. Depth (ft) | | 0.82 | |
| Conv. Total (cfs) | 5114.4 | Conv. (cfs) | | 5114.4 | |
| Length Wtd. (ft) | 199.53 | Wetted Per. (ft) | | 179.66 | |
| Min Ch El (ft) | 1027.40 | Shear (lb/sq ft) | | 0.49 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.66 | |
| Frctn Loss (ft) | 1.48 | Cum Volume (acre-ft) | 0.24 | 33.35 | 0.47 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.12 | 21.54 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1029.02 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 1028.83 | Reach Len. (ft) | 210.94 | 199.53 | 213.82 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 143.12 | |
| E.G. Slope (ft/ft) | 0.010575 | Area (sq ft) | | 143.12 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 178.55 | Top Width (ft) | | 178.55 | |
| Vel Total (ft/s) | 3.49 | Avg. Vel. (ft/s) | | 3.49 | |
| Max Chl Dpth (ft) | 1.43 | Hydr. Depth (ft) | | 0.80 | |
| Conv. Total (cfs) | 4862.1 | Conv. (cfs) | | 4862.1 | |
| Length Wtd. (ft) | 199.53 | Wetted Per. (ft) | | 178.66 | |
| Min Ch El (ft) | 1027.40 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.85 | |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 6.28 | 30.33 | 1.25 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 6.41 | 21.48 | 1.61 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.522

INPUT
Description: 18598.76 - Thalweg Sta. 421.62
Station Elevation Data num= 153

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1038.16 | 1.04 | 1038.07 | 8.76 | 1037.54 | 11.6 | 1037.3 | 17.13 | 1037.09 |
| 22.16 | 1037.01 | 24.73 | 1037.01 | 32.72 | 1036.99 | 40.72 | 1036.94 | 43.28 | 1036.92 |
| 48.25 | 1036.87 | 52.42 | 1036.8 | 53.84 | 1036.77 | 60.31 | 1036.82 | 64.4 | 1036.75 |
| 68.19 | 1036.88 | 74.96 | 1036.99 | 76.08 | 1037.01 | 79.36 | 1037.03 | 85.52 | 1037.03 |
| 96.08 | 1036.5 | 106.64 | 1035.71 | 107.61 | 1035.64 | 110.48 | 1035.41 | 117.2 | 1034.85 |
| 127.76 | 1034.12 | 136.64 | 1033.56 | 138.32 | 1033.45 | 141.59 | 1033.26 | 148.88 | 1032.82 |
| 159.44 | 1032.35 | 168.61 | 1031.99 | 170 | 1031.94 | 172.7 | 1031.86 | 180.56 | 1031.56 |
| 184.59 | 1031.46 | 191.12 | 1031.34 | 200.58 | 1031.41 | 201.68 | 1031.41 | 203.82 | 1031.47 |
| 216.57 | 1031.7 | 222.8 | 1031.76 | 232.55 | 1031.72 | 233.36 | 1031.71 | 234.94 | 1031.68 |
| 243.92 | 1031.45 | 248.54 | 1031.38 | 254.48 | 1031.23 | 264.53 | 1031.2 | 265.04 | 1031.19 |
| 266.06 | 1031.2 | 275.6 | 1031.17 | 280.51 | 1031.03 | 286.16 | 1030.89 | 296.49 | 1030.27 |
| 296.72 | 1030.26 | 296.79 | 1030.25 | 297.17 | 1030.22 | 307.28 | 1029.14 | 312.48 | 1028.61 |
| 317.85 | 1027.95 | 328.28 | 1027.08 | 328.4 | 1027.08 | 328.47 | 1027.07 | 330.84 | 1026.98 |
| 344.14 | 1026.48 | 349.53 | 1026.39 | 359.4 | 1026.2 | 360.08 | 1026.19 | 360.45 | 1026.19 |
| 370.65 | 1026.14 | 376.42 | 1026.09 | 381.21 | 1026.07 | 390.51 | 1026.01 | 391.76 | 1026 |
| 392.41 | 1026.01 | 402.33 | 1026.14 | 408.4 | 1026.24 | 412.89 | 1026.34 | 421.62 | 1026.32 |
| 423.45 | 1026.32 | 424.39 | 1026.35 | 434.01 | 1026.49 | 440.36 | 1026.83 | 444.57 | 1027.03 |
| 452.74 | 1027.12 | 455.13 | 1027.12 | 465.69 | 1026.87 | 472.34 | 1026.78 | 476.25 | 1026.72 |
| 486.81 | 1026.64 | 488.33 | 1026.64 | 497.08 | 1026.6 | 497.37 | 1026.6 | 507.93 | 1026.59 |
| 518.49 | 1026.67 | 519.92 | 1026.69 | 520.18 | 1026.7 | 528.58 | 1026.82 | 530.84 | 1026.87 |
| 538.6 | 1027.06 | 548.62 | 1027.48 | 552.17 | 1027.86 | 558.64 | 1028.6 | 562.84 | 1029.26 |
| 568.66 | 1030.2 | 570.06 | 1030.41 | 573.51 | 1030.93 | 578.67 | 1031.64 | 588.69 | 1032.56 |
| 594.85 | 1033.08 | 598.71 | 1033.39 | 605.52 | 1034.11 | 608.73 | 1034.37 | 616.19 | 1034.78 |
| 618.75 | 1034.9 | 626.86 | 1035.05 | 628.77 | 1035.04 | 637.52 | 1035.01 | 638.78 | 1034.98 |
| 648.19 | 1034.93 | 648.8 | 1034.92 | 658.18 | 1034.86 | 658.82 | 1034.85 | 668.84 | 1034.86 |
| 669.53 | 1034.87 | 678.86 | 1035.28 | 680.2 | 1035.36 | 688.88 | 1035.97 | 690.87 | 1036.08 |
| 698.9 | 1036.6 | 701.54 | 1036.71 | 708.91 | 1037 | 712.21 | 1037.1 | 718.93 | 1037.26 |
| 722.87 | 1037.34 | 728.95 | 1037.43 | 733.54 | 1037.46 | 738.97 | 1037.45 | 744.21 | 1037.48 |
| 748.99 | 1037.47 | 754.88 | 1037.54 | 759.01 | 1037.58 | 765.55 | 1037.83 | 769.03 | 1038 |
| 776.22 | 1038.38 | 779.04 | 1038.59 | 786.89 | 1038.93 | 789.06 | 1039.04 | 797.56 | 1039.31 |
| 808.23 | 1039.6 | 809.1 | 1039.62 | 810.89 | 1039.67 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 330.84 | .04 | 497.08 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 296.79 | 570.06 | 129.19 | 197.93 | 248.14 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1027.45 | Reach Len. (ft) | 129.19 | 197.93 | 248.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 194.09 | |
| E.G. Slope (ft/ft) | 0.005353 | Area (sq ft) | | 194.09 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 224.15 | Top Width (ft) | | 224.15 | |
| Vel Total (ft/s) | 2.58 | Avg. Vel. (ft/s) | | 2.58 | |
| Max Chl Dpth (ft) | 1.45 | Hydr. Depth (ft) | | 0.87 | |
| Conv. Total (cfs) | 6834.0 | Conv. (cfs) | | 6834.0 | |
| Length Wtd. (ft) | 197.93 | Wetted Per. (ft) | | 224.21 | |
| Min Ch El (ft) | 1026.00 | Shear (lb/sq ft) | | 0.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.75 | |
| Frctn Loss (ft) | 1.06 | Cum Volume (acre-ft) | 11.89 | 23.35 | 9.96 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.69 | 20.39 | 14.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.54 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1027.43 | Reach Len. (ft) | 129.19 | 197.93 | 248.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 188.08 | |
| E.G. Slope (ft/ft) | 0.005916 | Area (sq ft) | | 188.08 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 223.18 | Top Width (ft) | | 223.18 | |
| Vel Total (ft/s) | 2.66 | Avg. Vel. (ft/s) | | 2.66 | |
| Max Chl Dpth (ft) | 1.43 | Hydr. Depth (ft) | | 0.84 | |
| Conv. Total (cfs) | 6500.9 | Conv. (cfs) | | 6500.9 | |
| Length Wtd. (ft) | 197.93 | Wetted Per. (ft) | | 223.25 | |
| Min Ch El (ft) | 1026.00 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.83 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 0.24 | 32.58 | 0.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 20.61 | 0.30 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1027.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1027.46 | Reach Len. (ft) | 129.19 | 197.93 | 248.14 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 196.17 | |
| E.G. Slope (ft/ft) | 0.005175 | Area (sq ft) | | 196.17 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 224.48 | Top Width (ft) | | 224.48 | |
| Vel Total (ft/s) | 2.55 | Avg. Vel. (ft/s) | | 2.55 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 0.87 | |
| Conv. Total (cfs) | 6950.7 | Conv. (cfs) | | 6950.7 | |
| Length Wtd. (ft) | 197.93 | Wetted Per. (ft) | | 224.55 | |
| Min Ch El (ft) | 1026.00 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.72 | |
| Frctn Loss (ft) | 1.10 | Cum Volume (acre-ft) | 6.28 | 29.55 | 1.25 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.41 | 20.55 | 1.61 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.485

INPUT
Description: 18400.83 - Thalweg Sta. 442.50
Station Elevation Data num= 152

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1038.42 | 1.46 | 1038.32 | 4.44 | 1038.04 | 7.4 | 1037.78 | 14.44 | 1037.23 |
| 17.37 | 1037.03 | 24.44 | 1036.47 | 27.33 | 1036.31 | 34.44 | 1035.84 | 37.3 | 1035.72 |
| 44.44 | 1035.36 | 51.64 | 1035.09 | 54.44 | 1035.02 | 57.22 | 1035.04 | 64.44 | 1034.74 |
| 67.19 | 1034.77 | 74.44 | 1034.23 | 77.15 | 1034.2 | 84.44 | 1034.22 | 87.12 | 1034.09 |
| 94.44 | 1033.83 | 97.08 | 1033.72 | 104.44 | 1033.49 | 114.44 | 1032.99 | 117.01 | 1032.82 |
| 126.97 | 1032.26 | 134.44 | 1031.9 | 136.94 | 1031.8 | 144.44 | 1031.6 | 146.9 | 1031.54 |
| 154.44 | 1031.34 | 156.87 | 1031.29 | 164.44 | 1031.07 | 174.44 | 1030.86 | 184.44 | 1030.81 |
| 186.76 | 1030.83 | 194.44 | 1030.87 | 204.44 | 1031.01 | 206.69 | 1031.06 | 214.44 | 1031.21 |
| 216.65 | 1031.28 | 224.44 | 1031.49 | 226.62 | 1031.56 | 234.44 | 1031.8 | 236.58 | 1031.86 |
| 244.44 | 1032.06 | 246.55 | 1032.08 | 254.44 | 1032.11 | 264.44 | 1031.97 | 266.47 | 1031.91 |
| 276.44 | 1031.67 | 284.44 | 1031.5 | 286.4 | 1031.45 | 294.44 | 1031.31 | 296.37 | 1031.24 |
| 304.44 | 1031.06 | 306.33 | 1030.99 | 314.44 | 1030.74 | 324.44 | 1030.32 | 324.53 | 1030.31 |
| 325.25 | 1030.26 | 326.26 | 1030.19 | 334.44 | 1029.6 | 336.22 | 1029.35 | 344.44 | 1028.17 |
| 346.19 | 1027.87 | 349.31 | 1027.37 | 354.69 | 1026.54 | 354.79 | 1026.53 | 355.1 | 1026.51 |
| 362.76 | 1025.83 | 365.18 | 1025.68 | 370.73 | 1025.36 | 375.66 | 1025.2 | 378.71 | 1025.35 |
| 386.15 | 1025.15 | 386.68 | 1025.15 | 388.39 | 1025.16 | 394.66 | 1025.24 | 396.63 | 1025.2 |
| 402.63 | 1025.02 | 407.11 | 1024.91 | 410.6 | 1024.81 | 417.6 | 1025.04 | 418.57 | 1025.09 |
| 421.68 | 1025.21 | 426.55 | 1025.41 | 428.08 | 1025.44 | 434.52 | 1025.45 | 438.56 | 1025.44 |
| 442.5 | 1025.36 | 449.05 | 1025.2 | 450.47 | 1025.17 | 454.96 | 1025.13 | 458.44 | 1025.09 |
| 459.53 | 1025.11 | 466.41 | 1025.21 | 470.02 | 1025.25 | 474.39 | 1025.25 | 480.5 | 1025.2 |
| 482.36 | 1025.23 | 486.08 | 1025.24 | 490.33 | 1025.26 | 490.99 | 1025.26 | 498.3 | 1025.35 |
| 501.47 | 1025.37 | 506.28 | 1025.46 | 511.96 | 1025.59 | 520.28 | 1025.91 | 522.57 | 1026.01 |
| 531.97 | 1026.64 | 532.37 | 1026.66 | 541.37 | 1027.39 | 542.39 | 1027.47 | 550.77 | 1028.32 |
| 552.41 | 1028.51 | 560.16 | 1029.54 | 562.43 | 1029.88 | 564.69 | 1030.18 | 569.56 | 1030.83 |
| 572.45 | 1031.18 | 578.95 | 1031.85 | 582.48 | 1031.98 | 588.35 | 1032.32 | 592.5 | 1032.37 |
| 597.75 | 1032.39 | 602.52 | 1032.25 | 607.14 | 1032.04 | 612.54 | 1031.73 | 616.54 | 1031.39 |
| 622.57 | 1030.9 | 625.93 | 1030.58 | 632.59 | 1030.14 | 635.33 | 1030 | 642.61 | 1029.78 |
| 644.73 | 1029.72 | 652.63 | 1029.65 | 654.13 | 1029.61 | 662.65 | 1029.6 | 672.4 | 1030.09 |
| 672.68 | 1030.1 | 676.6 | 1030.52 | 682.32 | 1031.15 | 682.7 | 1031.2 | 691.72 | 1032.49 |
| 692.72 | 1032.63 | 701.11 | 1033.84 | 702.74 | 1034.06 | 710.51 | 1034.98 | 712.76 | 1035.17 |

719.9 1035.59 721.18 1035.62

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 325.25 | .04 | 486.08 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 324.53 | 564.69 | 240.51 | 197.8 | 144.29 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.50 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1026.37 | Reach Len. (ft) | 240.51 | 197.80 | 144.29 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 175.18 | |
| E.G. Slope (ft/ft) | 0.005377 | Area (sq ft) | | 175.18 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 171.24 | Top Width (ft) | | 171.24 | |
| Vel Total (ft/s) | 2.85 | Avg. Vel. (ft/s) | | 2.85 | |
| Max Chl Dpth (ft) | 1.56 | Hydr. Depth (ft) | | 1.02 | |
| Conv. Total (cfs) | 6818.4 | Conv. (cfs) | | 6818.4 | |
| Length Wtd. (ft) | 196.66 | Wetted Per. (ft) | | 171.33 | |
| Min Ch El (ft) | 1024.81 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.98 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 11.89 | 22.51 | 9.96 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.69 | 19.49 | 14.44 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.56 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1026.46 | Reach Len. (ft) | 240.51 | 197.80 | 144.29 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 189.93 | |
| E.G. Slope (ft/ft) | 0.004176 | Area (sq ft) | | 189.93 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 173.48 | Top Width (ft) | | 173.48 | |
| Vel Total (ft/s) | 2.63 | Avg. Vel. (ft/s) | | 2.63 | |
| Max Chl Dpth (ft) | 1.64 | Hydr. Depth (ft) | | 1.09 | |
| Conv. Total (cfs) | 7737.4 | Conv. (cfs) | | 7737.4 | |
| Length Wtd. (ft) | 197.80 | Wetted Per. (ft) | | 173.58 | |
| Min Ch El (ft) | 1024.81 | Shear (lb/sq ft) | | 0.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.75 | |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | 0.24 | 31.72 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 19.71 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1026.47 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1026.34 | Reach Len. (ft) | 240.51 | 197.80 | 144.29 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 169.62 | |
| E.G. Slope (ft/ft) | 0.005950 | Area (sq ft) | | 169.62 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 170.39 | Top Width (ft) | | 170.39 | |
| Vel Total (ft/s) | 2.95 | Avg. Vel. (ft/s) | | 2.95 | |
| Max Chl Dpth (ft) | 1.53 | Hydr. Depth (ft) | | 1.00 | |
| Conv. Total (cfs) | 6481.8 | Conv. (cfs) | | 6481.8 | |
| Length Wtd. (ft) | 196.61 | Wetted Per. (ft) | | 170.48 | |
| Min Ch El (ft) | 1024.81 | Shear (lb/sq ft) | | 0.37 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.09 | |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 6.28 | 28.72 | 1.25 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.41 | 19.66 | 1.61 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.448

INPUT
Description: 18203.02 - Thalweg Sta. 501.62
Station Elevation Data num= 138

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1034.24 | .93 | 1034.21 | 10.94 | 1033.74 | 11.58 | 1033.72 | 18.73 | 1033.4 |
| 22.24 | 1033.23 | 29.81 | 1032.9 | 32.89 | 1032.78 | 38.19 | 1032.3 | 42.11 | 1031.77 |
| 43.55 | 1031.56 | 49.9 | 1030.74 | 57.68 | 1029.87 | 64.85 | 1029.26 | 65.47 | 1029.19 |
| 67.17 | 1029.08 | 75.51 | 1028.64 | 80.37 | 1028.48 | 86.17 | 1028.3 | 96.14 | 1028.09 |
| 96.82 | 1028.08 | 107.47 | 1027.8 | 114.07 | 1028.28 | 118.13 | 1028.31 | 125.12 | 1028.63 |
| 128.78 | 1028.91 | 135.59 | 1029.3 | 139.44 | 1029.47 | 147.77 | 1029.59 | 150.09 | 1029.67 |
| 154.1 | 1029.72 | 160.75 | 1029.72 | 171.4 | 1030.44 | 181.47 | 1031.31 | 182.06 | 1031.36 |
| 183.07 | 1031.42 | 190.12 | 1031.79 | 192.71 | 1031.87 | 198.31 | 1031.87 | 203.36 | 1031.86 |
| 212.05 | 1031.58 | 214.02 | 1031.49 | 215.17 | 1031.42 | 224.67 | 1030.86 | 232.01 | 1030.41 |
| 235.33 | 1030.2 | 241.03 | 1029.89 | 245.98 | 1029.65 | 248.87 | 1029.6 | 256.64 | 1029.44 |
| 265.71 | 1029.69 | 267.29 | 1029.73 | 270 | 1029.87 | 282.57 | 1030.48 | 288.6 | 1030.83 |
| 298.98 | 1031.32 | 299.25 | 1031.34 | 299.42 | 1031.33 | 309.91 | 1031.49 | 316.27 | 1031.05 |
| 320.57 | 1030.67 | 327.96 | 1030.15 | 331.22 | 1029.93 | 333.12 | 1029.84 | 341.87 | 1029.37 |
| 349.96 | 1029.04 | 352.53 | 1028.92 | 356.94 | 1028.76 | 363.18 | 1028.61 | 366.82 | 1028.56 |
| 373.84 | 1028.42 | 383.66 | 1028.37 | 384.49 | 1028.36 | 385.91 | 1028.36 | 395.15 | 1028.23 |
| 405.8 | 1027.98 | 414.89 | 1027.68 | 416.46 | 1027.57 | 417.36 | 1027.47 | 427.11 | 1026.21 |
| 432.72 | 1025.6 | 434.22 | 1025.44 | 437.76 | 1025.02 | 443.87 | 1024.63 | 448.42 | 1024.43 |
| 451.06 | 1024.44 | 467.92 | 1024.46 | 469.85 | 1024.46 | 472.84 | 1024.37 | 480.38 | 1024.17 |
| 484.76 | 1024 | 491.04 | 1023.8 | 501.62 | 1023.74 | 501.82 | 1023.74 | 512.35 | 1023.95 |
| 523 | 1024.05 | 530.8 | 1024.03 | 533.66 | 1024.01 | 535.32 | 1024.01 | 544.31 | 1023.95 |
| 552.16 | 1023.98 | 554.96 | 1023.98 | 565.62 | 1024.17 | 576.27 | 1024.39 | 585.86 | 1024.53 |
| 586.93 | 1024.55 | 588.75 | 1024.57 | 597.58 | 1024.65 | 597.93 | 1024.65 | 608.24 | 1024.66 |
| 610.05 | 1024.6 | 617.73 | 1024.33 | 618.89 | 1024.28 | 619.56 | 1024.3 | 629.55 | 1024.42 |
| 640.2 | 1025.41 | 646.71 | 1026.26 | 650.86 | 1026.75 | 653.26 | 1027.01 | 661.51 | 1028 |
| 670.12 | 1028.84 | 672.17 | 1029.07 | 675.68 | 1029.38 | 682.82 | 1029.97 | 686.96 | 1030.53 |
| 693.47 | 1031.23 | 703.82 | 1032.36 | 704.13 | 1032.38 | 704.66 | 1032.41 | 714.78 | 1032.93 |
| 720.66 | 1033.04 | 733.64 | 1033.23 | 736.09 | 1033.2 | 737.52 | 1033.24 | 746.75 | 1033.36 |
| 754.36 | 1033.66 | 757.4 | 1033.76 | 757.83 | 1033.78 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 432.72 | .04 | 610.05 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 469.85 | 597.93 | 219.36 | 199.66 | 172.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.25 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.040 | 0.040 | 0.036 |
| W.S. Elev (ft) | 1025.10 | Reach Len. (ft) | 219.36 | 199.66 | 172.54 |
| Crit W.S. (ft) | 1024.84 | Flow Area (sq ft) | 18.19 | 126.48 | 21.59 |
| E.G. Slope (ft/ft) | 0.007633 | Area (sq ft) | 18.19 | 126.48 | 21.59 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 39.89 | 407.03 | 53.08 |
| Top Width (ft) | 199.75 | Top Width (ft) | 32.75 | 128.08 | 38.92 |
| Vel Total (ft/s) | 3.01 | Avg. Vel. (ft/s) | 2.19 | 3.22 | 2.46 |
| Max Chl Dpth (ft) | 1.36 | Hydr. Depth (ft) | 0.56 | 0.99 | 0.55 |
| Conv. Total (cfs) | 5723.1 | Conv. (cfs) | 456.6 | 4658.9 | 607.6 |
| Length Wtd. (ft) | 201.51 | Wetted Per. (ft) | 32.77 | 128.10 | 38.96 |
| Min Ch El (ft) | 1023.74 | Shear (lb/sq ft) | 0.26 | 0.47 | 0.26 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.58 | 1.51 | 0.65 |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | 11.84 | 21.83 | 9.93 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 16.60 | 18.81 | 14.38 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.39 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1025.18 | Reach Len. (ft) | 219.36 | 199.66 | 172.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 137.05 | |
| E.G. Slope (ft/ft) | 0.008929 | Area (sq ft) | | 137.05 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 128.08 | Top Width (ft) | | 128.08 | |
| Vel Total (ft/s) | 3.65 | Avg. Vel. (ft/s) | | 3.65 | |
| Max Chl Dpth (ft) | 1.44 | Hydr. Depth (ft) | | 1.07 | |
| Conv. Total (cfs) | 5291.3 | Conv. (cfs) | | 5291.3 | |
| Length Wtd. (ft) | 199.66 | Wetted Per. (ft) | | 129.35 | |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 1023.74 | Shear (lb/sq ft) | | 0.59 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.15 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 0.24 | 30.98 | 0.47 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.12 | 19.03 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1025.29 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.040 | 0.040 | 0.036 |
| W.S. Elev (ft) | 1025.16 | Reach Len. (ft) | 219.36 | 199.66 | 172.54 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 20.31 | 134.71 | 24.11 |
| E.G. Slope (ft/ft) | 0.006036 | Area (sq ft) | 20.31 | 134.71 | 24.11 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 42.16 | 402.03 | 55.82 |
| Top Width (ft) | 200.98 | Top Width (ft) | 33.29 | 128.08 | 39.61 |
| Vel Total (ft/s) | 2.79 | Avg. Vel. (ft/s) | 2.08 | 2.98 | 2.31 |
| Max Chl Dpth (ft) | 1.42 | Hydr. Depth (ft) | 0.61 | 1.05 | 0.61 |
| Conv. Total (cfs) | 6435.7 | Conv. (cfs) | 542.6 | 5174.7 | 718.4 |
| Length Wtd. (ft) | 198.86 | Wetted Per. (ft) | 33.32 | 128.10 | 39.65 |
| Min Ch El (ft) | 1023.74 | Shear (lb/sq ft) | 0.23 | 0.40 | 0.23 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.48 | 1.18 | 0.53 |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 6.23 | 28.03 | 1.21 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.32 | 18.98 | 1.54 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.410

INPUT
Description: 18003.37 - Thalweg Sta. 420.57
Station Elevation Data num= 114

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1031.92 | 4.43 | 1031.81 | 6.67 | 1031.72 | 14.79 | 1031.31 | 17.77 | 1031.06 |
| 25.14 | 1030.6 | 31.93 | 1029.99 | 35.5 | 1029.75 | 45.19 | 1028.98 | 45.85 | 1028.92 |
| 46.1 | 1028.9 | 60.26 | 1027.6 | 66.56 | 1026.95 | 70.79 | 1026.6 | 74.42 | 1026.29 |
| 76.92 | 1026.05 | 83.71 | 1025.58 | 87.27 | 1025.4 | 88.59 | 1025.38 | 97.63 | 1025.18 |
| 102.74 | 1025.19 | 107.98 | 1025.14 | 116.91 | 1025.14 | 118.34 | 1025.12 | 122.23 | 1025.14 |
| 128.69 | 1025.24 | 131.06 | 1025.34 | 139.05 | 1025.51 | 145.23 | 1025.68 | 149.4 | 1025.77 |
| 159.4 | 1026.03 | 159.76 | 1026.04 | 168.12 | 1026.21 | 170.11 | 1026.25 | 173.55 | 1026.14 |
| 180.47 | 1026.01 | 187.72 | 1025.55 | 190.82 | 1025.4 | 199.27 | 1024.87 | 201.18 | 1024.73 |
| 201.88 | 1024.71 | 211.53 | 1024.45 | 216.04 | 1024.35 | 221.89 | 1024.26 | 230.2 | 1024.07 |
| 232.24 | 1024.03 | 242.6 | 1023.81 | 244.37 | 1023.77 | 258.52 | 1023.48 | 263.31 | 1023.39 |
| 272.69 | 1023.3 | 273.66 | 1023.28 | 276.31 | 1023.27 | 284.02 | 1023.22 | 301.01 | 1023.15 |
| 313.78 | 1023.11 | 326.13 | 1023.11 | 336.54 | 1023.18 | 338.84 | 1023.19 | 351.27 | 1023.22 |
| 352.46 | 1023.22 | 362.79 | 1023.19 | 366 | 1023.18 | 366.08 | 1023.18 | 367.16 | 1023.16 |
| 379.71 | 1022.84 | 380.73 | 1022.81 | 393.32 | 1022.78 | 395.45 | 1022.84 | 406.94 | 1023.1 |
| 410.18 | 1023.12 | 415.58 | 1023.11 | 420.57 | 1022.92 | 422.65 | 1022.85 | 424.91 | 1022.68 |
| 434.19 | 1022.16 | 439.64 | 1022.07 | 454.37 | 1022.51 | 461.43 | 1022.53 | 469.1 | 1022.64 |
| 475.05 | 1022.78 | 483.82 | 1023.36 | 483.95 | 1023.37 | 488.67 | 1023.71 | 498.56 | 1024.6 |
| 502.29 | 1025.13 | 513.21 | 1026.52 | 513.28 | 1026.53 | 515.91 | 1026.86 | 528.01 | 1028.02 |
| 529.53 | 1028.1 | 542.74 | 1029.38 | 543.15 | 1029.4 | 548.23 | 1029.85 | 556.77 | 1030.58 |
| 557.47 | 1030.61 | 570.4 | 1029.77 | 572.19 | 1029.67 | 584.01 | 1030.25 | 586.93 | 1030.37 |
| 597.63 | 1031.15 | 601.65 | 1031.49 | 611.26 | 1032.24 | 616.38 | 1032.65 | 624.88 | 1033.13 |
| 631.11 | 1033.42 | 634.95 | 1033.53 | 638.5 | 1033.65 | 645.84 | 1033.82 | 652.11 | 1033.99 |
| 660.56 | 1034 | 665.74 | 1034.06 | 679.36 | 1033.93 | 680.65 | 1033.91 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 70.79 | .04 | 168.12 | .035 | 313.78 | .04 | 513.21 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 362.79 | 483.95 | 145.7 | 196.95 | 230.38 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.91 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.037 | 0.040 | 0.040 |
| W.S. Elev (ft) | 1023.80 | Reach Len. (ft) | 145.70 | 196.95 | 230.38 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 64.38 | 127.37 | 1.26 |
| E.G. Slope (ft/ft) | 0.005714 | Area (sq ft) | 64.38 | 127.37 | 1.26 |

| | | | | | |
|---|---|---|---|---|---|
| Q Total (cfs) | 500.00 | Flow (cfs) | 129.09 | 369.62 | 1.29 |
| Top Width (ft) | 246.49 | Top Width (ft) | 119.64 | 121.16 | 5.69 |
| Vel Total (ft/s) | 2.59 | Avg. Vel. (ft/s) | 2.01 | 2.90 | 1.02 |
| Max Chl Dpth (ft) | 1.73 | Hydr. Depth (ft) | 0.54 | 1.05 | 0.22 |
| Conv. Total (cfs) | 6614.7 | Conv. (cfs) | 1707.8 | 4889.9 | 17.1 |
| Length Wtd. (ft) | 186.66 | Wetted Per. (ft) | 119.64 | 121.22 | 5.71 |
| Min Ch El (ft) | 1022.07 | Shear (lb/sq ft) | 0.19 | 0.37 | 0.08 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.38 | 1.09 | 0.08 |
| Frctn Loss (ft) | 1.19 | Cum Volume (acre-ft) | 11.63 | 21.25 | 9.88 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 16.22 | 18.24 | 14.29 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1024.39 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1024.28 | Reach Len. (ft) | 145.70 | 196.95 | 230.38 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 185.87 | |
| E.G. Slope (ft/ft) | 0.003031 | Area (sq ft) | | 185.87 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 121.16 | Top Width (ft) | | 121.16 | |
| Vel Total (ft/s) | 2.69 | Avg. Vel. (ft/s) | | 2.69 | |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | | 1.53 | |
| Conv. Total (cfs) | 9081.2 | Conv. (cfs) | | 9081.2 | |
| Length Wtd. (ft) | 196.95 | Wetted Per. (ft) | | 123.22 | |
| Min Ch El (ft) | 1022.07 | Shear (lb/sq ft) | | 0.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.77 | |
| Frctn Loss (ft) | 0.93 | Cum Volume (acre-ft) | 0.24 | 30.24 | 0.47 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.12 | 18.46 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1024.22 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 1024.07 | Reach Len. (ft) | 145.70 | 196.95 | 230.38 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 160.31 | 3.22 |
| E.G. Slope (ft/ft) | 0.004820 | Area (sq ft) | | 160.31 | 3.22 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 495.74 | 4.26 |
| Top Width (ft) | 129.87 | Top Width (ft) | | 121.16 | 8.71 |
| Vel Total (ft/s) | 3.06 | Avg. Vel. (ft/s) | | 3.09 | 1.32 |
| Max Chl Dpth (ft) | 2.00 | Hydr. Depth (ft) | | 1.32 | 0.37 |
| Conv. Total (cfs) | 7201.7 | Conv. (cfs) | | 7140.3 | 61.4 |
| Length Wtd. (ft) | 201.51 | Wetted Per. (ft) | | 122.10 | 8.74 |
| Min Ch El (ft) | 1022.07 | Shear (lb/sq ft) | | 0.40 | 0.11 |
| Alpha | 1.02 | Stream Power (lb/ft s) | | 1.22 | 0.15 |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 6.18 | 27.35 | 1.16 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.23 | 18.41 | 1.45 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.372

INPUT
Description: 17806.42 - Thalweg Sta. 483.24
Station Elevation Data num= 127

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1032.16 | 5.62 | 1031.93 | 5.99 | 1031.92 | 15.83 | 1031.61 | 18.87 | 1031.5 |
| 26.04 | 1031.23 | 31.74 | 1031 | 36.25 | 1030.83 | 46.46 | 1030.4 | 47.68 | 1030.34 |
| 56.67 | 1030.01 | 57.47 | 1030.01 | 66.88 | 1029.8 | 83.21 | 1029.76 | 87.3 | 1029.76 |
| 96.08 | 1029.67 | 97.51 | 1029.65 | 107.73 | 1029.6 | 108.94 | 1029.6 | 117.94 | 1029.65 |
| 121.81 | 1029.6 | 128.15 | 1029.62 | 134.68 | 1029.3 | 138.36 | 1029.21 | 147.55 | 1028.5 |
| 148.57 | 1028.43 | 152.5 | 1028.11 | 158.78 | 1027.56 | 160.41 | 1027.5 | 168.99 | 1027.26 |
| 173.28 | 1027.32 | 179.2 | 1027.33 | 186.16 | 1027.31 | 189.41 | 1027.25 | 199.02 | 1027.03 |
| 199.62 | 1027 | 201.94 | 1026.79 | 209.84 | 1025.98 | 211.89 | 1025.79 | 220.05 | 1024.87 |
| 224.75 | 1024.52 | 225.23 | 1024.48 | 230.26 | 1024.01 | 240.47 | 1023.47 | 250.5 | 1023.09 |
| 250.68 | 1023.08 | 251.39 | 1023.06 | 260.89 | 1022.82 | 263.36 | 1022.78 | 271.1 | 1022.7 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 276.23 | 1022.62 | 281.31 | 1022.59 | 289.09 | 1022.43 | 300.85 | 1022.13 | 301.73 | 1022.11 |
| 301.97 | 1022.11 | 311.95 | 1022.06 | 314.84 | 1022.09 | 327.7 | 1022.36 | 332.37 | 1022.48 |
| 342.58 | 1022.63 | 350.29 | 1022.62 | 352.79 | 1022.61 | 353.44 | 1022.61 | 366.31 | 1022.46 |
| 378.2 | 1022.29 | 378.81 | 1022.29 | 383.54 | 1022.21 | 386.84 | 1022.17 | 393.98 | 1022.06 |
| 394.87 | 1022.05 | 397.88 | 1021.99 | 404.41 | 1021.87 | 410.94 | 1021.72 | 414.85 | 1021.57 |
| 418.98 | 1021.6 | 425.29 | 1021.58 | 427.01 | 1021.59 | 435.04 | 1021.62 | 435.73 | 1021.62 |
| 443.08 | 1021.61 | 446.08 | 1021.64 | 446.17 | 1021.64 | 451.11 | 1021.61 | 456.61 | 1021.59 |
| 459.14 | 1021.55 | 467.04 | 1021.35 | 467.18 | 1021.34 | 467.62 | 1021.32 | 477.48 | 1020.82 |
| 483.24 | 1020.62 | 487.92 | 1020.7 | 491.28 | 1020.86 | 498.36 | 1021.26 | 498.49 | 1021.26 |
| 499.12 | 1021.28 | 499.31 | 1021.29 | 507.35 | 1021.29 | 508.8 | 1021.28 | 515.38 | 1021.53 |
| 519.24 | 1021.74 | 523.41 | 1022.15 | 529.68 | 1022.96 | 531.45 | 1023.24 | 537.36 | 1024.36 |
| 539.48 | 1024.74 | 540.11 | 1024.86 | 547.51 | 1026.28 | 550.55 | 1026.82 | 555.54 | 1027.43 |
| 560.99 | 1028.07 | 563.58 | 1028.2 | 571.43 | 1028.44 | 572.23 | 1028.44 | 579.65 | 1028.39 |
| 581.87 | 1028.27 | 587.68 | 1028.07 | 592.31 | 1027.67 | 595.71 | 1027.43 | 602.74 | 1026.61 |
| 603.75 | 1026.52 | 607.1 | 1026.28 | 611.78 | 1026.07 | 613.18 | 1026.24 | 619.81 | 1027.19 |
| 623.62 | 1027.72 | 623.89 | 1027.76 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 225.23 | .04 | 498.49 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 446.08 | 499.12 | 216.81 | 197.52 | 165 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1022.71 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.040 | 0.040 | 0.035 |
| W.S. Elev (ft) | 1022.53 | Reach Len. (ft) | 216.81 | 197.52 | 165.00 |
| Crit W.S. (ft) | 1022.27 | Flow Area (sq ft) | 65.04 | 72.30 | 25.95 |
| E.G. Slope (ft/ft) | 0.007123 | Area (sq ft) | 65.04 | 72.30 | 25.95 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 131.17 | 278.97 | 89.86 |
| Top Width (ft) | 218.23 | Top Width (ft) | 137.93 | 53.04 | 27.25 |
| Vel Total (ft/s) | 3.06 | Avg. Vel. (ft/s) | 2.02 | 3.86 | 3.46 |
| Max Chl Dpth (ft) | 1.91 | Hydr. Depth (ft) | 0.47 | 1.36 | 0.95 |
| Conv. Total (cfs) | 5924.4 | Conv. (cfs) | 1554.2 | 3305.5 | 1064.7 |
| Length Wtd. (ft) | 201.17 | Wetted Per. (ft) | 137.95 | 53.08 | 27.31 |
| Min Ch El (ft) | 1020.62 | Shear (lb/sq ft) | 0.21 | 0.61 | 0.42 |
| Alpha | 1.23 | Stream Power (lb/ft s) | 0.42 | 2.34 | 1.46 |
| Frctn Loss (ft) | 1.33 | Cum Volume (acre-ft) | 11.42 | 20.80 | 9.81 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 15.79 | 17.85 | 14.20 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.43 | Element | | | |
| Vel Head (ft) | 0.40 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1023.04 | Reach Len. (ft) | 216.81 | 197.52 | 165.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 99.07 | |
| E.G. Slope (ft/ft) | 0.008414 | Area (sq ft) | | 99.07 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 53.04 | Top Width (ft) | | 53.04 | |
| Vel Total (ft/s) | 5.05 | Avg. Vel. (ft/s) | | 5.05 | |
| Max Chl Dpth (ft) | 2.42 | Hydr. Depth (ft) | | 1.87 | |
| Conv. Total (cfs) | 5451.0 | Conv. (cfs) | | 5451.0 | |
| Length Wtd. (ft) | 197.52 | Wetted Per. (ft) | | 56.23 | |
| Min Ch El (ft) | 1020.62 | Shear (lb/sq ft) | | 0.93 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.67 | |
| Frctn Loss (ft) | 1.59 | Cum Volume (acre-ft) | 0.24 | 29.60 | 0.47 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 0.12 | 18.06 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1023.11 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.040 | 0.035 |
| W.S. Elev (ft) | 1022.87 | Reach Len. (ft) | 216.81 | 197.52 | 165.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 89.93 | 35.44 |
| E.G. Slope (ft/ft) | 0.006164 | Area (sq ft) | | 89.93 | 35.44 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 367.73 | 132.27 |
| Top Width (ft) | 82.87 | Top Width (ft) | | 53.04 | 29.83 |
| Vel Total (ft/s) | 3.99 | Avg. Vel. (ft/s) | | 4.09 | 3.73 |

| | | | | | |
|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 2.25 | Hydr. Depth (ft) | | 1.70 | 1.19 |
| Conv. Total (cfs) | 6368.3 | Conv. (cfs) | | 4683.6 | 1684.7 |
| Length Wtd. (ft) | 193.17 | Wetted Per. (ft) | | 54.30 | 29.90 |
| Min Ch El (ft) | 1020.62 | Shear (lb/sq ft) | | 0.64 | 0.46 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.61 | 1.70 |
| Frctn Loss (ft) | 1.33 | Cum Volume (acre-ft) | 6.18 | 26.79 | 1.06 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.23 | 18.01 | 1.34 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.335

INPUT
Description: 17608.90 - Thalweg Sta. 447.85
Station Elevation Data num= 115

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1027.9 | 4.01 | 1027.67 | 9.85 | 1027.28 | 15.96 | 1026.81 | 21.08 | 1026.46 |
| 25.98 | 1026.15 | 32.31 | 1026.04 | 38.94 | 1025.8 | 43.54 | 1025.78 | 47.94 | 1025.54 |
| 54.77 | 1025.19 | 61.91 | 1024.62 | 66 | 1024.37 | 69.91 | 1024.11 | 77.23 | 1023.72 |
| 84.89 | 1023.45 | 88.46 | 1023.36 | 91.88 | 1023.21 | 94.38 | 1023.07 | 99.7 | 1022.78 |
| 107.86 | 1022.45 | 110.93 | 1022.32 | 113.86 | 1022.24 | 122.16 | 1022.26 | 133.39 | 1022.21 |
| 135.82 | 1022.19 | 144.62 | 1022.05 | 155.85 | 1021.72 | 157.79 | 1021.66 | 167.08 | 1021.51 |
| 176.8 | 1021 | 178.31 | 1020.95 | 179.76 | 1020.93 | 189.54 | 1021.05 | 199.77 | 1021.42 |
| 200.77 | 1021.45 | 201.73 | 1021.47 | 212.01 | 1021.87 | 218.04 | 1021.84 | 222.75 | 1021.81 |
| 223.7 | 1021.81 | 234.47 | 1021.69 | 245.67 | 1021.47 | 245.72 | 1021.47 | 256.93 | 1021.38 |
| 268.16 | 1021.38 | 268.7 | 1021.37 | 279.39 | 1021.29 | 289.61 | 1021.16 | 290.28 | 1021.15 |
| 290.62 | 1021.15 | 291.68 | 1021.13 | 301.85 | 1020.98 | 311.58 | 1020.8 | 313.08 | 1020.76 |
| 314.65 | 1020.71 | 315.02 | 1020.7 | 324.31 | 1020.41 | 333.55 | 1020.16 | 334.87 | 1020.12 |
| 335.54 | 1020.12 | 337.63 | 1020.14 | 346.77 | 1020.17 | 355.51 | 1020.3 | 369.23 | 1020.45 |
| 380.47 | 1020.53 | 383.59 | 1020.53 | 391.7 | 1020.55 | 399.64 | 1020.55 | 414.16 | 1020.51 |
| 421.43 | 1020.46 | 425.39 | 1020.41 | 429.53 | 1020.28 | 443.39 | 1019.89 | 447.85 | 1019.84 |
| 452.51 | 1020 | 459.08 | 1020.24 | 465.36 | 1020.29 | 470.31 | 1020.28 | 475.49 | 1020.09 |
| 481.55 | 1019.91 | 487.33 | 1020.08 | 492.78 | 1020.4 | 498.47 | 1021.04 | 498.57 | 1021.05 |
| 504.01 | 1021.62 | 505.73 | 1021.95 | 509.31 | 1022.63 | 515.24 | 1023.7 | 521.45 | 1025.08 |
| 526.47 | 1026.24 | 531.28 | 1027.21 | 537.7 | 1028.14 | 544.43 | 1028.67 | 548.93 | 1028.93 |
| 553.24 | 1029.05 | 560.16 | 1029.26 | 567.39 | 1029.44 | 571.39 | 1029.47 | 575.21 | 1029.47 |
| 582.62 | 1029.52 | 590.37 | 1029.28 | 593.86 | 1029.13 | 597.18 | 1028.89 | 605.09 | 1028.39 |
| 613.35 | 1027.82 | 616.32 | 1027.61 | 619.15 | 1027.45 | 627.55 | 1027.11 | 636.33 | 1027.56 |
| 638.78 | 1027.73 | 639.57 | 1027.83 | 641.12 | 1028.02 | 650.01 | 1029.05 | 650.87 | 1029.14 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 94.38 | .04 | 218.04 | .035 | 315.02 | .04 | 505.73 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 399.64 | 498.57 | 190.01 | 198.9 | 215.88 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.37 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 1021.26 | Reach Len. (ft) | 190.01 | 198.90 | 215.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 86.00 | 99.33 | 0.20 |
| E.G. Slope (ft/ft) | 0.006163 | Area (sq ft) | 86.00 | 99.33 | 0.20 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 209.54 | 290.33 | 0.13 |
| Top Width (ft) | 241.73 | Top Width (ft) | 140.84 | 98.93 | 1.96 |
| Vel Total (ft/s) | 2.69 | Avg. Vel. (ft/s) | 2.44 | 2.92 | 0.64 |
| Max Chl Dpth (ft) | 1.42 | Hydr. Depth (ft) | 0.61 | 1.00 | 0.10 |
| Conv. Total (cfs) | 6369.1 | Conv. (cfs) | 2669.2 | 3698.3 | 1.6 |
| Length Wtd. (ft) | 198.04 | Wetted Per. (ft) | 140.87 | 99.00 | 1.97 |
| Min Ch El (ft) | 1019.84 | Shear (lb/sq ft) | 0.23 | 0.39 | 0.04 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.57 | 1.13 | 0.03 |
| Frctn Loss (ft) | 1.64 | Cum Volume (acre-ft) | 11.04 | 20.41 | 9.76 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 15.10 | 17.50 | 14.15 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.79 | Element | Left OB | Channel | Right OB |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1021.56 | Reach Len. (ft) | 190.01 | 198.90 | 215.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 129.26 | |
| E.G. Slope (ft/ft) | 0.007754 | Area (sq ft) | | 129.26 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 98.93 | Top Width (ft) | | 98.93 | |
| Vel Total (ft/s) | 3.87 | Avg. Vel. (ft/s) | | 3.87 | |
| Max Chl Dpth (ft) | 1.72 | Hydr. Depth (ft) | | 1.31 | |
| Conv. Total (cfs) | 5678.2 | Conv. (cfs) | | 5678.2 | |
| Length Wtd. (ft) | 198.90 | Wetted Per. (ft) | | 100.52 | |
| Min Ch El (ft) | 1019.84 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.41 | |
| Frctn Loss (ft) | 1.94 | Cum Volume (acre-ft) | 0.24 | 29.08 | 0.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 17.72 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1021.79 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 1021.56 | Reach Len. (ft) | 190.01 | 198.90 | 215.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 129.01 | 1.22 |
| E.G. Slope (ft/ft) | 0.007702 | Area (sq ft) | | 129.01 | 1.22 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 498.42 | 1.58 |
| Top Width (ft) | 103.75 | Top Width (ft) | | 98.93 | 4.82 |
| Vel Total (ft/s) | 3.84 | Avg. Vel. (ft/s) | | 3.86 | 1.30 |
| Max Chl Dpth (ft) | 1.72 | Hydr. Depth (ft) | | 1.30 | 0.25 |
| Conv. Total (cfs) | 5697.4 | Conv. (cfs) | | 5679.4 | 18.0 |
| Length Wtd. (ft) | 198.93 | Wetted Per. (ft) | | 100.01 | 4.85 |
| Min Ch El (ft) | 1019.84 | Shear (lb/sq ft) | | 0.62 | 0.12 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 2.40 | 0.16 |
| Frctn Loss (ft) | 1.94 | Cum Volume (acre-ft) | 6.18 | 26.29 | 0.99 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.23 | 17.67 | 1.28 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.297

INPUT
Description: 17410.00 - Thalweg Sta. 498.63
Station Elevation Data num= 182

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1029.72 | 1.71 | 1029.62 | 10.13 | 1028.99 | 14.26 | 1028.72 | 20.3 | 1028.28 |
| 26.81 | 1027.95 | 30.48 | 1027.7 | 39.35 | 1027.39 | 46.24 | 1027.23 | 50.83 | 1027.07 |
| 51.9 | 1027.02 | 61.01 | 1026.64 | 64.45 | 1026.48 | 77 | 1025.95 | 81.37 | 1025.79 |
| 89.56 | 1025.39 | 91.54 | 1025.3 | 100.07 | 1024.83 | 101.46 | 1024.74 | 101.72 | 1024.74 |
| 102.11 | 1024.73 | 111.9 | 1024.37 | 114.66 | 1024.38 | 122.08 | 1024.29 | 127.2 | 1024.34 |
| 139.75 | 1024.3 | 142.43 | 1024.28 | 152.3 | 1024.22 | 152.61 | 1024.21 | 153.9 | 1024.19 |
| 162.78 | 1024.01 | 164.85 | 1023.98 | 177.41 | 1023.78 | 183.14 | 1023.74 | 189.96 | 1023.67 |
| 193.31 | 1023.67 | 202.51 | 1023.35 | 203.49 | 1023.34 | 207.74 | 1023.17 | 213.67 | 1022.91 |
| 223.85 | 1022.62 | 234.02 | 1022.45 | 240.15 | 1022.37 | 244.2 | 1022.31 | 254.38 | 1022.13 |
| 264.56 | 1021.93 | 265.26 | 1021.91 | 274.73 | 1021.69 | 277.81 | 1021.65 | 284.91 | 1021.51 |
| 290.35 | 1021.53 | 295.09 | 1021.52 | 302.9 | 1021.72 | 305.26 | 1021.74 | 315.39 | 1022.12 |
| 315.45 | 1022.12 | 325.62 | 1022.45 | 328 | 1022.4 | 335.8 | 1022.46 | 340.55 | 1022.13 |
| 345.97 | 1022.02 | 356.15 | 1021.18 | 365.66 | 1020.53 | 366.33 | 1020.48 | 369.23 | 1020.3 |
| 376.5 | 1019.79 | 379.18 | 1019.66 | 383.9 | 1019.43 | 386.68 | 1019.45 | 390.75 | 1019.49 |
| 396.86 | 1019.24 | 403.3 | 1019.31 | 407.03 | 1019.41 | 409.58 | 1019.42 | 423.56 | 1019.42 |
| 427.39 | 1019.4 | 428.4 | 1019.39 | 437.57 | 1019.36 | 440.94 | 1019.33 | 447.74 | 1019.32 |
| 453.5 | 1019.19 | 457.92 | 1019.13 | 466.05 | 1018.84 | 468.1 | 1018.77 | 476.88 | 1018.54 |
| 478.28 | 1018.51 | 486.61 | 1018.46 | 488.45 | 1018.46 | 491.15 | 1018.39 | 498.63 | 1018.17 |
| 503.7 | 1018.24 | 508.81 | 1018.34 | 516.25 | 1018.44 | 518.98 | 1018.47 | 528.79 | 1018.35 |
| 529.16 | 1018.34 | 530.71 | 1018.35 | 539.34 | 1018.39 | 541.35 | 1018.43 | 549.51 | 1018.71 |
| 559.69 | 1019.01 | 566.45 | 1019.1 | 569.87 | 1019.14 | 579 | 1019.21 | 579.87 | 1019.23 |
| 591.55 | 1019.23 | 600.4 | 1019.15 | 604.1 | 1019.18 | 610.58 | 1019.14 | 616.64 | 1019.15 |
| 620.76 | 1019.17 | 629.2 | 1019.13 | 630.93 | 1019.13 | 641.11 | 1019.09 | 641.75 | 1019.11 |
| 651.29 | 1019.22 | 654.3 | 1019.38 | 658.53 | 1019.57 | 661.46 | 1019.7 | 666.85 | 1020 |
| 671.64 | 1020.24 | 679.4 | 1020.59 | 691.94 | 1021.12 | 692 | 1021.12 | 692.2 | 1021.13 |
| 702.17 | 1021.67 | 704.49 | 1021.73 | 712.35 | 1021.98 | 717.05 | 1021.64 | 722.53 | 1021.44 |
| 729.6 | 1020.22 | 732.7 | 1019.85 | 742.15 | 1020.35 | 742.88 | 1020.36 | 753.06 | 1021.62 |
| 754.7 | 1021.88 | 763.24 | 1023.12 | 767.25 | 1023.72 | 773.41 | 1024.55 | 779.79 | 1025.34 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 783.59 | 1025.78 | 792.34 | 1026.44 | 793.77 | 1026.53 | 799.86 | 1026.78 | 803.94 | 1026.92 |
| 804.89 | 1026.95 | 814.12 | 1027.05 | 817.45 | 1027.08 | 824.3 | 1027.1 | 834.48 | 1027.32 |
| 842.55 | 1027.77 | 844.65 | 1028 | 853.69 | 1028.51 | 854.83 | 1028.57 | 855.09 | 1028.58 |
| 865.01 | 1028.81 | 867.64 | 1028.78 | 875.18 | 1028.72 | 885.36 | 1028.42 | 892.74 | 1028.13 |
| 905.3 | 1027.59 | 905.72 | 1027.58 | 915.89 | 1027.14 | 917.85 | 1027.07 | 926.07 | 1026.81 |
| 930.4 | 1026.86 | 936.25 | 1026.98 | 942.94 | 1027.47 | 946.43 | 1027.71 | 955.49 | 1028.24 |
| 956.6 | 1028.3 | 961.35 | 1028.38 | 966.78 | 1028.46 | 968.04 | 1028.47 | 976.96 | 1028.4 |
| 980.59 | 1028.35 | 987.13 | 1028.2 | 993.15 | 1028.08 | 997.31 | 1027.97 | 1005.7 | 1028.16 |
| 1007.49 | 1028.21 | 1008.46 | 1028.26 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 379.18 | .04 | 658.53 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 423.56 | 579.87 | 204.11 | 198.93 | 206.37 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1019.74 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 1019.57 | Reach Len. (ft) | 204.11 | 198.93 | 206.37 |
| Crit W.S. (ft) | 1019.45 | Flow Area (sq ft) | 7.33 | 124.06 | 30.00 |
| E.G. Slope (ft/ft) | 0.011710 | Area (sq ft) | 7.33 | 124.06 | 30.00 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 9.13 | 427.42 | 63.44 |
| Top Width (ft) | 277.44 | Top Width (ft) | 42.50 | 156.31 | 78.63 |
| Vel Total (ft/s) | 3.10 | Avg. Vel. (ft/s) | 1.25 | 3.45 | 2.11 |
| Max Chl Dpth (ft) | 1.40 | Hydr. Depth (ft) | 0.17 | 0.79 | 0.38 |
| Conv. Total (cfs) | 4620.6 | Conv. (cfs) | 84.4 | 3949.9 | 586.3 |
| Length Wtd. (ft) | 199.61 | Wetted Per. (ft) | 42.51 | 156.34 | 78.64 |
| Min Ch El (ft) | 1018.17 | Shear (lb/sq ft) | 0.13 | 0.58 | 0.28 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.16 | 2.00 | 0.59 |
| Frctn Loss (ft) | 1.58 | Cum Volume (acre-ft) | 10.84 | 19.90 | 9.68 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.70 | 16.92 | 13.95 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1019.85 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1019.63 | Reach Len. (ft) | 204.11 | 198.93 | 206.37 |
| Crit W.S. (ft) | 1019.45 | Flow Area (sq ft) | | 133.23 | |
| E.G. Slope (ft/ft) | 0.012697 | Area (sq ft) | | 133.23 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 156.31 | Top Width (ft) | | 156.31 | |
| Vel Total (ft/s) | 3.75 | Avg. Vel. (ft/s) | | 3.75 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 0.85 | |
| Conv. Total (cfs) | 4437.4 | Conv. (cfs) | | 4437.4 | |
| Length Wtd. (ft) | 198.93 | Wetted Per. (ft) | | 156.94 | |
| Min Ch El (ft) | 1018.17 | Shear (lb/sq ft) | | 0.67 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.53 | |
| Frctn Loss (ft) | 1.66 | Cum Volume (acre-ft) | 0.24 | 28.48 | 0.47 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.12 | 17.14 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1019.85 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1019.63 | Reach Len. (ft) | 204.11 | 198.93 | 206.37 |
| Crit W.S. (ft) | 1019.45 | Flow Area (sq ft) | | 132.99 | |
| E.G. Slope (ft/ft) | 0.012772 | Area (sq ft) | | 132.99 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 156.31 | Top Width (ft) | | 156.31 | |
| Vel Total (ft/s) | 3.76 | Avg. Vel. (ft/s) | | 3.76 | |
| Max Chl Dpth (ft) | 1.46 | Hydr. Depth (ft) | | 0.85 | |
| Conv. Total (cfs) | 4424.2 | Conv. (cfs) | | 4424.2 | |
| Length Wtd. (ft) | 198.93 | Wetted Per. (ft) | | 156.94 | |
| Min Ch El (ft) | 1018.17 | Shear (lb/sq ft) | | 0.68 | |

| | | | | | |
|---|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.54 | |
| Frctn Loss (ft) | 1.65 | Cum Volume (acre-ft) | 6.18 | 25.69 | 0.98 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 6.23 | 17.09 | 1.27 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.260

INPUT
Description: 17211.07 - Thalweg Sta. 497.10
Station Elevation Data num= 179

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1028.3 | 2.21 | 1028.29 | 8.62 | 1028.24 | 10.39 | 1028.29 | 18.96 | 1028.48 |
| 19.61 | 1028.5 | 29.3 | 1028.82 | 33.65 | 1028.88 | 39.64 | 1029.03 | 47.7 | 1028.98 |
| 49.98 | 1028.99 | 56.37 | 1028.91 | 61.74 | 1028.83 | 70.66 | 1028.68 | 75.78 | 1028.57 |
| 81.01 | 1028.44 | 91.35 | 1028.16 | 101.69 | 1027.82 | 103.87 | 1027.74 | 112.03 | 1027.39 |
| 117.92 | 1027.18 | 122.37 | 1026.99 | 131.96 | 1026.69 | 132.71 | 1026.67 | 134.82 | 1026.61 |
| 146 | 1026.27 | 153.4 | 1026.09 | 160.05 | 1025.83 | 163.74 | 1025.7 | 174.06 | 1025.21 |
| 184.42 | 1024.7 | 188.14 | 1024.56 | 202.18 | 1023.91 | 205.11 | 1023.77 | 213.29 | 1023.42 |
| 216.22 | 1023.27 | 225.79 | 1022.8 | 230.27 | 1022.59 | 246.47 | 1021.77 | 252.51 | 1021.64 |
| 256.82 | 1021.66 | 258.36 | 1021.64 | 267.16 | 1021.58 | 277.5 | 1021.87 | 286.44 | 1022.52 |
| 287.84 | 1022.61 | 291.74 | 1022.89 | 298.18 | 1023.33 | 300.49 | 1023.42 | 308.52 | 1023.76 |
| 318.86 | 1024.07 | 328.58 | 1024.32 | 329.21 | 1024.34 | 330.98 | 1024.36 | 339.55 | 1024.42 |
| 342.62 | 1024.25 | 349.89 | 1023.98 | 356.66 | 1023.13 | 360.23 | 1022.74 | 370.2 | 1021.29 |
| 370.57 | 1021.23 | 370.71 | 1021.22 | 380.91 | 1019.99 | 384.75 | 1019.78 | 391.26 | 1019.33 |
| 398.8 | 1019.01 | 401.6 | 1018.87 | 412.84 | 1018.24 | 415.45 | 1018.08 | 422.28 | 1017.66 |
| 428.5 | 1017.35 | 432.62 | 1017.14 | 440.93 | 1017.07 | 442.97 | 1017.05 | 448.65 | 1017.1 |
| 453.31 | 1017.13 | 463.65 | 1016.82 | 469.02 | 1016.83 | 473.99 | 1016.78 | 483.06 | 1016.9 |
| 484.33 | 1016.91 | 487.89 | 1016.89 | 494.67 | 1016.82 | 497.1 | 1016.82 | 505.02 | 1016.77 |
| 511.15 | 1016.95 | 515.36 | 1017.09 | 525.19 | 1017.27 | 525.7 | 1017.28 | 536.04 | 1017.21 |
| 539.24 | 1017.15 | 546.38 | 1017.04 | 553.28 | 1016.9 | 556.72 | 1016.76 | 567.06 | 1016.91 |
| 567.32 | 1016.91 | 577.41 | 1017.2 | 581.37 | 1017.25 | 587.75 | 1017.37 | 595.41 | 1017.45 |
| 598.09 | 1017.49 | 608.43 | 1017.42 | 609.46 | 1017.44 | 618.77 | 1017.59 | 623.5 | 1017.7 |
| 629.11 | 1017.8 | 637.54 | 1017.87 | 639.46 | 1017.89 | 644.8 | 1017.9 | 649.8 | 1017.92 |
| 650.27 | 1017.92 | 651.59 | 1017.91 | 660.14 | 1017.89 | 665.63 | 1017.85 | 679.68 | 1017.6 |
| 680.82 | 1017.57 | 684.03 | 1017.56 | 691.17 | 1017.51 | 693.72 | 1017.57 | 701.51 | 1017.78 |
| 707.76 | 1018.01 | 721.81 | 1018.35 | 722.19 | 1018.36 | 723.26 | 1018.38 | 732.53 | 1018.69 |
| 735.85 | 1018.81 | 741.59 | 1019.09 | 742.87 | 1019.15 | 749.9 | 1019.35 | 753.22 | 1019.56 |
| 755.15 | 1019.71 | 762.48 | 1019.72 | 763.56 | 1019.78 | 763.94 | 1019.81 | 773.9 | 1020.57 |
| 777.98 | 1020.61 | 784.24 | 1021.07 | 792.03 | 1021.51 | 794.58 | 1021.94 | 801.72 | 1023.11 |
| 804.92 | 1023.66 | 806.07 | 1023.77 | 815.26 | 1024.95 | 820.11 | 1025.15 | 825.61 | 1025.25 |
| 834.16 | 1025.43 | 835.95 | 1025.44 | 840.94 | 1025.46 | 846.29 | 1025.54 | 848.2 | 1025.67 |
| 856.63 | 1026.09 | 862.25 | 1026.57 | 876.29 | 1027.66 | 877.31 | 1027.73 | 887.66 | 1028.05 |
| 890.33 | 1028.03 | 898 | 1028 | 904.38 | 1027.86 | 908.34 | 1027.79 | 918.42 | 1027.23 |
| 918.68 | 1027.22 | 918.83 | 1027.2 | 919.4 | 1027.14 | 929.02 | 1026.03 | 932.47 | 1025.58 |
| 939.37 | 1024.65 | 943.39 | 1024.14 | 949.71 | 1023.47 | 958.63 | 1023.66 | 960.05 | 1023.7 |
| 960.55 | 1023.77 | 970.39 | 1024.96 | 974.6 | 1025.45 | 980.73 | 1026.21 | 988.64 | 1026.63 |
| 991.07 | 1026.78 | 1000.67 | 1026.92 | 1001.42 | 1026.92 | 1003.5 | 1026.93 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 428.5 | .04 | 741.59 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 415.45 | 650.27 | 191.96 | 199.23 | 236.34 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.13 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 1018.04 | Reach Len. (ft) | 191.96 | 199.23 | 236.34 |
| Crit W.S. (ft) | 1017.69 | Flow Area (sq ft) | | 192.38 | 17.16 |
| E.G. Slope (ft/ft) | 0.005691 | Area (sq ft) | | 192.38 | 17.16 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 478.79 | 21.21 |
| Top Width (ft) | 292.65 | Top Width (ft) | | 234.10 | 58.55 |
| Vel Total (ft/s) | 2.39 | Avg. Vel. (ft/s) | | 2.49 | 1.24 |
| Max Chl Dpth (ft) | 1.28 | Hydr. Depth (ft) | | 0.82 | 0.29 |
| Conv. Total (cfs) | 6627.7 | Conv. (cfs) | | 6346.5 | 281.2 |
| Length Wtd. (ft) | 199.63 | Wetted Per. (ft) | | 234.15 | 58.56 |
| Min Ch El (ft) | 1016.76 | Shear (lb/sq ft) | | 0.29 | 0.10 |
| Alpha | 1.05 | Stream Power (lb/ft s) | | 0.73 | 0.13 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.13 | Cum Volume (acre-ft) | 10.82 | 19.17 | 9.57 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.60 | 16.03 | 13.62 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.15 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1018.05 | Reach Len. (ft) | 191.96 | 199.23 | 236.34 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 195.72 | |
| E.G. Slope (ft/ft) | 0.005870 | Area (sq ft) | | 195.72 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 234.33 | Top Width (ft) | | 234.33 | |
| Vel Total (ft/s) | 2.55 | Avg. Vel. (ft/s) | | 2.55 | |
| Max Chl Dpth (ft) | 1.29 | Hydr. Depth (ft) | | 0.84 | |
| Conv. Total (cfs) | 6525.8 | Conv. (cfs) | | 6525.8 | |
| Length Wtd. (ft) | 199.23 | Wetted Per. (ft) | | 234.52 | |
| Min Ch El (ft) | 1016.76 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.78 | |
| Frctn Loss (ft) | 0.69 | Cum Volume (acre-ft) | 0.24 | 27.73 | 0.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 16.24 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1018.15 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1018.05 | Reach Len. (ft) | 191.96 | 199.23 | 236.34 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 196.07 | |
| E.G. Slope (ft/ft) | 0.005837 | Area (sq ft) | | 196.07 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 234.35 | Top Width (ft) | | 234.35 | |
| Vel Total (ft/s) | 2.55 | Avg. Vel. (ft/s) | | 2.55 | |
| Max Chl Dpth (ft) | 1.29 | Hydr. Depth (ft) | | 0.84 | |
| Conv. Total (cfs) | 6544.5 | Conv. (cfs) | | 6544.5 | |
| Length Wtd. (ft) | 199.23 | Wetted Per. (ft) | | 234.54 | |
| Min Ch El (ft) | 1016.76 | Shear (lb/sq ft) | | 0.30 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.78 | |
| Frctn Loss (ft) | 0.71 | Cum Volume (acre-ft) | 6.18 | 24.94 | 0.98 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.23 | 16.19 | 1.27 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.222

INPUT
Description: 17011.84 - Thalweg Sta. 344.62
Station Elevation Data num= 127

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1028.13 | 4.92 | 1027.79 | 5.43 | 1027.76 | 14.63 | 1026.94 | 15.44 | 1026.87 |
| 24.33 | 1026.12 | 25.44 | 1026 | 34.04 | 1025.52 | 35.45 | 1025.37 | 43.74 | 1024.96 |
| 45.45 | 1024.85 | 53.45 | 1024.46 | 55.46 | 1024.33 | 63.16 | 1023.93 | 65.46 | 1023.79 |
| 72.86 | 1023.37 | 75.47 | 1023.21 | 82.57 | 1022.72 | 85.47 | 1022.53 | 92.27 | 1021.99 |
| 95.48 | 1021.71 | 101.98 | 1021.35 | 105.48 | 1021.35 | 111.68 | 1021.05 | 115.48 | 1021.03 |
| 121.39 | 1020.65 | 125.49 | 1020.57 | 131.09 | 1020.39 | 135.49 | 1020.26 | 140.81 | 1020.19 |
| 145.5 | 1020.1 | 150.51 | 1020.06 | 155.5 | 1019.93 | 160.22 | 1019.83 | 165.51 | 1019.67 |
| 169.92 | 1019.57 | 175.51 | 1019.38 | 179.63 | 1019.33 | 185.52 | 1019.14 | 189.33 | 1019.13 |
| 195.52 | 1019.02 | 199.03 | 1018.97 | 205.53 | 1018.82 | 208.74 | 1018.73 | 215.53 | 1018.57 |
| 218.44 | 1018.48 | 225.54 | 1018.29 | 228.16 | 1018.21 | 237.86 | 1018 | 245.55 | 1017.81 |
| 247.57 | 1017.74 | 255.55 | 1017.45 | 265.56 | 1016.87 | 266.98 | 1016.78 | 275.56 | 1016.15 |
| 276.68 | 1016.11 | 280.76 | 1015.99 | 285.57 | 1015.84 | 286.39 | 1015.86 | 295.57 | 1016.17 |
| 296.09 | 1016.18 | 305.58 | 1016.38 | 305.92 | 1016.38 | 313.09 | 1016.28 | 315.51 | 1016.25 |
| 315.58 | 1016.25 | 325.21 | 1015.79 | 325.58 | 1015.77 | 334.92 | 1015.24 | 335.59 | 1015.2 |
| 344.62 | 1014.87 | 345.59 | 1014.84 | 354.33 | 1014.76 | 355.6 | 1014.76 | 364.03 | 1014.88 |
| 365.6 | 1014.93 | 373.74 | 1015.2 | 375.61 | 1015.25 | 377.98 | 1015.32 | 383.44 | 1015.48 |
| 385.61 | 1015.49 | 393.15 | 1015.89 | 395.62 | 1016.03 | 402.86 | 1016.59 | 405.62 | 1016.78 |
| 412.57 | 1016.96 | 415.37 | 1017.01 | 415.63 | 1017.02 | 431.98 | 1016.98 | 455.65 | 1017.03 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 461.09 | 1017.02 | 465.65 | 1017.02 | 490.21 | 1016.97 | 495.67 | 1016.95 | 505.67 | 1016.95 |
| 509.62 | 1016.97 | 529.03 | 1017.04 | 538.74 | 1017.1 | 545.69 | 1017.16 | 548.44 | 1017.23 |
| 555.69 | 1017.39 | 558.15 | 1017.47 | 565.7 | 1017.73 | 567.86 | 1017.81 | 575.7 | 1018.05 |
| 577.56 | 1018.13 | 585.71 | 1018.39 | 587.27 | 1018.52 | 595.71 | 1019.07 | 596.97 | 1019.24 |
| 605.72 | 1020.37 | 606.68 | 1020.52 | 615.72 | 1022 | 616.38 | 1022.09 | 625.73 | 1023.5 |
| 626.09 | 1023.53 | 635.73 | 1024.47 | 635.79 | 1024.47 | 637.84 | 1024.53 | 645.5 | 1024.71 |
| 645.74 | 1024.72 | 655.21 | 1024.6 | 655.74 | 1024.6 | 664.92 | 1024.4 | 665.75 | 1024.38 |
| 675.75 | 1024.11 | 679.81 | 1023.98 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 280.76 | .04 | 377.98 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 305.92 | 415.37 | 202.65 | 197.72 | 214.2 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1016.98 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.039 | 0.039 | |
| W.S. Elev (ft) | 1016.81 | Reach Len. (ft) | 202.65 | 197.72 | 214.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 24.63 | 129.55 | |
| E.G. Slope (ft/ft) | 0.005663 | Area (sq ft) | 24.63 | 129.55 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 52.89 | 447.11 | |
| Top Width (ft) | 140.14 | Top Width (ft) | 39.38 | 100.77 | |
| Vel Total (ft/s) | 3.24 | Avg. Vel. (ft/s) | 2.15 | 3.45 | |
| Max Chl Dpth (ft) | 2.05 | Hydr. Depth (ft) | 0.63 | 1.29 | |
| Conv. Total (cfs) | 6644.5 | Conv. (cfs) | 702.8 | 5941.7 | |
| Length Wtd. (ft) | 202.18 | Wetted Per. (ft) | 39.41 | 100.85 | |
| Min Ch El (ft) | 1014.76 | Shear (lb/sq ft) | 0.22 | 0.45 | |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.47 | 1.57 | |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 10.77 | 18.44 | 9.53 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 14.51 | 15.26 | 13.47 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.47 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1017.36 | Reach Len. (ft) | 202.65 | 197.72 | 214.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 188.55 | |
| E.G. Slope (ft/ft) | 0.002260 | Area (sq ft) | | 188.55 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 109.45 | Top Width (ft) | | 109.45 | |
| Vel Total (ft/s) | 2.65 | Avg. Vel. (ft/s) | | 2.65 | |
| Max Chl Dpth (ft) | 2.60 | Hydr. Depth (ft) | | 1.72 | |
| Conv. Total (cfs) | 10518.4 | Conv. (cfs) | | 10518.4 | |
| Length Wtd. (ft) | 197.72 | Wetted Per. (ft) | | 110.86 | |
| Min Ch El (ft) | 1014.76 | Shear (lb/sq ft) | | 0.24 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.64 | |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 0.24 | 26.85 | 0.47 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.12 | 15.46 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1017.44 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.039 | |
| W.S. Elev (ft) | 1017.32 | Reach Len. (ft) | 202.65 | 197.72 | 214.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 184.92 | |
| E.G. Slope (ft/ft) | 0.002406 | Area (sq ft) | | 184.92 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 109.45 | Top Width (ft) | | 109.45 | |
| Vel Total (ft/s) | 2.70 | Avg. Vel. (ft/s) | | 2.70 | |
| Max Chl Dpth (ft) | 2.56 | Hydr. Depth (ft) | | 1.69 | |
| Conv. Total (cfs) | 10194.0 | Conv. (cfs) | | 10194.0 | |
| Length Wtd. (ft) | 197.79 | Wetted Per. (ft) | | 110.80 | |
| Min Ch El (ft) | 1014.76 | Shear (lb/sq ft) | | 0.25 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.68 | |
| Frctn Loss (ft) | 0.90 | Cum Volume (acre-ft) | 6.18 | 24.07 | 0.98 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 6.23 | 15.41 | 1.27 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.184

INPUT
Description: 16814.13 - Thalweg Sta. 303.73
Station Elevation Data num= 112

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1027.94 | .28 | 1027.93 | 2.19 | 1027.87 | 9.41 | 1027.48 | 18.53 | 1027.06 |
| 22.29 | 1026.94 | 27.66 | 1026.7 | 32.35 | 1026.58 | 36.78 | 1026.32 | 42.4 | 1026.09 |
| 45.91 | 1025.82 | 52.45 | 1025.48 | 55.03 | 1025.27 | 62.5 | 1024.76 | 64.16 | 1024.63 |
| 72.55 | 1023.84 | 73.28 | 1023.83 | 80.47 | 1023.16 | 82.4 | 1022.99 | 82.6 | 1022.97 |
| 91.53 | 1022.22 | 92.65 | 1022.2 | 100.66 | 1022.55 | 102.71 | 1022.62 | 109.78 | 1022.64 |
| 112.76 | 1022.72 | 118.91 | 1022.64 | 128.03 | 1022.67 | 132.86 | 1022.77 | 137.15 | 1022.83 |
| 142.91 | 1022.73 | 146.28 | 1022.6 | 152.96 | 1022.29 | 155.41 | 1022.12 | 163.01 | 1021.55 |
| 164.53 | 1021.46 | 173.07 | 1021.12 | 173.66 | 1021.1 | 182.78 | 1020.63 | 183.12 | 1020.59 |
| 191.9 | 1019.73 | 193.17 | 1019.54 | 194.72 | 1019.39 | 203.22 | 1018.73 | 210.16 | 1018.27 |
| 213.27 | 1018.14 | 219.28 | 1017.91 | 231.85 | 1017.63 | 233.37 | 1017.59 | 237.53 | 1017.51 |
| 243.43 | 1017.34 | 250.65 | 1017.05 | 253.48 | 1016.89 | 255.78 | 1016.73 | 263.53 | 1016.32 |
| 264.91 | 1016.29 | 271.56 | 1015.71 | 273.58 | 1015.53 | 274.02 | 1015.51 | 278.42 | 1014.96 |
| 283.15 | 1014.42 | 283.63 | 1014.37 | 292.28 | 1014.16 | 293.68 | 1014.05 | 301.4 | 1013.92 |
| 303.73 | 1013.87 | 310.53 | 1014.06 | 313.79 | 1014.27 | 319.66 | 1014.63 | 323.84 | 1014.86 |
| 328.77 | 1014.95 | 328.99 | 1014.95 | 333.89 | 1014.96 | 337.9 | 1014.94 | 343.94 | 1014.88 |
| 347.03 | 1014.86 | 353.99 | 1014.78 | 356.15 | 1014.76 | 364.04 | 1014.67 | 374.09 | 1014.59 |
| 374.4 | 1014.59 | 377.41 | 1014.57 | 383.52 | 1014.55 | 384.15 | 1014.54 | 390.17 | 1014.6 |
| 392.65 | 1014.63 | 394.2 | 1014.66 | 401.78 | 1014.94 | 404.25 | 1015.01 | 410.9 | 1015.26 |
| 414.3 | 1015.37 | 424.35 | 1015.48 | 429.15 | 1015.46 | 438.27 | 1015.44 | 454.51 | 1015.43 |
| 464.56 | 1015.33 | 465.65 | 1015.3 | 474.61 | 1015.12 | 474.77 | 1015.12 | 483.9 | 1015.07 |
| 484.66 | 1015.06 | 493.02 | 1015.69 | 494.71 | 1015.8 | 502.15 | 1017.06 | 504.76 | 1017.38 |
| 511.28 | 1018.58 | 514.81 | 1018.96 | 520.39 | 1019 | 524.87 | 1019.15 | 529.52 | 1019.16 |
| 534.92 | 1019.53 | 536.69 | 1019.62 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 271.56 | .04 | 390.17 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 278.42 | 328.99 | 229.99 | 198.29 | 160.44 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.86 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.040 | 0.040 | 0.038 |
| W.S. Elev (ft) | 1015.73 | Reach Len. (ft) | 229.99 | 198.29 | 160.44 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2.46 | 71.01 | 108.38 |
| E.G. Slope (ft/ft) | 0.005412 | Area (sq ft) | 2.46 | 71.01 | 108.38 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 3.39 | 243.12 | 253.50 |
| Top Width (ft) | 222.19 | Top Width (ft) | 7.04 | 50.57 | 164.58 |
| Vel Total (ft/s) | 2.75 | Avg. Vel. (ft/s) | 1.37 | 3.42 | 2.34 |
| Max Chl Dpth (ft) | 1.86 | Hydr. Depth (ft) | 0.35 | 1.40 | 0.66 |
| Conv. Total (cfs) | 6796.4 | Conv. (cfs) | 46.0 | 3304.6 | 3445.8 |
| Length Wtd. (ft) | 183.89 | Wetted Per. (ft) | 7.08 | 50.64 | 164.62 |
| Min Ch El (ft) | 1013.87 | Shear (lb/sq ft) | 0.12 | 0.47 | 0.22 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.16 | 1.62 | 0.52 |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | 10.70 | 17.98 | 9.26 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.40 | 14.92 | 13.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1016.57 | Element | | | |
| Vel Head (ft) | 0.50 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1016.07 | Reach Len. (ft) | 229.99 | 198.29 | 160.44 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 88.53 | |
| E.G. Slope (ft/ft) | 0.011626 | Area (sq ft) | | 88.53 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 50.57 | Top Width (ft) | | 50.57 | |
| Vel Total (ft/s) | 5.65 | Avg. Vel. (ft/s) | | 5.65 | |
| Max Chl Dpth (ft) | 2.20 | Hydr. Depth (ft) | | 1.75 | |
| Conv. Total (cfs) | 4637.3 | Conv. (cfs) | | 4637.3 | |
| Length Wtd. (ft) | 198.29 | Wetted Per. (ft) | | 52.87 | |

| | | | | | |
|---|---|---|---|---|---|
| Min Ch El (ft) | 1013.87 | Shear (lb/sq ft) | | 1.22 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 6.86 | |
| Frctn Loss (ft) | 1.20 | Cum Volume (acre-ft) | 0.24 | 26.22 | 0.47 |
| C & E Loss (ft) | 0.10 | Cum SA (acres) | 0.12 | 15.09 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1016.51 | Element | | | |
| Vel Head (ft) | 0.48 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 1016.03 | Reach Len. (ft) | 229.99 | 198.29 | 160.44 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 5.17 | 86.54 | |
| E.G. Slope (ft/ft) | 0.011478 | Area (sq ft) | 5.17 | 86.54 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 14.61 | 485.39 | |
| Top Width (ft) | 61.13 | Top Width (ft) | 10.56 | 50.57 | |
| Vel Total (ft/s) | 5.45 | Avg. Vel. (ft/s) | 2.83 | 5.61 | |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | 0.49 | 1.71 | |
| Conv. Total (cfs) | 4666.9 | Conv. (cfs) | 136.4 | 4530.5 | |
| Length Wtd. (ft) | 199.18 | Wetted Per. (ft) | 10.62 | 51.72 | |
| Min Ch El (ft) | 1013.87 | Shear (lb/sq ft) | 0.35 | 1.20 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.99 | 6.72 | |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | 6.16 | 23.45 | 0.98 |
| C & E Loss (ft) | 0.10 | Cum SA (acres) | 6.21 | 15.05 | 1.27 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.147

INPUT
Description: 16615.83 - Thalweg Sta. 266.01
Station Elevation Data num= 81

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1026.17 | 6.93 | 1025.52 | 14.95 | 1024.71 | 17.64 | 1024.42 | 21.96 | 1024.02 |
| 28.35 | 1023.48 | 32.34 | 1023.16 | 39.06 | 1022.69 | 49.72 | 1022.19 | 49.87 | 1022.19 |
| 60.49 | 1022.14 | 67.11 | 1022.06 | 71.2 | 1022.05 | 77.78 | 1021.84 | 81.91 | 1021.73 |
| 84.49 | 1021.61 | 92.62 | 1020.96 | 101.86 | 1019.8 | 103.33 | 1019.59 | 105.68 | 1019.27 |
| 114.04 | 1018.12 | 124.76 | 1017.18 | 135.47 | 1016.72 | 136.63 | 1016.68 | 146.18 | 1016.4 |
| 154.02 | 1016.23 | 156.89 | 1016.16 | 167.6 | 1016 | 168.84 | 1015.98 | 179.74 | 1015.88 |
| 181.44 | 1015.86 | 198.56 | 1015.6 | 215.66 | 1015.32 | 216.71 | 1015.31 | 229.03 | 1015.07 |
| 232.78 | 1014.97 | 235.92 | 1014.86 | 241.36 | 1014.68 | 245.44 | 1014.38 | 249.89 | 1014.05 |
| 253.68 | 1013.59 | 263.46 | 1013 | 266.01 | 1012.79 | 266.99 | 1012.82 | 278.33 | 1013.29 |
| 284.11 | 1013.47 | 287.91 | 1013.53 | 290.66 | 1013.54 | 295.08 | 1013.52 | 301.22 | 1013.46 |
| 315.3 | 1013.38 | 316.57 | 1013.39 | 318.33 | 1013.41 | 327.62 | 1013.54 | 335.44 | 1013.68 |
| 339.95 | 1013.74 | 343.62 | 1013.72 | 351.57 | 1013.69 | 352.55 | 1013.69 | 364.6 | 1013.64 |
| 376.92 | 1013.94 | 377.68 | 1013.95 | 386.77 | 1014.07 | 389.25 | 1014.08 | 401.57 | 1014.1 |
| 403.88 | 1014.1 | 413.89 | 1014.12 | 426.22 | 1014.18 | 438.1 | 1014.3 | 438.54 | 1014.3 |
| 439.67 | 1014.32 | 450.86 | 1014.47 | 455.21 | 1014.58 | 463.19 | 1014.82 | 472.32 | 1015.58 |
| 475.51 | 1015.85 | 483.73 | 1016.94 | 487.84 | 1017.47 | 489.43 | 1017.7 | 500.16 | 1019.12 |
| 500.9 | 1019.2 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 245.44 | .04 | 377.68 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 249.89 | 343.62 | 203.41 | 197.54 | 171.01 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.71 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | 0.040 | 0.040 | 0.038 |
| W.S. Elev (ft) | 1014.56 | Reach Len. (ft) | 203.41 | 197.54 | 171.01 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.73 | 106.62 | 56.79 |
| E.G. Slope (ft/ft) | 0.007190 | Area (sq ft) | 1.73 | 106.62 | 56.79 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 2.48 | 365.76 | 131.76 |
| Top Width (ft) | 211.23 | Top Width (ft) | 6.85 | 93.73 | 110.65 |

| | | | | | |
|---|---|---|---|---|---|
| Vel Total (ft/s) | 3.03 | Avg. Vel. (ft/s) | 1.43 | 3.43 | 2.32 |
| Max Chl Dpth (ft) | 1.77 | Hydr. Depth (ft) | 0.25 | 1.14 | 0.51 |
| Conv. Total (cfs) | 5896.8 | Conv. (cfs) | 29.3 | 4313.6 | 1553.9 |
| Length Wtd. (ft) | 195.44 | Wetted Per. (ft) | 6.87 | 93.80 | 110.66 |
| Min Ch El (ft) | 1012.79 | Shear (lb/sq ft) | 0.11 | 0.51 | 0.23 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.16 | 1.75 | 0.53 |
| Frctn Loss (ft) | 0.99 | Cum Volume (acre-ft) | 10.69 | 17.58 | 8.96 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 14.36 | 14.59 | 12.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1015.11 | Reach Len. (ft) | 203.41 | 197.54 | 171.01 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 158.44 | |
| E.G. Slope (ft/ft) | 0.003713 | Area (sq ft) | | 158.44 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 93.73 | Top Width (ft) | | 93.73 | |
| Vel Total (ft/s) | 3.16 | Avg. Vel. (ft/s) | | 3.16 | |
| Max Chl Dpth (ft) | 2.32 | Hydr. Depth (ft) | | 1.69 | |
| Conv. Total (cfs) | 8205.8 | Conv. (cfs) | | 8205.8 | |
| Length Wtd. (ft) | 197.54 | Wetted Per. (ft) | | 96.25 | |
| Min Ch El (ft) | 1012.79 | Shear (lb/sq ft) | | 0.38 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.20 | |
| Frctn Loss (ft) | 0.97 | Cum Volume (acre-ft) | 0.24 | 25.66 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 14.77 | 0.30 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1015.24 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.038 | 0.040 | |
| W.S. Elev (ft) | 1015.10 | Reach Len. (ft) | 203.41 | 197.54 | 171.01 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 8.87 | 157.18 | |
| E.G. Slope (ft/ft) | 0.003559 | Area (sq ft) | 8.87 | 157.18 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 13.31 | 486.69 | |
| Top Width (ft) | 115.91 | Top Width (ft) | 22.18 | 93.73 | |
| Vel Total (ft/s) | 3.01 | Avg. Vel. (ft/s) | 1.50 | 3.10 | |
| Max Chl Dpth (ft) | 2.31 | Hydr. Depth (ft) | 0.40 | 1.68 | |
| Conv. Total (cfs) | 8380.8 | Conv. (cfs) | 223.1 | 8157.7 | |
| Length Wtd. (ft) | 197.62 | Wetted Per. (ft) | 22.21 | 95.18 | |
| Min Ch El (ft) | 1012.79 | Shear (lb/sq ft) | 0.09 | 0.37 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.13 | 1.14 | |
| Frctn Loss (ft) | 0.94 | Cum Volume (acre-ft) | 6.13 | 22.90 | 0.98 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.12 | 14.72 | 1.27 |

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.110

INPUT
Description: 16418.29 - Thalweg Sta. 268.96
Station Elevation Data num= 70

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1030.59 | 1.05 | 1030.49 | 5.96 | 1028.91 | 11.78 | 1027.09 | 15.48 | 1025.77 |
| 22.51 | 1023.25 | 33.03 | 1019.88 | 33.24 | 1019.81 | 33.55 | 1019.72 | 43.97 | 1016.75 |
| 50.59 | 1015.57 | 54.7 | 1014.75 | 61.15 | 1014.17 | 65.43 | 1013.8 | 76.16 | 1013.24 |
| 86.89 | 1013.05 | 88.74 | 1013.05 | 108.34 | 1013.18 | 119.07 | 1013.22 | 120.81 | 1013.21 |
| 129.8 | 1013.21 | 140.53 | 1013.17 | 141.65 | 1013.16 | 143.93 | 1013.14 | 151.26 | 1013.09 |
| 161.99 | 1012.95 | 171.53 | 1012.77 | 172.72 | 1012.75 | 183.45 | 1012.61 | 191.04 | 1012.59 |
| 194.35 | 1012.59 | 196.2 | 1012.6 | 208.33 | 1012.63 | 220.46 | 1012.57 | 229.71 | 1012.56 |
| 232.58 | 1012.58 | 244.71 | 1012.62 | 244.83 | 1012.62 | 247.39 | 1012.58 | 256.83 | 1012.24 |
| 265.07 | 1011.76 | 268.96 | 1011.54 | 277.46 | 1011.5 | 281.09 | 1011.46 | 282.75 | 1011.52 |
| 293.21 | 1012.29 | 300.43 | 1012.91 | 305.34 | 1013.37 | 310.53 | 1013.74 | 316.53 | 1014.03 |
| 317.47 | 1014.07 | 318.11 | 1014.09 | 321.34 | 1014.16 | 329.59 | 1014.34 | 335.79 | 1014.44 |
| 341.71 | 1014.51 | 353.47 | 1014.63 | 353.84 | 1014.63 | 354.67 | 1014.64 | 365.97 | 1014.8 |
| 378.1 | 1015.06 | 388.83 | 1015.32 | 390.22 | 1015.36 | 393.26 | 1015.46 | 402.35 | 1015.74 |
| 406.51 | 1015.91 | 414.48 | 1016.29 | 424.19 | 1016.88 | 426.6 | 1017.04 | 437.2 | 1017.72 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 141.65 | .04 | 321.34 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 244.83 | 316.53 | 139.09 | 195.6 | 245.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1013.70 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.039 | 0.040 | |
| W.S. Elev (ft) | 1013.60 | Reach Len. (ft) | 139.09 | 195.60 | 245.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 121.15 | 91.30 | |
| E.G. Slope (ft/ft) | 0.003790 | Area (sq ft) | 121.15 | 91.30 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 235.14 | 264.86 | |
| Top Width (ft) | 239.45 | Top Width (ft) | 175.65 | 63.80 | |
| Vel Total (ft/s) | 2.35 | Avg. Vel. (ft/s) | 1.94 | 2.90 | |
| Max Chl Dpth (ft) | 2.14 | Hydr. Depth (ft) | 0.69 | 1.43 | |
| Conv. Total (cfs) | 8121.2 | Conv. (cfs) | 3819.3 | 4302.0 | |
| Length Wtd. (ft) | 180.24 | Wetted Per. (ft) | 175.67 | 63.91 | |
| Min Ch El (ft) | 1011.46 | Shear (lb/sq ft) | 0.16 | 0.34 | |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.32 | 0.98 | |
| Frctn Loss (ft) | 0.88 | Cum Volume (acre-ft) | 10.41 | 17.13 | 8.84 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 13.94 | 14.23 | 12.34 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.28 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1014.00 | Reach Len. (ft) | 139.09 | 195.60 | 245.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 118.13 | |
| E.G. Slope (ft/ft) | 0.006792 | Area (sq ft) | | 118.13 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 71.16 | Top Width (ft) | | 71.16 | |
| Vel Total (ft/s) | 4.23 | Avg. Vel. (ft/s) | | 4.23 | |
| Max Chl Dpth (ft) | 2.54 | Hydr. Depth (ft) | | 1.66 | |
| Conv. Total (cfs) | 6067.0 | Conv. (cfs) | | 6067.0 | |
| Length Wtd. (ft) | 195.60 | Wetted Per. (ft) | | 72.66 | |
| Min Ch El (ft) | 1011.46 | Shear (lb/sq ft) | | 0.69 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.92 | |
| Frctn Loss (ft) | 1.40 | Cum Volume (acre-ft) | 0.24 | 25.03 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 14.39 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1014.29 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1014.01 | Reach Len. (ft) | 139.09 | 195.60 | 245.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 118.58 | |
| E.G. Slope (ft/ft) | 0.006722 | Area (sq ft) | | 118.58 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 71.29 | Top Width (ft) | | 71.29 | |
| Vel Total (ft/s) | 4.22 | Avg. Vel. (ft/s) | | 4.22 | |
| Max Chl Dpth (ft) | 2.55 | Hydr. Depth (ft) | | 1.66 | |
| Conv. Total (cfs) | 6098.4 | Conv. (cfs) | | 6098.4 | |
| Length Wtd. (ft) | 195.60 | Wetted Per. (ft) | | 72.80 | |
| Min Ch El (ft) | 1011.46 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.88 | |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 6.11 | 22.27 | 0.98 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.07 | 14.34 | 1.27 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.072

INPUT
Description: 16222.69 - Thalweg Sta. 267.59
Station Elevation Data num= 143

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1029.54 | 3.5 | 1028.9 | 8.72 | 1026.92 | 13.51 | 1025.22 | 19.09 | 1023.22 |
| 23.52 | 1021.71 | 29.48 | 1019.82 | 33.52 | 1018.53 | 39.86 | 1016.78 | 43.53 | 1015.75 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 50.23 | 1014.76 | 53.53 | 1014.2 | 60.61 | 1013.68 | 63.54 | 1013.46 | 71 | 1013.11 |
| 73.55 | 1012.98 | 81.37 | 1012.84 | 83.55 | 1012.78 | 91.75 | 1012.78 | 93.56 | 1012.77 |
| 102.13 | 1012.85 | 103.57 | 1012.87 | 112.5 | 1012.97 | 113.57 | 1012.99 | 122.89 | 1013.07 |
| 123.58 | 1013.08 | 133.27 | 1013.12 | 133.59 | 1013.13 | 140.14 | 1013.06 | 142.23 | 1013.04 |
| 143.59 | 1013.03 | 143.64 | 1013.03 | 153.6 | 1012.73 | 154.02 | 1012.71 | 160.41 | 1012.38 |
| 162.83 | 1012.27 | 163.53 | 1012.23 | 163.73 | 1012.22 | 171.64 | 1012.02 | 174.11 | 1011.93 |
| 179.75 | 1011.99 | 184.5 | 1012 | 187.86 | 1012.11 | 194.88 | 1012.23 | 195.42 | 1012.23 |
| 195.97 | 1012.24 | 199.83 | 1012.21 | 204.08 | 1012.19 | 205.27 | 1012.18 | 212.19 | 1012.02 |
| 215.66 | 1011.97 | 220.3 | 1011.86 | 226.04 | 1011.8 | 228.41 | 1011.75 | 236.43 | 1011.65 |
| 236.52 | 1011.65 | 236.84 | 1011.64 | 244.63 | 1011.46 | 246.82 | 1011.42 | 252.74 | 1011.16 |
| 257.2 | 1010.94 | 260.85 | 1010.55 | 267.59 | 1010.07 | 268.96 | 1010.13 | 273.84 | 1010.17 |
| 277.07 | 1010.23 | 277.98 | 1010.21 | 285.18 | 1010.79 | 288.36 | 1011.04 | 291.96 | 1011.72 |
| 293.29 | 1011.97 | 298.75 | 1013.03 | 301.4 | 1013.15 | 309.09 | 1013.51 | 310.84 | 1013.51 |
| 317.62 | 1013.49 | 319.52 | 1013.49 | 322.91 | 1013.47 | 340.3 | 1013.39 | 350.06 | 1013.3 |
| 350.68 | 1013.29 | 358.17 | 1013.2 | 374.39 | 1012.98 | 375.37 | 1012.97 | 381.72 | 1012.87 |
| 411.68 | 1012.49 | 424.28 | 1012.29 | 432.63 | 1012.12 | 436.89 | 1012 | 442.82 | 1011.87 |
| 445.34 | 1011.82 | 446.83 | 1011.79 | 453 | 1011.57 | 462.1 | 1011.38 | 463.18 | 1011.34 |
| 472.45 | 1010.44 | 473.37 | 1010.47 | 474.71 | 1010.41 | 483.55 | 1011.4 | 489.54 | 1011.54 |
| 493.73 | 1011.98 | 499.93 | 1012.11 | 503.92 | 1012.11 | 512.54 | 1011.6 | 514.1 | 1011.48 |
| 520.65 | 1011.84 | 524.28 | 1012.03 | 525.15 | 1012.06 | 534.47 | 1012.42 | 537.75 | 1012.41 |
| 537.99 | 1012.41 | 544.65 | 1012.39 | 550.36 | 1012.4 | 554.83 | 1012.39 | 575.2 | 1012.5 |
| 575.57 | 1012.5 | 585.38 | 1012.55 | 588.18 | 1012.56 | 595.56 | 1012.6 | 600.8 | 1012.61 |
| 626.01 | 1012.7 | 626.55 | 1012.7 | 636.3 | 1012.73 | 656.66 | 1012.84 | 663.83 | 1012.9 |
| 676.44 | 1013.03 | 677.03 | 1013.04 | 679.5 | 1013.07 | 687.21 | 1013.18 | 697.4 | 1013.35 |
| 707.58 | 1013.55 | 714.27 | 1013.72 | 717.76 | 1013.8 | 732.45 | 1014.21 | 738.13 | 1014.39 |
| 739.48 | 1014.47 | 748.31 | 1014.85 | 752.09 | 1015.39 | 758.5 | 1015.89 | 764.7 | 1017.08 |
| 768.68 | 1017.76 | 777.3 | 1019.02 | 778.57 | 1019.2 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 140.14 | .04 | 291.96 | .035 | 445.34 | .04 | 537.99 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 195.42 | 309.09 | 226.42 | 193.75 | 146.63 | .1 | .3 |

Right Levee Station= 309.09 Elevation= 1013.51

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.82 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 1012.63 | Reach Len. (ft) | 226.42 | 193.75 | 146.63 |
| Crit W.S. (ft) | 1012.29 | Flow Area (sq ft) | 19.65 | 129.74 | |
| E.G. Slope (ft/ft) | 0.006485 | Area (sq ft) | 19.65 | 129.74 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 36.64 | 463.36 | |
| Top Width (ft) | 141.20 | Top Width (ft) | 39.92 | 101.29 | |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 1.86 | 3.57 | |
| Max Chl Dpth (ft) | 2.56 | Hydr. Depth (ft) | 0.49 | 1.28 | |
| Conv. Total (cfs) | 6208.8 | Conv. (cfs) | 455.0 | 5753.8 | |
| Length Wtd. (ft) | 194.93 | Wetted Per. (ft) | 39.93 | 101.53 | |
| Min Ch El (ft) | 1010.07 | Shear (lb/sq ft) | 0.20 | 0.52 | |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.37 | 1.85 | |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 10.18 | 16.63 | 8.84 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.59 | 13.86 | 12.34 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.86 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1012.63 | Reach Len. (ft) | 226.42 | 193.75 | 146.63 |
| Crit W.S. (ft) | 1012.26 | Flow Area (sq ft) | | 129.73 | |
| E.G. Slope (ft/ft) | 0.007594 | Area (sq ft) | | 129.73 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 101.29 | Top Width (ft) | | 101.29 | |
| Vel Total (ft/s) | 3.85 | Avg. Vel. (ft/s) | | 3.85 | |
| Max Chl Dpth (ft) | 2.56 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 5737.5 | Conv. (cfs) | | 5737.5 | |
| Length Wtd. (ft) | 193.75 | Wetted Per. (ft) | | 101.93 | |
| Min Ch El (ft) | 1010.07 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.33 | |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 0.24 | 24.47 | 0.47 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.12 | 14.01 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1012.85 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1012.61 | Reach Len. (ft) | 226.42 | 193.75 | 146.63 |
| Crit W.S. (ft) | 1012.25 | Flow Area (sq ft) | | 127.67 | |
| E.G. Slope (ft/ft) | 0.008001 | Area (sq ft) | | 127.67 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 101.18 | Top Width (ft) | | 101.18 | |
| Vel Total (ft/s) | 3.92 | Avg. Vel. (ft/s) | | 3.92 | |
| Max Chl Dpth (ft) | 2.54 | Hydr. Depth (ft) | | 1.26 | |
| Conv. Total (cfs) | 5589.7 | Conv. (cfs) | | 5589.7 | |
| Length Wtd. (ft) | 193.53 | Wetted Per. (ft) | | 101.81 | |
| Min Ch El (ft) | 1010.07 | Shear (lb/sq ft) | | 0.63 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.45 | |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | 6.11 | 21.72 | 0.98 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 6.07 | 13.96 | 1.27 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 3.036

INPUT
Description: 16028.94 - Thalweg Sta. 110.61
Station Elevation Data num= 120

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1023.64 | 3.75 | 1023.77 | 10.05 | 1023.96 | 20.26 | 1023.74 | 22.62 | 1023.67 |
| 30.16 | 1023.04 | 35.19 | 1022.63 | 36.76 | 1022.44 | 47.76 | 1021.09 | 53.27 | 1020.26 |
| 57.85 | 1018.75 | 60.33 | 1017.93 | 69.78 | 1014.5 | 72.9 | 1013.4 | 79.79 | 1010.87 |
| 82.87 | 1009.74 | 85.47 | 1008.77 | 86.28 | 1008.67 | 102.79 | 1009.25 | 110.61 | 1009.51 |
| 123.18 | 1009.44 | 135.57 | 1010.04 | 135.75 | 1010.05 | 135.8 | 1010.05 | 148.31 | 1011.01 |
| 152.3 | 1011.15 | 160.89 | 1011.34 | 160.91 | 1011.34 | 167.56 | 1011.44 | 168.81 | 1011.46 |
| 173.45 | 1011.55 | 185.32 | 1011.86 | 186.03 | 1011.88 | 186.26 | 1011.88 | 186.78 | 1011.89 |
| 196.35 | 1012.11 | 200.29 | 1012.17 | 206.63 | 1012.3 | 213.81 | 1012.37 | 216.91 | 1012.41 |
| 226.8 | 1012.45 | 237.48 | 1012.46 | 240.83 | 1012.45 | 247.76 | 1012.45 | 254.35 | 1012.43 |
| 258.04 | 1012.43 | 267.86 | 1012.38 | 268.32 | 1012.38 | 269.79 | 1012.37 | 278.6 | 1012.28 |
| 281.37 | 1012.23 | 288.89 | 1012.12 | 294.89 | 1011.96 | 299.17 | 1011.86 | 308.4 | 1011.55 |
| 309.45 | 1011.51 | 312.79 | 1011.4 | 313.84 | 1011.37 | 318.39 | 1011.22 | 319.73 | 1011.18 |
| 326.69 | 1011 | 330.01 | 1010.94 | 335.42 | 1010.66 | 340.3 | 1010.26 | 348.94 | 1010.35 |
| 350.58 | 1010.44 | 355.79 | 1010.93 | 359.88 | 1011.26 | 360.86 | 1011.41 | 368.18 | 1011.1 |
| 371.14 | 1011.02 | 375.96 | 1011.23 | 381.42 | 1011.49 | 389.49 | 1011.75 | 389.64 | 1011.75 |
| 391.7 | 1011.82 | 401.99 | 1011.76 | 412.27 | 1011.66 | 422.55 | 1011.58 | 430.03 | 1011.59 |
| 432.83 | 1011.58 | 441.78 | 1011.68 | 443.11 | 1011.69 | 443.54 | 1011.69 | 453.4 | 1011.79 |
| 457.05 | 1011.81 | 463.68 | 1011.86 | 470.56 | 1011.89 | 473.96 | 1011.91 | 484.08 | 1011.94 |
| 484.78 | 1011.94 | 494.53 | 1011.97 | 497.59 | 1012 | 504.81 | 1012.04 | 511.1 | 1012.1 |
| 515.09 | 1012.13 | 524.62 | 1012.22 | 525.37 | 1012.23 | 527.77 | 1012.25 | 535.65 | 1012.3 |
| 545.94 | 1012.31 | 570.77 | 1012.29 | 576.78 | 1012.3 | 578.67 | 1012.33 | 587.06 | 1012.41 |
| 592.18 | 1012.52 | 597.34 | 1012.61 | 605.7 | 1012.82 | 607.63 | 1012.86 | 617.91 | 1013.11 |
| 625.4 | 1013.34 | 628.19 | 1013.45 | 632.72 | 1013.72 | 638.47 | 1014.05 | 646.23 | 1015.24 |
| 648.75 | 1015.58 | 656.75 | 1017.27 | 659.04 | 1017.76 | 659.76 | 1017.9 | 664.92 | 1018.95 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .035 | 57.85 | .04 | 167.56 | .035 | 313.84 | .04 | 389.64 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 79.79 | 160.91 | 193.99 | 198.75 | 207.66 | .1 | .3 |

Right Levee Station= 237.48 Elevation= 1012.46

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.75 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.040 | 0.040 | 0.039 |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 1011.55 | Reach Len. (ft) | 193.99 | 198.75 | 207.66 |
| Crit W.S. (ft) | 1010.76 | Flow Area (sq ft) | 0.63 | 137.95 | 1.40 |
| E.G. Slope (ft/ft) | 0.004693 | Area (sq ft) | 0.63 | 137.95 | 1.40 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 0.75 | 498.31 | 0.94 |
| Top Width (ft) | 95.52 | Top Width (ft) | 1.85 | 81.12 | 12.55 |
| Vel Total (ft/s) | 3.57 | Avg. Vel. (ft/s) | 1.19 | 3.61 | 0.67 |
| Max Chl Dpth (ft) | 2.88 | Hydr. Depth (ft) | 0.34 | 1.70 | 0.11 |
| Conv. Total (cfs) | 7298.9 | Conv. (cfs) | 10.9 | 7274.2 | 13.8 |
| Length Wtd. (ft) | 199.88 | Wetted Per. (ft) | 1.97 | 81.57 | 12.55 |
| Min Ch El (ft) | 1008.67 | Shear (lb/sq ft) | 0.09 | 0.50 | 0.03 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.11 | 1.79 | 0.02 |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 10.13 | 16.04 | 8.84 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.49 | 13.46 | 12.32 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.98 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1011.83 | Reach Len. (ft) | 193.99 | 198.75 | 207.66 |
| Crit W.S. (ft) | 1010.76 | Flow Area (sq ft) | | 160.31 | |
| E.G. Slope (ft/ft) | 0.002931 | Area (sq ft) | | 160.31 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 81.12 | Top Width (ft) | | 81.12 | |
| Vel Total (ft/s) | 3.12 | Avg. Vel. (ft/s) | | 3.12 | |
| Max Chl Dpth (ft) | 3.16 | Hydr. Depth (ft) | | 1.98 | |
| Conv. Total (cfs) | 9235.1 | Conv. (cfs) | | 9235.1 | |
| Length Wtd. (ft) | 198.75 | Wetted Per. (ft) | | 83.01 | |
| Min Ch El (ft) | 1008.67 | Shear (lb/sq ft) | | 0.35 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.10 | |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 0.24 | 23.83 | 0.47 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.12 | 13.60 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.96 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.040 | 0.040 | 0.038 |
| W.S. Elev (ft) | 1011.81 | Reach Len. (ft) | 193.99 | 198.75 | 207.66 |
| Crit W.S. (ft) | 1010.76 | Flow Area (sq ft) | 1.20 | 158.93 | 5.92 |
| E.G. Slope (ft/ft) | 0.002866 | Area (sq ft) | 1.20 | 158.93 | 5.92 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 1.38 | 493.09 | 5.53 |
| Top Width (ft) | 106.13 | Top Width (ft) | 2.56 | 81.12 | 22.45 |
| Vel Total (ft/s) | 3.01 | Avg. Vel. (ft/s) | 1.15 | 3.10 | 0.93 |
| Max Chl Dpth (ft) | 3.14 | Hydr. Depth (ft) | 0.47 | 1.96 | 0.26 |
| Conv. Total (cfs) | 9338.9 | Conv. (cfs) | 25.8 | 9209.8 | 103.3 |
| Length Wtd. (ft) | 198.79 | Wetted Per. (ft) | 2.72 | 81.57 | 22.45 |
| Min Ch El (ft) | 1008.67 | Shear (lb/sq ft) | 0.08 | 0.35 | 0.05 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.09 | 1.08 | 0.04 |
| Frctn Loss (ft) | 0.84 | Cum Volume (acre-ft) | 6.10 | 21.08 | 0.97 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 6.06 | 13.55 | 1.23 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.998

INPUT
Description: 15830.19 - Thalweg Sta. 138.42

Station Elevation Data num= 104

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1017.05 | 6.51 | 1017.66 | 7.56 | 1017.77 | 8.91 | 1017.79 | 18.46 | 1017.73 |
| 25.81 | 1017.26 | 29.37 | 1017.07 | 33.98 | 1016.7 | 40.27 | 1016.14 | 45.12 | 1015.69 |
| 59.05 | 1014.43 | 62.09 | 1014.19 | 64.42 | 1014.13 | 72.99 | 1013.65 | 83.72 | 1013.94 |
| 83.9 | 1013.94 | 84.11 | 1013.95 | 94.8 | 1014.29 | 103.02 | 1014.3 | 105.71 | 1014.31 |
| 107.5 | 1014.25 | 109.19 | 1014.2 | 116.61 | 1013.72 | 122.33 | 1012.19 | 127.52 | 1011.17 |
| 127.73 | 1011.09 | 134.26 | 1008.74 | 138.42 | 1007.39 | 141.63 | 1007.51 | 149.33 | 1007.62 |
| 159.32 | 1008.82 | 160.23 | 1008.94 | 160.93 | 1008.98 | 171.14 | 1009.68 | 180.23 | 1009.8 |
| 182.04 | 1009.84 | 182.12 | 1009.84 | 184.39 | 1009.83 | 192.95 | 1009.78 | 203.86 | 1009.65 |
| 209.46 | 1009.64 | 214.76 | 1009.67 | 218.85 | 1009.75 | 225.67 | 1009.86 | 236.57 | 1010.07 |
| 238.15 | 1010.09 | 247.48 | 1010.25 | 257.46 | 1010.4 | 258.38 | 1010.41 | 259.59 | 1010.43 |
| 269.29 | 1010.45 | 276.76 | 1010.25 | 280.19 | 1010.2 | 284.66 | 1009.86 | 291.1 | 1009.24 |
| 296.06 | 1009.55 | 302 | 1009.48 | 304.79 | 1009.75 | 309.72 | 1010.24 | 312.91 | 1010.51 |
| 315.36 | 1010.61 | 323.81 | 1011 | 334.66 | 1011.22 | 334.79 | 1011.22 | 345.62 | 1011.33 |
| 349.94 | 1011.34 | 357.54 | 1011.34 | 367.43 | 1011.3 | 373.27 | 1011.21 | 378.34 | 1011.15 |
| 384.93 | 1010.95 | 387.94 | 1010.84 | 389.24 | 1010.79 | 392.57 | 1010.65 | 400.15 | 1010.31 |
| 410 | 1010.07 | 411.05 | 1010.06 | 411.87 | 1010.09 | 421.96 | 1010.58 | 431.18 | 1010.76 |
| 432.86 | 1010.8 | 443.77 | 1010.84 | 454.68 | 1010.86 | 465.58 | 1010.98 | 476.49 | 1011.09 |
| 485.2 | 1011.15 | 508.39 | 1011.3 | 509.2 | 1011.31 | 510.27 | 1011.32 | 531.02 | 1011.49 |
| 552.83 | 1011.64 | 563.73 | 1011.81 | 570.32 | 1011.99 | 574.64 | 1012.1 | 585.47 | 1012.44 |
| 585.54 | 1012.45 | 585.6 | 1012.45 | 596.45 | 1012.87 | 607.35 | 1013.49 | 610.55 | 1013.84 |
| 618.26 | 1014.76 | 623.51 | 1015.68 | 629.16 | 1016.69 | 632.35 | 1017.22 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 107.5 | .04 | 304.79 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 127.73 | 182.12 | 192.5 | 199.44 | 210.03 | .1 | .3 |

Right Levee Station= 349.94 Elevation= 1011.34

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1010.66 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 1010.44 | Reach Len. (ft) | 192.50 | 199.44 | 210.03 |
| Crit W.S. (ft) | 1010.16 | Flow Area (sq ft) | | 88.85 | 63.88 |
| E.G. Slope (ft/ft) | 0.006479 | Area (sq ft) | | 88.85 | 63.88 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 374.07 | 125.93 |
| Top Width (ft) | 174.51 | Top Width (ft) | | 52.57 | 121.94 |
| Vel Total (ft/s) | 3.27 | Avg. Vel. (ft/s) | | 4.21 | 1.97 |
| Max Chl Dpth (ft) | 3.04 | Hydr. Depth (ft) | | 1.69 | 0.52 |
| Conv. Total (cfs) | 6211.7 | Conv. (cfs) | | 4647.2 | 1564.5 |
| Length Wtd. (ft) | 201.68 | Wetted Per. (ft) | | 53.19 | 122.05 |
| Min Ch El (ft) | 1007.39 | Shear (lb/sq ft) | | 0.68 | 0.21 |
| Alpha | 1.33 | Stream Power (lb/ft s) | | 2.84 | 0.42 |
| Frctn Loss (ft) | 1.56 | Cum Volume (acre-ft) | 10.13 | 15.52 | 8.69 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 13.48 | 13.15 | 12.00 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.14 | Element | | | |
| Vel Head (ft) | 0.33 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1010.81 | Reach Len. (ft) | 192.50 | 199.44 | 210.03 |
| Crit W.S. (ft) | 1010.15 | Flow Area (sq ft) | | 108.72 | |
| E.G. Slope (ft/ft) | 0.006217 | Area (sq ft) | | 108.72 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 53.61 | Top Width (ft) | | 53.61 | |
| Vel Total (ft/s) | 4.60 | Avg. Vel. (ft/s) | | 4.60 | |
| Max Chl Dpth (ft) | 3.42 | Hydr. Depth (ft) | | 2.03 | |
| Conv. Total (cfs) | 6341.6 | Conv. (cfs) | | 6341.6 | |
| Length Wtd. (ft) | 199.44 | Wetted Per. (ft) | | 55.26 | |
| Min Ch El (ft) | 1007.39 | Shear (lb/sq ft) | | 0.76 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.51 | |
| Frctn Loss (ft) | 1.94 | Cum Volume (acre-ft) | 0.24 | 23.22 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 13.29 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1011.09 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.35 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1010.74 | Reach Len. (ft) | 192.50 | 199.44 | 210.03 |
| Crit W.S. (ft) | 1010.15 | Flow Area (sq ft) | | 104.96 | |
| E.G. Slope (ft/ft) | 0.006943 | Area (sq ft) | | 104.96 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 53.41 | Top Width (ft) | | 53.41 | |
| Vel Total (ft/s) | 4.76 | Avg. Vel. (ft/s) | | 4.76 | |
| Max Chl Dpth (ft) | 3.35 | Hydr. Depth (ft) | | 1.97 | |
| Conv. Total (cfs) | 6000.5 | Conv. (cfs) | | 6000.5 | |
| Length Wtd. (ft) | 199.39 | Wetted Per. (ft) | | 54.98 | |
| Min Ch El (ft) | 1007.39 | Shear (lb/sq ft) | | 0.83 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.94 | |
| Frctn Loss (ft) | 1.87 | Cum Volume (acre-ft) | 6.10 | 20.48 | 0.96 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.06 | 13.24 | 1.17 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.960

INPUT
Description: 15630.74 - Thalweg Sta. 347.16
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1016.51 | 13.13 | 1015.26 | 23.92 | 1014.28 | 25.34 | 1014.16 | 34.72 | 1013.41 |
| 35.37 | 1013.35 | 43.91 | 1012.81 | 45.39 | 1012.72 | 45.5 | 1012.72 | 55.42 | 1012.31 |
| 56.3 | 1012.3 | 65.44 | 1012.01 | 67.09 | 1011.91 | 75.47 | 1011.62 | 77.89 | 1011.56 |
| 85.49 | 1011.27 | 88.67 | 1011.16 | 95.52 | 1010.87 | 99.46 | 1010.74 | 105.54 | 1010.5 |
| 110.26 | 1010.38 | 115.57 | 1010.18 | 121.04 | 1010.08 | 125.6 | 1009.92 | 131.84 | 1009.83 |
| 135.62 | 1009.73 | 142.63 | 1009.63 | 153.43 | 1009.52 | 155.67 | 1009.51 | 165.7 | 1009.51 |
| 175 | 1009.7 | 175.72 | 1009.71 | 185.12 | 1010.27 | 185.75 | 1010.31 | 185.8 | 1010.32 |
| 195.77 | 1011 | 205.8 | 1011.25 | 207.38 | 1011.17 | 215.82 | 1010.81 | 218.17 | 1010.61 |
| 225.85 | 1010.06 | 228.97 | 1009.81 | 235.87 | 1009.42 | 239.75 | 1009.28 | 245.9 | 1009.1 |
| 255.92 | 1008.94 | 272.12 | 1008.74 | 275.97 | 1008.7 | 282.92 | 1008.61 | 285.98 | 1008.58 |
| 293.71 | 1008.43 | 295.69 | 1008.4 | 296.03 | 1008.4 | 306.18 | 1008.15 | 306.28 | 1008.15 |
| 316.48 | 1007.87 | 319.29 | 1007.77 | 326.71 | 1007.56 | 332.3 | 1007.34 | 336.94 | 1007.17 |
| 339.93 | 1007.07 | 347.16 | 1006.84 | 357.39 | 1006.93 | 358.34 | 1007.05 | 367.62 | 1007.97 |
| 373.62 | 1008.39 | 377.84 | 1008.62 | 382.05 | 1008.73 | 398.14 | 1008.94 | 398.3 | 1008.94 |
| 408.1 | 1009.01 | 408.34 | 1009.01 | 418.35 | 1009.04 | 428.37 | 1009.04 | 438.4 | 1008.98 |
| 440.75 | 1008.92 | 448.43 | 1008.67 | 451.56 | 1008.42 | 458.45 | 1007.48 | 462.35 | 1007.22 |
| 468.48 | 1007.36 | 473.16 | 1009.18 | 473.39 | 1009.26 | 478.5 | 1010.98 | 483.96 | 1013.59 |
| 485.53 | 1014.3 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 295.69 | .04 | 473.39 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 285.98 | 398.14 | 155.92 | 195.14 | 218.39 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.09 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.035 | 0.040 | 0.040 |
| W.S. Elev (ft) | 1008.89 | Reach Len. (ft) | 155.92 | 195.14 | 218.39 |
| Crit W.S. (ft) | 1008.55 | Flow Area (sq ft) | 4.10 | 109.26 | 27.12 |
| E.G. Slope (ft/ft) | 0.009434 | Area (sq ft) | 4.10 | 109.26 | 27.12 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 4.93 | 405.79 | 89.29 |
| Top Width (ft) | 165.05 | Top Width (ft) | 26.00 | 108.32 | 30.74 |
| Vel Total (ft/s) | 3.56 | Avg. Vel. (ft/s) | 1.20 | 3.71 | 3.29 |
| Max Chl Dpth (ft) | 2.05 | Hydr. Depth (ft) | 0.16 | 1.01 | 0.88 |
| Conv. Total (cfs) | 5147.9 | Conv. (cfs) | 50.8 | 4177.9 | 919.3 |

| | | | | | |
|---|---|---|---|---|---|
| Length Wtd. (ft) | 196.99 | Wetted Per. (ft) | 26.00 | 108.42 | 31.11 |
| Min Ch El (ft) | 1006.84 | Shear (lb/sq ft) | 0.09 | 0.59 | 0.51 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.11 | 2.20 | 1.69 |
| Frctn Loss (ft) | 1.71 | Cum Volume (acre-ft) | 10.12 | 15.07 | 8.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.42 | 12.78 | 11.63 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.19 | Element | | | |
| Vel Head (ft) | 0.39 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1008.80 | Reach Len. (ft) | 155.92 | 195.14 | 218.39 |
| Crit W.S. (ft) | 1008.69 | Flow Area (sq ft) | | 100.03 | |
| E.G. Slope (ft/ft) | 0.017394 | Area (sq ft) | | 100.03 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 101.58 | Top Width (ft) | | 101.58 | |
| Vel Total (ft/s) | 5.00 | Avg. Vel. (ft/s) | | 5.00 | |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | | 0.98 | |
| Conv. Total (cfs) | 3791.2 | Conv. (cfs) | | 3791.2 | |
| Length Wtd. (ft) | 195.14 | Wetted Per. (ft) | | 101.90 | |
| Min Ch El (ft) | 1006.84 | Shear (lb/sq ft) | | 1.07 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.33 | |
| Frctn Loss (ft) | 1.56 | Cum Volume (acre-ft) | 0.24 | 22.74 | 0.47 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 0.12 | 12.94 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1009.21 | Element | | | |
| Vel Head (ft) | 0.30 | Wt. n-Val. | 0.035 | 0.040 | |
| W.S. Elev (ft) | 1008.91 | Reach Len. (ft) | 155.92 | 195.14 | 218.39 |
| Crit W.S. (ft) | 1008.71 | Flow Area (sq ft) | 4.54 | 111.09 | |
| E.G. Slope (ft/ft) | 0.013430 | Area (sq ft) | 4.54 | 111.09 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 6.75 | 493.25 | |
| Top Width (ft) | 136.95 | Top Width (ft) | 27.35 | 109.60 | |
| Vel Total (ft/s) | 4.32 | Avg. Vel. (ft/s) | 1.49 | 4.44 | |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | 0.17 | 1.01 | |
| Conv. Total (cfs) | 4314.5 | Conv. (cfs) | 58.3 | 4256.2 | |
| Length Wtd. (ft) | 194.88 | Wetted Per. (ft) | 27.35 | 109.70 | |
| Min Ch El (ft) | 1006.84 | Shear (lb/sq ft) | 0.14 | 0.85 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.21 | 3.77 | |
| Frctn Loss (ft) | 1.71 | Cum Volume (acre-ft) | 6.09 | 19.98 | 0.96 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 6.00 | 12.87 | 1.17 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.923

INPUT
Description: 15435.60 - Thalweg Sta. 306.30
Station Elevation Data num= 128

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1015.43 | 5.44 | 1015.13 | 10.63 | 1014.99 | 13.15 | 1014.88 | 19.58 | 1014.91 |
| 20.87 | 1014.9 | 21.37 | 1014.9 | 28.58 | 1014.93 | 32.11 | 1015 | 36.29 | 1015.02 |
| 42.86 | 1015.13 | 44.01 | 1015.12 | 46.94 | 1015.07 | 51.72 | 1014.97 | 53.6 | 1014.88 |
| 59.43 | 1014.53 | 74.31 | 1013.55 | 74.87 | 1013.51 | 75.08 | 1013.5 | 82.58 | 1013.04 |
| 85.83 | 1012.85 | 90.3 | 1012.6 | 96.57 | 1012.27 | 98.01 | 1012.18 | 101.67 | 1012.01 |
| 105.72 | 1011.84 | 107.31 | 1011.79 | 113.44 | 1011.48 | 118.06 | 1011.23 | 128.8 | 1010.33 |
| 128.87 | 1010.32 | 129.04 | 1010.3 | 136.58 | 1009.61 | 139.54 | 1009.45 | 144.29 | 1009 |
| 150.29 | 1008.7 | 152.01 | 1008.57 | 156.4 | 1008.41 | 159.73 | 1008.26 | 161.03 | 1008.24 |
| 167.44 | 1008.03 | 171.77 | 1007.93 | 175.16 | 1007.83 | 182.51 | 1007.66 | 182.87 | 1007.65 |
| 183.76 | 1007.63 | 193.26 | 1007.38 | 204 | 1007.19 | 206.01 | 1007.17 | 211.13 | 1007.14 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 213.73 | 1007.13 | 214.74 | 1007.12 | 225.49 | 1007.06 | 229.15 | 1007.02 | 236.23 | 1006.99 |
| 236.87 | 1006.98 | 238.5 | 1006.98 | 244.59 | 1006.91 | 246.97 | 1006.91 | 250.21 | 1006.88 |
| 252.3 | 1006.86 | 257.72 | 1006.79 | 260.01 | 1006.73 | 265.86 | 1006.62 | 266.47 | 1006.61 |
| 267.73 | 1006.58 | 268.46 | 1006.57 | 275.44 | 1006.39 | 279.2 | 1006.34 | 283.16 | 1006.12 |
| 289.95 | 1005.8 | 290.87 | 1005.75 | 293.22 | 1005.5 | 300.69 | 1004.74 | 306.3 | 1004.64 |
| 311.43 | 1004.67 | 314.01 | 1004.82 | 321.73 | 1005.29 | 322.18 | 1005.32 | 329.44 | 1005.92 |
| 332.92 | 1006.23 | 337.16 | 1006.49 | 342.53 | 1006.74 | 343.66 | 1006.79 | 352.59 | 1006.95 |
| 354.41 | 1006.97 | 360.3 | 1007 | 360.36 | 1007 | 365.15 | 1006.99 | 375.32 | 1006.91 |
| 375.89 | 1006.91 | 383.44 | 1006.95 | 386.64 | 1006.95 | 391.16 | 1007.18 | 397.38 | 1007.43 |
| 398.87 | 1007.58 | 402.68 | 1007.9 | 406.59 | 1008.25 | 408.12 | 1008.36 | 414.3 | 1009.06 |
| 418.86 | 1009.55 | 422.02 | 1009.91 | 429.61 | 1010.69 | 429.73 | 1010.7 | 430.05 | 1010.73 |
| 437.45 | 1011.26 | 440.35 | 1011.39 | 445.16 | 1011.48 | 451.09 | 1011.42 | 452.87 | 1011.41 |
| 457.41 | 1011.41 | 460.59 | 1011.4 | 461.84 | 1011.42 | 468.3 | 1011.85 | 472.58 | 1012.22 |
| 476.02 | 1012.45 | 483.32 | 1013.1 | 483.73 | 1013.11 | 484.78 | 1013.14 | 494.06 | 1013.48 |
| 499.16 | 1013.44 | 504.81 | 1013.5 | 506.87 | 1013.37 | 512.14 | 1013.28 | 514.59 | 1013.22 |
| 515.55 | 1013.22 | 522.31 | 1012.5 | 524.54 | 1012.22 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 266.47 | .04 | 342.53 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 250.21 | 360.36 | 206.33 | 199.88 | 191.65 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1007.39 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | 0.035 | 0.040 | 0.035 |
| W.S. Elev (ft) | 1007.14 | Reach Len. (ft) | 206.33 | 199.88 | 191.65 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 4.80 | 120.94 | 5.33 |
| E.G. Slope (ft/ft) | 0.007983 | Area (sq ft) | 4.80 | 120.94 | 5.33 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 4.50 | 489.13 | 6.38 |
| Top Width (ft) | 179.37 | Top Width (ft) | 39.19 | 110.15 | 30.03 |
| Vel Total (ft/s) | 3.81 | Avg. Vel. (ft/s) | 0.94 | 4.04 | 1.20 |
| Max Chl Dpth (ft) | 2.50 | Hydr. Depth (ft) | 0.12 | 1.10 | 0.18 |
| Conv. Total (cfs) | 5596.3 | Conv. (cfs) | 50.3 | 5474.5 | 71.4 |
| Length Wtd. (ft) | 198.22 | Wetted Per. (ft) | 39.20 | 110.30 | 30.03 |
| Min Ch El (ft) | 1004.64 | Shear (lb/sq ft) | 0.06 | 0.55 | 0.09 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.06 | 2.21 | 0.11 |
| Frctn Loss (ft) | 1.47 | Cum Volume (acre-ft) | 10.10 | 14.55 | 8.39 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 13.31 | 12.29 | 11.47 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1007.57 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1007.39 | Reach Len. (ft) | 206.33 | 199.88 | 191.65 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 148.48 | |
| E.G. Slope (ft/ft) | 0.004567 | Area (sq ft) | | 148.48 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 110.15 | Top Width (ft) | | 110.15 | |
| Vel Total (ft/s) | 3.37 | Avg. Vel. (ft/s) | | 3.37 | |
| Max Chl Dpth (ft) | 2.75 | Hydr. Depth (ft) | | 1.35 | |
| Conv. Total (cfs) | 7398.4 | Conv. (cfs) | | 7398.4 | |
| Length Wtd. (ft) | 199.88 | Wetted Per. (ft) | | 111.20 | |
| Min Ch El (ft) | 1004.64 | Shear (lb/sq ft) | | 0.38 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.28 | |
| Frctn Loss (ft) | 0.98 | Cum Volume (acre-ft) | 0.24 | 22.18 | 0.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 12.46 | 0.30 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1007.48 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1007.26 | Reach Len. (ft) | 206.33 | 199.88 | 191.65 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 134.35 | |
| E.G. Slope (ft/ft) | 0.006154 | Area (sq ft) | | 134.35 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 110.15 | Top Width (ft) | | 110.15 | |
| Vel Total (ft/s) | 3.72 | Avg. Vel. (ft/s) | | 3.72 | |
| Max Chl Dpth (ft) | 2.62 | Hydr. Depth (ft) | | 1.22 | |
| Conv. Total (cfs) | 6373.5 | Conv. (cfs) | | 6373.5 | |
| Length Wtd. (ft) | 198.63 | Wetted Per. (ft) | | 110.94 | |
| Min Ch El (ft) | 1004.64 | Shear (lb/sq ft) | | 0.47 | |

| | | | | | |
|---|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.73 | |
| Frctn Loss (ft) | 1.37 | Cum Volume (acre-ft) | 6.08 | 19.44 | 0.96 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.95 | 12.38 | 1.17 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.886

INPUT
Description: 15235.72 - Thalweg Sta. 319.09
Station Elevation Data num= 136

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1027.88 | 1.54 | 1027.91 | 3.52 | 1027.97 | 9.9 | 1028 | 13.77 | 1028.05 |
| 18.25 | 1027.98 | 24.03 | 1027.94 | 26.61 | 1027.88 | 34.97 | 1027.63 | 37.99 | 1027.47 |
| 43.32 | 1027.2 | 44.54 | 1027.11 | 51.68 | 1026.63 | 54.79 | 1026.23 | 60.04 | 1025.35 |
| 65.04 | 1023.91 | 68.4 | 1023.06 | 75.3 | 1020.83 | 76.75 | 1020.38 | 83.13 | 1018.29 |
| 85.1 | 1017.66 | 85.55 | 1017.51 | 93.46 | 1015.1 | 95.81 | 1014.33 | 101.82 | 1012.74 |
| 106.06 | 1011.7 | 110.18 | 1010.74 | 116.32 | 1009.57 | 118.53 | 1009.11 | 126.57 | 1008.05 |
| 126.89 | 1008 | 128.29 | 1007.85 | 135.25 | 1007.07 | 136.83 | 1006.93 | 143.61 | 1006.17 |
| 147.08 | 1005.9 | 151.96 | 1005.54 | 157.34 | 1005.45 | 160.32 | 1005.46 | 167.59 | 1005.6 |
| 177.03 | 1005.73 | 177.85 | 1005.74 | 188.1 | 1005.77 | 198.36 | 1005.75 | 218.86 | 1005.73 |
| 227.17 | 1005.71 | 229.12 | 1005.7 | 235.53 | 1005.64 | 249.63 | 1005.45 | 259.88 | 1005.33 |
| 268.96 | 1005.33 | 270.14 | 1005.34 | 274.32 | 1005.36 | 277.31 | 1005.38 | 280.23 | 1005.41 |
| 280.39 | 1005.41 | 285.67 | 1005.35 | 290.65 | 1005.28 | 294.02 | 1005.15 | 300.9 | 1004.77 |
| 302.38 | 1004.62 | 308.89 | 1004.11 | 310.74 | 1003.96 | 311.16 | 1003.93 | 319.09 | 1003.88 |
| 321.41 | 1003.91 | 327.45 | 1004.26 | 335.81 | 1004.79 | 341.92 | 1005.09 | 344.17 | 1005.15 |
| 352.18 | 1005.3 | 352.52 | 1005.3 | 362.43 | 1005.37 | 368.96 | 1005.39 | 372.69 | 1005.39 |
| 382.94 | 1005.34 | 393.19 | 1005.11 | 394.3 | 1005.09 | 395.58 | 1005.08 | 399.19 | 1005.06 |
| 402.66 | 1005.03 | 403.45 | 1005.03 | 411.02 | 1005.13 | 423.96 | 1005.33 | 434.21 | 1005.46 |
| 444.34 | 1005.51 | 464.98 | 1005.51 | 469.52 | 1005.5 | 486.23 | 1005.49 | 494.58 | 1005.44 |
| 495.74 | 1005.43 | 502.94 | 1005.38 | 506 | 1005.35 | 511.3 | 1005.32 | 516.25 | 1005.28 |
| 519.66 | 1005.27 | 526.51 | 1005.22 | 528.01 | 1005.22 | 534.65 | 1005.2 | 536.76 | 1005.2 |
| 544.73 | 1005.24 | 567.52 | 1005.43 | 577.78 | 1005.48 | 579.8 | 1005.48 | 586.51 | 1005.45 |
| 588.03 | 1005.45 | 598.29 | 1005.22 | 608.54 | 1005.13 | 618.8 | 1005.33 | 619.94 | 1005.36 |
| 624.95 | 1005.52 | 628.29 | 1005.62 | 629.05 | 1005.64 | 639.31 | 1005.95 | 645.01 | 1006.1 |
| 649.56 | 1006.19 | 653.37 | 1006.29 | 659.82 | 1006.36 | 661.72 | 1006.46 | 670.07 | 1006.56 |
| 678.43 | 1006.91 | 680.33 | 1006.92 | 686.79 | 1007.39 | 690.58 | 1007.43 | 695.15 | 1007.72 |
| 700.84 | 1007.91 | 703.5 | 1007.98 | 711.09 | 1008.11 | 711.86 | 1008.11 | 715.25 | 1008.13 |
| 720.22 | 1008.22 | 721.35 | 1008.25 | 728.58 | 1008.54 | 731.6 | 1008.78 | 736.93 | 1009.15 |
| 739.4 | 1009.42 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 274.32 | .04 | 395.58 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 280.23 | 368.96 | 212.53 | 199.33 | 178.18 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.87 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.036 | 0.040 | 0.036 |
| W.S. Elev (ft) | 1005.77 | Reach Len. (ft) | 212.53 | 199.33 | 178.18 |
| Crit W.S. (ft) | 1005.65 | Flow Area (sq ft) | 23.72 | 84.52 | 111.92 |
| E.G. Slope (ft/ft) | 0.006940 | Area (sq ft) | 23.72 | 84.52 | 111.92 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 27.11 | 253.04 | 219.85 |
| Top Width (ft) | 484.69 | Top Width (ft) | 131.44 | 88.73 | 264.52 |
| Vel Total (ft/s) | 2.27 | Avg. Vel. (ft/s) | 1.14 | 2.99 | 1.96 |
| Max Chl Dpth (ft) | 1.89 | Hydr. Depth (ft) | 0.18 | 0.95 | 0.42 |
| Conv. Total (cfs) | 6002.1 | Conv. (cfs) | 325.4 | 3037.6 | 2639.1 |
| Length Wtd. (ft) | 193.24 | Wetted Per. (ft) | 131.45 | 88.82 | 264.54 |
| Min Ch El (ft) | 1003.88 | Shear (lb/sq ft) | 0.08 | 0.41 | 0.18 |
| Alpha | 1.22 | Stream Power (lb/ft s) | 0.09 | 1.23 | 0.36 |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 10.03 | 14.08 | 8.13 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 12.90 | 11.84 | 10.83 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.59 | Element | | | |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1006.39 | Reach Len. (ft) | 212.53 | 199.33 | 178.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 139.12 | |
| E.G. Slope (ft/ft) | 0.005298 | Area (sq ft) | | 139.12 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 88.73 | Top Width (ft) | | 88.73 | |
| Vel Total (ft/s) | 3.59 | Avg. Vel. (ft/s) | | 3.59 | |
| Max Chl Dpth (ft) | 2.51 | Hydr. Depth (ft) | | 1.57 | |
| Conv. Total (cfs) | 6869.2 | Conv. (cfs) | | 6869.2 | |
| Length Wtd. (ft) | 199.33 | Wetted Per. (ft) | | 90.79 | |
| Min Ch El (ft) | 1003.88 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.82 | |
| Frctn Loss (ft) | 1.33 | Cum Volume (acre-ft) | 0.24 | 21.52 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 12.01 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1006.10 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.040 | 0.036 |
| W.S. Elev (ft) | 1005.94 | Reach Len. (ft) | 212.53 | 199.33 | 178.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 99.07 | 58.82 |
| E.G. Slope (ft/ft) | 0.007774 | Area (sq ft) | | 99.07 | 58.82 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 347.59 | 152.41 |
| Top Width (ft) | 184.75 | Top Width (ft) | | 88.73 | 96.02 |
| Vel Total (ft/s) | 3.17 | Avg. Vel. (ft/s) | | 3.51 | 2.59 |
| Max Chl Dpth (ft) | 2.06 | Hydr. Depth (ft) | | 1.12 | 0.61 |
| Conv. Total (cfs) | 5671.0 | Conv. (cfs) | | 3942.4 | 1728.6 |
| Length Wtd. (ft) | 191.68 | Wetted Per. (ft) | | 89.34 | 96.45 |
| Min Ch El (ft) | 1003.88 | Shear (lb/sq ft) | | 0.54 | 0.30 |
| Alpha | 1.06 | Stream Power (lb/ft s) | | 1.89 | 0.77 |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 6.08 | 18.90 | 0.83 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.95 | 11.92 | 0.96 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.848

INPUT
Description: 15036.38 - Thalweg Sta. 439.97
Station Elevation Data num= 153

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1027.72 | 2.36 | 1027.81 | 4.27 | 1027.89 | 14 | 1027.97 | 14.4 | 1027.98 |
| 14.48 | 1027.97 | 24.53 | 1027.66 | 26.59 | 1027.57 | 38.7 | 1027.06 | 44.8 | 1026.83 |
| 50.8 | 1026.63 | 54.93 | 1026.53 | 62.92 | 1026.38 | 65.06 | 1026.35 | 76.03 | 1026.36 |
| 85.33 | 1026.27 | 87.14 | 1026.18 | 95.46 | 1025.79 | 99.26 | 1025.25 | 105.59 | 1024.56 |
| 111.37 | 1023.3 | 123.48 | 1021.38 | 125.86 | 1021.09 | 135.58 | 1020.63 | 135.99 | 1020.6 |
| 136.27 | 1020.48 | 138.05 | 1019.91 | 146.12 | 1017.24 | 147.7 | 1016.75 | 156.26 | 1013.68 |
| 159.81 | 1012.48 | 166.39 | 1010.12 | 171.92 | 1008.38 | 176.52 | 1006.84 | 184.03 | 1005.13 |
| 186.65 | 1004.38 | 196.15 | 1003.98 | 196.79 | 1003.95 | 200.07 | 1003.96 | 206.92 | 1004 |
| 208.26 | 1004.01 | 227.18 | 1004.18 | 232.48 | 1004.2 | 237.32 | 1004.23 | 244.59 | 1004.21 |
| 247.45 | 1004.22 | 256.7 | 1004.15 | 257.58 | 1004.15 | 267.71 | 1004.06 | 268.81 | 1004.06 |
| 277.85 | 1003.99 | 280.93 | 1003.99 | 287.98 | 1003.97 | 298.11 | 1004.01 | 308.24 | 1004.08 |
| 317.25 | 1004.17 | 324.11 | 1004.23 | 328.51 | 1004.26 | 329.37 | 1004.25 | 338.64 | 1004.25 |
| 358.91 | 1004.2 | 369.04 | 1004.21 | 377.81 | 1004.25 | 379.17 | 1004.26 | 380.31 | 1004.26 |
| 386.13 | 1004.29 | 389.3 | 1004.3 | 397.57 | 1004.34 | 399.44 | 1004.36 | 402.03 | 1004.37 |
| 409.23 | 1004.38 | 409.57 | 1004.38 | 419.7 | 1004.33 | 429.84 | 1004.18 | 438.37 | 1003.9 |
| 439.97 | 1003.86 | 448.15 | 1003.05 | 450.1 | 1002.85 | 450.47 | 1002.86 | 460.23 | 1002.84 |
| 462.59 | 1002.94 | 470.36 | 1003.23 | 474.7 | 1003.4 | 480.5 | 1003.68 | 486.81 | 1003.78 |
| 490.63 | 1003.87 | 498.92 | 1003.88 | 500.37 | 1003.88 | 500.76 | 1003.88 | 510.19 | 1003.82 |
| 511.04 | 1003.82 | 521.03 | 1003.65 | 523.15 | 1003.62 | 531.16 | 1003.52 | 535.25 | 1003.53 |
| 541.29 | 1003.53 | 547.37 | 1003.62 | 551.43 | 1003.67 | 559.48 | 1003.79 | 561.56 | 1003.83 |
| 571.59 | 1004.21 | 571.69 | 1004.21 | 572.21 | 1004.23 | 581.82 | 1004.48 | 583.7 | 1004.51 |
| 586.24 | 1004.54 | 591.96 | 1004.61 | 602.09 | 1004.71 | 607.93 | 1004.74 | 612.22 | 1004.75 |
| 620.03 | 1004.67 | 622.35 | 1004.65 | 632.14 | 1004.49 | 632.49 | 1004.48 | 634.23 | 1004.45 |
| 642.62 | 1004.32 | 644.26 | 1004.3 | 652.75 | 1004.18 | 662.88 | 1004.1 | 673.02 | 1004.12 |
| 680.6 | 1004.18 | 683.15 | 1004.19 | 692.7 | 1004.27 | 693.28 | 1004.27 | 696.25 | 1004.3 |
| 703.42 | 1004.34 | 704.81 | 1004.34 | 713.55 | 1004.36 | 716.92 | 1004.32 | 723.68 | 1004.27 |
| 733.81 | 1004.33 | 741.15 | 1004.48 | 753.26 | 1004.7 | 754.08 | 1004.72 | 758.27 | 1004.78 |
| 765.36 | 1004.9 | 774.34 | 1005.02 | 777.48 | 1005.07 | 784.47 | 1005.15 | 813.82 | 1005.56 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 814.87 | 1005.58 | 825.01 | 1005.73 | 825.93 | 1005.75 | 835.14 | 1005.9 | 838.04 | 1005.97 |
| 845.27 | 1006.12 | 850.14 | 1006.35 | 855.4 | 1006.54 | 862.26 | 1007.3 | 865.53 | 1007.62 |
| 874.37 | 1008.98 | 875.67 | 1009.17 | 876.3 | 1009.26 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 380.31 | .04 | 586.24 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 409.23 | 500.37 | 208.34 | 199.67 | 179.49 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.58 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.035 | 0.040 | 0.039 |
| W.S. Elev (ft) | 1004.51 | Reach Len. (ft) | 208.34 | 199.67 | 179.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 77.27 | 76.91 | 83.77 |
| E.G. Slope (ft/ft) | 0.006326 | Area (sq ft) | 77.27 | 76.91 | 83.77 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 130.61 | 202.81 | 166.58 |
| Top Width (ft) | 508.96 | Top Width (ft) | 223.03 | 91.14 | 194.79 |
| Vel Total (ft/s) | 2.10 | Avg. Vel. (ft/s) | 1.69 | 2.64 | 1.99 |
| Max Chl Dpth (ft) | 1.67 | Hydr. Depth (ft) | 0.35 | 0.84 | 0.43 |
| Conv. Total (cfs) | 6286.5 | Conv. (cfs) | 1642.1 | 2549.9 | 2094.4 |
| Length Wtd. (ft) | 197.03 | Wetted Per. (ft) | 223.06 | 91.22 | 194.81 |
| Min Ch El (ft) | 1002.84 | Shear (lb/sq ft) | 0.14 | 0.33 | 0.17 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 0.23 | 0.88 | 0.34 |
| Frctn Loss (ft) | 1.48 | Cum Volume (acre-ft) | 9.79 | 13.71 | 7.73 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 12.04 | 11.43 | 9.89 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1005.26 | Element | | | |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1005.00 | Reach Len. (ft) | 208.34 | 199.67 | 179.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 121.36 | |
| E.G. Slope (ft/ft) | 0.008620 | Area (sq ft) | | 121.36 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 91.14 | Top Width (ft) | | 91.14 | |
| Vel Total (ft/s) | 4.12 | Avg. Vel. (ft/s) | | 4.12 | |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 1.33 | |
| Conv. Total (cfs) | 5385.4 | Conv. (cfs) | | 5385.4 | |
| Length Wtd. (ft) | 199.67 | Wetted Per. (ft) | | 92.95 | |
| Min Ch El (ft) | 1002.84 | Shear (lb/sq ft) | | 0.70 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.89 | |
| Frctn Loss (ft) | 1.47 | Cum Volume (acre-ft) | 0.24 | 20.92 | 0.47 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.12 | 11.59 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1004.90 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 1004.79 | Reach Len. (ft) | 208.34 | 199.67 | 179.49 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 102.51 | 84.45 |
| E.G. Slope (ft/ft) | 0.005012 | Area (sq ft) | | 102.51 | 84.45 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 290.54 | 209.46 |
| Top Width (ft) | 198.70 | Top Width (ft) | | 91.14 | 107.56 |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | | 2.83 | 2.48 |
| Max Chl Dpth (ft) | 1.95 | Hydr. Depth (ft) | | 1.12 | 0.79 |
| Conv. Total (cfs) | 7062.8 | Conv. (cfs) | | 4104.0 | 2958.8 |
| Length Wtd. (ft) | 195.44 | Wetted Per. (ft) | | 91.62 | 107.63 |
| Min Ch El (ft) | 1002.84 | Shear (lb/sq ft) | | 0.35 | 0.25 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 0.99 | 0.61 |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 6.08 | 18.44 | 0.54 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.95 | 11.51 | 0.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.810

INPUT
Description: 14836.72 - Thalweg Sta. 243.61
Station Elevation Data num= 107

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1015.66 | 5.41 | 1015.93 | 15.56 | 1016.49 | 16.75 | 1016.56 | 17.78 | 1016.61 |
| 28.1 | 1016.3 | 38.97 | 1014.46 | 39.44 | 1014.33 | 39.97 | 1014.18 | 50.78 | 1011.26 |
| 60.16 | 1008.76 | 62.12 | 1008.26 | 64.39 | 1007.74 | 73.47 | 1005.64 | 81.34 | 1004.07 |
| 84.81 | 1003.7 | 88.8 | 1003.39 | 96.15 | 1002.6 | 102.53 | 1002.4 | 107.49 | 1002.4 |
| 113.22 | 1002.45 | 118.84 | 1002.48 | 137.63 | 1002.35 | 141.53 | 1002.31 | 144.9 | 1002.32 |
| 152.87 | 1002.37 | 162.04 | 1002.45 | 164.21 | 1002.46 | 166.08 | 1002.46 | 175.55 | 1002.4 |
| 185.36 | 1002.25 | 186.47 | 1002.23 | 186.9 | 1002.22 | 187.27 | 1002.22 | 198.24 | 1002.3 |
| 208.46 | 1002.64 | 209.58 | 1002.67 | 210.88 | 1002.66 | 220.73 | 1002.71 | 220.92 | 1002.71 |
| 229.65 | 1002.24 | 232.27 | 1002.05 | 235.29 | 1002.13 | 243.61 | 1001.91 | 250.84 | 1002 |
| 254.96 | 1001.92 | 259.71 | 1002.1 | 266.3 | 1002.3 | 277.64 | 1002.43 | 284.12 | 1002.35 |
| 288.99 | 1002.28 | 300.33 | 1002.26 | 308.54 | 1002.38 | 311.67 | 1002.44 | 314.39 | 1002.5 |
| 323.01 | 1002.67 | 332.95 | 1002.79 | 334.05 | 1002.81 | 335.58 | 1002.81 | 345.7 | 1002.72 |
| 356.76 | 1002.28 | 357.04 | 1002.27 | 357.36 | 1002.26 | 368.39 | 1001.89 | 377.95 | 1002.02 |
| 379.73 | 1002.08 | 381.78 | 1002.19 | 391.07 | 1002.74 | 395.62 | 1002.85 | 399.14 | 1002.94 |
| 402.42 | 1003 | 413.76 | 1002.95 | 420.33 | 1002.89 | 425.1 | 1002.82 | 430.6 | 1002.76 |
| 436.44 | 1002.71 | 447.79 | 1002.9 | 459.13 | 1003.2 | 462.69 | 1003.27 | 470.47 | 1003.41 |
| 481.82 | 1003.59 | 483.88 | 1003.63 | 489.93 | 1003.71 | 493.16 | 1003.77 | 497.31 | 1003.82 |
| 504.5 | 1003.92 | 505.07 | 1003.92 | 515.85 | 1004.01 | 549.88 | 1004 | 561.22 | 1004.04 |
| 568.63 | 1004.11 | 572.56 | 1004.16 | 583.9 | 1004.42 | 593.35 | 1004.71 | 595.24 | 1004.75 |
| 601.51 | 1004.95 | 606.59 | 1005.13 | 611 | 1005.35 | 617.93 | 1005.66 | 625.92 | 1006.23 |
| 629.28 | 1006.5 | 632.19 | 1006.79 | 640.62 | 1007.72 | 650.34 | 1008.88 | 651.96 | 1009.07 |
| 653.37 | 1009.2 | 654.99 | 1009.37 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 185.36 | .04 | 395.62 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 220.73 | 334.05 | | 187.08 | 198.58 | 226.9 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.10 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.036 | 0.040 | 0.040 |
| W.S. Elev (ft) | 1002.99 | Reach Len. (ft) | 187.08 | 198.58 | 226.90 |
| Crit W.S. (ft) | 1002.81 | Flow Area (sq ft) | 71.54 | 76.52 | 44.05 |
| E.G. Slope (ft/ft) | 0.009052 | Area (sq ft) | 71.54 | 76.52 | 44.05 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 189.87 | 208.10 | 102.02 |
| Top Width (ft) | 355.67 | Top Width (ft) | 128.20 | 113.32 | 114.15 |
| Vel Total (ft/s) | 2.60 | Avg. Vel. (ft/s) | 2.65 | 2.72 | 2.32 |
| Max Chl Dpth (ft) | 1.10 | Hydr. Depth (ft) | 0.56 | 0.68 | 0.39 |
| Conv. Total (cfs) | 5255.4 | Conv. (cfs) | 1995.7 | 2187.3 | 1072.3 |
| Length Wtd. (ft) | 209.09 | Wetted Per. (ft) | 128.24 | 113.36 | 114.19 |
| Min Ch El (ft) | 1001.91 | Shear (lb/sq ft) | 0.32 | 0.38 | 0.22 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.84 | 1.04 | 0.50 |
| Frctn Loss (ft) | 1.56 | Cum Volume (acre-ft) | 9.43 | 13.36 | 7.46 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 11.20 | 10.96 | 9.25 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.78 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1003.59 | Reach Len. (ft) | 187.08 | 198.58 | 226.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 144.94 | |
| E.G. Slope (ft/ft) | 0.006337 | Area (sq ft) | | 144.94 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 113.32 | Top Width (ft) | | 113.32 | |
| Vel Total (ft/s) | 3.45 | Avg. Vel. (ft/s) | | 3.45 | |
| Max Chl Dpth (ft) | 1.70 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 6281.2 | Conv. (cfs) | | 6281.2 | |
| Length Wtd. (ft) | 198.58 | Wetted Per. (ft) | | 115.02 | |
| Min Ch El (ft) | 1001.91 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.72 | |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | 0.24 | 20.31 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 11.13 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1003.77 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1003.57 | Reach Len. (ft) | 187.08 | 198.58 | 226.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 142.79 | |
| E.G. Slope (ft/ft) | 0.006658 | Area (sq ft) | | 142.79 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 113.32 | Top Width (ft) | | 113.32 | |
| Vel Total (ft/s) | 3.50 | Avg. Vel. (ft/s) | | 3.50 | |
| Max Chl Dpth (ft) | 1.66 | Hydr. Depth (ft) | | 1.26 | |
| Conv. Total (cfs) | 6127.9 | Conv. (cfs) | | 6127.9 | |
| Length Wtd. (ft) | 198.46 | Wetted Per. (ft) | | 114.99 | |
| Min Ch El (ft) | 1001.91 | Shear (lb/sq ft) | | 0.52 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.81 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 6.08 | 17.88 | 0.36 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.95 | 11.04 | 0.33 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.772

INPUT
Description: 14638.14 - Thalweg Sta. 187.03
Station Elevation Data num= 110

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1013.26 | 4.83 | 1013.66 | 6.28 | 1013.87 | 15.89 | 1014.43 | 16.32 | 1014.46 |
| 20.63 | 1014.5 | 26.36 | 1014.53 | 26.93 | 1014.51 | 36.4 | 1014.23 | 37.99 | 1014.14 |
| 46.44 | 1013.7 | 49.03 | 1013.55 | 56.48 | 1013 | 60.09 | 1012.77 | 66.53 | 1012.27 |
| 71.13 | 1011.85 | 76.57 | 1011.34 | 82.19 | 1010.47 | 93.24 | 1008.18 | 96.65 | 1007.41 |
| 104.29 | 1006 | 106.69 | 1005.53 | 115.34 | 1004.25 | 116.73 | 1004.08 | 126.39 | 1003.21 |
| 126.78 | 1003.19 | 136.82 | 1002.82 | 137.44 | 1002.8 | 137.53 | 1002.8 | 146.86 | 1002.52 |
| 148.5 | 1002.45 | 156.9 | 1002.12 | 156.95 | 1002.12 | 159.54 | 1001.97 | 166.94 | 1001.6 |
| 170.6 | 1001.31 | 176.98 | 1000.87 | 181.64 | 1000.43 | 187.03 | 999.87 | 192.69 | 1000.09 |
| 197.07 | 1000.22 | 203.74 | 1000.45 | 207.11 | 1000.56 | 214.79 | 1000.58 | 217.15 | 1000.6 |
| 225.85 | 1000.77 | 227.19 | 1000.81 | 228.32 | 1000.83 | 237.23 | 1001.05 | 237.51 | 1001.05 |
| 240.6 | 1001.06 | 247.02 | 1001.07 | 247.95 | 1001.07 | 257.32 | 1000.98 | 258.99 | 1000.95 |
| 267.36 | 1000.94 | 270.05 | 1000.83 | 277.4 | 1000.61 | 281.09 | 1000.47 | 287.44 | 1000.16 |
| 292.15 | 1000.07 | 297.48 | 999.8 | 303.2 | 1000.13 | 307.52 | 1000.18 | 314.25 | 1000.34 |
| 317.57 | 1000.48 | 325.3 | 1000.39 | 327.61 | 1000.39 | 336.35 | 1000.07 | 337.65 | 1000.03 |
| 347.4 | 1000.3 | 347.69 | 1000.31 | 350.57 | 1000.38 | 351.65 | 1000.4 | 357.73 | 1000.53 |
| 358.46 | 1000.54 | 367.77 | 1000.81 | 369.5 | 1000.87 | 380.56 | 1001.2 | 387.86 | 1001.35 |
| 391.6 | 1001.45 | 397.9 | 1001.58 | 402.66 | 1001.71 | 407.94 | 1001.83 | 413.7 | 1001.98 |
| 417.98 | 1002.08 | 428.02 | 1002.33 | 435.81 | 1002.55 | 438.06 | 1002.61 | 446.85 | 1002.97 |
| 448.11 | 1003.02 | 457.91 | 1003.9 | 458.15 | 1003.92 | 460.56 | 1004.26 | 468.19 | 1005.35 |
| 468.95 | 1005.46 | 478.23 | 1006.9 | 480.01 | 1007.02 | 488.27 | 1007.92 | 491.05 | 1007.85 |
| 498.31 | 1008.06 | 502.11 | 1007.88 | 508.36 | 1007.74 | 513.16 | 1007.76 | 518.4 | 1007.84 |
| 524.21 | 1008.43 | 528.44 | 1008.61 | 535.26 | 1009.34 | 538.48 | 1009.76 | 539.33 | 1009.82 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 137.53 | .04 | 351.65 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 170.6 | 247.02 | 210.06 | 199.66 | 175.66 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1001.54 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.040 | 0.040 | 0.039 |
| W.S. Elev (ft) | 1001.42 | Reach Len. (ft) | 210.06 | 199.66 | 175.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.08 | 60.98 | 123.82 |
| E.G. Slope (ft/ft) | 0.006241 | Area (sq ft) | 0.08 | 60.98 | 123.82 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 0.03 | 153.86 | 346.10 |
| Top Width (ft) | 221.42 | Top Width (ft) | 1.43 | 76.42 | 143.58 |
| Vel Total (ft/s) | 2.70 | Avg. Vel. (ft/s) | 0.43 | 2.52 | 2.80 |
| Max Chl Dpth (ft) | 1.62 | Hydr. Depth (ft) | 0.06 | 0.80 | 0.86 |
| Conv. Total (cfs) | 6328.9 | Conv. (cfs) | 0.4 | 1947.6 | 4380.9 |

| | | | | | |
|---|---|---|---|---|---|
| Length Wtd. (ft) | 185.73 | Wetted Per. (ft) | 1.43 | 76.50 | 143.64 |
| Min Ch El (ft) | 999.87 | Shear (lb/sq ft) | 0.02 | 0.31 | 0.34 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.01 | 0.78 | 0.94 |
| Frctn Loss (ft) | 1.22 | Cum Volume (acre-ft) | 9.28 | 13.05 | 7.03 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 10.92 | 10.52 | 8.58 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.50 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1002.24 | Reach Len. (ft) | 210.06 | 199.66 | 175.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 123.46 | |
| E.G. Slope (ft/ft) | 0.006510 | Area (sq ft) | | 123.46 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 76.42 | Top Width (ft) | | 76.42 | |
| Vel Total (ft/s) | 4.05 | Avg. Vel. (ft/s) | | 4.05 | |
| Max Chl Dpth (ft) | 2.44 | Hydr. Depth (ft) | | 1.62 | |
| Conv. Total (cfs) | 6196.7 | Conv. (cfs) | | 6196.7 | |
| Length Wtd. (ft) | 199.66 | Wetted Per. (ft) | | 78.60 | |
| Min Ch El (ft) | 999.87 | Shear (lb/sq ft) | | 0.64 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.59 | |
| Frctn Loss (ft) | 1.71 | Cum Volume (acre-ft) | 0.24 | 19.70 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 10.69 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1002.47 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.24 | Wt. n-Val. | 0.040 | 0.040 | |
| W.S. Elev (ft) | 1002.22 | Reach Len. (ft) | 210.06 | 199.66 | 175.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 6.65 | 122.11 | |
| E.G. Slope (ft/ft) | 0.006360 | Area (sq ft) | 6.65 | 122.11 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 10.83 | 489.17 | |
| Top Width (ft) | 92.74 | Top Width (ft) | 16.32 | 76.42 | |
| Vel Total (ft/s) | 3.88 | Avg. Vel. (ft/s) | 1.63 | 4.01 | |
| Max Chl Dpth (ft) | 2.35 | Hydr. Depth (ft) | 0.41 | 1.60 | |
| Conv. Total (cfs) | 6269.6 | Conv. (cfs) | 135.7 | 6133.8 | |
| Length Wtd. (ft) | 199.77 | Wetted Per. (ft) | 16.35 | 77.66 | |
| Min Ch El (ft) | 999.87 | Shear (lb/sq ft) | 0.16 | 0.62 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.26 | 2.50 | |
| Frctn Loss (ft) | 1.67 | Cum Volume (acre-ft) | 6.07 | 17.27 | 0.36 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.91 | 10.61 | 0.33 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.735

INPUT
Description: 14438.48 - Thalweg Sta. 438.71
Station Elevation Data num= 130

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1024 | 1.71 | 1023.93 | 4.98 | 1023.79 | 5.56 | 1023.77 | 15.09 | 1023.32 |
| 17.48 | 1023.19 | 25.2 | 1022.75 | 29.38 | 1022.39 | 35.32 | 1021.89 | 45.43 | 1020.82 |
| 53.21 | 1019.98 | 55.54 | 1019.72 | 65.12 | 1018.67 | 65.66 | 1018.62 | 68.64 | 1018.28 |
| 77.03 | 1017.28 | 85.89 | 1016.18 | 88.95 | 1015.83 | 96 | 1015 | 100.86 | 1014.41 |
| 106.11 | 1013.87 | 112.78 | 1013.07 | 116.23 | 1012.81 | 124.69 | 1011.58 | 126.34 | 1011.36 |
| 135.58 | 1009.52 | 136.45 | 1009.38 | 136.6 | 1009.36 | 146.57 | 1007.49 | 153.91 | 1007.39 |
| 156.68 | 1007.34 | 160.43 | 1007.36 | 166.79 | 1007.28 | 171.48 | 1007.41 | 176.91 | 1007.58 |
| 184.26 | 1008 | 187.02 | 1008.11 | 196.17 | 1007.52 | 197.13 | 1007.5 | 197.84 | 1007.42 |
| 202.51 | 1006.52 | 217.36 | 1003.51 | 224.2 | 1002.28 | 227.47 | 1001.68 | 231.91 | 1001.2 |
| 237.59 | 1000.7 | 241.77 | 1000.67 | 247.7 | 1000.52 | 255.74 | 1000.57 | 257.81 | 1000.58 |
| 267.65 | 1000.64 | 267.93 | 1000.64 | 278.04 | 1000.7 | 288.15 | 1000.71 | 291.48 | 1000.68 |
| 298.27 | 1000.65 | 315.31 | 1000.53 | 318.5 | 1000.52 | 327.22 | 1000.48 | 328.61 | 1000.48 |
| 345.56 | 1000.58 | 350.51 | 1000.62 | 361.53 | 1000.74 | 383.58 | 1001.17 | 394.4 | 1001.14 |
| 394.61 | 1001.14 | 403.7 | 1000.89 | 405.63 | 1000.84 | 406.61 | 1000.8 | 407.31 | 1000.77 |
| 416.66 | 1000.38 | 427.45 | 999.59 | 427.69 | 999.57 | 427.88 | 999.55 | 438.71 | 998.33 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 442.67 | 998.46 | 449.74 | 998.67 | 451.19 | 998.7 | 460.76 | 998.82 | 469.05 | 999.03 |
| 471.79 | 999.09 | 482.81 | 999.51 | 493.84 | 999.69 | 504.86 | 999.69 | 522.43 | 999.5 |
| 526.91 | 999.46 | 530.81 | 999.44 | 537.94 | 999.46 | 546.17 | 999.52 | 548.97 | 999.51 |
| 551.38 | 999.4 | 558.42 | 999.12 | 559.99 | 999.06 | 569.92 | 998.71 | 571.01 | 998.69 |
| 578.2 | 998.96 | 582.04 | 999.13 | 592.55 | 999.57 | 593.07 | 999.6 | 593.66 | 999.61 |
| 603.43 | 999.76 | 604.09 | 999.77 | 613.13 | 999.89 | 615.12 | 999.91 | 617.41 | 999.96 |
| 626.14 | 1000.18 | 633.72 | 1000.46 | 637.17 | 1000.6 | 648.19 | 1001.1 | 659.22 | 1001.62 |
| 664.9 | 1001.91 | 670.24 | 1002.16 | 674.87 | 1002.36 | 681.27 | 1002.66 | 688.65 | 1002.99 |
| 692.3 | 1003.16 | 695.46 | 1003.38 | 703.32 | 1003.91 | 712.38 | 1004.45 | 721.26 | 1005.44 |
| 725.37 | 1006.09 | 728.78 | 1006.47 | 736.13 | 1007.61 | 736.4 | 1007.65 | 736.63 | 1007.69 |
| 747.42 | 1009.41 | 757.21 | 1011.44 | 758.45 | 1011.69 | 759.88 | 1012.07 | 762.87 | 1012.67 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 406.61 | .04 | 603.43 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 394.4 | 504.86 | 179.06 | 199.03 | 255.67 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.32 | Element | | | |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 1000.19 | Reach Len. (ft) | 179.06 | 199.03 | 255.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 86.03 | 88.31 |
| E.G. Slope (ft/ft) | 0.006883 | Area (sq ft) | | 86.03 | 88.31 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 265.84 | 234.16 |
| Top Width (ft) | 207.11 | Top Width (ft) | | 85.59 | 121.52 |
| Vel Total (ft/s) | 2.87 | Avg. Vel. (ft/s) | | 3.09 | 2.65 |
| Max Chl Dpth (ft) | 1.86 | Hydr. Depth (ft) | | 1.01 | 0.73 |
| Conv. Total (cfs) | 6026.8 | Conv. (cfs) | | 3204.3 | 2822.5 |
| Length Wtd. (ft) | 209.65 | Wetted Per. (ft) | | 85.70 | 121.56 |
| Min Ch El (ft) | 998.33 | Shear (lb/sq ft) | | 0.43 | 0.31 |
| Alpha | 1.02 | Stream Power (lb/ft s) | | 1.33 | 0.83 |
| Frctn Loss (ft) | 1.45 | Cum Volume (acre-ft) | 9.28 | 12.71 | 6.60 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 10.92 | 10.15 | 8.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.78 | Element | | | |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1000.46 | Reach Len. (ft) | 179.06 | 199.03 | 255.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 109.72 | |
| E.G. Slope (ft/ft) | 0.011725 | Area (sq ft) | | 109.72 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 90.10 | Top Width (ft) | | 90.10 | |
| Vel Total (ft/s) | 4.56 | Avg. Vel. (ft/s) | | 4.56 | |
| Max Chl Dpth (ft) | 2.13 | Hydr. Depth (ft) | | 1.22 | |
| Conv. Total (cfs) | 4617.5 | Conv. (cfs) | | 4617.5 | |
| Length Wtd. (ft) | 199.03 | Wetted Per. (ft) | | 90.99 | |
| Min Ch El (ft) | 998.33 | Shear (lb/sq ft) | | 0.88 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.02 | |
| Frctn Loss (ft) | 1.38 | Cum Volume (acre-ft) | 0.24 | 19.17 | 0.47 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.12 | 10.31 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 1000.79 | Element | | | |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 1000.47 | Reach Len. (ft) | 179.06 | 199.03 | 255.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 110.78 | |
| E.G. Slope (ft/ft) | 0.011403 | Area (sq ft) | | 110.78 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 90.38 | Top Width (ft) | | 90.38 | |
| Vel Total (ft/s) | 4.51 | Avg. Vel. (ft/s) | | 4.51 | |
| Max Chl Dpth (ft) | 2.14 | Hydr. Depth (ft) | | 1.23 | |
| Conv. Total (cfs) | 4682.2 | Conv. (cfs) | | 4682.2 | |
| Length Wtd. (ft) | 199.11 | Wetted Per. (ft) | | 91.29 | |
| Min Ch El (ft) | 998.33 | Shear (lb/sq ft) | | 0.86 | |

| | | | | | |
|---|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.90 | |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 6.05 | 16.74 | 0.36 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 5.87 | 10.23 | 0.33 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.697

INPUT
Description: 14239.45 - Thalweg Sta. 451.90
Station Elevation Data num= 138

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1021.85 | 4.74 | 1021.53 | 13.64 | 1020.9 | 18.09 | 1020.63 | 22.55 | 1020.18 |
| 28.18 | 1019.7 | 31.45 | 1019.31 | 38.27 | 1018.45 | 40.34 | 1018.18 | 48.36 | 1016.72 |
| 49.25 | 1016.64 | 55.94 | 1015.26 | 58.15 | 1014.86 | 58.44 | 1014.8 | 67.05 | 1014.38 |
| 68.53 | 1014.02 | 70.47 | 1013.96 | 78.62 | 1013.29 | 82.11 | 1013.09 | 88.71 | 1012.48 |
| 93.75 | 1012.32 | 98.8 | 1011.98 | 102.65 | 1011.79 | 108.89 | 1011.64 | 111.56 | 1011.49 |
| 118.98 | 1011.21 | 120.46 | 1011.1 | 129.06 | 1010.56 | 129.36 | 1010.54 | 139.15 | 1009.73 |
| 140.32 | 1009.63 | 149.24 | 1008.77 | 159.33 | 1007.67 | 163.61 | 1006.96 | 169.42 | 1006.12 |
| 175.25 | 1005.01 | 179.51 | 1004.23 | 186.89 | 1002.85 | 189.6 | 1002.3 | 198.53 | 1000.85 |
| 199.68 | 1000.65 | 200.56 | 1000.55 | 207.17 | 999.99 | 209.47 | 999.79 | 209.77 | 999.77 |
| 218.37 | 999.53 | 219.86 | 999.5 | 227.27 | 999.37 | 229.95 | 999.35 | 236.17 | 999.25 |
| 240.04 | 999.21 | 245.07 | 999.08 | 250.13 | 998.97 | 250.93 | 998.94 | 253.97 | 998.84 |
| 260.22 | 998.62 | 262.87 | 998.6 | 270.3 | 998.49 | 271.78 | 998.52 | 280.39 | 998.74 |
| 280.68 | 998.74 | 282.79 | 998.81 | 289.57 | 999.01 | 290.48 | 999.04 | 298.48 | 999.15 |
| 300.57 | 999.17 | 307.38 | 999.2 | 310.66 | 999.2 | 316.28 | 999.19 | 325.18 | 999.07 |
| 334.08 | 998.66 | 342.98 | 998.14 | 351.01 | 997.83 | 351.88 | 997.79 | 358.41 | 997.69 |
| 360.79 | 997.65 | 361.1 | 997.66 | 369.69 | 997.75 | 371.19 | 997.79 | 378.59 | 997.93 |
| 381.28 | 997.99 | 387.48 | 998.07 | 391.37 | 998.11 | 401.46 | 998.19 | 405.29 | 998.23 |
| 414.19 | 998.29 | 421.75 | 998.29 | 423.1 | 998.28 | 431.72 | 998.09 | 431.99 | 998.08 |
| 440.89 | 997.68 | 441.81 | 997.64 | 443.01 | 997.57 | 451.9 | 997.12 | 454.65 | 997.13 |
| 461.99 | 997.07 | 466.3 | 997.12 | 476.5 | 997.13 | 482.17 | 997.02 | 489.58 | 997.14 |
| 492.25 | 997.19 | 501.22 | 997.99 | 502.34 | 998.01 | 503.19 | 998.29 | 509.64 | 1000.4 |
| 512.1 | 1001.22 | 512.43 | 1001.26 | 521.01 | 1001.82 | 522.52 | 1002.05 | 529.9 | 1002.19 |
| 532.61 | 1002.43 | 538.28 | 1002.91 | 538.8 | 1002.96 | 542.7 | 1003.33 | 547.71 | 1003.79 |
| 552.79 | 1004.31 | 556.61 | 1004.69 | 562.87 | 1005.28 | 565.51 | 1005.52 | 572.96 | 1006.24 |
| 574.41 | 1006.34 | 583.05 | 1007.26 | 583.31 | 1007.28 | 585.25 | 1007.5 | 592.21 | 1008.25 |
| 593.14 | 1008.38 | 601.11 | 1009.45 | 603.23 | 1009.8 | 610.02 | 1011 | 613.32 | 1011.66 |
| 623.41 | 1013.82 | 627.82 | 1014.96 | 633.49 | 1016.25 | 640.92 | 1017.58 | 643.58 | 1018.28 |
| 652.56 | 1019.12 | 653.67 | 1019.24 | 662.09 | 1019.79 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 250.93 | .04 | 538.28 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 421.75 | 503.19 | 188.29 | 197.81 | 215.28 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 998.86 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 998.69 | Reach Len. (ft) | 188.29 | 197.81 | 215.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 59.12 | 101.88 | 0.25 |
| E.G. Slope (ft/ft) | 0.006978 | Area (sq ft) | 59.12 | 101.88 | 0.25 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 133.01 | 366.73 | 0.26 |
| Top Width (ft) | 191.56 | Top Width (ft) | 108.89 | 81.44 | 1.24 |
| Vel Total (ft/s) | 3.10 | Avg. Vel. (ft/s) | 2.25 | 3.60 | 1.03 |
| Max Chl Dpth (ft) | 1.67 | Hydr. Depth (ft) | 0.54 | 1.25 | 0.20 |
| Conv. Total (cfs) | 5985.5 | Conv. (cfs) | 1592.3 | 4390.1 | 3.1 |
| Length Wtd. (ft) | 194.03 | Wetted Per. (ft) | 108.92 | 81.55 | 1.30 |
| Min Ch El (ft) | 997.02 | Shear (lb/sq ft) | 0.24 | 0.54 | 0.08 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.53 | 1.96 | 0.09 |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 9.16 | 12.28 | 6.34 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 10.69 | 9.77 | 7.69 |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.37 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 999.17 | Reach Len. (ft) | 188.29 | 197.81 | 215.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 140.51 | |
| E.G. Slope (ft/ft) | 0.004570 | Area (sq ft) | | 140.51 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 81.44 | Top Width (ft) | | 81.44 | |
| Vel Total (ft/s) | 3.56 | Avg. Vel. (ft/s) | | 3.56 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | | 1.73 | |
| Conv. Total (cfs) | 7396.3 | Conv. (cfs) | | 7396.3 | |
| Length Wtd. (ft) | 197.81 | Wetted Per. (ft) | | 83.31 | |
| Min Ch El (ft) | 997.02 | Shear (lb/sq ft) | | 0.48 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.71 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 0.24 | 18.60 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 9.92 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 999.33 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 999.12 | Reach Len. (ft) | 188.29 | 197.81 | 215.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 136.53 | 1.05 |
| E.G. Slope (ft/ft) | 0.004926 | Area (sq ft) | | 136.53 | 1.05 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 498.53 | 1.47 |
| Top Width (ft) | 83.98 | Top Width (ft) | | 81.44 | 2.54 |
| Vel Total (ft/s) | 3.63 | Avg. Vel. (ft/s) | | 3.65 | 1.40 |
| Max Chl Dpth (ft) | 2.10 | Hydr. Depth (ft) | | 1.68 | 0.41 |
| Conv. Total (cfs) | 7124.1 | Conv. (cfs) | | 7103.1 | 21.0 |
| Length Wtd. (ft) | 198.21 | Wetted Per. (ft) | | 82.38 | 2.67 |
| Min Ch El (ft) | 997.02 | Shear (lb/sq ft) | | 0.51 | 0.12 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 1.86 | 0.17 |
| Frctn Loss (ft) | 1.01 | Cum Volume (acre-ft) | 6.05 | 16.17 | 0.36 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.87 | 9.83 | 0.32 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.659

INPUT
Description: 14041.64 - Thalweg Sta. 409.05
Station Elevation Data num= 168

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1019.86 | 1.27 | 1019.72 | 6.22 | 1019.21 | 12.02 | 1018.2 | 17.41 | 1017.18 |
| 19.47 | 1016.63 | 23.56 | 1015.36 | 26.92 | 1014.43 | 28.6 | 1013.97 | 34.36 | 1013.69 |
| 39.79 | 1011.65 | 41.81 | 1011.48 | 45.85 | 1011.52 | 49.27 | 1011.76 | 50.98 | 1011.66 |
| 56.72 | 1011.73 | 62.17 | 1011.67 | 64.16 | 1011.6 | 68.13 | 1011.59 | 71.61 | 1011.56 |
| 73.36 | 1011.54 | 79.06 | 1011.35 | 84.55 | 1011.34 | 86.51 | 1011.22 | 90.42 | 1011.2 |
| 93.96 | 1011.09 | 95.74 | 1011.14 | 101.41 | 1010.73 | 106.93 | 1010.58 | 108.86 | 1010.38 |
| 112.71 | 1010.09 | 116.31 | 1009.76 | 118.12 | 1009.65 | 123.76 | 1008.87 | 129.31 | 1008.29 |
| 131.21 | 1007.86 | 134.99 | 1007.2 | 138.66 | 1006.47 | 140.5 | 1006.51 | 146.11 | 1006.01 |
| 151.69 | 1006.26 | 153.56 | 1006.24 | 157.28 | 1006.19 | 161.01 | 1005.74 | 162.88 | 1005.68 |
| 168.46 | 1005.33 | 174.06 | 1005.07 | 175.9 | 1004.77 | 179.57 | 1004.15 | 183.35 | 1003.32 |
| 185.25 | 1003 | 190.8 | 1001.9 | 196.44 | 1000.89 | 198.25 | 1000.64 | 201.86 | 1000.18 |
| 205.7 | 999.61 | 207.63 | 999.42 | 213.15 | 999.1 | 218.82 | 998.9 | 224.14 | 998.78 |
| 235.5 | 998.48 | 244.6 | 998.21 | 246.43 | 998.15 | 252.39 | 997.94 | 263.58 | 997.5 |
| 265.3 | 997.42 | 268.72 | 997.28 | 274.77 | 997.01 | 280.2 | 996.78 | 287.65 | 996.56 |
| 291 | 996.51 | 295.09 | 996.43 | 297.15 | 996.44 | 308.34 | 996.39 | 310 | 996.38 |
| 313.29 | 996.32 | 317.44 | 996.27 | 319.53 | 996.23 | 324.89 | 996.16 | 330.72 | 996.07 |
| 332.34 | 996.06 | 335.58 | 996.08 | 339.79 | 996.09 | 341.91 | 996.15 | 353.1 | 996.59 |
| 354.69 | 996.65 | 357.86 | 996.75 | 362.14 | 996.85 | 364.29 | 996.87 | 369.59 | 996.93 |
| 375.19 | 996.98 | 375.48 | 996.98 | 380.15 | 996.93 | 384.49 | 996.87 | 386.67 | 996.85 |
| 391.94 | 996.63 | 397.86 | 996.32 | 399.39 | 996.22 | 406.84 | 995.75 | 409.05 | 995.66 |
| 414.29 | 995.68 | 420.1 | 995.86 | 420.24 | 995.86 | 424.72 | 996.13 | 429.19 | 996.43 |
| 431.43 | 996.53 | 436.63 | 996.75 | 444.08 | 997 | 447.74 | 997.15 | 451.53 | 997.28 |
| 458.99 | 997.58 | 473.88 | 998.21 | 476.19 | 998.3 | 487.37 | 998.76 | 488.78 | 998.81 |
| 491.58 | 998.92 | 496.23 | 999.09 | 503.68 | 999.37 | 509.76 | 999.57 | 511.13 | 999.62 |
| 513.86 | 999.7 | 518.58 | 999.86 | 520.95 | 999.93 | 526.03 | 1000.05 | 532.14 | 1000.25 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 533.48 | 1000.29 | 536.15 | 1000.42 | 540.93 | 1000.63 | 543.33 | 1000.87 | 548.37 | 1001.3 |
| 554.51 | 1002.36 | 555.83 | 1002.53 | 558.44 | 1003.05 | 563.28 | 1003.83 | 565.7 | 1004.59 |
| 570.73 | 1005.26 | 576.89 | 1006.57 | 578.17 | 1006.71 | 580.72 | 1006.9 | 585.62 | 1007.2 |
| 588.08 | 1007.5 | 593.07 | 1007.77 | 599.27 | 1007.83 | 600.52 | 1007.89 | 603.01 | 1007.87 |
| 607.97 | 1007.89 | 610.46 | 1008.04 | 615.42 | 1008.88 | 621.65 | 1009.58 | 622.87 | 1009.78 |
| 625.3 | 1010.23 | 630.32 | 1011.11 | 632.84 | 1011.58 | 637.77 | 1012.64 | 644.03 | 1014.14 |
| 645.22 | 1014.4 | 647.58 | 1014.76 | 652.67 | 1015.34 | 655.22 | 1015.53 | 660.12 | 1015.82 |
| 666.41 | 1016.05 | 667.57 | 1016.1 | 675.02 | 1016.19 | 677.6 | 1016.16 | 682.47 | 1016.16 |
| 688.79 | 1015.92 | 689.92 | 1015.89 | 690.95 | 1015.84 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 244.6 | .04 | 420.1 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 375.19 | 447.74 | 201.87 | 199.99 | 198.68 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | 0.040 | 0.038 | 0.035 |
| W.S. Elev (ft) | 997.43 | Reach Len. (ft) | 201.87 | 199.99 | 198.68 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 97.77 | 74.00 | 1.11 |
| E.G. Slope (ft/ft) | 0.006322 | Area (sq ft) | 97.77 | 74.00 | 1.11 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 266.64 | 232.32 | 1.04 |
| Top Width (ft) | 190.26 | Top Width (ft) | 110.15 | 72.55 | 7.57 |
| Vel Total (ft/s) | 2.89 | Avg. Vel. (ft/s) | 2.73 | 3.14 | 0.94 |
| Max Chl Dpth (ft) | 1.77 | Hydr. Depth (ft) | 0.89 | 1.02 | 0.15 |
| Conv. Total (cfs) | 6288.7 | Conv. (cfs) | 3353.7 | 2921.9 | 13.1 |
| Length Wtd. (ft) | 200.84 | Wetted Per. (ft) | 110.18 | 72.62 | 7.57 |
| Min Ch El (ft) | 995.66 | Shear (lb/sq ft) | 0.35 | 0.40 | 0.06 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.96 | 1.26 | 0.05 |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | 8.82 | 11.88 | 6.34 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 10.22 | 9.42 | 7.66 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 998.36 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.038 | |
| W.S. Elev (ft) | 998.10 | Reach Len. (ft) | 201.87 | 199.99 | 198.68 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 122.68 | |
| E.G. Slope (ft/ft) | 0.005641 | Area (sq ft) | | 122.68 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 72.55 | Top Width (ft) | | 72.55 | |
| Vel Total (ft/s) | 4.08 | Avg. Vel. (ft/s) | | 4.08 | |
| Max Chl Dpth (ft) | 2.44 | Hydr. Depth (ft) | | 1.69 | |
| Conv. Total (cfs) | 6657.3 | Conv. (cfs) | | 6657.3 | |
| Length Wtd. (ft) | 199.99 | Wetted Per. (ft) | | 74.69 | |
| Min Ch El (ft) | 995.66 | Shear (lb/sq ft) | | 0.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.36 | |
| Frctn Loss (ft) | 0.96 | Cum Volume (acre-ft) | 0.24 | 18.00 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 9.57 | 0.30 |

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 998.32 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.038 | 0.035 |
| W.S. Elev (ft) | 998.09 | Reach Len. (ft) | 201.87 | 199.99 | 198.68 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 121.66 | 11.29 |
| E.G. Slope (ft/ft) | 0.005231 | Area (sq ft) | | 121.66 | 11.29 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 478.62 | 21.38 |
| Top Width (ft) | 95.83 | Top Width (ft) | | 72.55 | 23.28 |
| Vel Total (ft/s) | 3.76 | Avg. Vel. (ft/s) | | 3.93 | 1.89 |
| Max Chl Dpth (ft) | 2.43 | Hydr. Depth (ft) | | 1.68 | 0.48 |
| Conv. Total (cfs) | 6913.3 | Conv. (cfs) | | 6617.8 | 295.6 |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 73.73 | 23.30 |
| Min Ch El (ft) | 995.66 | Shear (lb/sq ft) | | 0.54 | 0.16 |
| Alpha | 1.06 | Stream Power (lb/ft s) | | 2.12 | 0.30 |
| Frctn Loss (ft) | 0.91 | Cum Volume (acre-ft) | 6.05 | 15.59 | 0.33 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.87 | 9.48 | 0.25 |

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.622

INPUT
Description: 13841.65 - Thalweg Sta. 399.10
Station Elevation Data num= 181

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1009.68 | 5.57 | 1008.91 | 7.43 | 1008.6 | 11.64 | 1007.91 | 15.02 | 1007.28 |
| 16.5 | 1007 | 22.6 | 1006.3 | 27.44 | 1006.08 | 37.77 | 1007.88 | 38.37 | 1007.95 |
| 45.35 | 1008 | 49.3 | 1008.24 | 52.93 | 1008.15 | 60.23 | 1008.03 | 60.51 | 1008.02 |
| 61.16 | 1008 | 68.1 | 1007.75 | 71.16 | 1007.65 | 82.1 | 1007.2 | 90.85 | 1006.74 |
| 93.02 | 1006.6 | 103.96 | 1005.88 | 106.01 | 1005.74 | 110.67 | 1005.44 | 113.6 | 1005.22 |
| 114.89 | 1005.12 | 121.18 | 1004.65 | 125.82 | 1004.32 | 128.76 | 1004.07 | 136.35 | 1003.41 |
| 143.93 | 1002.65 | 147.68 | 1002.33 | 151.51 | 1001.94 | 158.62 | 1001.71 | 159.1 | 1001.76 |
| 160.19 | 1001.85 | 166.68 | 1002.32 | 169.55 | 1002.68 | 174.26 | 1003.32 | 180.48 | 1004.27 |
| 181.84 | 1004.38 | 184.95 | 1004.6 | 189.43 | 1004.99 | 191.41 | 1005.08 | 197.01 | 1005.05 |
| 202.34 | 1004.98 | 212.18 | 1004.63 | 213.27 | 1004.61 | 219.76 | 1004.2 | 224.2 | 1004.02 |
| 227.34 | 1003.64 | 234.46 | 1003.14 | 234.93 | 1003.11 | 235.13 | 1003.12 | 242.51 | 1002.6 |
| 246.07 | 1002.44 | 250.09 | 1002.19 | 257 | 1001.95 | 259.22 | 1001.86 | 265.26 | 1001.55 |
| 267.93 | 1001.46 | 268.66 | 1001.43 | 272.84 | 1001.28 | 278.86 | 1001.08 | 280.42 | 1001.12 |
| 283.98 | 1000.77 | 288.01 | 1000.57 | 289.79 | 1000.23 | 295.59 | 998.63 | 300.72 | 996.95 |
| 303.17 | 996.62 | 308.73 | 995.73 | 310.76 | 995.41 | 311.65 | 995.26 | 318.34 | 994.91 |
| 322.59 | 994.72 | 325.92 | 994.72 | 333.48 | 994.78 | 348.68 | 995.09 | 355.38 | 995.21 |
| 356.26 | 995.22 | 358.24 | 995.23 | 363.84 | 995.24 | 363.99 | 995.24 | 366.31 | 995.23 |
| 371.43 | 995.2 | 377.24 | 995.15 | 379.01 | 995.13 | 388.18 | 994.9 | 394.18 | 994.76 |
| 399.1 | 994.72 | 401.76 | 994.72 | 407.76 | 994.84 | 409.34 | 994.86 | 410.04 | 994.88 |
| 416.92 | 995.17 | 420.97 | 995.3 | 424.51 | 995.39 | 424.66 | 995.39 | 430.17 | 995.49 |
| 431.9 | 995.52 | 432.09 | 995.52 | 432.52 | 995.53 | 439.67 | 995.65 | 442.83 | 995.69 |
| 447.26 | 995.78 | 453.76 | 995.89 | 457.27 | 995.99 | 462.42 | 996.12 | 464.7 | 996.17 |
| 475.63 | 996.5 | 477.59 | 996.55 | 485.17 | 996.79 | 497.49 | 997.14 | 506.79 | 997.36 |
| 507.92 | 997.38 | 508.42 | 997.39 | 515.5 | 997.41 | 519.35 | 997.46 | 523.09 | 997.43 |
| 531.55 | 997.43 | 538.25 | 997.39 | 541.21 | 997.4 | 545.84 | 997.39 | 552.15 | 997.39 |
| 556.31 | 997.42 | 561 | 997.44 | 563.08 | 997.46 | 574.01 | 997.84 | 576.17 | 997.98 |
| 581.06 | 998.31 | 583.75 | 998.48 | 584.94 | 998.57 | 591.34 | 999.35 | 595.87 | 999.96 |
| 605.82 | 1001.65 | 606.5 | 1001.75 | 606.8 | 1001.8 | 614.08 | 1002.93 | 617.73 | 1003.56 |
| 621.67 | 1004.2 | 628.67 | 1004.47 | 629.25 | 1004.52 | 636.83 | 1004.29 | 639.6 | 1004.14 |
| 644.42 | 1003.75 | 650.53 | 1003.17 | 652 | 1003.04 | 655.34 | 1002.8 | 659.58 | 1002.53 |
| 661.46 | 1002.44 | 667.17 | 1002.3 | 672.39 | 1002.25 | 674.75 | 1002.07 | 682.33 | 1001.86 |
| 683.32 | 1001.83 | 689.92 | 1001.47 | 694.25 | 1001.28 | 697.5 | 1001.3 | 704.85 | 1000.9 |
| 705.09 | 1000.9 | 705.19 | 1000.89 | 712.67 | 1000.72 | 716.12 | 1000.71 | 720.25 | 1000.64 |
| 727.05 | 1001.36 | 729.61 | 1001.61 | 735.41 | 1002.38 | 743 | 1003.62 | 748.91 | 1004.67 |
| 750.58 | 1005.06 | 754.37 | 1005.72 | 758.17 | 1006.44 | 759.84 | 1006.74 | 765.75 | 1007.93 |
| 770.78 | 1008.64 | 773.33 | 1008.95 | 779.13 | 1009.35 | 780.92 | 1009.49 | 781.71 | 1009.53 |
| 787.86 | 1009.6 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 268.66 | .04 | 430.17 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 363.99 | 424.66 | 196.93 | 199.78 | 201.56 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 996.43 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.040 | 0.040 | 0.036 |
| W.S. Elev (ft) | 996.29 | Reach Len. (ft) | 196.93 | 199.78 | 201.56 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 71.63 | 77.28 | 21.74 |
| E.G. Slope (ft/ft) | 0.005125 | Area (sq ft) | 71.63 | 77.28 | 21.74 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 217.19 | 241.46 | 41.35 |
| Top Width (ft) | 163.30 | Top Width (ft) | 58.74 | 60.67 | 43.89 |
| Vel Total (ft/s) | 2.93 | Avg. Vel. (ft/s) | 3.03 | 3.12 | 1.90 |
| Max Chl Dpth (ft) | 1.57 | Hydr. Depth (ft) | 1.22 | 1.27 | 0.50 |
| Conv. Total (cfs) | 6984.3 | Conv. (cfs) | 3033.9 | 3372.9 | 577.5 |
| Length Wtd. (ft) | 199.55 | Wetted Per. (ft) | 58.84 | 60.69 | 43.90 |
| Min Ch El (ft) | 994.72 | Shear (lb/sq ft) | 0.39 | 0.41 | 0.16 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.18 | 1.27 | 0.30 |
| Frctn Loss (ft) | 1.30 | Cum Volume (acre-ft) | 8.43 | 11.53 | 6.28 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 9.83 | 9.12 | 7.55 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.40 | Element | | | |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.040 | |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 997.17 | Reach Len. (ft) | 196.93 | 199.78 | 201.56 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 130.98 | |
| E.G. Slope (ft/ft) | 0.004098 | Area (sq ft) | | 130.98 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 60.67 | Top Width (ft) | | 60.67 | |
| Vel Total (ft/s) | 3.82 | Avg. Vel. (ft/s) | | 3.82 | |
| Max Chl Dpth (ft) | 2.45 | Hydr. Depth (ft) | | 2.16 | |
| Conv. Total (cfs) | 7810.9 | Conv. (cfs) | | 7810.9 | |
| Length Wtd. (ft) | 199.78 | Wetted Per. (ft) | | 64.40 | |
| Min Ch El (ft) | 994.72 | Shear (lb/sq ft) | | 0.52 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.99 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | 0.24 | 17.42 | 0.47 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.12 | 9.26 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 997.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 997.19 | Reach Len. (ft) | 196.93 | 199.78 | 201.56 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 131.99 | |
| E.G. Slope (ft/ft) | 0.003997 | Area (sq ft) | | 131.99 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 60.67 | Top Width (ft) | | 60.67 | |
| Vel Total (ft/s) | 3.79 | Avg. Vel. (ft/s) | | 3.79 | |
| Max Chl Dpth (ft) | 2.47 | Hydr. Depth (ft) | | 2.18 | |
| Conv. Total (cfs) | 7908.2 | Conv. (cfs) | | 7908.2 | |
| Length Wtd. (ft) | 199.78 | Wetted Per. (ft) | | 64.43 | |
| Min Ch El (ft) | 994.72 | Shear (lb/sq ft) | | 0.51 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.94 | |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 6.05 | 15.01 | 0.30 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 5.87 | 9.18 | 0.20 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.584

INPUT
Description: 13641.88 - Thalweg Sta. 287.68
Station Elevation Data num= 138

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1005.58 | 4.09 | 1005.38 | 6.64 | 1005.06 | 11.45 | 1004.85 | 14.04 | 1004.61 |
| 15.41 | 1004.65 | 21.43 | 1004.02 | 26.73 | 1003.66 | 28.83 | 1003.44 | 32.78 | 1003.13 |
| 36.22 | 1002.77 | 38.05 | 1002.65 | 49.37 | 1001.46 | 51.02 | 1001.29 | 54.11 | 1000.84 |
| 58.41 | 1000.24 | 60.7 | 999.94 | 65.8 | 999.2 | 72.02 | 998.48 | 73.2 | 998.68 |
| 75.43 | 998.41 | 80.6 | 998.26 | 83.34 | 997.98 | 87.99 | 998.5 | 94.66 | 997.61 |
| 95.39 | 997.63 | 96.76 | 997.6 | 102.79 | 997.84 | 105.98 | 997.6 | 110.18 | 997.59 |
| 117.3 | 997.22 | 117.58 | 997.21 | 118.09 | 997.18 | 124.97 | 997.11 | 128.63 | 996.92 |
| 132.37 | 996.84 | 139.42 | 996.38 | 139.76 | 996.38 | 139.95 | 996.37 | 147.16 | 996.28 |
| 151.27 | 996.11 | 154.55 | 995.92 | 160.75 | 995.71 | 161.95 | 995.7 | 162.59 | 995.69 |
| 169.35 | 995.7 | 173.91 | 995.54 | 176.74 | 995.56 | 182.07 | 995.35 | 184.14 | 995.35 |
| 185.23 | 995.29 | 191.53 | 995.3 | 196.56 | 995.15 | 198.93 | 995.13 | 203.4 | 995 |
| 206.33 | 994.97 | 207.88 | 994.94 | 219.2 | 994.77 | 220.95 | 994.74 | 221.11 | 994.74 |
| 228.51 | 994.62 | 230.52 | 994.59 | 235.91 | 994.47 | 241.84 | 994.38 | 243.3 | 994.36 |
| 246.05 | 994.33 | 250.7 | 994.27 | 253.16 | 994.25 | 257.96 | 994.24 | 258.1 | 994.24 |
| 264.48 | 994.19 | 265.49 | 994.15 | 267.38 | 994.07 | 272.89 | 993.81 | 275.81 | 993.66 |
| 287.68 | 993.44 | 288.71 | 993.47 | 295.07 | 993.68 | 298.45 | 993.85 | 302.47 | 993.98 |
| 309.77 | 994.04 | 309.88 | 994.04 | 310.04 | 994.04 | 317.26 | 993.97 | 321.09 | 993.96 |
| 324.66 | 994 | 332.05 | 994.11 | 332.41 | 994.11 | 339.45 | 994.02 | 343.74 | 993.99 |
| 346.84 | 994.01 | 352.69 | 993.84 | 354.24 | 993.81 | 355.06 | 993.79 | 356.83 | 993.79 |
| 366.38 | 993.79 | 369.03 | 993.82 | 374.02 | 994.04 | 376.43 | 994.13 | 377.7 | 994.21 |
| 383.82 | 994.58 | 389.02 | 994.95 | 391.22 | 995.08 | 398.61 | 995.47 | 400.34 | 995.55 |
| 406.01 | 995.7 | 411.67 | 995.8 | 413.41 | 995.82 | 420.8 | 995.87 | 434.31 | 995.94 |
| 435.59 | 995.95 | 438.01 | 995.96 | 442.99 | 995.97 | 445.63 | 995.97 | 456.95 | 995.99 |
| 457.78 | 996 | 459.34 | 996 | 465.17 | 996.02 | 468.27 | 996.04 | 472.57 | 996.05 |
| 479.6 | 996.12 | 479.97 | 996.12 | 480.66 | 996.13 | 487.36 | 996.18 | 494.76 | 996.29 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 501.99 | 996.48 | 502.24 | 996.49 | 509.55 | 996.94 | 513.56 | 997.23 | 516.95 | 997.82 |
| 523.32 | 998.96 | 524.34 | 999.14 | 524.88 | 999.24 | 536.2 | 1001.75 | 544.65 | 1003.56 |
| 546.53 | 1003.97 | 547.53 | 1004.19 | 552.37 | 1005.13 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 220.95 | .04 | 356.83 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 257.96 | 309.88 | 201.91 | 199.34 | 215.78 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 995.13 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | 0.040 | 0.040 | 0.038 |
| W.S. Elev (ft) | 994.95 | Reach Len. (ft) | 201.91 | 199.34 | 215.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 20.11 | 58.28 | 71.68 |
| E.G. Slope (ft/ft) | 0.008526 | Area (sq ft) | 20.11 | 58.28 | 71.68 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 41.90 | 215.84 | 242.26 |
| Top Width (ft) | 181.62 | Top Width (ft) | 50.57 | 51.92 | 79.13 |
| Vel Total (ft/s) | 3.33 | Avg. Vel. (ft/s) | 2.08 | 3.70 | 3.38 |
| Max Chl Dpth (ft) | 1.51 | Hydr. Depth (ft) | 0.40 | 1.12 | 0.91 |
| Conv. Total (cfs) | 5415.1 | Conv. (cfs) | 453.8 | 2337.6 | 2623.7 |
| Length Wtd. (ft) | 203.88 | Wetted Per. (ft) | 50.57 | 51.95 | 79.17 |
| Min Ch El (ft) | 993.44 | Shear (lb/sq ft) | 0.21 | 0.60 | 0.48 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.44 | 2.21 | 1.63 |
| Frctn Loss (ft) | 1.20 | Cum Volume (acre-ft) | 8.22 | 11.22 | 6.07 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 9.58 | 8.86 | 7.26 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 996.01 | Element | | | |
| Vel Head (ft) | 0.53 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 995.48 | Reach Len. (ft) | 201.91 | 199.34 | 215.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 85.73 | |
| E.G. Slope (ft/ft) | 0.013514 | Area (sq ft) | | 85.73 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 51.92 | Top Width (ft) | | 51.92 | |
| Vel Total (ft/s) | 5.83 | Avg. Vel. (ft/s) | | 5.83 | |
| Max Chl Dpth (ft) | 2.04 | Hydr. Depth (ft) | | 1.65 | |
| Conv. Total (cfs) | 4301.1 | Conv. (cfs) | | 4301.1 | |
| Length Wtd. (ft) | 199.34 | Wetted Per. (ft) | | 54.62 | |
| Min Ch El (ft) | 993.44 | Shear (lb/sq ft) | | 1.32 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 7.72 | |
| Frctn Loss (ft) | 1.65 | Cum Volume (acre-ft) | 0.24 | 16.92 | 0.47 |
| C & E Loss (ft) | 0.10 | Cum SA (acres) | 0.12 | 9.01 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 995.99 | Element | | | |
| Vel Head (ft) | 0.56 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 995.43 | Reach Len. (ft) | 201.91 | 199.34 | 215.78 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 83.21 | |
| E.G. Slope (ft/ft) | 0.014893 | Area (sq ft) | | 83.21 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 51.92 | Top Width (ft) | | 51.92 | |
| Vel Total (ft/s) | 6.01 | Avg. Vel. (ft/s) | | 6.01 | |
| Max Chl Dpth (ft) | 1.99 | Hydr. Depth (ft) | | 1.60 | |
| Conv. Total (cfs) | 4097.1 | Conv. (cfs) | | 4097.1 | |
| Length Wtd. (ft) | 199.34 | Wetted Per. (ft) | | 54.52 | |
| Min Ch El (ft) | 993.44 | Shear (lb/sq ft) | | 1.42 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 8.53 | |
| Frctn Loss (ft) | 1.57 | Cum Volume (acre-ft) | 6.05 | 14.51 | 0.30 |
| C & E Loss (ft) | 0.11 | Cum SA (acres) | 5.87 | 8.92 | 0.20 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.546

INPUT
Description: 13442.54 - Thalweg Sta. 356.59
Station Elevation Data num= 173

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1003.77 | 1.56 | 1003.73 | 5.07 | 1003.48 | 12.29 | 1003.23 | 12.68 | 1003.21 |
| 13.06 | 1003.2 | 23.81 | 1002.51 | 34.76 | 1001.7 | 34.93 | 1001.69 | 34.99 | 1001.68 |
| 35.11 | 1001.67 | 42.47 | 1001.2 | 46.06 | 1001.16 | 56.47 | 1001.29 | 57.18 | 1001.29 |
| 57.43 | 1001.28 | 57.93 | 1001.24 | 64.9 | 1000.38 | 68.31 | 1000.17 | 72.39 | 999.66 |
| 79.43 | 998.85 | 79.86 | 998.78 | 80.75 | 998.68 | 87.34 | 997.85 | 90.56 | 997.74 |
| 94.82 | 997.63 | 101.68 | 997.49 | 102.3 | 997.51 | 103.57 | 997.46 | 109.78 | 997.37 |
| 112.81 | 997.23 | 117.26 | 997.09 | 123.93 | 996.66 | 124.73 | 996.68 | 126.39 | 996.55 |
| 132.22 | 996.23 | 135.06 | 995.92 | 139.69 | 995.7 | 146.18 | 995.08 | 147.17 | 995.09 |
| 149.21 | 994.96 | 154.65 | 994.78 | 157.31 | 994.57 | 165 | 994.4 | 168.43 | 994.37 |
| 169.61 | 994.38 | 172.03 | 994.37 | 177.09 | 994.37 | 179.56 | 994.31 | 184.57 | 994.32 |
| 190.68 | 994.3 | 192.05 | 994.29 | 194.85 | 994.26 | 199.53 | 994.23 | 201.81 | 994.22 |
| 207 | 994.1 | 212.93 | 994 | 214.49 | 993.96 | 217.67 | 993.9 | 221.96 | 993.81 |
| 224.06 | 993.76 | 235.18 | 993.52 | 236.92 | 993.48 | 240.49 | 993.41 | 244.4 | 993.32 |
| 246.31 | 993.29 | 251.88 | 993.15 | 257.43 | 993.07 | 259.36 | 993.03 | 262.76 | 993 |
| 263.32 | 993 | 266.84 | 992.96 | 268.56 | 992.95 | 274.32 | 992.94 | 279.68 | 992.92 |
| 281.8 | 992.92 | 289.27 | 992.9 | 290.81 | 992.88 | 296.76 | 992.82 | 301.93 | 992.74 |
| 304.23 | 992.7 | 308.95 | 992.71 | 311.71 | 992.7 | 313.06 | 992.71 | 319.19 | 992.74 |
| 324.18 | 992.8 | 326.43 | 992.81 | 326.67 | 992.81 | 334.15 | 992.75 | 335.31 | 992.73 |
| 341.63 | 992.51 | 346.43 | 992.32 | 349.1 | 992.25 | 354.6 | 992.2 | 356.59 | 992.17 |
| 357.56 | 992.17 | 364.06 | 992.28 | 368.68 | 992.42 | 371.54 | 992.5 | 377.41 | 992.62 |
| 379.02 | 992.66 | 379.81 | 992.67 | 386.5 | 992.63 | 390.93 | 992.54 | 393.98 | 992.47 |
| 400.23 | 992.39 | 401.46 | 992.37 | 402.06 | 992.38 | 403.28 | 992.45 | 408.94 | 992.78 |
| 413.18 | 993.14 | 416.42 | 993.43 | 423.05 | 993.95 | 423.9 | 994.01 | 424.31 | 994.03 |
| 431.37 | 994.21 | 435.43 | 994.25 | 435.49 | 994.25 | 446.56 | 994.24 | 453.81 | 994.22 |
| 468.7 | 994.14 | 468.81 | 994.14 | 476.25 | 994.13 | 483.73 | 994.17 | 491.06 | 994.28 |
| 491.21 | 994.28 | 491.51 | 994.29 | 498.69 | 994.42 | 502.18 | 994.47 | 513.31 | 994.66 |
| 513.64 | 994.67 | 514.34 | 994.68 | 535.56 | 995.05 | 537.16 | 995.08 | 557.81 | 995.49 |
| 558.52 | 995.51 | 577.45 | 995.89 | 580.06 | 995.95 | 591.18 | 996.16 | 602.31 | 996.35 |
| 603.39 | 996.37 | 605.62 | 996.4 | 610.87 | 996.48 | 613.43 | 996.51 | 618.35 | 996.59 |
| 624.56 | 996.66 | 628.44 | 996.72 | 633.31 | 996.78 | 646.81 | 997.02 | 648.27 | 997.05 |
| 651.26 | 997.12 | 655.74 | 997.25 | 657.93 | 997.3 | 663.23 | 997.44 | 669.06 | 997.63 |
| 670.7 | 997.67 | 674.08 | 997.86 | 678.18 | 998.05 | 680.18 | 998.26 | 685.66 | 998.71 |
| 691.31 | 999.64 | 693.14 | 999.87 | 696.9 | 1000.62 | 700.62 | 1001.24 | 702.43 | 1001.72 |
| 708.1 | 1002.58 | 713.56 | 1003.52 | 715.58 | 1003.69 | 719.72 | 1004.25 | 723.06 | 1004.43 |
| 724.68 | 1004.44 | 730.53 | 1003.63 | 731.91 | 1003.56 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 262.76 | .04 | 403.28 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 326.43 | 435.49 | 194.56 | 199.9 | 214.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 993.91 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.039 | 0.040 | |
| W.S. Elev (ft) | 993.80 | Reach Len. (ft) | 194.56 | 199.90 | 214.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 78.62 | 114.07 | |
| E.G. Slope (ft/ft) | 0.004335 | Area (sq ft) | 78.62 | 114.07 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 173.67 | 326.33 | |
| Top Width (ft) | 198.68 | Top Width (ft) | 103.99 | 94.69 | |
| Vel Total (ft/s) | 2.59 | Avg. Vel. (ft/s) | 2.21 | 2.86 | |
| Max Chl Dpth (ft) | 1.63 | Hydr. Depth (ft) | 0.76 | 1.20 | |
| Conv. Total (cfs) | 7593.7 | Conv. (cfs) | 2637.6 | 4956.1 | |
| Length Wtd. (ft) | 198.24 | Wetted Per. (ft) | 104.00 | 94.76 | |
| Min Ch El (ft) | 992.17 | Shear (lb/sq ft) | 0.20 | 0.33 | |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.45 | 0.93 | |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 7.99 | 10.83 | 5.89 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 9.22 | 8.52 | 7.07 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 994.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 994.06 | Reach Len. (ft) | 194.56 | 199.90 | 214.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 139.07 | |
| E.G. Slope (ft/ft) | 0.005584 | Area (sq ft) | | 139.07 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 98.97 | Top Width (ft) | | 98.97 | |
| Vel Total (ft/s) | 3.60 | Avg. Vel. (ft/s) | | 3.60 | |
| Max Chl Dpth (ft) | 1.89 | Hydr. Depth (ft) | | 1.41 | |
| Conv. Total (cfs) | 6691.0 | Conv. (cfs) | | 6691.0 | |
| Length Wtd. (ft) | 199.90 | Wetted Per. (ft) | | 100.30 | |
| Min Ch El (ft) | 992.17 | Shear (lb/sq ft) | | 0.48 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.74 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 0.24 | 16.41 | 0.47 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 8.66 | 0.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 994.31 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 994.13 | Reach Len. (ft) | 194.56 | 199.90 | 214.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 145.98 | |
| E.G. Slope (ft/ft) | 0.004851 | Area (sq ft) | | 145.98 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 101.67 | Top Width (ft) | | 101.67 | |
| Vel Total (ft/s) | 3.43 | Avg. Vel. (ft/s) | | 3.43 | |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | | 1.44 | |
| Conv. Total (cfs) | 7178.6 | Conv. (cfs) | | 7178.6 | |
| Length Wtd. (ft) | 199.90 | Wetted Per. (ft) | | 103.07 | |
| Min Ch El (ft) | 992.17 | Shear (lb/sq ft) | | 0.43 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.47 | |
| Frctn Loss (ft) | 1.43 | Cum Volume (acre-ft) | 6.05 | 13.99 | 0.30 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.87 | 8.57 | 0.20 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.508

INPUT
Description: 13242.64 - Thalweg Sta. 356.57
Station Elevation Data num= 171

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1004.02 | 6.49 | 1003.83 | 11.65 | 1003.62 | 13.64 | 1003.55 | 16.3 | 1003.42 |
| 20.78 | 1003.23 | 24.14 | 1003.04 | 27.93 | 1002.88 | 33 | 1002.56 | 35.07 | 1002.47 |
| 36.62 | 1002.42 | 42.22 | 1002.23 | 49.11 | 1002.01 | 49.36 | 1002 | 49.7 | 1001.98 |
| 61.6 | 1001.7 | 63.65 | 1001.58 | 66.4 | 1001.48 | 70.79 | 1001.23 | 74.08 | 1001.19 |
| 77.94 | 1001.1 | 83.1 | 1001.13 | 85.08 | 1001.06 | 86.57 | 1001.03 | 99.05 | 1000.8 |
| 99.37 | 1000.8 | 99.8 | 1000.78 | 106.52 | 1000.4 | 111.54 | 999.84 | 113.66 | 999.66 |
| 120.8 | 998.46 | 124.03 | 997.83 | 127.95 | 996.97 | 133.2 | 995.93 | 135.09 | 995.55 |
| 136.51 | 995.27 | 142.24 | 994.23 | 149 | 994.44 | 149.38 | 994.49 | 149.9 | 994.57 |
| 156.53 | 995.49 | 161.48 | 996.29 | 163.67 | 996.72 | 166.6 | 997.2 | 170.81 | 997.94 |
| 173.97 | 998.42 | 177.96 | 998.94 | 183.3 | 999.48 | 185.1 | 999.68 | 186.45 | 999.79 |
| 192.25 | 999.94 | 198.94 | 999.96 | 199.39 | 999.95 | 200 | 999.82 | 206.54 | 998.29 |
| 211.42 | 997.12 | 223.91 | 993.77 | 233.4 | 992.24 | 235.11 | 992.13 | 242.26 | 991.85 |
| 248.88 | 991.75 | 249.4 | 991.74 | 250.1 | 991.73 | 257.73 | 991.66 | 270.84 | 991.55 |
| 273.86 | 991.52 | 277.98 | 991.47 | 283.5 | 991.38 | 285.12 | 991.35 | 286.34 | 991.36 |
| 292.27 | 991.44 | 298.83 | 991.57 | 299.41 | 991.58 | 300.2 | 991.59 | 306.56 | 991.65 |
| 311.32 | 991.68 | 312.24 | 991.68 | 313.7 | 991.68 | 316.9 | 991.66 | 320.85 | 991.65 |
| 323.8 | 991.63 | 327.99 | 991.58 | 335.14 | 991.4 | 336.29 | 991.35 | 348.78 | 990.6 |
| 349.43 | 990.58 | 350.3 | 990.57 | 356.57 | 990.44 | 361.26 | 990.46 | 363.72 | 990.49 |
| 367 | 990.64 | 370.86 | 990.83 | 373.75 | 991.03 | 378 | 991.31 | 383.57 | 991.8 |
| 383.7 | 991.81 | 385.15 | 991.92 | 386.23 | 992.01 | 392.29 | 992.48 | 399.44 | 992.98 |
| 400.4 | 993 | 406.58 | 993.17 | 411.16 | 993.2 | 413.73 | 993.2 | 417.1 | 993.19 |
| 420.87 | 993.16 | 423.69 | 993.16 | 428.01 | 993.13 | 433.8 | 993.1 | 435.16 | 993.09 |
| 436.17 | 993.08 | 442.3 | 993.01 | 448.66 | 992.92 | 449.45 | 992.91 | 450.5 | 992.89 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 456.59 | 992.79 | 461.15 | 992.67 | 463.74 | 992.62 | 467.2 | 992.52 | 483.9 | 992.16 |
| 485.17 | 992.14 | 486.12 | 992.12 | 492.7 | 992.1 | 498.61 | 992.06 | 499.46 | 992.07 |
| 500.6 | 992.09 | 506.6 | 992.18 | 513.75 | 992.32 | 517.3 | 992.4 | 520.89 | 992.46 |
| 523.58 | 992.52 | 534 | 992.72 | 535.18 | 992.74 | 536.07 | 992.76 | 542.32 | 992.89 |
| 548.55 | 993.04 | 549.47 | 993.07 | 550.7 | 993.1 | 556.61 | 993.38 | 561.04 | 993.64 |
| 563.76 | 993.77 | 567.4 | 993.86 | 570.9 | 994.12 | 573.52 | 994.16 | 578.05 | 994.41 |
| 584.1 | 994.47 | 585.19 | 994.54 | 586.01 | 994.48 | 592.34 | 994.93 | 598.49 | 995.77 |
| 599.48 | 995.94 | 600.8 | 996.24 | 606.62 | 997.32 | 610.98 | 998.12 | 613.77 | 998.81 |
| 617.5 | 999.62 | 620.91 | 1000.27 | 623.46 | 1000.73 | 628.06 | 1001.37 | 634.2 | 1002.59 |
| 635.95 | 1002.82 | 641.15 | 1003.07 | 648.44 | 1003.39 | 649.49 | 1003.41 | 650.9 | 1003.55 |
| 656.63 | 1004.29 | 660.92 | 1004.92 | 663.78 | 1005.21 | 667.6 | 1005.47 | 670.92 | 1005.79 |
| 672.92 | 1005.88 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 257.73 | .04 | 383.57 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 312.24 | 411.16 | 189.62 | 199.54 | 210.02 | .1 | .3 |

Right Levee Station= 411.16 Elevation= 993.2

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.47 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | 0.039 | 0.040 | |
| W.S. Elev (ft) | 992.18 | Reach Len. (ft) | 189.62 | 199.54 | 210.02 |
| Crit W.S. (ft) | 992.12 | Flow Area (sq ft) | 43.48 | 77.96 | |
| E.G. Slope (ft/ft) | 0.014334 | Area (sq ft) | 43.48 | 77.96 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | 138.08 | 361.92 | |
| Top Width (ft) | 154.16 | Top Width (ft) | 77.95 | 76.21 | |
| Vel Total (ft/s) | 4.12 | Avg. Vel. (ft/s) | 3.18 | 4.64 | |
| Max Chl Dpth (ft) | 1.74 | Hydr. Depth (ft) | 0.56 | 1.02 | |
| Conv. Total (cfs) | 4176.2 | Conv. (cfs) | 1153.3 | 3022.9 | |
| Length Wtd. (ft) | 199.95 | Wetted Per. (ft) | 77.96 | 76.30 | |
| Min Ch El (ft) | 990.44 | Shear (lb/sq ft) | 0.50 | 0.91 | |
| Alpha | 1.08 | Stream Power (lb/ft s) | 1.59 | 4.24 | |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | 7.72 | 10.39 | 5.89 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 8.82 | 8.13 | 7.07 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.96 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 992.69 | Reach Len. (ft) | 189.62 | 199.54 | 210.02 |
| Crit W.S. (ft) | 992.26 | Flow Area (sq ft) | | 118.02 | |
| E.G. Slope (ft/ft) | 0.007517 | Area (sq ft) | | 118.02 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 83.00 | Top Width (ft) | | 83.00 | |
| Vel Total (ft/s) | 4.24 | Avg. Vel. (ft/s) | | 4.24 | |
| Max Chl Dpth (ft) | 2.25 | Hydr. Depth (ft) | | 1.42 | |
| Conv. Total (cfs) | 5767.0 | Conv. (cfs) | | 5767.0 | |
| Length Wtd. (ft) | 199.54 | Wetted Per. (ft) | | 84.11 | |
| Min Ch El (ft) | 990.44 | Shear (lb/sq ft) | | 0.66 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.79 | |
| Frctn Loss (ft) | 0.82 | Cum Volume (acre-ft) | 0.24 | 15.82 | 0.47 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.12 | 8.24 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.87 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.37 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 992.50 | Reach Len. (ft) | 189.62 | 199.54 | 210.02 |
| Crit W.S. (ft) | 992.26 | Flow Area (sq ft) | | 102.50 | |

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.011643 | Area (sq ft) | | 102.50 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 80.28 | Top Width (ft) | | 80.28 | |
| Vel Total (ft/s) | 4.88 | Avg. Vel. (ft/s) | | 4.88 | |
| Max Chl Dpth (ft) | 2.06 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 4633.7 | Conv. (cfs) | | 4633.7 | |
| Length Wtd. (ft) | 200.46 | Wetted Per. (ft) | | 81.20 | |
| Min Ch El (ft) | 990.44 | Shear (lb/sq ft) | | 0.92 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.48 | |
| Frctn Loss (ft) | 0.69 | Cum Volume (acre-ft) | 6.05 | 13.42 | 0.30 |
| C & E Loss (ft) | 0.08 | Cum SA (acres) | 5.87 | 8.15 | 0.20 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.470

INPUT
Description: 13043.10 - Thalweg Sta. 305.48
Station Elevation Data num= 164

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1002.05 | 4.56 | 1001.9 | 7.52 | 1001.79 | 10.04 | 1001.73 | 14.61 | 1001.57 |
| 20 | 1001.48 | 21.71 | 1001.43 | 23.16 | 1001.43 | 28.8 | 1001.27 | 35.44 | 1001.25 |
| 36.29 | 1001.25 | 42.99 | 1001.08 | 50.09 | 1000.98 | 50.88 | 1000.98 | 57.18 | 1000.78 |
| 62.54 | 1000.65 | 64.28 | 1000.64 | 66.33 | 1000.64 | 71.37 | 1000.36 | 75.66 | 1000.41 |
| 78.46 | 1000.35 | 81.76 | 1000.46 | 85.56 | 1000.54 | 88.79 | 1000.75 | 92.65 | 1000.78 |
| 97.2 | 1000.94 | 99.75 | 1001.05 | 101.91 | 1001.12 | 106.84 | 1001.13 | 112.64 | 1001.12 |
| 113.93 | 1001.1 | 115.03 | 1001.07 | 121.03 | 1000.83 | 128.08 | 1000.52 | 128.16 | 1000.51 |
| 135.22 | 1000.04 | 141.28 | 999.54 | 142.31 | 999.48 | 143.53 | 999.39 | 149.41 | 998.68 |
| 154.41 | 997.94 | 156.5 | 997.68 | 158.96 | 997.43 | 163.59 | 996.68 | 167.53 | 996.15 |
| 170.69 | 995.89 | 174.41 | 995.62 | 177.78 | 995.31 | 180.66 | 995.03 | 184.25 | 994.79 |
| 184.88 | 994.75 | 189.84 | 993.92 | 191.97 | 993.72 | 193.78 | 993.33 | 199.07 | 992.22 |
| 205.29 | 990.99 | 206.16 | 990.95 | 206.91 | 990.91 | 213.25 | 990.55 | 220.35 | 990.11 |
| 220.73 | 990.09 | 227.44 | 989.97 | 233.15 | 990.07 | 234.54 | 990.08 | 236.17 | 990.12 |
| 241.63 | 990.22 | 246.28 | 990.25 | 248.73 | 990.27 | 249.01 | 990.27 | 255.82 | 990.24 |
| 267.05 | 990.14 | 270.01 | 990.12 | 272.53 | 990.09 | 277.1 | 990.05 | 282.49 | 989.97 |
| 284.2 | 989.95 | 285.65 | 989.91 | 297.92 | 989.62 | 298.39 | 989.6 | 298.78 | 989.6 |
| 305.48 | 989.54 | 311.9 | 989.67 | 312.57 | 989.68 | 313.37 | 989.72 | 325.03 | 990.14 |
| 326.76 | 990.18 | 328.81 | 990.19 | 333.79 | 990.24 | 333.86 | 990.24 | 338.15 | 990.22 |
| 339.13 | 990.22 | 340.95 | 990.22 | 344.25 | 990.21 | 348.05 | 990.23 | 351.27 | 990.22 |
| 355.14 | 990.23 | 364.4 | 990.23 | 369.33 | 990.26 | 375.13 | 990.26 | 376.42 | 990.27 |
| 377.52 | 990.27 | 383.52 | 990.3 | 390.57 | 990.32 | 390.65 | 990.32 | 397.71 | 990.36 |
| 403.77 | 990.37 | 404.8 | 990.37 | 406.01 | 990.38 | 411.9 | 990.4 | 416.9 | 990.4 |
| 418.99 | 990.41 | 426.08 | 990.41 | 436.9 | 990.38 | 440.27 | 990.36 | 443.15 | 990.36 |
| 447.37 | 990.34 | 454.46 | 990.34 | 456.27 | 990.35 | 461.56 | 990.34 | 467.78 | 990.37 |
| 468.65 | 990.36 | 469.39 | 990.37 | 475.74 | 990.37 | 482.52 | 990.4 | 483.21 | 990.4 |
| 489.93 | 990.42 | 495.64 | 990.47 | 497.03 | 990.48 | 498.65 | 990.5 | 504.12 | 990.55 |
| 532.5 | 990.94 | 544.98 | 991.14 | 546.69 | 991.16 | 548.14 | 991.19 | 553.78 | 991.29 |
| 560.87 | 991.44 | 561.27 | 991.45 | 567.97 | 991.65 | 574.39 | 991.92 | 575.06 | 991.95 |
| 575.86 | 992.02 | 582.16 | 992.58 | 587.51 | 993.29 | 589.25 | 993.51 | 591.3 | 993.83 |
| 596.35 | 994.55 | 600.64 | 995.24 | 603.44 | 995.67 | 606.74 | 996.34 | 610.53 | 996.99 |
| 613.76 | 997.65 | 617.63 | 998.46 | 622.18 | 999.55 | 624.72 | 999.97 | 626.89 | 1000.29 |
| 631.82 | 1001.05 | 638.91 | 1002.09 | 640.01 | 1002.24 | 653.06 | 1003.96 | 653.14 | 1003.97 |
| 660.2 | 1005 | 666.26 | 1005.68 | 667.29 | 1005.79 | 667.59 | 1005.82 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 184.25 | .04 | 339.13 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 249.01 | 333.79 | 210.99 | 198 | 181.58 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.08 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.040 | 0.040 | 0.035 |
| W.S. Elev (ft) | 991.02 | Reach Len. (ft) | 210.99 | 198.00 | 181.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 32.51 | 89.52 | 122.52 |
| E.G. Slope (ft/ft) | 0.003780 | Area (sq ft) | 32.51 | 89.52 | 122.52 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 60.80 | 211.97 | 227.23 |
| Top Width (ft) | 332.02 | Top Width (ft) | 43.85 | 84.78 | 203.39 |

| | | | | | |
|---|---|---|---|---|---|
| Vel Total (ft/s) | 2.04 | Avg. Vel. (ft/s) | 1.87 | 2.37 | 1.85 |
| Max Chl Dpth (ft) | 1.48 | Hydr. Depth (ft) | 0.74 | 1.06 | 0.60 |
| Conv. Total (cfs) | 8132.4 | Conv. (cfs) | 988.9 | 3447.6 | 3695.8 |
| Length Wtd. (ft) | 188.80 | Wetted Per. (ft) | 43.88 | 84.80 | 203.40 |
| Min Ch El (ft) | 989.54 | Shear (lb/sq ft) | 0.17 | 0.25 | 0.14 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.33 | 0.59 | 0.26 |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 7.55 | 10.00 | 5.59 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 8.55 | 7.76 | 6.57 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.11 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.13 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 991.98 | Reach Len. (ft) | 210.99 | 198.00 | 181.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 171.01 | |
| E.G. Slope (ft/ft) | 0.002564 | Area (sq ft) | | 171.01 | |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 500.00 | |
| Top Width (ft) | 84.78 | Top Width (ft) | | 84.78 | |
| Vel Total (ft/s) | 2.92 | Avg. Vel. (ft/s) | | 2.92 | |
| Max Chl Dpth (ft) | 2.44 | Hydr. Depth (ft) | | 2.02 | |
| Conv. Total (cfs) | 9874.9 | Conv. (cfs) | | 9874.9 | |
| Length Wtd. (ft) | 195.61 | Wetted Per. (ft) | | 88.24 | |
| Min Ch El (ft) | 989.54 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.91 | |
| Frctn Loss (ft) | 0.87 | Cum Volume (acre-ft) | 0.24 | 15.15 | 0.47 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.12 | 7.86 | 0.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 992.09 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.040 | 0.036 |
| W.S. Elev (ft) | 992.01 | Reach Len. (ft) | 210.99 | 198.00 | 181.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 173.66 | 38.10 |
| E.G. Slope (ft/ft) | 0.001613 | Area (sq ft) | | 173.66 | 38.10 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 412.25 | 87.75 |
| Top Width (ft) | 106.13 | Top Width (ft) | | 84.78 | 21.35 |
| Vel Total (ft/s) | 2.36 | Avg. Vel. (ft/s) | | 2.37 | 2.30 |
| Max Chl Dpth (ft) | 2.47 | Hydr. Depth (ft) | | 2.05 | 1.78 |
| Conv. Total (cfs) | 12447.8 | Conv. (cfs) | | 10263.3 | 2184.5 |
| Length Wtd. (ft) | 194.96 | Wetted Per. (ft) | | 86.53 | 23.13 |
| Min Ch El (ft) | 989.54 | Shear (lb/sq ft) | | 0.20 | 0.17 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.48 | 0.38 |
| Frctn Loss (ft) | 0.63 | Cum Volume (acre-ft) | 6.05 | 12.78 | 0.21 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 5.87 | 7.77 | 0.15 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.433

INPUT
Description: 12845.10 - Thalweg Sta. 275.73
Station Elevation Data num= 152

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 989.97 | 4.04 | 990.08 | 6.73 | 990.16 | 12.21 | 990.42 | 14.2 | 990.49 |
| 15.18 | 990.53 | 21.68 | 991.01 | 26.32 | 991.96 | 29.15 | 992.44 | 34.9 | 993.91 |
| 36.62 | 994.28 | 37.46 | 994.54 | 51.57 | 998.05 | 57.59 | 999.28 | 59.04 | 999.51 |
| 59.74 | 999.61 | 66.51 | 1000.1 | 70.88 | 1000.35 | 73.98 | 1000.36 | 80.29 | 1000.39 |
| 81.45 | 1000.38 | 82.02 | 1000.39 | 88.93 | 1000.31 | 93.16 | 1000.29 | 96.4 | 1000.24 |
| 102.98 | 1000.09 | 103.87 | 1000.08 | 104.3 | 1000.06 | 111.34 | 999.89 | 115.44 | 999.73 |
| 118.81 | 999.63 | 125.68 | 999.36 | 126.28 | 999.34 | 126.58 | 999.32 | 133.76 | 998.99 |
| 141.23 | 998.56 | 148.37 | 998.18 | 148.7 | 998.15 | 148.86 | 998.14 | 156.17 | 997.54 |
| 160 | 997.32 | 163.64 | 997.1 | 171.06 | 997.13 | 171.15 | 997.13 | 178.59 | 997 |
| 182.29 | 997.03 | 186.06 | 996.96 | 193.42 | 997.07 | 193.53 | 997.07 | 193.76 | 997.08 |
| 204.56 | 997.21 | 214.57 | 997.87 | 214.99 | 997.9 | 215.7 | 997.94 | 215.95 | 997.95 |
| 216.45 | 997.99 | 223.42 | 998.36 | 226.84 | 998.68 | 230.89 | 998.74 | 237.98 | 999.51 |
| 238.2 | 999.51 | 238.36 | 999.51 | 239.14 | 999.28 | 245.84 | 997.11 | 249.12 | 996.17 |
| 253.31 | 994.63 | 260.26 | 992.24 | 260.78 | 992.04 | 261.83 | 991.64 | 268.25 | 989.24 |
| 271.41 | 988.65 | 275.73 | 988.08 | 282.55 | 988.56 | 283.2 | 988.62 | 284.53 | 988.74 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 290.67 | 989.33 | 293.69 | 989.48 | 298.14 | 989.65 | 302.06 | 989.67 | 304.82 | 989.68 |
| 305.61 | 989.67 | 307.22 | 989.67 | 327.1 | 989.54 | 328.03 | 989.53 | 329.91 | 989.52 |
| 335.5 | 989.48 | 349.38 | 989.42 | 350.44 | 989.42 | 352.6 | 989.41 | 357.92 | 989.4 |
| 360.52 | 989.4 | 371.66 | 989.38 | 375.3 | 989.38 | 380.33 | 989.37 | 387.8 | 989.34 |
| 393.95 | 989.33 | 395.28 | 989.32 | 397.99 | 989.32 | 402.75 | 989.29 | 405.09 | 989.28 |
| 410.22 | 989.24 | 416.22 | 989.24 | 417.69 | 989.23 | 420.68 | 989.22 | 425.17 | 989.18 |
| 427.36 | 989.18 | 432.63 | 989.14 | 438.5 | 989.12 | 439.36 | 989.11 | 440.11 | 989.11 |
| 449.64 | 989.07 | 460.78 | 989.08 | 462.52 | 989.1 | 466.07 | 989.12 | 470 | 989.15 |
| 471.92 | 989.16 | 494.2 | 989.4 | 505.34 | 989.54 | 507.36 | 989.57 | 514.83 | 989.72 |
| 516.49 | 989.75 | 522.3 | 989.9 | 527.62 | 990.07 | 529.77 | 990.12 | 534.15 | 990.27 |
| 538.76 | 990.44 | 544.71 | 990.63 | 549.9 | 990.85 | 552.19 | 990.93 | 556.84 | 991.13 |
| 559.66 | 991.24 | 561.04 | 991.3 | 567.13 | 991.61 | 572.18 | 991.94 | 574.6 | 992.17 |
| 579.53 | 992.87 | 582.08 | 993.18 | 583.32 | 993.37 | 589.55 | 994.58 | 594.46 | 995.7 |
| 597.02 | 996.24 | 602.23 | 997.52 | 604.49 | 998 | 605.6 | 998.25 | 611.96 | 999.56 |
| 616.74 | 1000.68 | 619.44 | 1001.25 | 624.92 | 1002.5 | 626.91 | 1002.88 | 627.88 | 1003.08 |
| 634.38 | 1004.24 | 638.61 | 1004.97 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 214.57 | .04 | 439.36 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 238.2 | 302.06 | 198.29 | 200.12 | 206 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 990.18 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.035 | 0.040 | 0.038 |
| W.S. Elev (ft) | 990.08 | Reach Len. (ft) | 198.29 | 200.12 | 206.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.21 | 39.04 | 157.90 |
| E.G. Slope (ft/ft) | 0.006083 | Area (sq ft) | 0.21 | 39.04 | 157.90 |
| Q Total (cfs) | 500.00 | Flow (cfs) | 0.10 | 118.61 | 381.29 |
| Top Width (ft) | 265.80 | Top Width (ft) | 3.91 | 36.05 | 225.84 |
| Vel Total (ft/s) | 2.54 | Avg. Vel. (ft/s) | 0.46 | 3.04 | 2.41 |
| Max Chl Dpth (ft) | 2.00 | Hydr. Depth (ft) | 0.05 | 1.08 | 0.70 |
| Conv. Total (cfs) | 6410.9 | Conv. (cfs) | 1.2 | 1520.8 | 4888.9 |
| Length Wtd. (ft) | 203.68 | Wetted Per. (ft) | 4.02 | 36.35 | 225.85 |
| Min Ch El (ft) | 988.08 | Shear (lb/sq ft) | 0.02 | 0.41 | 0.27 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.01 | 1.24 | 0.64 |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | 7.47 | 9.71 | 5.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 8.44 | 7.49 | 5.68 |

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.22 | Element | | | |
| Vel Head (ft) | 0.38 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 990.84 | Reach Len. (ft) | 198.29 | 200.12 | 206.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 67.38 | 35.87 |
| E.G. Slope (ft/ft) | 0.009529 | Area (sq ft) | | 67.38 | 35.87 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 354.67 | 145.33 |
| Top Width (ft) | 67.14 | Top Width (ft) | | 38.09 | 29.04 |
| Vel Total (ft/s) | 4.84 | Avg. Vel. (ft/s) | | 5.26 | 4.05 |
| Max Chl Dpth (ft) | 2.76 | Hydr. Depth (ft) | | 1.77 | 1.24 |
| Conv. Total (cfs) | 5122.1 | Conv. (cfs) | | 3633.3 | 1488.8 |
| Length Wtd. (ft) | 200.72 | Wetted Per. (ft) | | 38.53 | 30.37 |
| Min Ch El (ft) | 988.08 | Shear (lb/sq ft) | | 1.04 | 0.70 |
| Alpha | 1.04 | Stream Power (lb/ft s) | | 5.48 | 2.85 |
| Frctn Loss (ft) | 1.42 | Cum Volume (acre-ft) | 0.24 | 14.61 | 0.39 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 0.12 | 7.58 | 0.24 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 991.42 | Element | | | |
| Vel Head (ft) | 0.44 | Wt. n-Val. | | 0.040 | 0.040 |
| W.S. Elev (ft) | 990.98 | Reach Len. (ft) | 198.29 | 200.12 | 206.00 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | | 72.84 | 23.11 |
| E.G. Slope (ft/ft) | 0.009618 | Area (sq ft) | | 72.84 | 23.11 |
| Q Total (cfs) | 500.00 | Flow (cfs) | | 402.84 | 97.16 |
| Top Width (ft) | 55.71 | Top Width (ft) | | 38.47 | 17.24 |
| Vel Total (ft/s) | 5.21 | Avg. Vel. (ft/s) | | 5.53 | 4.21 |
| Max Chl Dpth (ft) | 2.90 | Hydr. Depth (ft) | | 1.89 | 1.34 |
| Conv. Total (cfs) | 5098.3 | Conv. (cfs) | | 4107.6 | 990.7 |
| Length Wtd. (ft) | 200.46 | Wetted Per. (ft) | | 38.94 | 18.63 |
| Min Ch El (ft) | 988.08 | Shear (lb/sq ft) | | 1.12 | 0.74 |
| Alpha | 1.03 | Stream Power (lb/ft s) | | 6.21 | 3.13 |
| Frctn Loss (ft) | 1.92 | Cum Volume (acre-ft) | 6.05 | 12.22 | 0.08 |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 5.87 | 7.49 | 0.07 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.395

INPUT
Description: 12644.98 - Thalweg Sta. 146.58 - Discharge from A2-100y6h.out
HEC-1 Model Sub-basin A1 Routed to 1R - 929 CFS
Station Elevation Data num= 145

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 989.72 | 4.82 | 990.34 | 6.63 | 990.59 | 7.62 | 990.72 | 19.02 | 992.68 |
| 21.36 | 993.07 | 25.63 | 993.81 | 30.43 | 994.66 | 36.09 | 995.56 | 41.83 | 996.5 |
| 43.46 | 996.68 | 46.42 | 996.84 | 50.82 | 997.13 | 53.24 | 996.95 | 58.19 | 996.84 |
| 64.64 | 995.76 | 65.56 | 995.53 | 67.22 | 995.17 | 72.92 | 993.8 | 76.05 | 993.17 |
| 80.29 | 992.02 | 87.45 | 990.38 | 87.65 | 990.33 | 88.01 | 990.25 | 92.92 | 989.11 |
| 95.02 | 988.62 | 98.86 | 988.39 | 102.38 | 988.01 | 108.81 | 987.76 | 109.75 | 987.73 |
| 109.82 | 987.73 | 110.26 | 987.73 | 117.12 | 987.63 | 121.67 | 987.58 | 124.48 | 987.54 |
| 131.84 | 987.37 | 133.07 | 987.32 | 139.21 | 986.98 | 144.48 | 986.87 | 146.58 | 986.85 |
| 150.41 | 987.17 | 153.94 | 987.43 | 155.88 | 987.54 | 161.31 | 987.65 | 167.29 | 987.57 |
| 168.68 | 987.54 | 171.2 | 987.43 | 176.04 | 987.26 | 178.69 | 987.12 | 183.41 | 987.08 |
| 190.1 | 986.93 | 190.77 | 986.94 | 198.14 | 987.12 | 201.5 | 987.18 | 205.5 | 987.29 |
| 212.79 | 987.54 | 212.91 | 987.54 | 220.23 | 987.65 | 224.31 | 987.74 | 224.46 | 987.74 |
| 227.6 | 987.73 | 233.6 | 987.74 | 235.72 | 987.74 | 242.33 | 987.69 | 247.12 | 987.67 |
| 264.43 | 987.55 | 269.93 | 987.52 | 271.79 | 987.5 | 286.53 | 987.42 | 292.74 | 987.4 |
| 293.89 | 987.39 | 301.26 | 987.39 | 308.62 | 987.41 | 315.55 | 987.48 | 315.99 | 987.48 |
| 316.78 | 987.49 | 323.35 | 987.54 | 326.96 | 987.56 | 330.72 | 987.57 | 337.59 | 987.6 |
| 338.37 | 987.6 | 345.45 | 987.58 | 349.77 | 987.58 | 352.82 | 987.57 | 356 | 987.58 |
| 361.17 | 987.58 | 372.58 | 987.61 | 374.92 | 987.62 | 379.18 | 987.68 | 382.28 | 987.73 |
| 383.98 | 987.77 | 389.65 | 987.89 | 395.39 | 988 | 397.01 | 988.04 | 399.97 | 988.1 |
| 404.38 | 988.21 | 406.79 | 988.25 | 411.74 | 988.36 | 418.2 | 988.45 | 420.77 | 988.48 |
| 426.48 | 988.57 | 429.6 | 988.64 | 433.84 | 988.75 | 441.01 | 988.96 | 441.2 | 988.97 |
| 441.57 | 988.98 | 448.57 | 989.31 | 452.41 | 989.5 | 455.94 | 989.69 | 462.37 | 990.05 |
| 463.3 | 990.11 | 463.82 | 990.14 | 470.67 | 990.59 | 475.22 | 990.92 | 478.04 | 991.14 |
| 483.16 | 991.57 | 485.4 | 991.78 | 486.63 | 991.92 | 492.77 | 992.77 | 498.03 | 993.38 |
| 500.13 | 993.75 | 503.96 | 994.48 | 507.5 | 995.25 | 509.44 | 995.59 | 514.86 | 996.89 |
| 520.84 | 998.29 | 522.23 | 998.65 | 532.25 | 1001.22 | 536.96 | 1002.36 | 543.65 | 1003.87 |
| 544.33 | 1004.01 | 545.56 | 1004.07 | 551.69 | 1004.74 | 555.06 | 1004.78 | 566.35 | 1003.77 |
| 566.42 | 1003.76 | 573.79 | 1002.51 | 577.87 | 1001.85 | 581.16 | 1001.28 | 587.15 | 1000.34 |
| 589.27 | 1000.03 | 595.89 | 999.16 | 600.68 | 998.75 | 603.25 | 999.23 | 603.38 | 999.23 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .052 | 6.63 | .035 | 92.92 | .052 | 356 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 109.82 | 224.46 | 180.38 | 172.66 | 154.99 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.73 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.052 | 0.052 | 0.048 |
| W.S. Elev (ft) | 988.60 | Reach Len. (ft) | 180.38 | 172.66 | 154.99 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 7.30 | 145.00 | 183.41 |
| E.G. Slope (ft/ft) | 0.007884 | Area (sq ft) | 7.30 | 145.00 | 183.41 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 11.69 | 430.10 | 487.21 |
| Top Width (ft) | 332.73 | Top Width (ft) | 14.54 | 114.64 | 203.55 |
| Vel Total (ft/s) | 2.77 | Avg. Vel. (ft/s) | 1.60 | 2.97 | 2.66 |
| Max Chl Dpth (ft) | 1.75 | Hydr. Depth (ft) | 0.50 | 1.26 | 0.90 |
| Conv. Total (cfs) | 10462.9 | Conv. (cfs) | 131.6 | 4844.1 | 5487.3 |

| | | | | | |
|---|---|---|---|---|---|
| Length Wtd. (ft) | 164.87 | Wetted Per. (ft) | 14.57 | 114.70 | 203.56 |
| Min Ch El (ft) | 986.85 | Shear (lb/sq ft) | 0.25 | 0.62 | 0.44 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.39 | 1.85 | 1.18 |
| Frctn Loss (ft) | 1.17 | Cum Volume (acre-ft) | 7.45 | 9.29 | 4.20 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 8.39 | 7.14 | 4.67 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.74 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 989.53 | Reach Len. (ft) | 180.38 | 172.66 | 154.99 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 251.05 | |
| E.G. Slope (ft/ft) | 0.006149 | Area (sq ft) | | 251.05 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 114.64 | Top Width (ft) | | 114.64 | |
| Vel Total (ft/s) | 3.70 | Avg. Vel. (ft/s) | | 3.70 | |
| Max Chl Dpth (ft) | 2.68 | Hydr. Depth (ft) | | 2.19 | |
| Conv. Total (cfs) | 11847.5 | Conv. (cfs) | | 11847.5 | |
| Length Wtd. (ft) | 169.99 | Wetted Per. (ft) | | 118.29 | |
| Min Ch El (ft) | 986.85 | Shear (lb/sq ft) | | 0.81 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.01 | |
| Frctn Loss (ft) | 1.19 | Cum Volume (acre-ft) | 0.24 | 13.88 | 0.31 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 7.23 | 0.18 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 989.45 | Element | | | |
| Vel Head (ft) | 0.26 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 989.19 | Reach Len. (ft) | 180.38 | 172.66 | 154.99 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 16.64 | 212.00 | |
| E.G. Slope (ft/ft) | 0.009530 | Area (sq ft) | 16.64 | 212.00 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 45.74 | 883.26 | |
| Top Width (ft) | 131.88 | Top Width (ft) | 17.24 | 114.64 | |
| Vel Total (ft/s) | 4.06 | Avg. Vel. (ft/s) | 2.75 | 4.17 | |
| Max Chl Dpth (ft) | 2.34 | Hydr. Depth (ft) | 0.97 | 1.85 | |
| Conv. Total (cfs) | 9516.2 | Conv. (cfs) | 468.5 | 9047.7 | |
| Length Wtd. (ft) | 175.07 | Wetted Per. (ft) | 17.34 | 116.15 | |
| Min Ch El (ft) | 986.85 | Shear (lb/sq ft) | 0.57 | 1.09 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 1.57 | 4.52 | |
| Frctn Loss (ft) | 1.46 | Cum Volume (acre-ft) | 6.02 | 11.57 | 0.03 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 5.84 | 7.14 | 0.03 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.362

INPUT
Description: 12472.32 - Thalweg Sta. 204.15
Station Elevation Data num= 118

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 993.78 | 2.33 | 993.41 | 6.92 | 992.69 | 7.77 | 992.52 | 10.95 | 991.98 |
| 15.93 | 991.08 | 17.27 | 990.86 | 24.1 | 989.58 | 27.62 | 989.02 | 32.26 | 988.25 |
| 37.97 | 987.53 | 47.86 | 986.99 | 48.33 | 986.95 | 49.59 | 986.93 | 56.76 | 986.85 |
| 58.68 | 986.84 | 69.03 | 986.74 | 79.39 | 986.59 | 88.23 | 986.35 | 89.42 | 986.32 |
| 97.59 | 986.07 | 100.09 | 986 | 105.75 | 985.97 | 110.44 | 985.97 | 113.91 | 986.08 |
| 120.8 | 986.27 | 122.08 | 986.32 | 126.86 | 986.47 | 130.25 | 986.59 | 131.15 | 986.61 |
| 138.41 | 986.76 | 141.5 | 986.8 | 151.86 | 986.82 | 162.21 | 986.79 | 165.51 | 986.79 |
| 171.07 | 986.78 | 172.56 | 986.78 | 187.4 | 986.76 | 193.27 | 986.77 | 204.15 | 986.77 |
| 213.97 | 986.73 | 215.04 | 986.71 | 220.06 | 986.64 | 224.32 | 986.54 | 228.23 | 986.34 |
| 234.68 | 985.99 | 236.39 | 986.06 | 242.78 | 986.39 | 244.55 | 986.49 | 245.03 | 986.5 |
| 252.72 | 986.79 | 255.38 | 986.88 | 260.89 | 986.88 | 265.74 | 986.89 | 269.05 | 986.88 |
| 276.09 | 986.83 | 277.22 | 986.83 | 285.38 | 986.77 | 286.44 | 986.76 | 293.54 | 986.75 |
| 296.79 | 986.74 | 309.88 | 986.75 | 317.5 | 986.77 | 321.1 | 986.77 | 327.85 | 986.77 |
| 334.37 | 986.74 | 338.21 | 986.74 | 342.53 | 986.67 | 348.56 | 986.6 | 350.7 | 986.55 |
| 358.7 | 986.38 | 358.91 | 986.38 | 369.26 | 986.14 | 375.2 | 986.04 | 379.62 | 985.95 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 383.36 | 985.98 | 389.97 | 985.9 | 391.52 | 985.92 | 397.34 | 985.92 | 399.69 | 985.93 |
| 400.32 | 985.94 | 407.86 | 986 | 410.67 | 986.03 | 421.03 | 986.11 | 424.18 | 986.13 |
| 431.38 | 986.19 | 432.35 | 986.2 | 448.68 | 986.34 | 456.85 | 986.43 | 465.01 | 986.55 |
| 469.12 | 986.63 | 472.79 | 986.71 | 473.17 | 986.71 | 474.61 | 986.76 | 481.34 | 986.98 |
| 483.14 | 987.1 | 489.51 | 987.47 | 493.5 | 987.85 | 497.67 | 988.12 | 503.85 | 988.66 |
| 505.84 | 988.79 | 513.25 | 989.44 | 514 | 989.51 | 514.2 | 989.54 | 522.16 | 990.36 |
| 524.56 | 990.6 | 534.91 | 991.71 | 538.5 | 992.14 | 545.26 | 992.89 | 546.66 | 993.09 |
| 551.89 | 993.9 | 554.83 | 994.4 | 555.61 | 994.54 | 562.99 | 996.05 | 565.96 | 996.65 |
| 571.15 | 997.74 | 579.32 | 999.38 | 582.76 | 1000.03 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 2.33 | .052 | 469.12 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 215.04 | 321.1 | 226.02 | 199.92 | 185.88 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.55 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.052 | 0.052 | 0.051 |
| W.S. Elev (ft) | 987.47 | Reach Len. (ft) | 226.02 | 199.92 | 185.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 146.30 | 84.91 | 184.63 |
| E.G. Slope (ft/ft) | 0.006391 | Area (sq ft) | 146.30 | 84.91 | 184.63 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 295.47 | 167.19 | 466.33 |
| Top Width (ft) | 450.38 | Top Width (ft) | 175.94 | 106.06 | 168.38 |
| Vel Total (ft/s) | 2.23 | Avg. Vel. (ft/s) | 2.02 | 1.97 | 2.53 |
| Max Chl Dpth (ft) | 1.57 | Hydr. Depth (ft) | 0.83 | 0.80 | 1.10 |
| Conv. Total (cfs) | 11620.8 | Conv. (cfs) | 3696.0 | 2091.4 | 5833.3 |
| Length Wtd. (ft) | 204.67 | Wetted Per. (ft) | 175.98 | 106.10 | 168.42 |
| Min Ch El (ft) | 985.99 | Shear (lb/sq ft) | 0.33 | 0.32 | 0.44 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.67 | 0.63 | 1.10 |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 7.14 | 8.83 | 3.55 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 8.00 | 6.70 | 4.00 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 988.55 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 988.35 | Reach Len. (ft) | 226.02 | 199.92 | 185.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.63 | 177.98 | 78.19 |
| E.G. Slope (ft/ft) | 0.008051 | Area (sq ft) | 1.63 | 177.98 | 78.19 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 3.04 | 644.29 | 281.67 |
| Top Width (ft) | 151.89 | Top Width (ft) | 1.00 | 106.06 | 44.82 |
| Vel Total (ft/s) | 3.60 | Avg. Vel. (ft/s) | 1.87 | 3.62 | 3.60 |
| Max Chl Dpth (ft) | 2.45 | Hydr. Depth (ft) | 1.63 | 1.68 | 1.74 |
| Conv. Total (cfs) | 10353.5 | Conv. (cfs) | 33.9 | 7180.5 | 3139.1 |
| Length Wtd. (ft) | 197.83 | Wetted Per. (ft) | 2.62 | 106.10 | 46.96 |
| Min Ch El (ft) | 985.99 | Shear (lb/sq ft) | 0.31 | 0.84 | 0.84 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.58 | 3.05 | 3.01 |
| Frctn Loss (ft) | 1.33 | Cum Volume (acre-ft) | 0.23 | 13.03 | 0.17 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 6.79 | 0.10 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.95 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 987.83 | Reach Len. (ft) | 226.02 | 199.92 | 185.88 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 210.81 | 123.35 | 7.76 |
| E.G. Slope (ft/ft) | 0.007381 | Area (sq ft) | 210.81 | 123.35 | 7.76 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 576.06 | 334.85 | 18.09 |
| Top Width (ft) | 292.83 | Top Width (ft) | 179.46 | 106.06 | 7.31 |
| Vel Total (ft/s) | 2.72 | Avg. Vel. (ft/s) | 2.73 | 2.71 | 2.33 |
| Max Chl Dpth (ft) | 1.86 | Hydr. Depth (ft) | 1.17 | 1.16 | 1.06 |
| Conv. Total (cfs) | 10812.9 | Conv. (cfs) | 6704.9 | 3897.4 | 210.6 |
| Length Wtd. (ft) | 214.86 | Wetted Per. (ft) | 179.51 | 106.10 | 8.37 |
| Min Ch El (ft) | 985.99 | Shear (lb/sq ft) | 0.54 | 0.54 | 0.43 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.48 | 1.45 | 1.00 |
| Frctn Loss (ft) | 1.58 | Cum Volume (acre-ft) | 5.54 | 10.91 | 0.02 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.43 | 6.70 | 0.02 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.324

INPUT
Description: 12272.40 - Thalweg Sta. 458.08
Station Elevation Data num= 142

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 994.34 | 1.86 | 994.01 | 9.89 | 992.36 | 10.18 | 992.31 | 11.41 | 992.06 |
| 18.5 | 990.73 | 20.16 | 990.62 | 26.82 | 989.87 | 30.44 | 989.53 | 35.14 | 989.25 |
| 40.71 | 988.67 | 43.45 | 988.52 | 50.98 | 987.88 | 51.77 | 987.85 | 55.14 | 987.67 |
| 60.09 | 987.47 | 61.25 | 987.38 | 68.41 | 987.17 | 71.53 | 987.03 | 76.72 | 986.91 |
| 81.8 | 986.76 | 85.04 | 986.71 | 92.07 | 986.53 | 93.36 | 986.51 | 98.88 | 986.41 |
| 112.61 | 986.2 | 118.32 | 986.13 | 133.16 | 986.01 | 142.61 | 985.95 | 143.28 | 985.94 |
| 143.43 | 985.94 | 151.6 | 985.89 | 153.7 | 985.88 | 163.27 | 985.82 | 163.98 | 985.81 |
| 174.25 | 985.74 | 184.52 | 985.65 | 184.87 | 985.65 | 186.34 | 985.63 | 193.18 | 985.57 |
| 194.79 | 985.55 | 205.06 | 985.44 | 230.07 | 985.16 | 234.77 | 985.1 | 235.88 | 985.09 |
| 251.41 | 984.89 | 256.43 | 984.84 | 259.73 | 984.8 | 266.7 | 984.77 | 268.04 | 984.76 |
| 273.8 | 984.77 | 277.95 | 984.77 | 291.37 | 984.83 | 297.51 | 984.88 | 301.32 | 984.93 |
| 317.52 | 985.04 | 318.7 | 985.04 | 327.72 | 985.13 | 328.08 | 985.13 | 329.62 | 985.14 |
| 337.61 | 985.18 | 338.08 | 985.18 | 347.5 | 985.1 | 348.08 | 985.09 | 357.4 | 984.9 |
| 358.08 | 984.89 | 367.29 | 984.73 | 368.08 | 984.72 | 377.19 | 984.67 | 378.08 | 984.67 |
| 387.08 | 984.85 | 388.08 | 984.88 | 396.97 | 985.09 | 398.08 | 985.12 | 406.87 | 985.24 |
| 408.08 | 985.26 | 416.76 | 985.37 | 418.08 | 985.38 | 426.65 | 985.46 | 428.08 | 985.47 |
| 436.55 | 985.44 | 438.08 | 985.45 | 446.44 | 985.12 | 448.08 | 985.08 | 456.34 | 985.25 |
| 458.08 | 985.25 | 466.23 | 985.51 | 468.08 | 985.56 | 476.12 | 985.58 | 478.08 | 985.59 |
| 482.89 | 985.52 | 486.03 | 985.48 | 488.09 | 985.45 | 495.92 | 985.37 | 498.09 | 985.34 |
| 528.09 | 985.1 | 535.5 | 985.06 | 538.09 | 985.05 | 545.39 | 985.1 | 548.09 | 985.13 |
| 555.28 | 985.24 | 558.09 | 985.29 | 565.18 | 985.4 | 568.09 | 985.45 | 588.09 | 985.77 |
| 593.02 | 985.89 | 594.86 | 985.93 | 598.09 | 986.01 | 604.75 | 986.22 | 608.09 | 986.34 |
| 614.65 | 986.59 | 618.09 | 986.73 | 624.54 | 986.94 | 628.09 | 987.12 | 634.43 | 987.31 |
| 644.33 | 987.64 | 648.09 | 987.71 | 654.22 | 988.18 | 658.1 | 988.26 | 664.12 | 989.22 |
| 668.1 | 989.39 | 674.02 | 990.37 | 678.1 | 990.84 | 683.91 | 991.57 | 688.1 | 991.98 |
| 693.81 | 992.52 | 698.1 | 992.87 | 703.7 | 993.1 | 708.1 | 993.25 | 713.59 | 993.02 |
| 718.1 | 992.81 | 722.71 | 992.89 | 728.1 | 992.49 | 733.38 | 991.96 | 738.1 | 992.79 |
| 743.27 | 993.52 | 748.1 | 994.57 | 753.17 | 995.63 | 758.1 | 996.73 | 763.06 | 997.88 |
| 768.1 | 998.94 | 770.15 | 999.42 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 163.27 | .052 | 593.02 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 329.62 | 482.89 | 207.24 | 199.58 | 241.24 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 986.25 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 986.17 | Reach Len. (ft) | 207.24 | 199.58 | 241.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 178.07 | 153.79 | 94.00 |
| E.G. Slope (ft/ft) | 0.006229 | Area (sq ft) | 178.07 | 153.79 | 94.00 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 394.43 | 347.58 | 186.99 |
| Top Width (ft) | 488.46 | Top Width (ft) | 214.81 | 153.27 | 120.37 |
| Vel Total (ft/s) | 2.18 | Avg. Vel. (ft/s) | 2.21 | 2.26 | 1.99 |
| Max Chl Dpth (ft) | 1.50 | Hydr. Depth (ft) | 0.83 | 1.00 | 0.78 |
| Conv. Total (cfs) | 11771.1 | Conv. (cfs) | 4997.7 | 4404.0 | 2369.3 |
| Length Wtd. (ft) | 208.25 | Wetted Per. (ft) | 214.82 | 153.30 | 120.39 |
| Min Ch El (ft) | 984.67 | Shear (lb/sq ft) | 0.32 | 0.39 | 0.30 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.71 | 0.88 | 0.60 |
| Frctn Loss (ft) | 1.24 | Cum Volume (acre-ft) | 6.30 | 8.28 | 2.95 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.99 | 6.11 | 3.39 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 987.21 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 987.05 | Reach Len. (ft) | 207.24 | 199.58 | 241.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 287.50 | |

| | | | | |
|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.005694 | Area (sq ft) | | 287.50 |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 |
| Top Width (ft) | 153.27 | Top Width (ft) | | 153.27 |
| Vel Total (ft/s) | 3.23 | Avg. Vel. (ft/s) | | 3.23 |
| Max Chl Dpth (ft) | 2.38 | Hydr. Depth (ft) | | 1.88 |
| Conv. Total (cfs) | 12310.9 | Conv. (cfs) | | 12310.9 |
| Length Wtd. (ft) | 199.58 | Wetted Per. (ft) | | 156.73 |
| Min Ch El (ft) | 984.67 | Shear (lb/sq ft) | | 0.65 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.11 |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 0.23 | 11.96 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.12 | 6.20 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 986.36 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.051 | 0.052 | |
| W.S. Elev (ft) | 986.26 | Reach Len. (ft) | 207.24 | 199.58 | 241.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 196.69 | 166.88 | |
| E.G. Slope (ft/ft) | 0.007357 | Area (sq ft) | 196.69 | 166.88 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 497.54 | 431.46 | |
| Top Width (ft) | 374.10 | Top Width (ft) | 220.83 | 153.27 | |
| Vel Total (ft/s) | 2.56 | Avg. Vel. (ft/s) | 2.53 | 2.59 | |
| Max Chl Dpth (ft) | 1.59 | Hydr. Depth (ft) | 0.89 | 1.09 | |
| Conv. Total (cfs) | 10830.6 | Conv. (cfs) | 5800.6 | 5030.1 | |
| Length Wtd. (ft) | 204.49 | Wetted Per. (ft) | 220.84 | 154.03 | |
| Min Ch El (ft) | 984.67 | Shear (lb/sq ft) | 0.41 | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.03 | 1.29 | |
| Frctn Loss (ft) | 1.34 | Cum Volume (acre-ft) | 4.49 | 10.24 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 4.39 | 6.11 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.287

INPUT
Description: 12072.82 - Thalweg Sta. 503.68
Station Elevation Data num= 114

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 993.51 | .38 | 993.49 | 3.3 | 993.39 | 9.71 | 992.56 | 13.33 | 992.34 |
| 19.02 | 991.5 | 23.36 | 990.91 | 28.35 | 990.11 | 33.39 | 989.47 | 37.67 | 989.44 |
| 43.41 | 988.82 | 46.99 | 988.78 | 53.44 | 988 | 56.31 | 988 | 63.47 | 987.84 |
| 73.5 | 988.4 | 74.95 | 988.51 | 83.53 | 989.1 | 84.27 | 989.13 | 93.56 | 989.43 |
| 103.59 | 989.19 | 112.23 | 988.58 | 113.62 | 988.51 | 121.55 | 987.65 | 123.65 | 987.5 |
| 130.87 | 986.6 | 133.67 | 986.32 | 140.19 | 985.55 | 143.7 | 985.26 | 149.51 | 984.8 |
| 153.11 | 984.65 | 153.73 | 984.62 | 158.83 | 984.45 | 163.76 | 984.35 | 183.82 | 984 |
| 193.85 | 983.88 | 196.11 | 983.86 | 203.88 | 983.81 | 212.92 | 983.77 | 214.75 | 983.77 |
| 223.93 | 983.73 | 224.07 | 983.73 | 225.89 | 983.72 | 233.39 | 983.69 | 233.96 | 983.69 |
| 242.71 | 983.65 | 243.99 | 983.65 | 252.04 | 983.62 | 254.02 | 983.61 | 264.05 | 983.61 |
| 270.68 | 983.63 | 274.08 | 983.65 | 280 | 983.74 | 289.31 | 983.85 | 294.14 | 983.89 |
| 304.16 | 983.88 | 307.96 | 983.87 | 314.19 | 983.84 | 334.25 | 983.77 | 335.92 | 983.76 |
| 344.28 | 983.75 | 354.56 | 983.75 | 363.88 | 983.77 | 364.34 | 983.77 | 373.19 | 983.79 |
| 374.37 | 983.79 | 382.52 | 983.82 | 384.4 | 983.83 | 394.43 | 983.87 | 410.48 | 983.96 |
| 414.48 | 983.99 | 434.54 | 984.07 | 434.69 | 984.07 | 447.76 | 984.1 | 454.6 | 984.1 |
| 457.08 | 984.11 | 464.63 | 984.12 | 466.4 | 984.12 | 474.66 | 984.14 | 475.72 | 984.15 |
| 484.68 | 984.21 | 485.05 | 984.22 | 494.36 | 984.43 | 494.71 | 984.44 | 503.68 | 984.53 |
| 504.74 | 984.53 | 513.01 | 984.38 | 514.77 | 984.36 | 522.32 | 984.09 | 524.8 | 984.01 |
| 531.64 | 983.8 | 534.83 | 983.74 | 540.97 | 983.76 | 544.86 | 983.82 | 550.28 | 983.88 |
| 554.89 | 983.95 | 564.92 | 984.04 | 571.58 | 984.12 | 574.94 | 984.15 | 578.24 | 984.25 |
| 584.97 | 984.38 | 587.56 | 984.55 | 595 | 984.9 | 596.89 | 985.14 | 605.03 | 985.68 |
| 606.2 | 985.9 | 615.06 | 987.43 | 615.52 | 987.53 | 625.09 | 989.64 | 635.12 | 991.97 |
| 638.41 | 992.71 | 643.48 | 993.84 | 645.15 | 994.2 | 648.79 | 994.94 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 153.11 | .052 | 571.58 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 434.69 | 638.41 | 199.43 | 199.99 | 209.85 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.01 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.052 | 0.050 | |
| W.S. Elev (ft) | 984.94 | Reach Len. (ft) | 199.43 | 199.99 | 209.85 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 305.28 | 124.54 | |
| E.G. Slope (ft/ft) | 0.005687 | Area (sq ft) | 305.28 | 124.54 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 691.77 | 237.23 | |
| Top Width (ft) | 447.52 | Top Width (ft) | 286.92 | 160.61 | |
| Vel Total (ft/s) | 2.16 | Avg. Vel. (ft/s) | 2.27 | 1.90 | |
| Max Chl Dpth (ft) | 1.33 | Hydr. Depth (ft) | 1.06 | 0.78 | |
| Conv. Total (cfs) | 12318.6 | Conv. (cfs) | 9172.9 | 3145.7 | |
| Length Wtd. (ft) | 199.59 | Wetted Per. (ft) | 286.94 | 160.64 | |
| Min Ch El (ft) | 983.74 | Shear (lb/sq ft) | 0.38 | 0.28 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.86 | 0.52 | |
| Frctn Loss (ft) | 1.29 | Cum Volume (acre-ft) | 5.15 | 7.65 | 2.69 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 5.79 | 5.39 | 3.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 986.12 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.049 | |
| W.S. Elev (ft) | 985.96 | Reach Len. (ft) | 199.43 | 199.99 | 209.85 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 295.60 | |
| E.G. Slope (ft/ft) | 0.005229 | Area (sq ft) | | 295.60 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 171.88 | Top Width (ft) | | 171.88 | |
| Vel Total (ft/s) | 3.14 | Avg. Vel. (ft/s) | | 3.14 | |
| Max Chl Dpth (ft) | 2.35 | Hydr. Depth (ft) | | 1.72 | |
| Conv. Total (cfs) | 12847.5 | Conv. (cfs) | | 12847.5 | |
| Length Wtd. (ft) | 199.96 | Wetted Per. (ft) | | 173.87 | |
| Min Ch El (ft) | 983.74 | Shear (lb/sq ft) | | 0.55 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.74 | |
| Frctn Loss (ft) | 1.18 | Cum Volume (acre-ft) | 0.23 | 10.63 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.12 | 5.45 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 985.00 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.052 | 0.050 | |
| W.S. Elev (ft) | 984.93 | Reach Len. (ft) | 199.43 | 199.99 | 209.85 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 302.09 | 122.76 | |
| E.G. Slope (ft/ft) | 0.005907 | Area (sq ft) | 302.09 | 122.76 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 692.93 | 236.07 | |
| Top Width (ft) | 447.29 | Top Width (ft) | 286.78 | 160.52 | |
| Vel Total (ft/s) | 2.19 | Avg. Vel. (ft/s) | 2.29 | 1.92 | |
| Max Chl Dpth (ft) | 1.32 | Hydr. Depth (ft) | 1.05 | 0.76 | |
| Conv. Total (cfs) | 12087.0 | Conv. (cfs) | 9015.5 | 3071.4 | |
| Length Wtd. (ft) | 199.59 | Wetted Per. (ft) | 286.80 | 160.55 | |
| Min Ch El (ft) | 983.74 | Shear (lb/sq ft) | 0.39 | 0.28 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.89 | 0.54 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 3.30 | 9.58 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.18 | 5.39 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.249

INPUT
Description: 11872.83 - Thalweg Sta. 393.83
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 988.25 | .25 | 988.2 | 3.57 | 987.48 | 10.34 | 986.1 | 12.45 | 985.71 |
| 20.43 | 984.68 | 21.33 | 984.62 | 30.22 | 984.23 | 30.53 | 984.22 | 44.11 | 983.94 |
| 48 | 983.86 | 56.88 | 983.7 | 65.96 | 983.57 | 70.89 | 983.51 | 74.65 | 983.45 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 80.99 | 983.38 | 83.53 | 983.34 | 91.08 | 983.24 | 92.42 | 983.21 | 101.17 | 983.08 |
| 101.3 | 983.08 | 102.3 | 983.07 | 110.19 | 982.97 | 111.26 | 982.95 | 119.07 | 982.9 |
| 145.73 | 982.77 | 151.63 | 982.73 | 161.72 | 982.69 | 172.39 | 982.7 | 181.27 | 982.72 |
| 181.9 | 982.73 | 192 | 982.74 | 199.04 | 982.73 | 202.09 | 982.72 | 212.18 | 982.61 |
| 222.27 | 982.42 | 232.36 | 982.31 | 234.58 | 982.31 | 242.45 | 982.33 | 250.93 | 982.41 |
| 252.35 | 982.42 | 252.55 | 982.42 | 262.64 | 982.49 | 272.73 | 982.52 | 287.9 | 982.52 |
| 292.91 | 982.53 | 323.19 | 982.52 | 323.43 | 982.51 | 325.26 | 982.51 | 332.32 | 982.5 |
| 341.2 | 982.5 | 350.09 | 982.54 | 353.46 | 982.57 | 363.13 | 982.7 | 363.56 | 982.71 |
| 367.86 | 982.77 | 373.65 | 982.82 | 376.75 | 982.79 | 383.74 | 982.71 | 385.64 | 982.67 |
| 393.83 | 982.51 | 403.4 | 982.43 | 403.92 | 982.42 | 414.01 | 982.24 | 421.17 | 982.07 |
| 424.11 | 982.01 | 430.06 | 981.97 | 434.2 | 981.96 | 438.94 | 982.17 | 444.29 | 982.53 |
| 444.68 | 982.57 | 454.38 | 983.44 | 456.71 | 983.69 | 464.47 | 984.72 | 465.6 | 984.95 |
| 474.48 | 987.05 | 474.57 | 987.07 | 483.37 | 989.47 | 484.66 | 989.83 | 492.26 | 991.82 |
| 494.75 | 992.53 | 501.14 | 994.14 | 504.69 | 995.09 | 504.84 | 995.13 | 510.03 | 996.31 |
| 512.89 | 996.9 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 44.11 | .052 | 444.68 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 363.13 | 504.69 | 203.3 | 200.11 | 220.63 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.72 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.052 | 0.050 | |
| W.S. Elev (ft) | 983.63 | Reach Len. (ft) | 203.30 | 200.11 | 220.63 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 275.86 | 105.44 | |
| E.G. Slope (ft/ft) | 0.007351 | Area (sq ft) | 275.86 | 105.44 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 637.43 | 291.57 | |
| Top Width (ft) | 394.14 | Top Width (ft) | 301.15 | 92.99 | |
| Vel Total (ft/s) | 2.44 | Avg. Vel. (ft/s) | 2.31 | 2.77 | |
| Max Chl Dpth (ft) | 1.67 | Hydr. Depth (ft) | 0.92 | 1.13 | |
| Conv. Total (cfs) | 10835.6 | Conv. (cfs) | 7434.7 | 3400.8 | |
| Length Wtd. (ft) | 204.15 | Wetted Per. (ft) | 301.16 | 93.07 | |
| Min Ch El (ft) | 981.96 | Shear (lb/sq ft) | 0.42 | 0.52 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.97 | 1.44 | |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | 3.82 | 7.12 | 2.69 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 4.45 | 4.81 | 3.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 984.93 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.24 | Wt. n-Val. | 0.052 | 0.049 | |
| W.S. Elev (ft) | 984.69 | Reach Len. (ft) | 203.30 | 200.11 | 220.63 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 26.80 | 208.35 | |
| E.G. Slope (ft/ft) | 0.006689 | Area (sq ft) | 26.80 | 208.35 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 91.88 | 837.12 | |
| Top Width (ft) | 114.02 | Top Width (ft) | 12.93 | 101.09 | |
| Vel Total (ft/s) | 3.95 | Avg. Vel. (ft/s) | 3.43 | 4.02 | |
| Max Chl Dpth (ft) | 2.73 | Hydr. Depth (ft) | 2.07 | 2.06 | |
| Conv. Total (cfs) | 11358.8 | Conv. (cfs) | 1123.4 | 10235.4 | |
| Length Wtd. (ft) | 200.42 | Wetted Per. (ft) | 15.08 | 101.24 | |
| Min Ch El (ft) | 981.96 | Shear (lb/sq ft) | 0.74 | 0.86 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 2.54 | 3.45 | |
| Frctn Loss (ft) | 1.69 | Cum Volume (acre-ft) | 0.17 | 9.47 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.09 | 4.83 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.75 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.052 | 0.050 | |
| W.S. Elev (ft) | 983.66 | Reach Len. (ft) | 203.30 | 200.11 | 220.63 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 285.30 | 108.35 | |
| E.G. Slope (ft/ft) | 0.006664 | Area (sq ft) | 285.30 | 108.35 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 638.85 | 290.15 | |
| Top Width (ft) | 396.61 | Top Width (ft) | 303.33 | 93.28 | |
| Vel Total (ft/s) | 2.36 | Avg. Vel. (ft/s) | 2.24 | 2.68 | |

| | | | | |
|---|---|---|---|---|
| Max Chl Dpth (ft) | 1.70 | Hydr. Depth (ft) | 0.94 | 1.16 |
| Conv. Total (cfs) | 11380.4 | Conv. (cfs) | 7826.1 | 3554.4 |
| Length Wtd. (ft) | 202.19 | Wetted Per. (ft) | 303.34 | 93.36 |
| Min Ch El (ft) | 981.96 | Shear (lb/sq ft) | 0.39 | 0.48 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.88 | 1.29 |
| Frctn Loss (ft) | 1.08 | Cum Volume (acre-ft) | 1.96 | 9.05 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.83 | 4.81 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.211

INPUT
Description: 11672.72 - Thalweg Sta. 477.44
Station Elevation Data num= 135

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 992.45 | 1.99 | 992.36 | 7.95 | 991.98 | 9.48 | 992.01 | 18.16 | 991.9 |
| 22.3 | 991.99 | 28.36 | 992 | 35.13 | 991.99 | 38.57 | 992 | 47.95 | 991.83 |
| 48.78 | 991.82 | 51.99 | 991.77 | 57.8 | 991.54 | 58.98 | 991.52 | 66.27 | 991.45 |
| 69.19 | 991.44 | 74.75 | 991.04 | 79.39 | 990.99 | 83.22 | 990.46 | 91.7 | 988.89 |
| 99.81 | 987.22 | 100.18 | 987.16 | 108.66 | 985.48 | 110.01 | 985.2 | 117.13 | 984.27 |
| 120.22 | 983.77 | 125.61 | 983.48 | 130.43 | 983.14 | 138.35 | 982.99 | 142.56 | 982.9 |
| 150.84 | 982.77 | 151.03 | 982.76 | 151.99 | 982.75 | 159.51 | 982.62 | 161.04 | 982.59 |
| 176.46 | 982.32 | 181.46 | 982.22 | 201.87 | 981.89 | 201.98 | 981.88 | 210.36 | 981.76 |
| 218.84 | 981.66 | 242.69 | 981.47 | 244.27 | 981.46 | 251.98 | 981.4 | 252.75 | 981.4 |
| 252.9 | 981.39 | 269.7 | 981.29 | 273.31 | 981.28 | 278.17 | 981.22 | 283.52 | 981.18 |
| 286.65 | 981.07 | 293.73 | 980.85 | 295.12 | 980.85 | 301.98 | 980.71 | 303.6 | 980.68 |
| 303.93 | 980.67 | 312.08 | 980.88 | 314.14 | 980.91 | 320.56 | 981.14 | 324.34 | 981.24 |
| 329.03 | 981.28 | 334.55 | 981.3 | 337.51 | 981.3 | 344.76 | 981.28 | 345.98 | 981.28 |
| 351.98 | 981.26 | 354.96 | 981.26 | 362.93 | 981.24 | 365.17 | 981.23 | 375.38 | 981.21 |
| 388.36 | 981.2 | 395.79 | 981.18 | 396.84 | 981.18 | 400.21 | 981.16 | 401.98 | 981.15 |
| 405.31 | 981.14 | 405.99 | 981.14 | 413.79 | 981.12 | 416.2 | 981.11 | 426.41 | 981.09 |
| 436.61 | 981.09 | 439.22 | 981.1 | 446.82 | 981.14 | 447.7 | 981.14 | 451.98 | 981.17 |
| 456.17 | 981.19 | 457.03 | 981.2 | 464.65 | 981.24 | 467.23 | 981.26 | 473.12 | 981.29 |
| 477.44 | 981.32 | 487.64 | 981.35 | 498.55 | 981.34 | 507.03 | 981.31 | 512.44 | 981.31 |
| 518.26 | 981.31 | 528.47 | 981.36 | 532.45 | 981.39 | 538.68 | 981.38 | 539.97 | 981.38 |
| 540.93 | 981.38 | 548.88 | 981.33 | 549.4 | 981.33 | 557.88 | 981.3 | 559.09 | 981.29 |
| 566.36 | 981.31 | 579.5 | 981.45 | 589.71 | 981.66 | 591.79 | 981.73 | 599.91 | 981.98 |
| 600.26 | 982 | 601.97 | 982.05 | 608.74 | 982.28 | 610.12 | 982.32 | 617.21 | 982.55 |
| 620.32 | 982.64 | 625.69 | 982.82 | 630.53 | 982.97 | 634.16 | 983.13 | 640.74 | 983.36 |
| 642.65 | 983.49 | 650.94 | 983.86 | 651.12 | 983.88 | 651.97 | 983.94 | 659.6 | 984.57 |
| 661.15 | 984.65 | 668.07 | 985.41 | 671.36 | 985.66 | 676.55 | 986.3 | 681.56 | 986.67 |
| 685.02 | 987.18 | 691.77 | 988.2 | 693.5 | 988.52 | 701.97 | 990.45 | 705.84 | 991.32 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 138.35 | .052 | 539.97 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 400.21 | 512.44 | 206.37 | 207.25 | 201.1 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 982.40 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.052 | 0.052 | 0.040 |
| W.S. Elev (ft) | 982.32 | Reach Len. (ft) | 206.37 | 207.25 | 201.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 212.21 | 124.03 | 79.68 |
| E.G. Slope (ft/ft) | 0.005743 | Area (sq ft) | 212.21 | 124.03 | 79.68 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 443.76 | 287.09 | 198.16 |
| Top Width (ft) | 433.44 | Top Width (ft) | 223.62 | 112.23 | 97.59 |
| Vel Total (ft/s) | 2.23 | Avg. Vel. (ft/s) | 2.09 | 2.31 | 2.49 |
| Max Chl Dpth (ft) | 1.65 | Hydr. Depth (ft) | 0.95 | 1.11 | 0.82 |
| Conv. Total (cfs) | 12258.5 | Conv. (cfs) | 5855.5 | 3788.2 | 2614.7 |
| Length Wtd. (ft) | 205.42 | Wetted Per. (ft) | 223.64 | 112.23 | 97.60 |
| Min Ch El (ft) | 981.09 | Shear (lb/sq ft) | 0.34 | 0.40 | 0.29 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.71 | 0.92 | 0.73 |
| Frctn Loss (ft) | 1.19 | Cum Volume (acre-ft) | 2.68 | 6.59 | 2.49 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.22 | 4.34 | 2.81 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 983.24 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.28 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 982.95 | Reach Len. (ft) | 206.37 | 207.25 | 201.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 22.68 | 195.38 | |
| E.G. Slope (ft/ft) | 0.010965 | Area (sq ft) | 22.68 | 195.38 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 91.13 | 837.87 | |
| Top Width (ft) | 125.06 | Top Width (ft) | 12.83 | 112.23 | |
| Vel Total (ft/s) | 4.26 | Avg. Vel. (ft/s) | 4.02 | 4.29 | |
| Max Chl Dpth (ft) | 2.28 | Hydr. Depth (ft) | 1.77 | 1.74 | |
| Conv. Total (cfs) | 8872.0 | Conv. (cfs) | 870.2 | 8001.7 | |
| Length Wtd. (ft) | 207.21 | Wetted Per. (ft) | 14.58 | 113.87 | |
| Min Ch El (ft) | 981.09 | Shear (lb/sq ft) | 1.07 | 1.17 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 4.28 | 5.04 | |
| Frctn Loss (ft) | 1.53 | Cum Volume (acre-ft) | 0.05 | 8.54 | |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | 0.03 | 4.34 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 982.66 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 982.59 | Reach Len. (ft) | 206.37 | 207.25 | 201.10 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 274.35 | 154.18 | |
| E.G. Slope (ft/ft) | 0.004404 | Area (sq ft) | 274.35 | 154.18 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | 570.40 | 358.60 | |
| Top Width (ft) | 351.17 | Top Width (ft) | 238.94 | 112.23 | |
| Vel Total (ft/s) | 2.17 | Avg. Vel. (ft/s) | 2.08 | 2.33 | |
| Max Chl Dpth (ft) | 1.92 | Hydr. Depth (ft) | 1.15 | 1.37 | |
| Conv. Total (cfs) | 13999.0 | Conv. (cfs) | 8595.4 | 5403.6 | |
| Length Wtd. (ft) | 206.98 | Wetted Per. (ft) | 238.97 | 113.51 | |
| Min Ch El (ft) | 981.09 | Shear (lb/sq ft) | 0.32 | 0.37 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.66 | 0.87 | |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 0.65 | 8.44 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.57 | 4.34 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.171

INPUT
Description: 11465.47 - Thalweg Sta. 271.76
Station Elevation Data num= 144

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 989.79 | 4.8 | 989.44 | 7.83 | 988.99 | 15.06 | 988.11 | 15.36 | 988.05 |
| 16.15 | 987.88 | 20.83 | 987.05 | 24.48 | 986.38 | 25.33 | 986.27 | 32.81 | 984.82 |
| 35.6 | 984.34 | 41.13 | 983.42 | 45.87 | 982.56 | 49.46 | 982.31 | 56.13 | 981.47 |
| 57.79 | 981.41 | 64.89 | 981.01 | 66.12 | 980.95 | 66.4 | 980.93 | 76.67 | 980.75 |
| 86.94 | 980.66 | 107.47 | 980.56 | 107.75 | 980.55 | 108.96 | 980.54 | 117.74 | 980.44 |
| 124.41 | 980.24 | 128.01 | 980.07 | 132.74 | 980.05 | 138.28 | 980.22 | 148.55 | 980.44 |
| 149.39 | 980.43 | 157.72 | 980.29 | 166.04 | 980.13 | 169.08 | 980.08 | 179.35 | 979.94 |
| 189.62 | 979.88 | 190.88 | 979.88 | 191.03 | 979.88 | 197.09 | 979.86 | 199.36 | 979.86 |
| 199.89 | 979.85 | 207.69 | 979.85 | 210.15 | 979.84 | 216.02 | 979.85 | 220.42 | 979.84 |
| 230.69 | 979.83 | 232.67 | 979.82 | 240.96 | 979.8 | 241.15 | 979.79 | 249.33 | 979.77 |
| 251.23 | 979.76 | 271.76 | 979.71 | 282.03 | 979.74 | 282.63 | 979.74 | 285.22 | 979.77 |
| 290.96 | 979.82 | 292.3 | 979.83 | 323.1 | 980.22 | 324.27 | 980.23 | 329.28 | 980.29 |
| 332.6 | 980.32 | 333.37 | 980.33 | 340.93 | 980.4 | 343.64 | 980.43 | 349.25 | 980.48 |
| 364.17 | 980.56 | 365.91 | 980.56 | 373.35 | 980.55 | 374.45 | 980.55 | 384.71 | 980.46 |
| 394.98 | 980.3 | 407.54 | 980.07 | 415.51 | 979.94 | 415.87 | 979.94 | 417.42 | 979.92 |
| 424.2 | 979.87 | 424.92 | 979.87 | 425.78 | 979.86 | 436.05 | 979.87 | 440.85 | 979.96 |
| 446.32 | 980.02 | 449.18 | 980.07 | 456.58 | 980.17 | 457.51 | 980.18 | 465.84 | 980.29 |
| 466.85 | 980.3 | 474.16 | 980.39 | 477.12 | 980.42 | 482.49 | 980.51 | 487.39 | 980.56 |
| 490.82 | 980.61 | 497.66 | 980.68 | 499.14 | 980.7 | 507.47 | 980.79 | 507.92 | 980.8 |
| 515.8 | 980.9 | 518.19 | 980.94 | 524.13 | 981.02 | 532.45 | 981.16 | 538.73 | 981.28 |
| 548.99 | 981.43 | 549.11 | 981.43 | 549.61 | 981.45 | 557.44 | 981.78 | 559.26 | 981.89 |
| 565.76 | 982.14 | 569.53 | 982.31 | 574.09 | 982.48 | 579.8 | 982.91 | 582.42 | 983.12 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 590.07 | 984.16 | 590.75 | 984.24 | 593.68 | 984.7 | 599.07 | 985.56 | 600.33 | 985.8 |
| 602.36 | 986.07 | 610.6 | 987.03 | 620.87 | 987.33 | 624.06 | 987.27 | 631.14 | 987.03 |
| 637.74 | 986.63 | 640.72 | 986.46 | 641.41 | 986.4 | 649.04 | 985.93 | 651.67 | 985.62 |
| 657.37 | 985.23 | 661.94 | 984.7 | 665.7 | 985.07 | 672.21 | 984.52 | 674.03 | 984.71 |
| 681.81 | 985.22 | 682.35 | 985.28 | 682.48 | 985.27 | 690.68 | 986.05 | 692.75 | 986.09 |
| 699.01 | 986.54 | 703.01 | 986.55 | 707.34 | 986.7 | 713.28 | 986.88 | 715.66 | 986.84 |
| 723.55 | 988.09 | 723.99 | 988.13 | 725.87 | 988.51 | 731.35 | 989.67 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 15.36 | .052 | 424.92 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 148.55 | 374.45 | 230.9 | 210.14 | 184.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 981.20 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.052 | 0.052 | 0.041 |
| W.S. Elev (ft) | 981.12 | Reach Len. (ft) | 230.90 | 210.14 | 184.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 51.74 | 246.17 | 118.68 |
| E.G. Slope (ft/ft) | 0.005846 | Area (sq ft) | 51.74 | 246.17 | 118.68 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 80.77 | 569.54 | 278.68 |
| Top Width (ft) | 467.28 | Top Width (ft) | 85.64 | 225.90 | 155.73 |
| Vel Total (ft/s) | 2.23 | Avg. Vel. (ft/s) | 1.56 | 2.31 | 2.35 |
| Max Chl Dpth (ft) | 1.41 | Hydr. Depth (ft) | 0.60 | 1.09 | 0.76 |
| Conv. Total (cfs) | 12150.3 | Conv. (cfs) | 1056.4 | 7449.0 | 3644.9 |
| Length Wtd. (ft) | 205.59 | Wetted Per. (ft) | 85.67 | 225.91 | 155.75 |
| Min Ch El (ft) | 979.71 | Shear (lb/sq ft) | 0.22 | 0.40 | 0.28 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.34 | 0.92 | 0.65 |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 2.05 | 5.71 | 2.03 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.49 | 3.53 | 2.22 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 981.66 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 981.54 | Reach Len. (ft) | 230.90 | 210.14 | 184.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 341.02 | |
| E.G. Slope (ft/ft) | 0.005313 | Area (sq ft) | | 341.02 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 225.90 | Top Width (ft) | | 225.90 | |
| Vel Total (ft/s) | 2.72 | Avg. Vel. (ft/s) | | 2.72 | |
| Max Chl Dpth (ft) | 1.83 | Hydr. Depth (ft) | | 1.51 | |
| Conv. Total (cfs) | 12744.6 | Conv. (cfs) | | 12744.6 | |
| Length Wtd. (ft) | 210.14 | Wetted Per. (ft) | | 228.00 | |
| Min Ch El (ft) | 979.71 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.35 | |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | | 7.27 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 3.53 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 981.66 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 981.54 | Reach Len. (ft) | 230.90 | 210.14 | 184.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 341.02 | |
| E.G. Slope (ft/ft) | 0.005313 | Area (sq ft) | | 341.02 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 225.90 | Top Width (ft) | | 225.90 | |
| Vel Total (ft/s) | 2.72 | Avg. Vel. (ft/s) | | 2.72 | |
| Max Chl Dpth (ft) | 1.83 | Hydr. Depth (ft) | | 1.51 | |
| Conv. Total (cfs) | 12744.6 | Conv. (cfs) | | 12744.6 | |
| Length Wtd. (ft) | 210.14 | Wetted Per. (ft) | | 228.00 | |
| Min Ch El (ft) | 979.71 | Shear (lb/sq ft) | | 0.50 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.35 | |
| Frctn Loss (ft) | 1.28 | Cum Volume (acre-ft) | | 7.26 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 3.53 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.132

INPUT
Description: 11255.33 - Thalweg Sta. 351.71
Station Elevation Data num= 93

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 988.32 | 1.59 | 988.17 | 5.14 | 987.54 | 11.59 | 986.55 | 15.42 | 985.76 |
| 21.6 | 984.8 | 25.69 | 984.32 | 31.6 | 983.84 | 35.96 | 983.55 | 41.6 | 982.57 |
| 46.24 | 982.31 | 51.61 | 981.84 | 56.51 | 981.7 | 61.61 | 981.54 | 71.61 | 981.3 |
| 77.07 | 981.16 | 87.34 | 980.87 | 91.62 | 980.72 | 101.63 | 980.45 | 107.89 | 980.35 |
| 111.63 | 980.3 | 121.63 | 980.21 | 133.25 | 980.07 | 138.72 | 980 | 141.64 | 979.97 |
| 148.99 | 979.87 | 159.27 | 979.72 | 161.65 | 979.68 | 169.54 | 979.58 | 171.65 | 979.54 |
| 181.65 | 979.43 | 190.09 | 979.36 | 191.66 | 979.34 | 200.37 | 979.32 | 201.66 | 979.31 |
| 210.64 | 979.35 | 211.66 | 979.36 | 220.92 | 979.4 | 221.67 | 979.41 | 231.19 | 979.38 |
| 231.67 | 979.38 | 241.46 | 979.17 | 241.67 | 979.17 | 251.74 | 979.18 | 261.68 | 979.22 |
| 262.01 | 979.21 | 270.66 | 979.15 | 271.69 | 979.14 | 272.3 | 979.13 | 281.69 | 979.01 |
| 282.57 | 978.99 | 291.69 | 978.85 | 292.84 | 978.84 | 301.7 | 978.71 | 311.7 | 978.64 |
| 313.39 | 978.64 | 331.71 | 978.54 | 333.95 | 978.5 | 341.71 | 978.39 | 344.22 | 978.36 |
| 351.71 | 978.23 | 371.72 | 978.62 | 375.04 | 978.63 | 385.31 | 978.65 | 405.87 | 978.64 |
| 426.42 | 978.67 | 431.74 | 978.67 | 436.69 | 978.68 | 451.75 | 978.7 | 455.06 | 978.71 |
| 457.24 | 978.71 | 477.8 | 978.76 | 481.76 | 978.78 | 488.07 | 978.8 | 498.34 | 978.85 |
| 508.62 | 978.93 | 511.77 | 978.95 | 521.77 | 979.06 | 522.87 | 979.08 | 529.18 | 979.19 |
| 531.78 | 979.24 | 541.78 | 979.66 | 549.72 | 980.67 | 551.78 | 980.94 | 560 | 982.79 |
| 561.79 | 983.23 | 570.27 | 985.43 | 571.79 | 985.86 | 580.54 | 987.76 | 581.79 | 988.1 |
| 590.83 | 990.15 | 591.8 | 990.41 | 594.85 | 991.01 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 133.25 | .052 | 522.87 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 270.66 | 455.06 | 239.21 | 204.96 | 164.58 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 980.08 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.052 | 0.052 | 0.050 |
| W.S. Elev (ft) | 979.99 | Reach Len. (ft) | 239.21 | 204.96 | 164.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 73.95 | 248.25 | 91.79 |
| E.G. Slope (ft/ft) | 0.005128 | Area (sq ft) | 73.95 | 248.25 | 91.79 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 103.31 | 619.32 | 206.37 |
| Top Width (ft) | 404.82 | Top Width (ft) | 131.09 | 184.40 | 89.32 |
| Vel Total (ft/s) | 2.24 | Avg. Vel. (ft/s) | 1.40 | 2.49 | 2.25 |
| Max Chl Dpth (ft) | 1.76 | Hydr. Depth (ft) | 0.56 | 1.35 | 1.03 |
| Conv. Total (cfs) | 12973.4 | Conv. (cfs) | 1442.7 | 8648.7 | 2882.0 |
| Length Wtd. (ft) | 203.60 | Wetted Per. (ft) | 131.10 | 184.41 | 89.36 |
| Min Ch El (ft) | 978.23 | Shear (lb/sq ft) | 0.18 | 0.43 | 0.33 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.25 | 1.08 | 0.74 |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 1.72 | 4.52 | 1.59 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.91 | 2.54 | 1.70 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 980.38 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 980.22 | Reach Len. (ft) | 239.21 | 204.96 | 164.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 289.85 | |
| E.G. Slope (ft/ft) | 0.007013 | Area (sq ft) | | 289.85 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 184.40 | Top Width (ft) | | 184.40 | |
| Vel Total (ft/s) | 3.21 | Avg. Vel. (ft/s) | | 3.21 | |
| Max Chl Dpth (ft) | 1.99 | Hydr. Depth (ft) | | 1.57 | |
| Conv. Total (cfs) | 11093.6 | Conv. (cfs) | | 11093.6 | |
| Length Wtd. (ft) | 204.96 | Wetted Per. (ft) | | 186.98 | |
| Min Ch El (ft) | 978.23 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.18 | |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | | 5.74 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 2.54 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 980.38 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 980.22 | Reach Len. (ft) | 239.21 | 204.96 | 164.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 289.85 | |
| E.G. Slope (ft/ft) | 0.007013 | Area (sq ft) | | 289.85 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 184.40 | Top Width (ft) | | 184.40 | |
| Vel Total (ft/s) | 3.21 | Avg. Vel. (ft/s) | | 3.21 | |
| Max Chl Dpth (ft) | 1.99 | Hydr. Depth (ft) | | 1.57 | |
| Conv. Total (cfs) | 11093.6 | Conv. (cfs) | | 11093.6 | |
| Length Wtd. (ft) | 204.96 | Wetted Per. (ft) | | 186.98 | |
| Min Ch El (ft) | 978.23 | Shear (lb/sq ft) | | 0.68 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.18 | |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | | 5.74 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 2.54 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.093

INPUT
Description: 11050.37 - Thalweg Sta. 310.90
Station Elevation Data num= 98

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 985.8 | 3.32 | 985.75 | 5.18 | 985.76 | 7.55 | 985.64 | 16.09 | 984.97 |
| 22.77 | 983.71 | 27.01 | 983.02 | 32.45 | 981.84 | 37.93 | 980.68 | 42.21 | 980.53 |
| 48.85 | 979.8 | 57.36 | 980.03 | 59.77 | 980.14 | 61.65 | 980.26 | 70.69 | 980.88 |
| 81.09 | 981.76 | 81.61 | 981.81 | 82.26 | 981.85 | 92.53 | 982.3 | 100.54 | 981.9 |
| 103.44 | 981.75 | 114.36 | 980.51 | 119.97 | 979.92 | 125.28 | 979.32 | 132.07 | 978.84 |
| 136.2 | 978.53 | 139.42 | 978.35 | 143.97 | 978.13 | 147.12 | 977.97 | 156.98 | 977.57 |
| 158.04 | 977.53 | 168.96 | 977.53 | 178.3 | 977.69 | 179.88 | 977.72 | 181.89 | 977.73 |
| 190.8 | 977.79 | 196.38 | 977.79 | 201.71 | 977.79 | 212.63 | 977.7 | 217.2 | 977.64 |
| 234.47 | 977.45 | 236.64 | 977.44 | 256.08 | 977.28 | 256.6 | 977.28 | 260.23 | 977.25 |
| 278.15 | 977.13 | 281.51 | 977.13 | 289.07 | 977.09 | 294.97 | 977.01 | 299.98 | 976.97 |
| 306.4 | 976.86 | 310.9 | 976.84 | 314.41 | 976.92 | 321.82 | 977.07 | 331.31 | 977.19 |
| 332.74 | 977.21 | 343.66 | 977.3 | 353.3 | 977.42 | 354.58 | 977.44 | 365.5 | 977.63 |
| 372.74 | 977.74 | 376.42 | 977.81 | 387.33 | 977.98 | 398.25 | 978.1 | 406.01 | 978.11 |
| 411.63 | 978.09 | 430.93 | 977.98 | 431.08 | 977.98 | 441.93 | 977.92 | 452.85 | 977.97 |
| 455.84 | 978.03 | 463.77 | 978.23 | 469.96 | 978.63 | 474.69 | 978.85 | 480.75 | 979.91 |
| 485.6 | 981.12 | 487.33 | 981.68 | 489.41 | 982.36 | 496.52 | 984.38 | 505.65 | 986.89 |
| 507.44 | 987.41 | 508.84 | 987.73 | 518.36 | 989.87 | 528.29 | 991.37 | 529.28 | 991.53 |
| 530.56 | 991.62 | 540.2 | 992.14 | 547.73 | 992.32 | 551.12 | 992.39 | 555.45 | 992.34 |
| 562.04 | 992.03 | 567.17 | 992.05 | 572.96 | 991.85 | 580.36 | 992.85 | 583.87 | 993.14 |
| 586.61 | 993.48 | 594.79 | 994.97 | 602.39 | 995.68 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 143.97 | .045 | 260.23 | .052 | 487.33 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 196.38 | 406.01 | 202.77 | 199.7 | 211.92 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 978.69 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | 0.045 | 0.050 | 0.052 |
| W.S. Elev (ft) | 978.55 | Reach Len. (ft) | 202.77 | 199.70 | 211.92 |
| Crit W.S. (ft) | 978.22 | Flow Area (sq ft) | 46.36 | 236.37 | 31.51 |
| E.G. Slope (ft/ft) | 0.009474 | Area (sq ft) | 46.36 | 236.37 | 31.51 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 131.28 | 742.33 | 55.38 |
| Top Width (ft) | 332.82 | Top Width (ft) | 60.46 | 209.63 | 62.73 |
| Vel Total (ft/s) | 2.96 | Avg. Vel. (ft/s) | 2.83 | 3.14 | 1.76 |
| Max Chl Dpth (ft) | 1.71 | Hydr. Depth (ft) | 0.77 | 1.13 | 0.50 |
| Conv. Total (cfs) | 9544.6 | Conv. (cfs) | 1348.8 | 7626.7 | 569.0 |
| Length Wtd. (ft) | 201.55 | Wetted Per. (ft) | 60.49 | 209.64 | 62.74 |
| Min Ch El (ft) | 976.84 | Shear (lb/sq ft) | 0.45 | 0.67 | 0.30 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.28 | 2.09 | 0.52 |

| | | | | | |
|---|---|---|---|---|---|
| Frctn Loss (ft) | 1.38 | Cum Volume (acre-ft) | 1.39 | 3.38 | 1.35 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.39 | 1.61 | 1.41 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 978.91 | Reach Len. (ft) | 202.77 | 199.70 | 211.92 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 311.52 | |
| E.G. Slope (ft/ft) | 0.005975 | Area (sq ft) | | 311.52 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 209.63 | Top Width (ft) | | 209.63 | |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.98 | |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | | 1.49 | |
| Conv. Total (cfs) | 12018.7 | Conv. (cfs) | | 12018.7 | |
| Length Wtd. (ft) | 199.70 | Wetted Per. (ft) | | 211.56 | |
| Min Ch El (ft) | 976.84 | Shear (lb/sq ft) | | 0.55 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.64 | |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | | 4.33 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 1.61 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 979.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.050 | |
| W.S. Elev (ft) | 978.91 | Reach Len. (ft) | 202.77 | 199.70 | 211.92 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 311.54 | |
| E.G. Slope (ft/ft) | 0.005973 | Area (sq ft) | | 311.54 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 209.63 | Top Width (ft) | | 209.63 | |
| Vel Total (ft/s) | 2.98 | Avg. Vel. (ft/s) | | 2.98 | |
| Max Chl Dpth (ft) | 2.07 | Hydr. Depth (ft) | | 1.49 | |
| Conv. Total (cfs) | 12020.3 | Conv. (cfs) | | 12020.3 | |
| Length Wtd. (ft) | 199.70 | Wetted Per. (ft) | | 211.56 | |
| Min Ch El (ft) | 976.84 | Shear (lb/sq ft) | | 0.55 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.64 | |
| Frctn Loss (ft) | 1.14 | Cum Volume (acre-ft) | | 4.33 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 1.61 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.055

INPUT
Description: 10850.66 - Thalweg Sta. 408.57
Station Elevation Data num= 98

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 983.75 | 3.37 | 983.46 | 10.8 | 982.94 | 11.06 | 982.91 | 21.85 | 981.81 |
| 25.92 | 981.41 | 34.57 | 980.58 | 43.95 | 979.72 | 52.27 | 979 | 55 | 978.78 |
| 66.05 | 978.13 | 73.12 | 977.9 | 77.1 | 977.81 | 88.15 | 977.66 | 93.96 | 977.54 |
| 99.2 | 977.46 | 121.3 | 976.94 | 128.61 | 976.84 | 132.35 | 976.77 | 135.66 | 976.76 |
| 143.4 | 976.75 | 152.12 | 976.77 | 154.45 | 976.78 | 156.5 | 976.77 | 165.5 | 976.76 |
| 175.64 | 976.67 | 198.19 | 976.39 | 198.64 | 976.38 | 199.15 | 976.38 | 200.58 | 976.36 |
| 220.74 | 976.13 | 222.66 | 976.12 | 231.79 | 976.06 | 242.84 | 976.05 | 246.17 | 976.08 |
| 260.73 | 976.28 | 264.94 | 976.35 | 269.69 | 976.4 | 275.99 | 976.45 | 286.82 | 976.47 |
| 287.04 | 976.47 | 293.19 | 976.44 | 298.08 | 976.4 | 302.41 | 976.19 | 309.13 | 975.95 |
| 316.7 | 976 | 320.18 | 976.09 | 323.27 | 975.63 | 331.23 | 974.67 | 340.22 | 976.04 |
| 342.28 | 976.39 | 344.12 | 976.46 | 353.33 | 976.78 | 363.73 | 976.68 | 364.38 | 976.67 |
| 364.95 | 976.65 | 375.43 | 976.27 | 385.8 | 975.78 | 386.48 | 975.75 | 387.24 | 975.67 |
| 397.53 | 974.95 | 406.64 | 974.19 | 408.57 | 974.12 | 410.75 | 974.49 | 418.79 | 976.03 |
| 419.62 | 976.19 | 427.49 | 976.52 | 430.55 | 976.66 | 430.67 | 976.67 | 434.27 | 976.61 |
| 441.72 | 976.46 | 452.77 | 976.45 | 463.82 | 976.5 | 481.29 | 976.53 | 508.02 | 976.67 |
| 510.87 | 976.67 | 519.07 | 976.7 | 551.82 | 976.66 | 563.27 | 976.67 | 573.41 | 976.76 |
| 574.32 | 976.77 | 575.33 | 976.8 | 582.16 | 976.96 | 585.37 | 977.04 | 589.97 | 977.22 |
| 594.26 | 977.39 | 596.42 | 977.47 | 598.84 | 977.61 | 607.46 | 978.54 | 615.11 | 980.31 |

618.51 981.04 622.36 982.04 629.56 984.09 635.95 985.97 640.61 987.24
645.87 988.61 651.66 990.14 653.34 990.42

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 200.58 | .045 | 418.79 | .052 | 589.97 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 286.82 | 430.55 | 179.25 | 199.4 | 207.72 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 977.30 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.042 | 0.045 | 0.052 |
| W.S. Elev (ft) | 977.20 | Reach Len. (ft) | 179.25 | 199.40 | 207.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 125.65 | 187.97 | 89.69 |
| E.G. Slope (ft/ft) | 0.005147 | Area (sq ft) | 125.65 | 187.97 | 89.69 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 270.82 | 532.66 | 125.52 |
| Top Width (ft) | 479.48 | Top Width (ft) | 176.74 | 143.73 | 159.01 |
| Vel Total (ft/s) | 2.30 | Avg. Vel. (ft/s) | 2.16 | 2.83 | 1.40 |
| Max Chl Dpth (ft) | 3.08 | Hydr. Depth (ft) | 0.71 | 1.31 | 0.56 |
| Conv. Total (cfs) | 12949.5 | Conv. (cfs) | 3775.1 | 7424.8 | 1749.6 |
| Length Wtd. (ft) | 196.07 | Wetted Per. (ft) | 176.75 | 144.26 | 159.02 |
| Min Ch El (ft) | 974.12 | Shear (lb/sq ft) | 0.23 | 0.42 | 0.18 |
| Alpha | 1.17 | Stream Power (lb/ft s) | 0.49 | 1.19 | 0.25 |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 0.99 | 2.41 | 1.06 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.84 | 0.80 | 0.88 |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 977.90 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 977.70 | Reach Len. (ft) | 179.25 | 199.40 | 207.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 259.88 | |
| E.G. Slope (ft/ft) | 0.005462 | Area (sq ft) | | 259.88 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 143.73 | Top Width (ft) | | 143.73 | |
| Vel Total (ft/s) | 3.57 | Avg. Vel. (ft/s) | | 3.57 | |
| Max Chl Dpth (ft) | 3.58 | Hydr. Depth (ft) | | 1.81 | |
| Conv. Total (cfs) | 12569.9 | Conv. (cfs) | | 12569.9 | |
| Length Wtd. (ft) | 199.40 | Wetted Per. (ft) | | 146.54 | |
| Min Ch El (ft) | 974.12 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.16 | |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | | 3.02 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 0.80 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 977.90 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 977.70 | Reach Len. (ft) | 179.25 | 199.40 | 207.72 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 259.74 | |
| E.G. Slope (ft/ft) | 0.005472 | Area (sq ft) | | 259.74 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 143.73 | Top Width (ft) | | 143.73 | |
| Vel Total (ft/s) | 3.58 | Avg. Vel. (ft/s) | | 3.58 | |
| Max Chl Dpth (ft) | 3.58 | Hydr. Depth (ft) | | 1.81 | |
| Conv. Total (cfs) | 12558.8 | Conv. (cfs) | | 12558.8 | |
| Length Wtd. (ft) | 199.40 | Wetted Per. (ft) | | 146.53 | |
| Min Ch El (ft) | 974.12 | Shear (lb/sq ft) | | 0.61 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.17 | |
| Frctn Loss (ft) | 1.05 | Cum Volume (acre-ft) | | 3.02 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 0.80 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 3 RS: 2.017

INPUT
Description: 10651.27 - Thalweg Sta. 559.05
Station Elevation Data num= 180

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 980.59 | 4.89 | 979.87 | 8.89 | 979.44 | 13.02 | 979.18 | 19.27 | 978.84 |
| 21.13 | 978.81 | 27.83 | 978.66 | 29.65 | 978.63 | 30.34 | 978.61 | 40.03 | 978.36 |
| 45.49 | 978.21 | 50.41 | 978.06 | 59.12 | 977.81 | 60.79 | 977.76 | 65.12 | 977.66 |
| 71.17 | 977.59 | 73.5 | 977.6 | 81.55 | 977.59 | 87.89 | 977.65 | 102.28 | 977.72 |
| 112.69 | 977.72 | 116.67 | 977.66 | 123.07 | 977.59 | 131.04 | 977.44 | 133.45 | 977.4 |
| 143.83 | 977.18 | 145.43 | 977.13 | 154.21 | 976.88 | 164.59 | 976.55 | 174.97 | 976.28 |
| 185.35 | 976.13 | 202.98 | 975.97 | 206.11 | 975.93 | 216.49 | 975.84 | 217.37 | 975.83 |
| 231.74 | 975.65 | 237.25 | 975.56 | 246.13 | 975.45 | 247.64 | 975.42 | 251.53 | 975.4 |
| 258.02 | 975.38 | 260.52 | 975.4 | 260.81 | 975.4 | 268.4 | 975.5 | 274.9 | 975.57 |
| 278.78 | 975.63 | 288.81 | 975.54 | 289.16 | 975.54 | 289.29 | 975.53 | 299.54 | 975.49 |
| 303.68 | 975.52 | 309.92 | 975.58 | 326.09 | 975.86 | 330.68 | 975.93 | 341.06 | 975.98 |
| 351.44 | 976 | 361.22 | 976.04 | 361.82 | 976.04 | 372.2 | 976.1 | 375.6 | 976.11 |
| 392.96 | 976.12 | 400.65 | 976.11 | 402.75 | 976.11 | 404.38 | 976.11 | 418.77 | 976.06 |
| 424.1 | 976.03 | 434.48 | 975.88 | 444.86 | 975.58 | 455.24 | 975.15 | 461.92 | 974.65 |
| 465.62 | 974.39 | 475.22 | 974.42 | 476 | 974.43 | 476.3 | 974.44 | 486.38 | 974.82 |
| 490.69 | 974.86 | 496.77 | 974.94 | 505.08 | 974.97 | 507.14 | 974.97 | 517.53 | 975.01 |
| 519.47 | 975.02 | 527.91 | 975.09 | 532.67 | 975.18 | 538.29 | 975.26 | 548.67 | 975.55 |
| 548.91 | 975.54 | 549.79 | 975.54 | 559.05 | 975.42 | 562.62 | 975.02 | 569.43 | 974.43 |
| 577 | 974.76 | 579.81 | 974.79 | 587.06 | 975.14 | 590.19 | 975.32 | 591.39 | 975.33 |
| 600.57 | 975.42 | 605.78 | 975.41 | 610.48 | 975.43 | 610.95 | 975.43 | 620.17 | 975.41 |
| 621.33 | 975.41 | 624.35 | 975.4 | 631.71 | 975.39 | 634.55 | 975.38 | 649.71 | 975.38 |
| 662.85 | 975.39 | 663.32 | 975.4 | 673.23 | 975.42 | 683.61 | 975.46 | 692.09 | 975.52 |
| 693.99 | 975.53 | 704.37 | 975.65 | 706.48 | 975.67 | 714.75 | 975.76 | 720.87 | 975.78 |
| 725.13 | 975.81 | 735.25 | 975.82 | 735.51 | 975.83 | 760.02 | 975.83 | 765.11 | 975.84 |
| 773.47 | 975.84 | 777.03 | 975.85 | 787.42 | 975.86 | 792.79 | 975.89 | 797.8 | 975.9 |
| 807.18 | 976.01 | 808.18 | 976.02 | 810.76 | 976.08 | 818.56 | 976.33 | 821.57 | 976.59 |
| 828.94 | 977.14 | 835.95 | 977.92 | 839.32 | 978.3 | 848.04 | 979.04 | 849.7 | 979.17 |
| 850.34 | 979.19 | 860.08 | 979.52 | 864.72 | 979.39 | 870.46 | 979.26 | 879.1 | 978.79 |
| 880.84 | 978.7 | 891.22 | 978.46 | 901.6 | 978.41 | 907.88 | 978.43 | 911.98 | 978.43 |
| 922.27 | 978.52 | 922.6 | 978.52 | 943.12 | 978.71 | 951.04 | 978.86 | 953.5 | 978.89 |
| 959.89 | 979.1 | 963.88 | 979.24 | 974.26 | 979.5 | 979.81 | 979.39 | 984.64 | 979.35 |
| 994.19 | 979.08 | 995.02 | 979.07 | 997.17 | 979.05 | 1005.4 | 978.99 | 1034.45 | 979.18 |
| 1036.54 | 979.2 | 1046.93 | 979.32 | 1057.31 | 979.5 | 1067.69 | 979.76 | 1080.51 | 980.14 |
| 1088.45 | 980.39 | 1094.89 | 980.67 | 1098.83 | 980.82 | 1109.01 | 981.6 | 1109.21 | 981.61 |
| 1109.28 | 981.63 | 1119.59 | 983.43 | 1123.67 | 984.34 | 1129.97 | 985.68 | 1138.05 | 987.48 |
| 1140.35 | 988 | 1146.3 | 989.31 | 1150.73 | 990.27 | 1152.44 | 990.57 | 1154.02 | 990.87 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .035 | 260.81 | .045 | 649.71 | .052 | 765.11 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 402.75 | 610.48 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 976.40 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.040 | 0.045 | 0.047 |
| W.S. Elev (ft) | 976.34 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | | Flow Area (sq ft) | 119.05 | 232.93 | 139.28 |
| E.G. Slope (ft/ft) | 0.004042 | Area (sq ft) | 119.05 | 232.93 | 139.28 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 179.50 | 527.55 | 221.95 |
| Top Width (ft) | 645.96 | Top Width (ft) | 230.04 | 207.73 | 208.18 |
| Vel Total (ft/s) | 1.89 | Avg. Vel. (ft/s) | 1.51 | 2.26 | 1.59 |
| Max Chl Dpth (ft) | 1.95 | Hydr. Depth (ft) | 0.52 | 1.12 | 0.67 |
| Conv. Total (cfs) | 14612.7 | Conv. (cfs) | 2823.4 | 8298.1 | 3491.2 |
| Length Wtd. (ft) | | Wetted Per. (ft) | 230.06 | 207.86 | 208.19 |
| Min Ch El (ft) | 974.39 | Shear (lb/sq ft) | 0.13 | 0.28 | 0.17 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 0.20 | 0.64 | 0.27 |
| Frctn Loss (ft) | 1.83 | Cum Volume (acre-ft) | 0.48 | 1.44 | 0.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | | |

Warning: A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with the highest momentum downstream to the section upstream.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 976.83 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 976.69 | Reach Len. (ft) | | | |

| | | | |
|---|---|---|---|
| Crit W.S. (ft) | 976.04 | Flow Area (sq ft) | 305.95 |
| E.G. Slope (ft/ft) | 0.005110 | Area (sq ft) | 305.95 |
| Q Total (cfs) | 929.00 | Flow (cfs) | 929.00 |
| Top Width (ft) | 207.73 | Top Width (ft) | 207.73 |
| Vel Total (ft/s) | 3.04 | Avg. Vel. (ft/s) | 3.04 |
| Max Chl Dpth (ft) | 2.30 | Hydr. Depth (ft) | 1.47 |
| Conv. Total (cfs) | 12995.6 | Conv. (cfs) | 12995.6 |
| Length Wtd. (ft) | | Wetted Per. (ft) | 209.70 |
| Min Ch El (ft) | 974.39 | Shear (lb/sq ft) | 0.47 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 1.41 |
| Frctn Loss (ft) | 2.25 | Cum Volume (acre-ft) | 1.72 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | |

Warning: A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with

the highest momentum downstream to the section upstream.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 976.84 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 976.70 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 976.04 | Flow Area (sq ft) | | 306.91 | |
| E.G. Slope (ft/ft) | 0.005057 | Area (sq ft) | | 306.91 | |
| Q Total (cfs) | 929.00 | Flow (cfs) | | 929.00 | |
| Top Width (ft) | 207.73 | Top Width (ft) | | 207.73 | |
| Vel Total (ft/s) | 3.03 | Avg. Vel. (ft/s) | | 3.03 | |
| Max Chl Dpth (ft) | 2.31 | Hydr. Depth (ft) | | 1.48 | |
| Conv. Total (cfs) | 13063.5 | Conv. (cfs) | | 13063.5 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 209.71 | |
| Min Ch El (ft) | 974.39 | Shear (lb/sq ft) | | 0.46 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.40 | |
| Frctn Loss (ft) | 2.27 | Cum Volume (acre-ft) | | 1.72 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

Warning: A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with

the highest momentum downstream to the section upstream.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.965

INPUT
Description: 10372.84 - Thalweg Sta. 171.28 - Discharge Split from trib4E Reach 3 XS 2.395 929 CFS - Using HEC-RAS Optimization Function for Split flow - It was determined that 299 CFS would be split to this XS out of 929 CFS total.

Station Elevation Data num= 94

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 974.66 | 7.65 | 974.63 | 10.12 | 974.63 | 19.64 | 974.53 | 20.24 | 974.52 |
| 23.5 | 974.48 | 30.36 | 974.38 | 31.63 | 974.37 | 40.48 | 974.23 | 43.61 | 974.19 |
| 50.6 | 974.09 | 60.72 | 973.98 | 67.58 | 973.98 | 70.84 | 973.97 | 88.54 | 974.12 |
| 91.08 | 974.15 | 91.55 | 974.15 | 101.2 | 974.24 | 101.77 | 974.24 | 102.3 | 974.24 |
| 103.38 | 974.23 | 111.22 | 974.18 | 113.86 | 974.11 | 121.23 | 973.9 | 124.33 | 973.89 |
| 131.24 | 973.84 | 134.81 | 973.88 | 141.25 | 973.97 | 145.28 | 973.9 | 151.26 | 973.82 |
| 155.76 | 973.41 | 161.27 | 972.96 | 166.24 | 972.27 | 171.28 | 971.56 | 176.71 | 972.51 |
| 181.29 | 973.32 | 188.86 | 973.87 | 191.3 | 974.04 | 195.07 | 974.11 | 201.31 | 974.28 |
| 211.32 | 974.4 | 214.24 | 974.41 | 219.74 | 974.42 | 221.33 | 974.42 | 223.83 | 974.41 |
| 231.34 | 974.39 | 233.4 | 974.39 | 241.35 | 974.37 | 242.98 | 974.36 | 251.36 | 974.33 |
| 252.57 | 974.33 | 261.37 | 974.29 | 262.15 | 974.29 | 271.38 | 974.25 | 271.74 | 974.25 |
| 279.74 | 974.23 | 281.39 | 974.22 | 281.47 | 974.22 | 291.4 | 974.2 | 301.41 | 974.19 |
| 302.42 | 974.2 | 312.89 | 974.21 | 331.44 | 974.29 | 333.84 | 974.29 | 351.46 | 974.35 |
| 354.81 | 974.37 | 361.47 | 974.44 | 365.28 | 974.47 | 371.48 | 974.56 | 375.76 | 974.59 |
| 381.49 | 974.66 | 396.71 | 974.79 | 401.51 | 974.86 | 407.18 | 974.93 | 411.52 | 975.03 |
| 417.66 | 975.13 | 421.53 | 975.21 | 428.14 | 975.29 | 431.54 | 975.36 | 438.61 | 975.43 |
| 441.55 | 975.47 | 449.09 | 975.52 | 451.56 | 975.53 | 459.56 | 975.58 | 461.57 | 975.57 |
| 471.58 | 975.64 | 480.51 | 975.74 | 481.59 | 975.75 | 490.99 | 975.86 | 491.6 | 975.87 |
| 501.46 | 976 | 501.61 | 976 | 504.74 | 976.07 | 506.32 | 976.1 | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .045 | 188.86 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 101.77 | 219.74 | 205.01 | 200.71 | 198.66 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.54 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.045 | 0.045 | 0.040 |
| W.S. Elev (ft) | 974.41 | Reach Len. (ft) | 205.01 | 200.71 | 198.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 21.50 | 83.89 | 17.26 |
| E.G. Slope (ft/ft) | 0.010062 | Area (sq ft) | 21.50 | 83.89 | 17.26 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 31.31 | 251.47 | 16.22 |
| Top Width (ft) | 325.01 | Top Width (ft) | 73.77 | 114.92 | 136.32 |
| Vel Total (ft/s) | 2.44 | Avg. Vel. (ft/s) | 1.46 | 3.00 | 0.94 |
| Max Chl Dpth (ft) | 2.85 | Hydr. Depth (ft) | 0.29 | 0.73 | 0.13 |
| Conv. Total (cfs) | 2980.7 | Conv. (cfs) | 312.2 | 2506.8 | 161.7 |
| Length Wtd. (ft) | 201.52 | Wetted Per. (ft) | 73.78 | 115.24 | 136.32 |
| Min Ch El (ft) | 971.56 | Shear (lb/sq ft) | 0.18 | 0.46 | 0.08 |
| Alpha | 1.32 | Stream Power (lb/ft s) | 0.27 | 1.37 | 0.07 |
| Frctn Loss (ft) | 0.93 | Cum Volume (acre-ft) | 4.08 | 11.88 | 6.83 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 5.43 | 6.98 | 13.41 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.76 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 974.65 | Reach Len. (ft) | 205.01 | 200.71 | 198.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 111.94 | |
| E.G. Slope (ft/ft) | 0.006073 | Area (sq ft) | | 111.94 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 117.97 | Top Width (ft) | | 117.97 | |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | | 2.67 | |
| Max Chl Dpth (ft) | 3.09 | Hydr. Depth (ft) | | 0.95 | |
| Conv. Total (cfs) | 3836.7 | Conv. (cfs) | | 3836.7 | |
| Length Wtd. (ft) | 200.71 | Wetted Per. (ft) | | 118.94 | |
| Min Ch El (ft) | 971.56 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.95 | |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 0.15 | 15.51 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.13 | 7.06 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.76 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 974.65 | Reach Len. (ft) | 205.01 | 200.71 | 198.66 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 111.83 | |
| E.G. Slope (ft/ft) | 0.006092 | Area (sq ft) | | 111.83 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 117.97 | Top Width (ft) | | 117.97 | |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | | 2.67 | |
| Max Chl Dpth (ft) | 3.09 | Hydr. Depth (ft) | | 0.95 | |
| Conv. Total (cfs) | 3830.7 | Conv. (cfs) | | 3830.7 | |
| Length Wtd. (ft) | 200.71 | Wetted Per. (ft) | | 118.94 | |
| Min Ch El (ft) | 971.56 | Shear (lb/sq ft) | | 0.36 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.96 | |
| Frctn Loss (ft) | 0.80 | Cum Volume (acre-ft) | 0.21 | 15.47 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.23 | 7.06 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E

REACH: reach 2 RS: 1.927

INPUT
Description: 10172.13 - Thalweg Sta. 144.84
Station Elevation Data num= 52

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 973.13 | 4.46 | 973.12 | 10.82 | 973.03 | 14.49 | 972.96 | 21.64 | 972.76 |
| 24.52 | 972.71 | 32.46 | 972.66 | 34.54 | 972.67 | 43.26 | 972.77 | 44.57 | 972.78 |
| 54.08 | 972.88 | 54.6 | 972.88 | 64.62 | 972.77 | 64.9 | 972.77 | 74.65 | 972.74 |
| 75.72 | 972.76 | 84.68 | 972.85 | 86.54 | 972.86 | 94.7 | 972.95 | 104.73 | 972.95 |
| 105.33 | 972.94 | 114.76 | 972.87 | 119 | 972.76 | 124.78 | 972.63 | 129.82 | 972.32 |
| 134.81 | 972.08 | 140.62 | 971.18 | 144.84 | 970.67 | 151.44 | 971.49 | 154.86 | 971.68 |
| 162.26 | 972.3 | 164.89 | 972.49 | 173.08 | 972.76 | 174.92 | 972.85 | 183.9 | 972.96 |
| 184.94 | 972.99 | 185.07 | 972.99 | 194.72 | 973.08 | 194.97 | 973.09 | 198.15 | 973.12 |
| 204.53 | 973.2 | 205 | 973.2 | 205.54 | 973.21 | 215.02 | 973.44 | 216.36 | 973.5 |
| 217.11 | 973.52 | 225.05 | 973.74 | 232.56 | 975.04 | 235.08 | 975.37 | 241.9 | 976.51 |
| 245.1 | 977.14 | 248.41 | 977.7 | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .045 | 217.11 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 105.33 | 185.07 | 208.26 | 197.18 | 181.45 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.58 | Element | | | |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 973.53 | Reach Len. (ft) | 208.26 | 197.18 | 181.45 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 71.83 | 99.83 | 10.92 |
| E.G. Slope (ft/ft) | 0.002629 | Area (sq ft) | 71.83 | 99.83 | 10.92 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 93.99 | 195.99 | 9.02 |
| Top Width (ft) | 217.42 | Top Width (ft) | 105.33 | 79.74 | 32.35 |
| Vel Total (ft/s) | 1.64 | Avg. Vel. (ft/s) | 1.31 | 1.96 | 0.83 |
| Max Chl Dpth (ft) | 2.86 | Hydr. Depth (ft) | 0.68 | 1.25 | 0.34 |
| Conv. Total (cfs) | 5830.9 | Conv. (cfs) | 1832.9 | 3822.1 | 176.0 |
| Length Wtd. (ft) | 200.42 | Wetted Per. (ft) | 105.74 | 79.96 | 32.35 |
| Min Ch El (ft) | 970.67 | Shear (lb/sq ft) | 0.11 | 0.20 | 0.06 |
| Alpha | 1.15 | Stream Power (lb/ft s) | 0.15 | 0.40 | 0.05 |
| Frctn Loss (ft) | 1.00 | Cum Volume (acre-ft) | 3.86 | 11.46 | 6.77 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 5.00 | 6.53 | 13.02 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.95 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 973.87 | Reach Len. (ft) | 208.26 | 197.18 | 181.45 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 126.95 | |
| E.G. Slope (ft/ft) | 0.002830 | Area (sq ft) | | 126.95 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 79.74 | Top Width (ft) | | 79.74 | |
| Vel Total (ft/s) | 2.36 | Avg. Vel. (ft/s) | | 2.36 | |
| Max Chl Dpth (ft) | 3.20 | Hydr. Depth (ft) | | 1.59 | |
| Conv. Total (cfs) | 5620.5 | Conv. (cfs) | | 5620.5 | |
| Length Wtd. (ft) | 197.18 | Wetted Per. (ft) | | 81.76 | |
| Min Ch El (ft) | 970.67 | Shear (lb/sq ft) | | 0.27 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.65 | |
| Frctn Loss (ft) | 0.89 | Cum Volume (acre-ft) | 0.15 | 14.96 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.13 | 6.60 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.96 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 973.87 | Reach Len. (ft) | 208.26 | 197.18 | 181.45 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 127.16 | |
| E.G. Slope (ft/ft) | 0.002814 | Area (sq ft) | | 127.16 | |

| | | | | |
|---|---|---|---|---|
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 |
| Top Width (ft) | 79.74 | Top Width (ft) | | 79.74 |
| Vel Total (ft/s) | 2.35 | Avg. Vel. (ft/s) | | 2.35 |
| Max Chl Dpth (ft) | 3.20 | Hydr. Depth (ft) | | 1.59 |
| Conv. Total (cfs) | 5636.5 | Conv. (cfs) | | 5636.5 |
| Length Wtd. (ft) | 197.18 | Wetted Per. (ft) | | 81.77 |
| Min Ch El (ft) | 970.67 | Shear (lb/sq ft) | | 0.27 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.64 |
| Frctn Loss (ft) | 0.94 | Cum Volume (acre-ft) | 0.21 | 14.92 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.23 | 6.60 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.889

INPUT
Description: 9974.956 - Thalweg Sta. 120.78
Station Elevation Data num= 43

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 971.93 | 6.13 | 971.92 | 7.31 | 971.92 | 15.32 | 971.87 | 24.51 | 971.87 |
| 27.4 | 971.85 | 33.69 | 971.79 | 37.44 | 971.77 | 42.88 | 971.79 | 47.48 | 971.83 |
| 52.07 | 971.91 | 57.53 | 971.97 | 67.57 | 972 | 70.45 | 971.96 | 77.61 | 971.94 |
| 79.64 | 971.9 | 80.31 | 971.9 | 87.66 | 971.89 | 88.25 | 971.88 | 89.56 | 971.85 |
| 108.79 | 971.52 | 109.72 | 971.51 | 110.55 | 971.42 | 120.78 | 970.51 | 131.55 | 971.02 |
| 131.84 | 970.99 | 132.18 | 971.13 | 134.95 | 972.13 | 142.91 | 975.01 | 152.53 | 978.71 |
| 153.97 | 979.26 | 155.57 | 979.74 | 161.99 | 981.53 | 165.03 | 982.01 | 168.64 | 982.07 |
| 169.5 | 982.08 | 176.09 | 982.32 | 178.96 | 982.29 | 187.15 | 982.24 | 194.51 | 982.16 |
| 198.21 | 982.1 | 202.34 | 982 | 205.41 | 981.9 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .045 | 134.95 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 80.31 | 168.64 | 201.33 | 181.47 | 165.11 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 972.57 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.045 | 0.045 | |
| W.S. Elev (ft) | 972.39 | Reach Len. (ft) | 201.33 | 181.47 | 165.11 |
| Crit W.S. (ft) | 972.27 | Flow Area (sq ft) | 40.10 | 55.16 | |
| E.G. Slope (ft/ft) | 0.012799 | Area (sq ft) | 40.10 | 55.16 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | 93.93 | 205.07 | |
| Top Width (ft) | 135.68 | Top Width (ft) | 80.31 | 55.37 | |
| Vel Total (ft/s) | 3.14 | Avg. Vel. (ft/s) | 2.34 | 3.72 | |
| Max Chl Dpth (ft) | 1.88 | Hydr. Depth (ft) | 0.50 | 1.00 | |
| Conv. Total (cfs) | 2642.9 | Conv. (cfs) | 830.3 | 1812.6 | |
| Length Wtd. (ft) | 193.64 | Wetted Per. (ft) | 80.78 | 55.68 | |
| Min Ch El (ft) | 970.51 | Shear (lb/sq ft) | 0.40 | 0.79 | |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.93 | 2.94 | |
| Frctn Loss (ft) | 2.40 | Cum Volume (acre-ft) | 3.60 | 11.11 | 6.75 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 4.56 | 6.23 | 12.96 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.05 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 972.83 | Reach Len. (ft) | 201.33 | 181.47 | 165.11 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 79.77 | |
| E.G. Slope (ft/ft) | 0.008343 | Area (sq ft) | | 79.77 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 56.59 | Top Width (ft) | | 56.59 | |
| Vel Total (ft/s) | 3.75 | Avg. Vel. (ft/s) | | 3.75 | |
| Max Chl Dpth (ft) | 2.32 | Hydr. Depth (ft) | | 1.41 | |
| Conv. Total (cfs) | 3273.5 | Conv. (cfs) | | 3273.5 | |
| Length Wtd. (ft) | 184.86 | Wetted Per. (ft) | | 57.91 | |

| | | | | |
|---|---|---|---|---|
| Min Ch El (ft) | 970.51 | Shear (lb/sq ft) | | 0.72 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.69 |
| Frctn Loss (ft) | 1.70 | Cum Volume (acre-ft) | 0.15 | 14.49 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.13 | 6.30 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.01 | Element | | | |
| Vel Head (ft) | 0.24 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 972.77 | Reach Len. (ft) | 201.33 | 181.47 | 165.11 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 76.24 | |
| E.G. Slope (ft/ft) | 0.009653 | Area (sq ft) | | 76.24 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 56.41 | Top Width (ft) | | 56.41 | |
| Vel Total (ft/s) | 3.92 | Avg. Vel. (ft/s) | | 3.92 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.35 | |
| Conv. Total (cfs) | 3043.2 | Conv. (cfs) | | 3043.2 | |
| Length Wtd. (ft) | 185.74 | Wetted Per. (ft) | | 57.66 | |
| Min Ch El (ft) | 970.51 | Shear (lb/sq ft) | | 0.80 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.12 | |
| Frctn Loss (ft) | 1.77 | Cum Volume (acre-ft) | 0.21 | 14.46 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.23 | 6.29 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.855

INPUT
Description: 9793.483 - Thalweg Sta. 274.97
Station Elevation Data num= 46

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 969.88 | 1.46 | 969.87 | 10.21 | 969.83 | 14.25 | 969.8 | 39.87 | 969.66 |
| 40.83 | 969.65 | 51.03 | 969.6 | 52.66 | 969.6 | 78.27 | 969.49 | 91.07 | 969.45 |
| 91.85 | 969.44 | 94.89 | 969.43 | 102.05 | 969.39 | 103.88 | 969.39 | 112.25 | 969.35 |
| 116.67 | 969.35 | 122.46 | 969.33 | 142.28 | 969.36 | 145.16 | 969.36 | 153.07 | 969.38 |
| 155.08 | 969.39 | 156.42 | 969.39 | 165.45 | 969.45 | 166.6 | 969.46 | 166.79 | 969.46 |
| 192.83 | 969.55 | 197.71 | 969.56 | 213.16 | 969.61 | 219.06 | 969.64 | 228.61 | 969.73 |
| 241.38 | 969.92 | 245.3 | 969.98 | 258.41 | 970.04 | 259.51 | 970.02 | 271.53 | 969.41 |
| 274.97 | 969.32 | 284.64 | 969.64 | 290.43 | 970.23 | 297.76 | 971.48 | 305.88 | 973.27 |
| 310.88 | 974.66 | 313.79 | 975.37 | 321.33 | 977.21 | 323.99 | 977.72 | 329.99 | 977.37 |
| 330.65 | 977.33 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .045 | 329.99 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 258.41 | 313.79 | 250.34 | 327.38 | 382.4 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 970.13 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | 0.045 | 0.045 | |
| W.S. Elev (ft) | 970.06 | Reach Len. (ft) | 250.34 | 327.38 | 382.40 |
| Crit W.S. (ft) | 969.89 | Flow Area (sq ft) | 123.36 | 12.95 | |
| E.G. Slope (ft/ft) | 0.012005 | Area (sq ft) | 123.36 | 12.95 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | 272.47 | 26.53 | |
| Top Width (ft) | 288.73 | Top Width (ft) | 258.41 | 30.32 | |
| Vel Total (ft/s) | 2.19 | Avg. Vel. (ft/s) | 2.21 | 2.05 | |
| Max Chl Dpth (ft) | 0.74 | Hydr. Depth (ft) | 0.48 | 0.43 | |
| Conv. Total (cfs) | 2729.0 | Conv. (cfs) | 2486.8 | 242.2 | |
| Length Wtd. (ft) | 307.18 | Wetted Per. (ft) | 258.59 | 30.36 | |
| Min Ch El (ft) | 969.32 | Shear (lb/sq ft) | 0.36 | 0.32 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.79 | 0.65 | |
| Frctn Loss (ft) | 1.94 | Cum Volume (acre-ft) | 3.22 | 10.97 | 6.75 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.78 | 6.05 | 12.96 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.35 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | 0.045 | 0.045 | |
| W.S. Elev (ft) | 971.12 | Reach Len. (ft) | 250.34 | 327.38 | 382.40 |
| Crit W.S. (ft) | 970.76 | Flow Area (sq ft) | 28.61 | 49.25 | |
| E.G. Slope (ft/ft) | 0.010166 | Area (sq ft) | 28.61 | 49.25 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | 101.93 | 197.07 | |
| Top Width (ft) | 61.78 | Top Width (ft) | 24.53 | 37.25 | |
| Vel Total (ft/s) | 3.84 | Avg. Vel. (ft/s) | 3.56 | 4.00 | |
| Max Chl Dpth (ft) | 1.80 | Hydr. Depth (ft) | 1.17 | 1.32 | |
| Conv. Total (cfs) | 2965.4 | Conv. (cfs) | 1010.9 | 1954.5 | |
| Length Wtd. (ft) | 314.25 | Wetted Per. (ft) | 25.84 | 37.38 | |
| Min Ch El (ft) | 969.32 | Shear (lb/sq ft) | 0.70 | 0.84 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 2.50 | 3.35 | |
| Frctn Loss (ft) | 2.50 | Cum Volume (acre-ft) | 0.08 | 14.22 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.07 | 6.10 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.23 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.045 | 0.045 | |
| W.S. Elev (ft) | 971.03 | Reach Len. (ft) | 250.34 | 327.38 | 382.40 |
| Crit W.S. (ft) | 970.65 | Flow Area (sq ft) | 37.90 | 46.01 | |
| E.G. Slope (ft/ft) | 0.009378 | Area (sq ft) | 37.90 | 46.01 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | 128.43 | 170.57 | |
| Top Width (ft) | 70.15 | Top Width (ft) | 33.41 | 36.74 | |
| Vel Total (ft/s) | 3.56 | Avg. Vel. (ft/s) | 3.39 | 3.71 | |
| Max Chl Dpth (ft) | 1.71 | Hydr. Depth (ft) | 1.13 | 1.25 | |
| Conv. Total (cfs) | 3087.6 | Conv. (cfs) | 1326.3 | 1761.4 | |
| Length Wtd. (ft) | 310.83 | Wetted Per. (ft) | 34.75 | 36.86 | |
| Min Ch El (ft) | 969.32 | Shear (lb/sq ft) | 0.64 | 0.73 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 2.16 | 2.71 | |
| Frctn Loss (ft) | 2.39 | Cum Volume (acre-ft) | 0.12 | 14.20 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.15 | 6.10 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.793

INPUT
Description: 9466.101 - Thalweg Sta. 218.12
Station Elevation Data num= 64

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 968.24 | 2.49 | 968.22 | 21.55 | 968.15 | 27.88 | 968.14 | 47.9 | 968.15 |
| 50.13 | 968.16 | 57.92 | 968.17 | 69.18 | 968.18 | 77.94 | 968.17 | 97.76 | 968.14 |
| 97.97 | 968.14 | 126.33 | 968.1 | 128.01 | 968.09 | 132.49 | 968.08 | 135.87 | 968.08 |
| 138.02 | 968.07 | 145.39 | 968.06 | 148.03 | 968.05 | 154.91 | 968.04 | 158.05 | 968.03 |
| 164.44 | 967.99 | 168.06 | 967.96 | 173.97 | 967.89 | 178.07 | 967.85 | 188.09 | 967.7 |
| 193.02 | 967.61 | 198.1 | 967.5 | 208.11 | 967.09 | 212.08 | 967.06 | 218.12 | 967.04 |
| 221.6 | 967.07 | 228.14 | 967.17 | 231.12 | 967.17 | 238.15 | 967.14 | 240.65 | 967.15 |
| 248.16 | 967.28 | 258.18 | 967.43 | 259.7 | 967.44 | 268.19 | 967.44 | 269.23 | 967.43 |
| 278.2 | 967.4 | 278.75 | 967.4 | 288.22 | 967.38 | 288.29 | 967.38 | 289.58 | 967.37 |
| 297.81 | 967.36 | 298.23 | 967.36 | 307.33 | 967.34 | 308.24 | 967.34 | 316.86 | 967.32 |
| 321.32 | 967.29 | 321.58 | 967.29 | 325.39 | 967.28 | 331.23 | 967.28 | 331.54 | 967.28 |
| 339.78 | 967.27 | 361.57 | 967.3 | 372.46 | 967.38 | 383.36 | 967.62 | 394.26 | 967.9 |
| 400.95 | 968.03 | 405.15 | 968.1 | 416.05 | 968.21 | 419.27 | 968.19 | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .045 | 331.23 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 198.1 | 259.7 | 228.63 | 218.48 | 190.55 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.045 | 0.045 | 0.043 |
| W.S. Elev (ft) | 968.14 | Reach Len. (ft) | 228.63 | 218.48 | 190.55 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 15.80 | 57.89 | 102.95 |
| E.G. Slope (ft/ft) | 0.003879 | Area (sq ft) | 15.80 | 57.89 | 102.95 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 9.50 | 114.22 | 175.29 |
| Top Width (ft) | 311.00 | Top Width (ft) | 100.00 | 61.60 | 149.40 |
| Vel Total (ft/s) | 1.69 | Avg. Vel. (ft/s) | 0.60 | 1.97 | 1.70 |
| Max Chl Dpth (ft) | 1.10 | Hydr. Depth (ft) | 0.16 | 0.94 | 0.69 |
| Conv. Total (cfs) | 4800.9 | Conv. (cfs) | 152.5 | 1833.9 | 2814.5 |
| Length Wtd. (ft) | 209.27 | Wetted Per. (ft) | 100.00 | 61.61 | 149.41 |
| Min Ch El (ft) | 967.04 | Shear (lb/sq ft) | 0.04 | 0.23 | 0.17 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.02 | 0.45 | 0.28 |
| Frctn Loss (ft) | 1.47 | Cum Volume (acre-ft) | 2.82 | 10.70 | 6.29 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.75 | 5.70 | 12.30 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.83 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 968.66 | Reach Len. (ft) | 228.63 | 218.48 | 190.55 |
| Crit W.S. (ft) | 968.10 | Flow Area (sq ft) | | 90.15 | |
| E.G. Slope (ft/ft) | 0.006389 | Area (sq ft) | | 90.15 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 61.60 | Top Width (ft) | | 61.60 | |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 | |
| Max Chl Dpth (ft) | 1.62 | Hydr. Depth (ft) | | 1.46 | |
| Conv. Total (cfs) | 3740.7 | Conv. (cfs) | | 3740.7 | |
| Length Wtd. (ft) | 218.48 | Wetted Per. (ft) | | 64.00 | |
| Min Ch El (ft) | 967.04 | Shear (lb/sq ft) | | 0.56 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.86 | |
| Frctn Loss (ft) | 1.93 | Cum Volume (acre-ft) | | 13.70 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 5.73 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.83 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 968.66 | Reach Len. (ft) | 228.63 | 218.48 | 190.55 |
| Crit W.S. (ft) | 968.10 | Flow Area (sq ft) | | 90.05 | |
| E.G. Slope (ft/ft) | 0.006412 | Area (sq ft) | | 90.05 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 61.60 | Top Width (ft) | | 61.60 | |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 | |
| Max Chl Dpth (ft) | 1.62 | Hydr. Depth (ft) | | 1.46 | |
| Conv. Total (cfs) | 3734.1 | Conv. (cfs) | | 3734.1 | |
| Length Wtd. (ft) | 218.48 | Wetted Per. (ft) | | 64.00 | |
| Min Ch El (ft) | 967.04 | Shear (lb/sq ft) | | 0.56 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.87 | |
| Frctn Loss (ft) | 1.93 | Cum Volume (acre-ft) | 0.01 | 13.69 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.05 | 5.73 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E

REACH: reach 2 RS: 1.751

INPUT
Description: 9247.619 - Thalweg Sta. 236.49
Station Elevation Data num= 88

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 966.87 | 4.4 | 966.85 | 14.53 | 966.79 | 14.66 | 966.79 | 15.45 | 966.78 |
| 23.37 | 966.73 | 24.66 | 966.72 | 32.09 | 966.64 | 34.79 | 966.63 | 40.8 | 966.44 |
| 44.92 | 966.37 | 49.51 | 966.47 | 55.05 | 966.56 | 58.23 | 966.64 | 65.18 | 966.73 |
| 66.95 | 966.74 | 75.32 | 966.75 | 77.76 | 966.75 | 84.37 | 966.76 | 85.45 | 966.76 |
| 93.09 | 966.77 | 95.58 | 966.78 | 101.8 | 966.78 | 105.71 | 966.79 | 115.84 | 966.8 |
| 119.23 | 966.79 | 125.97 | 966.8 | 127.95 | 966.79 | 136.1 | 966.78 | 136.66 | 966.78 |
| 145.37 | 966.73 | 146.24 | 966.72 | 154.09 | 966.64 | 156.37 | 966.62 | 160.56 | 966.57 |
| 165.6 | 966.52 | 176.49 | 966.41 | 182.22 | 966.37 | 186.49 | 966.33 | 192.12 | 966.31 |
| 196.49 | 966.28 | 202.02 | 966.28 | 206.49 | 966.27 | 216.49 | 966.27 | 226.49 | 966.25 |
| 236.49 | 966.12 | 246.49 | 965.97 | 256.49 | 965.71 | 261.42 | 965.67 | 266.49 | 965.65 |
| 276.49 | 965.93 | 281.22 | 965.98 | 286.49 | 966.01 | 296.49 | 965.98 | 301.02 | 966 |
| 306.49 | 966 | 310.92 | 966.03 | 336.5 | 966.14 | 340.63 | 966.15 | 346.5 | 966.18 |
| 356.5 | 966.21 | 362.59 | 966.21 | 366.5 | 966.19 | 367.92 | 966.16 | 378.19 | 966.04 |
| 378.62 | 966.04 | 391.1 | 966.32 | 394.91 | 966.44 | 403.58 | 966.68 | 411.62 | 966.73 |
| 416.06 | 966.75 | 428.34 | 966.68 | 429.14 | 966.68 | 445.05 | 966.6 | 453.5 | 966.58 |
| 454.75 | 966.58 | 461.77 | 966.56 | 465.98 | 966.56 | 478.35 | 966.58 | 478.49 | 966.58 |
| 490.94 | 966.62 | 495.2 | 966.64 | 503.41 | 966.71 | 511.92 | 966.84 | 527.58 | 967.11 |
| 528.37 | 967.12 | 528.64 | 967.12 | 538.8 | 967.23 | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .045 | 454.75 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 226.49 | 356.5 | 300.02 | 270.8 | 163.34 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.72 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 966.60 | Reach Len. (ft) | 300.02 | 270.80 | 163.34 |
| Crit W.S. (ft) | 966.50 | Flow Area (sq ft) | 19.47 | 77.30 | 17.43 |
| E.G. Slope (ft/ft) | 0.016461 | Area (sq ft) | 19.47 | 77.30 | 17.43 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 30.88 | 231.56 | 36.56 |
| Top Width (ft) | 303.58 | Top Width (ft) | 89.43 | 130.01 | 84.14 |
| Vel Total (ft/s) | 2.62 | Avg. Vel. (ft/s) | 1.59 | 3.00 | 2.10 |
| Max Chl Dpth (ft) | 0.95 | Hydr. Depth (ft) | 0.22 | 0.59 | 0.21 |
| Conv. Total (cfs) | 2330.4 | Conv. (cfs) | 240.7 | 1804.8 | 285.0 |
| Length Wtd. (ft) | 247.29 | Wetted Per. (ft) | 89.43 | 130.02 | 84.15 |
| Min Ch El (ft) | 965.65 | Shear (lb/sq ft) | 0.22 | 0.61 | 0.21 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.35 | 1.83 | 0.45 |
| Frctn Loss (ft) | 1.42 | Cum Volume (acre-ft) | 2.73 | 10.36 | 6.03 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 2.25 | 5.22 | 11.79 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.90 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 966.75 | Reach Len. (ft) | 300.02 | 270.80 | 163.34 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 97.05 | |
| E.G. Slope (ft/ft) | 0.012994 | Area (sq ft) | | 97.05 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 130.01 | Top Width (ft) | | 130.01 | |
| Vel Total (ft/s) | 3.08 | Avg. Vel. (ft/s) | | 3.08 | |
| Max Chl Dpth (ft) | 1.10 | Hydr. Depth (ft) | | 0.75 | |
| Conv. Total (cfs) | 2623.0 | Conv. (cfs) | | 2623.0 | |
| Length Wtd. (ft) | 270.80 | Wetted Per. (ft) | | 131.07 | |
| Min Ch El (ft) | 965.65 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.85 | |
| Frctn Loss (ft) | 1.31 | Cum Volume (acre-ft) | | 13.23 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 5.25 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.90 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 966.75 | Reach Len. (ft) | 300.02 | 270.80 | 163.34 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 97.28 | |
| E.G. Slope (ft/ft) | 0.012892 | Area (sq ft) | | 97.28 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 130.01 | Top Width (ft) | | 130.01 | |
| Vel Total (ft/s) | 3.07 | Avg. Vel. (ft/s) | | 3.07 | |
| Max Chl Dpth (ft) | 1.10 | Hydr. Depth (ft) | | 0.75 | |
| Conv. Total (cfs) | 2633.4 | Conv. (cfs) | | 2633.4 | |
| Length Wtd. (ft) | 270.80 | Wetted Per. (ft) | | 131.07 | |
| Min Ch El (ft) | 965.65 | Shear (lb/sq ft) | | 0.60 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.84 | |
| Frctn Loss (ft) | 1.31 | Cum Volume (acre-ft) | 0.01 | 13.22 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.05 | 5.25 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.700

INPUT
Description: 8976.824 - Thalweg Sta. 118.57
Station Elevation Data num= 65

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 965.27 | 4.51 | 965.26 | 32.35 | 965.24 | 40.56 | 965.22 | 42.99 | 965.22 |
| 43.12 | 965.22 | 46.93 | 965.21 | 53.9 | 965.18 | 64.68 | 965.11 | 73.73 | 965.02 |
| 75.46 | 965 | 76.62 | 964.98 | 86.24 | 964.84 | 94.64 | 964.67 | 97.02 | 964.63 |
| 100.53 | 964.56 | 107.8 | 964.43 | 112.68 | 964.39 | 118.57 | 964.32 | 127.34 | 964.33 |
| 129.35 | 964.35 | 130.71 | 964.36 | 150.91 | 964.56 | 154.13 | 964.58 | 161.69 | 964.6 |
| 172.47 | 964.58 | 183.24 | 964.53 | 184.8 | 964.52 | 194.02 | 964.48 | 202.83 | 964.46 |
| 204.8 | 964.45 | 215.96 | 964.45 | 226.51 | 964.49 | 228.75 | 964.49 | 241.74 | 964.55 |
| 242.01 | 964.55 | 243.87 | 964.56 | 255.27 | 964.6 | 256.96 | 964.61 | 268.54 | 964.64 |
| 272.19 | 964.64 | 287.42 | 964.59 | 317.87 | 964.41 | 321.58 | 964.4 | 333.09 | 964.35 |
| 334.84 | 964.35 | 346.63 | 964.43 | 348.1 | 964.43 | 348.32 | 964.44 | 361.37 | 964.6 |
| 363.55 | 964.62 | 394.91 | 964.99 | 409.22 | 965.12 | 424.45 | 965.23 | 427.67 | 965.26 |
| 439.68 | 965.34 | 454.19 | 965.44 | 454.9 | 965.45 | 480.71 | 965.64 | 485.35 | 965.66 |
| 500.58 | 965.79 | 507.23 | 965.86 | 515.81 | 965.92 | 520.49 | 965.93 | 530.79 | 965.86 |

Manning's n Values num= 1

| Sta | n Val |
|---|---|
| 0 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 94.64 | 272.19 | 189.34 | 198.99 | 185.46 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.27 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.03 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 965.24 | Reach Len. (ft) | 189.34 | 198.99 | 185.46 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 11.14 | 130.35 | 86.23 |
| E.G. Slope (ft/ft) | 0.002895 | Area (sq ft) | 11.14 | 130.35 | 86.23 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 6.21 | 188.46 | 104.33 |
| Top Width (ft) | 394.36 | Top Width (ft) | 63.39 | 177.55 | 153.42 |
| Vel Total (ft/s) | 1.31 | Avg. Vel. (ft/s) | 0.56 | 1.45 | 1.21 |
| Max Chl Dpth (ft) | 0.92 | Hydr. Depth (ft) | 0.18 | 0.73 | 0.56 |
| Conv. Total (cfs) | 5557.0 | Conv. (cfs) | 115.3 | 3502.6 | 1939.1 |
| Length Wtd. (ft) | 193.81 | Wetted Per. (ft) | 63.40 | 177.55 | 153.42 |
| Min Ch El (ft) | 964.32 | Shear (lb/sq ft) | 0.03 | 0.13 | 0.10 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.02 | 0.19 | 0.12 |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 2.62 | 9.72 | 5.84 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.72 | 4.27 | 11.35 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.57 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.04 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 965.52 | Reach Len. (ft) | 189.34 | 198.99 | 185.46 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 180.40 | |
| E.G. Slope (ft/ft) | 0.002499 | Area (sq ft) | | 180.40 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 177.55 | Top Width (ft) | | 177.55 | |
| Vel Total (ft/s) | 1.66 | Avg. Vel. (ft/s) | | 1.66 | |
| Max Chl Dpth (ft) | 1.20 | Hydr. Depth (ft) | | 1.02 | |
| Conv. Total (cfs) | 5981.5 | Conv. (cfs) | | 5981.5 | |
| Length Wtd. (ft) | 198.99 | Wetted Per. (ft) | | 179.29 | |
| Min Ch El (ft) | 964.32 | Shear (lb/sq ft) | | 0.16 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.26 | |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | | 12.37 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 4.29 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.04 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 965.52 | Reach Len. (ft) | 189.34 | 198.99 | 185.46 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 180.01 | |
| E.G. Slope (ft/ft) | 0.002517 | Area (sq ft) | | 180.01 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 177.55 | Top Width (ft) | | 177.55 | |
| Vel Total (ft/s) | 1.66 | Avg. Vel. (ft/s) | | 1.66 | |
| Max Chl Dpth (ft) | 1.20 | Hydr. Depth (ft) | | 1.01 | |
| Conv. Total (cfs) | 5960.0 | Conv. (cfs) | | 5960.0 | |
| Length Wtd. (ft) | 198.97 | Wetted Per. (ft) | | 179.29 | |
| Min Ch El (ft) | 964.32 | Shear (lb/sq ft) | | 0.16 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.26 | |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 0.01 | 12.36 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.05 | 4.29 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.662

INPUT
Description: 8777.831 - Thalweg Sta. 96.60
Station Elevation Data num= 62

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.85 | 1.24 | 976.77 | 8.71 | 976.14 | 9.16 | 976.1 | 11.78 | 975.85 |
| 22.32 | 974.81 | 28.9 | 974.08 | 32.86 | 973.63 | 40.8 | 972.03 | 43.4 | 971.41 |
| 47.12 | 970.41 | 53.94 | 968.57 | 60.51 | 966.92 | 64.48 | 965.87 | 72.44 | 964.43 |
| 75.03 | 963.98 | 76.31 | 963.89 | 85.56 | 962.97 | 93.9 | 962.89 | 96.6 | 962.84 |
| 99.36 | 962.88 | 115.97 | 963.19 | 118.91 | 963.25 | 121.92 | 963.3 | 130.07 | 963.46 |
| 138.03 | 963.6 | 144.48 | 963.7 | 152.38 | 963.77 | 160.02 | 963.8 | 160.4 | 963.8 |
| 164.21 | 963.82 | 164.74 | 963.82 | 177.52 | 963.85 | 179.9 | 963.86 | 204.13 | 963.91 |
| 225.36 | 963.9 | 235.32 | 963.86 | 255.67 | 963.74 | 257.36 | 963.72 | 269.53 | 963.65 |
| 270.67 | 963.64 | 270.83 | 963.64 | 283.98 | 963.58 | 297.29 | 963.59 | 323.91 | 963.72 |
| 326.26 | 963.72 | 331.46 | 963.72 | 348.87 | 963.66 | 351.37 | 963.66 | 358.67 | 963.68 |
| 370.18 | 963.75 | 371.52 | 963.77 | 391.69 | 964 | 395.27 | 964.05 | 416.26 | 964.29 |
| 427.77 | 964.37 | 450.81 | 964.48 | 452.16 | 964.48 | 472.32 | 964.57 | 475.87 | 964.59 |
| 485.36 | 964.66 | 512.18 | 964.92 | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 47.12 | .052 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 75.03 | 152.38 | 316.83 | 347.64 | 389.86 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.18 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 964.08 | Reach Len. (ft) | 316.83 | 347.64 | 389.86 |
| Crit W.S. (ft) | 964.00 | Flow Area (sq ft) | 0.03 | 60.14 | 75.13 |
| E.G. Slope (ft/ft) | 0.015167 | Area (sq ft) | 0.03 | 60.14 | 75.13 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 0.01 | 178.86 | 120.12 |
| Top Width (ft) | 323.21 | Top Width (ft) | 0.56 | 77.35 | 245.30 |
| Vel Total (ft/s) | 2.21 | Avg. Vel. (ft/s) | 0.47 | 2.97 | 1.60 |
| Max Chl Dpth (ft) | 1.24 | Hydr. Depth (ft) | 0.05 | 0.78 | 0.31 |
| Conv. Total (cfs) | 2427.9 | Conv. (cfs) | 0.1 | 1452.4 | 975.4 |
| Length Wtd. (ft) | 371.15 | Wetted Per. (ft) | 0.57 | 77.41 | 245.31 |
| Min Ch El (ft) | 962.84 | Shear (lb/sq ft) | 0.05 | 0.74 | 0.29 |
| Alpha | 1.29 | Stream Power (lb/ft s) | 0.02 | 2.19 | 0.46 |
| Frctn Loss (ft) | 2.67 | Cum Volume (acre-ft) | 2.60 | 9.28 | 5.49 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 1.59 | 3.69 | 10.50 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.69 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 964.54 | Reach Len. (ft) | 316.83 | 347.64 | 389.86 |
| Crit W.S. (ft) | 964.07 | Flow Area (sq ft) | | 95.66 | |
| E.G. Slope (ft/ft) | 0.009229 | Area (sq ft) | | 95.66 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 77.35 | Top Width (ft) | | 77.35 | |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | | 3.13 | |
| Max Chl Dpth (ft) | 1.70 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 3112.3 | Conv. (cfs) | | 3112.3 | |
| Length Wtd. (ft) | 347.64 | Wetted Per. (ft) | | 78.73 | |
| Min Ch El (ft) | 962.84 | Shear (lb/sq ft) | | 0.70 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.19 | |
| Frctn Loss (ft) | 2.69 | Cum Volume (acre-ft) | | 11.74 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 3.71 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.68 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 964.53 | Reach Len. (ft) | 316.83 | 347.64 | 389.86 |
| Crit W.S. (ft) | 964.07 | Flow Area (sq ft) | 0.87 | 95.19 | |
| E.G. Slope (ft/ft) | 0.009228 | Area (sq ft) | 0.87 | 95.19 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | 1.01 | 297.99 | |
| Top Width (ft) | 80.50 | Top Width (ft) | 3.15 | 77.35 | |
| Vel Total (ft/s) | 3.11 | Avg. Vel. (ft/s) | 1.15 | 3.13 | |
| Max Chl Dpth (ft) | 1.69 | Hydr. Depth (ft) | 0.28 | 1.23 | |
| Conv. Total (cfs) | 3112.6 | Conv. (cfs) | 10.5 | 3102.1 | |
| Length Wtd. (ft) | 347.56 | Wetted Per. (ft) | 3.19 | 78.17 | |
| Min Ch El (ft) | 962.84 | Shear (lb/sq ft) | 0.16 | 0.70 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.18 | 2.20 | |
| Frctn Loss (ft) | 2.69 | Cum Volume (acre-ft) | 0.01 | 11.73 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.05 | 3.71 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.597

INPUT
Description: 8430.189 - Thalweg Sta. 129.97
Station Elevation Data num= 90

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.12 | 7.64 | 970.36 | 18.12 | 970.41 | 19.82 | 970.36 | 28.6 | 970.09 |
| 29.83 | 970.04 | 32.42 | 969.91 | 39.08 | 969.59 | 39.84 | 969.56 | 49.56 | 968.7 |
| 49.85 | 968.68 | 56.13 | 968.38 | 59.86 | 968.18 | 60.03 | 968.14 | 69.87 | 966.02 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 70.51 | 965.88 | 79.88 | 963.91 | 80.99 | 963.71 | 89.89 | 962.31 | 89.96 | 962.3 |
| 91.47 | 962.17 | 99.9 | 961.58 | 107.61 | 961.25 | 112.43 | 961.02 | 119.92 | 960.71 |
| 122.91 | 960.65 | 129.97 | 960.53 | 135.22 | 960.57 | 149.26 | 960.71 | 161.06 | 960.79 |
| 177.72 | 960.91 | 181.79 | 960.93 | 191.96 | 961 | 192.66 | 961 | 202.51 | 961.07 |
| 230.76 | 961.24 | 233.6 | 961.25 | 234.66 | 961.25 | 243.97 | 961.28 | 250.03 | 961.26 |
| 254.93 | 961.26 | 272.9 | 961.17 | 278.83 | 961.13 | 281.69 | 961.12 | 295.77 | 961.05 |
| 299.82 | 961.04 | 311.04 | 961.04 | 341.53 | 961.1 | 355.94 | 961.1 | 364.4 | 961.08 |
| 367.16 | 961.08 | 369.82 | 961.07 | 375.23 | 961.06 | 387.27 | 961.03 | 389.6 | 961.02 |
| 391.85 | 961.02 | 400.82 | 961 | 413.88 | 961 | 433.02 | 961.04 | 456.94 | 961.03 |
| 457.95 | 961.02 | 478.77 | 960.98 | 479.98 | 960.98 | 501.64 | 960.93 | 524.04 | 960.91 |
| 524.28 | 960.9 | 546.72 | 960.9 | 547.39 | 960.89 | 591.61 | 960.92 | 593.14 | 960.93 |
| 612.17 | 960.97 | 614.06 | 960.97 | 616.01 | 960.98 | 625.28 | 961 | 658.95 | 961.14 |
| 692.61 | 961.16 | 702.64 | 961.15 | 703.84 | 961.14 | 707.51 | 961.14 | 722.33 | 961.11 |
| 732.38 | 961.12 | 737.51 | 961.16 | 739.82 | 961.17 | 771.17 | 961.43 | 776.13 | 961.48 |
| 782.39 | 961.53 | 784.43 | 961.54 | 793.62 | 961.6 | 804.84 | 961.63 | 810.44 | 961.61 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 89.96 | .052 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 99.9 | 243.97 | 393.55 | 396.76 | 423.41 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 961.48 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.02 | Wt. n-Val. | | 0.052 | 0.052 |
| W.S. Elev (ft) | 961.46 | Reach Len. (ft) | 393.55 | 396.76 | 423.41 |
| Crit W.S. (ft) | 961.21 | Flow Area (sq ft) | | 72.55 | 211.93 |
| E.G. Slope (ft/ft) | 0.004194 | Area (sq ft) | | 72.55 | 211.93 |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 86.11 | 212.89 |
| Top Width (ft) | 671.18 | Top Width (ft) | | 141.22 | 529.97 |
| Vel Total (ft/s) | 1.05 | Avg. Vel. (ft/s) | | 1.19 | 1.00 |
| Max Chl Dpth (ft) | 0.93 | Hydr. Depth (ft) | | 0.51 | 0.40 |
| Conv. Total (cfs) | 4616.9 | Conv. (cfs) | | 1329.7 | 3287.2 |
| Length Wtd. (ft) | 407.27 | Wetted Per. (ft) | | 141.24 | 529.97 |
| Min Ch El (ft) | 960.53 | Shear (lb/sq ft) | | 0.13 | 0.10 |
| Alpha | 1.02 | Stream Power (lb/ft s) | | 0.16 | 0.11 |
| Frctn Loss (ft) | 3.92 | Cum Volume (acre-ft) | 2.60 | 8.75 | 4.21 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.58 | 2.81 | 7.03 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 961.97 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 961.89 | Reach Len. (ft) | 393.55 | 396.76 | 423.41 |
| Crit W.S. (ft) | 961.46 | Flow Area (sq ft) | | 135.09 | |
| E.G. Slope (ft/ft) | 0.006595 | Area (sq ft) | | 135.09 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 144.07 | Top Width (ft) | | 144.07 | |
| Vel Total (ft/s) | 2.21 | Avg. Vel. (ft/s) | | 2.21 | |
| Max Chl Dpth (ft) | 1.36 | Hydr. Depth (ft) | | 0.94 | |
| Conv. Total (cfs) | 3681.9 | Conv. (cfs) | | 3681.9 | |
| Length Wtd. (ft) | 396.76 | Wetted Per. (ft) | | 145.02 | |
| Min Ch El (ft) | 960.53 | Shear (lb/sq ft) | | 0.38 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.85 | |
| Frctn Loss (ft) | 4.17 | Cum Volume (acre-ft) | | 10.81 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 2.83 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 961.97 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 961.89 | Reach Len. (ft) | 393.55 | 396.76 | 423.41 |
| Crit W.S. (ft) | 961.46 | Flow Area (sq ft) | 0.70 | 134.93 | |
| E.G. Slope (ft/ft) | 0.006581 | Area (sq ft) | 0.70 | 134.93 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | 0.47 | 298.53 | |

| | | | | |
|---|---|---|---|---|
| Top Width (ft) | 148.53 | Top Width (ft) | 4.46 | 144.07 |
| Vel Total (ft/s) | 2.20 | Avg. Vel. (ft/s) | 0.67 | 2.21 |
| Max Chl Dpth (ft) | 1.36 | Hydr. Depth (ft) | 0.16 | 0.94 |
| Conv. Total (cfs) | 3685.8 | Conv. (cfs) | 5.8 | 3680.1 |
| Length Wtd. (ft) | 396.76 | Wetted Per. (ft) | 4.47 | 144.71 |
| Min Ch El (ft) | 960.53 | Shear (lb/sq ft) | 0.06 | 0.38 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.04 | 0.85 |
| Frctn Loss (ft) | 4.17 | Cum Volume (acre-ft) | 0.00 | 10.81 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.02 | 2.83 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.521

INPUT
Description: 8033.430 - Thalweg Sta. 244.53
Station Elevation Data num= 126

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 968.3 | 3.84 | 968.29 | 8.23 | 968.24 | 13.86 | 968.08 | 17.78 | 967.95 |
| 23.87 | 967.68 | 27.33 | 967.5 | 33.88 | 967.11 | 46.42 | 966.22 | 55.98 | 965.31 |
| 63.91 | 964.36 | 65.53 | 964.13 | 73.93 | 962.9 | 75.08 | 962.73 | 84.62 | 961.33 |
| 93.95 | 960.2 | 94.17 | 960.18 | 98.73 | 959.88 | 103.41 | 959.56 | 103.72 | 959.54 |
| 103.96 | 959.53 | 113.27 | 959.11 | 113.97 | 959.07 | 122.81 | 958.34 | 123.99 | 958.25 |
| 132.37 | 957.82 | 134 | 957.75 | 141.92 | 957.33 | 144.01 | 957.23 | 151.47 | 956.99 |
| 154.02 | 956.94 | 161.01 | 956.93 | 164.03 | 956.92 | 170.56 | 956.95 | 174.04 | 956.95 |
| 180.11 | 956.99 | 184.06 | 957 | 189.66 | 957.05 | 192.97 | 957.07 | 214.09 | 957.27 |
| 218.31 | 957.25 | 224.19 | 957.25 | 229.14 | 957.18 | 234.31 | 957.13 | 242.04 | 957.04 |
| 244.53 | 957.02 | 264.95 | 957.02 | 267.81 | 957.03 | 285.38 | 956.99 | 295.6 | 956.99 |
| 305.81 | 957.03 | 306.49 | 957.04 | 316.02 | 957.09 | 319.39 | 957.09 | 326.24 | 957.11 |
| 356.88 | 957.09 | 358.07 | 957.1 | 377.31 | 957.12 | 381.46 | 957.13 | 385.64 | 957.13 |
| 387.55 | 957.14 | 397.54 | 957.16 | 398.1 | 957.16 | 429.1 | 957.29 | 455.89 | 957.43 |
| 460.26 | 957.46 | 462.72 | 957.47 | 470.65 | 957.52 | 470.83 | 957.52 | 471.46 | 957.53 |
| 491.43 | 957.63 | 499.24 | 957.65 | 512.2 | 957.65 | 513.69 | 957.64 | 514.93 | 957.64 |
| 528.12 | 957.62 | 532.98 | 957.62 | 542.57 | 957.6 | 595.3 | 957.57 | 600.37 | 957.56 |
| 672.62 | 957.52 | 687.06 | 957.54 | 688.79 | 957.55 | 693.2 | 957.55 | 699.18 | 957.57 |
| 709.56 | 957.57 | 715.96 | 957.54 | 719.95 | 957.53 | 730.16 | 957.47 | 730.34 | 957.47 |
| 738.41 | 957.43 | 740.93 | 957.43 | 749.56 | 957.41 | 798.06 | 957.4 | 800.69 | 957.38 |
| 816.61 | 957.32 | 832.34 | 957.29 | 855.2 | 957.3 | 857.94 | 957.31 | 877.38 | 957.36 |
| 878.05 | 957.36 | 878.6 | 957.37 | 899.26 | 957.46 | 900.9 | 957.46 | 902.94 | 957.47 |
| 919.93 | 957.48 | 935.18 | 957.45 | 946.61 | 957.41 | 958.04 | 957.35 | 961.26 | 957.32 |
| 979.61 | 957.26 | 981.92 | 957.26 | 992.32 | 957.29 | 1002.59 | 957.38 | 1003.33 | 957.39 |
| 1003.75 | 957.39 | 1015.17 | 957.54 | 1023.25 | 957.66 | 1026.6 | 957.72 | 1030.74 | 957.78 |
| 1038.03 | 957.9 | 1049.46 | 958.03 | 1056.3 | 958.04 | 1060.88 | 958.06 | 1064.58 | 958.05 |
| 1066.11 | 958.05 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 103.41 | .052 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 214.09 | 398.1 | 377.59 | 369.45 | 372.44 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 957.55 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 957.43 | Reach Len. (ft) | 377.59 | 369.45 | 372.44 |
| Crit W.S. (ft) | 957.43 | Flow Area (sq ft) | 27.63 | 64.13 | 26.25 |
| E.G. Slope (ft/ft) | 0.040869 | Area (sq ft) | 27.63 | 64.13 | 26.25 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 82.66 | 183.48 | 32.86 |
| Top Width (ft) | 539.16 | Top Width (ft) | 74.12 | 184.01 | 281.03 |
| Vel Total (ft/s) | 2.53 | Avg. Vel. (ft/s) | 2.99 | 2.86 | 1.25 |
| Max Chl Dpth (ft) | 0.51 | Hydr. Depth (ft) | 0.37 | 0.35 | 0.09 |
| Conv. Total (cfs) | 1479.0 | Conv. (cfs) | 408.9 | 907.6 | 162.6 |
| Length Wtd. (ft) | 372.20 | Wetted Per. (ft) | 74.13 | 184.01 | 281.03 |
| Min Ch El (ft) | 956.99 | Shear (lb/sq ft) | 0.95 | 0.89 | 0.24 |
| Alpha | 1.19 | Stream Power (lb/ft s) | 2.84 | 2.54 | 0.30 |
| Frctn Loss (ft) | 1.39 | Cum Volume (acre-ft) | 2.47 | 8.13 | 3.05 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.25 | 1.33 | 3.09 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 957.79 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 957.67 | Reach Len. (ft) | 377.59 | 369.45 | 372.44 |
| Crit W.S. (ft) | 957.52 | Flow Area (sq ft) | | 107.81 | |
| E.G. Slope (ft/ft) | 0.019342 | Area (sq ft) | | 107.81 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 184.01 | Top Width (ft) | | 184.01 | |
| Vel Total (ft/s) | 2.77 | Avg. Vel. (ft/s) | | 2.77 | |
| Max Chl Dpth (ft) | 0.75 | Hydr. Depth (ft) | | 0.59 | |
| Conv. Total (cfs) | 2149.9 | Conv. (cfs) | | 2149.9 | |
| Length Wtd. (ft) | 369.45 | Wetted Per. (ft) | | 184.92 | |
| Min Ch El (ft) | 956.99 | Shear (lb/sq ft) | | 0.70 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.95 | |
| Frctn Loss (ft) | 2.91 | Cum Volume (acre-ft) | | 9.71 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 1.33 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 957.79 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 957.67 | Reach Len. (ft) | 377.59 | 369.45 | 372.44 |
| Crit W.S. (ft) | 957.52 | Flow Area (sq ft) | | 107.67 | |
| E.G. Slope (ft/ft) | 0.019422 | Area (sq ft) | | 107.67 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 184.01 | Top Width (ft) | | 184.01 | |
| Vel Total (ft/s) | 2.78 | Avg. Vel. (ft/s) | | 2.78 | |
| Max Chl Dpth (ft) | 0.68 | Hydr. Depth (ft) | | 0.59 | |
| Conv. Total (cfs) | 2145.5 | Conv. (cfs) | | 2145.5 | |
| Length Wtd. (ft) | 369.45 | Wetted Per. (ft) | | 184.92 | |
| Min Ch El (ft) | 956.99 | Shear (lb/sq ft) | | 0.71 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.96 | |
| Frctn Loss (ft) | 2.91 | Cum Volume (acre-ft) | | 9.71 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 1.33 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 2 RS: 1.452

INPUT
Description: 7663.984 - Thalweg Sta. 360.07
Station Elevation Data num= 145

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 955.03 | 6.75 | 954.92 | 9.13 | 954.91 | 14.95 | 954.86 | 19.46 | 954.87 |
| 23.14 | 954.83 | 29.8 | 954.8 | 37.34 | 954.71 | 39.55 | 954.69 | 40.13 | 954.69 |
| 47.75 | 954.62 | 60.79 | 954.53 | 64.16 | 954.52 | 71.12 | 954.48 | 72.36 | 954.47 |
| 80.56 | 954.43 | 81.45 | 954.43 | 88.77 | 954.4 | 96.92 | 954.35 | 102.12 | 954.33 |
| 112.45 | 954.27 | 113.38 | 954.26 | 121.58 | 954.23 | 122.78 | 954.22 | 129.77 | 954.2 |
| 133.11 | 954.2 | 137.98 | 954.18 | 143.44 | 954.18 | 146.18 | 954.17 | 153.77 | 954.16 |
| 154.38 | 954.16 | 178.99 | 954.03 | 187.19 | 954 | 195.1 | 953.95 | 195.4 | 953.95 |
| 196.54 | 953.94 | 203.6 | 953.89 | 205.43 | 953.87 | 215.76 | 953.81 | 220.01 | 953.81 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 226.09 | 953.78 | 228.21 | 953.79 | 236.35 | 953.77 | 236.41 | 953.77 | 246.76 | 953.73 |
| 252.81 | 953.73 | 257.09 | 953.72 | 259.55 | 953.72 | 261.02 | 953.72 | 267.42 | 953.7 |
| 269.22 | 953.7 | 272.09 | 953.69 | 277.73 | 953.71 | 288.02 | 953.71 | 294.55 | 953.69 |
| 298.32 | 953.69 | 308.17 | 953.67 | 310 | 953.67 | 321.77 | 953.62 | 339.49 | 953.59 |
| 360.07 | 953.6 | 370.37 | 953.64 | 380.66 | 953.71 | 389.83 | 953.74 | 390.95 | 953.74 |
| 394.43 | 953.72 | 401.24 | 953.7 | 403.44 | 953.68 | 421.83 | 953.6 | 430.66 | 953.62 |
| 432.12 | 953.62 | 436.65 | 953.65 | 442.42 | 953.7 | 444.28 | 953.72 | 471.49 | 953.95 |
| 473.3 | 953.97 | 483.59 | 954.05 | 485.11 | 954.06 | 498.72 | 954.19 | 514.47 | 954.35 |
| 521.1 | 954.4 | 524.76 | 954.42 | 525.94 | 954.42 | 535.05 | 954.44 | 553.17 | 954.41 |
| 555.64 | 954.41 | 563.32 | 954.39 | 564.32 | 954.39 | 565.93 | 954.38 | 568.11 | 954.38 |
| 576 | 954.35 | 577.41 | 954.34 | 586 | 954.32 | 587.72 | 954.32 | 603.82 | 954.28 |
| 606.01 | 954.27 | 613.53 | 954.26 | 616.02 | 954.25 | 618.65 | 954.25 | 636.02 | 954.2 |
| 639.27 | 954.2 | 649.57 | 954.17 | 666.04 | 954.17 | 676.04 | 954.2 | 681.55 | 954.24 |
| 686.05 | 954.26 | 706.05 | 954.42 | 726.06 | 954.53 | 732.05 | 954.55 | 776.09 | 954.58 |
| 783.59 | 954.6 | 786.09 | 954.61 | 793.9 | 954.63 | 804.21 | 954.67 | 806.1 | 954.69 |
| 814.52 | 954.73 | 816.1 | 954.74 | 824.83 | 954.78 | 826.11 | 954.79 | 836.11 | 954.78 |
| 845.45 | 954.74 | 846.12 | 954.74 | 855.76 | 954.68 | 856.12 | 954.67 | 866.06 | 954.59 |
| 866.12 | 954.59 | 868.11 | 954.58 | 876.13 | 954.51 | 886.13 | 954.51 | 890.72 | 954.58 |
| 895.34 | 954.66 | 896.14 | 954.67 | 905.05 | 954.87 | 916.15 | 955.06 | 926.15 | 955.2 |
| 927.92 | 955.21 | 936.16 | 955.27 | 938.23 | 955.28 | 946.16 | 955.3 | 948.54 | 955.31 |
| 956.16 | 955.32 | 958.85 | 955.33 | 976.17 | 955.34 | 979.46 | 955.36 | 983.14 | 955.37 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 890.72 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 259.55 | 389.83 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 954.65 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 954.64 | Reach Len. (ft) | 1050.00 | 1050.00 | 1050.00 |
| Crit W.S. (ft) | 954.05 | Flow Area (sq ft) | 109.37 | 127.84 | 172.08 |
| E.G. Slope (ft/ft) | 0.001292 | Area (sq ft) | 109.37 | 127.84 | 172.08 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 71.83 | 129.67 | 97.50 |
| Top Width (ft) | 784.92 | Top Width (ft) | 213.91 | 130.28 | 440.72 |
| Vel Total (ft/s) | 0.73 | Avg. Vel. (ft/s) | 0.66 | 1.01 | 0.57 |
| Max Chl Dpth (ft) | 1.05 | Hydr. Depth (ft) | 0.51 | 0.98 | 0.39 |
| Conv. Total (cfs) | 8317.4 | Conv. (cfs) | 1998.2 | 3607.1 | 2712.1 |
| Length Wtd. (ft) | 1050.00 | Wetted Per. (ft) | 213.92 | 130.28 | 440.73 |
| Min Ch El (ft) | 953.59 | Shear (lb/sq ft) | 0.04 | 0.08 | 0.03 |
| Alpha | 1.23 | Stream Power (lb/ft s) | 0.03 | 0.08 | 0.02 |
| Frctn Loss (ft) | 5.45 | Cum Volume (acre-ft) | 1.88 | 7.32 | 2.20 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 954.86 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 954.80 | Reach Len. (ft) | 1050.00 | 1050.00 | 1050.00 |
| Crit W.S. (ft) | 954.20 | Flow Area (sq ft) | | 148.71 | |
| E.G. Slope (ft/ft) | 0.004241 | Area (sq ft) | | 148.71 | |
| Q Total (cfs) | 299.00 | Flow (cfs) | | 299.00 | |
| Top Width (ft) | 130.28 | Top Width (ft) | | 130.28 | |
| Vel Total (ft/s) | 2.01 | Avg. Vel. (ft/s) | | 2.01 | |
| Max Chl Dpth (ft) | 1.21 | Hydr. Depth (ft) | | 1.14 | |
| Conv. Total (cfs) | 4591.1 | Conv. (cfs) | | 4591.1 | |
| Length Wtd. (ft) | 1050.00 | Wetted Per. (ft) | | 132.42 | |
| Min Ch El (ft) | 953.59 | Shear (lb/sq ft) | | 0.30 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.60 | |
| Frctn Loss (ft) | 5.51 | Cum Volume (acre-ft) | | 8.62 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 954.86 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 954.80 | Reach Len. (ft) | 1050.00 | 1050.00 | 1050.00 |

| | | | |
|---|---|---|---|
| Crit W.S. (ft) | 954.20 | Flow Area (sq ft) | 148.84 |
| E.G. Slope (ft/ft) | 0.004229 | Area (sq ft) | 148.84 |
| Q Total (cfs) | 299.00 | Flow (cfs) | 299.00 |
| Top Width (ft) | 130.28 | Top Width (ft) | 130.28 |
| Vel Total (ft/s) | 2.01 | Avg. Vel. (ft/s) | 2.01 |
| Max Chl Dpth (ft) | 1.21 | Hydr. Depth (ft) | 1.14 |
| Conv. Total (cfs) | 4597.6 | Conv. (cfs) | 4597.6 |
| Length Wtd. (ft) | 1050.00 | Wetted Per. (ft) | 132.42 |
| Min Ch El (ft) | 953.59 | Shear (lb/sq ft) | 0.30 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.60 |
| Frctn Loss (ft) | 5.52 | Cum Volume (acre-ft) | 8.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 1 RS: 1.238

INPUT
Description: 6537.890 - Thalweg Sta. 698.13 - Discharge 1351 CFS from combination of trib4E1 Reach 1 XS 0.201 (1052 CFS) and trib 4E Reach 2 XS 1.965 (299 CFS)

Station Elevation Data num= 151

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 949.58 | .76 | 949.58 | 18.77 | 949.52 | 20.83 | 949.51 | 81.03 | 949.47 |
| 84.33 | 949.48 | 101.1 | 949.48 | 117.11 | 949.47 | 128.04 | 949.45 | 131.2 | 949.43 |
| 149.88 | 949.34 | 151.26 | 949.33 | 160.8 | 949.28 | 161.3 | 949.28 | 171.73 | 949.27 |
| 181.36 | 949.32 | 182.66 | 949.33 | 201.43 | 949.42 | 204.51 | 949.38 | 211.46 | 949.33 |
| 215.44 | 948.98 | 221.5 | 948.8 | 225.09 | 949.04 | 226.36 | 949.13 | 231.53 | 949.22 |
| 237.29 | 949.25 | 241.56 | 949.25 | 248.21 | 949.11 | 251.6 | 949.05 | 261.63 | 948.89 |
| 262.15 | 948.88 | 271.96 | 948.8 | 272.36 | 948.8 | 282.31 | 948.77 | 286.46 | 948.77 |
| 292.65 | 948.75 | 300.54 | 948.74 | 313.35 | 948.68 | 314.63 | 948.68 | 323.69 | 948.64 |
| 342.8 | 948.6 | 344.39 | 948.6 | 354.73 | 948.57 | 370.99 | 948.49 | 375.43 | 948.46 |
| 385.08 | 948.38 | 385.78 | 948.38 | 387.7 | 948.36 | 396.12 | 948.29 | 399.16 | 948.26 |
| 413.25 | 948.14 | 416.81 | 948.12 | 426.65 | 948.08 | 437.51 | 948.08 | 447.85 | 948.1 |
| 455.52 | 948.14 | 458.2 | 948.15 | 465.6 | 948.19 | 468.55 | 948.2 | 478.89 | 948.2 |
| 511.88 | 948.01 | 520.28 | 947.99 | 530.63 | 947.99 | 539.07 | 948.03 | 557.09 | 948.21 |
| 565.94 | 948.25 | 575.13 | 948.23 | 577.96 | 948.21 | 589.97 | 948.2 | 593.16 | 948.21 |
| 611.19 | 948.24 | 626.03 | 948.29 | 629.21 | 948.29 | 638.05 | 948.32 | 647.25 | 948.27 |
| 650.06 | 948.26 | 655.69 | 948.18 | 662.08 | 948.11 | 674.1 | 947.88 | 683.3 | 947.49 |
| 686.12 | 947.34 | 691.73 | 947.23 | 698.13 | 947 | 701.33 | 947.19 | 710.15 | 947.69 |
| 719.37 | 947.98 | 722.17 | 948.02 | 734.19 | 948.08 | 755.42 | 948.12 | 758.22 | 948.12 |
| 763.81 | 948.1 | 770.24 | 948.09 | 773.45 | 948.07 | 782.26 | 947.97 | 791.49 | 947.82 |
| 794.28 | 947.78 | 799.85 | 947.76 | 806.29 | 947.7 | 809.52 | 947.73 | 818.31 | 947.88 |
| 845.58 | 948.46 | 863.61 | 948.8 | 865.27 | 948.82 | 866.38 | 948.85 | 878.4 | 949.01 |
| 879.08 | 949.02 | 883.58 | 949.07 | 889.02 | 949.12 | 891.73 | 949.14 | 893.23 | 949.16 |
| 907.5 | 949.3 | 910.1 | 949.33 | 920.63 | 949.41 | 931.17 | 949.44 | 939.05 | 949.43 |
| 941.71 | 949.42 | 954.84 | 949.41 | 957.54 | 949.4 | 962.78 | 949.39 | 970.61 | 949.41 |
| 973.32 | 949.41 | 978.77 | 949.47 | 983.85 | 949.51 | 994.39 | 949.26 | 1002.16 | 949.27 |
| 1004.93 | 949.24 | 1014.22 | 949.57 | 1015.47 | 949.61 | 1017.94 | 949.68 | 1026 | 949.94 |
| 1033.72 | 949.97 | 1036.54 | 949.99 | 1049.49 | 949.77 | 1057.61 | 949.61 | 1065.26 | 949.57 |
| 1068.15 | 949.54 | 1073.96 | 949.57 | 1081.04 | 949.63 | 1099.76 | 949.82 | 1110.3 | 949.94 |
| 1112.6 | 949.96 | 1128.37 | 950.19 | 1131.37 | 950.24 | 1141.91 | 950.46 | 1159.92 | 950.86 |
| 1162.98 | 950.92 | 1169.14 | 951.05 | 1173.52 | 951.13 | 1175.7 | 951.15 | 1184.06 | 951.25 |
| 1190.97 | 951.24 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 893.23 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 370.99 | 845.58 | 410.79 | 450.03 | 482.2 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 949.18 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 949.08 | Reach Len. (ft) | 410.79 | 450.03 | 482.20 |
| Crit W.S. (ft) | 948.69 | Flow Area (sq ft) | 46.45 | 479.20 | 10.68 |
| E.G. Slope (ft/ft) | 0.008583 | Area (sq ft) | 46.45 | 479.20 | 10.68 |
| Q Total (cfs) | 1351.00 | Flow (cfs) | 62.31 | 1276.69 | 12.00 |
| Top Width (ft) | 645.30 | Top Width (ft) | 132.09 | 474.59 | 38.62 |
| Vel Total (ft/s) | 2.52 | Avg. Vel. (ft/s) | 1.34 | 2.66 | 1.12 |
| Max Chl Dpth (ft) | 2.08 | Hydr. Depth (ft) | 0.35 | 1.01 | 0.28 |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 14582.7 | Conv. (cfs) | 672.6 | 13780.6 | 129.5 |
| Length Wtd. (ft) | 440.84 | Wetted Per. (ft) | 132.11 | 474.65 | 38.63 |
| Min Ch El (ft) | 947.00 | Shear (lb/sq ft) | 0.19 | 0.54 | 0.15 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.25 | 1.44 | 0.17 |
| Frctn Loss (ft) | 2.07 | Cum Volume (acre-ft) | 1.77 | 4.51 | 0.06 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 2.56 | 4.40 | 0.21 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 949.35 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 949.26 | Reach Len. (ft) | 410.79 | 450.03 | 482.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 566.53 | |
| E.G. Slope (ft/ft) | 0.005525 | Area (sq ft) | | 566.53 | |
| Q Total (cfs) | 1351.00 | Flow (cfs) | | 1351.00 | |
| Top Width (ft) | 474.59 | Top Width (ft) | | 474.59 | |
| Vel Total (ft/s) | 2.38 | Avg. Vel. (ft/s) | | 2.38 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.19 | |
| Conv. Total (cfs) | 18175.9 | Conv. (cfs) | | 18175.9 | |
| Length Wtd. (ft) | 450.03 | Wetted Per. (ft) | | 476.22 | |
| Min Ch El (ft) | 947.00 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.98 | |
| Frctn Loss (ft) | 1.78 | Cum Volume (acre-ft) | | 5.82 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 4.46 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 949.35 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 949.26 | Reach Len. (ft) | 410.79 | 450.03 | 482.20 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 566.36 | |
| E.G. Slope (ft/ft) | 0.005530 | Area (sq ft) | | 566.36 | |
| Q Total (cfs) | 1351.00 | Flow (cfs) | | 1351.00 | |
| Top Width (ft) | 474.59 | Top Width (ft) | | 474.59 | |
| Vel Total (ft/s) | 2.39 | Avg. Vel. (ft/s) | | 2.39 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.19 | |
| Conv. Total (cfs) | 18166.6 | Conv. (cfs) | | 18166.6 | |
| Length Wtd. (ft) | 450.03 | Wetted Per. (ft) | | 476.22 | |
| Min Ch El (ft) | 947.00 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.98 | |
| Frctn Loss (ft) | 1.78 | Cum Volume (acre-ft) | | 5.82 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 4.46 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E
REACH: reach 1 RS: 1.153

INPUT
Description: 6087.856 - Thalweg Sta. 635.67
Station Elevation Data num= 163

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 947.7 | 3.27 | 947.67 | 4.64 | 947.66 | 4.75 | 947.66 | 14.67 | 947.58 |
| 15.57 | 947.58 | 26.4 | 947.52 | 34.72 | 947.5 | 48.05 | 947.46 | 54.78 | 947.45 |
| 80.53 | 947.35 | 84.86 | 947.32 | 102.18 | 947.23 | 113.01 | 947.14 | 114.94 | 947.13 |
| 123.82 | 947.02 | 124.97 | 947.01 | 131.11 | 946.93 | 134.65 | 946.88 | 135.29 | 946.88 |
| 139.3 | 946.82 | 145.02 | 946.75 | 145.47 | 946.74 | 155.05 | 946.63 | 165.08 | 946.55 |
| 175.1 | 946.55 | 195.16 | 946.61 | 205.19 | 946.65 | 210.43 | 946.69 | 215.21 | 946.71 |
| 221.26 | 946.72 | 225.24 | 946.75 | 232.08 | 946.71 | 235.27 | 946.67 | 242.91 | 946.51 |
| 245.29 | 946.45 | 253.73 | 946.25 | 255.32 | 946.22 | 264.56 | 946.03 | 265.35 | 946.01 |
| 275.33 | 945.94 | 308.06 | 945.92 | 311.16 | 945.92 | 316.04 | 945.91 | 330.61 | 945.91 |
| 336.66 | 945.92 | 352.46 | 945.92 | 366.24 | 945.95 | 367.6 | 945.95 | 371.66 | 945.98 |
| 377.91 | 946.01 | 380 | 946.01 | 388.22 | 946.04 | 393.78 | 946.04 | 398.53 | 946.05 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 453.75 | 946.02 | 460.39 | 946.03 | 470.7 | 946.04 | 490.16 | 946.15 | 494.8 | 946.19 |
| 501.64 | 946.23 | 511.95 | 946.31 | 522.26 | 946.43 | 531.48 | 946.71 | 532.57 | 946.74 |
| 542.88 | 946.65 | 545.24 | 946.54 | 553.19 | 946.13 | 559 | 945.95 | 563.5 | 945.83 |
| 572.78 | 945.76 | 573.81 | 945.75 | 584.12 | 945.69 | 586.54 | 945.67 | 614.08 | 945.51 |
| 615.05 | 945.51 | 617.93 | 945.5 | 625.36 | 945.46 | 635.67 | 945.45 | 645.99 | 945.47 |
| 656.3 | 945.58 | 666.61 | 945.96 | 669.16 | 945.99 | 676.92 | 946.14 | 687.23 | 945.94 |
| 696.7 | 945.89 | 697.54 | 945.88 | 700.01 | 945.9 | 707.85 | 945.98 | 710.48 | 945.99 |
| 724.24 | 946.08 | 735.23 | 946.13 | 738.32 | 946.15 | 738.97 | 946.15 | 757.45 | 946.19 |
| 760.61 | 946.19 | 771.43 | 946.17 | 782.25 | 946.16 | 803.9 | 946.19 | 812.86 | 946.22 |
| 825.55 | 946.27 | 831.34 | 946.27 | 836.37 | 946.29 | 843.49 | 946.29 | 847.2 | 946.28 |
| 858.02 | 946.2 | 868.29 | 945.85 | 868.84 | 945.84 | 869.63 | 945.82 | 879.67 | 945.67 |
| 890.49 | 945.94 | 897.44 | 946.35 | 901.31 | 946.58 | 912.14 | 947.18 | 921.9 | 947.47 |
| 922.96 | 947.5 | 923.71 | 947.51 | 933.79 | 947.62 | 942.18 | 947.64 | 948.04 | 947.64 |
| 966.25 | 947.7 | 976.23 | 947.75 | 977.08 | 947.75 | 979.14 | 947.77 | 987.9 | 947.87 |
| 1009.55 | 948.02 | 1016.08 | 948.08 | 1026.45 | 948.15 | 1031.2 | 948.19 | 1036.19 | 948.19 |
| 1040.25 | 948.2 | 1041.9 | 948.2 | 1048.33 | 948.14 | 1051.99 | 948.13 | 1060.01 | 947.95 |
| 1062.08 | 947.92 | 1071.68 | 947.63 | 1072.17 | 947.61 | 1082.27 | 947.36 | 1083.36 | 947.37 |
| 1092.36 | 947.52 | 1095.03 | 947.61 | 1102.45 | 947.84 | 1112.54 | 948.03 | 1122.63 | 948.15 |
| 1130.06 | 948.22 | 1132.73 | 948.24 | 1141.74 | 948.27 | 1163 | 948.27 | 1165.09 | 948.29 |
| 1173.09 | 948.3 | 1176.77 | 948.34 | 1183.18 | 948.37 | 1193.28 | 948.45 | 1200.12 | 948.52 |
| 1223.47 | 948.83 | 1224.04 | 948.83 | 1233.64 | 948.95 | 1243.73 | 949.02 | 1246.83 | 949.03 |
| 1258.51 | 949.04 | 1270.18 | 949.01 | 1272.96 | 949.01 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .052 | 131.11 | .04 | 738.32 | .052 | 897.44 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 532.57 | 933.79 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 947.10 | Element | | | |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.040 | 0.043 | |
| W.S. Elev (ft) | 947.05 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 946.51 | Flow Area (sq ft) | 329.06 | 393.99 | |
| E.G. Slope (ft/ft) | 0.002955 | Area (sq ft) | 329.06 | 393.99 | |
| Q Total (cfs) | 1351.00 | Flow (cfs) | 580.53 | 770.47 | |
| Top Width (ft) | 788.10 | Top Width (ft) | 410.93 | 377.17 | |
| Vel Total (ft/s) | 1.87 | Avg. Vel. (ft/s) | 1.76 | 1.96 | |
| Max Chl Dpth (ft) | 1.60 | Hydr. Depth (ft) | 0.80 | 1.04 | |
| Conv. Total (cfs) | 24851.9 | Conv. (cfs) | 10679.0 | 14172.9 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | 410.95 | 377.24 | |
| Min Ch El (ft) | 945.45 | Shear (lb/sq ft) | 0.15 | 0.19 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.26 | 0.38 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 947.57 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.044 | |
| W.S. Elev (ft) | 947.48 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 946.73 | Flow Area (sq ft) | | 560.26 | |
| E.G. Slope (ft/ft) | 0.002960 | Area (sq ft) | | 560.26 | |
| Q Total (cfs) | 1351.00 | Flow (cfs) | | 1351.00 | |
| Top Width (ft) | 389.74 | Top Width (ft) | | 389.74 | |
| Vel Total (ft/s) | 2.41 | Avg. Vel. (ft/s) | | 2.41 | |
| Max Chl Dpth (ft) | 2.03 | Hydr. Depth (ft) | | 1.44 | |
| Conv. Total (cfs) | 24832.8 | Conv. (cfs) | | 24832.8 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 390.56 | |
| Min Ch El (ft) | 945.45 | Shear (lb/sq ft) | | 0.27 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.64 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 947.57 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.044 | |
| W.S. Elev (ft) | 947.48 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 946.73 | Flow Area (sq ft) | | 560.45 | |
| E.G. Slope (ft/ft) | 0.002957 | Area (sq ft) | | 560.45 | |
| Q Total (cfs) | 1351.00 | Flow (cfs) | | 1351.00 | |
| Top Width (ft) | 389.75 | Top Width (ft) | | 389.75 | |
| Vel Total (ft/s) | 2.41 | Avg. Vel. (ft/s) | | 2.41 | |
| Max Chl Dpth (ft) | 2.03 | Hydr. Depth (ft) | | 1.44 | |

| | | | |
|---|---|---|---|
| Conv. Total (cfs) | 24846.2 | Conv. (cfs) | 24846.2 |
| Length Wtd. (ft) | | Wetted Per. (ft) | 390.58 |
| Min Ch El (ft) | 945.45 | Shear (lb/sq ft) | 0.26 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.64 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | |
| C & E Loss (ft) | | Cum SA (acres) | |

CROSS SECTION

RIVER: trib4E1
REACH: reach 2 RS: 0.647

INPUT
Description: 3415.340 - Thalweg Sta. 410.83 - Discharge Split from trib4E Reach 3 XS 2.395 929 CFS - Using HEC-RAS Optimization Function for Split flow - It was determined that 630 CFS would be split to this XS out of 929 CFS total.

Station Elevation Data num= 69

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.97 | 5.79 | 976.44 | 8.36 | 976.18 | 12.19 | 976.08 | 19.13 | 975.93 |
| 23.76 | 975.89 | 29.9 | 975.85 | 39.1 | 975.77 | 40.67 | 975.76 | 41.73 | 975.75 |
| 70.99 | 975.51 | 72.99 | 975.49 | 83.76 | 975.42 | 92.91 | 975.38 | 94.53 | 975.37 |
| 95.62 | 975.37 | 105.3 | 975.34 | 116.07 | 975.34 | 119.8 | 975.38 | 126.85 | 975.43 |
| 131.54 | 975.49 | 137.62 | 975.74 | 146.71 | 975.81 | 147.91 | 975.84 | 148.39 | 975.84 |
| 149.51 | 975.8 | 159.16 | 974.94 | 167.48 | 974.26 | 169.93 | 974.04 | 173.62 | 973.89 |
| 180.71 | 973.39 | 185.45 | 973.56 | 191.48 | 974.04 | 200.52 | 974.92 | 202.25 | 975.07 |
| 203.4 | 975.21 | 208.32 | 975.4 | 213.02 | 975.58 | 221.37 | 975.3 | 223.79 | 975.21 |
| 238.87 | 974.41 | 239.34 | 974.38 | 250 | 974.003 | 254.32 | 973.85 | 256.11 | 973.77 |
| 257.31 | 973.72 | 266.88 | 973.37 | 275.26 | 973.33 | 277.65 | 973.31 | 288.43 | 973.39 |
| 299.2 | 973.44 | 309.97 | 973.45 | 311.2 | 973.46 | 312.7 | 973.46 | 332.51 | 973.47 |
| 346.73 | 973.47 | 353.06 | 973.46 | 375.11 | 973.43 | 388.39 | 973.37 | 410.83 | 973.09 |
| 422.05 | 973.16 | 424.99 | 973.22 | 441.27 | 973.49 | 485.38 | 973.98 | 486.75 | 973.99 |
| 489.37 | 974.02 | 493.51 | 974.03 | 500.59 | 974.07 | 500.77 | 974.07 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .045 | 208.32 | .04 | 238.87 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 250 | 486.75 | 189.26 | 214.41 | 242.7 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.56 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 974.47 | Reach Len. (ft) | 189.26 | 214.41 | 242.70 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 21.42 | 237.13 | 6.06 |
| E.G. Slope (ft/ft) | 0.005597 | Area (sq ft) | 21.42 | 237.13 | 6.06 |
| Q Total (cfs) | 630.00 | Flow (cfs) | 35.19 | 586.40 | 8.41 |
| Top Width (ft) | 293.89 | Top Width (ft) | 43.12 | 236.75 | 14.02 |
| Vel Total (ft/s) | 2.38 | Avg. Vel. (ft/s) | 1.64 | 2.47 | 1.39 |
| Max Chl Dpth (ft) | 1.38 | Hydr. Depth (ft) | 0.50 | 1.00 | 0.43 |
| Conv. Total (cfs) | 8420.8 | Conv. (cfs) | 470.4 | 7838.0 | 112.4 |
| Length Wtd. (ft) | 212.66 | Wetted Per. (ft) | 43.21 | 236.77 | 14.42 |
| Min Ch El (ft) | 973.09 | Shear (lb/sq ft) | 0.17 | 0.35 | 0.15 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.28 | 0.87 | 0.20 |
| Frctn Loss (ft) | 1.72 | Cum Volume (acre-ft) | 2.99 | 9.58 | 1.78 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.00 | 7.85 | 3.04 |

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.57 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 974.46 | Reach Len. (ft) | 189.26 | 214.41 | 242.70 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 236.29 | |
| E.G. Slope (ft/ft) | 0.006572 | Area (sq ft) | | 236.29 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 236.75 | Top Width (ft) | | 236.75 | |
| Vel Total (ft/s) | 2.67 | Avg. Vel. (ft/s) | | 2.67 | |

| | | | | |
|---|---|---|---|---|
| Max Chl Dpth (ft) | 1.37 | Hydr. Depth (ft) | | 1.00 |
| Conv. Total (cfs) | 7771.5 | Conv. (cfs) | | 7771.5 |
| Length Wtd. (ft) | 214.41 | Wetted Per. (ft) | | 237.70 |
| Min Ch El (ft) | 973.09 | Shear (lb/sq ft) | | 0.41 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.09 |
| Frctn Loss (ft) | 1.59 | Cum Volume (acre-ft) | 0.02 | 11.54 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 7.85 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.56 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 974.45 | Reach Len. (ft) | 189.26 | 214.41 | 242.70 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 233.57 | |
| E.G. Slope (ft/ft) | 0.006829 | Area (sq ft) | | 233.57 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 236.75 | Top Width (ft) | | 236.75 | |
| Vel Total (ft/s) | 2.70 | Avg. Vel. (ft/s) | | 2.70 | |
| Max Chl Dpth (ft) | 1.36 | Hydr. Depth (ft) | | 0.99 | |
| Conv. Total (cfs) | 7623.6 | Conv. (cfs) | | 7623.6 | |
| Length Wtd. (ft) | 214.41 | Wetted Per. (ft) | | 237.68 | |
| Min Ch El (ft) | 973.09 | Shear (lb/sq ft) | | 0.42 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.13 | |
| Frctn Loss (ft) | 1.58 | Cum Volume (acre-ft) | 1.26 | 10.69 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 7.85 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 2 RS: 0.606

INPUT
Description: 3200.929 - Thalweg Sta. 407.95
Station Elevation Data num= 80

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 977.7 | 3.19 | 976.6 | 11.29 | 973.73 | 13.98 | 972.8 | 15.12 | 972.96 |
| 17.95 | 973.25 | 24.76 | 973.86 | 29.36 | 974.79 | 35.54 | 975.84 | 38.17 | 975.46 |
| 44.67 | 974.62 | 46.33 | 974.4 | 47.45 | 974.29 | 57.11 | 973.27 | 67.89 | 973.04 |
| 71.4 | 973.07 | 78.68 | 973.15 | 89.46 | 973.18 | 98.12 | 973.12 | 100.25 | 973.1 |
| 121.81 | 972.77 | 132.59 | 972.6 | 137.85 | 972.55 | 143.38 | 972.48 | 154.16 | 972.43 |
| 192.08 | 972.41 | 205.01 | 972.39 | 208.08 | 972.39 | 210.16 | 972.38 | 231.73 | 972.37 |
| 240.43 | 972.38 | 251.21 | 972.35 | 260.63 | 972.3 | 272.78 | 972.21 | 282.48 | 972.11 |
| 283.57 | 972.1 | 285.17 | 972.08 | 294.35 | 971.93 | 300.56 | 971.9 | 305.13 | 971.77 |
| 311.89 | 971.97 | 315.91 | 972.06 | 318.63 | 972.08 | 326.7 | 972.21 | 337.81 | 972.22 |
| 340.6 | 972.23 | 347.57 | 972.24 | 357.63 | 972.25 | 359.35 | 972.24 | 359.8 | 972.24 |
| 367.69 | 972.21 | 387.82 | 972.04 | 405.2 | 971.87 | 407.95 | 971.85 | 416.55 | 971.77 |
| 418.01 | 971.76 | 427.91 | 971.67 | 428.08 | 971.67 | 429.45 | 971.66 | 438.14 | 971.61 |
| 439.25 | 971.64 | 448.2 | 971.78 | 450.6 | 971.81 | 458.27 | 971.89 | 477.26 | 971.95 |
| 478.43 | 971.96 | 488.82 | 972 | 499.21 | 972.05 | 501.11 | 972.07 | 509.6 | 972.12 |
| 519.98 | 972.23 | 522.47 | 972.26 | 530.37 | 972.34 | 530.58 | 972.34 | 531.32 | 972.35 |
| 540.76 | 972.45 | 544.38 | 972.47 | 544.44 | 972.47 | 551.14 | 972.53 | 564.13 | 972.58 |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 260.63 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 251.21 | 544.38 | 228.12 | 236.12 | 239.66 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 972.84 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.040 | 0.045 | 0.045 |
| W.S. Elev (ft) | 972.72 | Reach Len. (ft) | 228.12 | 236.12 | 239.66 |
| Crit W.S. (ft) | 972.58 | Flow Area (sq ft) | 36.39 | 195.48 | 3.58 |
| E.G. Slope (ft/ft) | 0.012751 | Area (sq ft) | 36.39 | 195.48 | 3.58 |
| Q Total (cfs) | 630.00 | Flow (cfs) | 66.68 | 559.06 | 4.26 |
| Top Width (ft) | 438.99 | Top Width (ft) | 126.07 | 293.17 | 19.75 |
| Vel Total (ft/s) | 2.68 | Avg. Vel. (ft/s) | 1.83 | 2.86 | 1.19 |
| Max Chl Dpth (ft) | 1.11 | Hydr. Depth (ft) | 0.29 | 0.67 | 0.18 |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 5579.1 | Conv. (cfs) | 590.5 | 4950.8 | 37.7 |
| Length Wtd. (ft) | 235.23 | Wetted Per. (ft) | 126.07 | 293.19 | 19.89 |
| Min Ch El (ft) | 971.61 | Shear (lb/sq ft) | 0.23 | 0.53 | 0.14 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.42 | 1.52 | 0.17 |
| Frctn Loss (ft) | 1.96 | Cum Volume (acre-ft) | 2.87 | 8.52 | 1.75 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.64 | 6.55 | 2.95 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 972.97 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 972.86 | Reach Len. (ft) | 228.12 | 236.12 | 239.66 |
| Crit W.S. (ft) | 972.57 | Flow Area (sq ft) | | 237.69 | |
| E.G. Slope (ft/ft) | 0.008477 | Area (sq ft) | | 237.69 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 293.17 | Top Width (ft) | | 293.17 | |
| Vel Total (ft/s) | 2.65 | Avg. Vel. (ft/s) | | 2.65 | |
| Max Chl Dpth (ft) | 1.25 | Hydr. Depth (ft) | | 0.81 | |
| Conv. Total (cfs) | 6842.5 | Conv. (cfs) | | 6842.5 | |
| Length Wtd. (ft) | 236.12 | Wetted Per. (ft) | | 294.09 | |
| Min Ch El (ft) | 971.61 | Shear (lb/sq ft) | | 0.43 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.13 | |
| Frctn Loss (ft) | 1.92 | Cum Volume (acre-ft) | 0.02 | 10.37 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 6.55 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 972.98 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 972.88 | Reach Len. (ft) | 228.12 | 236.12 | 239.66 |
| Crit W.S. (ft) | 972.57 | Flow Area (sq ft) | | 242.17 | |
| E.G. Slope (ft/ft) | 0.007968 | Area (sq ft) | | 242.17 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 293.17 | Top Width (ft) | | 293.17 | |
| Vel Total (ft/s) | 2.60 | Avg. Vel. (ft/s) | | 2.60 | |
| Max Chl Dpth (ft) | 1.27 | Hydr. Depth (ft) | | 0.83 | |
| Conv. Total (cfs) | 7057.7 | Conv. (cfs) | | 7057.7 | |
| Length Wtd. (ft) | 236.12 | Wetted Per. (ft) | | 294.12 | |
| Min Ch El (ft) | 971.61 | Shear (lb/sq ft) | | 0.41 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.07 | |
| Frctn Loss (ft) | 1.96 | Cum Volume (acre-ft) | 1.26 | 9.52 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 6.55 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 2 RS: 0.562

INPUT
Description: 2964.810 - Thalweg Sta. 392.96
Station Elevation Data num= 96

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 977.34 | 4.9 | 974.96 | 10.87 | 975.46 | 15.17 | 974.69 | 24.19 | 977.99 |
| 25.42 | 978.48 | 29.56 | 977.34 | 35.69 | 975.42 | 37.51 | 975.13 | 45.95 | 973.4 |
| 50.84 | 973.12 | 56.21 | 972.74 | 64.16 | 972.55 | 66.47 | 972.51 | 74.2 | 972.36 |
| 76.73 | 972.3 | 77.49 | 972.29 | 86.99 | 972.11 | 90.81 | 972.03 | 97.25 | 971.91 |
| 117.45 | 971.49 | 117.77 | 971.48 | 118.84 | 971.47 | 128.03 | 971.31 | 130.78 | 971.28 |
| 138.29 | 971.21 | 144.1 | 971.17 | 148.56 | 971.13 | 157.42 | 971.08 | 169.08 | 971 |
| 176.37 | 970.93 | 179.34 | 970.91 | 210.12 | 970.58 | 210.71 | 970.57 | 224.04 | 970.4 |
| 230.64 | 970.28 | 237.36 | 970.24 | 240.9 | 970.21 | 250.69 | 970.26 | 251.16 | 970.26 |
| 252.75 | 970.27 | 262.55 | 970.36 | 264.01 | 970.37 | 271.68 | 970.44 | 281.95 | 970.46 |
| 290.66 | 970.39 | 292.21 | 970.38 | 297.4 | 970.29 | 302.47 | 970.18 | 303.99 | 970.12 |
| 312.73 | 969.71 | 317.3 | 969.92 | 320.87 | 970.03 | 322.94 | 970.1 | 327.99 | 970.17 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 332.94 | 970.25 | 334.06 | 970.23 | 337.72 | 970.15 | 342.94 | 970.05 | 347.45 | 969.89 |
| 357.17 | 969.61 | 362.95 | 969.36 | 366.89 | 969.4 | 372.96 | 969.31 | 376.63 | 969.32 |
| 382.96 | 969.39 | 386.35 | 969.35 | 392.96 | 969.47 | 396.08 | 969.43 | 402.97 | 969.44 |
| 405.8 | 969.44 | 412.97 | 969.42 | 415.52 | 969.42 | 422.98 | 969.33 | 425.26 | 969.29 |
| 432.98 | 969.27 | 434.98 | 969.35 | 442.98 | 969.68 | 444.71 | 969.71 | 452.99 | 969.92 |
| 454.43 | 969.93 | 463.97 | 970.02 | 464.29 | 970.02 | 484.17 | 970.2 | 490.21 | 970.23 |
| 494.79 | 970.24 | 497.34 | 970.24 | 505.41 | 970.22 | 526.65 | 970.24 | 534.04 | 970.22 |
| 537.27 | 970.21 | 546.9 | 970.23 | 547.88 | 970.23 | 549.66 | 970.24 | 558.51 | 970.25 |
| 558.62 | 970.25 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 262.55 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 334.06 | 494.79 | 255.06 | 254.6 | 268.65 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 970.87 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.043 | 0.045 | 0.045 |
| W.S. Elev (ft) | 970.77 | Reach Len. (ft) | 255.06 | 254.60 | 268.65 |
| Crit W.S. (ft) | 970.46 | Flow Area (sq ft) | 63.87 | 175.23 | 34.64 |
| E.G. Slope (ft/ft) | 0.005892 | Area (sq ft) | 63.87 | 175.23 | 34.64 |
| Q Total (cfs) | 630.00 | Flow (cfs) | 101.46 | 470.43 | 58.11 |
| Top Width (ft) | 366.51 | Top Width (ft) | 141.95 | 160.73 | 63.83 |
| Vel Total (ft/s) | 2.30 | Avg. Vel. (ft/s) | 1.59 | 2.68 | 1.68 |
| Max Chl Dpth (ft) | 1.50 | Hydr. Depth (ft) | 0.45 | 1.09 | 0.54 |
| Conv. Total (cfs) | 8207.3 | Conv. (cfs) | 1321.7 | 6128.5 | 757.0 |
| Length Wtd. (ft) | 255.87 | Wetted Per. (ft) | 141.98 | 160.76 | 64.35 |
| Min Ch El (ft) | 969.27 | Shear (lb/sq ft) | 0.17 | 0.40 | 0.20 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.26 | 1.08 | 0.33 |
| Frctn Loss (ft) | 2.06 | Cum Volume (acre-ft) | 2.60 | 7.52 | 1.64 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.93 | 5.32 | 2.72 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 970.88 | Reach Len. (ft) | 255.06 | 254.60 | 268.65 |
| Crit W.S. (ft) | 970.46 | Flow Area (sq ft) | | 192.69 | |
| E.G. Slope (ft/ft) | 0.007782 | Area (sq ft) | | 192.69 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 160.73 | Top Width (ft) | | 160.73 | |
| Vel Total (ft/s) | 3.27 | Avg. Vel. (ft/s) | | 3.27 | |
| Max Chl Dpth (ft) | 1.61 | Hydr. Depth (ft) | | 1.20 | |
| Conv. Total (cfs) | 7141.5 | Conv. (cfs) | | 7141.5 | |
| Length Wtd. (ft) | 254.60 | Wetted Per. (ft) | | 162.05 | |
| Min Ch El (ft) | 969.27 | Shear (lb/sq ft) | | 0.58 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.89 | |
| Frctn Loss (ft) | 2.04 | Cum Volume (acre-ft) | 0.02 | 9.21 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 5.32 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.02 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 970.85 | Reach Len. (ft) | 255.06 | 254.60 | 268.65 |
| Crit W.S. (ft) | 970.46 | Flow Area (sq ft) | | 186.85 | |
| E.G. Slope (ft/ft) | 0.008619 | Area (sq ft) | | 186.85 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 160.73 | Top Width (ft) | | 160.73 | |
| Vel Total (ft/s) | 3.37 | Avg. Vel. (ft/s) | | 3.37 | |
| Max Chl Dpth (ft) | 1.58 | Hydr. Depth (ft) | | 1.16 | |
| Conv. Total (cfs) | 6786.1 | Conv. (cfs) | | 6786.1 | |
| Length Wtd. (ft) | 254.60 | Wetted Per. (ft) | | 161.98 | |
| Min Ch El (ft) | 969.27 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.09 | |

| | | | | |
|---|---|---|---|---|
| Frctn Loss (ft) | 1.95 | Cum Volume (acre-ft) | 1.26 | 8.36 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 5.32 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 2 RS: 0.513

INPUT
Description: 2710.211 - Thalweg Sta. 383.20
Station Elevation Data num= 101

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 977.95 | 8.37 | 978.73 | 13.14 | 979.2 | 18.2 | 978.17 | 23.14 | 977.7 |
| 28.03 | 975.47 | 33.15 | 973.23 | 37.86 | 974.51 | 43.15 | 975.52 | 47.69 | 975.67 |
| 53.15 | 976.23 | 57.52 | 975.27 | 63.15 | 974.53 | 68.98 | 974.15 | 73.15 | 973.91 |
| 77.17 | 973.71 | 83.15 | 973.44 | 87 | 973.09 | 93.15 | 972.49 | 96.83 | 972.17 |
| 103.16 | 971.44 | 106.66 | 971.24 | 113.16 | 970.74 | 116.49 | 970.6 | 123.16 | 970.26 |
| 126.32 | 970.15 | 133.16 | 969.83 | 136.14 | 969.62 | 143.16 | 969.25 | 145.97 | 969.42 |
| 153.16 | 969.01 | 155.8 | 969 | 163.17 | 969.53 | 165.63 | 969.51 | 173.17 | 969.37 |
| 175.46 | 969.34 | 193.17 | 969.18 | 195.11 | 969.17 | 203.17 | 969.07 | 204.94 | 969.07 |
| 213.17 | 969.02 | 214.77 | 969.02 | 223.17 | 969 | 243.18 | 968.99 | 244.26 | 969 |
| 253.18 | 969.01 | 254.09 | 969.02 | 263.18 | 969.05 | 263.91 | 969.06 | 273.18 | 969.14 |
| 273.74 | 969.14 | 281.62 | 969.18 | 283.18 | 969.19 | 283.57 | 969.18 | 288.58 | 969.08 |
| 293.19 | 968.99 | 293.4 | 968.98 | 303.19 | 968.57 | 313.06 | 967.61 | 313.19 | 967.61 |
| 322.88 | 968.08 | 323.19 | 968.09 | 332.71 | 968.25 | 333.19 | 968.26 | 342.54 | 968.15 |
| 343.19 | 968.14 | 352.38 | 967.98 | 353.2 | 967.96 | 362.2 | 967.65 | 363.2 | 967.63 |
| 372.03 | 967.14 | 373.2 | 967.07 | 381.86 | 966.77 | 383.2 | 966.7 | 391.68 | 966.49 |
| 393.2 | 966.45 | 401.51 | 966.67 | 403.2 | 966.75 | 411.34 | 967.46 | 413.2 | 967.61 |
| 421.17 | 967.87 | 423.21 | 967.93 | 431 | 967.94 | 433.21 | 967.95 | 440.83 | 967.97 |
| 443.21 | 967.98 | 450.66 | 967.99 | 453.21 | 968 | 453.27 | 968 | 463.67 | 968.01 |
| 464.39 | 968.02 | 494.66 | 968.23 | 495.07 | 968.24 | 495.97 | 968.24 | 505.54 | 968.29 |
| 515.62 | 968.3 | 547.4 | 968.3 | 568.33 | 968.27 | 570.37 | 968.26 | 578.8 | 968.25 |
| 580.65 | 968.24 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 281.62 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 333.19 | 494.66 | 358.05 | 351.8 | 345.55 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.80 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 968.63 | Reach Len. (ft) | 358.05 | 351.80 | 345.55 |
| Crit W.S. (ft) | 968.46 | Flow Area (sq ft) | 17.75 | 154.46 | 29.47 |
| E.G. Slope (ft/ft) | 0.011695 | Area (sq ft) | 17.75 | 154.46 | 29.47 |
| Q Total (cfs) | 630.00 | Flow (cfs) | 43.32 | 535.30 | 51.38 |
| Top Width (ft) | 278.83 | Top Width (ft) | 31.37 | 161.47 | 85.99 |
| Vel Total (ft/s) | 3.12 | Avg. Vel. (ft/s) | 2.44 | 3.47 | 1.74 |
| Max Chl Dpth (ft) | 2.18 | Hydr. Depth (ft) | 0.57 | 0.96 | 0.34 |
| Conv. Total (cfs) | 5825.6 | Conv. (cfs) | 400.6 | 4949.9 | 475.1 |
| Length Wtd. (ft) | 350.90 | Wetted Per. (ft) | 31.43 | 161.55 | 86.38 |
| Min Ch El (ft) | 966.45 | Shear (lb/sq ft) | 0.41 | 0.70 | 0.25 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 1.01 | 2.42 | 0.43 |
| Frctn Loss (ft) | 2.14 | Cum Volume (acre-ft) | 2.36 | 6.55 | 1.45 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 1.43 | 4.37 | 2.26 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 969.02 | Element | | | |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 968.85 | Reach Len. (ft) | 358.05 | 351.80 | 345.55 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 189.86 | |
| E.G. Slope (ft/ft) | 0.008223 | Area (sq ft) | | 189.86 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |

| | | | | |
|---|---|---|---|---|
| Top Width (ft) | 161.47 | Top Width (ft) | | 161.47 |
| Vel Total (ft/s) | 3.32 | Avg. Vel. (ft/s) | | 3.32 |
| Max Chl Dpth (ft) | 2.40 | Hydr. Depth (ft) | | 1.18 |
| Conv. Total (cfs) | 6947.3 | Conv. (cfs) | | 6947.3 |
| Length Wtd. (ft) | 351.80 | Wetted Per. (ft) | | 162.75 |
| Min Ch El (ft) | 966.45 | Shear (lb/sq ft) | | 0.60 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.99 |
| Frctn Loss (ft) | 2.01 | Cum Volume (acre-ft) | 0.02 | 8.09 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 4.37 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 969.07 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 968.91 | Reach Len. (ft) | 358.05 | 351.80 | 345.55 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 200.58 | |
| E.G. Slope (ft/ft) | 0.006855 | Area (sq ft) | | 200.58 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 161.47 | Top Width (ft) | | 161.47 | |
| Vel Total (ft/s) | 3.14 | Avg. Vel. (ft/s) | | 3.14 | |
| Max Chl Dpth (ft) | 2.46 | Hydr. Depth (ft) | | 1.24 | |
| Conv. Total (cfs) | 7609.3 | Conv. (cfs) | | 7609.3 | |
| Length Wtd. (ft) | 351.80 | Wetted Per. (ft) | | 162.89 | |
| Min Ch El (ft) | 966.45 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.66 | |
| Frctn Loss (ft) | 2.16 | Cum Volume (acre-ft) | 1.26 | 7.22 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 4.37 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 2 RS: 0.447

INPUT
Description: 2358.414 - Thalweg Sta. 439.26
Station Elevation Data num= 111

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 970.86 | .45 | 970.85 | 7.82 | 970.72 | 10.48 | 970.68 | 12.77 | 970.65 |
| 20.5 | 970.5 | 22.14 | 970.48 | 30.53 | 970.3 | 31.49 | 970.29 | 40.55 | 970.11 |
| 40.84 | 970.11 | 44.92 | 970.07 | 50.2 | 970.04 | 50.58 | 970.03 | 59.56 | 970 |
| 60.6 | 969.99 | 68.92 | 969.85 | 70.63 | 969.83 | 78.27 | 969.6 | 80.66 | 969.55 |
| 87.62 | 969.31 | 90.68 | 969.23 | 96.99 | 969.02 | 106.34 | 968.75 | 110.73 | 968.63 |
| 120.76 | 968.43 | 130.78 | 968.26 | 134.41 | 968.21 | 150.83 | 967.93 | 162.48 | 967.78 |
| 171.84 | 967.68 | 180.91 | 967.55 | 181.19 | 967.55 | 190.55 | 967.39 | 190.94 | 967.38 |
| 192.14 | 967.34 | 199.91 | 967.11 | 200.96 | 967.11 | 209.26 | 967.18 | 210.99 | 967.17 |
| 218.62 | 967.07 | 221.01 | 967.06 | 227.98 | 966.82 | 229.7 | 966.75 | 238.79 | 966.34 |
| 241.09 | 966.25 | 251.14 | 965.92 | 261.06 | 965.88 | 261.19 | 965.87 | 271.23 | 965.95 |
| 272.2 | 965.95 | 281.28 | 965.99 | 286.53 | 965.99 | 291.33 | 965.99 | 294.47 | 965.98 |
| 311.42 | 965.88 | 316.75 | 965.83 | 321.47 | 965.81 | 327.89 | 965.72 | 331.52 | 965.69 |
| 339.03 | 965.57 | 341.57 | 965.52 | 350.17 | 965.33 | 351.62 | 965.29 | 361.3 | 964.83 |
| 361.66 | 964.82 | 365 | 964.88 | 371.71 | 965.02 | 372.43 | 965.06 | 381.76 | 965.54 |
| 383.58 | 965.61 | 391.81 | 965.85 | 394.71 | 965.89 | 401.85 | 966.02 | 405.85 | 966.02 |
| 411.9 | 966.05 | 416.99 | 965.96 | 421.95 | 965.9 | 428.13 | 965.74 | 432 | 965.66 |
| 439.26 | 965.47 | 450.4 | 965.22 | 452.09 | 965.18 | 461.54 | 965.07 | 462.14 | 965.06 |
| 472.19 | 965.62 | 472.68 | 965.64 | 482.24 | 965.92 | 483.81 | 965.89 | 492.28 | 965.79 |
| 495.54 | 965.75 | 502.66 | 965.68 | 510.15 | 965.64 | 513.07 | 965.62 | 533.88 | 965.63 |
| 554 | 965.66 | 556.43 | 965.66 | 565.1 | 965.69 | 571.24 | 965.73 | 575.5 | 965.75 |
| 592.59 | 965.86 | 596.31 | 965.89 | 612.43 | 966 | 617.13 | 966.02 | 627.04 | 966.08 |
| 627.53 | 966.09 | 628.74 | 966.09 | 656.26 | 966.25 | 661.37 | 966.27 | 669.16 | 966.29 |
| 674.18 | 966.29 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 192.14 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 286.53 | 482.24 | 245.88 | 359.8 | 458.77 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.63 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 966.57 | Reach Len. (ft) | 245.88 | 359.80 | 458.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 28.80 | 191.01 | 134.03 |
| E.G. Slope (ft/ft) | 0.003728 | Area (sq ft) | 28.80 | 191.01 | 134.03 |
| Q Total (cfs) | 630.00 | Flow (cfs) | 38.68 | 378.83 | 212.49 |
| Top Width (ft) | 440.59 | Top Width (ft) | 52.94 | 195.71 | 191.94 |
| Vel Total (ft/s) | 1.78 | Avg. Vel. (ft/s) | 1.34 | 1.98 | 1.59 |
| Max Chl Dpth (ft) | 1.75 | Hydr. Depth (ft) | 0.54 | 0.98 | 0.70 |
| Conv. Total (cfs) | 10318.0 | Conv. (cfs) | 633.5 | 6204.4 | 3480.1 |
| Length Wtd. (ft) | 371.64 | Wetted Per. (ft) | 52.96 | 195.78 | 192.23 |
| Min Ch El (ft) | 964.82 | Shear (lb/sq ft) | 0.13 | 0.23 | 0.16 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.17 | 0.45 | 0.26 |
| Frctn Loss (ft) | 1.84 | Cum Volume (acre-ft) | 2.17 | 5.16 | 0.80 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.08 | 2.93 | 1.15 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.98 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 966.88 | Reach Len. (ft) | 245.88 | 359.80 | 458.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 250.87 | |
| E.G. Slope (ft/ft) | 0.004208 | Area (sq ft) | | 250.87 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 195.71 | Top Width (ft) | | 195.71 | |
| Vel Total (ft/s) | 2.51 | Avg. Vel. (ft/s) | | 2.51 | |
| Max Chl Dpth (ft) | 2.06 | Hydr. Depth (ft) | | 1.28 | |
| Conv. Total (cfs) | 9711.5 | Conv. (cfs) | | 9711.5 | |
| Length Wtd. (ft) | 359.80 | Wetted Per. (ft) | | 197.63 | |
| Min Ch El (ft) | 964.82 | Shear (lb/sq ft) | | 0.33 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.84 | |
| Frctn Loss (ft) | 2.26 | Cum Volume (acre-ft) | 0.02 | 6.31 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 2.93 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.90 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 966.78 | Reach Len. (ft) | 245.88 | 359.80 | 458.77 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 231.27 | |
| E.G. Slope (ft/ft) | 0.005512 | Area (sq ft) | | 231.27 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 195.71 | Top Width (ft) | | 195.71 | |
| Vel Total (ft/s) | 2.72 | Avg. Vel. (ft/s) | | 2.72 | |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | | 1.18 | |
| Conv. Total (cfs) | 8485.8 | Conv. (cfs) | | 8485.8 | |
| Length Wtd. (ft) | 359.80 | Wetted Per. (ft) | | 197.43 | |
| Min Ch El (ft) | 964.82 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.10 | |
| Frctn Loss (ft) | 2.05 | Cum Volume (acre-ft) | 1.26 | 5.48 | |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 2.93 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 2 RS: 0.379

INPUT
Description: 1998.612 - Thalweg Sta. 416.79
Station Elevation Data num= 108

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 971.74 | 9.56 | 969.11 | 15.06 | 968.2 | 19.6 | 967.48 | 26.19 | 966.9 |
| 29.65 | 966.64 | 32.49 | 966.45 | 39.7 | 966.2 | 41.65 | 966.2 | 49.75 | 966.08 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 50.8 | 966.03 | 59.79 | 965.78 | 59.96 | 965.78 | 61.67 | 965.76 | 69.12 | 965.69 |
| 69.84 | 965.67 | 75.46 | 965.58 | 79.89 | 965.5 | 87.42 | 965.39 | 89.93 | 965.37 |
| 96.58 | 965.28 | 99.98 | 965.25 | 105.73 | 965.17 | 110.03 | 965.13 | 114.88 | 965.06 |
| 120.08 | 965.01 | 124.05 | 964.96 | 150.22 | 964.7 | 151.51 | 964.7 | 160.27 | 964.62 |
| 160.66 | 964.62 | 169.81 | 964.57 | 170.32 | 964.57 | 178.97 | 964.54 | 180.36 | 964.53 |
| 188.13 | 964.51 | 190.41 | 964.5 | 200.46 | 964.47 | 220.55 | 964.38 | 227.75 | 964.36 |
| 240.06 | 964.28 | 242.4 | 964.27 | 242.81 | 964.27 | 253.81 | 964.2 | 254.79 | 964.19 |
| 256.56 | 964.18 | 265.22 | 964.12 | 276.63 | 963.97 | 276.88 | 963.97 | 277.33 | 963.96 |
| 284.24 | 963.82 | 288.04 | 963.75 | 291.6 | 963.67 | 298.08 | 963.54 | 298.97 | 963.52 |
| 299.45 | 963.51 | 306.33 | 963.38 | 310.86 | 963.31 | 321.06 | 963.13 | 322.27 | 963.12 |
| 328.42 | 963.22 | 333.69 | 963.27 | 335.79 | 963.35 | 339.61 | 963.45 | 343.15 | 963.55 |
| 345.09 | 963.6 | 350.51 | 963.66 | 356.51 | 963.71 | 367.92 | 963.71 | 379.33 | 963.68 |
| 379.97 | 963.68 | 390.74 | 963.59 | 394.7 | 963.53 | 401.9 | 963.36 | 402.06 | 963.36 |
| 402.15 | 963.35 | 409.42 | 963.03 | 413.56 | 962.91 | 416.79 | 962.81 | 422.66 | 962.96 |
| 424.15 | 962.99 | 424.97 | 963.04 | 431.51 | 963.36 | 436.38 | 963.69 | 438.88 | 963.81 |
| 443.42 | 964.19 | 446.24 | 964.47 | 447.79 | 964.65 | 453.6 | 965.28 | 459.2 | 965.98 |
| 460.97 | 966.21 | 464.18 | 966.71 | 468.33 | 967.3 | 468.69 | 967.35 | 470.62 | 967.61 |
| 475.7 | 968.38 | 482.03 | 969.31 | 483.06 | 969.48 | 484.94 | 969.74 | 490.42 | 970.4 |
| 491.27 | 970.48 | 493.44 | 970.68 | 497.79 | 971.12 | 504.85 | 971.65 | 505.15 | 971.67 |
| 505.7 | 971.7 | 512.52 | 971.9 | 513.35 | 971.89 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 75.46 | .045 | 468.69 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 242.81 | 446.24 | 360.73 | 296.31 | 243.42 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.78 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.045 | 0.045 | 0.045 |
| W.S. Elev (ft) | 964.65 | Reach Len. (ft) | 360.73 | 296.31 | 243.42 |
| Crit W.S. (ft) | 964.25 | Flow Area (sq ft) | 16.47 | 215.65 | 0.14 |
| E.G. Slope (ft/ft) | 0.006903 | Area (sq ft) | 16.47 | 215.65 | 0.14 |
| Q Total (cfs) | 630.00 | Flow (cfs) | 15.00 | 614.92 | 0.08 |
| Top Width (ft) | 291.16 | Top Width (ft) | 86.15 | 203.43 | 1.58 |
| Vel Total (ft/s) | 2.71 | Avg. Vel. (ft/s) | 0.91 | 2.85 | 0.55 |
| Max Chl Dpth (ft) | 1.84 | Hydr. Depth (ft) | 0.19 | 1.06 | 0.09 |
| Conv. Total (cfs) | 7582.7 | Conv. (cfs) | 180.5 | 7401.2 | 1.0 |
| Length Wtd. (ft) | 298.40 | Wetted Per. (ft) | 86.15 | 203.52 | 1.59 |
| Min Ch El (ft) | 962.81 | Shear (lb/sq ft) | 0.08 | 0.46 | 0.04 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.08 | 1.30 | 0.02 |
| Frctn Loss (ft) | 1.64 | Cum Volume (acre-ft) | 2.05 | 3.48 | 0.09 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.69 | 1.28 | 0.13 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.71 | Element | | | |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 964.54 | Reach Len. (ft) | 360.73 | 296.31 | 243.42 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 193.66 | |
| E.G. Slope (ft/ft) | 0.010394 | Area (sq ft) | | 193.66 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 203.43 | Top Width (ft) | | 203.43 | |
| Vel Total (ft/s) | 3.25 | Avg. Vel. (ft/s) | | 3.25 | |
| Max Chl Dpth (ft) | 1.73 | Hydr. Depth (ft) | | 0.95 | |
| Conv. Total (cfs) | 6179.6 | Conv. (cfs) | | 6179.6 | |
| Length Wtd. (ft) | 296.31 | Wetted Per. (ft) | | 203.86 | |
| Min Ch El (ft) | 962.81 | Shear (lb/sq ft) | | 0.62 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.01 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 0.02 | 4.47 | |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | | 1.28 | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 964.84 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | | 0.045 | |
| W.S. Elev (ft) | 964.72 | Reach Len. (ft) | 360.73 | 296.31 | 243.42 |

| | | | | |
|---|---|---|---|---|
| Crit W.S. (ft) | 964.25 | Flow Area (sq ft) | | 229.45 |
| E.G. Slope (ft/ft) | 0.005920 | Area (sq ft) | | 229.45 |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 |
| Top Width (ft) | 203.43 | Top Width (ft) | | 203.43 |
| Vel Total (ft/s) | 2.75 | Avg. Vel. (ft/s) | | 2.75 |
| Max Chl Dpth (ft) | 1.91 | Hydr. Depth (ft) | | 1.13 |
| Conv. Total (cfs) | 8188.2 | Conv. (cfs) | | 8188.2 |
| Length Wtd. (ft) | 296.31 | Wetted Per. (ft) | | 204.22 |
| Min Ch El (ft) | 962.81 | Shear (lb/sq ft) | | 0.42 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.14 |
| Frctn Loss (ft) | 1.70 | Cum Volume (acre-ft) | 1.26 | 3.58 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 1.28 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 2 RS: 0.322

INPUT
Description: 1702.303 - Thalweg Sta. 526.44
Station Elevation Data num= 77

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 967 | 28.76 | 966 | 217.39 | 964 | 242.21 | 963.74 | 245.64 | 963.71 |
| 252.73 | 963.62 | 255.68 | 963.59 | 261.96 | 963.49 | 265.72 | 963.44 | 280.42 | 963.2 |
| 295.83 | 962.97 | 298.88 | 962.93 | 308.11 | 962.84 | 325.95 | 962.74 | 326.56 | 962.73 |
| 335.8 | 962.68 | 335.99 | 962.68 | 345.02 | 962.62 | 351.36 | 962.56 | 356.06 | 962.51 |
| 363.48 | 962.41 | 366.1 | 962.38 | 372.72 | 962.28 | 376.14 | 962.22 | 381.94 | 962.13 |
| 391.18 | 961.95 | 396.22 | 961.84 | 400.4 | 961.73 | 406.25 | 961.62 | 409.83 | 961.59 |
| 426.28 | 961.58 | 428.8 | 961.51 | 436.29 | 961.24 | 438.29 | 961.21 | 446.31 | 961.19 |
| 447.77 | 961.26 | 456.33 | 961.76 | 457.26 | 961.78 | 466.34 | 961.95 | 466.74 | 961.95 |
| 473.85 | 961.84 | 476.23 | 961.8 | 476.36 | 961.8 | 485.71 | 961.84 | 486.37 | 961.84 |
| 495.2 | 962.05 | 504.68 | 962.2 | 506.4 | 962.23 | 514.17 | 961.89 | 516.42 | 961.8 |
| 523.65 | 961.7 | 526.44 | 961.68 | 533.14 | 961.92 | 536.45 | 962.05 | 542.62 | 962.28 |
| 546.47 | 962.43 | 556.48 | 962.7 | 561.59 | 962.76 | 566.5 | 962.83 | 586.53 | 962.97 |
| 590.05 | 963 | 596.55 | 963.03 | 599.53 | 963.05 | 606.56 | 963.07 | 609.01 | 963.11 |
| 616.58 | 963.21 | 618.5 | 963.26 | 626.59 | 963.61 | 627.98 | 963.68 | 634.48 | 964.27 |
| 637.47 | 964.55 | 646.62 | 965.59 | 646.95 | 965.62 | 652.88 | 966.29 | 656.44 | 966.68 |
| 656.64 | 966.71 | 660.41 | 967.09 | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 242.21 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 372.72 | 546.47 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.13 | Element | | | |
| Vel Head (ft) | 0.12 | Wt. n-Val. | 0.040 | 0.040 | 0.040 |
| W.S. Elev (ft) | 963.01 | Reach Len. (ft) | 600.00 | 600.00 | 600.00 |
| Crit W.S. (ft) | 962.56 | Flow Area (sq ft) | 26.89 | 209.29 | 9.35 |
| E.G. Slope (ft/ft) | 0.004488 | Area (sq ft) | 26.89 | 209.29 | 9.35 |
| Q Total (cfs) | 630.00 | Flow (cfs) | 32.43 | 589.55 | 8.02 |
| Top Width (ft) | 299.74 | Top Width (ft) | 79.73 | 173.75 | 46.26 |
| Vel Total (ft/s) | 2.57 | Avg. Vel. (ft/s) | 1.21 | 2.82 | 0.86 |
| Max Chl Dpth (ft) | 1.82 | Hydr. Depth (ft) | 0.34 | 1.20 | 0.20 |
| Conv. Total (cfs) | 9403.6 | Conv. (cfs) | 484.1 | 8799.8 | 119.7 |
| Length Wtd. (ft) | 600.00 | Wetted Per. (ft) | 79.74 | 173.81 | 46.27 |
| Min Ch El (ft) | 961.19 | Shear (lb/sq ft) | 0.09 | 0.34 | 0.06 |
| Alpha | 1.14 | Stream Power (lb/ft s) | 0.11 | 0.95 | 0.05 |
| Frctn Loss (ft) | 5.01 | Cum Volume (acre-ft) | 1.87 | 2.03 | 0.06 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.44 | Element | | | |
| Vel Head (ft) | 0.09 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 963.35 | Reach Len. (ft) | 600.00 | 600.00 | 600.00 |
| Crit W.S. (ft) | 962.54 | Flow Area (sq ft) | | 268.80 | |

| | | | | |
|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.002260 | Area (sq ft) | | 268.80 |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 |
| Top Width (ft) | 173.75 | Top Width (ft) | | 173.75 |
| Vel Total (ft/s) | 2.34 | Avg. Vel. (ft/s) | | 2.34 |
| Max Chl Dpth (ft) | 2.16 | Hydr. Depth (ft) | | 1.55 |
| Conv. Total (cfs) | 13251.8 | Conv. (cfs) | | 13251.8 |
| Length Wtd. (ft) | 600.00 | Wetted Per. (ft) | | 175.81 |
| Min Ch El (ft) | 961.19 | Shear (lb/sq ft) | | 0.22 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.51 |
| Frctn Loss (ft) | 3.91 | Cum Volume (acre-ft) | 0.02 | 2.90 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | | |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 963.13 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 962.99 | Reach Len. (ft) | 600.00 | 600.00 | 600.00 |
| Crit W.S. (ft) | 962.54 | Flow Area (sq ft) | | 205.15 | |
| E.G. Slope (ft/ft) | 0.005532 | Area (sq ft) | | 205.15 | |
| Q Total (cfs) | 630.00 | Flow (cfs) | | 630.00 | |
| Top Width (ft) | 173.75 | Top Width (ft) | | 173.75 | |
| Vel Total (ft/s) | 3.07 | Avg. Vel. (ft/s) | | 3.07 | |
| Max Chl Dpth (ft) | 1.80 | Hydr. Depth (ft) | | 1.18 | |
| Conv. Total (cfs) | 8470.0 | Conv. (cfs) | | 8470.0 | |
| Length Wtd. (ft) | 600.00 | Wetted Per. (ft) | | 175.08 | |
| Min Ch El (ft) | 961.19 | Shear (lb/sq ft) | | 0.40 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.24 | |
| Frctn Loss (ft) | 4.80 | Cum Volume (acre-ft) | 1.26 | 2.10 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 1 RS: 0.201

INPUT
Description: 1090.129 - Thalweg Sta. 441.11 - Discharge 1052 CFS from combination of trib4E1 Reach 2 XS 0.647 (630 CFS) and trib4E2 Reach 1 XS 0.281 (422 CFS)
Station Elevation Data num= 78

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 962.01 | .26 | 961.98 | 9.79 | 960.9 | 15.51 | 960.18 | 23.04 | 959.49 |
| 30.76 | 958.94 | 33.71 | 958.84 | 36.28 | 958.81 | 40.8 | 958.75 | 40.9 | 958.75 |
| 46 | 958.82 | 49.53 | 958.82 | 61.25 | 958.62 | 62.78 | 958.55 | 72.88 | 957.92 |
| 76.02 | 957.72 | 76.5 | 957.71 | 89.27 | 957.74 | 91.75 | 957.71 | 102.52 | 957.47 |
| 106.99 | 957.41 | 115.76 | 957.33 | 122.24 | 957.34 | 129.01 | 957.38 | 152.74 | 957.43 |
| 155.51 | 957.43 | 167.98 | 957.45 | 168.76 | 957.45 | 173.87 | 957.44 | 229.87 | 957.46 |
| 234.99 | 957.43 | 244.22 | 957.32 | 248.24 | 957.21 | 259.47 | 956.77 | 260.54 | 956.73 |
| 261.48 | 956.71 | 267.63 | 956.51 | 274.71 | 956.52 | 274.85 | 956.52 | 287.98 | 956.3 |
| 289.96 | 956.22 | 301.22 | 955.98 | 305.21 | 956.05 | 320.46 | 956.75 | 327.71 | 956.93 |
| 335.7 | 956.92 | 340.96 | 956.9 | 350.95 | 956.95 | 354.21 | 957.02 | 354.42 | 957.02 |
| 358.41 | 957.03 | 365.11 | 957.1 | 374.25 | 957.17 | 377.22 | 957.17 | 386.82 | 957.14 |
| 396.04 | 957.07 | 397.68 | 957.06 | 399.92 | 957.03 | 408.54 | 956.93 | 421.42 | 956.75 |
| 425.59 | 956.7 | 430.25 | 956.61 | 433.66 | 956.58 | 441.11 | 956.47 | 451.27 | 956.72 |
| 451.97 | 956.74 | 460 | 958.154 | 462.82 | 958.65 | 473.19 | 960.29 | 473.68 | 960.37 |
| 476.95 | 960.75 | 484.54 | 961.58 | 490.1 | 962.09 | 495.4 | 962.55 | 506.25 | 963.04 |
| 508.91 | 963.04 | 517.11 | 962.99 | 517.72 | 962.97 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 40.9 | .052 | 421.42 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 377.22 | 460 | 400 | 400 | 400 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.11 | Element | | | |

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.17 | Wt. n-Val. | 0.052 | 0.044 | |
| W.S. Elev (ft) | 957.94 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | 957.69 | Flow Area (sq ft) | 244.07 | 85.72 | |
| E.G. Slope (ft/ft) | 0.013666 | Area (sq ft) | 244.07 | 85.72 | |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 703.24 | 348.77 | |
| Top Width (ft) | 386.18 | Top Width (ft) | 304.63 | 81.55 | |
| Vel Total (ft/s) | 3.19 | Avg. Vel. (ft/s) | 2.88 | 4.07 | |
| Max Chl Dpth (ft) | 1.96 | Hydr. Depth (ft) | 0.80 | 1.05 | |
| Conv. Total (cfs) | 8999.0 | Conv. (cfs) | 6015.6 | 2983.4 | |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | 304.68 | 81.66 | |
| Min Ch El (ft) | 956.47 | Shear (lb/sq ft) | 0.68 | 0.90 | |
| Alpha | 1.08 | Stream Power (lb/ft s) | 1.97 | 3.64 | |
| Frctn Loss (ft) | 3.64 | Cum Volume (acre-ft) | 5.06 | 5.37 | 3.26 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 4.39 | 1.29 | 2.14 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 959.47 | Element | | | |
| Vel Head (ft) | 0.72 | Wt. n-Val. | 0.052 | 0.045 | |
| W.S. Elev (ft) | 958.74 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | 958.60 | Flow Area (sq ft) | 2.84 | 152.29 | |
| E.G. Slope (ft/ft) | 0.019251 | Area (sq ft) | 2.84 | 152.29 | |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 10.01 | 1041.99 | |
| Top Width (ft) | 84.58 | Top Width (ft) | 1.80 | 82.78 | |
| Vel Total (ft/s) | 6.78 | Avg. Vel. (ft/s) | 3.53 | 6.84 | |
| Max Chl Dpth (ft) | 2.76 | Hydr. Depth (ft) | 1.57 | 1.84 | |
| Conv. Total (cfs) | 7582.0 | Conv. (cfs) | 72.1 | 7509.9 | |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | 3.38 | 83.50 | |
| Min Ch El (ft) | 956.47 | Shear (lb/sq ft) | 1.01 | 2.19 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 3.56 | 15.00 | |
| Frctn Loss (ft) | 3.56 | Cum Volume (acre-ft) | 0.85 | 7.33 | 0.65 |
| C & E Loss (ft) | 0.15 | Cum SA (acres) | 0.22 | 1.30 | 0.28 |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 958.32 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | 0.052 | 0.045 | |
| W.S. Elev (ft) | 958.11 | Reach Len. (ft) | 400.00 | 400.00 | 400.00 |
| Crit W.S. (ft) | 957.67 | Flow Area (sq ft) | 182.93 | 99.74 | |
| E.G. Slope (ft/ft) | 0.010358 | Area (sq ft) | 182.93 | 99.74 | |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 667.53 | 384.47 | |
| Top Width (ft) | 211.74 | Top Width (ft) | 129.22 | 82.52 | |
| Vel Total (ft/s) | 3.72 | Avg. Vel. (ft/s) | 3.65 | 3.85 | |
| Max Chl Dpth (ft) | 2.13 | Hydr. Depth (ft) | 1.42 | 1.21 | |
| Conv. Total (cfs) | 10336.5 | Conv. (cfs) | 6558.9 | 3777.6 | |
| Length Wtd. (ft) | 400.00 | Wetted Per. (ft) | 130.15 | 82.65 | |
| Min Ch El (ft) | 956.47 | Shear (lb/sq ft) | 0.91 | 0.78 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | 3.32 | 3.01 | |
| Frctn Loss (ft) | 2.79 | Cum Volume (acre-ft) | 2.52 | 6.90 | 0.43 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.20 | 1.30 | 0.21 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 1 RS: 0.125

INPUT
Description: 659.438 - Thalweg Sta. 410.90

Station Elevation Data num= 81

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 960.37 | 1.43 | 960.28 | 3.85 | 960.09 | 12.07 | 959.46 | 16.79 | 959.15 |
| 22.71 | 958.64 | 33.06 | 957.73 | 33.36 | 957.7 | 33.53 | 957.69 | 44 | 957.13 |
| 50.27 | 957.12 | 62.26 | 957.06 | 65.28 | 957.08 | 67.02 | 956.99 | 75.93 | 956.51 |
| 83.76 | 955.98 | 86.57 | 955.84 | 91.47 | 955.58 | 97.22 | 955.24 | 107.86 | 954.76 |
| 118.5 | 954.5 | 120.67 | 954.47 | 129.15 | 954.4 | 149.88 | 954.27 | 150.75 | 954.27 |
| 171.72 | 954.17 | 182.36 | 954.1 | 193.01 | 954.11 | 203.65 | 954.23 | 214.3 | 954.17 |
| 224.94 | 953.99 | 229.68 | 953.92 | 234.48 | 953.84 | 235.58 | 953.82 | 237.5 | 953.79 |
| 246.22 | 953.7 | 256.87 | 953.58 | 266.69 | 953.49 | 267.51 | 953.48 | 267.98 | 953.48 |
| 278.15 | 953.46 | 299.44 | 953.5 | 301.66 | 953.5 | 319.61 | 953.55 | 321.68 | 953.56 |
| 332.83 | 953.57 | 342.21 | 953.53 | 345.71 | 953.51 | 355.13 | 953.47 | 367.74 | 953.46 |
| 377.44 | 953.42 | 387.39 | 953.23 | 388.59 | 953.2 | 389.76 | 953.12 | 399.74 | 952.42 |
| 409.97 | 952.06 | 410.9 | 952.05 | 411.79 | 952.1 | 422.05 | 952.69 | 432.56 | 953.17 |
| 433.2 | 953.2 | 433.81 | 953.2 | 444.35 | 953.28 | 455.5 | 953.28 | 455.84 | 953.27 |
| 477.74 | 953.15 | 477.86 | 953.15 | 480.9 | 953.13 | 491.69 | 953.08 | 492.5 | 953.08 |
| 505.97 | 953.06 | 506.6 | 953.07 | 519.45 | 953.08 | 521.51 | 953.09 | 551.34 | 953.15 |
| 559.9 | 953.18 | 581.16 | 953.21 | 599.17 | 953.22 | 610.99 | 953.22 | 613.81 | 953.23 |
| 624.13 | 953.25 | | | | | | | | |

Manning's n Values num= 1

| Sta | n Val |
|---|---|
| 0 | .052 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 367.74 | 444.35 | 333.2 | 316.83 | 300.84 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 954.44 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 954.34 | Reach Len. (ft) | 333.20 | 316.83 | 300.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 124.08 | 110.61 | 210.49 |
| E.G. Slope (ft/ft) | 0.006502 | Area (sq ft) | 124.08 | 110.61 | 210.49 |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 190.06 | 325.36 | 536.58 |
| Top Width (ft) | 485.31 | Top Width (ft) | 228.92 | 76.61 | 179.78 |
| Vel Total (ft/s) | 2.36 | Avg. Vel. (ft/s) | 1.53 | 2.94 | 2.55 |
| Max Chl Dpth (ft) | 2.29 | Hydr. Depth (ft) | 0.54 | 1.44 | 1.17 |
| Conv. Total (cfs) | 13046.9 | Conv. (cfs) | 2357.2 | 4035.1 | 6654.6 |
| Length Wtd. (ft) | 316.11 | Wetted Per. (ft) | 228.92 | 76.68 | 180.87 |
| Min Ch El (ft) | 952.05 | Shear (lb/sq ft) | 0.22 | 0.59 | 0.47 |
| Alpha | 1.15 | Stream Power (lb/ft s) | 0.34 | 1.72 | 1.20 |
| Frctn Loss (ft) | 1.76 | Cum Volume (acre-ft) | 3.37 | 4.47 | 2.30 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.94 | 0.57 | 1.31 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.75 | Element | | | |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.052 | 0.052 |
| W.S. Elev (ft) | 955.54 | Reach Len. (ft) | 333.20 | 316.83 | 300.84 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 202.37 | 81.09 |
| E.G. Slope (ft/ft) | 0.005107 | Area (sq ft) | | 202.37 | 81.09 |
| Q Total (cfs) | 1052.00 | Flow (cfs) | | 775.30 | 276.70 |
| Top Width (ft) | 111.75 | Top Width (ft) | | 76.61 | 35.14 |
| Vel Total (ft/s) | 3.71 | Avg. Vel. (ft/s) | | 3.83 | 3.41 |
| Max Chl Dpth (ft) | 3.49 | Hydr. Depth (ft) | | 2.64 | 2.31 |
| Conv. Total (cfs) | 14721.0 | Conv. (cfs) | | 10849.1 | 3871.9 |
| Length Wtd. (ft) | 317.36 | Wetted Per. (ft) | | 78.75 | 37.54 |
| Min Ch El (ft) | 952.05 | Shear (lb/sq ft) | | 0.82 | 0.69 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 3.14 | 2.35 |
| Frctn Loss (ft) | 2.35 | Cum Volume (acre-ft) | 0.84 | 5.70 | 0.28 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.21 | 0.57 | 0.12 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 955.53 | Element | | | |
| Vel Head (ft) | 0.19 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 955.34 | Reach Len. (ft) | 333.20 | 316.83 | 300.84 |

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | | Flow Area (sq ft) | 65.82 | 187.52 | 53.61 |
| E.G. Slope (ft/ft) | 0.005028 | Area (sq ft) | 65.82 | 187.52 | 53.61 |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 194.00 | 689.69 | 168.32 |
| Top Width (ft) | 138.00 | Top Width (ft) | 35.74 | 76.61 | 25.65 |
| Vel Total (ft/s) | 3.43 | Avg. Vel. (ft/s) | 2.95 | 3.68 | 3.14 |
| Max Chl Dpth (ft) | 3.29 | Hydr. Depth (ft) | 1.84 | 2.45 | 2.09 |
| Conv. Total (cfs) | 14835.8 | Conv. (cfs) | 2735.8 | 9726.3 | 2373.7 |
| Length Wtd. (ft) | 320.29 | Wetted Per. (ft) | 37.51 | 76.68 | 27.80 |
| Min Ch El (ft) | 952.05 | Shear (lb/sq ft) | 0.55 | 0.77 | 0.61 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 1.62 | 2.82 | 1.90 |
| Frctn Loss (ft) | 2.27 | Cum Volume (acre-ft) | 1.37 | 5.58 | 0.19 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.44 | 0.57 | 0.09 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E1
REACH: reach 1 RS: 0.065

INPUT
Description: 342.611 - Thalweg Sta. 484.06
Station Elevation Data num= 92

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 954.21 | 3.02 | 954.18 | 3.48 | 954.17 | 4.2 | 954.17 | 14.22 | 954.19 |
| 24.95 | 953.98 | 31.65 | 954.04 | 35.69 | 954.06 | 38.28 | 954.1 | 46.43 | 954.2 |
| 57.17 | 954.19 | 67.9 | 954.07 | 73.54 | 953.97 | 78.64 | 953.89 | 86.58 | 953.73 |
| 89.38 | 953.65 | 108.81 | 953.23 | 110.85 | 953.19 | 121.59 | 953.03 | 132.33 | 952.98 |
| 141.5 | 952.96 | 143.06 | 952.95 | 153.8 | 952.85 | 164.54 | 952.69 | 186.01 | 952.43 |
| 196.42 | 952.32 | 196.75 | 952.31 | 196.97 | 952.31 | 214.6 | 952.09 | 223.11 | 951.99 |
| 223.87 | 951.98 | 249.86 | 951.66 | 250.44 | 951.65 | 250.69 | 951.65 | 251.33 | 951.64 |
| 261.17 | 951.53 | 267.5 | 951.47 | 282.65 | 951.31 | 285.13 | 951.29 | 293.39 | 951.21 |
| 304.13 | 951.14 | 306.25 | 951.14 | 314.86 | 951.18 | 325.6 | 951.3 | 333.71 | 951.41 |
| 336.34 | 951.45 | 347.36 | 951.58 | 358.76 | 951.69 | 370.14 | 951.7 | 381.54 | 951.67 |
| 392.93 | 951.63 | 398.42 | 951.6 | 411.4 | 951.55 | 427.1 | 951.52 | 438.49 | 951.53 |
| 440.18 | 951.54 | 449.88 | 951.53 | 461.07 | 951.34 | 461.27 | 951.33 | 461.52 | 951.32 |
| 472.66 | 950.84 | 484.06 | 950.4 | 486.58 | 950.51 | 495.44 | 950.82 | 502.83 | 951.25 |
| 506.84 | 951.44 | 511.64 | 951.52 | 518.23 | 951.7 | 523.72 | 951.72 | 529.62 | 951.78 |
| 536.7 | 951.75 | 544.6 | 951.7 | 547.14 | 951.68 | 555.72 | 951.66 | 557.57 | 951.66 |
| 564.08 | 951.65 | 569.44 | 951.66 | 592.82 | 951.78 | 593.85 | 951.78 | 605.06 | 951.83 |
| 611.36 | 951.84 | 626.82 | 951.82 | 628.8 | 951.81 | 629.92 | 951.81 | 648.47 | 951.78 |
| 660.57 | 951.78 | 667.02 | 951.78 | 676.29 | 951.8 | 685.57 | 951.84 | 700.04 | 951.96 |
| 723.79 | 952.18 | 729.11 | 952.21 | | | | | | |

Manning's n Values num= 1

| Sta | n Val |
|---|---|
| 0 | .052 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 449.88 | 529.62 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 952.67 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 952.61 | Reach Len. (ft) | 535.00 | 535.00 | 535.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 262.30 | 114.66 | 156.83 |
| E.G. Slope (ft/ft) | 0.004799 | Area (sq ft) | 262.30 | 114.66 | 156.83 |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 498.85 | 289.05 | 264.10 |
| Top Width (ft) | 557.76 | Top Width (ft) | 278.53 | 79.74 | 199.49 |
| Vel Total (ft/s) | 1.97 | Avg. Vel. (ft/s) | 1.90 | 2.52 | 1.68 |
| Max Chl Dpth (ft) | 2.21 | Hydr. Depth (ft) | 0.94 | 1.44 | 0.79 |
| Conv. Total (cfs) | 15185.6 | Conv. (cfs) | 7200.9 | 4172.5 | 3812.2 |
| Length Wtd. (ft) | 535.00 | Wetted Per. (ft) | 278.54 | 79.79 | 199.89 |
| Min Ch El (ft) | 950.40 | Shear (lb/sq ft) | 0.28 | 0.43 | 0.24 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.54 | 1.09 | 0.40 |
| Frctn Loss (ft) | 3.49 | Cum Volume (acre-ft) | 1.90 | 3.65 | 1.03 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | | |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 953.39 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.31 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 953.07 | Reach Len. (ft) | 535.00 | 535.00 | 535.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 84.03 | 151.78 | |
| E.G. Slope (ft/ft) | 0.011726 | Area (sq ft) | 84.03 | 151.78 | |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 338.66 | 713.34 | |
| Top Width (ft) | 134.81 | Top Width (ft) | 55.07 | 79.74 | |
| Vel Total (ft/s) | 4.46 | Avg. Vel. (ft/s) | 4.03 | 4.70 | |
| Max Chl Dpth (ft) | 2.67 | Hydr. Depth (ft) | 1.53 | 1.90 | |
| Conv. Total (cfs) | 9714.9 | Conv. (cfs) | 3127.5 | 6587.5 | |
| Length Wtd. (ft) | 535.00 | Wetted Per. (ft) | 56.53 | 81.08 | |
| Min Ch El (ft) | 950.40 | Shear (lb/sq ft) | 1.09 | 1.37 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 4.39 | 6.44 | |
| Frctn Loss (ft) | 3.97 | Cum Volume (acre-ft) | 0.52 | 4.41 | |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 953.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.26 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 952.99 | Reach Len. (ft) | 535.00 | 535.00 | 535.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 112.57 | 145.39 | |
| E.G. Slope (ft/ft) | 0.010772 | Area (sq ft) | 112.57 | 145.39 | |
| Q Total (cfs) | 1052.00 | Flow (cfs) | 415.16 | 636.84 | |
| Top Width (ft) | 159.62 | Top Width (ft) | 79.88 | 79.74 | |
| Vel Total (ft/s) | 4.08 | Avg. Vel. (ft/s) | 3.69 | 4.38 | |
| Max Chl Dpth (ft) | 2.59 | Hydr. Depth (ft) | 1.41 | 1.82 | |
| Conv. Total (cfs) | 10135.8 | Conv. (cfs) | 4000.0 | 6135.8 | |
| Length Wtd. (ft) | 535.00 | Wetted Per. (ft) | 81.17 | 81.00 | |
| Min Ch El (ft) | 950.40 | Shear (lb/sq ft) | 0.93 | 1.21 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 3.44 | 5.29 | |
| Frctn Loss (ft) | 3.86 | Cum Volume (acre-ft) | 0.69 | 4.37 | |
| C & E Loss (ft) | 0.05 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E2
REACH: reach 1 RS: 0.281

INPUT
Description: Thalweg Sta. 193.66 - Discharge 422 from A2-100y6h.out HEC-1 Model Sta. 2R.
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.13 | 2.74 | 975.9 | 9.36 | 975.28 | 9.81 | 975.23 | 10.25 | 975.19 |
| 16.88 | 974.91 | 18.28 | 974.86 | 23.61 | 974.65 | 24.28 | 974.62 | 37.86 | 974.35 |
| 38.09 | 974.34 | 38.32 | 974.34 | 52.12 | 974.15 | 52.24 | 974.14 | 52.36 | 974.14 |
| 66.36 | 973.96 | 73.45 | 973.87 | 73.48 | 973.87 | 80.42 | 973.79 | 80.62 | 973.79 |
| 94.46 | 973.61 | 94.87 | 973.61 | 108.5 | 973.45 | 109.12 | 973.45 | 122.52 | 973.31 |
| 123.37 | 973.3 | 136.56 | 973.16 | 137.63 | 973.15 | 150.6 | 972.92 | 151.23 | 972.91 |
| 151.88 | 972.89 | 164.63 | 972.9 | 166.13 | 972.92 | 178.66 | 972.81 | 179.52 | 972.8 |
| 180.38 | 972.74 | 192.7 | 971.72 | 193.66 | 971.63 | 194.64 | 971.69 | 200.73 | 972.18 |
| 206.74 | 972.45 | 207.8 | 972.51 | 208.89 | 972.55 | 220.77 | 972.87 | 223.14 | 972.91 |
| 229.02 | 973 | 234.8 | 973.06 | 236.09 | 973.08 | 237.39 | 973.09 | 243.16 | 973.17 |
| 250.23 | 973.22 | 256.26 | 973.3 | 257.3 | 973.31 | 264.37 | 973.41 | 265.89 | 973.44 |
| 276.91 | 973.61 | 278.52 | 973.64 | 280.15 | 973.66 | 282.75 | 973.7 | 290.94 | 973.83 |
| 304.98 | 974.04 | 319.01 | 974.26 | 320.94 | 974.28 | 328.02 | 974.39 | 337.16 | 974.45 |
| 347.08 | 974.56 | 351.42 | 974.7 | 356.3 | 974.89 | 361.12 | 975.13 | 365.66 | 975.59 |
| 373.02 | 976.2 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 18.28 | .052 | 256.26 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 137.63 | 243.16 | 281.26 | 275.01 | 270.65 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 973.88 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.052 | 0.052 | 0.045 |
| W.S. Elev (ft) | 973.68 | Reach Len. (ft) | 281.26 | 275.01 | 270.65 |
| Crit W.S. (ft) | 973.52 | Flow Area (sq ft) | 13.33 | 101.73 | 10.93 |
| E.G. Slope (ft/ft) | 0.017748 | Area (sq ft) | 13.33 | 101.73 | 10.93 |
| Q Total (cfs) | 422.00 | Flow (cfs) | 21.38 | 377.69 | 22.93 |
| Top Width (ft) | 192.62 | Top Width (ft) | 48.69 | 105.53 | 38.40 |
| Vel Total (ft/s) | 3.35 | Avg. Vel. (ft/s) | 1.60 | 3.71 | 2.10 |
| Max Chl Dpth (ft) | 2.05 | Hydr. Depth (ft) | 0.27 | 0.96 | 0.28 |
| Conv. Total (cfs) | 3167.6 | Conv. (cfs) | 160.5 | 2835.0 | 172.1 |
| Length Wtd. (ft) | 273.31 | Wetted Per. (ft) | 48.69 | 105.62 | 38.41 |
| Min Ch El (ft) | 971.63 | Shear (lb/sq ft) | 0.30 | 1.07 | 0.32 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.49 | 3.96 | 0.66 |
| Frctn Loss (ft) | 3.23 | Cum Volume (acre-ft) | 4.05 | 2.70 | 1.19 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 1.58 | 1.48 | 1.57 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.07 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 973.89 | Reach Len. (ft) | 281.26 | 275.01 | 270.65 |
| Crit W.S. (ft) | 973.51 | Flow Area (sq ft) | | 124.21 | |
| E.G. Slope (ft/ft) | 0.011601 | Area (sq ft) | | 124.21 | |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 422.00 | |
| Top Width (ft) | 105.53 | Top Width (ft) | | 105.53 | |
| Vel Total (ft/s) | 3.40 | Avg. Vel. (ft/s) | | 3.40 | |
| Max Chl Dpth (ft) | 2.26 | Hydr. Depth (ft) | | 1.18 | |
| Conv. Total (cfs) | 3918.0 | Conv. (cfs) | | 3918.0 | |
| Length Wtd. (ft) | 274.78 | Wetted Per. (ft) | | 107.09 | |
| Min Ch El (ft) | 971.63 | Shear (lb/sq ft) | | 0.84 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.85 | |
| Frctn Loss (ft) | 2.18 | Cum Volume (acre-ft) | 0.02 | 5.14 | 0.10 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 1.48 | 0.06 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 974.18 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 974.04 | Reach Len. (ft) | 281.26 | 275.01 | 270.65 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 139.80 | |
| E.G. Slope (ft/ft) | 0.007850 | Area (sq ft) | | 139.80 | |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 422.00 | |
| Top Width (ft) | 105.53 | Top Width (ft) | | 105.53 | |
| Vel Total (ft/s) | 3.02 | Avg. Vel. (ft/s) | | 3.02 | |
| Max Chl Dpth (ft) | 2.41 | Hydr. Depth (ft) | | 1.32 | |
| Conv. Total (cfs) | 4762.9 | Conv. (cfs) | | 4762.9 | |
| Length Wtd. (ft) | 274.91 | Wetted Per. (ft) | | 107.38 | |
| Min Ch El (ft) | 971.63 | Shear (lb/sq ft) | | 0.64 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.93 | |
| Frctn Loss (ft) | 2.44 | Cum Volume (acre-ft) | 1.56 | 4.11 | 0.04 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 1.48 | 0.03 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E2
REACH: reach 1 RS: 0.229

INPUT
Description: Thalweg Sta. 118.88
Station Elevation Data num= 76

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 977.03 | 5.36 | 976.15 | 9.04 | 975.53 | 12.29 | 974.69 | 20.49 | 972.35 |
| 23.21 | 971.66 | 25.61 | 971.21 | 35.63 | 970.66 | 38.93 | 970.53 | 43.64 | 970.44 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 44.47 | 970.42 | 50.75 | 970.29 | 52.25 | 970.27 | 63.31 | 970.22 | 65.58 | 970.2 |
| 65.72 | 970.21 | 65.89 | 970.21 | 72.81 | 970.31 | 78.9 | 970.28 | 81.02 | 970.28 |
| 92.23 | 970.19 | 96.16 | 970.13 | 101.15 | 970.03 | 105.55 | 969.85 | 111.28 | 969.63 |
| 118.88 | 969.61 | 122.41 | 969.66 | 126.42 | 969.8 | 132.2 | 969.91 | 136.58 | 969.98 |
| 141.55 | 969.99 | 143.66 | 969.98 | 145.53 | 969.95 | 156.69 | 969.85 | 158.85 | 969.84 |
| 164.92 | 969.78 | 171.81 | 969.74 | 172.17 | 969.74 | 185.49 | 969.65 | 186.17 | 969.65 |
| 186.95 | 969.64 | 198.82 | 969.62 | 212.14 | 969.53 | 214.52 | 969.53 | 217.22 | 969.52 |
| 221.6 | 969.46 | 225.46 | 969.42 | 232.34 | 969.37 | 235.77 | 969.42 | 238.79 | 969.24 |
| 247.48 | 969.25 | 257.03 | 969.81 | 260 | 969.4 | 262.61 | 969.04 | 265.44 | 969.15 |
| 268.36 | 969.3 | 277.75 | 969.78 | 278.28 | 969.8 | 278.76 | 969.82 | 286.26 | 970.05 |
| 292.09 | 970.29 | 292.87 | 970.26 | 299.54 | 970.45 | 308.01 | 970.55 | 318.73 | 970.95 |
| 320.8 | 971.28 | 323.14 | 971.19 | 332.05 | 971.81 | 334.97 | 972.19 | 338.28 | 972.74 |
| 342.05 | 973.53 | 345.38 | 974.03 | 349.14 | 975.01 | 353.4 | 975.24 | 358.7 | 974.21 |
| 363.63 | 973.07 | | | | | | | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .052 | 268.36 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 72.81 | 141.55 | 300 | 300 | 300 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 970.62 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.09 | Wt. n-Val. | 0.052 | 0.052 | 0.050 |
| W.S. Elev (ft) | 970.53 | Reach Len. (ft) | 300.00 | 300.00 | 300.00 |
| Crit W.S. (ft) | 970.19 | Flow Area (sq ft) | 7.50 | 38.31 | 138.09 |
| E.G. Slope (ft/ft) | 0.008436 | Area (sq ft) | 7.50 | 38.31 | 138.09 |
| Q Total (cfs) | 422.00 | Flow (cfs) | 7.23 | 68.08 | 346.69 |
| Top Width (ft) | 266.91 | Top Width (ft) | 33.70 | 68.74 | 164.47 |
| Vel Total (ft/s) | 2.29 | Avg. Vel. (ft/s) | 0.96 | 1.78 | 2.51 |
| Max Chl Dpth (ft) | 1.49 | Hydr. Depth (ft) | 0.22 | 0.56 | 0.84 |
| Conv. Total (cfs) | 4594.5 | Conv. (cfs) | 78.7 | 741.2 | 3774.6 |
| Length Wtd. (ft) | 300.00 | Wetted Per. (ft) | 33.70 | 68.75 | 164.58 |
| Min Ch El (ft) | 969.61 | Shear (lb/sq ft) | 0.12 | 0.29 | 0.44 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.11 | 0.52 | 1.11 |
| Frctn Loss (ft) | 2.87 | Cum Volume (acre-ft) | 3.98 | 2.26 | 0.73 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.32 | 0.93 | 0.94 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.88 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.052 | 0.052 |
| W.S. Elev (ft) | 971.73 | Reach Len. (ft) | 300.00 | 300.00 | 300.00 |
| Crit W.S. (ft) | 970.94 | Flow Area (sq ft) | | 120.96 | 15.81 |
| E.G. Slope (ft/ft) | 0.005772 | Area (sq ft) | | 120.96 | 15.81 |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 377.51 | 44.49 |
| Top Width (ft) | 77.62 | Top Width (ft) | | 68.74 | 8.88 |
| Vel Total (ft/s) | 3.09 | Avg. Vel. (ft/s) | | 3.12 | 2.81 |
| Max Chl Dpth (ft) | 2.69 | Hydr. Depth (ft) | | 1.76 | 1.78 |
| Conv. Total (cfs) | 5554.6 | Conv. (cfs) | | 4969.0 | 585.6 |
| Length Wtd. (ft) | 300.00 | Wetted Per. (ft) | | 70.17 | 10.71 |
| Min Ch El (ft) | 969.61 | Shear (lb/sq ft) | | 0.62 | 0.53 |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.94 | 1.50 |
| Frctn Loss (ft) | 3.41 | Cum Volume (acre-ft) | 0.02 | 4.37 | 0.05 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | | 0.93 | 0.03 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 971.74 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.22 | Wt. n-Val. | | 0.052 | 0.052 |
| W.S. Elev (ft) | 971.52 | Reach Len. (ft) | 300.00 | 300.00 | 300.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 106.32 | 6.13 |
| E.G. Slope (ft/ft) | 0.010080 | Area (sq ft) | | 106.32 | 6.13 |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 403.20 | 18.80 |
| Top Width (ft) | 72.72 | Top Width (ft) | | 68.74 | 3.98 |
| Vel Total (ft/s) | 3.75 | Avg. Vel. (ft/s) | | 3.79 | 3.07 |
| Max Chl Dpth (ft) | 1.91 | Hydr. Depth (ft) | | 1.55 | 1.54 |

| | | | | | |
|---|---|---|---|---|---|
| Conv. Total (cfs) | 4203.1 | Conv. (cfs) | | 4015.8 | 187.3 |
| Length Wtd. (ft) | 300.00 | Wetted Per. (ft) | | 69.96 | 5.55 |
| Min Ch El (ft) | 969.61 | Shear (lb/sq ft) | | 0.96 | 0.70 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 3.63 | 2.13 |
| Frctn Loss (ft) | 3.05 | Cum Volume (acre-ft) | 1.56 | 3.33 | 0.02 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | | 0.93 | 0.01 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E2
REACH: reach 1 RS: 0.172

INPUT
Description: Thalweg Sta. 245.62
Station Elevation Data num= 66

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 975.26 | 8.05 | 974.94 | 11.33 | 974.83 | 22.59 | 974.39 | 25.11 | 974.32 |
| 37.11 | 973.82 | 38.03 | 973.79 | 38.89 | 973.76 | 51.65 | 973.02 | 52.67 | 972.95 |
| 57.21 | 972.37 | 66.18 | 971.23 | 66.46 | 971.2 | 72.68 | 970.35 | 80.24 | 969.32 |
| 80.72 | 969.27 | 94.01 | 968.04 | 95.25 | 967.96 | 107.8 | 967.45 | 109.78 | 967.41 |
| 121.58 | 967.19 | 124.31 | 967.19 | 129.98 | 967.15 | 135.36 | 967.13 | 138.85 | 967.13 |
| 153.38 | 967.05 | 162.93 | 966.98 | 165.35 | 966.97 | 167.91 | 966.94 | 172.42 | 966.93 |
| 176.7 | 966.91 | 182.44 | 966.85 | 190.48 | 966.83 | 196.98 | 966.83 | 204.27 | 966.87 |
| 211.51 | 967.02 | 218.05 | 967.13 | 226.04 | 967.11 | 231.83 | 967.01 | 240.57 | 966.64 |
| 245.62 | 966.48 | 255.11 | 966.51 | 259.39 | 966.56 | 269.64 | 966.72 | 273.17 | 966.75 |
| 284.17 | 966.81 | 286.96 | 966.83 | 298.7 | 966.85 | 300.74 | 966.85 | 313.24 | 966.81 |
| 314.52 | 966.81 | 327.77 | 966.92 | 328.3 | 966.93 | 338.05 | 967.1 | 342.08 | 967.16 |
| 342.3 | 967.17 | 350 | 967.658 | 352.55 | 967.82 | 355.86 | 968.03 | 356.83 | 968.1 |
| 368.01 | 969.39 | 369.64 | 969.58 | 370.48 | 969.66 | 371.37 | 969.76 | 385.9 | 971.47 |
| 386.57 | 971.55 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 57.21 | .052 | 352.55 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 226.04 | 286.96 | 239.28 | 211.23 | 210.85 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 967.75 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.052 | 0.052 | 0.052 |
| W.S. Elev (ft) | 967.65 | Reach Len. (ft) | 239.28 | 211.23 | 210.85 |
| Crit W.S. (ft) | 967.40 | Flow Area (sq ft) | 73.14 | 57.52 | 43.66 |
| E.G. Slope (ft/ft) | 0.010938 | Area (sq ft) | 73.14 | 57.52 | 43.66 |
| Q Total (cfs) | 422.00 | Flow (cfs) | 154.35 | 165.44 | 102.21 |
| Top Width (ft) | 247.12 | Top Width (ft) | 123.24 | 60.92 | 62.96 |
| Vel Total (ft/s) | 2.42 | Avg. Vel. (ft/s) | 2.11 | 2.88 | 2.34 |
| Max Chl Dpth (ft) | 1.17 | Hydr. Depth (ft) | 0.59 | 0.94 | 0.69 |
| Conv. Total (cfs) | 4034.9 | Conv. (cfs) | 1475.8 | 1581.9 | 977.3 |
| Length Wtd. (ft) | 224.66 | Wetted Per. (ft) | 123.25 | 60.93 | 62.98 |
| Min Ch El (ft) | 966.48 | Shear (lb/sq ft) | 0.41 | 0.64 | 0.47 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.86 | 1.85 | 1.11 |
| Frctn Loss (ft) | 1.81 | Cum Volume (acre-ft) | 3.71 | 1.93 | 0.11 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.78 | 0.48 | 0.15 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.43 | Element | | | |
| Vel Head (ft) | 0.50 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 967.93 | Reach Len. (ft) | 239.28 | 211.23 | 210.85 |
| Crit W.S. (ft) | 967.85 | Flow Area (sq ft) | | 74.09 | |
| E.G. Slope (ft/ft) | 0.031897 | Area (sq ft) | | 74.09 | |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 422.00 | |
| Top Width (ft) | 60.92 | Top Width (ft) | | 60.92 | |
| Vel Total (ft/s) | 5.70 | Avg. Vel. (ft/s) | | 5.70 | |
| Max Chl Dpth (ft) | 1.45 | Hydr. Depth (ft) | | 1.22 | |
| Conv. Total (cfs) | 2362.9 | Conv. (cfs) | | 2362.9 | |
| Length Wtd. (ft) | 211.23 | Wetted Per. (ft) | | 62.84 | |
| Min Ch El (ft) | 966.48 | Shear (lb/sq ft) | | 2.35 | |

| | | | | |
|---|---|---|---|---|
| Alpha | 1.00 | Stream Power (lb/ft s) | | 13.37 |
| Frctn Loss (ft) | 1.58 | Cum Volume (acre-ft) | 0.02 | 3.70 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | | 0.48 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 968.68 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 968.43 | Reach Len. (ft) | 239.28 | 211.23 | 210.85 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 104.78 | |
| E.G. Slope (ft/ft) | 0.010263 | Area (sq ft) | | 104.78 | |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 422.00 | |
| Top Width (ft) | 60.92 | Top Width (ft) | | 60.92 | |
| Vel Total (ft/s) | 4.03 | Avg. Vel. (ft/s) | | 4.03 | |
| Max Chl Dpth (ft) | 1.95 | Hydr. Depth (ft) | | 1.72 | |
| Conv. Total (cfs) | 4165.5 | Conv. (cfs) | | 4165.5 | |
| Length Wtd. (ft) | 211.23 | Wetted Per. (ft) | | 63.85 | |
| Min Ch El (ft) | 966.48 | Shear (lb/sq ft) | | 1.05 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.23 | |
| Frctn Loss (ft) | 2.33 | Cum Volume (acre-ft) | 1.56 | 2.61 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | | 0.48 | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: trib4E2
REACH: reach 1 RS: 0.132

INPUT
Description: Thalweg Sta. 343.06
Station Elevation Data num= 64

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 976.65 | 4.22 | 975.19 | 5.81 | 974.55 | 15.09 | 972.44 | 18.96 | 971.55 |
| 19.26 | 971.5 | 19.62 | 971.45 | 32.11 | 970.65 | 35.03 | 970.58 | 45.25 | 969.72 |
| 50.42 | 969.09 | 58.4 | 967.6 | 65.83 | 966.14 | 71.55 | 966.14 | 81.23 | 966.8 |
| 84.7 | 966.95 | 96.64 | 966.87 | 97.85 | 966.85 | 101.26 | 966.7 | 104.93 | 966.54 |
| 111 | 966.3 | 111.47 | 966.29 | 112.04 | 966.27 | 118.57 | 966.11 | 124.14 | 965.72 |
| 137.29 | 965.36 | 137.62 | 965.35 | 142.84 | 965.27 | 150.44 | 965.14 | 163.59 | 964.97 |
| 173.65 | 964.87 | 176.74 | 964.85 | 189.04 | 964.82 | 189.89 | 964.83 | 203.03 | 964.88 |
| 204.45 | 964.88 | 250.66 | 965.14 | 266.05 | 965.21 | 268.78 | 965.21 | 281.46 | 965.24 |
| 281.92 | 965.24 | 295.07 | 965.22 | 296.86 | 965.21 | 327.66 | 965.11 | 334.52 | 965.11 |
| 343.06 | 965.09 | 347.66 | 965.1 | 358.47 | 965.1 | 360.81 | 965.11 | 373.87 | 965.13 |
| 374.49 | 965.13 | 387.1 | 965.15 | 389.28 | 965.16 | 400.26 | 965.19 | 404.67 | 965.23 |
| 413.41 | 965.41 | 420.07 | 965.9 | 426.55 | 966.59 | 435.48 | 967.84 | 439.7 | 968.29 |
| 441.4 | 968.39 | 450.88 | 968.92 | 452.85 | 968.94 | 460.27 | 968.67 | | |

Manning's n Values num= 2

| Sta | n Val | Sta | n Val |
|---|---|---|---|
| 0 | .04 | 137.62 | .052 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 281.46 | 420.07 | 0 | 0 | 0 | .1 | .3 |

CROSS SECTION OUTPUT Profile #100-Year

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 965.94 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.052 | 0.052 | |
| W.S. Elev (ft) | 965.88 | Reach Len. (ft) | 742.00 | 742.00 | 742.00 |
| Crit W.S. (ft) | 965.52 | Flow Area (sq ft) | 126.66 | 96.61 | |
| E.G. Slope (ft/ft) | 0.006175 | Area (sq ft) | 126.66 | 96.61 | |
| Q Total (cfs) | 422.00 | Flow (cfs) | 251.26 | 170.74 | |
| Top Width (ft) | 297.99 | Top Width (ft) | 159.63 | 138.36 | |
| Vel Total (ft/s) | 1.89 | Avg. Vel. (ft/s) | 1.98 | 1.77 | |
| Max Chl Dpth (ft) | 1.06 | Hydr. Depth (ft) | 0.79 | 0.70 | |
| Conv. Total (cfs) | 5370.3 | Conv. (cfs) | 3197.5 | 2172.8 | |
| Length Wtd. (ft) | 742.00 | Wetted Per. (ft) | 159.64 | 138.38 | |
| Min Ch El (ft) | 965.09 | Shear (lb/sq ft) | 0.31 | 0.27 | |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.61 | 0.48 | |
| Frctn Loss (ft) | 7.81 | Cum Volume (acre-ft) | 3.16 | 1.55 | |

| | | | |
|---|---|---|---|
| C & E Loss (ft) | 0.01 | Cum SA (acres) | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 4

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.72 | Element | | | |
| Vel Head (ft) | 0.07 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 966.65 | Reach Len. (ft) | 742.00 | 742.00 | 742.00 |
| Crit W.S. (ft) | 965.84 | Flow Area (sq ft) | | 202.92 | |
| E.G. Slope (ft/ft) | 0.003253 | Area (sq ft) | | 202.92 | |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 422.00 | |
| Top Width (ft) | 138.61 | Top Width (ft) | | 138.61 | |
| Vel Total (ft/s) | 2.08 | Avg. Vel. (ft/s) | | 2.08 | |
| Max Chl Dpth (ft) | 1.83 | Hydr. Depth (ft) | | 1.46 | |
| Conv. Total (cfs) | 7398.8 | Conv. (cfs) | | 7398.8 | |
| Length Wtd. (ft) | 742.00 | Wetted Per. (ft) | | 140.79 | |
| Min Ch El (ft) | 965.09 | Shear (lb/sq ft) | | 0.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.61 | |
| Frctn Loss (ft) | 7.18 | Cum Volume (acre-ft) | 0.02 | 3.03 | |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | | | |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Method 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 966.32 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.052 | |
| W.S. Elev (ft) | 966.17 | Reach Len. (ft) | 742.00 | 742.00 | 742.00 |
| Crit W.S. (ft) | 965.84 | Flow Area (sq ft) | | 137.25 | |
| E.G. Slope (ft/ft) | 0.011871 | Area (sq ft) | | 137.25 | |
| Q Total (cfs) | 422.00 | Flow (cfs) | | 422.00 | |
| Top Width (ft) | 138.61 | Top Width (ft) | | 138.61 | |
| Vel Total (ft/s) | 3.07 | Avg. Vel. (ft/s) | | 3.07 | |
| Max Chl Dpth (ft) | 1.08 | Hydr. Depth (ft) | | 0.99 | |
| Conv. Total (cfs) | 3873.2 | Conv. (cfs) | | 3873.2 | |
| Length Wtd. (ft) | 742.00 | Wetted Per. (ft) | | 139.84 | |
| Min Ch El (ft) | 965.09 | Shear (lb/sq ft) | | 0.73 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.24 | |
| Frctn Loss (ft) | 7.98 | Cum Volume (acre-ft) | 1.56 | 2.02 | |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | | |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:trib4E

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 |
|---|---|---|---|---|---|---|
| reach 3 | 3.710 | .035 | .04 | .035 | | |
| reach 3 | 3.673 | .035 | .04 | .035 | | |
| reach 3 | 3.635 | .04 | .035 | | | |
| reach 3 | 3.602 | .035 | .04 | .035 | | |
| reach 3 | 3.560 | .035 | .04 | .035 | | |
| reach 3 | 3.522 | .035 | .04 | .035 | | |
| reach 3 | 3.485 | .035 | .04 | .035 | | |
| reach 3 | 3.448 | .035 | .04 | .035 | | |
| reach 3 | 3.410 | .035 | .04 | .035 | .04 | .035 |
| reach 3 | 3.372 | .035 | .04 | .035 | | |
| reach 3 | 3.335 | .035 | .04 | .035 | .04 | .035 |
| reach 3 | 3.297 | .035 | .04 | .035 | | |
| reach 3 | 3.260 | .035 | .04 | .035 | | |
| reach 3 | 3.222 | .035 | .04 | .035 | | |
| reach 3 | 3.184 | .035 | .04 | .035 | | |
| reach 3 | 3.147 | .035 | .04 | .035 | | |
| reach 3 | 3.110 | .035 | .04 | .035 | | |
| reach 3 | 3.072 | .035 | .04 | .035 | .04 | .035 |
| reach 3 | 3.036 | .035 | .04 | .035 | .04 | .035 |

| | | | | | |
|---|---|---|---|---|---|
| reach 3 | 2.998 | .035 | .04 | .035 | |
| reach 3 | 2.960 | .035 | .04 | .035 | |
| reach 3 | 2.923 | .035 | .04 | .035 | |
| reach 3 | 2.886 | .035 | .04 | .035 | |
| reach 3 | 2.848 | .035 | .04 | .035 | |
| reach 3 | 2.810 | .035 | .04 | .035 | |
| reach 3 | 2.772 | .035 | .04 | .035 | |
| reach 3 | 2.735 | .035 | .04 | .035 | |
| reach 3 | 2.697 | .035 | .04 | .035 | |
| reach 3 | 2.659 | .035 | .04 | .035 | |
| reach 3 | 2.622 | .035 | .04 | .035 | |
| reach 3 | 2.584 | .035 | .04 | .035 | |
| reach 3 | 2.546 | .035 | .04 | .035 | |
| reach 3 | 2.508 | .035 | .04 | .035 | |
| reach 3 | 2.470 | .035 | .04 | .035 | |
| reach 3 | 2.433 | .035 | .04 | .035 | |
| reach 3 | 2.395 | .052 | .035 | .052 | .035 |
| reach 3 | 2.362 | .035 | .052 | .035 | |
| reach 3 | 2.324 | .035 | .052 | .035 | |
| reach 3 | 2.287 | .035 | .052 | .035 | |
| reach 3 | 2.249 | .035 | .052 | .035 | |
| reach 3 | 2.211 | .035 | .052 | .035 | |
| reach 3 | 2.171 | .035 | .052 | .035 | |
| reach 3 | 2.132 | .035 | .052 | .035 | |
| reach 3 | 2.093 | .035 | .045 | .052 | .035 |
| reach 3 | 2.055 | .035 | .045 | .052 | .035 |
| reach 3 | 2.017 | .035 | .045 | .052 | .035 |
| reach 2 | 1.965 | .045 | .04 | | |
| reach 2 | 1.927 | .045 | .04 | | |
| reach 2 | 1.889 | .045 | .04 | | |
| reach 2 | 1.855 | .045 | .04 | | |
| reach 2 | 1.793 | .045 | .04 | | |
| reach 2 | 1.751 | .045 | .04 | | |
| reach 2 | 1.700 | .045 | | | |
| reach 2 | 1.662 | .04 | .052 | | |
| reach 2 | 1.597 | .04 | .052 | | |
| reach 2 | 1.521 | .04 | .052 | | |
| reach 2 | 1.452 | .052 | .04 | | |
| reach 1 | 1.238 | .052 | .04 | | |
| reach 1 | 1.153 | .052 | .04 | .052 | .04 |

River:trib4E1

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| reach 2 | 0.647 | .045 | .04 | .045 |
| reach 2 | 0.606 | .04 | .045 | |
| reach 2 | 0.562 | .04 | .045 | |
| reach 2 | 0.513 | .04 | .045 | |
| reach 2 | 0.447 | .04 | .045 | |
| reach 2 | 0.379 | .04 | .045 | .04 |
| reach 2 | 0.322 | .04 | .04 | |
| reach 1 | 0.201 | .04 | .052 | .04 |
| reach 1 | 0.125 | .052 | | |
| reach 1 | 0.065 | .052 | | |

River:trib4E2

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| reach 1 | 0.281 | .04 | .052 | .035 |
| reach 1 | 0.229 | .052 | .035 | |
| reach 1 | 0.172 | .04 | .052 | .04 |
| reach 1 | 0.132 | .04 | .052 | |

SUMMARY OF REACH LENGTHS

River: trib4E

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| reach 3 | 3.710 | 178.08 | 199.5 | 231.47 |
| reach 3 | 3.673 | 209.89 | 198.46 | 181 |
| reach 3 | 3.635 | 174.5 | 174.9 | 164.84 |

| | | | | |
|---|---|---|---|---|
| reach 3 | 3.602 | 221.77 | 219.61 | 213.61 |
| reach 3 | 3.560 | 210.94 | 199.53 | 213.82 |
| reach 3 | 3.522 | 129.19 | 197.93 | 248.14 |
| reach 3 | 3.485 | 240.51 | 197.8 | 144.29 |
| reach 3 | 3.448 | 219.36 | 199.66 | 172.54 |
| reach 3 | 3.410 | 145.7 | 196.95 | 230.38 |
| reach 3 | 3.372 | 216.81 | 197.52 | 165 |
| reach 3 | 3.335 | 190.01 | 198.9 | 215.88 |
| reach 3 | 3.297 | 204.11 | 198.93 | 206.37 |
| reach 3 | 3.260 | 191.96 | 199.23 | 236.34 |
| reach 3 | 3.222 | 202.65 | 197.72 | 214.2 |
| reach 3 | 3.184 | 229.99 | 198.29 | 160.44 |
| reach 3 | 3.147 | 203.41 | 197.54 | 171.01 |
| reach 3 | 3.110 | 139.09 | 195.6 | 245.84 |
| reach 3 | 3.072 | 226.42 | 193.75 | 146.63 |
| reach 3 | 3.036 | 193.99 | 198.75 | 207.66 |
| reach 3 | 2.998 | 192.5 | 199.44 | 210.03 |
| reach 3 | 2.960 | 155.92 | 195.14 | 218.39 |
| reach 3 | 2.923 | 206.33 | 199.88 | 191.65 |
| reach 3 | 2.886 | 212.53 | 199.33 | 178.18 |
| reach 3 | 2.848 | 208.34 | 199.67 | 179.49 |
| reach 3 | 2.810 | 187.08 | 198.58 | 226.9 |
| reach 3 | 2.772 | 210.06 | 199.66 | 175.66 |
| reach 3 | 2.735 | 179.06 | 199.03 | 255.67 |
| reach 3 | 2.697 | 188.29 | 197.81 | 215.28 |
| reach 3 | 2.659 | 201.87 | 199.99 | 198.68 |
| reach 3 | 2.622 | 196.93 | 199.78 | 201.56 |
| reach 3 | 2.584 | 201.91 | 199.34 | 215.78 |
| reach 3 | 2.546 | 194.56 | 199.9 | 214.84 |
| reach 3 | 2.508 | 189.62 | 199.54 | 210.02 |
| reach 3 | 2.470 | 210.99 | 198 | 181.58 |
| reach 3 | 2.433 | 198.29 | 200.12 | 206 |
| reach 3 | 2.395 | 180.38 | 172.66 | 154.99 |
| reach 3 | 2.362 | 226.02 | 199.92 | 185.88 |
| reach 3 | 2.324 | 207.24 | 199.58 | 241.24 |
| reach 3 | 2.287 | 199.43 | 199.99 | 209.85 |
| reach 3 | 2.249 | 203.3 | 200.11 | 220.63 |
| reach 3 | 2.211 | 206.37 | 207.25 | 201.1 |
| reach 3 | 2.171 | 230.9 | 210.14 | 184.84 |
| reach 3 | 2.132 | 239.21 | 204.96 | 164.58 |
| reach 3 | 2.093 | 202.77 | 199.7 | 211.92 |
| reach 3 | 2.055 | 179.25 | 199.4 | 207.72 |
| reach 3 | 2.017 | 0 | 0 | 0 |
| reach 2 | 1.965 | 205.01 | 200.71 | 198.66 |
| reach 2 | 1.927 | 208.26 | 197.18 | 181.45 |
| reach 2 | 1.889 | 201.33 | 181.47 | 165.11 |
| reach 2 | 1.855 | 250.34 | 327.38 | 382.4 |
| reach 2 | 1.793 | 228.63 | 218.48 | 190.55 |
| reach 2 | 1.751 | 300.02 | 270.8 | 163.34 |
| reach 2 | 1.700 | 189.34 | 198.99 | 185.46 |
| reach 2 | 1.662 | 316.83 | 347.64 | 389.86 |
| reach 2 | 1.597 | 393.55 | 396.76 | 423.41 |
| reach 2 | 1.521 | 377.59 | 369.45 | 372.44 |
| reach 2 | 1.452 | 0 | 0 | 0 |
| reach 1 | 1.238 | 410.79 | 450.03 | 482.2 |
| reach 1 | 1.153 | 0 | 0 | 0 |

River: trib4E1

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| reach 2 | 0.647 | 189.26 | 214.41 | 242.7 |
| reach 2 | 0.606 | 228.12 | 236.12 | 239.66 |
| reach 2 | 0.562 | 255.06 | 254.6 | 268.65 |
| reach 2 | 0.513 | 358.05 | 351.8 | 345.55 |
| reach 2 | 0.447 | 245.88 | 359.8 | 458.77 |
| reach 2 | 0.379 | 360.73 | 296.31 | 243.42 |
| reach 2 | 0.322 | 0 | 0 | 0 |
| reach 1 | 0.201 | 400 | 400 | 400 |
| reach 1 | 0.125 | 333.2 | 316.83 | 300.84 |
| reach 1 | 0.065 | 0 | 0 | 0 |

River: trib4E2

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| reach 1 | 0.281 | 281.26 | 275.01 | 270.65 |

| | | | | |
|---|---|---|---|---|
| reach 1 | 0.229 | 300 | 300 | 300 |
| reach 1 | 0.172 | 239.28 | 211.23 | 210.85 |
| reach 1 | 0.132 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: trib4E

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| reach 3 | 3.710 | .1 | .3 |
| reach 3 | 3.673 | .1 | .3 |
| reach 3 | 3.635 | .1 | .3 |
| reach 3 | 3.602 | .1 | .3 |
| reach 3 | 3.560 | .1 | .3 |
| reach 3 | 3.522 | .1 | .3 |
| reach 3 | 3.485 | .1 | .3 |
| reach 3 | 3.448 | .1 | .3 |
| reach 3 | 3.410 | .1 | .3 |
| reach 3 | 3.372 | .1 | .3 |
| reach 3 | 3.335 | .1 | .3 |
| reach 3 | 3.297 | .1 | .3 |
| reach 3 | 3.260 | .1 | .3 |
| reach 3 | 3.222 | .1 | .3 |
| reach 3 | 3.184 | .1 | .3 |
| reach 3 | 3.147 | .1 | .3 |
| reach 3 | 3.110 | .1 | .3 |
| reach 3 | 3.072 | .1 | .3 |
| reach 3 | 3.036 | .1 | .3 |
| reach 3 | 2.998 | .1 | .3 |
| reach 3 | 2.960 | .1 | .3 |
| reach 3 | 2.923 | .1 | .3 |
| reach 3 | 2.886 | .1 | .3 |
| reach 3 | 2.848 | .1 | .3 |
| reach 3 | 2.810 | .1 | .3 |
| reach 3 | 2.772 | .1 | .3 |
| reach 3 | 2.735 | .1 | .3 |
| reach 3 | 2.697 | .1 | .3 |
| reach 3 | 2.659 | .1 | .3 |
| reach 3 | 2.622 | .1 | .3 |
| reach 3 | 2.584 | .1 | .3 |
| reach 3 | 2.546 | .1 | .3 |
| reach 3 | 2.508 | .1 | .3 |
| reach 3 | 2.470 | .1 | .3 |
| reach 3 | 2.433 | .1 | .3 |
| reach 3 | 2.395 | .1 | .3 |
| reach 3 | 2.362 | .1 | .3 |
| reach 3 | 2.324 | .1 | .3 |
| reach 3 | 2.287 | .1 | .3 |
| reach 3 | 2.249 | .1 | .3 |
| reach 3 | 2.211 | .1 | .3 |
| reach 3 | 2.171 | .1 | .3 |
| reach 3 | 2.132 | .1 | .3 |
| reach 3 | 2.093 | .1 | .3 |
| reach 3 | 2.055 | .1 | .3 |
| reach 3 | 2.017 | .1 | .3 |
| reach 2 | 1.965 | .1 | .3 |
| reach 2 | 1.927 | .1 | .3 |
| reach 2 | 1.889 | .1 | .3 |
| reach 2 | 1.855 | .1 | .3 |
| reach 2 | 1.793 | .1 | .3 |
| reach 2 | 1.751 | .1 | .3 |
| reach 2 | 1.700 | .1 | .3 |
| reach 2 | 1.662 | .1 | .3 |
| reach 2 | 1.597 | .1 | .3 |
| reach 2 | 1.521 | .1 | .3 |
| reach 2 | 1.452 | .1 | .3 |
| reach 1 | 1.238 | .1 | .3 |
| reach 1 | 1.153 | .1 | .3 |

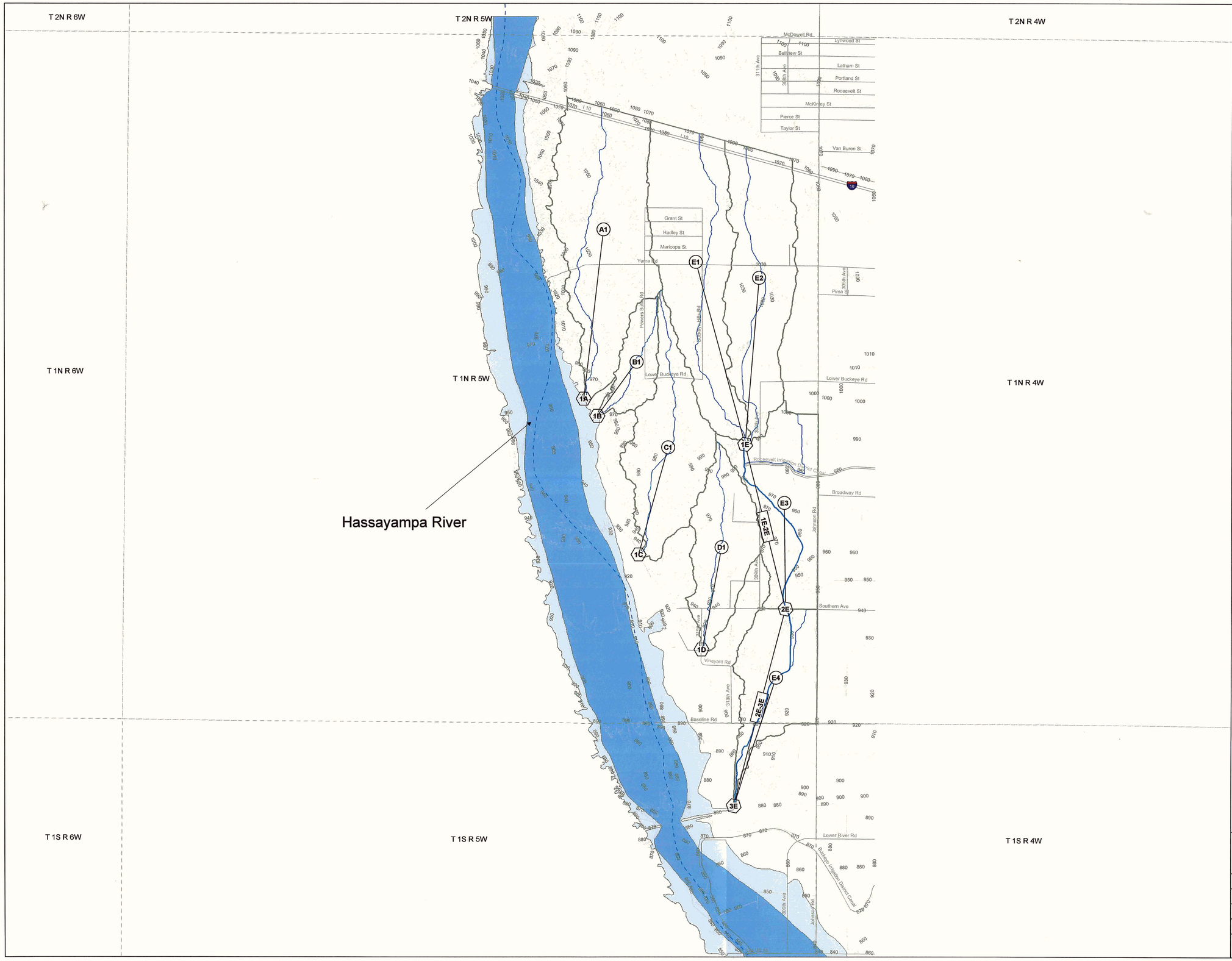
River: trib4E1

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| reach 2 | 0.647 | .1 | .3 |

| | | | |
|---|---|---|---|
| reach 2 | 0.606 | .1 | .3 |
| reach 2 | 0.562 | .1 | .3 |
| reach 2 | 0.513 | .1 | .3 |
| reach 2 | 0.447 | .1 | .3 |
| reach 2 | 0.379 | .1 | .3 |
| reach 2 | 0.322 | .1 | .3 |
| reach 1 | 0.201 | .1 | .3 |
| reach 1 | 0.125 | .1 | .3 |
| reach 1 | 0.065 | .1 | .3 |

River: trib4E2

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| reach 1 | 0.281 | .1 | .3 |
| reach 1 | 0.229 | .1 | .3 |
| reach 1 | 0.172 | .1 | .3 |
| reach 1 | 0.132 | .1 | .3 |




**BUCKEYE/SUN VALLEY**
**AREA DRAINAGE MASTER STUDY**
**FCD CONTRACT NO. 2002C027**

**Area 2 Figure 4-1**
**Existing Conditions Schematic Map**

## LEGEND

- (E1) Sub-basin ID
- (1E) Concentration/Combining Point
- [1E-2E] Routing Channel ID
- Sub-basin Boundary
- Routing Channel
- Lag Time Path
- Road
- Contour

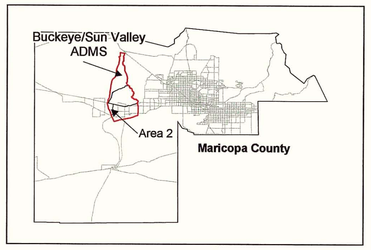
**FEMA Floodplain Zone**

- AE
- FW

## NOTES

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 11-4-04 ARIZONA U.S.A.

## INDEX MAP




0 2,000 4,000 6,000 Feet

N

1 inch equals 2,000 feet
Contour Interval = 10 Feet

Horizontal Coordinate System:
NAD 1983 State Plane Arizona Central
Vertical Coordinate System:
NAVD 1988

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7310 N. 16th Street, Suite 310
Phoenix, Arizona 85020
(602) 943-1003

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 1 OF 1

**BUCKEYE/SUN VALLEY**
**AREA DRAINAGE MASTER STUDY**
**FCD CONTRACT NO. 2002C027**

**Area 2 Figure 4-2**
**Routing Map**

## LEGEND

- 1A Concentration/Combining Point
- A1 Sub-basin Boundary
- Routing Channel
- Lag Time Path
- Road
- Contour
- Township-Range

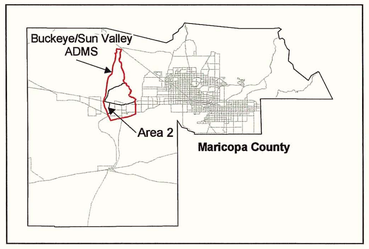
**FEMA Floodplain Zone**

- AE
- FW

## NOTES

Registered Professional Engineer (Civil) CERTIFICATE NO. 32481 STEPHEN W. ROWERS Expires 4-1-05 ARIZONA U.S.A.

## INDEX MAP




0 1,000 2,000 4,000 6,000 Feet

N

1 inch equals 2,000 feet
Contour Interval = 10 Feet

Horizontal Coordinate System:
NAD 1983 State Plane Arizona Central
Vertical Coordinate System:
NAVD 1988

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Phoenix, Arizona 85020
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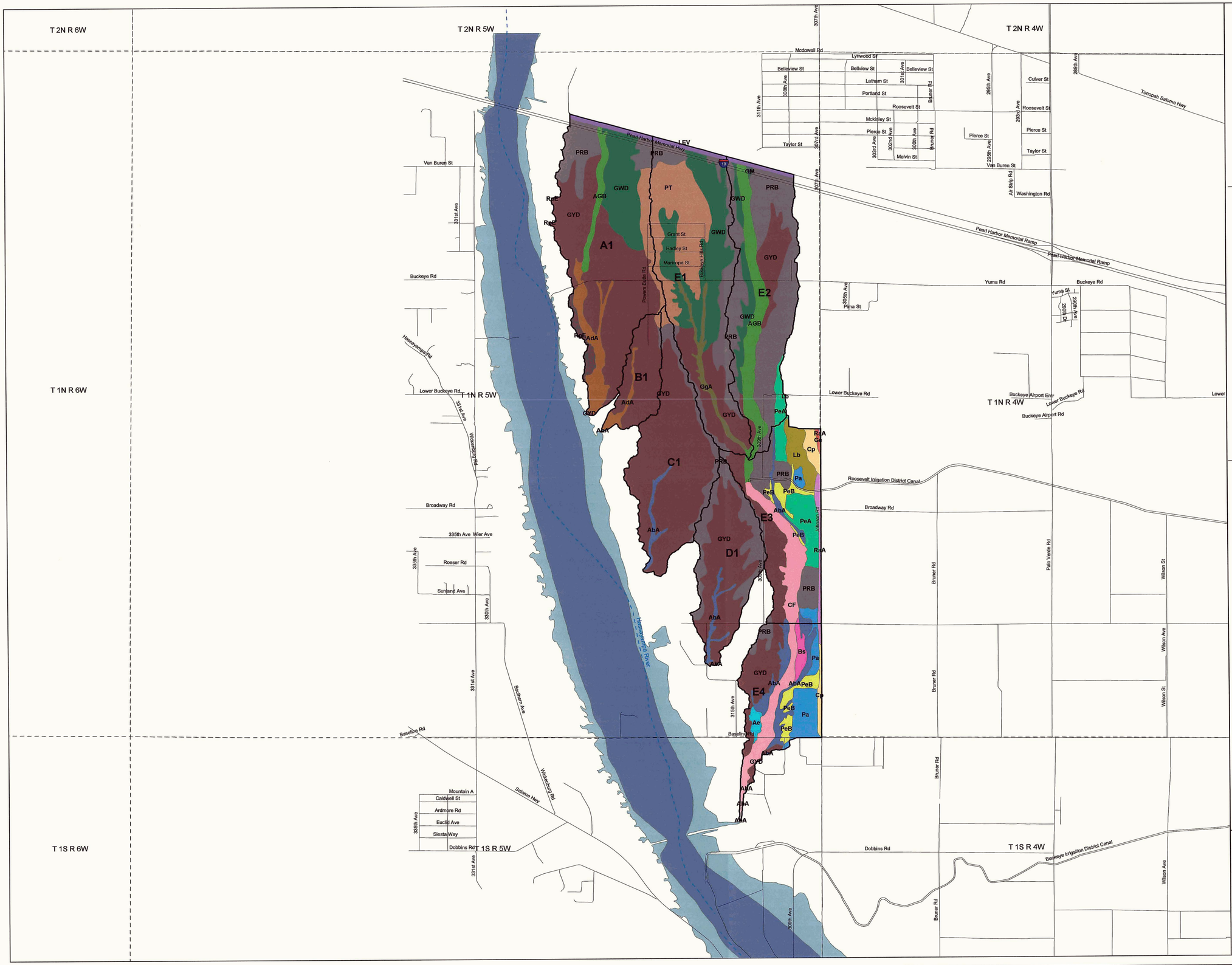



Flood Control District of Maricopa County

# BUCKEYE/SUN VALLEY AREA DRAINAGE MASTER STUDY FCD CONTRACT NO. 2002C027

## Figure 4-3
## Area 2 Soil Map

### LEGEND

A1 Sub-basin Boundary

Township-Range

Roads

**Soil Type**

| | | | |
|---|---|---|---|
| AGB | CF | Ge | PT |
| AbA | Cp | GgA | Pa |
| AdA | GM | LEV | PeA |
| Ae | GWD | Lb | PeB |
| Bs | GYD | PRB | RaA |
| | | | RpE |

**FEMA Floodplain Zone**

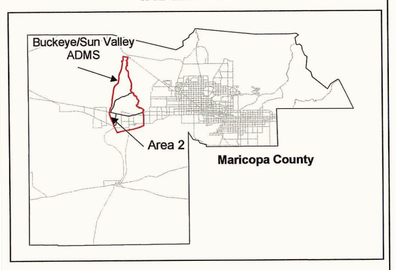
AE

FW

### NOTES

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 4-23-04 ARIZONA U.S.A.

### INDEX MAP




0 2,000 4,000 6,000 Feet

1 inch equals 2,000 feet

N

Horizontal Coordinate System:
NAD 1983 State Plane Arizona Central
Vertical Coordinate System:
NAVD 1988

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| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

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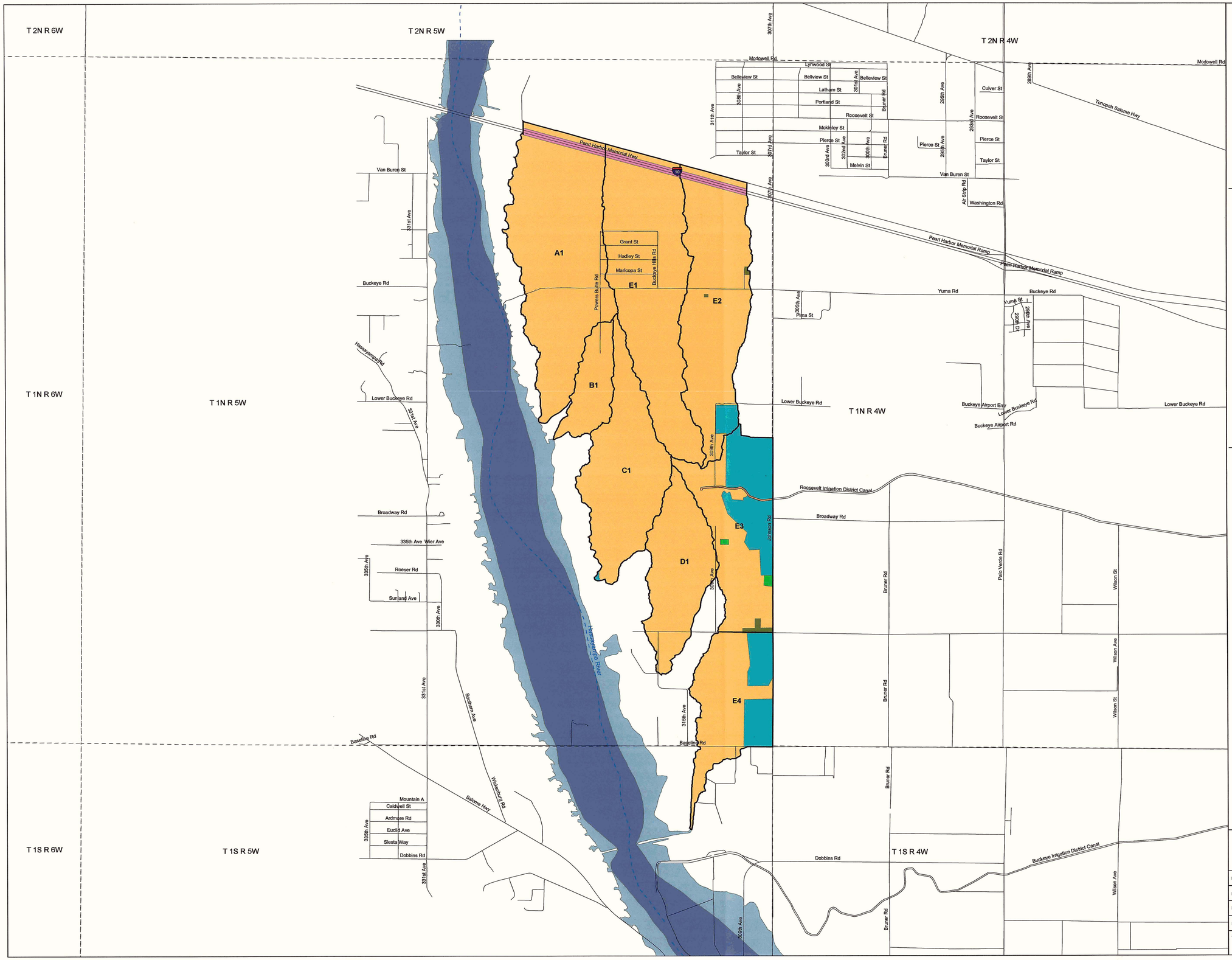



Flood Control District of Maricopa County

# BUCKEYE/SUN VALLEY AREA DRAINAGE MASTER STUDY
## FCD. CONTRACT NO. 2002C027

## Figure 4-4
## Area 2 Existing Conditions Land Use Map

### LEGEND

- A1 Sub-basin Boundary
- Roads
- Township-Range

**Land Use Code**

- Agriculture
- Large Lot Residential - Single Family
- Transportation
- Vacant
- Very Small Lot Residential - Single Family
- Water

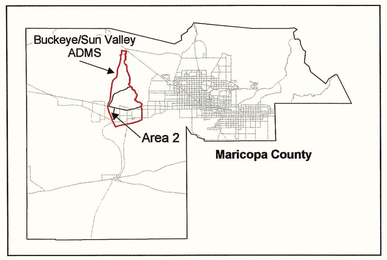
**FEMA Floodplain Zone**

- AE
- FW

### NOTES

Registered Professional Engineer (Civil) CERTIFICATE NO. 42681 STEPHEN V. ROGERS Date Signed 4-13-05 ARIZONA U.S.A.

### INDEX MAP




N

0 2,000 4,000 6,000 Feet

1 inch equals 2,000 feet

Horizontal Coordinate System:
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Vertical Coordinate System:
NAVD 1988

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| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

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**BUCKEYE/SUN VALLEY**
**AREA DRAINAGE MASTER STUDY**
**FCD CONTRACT NO. 2002C027**

**Figure 4-5**
**Area 2 Existing Conditions Flow Map**

## LEGEND

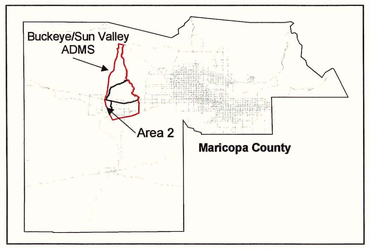
- A1 — Sub-basin Boundary
- 1A — Concentration Point w/ Existing 100-year 6-hour Combined Peak Flows
- Existing 100-year 6-hour Routed Peak Flow
- Existing 100-year 6-hour Sub-basin Peak Flow
- Lag Time Path
- Routing Channel
- Roads
- Contour
- Township-Range

**FEMA Floodplain Zone**

- AE
- FW

## NOTES

## INDEX MAP




0 2,000 4,000 6,000 Feet

1 inch equals 2,000 feet
Contour Interval = 10 Feet

Horizontal Coordinate System:
NAD 1983 State Plane Arizona Central
Vertical Coordinate System:
NAVD 1988

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| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

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**BUCKEYE/SUN VALLEY**
**AREA DRAINAGE MASTER STUDY**
**FCD CONTRACT NO. 2002C027**

**Figure 4-6**
**Area 2 Watershed Workmap**

## LEGEND

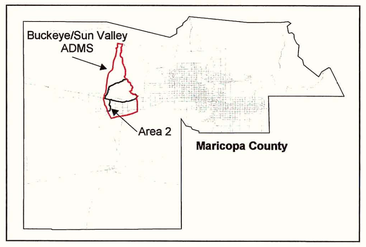
- 1A Concentration/Combining Point
- A1 Sub-basin Boundary
- Contour
- Roads
- Township-Range

**FEMA Floodplain Zone**

- AE
- FW

## NOTES

## INDEX MAP




0 2,000 4,000 6,000 Feet

1 inch equals 2,024.968968 feet

Horizontal Coordinate System:
NAD 1983 State Plane Arizona Central
Vertical Coordinate System:
NAVD 1988
Contours intervals at 10 feet

N

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Phoenix, Arizona 85020
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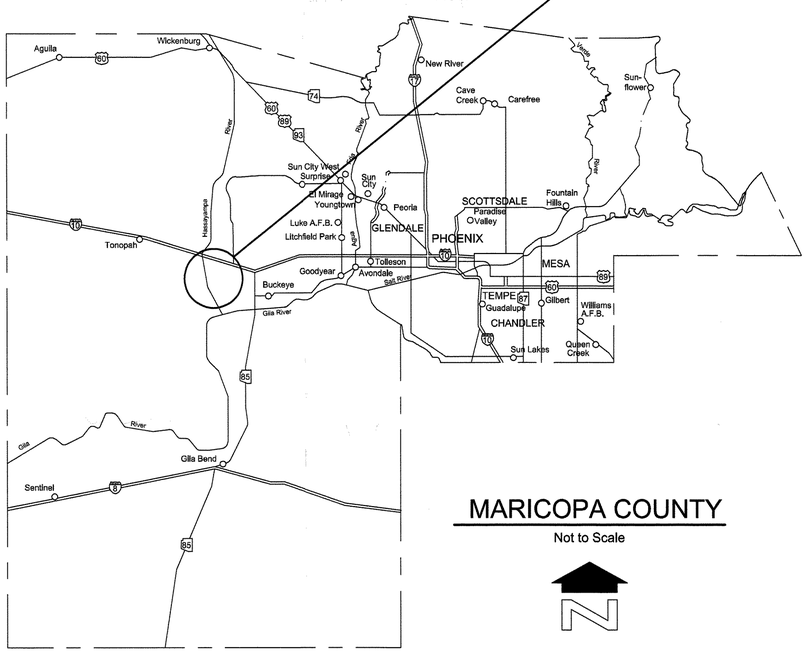
| DESIGN CHK. | WC | 10/04 | |
| PLANS | JSL | 10/04 | RECOMMENDED BY: DATE |
| PLANS CHK. | WC | 10/04 | APPROVED BY: DATE |
| SUBMITTED BY: DATE: | | | CHIEF ENGINEER AND GENERAL MANAGER |
| | | | SHEET 1 OF 1 |

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

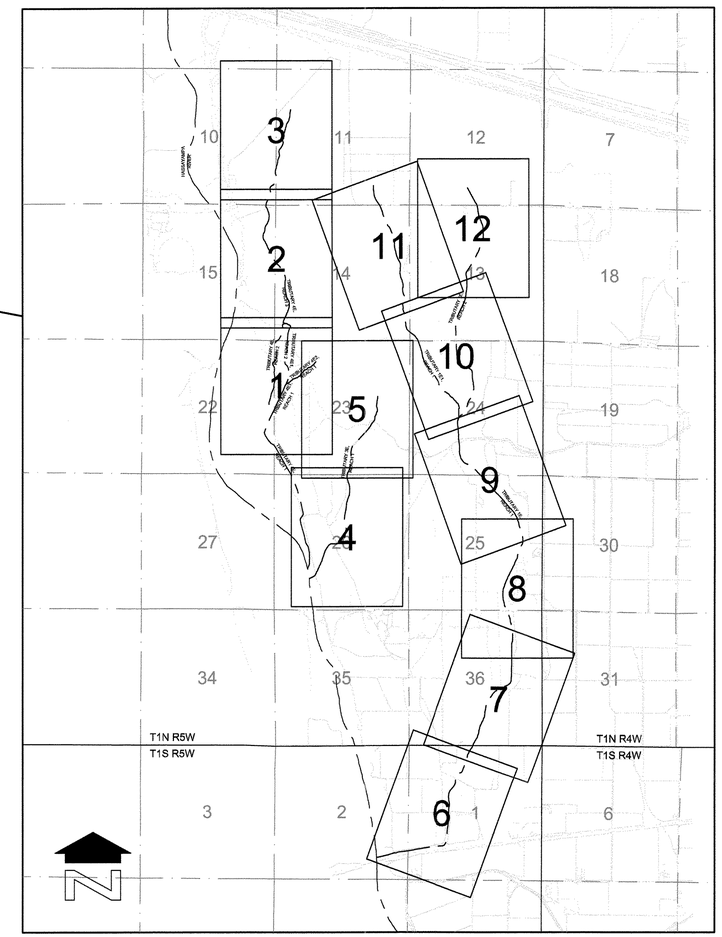
F.C.D. CONTRACT NO. 2002C027

PROJECT LOCATION




MARICOPA COUNTY

Not to Scale




SHEET INDEX MAP

Not to Scale

FLIGHT DATES: 03/27/02, 04/08/02

Registered Professional Engineer (Civil) CERTIFICATE NO. 42861 STEPHEN W. ROGERS Date Signed 12-2-04 ARIZONA U.S.A.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7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303


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|---|---|---|
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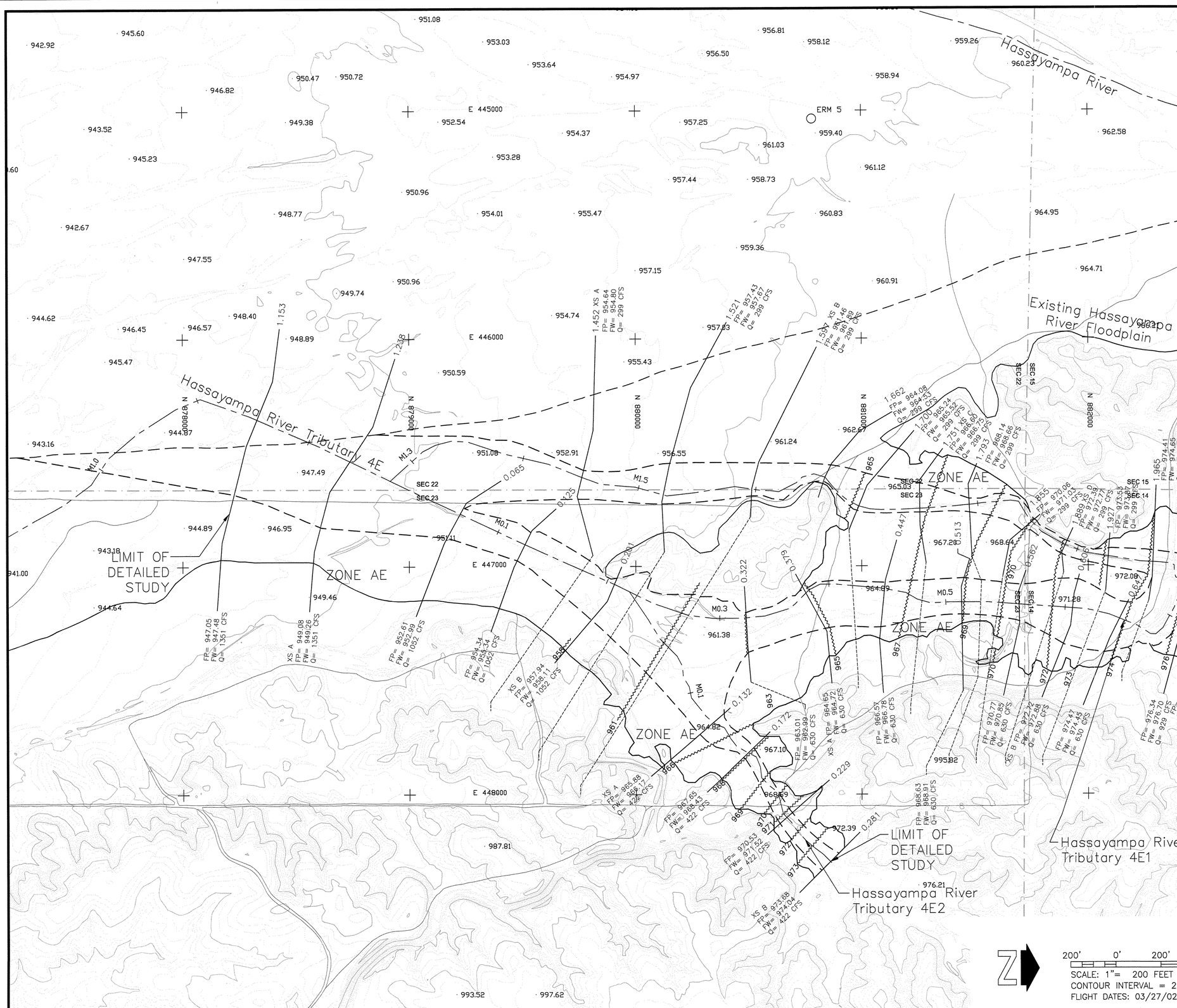
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

COVER SHEET




## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FP= 1888.74 / FW= 1889.54 / Q = CFS |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

FEMA CROSS SECTION DESIGNATION — CROSS SECTION RIVER MILE DESIGNATION — FLOODPLAIN WATER SURFACE ELEVATION — ENCROACHED WATER SURFACE ELEVATION — 100 YEAR DISCHARGE

## ELEVATION REFERENCE MARKS

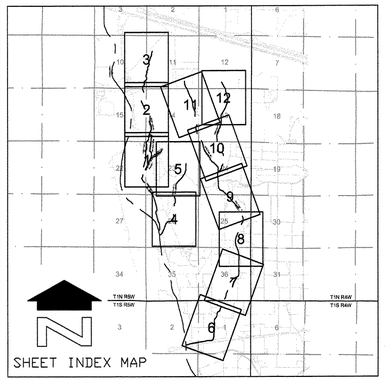
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 5 | 960.06 | SET FCDMC BRASS CAP IN 8 CONC. COLLAR, 0.5 ABOVE GROUND. STATION IS LOCATED APPROXIMATELY 0.3 MILE SOUTH OF THE LOWER BUCKEYE ROAD ALIGNMENT, 2.2 MILES WEST OF JOHNSON ROAD AND 300 MORE OR LESS EAST OF THE EAST BANK, HASSAYAMPA RIVER. ATV AND FOOT TRAVEL REQUIRED. N: 880782 E: 445036 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET




| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 2 | | | |
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**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**

FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

F.C.D. CONTRACT NO. 2002C027

200' 0' 200' 400'

SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET
FLIGHT DATES: 03/27/02, 04/08/02

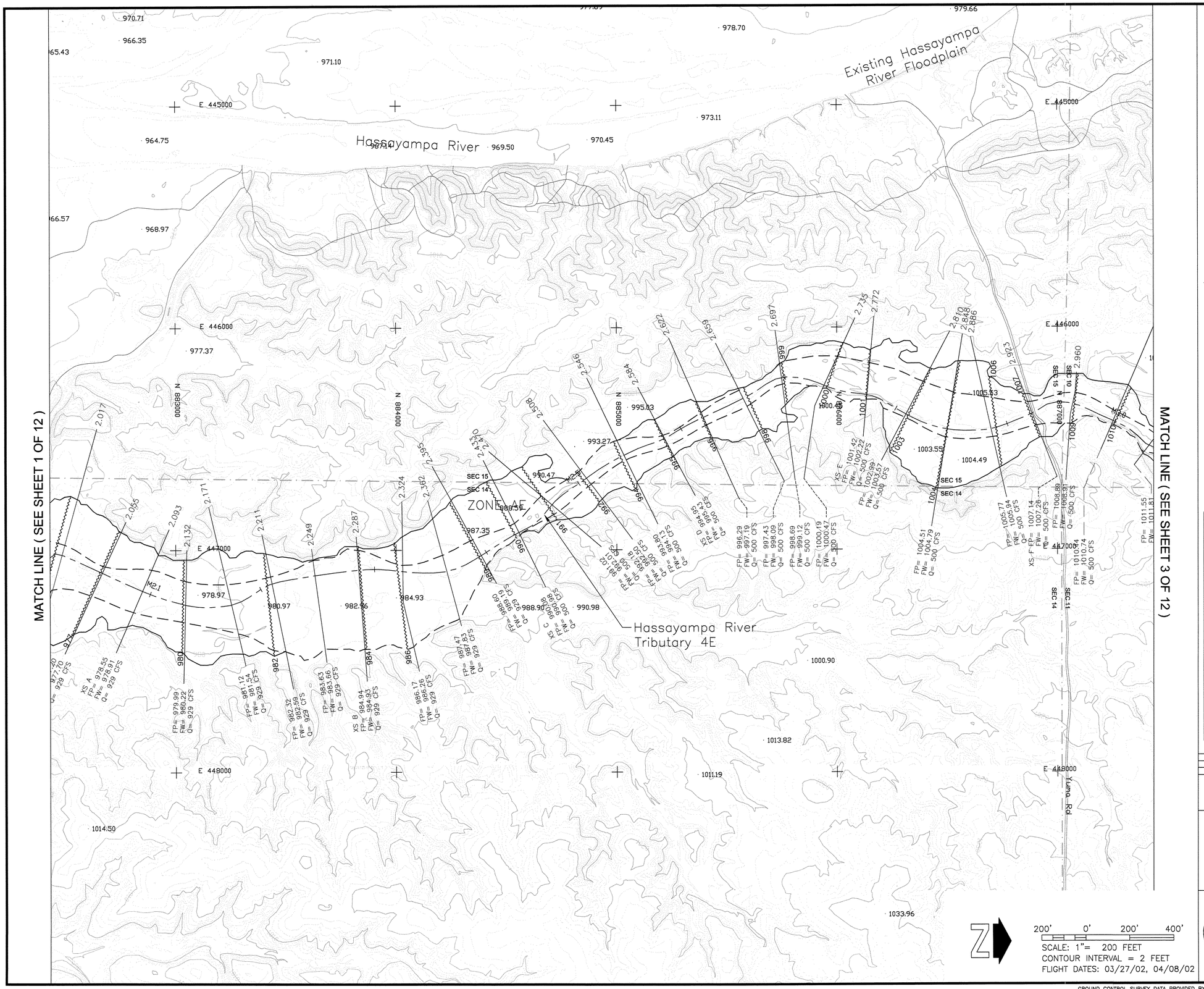
PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1303
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 01 OF 12

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.




## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | (A) 0.10 — FP= 1888.74 (FLOODPLAIN WATER SURFACE ELEVATION); FW= 1889.54 (ENCROACHED WATER SURFACE ELEVATION); Q = CFS (100 YEAR DISCHARGE); FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

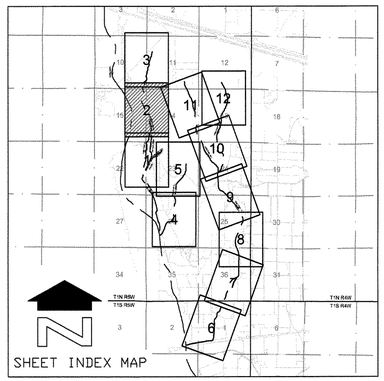
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 6 | 983.43 | SET FCDMC BRASS CAP IN 8 CONC. COLLAR, 0.3 ABOVE GROUND. FROM INTERSECTION OF YUMA ROAD & JOHNSON ROAD, DRIVE 2.3 MILES WEST ALONG YUMA ROAD TO ITS TERMINUS AT EAST BANK OF HASSAYAMPA RIVER, THENCE WALK 0.3 MILE SOUTHERLY ALONG EAST BANK OF RIVER TO STATION, LOCATED 50 MORE OR LESS EAST OF BANK. N: 885639 E: 445134 |
| 24 | 1021.34 | SET FCDMC BRASS CAP IN 8 CONCRETE COLLAR, 0.5 ABOVE GROUND. FROM INTERSECTION OF JOHNSON ROAD AND YUMA ROAD, DRIVE WEST 2.0 MILES ON YUMA ROAD (DIRT) TO STATION ON RIGHT. STATION IS APPROXIMATELY 110 FEET NORTH OF YUMA ROAD AND 100 FEET NORTH OF GLO BRASS CAP ATOP GALVANIZED POST (STAMPED: T-1-N, R-5-W, SECTION CORNERS NUMBERED CLOCKWISE FROM UPPER LEFT: 10, 11, 14, 15. N: 887148 E: 446756 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET




| NO. | REVISION | BY | DATE |
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| 2 | | | |
| 1 | | | |

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

## F.C.D. CONTRACT NO. 2002C027

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 12-3-04 ARIZONA U.S.A.

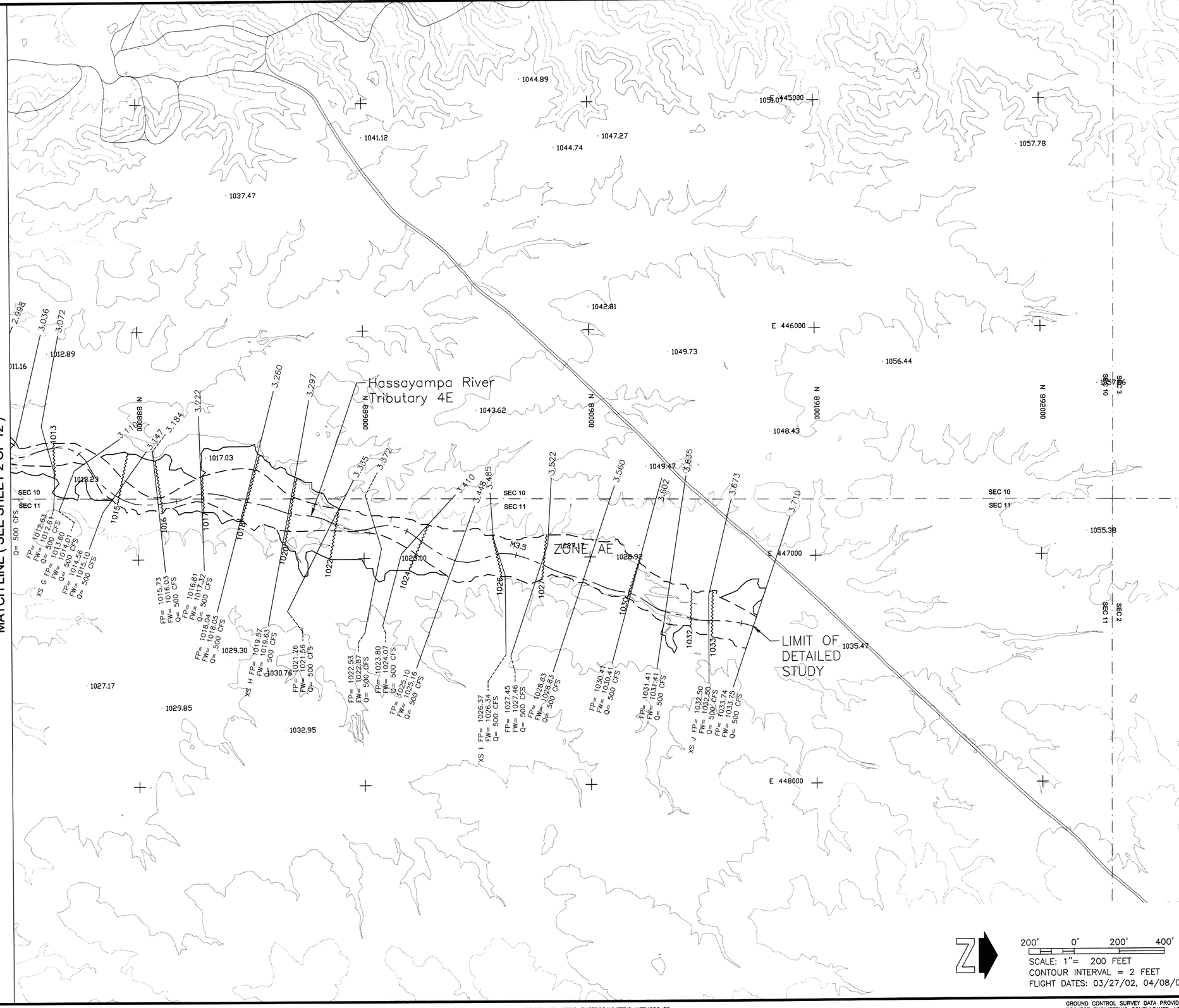
PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 02 OF 12

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.




## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 FP= 1888.74 FW= 1889.54 Q = CFS |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

FEMA CROSS SECTION DESIGNATION — CROSS SECTION RIVER MILE DESIGNATION — FLOODPLAIN WATER SURFACE ELEVATION — ENCROACHED WATER SURFACE ELEVATION — 100 YEAR DISCHARGE

## ELEVATION REFERENCE MARKS

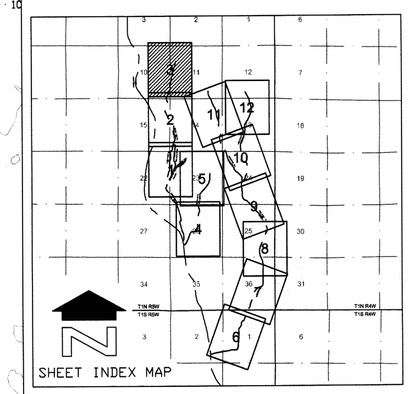
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 7 | 1044.94 | SET FCDMC BRASS CAP IN 8 CONC. COLLAR, 0.5 ABOVE GROUND. FROM INTERSECTION OF INTERSTATE HIGHWAY 10 & JOHNSON ROAD OVERPASS BRIDGE DRIVE WNW ALONG A DIRT TRAIL PARALLELING THE SOUTH ROW FENCE OF INTERSTATE HWY 10 FOR APPROXIMATELY 1.0 MILE TO AN ANGLE POINT, THENCE CONTINUE WESTERLY ALONG SAID TRAIL FOR 0.6 MILE TO A 3-COLUMN SRP POWER TOWER TRANSMISSION LINE (NE-SW), THENCE BEAR SW ALONG DIRT SERVICE TRAIL FOR 0.8 MILE TO POWER TOWER #142 (WESTERLY MOST OF 3 TOWERS), THENCE WALK 800, MORE OR LESS, SOUTHWESTERLY TO STATION ON RIDGELINE OVERLOOKING HASSAYAMPA RIVER BASIN. N: 889746 E: 444878 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE.

2- NGVD29 = NAVD88 - 2.09 FEET




| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 2 | | | |
| 1 | | | |

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF

HASSAYAMPA RIVER EAST TRIBUTARIES

F.C.D. CONTRACT NO. 2002C027

200' 0' 200' 400'

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

FLIGHT DATES: 03/27/02, 04/08/02

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. RIGGINS Date Signed 11-4-04 ARIZONA, U.S.A.

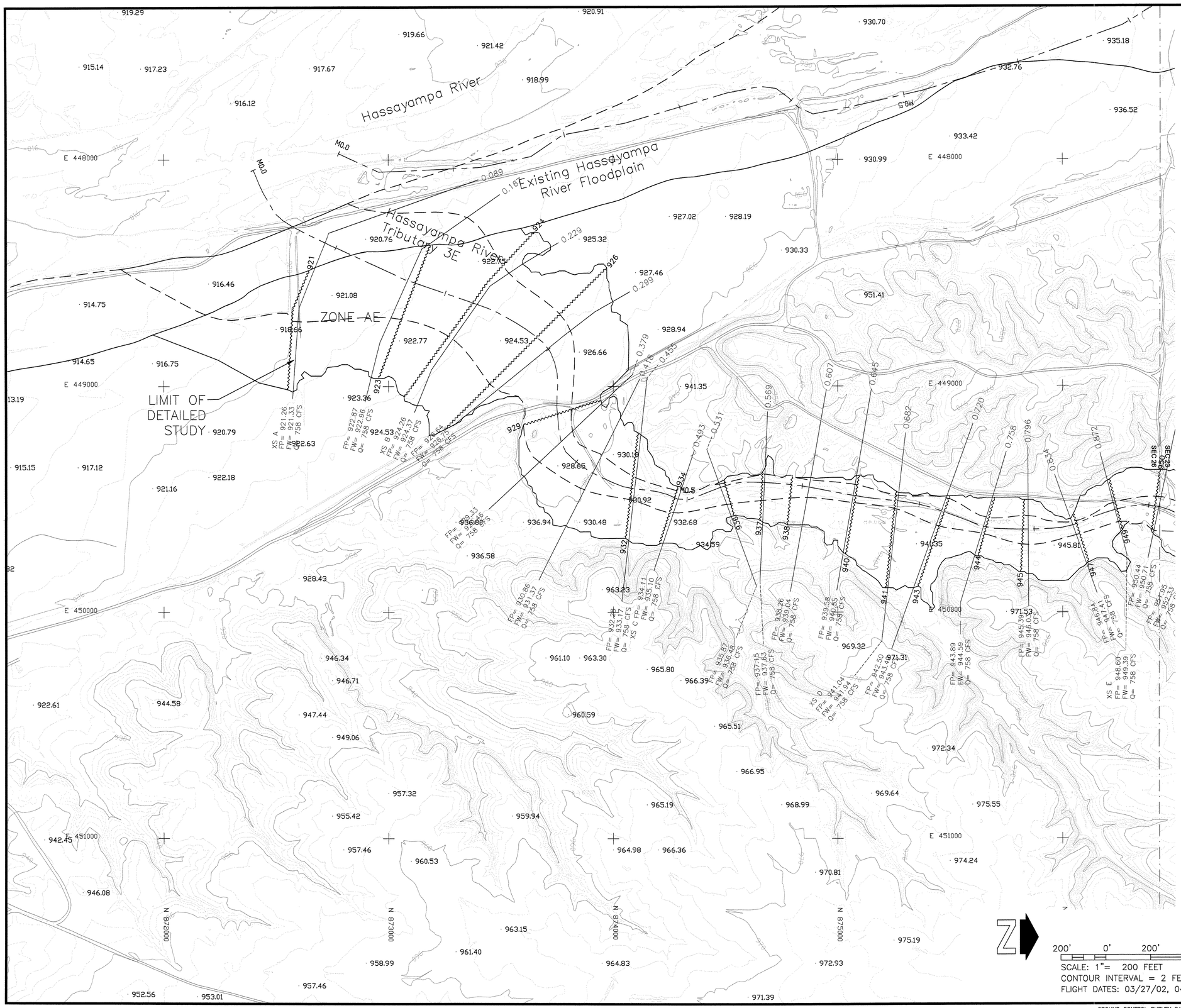
PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1033
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 03 OF 12

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.




THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.

## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 FP= 1888.74 FW= 1889.54 Q = CFS |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

FEMA CROSS SECTION DESIGNATION — CROSS SECTION RIVER MILE DESIGNATION — FLOODPLAIN WATER SURFACE ELEVATION — ENCROACHED WATER SURFACE ELEVATION — 100 YEAR DISCHARGE

## ELEVATION REFERENCE MARKS

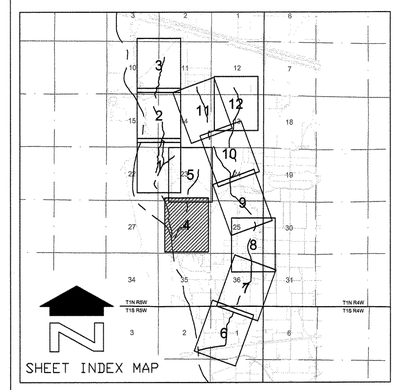
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 4 | 929.02 | SET FCDMC BRASS CAP IN 8" CONC. COLLAR, 0.4' ABOVE GROUND. FROM INTERSECTION OF 315TH AVENUE & SOUTHERN AVENUE, DRIVE 0.6 MILE WEST ALONG SOUTHERN AVENUE (GRAVEL TRAIL), THENCE TURN NORTHERLY ALONG DIRT FARM DRIVE THAT PARALLELS EAST BANK OF HASSAYAMPA RIVER AND TRAVEL 0.6 MILE TO STATION ON LEFT ATOP EARTHEN BERM. N: 874159 E: 447906 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET




| NO. | REVISION | BY | DATE |
|---|---|---|---|
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| 1 | | | |

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

## F.C.D. CONTRACT NO. 2002C027

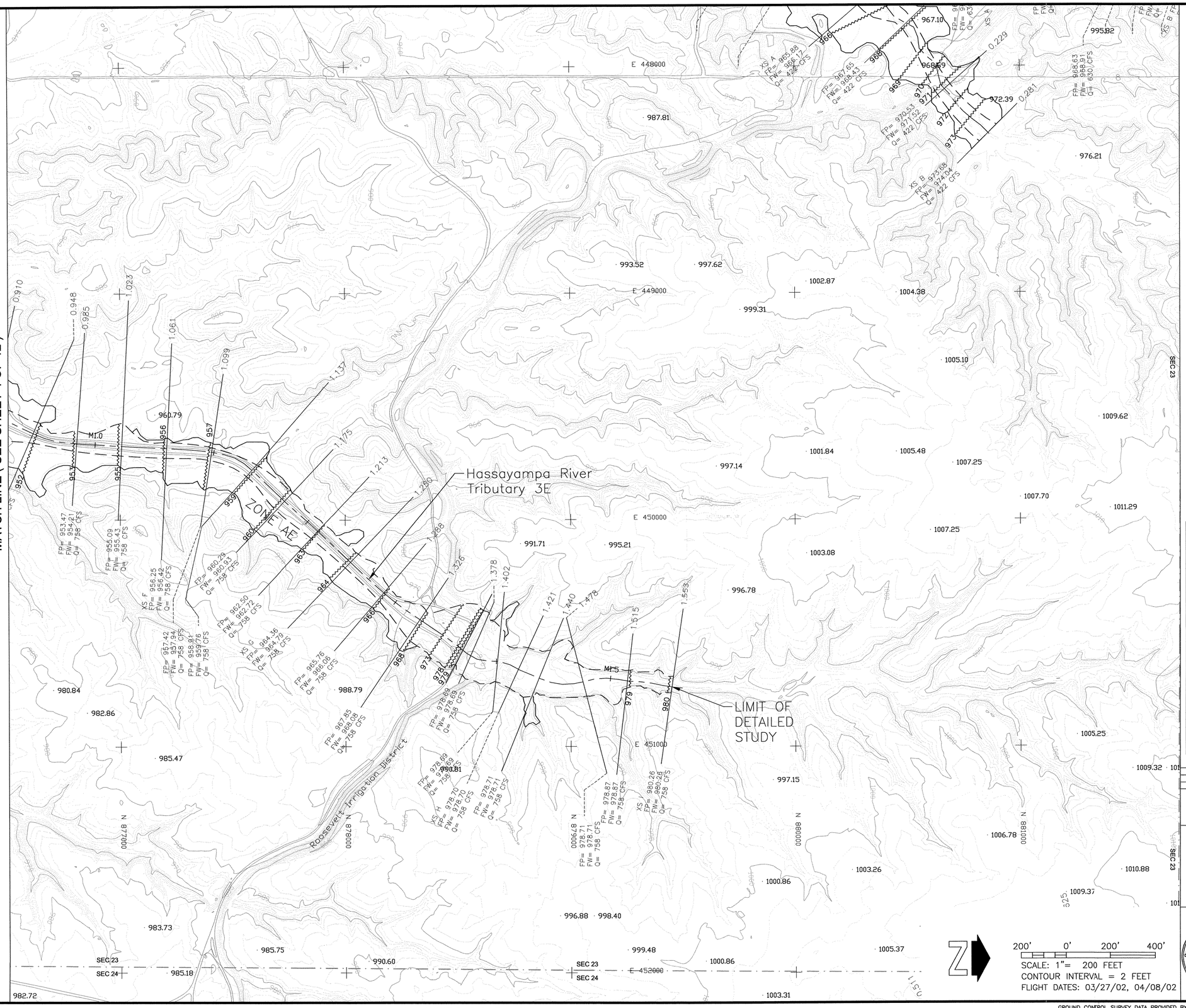
PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

Registered Professional Engineer (Civil) CERTIFICATE NO. 42861 STEPHEN W. ROGERS Date Signed 4-8-02 ARIZONA U.S.A.

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 04 OF 12

MATCH LINE ( SEE SHEET 4 OF 12 )




## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 — M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FP= 1888.74 (FLOODPLAIN WATER SURFACE ELEVATION); FW= 1889.54 (ENCROACHED WATER SURFACE ELEVATION); Q = CFS (100 YEAR DISCHARGE); FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

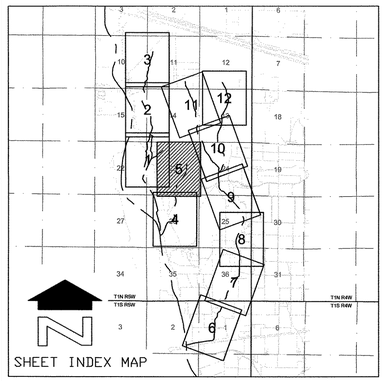
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 19 | 963.62 | Set FCDMC brass cap in 8 concrete collar, 0.6 above ground. From intersection of Johnson Road and Roosevelt Canal, drive 1.5 miles along north bank service road to earthen dam. Travel across dam then turn south along gravel road and go 0.2 mile to station atop embankment, 25 feet right of road. N: 877787 E: 449916 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGDV29 = NAVD88 - 2.08 FEET

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# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF

HASSAYAMPA RIVER EAST TRIBUTARIES

F.C.D. CONTRACT NO. 2002C027

200' 0' 200' 400'

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

FLIGHT DATES: 03/27/02, 04/08/02

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 10-21-04 ARIZONA U.S.A.

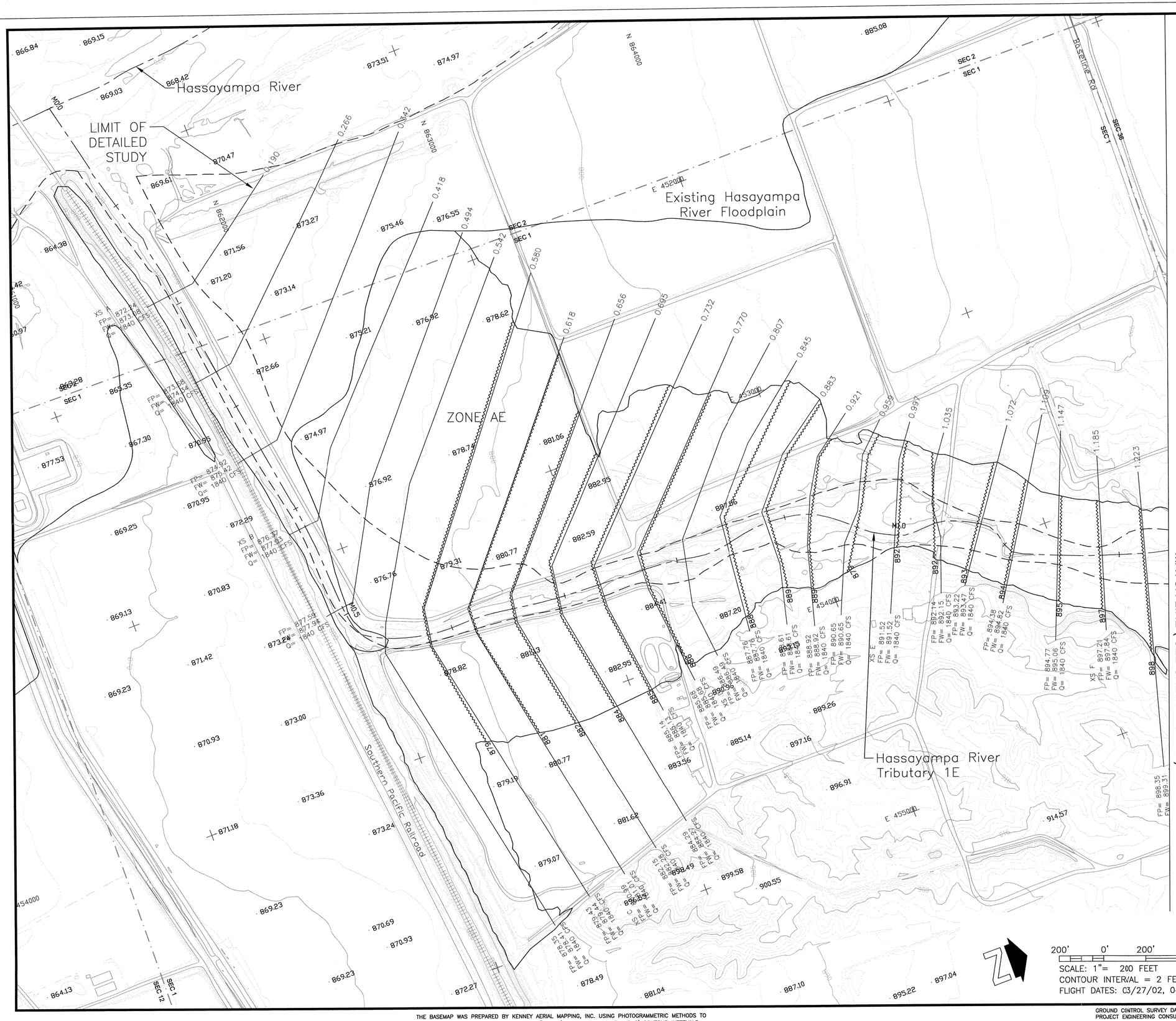
PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 05 OF 12

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.




THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.

## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION — FP= 1888.74 (FLOODPLAIN WATER SURFACE ELEVATION); FW= 1889.54 (ENCROACHED WATER SURFACE ELEVATION); Q = CFS (100 YEAR DISCHARGE) |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

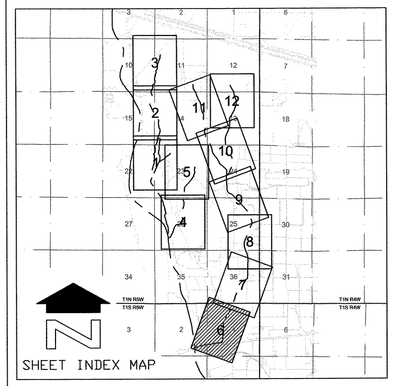
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 9 | 902.78 | SET FCDMC BRASS CAP IN 8 CONCRETE COLLAR, 0.5 ABOVE GROUND. FROM INTERSECTION OF JOHNSON ROAD & BASELINE ROAD, DRIVE 0.25 MILE WEST ON BASELINE ROAD TO DIRT DRIVE HEADING SOUTH. TRAVEL 0.3 MILE SOUTH THROUGH HOUSING SUBDIVISION TO DIRT ROAD HEADING WEST, CONTINUE WESTERLY 0.2 MILE TO STATION AT SE CORNER OF DIRT ROADS BEARING E, S & NW. N: 864100 E: 454632 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET




| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 2 | | | |
| 1 | | | |

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

## F.C.D. CONTRACT NO. 2002C027

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 11-7-03 ARIZONA, U.S.A.

PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 06 OF 12

MATCH LINE ( SEE SHEET 6 OF 12 )

MATCH LINE ( SEE SHEET 8 OF 12 )

200' 0' 200' 400'

SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET
FLIGHT DATES: 03/27/02, 04/08/02

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.

## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | (A) 0.10 — FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION; FP= 1888.74 FLOODPLAIN WATER SURFACE ELEVATION; FW= 1889.54 ENCROACHED WATER SURFACE ELEVATION; Q = CFS 100 YEAR DISCHARGE |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

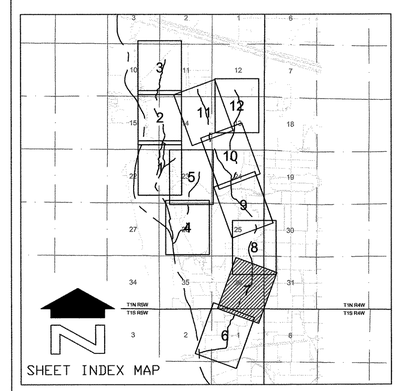
NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 10 | 933.43 | SET FCDMC BRASS CAP IN 8 CONCRETE COLLAR, 1.0 ABOVE GROUND. FROM INTERSECTION OF BASELINE ROAD & 313TH AVENUE, TRAVEL 0.5 MILE NORTH ON 313TH AVENUE (GRAVEL), THENCE CONTINUE NORTHERLY ALONG DIRT TRAIL APPROXIMATELY 200 FEET, THENCE TURN EASTERLY, WALK OR 4WD APPROXIMATELY 800 FEET TO STATION OVERLOOKING N-S WASH. N: 869087 E: 453923 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET




| NO. | REVISION | BY | DATE |
|---|---|---|---|
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| 1 | | | |

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

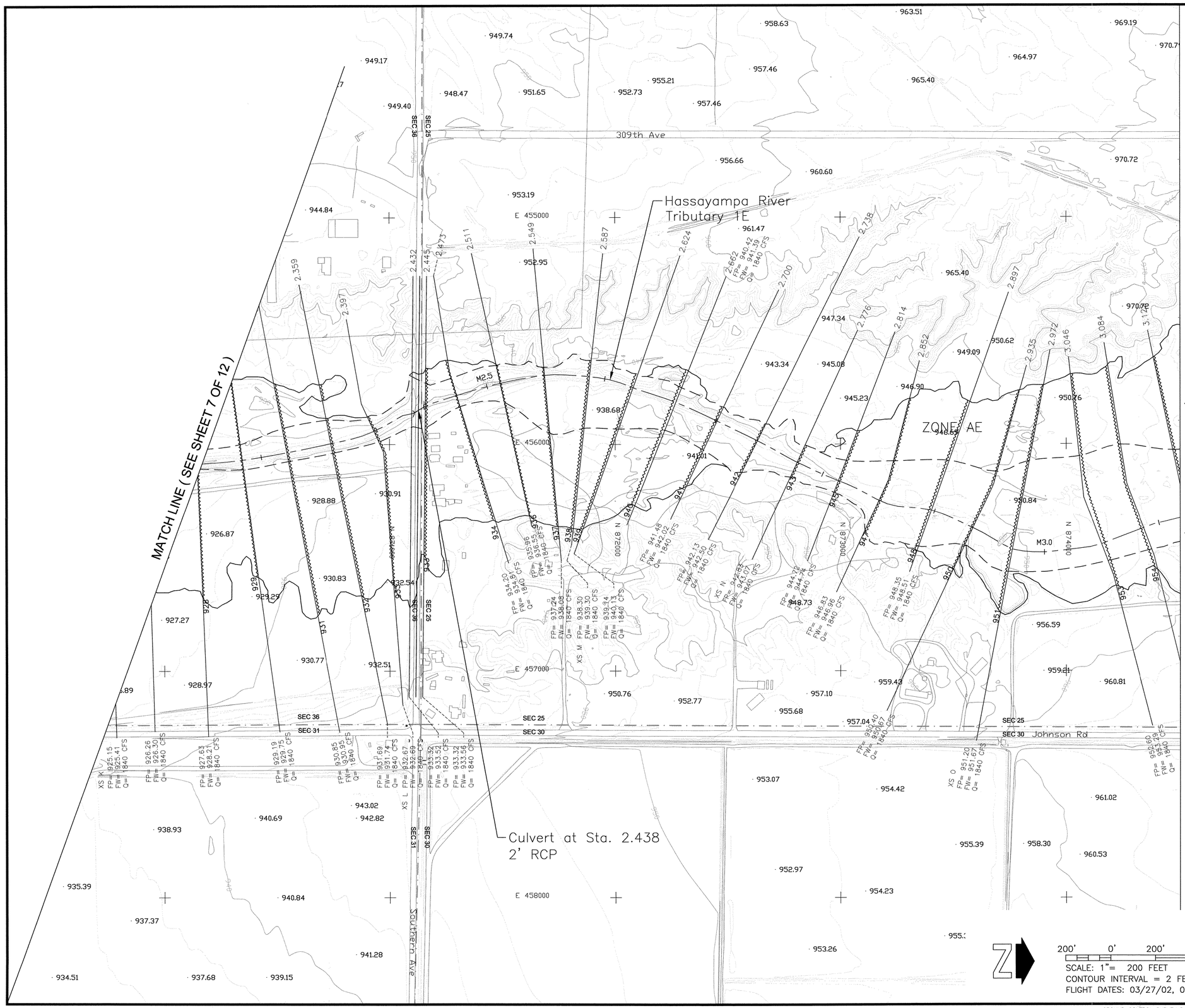
FLOOD DELINEATION STUDY OF
HASSAYAMPA RIVER EAST TRIBUTARIES
F.C.D. CONTRACT NO. 2002C027

Registered Professional Engineer (Civil) CERTIFICATE NO. 32841 STEPHEN W. ROGERS Date Signed 4-2-04 ARIZONA U.S.A.

PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 07 OF 12




SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET
FLIGHT DATES: 03/27/02, 04/08/02

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.

## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION; FP= 1888.74 FLOODPLAIN WATER SURFACE ELEVATION; FW= 1889.54 ENCROACHED WATER SURFACE ELEVATION; Q = CFS 100 YEAR DISCHARGE |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

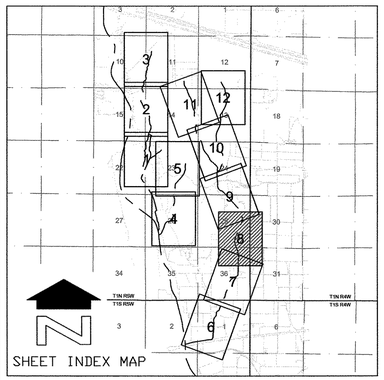
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 12 | 954.49 | SET FCDMC BRASS CAP IN 8 CONCRETE COLLAR, 0.2 ABOVE GROUND. LOCATED 75 FEET OF JOHNSON ROAD AND 0.25 MILE NORTH OF SOUTHERN AVENUE WITH FARM DRIVES N, S & E. GUARDED BY CARSON-ITE WITNESS POST (TYPICAL FOR ALL FCDMC BENCH MARKS). N: 872513 E: 457349 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET

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# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

F.C.D. CONTRACT NO. 2002C027

Registered Professional Engineer (Civil) CERTIFICATE NO. 40081 STEPHEN W. MOORES Expires 12-31-03 ARIZONA U.S.A.

PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 08 OF 12

## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FP= 1888.74 (FLOODPLAIN WATER SURFACE ELEVATION); FW= 1889.54 (ENCROACHED WATER SURFACE ELEVATION); Q = CFS (100 YEAR DISCHARGE); FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

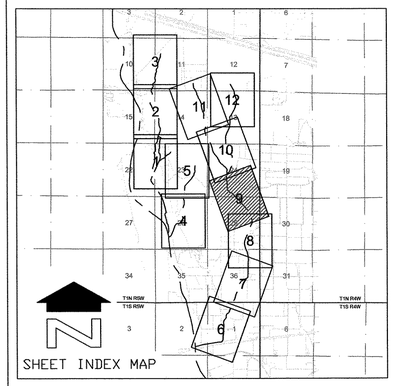
## ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET




| NO. | REVISION | BY | DATE |
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# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

## F.C.D. CONTRACT NO. 2002C027

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 4-7-03 ARIZONA U.S.A.

PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 09 OF 12

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.

MATCH LINE ( SEE SHEET 9 OF 12 )

MATCH LINE ( SEE SHEET 11 OF 12 )

MATCH LINE ( SEE SHEET 12 OF 12 )

ZONE AE

Hassayampa River Tributary 1E1

Hassayampa River Tributary 1E

Lower Buckeye Rd

SEC 13

SEC 14

SEC 23

SEC 24

E 453000

E 455000

E 456000

N 880000

200' 0' 200' 400'

SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET
FLIGHT DATES: 03/27/02, 04/08/02

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.

## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FP= 1888.74 (FLOODPLAIN WATER SURFACE ELEVATION); FW= 1889.54 (ENCROACHED WATER SURFACE ELEVATION); Q = CFS (100 YEAR DISCHARGE); FDMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

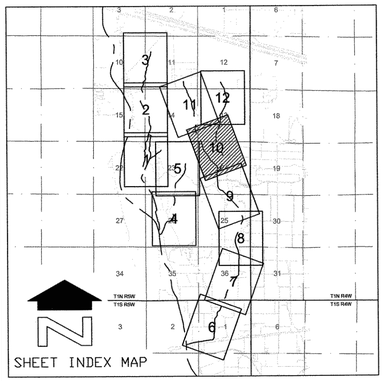
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 13 | 999.29 | SET FCDMC BRASS CAP IN 8 CONCRETE COLLAR, 0.2 ABOVE GROUND. FROM INTERSECTION OF JOHNSON ROAD & LOWER BUCKEYE ROAD, TRAVEL 0.5 MILE WEST ON LOWER BUCKEYE ROAD (DIRT) TO B.W.F. HEADING SOUTH. TRAVEL DIRT TRAIL ON WEST SIDE OF FENCE APPROXIMATELY 700 FEET TO STATION, 30 FEET WEST OF FENCE. N 880983 E 454630 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET

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# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

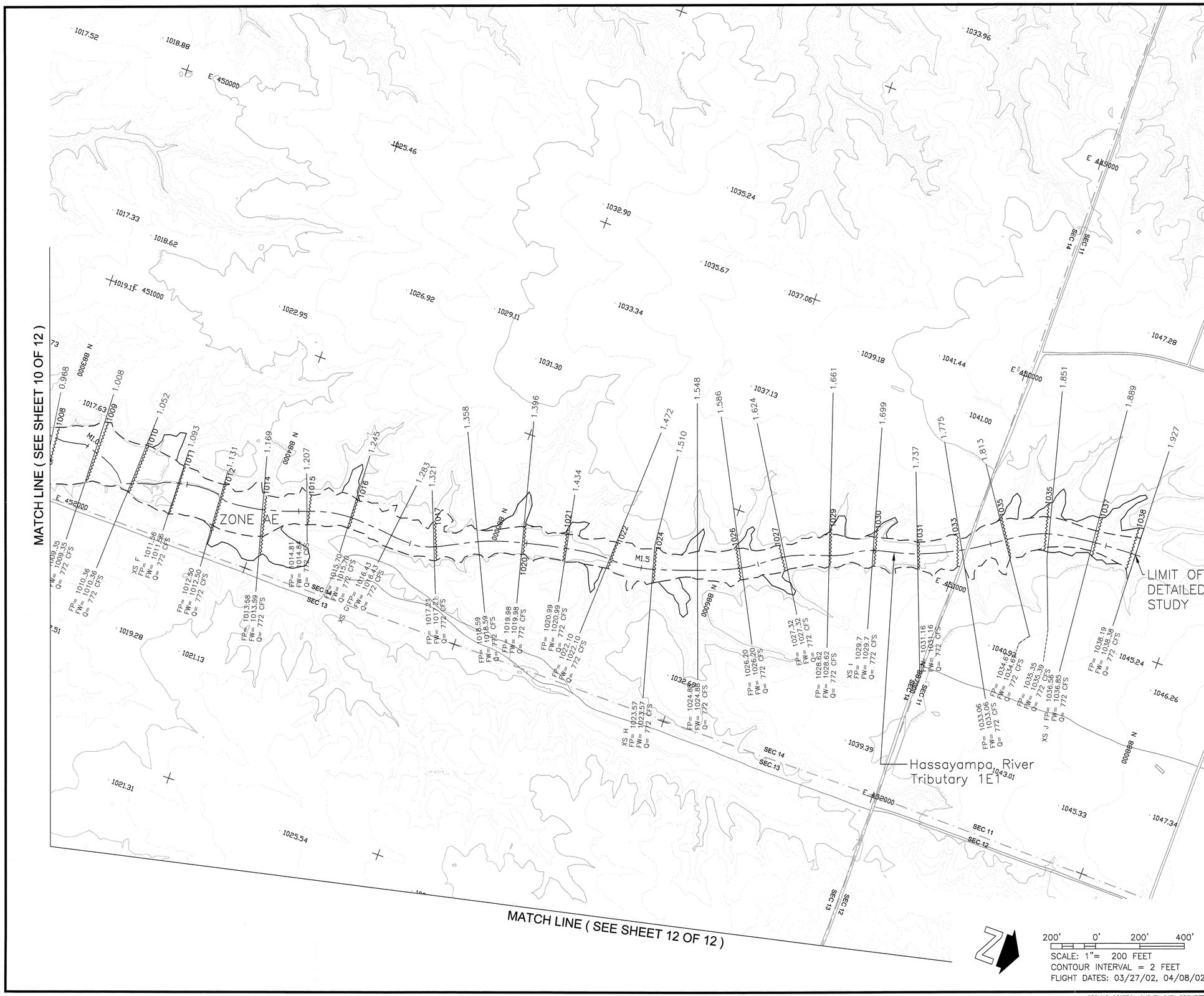
F.C.D. CONTRACT NO. 2002C027

Registered Professional Engineer (Civil) CERTIFICATE NO. 22481 STEPHEN W. ROGERS Date Signed 10-21-02 ARIZONA U.S.A.

PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 10 OF 12




## LEGEND

| | |
|---|---|
| 100-YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FP= 1888.74 (FLOODPLAIN WATER SURFACE ELEVATION); FW= 1889.54 (FLOODWATER WATER SURFACE ELEVATION); Q = CFS (100 YEAR DISCHARGE); FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

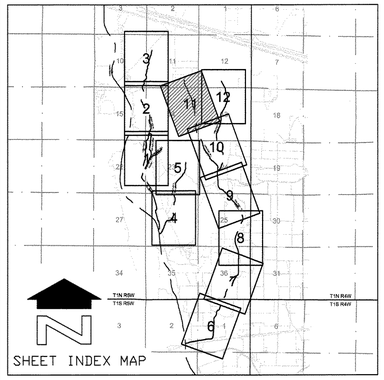
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 18 | 1029.11 | SET FCDMC BRASS CAP IN 8" CONCRETE COLLAR, 0.2' ABOVE GROUND. FROM INTERSECTION OF JOHNSON ROAD & YUMA ROAD, DRIVE 1.5 MILES WEST ON YUMA ROAD (DIRT), TURN SOUTH ALONG EAST SIDE OF N-S B.W.F. AND TRAVEL 0.5 MILE TO STATION LOCATED 500 FEET, MORE OR LESS EAST OF B.W.F. N: 884464 E: 449906 |
| 28 | 1041.07 | SET FCDMC BRASS CAP IN 8" CONCRETE COLLAR, 0.8' ABOVE GROUND. STATION IS LOCATED 1.2 MILES WEST OF JOHNSON ROAD AND APPROXIMATELY 65 FEET NORTH OF YUMA ROAD (DIRT). GUARDED BY TYPICAL CARSONITE WITNESS POST. N: 887077 E: 451227 |

## NOTES

1- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2- NGVD29 = NAVD88 - 2.08 FEET




| NO. | REVISION | BY | DATE |
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| 1 | | | |

# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

## F.C.D. CONTRACT NO. 2002C027

200' 0' 200' 400'

SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET
FLIGHT DATES: 03/27/02, 04/08/02

Registered Professional Engineer (Civil) CERTIFICATE NO. 4288 STEPHEN W. ROGERS Date Signed 10-8-04 ARIZONA U.S.A.

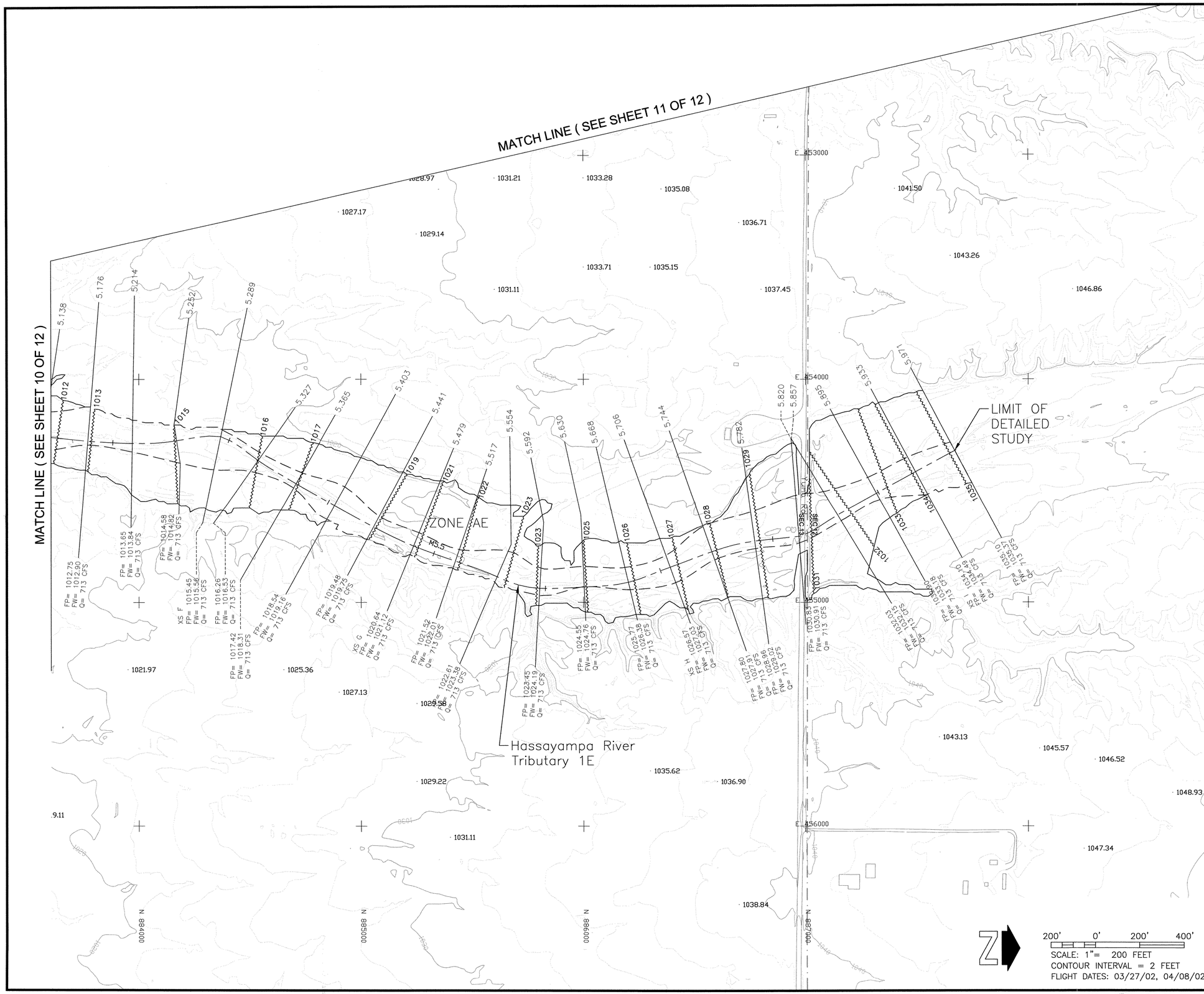
PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1303
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |

SHEET 11 OF 12

THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT-ZOLLARS, INC.




THE BASEMAP WAS PREPARED BY KENNEY AERIAL MAPPING, INC. USING PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

GROUND CONTROL SURVEY DATA PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD. & HUITT–ZOLLARS, INC.

## LEGEND

| | |
|---|---|
| 100–YR FLOODPLAIN BOUNDARY | |
| FLOODWAY BOUNDARY | |
| HYDRAULIC BASE LINE WITH RIVER MILE | M12.0 M13.0 |
| EROSION SETBACK (WHEN APPLICABLE) | |
| CROSS SECTION | A 0.10 — FEMA CROSS SECTION DESIGNATION; CROSS SECTION RIVER MILE DESIGNATION; FP= 1888.74 FLOODPLAIN WATER SURFACE ELEVATION; FW= 1889.54 ENCROACHED WATER SURFACE ELEVATION; Q = CFS 100 YEAR DISCHARGE |
| ELEVATION REFERENCE MARK | ERM XXX |
| BASE FLOOD ELEVATIONS | 1221 |
| ZONE DESIGNATIONS | ZONE AE |
| SECTION LINE | Section Boundary |

## ELEVATION REFERENCE MARKS

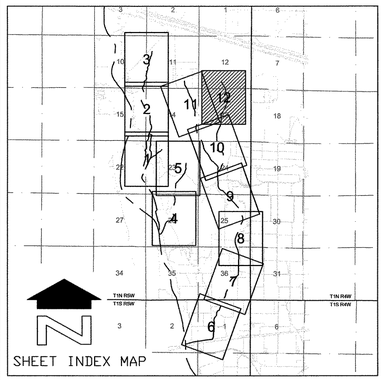
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1988.

| I.D. # | ELEV. (FT) | DESCRIPTION/LOCATION |
|---|---|---|
| 14 | 1020.68 | SET FCDMC BRASS CAP IN 8 CONCRETE COLLAR, 0.3 ABOVE GROUND. FROM INTERSECTION OF JOHNSON ROAD & LOWER BUCKEYE ROAD, TRAVEL 0.5 MILE WEST ON LOWER BUCKEYE ROAD (DIRT) TO B.W.F. HEADING NORTH. DRIVE DIRT TRAIL ALONG WEST SIDE OF FENCE FOR 0.5 MILE TO STATION, LOCATED 20 FEET WEST OF FENCE AND 150 SOUTH OF AN INTERSECTION OF B.W.F.S RUNNING N, S, E & W. N: 884199 E: 454659 |

## NOTES

1– THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE

2– NGVD29 = NAVD88 – 2.08 FEET




| NO. | REVISION | BY | DATE |
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# FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

## FLOOD DELINEATION STUDY OF HASSAYAMPA RIVER EAST TRIBUTARIES

## F.C.D. CONTRACT NO. 2002C027

Registered Professional Engineer (Civil) CERTIFICATE NO. 42881 STEPHEN W. ROGERS Date Signed 4-2-04 ARIZONA U.S.A.

PBSJ
7310 N. 16th St., Suite 310
Phoenix, Arizona 85020
Phone: (602) 943-1003
Fax: (602) 943-1303

| | BY | DATE |
|---|---|---|
| DESIGN | JSL | 10/04 |
| DESIGN CHK. | WC | 10/04 |
| PLANS | JSL | 10/04 |
| PLANS CHK. | WC | 10/04 |