LOWER DUCK CREEK
CONDITIONAL LETTER OF MAP REVISION

550.039

March 2004

Prepared for:

Clark County Regional Flood Control District
600 South Grand Central Parkway, Suite 300
Las Vegas, Nevada 89106-4511
Phone: (702) 455-3139
Fax: (702) 455-3870

Prepared by:

G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, NV 89146
Phone: (702) 804-2000
Fax: (702) 804-2297

G. C. WALLACE, INC.
Engineers • Planners • Surveyors

G. C. WALLACE, PE/SE, PLS
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MICHAEL D. ROSS, PE
CHRISTOPHER W. ANDERSON, PE
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JERRY TSUNETA
F. EDUARDO VILLALOBOS, PE/SE
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KEVIN W. WALLACE, PLS
GLENN B. WATANABE, PE
STEPHEN L. WEATHERMAN, PE
MANSON W. WONG, PE, PTOE

AFFILIATE OFFICE IN
SACRAMENTO, CA

550.039

March 5, 2004

RFCD
2004 MAR 22 PM 3:52

Ms. Pernille Buch-Pedersen
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

Subject: Lower Duck Creek CLOMR

Dear Ms. Buch-Pedersen:

G. C. Wallace, Inc. (GCW) has been contracted by the Clark County Regional Flood Control District (CCRFCD) to complete a Conditional Letter of Map Revision (CLOMR) for Lower Duck Creek in Clark County, Nevada. The study area consists of three channel reaches:

- Duck Creek from Emerald Avenue to Confluence
- Lower Pittman Wash from US 95 to Confluence
- Duck Creek from Confluence to Broadbent Boulevard

The purpose of this CLOMR is to lay the groundwork for a Letter of Map Revision (LOMR) in order to clarify and/ or correct the existing Community Panels to reflect the proposed developed condition within the watershed. The affected Community Panels are Number 32003C2583 E, dated August 8, 2003, and Number 32003C2585 E, dated August 8, 2003. See Figures 1 and 2 for the location of the project. The Effective FIRM is shown on Figure 3.

The following information is enclosed supporting this request for a CLOMR. This request is based on proposed channelization.

- Copy of the check for the amount of $4,000.^{00}$ payable to the National Flood Insurance Program (NFIP). The actual check has been sent to the FEMA Fee-Collection System Administrator.
- Effective FIRM
- Annotated FIRM
- Flood Profile Data
- FEMA Forms
- Hydrologic Modeling
- Hydraulic Modeling
- Operation and Maintenance Plan
- References
- Design drawings
- Electronic files on disk

Proposed Improvements

Note that all channel improvements, modeling, and mapping in support of this CLOMR are based on the NAVD 88 datum. See Figure 4 for the location of the channel improvements listed below.

- Duck Creek Channel – Phase 2
- Duck Creek Channel – Phase 3B
- Lower Pittman Channel
- Boulder Highway Bridge
- Broadbent Boulevard Box Culvert
- Russell Road Box Culvert
- New Beginnings Drive Box Culvert
- Park Lane Box Culvert

Hydrologic Modeling

The 100-year Effective flow rates recognized by FEMA were referenced from previous studies and used in the hydraulic modeling for this CLOMR. These referenced flows are summarized below in Table 1.

TABLE 1

Channel Reach	Effective Flow
Lower Pittman Channel downstream of US 95	7,638 cfs
Duck Creek Channel upstream of Confluence	8,562 cfs
Duck Creek Channel downstream of Confluence	11,500 cfs

The Effective flow for this reach of the Pittman Wash was referenced from the *Pittman Wash Flood Insurance Study Restudy* (Reference 1). The *2002 Duck Creek/ Blue Diamond Washes FIS Restudy* (Reference 2, hereafter referred to as the 2002 FIS Restudy) determined the Effective flow in Duck Creek upstream of the confluence to be 8,562 cfs. The combined flow in Duck Creek downstream of the confluence is 11,500, which was referenced from the *1991 Las Vegas Valley Flood Insurance Study* by James M. Montgomery Engineers (Reference 3).

Hydraulic Modeling

The proposed channel improvements were modeled using the USACOE's HEC-RAS software (Reference 4). The hydraulic modeling was broken up into two HEC-RAS models, PHASE2 and PHASE3B. Note that model, PHASE2, includes both the Duck Creek - Phase 2 channel improvements and the Lower Pittman channel improvements. The Duck Creek – Phase 3B channel improvements are modeled in PHASE3B. The following improvements were incorporated into each of these models:

- HEC-RAS model: PHASE2.PRJ
  Duck Creek Channel – Phase 2 (upstream and downstream of confluence)
  Lower Pittman Channel

Park Lane Box Culvert
New Beginnings Drive Box Culvert
Russell Road Box Culvert
Boulder Highway Bridge
Confluence

- HEC-RAS model: PHASE3B.PRJ
  Duck Creek Channel – Phase 3B
  Broadbent Boulevard Box Culvert

In the existing condition, Duck Creek and the Lower Pittman Wash combine just upstream of Boulder Highway. Completion of the proposed channel improvements will move this combination point approximately 800 feet downstream of Boulder Highway. The proposed channel improvements incorporate a zero-degree confluence that will keep the two washes separate until they combine downstream of Boulder Highway.

The HEC-RAS models were run using the mixed flow regime. The upstream starting water surface elevation for Duck Creek at the Emerald Avenue tie-in was set at 1651.1 feet (NAVD 88), matching the Effective BFE from the 2002 FIS Restudy. The upstream starting water surface elevation for the PHASE3B model was set equal to the downstream water surface elevation from the PHASE2 model. The Duck Creek side of the zero-degree confluence produced a greater water surface elevation. Therefore, the upstream starting water surface elevation for PHASE3B was based on the water surface from the Duck Creek side. The upstream starting water surface elevation for the Pittman Wash at US 95 was set at normal depth.

Results of the modeling show supercritical flow in all proposed channel reaches and low flow through all proposed bridges/ culverts. Moreover, the results show the Effective flow confined to the channel improvements throughout the study area. Note that a backwater affect will occur near Broadbent Boulevard at the downstream tie-in to the Effective BFE. A complete printout of the HEC-RAS modeling is attached in the Appendix.

Mapping

The proposed channel improvements are designated Zone AE with Base Flood Elevations. The proposed floodplain is located within public drainage facilities and will not be encroached upon. Therefore, the 100-year floodway was not delineated.

The Pittman Wash is confined to channel, downstream of US95. The upstream reach of Duck Creek ties into the Effective BFE at Emerald Avenue that was set in the 2002 FIS Restudy. The downstream tie-in and limit of study was set at the east side of Broadbent Boulevard. It is at this point that flow from the Las Vegas Wash will coalesce with flow from Duck Creek during the 100-year storm event. The proposed FIRM revisions affect NFIP Zones A, AE, and X. The proposed mapping revisions are shown on the Annotated FIRM on Figure 5.

Summary

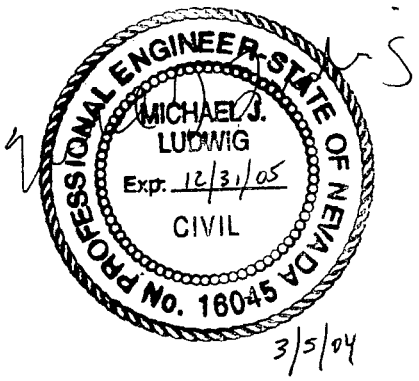
The proposed 100-year floodplain for this study area will be confined to proposed regional drainage facilities. Therefore, the revisions to the Effective FIRM proposed in this CLOMR will not adversely affect downstream property owners. These facilities will be publicly operated and maintained. An operation and maintenance plan is attached.

GCW trusts that this submittal will provide all of the information needed to support a CLOMR for this project. If you have any questions or need additional information, please do not hesitate to call us at (702) 804-2000.

Very truly yours,

G. C. WALLACE, INC.

Michael J. Ludwig, P.E.
Project Engineer
Flood Control Division



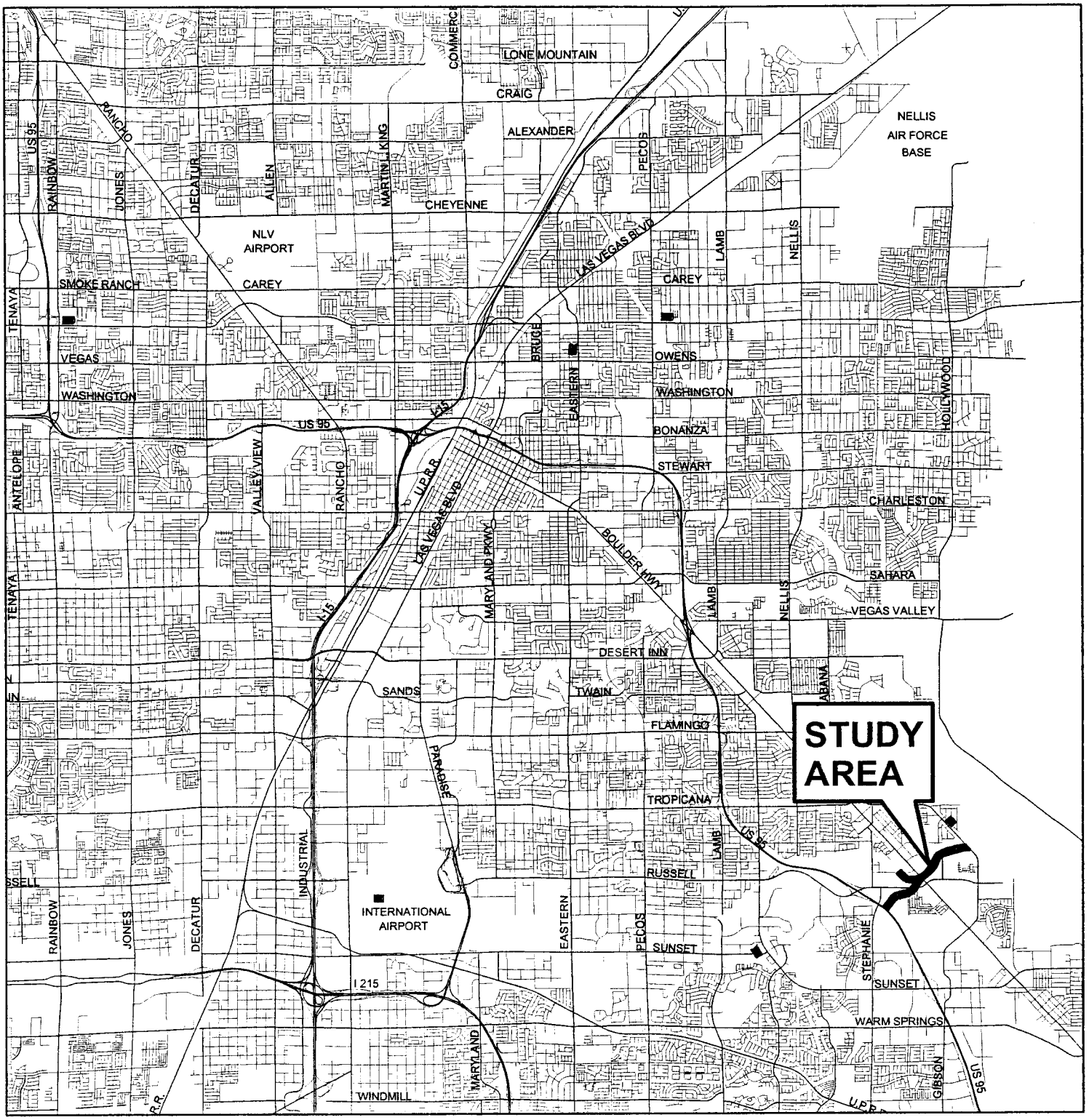
MJL:jj

Enc.

pc: Calvin L. Black, GCW
Jerry E. Pruitt, GCW

References:

1. Nimbus Engineers, *Pittman Wash Flood Insurance Study Restudy*, July 1995.
2. G. C. Wallace, Inc., *Duck Creek/ Blue Diamond Washes FIS Restudy*, March 2002.
3. James M. Montgomery Engineers, Inc., *Las Vegas Valley Flood Insurance Study*, September 1991.
4. U.S. Army Corps of Engineers, *HEC-RAS v3.0.1*, March 2001.



NORTH

SCALE: 1" = 10,000'

Feet

10,000 5,000 0 10,000

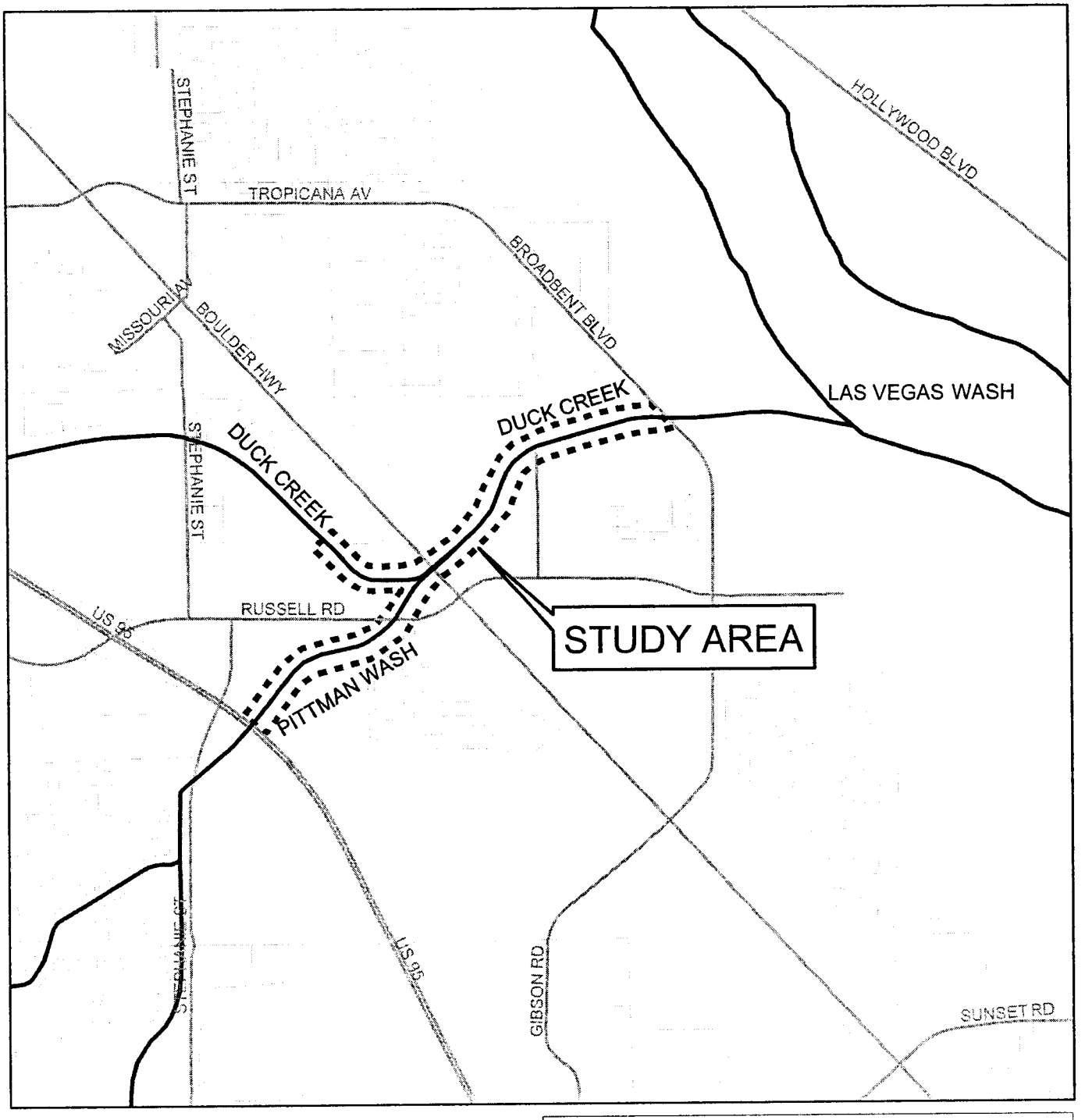
LOWER DUCK CREEK CLOMR

FIGURE 1

VICINITY MAP

G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89145

G:\550-039\dwg\fig\GIS\FIG-1



NORTH

SCALE: 1" = 2,000'

Feet

2,000 1,000 0 2,000

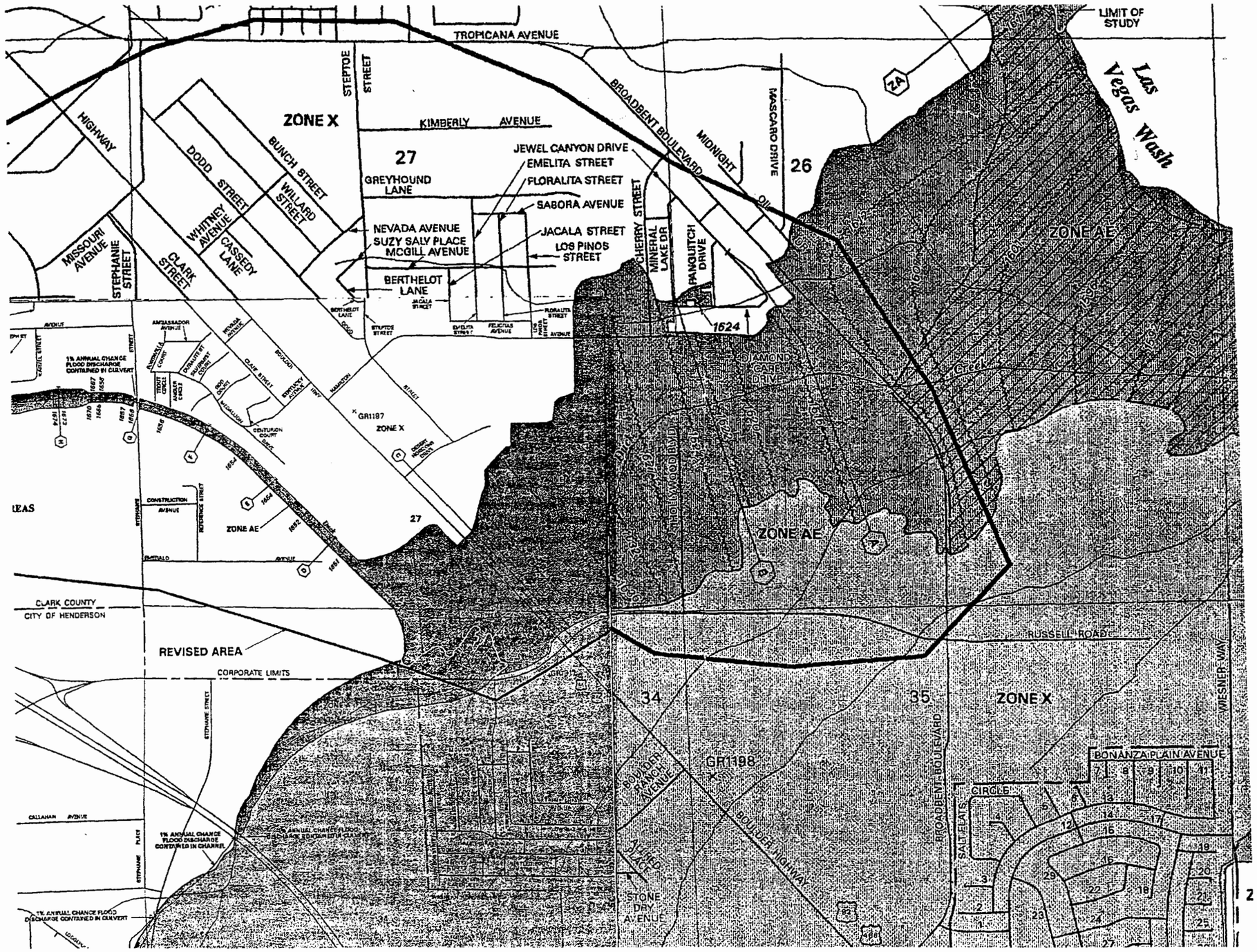
LOWER DUCK CREEK CLOMR

FIGURE 2

LOCATION MAP

G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

G:\550-039\dwg\fig\GIS\FIG-2



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2583E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2583 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2583	E
HENDERSON, CITY OF	320035	2583	E

AUG 13 2003

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 32003C2583E

MAP REVISED: SEPTEMBER 27, 2002

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2585E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2585 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2585	E
HENDERSON, CITY OF	320035	2585	E

AUG 13 2003

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 32003C2585E

MAP REVISED: SEPTEMBER 27, 2002

Federal Emergency Management Agency

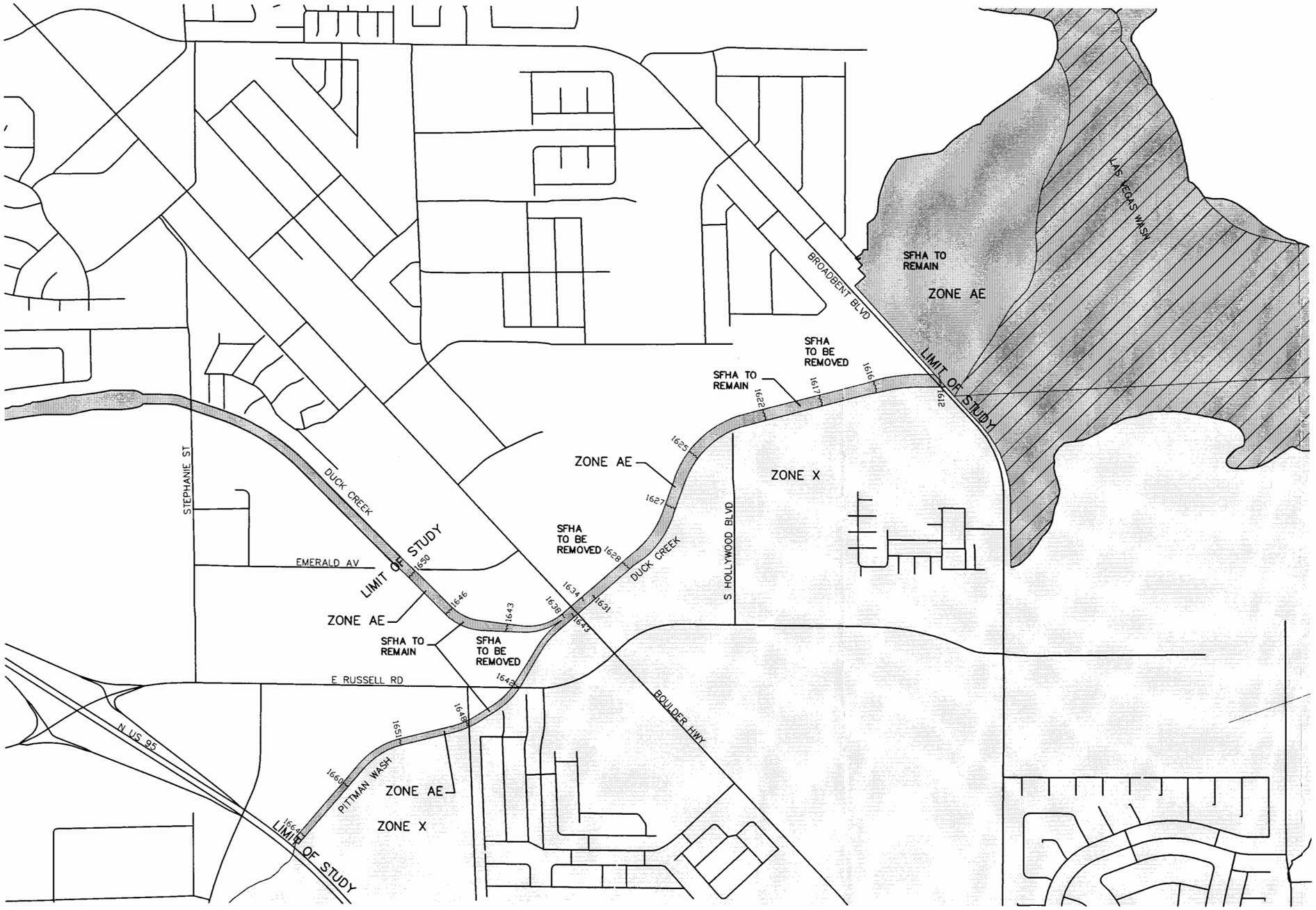
LOWER DUCK CREEK CLOMR

FIGURE 3

EFFECTIVE FIRM

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

G:\550-039\DWG\FIG\FIG-3M.JL.DWG



PROPOSED ZONE AE

EXISTING FLOODWAY

EXISTING SHADED ZONE X

2257 BASE FLOOD ELEVATION (BFE)

NORTH

GRAPHIC SCALE

1000 0 500 1000

(IN FEET)

1 inch = 1000 ft.

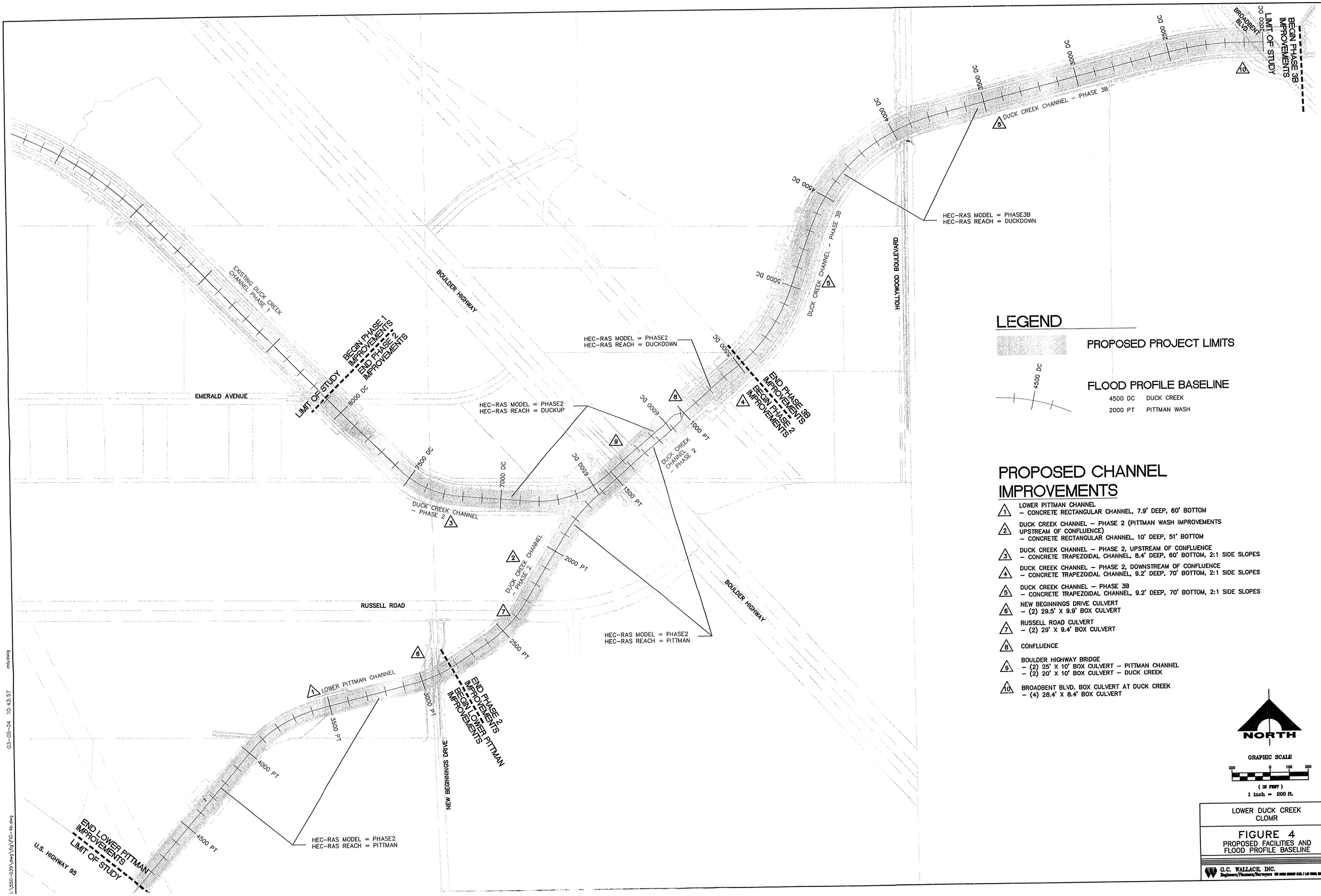
LOWER DUCK CREEK CLOMR

FIGURE 5

PROPOSED FIRM REVISIONS

G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

G:\550-039\DWG\FIG\FIG-3MJL.DWG



LEGEND

PROPOSED PROJECT LIMITS

4500 DC

FLOOD PROFILE BASELINE

4500 DC DUCK CREEK

2000 PT PITTMAN WASH

PROPOSED CHANNEL IMPROVEMENTS

1. LOWER PITTMAN CHANNEL
   – CONCRETE RECTANGULAR CHANNEL, 7.9' DEEP, 60' BOTTOM
2. DUCK CREEK CHANNEL – PHASE 2 (PITTMAN WASH IMPROVEMENTS UPSTREAM OF CONFLUENCE)
   – CONCRETE RECTANGULAR CHANNEL, 10' DEEP, 51' BOTTOM
3. DUCK CREEK CHANNEL – PHASE 2, UPSTREAM OF CONFLUENCE
   – CONCRETE TRAPEZOIDAL CHANNEL, 8.4' DEEP, 60' BOTTOM, 2:1 SIDE SLOPES
4. DUCK CREEK CHANNEL – PHASE 2, DOWNSTREAM OF CONFLUENCE
   – CONCRETE TRAPEZOIDAL CHANNEL, 9.2' DEEP, 70' BOTTOM, 2:1 SIDE SLOPES
5. DUCK CREEK CHANNEL – PHASE 3B
   – CONCRETE TRAPEZOIDAL CHANNEL, 9.2' DEEP, 70' BOTTOM, 2:1 SIDE SLOPES
6. NEW BEGINNINGS DRIVE CULVERT
   – (2) 29.5' X 9.9' BOX CULVERT
7. RUSSELL ROAD CULVERT
   – (2) 29' X 9.4' BOX CULVERT
8. CONFLUENCE
9. BOULDER HIGHWAY BRIDGE
   – (2) 25' X 10' BOX CULVERT – PITTMAN CHANNEL
   – (2) 20' X 10' BOX CULVERT – DUCK CREEK
10. BROADBENT BLVD. BOX CULVERT AT DUCK CREEK
    – (4) 28.4' X 8.4' BOX CULVERT

NORTH

GRAPHIC SCALE

200 0 100 200

(IN FEET)

1 inch = 200 ft.

LOWER DUCK CREEK CLOMR

FIGURE 4
PROPOSED FACILITIES AND FLOOD PROFILE BASELINE

G.C. WALLACE, INC.
Engineers/Planners/Surveyors

03-05-04 10:43:57 mludwig

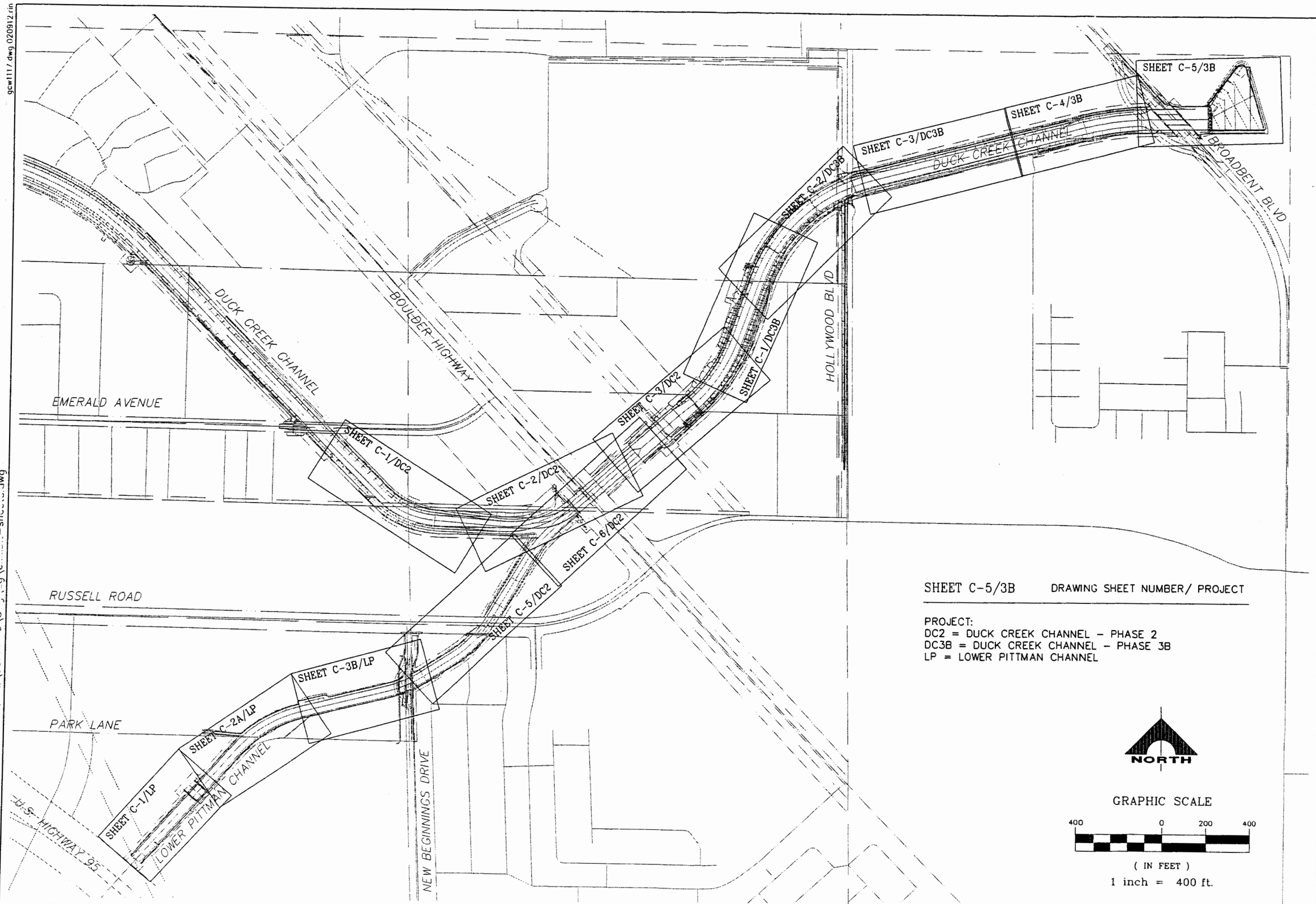
J:\550-039\dwg\Vig\FIG-4b.dwg

DESIGN DRAWINGS

DESIGN DRAWING LOCATION EXHIBIT: EX-1
ATTACHED DESIGN DRAWINGS:

- DUCK CREEK CHANNEL - PHASE 2
- DUCK CREEK CHANNEL - PHASE 3B
- LOWER PITTMAN CHANNEL
- BROADBENT BOULEVARD BOX CULVERT AT DUCK CREEK

gcw111 / dwg 020912.rin



SHEET C-5/3B DRAWING SHEET NUMBER/ PROJECT

PROJECT:
DC2 = DUCK CREEK CHANNEL – PHASE 2
DC3B = DUCK CREEK CHANNEL – PHASE 3B
LP = LOWER PITTMAN CHANNEL

NORTH

GRAPHIC SCALE

400 0 200 400

(IN FEET)

1 inch = 400 ft.

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

DESIGN DRAWING LOCATION EXHIBIT
LOWER DUCK CREEK CLOMR

SHEET
EX-1
1 OF 1 SHTS

udw 03-24-55 g:\d...g\e...-sh...dwg

FEMA FORMS

FORM 1: OVERVIEW & CONCURRENCE FORM

FORM 2: RIVERINE HYDROLOGY & HYDRAULICS FORM - DUCK CREEK PHASE 2

FORM 2: RIVERINE HYDROLOGY & HYDRAULICS FORM - DUCK CREEK PHASE 3B

FORM 2: RIVERINE HYDROLOGY & HYDRAULICS FORM - PITTMAN WASH

FORM 3: RIVERINE STRUCTURES FORM - DUCK CREEK CHANNEL PHASE 2
BOULDER HIGHWAY BRIDGE

FORM 3: RIVERINE STRUCTURES FORM - DUCK CREEK CHANNEL PHASE 3B
BROADBENT BOULEVARD BOX CULVERT

FORM 3: RIVERINE STRUCTURES FORM - LOWER PITTMAN CHANNEL
PARK LANE CULVERT

FORM 3: RIVERINE STRUCTURES FORM - RUSSELL ROAD BOX CULVERT

FORM 3: RIVERINE STRUCTURES FORM - NEW BEGINNINGS DRIVE BOX CULVERT

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 480287	City of Katy Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
32003	Clark County	NV	32003C	2583E	08/13/03
32003	Clark County	NV	32003C	2585E	08/13/03

2. Flooding Source: Duck Creek and Pittman Wash

3. Project Name/Identifier: Lower Duck Creek CLOMR

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

5. Basis for Request and Type of Revision:

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

☒ Physical Change ☐ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ Other (Attach Description)

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

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

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

☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

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

☐ Dam ☐ Fill ☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4,000.

☐ 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: Michael J. Ludwig, P.E.	Company: G. C. WALLACE, INC.	
Mailing Address: 1555 S. Rainbow Blvd. Las Vegas, NV 89146	Daytime Telephone No.: (702) 804-2000	Fax No.: (702) 804-2297
	E-Mail Address: MLudwig@gcwallace.com	
Signature of Requester (required): Michael J Ludwig		Date: 3/5/04

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

Community Official's Name and Title: Kevin Eubanks, P.E.; Assistant General Manager		Telephone No.: (702) 455-3139
Community Name: Clark County, NV	Community Official's Signature (required):	Date:

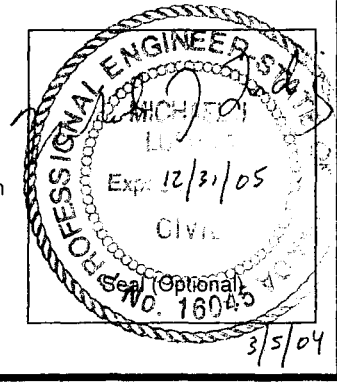
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

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: Michael J. Ludwig, P.E.	License No.: 16045 (Nevada)	Expiration Date: 12/31/05
Company Name: G. C. WALLACE, INC.	Telephone No.: (702) 804-2000	Fax No.: (702) 804-2297
Signature: Michael J Ludwig		Date: 3/5/04

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



C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4,000.

☐ 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: Michael J. Ludwig, P.E.	Company: G. C. WALLACE, INC.	
Mailing Address: 1555 S. Rainbow Blvd. Las Vegas, NV 89146	Daytime Telephone No.: (702) 804-2000	Fax No.: (702) 804-2297
	E-Mail Address: MLudwig@gcwallace.com	
Signature of Requester (required):		Date: 3/5/04

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

Community Official's Name and Title: Kevin Eubanks, P.E.; Assistant General Manager		Telephone No.: (702) 455-3139
Community Name: Clark County, NV	Community Official's Signature (required):	Date:

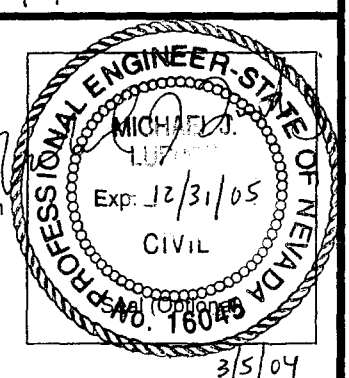
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

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: Michael J. Ludwig, P.E.	License No.: 16045 (Nevada)	Expiration Date: 12/31/05
Company Name: G. C. WALLACE, INC.	Telephone No.: (702) 804-2000	Fax No.: (702) 804-2297
Signature:		Date: 3/5/04

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



3/5/04

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: Duck Creek
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

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

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

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

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

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

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [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

Duck Creek - Phase 3B	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	50 ft. downstream of Broadbent Boulevard	8065.20	1612	1612
Upstream Limit	800 ft. downstream of Boulder Highwat	11785.87	1636	1627.6

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS V3.0.1 March 2001 [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:		Floodway File Name:
Revised or Post-Project Conditions Model	Natural File Name:	PHASE3B.PRJ	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

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Flooding Source: Pittman Wash
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

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

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

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

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

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model [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

Pittman Wash	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	800 ft. downstream of Boulder Highway	12111.21	1636	1630
Upstream Limit	Downstream face of US 95 Bridge	16028.70	N/A	1665

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS V3.0.1 March 2001 [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:		Floodway File Name:
Revised or Post-Project Conditions Model	Natural File Name:	PHASE2.PRJ	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 STRUCTURES FORM

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

PAPERWORK REDUCTION ACT

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Flooding Source: Duck Creek
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: Duck Creek Channel - Phase 2

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 800 ft. downstream of Boulder Highway

Upstream Limit/Cross Section: Emerald Avenue

2. Name of Structure: Boulder Highway Bridge

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: Boulder Highway / 12604.26

Upstream Limit/Cross Section: Boulder Highway / 12121.12

3. Name of Structure:

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

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

B. CHANNELIZATION

Flooding Source: Duck Creek

Name of Structure: Duck Creek Channel - Phase 2

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 8562 (cfs) and/or the 100-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: Duck Creek

Name of Structure: Boulder Highway Bridge

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): HEC-RAS
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.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

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Flooding Source: Duck Creek
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: Duck Creek Channel - Phase 3B**

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

   Location of Structure: Duck Creek

   Downstream Limit/Cross Section: 50 ft. downstream of Broadbent Boulevard / 8065.2

   Upstream Limit/Cross Section: 800 ft. downstream of Boulder Highway / 11785.87

2. **Name of Structure: Broadbent Boulevard Box Culvert**

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

   Location of Structure: Duck Creek

   Downstream Limit/Cross Section: Broadbent Boulevard / 8118.7

   Upstream Limit/Cross Section: Broadbent Boulevard / 8259.5

3. **Name of Structure:**

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

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

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

B. CHANNELIZATION

Flooding Source: Duck Creek

Name of Structure: Duck Creek Channel - Phase 3B

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 11500 (cfs) and/or the 100-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: Duck Creek

Name of Structure: Broadbent Boulevard Box Culvert

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): HEC-RAS
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.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

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Flooding Source: Pittman Wash
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: Lower Pittman Channel

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

Location of Structure: Pittman Wash

Downstream Limit/Cross Section: 800 ft. downstream of Boulder Highway / 12111.21

Upstream Limit/Cross Section: Downstream face of US 95 Bridge / 16028.70

2. Name of Structure: Park Lane Culvert

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

Location of Structure: Park Lane

Downstream Limit/Cross Section: Park Lane / 15350

Upstream Limit/Cross Section: Park Lane / 15438

3. Name of Structure:

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

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

B. CHANNELIZATION

Flooding Source: Pittman Wash

Name of Structure: Lower Pittman Channel

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 7638 (cfs) and/or the 100-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: Pittman Wash

Name of Structure: Park Lane Culvert

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): HEC-RAS
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.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

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

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 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: Pittman Wash
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: Russell Road Box Culvert

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

Location of Structure: Pittman Wash

Downstream Limit/Cross Section: Russell Road / 13368.7

Upstream Limit/Cross Section: Russell Road / 13491.7

2. Name of Structure:

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure:

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

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: Pittman Wash

Name of Structure: Russell Road Box Culvert

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): HEC-RAS
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.

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: Pittman Wash
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: New Beginnings Drive Box Culvert**

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

   Location of Structure: Pittman Wash

   Downstream Limit/Cross Section: New Beginnings Drive / 13967.75

   Upstream Limit/Cross Section: New Beginnings Drive / 14055.35

2. **Name of Structure:**

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

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

3. **Name of Structure:**

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

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

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: Pittman Wash

Name of Structure: New Beginnings Drive

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): HEC-RAS
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.

FLOOD PROFILE DATA

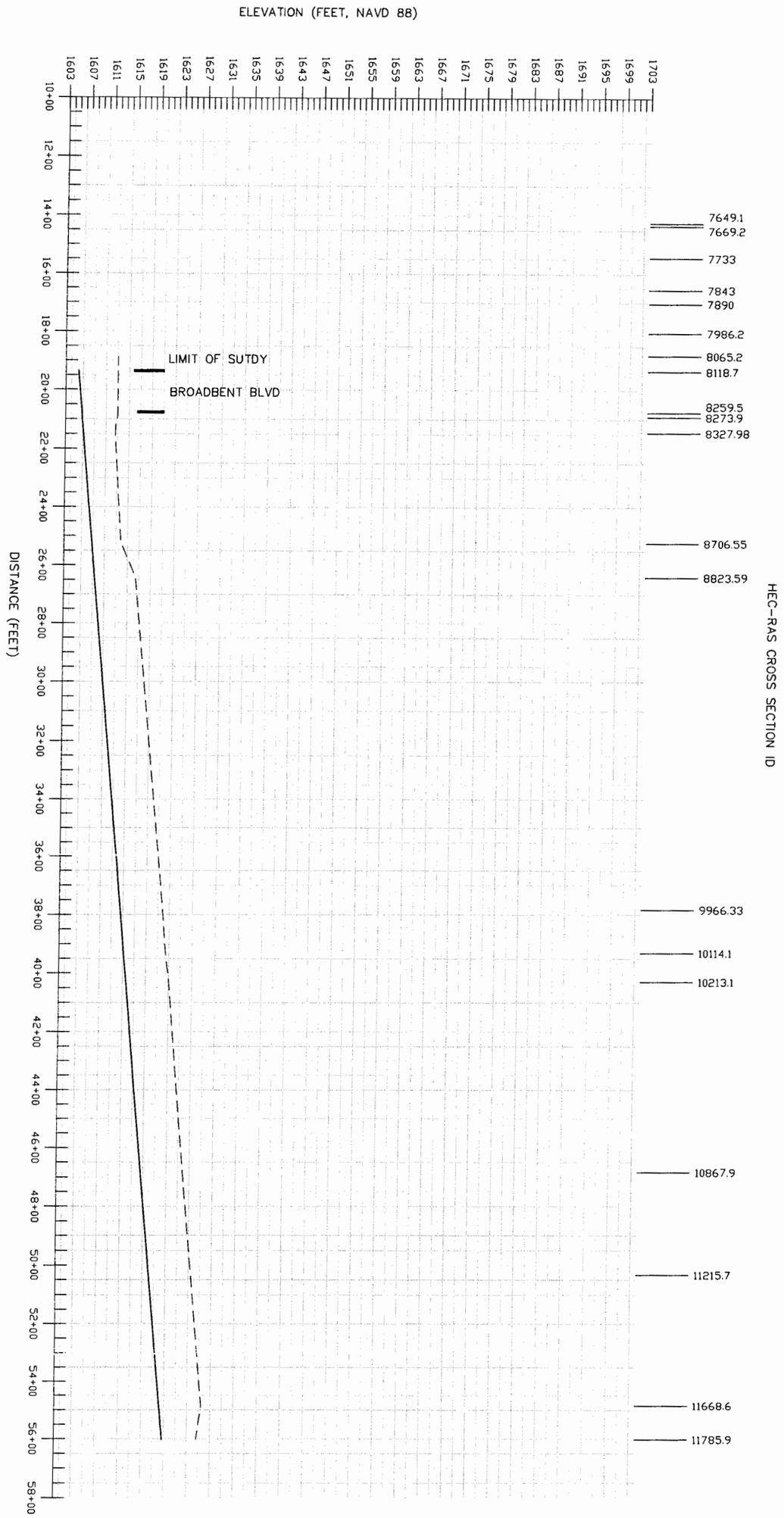
FLOOD PROFILE TABLE – DUCK CREEK
FLOOD PROFILE TABLE – PITTMAN WASH
FLOOD PROFILE – SHEET PR1
FLOOD PROFILE – SHEET PR2
FLOOD PROFILE – SHEET PR3

DUCK CREEK

HEC-RAS MODELING					FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (NAVD 88)			
CROSS-SECTION	REACH	MODEL	DISTANCE BASELINE (x1000 FT)	FLOW (CFS)	WIDTH (FT)	AREA (SQ. FT)	VELOCITY (FPS)	REGULATORY WSE (FT)	FLOODWAY WSE (FT)	W/O FLOODWAY WSE (FT)	DIFFERENCE WSE (FT)
				EMERALD AVENUE							
14300.00	DUCKUP	PHASE2	8.1	8562	90	589	14.5	1651.0	--	1650.7	NA
14200.00	DUCKUP	PHASE2	8.0	8562	86	493	17.4	1650.8	--	1648.9	NA
14123.61	DUCKUP	PHASE2	7.9	8562	84	469	18.3	1650.6	--	1648.1	NA
13764.88	DUCKUP	PHASE2	7.6	8562	82	442	19.4	1649.7	--	1646.0	NA
13409.39	DUCKUP	PHASE2	7.2	8562	83	429	20.0	1648.0	--	1644.0	NA
13027.54	DUCKUP	PHASE2	6.8	8562	60	430	19.9	1645.5	--	1642.5	NA
12723.61	DUCKUP	PHASE2	6.5	8562	41	363	23.6	1644.4	--	1638.3	NA
12604.26	DUCKUP	PHASE2	6.4	8562	41	344	24.9	1643.8	--	1636.6	NA
12603.26	DUCKUP	PHASE2	6.3	BOULDER HIGHWAY BRIDGE							
12121.12	DUCKUP	PHASE2	5.9	8562	41	396	21.6	1640.5	--	1633.7	NA
				CONFLUENCE							
12074.41	DUCKDOWN	PHASE2	5.9	11500	93	435	26.5	1640.5	--	1628.7	NA
11982.12	DUCKDOWN	PHASE2	5.8	11500	93	440	26.2	1639.4	--	1628.0	NA
11905.87	DUCKDOWN	PHASE2	5.7	11500	93	457	25.2	1638.0	--	1627.8	NA
11785.87	DUCKDOWN	PHASE2	5.6	11500	93	482	23.9	1636.6	--	1627.6	NA
11785.87	DUCKDOWN	PHASE3B	5.6	11500	93	486	23.6	1636.6	--	1627.6	NA
11668.62	DUCKDOWN	PHASE3B	5.5	11500	93	532	21.6	1635.2	--	1628.3	NA
11215.68	DUCKDOWN	PHASE3B	5.0	11500	94	541	21.3	1631.5	--	1626.3	NA
10867.92	DUCKDOWN	PHASE3B	4.7	11500	94	543	21.2	1629.2	--	1624.8	NA
10213.13	DUCKDOWN	PHASE3B	4.0	11500	93	547	21.0	1625.0	--	1621.9	NA
10114.10	DUCKDOWN	PHASE3B	3.9	11500	94	543	21.2	1624.2	--	1621.4	NA
9966.33	DUCKDOWN	PHASE3B	3.8	11500	94	544	21.2	1623.5	--	1620.7	NA
8823.59	DUCKDOWN	PHASE3B	2.6	11500	94	539	21.3	1616.0	--	1615.5	NA
8706.55	DUCKDOWN	PHASE3B	2.5	11500	118	480	24.0	1615.8	--	1612.8	NA
8327.98	DUCKDOWN	PHASE3B	2.1	11500	118	538	21.4	1615.5	--	1611.6	NA
8273.90	DUCKDOWN	PHASE3B	2.1	11500	118	543	21.2	1615.2	--	1611.4	NA
8259.50	DUCKDOWN	PHASE3B	2.1	11500	118	546	21.1	1615.0	--	1611.3	NA
8202.60	DUCKDOWN	PHASE3B	2.0	BROADBENT BOULEVARD BOX CULVERT							
8118.70	DUCKDOWN	PHASE3B	1.9	11500	118	585	19.7	1613.0	--	1611.0	NA
8065.20	DUCKDOWN	PHASE3B	1.9	11500	118	727	15.8	1612.0	--	1612.0	NA
7986.20	DUCKDOWN	PHASE3B	1.8	11500	135	875	13.2	1612.0	--	1612.0	NA

PITTMAN WASH

HEC-RAS MODELING					FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (NAVD 88)			
CROSS-SECTION	REACH	MODEL	DISTANCE BASELINE (x1000 FT)	FLOW (CFS)	WIDTH (FT)	AREA (SQ. FT)	VELOCITY (FPS)	REGULATORY WSE (FT)	FLOODWAY WSE (FT)	W/O FLOODWAY WSE (FT)	DIFFERENCE WSE (FT)
				US 95 BRIDGE							
16028.70	PITTMAN	PHASE2	4.8	7638	45	299	25.6	--	--	1665.7	NA
15958.00	PITTMAN	PHASE2	4.7	7638	58	287	26.7	--	--	1664.0	NA
15917.75	PITTMAN	PHASE2	4.7	7638	63	289	26.5	--	--	1663.7	NA
15868.00	PITTMAN	PHASE2	4.6	7638	60	288	26.5	--	--	1663.1	NA
15768.00	PITTMAN	PHASE2	4.5	7638	60	300	25.5	--	--	1662.7	NA
15668.00	PITTMAN	PHASE2	4.4	7638	60	302	25.3	--	--	1661.9	NA
15568.00	PITTMAN	PHASE2	4.3	7638	60	304	25.2	--	--	1661.1	NA
15468.00	PITTMAN	PHASE2	4.2	7638	60	305	25.1	--	--	1660.2	NA
15438.00	PITTMAN	PHASE2	4.2	7638	60	305	25.1	--	--	1660.0	NA
15437.00	PITTMAN	PHASE2	4.2	PARK LANE CULVERT							
15350.00	PITTMAN	PHASE2	4.2	7638	60	331	23.1	--	--	1659.7	NA
15268.00	PITTMAN	PHASE2	4.1	7638	60	327	23.3	--	--	1658.9	NA
15168.00	PITTMAN	PHASE2	4.0	7638	60	324	23.6	--	--	1658.0	NA
15068.00	PITTMAN	PHASE2	3.9	7638	60	322	23.7	--	--	1657.1	NA
15064.22	PITTMAN	PHASE2	3.9	7638	60	322	23.8	--	--	1657.1	NA
14632.63	PITTMAN	PHASE2	3.5	7638	60	315	24.3	--	--	1653.3	NA
14118.06	PITTMAN	PHASE2	3.0	7638	60	311	24.6	--	--	1648.9	NA
14067.99	PITTMAN	PHASE2	2.9	7638	60	311	24.6	--	--	1648.4	NA
14055.35	PITTMAN	PHASE2	2.9	7638	60	311	24.6	--	--	1648.3	NA
14054.35	PITTMAN	PHASE2	2.9	NEW BEGINNINGS DRIVE CULVERT							
13967.75	PITTMAN	PHASE2	2.8	7638	60	337	22.7	--	--	1648.0	NA
13895.99	PITTMAN	PHASE2	2.7	7638	60	333	22.9	--	--	1647.3	NA
13888.29	PITTMAN	PHASE2	2.7	7638	60	332	23.0	--	--	1647.3	NA
13867.99	PITTMAN	PHASE2	2.7	7638	60	331	23.1	--	--	1647.0	NA
13767.99	PITTMAN	PHASE2	2.6	7638	60	323	23.6	--	--	1645.9	NA
13688.29	PITTMAN	PHASE2	2.5	7638	60	319	24.0	--	--	1645.0	NA
13518.09	PITTMAN	PHASE2	2.3	7638	60	310	24.7	--	--	1643.1	NA
13491.70	PITTMAN	PHASE2	2.3	7638	60	307	24.9	--	--	1642.6	NA
13490.70	PITTMAN	PHASE2	2.3	RUSSELL ROAD BOX CULVERT							
13368.70	PITTMAN	PHASE2	2.3	7638	60	316	24.2	--	--	1641.5	NA
13342.26	PITTMAN	PHASE2	2.3	7638	60	319	23.9	--	--	1641.4	NA
13291.09	PITTMAN	PHASE2	2.2	7638	60	319	23.9	--	--	1641.1	NA
13118.20	PITTMAN	PHASE2	2.0	7638	51	331	23.1	--	--	1640.3	NA
12971.20	PITTMAN	PHASE2	1.9	7638	51	316	24.2	--	--	1638.5	NA
12744.19	PITTMAN	PHASE2	1.7	7638	51	301	25.4	--	--	1635.8	NA
12594.35	PITTMAN	PHASE2	1.5	7638	51	295	25.9	--	--	1634.1	NA
12593.35	PITTMAN	PHASE2	1.4	BOULDER HIGHWAY BRIDGE							
12111.21	PITTMAN	PHASE2	1.0	7638	51	314	24.4	--	--	1630.3	NA
				CONFLUENCE							



LEGEND

WATER SURFACE ELEVATION (100-YR)

CHANNEL INVERT ELEVATION

HORIZONTAL SCALE: 1 IN = 400 FT
VERTICAL SCALE: 1 IN = 20 FT

FLOOD PROFILES

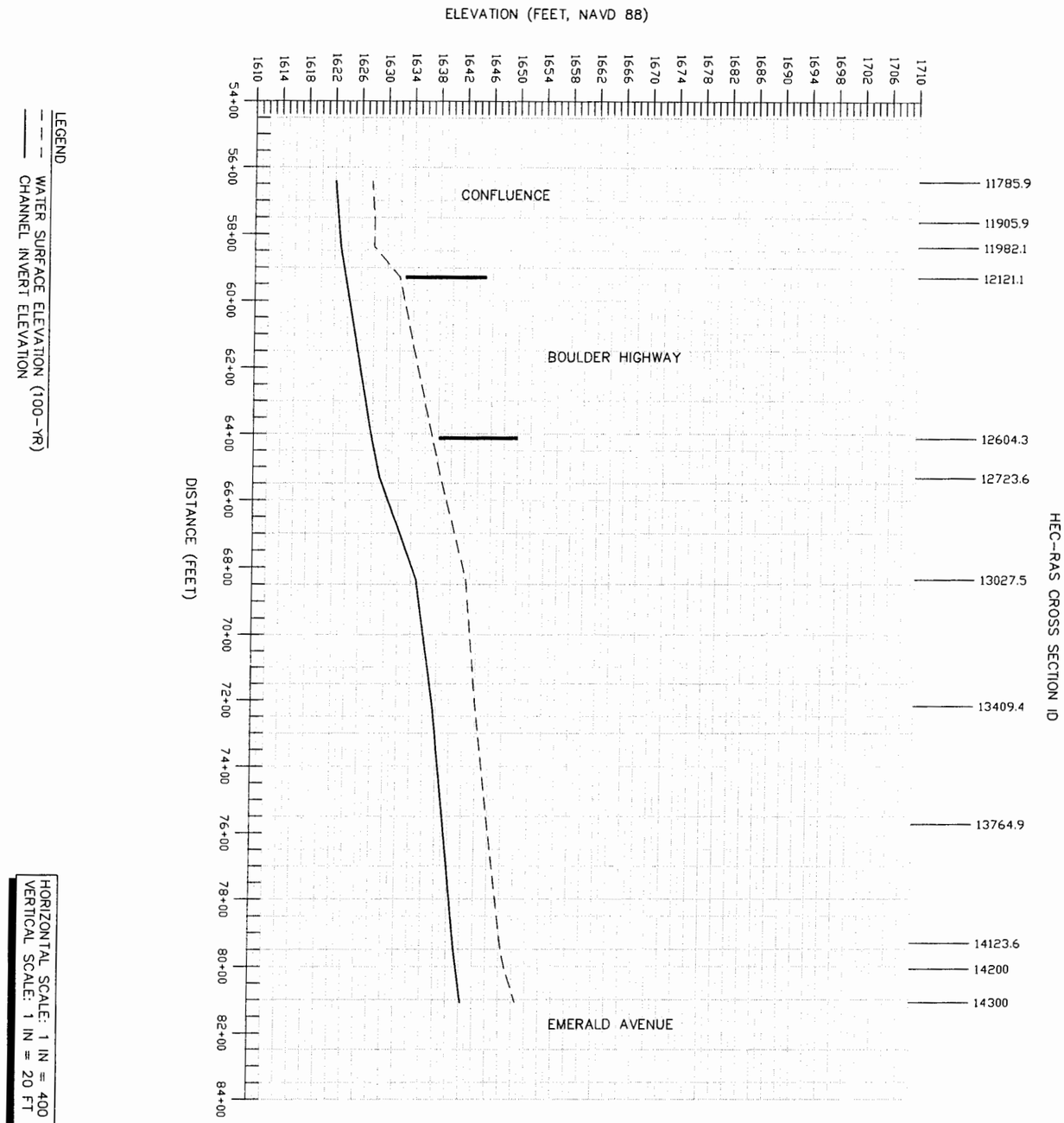
LOWER DUCK CREEK CLOMR

DUCK CREEK CHANNEL

BROADBENT BLVD. TO 800 FT D/S OF BOULDER HWY.

SHEET PR1 1 OF 1 SHTS

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299



FLOOD PROFILES

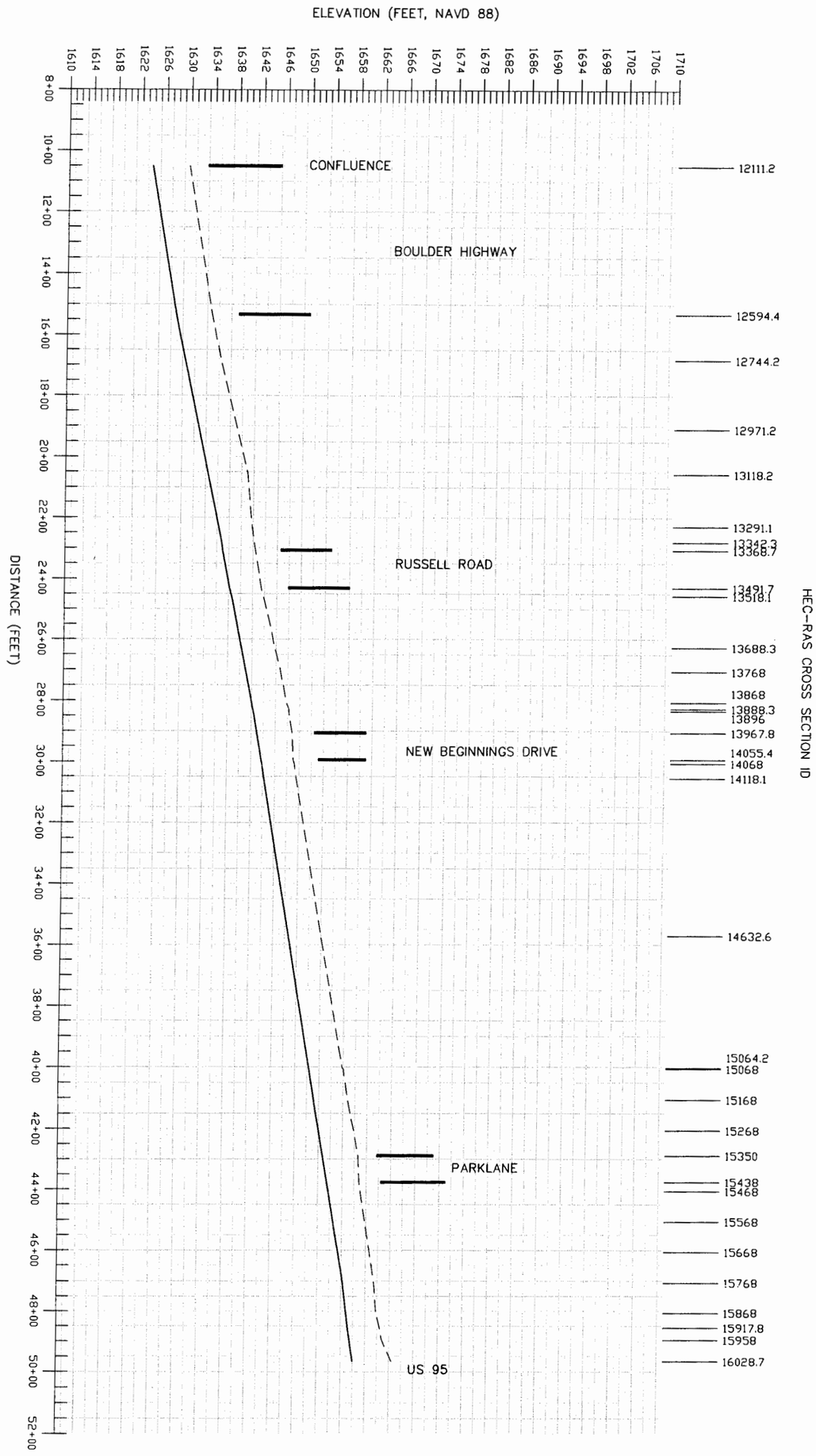
LOWER DUCK CREEK CLOMR

DUCK CREEK CHANNEL
400 FT D/S OF BOULDER HWY. TO EMERALD AVE.

SHEET PR2

1 OF 1 SHTS

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299



LEGEND

WATER SURFACE ELEVATION (100-YR)

CHANNEL INVERT ELEVATION

HORIZONTAL SCALE: 1 IN = 400 FT
VERTICAL SCALE: 1 IN = 20 FT

FLOOD PROFILES

LOWER DUCK CREEK CLOMR

LOWER PITTMAN CHANNEL

400 FT D/S OF BOULDER HWY. TO U.S. 95

SHEET PR3

1 OF 1 SHTS

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

HEC-RAS OUTPUT

PHASE2. PRJ: STANDARD TABLE 1
SIX XS BRIDGE TABLE
HEC-RAS SUMMARY REPORT
HEC-RAS CROSS SECTION PLOTS

THABLE.PRJ
STANDARD TABLE 1

HEC-RAS Plan: Improvements Profile: PF 1

Reach	River Sta	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)	
pittman	16028.7	7638.00	1658.97	1665.72	1668.72	1675.88	0.007504	25.57	298.66	45.00	1.75
pittman	16014.5*	7638.00	1658.87	1665.20	1668.31	1675.67	0.008014	25.97	294.11	47.40	1.84
pittman	16000.4*	7638.00	1658.76	1664.79	1667.96	1675.49	0.008479	26.26	290.91	49.81	1.91
pittman	15986.2*	7638.00	1658.66	1664.48	1667.79	1675.33	0.008897	26.44	288.90	52.24	1.98
pittman	15972.1*	7638.00	1658.55	1664.23	1667.53	1675.18	0.009284	26.55	287.66	54.63	2.04
pittman	15958	7638.00	1658.45	1663.98	1667.23	1675.01	0.009857	26.65	286.60	57.92	2.11
pittman	15917.75	7638.00	1658.15	1663.71	1666.88	1674.57	0.009957	26.45	288.79	63.10	2.18
pittman	15868	7638.00	1657.85	1663.10	1666.25	1674.03	0.010631	26.54	287.81	60.00	2.14
pittman	15818.*	7638.00	1657.55	1662.90	1665.95	1673.39	0.009951	25.99	293.92	60.00	2.07
pittman	15768	7638.00	1657.25	1662.69	1665.65	1672.78	0.009365	25.49	299.65	60.00	2.01
pittman	15744.7*	7638.00	1656.97	1662.43	1665.37	1672.46	0.009288	25.42	300.44	60.00	2.00
pittman	15711.4*	7638.00	1656.68	1662.15	1665.08	1672.14	0.009229	25.37	301.05	60.00	2.00
pittman	15668	7638.00	1656.40	1661.88	1664.80	1671.83	0.009159	25.31	301.78	60.00	1.99
pittman	15644.7*	7638.00	1656.12	1661.61	1664.52	1671.51	0.009090	25.25	302.52	60.00	1.98
pittman	15611.4*	7638.00	1655.83	1661.33	1664.23	1671.20	0.009051	25.21	302.93	60.00	1.98
pittman	15568	7638.00	1655.55	1661.06	1663.95	1670.89	0.008998	25.17	303.50	60.00	1.97
pittman	15544.7*	7638.00	1655.27	1660.79	1663.67	1670.59	0.008944	25.12	304.08	60.00	1.97
pittman	15511.4*	7638.00	1654.98	1660.50	1663.38	1670.28	0.008921	25.10	304.33	60.00	1.96
pittman	15468	7638.00	1654.70	1660.23	1663.10	1669.99	0.008893	25.07	304.63	60.00	1.96
pittman	15438	7638.00	1654.45	1659.98	1662.85	1669.73	0.008872	25.05	304.87	60.00	1.96
pittman	15437	Bridge									
pittman	15350	7638.00	1653.70	1659.66	1662.08	1667.95	0.006881	23.10	330.65	60.00	1.73
pittman	15319.1*	7638.00	1653.35	1659.28	1661.75	1667.65	0.006990	23.22	328.98	60.00	1.75
pittman	15268	7638.00	1653.00	1658.91	1661.40	1667.36	0.007102	23.34	327.31	60.00	1.76
pittman	15244.7*	7638.00	1652.72	1658.61	1661.12	1667.12	0.007176	23.41	326.23	60.00	1.77
pittman	15211.4*	7638.00	1652.43	1658.30	1660.83	1666.87	0.007254	23.49	325.10	60.00	1.78
pittman	15168	7638.00	1652.15	1658.00	1660.55	1666.62	0.007318	23.56	324.20	60.00	1.79
pittman	15144.7*	7638.00	1651.87	1657.71	1660.25	1666.38	0.007382	23.63	323.29	60.00	1.79
pittman	15111.4*	7638.00	1651.58	1657.40	1659.98	1666.12	0.007445	23.69	322.41	60.00	1.80
pittman	15068	7638.00	1651.30	1657.11	1659.70	1665.87	0.007498	23.74	321.68	60.00	1.81
pittman	15064.22	7638.00	1651.27	1657.08	1659.67	1665.84	0.007503	23.75	321.61	60.00	1.81
pittman	15016.2*	7638.00	1650.86	1656.65	1659.24	1665.47	0.007584	23.83	320.51	60.00	1.82
pittman	14968.3*	7638.00	1650.45	1656.22	1658.83	1665.10	0.007666	23.91	319.41	60.00	1.83
pittman	14920.3*	7638.00	1650.05	1655.81	1658.45	1664.73	0.007720	23.97	318.70	60.00	1.83
pittman	14872.4*	7638.00	1649.64	1655.39	1658.04	1664.35	0.007770	24.02	318.04	60.00	1.84
pittman	14824.4*	7638.00	1649.23	1654.97	1657.61	1663.96	0.007820	24.06	317.39	60.00	1.84
pittman	14776.4*	7638.00	1648.82	1654.55	1657.20	1663.58	0.007870	24.11	316.74	60.00	1.85
pittman	14728.5*	7638.00	1648.42	1654.14	1656.80	1663.20	0.007908	24.15	316.26	60.00	1.85
pittman	14680.5*	7638.00	1648.01	1653.72	1656.39	1662.81	0.007958	24.20	315.63	60.00	1.86
pittman	14632.63	7638.00	1647.60	1653.30	1655.98	1662.43	0.008008	24.25	315.00	60.00	1.86
pittman	14546.8*	7638.00	1646.87	1652.56	1655.25	1661.74	0.008076	24.31	314.15	60.00	1.87
pittman	14461.1*	7638.00	1646.14	1651.81	1654.52	1661.04	0.008144	24.38	313.30	60.00	1.88
pittman	14375.3*	7638.00	1645.42	1651.08	1653.79	1660.34	0.008188	24.42	312.78	60.00	1.88
pittman	14289.5*	7638.00	1644.69	1650.34	1653.07	1659.64	0.008229	24.46	312.26	60.00	1.89
pittman	14203.8*	7638.00	1643.96	1649.61	1652.34	1658.93	0.008275	24.50	311.72	60.00	1.89
pittman	14118.06	7638.00	1643.23	1648.87	1651.61	1658.22	0.008321	24.55	311.17	60.00	1.90
pittman	14093.0*	7638.00	1643.02	1648.65	1651.40	1658.02	0.008329	24.55	311.06	60.00	1.90
pittman	14067.99	7638.00	1642.81	1648.44	1651.19	1657.81	0.008337	24.56	310.96	60.00	1.90
pittman	14055.35	7638.00	1642.70	1648.33	1651.08	1657.71	0.008352	24.58	310.79	60.00	1.90
pittman	14054.35	Bridge									
pittman	13967.75	7638.00	1641.95	1648.02	1650.33	1656.00	0.006488	22.67	336.93	60.00	1.69
pittman	13931.8*	7638.00	1641.65	1647.68	1650.02	1655.75	0.006607	22.80	334.98	60.00	1.70
pittman	13895.99	7638.00	1641.34	1647.34	1649.72	1655.51	0.006727	22.93	333.04	60.00	1.72
pittman	13888.29	7638.00	1641.26	1647.25	1649.64	1655.45	0.006775	22.99	332.28	60.00	1.72
pittman	13867.99	7638.00	1641.06	1647.02	1649.44	1655.31	0.006886	23.11	330.57	60.00	1.73
pittman	13767.99	7638.00	1640.06	1645.90	1648.44	1654.56	0.007371	23.62	323.44	60.00	1.79
pittman	13728.1*	7638.00	1639.66	1645.46	1648.04	1654.25	0.007544	23.79	321.05	60.00	1.81
pittman	13688.29	7638.00	1639.26	1645.02	1647.64	1653.94	0.007722	23.97	318.67	60.00	1.83
pittman	13645.7*	7638.00	1638.83	1644.52	1647.21	1653.59	0.007933	24.17	316.03	60.00	1.86
pittman	13603.1*	7638.00	1638.41	1644.03	1646.74	1653.24	0.008126	24.35	313.72	60.00	1.88
pittman	13560.6*	7638.00	1637.99	1643.55	1646.31	1652.88	0.008301	24.50	311.70	60.00	1.89
pittman	13518.09	7638.00	1637.56	1643.07	1645.84	1652.51	0.008476	24.66	309.72	60.00	1.91
pittman	13509.2*	7638.00	1637.43	1642.88	1645.70	1652.43	0.008625	24.80	307.99	60.00	1.93
pittman	13500.4*	7638.00	1637.31	1642.74	1645.58	1652.35	0.008734	24.89	306.91	60.00	1.94
pittman	13491.7	7638.00	1637.18	1642.64	1645.47	1652.28	0.008791	24.92	306.54	60.00	1.94
pittman	13490.7	Bridge									
pittman	13368.7	7638.00	1635.97	1641.53	1644.19	1650.60	0.007984	24.17	316.03	60.00	1.86
pittman	13342.26	7638.00	1635.80	1641.44	1644.05	1650.34	0.007720	23.93	319.17	60.00	1.83
pittman	13291.09	7638.00	1635.29	1641.06	1643.68	1649.94	0.007678	23.92	319.28	60.00	1.83
pittman	13266.4*	7638.00	1635.03	1640.93	1643.51	1649.74	0.007427	23.82	320.65	58.72	1.80
pittman	13241.7*	7638.00	1634.77	1640.81	1643.38	1649.53	0.007163	23.70	322.29	57.42	1.76
pittman	13217.0*	7638.00	1634.51	1640.70	1643.21	1649.34	0.006922	23.59	323.78	56.14	1.73
pittman	13192.3*	7638.00	1634.24	1640.58	1643.09	1649.15	0.006696	23.49	325.16	54.86	1.70
pittman	13167.6*	7638.00	1633.98	1640.48	1642.96	1648.96	0.006459	23.37	326.86	53.58	1.67

HEC-RAS Plan: Improvements Profile: PF 1 (Continued)

Reach	River Sta	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)	
pittman	13142.9*	7638.00	1633.72	1640.41	1642.82	1648.77	0.006190	23.20	329.23	52.28	1.63
pittman	13118.20	7638.00	1633.46	1640.34	1642.70	1648.59	0.005952	23.05	331.34	51.00	1.59
pittman	13069.2*	7638.00	1632.94	1639.70	1642.18	1648.26	0.006294	23.48	325.33	51.00	1.64
pittman	13020.2*	7638.00	1632.42	1639.08	1641.66	1647.92	0.006611	23.86	320.17	51.00	1.68
pittman	12971.2	7638.00	1631.90	1638.48	1641.14	1647.56	0.006902	24.19	315.71	51.00	1.71
pittman	12925.8*	7638.00	1631.42	1637.92	1640.66	1647.23	0.007159	24.48	311.96	51.00	1.74
pittman	12880.4*	7638.00	1630.94	1637.38	1640.18	1646.88	0.007389	24.74	308.77	51.00	1.77
pittman	12835.0*	7638.00	1630.45	1636.83	1639.69	1646.52	0.007618	24.98	305.73	51.00	1.80
pittman	12789.6*	7638.00	1629.97	1636.30	1639.21	1646.16	0.007817	25.19	303.17	51.00	1.82
pittman	12744.19	7638.00	1629.49	1635.78	1638.73	1645.78	0.008002	25.39	300.88	51.00	1.84
pittman	12694.2*	7638.00	1628.96	1635.20	1638.20	1645.36	0.008193	25.58	298.59	51.00	1.86
pittman	12644.3*	7638.00	1628.43	1634.63	1637.68	1644.93	0.008371	25.76	296.51	51.00	1.88
pittman	12594.35	7638.00	1627.90	1634.06	1637.14	1644.50	0.008536	25.92	294.64	51.00	1.90
pittman	12593.35	Bridge									
pittman	12111.21	7638.00	1623.74	1630.27	1632.99	1639.49	0.007052	24.36	313.50	51.00	1.73
duckup	14300	8562.00	1642.30	1650.69	1650.70	1653.98	0.001854	14.54	588.75	89.97	1.00
duckup	14250.*	8562.00	1641.95	1649.56	1650.34	1653.77	0.002668	16.47	519.91	86.85	1.19
duckup	14200	8562.00	1641.60	1648.91	1649.99	1653.58	0.003114	17.36	493.32	85.62	1.27
duckup	14161.8*	8562.00	1641.34	1648.48	1649.73	1653.44	0.003394	17.87	479.10	84.95	1.33
duckup	14123.61	8562.00	1641.09	1648.11	1649.46	1653.29	0.003617	18.26	468.91	84.47	1.37
duckup	14099.6*	8562.00	1640.97	1647.96	1649.35	1653.20	0.003679	18.37	466.01	84.25	1.38
duckup	14075.7*	8562.00	1640.85	1647.82	1649.23	1653.11	0.003723	18.46	463.93	84.04	1.38
duckup	14051.8*	8562.00	1640.73	1647.68	1649.12	1653.01	0.003767	18.53	461.95	83.87	1.39
duckup	14027.9*	8562.00	1640.61	1647.54	1649.00	1652.92	0.003810	18.61	459.98	83.69	1.40
duckup	14004.0*	8562.00	1640.49	1647.40	1648.88	1652.83	0.003856	18.70	457.92	83.49	1.41
duckup	13980.1*	8562.00	1640.37	1647.26	1648.77	1652.73	0.003901	18.78	455.97	83.32	1.41
duckup	13956.2*	8562.00	1640.25	1647.12	1648.65	1652.64	0.003947	18.86	454.02	83.15	1.42
duckup	13932.2*	8562.00	1640.13	1646.98	1648.53	1652.55	0.003994	18.94	452.00	82.96	1.43
duckup	13908.3*	8562.00	1640.01	1646.84	1648.43	1652.46	0.004041	19.02	450.07	82.79	1.44
duckup	13884.4*	8562.00	1639.89	1646.70	1648.30	1652.36	0.004072	19.08	448.76	82.66	1.44
duckup	13860.5*	8562.00	1639.77	1646.57	1648.18	1652.26	0.004104	19.14	447.37	82.49	1.45
duckup	13836.6*	8562.00	1639.65	1646.44	1648.06	1652.16	0.004136	19.19	446.07	82.36	1.45
duckup	13812.7*	8562.00	1639.53	1646.31	1647.94	1652.06	0.004168	19.25	444.78	82.23	1.46
duckup	13788.7*	8562.00	1639.41	1646.17	1647.83	1651.96	0.004201	19.31	443.41	82.07	1.46
duckup	13764.88	8562.00	1639.29	1646.04	1647.73	1651.86	0.004233	19.37	442.13	81.94	1.47
duckup	13720.4*	8562.00	1639.07	1645.78	1647.48	1651.67	0.004318	19.48	439.51	81.98	1.48
duckup	13676.0*	8562.00	1638.84	1645.52	1647.25	1651.47	0.004383	19.57	437.54	82.01	1.49
duckup	13631.5*	8562.00	1638.62	1645.27	1647.04	1651.27	0.004445	19.65	435.81	82.10	1.50
duckup	13587.1*	8562.00	1638.40	1645.03	1646.80	1651.07	0.004509	19.73	434.01	82.16	1.51
duckup	13542.6*	8562.00	1638.18	1644.78	1646.57	1650.87	0.004574	19.81	432.21	82.23	1.52
duckup	13498.2*	8562.00	1637.96	1644.53	1646.34	1650.66	0.004625	19.87	430.93	82.33	1.53
duckup	13453.8*	8562.00	1637.73	1644.28	1646.11	1650.46	0.004682	19.94	429.43	82.40	1.54
duckup	13409.39	8562.00	1637.51	1644.04	1645.88	1650.24	0.004723	19.98	428.50	82.53	1.55
duckup	13385.5*	8562.00	1637.34	1643.94	1645.77	1650.14	0.004623	19.98	428.57	80.97	1.53
duckup	13361.6*	8562.00	1637.18	1643.85	1645.65	1650.03	0.004513	19.95	429.13	79.47	1.51
duckup	13337.7*	8562.00	1637.01	1643.74	1645.53	1649.93	0.004432	19.96	428.88	77.96	1.50
duckup	13313.9*	8562.00	1636.84	1643.63	1645.42	1649.82	0.004357	19.98	428.58	76.45	1.49
duckup	13290.0*	8562.00	1636.68	1643.53	1645.31	1649.72	0.004269	19.96	428.90	75.01	1.47
duckup	13266.1*	8562.00	1636.51	1643.43	1645.18	1649.62	0.004194	19.96	428.95	73.57	1.46
duckup	13242.3*	8562.00	1636.34	1643.32	1645.04	1649.51	0.004127	19.96	428.93	72.14	1.44
duckup	13218.4*	8562.00	1636.18	1643.22	1644.91	1649.42	0.004077	19.98	428.57	70.72	1.43
duckup	13194.5*	8562.00	1636.01	1643.11	1644.78	1649.32	0.004034	20.00	428.14	69.33	1.42
duckup	13170.7*	8562.00	1635.84	1643.01	1644.66	1649.22	0.003989	20.00	428.01	67.95	1.40
duckup	13146.8*	8562.00	1635.67	1642.90	1644.53	1649.12	0.003953	20.01	427.89	66.60	1.39
duckup	13123.0*	8562.00	1635.51	1642.81	1644.38	1649.03	0.003919	20.01	427.99	65.26	1.38
duckup	13099.1*	8562.00	1635.34	1642.72	1644.28	1648.92	0.003878	19.97	428.65	63.93	1.36
duckup	13075.2*	8562.00	1635.17	1642.63	1644.11	1648.81	0.003848	19.94	429.28	62.62	1.34
duckup	13051.4*	8562.00	1635.01	1642.54	1644.01	1648.72	0.003847	19.95	429.18	61.31	1.33
duckup	13027.54	8562.00	1634.84	1642.45	1643.84	1648.62	0.003840	19.93	429.61	60.00	1.31
duckup	13004.1*	8562.00	1634.40	1641.99	1643.55	1648.49	0.004085	20.47	418.34	58.54	1.35
duckup	12980.7*	8562.00	1633.97	1641.56	1643.26	1648.37	0.004289	20.93	409.05	57.08	1.38
duckup	12957.4*	8562.00	1633.53	1641.15	1642.96	1648.24	0.004468	21.35	400.94	55.62	1.40
duckup	12934.0*	8562.00	1633.10	1640.79	1642.68	1648.11	0.004605	21.71	394.34	54.16	1.42
duckup	12910.6*	8562.00	1632.66	1640.42	1642.40	1647.98	0.004737	22.06	388.05	52.70	1.43
duckup	12887.2*	8562.00	1632.22	1640.08	1642.13	1647.85	0.004838	22.37	382.74	51.24	1.44
duckup	12863.8*	8562.00	1631.79	1639.77	1641.87	1647.71	0.004905	22.63	378.41	49.76	1.45
duckup	12840.5*	8562.00	1631.35	1639.46	1641.62	1647.59	0.004975	22.89	374.07	48.30	1.45
duckup	12817.1*	8562.00	1630.91	1639.17	1641.37	1647.46	0.005010	23.10	370.66	46.84	1.45
duckup	12793.7*	8562.00	1630.48	1638.93	1641.15	1647.33	0.005011	23.26	368.14	45.38	1.44
duckup	12770.3*	8562.00	1630.04	1638.70	1640.93	1647.20	0.005003	23.40	365.87	43.92	1.43
duckup	12746.9*	8562.00	1629.61	1638.51	1640.72	1647.08	0.004969	23.50	364.33	42.46	1.41
duckup	12723.61	8562.00	1629.17	1638.34	1640.53	1646.96	0.004918	23.57	363.27	41.00	1.40
duckup	12683.8*	8562.00	1628.75	1637.74	1640.12	1646.72	0.005222	24.06	355.90	41.00	1.44
duckup	12644.0*	8562.00	1628.32	1637.15	1639.69	1646.48	0.005510	24.50	349.42	41.00	1.48

HEC-RAS Plan: Improvements Profile: PF 1 (Continued)

Reach	River Sta	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)	
duckup	12604.26	8562.00	1627.90	1636.59	1639.27	1646.22	0.005777	24.90	343.86	41.00	1.52
duckup	12603.26	Bridge									
duckup	12121.12	8562.00	1623.75	1633.73	1635.12	1640.97	0.003815	21.60	396.31	41.00	1.22
DUCKDOWN	12074.41	11500.00	1623.35	1628.73	1631.83	1639.59	0.010175	26.45	434.84	93.00	2.16
DUCKDOWN	11982.12	11500.00	1622.54	1627.97	1631.01	1638.59	0.009826	26.16	439.60	93.00	2.12
DUCKDOWN	11905.87	11500.00	1622.21	1627.83	1630.71	1637.65	0.008664	25.15	457.20	93.00	2.00
DUCKDOWN	11785.87	11500.00	1621.67	1627.55	1630.16	1636.40	0.007328	23.87	481.75	93.00	1.85

PHASE2.PRJ
SIX XS BRIDGE

HEC-RAS Plan: Improvements Profile: PF 1

Reach	River Sta	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
pittman	15468	1669.99	1660.23	1663.10	0.30	0.01	60.00		7638.00		25.07
pittman	15438	1669.73	1659.98	1662.85	0.27	0.00	60.00		7638.00		25.05
pittman	15437 BR U	1669.48	1660.20	1662.97			59.00		7638.00		24.44
pittman	15437 BR D	1667.95	1659.81	1662.23			59.00		7638.00		22.90
pittman	15350	1667.95	1659.66	1662.08			60.00		7638.00		23.10
pittman	15319.1*	1667.65	1659.28	1661.75	0.28	0.01	60.00		7638.00		23.22
pittman	14067.99	1657.81	1648.44	1651.19	0.21	0.00	60.00		7638.00		24.56
pittman	14055.35	1657.71	1648.33	1651.08	0.11	0.00	60.00		7638.00		24.58
pittman	14054.35BR U	1657.47	1648.56	1651.18			59.00		7638.00		23.96
pittman	14054.35BR D	1656.00	1648.18	1650.43			59.00		7638.00		22.45
pittman	13967.75	1656.00	1648.02	1650.33			60.00		7638.00		22.67
pittman	13931.8*	1655.75	1647.68	1650.02	0.23	0.01	60.00		7638.00		22.80
pittman	13500.4*	1652.35	1642.74	1645.58	0.08	0.01	60.00		7638.00		24.89
pittman	13491.7	1652.28	1642.64	1645.47	0.08	0.00	60.00		7638.00		24.92
pittman	13490.7 BR U	1651.87	1643.05	1645.66			58.00		7638.00		23.83
pittman	13490.7 BR D	1650.60	1641.78	1644.37			58.00		7638.00		23.83
pittman	13388.7	1650.60	1641.53	1644.19			60.00		7638.00		24.17
pittman	13342.26	1650.34	1641.44	1644.05	0.21	0.05	60.00		7638.00		23.93
pittman	12644.3*	1644.93	1634.63	1637.68	0.41	0.01	51.00		7638.00		25.76
pittman	12594.35	1644.50	1634.06	1637.14	0.42	0.01	51.00		7638.00		25.92
pittman	12593.35BR U	1644.39	1634.28	1637.29	0.01	0.10	50.00		7638.00		25.52
pittman	12593.35BR D	1639.51	1630.46	1632.73	4.56	0.32	50.00		7638.00		24.14
pittman	12111.21	1639.49	1630.27	1632.99	0.01	0.02	51.00		7638.00		24.36
duckup	12644.0*	1646.48	1637.15	1639.69	0.21	0.03	41.00		8562.00		24.50
duckup	12604.26	1646.22	1636.59	1639.27	0.22	0.03	41.00		8562.00		24.90
duckup	12603.26BR U	1645.94	1637.26	1638.04	0.01	0.28	40.00		8562.00		23.65
duckup	12603.26BR D	1641.77	1630.99	1633.73	3.96	0.21	40.00		8562.00		26.35
duckup	12121.12	1640.97	1633.73	1635.12	0.01	0.45	41.00		8562.00		21.60

PHASE2.PRJ

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Duck Creek and Pittman Channel Imp
Project File : PHASE2.prj
Run Date and Time: 3/5/2004 9:47:31 AM

Project in English units

Project Description:
Duck Creek and Pittman Channel -- Phase 2 Improvements

PLAN DATA

Plan Title: Plan 01
Plan File : g:\550-039\calc\RAS\PHASE2.p01

Geometry Title: master
Geometry File : g:\550-039\calc\RAS\PHASE2.g01

Flow Title : 8562/7638/11500
Flow File : g:\550-039\calc\RAS\PHASE2.f01

Plan Summary Information:
Number of: Cross Sections = 150 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 5

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 8562/7638/11500
Flow File : g:\550-039\calc\RAS\PHASE2.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Duckcreek	pittman	16028.7	7638
Duckcreek	duckup	14300	8562
Duckcreek	DUCKDOWN	12074.41	11500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Duckcreek	pittman	PF 1	Normal S = .0075	
Duckcreek	duckup	PF 1	Known WS = 1651.1	
Duckcreek	DUCKDOWN	PF 1		Normal S = .0045

GEOMETRY DATA

Geometry Title: master
Geometry File : g:\550-039\calc\RAS\PHASE2.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Duckcreek	pittman		CONF
Duckcreek	duckup		CONF
Duckcreek	DUCKDOWN	CONF	

CROSS SECTION RIVER: Duckcreek

REACH: pittman RS: 16028.7

INPUT
Description: D/S FACE US95 CVT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1672.2	1062	1659.2	1084.5	1658.97	1107	1659.2	1107	1672.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1107	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1107	14.13	14.13	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1675.88	Element			
Vel Head (ft)	10.16	Wt. n-Val.		0.015	
W.S. Elev (ft)	1665.72	Reach Len. (ft)	14.13	14.13	14.13
Crit W.S. (ft)	1668.72	Flow Area (sq ft)		298.66	
E.G. Slope (ft/ft)	0.007504	Area (sq ft)		298.66	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	45.00	Top Width (ft)		45.00	
Vel Total (ft/s)	25.57	Avg. Vel. (ft/s)		25.57	
Max Chl Dpth (ft)	6.75	Hydr. Depth (ft)		6.64	
Conv. Total (cfs)	88175.0	Conv. (cfs)		88175.0	
Length Wtd. (ft)	14.13	Wetted Per. (ft)		58.05	
Min Ch El (ft)	1658.97	Shear (lb/sq ft)		2.41	
Alpha	1.00	Stream Power (lb/ft s)		61.64	
Frctn Loss (ft)		Cum Volume (acre-ft)		28.57	
C & E Loss (ft)		Cum SA (acres)		5.14	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 16014.5*

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1064.4	1670.96	1064.8	1660.36	1065.2	1660.16	1065.6	1659.96	1066	1659.05
1084	1658.87	1093.8	1658.87	1111.8	1659.05	1112.2	1670.36	1112.8	1670.56
1113.2	1670.76	1113.6	1670.96						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1064.4	.015	1064.4	.015	1113.6	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1064.4	1113.6	14.13	14.13	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1675.67	Element			
Vel Head (ft)	10.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1665.20	Reach Len. (ft)	14.13	14.13	14.13
Crit W.S. (ft)	1668.31	Flow Area (sq ft)		294.11	
E.G. Slope (ft/ft)	0.008014	Area (sq ft)		294.11	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	47.40	Top Width (ft)		47.40	
Vel Total (ft/s)	25.97	Avg. Vel. (ft/s)		25.97	
Max Chl Dpth (ft)	6.33	Hydr. Depth (ft)		6.20	
Conv. Total (cfs)	85322.4	Conv. (cfs)		85322.4	
Length Wtd. (ft)	14.13	Wetted Per. (ft)		58.69	
Min Ch El (ft)	1658.87	Shear (lb/sq ft)		2.51	
Alpha	1.00	Stream Power (lb/ft s)		65.11	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		28.48	
C & E Loss (ft)	0.09	Cum SA (acres)		5.12	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 16000.4*

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.8	1669.72	1067.6	1661.52	1068.4	1661.12	1069.2	1660.72	1070	1658.9
1083.5	1658.76	1103.1	1658.76	1116.6	1658.9	1117.4	1668.52	1118.6	1668.92
1119.4	1669.32	1120.2	1669.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.8	.015	1066.8	.015	1120.2	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.8	1120.2	14.13	14.13	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1675.49	Element			
Vel Head (ft)	10.70	Wt. n-Val.		0.015	
W.S. Elev (ft)	1664.79	Reach Len. (ft)	14.13	14.13	14.13
Crit W.S. (ft)	1667.96	Flow Area (sq ft)		290.91	
E.G. Slope (ft/ft)	0.008479	Area (sq ft)		290.91	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	49.81	Top Width (ft)		49.81	
Vel Total (ft/s)	26.26	Avg. Vel. (ft/s)		26.26	
Max Chl Dpth (ft)	6.03	Hydr. Depth (ft)		5.84	
Conv. Total (cfs)	82946.8	Conv. (cfs)		82946.8	
Length Wtd. (ft)	14.13	Wetted Per. (ft)		59.57	
Min Ch El (ft)	1658.76	Shear (lb/sq ft)		2.58	
Alpha	1.00	Stream Power (lb/ft s)		67.87	

Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	28.38
C & E Loss (ft)	0.07	Cum SA (acres)	5.11

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15986.2*

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1069.2	1668.48	1070.4	1662.68	1071.6	1662.08	1072.8	1661.48	1074	1658.75
1083	1658.66	1112.4	1658.66	1121.4	1658.75	1122.6	1666.68	1124.4	1667.28
1125.6	1667.88	1126.8	1668.48						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1069.2	.015	1069.2	.015	1126.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1069.2	1126.8	14.13	14.13	14.13	.3 .5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1675.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.85	Wt. n-Val.		0.015	
W.S. Elev (ft)	1664.48	Reach Len. (ft)	14.13	14.13	14.13
Crit W.S. (ft)	1667.79	Flow Area (sq ft)		288.90	
E.G. Slope (ft/ft)	0.008897	Area (sq ft)		288.90	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	52.24	Top Width (ft)		52.24	
Vel Total (ft/s)	26.44	Avg. Vel. (ft/s)		26.44	
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	80977.4	Conv. (cfs)		80977.4	
Length Wtd. (ft)	14.13	Wetted Per. (ft)		60.70	
Min Ch El (ft)	1658.66	Shear (lb/sq ft)		2.64	
Alpha	1.00	Stream Power (lb/ft s)		69.89	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		28.29	
C & E Loss (ft)	0.04	Cum SA (acres)		5.09	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15972.1*

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1071.6	1667.24	1073.2	1663.84	1074.8	1663.04	1076.4	1662.24	1078	1658.6
1082.5	1658.55	1121.7	1658.55	1126.2	1658.6	1127.8	1664.84	1130.2	1665.64
1131.8	1666.44	1133.4	1667.24						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1071.6	.015	1071.6	.015	1133.4	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1071.6	1133.4	14.13	14.13	14.13	.3 .5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1675.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.95	Wt. n-Val.		0.015	
W.S. Elev (ft)	1664.23	Reach Len. (ft)	14.13	14.13	14.13
Crit W.S. (ft)	1667.53	Flow Area (sq ft)		287.66	
E.G. Slope (ft/ft)	0.009284	Area (sq ft)		287.66	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	54.63	Top Width (ft)		54.63	
Vel Total (ft/s)	26.55	Avg. Vel. (ft/s)		26.55	
Max Chl Dpth (ft)	5.68	Hydr. Depth (ft)		5.27	
Conv. Total (cfs)	79270.5	Conv. (cfs)		79270.5	
Length Wtd. (ft)	14.13	Wetted Per. (ft)		62.00	
Min Ch El (ft)	1658.55	Shear (lb/sq ft)		2.69	
Alpha	1.00	Stream Power (lb/ft s)		71.40	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		28.19	
C & E Loss (ft)	0.03	Cum SA (acres)		5.07	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15958

INPUT
Description: END US95 R/W
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1074	1666	1076	1665	1078	1664	1080	1663	1082	1658.45
1131	1658.45	1133	1663	1136	1664	1138	1665	1140	1666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1074	.015	1074	.015	1140	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1074	1140	40	40	40	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1675.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	11.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1663.98	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	1667.23	Flow Area (sq ft)		286.60	
E.G. Slope (ft/ft)	0.009857	Area (sq ft)		286.60	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	57.92	Top Width (ft)		57.92	

Vel Total (ft/s)	26.65	Avg. Vel. (ft/s)	26.65
Max Chl Dpth (ft)	5.53	Hydr. Depth (ft)	4.95
Conv. Total (cfs)	76932.5	Conv. (cfs)	76932.5
Length Wtd. (ft)	40.00	Wetted Per. (ft)	64.25
Min Ch El (ft)	1658.45	Shear (lb/sq ft)	2.74
Alpha	1.00	Stream Power (lb/ft s)	73.15
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	28.10
C & E Loss (ft)	0.02	Cum SA (acres)	5.05

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15917.75

INPUT
Description: TIE INTO CONCRETE 209+50.28
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1057.8	1666.18	1068.4	1658.54	1092	1658.15	1114.5	1658.68	1128.5	1665.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1057.8	.015	1057.8	.015	1128.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1057.8	1128.5	49.75	49.75	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1674.57	Element			
Vel Head (ft)	10.86	Wt. n-Val.		0.015	
W.S. Elev (ft)	1663.71	Reach Len. (ft)	49.75	49.75	49.75
Crit W.S. (ft)	1666.88	Flow Area (sq ft)		288.79	
E.G. Slope (ft/ft)	0.009957	Area (sq ft)		288.79	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	63.10	Top Width (ft)		63.10	
Vel Total (ft/s)	26.45	Avg. Vel. (ft/s)		26.45	
Max Chl Dpth (ft)	5.56	Hydr. Depth (ft)		4.58	
Conv. Total (cfs)	76546.5	Conv. (cfs)		76546.5	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		65.98	
Min Ch El (ft)	1658.15	Shear (lb/sq ft)		2.72	
Alpha	1.00	Stream Power (lb/ft s)		71.95	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		27.84	
C & E Loss (ft)	0.05	Cum SA (acres)		5.00	

Warning: The cross section had to be extended vertically during the critical depth calculations.
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: Duckcreek
REACH: pittman RS: 15868

INPUT
Description: Sta 210+00 end transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1665.75	1062	1658.75	1092	1657.85	1122	1658.75	1122	1665.75

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	49.99	49.99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1674.03	Element			
Vel Head (ft)	10.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1663.10	Reach Len. (ft)	49.99	49.99	49.99
Crit W.S. (ft)	1666.25	Flow Area (sq ft)		287.81	
E.G. Slope (ft/ft)	0.010631	Area (sq ft)		287.81	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	26.54	Avg. Vel. (ft/s)		26.54	
Max Chl Dpth (ft)	5.25	Hydr. Depth (ft)		4.80	
Conv. Total (cfs)	74077.5	Conv. (cfs)		74077.5	
Length Wtd. (ft)	49.99	Wetted Per. (ft)		68.72	
Min Ch El (ft)	1657.85	Shear (lb/sq ft)		2.78	
Alpha	1.00	Stream Power (lb/ft s)		73.77	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)		27.51	
C & E Loss (ft)	0.02	Cum SA (acres)		4.93	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15818.*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1665.45	1062	1658.45	1092	1657.55	1122	1658.45	1122	1665.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	49.99	49.99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1673.39	Element			
Vel Head (ft)	10.49	Wt. n-Val.		0.015	

W.S. Elev (ft)	1662.90	Reach Len. (ft)	49.99	49.99	49.99
Crit W.S. (ft)	1665.95	Flow Area (sq ft)		293.92	
E.G. Slope (ft/ft)	0.009951	Area (sq ft)		293.92	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.99	Avg. Vel. (ft/s)		25.99	
Max Chl Dpth (ft)	5.35	Hydr. Depth (ft)		4.90	
Conv. Total (cfs)	76566.6	Conv. (cfs)		76566.6	
Length Wtd. (ft)	49.99	Wetted Per. (ft)		68.92	
Min Ch El (ft)	1657.55	Shear (lb/sq ft)		2.65	
Alpha	1.00	Stream Power (lb/ft s)		68.85	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)		27.17	
C & E Loss (ft)	0.14	Cum SA (acres)		4.86	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15768

INPUT
Description: Sta 211+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1665.15	1062	1658.15	1092	1657.25	1122	1658.15	1122	1665.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1672.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1662.69	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1665.65	Flow Area (sq ft)		299.65	
E.G. Slope (ft/ft)	0.009365	Area (sq ft)		299.65	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.49	Avg. Vel. (ft/s)		25.49	
Max Chl Dpth (ft)	5.44	Hydr. Depth (ft)		4.99	
Conv. Total (cfs)	78925.3	Conv. (cfs)		78925.3	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.12	
Min Ch El (ft)	1657.25	Shear (lb/sq ft)		2.53	
Alpha	1.00	Stream Power (lb/ft s)		64.61	
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)		26.83	
C & E Loss (ft)	0.12	Cum SA (acres)		4.79	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15744.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1664.87	1062	1657.87	1092	1656.97	1122	1657.87	1122	1664.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1672.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.04	Wt. n-Val.		0.015	
W.S. Elev (ft)	1662.43	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1665.37	Flow Area (sq ft)		300.44	
E.G. Slope (ft/ft)	0.009288	Area (sq ft)		300.44	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.42	Avg. Vel. (ft/s)		25.42	
Max Chl Dpth (ft)	5.46	Hydr. Depth (ft)		5.01	
Conv. Total (cfs)	79252.7	Conv. (cfs)		79252.7	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.14	
Min Ch El (ft)	1656.97	Shear (lb/sq ft)		2.52	
Alpha	1.00	Stream Power (lb/ft s)		64.06	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)		26.60	
C & E Loss (ft)	0.02	Cum SA (acres)		4.74	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15711.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1664.58	1062	1657.58	1092	1656.68	1122	1657.58	1122	1664.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1672.14	Element	Left OB	Channel	Right OB

Vel Head (ft)	9.99	Wt. n-Val.		0.015		
W.S. Elev (ft)	1662.15	Reach Len. (ft)	33.33	33.33	33.33	
Crit W.S. (ft)	1665.08	Flow Area (sq ft)		301.05		
E.G. Slope (ft/ft)	0.009229	Area (sq ft)		301.05		
Q Total (cfs)	7638.00	Flow (cfs)		7638.00		
Top Width (ft)	60.00	Top Width (ft)		60.00		
Vel Total (ft/s)	25.37	Avg. Vel. (ft/s)		25.37		
Max Chl Dpth (ft)	5.47	Hydr. Depth (ft)		5.02		
Conv. Total (cfs)	79506.1	Conv. (cfs)		79506.1		
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.16		
Min Ch El (ft)	1656.68	Shear (lb/sq ft)		2.51		
Alpha	1.00	Stream Power (lb/ft s)		63.63		
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)		26.37		
C & E Loss (ft)	0.01	Cum SA (acres)		4.70		

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15668

INPUT
Description: Sta 212+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1664.3	1062	1657.3	1092	1656.4	1122	1657.3	1122	1664.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33 33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1671.83	Element	Left OB	Channel	Right OB	
Vel Head (ft)	9.95	Wt. n-Val.		0.015		
W.S. Elev (ft)	1661.88	Reach Len. (ft)	33.33	33.33	33.33	
Crit W.S. (ft)	1664.80	Flow Area (sq ft)		301.78		
E.G. Slope (ft/ft)	0.009159	Area (sq ft)		301.78		
Q Total (cfs)	7638.00	Flow (cfs)		7638.00		
Top Width (ft)	60.00	Top Width (ft)		60.00		
Vel Total (ft/s)	25.31	Avg. Vel. (ft/s)		25.31		
Max Chl Dpth (ft)	5.48	Hydr. Depth (ft)		5.03		
Conv. Total (cfs)	79808.5	Conv. (cfs)		79808.5		
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.19		
Min Ch El (ft)	1656.40	Shear (lb/sq ft)		2.49		
Alpha	1.00	Stream Power (lb/ft s)		63.13		
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)		26.14		
C & E Loss (ft)	0.01	Cum SA (acres)		4.65		

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15644.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1664.02	1062	1657.02	1092	1656.12	1122	1657.02	1122	1664.02

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33 33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1671.51	Element	Left OB	Channel	Right OB	
Vel Head (ft)	9.90	Wt. n-Val.		0.015		
W.S. Elev (ft)	1661.61	Reach Len. (ft)	33.33	33.33	33.33	
Crit W.S. (ft)	1664.52	Flow Area (sq ft)		302.52		
E.G. Slope (ft/ft)	0.009090	Area (sq ft)		302.52		
Q Total (cfs)	7638.00	Flow (cfs)		7638.00		
Top Width (ft)	60.00	Top Width (ft)		60.00		
Vel Total (ft/s)	25.25	Avg. Vel. (ft/s)		25.25		
Max Chl Dpth (ft)	5.49	Hydr. Depth (ft)		5.04		
Conv. Total (cfs)	80112.7	Conv. (cfs)		80112.7		
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.21		
Min Ch El (ft)	1656.12	Shear (lb/sq ft)		2.48		
Alpha	1.00	Stream Power (lb/ft s)		62.63		
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		25.91		
C & E Loss (ft)	0.01	Cum SA (acres)		4.61		

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15611.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1663.73	1062	1656.73	1092	1655.83	1122	1656.73	1122	1663.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33 33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1671.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1661.33	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1664.23	Flow Area (sq ft)		302.93	
E.G. Slope (ft/ft)	0.009051	Area (sq ft)		302.93	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.21	Avg. Vel. (ft/s)		25.21	
Max Chl Dpth (ft)	5.50	Hydr. Depth (ft)		5.05	
Conv. Total (cfs)	80283.3	Conv. (cfs)		80283.3	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.22	
Min Ch El (ft)	1655.83	Shear (lb/sq ft)		2.47	
Alpha	1.00	Stream Power (lb/ft s)		62.35	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		25.68	
C & E Loss (ft)	0.01	Cum SA (acres)		4.56	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15568

INPUT
Description: Sta 213+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1663.45	1062	1656.45	1092	1655.55	1122	1656.45	1122	1663.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33 33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1670.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.83	Wt. n-Val.		0.015	
W.S. Elev (ft)	1661.06	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1663.95	Flow Area (sq ft)		303.50	
E.G. Slope (ft/ft)	0.008998	Area (sq ft)		303.50	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.17	Avg. Vel. (ft/s)		25.17	
Max Chl Dpth (ft)	5.51	Hydr. Depth (ft)		5.06	
Conv. Total (cfs)	80522.4	Conv. (cfs)		80522.4	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.24	
Min Ch El (ft)	1655.55	Shear (lb/sq ft)		2.46	
Alpha	1.00	Stream Power (lb/ft s)		61.96	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		25.45	
C & E Loss (ft)	0.01	Cum SA (acres)		4.51	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15544.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1663.17	1062	1656.17	1092	1655.27	1122	1656.17	1122	1663.17

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33 33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1670.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.80	Wt. n-Val.		0.015	
W.S. Elev (ft)	1660.79	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1663.67	Flow Area (sq ft)		304.08	
E.G. Slope (ft/ft)	0.008944	Area (sq ft)		304.08	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.12	Avg. Vel. (ft/s)		25.12	
Max Chl Dpth (ft)	5.52	Hydr. Depth (ft)		5.07	
Conv. Total (cfs)	80762.0	Conv. (cfs)		80762.0	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.26	
Min Ch El (ft)	1655.27	Shear (lb/sq ft)		2.45	
Alpha	1.00	Stream Power (lb/ft s)		61.58	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		25.22	
C & E Loss (ft)	0.01	Cum SA (acres)		4.47	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15511.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1662.88	1062	1655.88	1092	1654.98	1122	1655.88	1122	1662.88

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33 33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1670.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.78	Wt. n-Val.		0.015	
W.S. Elev (ft)	1660.50	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1663.38	Flow Area (sq ft)		304.33	
E.G. Slope (ft/ft)	0.008921	Area (sq ft)		304.33	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.10	Avg. Vel. (ft/s)		25.10	
Max Chl Dpth (ft)	5.52	Hydr. Depth (ft)		5.07	
Conv. Total (cfs)	80868.9	Conv. (cfs)		80868.9	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.27	
Min Ch El (ft)	1654.98	Shear (lb/sq ft)		2.45	
Alpha	1.00	Stream Power (lb/ft s)		61.41	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		24.98	
C & E Loss (ft)	0.00	Cum SA (acres)		4.42	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15468

INPUT
Description: Sta 214+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1662.6	1062	1655.6	1092	1654.7	1122	1655.6	1122	1662.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	30	30	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1669.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.76	Wt. n-Val.		0.015	
W.S. Elev (ft)	1660.23	Reach Len. (ft)	30.00	30.00	30.00
Crit W.S. (ft)	1663.10	Flow Area (sq ft)		304.63	
E.G. Slope (ft/ft)	0.008893	Area (sq ft)		304.63	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.07	Avg. Vel. (ft/s)		25.07	
Max Chl Dpth (ft)	5.53	Hydr. Depth (ft)		5.08	
Conv. Total (cfs)	80994.1	Conv. (cfs)		80994.1	
Length Wtd. (ft)	30.00	Wetted Per. (ft)		69.28	
Min Ch El (ft)	1654.70	Shear (lb/sq ft)		2.44	
Alpha	1.00	Stream Power (lb/ft s)		61.21	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		24.75	
C & E Loss (ft)	0.01	Cum SA (acres)		4.38	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15438

INPUT
Description: Sta 214+29.95 U/S of Park Lane Bridge
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1664.45	1062	1655.35	1092	1654.45	1122	1655.35	1122	1664.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	88	88	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1669.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.75	Wt. n-Val.		0.015	
W.S. Elev (ft)	1659.98	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1662.85	Flow Area (sq ft)		304.87	
E.G. Slope (ft/ft)	0.008872	Area (sq ft)		304.87	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	25.05	Avg. Vel. (ft/s)		25.05	
Max Chl Dpth (ft)	5.53	Hydr. Depth (ft)		5.08	
Conv. Total (cfs)	81091.9	Conv. (cfs)		81091.9	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		69.29	
Min Ch El (ft)	1654.45	Shear (lb/sq ft)		2.44	
Alpha	1.00	Stream Power (lb/ft s)		61.05	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		24.54	
C & E Loss (ft)	0.00	Cum SA (acres)		4.34	

BRIDGE RIVER: Duckcreek
REACH: pittman RS: 15437

INPUT
Description: Park Lane Bridge
Distance from Upstream XS = 1
Deck/Roadway Width = 86
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1062	1674	1663.3	1122	1674	1663.3

Upstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
    1062 1664.45    1062 1655.35    1092 1654.45    1122 1655.35    1122 1664.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1062    1122             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1062    1672 1662.65    1122    1672 1662.65

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062  1663.7    1062  1654.6    1092  1653.7    1122  1654.6    1122  1663.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1062    1122             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 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 Piers = 1

Pier Data
Pier Station     Upstream=    1092    Downstream=    1092
Upstream     num=       2
    Width   Elev    Width   Elev
        1   1652        1   1667
Downstream     num=       2
    Width   Elev    Width   Elev
        1   1652        1   1666

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
       Energy
       Momentum              Cd   =    1.33
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT    Profile #PF 1
Opening : Single BR

  E.G. US. (ft)              1667.95    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)              1659.98    E.G. Elev (ft)            1669.48       1667.95
  Q Total (cfs)              7638.00    W.S. Elev (ft)            1660.20       1659.81
  Q Bridge (cfs)             7638.00    Crit W.S. (ft)            1662.97       1662.23
  Q Weir (cfs)                          Max Chl Dpth (ft)           5.74          6.10
  Weir Sta Lft (ft)                     Vel Total (ft/s)           24.44         22.90
  Weir Sta Rgt (ft)                     Flow Area (sq ft)         312.52        333.54
  Weir Submerg                          Froude # Chl               1.87          1.70
  Weir Max Depth (ft)                   Specif Force (cu ft)    6678.77       6616.34
  Min El Weir Flow (ft)      1674.01    Hydr Depth (ft)            5.30          5.65
  Min El Prs (ft)            1663.30    W.P. Total (ft)           80.21         81.64
  Delta EG (ft)                 0.00    Conv. Total (cfs)        76654.6       84440.0
  Delta WS (ft)                 0.32    Top Width (ft)            59.00         59.00
  BR Open Area (sq ft)        495.16    Frctn Loss (ft)
  BR Open Vel (ft/s)           24.44    C & E Loss (ft)
  Coef of Q                             Shear Total (lb/sq ft)     2.41          2.09
  Br Sel Method            Momentum     Power Total (lb/ft s)     59.02         47.79


CROSS SECTION          RIVER: Duckcreek
REACH: pittman           RS: 15350

INPUT
Description: Sta 215+17.95 D/S of Park Lane Bridge
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062  1663.7    1062  1654.6    1092  1653.7    1122  1654.6    1122  1663.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1062    1122               41      41      41             .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)             1667.95    Element                  Left OB    Channel   Right OB
  Vel Head (ft)                 8.29    Wt. n-Val.                            0.015
```

W.S. Elev (ft)	1659.66	Reach Len. (ft)	41.00	41.00	41.00
Crit W.S. (ft)	1662.08	Flow Area (sq ft)		330.65	
E.G. Slope (ft/ft)	0.006881	Area (sq ft)		330.65	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.10	Avg. Vel. (ft/s)		23.10	
Max Chl Dpth (ft)	5.96	Hydr. Depth (ft)		5.51	
Conv. Total (cfs)	92080.6	Conv. (cfs)		92080.6	
Length Wtd. (ft)	41.00	Wetted Per. (ft)		70.15	
Min Ch El (ft)	1653.70	Shear (lb/sq ft)		2.02	
Alpha	1.00	Stream Power (lb/ft s)		46.77	
Frctn Loss (ft)		Cum Volume (acre-ft)		23.89	
C & E Loss (ft)		Cum SA (acres)		4.22	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15319.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1663.3	1062	1654.25	1092	1653.35	1122	1654.25	1122	1663.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	41	41	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1667.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.37	Wt. n-Val.		0.015	
W.S. Elev (ft)	1659.28	Reach Len. (ft)	41.00	41.00	41.00
Crit W.S. (ft)	1661.75	Flow Area (sq ft)		328.98	
E.G. Slope (ft/ft)	0.006990	Area (sq ft)		328.98	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.22	Avg. Vel. (ft/s)		23.22	
Max Chl Dpth (ft)	5.93	Hydr. Depth (ft)		5.48	
Conv. Total (cfs)	91355.2	Conv. (cfs)		91355.2	
Length Wtd. (ft)	41.00	Wetted Per. (ft)		70.09	
Min Ch El (ft)	1653.35	Shear (lb/sq ft)		2.05	
Alpha	1.00	Stream Power (lb/ft s)		47.55	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		23.58	
C & E Loss (ft)	0.01	Cum SA (acres)		4.16	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15268

INPUT
Description: Sta 216+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1660.9	1062	1653.9	1092	1653	1122	1653.9	1122	1660.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1667.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1658.91	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1661.40	Flow Area (sq ft)		327.31	
E.G. Slope (ft/ft)	0.007102	Area (sq ft)		327.31	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.34	Avg. Vel. (ft/s)		23.34	
Max Chl Dpth (ft)	5.91	Hydr. Depth (ft)		5.46	
Conv. Total (cfs)	90631.6	Conv. (cfs)		90631.6	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		70.04	
Min Ch El (ft)	1653.00	Shear (lb/sq ft)		2.07	
Alpha	1.00	Stream Power (lb/ft s)		48.36	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)		23.27	
C & E Loss (ft)	0.01	Cum SA (acres)		4.10	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15244.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1660.62	1062	1653.62	1092	1652.72	1122	1653.62	1122	1660.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1667.12	Element	Left OB	Channel	Right OB

Vel Head (ft)	8.51	Wt. n-Val.		0.015	
W.S. Elev (ft)	1658.61	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1661.12	Flow Area (sq ft)		326.23	
E.G. Slope (ft/ft)	0.007176	Area (sq ft)		326.23	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.41	Avg. Vel. (ft/s)		23.41	
Max Chl Dpth (ft)	5.89	Hydr. Depth (ft)		5.44	
Conv. Total (cfs)	90166.1	Conv. (cfs)		90166.1	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		70.00	
Min Ch El (ft)	1652.72	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)		48.88	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		23.02	
C & E Loss (ft)	0.01	Cum SA (acres)		4.06	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15211.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1660.33	1062	1653.33	1092	1652.43	1122	1653.33	1122	1660.33

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1666.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1658.30	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1660.83	Flow Area (sq ft)		325.10	
E.G. Slope (ft/ft)	0.007254	Area (sq ft)		325.10	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.49	Avg. Vel. (ft/s)		23.49	
Max Chl Dpth (ft)	5.87	Hydr. Depth (ft)		5.42	
Conv. Total (cfs)	89677.5	Conv. (cfs)		89677.5	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.96	
Min Ch El (ft)	1652.43	Shear (lb/sq ft)		2.10	
Alpha	1.00	Stream Power (lb/ft s)		49.44	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		22.77	
C & E Loss (ft)	0.01	Cum SA (acres)		4.01	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15168

INPUT
Description: Sta 217+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1660.05	1062	1653.05	1092	1652.15	1122	1653.05	1122	1660.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1666.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.62	Wt. n-Val.		0.015	
W.S. Elev (ft)	1658.00	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1660.55	Flow Area (sq ft)		324.20	
E.G. Slope (ft/ft)	0.007318	Area (sq ft)		324.20	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.56	Avg. Vel. (ft/s)		23.56	
Max Chl Dpth (ft)	5.85	Hydr. Depth (ft)		5.40	
Conv. Total (cfs)	89287.8	Conv. (cfs)		89287.8	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.93	
Min Ch El (ft)	1652.15	Shear (lb/sq ft)		2.12	
Alpha	1.00	Stream Power (lb/ft s)		49.90	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		22.52	
C & E Loss (ft)	0.00	Cum SA (acres)		3.97	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15144.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1660.27	1062	1652.77	1092	1651.87	1122	1652.77	1122	1660.27

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1666.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.67	Wt. n-Val.		0.015	
W.S. Elev (ft)	1657.71	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1660.25	Flow Area (sq ft)		323.29	
E.G. Slope (ft/ft)	0.007382	Area (sq ft)		323.29	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.63	Avg. Vel. (ft/s)		23.63	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		5.39	
Conv. Total (cfs)	88900.1	Conv. (cfs)		88900.1	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.90	
Min Ch El (ft)	1651.87	Shear (lb/sq ft)		2.13	
Alpha	1.00	Stream Power (lb/ft s)		50.35	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		22.27	
C & E Loss (ft)	0.00	Cum SA (acres)		3.92	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15111.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1660.48	1062	1652.48	1092	1651.58	1122	1652.48	1122	1660.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	33.33 33.33	33.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1666.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.71	Wt. n-Val.		0.015	
W.S. Elev (ft)	1657.40	Reach Len. (ft)	33.33	33.33	33.33
Crit W.S. (ft)	1659.98	Flow Area (sq ft)		322.41	
E.G. Slope (ft/ft)	0.007445	Area (sq ft)		322.41	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.69	Avg. Vel. (ft/s)		23.69	
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)		5.37	
Conv. Total (cfs)	88519.3	Conv. (cfs)		88519.3	
Length Wtd. (ft)	33.33	Wetted Per. (ft)		69.87	
Min Ch El (ft)	1651.58	Shear (lb/sq ft)		2.14	
Alpha	1.00	Stream Power (lb/ft s)		50.81	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)		22.03	
C & E Loss (ft)	0.00	Cum SA (acres)		3.87	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15068

INPUT
Description: Sta 218+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1660.7	1062	1652.2	1092	1651.3	1122	1652.2	1122	1660.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	3.77 3.77	3.77	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1665.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.75	Wt. n-Val.		0.015	
W.S. Elev (ft)	1657.11	Reach Len. (ft)	3.77	3.77	3.77
Crit W.S. (ft)	1659.70	Flow Area (sq ft)		321.68	
E.G. Slope (ft/ft)	0.007498	Area (sq ft)		321.68	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.74	Avg. Vel. (ft/s)		23.74	
Max Chl Dpth (ft)	5.81	Hydr. Depth (ft)		5.36	
Conv. Total (cfs)	88206.4	Conv. (cfs)		88206.4	
Length Wtd. (ft)	3.77	Wetted Per. (ft)		69.85	
Min Ch El (ft)	1651.30	Shear (lb/sq ft)		2.16	
Alpha	1.00	Stream Power (lb/ft s)		51.19	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)		21.78	
C & E Loss (ft)	0.00	Cum SA (acres)		3.83	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15064.22

INPUT
Description: PLANS STA = 21803.77 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1659.17	1062	1652.17	1092	1651.27	1122	1652.17	1122	1660.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96 47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1665.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.76	Wt. n-Val.		0.015	
W.S. Elev (ft)	1657.08	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1659.67	Flow Area (sq ft)		321.61	
E.G. Slope (ft/ft)	0.007503	Area (sq ft)		321.61	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.75	Avg. Vel. (ft/s)		23.75	
Max Chl Dpth (ft)	5.81	Hydr. Depth (ft)		5.36	
Conv. Total (cfs)	88176.7	Conv. (cfs)		88176.7	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.85	
Min Ch El (ft)	1651.27	Shear (lb/sq ft)		2.16	
Alpha	1.00	Stream Power (lb/ft s)		51.22	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		21.75	
C & E Loss (ft)	0.00	Cum SA (acres)		3.82	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 15016.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1659.04	1062	1651.76	1092	1650.86	1122	1651.76	1122	1660.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96 47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1665.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.82	Wt. n-Val.		0.015	
W.S. Elev (ft)	1656.65	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1659.24	Flow Area (sq ft)		320.51	
E.G. Slope (ft/ft)	0.007584	Area (sq ft)		320.51	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.83	Avg. Vel. (ft/s)		23.83	
Max Chl Dpth (ft)	5.79	Hydr. Depth (ft)		5.34	
Conv. Total (cfs)	87705.9	Conv. (cfs)		87705.9	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.81	
Min Ch El (ft)	1650.86	Shear (lb/sq ft)		2.17	
Alpha	1.00	Stream Power (lb/ft s)		51.80	
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)		21.40	
C & E Loss (ft)	0.01	Cum SA (acres)		3.76	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14968.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658.91	1062	1651.35	1092	1650.45	1122	1651.35	1122	1660.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96 47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1665.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.88	Wt. n-Val.		0.015	
W.S. Elev (ft)	1656.22	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1658.83	Flow Area (sq ft)		319.41	
E.G. Slope (ft/ft)	0.007666	Area (sq ft)		319.41	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.91	Avg. Vel. (ft/s)		23.91	
Max Chl Dpth (ft)	5.77	Hydr. Depth (ft)		5.32	
Conv. Total (cfs)	87235.9	Conv. (cfs)		87235.9	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.77	
Min Ch El (ft)	1650.45	Shear (lb/sq ft)		2.19	
Alpha	1.00	Stream Power (lb/ft s)		52.39	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)		21.05	
C & E Loss (ft)	0.01	Cum SA (acres)		3.69	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14920.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658.78	1062	1650.95	1092	1650.05	1122	1650.95	1122	1659.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96 47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1664.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.92	Wt. n-Val.		0.015	
W.S. Elev (ft)	1655.81	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1658.45	Flow Area (sq ft)		318.70	
E.G. Slope (ft/ft)	0.007720	Area (sq ft)		318.70	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.97	Avg. Vel. (ft/s)		23.97	
Max Chl Dpth (ft)	5.76	Hydr. Depth (ft)		5.31	
Conv. Total (cfs)	86930.8	Conv. (cfs)		86930.8	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.75	
Min Ch El (ft)	1650.05	Shear (lb/sq ft)		2.20	
Alpha	1.00	Stream Power (lb/ft s)		52.78	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)		20.69	
C & E Loss (ft)	0.00	Cum SA (acres)		3.62	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14872.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658.65	1062	1650.54	1092	1649.64	1122	1650.54	1122	1659.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96 47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1664.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.96	Wt. n-Val.		0.015	
W.S. Elev (ft)	1655.39	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1658.04	Flow Area (sq ft)		318.04	
E.G. Slope (ft/ft)	0.007770	Area (sq ft)		318.04	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.02	Avg. Vel. (ft/s)		24.02	
Max Chl Dpth (ft)	5.75	Hydr. Depth (ft)		5.30	
Conv. Total (cfs)	86651.1	Conv. (cfs)		86651.1	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.73	
Min Ch El (ft)	1649.64	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		53.13	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)		20.34	
C & E Loss (ft)	0.00	Cum SA (acres)		3.56	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14824.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658.52	1062	1650.13	1092	1649.23	1122	1650.13	1122	1659.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96 47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1663.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1654.97	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1657.61	Flow Area (sq ft)		317.39	
E.G. Slope (ft/ft)	0.007820	Area (sq ft)		317.39	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.06	Avg. Vel. (ft/s)		24.06	
Max Chl Dpth (ft)	5.74	Hydr. Depth (ft)		5.29	
Conv. Total (cfs)	86373.3	Conv. (cfs)		86373.3	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.71	
Min Ch El (ft)	1649.23	Shear (lb/sq ft)		2.22	
Alpha	1.00	Stream Power (lb/ft s)		53.49	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)		19.99	
C & E Loss (ft)	0.00	Cum SA (acres)		3.49	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14776.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658.39	1062	1649.72	1092	1648.82	1122	1649.72	1122	1659.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96 47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1663.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1654.55	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1657.20	Flow Area (sq ft)		316.74	
E.G. Slope (ft/ft)	0.007870	Area (sq ft)		316.74	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.11	Avg. Vel. (ft/s)		24.11	
Max Chl Dpth (ft)	5.73	Hydr. Depth (ft)		5.28	
Conv. Total (cfs)	86095.7	Conv. (cfs)		86095.7	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.68	
Min Ch El (ft)	1648.82	Shear (lb/sq ft)		2.23	
Alpha	1.00	Stream Power (lb/ft s)		53.86	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)		19.64	
C & E Loss (ft)	0.00	Cum SA (acres)		3.43	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14728.5*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658.26	1062	1649.32	1092	1648.42	1122	1649.32	1122	1658.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1663.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1654.14	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1656.80	Flow Area (sq ft)		316.26	
E.G. Slope (ft/ft)	0.007908	Area (sq ft)		316.26	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.15	Avg. Vel. (ft/s)		24.15	
Max Chl Dpth (ft)	5.72	Hydr. Depth (ft)		5.27	
Conv. Total (cfs)	85891.6	Conv. (cfs)		85891.6	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.67	
Min Ch El (ft)	1648.42	Shear (lb/sq ft)		2.24	
Alpha	1.00	Stream Power (lb/ft s)		54.12	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)		19.30	
C & E Loss (ft)	0.00	Cum SA (acres)		3.36	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14680.5*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658.13	1062	1648.91	1092	1648.01	1122	1648.91	1122	1658.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	47.96	47.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1662.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1653.72	Reach Len. (ft)	47.96	47.96	47.96
Crit W.S. (ft)	1656.39	Flow Area (sq ft)		315.63	
E.G. Slope (ft/ft)	0.007958	Area (sq ft)		315.63	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.20	Avg. Vel. (ft/s)		24.20	
Max Chl Dpth (ft)	5.71	Hydr. Depth (ft)		5.26	
Conv. Total (cfs)	85622.4	Conv. (cfs)		85622.4	
Length Wtd. (ft)	47.96	Wetted Per. (ft)		69.65	
Min Ch El (ft)	1648.01	Shear (lb/sq ft)		2.25	
Alpha	1.00	Stream Power (lb/ft s)		54.48	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)		18.95	
C & E Loss (ft)	0.00	Cum SA (acres)		3.29	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14632.63

INPUT
Description: PT at plans 222+35.36
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1658	1062	1648.5	1092	1647.6	1122	1648.5	1122	1658.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.

1062	1122		85.76	85.76	85.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1662.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.13	Wt. n-Val.		0.015	
W.S. Elev (ft)	1653.30	Reach Len. (ft)	85.76	85.76	85.76
Crit W.S. (ft)	1655.98	Flow Area (sq ft)		315.00	
E.G. Slope (ft/ft)	0.008008	Area (sq ft)		315.00	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.25	Avg. Vel. (ft/s)		24.25	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		5.25	
Conv. Total (cfs)	85354.9	Conv. (cfs)		85354.9	
Length Wtd. (ft)	85.76	Wetted Per. (ft)		69.63	
Min Ch El (ft)	1647.60	Shear (lb/sq ft)		2.26	
Alpha	1.00	Stream Power (lb/ft s)		54.84	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)		18.60	
C & E Loss (ft)	0.00	Cum SA (acres)		3.23	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14546.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1657.44	1062	1647.77	1092	1646.87	1122	1647.77	1122	1657.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	85.76	85.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1661.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1652.56	Reach Len. (ft)	85.76	85.76	85.76
Crit W.S. (ft)	1655.25	Flow Area (sq ft)		314.15	
E.G. Slope (ft/ft)	0.008076	Area (sq ft)		314.15	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.31	Avg. Vel. (ft/s)		24.31	
Max Chl Dpth (ft)	5.69	Hydr. Depth (ft)		5.24	
Conv. Total (cfs)	84994.6	Conv. (cfs)		84994.6	
Length Wtd. (ft)	85.76	Wetted Per. (ft)		69.60	
Min Ch El (ft)	1646.87	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		55.33	
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)		17.98	
C & E Loss (ft)	0.00	Cum SA (acres)		3.11	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14461.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1656.88	1062	1647.04	1092	1646.14	1122	1647.04	1122	1657.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	85.76	85.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1661.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.23	Wt. n-Val.		0.015	
W.S. Elev (ft)	1651.81	Reach Len. (ft)	85.76	85.76	85.76
Crit W.S. (ft)	1654.52	Flow Area (sq ft)		313.30	
E.G. Slope (ft/ft)	0.008144	Area (sq ft)		313.30	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.38	Avg. Vel. (ft/s)		24.38	
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)		5.22	
Conv. Total (cfs)	84634.8	Conv. (cfs)		84634.8	
Length Wtd. (ft)	85.76	Wetted Per. (ft)		69.57	
Min Ch El (ft)	1646.14	Shear (lb/sq ft)		2.29	
Alpha	1.00	Stream Power (lb/ft s)		55.82	
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)		17.36	
C & E Loss (ft)	0.00	Cum SA (acres)		2.99	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14375.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1656.31	1062	1646.31	1092	1645.42	1122	1646.31	1122	1656.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062 1122 85.76 85.76 85.76 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1660.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.26	Wt. n-Val.		0.015	
W.S. Elev (ft)	1651.08	Reach Len. (ft)	85.76	85.76	85.76
Crit W.S. (ft)	1653.79	Flow Area (sq ft)		312.78	
E.G. Slope (ft/ft)	0.008188	Area (sq ft)		312.78	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.42	Avg. Vel. (ft/s)		24.42	
Max Chl Dpth (ft)	5.66	Hydr. Depth (ft)		5.21	
Conv. Total (cfs)	84407.2	Conv. (cfs)		84407.2	
Length Wtd. (ft)	85.76	Wetted Per. (ft)		69.56	
Min Ch El (ft)	1645.42	Shear (lb/sq ft)		2.30	
Alpha	1.00	Stream Power (lb/ft s)		56.13	
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)		16.75	
C & E Loss (ft)	0.00	Cum SA (acres)		2.87	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14289.5*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1655.75	1062	1645.59	1092	1644.69	1122	1645.59	1122	1655.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062 1122 85.76 85.76 85.76 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1659.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.29	Wt. n-Val.		0.015	
W.S. Elev (ft)	1650.34	Reach Len. (ft)	85.76	85.76	85.76
Crit W.S. (ft)	1653.07	Flow Area (sq ft)		312.26	
E.G. Slope (ft/ft)	0.008229	Area (sq ft)		312.26	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.46	Avg. Vel. (ft/s)		24.46	
Max Chl Dpth (ft)	5.65	Hydr. Depth (ft)		5.20	
Conv. Total (cfs)	84198.1	Conv. (cfs)		84198.1	
Length Wtd. (ft)	85.76	Wetted Per. (ft)		69.54	
Min Ch El (ft)	1644.69	Shear (lb/sq ft)		2.31	
Alpha	1.00	Stream Power (lb/ft s)		56.43	
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)		16.13	
C & E Loss (ft)	0.00	Cum SA (acres)		2.76	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14203.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1655.19	1062	1644.86	1092	1643.96	1122	1644.86	1122	1655.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062 1122 85.76 85.76 85.76 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1658.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1649.61	Reach Len. (ft)	85.76	85.76	85.76
Crit W.S. (ft)	1652.34	Flow Area (sq ft)		311.72	
E.G. Slope (ft/ft)	0.008275	Area (sq ft)		311.72	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.50	Avg. Vel. (ft/s)		24.50	
Max Chl Dpth (ft)	5.65	Hydr. Depth (ft)		5.20	
Conv. Total (cfs)	83966.2	Conv. (cfs)		83966.2	
Length Wtd. (ft)	85.76	Wetted Per. (ft)		69.52	
Min Ch El (ft)	1643.96	Shear (lb/sq ft)		2.32	
Alpha	1.00	Stream Power (lb/ft s)		56.76	
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)		15.52	
C & E Loss (ft)	0.00	Cum SA (acres)		2.64	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14118.06

INPUT
Description: pc at plans 227+49.93
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1652.63	1062	1644.13	1092	1643.23	1122	1644.13	1122	1652.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062 1122 25.03 25.03 25.03 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1658.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.36	Wt. n-Val.		0.015	
W.S. Elev (ft)	1648.87	Reach Len. (ft)	25.03	25.03	25.03
Crit W.S. (ft)	1651.61	Flow Area (sq ft)		311.17	
E.G. Slope (ft/ft)	0.008321	Area (sq ft)		311.17	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.55	Avg. Vel. (ft/s)		24.55	
Max Chl Dpth (ft)	5.64	Hydr. Depth (ft)		5.19	
Conv. Total (cfs)	83734.4	Conv. (cfs)		83734.4	
Length Wtd. (ft)	25.03	Wetted Per. (ft)		69.50	
Min Ch El (ft)	1643.23	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)		57.09	
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)		14.91	
C & E Loss (ft)	0.00	Cum SA (acres)		2.52	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14093.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1652.42	1062	1643.92	1092	1643.02	1122	1643.92	1122	1652.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062 1122 25.03 25.03 25.03 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1658.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.36	Wt. n-Val.		0.015	
W.S. Elev (ft)	1648.65	Reach Len. (ft)	25.03	25.03	25.03
Crit W.S. (ft)	1651.40	Flow Area (sq ft)		311.06	
E.G. Slope (ft/ft)	0.008329	Area (sq ft)		311.06	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.55	Avg. Vel. (ft/s)		24.55	
Max Chl Dpth (ft)	5.63	Hydr. Depth (ft)		5.18	
Conv. Total (cfs)	83691.2	Conv. (cfs)		83691.2	
Length Wtd. (ft)	25.03	Wetted Per. (ft)		69.50	
Min Ch El (ft)	1643.02	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)		57.15	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		14.73	
C & E Loss (ft)	0.00	Cum SA (acres)		2.49	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14067.99

INPUT
Description: Plan Station 228+00.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1652.21	1062	1643.71	1092	1642.81	1122	1643.71	1122	1652.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062 1122 12.64 12.64 12.64 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1657.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.37	Wt. n-Val.		0.015	
W.S. Elev (ft)	1648.44	Reach Len. (ft)	12.64	12.64	12.64
Crit W.S. (ft)	1651.19	Flow Area (sq ft)		310.96	
E.G. Slope (ft/ft)	0.008337	Area (sq ft)		310.96	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.56	Avg. Vel. (ft/s)		24.56	
Max Chl Dpth (ft)	5.63	Hydr. Depth (ft)		5.18	
Conv. Total (cfs)	83649.4	Conv. (cfs)		83649.4	
Length Wtd. (ft)	12.64	Wetted Per. (ft)		69.49	
Min Ch El (ft)	1642.81	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)		57.21	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		14.55	
C & E Loss (ft)	0.00	Cum SA (acres)		2.45	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 14055.35

INPUT
Description: Plan Station 228+12.64 (U/S of New Beginnings Dr. Bridge)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1654.7	1062	1643.6	1092	1642.7	1122	1643.6	1122	1654.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1062    1122             87.6    87.6    87.6            .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1657.71    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              9.38    Wt. n-Val.                         0.015
  W.S. Elev (ft)          1648.33    Reach Len. (ft)            1.00       1.00      1.00
  Crit W.S. (ft)          1651.08    Flow Area (sq ft)                   310.79
  E.G. Slope (ft/ft)     0.008352    Area (sq ft)                        310.79
  Q Total (cfs)           7638.00    Flow (cfs)                         7638.00
  Top Width (ft)            60.00    Top Width (ft)                       60.00
  Vel Total (ft/s)          24.58    Avg. Vel. (ft/s)                     24.58
  Max Chl Dpth (ft)          5.63    Hydr. Depth (ft)                      5.18
  Conv. Total (cfs)         83576.9   Conv. (cfs)                        83576.9
  Length Wtd. (ft)           1.00    Wetted Per. (ft)                     69.49
  Min Ch El (ft)          1642.70    Shear (lb/sq ft)                      2.33
  Alpha                      1.00    Stream Power (lb/ft s)               57.31
  Frctn Loss (ft)            0.11    Cum Volume (acre-ft)                 14.46
  C & E Loss (ft)            0.00    Cum SA (acres)                        2.43


BRIDGE                  RIVER: Duckcreek
REACH: pittman          RS: 14054.35

INPUT
Description: NEW BEGINNINGS DRIVE CULVERT
Distance from Upstream XS =       1
Deck/Roadway Width        =    85.6
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1062    1660  1652.1    1122    1660  1652.1

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062  1654.7    1062  1643.6    1092  1642.7    1122  1643.6    1122  1654.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1062    1122             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1062    1660  1651.4    1122    1660  1651.4

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062 1653.95    1062 1642.85    1092 1641.95    1122 1642.85    1122 1653.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1062    1122             .1       .3

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 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 Piers =  1

Pier Data
Pier Station     Upstream=    1092    Downstream=    1092
Upstream     num=       2
    Width   Elev    Width   Elev
       1    1640        1    1655
Downstream     num=       2
    Width   Elev    Width   Elev
       1    1640        1    1655

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =    1.33
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT    Profile #PF 1
Opening : Single BR
```

E.G. US. (ft)	1656.00	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1648.33	E.G. Elev (ft)	1657.47	1656.00
Q Total (cfs)	7638.00	W.S. Elev (ft)	1648.56	1648.18
Q Bridge (cfs)	7638.00	Crit W.S. (ft)	1651.18	1650.43
Q Weir (cfs)		Max Chl Dpth (ft)	5.85	6.21
Weir Sta Lft (ft)		Vel Total (ft/s)	23.96	22.45
Weir Sta Rgt (ft)		Flow Area (sq ft)	318.85	340.28
Weir Submerg		Froude # Chl	1.82	1.65
Weir Max Depth (ft)		Specif Force (cu ft)	6594.09	6555.27
Min El Weir Flow (ft)	1660.01	Hydr Depth (ft)	5.40	5.77
Min El Prs (ft)	1652.10	W.P. Total (ft)	80.64	82.10
Delta EG (ft)	0.00	Conv. Total (cfs)	78975.8	86979.1
Delta WS (ft)	0.31	Top Width (ft)	59.00	59.00
BR Open Area (sq ft)	527.61	Frctn Loss (ft)		
BR Open Vel (ft/s)	23.96	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.31	2.00
Br Sel Method	Momentum	Power Total (lb/ft s)	55.31	44.79

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13967.75

INPUT
Description: Plan Station 229+00.24 (D/S of New Beginnings Dr. Bridge)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1653.95	1062	1642.85	1092	1641.95	1122	1642.85	1122	1653.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	35.88	35.88	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1656.00	Element			
Vel Head (ft)	7.98	Wt. n-Val.		0.015	
W.S. Elev (ft)	1648.02	Reach Len. (ft)	35.88	35.88	35.88
Crit W.S. (ft)	1650.33	Flow Area (sq ft)		336.93	
E.G. Slope (ft/ft)	0.006488	Area (sq ft)		336.93	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	22.67	Avg. Vel. (ft/s)		22.67	
Max Chl Dpth (ft)	6.07	Hydr. Depth (ft)		5.62	
Conv. Total (cfs)	94827.1	Conv. (cfs)		94827.1	
Length Wtd. (ft)	35.88	Wetted Per. (ft)		70.36	
Min Ch El (ft)	1641.95	Shear (lb/sq ft)		1.94	
Alpha	1.00	Stream Power (lb/ft s)		43.97	
Frctn Loss (ft)		Cum Volume (acre-ft)		13.80	
C & E Loss (ft)		Cum SA (acres)		2.31	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13931.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1652.34	1062	1642.54	1092	1641.65	1122	1642.54	1122	1652.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	35.88	35.88	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Rignt OB
E.G. Elev (ft)	1655.75	Element			
Vel Head (ft)	8.07	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.68	Reach Len. (ft)	35.88	35.88	35.88
Crit W.S. (ft)	1650.02	Flow Area (sq ft)		334.98	
E.G. Slope (ft/ft)	0.006607	Area (sq ft)		334.98	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	22.80	Avg. Vel. (ft/s)		22.80	
Max Chl Dpth (ft)	6.03	Hydr. Depth (ft)		5.58	
Conv. Total (cfs)	93964.5	Conv. (cfs)		93964.5	
Length Wtd. (ft)	35.88	Wetted Per. (ft)		70.30	
Min Ch El (ft)	1641.65	Shear (lb/sq ft)		1.97	
Alpha	1.00	Stream Power (lb/ft s)		44.82	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)		13.52	
C & E Loss (ft)	0.01	Cum SA (acres)		2.27	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13895.99

INPUT
Description: Plan Station 229+72.00 (Grade Break)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1650.74	1062	1642.24	1092	1641.34	1122	1642.24	1122	1650.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left Pight Lengths: Left Channel Right Coeff Contr. Expan.

1062	1122	7.7	7.7	7.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1655.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.17	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.34	Reach Len. (ft)	7.70	7.70	7.70
Crit W.S. (ft)	1649.72	Flow Area (sq ft)		333.04	
E.G. Slope (ft/ft)	0.006727	Area (sq ft)		333.04	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	22.93	Avg. Vel. (ft/s)		22.93	
Max Chl Dpth (ft)	6.00	Hydr. Depth (ft)		5.55	
Conv. Total (cfs)	93124.3	Conv. (cfs)		93124.3	
Length Wtd. (ft)	7.70	Wetted Per. (ft)		70.23	
Min Ch El (ft)	1641.34	Shear (lb/sq ft)		1.99	
Alpha	1.00	Stream Power (lb/ft s)		45.68	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		13.24	
C & E Loss (ft)	0.01	Cum SA (acres)		2.22	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13888.29

INPUT
Description: Plan Station 229+79.70 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1650.66	1062	1642.16	1092	1641.26	1122	1642.16	1122	1650.66

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	20.3	20.3	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1655.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.25	Reach Len. (ft)	20.30	20.30	20.30
Crit W.S. (ft)	1649.64	Flow Area (sq ft)		332.28	
E.G. Slope (ft/ft)	0.006775	Area (sq ft)		332.28	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	22.99	Avg. Vel. (ft/s)		22.99	
Max Chl Dpth (ft)	5.99	Hydr. Depth (ft)		5.54	
Conv. Total (cfs)	92792.0	Conv. (cfs)		92792.0	
Length Wtd. (ft)	20.30	Wetted Per. (ft)		70.20	
Min Ch El (ft)	1641.26	Shear (lb/sq ft)		2.00	
Alpha	1.00	Stream Power (lb/ft s)		46.02	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		13.18	
C & E Loss (ft)	0.00	Cum SA (acres)		2.21	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13867.99

INPUT
Description: Plan Station 230+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1650.46	1062	1641.96	1092	1641.06	1122	1641.96	1122	1650.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1655.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.29	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.02	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1649.44	Flow Area (sq ft)		330.57	
E.G. Slope (ft/ft)	0.006886	Area (sq ft)		330.57	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.11	Avg. Vel. (ft/s)		23.11	
Max Chl Dpth (ft)	5.96	Hydr. Depth (ft)		5.51	
Conv. Total (cfs)	92047.1	Conv. (cfs)		92047.1	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		70.15	
Min Ch El (ft)	1641.06	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)		46.81	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		13.03	
C & E Loss (ft)	0.01	Cum SA (acres)		2.18	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13767.99

INPUT
Description: Plan Station 231+00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1649.46	1062	1640.96	1092	1640.06	1122	1640.96	1122	1649.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	39.85	39.85	39.85	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1654.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1645.90	Reach Len. (ft)	39.85	39.85	39.85
Crit W.S. (ft)	1648.44	Flow Area (sq ft)		323.44	
E.G. Slope (ft/ft)	0.007371	Area (sq ft)		323.44	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.62	Avg. Vel. (ft/s)		23.62	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		5.39	
Conv. Total (cfs)	88961.5	Conv. (cfs)		88961.5	
Length Wtd. (ft)	39.85	Wetted Per. (ft)		69.91	
Min Ch El (ft)	1640.06	Shear (lb/sq ft)		2.13	
Alpha	1.00	Stream Power (lb/ft s)		50.28	
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)		12.28	
C & E Loss (ft)	0.04	Cum SA (acres)		2.04	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13728.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1649.06	1062	1640.56	1092	1639.66	1122	1640.56	1122	1649.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	39.85	39.85	39.85	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1654.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1645.46	Reach Len. (ft)	39.85	39.85	39.85
Crit W.S. (ft)	1648.04	Flow Area (sq ft)		321.05	
E.G. Slope (ft/ft)	0.007544	Area (sq ft)		321.05	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.79	Avg. Vel. (ft/s)		23.79	
Max Chl Dpth (ft)	5.80	Hydr. Depth (ft)		5.35	
Conv. Total (cfs)	87938.0	Conv. (cfs)		87938.0	
Length Wtd. (ft)	39.85	Wetted Per. (ft)		69.83	
Min Ch El (ft)	1639.66	Shear (lb/sq ft)		2.17	
Alpha	1.00	Stream Power (lb/ft s)		51.52	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		11.98	
C & E Loss (ft)	0.01	Cum SA (acres)		1.98	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13688.29

INPUT
Description: Plan Station 231+79.70 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1648.66	1062	1640.16	1092	1639.26	1122	1640.16	1122	1648.66

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	42.55	42.55	42.55	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.92	Wt. n-Val.		0.015	
W.S. Elev (ft)	1645.02	Reach Len. (ft)	42.55	42.55	42.55
Crit W.S. (ft)	1647.64	Flow Area (sq ft)		318.67	
E.G. Slope (ft/ft)	0.007722	Area (sq ft)		318.67	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.97	Avg. Vel. (ft/s)		23.97	
Max Chl Dpth (ft)	5.76	Hydr. Depth (ft)		5.31	
Conv. Total (cfs)	86919.9	Conv. (cfs)		86919.9	
Length Wtd. (ft)	42.55	Wetted Per. (ft)		69.75	
Min Ch El (ft)	1639.26	Shear (lb/sq ft)		2.20	
Alpha	1.00	Stream Power (lb/ft s)		52.79	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		11.69	
C & E Loss (ft)	0.01	Cum SA (acres)		1.93	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13645.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1649.29	1062	1639.63	1092	1638.83	1122	1639.73	1122	1648.23

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	42.55	42.55	42.55	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.07	Wt. n-Val.		0.015	
W.S. Elev (ft)	1644.52	Reach Len. (ft)	42.55	42.55	42.55
Crit W.S. (ft)	1647.21	Flow Area (sq ft)		316.03	
E.G. Slope (ft/ft)	0.007933	Area (sq ft)		316.03	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.17	Avg. Vel. (ft/s)		24.17	
Max Chl Dpth (ft)	5.69	Hydr. Depth (ft)		5.27	
Conv. Total (cfs)	85754.1	Conv. (cfs)		85754.1	
Length Wtd. (ft)	42.55	Wetted Per. (ft)		69.71	
Min Ch El (ft)	1638.83	Shear (lb/sq ft)		2.25	
Alpha	1.00	Stream Power (lb/ft s)		54.27	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		11.38	
C & E Loss (ft)	0.01	Cum SA (acres)		1.87	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13603.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1649.92	1062	1639.09	1092	1638.41	1122	1639.31	1122	1647.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	42.55	42.55	42.55	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1644.03	Reach Len. (ft)	42.55	42.55	42.55
Crit W.S. (ft)	1646.74	Flow Area (sq ft)		313.72	
E.G. Slope (ft/ft)	0.008126	Area (sq ft)		313.72	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.35	Avg. Vel. (ft/s)		24.35	
Max Chl Dpth (ft)	5.62	Hydr. Depth (ft)		5.23	
Conv. Total (cfs)	84729.3	Conv. (cfs)		84729.3	
Length Wtd. (ft)	42.55	Wetted Per. (ft)		69.69	
Min Ch El (ft)	1638.41	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		55.60	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)		11.07	
C & E Loss (ft)	0.01	Cum SA (acres)		1.81	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13560.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1650.54	1062	1638.56	1092	1637.99	1122	1638.89	1122	1647.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	42.55	42.55	42.55	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.55	Reach Len. (ft)	42.55	42.55	42.55
Crit W.S. (ft)	1646.31	Flow Area (sq ft)		311.70	
E.G. Slope (ft/ft)	0.008301	Area (sq ft)		311.70	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.50	Avg. Vel. (ft/s)		24.50	
Max Chl Dpth (ft)	5.56	Hydr. Depth (ft)		5.19	
Conv. Total (cfs)	83833.1	Conv. (cfs)		83833.1	
Length Wtd. (ft)	42.55	Wetted Per. (ft)		69.67	
Min Ch El (ft)	1637.99	Shear (lb/sq ft)		2.32	
Alpha	1.00	Stream Power (lb/ft s)		56.81	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)		10.77	
C & E Loss (ft)	0.01	Cum SA (acres)		1.75	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13518.09

INPUT
Description: flowline seperation 233+50.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1651.17	1062	1638.03	1092	1637.56	1122	1638.46	1122	1646.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

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    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1062    1122              8.8     8.8     8.8             .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1652.51   Element                 Left OB    Channel   Right OB
  Vel Head (ft)              9.44   Wt. n-Val.                         0.015
  W.S. Elev (ft)          1643.07   Reach Len. (ft)            8.80      8.80      8.80
  Crit W.S. (ft)          1645.84   Flow Area (sq ft)                  309.72
  E.G. Slope (ft/ft)     0.008476   Area (sq ft)                       309.72
  Q Total (cfs)           7638.00   Flow (cfs)                        7638.00
  Top Width (ft)            60.00   Top Width (ft)                     60.00
  Vel Total (ft/s)          24.66   Avg. Vel. (ft/s)                   24.66
  Max Chl Dpth (ft)          5.50   Hydr. Depth (ft)                    5.16
  Conv. Total (cfs)        82963.2   Conv. (cfs)                       82963.2
  Length Wtd. (ft)           8.80   Wetted Per. (ft)                   69.66
  Min Ch El (ft)          1637.56   Shear (lb/sq ft)                    2.35
  Alpha                      1.00   Stream Power (lb/ft s)             58.02
  Frctn Loss (ft)            0.36   Cum Volume (acre-ft)               10.47
  C & E Loss (ft)            0.01   Cum SA (acres)                      1.70


CROSS SECTION          RIVER: Duckcreek
REACH: pittman           RS: 13509.2*

INPUT
Description:
Station Elevation Data    num=      7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062 1651.11    1062 1638.03    1087 1637.52    1092 1637.62    1097 1637.43
    1122 1638.15    1122 1648.26

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1062    1122              8.8     8.8     8.8             .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1652.43   Element                 Left OB    Channel   Right OB
  Vel Head (ft)              9.55   Wt. n-Val.                         0.015
  W.S. Elev (ft)          1642.88   Reach Len. (ft)            8.80      8.80      8.80
  Crit W.S. (ft)          1645.70   Flow Area (sq ft)                  307.99
  E.G. Slope (ft/ft)     0.008625   Area (sq ft)                       307.99
  Q Total (cfs)           7638.00   Flow (cfs)                        7638.00
  Top Width (ft)            60.00   Top Width (ft)                     60.00
  Vel Total (ft/s)          24.80   Avg. Vel. (ft/s)                   24.80
  Max Chl Dpth (ft)          5.45   Hydr. Depth (ft)                    5.13
  Conv. Total (cfs)        82242.2   Conv. (cfs)                       82242.2
  Length Wtd. (ft)           8.80   Wetted Per. (ft)                   69.59
  Min Ch El (ft)          1637.43   Shear (lb/sq ft)                    2.38
  Alpha                      1.00   Stream Power (lb/ft s)             59.10
  Frctn Loss (ft)            0.08   Cum Volume (acre-ft)               10.40
  C & E Loss (ft)            0.01   Cum SA (acres)                      1.68


CROSS SECTION          RIVER: Duckcreek
REACH: pittman           RS: 13500.4*

INPUT
Description:
Station Elevation Data    num=      7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062 1651.06    1062 1638.03    1082 1637.48    1092 1637.68    1102 1637.31
    1122 1637.83    1122 1649.55

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1062    1122              8.8     8.8     8.8             .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1652.35   Element                 Left OB    Channel   Right OB
  Vel Head (ft)              9.62   Wt. n-Val.                         0.015
  W.S. Elev (ft)          1642.74   Reach Len. (ft)            8.80      8.80      8.80
  Crit W.S. (ft)          1645.58   Flow Area (sq ft)                  306.91
  E.G. Slope (ft/ft)     0.008734   Area (sq ft)                       306.91
  Q Total (cfs)           7638.00   Flow (cfs)                        7638.00
  Top Width (ft)            60.00   Top Width (ft)                     60.00
  Vel Total (ft/s)          24.89   Avg. Vel. (ft/s)                   24.89
  Max Chl Dpth (ft)          5.43   Hydr. Depth (ft)                    5.12
  Conv. Total (cfs)        81729.5   Conv. (cfs)                       81729.5
  Length Wtd. (ft)           8.80   Wetted Per. (ft)                   69.64
  Min Ch El (ft)          1637.31   Shear (lb/sq ft)                    2.40
  Alpha                      1.00   Stream Power (lb/ft s)             59.81
  Frctn Loss (ft)            0.08   Cum Volume (acre-ft)               10.34
  C & E Loss (ft)            0.01   Cum SA (acres)                      1.67


CROSS SECTION          RIVER: Duckcreek
REACH: pittman           RS: 13491.7

INPUT
Description: U/S RUSSELL BRIDGE
Station Elevation Data    num=      7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062    1651    1062 1638.03    1077 1637.44    1092 1637.74    1107 1637.18
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    1122 1637.52    1122 1650.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1062    1122              123     123     123             .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1652.28    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              9.64     Wt. n-Val.                         0.015
  W.S. Elev (ft)           1642.64    Reach Len. (ft)            1.00      1.00       1.00
  Crit W.S. (ft)           1645.47    Flow Area (sq ft)                   306.54
  E.G. Slope (ft/ft)       0.008791   Area (sq ft)                        306.54
  Q Total (cfs)            7638.00    Flow (cfs)                         7638.00
  Top Width (ft)             60.00    Top Width (ft)                       60.00
  Vel Total (ft/s)           24.92    Avg. Vel. (ft/s)                     24.92
  Max Chl Dpth (ft)           5.46    Hydr. Depth (ft)                      5.11
  Conv. Total (cfs)        81461.6    Conv. (cfs)                        81461.6
  Length Wtd. (ft)           1.00     Wetted Per. (ft)                     69.76
  Min Ch El (ft)           1637.18    Shear (lb/sq ft)                      2.41
  Alpha                      1.00     Stream Power (lb/ft s)               60.09
  Frctn Loss (ft)            0.08     Cum Volume (acre-ft)                 10.28
  C & E Loss (ft)            0.00     Cum SA (acres)                        1.66


BRIDGE                  RIVER: Duckcreek
REACH: pittman          RS: 13490.7

INPUT
Description: RUSSELL ROAD BRIDGE
Distance from Upstream XS =       1
Deck/Roadway Width        =     121
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1062    1657 1646.84    1122    1657 1646.58

Upstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062    1651    1062 1638.03    1077 1637.44    1092 1637.74    1107 1637.18
    1122 1637.52    1122 1650.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1062    1122             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1062    1654 1645.55    1122    1654 1645.36

Downstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1062 1648.86    1062 1636.69    1077 1636.15    1092  1636.4    1107 1635.97
    1122 1636.34    1122 1648.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1062    .015    1062    .015    1122    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1062    1122             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 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 Piers =  1

Pier Data
Pier Station     Upstream=    1092    Downstream=    1092
Upstream     num=       2
    Width   Elev    Width   Elev
        2    1637        2 1651.01
Downstream       num=       2
    Width   Elev    Width   Elev
        2  1635.5        2 1648.72

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =    1.33
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Do not add Friction component to Momentum
       Do not add Weight component to Momentum
```

Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1
Opening : Single BR

			Inside BR US	Inside BR DS
E.G. US. (ft)	1650.60	Element		
W.S. US. (ft)	1642.64	E.G. Elev (ft)	1651.87	1650.60
Q Total (cfs)	7638.00	W.S. Elev (ft)	1643.05	1641.78
Q Bridge (cfs)	7638.00	Crit W.S. (ft)	1645.66	1644.37
Q Weir (cfs)		Max Chl Dpth (ft)	5.87	5.81
Weir Sta Lft (ft)		Vel Total (ft/s)	23.83	23.83
Weir Sta Rgt (ft)		Flow Area (sq ft)	320.53	320.56
Weir Submerg		Froude # Chl	1.79	1.79
Weir Max Depth (ft)		Specif Force (cu ft)	6627.82	6654.24
Min El Weir Flow (ft)	1657.01	Hydr Depth (ft)	5.53	5.53
Min El Prs (ft)	1646.84	W.P. Total (ft)	79.27	79.36
Delta EG (ft)	0.00	Conv. Total (cfs)	80590.9	80538.2
Delta WS (ft)	1.12	Top Width (ft)	58.00	58.00
BR Open Area (sq ft)	532.60	Frctn Loss (ft)		
BR Open Vel (ft/s)	23.83	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.27	2.27
Br Sel Method	Momentum	Power Total (lb/ft s)	54.03	54.04

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: Duckcreek
REACH: pittman RS: 13368.7

INPUT
Description: D/S RUSSELL BRIDGE
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1648.86	1062	1636.69	1077	1636.15	1092	1636.4	1107	1635.97
1122	1636.34	1122	1648.57						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	26.44	26.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1650.60	Element			
Vel Head (ft)	9.07	Wt. n-Val.		0.015	
W.S. Elev (ft)	1641.53	Reach Len. (ft)	26.44	26.44	26.44
Crit W.S. (ft)	1644.19	Flow Area (sq ft)		316.03	
E.G. Slope (ft/ft)	0.007984	Area (sq ft)		316.03	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	24.17	Avg. Vel. (ft/s)		24.17	
Max Chl Dpth (ft)	5.56	Hydr. Depth (ft)		5.27	
Conv. Total (cfs)	85480.0	Conv. (cfs)		85480.0	
Length Wtd. (ft)	26.44	Wetted Per. (ft)		70.04	
Min Ch El (ft)	1635.97	Shear (lb/sq ft)		2.25	
Alpha	1.00	Stream Power (lb/ft s)		54.35	
Frctn Loss (ft)		Cum Volume (acre-ft)		9.37	
C & E Loss (ft)		Cum SA (acres)		1.50	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13342.26

INPUT
Description: flowline junction
13352 (PLAN STA = 23525)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1644.94	1062	1636.57	1077	1636.19	1092	1635.8	1107	1636.06
1122	1636.32	1122	1647.94						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	51.17	51.17	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1650.34	Element			
Vel Head (ft)	8.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1641.44	Reach Len. (ft)	51.17	51.17	51.17
Crit W.S. (ft)	1644.05	Flow Area (sq ft)		319.17	
E.G. Slope (ft/ft)	0.007720	Area (sq ft)		319.17	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.93	Avg. Vel. (ft/s)		23.93	
Max Chl Dpth (ft)	5.64	Hydr. Depth (ft)		5.32	
Conv. Total (cfs)	86928.4	Conv. (cfs)		86928.4	
Length Wtd. (ft)	51.17	Wetted Per. (ft)		70.01	
Min Ch El (ft)	1635.80	Shear (lb/sq ft)		2.20	
Alpha	1.00	Stream Power (lb/ft s)		52.58	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		9.18	
C & E Loss (ft)	0.05	Cum SA (acres)		1.46	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13291.09

INPUT
Description: grade break start transition 235+77.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062	1646.19	1062	1636.19	1092	1635.29	1122	1636.17	1122	1646.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062	.015	1062	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062	1122	24.7	24.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.94	Element			
Vel Head (ft)	8.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1641.06	Reach Len. (ft)	24.70	24.70	24.70
Crit W.S. (ft)	1643.68	Flow Area (sq ft)		319.28	
E.G. Slope (ft/ft)	0.007678	Area (sq ft)		319.28	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.92	Avg. Vel. (ft/s)		23.92	
Max Chl Dpth (ft)	5.77	Hydr. Depth (ft)		5.32	
Conv. Total (cfs)	87169.3	Conv. (cfs)		87169.3	
Length Wtd. (ft)	24.70	Wetted Per. (ft)		69.78	
Min Ch El (ft)	1635.29	Shear (lb/sq ft)		2.19	
Alpha	1.00	Stream Power (lb/ft s)		52.47	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		8.81	
C & E Loss (ft)	0.00	Cum SA (acres)		1.39	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13266.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.64	1645.96	1062.64	1635.91	1092	1635.03	1121.36	1635.89	1121.36	1645.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.64	.015	1062.64	.015	1121.36	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062.64	1121.36	24.7	24.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.74	Element			
Vel Head (ft)	8.81	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.93	Reach Len. (ft)	24.70	24.70	24.70
Crit W.S. (ft)	1643.51	Flow Area (sq ft)		320.65	
E.G. Slope (ft/ft)	0.007427	Area (sq ft)		320.65	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	58.72	Top Width (ft)		58.72	
Vel Total (ft/s)	23.82	Avg. Vel. (ft/s)		23.82	
Max Chl Dpth (ft)	5.90	Hydr. Depth (ft)		5.46	
Conv. Total (cfs)	88628.2	Conv. (cfs)		88628.2	
Length Wtd. (ft)	24.70	Wetted Per. (ft)		68.80	
Min Ch El (ft)	1635.03	Shear (lb/sq ft)		2.16	
Alpha	1.00	Stream Power (lb/ft s)		51.48	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		8.62	
C & E Loss (ft)	0.02	Cum SA (acres)		1.35	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13241.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1063.29	1645.72	1063.29	1635.63	1092	1634.77	1120.71	1635.62	1120.71	1645.72

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1063.29	.015	1063.29	.015	1120.71	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1063.29	1120.71	24.7	24.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.53	Element			
Vel Head (ft)	8.72	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.81	Reach Len. (ft)	24.70	24.70	24.70
Crit W.S. (ft)	1643.38	Flow Area (sq ft)		322.29	
E.G. Slope (ft/ft)	0.007163	Area (sq ft)		322.29	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	57.42	Top Width (ft)		57.42	
Vel Total (ft/s)	23.70	Avg. Vel. (ft/s)		23.70	
Max Chl Dpth (ft)	6.04	Hydr. Depth (ft)		5.61	
Conv. Total (cfs)	90244.0	Conv. (cfs)		90244.0	
Length Wtd. (ft)	24.70	Wetted Per. (ft)		67.82	
Min Ch El (ft)	1634.77	Shear (lb/sq ft)		2.13	
Alpha	1.00	Stream Power (lb/ft s)		50.37	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)		8.44	
C & E Loss (ft)	0.03	Cum SA (acres)		1.32	

CROSS SECTION RIVER: Duckcreek

REACH: pittman RS: 13217.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1063.93	1645.49	1063.93	1635.35	1092	1634.51	1120.07	1635.34	1120.07	1645.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1063.93	.015	1063.93	.015	1120.07	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1063.93	1120.07	24.7	24.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.34	Element			
Vel Head (ft)	8.64	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.70	Reach Len. (ft)	24.70	24.70	24.70
Crit W.S. (ft)	1643.21	Flow Area (sq ft)		323.78	
E.G. Slope (ft/ft)	0.006922	Area (sq ft)		323.78	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	56.14	Top Width (ft)		56.14	
Vel Total (ft/s)	23.59	Avg. Vel. (ft/s)		23.59	
Max Chl Dpth (ft)	6.18	Hydr. Depth (ft)		5.77	
Conv. Total (cfs)	91804.9	Conv. (cfs)		91804.9	
Length Wtd. (ft)	24.70	Wetted Per. (ft)		66.86	
Min Ch El (ft)	1634.51	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)		49.36	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		8.26	
C & E Loss (ft)	0.02	Cum SA (acres)		1.29	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13192.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1064.57	1645.26	1064.57	1635.07	1092	1634.24	1119.43	1635.06	1119.43	1645.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1064.57	.015	1064.57	.015	1119.43	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1064.57	1119.43	24.7	24.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.15	Element			
Vel Head (ft)	8.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.58	Reach Len. (ft)	24.70	24.70	24.70
Crit W.S. (ft)	1643.09	Flow Area (sq ft)		325.16	
E.G. Slope (ft/ft)	0.006696	Area (sq ft)		325.16	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	54.86	Top Width (ft)		54.86	
Vel Total (ft/s)	23.49	Avg. Vel. (ft/s)		23.49	
Max Chl Dpth (ft)	6.34	Hydr. Depth (ft)		5.93	
Conv. Total (cfs)	93343.1	Conv. (cfs)		93343.1	
Length Wtd. (ft)	24.70	Wetted Per. (ft)		65.91	
Min Ch El (ft)	1634.24	Shear (lb/sq ft)		2.06	
Alpha	1.00	Stream Power (lb/ft s)		48.44	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		8.08	
C & E Loss (ft)	0.02	Cum SA (acres)		1.26	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13167.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1065.21	1645.03	1065.21	1634.79	1092	1633.98	1118.79	1634.78	1118.79	1645.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1065.21	.015	1065.21	.015	1118.79	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1065.21	1118.79	24.7	24.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.96	Element			
Vel Head (ft)	8.48	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.48	Reach Len. (ft)	24.70	24.70	24.70
Crit W.S. (ft)	1642.96	Flow Area (sq ft)		326.86	
E.G. Slope (ft/ft)	0.006459	Area (sq ft)		326.86	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	53.58	Top Width (ft)		53.58	
Vel Total (ft/s)	23.37	Avg. Vel. (ft/s)		23.37	
Max Chl Dpth (ft)	6.50	Hydr. Depth (ft)		6.10	
Conv. Total (cfs)	95038.2	Conv. (cfs)		95038.2	
Length Wtd. (ft)	24.70	Wetted Per. (ft)		65.00	
Min Ch El (ft)	1633.98	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)		47.38	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)		7.89	
C & E Loss (ft)	0.03	Cum SA (acres)		1.23	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13142.9*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1065.86	1644.79	1065.86	1634.51	1092	1633.72	1118.14	1634.51	1118.14	1644.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1065.86	.015	1065.86	.015	1118.14	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1065.86	1118.14	24.7	24.7	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.77	Element			
Vel Head (ft)	8.36	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.41	Reach Len. (ft)	24.70	24.70	24.70
Crit W.S. (ft)	1642.82	Flow Area (sq ft)		329.23	
E.G. Slope (ft/ft)	0.006190	Area (sq ft)		329.23	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	52.28	Top Width (ft)		52.28	
Vel Total (ft/s)	23.20	Avg. Vel. (ft/s)		23.20	
Max Chl Dpth (ft)	6.69	Hydr. Depth (ft)		6.30	
Conv. Total (cfs)	97077.2	Conv. (cfs)		97077.2	
Length Wtd. (ft)	24.70	Wetted Per. (ft)		64.11	
Min Ch El (ft)	1633.72	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)		46.04	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)		7.70	
C & E Loss (ft)	0.04	Cum SA (acres)		1.20	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13118.20

INPUT
Description: end transition 237+50.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1644.56	1066.5	1634.23	1092	1633.46	1117.5	1634.23	1117.5	1644.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	48.98	48.98	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.59	Element			
Vel Head (ft)	8.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.34	Reach Len. (ft)	48.98	48.98	48.98
Crit W.S. (ft)	1642.70	Flow Area (sq ft)		331.34	
E.G. Slope (ft/ft)	0.005952	Area (sq ft)		331.34	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	23.05	Avg. Vel. (ft/s)		23.05	
Max Chl Dpth (ft)	6.88	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	99006.5	Conv. (cfs)		99006.5	
Length Wtd. (ft)	48.98	Wetted Per. (ft)		63.25	
Min Ch El (ft)	1633.46	Shear (lb/sq ft)		1.95	
Alpha	1.00	Stream Power (lb/ft s)		44.87	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		7.52	
C & E Loss (ft)	0.03	Cum SA (acres)		1.17	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13069.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1644.04	1066.5	1633.71	1092	1632.94	1117.5	1633.71	1117.5	1644.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	48.98	48.98	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.26	Element			
Vel Head (ft)	8.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	1639.70	Reach Len. (ft)	48.98	48.98	48.98
Crit W.S. (ft)	1642.18	Flow Area (sq ft)		325.33	
E.G. Slope (ft/ft)	0.006294	Area (sq ft)		325.33	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	23.48	Avg. Vel. (ft/s)		23.48	
Max Chl Dpth (ft)	6.76	Hydr. Depth (ft)		6.38	
Conv. Total (cfs)	96271.9	Conv. (cfs)		96271.9	
Length Wtd. (ft)	48.98	Wetted Per. (ft)		63.01	
Min Ch El (ft)	1632.94	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)		47.63	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		7.15	
C & E Loss (ft)	0.03	Cum SA (acres)		1.11	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 13020.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1643.52	1066.5	1633.19	1092	1632.42	1117.5	1633.19	1117.5	1643.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	48.98	48.98	48.98	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.92	Element			
Vel Head (ft)	8.84	Wt. n-Val.		0.015	
W.S. Elev (ft)	1639.08	Reach Len. (ft)	48.98	48.98	48.98
Crit W.S. (ft)	1641.66	Flow Area (sq ft)		320.17	
E.G. Slope (ft/ft)	0.006611	Area (sq ft)		320.17	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	23.86	Avg. Vel. (ft/s)		23.86	
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)		6.28	
Conv. Total (cfs)	93942.5	Conv. (cfs)		93942.5	
Length Wtd. (ft)	48.98	Wetted Per. (ft)		62.81	
Min Ch El (ft)	1632.42	Shear (lb/sq ft)		2.10	
Alpha	1.00	Stream Power (lb/ft s)		50.19	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)		6.79	
C & E Loss (ft)	0.03	Cum SA (acres)		1.05	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12971.2

INPUT
Description: pc at plans 238+96.93
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1643	1066.5	1632.67	1092	1631.9	1117.5	1632.67	1117.5	1643

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	45.41	45.41	45.41	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.56	Element			
Vel Head (ft)	9.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1638.48	Reach Len. (ft)	45.41	45.41	45.41
Crit W.S. (ft)	1641.14	Flow Area (sq ft)		315.71	
E.G. Slope (ft/ft)	0.006902	Area (sq ft)		315.71	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	24.19	Avg. Vel. (ft/s)		24.19	
Max Chl Dpth (ft)	6.58	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	91939.5	Conv. (cfs)		91939.5	
Length Wtd. (ft)	45.41	Wetted Per. (ft)		62.63	
Min Ch El (ft)	1631.90	Shear (lb/sq ft)		2.17	
Alpha	1.00	Stream Power (lb/ft s)		52.54	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		6.43	
C & E Loss (ft)	0.03	Cum SA (acres)		1.00	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12925.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1642.52	1066.5	1632.19	1092	1631.42	1117.5	1632.19	1117.5	1642.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	45.41	45.41	45.41	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.23	Element			
Vel Head (ft)	9.31	Wt. n-Val.		0.015	
W.S. Elev (ft)	1637.92	Reach Len. (ft)	45.41	45.41	45.41
Crit W.S. (ft)	1640.66	Flow Area (sq ft)		311.96	
E.G. Slope (ft/ft)	0.007159	Area (sq ft)		311.96	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	24.48	Avg. Vel. (ft/s)		24.48	
Max Chl Dpth (ft)	6.50	Hydr. Depth (ft)		6.12	
Conv. Total (cfs)	90270.1	Conv. (cfs)		90270.1	
Length Wtd. (ft)	45.41	Wetted Per. (ft)		62.49	
Min Ch El (ft)	1631.42	Shear (lb/sq ft)		2.23	
Alpha	1.00	Stream Power (lb/ft s)		54.63	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)		6.10	
C & E Loss (ft)	0.02	Cum SA (acres)		0.94	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12880.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1642.04	1066.5	1631.71	1092	1630.94	1117.5	1631.71	1117.5	1642.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	45.41	45.41	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1646.88	Element			
Vel Head (ft)	9.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1637.38	Reach Len. (ft)	45.41	45.41	45.41
Crit W.S. (ft)	1640.18	Flow Area (sq ft)		308.77	
E.G. Slope (ft/ft)	0.007389	Area (sq ft)		308.77	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	24.74	Avg. Vel. (ft/s)		24.74	
Max Chl Dpth (ft)	6.44	Hydr. Depth (ft)		6.05	
Conv. Total (cfs)	88855.4	Conv. (cfs)		88855.4	
Length Wtd. (ft)	45.41	Wetted Per. (ft)		62.36	
Min Ch El (ft)	1630.94	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		56.50	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		5.78	
C & E Loss (ft)	0.02	Cum SA (acres)		0.89	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12835.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1641.55	1066.5	1631.22	1092	1630.45	1117.5	1631.22	1117.5	1641.55

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	45.41	45.41	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1646.52	Element			
Vel Head (ft)	9.69	Wt. n-Val.		0.015	
W.S. Elev (ft)	1636.83	Reach Len. (ft)	45.41	45.41	45.41
Crit W.S. (ft)	1639.69	Flow Area (sq ft)		305.73	
E.G. Slope (ft/ft)	0.007618	Area (sq ft)		305.73	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	24.98	Avg. Vel. (ft/s)		24.98	
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		5.99	
Conv. Total (cfs)	87511.8	Conv. (cfs)		87511.8	
Length Wtd. (ft)	45.41	Wetted Per. (ft)		62.24	
Min Ch El (ft)	1630.45	Shear (lb/sq ft)		2.34	
Alpha	1.00	Stream Power (lb/ft s)		58.36	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)		5.46	
C & E Loss (ft)	0.02	Cum SA (acres)		0.84	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12789.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1641.07	1066.5	1630.74	1092	1629.97	1117.5	1630.74	1117.5	1641.07

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	45.41	45.41	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1646.16	Element			
Vel Head (ft)	9.86	Wt. n-Val.		0.015	
W.S. Elev (ft)	1636.30	Reach Len. (ft)	45.41	45.41	45.41
Crit W.S. (ft)	1639.21	Flow Area (sq ft)		303.17	
E.G. Slope (ft/ft)	0.007817	Area (sq ft)		303.17	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	25.19	Avg. Vel. (ft/s)		25.19	
Max Chl Dpth (ft)	6.33	Hydr. Depth (ft)		5.94	
Conv. Total (cfs)	86387.4	Conv. (cfs)		86387.4	
Length Wtd. (ft)	45.41	Wetted Per. (ft)		62.14	
Min Ch El (ft)	1629.97	Shear (lb/sq ft)		2.38	
Alpha	1.00	Stream Power (lb/ft s)		59.99	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)		5.14	

C & E Loss (ft)	0.02	Cum SA (acres)	0.78

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12744.19

INPUT
Description: pt at plans 241+24.00

Station Elevation Data	num=	5							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1640.59	1066.5	1630.26	1092	1629.49	1117.5	1630.26	1117.5	1640.59

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	49.95	49.95	49.95	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1645.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.01	Wt. n-Val.		0.015	
W.S. Elev (ft)	1635.78	Reach Len. (ft)	49.95	49.95	49.95
Crit W.S. (ft)	1638.73	Flow Area (sq ft)		300.88	
E.G. Slope (ft/ft)	0.008002	Area (sq ft)		300.88	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	25.39	Avg. Vel. (ft/s)		25.39	
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	85384.4	Conv. (cfs)		85384.4	
Length Wtd. (ft)	49.95	Wetted Per. (ft)		62.05	
Min Ch El (ft)	1629.49	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		61.49	
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)		4.82	
C & E Loss (ft)	0.02	Cum SA (acres)		0.73	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12694.2*

INPUT
Description:

Station Elevation Data	num=	5							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1640.06	1066.5	1629.73	1092	1628.96	1117.5	1629.73	1117.5	1640.06

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	49.95	49.95	49.95	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1645.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.16	Wt. n-Val.		0.015	
W.S. Elev (ft)	1635.20	Reach Len. (ft)	49.95	49.95	49.95
Crit W.S. (ft)	1638.20	Flow Area (sq ft)		298.59	
E.G. Slope (ft/ft)	0.008193	Area (sq ft)		298.59	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	25.58	Avg. Vel. (ft/s)		25.58	
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		5.85	
Conv. Total (cfs)	84385.1	Conv. (cfs)		84385.1	
Length Wtd. (ft)	49.95	Wetted Per. (ft)		61.96	
Min Ch El (ft)	1628.96	Shear (lb/sq ft)		2.46	
Alpha	1.00	Stream Power (lb/ft s)		63.05	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		4.48	
C & E Loss (ft)	0.02	Cum SA (acres)		0.67	

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12644.3*

INPUT
Description:

Station Elevation Data	num=	5							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1639.53	1066.5	1629.2	1092	1628.43	1117.5	1629.2	1117.5	1639.53

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	49.95	49.95	49.95	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1644.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.30	Wt. n-Val.		0.015	
W.S. Elev (ft)	1634.63	Reach Len. (ft)	49.95	49.95	49.95
Crit W.S. (ft)	1637.68	Flow Area (sq ft)		296.51	
E.G. Slope (ft/ft)	0.008371	Area (sq ft)		296.51	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	25.76	Avg. Vel. (ft/s)		25.76	
Max Chl Dpth (ft)	6.20	Hydr. Depth (ft)		5.81	
Conv. Total (cfs)	83482.4	Conv. (cfs)		83482.4	
Length Wtd. (ft)	49.95	Wetted Per. (ft)		61.88	
Min Ch El (ft)	1628.43	Shear (lb/sq ft)		2.50	
Alpha	1.00	Stream Power (lb/ft s)		64.50	

Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	4.14
C & E Loss (ft)	0.01	Cum SA (acres)	0.61

CROSS SECTION RIVER: Duckcreek
REACH: pittman RS: 12594.35

INPUT
Description: start rcb at boulder highway -- Sta. 242+73.86
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1639	1066.5	1628.67	1092	1627.9	1117.5	1628.67	1117.5	1639

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	483.14	483.14	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1644.50	Element			
Vel Head (ft)	10.44	Wt. n-Val.		0.015	
W.S. Elev (ft)	1634.06	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1637.14	Flow Area (sq ft)		294.64	
E.G. Slope (ft/ft)	0.008536	Area (sq ft)		294.64	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	25.92	Avg. Vel. (ft/s)		25.92	
Max Chl Dpth (ft)	6.16	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	82671.9	Conv. (cfs)		82671.9	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		61.81	
Min Ch El (ft)	1627.90	Shear (lb/sq ft)		2.54	
Alpha	1.00	Stream Power (lb/ft s)		65.85	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		3.80	
C & E Loss (ft)	0.01	Cum SA (acres)		0.55	

BRIDGE RIVER: Duckcreek
REACH: pittman RS: 12593.35

INPUT
Description: BOULDER HIGHWAY OVER PITTMAN
Distance from Upstream XS = 1
Deck/Roadway Width = 481.14
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1066.5	1650	1638.08	1092	1650	1638.12	1117.5	16501638.165	

Upstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1639	1066.5	1628.67	1092	1627.9	1117.5	1628.67	1117.5	1639

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
1066.5	1117.5	.1	.3

Downstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1066.5	1645	1632.72	1092	1645	1632.76	1117.5	16451632.805	

Downstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1634.84	1066.5	1624.51	1092	1623.74	1117.5	1624.51	1117.5	1634.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
1066.5	1117.5	.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 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 Piers = 1

Pier Data
Pier Station Upstream= 1092 Downstream= 1092
Upstream num= 2

Width	Elev	Width	Elev
1	1625	1	1640

Downstream num= 2

Width	Elev	Width	Elev
1	1620	1	1635

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy

Momentum Cd = 1.33
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1
Opening : Single BR

			Inside BR US	Inside BR DS
E.G. US. (ft)	1644.50	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1634.06	E.G. Elev (ft)	1644.39	1639.51
Q Total (cfs)	7638.00	W.S. Elev (ft)	1634.28	1630.46
Q Bridge (cfs)	7638.00	Crit W.S. (ft)	1637.29	1632.73
Q Weir (cfs)		Max Chl Dpth (ft)	6.36	6.71
Weir Sta Lft (ft)		Vel Total (ft/s)	25.52	24.14
Weir Sta Rgt (ft)		Flow Area (sq ft)	299.24	316.38
Weir Submerg		Froude # Chl	1.84	1.69
Weir Max Depth (ft)		Specif Force (cu ft)	6351.21	6728.73
Min El Weir Flow (ft)	1650.01	Hydr Depth (ft)	5.98	6.33
Min El Prs (ft)	1638.17	W.P. Total (ft)	73.96	75.33
Delta EG (ft)	5.01	Conv. Total (cfs)	75265.8	81581.6
Delta WS (ft)	3.79	Top Width (ft)	50.00	50.00
BR Open Area (sq ft)	431.44	Frctn Loss (ft)	0.01	4.56
BR Open Vel (ft/s)	25.52	C & E Loss (ft)	0.10	0.32
Coef of Q		Shear Total (lb/sq ft)	2.60	2.30
Br Sel Method	Energy only	Power Total (lb/ft s)	66.39	55.48

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was 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: Duckcreek
REACH: pittman RS: 12111.21

INPUT
Description: END RCB -- Sta. 247+57
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1066.5	1634.84	1066.5	1624.51	1092	1623.74	1117.5	1624.51	1117.5	1634.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1066.5	.015	1066.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1066.5	1117.5	0	0	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1639.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.22	Wt. n-Val.		0.015	
W.S. Elev (ft)	1630.27	Reach Len. (ft)	45.00	45.00	45.00
Crit W.S. (ft)	1632.99	Flow Area (sq ft)		313.50	
E.G. Slope (ft/ft)	0.007052	Area (sq ft)		313.50	
Q Total (cfs)	7638.00	Flow (cfs)		7638.00	
Top Width (ft)	51.00	Top Width (ft)		51.00	
Vel Total (ft/s)	24.36	Avg. Vel. (ft/s)		24.36	
Max Chl Dpth (ft)	6.53	Hydr. Depth (ft)		6.15	
Conv. Total (cfs)	90956.0	Conv. (cfs)		90956.0	
Length Wtd. (ft)	45.00	Wetted Per. (ft)		62.55	
Min Ch El (ft)	1623.74	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		53.76	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		0.39	
C & E Loss (ft)	0.02	Cum SA (acres)			

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14300

INPUT
Description: cl of emerald / channel begin grade break 0.3% to 0.7%
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1652.2	1018	1643.2	1048	1642.3	1078	1643.2	1096	1652.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1096	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1096	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1653.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.28	Wt. n-Val.		0.015	
W.S. Elev (ft)	1650.69	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1650.70	Flow Area (sq ft)		588.75	
E.G. Slope (ft/ft)	0.001854	Area (sq ft)		588.75	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	89.97	Top Width (ft)		89.97	
Vel Total (ft/s)	14.54	Avg. Vel. (ft/s)		14.54	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		6.54	

Conv. Total (cfs)	198831.7	Conv. (cfs)	198831.7
Length Wtd. (ft)	50.00	Wetted Per. (ft)	93.53
Min Ch El (ft)	1642.30	Shear (lb/sq ft)	0.73
Alpha	1.00	Stream Power (lb/ft s)	10.60
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	21.02
C & E Loss (ft)	0.00	Cum SA (acres)	3.23

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: 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: Duckcreek
REACH: duckup RS: 14250.*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1651.85	1018	1642.35	1048	1641.95	1078	1642.85	1096	1651.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1096	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1096	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1653.77	Element			
Vel Head (ft)	4.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1649.56	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1650.34	Flow Area (sq ft)		519.91	
E.G. Slope (ft/ft)	0.002668	Area (sq ft)		519.91	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	86.85	Top Width (ft)		86.85	
Vel Total (ft/s)	16.47	Avg. Vel. (ft/s)		16.47	
Max Chl Dpth (ft)	7.61	Hydr. Depth (ft)		5.99	
Conv. Total (cfs)	165755.3	Conv. (cfs)		165755.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		90.05	
Min Ch El (ft)	1641.95	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)		15.84	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		20.39	
C & E Loss (ft)	0.09	Cum SA (acres)		3.13	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14200

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1651.5	1018	1642.5	1048	1641.6	1078	1642.5	1096	1651.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1096	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1096	38.2	38.2	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1653.58	Element			
Vel Head (ft)	4.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	1648.91	Reach Len. (ft)	38.20	38.20	38.20
Crit W.S. (ft)	1649.99	Flow Area (sq ft)		493.32	
E.G. Slope (ft/ft)	0.003114	Area (sq ft)		493.32	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	85.62	Top Width (ft)		85.62	
Vel Total (ft/s)	17.36	Avg. Vel. (ft/s)		17.36	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	153438.9	Conv. (cfs)		153438.9	
Length Wtd. (ft)	38.20	Wetted Per. (ft)		88.67	
Min Ch El (ft)	1641.60	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)		18.77	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		19.80	
C & E Loss (ft)	0.05	Cum SA (acres)		3.03	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14161.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1650.49	1016.5	1642.24	1046.5	1641.34	1076.5	1642.24	1093	1650.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1093	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1093	38.2	38.2	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.96	Wt. n-Val.		0.015	
W.S. Elev (ft)	1648.48	Reach Len. (ft)	38.20	38.20	38.20
Crit W.S. (ft)	1649.73	Flow Area (sq ft)		479.10	
E.G. Slope (ft/ft)	0.003394	Area (sq ft)		479.10	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	84.95	Top Width (ft)		84.95	
Vel Total (ft/s)	17.87	Avg. Vel. (ft/s)		17.87	
Max Chl Dpth (ft)	7.14	Hydr. Depth (ft)		5.64	
Conv. Total (cfs)	146963.0	Conv. (cfs)		146963.0	
Length Wtd. (ft)	38.20	Wetted Per. (ft)		87.92	
Min Ch El (ft)	1641.34	Shear (lb/sq ft)		1.15	
Alpha	1.00	Stream Power (lb/ft s)		20.63	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		19.38	
C & E Loss (ft)	0.03	Cum SA (acres)		2.96	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14123.61

INPUT
Description: END PHASE I/BEGIN PHASE II 127+50 PLANS
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1649.49	1015	1641.99	1045	1641.09	1075	1641.99	1090	1649.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1648.11	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1649.46	Flow Area (sq ft)		468.91	
E.G. Slope (ft/ft)	0.003617	Area (sq ft)		468.91	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	84.47	Top Width (ft)		84.47	
Vel Total (ft/s)	18.26	Avg. Vel. (ft/s)		18.26	
Max Chl Dpth (ft)	7.02	Hydr. Depth (ft)		5.55	
Conv. Total (cfs)	142373.7	Conv. (cfs)		142373.7	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		87.39	
Min Ch El (ft)	1641.09	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)		22.12	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		18.96	
C & E Loss (ft)	0.02	Cum SA (acres)		2.88	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14099.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1649.4	1015	1641.87	1045	1640.97	1075	1641.87	1090	1649.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.24	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.96	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1649.35	Flow Area (sq ft)		466.01	
E.G. Slope (ft/ft)	0.003679	Area (sq ft)		466.01	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	84.25	Top Width (ft)		84.25	
Vel Total (ft/s)	18.37	Avg. Vel. (ft/s)		18.37	
Max Chl Dpth (ft)	6.99	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	141150.4	Conv. (cfs)		141150.4	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		87.16	
Min Ch El (ft)	1640.97	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		22.56	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		18.71	
C & E Loss (ft)	0.01	Cum SA (acres)		2.84	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14075.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1649.32	1015	1641.75	1045	1640.85	1075	1641.75	1090	1649.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.29	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.82	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1649.23	Flow Area (sq ft)		463.93	
E.G. Slope (ft/ft)	0.003723	Area (sq ft)		463.93	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	84.04	Top Width (ft)		84.04	
Vel Total (ft/s)	18.46	Avg. Vel. (ft/s)		18.46	
Max Chl Dpth (ft)	6.97	Hydr. Depth (ft)		5.52	
Conv. Total (cfs)	140319.2	Conv. (cfs)		140319.2	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		86.96	
Min Ch El (ft)	1640.85	Shear (lb/sq ft)		1.24	
Alpha	1.00	Stream Power (lb/ft s)		22.89	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		18.45	
C & E Loss (ft)	0.00	Cum SA (acres)		2.79	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14051.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1649.23	1015	1641.63	1045	1640.73	1075	1641.63	1090	1649.23

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.33	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.68	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1649.12	Flow Area (sq ft)		461.95	
E.G. Slope (ft/ft)	0.003767	Area (sq ft)		461.95	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	83.87	Top Width (ft)		83.87	
Vel Total (ft/s)	18.53	Avg. Vel. (ft/s)		18.53	
Max Chl Dpth (ft)	6.95	Hydr. Depth (ft)		5.51	
Conv. Total (cfs)	139509.5	Conv. (cfs)		139509.5	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		86.78	
Min Ch El (ft)	1640.73	Shear (lb/sq ft)		1.25	
Alpha	1.00	Stream Power (lb/ft s)		23.20	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		18.20	
C & E Loss (ft)	0.00	Cum SA (acres)		2.75	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14027.9*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1649.14	1015	1641.51	1045	1640.61	1075	1641.51	1090	1649.14

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.38	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.54	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1649.00	Flow Area (sq ft)		459.98	
E.G. Slope (ft/ft)	0.003810	Area (sq ft)		459.98	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	83.69	Top Width (ft)		83.69	
Vel Total (ft/s)	18.61	Avg. Vel. (ft/s)		18.61	
Max Chl Dpth (ft)	6.93	Hydr. Depth (ft)		5.50	
Conv. Total (cfs)	138703.0	Conv. (cfs)		138703.0	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		86.61	
Min Ch El (ft)	1640.61	Shear (lb/sq ft)		1.26	
Alpha	1.00	Stream Power (lb/ft s)		23.52	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		17.94	
C & E Loss (ft)	0.00	Cum SA (acres)		2.70	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 14004.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1649.06	1015	1641.39	1045	1640.49	1075	1641.39	1090	1649.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.

1000	1090	23.91	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.40	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1648.88	Flow Area (sq ft)		457.92	
E.G. Slope (ft/ft)	0.003856	Area (sq ft)		457.92	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	83.49	Top Width (ft)		83.49	
Vel Total (ft/s)	18.70	Avg. Vel. (ft/s)		18.70	
Max Chl Dpth (ft)	6.91	Hydr. Depth (ft)		5.48	
Conv. Total (cfs)	137882.6	Conv. (cfs)		137882.6	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		86.41	
Min Ch El (ft)	1640.49	Shear (lb/sq ft)		1.28	
Alpha	1.00	Stream Power (lb/ft s)		23.85	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		17.69	
C & E Loss (ft)	0.00	Cum SA (acres)		2.65	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13980.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1648.97	1015	1641.27	1045	1640.37	1075	1641.27	1090	1648.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.48	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.26	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1648.77	Flow Area (sq ft)		455.97	
E.G. Slope (ft/ft)	0.003901	Area (sq ft)		455.97	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	83.32	Top Width (ft)		83.32	
Vel Total (ft/s)	18.78	Avg. Vel. (ft/s)		18.78	
Max Chl Dpth (ft)	6.89	Hydr. Depth (ft)		5.47	
Conv. Total (cfs)	137083.1	Conv. (cfs)		137083.1	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		86.24	
Min Ch El (ft)	1640.37	Shear (lb/sq ft)		1.29	
Alpha	1.00	Stream Power (lb/ft s)		24.18	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		17.44	
C & E Loss (ft)	0.00	Cum SA (acres)		2.61	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13956.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1648.88	1015	1641.15	1045	1640.25	1075	1641.15	1090	1648.88

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.91	23.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.52	Wt. n-Val.		0.015	
W.S. Elev (ft)	1647.12	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1648.65	Flow Area (sq ft)		454.02	
E.G. Slope (ft/ft)	0.003947	Area (sq ft)		454.02	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	83.15	Top Width (ft)		83.15	
Vel Total (ft/s)	18.86	Avg. Vel. (ft/s)		18.86	
Max Chl Dpth (ft)	6.87	Hydr. Depth (ft)		5.46	
Conv. Total (cfs)	136286.6	Conv. (cfs)		136286.6	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		86.07	
Min Ch El (ft)	1640.25	Shear (lb/sq ft)		1.30	
Alpha	1.00	Stream Power (lb/ft s)		24.51	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		17.19	
C & E Loss (ft)	0.00	Cum SA (acres)		2.56	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13932.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1648.8	1015	1641.03	1045	1640.13	1075	1641.03	1090	1648.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1090             23.91   23.91   23.91            .1      .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1652.55    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              5.57    Wt. n-Val.                         0.015
  W.S. Elev (ft)          1646.98    Reach Len. (ft)          23.91     23.91      23.91
  Crit W.S. (ft)          1648.53    Flow Area (sq ft)                  452.00
  E.G. Slope (ft/ft)      0.003994   Area (sq ft)                       452.00
  Q Total (cfs)           8562.00    Flow (cfs)                        8562.00
  Top Width (ft)            82.96    Top Width (ft)                     82.96
  Vel Total (ft/s)          18.94    Avg. Vel. (ft/s)                   18.94
  Max Chl Dpth (ft)          6.85    Hydr. Depth (ft)                    5.45
  Conv. Total (cfs)       135476.9   Conv. (cfs)                      135476.9
  Length Wtd. (ft)          23.91    Wetted Per. (ft)                   85.88
  Min Ch El (ft)          1640.13    Shear (lb/sq ft)                    1.31
  Alpha                      1.00    Stream Power (lb/ft s)             24.86
  Frctn Loss (ft)            0.09    Cum Volume (acre-ft)               16.94
  C & E Loss (ft)            0.00    Cum SA (acres)                      2.52


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13908.3*

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1648.71    1015 1640.91    1045 1640.01    1075 1640.91    1090 1648.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .015    1000    .015    1090    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1090             23.91   23.91   23.91            .1      .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1652.46    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              5.62    Wt. n-Val.                         0.015
  W.S. Elev (ft)          1646.84    Reach Len. (ft)          23.91     23.91      23.91
  Crit W.S. (ft)          1648.43    Flow Area (sq ft)                  450.07
  E.G. Slope (ft/ft)      0.004041   Area (sq ft)                       450.07
  Q Total (cfs)           8562.00    Flow (cfs)                        8562.00
  Top Width (ft)            82.79    Top Width (ft)                     82.79
  Vel Total (ft/s)          19.02    Avg. Vel. (ft/s)                   19.02
  Max Chl Dpth (ft)          6.83    Hydr. Depth (ft)                    5.44
  Conv. Total (cfs)       134687.2   Conv. (cfs)                      134687.2
  Length Wtd. (ft)          23.91    Wetted Per. (ft)                   85.72
  Min Ch El (ft)          1640.01    Shear (lb/sq ft)                    1.32
  Alpha                      1.00    Stream Power (lb/ft s)             25.20
  Frctn Loss (ft)            0.10    Cum Volume (acre-ft)               16.70
  C & E Loss (ft)            0.00    Cum SA (acres)                      2.47


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13884.4*

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1648.62    1015 1640.79    1045 1639.89    1075 1640.79    1090 1648.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .015    1000    .015    1090    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1090             23.91   23.91   23.91            .1      .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1652.36    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              5.65    Wt. n-Val.                         0.015
  W.S. Elev (ft)          1646.70    Reach Len. (ft)          23.91     23.91      23.91
  Crit W.S. (ft)          1648.30    Flow Area (sq ft)                  448.76
  E.G. Slope (ft/ft)      0.004072   Area (sq ft)                       448.76
  Q Total (cfs)           8562.00    Flow (cfs)                        8562.00
  Top Width (ft)            82.66    Top Width (ft)                     82.66
  Vel Total (ft/s)          19.08    Avg. Vel. (ft/s)                   19.08
  Max Chl Dpth (ft)          6.81    Hydr. Depth (ft)                    5.43
  Conv. Total (cfs)       134173.3   Conv. (cfs)                      134173.3
  Length Wtd. (ft)          23.91    Wetted Per. (ft)                   85.58
  Min Ch El (ft)          1639.89    Shear (lb/sq ft)                    1.33
  Alpha                      1.00    Stream Power (lb/ft s)             25.43
  Frctn Loss (ft)            0.10    Cum Volume (acre-ft)               16.45
  C & E Loss (ft)            0.00    Cum SA (acres)                      2.43


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13860.5*

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1648.54    1015 1640.67    1045 1639.77    1075 1640.67    1090 1648.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .015    1000    .015    1090    .015
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Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1000 1090 23.91 23.91 23.91 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.69	Wt. n-Val.		0.015	
W.S. Elev (ft)	1646.57	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1648.18	Flow Area (sq ft)		447.37	
E.G. Slope (ft/ft)	0.004104	Area (sq ft)		447.37	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.49	Top Width (ft)		82.49	
Vel Total (ft/s)	19.14	Avg. Vel. (ft/s)		19.14	
Max Chl Dpth (ft)	6.80	Hydr. Depth (ft)		5.42	
Conv. Total (cfs)	133645.4	Conv. (cfs)		133645.4	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		85.43	
Min Ch El (ft)	1639.77	Shear (lb/sq ft)		1.34	
Alpha	1.00	Stream Power (lb/ft s)		25.68	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		16.20	
C & E Loss (ft)	0.00	Cum SA (acres)		2.38	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13836.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1648.45	1015	1640.55	1045	1639.65	1075	1640.55	1090	1648.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1000 1090 23.91 23.91 23.91 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.72	Wt. n-Val.		0.015	
W.S. Elev (ft)	1646.44	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1648.06	Flow Area (sq ft)		446.07	
E.G. Slope (ft/ft)	0.004136	Area (sq ft)		446.07	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.36	Top Width (ft)		82.36	
Vel Total (ft/s)	19.19	Avg. Vel. (ft/s)		19.19	
Max Chl Dpth (ft)	6.79	Hydr. Depth (ft)		5.42	
Conv. Total (cfs)	133135.2	Conv. (cfs)		133135.2	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		85.30	
Min Ch El (ft)	1639.65	Shear (lb/sq ft)		1.35	
Alpha	1.00	Stream Power (lb/ft s)		25.92	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		15.96	
C & E Loss (ft)	0.00	Cum SA (acres)		2.34	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13812.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1648.36	1015	1640.43	1045	1639.53	1075	1640.43	1090	1648.36

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1000 1090 23.91 23.91 23.91 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.75	Wt. n-Val.		0.015	
W.S. Elev (ft)	1646.31	Reach Len. (ft)	23.91	23.91	23.91
Crit W.S. (ft)	1647.94	Flow Area (sq ft)		444.78	
E.G. Slope (ft/ft)	0.004168	Area (sq ft)		444.78	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.23	Top Width (ft)		82.23	
Vel Total (ft/s)	19.25	Avg. Vel. (ft/s)		19.25	
Max Chl Dpth (ft)	6.77	Hydr. Depth (ft)		5.41	
Conv. Total (cfs)	132626.4	Conv. (cfs)		132626.4	
Length Wtd. (ft)	23.91	Wetted Per. (ft)		85.17	
Min Ch El (ft)	1639.53	Shear (lb/sq ft)		1.36	
Alpha	1.00	Stream Power (lb/ft s)		26.16	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		15.71	
C & E Loss (ft)	0.00	Cum SA (acres)		2.29	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13788.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1648.28	1015	1640.31	1045	1639.41	1075	1640.31	1090	1648.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
    1000    .015    1000    .015    1090    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1090             23.91   23.91   23.91            .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1651.96    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              5.79    Wt. n-Val.                         0.015
  W.S. Elev (ft)          1646.17    Reach Len. (ft)          23.91     23.91      23.91
  Crit W.S. (ft)          1647.83    Flow Area (sq ft)                  443.41
  E.G. Slope (ft/ft)     0.004201    Area (sq ft)                       443.41
  Q Total (cfs)           8562.00    Flow (cfs)                        8562.00
  Top Width (ft)            82.07    Top Width (ft)                      82.07
  Vel Total (ft/s)          19.31    Avg. Vel. (ft/s)                    19.31
  Max Chl Dpth (ft)          6.76    Hydr. Depth (ft)                     5.40
  Conv. Total (cfs)       132104.2    Conv. (cfs)                     132104.2
  Length Wtd. (ft)          23.91    Wetted Per. (ft)                    85.01
  Min Ch El (ft)          1639.41    Shear (lb/sq ft)                     1.37
  Alpha                      1.00    Stream Power (lb/ft s)              26.41
  Frctn Loss (ft)            0.10    Cum Volume (acre-ft)                15.47
  C & E Loss (ft)            0.00    Cum SA (acres)                       2.25


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13764.88

INPUT
Description: STA 13768.37 PC (PLAN 13108.73)
Station Elevation Data    num=      5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1648.19    1015 1640.19    1045 1639.29    1075 1640.19    1090 1648.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .015    1000    .015    1090    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1090             44.44   44.44   44.44            .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1651.86    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              5.82    Wt. n-Val.                         0.015
  W.S. Elev (ft)          1646.04    Reach Len. (ft)          44.44     44.44      44.44
  Crit W.S. (ft)          1647.73    Flow Area (sq ft)                  442.13
  E.G. Slope (ft/ft)     0.004233    Area (sq ft)                       442.13
  Q Total (cfs)           8562.00    Flow (cfs)                        8562.00
  Top Width (ft)            81.94    Top Width (ft)                      81.94
  Vel Total (ft/s)          19.37    Avg. Vel. (ft/s)                    19.37
  Max Chl Dpth (ft)          6.75    Hydr. Depth (ft)                     5.40
  Conv. Total (cfs)       131601.4    Conv. (cfs)                     131601.4
  Length Wtd. (ft)          44.44    Wetted Per. (ft)                    84.89
  Min Ch El (ft)          1639.29    Shear (lb/sq ft)                     1.38
  Alpha                      1.00    Stream Power (lb/ft s)              26.65
  Frctn Loss (ft)            0.10    Cum Volume (acre-ft)                15.23
  C & E Loss (ft)            0.00    Cum SA (acres)                       2.20


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13720.4*

INPUT
Description:
Station Elevation Data    num=      5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1647.9    1015 1639.97    1045 1639.07    1075 1639.97    1090  1647.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .015    1000    .015    1090    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1090             44.44   44.44   44.44            .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)          1651.67    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              5.89    Wt. n-Val.                         0.015
  W.S. Elev (ft)          1645.78    Reach Len. (ft)          44.44     44.44      44.44
  Crit W.S. (ft)          1647.48    Flow Area (sq ft)                  439.51
  E.G. Slope (ft/ft)     0.004318    Area (sq ft)                       439.51
  Q Total (cfs)           8562.00    Flow (cfs)                        8562.00
  Top Width (ft)            81.98    Top Width (ft)                      81.98
  Vel Total (ft/s)          19.48    Avg. Vel. (ft/s)                    19.48
  Max Chl Dpth (ft)          6.71    Hydr. Depth (ft)                     5.36
  Conv. Total (cfs)       130297.1    Conv. (cfs)                     130297.1
  Length Wtd. (ft)          44.44    Wetted Per. (ft)                    84.89
  Min Ch El (ft)          1639.07    Shear (lb/sq ft)                     1.40
  Alpha                      1.00    Stream Power (lb/ft s)              27.19
  Frctn Loss (ft)            0.19    Cum Volume (acre-ft)                14.78
  C & E Loss (ft)            0.01    Cum SA (acres)                       2.12


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13676.0*

INPUT
Description:
Station Elevation Data    num=      5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1647.62    1015 1639.74    1045 1638.84    1075 1639.74    1090 1647.62

Manning's n Values        num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	44.44	44.44	44.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1651.47	Element			
Vel Head (ft)	5.95	Wt. n-Val.		0.015	
W.S. Elev (ft)	1645.52	Reach Len. (ft)	44.44	44.44	44.44
Crit W.S. (ft)	1647.25	Flow Area (sq ft)		437.54	
E.G. Slope (ft/ft)	0.004383	Area (sq ft)		437.54	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.01	Top Width (ft)		82.01	
Vel Total (ft/s)	19.57	Avg. Vel. (ft/s)		19.57	
Max Chl Dpth (ft)	6.68	Hydr. Depth (ft)		5.34	
Conv. Total (cfs)	129326.8	Conv. (cfs)		129326.8	
Length Wtd. (ft)	44.44	Wetted Per. (ft)		84.89	
Min Ch El (ft)	1638.84	Shear (lb/sq ft)		1.41	
Alpha	1.00	Stream Power (lb/ft s)		27.60	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		14.33	
C & E Loss (ft)	0.01	Cum SA (acres)		2.03	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13631.5*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1647.33	1015	1639.52	1045	1638.62	1075	1639.52	1090	1647.33

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	44.44	44.44	44.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1651.27	Element			
Vel Head (ft)	5.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1645.27	Reach Len. (ft)	44.44	44.44	44.44
Crit W.S. (ft)	1647.04	Flow Area (sq ft)		435.81	
E.G. Slope (ft/ft)	0.004445	Area (sq ft)		435.81	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.10	Top Width (ft)		82.10	
Vel Total (ft/s)	19.65	Avg. Vel. (ft/s)		19.65	
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)		5.31	
Conv. Total (cfs)	128423.3	Conv. (cfs)		128423.3	
Length Wtd. (ft)	44.44	Wetted Per. (ft)		84.95	
Min Ch El (ft)	1638.62	Shear (lb/sq ft)		1.42	
Alpha	1.00	Stream Power (lb/ft s)		27.97	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		13.88	
C & E Loss (ft)	0.00	Cum SA (acres)		1.95	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13587.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1647.05	1015	1639.3	1045	1638.4	1075	1639.3	1090	1647.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	44.44	44.44	44.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1651.07	Element			
Vel Head (ft)	6.04	Wt. n-Val.		0.015	
W.S. Elev (ft)	1645.03	Reach Len. (ft)	44.44	44.44	44.44
Crit W.S. (ft)	1646.80	Flow Area (sq ft)		434.01	
E.G. Slope (ft/ft)	0.004509	Area (sq ft)		434.01	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.16	Top Width (ft)		82.16	
Vel Total (ft/s)	19.73	Avg. Vel. (ft/s)		19.73	
Max Chl Dpth (ft)	6.63	Hydr. Depth (ft)		5.28	
Conv. Total (cfs)	127507.4	Conv. (cfs)		127507.4	
Length Wtd. (ft)	44.44	Wetted Per. (ft)		84.98	
Min Ch El (ft)	1638.40	Shear (lb/sq ft)		1.44	
Alpha	1.00	Stream Power (lb/ft s)		28.36	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		13.44	
C & E Loss (ft)	0.00	Cum SA (acres)		1.87	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13542.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1646.77	1015	1639.08	1045	1638.18	1075	1639.08	1090	1646.77

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	44.44	44.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1650.87	Element			
Vel Head (ft)	6.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1644.78	Reach Len. (ft)	44.44	44.44	44.44
Crit W.S. (ft)	1646.57	Flow Area (sq ft)		432.21	
E.G. Slope (ft/ft)	0.004574	Area (sq ft)		432.21	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.23	Top Width (ft)		82.23	
Vel Total (ft/s)	19.81	Avg. Vel. (ft/s)		19.81	
Max Chl Dpth (ft)	6.60	Hydr. Depth (ft)		5.26	
Conv. Total (cfs)	126596.2	Conv. (cfs)		126596.2	
Length Wtd. (ft)	44.44	Wetted Per. (ft)		85.01	
Min Ch El (ft)	1638.18	Shear (lb/sq ft)		1.45	
Alpha	1.00	Stream Power (lb/ft s)		28.76	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		13.00	
C & E Loss (ft)	0.01	Cum SA (acres)		1.78	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13498.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1646.48	1015	1638.85	1045	1637.96	1075	1638.85	1090	1646.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	44.44	44.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1650.66	Element			
Vel Head (ft)	6.13	Wt. n-Val.		0.015	
W.S. Elev (ft)	1644.53	Reach Len. (ft)	44.44	44.44	44.44
Crit W.S. (ft)	1646.34	Flow Area (sq ft)		430.93	
E.G. Slope (ft/ft)	0.004625	Area (sq ft)		430.93	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.33	Top Width (ft)		82.33	
Vel Total (ft/s)	19.87	Avg. Vel. (ft/s)		19.87	
Max Chl Dpth (ft)	6.57	Hydr. Depth (ft)		5.23	
Conv. Total (cfs)	125898.7	Conv. (cfs)		125898.7	
Length Wtd. (ft)	44.44	Wetted Per. (ft)		85.08	
Min Ch El (ft)	1637.96	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)		29.06	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		12.56	
C & E Loss (ft)	0.00	Cum SA (acres)		1.70	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13453.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1646.2	1015	1638.63	1045	1637.73	1075	1638.63	1090	1646.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	44.44	44.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1650.46	Element			
Vel Head (ft)	6.17	Wt. n-Val.		0.015	
W.S. Elev (ft)	1644.28	Reach Len. (ft)	44.44	44.44	44.44
Crit W.S. (ft)	1646.11	Flow Area (sq ft)		429.43	
E.G. Slope (ft/ft)	0.004682	Area (sq ft)		429.43	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.40	Top Width (ft)		82.40	
Vel Total (ft/s)	19.94	Avg. Vel. (ft/s)		19.94	
Max Chl Dpth (ft)	6.55	Hydr. Depth (ft)		5.21	
Conv. Total (cfs)	125134.6	Conv. (cfs)		125134.6	
Length Wtd. (ft)	44.44	Wetted Per. (ft)		85.12	
Min Ch El (ft)	1637.73	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)		29.40	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		12.12	
C & E Loss (ft)	0.00	Cum SA (acres)		1.61	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13409.39

INPUT
Description: STA 13409 PT (PLAN 134+64.22) 60 TRAP TO 60 RECT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1645.91	1015	1638.41	1045	1637.51	1075	1638.41	1090	1645.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1000	.015	1090	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1090	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1650.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1644.04	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1645.88	Flow Area (sq ft)		428.50	
E.G. Slope (ft/ft)	0.004723	Area (sq ft)		428.50	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	82.53	Top Width (ft)		82.53	
Vel Total (ft/s)	19.98	Avg. Vel. (ft/s)		19.98	
Max Chl Dpth (ft)	6.53	Hydr. Depth (ft)		5.19	
Conv. Total (cfs)	124580.8	Conv. (cfs)		124580.8	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		85.22	
Min Ch El (ft)	1637.51	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)		29.63	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		11.68	
C & E Loss (ft)	0.00	Cum SA (acres)		1.53	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13385.5*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000.94	1645.88	1015	1638.24	1045	1637.34	1075	1638.24	1089.06	1645.88

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000.94	.015	1000.94	.015	1089.06	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000.94	1089.06	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1650.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.94	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1645.77	Flow Area (sq ft)		428.57	
E.G. Slope (ft/ft)	0.004623	Area (sq ft)		428.57	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	80.97	Top Width (ft)		80.97	
Vel Total (ft/s)	19.98	Avg. Vel. (ft/s)		19.98	
Max Chl Dpth (ft)	6.60	Hydr. Depth (ft)		5.29	
Conv. Total (cfs)	125929.4	Conv. (cfs)		125929.4	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		83.89	
Min Ch El (ft)	1637.34	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)		29.45	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		11.45	
C & E Loss (ft)	0.00	Cum SA (acres)		1.48	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13361.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001.88	1645.85	1015	1638.08	1045	1637.18	1075	1638.08	1088.12	1645.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1001.88	.015	1001.88	.015	1088.12	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1001.88	1088.12	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1650.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.85	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1645.65	Flow Area (sq ft)		429.13	
E.G. Slope (ft/ft)	0.004513	Area (sq ft)		429.13	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	79.47	Top Width (ft)		79.47	
Vel Total (ft/s)	19.95	Avg. Vel. (ft/s)		19.95	
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)		5.40	
Conv. Total (cfs)	127456.6	Conv. (cfs)		127456.6	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		82.66	
Min Ch El (ft)	1637.18	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)		29.18	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		11.21	
C & E Loss (ft)	0.00	Cum SA (acres)		1.44	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13337.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 1002.81 1645.82    1015 1637.91    1045 1637.01    1075 1637.91 1087.19 1645.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1002.81    .015 1002.81    .015 1087.19    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1002.81 1087.19            23.86   23.86   23.86             .1      .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1649.93    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              6.19     Wt. n-Val.                         0.015
  W.S. Elev (ft)           1643.74    Reach Len. (ft)           23.86     23.86      23.86
  Crit W.S. (ft)           1645.53    Flow Area (sq ft)                  428.88
  E.G. Slope (ft/ft)      0.004432    Area (sq ft)                       428.88
  Q Total (cfs)            8562.00    Flow (cfs)                        8562.00
  Top Width (ft)             77.96    Top Width (ft)                     77.96
  Vel Total (ft/s)           19.96    Avg. Vel. (ft/s)                   19.96
  Max Chl Dpth (ft)           6.73    Hydr. Depth (ft)                    5.50
  Conv. Total (cfs)       128607.1    Conv. (cfs)                      128607.1
  Length Wtd. (ft)           23.86    Wetted Per. (ft)                   81.43
  Min Ch El (ft)           1637.01    Shear (lb/sq ft)                    1.46
  Alpha                       1.00    Stream Power (lb/ft s)             29.09
  Frctn Loss (ft)             0.11    Cum Volume (acre-ft)               10.98
  C & E Loss (ft)             0.00    Cum SA (acres)                      1.40


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13313.9*

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1003.75 1645.79    1015 1637.74    1045 1636.84    1075 1637.74 1086.25 1645.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1003.75    .015 1003.75    .015 1086.25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1003.75 1086.25            23.86   23.86   23.86             .1      .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1649.82    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              6.20     Wt. n-Val.                         0.015
  W.S. Elev (ft)           1643.63    Reach Len. (ft)           23.86     23.86      23.86
  Crit W.S. (ft)           1645.42    Flow Area (sq ft)                  428.58
  E.G. Slope (ft/ft)      0.004357    Area (sq ft)                       428.58
  Q Total (cfs)            8562.00    Flow (cfs)                        8562.00
  Top Width (ft)             76.45    Top Width (ft)                     76.45
  Vel Total (ft/s)           19.98    Avg. Vel. (ft/s)                   19.98
  Max Chl Dpth (ft)           6.79    Hydr. Depth (ft)                    5.61
  Conv. Total (cfs)       129707.3    Conv. (cfs)                      129707.3
  Length Wtd. (ft)           23.86    Wetted Per. (ft)                   80.26
  Min Ch El (ft)           1636.84    Shear (lb/sq ft)                    1.45
  Alpha                       1.00    Stream Power (lb/ft s)             29.02
  Frctn Loss (ft)             0.10    Cum Volume (acre-ft)               10.74
  C & E Loss (ft)             0.00    Cum SA (acres)                      1.36


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13290.0*

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1004.69 1645.76    1015 1637.58    1045 1636.68    1075 1637.58 1085.31 1645.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1004.69    .015 1004.69    .015 1085.31    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1004.69 1085.31            23.86   23.86   23.86             .1      .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1649.72    Element                 Left OB    Channel   Right OB
  Vel Head (ft)              6.19     Wt. n-Val.                         0.015
  W.S. Elev (ft)           1643.53    Reach Len. (ft)           23.86     23.86      23.86
  Crit W.S. (ft)           1645.31    Flow Area (sq ft)                  428.90
  E.G. Slope (ft/ft)      0.004269    Area (sq ft)                       428.90
  Q Total (cfs)            8562.00    Flow (cfs)                        8562.00
  Top Width (ft)             75.01    Top Width (ft)                     75.01
  Vel Total (ft/s)           19.96    Avg. Vel. (ft/s)                   19.96
  Max Chl Dpth (ft)           6.85    Hydr. Depth (ft)                    5.72
  Conv. Total (cfs)       131038.5    Conv. (cfs)                      131038.5
  Length Wtd. (ft)           23.86    Wetted Per. (ft)                   79.18
  Min Ch El (ft)           1636.68    Shear (lb/sq ft)                    1.44
  Alpha                       1.00    Stream Power (lb/ft s)             28.82
  Frctn Loss (ft)             0.10    Cum Volume (acre-ft)               10.51
  C & E Loss (ft)             0.00    Cum SA (acres)                      1.31


CROSS SECTION          RIVER: Duckcreek
REACH: duckup             RS: 13266.1*

INPUT
Description:
Station Elevation Data    num=       5
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1005.62	1645.73	1015	1637.41	1045	1636.51	1075	1637.41	1084.38	1645.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1005.62	.015	1005.62	.015	1084.38	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1005.62	1084.38	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.62	Element			
Vel Head (ft)	6.19	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.43	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1645.18	Flow Area (sq ft)		428.95	
E.G. Slope (ft/ft)	0.004194	Area (sq ft)		428.95	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	73.57	Top Width (ft)		73.57	
Vel Total (ft/s)	19.96	Avg. Vel. (ft/s)		19.96	
Max Chl Dpth (ft)	6.92	Hydr. Depth (ft)		5.83	
Conv. Total (cfs)	132201.6	Conv. (cfs)		132201.6	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		78.17	
Min Ch El (ft)	1636.51	Shear (lb/sq ft)		1.44	
Alpha	1.00	Stream Power (lb/ft s)		28.68	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		10.27	
C & E Loss (ft)	0.00	Cum SA (acres)		1.27	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13242.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1006.56	1645.7	1015	1637.24	1045	1636.34	1075	1637.24	1083.44	1645.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1006.56	.015	1006.56	.015	1083.44	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1006.56	1083.44	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.51	Element			
Vel Head (ft)	6.19	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.32	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1645.04	Flow Area (sq ft)		428.93	
E.G. Slope (ft/ft)	0.004127	Area (sq ft)		428.93	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	72.14	Top Width (ft)		72.14	
Vel Total (ft/s)	19.96	Avg. Vel. (ft/s)		19.96	
Max Chl Dpth (ft)	6.98	Hydr. Depth (ft)		5.95	
Conv. Total (cfs)	133277.3	Conv. (cfs)		133277.3	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		77.21	
Min Ch El (ft)	1636.34	Shear (lb/sq ft)		1.43	
Alpha	1.00	Stream Power (lb/ft s)		28.57	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		10.04	
C & E Loss (ft)	0.00	Cum SA (acres)		1.23	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13218.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007.5	1645.67	1015	1637.07	1045	1636.18	1075	1637.07	1082.5	1645.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007.5	.015	1007.5	.015	1082.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007.5	1082.5	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.42	Element			
Vel Head (ft)	6.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.22	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.91	Flow Area (sq ft)		428.57	
E.G. Slope (ft/ft)	0.004077	Area (sq ft)		428.57	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	70.72	Top Width (ft)		70.72	
Vel Total (ft/s)	19.98	Avg. Vel. (ft/s)		19.98	
Max Chl Dpth (ft)	7.04	Hydr. Depth (ft)		6.06	
Conv. Total (cfs)	134100.5	Conv. (cfs)		134100.5	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		76.34	
Min Ch El (ft)	1636.18	Shear (lb/sq ft)		1.43	
Alpha	1.00	Stream Power (lb/ft s)		28.54	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		9.80	
C & E Loss (ft)	0.00	Cum SA (acres)		1.19	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13194.5*

INPUT
Description:

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1008.44	1645.63	1015	1636.91	1045	1636.01	1075	1636.91	1081.56	1645.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1008.44	.015	1008.44	.015	1081.56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1008.44	1081.56	23.86	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.32	Element			
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.11	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.78	Flow Area (sq ft)		428.14	
E.G. Slope (ft/ft)	0.004034	Area (sq ft)		428.14	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	69.33	Top Width (ft)		69.33	
Vel Total (ft/s)	20.00	Avg. Vel. (ft/s)		20.00	
Max Chl Dpth (ft)	7.10	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	134810.1	Conv. (cfs)		134810.1	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		75.55	
Min Ch El (ft)	1636.01	Shear (lb/sq ft)		1.43	
Alpha	1.00	Stream Power (lb/ft s)		28.54	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		9.57	
C & E Loss (ft)	0.00	Cum SA (acres)		1.16	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13170.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1009.38	1645.6	1015	1636.74	1045	1635.84	1075	1636.74	1080.62	1645.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1009.38	.015	1009.38	.015	1080.62	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1009.38	1080.62	23.86	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.22	Element			
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1643.01	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.66	Flow Area (sq ft)		428.01	
E.G. Slope (ft/ft)	0.003989	Area (sq ft)		428.01	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	67.95	Top Width (ft)		67.95	
Vel Total (ft/s)	20.00	Avg. Vel. (ft/s)		20.00	
Max Chl Dpth (ft)	7.17	Hydr. Depth (ft)		6.30	
Conv. Total (cfs)	135556.0	Conv. (cfs)		135556.0	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		74.87	
Min Ch El (ft)	1635.84	Shear (lb/sq ft)		1.42	
Alpha	1.00	Stream Power (lb/ft s)		28.48	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		9.33	
C & E Loss (ft)	0.00	Cum SA (acres)		1.12	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13146.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1010.31	1645.57	1015	1636.57	1045	1635.67	1075	1636.57	1079.69	1645.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1010.31	.015	1010.31	.015	1079.69	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1010.31	1079.69	23.86	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.12	Element			
Vel Head (ft)	6.22	Wt. n-Val.		0.015	
W.S. Elev (ft)	1642.90	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.53	Flow Area (sq ft)		427.89	
E.G. Slope (ft/ft)	0.003953	Area (sq ft)		427.89	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	66.60	Top Width (ft)		66.60	
Vel Total (ft/s)	20.01	Avg. Vel. (ft/s)		20.01	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		6.42	
Conv. Total (cfs)	136171.6	Conv. (cfs)		136171.6	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		74.31	
Min Ch El (ft)	1635.67	Shear (lb/sq ft)		1.42	
Alpha	1.00	Stream Power (lb/ft s)		28.44	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		9.10	
C & E Loss (ft)	0.00	Cum SA (acres)		1.08	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13123.0*

INPUT

Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1011.25	1645.54	1015	1636.41	1045	1635.51	1075	1636.41	1078.75	1645.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1011.25	.015	1011.25	.015	1078.75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1011.25	1078.75	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1649.03	Element			
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1642.81	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.38	Flow Area (sq ft)		427.99	
E.G. Slope (ft/ft)	0.003919	Area (sq ft)		427.99	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	65.26	Top Width (ft)		65.26	
Vel Total (ft/s)	20.01	Avg. Vel. (ft/s)		20.01	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		6.56	
Conv. Total (cfs)	136764.3	Conv. (cfs)		136764.3	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		73.87	
Min Ch El (ft)	1635.51	Shear (lb/sq ft)		1.42	
Alpha	1.00	Stream Power (lb/ft s)		28.36	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		8.86	
C & E Loss (ft)	0.00	Cum SA (acres)		1.05	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13099.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1012.19	1645.51	1015	1636.24	1045	1635.34	1075	1636.24	1077.81	1645.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1012.19	.015	1012.19	.015	1077.81	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1012.19	1077.81	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.92	Element			
Vel Head (ft)	6.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1642.72	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.28	Flow Area (sq ft)		428.65	
E.G. Slope (ft/ft)	0.003878	Area (sq ft)		428.65	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	63.93	Top Width (ft)		63.93	
Vel Total (ft/s)	19.97	Avg. Vel. (ft/s)		19.97	
Max Chl Dpth (ft)	7.38	Hydr. Depth (ft)		6.71	
Conv. Total (cfs)	137488.6	Conv. (cfs)		137488.6	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		73.57	
Min Ch El (ft)	1635.34	Shear (lb/sq ft)		1.41	
Alpha	1.00	Stream Power (lb/ft s)		28.18	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		8.63	
C & E Loss (ft)	0.41	Cum SA (acres)		1.01	

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.

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13075.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013.12	1645.48	1015	1636.07	1045	1635.17	1075	1636.07	1076.88	1645.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013.12	.015	1013.12	.015	1076.88	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013.12	1076.88	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.81	Element			
Vel Head (ft)	6.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1642.63	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.11	Flow Area (sq ft)		429.28	
E.G. Slope (ft/ft)	0.003848	Area (sq ft)		429.28	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	62.62	Top Width (ft)		62.62	
Vel Total (ft/s)	19.94	Avg. Vel. (ft/s)		19.94	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		6.86	
Conv. Total (cfs)	138030.6	Conv. (cfs)		138030.6	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		73.41	
Min Ch El (ft)	1635.17	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)		28.02	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		8.39	
C & E Loss (ft)	0.35	Cum SA (acres)		0.98	

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.

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13051.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1014.06	1645.45	1015	1635.91	1045	1635.01	1075	1635.91	1075.94	1645.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1014.06	.015	1014.06	.015	1075.94	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1014.06	1075.94	23.86	23.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.72	Element			
Vel Head (ft)	6.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1642.54	Reach Len. (ft)	23.86	23.86	23.86
Crit W.S. (ft)	1644.01	Flow Area (sq ft)		429.18	
E.G. Slope (ft/ft)	0.003847	Area (sq ft)		429.18	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	61.31	Top Width (ft)		61.31	
Vel Total (ft/s)	19.95	Avg. Vel. (ft/s)		19.95	
Max Chl Dpth (ft)	7.53	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	138045.3	Conv. (cfs)		138045.3	
Length Wtd. (ft)	23.86	Wetted Per. (ft)		73.35	
Min Ch El (ft)	1635.01	Shear (lb/sq ft)		1.41	
Alpha	1.00	Stream Power (lb/ft s)		28.03	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		8.16	
C & E Loss (ft)	0.00	Cum SA (acres)		0.94	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13027.54

INPUT
Description: STA 13028 PC (PLAN 138+46) TRANS 60 TO 41
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1015	1645.42	1015	1635.74	1045	1634.84	1075	1635.74	1075	1645.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1015	.015	1015	.015	1075	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1015	1075	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.62	Element			
Vel Head (ft)	6.17	Wt. n-Val.		0.015	
W.S. Elev (ft)	1642.45	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1643.84	Flow Area (sq ft)		429.61	
E.G. Slope (ft/ft)	0.003840	Area (sq ft)		429.61	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	19.93	Avg. Vel. (ft/s)		19.93	
Max Chl Dpth (ft)	7.61	Hydr. Depth (ft)		7.16	
Conv. Total (cfs)	138159.9	Conv. (cfs)		138159.9	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		73.45	
Min Ch El (ft)	1634.84	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)		27.95	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		7.92	
C & E Loss (ft)	0.00	Cum SA (acres)		0.91	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 13004.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1015.73	1645.12	1015.73	1635.28	1045	1634.4	1074.27	1635.28	1074.27	1645.12

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1015.73	.015	1015.73	.015	1074.27	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1015.73	1074.27	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.49	Element			
Vel Head (ft)	6.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1641.99	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1643.55	Flow Area (sq ft)		418.34	
E.G. Slope (ft/ft)	0.004085	Area (sq ft)		418.34	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	58.54	Top Width (ft)		58.54	
Vel Total (ft/s)	20.47	Avg. Vel. (ft/s)		20.47	
Max Chl Dpth (ft)	7.59	Hydr. Depth (ft)		7.15	
Conv. Total (cfs)	133961.1	Conv. (cfs)		133961.1	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		71.98	

Min Ch El (ft)	1634.40	Shear (lb/sq ft)	1.48
Alpha	1.00	Stream Power (lb/ft s)	30.34
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	7.70
C & E Loss (ft)	0.03	Cum SA (acres)	0.88

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12980.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1016.46	1644.81	1016.46	1634.82	1045	1633.97	1073.54	1634.82	1073.54	1644.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1016.46	.015	1016.46	.015	1073.54	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1016.46	1073.54	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1648.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.80	Wt. n-Val.		0.015	
W.S. Elev (ft)	1641.56	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1643.26	Flow Area (sq ft)		409.05	
E.G. Slope (ft/ft)	0.004289	Area (sq ft)		409.05	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	57.08	Top Width (ft)		57.08	
Vel Total (ft/s)	20.93	Avg. Vel. (ft/s)		20.93	
Max Chl Dpth (ft)	7.59	Hydr. Depth (ft)		7.17	
Conv. Total (cfs)	130729.2	Conv. (cfs)		130729.2	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		70.59	
Min Ch El (ft)	1633.97	Shear (lb/sq ft)		1.55	
Alpha	1.00	Stream Power (lb/ft s)		32.48	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		7.47	
C & E Loss (ft)	0.03	Cum SA (acres)		0.85	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12957.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1017.19	1644.51	1017.19	1634.36	1045	1633.53	1072.81	1634.36	1072.81	1644.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1017.19	.015	1017.19	.015	1072.81	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1017.19	1072.81	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1648.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1641.15	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1642.96	Flow Area (sq ft)		400.94	
E.G. Slope (ft/ft)	0.004468	Area (sq ft)		400.94	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	55.62	Top Width (ft)		55.62	
Vel Total (ft/s)	21.35	Avg. Vel. (ft/s)		21.35	
Max Chl Dpth (ft)	7.62	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	128085.2	Conv. (cfs)		128085.2	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		69.23	
Min Ch El (ft)	1633.53	Shear (lb/sq ft)		1.62	
Alpha	1.00	Stream Power (lb/ft s)		34.50	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		7.26	
C & E Loss (ft)	0.03	Cum SA (acres)		0.82	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12934.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1017.92	1644.2	1017.92	1633.91	1045	1633.1	1072.08	1633.91	1072.08	1644.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1017.92	.015	1017.92	.015	1072.08	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1017.92	1072.08	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1648.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.79	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1642.68	Flow Area (sq ft)		394.34	
E.G. Slope (ft/ft)	0.004605	Area (sq ft)		394.34	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	54.16	Top Width (ft)		54.16	
Vel Total (ft/s)	21.71	Avg. Vel. (ft/s)		21.71	
Max Chl Dpth (ft)	7.69	Hydr. Depth (ft)		7.28	
Conv. Total (cfs)	126169.1	Conv. (cfs)		126169.1	

Length Wtd. (ft)	23.37	Wetted Per. (ft)	67.94
Min Ch El (ft)	1633.10	Shear (lb/sq ft)	1.67
Alpha	1.00	Stream Power (lb/ft s)	36.23
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	7.04
C & E Loss (ft)	0.02	Cum SA (acres)	0.79

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12910.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1018.65	1643.9	1018.65	1633.45	1045	1632.66	1071.35	1633.45	1071.35	1643.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1018.65	.015	1018.65	.015	1071.35	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1018.65	1071.35	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1647.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.42	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1642.40	Flow Area (sq ft)		388.05	
E.G. Slope (ft/ft)	0.004737	Area (sq ft)		388.05	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	52.70	Top Width (ft)		52.70	
Vel Total (ft/s)	22.06	Avg. Vel. (ft/s)		22.06	
Max Chl Dpth (ft)	7.76	Hydr. Depth (ft)		7.36	
Conv. Total (cfs)	124397.5	Conv. (cfs)		124397.5	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		66.66	
Min Ch El (ft)	1632.66	Shear (lb/sq ft)		1.72	
Alpha	1.00	Stream Power (lb/ft s)		37.99	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		6.83	
C & E Loss (ft)	0.02	Cum SA (acres)		0.76	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12887.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1019.38	1643.6	1019.38	1632.99	1045	1632.22	1070.62	1632.99	1070.62	1643.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1019.38	.015	1019.38	.015	1070.62	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1019.38	1070.62	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1647.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.77	Wt. n-Val.		0.015	
W.S. Elev (ft)	1640.08	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1642.13	Flow Area (sq ft)		382.74	
E.G. Slope (ft/ft)	0.004838	Area (sq ft)		382.74	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	51.24	Top Width (ft)		51.24	
Vel Total (ft/s)	22.37	Avg. Vel. (ft/s)		22.37	
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)		7.47	
Conv. Total (cfs)	123089.2	Conv. (cfs)		123089.2	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		65.43	
Min Ch El (ft)	1632.22	Shear (lb/sq ft)		1.77	
Alpha	1.00	Stream Power (lb/ft s)		39.53	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		6.63	
C & E Loss (ft)	0.02	Cum SA (acres)		0.73	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12863.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1020.12	1643.29	1020.12	1632.53	1045	1631.79	1069.88	1632.53	1069.88	1643.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1020.12	.015	1020.12	.015	1069.88	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1020.12	1069.88	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1647.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.95	Wt. n-Val.		0.015	
W.S. Elev (ft)	1639.77	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1641.87	Flow Area (sq ft)		378.41	
E.G. Slope (ft/ft)	0.004905	Area (sq ft)		378.41	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	49.76	Top Width (ft)		49.76	
Vel Total (ft/s)	22.63	Avg. Vel. (ft/s)		22.63	
Max Chl Dpth (ft)	7.97	Hydr. Depth (ft)		7.60	

Conv. Total (cfs)	122249.1	Conv. (cfs)	122249.1
Length Wtd. (ft)	23.37	Wetted Per. (ft)	64.25
Min Ch El (ft)	1631.79	Shear (lb/sq ft)	1.80
Alpha	1.00	Stream Power (lb/ft s)	40.81
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	6.42
C & E Loss (ft)	0.02	Cum SA (acres)	0.70

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12840.5*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1020.85	1642.99	1020.85	1632.07	1045	1631.35	1069.15	1632.07	1069.15	1642.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1020.85	.015	1020.85	.015	1069.15	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1020.85	1069.15	23.37	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.59	Element			
Vel Head (ft)	8.13	Wt. n-Val.		0.015	
W.S. Elev (ft)	1639.46	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1641.62	Flow Area (sq ft)		374.07	
E.G. Slope (ft/ft)	0.004975	Area (sq ft)		374.07	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	48.30	Top Width (ft)		48.30	
Vel Total (ft/s)	22.89	Avg. Vel. (ft/s)		22.89	
Max Chl Dpth (ft)	8.10	Hydr. Depth (ft)		7.74	
Conv. Total (cfs)	121390.3	Conv. (cfs)		121390.3	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		63.09	
Min Ch El (ft)	1631.35	Shear (lb/sq ft)		1.84	
Alpha	1.00	Stream Power (lb/ft s)		42.15	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		6.22	
C & E Loss (ft)	0.02	Cum SA (acres)		0.68	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12817.1*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1021.58	1642.69	1021.58	1631.61	1045	1630.91	1068.42	1631.61	1068.42	1642.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1021.58	.015	1021.58	.015	1068.42	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1021.58	1068.42	23.37	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.46	Element			
Vel Head (ft)	8.29	Wt. n-Val.		0.015	
W.S. Elev (ft)	1639.17	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1641.37	Flow Area (sq ft)		370.66	
E.G. Slope (ft/ft)	0.005010	Area (sq ft)		370.66	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	46.84	Top Width (ft)		46.84	
Vel Total (ft/s)	23.10	Avg. Vel. (ft/s)		23.10	
Max Chl Dpth (ft)	8.26	Hydr. Depth (ft)		7.91	
Conv. Total (cfs)	120965.4	Conv. (cfs)		120965.4	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		61.99	
Min Ch El (ft)	1630.91	Shear (lb/sq ft)		1.87	
Alpha	1.00	Stream Power (lb/ft s)		43.20	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		6.02	
C & E Loss (ft)	0.02	Cum SA (acres)		0.65	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12793.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1022.31	1642.38	1022.31	1631.16	1045	1630.48	1067.69	1631.16	1067.69	1642.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1022.31	.015	1022.31	.015	1067.69	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1022.31	1067.69	23.37	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.33	Element			
Vel Head (ft)	8.40	Wt. n-Val.		0.015	
W.S. Elev (ft)	1638.93	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1641.15	Flow Area (sq ft)		368.14	
E.G. Slope (ft/ft)	0.005011	Area (sq ft)		368.14	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	45.38	Top Width (ft)		45.38	
Vel Total (ft/s)	23.26	Avg. Vel. (ft/s)		23.26	

Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)	8.11
Conv. Total (cfs)	120957.0	Conv. (cfs)	120957.0
Length Wtd. (ft)	23.37	Wetted Per. (ft)	60.95
Min Ch El (ft)	1630.48	Shear (lb/sq ft)	1.89
Alpha	1.00	Stream Power (lb/ft s)	43.95
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	5.82
C & E Loss (ft)	0.01	Cum SA (acres)	0.63

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12770.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1023.04	1642.08	1023.04	1630.7	1045	1630.04	1066.96	1630.7	1066.96	1642.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1023.04	.015	1023.04	.015	1066.96	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1023.04	1066.96	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.20	Element			
Vel Head (ft)	8.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1638.70	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1640.93	Flow Area (sq ft)		365.87	
E.G. Slope (ft/ft)	0.005003	Area (sq ft)		365.87	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	43.92	Top Width (ft)		43.92	
Vel Total (ft/s)	23.40	Avg. Vel. (ft/s)		23.40	
Max Chl Dpth (ft)	8.66	Hydr. Depth (ft)		8.33	
Conv. Total (cfs)	121049.6	Conv. (cfs)		121049.6	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		59.94	
Min Ch El (ft)	1630.04	Shear (lb/sq ft)		1.91	
Alpha	1.00	Stream Power (lb/ft s)		44.61	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		5.63	
C & E Loss (ft)	0.01	Cum SA (acres)		0.60	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12746.9*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1023.77	1641.77	1023.77	1630.24	1045	1629.61	1066.23	1630.24	1066.23	1641.77

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1023.77	.015	1023.77	.015	1066.23	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1023.77	1066.23	23.37	23.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1647.08	Element			
Vel Head (ft)	8.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1638.51	Reach Len. (ft)	23.37	23.37	23.37
Crit W.S. (ft)	1640.72	Flow Area (sq ft)		364.33	
E.G. Slope (ft/ft)	0.004969	Area (sq ft)		364.33	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	42.46	Top Width (ft)		42.46	
Vel Total (ft/s)	23.50	Avg. Vel. (ft/s)		23.50	
Max Chl Dpth (ft)	8.90	Hydr. Depth (ft)		8.58	
Conv. Total (cfs)	121462.6	Conv. (cfs)		121462.6	
Length Wtd. (ft)	23.37	Wetted Per. (ft)		59.01	
Min Ch El (ft)	1629.61	Shear (lb/sq ft)		1.92	
Alpha	1.00	Stream Power (lb/ft s)		45.01	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		5.43	
C & E Loss (ft)	0.01	Cum SA (acres)		0.58	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12723.61

INPUT
Description: STA 12773.61 PT (PLAN 141+50) TRANS TO 1.06
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1641.47	1024.5	1629.78	1045	1629.17	1065.5	1629.78	1065.5	1641.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1065.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1065.5	39.79	39.79	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1646.96	Element			
Vel Head (ft)	8.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1638.34	Reach Len. (ft)	39.79	39.79	39.79
Crit W.S. (ft)	1640.53	Flow Area (sq ft)		363.27	
E.G. Slope (ft/ft)	0.004918	Area (sq ft)		363.27	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	41.00	Top Width (ft)		41.00	

Vel Total (ft/s)	23.57	Avg. Vel. (ft/s)	23.57
Max Chl Dpth (ft)	9.17	Hydr. Depth (ft)	8.86
Conv. Total (cfs)	122094.6	Conv. (cfs)	122094.6
Length Wtd. (ft)	39.79	Wetted Per. (ft)	58.13
Min Ch El (ft)	1629.17	Shear (lb/sq ft)	1.92
Alpha	1.00	Stream Power (lb/ft s)	45.22
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	5.24
C & E Loss (ft)	0.00	Cum SA (acres)	0.56

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12683.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1640.98	1024.5	1629.36	1045	1628.75	1065.5	1629.36	1065.5	1640.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1065.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1065.5	39.79	39.79	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1646.72	Element			
Vel Head (ft)	8.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1637.74	Reach Len. (ft)	39.79	39.79	39.79
Crit W.S. (ft)	1640.12	Flow Area (sq ft)		355.90	
E.G. Slope (ft/ft)	0.005222	Area (sq ft)		355.90	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	41.00	Top Width (ft)		41.00	
Vel Total (ft/s)	24.06	Avg. Vel. (ft/s)		24.06	
Max Chl Dpth (ft)	8.99	Hydr. Depth (ft)		8.68	
Conv. Total (cfs)	118482.1	Conv. (cfs)		118482.1	
Length Wtd. (ft)	39.79	Wetted Per. (ft)		57.77	
Min Ch El (ft)	1628.75	Shear (lb/sq ft)		2.01	
Alpha	1.00	Stream Power (lb/ft s)		48.32	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		4.91	
C & E Loss (ft)	0.04	Cum SA (acres)		0.52	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12644.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1640.49	1024.5	1628.94	1045	1628.32	1065.5	1628.94	1065.5	1640.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1065.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1065.5	39.79	39.79	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1646.48	Element			
Vel Head (ft)	9.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1637.15	Reach Len. (ft)	39.79	39.79	39.79
Crit W.S. (ft)	1639.69	Flow Area (sq ft)		349.42	
E.G. Slope (ft/ft)	0.005510	Area (sq ft)		349.42	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	41.00	Top Width (ft)		41.00	
Vel Total (ft/s)	24.50	Avg. Vel. (ft/s)		24.50	
Max Chl Dpth (ft)	8.83	Hydr. Depth (ft)		8.52	
Conv. Total (cfs)	115344.0	Conv. (cfs)		115344.0	
Length Wtd. (ft)	39.79	Wetted Per. (ft)		57.44	
Min Ch El (ft)	1628.32	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)		51.27	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		4.58	
C & E Loss (ft)	0.03	Cum SA (acres)		0.48	

CROSS SECTION RIVER: Duckcreek
REACH: duckup RS: 12604.26

INPUT
Description: BEGIN RCB AT BOULDER HIGHWAY -- Sta. 142+69.35
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1640	1024.51	628.515	1045	1627.9	1065.51	628.515	1065.5	1640

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1065.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1065.5	483.14	483.14	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1646.22	Element			
Vel Head (ft)	9.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1636.59	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1639.27	Flow Area (sq ft)		343.86	
E.G. Slope (ft/ft)	0.005777	Area (sq ft)		343.86	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	

Top Width (ft)	41.00	Top Width (ft)	41.00
Vel Total (ft/s)	24.90	Avg. Vel. (ft/s)	24.90
Max Chl Dpth (ft)	8.69	Hydr. Depth (ft)	8.39
Conv. Total (cfs)	112648.7	Conv. (cfs)	112648.7
Length Wtd. (ft)	1.00	Wetted Per. (ft)	57.18
Min Ch El (ft)	1627.90	Shear (lb/sq ft)	2.17
Alpha	1.00	Stream Power (lb/ft s)	54.01
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	4.27
C & E Loss (ft)	0.03	Cum SA (acres)	0.44

BRIDGE RIVER: Duckcreek
REACH: duckup RS: 12603.26

INPUT
Description: BOULDER HIGHWAY OVER DUCK CREEK BRIDGE
Distance from Upstream XS = 1
Deck/Roadway Width = 481.14
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1024.5	16501638.015		1045	1650	1638.05	1065.5	1650	1638.08

Upstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.51639.991		1024.51628.506		10451627.891		1065.51628.506		1065.51639.991	

Manning's n Values num= 1

Sta	n Val
1024.5	.015

Bank Sta: Left Right Coeff Contr. Expan.
1024.5 1065.5 .1 .3

Downstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1024.5	1645	1633.72	1045	1645	1633.75	1065.5	1645	1633.78

Downstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.51634.649		1024.51623.169		10451622.549		1065.51623.169		1065.51634.649	

Manning's n Values num= 1

Sta	n Val
1024.5	.015

Bank Sta: Left Right Coeff Contr. Expan.
1024.5 1065.5 .3 .5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 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 Piers = 1

Pier Data
Pier Station Upstream= 1045 Downstream= 1045
Upstream num= 2

Width	Elev	Width	Elev
1	1625	1	1640

Downstream num= 2

Width	Elev	Width	Elev
1	1620	1	1635

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 1.33
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1
Opening : Single BR

			Inside BR US	Inside BR DS
E.G. US. (ft)	1646.22	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1636.59	E.G. Elev (ft)	1645.94	1641.77
Q Total (cfs)	8562.00	W.S. Elev (ft)	1637.26	1630.99
Q Bridge (cfs)	8562.00	Crit W.S. (ft)	1638.04	1633.73
Q Weir (cfs)		Max Chl Dpth (ft)	9.35	8.43
Weir Sta Lft (ft)		Vel Total (ft/s)	23.65	26.35
Weir Sta Rgt (ft)		Flow Area (sq ft)	362.07	324.91
Weir Submerg		Froude # Chl	1.39	1.63
Weir Max Depth (ft)		Specif Force (cu ft)	7927.15	8327.22
Min El Weir Flow (ft)	1650.01	Hydr Depth (ft)	9.05	8.12
Min El Prs (ft)	1638.08	W.P. Total (ft)	76.22	72.51
Delta EG (ft)	-19.86	Conv. Total (cfs)	101349.9	87479.9

Delta WS (ft)	2.87	Top Width (ft)	40.00	40.00
BR Open Area (sq ft)	393.71	Frctn Loss (ft)	0.01	3.96
BR Open Vel (ft/s)	26.35	C & E Loss (ft)	0.28	0.21
Coef of Q		Shear Total (lb/sq ft)	2.12	2.68
Br Sel Method	Energy only	Power Total (lb/ft s)	50.05	70.62

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 parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
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.
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: Duckcreek
REACH: duckup RS: 12121.12

INPUT
Description: END RCB -- Sta. 147+52.49
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1635.85	1024.5	1624.37	1045	1623.75	1065.5	1624.37	1065.5	1635.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1065.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1065.5	0	0	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1640.97	Element			
Vel Head (ft)	7.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1633.73	Reach Len. (ft)	48.00	48.00	48.00
Crit W.S. (ft)	1635.12	Flow Area (sq ft)		396.31	
E.G. Slope (ft/ft)	0.003815	Area (sq ft)		396.31	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	41.00	Top Width (ft)		41.00	
Vel Total (ft/s)	21.60	Avg. Vel. (ft/s)		21.60	
Max Chl Dpth (ft)	9.98	Hydr. Depth (ft)		9.67	
Conv. Total (cfs)	138620.7	Conv. (cfs)		138620.7	
Length Wtd. (ft)	48.00	Wetted Per. (ft)		59.73	
Min Ch El (ft)	1623.75	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		34.14	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		0.46	
C & E Loss (ft)	0.45	Cum SA (acres)			

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.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 12074.41

INPUT
Description: CONFLUENCE
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1636.8	1024.5	1624.75	1066	1623.35	1117.5	1624.75	1117.5	1636.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1117.5	92.29	92.29	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1639.59	Element			
Vel Head (ft)	10.86	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.73	Reach Len. (ft)	92.29	92.29	92.29
Crit W.S. (ft)	1631.83	Flow Area (sq ft)		434.84	
E.G. Slope (ft/ft)	0.010175	Area (sq ft)		434.84	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	26.45	Avg. Vel. (ft/s)		26.45	
Max Chl Dpth (ft)	5.38	Hydr. Depth (ft)		4.68	
Conv. Total (cfs)	114005.5	Conv. (cfs)		114005.5	
Length Wtd. (ft)	92.29	Wetted Per. (ft)		100.99	
Min Ch El (ft)	1623.35	Shear (lb/sq ft)		2.74	
Alpha	1.00	Stream Power (lb/ft s)		72.33	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		3.00	
C & E Loss (ft)	1.08	Cum SA (acres)		0.62	

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: During supercritical flow calculations a junction was encountered. During standard step calculations the program used the stream with the greatest momentum to balance the energy equation.
Warning: The energy loss was greater than 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: Duckcreek
REACH: DUCKDOWN RS: 11982.12

INPUT
Description: Gradebreak at Plan Sta 148+91.49
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1635.99	1024.5	1623.94	1066	1622.54	1117.5	1623.94	1117.5	1635.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1117.5	76.25	76.25	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1638.59	Element			
Vel Head (ft)	10.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.97	Reach Len. (ft)	76.25	76.25	76.25
Crit W.S. (ft)	1631.01	Flow Area (sq ft)		439.60	
E.G. Slope (ft/ft)	0.009826	Area (sq ft)		439.60	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	26.16	Avg. Vel. (ft/s)		26.16	
Max Chl Dpth (ft)	5.43	Hydr. Depth (ft)		4.73	
Conv. Total (cfs)	116015.6	Conv. (cfs)		116015.6	
Length Wtd. (ft)	76.25	Wetted Per. (ft)		101.10	
Min Ch El (ft)	1622.54	Shear (lb/sq ft)		2.67	
Alpha	1.00	Stream Power (lb/ft s)		69.78	
Frctn Loss (ft)	0.92	Cum Volume (acre-ft)		2.08	
C & E Loss (ft)	0.07	Cum SA (acres)		0.42	

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11905.87

INPUT
Description: PLAN STA 149+67.74
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1630.11	1024.5	1623.61	1066	1622.21	1117.5	1623.61	1117.5	1630.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1117.5	120	120	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1637.65	Element			
Vel Head (ft)	9.82	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.83	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)	1630.71	Flow Area (sq ft)		457.20	
E.G. Slope (ft/ft)	0.008664	Area (sq ft)		457.20	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	25.15	Avg. Vel. (ft/s)		25.15	
Max Chl Dpth (ft)	5.62	Hydr. Depth (ft)		4.92	
Conv. Total (cfs)	123547.7	Conv. (cfs)		123547.7	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		101.47	
Min Ch El (ft)	1622.21	Shear (lb/sq ft)		2.44	
Alpha	1.00	Stream Power (lb/ft s)		61.30	
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)		1.29	
C & E Loss (ft)	0.24	Cum SA (acres)		0.26	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11785.87

INPUT
Description: PLAN STA 150+87.74
START TRANSITION TO TRAPEZOIDAL
MATCH PHASE 3
IMPROVEMENTS
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1629.57	1024.5	1623.07	1066	1621.67	1117.5	1623.07	1117.5	1629.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1117.5	0	0	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1636.40	Element			
Vel Head (ft)	8.85	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.55	Reach Len. (ft)			
Crit W.S. (ft)	1630.16	Flow Area (sq ft)		481.75	
E.G. Slope (ft/ft)	0.007328	Area (sq ft)		481.75	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	23.87	Avg. Vel. (ft/s)		23.87	
Max Chl Dpth (ft)	5.88	Hydr. Depth (ft)		5.18	
Conv. Total (cfs)	134335.6	Conv. (cfs)		134335.6	

Length Wtd. (ft)		Wetted Per. (ft)	102.00
Min Ch El (ft)	1621.67	Shear (lb/sq ft)	2.16
Alpha	1.00	Stream Power (lb/ft s)	51.58
Frctn Loss (ft)	0.95	Cum Volume (acre-ft)	
C & E Loss (ft)	0.29	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.

SUMMARY OF MANNING'S N VALUES

River:Duckcreek

Reach	River Sta.	n1	n2	n3
pittman	16028.7	.015	.015	.015
pittman	16014.5*	.015	.015	.015
pittman	16000.4*	.015	.015	.015
pittman	15986.2*	.015	.015	.015
pittman	15972.1*	.015	.015	.015
pittman	15958	.015	.015	.015
pittman	15917.75	.015	.015	.015
pittman	15868	.015	.015	.015
pittman	15818.*	.015	.015	.015
pittman	15768	.015	.015	.015
pittman	15744.7*	.015	.015	.015
pittman	15711.4*	.015	.015	.015
pittman	15668	.015	.015	.015
pittman	15644.7*	.015	.015	.015
pittman	15611.4*	.015	.015	.015
pittman	15568	.015	.015	.015
pittman	15544.7*	.015	.015	.015
pittman	15511.4*	.015	.015	.015
pittman	15468	.015	.015	.015
pittman	15438	.015	.015	.015
pittman	15437	Bridge		
pittman	15350	.015	.015	.015
pittman	15319.1*	.015	.015	.015
pittman	15268	.015	.015	.015
pittman	15244.7*	.015	.015	.015
pittman	15211.4*	.015	.015	.015
pittman	15168	.015	.015	.015
pittman	15144.7*	.015	.015	.015
pittman	15111.4*	.015	.015	.015
pittman	15068	.015	.015	.015
pittman	15064.22	.015	.015	.015
pittman	15016.2*	.015	.015	.015
pittman	14968.3*	.015	.015	.015
pittman	14920.3*	.015	.015	.015
pittman	14872.4*	.015	.015	.015
pittman	14824.4*	.015	.015	.015
pittman	14776.4*	.015	.015	.015
pittman	14728.5*	.015	.015	.015
pittman	14680.5*	.015	.015	.015
pittman	14632.63	.015	.015	.015
pittman	14546.8*	.015	.015	.015
pittman	14461.1*	.015	.015	.015
pittman	14375.3*	.015	.015	.015
pittman	14289.5*	.015	.015	.015
pittman	14203.8*	.015	.015	.015
pittman	14118.06	.015	.015	.015
pittman	14093.0*	.015	.015	.015
pittman	14067.99	.015	.015	.015
pittman	14055.35	.015	.015	.015
pittman	14054.35	Bridge		
pittman	13967.75	.015	.015	.015
pittman	13931.8*	.015	.015	.015
pittman	13895.99	.015	.015	.015
pittman	13888.29	.015	.015	.015
pittman	13867.99	.015	.015	.015
pittman	13767.99	.015	.015	.015
pittman	13728.1*	.015	.015	.015
pittman	13688.29	.015	.015	.015
pittman	13645.7*	.015	.015	.015
pittman	13603.1*	.015	.015	.015
pittman	13560.6*	.015	.015	.015
pittman	13518.09	.015	.015	.015
pittman	13509.2*	.015	.015	.015
pittman	13500.4*	.015	.015	.015
pittman	13491.7	.015	.015	.015
pittman	13490.7	Bridge		
pittman	13368.7	.015	.015	.015
pittman	13342.26	.015	.015	.015
pittman	13291.09	.015	.015	.015
pittman	13266.4*	.015	.015	.015
pittman	13241.7*	.015	.015	.015
pittman	13217.0*	.015	.015	.015
pittman	13192.3*	.015	.015	.015
pittman	13167.6*	.015	.015	.015
pittman	13142.9*	.015	.015	.015
pittman	13118.20	.015	.015	.015
pittman	13069.2*	.015	.015	.015
pittman	13020.2*	.015	.015	.015
pittman	12971.2	.015	.015	.015
pittman	12925.8*	.015	.015	.015
pittman	12880.4*	.015	.015	.015
pittman	12835.0*	.015	.015	.015
pittman	12789.6*	.015	.015	.015
pittman	12744.19	.015	.015	.015

pittman	12694.2*	.015	.015	.015
pittman	12644.3*	.015	.015	.015
pittman	12594.35	.015	.015	.015
pittman	12593.35	Bridge		
pittman	12111.21	.015	.015	.015
duckup	14300	.015	.015	.015
duckup	14250.*	.015	.015	.015
duckup	14200	.015	.015	.015
duckup	14161.8*	.015	.015	.015
duckup	14123.61	.015	.015	.015
duckup	14099.6*	.015	.015	.015
duckup	14075.7*	.015	.015	.015
duckup	14051.8*	.015	.015	.015
duckup	14027.9*	.015	.015	.015
duckup	14004.0*	.015	.015	.015
duckup	13980.1*	.015	.015	.015
duckup	13956.2*	.015	.015	.015
duckup	13932.2*	.015	.015	.015
duckup	13908.3*	.015	.015	.015
duckup	13884.4*	.015	.015	.015
duckup	13860.5*	.015	.015	.015
duckup	13836.6*	.015	.015	.015
duckup	13812.7*	.015	.015	.015
duckup	13788.7*	.015	.015	.015
duckup	13764.88	.015	.015	.015
duckup	13720.4*	.015	.015	.015
duckup	13676.0*	.015	.015	.015
duckup	13631.5*	.015	.015	.015
duckup	13587.1*	.015	.015	.015
duckup	13542.6*	.015	.015	.015
duckup	13498.2*	.015	.015	.015
duckup	13453.8*	.015	.015	.015
duckup	13409.39	.015	.015	.015
duckup	13385.5*	.015	.015	.015
duckup	13361.6*	.015	.015	.015
duckup	13337.7*	.015	.015	.015
duckup	13313.9*	.015	.015	.015
duckup	13290.0*	.015	.015	.015
duckup	13266.1*	.015	.015	.015
duckup	13242.3*	.015	.015	.015
duckup	13218.4*	.015	.015	.015
duckup	13194.5*	.015	.015	.015
duckup	13170.7*	.015	.015	.015
duckup	13146.8*	.015	.015	.015
duckup	13123.0*	.015	.015	.015
duckup	13099.1*	.015	.015	.015
duckup	13075.2*	.015	.015	.015
duckup	13051.4*	.015	.015	.015
duckup	13027.54	.015	.015	.015
duckup	13004.1*	.015	.015	.015
duckup	12980.7*	.015	.015	.015
duckup	12957.4*	.015	.015	.015
duckup	12934.0*	.015	.015	.015
duckup	12910.6*	.015	.015	.015
duckup	12887.2*	.015	.015	.015
duckup	12863.8*	.015	.015	.015
duckup	12840.5*	.015	.015	.015
duckup	12817.1*	.015	.015	.015
duckup	12793.7*	.015	.015	.015
duckup	12770.3*	.015	.015	.015
duckup	12746.9*	.015	.015	.015
duckup	12723.61	.015	.015	.015
duckup	12683.8*	.015	.015	.015
duckup	12644.0*	.015	.015	.015
duckup	12604.26	.015	.015	.015
duckup	12603.26	Bridge		
duckup	12121.12	.015	.015	.015
DUCKDOWN	12074.41	.015	.015	.015
DUCKDOWN	11982.12	.015	.015	.015
DUCKDOWN	11905.87	.015	.015	.015
DUCKDOWN	11785.87	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Duckcreek

Reach	River Sta.	Left	Channel	Right
pittman	16028.7	14.13	14.13	14.13
pittman	16014.5*	14.13	14.13	14.13
pittman	16000.4*	14.13	14.13	14.13
pittman	15986.2*	14.13	14.13	14.13
pittman	15972.1*	14.13	14.13	14.13
pittman	15958	40	40	40
pittman	15917.75	49.75	49.75	49.75
pittman	15868	49.99	49.99	49.99
pittman	15818.*	49.99	49.99	49.99
pittman	15768	33.33	33.33	33.33
pittman	15744.7*	33.33	33.33	33.33
pittman	15711.4*	33.33	33.33	33.33
pittman	15668	33.33	33.33	33.33
pittman	15644.7*	33.33	33.33	33.33
pittman	15611.4*	33.33	33.33	33.33
pittman	15568	33.33	33.33	33.33
pittman	15544.7*	33.33	33.33	33.33
pittman	15511.4*	33.33	33.33	33.33
pittman	15468	30	30	30
pittman	15438	88	88	88
pittman	15437	Bridge		
pittman	15350	41	41	41
pittman	15319.1*	41	41	41

pittman	15268	33.33	33.33	33.33
pittman	15244.7*	33.33	33.33	33.33
pittman	15211.4*	33.33	33.33	33.33
pittman	15168	33.33	33.33	33.33
pittman	15144.7*	33.33	33.33	33.33
pittman	15111.4*	33.33	33.33	33.33
pittman	15068	3.77	3.77	3.77
pittman	15064.22	47.96	47.96	47.96
pittman	15016.2*	47.96	47.96	47.96
pittman	14968.3*	47.96	47.96	47.96
pittman	14920.3*	47.96	47.96	47.96
pittman	14872.4*	47.96	47.96	47.96
pittman	14824.4*	47.96	47.96	47.96
pittman	14776.4*	47.96	47.96	47.96
pittman	14728.5*	47.96	47.96	47.96
pittman	14680.5*	47.96	47.96	47.96
pittman	14632.63	85.76	85.76	85.76
pittman	14546.8*	85.76	85.76	85.76
pittman	14461.1*	85.76	85.76	85.76
pittman	14375.3*	85.76	85.76	85.76
pittman	14289.5*	85.76	85.76	85.76
pittman	14203.8*	85.76	85.76	85.76
pittman	14118.06	25.03	25.03	25.03
pittman	14093.0*	25.03	25.03	25.03
pittman	14067.99	12.64	12.64	12.64
pittman	14055.35	87.6	87.6	87.6
pittman	14054.35	Bridge		
pittman	13967.75	35.88	35.88	35.88
pittman	13931.8*	35.88	35.88	35.88
pittman	13895.99	7.7	7.7	7.7
pittman	13888.29	20.3	20.3	20.3
pittman	13867.99	100	100	100
pittman	13767.99	39.85	39.85	39.85
pittman	13728.1*	39.85	39.85	39.85
pittman	13688.29	42.55	42.55	42.55
pittman	13645.7*	42.55	42.55	42.55
pittman	13603.1*	42.55	42.55	42.55
pittman	13560.6*	42.55	42.55	42.55
pittman	13518.09	8.8	8.8	8.8
pittman	13509.2*	8.8	8.8	8.8
pittman	13500.4*	8.8	8.8	8.8
pittman	13491.7	123	123	123
pittman	13490.7	Bridge		
pittman	13368.7	26.44	26.44	26.44
pittman	13342.26	51.17	51.17	51.17
pittman	13291.09	24.7	24.7	24.7
pittman	13266.4*	24.7	24.7	24.7
pittman	13241.7*	24.7	24.7	24.7
pittman	13217.0*	24.7	24.7	24.7
pittman	13192.3*	24.7	24.7	24.7
pittman	13167.6*	24.7	24.7	24.7
pittman	13142.9*	24.7	24.7	24.7
pittman	13118.20	48.98	48.98	48.98
pittman	13069.2*	48.98	48.98	48.98
pittman	13020.2*	48.98	48.98	48.98
pittman	12971.2	45.41	45.41	45.41
pittman	12925.8*	45.41	45.41	45.41
pittman	12880.4*	45.41	45.41	45.41
pittman	12835.0*	45.41	45.41	45.41
pittman	12789.6*	45.41	45.41	45.41
pittman	12744.19	49.95	49.95	49.95
pittman	12694.2*	49.95	49.95	49.95
pittman	12644.3*	49.95	49.95	49.95
pittman	12594.35	483.14	483.14	483.14
pittman	12593.35	Bridge		
pittman	12111.21	0	0	0
duckup	14300	50	50	50
duckup	14250.*	50	50	50
duckup	14200	38.2	38.2	38.2
duckup	14161.8*	38.2	38.2	38.2
duckup	14123.61	23.91	23.91	23.91
duckup	14099.6*	23.91	23.91	23.91
duckup	14075.7*	23.91	23.91	23.91
duckup	14051.8*	23.91	23.91	23.91
duckup	14027.9*	23.91	23.91	23.91
duckup	14004.0*	23.91	23.91	23.91
duckup	13980.1*	23.91	23.91	23.91
duckup	13956.2*	23.91	23.91	23.91
duckup	13932.2*	23.91	23.91	23.91
duckup	13908.3*	23.91	23.91	23.91
duckup	13884.4*	23.91	23.91	23.91
duckup	13860.5*	23.91	23.91	23.91
duckup	13836.6*	23.91	23.91	23.91
duckup	13812.7*	23.91	23.91	23.91
duckup	13788.7*	23.91	23.91	23.91
duckup	13764.88	44.44	44.44	44.44
duckup	13720.4*	44.44	44.44	44.44
duckup	13676.0*	44.44	44.44	44.44
duckup	13631.5*	44.44	44.44	44.44
duckup	13587.1*	44.44	44.44	44.44
duckup	13542.6*	44.44	44.44	44.44
duckup	13498.2*	44.44	44.44	44.44
duckup	13453.8*	44.44	44.44	44.44
duckup	13409.39	23.86	23.86	23.86
duckup	13385.5*	23.86	23.86	23.86
duckup	13361.6*	23.86	23.86	23.86
duckup	13337.7*	23.86	23.86	23.86
duckup	13313.9*	23.86	23.86	23.86
duckup	13290.0*	23.86	23.86	23.86
duckup	13266.1*	23.86	23.86	23.86
duckup	13242.3*	23.86	23.86	23.86
duckup	13218.4*	23.86	23.86	23.86
duckup	13194.5*	23.86	23.86	23.86
duckup	13170.7*	23.86	23.86	23.86

duckup	13146.8*	23.86	23.86	23.86
duckup	13123.0*	23.86	23.86	23.86
duckup	13099.1*	23.86	23.86	23.86
duckup	13075.2*	23.86	23.86	23.86
duckup	13051.4*	23.86	23.86	23.86
duckup	13027.54	23.37	23.37	23.37
duckup	13004.1*	23.37	23.37	23.37
duckup	12980.7*	23.37	23.37	23.37
duckup	12957.4*	23.37	23.37	23.37
duckup	12934.0*	23.37	23.37	23.37
duckup	12910.6*	23.37	23.37	23.37
duckup	12887.2*	23.37	23.37	23.37
duckup	12863.8*	23.37	23.37	23.37
duckup	12840.5*	23.37	23.37	23.37
duckup	12817.1*	23.37	23.37	23.37
duckup	12793.7*	23.37	23.37	23.37
duckup	12770.3*	23.37	23.37	23.37
duckup	12746.9*	23.37	23.37	23.37
duckup	12723.61	39.79	39.79	39.79
duckup	12683.8*	39.79	39.79	39.79
duckup	12644.0*	39.79	39.79	39.79
duckup	12604.26	483.14	483.14	483.14
duckup	12603.26	Bridge		
duckup	12121.12	0	0	0
DUCKDOWN	12074.41	92.29	92.29	92.29
DUCKDOWN	11982.12	76.25	76.25	76.25
DUCKDOWN	11905.87	120	120	120
DUCKDOWN	11785.87	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Duckcreek

Reach	River Sta.	Contr.	Expan.
pittman	16028.7	.3	.5
pittman	16014.5*	.3	.5
pittman	16000.4*	.3	.5
pittman	15986.2*	.3	.5
pittman	15972.1*	.3	.5
pittman	15958	.1	.3
pittman	15917.75	.3	.5
pittman	15868	.1	.3
pittman	15818.*	.1	.3
pittman	15768	.1	.3
pittman	15744.7*	.1	.3
pittman	15711.4*	.1	.3
pittman	15668	.1	.3
pittman	15644.7*	.1	.3
pittman	15611.4*	.1	.3
pittman	15568	.1	.3
pittman	15544.7*	.1	.3
pittman	15511.4*	.1	.3
pittman	15468	.1	.3
pittman	15438	.1	.3
pittman	15437 Bridge		
pittman	15350	.1	.3
pittman	15319.1*	.1	.3
pittman	15268	.1	.3
pittman	15244.7*	.1	.3
pittman	15211.4*	.1	.3
pittman	15168	.1	.3
pittman	15144.7*	.1	.3
pittman	15111.4*	.1	.3
pittman	15068	.1	.3
pittman	15064.22	.1	.3
pittman	15016.2*	.1	.3
pittman	14968.3*	.1	.3
pittman	14920.3*	.1	.3
pittman	14872.4*	.1	.3
pittman	14824.4*	.1	.3
pittman	14776.4*	.1	.3
pittman	14728.5*	.1	.3
pittman	14680.5*	.1	.3
pittman	14632.63	.1	.3
pittman	14546.8*	.1	.3
pittman	14461.1*	.1	.3
pittman	14375.3*	.1	.3
pittman	14289.5*	.1	.3
pittman	14203.8*	.1	.3
pittman	14118.06	.1	.3
pittman	14093.0*	.1	.3
pittman	14067.99	.1	.3
pittman	14055.35	.1	.3
pittman	14054.35 Bridge		
pittman	13967.75	.1	.3
pittman	13931.8*	.1	.3
pittman	13895.99	.1	.3
pittman	13888.29	.1	.3
pittman	13867.99	.1	.3
pittman	13767.99	.1	.3
pittman	13728.1*	.1	.3
pittman	13688.29	.1	.3
pittman	13645.7*	.1	.3
pittman	13603.1*	.1	.3
pittman	13560.6*	.1	.3
pittman	13518.09	.1	.3
pittman	13509.2*	.1	.3
pittman	13500.4*	.1	.3
pittman	13491.7	.1	.3
pittman	13490.7 Bridge		

pittman	13368.7		.1	.3
pittman	13342.26		.1	.3
pittman	13291.09		.1	.3
pittman	13266.4*		.1	.3
pittman	13241.7*		.1	.3
pittman	13217.0*		.1	.3
pittman	13192.3*		.1	.3
pittman	13167.6*		.1	.3
pittman	13142.9*		.1	.3
pittman	13118.20		.1	.3
pittman	13069.2*		.1	.3
pittman	13020.2*		.1	.3
pittman	12971.2		.1	.3
pittman	12925.8*		.1	.3
pittman	12880.4*		.1	.3
pittman	12835.0*		.1	.3
pittman	12789.6*		.1	.3
pittman	12744.19		.1	.3
pittman	12694.2*		.1	.3
pittman	12644.3*		.1	.3
pittman	12594.35		.1	.3
pittman	12593.35	Bridge		
pittman	12111.21		.3	.5
duckup	14300		.1	.3
duckup	14250.*		.1	.3
duckup	14200		.1	.3
duckup	14161.8*		.1	.3
duckup	14123.61		.1	.3
duckup	14099.6*		.1	.3
duckup	14075.7*		.1	.3
duckup	14051.8*		.1	.3
duckup	14027.9*		.1	.3
duckup	14004.0*		.1	.3
duckup	13980.1*		.1	.3
duckup	13956.2*		.1	.3
duckup	13932.2*		.1	.3
duckup	13908.3*		.1	.3
duckup	13884.4*		.1	.3
duckup	13860.5*		.1	.3
duckup	13836.6*		.1	.3
duckup	13812.7*		.1	.3
duckup	13788.7*		.1	.3
duckup	13764.88		.1	.3
duckup	13720.4*		.1	.3
duckup	13676.0*		.1	.3
duckup	13631.5*		.1	.3
duckup	13587.1*		.1	.3
duckup	13542.6*		.1	.3
duckup	13498.2*		.1	.3
duckup	13453.8*		.1	.3
duckup	13409.39		.1	.3
duckup	13385.5*		.1	.3
duckup	13361.6*		.1	.3
duckup	13337.7*		.1	.3
duckup	13313.9*		.1	.3
duckup	13290.0*		.1	.3
duckup	13266.1*		.1	.3
duckup	13242.3*		.1	.3
duckup	13218.4*		.1	.3
duckup	13194.5*		.1	.3
duckup	13170.7*		.1	.3
duckup	13146.8*		.1	.3
duckup	13123.0*		.1	.3
duckup	13099.1*		.1	.3
duckup	13075.2*		.1	.3
duckup	13051.4*		.1	.3
duckup	13027.54		.1	.3
duckup	13004.1*		.1	.3
duckup	12980.7*		.1	.3
duckup	12957.4*		.1	.3
duckup	12934.0*		.1	.3
duckup	12910.6*		.1	.3
duckup	12887.2*		.1	.3
duckup	12863.8*		.1	.3
duckup	12840.5*		.1	.3
duckup	12817.1*		.1	.3
duckup	12793.7*		.1	.3
duckup	12770.3*		.1	.3
duckup	12746.9*		.1	.3
duckup	12723.61		.1	.3
duckup	12683.8*		.1	.3
duckup	12644.0*		.1	.3
duckup	12604.26		.1	.3
duckup	12603.26	Bridge		
duckup	12121.12		.3	.5
DUCKDOWN	12074.41		.1	.3
DUCKDOWN	11982.12		.1	.3
DUCKDOWN	11905.87		.1	.3
DUCKDOWN	11785.87		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	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
pittman	16028.7	7638.00	1658.97	1665.72	1668.72	1675.88	0.007504	25.57	298.66	45.00	1.75
pittman	16014.5*	7638.00	1658.87	1665.20	1668.31	1675.67	0.008014	25.97	294.11	47.40	1.84
pittman	16000.4*	7638.00	1658.76	1664.79	1667.96	1675.49	0.008479	26.26	290.91	49.81	1.91
pittman	15986.2*	7638.00	1658.66	1664.48	1667.79	1675.33	0.008897	26.44	288.90	52.24	1.98
pittman	15972.1*	7638.00	1658.55	1664.23	1667.53	1675.18	0.009284	26.55	287.66	54.63	2.04
pittman	15958	7638.00	1658.45	1663.98	1667.23	1675.01	0.009857	26.65	286.60	57.92	2.11
pittman	15917.75	7638.00	1658.15	1663.71	1666.88	1674.57	0.009957	26.45	288.79	63.10	2.18
pittman	15868	7638.00	1657.85	1663.10	1666.25	1674.03	0.010631	26.54	287.81	60.00	2.14

pittman	15818.*	7638.00	1657.55	1662.90	1665.95	1673.39	0.009951	25.99	293.92	60.00	2.07
pittman	15768	7638.00	1657.25	1662.69	1665.65	1672.78	0.009365	25.49	299.65	60.00	2.01
pittman	15744.7*	7638.00	1656.97	1662.43	1665.37	1672.46	0.009288	25.42	300.44	60.00	2.00
pittman	15711.4*	7638.00	1656.68	1662.15	1665.08	1672.14	0.009229	25.37	301.05	60.00	2.00
pittman	15668	7638.00	1656.40	1661.88	1664.80	1671.83	0.009159	25.31	301.78	60.00	1.99
pittman	15644.7*	7638.00	1656.12	1661.61	1664.52	1671.51	0.009090	25.25	302.52	60.00	1.98
pittman	15611.4*	7638.00	1655.83	1661.33	1664.23	1671.20	0.009051	25.21	302.93	60.00	1.98
pittman	15568	7638.00	1655.55	1661.06	1663.95	1670.89	0.008998	25.17	303.50	60.00	1.97
pittman	15544.7*	7638.00	1655.27	1660.79	1663.67	1670.59	0.008944	25.12	304.08	60.00	1.97
pittman	15511.4*	7638.00	1654.98	1660.50	1663.38	1670.28	0.008921	25.10	304.33	60.00	1.96
pittman	15468	7638.00	1654.70	1660.23	1663.10	1669.99	0.008893	25.07	304.63	60.00	1.96
pittman	15438	7638.00	1654.45	1659.98	1662.85	1669.73	0.008872	25.05	304.87	60.00	1.96
pittman	15437	Bridge									
pittman	15350	7638.00	1653.70	1659.66	1662.08	1667.95	0.006881	23.10	330.65	60.00	1.73
pittman	15319.1*	7638.00	1653.35	1659.28	1661.75	1667.65	0.006990	23.22	328.38	60.00	1.75
pittman	15268	7638.00	1653.00	1658.91	1661.40	1667.36	0.007102	23.34	327.31	60.00	1.76
pittman	15244.7*	7638.00	1652.72	1658.61	1661.12	1667.12	0.007176	23.41	326.23	60.00	1.77
pittman	15211.4*	7638.00	1652.43	1658.30	1660.83	1666.87	0.007254	23.49	325.10	60.00	1.78
pittman	15168	7638.00	1652.15	1658.00	1660.55	1666.62	0.007318	23.56	324.20	60.00	1.79
pittman	15144.7*	7638.00	1651.87	1657.71	1660.25	1666.38	0.007382	23.63	323.29	60.00	1.79
pittman	15111.4*	7638.00	1651.58	1657.40	1659.98	1666.12	0.007445	23.69	322.41	60.00	1.80
pittman	15068	7638.00	1651.30	1657.11	1659.70	1665.87	0.007498	23.74	321.68	60.00	1.81
pittman	15064.22	7638.00	1651.27	1657.08	1659.67	1665.84	0.007503	23.75	321.61	60.00	1.81
pittman	15016.2*	7638.00	1650.86	1656.65	1659.24	1665.47	0.007584	23.83	320.51	60.00	1.82
pittman	14968.3*	7638.00	1650.45	1656.22	1658.83	1665.10	0.007666	23.91	319.41	60.00	1.83
pittman	14920.3*	7638.00	1650.05	1655.81	1658.45	1664.73	0.007720	23.97	318.70	60.00	1.83
pittman	14872.4*	7638.00	1649.64	1655.39	1658.04	1664.35	0.007770	24.02	318.04	60.00	1.84
pittman	14824.4*	7638.00	1649.23	1654.97	1657.61	1663.96	0.007820	24.06	317.39	60.00	1.84
pittman	14776.4*	7638.00	1648.82	1654.55	1657.20	1663.58	0.007870	24.11	316.74	60.00	1.85
pittman	14728.5*	7638.00	1648.42	1654.14	1656.80	1663.20	0.007908	24.15	316.26	60.00	1.85
pittman	14680.5*	7638.00	1648.01	1653.72	1656.39	1662.81	0.007958	24.20	315.63	60.00	1.86
pittman	14632.63	7638.00	1647.60	1653.30	1655.98	1662.43	0.008008	24.25	315.00	60.00	1.86
pittman	14546.8*	7638.00	1646.87	1652.56	1655.25	1661.74	0.008076	24.31	314.15	60.00	1.87
pittman	14461.1*	7638.00	1646.14	1651.81	1654.52	1661.04	0.008144	24.38	313.30	60.00	1.88
pittman	14375.3*	7638.00	1645.42	1651.08	1653.79	1660.34	0.008188	24.42	312.78	60.00	1.88
pittman	14289.5*	7638.00	1644.69	1650.34	1653.07	1659.64	0.008229	24.46	312.26	60.00	1.89
pittman	14203.8*	7638.00	1643.96	1649.61	1652.34	1658.93	0.008275	24.50	311.72	60.00	1.89
pittman	14118.06	7638.00	1643.23	1648.87	1651.61	1658.22	0.008321	24.55	311.17	60.00	1.90
pittman	14093.0*	7638.00	1643.02	1648.65	1651.40	1658.02	0.008329	24.55	311.06	60.00	1.90
pittman	14067.99	7638.00	1642.81	1648.44	1651.19	1657.81	0.008337	24.56	310.96	60.00	1.90
pittman	14055.35	7638.00	1642.70	1648.33	1651.08	1657.71	0.008352	24.58	310.79	60.00	1.90
pittman	14054.35	Bridge									
pittman	13967.75	7638.00	1641.95	1648.02	1650.33	1656.00	0.006488	22.67	336.93	60.00	1.69
pittman	13931.8*	7638.00	1641.65	1647.68	1650.02	1655.75	0.006607	22.80	334.98	60.00	1.70
pittman	13895.99	7638.00	1641.34	1647.34	1649.72	1655.51	0.006727	22.93	333.04	60.00	1.72
pittman	13888.29	7638.00	1641.26	1647.25	1649.64	1655.45	0.006775	22.99	332.28	60.00	1.72
pittman	13867.99	7638.00	1641.06	1647.02	1649.44	1655.31	0.006886	23.11	330.57	60.00	1.73
pittman	13767.99	7638.00	1640.06	1645.90	1648.44	1654.56	0.007371	23.62	323.44	60.00	1.79
pittman	13728.1*	7638.00	1639.66	1645.46	1648.04	1654.25	0.007544	23.79	321.05	60.00	1.81
pittman	13688.29	7638.00	1639.26	1645.02	1647.64	1653.94	0.007722	23.97	318.67	60.00	1.83
pittman	13645.7*	7638.00	1638.83	1644.52	1647.21	1653.59	0.007933	24.17	316.03	60.00	1.86
pittman	13603.1*	7638.00	1638.41	1644.03	1646.74	1653.24	0.008126	24.35	313.72	60.00	1.88
pittman	13560.6*	7638.00	1637.99	1643.55	1646.31	1652.88	0.008301	24.50	311.70	60.00	1.89
pittman	13518.09	7638.00	1637.56	1643.07	1645.84	1652.51	0.008476	24.66	309.72	60.00	1.91
pittman	13509.2*	7638.00	1637.43	1642.88	1645.70	1652.43	0.008625	24.80	307.99	60.00	1.93
pittman	13500.4*	7638.00	1637.31	1642.74	1645.58	1652.35	0.008734	24.89	306.91	60.00	1.94
pittman	13491.7	7638.00	1637.18	1642.64	1645.47	1652.28	0.008791	24.92	306.54	60.00	1.94
pittman	13490.7	Bridge									
pittman	13368.7	7638.00	1635.97	1641.53	1644.19	1650.60	0.007984	24.17	316.03	60.00	1.86
pittman	13342.26	7638.00	1635.80	1641.44	1644.05	1650.34	0.007720	23.93	319.17	60.00	1.83
pittman	13291.09	7638.00	1635.29	1641.06	1643.68	1649.94	0.007678	23.92	319.28	60.00	1.83
pittman	13266.4*	7638.00	1635.03	1640.93	1643.51	1649.74	0.007427	23.82	320.65	58.72	1.80
pittman	13241.7*	7638.00	1634.77	1640.81	1643.38	1649.53	0.007163	23.70	322.29	57.42	1.76
pittman	13217.0*	7638.00	1634.51	1640.70	1643.21	1649.34	0.006922	23.59	323.78	56.14	1.73
pittman	13192.3*	7638.00	1634.24	1640.58	1643.09	1649.15	0.006696	23.49	325.16	54.86	1.70
pittman	13167.6*	7638.00	1633.98	1640.48	1642.96	1648.96	0.006459	23.37	326.86	53.58	1.67
pittman	13142.9*	7638.00	1633.72	1640.41	1642.82	1648.77	0.006190	23.20	329.23	52.28	1.63
pittman	13118.20	7638.00	1633.46	1640.34	1642.70	1648.59	0.005952	23.05	331.34	51.00	1.59
pittman	13069.2*	7638.00	1632.94	1639.70	1642.18	1648.26	0.006294	23.48	325.33	51.00	1.64
pittman	13020.2*	7638.00	1632.42	1639.08	1641.66	1647.92	0.006611	23.86	320.17	51.00	1.68
pittman	12971.2	7638.00	1631.90	1638.48	1641.14	1647.56	0.006902	24.19	315.71	51.00	1.71
pittman	12925.8*	7638.00	1631.42	1637.92	1640.66	1647.23	0.007159	24.48	311.96	51.00	1.74
pittman	12880.4*	7638.00	1630.94	1637.38	1640.18	1646.88	0.007389	24.74	308.77	51.00	1.77
pittman	12835.0*	7638.00	1630.45	1636.83	1639.69	1646.52	0.007618	24.98	305.73	51.00	1.80
pittman	12789.6*	7638.00	1629.97	1636.30	1639.21	1646.16	0.007817	25.19	303.17	51.00	1.82
pittman	12744.19	7638.00	1629.49	1635.78	1638.73	1645.78	0.008002	25.39	300.88	51.00	1.84
pittman	12694.2*	7638.00	1628.96	1635.20	1638.20	1645.36	0.008193	25.58	298.59	51.00	1.86
pittman	12644.3*	7638.00	1628.43	1634.63	1637.68	1644.93	0.008371	25.76	296.51	51.00	1.88
pittman	12594.35	7638.00	1627.90	1634.06	1637.14	1644.50	0.008536	25.92	294.64	51.00	1.90
pittman	12593.35	Bridge									
pittman	12111.21	7638.00	1623.74	1630.27	1632.99	1639.49	0.007052	24.36	313.50	51.00	1.73
duckup	14300	8562.00	1642.30	1650.69	1650.70	1653.98	0.001854	14.54	588.75	89.97	1.00
duckup	14250.*	8562.00	1641.95	1649.56	1650.34	1653.77	0.002668	16.47	519.91	86.85	1.19
duckup	14200	8562.00	1641.60	1648.91	1649.99	1653.58	0.003114	17.36	493.32	85.62	1.27
duckup	14161.8*	8562.00	1641.34	1648.48	1649.73	1653.44	0.003394	17.87	479.10	84.95	1.33
duckup	14123.61	8562.00	1641.09	1648.11	1649.46	1653.29	0.003617	18.26	468.91	84.47	1.37
duckup	14099.6*	8562.00	1640.97	1647.96	1649.35	1653.20	0.003679	18.37	466.01	84.25	1.38
duckup	14075.7*	8562.00	1640.85	1647.82	1649.23	1653.11	0.003723	18.46	463.93	84.04	1.38
duckup	14051.8*	8562.00	1640.73	1647.68	1649.12	1653.01	0.003767	18.53	461.95	83.87	1.39
duckup	14027.9*	8562.00	1640.61	1647.54	1649.00	1652.92	0.003810	18.61	459.98	83.69	1.40
duckup	14004.0*	8562.00	1640.49	1647.40	1648.88	1652.83	0.003856	18.70	457.92	83.49	1.41
duckup	13980.1*	8562.00	1640.37	1647.26	1648.77	1652.73	0.003901	18.78	455.97	83.32	1.41
duckup	13956.2*	8562.00	1640.25	1647.12	1648.65	1652.64	0.003947	18.86	454.02	83.15	1.42
duckup	13932.2*	8562.00	1640.13	1646.98	1648.53	1652.55	0.003994	18.94	452.00	82.96	1.43
duckup	13908.3*	8562.00	1640.01	1646.84	1648.43	1652.46	0.004041	19.02	450.07	82.79	1.44
duckup	13884.4*	8562.00	1639.89	1646.70	1648.30	1652.36	0.004072	19.08	448.76	82.66	1.44
duckup	13860.5*	8562.00	1639.77	1646.57	1648.18	1652.26	0.004104	19.14	447.37	82.49	1.45
duckup	13836.6*	8562.00	1639.65	1646.44	1648.06	1652.16	0.004136	19.19	446.07	82.36	1.45
duckup	13812.7*	8562.00	1639.53	1646.31	1647.94	1652.06	0.004168	19.25	444.78	82.23	1.46
duckup	13788.7*	8562.00	1639.41	1646.17	1647.83	1651.96	0.004201	19.31	443.41	82.07	1.46
duckup	13764.88	8562.00	1639.29	1646.04	1647.73	1651.86	0.004233	19.37	442.13	81.94	1.47
duckup	13720.4*	8562.00	1639.07	1645.78	1647.48	1651.67	0.004318	19.48	439.51	81.98	1.48
duckup	13676.0*	8562.00	1638.84	1645.52	1647.25	1651.47	0.004383	19.57	437.54	82.01	1.49
duckup	13631.5*	8562.00	1638.62	1645.27	1647.04	1651.27	0.004445	19.65	435.81	82.10	1.50

duckup	13587.1*	8562.00	1638.40	1645.03	1646.80	1651.07	0.004509	19.73	434.01	82.16	1.51
duckup	13542.6*	8562.00	1638.18	1644.78	1646.57	1650.87	0.004574	19.81	432.21	82.23	1.52
duckup	13498.2*	8562.00	1637.96	1644.53	1646.34	1650.66	0.004625	19.87	430.93	82.33	1.53
duckup	13453.8*	8562.00	1637.73	1644.28	1646.11	1650.46	0.004682	19.94	429.43	82.40	1.54
duckup	13409.39	8562.00	1637.51	1644.04	1645.88	1650.24	0.004723	19.98	428.50	82.53	1.55
duckup	13385.5*	8562.00	1637.34	1643.94	1645.77	1650.14	0.004623	19.98	428.57	80.97	1.53
duckup	13361.6*	8562.00	1637.18	1643.85	1645.65	1650.03	0.004513	19.95	429.13	79.47	1.51
duckup	13337.7*	8562.00	1637.01	1643.74	1645.53	1649.93	0.004432	19.96	428.88	77.96	1.50
duckup	13313.9*	8562.00	1636.84	1643.63	1645.42	1649.82	0.004357	19.98	428.58	76.45	1.49
duckup	13290.0*	8562.00	1636.68	1643.53	1645.31	1649.72	0.004269	19.96	428.90	75.01	1.47
duckup	13266.1*	8562.00	1636.51	1643.43	1645.18	1649.62	0.004194	19.96	428.95	73.57	1.46
duckup	13242.3*	8562.00	1636.34	1643.32	1645.04	1649.51	0.004127	19.96	428.93	72.14	1.44
duckup	13218.4*	8562.00	1636.18	1643.22	1644.91	1649.42	0.004077	19.98	428.57	70.72	1.43
duckup	13194.5*	8562.00	1636.01	1643.11	1644.78	1649.32	0.004034	20.00	428.14	69.33	1.42
duckup	13170.7*	8562.00	1635.84	1643.01	1644.66	1649.22	0.003989	20.00	428.01	67.95	1.40
duckup	13146.8*	8562.00	1635.67	1642.90	1644.53	1649.12	0.003953	20.01	427.89	66.60	1.39
duckup	13123.0*	8562.00	1635.51	1642.81	1644.38	1649.03	0.003919	20.01	427.99	65.26	1.38
duckup	13099.1*	8562.00	1635.34	1642.72	1644.28	1648.92	0.003878	19.97	428.65	63.93	1.36
duckup	13075.2*	8562.00	1635.17	1642.63	1644.11	1648.81	0.003848	19.94	429.28	62.62	1.34
duckup	13051.4*	8562.00	1635.01	1642.54	1644.01	1648.72	0.003847	19.95	429.18	61.31	1.33
duckup	13027.54	8562.00	1634.84	1642.45	1643.84	1648.62	0.003840	19.93	429.61	60.00	1.31
duckup	13004.1*	8562.00	1634.40	1641.99	1643.55	1648.49	0.004085	20.47	418.34	58.54	1.35
duckup	12980.7*	8562.00	1633.97	1641.56	1643.26	1648.37	0.004289	20.93	409.05	57.08	1.38
duckup	12957.4*	8562.00	1633.53	1641.15	1642.96	1648.24	0.004468	21.35	400.94	55.62	1.40
duckup	12934.0*	8562.00	1633.10	1640.79	1642.68	1648.11	0.004605	21.71	394.34	54.16	1.42
duckup	12910.6*	8562.00	1632.66	1640.42	1642.40	1647.98	0.004737	22.06	388.05	52.70	1.43
duckup	12887.2*	8562.00	1632.22	1640.08	1642.13	1647.85	0.004838	22.37	382.74	51.24	1.44
duckup	12863.8*	8562.00	1631.79	1639.77	1641.87	1647.71	0.004905	22.63	378.41	49.76	1.45
duckup	12840.5*	8562.00	1631.35	1639.46	1641.62	1647.59	0.004975	22.89	374.07	48.30	1.45
duckup	12817.1*	8562.00	1630.91	1639.17	1641.37	1647.46	0.005010	23.10	370.66	46.84	1.45
duckup	12793.7*	8562.00	1630.48	1638.93	1641.15	1647.33	0.005011	23.26	368.14	45.38	1.44
duckup	12770.3*	8562.00	1630.04	1638.70	1640.93	1647.20	0.005003	23.40	365.87	43.92	1.43
duckup	12746.9*	8562.00	1629.61	1638.51	1640.72	1647.08	0.004969	23.50	364.33	42.46	1.41
duckup	12723.61	8562.00	1629.17	1638.34	1640.53	1646.96	0.004918	23.57	363.27	41.00	1.40
duckup	12683.8*	8562.00	1628.75	1637.74	1640.12	1646.72	0.005222	24.06	355.90	41.00	1.44
duckup	12644.0*	8562.00	1628.32	1637.15	1639.69	1646.48	0.005510	24.50	349.42	41.00	1.48
duckup	12604.26	8562.00	1627.90	1636.59	1639.27	1646.22	0.005777	24.90	343.86	41.00	1.52
duckup	12603.26	Bridge									
duckup	12121.12	8562.00	1623.75	1633.73	1635.12	1640.97	0.003815	21.60	396.31	41.00	1.22
DUCKDOWN	12074.41	11500.00	1623.35	1628.73	1631.83	1639.59	0.010175	26.45	434.84	93.00	2.16
DUCKDOWN	11982.12	11500.00	1622.54	1627.97	1631.01	1638.59	0.009826	26.16	439.60	93.00	2.12
DUCKDOWN	11905.87	11500.00	1622.21	1627.83	1630.71	1637.65	0.008664	25.15	457.20	93.00	2.00
DUCKDOWN	11785.87	11500.00	1621.67	1627.55	1630.16	1636.40	0.007328	23.87	481.75	93.00	1.85

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
pittman	16028.7	1675.88	1665.72	10.16				7638.00		45.00
pittman	16014.5*	1675.67	1665.20	10.47	0.11	0.09		7638.00		47.40
pittman	16000.4*	1675.49	1664.79	10.70	0.12	0.07		7638.00		49.81
pittman	15986.2*	1675.33	1664.48	10.85	0.12	0.04		7638.00		52.24
pittman	15972.1*	1675.18	1664.23	10.95	0.13	0.03		7638.00		54.63
pittman	15958	1675.01	1663.98	11.03	0.14	0.02		7638.00		57.92
pittman	15917.75	1674.57	1663.71	10.86	0.40	0.05		7638.00		63.10
pittman	15868	1674.03	1663.10	10.94	0.51	0.02		7638.00		60.00
pittman	15818.*	1673.39	1662.90	10.49	0.51	0.14		7638.00		60.00
pittman	15768	1672.78	1662.69	10.09	0.48	0.12		7638.00		60.00
pittman	15744.7*	1672.46	1662.43	10.04	0.31	0.02		7638.00		60.00
pittman	15711.4*	1672.14	1662.15	9.99	0.31	0.01		7638.00		60.00
pittman	15668	1671.83	1661.88	9.95	0.31	0.01		7638.00		60.00
pittman	15644.7*	1671.51	1661.61	9.90	0.30	0.01		7638.00		60.00
pittman	15611.4*	1671.20	1661.33	9.87	0.30	0.01		7638.00		60.00
pittman	15568	1670.89	1661.06	9.83	0.30	0.01		7638.00		60.00
pittman	15544.7*	1670.59	1660.79	9.80	0.30	0.01		7638.00		60.00
pittman	15511.4*	1670.28	1660.50	9.78	0.30	0.00		7638.00		60.00
pittman	15468	1669.99	1660.23	9.76	0.30	0.01		7638.00		60.00
pittman	15438	1669.73	1659.98	9.75	0.27	0.00		7638.00		60.00
pittman	15437	Bridge								
pittman	15350	1667.95	1659.66	8.29				7638.00		60.00
pittman	15319.1*	1667.65	1659.28	8.37	0.28	0.01		7638.00		60.00
pittman	15268	1667.36	1658.91	8.46	0.29	0.01		7638.00		60.00
pittman	15244.7*	1667.12	1658.61	8.51	0.24	0.01		7638.00		60.00
pittman	15211.4*	1666.87	1658.30	8.57	0.24	0.01		7638.00		60.00
pittman	15168	1666.62	1658.00	8.62	0.24	0.00		7638.00		60.00
pittman	15144.7*	1666.38	1657.71	8.67	0.24	0.00		7638.00		60.00
pittman	15111.4*	1666.12	1657.40	8.71	0.25	0.00		7638.00		60.00
pittman	15068	1665.87	1657.11	8.75	0.25	0.00		7638.00		60.00
pittman	15064.22	1665.84	1657.08	8.76	0.03	0.00		7638.00		60.00
pittman	15016.2*	1665.47	1656.65	8.82	0.36	0.01		7638.00		60.00
pittman	14968.3*	1665.10	1656.22	8.88	0.37	0.01		7638.00		60.00
pittman	14920.3*	1664.73	1655.81	8.92	0.37	0.00		7638.00		60.00
pittman	14872.4*	1664.35	1655.39	8.96	0.37	0.00		7638.00		60.00
pittman	14824.4*	1663.96	1654.97	8.99	0.37	0.00		7638.00		60.00
pittman	14776.4*	1663.58	1654.55	9.03	0.38	0.00		7638.00		60.00
pittman	14728.5*	1663.20	1654.14	9.06	0.38	0.00		7638.00		60.00
pittman	14680.5*	1662.81	1653.72	9.09	0.38	0.00		7638.00		60.00
pittman	14632.63	1662.43	1653.30	9.13	0.38	0.00		7638.00		60.00
pittman	14546.8*	1661.74	1652.56	9.18	0.69	0.00		7638.00		60.00
pittman	14461.1*	1661.04	1651.81	9.23	0.70	0.00		7638.00		60.00
pittman	14375.3*	1660.34	1651.08	9.26	0.70	0.00		7638.00		60.00
pittman	14289.5*	1659.64	1650.34	9.29	0.70	0.00		7638.00		60.00
pittman	14203.8*	1658.93	1649.61	9.32	0.71	0.00		7638.00		60.00
pittman	14118.06	1658.22	1648.87	9.36	0.71	0.00		7638.00		60.00
pittman	14093.0*	1658.02	1648.65	9.36	0.21	0.00		7638.00		60.00
pittman	14067.99	1657.81	1648.44	9.37	0.21	0.00		7638.00		60.00
pittman	14055.35	1657.71	1648.33	9.38	0.11	0.00		7638.00		60.00
pittman	14054.35	Bridge								
pittman	13967.75	1656.00	1648.02	7.98				7638.00		60.00
pittman	13931.8*	1655.75	1647.68	8.07	0.23	0.01		7638.00		60.00
pittman	13895.99	1655.51	1647.34	8.17	0.24	0.01		7638.00		60.00
pittman	13888.29	1655.45	1647.25	8.20	0.05	0.00		7638.00		60.00

pittman	13867.99	1655.31	1647.02	8.29	0.14	0.01	7638.00	60.00
pittman	13767.99	1654.56	1645.90	8.66	0.71	0.04	7638.00	60.00
pittman	13728.1*	1654.25	1645.46	8.79	0.30	0.01	7638.00	60.00
pittman	13688.29	1653.94	1645.02	8.92	0.30	0.01	7638.00	60.00
pittman	13645.7*	1653.59	1644.52	9.07	0.33	0.01	7638.00	60.00
pittman	13603.1*	1653.24	1644.03	9.20	0.34	0.01	7638.00	60.00
pittman	13560.6*	1652.88	1643.55	9.32	0.35	0.01	7638.00	60.00
pittman	13518.09	1652.51	1643.07	9.44	0.36	0.01	7638.00	60.00
pittman	13509.2*	1652.43	1642.88	9.55	0.08	0.01	7638.00	60.00
pittman	13500.4*	1652.35	1642.74	9.62	0.08	0.01	7638.00	60.00
pittman	13491.7	1652.28	1642.64	9.64	0.08	0.00	7638.00	60.00
pittman	13490.7	Bridge						
pittman	13368.7	1650.60	1641.53	9.07			7638.00	60.00
pittman	13342.26	1650.34	1641.44	8.89	0.21	0.05	7638.00	60.00
pittman	13291.09	1649.94	1641.06	8.89	0.39	0.00	7638.00	60.00
pittman	13266.4*	1649.74	1640.93	8.81	0.19	0.02	7638.00	58.72
pittman	13241.7*	1649.53	1640.81	8.72	0.18	0.03	7638.00	57.42
pittman	13217.0*	1649.34	1640.70	8.64	0.17	0.02	7638.00	56.14
pittman	13192.3*	1649.15	1640.58	8.57	0.17	0.02	7638.00	54.86
pittman	13167.6*	1648.96	1640.48	8.48	0.16	0.03	7638.00	53.58
pittman	13142.9*	1648.77	1640.41	8.36	0.16	0.04	7638.00	52.28
pittman	13118.20	1648.59	1640.34	8.25	0.15	0.03	7638.00	51.00
pittman	13069.2*	1648.26	1639.70	8.56	0.30	0.03	7638.00	51.00
pittman	13020.2*	1647.92	1639.08	8.84	0.32	0.03	7638.00	51.00
pittman	12971.2	1647.56	1638.48	9.09	0.33	0.03	7638.00	51.00
pittman	12925.8*	1647.23	1637.92	9.31	0.32	0.02	7638.00	51.00
pittman	12880.4*	1646.88	1637.38	9.50	0.33	0.02	7638.00	51.00
pittman	12835.0*	1646.52	1636.83	9.69	0.34	0.02	7638.00	51.00
pittman	12789.6*	1646.16	1636.30	9.86	0.35	0.02	7638.00	51.00
pittman	12744.19	1645.78	1635.78	10.01	0.36	0.02	7638.00	51.00
pittman	12694.2*	1645.36	1635.20	10.16	0.40	0.02	7638.00	51.00
pittman	12644.3*	1644.93	1634.63	10.30	0.41	0.01	7638.00	51.00
pittman	12594.35	1644.50	1634.06	10.44	0.42	0.01	7638.00	51.00
pittman	12593.35	Bridge						
pittman	12111.21	1639.49	1630.27	9.22	0.01	0.32	7638.00	51.00
duckup	14300	1653.98	1650.69	3.28	0.09	0.00	8562.00	89.97
duckup	14250.*	1653.77	1649.56	4.21	0.11	0.09	8562.00	86.85
duckup	14200	1653.58	1648.91	4.68	0.14	0.05	8562.00	85.62
duckup	14161.8*	1653.44	1648.48	4.96	0.12	0.03	8562.00	84.95
duckup	14123.61	1653.29	1648.11	5.18	0.13	0.02	8562.00	84.47
duckup	14099.6*	1653.20	1647.96	5.24	0.09	0.01	8562.00	84.25
duckup	14075.7*	1653.11	1647.82	5.29	0.09	0.00	8562.00	84.04
duckup	14051.8*	1653.01	1647.68	5.33	0.09	0.00	8562.00	83.87
duckup	14027.9*	1652.92	1647.54	5.38	0.09	0.00	8562.00	83.69
duckup	14004.0*	1652.83	1647.40	5.43	0.09	0.00	8562.00	83.49
duckup	13980.1*	1652.73	1647.26	5.48	0.09	0.00	8562.00	83.32
duckup	13956.2*	1652.64	1647.12	5.52	0.09	0.00	8562.00	83.15
duckup	13932.2*	1652.55	1646.98	5.57	0.09	0.00	8562.00	82.96
duckup	13908.3*	1652.46	1646.84	5.62	0.10	0.00	8562.00	82.79
duckup	13884.4*	1652.36	1646.70	5.65	0.10	0.00	8562.00	82.66
duckup	13860.5*	1652.26	1646.57	5.69	0.10	0.00	8562.00	82.49
duckup	13836.6*	1652.16	1646.44	5.72	0.10	0.00	8562.00	82.36
duckup	13812.7*	1652.06	1646.31	5.75	0.10	0.00	8562.00	82.23
duckup	13788.7*	1651.96	1646.17	5.79	0.10	0.00	8562.00	82.07
duckup	13764.88	1651.86	1646.04	5.82	0.10	0.00	8562.00	81.94
duckup	13720.4*	1651.67	1645.78	5.89	0.19	0.01	8562.00	81.98
duckup	13676.0*	1651.47	1645.52	5.95	0.19	0.01	8562.00	82.01
duckup	13631.5*	1651.27	1645.27	5.99	0.20	0.00	8562.00	82.10
duckup	13587.1*	1651.07	1645.03	6.04	0.20	0.00	8562.00	82.16
duckup	13542.6*	1650.87	1644.78	6.09	0.20	0.01	8562.00	82.23
duckup	13498.2*	1650.66	1644.53	6.13	0.20	0.00	8562.00	82.33
duckup	13453.8*	1650.46	1644.28	6.17	0.21	0.00	8562.00	82.40
duckup	13409.39	1650.24	1644.04	6.20	0.21	0.00	8562.00	82.53
duckup	13385.5*	1650.14	1643.94	6.20	0.11	0.00	8562.00	80.97
duckup	13361.6*	1650.03	1643.85	6.18	0.11	0.00	8562.00	79.47
duckup	13337.7*	1649.93	1643.74	6.19	0.11	0.00	8562.00	77.96
duckup	13313.9*	1649.82	1643.63	6.20	0.10	0.00	8562.00	76.45
duckup	13290.0*	1649.72	1643.53	6.19	0.10	0.00	8562.00	75.01
duckup	13266.1*	1649.62	1643.43	6.19	0.10	0.00	8562.00	73.57
duckup	13242.3*	1649.51	1643.32	6.19	0.10	0.00	8562.00	72.14
duckup	13218.4*	1649.42	1643.22	6.20	0.10	0.00	8562.00	70.72
duckup	13194.5*	1649.32	1643.11	6.21	0.10	0.00	8562.00	69.33
duckup	13170.7*	1649.22	1643.01	6.21	0.10	0.00	8562.00	67.95
duckup	13146.8*	1649.12	1642.90	6.22	0.09	0.00	8562.00	66.60
duckup	13123.0*	1649.03	1642.81	6.21	0.09	0.00	8562.00	65.26
duckup	13099.1*	1648.92	1642.72	6.20	0.08	0.41	8562.00	63.93
duckup	13075.2*	1648.81	1642.63	6.18	0.08	0.35	8562.00	62.62
duckup	13051.4*	1648.72	1642.54	6.18	0.09	0.00	8562.00	61.31
duckup	13027.54	1648.62	1642.45	6.17	0.09	0.00	8562.00	60.00
duckup	13004.1*	1648.49	1641.99	6.50	0.09	0.03	8562.00	58.54
duckup	12980.7*	1648.37	1641.56	6.80	0.10	0.03	8562.00	57.08
duckup	12957.4*	1648.24	1641.15	7.08	0.10	0.03	8562.00	55.62
duckup	12934.0*	1648.11	1640.79	7.32	0.11	0.02	8562.00	54.16
duckup	12910.6*	1647.98	1640.42	7.56	0.11	0.02	8562.00	52.70
duckup	12887.2*	1647.85	1640.08	7.77	0.11	0.02	8562.00	51.24
duckup	12863.8*	1647.71	1639.77	7.95	0.11	0.02	8562.00	49.76
duckup	12840.5*	1647.59	1639.46	8.13	0.12	0.02	8562.00	48.30
duckup	12817.1*	1647.46	1639.17	8.29	0.12	0.02	8562.00	46.84
duckup	12793.7*	1647.33	1638.93	8.40	0.12	0.01	8562.00	45.38
duckup	12770.3*	1647.20	1638.70	8.50	0.12	0.01	8562.00	43.92
duckup	12746.9*	1647.08	1638.51	8.58	0.12	0.01	8562.00	42.46
duckup	12723.61	1646.96	1638.34	8.63	0.12	0.00	8562.00	41.00
duckup	12683.8*	1646.72	1637.74	8.99	0.20	0.04	8562.00	41.00
duckup	12644.0*	1646.48	1637.15	9.32	0.21	0.03	8562.00	41.00
duckup	12604.26	1646.22	1636.59	9.63	0.22	0.03	8562.00	41.00
duckup	12603.26	Bridge						
duckup	12121.12	1640.97	1633.73	7.25	0.01	0.45	8562.00	41.00
DUCKDOWN	12074.41	1639.59	1628.73	10.86	0.30	1.08	11500.00	93.00
DUCKDOWN	11982.12	1638.59	1627.97	10.63	0.92	0.07	11500.00	93.00
DUCKDOWN	11905.87	1637.65	1627.83	9.82	0.70	0.24	11500.00	93.00
DUCKDOWN	11785.87	1636.40	1627.55	8.85	0.95	0.29	11500.00	93.00

Profile Output Table - Six XS Bridge

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Frctn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)
pittman	15468	1669.99	1660.23	1663.10	0.30	0.01	60.00		7638.00		25.07
pittman	15438	1669.73	1659.98	1662.85	0.27	0.00	60.00		7638.00		25.05
pittman	15437 BR U	1669.48	1660.20	1662.97			59.00		7638.00		24.44
pittman	15437 BR D	1667.95	1659.81	1662.23			59.00		7638.00		22.90
pittman	15350	1667.95	1659.66	1662.08			60.00		7638.00		23.10
pittman	15319.1*	1667.65	1659.28	1661.75	0.28	0.01	60.00		7638.00		23.22
pittman	14067.99	1657.81	1648.44	1651.19	0.21	0.00	60.00		7638.00		24.56
pittman	14055.35	1657.71	1648.33	1651.08	0.11	0.00	60.00		7638.00		24.58
pittman	14054.35BR U	1657.47	1648.56	1651.18			59.00		7638.00		23.96
pittman	14054.35BR D	1656.00	1648.18	1650.43			59.00		7638.00		22.45
pittman	13967.75	1656.00	1648.02	1650.33			60.00		7638.00		22.67
pittman	13931.8*	1655.75	1647.68	1650.02	0.23	0.01	60.00		7638.00		22.80
pittman	13500.4*	1652.35	1642.74	1645.58	0.08	0.01	60.00		7638.00		24.89
pittman	13491.7	1652.28	1642.64	1645.47	0.08	0.00	60.00		7638.00		24.92
pittman	13490.7 BR U	1651.87	1643.05	1645.66			58.00		7638.00		23.83
pittman	13490.7 BR D	1650.60	1641.78	1644.37			58.00		7638.00		23.83
pittman	13368.7	1650.60	1641.53	1644.19			60.00		7638.00		24.17
pittman	13342.26	1650.34	1641.44	1644.05	0.21	0.05	60.00		7638.00		23.93
pittman	12644.3*	1644.93	1634.63	1637.68	0.41	0.01	51.00		7638.00		25.76
pittman	12594.35	1644.50	1634.06	1637.14	0.42	0.01	51.00		7638.00		25.92
pittman	12593.35BR U	1644.39	1634.28	1637.29	0.01	0.10	50.00		7638.00		25.52
pittman	12593.35BR D	1639.51	1630.46	1632.73	4.56	0.32	50.00		7638.00		24.14
pittman	12111.21	1639.49	1630.27	1632.99	0.01	0.02	51.00		7638.00		24.36
duckup	12644.0*	1646.48	1637.15	1639.69	0.21	0.03	41.00		8562.00		24.50
duckup	12604.26	1646.22	1636.59	1639.27	0.22	0.03	41.00		8562.00		24.90
duckup	12603.26BR U	1645.94	1637.26	1638.04	0.01	0.28	40.00		8562.00		23.65
duckup	12603.26BR D	1641.77	1630.99	1633.73	3.96	0.21	40.00		8562.00		26.35
duckup	12121.12	1640.97	1633.73	1635.12	0.01	0.45	41.00		8562.00		21.60

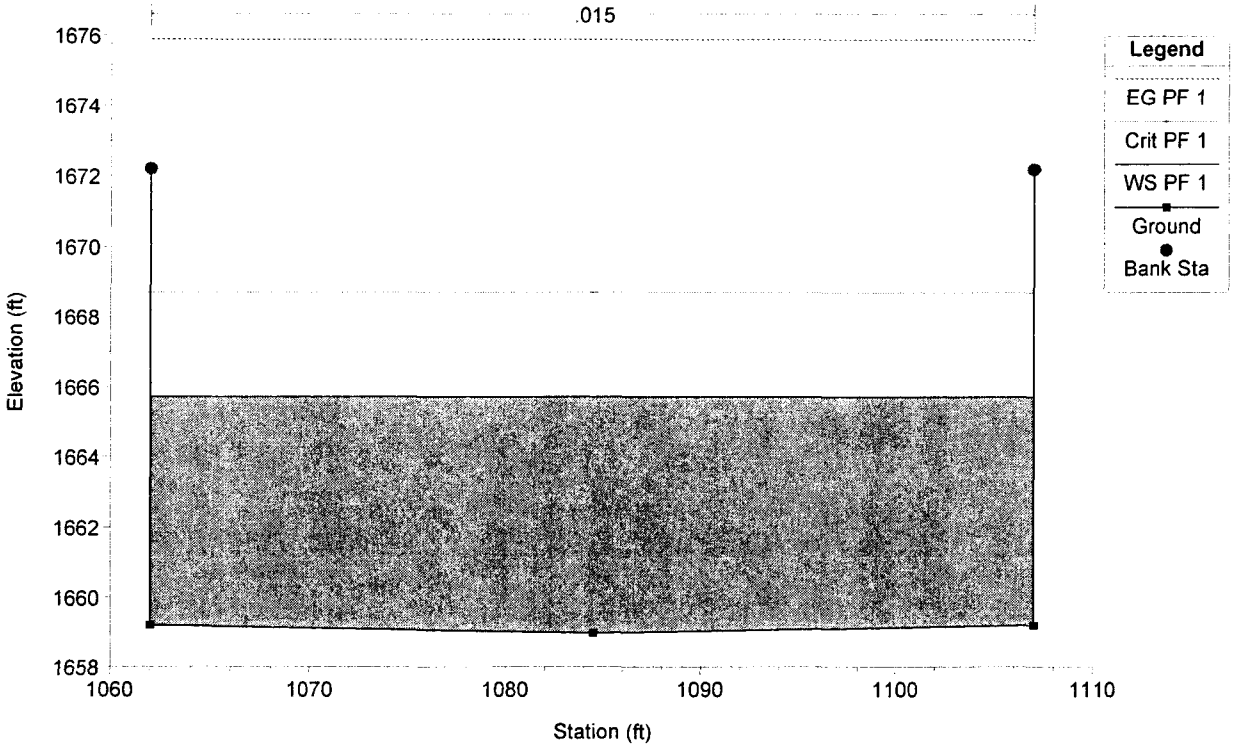
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Improvements

River: Duckcreek Reach: pittman RS: 15917.75 Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
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.
River: Duckcreek Reach: pittman RS: 13490.7 Profile: PF 1 Downstream
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Duckcreek Reach: pittman RS: 12593.35 Profile: PF 1 Downstream
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.
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.
River: Duckcreek Reach: duckup RS: 14300 Profile: PF 1
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: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.
River: Duckcreek Reach: duckup RS: 14250.* Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Duckcreek Reach: duckup RS: 13099.1* Profile: PF 1
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.
River: Duckcreek Reach: duckup RS: 13075.2* Profile: PF 1
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.
River: Duckcreek Reach: duckup RS: 12603.26 Profile: PF 1 Upstream
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 parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
River: Duckcreek Reach: duckup RS: 12603.26 Profile: PF 1 Downstream
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.
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.
River: Duckcreek Reach: duckup RS: 12121.12 Profile: PF 1
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.
River: Duckcreek Reach: DUCKDOWN RS: 12074.41 Profile: PF 1
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:During supercritical flow calculations a junction was encountered. During standard step calculations the program used the stream with the greatest momentum to balance the energy equation.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Duckcreek Reach: DUCKDOWN RS: 11905.87 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Duckcreek Reach: DUCKDOWN RS: 11785.87 Profile: PF 1
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.

Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

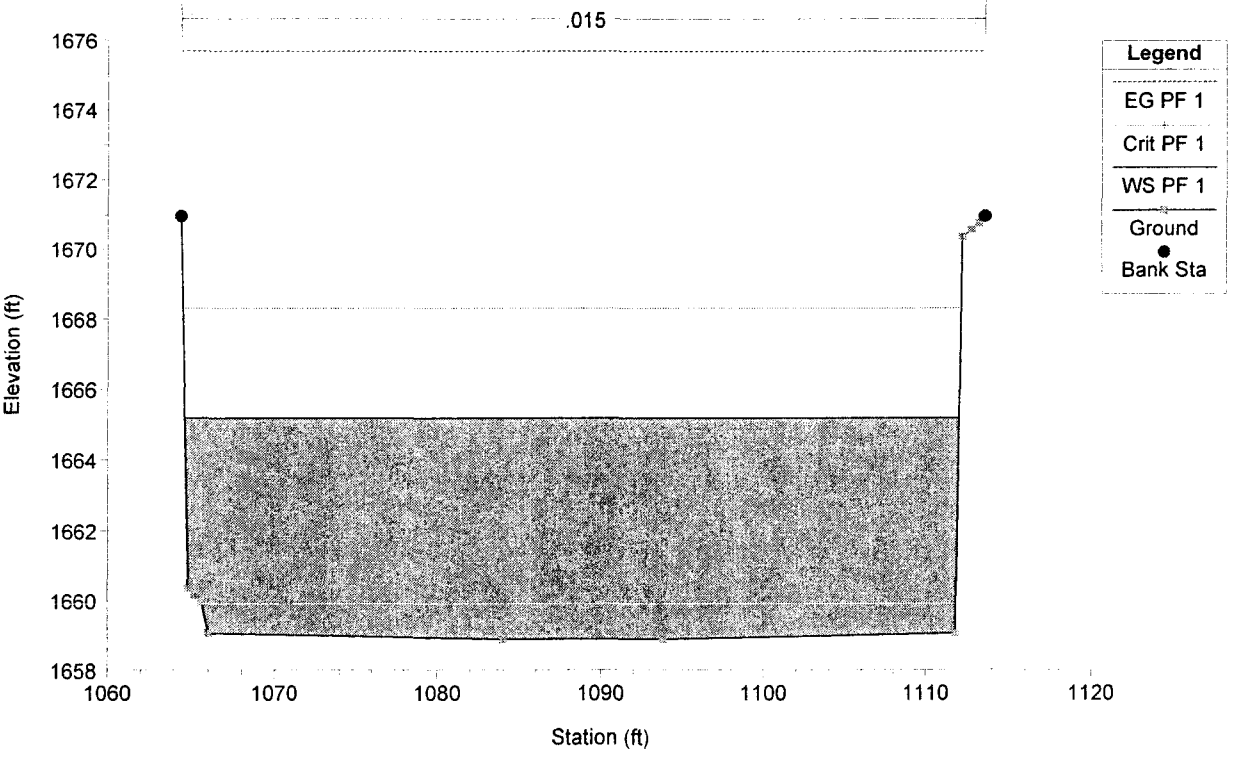
River = Duckcreek Reach = pittman RS = 16028.7 D/S FACE US95 CVT

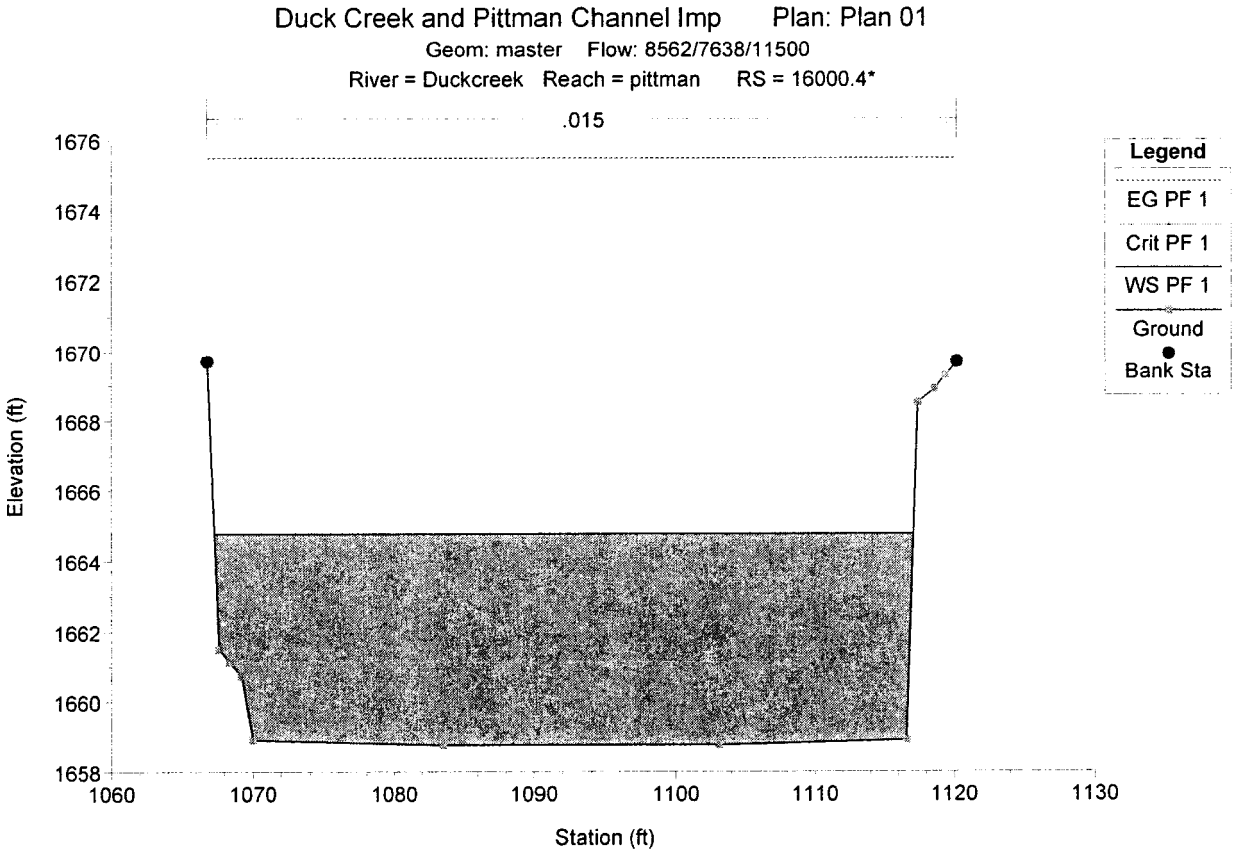


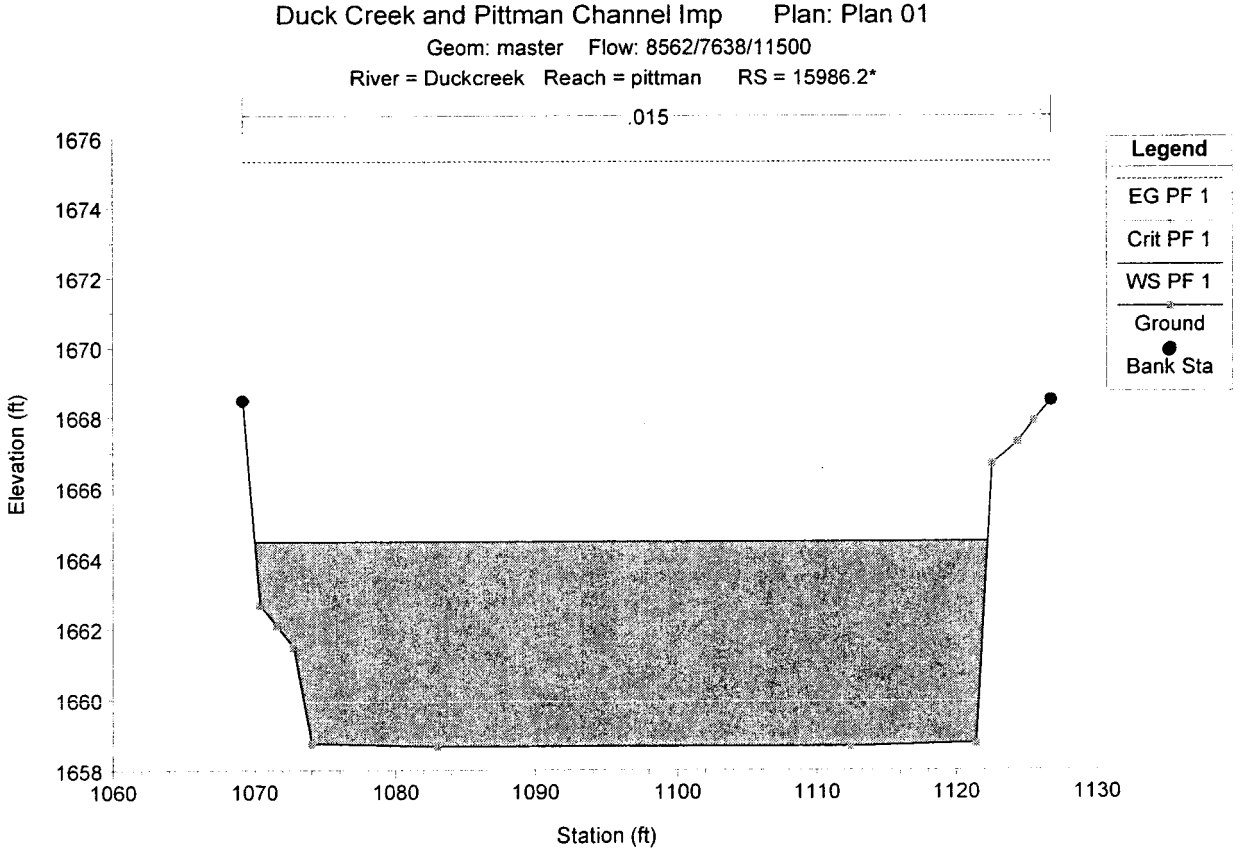
Duck Creek and Pittman Channel Imp Plan: Plan 01

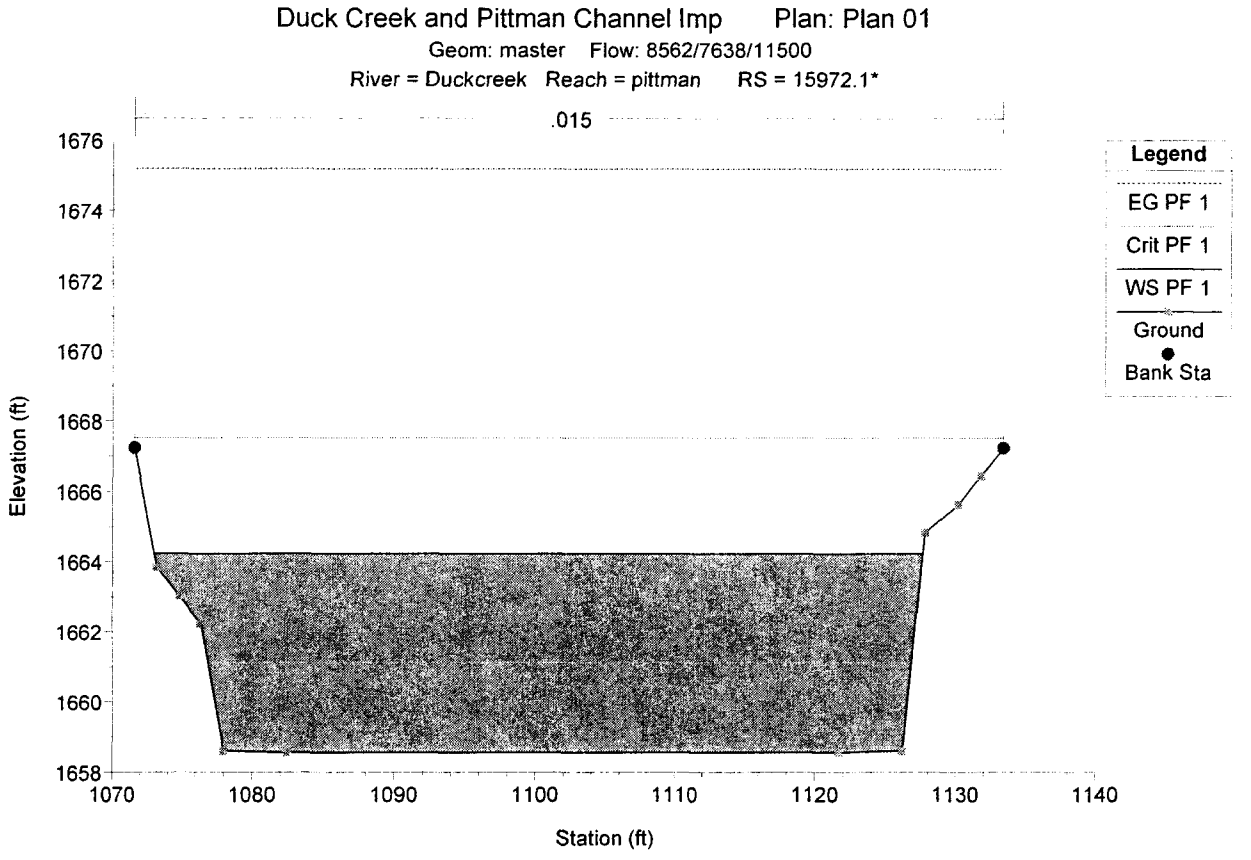
Geom: master Flow: 8562/7638/11500

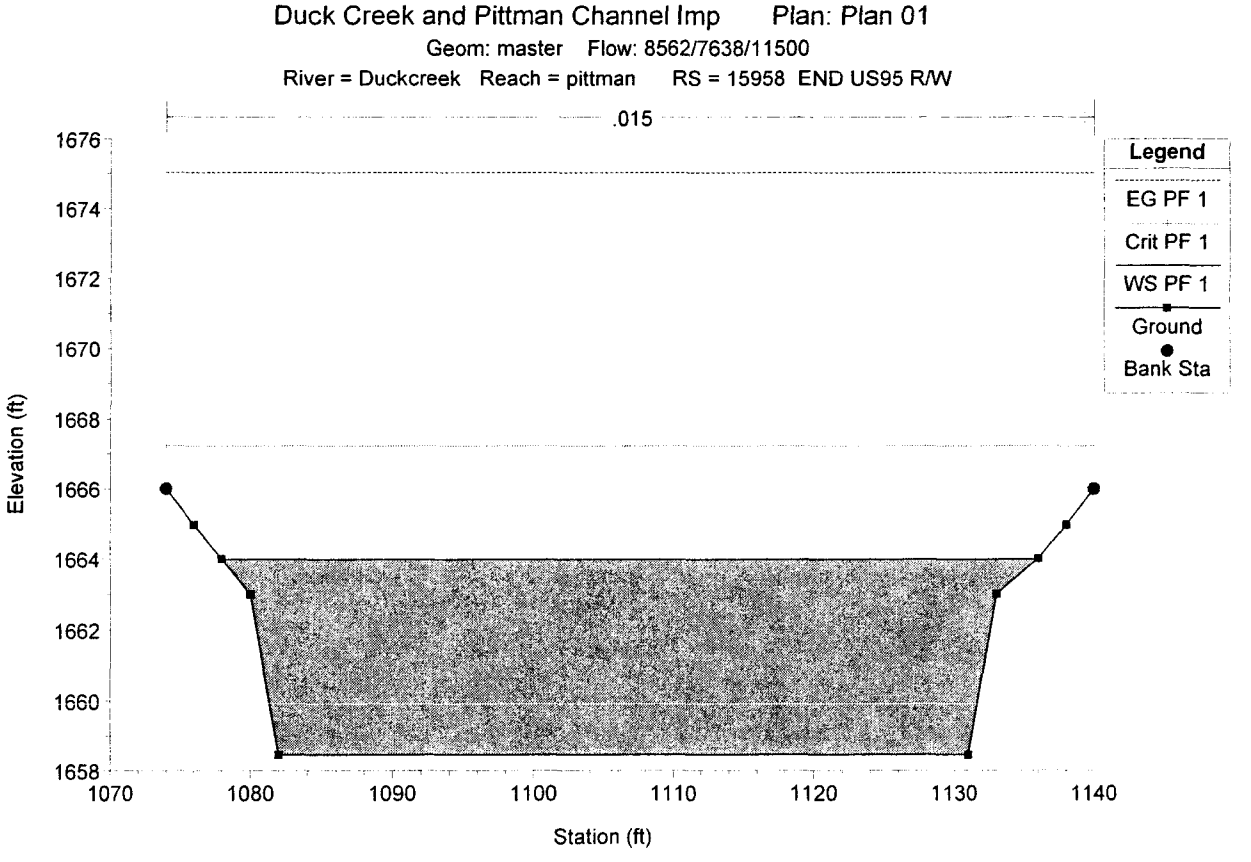
River = Duckcreek Reach = pittman RS = 16014.5*

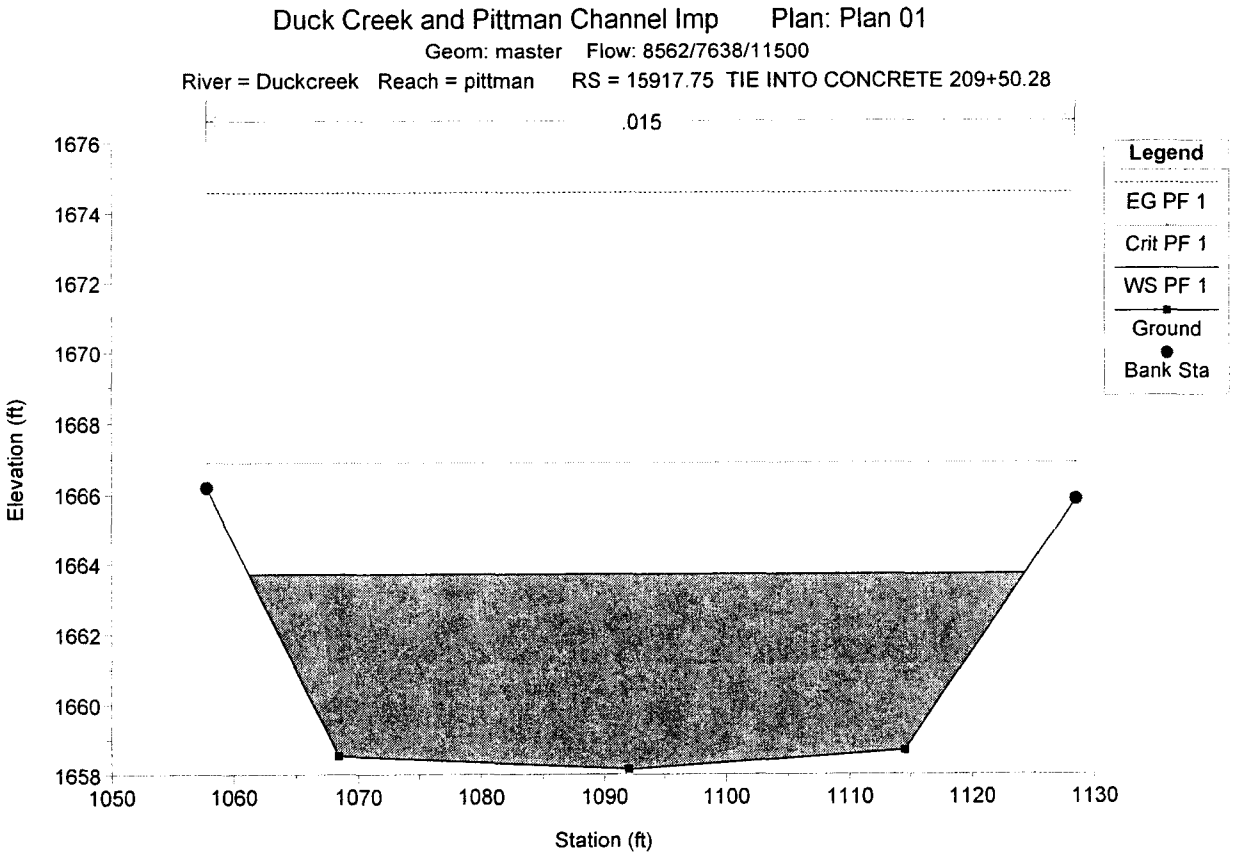


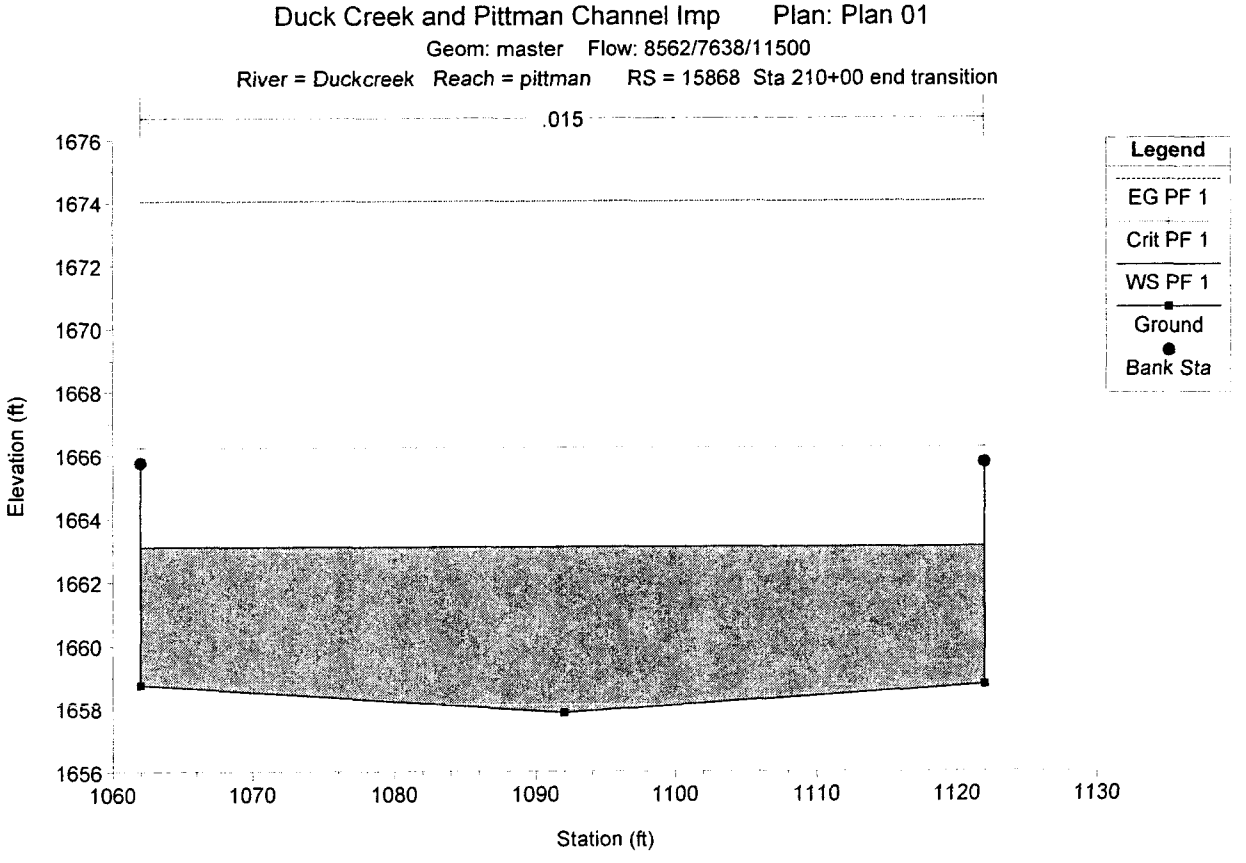

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 16000.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1676
1674
1672
1670
1668
1666
1664
1662
1660
1658
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

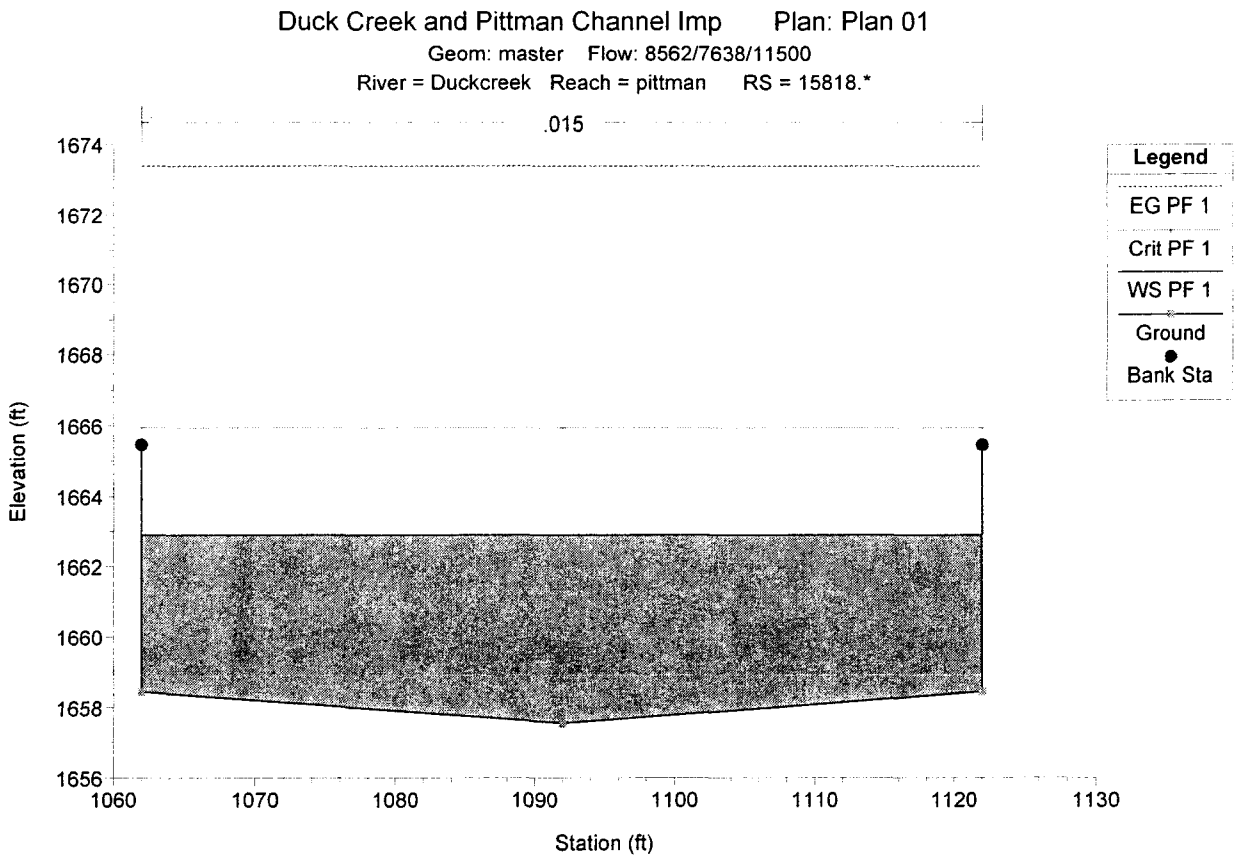

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15986.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1676
1674
1672
1670
1668
1666
1664
1662
1660
1658
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

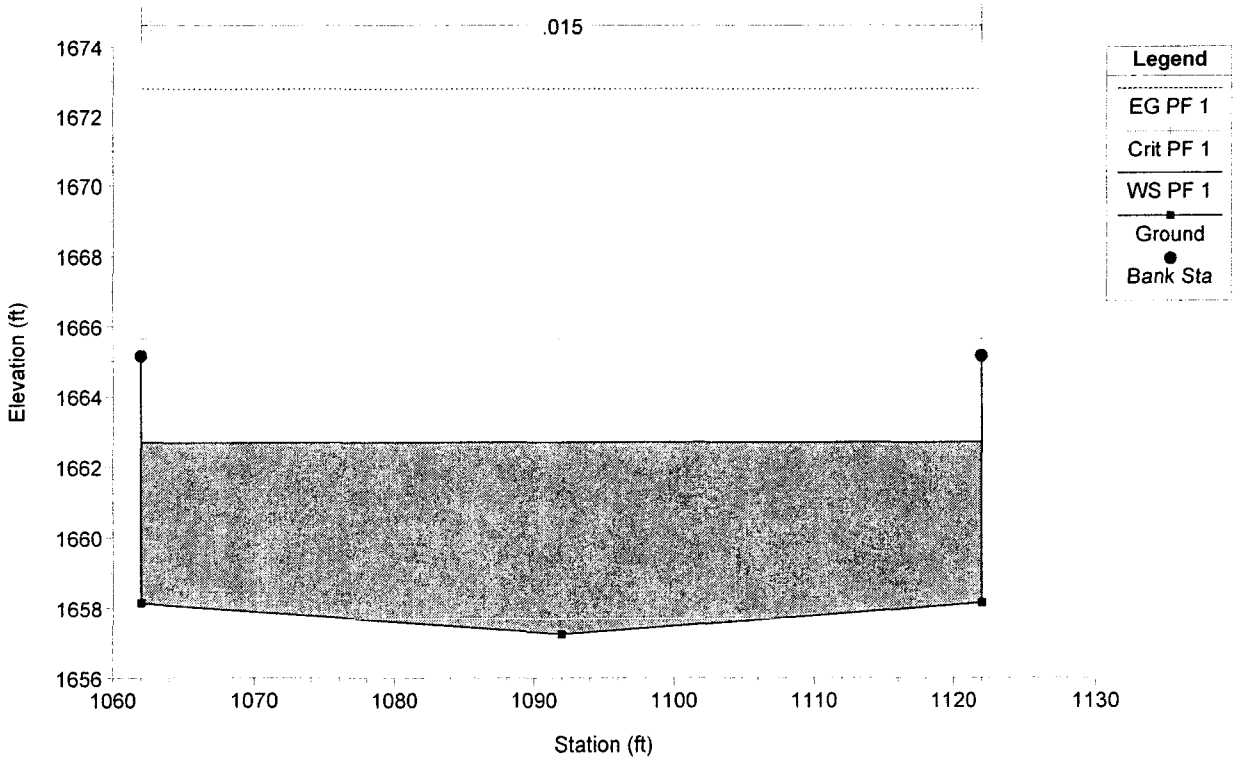

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15972.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1676
1674
1672
1670
1668
1666
1664
1662
1660
1658
1070
1080
1090
1100
1110
1120
1130
1140
Station (ft)

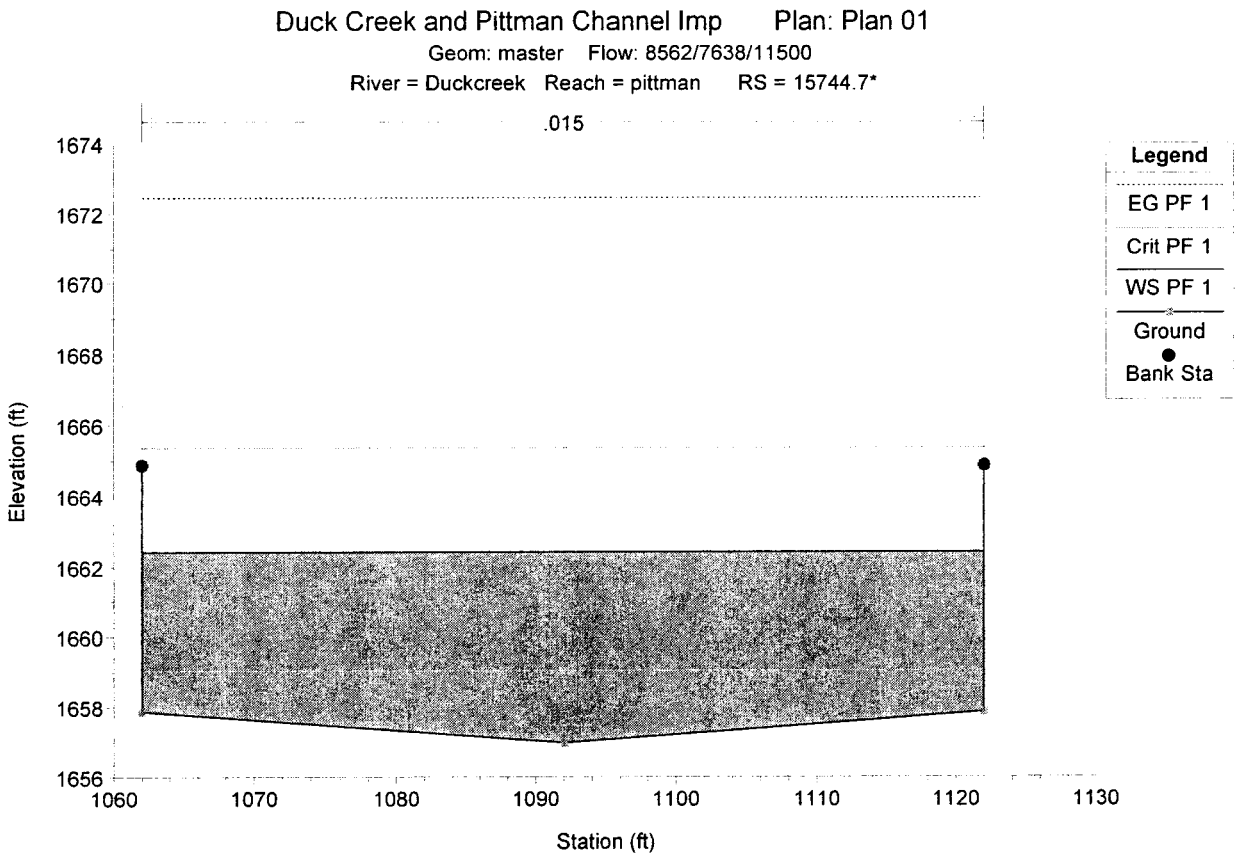

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15958 END US95 R/W
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1676
1674
1672
1670
1668
1666
1664
1662
1660
1658
1070
1080
1090
1100
1110
1120
1130
1140
Station (ft)

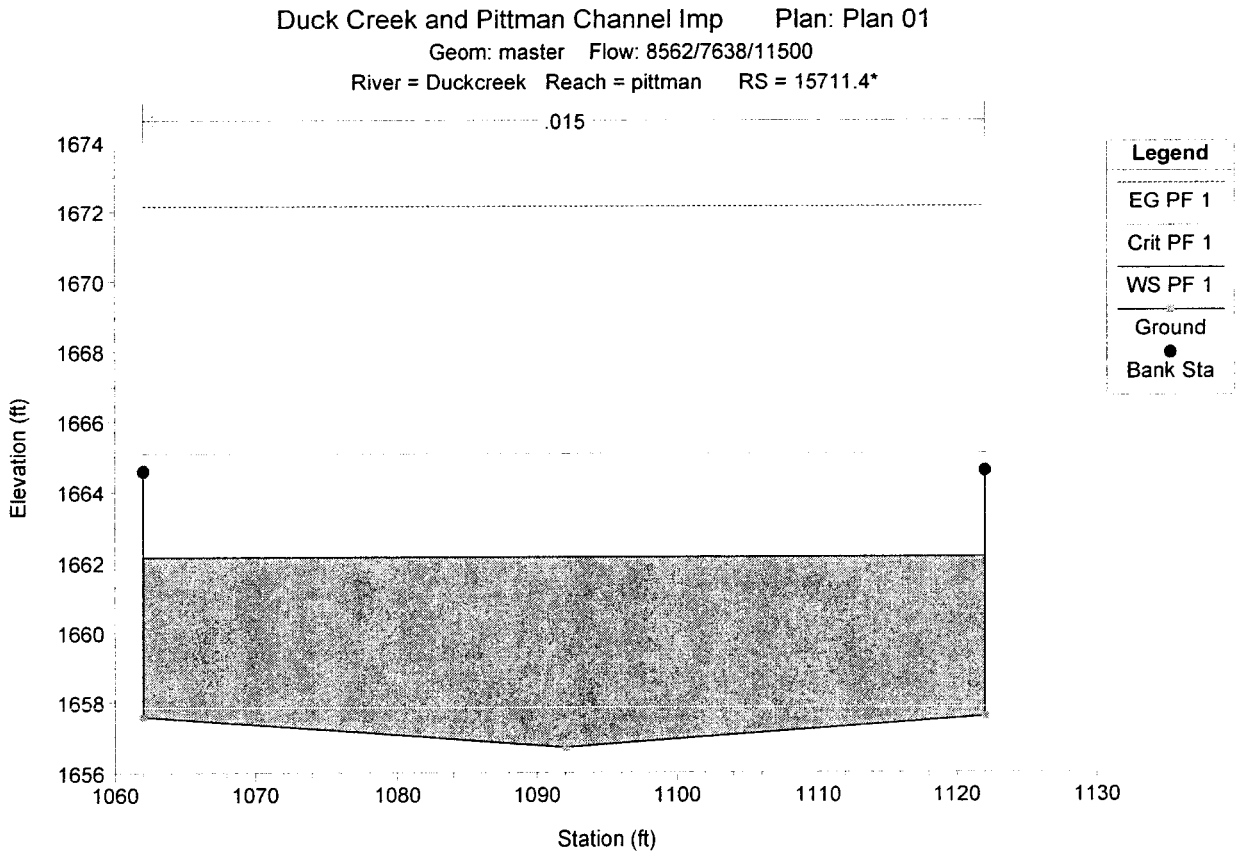

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15917.75 TIE INTO CONCRETE 209+50.28
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1676
1674
1672
1670
1668
1666
1664
1662
1660
1658
1050
1060
1070
1080
1090
1100
1110
1120
1130

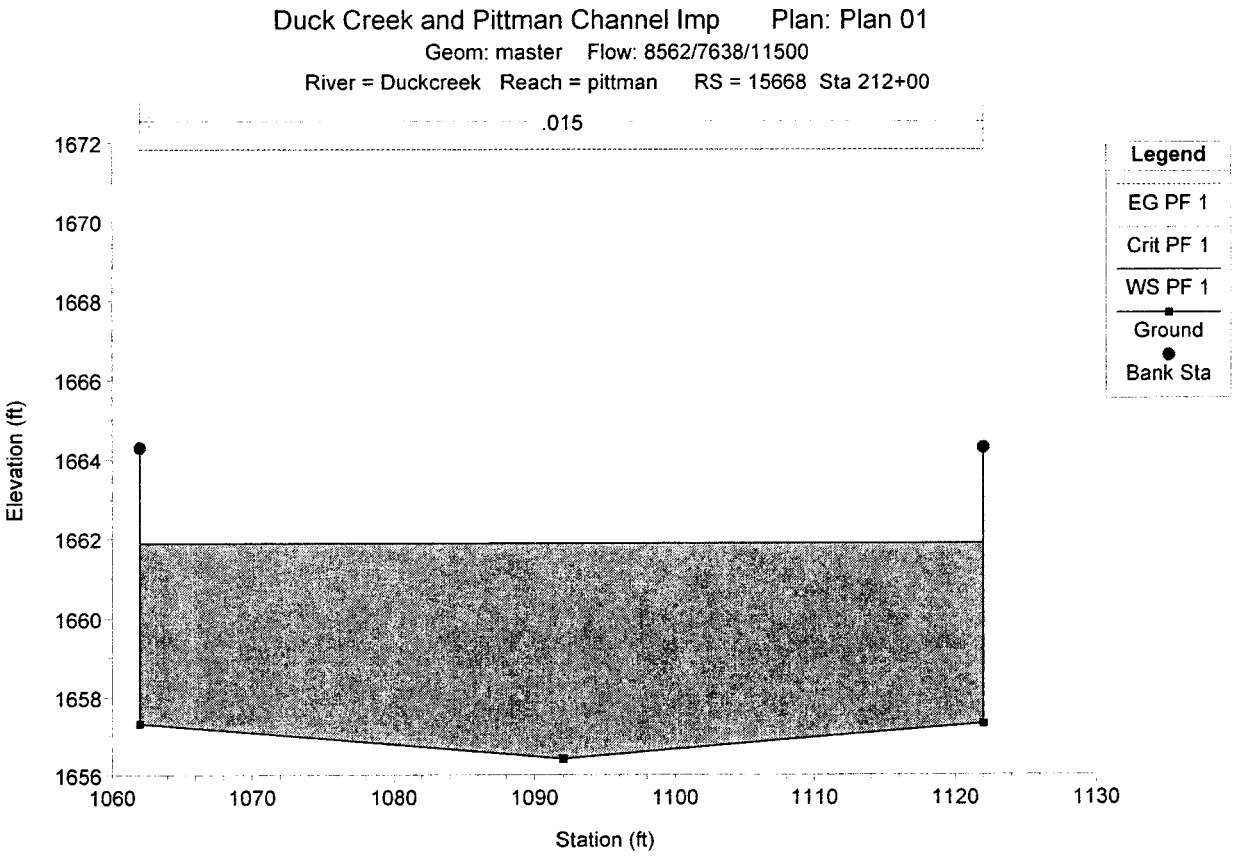

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15868 Sta 210+00 end transition
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1676
1674
1672
1670
1668
1666
1664
1662
1660
1658
1656
1060
1070
1080
1090
1100
1110
1120
1130

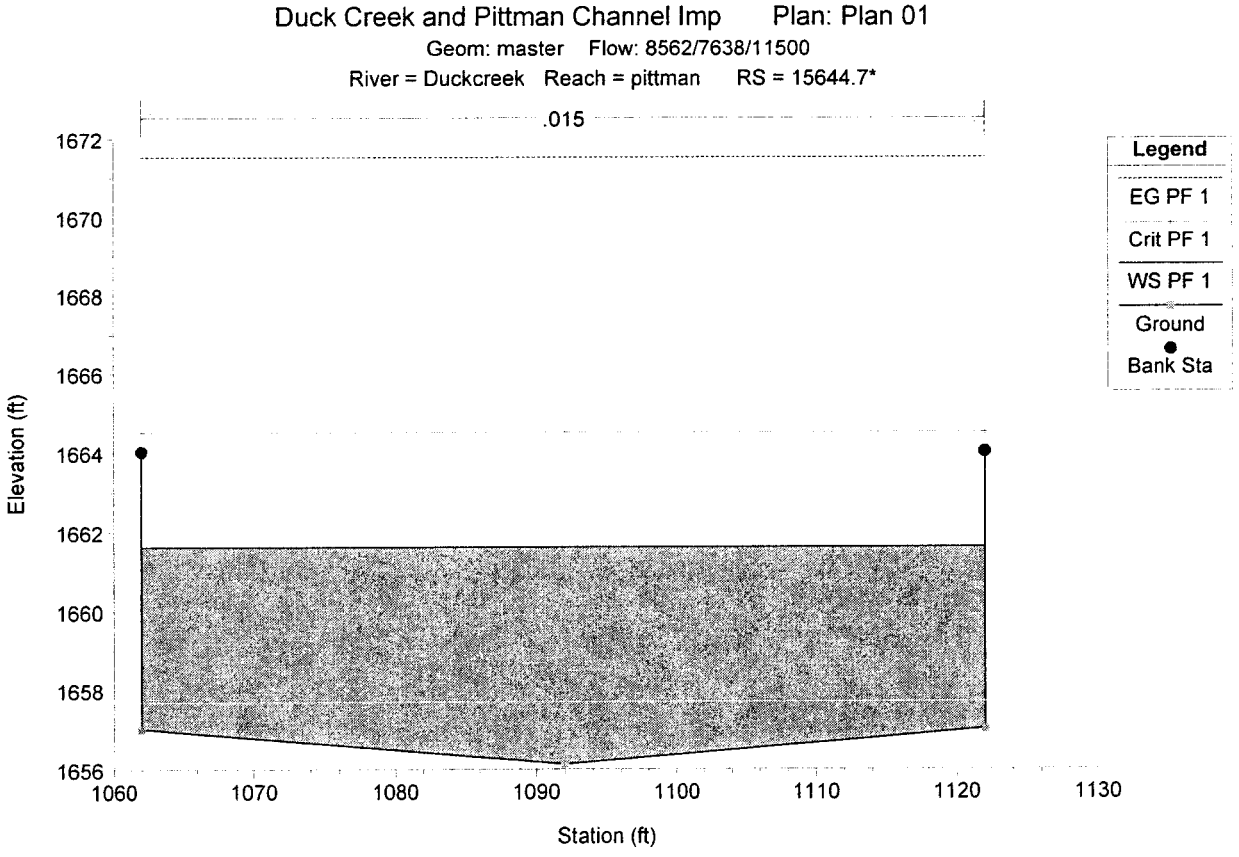

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15818.*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1674
1672
1670
1668
1666
1664
1662
1660
1658
1656
1060
1070
1080
1090
1100
1110
1120
1130

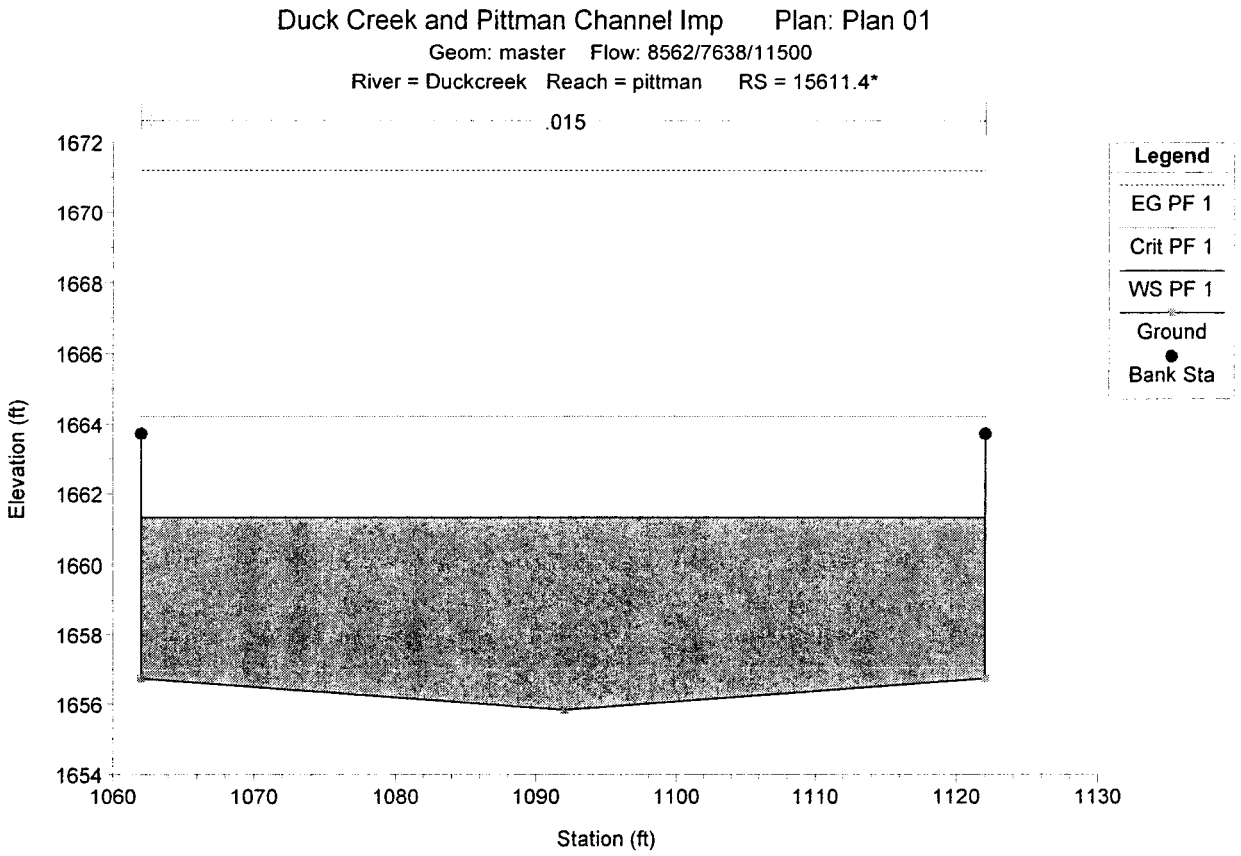

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15768 Sta 211+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1674
1672
1670
1668
1666
1664
1662
1660
1658
1656
1060
1070
1080
1090
1100
1110
1120
1130

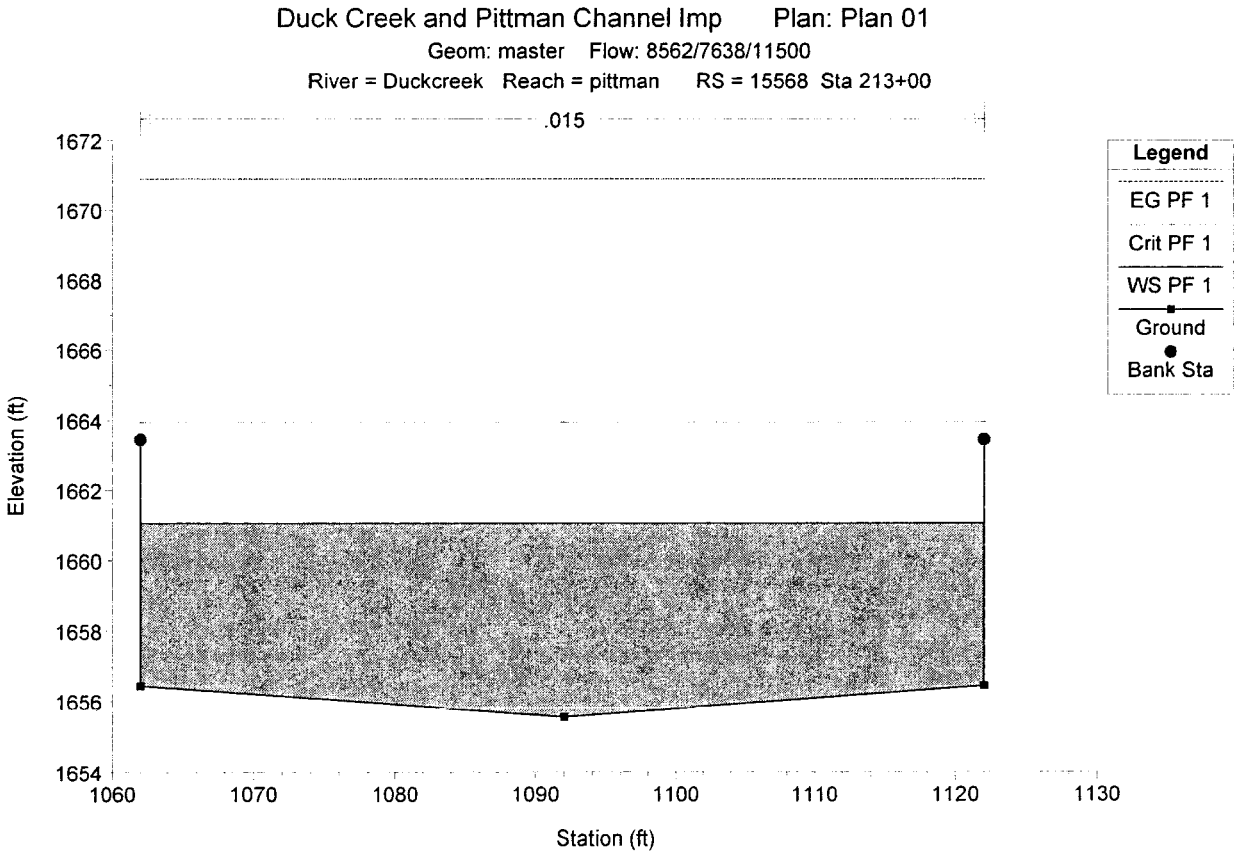

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15744.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1674
1672
1670
1668
1666
1664
1662
1660
1658
1656
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

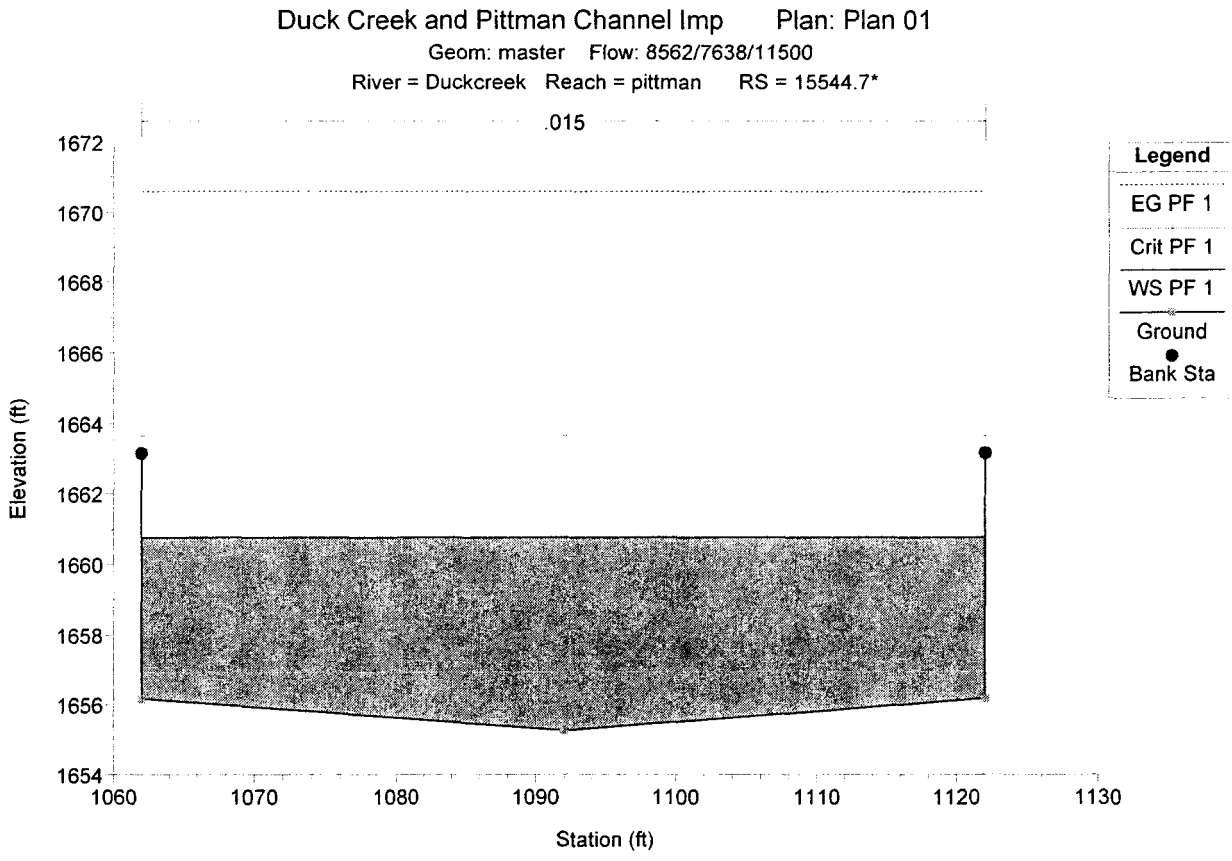

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15711.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1674
1672
1670
1668
1666
1664
1662
1660
1658
1656
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

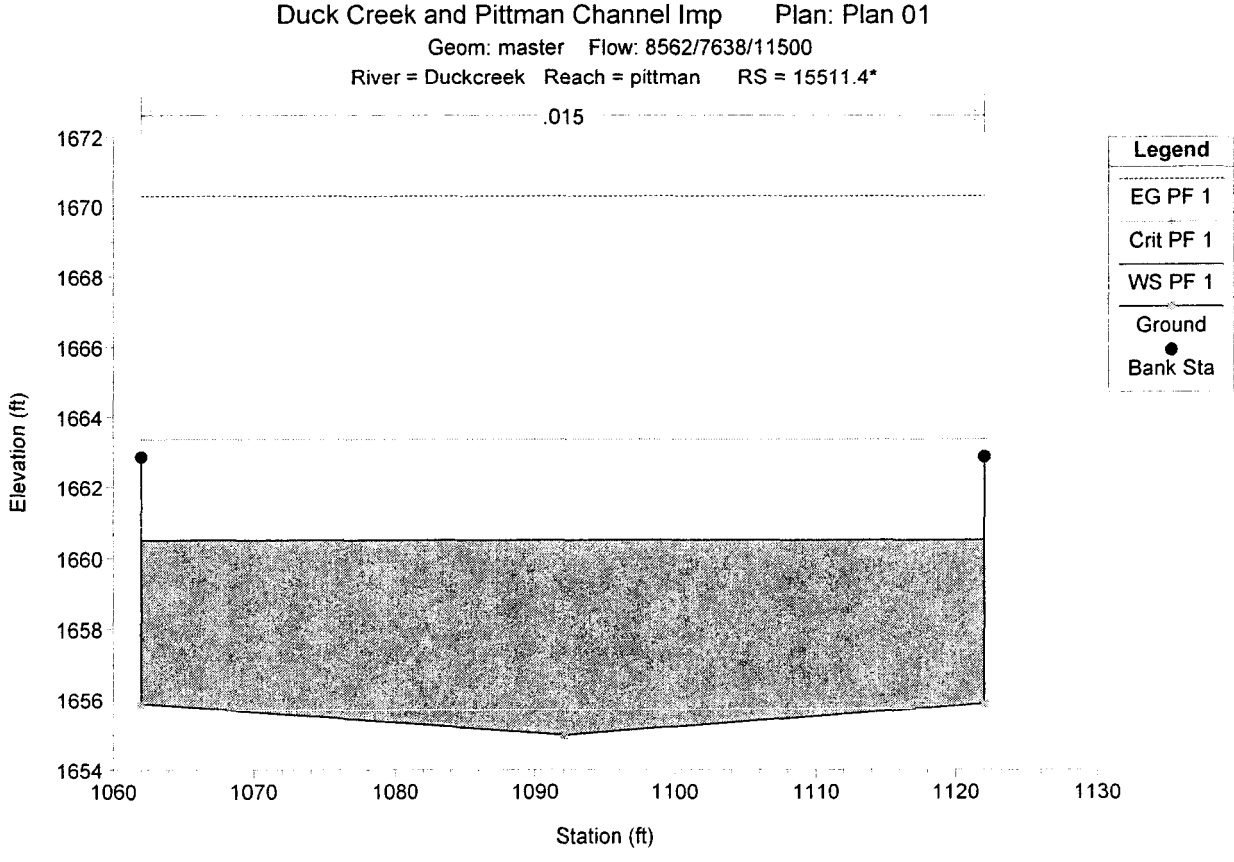

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15668 Sta 212+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1672
1670
1668
1666
1664
1662
1660
1658
1656
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

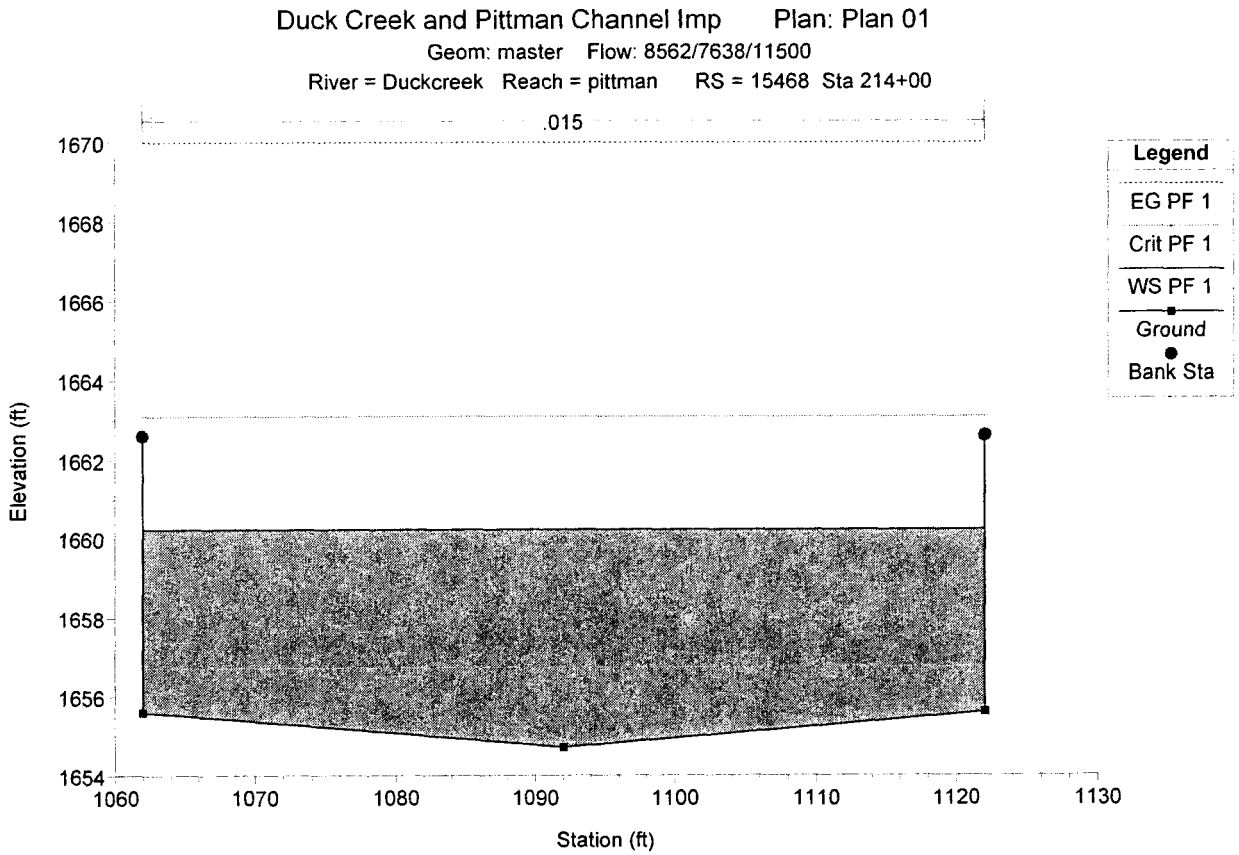

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15644.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1672
1670
1668
1666
1664
1662
1660
1658
1656
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

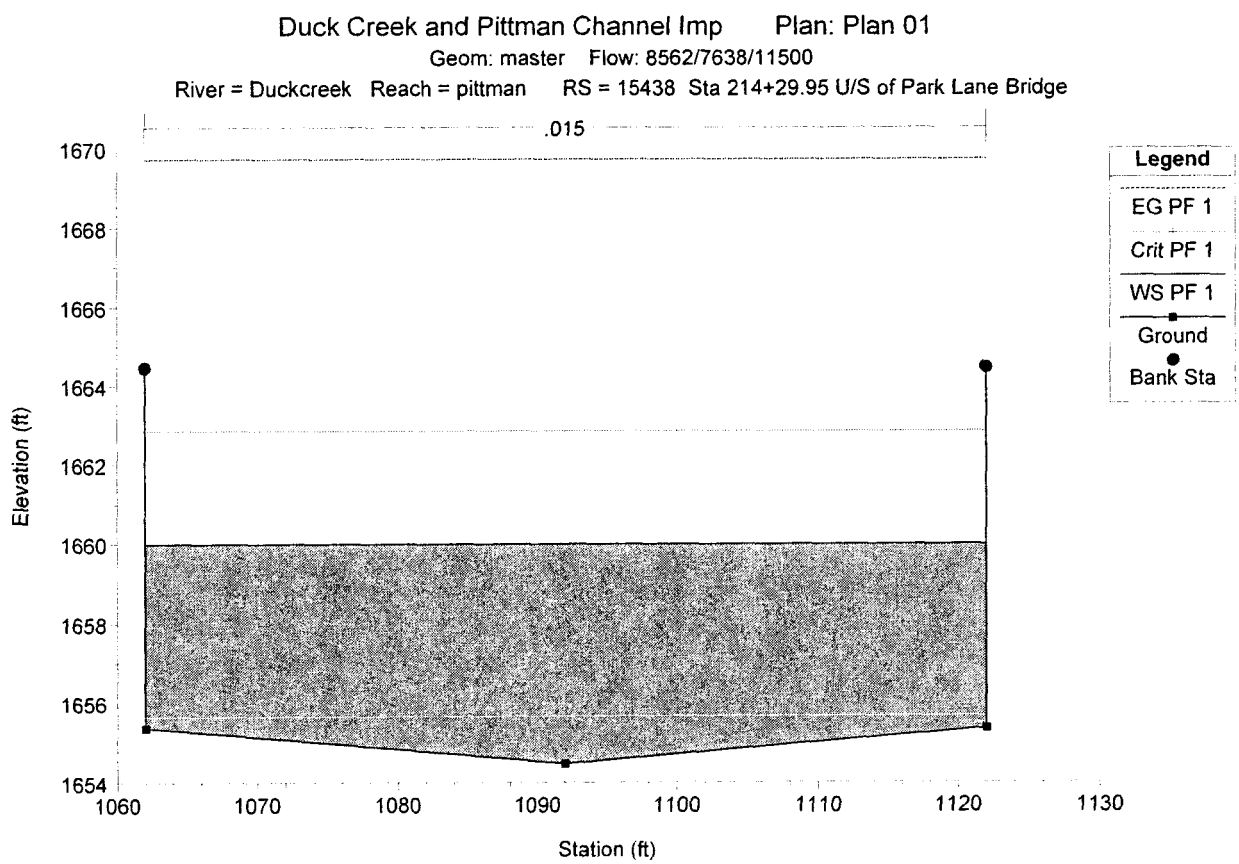

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15611.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1672
1670
1668
1666
1664
1662
1660
1658
1656
1654
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

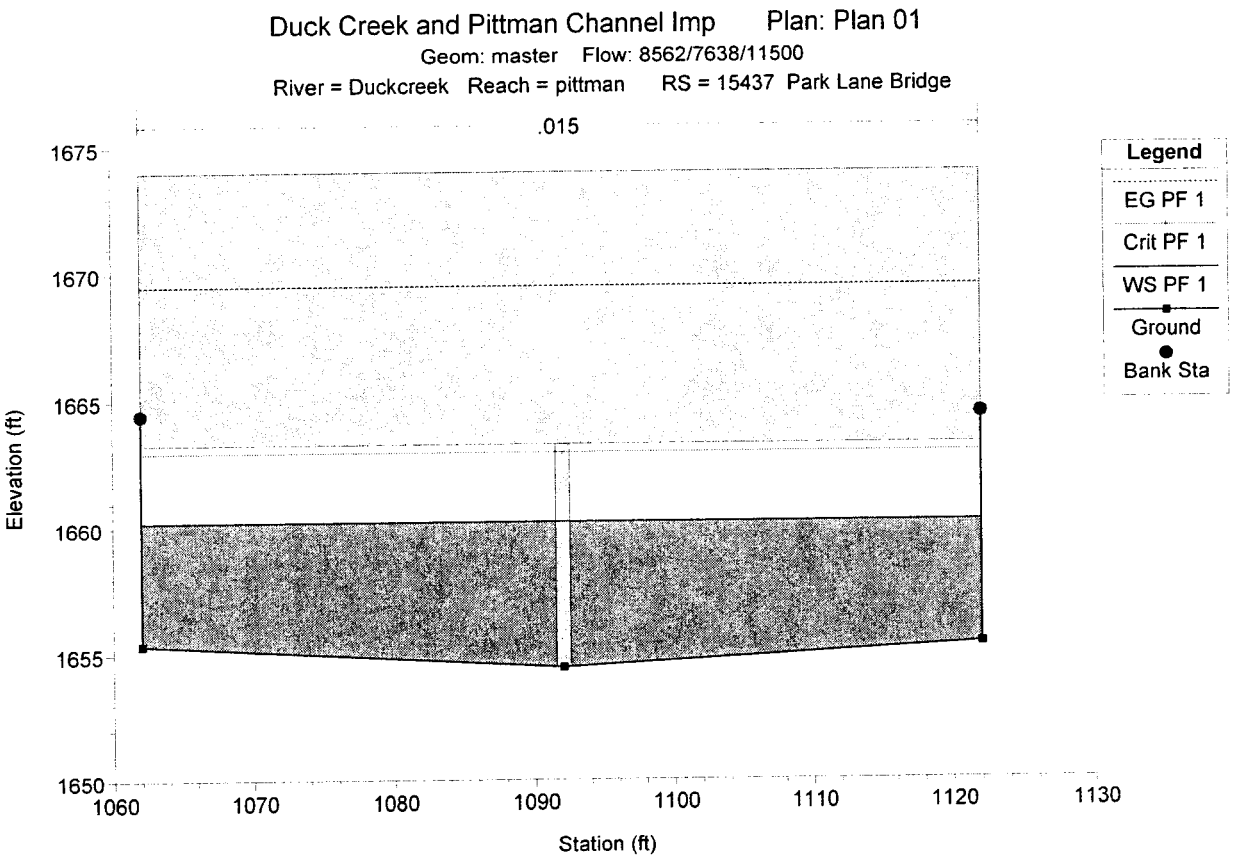

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15568 Sta 213+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1672
1670
1668
1666
1664
1662
1660
1658
1656
1654
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

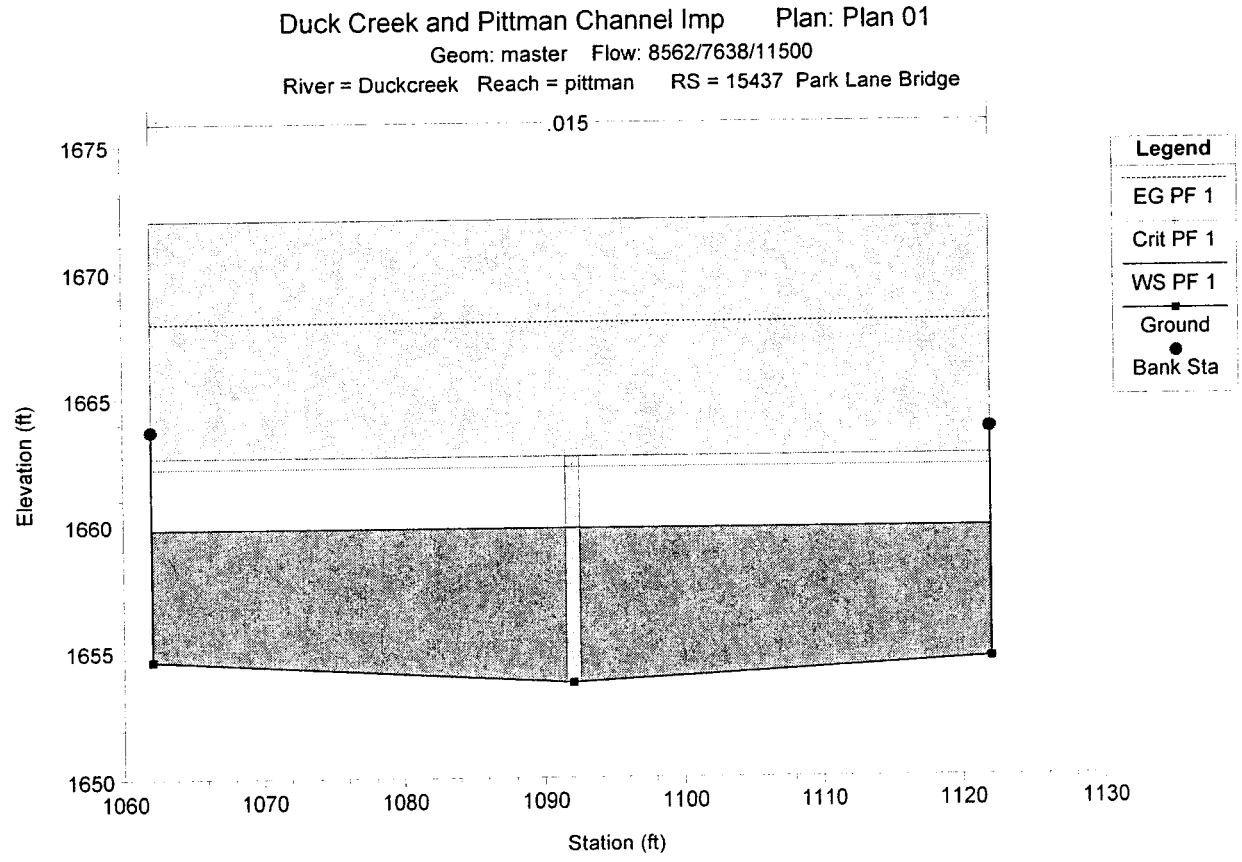

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15544.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1672
1670
1668
1666
1664
1662
1660
1658
1656
1654
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

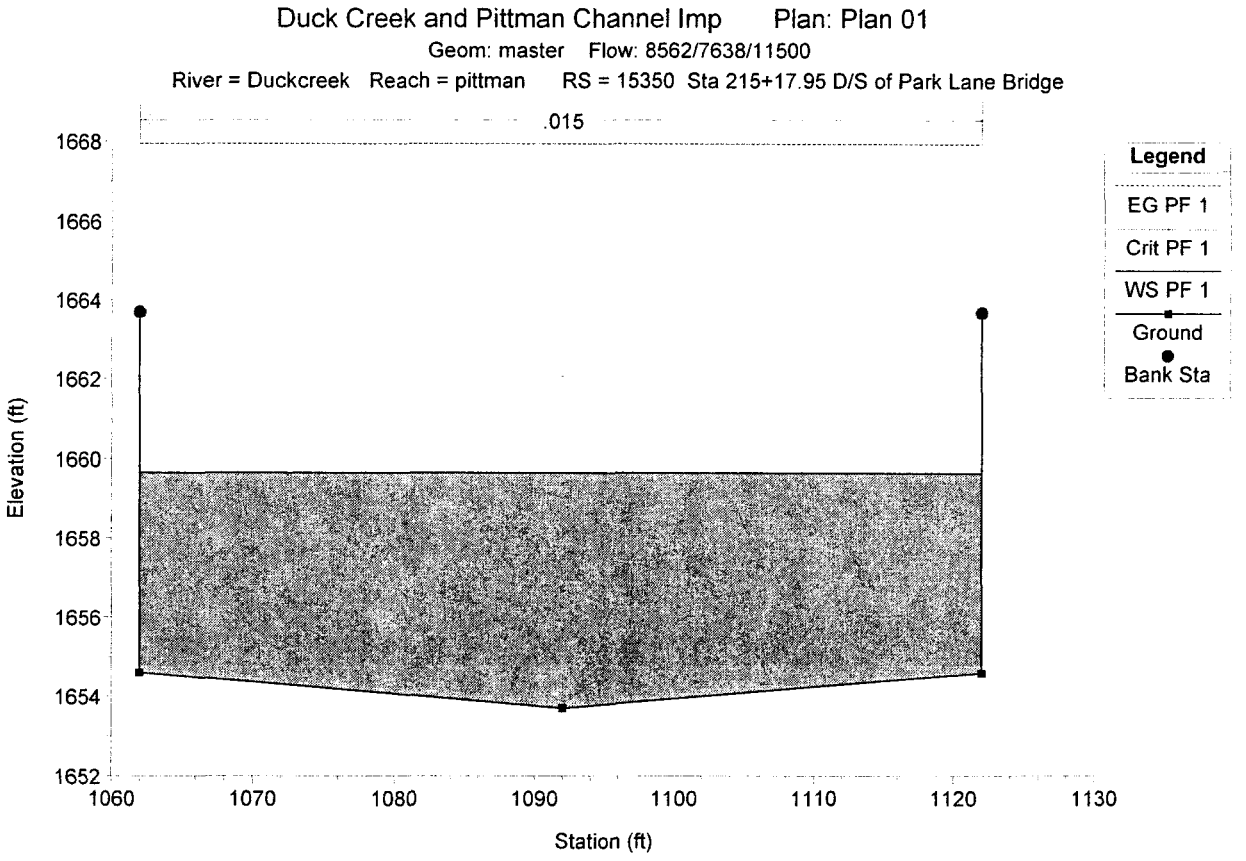

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15511.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1672
1670
1668
1666
1664
1662
1660
1658
1656
1654
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

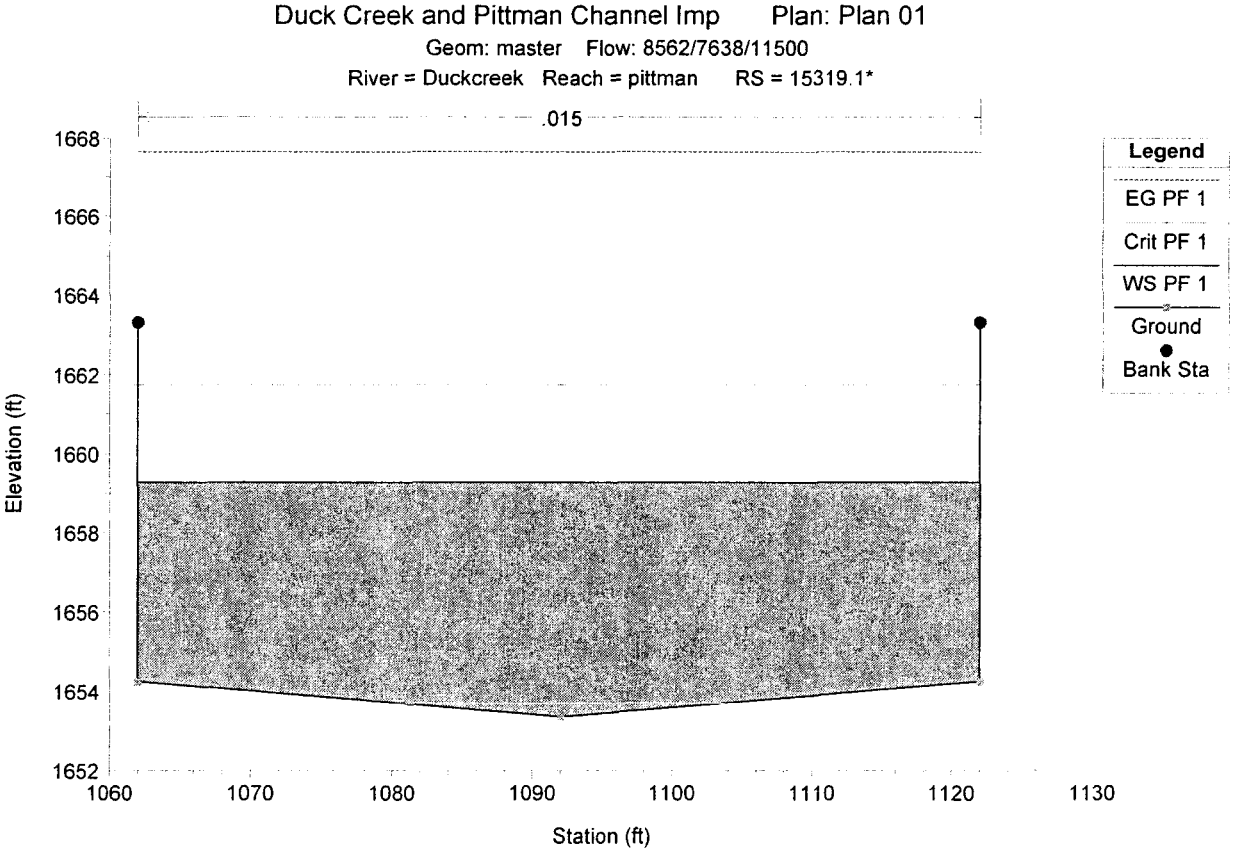

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15468 Sta 214+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1670
1668
1666
1664
1662
1660
1658
1656
1654
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

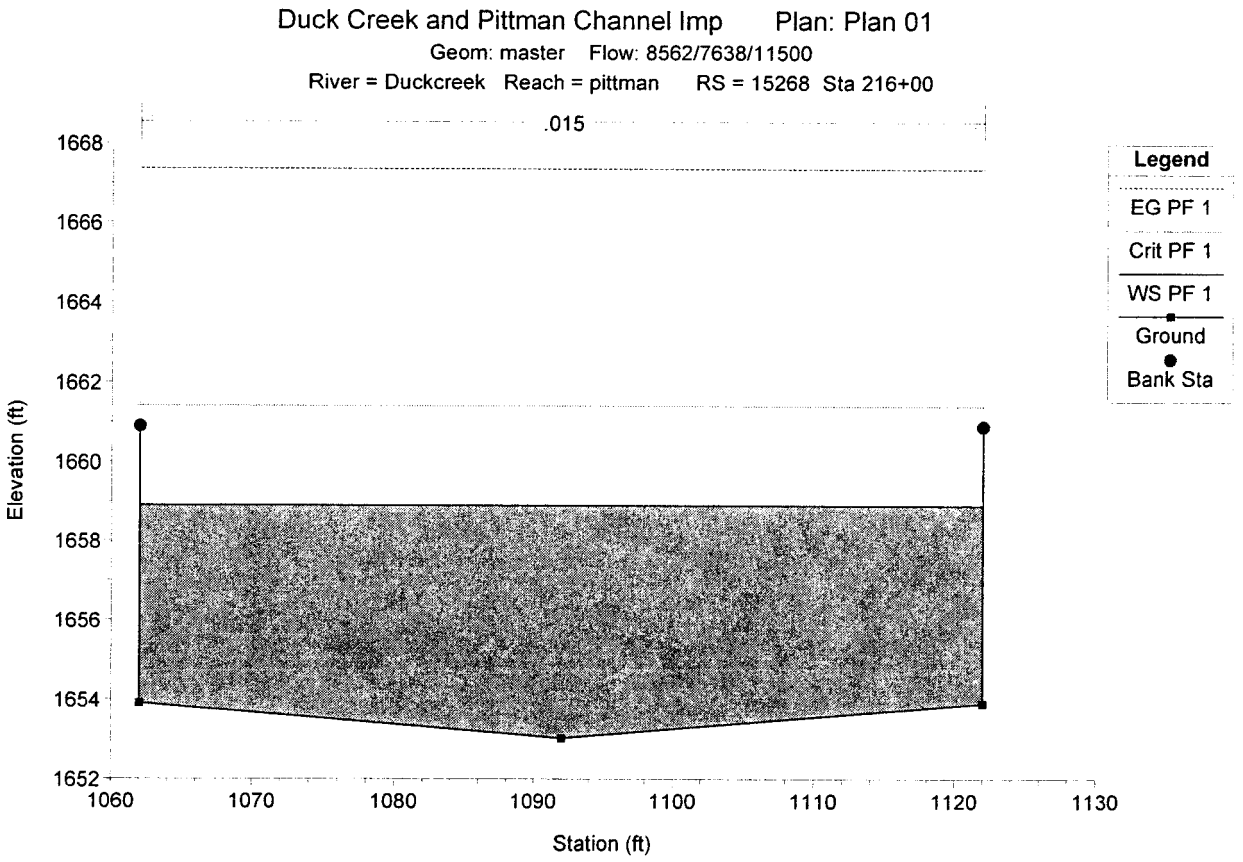

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15438 Sta 214+29.95 U/S of Park Lane Bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1670
1668
1666
1664
1662
1660
1658
1656
1654
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

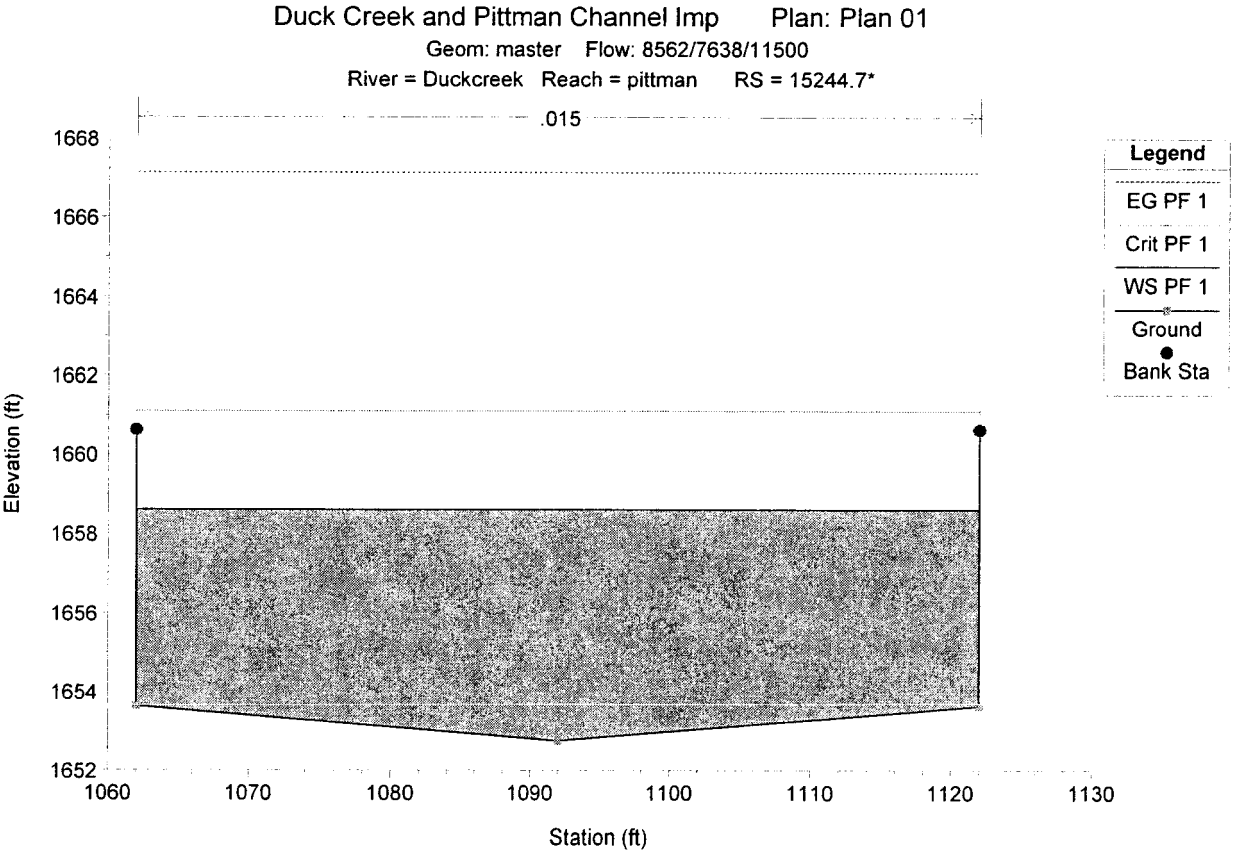

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15437 Park Lane Bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1675
1670
1665
1660
1655
1650
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

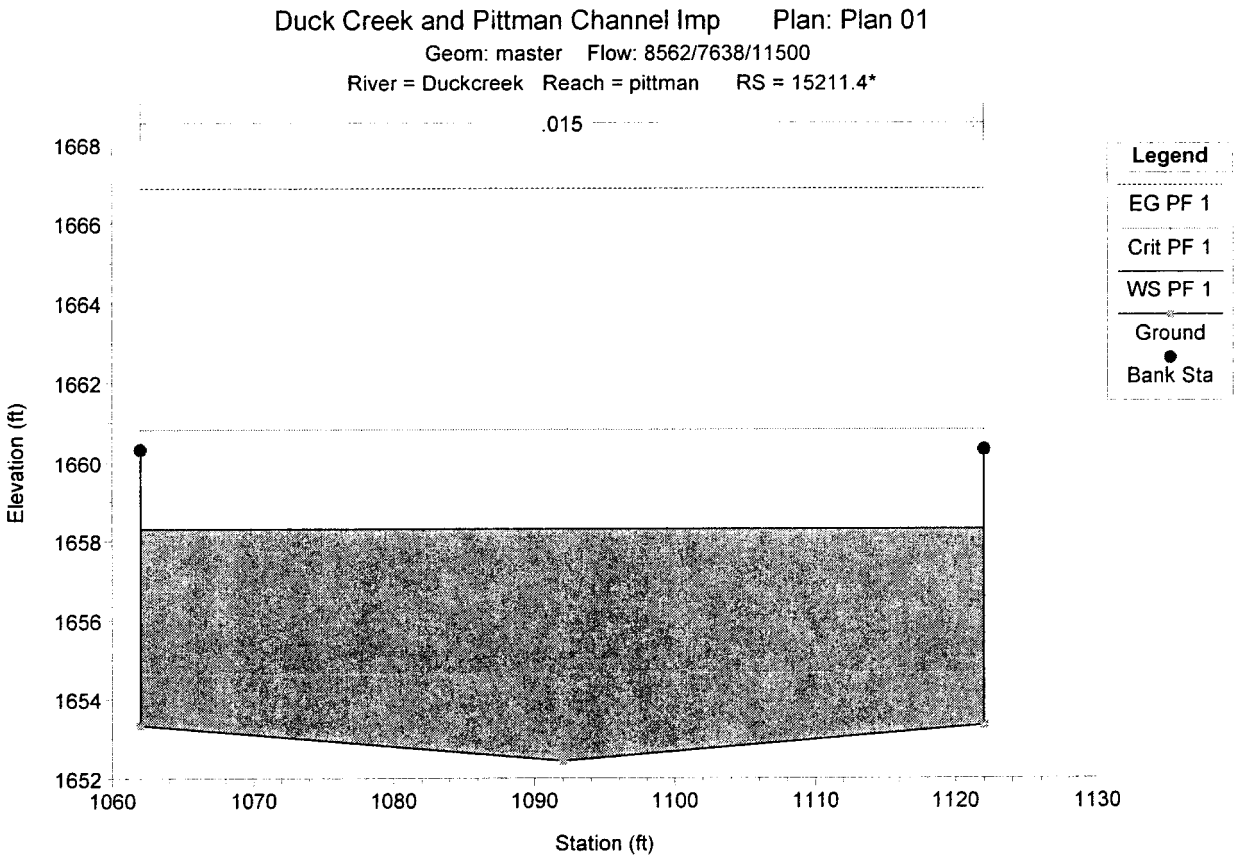

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15437 Park Lane Bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1675
1670
1665
1660
1655
1650
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

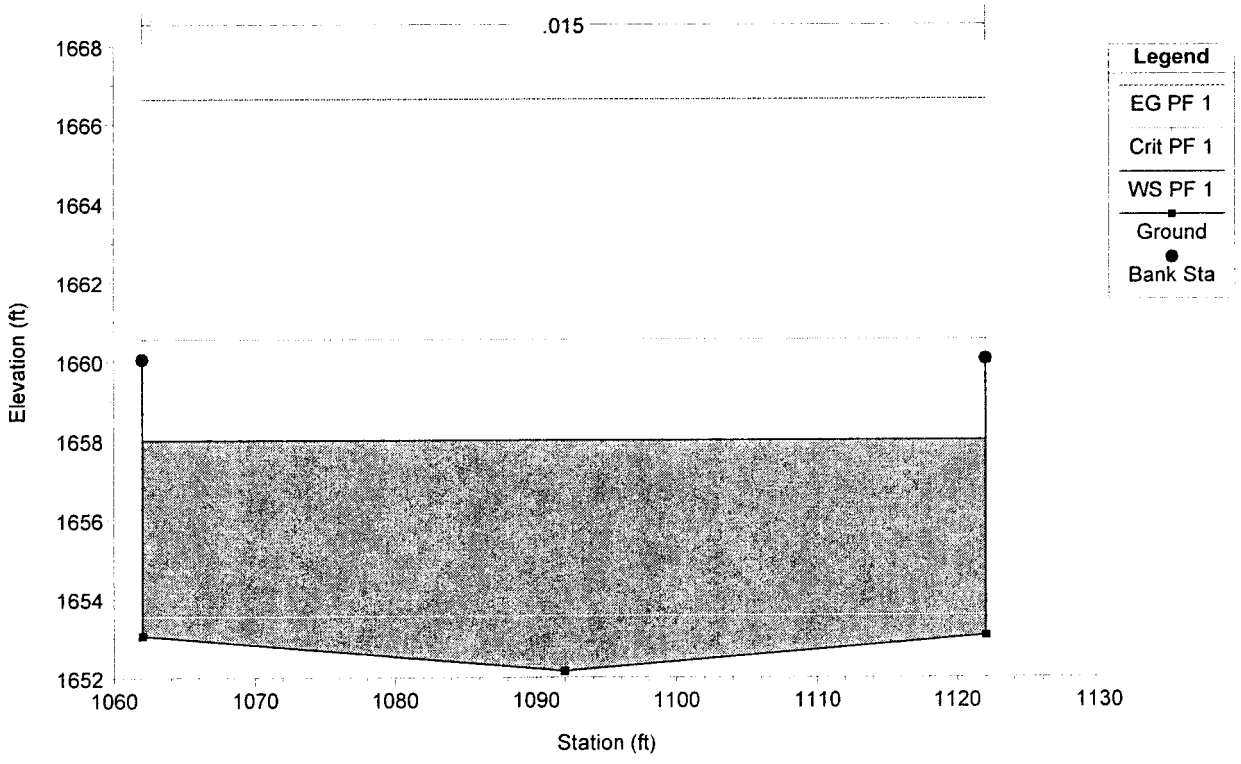

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15350 Sta 215+17.95 D/S of Park Lane Bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1668
1666
1664
1662
1660
1658
1656
1654
1652
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15319.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1668
1666
1664
1662
1660
1658
1656
1654
1652
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15268 Sta 216+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1668
1666
1664
1662
1660
1658
1656
1654
1652
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15244.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1668
1666
1664
1662
1660
1658
1656
1654
1652
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

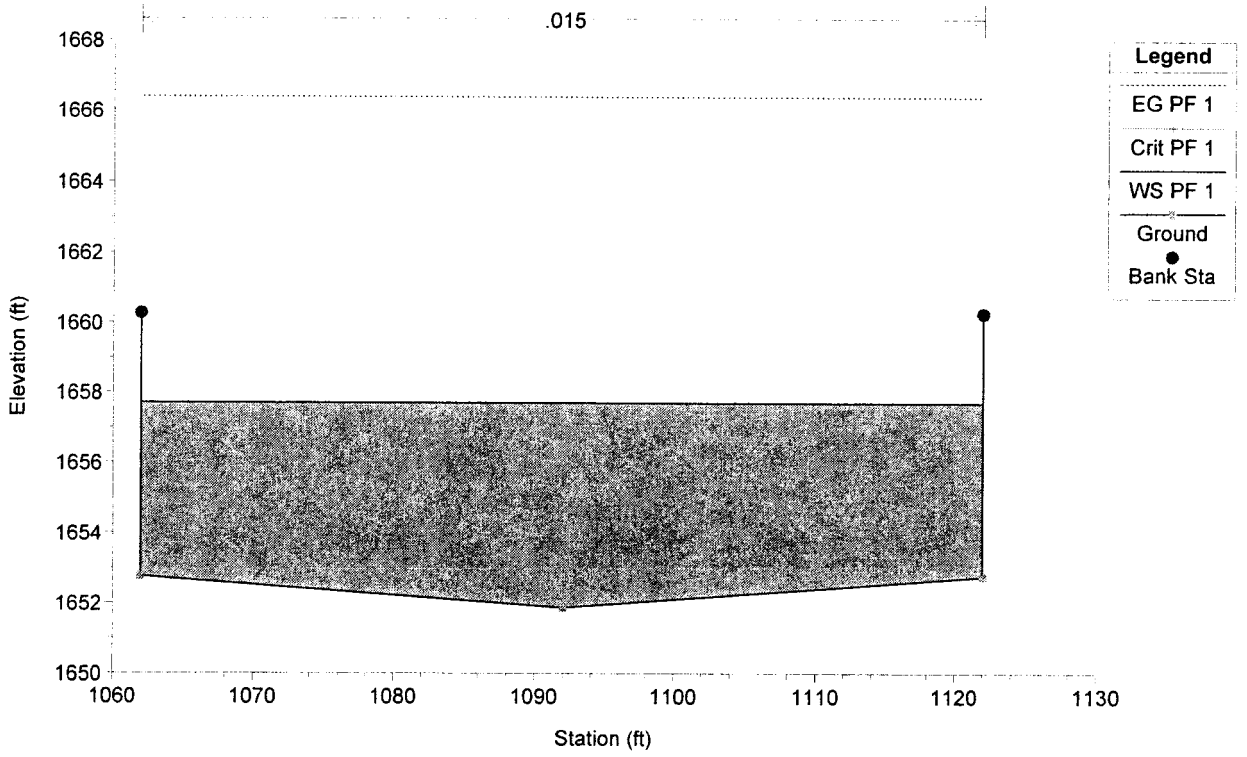

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15211.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1668
1666
1664
1662
1660
1658
1656
1654
1652
1060
1070
1080
1090
1100
1110
1120
1130


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15168 Sta 217+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1668
1666
1664
1662
1660
1658
1656
1654
1652
1060
1070
1080
1090
1100
1110
1120
1130

Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

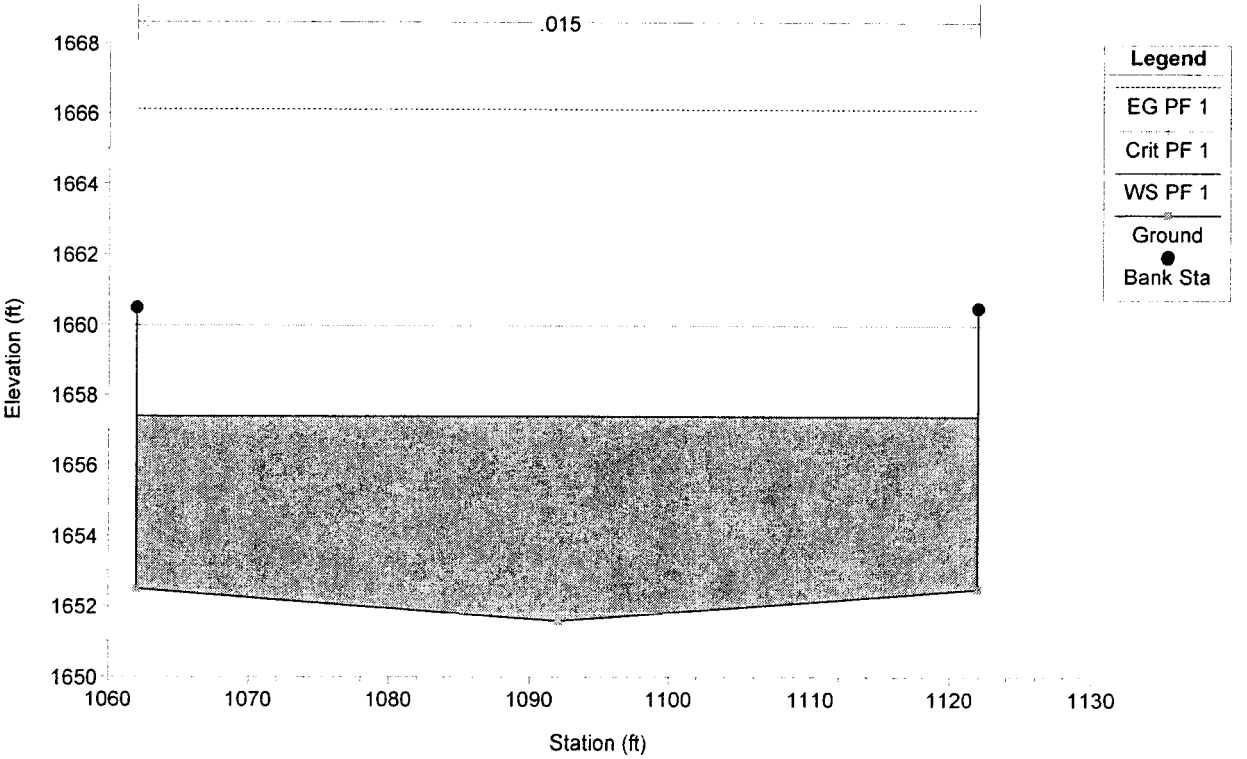
River = Duckcreek Reach = pittman RS = 15144.7*

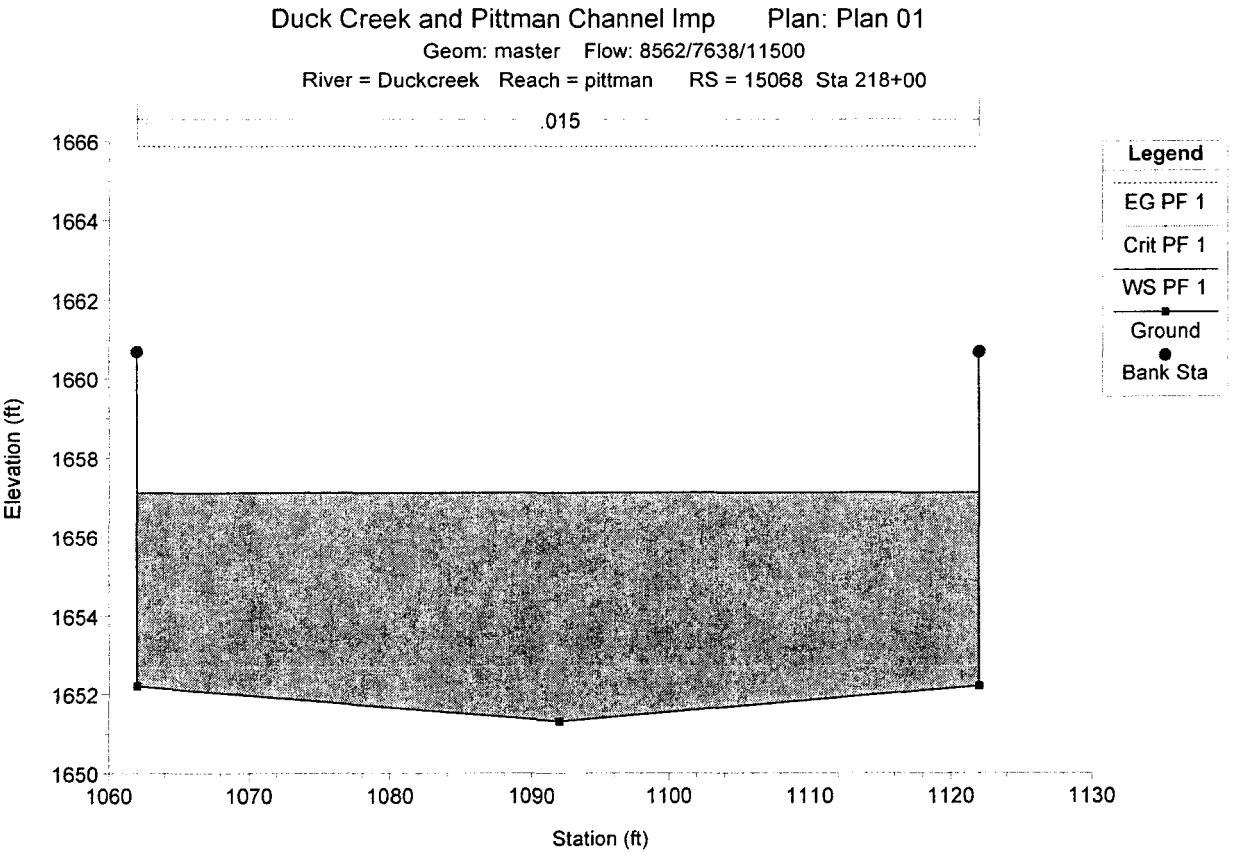


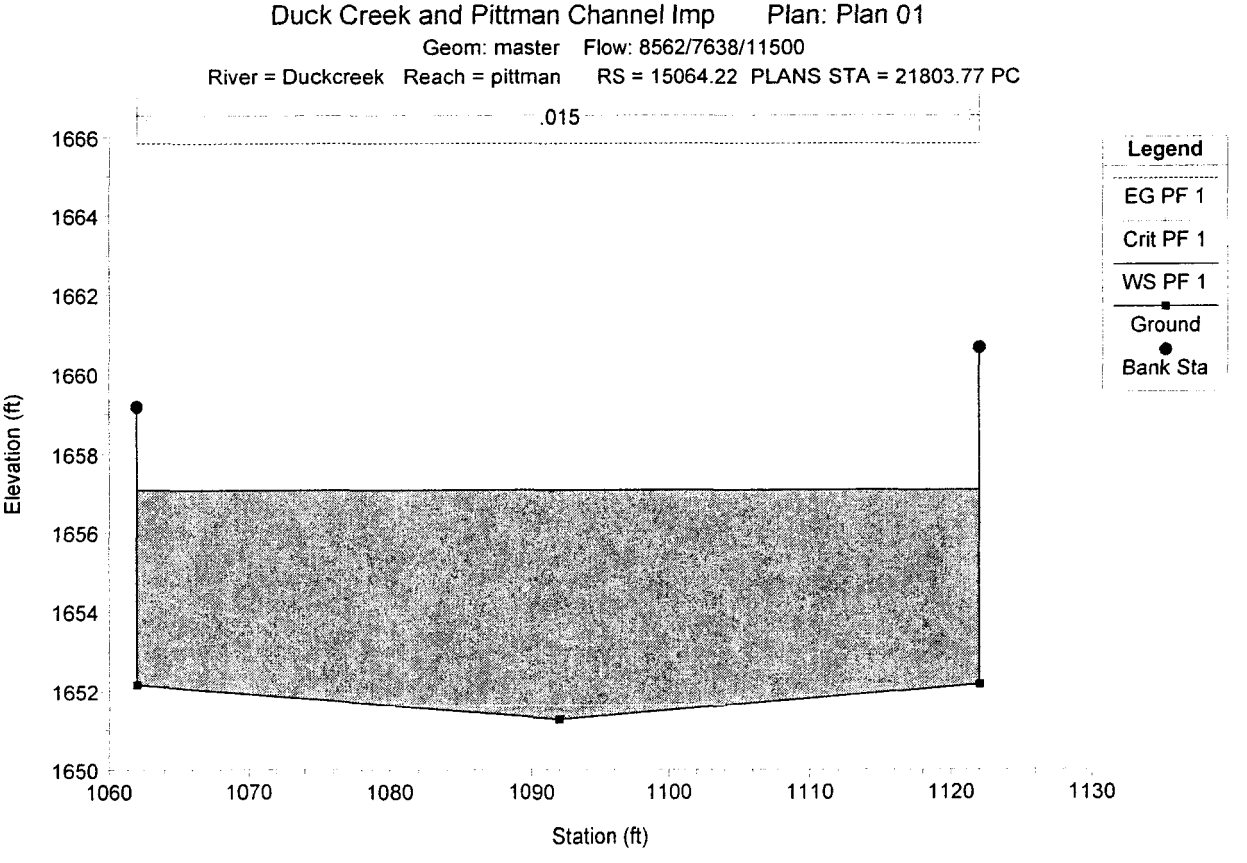
Duck Creek and Pittman Channel Imp Plan: Plan 01

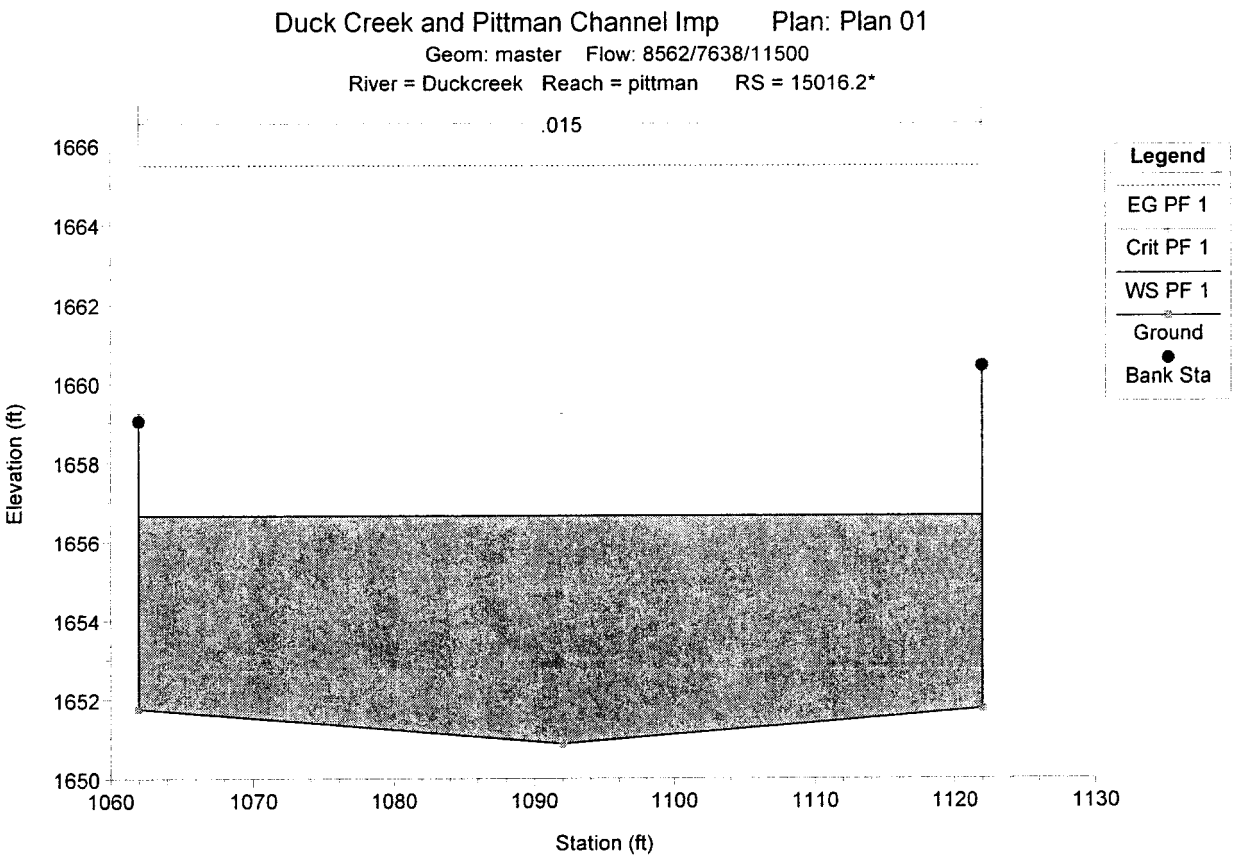
Geom: master Flow: 8562/7638/11500

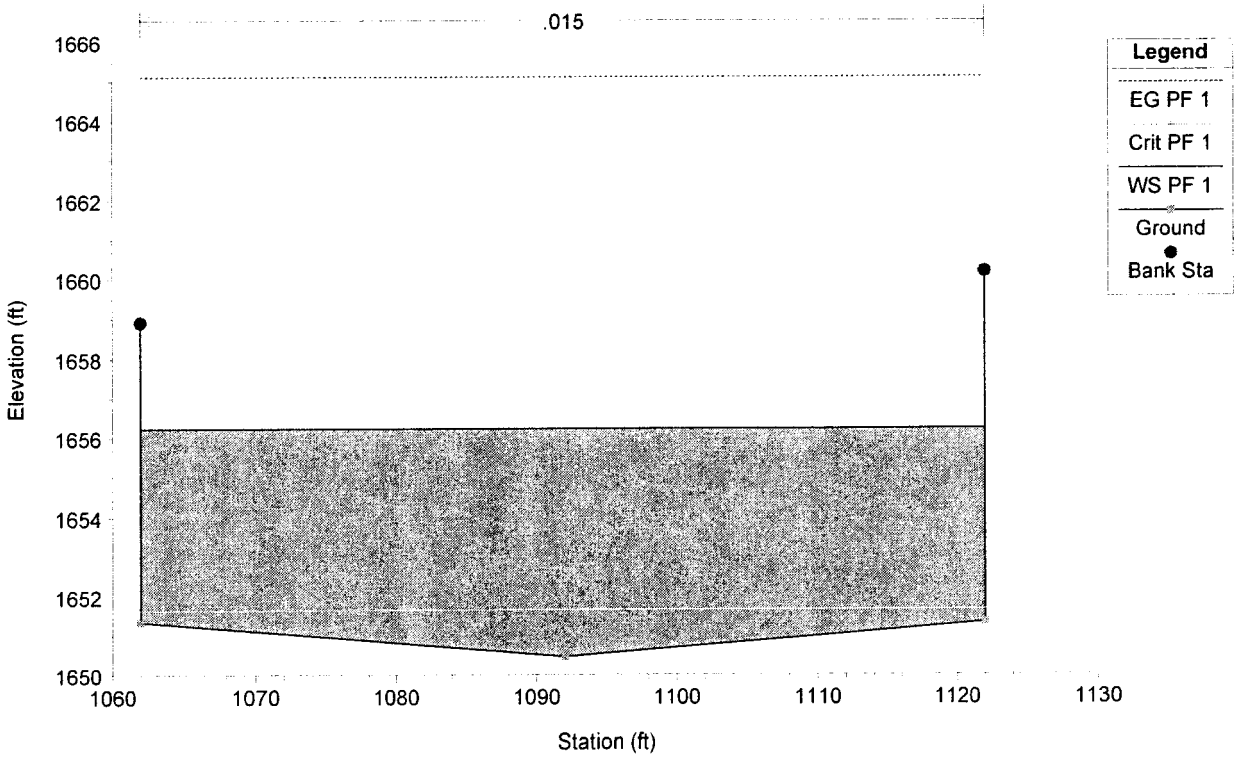
River = Duckcreek Reach = pittman RS = 15111.4*

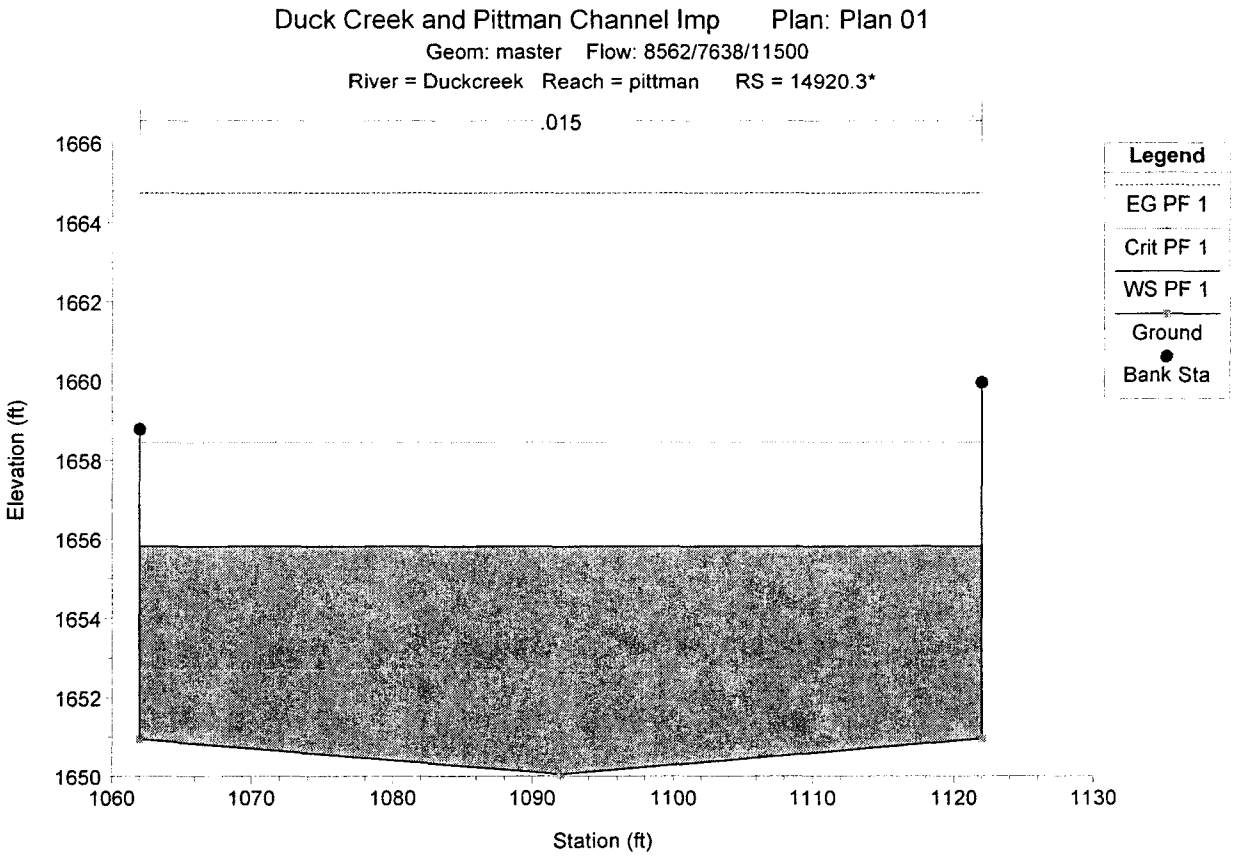


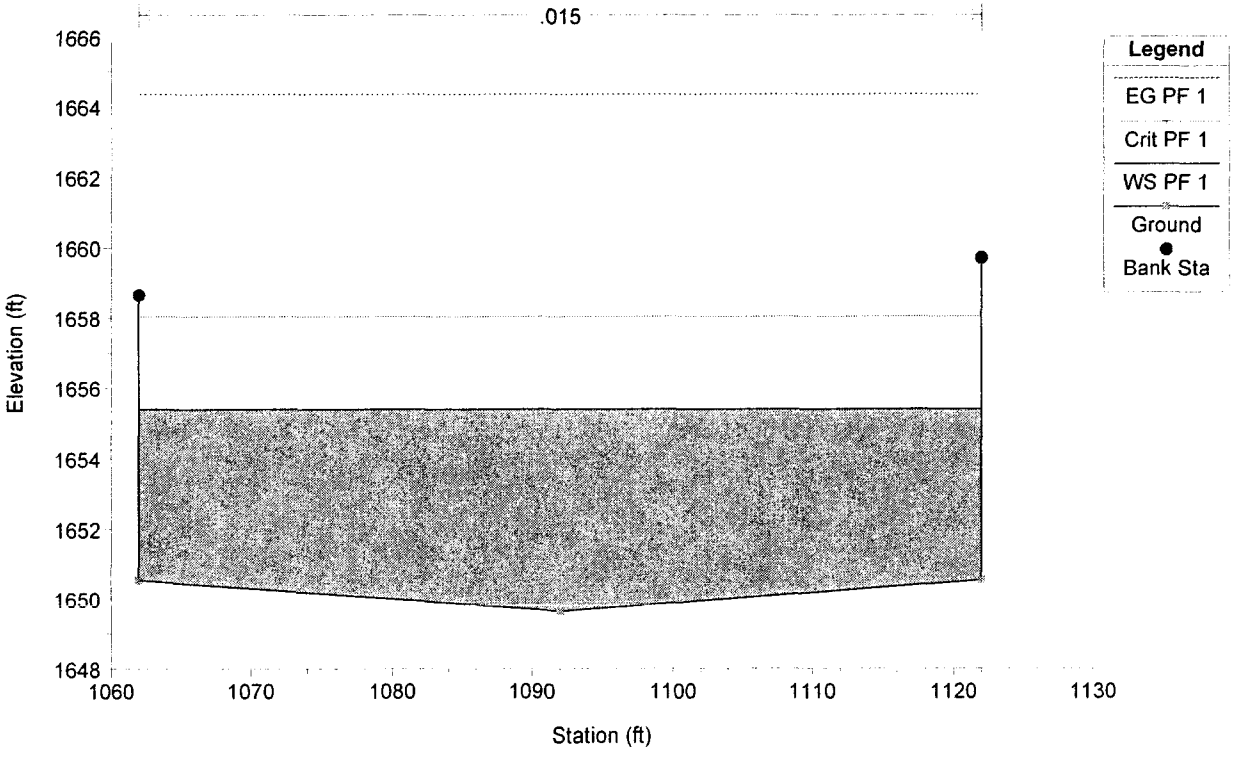

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15068 Sta 218+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1666
1664
1662
1660
1658
1656
1654
1652
1650
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

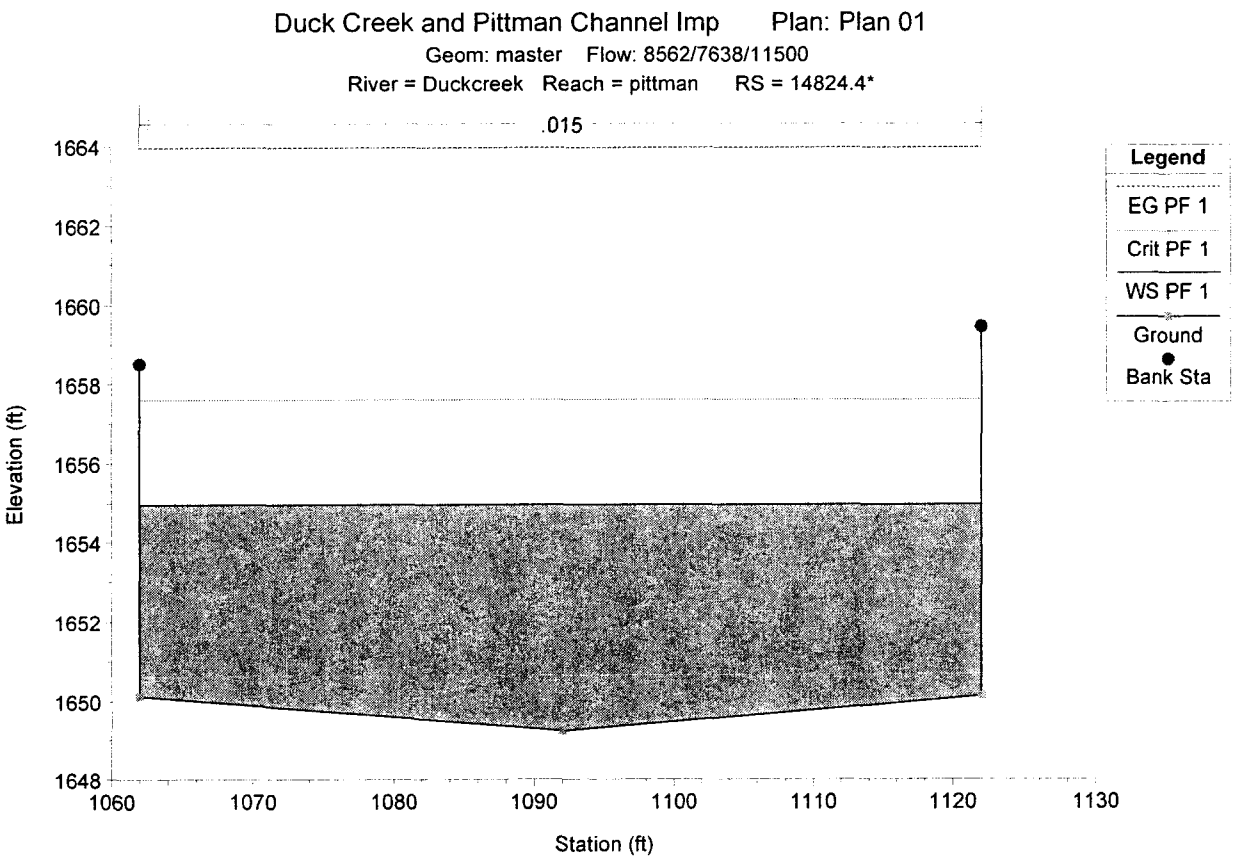

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15064.22 PLANS STA = 21803.77 PC
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1666
1664
1662
1660
1658
1656
1654
1652
1650
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

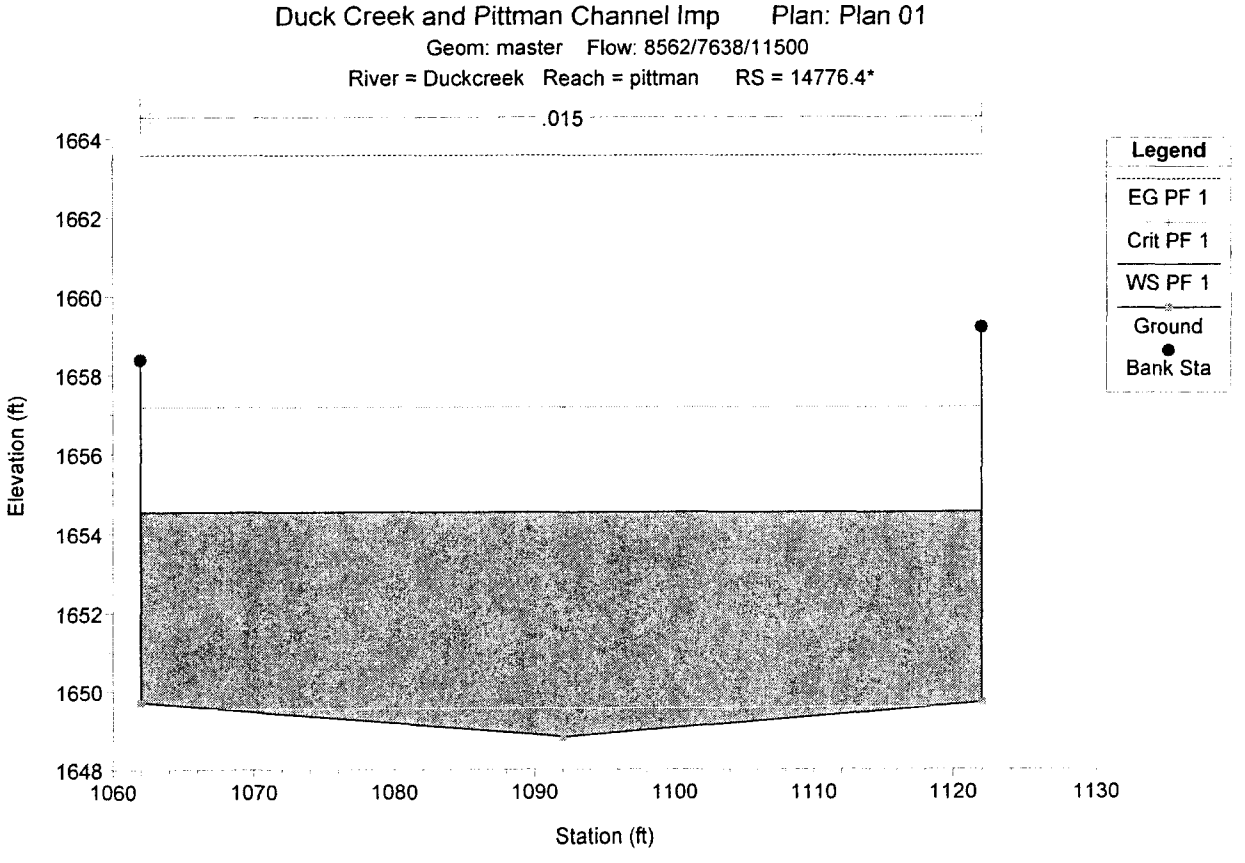

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 15016.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1666
1664
1662
1660
1658
1656
1654
1652
1650
1060
1070
1080
1090
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1120
1130
Station (ft)

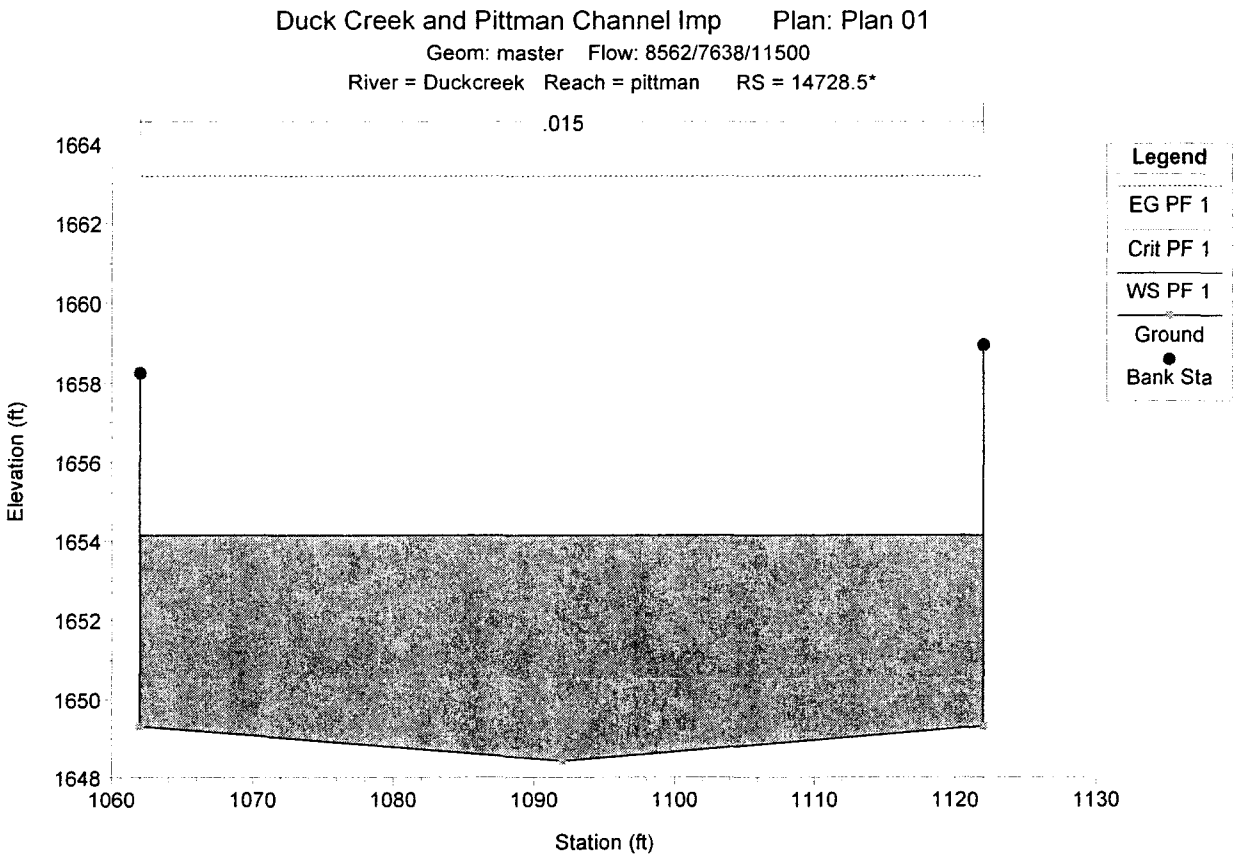

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14968.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1666
1664
1662
1660
1658
1656
1654
1652
1650
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

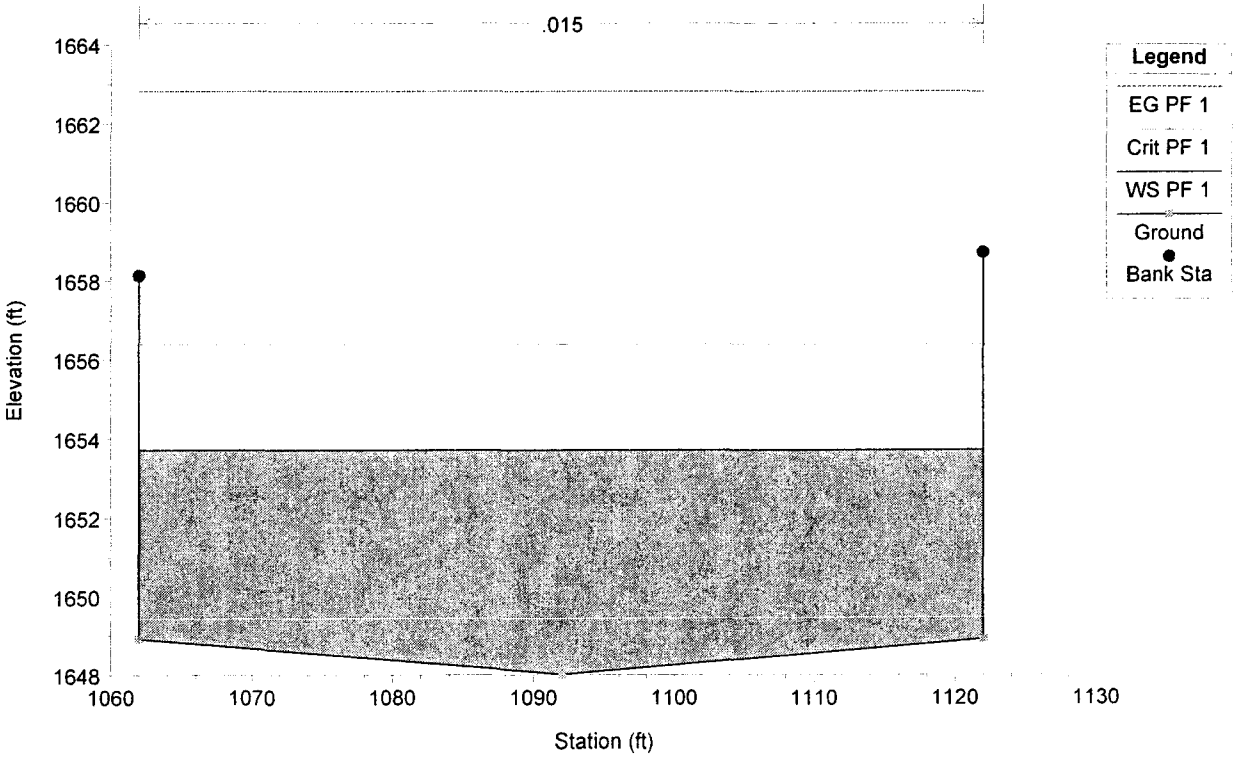

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14920.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1666
1664
1662
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1656
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1652
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1080
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1100
1110
1120
1130

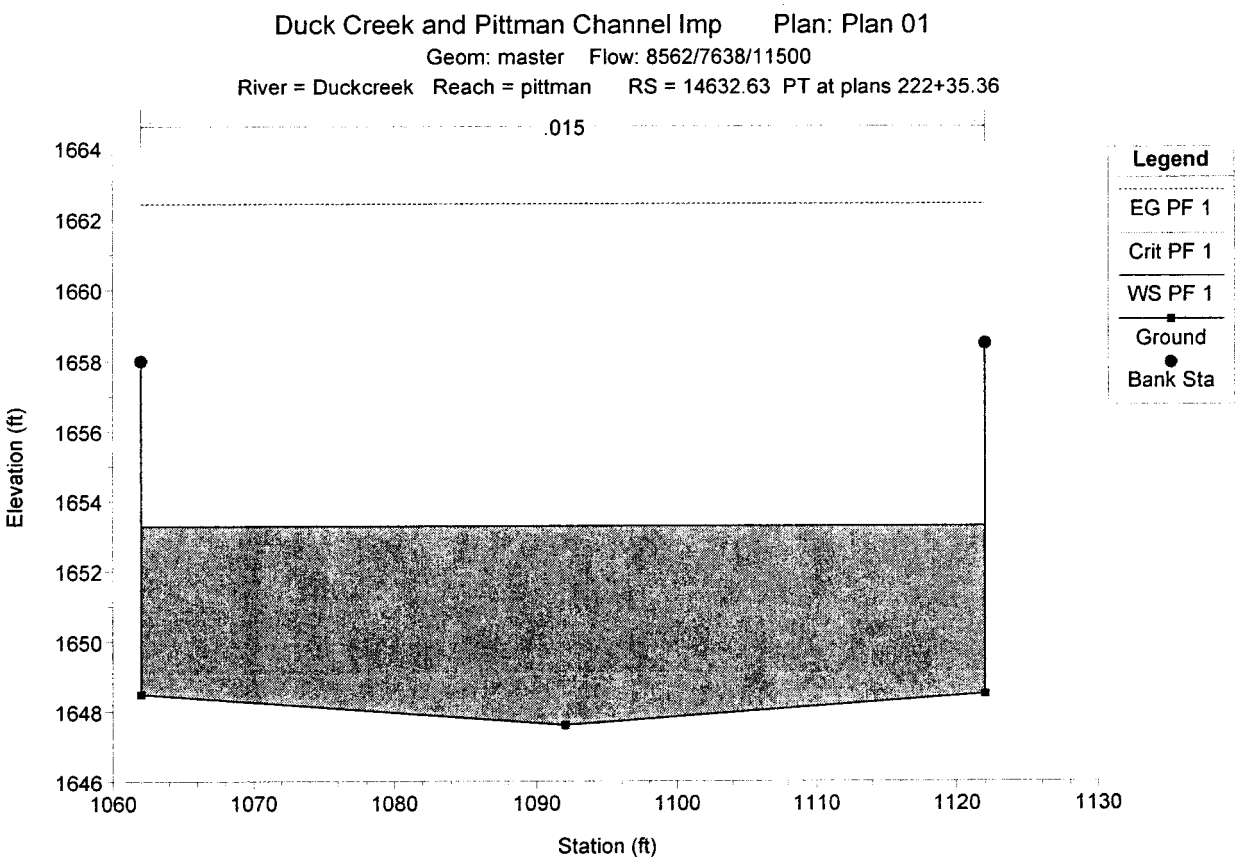

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14872.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1666
1664
1662
1660
1658
1656
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1110
1120
1130

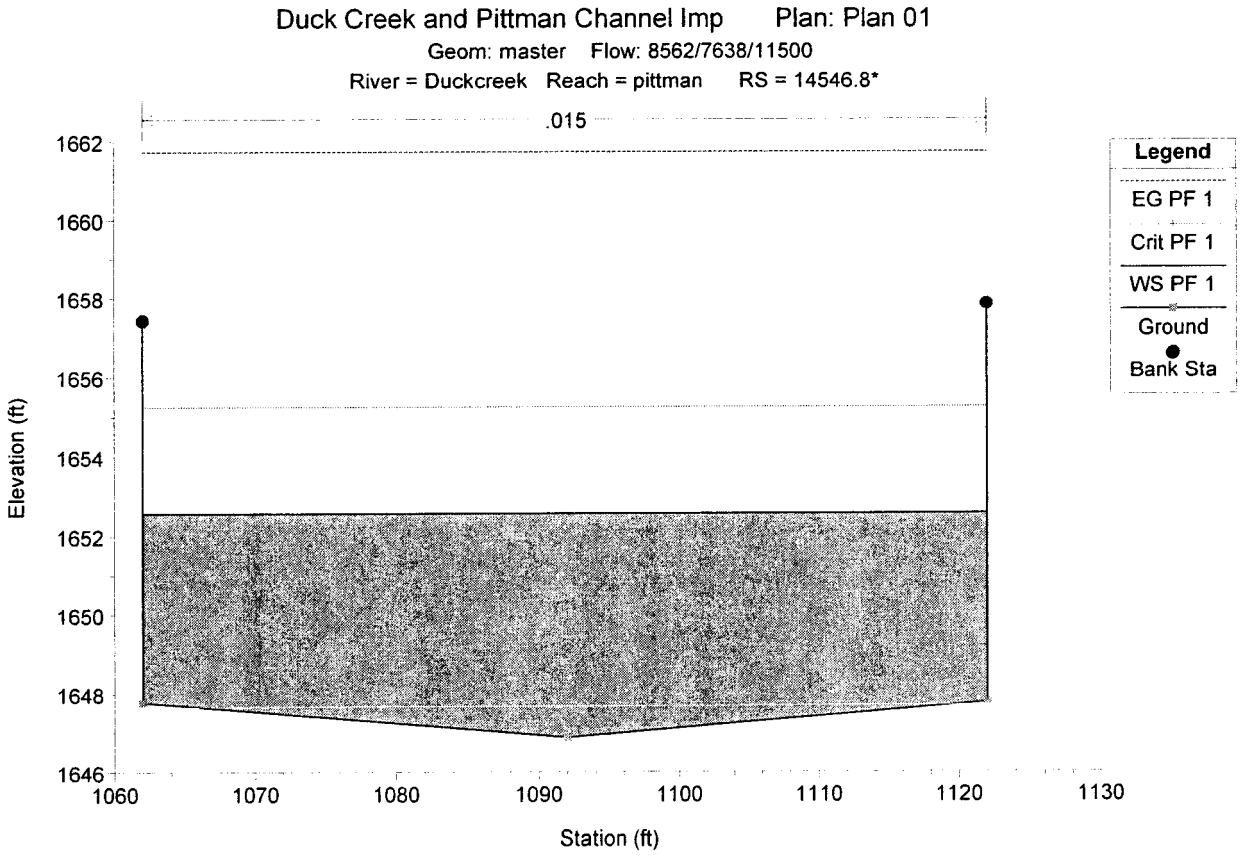

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14824.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1664
1662
1660
1658
1656
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1652
1650
1648
1060
1070
1080
1090
1100
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1120
1130
Station (ft)

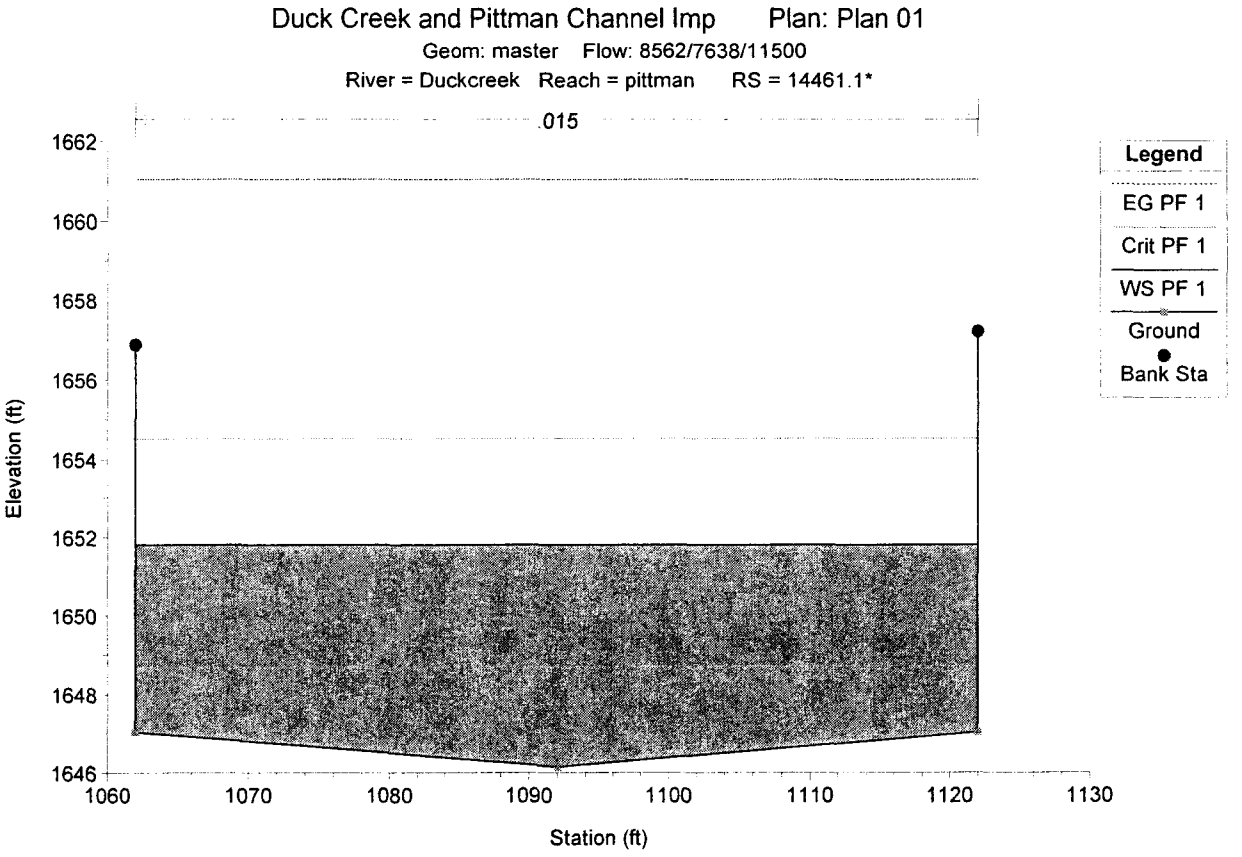

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14776.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1664
1662
1660
1658
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1652
1650
1648
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

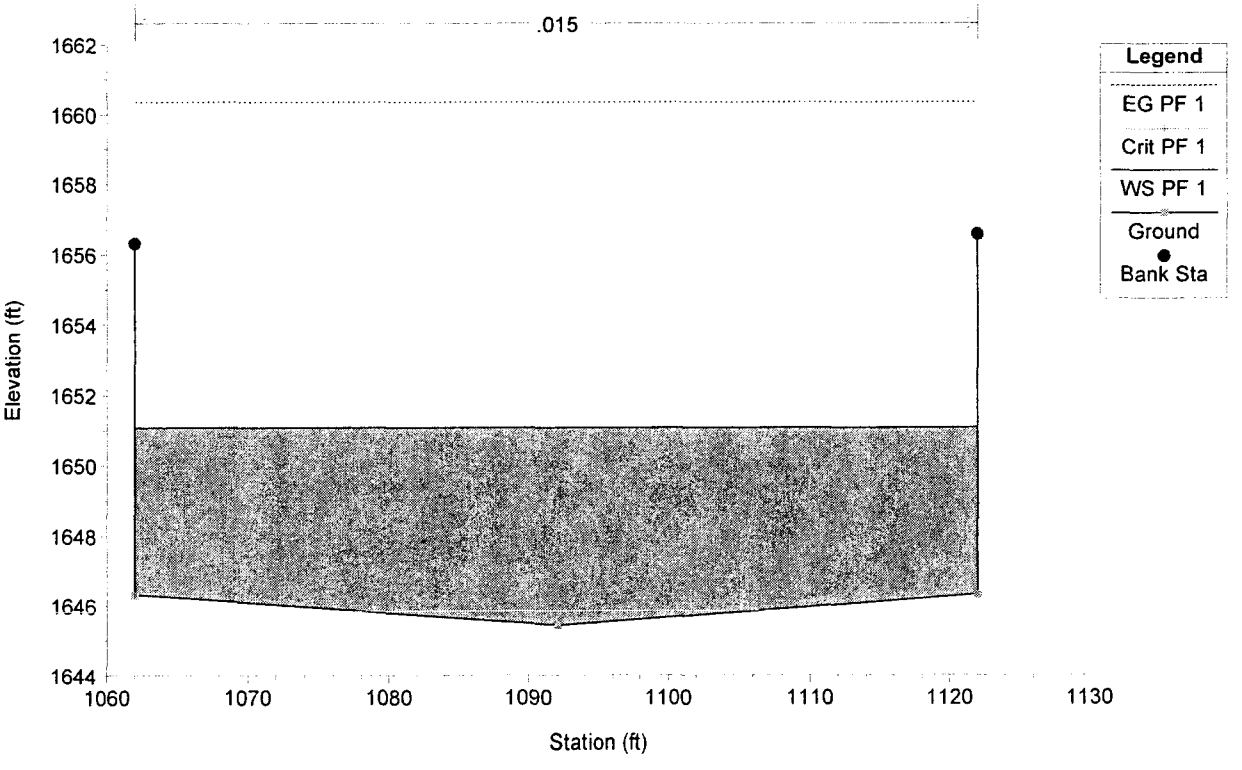

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14728.5*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1664
1662
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1652
1650
1648
1060
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1080
1090
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1110
1120
1130

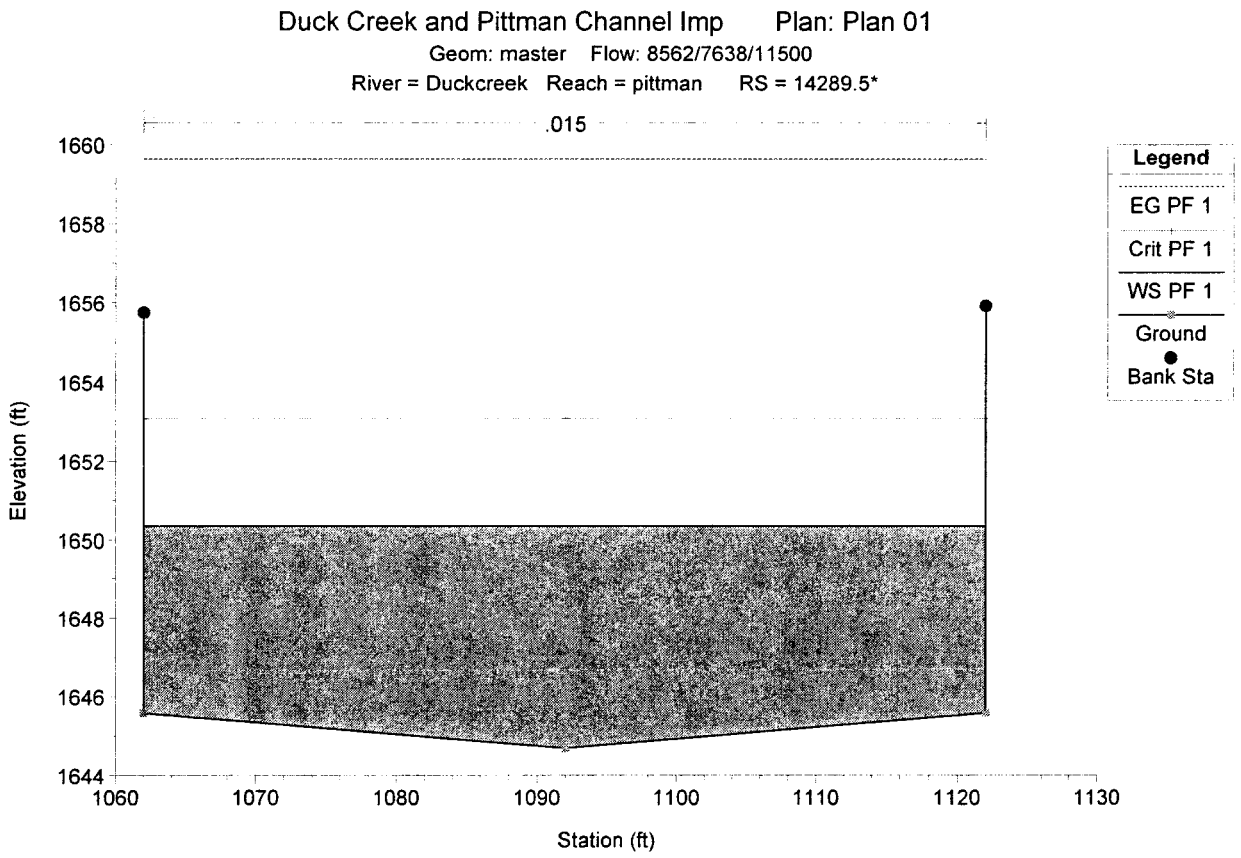

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14680.5*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1664
1662
1660
1658
1656
1654
1652
1650
1648
1060
1070
1080
1090
1100
1110
1120
1130

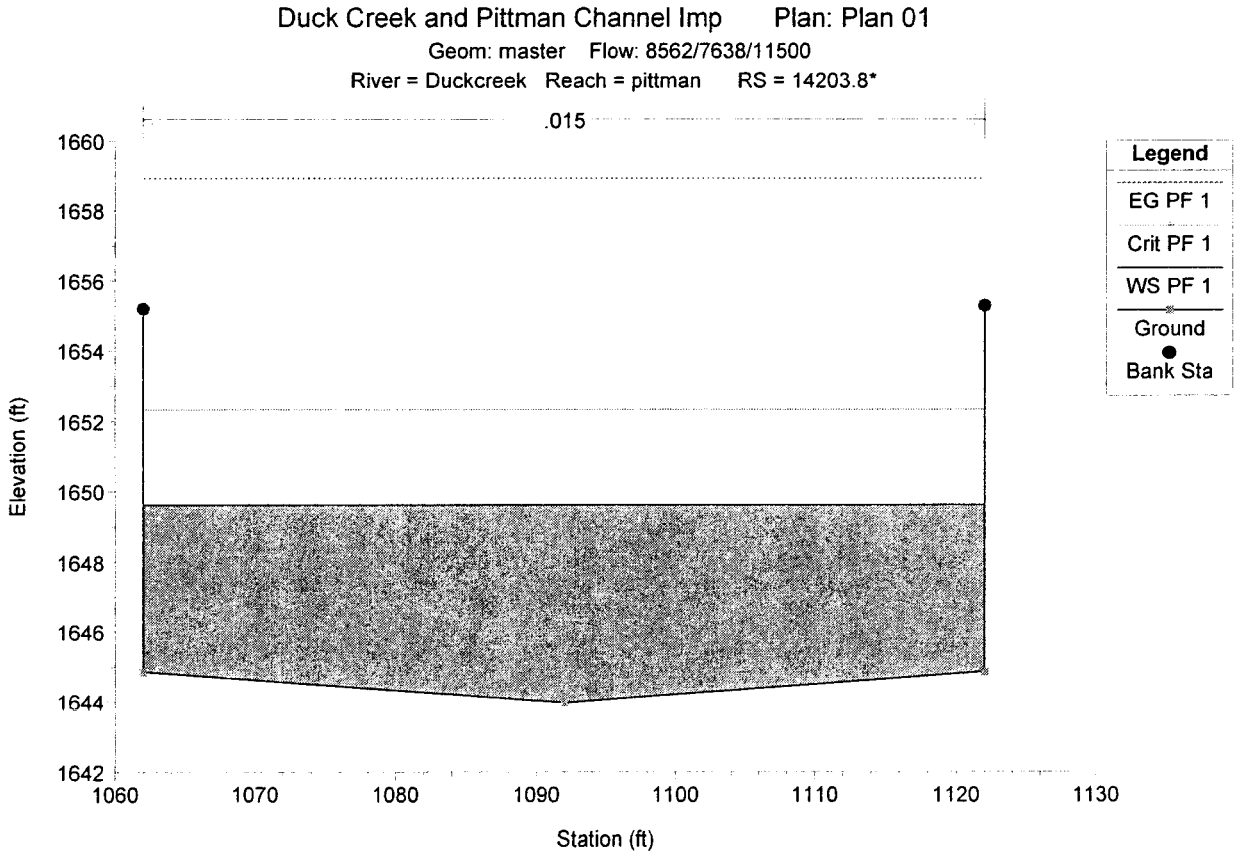

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14632.63 PT at plans 222+35.36
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1664
1662
1660
1658
1656
1654
1652
1650
1648
1646
1060
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1080
1090
1100
1110
1120
1130
Station (ft)

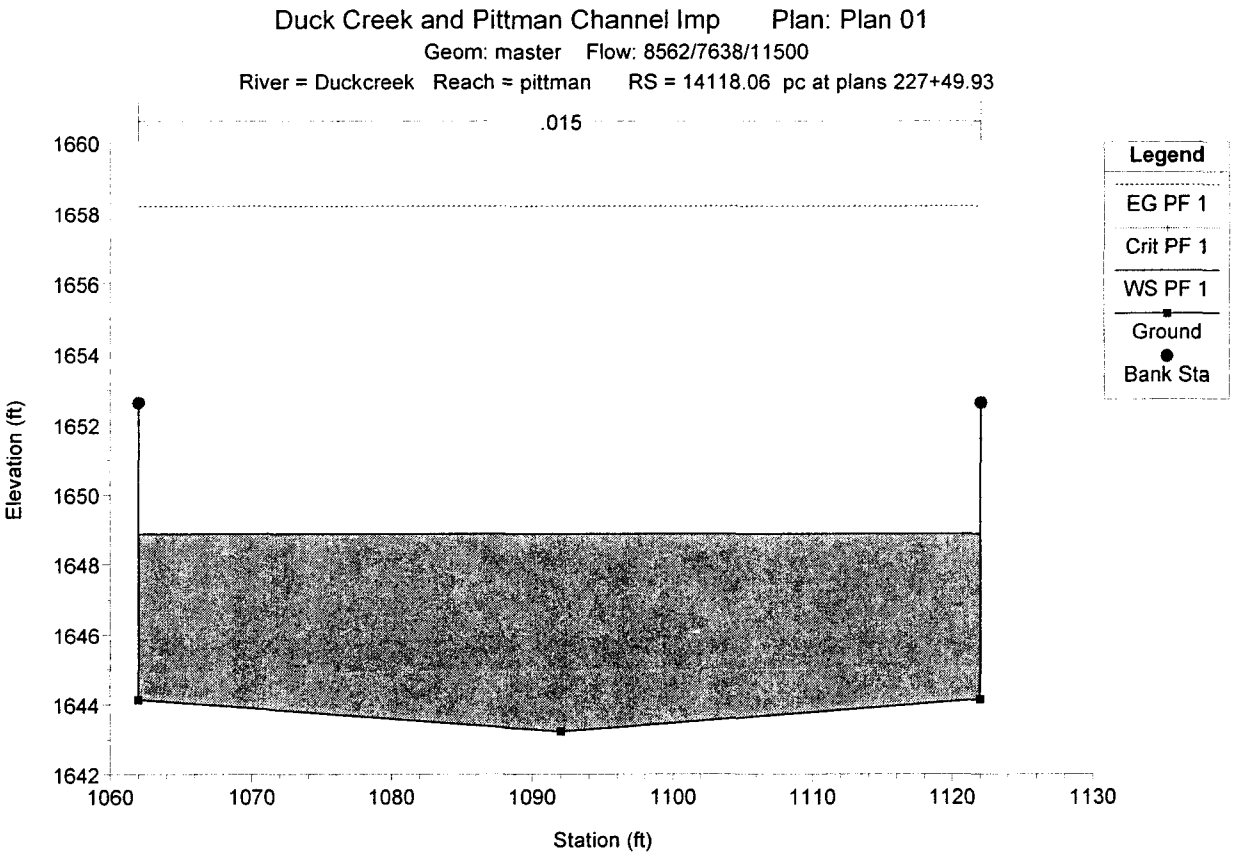

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14546.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1662
1660
1658
1656
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1652
1650
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1646
1060
1070
1080
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1100
1110
1120
1130
Station (ft)

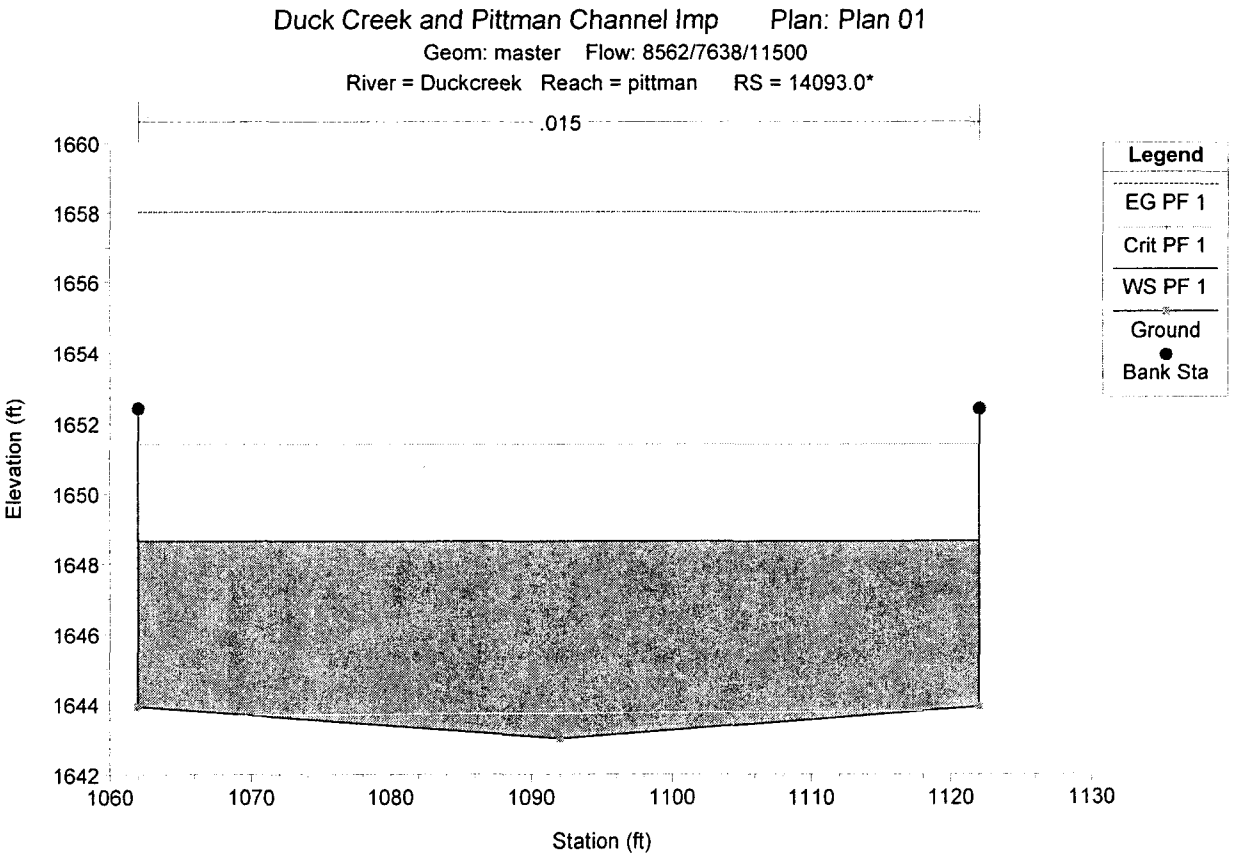

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14461.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1662
1660
1658
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1652
1650
1648
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1080
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1120
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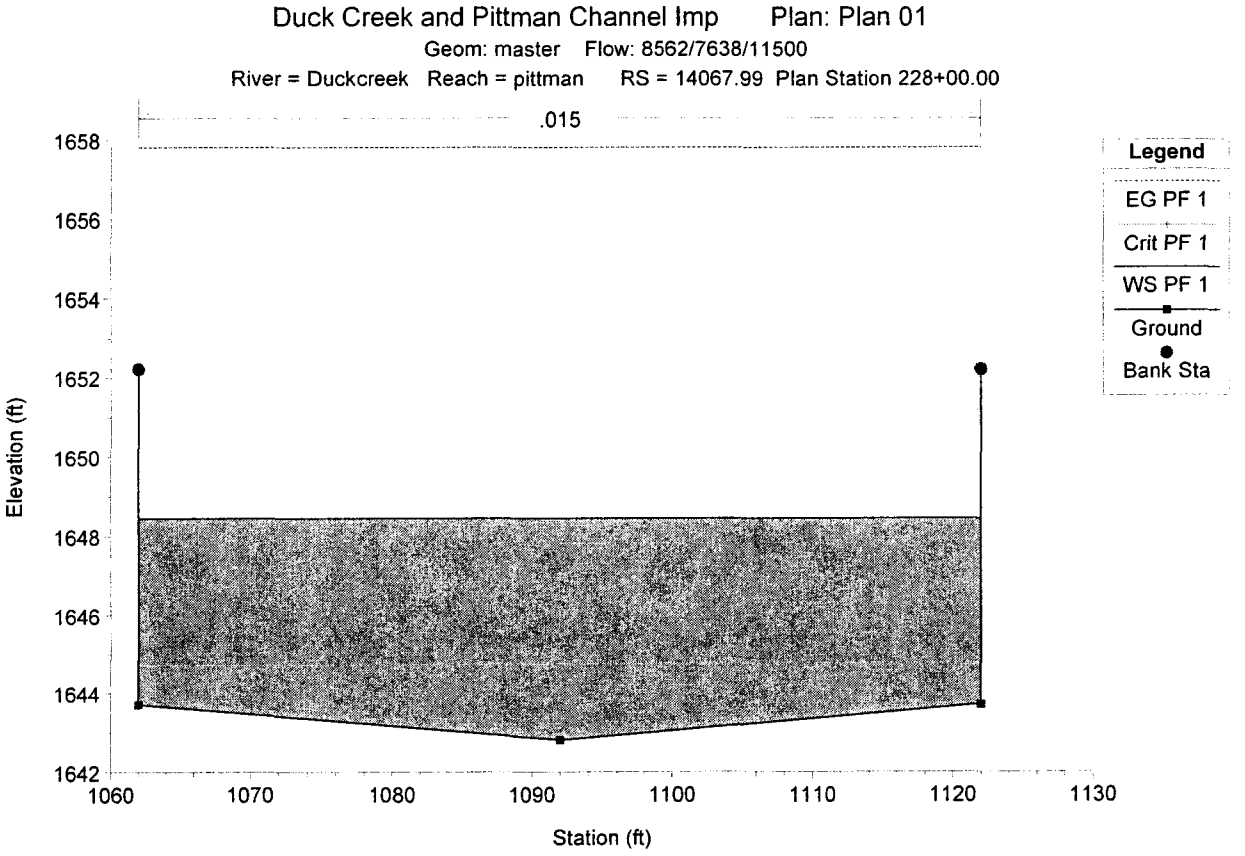

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14375.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1662
1660
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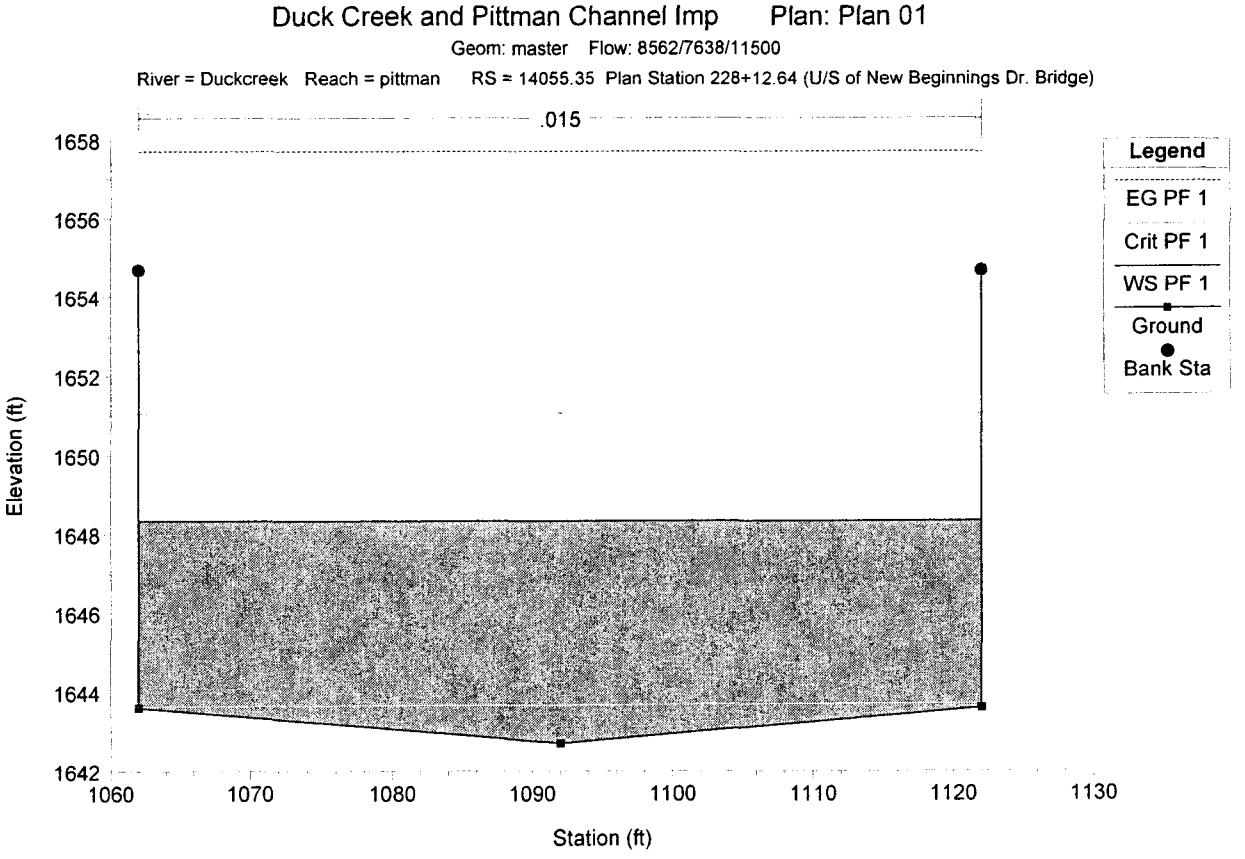

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14289.5*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1660
1658
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1120
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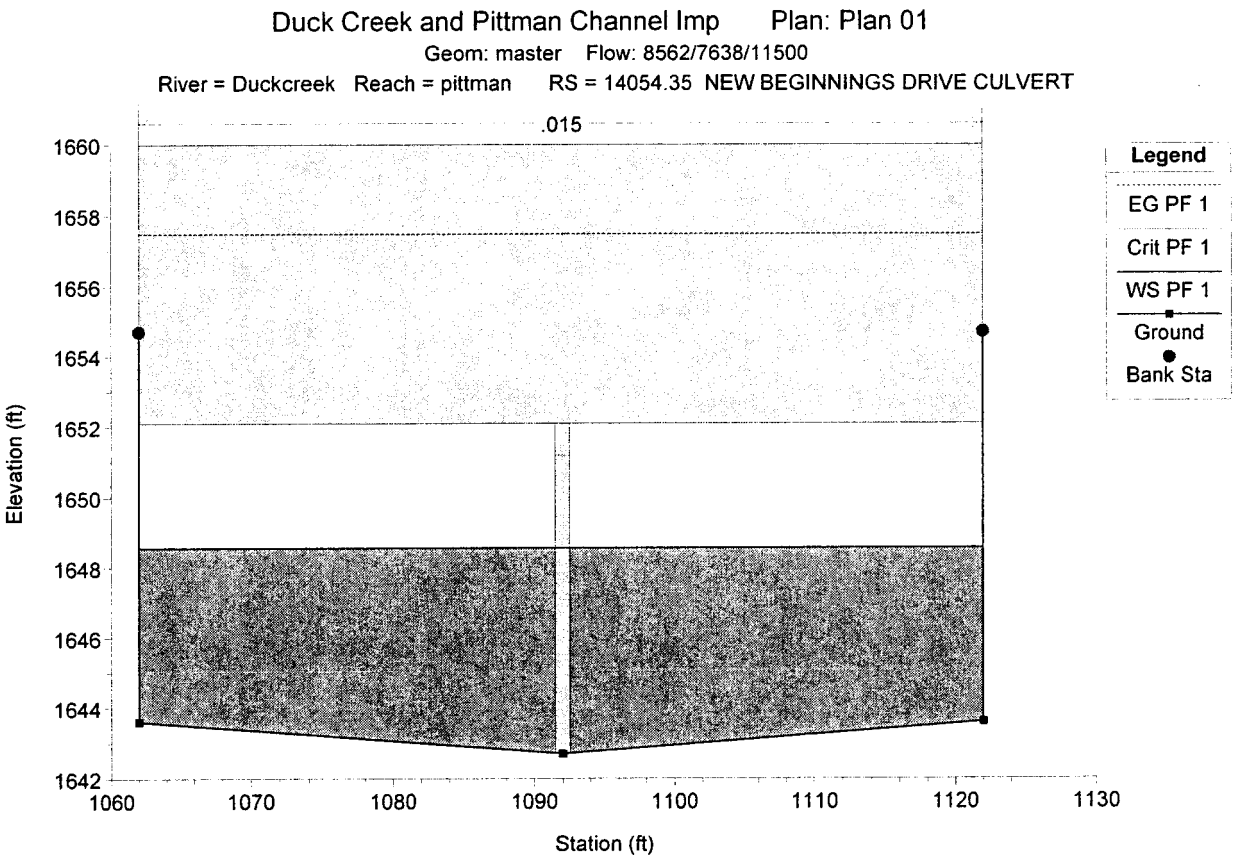

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14203.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1660
1658
1656
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1080
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1100
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1120
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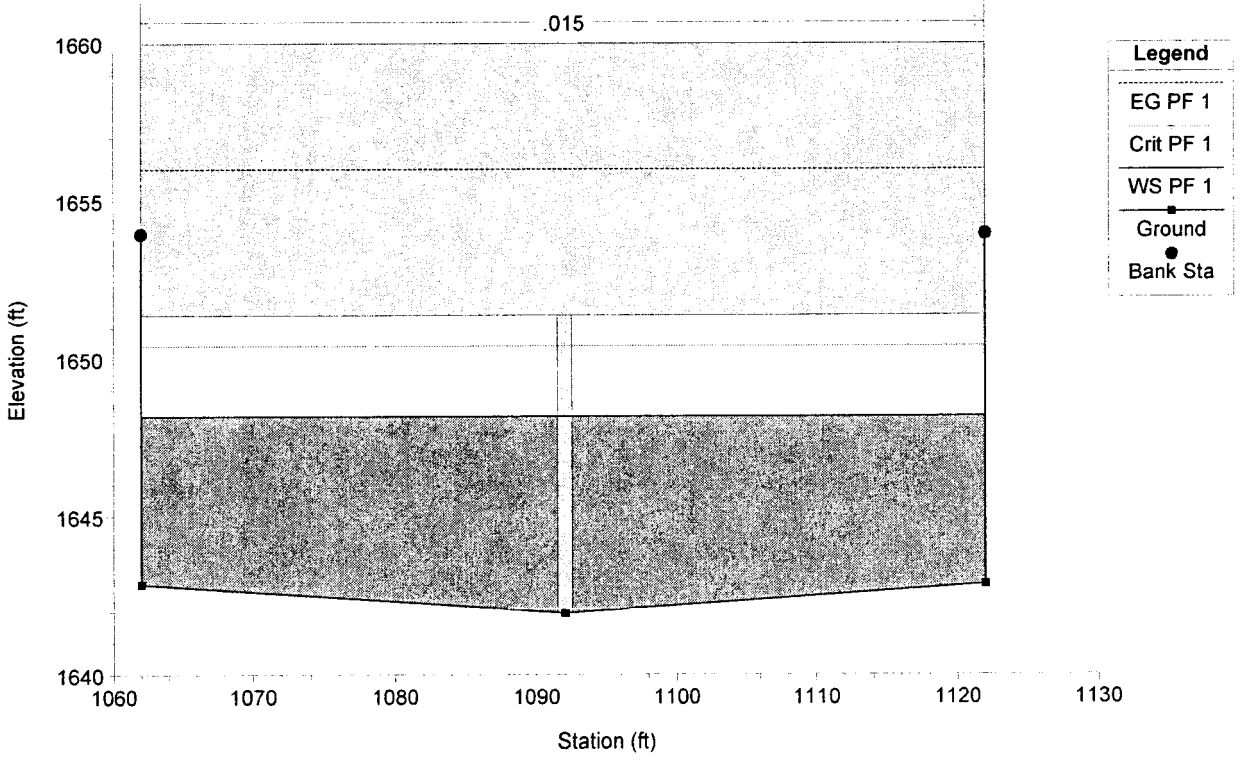

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14118.06 pc at plans 227+49.93
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1660
1658
1656
1654
1652
1650
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1646
1644
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1060
1070
1080
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1120
1130
Station (ft)

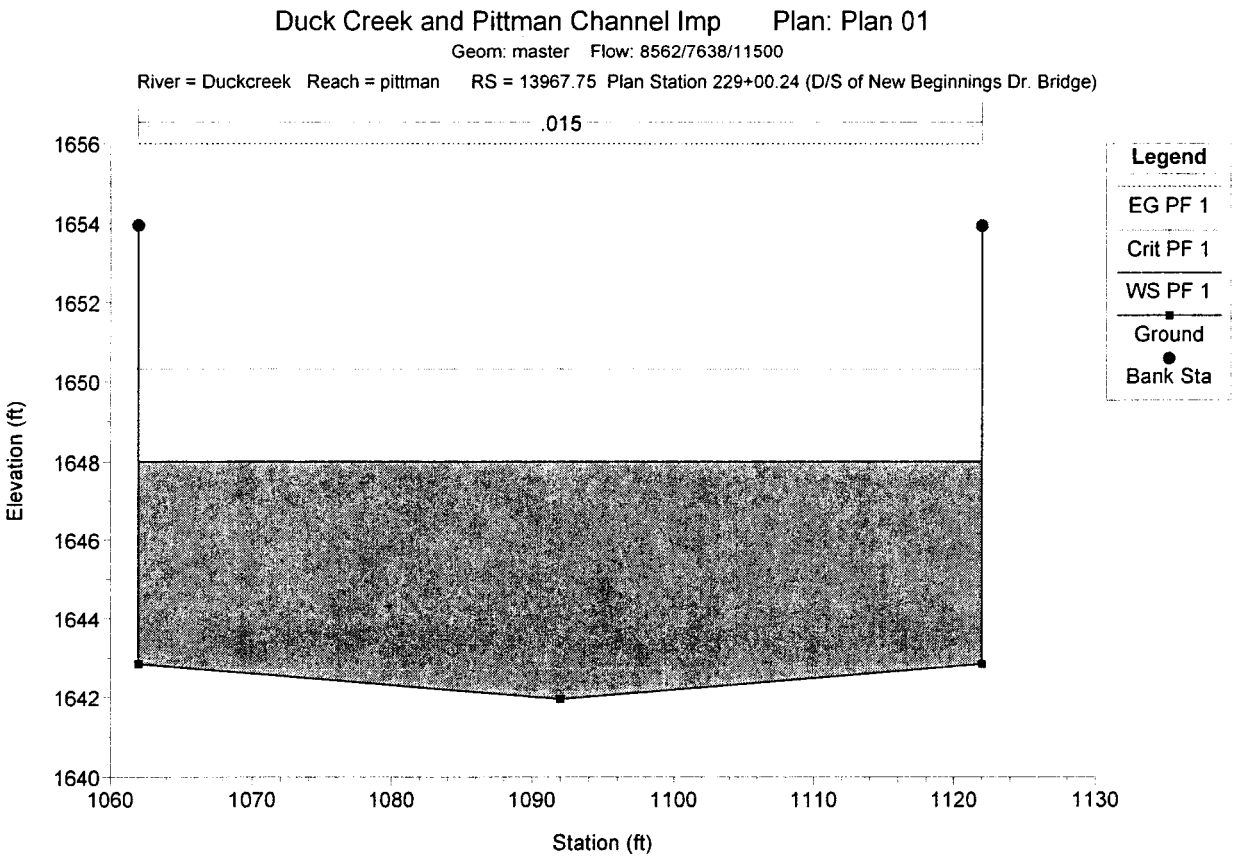

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14093.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1660
1658
1656
1654
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1060
1070
1080
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1120
1130
Station (ft)

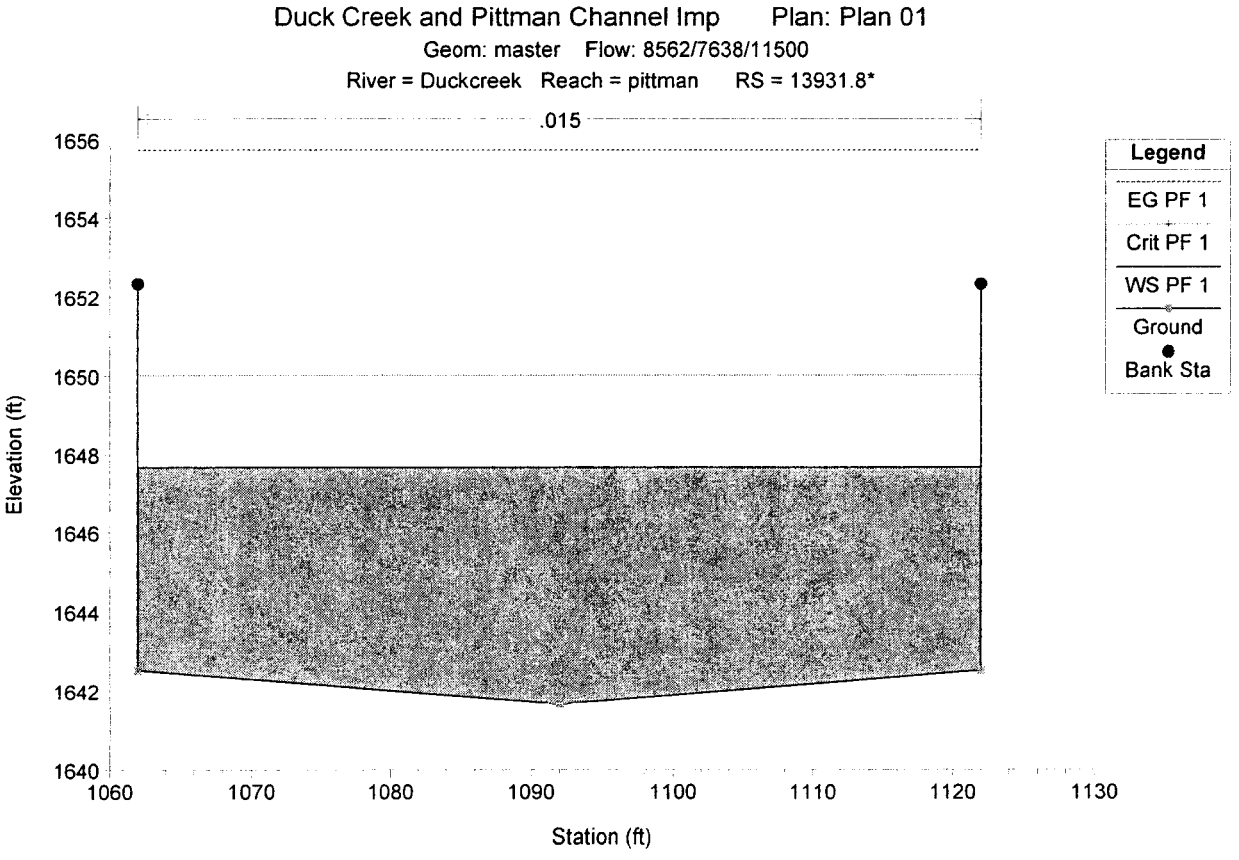

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14067.99 Plan Station 228+00.00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1658
1656
1654
1652
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1060
1070
1080
1090
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1120
1130
Station (ft)

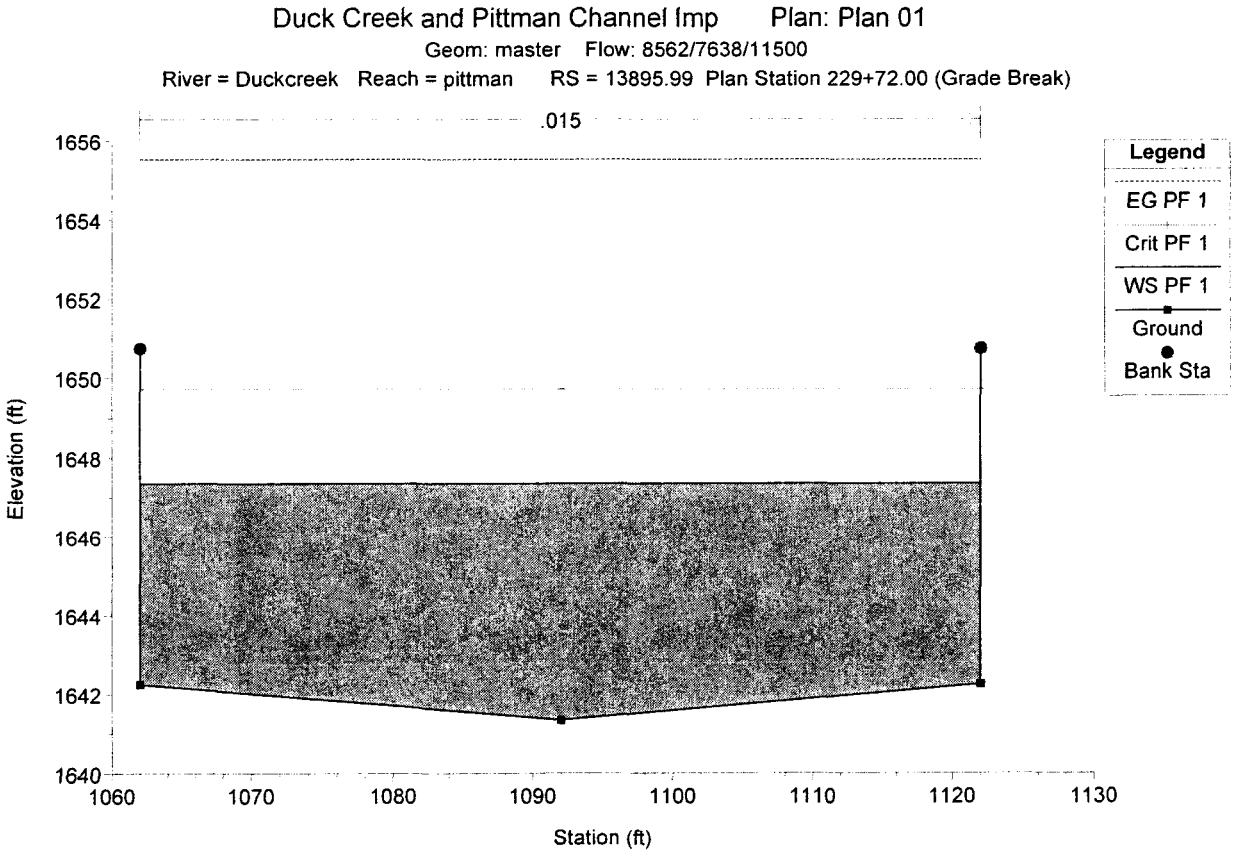

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14055.35 Plan Station 228+12.64 (U/S of New Beginnings Dr. Bridge)
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1658
1656
1654
1652
1650
1648
1646
1644
1642
1060
1070
1080
1090
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1120
1130
Station (ft)

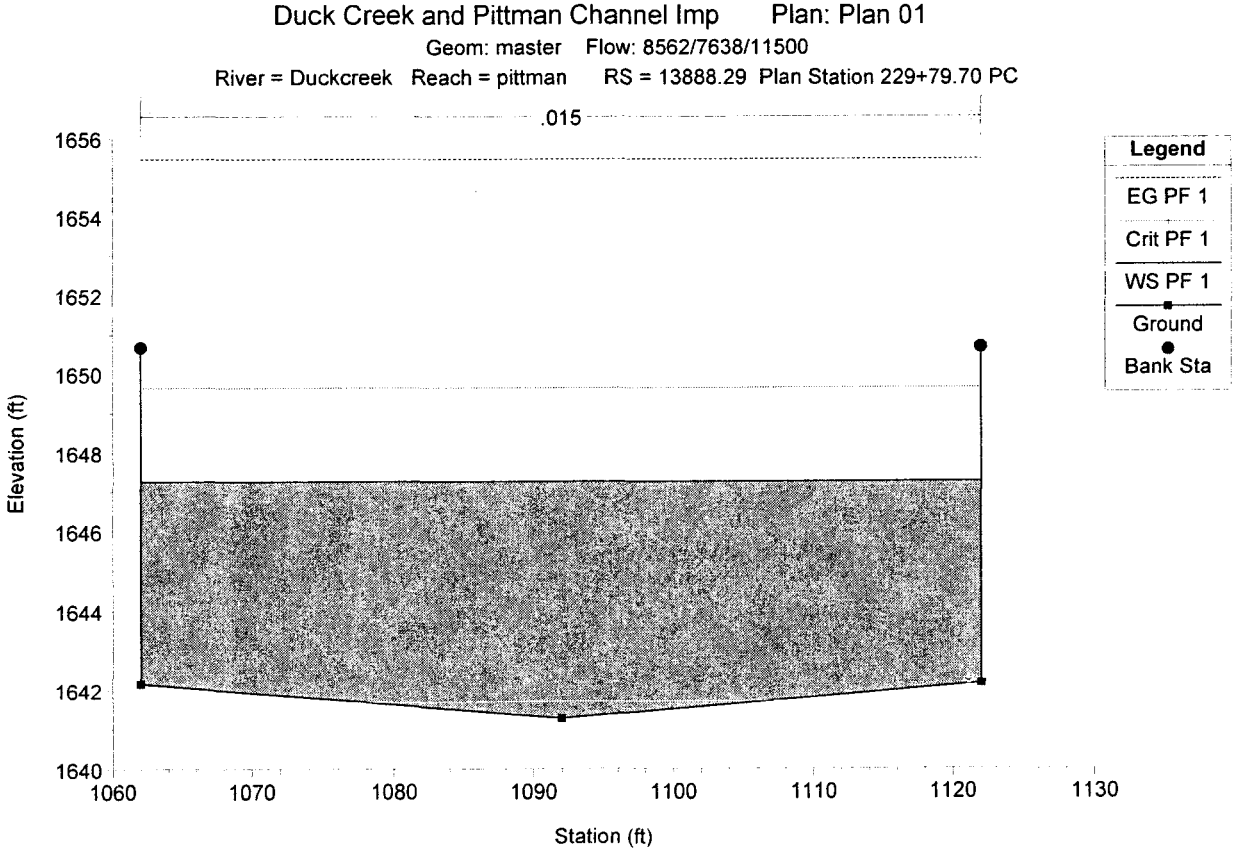

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14054.35 NEW BEGINNINGS DRIVE CULVERT
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1660
1658
1656
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1646
1644
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1060
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1080
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1100
1110
1120
1130

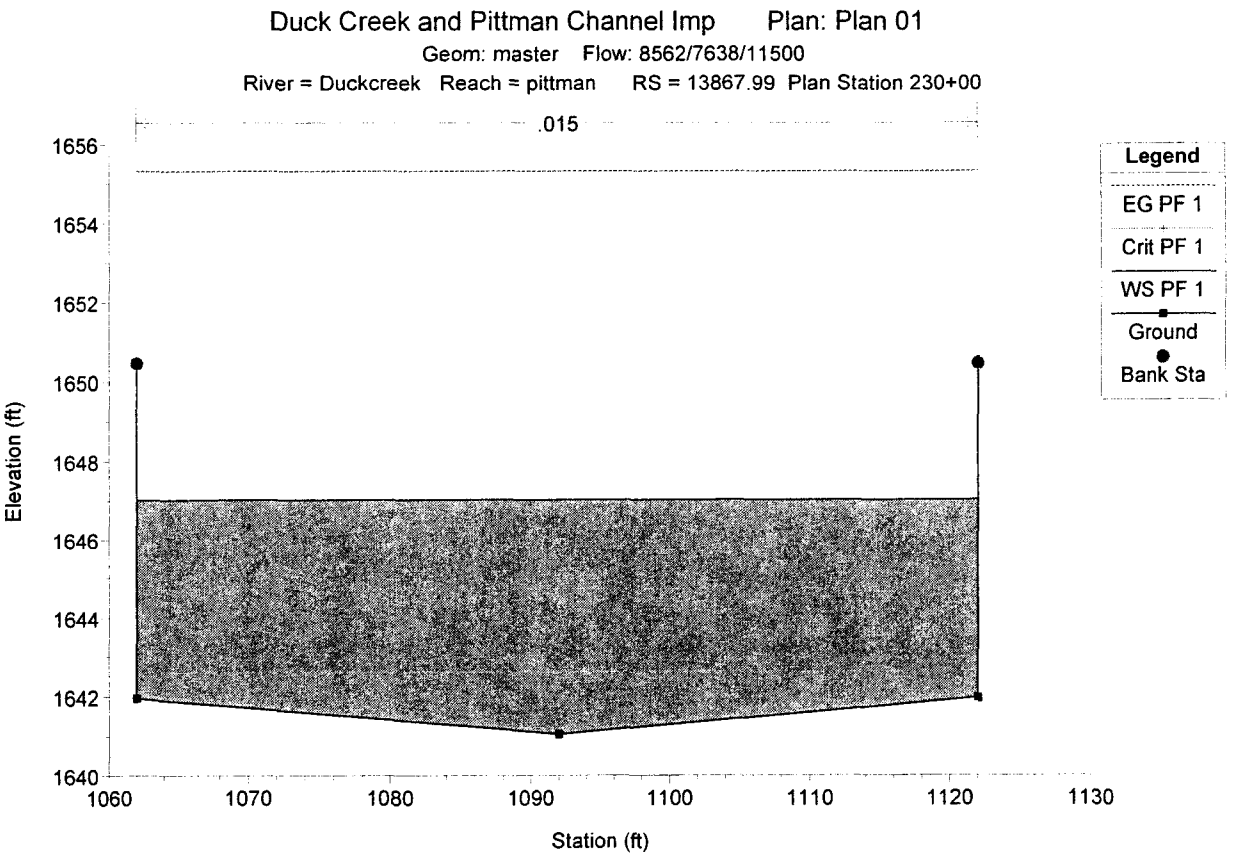

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 14054.35 NEW BEGINNINGS DRIVE CULVERT
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
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1650
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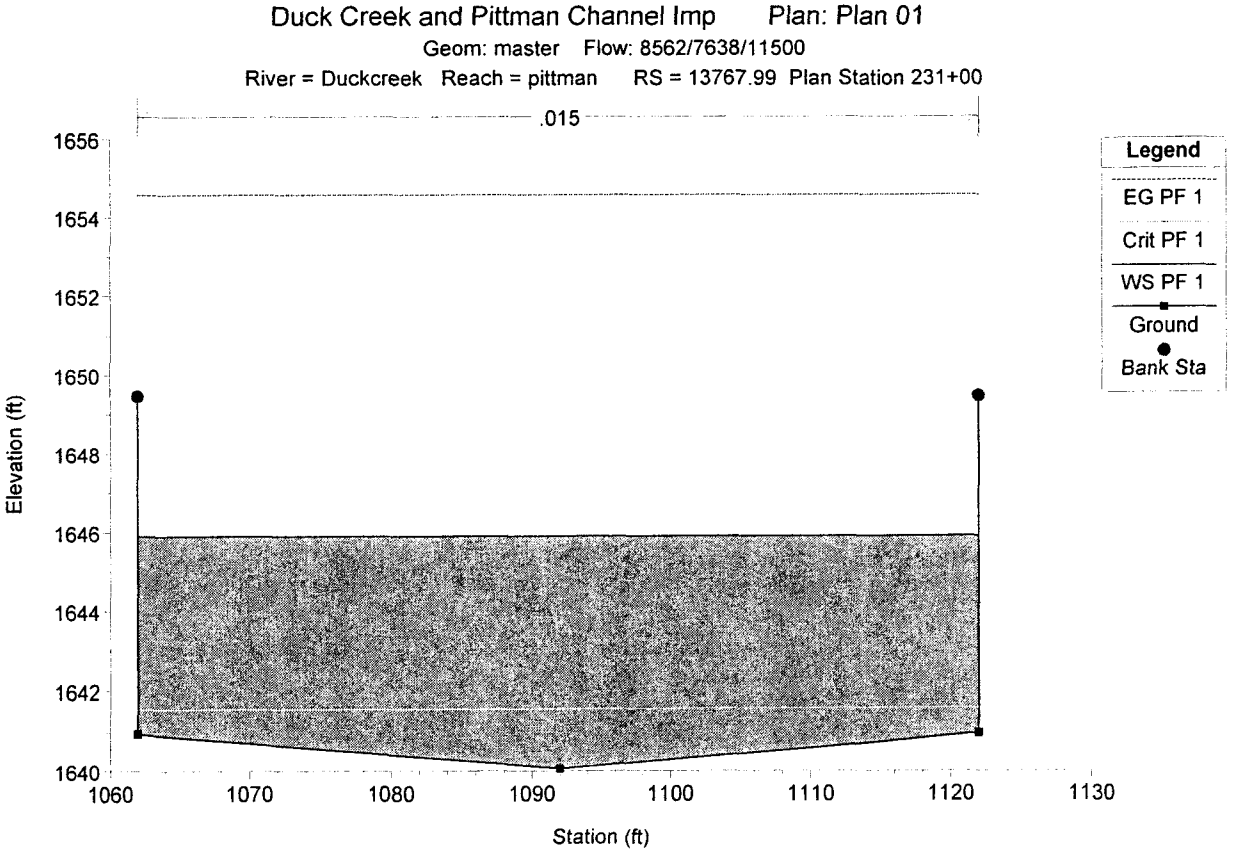

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13967.75 Plan Station 229+00.24 (D/S of New Beginnings Dr. Bridge)
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1656
1654
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1120
1130

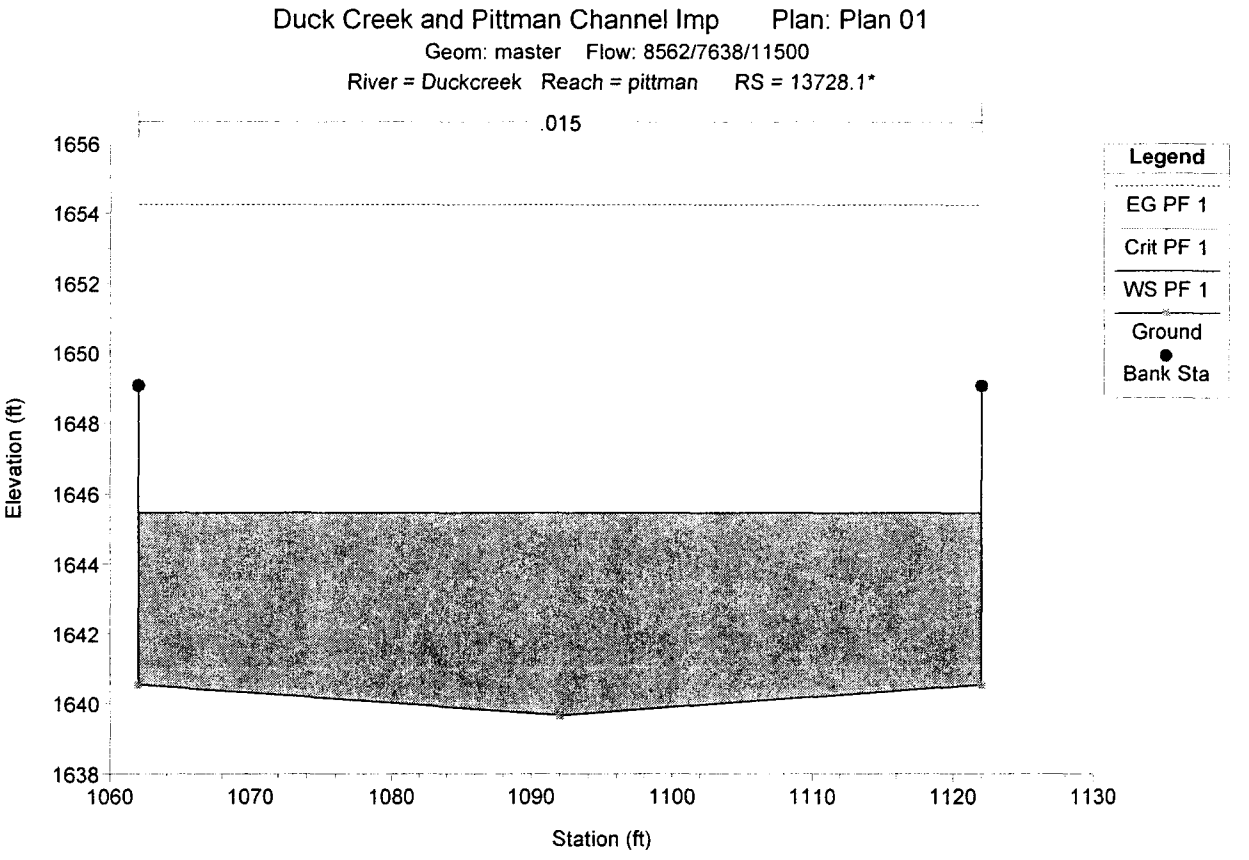

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13931.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1656
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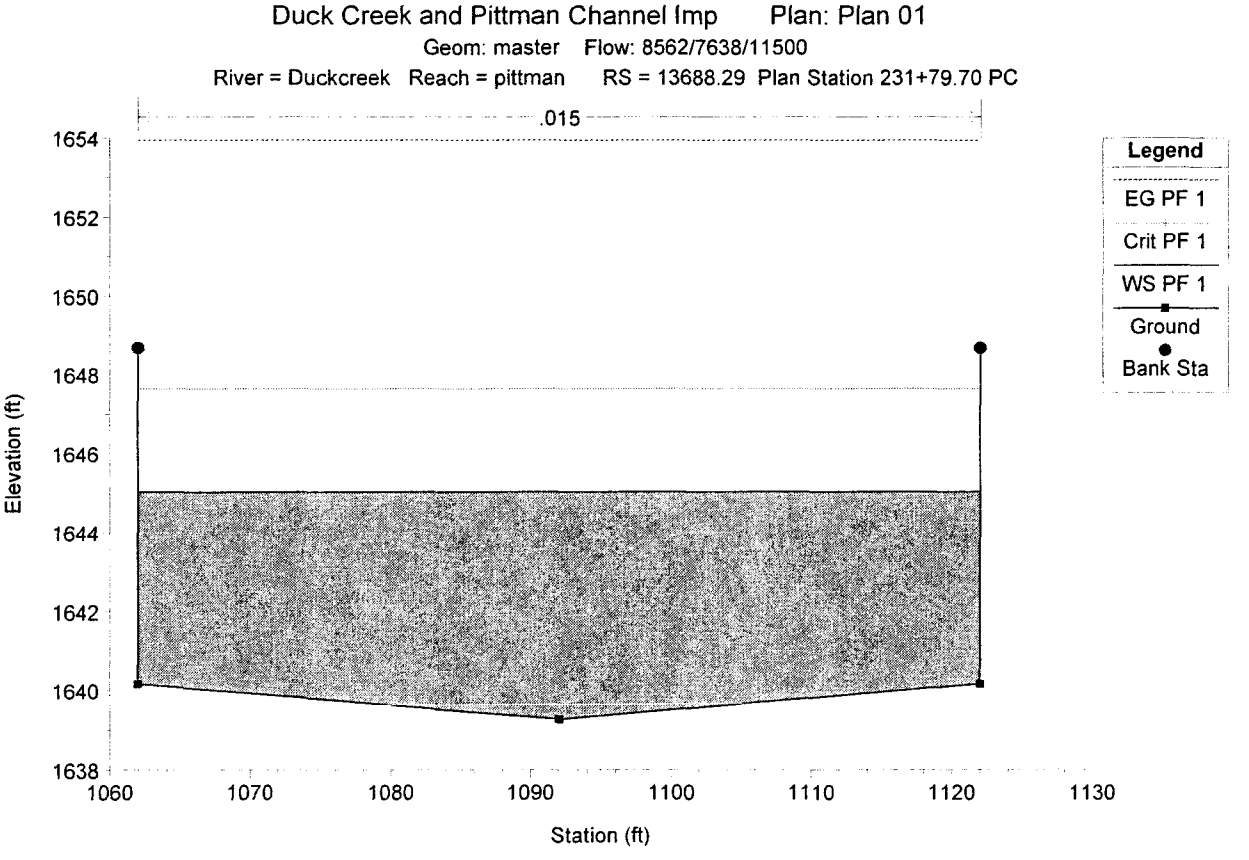

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13895.99 Plan Station 229+72.00 (Grade Break)
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1656
1654
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1130

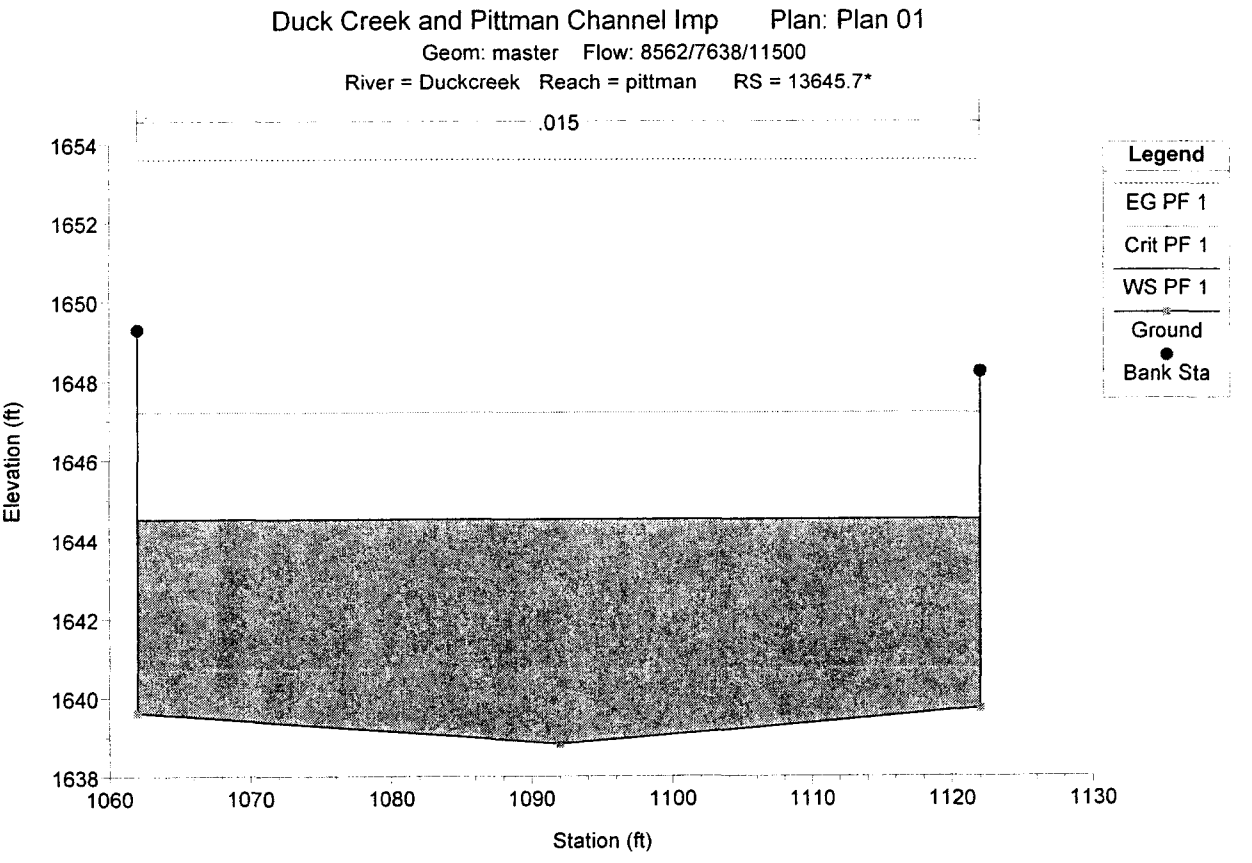

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13888.29 Plan Station 229+79.70 PC
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1656
1654
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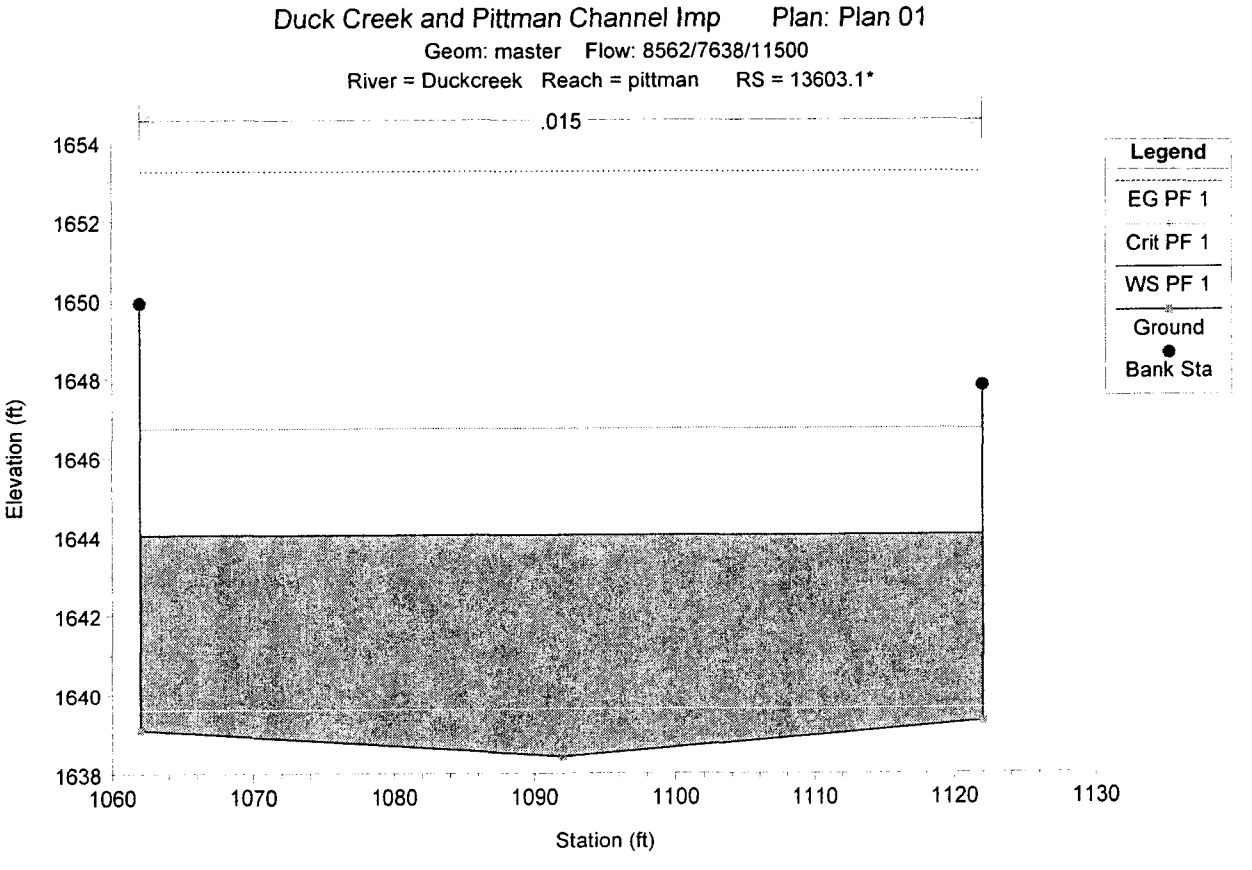

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13867.99 Plan Station 230+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1656
1654
1652
1650
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1644
1642
1640
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

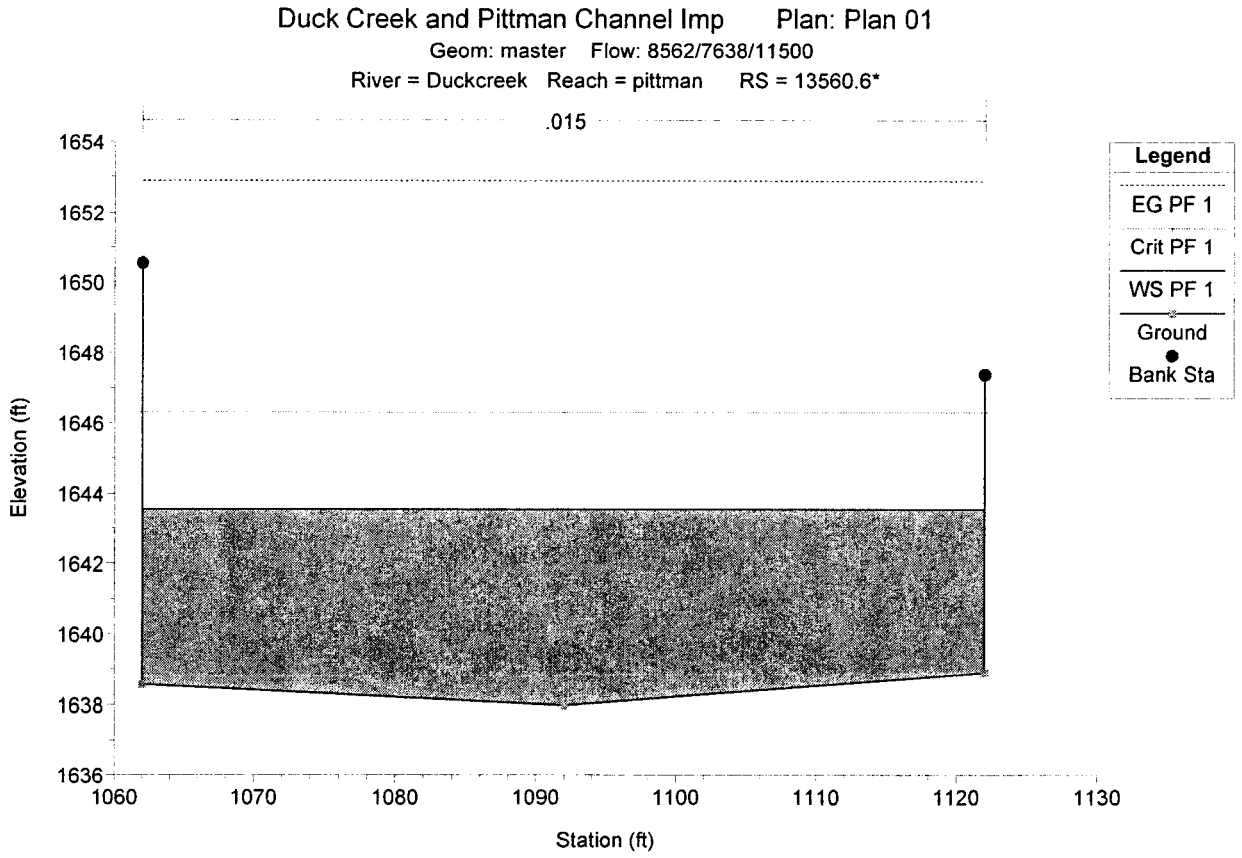

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13767.99 Plan Station 231+00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1656
1654
1652
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1090
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1120
1130
Station (ft)

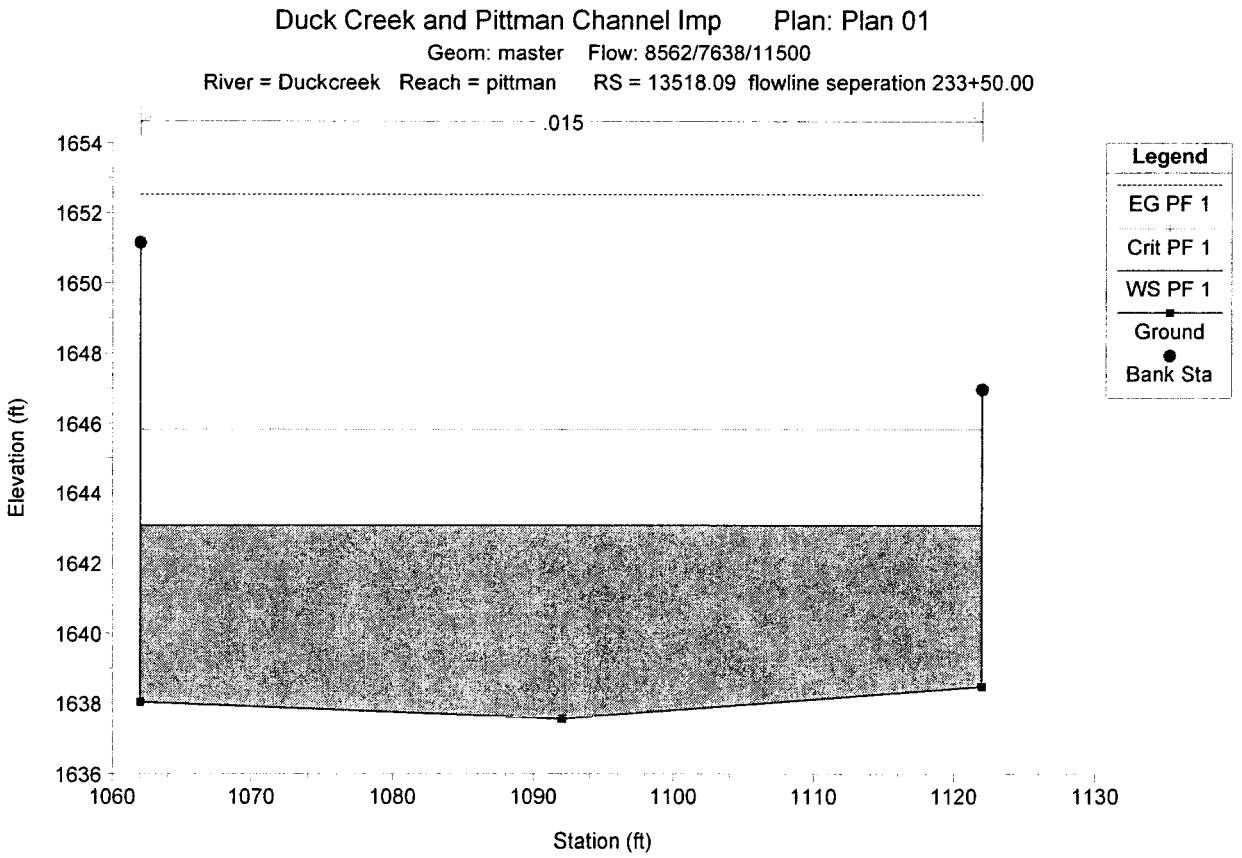

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13728.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1656
1654
1652
1650
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1640
1638
1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

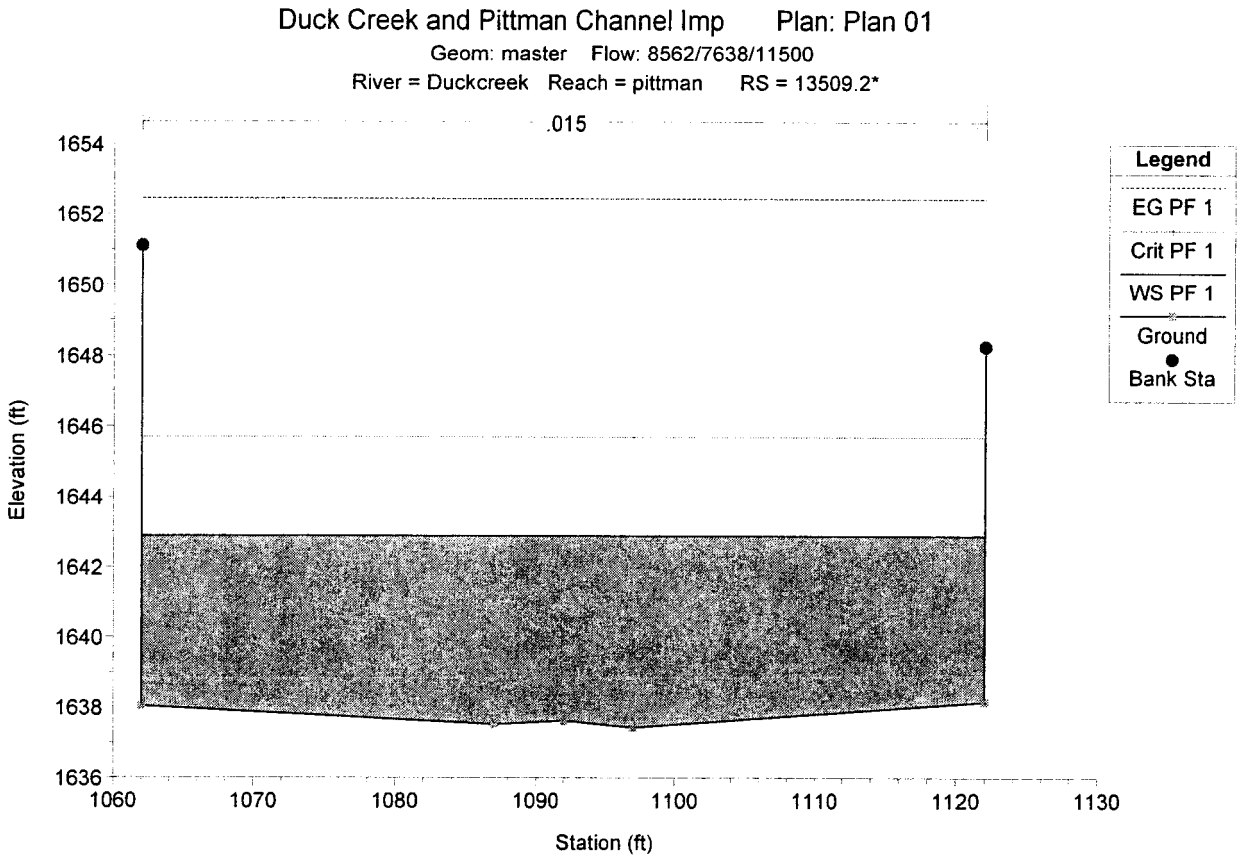

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13688.29 Plan Station 231+79.70 PC
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
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1642
1640
1638
1060
1070
1080
1090
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1120
1130
Station (ft)

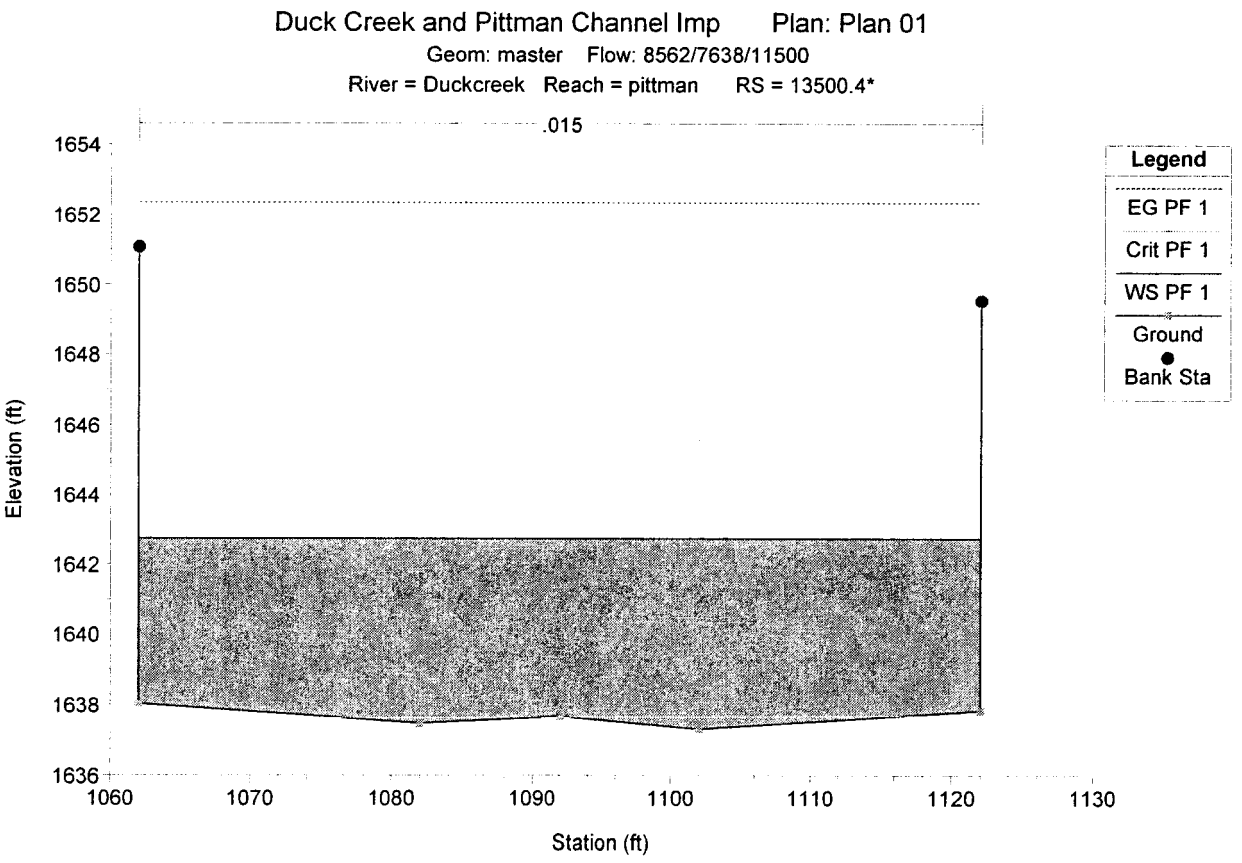

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13645.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
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1090
1100
1110
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1130
Station (ft)

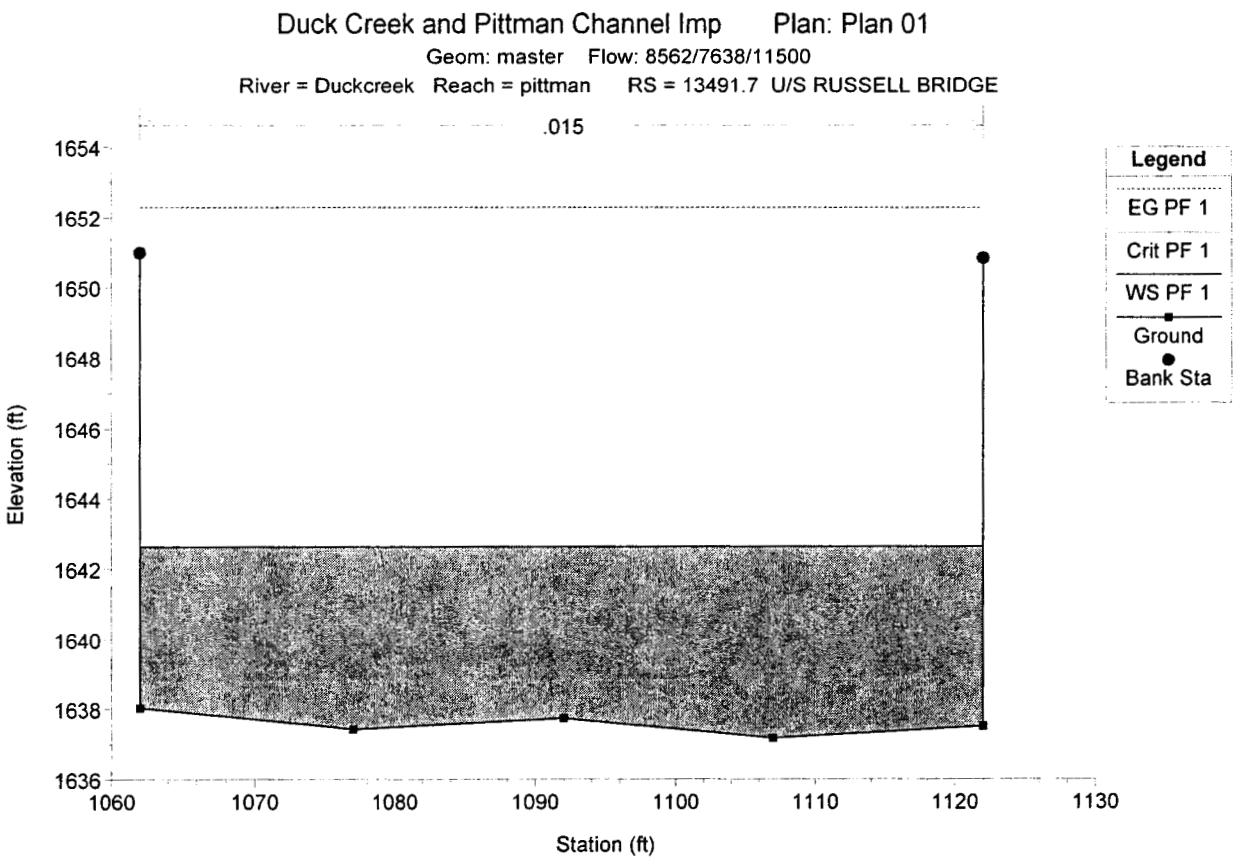

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13603.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
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1070
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1100
1110
1120
1130
Station (ft)

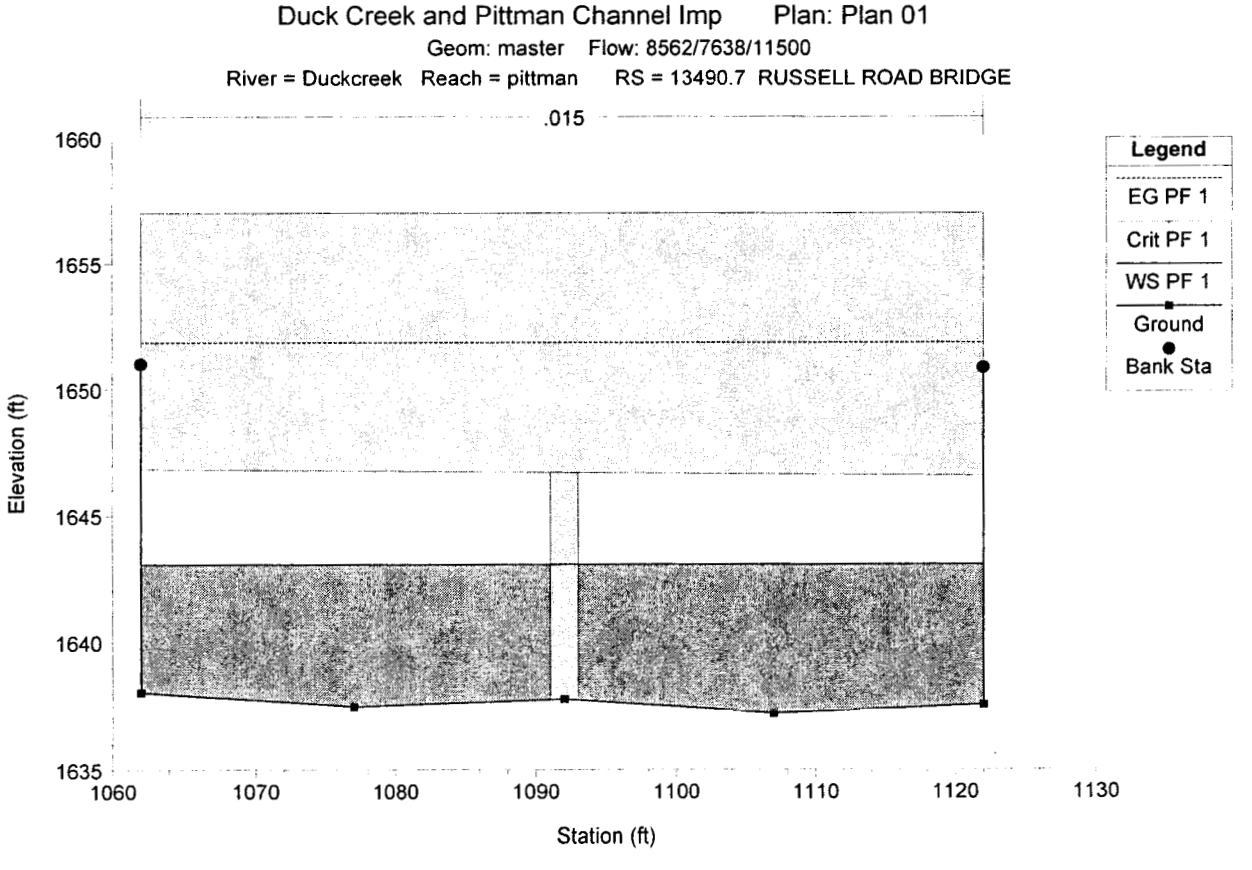

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13560.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1654
1652
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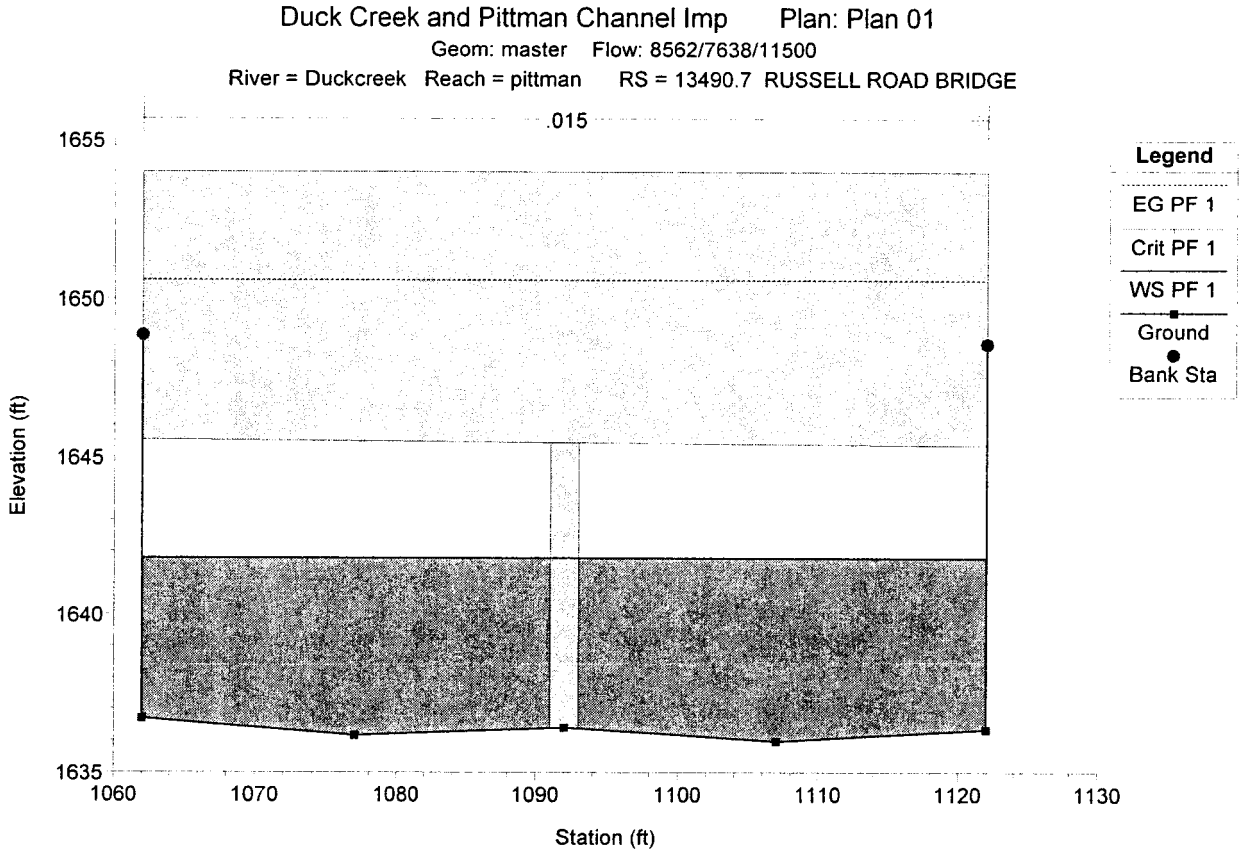

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13518.09 flowline seperation 233+50.00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1654
1652
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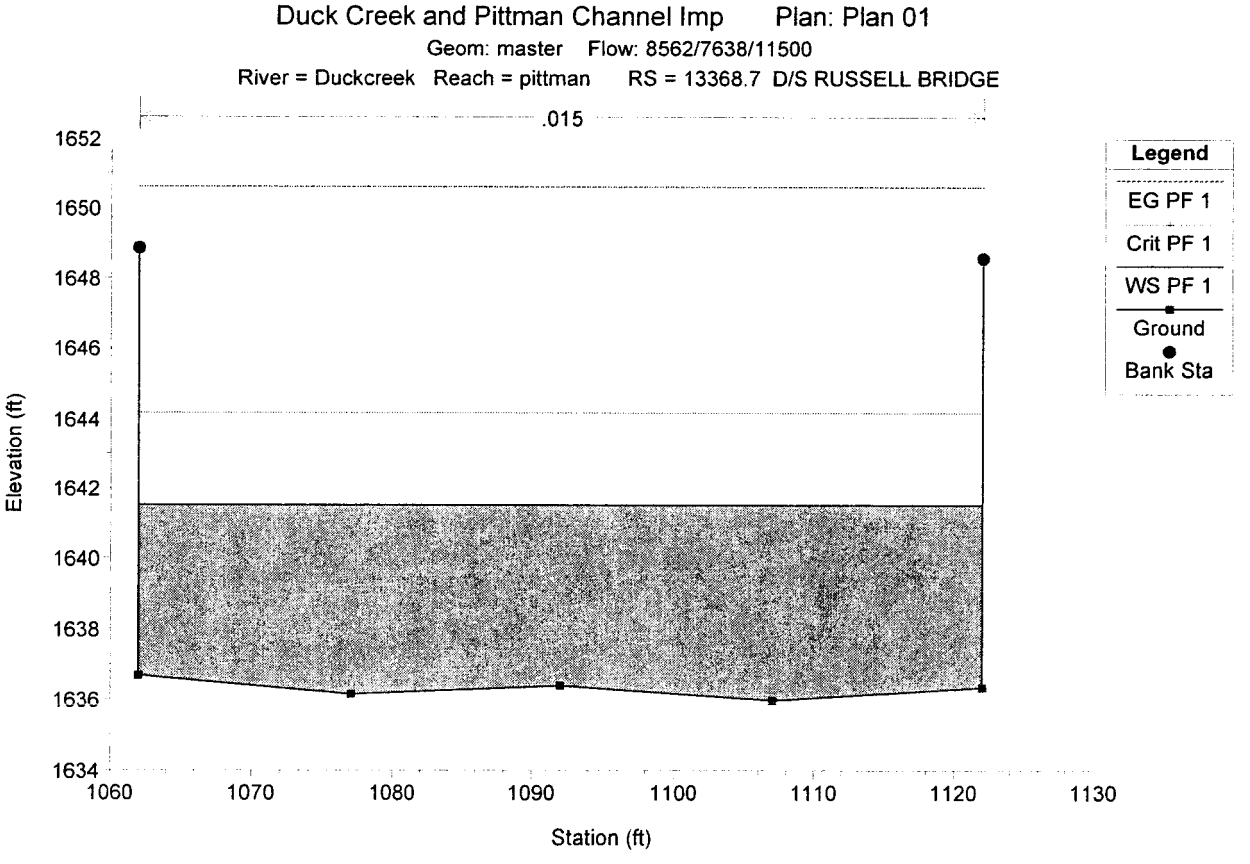

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13509.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
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1648
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1070
1080
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1120
1130
Station (ft)

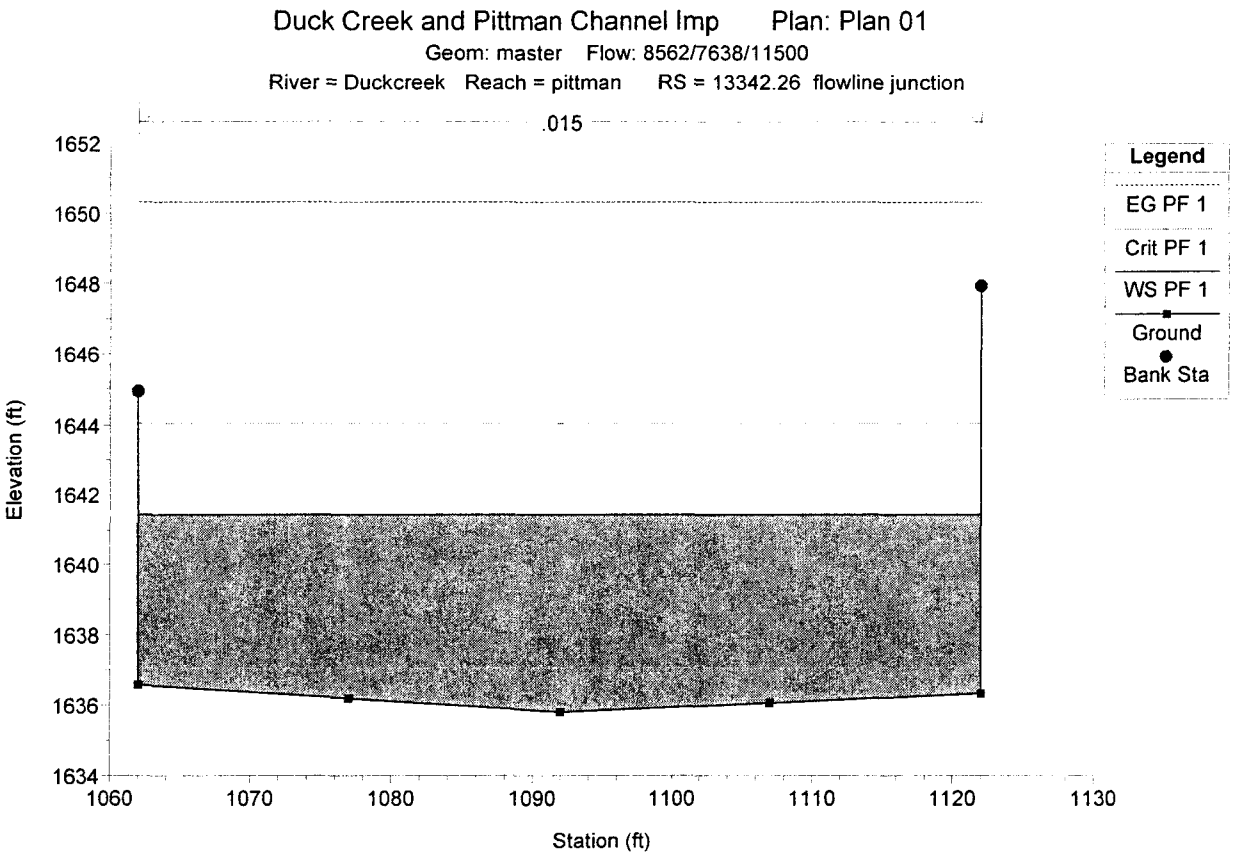

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13500.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
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1070
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1120
1130
Station (ft)

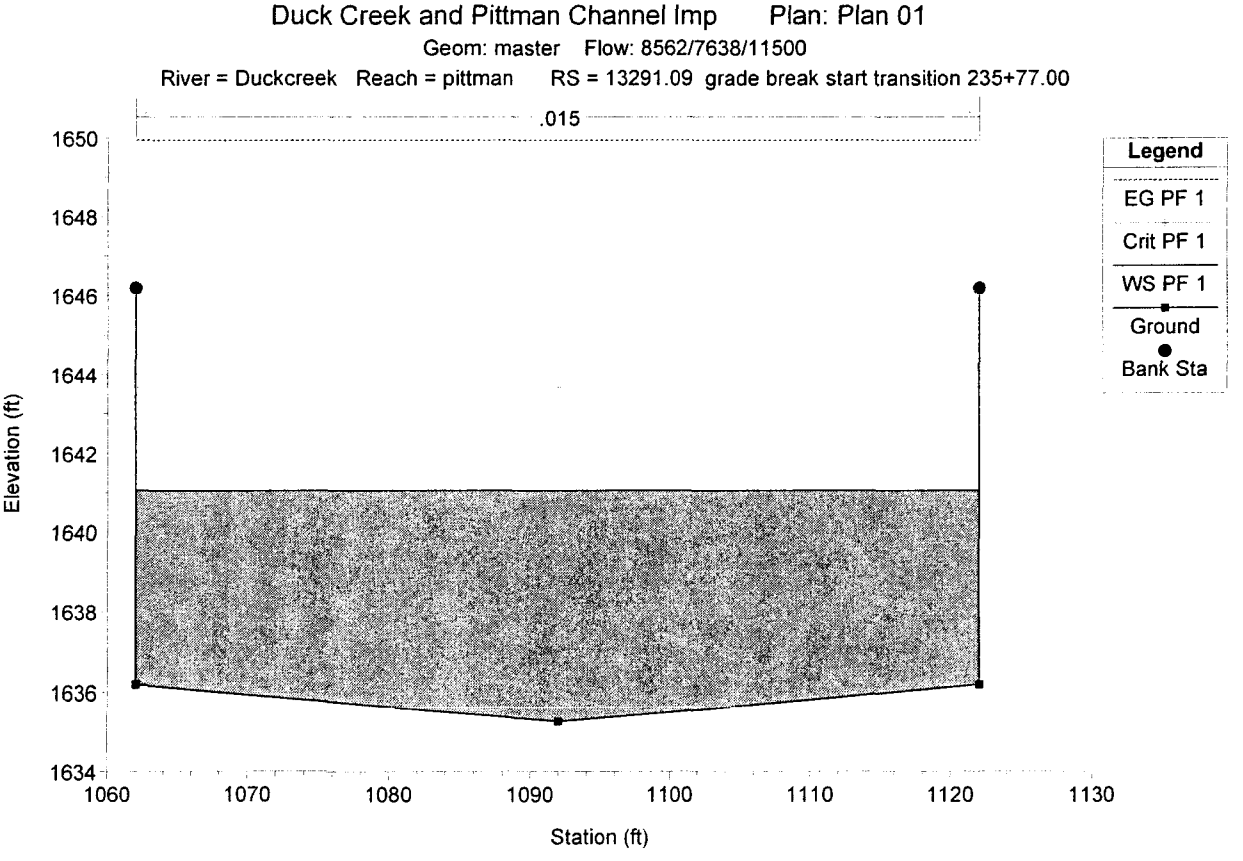

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13491.7 U/S RUSSELL BRIDGE
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1654
1652
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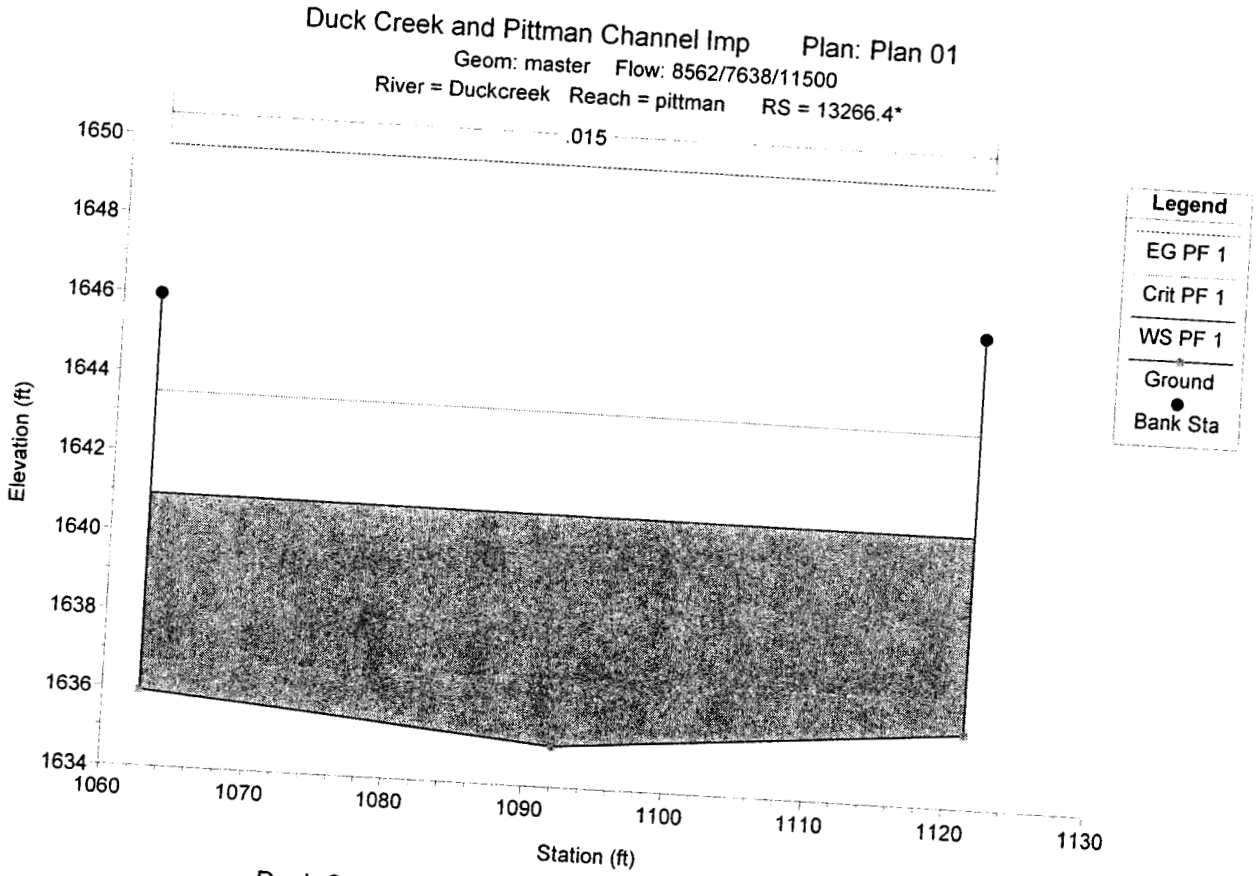

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13490.7 RUSSELL ROAD BRIDGE
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1660
1655
1650
1645
1640
1635
1060
1070
1080
1090
1100
1110
1120
1130

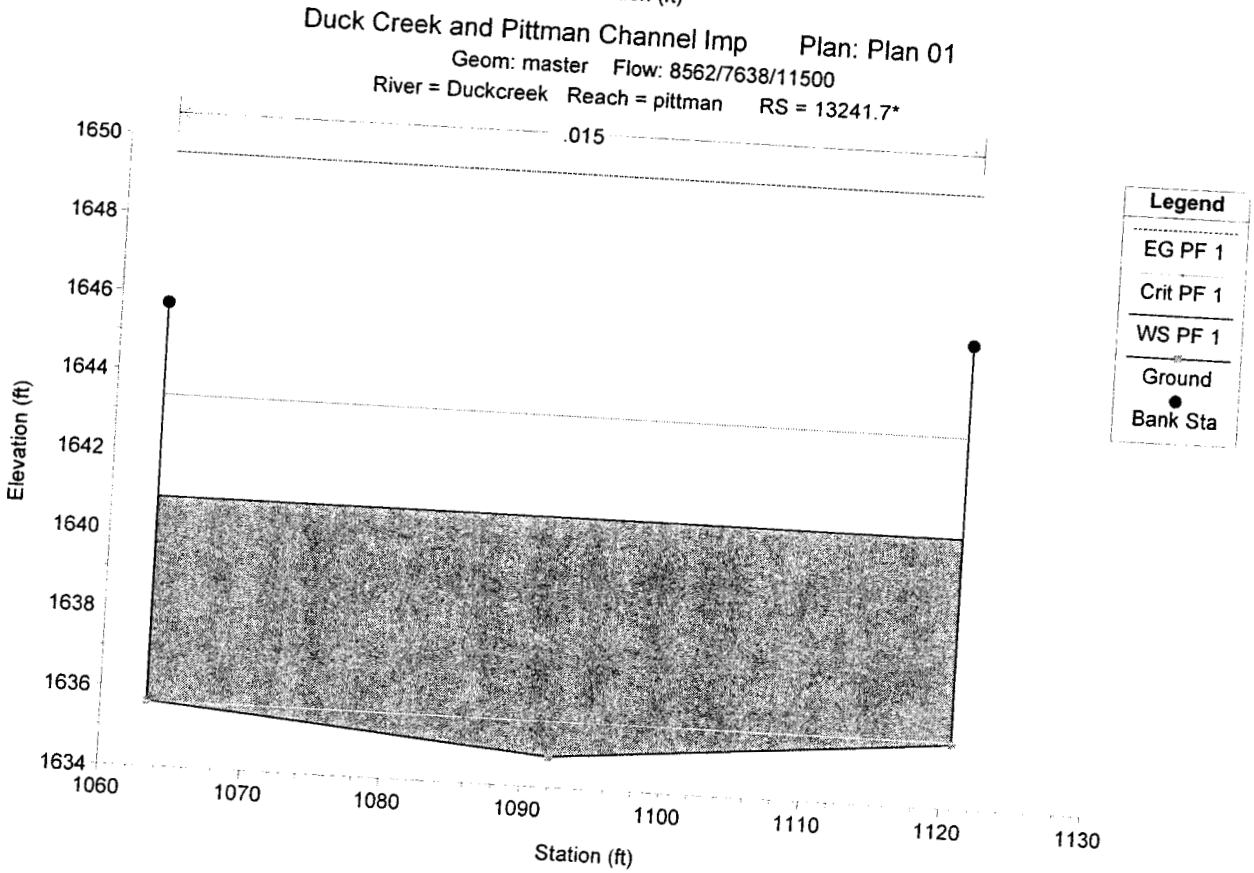

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13490.7 RUSSELL ROAD BRIDGE
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1655
1650
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1080
1090
1100
1110
1120
1130
Station (ft)

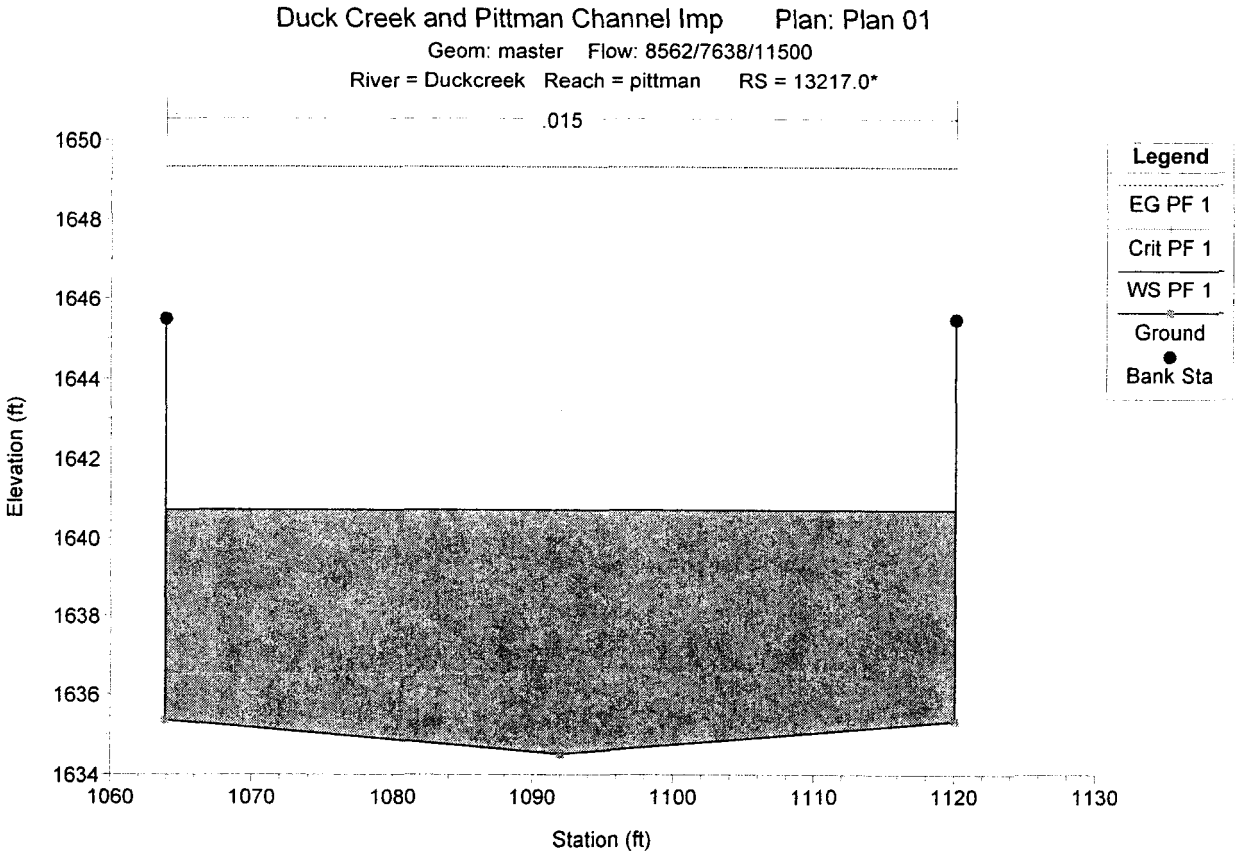

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13368.7 D/S RUSSELL BRIDGE
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
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1638
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1070
1080
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1100
1110
1120
1130
Station (ft)

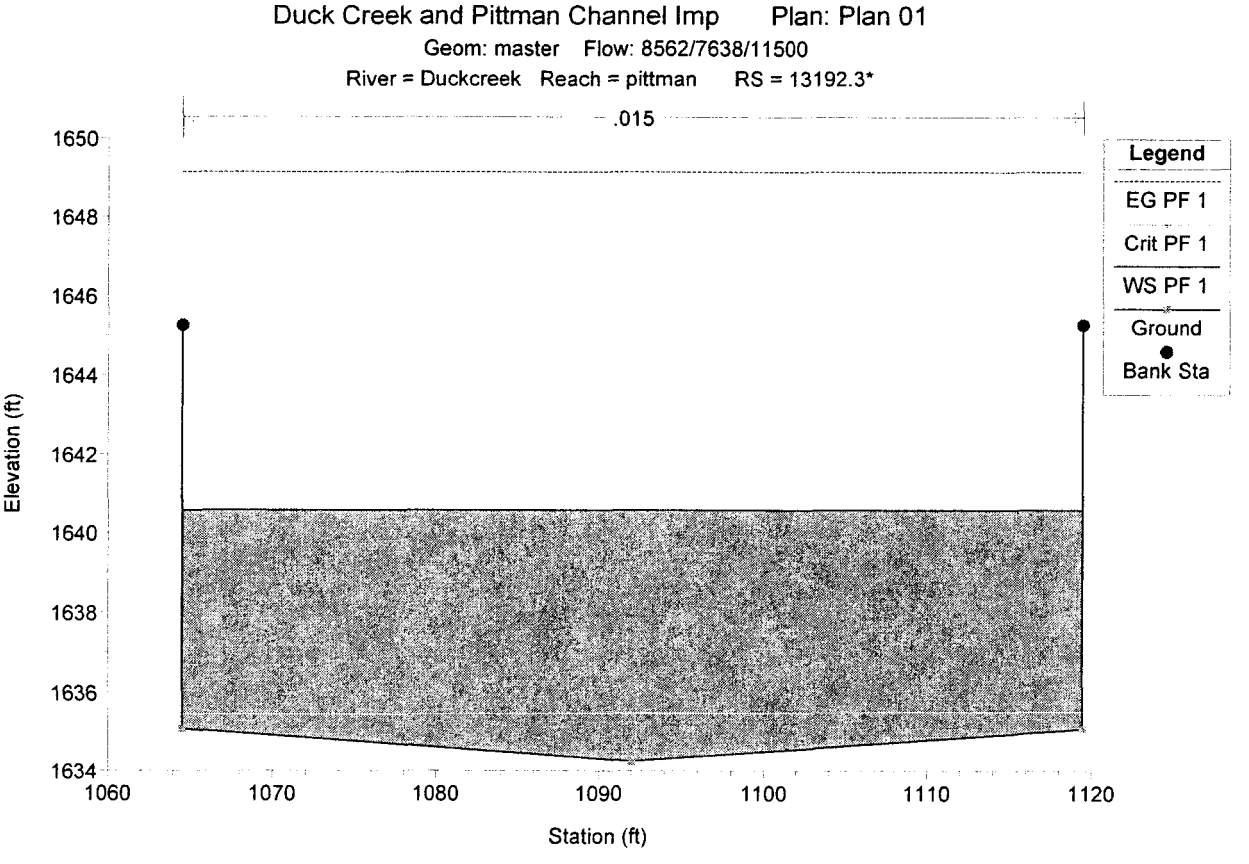

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13342.26 flowline junction
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
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1070
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1100
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1120
1130
Station (ft)

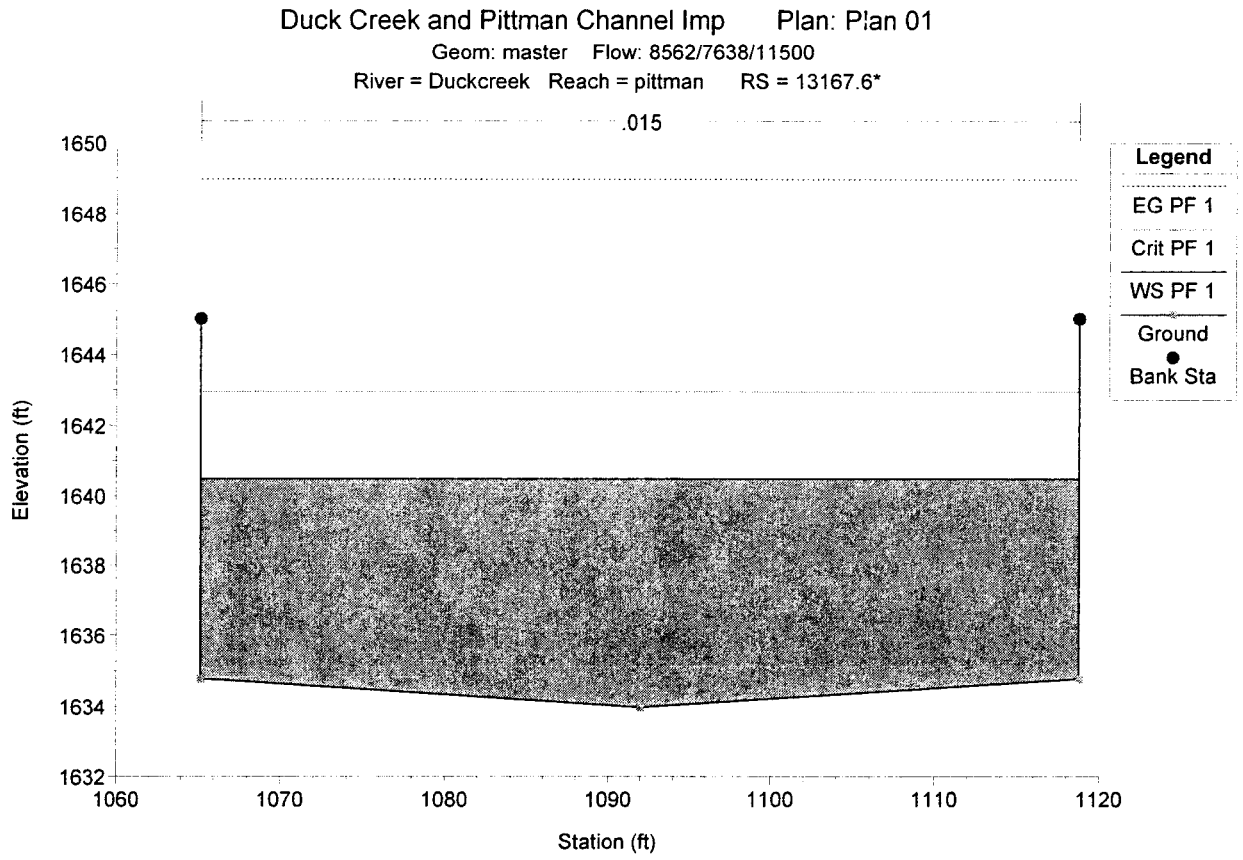

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13291.09 grade break start transition 235+77.00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
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1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

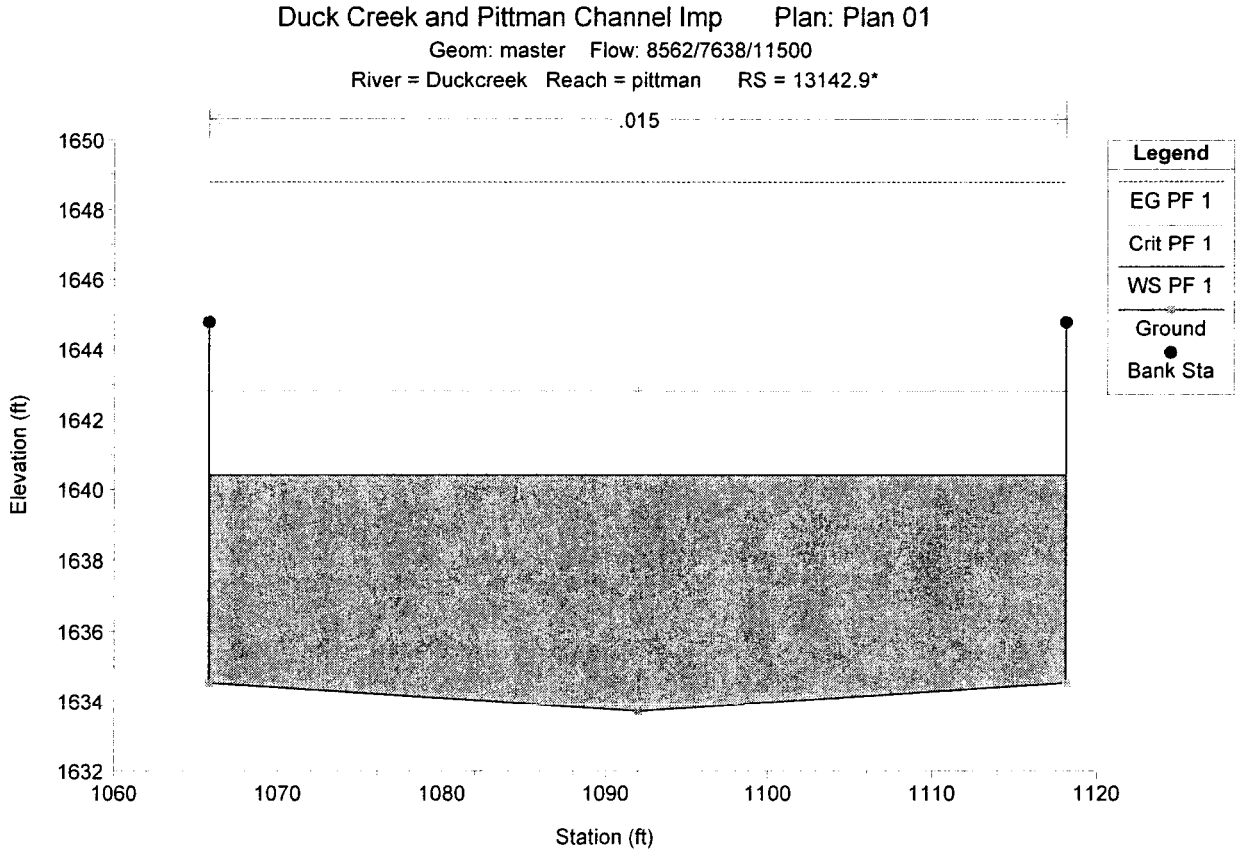

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13266.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
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1638
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1070
1080
1090
1100
1110
1120
1130
Station (ft)

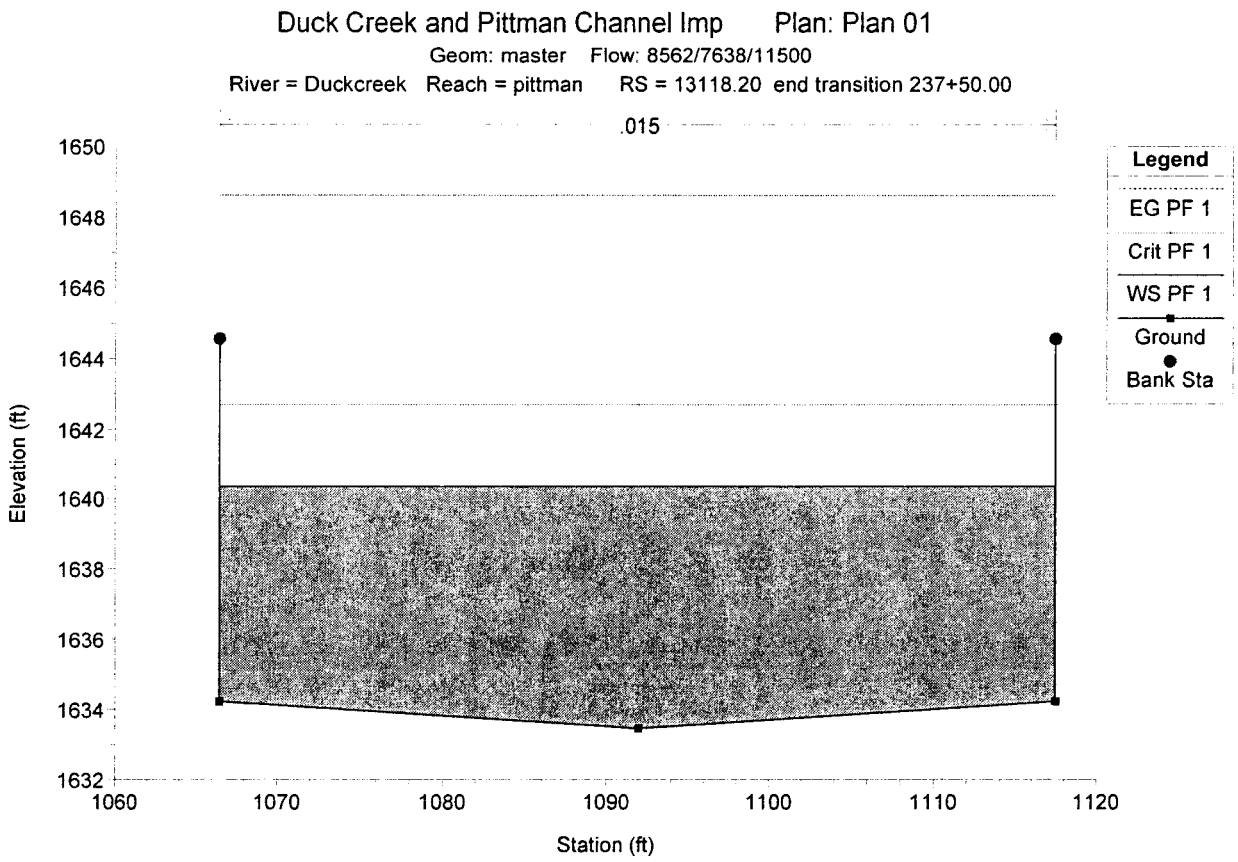

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13241.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
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1638
1636
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1060
1070
1080
1090
1100
1110
1120
1130
Station (ft)

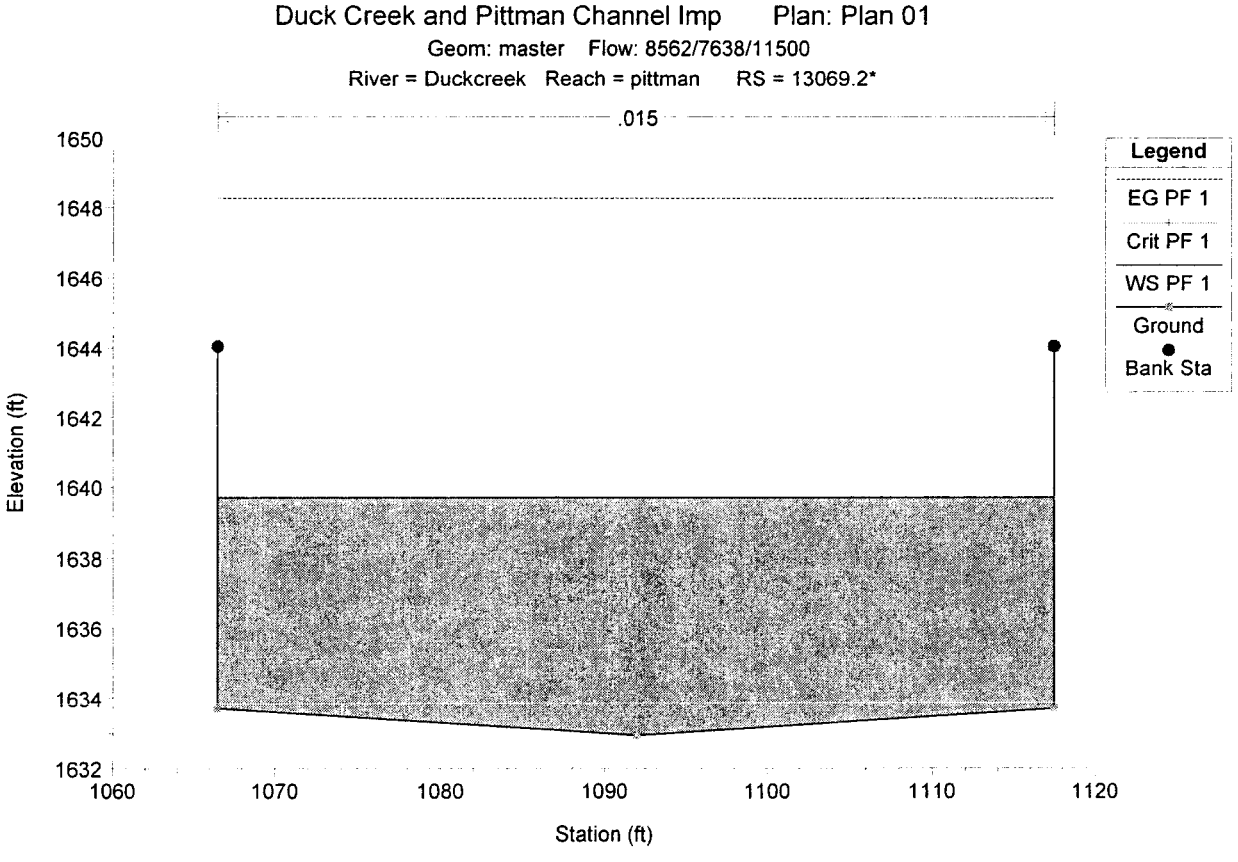

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13217.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1650
1648
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1642
1640
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1636
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1110
1120
1130

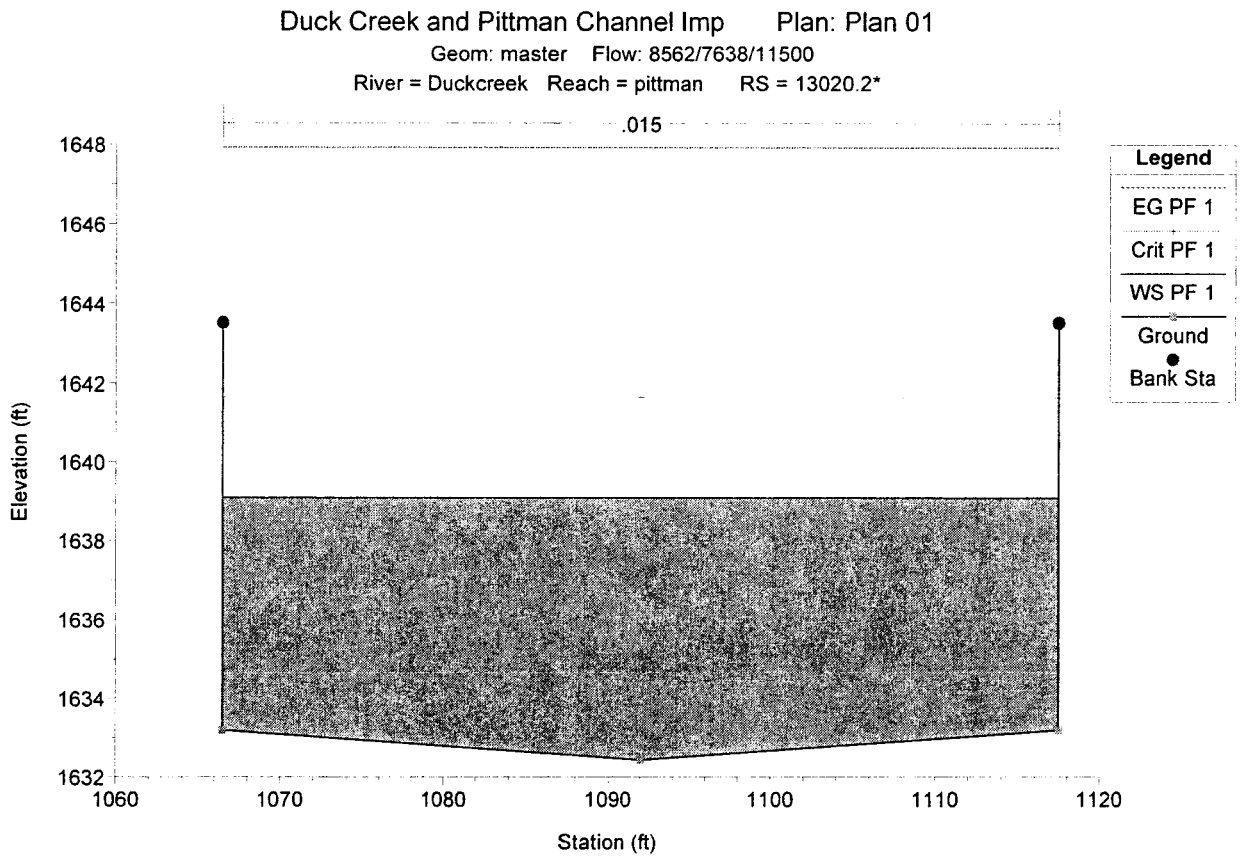

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13192.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1650
1648
1646
1644
1642
1640
1638
1636
1634
1060
1070
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1100
1110
1120

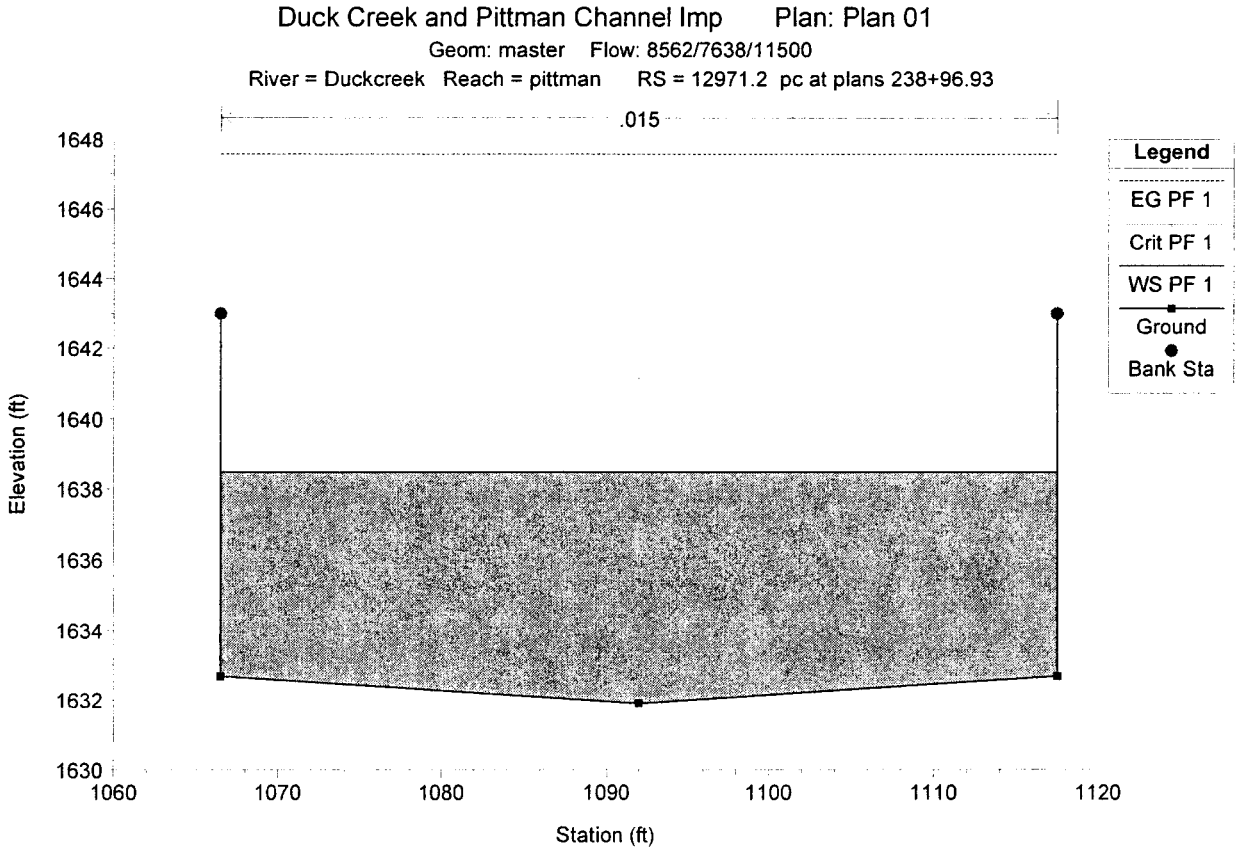

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13167.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
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1638
1636
1634
1632
1060
1070
1080
1090
1100
1110
1120
Station (ft)

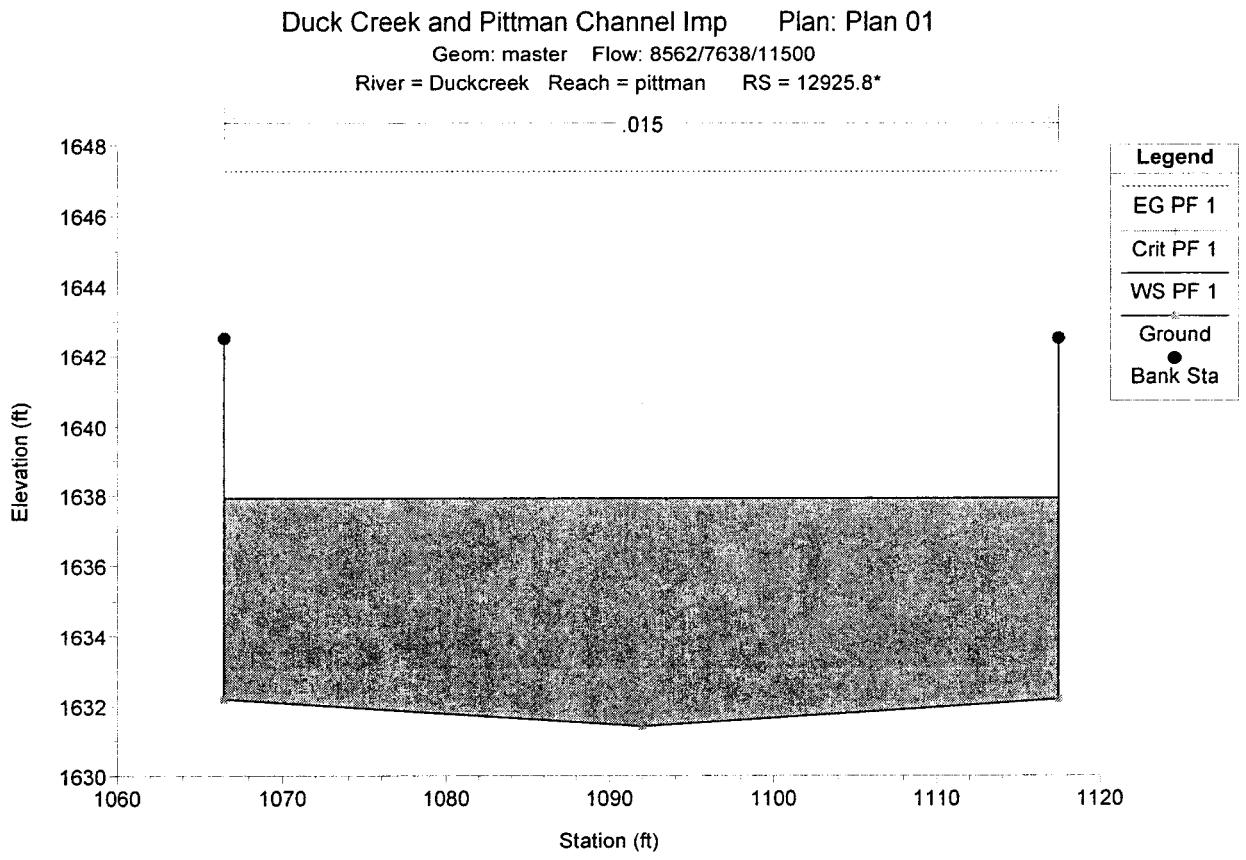

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13142.9*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
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1638
1636
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1060
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1080
1090
1100
1110
1120
Station (ft)

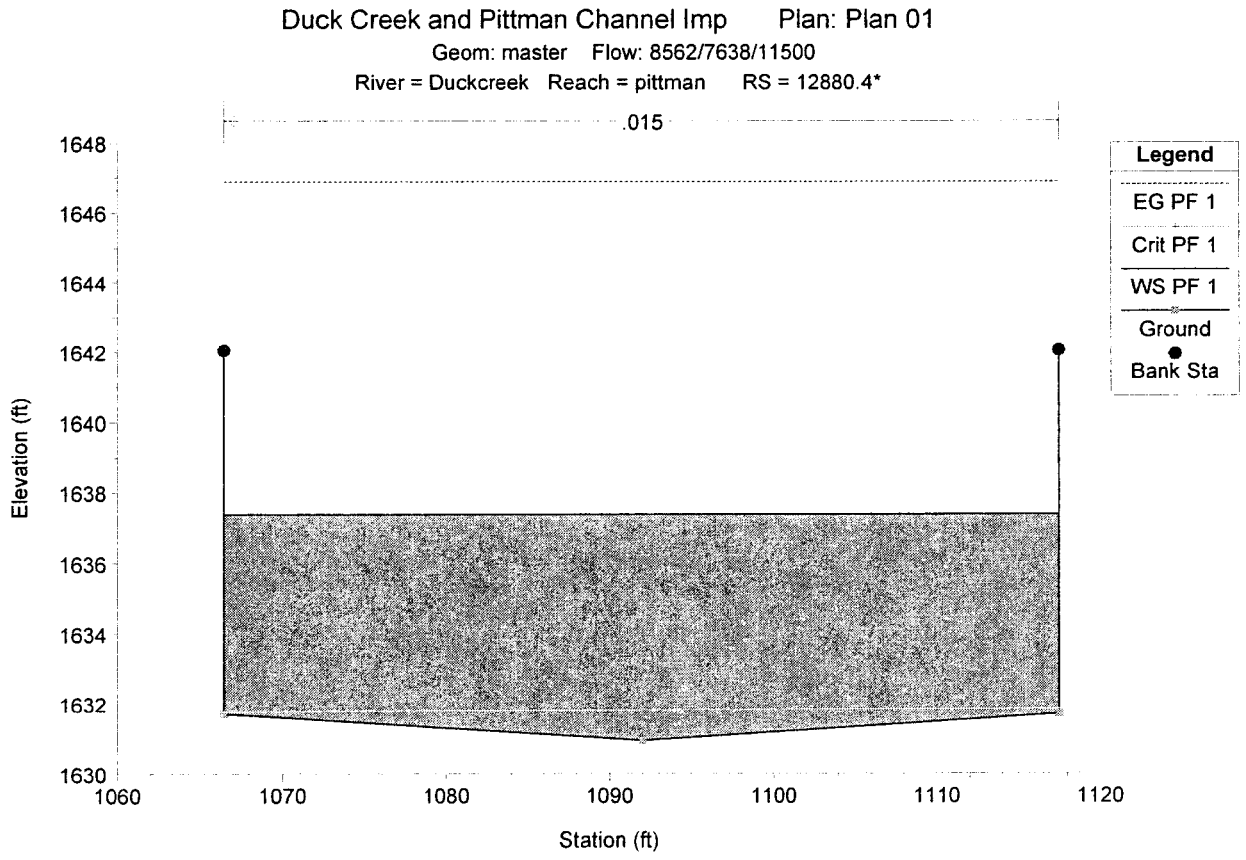

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13118.20 end transition 237+50.00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
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1638
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1634
1632
1060
1070
1080
1090
1100
1110
1120
Station (ft)

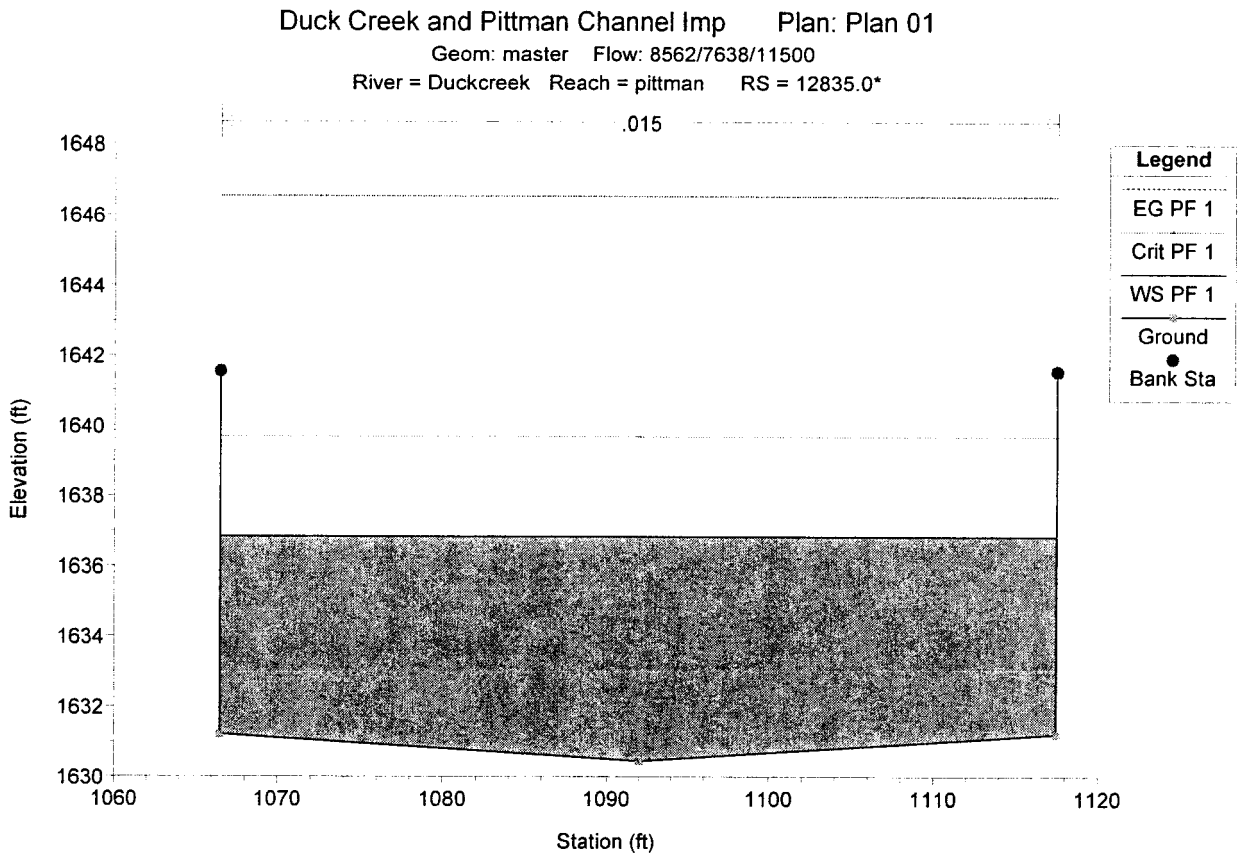

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13069.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
1640
1638
1636
1634
1632
1060
1070
1080
1090
1100
1110
1120
Station (ft)

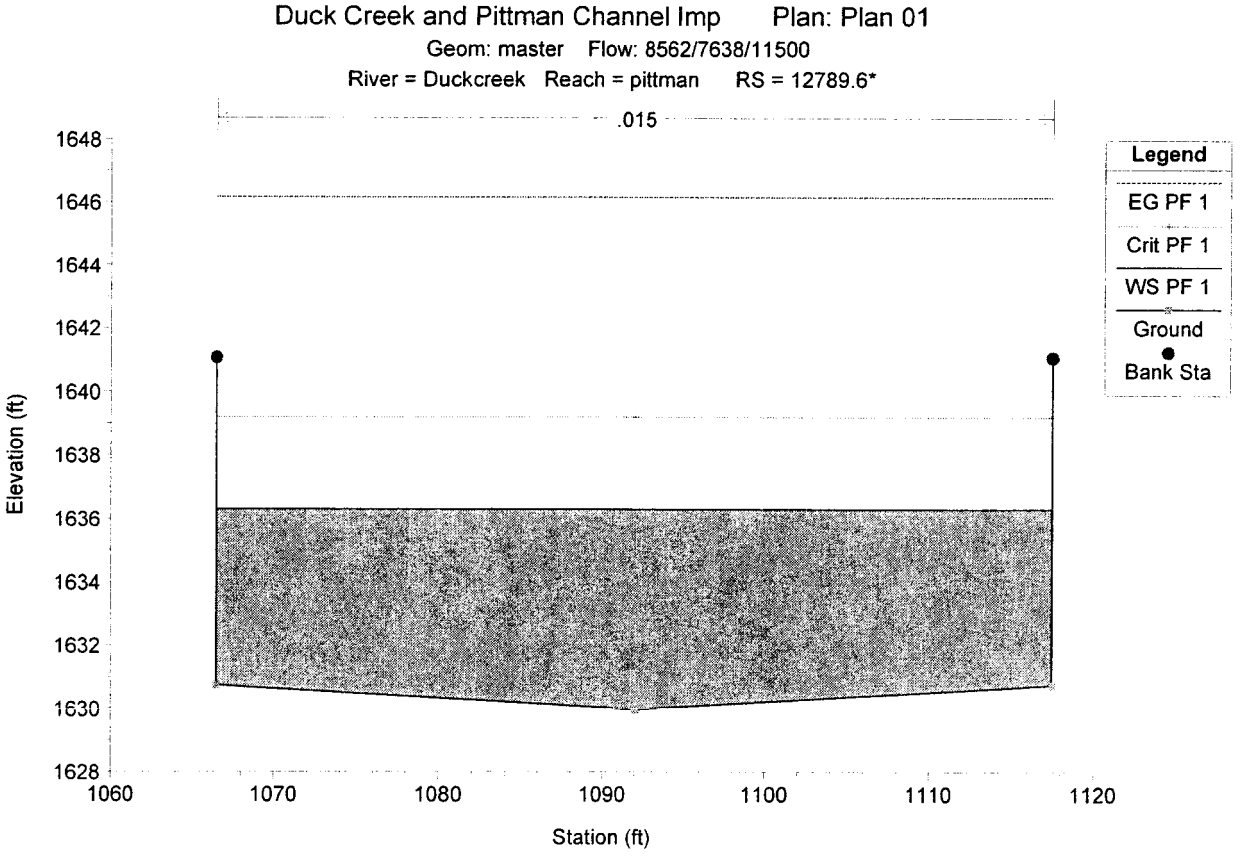

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 13020.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1648
1646
1644
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1636
1634
1632
1060
1070
1080
1090
1100
1110
1120

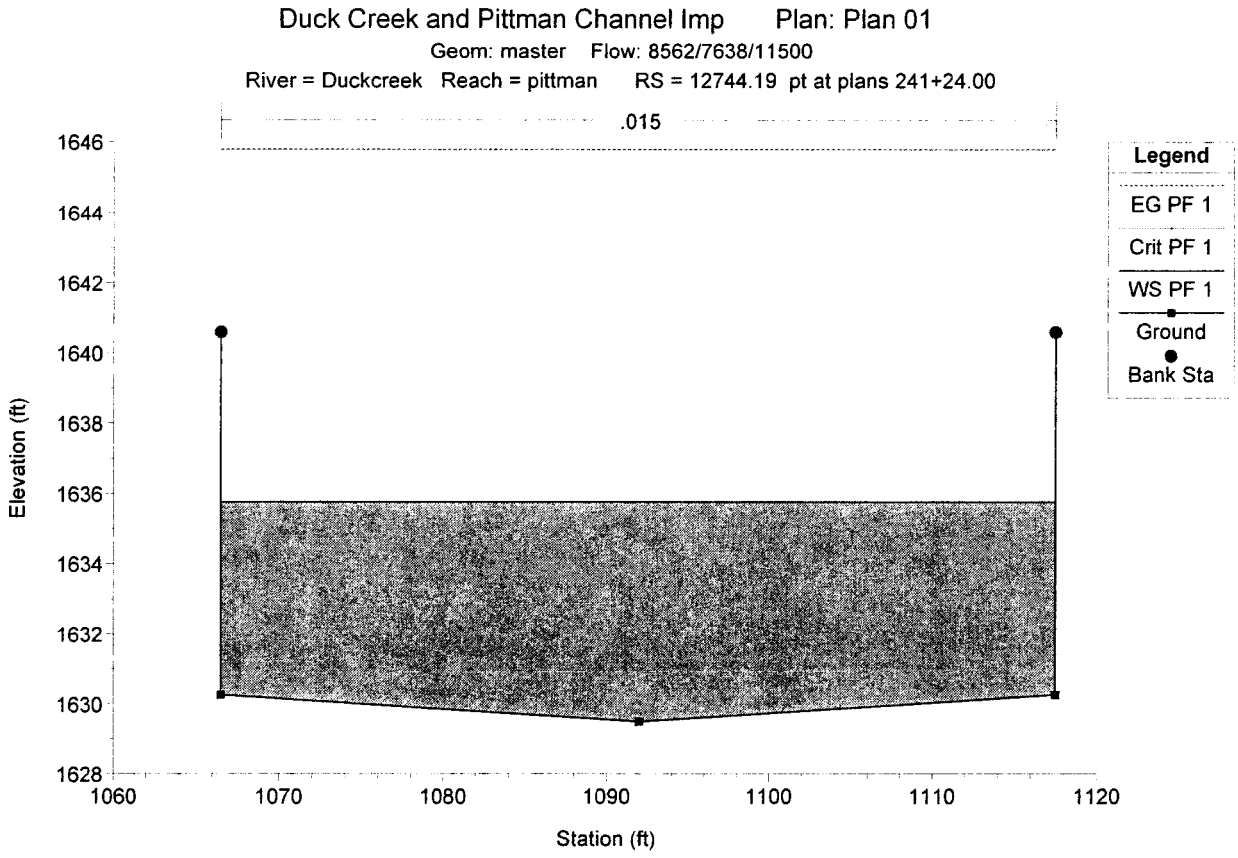

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12971.2 pc at plans 238+96.93
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1648
1646
1644
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1638
1636
1634
1632
1630
1060
1070
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1100
1110
1120

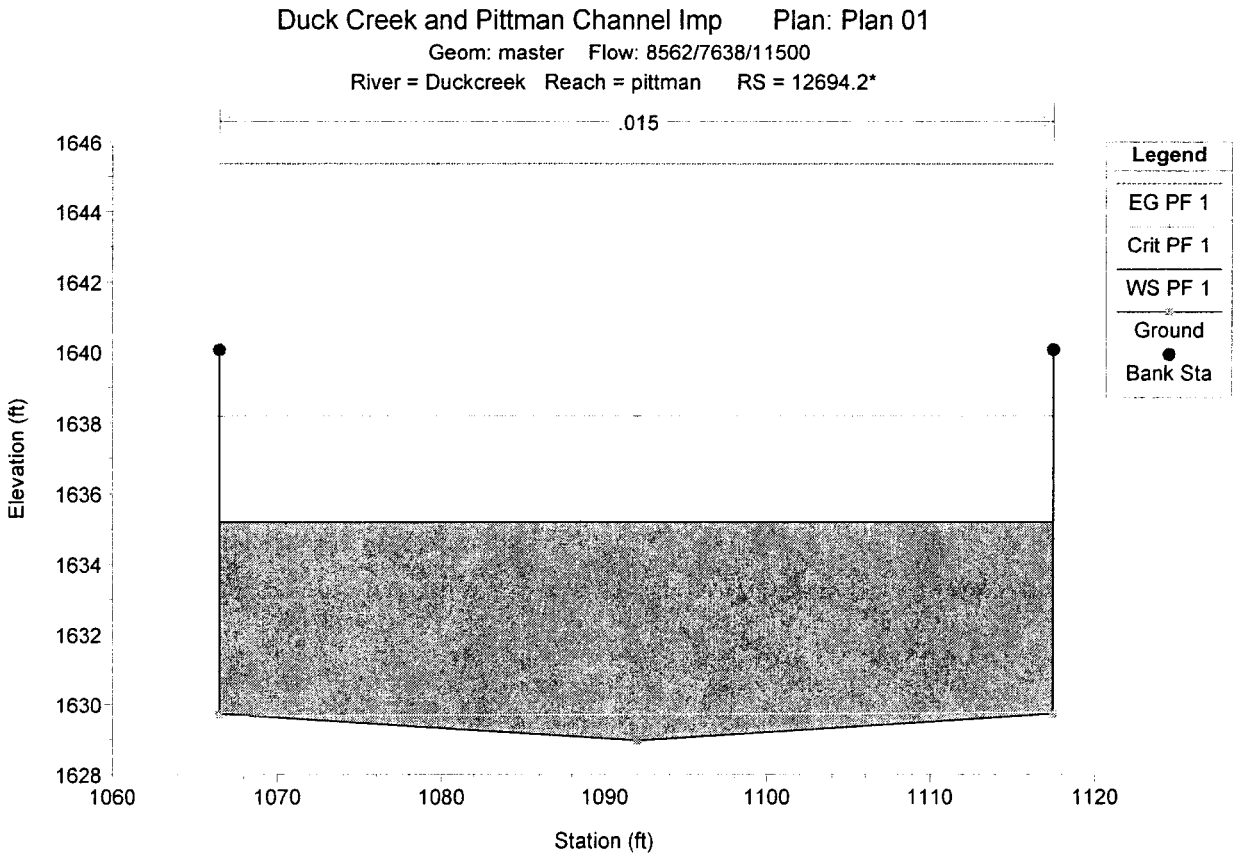

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12925.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
1642
1640
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1636
1634
1632
1630
1060
1070
1080
1090
1100
1110
1120
Station (ft)

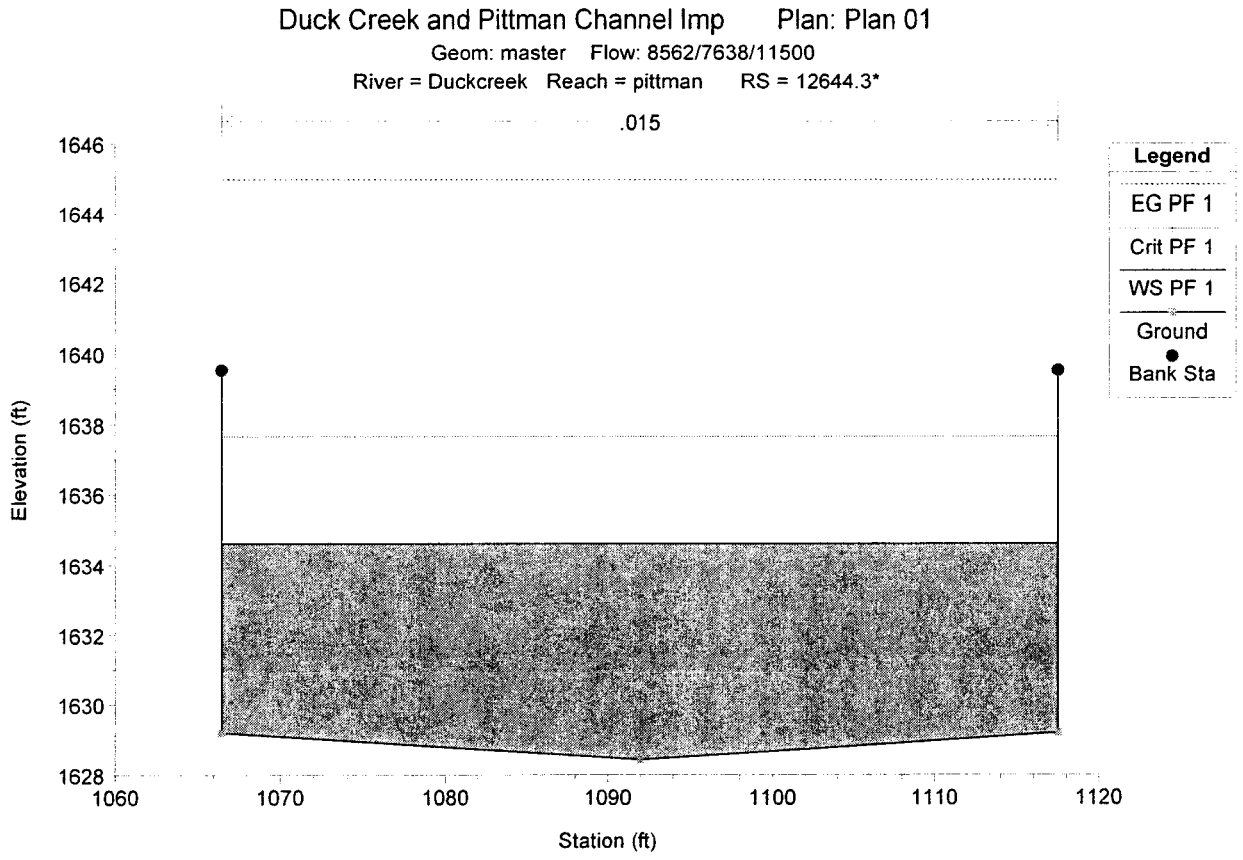

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12880.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
1642
1640
1638
1636
1634
1632
1630
1060
1070
1080
1090
1100
1110
1120
Station (ft)

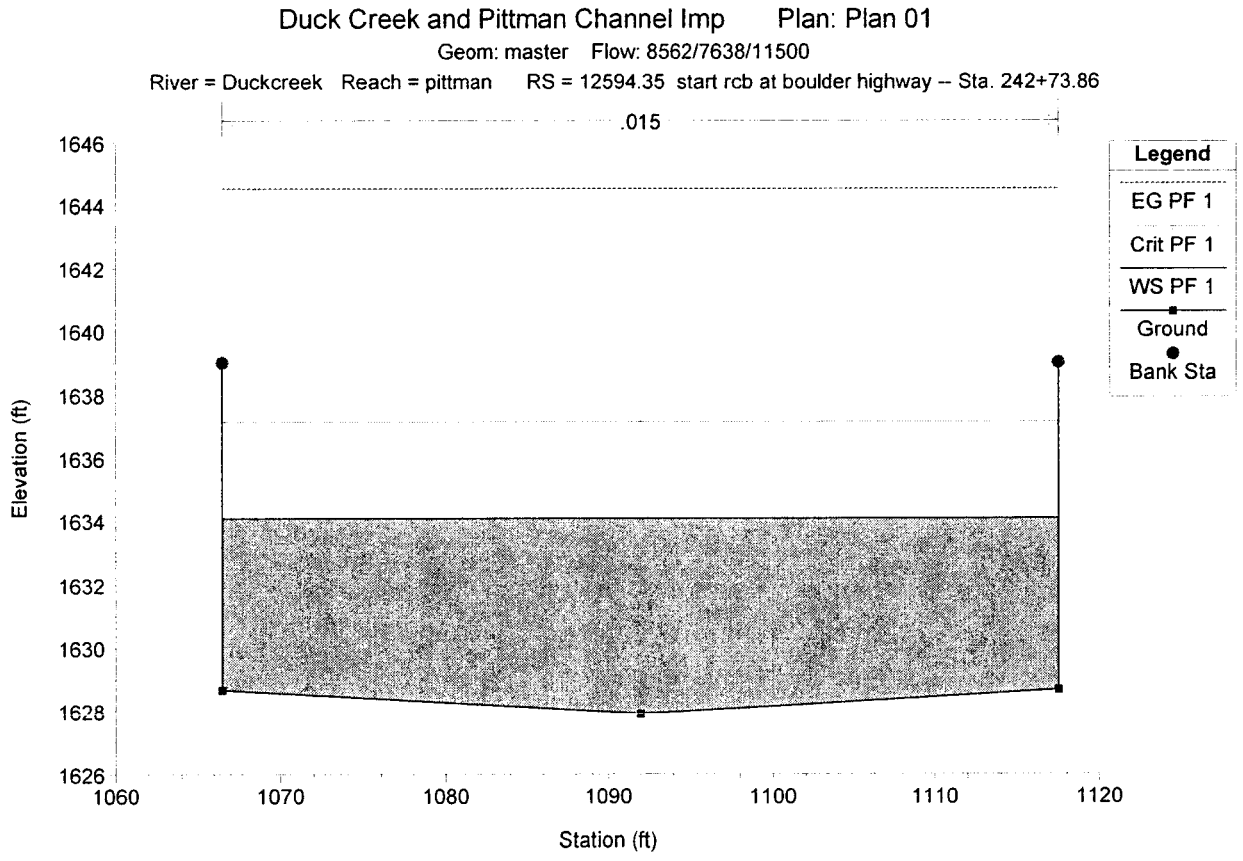

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12835.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1648
1646
1644
1642
1640
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1636
1634
1632
1630
1060
1070
1080
1090
1100
1110
1120

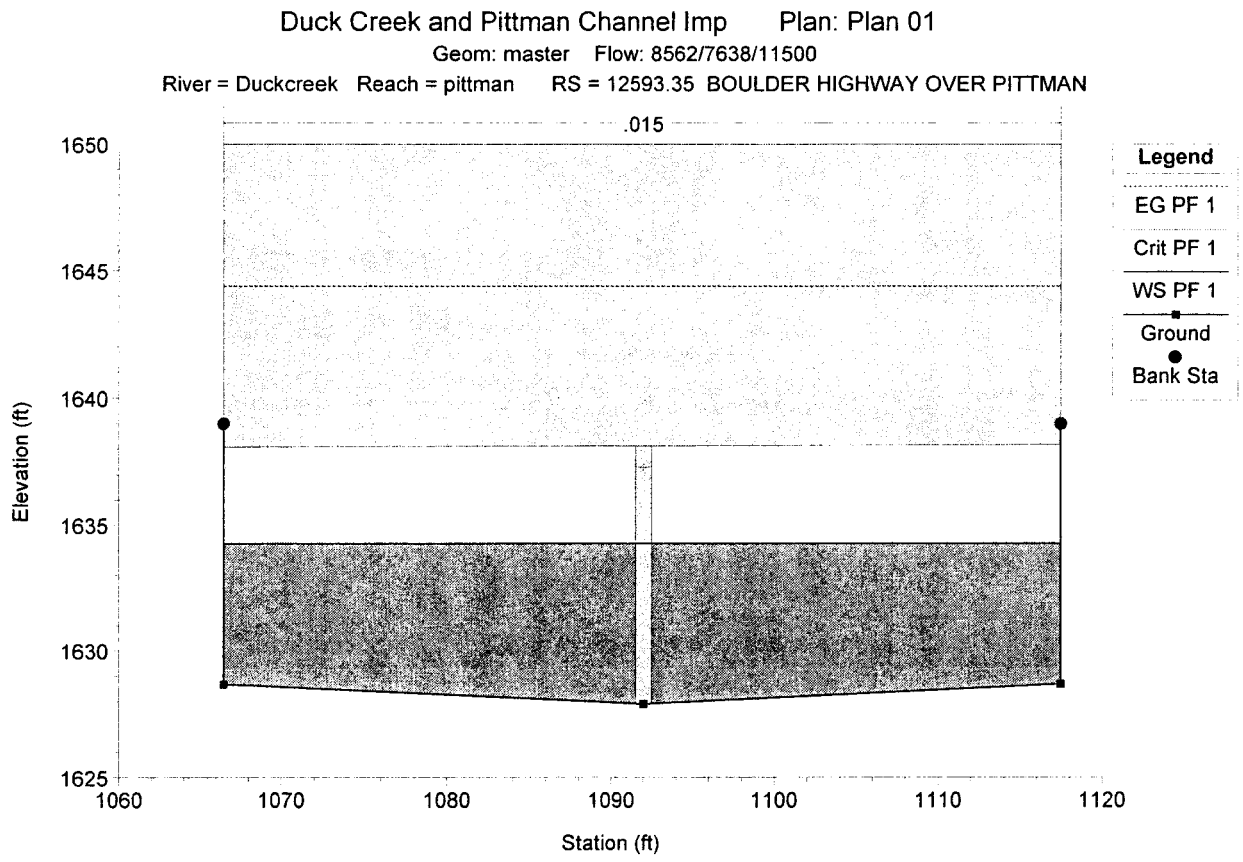

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12789.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1648
1646
1644
1642
1640
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1632
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1628
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1100
1110
1120

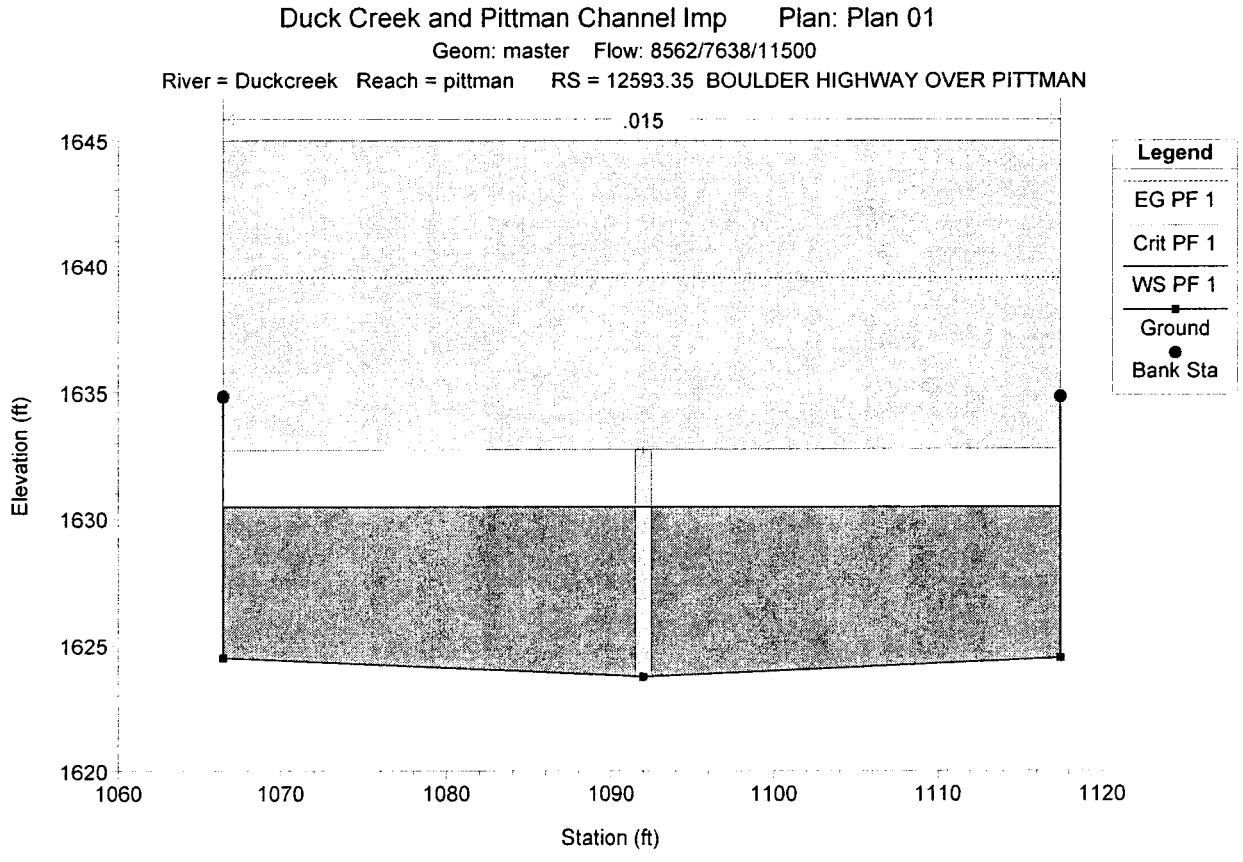

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12744.19 pt at plans 241+24.00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1646
1644
1642
1640
1638
1636
1634
1632
1630
1628
1060
1070
1080
1090
1100
1110
1120
Station (ft)

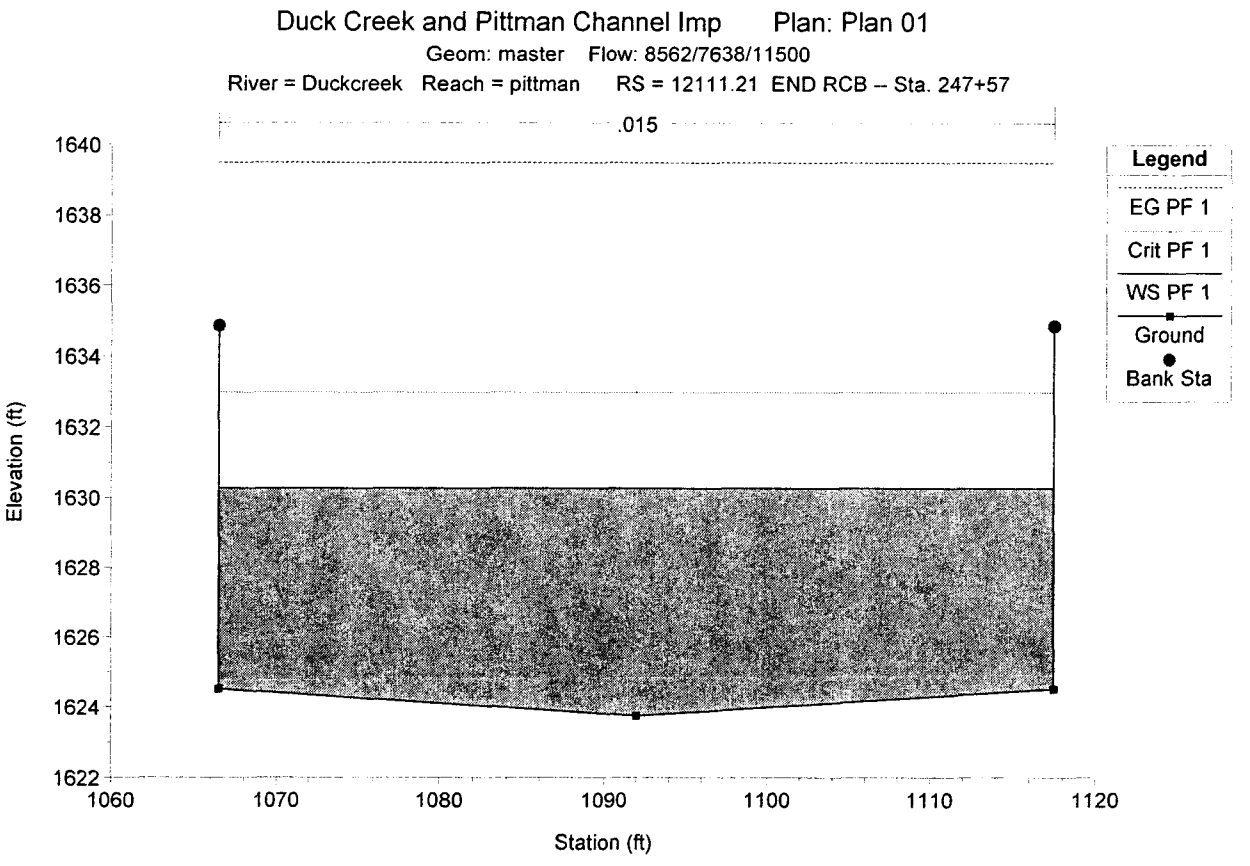

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12694.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1646
1644
1642
1640
1638
1636
1634
1632
1630
1628
1060
1070
1080
1090
1100
1110
1120
Station (ft)

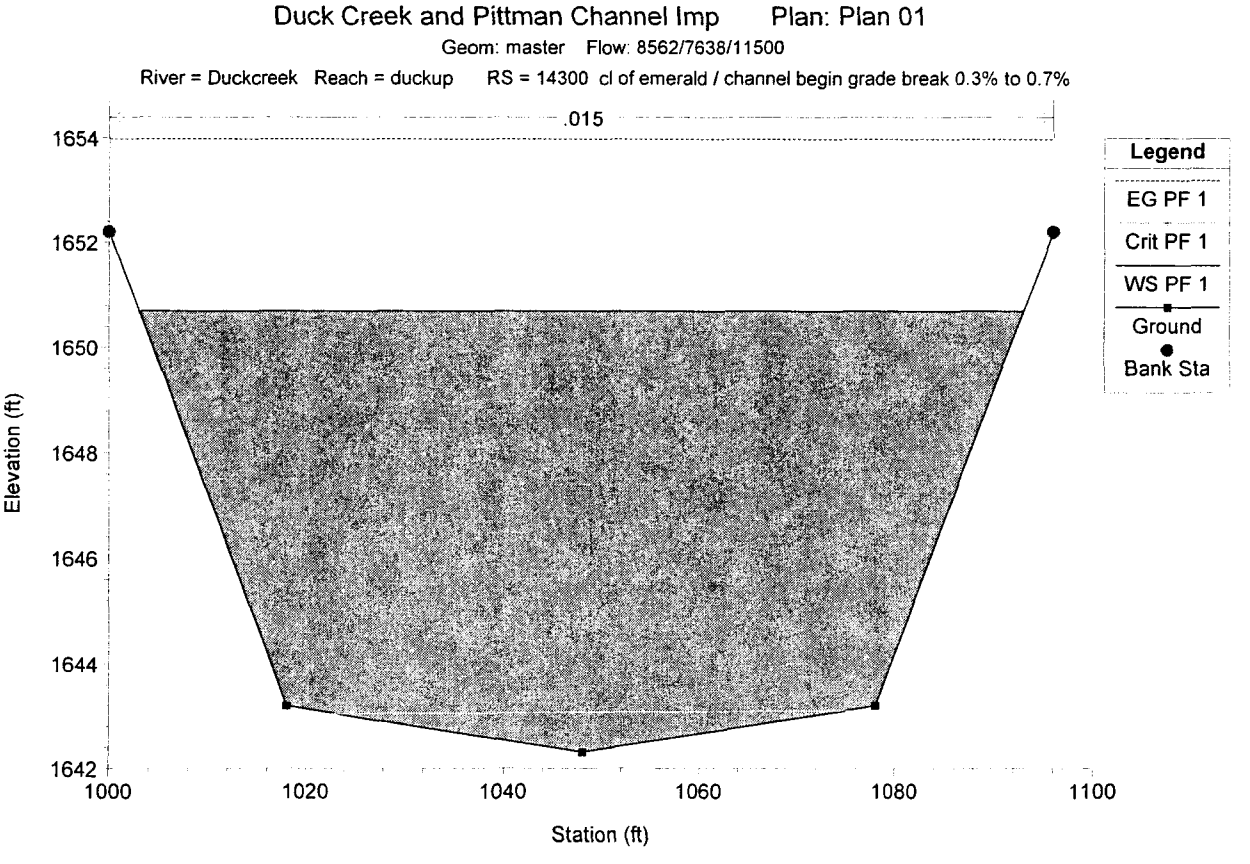

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12644.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1646
1644
1642
1640
1638
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1634
1632
1630
1628
1060
1070
1080
1090
1100
1110
1120
Station (ft)

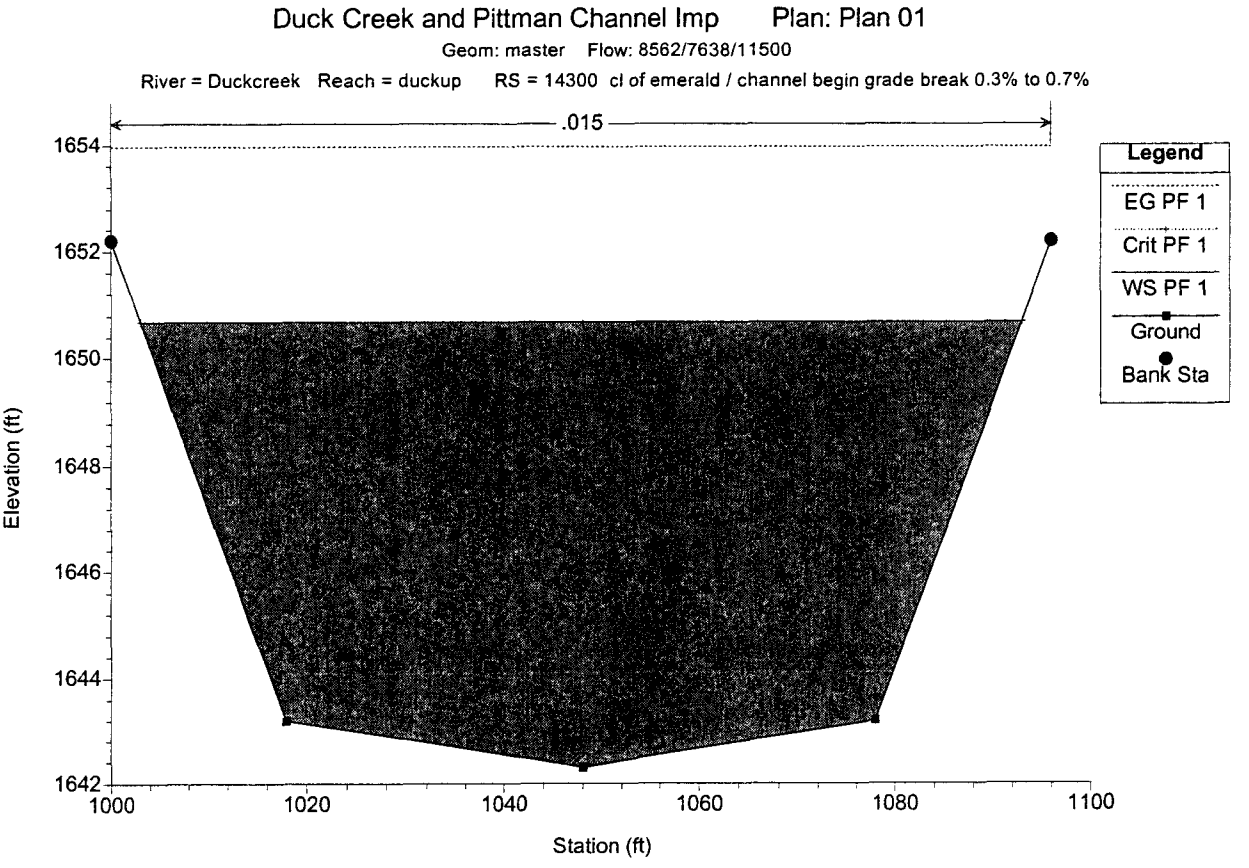

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12594.35 start rcb at boulder highway -- Sta. 242+73.86
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1646
1644
1642
1640
1638
1636
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1632
1630
1628
1626
1060
1070
1080
1090
1100
1110
1120
Station (ft)

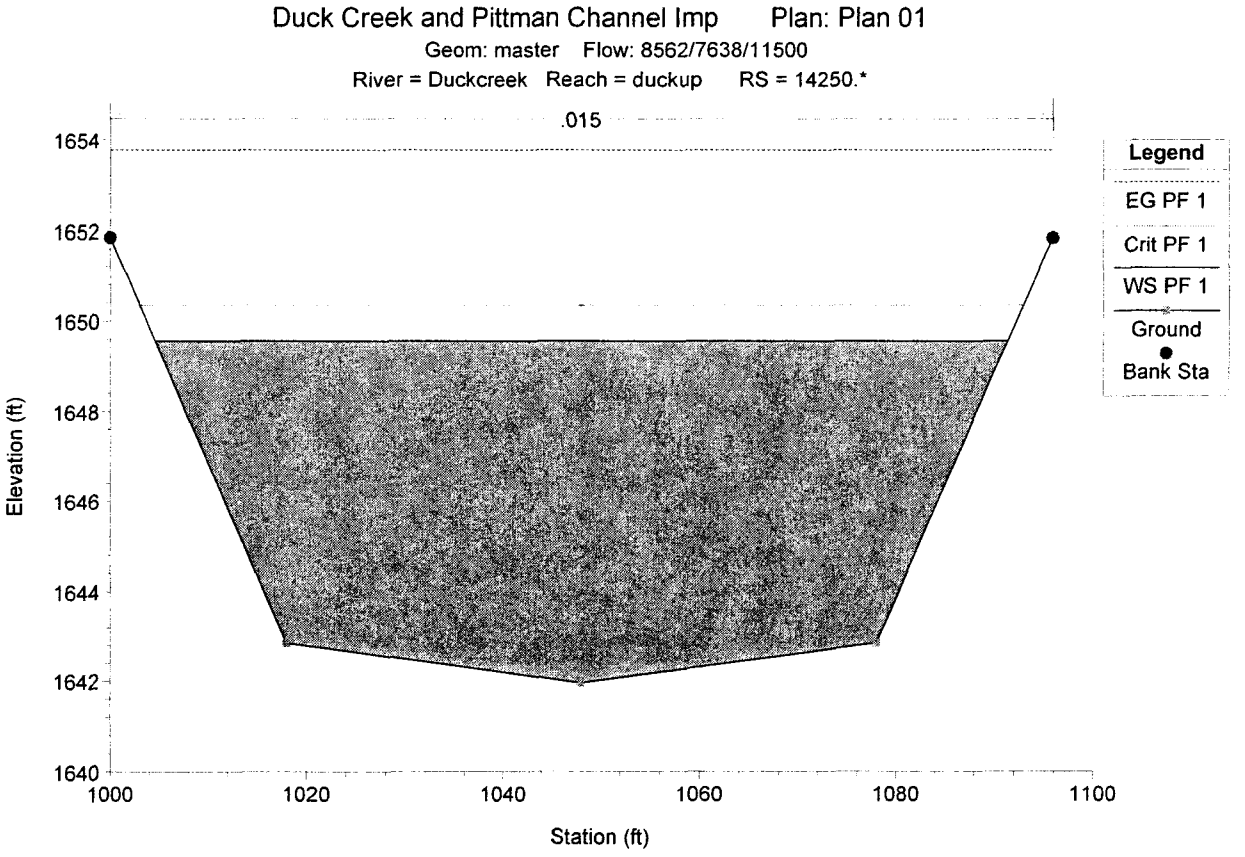

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12593.35 BOULDER HIGHWAY OVER PITTMAN
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1645
1640
1635
1630
1625
1060
1070
1080
1090
1100
1110
1120
Station (ft)

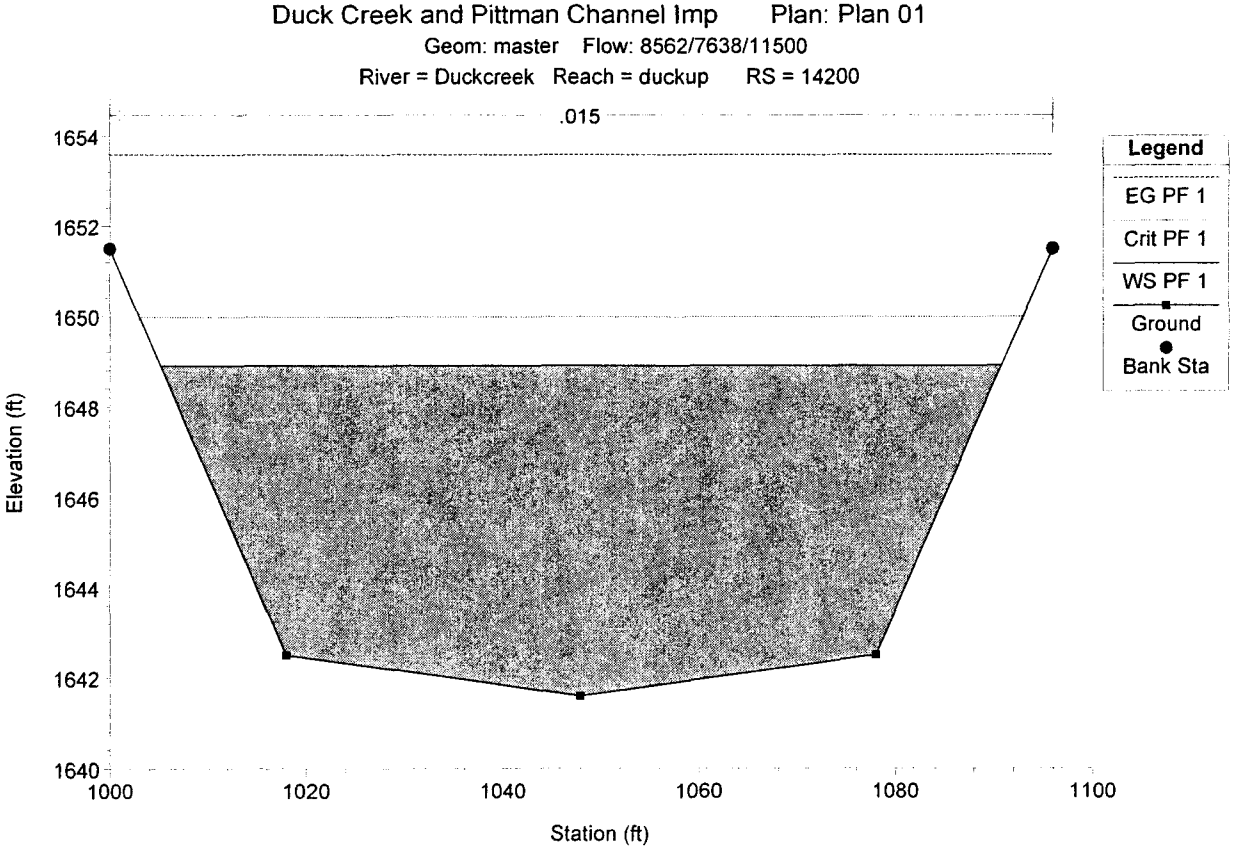

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12593.35 BOULDER HIGHWAY OVER PITTMAN
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1645
1640
1635
1630
1625
1620
1060
1070
1080
1090
1100
1110
1120
Station (ft)

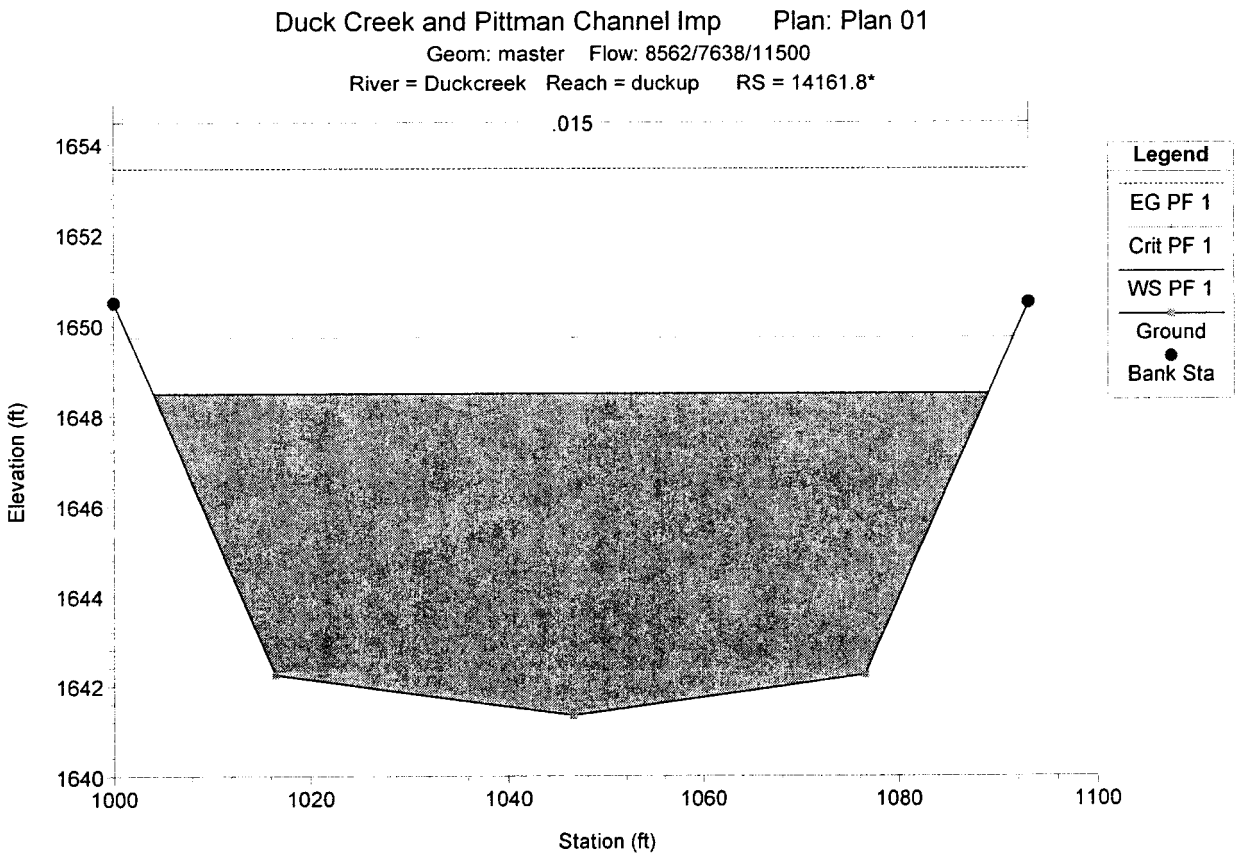

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = pittman RS = 12111.21 END RCB -- Sta. 247+57
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1640
1638
1636
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1080
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1110
1120
Station (ft)

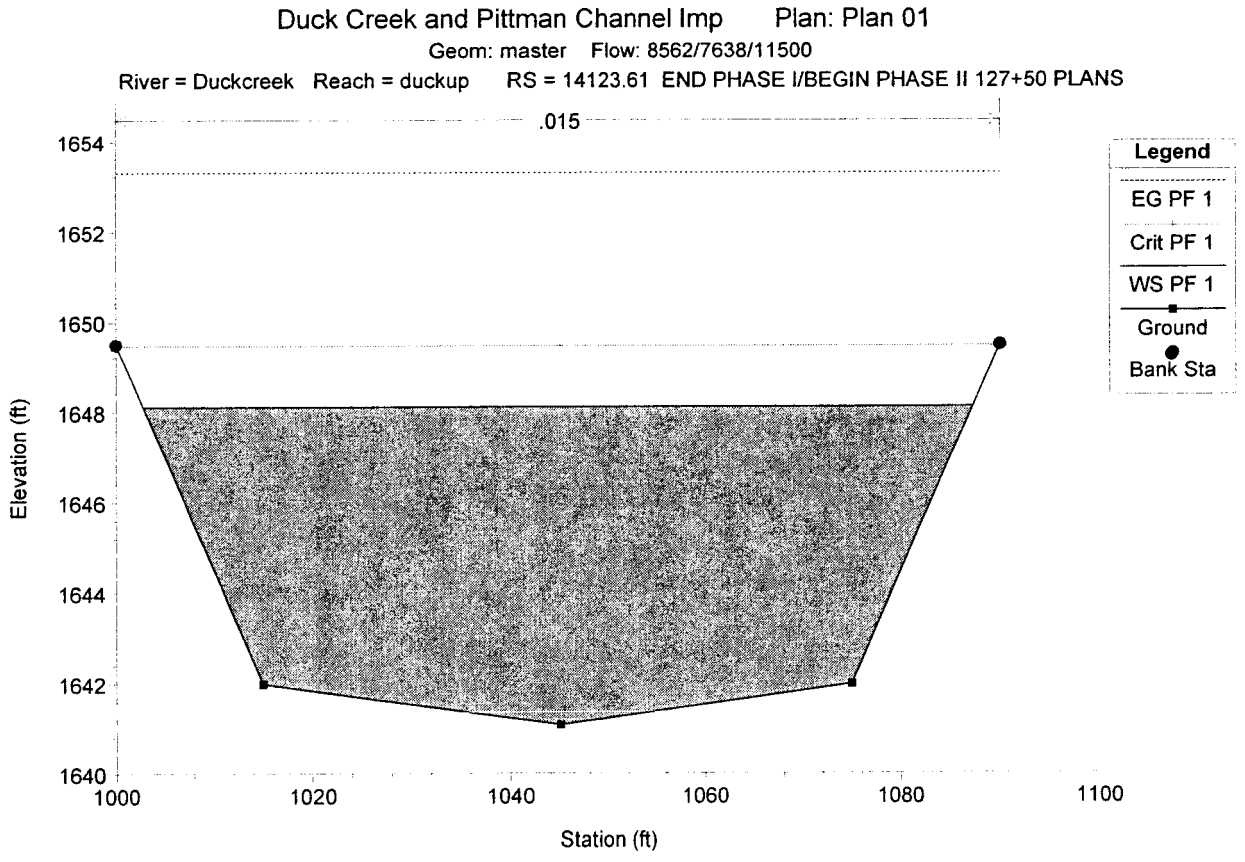

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14300 cl of emerald / channel begin grade break 0.3% to 0.7%
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1000
1020
1040
1060
1080
1100
Station (ft)

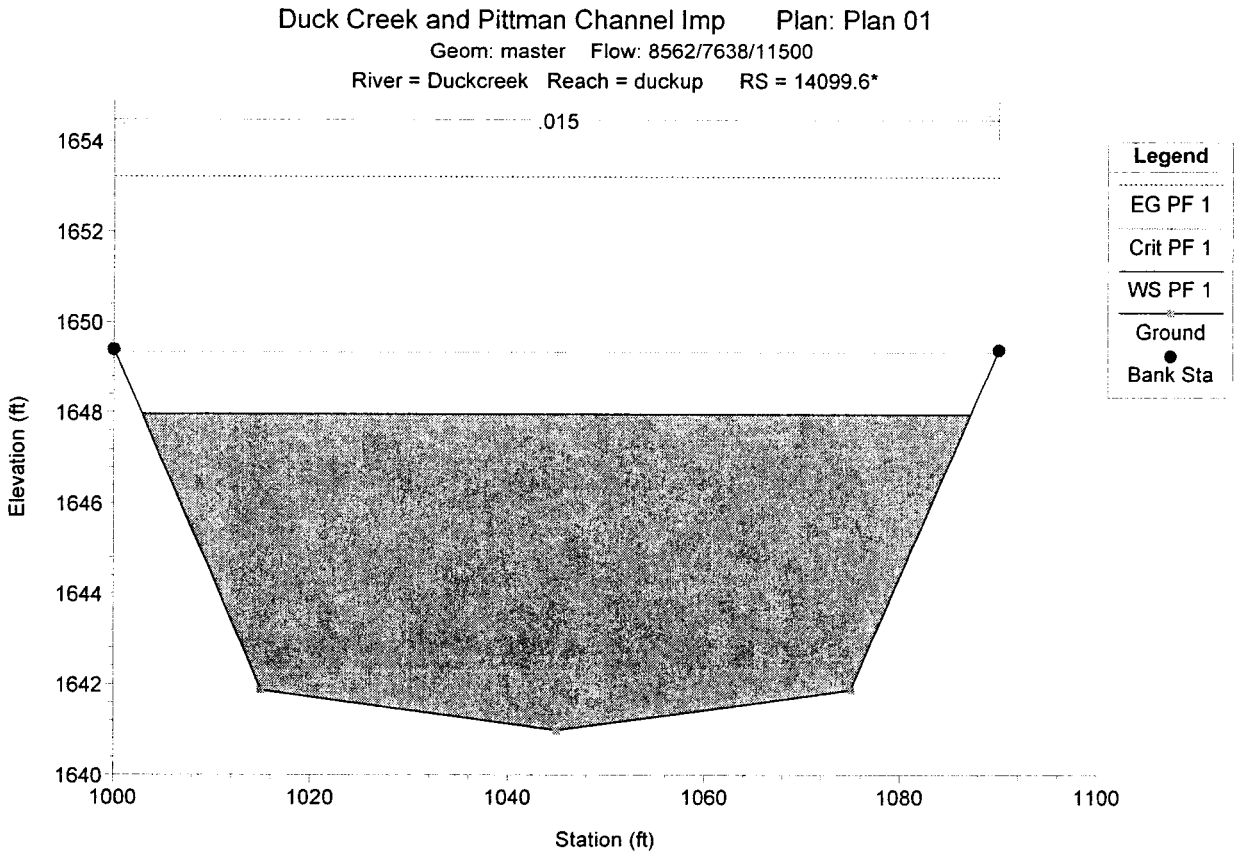

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14300 cl of emerald / channel begin grade break 0.3% to 0.7%
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1000
1020
1040
1060
1080
1100
Station (ft)

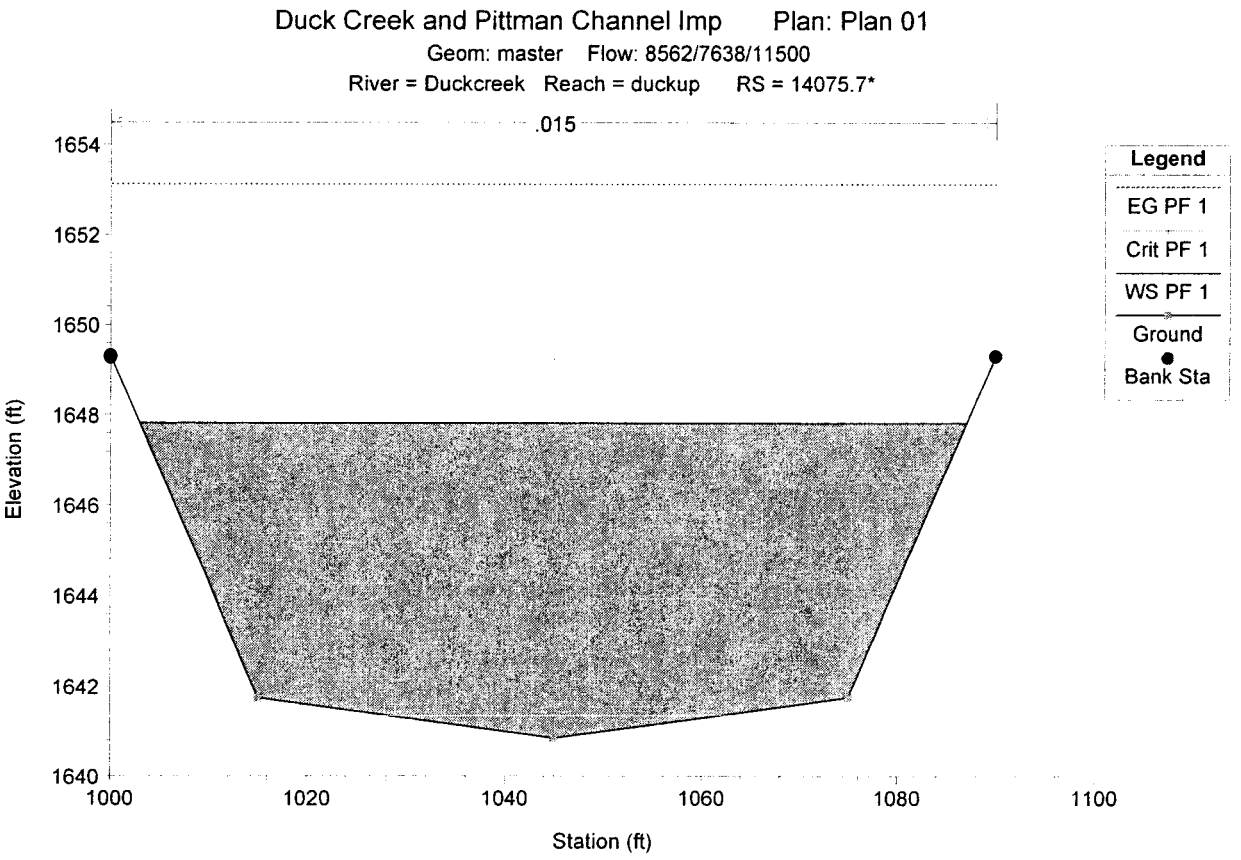

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14250.*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14200
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14161.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14123.61 END PHASE I/BEGIN PHASE II 127+50 PLANS
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)

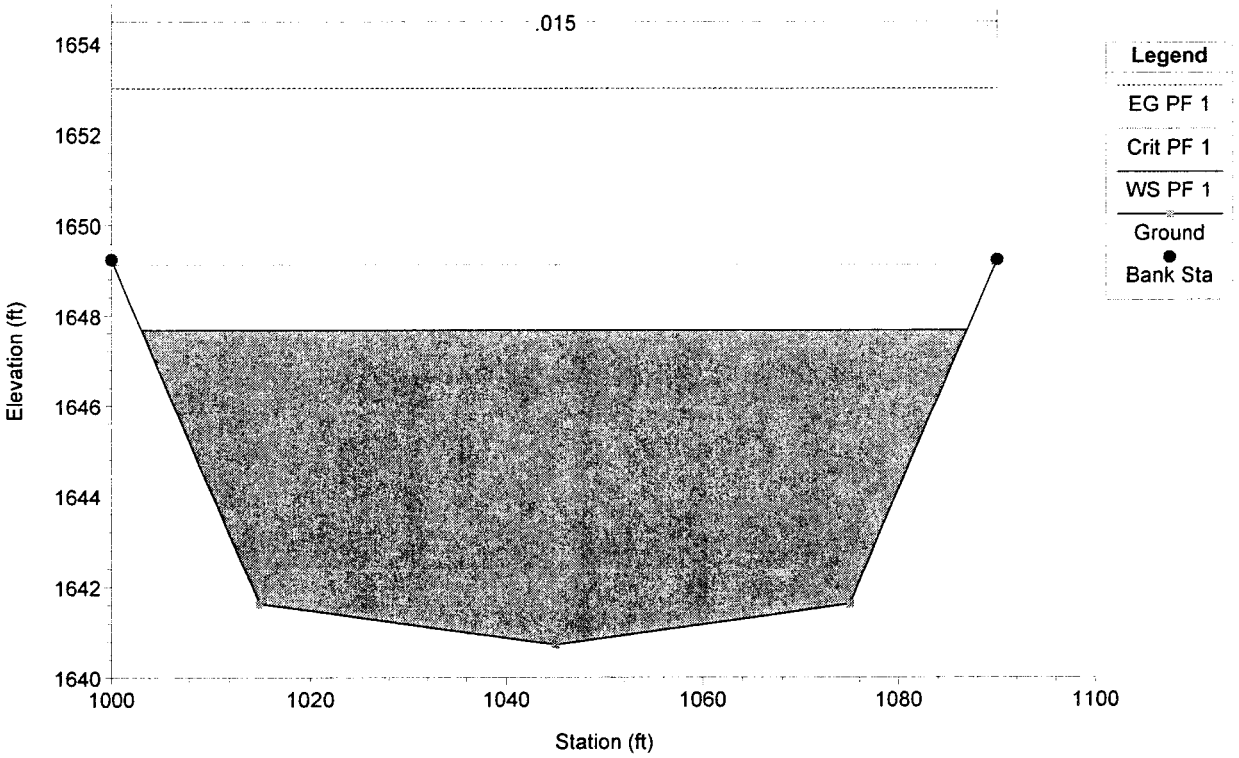

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14099.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14075.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)

Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

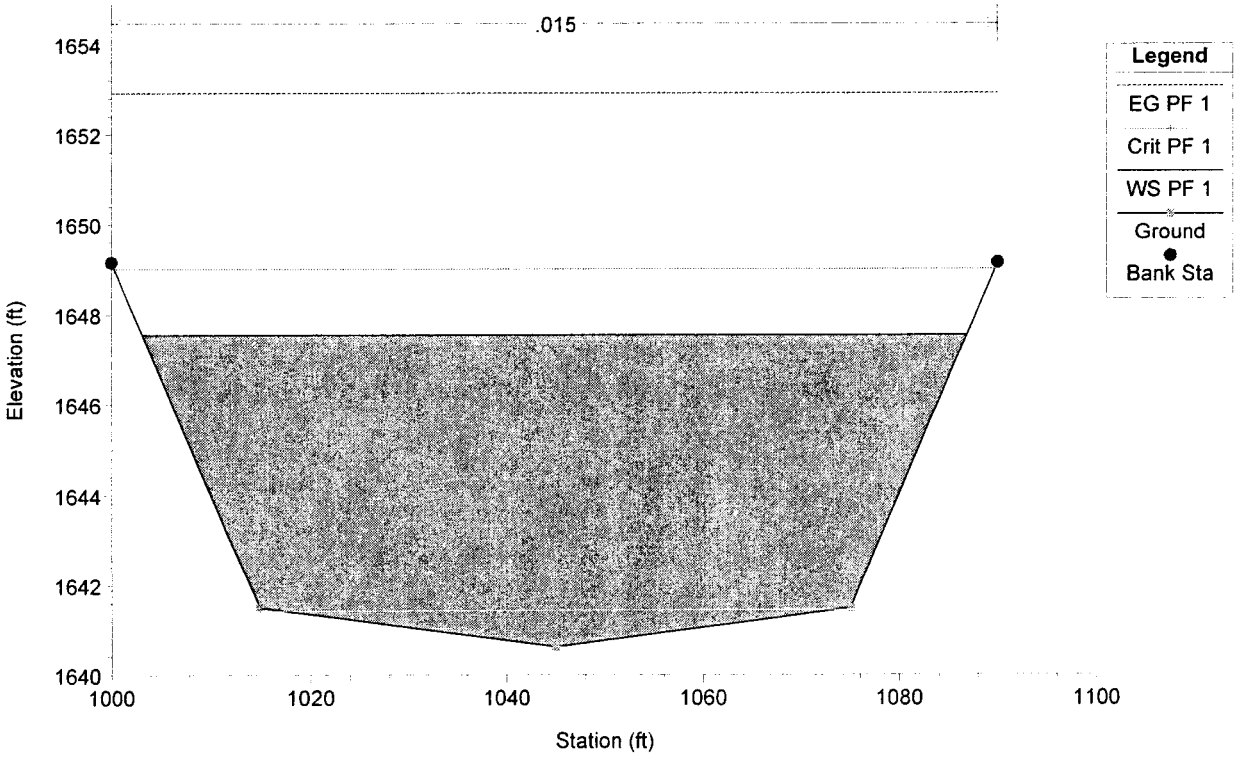
River = Duckcreek Reach = duckup RS = 14051.8*

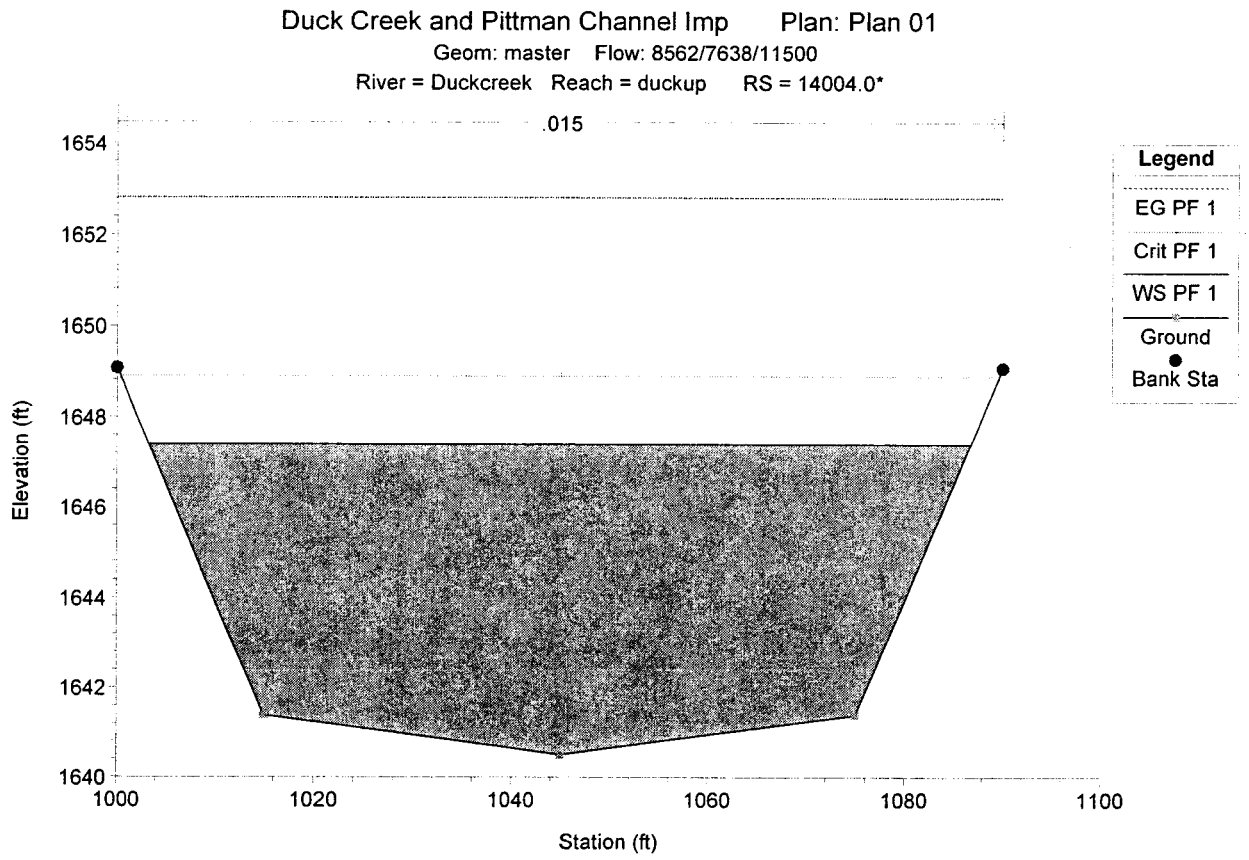


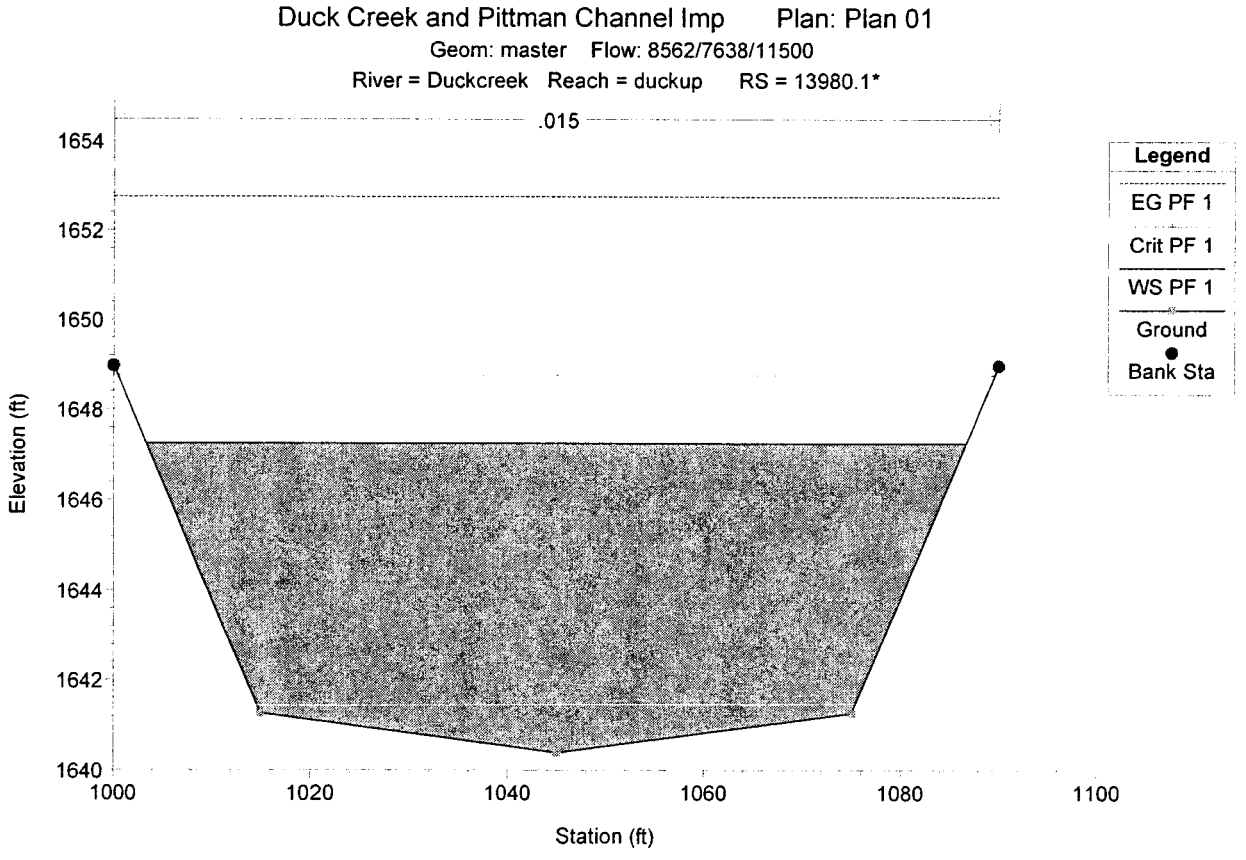
Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

River = Duckcreek Reach = duckup RS = 14027.9*



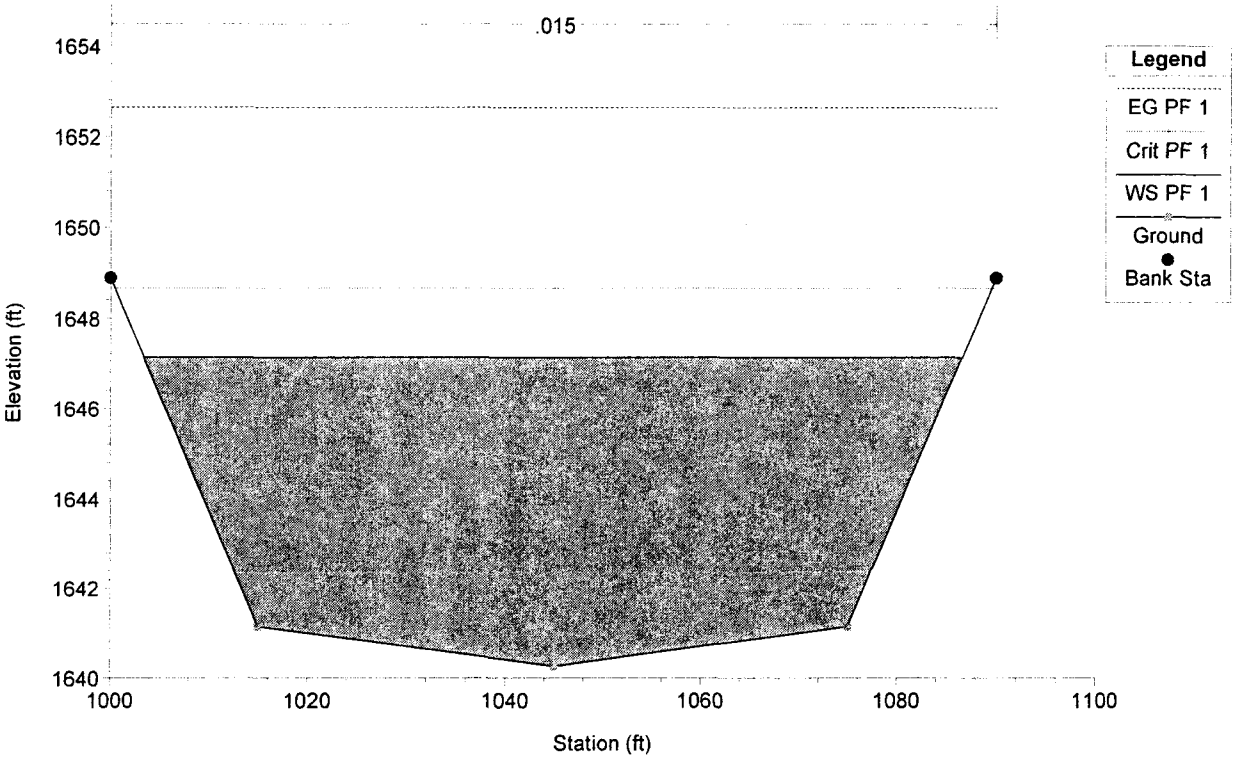

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 14004.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13980.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
Station (ft)

Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

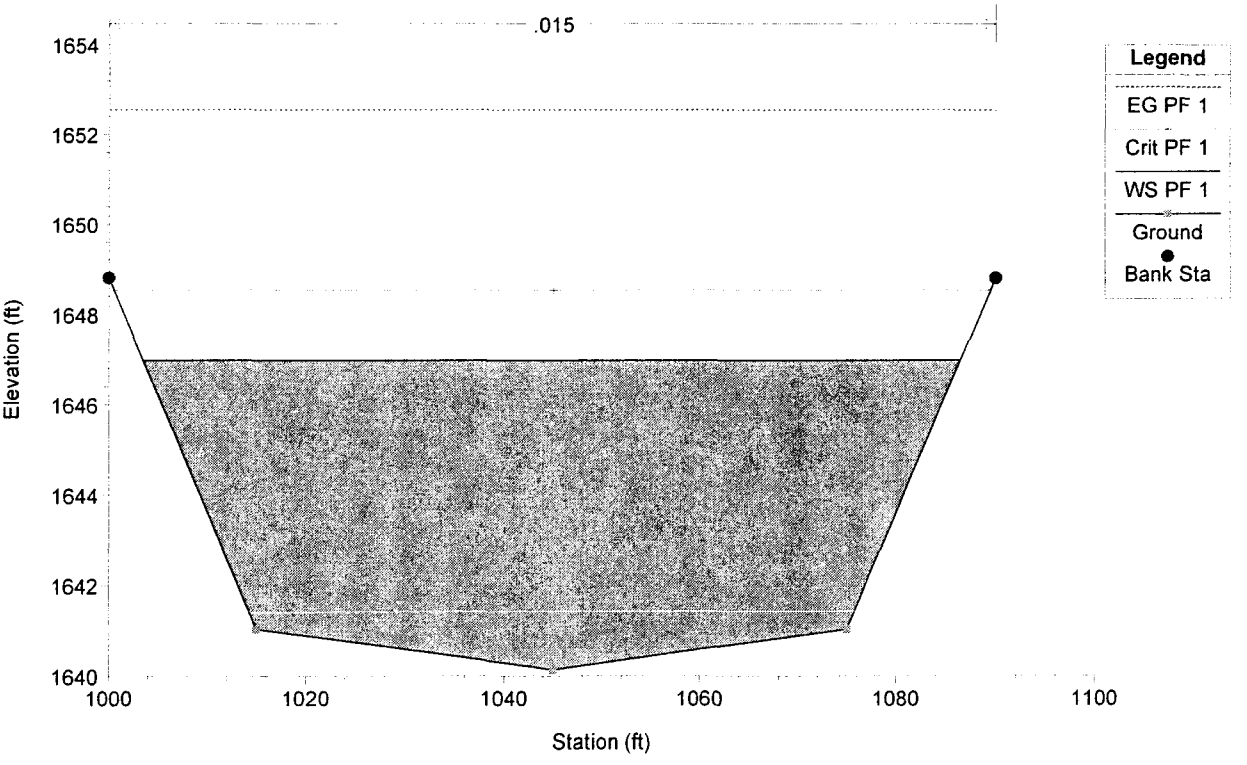
River = Duckcreek Reach = duckup RS = 13956.2*



Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

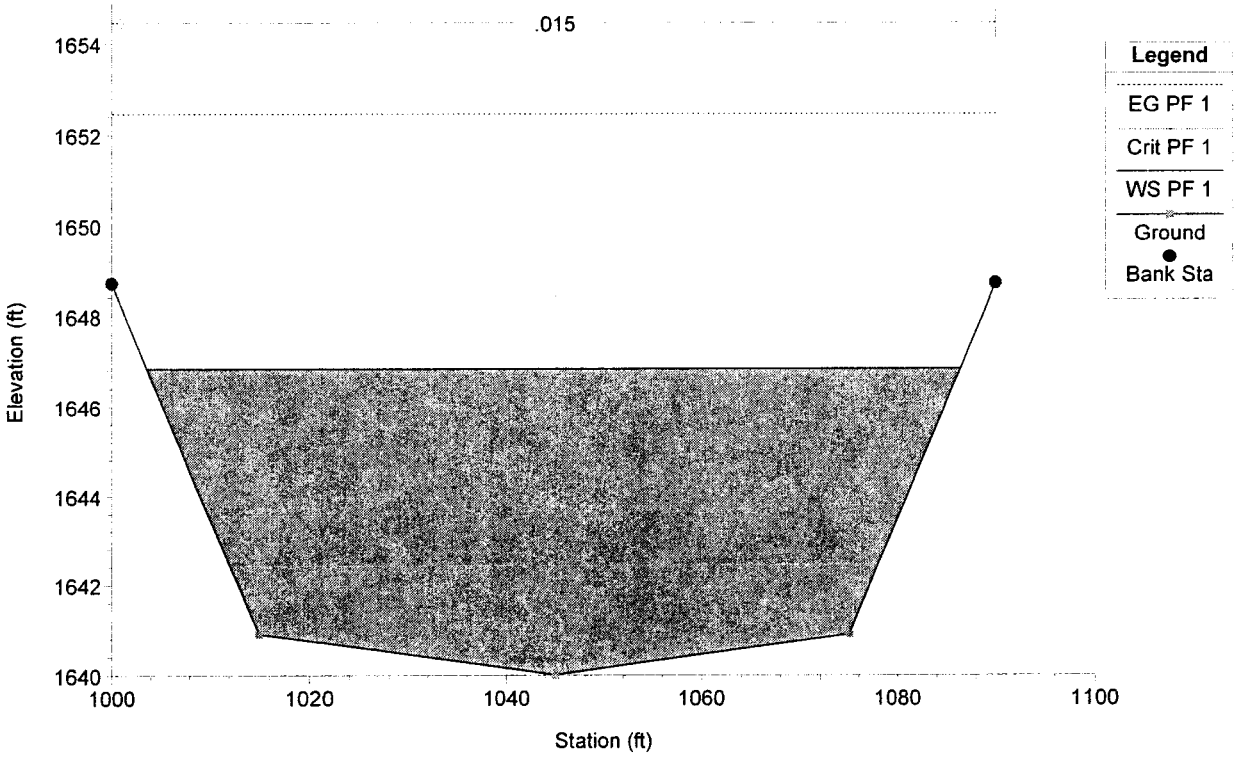
River = Duckcreek Reach = duckup RS = 13932.2*



Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

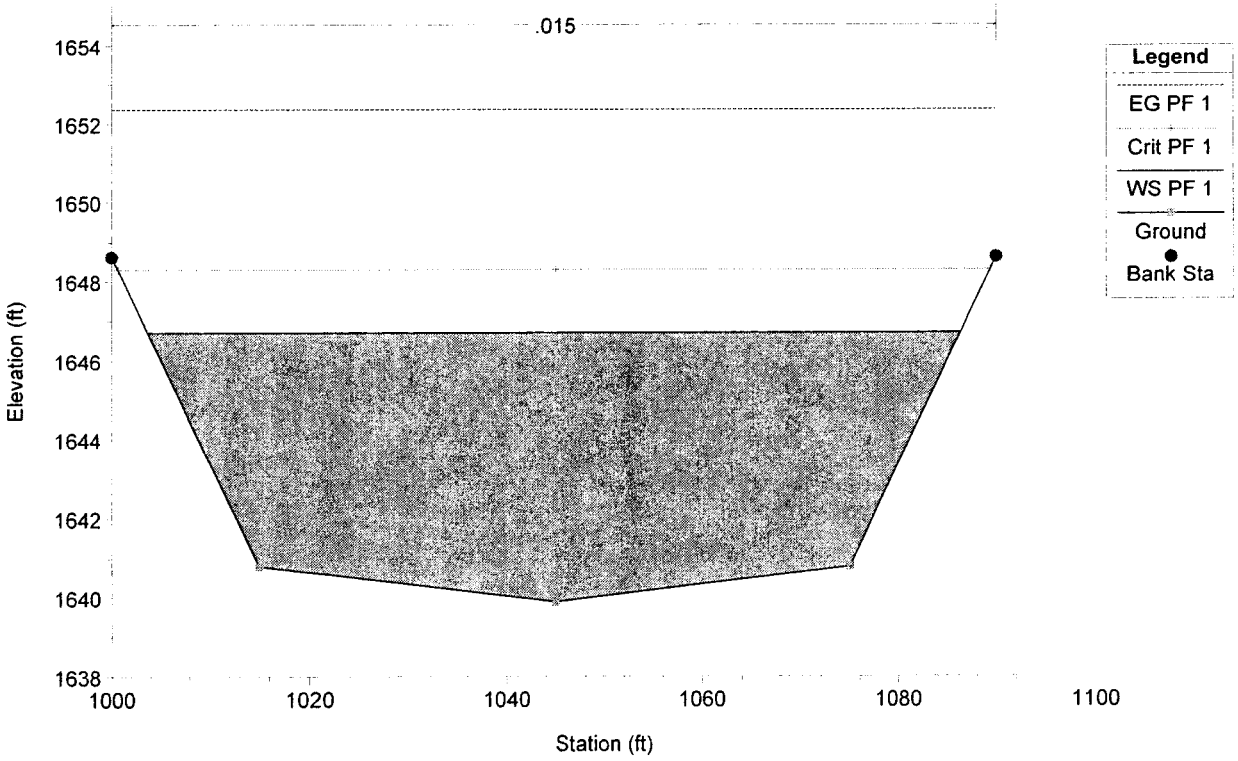
River = Duckcreek Reach = duckup RS = 13908.3*



Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

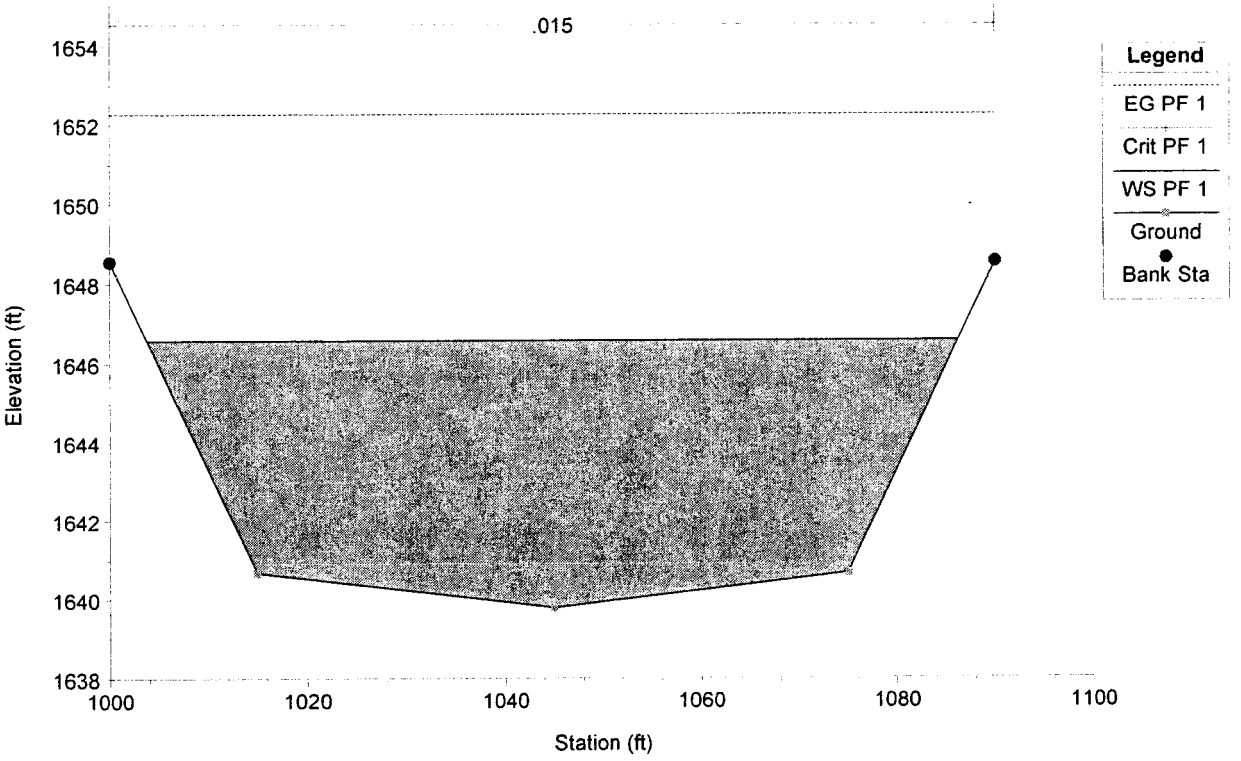
River = Duckcreek Reach = duckup RS = 13884.4*



Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

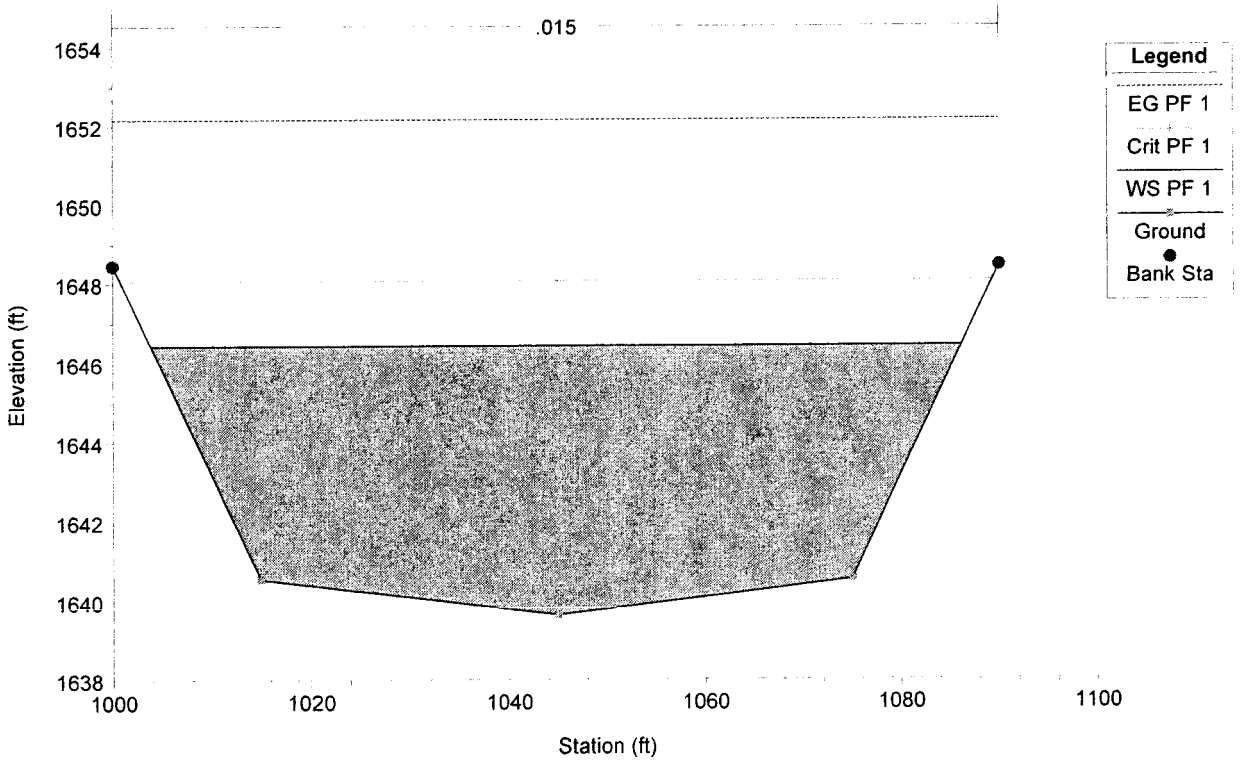
River = Duckcreek Reach = duckup RS = 13860.5*

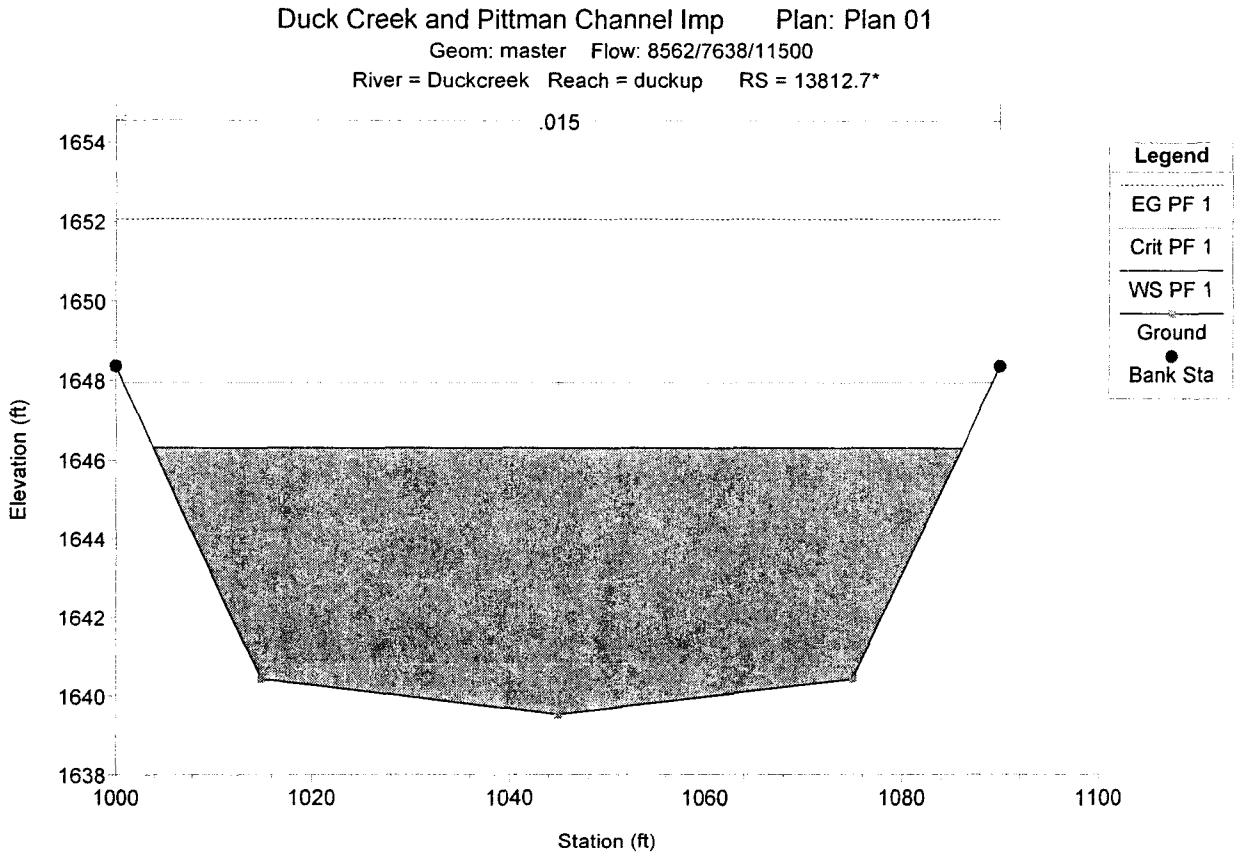


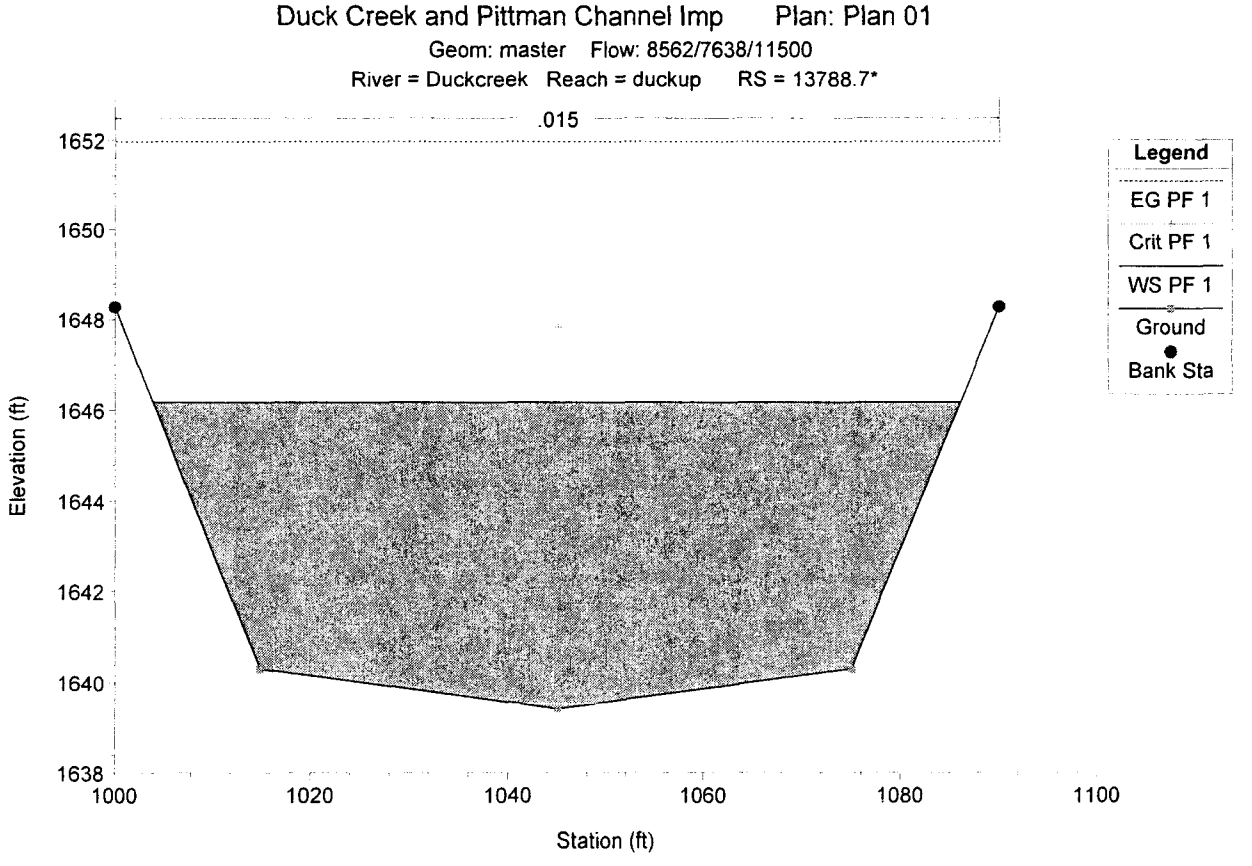
Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

River = Duckcreek Reach = duckup RS = 13836.6*



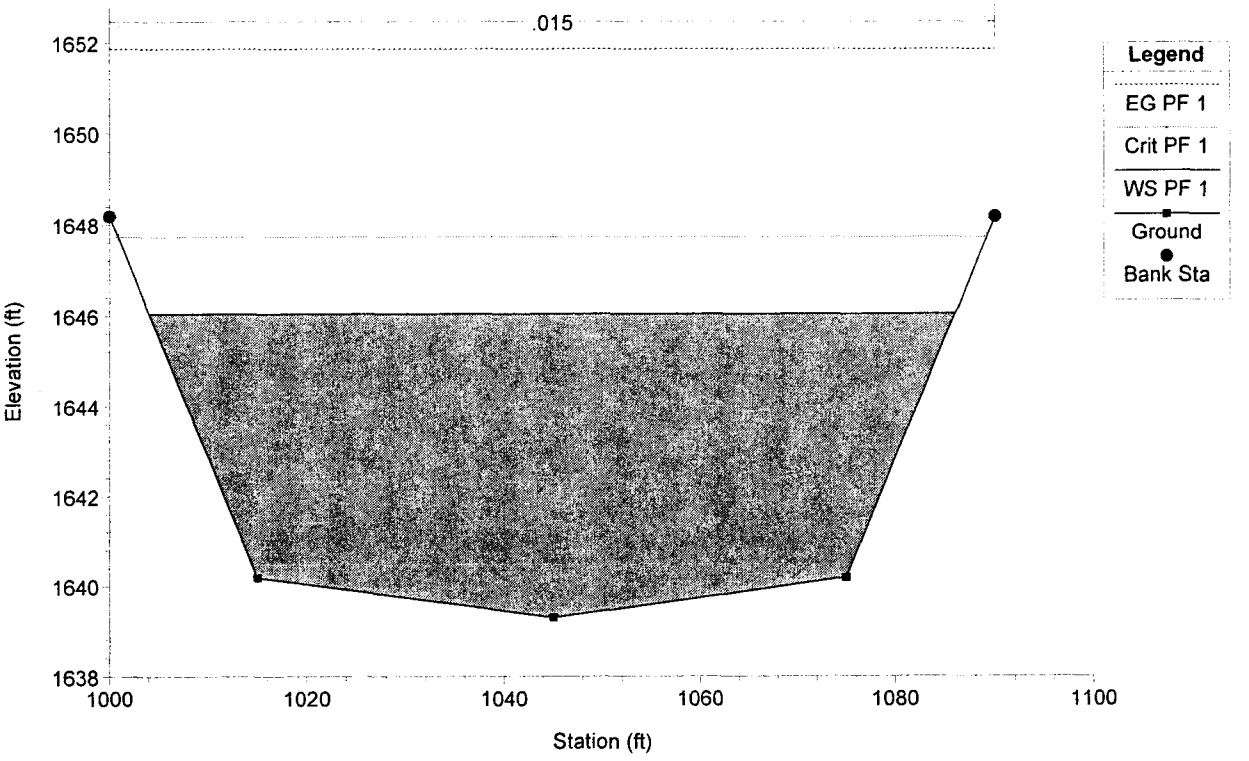

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13812.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1638
1000
1020
1040
1060
1080
1100
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13788.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1000
1020
1040
1060
1080
1100
Station (ft)

Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

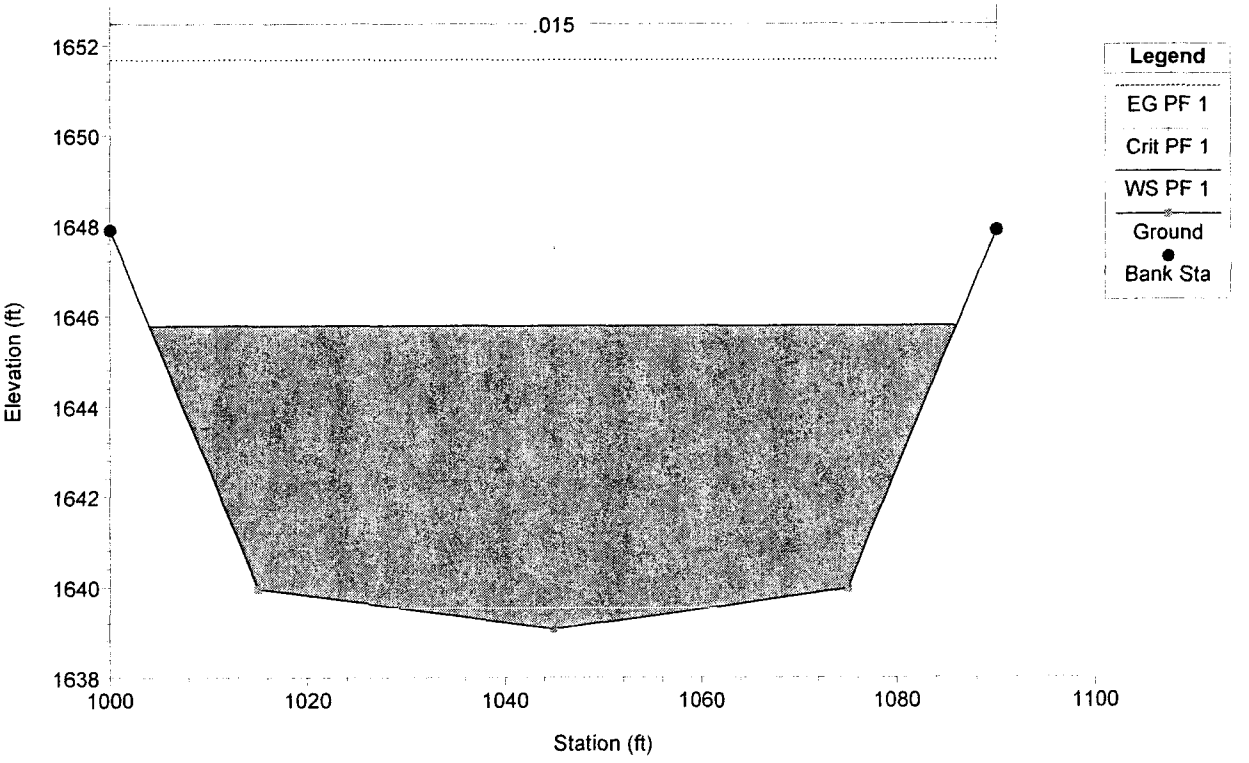
River = Duckcreek Reach = duckup RS = 13764.88 STA 13768.37 PC (PLAN 13108.73)

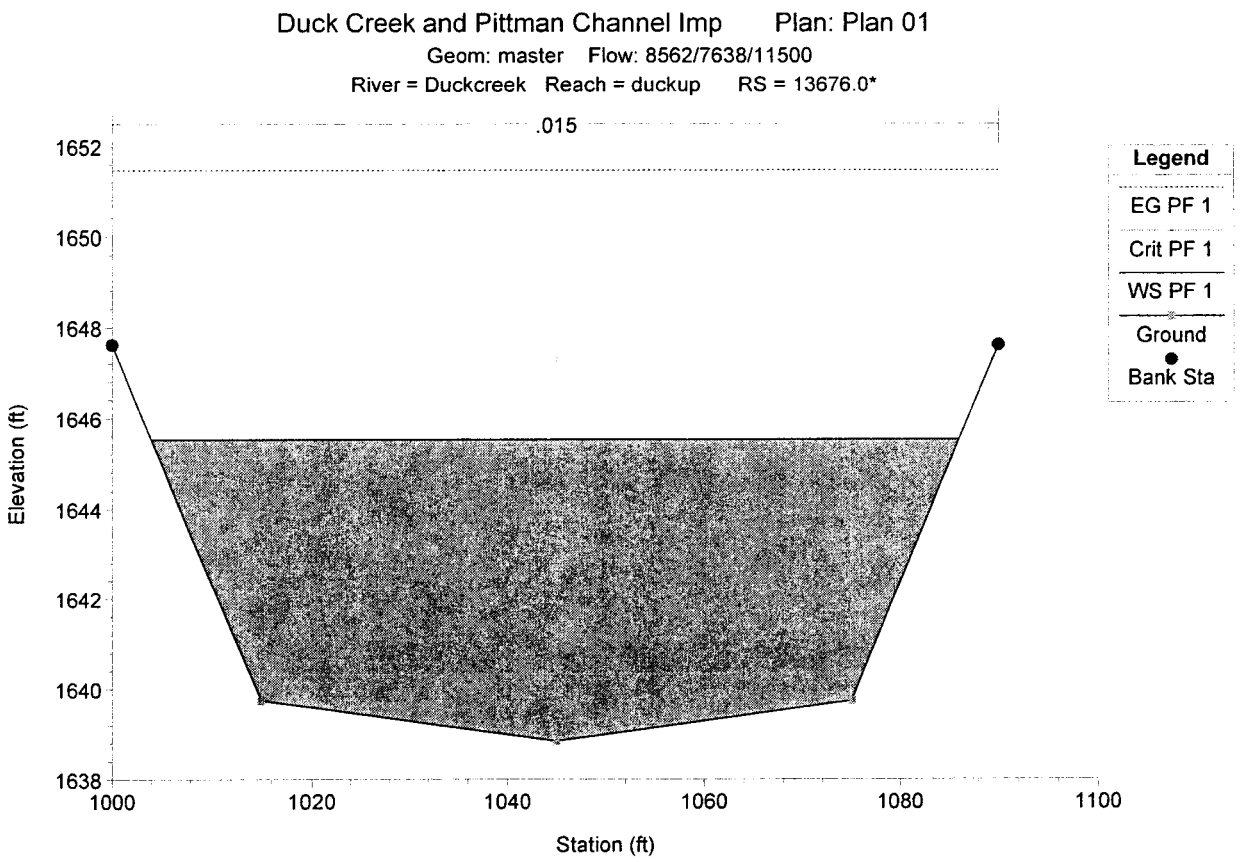


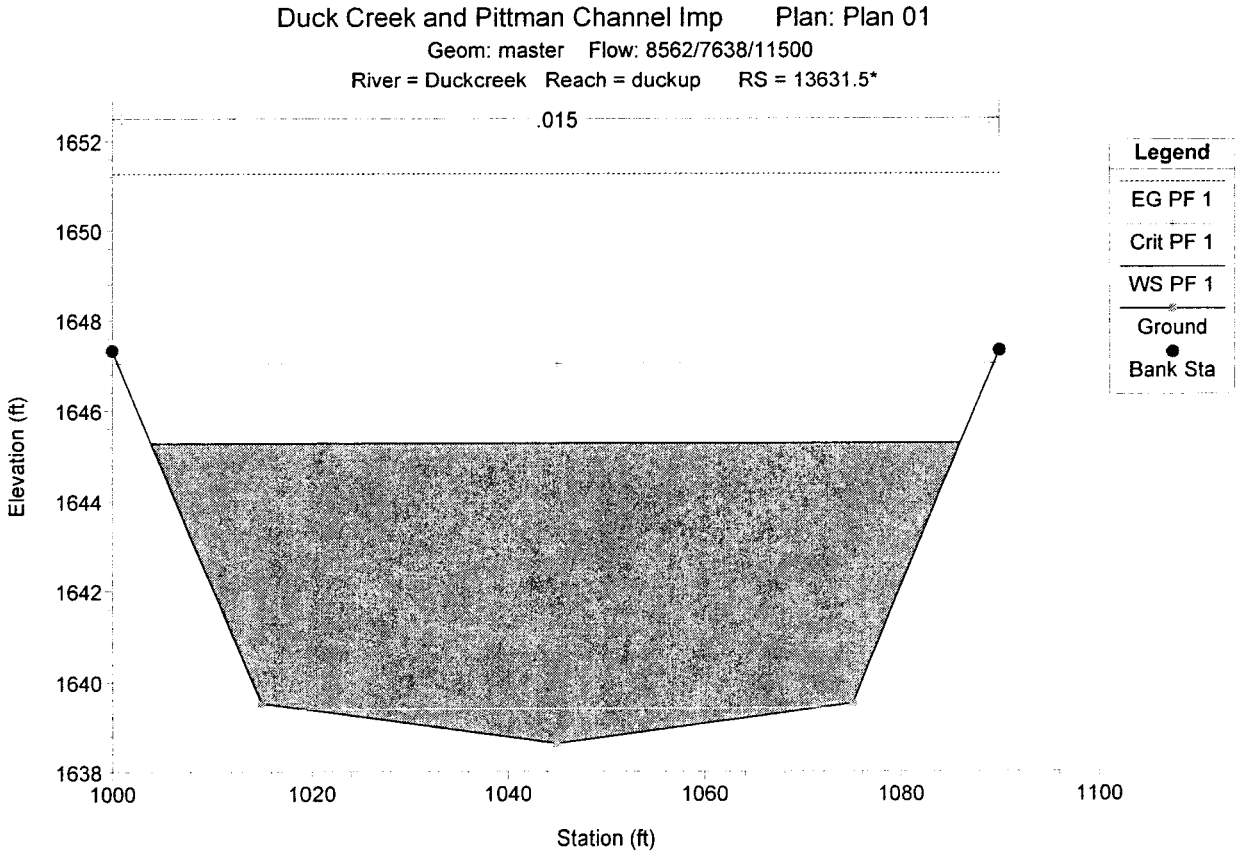
Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

River = Duckcreek Reach = duckup RS = 13720.4*



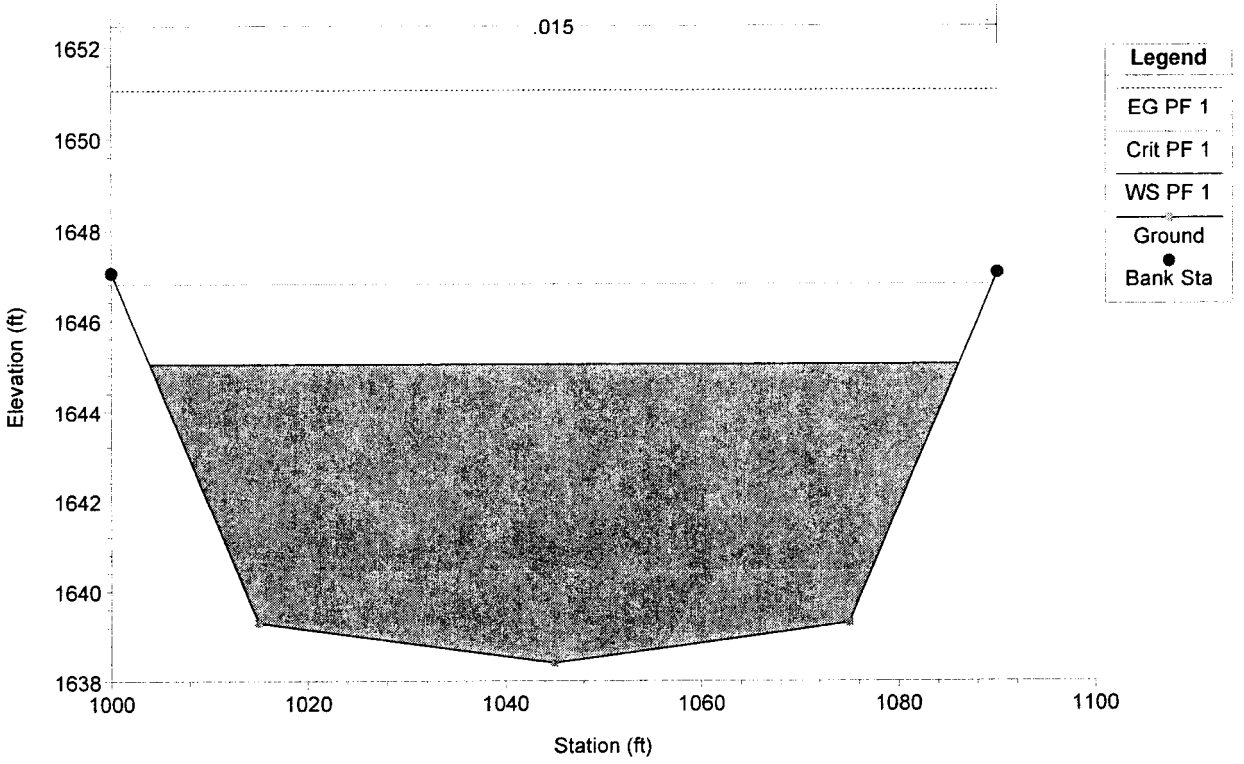

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13676.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1000
1020
1040
1060
1080
1100


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13631.5*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1000
1020
1040
1060
1080
1100

Duck Creek and Pittman Channel Imp Plan: Plan 01

Geom: master Flow: 8562/7638/11500

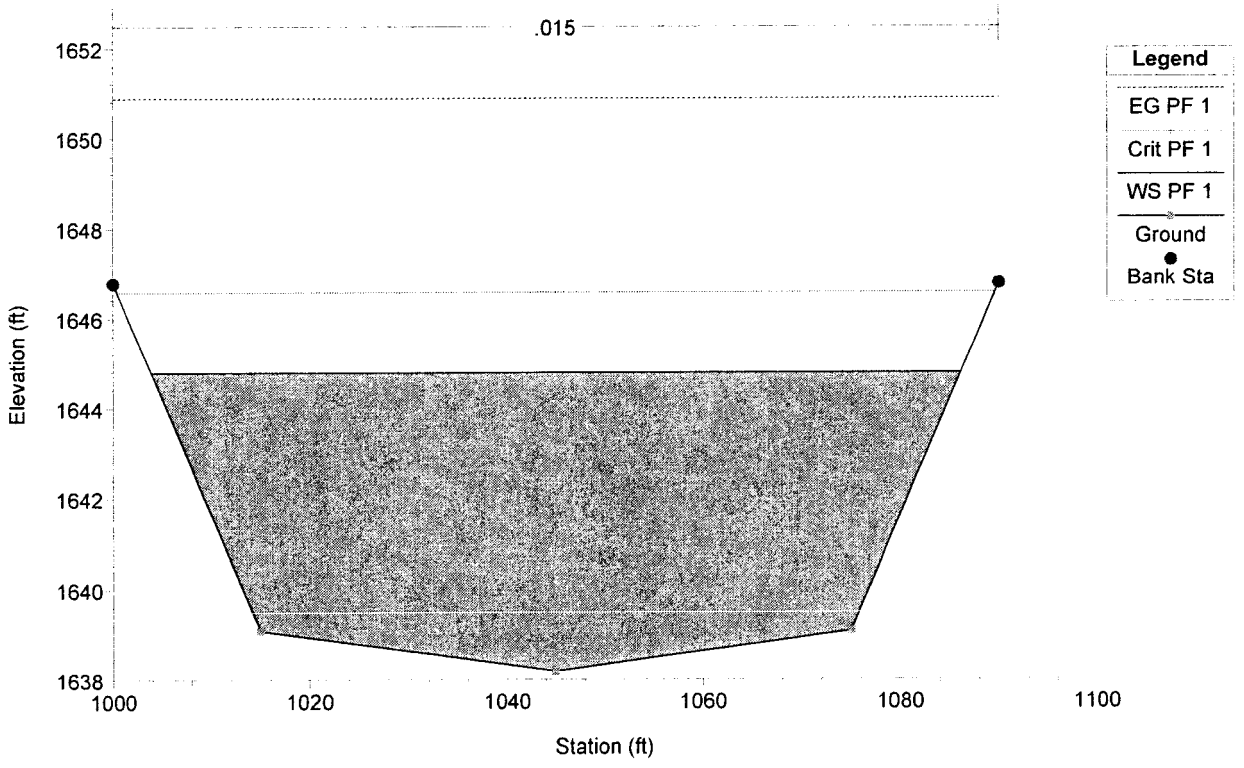
River = Duckcreek Reach = duckup RS = 13587.1*

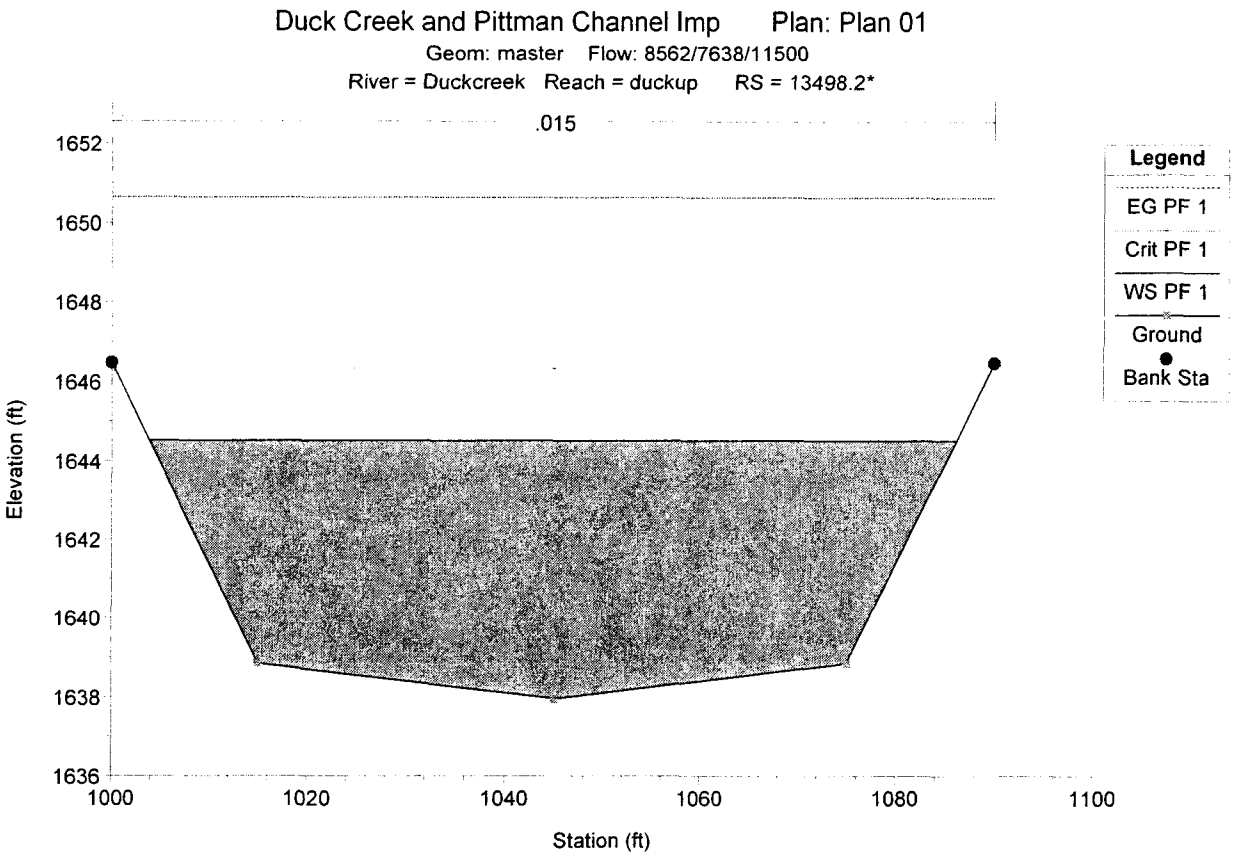


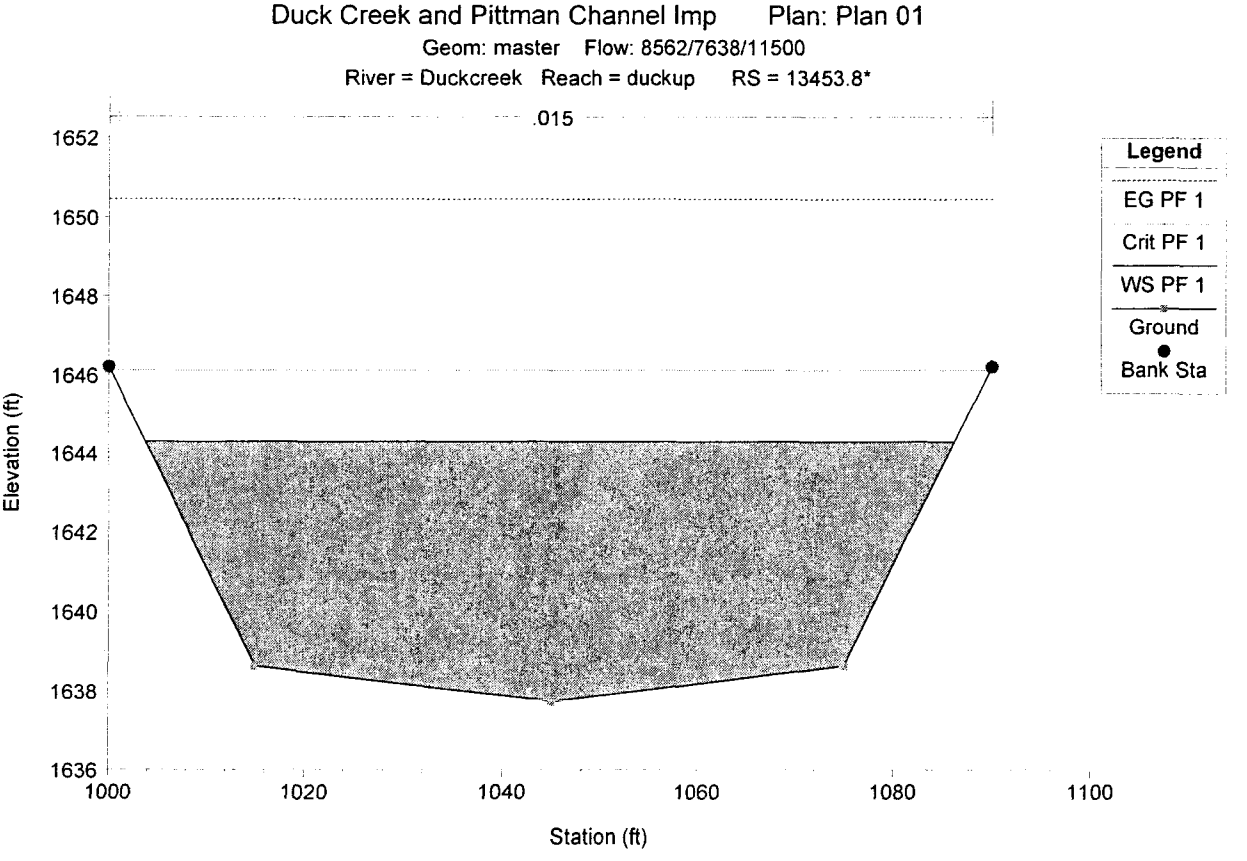
Duck Creek and Pittman Channel Imp Plan: Plan 01

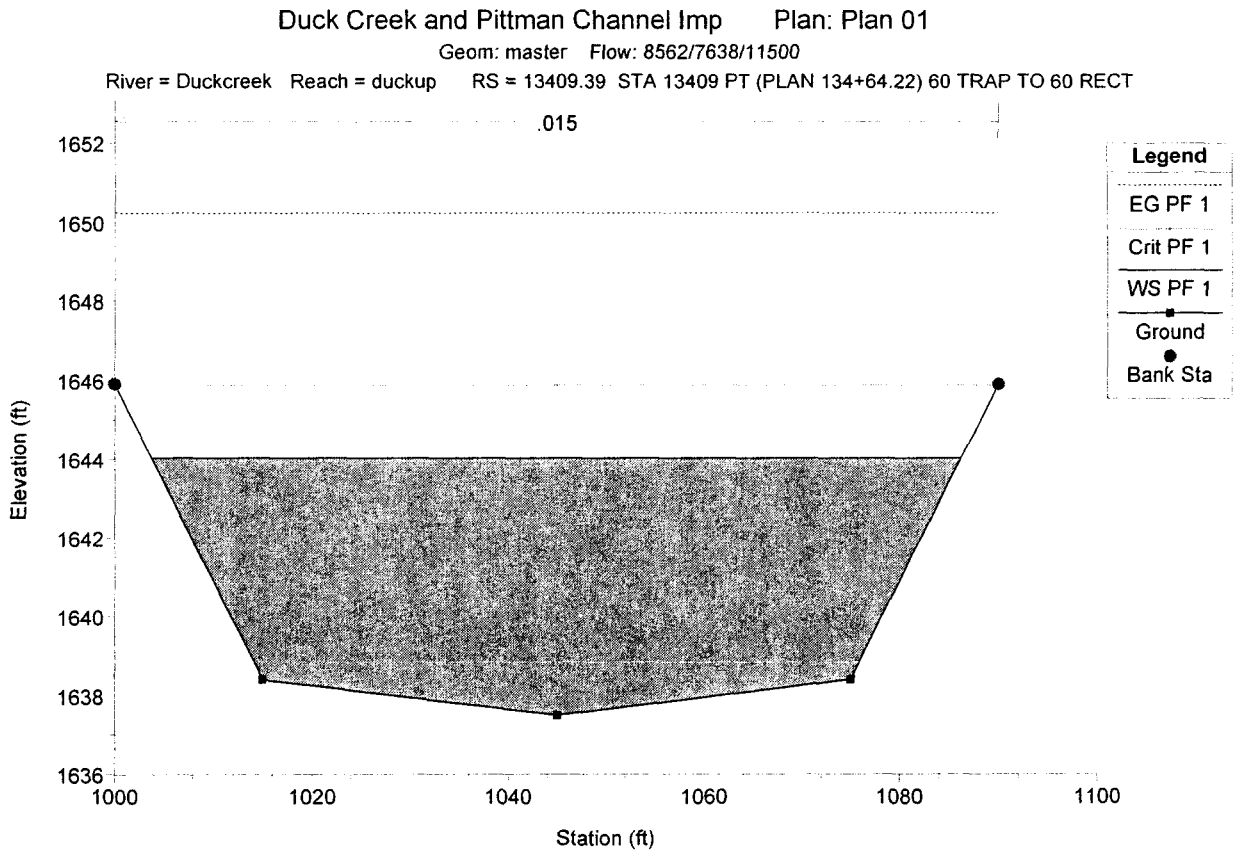
Geom: master Flow: 8562/7638/11500

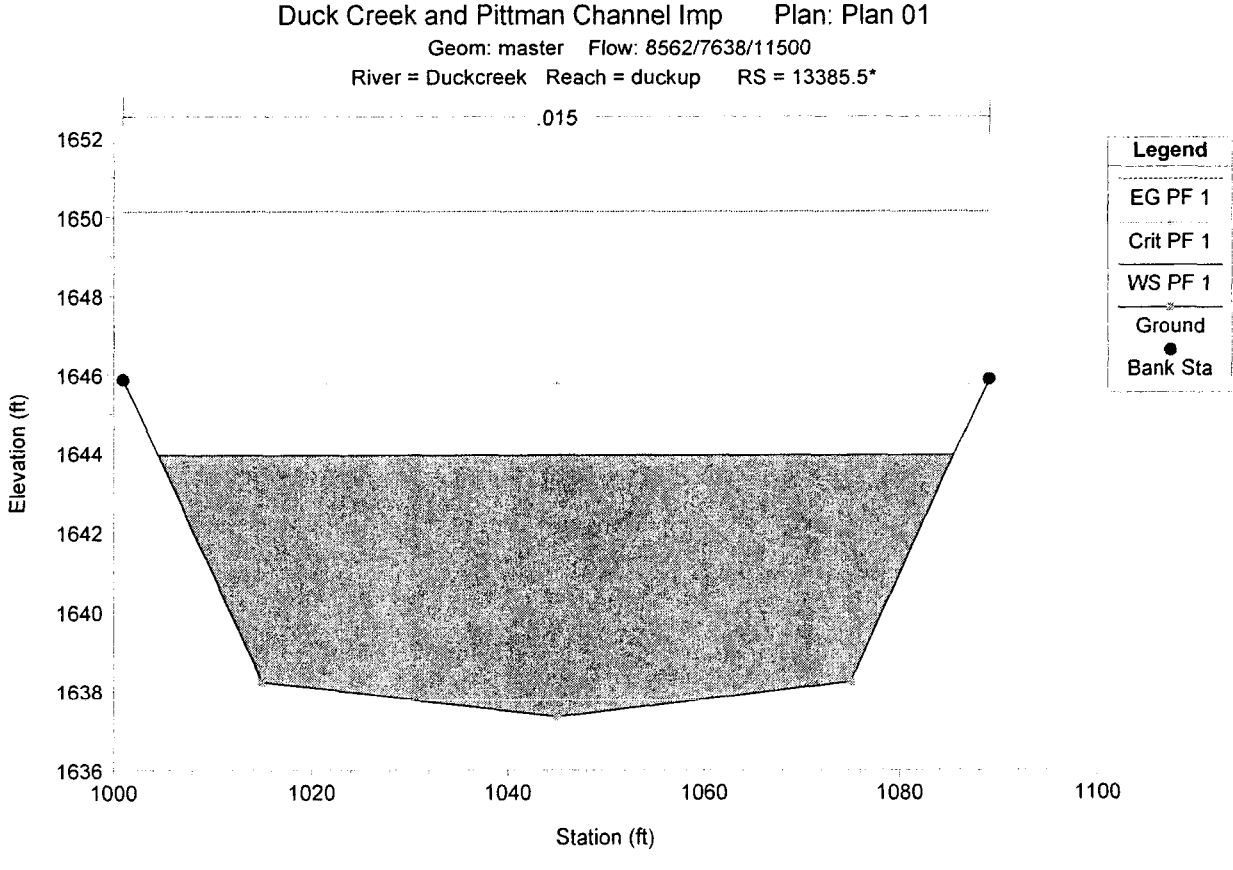
River = Duckcreek Reach = duckup RS = 13542.6*

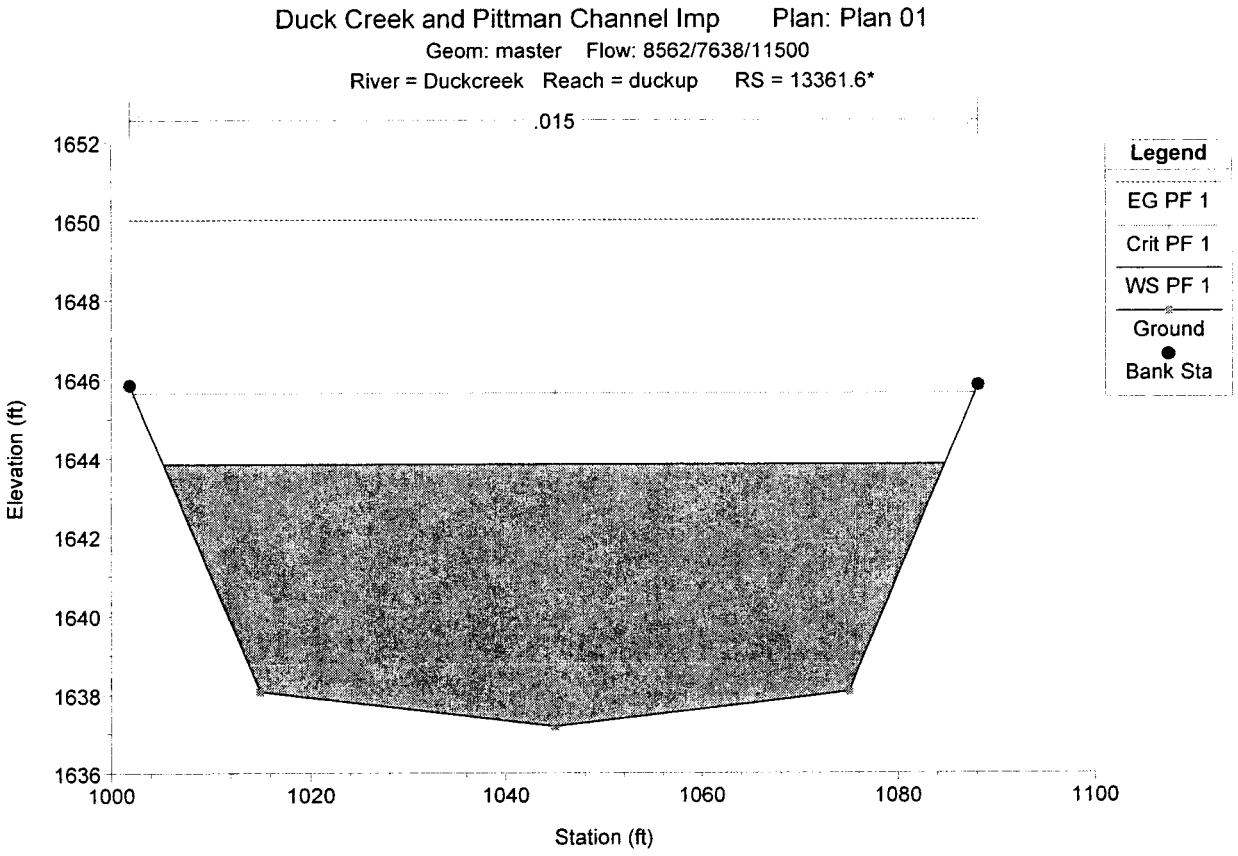


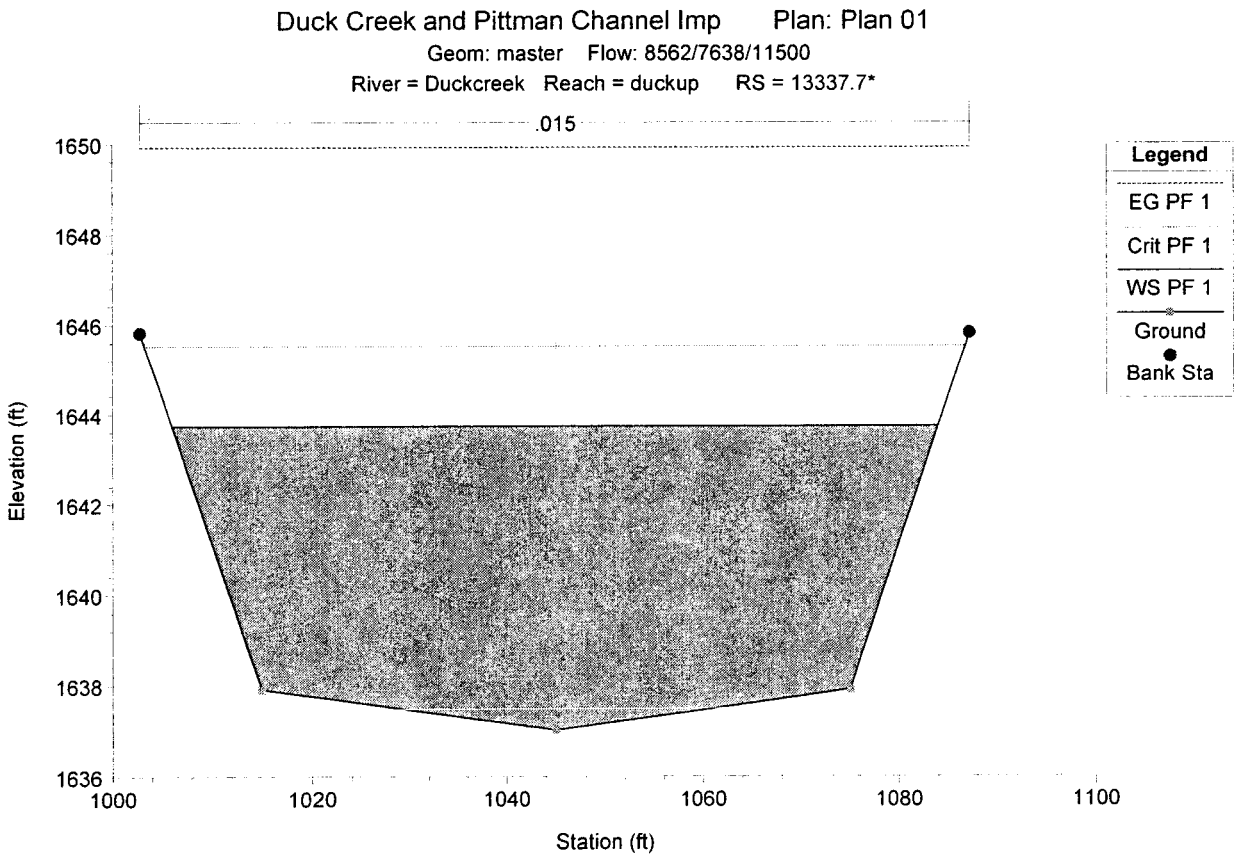

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13498.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

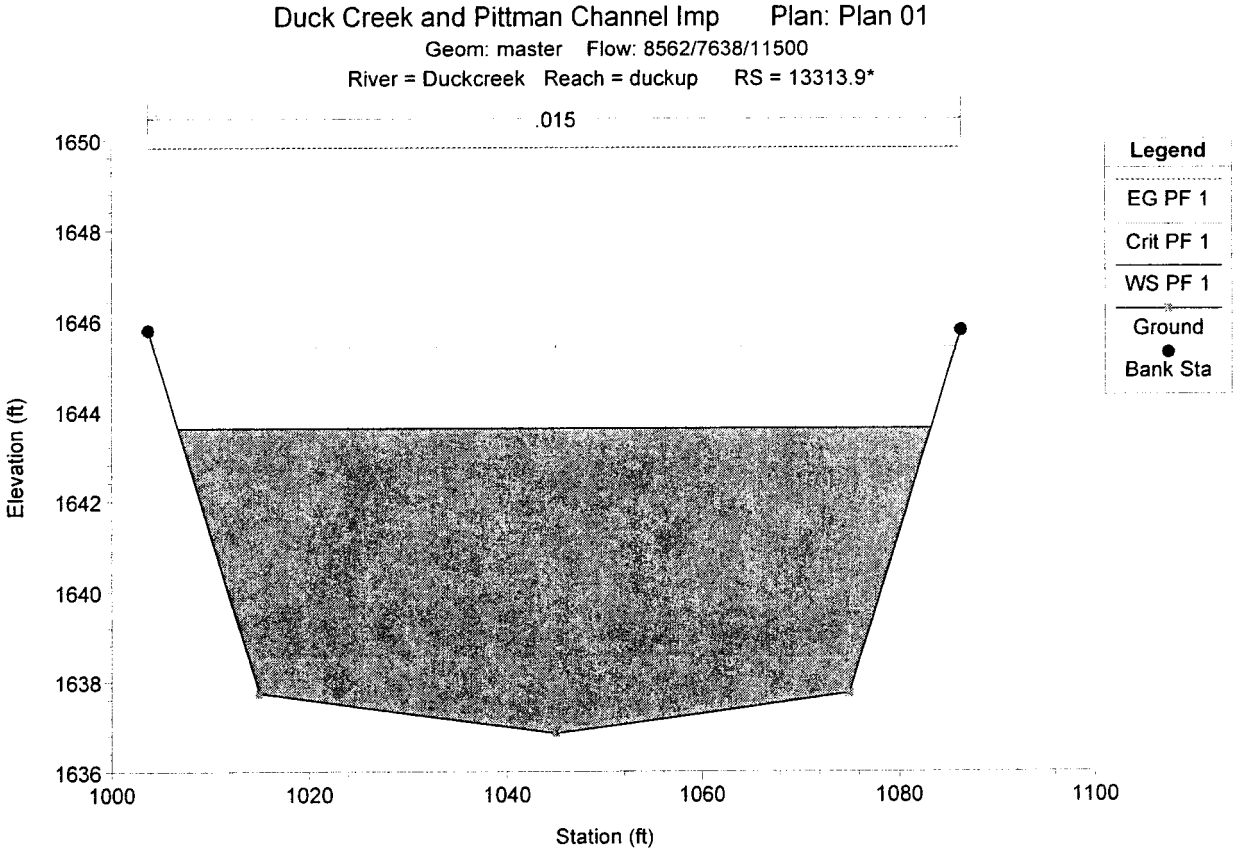

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13453.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

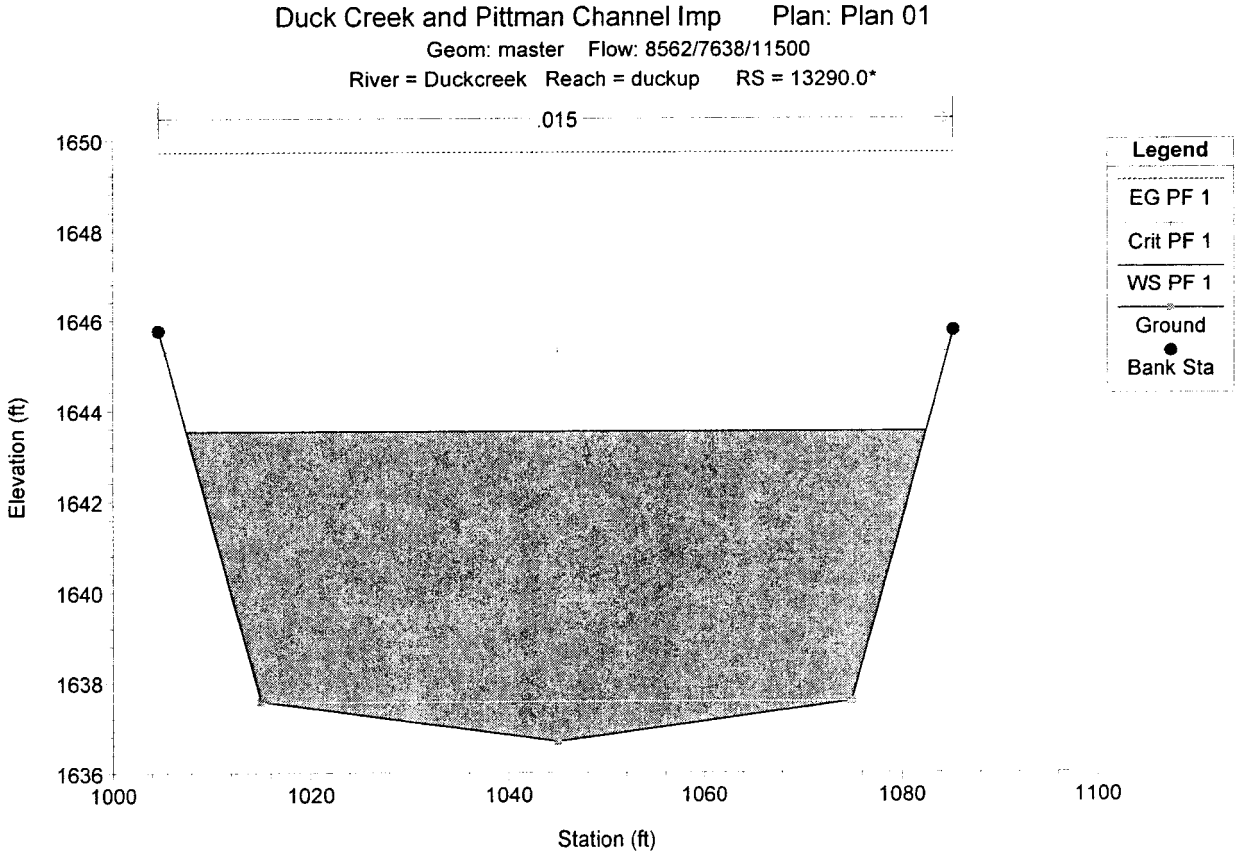

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13409.39 STA 13409 PT (PLAN 134+64.22) 60 TRAP TO 60 RECT
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

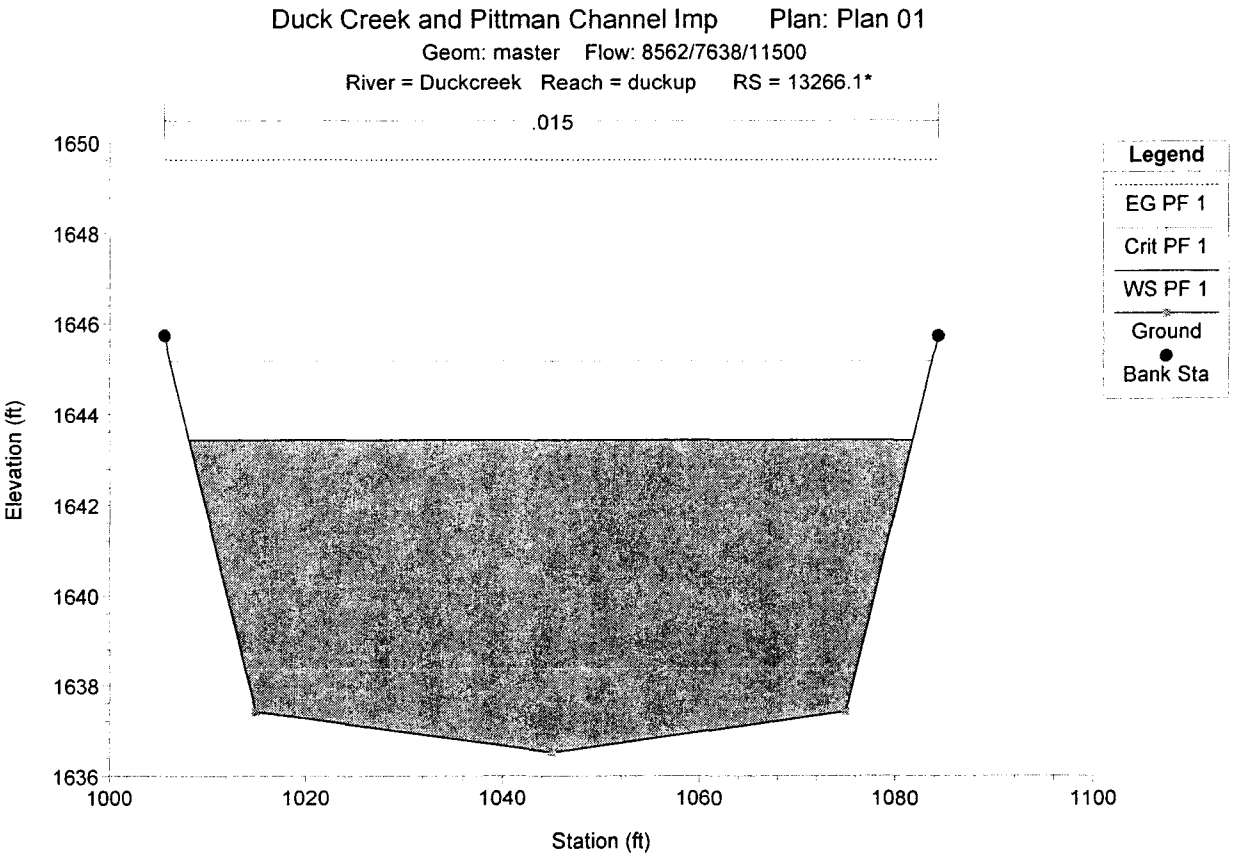

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13385.5*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

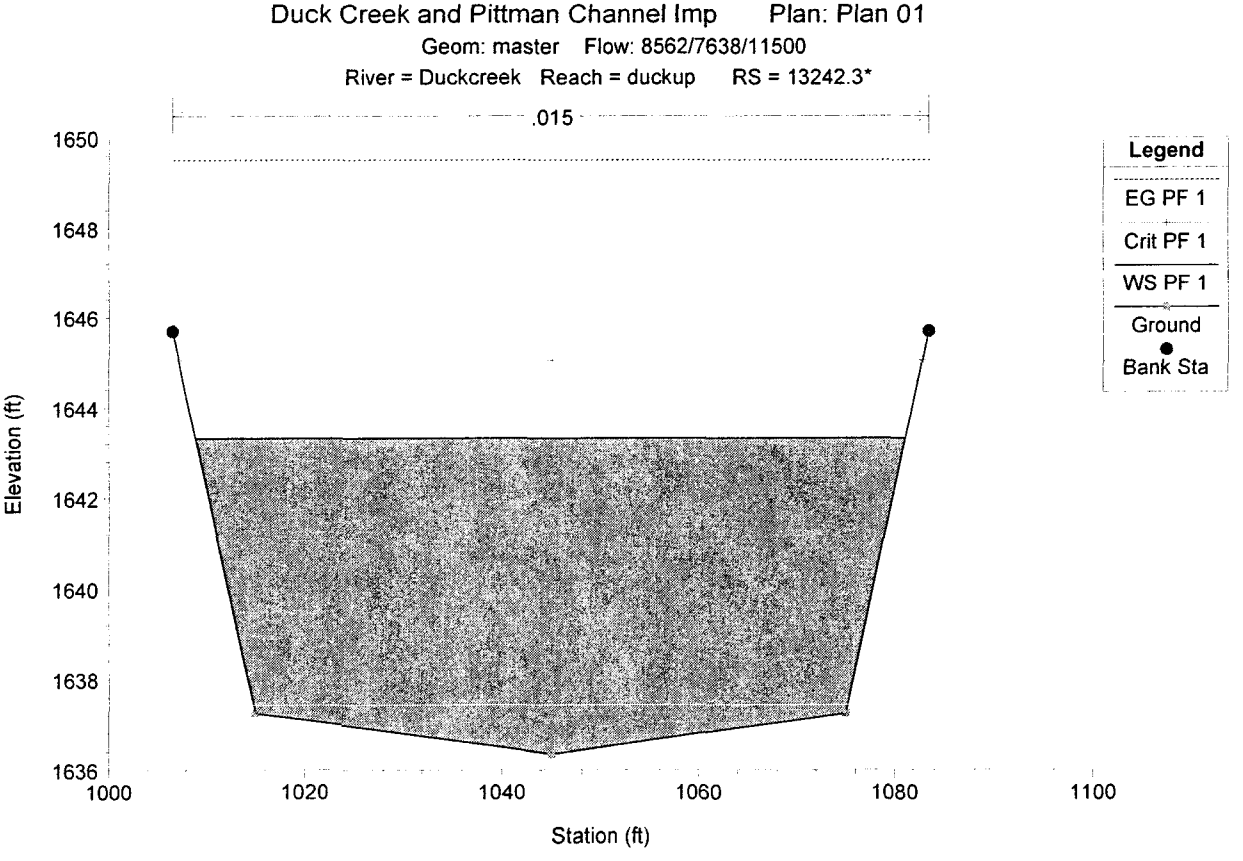

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13361.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

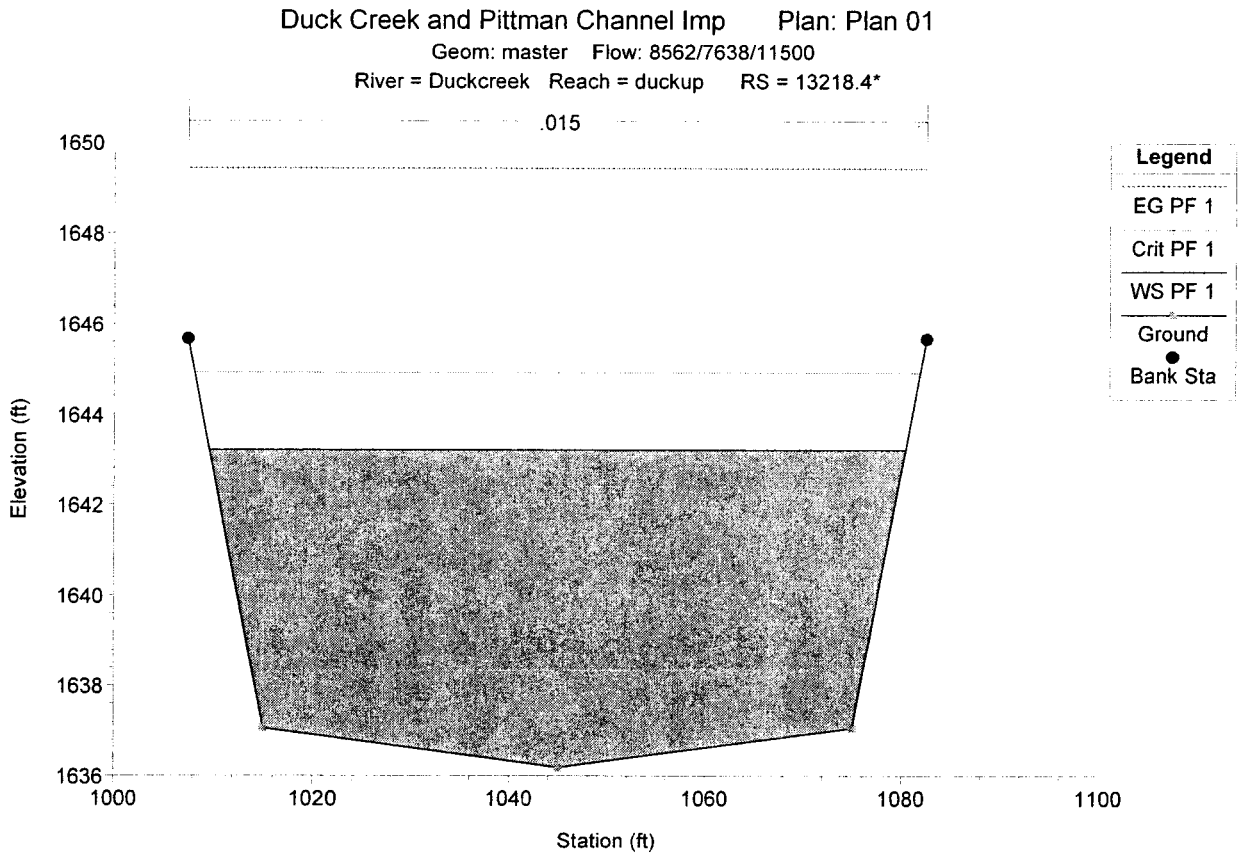

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13337.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

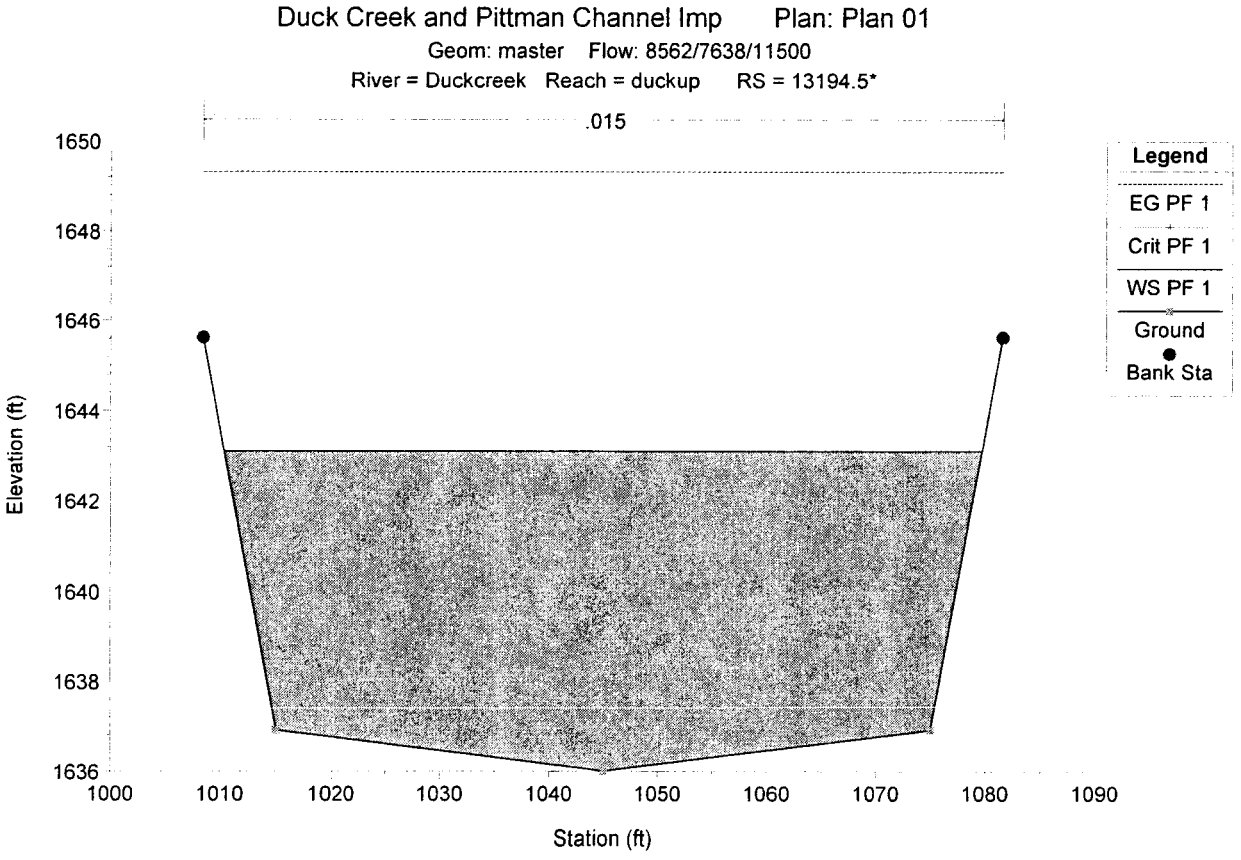

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13313.9*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

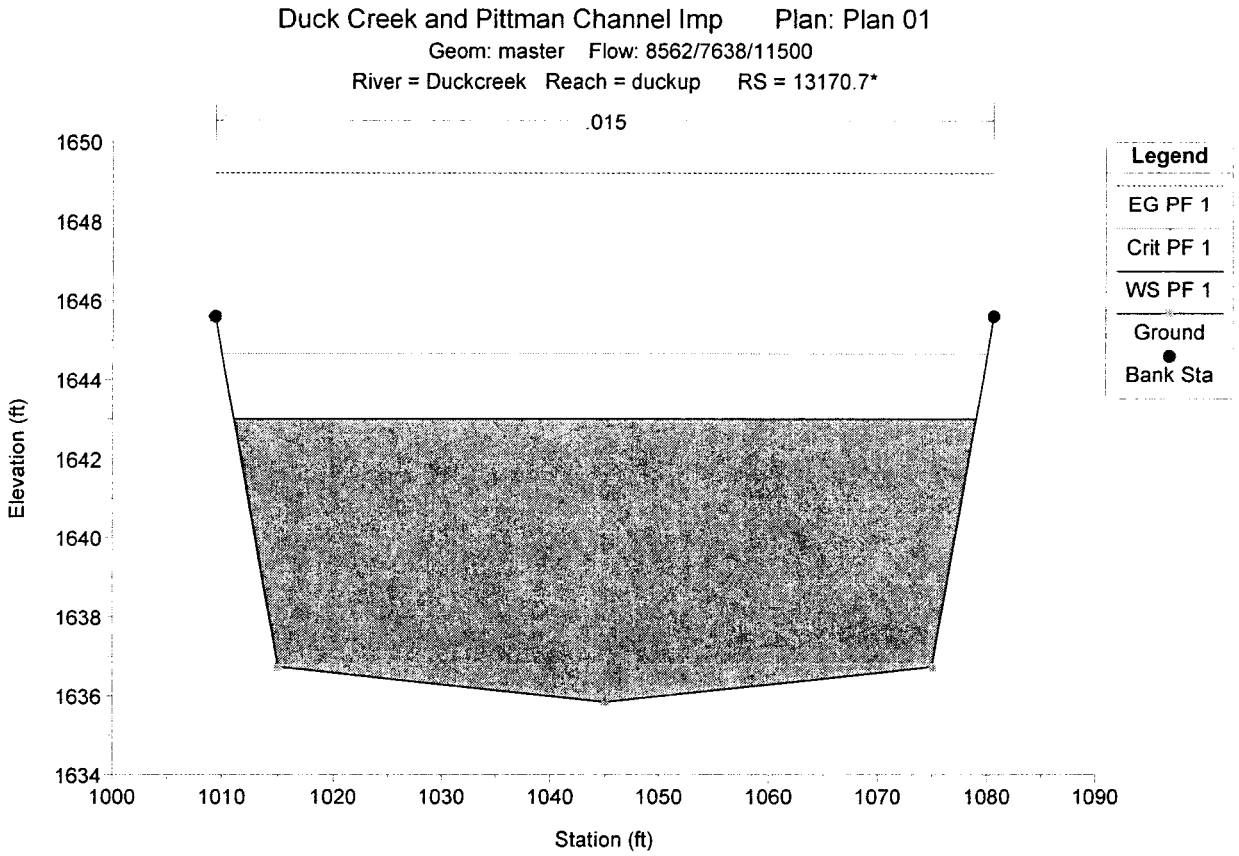

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13290.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
1640
1638
1636
1000
1020
1040
1060
1080
1100
Station (ft)

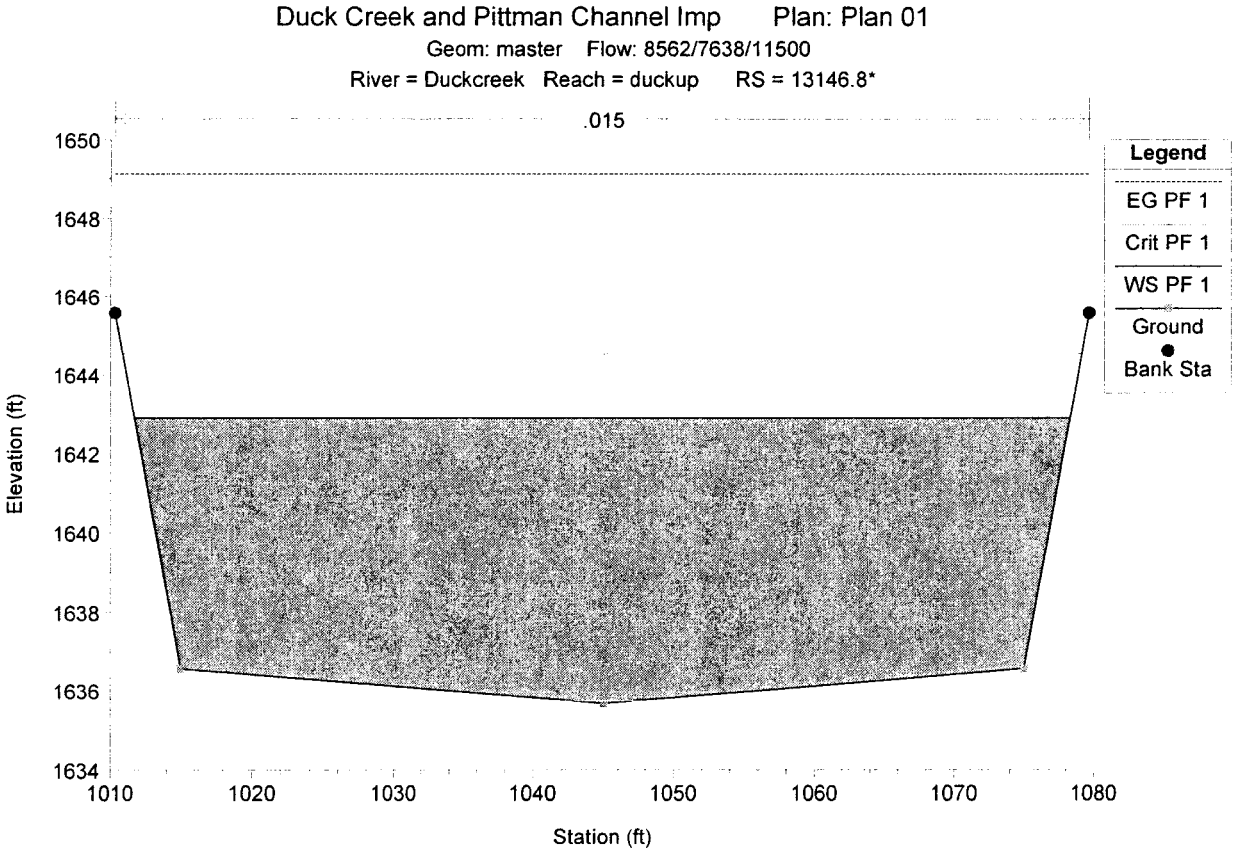

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13266.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
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1644
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1640
1638
1636
1000
1020
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1060
1080
1100
Station (ft)

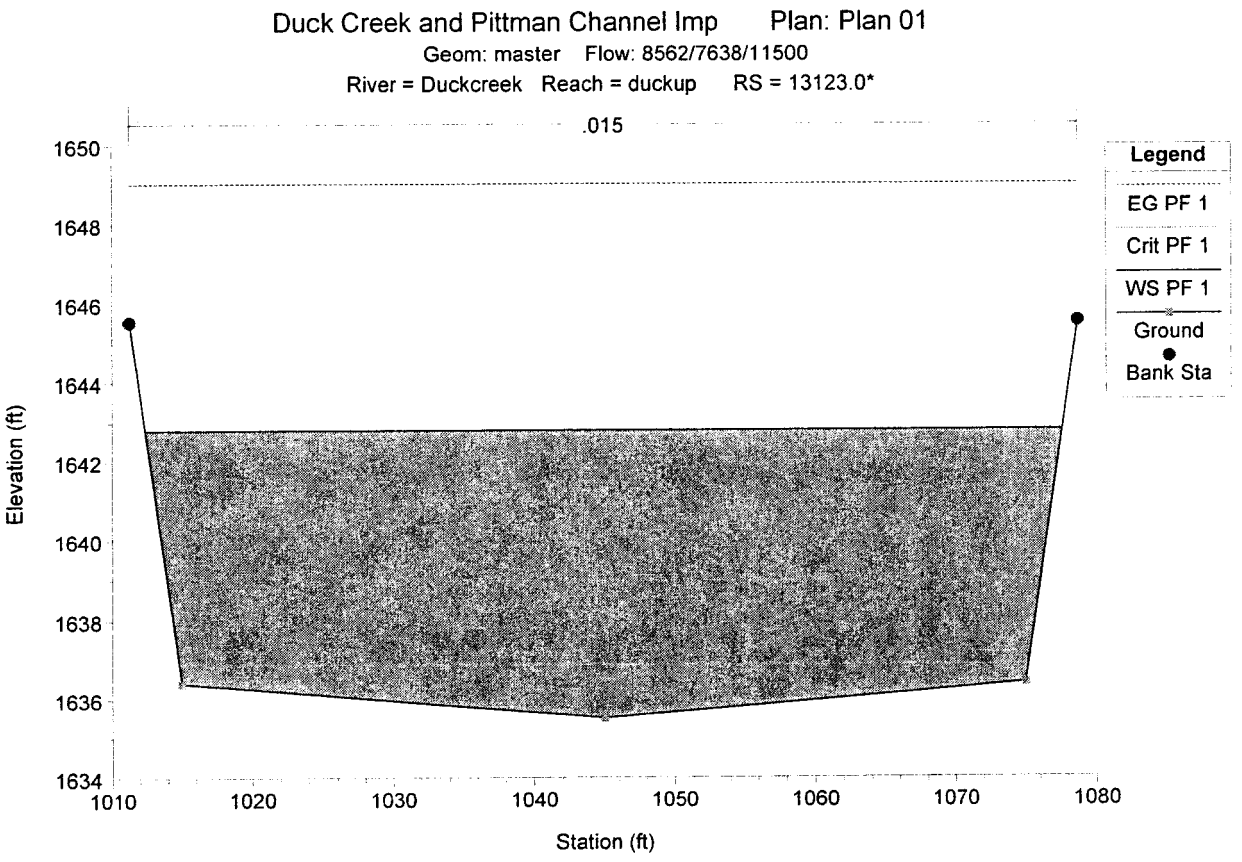

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13242.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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1638
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1060
1080
1100
Station (ft)

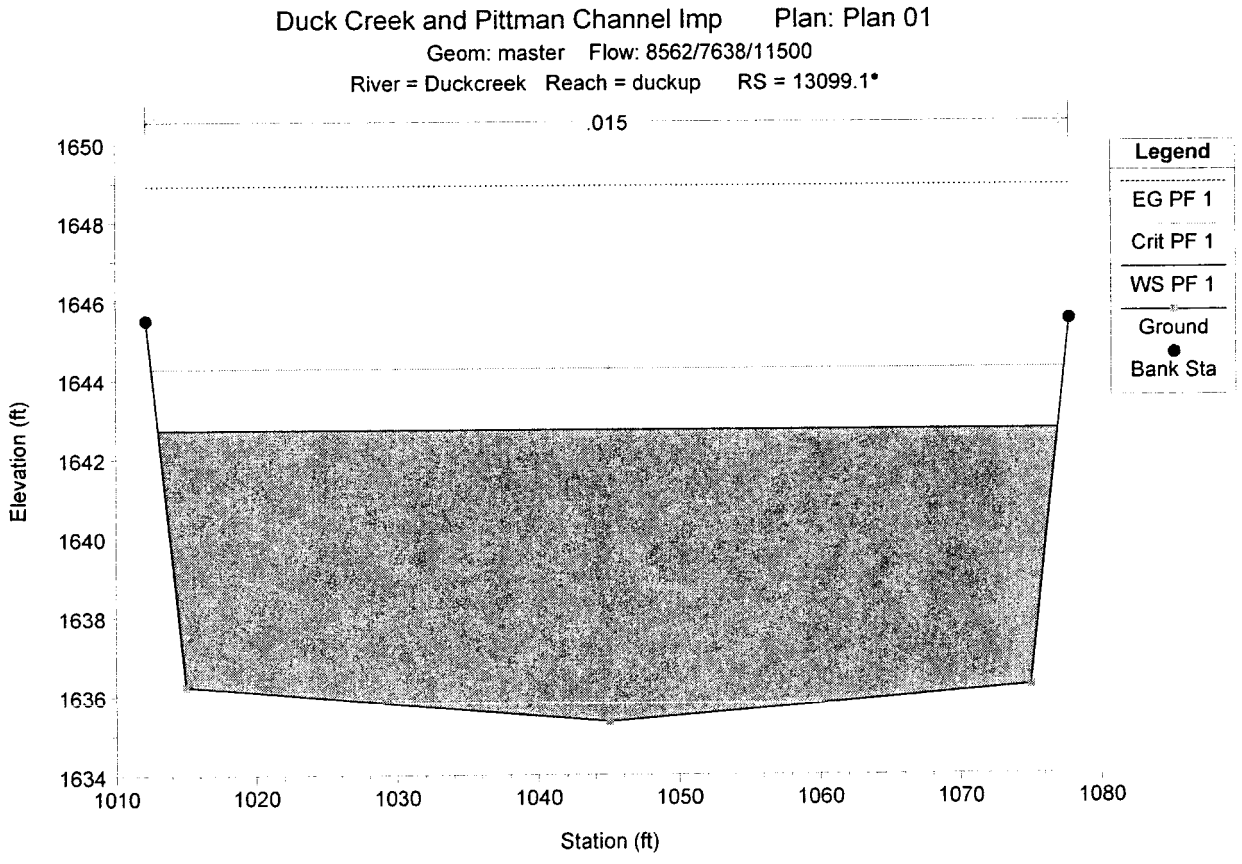

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13218.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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1100
Station (ft)

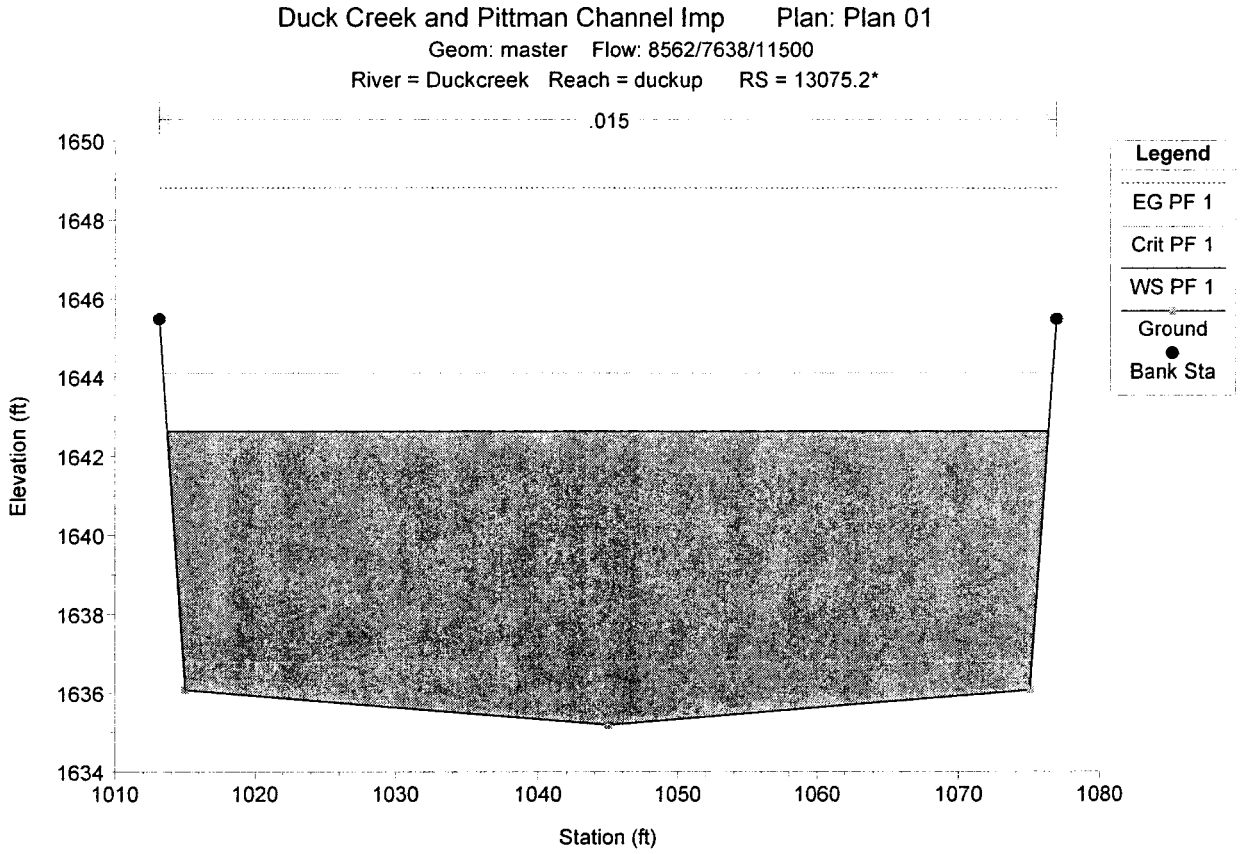

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13194.5*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
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1090
Station (ft)

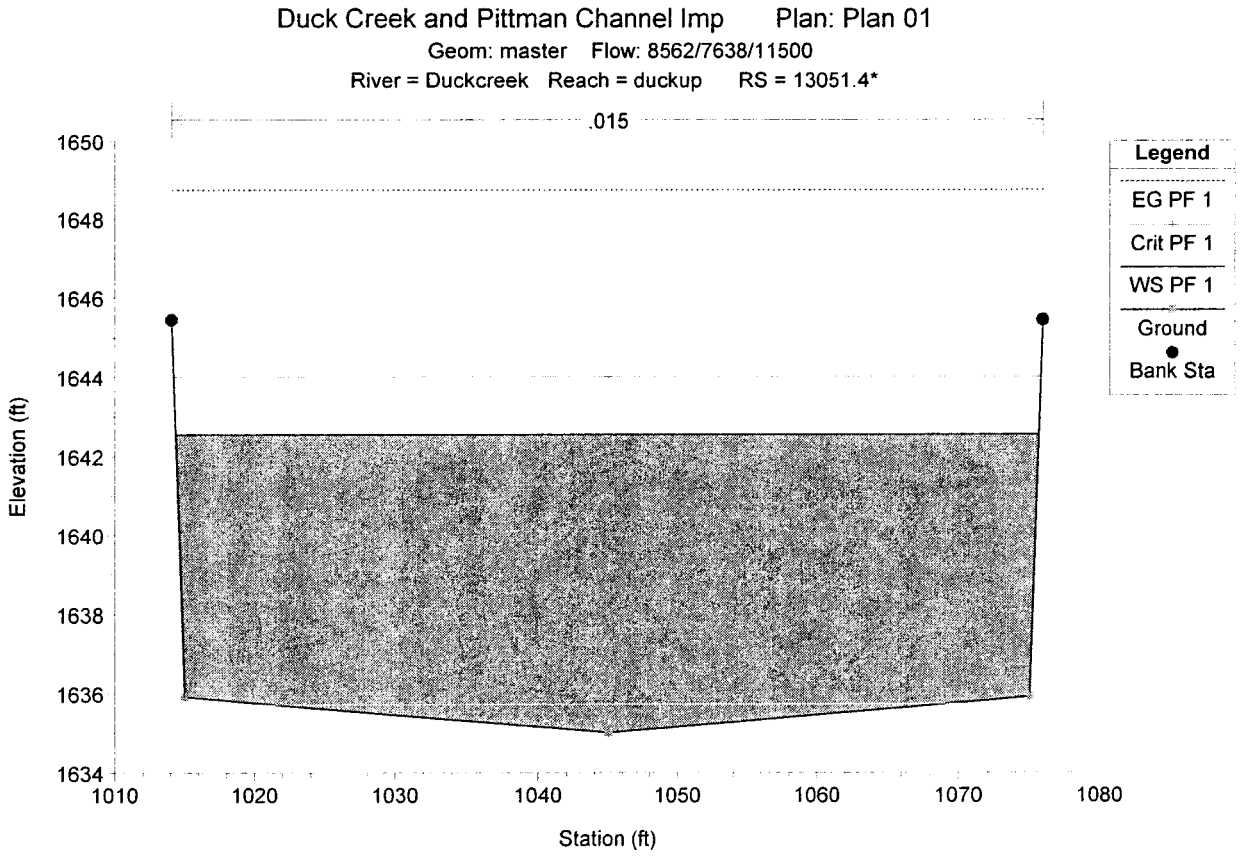

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13170.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
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1080
1090
Station (ft)

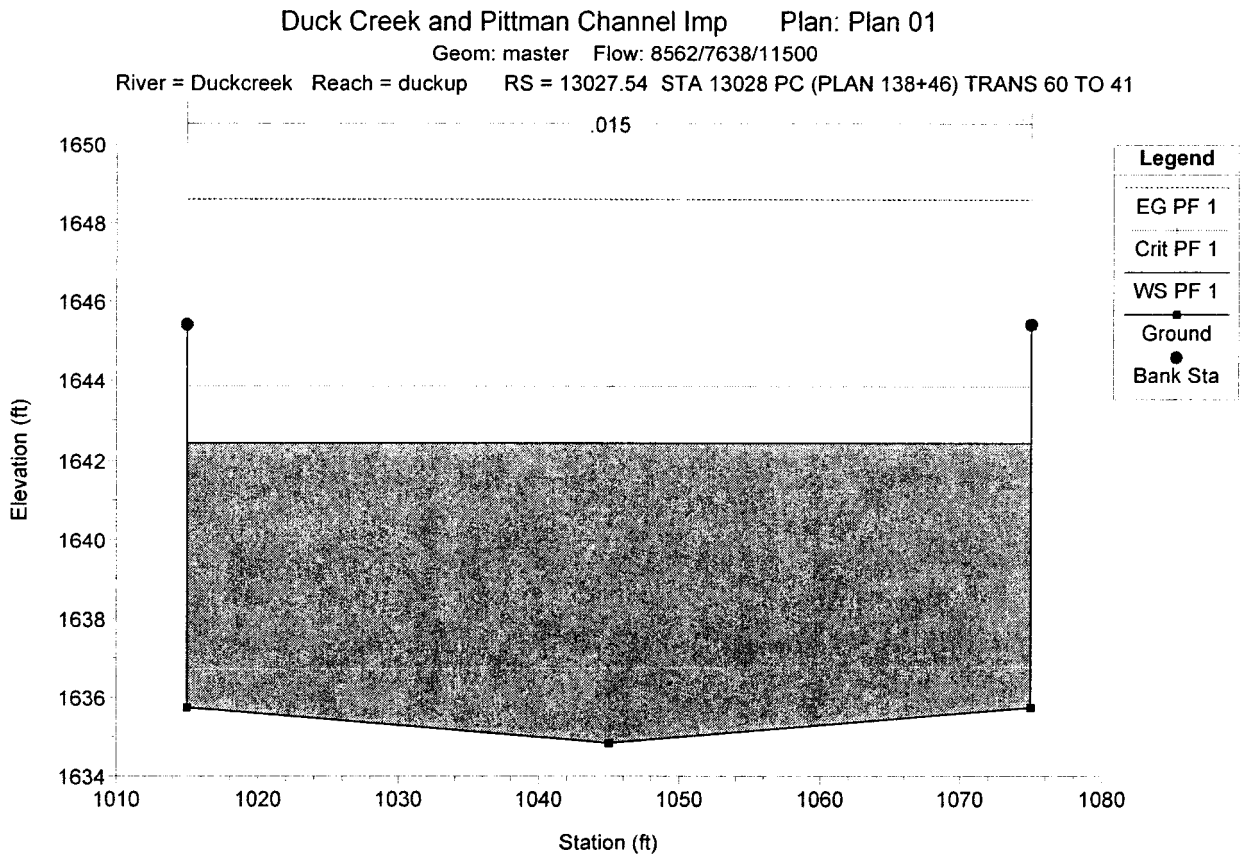

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13146.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
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1080
Station (ft)

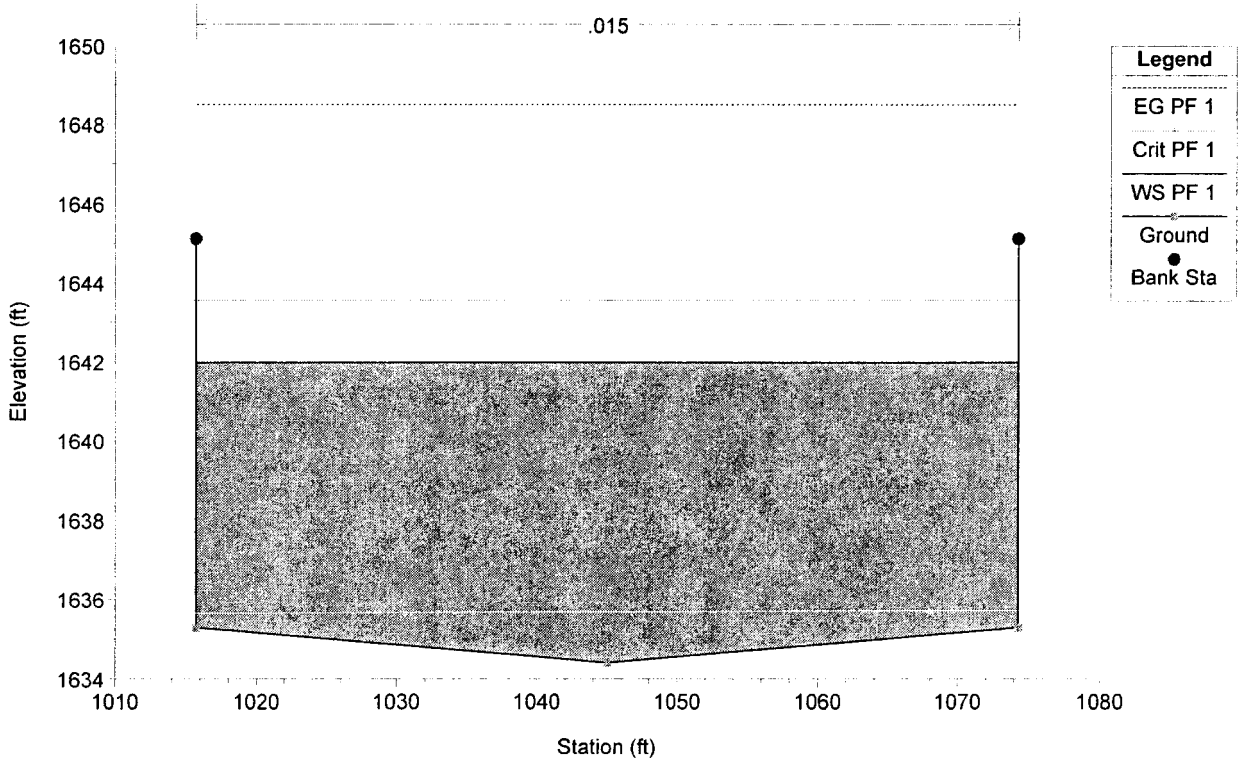

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13123.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
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1010
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1080
Station (ft)

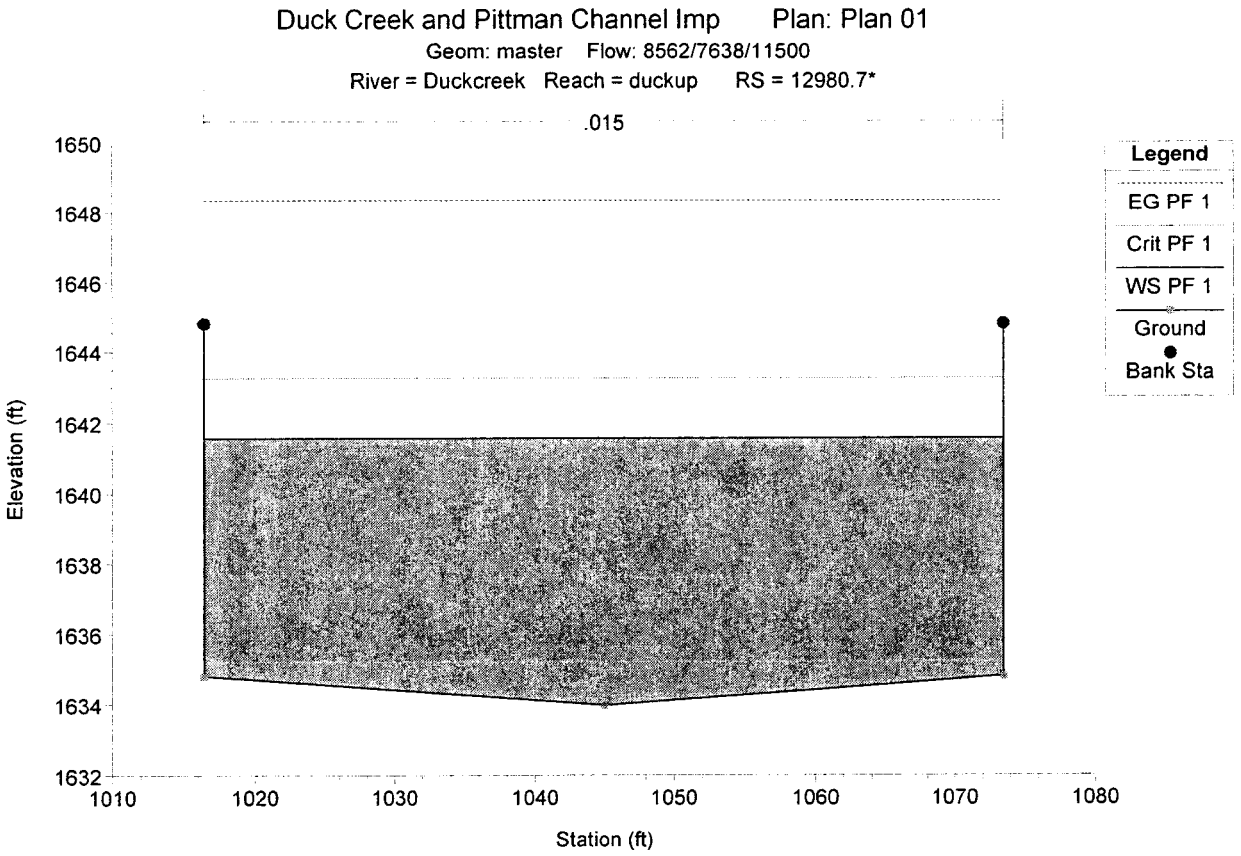

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13099.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
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1010
1020
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1070
1080
Station (ft)

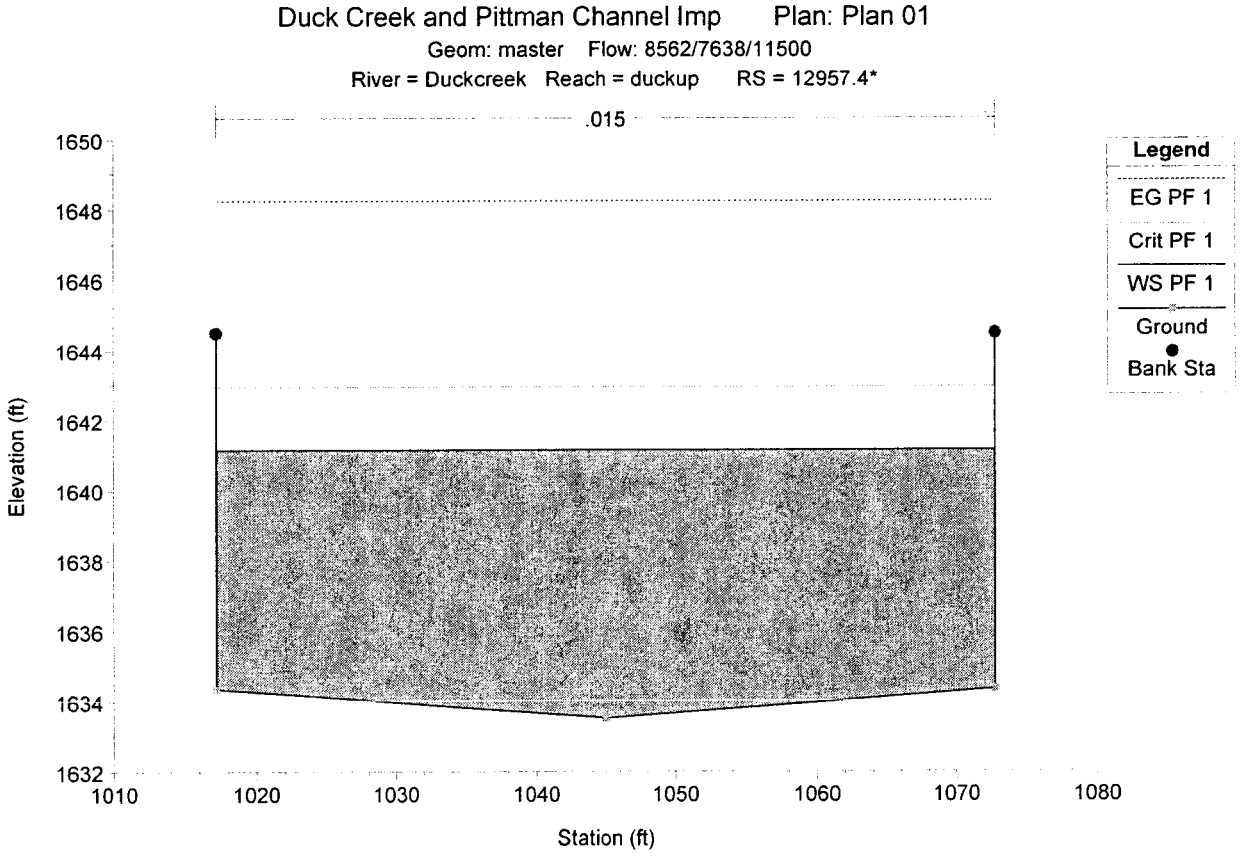

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13075.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
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1010
1020
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1040
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1070
1080
Station (ft)

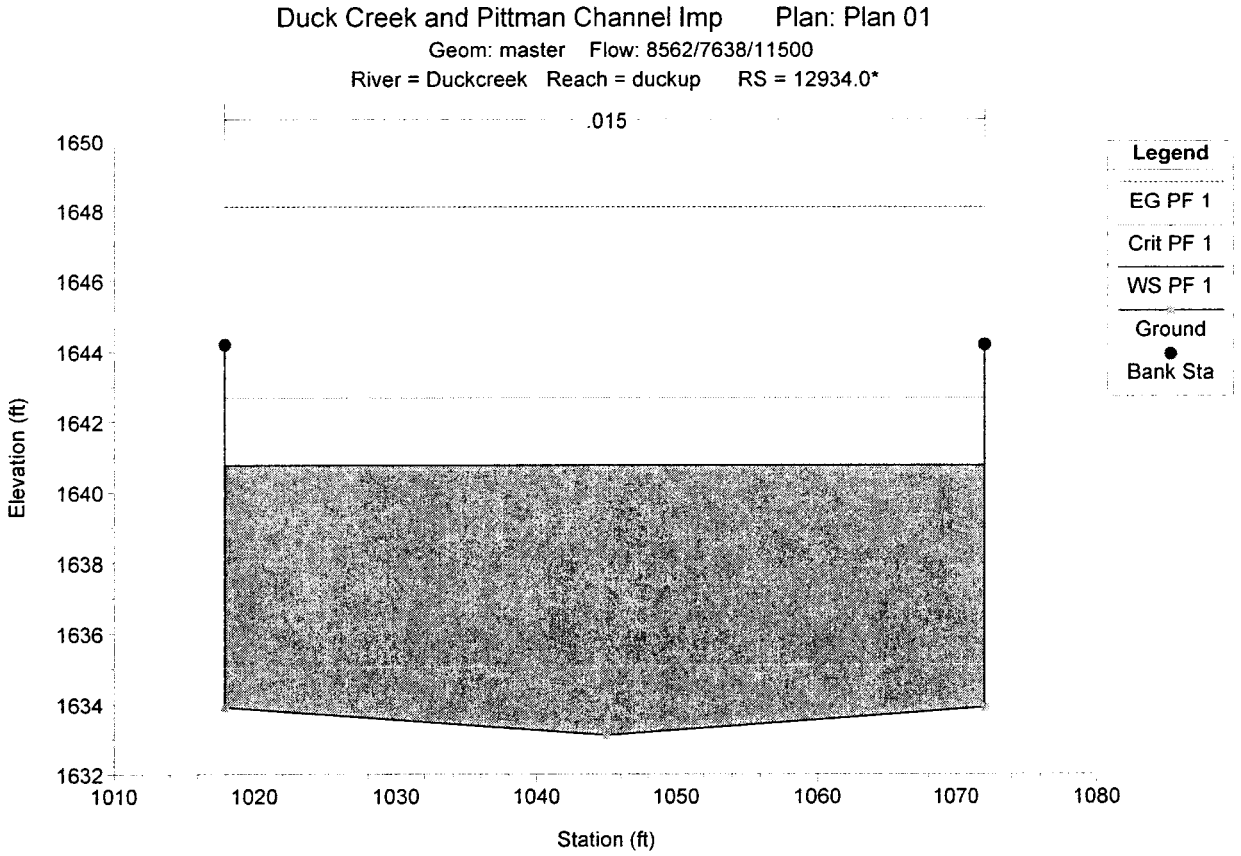

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13051.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
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1644
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1070
1080
Station (ft)

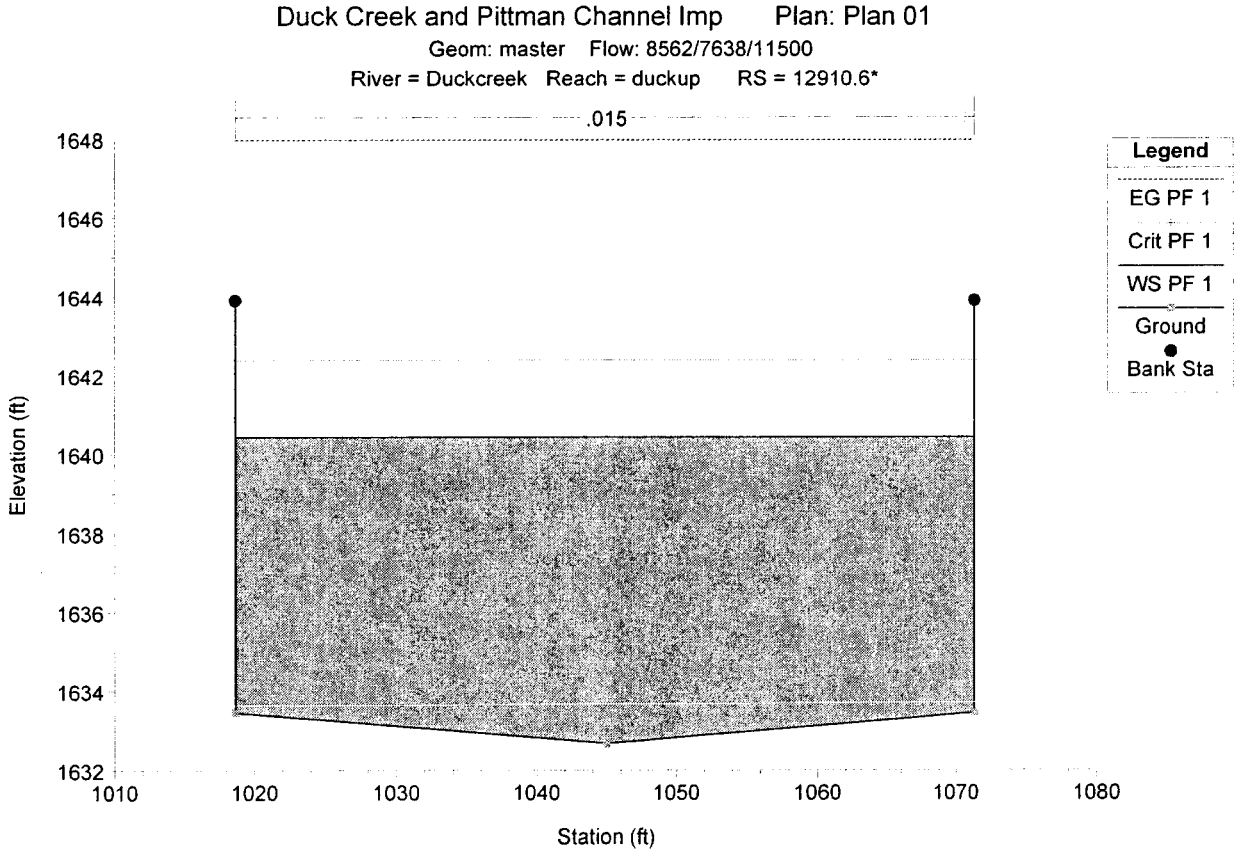

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13027.54 STA 13028 PC (PLAN 138+46) TRANS 60 TO 41
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
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1080
Station (ft)

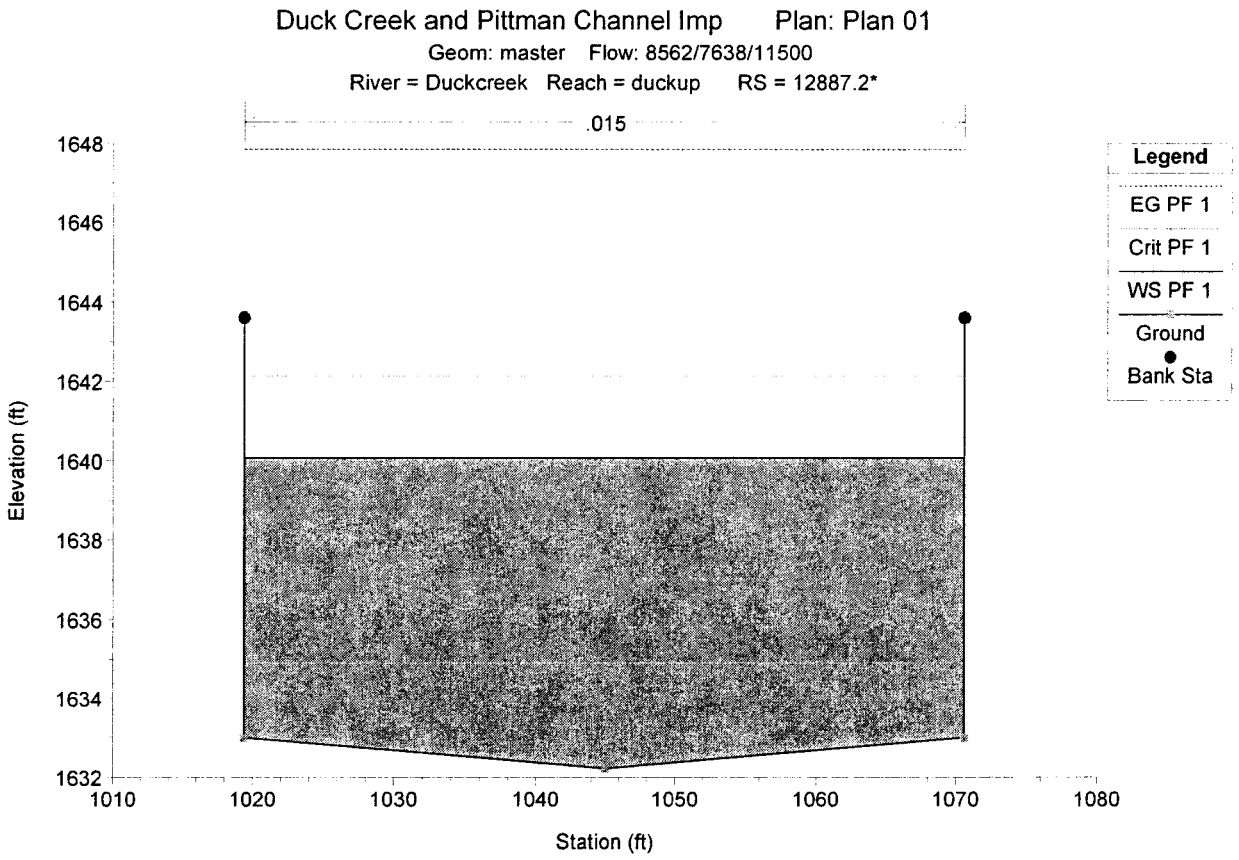

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 13004.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
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1638
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1010
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1030
1040
1050
1060
1070
1080
Station (ft)

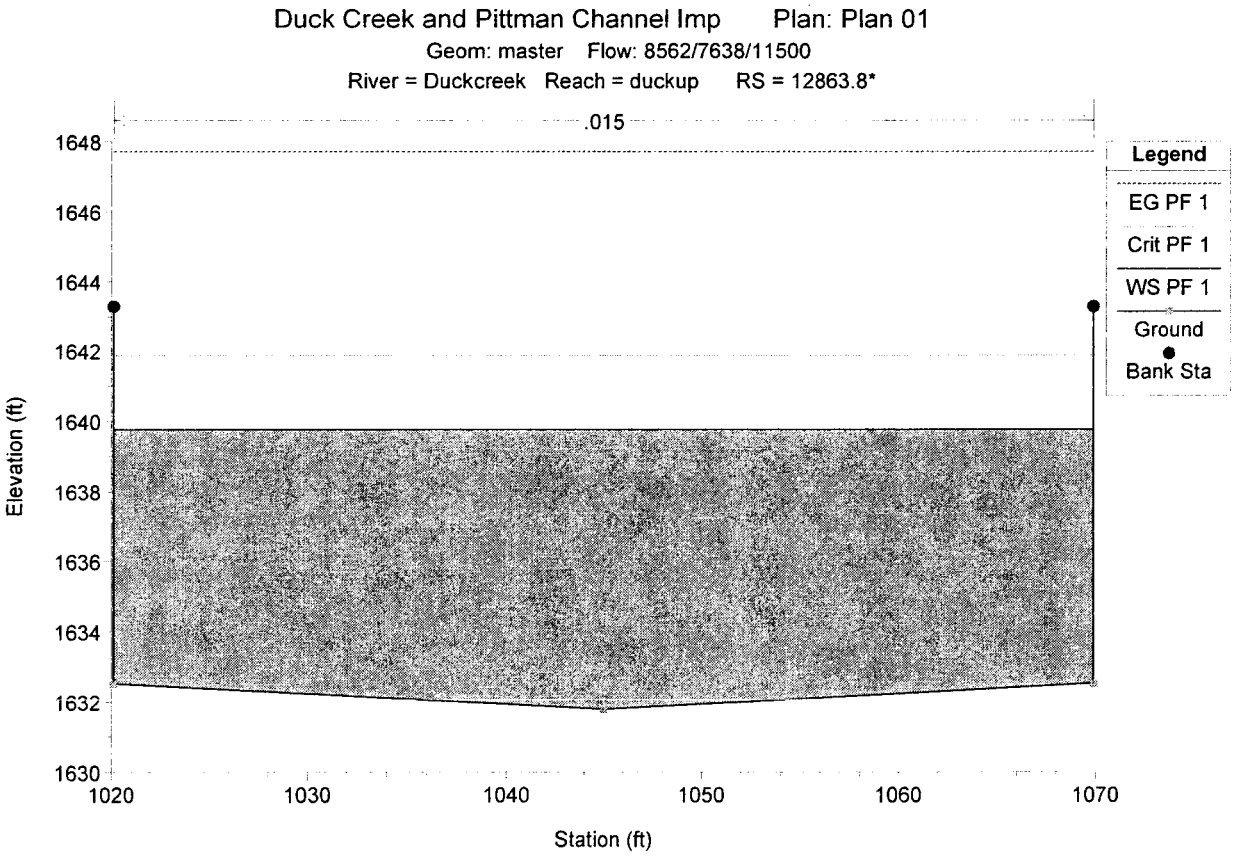

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12980.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
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1010
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1070
1080
Station (ft)

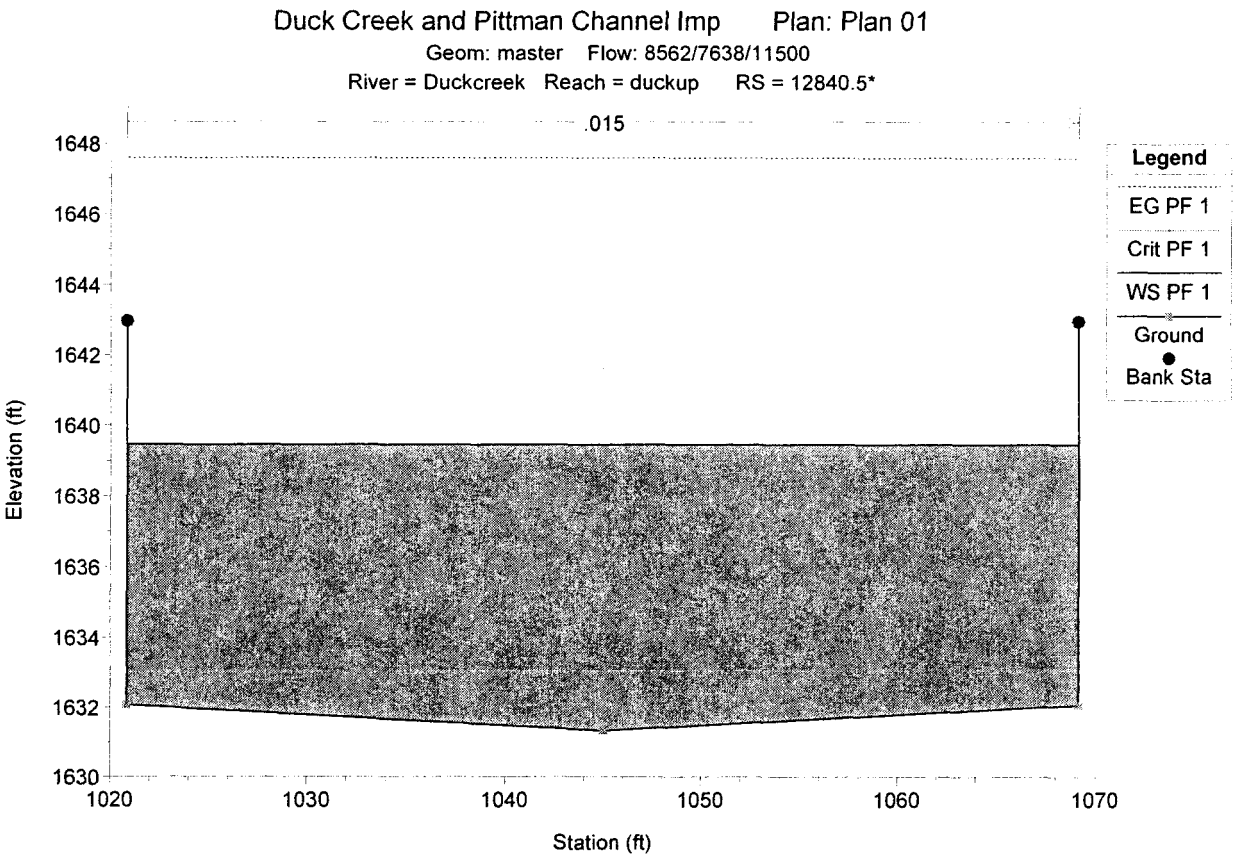

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12957.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
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1010
1020
1030
1040
1050
1060
1070
1080
Station (ft)

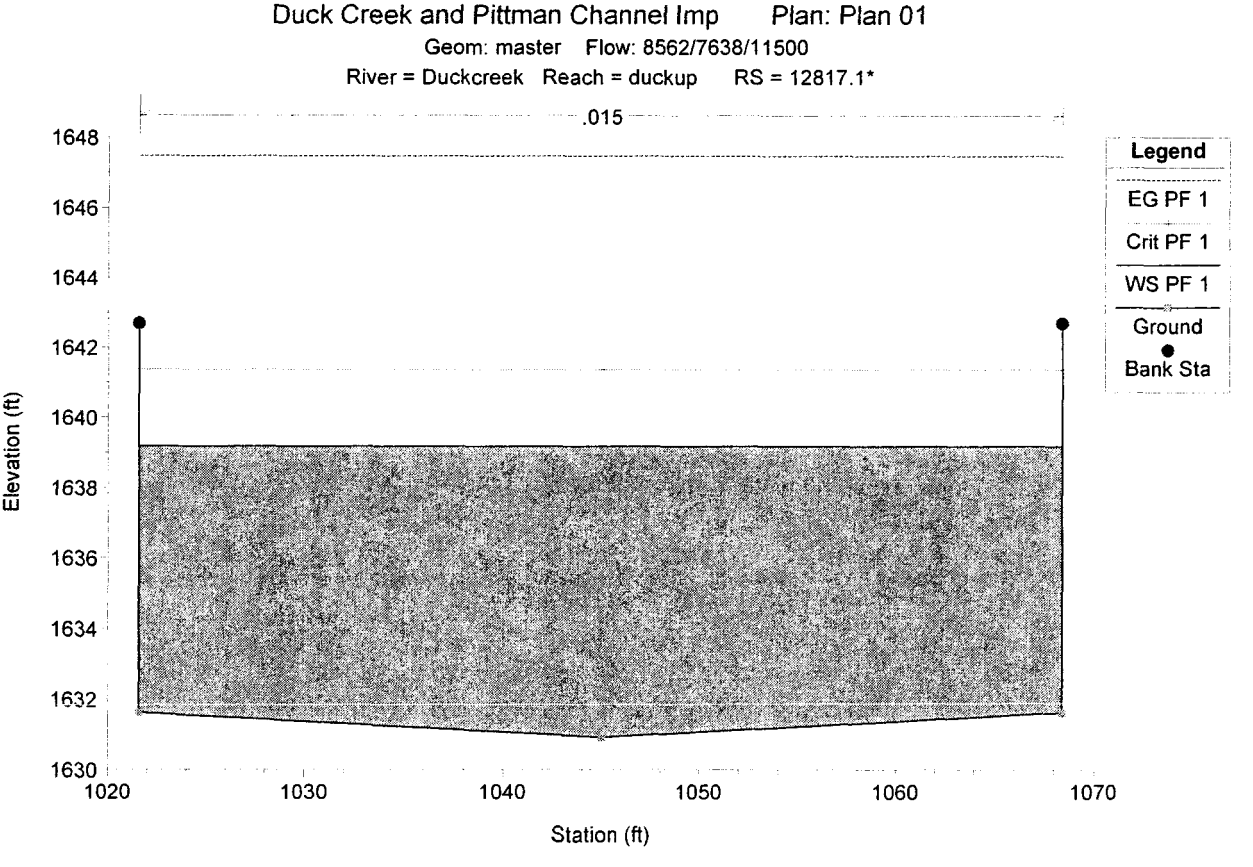

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12934.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
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1636
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1632
1010
1020
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1040
1050
1060
1070
1080
Station (ft)

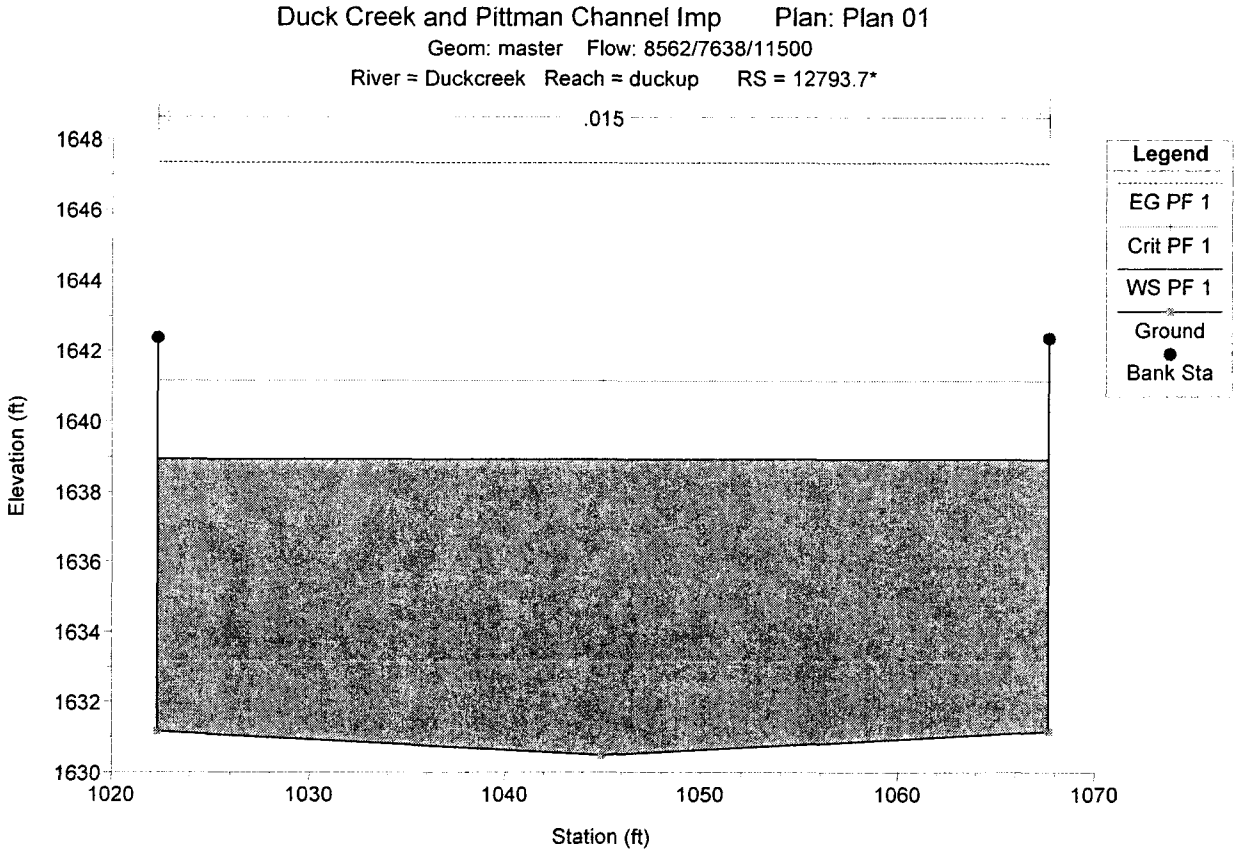

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12910.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
1642
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1636
1634
1632
1010
1020
1030
1040
1050
1060
1070
1080
Station (ft)

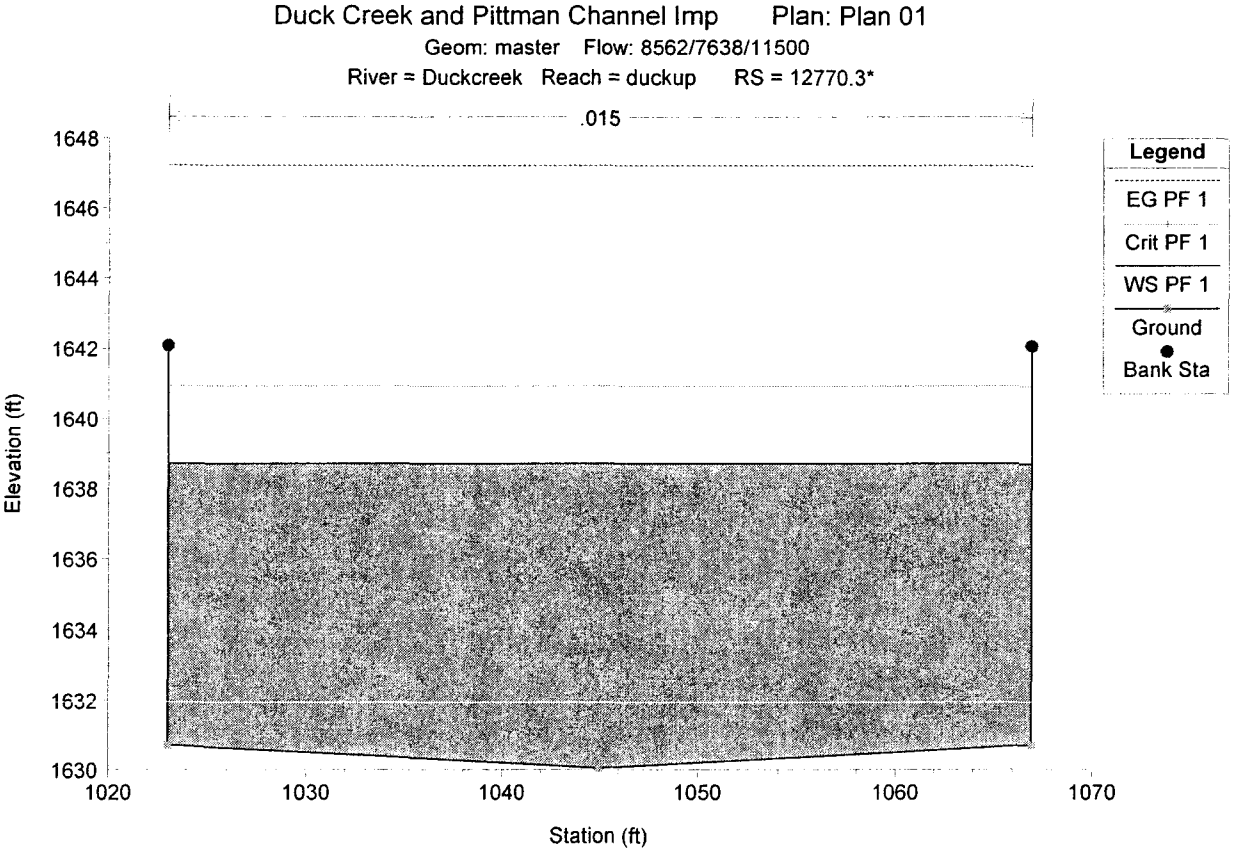

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12887.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
1642
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1636
1634
1632
1010
1020
1030
1040
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1060
1070
1080
Station (ft)

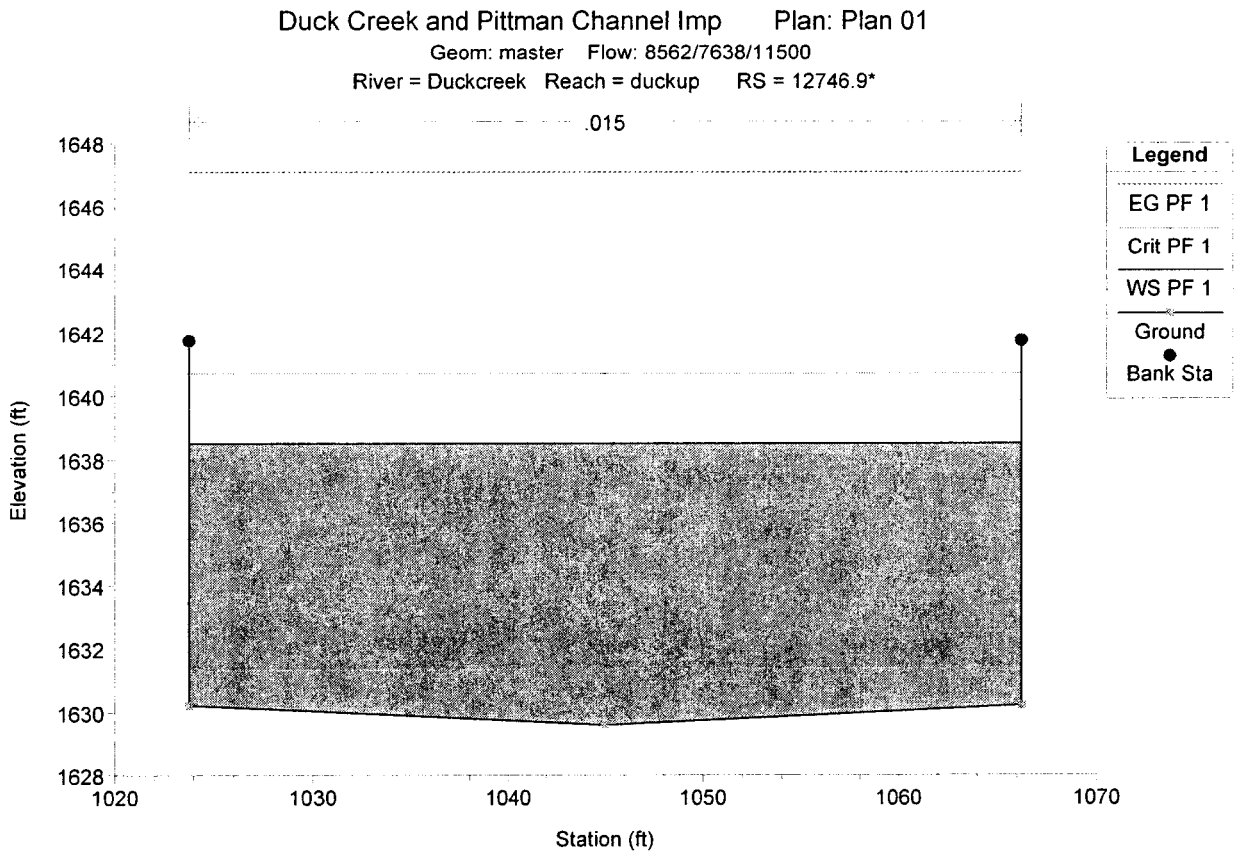

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12863.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
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1636
1634
1632
1630
1020
1030
1040
1050
1060
1070
Station (ft)

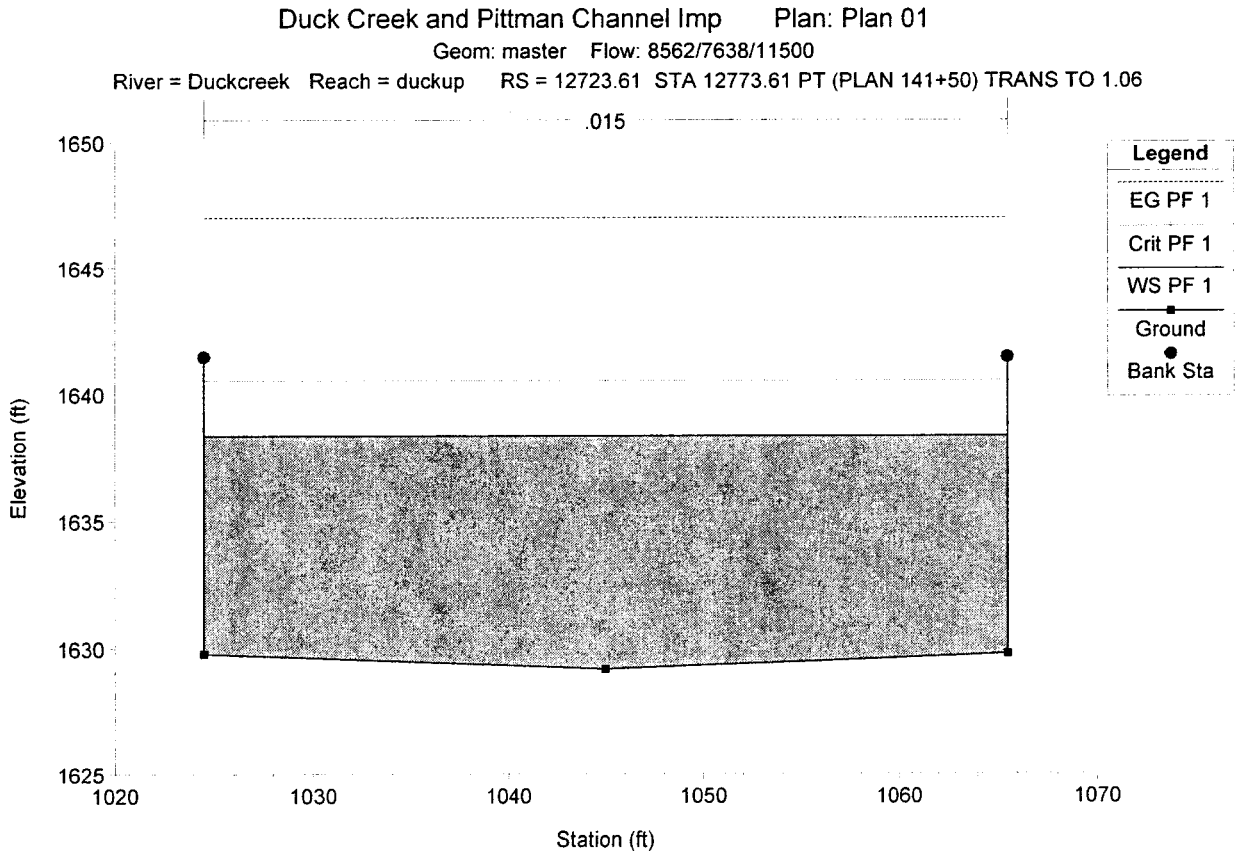

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12840.5*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
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1636
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1632
1630
1020
1030
1040
1050
1060
1070
Station (ft)

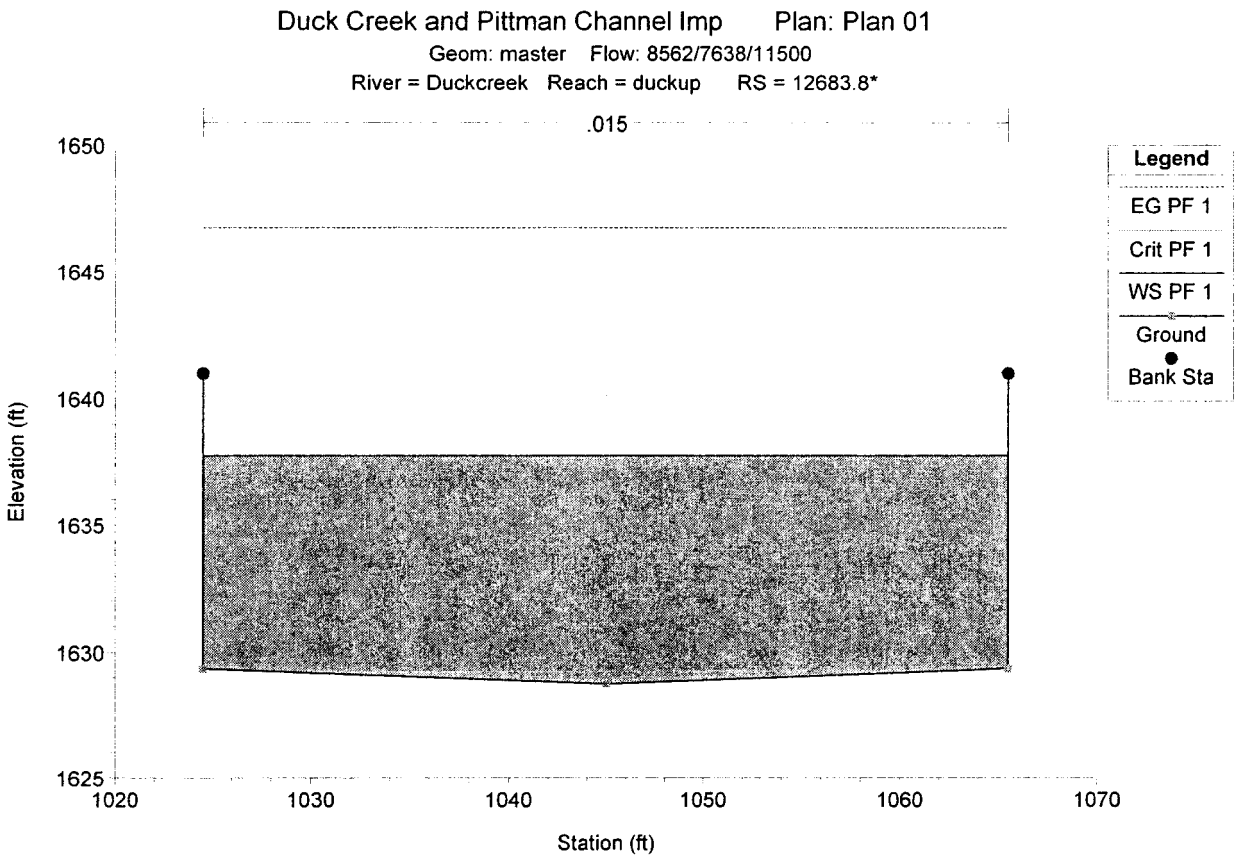

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12817.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
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1636
1634
1632
1630
1020
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1040
1050
1060
1070
Station (ft)

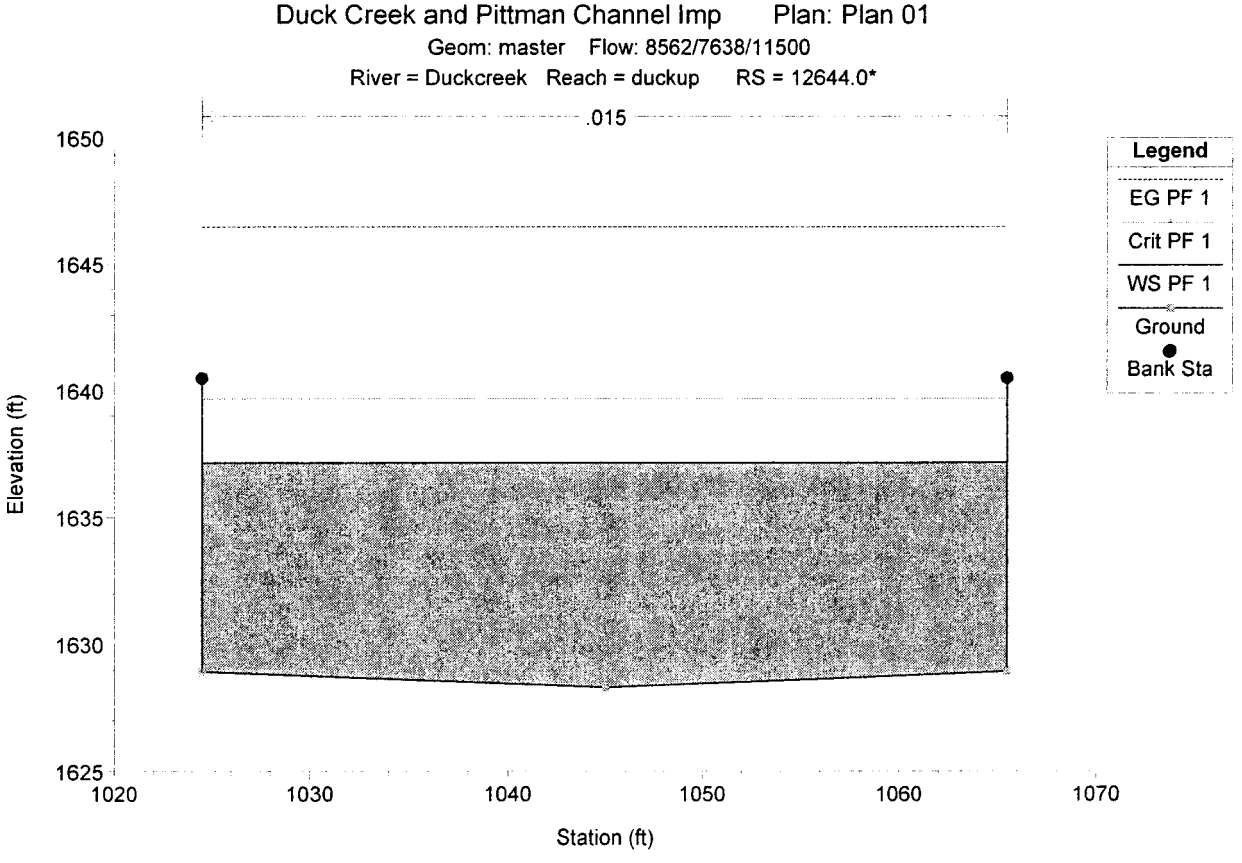

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12793.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
1642
1640
1638
1636
1634
1632
1630
1020
1030
1040
1050
1060
1070
Station (ft)

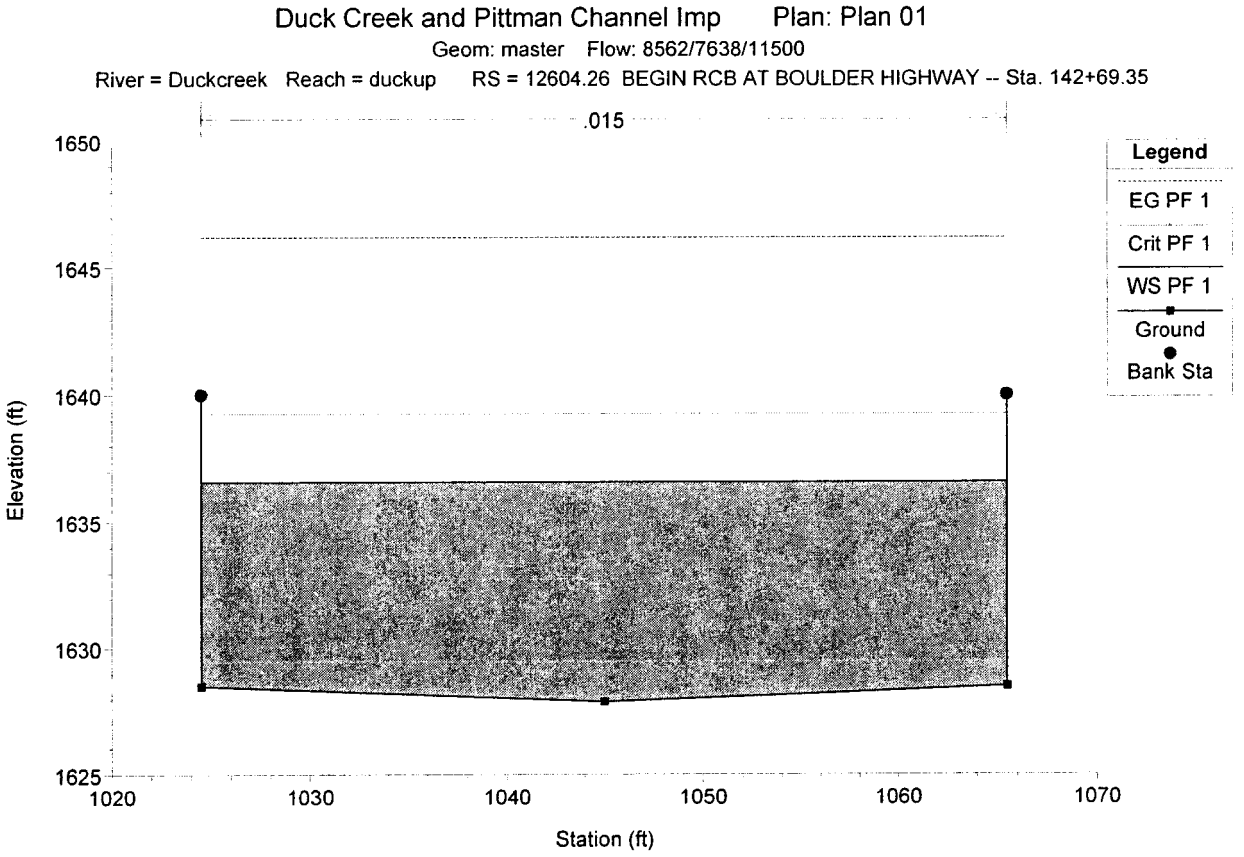

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12770.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
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1636
1634
1632
1630
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1030
1040
1050
1060
1070
Station (ft)

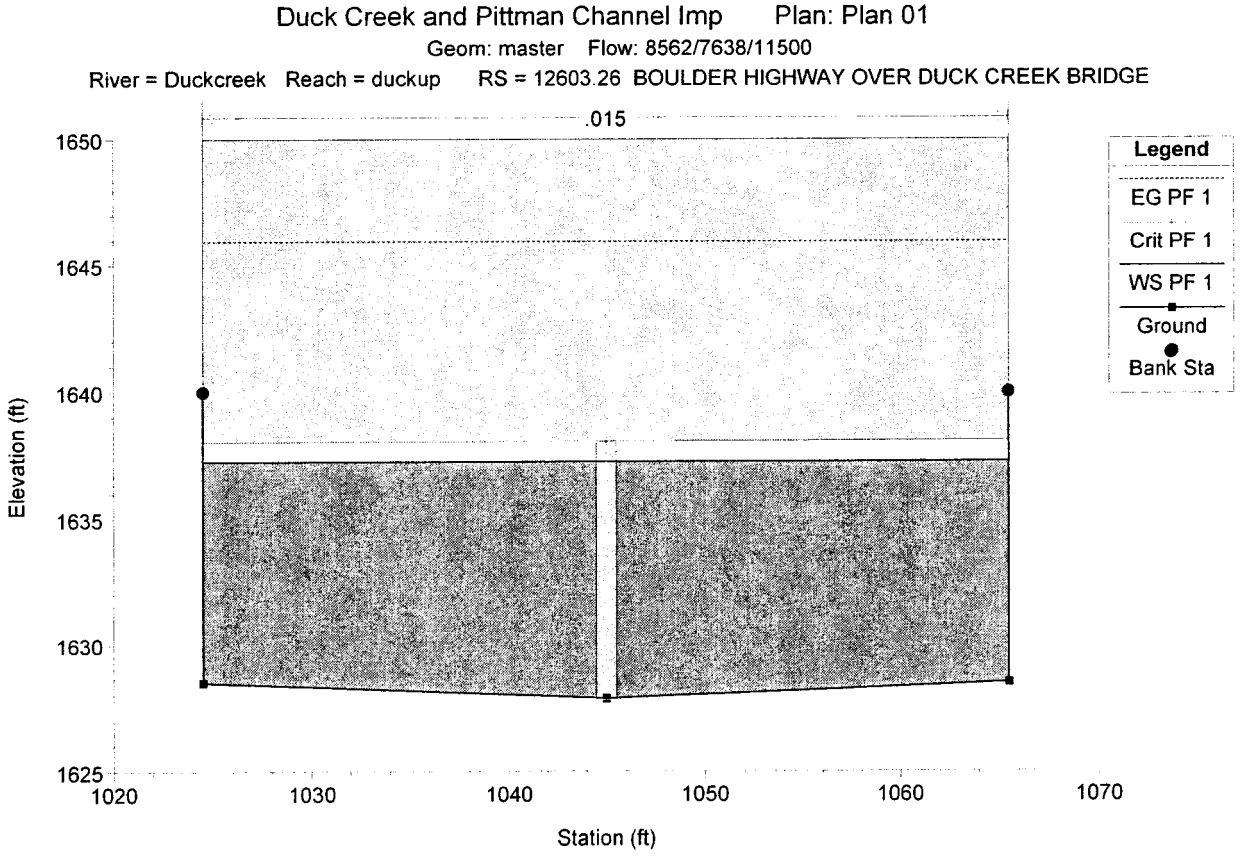

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12746.9*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1648
1646
1644
1642
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1030
1040
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1060
1070
Station (ft)

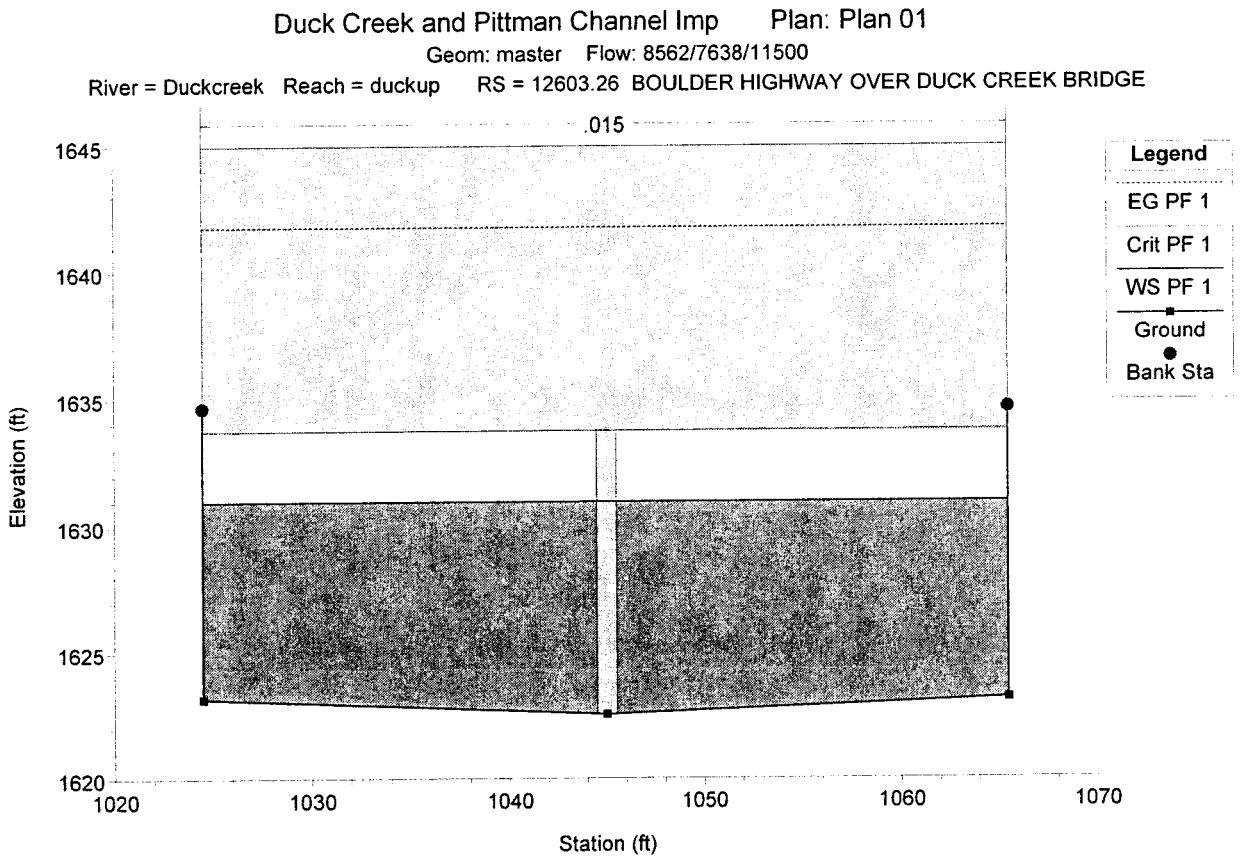

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12723.61 STA 12773.61 PT (PLAN 141+50) TRANS TO 1.06
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1645
1640
1635
1630
1625
1020
1030
1040
1050
1060
1070
Station (ft)

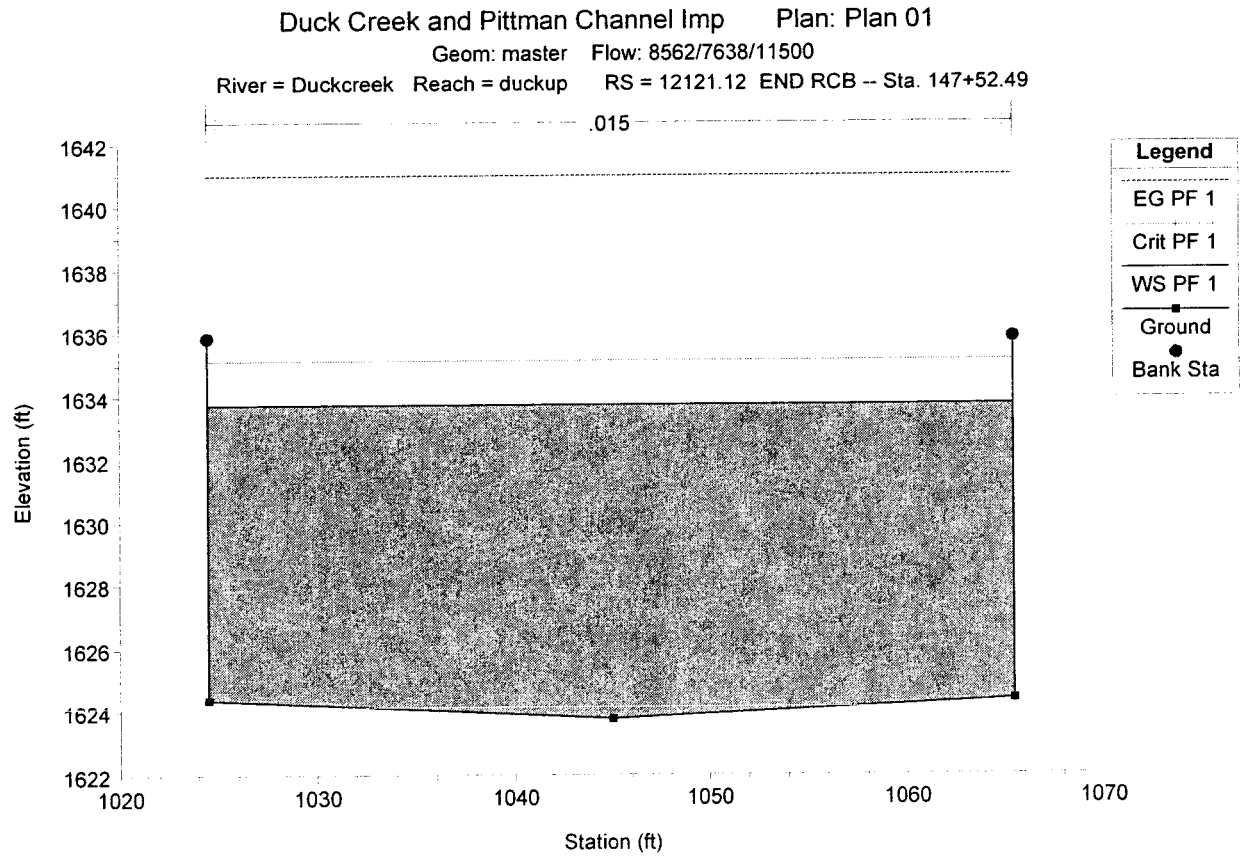

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12683.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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1630
1625
1020
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1040
1050
1060
1070
Station (ft)

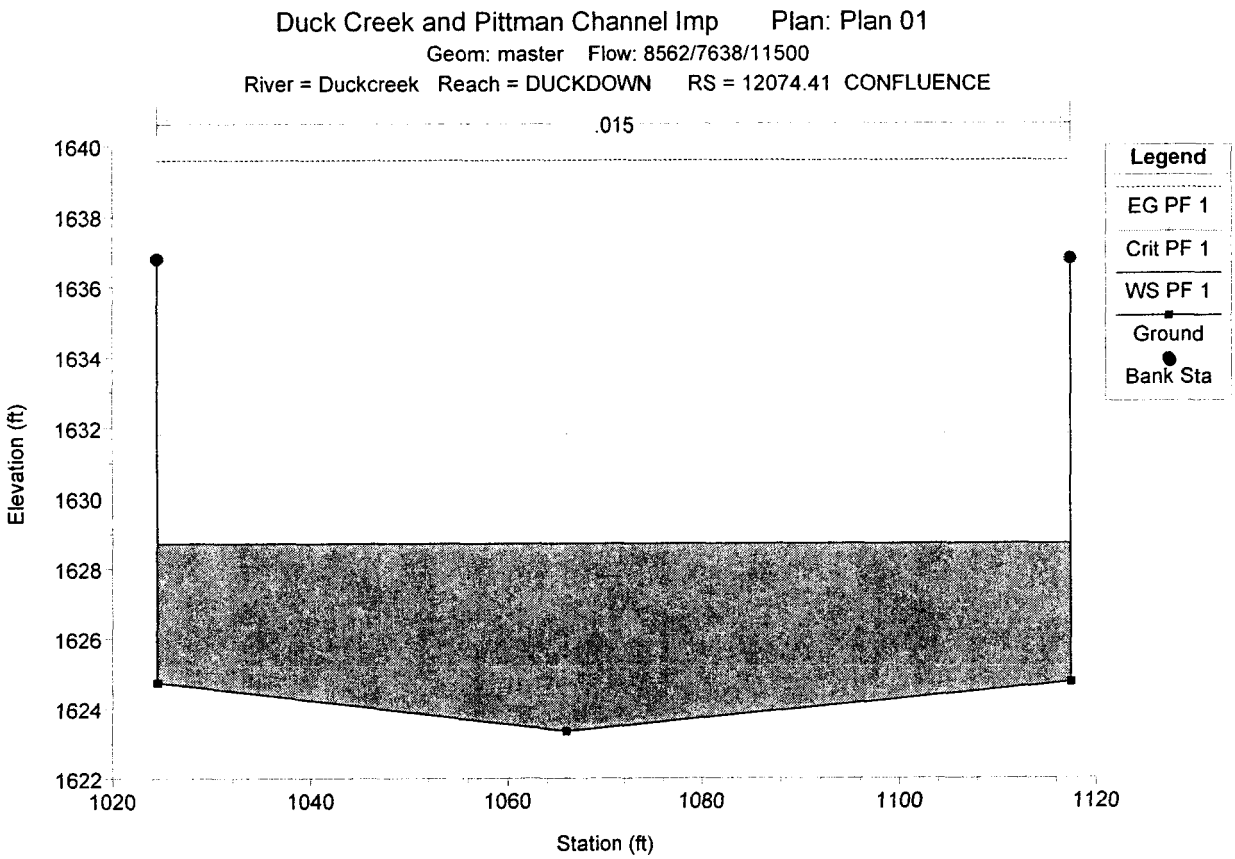

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12644.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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1630
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1040
1050
1060
1070
Station (ft)

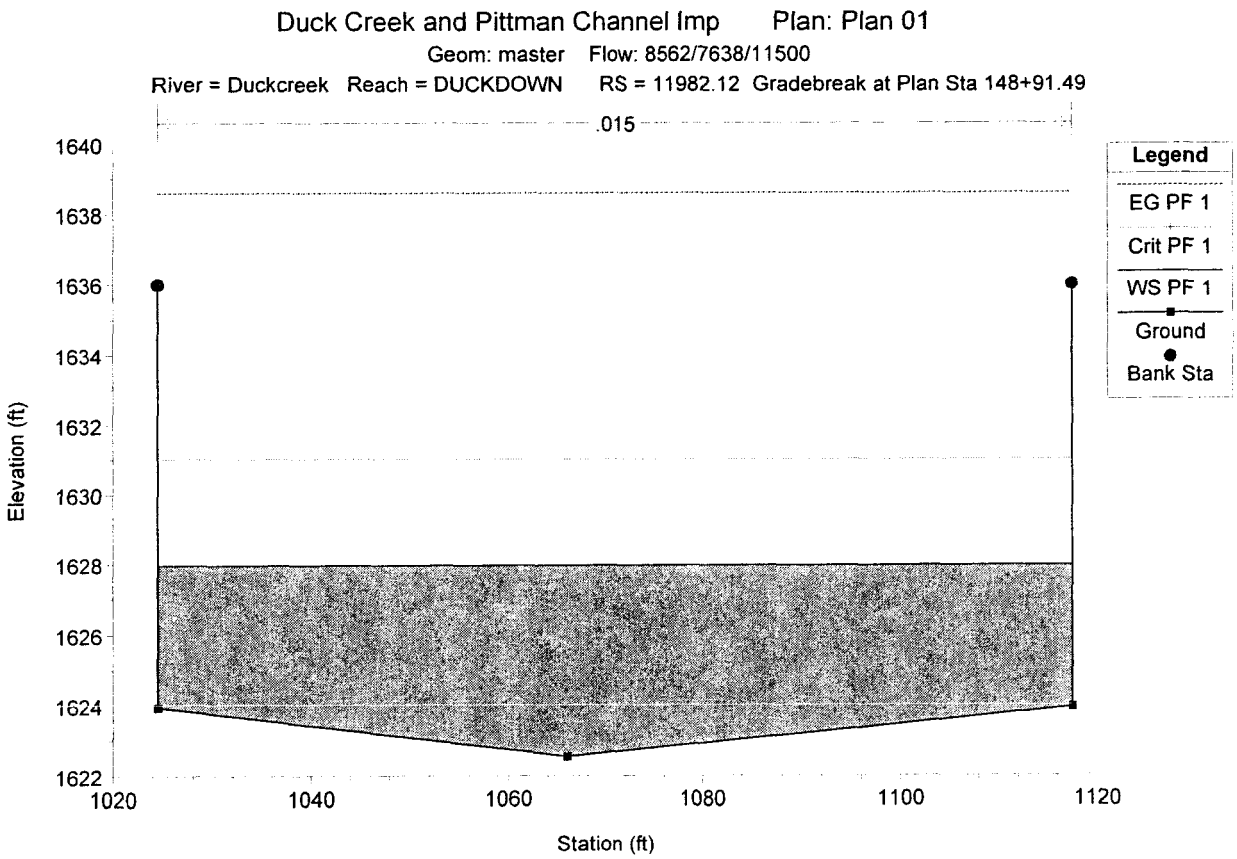

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12604.26 BEGIN RCB AT BOULDER HIGHWAY -- Sta. 142+69.35
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1645
1640
1635
1630
1625
1020
1030
1040
1050
1060
1070
Station (ft)

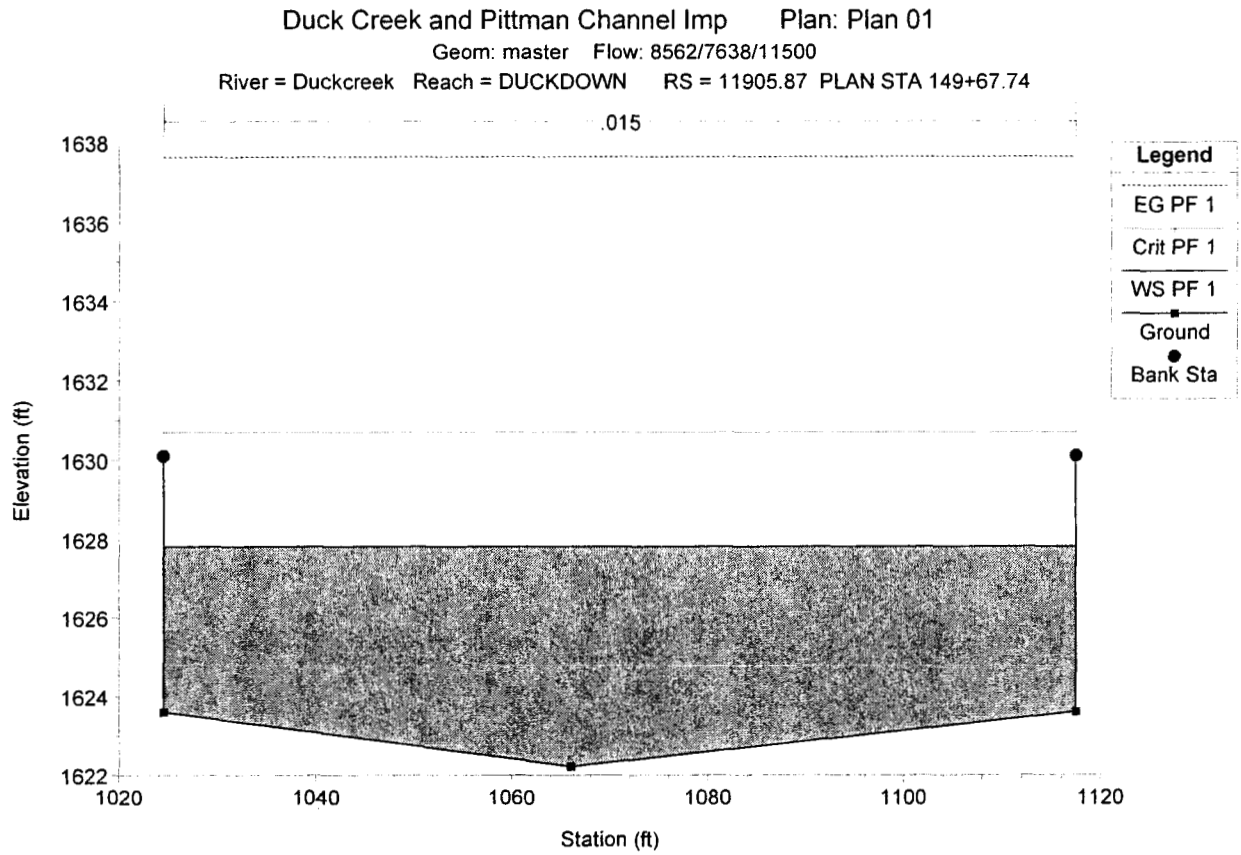

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12603.26 BOULDER HIGHWAY OVER DUCK CREEK BRIDGE
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1650
1645
1640
1635
1630
1625
1020
1030
1040
1050
1060
1070
Station (ft)

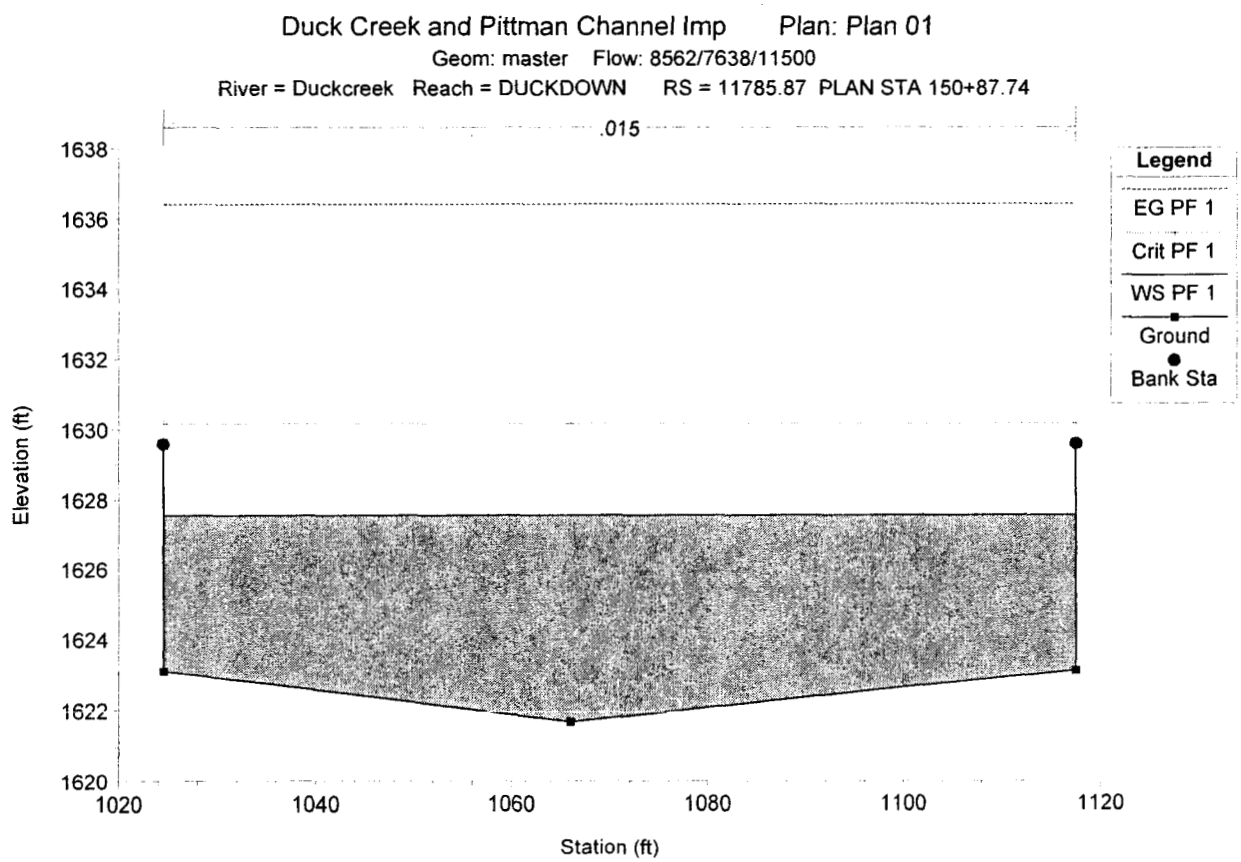

Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12603.26 BOULDER HIGHWAY OVER DUCK CREEK BRIDGE
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1645
1640
1635
1630
1625
1620
1020
1030
1040
1050
1060
1070
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = duckup RS = 12121.12 END RCB -- Sta. 147+52.49
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1642
1640
1638
1636
1634
1632
1630
1628
1626
1624
1622
1020
1030
1040
1050
1060
1070
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = DUCKDOWN RS = 12074.41 CONFLUENCE
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1640
1638
1636
1634
1632
1630
1628
1626
1624
1622
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = DUCKDOWN RS = 11982.12 Gradebreak at Plan Sta 148+91.49
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1640
1638
1636
1634
1632
1630
1628
1626
1624
1622
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = DUCKDOWN RS = 11905.87 PLAN STA 149+67.74
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1638
1636
1634
1632
1630
1628
1626
1624
1622
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek and Pittman Channel Imp Plan: Plan 01
Geom: master Flow: 8562/7638/11500
River = Duckcreek Reach = DUCKDOWN RS = 11785.87 PLAN STA 150+87.74
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1638
1636
1634
1632
1630
1628
1626
1624
1622
1620
1020
1040
1060
1080
1100
1120
Station (ft)

HEC-RAS OUTPUT

PHASE3B. PRJ: STANDARD TABLE 1
SIX XS BRIDGE TABLE
HEC-RAS SUMMARY REPORT
HEC-RAS CROSS SECTION PLOTS

PHASE3B.PRJ
STANDARD TABLE 1

HEC-RAS Plan: IS, n=.015 River: Duckcreek Reach: DUCKDOWN Profile: PF 1

Reach	River Sta	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)	
DUCKDOWN	11785.87	11500.00	1621.67	1627.60	1630.19	1636.28	0.007107	23.64	486.39	93.00	1.82
DUCKDOWN	11769.1*	11500.00	1621.59	1627.80	1630.36	1636.13	0.006416	23.17	496.32	89.71	1.74
DUCKDOWN	11752.3*	11500.00	1621.52	1628.04	1630.46	1636.00	0.005840	22.63	508.07	88.67	1.67
DUCKDOWN	11735.6*	11500.00	1621.44	1628.22	1630.58	1635.88	0.005497	22.21	517.79	90.11	1.63
DUCKDOWN	11718.8*	11500.00	1621.37	1628.34	1630.63	1635.77	0.005219	21.87	525.81	91.35	1.61
DUCKDOWN	11702.1*	11500.00	1621.29	1628.37	1630.62	1635.68	0.005043	21.68	530.34	92.25	1.59
DUCKDOWN	11685.3*	11500.00	1621.22	1628.35	1630.56	1635.59	0.004923	21.59	532.74	92.96	1.59
DUCKDOWN	11668.62	11500.00	1621.14	1628.26	1630.48	1635.50	0.004867	21.60	532.44	93.36	1.59
DUCKDOWN	11578.0*	11500.00	1620.73	1627.82	1630.05	1635.06	0.004903	21.59	532.77	94.17	1.60
DUCKDOWN	11487.4*	11500.00	1620.32	1627.43	1629.64	1634.62	0.004855	21.51	534.54	94.25	1.59
DUCKDOWN	11396.8*	11500.00	1619.92	1627.06	1629.24	1634.18	0.004794	21.42	536.82	94.34	1.58
DUCKDOWN	11306.2*	11500.00	1619.51	1626.66	1628.83	1633.75	0.004757	21.37	538.22	94.40	1.58
DUCKDOWN	11215.68	11500.00	1619.10	1626.31	1628.44	1633.33	0.004640	21.26	540.98	93.72	1.56
DUCKDOWN	11128.7*	11500.00	1618.71	1625.93	1628.05	1632.93	0.004621	21.23	541.73	93.75	1.56
DUCKDOWN	11041.8*	11500.00	1618.31	1625.53	1627.65	1632.52	0.004617	21.22	541.86	93.73	1.56
DUCKDOWN	10954.8*	11500.00	1617.92	1625.15	1627.27	1632.12	0.004602	21.20	542.50	93.78	1.55
DUCKDOWN	10867.92	11500.00	1617.53	1624.76	1626.87	1631.73	0.004588	21.18	543.06	93.80	1.55
DUCKDOWN	10774.3*	11500.00	1617.11	1624.29	1626.41	1631.31	0.004575	21.25	541.15	92.54	1.55
DUCKDOWN	10680.8*	11500.00	1616.69	1623.89	1626.01	1630.88	0.004552	21.22	542.00	92.55	1.55
DUCKDOWN	10587.2*	11500.00	1616.27	1623.50	1625.60	1630.46	0.004529	21.18	542.85	92.56	1.54
DUCKDOWN	10493.7*	11500.00	1615.85	1623.11	1625.20	1630.04	0.004492	21.13	544.24	92.57	1.54
DUCKDOWN	10400.2*	11500.00	1615.43	1622.71	1624.77	1629.62	0.004471	21.10	545.01	92.57	1.53
DUCKDOWN	10306.6*	11500.00	1615.01	1622.31	1624.38	1629.21	0.004450	21.07	545.78	92.57	1.53
DUCKDOWN	10213.13	11500.00	1614.59	1621.91	1623.96	1628.79	0.004429	21.04	546.56	92.58	1.53
DUCKDOWN	10114.1	11500.00	1614.14	1621.37	1623.48	1628.34	0.004590	21.18	542.97	93.80	1.55
DUCKDOWN	10040.2*	11500.00	1613.81	1621.13	1623.20	1628.00	0.004425	21.04	546.71	92.58	1.53
DUCKDOWN	9966.33	11500.00	1613.48	1620.72	1622.83	1627.67	0.004573	21.15	543.69	93.85	1.55
DUCKDOWN	9916.64*	11500.00	1613.26	1620.59	1622.63	1627.44	0.004406	21.00	547.51	92.61	1.52
DUCKDOWN	9866.96*	11500.00	1613.03	1620.36	1622.42	1627.22	0.004422	21.03	546.85	92.59	1.52
DUCKDOWN	9817.27*	11500.00	1612.81	1620.13	1622.20	1627.00	0.004423	21.03	546.81	92.59	1.53
DUCKDOWN	9767.59*	11500.00	1612.59	1619.91	1621.96	1626.78	0.004424	21.03	546.77	92.59	1.53
DUCKDOWN	9717.90*	11500.00	1612.36	1619.68	1621.73	1626.56	0.004441	21.06	546.06	92.56	1.53
DUCKDOWN	9668.22*	11500.00	1612.14	1619.46	1621.53	1626.34	0.004441	21.06	546.08	92.56	1.53
DUCKDOWN	9618.53*	11500.00	1611.92	1619.24	1621.31	1626.12	0.004440	21.06	546.11	92.56	1.53
DUCKDOWN	9568.85*	11500.00	1611.69	1619.00	1621.06	1625.90	0.004456	21.08	545.46	92.53	1.53
DUCKDOWN	9519.17*	11500.00	1611.47	1618.78	1620.84	1625.68	0.004454	21.08	545.54	92.54	1.53
DUCKDOWN	9469.48*	11500.00	1611.25	1618.56	1620.62	1625.46	0.004452	21.08	545.61	92.54	1.53
DUCKDOWN	9419.80*	11500.00	1611.02	1618.33	1620.41	1625.24	0.004467	21.10	545.01	92.52	1.53
DUCKDOWN	9370.11*	11500.00	1610.80	1618.11	1620.19	1625.02	0.004464	21.10	545.11	92.52	1.53
DUCKDOWN	9320.43*	11500.00	1610.57	1617.87	1619.94	1624.80	0.004478	21.12	544.55	92.50	1.53
DUCKDOWN	9270.74*	11500.00	1610.35	1617.65	1619.72	1624.57	0.004474	21.11	544.70	92.51	1.53
DUCKDOWN	9221.06*	11500.00	1610.13	1617.43	1619.50	1624.35	0.004471	21.11	544.85	92.51	1.53
DUCKDOWN	9171.38*	11500.00	1609.90	1617.20	1619.29	1624.13	0.004484	21.13	544.30	92.49	1.53
DUCKDOWN	9121.69*	11500.00	1609.68	1616.98	1619.07	1623.91	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	9072.01*	11500.00	1609.46	1616.76	1618.83	1623.68	0.004476	21.11	544.64	92.50	1.53
DUCKDOWN	9022.32*	11500.00	1609.23	1616.53	1618.60	1623.46	0.004489	21.13	544.12	92.48	1.54
DUCKDOWN	8972.64*	11500.00	1609.01	1616.31	1618.38	1623.24	0.004485	21.13	544.29	92.49	1.53
DUCKDOWN	8922.95*	11500.00	1608.79	1616.09	1618.18	1623.02	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	8873.27*	11500.00	1608.56	1615.85	1617.95	1622.79	0.004492	21.14	543.97	92.48	1.54
DUCKDOWN	8823.59	11500.00	1608.34	1615.50	1617.66	1622.56	0.004728	21.32	539.29	94.45	1.57
DUCKDOWN	8808.96*	11500.00	1608.27	1615.11	1617.36	1622.48	0.005068	21.78	528.08	93.97	1.62
DUCKDOWN	8794.33*	11500.00	1608.21	1614.67	1617.03	1622.38	0.005648	22.29	515.96	96.11	1.70
DUCKDOWN	8779.70*	11500.00	1608.14	1614.25	1616.72	1622.28	0.006269	22.74	505.78	98.79	1.77
DUCKDOWN	8765.07*	11500.00	1608.07	1613.88	1616.41	1622.18	0.006917	23.11	497.55	101.92	1.84
DUCKDOWN	8750.43*	11500.00	1608.01	1613.57	1616.13	1622.06	0.007560	23.39	491.59	105.47	1.91
DUCKDOWN	8735.81*	11500.00	1607.94	1613.27	1615.83	1621.94	0.008245	23.63	486.58	109.36	1.97
DUCKDOWN	8721.18*	11500.00	1607.88	1613.01	1615.61	1621.82	0.008946	23.82	482.81	113.55	2.04
DUCKDOWN	8706.55	11500.00	1607.81	1612.76	1615.36	1621.68	0.009669	23.96	479.97	118.00	2.09
DUCKDOWN	8327.98	11500.00	1606.11	1611.55	1613.65	1618.66	0.006696	21.39	537.57	118.00	1.77
DUCKDOWN	8273.9	11500.00	1605.86	1611.35	1613.40	1618.31	0.006473	21.17	543.24	118.00	1.74
DUCKDOWN	8259.5	11500.00	1605.81	1611.32	1613.37	1618.22	0.006377	21.07	545.74	118.00	1.73
DUCKDOWN	8202.6	Bridge									
DUCKDOWN	8118.7	11500.00	1605.19	1611.03	1612.73	1617.04	0.005101	19.67	584.77	118.00	1.56
DUCKDOWN	8065.2	11500.00	1604.95	1612.00	1612.49	1615.88	0.002527	15.81	727.47	118.00	1.12
DUCKDOWN	7986.2	11500.00	1604.59	1612.00	1611.60	1614.68	0.001621	13.15	874.80	135.00	0.91

PHASE3B.PRJ
SIX XS BRIDGE

HEC-RAS Plan: IS, n=.015 River: Duckcreek Reach: DUCKDOWN Profile: PF 1

Reach	River Sta	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
DUCKDOWN	8273.9	1618.31	1611.35	1613.40	0.36	0.00	118.00		11500.00		21.17
DUCKDOWN	8259.5	1618.22	1611.32	1613.37	0.09	0.00	118.00		11500.00		21.07
DUCKDOWN	8202.6 BR U	1617.91	1612.09	1613.68	0.09	0.21	110.50		11500.00		19.36
DUCKDOWN	8202.6 BR D	1617.12	1611.62	1613.07	0.72	0.06	110.50		11500.00		18.82
DUCKDOWN	8118.7	1617.04	1611.03	1612.73	0.04	0.05	118.00		11500.00		19.67
DUCKDOWN	8065.2	1615.88	1612.00	1612.49			118.00		11500.00		15.81

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Duck Creek Phase 3 Improvements
Project File : phase3b.prj
Run Date and Time: 3/3/2004 11:07:44 AM

Project in English units

Project Description:
Duck Creek Phase 3 Improvements - floodplain model

PLAN DATA

Plan Title: Sill Modeled as Inline Weir
Plan File : g:\550-039\calc\RAS\phase3b.p03

Geometry Title: Phase 3, n = 0.015, Inline Weir
Geometry File : g:\550-039\calc\RAS\phase3b.g03

Flow Title : 11500 cfs
Flow File : g:\550-039\calc\RAS\phase3b.f01

Plan Summary Information:
Number of: Cross Sections = 64 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 1

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 11500 cfs
Flow File : g:\550-039\calc\RAS\phase3b.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Duckcreek	DUCKDOWN	11785.87	11500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Duckcreek	DUCKDOWN	PF 1	Known WS = 1627.6	Known WS = 1612

Changes in WS and EG

River	Reach	RS	Profile	Type	Value
Duckcreek	DUCKDOWN	8118.7	PF 1	Known WS	1612
Duckcreek	DUCKDOWN	8065.2	PF 1	Known WS	1612
Duckcreek	DUCKDOWN	7986.2	PF 1	Known WS	1612

GEOMETRY DATA

Geometry Title: Phase 3, n = 0.015, Inline Weir
Geometry File : g:\550-039\calc\RAS\phase3b.g03

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11785.87

INPUT
Description: Transition Begins at 150+87.74
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
  1024.5 1629.57  1024.5 1623.07    1066 1621.67  1117.5 1623.07  1117.5 1629.57

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  1024.5    .015  1024.5    .015  1117.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        1024.5  1117.5             16.75   16.75   16.75            .05      .1

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1636.28    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               8.68    Wt. n-Val.                            0.015
  W.S. Elev (ft)           1627.60    Reach Len. (ft)           16.75       16.75      16.75
  Crit W.S. (ft)           1630.19    Flow Area (sq ft)                    486.39
  E.G. Slope (ft/ft)       0.007107   Area (sq ft)                         486.39
  Q Total (cfs)           11500.00    Flow (cfs)                         11500.00
  Top Width (ft)             93.00    Top Width (ft)                        93.00
  Vel Total (ft/s)           23.64    Avg. Vel. (ft/s)                      23.64
  Max Chl Dpth (ft)           5.93    Hydr. Depth (ft)                       5.23
  Conv. Total (cfs)      136411.5     Conv. (cfs)                        136411.5
  Length Wtd. (ft)           16.75    Wetted Per. (ft)                     102.10
  Min Ch El (ft)          1621.67     Shear (lb/sq ft)                       2.11
  Alpha                      1.00     Stream Power (lb/ft s)                49.97
  Frctn Loss (ft)                     Cum Volume (acre-ft)                  47.67
  C & E Loss (ft)                     Cum SA (acres)                         8.54


Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION           RIVER: Duckcreek
REACH: DUCKDOWN           RS: 11769.1*

INPUT
Description:
Station Elevation Data     num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1022.86 1629.85 1025.43 1628.52 1025.43 1622.94    1066 1621.59 1115.14 1622.94
 1115.14 1628.52 1117.71 1629.85

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 1022.86    .015 1022.86    .015 1117.71    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1022.86 1117.71             16.75   16.75   16.75            .05      .1

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1636.13    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               8.34    Wt. n-Val.                            0.015
  W.S. Elev (ft)           1627.80    Reach Len. (ft)           16.75       16.75      16.75
  Crit W.S. (ft)           1630.36    Flow Area (sq ft)                    496.32
  E.G. Slope (ft/ft)       0.006416   Area (sq ft)                         496.32
  Q Total (cfs)           11500.00    Flow (cfs)                         11500.00
  Top Width (ft)             89.71    Top Width (ft)                        89.71
  Vel Total (ft/s)           23.17    Avg. Vel. (ft/s)                      23.17
  Max Chl Dpth (ft)           6.21    Hydr. Depth (ft)                       5.53
  Conv. Total (cfs)      143569.3     Conv. (cfs)                        143569.3
  Length Wtd. (ft)           16.75    Wetted Per. (ft)                      99.47
  Min Ch El (ft)          1621.59     Shear (lb/sq ft)                       2.00
  Alpha                      1.00     Stream Power (lb/ft s)                46.31
  Frctn Loss (ft)            0.11     Cum Volume (acre-ft)                  47.48
  C & E Loss (ft)            0.03     Cum SA (acres)                         8.51


Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION           RIVER: Duckcreek
REACH: DUCKDOWN           RS: 11752.3*

INPUT
Description:
Station Elevation Data     num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1021.21 1630.13 1026.36 1627.46 1026.36 1622.82    1066 1621.52 1112.79 1622.82
 1112.79 1627.46 1117.93 1630.13

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 1021.21    .015 1021.21    .015 1117.93    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1021.21 1117.93             16.75   16.75   16.75            .05      .1

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1636.00    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               7.96    Wt. n-Val.                            0.015
  W.S. Elev (ft)           1628.04    Reach Len. (ft)           16.75       16.75      16.75
  Crit W.S. (ft)           1630.46    Flow Area (sq ft)                    508.07
  E.G. Slope (ft/ft)       0.005840   Area (sq ft)                         508.07
  Q Total (cfs)           11500.00    Flow (cfs)                         11500.00
  Top Width (ft)             88.67    Top Width (ft)                        88.67
  Vel Total (ft/s)           22.63    Avg. Vel. (ft/s)                      22.63
  Max Chl Dpth (ft)           6.52    Hydr. Depth (ft)                       5.73
  Conv. Total (cfs)      150485.8     Conv. (cfs)                        150485.8
  Length Wtd. (ft)           16.75    Wetted Per. (ft)                      98.27
  Min Ch El (ft)          1621.52     Shear (lb/sq ft)                       1.88
  Alpha                      1.00     Stream Power (lb/ft s)                42.66
  Frctn Loss (ft)            0.10     Cum Volume (acre-ft)                  47.29
  C & E Loss (ft)            0.04     Cum SA (acres)                         8.48
```

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11735.6*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1019.57	1630.41	1027.29	1626.41	1027.29	1622.69	1066	1621.44	1110.43	1622.69
1110.43	1626.41	1118.14	1630.41						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1019.57	.015	1019.57	.015	1118.14	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1019.57	1118.14	16.75 16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1635.88	Element			
Vel Head (ft)	7.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.22	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.58	Flow Area (sq ft)		517.79	
E.G. Slope (ft/ft)	0.005497	Area (sq ft)		517.79	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	90.11	Top Width (ft)		90.11	
Vel Total (ft/s)	22.21	Avg. Vel. (ft/s)		22.21	
Max Chl Dpth (ft)	6.78	Hydr. Depth (ft)		5.75	
Conv. Total (cfs)	155106.4	Conv. (cfs)		155106.4	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		98.47	
Min Ch El (ft)	1621.44	Shear (lb/sq ft)		1.80	
Alpha	1.00	Stream Power (lb/ft s)		40.08	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		47.09	
C & E Loss (ft)	0.03	Cum SA (acres)		8.44	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11718.8*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1017.93	1630.7	1028.21	1625.35	1028.21	1622.57	1066	1621.37	1108.07	1622.57
1108.07	1625.35	1118.36	1630.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1017.93	.015	1017.93	.015	1118.36	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1017.93	1118.36	16.75 16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1635.77	Element			
Vel Head (ft)	7.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.34	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.63	Flow Area (sq ft)		525.81	
E.G. Slope (ft/ft)	0.005219	Area (sq ft)		525.81	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	91.35	Top Width (ft)		91.35	
Vel Total (ft/s)	21.87	Avg. Vel. (ft/s)		21.87	
Max Chl Dpth (ft)	6.97	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	159190.8	Conv. (cfs)		159190.8	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		98.41	
Min Ch El (ft)	1621.37	Shear (lb/sq ft)		1.74	
Alpha	1.00	Stream Power (lb/ft s)		38.07	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		46.89	
C & E Loss (ft)	0.02	Cum SA (acres)		8.41	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11702.1*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1016.29	1630.98	1029.14	1624.3	1029.14	1622.44	1066	1621.29	1105.71	1622.44
1105.71	1624.3	1118.57	1630.98						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1016.29	.015	1016.29	.015	1118.57	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1016.29	1118.57	16.75 16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1635.68	Element			
Vel Head (ft)	7.30	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.37	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.62	Flow Area (sq ft)		530.34	
E.G. Slope (ft/ft)	0.005043	Area (sq ft)		530.34	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.25	Top Width (ft)		92.25	

Vel Total (ft/s)	21.68	Avg. Vel. (ft/s)	21.68
Max Chl Dpth (ft)	7.08	Hydr. Depth (ft)	5.75
Conv. Total (cfs)	161939.4	Conv. (cfs)	161939.4
Length Wtd. (ft)	16.75	Wetted Per. (ft)	98.00
Min Ch El (ft)	1621.29	Shear (lb/sq ft)	1.70
Alpha	1.00	Stream Power (lb/ft s)	36.95
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	46.69
C & E Loss (ft)	0.01	Cum SA (acres)	8.37

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11685.3*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1014.64	1631.26	1030.07	1623.24	1030.07	1622.32	1066	1621.22	1103.36	1622.32
1103.36	1623.24	1118.79	1631.26						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1014.64	.015	1014.64	.015	1118.79	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1014.64	1118.79	16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.24	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.35	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.56	Flow Area (sq ft)		532.74	
E.G. Slope (ft/ft)	0.004923	Area (sq ft)		532.74	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.96	Top Width (ft)		92.96	
Vel Total (ft/s)	21.59	Avg. Vel. (ft/s)		21.59	
Max Chl Dpth (ft)	7.13	Hydr. Depth (ft)		5.73	
Conv. Total (cfs)	163900.5	Conv. (cfs)		163900.5	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		97.33	
Min Ch El (ft)	1621.22	Shear (lb/sq ft)		1.68	
Alpha	1.00	Stream Power (lb/ft s)		36.31	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		46.48	
C & E Loss (ft)	0.01	Cum SA (acres)		8.34	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11668.62

INPUT
Description: PC at Sta 152+04.97 (END TRANSITION)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1631.54	1031	1622.19	1066	1621.14	1101	1622.19	1119	1631.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.24	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.26	Reach Len. (ft)	90.59	90.59	90.59
Crit W.S. (ft)	1630.48	Flow Area (sq ft)		532.44	
E.G. Slope (ft/ft)	0.004867	Area (sq ft)		532.44	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.36	Top Width (ft)		93.36	
Vel Total (ft/s)	21.60	Avg. Vel. (ft/s)		21.60	
Max Chl Dpth (ft)	7.12	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	164847.8	Conv. (cfs)		164847.8	
Length Wtd. (ft)	90.59	Wetted Per. (ft)		96.36	
Min Ch El (ft)	1621.14	Shear (lb/sq ft)		1.68	
Alpha	1.00	Stream Power (lb/ft s)		36.26	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		46.28	
C & E Loss (ft)	0.00	Cum SA (acres)		8.30	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11578.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1630.79	1031	1621.78	1066	1620.73	1101	1621.78	1119	1630.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.23	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.82	Reach Len. (ft)	90.59	90.59	90.59
Crit W.S. (ft)	1630.05	Flow Area (sq ft)		532.77	
E.G. Slope (ft/ft)	0.004903	Area (sq ft)		532.77	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	94.17	Top Width (ft)		94.17	
Vel Total (ft/s)	21.59	Avg. Vel. (ft/s)		21.59	
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)		5.66	
Conv. Total (cfs)	164232.5	Conv. (cfs)		164232.5	
Length Wtd. (ft)	90.59	Wetted Per. (ft)		97.06	
Min Ch El (ft)	1620.73	Shear (lb/sq ft)		1.68	
Alpha	1.00	Stream Power (lb/ft s)		36.27	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)		45.17	
C & E Loss (ft)	0.00	Cum SA (acres)		8.10	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11487.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1630.37	1031	1621.37	1066	1620.32	1101	1621.37	1119	1630.37

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1634.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.19	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.43	Reach Len. (ft)	90.59	90.59	90.59
Crit W.S. (ft)	1629.64	Flow Area (sq ft)		534.54	
E.G. Slope (ft/ft)	0.004855	Area (sq ft)		534.54	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	94.25	Top Width (ft)		94.25	
Vel Total (ft/s)	21.51	Avg. Vel. (ft/s)		21.51	
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)		5.67	
Conv. Total (cfs)	165048.1	Conv. (cfs)		165048.1	
Length Wtd. (ft)	90.59	Wetted Per. (ft)		97.14	
Min Ch El (ft)	1620.32	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)		35.88	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)		44.06	
C & E Loss (ft)	0.00	Cum SA (acres)		7.91	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11396.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1629.97	1031	1620.97	1066	1619.92	1101	1620.97	1119	1629.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1634.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.13	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.06	Reach Len. (ft)	90.59	90.59	90.59
Crit W.S. (ft)	1629.24	Flow Area (sq ft)		536.82	
E.G. Slope (ft/ft)	0.004794	Area (sq ft)		536.82	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	94.34	Top Width (ft)		94.34	
Vel Total (ft/s)	21.42	Avg. Vel. (ft/s)		21.42	
Max Chl Dpth (ft)	7.14	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	166097.2	Conv. (cfs)		166097.2	
Length Wtd. (ft)	90.59	Wetted Per. (ft)		97.25	
Min Ch El (ft)	1619.92	Shear (lb/sq ft)		1.65	
Alpha	1.00	Stream Power (lb/ft s)		35.39	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)		42.95	
C & E Loss (ft)	0.00	Cum SA (acres)		7.71	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11306.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1629.56	1031	1620.56	1066	1619.51	1101	1620.56	1119	1629.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1633.75	Element		Left OB	Channel	Right OB
Vel Head (ft)	7.09	Wt. n-Val.			0.015	
W.S. Elev (ft)	1626.66	Reach Len. (ft)		90.59	90.59	90.59
Crit W.S. (ft)	1628.83	Flow Area (sq ft)			538.22	
E.G. Slope (ft/ft)	0.004757	Area (sq ft)			538.22	
Q Total (cfs)	11500.00	Flow (cfs)			11500.00	
Top Width (ft)	94.40	Top Width (ft)			94.40	
Vel Total (ft/s)	21.37	Avg. Vel. (ft/s)			21.37	
Max Chl Dpth (ft)	7.15	Hydr. Depth (ft)			5.70	
Conv. Total (cfs)	166743.4	Conv. (cfs)			166743.4	
Length Wtd. (ft)	90.59	Wetted Per. (ft)			97.31	
Min Ch El (ft)	1619.51	Shear (lb/sq ft)			1.64	
Alpha	1.00	Stream Power (lb/ft s)			35.09	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)			41.83	
C & E Loss (ft)	0.00	Cum SA (acres)			7.52	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11215.68

INPUT
Description: PT AT 156+57.92
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1629.5	1031	1620.15	1066	1619.1	1101	1620.15	1119	1629.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1633.33	Element		Left OB	Channel	Right OB
Vel Head (ft)	7.02	Wt. n-Val.			0.015	
W.S. Elev (ft)	1626.31	Reach Len. (ft)		86.94	86.94	86.94
Crit W.S. (ft)	1628.44	Flow Area (sq ft)			540.98	
E.G. Slope (ft/ft)	0.004640	Area (sq ft)			540.98	
Q Total (cfs)	11500.00	Flow (cfs)			11500.00	
Top Width (ft)	93.72	Top Width (ft)			93.72	
Vel Total (ft/s)	21.26	Avg. Vel. (ft/s)			21.26	
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)			5.77	
Conv. Total (cfs)	168818.7	Conv. (cfs)			168818.7	
Length Wtd. (ft)	86.94	Wetted Per. (ft)			96.76	
Min Ch El (ft)	1619.10	Shear (lb/sq ft)			1.62	
Alpha	1.00	Stream Power (lb/ft s)			34.43	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)			40.71	
C & E Loss (ft)	0.00	Cum SA (acres)			7.32	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11128.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1629.11	1031	1619.76	1066	1618.71	1101	1619.76	1119	1629.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1632.93	Element		Left OB	Channel	Right OB
Vel Head (ft)	7.00	Wt. n-Val.			0.015	
W.S. Elev (ft)	1625.93	Reach Len. (ft)		86.94	86.94	86.94
Crit W.S. (ft)	1628.05	Flow Area (sq ft)			541.73	
E.G. Slope (ft/ft)	0.004621	Area (sq ft)			541.73	
Q Total (cfs)	11500.00	Flow (cfs)			11500.00	
Top Width (ft)	93.75	Top Width (ft)			93.75	
Vel Total (ft/s)	21.23	Avg. Vel. (ft/s)			21.23	
Max Chl Dpth (ft)	7.22	Hydr. Depth (ft)			5.78	
Conv. Total (cfs)	169165.6	Conv. (cfs)			169165.6	
Length Wtd. (ft)	86.94	Wetted Per. (ft)			96.79	
Min Ch El (ft)	1618.71	Shear (lb/sq ft)			1.61	
Alpha	1.00	Stream Power (lb/ft s)			34.28	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)			39.63	
C & E Loss (ft)	0.00	Cum SA (acres)			7.13	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11041.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1628.72	1031	1619.36	1066	1618.31	1101	1619.36	1119	1628.72

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1632.52	Element			
Vel Head (ft)	6.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1625.53	Reach Len. (ft)	86.94	86.94	86.94
Crit W.S. (ft)	1627.65	Flow Area (sq ft)		541.86	
E.G. Slope (ft/ft)	0.004617	Area (sq ft)		541.86	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.73	Top Width (ft)		93.73	
Vel Total (ft/s)	21.22	Avg. Vel. (ft/s)		21.22	
Max Chl Dpth (ft)	7.22	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	169250.2	Conv. (cfs)		169250.2	
Length Wtd. (ft)	86.94	Wetted Per. (ft)		96.78	
Min Ch El (ft)	1618.31	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.25	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		38.55	
C & E Loss (ft)	0.00	Cum SA (acres)		6.95	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10954.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1628.32	1031	1618.97	1066	1617.92	1101	1618.97	1119	1628.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1632.12	Element			
Vel Head (ft)	6.98	Wt. n-Val.		0.015	
W.S. Elev (ft)	1625.15	Reach Len. (ft)	86.94	86.94	86.94
Crit W.S. (ft)	1627.27	Flow Area (sq ft)		542.50	
E.G. Slope (ft/ft)	0.004602	Area (sq ft)		542.50	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.78	Top Width (ft)		93.78	
Vel Total (ft/s)	21.20	Avg. Vel. (ft/s)		21.20	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	169526.5	Conv. (cfs)		169526.5	
Length Wtd. (ft)	86.94	Wetted Per. (ft)		96.83	
Min Ch El (ft)	1617.92	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.12	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		37.46	
C & E Loss (ft)	0.00	Cum SA (acres)		6.76	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10867.92

INPUT
Description: PC at STA 160+05.69
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1627.93	1031	1618.58	1066	1617.53	1101	1618.58	1119	1627.93

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1631.73	Element			
Vel Head (ft)	6.96	Wt. n-Val.		0.015	
W.S. Elev (ft)	1624.76	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1626.87	Flow Area (sq ft)		543.06	
E.G. Slope (ft/ft)	0.004588	Area (sq ft)		543.06	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.80	Top Width (ft)		93.80	
Vel Total (ft/s)	21.18	Avg. Vel. (ft/s)		21.18	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	169788.3	Conv. (cfs)		169788.3	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		96.85	
Min Ch El (ft)	1617.53	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.01	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		36.38	
C & E Loss (ft)	0.00	Cum SA (acres)		6.57	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10774.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1628.03	1031	1618.03	1066	1617.11	1101	1618.03	1119	1628.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1631.31	Element			
Vel Head (ft)	7.01	Wt. n-Val.		0.015	
W.S. Elev (ft)	1624.29	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1626.41	Flow Area (sq ft)		541.15	
E.G. Slope (ft/ft)	0.004575	Area (sq ft)		541.15	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.54	Top Width (ft)		92.54	
Vel Total (ft/s)	21.25	Avg. Vel. (ft/s)		21.25	
Max Chl Dpth (ft)	7.18	Hydr. Depth (ft)		5.85	
Conv. Total (cfs)	170014.9	Conv. (cfs)		170014.9	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.81	
Min Ch El (ft)	1617.11	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.28	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		35.22	
C & E Loss (ft)	0.00	Cum SA (acres)		6.37	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10680.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1627.63	1031	1617.63	1066	1616.69	1101	1617.63	1119	1627.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1630.88	Element			
Vel Head (ft)	6.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1623.89	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1626.01	Flow Area (sq ft)		542.00	
E.G. Slope (ft/ft)	0.004552	Area (sq ft)		542.00	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.55	Top Width (ft)		92.55	
Vel Total (ft/s)	21.22	Avg. Vel. (ft/s)		21.22	
Max Chl Dpth (ft)	7.20	Hydr. Depth (ft)		5.86	
Conv. Total (cfs)	170449.9	Conv. (cfs)		170449.9	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.82	
Min Ch El (ft)	1616.69	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.11	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		34.05	
C & E Loss (ft)	0.00	Cum SA (acres)		6.17	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10587.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1627.23	1031	1617.23	1066	1616.27	1101	1617.23	1119	1627.23

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1630.46	Element			
Vel Head (ft)	6.97	Wt. n-Val.		0.015	
W.S. Elev (ft)	1623.50	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1625.60	Flow Area (sq ft)		542.85	
E.G. Slope (ft/ft)	0.004529	Area (sq ft)		542.85	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.56	Top Width (ft)		92.56	
Vel Total (ft/s)	21.18	Avg. Vel. (ft/s)		21.18	

Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)	5.87
Conv. Total (cfs)	170883.1	Conv. (cfs)	170883.1
Length Wtd. (ft)	93.54	Wetted Per. (ft)	95.83
Min Ch El (ft)	1616.27	Shear (lb/sq ft)	1.60
Alpha	1.00	Stream Power (lb/ft s)	33.93
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	32.89
C & E Loss (ft)	0.00	Cum SA (acres)	5.97

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10493.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1626.84	1031	1616.84	1066	1615.85	1101	1616.84	1119	1626.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1630.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1623.11	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1625.20	Flow Area (sq ft)		544.24	
E.G. Slope (ft/ft)	0.004492	Area (sq ft)		544.24	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.57	Top Width (ft)		92.57	
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13	
Max Chl Dpth (ft)	7.26	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171593.0	Conv. (cfs)		171593.0	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.85	
Min Ch El (ft)	1615.85	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.64	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		31.72	
C & E Loss (ft)	0.00	Cum SA (acres)		5.78	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10400.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1626.44	1031	1616.44	1066	1615.43	1101	1616.44	1119	1626.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1629.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1622.71	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1624.77	Flow Area (sq ft)		545.01	
E.G. Slope (ft/ft)	0.004471	Area (sq ft)		545.01	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.57	Top Width (ft)		92.57	
Vel Total (ft/s)	21.10	Avg. Vel. (ft/s)		21.10	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	171995.1	Conv. (cfs)		171995.1	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.85	
Min Ch El (ft)	1615.43	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.49	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		30.55	
C & E Loss (ft)	0.00	Cum SA (acres)		5.58	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10306.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1626.04	1031	1616.04	1066	1615.01	1101	1616.04	1119	1626.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1629.21	Element	Left OB	Channel	Right OB

Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1622.31	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1624.38	Flow Area (sq ft)		545.78	
E.G. Slope (ft/ft)	0.004450	Area (sq ft)		545.78	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.57	Top Width (ft)		92.57	
Vel Total (ft/s)	21.07	Avg. Vel. (ft/s)		21.07	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172396.7	Conv. (cfs)		172396.7	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.85	
Min Ch El (ft)	1615.01	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.33	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		29.38	
C & E Loss (ft)	0.00	Cum SA (acres)		5.38	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10213.13

INPUT
Description: PCC at STA 166+60.48
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1625.64	1031	1615.64	1066	1614.59	1101	1615.64	1119	1625.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	98.96	98.96	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1628.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1621.91	Reach Len. (ft)	98.96	98.96	98.96
Crit W.S. (ft)	1623.96	Flow Area (sq ft)		546.56	
E.G. Slope (ft/ft)	0.004429	Area (sq ft)		546.56	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.58	Top Width (ft)		92.58	
Vel Total (ft/s)	21.04	Avg. Vel. (ft/s)		21.04	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172801.8	Conv. (cfs)		172801.8	
Length Wtd. (ft)	98.96	Wetted Per. (ft)		95.86	
Min Ch El (ft)	1614.59	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.17	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		28.21	
C & E Loss (ft)	0.00	Cum SA (acres)		5.18	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10114.1

INPUT
Description: cl hollywood boulevard
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.54	1031	1615.19	1066	1614.14	1101	1615.19	1119	1624.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	73.93	73.93	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1628.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.97	Wt. n-Val.		0.015	
W.S. Elev (ft)	1621.37	Reach Len. (ft)	73.93	73.93	73.93
Crit W.S. (ft)	1623.48	Flow Area (sq ft)		542.97	
E.G. Slope (ft/ft)	0.004590	Area (sq ft)		542.97	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.80	Top Width (ft)		93.80	
Vel Total (ft/s)	21.18	Avg. Vel. (ft/s)		21.18	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	169745.5	Conv. (cfs)		169745.5	
Length Wtd. (ft)	73.93	Wetted Per. (ft)		96.85	
Min Ch El (ft)	1614.14	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.02	
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)		26.97	
C & E Loss (ft)	0.00	Cum SA (acres)		4.97	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10040.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.86	1031	1614.86	1066	1613.81	1101	1614.86	1119	1624.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1013 1119 73.93 73.93 73.93 0 0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1628.00	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.87	Wt. n-Val.		0.015		
W.S. Elev (ft)	1621.13	Reach Len. (ft)	73.93	73.93	73.93	
Crit W.S. (ft)	1623.20	Flow Area (sq ft)		546.71		
E.G. Slope (ft/ft)	0.004425	Area (sq ft)		546.71		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.58	Top Width (ft)		92.58		
Vel Total (ft/s)	21.04	Avg. Vel. (ft/s)		21.04		
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91		
Conv. Total (cfs)	172869.1	Conv. (cfs)		172869.1		
Length Wtd. (ft)	73.93	Wetted Per. (ft)		95.87		
Min Ch El (ft)	1613.81	Shear (lb/sq ft)		1.58		
Alpha	1.00	Stream Power (lb/ft s)		33.14		
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		26.04		
C & E Loss (ft)	0.00	Cum SA (acres)		4.81		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9966.33

INPUT
Description: PT at STA 169+07.28
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.87	1031	1614.53	1066	1613.48	1101	1614.53	1119	1623.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1013 1119 49.69 49.69 49.69 0 0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1627.67	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.95	Wt. n-Val.		0.015		
W.S. Elev (ft)	1620.72	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1622.83	Flow Area (sq ft)		543.69		
E.G. Slope (ft/ft)	0.004573	Area (sq ft)		543.69		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	93.85	Top Width (ft)		93.85		
Vel Total (ft/s)	21.15	Avg. Vel. (ft/s)		21.15		
Max Chl Dpth (ft)	7.24	Hydr. Depth (ft)		5.79		
Conv. Total (cfs)	170062.2	Conv. (cfs)		170062.2		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		96.90		
Min Ch El (ft)	1613.48	Shear (lb/sq ft)		1.60		
Alpha	1.00	Stream Power (lb/ft s)		33.88		
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		25.12		
C & E Loss (ft)	0.00	Cum SA (acres)		4.65		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9916.64*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.31	1031	1614.31	1066	1613.26	1101	1614.31	1119	1624.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1013 1119 49.69 49.69 49.69 0 0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1627.44	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.85	Wt. n-Val.		0.015		
W.S. Elev (ft)	1620.59	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1622.63	Flow Area (sq ft)		547.51		
E.G. Slope (ft/ft)	0.004406	Area (sq ft)		547.51		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.61	Top Width (ft)		92.61		
Vel Total (ft/s)	21.00	Avg. Vel. (ft/s)		21.00		
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)		5.91		
Conv. Total (cfs)	173251.5	Conv. (cfs)		173251.5		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.90		
Min Ch El (ft)	1613.26	Shear (lb/sq ft)		1.57		
Alpha	1.00	Stream Power (lb/ft s)		32.98		
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		24.50		
C & E Loss (ft)	0.00	Cum SA (acres)		4.54		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9866.96*

INPUT
Description:

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.08	1031	1614.08	1066	1613.03	1101	1614.08	1119	1624.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1627.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.36	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1622.42	Flow Area (sq ft)		546.85	
E.G. Slope (ft/ft)	0.004422	Area (sq ft)		546.85	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.59	Top Width (ft)		92.59	
Vel Total (ft/s)	21.03	Avg. Vel. (ft/s)		21.03	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	172938.7	Conv. (cfs)		172938.7	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.87	
Min Ch El (ft)	1613.03	Shear (lb/sq ft)		1.57	
Alpha	1.00	Stream Power (lb/ft s)		33.11	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		23.87	
C & E Loss (ft)	0.00	Cum SA (acres)		4.44	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9817.27*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.86	1031	1613.86	1066	1612.81	1101	1613.86	1119	1623.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1627.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.13	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1622.20	Flow Area (sq ft)		546.81	
E.G. Slope (ft/ft)	0.004423	Area (sq ft)		546.81	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.59	Top Width (ft)		92.59	
Vel Total (ft/s)	21.03	Avg. Vel. (ft/s)		21.03	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	172917.2	Conv. (cfs)		172917.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.87	
Min Ch El (ft)	1612.81	Shear (lb/sq ft)		1.57	
Alpha	1.00	Stream Power (lb/ft s)		33.12	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		23.25	
C & E Loss (ft)	0.00	Cum SA (acres)		4.33	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9767.59*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.64	1031	1613.64	1066	1612.59	1101	1613.64	1119	1623.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1626.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.91	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.96	Flow Area (sq ft)		546.77	
E.G. Slope (ft/ft)	0.004424	Area (sq ft)		546.77	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.59	Top Width (ft)		92.59	
Vel Total (ft/s)	21.03	Avg. Vel. (ft/s)		21.03	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	172898.1	Conv. (cfs)		172898.1	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.87	
Min Ch El (ft)	1612.59	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.13	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		22.63	
C & E Loss (ft)	0.00	Cum SA (acres)		4.23	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9717.90*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.41	1031	1613.41	1066	1612.36	1101	1613.41	1119	1623.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1012	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1626.56	Element			
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.68	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.73	Flow Area (sq ft)		546.06	
E.G. Slope (ft/ft)	0.004441	Area (sq ft)		546.06	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.56	Top Width (ft)		92.56	
Vel Total (ft/s)	21.06	Avg. Vel. (ft/s)		21.06	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172561.1	Conv. (cfs)		172561.1	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.84	
Min Ch El (ft)	1612.36	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.27	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		22.00	
C & E Loss (ft)	0.00	Cum SA (acres)		4.12	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9668.22*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.19	1031	1613.19	1066	1612.14	1101	1613.19	1119	1623.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1626.34	Element			
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.46	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.53	Flow Area (sq ft)		546.08	
E.G. Slope (ft/ft)	0.004441	Area (sq ft)		546.08	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.56	Top Width (ft)		92.56	
Vel Total (ft/s)	21.06	Avg. Vel. (ft/s)		21.06	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172574.9	Conv. (cfs)		172574.9	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.84	
Min Ch El (ft)	1612.14	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.27	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		21.38	
C & E Loss (ft)	0.00	Cum SA (acres)		4.02	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9618.53*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.97	1031	1612.97	1066	1611.92	1101	1612.97	1119	1622.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1626.12	Element			
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.24	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.31	Flow Area (sq ft)		546.11	
E.G. Slope (ft/ft)	0.004440	Area (sq ft)		546.11	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.56	Top Width (ft)		92.56	
Vel Total (ft/s)	21.06	Avg. Vel. (ft/s)		21.06	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172585.6	Conv. (cfs)		172585.6	

Length Wtd. (ft)	49.69	Wetted Per. (ft)	95.84
Min Ch El (ft)	1611.92	Shear (lb/sq ft)	1.58
Alpha	1.00	Stream Power (lb/ft s)	33.26
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	20.76
C & E Loss (ft)	0.00	Cum SA (acres)	3.91

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9568.85*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.74	1031	1612.74	1066	1611.69	1101	1612.74	1119	1622.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1625.90	Element			
Vel Head (ft)	6.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.00	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.06	Flow Area (sq ft)		545.46	
E.G. Slope (ft/ft)	0.004456	Area (sq ft)		545.46	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.53	Top Width (ft)		92.53	
Vel Total (ft/s)	21.08	Avg. Vel. (ft/s)		21.08	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	172277.7	Conv. (cfs)		172277.7	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.81	
Min Ch El (ft)	1611.69	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.39	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		20.13	
C & E Loss (ft)	0.00	Cum SA (acres)		3.81	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9519.17*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.52	1031	1612.52	1066	1611.47	1101	1612.52	1119	1622.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1625.68	Element			
Vel Head (ft)	6.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.78	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1620.84	Flow Area (sq ft)		545.54	
E.G. Slope (ft/ft)	0.004454	Area (sq ft)		545.54	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.54	Top Width (ft)		92.54	
Vel Total (ft/s)	21.08	Avg. Vel. (ft/s)		21.08	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172315.2	Conv. (cfs)		172315.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.81	
Min Ch El (ft)	1611.47	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.37	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		19.51	
C & E Loss (ft)	0.00	Cum SA (acres)		3.70	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9469.48*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.3	1031	1612.3	1066	1611.25	1101	1612.3	1119	1622.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1625.46	Element			
Vel Head (ft)	6.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.56	Reach Len. (ft)	49.69	49.69	49.69

Crit W.S. (ft)	1620.62	Flow Area (sq ft)	545.61
E.G. Slope (ft/ft)	0.004452	Area (sq ft)	545.61
Q Total (cfs)	11500.00	Flow (cfs)	11500.00
Top Width (ft)	92.54	Top Width (ft)	92.54
Vel Total (ft/s)	21.08	Avg. Vel. (ft/s)	21.08
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)	5.90
Conv. Total (cfs)	172352.6	Conv. (cfs)	172352.6
Length Wtd. (ft)	49.69	Wetted Per. (ft)	95.82
Min Ch El (ft)	1611.25	Shear (lb/sq ft)	1.58
Alpha	1.00	Stream Power (lb/ft s)	33.36
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	18.89
C & E Loss (ft)	0.00	Cum SA (acres)	3.59

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9419.80*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.07	1031	1612.07	1066	1611.02	1101	1612.07	1119	1622.07

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.33	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1620.41	Flow Area (sq ft)		545.01	
E.G. Slope (ft/ft)	0.004467	Area (sq ft)		545.01	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.52	Top Width (ft)		92.52	
Vel Total (ft/s)	21.10	Avg. Vel. (ft/s)		21.10	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	172067.2	Conv. (cfs)		172067.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.79	
Min Ch El (ft)	1611.02	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.48	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		18.27	
C & E Loss (ft)	0.00	Cum SA (acres)		3.49	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9370.11*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.85	1031	1611.85	1066	1610.8	1101	1611.85	1119	1621.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.11	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1620.19	Flow Area (sq ft)		545.11	
E.G. Slope (ft/ft)	0.004464	Area (sq ft)		545.11	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.52	Top Width (ft)		92.52	
Vel Total (ft/s)	21.10	Avg. Vel. (ft/s)		21.10	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	172115.2	Conv. (cfs)		172115.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.80	
Min Ch El (ft)	1610.80	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.46	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		17.65	
C & E Loss (ft)	0.00	Cum SA (acres)		3.38	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9320.43*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.62	1031	1611.62	1066	1610.57	1101	1611.62	1119	1621.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1013	1119		49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.80	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.93	Wt. n-Val.		0.015		
W.S. Elev (ft)	1617.87	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1619.94	Flow Area (sq ft)		544.55		
E.G. Slope (ft/ft)	0.004478	Area (sq ft)		544.55		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.50	Top Width (ft)		92.50		
Vel Total (ft/s)	21.12	Avg. Vel. (ft/s)		21.12		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89		
Conv. Total (cfs)	171850.5	Conv. (cfs)		171850.5		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.77		
Min Ch El (ft)	1610.57	Shear (lb/sq ft)		1.59		
Alpha	1.00	Stream Power (lb/ft s)		33.57		
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		17.02		
C & E Loss (ft)	0.00	Cum SA (acres)		3.28		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9270.74*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.4	1031	1611.4	1066	1610.35	1101	1611.4	1119	1621.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.57	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.92	Wt. n-Val.		0.015		
W.S. Elev (ft)	1617.65	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1619.72	Flow Area (sq ft)		544.70		
E.G. Slope (ft/ft)	0.004474	Area (sq ft)		544.70		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.51	Top Width (ft)		92.51		
Vel Total (ft/s)	21.11	Avg. Vel. (ft/s)		21.11		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89		
Conv. Total (cfs)	171919.9	Conv. (cfs)		171919.9		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.78		
Min Ch El (ft)	1610.35	Shear (lb/sq ft)		1.59		
Alpha	1.00	Stream Power (lb/ft s)		33.54		
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		16.40		
C & E Loss (ft)	0.00	Cum SA (acres)		3.17		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9221.06*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.18	1031	1611.18	1066	1610.13	1101	1611.18	1119	1621.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.35	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.92	Wt. n-Val.		0.015		
W.S. Elev (ft)	1617.43	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1619.50	Flow Area (sq ft)		544.85		
E.G. Slope (ft/ft)	0.004471	Area (sq ft)		544.85		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.51	Top Width (ft)		92.51		
Vel Total (ft/s)	21.11	Avg. Vel. (ft/s)		21.11		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89		
Conv. Total (cfs)	171989.3	Conv. (cfs)		171989.3		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.78		
Min Ch El (ft)	1610.13	Shear (lb/sq ft)		1.59		
Alpha	1.00	Stream Power (lb/ft s)		33.51		
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		15.78		
C & E Loss (ft)	0.00	Cum SA (acres)		3.07		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9171.38*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

1013	1620.95	1031	1610.95	1066	1609.9	1101	1610.95	1119	1620.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.13	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.93	Wt. n-Val.		0.015		
W.S. Elev (ft)	1617.20	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1619.29	Flow Area (sq ft)		544.30		
E.G. Slope (ft/ft)	0.004484	Area (sq ft)		544.30		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.49	Top Width (ft)		92.49		
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.88		
Conv. Total (cfs)	171730.9	Conv. (cfs)		171730.9		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.76		
Min Ch El (ft)	1609.90	Shear (lb/sq ft)		1.59		
Alpha	1.00	Stream Power (lb/ft s)		33.62		
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		15.16		
C & E Loss (ft)	0.00	Cum SA (acres)		2.96		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9121.69*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.73	1031	1610.73	1066	1609.68	1101	1610.73	1119	1620.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.91	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.93	Wt. n-Val.		0.015		
W.S. Elev (ft)	1616.98	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1619.07	Flow Area (sq ft)		544.47		
E.G. Slope (ft/ft)	0.004480	Area (sq ft)		544.47		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.50	Top Width (ft)		92.50		
Vel Total (ft/s)	21.12	Avg. Vel. (ft/s)		21.12		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89		
Conv. Total (cfs)	171810.9	Conv. (cfs)		171810.9		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.77		
Min Ch El (ft)	1609.68	Shear (lb/sq ft)		1.59		
Alpha	1.00	Stream Power (lb/ft s)		33.59		
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		14.54		
C & E Loss (ft)	0.00	Cum SA (acres)		2.86		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9072.01*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.51	1031	1610.51	1066	1609.46	1101	1610.51	1119	1620.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.68	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.92	Wt. n-Val.		0.015		
W.S. Elev (ft)	1616.76	Reach Len. (ft)	49.69	49.69	49.69	
Crit W.S. (ft)	1618.83	Flow Area (sq ft)		544.64		
E.G. Slope (ft/ft)	0.004476	Area (sq ft)		544.64		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.50	Top Width (ft)		92.50		
Vel Total (ft/s)	21.11	Avg. Vel. (ft/s)		21.11		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89		
Conv. Total (cfs)	171893.3	Conv. (cfs)		171893.3		
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.77		
Min Ch El (ft)	1609.46	Shear (lb/sq ft)		1.59		
Alpha	1.00	Stream Power (lb/ft s)		33.55		
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		13.92		
C & E Loss (ft)	0.00	Cum SA (acres)		2.75		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9022.32*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.28	1031	1610.28	1066	1609.23	1101	1610.28	1119	1620.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1623.46	Element			
Vel Head (ft)	6.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.53	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1618.60	Flow Area (sq ft)		544.12	
E.G. Slope (ft/ft)	0.004489	Area (sq ft)		544.12	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.48	Top Width (ft)		92.48	
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171647.8	Conv. (cfs)		171647.8	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.75	
Min Ch El (ft)	1609.23	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.66	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		13.30	
C & E Loss (ft)	0.00	Cum SA (acres)		2.64	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8972.64*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.06	1031	1610.06	1066	1609.01	1101	1610.06	1119	1620.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1623.24	Element			
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.31	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1618.38	Flow Area (sq ft)		544.29	
E.G. Slope (ft/ft)	0.004485	Area (sq ft)		544.29	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.49	Top Width (ft)		92.49	
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171727.8	Conv. (cfs)		171727.8	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.76	
Min Ch El (ft)	1609.01	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.62	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		12.68	
C & E Loss (ft)	0.00	Cum SA (acres)		2.54	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8922.95*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1619.84	1031	1609.84	1066	1608.79	1101	1609.84	1119	1619.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69 49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1623.02	Element			
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.09	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1618.18	Flow Area (sq ft)		544.47	
E.G. Slope (ft/ft)	0.004480	Area (sq ft)		544.47	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.50	Top Width (ft)		92.50	
Vel Total (ft/s)	21.12	Avg. Vel. (ft/s)		21.12	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	171810.9	Conv. (cfs)		171810.9	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.77	
Min Ch El (ft)	1608.79	Shear (lb/sq ft)		1.59	

Alpha	1.00	Stream Power (lb/ft s)	33.59
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	12.05
C & E Loss (ft)	0.00	Cum SA (acres)	2.43

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8873.27*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1619.61	1031	1609.61	1066	1608.56	1101	1609.61	1119	1619.61

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1615.85	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1617.95	Flow Area (sq ft)		543.97	
E.G. Slope (ft/ft)	0.004492	Area (sq ft)		543.97	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.48	Top Width (ft)		92.48	
Vel Total (ft/s)	21.14	Avg. Vel. (ft/s)		21.14	
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171576.1	Conv. (cfs)		171576.1	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.74	
Min Ch El (ft)	1608.56	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.69	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		11.43	
C & E Loss (ft)	0.00	Cum SA (acres)		2.33	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8823.59

INPUT
Description: TRANSITION TO 118' WIDE RECT. STA 180+50
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1618.39	1031	1609.39	1066	1608.34	1101	1609.39	1119	1618.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1615.50	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1617.66	Flow Area (sq ft)		539.29	
E.G. Slope (ft/ft)	0.004728	Area (sq ft)		539.29	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	94.45	Top Width (ft)		94.45	
Vel Total (ft/s)	21.32	Avg. Vel. (ft/s)		21.32	
Max Chl Dpth (ft)	7.16	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	167239.1	Conv. (cfs)		167239.1	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		97.36	
Min Ch El (ft)	1608.34	Shear (lb/sq ft)		1.64	
Alpha	1.00	Stream Power (lb/ft s)		34.87	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)		10.82	
C & E Loss (ft)	0.00	Cum SA (acres)		2.22	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8808.96*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1012.25	1619.41	1028	1609.41	1066	1608.27	1104	1609.41	1119.75	1619.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1012.25	.015	1012.25	.015	1119.75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1012.25	1119.75	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.36	Wt. n-Val.		0.015	
W.S. Elev (ft)	1615.11	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1617.36	Flow Area (sq ft)		528.08	
E.G. Slope (ft/ft)	0.005068	Area (sq ft)		528.08	

Q Total (cfs)	11500.00	Flow (cfs)	11500.00
Top Width (ft)	93.97	Top Width (ft)	93.97
Vel Total (ft/s)	21.78	Avg. Vel. (ft/s)	21.78
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)	5.62
Conv. Total (cfs)	161537.0	Conv. (cfs)	161537.0
Length Wtd. (ft)	14.63	Wetted Per. (ft)	97.32
Min Ch El (ft)	1608.27	Shear (lb/sq ft)	1.72
Alpha	1.00	Stream Power (lb/ft s)	37.39
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	10.64
C & E Loss (ft)	0.02	Cum SA (acres)	2.19

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8794.33*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1011.5	1619.44	1025	1609.44	1066	1608.21	1107	1609.44	1120.5	1619.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1011.5	.015	1011.5	.015	1120.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1011.5	1120.5	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.71	Wt. n-Val.		0.015	
W.S. Elev (ft)	1614.67	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1617.03	Flow Area (sq ft)		515.96	
E.G. Slope (ft/ft)	0.005648	Area (sq ft)		515.96	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	96.11	Top Width (ft)		96.11	
Vel Total (ft/s)	22.29	Avg. Vel. (ft/s)		22.29	
Max Chl Dpth (ft)	6.46	Hydr. Depth (ft)		5.37	
Conv. Total (cfs)	153020.3	Conv. (cfs)		153020.3	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		99.60	
Min Ch El (ft)	1608.21	Shear (lb/sq ft)		1.83	
Alpha	1.00	Stream Power (lb/ft s)		40.71	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		10.46	
C & E Loss (ft)	0.02	Cum SA (acres)		2.16	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8779.70*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1010.75	1619.46	1022	1609.46	1066	1608.14	1110	1609.46	1121.25	1619.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1010.75	.015	1010.75	.015	1121.25	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1010.75	1121.25	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1614.25	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1616.72	Flow Area (sq ft)		505.78	
E.G. Slope (ft/ft)	0.006269	Area (sq ft)		505.78	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	98.79	Top Width (ft)		98.79	
Vel Total (ft/s)	22.74	Avg. Vel. (ft/s)		22.74	
Max Chl Dpth (ft)	6.11	Hydr. Depth (ft)		5.12	
Conv. Total (cfs)	145244.9	Conv. (cfs)		145244.9	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		102.47	
Min Ch El (ft)	1608.14	Shear (lb/sq ft)		1.93	
Alpha	1.00	Stream Power (lb/ft s)		43.92	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		10.29	
C & E Loss (ft)	0.02	Cum SA (acres)		2.13	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8765.07*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1010	1619.48	1019	1609.48	1066	1608.07	1113	1609.48	1122	1619.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1010	.015	1010	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1010	1122	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.30	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.88	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1616.41	Flow Area (sq ft)		497.55	
E.G. Slope (ft/ft)	0.006917	Area (sq ft)		497.55	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	101.92	Top Width (ft)		101.92	
Vel Total (ft/s)	23.11	Avg. Vel. (ft/s)		23.11	
Max Chl Dpth (ft)	5.81	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	138270.5	Conv. (cfs)		138270.5	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		105.89	
Min Ch El (ft)	1608.07	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)		46.90	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		10.12	
C & E Loss (ft)	0.01	Cum SA (acres)		2.09	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8750.43*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1009.25	1619.51	1016	1609.51	1066	1608.01	1116	1609.51	1122.75	1619.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1009.25	.015	1009.25	.015	1122.75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1009.25	1122.75	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.57	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1616.13	Flow Area (sq ft)		491.59	
E.G. Slope (ft/ft)	0.007560	Area (sq ft)		491.59	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	105.47	Top Width (ft)		105.47	
Vel Total (ft/s)	23.39	Avg. Vel. (ft/s)		23.39	
Max Chl Dpth (ft)	5.55	Hydr. Depth (ft)		4.66	
Conv. Total (cfs)	132261.2	Conv. (cfs)		132261.2	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		109.83	
Min Ch El (ft)	1608.01	Shear (lb/sq ft)		2.11	
Alpha	1.00	Stream Power (lb/ft s)		49.42	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		9.96	
C & E Loss (ft)	0.01	Cum SA (acres)		2.06	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8735.81*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1008.5	1619.53	1013	1609.53	1066	1607.94	1119	1609.53	1123.5	1619.53

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1008.5	.015	1008.5	.015	1123.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1008.5	1123.5	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.67	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.27	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1615.83	Flow Area (sq ft)		486.58	
E.G. Slope (ft/ft)	0.008245	Area (sq ft)		486.58	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	109.36	Top Width (ft)		109.36	
Vel Total (ft/s)	23.63	Avg. Vel. (ft/s)		23.63	
Max Chl Dpth (ft)	5.33	Hydr. Depth (ft)		4.45	
Conv. Total (cfs)	126652.1	Conv. (cfs)		126652.1	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		114.24	
Min Ch El (ft)	1607.94	Shear (lb/sq ft)		2.19	
Alpha	1.00	Stream Power (lb/ft s)		51.81	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		9.79	
C & E Loss (ft)	0.01	Cum SA (acres)		2.02	

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8721.18*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007.75	1619.56	1010	1609.56	1066	1607.88	1122	1609.56	1124.25	1619.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

1007.75 .015 1007.75 .015 1124.25 .015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007.75	1124.25	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1621.82	Element			
Vel Head (ft)	8.81	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.01	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1615.61	Flow Area (sq ft)		482.81	
E.G. Slope (ft/ft)	0.008946	Area (sq ft)		482.81	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	113.55	Top Width (ft)		113.55	
Vel Total (ft/s)	23.82	Avg. Vel. (ft/s)		23.82	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	121585.5	Conv. (cfs)		121585.5	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		119.12	
Min Ch El (ft)	1607.88	Shear (lb/sq ft)		2.26	
Alpha	1.00	Stream Power (lb/ft s)		53.92	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		9.63	
C & E Loss (ft)	0.01	Cum SA (acres)		1.98	

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8706.55

INPUT
Description: PC at STA 181+67.05 (END TRANSITION)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1619.58	1007	1609.58	1066	1607.81	1125	1609.58	1125	1619.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	378.56	378.56	378.56	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1621.68	Element			
Vel Head (ft)	8.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.76	Reach Len. (ft)	378.56	378.56	378.56
Crit W.S. (ft)	1615.36	Flow Area (sq ft)		479.97	
E.G. Slope (ft/ft)	0.009669	Area (sq ft)		479.97	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	23.96	Avg. Vel. (ft/s)		23.96	
Max Chl Dpth (ft)	4.95	Hydr. Depth (ft)		4.07	
Conv. Total (cfs)	116952.3	Conv. (cfs)		116952.3	
Length Wtd. (ft)	378.56	Wetted Per. (ft)		124.42	
Min Ch El (ft)	1607.81	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)		55.79	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		9.47	
C & E Loss (ft)	0.01	Cum SA (acres)		1.94	

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8327.98

INPUT
Description: PT at STA 185+45.62
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1617.88	1007	1607.88	1066	1606.11	1125	1607.88	1125	1617.88

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	54.08	54.08	54.08	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.66	Element			
Vel Head (ft)	7.11	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.55	Reach Len. (ft)	54.08	54.08	54.08
Crit W.S. (ft)	1613.65	Flow Area (sq ft)		537.57	
E.G. Slope (ft/ft)	0.006696	Area (sq ft)		537.57	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	21.39	Avg. Vel. (ft/s)		21.39	
Max Chl Dpth (ft)	5.44	Hydr. Depth (ft)		4.56	
Conv. Total (cfs)	140531.8	Conv. (cfs)		140531.8	
Length Wtd. (ft)	54.08	Wetted Per. (ft)		125.39	
Min Ch El (ft)	1606.11	Shear (lb/sq ft)		1.79	
Alpha	1.00	Stream Power (lb/ft s)		38.34	
Frctn Loss (ft)	3.02	Cum Volume (acre-ft)		5.05	
C & E Loss (ft)	0.00	Cum SA (acres)		0.92	

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 RIVER: Duckcreek
REACH: DUCKDOWN RS: 8273.9

INPUT
Description: 14.4' upstream of bridge face at BBent

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1616.63	1007	1607.63	1066	1605.86	1125	1607.63	1125	1616.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	14.4	14.4	14.4	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.31	Element			
Vel Head (ft)	6.96	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.35	Reach Len. (ft)	14.40	14.40	14.40
Crit W.S. (ft)	1613.40	Flow Area (sq ft)		543.24	
E.G. Slope (ft/ft)	0.006473	Area (sq ft)		543.24	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	21.17	Avg. Vel. (ft/s)		21.17	
Max Chl Dpth (ft)	5.49	Hydr. Depth (ft)		4.60	
Conv. Total (cfs)	142940.1	Conv. (cfs)		142940.1	
Length Wtd. (ft)	14.40	Wetted Per. (ft)		125.49	
Min Ch El (ft)	1605.86	Shear (lb/sq ft)		1.75	
Alpha	1.00	Stream Power (lb/ft s)		37.03	
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)		4.37	
C & E Loss (ft)	0.00	Cum SA (acres)		0.77	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8259.5

INPUT
Description: upstream of bridge face at BBent
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1615.1	1007	1607.58	1066	1605.81	1125	1607.58	1125	1615.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	140.8	140.8	140.8	.1	.2

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.22	Element			
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.32	Reach Len. (ft)	14.40	14.40	14.40
Crit W.S. (ft)	1613.37	Flow Area (sq ft)		545.74	
E.G. Slope (ft/ft)	0.006377	Area (sq ft)		545.74	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	21.07	Avg. Vel. (ft/s)		21.07	
Max Chl Dpth (ft)	5.51	Hydr. Depth (ft)		4.62	
Conv. Total (cfs)	144005.3	Conv. (cfs)		144005.3	
Length Wtd. (ft)	14.40	Wetted Per. (ft)		125.53	
Min Ch El (ft)	1605.81	Shear (lb/sq ft)		1.73	
Alpha	1.00	Stream Power (lb/ft s)		36.47	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		4.19	
C & E Loss (ft)	0.00	Cum SA (acres)		0.73	

Warning: The cross section had to be extended vertically during the critical depth calculations.

BRIDGE RIVER: Duckcreek
REACH: DUCKDOWN RS: 8202.6

INPUT
Description: broadbent bridge
Distance from Upstream XS = 14.4
Deck/Roadway Width = 119.6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
1007	1620	1615.31	1125	1620	1615.31

Upstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1615.1	1007	1607.58	1066	1605.81	1125	1607.58	1125	1615.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
1007	1125	.1	.2

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
1007	1620	1614.69	1125	1620	1614.69

Downstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1614.69	1007	1606.96	1066	1605.19	1125	1606.96	1125	1614.69

```
Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1007    .015    1007    .015    1125    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1007    1125             .1       .2

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 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 Piers =  3

Pier Data
Pier Station     Upstream=1036.125    Downstream=1036.125
Upstream     num=       2
    Width   Elev    Width   Elev
      2.5   1600      2.5   1616
Downstream     num=       2
    Width   Elev    Width   Elev
      2.5   1600      2.5   1616

Pier Data
Pier Station     Upstream=    1066    Downstream=    1066
Upstream     num=       2
    Width   Elev    Width   Elev
      2.5   1600      2.5   1616
Downstream     num=       2
    Width   Elev    Width   Elev
      2.5   1600      2.5   1616

Pier Data
Pier Station     Upstream=1095.875    Downstream=1095.875
Upstream     num=       2
    Width   Elev    Width   Elev
      2.5   1600      2.5   1616
Downstream     num=       2
    Width   Elev    Width   Elev
      2.5   1600      2.5   1616

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =    1.33
Selected Low Flow Methods = Momentum

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT    Profile #PF 1
Opening : Single BR

  E.G. US. (ft)               1618.22    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)               1611.32    E.G. Elev (ft)            1617.91       1617.12
  Q Total (cfs)              11500.00    W.S. Elev (ft)            1612.09       1611.62
  Q Bridge (cfs)             11500.00    Crit W.S. (ft)            1613.68       1613.07
  Q Weir (cfs)                           Max Chl Dpth (ft)            6.24          6.40
  Weir Sta Lft (ft)                      Vel Total (ft/s)            19.36         18.82
  Weir Sta Rgt (ft)                      Flow Area (sq ft)          593.87        611.06
  Weir Submerg                           Froude # Chl                 1.47          1.41
  Weir Max Depth (ft)                    Specif Force (cu ft)      8526.15       8425.37
  Min El Weir Flow (ft)       1620.01    Hydr Depth (ft)              5.37          5.53
  Min El Prs (ft)             1615.31    W.P. Total (ft)            153.58        154.82
  Delta EG (ft)                  1.18    Conv. Total (cfs)        144935.6      151177.2
  Delta WS (ft)                  0.29    Top Width (ft)             110.50        110.50
  BR Open Area (sq ft)         949.83    Frctn Loss (ft)              0.09          0.72
  BR Open Vel (ft/s)            19.36    C & E Loss (ft)              0.21          0.06
  Coef of Q                              Shear Total (lb/sq ft)       1.52          1.43
  Br Sel Method          Energy only     Power Total (lb/ft s)       29.43         26.83


Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.

CROSS SECTION          RIVER: Duckcreek
REACH: DUCKDOWN           RS: 8118.7

INPUT
Description: downstream of bbent bridge
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1007 1614.69    1007 1606.96    1066 1605.19    1125 1606.96    1125 1614.69

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1007    .015    1007    .015    1125    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1007    1125              53.5    53.5    53.5             .1       .2

CROSS SECTION OUTPUT    Profile #PF 1
```

E.G. Elev (ft)	1617.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.01	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.03	Reach Len. (ft)	53.50	53.50	53.50
Crit W.S. (ft)	1612.73	Flow Area (sq ft)		584.77	
E.G. Slope (ft/ft)	0.005101	Area (sq ft)		584.77	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	19.67	Avg. Vel. (ft/s)		19.67	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	161010.3	Conv. (cfs)		161010.3	
Length Wtd. (ft)		Wetted Per. (ft)		126.19	
Min Ch El (ft)	1605.19	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)		29.02	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		2.26	
C & E Loss (ft)	0.05	Cum SA (acres)		0.37	

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 cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8065.2

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1615.98	1007	1606.72	1066	1604.95	1125	1606.72	1125	1615.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	78.99	78.99	78.99	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1615.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.88	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.00	Reach Len. (ft)	78.99	78.99	78.99
Crit W.S. (ft)	1612.49	Flow Area (sq ft)		727.47	
E.G. Slope (ft/ft)	0.002527	Area (sq ft)		727.47	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	15.81	Avg. Vel. (ft/s)		15.81	
Max Chl Dpth (ft)	7.05	Hydr. Depth (ft)		6.17	
Conv. Total (cfs)	228775.8	Conv. (cfs)		228775.8	
Length Wtd. (ft)		Wetted Per. (ft)		128.61	
Min Ch El (ft)	1604.95	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)		14.11	
Frctn Loss (ft)		Cum Volume (acre-ft)		1.45	
C & E Loss (ft)		Cum SA (acres)		0.23	

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.
Note: The user has entered a known water surface elevation at this cross section.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 7986.2

INPUT
Description: END CONCRETE CHANNEL
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
990	1613.15	990	1606.52	1066	1604.59	1125	1606.36	1125	1612.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
990	.015	990	.015	1125	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
990	1125	.1	.2

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1614.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.00	Reach Len. (ft)			
Crit W.S. (ft)	1611.60	Flow Area (sq ft)		874.80	
E.G. Slope (ft/ft)	0.001621	Area (sq ft)		874.80	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	135.00	Top Width (ft)		135.00	
Vel Total (ft/s)	13.15	Avg. Vel. (ft/s)		13.15	
Max Chl Dpth (ft)	7.41	Hydr. Depth (ft)		6.48	
Conv. Total (cfs)	285655.0	Conv. (cfs)		285655.0	
Length Wtd. (ft)		Wetted Per. (ft)		146.17	
Min Ch El (ft)	1604.59	Shear (lb/sq ft)		0.61	
Alpha	1.00	Stream Power (lb/ft s)		7.96	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

SUMMARY OF MANNING'S N VALUES

River:Duckcreek

Reach	River Sta.	n1	n2	n3
DUCKDOWN	11785.87	.015	.015	.015
DUCKDOWN	11769.1*	.015	.015	.015
DUCKDOWN	11752.3*	.015	.015	.015
DUCKDOWN	11735.6*	.015	.015	.015
DUCKDOWN	11718.8*	.015	.015	.015
DUCKDOWN	11702.1*	.015	.015	.015
DUCKDOWN	11685.3*	.015	.015	.015
DUCKDOWN	11668.62	.015	.015	.015
DUCKDOWN	11578.0*	.015	.015	.015
DUCKDOWN	11487.4*	.015	.015	.015
DUCKDOWN	11396.8*	.015	.015	.015
DUCKDOWN	11306.2*	.015	.015	.015
DUCKDOWN	11215.68	.015	.015	.015
DUCKDOWN	11128.7*	.015	.015	.015
DUCKDOWN	11041.8*	.015	.015	.015
DUCKDOWN	10954.8*	.015	.015	.015
DUCKDOWN	10867.92	.015	.015	.015
DUCKDOWN	10774.3*	.015	.015	.015
DUCKDOWN	10680.8*	.015	.015	.015
DUCKDOWN	10587.2*	.015	.015	.015
DUCKDOWN	10493.7*	.015	.015	.015
DUCKDOWN	10400.2*	.015	.015	.015
DUCKDOWN	10306.6*	.015	.015	.015
DUCKDOWN	10213.13	.015	.015	.015
DUCKDOWN	10114.1	.015	.015	.015
DUCKDOWN	10040.2*	.015	.015	.015
DUCKDOWN	9966.33	.015	.015	.015
DUCKDOWN	9916.64*	.015	.015	.015
DUCKDOWN	9866.96*	.015	.015	.015
DUCKDOWN	9817.27*	.015	.015	.015
DUCKDOWN	9767.59*	.015	.015	.015
DUCKDOWN	9717.90*	.015	.015	.015
DUCKDOWN	9668.22*	.015	.015	.015
DUCKDOWN	9618.53*	.015	.015	.015
DUCKDOWN	9568.85*	.015	.015	.015
DUCKDOWN	9519.17*	.015	.015	.015
DUCKDOWN	9469.48*	.015	.015	.015
DUCKDOWN	9419.80*	.015	.015	.015
DUCKDOWN	9370.11*	.015	.015	.015
DUCKDOWN	9320.43*	.015	.015	.015
DUCKDOWN	9270.74*	.015	.015	.015
DUCKDOWN	9221.06*	.015	.015	.015
DUCKDOWN	9171.38*	.015	.015	.015
DUCKDOWN	9121.69*	.015	.015	.015
DUCKDOWN	9072.01*	.015	.015	.015
DUCKDOWN	9022.32*	.015	.015	.015
DUCKDOWN	8972.64*	.015	.015	.015
DUCKDOWN	8922.95*	.015	.015	.015
DUCKDOWN	8873.27*	.015	.015	.015
DUCKDOWN	8823.59	.015	.015	.015
DUCKDOWN	8808.96*	.015	.015	.015
DUCKDOWN	8794.33*	.015	.015	.015
DUCKDOWN	8779.70*	.015	.015	.015
DUCKDOWN	8765.07*	.015	.015	.015
DUCKDOWN	8750.43*	.015	.015	.015
DUCKDOWN	8735.81*	.015	.015	.015
DUCKDOWN	8721.18*	.015	.015	.015
DUCKDOWN	8706.55	.015	.015	.015
DUCKDOWN	8327.98	.015	.015	.015
DUCKDOWN	8273.9	.015	.015	.015
DUCKDOWN	8259.5	.015	.015	.015
DUCKDOWN	8202.6	Bridge		
DUCKDOWN	8118.7	.015	.015	.015
DUCKDOWN	8065.2	.015	.015	.015
DUCKDOWN	7986.2	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Duckcreek

Reach	River Sta.	Left	Channel	Right
DUCKDOWN	11785.87	16.75	16.75	16.75
DUCKDOWN	11769.1*	16.75	16.75	16.75
DUCKDOWN	11752.3*	16.75	16.75	16.75
DUCKDOWN	11735.6*	16.75	16.75	16.75
DUCKDOWN	11718.8*	16.75	16.75	16.75
DUCKDOWN	11702.1*	16.75	16.75	16.75
DUCKDOWN	11685.3*	16.75	16.75	16.75
DUCKDOWN	11668.62	90.59	90.59	90.59
DUCKDOWN	11578.0*	90.59	90.59	90.59
DUCKDOWN	11487.4*	90.59	90.59	90.59
DUCKDOWN	11396.8*	90.59	90.59	90.59
DUCKDOWN	11306.2*	90.59	90.59	90.59
DUCKDOWN	11215.68	86.94	86.94	86.94
DUCKDOWN	11128.7*	86.94	86.94	86.94
DUCKDOWN	11041.8*	86.94	86.94	86.94
DUCKDOWN	10954.8*	86.94	86.94	86.94
DUCKDOWN	10867.92	93.54	93.54	93.54
DUCKDOWN	10774.3*	93.54	93.54	93.54
DUCKDOWN	10680.8*	93.54	93.54	93.54
DUCKDOWN	10587.2*	93.54	93.54	93.54
DUCKDOWN	10493.7*	93.54	93.54	93.54
DUCKDOWN	10400.2*	93.54	93.54	93.54
DUCKDOWN	10306.6*	93.54	93.54	93.54
DUCKDOWN	10213.13	98.96	98.96	98.96
DUCKDOWN	10114.1	73.93	73.93	73.93

DUCKDOWN	10040.2*	73.93	73.93	73.93
DUCKDOWN	9966.33	49.69	49.69	49.69
DUCKDOWN	9916.64*	49.69	49.69	49.69
DUCKDOWN	9866.96*	49.69	49.69	49.69
DUCKDOWN	9817.27*	49.69	49.69	49.69
DUCKDOWN	9767.59*	49.69	49.69	49.69
DUCKDOWN	9717.90*	49.69	49.69	49.69
DUCKDOWN	9668.22*	49.69	49.69	49.69
DUCKDOWN	9618.53*	49.69	49.69	49.69
DUCKDOWN	9568.85*	49.69	49.69	49.69
DUCKDOWN	9519.17*	49.69	49.69	49.69
DUCKDOWN	9469.48*	49.69	49.69	49.69
DUCKDOWN	9419.80*	49.69	49.69	49.69
DUCKDOWN	9370.11*	49.69	49.69	49.69
DUCKDOWN	9320.43*	49.69	49.69	49.69
DUCKDOWN	9270.74*	49.69	49.69	49.69
DUCKDOWN	9221.06*	49.69	49.69	49.69
DUCKDOWN	9171.38*	49.69	49.69	49.69
DUCKDOWN	9121.69*	49.69	49.69	49.69
DUCKDOWN	9072.01*	49.69	49.69	49.69
DUCKDOWN	9022.32*	49.69	49.69	49.69
DUCKDOWN	8972.64*	49.69	49.69	49.69
DUCKDOWN	8922.95*	49.69	49.69	49.69
DUCKDOWN	8873.27*	49.69	49.69	49.69
DUCKDOWN	8823.59	14.63	14.63	14.63
DUCKDOWN	8808.96*	14.63	14.63	14.63
DUCKDOWN	8794.33*	14.63	14.63	14.63
DUCKDOWN	8779.70*	14.63	14.63	14.63
DUCKDOWN	8765.07*	14.63	14.63	14.63
DUCKDOWN	8750.43*	14.63	14.63	14.63
DUCKDOWN	8735.81*	14.63	14.63	14.63
DUCKDOWN	8721.18*	14.63	14.63	14.63
DUCKDOWN	8706.55	378.56	378.56	378.56
DUCKDOWN	8327.98	54.08	54.08	54.08
DUCKDOWN	8273.9	14.4	14.4	14.4
DUCKDOWN	8259.5	140.8	140.8	140.8
DUCKDOWN	8202.6	Bridge		
DUCKDOWN	8118.7	53.5	53.5	53.5
DUCKDOWN	8065.2	78.99	78.99	78.99
DUCKDOWN	7986.2			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Duckcreek

Reach	River Sta.	Contr.	Expan.
DUCKDOWN	11785.87	.05	.1
DUCKDOWN	11769.1*	.05	.1
DUCKDOWN	11752.3*	.05	.1
DUCKDOWN	11735.6*	.05	.1
DUCKDOWN	11718.8*	.05	.1
DUCKDOWN	11702.1*	.05	.1
DUCKDOWN	11685.3*	.05	.1
DUCKDOWN	11668.62	0	0
DUCKDOWN	11578.0*	0	0
DUCKDOWN	11487.4*	0	0
DUCKDOWN	11396.8*	0	0
DUCKDOWN	11306.2*	0	0
DUCKDOWN	11215.68	0	0
DUCKDOWN	11128.7*	0	0
DUCKDOWN	11041.8*	0	0
DUCKDOWN	10954.8*	0	0
DUCKDOWN	10867.92	0	0
DUCKDOWN	10774.3*	0	0
DUCKDOWN	10680.8*	0	0
DUCKDOWN	10587.2*	0	0
DUCKDOWN	10493.7*	0	0
DUCKDOWN	10400.2*	0	0
DUCKDOWN	10306.6*	0	0
DUCKDOWN	10213.13	0	0
DUCKDOWN	10114.1	0	0
DUCKDOWN	10040.2*	0	0
DUCKDOWN	9966.33	0	0
DUCKDOWN	9916.64*	0	0
DUCKDOWN	9866.96*	0	0
DUCKDOWN	9817.27*	0	0
DUCKDOWN	9767.59*	0	0
DUCKDOWN	9717.90*	0	0
DUCKDOWN	9668.22*	0	0
DUCKDOWN	9618.53*	0	0
DUCKDOWN	9568.85*	0	0
DUCKDOWN	9519.17*	0	0
DUCKDOWN	9469.48*	0	0
DUCKDOWN	9419.80*	0	0
DUCKDOWN	9370.11*	0	0
DUCKDOWN	9320.43*	0	0
DUCKDOWN	9270.74*	0	0
DUCKDOWN	9221.06*	0	0
DUCKDOWN	9171.38*	0	0
DUCKDOWN	9121.69*	0	0
DUCKDOWN	9072.01*	0	0
DUCKDOWN	9022.32*	0	0
DUCKDOWN	8972.64*	0	0
DUCKDOWN	8922.95*	0	0
DUCKDOWN	8873.27*	0	0
DUCKDOWN	8823.59	.05	.1
DUCKDOWN	8808.96*	.05	.1
DUCKDOWN	8794.33*	.05	.1
DUCKDOWN	8779.70*	.05	.1
DUCKDOWN	8765.07*	.05	.1

DUCKDOWN	8750.43*	.05	.1
DUCKDOWN	8735.81*	.05	.1
DUCKDOWN	8721.18*	.05	.1
DUCKDOWN	8706.55	0	0
DUCKDOWN	8327.98	0	0
DUCKDOWN	8273.9	0	0
DUCKDOWN	8259.5	.1	.2
DUCKDOWN	8202.6	Bridge	
DUCKDOWN	8118.7	.1	.2
DUCKDOWN	8065.2	0	0
DUCKDOWN	7986.2	.1	.2

Profile Output Table - Standard Table 1

Reach	River Sta	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
DUCKDOWN	11785.87	11500.00	1621.67	1627.60	1630.19	1636.28	0.007107	23.64	486.39	93.00	1.82
DUCKDOWN	11769.1*	11500.00	1621.59	1627.80	1630.36	1636.13	0.006416	23.17	496.32	89.71	1.74
DUCKDOWN	11752.3*	11500.00	1621.52	1628.04	1630.46	1636.00	0.005840	22.63	508.07	88.67	1.67
DUCKDOWN	11735.6*	11500.00	1621.44	1628.22	1630.58	1635.88	0.005497	22.21	517.79	90.11	1.63
DUCKDOWN	11718.8*	11500.00	1621.37	1628.34	1630.63	1635.77	0.005219	21.87	525.81	91.35	1.61
DUCKDOWN	11702.1*	11500.00	1621.29	1628.37	1630.62	1635.68	0.005043	21.68	530.34	92.25	1.59
DUCKDOWN	11685.3*	11500.00	1621.22	1628.35	1630.56	1635.59	0.004923	21.59	532.74	92.96	1.59
DUCKDOWN	11668.62	11500.00	1621.14	1628.26	1630.48	1635.50	0.004867	21.60	532.44	93.36	1.59
DUCKDOWN	11578.0*	11500.00	1620.73	1627.82	1630.05	1635.06	0.004903	21.59	532.77	94.17	1.60
DUCKDOWN	11487.4*	11500.00	1620.32	1627.43	1629.64	1634.62	0.004855	21.51	534.54	94.25	1.59
DUCKDOWN	11396.8*	11500.00	1619.92	1627.06	1629.24	1634.18	0.004794	21.42	536.82	94.34	1.58
DUCKDOWN	11306.2*	11500.00	1619.51	1626.66	1628.83	1633.75	0.004757	21.37	538.22	94.40	1.58
DUCKDOWN	11215.68	11500.00	1619.10	1626.31	1628.44	1633.33	0.004640	21.26	540.98	93.72	1.56
DUCKDOWN	11128.7*	11500.00	1618.71	1625.93	1628.05	1632.93	0.004621	21.23	541.73	93.75	1.56
DUCKDOWN	11041.8*	11500.00	1618.31	1625.53	1627.65	1632.52	0.004617	21.22	541.86	93.73	1.56
DUCKDOWN	10954.8*	11500.00	1617.92	1625.15	1627.27	1632.12	0.004602	21.20	542.50	93.78	1.55
DUCKDOWN	10867.92	11500.00	1617.53	1624.76	1626.87	1631.73	0.004588	21.18	543.06	93.80	1.55
DUCKDOWN	10774.3*	11500.00	1617.11	1624.29	1626.41	1631.31	0.004575	21.25	541.15	92.54	1.55
DUCKDOWN	10680.8*	11500.00	1616.69	1623.89	1626.01	1630.88	0.004552	21.22	542.00	92.55	1.55
DUCKDOWN	10587.2*	11500.00	1616.27	1623.50	1625.60	1630.46	0.004529	21.18	542.85	92.56	1.54
DUCKDOWN	10493.7*	11500.00	1615.85	1623.11	1625.20	1630.04	0.004492	21.13	544.24	92.57	1.54
DUCKDOWN	10400.2*	11500.00	1615.43	1622.71	1624.77	1629.62	0.004471	21.10	545.01	92.57	1.53
DUCKDOWN	10306.6*	11500.00	1615.01	1622.31	1624.38	1629.21	0.004450	21.07	545.78	92.57	1.53
DUCKDOWN	10213.13	11500.00	1614.59	1621.91	1623.96	1628.79	0.004429	21.04	546.56	92.58	1.53
DUCKDOWN	10114.1	11500.00	1614.14	1621.37	1623.48	1628.34	0.004590	21.18	542.97	93.80	1.55
DUCKDOWN	10040.2*	11500.00	1613.81	1621.13	1623.20	1628.00	0.004425	21.04	546.71	92.58	1.53
DUCKDOWN	9966.33	11500.00	1613.48	1620.72	1622.83	1627.67	0.004573	21.15	543.69	93.85	1.55
DUCKDOWN	9916.64*	11500.00	1613.26	1620.59	1622.63	1627.44	0.004406	21.00	547.51	92.61	1.52
DUCKDOWN	9866.96*	11500.00	1613.03	1620.36	1622.42	1627.22	0.004422	21.03	546.85	92.59	1.52
DUCKDOWN	9817.27*	11500.00	1612.81	1620.13	1622.20	1627.00	0.004423	21.03	546.81	92.59	1.53
DUCKDOWN	9767.59*	11500.00	1612.59	1619.91	1621.96	1626.78	0.004424	21.03	546.77	92.59	1.53
DUCKDOWN	9717.90*	11500.00	1612.36	1619.68	1621.73	1626.56	0.004441	21.06	546.06	92.56	1.53
DUCKDOWN	9668.22*	11500.00	1612.14	1619.46	1621.53	1626.34	0.004441	21.06	546.08	92.56	1.53
DUCKDOWN	9618.53*	11500.00	1611.92	1619.24	1621.31	1626.12	0.004440	21.06	546.11	92.56	1.53
DUCKDOWN	9568.85*	11500.00	1611.69	1619.00	1621.06	1625.90	0.004456	21.08	545.46	92.53	1.53
DUCKDOWN	9519.17*	11500.00	1611.47	1618.78	1620.84	1625.68	0.004454	21.08	545.54	92.54	1.53
DUCKDOWN	9469.48*	11500.00	1611.25	1618.56	1620.62	1625.46	0.004452	21.08	545.61	92.54	1.53
DUCKDOWN	9419.80*	11500.00	1611.02	1618.33	1620.41	1625.24	0.004467	21.10	545.01	92.52	1.53
DUCKDOWN	9370.11*	11500.00	1610.80	1618.11	1620.19	1625.02	0.004464	21.10	545.11	92.52	1.53
DUCKDOWN	9320.43*	11500.00	1610.57	1617.87	1619.94	1624.80	0.004478	21.12	544.55	92.50	1.53
DUCKDOWN	9270.74*	11500.00	1610.35	1617.65	1619.72	1624.57	0.004474	21.11	544.70	92.51	1.53
DUCKDOWN	9221.06*	11500.00	1610.13	1617.43	1619.50	1624.35	0.004471	21.11	544.85	92.51	1.53
DUCKDOWN	9171.38*	11500.00	1609.90	1617.20	1619.29	1624.13	0.004484	21.13	544.30	92.49	1.53
DUCKDOWN	9121.69*	11500.00	1609.68	1616.98	1619.07	1623.91	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	9072.01*	11500.00	1609.46	1616.76	1618.83	1623.68	0.004476	21.11	544.64	92.50	1.53
DUCKDOWN	9022.32*	11500.00	1609.23	1616.53	1618.60	1623.46	0.004489	21.13	544.12	92.48	1.54
DUCKDOWN	8972.64*	11500.00	1609.01	1616.31	1618.38	1623.24	0.004485	21.13	544.29	92.49	1.53
DUCKDOWN	8922.95*	11500.00	1608.79	1616.09	1618.18	1623.02	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	8873.27*	11500.00	1608.56	1615.85	1617.95	1622.79	0.004492	21.14	543.97	92.48	1.54
DUCKDOWN	8823.59	11500.00	1608.34	1615.50	1617.66	1622.56	0.004728	21.32	539.29	94.45	1.57
DUCKDOWN	8808.96*	11500.00	1608.27	1615.11	1617.36	1622.48	0.005068	21.78	528.08	93.97	1.62
DUCKDOWN	8794.33*	11500.00	1608.21	1614.67	1617.03	1622.38	0.005648	22.29	515.96	96.11	1.70
DUCKDOWN	8779.70*	11500.00	1608.14	1614.25	1616.72	1622.28	0.006269	22.74	505.78	98.79	1.77
DUCKDOWN	8765.07*	11500.00	1608.07	1613.88	1616.41	1622.18	0.006917	23.11	497.55	101.92	1.84
DUCKDOWN	8750.43*	11500.00	1608.01	1613.57	1616.13	1622.06	0.007560	23.39	491.59	105.47	1.91
DUCKDOWN	8735.81*	11500.00	1607.94	1613.27	1615.83	1621.94	0.008245	23.63	486.58	109.36	1.97
DUCKDOWN	8721.18*	11500.00	1607.88	1613.01	1615.61	1621.82	0.008946	23.82	482.81	113.55	2.04
DUCKDOWN	8706.55	11500.00	1607.81	1612.76	1615.36	1621.68	0.009669	23.96	479.97	118.00	2.09
DUCKDOWN	8327.98	11500.00	1606.11	1611.55	1613.65	1618.66	0.006696	21.39	537.57	118.00	1.77
DUCKDOWN	8273.9	11500.00	1605.86	1611.35	1613.40	1618.31	0.006473	21.17	543.24	118.00	1.74
DUCKDOWN	8259.5	11500.00	1605.81	1611.32	1613.37	1618.22	0.006377	21.07	545.74	118.00	1.73
DUCKDOWN	8202.6	Bridge									
DUCKDOWN	8118.7	11500.00	1605.19	1611.03	1612.73	1617.04	0.005101	19.67	584.77	118.00	1.56
DUCKDOWN	8065.2	11500.00	1604.95	1612.00	1612.49	1615.88	0.002527	15.81	727.47	118.00	1.12
DUCKDOWN	7986.2	11500.00	1604.59	1612.00	1611.60	1614.68	0.001621	13.15	874.80	135.00	0.91

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
DUCKDOWN	11785.87	1636.28	1627.60	8.68				11500.00		93.00
DUCKDOWN	11769.1*	1636.13	1627.80	8.34	0.11	0.03		11500.00		89.71
DUCKDOWN	11752.3*	1636.00	1628.04	7.96	0.10	0.04		11500.00		88.67
DUCKDOWN	11735.6*	1635.88	1628.22	7.66	0.09	0.03		11500.00		90.11
DUCKDOWN	11718.8*	1635.77	1628.34	7.43	0.09	0.02		11500.00		91.35
DUCKDOWN	11702.1*	1635.68	1628.37	7.30	0.09	0.01		11500.00		92.25
DUCKDOWN	11685.3*	1635.59	1628.35	7.24	0.08	0.01		11500.00		92.96
DUCKDOWN	11668.62	1635.50	1628.26	7.24	0.08	0.00		11500.00		93.36
DUCKDOWN	11578.0*	1635.06	1627.82	7.23	0.44	0.00		11500.00		94.17
DUCKDOWN	11487.4*	1634.62	1627.43	7.19	0.44	0.00		11500.00		94.25
DUCKDOWN	11396.8*	1634.18	1627.06	7.13	0.44	0.00		11500.00		94.34
DUCKDOWN	11306.2*	1633.75	1626.66	7.09	0.43	0.00		11500.00		94.40
DUCKDOWN	11215.68	1633.33	1626.31	7.02	0.43	0.00		11500.00		93.72
DUCKDOWN	11128.7*	1632.93	1625.93	7.00	0.40	0.00		11500.00		93.75

DUCKDOWN	11041.8*	1632.52	1625.53	6.99	0.40	0.00	11500.00	93.73
DUCKDOWN	10954.8*	1632.12	1625.15	6.98	0.40	0.00	11500.00	93.78
DUCKDOWN	10867.92	1631.73	1624.76	6.96	0.40	0.00	11500.00	93.80
DUCKDOWN	10774.3*	1631.31	1624.29	7.01	0.43	0.00	11500.00	92.54
DUCKDOWN	10680.8*	1630.88	1623.89	6.99	0.43	0.00	11500.00	92.55
DUCKDOWN	10587.2*	1630.46	1623.50	6.97	0.42	0.00	11500.00	92.56
DUCKDOWN	10493.7*	1630.04	1623.11	6.93	0.42	0.00	11500.00	92.57
DUCKDOWN	10400.2*	1629.62	1622.71	6.91	0.42	0.00	11500.00	92.57
DUCKDOWN	10306.6*	1629.21	1622.31	6.89	0.42	0.00	11500.00	92.57
DUCKDOWN	10213.13	1628.79	1621.91	6.87	0.42	0.00	11500.00	92.58
DUCKDOWN	10114.1	1628.34	1621.37	6.97	0.45	0.00	11500.00	93.80
DUCKDOWN	10040.2*	1628.00	1621.13	6.87	0.33	0.00	11500.00	92.58
DUCKDOWN	9966.33	1627.67	1620.72	6.95	0.33	0.00	11500.00	93.85
DUCKDOWN	9916.64*	1627.44	1620.59	6.85	0.22	0.00	11500.00	92.61
DUCKDOWN	9866.96*	1627.22	1620.36	6.87	0.22	0.00	11500.00	92.59
DUCKDOWN	9817.27*	1627.00	1620.13	6.87	0.22	0.00	11500.00	92.59
DUCKDOWN	9767.59*	1626.78	1619.91	6.87	0.22	0.00	11500.00	92.59
DUCKDOWN	9717.90*	1626.56	1619.68	6.89	0.22	0.00	11500.00	92.56
DUCKDOWN	9668.22*	1626.34	1619.46	6.89	0.22	0.00	11500.00	92.56
DUCKDOWN	9618.53*	1626.12	1619.24	6.89	0.22	0.00	11500.00	92.56
DUCKDOWN	9568.85*	1625.90	1619.00	6.90	0.22	0.00	11500.00	92.53
DUCKDOWN	9519.17*	1625.68	1618.78	6.90	0.22	0.00	11500.00	92.54
DUCKDOWN	9469.48*	1625.46	1618.56	6.90	0.22	0.00	11500.00	92.54
DUCKDOWN	9419.80*	1625.24	1618.33	6.91	0.22	0.00	11500.00	92.52
DUCKDOWN	9370.11*	1625.02	1618.11	6.91	0.22	0.00	11500.00	92.52
DUCKDOWN	9320.43*	1624.80	1617.87	6.93	0.22	0.00	11500.00	92.50
DUCKDOWN	9270.74*	1624.57	1617.65	6.92	0.22	0.00	11500.00	92.51
DUCKDOWN	9221.06*	1624.35	1617.43	6.92	0.22	0.00	11500.00	92.51
DUCKDOWN	9171.38*	1624.13	1617.20	6.93	0.22	0.00	11500.00	92.49
DUCKDOWN	9121.69*	1623.91	1616.98	6.93	0.22	0.00	11500.00	92.50
DUCKDOWN	9072.01*	1623.68	1616.76	6.92	0.22	0.00	11500.00	92.50
DUCKDOWN	9022.32*	1623.46	1616.53	6.94	0.22	0.00	11500.00	92.48
DUCKDOWN	8972.64*	1623.24	1616.31	6.93	0.22	0.00	11500.00	92.49
DUCKDOWN	8922.95*	1623.02	1616.09	6.93	0.22	0.00	11500.00	92.50
DUCKDOWN	8873.27*	1622.79	1615.85	6.94	0.22	0.00	11500.00	92.48
DUCKDOWN	8823.59	1622.56	1615.50	7.06	0.23	0.00	11500.00	94.45
DUCKDOWN	8808.96*	1622.48	1615.11	7.36	0.07	0.02	11500.00	93.97
DUCKDOWN	8794.33*	1622.38	1614.67	7.71	0.08	0.02	11500.00	96.11
DUCKDOWN	8779.70*	1622.28	1614.25	8.03	0.09	0.02	11500.00	98.79
DUCKDOWN	8765.07*	1622.18	1613.88	8.30	0.10	0.01	11500.00	101.92
DUCKDOWN	8750.43*	1622.06	1613.57	8.50	0.11	0.01	11500.00	105.47
DUCKDOWN	8735.81*	1621.94	1613.27	8.67	0.12	0.01	11500.00	109.36
DUCKDOWN	8721.18*	1621.82	1613.01	8.81	0.13	0.01	11500.00	113.55
DUCKDOWN	8706.55	1621.68	1612.76	8.91	0.14	0.01	11500.00	118.00
DUCKDOWN	8327.98	1618.66	1611.55	7.11	3.02	0.00	11500.00	118.00
DUCKDOWN	8273.9	1618.31	1611.35	6.96	0.36	0.00	11500.00	118.00
DUCKDOWN	8259.5	1618.22	1611.32	6.89	0.09	0.00	11500.00	118.00
DUCKDOWN	8202.6	Bridge						
DUCKDOWN	8118.7	1617.04	1611.03	6.01	0.04	0.05	11500.00	118.00
DUCKDOWN	8065.2	1615.88	1612.00	3.88			11500.00	118.00
DUCKDOWN	7986.2	1614.68	1612.00	2.68			11500.00	135.00

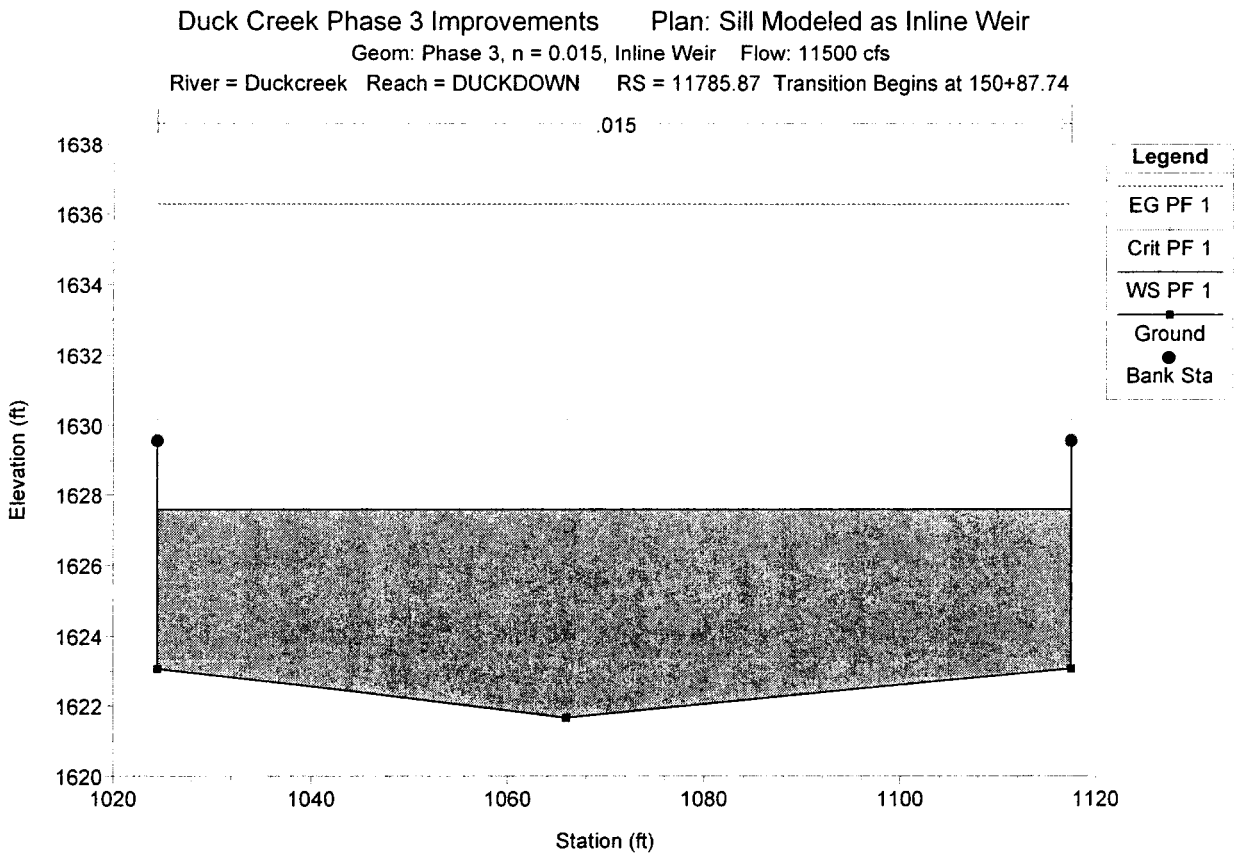
Profile Output Table - Six XS Bridge

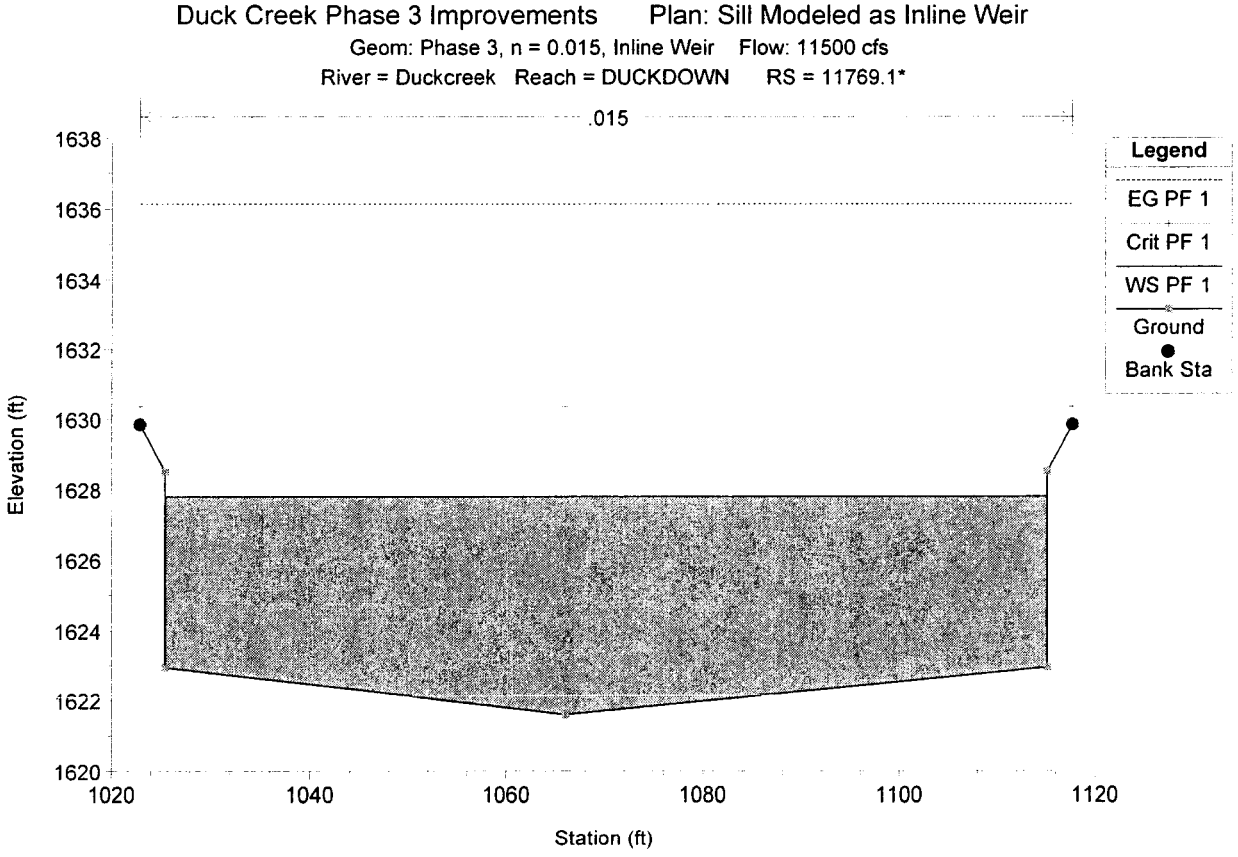
Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Frctn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)
DUCKDOWN	8273.9	1618.31	1611.35	1613.40	0.36	0.00	118.00		11500.00		21.17
DUCKDOWN	8259.5	1618.22	1611.32	1613.37	0.09	0.00	118.00		11500.00		21.07
DUCKDOWN	8202.6 BR U	1617.91	1612.09	1613.68	0.09	0.21	110.50		11500.00		19.36
DUCKDOWN	8202.6 BR D	1617.12	1611.62	1613.07	0.72	0.06	110.50		11500.00		18.82
DUCKDOWN	8118.7	1617.04	1611.03	1612.73	0.04	0.05	118.00		11500.00		19.67
DUCKDOWN	8065.2	1615.88	1612.00	1612.49			118.00		11500.00		15.81

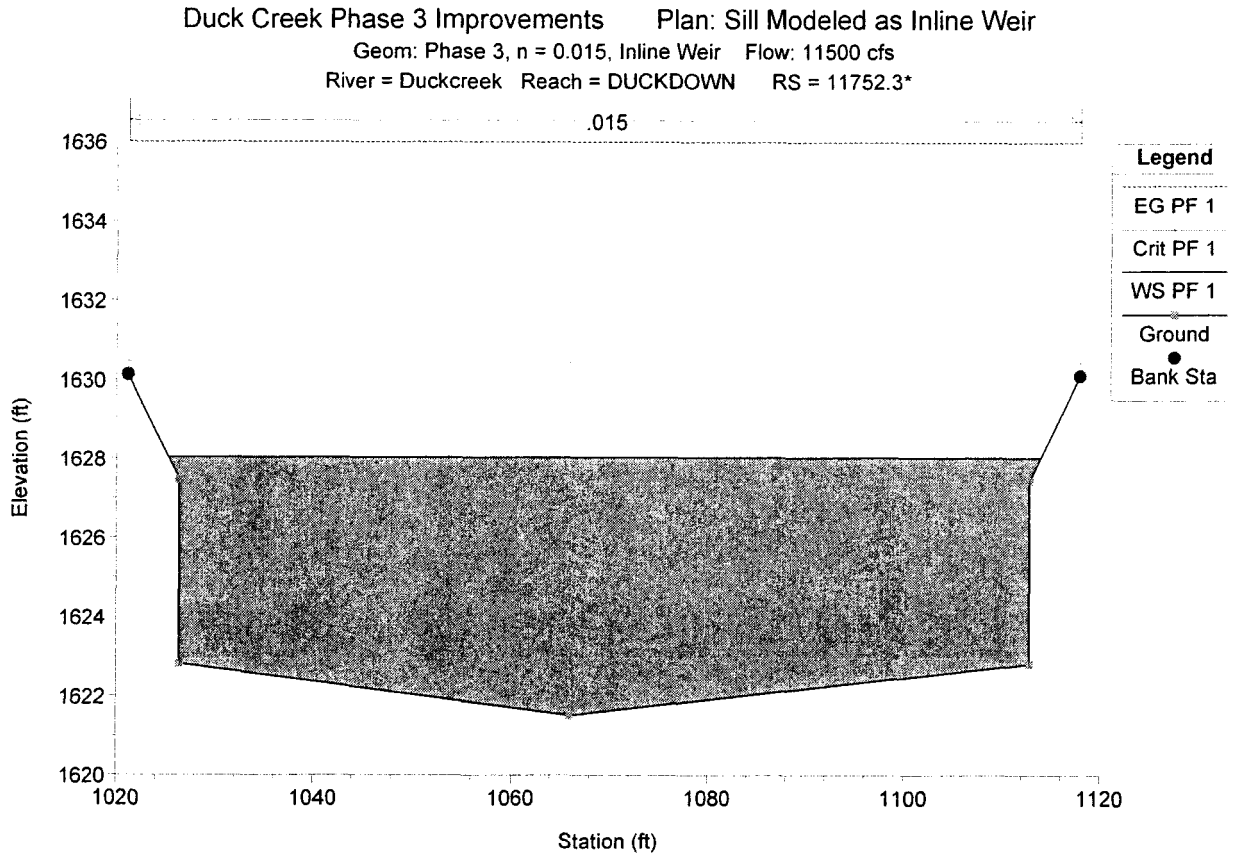
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : IS, n=.015

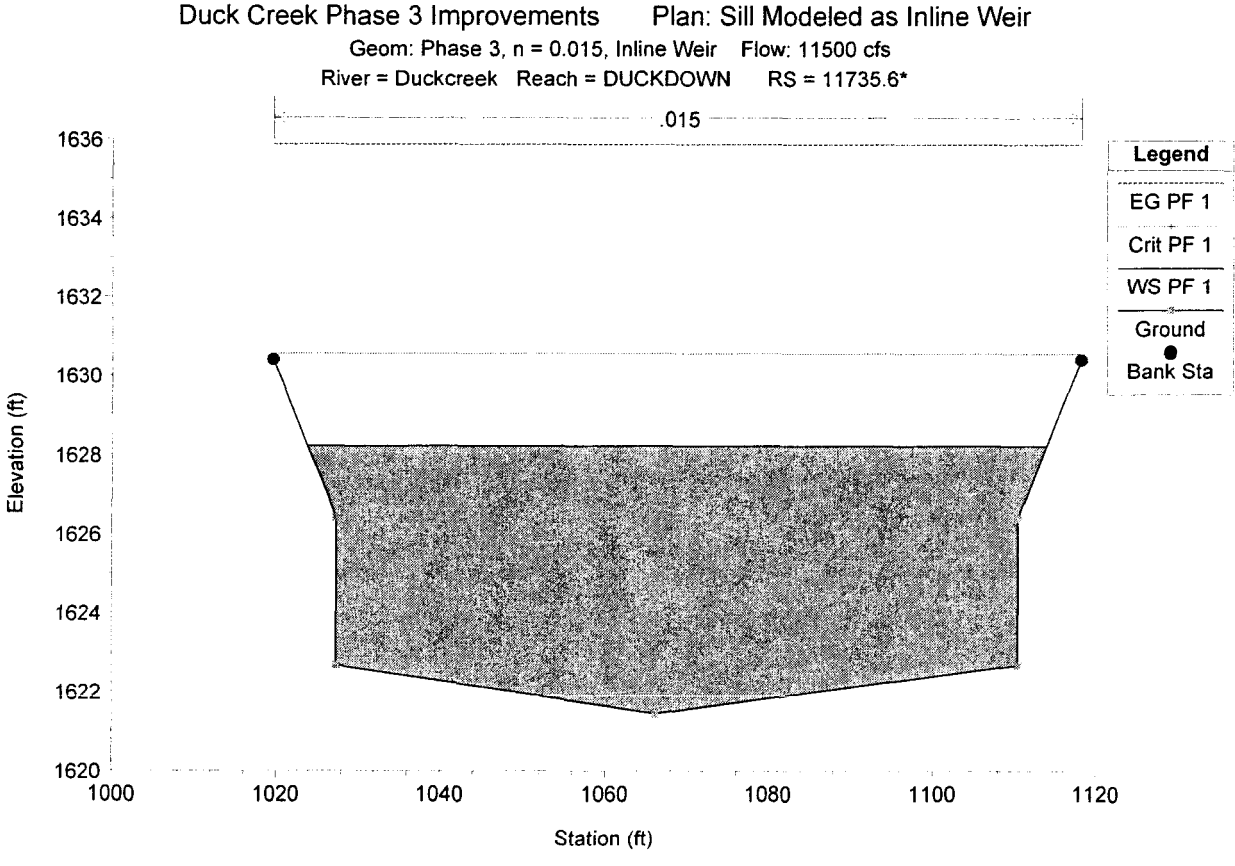
River: Duckcreek Reach: DUCKDOWN RS: 11785.87 Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11769.1* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11752.3* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11735.6* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11718.8* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11702.1* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11685.3* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11668.62 Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11578.0* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11487.4* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11396.8* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11306.2* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11215.68 Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11128.7* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11041.8* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 10954.8* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 10867.92 Profile: PF 1

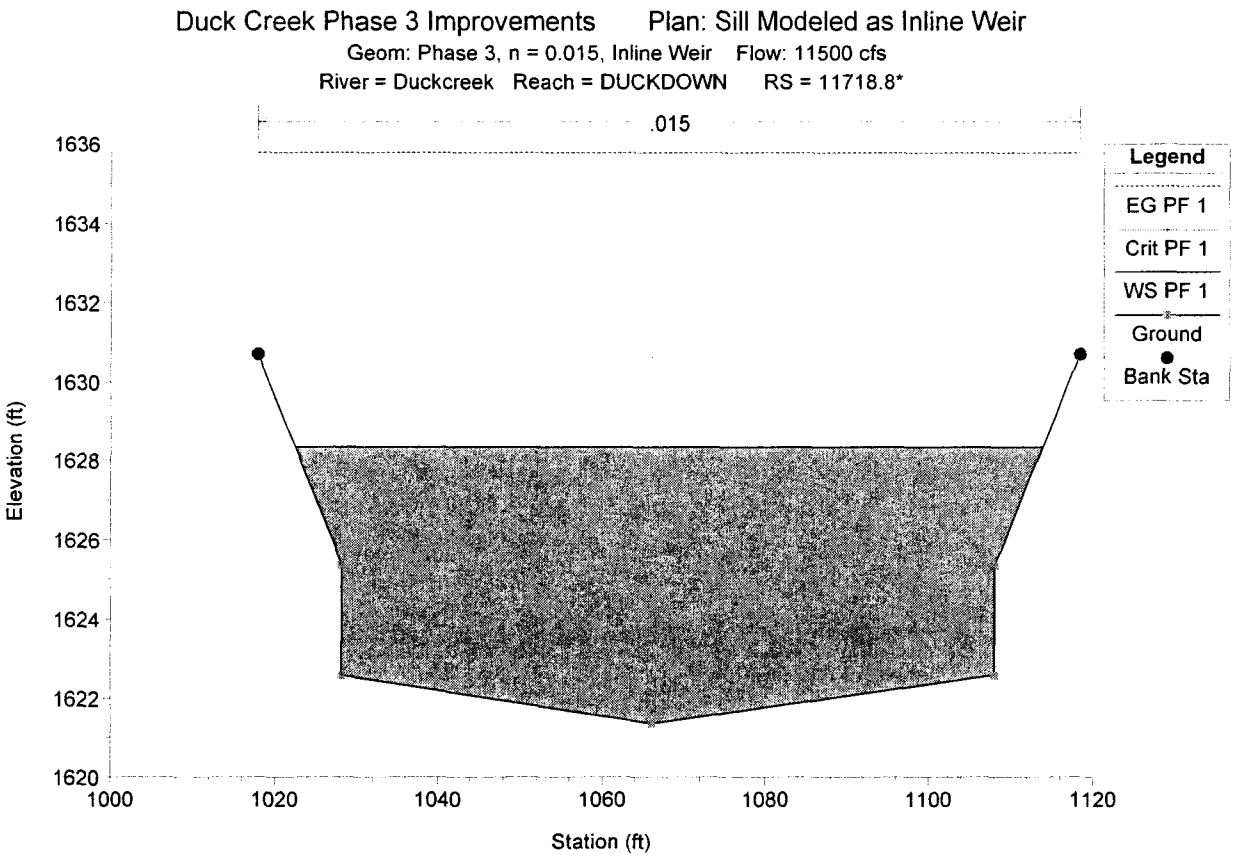
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     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10774.3*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10680.8*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10587.2*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10493.7*     Profile: PF 1
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River: Duckcreek  Reach: DUCKDOWN     RS: 10400.2*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10306.6*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10213.13     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10114.1      Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10040.2*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9966.33      Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9916.64*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9866.96*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9817.27*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9767.59*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9717.90*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9668.22*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9618.53*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9568.85*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9519.17*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9469.48*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9419.80*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9370.11*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9320.43*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9270.74*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9221.06*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9171.38*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9121.69*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9072.01*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9022.32*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8972.64*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8922.95*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8873.27*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8823.59      Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8808.96*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8794.33*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8779.70*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8765.07*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8750.43*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8327.98      Profile: PF 1
     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.
River: Duckcreek  Reach: DUCKDOWN     RS: 8273.9       Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8259.5       Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8202.6       Profile: PF 1 Upstream
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
River: Duckcreek  Reach: DUCKDOWN     RS: 8118.7       Profile: PF 1
     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 cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8065.2       Profile: PF 1
     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.
     Note:   The user has entered a known water surface elevation at this cross section.
River: Duckcreek  Reach: DUCKDOWN     RS: 7986.2       Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
     Note:   Hydraulic jump has occurred between this cross section and the previous upstream section.
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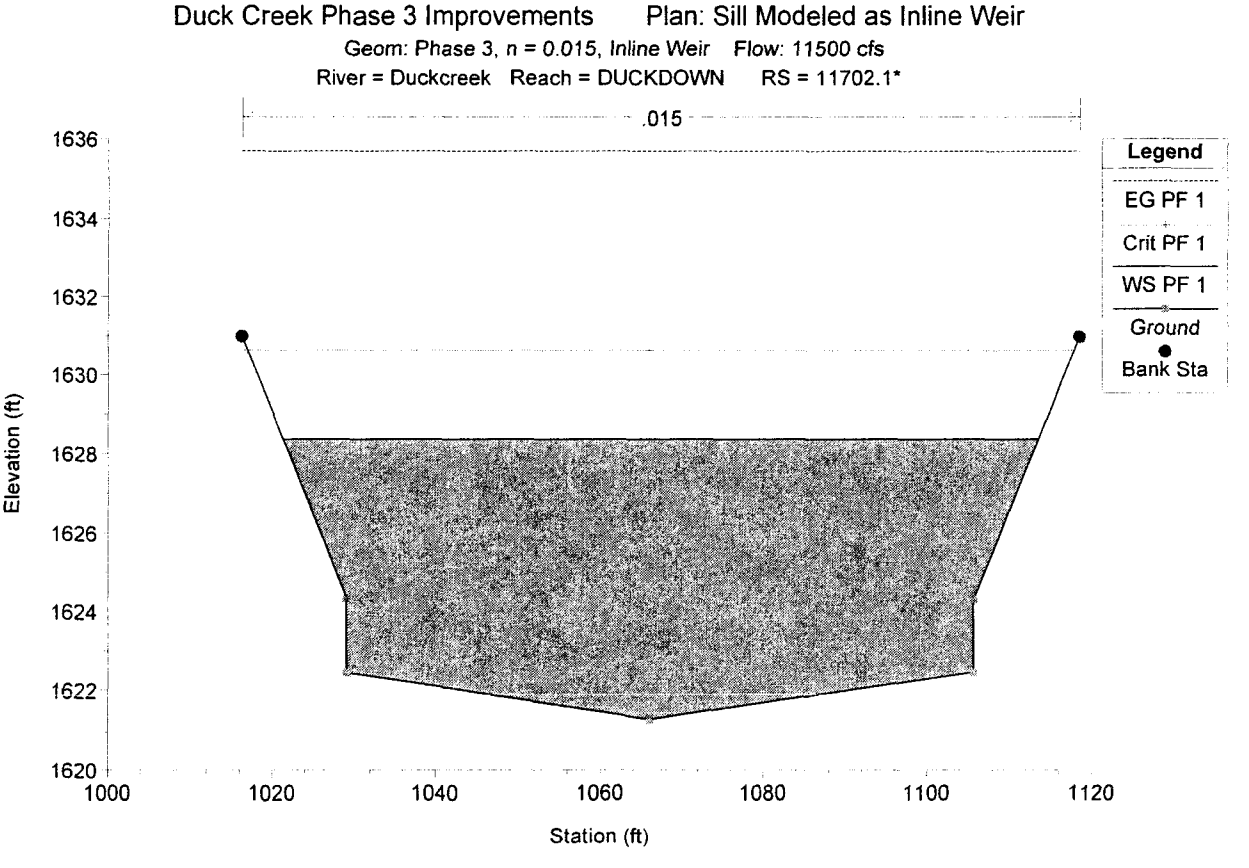

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11785.87 Transition Begins at 150+87.74
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1638
1636
1634
1632
1630
1628
1626
1624
1622
1620
1020
1040
1060
1080
1100
1120
Station (ft)

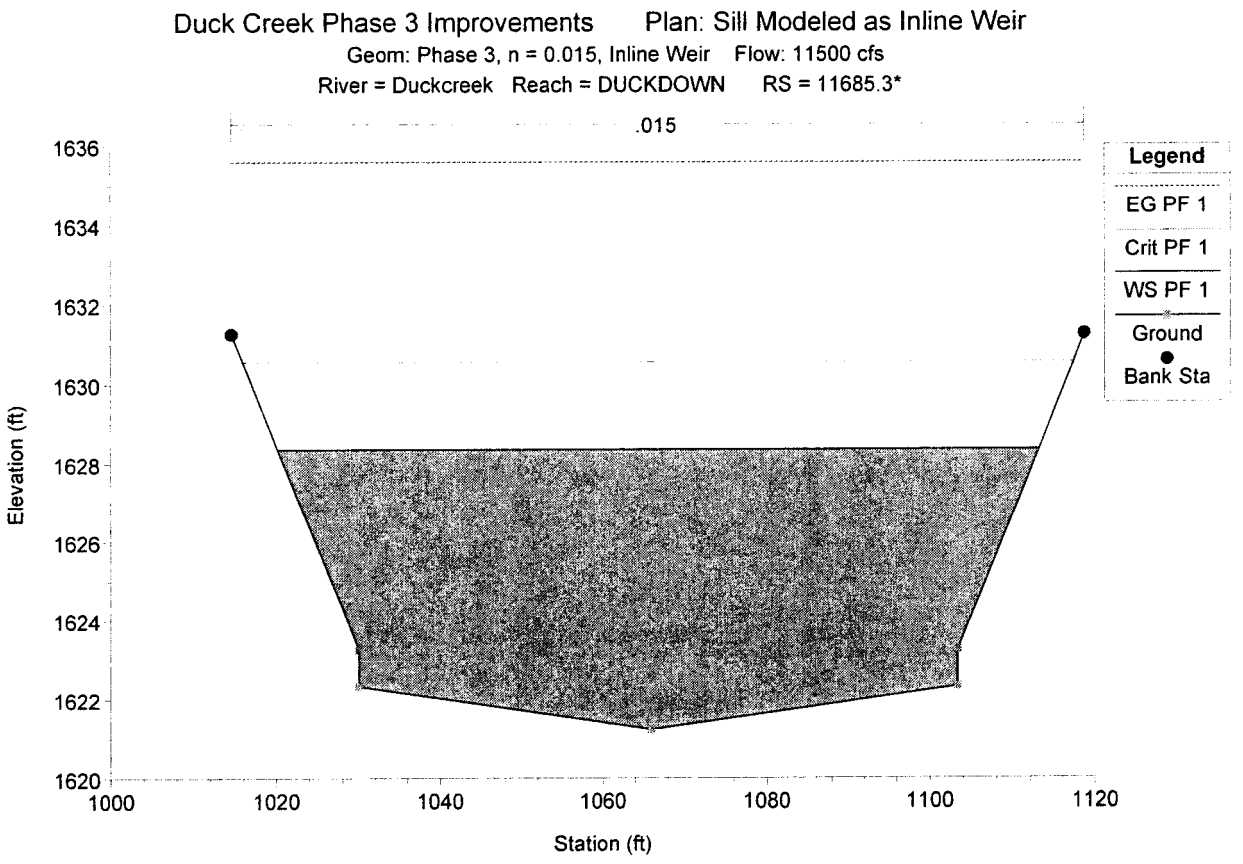

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11769.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1638
1636
1634
1632
1630
1628
1626
1624
1622
1620
1020
1040
1060
1080
1100
1120
Station (ft)

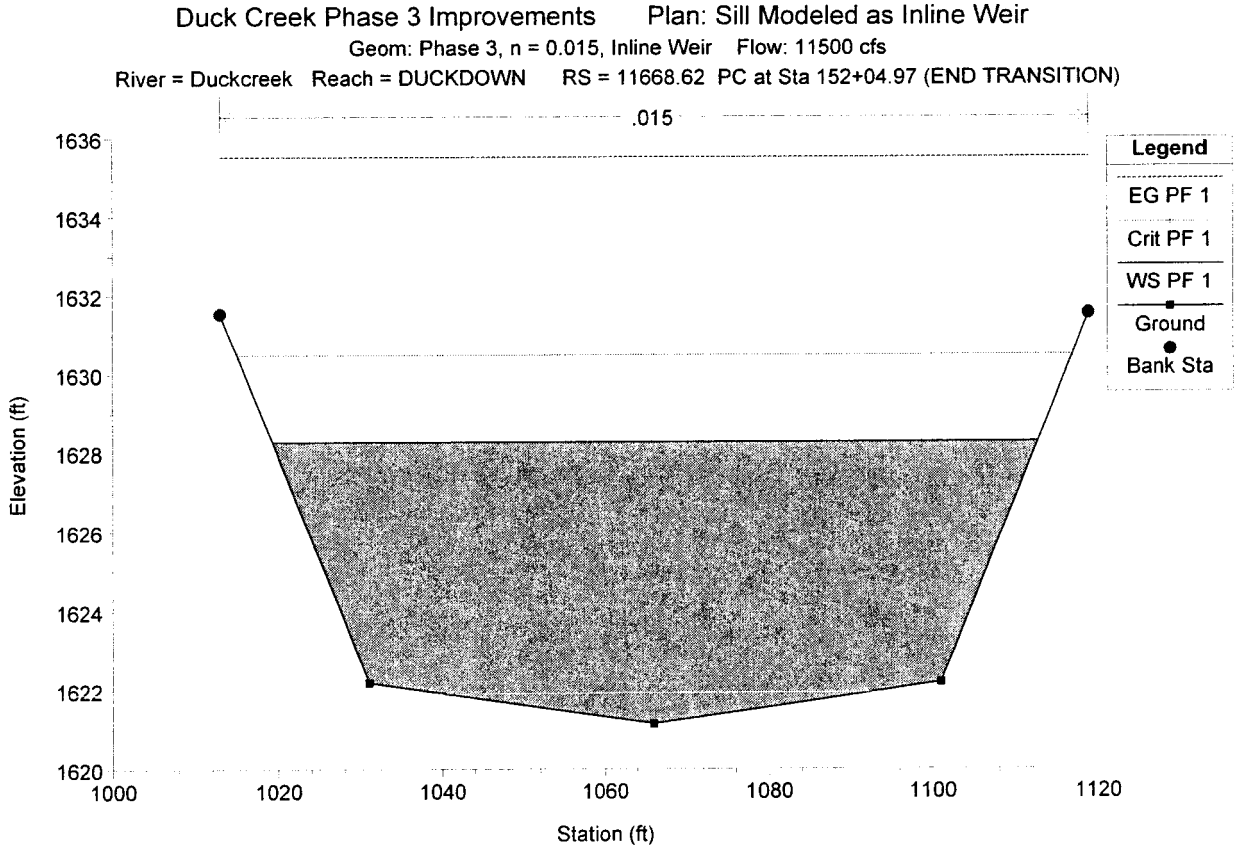

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11752.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1020
1040
1060
1080
1100
1120
Station (ft)

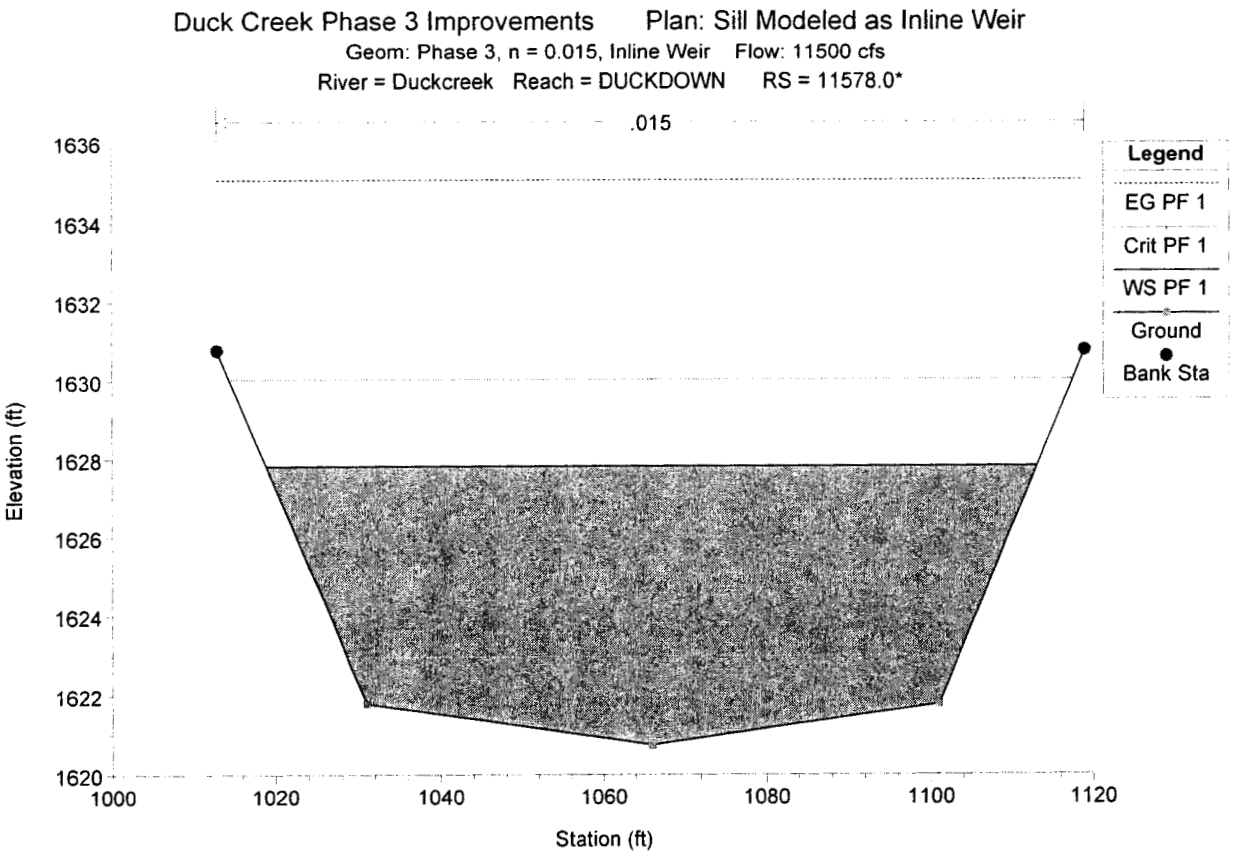

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11735.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120
Station (ft)

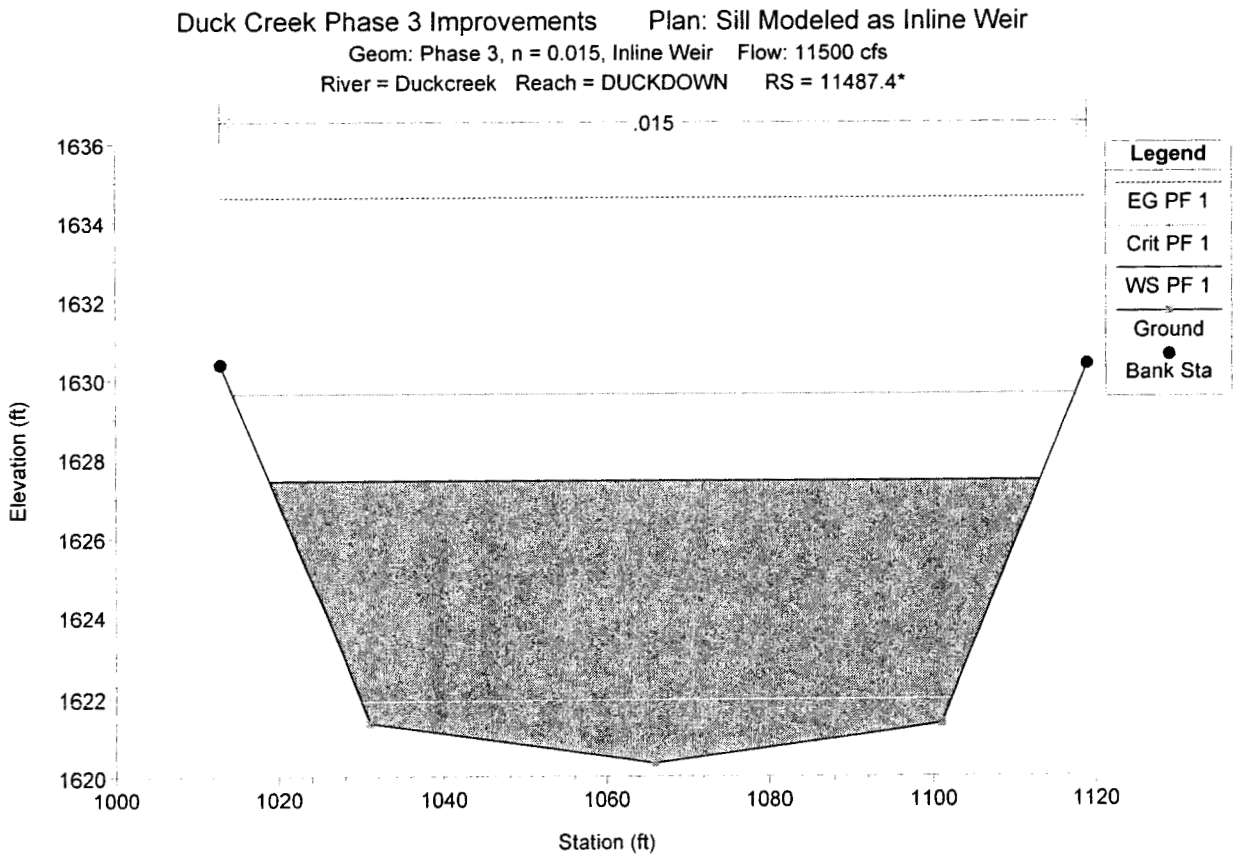

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11718.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120
Station (ft)

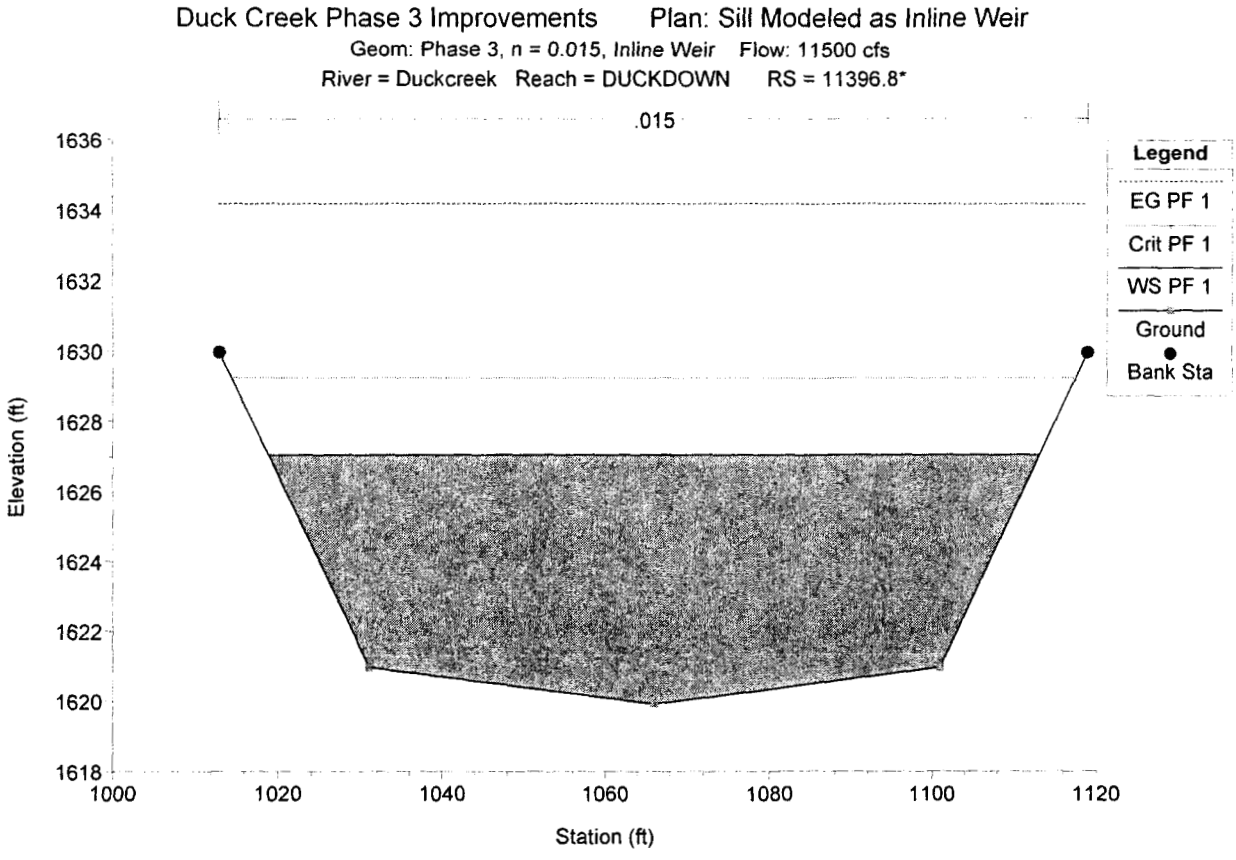

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11702.1*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120
Station (ft)

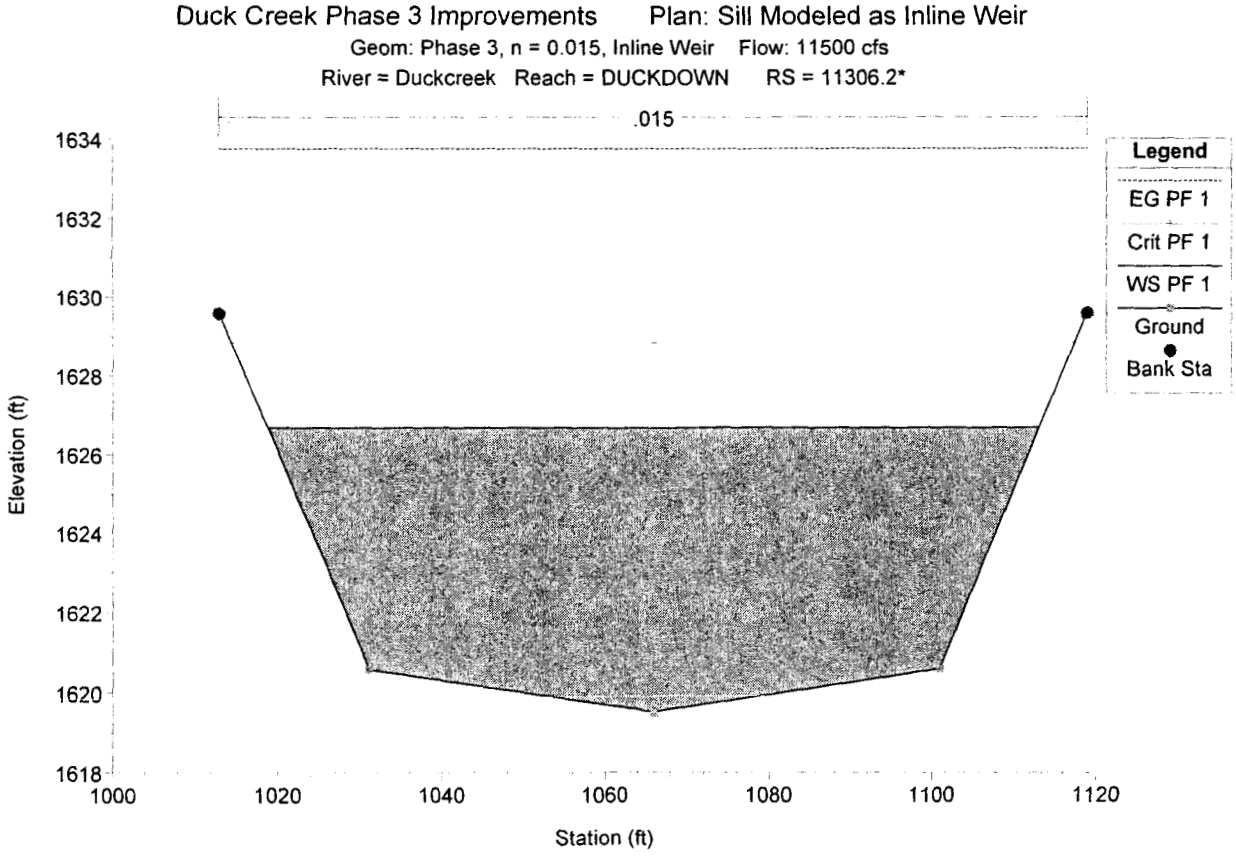

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11685.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120
Station (ft)

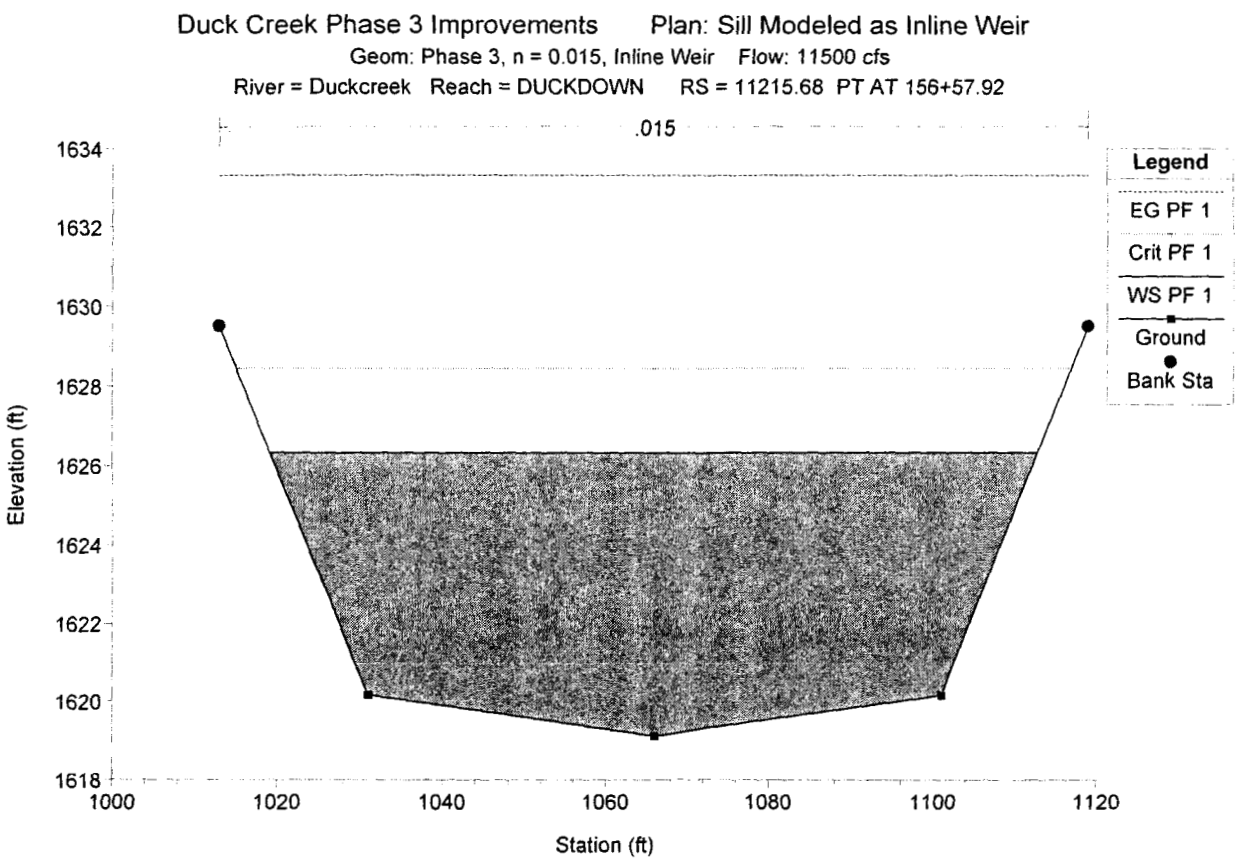

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11668.62 PC at Sta 152+04.97 (END TRANSITION)
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120
Station (ft)

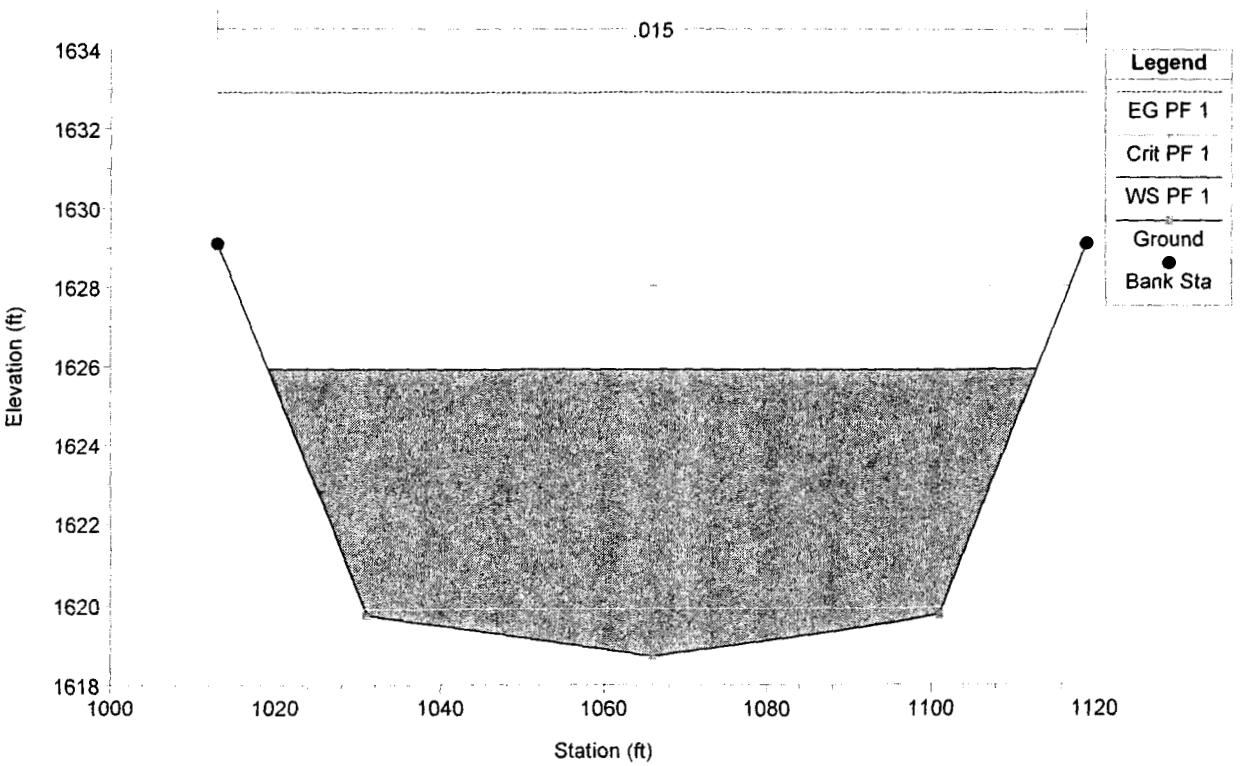

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11578.0*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120
Station (ft)

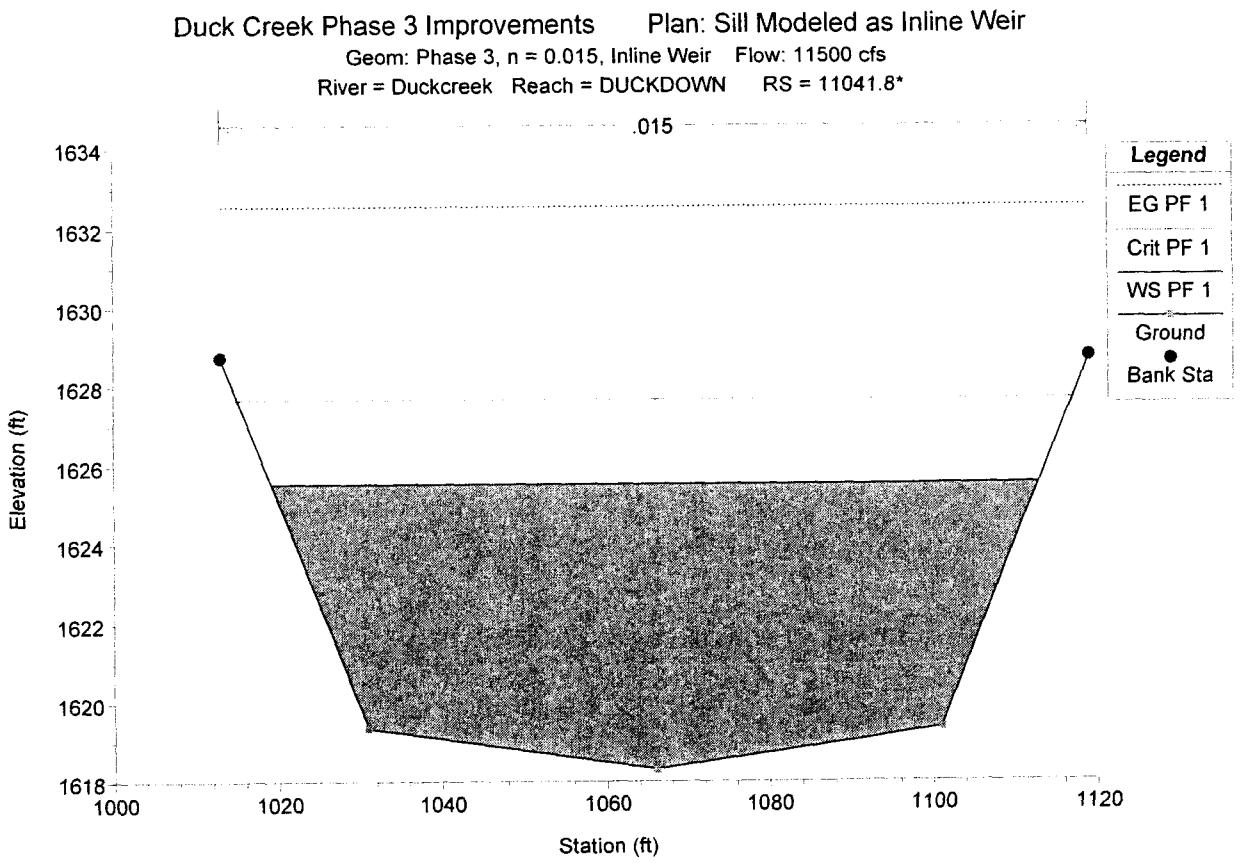

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11487.4*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120
Station (ft)

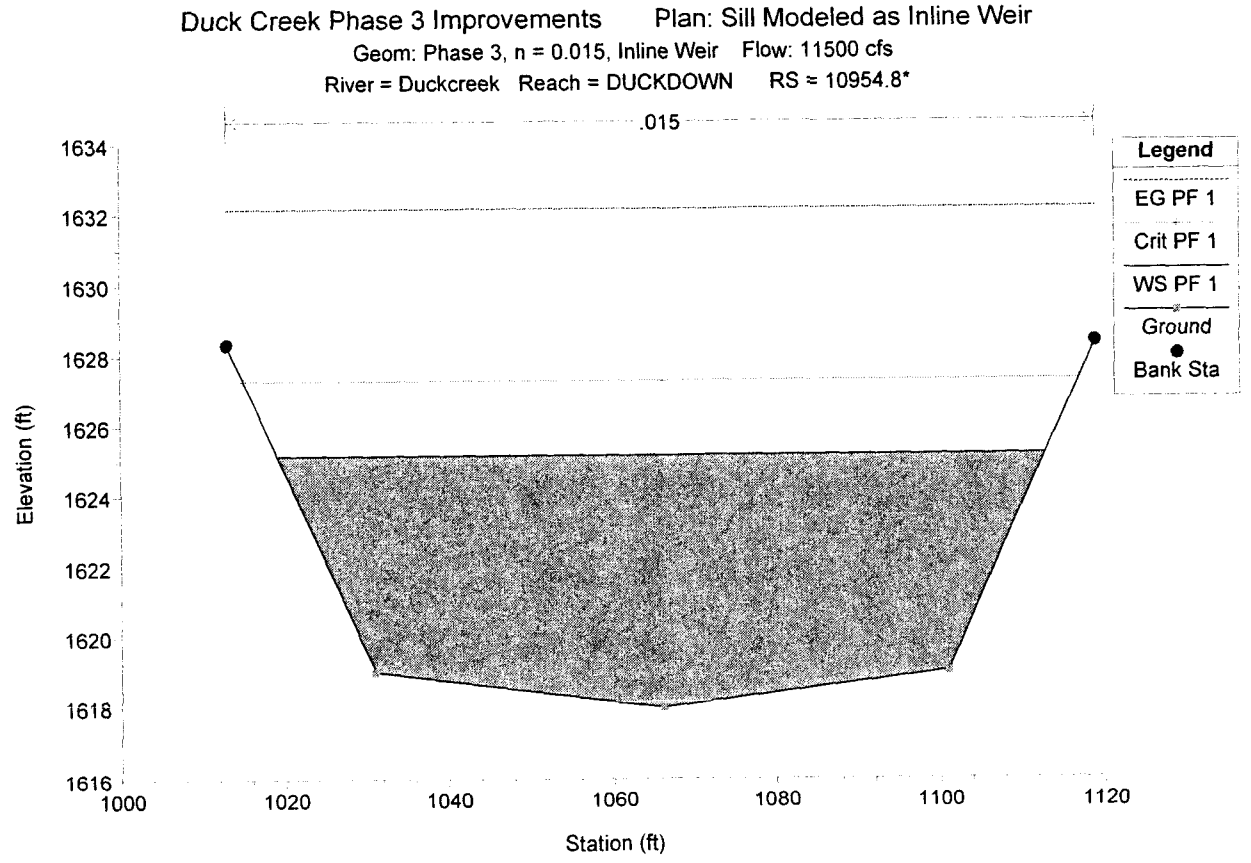

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11396.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120
Station (ft)

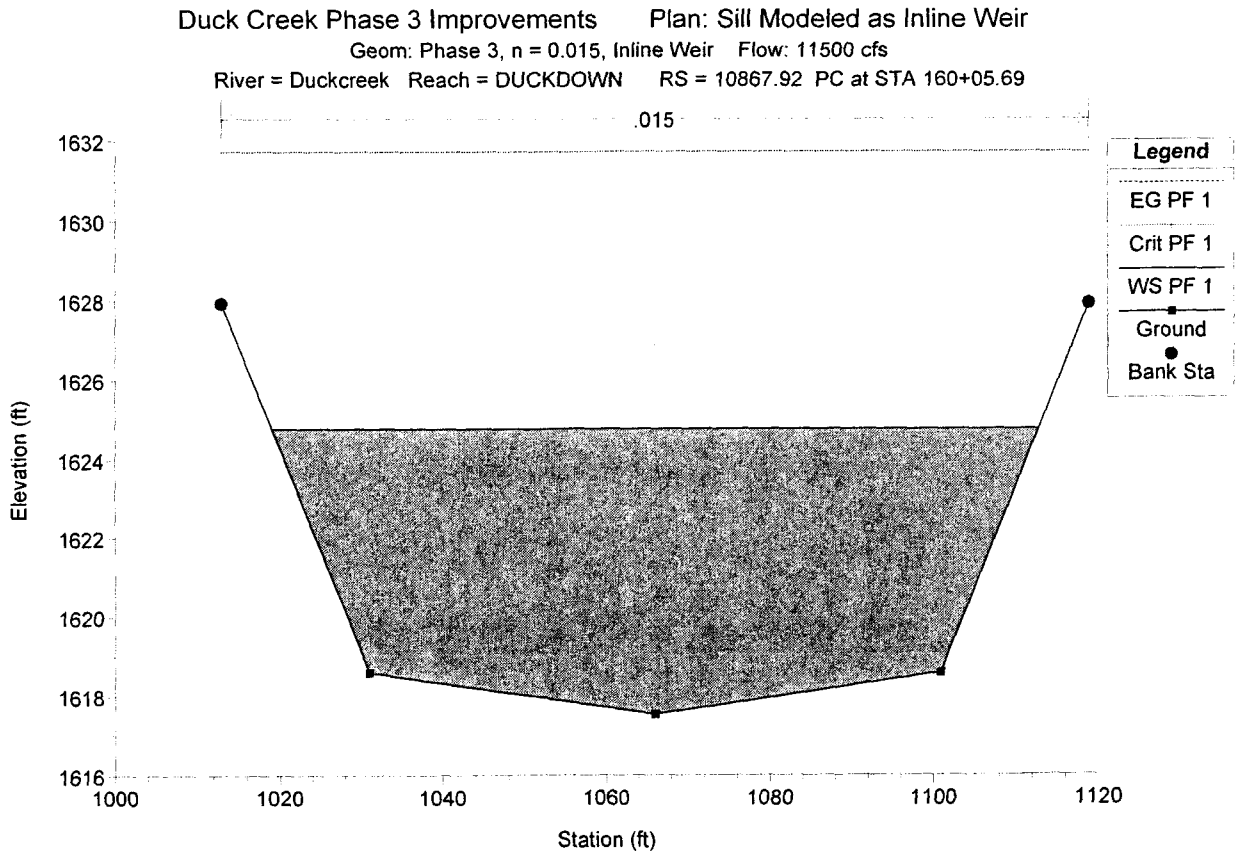

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11306.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120
Station (ft)

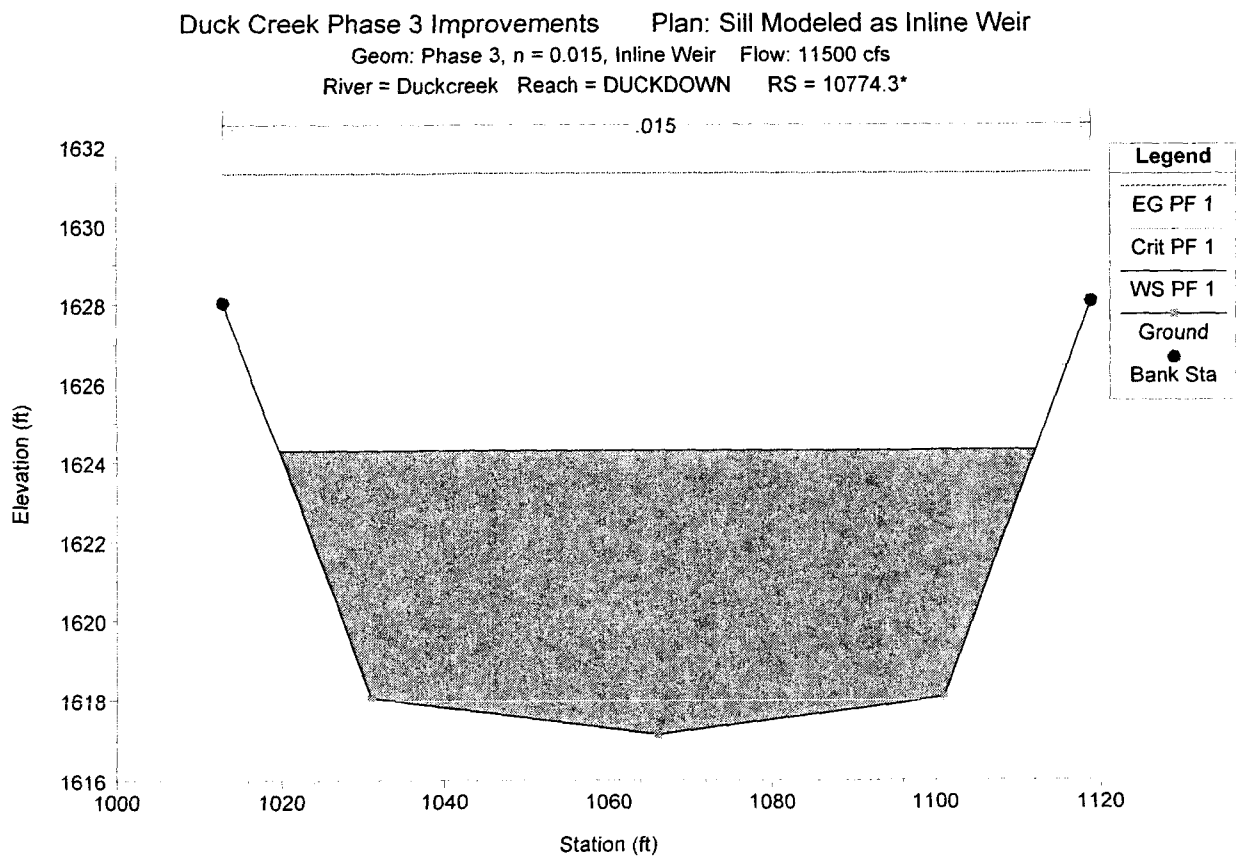

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11215.68 PT AT 156+57.92
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120

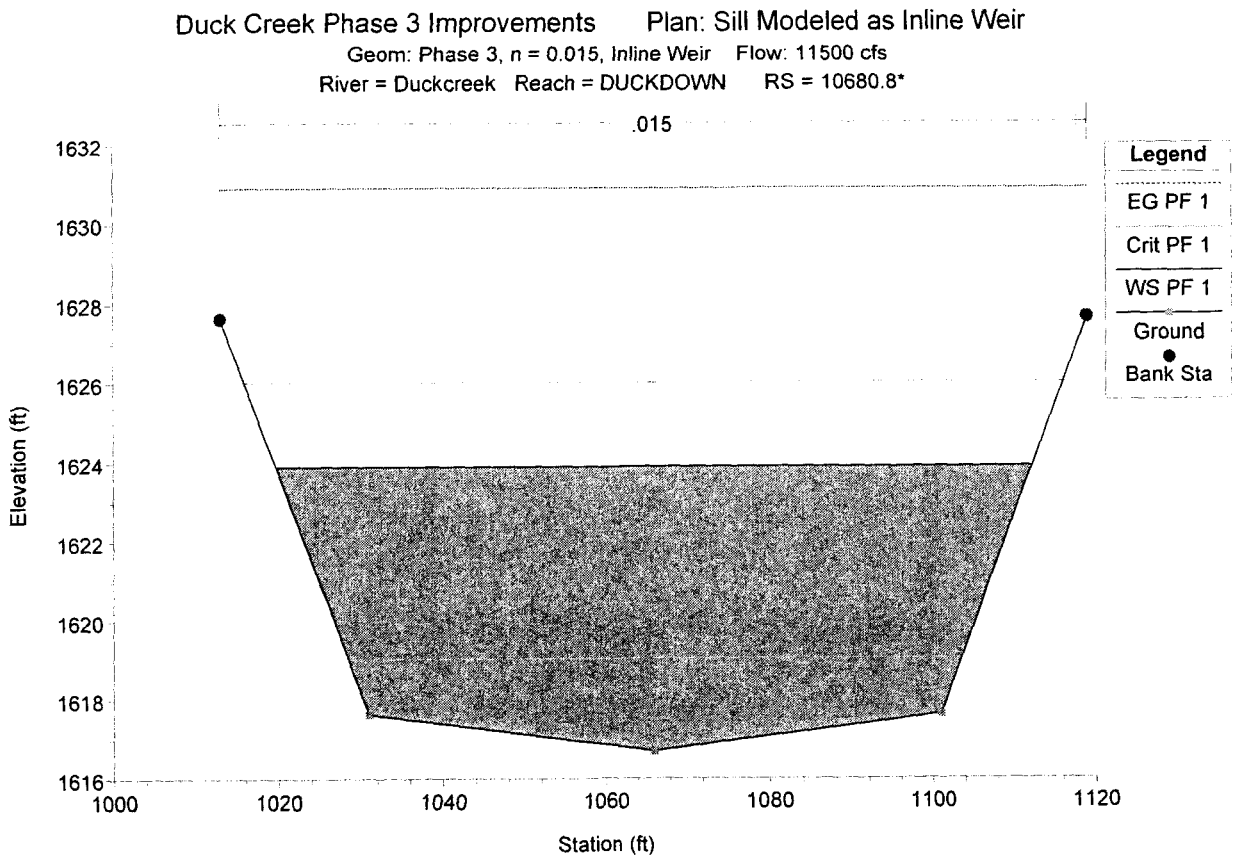

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11128.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120

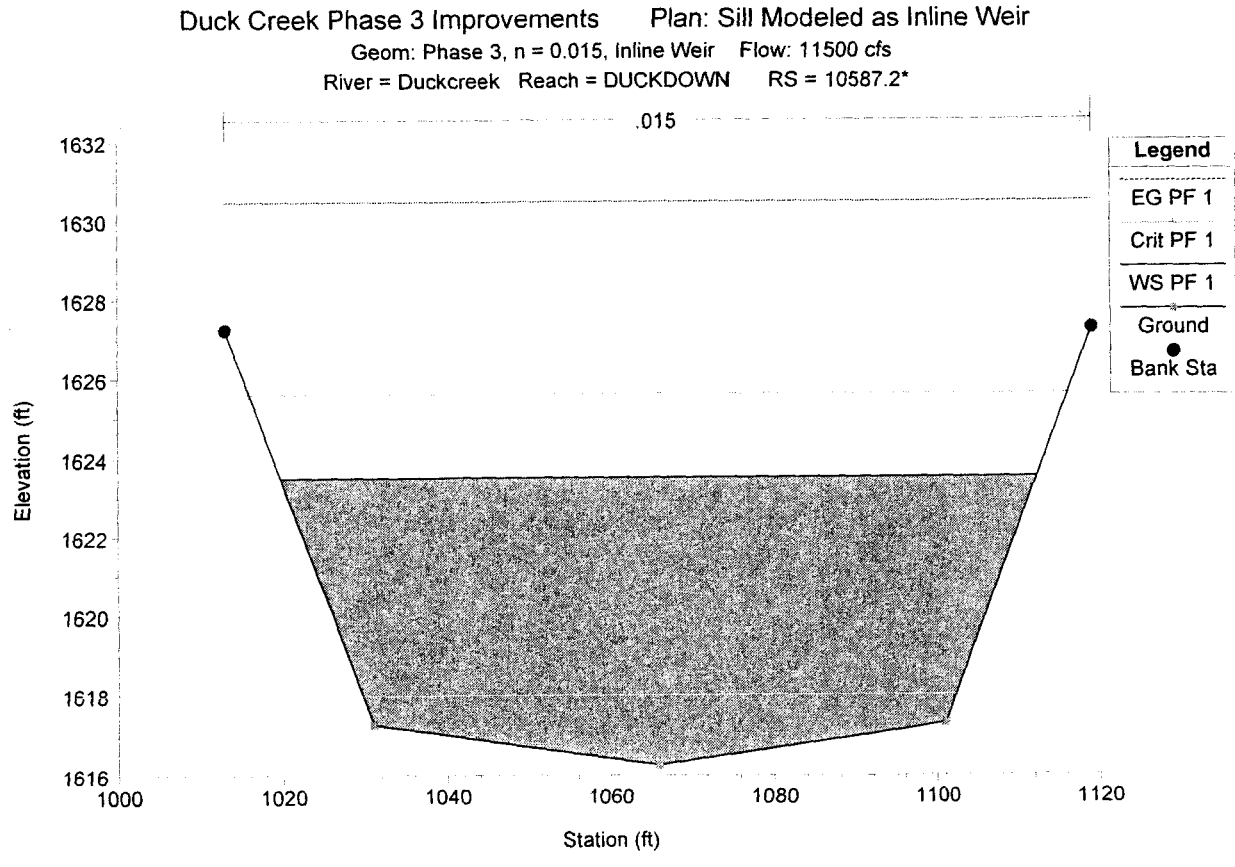

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11041.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10954.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1616
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10867.92 PC at STA 160+05.69
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1632
1630
1628
1626
1624
1622
1620
1618
1616
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10774.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1632
1630
1628
1626
1624
1622
1620
1618
1616
1000
1020
1040
1060
1080
1100
1120
Station (ft)

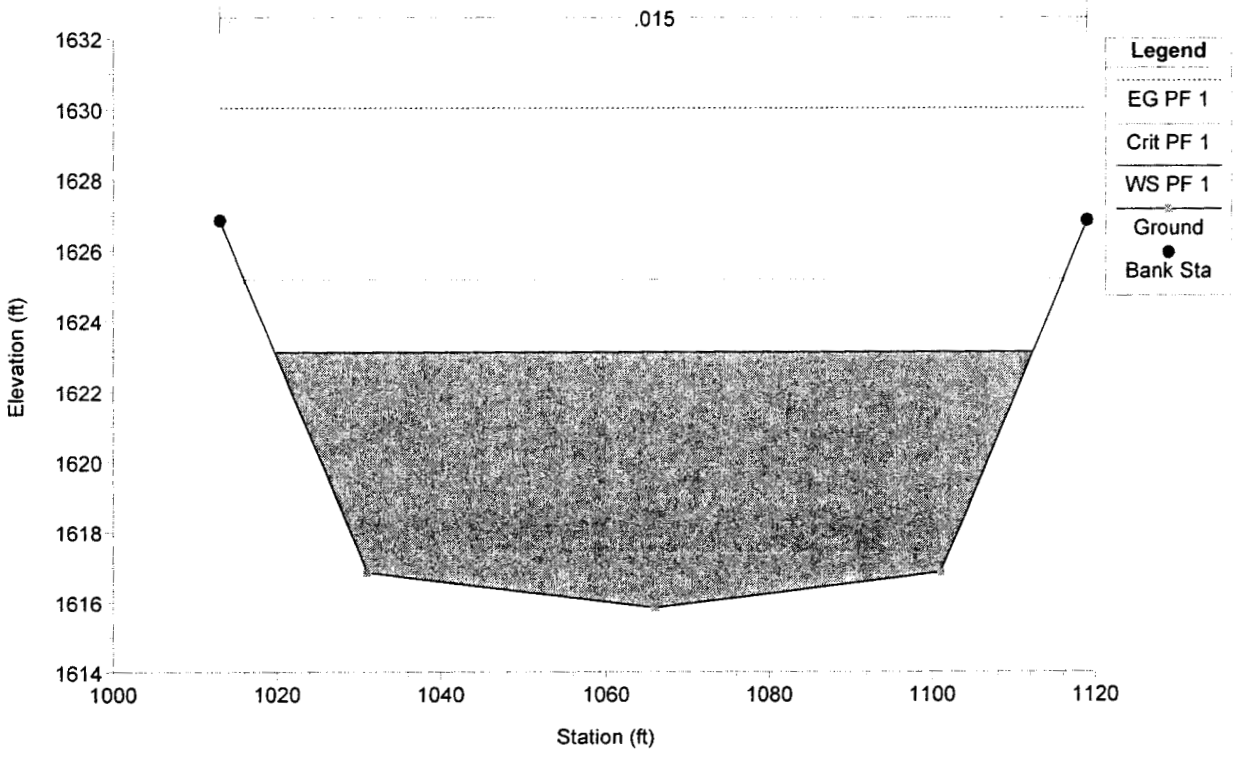

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10680.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1632
1630
1628
1626
1624
1622
1620
1618
1616
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10587.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1632
1630
1628
1626
1624
1622
1620
1618
1616
1000
1020
1040
1060
1080
1100
1120
Station (ft)

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

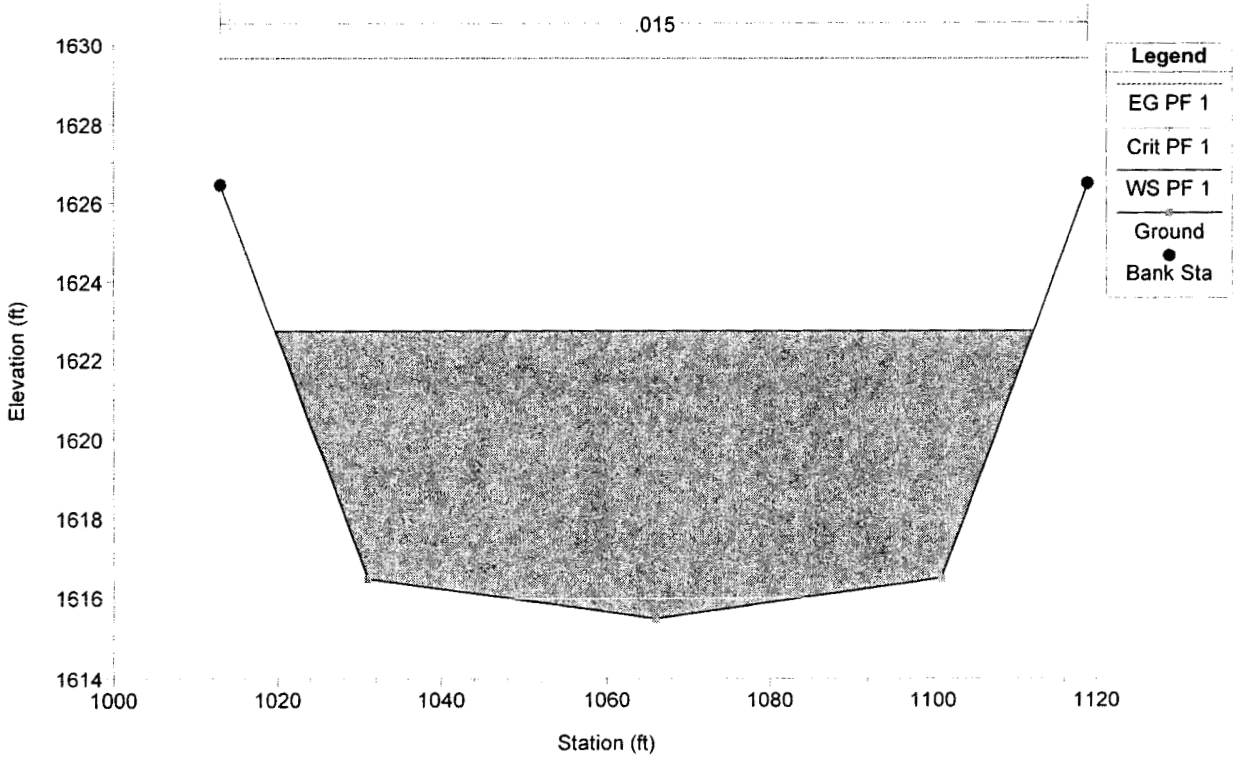
River = Duckcreek Reach = DUCKDOWN RS = 10493.7*

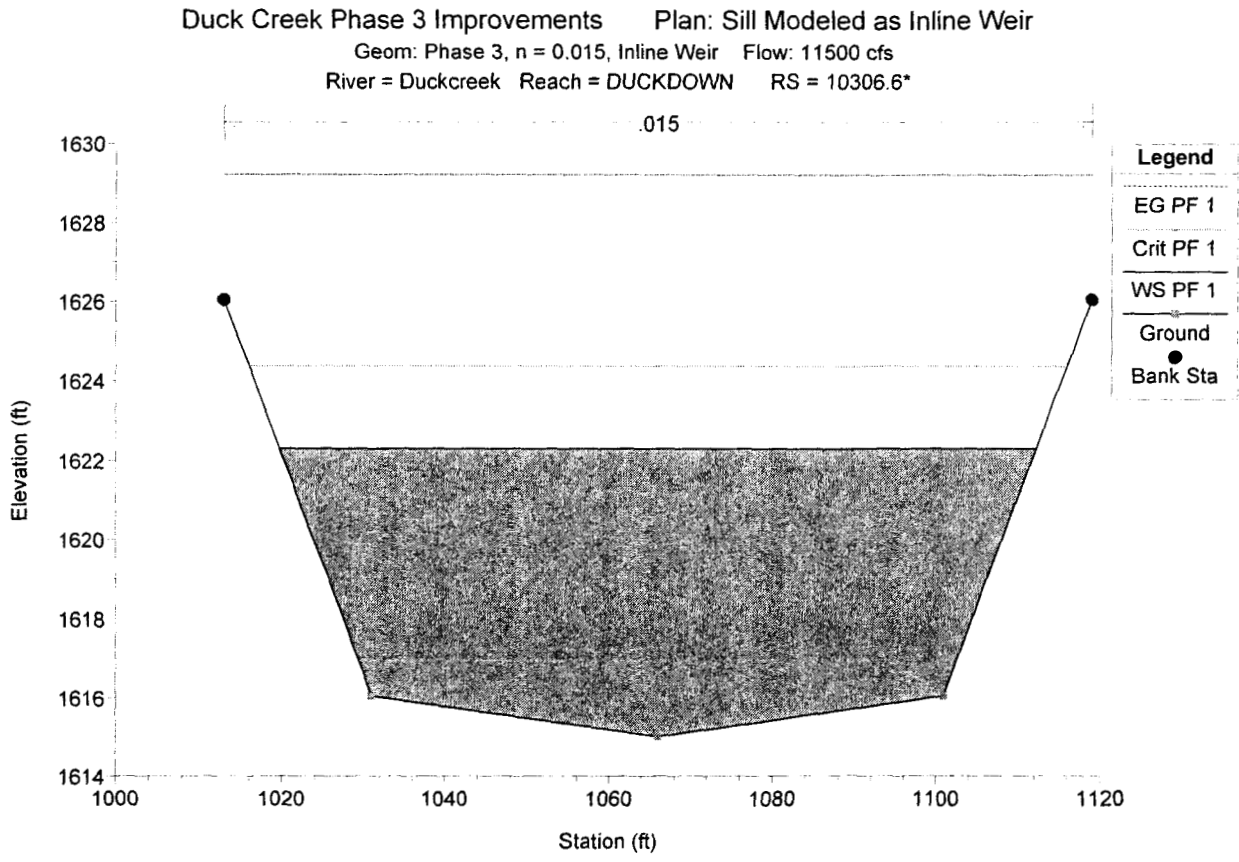


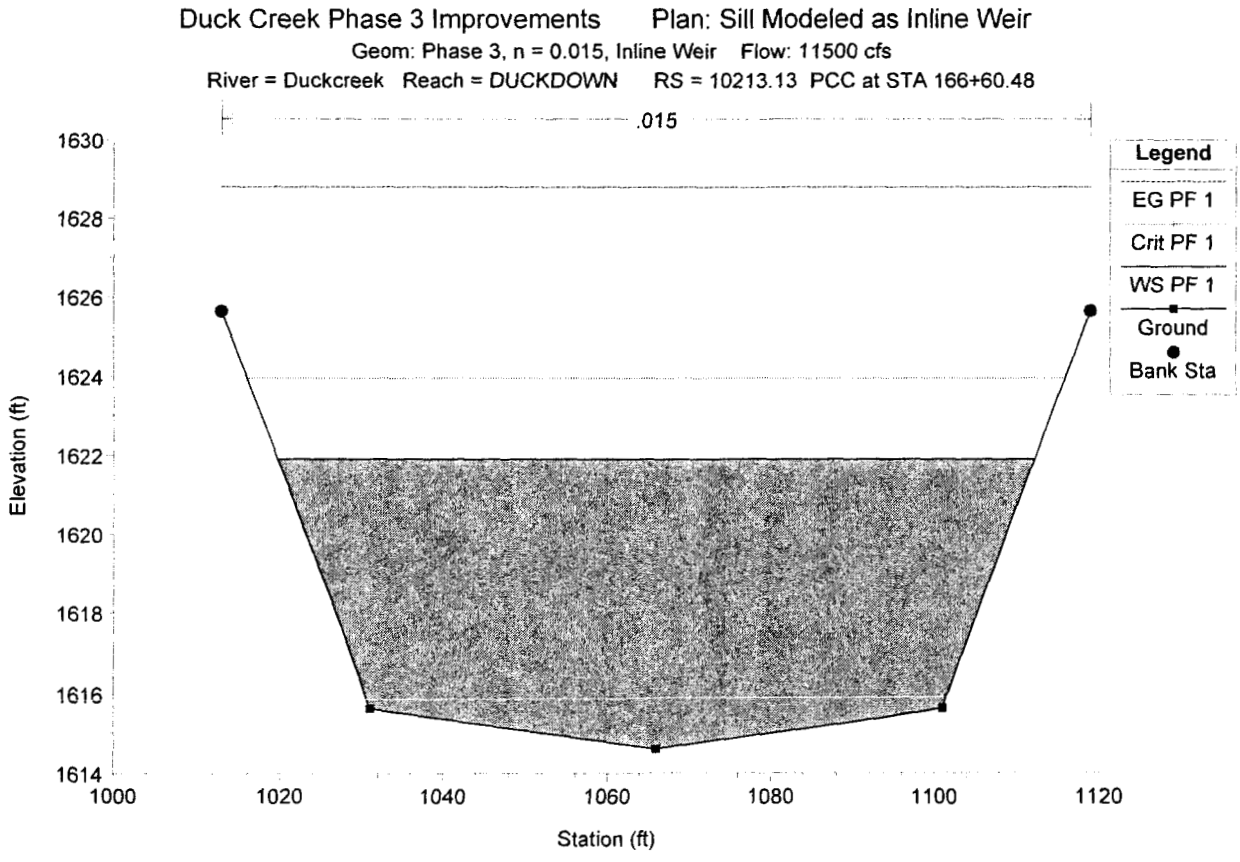
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

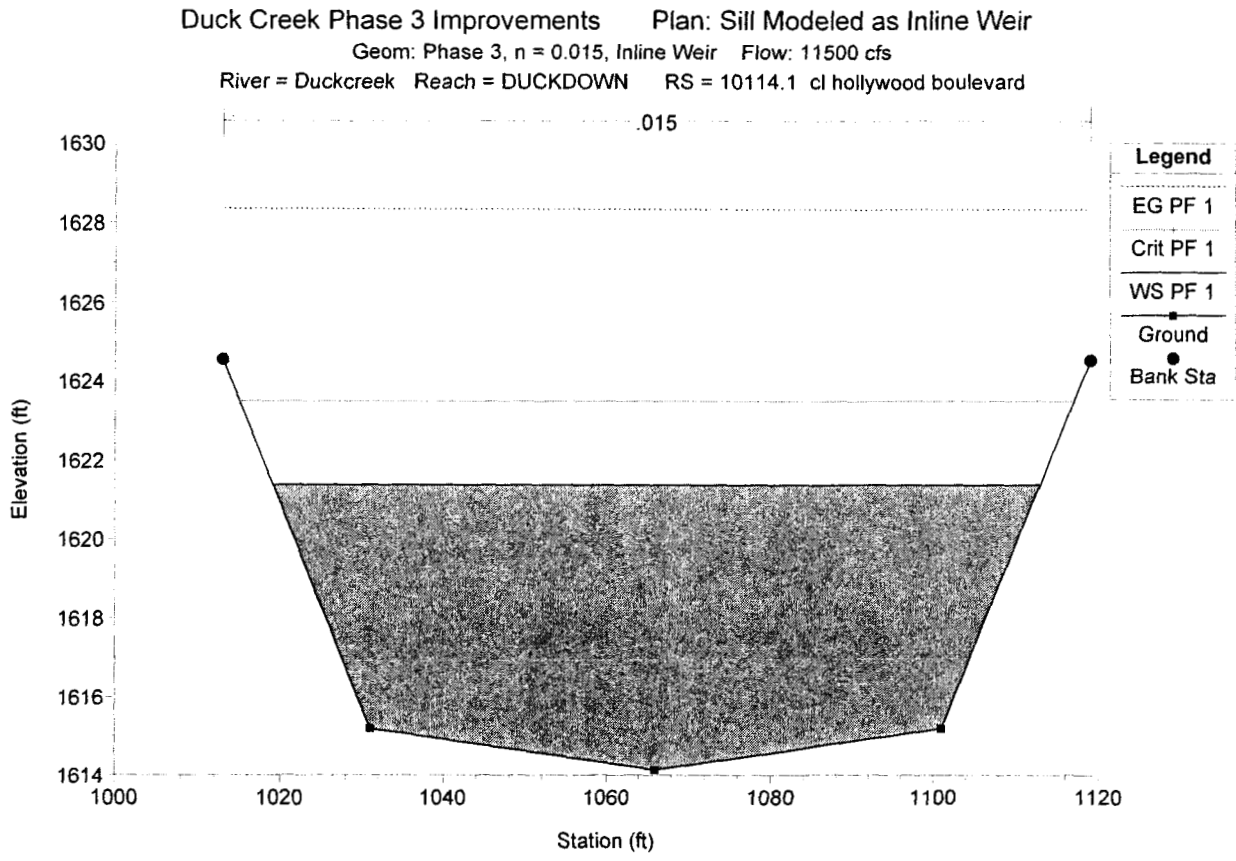
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

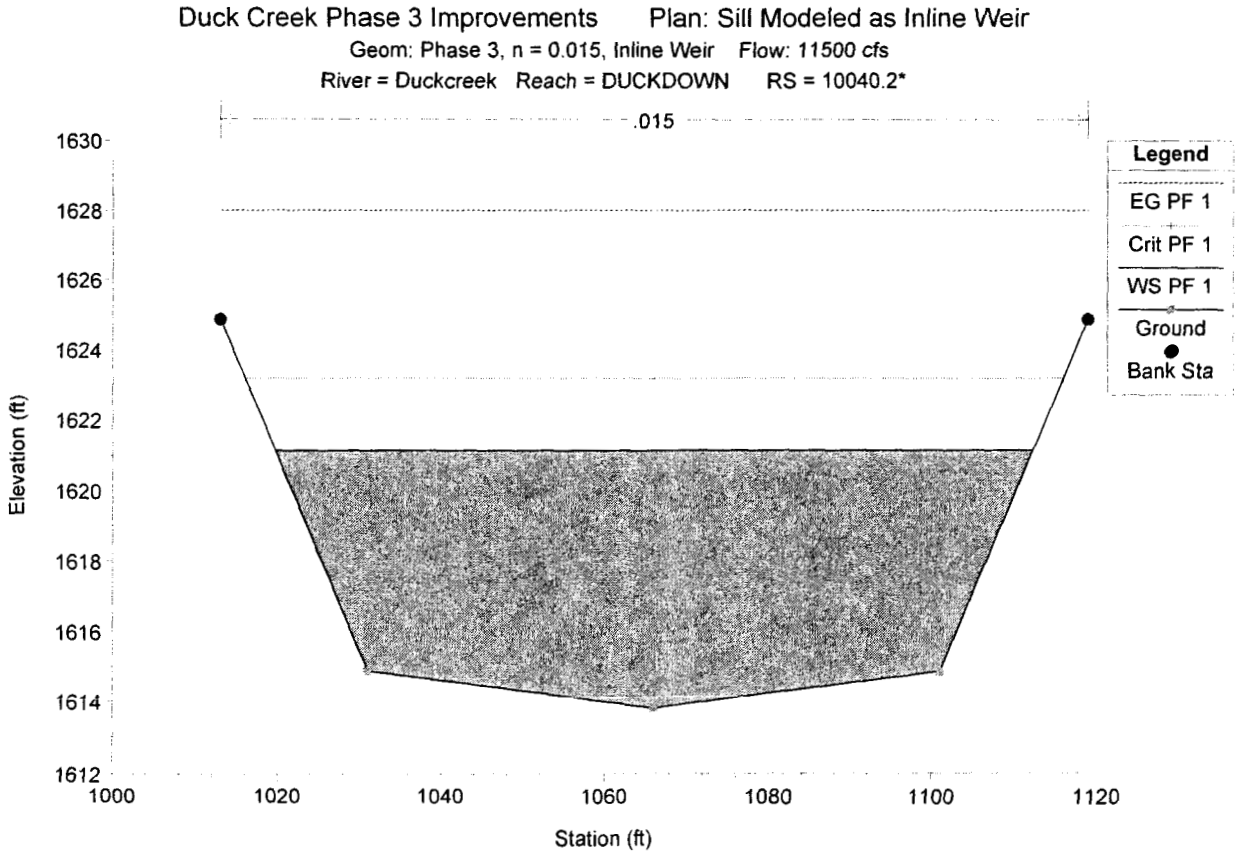
River = Duckcreek Reach = DUCKDOWN RS = 10400.2*

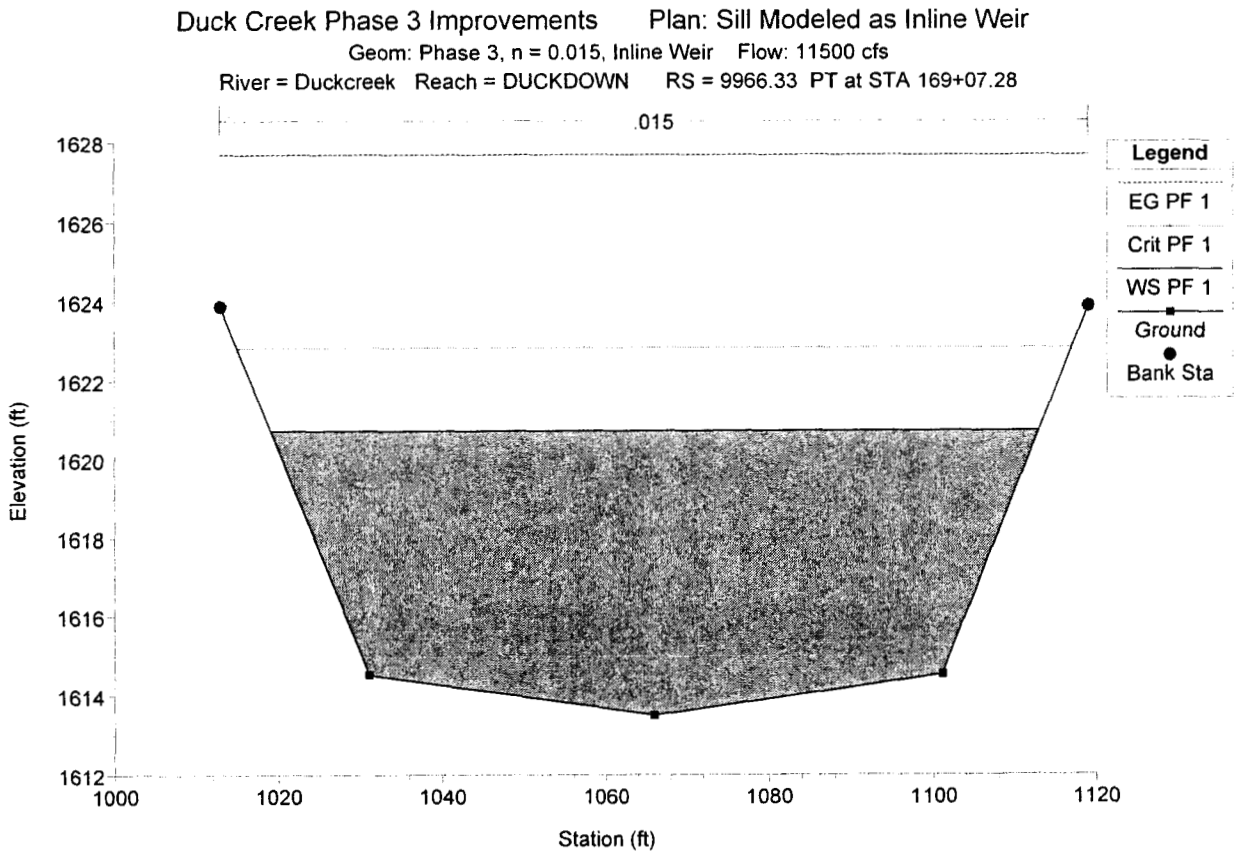


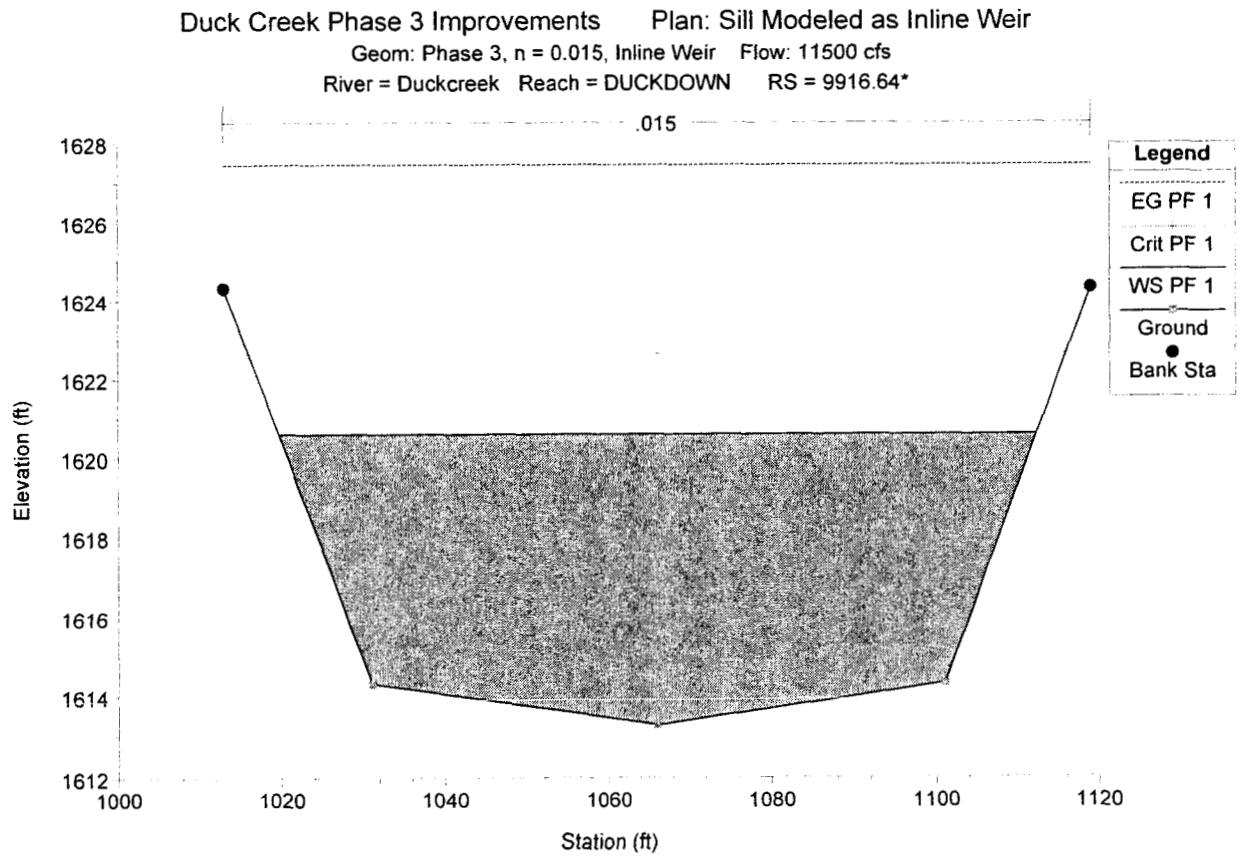

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10306.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120
Station (ft)

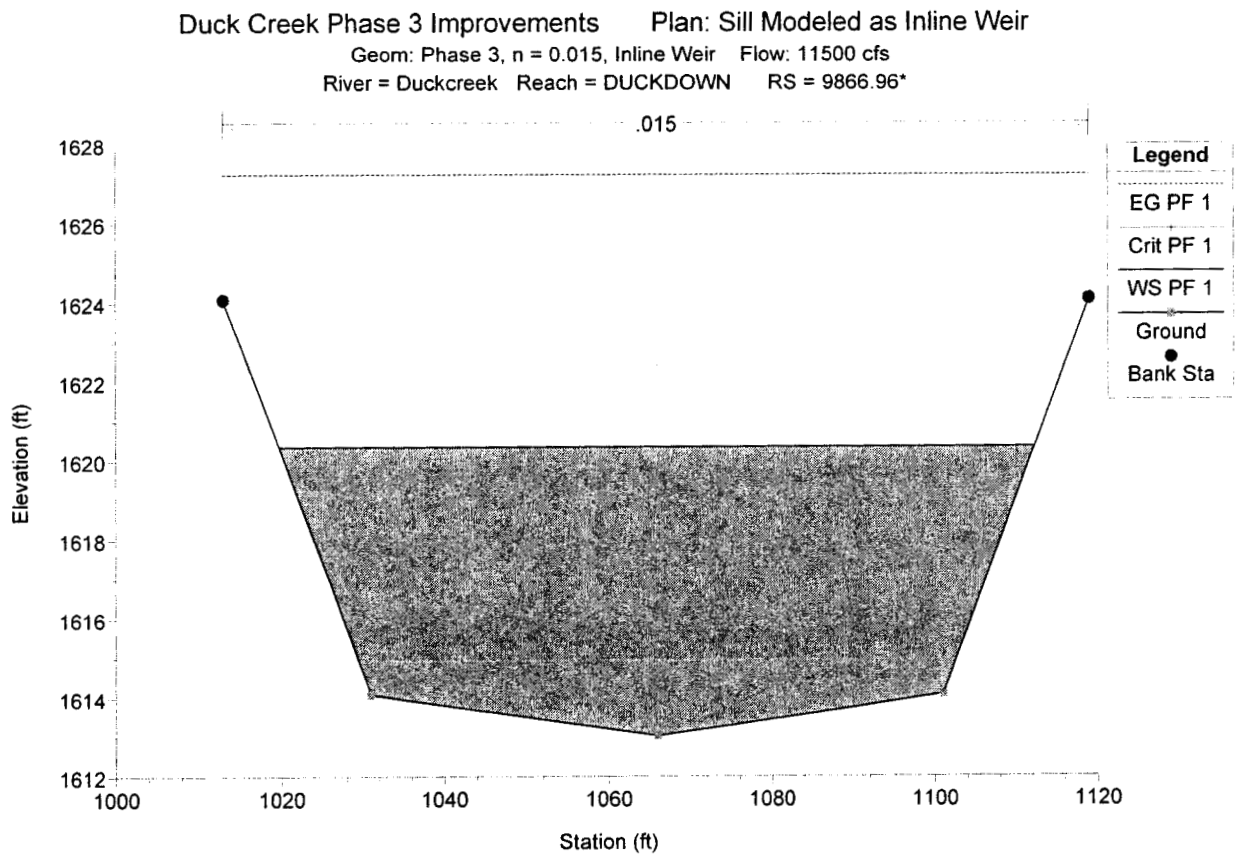

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10213.13 PCC at STA 166+60.48
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120
Station (ft)

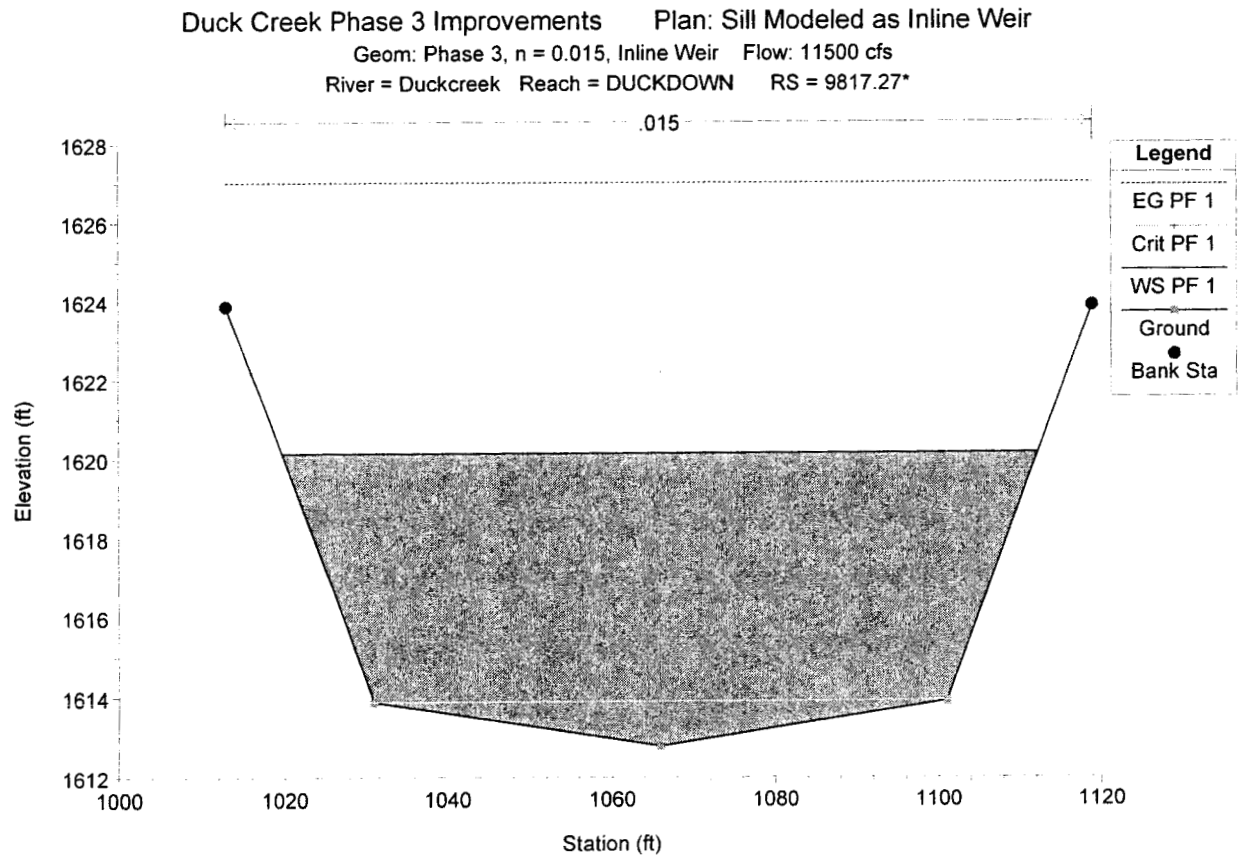

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10114.1 cl hollywood boulevard
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120

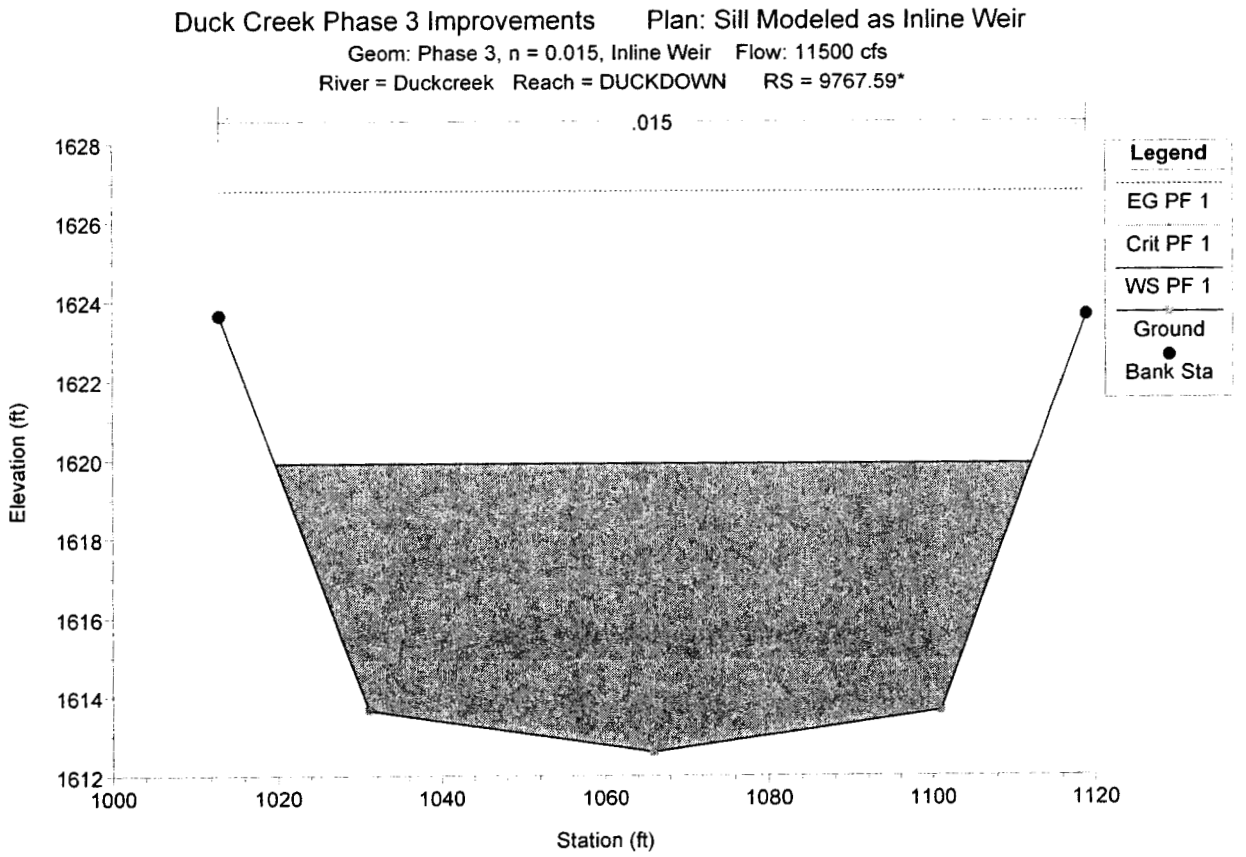

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10040.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
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1040
1060
1080
1100
1120

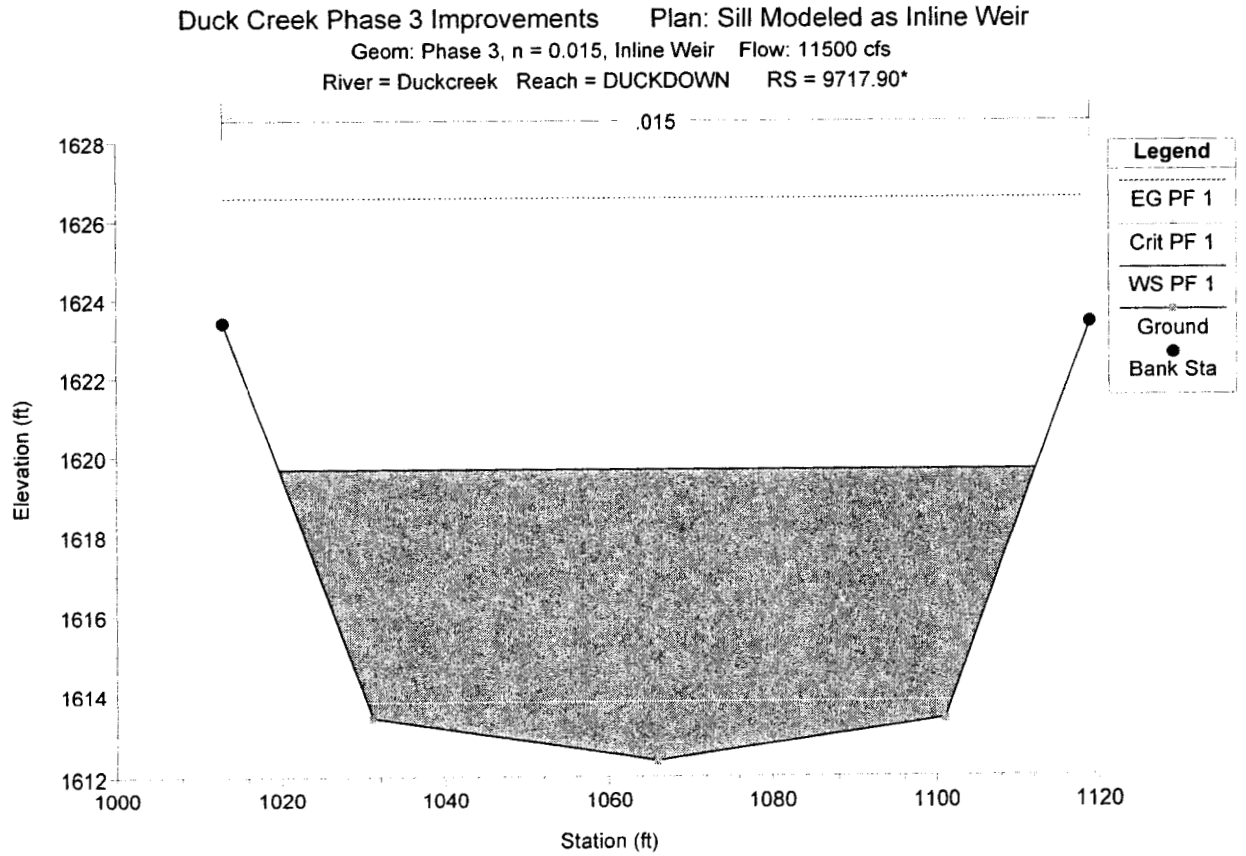

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9966.33 PT at STA 169+07.28
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

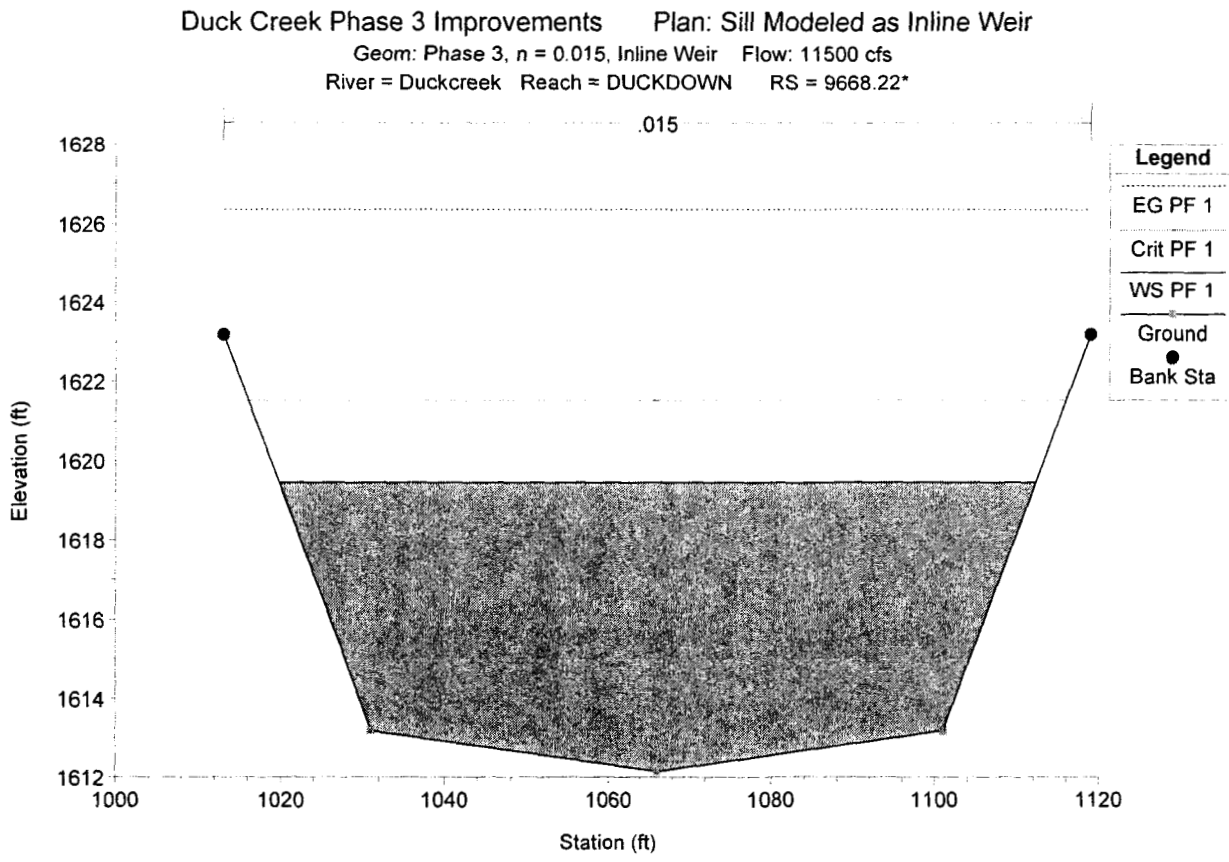

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9916.64*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

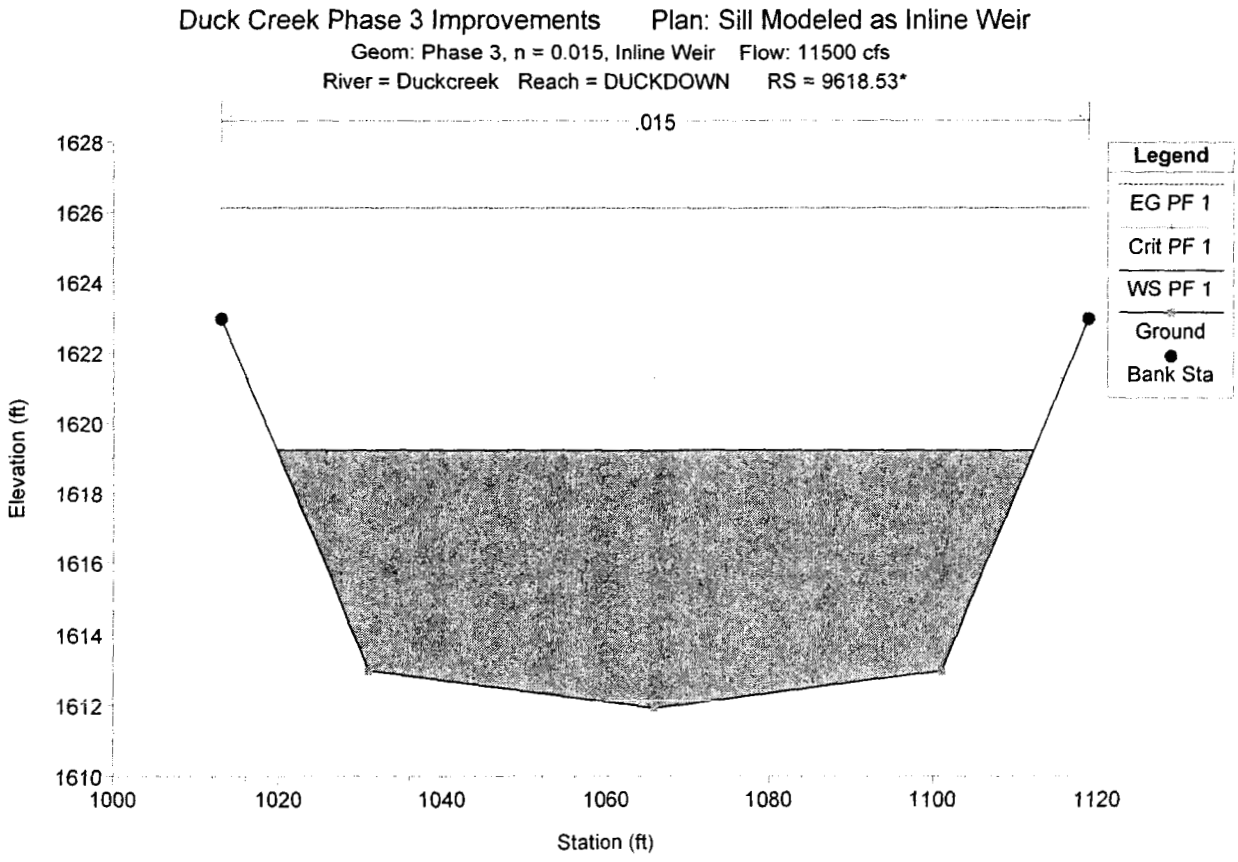

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9866.96*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

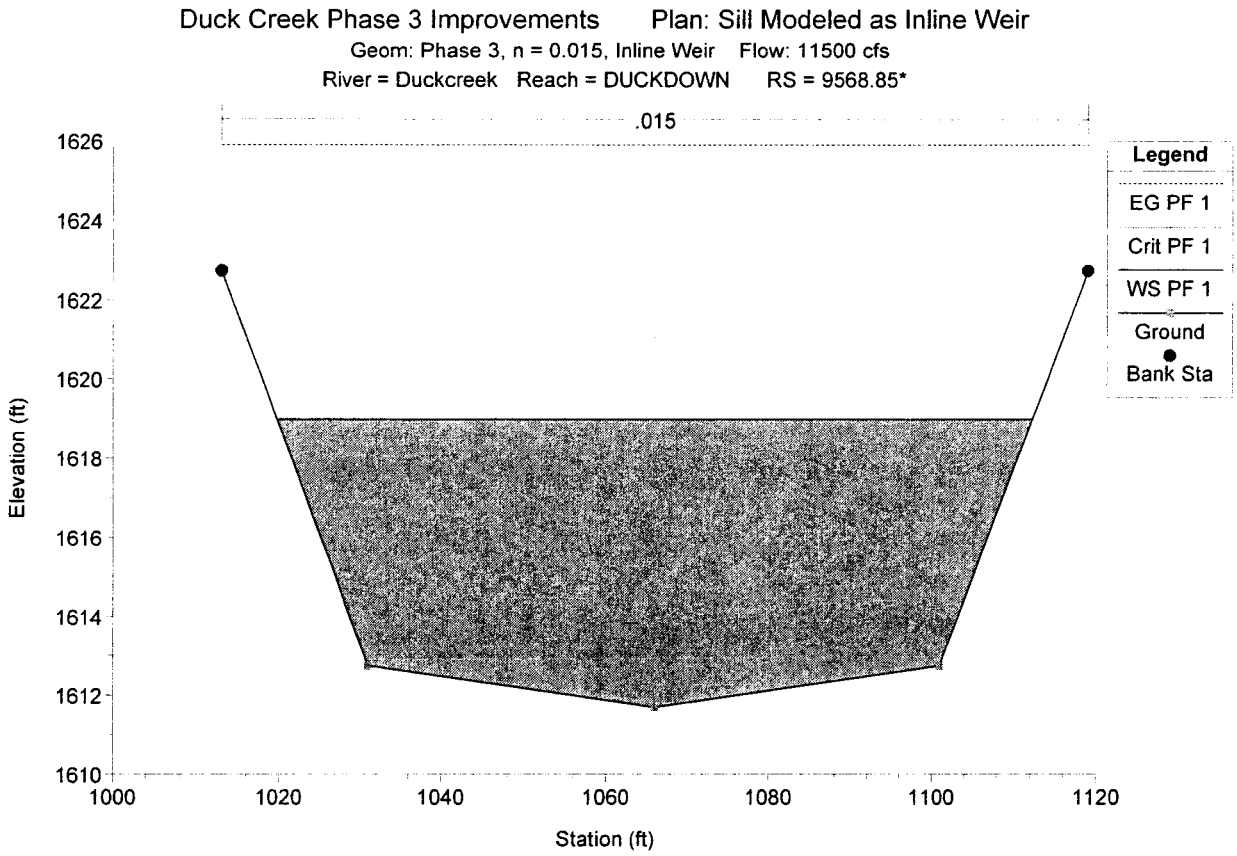

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9817.27*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

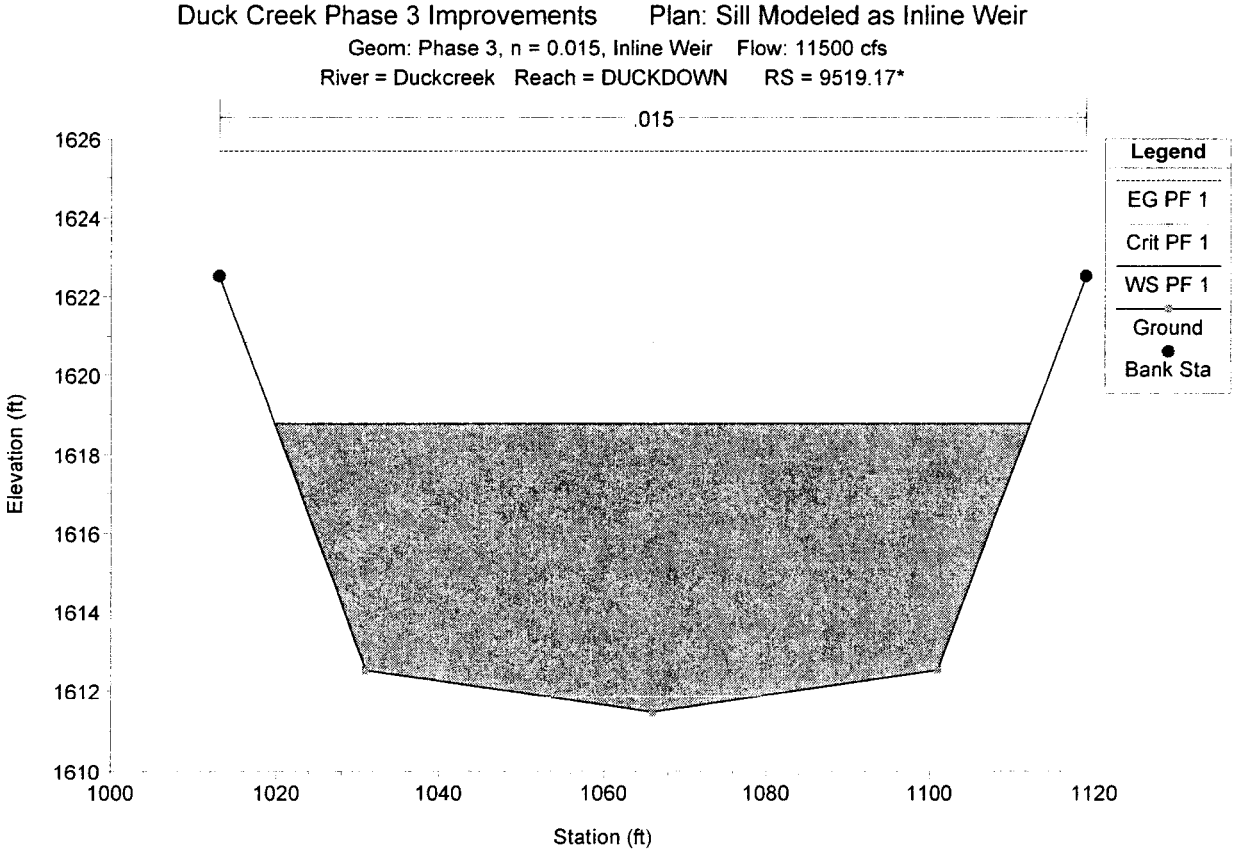

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9767.59*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

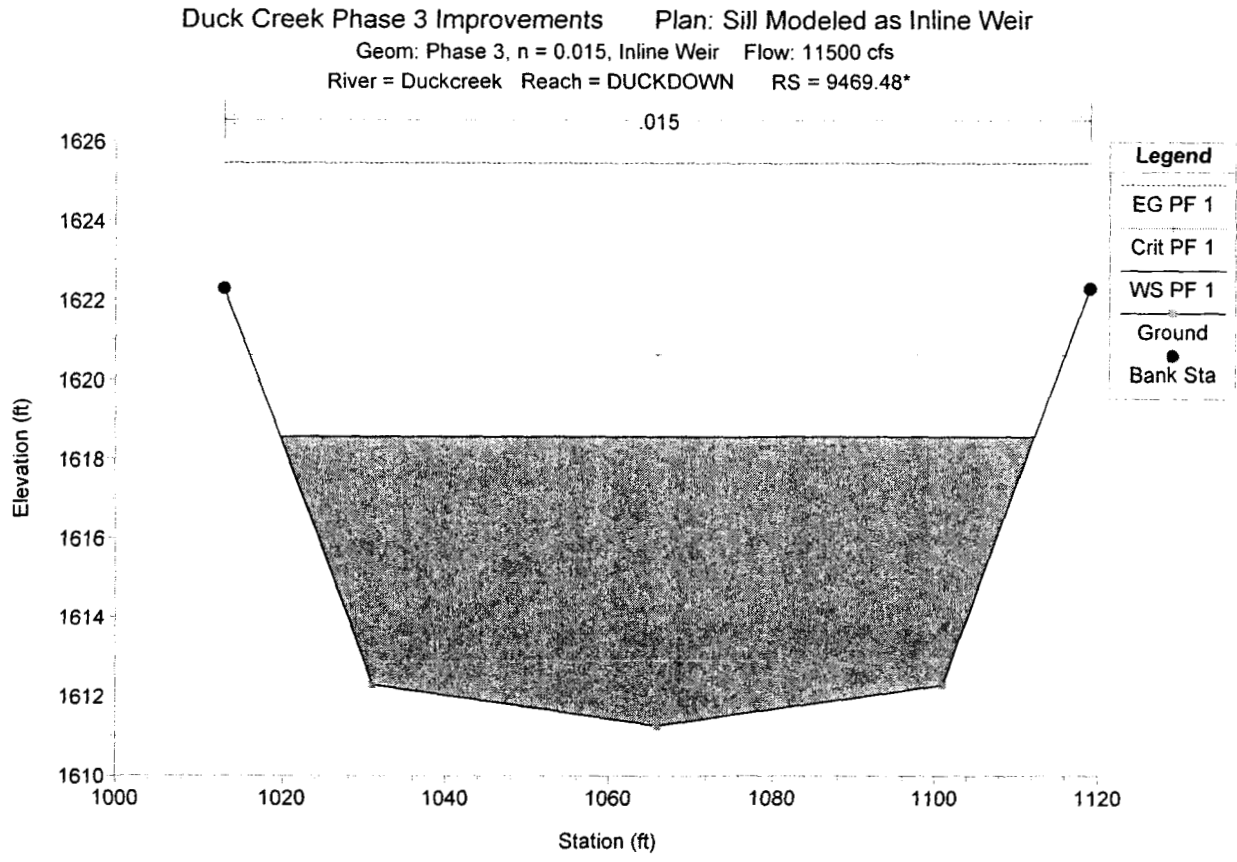

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9717.90*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

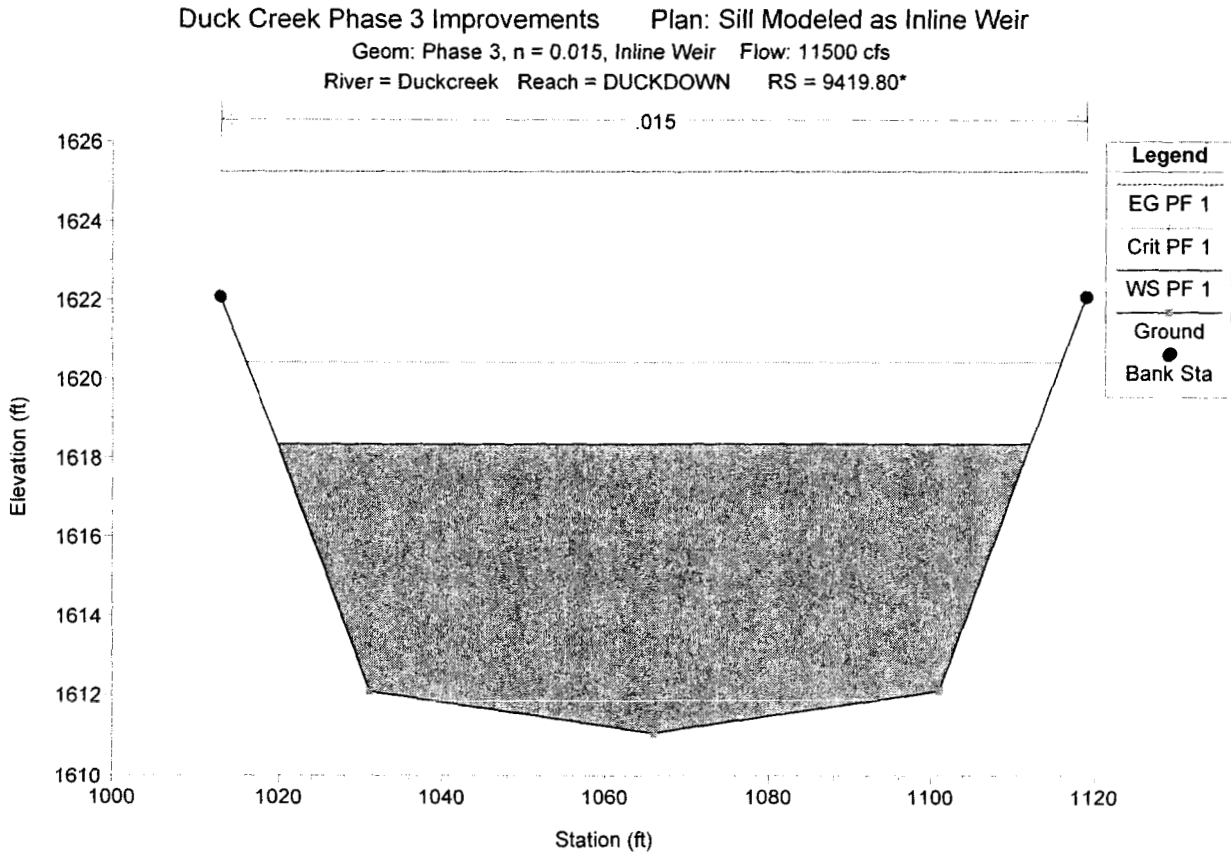

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9668.22*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9618.53*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9568.85*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9519.17*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)

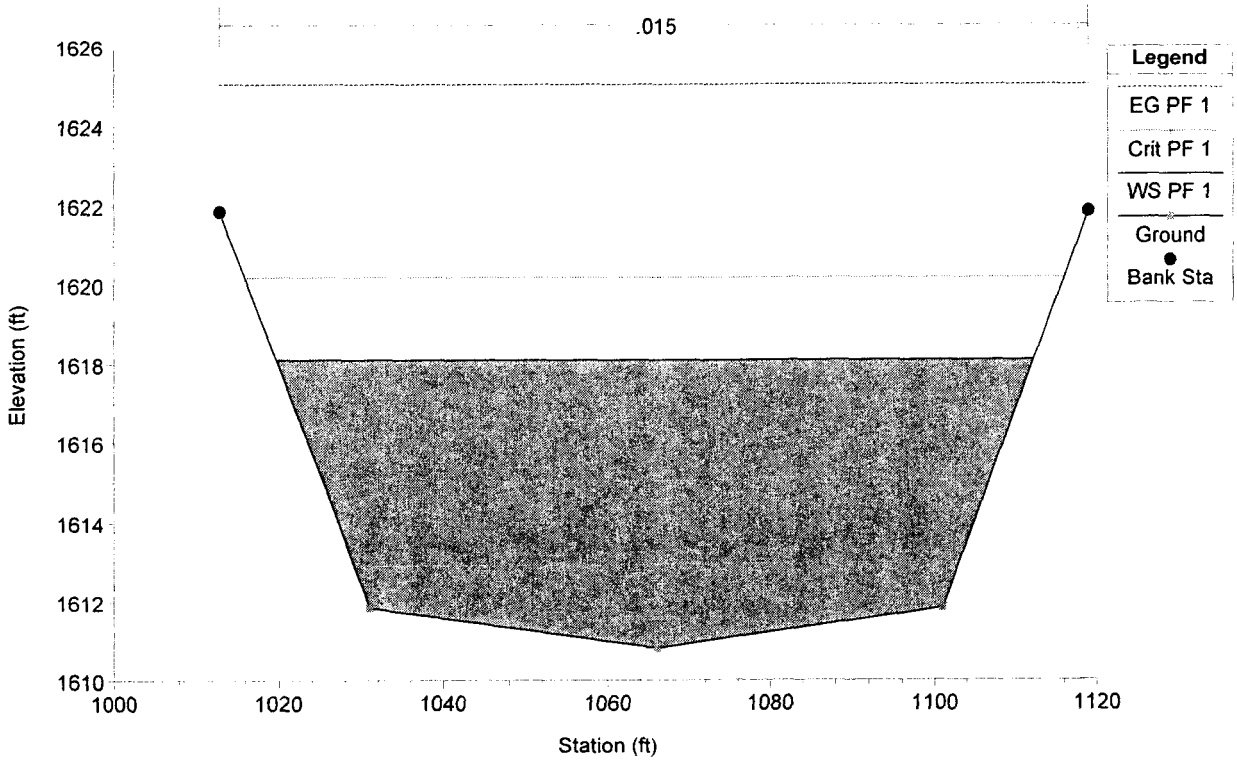

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9469.48*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9419.80*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

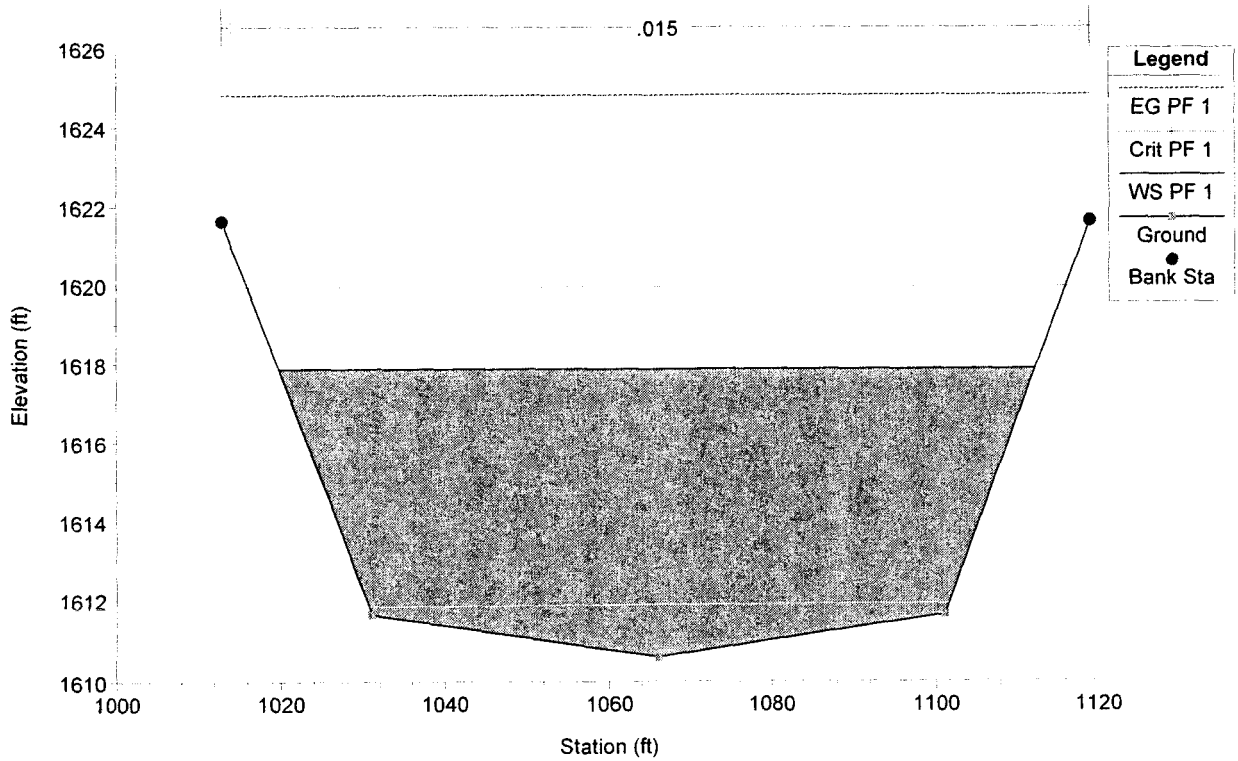
River = Duckcreek Reach = DUCKDOWN RS = 9370.11*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

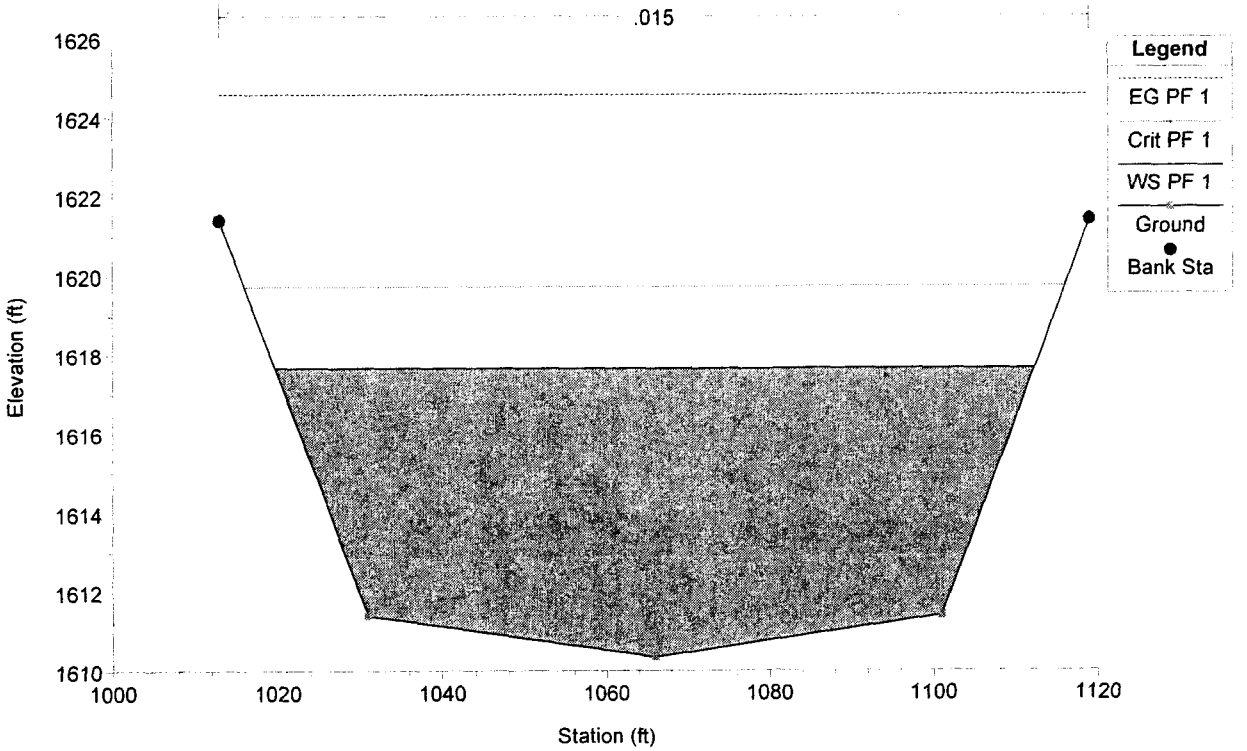
River = Duckcreek Reach = DUCKDOWN RS = 9320.43*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

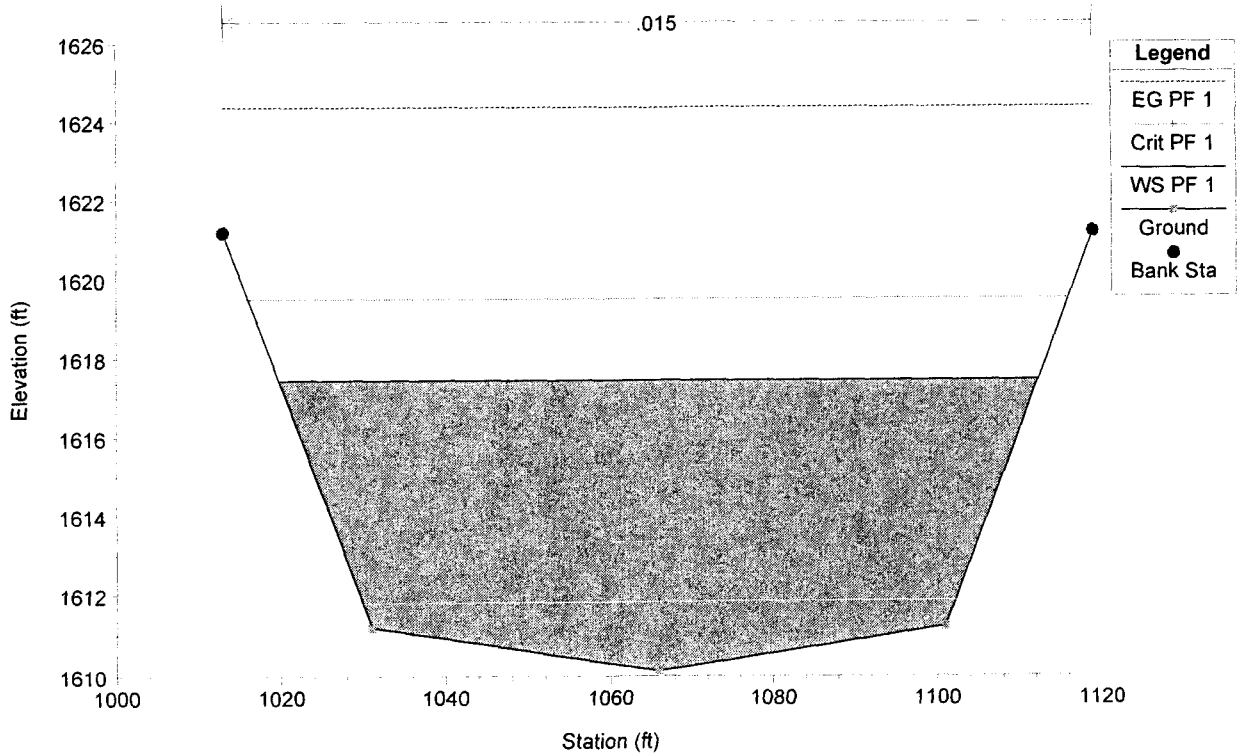
River = Duckcreek Reach = DUCKDOWN RS = 9270.74*

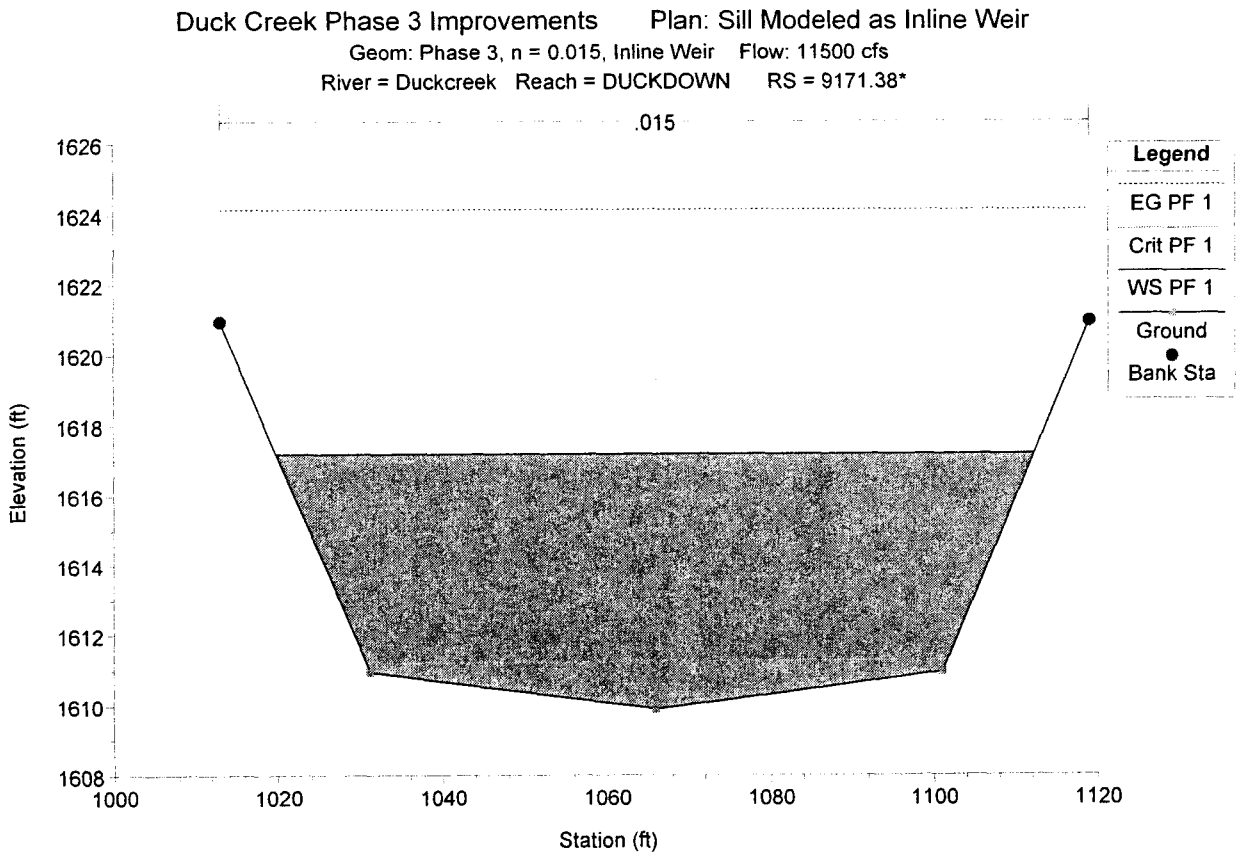


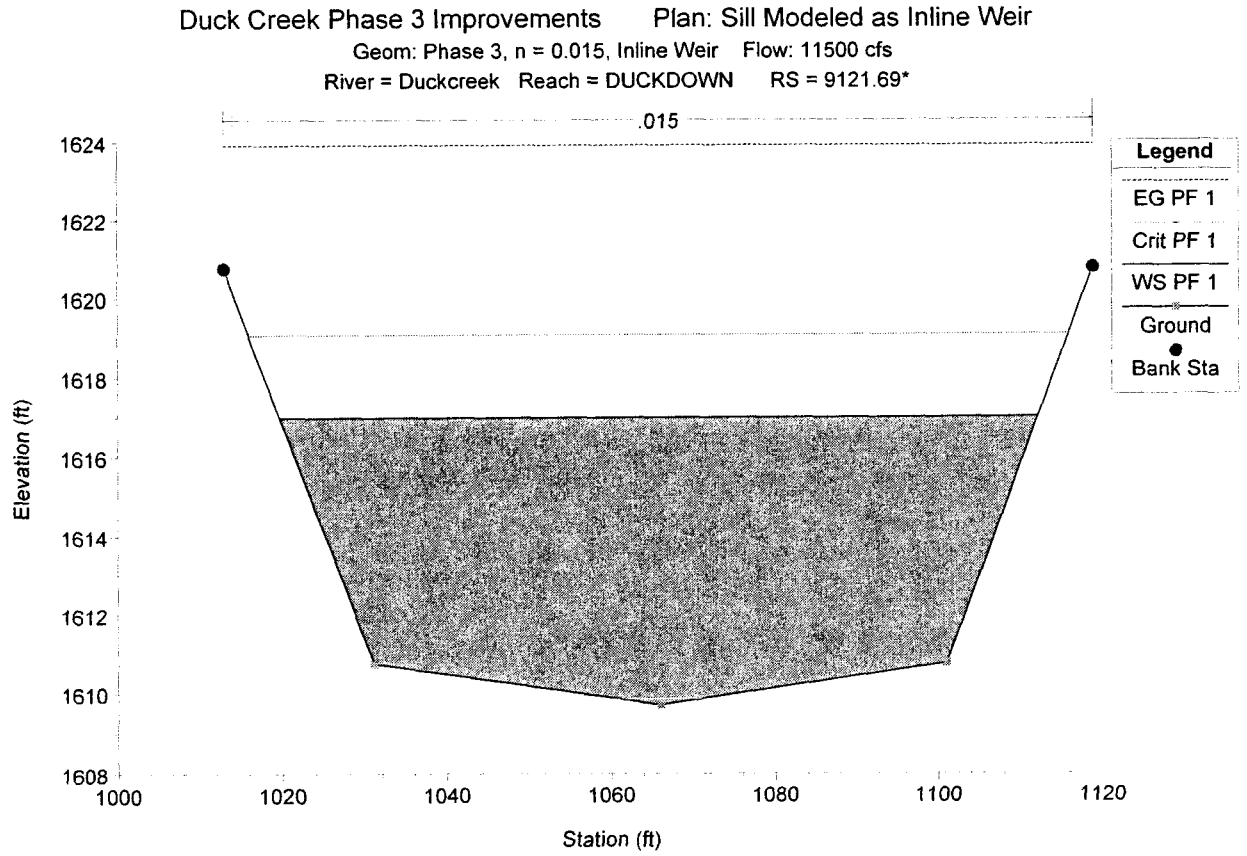
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

River = Duckcreek Reach = DUCKDOWN RS = 9221.06*



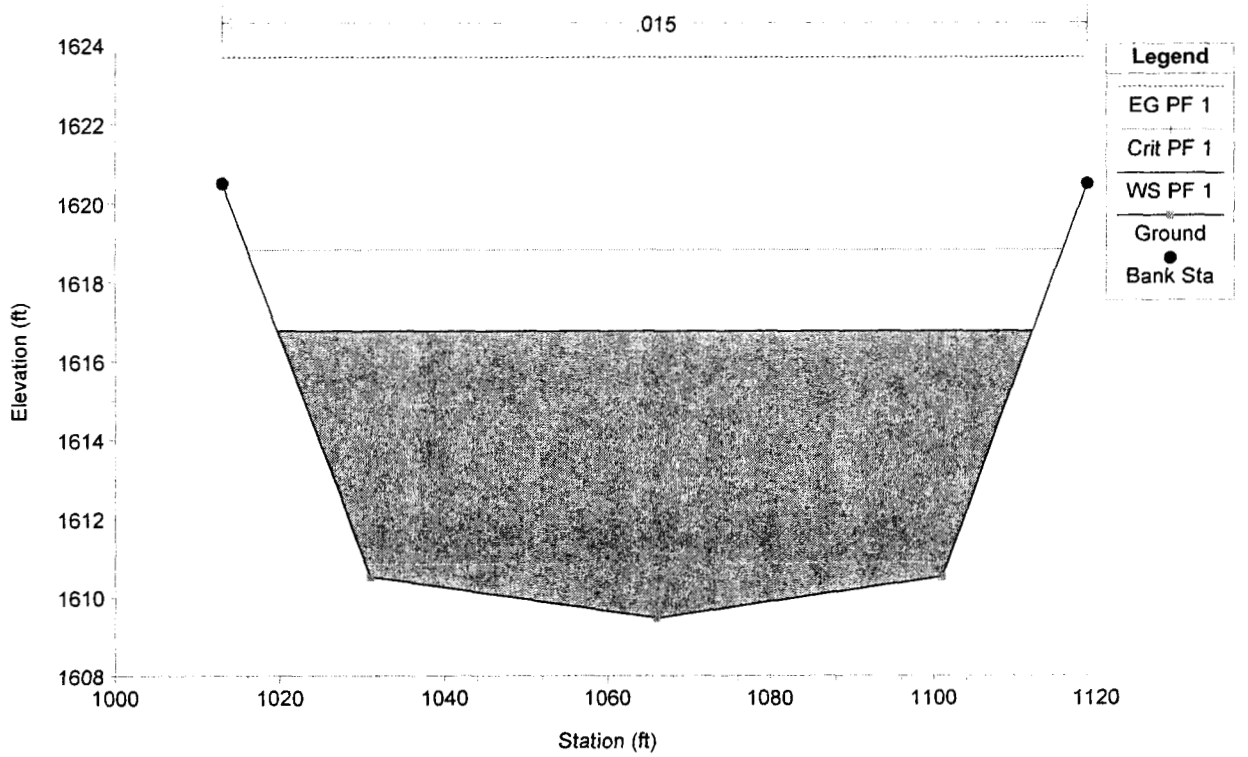

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9171.38*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9121.69*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

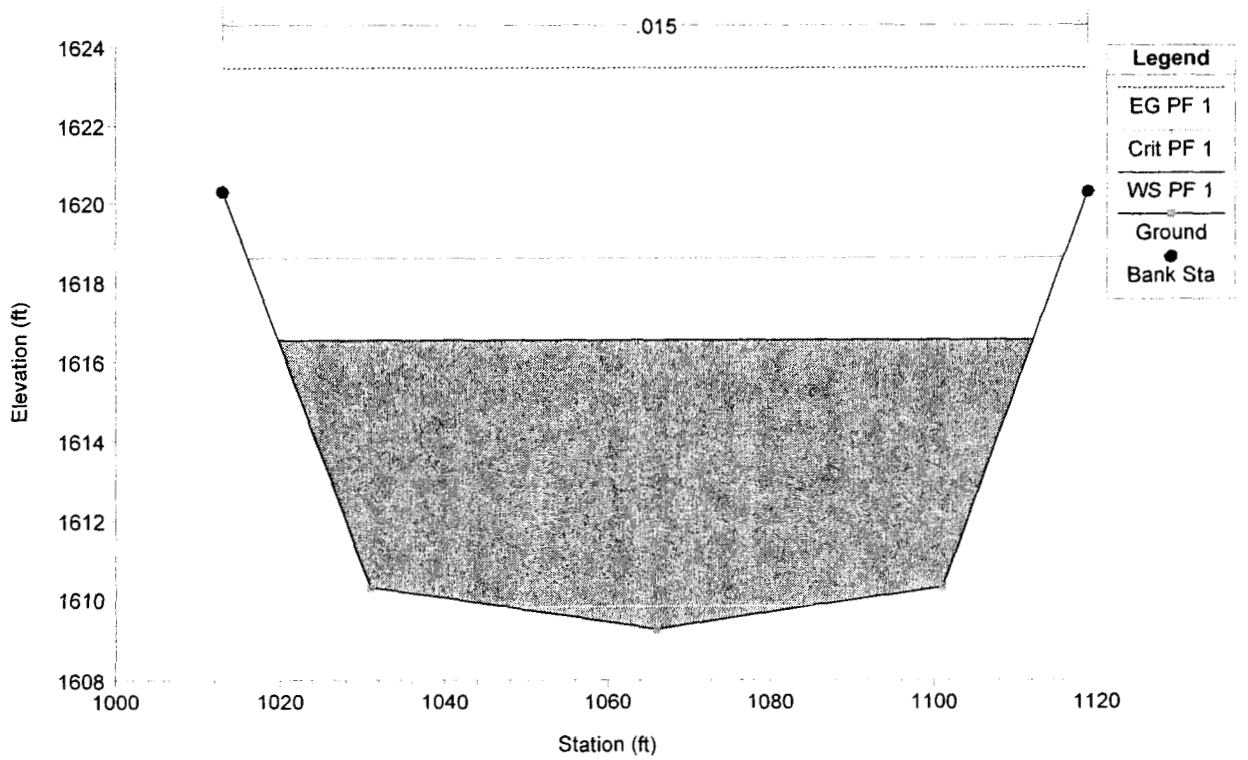
River = Duckcreek Reach = DUCKDOWN RS = 9072.01*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

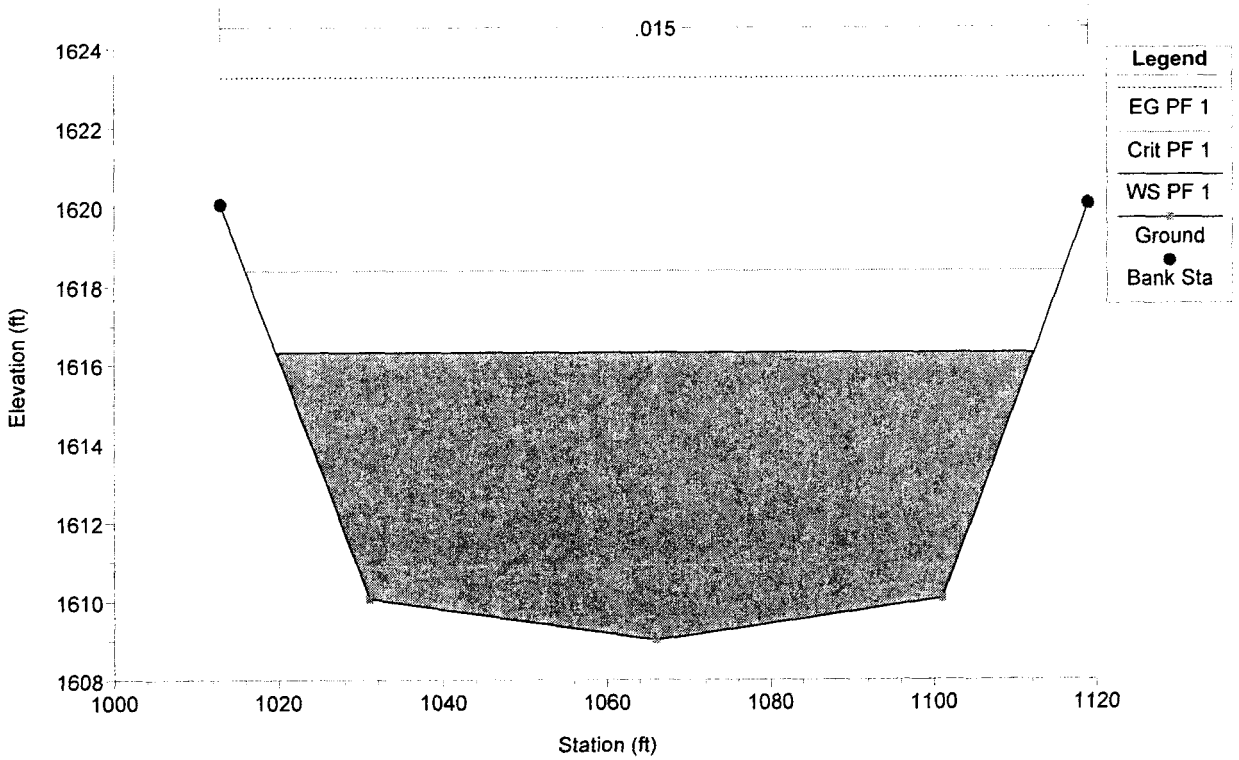
River = Duckcreek Reach = DUCKDOWN RS = 9022.32*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

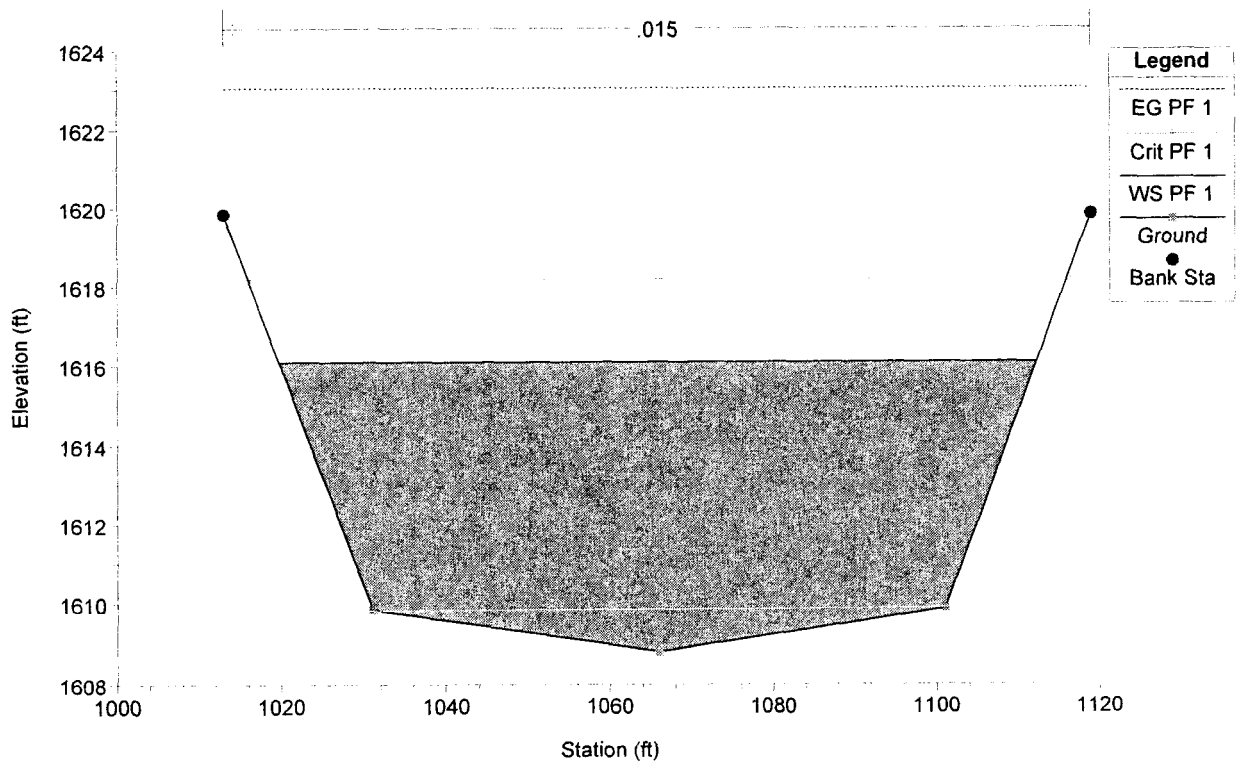
River = Duckcreek Reach = DUCKDOWN RS = 8972.64*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

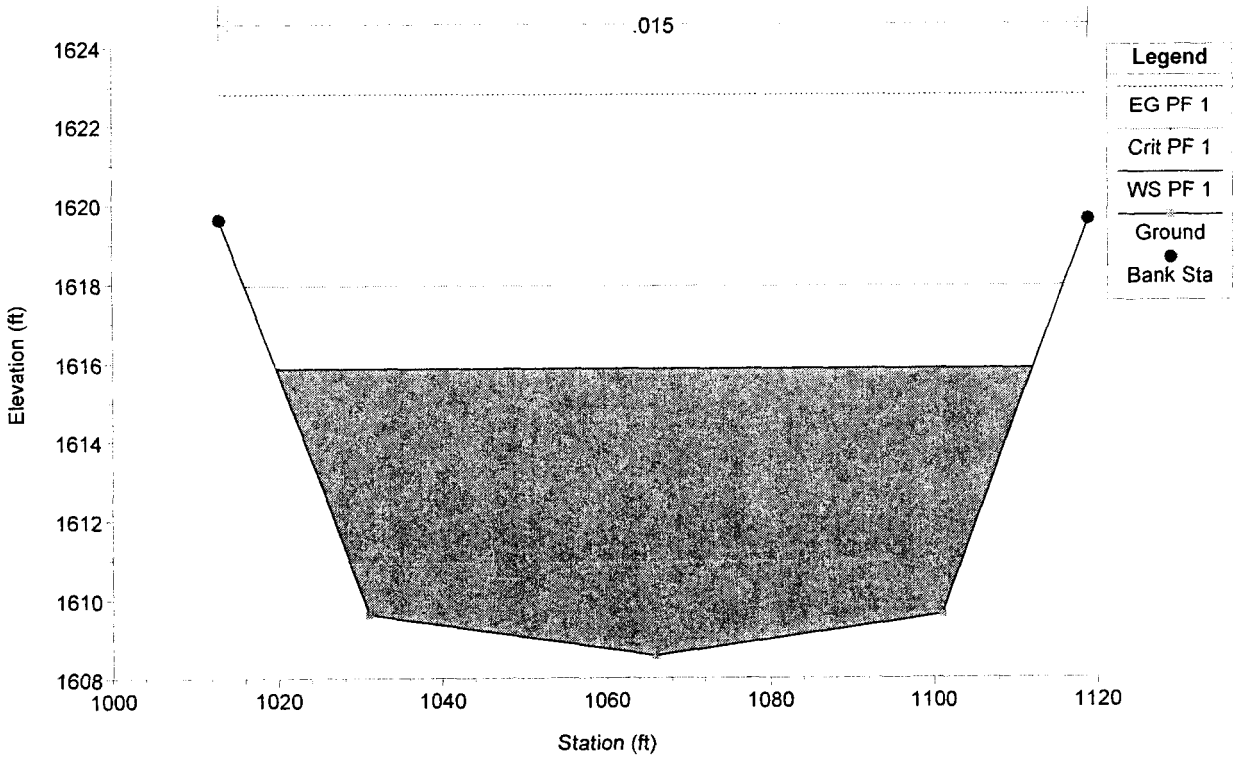
River = Duckcreek Reach = DUCKDOWN RS = 8922.95*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, *n* = 0.015, Inline Weir Flow: 11500 cfs

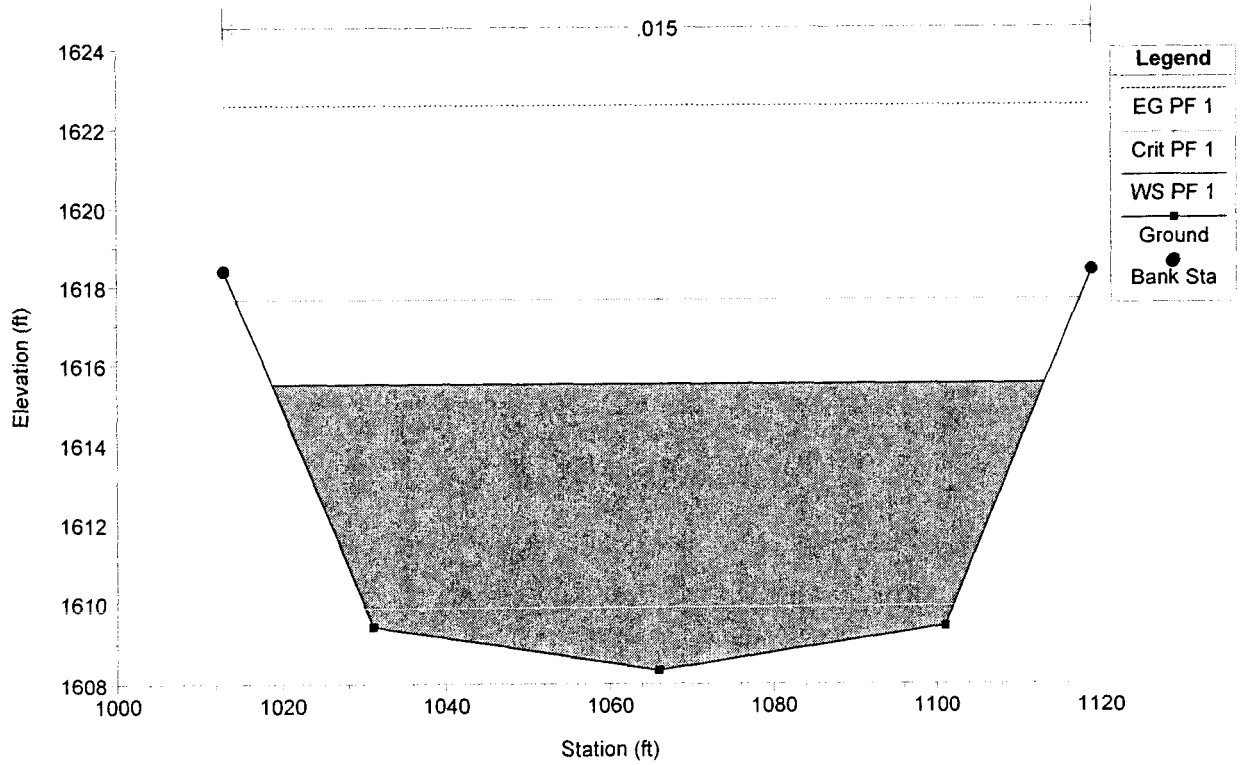
River = Duckcreek Reach = DUCKDOWN RS = 8873.27*

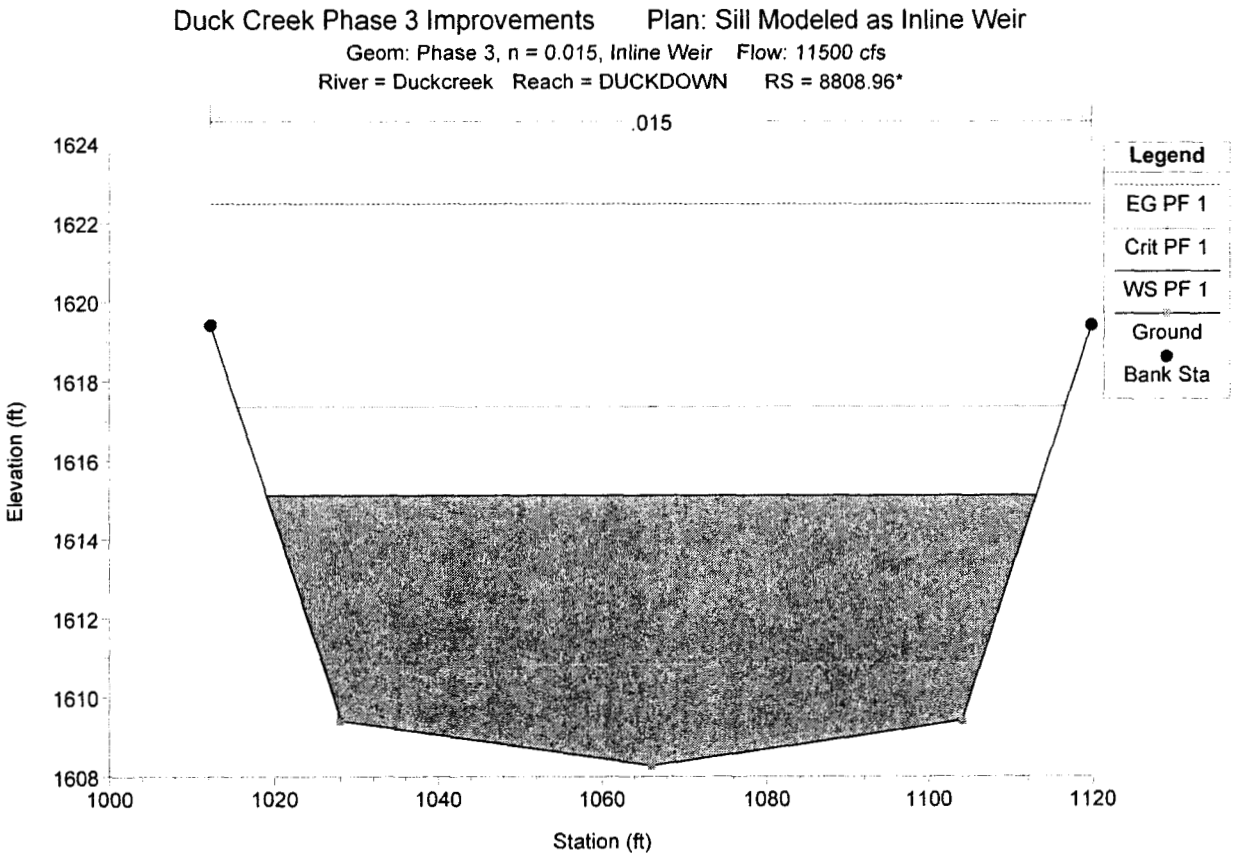


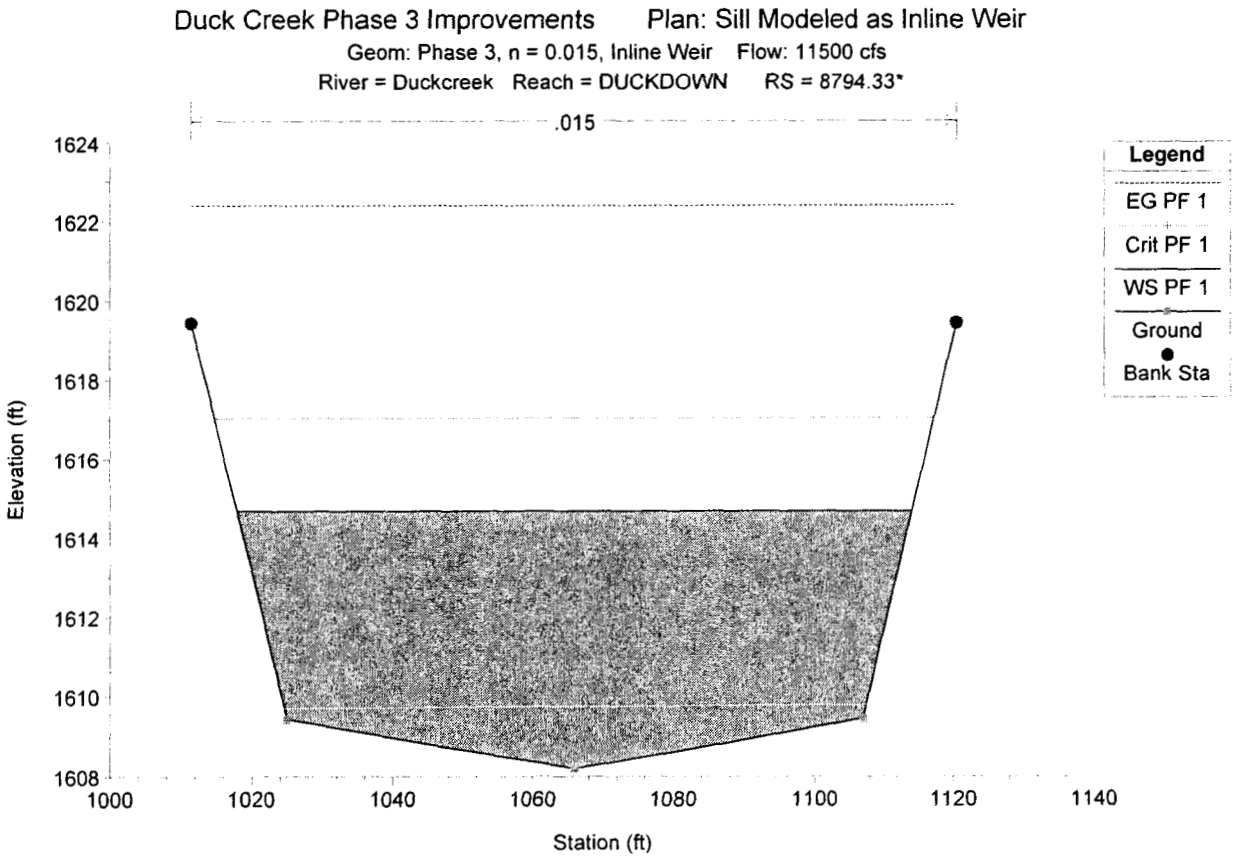
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

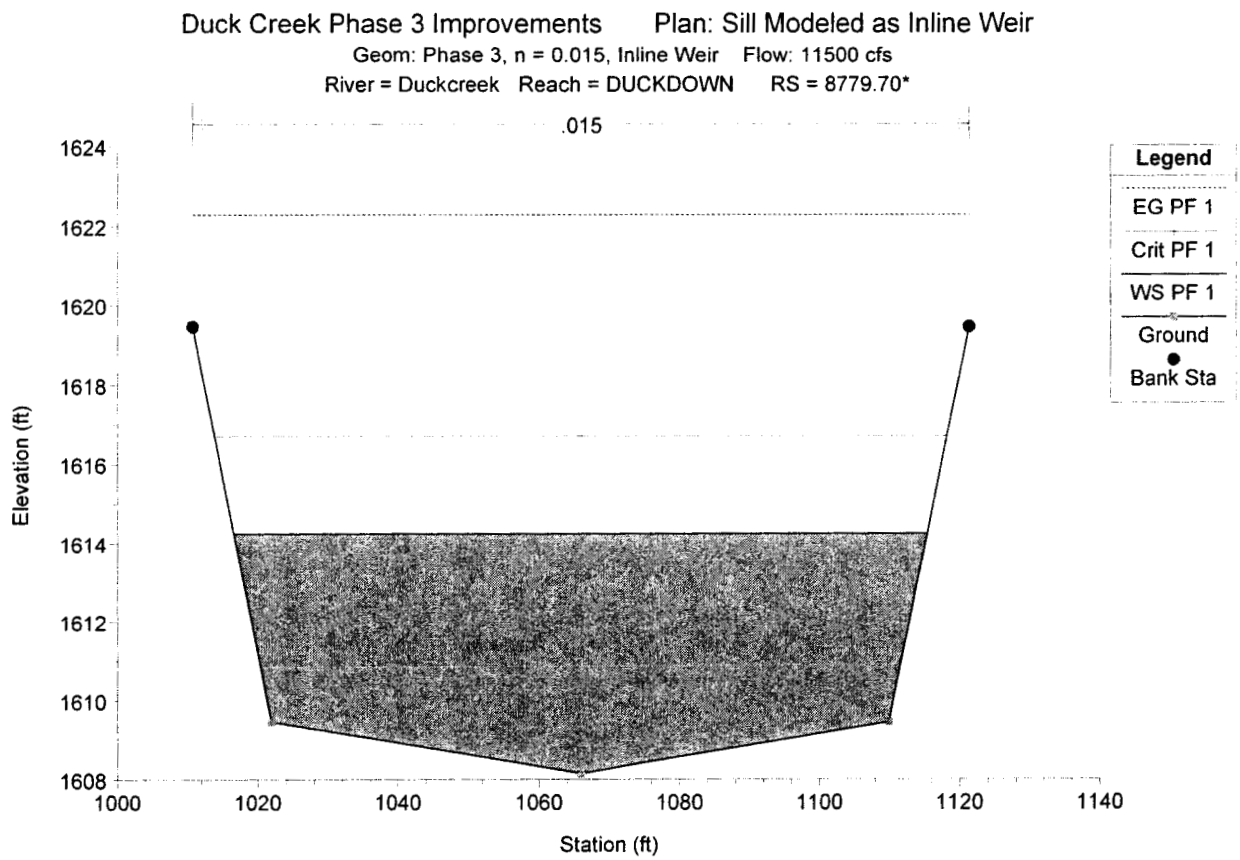
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

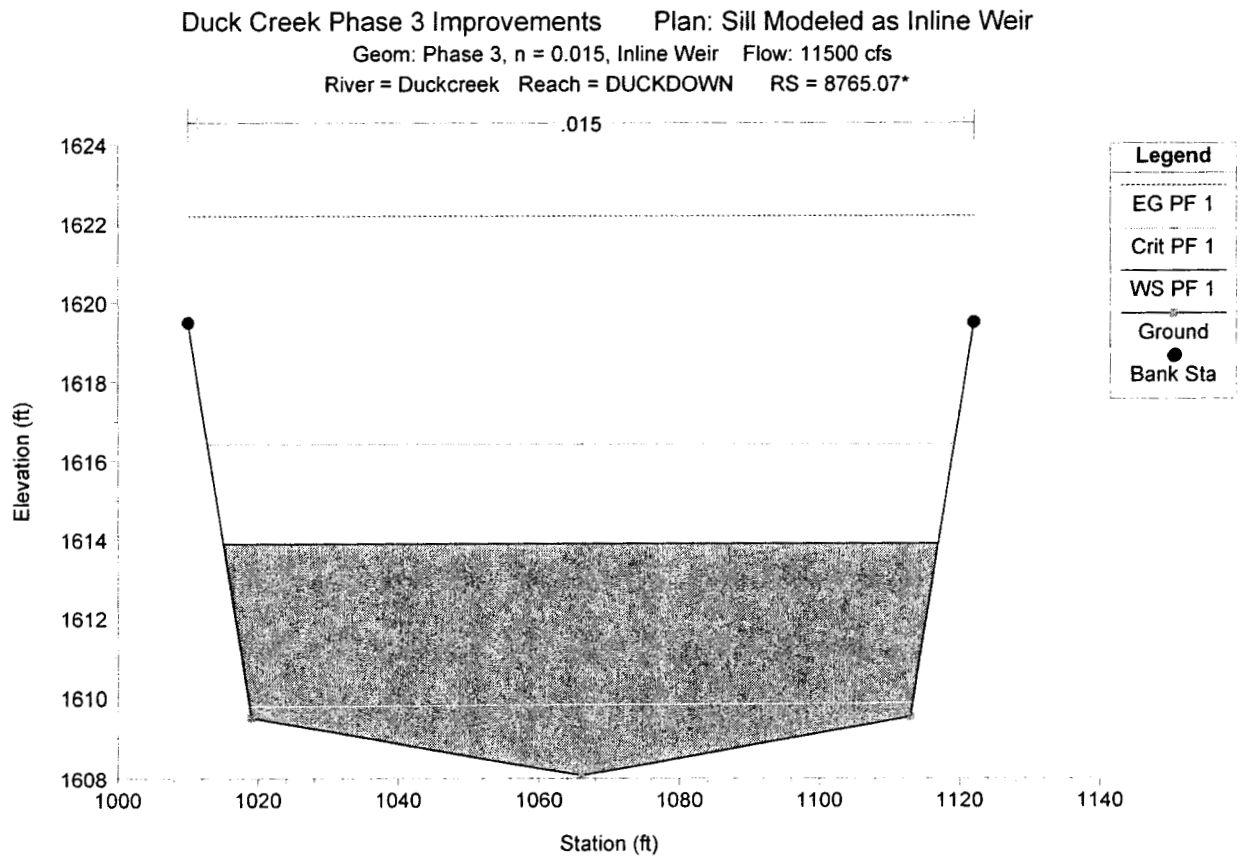
River = Duckcreek Reach = DUCKDOWN RS = 8823.59 TRANSITION TO 118' WIDE RECT. STA 180+50

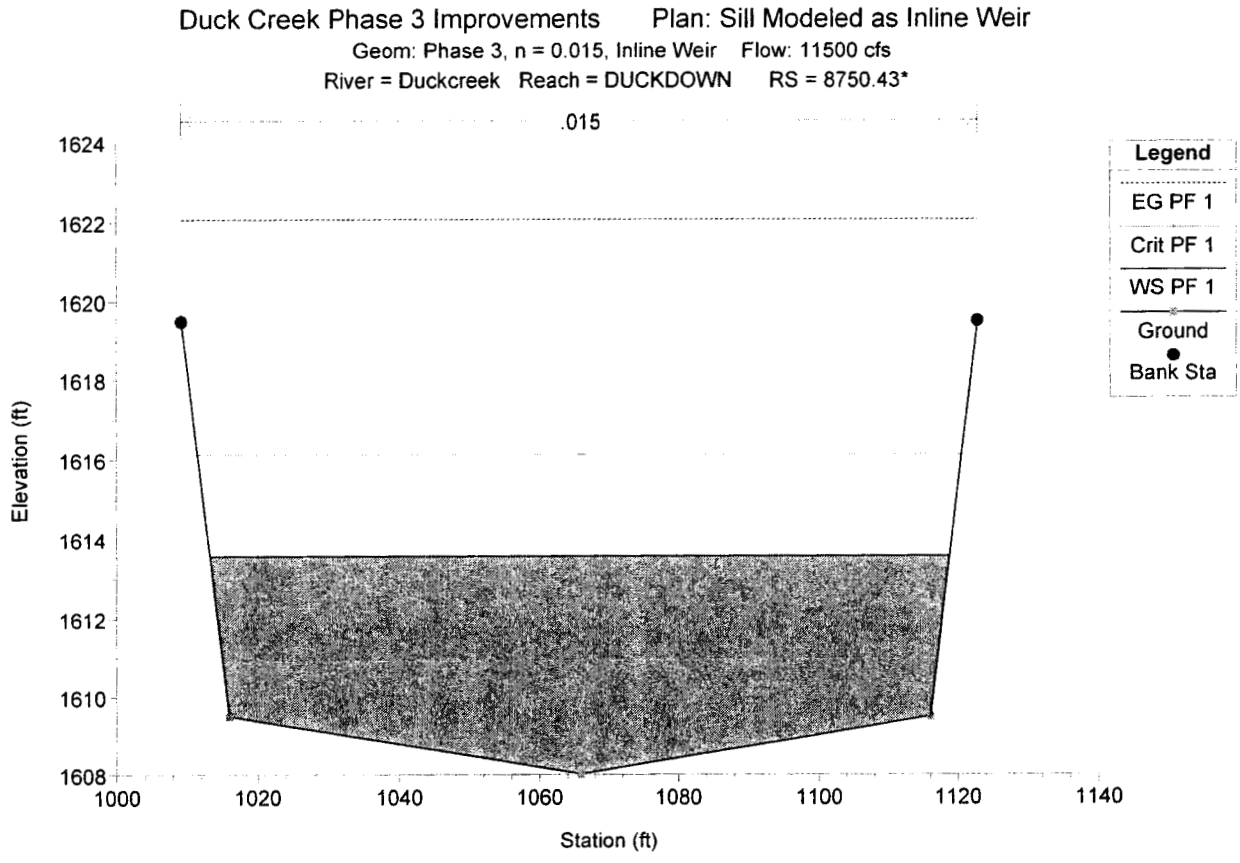


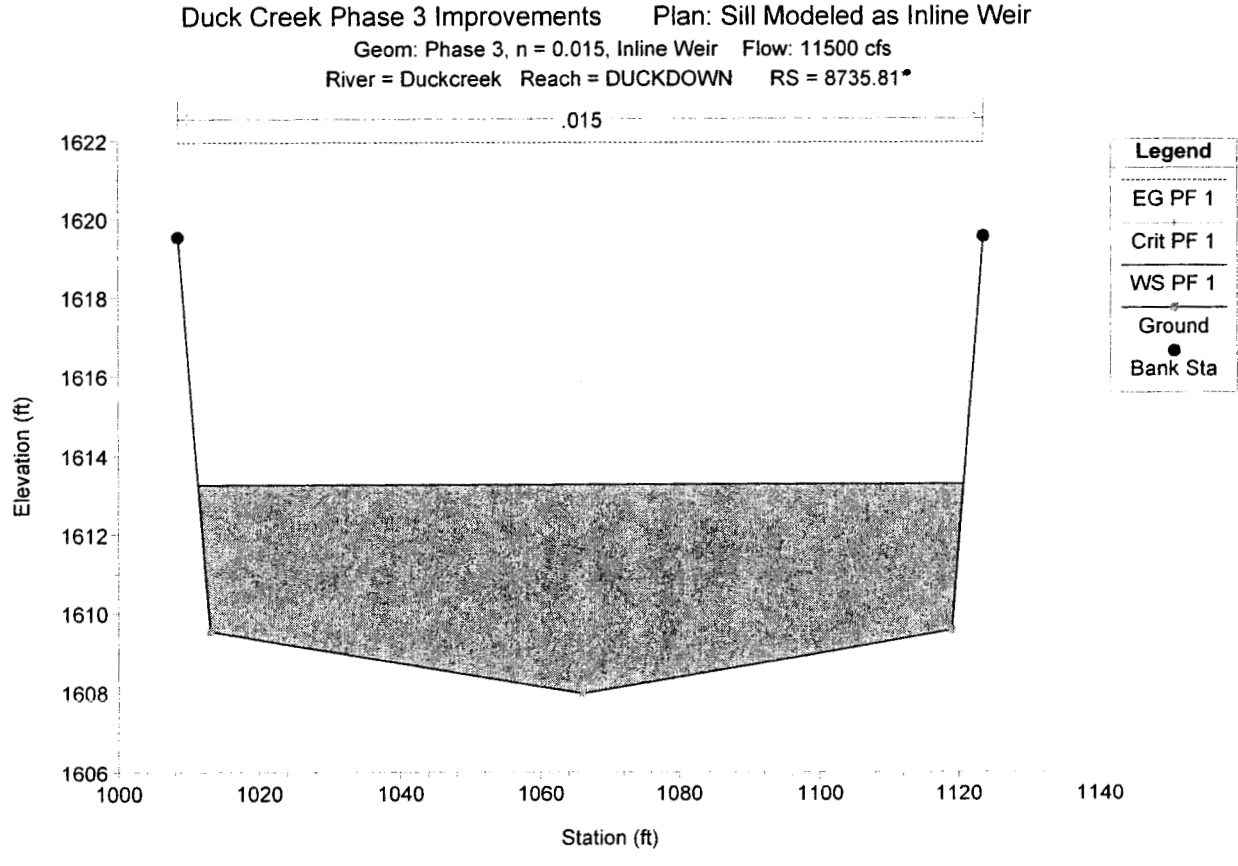

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8808.96*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

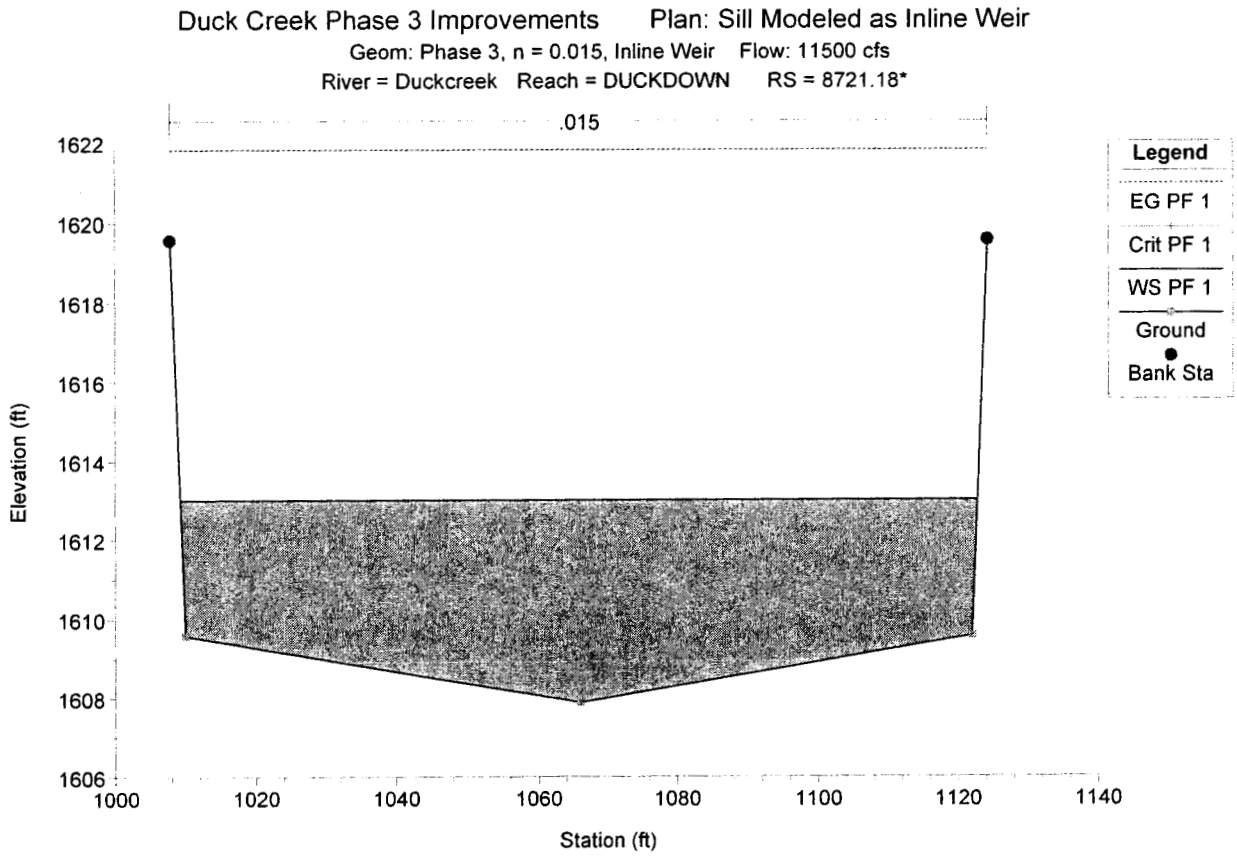

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8794.33*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

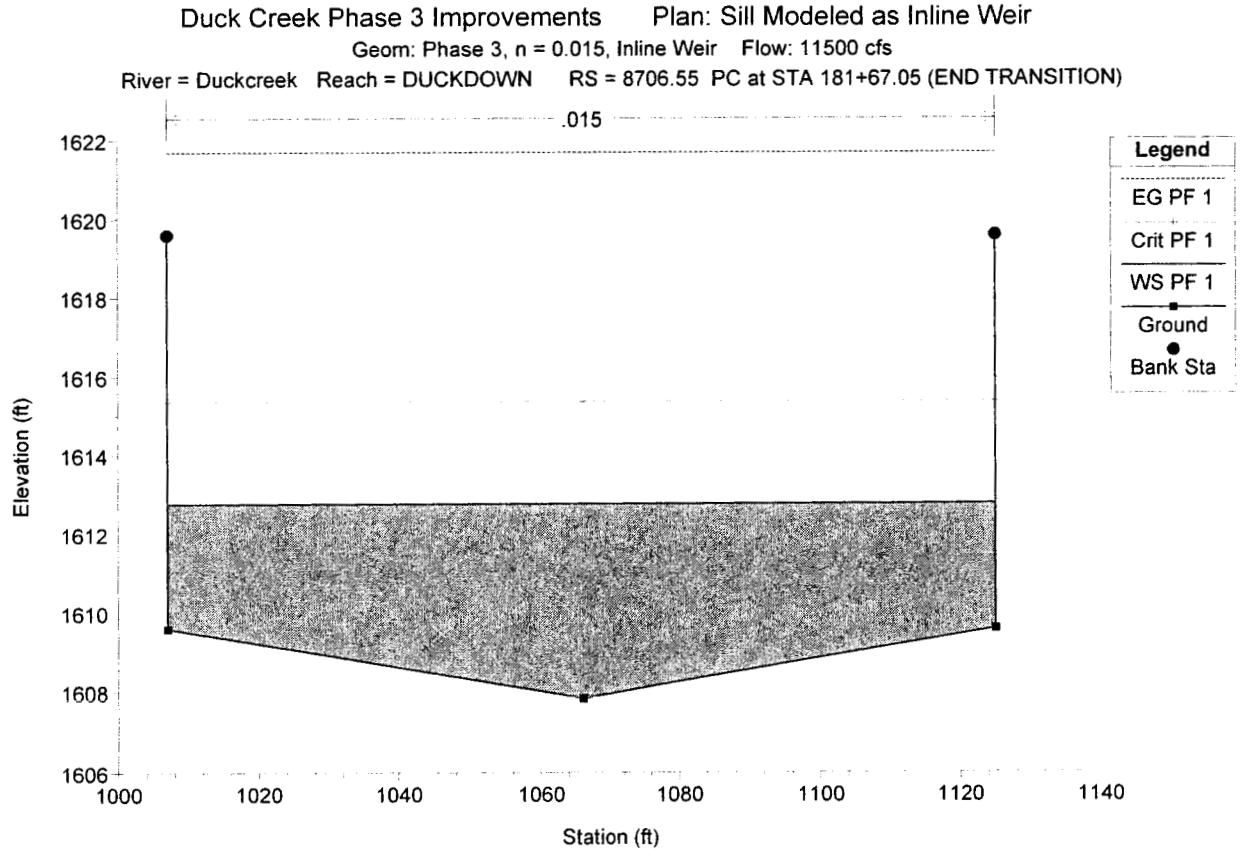

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8779.70*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140

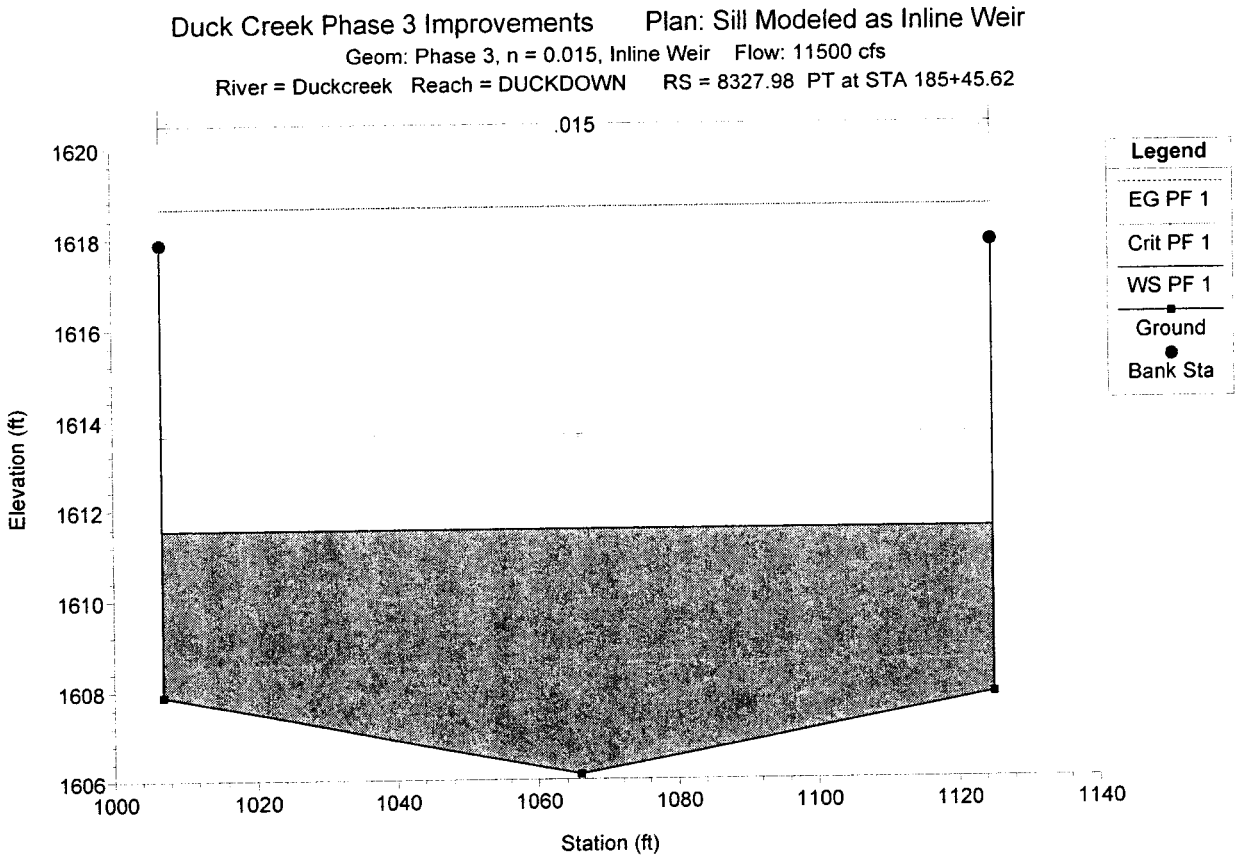

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8765.07*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140

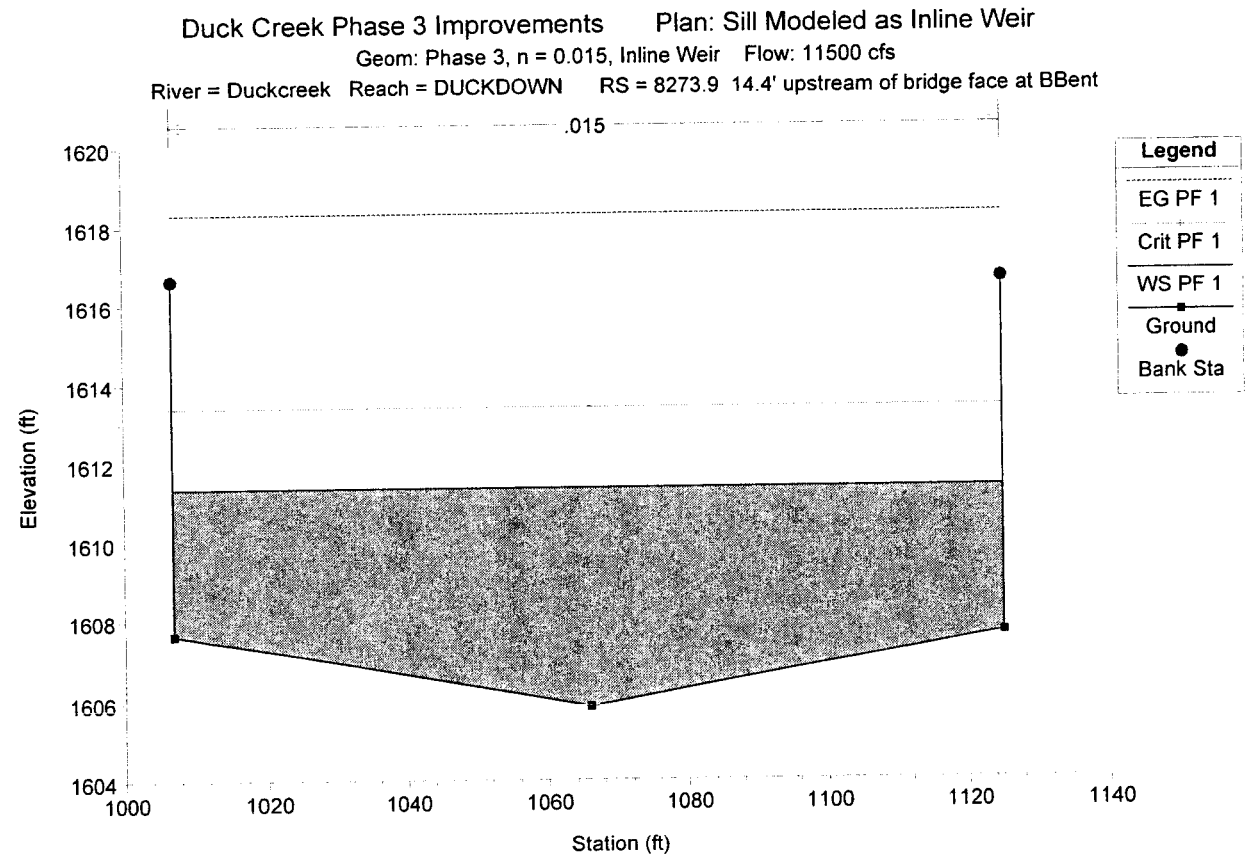

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8750.43*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

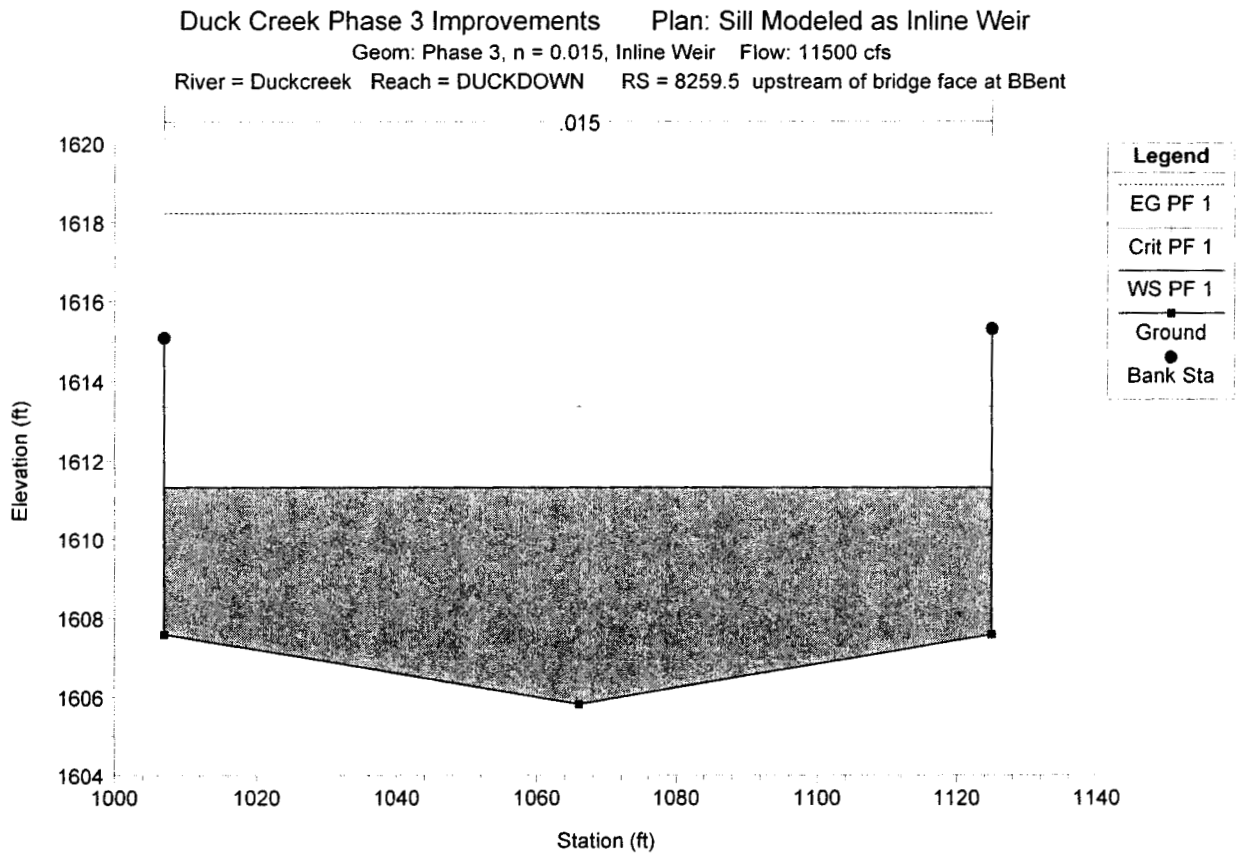

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8735.81*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1622
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

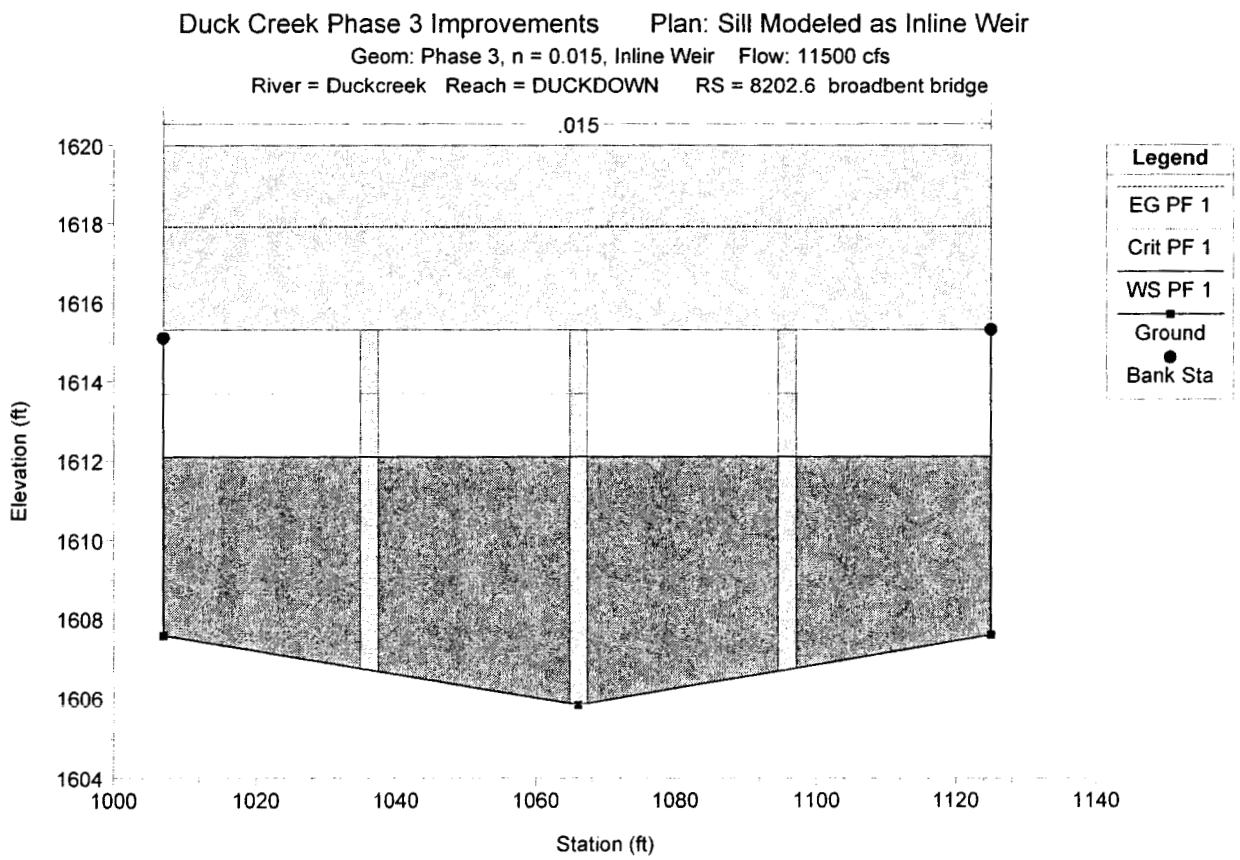

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8721.18*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1622
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

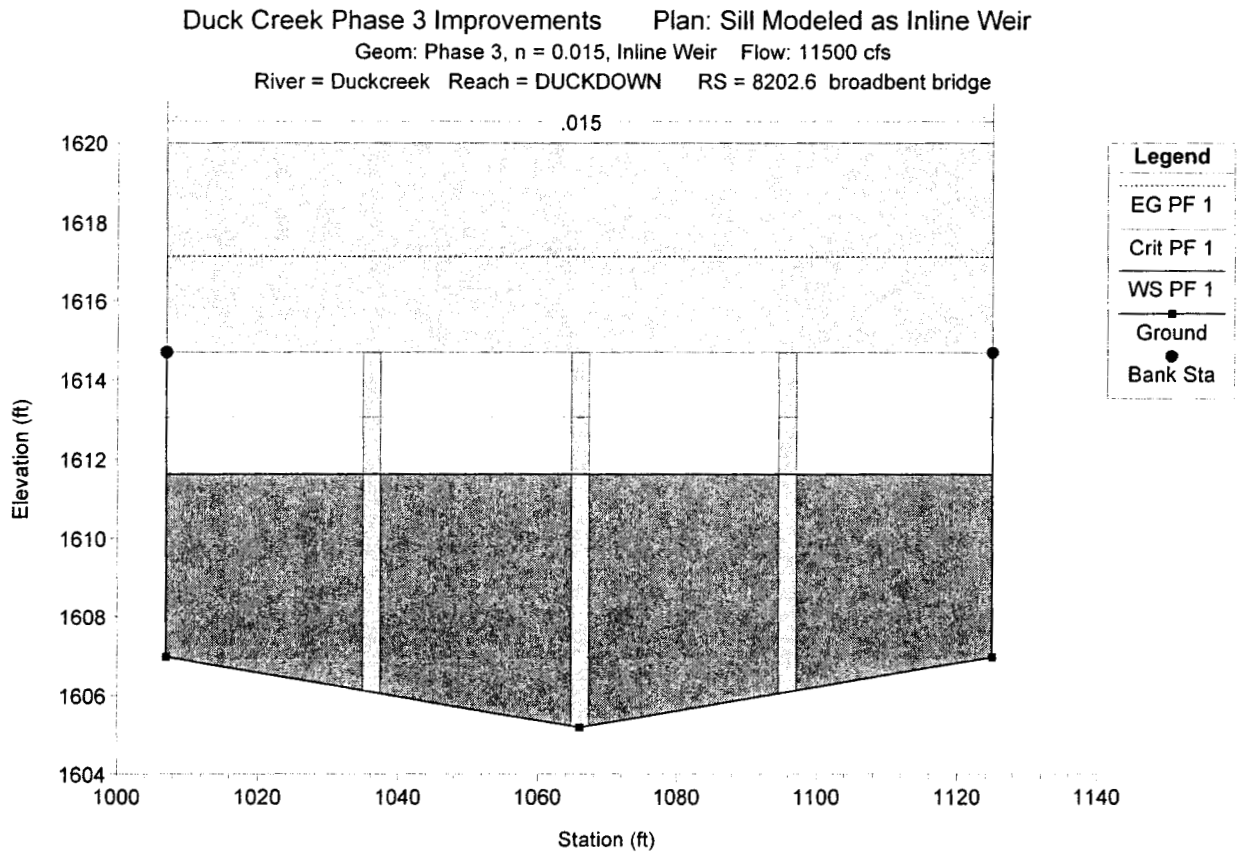

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8706.55 PC at STA 181+67.05 (END TRANSITION)
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1622
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

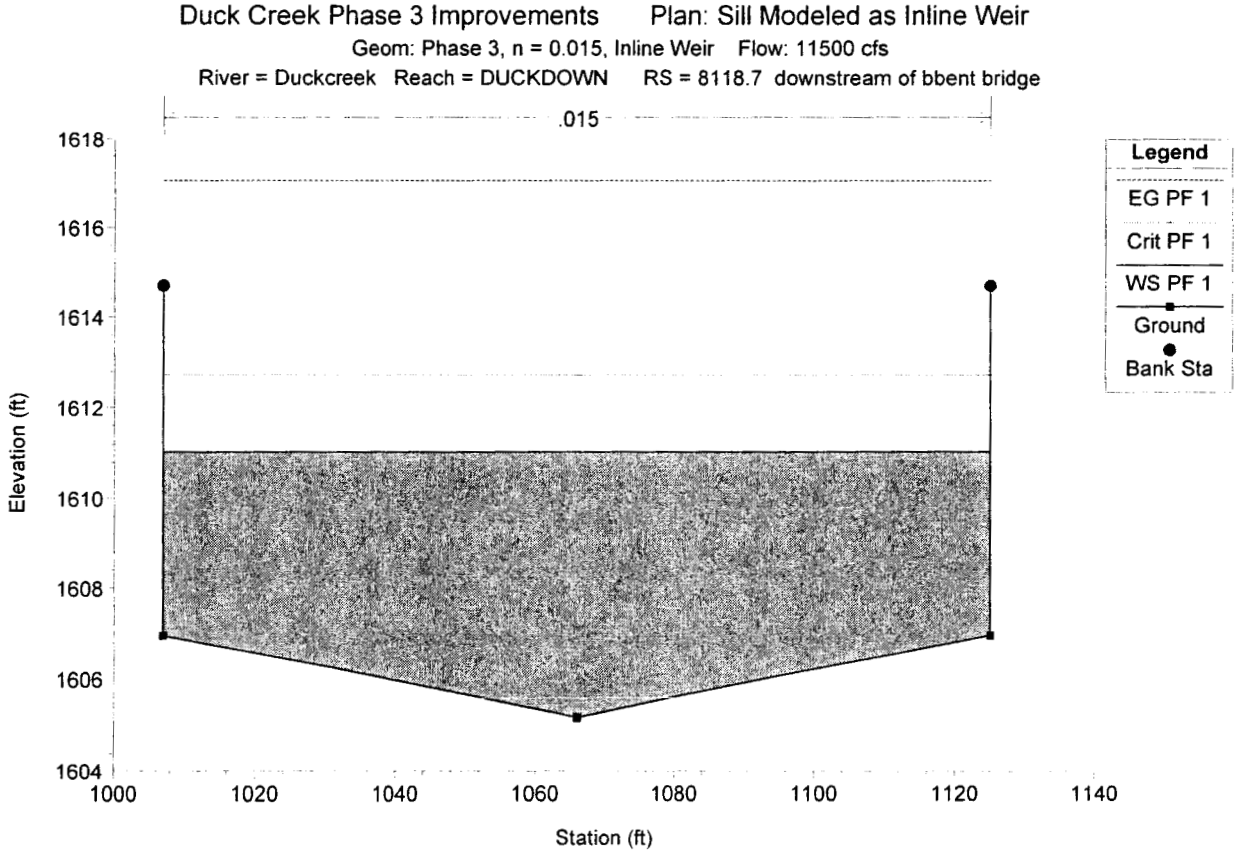

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8327.98 PT at STA 185+45.62
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

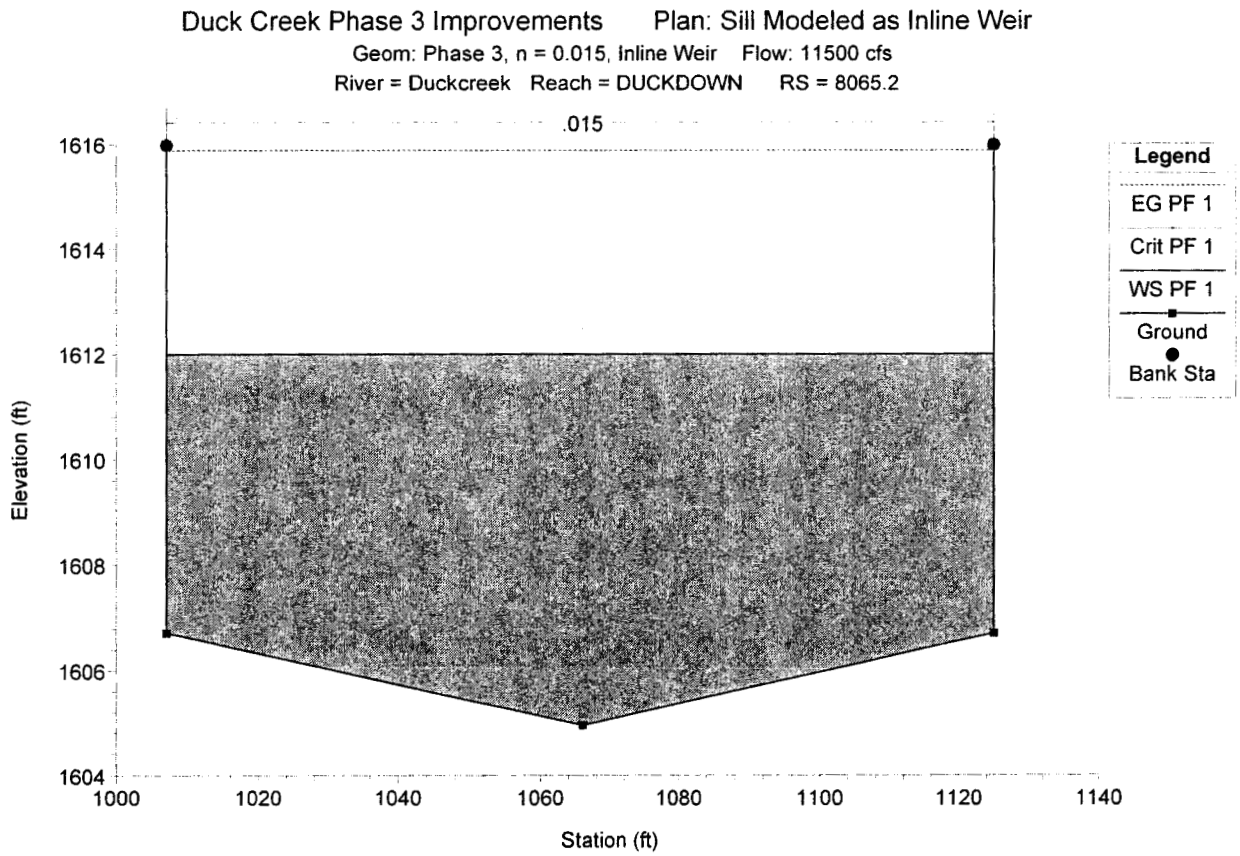

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8273.9 14.4' upstream of bridge face at BBent
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

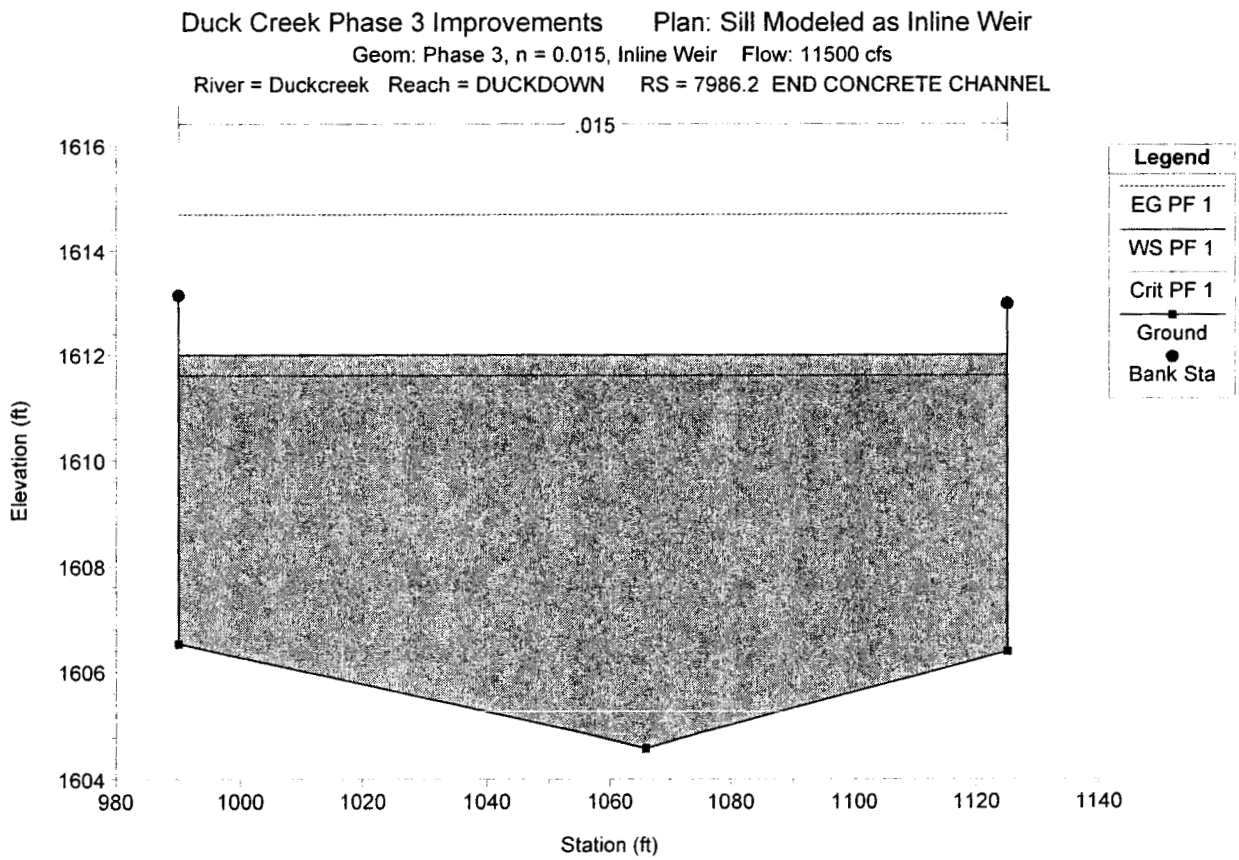

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8259.5 upstream of bridge face at BBent
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8202.6 broadbent bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8202.6 broadbent bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8118.7 downstream of bbent bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8065.2
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 7986.2 END CONCRETE CHANNEL
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1616
1614
1612
1610
1608
1606
1604
980
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

REFERENCES

PITTMAN WASH FLOOD INSURANCE STUDY
2002 FIS RESTUDY

PITTMAN WASH
FLOOD INSURANCE STUDY RESTUDY
CLARK COUNTY, NEVADA

VOLUME 1
TECHNICAL DATA NOTEBOOK

PREPARED FOR:
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
301 EAST CLARK AVENUE, SUITE 300
LAS VEGAS, NEVADA 89101

NIMBUS JOB # 9406
JUNE, 1995
REVISED AUGUST, 1995



Nimbus Engineers
3710 Grant drive Reno, Nevada 89509 (702) 689-8630

drainage area, a correspondingly smaller DARF and the diversion into the watershed, and (2) with a smaller drainage area, larger DARF and no diversions. It is recommended that the worst case scenario, as highlighted in Table 2, is used for flood insurance purposes.

The 100-year discharges computed in this hydrologic analysis were used in the approximate and detailed hydraulic analysis for this flood insurance study restudy.

Table 2. Summary of 100-Yr. Discharges

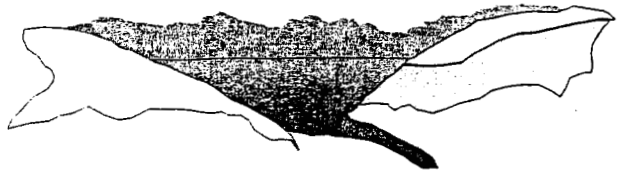
PITTMAN WASH

Location	HEC-1 I.D.	JMM I.D.	NIMBUS (SDN5) With Duck Creek Split DARF	NIMBUS (SDN5) With Duck Creek Split 100 yr. Discharge	NIMBUS (SDN5) Without Duck Creek Split DARF	NIMBUS (SDN5) Without Duck Creek Split 100 yr. Discharge	FIS by JMM (SDN3) DARF	FIS by JMM (SDN3) 100 yr Discharge
Duck Creek Split Flow	CB PIT	—	.73	3353	—	—	—	—
Southern Beltway Alignment	156	156	.59	9258	.64	9920	.64	10,600
U.P.R.R.	158	158	.58	9273	.62	9838	.62	10,500
Bonanza Gravel Pit & U.P.R.R.	160	—	.87	2974	.87	2974	—	—
Arroyo Grande Sports Complex	AGSC	—	.57	9011	.61	9638	—	—
Pittman Channel at U.S.95	US95	—	.57	7457	.60	7638	—	—
Gibson Road Channel at U.S.95	B3A	—	—	—	.60	1679	—	—
Boulder Highway at Castlerock Drive	B1E	B1E	—	—	.60	1676	.60	2,600

* JMM used SDN3 Storm distribution in the FIS Hydrology report.

** The worst case scenario is highlighted and is used in this study.

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



DRAFT

DUCK CREEK / BLUE DIAMOND WASHES FIS RESTUDY

TECHNICAL SUPPORT DATA NOTEBOOK
Volume I of V

Clark County, Nevada

Submitted by: Clark County Regional Flood Control District

Study Contractor: G. C. Wallace, Inc.

Date Submitted: March 2002

G. C. WALLACE, INC.
Engineers/Planners/Surveyors

TABLE 2: SUMMARY OF DIVERSION OUTPUT

DIVERSION ID	FACILITY ID	FACILITY DESCRIPTION	DIVERSION Q100 (CFS)	DIVERSION DIRECTION	BYPASS Q100 (CFS)	BYPASS DIRECTION
DVBD2	BD2	2- 36" RCP	466	EAST	786	NORTH
DVBD3	BD3	7' x 4' RCB	290	EAST	1261	NORTH
DVBD4	BD4	2- 36" RCP	227	EAST	1022	NORTH
DVBD7	NA	NA	1260	NORTH	630	EAST
DVI151	I151	3- 12' x 4' RCB	1328	EAST	1301	NORTH
DVI152	I152	2- 12' x 4' RCB	482	EAST	816	NORTH
DVI153	I153	3- 12' x 4' RCB	5088	EAST	4422	NORTH
DVI154	I154	2- 12' x 4' RCB	1232	EAST	3549	NORTH
DVI155	I155	3- 12' x 5' RCB	2277	EAST	1444	NORTH
DVPITT	NA	NA	3160	EAST	3282	NORTH
DVROSE	NA	NA	644	NORTHEAST	2683	NORTH
TORAW	NA	NA	611	SOUTH	2605	EAST

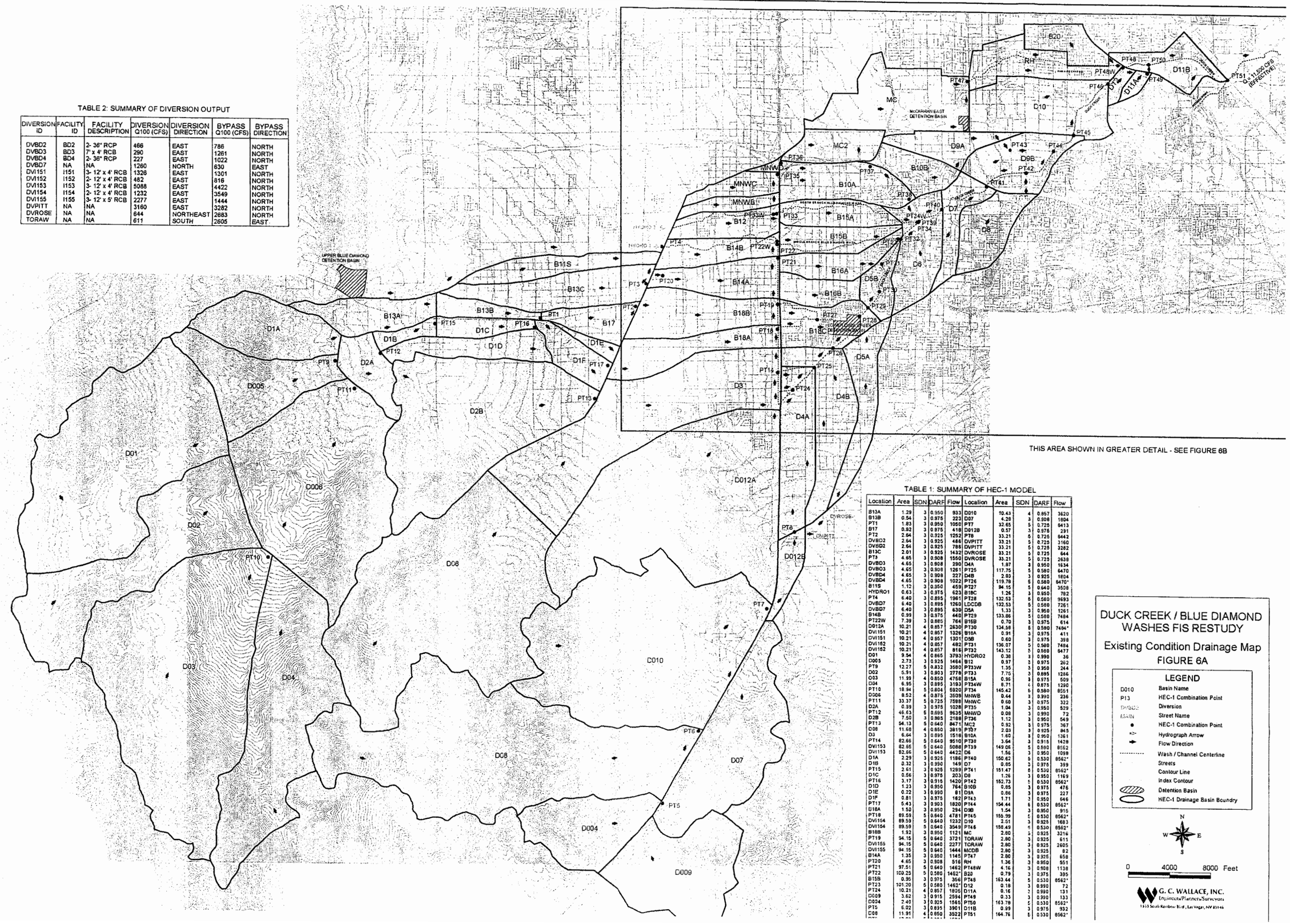


TABLE 1: SUMMARY OF HEC-1 MODEL

Location	Area	SDN	DARF	Flow	Location	Area	SDN	DARF	Flow
B13A	1.29	3	0.950	933	D010	10.43	4	0.857	3620
B13B	0.54	3	0.975	223	D07	4.28	3	0.908	1804
PT1	1.83	3	0.950	1050	PT7	32.65	5	0.725	8413
B17	0.82	3	0.975	418	D012B	0.57	3	0.976	231
PT2	2.64	3	0.925	1252	PT8	33.21	5	0.725	8442
DVBD2	2.64	3	0.925	466	DVPITT	33.21	5	0.725	3160
DVBD2	2.64	3	0.925	786	DVPITT	33.21	5	0.725	3282
B13C	0.61	3	0.925	1432	DVROSE	33.21	5	0.725	644
PT3	4.85	3	0.908	1550	DVROSE	33.21	5	0.725	2638
DVBD3	4.65	3	0.908	290	D4A	1.97	3	0.950	1634
DVBD3	4.65	3	0.908	1261	PT25	117.75	5	0.580	6470
DVBD4	4.65	3	0.908	227	D4B	2.03	3	0.925	1804
DVBD4	4.65	3	0.908	1022	PT26	119.78	5	0.580	6470*
B11S	1.12	3	0.950	459	PT27	94.15	5	0.640	3508
HYDRO1	0.63	3	0.975	623	B18C	1.26	3	0.950	782
PT4	6.40	3	0.895	1961	PT28	132.53	5	0.580	9693
DVBD7	6.40	3	0.895	1260	LDCDB	132.53	5	0.580	7261
DVBD7	6.40	3	0.895	630	D5A	1.33	3	0.950	1261
B14B	0.99	3	0.975	440	PT29	133.86	5	0.580	7484
PT22W	7.39	3	0.885	764	B15B	0.70	3	0.975	614
D012A	10.21	4	0.857	2630	PT30	134.58	5	0.580	7494*
DVI151	10.21	4	0.857	1326	B15A	0.91	3	0.975	411
DVI151	10.21	4	0.857	1301	D5B	0.60	3	0.975	398
DVI152	10.21	4	0.857	482	PT31	136.07	5	0.580	7484
DVI152	10.21	4	0.857	816	PT32	143.12	5	0.580	8477
D01	9.54	4	0.865	3793	HYDRO2	0.38	3	0.990	36
D005	2.73	3	0.925	1464	B12	0.97	3	0.975	262
PT9	12.27	5	0.832	3580	PT33W	1.35	3	0.950	244
D02	5.91	3	0.903	2778	PT33	7.75	3	0.895	1286
D03	11.99	4	0.850	4758	B15A	0.96	3	0.975	509
D04	6.95	3	0.895	3193	PT34W	8.71	3	0.875	1290
PT10	18.94	5	0.804	5920	PT34	145.42	5	0.580	8551
D006	8.52	4	0.875	3509	MNWB	0.44	3	0.990	236
PT11	33.37	5	0.725	7598	MnWC	0.60	3	0.975	322
D2A	0.99	3	0.975	1028	PT35	1.04	3	0.950	529
PT12	46.63	5	0.695	9635	MNWD	0.08	3	0.990	72
D2B	7.50	3	0.865	2188	PT36	1.12	3	0.950	549
PT13	54.13	5	0.640	8471	MC2	0.92	3	0.975	367
D08	11.68	4	0.850	3819	PT37	2.03	3	0.925	845
D3	6.64	3	0.895	1516	B10A	1.60	3	0.950	1361
PT14	82.66	5	0.640	9510	PT38	3.64	3	0.915	1428
DVI153	82.66	5	0.640	5088	PT39	149.06	5	0.580	8562
DVI153	82.66	5	0.640	4422	D6	1.56	3	0.950	1099
D1A	2.29	3	0.925	1186	PT40	150.62	5	0.530	8562*
D1B	0.32	3	0.990	149	D7	0.85	3	0.975	399
PT15	2.61	3	0.925	1299	PT41	151.47	5	0.530	8562*
D1C	0.66	3	0.975	203	D8	1.26	3	0.950	1169
PT16	3.17	3	0.915	1420	PT42	152.73	5	0.530	8562*
D1D	1.23	3	0.950	764	B10B	0.85	3	0.975	476
D1E	0.22	3	0.990	81	D9A	0.86	3	0.975	227
D1F	0.81	3	0.975	162	PT43	1.71	3	0.950	646
PT17	5.43	3	0.903	1820	PT44	154.44	5	0.530	8562*
B18A	1.50	3	0.950	294	D9B	1.54	3	0.950	915
PT18	89.59	5	0.640	4781	PT45	155.99	5	0.530	8562*
DVI154	89.59	5	0.640	1232	D10	2.51	3	0.925	1683
DVI154	89.59	5	0.640	3549	PT46	158.49	5	0.530	8562*
B18B	1.32	3	0.950	1121	MC	2.80	3	0.925	3216
PT19	94.15	5	0.640	3721	TORAW	2.80	3	0.925	611
DVI155	94.15	5	0.640	2277	TORAW	2.80	3	0.925	2605
DVI155	94.15	5	0.640	1444	MCDB	2.80	3	0.925	82
B14A	1.35	3	0.950	1145	PT47	2.80	3	0.925	658
PT20	4.65	3	0.908	516	RH	1.36	3	0.950	551
PT21	97.51	5	0.640	1462	PT48W	4.16	3	0.908	1138
PT22	109.25	5	0.580	1462*	B20	0.79	3	0.975	395
B15B	0.95	3	0.975	356	PT48	163.44	5	0.530	8562*
PT23	101.20	5	0.580	1462*	D12	0.18	3	0.990	72
PT24	10.21	4	0.857	1805	D11A	0.16	3	0.990	131
D009	3.62	3	0.915	2594	PT49	0.33	3	0.990	133
D004	2.40	3	0.925	1565	PT50	163.78	5	0.530	8562*
PT5	6.02	3	0.895	3901	D11B	0.99	3	0.975	932
D08	11.91	4	0.850	3522	PT51	164.76	5	0.530	8562*

DUCK CREEK / BLUE DIAMOND WASHES FIS RESTUDY

Existing Condition Drainage Map

FIGURE 6A

LEGEND

- D010 — Basin Name
- P13 — HEC-1 Combination Point
- DVBD2 — Diversion
- MAIN — Street Name
- Hydrograph Arrow
- Flow Direction
- Wash / Channel Centerline
- Streets
- Contour Line
- Index Contour
- Detention Basin
- HEC-1 Drainage Basin Boundry

N W E S

0 4000 8000 Feet

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Engineers/Planners/Surveyors
1555 South Rainbow Blvd., Las Vegas, NV 89146

OPERATION AND MAINTENANCE PLAN

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



OPERATIONS AND MAINTENANCE MANUAL

PRINTED
MAY 2003

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

OPERATIONS AND MAINTENANCE MANUAL

GALE WM. FRASER, II, P.E.
GENERAL MANAGER / CHIEF ENGINEER

The Operations and Maintenance Manual has been updated in accordance with Regional Flood Control District Board action on May 15, 2003. The Board adopted amendments to Sections 1.10, 2.10, 3.20, 4.11, 4.30, Appendix B, Appendix C, added Performance Standard 21, updated references to the Policies and Procedures Manual, and updated forms and charts.

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
OPERATIONS AND MAINTENANCE MANUAL

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CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
OPERATIONS AND MAINTENANCE MANUAL

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CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
OPERATIONS AND MAINTENANCE MANUAL

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APPENDIX C: Sample Interlocal Contract C-1

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
OPERATIONS AND MAINTENANCE MANUAL

CHAPTER 1
EXECUTIVE SUMMARY

1.10 EXECUTIVE SUMMARY

The Clark County Regional Flood Control District (District) was created under NRS 543 with responsibility to plan, construct and maintain drainage and flood control facilities throughout Clark County. In order to comply with NRS 543.340(4), this **Operations and Maintenance Manual** has been prepared through the cooperation and support of all of the affected member entities, which include Clark County and the incorporated cities within Clark County. The document sets forth both policies and procedures by which the maintenance of the drainage and flood control facilities will be achieved to assure their proper working order at the time of need. The overall goal of the maintenance program as adopted by the District Board is as follows:

> COMPLY WITH THE PROVISIONS OF NRS 543.340(4) AND ASSURE THAT FACILITIES IN THE MASTER PLAN ARE MAINTAINED IN A MANNER THAT MAXIMIZES THEIR USEFUL LIFE AND ENSURES THEIR OPERATION AT DESIGN CAPACITY DURING A STORM EVENT.

Nineteen policy statements have been adopted to support the above goal.

In order to achieve the goal, and to comply with the adopted policies, the following procedures have been developed in an open and very participatory manner.

Funding Procedure - Provides for a means by which the member entities can be reimbursed for activities associated with maintenance of drainage and flood control facilities on the Master Plan provided they meet criteria as set forth in the manual.

Administrative Procedure - Provides for establishing standards and levels of service by which maintenance will be achieved. This procedure includes the steps and schedule by which an annual work plan is established and adopted by the District Board. It also provides for the certification of performance by each member entity in accordance with the annual interlocal contract. The ability for the member entity to contract maintenance activities to private contractors is also authorized under this procedure.

Maintenance Procedures - This procedure provides the specific activities under which the maintenance program is to be carried out as listed below:

ACTIVITY NUMBER	ACTIVITY NAME	WORK MEASURE UNIT
05	Inspect Channels	Miles
10	Clean and Reshape Channels	Cubic Yards
15	Repair Lined Channel	Each
20	Provide/Maintain Erosion Control	Square Feet
21	Provide/Maintain Dust Control	Acres
25	Clean and Inspect Detention/Debris Basins	Cubic Yards
30	Erosion Repair	Cubic Yards
35	Fence Repair	Linear Feet
40	Vegetation Control - Chemical	Acres
45	Vegetation Control - Mechanical	Acres
50	Maintain Access Road	Miles
55	Clean and Inspect Inlet/Outlet Structures	Each
60	Repair Inlet/Outlet Structures	Each
65	Clean Storm Sewer Lines	Linear Feet
70	Storm Sewer Repair	Repairs
75	Clean/Flush Culverts & Bridges	Each
80	Miscellaneous Work Activities	Labor Hours
85	Engineering	Labor Hours

A specific performance standard has been developed for each activity setting forth the following elements:

- The most effective crew size.
- The kinds and number of equipment required.
- The major types of material that should be used.
- Recommended procedures for performing the work.
- An estimate of expected average daily accomplishment with standard crew size, equipment, and procedures.
- Authorization and scheduling criteria.

Inventory Procedures - A critical element of any maintenance program is the identification and condition of the overall drainage and flood control system. In the case of this program, the inventory also identifies those facilities that are "eligible" for reimbursement of maintenance activities, provided the work is a part of the annual plan. Facilities eligible are those identified in the Regional Flood Control District's Master Plan and any revisions, amendments, and/or changes subsequently approved. Only those facilities that exist as Master Plan facilities, or exist in the same alignment as a proposed Master Plan facility and appurtenant facilities are eligible.

Maintenance is an ongoing and very dynamic function of a successful drainage and flood control program. This **Operations and Maintenance Manual** sets forth an initial set of policies and procedures, including the various actions required to achieve the maintenance goal. The manual will need to be updated on a regular basis to reflect fiscal implications and the experience gained as the District continuous to grow and to serve the citizens and taxpayers of Clark County.

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
OPERATIONS AND MAINTENANCE MANUAL

CHAPTER 2
INTRODUCTION

2.10 BACKGROUND

The Clark County Regional Flood Control District (District) was established in 1986 to plan, construct, and maintain drainage and flood control facilities throughout Clark County. These responsibilities focus on alleviating the potential for flooding and protecting the lives and property of existing residents, future residents and visitors within the District's Service Area. The initial phases of the District's program succeeded in preparing a Master Plan, uniform design criteria, regulatory standards, and constructing facilities. As these areas have progressed, the District, along with other agencies and member entities in the County, has oriented its efforts towards assuring adequate maintenance of flood control facilities and conveyance systems. This orientation is consistent with the vital role maintenance plays in all comprehensive flood control programs. This **Operations and Maintenance Manual** has been prepared through the District with the support and cooperation of each affected member entity. It represents a commitment to uniform flood control system standards and establishes a blueprint for a cost effective and consistent maintenance program throughout the District's service area.

2.20 AUTHORITY

Nevada Revised Statute (NRS) 543 mandates that the District shall undertake programs for both construction and maintenance of flood control facilities. A commitment to building and maintaining flood control facilities within Clark County is reiterated in the District's **Uniform Regulations for the Control of Drainage** which states that capital improvements, operation, and maintenance are all interrelated parts of the District's overall flood control program. In accordance with NRS 543.340(4) and the Uniform Regulations, the District prepared an **Operations and Maintenance Manual**, which was adopted by the District Board on November 8, 1990. To reflect fiscal implications and experience gained, the manual was updated in 1995, 1999, and 2003.

2.30 RESPONSIBILITY

The District was formed, in part, to fund and coordinate the construction and maintenance of facilities to alleviate flooding and protect the life and property of citizens within the boundaries of the District. It is the responsibility of the District to prepare and update the Master Plan for the control of floods, and manage the Regional Fund for the Control of Floods in a manner consistent with NRS 543.

2.40 APPROACH

The maintenance program must assure that the flood control projects funded by the District are maintained at a level which maximizes their useful life and assures that facilities operate to design capacity. As an interconnected network of conveyances and structures, failure of any flood control facility to operate properly may affect the performance of the overall system within a specific watershed.

Flood control facilities require regular maintenance if they are to be functional, visually attractive, and last through their design life. Accordingly, the development of a maintenance program is just as critical to the overall success of a comprehensive flood control effort as basin planning and regulation enforcement. As stormwater and flood control programs begin to address nonpoint pollution/water quality issues, the maintenance program will play an even greater role by enabling cost effective reductions in pollutant loadings to receiving waters. Finally, visibility of the program to the public, which a comprehensive maintenance program affords, is an important factor in demonstrating that flood control management is truly a full-time commitment and not simply a priority only after a storm event. The primary objectives of the District's maintenance program are:

- To develop a complete physical feature inventory for the system.
- To establish overall policies and levels of service.
- To develop operating procedures.

It is also critical that ongoing inspection and reporting procedures continue to assure all systems are ready when needed.

Due to the multiple jurisdictions involved with maintenance of the flood control system, a commitment to this program from all member entities within the service area of the Regional Flood Control District was essential. This commitment was made through the Maintenance Technical Committee during the development of the manual in 1990. It was also recognized that coordination of this maintenance program with state transportation programs was critical. The level and consistency of the long range commitment has a direct impact on how effective the resulting maintenance system becomes. This commitment begins with a credible **Operations and Maintenance Manual**.

An essential building block for a successful flood control maintenance program in Clark County is a complete physical feature inventory of the system. It is also important to note that no maintenance program is ever truly "complete". Rather, these programs are constantly evolving as inventories are defined and standards/costs are further refined. A similar evolution is anticipated for this program. The flexibility to adjust to this evolutionary process has been built into this manual.

2.50 DEFINITIONS

In addition to the definitions of terms and phrases set forth in other District documents, the following apply to operation and maintenance:

Acceptance for Maintenance: "Acceptance for Maintenance" means that a project funded by the District, member entity, or other public/private funds is a part of the Master Plan and has been constructed in accordance with District standards and therefore eligible for maintenance funding by the District.

Annual Budget: "Annual Budget" means the anticipated costs associated with completion of each activity outlined within the annual work plan submitted by each of the member entities, and ultimately approved by the District Board of Directors prior to the start of each fiscal year.

Annual Work Plan: "Annual Work Plan" means a plan submitted by each of the member entities setting forth the type and quantity of maintenance to be performed during the ensuing budget year in a form prescribed by the District specifically requesting funds for budgeting purposes.

Certification: "Certification" means the documentation which evidences that required maintenance by a member entity has been completed in accordance with established standards.

Maintenance Program: The "Maintenance Program" has been established by the Board to provide funding of, and establish performance standards and guidelines for, the maintenance of flood control facilities located throughout Clark County and the incorporated areas. The Program provides funding to member entities to perform maintenance of eligible flood control facilities. Projects eligible for District maintenance funding are those identified in the Regional Flood Control District's Master Plan and any revisions, amendments, and/or changes subsequently approved. Only those facilities that exist as Master Plan Facilities or exist in the same alignment as a proposed Master Plan facility, and appurtenant facilities are eligible. Subsequently, the District works with the member entities annually to develop Maintenance Work Plans. The work plans undertaken through the Maintenance Program and budgets are funded through the annual interlocal contracts between each member entity and the District. No matching funds are required, except in those cases where an arrangement has been made to cooperatively fund a particular field activity. Work is performed using a combination of private contractors and member entity maintenance staff. The Maintenance Program contains three broad categories of work:

1. Routine and/or Preventive Maintenance: "Routine and/or Preventive Maintenance" means work on existing facilities to keep them in proper working condition, including but not limited to, debris/sedimentation removal, vegetative control, and reshaping.

2. Restoration: "Restoration" means the repair to existing facilities after a storm event including erosion repair, fence replacement, repairing/replacing trash racks, inlets, storm sewer systems, major debris removal, and similar "one time" work activities.

3. Rehabilitation: "Rehabilitation" means rebuilding a facility and/or conveyance system after it is destroyed by an event or it has been determined that it is not operating according to the intent of the design documents on file at the District causing a safety or maintenance problem or it has deteriorated to the extent that it must be replaced "in kind" including replacing or modifying drop structures, reshaping channels, bank protection restoration, inlets etc. In general, the rehabilitative projects are designed by consultants and the construction contracts are awarded through a bid process.

Maintenance Program Exclusions: "Exclusions" typically include local drainageway maintenance such as curb and gutter work, inlet maintenance, and repairs to small piped storm sewer systems, unless otherwise constructed as part of a regional facility. Maintenance work exclusions also include repair or replacement of existing flood control Master Plan facilities which undergo catastrophic damage of more than one-half (1/2) mile. These types of catastrophic damages will generally be classified as capital improvements, and requests for capital improvement funds must be reprogrammed as a capital improvement project in accordance with District Policies and Procedures.

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
OPERATIONS AND MAINTENANCE MANUAL

CHAPTER 3
POLICY STATEMENT

It is important that a maintenance policy statement be adopted which reflects the objectives of both the elected officials and the operations staff charged with its implementation. The initial policy document was prepared and reviewed by District staff and the Maintenance Committee. Following input from the group, it was reviewed by the respective Public Works Directors of all member entities and further revised to reflect their input. The document was then reviewed by the Technical Advisory Committee (TAC) and the Citizens Advisory Committee (CAC) before final adoption by the Board on November 8, 1990. To reflect fiscal implications and experience gained, the document was updated in 1995, 1999, and 2003. The final adopted policy statement is as follows:

3.10 GOAL

Comply with the provisions of NRS 543.340 (4) and assure that facilities in the Master Plan are maintained in a manner that maximizes their useful life and ensures their operation at design capacity during a storm event.

3.20 POLICIES

1. Flood control facilities identified in the Master Plan are eligible for District maintenance funding.

2. As specified in the **Uniform Regulations for the Control of Drainage** Section 12.050, facilities funded through the District shall be inspected on an annual basis to assure proper maintenance has been provided.

3. In cases where funded maintenance by the lead member entity is not performed to the standards specified, the District shall perform or cause to be performed the maintenance necessary to assure proper operations of the facility. Costs incurred by the District shall be deducted from the amount authorized in the maintenance agreement between the lead member entity and the District.

4. Flood control facilities improved or constructed after adoption of this policy, must be designed in accordance with District criteria and standards to be eligible for maintenance funding.

5. Access to the facility must be guaranteed to the lead member entity and the District in order to be eligible for maintenance funding.

6. Maintenance and repairs to flood control facilities will be performed in a manner that will minimize the degradation of water quality.

7. The maintenance requirements applied to these facilities shall be based on the standards contained in the District's **Operations and Maintenance Manual**.

8. The lead member entity must develop an annual work plan to be eligible for maintenance funds. Upon completion of the work, the member entity must certify that the work was completed in accordance with the standards contained in the District's **Operations and Maintenance Manual**.

9. Maintenance funding is available only for repair, restoration, rehabilitation, or maintenance of existing facilities and is not intended to supplement the District's capital improvement program. For example, if the intent of the field activity is to increase the designed capacity of a facility or conveyance, then that function is capital in nature.

10. Copies of plans and specifications must be furnished to the District for review and approval prior to finalizing design when maintenance projects are awarded through a bid process. This review will be for the purpose of ensuring compliance with the District's Master Plan and regional objectives and will be used to update the inventory of existing facilities. As-built plans or record drawings will be provided to the District upon project completion and prior to project closeout.

11. Expenditures for repair and replacement of existing flood control Master Plan facilities which undergo catastrophic damage of one-half (1/2) mile or less will be classified as maintenance. These expenditures will be made from funds budgeted in the Facilities Maintenance Fund.

12. Expenditures for repair and replacement of existing flood control Master Plan facilities which undergo catastrophic damage of more than one-half (1/2) mile will generally be classified as capital improvements. Requests for capital improvement funds must be programmed as a capital improvement project in accordance with District Policies and Procedures.

13. Expenditures for removal of debris and sediment captured or deposited in a debris basin, detention basin or a linear flood control facility will be classified as maintenance. Necessary repairs to a debris or detention basin will also be classified as maintenance. These expenditures will be made from funds budgeted in the Facilities Maintenance Fund.

14. Expenditures for repair and replacement of non-improved or "earth lined" flood control facilities and features will be classified as maintenance. These expenditures will be made from funds budgeted in the Facilities Maintenance Fund.

15. A member entity may consider another option in lieu of repairing or rehabilitating facilities that have not been improved to Master Plan design specifications. This option is to build/implement the long-term solution for the damaged facility. Expediting the implementation of the Master Plan may be a viable alternative that maximizes the use of available resources. This should be considered as an alternative if the long-term solution can be implemented in a timely manner. Requests for capital improvement funds to implement a Master Plan project must be programmed as a capital improvement project in accordance with District Policies and Procedures.

16. Funds may be provided by the District for maintenance of Master Plan facilities by outside contractors under conditions when the use of such an approach is deemed the most efficient and cost effective by the lead member entity.

17. If a member entity receives funds from other sources for maintenance and repair of drainage and flood control facilities paid for by the District, the funds will be reimbursed to the District. Examples of other sources include, but are not limited to, Federal Emergency Management Agency (FEMA) funds for repairs resulting from a designated disaster, and funding from developers for maintenance and repair of District facilities.

18. The District will not be responsible for any fines and/or penalties caused by the actions or inactions of the member entity's employees, consultants, contractors, or agents.

19. Bridge structures, generally speaking, are not eligible for District funding unless it can be shown that the flood carrying aspects of the regional facility causes a safety or maintenance problem.

CHAPTER 4
PROCEDURES

4.10 FUNDING PROCEDURES

4.11 Purpose

This element of the **Operations and Maintenance Manual** provides the member entities with procedures for the appropriation, expenditure and reimbursement of funds to perform maintenance activities. A principle role of the District shall be to manage and disburse payments to the member entities for maintenance that is performed in compliance with the approved plans. A diagram of the funding flow is shown on Figure 4-1.

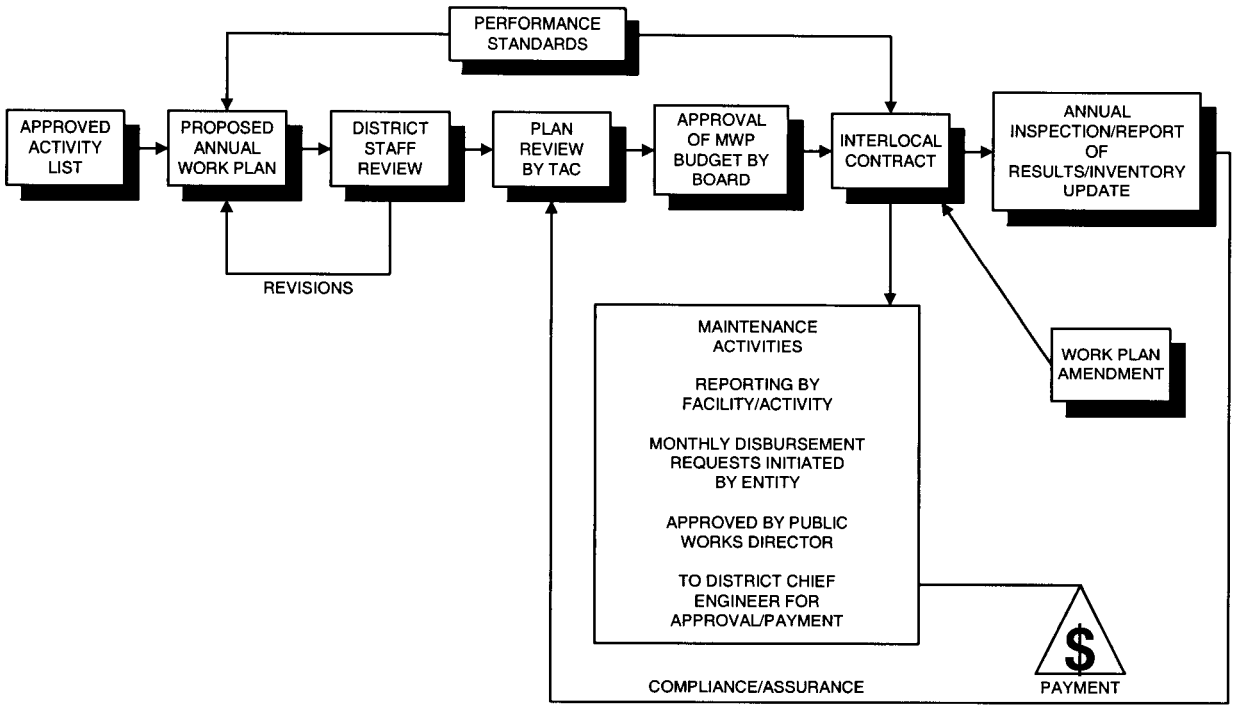
The District has authorized funding to assist the member entities with major drainageway maintenance in accordance with the priorities listed below:

- First priority: District owned facilities.
- Second priority: Facilities owned by member entities.
- Third priority: Facilities owned by other public agencies.
- Fourth priority: Facilities owned by others in which access has been guaranteed to the lead member entity and the District.
- Fifth priority: Unimproved drainageways.

4.12 Payment Procedures

Payment for work performed will be made in accordance with the annual interlocal contract executed as part of the approved work plan and the payment procedures outlined herein. The primary mechanism for reimbursements shall occur through a purchase order established between the District and each member entity. In cases where the member entity directs the District to make payments to a contractor or supplier directly, the purchase orders will be established between the District and the contractor, consultant, or supplier, at the member entity's request. Unless otherwise contained within this manual, all District Policies and Procedures relating to disbursement of funds and reimbursement to member entities apply.

Figure 4-1 Funding Flow Diagram



Schedule

Disbursement requests (invoices) from each member entity may only be submitted for completed work activity and may not be submitted more than once in a 30-day period. Disbursement requests must be accompanied by a verification statement from the member entity that the work for which payment is due has been completed in accordance with the standards contained in this manual. The disbursement request must identify the Master Plan facility maintained, specific plan activity or activities for which reimbursement is sought, and separately identify personnel, equipment, and other related costs. (Figure 4-2 represents a sample of the reporting required, and can be obtained on diskette from the District.) Administrative costs incurred by the member entity in the management of the interlocal contract are not reimbursable. Examples include cost accounting work, secretarial/clerical work, the preparation of requests for payment, and certification statements for work performed under the contract.

All invoices from the member entity requesting reimbursement to the member entity or direct payment to the member entity contractor or vendor must first be submitted to and approved by the member entity's Public Works Director or other designated responsible person in charge of the project. The Chief Engineer or designated District staff will process and approve such payments within 30 days providing the required approval has been obtained and terms of the interlocal contract have been satisfied.

Direct payments to contractors must originate from the member entity and include the following:

1. Invoice to the member entity from the contractor.
2. Certification of work performed by the contractor signed by the member entity, if applicable.
3. Disbursement Request Form (Figure 4-2).

Reporting

Monthly and annual summaries of purchase order balances, budget status, and facility expenditures shall be prepared by the District as a part of the routine financial reporting procedures to the Board.

Figure 4-2 Disbursement / Amended Annual Budget Request

REGIONAL FLOOD CONTROL DISTRICT
MAINTENANCE WORK PROGRAM - FISCAL YEAR 20XX-XX

ENTITY: _____

[ ] Disbursement Request

Vendor Name: _____

Invoice Number: _____

Amount Requested: _____

RFCD Purchase Order #:

[ ] Amended Annual Budget Request

Approved: _____

General Manager/Chief Engineer Date

Clark County Regional Flood Control District

MWP Facility #:											
Facility Name:											
Master Plan Facility ID:											ACTIVITY TOTAL
05-Chnl Insp											0.00
10-Reshape Chnl											0.00
15-Chnl Repair											0.00
20-Erosion Control											0.00
21-Dust Control											0.00
25-Clean DB											0.00
30-Erosion Repair											0.00
35-Fence Repair											0.00
40-Vege Control - C											0.00
45-Vege Control - M											0.00
50-Access Rd											0.00
55-Clean In/Outlet											0.00
60-Repair In/Out											0.00
65-Clean Storm Drn											0.00
70-Sewer Repair											0.00
75-Clean Culverts											0.00
80-Misc Maint											0.00
85-Engr											0.00
Facility Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

I certify that the above described maintenance was/will be performed in accordance with the criteria/standards contained in the District's Operations and Maintenance Manual. Further, the information contained in this Request accurately reflects those costs incurred/to be incurred during the performance of this work.

Project Manager Date

4.20 ADMINISTRATIVE PROCEDURES

4.21 Purpose

The purpose of this element of the **Operations and Maintenance Manual** is to provide specific procedures for establishing standards and levels of service, preparing the annual work plan, administrating the planning, approval and enforcement elements, and updating the manual over time. The principal role of the District shall be to review and approve annual maintenance work plans and monitor the performance of work activities. The principal role of the member entities shall be development of annual work plans that are consistent with the District's approved maintenance activity list; performance of the maintenance work set forth in the approved work plans; and the submittal of quarterly reports that summarize work performance while certifying compliance with maintenance activity performance standards as set forth in the **Operations and Maintenance Manual.**

4.22 Annual Work Plans

In accordance with the schedule on the following page, each member entity shall submit a proposed annual maintenance work plan containing the following components:

Section 1:	Program Summary by Maintenance Project Including Cost for Each Project
Section 2:	Summary by Maintenance Activity
Section 3:	Individual Maintenance Projects Showing Narrative, Location Map, Work Activities, Results, Costs

District staff shall review the proposed plans and work with the member entities to resolve any discrepancies found with District maintenance standards and policy objectives. After the initial staff review, the plans shall be forwarded to the Technical Advisory Committee (TAC) and Citizens Advisory Committee (CAC). Lastly, the plans will be submitted to the Board for final approval.

The activities in the work plan shall be consistent with the District's approved activity list for maintenance of flood control and drainage facilities. Work plans should also describe locally funded work activities that may be linked to the District maintenance work activities to show overlapping areas of responsibility for personnel and equipment. Where local personnel and equipment are going to be used to perform both District funded activities and locally funded activities, the member entity will describe how these resources are to be managed and the procedures for tracking costs related to both sets of activities.

Member entities may contract for the performance of maintenance work activities. The proposed work plan must specify that a contractor is to be utilized and the time frame for selection of a contractor. In the event that maintenance work is performed under contract, the contract must specify that the District has the authority to inspect all work performed under the contract and approve or deny payments to contractors based on inspection findings.

All work performed must comply with District approved maintenance activity performance standards as set forth in subsequent sections of this Manual. The member entity is required to inspect Master Plan facilities annually, including any maintenance work performed by member entities on Master Plan Facilities, and shall notify the District prior to the annual inspection of completed maintenance work. Member entities shall facilitate the inspection of maintenance work by the District. The District may withhold funding, require additional maintenance work, or seek repayment of disbursed funds when an inspection reveals that work activities were not performed in conformance with activity performance standards.

Schedule

February 1	-	Submittal of preliminary work plan proposal and tentative budget to District staff for review, recommendations, and coordination with member entities. This is important for the following reasons: 1) Fiscal Year Budget Authority submittal and approval. 2) Prioritization of maintenance funding activities.
April 1	-	Submittal of tentative annual work plans, budgets, and interlocal contracts to District staff for review, recommendations, and coordination with member entities.
May (TAC deadline)	-	Submittal of the member entity's final annual work plans, budgets, and interlocal contracts to the TAC and CAC for approval.
June (Board meeting)	-	After receiving approval from the TAC and CAC, member entities' final annual work plans, budgets, and interlocal contracts are submitted to the Board of Directors for approval.
July 1	-	Beginning of maintenance plan contract period, which ends June 30.

Reporting

Each member entity will submit quarterly reports indicating the status of the work completed under the current fiscal year's program (Figure 4-3). The reports are due 30 days after the close of the quarter, and will be submitted to the Board for review. Also, each member entity shall submit an annual certification to the District stating that all work contained in the work plan and reimbursed through the interlocal contract has been performed to the specifications established in this manual.

Figure 4-3 Quarterly Status Report

REGIONAL FLOOD CONTROL DISTRICT
MAINTENANCE WORK PROGRAM
QUARTERLY STATUS REPORT - FY 20XX-XX

MWP Facility #: _____ Entity: _____

Facility Name: _____ Date Prepared: _____

MP Facility ID: _____ Quarter: _____

Force Account/ Contract	Activity	Approved Work Plan Amount ($)	Amended Work Plan Amount ($)	Expended To Date ($)	Percent Complete	Scheduled Completion Date
	5 Inspect Channels					
	10 Clean and Reshape Channels					
	15 Repair Lined Channel					
	20 Provide/Maintain Erosion Control					
	21 Provide/Maintain Dust Control					
	25 Clean & Inspect Detention Debris Basins					
	30 Erosion Repair					
	35 Fence Repair					
	40 Vegetation Control - Chemical					
	45 Vegetation Control - Mechanical					
	50 Maintain Access Road					
	55 Clean & Inspect Inlet/Outlet Structures					
	60 Repair Inlet/Outlet Structures					
	65 Clean Storm Sewer Lines					
	70 Storm Sewer Repair					
	75 Clean/Flush Culverts & Bridges					
	80 Miscellaneous Work Activities					
	85 Engineering					
	TOTALS	$0.00	$0.00	$0.00	0%	

Delays or problem areas:

Work completed during current quarter:

Work to be completed during next quarter:

Consultant/
Contractor: _____

Project
Manager: _____ Phone Number: _____

4.23 Approval of Annual Work Plan

The work plans received by the District will be reviewed and budget requests compiled into a summary showing the dollar amount by member entity for each of the priority areas set forth in Section 4.11. The Chief Engineer shall review the total maintenance budget requests against the District's proposed annual total budget for facility maintenance and make a recommendation to the District Board as to the amount of maintenance funds to be disbursed to each respective member entity based upon equity and need.

Once the Technical Advisory Committee has reviewed the maintenance work plans and budget appropriation recommendation, the Chief Engineer will forward the compiled summary to the Board for consideration and approval as a key element of the Annual District Budget.

Schedule

The member entities will submit the proposed work plan to the Chief Engineer as outlined in Section 4.22.

Reporting

The Chief Engineer's report to the District Board shall show both the budget requested by the member entity and the recommended amount to be appropriated, the report will also make comments on any adjustments made to the initial request.

4.24 Work Plan and Budget Amendments

Requests for amendments to approved work plans and budgets must be submitted to the Chief Engineer in writing. The amendment request must specify the work elements affected, describe the reasons for the amendment request, and describe the impact of the proposed amendment on the affected work plan objectives.

Formal approval of work plan and/or budget amendments requiring a reallocation of funds between facilities must be obtained from the Chief Engineer prior to submittal of payment requests. (See Figure 4-2.) The member entity shall also notify District staff of work plan and/or budget amendments within a facility. Requests requiring an increase in the overall work plan budget must be submitted to the Board for approval with a supplemental interlocal contract for the amended work in accordance with Chapter VI.A.2 of the District's **Policies and Procedures Manual.**

Schedule

Amendment requests shall be reviewed by District staff and responded to in writing within 15 days of receipt of the original request. Work plan amendments which require an increase in the member entity's annual budget will require submittal of an agenda item and supplemental interlocal contract for approval by the District Board.

Reporting

Annual certification of results will include addressing all amendments made to the annual work plan.

4.25 Certification of Compliance

It is the intent of the District to rely to the maximum extent possible on the member entities to carry out the maintenance activities and comply "voluntarily" with the procedures and standards set forth in this manual. The District shall from time to time inspect facilities funded by the District or those on the Master Plan to assure compliance with the interlocal contract. Each member entity shall submit an annual certification to the District stating that all work contained in the work plan and reimbursed through the interlocal contract has been performed to the specifications established in this manual. This certification shall be signed by the person executing the interlocal contract or their designee. The certification should summarize proposed and actual plan accomplishments. It should also describe any major maintenance problems that have implications for the District as a whole, such as significant deterioration of major conveyance system components or the failure of system components to perform as intended, and suggest revisions to the activity list provisions.

Schedule

The certification and final payment requests shall be submitted to the District within 30 calendar days of the termination of the annual interlocal contract for maintenance funding.

Reporting

The certification shall be attested to on the Final Accounting Report (Figure 4-4), and an attachment may be used to describe additional pertinent information.

Figure 4-4 Final Accounting Report

(ENTITY)
MAINTENANCE WORK PROGRAM
FINAL ACCOUNTING REPORT - FY 20XX-XX
As of (Current Date)

VENDOR	P.O. NUMBER	P.O. AMOUNT	TOTAL EXPENDED	P.O. BALANCE
Sample Vendor 1	123456 01	1,000.00	1,000.00	0.00
Sample Vendor 2	123456 02	1,000.00	500.00	500.00
Sample Vendor 3	123456 03	1,000.00	200.00	800.00
	Total	$3,000	$1,700	$1,300

FY XX-XX INTERLOCAL AMOUNT/BUDGET	4,000.00	Total Encumbered	3,000.00
Total Encumbered	3,000.00	Total Expended	1,700.00
Total Unencumbered	$1,000.00	Total Unexpended	$1,300.00

Total Authorized	**$4,000.00**
Expended	**$1,700.00**
REPROGRAM FOR MWP	**$2,300.00**

Regional Flood Control District **(Entity)**

RFCD Date Project Manager Date

I certify that the above described maintenance was performed in accordance with the criteria/standards contained in the District's Operations and Maintenance Manual. Further, the information contained in this Final Accounting Report accurately reflects those costs incurred during the performance of this work. If there are any maintenance problems that have implications for the District as a whole, such as significant deterioration of major conveyance system components or failure of system components to perform as intended, a detailed description will accompany this report as an attachment.

4.26 Interlocal Contract Document

The performance of work outlined in the approved maintenance plan shall be guided by an interlocal contract entered into annually between the District and each member entity. Sample contracts are contained in Appendices B and C. Major provisions of the contract include: the adoption of the Board approved work plan as the document outlining the work to be performed; references to the performance standards, reimbursement and payment procedures, and plan amendment procedures outlined in this manual for governing maintenance work performance evaluations, and contract amendments; and a requirement for submittal of an annual certification of results.

Schedule

All member entities will enter into an "annual" interlocal contract in conjunction with adoption of the District and respective member entity budgets.

Reporting

Reporting requirements will be as prescribed in the respective interlocal contracts.

4.27 Contract for Maintenance Performance

If, in the opinion of the member entity, it appears to be most cost effective (or due to an emergency) to utilize the services of private contractors to perform maintenance functions, the member entity shall solicit bids from qualified contractors in compliance with their statutory procedures for the necessary work. The member entity will provide the District with copies of bid specifications and bid tabulations as well as copies of the respective contract documents. All expenditures must comply with NRS 332, Local Government Purchasing Act, NRS 338, the Public Works Act, and all relevant statutes, rules, regulations, and policies.

Schedule

All contracts for maintenance services shall be bid on an annual basis or for a specific project location.

Reporting

The member entity shall advise the District in advance that they intend to utilize a private contractor (may be included as part of annual work plan). They shall also provide a summary of work performed and a statement of inspection as part of the request for reimbursement to the member entity or directly by the District to the contractor.

4.30 MAINTENANCE PROCEDURES

4.31 Purpose

As a part of the overall operations and maintenance procedures adopted by the District, an outline for specific maintenance procedures has been developed. The accepted maintenance procedures are centered around specific elements of a management system for field maintenance, and include defined maintenance activities, standards, scheduling, and reporting procedures.

Due to the diversity in physical features among the various agencies involved, and the varied resources employed in maintenance activities, it is essential to treat these procedures as general guidelines which must be tailored to meet the situation at hand. It is also essential that these procedures remain dynamic, be actively reviewed, and periodically updated. An annual review is recommended.

4.32 Activities

Maintenance work activities identify all major maintenance work and include all activities which are performed frequently and in amounts that make them a significant part of the total work program. Each activity must be clearly defined so maintenance personnel at all levels of management uniformly understand the operation to be performed and the type of deficiency to be corrected.

Personnel who plan, schedule, perform, report, or evaluate maintenance work must know what each work activity means. Work activities are used for the following purposes:

- Planned maintenance work is identified in the annual maintenance work plan by activity name and number.
- Activity names and numbers are used for authorizing, assigning, and reporting work.
- Activity names and numbers are used on work scheduling guides and work performance summaries.

Work measurement units are established for the major maintenance activities. For example, "Acres Covered" is the work measurement unit for vegetation control while "Cubic Yards Removed" is the work unit for cleaning and reshaping channels. These measurement units are used to describe how much work is planned and to report how much work is accomplished for each activity.

For some activities, specific work measurement units--other than labor hours--would not be meaningful. For example, the miscellaneous maintenance activity includes a number of different operations. This activity cannot be measured by a common unit other than labor hours.

Following is the accepted maintenance Activity List for the District including work measure units.

ACTIVITY NUMBER	ACTIVITY NAME	WORK MEASURE UNIT
05	Inspect Channels	Miles
10	Clean and Reshape Channels	Cubic Yards
15	Repair Lined Channel	Each
20	Provide/Maintain Erosion Control	Square Feet
21	Provide/Maintain Dust Control	Acres
25	Clean and Inspect Detention/Debris Basins	Cubic Yards
30	Erosion Repair	Cubic Yards
35	Fence Repair	Linear Feet
40	Vegetation Control - Chemical	Acres
45	Vegetation Control - Mechanical	Acres
50	Maintain Access Road	Miles
55	Clean and Inspect Inlet/Outlet Structures	Each
60	Repair Inlet/Outlet Structures	Each
65	Clean Storm Sewer Lines	Linear Feet
70	Storm Sewer Repair	Repairs
75	Clean/Flush Culverts & Bridges	Each
80	Miscellaneous Work Activities	Labor Hours
85	Engineering	Labor Hours

4.33 Standards

"Performance Standards" have been established for each of the major maintenance work activities. These performance standards specify:

- The most effective crew size.
- The kinds and number of equipment required.
- The major types of material that should be used.
- Recommended procedures for performing the work.
- An estimate of expected average daily accomplishment with standard crew size, equipment and procedures.
- Authorization and scheduling criteria.

Following is an item-by-item description of the format of the performance standards.

1. Activity Identification/Date. The activity number and name are shown as well as the "effective date" of the performance standard--to be used when updating or replacing performance standards.

2. Description and Purpose. The Description and Purpose section of the performance standard explains the work activity and the kinds of defects to be corrected or reasons for doing the work.

3. Authorized By and Work Control Category. The level of management responsible for authorizing the work is identified. Certain activities requiring special equipment, coordination, or expertise are Engineer-authorized activities and should not be scheduled or performed without the Engineer's approval. The type of control to be placed on the quantity of work performed is identified. This control is unlimited or limited in terms of the amount of work done (accomplishment) or the amount of labor input (crew-day).

4. Performance Criteria. This section includes important information for the "scheduler" about when to schedule the work and for the crew leader to identify the work to be done.

5. Crew Size. The crew size outlines the numbers of personnel needed to do the work. The crew size is based on average conditions. Sometimes, there will be a need to add or delete people to satisfy special traffic safety conditions or hauling requirements.

6. Equipment. The basic requirements for major pieces of equipment are listed. Situations such as the breakdown or unavailability of equipment or special materials hauling requirements may require the addition, deletion or substitution of equipment.

7. Materials. The materials section includes a list of the major materials to be used for the activity.

8. Work Method. The work method outlines, step-by-step, the recommended procedures for performing the work. Each step should be performed in order to correctly maintain the feature as well as provide the quality of work desired.

9. Average Daily Production. The average daily production is an estimate of the amount of work a crew can accomplish during a day using the recommended crew size, equipment, materials and work method. This estimate is shown as a range and should be attainable over a period of time. Some days the accomplishment may be more or less than the estimate, but eventually, the average should fall in line.

10. Notes. Any other relevant, helpful information or instructions.

Use of Performance Standards

Maintenance supervisory personnel should become thoroughly familiar with these performance standards. It is important that the performance standards be used when making assignments and performing work. Some situations will require deviation from the performance standards--such as more or less flagmen or additional haul trucks. These situations are recognized, and crew leaders are expected to consider such situations when organizing and managing their activities.

Haul truck needs should be determined using factors such as haul distance and time estimates (spot, dump, load, and cycle times.)

The performance standards also provide guidance and a measure for supervisors to use when evaluating work in progress and completed.

Field personnel are in the best position to identify new or better work methods or difficulties with the current performance standards. These suggestions for improvements or questions should be directed to the crew leader or supervisor.

The performance standards should be reviewed and updated annually. If other changes occur that require more frequent review and update or development, the performance standards can be changed to suit these needs.

4.34 Scheduling

The objectives of work scheduling are:

- To do the planned amount of work.
- To perform the work when it should be done.
- To do the work where it should be done.
- To use the proper people, equipment and supplies to do the work.
- To ensure to the extent possible that all flood control facilities are functioning at design capacity during a storm event, noting that Flash Flood Season is July through September.

Three tools are available to help supervisors meet these objectives. The WORK PROGRAM defines the estimated amount of work and the estimated labor-days required for each activity to provide the desired levels of service; a WORK CALENDAR helps to establish when the various activities should be done; and the PERFORMANCE STANDARDS provide information about quantity standards, personnel requirements and how much work can be done in a given time.

The annual work program establishes the kinds and amount of work to be done during the year and the resources that will be required to do that work. This annual plan needs to be broken into a monthly plan for effective scheduling of work and to permit timely evaluations of work program performance.

The process of "distributing" the annual work load throughout the year is done by allocating a part of the work (in labor-hours, by activity) to specific months. Some types of work -- emergency or service activities -- must be done throughout the year as the need arises. Other types of work must be done on a regularly scheduled basis -- such as preventive maintenance work. Finally, some types of work can be done during certain periods but can be shifted from one month to the other, and still other work can be done almost any time during the year.

These factors must be considered when distributing the different types of work. Preventive maintenance and other types of work which must be performed on a regularly scheduled basis are distributed so as to level labor power needs as much as possible. Finally, work which can be performed any time is distributed to those months with the fewest labor-days. In this way, staffing needs are kept as uniform as possible resulting in more efficient use of available labor power.

A work calendar lists -- activity by activity -- the labor-hours for each month. These labor-hours are used in conjunction with the work program annual work quantities for work scheduling and the preparation of periodic Activity Status Reports. A sample work calendar is included in Figure 4-5.

Once the work program and staffing levels have been set, the work load distribution can be finalized and the calendar prepared to summarize/communicate the planned monthly distribution of the work program.

Work scheduling is the process of using the work calendar and specific scheduling procedures to plan ahead, establish work priorities and accomplish the work.

The performance standards outlined in the previous sections apply to corrective and preventive maintenance activities. These procedures are not as rigid or foolproof as implied by the description. Equipment breakdowns, emergencies, or bad weather will disrupt a schedule -- but part of the scheduling process is to be aware that these situations will occur and to be prepared to respond with little or no difficulty. Because of these situations, supervisors should not expect to accomplish all of the work as scheduled. Generally, a supervisor can consider his/her scheduling efforts to be successful if 75 to 80 percent of the scheduled work is completed as planned.

Figure 4-5 Work Calendar

REGIONAL FLOOD CONTROL DISTRICT
MAINTENANCE WORK PROGRAM
WORK CALENDAR

MWP Facility #: _____ Entity: _____
Facility Name: _____ Fiscal Year: _____
MP Facility ID: _____ Date Prepared: _____

ACTIVITY		Monthly Distribution of Time (in hours)												Total Per
No.	Description	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Activity
5	Inspect Channels													-
10	Clean and Reshape Channels													-
15	Repair Lined Channel													-
20	Provide/Maintain Erosion Control													-
21	Provide/Maintain Dust Control													
25	Clean & Inspect Detention/Debris Basins													-
30	Erosion Repair													-
35	Fence Repair													-
40	Vegetation Control - Chemical													-
45	Vegetation Control - Mechanical													-
50	Maintain Access Road													-
55	Clean & Inspect Inlet/Outlet Structures													-
60	Repair Inlet/Outlet Structures													-
65	Clean Storm Sewer Lines													-
70	Storm Sewer Repair													-
75	Clean/Flush Culverts & Bridges													-
80	Miscellaneous Work Activities													-
85	Engineering													-
	Total Per Month	-	-	-	-	-	-	-	-	-	-	-	-	-

I certify that the above described maintenance will be performed in accordance with the criteria/standards contained in the District's Operations and Maintenance Manual. Further the information contained in this Work Calendar accurately reflects the time expected to be incurred during the performance of this work.

_____
Project Manager Date

Following are some additional hints or techniques to consider:

- It is not necessary to "formally schedule" the daily, routine activities. It is necessary, however, to regularly check the work reports and accomplishments to verify the distribution of work assignments. A periodic review and adjustment of the work assignments may be necessary to maintain a "balanced work load."
- It is usually best to prepare a schedule (and work assignments) assuming everything will work as planned -- no equipment breakdowns, no emergencies, etc. But make sure a backlog of "alternate" work is available so that little time is wasted when adjustments to the schedule must be made.
- Some guidelines for identifying alternate work:
  - Low priority work that needs to be done, but not necessarily during the next week or so.
  - Work that does not require special equipment or a lot of preparation time.
  - Preventive maintenance on light equipment.

Take time to estimate the amount of work needed and the number of hours required to do the work. Good estimates will improve the scheduling process significantly. The performance standards, inspections and sound judgment based on experience all help the estimating process.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
05	**INSPECT CHANNELS**	05/15/03

DESCRIPTION & PURPOSE

Inspect both improved and unimproved flood channels for proper cross-section, sedimentation, debris and erosion damage, in order to schedule cleaning or repairs as needed.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Perform complete inspection of channels on an annual basis and after major storm events.

CREW SIZE	WORK METHOD
• 1 Crew Supervisor • • • 1 **TOTAL**	1. Use safety devices, as required. 2. Visually inspect channels for cross-section, sediment, debris, erosion, and vegetation. 3. Prioritize a list of channels requiring maintenance. 4. Schedule cleaning of channels referring to prioritized list.
EQUIPMENT	
• 1 Pickup • • •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• • • •	8 miles/day

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
10	**CLEAN & RESHAPE CHANNELS**	05/15/03

DESCRIPTION & PURPOSE

Mechanical silt, vegetation, and debris removal, and reshaping of unlined channels to restore adequate flow.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Improved earth channels should be scheduled for cleaning and re-profiling on an annual schedule, or as appropriate following a flood event. Natural channels on a 3-year cycle.

CREW SIZE	WORK METHOD
• 2 Equipment Operators • 1 Truck Driver • .5 Foreman • • 3.5 **TOTAL**	1. Set up safety devices as required. 2. Remove silt and vegetation. 3. Load and haul removed material to proper disposal site. 4. Reshape channel. 5. Clean up work site as necessary. 6. Remove safety devices.
EQUIPMENT	
• 1* 10 Wheel Dump Truck • 1 Scraper • 1 Gradall •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• Disposal Fees • • •	300 Cubic Yards/day

NOTES:

*Schedule sufficient trucks to insure maximum utilization of excavation equipment.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
15	**REPAIR LINED CHANNELS**	05/15/03

DESCRIPTION & PURPOSE

Repair of damaged concrete, rip rap, gabion, or other channel linings, retaining walls, etc., to restore to original condition and prevent further deterioration.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Repairs of channel linings, retaining walls, and other structures critical to the protection of a facility are to be scheduled immediately upon detection of damage.

CREW SIZE	WORK METHOD
• 1 Maintenance Foreman • 2 Maintenance Workers • • 3 **TOTAL**	1. Obtain safety equipment, materials, tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Clean and prepare damaged area. 4. Build and place forms as necessary. 5. Place and finish concrete. 6. Remove forms and back fill. 7. Clean up work site as necessary.
EQUIPMENT	
• Pickup • Flatbed Dump • Concrete Mixer •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• Assorted lumber • 6-30 bags sacked concrete • 3-15 tons concrete gravel mix • 2-10 CY ready-mix concrete	1Each/Day

NOTES:

Crew size and equipment may vary significantly depending on urgency, extent and complexity of repair.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
20	**PROVIDE / MAINTAIN EROSION CONTROL**	05/15/03

DESCRIPTION & PURPOSE

Placement of rip rap, sand bags, or other erosion control materials and repair of damaged areas of erosion protection to restore material to original condition. This work is done to prevent further deterioration and eliminate potential erosion problems.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Work is to be scheduled when damage or deterioration is severe enough to present potential erosion problems. Erosion undercutting roadways, sidewalks, or prepared embankments/improvements shall be repaired immediately. Repair of undermined stabilizers shall be scheduled immediately.

CREW SIZE	WORK METHOD
• 1 Foreman • 2 Equipment Operators • 2 Maintenance Workers • • 5 **TOTAL**	1. Obtain safety equipment, materials and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Shape work area to receive riprap, or other erosion control materials. 4. Place material and grout where applicable. 5. Back fill as necessary. 6. Clean up work site as necessary.
EQUIPMENT	
• 1 Truck Crane • - or - • Backhoe • 1 Dump Truck • 1 Pickup	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• 20-50 Tons Rock for riprap (delivered) • 5-12 yards ready mix concrete (if needed) • 5,000-15,000 gal Water	1300 Square Feet/day

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
21	**PROVIDE / MAINTAIN DUST CONTROL**	05/15/03

DESCRIPTION & PURPOSE

Uniform application and maintenance of surface gravel, dust palliatives, or other alternative dust control measures to limit the emission of particulate matter into the ambient air.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Work is to be scheduled when loose sand, dust, or dust particles are found to exist in excess of acceptable limits. Select and apply approved dust control measure in a manner that will minimize the degradation of water quality.

CREW SIZE

- 1 Foreman – Part-time
- 1 Driver
- 1 Nozzle operator
- 1 – 2 laborers to protect surrounding area from overspray
- 4 – 5 **TOTAL**

EQUIPMENT

- 1 Spray Truck
- 1 Flatbed truck for delivery of bulk materials
- 1 Forklift to load bulk materials into tank on spray truck
- 1 Motor grader
- 1 Compactor

WORK METHOD

1. Obtain safety equipment, materials and tools necessary for the day's work.
2. Begin applicable safety procedures and/or traffic control.
3. Prepare surface area to receive palliative or other dust control measures with motor grader and compactor if required.
4. Palliative with pre-emergent herbicide requires preparation of soil surface.
5. Apply dust palliative to prepared surface.
6. Clean up work site as necessary.

MATERIAL

- Gravel
- Dust palliative (i.e. gypsum, fiber mulch)
- Water source
- Other alternative dust control measure

AVERAGE DAILY PRODUCTION

6 acres/day – open areas (i.e. detention basin)
3 acres/day – strip areas with fence (i.e. channel)

NOTES:

Control measures shall be implemented to limit the disturbance of open areas.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
25	**CLEAN & INSPECT DETENTION/DEBRIS BASINS**	05/15/03

DESCRIPTION & PURPOSE

Inspection and removal, by loader (including hauling and disposal), of sediment and debris deposited in detention and debris basins to restore full capacity and original shape.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Remove sediment bi-annually or when debris basins or dams detention capacity is significantly reduced. Clean out is normally justified when the sedimentation reaches 1 to 2 feet in depth or as established by the design.

CREW SIZE	WORK METHOD
• 1 Foreman • 3 Equipment Operators • 1 Maintenance Worker • • 5 **TOTAL**	1. Obtain safety equipment, materials and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Prepare removal and disposal sites for access. 4. Stockpile material for removal. 5. Load material and haul to proper disposal site. 6. Shape dam or basin to desired line and grade. 7. Grade disposal site as necessary. 8. Clean up work site as necessary.
EQUIPMENT	
• 1 Pickup • 1 Loader • 2* Dump Trucks •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• Disposal Fees • • •	1000 Cubic Yards/day

NOTES:

*Schedule sufficient trucks to insure maximum utilization of excavation equipment.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
30	**EROSION REPAIR**	05/15/03

DESCRIPTION & PURPOSE

The replacement and compaction of material removed by erosion, using hand tools or other methods, to restore flood control channels, supporting embankments, levees or access roads.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

As needed when damage has occurred which has affected or will affect the structural integrity of a channel embankment, levee, or access road, at a location where mechanical methods cannot be used.

CREW SIZE	WORK METHOD
• 1 Foreman • 2 Maintenance Workers • • • 3 **TOTAL**	1. Obtain safety equipment, materials, and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Remove debris and growth from damage location. 4. Haul fill material from pre-determined source. 5. Place and compact fill material in lifts. 6. Shape repair area to conform to adjacent areas. 7. Clean up work site as necessary.
EQUIPMENT	
• 1 1-Ton Dump -or- Flatbed Truck • 1 Air Compressor w/compactor • 1 Pickup w/Water Tank • -or- Auxiliary Spray Truck	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• 15-30 Tons Select Fill Material • • •	15 Cubic Yards

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
35	**FENCE REPAIR**	05/15/03

DESCRIPTION & PURPOSE

The repair and/or re-establishment of downed or damaged fences to restore fence to proper condition and to provide right-of-way control.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Repair of downed or open fence areas to be performed upon detection. Repairs to damaged locations that remain partially functional are to be scheduled in priority with other work.

CREW SIZE	WORK METHOD
• 2 Maintenance Workers • • • 2 **TOTAL**	1. Obtain safety equipment, materials and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Perform necessary repairs to: • Posts • Fabric • Top rail 4. Clean up work site as necessary.
EQUIPMENT	
• 1 Fence Truck • 1 Concrete Mixer (if needed) • •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• 40-50 Linear Ft Fence Fabric • Miscellaneous Hardware • 5 bags "Ready Crete" •	100 Linear Feet/day

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
40	**VEGETATION CONTROL - CHEMICAL**	05/15/03

DESCRIPTION & PURPOSE

The application of herbicides, to designated areas, with a boom-mounted spray bar to prevent new growth and/or control existing vegetation, for the purpose of insuring the capacity and integrity of flood control facilities.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Spray pre-emergent herbicide and post-emergent herbicide annually to designated areas combining applications where possible. Select and apply herbicides in a manner to minimize the degradation of water quality.

CREW SIZE	WORK METHOD
• 2 Maintenance Workers • • • 2 **TOTAL**	1. Set up safety devices as required. 2. Treat channel areas as required. 3. Remove safety devices. 4. Clean up work site as necessary.
EQUIPMENT	
• 1 Truck-mounted chemical tank with spray bar and hand sprayer • •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• Pre 12.5-25 lb/Ac • Emerge Contact: 12.5-25 lb/Ac • Post Brush: 120 lb/Ac • Emerge Grass: 30 lb/Ac • Waterweed: 1 gal/Ac • Spreader: 1 gal/Ac • Water 200 gal/Ac	Acres

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
45	**VEGETATION CONTROL - MECHANICAL**	05/15/03

DESCRIPTION & PURPOSE

The mechanical removal of brush and weeds to maintain detention, debris basins, and channels free of vegetation.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Work to be scheduled when weeds and willows grow up at unsprayable locations, or when growth is too high for effective spraying.

CREW SIZE	WORK METHOD
• 1 Equipment Operator • • • 1 **TOTAL**	1. Obtain safety equipment, materials, and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Mow, blade down, or turn under unwanted vegetation. 4. Clean up work site as necessary.
EQUIPMENT	
• 1 Mower or Grader • 1 Tilt Trailer (if needed) • 1 Pickup •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• • • •	4 Acres/day

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
50	**MAINTAIN ACCESS ROADS**	05/15/03

DESCRIPTION & PURPOSE

Mechanical grading of access roads to remove minor ruts and erosion, and restore normal shape and cross slope, for access to flood control facilities.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

As needed prior to rainy season, or when the weather affects the road condition. Plan to re-profile access roads on a bi-annual (two year) frequency.

CREW SIZE	WORK METHOD
• 2 Equipment Operators • 1 Maintenance Workers • • 3 **TOTAL**	1. Obtain equipment and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Grade access roads: • Restoring X-section shape • Filling potholes • Grading out ruts • Restoring ditches and drainage. 4. Roll and compact regraded. 5. Clean up work site as necessary.
EQUIPMENT	
• 1 Grader • 0-1 Water Truck • 0-1 Roller • 1 Pickup	
MATERIAL	AVERAGE DAILY PRODUCTION
• 10,000 Gal Water (if needed) • • •	.5 Mile/day

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
55	**CLEAN & INSPECT INLET/OUTLET STRUCTURES**	05/15/03

DESCRIPTION & PURPOSE

Cleaning and inspection of catch basins, inlets, sumps, grates, outflow and other structures to remove silt and debris and to inspect for structural integrity and proper functioning.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Plan for structures to be inspected and cleaned a minimum of once per year. Annual cleaning shall be the major effort to allow thorough inspection of structure in order to schedule repairs.

CREW SIZE	WORK METHOD
• .25 Foreman • 2 Maintenance Workers • • 2.25 **TOTAL**	1. Perform daily vehicle P.M. check and check equipment. 2. Place signs/traffic control devices as required. 3. Locate truck in the best working position and as far off roadway as practical. 4. Remove grate. Then remove debris, trash & sediment from grate. 5. Loosen solids with spade if necessary. 6. Flush/vacuum basin. 7. Inspect structure visually to determine if further cleaning or repair is necessary. 8. Dispose of debris at proper disposal site. 9. Check and clean equipment after use. 10. Clean up work site as necessary.
EQUIPMENT	
• 1 1-Ton Truck • 1 Water Tanker (1500 gal) • -or- High Pressure Vacuum (Vactor) • Appropriate Hand Tools	
MATERIAL	AVERAGE DAILY PRODUCTION
• Water • •	15 Each/day

NOTES:

Structures that cannot be cleaned shall be reported to the Maintenance Supervisor for initiation of corrective action.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
60	**REPAIR INLET / OUTLET STRUCTURES**	05/15/03

DESCRIPTION & PURPOSE

Repair of catch basins, grates, inlets, control gates, outfalls, weirs, manholes, sumps, and other spot structures to restore elements to their original operational condition.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Based on detailed inspection of repair, replace components, or entire structure as conditions warrant. Plan repair of five percent (5%) of system structures per year.

CREW SIZE	WORK METHOD
• 1 Foreman • 2 Maintenance Workers • • • 3 **TOTAL**	1. Obtain necessary safety equipment, tools, and materials. 2. Initiate applicable safety procedures and traffic control. 3. Remove and clean area of damage/failure. 4. Repair as necessary to original condition and test operation as appropriate. 5. Clean up work site as necessary.
EQUIPMENT	
• 1 Pickup • 1 Compressor w/accessories • •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• Concrete • Aggregates • Miscellaneous parts, as required •	1 Each/day

NOTES:

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
65	**CLEAN STORM SEWER LINES**	05/15/03

DESCRIPTION & PURPOSE

The removal of debris of any type from within conduits by: flushing with water; the use of a sewer cleaning machine; or by physically entering the conduit and manually removing debris, to restore full capacity.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Plan cleaning of storm sewer lines on an average 5-year cycle. Specific areas may require annual cleaning while others will require less than 5-year cleaning.

CREW SIZE	WORK METHOD
• 1 Maintenance Foreman • 2 Maintenance Workers • • 3 **TOTAL**	1. Obtain safety equipment and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Remove debris from conduit. 4. Load debris and haul to designated disposal site if necessary. 5. Clean up work area as necessary.
EQUIPMENT	
• 1 Sewer Cleaner • • •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• 0-5,000 Gallons Water • • •	1500 linear feet/day

NOTES:

Work should be scheduled whenever possible, in conjunction with annual cleaning of adjacent structures.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
70	**STORM SEWER LINE REPAIR**	05/15/03

DESCRIPTION & PURPOSE

Excavation and repair of storm sewer lines to eliminate blockages and repair failed pipes.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Priority of repairs:
1. eliminate blockages and hazards to public safety;
2. remove flow restrictions and repair damaged/failed pipe sections.

CREW SIZE	WORK METHOD
• 1 Foreman • 1 Equipment Operator • 2 Maintenance Workers • • 4 **TOTAL**	1. Set up warning signs and traffic control devices. 2. Take necessary measures to control flow -- providing uninterrupted service whenever possible. 3. Cut pavement and/or excavate to the extent required to determine necessary scope of repairs. 4. Remove flow restrictions, as necessary. 5. Back fill and compact in lifts to within 10 inches of surface. 6. Place select material (rock or shell) and compact to within 2 inches of surface* (See Note below.) 7. Coordinate density test and request repaving as required. 8. Remove signs and warning devices. 9. Clean up work site as necessary. 10. Record work accomplishment.
EQUIPMENT	
• 1 Dump Truck • 1 Backhoe/Util Tractor • Air Compressor w/accessories • Appropriate Hand Tools	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• Pipe/fittings • Sand • Cement • Rock • Asphalt, as required	1 Repair/day

NOTES:

Verify location of other utilities prior to excavation. *Back fill specifications apply to paved areas. In easements and other unpaved areas, back fill and compact in 2-foot lifts to grade; re-sod as necessary. Install safety fence and secure job site at end of workday as required.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
75	**CLEAN / FLUSH CULVERTS & BRIDGES**	05/15/03

DESCRIPTION & PURPOSE

Cleaning/flushing of culverts and bridges to remove silt and debris, and eliminate restriction to flow.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Plan for all culverts to be cleaned/flushed annually.

CREW SIZE	WORK METHOD
• 1 Maintenance Supervisor • 1 Maintenance Worker • • 2 **TOTAL**	1. Place signs and safety devices. 2. Locate truck in best working position and as far off roadway as possible. 3. Clean out ends of culvert. 4. Flush culverts until flow is unrestricted. 5. Load excess material/debris into truck for disposal at proper disposal site. 6. Pick up signs and safety devices. 7. Clean up work site as necessary.
EQUIPMENT	
• 1 1-Ton Dump Truck • 1 Water Tanker (1500 gal) • -or- High Pressure/Vacuum cleaner/Vactor • Safety Equipment • Appropriate Hand Tools	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• Water • • •	5-7 Each/Day

NOTES:

1. Inform Maintenance Supervisor of any non-cleanable culverts or those that can only be partially cleaned.
2. Avoid damaging downstream property when flushing culverts.
3. Work should be scheduled, whenever possible, in conjunction with annual cleaning of adjacent structures.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
80	**MISCELLANEOUS WORK ACTIVITIES**	05/15/03

DESCRIPTION & PURPOSE

All work performed that is not described in previous activities. This includes, among others, activities such as catwalk repair, rodent control, pump maintenance, concrete spalled area repair, painting, building and grounds maintenance, trash pickup*, graffiti abatement, sign installation and maintenance.

AUTHORIZED BY	LIMITS ON WORK
Maintenance Supervisor	

PERFORMANCE CRITERIA

Plan 8 labor hours per channel mile per year for miscellaneous maintenance work.

CREW SIZE	WORK METHOD
• 1 Maintenance Worker • • • 1 **TOTAL**	1. Obtain safety equipment, materials, and tools necessary for the day's work. 2. Begin applicable safety procedures and/or traffic control. 3. Clean up work site as necessary.
EQUIPMENT	
• 1 Pickup • Hand tools • •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• As required • • •	8 Labor Hours

NOTES:

*Includes appliances, tires, car bodies, and other large objects dumped in channels/basins.

PERFORMANCE STANDARD

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

ACTIVITY NUMBER	NAME	DATE
85	**ENGINEERING**	05/15/03

DESCRIPTION & PURPOSE

All work that is by nature engineering. This includes, among others, surveying and preparation of plans and specifications for maintenance work.

AUTHORIZED BY	LIMITS ON WORK
Director of Public Works or designee	

PERFORMANCE CRITERIA

CREW SIZE	WORK METHOD
• N/A • • • **TOTAL**	1. As deemed most cost effective.
EQUIPMENT	
• N/A • • •	
MATERIAL	**AVERAGE DAILY PRODUCTION**
• N/A • • •	8 Hours/Day

NOTES:

4.35 Reporting

Comprehensive maintenance programs include procedures for reporting and summarizing work accomplished and labor-hours used for maintenance activities. This information enables managers and supervisors to compare actual performance with the planned work program. These planned-actual comparisons -- on a regular basis -- are essential for effective management and control of the work program.

The reporting procedures provide specific information:

- What Master Plan facility required work.
- What work was done by activity.
- How much of each activity was done.
- The labor-hours used to accomplish the work.

This information is used by managers in their effort to:

- Make sure the right kinds and amounts of maintenance work are done.
- Identify the problem areas and related corrective actions.
- Develop future work programs and budgets.
- Identify opportunities for improved productivity.

The work reporting process can consist of a simple form as outlined in the following section.

Daily Work Activity Report

The Daily Work Activity Report may be used to record and summarize: (1) the kinds and amounts of work performed by maintenance personnel, and (2) the number of labor-hours used to do that work. The report can be used to summarize all work activities. Each member entity may use its standard accounting/reporting procedures for the Daily Work Activity Report.

The Maintenance Supervisor or crew leader usually prepares the Daily Work Activity Report. Following are instructions for the completion of the sample report shown on Figure 4-6.

1. Identification Data - Fill in all blanks: the member entity, date, name of person preparing the report, and the names and employee numbers of all persons to perform work to be reported for the day. (The form provides for several combinations of activities and employees. If additional pages are needed, number the pages accordingly).

2. Master Plan Facility ID/Name - Enter the specific 4 letter-4 digit Master Plan Facility number and reach, which indicates the "from" and "to", if applicable. This number directly corresponds to the specific Master Plan location as identified on current Master Plan maps. Also, indicate the Facility Name.

3. MWP Facility Number - Enter the identifying Maintenance Work Plan facility number. (This number directly corresponds to the budget approved for the facility and will typically include a range of Master Plan facilities and reach.)

4. Activity Number - Enter the number of each activity performed. Use the Work Activity Directory or Performance Standards to complete the blank.

5. Employee Number - Enter the employee number of the person working a specific activity at the specific facility.

6. Hours Worked by Each Employee - Record the number of hours worked by each employee, by the appropriate activity. Record the time spent to the nearest quarter-hour. For example, record 1 hour and 45 minutes as 1.75 hours and 3 hours and 20 minutes as 3.25 hours.

7. Equipment Number - Enter the assigned equipment number for any mechanical equipment on which work was performed for preventive and corrective maintenance only.

8. Work Performed - Enter the location and a brief description of the work performed.

9. Accomplishment - Measure and record the amount of work done for each activity. Use the correct measurement unit for each activity. (See the Activity List in Section 4.32.) Record the amount of work done to the nearest whole unit. Record labor-hours to the nearest hour. For activities with labor-hours as the unit of measure, the "quantity" will be exactly the same as "total hours" for the activity.

10. Notes/Comments - Record any additional relevant information that may be of use in summarizing and analyzing work activity data.

The completed reports can be used for monthly summarization and report preparation, and serve as completion certification backup for the monthly force account reimbursement billings.

Figure 4-6 Daily Work Activity Report

REGIONAL FLOOD CONTROL DISTRICT
DAILY WORK ACTIVITY REPORT

ENTITY:_____

Date Work Performed:_____ 20____

Supervisor Name:_____

Employee Name:_____ No._____

Employee Name:_____ No._____

Employee Name:_____ No._____

Employee Name:_____ No._____

Employee Name:_____ No._____

MWP Facility Number	Master Plan Facility ID/Facility Name	Activity Number Worked	Empl. Number	Hours Worked by Activity	Equip. Number Used	Work Performance (Location, Brief Description, Materials Used, Etc.)	Accomplishment	
							Amount	Unit of Measure

NOTES/COMMENTS:_____

_____

The undersigned hereby certifies that the above described maintenance was performed in accordance with the criteria/standards contained in the District's Operations and Maintenance Manual. Further, the information contained herein accurately reflects the time and accomplishments reported during the performance of this work.

_____ _____ _____

Supervisor's Signature Date Title

Page_____ of_____

4.40 INVENTORY PROCEDURES

4.41 Purpose

The purpose of this element of the **Operations and Maintenance Manual** is to provide a record of the existing physical flood control system that is eligible for maintenance funding assistance by the District. The physical facilities that make up the collection and conveyance system have in many instances been paid for in whole or in part by the District, however, they are not "owned", operated, or maintained by the District. If, however, the total flood control system does not function properly when needed, it is ultimately the responsibility of the District to determine why and to take corrective action. A critical key in assuring the system functions properly is an up-to-date inventory of the physical system.

4.42 Physical System

In 1990, each member entity provided a list of the physical system that made up the flood control system in their jurisdiction. Facilities eligible for maintenance funding are those identified in the Regional Flood Control District's Master Plan and any revisions, amendments, and/or changes subsequently approved. Only those facilities that exist as Master Plan facilities, or exist in the same alignment as a proposed Master Plan facility and appurtenant facilities are eligible.

Schedule

The inventory work sheets must be expanded to represent a true and accurate accounting of facilities on the Master Plan and tributary (drainage) systems and updated as part of the annual certification process.

Reporting

The member entities should submit annual updates of the physical system inventory on the form required by the District (Figure C-1).

4.43 Physical System Maps

Each member entity must have a map that shows the physical system for drainage and flood control. This map should reflect that portion that is on the Master Plan and also that portion that is eligible for maintenance funding by the District.

Schedule

The individual member entities should submit to the District updated maps annually, or more frequently as project completion dictates, reflecting the size, location and material elements of their drainage and flood control system. The update should show those systems that are eligible for Regional Flood Control District funding under the categories shown in Section 4.11 of this manual.

Reporting

The physical system update with maps should be provided to the District and be in a form that is readily reproducible.

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
OPERATIONS AND MAINTENANCE MANUAL

CHAPTER 5
EMERGENCY FUNDING PROCEDURES

5.10 EMERGENCY FUNDING PROCEDURES

5.11 Purpose

This element of the **Operations and Maintenance Manual** provides the member entities with procedures to perform emergency restoration and rehabilitation immediately following a flood event. A principal role of the District shall be to support the member entities efforts to: (1) secure funding from state, federal, member entity reserves and private sources; and (2) facilitate required immediate repairs to regional flood control facilities without delay.

Projects eligible for District emergency restoration and rehabilitation funding are those included in the member entity's approved or amended Maintenance Work Program.

5.12 Procedures

If the governing body elects to declare an emergency, then the District, in accordance with NRS 332.055 (Emergency Contracts: Competitive bidding not required; "emergency" defined.), will authorize and process emergency purchase orders to the maximum limit of unexpended funds upon written request by the member entity.

APPENDIX A

KEY STATUTORY, REGULATORY, AND POLICY REFERENCES

NEVADA REVISED STATUTES

1. CHAPTER 332 – PURCHASING: LOCAL GOVERNMENTS
2. CHAPTER 338 – PUBLIC WORKS PROJECTS
3. CHAPTER 543 – CONTROL OF FLOODS

UNIFORM REGULATIONS FOR THE CONTROL OF DRAINAGE

1. SECTION 12 – DESIGN/IMPROVEMENT STANDARDS
   a. 12.050 – Construction/Operation/Maintenance

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

1. SECTION 300 – DRAINAGE POLICY
   a. 303.10 – Drainage Facilities Maintenance

REGIONAL FLOOD CONTROL DISTRICT POLICIES AND PROCEDURES MANUAL

1. CHAPTER XI – FACILITY MAINTENANCE

APPENDIX B

SAMPLE AUTHORIZATION-TO-PROCEED INTERLOCAL CONTRACT

INTERLOCAL CONTRACT
ANNUAL MAINTENANCE WORK PROGRAM

THIS CONTRACT, made and entered into this ___ day of _____, 20____, by and between the [legal name of CITY or COUNTY], a political subdivision of the State of Nevada, hereinafter referred to as "CITY" (or "COUNTY"), and the CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT, hereinafter referred to as "DISTRICT".

W I T N E S S E T H:

WHEREAS, pursuant to Chapter 543 of the Nevada Revised Statutes, the DISTRICT may approve and fund projects to maintain flood control improvements;

WHEREAS, the CITY (or COUNTY) desires to maintain flood control improvements within the CITY (or COUNTY) in accordance with the maintenance program set forth herein, and hereinafter referred to as "Project"; and

WHEREAS, the facilities upon which maintenance will be done are facilities described in the DISTRICT'S Master Plan.

NOW, THEREFORE, in consideration of the covenants, conditions, agreements, and promises of the parties hereto, the DISTRICT authorizes the Project as it is mutually understood and agreed as follows:

SECTION I - SCOPE OF PROJECT

This Interlocal Contract applies to the maintenance of flood control facilities, which are identified in the DISTRICT'S Master Plan facilities including updates and amendments subsequently approved. The basic maintenance to the facilities will be in accordance with performance standards set forth in the current DISTRICT *Operations and Maintenance Manual.*

The Project is more specifically described in Exhibit "A" which is attached hereto and by this reference incorporated herein.

SECTION II - PROJECT COSTS

The DISTRICT agrees to provide reimbursement for Project costs within the limits specified below:

1. The Project costs shall not exceed $_____.

The amounts allocated to each individual facility within the Project must be specified in Exhibit "A". Any changes to said allocated amounts must be approved by the DISTRICT'S Chief Engineer in accordance with Section 4.24 of the DISTRICT *Operations and Maintenance Manual.*

2. "Authorization to Proceed" is herein granted for maintenance of facilities in Exhibit "A" in an amount not to exceed _____, effective _____.

3. A separate request for an "Authorization to Proceed" will be required for additional facility maintenance funds.

4. A written request must be made to the DISTRICT and a Supplemental Interlocal Contract approved to increase the amount noted above prior to payment of any additional funds.

5. The CITY (or COUNTY) and DISTRICT will comply with Section 4.12 of the *Operations and Maintenance Manual.* In accordance with said manual the CITY (or COUNTY) shall submit invoices together with a detailed summary report of the maintenance service performed. The CITY (or COUNTY) shall submit an invoice voucher in the manner prescribed by the DISTRICT. The vouchers shall include such information as is necessary for the DISTRICT to determine the nature of all expenditures. Each voucher will clearly indicate that it is for services rendered in performance under this contract. Each voucher will also be accompanied by a written certification from the CITY (or COUNTY) stating that it is for performance of maintenance activities under this contract and is composed of completed elements set forth in the annual work program.

All invoices must be submitted for payment to:

Clark County Regional Flood Control District
Accounts Payable
600 S. Grand Central Parkway, Suite 300
Las Vegas, Nevada 89106-4511

Payment shall be considered timely if made by the DISTRICT within 30 days. Pursuant to Section IV, Paragraph 6, the DISTRICT may, in its sole discretion, withhold payments to the CITY (or COUNTY) for services rendered if the CITY (or COUNTY) fails to satisfactorily comply with any term or condition of this contract and/or the DISTRICT *Operations and Maintenance Manual.*

SECTION III - PROJECT TIME

The CITY (or COUNTY) agrees to perform the Project to the satisfaction of the DISTRICT between July 1, 20_____ and June 30, 20____. The DISTRICT may grant extensions or terminate this contract and require all sums advanced to the CITY (or COUNTY) to be repaid if the CITY (or COUNTY) fails to perform by said date.

SECTION IV - GENERAL

1. The CITY (or COUNTY) will complete the Project as set forth in Exhibit "A". The CITY (or COUNTY) staff personnel responsible for coordination of work under this contract are as listed below:

(list names and titles of CITY or COUNTY staff)

It is understood that staff named above will be responsible for work coordination throughout the period of this contract unless the DISTRICT is informed in writing of changes in these personnel assignments.

2. In addition to the specific terms set forth in this Contract, the parties hereto shall be subject to and governed by the DISTRICT *Operations and Maintenance Manual*, and any applicable portions of the *Policies and Procedures* adopted by the DISTRICT.

3. It is the intent of the DISTRICT that scheduling of maintenance and repair of drainage and flood control facilities in general and Master Plan Facilities specifically be coordinated among member entities. Therefore, in those cases where Master Plan approved, and DISTRICT-funded projects have regional flood control significance impacting more than one member entity, the CITY (or COUNTY) will allow all impacted member entities an opportunity to review the maintenance schedule in order to coordinate maintenance efforts.

4. The Chief Engineer or designee of the DISTRICT shall be responsible for monitoring the performance of the CITY (or COUNTY), approval for payment of billings and expenses submitted by the CITY (or COUNTY) and the acceptance of any report provided by the CITY (or COUNTY). The CITY (or COUNTY) shall be responsible for monitoring performance of CITY (or COUNTY) staff or private contractors, and the CITY (or COUNTY) shall maintain detailed records of all payments made to contractors and make such records available to the DISTRICT upon request.

5. The CITY (or COUNTY) shall provide right of access to its facilities to the DISTRICT or Chief Engineer at all reasonable times, in order to monitor and evaluate performance, compliance, and/or quality assurance under this contract.

6. In the event the CITY (or COUNTY) fails to perform the maintenance according to the standards specified in this contract and in the DISTRICT *Operations and Maintenance Manual,* the DISTRICT may perform or cause to be performed the maintenance necessary to assure proper operation of the facility. Cost incurred by the DISTRICT shall be reimbursed by the CITY (or COUNTY) or be deducted from the amount authorized by this contract. The DISTRICT may not exercise this right without giving the CITY (or COUNTY) specific written notice of the maintenance required and allowing the CITY (or COUNTY) 60 days within which to perform said maintenance. The notice required by this provision must be sent to:

(insert name of City or County staff)
(insert title)
(insert City or County mailing address)

7. The records of the CITY (or COUNTY) and/or private contractors pertaining to the subject matter of this contract shall at all reasonable times be subject to inspection and audit by the DISTRICT or an Agent of the DISTRICT.

8. If any provision of this contract shall be deemed in conflict with any statute or rule of law, such provision shall be deemed modified to be in conformance with said statute or rule of law.

9. All parties to this contract shall comply with applicable local, state, and federal laws.

10. The CITY (or COUNTY) hereby agrees to reimburse the DISTRICT if funds are received from other sources for maintenance and repair of drainage and flood control facilities paid for by the DISTRICT.

11. The DISTRICT will not be responsible for any fines and/or penalties caused by the actions or inactions of CITY (or COUNTY) employees, consultants, contractors, or agents.

12. Any costs found to be improperly allocated in the Project will be refunded by the CITY (or COUNTY) to the DISTRICT.

13. It is specifically understood and agreed to by and between the parties hereto that it is not intended by any of the provisions of any part of this contract to create in the public or any member thereof a third party beneficiary hereunder, or to authorize anyone not a party to this contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this contract.

14. The CITY (or COUNTY) hereby indemnifies and shall defend and hold harmless the DISTRICT, its representatives and their employees (or their authorized representatives) from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs and expenses whatsoever of any kind or nature whether arising before or after completion of the work hereunder and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of the CITY (or COUNTY), of anyone acting under its direction or control, or on its behalf in connection with or incident to the performance of this Contract. The CITY'S (or COUNTY'S) aforesaid indemnity and hold harmless obligations, or portions or applications thereof, shall apply to the fullest extent permitted by law, but in no event shall they apply to liability caused by the sole negligence or willful misconduct of the party indemnified or held harmless.

/

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/

IN WITNESS WHEREOF, the parties have caused this contract to be executed the day and year first above written.

Date of District Action:

_____

ATTEST:

REGIONAL FLOOD CONTROL DISTRICT

BY:_____
(Insert Chairman's Name), Chairman

_____
(Insert Board Secretary's Name), Secretary

Approved as to Form:

BY:_____
(Insert Chief Deputy District Attorney's Name)
Chief Deputy District Attorney

****

Date of Council Action:
(or Commission Action)

ATTEST:

(CITY or COUNTY) OF _____

BY:_____
(Insert Mayor/Board Chairman's Name), Title

_____
(Insert Name), (City or County Clerk)

APPENDIX C

SAMPLE INTERLOCAL CONTRACT

INTERLOCAL CONTRACT
ANNUAL MAINTENANCE WORK PROGRAM

THIS CONTRACT, made and entered into this ___ day of _____, 20____, by and between the [legal name of CITY or COUNTY], a political subdivision of the State of Nevada, hereinafter referred to as "CITY" (or "COUNTY"), and the CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT, hereinafter referred to as "DISTRICT".

W I T N E S S E T H:

WHEREAS, pursuant to Chapter 543 of the Nevada Revised Statutes, the DISTRICT may approve and fund projects to maintain flood control improvements;

WHEREAS, the CITY (or COUNTY) desires to maintain flood control improvements within the CITY (or COUNTY) in accordance with the maintenance program set forth herein, and hereinafter referred to as "Project"; and

WHEREAS, the facilities upon which maintenance will be done are facilities described in the DISTRICT'S Master Plan.

NOW, THEREFORE, in consideration of the covenants, conditions, agreements, and promises of the parties hereto, the DISTRICT authorizes the Project as it is mutually understood and agreed as follows:

SECTION I - SCOPE OF PROJECT

This Interlocal Contract applies to the maintenance of flood control facilities, which are identified in the DISTRICT'S Master Plan facilities including updates and amendments subsequently approved. The basic maintenance to the facilities will be in accordance with performance standards set forth in the current DISTRICT *Operations and Maintenance Manual.*

The Project is more specifically described in Exhibit "A" which is attached hereto and by this reference incorporated herein.

SECTION II - PROJECT COSTS

The DISTRICT agrees to provide reimbursement for Project costs within the limits specified below:

1. The Project costs shall not exceed $_____.

The amounts allocated to each individual facility within the Project must be specified in Exhibit "A". Any changes to said allocated amounts must be approved by the DISTRICT'S Chief Engineer in accordance with Section 4.24 of the DISTRICT *Operations and Maintenance Manual.*

A written request must be made to the DISTRICT and a Supplemental Interlocal Contract approved to increase the amount noted above prior to payment of any additional funds.

2. The CITY (or COUNTY) and DISTRICT will comply with Section 4.12 of the *Operations and Maintenance Manual.* In accordance with said manual the CITY (or COUNTY) shall submit invoices together with a detailed summary report of the maintenance service performed. The CITY (or COUNTY) shall submit an invoice voucher in the manner prescribed by the DISTRICT. The vouchers shall include such information as is necessary for the DISTRICT to determine the nature of all expenditures. Each voucher will clearly indicate that it is for services rendered in performance under this contract. Each voucher will also be accompanied by a written certification from the CITY (or COUNTY) stating that it is for performance of maintenance activities under this contract and is composed of completed elements set forth in the annual work program.

All invoices must be submitted for payment to:

Clark County Regional Flood Control District
Accounts Payable
600 S. Grand Central Parkway, Suite 300
Las Vegas, Nevada 89106-4511

Payment shall be considered timely if made by the DISTRICT within 30 days. Pursuant to Section IV, Paragraph 6, the DISTRICT may, in its sole discretion, withhold payments to the CITY (or COUNTY) for services rendered if the CITY (or COUNTY) fails to satisfactorily comply with any term or condition of this contract and/or the DISTRICT *Operations and Maintenance Manual.*

SECTION III - PROJECT TIME

The CITY (or COUNTY) agrees to perform the Project to the satisfaction of the DISTRICT between July 1, 20_____ and June 30, 20_____. The DISTRICT may grant extensions or terminate this contract and require all sums advanced to the CITY (or COUNTY) to be repaid if the CITY (or COUNTY) fails to perform by said date.

SECTION IV - GENERAL

1. The CITY (or COUNTY) will complete the Project as set forth in Exhibit "A". The CITY (or COUNTY) staff personnel responsible for coordination of work under this contract are as listed below:

(list names and titles of CITY or COUNTY staff)

It is understood that staff named above will be responsible for work coordination throughout the period of this contract unless the DISTRICT is informed in writing of changes in these personnel assignments.

2. In addition to the specific terms set forth in this Contract, the parties hereto shall be subject to and governed by the DISTRICT *Operations and Maintenance Manual*, and any applicable portions of the *Policies and Procedures* adopted by the DISTRICT.

3. It is the intent of the DISTRICT that scheduling of maintenance and repair of drainage and flood control facilities in general and Master Plan Facilities specifically be coordinated among member entities. Therefore, in those cases where Master Plan approved, and DISTRICT-funded projects have regional flood control significance impacting more than one member entity, the CITY (or COUNTY) will allow all impacted member entities an opportunity to review the maintenance schedule in order to coordinate maintenance efforts.

4. The Chief Engineer or designee of the DISTRICT shall be responsible for monitoring the performance of the CITY (or COUNTY), approval for payment of billings and expenses submitted by the CITY (or COUNTY) and the acceptance of any report provided by the CITY (or COUNTY). The CITY (or COUNTY) shall be responsible for monitoring performance of CITY (or COUNTY) staff or private contractors, and the CITY (or COUNTY) shall maintain detailed records of all payments made to contractors and make such records available to the DISTRICT upon request.

5. The CITY (or COUNTY) shall provide right of access to its facilities to the DISTRICT or Chief Engineer at all reasonable times, in order to monitor and evaluate performance, compliance, and/or quality assurance under this contract.

6. In the event the CITY (or COUNTY) fails to perform the maintenance according to the standards specified in this contract and in the DISTRICT *Operations and Maintenance Manual,* the DISTRICT may perform or cause to be performed the maintenance necessary to assure proper operation of the facility. Cost incurred by the DISTRICT shall be reimbursed by the CITY (or COUNTY) or be deducted from the amount authorized by this contract. The DISTRICT may not exercise this right without giving the CITY (or COUNTY) specific written notice of the maintenance required and allowing the CITY (or COUNTY) 60 days within which to perform said maintenance. The notice required by this provision must be sent to:

(insert name of City or County staff)

(insert title)

(insert City or County mailing address)

7. The records of the CITY (or COUNTY) and/or private contractors pertaining to the subject matter of this contract shall at all reasonable times be subject to inspection and audit by the DISTRICT or an Agent of the DISTRICT.

8. If any provision of this contract shall be deemed in conflict with any statute or rule of law, such provision shall be deemed modified to be in conformance with said statute or rule of law.

9. All parties to this contract shall comply with applicable local, state, and federal laws.

10. The CITY (or COUNTY) hereby agrees to reimburse the DISTRICT if funds are received from other sources for maintenance and repair of drainage and flood control facilities paid for by the DISTRICT.

11. The DISTRICT will not be responsible for any fines and/or penalties caused by the actions or inactions of CITY (or COUNTY) employees, consultants, contractors, or agents.

12. Any costs found to be improperly allocated in the Project will be refunded by the CITY (or COUNTY) to the DISTRICT.

13. It is specifically understood and agreed to by and between the parties hereto that it is not intended by any of the provisions of any part of this contract to create in the public or any member thereof a third party beneficiary hereunder, or to authorize anyone not a party to this contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this contract.

14. The CITY (or COUNTY) hereby indemnifies and shall defend and hold harmless the DISTRICT, its representatives and their employees (or their authorized representatives) from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs and expenses whatsoever of any kind or nature whether arising before or after completion of the work hereunder and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of the CITY (or COUNTY), of anyone acting under its direction or control, or on its behalf in connection with or incident to the performance of this Contract. The CITY'S (or COUNTY'S) aforesaid indemnity and hold harmless obligations, or portions or applications thereof, shall apply to the fullest extent permitted by law, but in no event shall they apply to liability caused by the sole negligence or willful misconduct of the party indemnified or held harmless.

/

/

IN WITNESS WHEREOF, the parties have caused this contract to be executed the day and year first above written.

Date of District Action: REGIONAL FLOOD CONTROL DISTRICT

_____ BY:_____
(Insert Chairman's Name), Chairman

ATTEST:

_____
(Insert Board Secretary's Name), Secretary

Approved as to Form:

BY:_____
(Insert Chief Deputy District Attorney's Name)
Chief Deputy District Attorney

****

Date of Council Action: (CITY or COUNTY) OF _____
(or Commission Action)

BY:_____
ATTEST: (Insert Mayor/Board Chairman's Name), Title

_____
(Insert Name), (City or County Clerk)

SAMPLE EXHIBIT A

PART I

Summary of overall work plan listing specific projects and associated costs attributable to each. (See Figure C-1)

PART II

Facility map(s) which identify location of planned maintenance work by project.

PART III

Summary of work plan broken into maintenance activities to be completed, with associated budgeted costs, for all projects identified in Part I. (See Figure C-2)

Figure C-1 Maintenance Work Plan Summary

(MEMBER ENTITY)
MAINTENANCE WORK PLAN SUMMARY
FISCAL YEAR 20XX-XX

Master Plan Facility ID	MWP Facility Number	Facility Description	Cost
		TOTAL	$ 0.00

Figure C-2 Maintenance Work Program Annual Budget

REGIONAL FLOOD CONTROL DISTRICT
MAINTENANCE WORK PROGRAM
ANNUAL BUDGET - FY 20XX-XX

MWP Facility #: _____ Entity: _____

Facility Name: _____ Date Prepared: _____

MP Facility ID: _____

Force Account/ Contract	Activity	Requested Work Plan Amount ($)	Amended Work Plan Amount ($)	Percent Complete	Scheduled Completion Date
	5 Inspect Channels				
	10 Clean and Reshape Channels				
	15 Repair Lined Channel				
	20 Provide/Maintain Erosion Control				
	21 Provide/Maintain Dust Control				
	25 Clean & Inspect Detention Debris Basins				
	30 Erosion Repair				
	35 Fence Repair				
	40 Vegetation Control - Chemical				
	45 Vegetation Control - Mechanical				
	50 Maintain Access Road				
	55 Clean & Inspect Inlet/Outlet Structures				
	60 Repair Inlet/Outlet Structures				
	65 Clean Storm Sewer Lines				
	70 Storm Sewer Repair				
	75 Clean/Flush Culverts & Bridges				
	80 Miscellaneous Work Activities				
	85 Engineering				
	TOTALS	$0.00	$0.00		

Delays or problem areas:

Work completed during prior fiscal year:

Work to be completed during current fiscal year:

Consultant/
Contractor: _____

Project
Manager: _____ Phone Number: _____

SECOND RESPONSE TO COMMENTS
FOR THE
LOWER DUCK CREEK
CONDITIONAL LETTER OF MAP REVISION

550.039

June 2004

RFCD
2004 JUN 18 PM 2:49

Prepared for:

Clark County Regional Flood Control District
600 South Grand Central Parkway, Suite 300
Las Vegas, Nevada 89106-4511
Phone: (702) 455-3139
Fax: (702) 455-3870

Prepared by:

G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, NV 89146
Phone: (702) 804-2000
Fax: (702) 804-2297

G. C. WALLACE, INC.
Engineers • Planners • Surveyors

G. C. WALLACE, PE/SE, PLS
JAMES A. DUDDLESTEN, PE
MICHAEL D. ROSS, PE
CHRISTOPHER W. ANDERSON, PE
CALVIN L. BLACK, PE, PLS
E. ROBERT PETERSON
SCOTT R. PLUMMER, PE
BENJAMIN C. SMITH, PE
EUGENE W. WRIGHT, PE

THOMAS P. DYSON, PE
DOUGLAS M. HANKEL
BERT A. HUGHES, PE
RICKEY D. HUNSAKER, PE, LC
NOEL C. LAUGHLIN, PE
MARVIN W. MAIZE
DANNY S. McFADDEN, PE
S. WILLIAM NEIGHBORS, PE
THOMAS R. NICHOLS, PE
FREDERICK W. ORBAN, PLS
JERRY E. PRUITT, PE
BRIAN L. SCHMIDT, PE
JEFF W. STAYTON, PE
JOHN R. TOBIN, PE, PTOE
HOWARD K. VANDER MEER, PE, WRS
G. IRA WALLACE, PE

JIM B. BAKKEDAHL, PE
JOSEPH A. BODROG, PLS
ROY D. CLARK, PE
HEIDI A. DEXHEIMER, PE
ERIC J. GALVAN
RANDALL K. GREMLICH, PE
PASCAL HAYES, PE/SE
J. P. HIGGINS, PLS, WRS
DANNY E. HILL, PLS
DAPHNE L. HOFFMAN
DONALD L. HOTCHKISS JR., PE
BILL HUNTER, PE
RANDY W. MROWICKI, PLS
JOHNNIE R. PATE JR., PE, PTOE
FRED A. SELLE
SAUNDRA L. VANCE, CCS, CCCA

[redacted]AL ARIDI, PE
[redacted]N R. BELSICK, PE
[redacted]HN T. BROWN, PE
PATRICK S. BYRD, PE
MARY A. CARR, PE
RICHARD G. CLARKE
GLENN R. CURTIS, III, CMI
IAIN DOLEMAN
MARK A. FERDA, PE
JOHN FITCH, PE
ERIC G. GILES, PE/SE
NICHOLAS G. GOLZ, PE
BRIJ M. GULATI, PE, PTOE
KEITH HATTON, PE
TODD C. HAYNE, PE
GERALD L. HOLTON, PLS, WRS
RUSSELL D. JAMISON, PLS
JOSH JOHNSON, PE
KAYANN JONGSMA, PE
TODD N. KELLEY, PE
DENNIS R. KETTERMAN
FRED KHANBOLOUKI, PE
SCOTT R. LANDERMAN, PLS
PAUL R. LOHMAN, PE
MICHAEL J. LUDWIG, PE
CHRISTOPHER M. LUQUETTE, PE, CFM
JEFFERY J. McBRIDE, PE
WILLIAM METCALF
MATTHEW D. MEYER, PE
WILLIAM J. MEYER, PE
RIMAH I. NAZZAL, PE/SE
GIA D. NGUYEN, PE
JERRY E. PASCOE, PLS
WESLEY T. PETTY, PE
CHRISTOPHER W. PLUTTE, PE
GEOFFREY G. PURSE, PE
RICK J. READ, PE
BRADFORD G. ROCKWELL, PE
CHRISTOPHER B. SMITH, PE
DONNA J. STRALOW, PLS
S. TRACY STRATTON
CHURAIRAT (ANN) TANAKUL, PE
GRANT Y. TOKUMI, PE
KEVIN L. TOMLINSON, PE
JERRY TSUNETA
F. EDUARDO VILLALOBOS, PE/SE
PAUL J. VILLALUZ, PE
KEVIN W. WALLACE, PLS
[redacted]N B. WATANABE, PE
[redacted]EN L. WEATHERMAN, PE
[redacted]SON W. WONG, PE, PTOE
DEBRA M. YAMACHIKA, PE
DERICK D.J. YORO, PE

AFFILIATE OFFICE IN
SACRAMENTO, CA

550.039

June 18, 2004

Ms. Pernille Buch-Pedersen
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

Subject: Lower Duck Creek CLOMR

Dear Ms. Buch-Pedersen:

The purpose of this letter is to address the comments from your office, dated June 10, 2004, regarding the subject project. The comments are individually addressed as follows:

Comment: "1. The April 23, 2004, submittal contained a corrected effective HEC-RAS hydraulic model for Duck Creek from the confluence of Pittman Wash to approximately 2,000 feet upstream. Because the proposed conditions HEC-RAS model for Duck Creek extends from Broadbent Boulevard to Emerald Avenue, please submit a corrected effective HEC-RAS model for Duck Creek that covers the entire reach between Broadbent Boulevard and Emerald Avenue.

Response: The effective HEC-2 models downstream of Hollywood Boulevard were not available. However, duplicate effective HEC-RAS models, DE5B.PRJ and DE6D.PRJ, were generated from portions of effective HEC-2 models, DCL1SUBC.OUT and DCL6SUBB.OUT. The effective HEC-2 models were referenced from the 2002 Duck Creek/ Blue Diamond Washes FIS Restudy. The duplicate effective models extend from 1,900 feet upstream of Emerald Avenue to 300 feet downstream of Hollywood Boulevard.

Note that the effective HEC-2 models were based on the NGVD29 datum. The post-project conditions models are based on the NAVD88 datum. Therefore, after conversion to HEC-RAS, the channel geometry for the duplicate effective models was raised 2.37 feet to the NAVD88 datum. The upstream and downstream boundary conditions were set at normal depth so the duplicate effective models could be run with a mixed flow regime.

The effective HEC-2 model, DCL6SUBB, used the Special Culvert routine to model the bridge at Boulder Highway.

After conversion to HEC-RAS, the bridge data was re-inserted in HEC-RAS format. See the attached exhibit showing the Boulder Highway bridge data used in the duplicate effective HEC-RAS model, DE5B.

The hydraulic models supporting this response are shown in Table 1.

TABLE 1

MODEL	FILE NAME	PROGRAM	REGIME	DATUM
Effective	DCL1SUBC.OUT	HEC-2	SUB	NGVD29
Effective	DCL6SUBB.OUT	HEC-2	SUB	NGVD29
Duplicate Effective	DE5B.PRJ	HEC-RAS	MIXED	NAVD88
Duplicate Effective	DE6D.PRJ	HEC-RAS	MIXED	NAVD88
Post-Project Conditions	PHASE2D.PRJ	HEC-RAS	MIXED	NAVD88
Post-Project Conditions	PHASE3B.PRJ	HEC-RAS	MIXED	NAVD88

Note: PHASE2D.PRJ is unchanged from the April 2004 response submittal.

Comment: "2. The known starting water-surface elevation (WSEL) used in the proposed conditions hydraulic analysis for Duck Creek is 1,612 feet. The WSEL assumes a coincident peak situation between Duck Creek and Las Vegas Wash. Please provide hydrologic justification for the coincident peak assumption, or revise the proposed conditions HEC-RAS model using critical depth as the starting WSEL for Duck Creek.

Response: The starting water surface elevation for Duck Creek downstream of Broadbent Boulevard has been changed to a critical depth of 1611.6 feet NAVD88. This is shown in the downstream boundary condition of HEC-RAS model, PHASE3B. Modeling results show that there were no significant changes to the upstream water surface elevations. Additionally, the difference between critical depth and the known water surface elevation previously used was 0.4 feet. Therefore, no mapping revisions were warranted. Figure 5 from the April 2004 response submittal is attached.

Summary:

There are minor differences in water surface elevation between the duplicate effective HEC-RAS models and the effective HEC-2 models. These differences may be attributed to the conversion from HEC-2 to HEC-RAS, and also from the bridge modeling routines. The results of the post-conditions modeling show that the 100-year effective flow is confined to the improved channel. See Table 2 for a summary of the hydraulic modeling and a comparison between the effective, duplicate effective, and post-conditions modeling.

The following items are attached in support of this response:

1. Effective HEC-2 models: DCL1SPRC, DCL1SUBC, DCL6SUBB (on disk only).
2. Duplicate Effective HEC-RAS models and output: DE5B, DE6D.
3. Post-conditions HEC-RAS model: PHASE3B, PHASE2D (on disk only)
4. Cross Section Exhibit from 2002 Duck Creek FIS Restudy.
5. Revised FEMA Form 2.

If you have any questions or need additional information, please do not hesitate to call us at (702) 804-2000.

Sincerely,

G. C. WALLACE, INC.

Michael J. Ludwig, P.E.
Project Engineer
Flood Control Division

MJL:jj

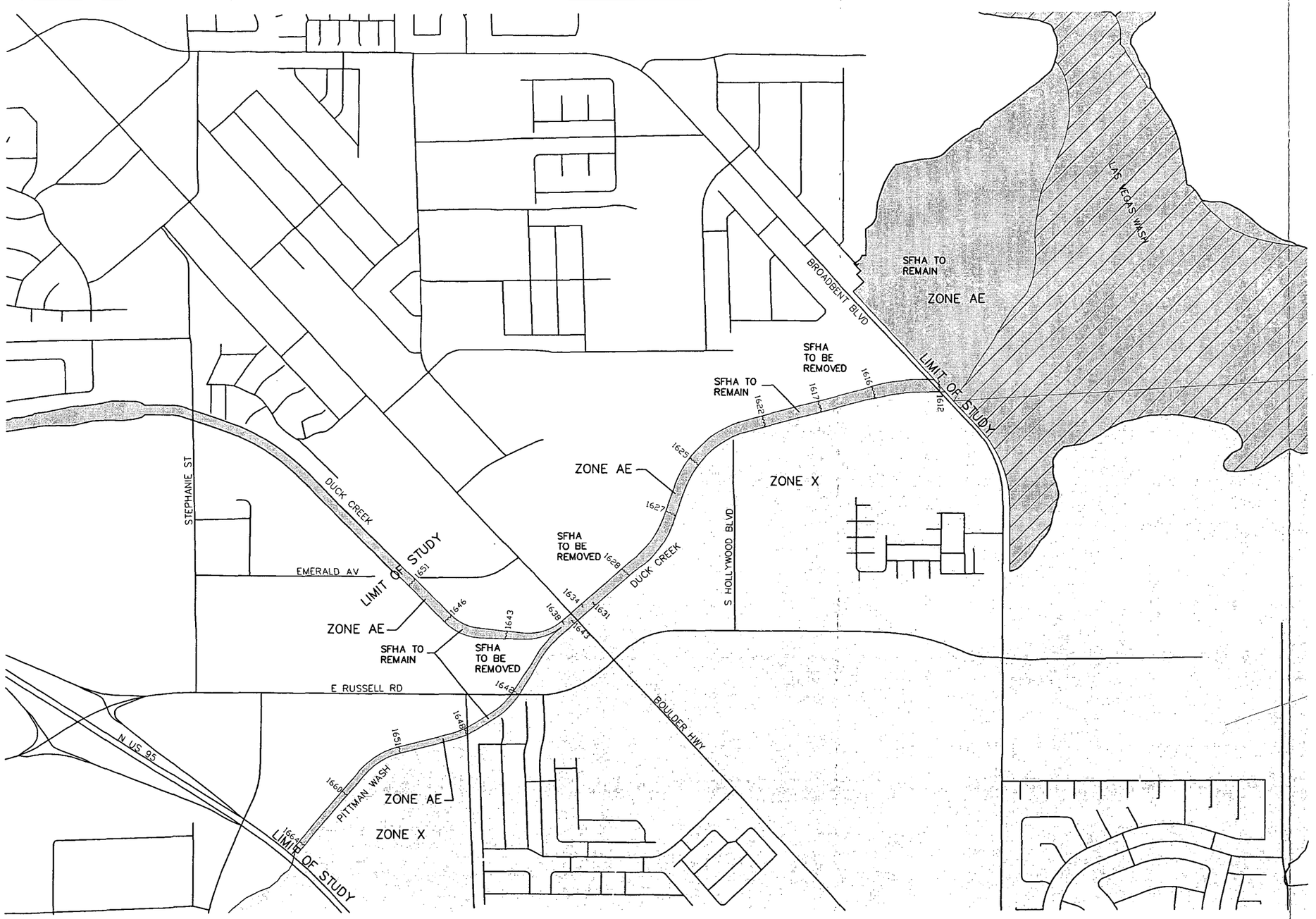
Enc.

cc: Kevin Eubanks, CCRFCD
Calvin L. Black, GCW
Jerry E. Pruitt, GCW

PROFESSIONAL ENGINEER - STATE OF NEVADA
MICHAEL J. LUDWIG
Exp: 12/31/05
CIVIL
No. 16045
6/18/04

TABLE 2: SUMMARY OF HYDRAULIC MODELING

GENERAL			EFFECTIVE (EF) - 2002 FIS RESTUDY				DUPLICATE EFFECTIVE (DE)				POST-CONDITIONS (PC)			
2002 FIS XS	FLOOD SOURCE	Q (CFS)	HEC-2 MODEL	FLOW REGIME	WSE (FT) (NGVD29)	WSE (FT) (NAVD88)	HEC-RAS MODEL	FLOW REGIME	WSE (FT) (NAVD88)	DE-EF (FT)	HEC-RAS MODEL	FLOW REGIME	WSE (FT) (NAVD88)	PC-DE (FT)
900	DUCK	11500	DCL6SUBB	SUB	1620.1	1622.5	DE6D	MIXED	1622.3	-0.2	PHASE3B	MIXED	1620	-2.3
1000	DUCK	11500	DCL6SUBB	SUB	1625.8	1628.2	DE6D	MIXED	1628.3	0.1	PHASE3B	MIXED	1624.1	-4.2
1100	DUCK	11500	DCL6SUBB	SUB	1629.4	1631.8	DE6D	MIXED	1631.3	-0.5	PHASE3B	MIXED	1626.3	-5.0
1200	DUCK	11500	DCL6SUBB	SUB	1633.2	1635.6	DE6D	MIXED	1635.0	-0.6	PHASE3B	MIXED	1628.2	-6.8
1300	DUCK	11500	DCL6SUBB	SUB	1637.5	1639.9	DE6D	MIXED	1638.7	-1.1	PHASE2D	MIXED	1633.7	-5.0
1400	DUCK	11500	DCL6SUBB	SUB	1641.4	1643.8	DE6D	MIXED	1643.7	0.0	PHASE2D	MIXED	1635	-8.7
1500	DUCK	11500	DCL6SUBB	SUB	1641.4	1643.8	DE6D	MIXED	1644.5	0.7	PHASE2D	MIXED	1636.6	-7.9
1600	DUCK	11500	DCL6SUBB	SUB	1642.0	1644.4	DE6D	MIXED	1644.7	0.3	PHASE2D	MIXED	1638.2	-6.5
1700	NO SECTION													
1800	DUCK	8562	DCL1SUBC	SUB	1642.4	1644.8	DE5B	MIXED	1646.4	1.6	PHASE2D	MIXED	1641.8	-4.5
1900	DUCK	8562	DCL1SUBC	SUB	1645.1	1647.5	DE5B	MIXED	1647.7	0.2	PHASE2D	MIXED	1644	-3.7
2000	DUCK	8562	DCL1SUBC	SUB	1646.3	1648.7	DE5B	MIXED	1648.8	0.1	PHASE2D	MIXED	1645	-3.8
2100	DUCK	8562	DCL1SUBC	SUB	1648.3	1650.7	DE5B	MIXED	1648.1	-2.6	PHASE2D	MIXED	1648.2	0.1
2200	DUCK	8562	DCL1SUBC	SUB	1648.7	1651.0	DE5B	MIXED	1649.6	-1.4	PHASE2D	MIXED	1649.7	0.1
2300	DUCK	8562	DCL1SPRC	SUPER	1648.2	1650.6	DE5B	MIXED	1650.6	0.0	PHASE2D	MIXED	1650.5	-0.1
2400	DUCK	8562	DCL1SPRC	SUPER	1649.6	1652.0	DE5B	MIXED	1651.7	-0.3	PHASE2D	MIXED	1651.6	-0.1
2500	DUCK	8562	DCL1SPRC	SUPER	1651.9	1654.3	DE5B	MIXED	1652.9	-1.3	PHASE2D	MIXED	1653	0.1
2600	DUCK	8562	DCL1SPRC	SUPER	1651.7	1654.1	DE5B	MIXED	1654.1	0.0	PHASE2D	MIXED	1654.3	0.2
2700	DUCK	8562	DCL1SPRC	SUPER	1652.9	1655.3	DE5B	MIXED	1655.3	0.1	PHASE2D	MIXED	1655.7	0.4



PROPOSED ZONE AE

EXISTING FLOODWAY

EXISTING SHADED ZONE X

2257 BASE FLOOD ELEVATION (BFE)

NORTH

GRAPHIC SCALE

1000 0 500 1000

(IN FEET)

1 inch = 1000 ft.

LOWER DUCK CREEK CLOMR

FIGURE 5

PROPOSED FIRM REVISIONS

G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

G:\550-039\DWG\FIG-3MJL.DWG

NATIONAL FLOOD INSURANCE PROGRAM
FEMA MAP COORDINATION CONTRACTOR

June 10, 2004

Mr. Kevin Eubanks, P.E., CFM
Assistant General Manager
Clark County Regional Flood Control District
600 South Grand Central Parkway, Suite 300
Las Vegas, NV 89106-4511

IN REPLY REFER TO:
Case No.: 04-09-0817R
Communities: City of Henderson and Clark County, NV
Community Nos.: 320005 and 320003

316-AD

Dear Mr. Eubanks:

This is in regard to your March 23, 2004, request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a Conditional Letter of Map Revision for the above-referenced communities. In a previous letter, you were informed that additional data might be required to complete our review of the request. The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed below.

1. The April 23, 2004, submittal contained a corrected effective HEC-RAS hydraulic model for Duck Creek from the confluence of Pittman Wash to approximately 2,000 feet upstream. Because the proposed conditions HEC-RAS model for Duck Creek extends from Broadbent Boulevard to Emerald Avenue, please submit a corrected effective HEC-RAS model for Duck Creek that covers the entire reach between Broadbent Boulevard and Emerald Avenue.

2. The known starting water-surface elevation (WSEL) used in the proposed conditions hydraulic analysis for Duck Creek is 1,612 feet. This WSEL assumes a coincident peak situation between Duck Creek and Las Vegas Wash. Please provide hydrologic justification for the coincident peak assumption, or revise the proposed conditions HEC-RAS model using critical depth as the starting WSEL for Duck Creek.

Please send the required data directly to us at the address shown at the bottom of this page. For identification purposes, please include the case number referenced above on all correspondence.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register,* is enclosed for your information.

If you are unable to meet the 90-day deadline for submittal of required items, and would like us to continue processing your request, you must request an extension of the deadline. This request must be submitted to us in writing and must provide (1) the reason why the data cannot be submitted within the requested timeframe, and (2) a new date for the submittal of the data. FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, the fees will be forfeited for any request for which neither the requested data nor a written extension request is received within 90 days.

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

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please call the Revisions Coordinator for your State, Mr. Sacha Tolme, who may be reached at (703) 960-8800, ext. 3028.

Sincerely,

Sheila M. Norlin
National LOMC Manager
Michael Baker Jr., Inc.

Enclosure

cc: Mr. Curt Chandler, P.E.
Land Development Manager
City of Henderson

Mr. David Betley, P.E.
Principal Engineer
Department of Public Works
Clark County

Mr. Michael J. Ludwig, P.E.
Project Engineer
G. C. Wallace, Inc.

APPENDIX

FEMA FORMS
BOULDER HIGHWAY BRIDGE EXHIBIT
HEC-RAS OUTPUT – DUPLICATE EFFECTIVE, DE5B
HEC-RAS OUTPUT- DUPLICATE EFFECTIVE, DE6D
HEC-RAS OUTPUT- POST-CONDITIONS, PHASE3B
REFERENCED INFORMATION
    HEC-2 SUMMARY TABLE – 2002 FIS RESTUDY
    CROSS SECTION EXHIBIT – 2002 FIS RESTUDY

FEMA FORMS

FEMA FORM 2

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: Duck Creek
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

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

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

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

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

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

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [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	800 ft. downstream of Boulder Highway	11785.87	1636	1627.6
Upstream Limit	Emerald Avenue (Duck Creek)	14300	1649.4	1649.7

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS V3.0.1 March 2001 [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:	DE5B & DE6D.PRJ	Floodway File Name:	
Corrected Effective Model*	Natural File Name:		Floodway File Name:	
Existing or Pre-Project Conditions Model	Natural File Name:		Floodway File Name:	
Revised or Post-Project Conditions Model	Natural File Name:	PHASE2D.PRJ	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.

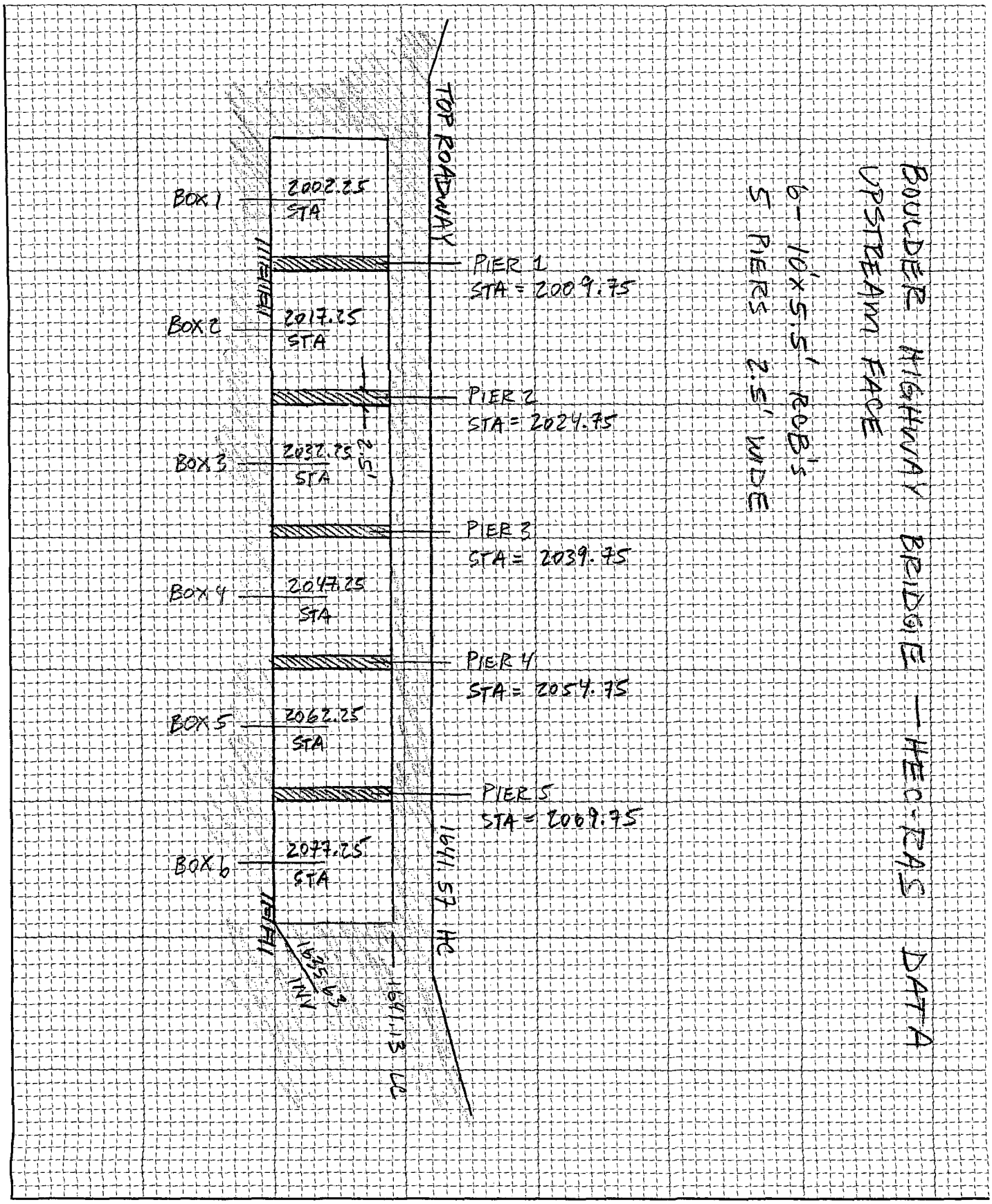
EXHIBIT

BOULDER HIGHWAY BRIDGE

DATE 6/14/04

CLIENT CCRFCD JOB NO 550.039 CALC BY MJL

DESCRIPTION LOWER DUCK CREEK CLOMR CHECKED BY



EN-3-N
3/66

G. C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

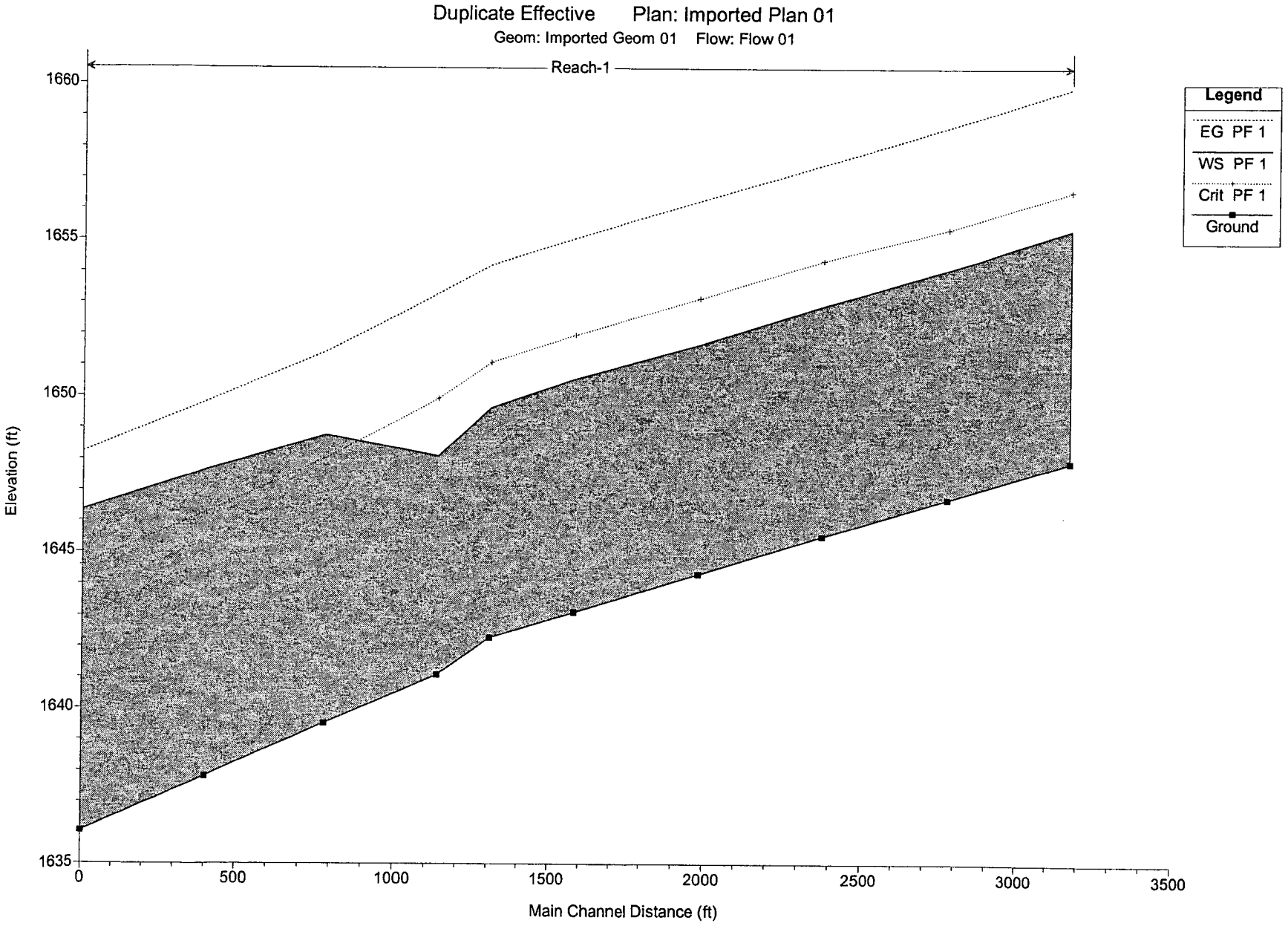
SHEET ____ OF ____

HEC-RAS OUTPUT

DE5B. PRJ: STANDARD TABLE 1
WATER SURFACE PROFILE
HEC-RAS SUMMARY REPORT
HEC-RAS CROSS SECTION PLOTS

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	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	2700	8562.00	1647.93	1655.31	1656.57	1659.87	0.003000	17.12	500.03	86.15	1.25
Reach-1	2600	8562.00	1646.73	1654.08	1655.35	1658.66	0.003023	17.17	498.55	85.97	1.26
Reach-1	2500	8562.00	1645.53	1652.92	1654.37	1657.46	0.002974	17.08	501.17	86.02	1.25
Reach-1	2400	8562.00	1644.33	1651.67	1653.15	1656.27	0.003041	17.20	497.69	85.99	1.26
Reach-1	2300	8562.00	1643.13	1650.56	1651.97	1655.05	0.002930	17.00	503.64	86.10	1.24
Reach-1	2200	8562.00	1642.30	1649.63	1651.09	1654.22	0.003019	17.18	498.37	85.72	1.26
Reach-1	2100	8562.00	1641.09	1648.11	1649.92	1653.31	0.010106	18.30	467.92	84.42	1.37
Reach-1	2000	8562.00	1639.52	1648.77	1648.04	1651.43	0.004213	13.10	653.72	93.14	0.87
Reach-1	1900	8562.00	1637.83	1647.67	1646.26	1649.82	0.003513	11.77	727.73	99.26	0.77
Reach-1	1800	8562.00	1636.06	1646.35	1644.58	1648.24	0.004002	11.02	777.11	114.12	0.74


Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1660
1655
1650
1645
1640
1635
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Duplicate Effective
Project File : de5B.prj
Run Date and Time: 6/15/2004 6:14:49 PM

Project in English units

Project Description:
LOWER DUCK CREEK CLOMR

DUPLICATE EFFECTIVE MODEL, DE5B.PRJ
HEC-RAS
FILE = DE5B.PRJ, CREATED FROM 2002 FIS FILE = DCL1SUBC
STREAM NAME: DUCK
CREEK
UPSTREAM LIMIT: FIS SECTION 2800, LOCATED APPROX. 300 FEET
DOWNSTREAM OF STEPHANIE STREET BRIDGE
DOWNSTREAM LIMIT: DUCK CREEK
CONFLUENCE WITH PITTMAN WASH
DUPLICATE EFFECTIVE MODEL SHIFTED UP 2.37
FT TO NAVD88 DATUM

PLAN DATA

Plan Title: Imported Plan 01
Plan File : g:\550-039\r061004\eff\de5B.p01

Geometry Title: Imported Geom 01
Geometry File : g:\550-039\r061004\eff\de5B.g01

Flow Title : Flow 01
Flow File : g:\550-039\r061004\eff\de5B.f01

Plan Summary Information:
Number of: Cross Sections = 10 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculaton tolerance = 0.003
Maximum number of interations = 20
Maximum difference tolerance = 0.1
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: Mixed Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1800	PF 2	0	0	0
1900	PF 2	0	0	0
2000	PF 2	0	0	0
2100	PF 2	0	0	0
2200	PF 2	0	0	0
2300	PF 2	0	0	0
2400	PF 2	0	0	0
2500	PF 2	0	0	0
2600	PF 2	0	0	0
2700	PF 2	0	0	0
2800	PF 2	0	0	0
2900	PF 2	0	0	0
2950	PF 2	0		
3000	PF 2	0	0	0
3100	PF 2	0	0	0
3200	PF 2	0	0	0
3300	PF 2	0	0	0
3400	PF 2	0	0	0
3500	PF 2	0	0	0
3600	PF 2	0	0	0
3700	PF 2	0	0	0

3800	PF 2	0	0	0
3900	PF 2	0	0	0
4000	PF 2	0	0	0
4100	PF 2	0	0	0
4200	PF 2	0	0	0
4300	PF 2	0	0	0
4400	PF 2	0	0	0
4500	PF 2	0	0	0
4600	PF 2	0	0	0
4700	PF 2	0	0	0
4800	PF 2	0	0	0
4900	PF 2	0	0	0
5000	PF 2	0	0	0
5100	PF 2	0	0	0
5200	PF 2	0	0	0
5250	PF 2	0		
5300	PF 2	0	0	0
5400	PF 2	0	0	0
5500	PF 2	0	0	0
5600	PF 2	0	0	0
5700	PF 2	0	0	0
5800	PF 2	0	0	0
5900	PF 2	0	0	0
6000	PF 2	0	0	0
6100	PF 2	0	0	0
6200	PF 2	0	0	0
6300	PF 2	0	0	0
6350	PF 2	0		
6400	PF 2	0	0	0
6500	PF 2	0	0	0
6600	PF 2	0	0	0
6700	PF 2	0	0	0
6750	PF 2	0		
6800	PF 2	0	0	0
6900	PF 2	0	0	0
7000	PF 2	0	0	0
7100	PF 2	0	0	0
7200	PF 2	0	0	0
7300	PF 2	0	0	0
7400	PF 2	0	0	0
7500	PF 2	0	0	0
7600	PF 2	0	0	0
7700	PF 2	0	0	0
7800	PF 2	0	0	0
7900	PF 2	0	0	0
8000	PF 2	4	.6	
8050	PF 2	0		
8100	PF 2	4	.6	
8200	PF 2	4	.6	
8300	PF 2	4	.6	
8400	PF 2	4	.6	
8500	PF 2	4	.6	
8600	PF 2	4	.6	
8650	PF 2	0		
8700	PF 2	4	.6	
8800	PF 2	4	.6	
8900	PF 2	4	.6	
9000	PF 2	4	.6	
9100	PF 2	4	.6	
9200	PF 2	4	.6	
9250	PF 2	0		
9300	PF 2	4	.6	
9400	PF 2	4	.6	
9500	PF 2	4	.6	
9600	PF 2	4	.6	
9650	PF 2	0		
9700	PF 2	4	.6	
9800	PF 2	4	.6	
9900	PF 2	4	.6	
10000	PF 2	4	.6	
10050	PF 2	0		
10100	PF 2	4	.6	
10200	PF 2	4	.6	
10300	PF 2	4	.6	
10400	PF 2	4	.6	
10500	PF 2	1	1810	2135
10600	PF 2	0		
10700	PF 2	0		
10800	PF 2	0		
10900	PF 2	0		
11000	PF 2	0		
11100	PF 2	0		
11200	PF 2	0		
11300	PF 2	0		
11400	PF 2	0		
11450	PF 2	0		
11500	PF 2	0		
11600	PF 2	0		
11650	PF 2	0		
11700	PF 2	0		
11800	PF 2	0		
11900	PF 2	0		
11950	PF 2	0		
12000	PF 2	0		
12100	PF 2	0		
12200	PF 2	0		
12300	PF 2	0		
12350	PF 2	0		
12400	PF 2	0		
12500	PF 2	0		
12600	PF 2	0		
12700	PF 2	0		
12800	PF 2	0		
12900	PF 2	0		

12950	PF 2	0		
13000	PF 2	0		
13100	PF 2	0		
13200	PF 2	0		
13300	PF 2	0		
13400	PF 2	0		
13450	PF 2	0		
13500	PF 2	0		
13600	PF 2	0		
13700	PF 2	0		
13800	PF 2	0		
13900	PF 2	0		
13950	PF 2	0		
14000	PF 2	0		
14100	PF 2	0		
14200	PF 2	0		
14300	PF 2	0		
14350	PF 2	0		
14400	PF 2	0		
14500	PF 2	0		
14600	PF 2	0		
14650	PF 2	0		
14700	PF 2	0		
14800	PF 2	1	1190	1430
14900	PF 2	1	1217	1417
15000	PF 2	4	.4	
15100	PF 2	4	.4	
15200	PF 2	4	.4	
15300	PF 2	4	.4	
15400	PF 2	4	.4	
15500	PF 2	4	.4	
15550	PF 2	0		
15600	PF 2	4	.4	
15700	PF 2	4	.4	
15800	PF 2	4	.4	
15900	PF 2	4	.4	
16000	PF 2	4	.4	
16100	PF 2	4	.4	
16200	PF 2	1	1371.54	1585.8
16300	PF 2	1	1161.82	1738.6
16400	PF 2	1	1219	2060
16500	PF 2	1	945	1685
16600	PF 2	1	1270	1880
16700	PF 2	1	1385	1885.98
16800	PF 2	1	1380	1789.21
16900	PF 2	4	.4	
17000	PF 2	1	1683	1854
17100	PF 2	1	960	1100
17150	PF 2	0		
17200	PF 2	1	1960	2200
17300	PF 2	4	.4	
17400	PF 2	1	975	1125
17500	PF 2	4	.4	
17550	PF 2	0		
17600	PF 2	4	.4	
17700	PF 2	4	.4	
17800	PF 2	1	1159	1303
17900	PF 2	4	.8	
18000	PF 2	4	.8	
18100	PF 2	4	.8	
18200	PF 2	4	.8	
18250	PF 2	0		
18300	PF 2	4	.8	
18400	PF 2	4	.8	
18500	PF 2	4	.8	
18600	PF 2	4	.8	
18700	PF 2	4	.8	
18800	PF 2	4	.8	
18900	PF 2	4	.8	
18950	PF 2	0		
19000	PF 2	4	.8	
19100	PF 2	4	.8	
19200	PF 2	4	.8	
19300	PF 2	4	.8	
19400	PF 2	4	.8	
19450	PF 2	0		
19500	PF 2	4	.8	
19600	PF 2	4	.8	
19700	PF 2	4	.8	
19800	PF 2	4	.8	
19900	PF 2	4	.8	
20000	PF 2	4	.8	
20100	PF 2	4	.8	
20150	PF 2	0		
20200	PF 2	4	.8	
20300	PF 2	4	.8	
20400	PF 2	4	.8	
20500	PF 2	4	.8	
20600	PF 2	4	.8	
20700	PF 2	4	.8	
20800	PF 2	4	.8	
20900	PF 2	4	.8	
21000	PF 2	4	.8	
21100	PF 2	4	.8	
21200	PF 2	4	.8	
21300	PF 2	4	.8	
21350	PF 2	0		
21400	PF 2	4	.8	
21500	PF 2	4	.8	
21600	PF 2	4	.8	
21700	PF 2	4	.8	
21800	PF 2	4	.8	
21900	PF 2	4	.8	
22000	PF 2	4	.8	

22100	PF 2	4	.8
22200	PF 2	4	.8
22300	PF 2	4	.8
22400	PF 2	4	.8
22450	PF 2	0	
22500	PF 2	4	.8
22600	PF 2	4	.8

FLOW DATA

Flow Title: Flow 01
Flow File : g:\550-039\r061004\eff\de5B.f01

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	2700	8562

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1	Normal S = .003	Normal S = .004

GEOMETRY DATA

Geometry Title: Imported Geom 01
Geometry File : g:\550-039\r061004\eff\de5B.g01

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 2700

INPUT
Description: PLANS STA 107+00, FIS STA 2700
DUCK CREEK CHANNEL PHASE 1
NAVD88
DATUM

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1658.07	1011.96	1657.83	1030.16	1648.93	1060	1647.93	1089.95	1648.83
1105.15	1656.27	1117.07	1656.57						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.11	1000	.015	1117.07	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1117.07	408.86	399.17	385.59	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1659.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.55	Wt. n-Val.		0.015	
W.S. Elev (ft)	1655.31	Reach Len. (ft)	408.86	399.17	385.59
Crit W.S. (ft)	1656.57	Flow Area (sq ft)		500.03	
E.G. Slope (ft/ft)	0.003000	Area (sq ft)		500.03	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	86.15	Top Width (ft)		86.15	
Vel Total (ft/s)	17.12	Avg. Vel. (ft/s)		17.12	
Max Chl Dpth (ft)	7.38	Hydr. Depth (ft)		5.80	
Conv. Total (cfs)	156316.8	Conv. (cfs)		156316.8	
Length Wtd. (ft)	399.17	Wetted Per. (ft)		89.19	
Min Ch El (ft)	1647.93	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)		17.98	
Frctn Loss (ft)		Cum Volume (acre-ft)		40.82	
C & E Loss (ft)		Cum SA (acres)		6.56	

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 2600

INPUT
Description: PLANS STA 111+00, FIS STA 2600
DUCK CREEK CHANNEL PHASE 1
NAVD88
DATUM

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1656.87	1012.07	1656.63	1030.04	1647.63	1060	1646.73	1090.21	1647.63
1105.11	1655.07	1116.95	1655.37						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.11	1000	.015	1116.95	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1116.95	401.61	398.88	398.4 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1658.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1654.08	Reach Len. (ft)	401.61	398.88	398.40
Crit W.S. (ft)	1655.35	Flow Area (sq ft)		498.55	
E.G. Slope (ft/ft)	0.003023	Area (sq ft)		498.55	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	85.97	Top Width (ft)		85.97	

Vel Total (ft/s)	17.17	Avg. Vel. (ft/s)	17.17
Max Chl Dpth (ft)	7.35	Hydr. Depth (ft)	5.80
Conv. Total (cfs)	155716.7	Conv. (cfs)	155716.7
Length Wtd. (ft)	398.88	Wetted Per. (ft)	89.05
Min Ch El (ft)	1646.73	Shear (lb/sq ft)	1.06
Alpha	1.00	Stream Power (lb/ft s)	18.15
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)	36.24
C & E Loss (ft)	0.00	Cum SA (acres)	5.77

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: RIVER-1
REACH: Reach-1 RS: 2500

INPUT
Description: PLANS STA 115+00, FIS STA 2500
DUCK CREEK CHANNEL PHASE 1
NAVD88
DATUM

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1654.17	1012.11	1653.93	1027.07	1646.43	1057.05	1645.53	1087.08	1646.43
1102.04	1653.87	1113.98	1654.17						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.045	1000	.015	1113.98	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1113.98	399	392.66	401.22	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1657.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.53	Wt. n-Val.		0.015	
W.S. Elev (ft)	1652.92	Reach Len. (ft)	399.00	392.66	401.22
Crit W.S. (ft)	1654.37	Flow Area (sq ft)		501.17	
E.G. Slope (ft/ft)	0.002974	Area (sq ft)		501.17	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	86.02	Top Width (ft)		86.02	
Vel Total (ft/s)	17.08	Avg. Vel. (ft/s)		17.08	
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)		5.83	
Conv. Total (cfs)	157009.6	Conv. (cfs)		157009.6	
Length Wtd. (ft)	392.66	Wetted Per. (ft)		89.11	
Min Ch El (ft)	1645.53	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)		17.84	
Frctn Loss (ft)	1.20	Cum Volume (acre-ft)		31.67	
C & E Loss (ft)	0.01	Cum SA (acres)		4.98	

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 energy loss was greater than 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: RIVER-1
REACH: Reach-1 RS: 2400

INPUT
Description: PLANS STA 119+00, FIS STA 2400
DUCK CREEK CHANNEL PHASE 1
NAVD88
DATUM

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1652.97	1011.94	1652.73	1026.89	1645.23	1057.04	1644.33	1087	1645.23
1102.05	1652.67	1113.9	1652.97						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.045	1000	.015	1113.9	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1113.9	390.08	400	398.4	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1656.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.60	Wt. n-Val.		0.015	
W.S. Elev (ft)	1651.67	Reach Len. (ft)	390.08	400.00	398.40
Crit W.S. (ft)	1653.15	Flow Area (sq ft)		497.69	
E.G. Slope (ft/ft)	0.003041	Area (sq ft)		497.69	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	85.99	Top Width (ft)		85.99	
Vel Total (ft/s)	17.20	Avg. Vel. (ft/s)		17.20	
Max Chl Dpth (ft)	7.34	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	155273.3	Conv. (cfs)		155273.3	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		89.04	
Min Ch El (ft)	1644.33	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		18.25	
Frctn Loss (ft)	1.18	Cum Volume (acre-ft)		27.17	
C & E Loss (ft)	0.01	Cum SA (acres)		4.21	

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: RIVER-1
REACH: Reach-1 RS: 2300

INPUT

Description: PLANS STA 123+00, FIS STA 2300
DUCK CREEK CHANNEL PHASE 1
NAVD88
DATUM

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1651.77	1011.96	1651.53	1027.08	1644.03	1056.93	1643.13	1087.02	1644.03
1101.84	1651.47	1113.94	1651.77						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.045	1000	.015	1113.94	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1113.94	275.68	275.48 273.31	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1655.05	Element			
Vel Head (ft)	4.49	Wt. n-Val.		0.015	
W.S. Elev (ft)	1650.56	Reach Len. (ft)	275.68	275.48	273.31
Crit W.S. (ft)	1651.97	Flow Area (sq ft)		503.64	
E.G. Slope (ft/ft)	0.002930	Area (sq ft)		503.64	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	86.10	Top Width (ft)		86.10	
Vel Total (ft/s)	17.00	Avg. Vel. (ft/s)		17.00	
Max Chl Dpth (ft)	7.43	Hydr. Depth (ft)		5.85	
Conv. Total (cfs)	158186.1	Conv. (cfs)		158186.1	
Length Wtd. (ft)	275.48	Wetted Per. (ft)		89.21	
Min Ch El (ft)	1643.13	Shear (lb/sq ft)		1.03	
Alpha	1.00	Stream Power (lb/ft s)		17.55	
Frctn Loss (ft)	1.22	Cum Volume (acre-ft)		22.57	
C & E Loss (ft)	0.00	Cum SA (acres)		3.42	

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 energy loss was greater than 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: RIVER-1
REACH: Reach-1 RS: 2200

INPUT
Description: PLANS STA 125+77.60, FIS STA 2200
GRADE BREAK, DUCK CREEK CHANNEL
PHASE 1
NAVD88 DATUM
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1650.87	1011.83	1650.7	1026.44	1643.2	1056.74	1642.3	1087.15	1643.2
1101.64	1650.67	1113.9	1650.87						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.045	1000	.015	1113.9	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1113.9	172.23	168.18 172.57	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1654.22	Element			
Vel Head (ft)	4.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1649.63	Reach Len. (ft)	172.23	168.18	172.57
Crit W.S. (ft)	1651.09	Flow Area (sq ft)		498.37	
E.G. Slope (ft/ft)	0.003019	Area (sq ft)		498.37	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	85.72	Top Width (ft)		85.72	
Vel Total (ft/s)	17.18	Avg. Vel. (ft/s)		17.18	
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)		5.81	
Conv. Total (cfs)	155836.6	Conv. (cfs)		155836.6	
Length Wtd. (ft)	168.18	Wetted Per. (ft)		88.87	
Min Ch El (ft)	1642.30	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		18.16	
Frctn Loss (ft)	0.82	Cum Volume (acre-ft)		19.40	
C & E Loss (ft)	0.01	Cum SA (acres)		2.88	

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 2100

INPUT
Description: PLANS STA 127+50, FIS STA 2100
GRADEBREAK, UPSTREAM INTERIM
CHANNEL, DUCK CREEK CHANNEL PHASE 1
NAVD88 DATUM
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1649.67	1011.69	1649.49	1027.12	1641.99	1057.06	1641.09	1086.89	1641.99
1101.64	1649.47	1114.02	1649.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.045	1000	.025	1114.02	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1114.02	353.86	355.79 360.71	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1653.31	Element			
Vel Head (ft)	5.20	Wt. n-Val.		0.025	

W.S. Elev (ft)	1648.11	Reach Len. (ft)	353.86	355.79	360.71
Crit W.S. (ft)	1649.92	Flow Area (sq ft)		467.92	
E.G. Slope (ft/ft)	0.010106	Area (sq ft)		467.92	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	84.42	Top Width (ft)		84.42	
Vel Total (ft/s)	18.30	Avg. Vel. (ft/s)		18.30	
Max Chl Dpth (ft)	7.02	Hydr. Depth (ft)		5.54	
Conv. Total (cfs)	85168.4	Conv. (cfs)		85168.4	
Length Wtd. (ft)	355.79	Wetted Per. (ft)		87.32	
Min Ch El (ft)	1641.09	Shear (lb/sq ft)		3.38	
Alpha	1.00	Stream Power (lb/ft s)		61.87	
Frctn Loss (ft)	0.85	Cum Volume (acre-ft)		17.53	
C & E Loss (ft)	0.06	Cum SA (acres)		2.55	

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: RIVER-1
REACH: Reach-1 RS: 2000

INPUT
Description: PLANS STA 131+08.73, FIS STA 2000
PC, INTERIM CHANNEL, DUCK CREEK
PHASE 1
NAVD88 DATUM
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
990.66	1654.37	1000	1651.09	1032.41	1640.42	1062.29	1639.52	1092.24	1640.42
1095.14	1646.37	1103.59	1650.37	1112.1	1654.37				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
990.66	.04	1000	.025	1095.14	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
990.66	1112.1	335.18	379.46	406.2	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1651.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.66	Wt. n-Val.		0.026	
W.S. Elev (ft)	1648.77	Reach Len. (ft)	335.18	379.46	406.20
Crit W.S. (ft)	1648.04	Flow Area (sq ft)		653.72	
E.G. Slope (ft/ft)	0.004213	Area (sq ft)		653.72	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	93.14	Top Width (ft)		93.14	
Vel Total (ft/s)	13.10	Avg. Vel. (ft/s)		13.10	
Max Chl Dpth (ft)	9.25	Hydr. Depth (ft)		7.02	
Conv. Total (cfs)	131915.8	Conv. (cfs)		131915.8	
Length Wtd. (ft)	379.46	Wetted Per. (ft)		98.77	
Min Ch El (ft)	1639.52	Shear (lb/sq ft)		1.74	
Alpha	1.00	Stream Power (lb/ft s)		22.80	
Frctn Loss (ft)	1.46	Cum Volume (acre-ft)		12.95	
C & E Loss (ft)	0.15	Cum SA (acres)		1.82	

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.
Note: Manning's n values were composited to a single value in the main channel.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1900

INPUT
Description: PLANS STA 134+96.55, FIS STA 1900
PT, INTERIM CHANNEL, DUCK CREEK
PHASE 1
NAVD88 DATUM
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
991.44	1650.37	1000	1648.73	1031.45	1638.73	1060.89	1637.83	1091.13	1638.73
1093.64	1642.37	1100.44	1646.37	1107.09	1650.37	1136.7	1650.37		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
991.44	.04	1000	.025	1091.13	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
991.44	1107.09	401.68	401.56	405.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1649.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.15	Wt. n-Val.		0.027	
W.S. Elev (ft)	1647.67	Reach Len. (ft)	401.68	401.56	405.37
Crit W.S. (ft)	1646.26	Flow Area (sq ft)		727.73	
E.G. Slope (ft/ft)	0.003513	Area (sq ft)		727.73	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	99.26	Top Width (ft)		99.26	
Vel Total (ft/s)	11.77	Avg. Vel. (ft/s)		11.77	
Max Chl Dpth (ft)	9.84	Hydr. Depth (ft)		7.33	
Conv. Total (cfs)	144462.7	Conv. (cfs)		144462.7	
Length Wtd. (ft)	401.56	Wetted Per. (ft)		104.04	
Min Ch El (ft)	1637.83	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)		18.05	
Frctn Loss (ft)	1.50	Cum Volume (acre-ft)		6.94	
C & E Loss (ft)	0.08	Cum SA (acres)		0.98	

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.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1800

INPUT
Description: PLANS STA 139+00
INTERIM CHANNEL, DUCK CREEK CHANNEL PHASE
1
NAVD88 DATUM
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
985.89	1646.37	1000	1644.96	1024.43	1636.96	1053.8	1636.06	1084.12	1636.69
1086.62	1642.37	1100.24	1646.37	1111.13	1646.37				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
985.89	.04	1000	.025	1084.12	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
985.89	1111.13	0	0	0 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1648.24	Element			
Vel Head (ft)	1.88	Wt. n-Val.		0.030	
W.S. Elev (ft)	1646.35	Reach Len. (ft)			
Crit W.S. (ft)	1644.58	Flow Area (sq ft)		777.11	
E.G. Slope (ft/ft)	0.004002	Area (sq ft)		777.11	
Q Total (cfs)	8562.00	Flow (cfs)		8562.00	
Top Width (ft)	114.12	Top Width (ft)		114.12	
Vel Total (ft/s)	11.02	Avg. Vel. (ft/s)		11.02	
Max Chl Dpth (ft)	10.29	Hydr. Depth (ft)		6.81	
Conv. Total (cfs)	135344.7	Conv. (cfs)		135344.7	
Length Wtd. (ft)		Wetted Per. (ft)		119.76	
Min Ch El (ft)	1636.06	Shear (lb/sq ft)		1.62	
Alpha	1.00	Stream Power (lb/ft s)		17.86	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Manning's n values were composited to a single value in the main channel.

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	2700	.11	.015	.045
Reach-1	2600	.11	.015	.045
Reach-1	2500	.045	.015	.045
Reach-1	2400	.045	.015	.045
Reach-1	2300	.045	.015	.045
Reach-1	2200	.045	.015	.045
Reach-1	2100	.045	.025	.045
Reach-1	2000	.04	.025	.04
Reach-1	1900	.04	.025	.04
Reach-1	1800	.04	.025	.04

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	2700	408.86	399.17	385.59
Reach-1	2600	401.61	398.88	398.4
Reach-1	2500	399	392.66	401.22
Reach-1	2400	390.08	400	398.4
Reach-1	2300	275.68	275.48	273.31
Reach-1	2200	172.23	168.18	172.57
Reach-1	2100	353.86	355.79	360.71
Reach-1	2000	335.18	379.46	406.2
Reach-1	1900	401.68	401.56	405.37
Reach-1	1800	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	2700	.1	.3
Reach-1	2600	.1	.3
Reach-1	2500	.1	.3
Reach-1	2400	.1	.3
Reach-1	2300	.1	.3
Reach-1	2200	.1	.3
Reach-1	2100	.1	.3
Reach-1	2000	.1	.3
Reach-1	1900	.1	.3
Reach-1	1800	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	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
Reach-1	2700	8562.00	1647.93	1655.31	1656.57	1659.87	0.003000	17.12	500.03	86.15	1.25
Reach-1	2600	8562.00	1646.73	1654.08	1655.35	1658.66	0.003023	17.17	498.55	85.97	1.26
Reach-1	2500	8562.00	1645.53	1652.92	1654.37	1657.46	0.002974	17.08	501.17	86.02	1.25
Reach-1	2400	8562.00	1644.33	1651.67	1653.15	1656.27	0.003041	17.20	497.69	85.99	1.26
Reach-1	2300	8562.00	1643.13	1650.56	1651.97	1655.05	0.002930	17.00	503.64	86.10	1.24
Reach-1	2200	8562.00	1642.30	1649.63	1651.09	1654.22	0.003019	17.18	498.37	85.72	1.26
Reach-1	2100	8562.00	1641.09	1648.11	1649.92	1653.31	0.010106	18.30	467.92	84.42	1.37
Reach-1	2000	8562.00	1639.52	1648.77	1648.04	1651.43	0.004213	13.10	653.72	93.14	0.87
Reach-1	1900	8562.00	1637.83	1647.67	1646.26	1649.82	0.003513	11.77	727.73	99.26	0.77
Reach-1	1800	8562.00	1636.06	1646.35	1644.58	1648.24	0.004002	11.02	777.11	114.12	0.74

Profile Output Table - Standard Table 2

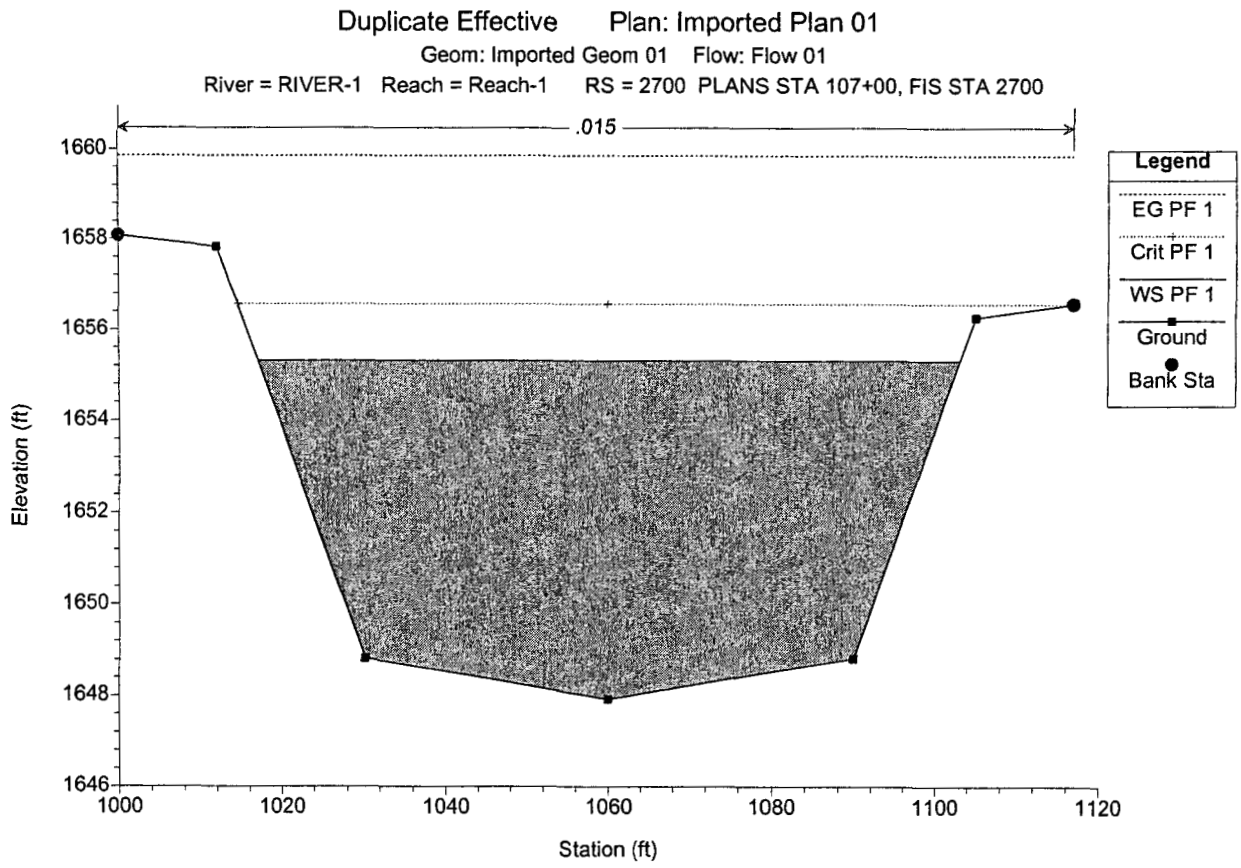
Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	2700	1659.87	1655.31	4.55				8562.00		86.15
Reach-1	2600	1658.66	1654.08	4.58	1.20	0.00		8562.00		85.97
Reach-1	2500	1657.46	1652.92	4.53	1.20	0.01		8562.00		86.02
Reach-1	2400	1656.27	1651.67	4.60	1.18	0.01		8562.00		85.99
Reach-1	2300	1655.05	1650.56	4.49	1.22	0.00		8562.00		86.10
Reach-1	2200	1654.22	1649.63	4.58	0.82	0.01		8562.00		85.72
Reach-1	2100	1653.31	1648.11	5.20	0.85	0.06		8562.00		84.42
Reach-1	2000	1651.43	1648.77	2.66	1.46	0.15		8562.00		93.14
Reach-1	1900	1649.82	1647.67	2.15	1.50	0.08		8562.00		99.26
Reach-1	1800	1648.24	1646.35	1.88				8562.00		114.12

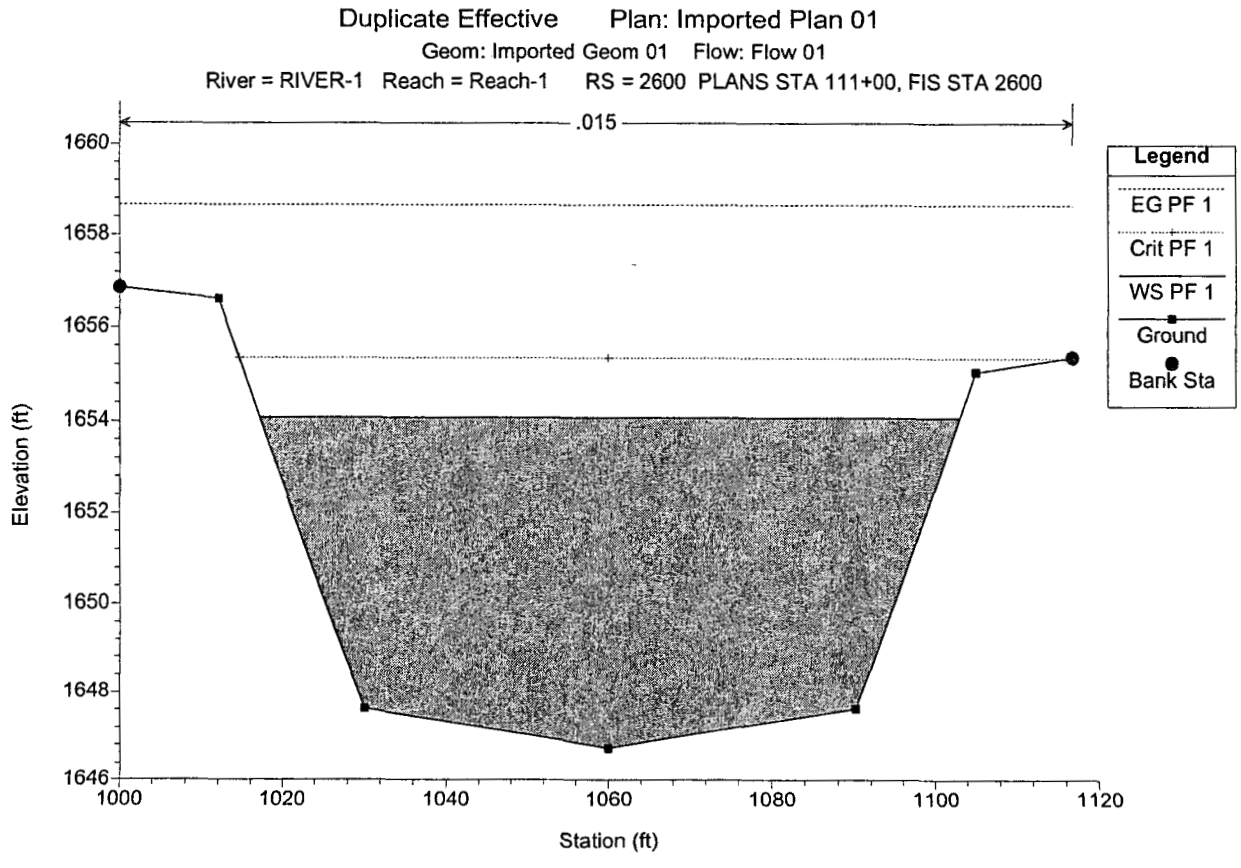
Profile Output Table - Six XS Bridge

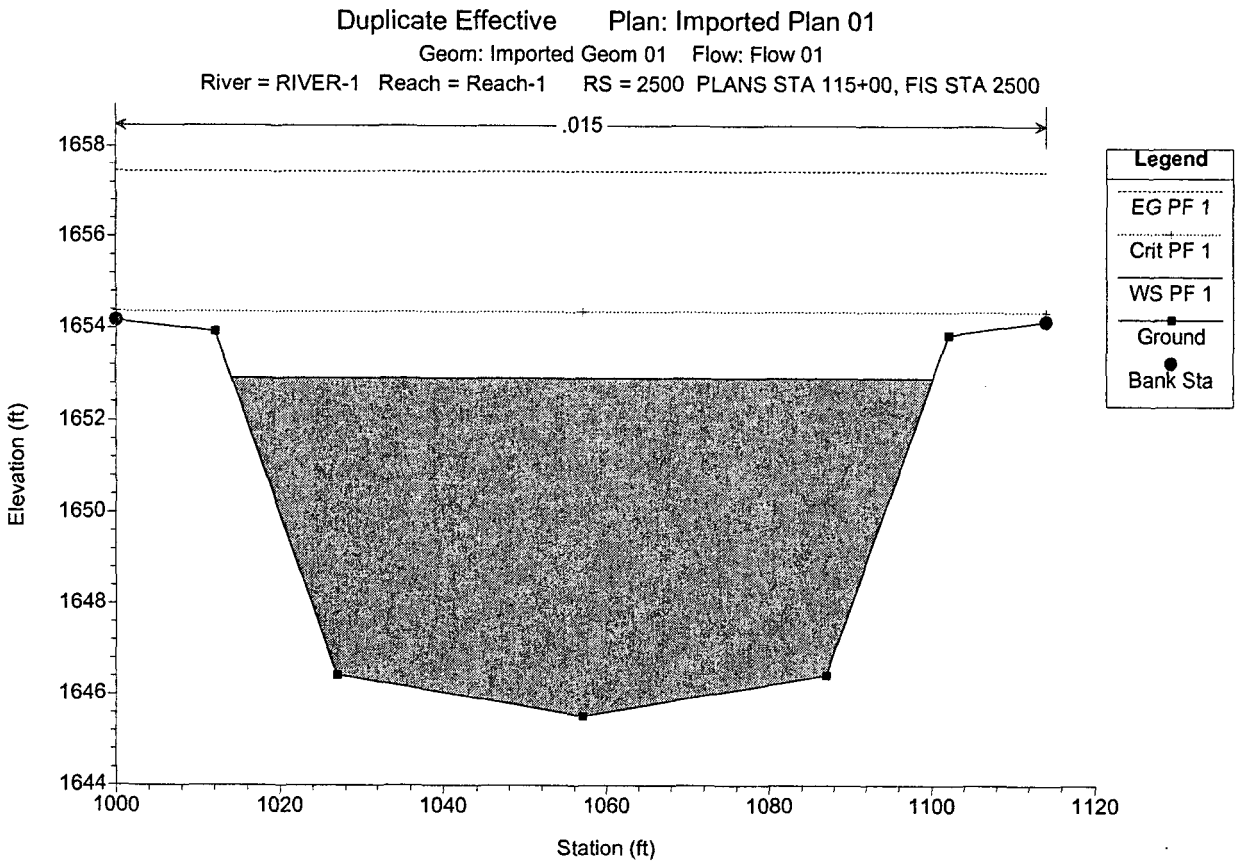
Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Frctn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)

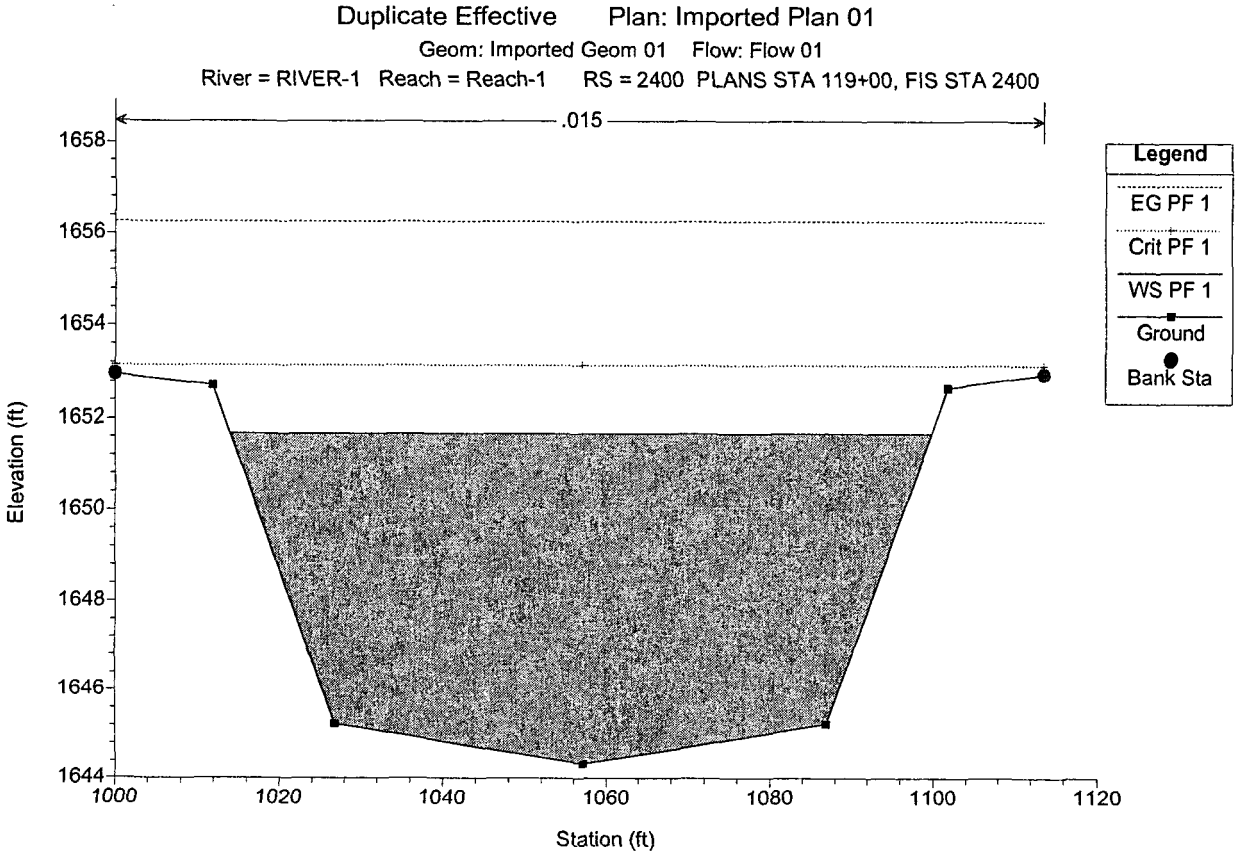
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Imported Pla

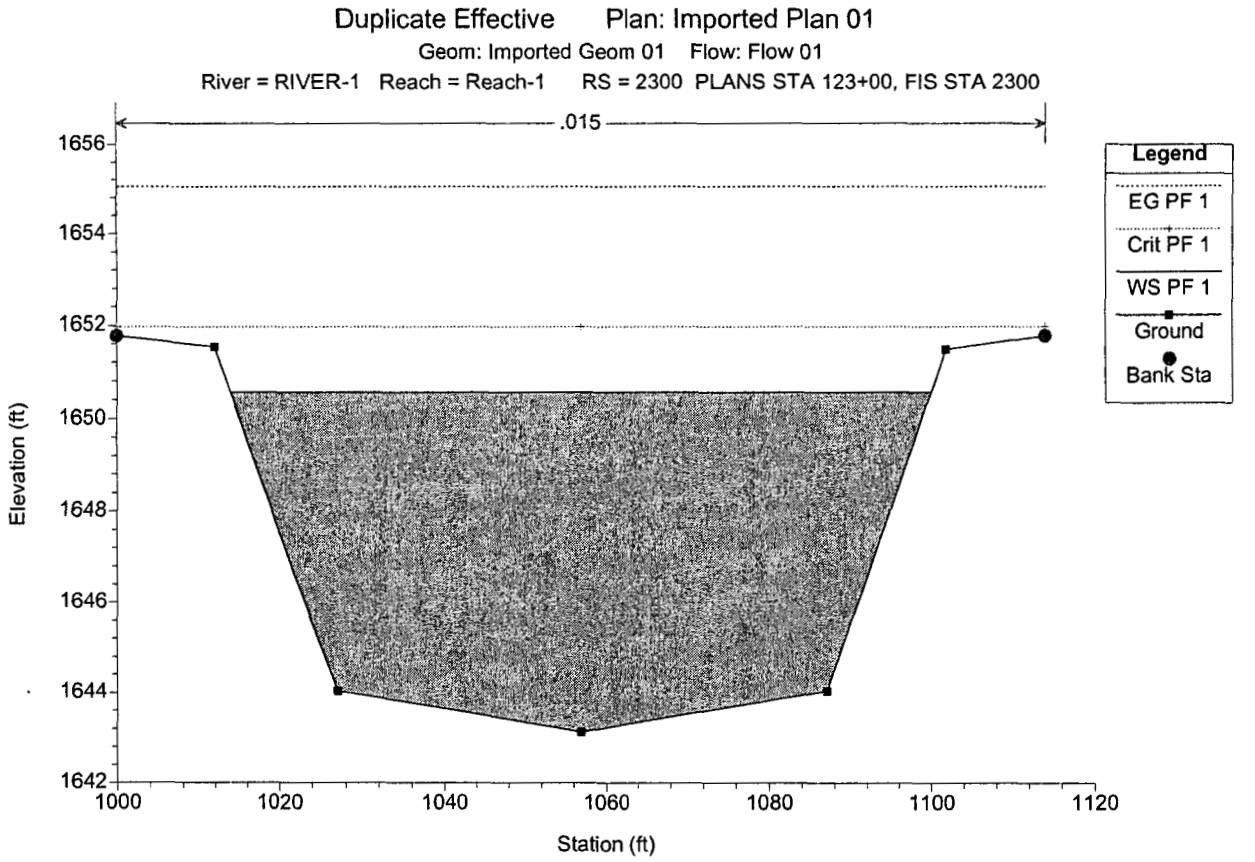
River: RIVER-1 Reach: Reach-1 RS: 2600 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 2500 Profile: PF 1
Warning:The energy equation could 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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 2400 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 2300 Profile: PF 1
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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 2100 Profile: PF 1
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.
River: RIVER-1 Reach: Reach-1 RS: 2000 Profile: PF 1
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.
Note: Manning's n values were composited to a single value in the main channel.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: RIVER-1 Reach: Reach-1 RS: 1900 Profile: PF 1
Warning:The energy loss was 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.
River: RIVER-1 Reach: Reach-1 RS: 1800 Profile: PF 1
Note: Manning's n values were composited to a single value in the main channel.

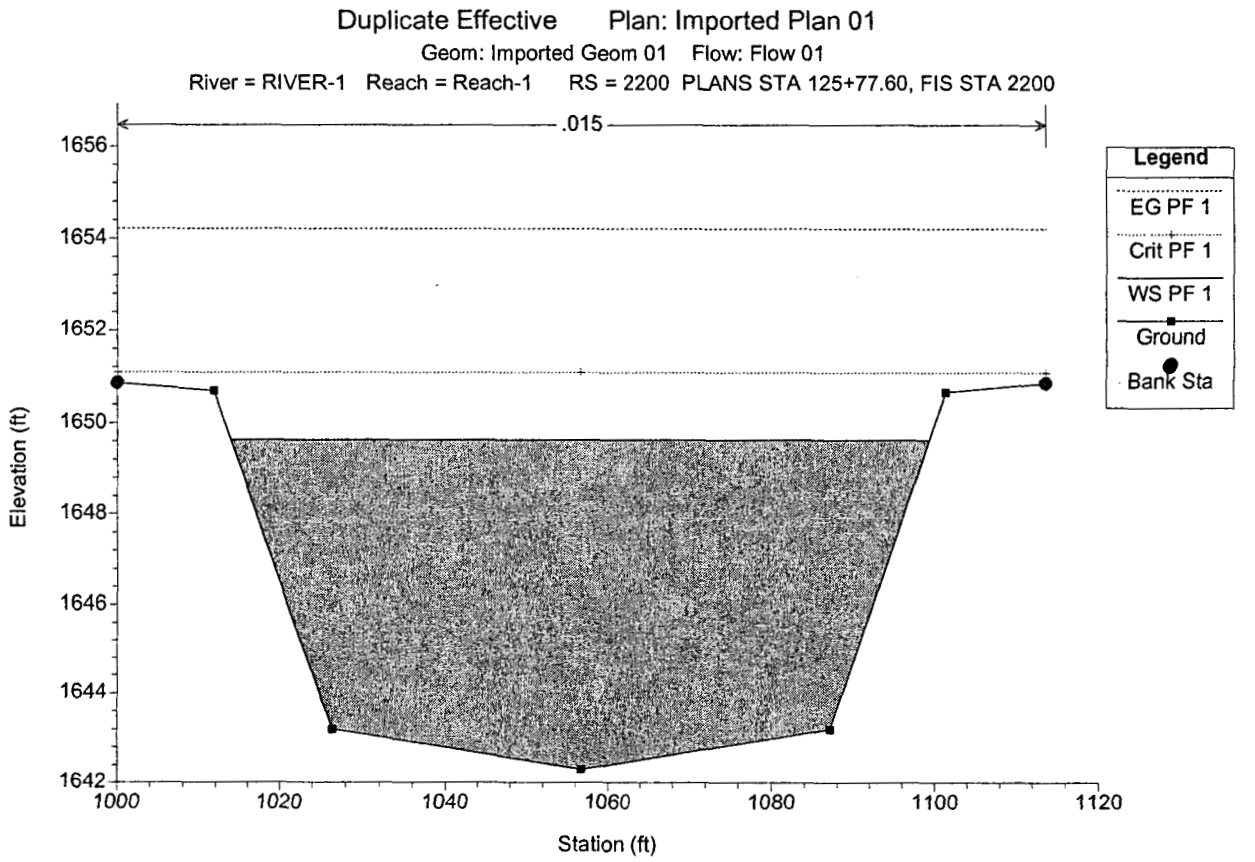

Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2700 PLANS STA 107+00, FIS STA 2700
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1660
1658
1656
1654
1652
1650
1648
1646
1000
1020
1040
1060
1080
1100
1120

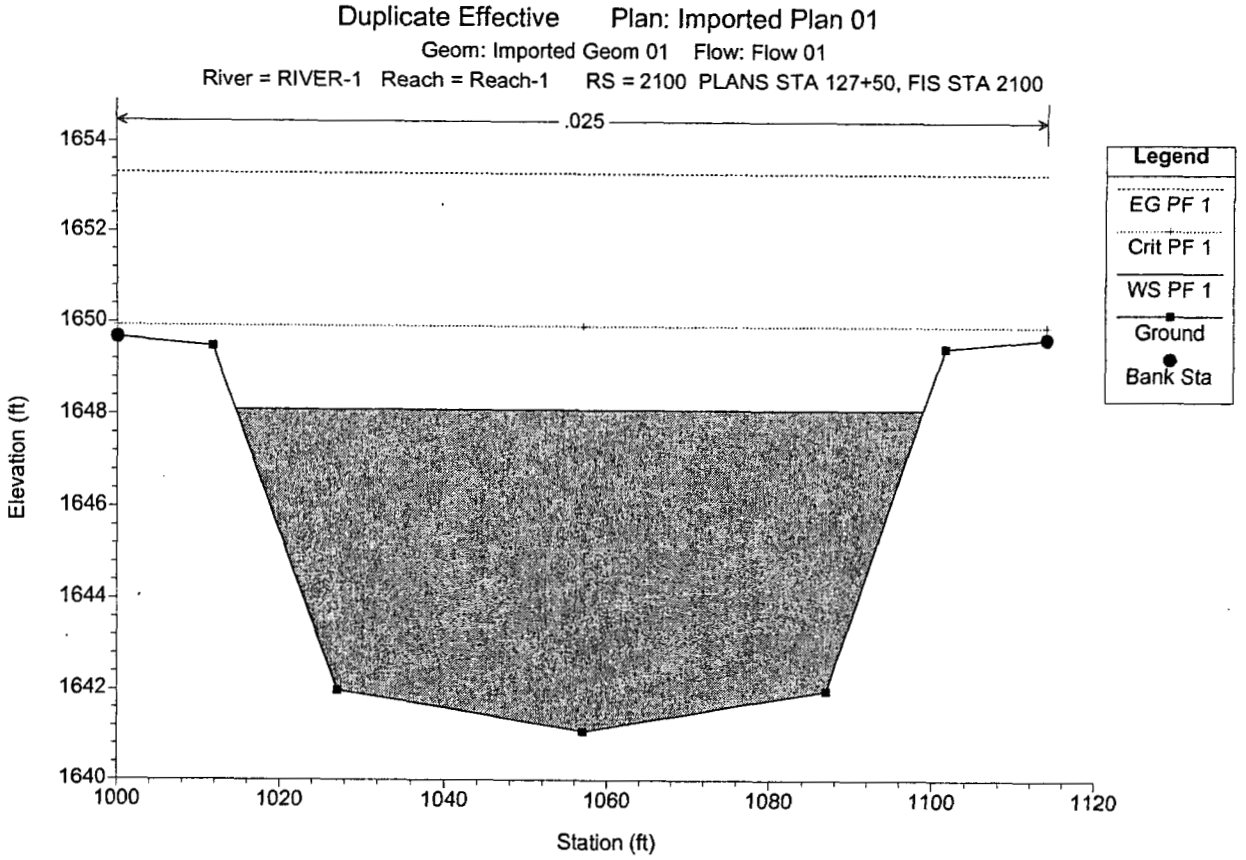

Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2600 PLANS STA 111+00, FIS STA 2600
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1660
1658
1656
1654
1652
1650
1648
1646
1000
1020
1040
1060
1080
1100
1120

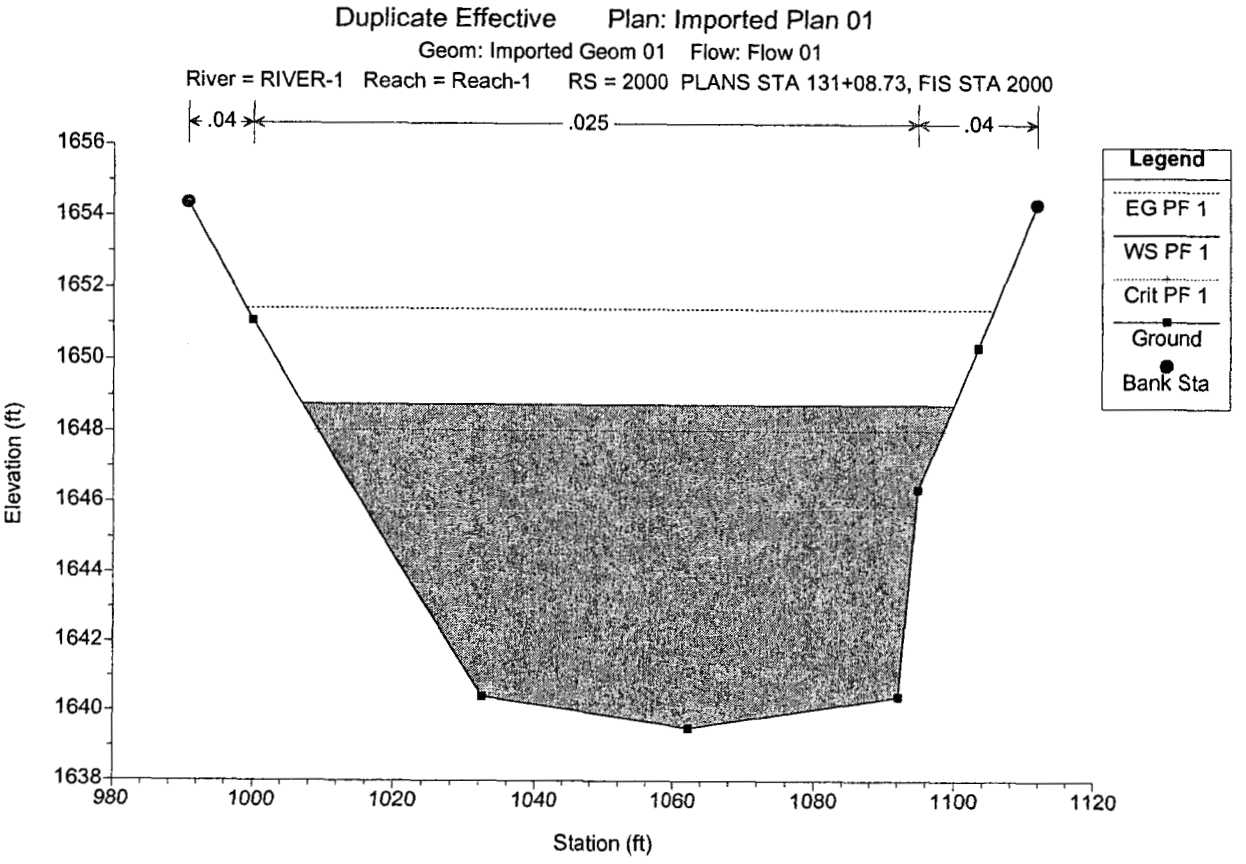

Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2500 PLANS STA 115+00, FIS STA 2500
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1658
1656
1654
1652
1650
1648
1646
1644
1000
1020
1040
1060
1080
1100
1120
Station (ft)

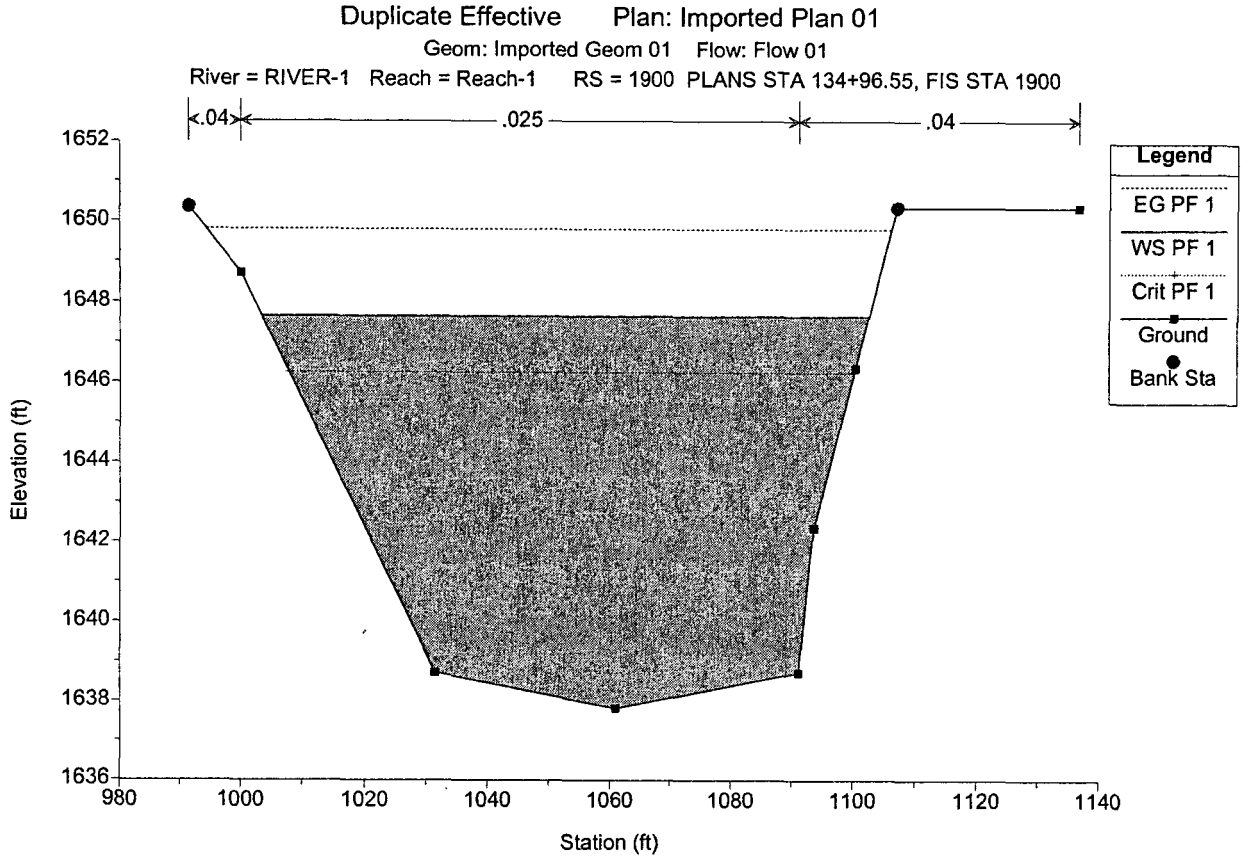

Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2400 PLANS STA 119+00, FIS STA 2400
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1658
1656
1654
1652
1650
1648
1646
1644
1000
1020
1040
1060
1080
1100
1120
Station (ft)

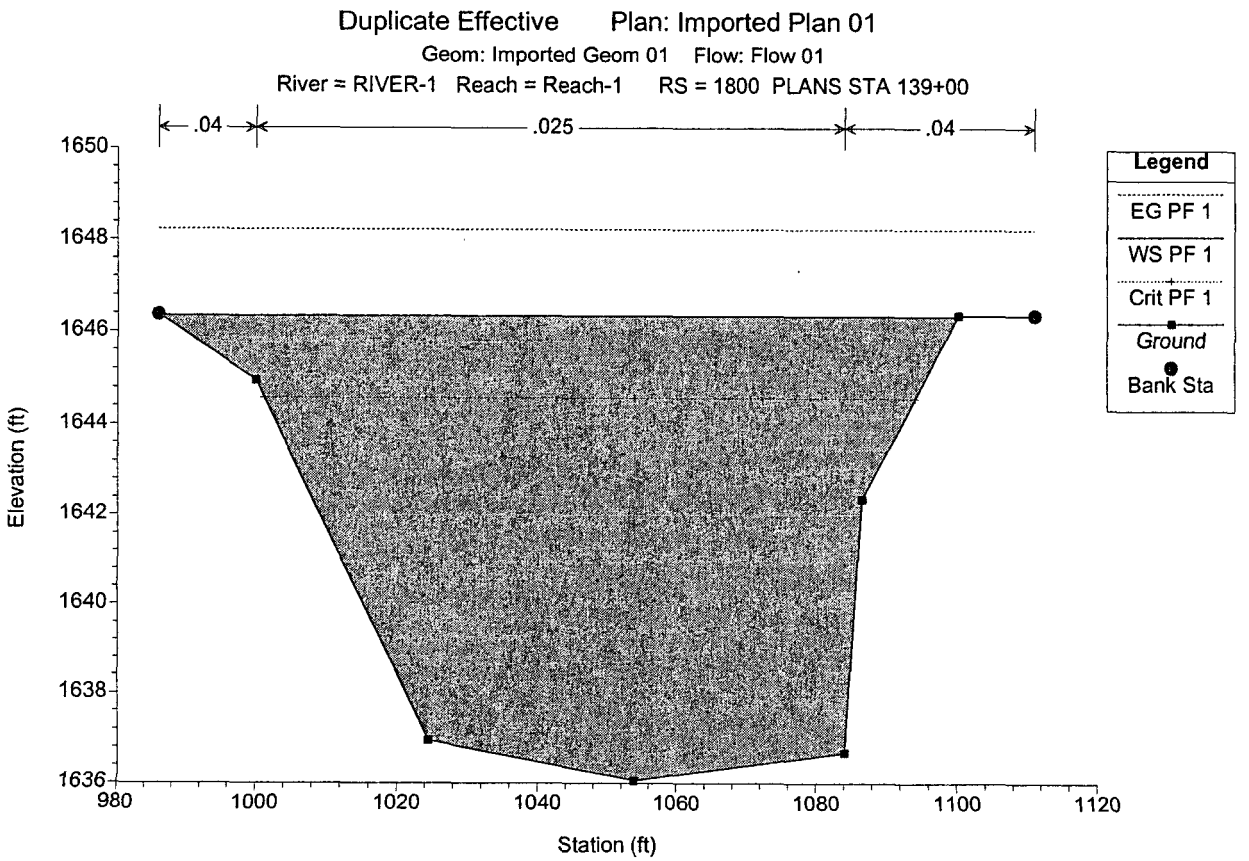

Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2300 PLANS STA 123+00, FIS STA 2300
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1656
1654
1652
1650
1648
1646
1644
1642
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2200 PLANS STA 125+77.60, FIS STA 2200
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1656
1654
1652
1650
1648
1646
1644
1642
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2100 PLANS STA 127+50, FIS STA 2100
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1654
1652
1650
1648
1646
1644
1642
1640
1000
1020
1040
1060
1080
1100
1120


Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 2000 PLANS STA 131+08.73, FIS STA 2000
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1656
1654
1652
1650
1648
1646
1644
1642
1640
1638
980
1000
1020
1040
1060
1080
1100
1120


Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1900 PLANS STA 134+96.55, FIS STA 1900
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
980
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duplicate Effective Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1800 PLANS STA 139+00
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1650
1648
1646
1644
1642
1640
1638
1636
980
1000
1020
1040
1060
1080
1100
1120
Station (ft)

HEC-RAS OUTPUT

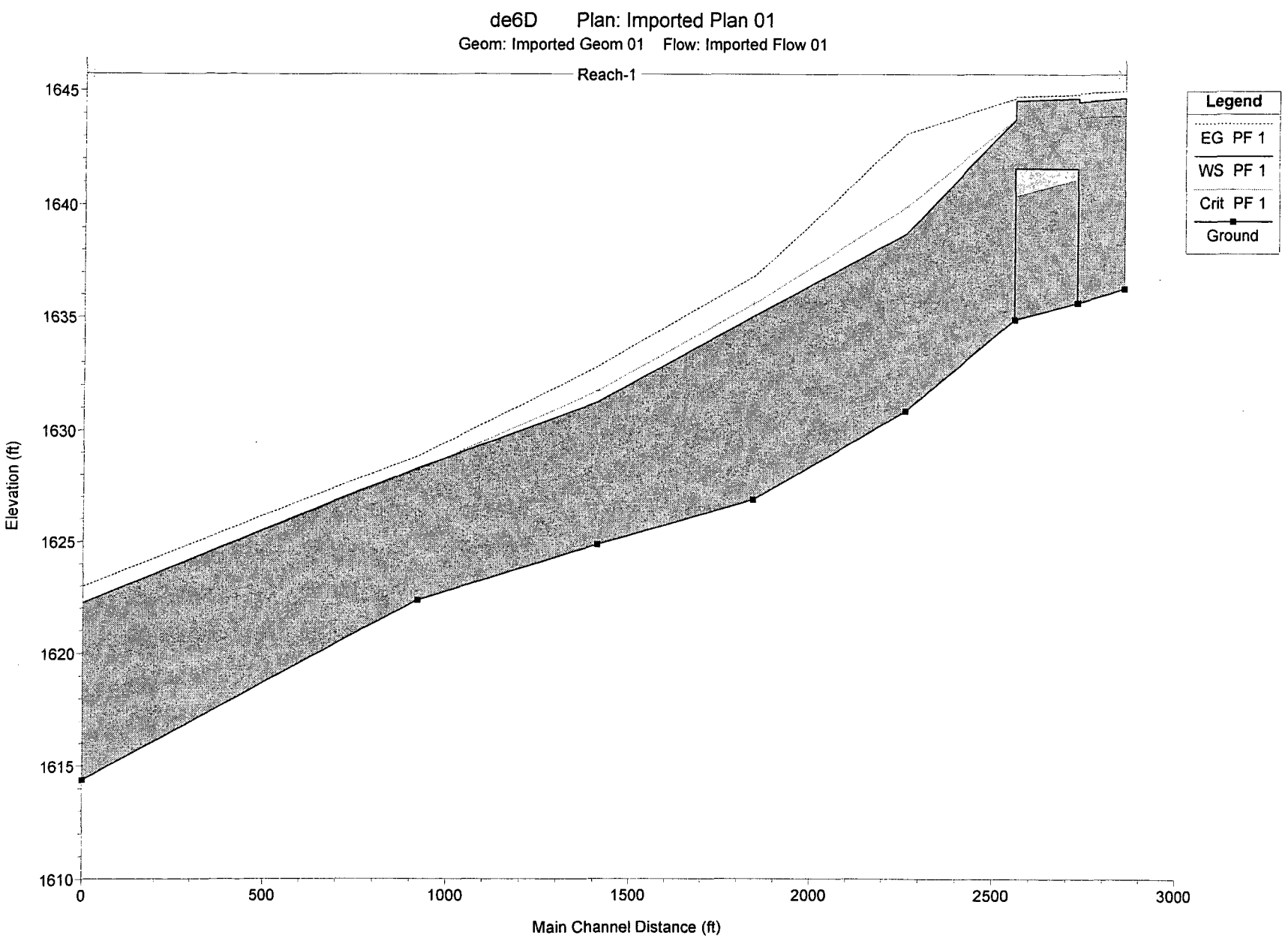
DE6D. PRJ:
STANDARD TABLE 1
SIX XS BRIDGE TABLE
WATER SURFACE PROFILE
HEC-RAS SUMMARY REPORT
HEC-RAS CROSS SECTION PLOTS

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	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	1600	11500.00	1636.27	1644.68	1643.91	1644.99	0.001143	6.47	3957.26	1679.65	0.40
Reach-1	1500	11500.00	1635.63	1644.51	1643.83	1644.90	0.000314	6.92	3479.22	1771.34	0.41
Reach-1	1450	Bridge									
Reach-1	1400	11500.00	1634.87	1643.74	1643.74	1644.66	0.000594	9.41	2359.24	1350.78	0.56
Reach-1	1300	11500.00	1630.87	1638.73	1639.90	1643.11	0.018461	17.54	1034.53	1343.07	1.18
Reach-1	1200	11500.00	1626.87	1635.04	1635.57	1636.80	0.007927	12.09	1949.06	2025.70	0.79
Reach-1	1100	11500.00	1624.87	1631.27	1631.77	1632.83	0.010154	11.98	2165.48	1985.77	0.87
Reach-1	1000	11500.00	1622.37	1628.31	1628.24	1628.85	0.006339	8.83	3798.11	2462.25	0.68
Reach-1	900	11500.00	1614.37	1622.25	1622.25	1622.99	0.008663	9.93	2859.00	1866.74	0.72

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
Reach-1	1600	1644.99	1644.68	1643.91	0.07	0.02	1679.65	3755.66	4887.22	2857.12	6.47
Reach-1	1500	1644.90	1644.51	1643.83	0.00	0.07	1771.34	2942.06	5373.49	3184.45	6.92
Reach-1	1450 BR U	1644.83	1644.67	1643.49	0.09	0.00	1864.28	4204.13	2630.81	4665.06	3.85
Reach-1	1450 BR D	1644.73	1644.55	1643.48	0.00	0.07	1795.68	4179.35	2770.77	4549.88	4.12
Reach-1	1400	1644.66	1643.74	1643.74	0.37	0.10	1350.78	2164.07	7307.51	2028.42	9.41
Reach-1	1300	1643.11	1638.73	1639.90	0.52	1.03	1343.07	771.18	10541.51	187.32	17.54


de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1645
1640
1635
1630
1625
1620
1615
1610
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: de6D
Project File : de6D.prj
Run Date and Time: 6/15/2004 3:46:43 PM

Project in English units

Project Description:
LOWER DUCK CREEK CLOMR

DUPLICATE EFFECTIVE MODEL, DE6D.PRJ
HEC-RAS
FILE = DE6D.PRJ, CREATED FROM 2002 FIS FILE = DCL6SUBB
STREAM NAME: DUCK
CREEK
UPSTREAM LIMIT: FIS SECTION 1600, LOCATED APPROX. 200 FEET
UPSTREAM OF BOULDER HIGHWAY BRIDGE
DOWNSTREAM LIMIT: APPROX. 300 FT
DOWNSTREAM OF HOLLYWOOD BLVD.
DUPLICATE EFFECTIVE MODEL SHIFTED UP 2.37
FT TO NAVD88 DATUM

PLAN DATA

Plan Title: Imported Plan 01
Plan File : g:\550-039\r061004\eff\de6D.p01

Geometry Title: Imported Geom 01
Geometry File : g:\550-039\r061004\eff\de6D.g01

Flow Title : Imported Flow 01
Flow File : g:\550-039\r061004\eff\de6D.f01

Plan Summary Information:
Number of: Cross Sections = 8 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 1

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculaton tolerance = 0.003
Maximum number of interations = 20
Maximum difference tolerance = 0.1
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: Mixed Flow

FLOW DATA

Flow Title: Imported Flow 01
Flow File : g:\550-039\r061004\eff\de6D.f01

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	1600	11500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1	Normal S = .004	Known WS = 1620.1

GEOMETRY DATA

Geometry Title: Imported Geom 01
Geometry File : g:\550-039\r061004\eff\de6D.g01

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1600

INPUT
Description: PLANS STA 141+64, FIS STA 1600
NAVD88 DATUM
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1650.37	1736.21	1646.37	2020.75	1642.37	2629.24	1642.37	2661.24	1642.37
2714.58	1642.37	2721.94	1636.27	2804.82	1636.27	2808.49	1642.37	2855.72	1642.37
2861.62	1642.37	3056.47	1642.37	3307.27	1642.37	3705.05	1646.37	3950.38	1646.37
4389.51	1646.37								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	2661.24	.03	2861.62	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

	2714.58	2808.49	119.69	129.64	131.42	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1644.99	Element			
Vel Head (ft)	0.31	Wt. n-Val.	0.039	0.030	0.039
W.S. Elev (ft)	1644.68	Reach Len. (ft)	119.69	129.64	131.42
Crit W.S. (ft)	1643.91	Flow Area (sq ft)	1787.98	755.64	1413.64
E.G. Slope (ft/ft)	0.001143	Area (sq ft)	1787.98	755.64	1413.64
Q Total (cfs)	11500.00	Flow (cfs)	3755.66	4887.22	2857.12
Top Width (ft)	1679.65	Top Width (ft)	857.77	93.91	727.97
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)	2.10	6.47	2.02
Max Chl Dpth (ft)	8.40	Hydr. Depth (ft)	2.08	8.05	1.94
Conv. Total (cfs)	340134.8	Conv. (cfs)	111081.0	144548.9	84505.0
Length Wtd. (ft)	127.21	Wetted Per. (ft)	857.79	99.56	727.98
Min Ch El (ft)	1636.27	Shear (lb/sq ft)	0.15	0.54	0.14
Alpha	2.40	Stream Power (lb/ft s)	0.31	3.50	0.28
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	68.74	40.32	47.51
C & E Loss (ft)	0.02	Cum SA (acres)	71.03	6.31	44.66

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: RIVER-1
REACH: Reach-1 RS: 1500

INPUT
Description: PLANS STA 142+90, FIS STA 1500
NAVD88 DATUM
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
423.75	1650.37	1013.75	1646.37	1198.75	1645	1423.75	1644	1633.75	1642.54
1723.75	1642.07	1996	1641.57	1996	1635.63	2083.5	1635.63	2083.5	1641.57
2278.75	1642.07	2458.75	1642.5	2548.75	1643	3738.75	1646.37		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
423.75	.016	1996	.015	2083.5	.016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

	1996	2083.5	177.24	171.02	184.09	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1644.90	Element			
Vel Head (ft)	0.39	Wt. n-Val.	0.016	0.015	0.016
W.S. Elev (ft)	1644.51	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1643.83	Flow Area (sq ft)	1218.55	776.75	1483.92
E.G. Slope (ft/ft)	0.000314	Area (sq ft)	1218.55	776.75	1483.92
Q Total (cfs)	11500.00	Flow (cfs)	2942.06	5373.49	3184.45
Top Width (ft)	1771.34	Top Width (ft)	686.37	87.50	997.47
Vel Total (ft/s)	3.31	Avg. Vel. (ft/s)	2.41	6.92	2.15
Max Chl Dpth (ft)	8.88	Hydr. Depth (ft)	1.78	8.88	1.49
Conv. Total (cfs)	648564.6	Conv. (cfs)	165923.2	303048.0	179593.3
Length Wtd. (ft)	1.00	Wetted Per. (ft)	686.38	99.38	997.47
Min Ch El (ft)	1635.63	Shear (lb/sq ft)	0.03	0.15	0.03
Alpha	2.30	Stream Power (lb/ft s)	0.08	1.06	0.06
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	64.61	38.04	43.14
C & E Loss (ft)	0.07	Cum SA (acres)	68.90	6.04	42.06

BRIDGE RIVER: RIVER-1
REACH: Reach-1 RS: 1450

INPUT
Description:
Distance from Upstream XS = 1
Deck/Roadway Width = 170
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 14

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
423.75 1650.37	1641.13	1013.75 1646.37	1641.13	1198.75 1645	1641.13
1423.75 1644	1641.13	1633.75 1642.54	1641.13	1723.75 1642.07	1641.13
1996 1641.57	1641.13	1996 1641.57	1641.13	2083.5 1641.57	1641.13
2083.5 1641.57	1641.13	2278.75 1642.07	1641.13	2458.75 1642.5	1641.13
2548.75 1643	1641.13	3738.75 1646.37	1641.13		

Upstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
423.75	1650.37	1013.75	1646.37	1198.75	1645	1423.75	1644	1633.75	1642.54
1723.75	1642.07	1996	1641.57	1996	1635.63	2083.5	1635.63	2083.5	1641.57
2278.75	1642.07	2458.75	1642.5	2548.75	1643	3738.75	1646.37		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
  423.75    .016    1996    .015  2083.5    .016

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1996  2083.5             .1       .3

Downstream  Deck/Roadway Coordinates
    num=      14
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  423.75 1650.37 1640.37 1013.75 1646.37 1640.37 1198.75    1645 1640.37
 1423.75    1644 1640.37 1633.75 1642.54 1640.37 1723.75 1642.07 1640.37
    1996 1641.57 1640.37    1996 1641.57 1640.37  2083.5 1641.57 1640.37
  2083.5 1641.57 1640.37 2278.75 1642.07 1640.37 2458.75  1642.5 1640.37
 2548.75    1643 1640.37 3738.75 1646.37 1640.37

Downstream Bridge Cross Section Data
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  423.25 1650.37 1013.25 1646.37 1198.25    1645 1423.25    1644 1633.25 1642.54
 1723.25 1642.07    1996 1641.57    1996 1634.87  2083.5 1634.87  2083.5 1641.57
 2278.25 1642.07 2458.25  1642.5 2548.25    1643 3738.25 1646.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  423.25    .016    1996    .015  2083.5    .016

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1996  2083.5             .3       .5

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 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 Piers =  5

Pier Data
Pier Station     Upstream= 2009.75    Downstream= 2009.75
Upstream     num=       2
    Width   Elev    Width   Elev
     2.5 1635.63     2.5 1641.13
Downstream     num=       2
    Width   Elev    Width   Elev
     2.5 1634.87     2.5 1640.37

Pier Data
Pier Station     Upstream= 2024.75    Downstream= 2024.75
Upstream     num=       2
    Width   Elev    Width   Elev
     2.5 1635.63     2.5 1641.13
Downstream     num=       2
    Width   Elev    Width   Elev
     2.5 1634.87     2.5 1640.37

Pier Data
Pier Station     Upstream= 2039.75    Downstream= 2039.75
Upstream     num=       2
    Width   Elev    Width   Elev
     2.5 1635.63     2.5 1641.13
Downstream     num=       2
    Width   Elev    Width   Elev
     2.5 1634.87     2.5 1640.37

Pier Data
Pier Station     Upstream= 2054.75    Downstream= 2054.75
Upstream     num=       2
    Width   Elev    Width   Elev
     2.5 1635.63     2.5 1641.13
Downstream     num=       2
    Width   Elev    Width   Elev
     2.5 1634.87     2.5 1640.37

Pier Data
Pier Station     Upstream= 2069.75    Downstream= 2069.75
Upstream     num=       2
    Width   Elev    Width   Elev
     2.5 1635.63     2.5 1641.13
Downstream     num=       2
    Width   Elev    Width   Elev
     2.5 1634.87     2.5 1640.37

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =       2
       Yarnell                KVal =    1.25
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT    Profile #PF 1
Opening : Single BR
```

E.G. US. (ft)	1644.90	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1644.51	E.G. Elev (ft)	1644.83	1644.73
Q Total (cfs)	11500.00	W.S. Elev (ft)	1644.67	1644.55
Q Bridge (cfs)	1412.14	Crit W.S. (ft)	1643.49	1643.48
Q Weir (cfs)		Max Chl Dpth (ft)	9.04	9.68
Weir Sta Lft (ft)		Vel Total (ft/s)	3.14	3.34
Weir Sta Rgt (ft)		Flow Area (sq ft)	3664.22	3447.26
Weir Submerg		Froude # Chl	0.01	0.01
Weir Max Depth (ft)		Specif Force (cu ft)	7490.21	7456.56
Min El Weir Flow (ft)	1641.58	Hydr Depth (ft)	1.97	1.92
Min El Prs (ft)	1641.13	W.P. Total (ft)	2080.29	2011.69
Delta EG (ft)	0.24	Conv. Total (cfs)	508611.3	470844.0
Delta WS (ft)	0.76	Top Width (ft)	1864.28	1795.68
BR Open Area (sq ft)	412.50	Frctn Loss (ft)	0.09	0.00
BR Open Vel (ft/s)	3.42	C & E Loss (ft)	0.00	0.07
Coef of Q		Shear Total (lb/sq ft)	0.06	0.06
Br Sel Method	Energy only	Power Total (lb/ft s)	0.18	0.21

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
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 parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1400

INPUT
Description: PLANS STA 144+75, FIS STA 1400
UPSTREAM FACE OF BOULDER HIGHWAY
BRIDGE
NAVD88 DATUM
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
423.25	1650.37	1013.25	1646.37	1198.25	1645	1423.25	1644	1633.25	1642.54
1723.25	1642.07	1996	1641.57	1996	1634.87	2083.5	1634.87	2083.5	1641.57
2278.25	1642.07	2458.25	1642.5	2548.25	1643	3738.25	1646.37		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
423.25	.016	1996	.015	2083.5	.016

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1996	2083.5	309.2	294.65 295.2	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1644.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.	0.016	0.015	0.016
W.S. Elev (ft)	1643.74	Reach Len. (ft)	309.20	294.65	295.20
Crit W.S. (ft)	1643.74	Flow Area (sq ft)	758.42	776.46	824.36
E.G. Slope (ft/ft)	0.000594	Area (sq ft)	758.42	776.46	824.36
Q Total (cfs)	11500.00	Flow (cfs)	2164.07	7307.51	2028.42
Top Width (ft)	1350.78	Top Width (ft)	535.89	87.50	727.39
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)	2.85	9.41	2.46
Max Chl Dpth (ft)	8.87	Hydr. Depth (ft)	1.42	8.87	1.13
Conv. Total (cfs)	471808.9	Conv. (cfs)	88785.0	299804.3	83219.6
Length Wtd. (ft)	296.54	Wetted Per. (ft)	535.90	100.90	727.39
Min Ch El (ft)	1634.87	Shear (lb/sq ft)	0.05	0.29	0.04
Alpha	2.48	Stream Power (lb/ft s)	0.15	2.69	0.10
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	59.54	35.38	36.91
C & E Loss (ft)	0.10	Cum SA (acres)	66.12	5.70	38.00

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1300

INPUT
Description: PLANS STA 147+78, FIS STA 1300
DOWNSTREAM FACE OF BOULDER HIGHWAY
BRIDGE
NAVD88 DATUM
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2527.46	1642.37	3074.47	1642.37	3323.22	1642.37	3358.33	1638.37	3546.98	1638.37
4284.3	1638.37	4321.99	1638.37	4326.85	1634.37	4331.12	1630.87	4395.85	1630.87
4401.5	1634.37	4410.27	1638.37	4631.05	1638.37	4950.82	1640.06	5083.47	1642.37

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2527.46	.045	4321.99	.04	4410.27	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
4321.99	4410.27	965.25	417.29 513.07	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1643.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.38	Wt. n-Val.	0.045	0.040	0.045
W.S. Elev (ft)	1638.73	Reach Len. (ft)	965.25	417.29	513.07
Crit W.S. (ft)	1639.90	Flow Area (sq ft)	342.99	601.14	90.40
E.G. Slope (ft/ft)	0.018461	Area (sq ft)	342.99	601.14	90.40
Q Total (cfs)	11500.00	Flow (cfs)	771.18	10541.51	187.32
Top Width (ft)	1343.07	Top Width (ft)	966.78	88.28	288.01
Vel Total (ft/s)	11.12	Avg. Vel. (ft/s)	2.25	17.54	2.07
Max Chl Dpth (ft)	7.86	Hydr. Depth (ft)	0.35	6.81	0.31
Conv. Total (cfs)	84638.3	Conv. (cfs)	5675.7	77583.9	1378.6
Length Wtd. (ft)	477.06	Wetted Per. (ft)	966.80	92.83	288.01
Min Ch El (ft)	1630.87	Shear (lb/sq ft)	0.41	7.46	0.36
Alpha	2.28	Stream Power (lb/ft s)	0.92	130.88	0.75
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	55.63	30.72	33.81
C & E Loss (ft)	1.03	Cum SA (acres)	60.79	5.10	34.56

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: RIVER-1
REACH: Reach-1 RS: 1200

INPUT
Description: PLANS STA 152+20, FIS STA 1200
NAVD88 DATUM
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2550.77	1636.37	2874.4	1634.37	3804.89	1634.37	3866.54	1634.37	3872.69	1630.37
3878.88	1626.87	3913.91	1626.87	3953.22	1626.87	3961.93	1630.37	3967.44	1634.37
4026.27	1634.37	4702.13	1634.37	4879.76	1635.68				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2550.77	.045	3866.54	.04	3967.44	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
3866.54	3967.44	517	431.73	400.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1636.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.77	Wt. n-Val.	0.045	0.040	0.045
W.S. Elev (ft)	1635.04	Reach Len. (ft)	517.00	431.73	400.02
Crit W.S. (ft)	1635.57	Flow Area (sq ft)	696.27	733.71	519.09
E.G. Slope (ft/ft)	0.007927	Area (sq ft)	696.27	733.71	519.09
Q Total (cfs)	11500.00	Flow (cfs)	1509.14	8870.30	1120.57
Top Width (ft)	2025.70	Top Width (ft)	1099.85	100.90	824.94
Vel Total (ft/s)	5.90	Avg. Vel. (ft/s)	2.17	12.09	2.16
Max Chl Dpth (ft)	8.17	Hydr. Depth (ft)	0.63	7.27	0.63
Conv. Total (cfs)	129168.0	Conv. (cfs)	16950.6	99631.2	12586.2
Length Wtd. (ft)	437.76	Wetted Per. (ft)	1099.85	104.98	824.95
Min Ch El (ft)	1626.87	Shear (lb/sq ft)	0.31	3.46	0.31
Alpha	3.27	Stream Power (lb/ft s)	0.68	41.81	0.67
Frctn Loss (ft)	5.52	Cum Volume (acre-ft)	44.12	24.33	30.22
C & E Loss (ft)	0.78	Cum SA (acres)	37.89	4.20	28.01

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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 1100

INPUT
Description: PLANS STA 156+58, FIS STA 1100
NAVD88 DATUM
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2363.61	1634.37	2684.84	1630.37	2910.73	1630.37	3149.74	1632.37	3513.61	1630.37
3560.98	1630.37	3675.87	1630.37	3695.59	1630.37	3710.62	1634.37	3737.3	1634.37
3742.76	1630.37	3748.29	1626.37	3753.38	1624.87	3840.81	1624.87	3846.52	1626.37
3853.28	1630.37	3894.66	1630.37	3937.11	1630.37	3950.71	1630.37	4472.57	1630.37
4639.27	1630.37	4909.5	1630.37	5181.96	1634.37				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2363.61	.045	3710.62	.04	3853.28	.045	4472.57	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
3737.3	3853.28	341.57	489.66	332.79	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1632.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.55	Wt. n-Val.	0.045	0.040	0.060
W.S. Elev (ft)	1631.27	Reach Len. (ft)	341.57	489.66	332.79
Crit W.S. (ft)	1631.77	Flow Area (sq ft)	526.00	657.18	982.30
E.G. Slope (ft/ft)	0.010154	Area (sq ft)	526.00	657.18	982.30
Q Total (cfs)	11500.00	Flow (cfs)	1373.90	7870.10	2256.00
Top Width (ft)	1985.77	Top Width (ft)	756.25	111.75	1117.78
Vel Total (ft/s)	5.31	Avg. Vel. (ft/s)	2.61	11.98	2.30
Max Chl Dpth (ft)	6.40	Hydr. Depth (ft)	0.70	5.88	0.88

Conv. Total (cfs)	114122.8	Conv. (cfs)	13634.2	78100.7	22387.9
Length Wtd. (ft)	408.59	Wetted Per. (ft)	756.38	114.85	1117.78
Min Ch El (ft)	1624.87	Shear (lb/sq ft)	0.44	3.63	0.56
Alpha	3.55	Stream Power (lb/ft s)	1.15	43.44	1.28
Frctn Loss (ft)	3.91	Cum Volume (acre-ft)	36.86	17.43	23.33
C & E Loss (ft)	0.06	Cum SA (acres)	26.87	3.14	19.08

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 RIVER: RIVER-1
REACH: Reach-1 RS: 1000

INPUT
Description: PLANS STA 161+85, FIS STA 1000
NAVD88 DATUM
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1026.98	1630.37	1146.04	1627.7	1239.85	1627.7	1626.95	1626.37	1666.52	1626.37
1777.96	1626.37	2129.38	1628.35	2812.88	1630.37	3144.65	1626.37	3156.37	1622.37
3226.41	1622.37	3241.51	1626.37	3248.2	1630.37	3272.33	1630.37	3415.56	1626.37
4205.54	1626.37	4901.53	1630.37						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1026.98	.045	3144.65	.04	3248.2	.045	3415.56	.11

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
3144.65	3272.33	812	918.99	431.31	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1628.85	Element			
Vel Head (ft)	0.54	Wt. n-Val.	0.045	0.040	0.106
W.S. Elev (ft)	1628.31	Reach Len. (ft)	812.00	918.99	431.31
Crit W.S. (ft)	1628.24	Flow Area (sq ft)	1343.90	525.01	1929.20
E.G. Slope (ft/ft)	0.006339	Area (sq ft)	1343.90	525.01	1929.20
Q Total (cfs)	11500.00	Flow (cfs)	3895.29	4634.16	2970.55
Top Width (ft)	2462.25	Top Width (ft)	1164.82	100.11	1197.32
Vel Total (ft/s)	3.03	Avg. Vel. (ft/s)	2.90	8.83	1.54
Max Chl Dpth (ft)	5.94	Hydr. Depth (ft)	1.15	5.24	1.61
Conv. Total (cfs)	144442.5	Conv. (cfs)	48925.7	58206.1	37310.7
Length Wtd. (ft)	793.70	Wetted Per. (ft)	1164.85	101.83	1197.36
Min Ch El (ft)	1622.37	Shear (lb/sq ft)	0.46	2.04	0.64
Alpha	3.80	Stream Power (lb/ft s)	1.32	18.01	0.98
Frctn Loss (ft)	5.85	Cum Volume (acre-ft)	29.53	10.79	12.21
C & E Loss (ft)	0.02	Cum SA (acres)	19.34	1.95	10.24

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.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 900

INPUT
Description: PLANS STA 170+82, FIS STA 900
NAVD88 DATUM
CROSS SECTION C, FROM
EFFECTIVE FIRM
SEE SECTION 124 FROM HEC-2 MODEL, BREAK1.OUT
DUCK
CREEK FIS RESTUDY BY NIMBUS ENGINEERS, 6/97
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
892	1624.37	1180	1620.37	1330	1620.37	1390	1620.87	1430	1620.87
1470	1620.37	1550	1619.57	1650	1619.77	1730	1620.37	1760	1620.57
1790	1620.37	1955	1618.37	1995	1616.37	2005	1614.37	2022	1614.37
2028	1616.37	2040	1618.37	2050	1620.37	2052	1622.37	2060	1624.37
2077	1624.37	2087	1622.37	2100	1621.57	2190	1621.37	2440	1621.37
2758	1622.37	2880	1621.57	2930	1621.67	3020	1622.37	3135	1622.57
3570	1624.37								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
892	.07	1955	.045	2040	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1955	2040	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1622.99	Element			
Vel Head (ft)	0.74	Wt. n-Val.	0.070	0.045	0.070
W.S. Elev (ft)	1622.25	Reach Len. (ft)			
Crit W.S. (ft)	1622.25	Flow Area (sq ft)	1824.69	497.84	536.47
E.G. Slope (ft/ft)	0.008663	Area (sq ft)	1824.69	497.84	536.47
Q Total (cfs)	11500.00	Flow (cfs)	5730.63	4942.82	826.55
Top Width (ft)	1866.74	Top Width (ft)	910.40	85.00	871.35
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)	3.14	9.93	1.54
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)	2.00	5.86	0.62
Conv. Total (cfs)	123559.4	Conv. (cfs)	61571.6	53107.1	8880.7
Length Wtd. (ft)		Wetted Per. (ft)	910.43	85.74	872.35
Min Ch El (ft)	1614.37	Shear (lb/sq ft)	1.08	3.14	0.33
Alpha	2.93	Stream Power (lb/ft s)	3.40	31.18	0.51
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: User specified water surface is not possible for the specified flow regime. The program used

critical depth as the starting water surface.
Warning: Divided flow computed for this cross-section.

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3	n4
Reach-1	1600	.04	.03	.04	
Reach-1	1500	.016	.015	.016	
Reach-1	1450	Bridge			
Reach-1	1400	.016	.015	.016	
Reach-1	1300	.045	.04	.045	
Reach-1	1200	.045	.04	.045	
Reach-1	1100	.045	.04	.045	.11
Reach-1	1000	.045	.04	.045	.11
Reach-1	900	.07	.045	.07	

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	1600	119.69	129.64	131.42
Reach-1	1500	177.24	171.02	184.09
Reach-1	1450	Bridge		
Reach-1	1400	309.2	294.65	295.2
Reach-1	1300	965.25	417.29	513.07
Reach-1	1200	517	431.73	400.02
Reach-1	1100	341.57	489.66	332.79
Reach-1	1000	812	918.99	431.31
Reach-1	900	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	1600	.3	.5
Reach-1	1500	.1	.3
Reach-1	1450	Bridge	
Reach-1	1400	.3	.5
Reach-1	1300	.1	.3
Reach-1	1200	.1	.3
Reach-1	1100	.1	.3
Reach-1	1000	.1	.3
Reach-1	900	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	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
Reach-1	1600	11500.00	1636.27	1644.68	1643.91	1644.99	0.001143	6.47	3957.26	1679.65	0.40
Reach-1	1500	11500.00	1635.63	1644.51	1643.83	1644.90	0.000314	6.92	3479.22	1771.34	0.41
Reach-1	1450	Bridge									
Reach-1	1400	11500.00	1634.87	1643.74	1643.74	1644.66	0.000594	9.41	2359.24	1350.78	0.56
Reach-1	1300	11500.00	1630.87	1638.73	1639.30	1643.11	0.018461	17.54	1034.53	1343.07	1.18
Reach-1	1200	11500.00	1626.87	1635.04	1635.57	1636.80	0.007927	12.09	1949.06	2025.70	0.79
Reach-1	1100	11500.00	1624.87	1631.27	1631.77	1632.83	0.010154	11.98	2165.48	1985.77	0.87
Reach-1	1000	11500.00	1622.37	1628.31	1628.24	1628.85	0.006339	8.83	3798.11	2462.25	0.68
Reach-1	900	11500.00	1614.37	1622.25	1622.25	1622.99	0.008663	9.93	2859.00	1866.74	0.72

Profile Output Table - Standard Table 2

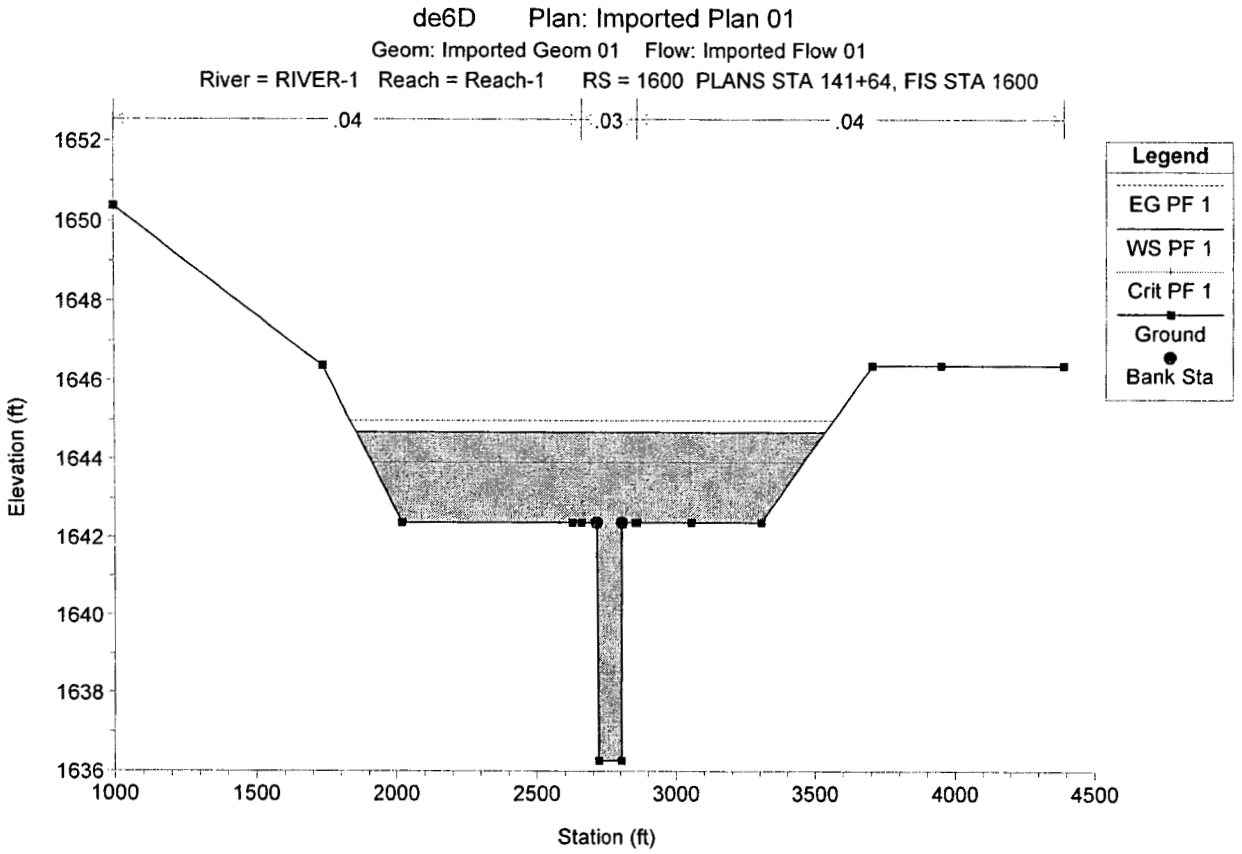
Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	1600	1644.99	1644.68	0.31	0.07	0.02	3755.66	4887.22	2857.12	1679.65
Reach-1	1500	1644.90	1644.51	0.39	0.00	0.07	2942.06	5373.49	3184.45	1771.34
Reach-1	1450	Bridge								
Reach-1	1400	1644.66	1643.74	0.91	0.37	0.10	2164.07	7307.51	2028.42	1350.78
Reach-1	1300	1643.11	1638.73	4.38	0.52	1.03	771.18	10541.51	187.32	1343.07
Reach-1	1200	1636.80	1635.04	1.77	5.52	0.78	1509.14	8870.30	1120.57	2025.70
Reach-1	1100	1632.83	1631.27	1.55	3.91	0.06	1373.90	7870.10	2256.00	1985.77
Reach-1	1000	1628.85	1628.31	0.54	5.85	0.02	3895.29	4634.16	2970.55	2462.25
Reach-1	900	1622.99	1622.25	0.74			5730.63	4942.82	826.55	1866.74

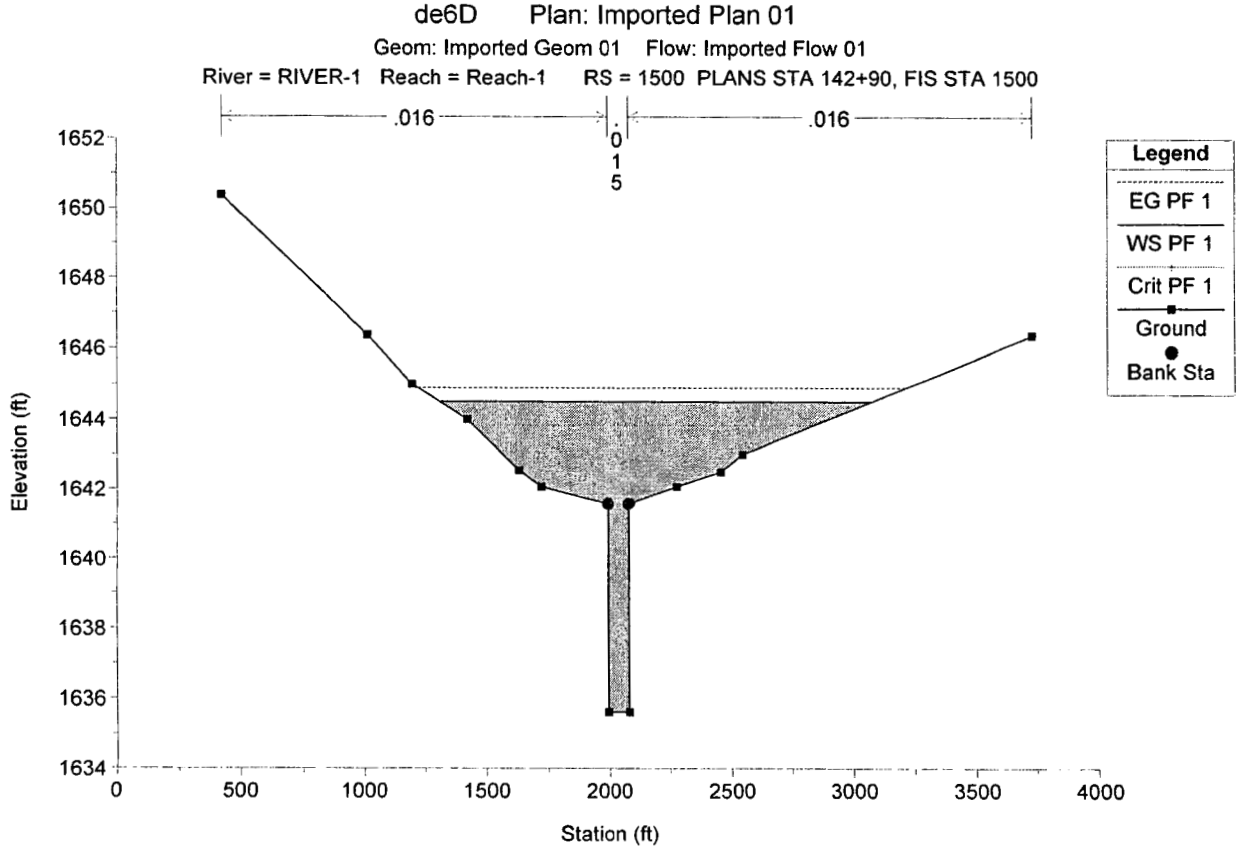
Profile Output Table - Six XS Bridge

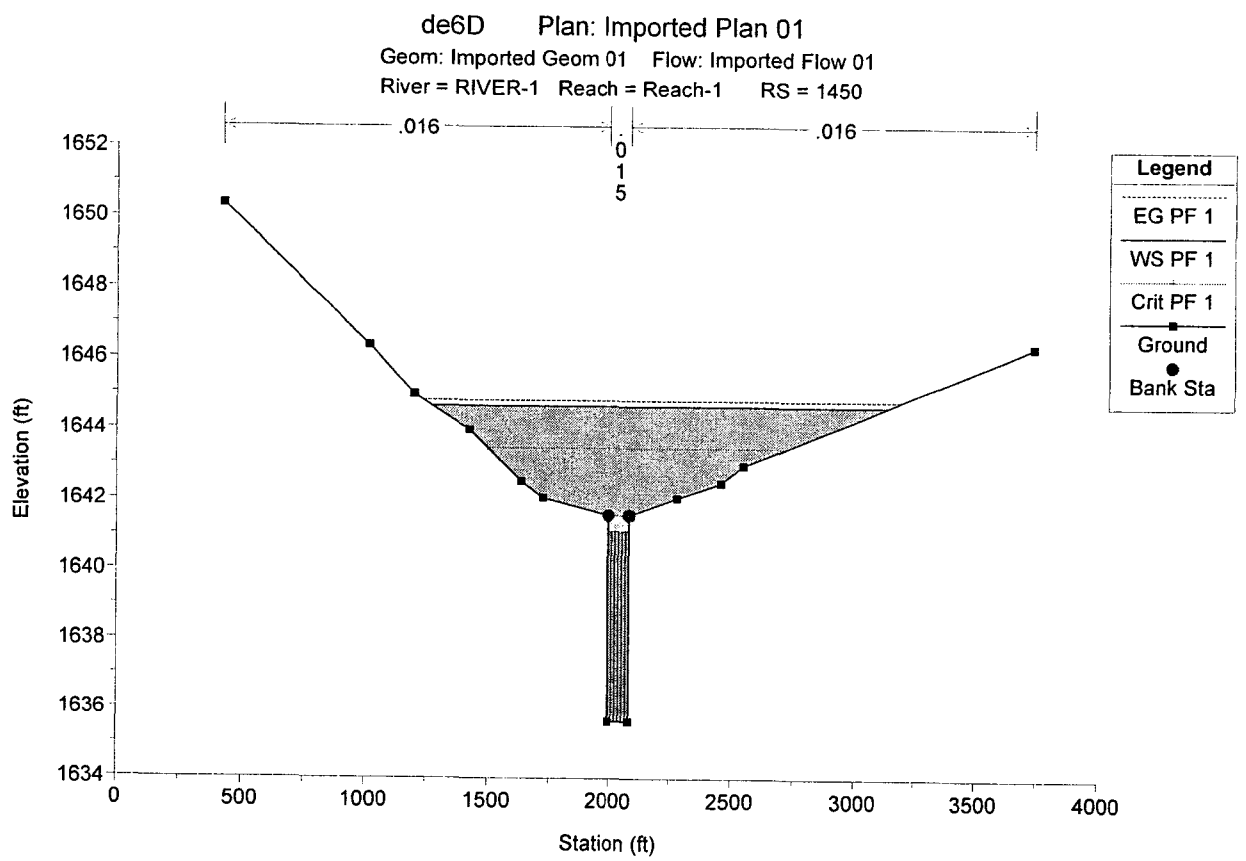
Reach	River Sta		E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Frctn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)
Reach-1	1600		1644.99	1644.68	1643.91	0.07	0.02	1679.65	3755.66	4887.22	2857.12	6.47
Reach-1	1500		1644.90	1644.51	1643.83	0.00	0.07	1771.34	2942.06	5373.49	3184.45	6.92
Reach-1	1450	BR U	1644.83	1644.67	1643.49	0.09	0.00	1864.28	4204.13	2630.81	4665.06	3.85
Reach-1	1450	BR D	1644.73	1644.55	1643.48	0.00	0.07	1795.68	4179.35	2770.77	4549.88	4.12
Reach-1	1400		1644.66	1643.74	1643.74	0.37	0.10	1350.78	2164.07	7307.51	2028.42	9.41
Reach-1	1300		1643.11	1638.73	1639.90	0.52	1.03	1343.07	771.18	10541.51	187.32	17.54

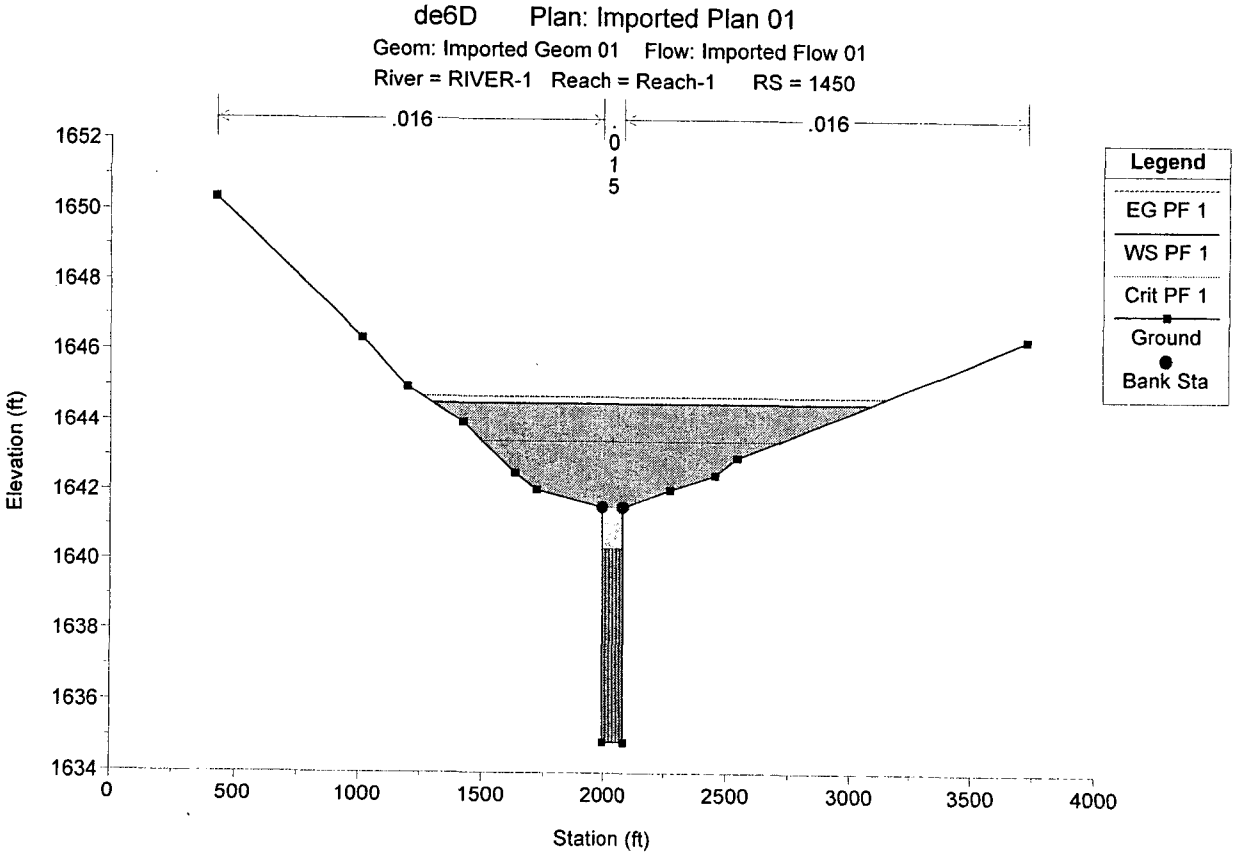
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Imported Pla

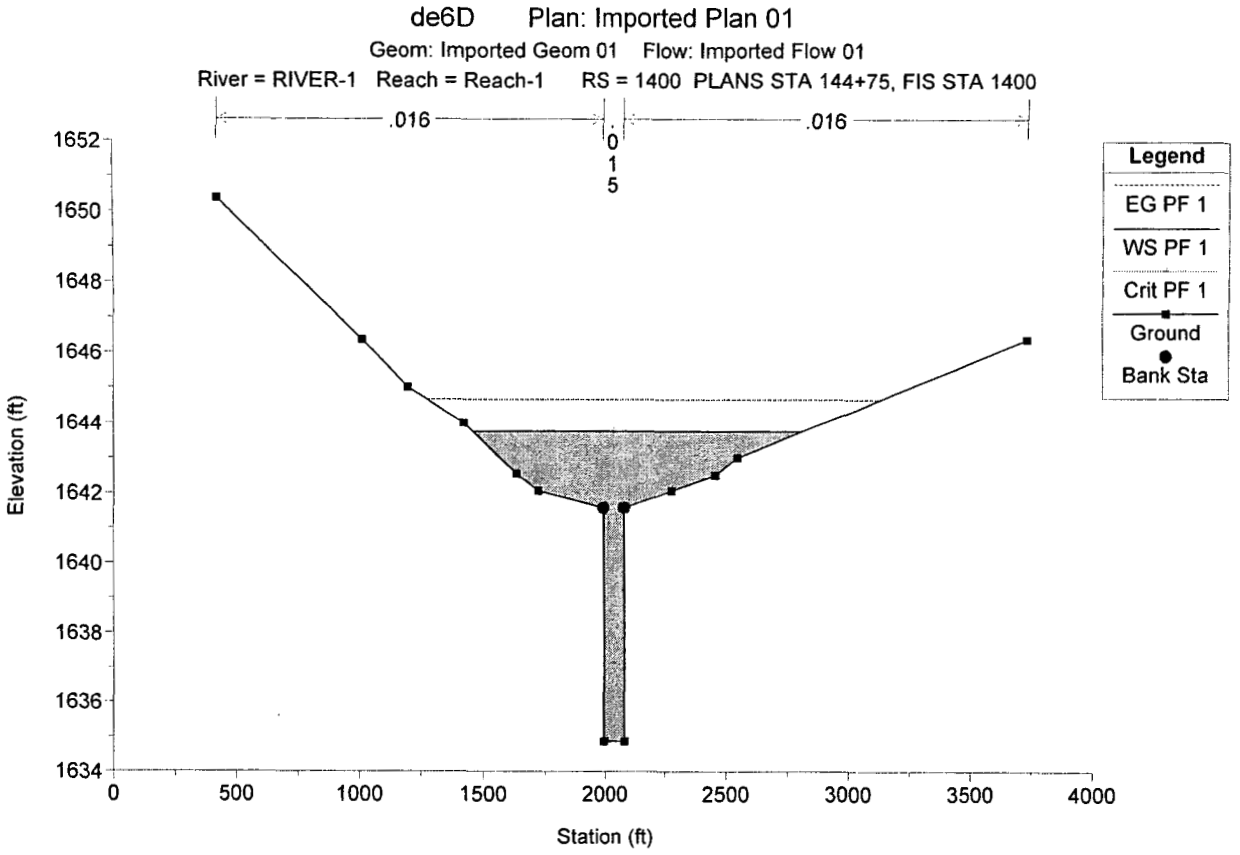
River: RIVER-1 Reach: Reach-1 RS: 1600 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 1450 Profile: PF 1
Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
River: RIVER-1 Reach: Reach-1 RS: 1450 Profile: PF 1 Upstream
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: RIVER-1 Reach: Reach-1 RS: 1450 Profile: PF 1 Downstream
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 parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: RIVER-1 Reach: Reach-1 RS: 1400 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 1300 Profile: PF 1
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.
River: RIVER-1 Reach: Reach-1 RS: 1200 Profile: PF 1
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.
River: RIVER-1 Reach: Reach-1 RS: 1100 Profile: PF 1
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.
River: RIVER-1 Reach: Reach-1 RS: 1000 Profile: PF 1
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: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: RIVER-1 Reach: Reach-1 RS: 900 Profile: PF 1
Warning:User specified water surface is not possible for the specified flow regime. The program used critical depth as the starting water surface.
Warning:Divided flow computed for this cross-section.

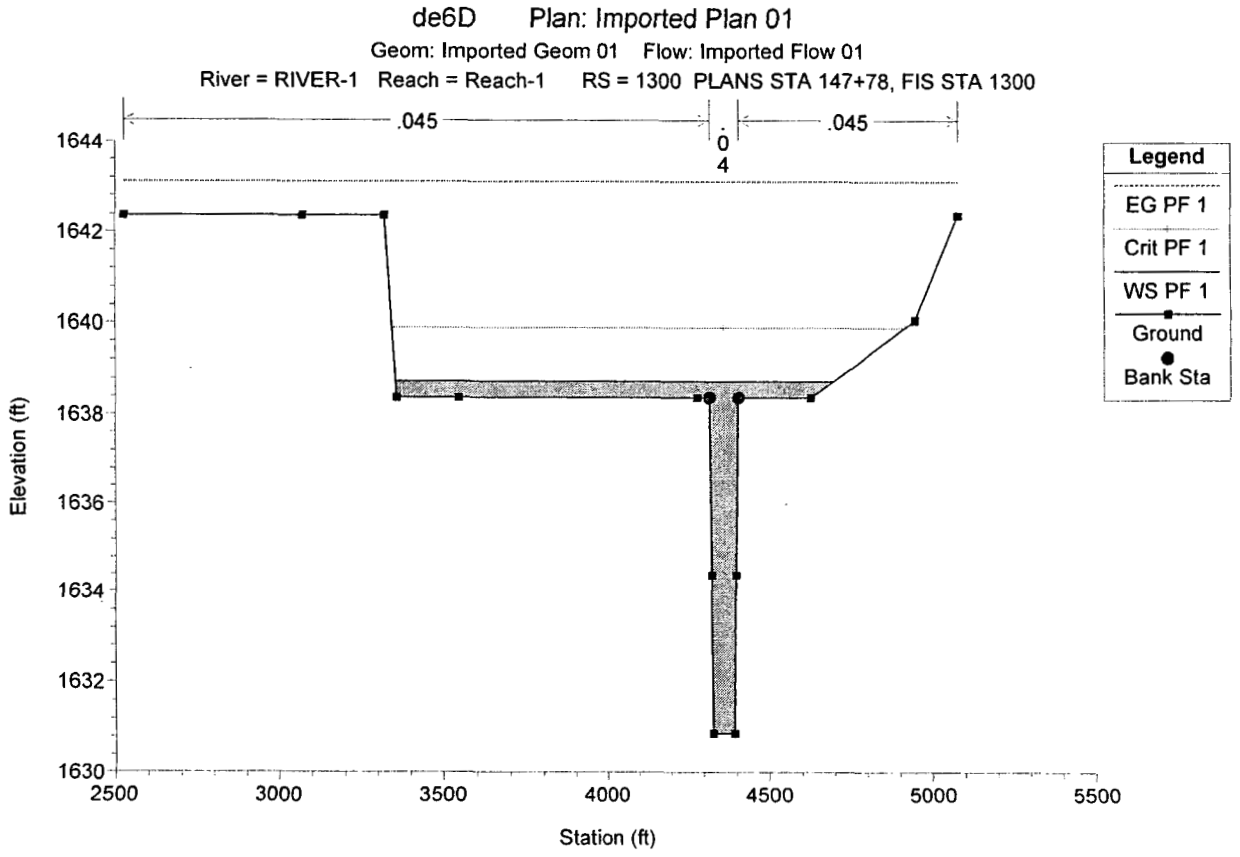

de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1600 PLANS STA 141+64, FIS STA 1600
.04
.03
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1000
1500
2000
2500
3000
3500
4000
4500
Station (ft)


de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1500 PLANS STA 142+90, FIS STA 1500
.016
.015
.016
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1634
0
500
1000
1500
2000
2500
3000
3500
4000
Station (ft)


de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1450
.016
.015
.016
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1634
0
500
1000
1500
2000
2500
3000
3500
4000


de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1450
.016
.015
.016
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1634
0
500
1000
1500
2000
2500
3000
3500
4000

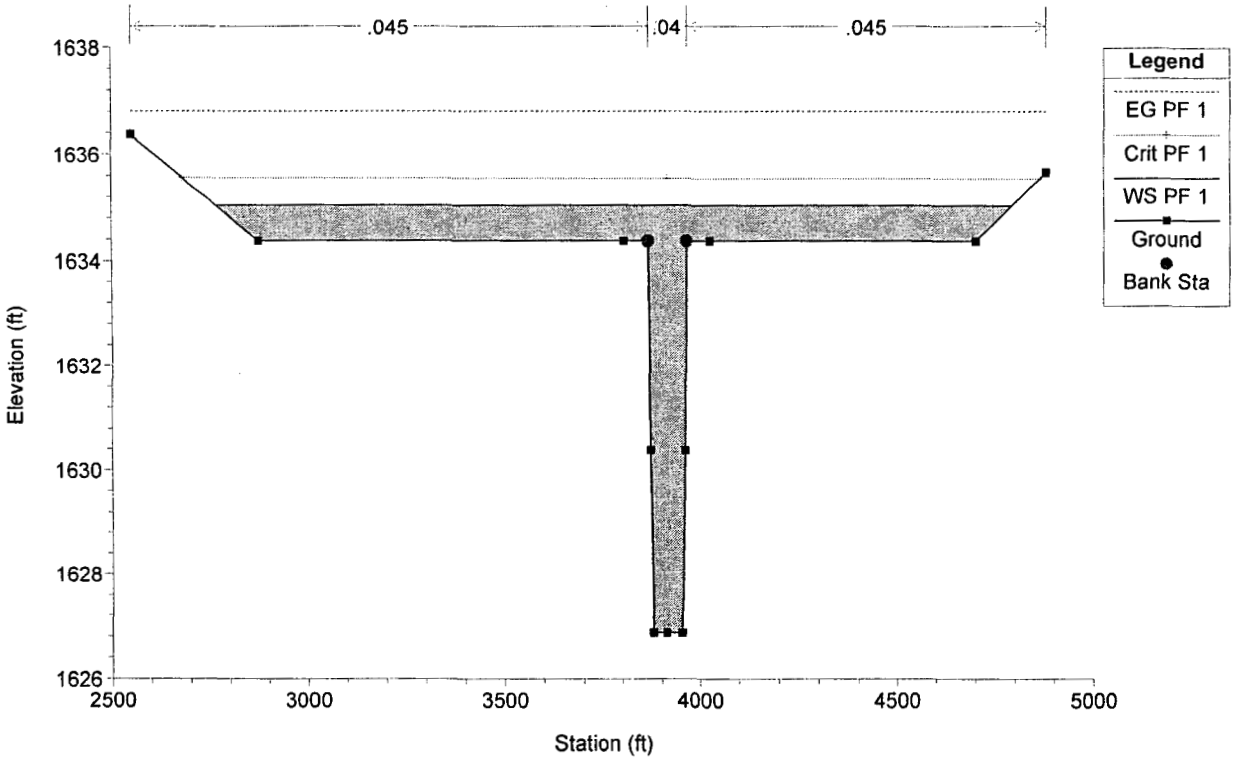

de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1400 PLANS STA 144+75, FIS STA 1400
.016
.015
.016
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1652
1650
1648
1646
1644
1642
1640
1638
1636
1634
0
500
1000
1500
2000
2500
3000
3500
4000


de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1300 PLANS STA 147+78, FIS STA 1300
.045
.045
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1644
1642
1640
1638
1636
1634
1632
1630
2500
3000
3500
4000
4500
5000
5500

de6D Plan: Imported Plan 01

Geom: Imported Geom 01 Flow: Imported Flow 01

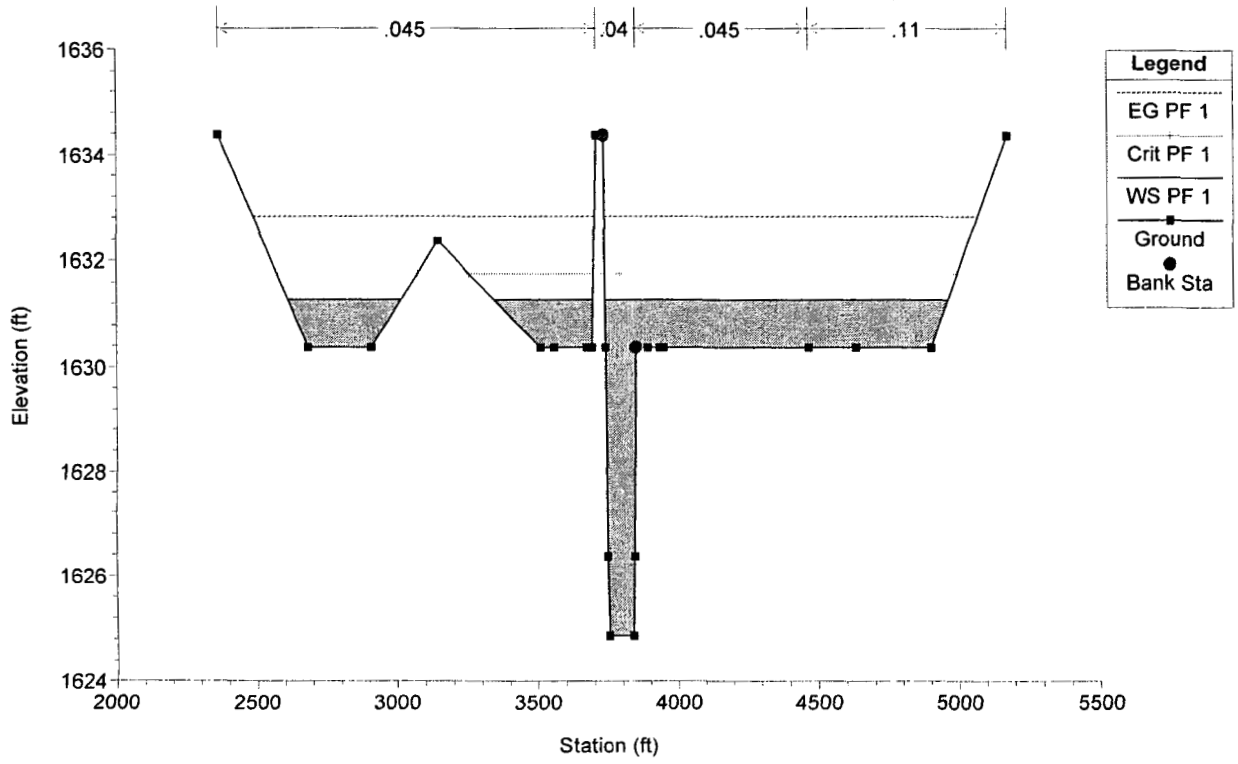
River = RIVER-1 Reach = Reach-1 RS = 1200 PLANS STA 152+20, FIS STA 1200

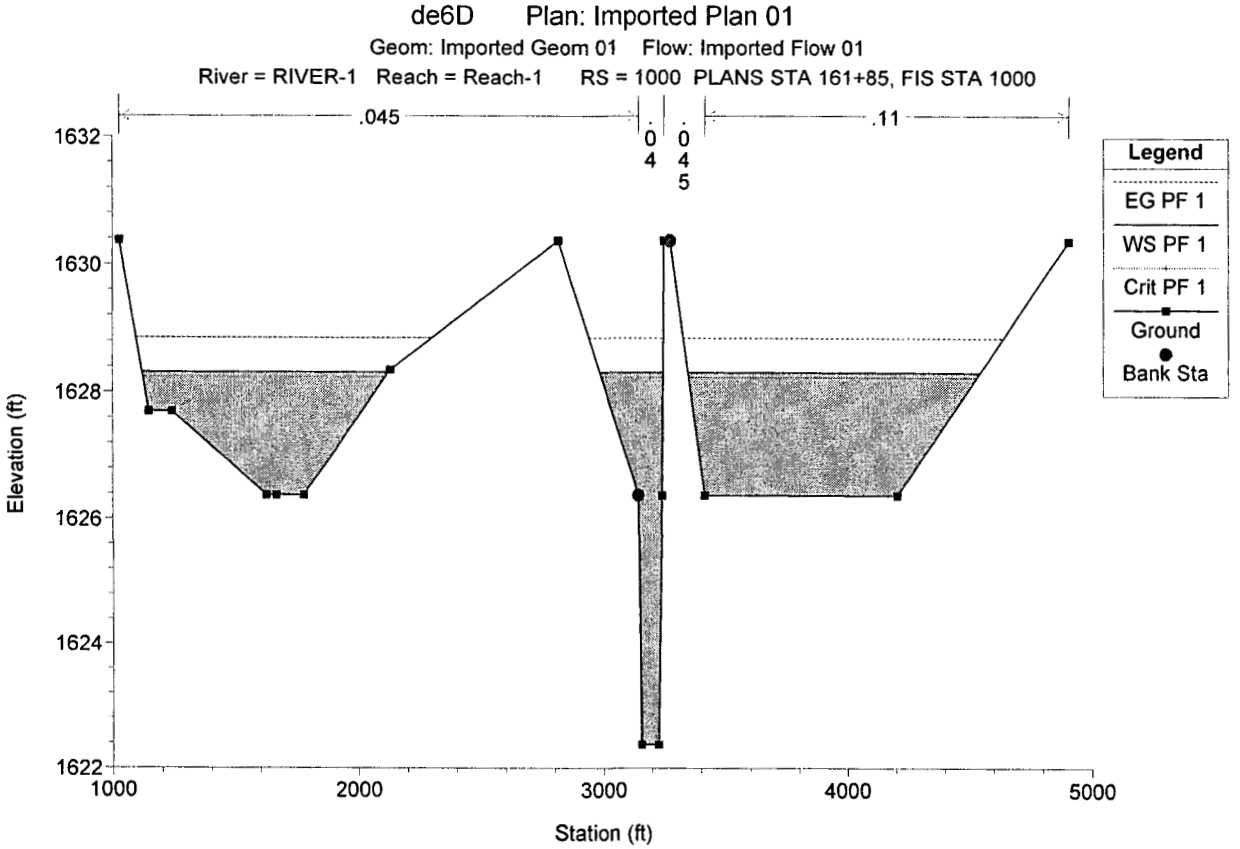


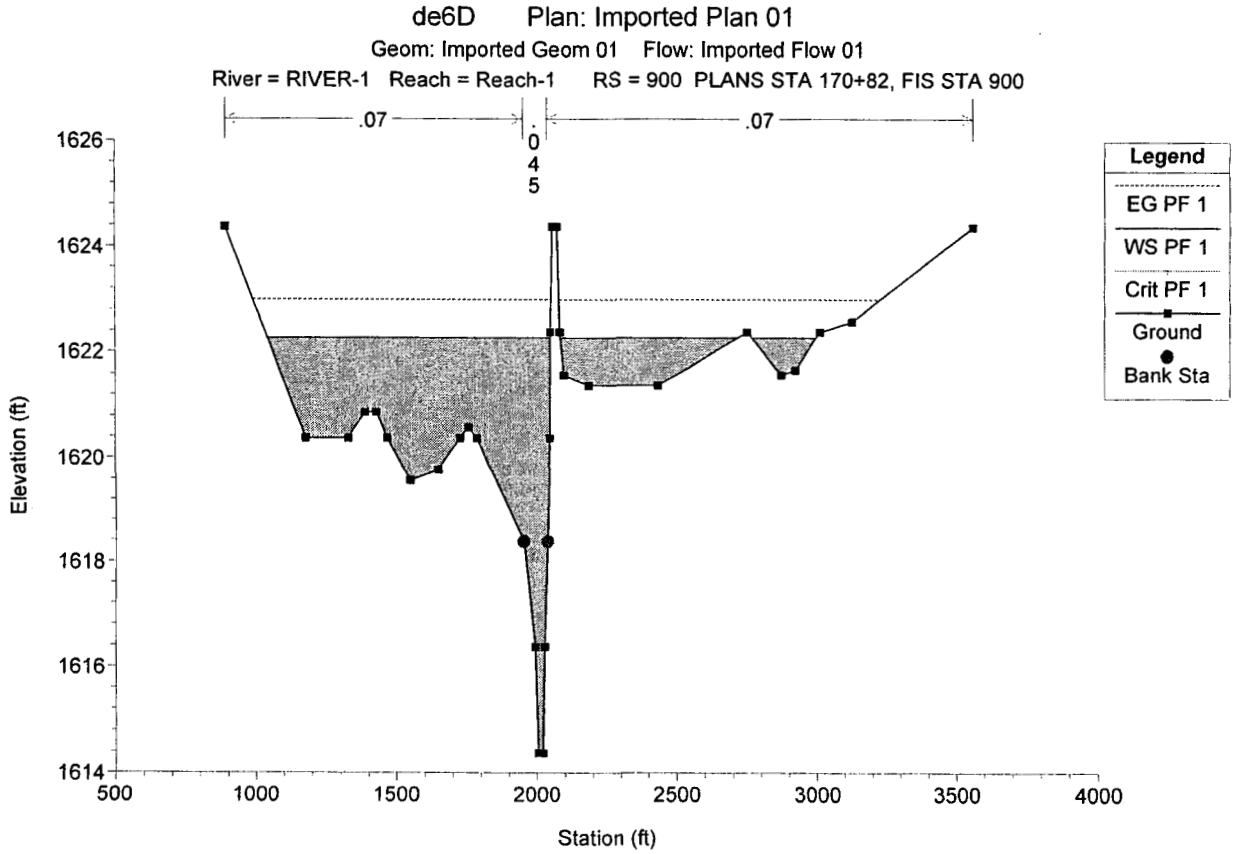
de6D Plan: Imported Plan 01

Geom: Imported Geom 01 Flow: Imported Flow 01

River = RIVER-1 Reach = Reach-1 RS = 1100 PLANS STA 156+58, FIS STA 1100




de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 1000 PLANS STA 161+85, FIS STA 1000
.045
.04
.045
.11
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1632
1630
1628
1626
1624
1622
1000
2000
3000
4000
5000
Station (ft)


de6D Plan: Imported Plan 01
Geom: Imported Geom 01 Flow: Imported Flow 01
River = RIVER-1 Reach = Reach-1 RS = 900 PLANS STA 170+82, FIS STA 900
.07
.045
.07
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
500
1000
1500
2000
2500
3000
3500
4000
Station (ft)

HEC-RAS OUTPUT

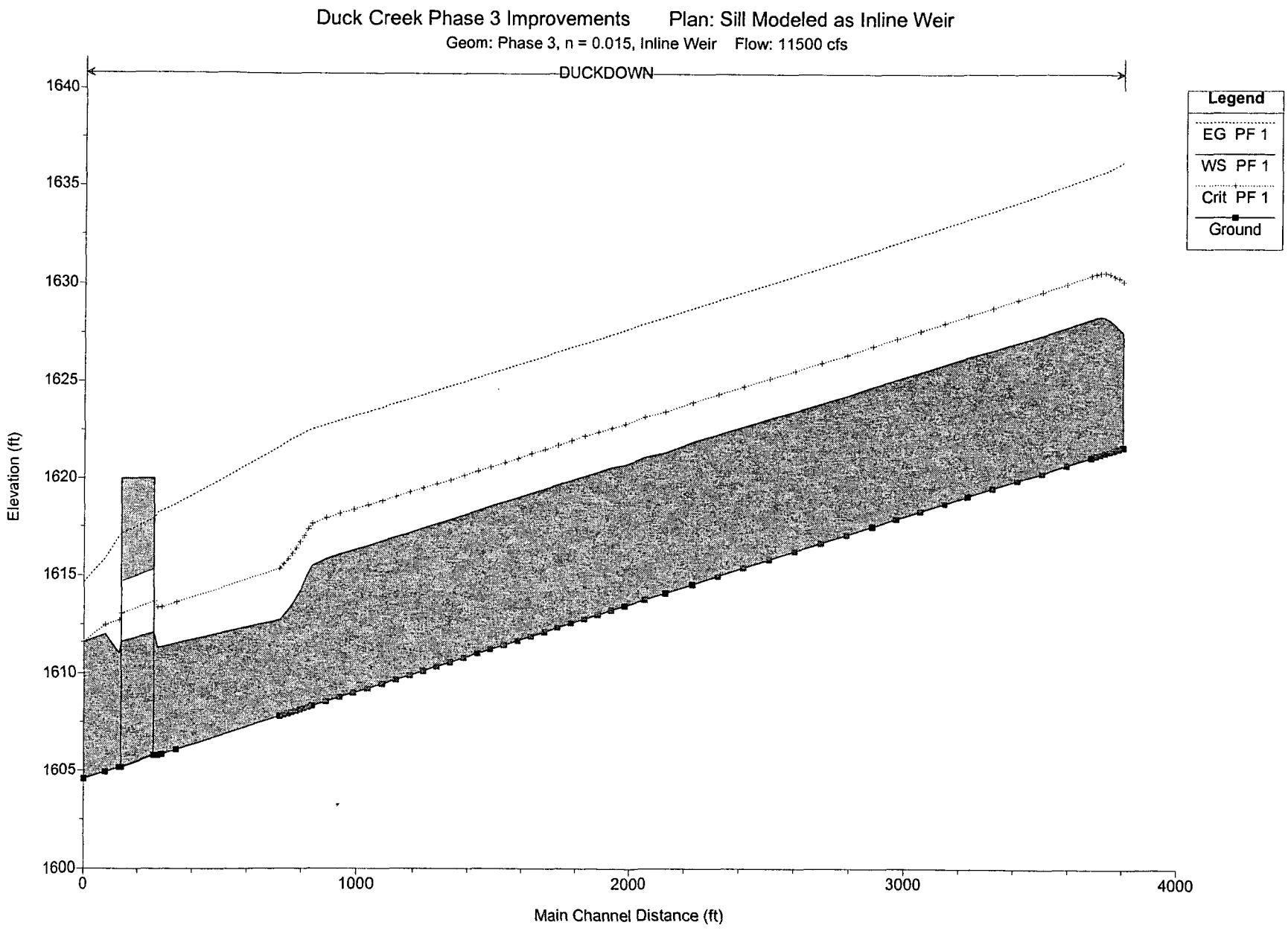
PHASE3B.PRJ: STANDARD TABLE 1
SIX XS BRIDGE TABLE
WATER SURFACE PROFILE
HEC-RAS SUMMARY REPORT
HEC-RAS CROSS SECTION PLOTS

HEC-RAS Plan: IS, n=.015 River: Duckcreek Reach: DUCKDOWN Profile: PF 1

Reach	River Sta	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)	
DUCKDOWN	11785.87	11500.00	1621.67	1627.60	1630.19	1636.28	0.007107	23.64	486.39	93.00	1.82
DUCKDOWN	11769.1*	11500.00	1621.59	1627.80	1630.36	1636.13	0.006416	23.17	496.32	89.71	1.74
DUCKDOWN	11752.3*	11500.00	1621.52	1628.04	1630.46	1636.00	0.005840	22.63	508.07	88.67	1.67
DUCKDOWN	11735.6*	11500.00	1621.44	1628.22	1630.58	1635.88	0.005497	22.21	517.79	90.11	1.63
DUCKDOWN	11718.8*	11500.00	1621.37	1628.34	1630.63	1635.77	0.005219	21.87	525.81	91.35	1.61
DUCKDOWN	11702.1*	11500.00	1621.29	1628.37	1630.62	1635.68	0.005043	21.68	530.34	92.25	1.59
DUCKDOWN	11685.3*	11500.00	1621.22	1628.35	1630.56	1635.59	0.004923	21.59	532.74	92.96	1.59
DUCKDOWN	11668.62	11500.00	1621.14	1628.26	1630.48	1635.50	0.004867	21.60	532.44	93.36	1.59
DUCKDOWN	11578.0*	11500.00	1620.73	1627.82	1630.05	1635.06	0.004903	21.59	532.77	94.17	1.60
DUCKDOWN	11487.4*	11500.00	1620.32	1627.43	1629.64	1634.62	0.004855	21.51	534.54	94.25	1.59
DUCKDOWN	11396.8*	11500.00	1619.92	1627.06	1629.24	1634.18	0.004794	21.42	536.82	94.34	1.58
DUCKDOWN	11306.2*	11500.00	1619.51	1626.66	1628.83	1633.75	0.004757	21.37	538.22	94.40	1.58
DUCKDOWN	11215.68	11500.00	1619.10	1626.31	1628.44	1633.33	0.004640	21.26	540.98	93.72	1.56
DUCKDOWN	11128.7*	11500.00	1618.71	1625.93	1628.05	1632.93	0.004621	21.23	541.73	93.75	1.56
DUCKDOWN	11041.8*	11500.00	1618.31	1625.53	1627.65	1632.52	0.004617	21.22	541.86	93.73	1.56
DUCKDOWN	10954.8*	11500.00	1617.92	1625.15	1627.27	1632.12	0.004602	21.20	542.50	93.78	1.55
DUCKDOWN	10867.92	11500.00	1617.53	1624.76	1626.87	1631.73	0.004588	21.18	543.06	93.80	1.55
DUCKDOWN	10774.3*	11500.00	1617.11	1624.29	1626.41	1631.31	0.004575	21.25	541.15	92.54	1.55
DUCKDOWN	10680.8*	11500.00	1616.69	1623.89	1626.01	1630.88	0.004552	21.22	542.00	92.55	1.55
DUCKDOWN	10587.2*	11500.00	1616.27	1623.50	1625.60	1630.46	0.004529	21.18	542.85	92.56	1.54
DUCKDOWN	10493.7*	11500.00	1615.85	1623.11	1625.20	1630.04	0.004492	21.13	544.24	92.57	1.54
DUCKDOWN	10400.2*	11500.00	1615.43	1622.71	1624.77	1629.62	0.004471	21.10	545.01	92.57	1.53
DUCKDOWN	10306.6*	11500.00	1615.01	1622.31	1624.38	1629.21	0.004450	21.07	545.78	92.57	1.53
DUCKDOWN	10213.13	11500.00	1614.59	1621.91	1623.96	1628.79	0.004429	21.04	546.56	92.58	1.53
DUCKDOWN	10114.1	11500.00	1614.14	1621.37	1623.48	1628.34	0.004590	21.18	542.97	93.80	1.55
DUCKDOWN	10040.2*	11500.00	1613.81	1621.13	1623.20	1628.00	0.004425	21.04	546.71	92.58	1.53
DUCKDOWN	9966.33	11500.00	1613.48	1620.72	1622.83	1627.67	0.004573	21.15	543.69	93.85	1.55
DUCKDOWN	9916.64*	11500.00	1613.26	1620.59	1622.63	1627.44	0.004406	21.00	547.51	92.61	1.52
DUCKDOWN	9866.96*	11500.00	1613.03	1620.36	1622.42	1627.22	0.004422	21.03	546.85	92.59	1.52
DUCKDOWN	9817.27*	11500.00	1612.81	1620.13	1622.20	1627.00	0.004423	21.03	546.81	92.59	1.53
DUCKDOWN	9767.59*	11500.00	1612.59	1619.91	1621.96	1626.78	0.004424	21.03	546.77	92.59	1.53
DUCKDOWN	9717.90*	11500.00	1612.36	1619.68	1621.73	1626.56	0.004441	21.06	546.06	92.56	1.53
DUCKDOWN	9668.22*	11500.00	1612.14	1619.46	1621.53	1626.34	0.004441	21.06	546.08	92.56	1.53
DUCKDOWN	9618.53*	11500.00	1611.92	1619.24	1621.31	1626.12	0.004440	21.06	546.11	92.56	1.53
DUCKDOWN	9568.85*	11500.00	1611.69	1619.00	1621.06	1625.90	0.004456	21.08	545.46	92.53	1.53
DUCKDOWN	9519.17*	11500.00	1611.47	1618.78	1620.84	1625.68	0.004454	21.08	545.54	92.54	1.53

HEC-RAS Plan: IS, n=.015 River: Duckcreek Reach: DUCKDOWN Profile: PF 1 (Continued)

Reach	River Sta	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)	
DUCKDOWN	9469.48*	11500.00	1611.25	1618.56	1620.62	1625.46	0.004452	21.08	545.61	92.54	1.53
DUCKDOWN	9419.80*	11500.00	1611.02	1618.33	1620.41	1625.24	0.004467	21.10	545.01	92.52	1.53
DUCKDOWN	9370.11*	11500.00	1610.80	1618.11	1620.19	1625.02	0.004464	21.10	545.11	92.52	1.53
DUCKDOWN	9320.43*	11500.00	1610.57	1617.87	1619.94	1624.80	0.004478	21.12	544.55	92.50	1.53
DUCKDOWN	9270.74*	11500.00	1610.35	1617.65	1619.72	1624.57	0.004474	21.11	544.70	92.51	1.53
DUCKDOWN	9221.06*	11500.00	1610.13	1617.43	1619.50	1624.35	0.004471	21.11	544.85	92.51	1.53
DUCKDOWN	9171.38*	11500.00	1609.90	1617.20	1619.29	1624.13	0.004484	21.13	544.30	92.49	1.53
DUCKDOWN	9121.69*	11500.00	1609.68	1616.98	1619.07	1623.91	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	9072.01*	11500.00	1609.46	1616.76	1618.83	1623.68	0.004476	21.11	544.64	92.50	1.53
DUCKDOWN	9022.32*	11500.00	1609.23	1616.53	1618.60	1623.46	0.004489	21.13	544.12	92.48	1.54
DUCKDOWN	8972.64*	11500.00	1609.01	1616.31	1618.38	1623.24	0.004485	21.13	544.29	92.49	1.53
DUCKDOWN	8922.95*	11500.00	1608.79	1616.09	1618.18	1623.02	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	8873.27*	11500.00	1608.56	1615.85	1617.95	1622.79	0.004492	21.14	543.97	92.48	1.54
DUCKDOWN	8823.59	11500.00	1608.34	1615.50	1617.66	1622.56	0.004728	21.32	539.29	94.45	1.57
DUCKDOWN	8808.96*	11500.00	1608.27	1615.11	1617.36	1622.48	0.005068	21.78	528.08	93.97	1.62
DUCKDOWN	8794.33*	11500.00	1608.21	1614.67	1617.03	1622.38	0.005648	22.29	515.96	96.11	1.70
DUCKDOWN	8779.70*	11500.00	1608.14	1614.25	1616.72	1622.28	0.006269	22.74	505.78	98.79	1.77
DUCKDOWN	8765.07*	11500.00	1608.07	1613.88	1616.41	1622.18	0.006917	23.11	497.55	101.92	1.84
DUCKDOWN	8750.43*	11500.00	1608.01	1613.57	1616.13	1622.06	0.007560	23.39	491.59	105.47	1.91
DUCKDOWN	8735.81*	11500.00	1607.94	1613.27	1615.83	1621.94	0.008245	23.63	486.58	109.36	1.97
DUCKDOWN	8721.18*	11500.00	1607.88	1613.01	1615.61	1621.82	0.008946	23.82	482.81	113.55	2.04
DUCKDOWN	8706.55	11500.00	1607.81	1612.76	1615.36	1621.68	0.009669	23.96	479.97	118.00	2.09
DUCKDOWN	8327.98	11500.00	1606.11	1611.55	1613.65	1618.66	0.006696	21.39	537.57	118.00	1.77
DUCKDOWN	8273.9	11500.00	1605.86	1611.35	1613.40	1618.31	0.006473	21.17	543.24	118.00	1.74
DUCKDOWN	8259.5	11500.00	1605.81	1611.32	1613.37	1618.22	0.006377	21.07	545.74	118.00	1.73
DUCKDOWN	8202.6	Bridge									
DUCKDOWN	8118.7	11500.00	1605.19	1611.03	1612.73	1617.04	0.005101	19.67	584.77	118.00	1.56
DUCKDOWN	8065.2	11500.00	1604.95	1612.00	1612.49	1615.88	0.002527	15.81	727.47	118.00	1.12
DUCKDOWN	7986.2	11500.00	1604.59	1611.60	1611.60	1614.65	0.001988	14.01	821.01	135.00	1.00


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
DUCKDOWN
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1640
1635
1630
1625
1620
1615
1610
1605
1600
0
1000
2000
3000
4000
Main Channel Distance (ft)

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Duck Creek Phase 3 Improvements
Project File : phase3b.prj
Run Date and Time: 6/17/2004 6:35:55 PM

Project in English units

Project Description:
Duck Creek Phase 3 Improvements - floodplain model
NAVD88 DATUM
Downstream
WSE set to critical depth.

PLAN DATA

Plan Title: Sill Modeled as Inline Weir
Plan File : g:\550-039\r061004\ras\phase3b.p03

Geometry Title: Phase 3, n = 0.015, Inline Weir
Geometry File : g:\550-039\r061004\ras\phase3b.g03

Flow Title : 11500 cfs
Flow File : g:\550-039\r061004\ras\phase3b.f01

Plan Summary Information:
Number of: Cross Sections = 64 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 1

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 11500 cfs
Flow File : g:\550-039\r061004\ras\phase3b.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Duckcreek	DUCKDOWN	11785.87	11500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Duckcreek	DUCKDOWN	PF 1	Known WS = 1627.6	Critical

Changes in WS and EG

River	Reach	RS	Profile	Type	Value
Duckcreek	DUCKDOWN	8118.7	PF 1 Known WS	1612	
Duckcreek	DUCKDOWN	8065.2	PF 1 Known WS	1612	
Duckcreek	DUCKDOWN	7986.2	PF 1 Known WS	1612	

GEOMETRY DATA

Geometry Title: Phase 3, n = 0.015, Inline Weir
Geometry File : g:\550-039\r061004\ras\phase3b.g03

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11785.87

INPUT

Description: Transition Begins at 150+87.74
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1024.5	1629.57	1024.5	1623.07	1066	1621.67	1117.5	1623.07	1117.5	1629.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1024.5	.015	1024.5	.015	1117.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1024.5	1117.5	16.75 16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1636.28	Element			
Vel Head (ft)	8.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.60	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.19	Flow Area (sq ft)		486.39	
E.G. Slope (ft/ft)	0.007107	Area (sq ft)		486.39	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	23.64	Avg. Vel. (ft/s)		23.64	
Max Chl Dpth (ft)	5.93	Hydr. Depth (ft)		5.23	
Conv. Total (cfs)	136411.5	Conv. (cfs)		136411.5	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		102.10	
Min Ch El (ft)	1621.67	Shear (lb/sq ft)		2.11	
Alpha	1.00	Stream Power (lb/ft s)		49.97	
Frctn Loss (ft)		Cum Volume (acre-ft)		47.62	
C & E Loss (ft)		Cum SA (acres)		8.54	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11769.1*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1022.86	1629.85	1025.43	1628.52	1025.43	1622.94	1066	1621.59	1115.14	1622.94
1115.14	1628.52	1117.71	1629.85						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1022.86	.015	1022.86	.015	1117.71	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1022.86	1117.71	16.75 16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1636.13	Element			
Vel Head (ft)	8.34	Wt. n-Val.		0.015	
W.S. Elev (ft)	1627.80	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.36	Flow Area (sq ft)		496.32	
E.G. Slope (ft/ft)	0.006416	Area (sq ft)		496.32	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	89.71	Top Width (ft)		89.71	
Vel Total (ft/s)	23.17	Avg. Vel. (ft/s)		23.17	
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	143569.3	Conv. (cfs)		143569.3	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		99.47	
Min Ch El (ft)	1621.59	Shear (lb/sq ft)		2.00	
Alpha	1.00	Stream Power (lb/ft s)		46.31	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		47.43	
C & E Loss (ft)	0.03	Cum SA (acres)		8.51	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11752.3*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1021.21	1630.13	1026.36	1627.46	1026.36	1622.82	1066	1621.52	1112.79	1622.82
1112.79	1627.46	1117.93	1630.13						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1021.21	.015	1021.21	.015	1117.93	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1021.21	1117.93	16.75 16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1636.00	Element			
Vel Head (ft)	7.96	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.04	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.46	Flow Area (sq ft)		508.07	
E.G. Slope (ft/ft)	0.005840	Area (sq ft)		508.07	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	88.67	Top Width (ft)		88.67	
Vel Total (ft/s)	22.63	Avg. Vel. (ft/s)		22.63	
Max Chl Dpth (ft)	6.52	Hydr. Depth (ft)		5.73	
Conv. Total (cfs)	150485.8	Conv. (cfs)		150485.8	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		98.27	
Min Ch El (ft)	1621.52	Shear (lb/sq ft)		1.88	
Alpha	1.00	Stream Power (lb/ft s)		42.66	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		47.24	

C & E Loss (ft)	0.04	Cum SA (acres)	8.48

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11735.6*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1019.57	1630.41	1027.29	1626.41	1027.29	1622.69	1066	1621.44	1110.43	1622.69
1110.43	1626.41	1118.14	1630.41						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1019.57	.015	1019.57	.015	1118.14	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1019.57	1118.14	16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.22	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.58	Flow Area (sq ft)		517.79	
E.G. Slope (ft/ft)	0.005497	Area (sq ft)		517.79	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	90.11	Top Width (ft)		90.11	
Vel Total (ft/s)	22.21	Avg. Vel. (ft/s)		22.21	
Max Chl Dpth (ft)	6.78	Hydr. Depth (ft)		5.75	
Conv. Total (cfs)	155106.4	Conv. (cfs)		155106.4	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		98.47	
Min Ch El (ft)	1621.44	Shear (lb/sq ft)		1.80	
Alpha	1.00	Stream Power (lb/ft s)		40.08	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		47.04	
C & E Loss (ft)	0.03	Cum SA (acres)		8.44	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11718.8*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1017.93	1630.7	1028.21	1625.35	1028.21	1622.57	1066	1621.37	1108.07	1622.57
1108.07	1625.35	1118.36	1630.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1017.93	.015	1017.93	.015	1118.36	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1017.93	1118.36	16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.34	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.63	Flow Area (sq ft)		525.81	
E.G. Slope (ft/ft)	0.005219	Area (sq ft)		525.81	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	91.35	Top Width (ft)		91.35	
Vel Total (ft/s)	21.87	Avg. Vel. (ft/s)		21.87	
Max Chl Dpth (ft)	6.97	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	159190.8	Conv. (cfs)		159190.8	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		98.41	
Min Ch El (ft)	1621.37	Shear (lb/sq ft)		1.74	
Alpha	1.00	Stream Power (lb/ft s)		38.07	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		46.84	
C & E Loss (ft)	0.02	Cum SA (acres)		8.41	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11702.1*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1016.29	1630.98	1029.14	1624.3	1029.14	1622.44	1066	1621.29	1105.71	1622.44
1105.71	1624.3	1118.57	1630.98						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1016.29	.015	1016.29	.015	1118.57	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1016.29	1118.57	16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.30	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.37	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.62	Flow Area (sq ft)		530.34	

E.G. Slope (ft/ft)	0.005043	Area (sq ft)	530.34
Q Total (cfs)	11500.00	Flow (cfs)	11500.00
Top Width (ft)	92.25	Top Width (ft)	92.25
Vel Total (ft/s)	21.68	Avg. Vel. (ft/s)	21.68
Max Chl Dpth (ft)	7.08	Hydr. Depth (ft)	5.75
Conv. Total (cfs)	161939.4	Conv. (cfs)	161939.4
Length Wtd. (ft)	16.75	Wetted Per. (ft)	98.00
Min Ch El (ft)	1621.29	Shear (lb/sq ft)	1.70
Alpha	1.00	Stream Power (lb/ft s)	36.95
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	46.64
C & E Loss (ft)	0.01	Cum SA (acres)	8.37

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11685.3*

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1014.64	1631.26	1030.07	1623.24	1030.07	1622.32	1066	1621.22	1103.36	1622.32
1103.36	1623.24	1118.79	1631.26						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1014.64	.015	1014.64	.015	1118.79	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1014.64	1118.79	16.75	16.75	16.75	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1635.59	Element			
Vel Head (ft)	7.24	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.35	Reach Len. (ft)	16.75	16.75	16.75
Crit W.S. (ft)	1630.56	Flow Area (sq ft)		532.74	
E.G. Slope (ft/ft)	0.004923	Area (sq ft)		532.74	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.96	Top Width (ft)		92.96	
Vel Total (ft/s)	21.59	Avg. Vel. (ft/s)		21.59	
Max Chl Dpth (ft)	7.13	Hydr. Depth (ft)		5.73	
Conv. Total (cfs)	163900.5	Conv. (cfs)		163900.5	
Length Wtd. (ft)	16.75	Wetted Per. (ft)		97.33	
Min Ch El (ft)	1621.22	Shear (lb/sq ft)		1.68	
Alpha	1.00	Stream Power (lb/ft s)		36.31	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		46.43	
C & E Loss (ft)	0.01	Cum SA (acres)		8.34	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11668.62

INPUT
Description: PC at Sta 152+04.97 (END TRANSITION)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1631.54	1031	1622.19	1066	1621.14	1101	1622.19	1119	1631.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1635.50	Element			
Vel Head (ft)	7.24	Wt. n-Val.		0.015	
W.S. Elev (ft)	1628.26	Reach Len. (ft)	90.59	90.59	90.59
Crit W.S. (ft)	1630.48	Flow Area (sq ft)		532.44	
E.G. Slope (ft/ft)	0.004867	Area (sq ft)		532.44	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.36	Top Width (ft)		93.36	
Vel Total (ft/s)	21.60	Avg. Vel. (ft/s)		21.60	
Max Chl Dpth (ft)	7.12	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	164847.8	Conv. (cfs)		164847.8	
Length Wtd. (ft)	90.59	Wetted Per. (ft)		96.36	
Min Ch El (ft)	1621.14	Shear (lb/sq ft)		1.68	
Alpha	1.00	Stream Power (lb/ft s)		36.26	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		46.23	
C & E Loss (ft)	0.00	Cum SA (acres)		8.30	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11578.0*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1630.78	1031	1621.78	1066	1620.73	1101	1621.78	1119	1630.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1013	1119		90.59	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.06	Element	Left OB	Channel	Right OB	
Vel Head (ft)	7.23	Wt. n-Val.		0.015		
W.S. Elev (ft)	1627.82	Reach Len. (ft)	90.59	90.59	90.59	
Crit W.S. (ft)	1630.05	Flow Area (sq ft)		532.77		
E.G. Slope (ft/ft)	0.004903	Area (sq ft)		532.77		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	94.17	Top Width (ft)		94.17		
Vel Total (ft/s)	21.59	Avg. Vel. (ft/s)		21.59		
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)		5.66		
Conv. Total (cfs)	164232.5	Conv. (cfs)		164232.5		
Length Wtd. (ft)	90.59	Wetted Per. (ft)		97.06		
Min Ch El (ft)	1620.73	Shear (lb/sq ft)		1.68		
Alpha	1.00	Stream Power (lb/ft s)		36.27		
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)		45.12		
C & E Loss (ft)	0.00	Cum SA (acres)		8.10		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11487.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1630.37	1031	1621.37	1066	1620.32	1101	1621.37	1119	1630.37

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59 90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1634.62	Element	Left OB	Channel	Right OB	
Vel Head (ft)	7.19	Wt. n-Val.		0.015		
W.S. Elev (ft)	1627.43	Reach Len. (ft)	90.59	90.59	90.59	
Crit W.S. (ft)	1629.64	Flow Area (sq ft)		534.54		
E.G. Slope (ft/ft)	0.004855	Area (sq ft)		534.54		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	94.25	Top Width (ft)		94.25		
Vel Total (ft/s)	21.51	Avg. Vel. (ft/s)		21.51		
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)		5.67		
Conv. Total (cfs)	165048.1	Conv. (cfs)		165048.1		
Length Wtd. (ft)	90.59	Wetted Per. (ft)		97.14		
Min Ch El (ft)	1620.32	Shear (lb/sq ft)		1.67		
Alpha	1.00	Stream Power (lb/ft s)		35.88		
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)		44.01		
C & E Loss (ft)	0.00	Cum SA (acres)		7.91		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11396.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1629.97	1031	1620.97	1066	1619.92	1101	1620.97	1119	1629.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59 90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1634.18	Element	Left OB	Channel	Right OB	
Vel Head (ft)	7.13	Wt. n-Val.		0.015		
W.S. Elev (ft)	1627.06	Reach Len. (ft)	90.59	90.59	90.59	
Crit W.S. (ft)	1629.24	Flow Area (sq ft)		536.82		
E.G. Slope (ft/ft)	0.004794	Area (sq ft)		536.82		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	94.34	Top Width (ft)		94.34		
Vel Total (ft/s)	21.42	Avg. Vel. (ft/s)		21.42		
Max Chl Dpth (ft)	7.14	Hydr. Depth (ft)		5.69		
Conv. Total (cfs)	166097.2	Conv. (cfs)		166097.2		
Length Wtd. (ft)	90.59	Wetted Per. (ft)		97.25		
Min Ch El (ft)	1619.92	Shear (lb/sq ft)		1.65		
Alpha	1.00	Stream Power (lb/ft s)		35.39		
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)		42.90		
C & E Loss (ft)	0.00	Cum SA (acres)		7.71		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11306.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

1013 1629.56 1031 1620.56 1066 1619.51 1101 1620.56 1119 1629.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	90.59	90.59	90.59	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1633.75	Element			
Vel Head (ft)	7.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1626.66	Reach Len. (ft)	90.59	90.59	90.59
Crit W.S. (ft)	1628.83	Flow Area (sq ft)		538.22	
E.G. Slope (ft/ft)	0.004757	Area (sq ft)		538.22	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	94.40	Top Width (ft)		94.40	
Vel Total (ft/s)	21.37	Avg. Vel. (ft/s)		21.37	
Max Chl Dpth (ft)	7.15	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	166743.4	Conv. (cfs)		166743.4	
Length Wtd. (ft)	90.59	Wetted Per. (ft)		97.31	
Min Ch El (ft)	1619.51	Shear (lb/sq ft)		1.64	
Alpha	1.00	Stream Power (lb/ft s)		35.09	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		41.78	
C & E Loss (ft)	0.00	Cum SA (acres)		7.52	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11215.68

INPUT
Description: PT AT 156+57.92
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1629.5	1031	1620.15	1066	1619.1	1101	1620.15	1119	1629.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1633.33	Element			
Vel Head (ft)	7.02	Wt. n-Val.		0.015	
W.S. Elev (ft)	1626.31	Reach Len. (ft)	86.94	86.94	86.94
Crit W.S. (ft)	1628.44	Flow Area (sq ft)		540.98	
E.G. Slope (ft/ft)	0.004640	Area (sq ft)		540.98	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.72	Top Width (ft)		93.72	
Vel Total (ft/s)	21.26	Avg. Vel. (ft/s)		21.26	
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)		5.77	
Conv. Total (cfs)	168818.7	Conv. (cfs)		168818.7	
Length Wtd. (ft)	86.94	Wetted Per. (ft)		96.76	
Min Ch El (ft)	1619.10	Shear (lb/sq ft)		1.62	
Alpha	1.00	Stream Power (lb/ft s)		34.43	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		40.66	
C & E Loss (ft)	0.00	Cum SA (acres)		7.32	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11128.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1629.11	1031	1619.76	1066	1618.71	1101	1619.76	1119	1629.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1632.93	Element			
Vel Head (ft)	7.00	Wt. n-Val.		0.015	
W.S. Elev (ft)	1625.93	Reach Len. (ft)	86.94	86.94	86.94
Crit W.S. (ft)	1628.05	Flow Area (sq ft)		541.73	
E.G. Slope (ft/ft)	0.004621	Area (sq ft)		541.73	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.75	Top Width (ft)		93.75	
Vel Total (ft/s)	21.23	Avg. Vel. (ft/s)		21.23	
Max Chl Dpth (ft)	7.22	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	169165.6	Conv. (cfs)		169165.6	
Length Wtd. (ft)	86.94	Wetted Per. (ft)		96.79	
Min Ch El (ft)	1618.71	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.28	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		39.58	
C & E Loss (ft)	0.00	Cum SA (acres)		7.13	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 11041.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1628.72	1031	1619.36	1066	1618.31	1101	1619.36	1119	1628.72

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1632.52	Element			
Vel Head (ft)	6.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1625.53	Reach Len. (ft)	86.94	86.94	86.94
Crit W.S. (ft)	1627.65	Flow Area (sq ft)		541.86	
E.G. Slope (ft/ft)	0.004617	Area (sq ft)		541.86	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.73	Top Width (ft)		93.73	
Vel Total (ft/s)	21.22	Avg. Vel. (ft/s)		21.22	
Max Chl Dpth (ft)	7.22	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	169250.2	Conv. (cfs)		169250.2	
Length Wtd. (ft)	86.94	Wetted Per. (ft)		96.78	
Min Ch El (ft)	1618.31	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.25	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		38.50	
C & E Loss (ft)	0.00	Cum SA (acres)		6.95	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10954.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1628.32	1031	1618.97	1066	1617.92	1101	1618.97	1119	1628.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	86.94	86.94	86.94	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1632.12	Element			
Vel Head (ft)	6.98	Wt. n-Val.		0.015	
W.S. Elev (ft)	1625.15	Reach Len. (ft)	86.94	86.94	86.94
Crit W.S. (ft)	1627.27	Flow Area (sq ft)		542.50	
E.G. Slope (ft/ft)	0.004602	Area (sq ft)		542.50	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.78	Top Width (ft)		93.78	
Vel Total (ft/s)	21.20	Avg. Vel. (ft/s)		21.20	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	169526.5	Conv. (cfs)		169526.5	
Length Wtd. (ft)	86.94	Wetted Per. (ft)		96.83	
Min Ch El (ft)	1617.92	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.12	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		37.41	
C & E Loss (ft)	0.00	Cum SA (acres)		6.76	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10867.92

INPUT
Description: PC at STA 160+05.69
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1627.93	1031	1618.58	1066	1617.53	1101	1618.58	1119	1627.93

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1631.73	Element			
Vel Head (ft)	6.96	Wt. n-Val.		0.015	
W.S. Elev (ft)	1624.76	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1626.87	Flow Area (sq ft)		543.06	
E.G. Slope (ft/ft)	0.004588	Area (sq ft)		543.06	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.80	Top Width (ft)		93.80	
Vel Total (ft/s)	21.18	Avg. Vel. (ft/s)		21.18	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	169788.3	Conv. (cfs)		169788.3	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		96.85	
Min Ch El (ft)	1617.53	Shear (lb/sq ft)		1.61	

Alpha	1.00	Stream Power (lb/ft s)	34.01
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	36.33
C & E Loss (ft)	0.00	Cum SA (acres)	6.57

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10774.3*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1628.03	1031	1618.03	1066	1617.11	1101	1618.03	1119	1628.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1631.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.01	Wt. n-Val.		0.015	
W.S. Elev (ft)	1624.29	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1626.41	Flow Area (sq ft)		541.15	
E.G. Slope (ft/ft)	0.004575	Area (sq ft)		541.15	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.54	Top Width (ft)		92.54	
Vel Total (ft/s)	21.25	Avg. Vel. (ft/s)		21.25	
Max Chl Dpth (ft)	7.18	Hydr. Depth (ft)		5.85	
Conv. Total (cfs)	170014.9	Conv. (cfs)		170014.9	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.81	
Min Ch El (ft)	1617.11	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.28	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		35.17	
C & E Loss (ft)	0.00	Cum SA (acres)		6.37	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10680.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1627.63	1031	1617.63	1066	1616.69	1101	1617.63	1119	1627.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1630.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1623.89	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1626.01	Flow Area (sq ft)		542.00	
E.G. Slope (ft/ft)	0.004552	Area (sq ft)		542.00	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.55	Top Width (ft)		92.55	
Vel Total (ft/s)	21.22	Avg. Vel. (ft/s)		21.22	
Max Chl Dpth (ft)	7.20	Hydr. Depth (ft)		5.86	
Conv. Total (cfs)	170449.9	Conv. (cfs)		170449.9	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.82	
Min Ch El (ft)	1616.69	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		34.11	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		34.00	
C & E Loss (ft)	0.00	Cum SA (acres)		6.17	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10587.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1627.23	1031	1617.23	1066	1616.27	1101	1617.23	1119	1627.23

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1630.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.97	Wt. n-Val.		0.015	
W.S. Elev (ft)	1623.50	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1625.60	Flow Area (sq ft)		542.85	
E.G. Slope (ft/ft)	0.004529	Area (sq ft)		542.85	

Q Total (cfs)	11500.00	Flow (cfs)	11500.00
Top Width (ft)	92.56	Top Width (ft)	92.56
Vel Total (ft/s)	21.18	Avg. Vel. (ft/s)	21.18
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)	5.87
Conv. Total (cfs)	170883.1	Conv. (cfs)	170883.1
Length Wtd. (ft)	93.54	Wetted Per. (ft)	95.83
Min Ch El (ft)	1616.27	Shear (lb/sq ft)	1.60
Alpha	1.00	Stream Power (lb/ft s)	33.93
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	32.84
C & E Loss (ft)	0.00	Cum SA (acres)	5.97

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10493.7*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1626.84	1031	1616.84	1066	1615.85	1101	1616.84	1119	1626.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1630.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1623.11	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1625.20	Flow Area (sq ft)		544.24	
E.G. Slope (ft/ft)	0.004492	Area (sq ft)		544.24	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.57	Top Width (ft)		92.57	
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13	
Max Chl Dpth (ft)	7.26	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171593.0	Conv. (cfs)		171593.0	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.85	
Min Ch El (ft)	1615.85	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.64	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		31.67	
C & E Loss (ft)	0.00	Cum SA (acres)		5.78	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10400.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1626.44	1031	1616.44	1066	1615.43	1101	1616.44	1119	1626.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1629.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1622.71	Reach Len. (ft)	93.54	93.54	93.54
Crit W.S. (ft)	1624.77	Flow Area (sq ft)		545.01	
E.G. Slope (ft/ft)	0.004471	Area (sq ft)		545.01	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.57	Top Width (ft)		92.57	
Vel Total (ft/s)	21.10	Avg. Vel. (ft/s)		21.10	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	171995.1	Conv. (cfs)		171995.1	
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.85	
Min Ch El (ft)	1615.43	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.49	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		30.50	
C & E Loss (ft)	0.00	Cum SA (acres)		5.58	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10306.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1626.04	1031	1616.04	1066	1615.01	1101	1616.04	1119	1626.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	93.54	93.54	93.54	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1629.21	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.89	Wt. n-Val.		0.015		
W.S. Elev (ft)	1622.31	Reach Len. (ft)	93.54	93.54	93.54	
Crit W.S. (ft)	1624.38	Flow Area (sq ft)		545.78		
E.G. Slope (ft/ft)	0.004450	Area (sq ft)		545.78		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.57	Top Width (ft)		92.57		
Vel Total (ft/s)	21.07	Avg. Vel. (ft/s)		21.07		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.90		
Conv. Total (cfs)	172396.7	Conv. (cfs)		172396.7		
Length Wtd. (ft)	93.54	Wetted Per. (ft)		95.85		
Min Ch El (ft)	1615.01	Shear (lb/sq ft)		1.58		
Alpha	1.00	Stream Power (lb/ft s)		33.33		
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		29.33		
C & E Loss (ft)	0.00	Cum SA (acres)		5.38		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10213.13

INPUT
Description: PCC at STA 166+60.48
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1625.64	1031	1615.64	1066	1614.59	1101	1615.64	1119	1625.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	98.96	98.96	98.96	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1628.79	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.87	Wt. n-Val.		0.015		
W.S. Elev (ft)	1621.91	Reach Len. (ft)	98.96	98.96	98.96	
Crit W.S. (ft)	1623.96	Flow Area (sq ft)		546.56		
E.G. Slope (ft/ft)	0.004429	Area (sq ft)		546.56		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	92.58	Top Width (ft)		92.58		
Vel Total (ft/s)	21.04	Avg. Vel. (ft/s)		21.04		
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.90		
Conv. Total (cfs)	172801.8	Conv. (cfs)		172801.8		
Length Wtd. (ft)	98.96	Wetted Per. (ft)		95.86		
Min Ch El (ft)	1614.59	Shear (lb/sq ft)		1.58		
Alpha	1.00	Stream Power (lb/ft s)		33.17		
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		28.16		
C & E Loss (ft)	0.00	Cum SA (acres)		5.18		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10114.1

INPUT
Description: cl hollywood boulevard
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.54	1031	1615.19	1066	1614.14	1101	1615.19	1119	1624.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	73.93	73.93	73.93	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1628.34	Element	Left OB	Channel	Right OB	
Vel Head (ft)	6.97	Wt. n-Val.		0.015		
W.S. Elev (ft)	1621.37	Reach Len. (ft)	73.93	73.93	73.93	
Crit W.S. (ft)	1623.48	Flow Area (sq ft)		542.97		
E.G. Slope (ft/ft)	0.004590	Area (sq ft)		542.97		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	93.80	Top Width (ft)		93.80		
Vel Total (ft/s)	21.18	Avg. Vel. (ft/s)		21.18		
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		5.79		
Conv. Total (cfs)	169745.5	Conv. (cfs)		169745.5		
Length Wtd. (ft)	73.93	Wetted Per. (ft)		96.85		
Min Ch El (ft)	1614.14	Shear (lb/sq ft)		1.61		
Alpha	1.00	Stream Power (lb/ft s)		34.02		
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)		26.92		
C & E Loss (ft)	0.00	Cum SA (acres)		4.97		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 10040.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.86	1031	1614.86	1066	1613.81	1101	1614.86	1119	1624.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	73.93	73.93	73.93	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1628.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1621.13	Reach Len. (ft)	73.93	73.93	73.93
Crit W.S. (ft)	1623.20	Flow Area (sq ft)		546.71	
E.G. Slope (ft/ft)	0.004425	Area (sq ft)		546.71	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.58	Top Width (ft)		92.58	
Vel Total (ft/s)	21.04	Avg. Vel. (ft/s)		21.04	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	172869.1	Conv. (cfs)		172869.1	
Length Wtd. (ft)	73.93	Wetted Per. (ft)		95.87	
Min Ch El (ft)	1613.81	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.14	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		26.00	
C & E Loss (ft)	0.00	Cum SA (acres)		4.81	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9966.33

INPUT
Description: PT at STA 169+07.28
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.87	1031	1614.53	1066	1613.48	1101	1614.53	1119	1623.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1627.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.95	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.72	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1622.83	Flow Area (sq ft)		543.69	
E.G. Slope (ft/ft)	0.004573	Area (sq ft)		543.69	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	93.85	Top Width (ft)		93.85	
Vel Total (ft/s)	21.15	Avg. Vel. (ft/s)		21.15	
Max Chl Dpth (ft)	7.24	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	170062.2	Conv. (cfs)		170062.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		96.90	
Min Ch El (ft)	1613.48	Shear (lb/sq ft)		1.60	
Alpha	1.00	Stream Power (lb/ft s)		33.88	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		25.07	
C & E Loss (ft)	0.00	Cum SA (acres)		4.65	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9916.64*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.31	1031	1614.31	1066	1613.26	1101	1614.31	1119	1624.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1627.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.85	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.59	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1622.63	Flow Area (sq ft)		547.51	
E.G. Slope (ft/ft)	0.004406	Area (sq ft)		547.51	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.61	Top Width (ft)		92.61	
Vel Total (ft/s)	21.00	Avg. Vel. (ft/s)		21.00	
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	173251.5	Conv. (cfs)		173251.5	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.90	
Min Ch El (ft)	1613.26	Shear (lb/sq ft)		1.57	
Alpha	1.00	Stream Power (lb/ft s)		32.98	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		24.45	
C & E Loss (ft)	0.00	Cum SA (acres)		4.54	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9866.96*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1624.08	1031	1614.08	1066	1613.03	1101	1614.08	1119	1624.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1627.22	Element			
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.36	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1622.42	Flow Area (sq ft)		546.85	
E.G. Slope (ft/ft)	0.004422	Area (sq ft)		546.85	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.59	Top Width (ft)		92.59	
Vel Total (ft/s)	21.03	Avg. Vel. (ft/s)		21.03	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	172938.7	Conv. (cfs)		172938.7	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.87	
Min Ch El (ft)	1613.03	Shear (lb/sq ft)		1.57	
Alpha	1.00	Stream Power (lb/ft s)		33.11	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		23.82	
C & E Loss (ft)	0.00	Cum SA (acres)		4.44	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9817.27*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.86	1031	1613.86	1066	1612.81	1101	1613.86	1119	1623.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1627.00	Element			
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.13	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1622.20	Flow Area (sq ft)		546.81	
E.G. Slope (ft/ft)	0.004423	Area (sq ft)		546.81	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.59	Top Width (ft)		92.59	
Vel Total (ft/s)	21.03	Avg. Vel. (ft/s)		21.03	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	172917.2	Conv. (cfs)		172917.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.87	
Min Ch El (ft)	1612.81	Shear (lb/sq ft)		1.57	
Alpha	1.00	Stream Power (lb/ft s)		33.12	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		23.20	
C & E Loss (ft)	0.00	Cum SA (acres)		4.33	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9767.59*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.64	1031	1613.64	1066	1612.59	1101	1613.64	1119	1623.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1626.78	Element			
Vel Head (ft)	6.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.91	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.96	Flow Area (sq ft)		546.77	
E.G. Slope (ft/ft)	0.004424	Area (sq ft)		546.77	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.59	Top Width (ft)		92.59	
Vel Total (ft/s)	21.03	Avg. Vel. (ft/s)		21.03	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	172898.1	Conv. (cfs)		172898.1	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.87	
Min Ch El (ft)	1612.59	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.13	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		22.58	

C & E Loss (ft)	0.00	Cum SA (acres)	4.23

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9717.90*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.41	1031	1613.41	1066	1612.36	1101	1613.41	1119	1623.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1626.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.68	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.73	Flow Area (sq ft)		546.06	
E.G. Slope (ft/ft)	0.004441	Area (sq ft)		546.06	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.56	Top Width (ft)		92.56	
Vel Total (ft/s)	21.06	Avg. Vel. (ft/s)		21.06	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172561.1	Conv. (cfs)		172561.1	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.84	
Min Ch El (ft)	1612.36	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.27	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		21.95	
C & E Loss (ft)	0.00	Cum SA (acres)		4.12	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9668.22*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1623.19	1031	1613.19	1066	1612.14	1101	1613.19	1119	1623.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1626.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.46	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.53	Flow Area (sq ft)		546.08	
E.G. Slope (ft/ft)	0.004441	Area (sq ft)		546.08	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.56	Top Width (ft)		92.56	
Vel Total (ft/s)	21.06	Avg. Vel. (ft/s)		21.06	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172574.9	Conv. (cfs)		172574.9	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.84	
Min Ch El (ft)	1612.14	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.27	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		21.33	
C & E Loss (ft)	0.00	Cum SA (acres)		4.02	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9618.53*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.97	1031	1612.97	1066	1611.92	1101	1612.97	1119	1622.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1626.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.24	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.31	Flow Area (sq ft)		546.11	
E.G. Slope (ft/ft)	0.004440	Area (sq ft)		546.11	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.56	Top Width (ft)		92.56	

Vel Total (ft/s)	21.06	Avg. Vel. (ft/s)	21.06
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)	5.90
Conv. Total (cfs)	172585.6	Conv. (cfs)	172585.6
Length Wtd. (ft)	49.69	Wetted Per. (ft)	95.84
Min Ch El (ft)	1611.92	Shear (lb/sq ft)	1.58
Alpha	1.00	Stream Power (lb/ft s)	33.26
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	20.71
C & E Loss (ft)	0.00	Cum SA (acres)	3.91

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9568.85*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.74	1031	1612.74	1066	1611.69	1101	1612.74	1119	1622.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.00	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1621.06	Flow Area (sq ft)		545.46	
E.G. Slope (ft/ft)	0.004456	Area (sq ft)		545.46	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.53	Top Width (ft)		92.53	
Vel Total (ft/s)	21.08	Avg. Vel. (ft/s)		21.08	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	172277.7	Conv. (cfs)		172277.7	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.81	
Min Ch El (ft)	1611.69	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.39	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		20.09	
C & E Loss (ft)	0.00	Cum SA (acres)		3.81	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9519.17*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.52	1031	1612.52	1066	1611.47	1101	1612.52	1119	1622.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.78	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1620.84	Flow Area (sq ft)		545.54	
E.G. Slope (ft/ft)	0.004454	Area (sq ft)		545.54	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.54	Top Width (ft)		92.54	
Vel Total (ft/s)	21.08	Avg. Vel. (ft/s)		21.08	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172315.2	Conv. (cfs)		172315.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.81	
Min Ch El (ft)	1611.47	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.37	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		19.46	
C & E Loss (ft)	0.00	Cum SA (acres)		3.70	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9469.48*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.3	1031	1612.3	1066	1611.25	1101	1612.3	1119	1622.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.56	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1620.62	Flow Area (sq ft)		545.61	
E.G. Slope (ft/ft)	0.004452	Area (sq ft)		545.61	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.54	Top Width (ft)		92.54	
Vel Total (ft/s)	21.08	Avg. Vel. (ft/s)		21.08	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	172352.6	Conv. (cfs)		172352.6	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.82	
Min Ch El (ft)	1611.25	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		33.36	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		18.84	
C & E Loss (ft)	0.00	Cum SA (acres)		3.59	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9419.80*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1622.07	1031	1612.07	1066	1611.02	1101	1612.07	1119	1622.07

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.33	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1620.41	Flow Area (sq ft)		545.01	
E.G. Slope (ft/ft)	0.004467	Area (sq ft)		545.01	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.52	Top Width (ft)		92.52	
Vel Total (ft/s)	21.10	Avg. Vel. (ft/s)		21.10	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	172067.2	Conv. (cfs)		172067.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.79	
Min Ch El (ft)	1611.02	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.48	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		18.22	
C & E Loss (ft)	0.00	Cum SA (acres)		3.49	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9370.11*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.85	1031	1611.85	1066	1610.8	1101	1611.85	1119	1621.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.11	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1620.19	Flow Area (sq ft)		545.11	
E.G. Slope (ft/ft)	0.004464	Area (sq ft)		545.11	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.52	Top Width (ft)		92.52	
Vel Total (ft/s)	21.10	Avg. Vel. (ft/s)		21.10	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	172115.2	Conv. (cfs)		172115.2	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.80	
Min Ch El (ft)	1610.80	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.46	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		17.60	
C & E Loss (ft)	0.00	Cum SA (acres)		3.38	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9320.43*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.62	1031	1611.62	1066	1610.57	1101	1611.62	1119	1621.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

1013	.015	1013	.015	1119	.015	

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.80	Element		Left OB	Channel	Right OB
Vel Head (ft)	6.93	Wt. n-Val.			0.015	
W.S. Elev (ft)	1617.87	Reach Len. (ft)		49.69	49.69	49.69
Crit W.S. (ft)	1619.94	Flow Area (sq ft)			544.55	
E.G. Slope (ft/ft)	0.004478	Area (sq ft)			544.55	
Q Total (cfs)	11500.00	Flow (cfs)			11500.00	
Top Width (ft)	92.50	Top Width (ft)			92.50	
Vel Total (ft/s)	21.12	Avg. Vel. (ft/s)			21.12	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)			5.89	
Conv. Total (cfs)	171850.5	Conv. (cfs)			171850.5	
Length Wtd. (ft)	49.69	Wetted Per. (ft)			95.77	
Min Ch El (ft)	1610.57	Shear (lb/sq ft)			1.59	
Alpha	1.00	Stream Power (lb/ft s)			33.57	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)			16.98	
C & E Loss (ft)	0.00	Cum SA (acres)			3.28	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9270.74*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.4	1031	1611.4	1066	1610.35	1101	1611.4	1119	1621.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.57	Element		Left OB	Channel	Right OB
Vel Head (ft)	6.92	Wt. n-Val.			0.015	
W.S. Elev (ft)	1617.65	Reach Len. (ft)		49.69	49.69	49.69
Crit W.S. (ft)	1619.72	Flow Area (sq ft)			544.70	
E.G. Slope (ft/ft)	0.004474	Area (sq ft)			544.70	
Q Total (cfs)	11500.00	Flow (cfs)			11500.00	
Top Width (ft)	92.51	Top Width (ft)			92.51	
Vel Total (ft/s)	21.11	Avg. Vel. (ft/s)			21.11	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)			5.89	
Conv. Total (cfs)	171919.9	Conv. (cfs)			171919.9	
Length Wtd. (ft)	49.69	Wetted Per. (ft)			95.78	
Min Ch El (ft)	1610.35	Shear (lb/sq ft)			1.59	
Alpha	1.00	Stream Power (lb/ft s)			33.54	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)			16.35	
C & E Loss (ft)	0.00	Cum SA (acres)			3.17	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9221.06*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1621.18	1031	1611.18	1066	1610.13	1101	1611.18	1119	1621.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.35	Element		Left OB	Channel	Right OB
Vel Head (ft)	6.92	Wt. n-Val.			0.015	
W.S. Elev (ft)	1617.43	Reach Len. (ft)		49.69	49.69	49.69
Crit W.S. (ft)	1619.50	Flow Area (sq ft)			544.85	
E.G. Slope (ft/ft)	0.004471	Area (sq ft)			544.85	
Q Total (cfs)	11500.00	Flow (cfs)			11500.00	
Top Width (ft)	92.51	Top Width (ft)			92.51	
Vel Total (ft/s)	21.11	Avg. Vel. (ft/s)			21.11	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)			5.89	
Conv. Total (cfs)	171989.3	Conv. (cfs)			171989.3	
Length Wtd. (ft)	49.69	Wetted Per. (ft)			95.78	
Min Ch El (ft)	1610.13	Shear (lb/sq ft)			1.59	
Alpha	1.00	Stream Power (lb/ft s)			33.51	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)			15.73	
C & E Loss (ft)	0.00	Cum SA (acres)			3.07	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9171.38*

INPUT

Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.95	1031	1610.95	1066	1609.9	1101	1610.95	1119	1620.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1617.20	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1619.29	Flow Area (sq ft)		544.30	
E.G. Slope (ft/ft)	0.004484	Area (sq ft)		544.30	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.49	Top Width (ft)		92.49	
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171730.9	Conv. (cfs)		171730.9	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.76	
Min Ch El (ft)	1609.90	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.62	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		15.11	
C & E Loss (ft)	0.00	Cum SA (acres)		2.96	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9121.69*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.73	1031	1610.73	1066	1609.68	1101	1610.73	1119	1620.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.98	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1619.07	Flow Area (sq ft)		544.47	
E.G. Slope (ft/ft)	0.004480	Area (sq ft)		544.47	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.50	Top Width (ft)		92.50	
Vel Total (ft/s)	21.12	Avg. Vel. (ft/s)		21.12	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	171810.9	Conv. (cfs)		171810.9	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.77	
Min Ch El (ft)	1609.68	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.59	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		14.49	
C & E Loss (ft)	0.00	Cum SA (acres)		2.86	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9072.01*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.51	1031	1610.51	1066	1609.46	1101	1610.51	1119	1620.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.92	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.76	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1618.83	Flow Area (sq ft)		544.64	
E.G. Slope (ft/ft)	0.004476	Area (sq ft)		544.64	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.50	Top Width (ft)		92.50	
Vel Total (ft/s)	21.11	Avg. Vel. (ft/s)		21.11	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	171893.3	Conv. (cfs)		171893.3	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.77	
Min Ch El (ft)	1609.46	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.55	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		13.87	
C & E Loss (ft)	0.00	Cum SA (acres)		2.75	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 9022.32*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.28	1031	1610.28	1066	1609.23	1101	1610.28	1119	1620.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1623.46	Element			
Vel Head (ft)	6.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.53	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1618.60	Flow Area (sq ft)		544.12	
E.G. Slope (ft/ft)	0.004489	Area (sq ft)		544.12	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.48	Top Width (ft)		92.48	
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171647.8	Conv. (cfs)		171647.8	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.75	
Min Ch El (ft)	1609.23	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.66	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		13.25	
C & E Loss (ft)	0.00	Cum SA (acres)		2.64	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8972.64*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1620.06	1031	1610.06	1066	1609.01	1101	1610.06	1119	1620.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1623.24	Element			
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.31	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1618.38	Flow Area (sq ft)		544.29	
E.G. Slope (ft/ft)	0.004485	Area (sq ft)		544.29	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.49	Top Width (ft)		92.49	
Vel Total (ft/s)	21.13	Avg. Vel. (ft/s)		21.13	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171727.8	Conv. (cfs)		171727.8	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.76	
Min Ch El (ft)	1609.01	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.62	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		12.63	
C & E Loss (ft)	0.00	Cum SA (acres)		2.54	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8922.95*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1619.84	1031	1609.84	1066	1608.79	1101	1609.84	1119	1619.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1623.02	Element			
Vel Head (ft)	6.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.09	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1618.18	Flow Area (sq ft)		544.47	
E.G. Slope (ft/ft)	0.004480	Area (sq ft)		544.47	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.50	Top Width (ft)		92.50	
Vel Total (ft/s)	21.12	Avg. Vel. (ft/s)		21.12	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.89	

Conv. Total (cfs)	171810.9	Conv. (cfs)	171810.9
Length Wtd. (ft)	49.69	Wetted Per. (ft)	95.77
Min Ch El (ft)	1608.79	Shear (lb/sq ft)	1.59
Alpha	1.00	Stream Power (lb/ft s)	33.59
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	12.01
C & E Loss (ft)	0.00	Cum SA (acres)	2.43

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8873.27*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1619.61	1031	1609.61	1066	1608.56	1101	1609.61	1119	1619.61

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	49.69	49.69	49.69	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1622.79	Element			
Vel Head (ft)	6.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1615.85	Reach Len. (ft)	49.69	49.69	49.69
Crit W.S. (ft)	1617.95	Flow Area (sq ft)		543.97	
E.G. Slope (ft/ft)	0.004492	Area (sq ft)		543.97	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	92.48	Top Width (ft)		92.48	
Vel Total (ft/s)	21.14	Avg. Vel. (ft/s)		21.14	
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	171576.1	Conv. (cfs)		171576.1	
Length Wtd. (ft)	49.69	Wetted Per. (ft)		95.74	
Min Ch El (ft)	1608.56	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		33.69	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		11.39	
C & E Loss (ft)	0.00	Cum SA (acres)		2.33	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8823.59

INPUT
Description: TRANSITION TO 118' WIDE RECT. STA 180+50
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1013	1618.39	1031	1609.39	1066	1608.34	1101	1609.39	1119	1618.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1013	.015	1013	.015	1119	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1013	1119	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1622.56	Element			
Vel Head (ft)	7.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1615.50	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1617.66	Flow Area (sq ft)		539.29	
E.G. Slope (ft/ft)	0.004728	Area (sq ft)		539.29	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	94.45	Top Width (ft)		94.45	
Vel Total (ft/s)	21.32	Avg. Vel. (ft/s)		21.32	
Max Chl Dpth (ft)	7.16	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	167239.1	Conv. (cfs)		167239.1	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		97.36	
Min Ch El (ft)	1608.34	Shear (lb/sq ft)		1.64	
Alpha	1.00	Stream Power (lb/ft s)		34.87	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)		10.77	
C & E Loss (ft)	0.00	Cum SA (acres)		2.22	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8808.96*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1012.25	1619.41	1028	1609.41	1066	1608.27	1104	1609.41	1119.75	1619.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1012.25	.015	1012.25	.015	1119.75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1012.25	1119.75	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1622.48	Element			
Vel Head (ft)	7.36	Wt. n-Val.		0.015	

W.S. Elev (ft)	1615.11	Reach Len. (ft)	14.63	14.63	14.63	
Crit W.S. (ft)	1617.36	Flow Area (sq ft)		528.08		
E.G. Slope (ft/ft)	0.005068	Area (sq ft)		528.08		
Q Total (cfs)	11500.00	Flow (cfs)		11500.00		
Top Width (ft)	93.97	Top Width (ft)		93.97		
Vel Total (ft/s)	21.78	Avg. Vel. (ft/s)		21.78		
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)		5.62		
Conv. Total (cfs)	161537.0	Conv. (cfs)		161537.0		
Length Wtd. (ft)	14.63	Wetted Per. (ft)		97.32		
Min Ch El (ft)	1608.27	Shear (lb/sq ft)		1.72		
Alpha	1.00	Stream Power (lb/ft s)		37.39		
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		10.59		
C & E Loss (ft)	0.02	Cum SA (acres)		2.19		

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8794.33*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1011.5	1619.44	1025	1609.44	1066	1608.21	1107	1609.44	1120.5	1619.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1011.5	.015	1011.5	.015	1120.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1011.5	1120.5	14.63 14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.71	Wt. n-Val.		0.015	
W.S. Elev (ft)	1614.67	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1617.03	Flow Area (sq ft)		515.96	
E.G. Slope (ft/ft)	0.005648	Area (sq ft)		515.96	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	96.11	Top Width (ft)		96.11	
Vel Total (ft/s)	22.29	Avg. Vel. (ft/s)		22.29	
Max Chl Dpth (ft)	6.46	Hydr. Depth (ft)		5.37	
Conv. Total (cfs)	153020.3	Conv. (cfs)		153020.3	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		99.60	
Min Ch El (ft)	1608.21	Shear (lb/sq ft)		1.83	
Alpha	1.00	Stream Power (lb/ft s)		40.71	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		10.41	
C & E Loss (ft)	0.02	Cum SA (acres)		2.16	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8779.70*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1010.75	1619.46	1022	1609.46	1066	1608.14	1110	1609.46	1121.25	1619.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1010.75	.015	1010.75	.015	1121.25	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1010.75	1121.25	14.63 14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1614.25	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1616.72	Flow Area (sq ft)		505.78	
E.G. Slope (ft/ft)	0.006269	Area (sq ft)		505.78	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	98.79	Top Width (ft)		98.79	
Vel Total (ft/s)	22.74	Avg. Vel. (ft/s)		22.74	
Max Chl Dpth (ft)	6.11	Hydr. Depth (ft)		5.12	
Conv. Total (cfs)	145244.9	Conv. (cfs)		145244.9	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		102.47	
Min Ch El (ft)	1608.14	Shear (lb/sq ft)		1.93	
Alpha	1.00	Stream Power (lb/ft s)		43.92	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		10.24	
C & E Loss (ft)	0.02	Cum SA (acres)		2.13	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8765.07*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1010	1619.48	1019	1609.48	1066	1608.07	1113	1609.48	1122	1619.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1010	.015	1010	.015	1122	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1010	1122	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.30	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.88	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1616.41	Flow Area (sq ft)		497.55	
E.G. Slope (ft/ft)	0.006917	Area (sq ft)		497.55	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	101.92	Top Width (ft)		101.92	
Vel Total (ft/s)	23.11	Avg. Vel. (ft/s)		23.11	
Max Chl Dpth (ft)	5.81	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	138270.5	Conv. (cfs)		138270.5	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		105.89	
Min Ch El (ft)	1608.07	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)		46.90	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		10.07	
C & E Loss (ft)	0.01	Cum SA (acres)		2.09	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8750.43*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1009.25	1619.51	1016	1609.51	1066	1608.01	1116	1609.51	1122.75	1619.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1009.25	.015	1009.25	.015	1122.75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1009.25	1122.75	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.57	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1616.13	Flow Area (sq ft)		491.59	
E.G. Slope (ft/ft)	0.007560	Area (sq ft)		491.59	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	105.47	Top Width (ft)		105.47	
Vel Total (ft/s)	23.39	Avg. Vel. (ft/s)		23.39	
Max Chl Dpth (ft)	5.55	Hydr. Depth (ft)		4.66	
Conv. Total (cfs)	132261.2	Conv. (cfs)		132261.2	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		109.83	
Min Ch El (ft)	1608.01	Shear (lb/sq ft)		2.11	
Alpha	1.00	Stream Power (lb/ft s)		49.42	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		9.91	
C & E Loss (ft)	0.01	Cum SA (acres)		2.06	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8735.81*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1008.5	1619.53	1013	1609.53	1066	1607.94	1119	1609.53	1123.5	1619.53

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1008.5	.015	1008.5	.015	1123.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1008.5	1123.5	14.63	14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.67	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.27	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1615.83	Flow Area (sq ft)		486.58	
E.G. Slope (ft/ft)	0.008245	Area (sq ft)		486.58	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	109.36	Top Width (ft)		109.36	
Vel Total (ft/s)	23.63	Avg. Vel. (ft/s)		23.63	
Max Chl Dpth (ft)	5.33	Hydr. Depth (ft)		4.45	
Conv. Total (cfs)	126652.1	Conv. (cfs)		126652.1	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		114.24	
Min Ch El (ft)	1607.94	Shear (lb/sq ft)		2.19	
Alpha	1.00	Stream Power (lb/ft s)		51.81	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		9.74	
C & E Loss (ft)	0.01	Cum SA (acres)		2.02	

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8721.18*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007.75	1619.56	1010	1609.56	1066	1607.88	1122	1609.56	1124.25	1619.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007.75	.015	1007.75	.015	1124.25	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
1007.75	1124.25		14.63	14.63	.05	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.81	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.01	Reach Len. (ft)	14.63	14.63	14.63
Crit W.S. (ft)	1615.61	Flow Area (sq ft)		482.81	
E.G. Slope (ft/ft)	0.008946	Area (sq ft)		482.81	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	113.55	Top Width (ft)		113.55	
Vel Total (ft/s)	23.82	Avg. Vel. (ft/s)		23.82	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	121585.5	Conv. (cfs)		121585.5	
Length Wtd. (ft)	14.63	Wetted Per. (ft)		119.12	
Min Ch El (ft)	1607.88	Shear (lb/sq ft)		2.26	
Alpha	1.00	Stream Power (lb/ft s)		53.92	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		9.58	
C & E Loss (ft)	0.01	Cum SA (acres)		1.98	

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8706.55

INPUT
Description: PC at STA 181+67.05 (END TRANSITION)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1619.58	1007	1609.58	1066	1607.81	1125	1609.58	1125	1619.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
1007	1125		378.56	378.56	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.76	Reach Len. (ft)	378.56	378.56	378.56
Crit W.S. (ft)	1615.36	Flow Area (sq ft)		479.97	
E.G. Slope (ft/ft)	0.009669	Area (sq ft)		479.97	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	23.96	Avg. Vel. (ft/s)		23.96	
Max Chl Dpth (ft)	4.95	Hydr. Depth (ft)		4.07	
Conv. Total (cfs)	116952.3	Conv. (cfs)		116952.3	
Length Wtd. (ft)	378.56	Wetted Per. (ft)		124.42	
Min Ch El (ft)	1607.81	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)		55.79	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		9.42	
C & E Loss (ft)	0.01	Cum SA (acres)		1.94	

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8327.98

INPUT
Description: PT at STA 185+45.62
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1617.88	1007	1607.88	1066	1606.11	1125	1607.88	1125	1617.88

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
1007	1125		54.08	54.08	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1618.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.11	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.55	Reach Len. (ft)	54.08	54.08	54.08
Crit W.S. (ft)	1613.65	Flow Area (sq ft)		537.57	
E.G. Slope (ft/ft)	0.006696	Area (sq ft)		537.57	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	21.39	Avg. Vel. (ft/s)		21.39	
Max Chl Dpth (ft)	5.44	Hydr. Depth (ft)		4.56	
Conv. Total (cfs)	140531.8	Conv. (cfs)		140531.8	
Length Wtd. (ft)	54.08	Wetted Per. (ft)		125.39	
Min Ch El (ft)	1606.11	Shear (lb/sq ft)		1.79	
Alpha	1.00	Stream Power (lb/ft s)		38.34	
Frctn Loss (ft)	3.02	Cum Volume (acre-ft)		5.00	
C & E Loss (ft)	0.00	Cum SA (acres)		0.92	

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 RIVER: Duckcreek
REACH: DUCKDOWN RS: 8273.9

INPUT
Description: 14.4' upstream of bridge face at BBent
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1616.63	1007	1607.63	1066	1605.86	1125	1607.63	1125	1616.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	14.4	14.4	14.4	0	0

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.31	Element			
Vel Head (ft)	6.96	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.35	Reach Len. (ft)	14.40	14.40	14.40
Crit W.S. (ft)	1613.40	Flow Area (sq ft)		543.24	
E.G. Slope (ft/ft)	0.006473	Area (sq ft)		543.24	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	21.17	Avg. Vel. (ft/s)		21.17	
Max Chl Dpth (ft)	5.49	Hydr. Depth (ft)		4.60	
Conv. Total (cfs)	142940.1	Conv. (cfs)		142940.1	
Length Wtd. (ft)	14.40	Wetted Per. (ft)		125.49	
Min Ch El (ft)	1605.86	Shear (lb/sq ft)		1.75	
Alpha	1.00	Stream Power (lb/ft s)		37.03	
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)		4.33	
C & E Loss (ft)	0.00	Cum SA (acres)		0.77	

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8259.5

INPUT
Description: upstream of bridge face at BBent
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1615.1	1007	1607.58	1066	1605.81	1125	1607.58	1125	1615.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	140.8	140.8	140.8	.1	.2

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.22	Element			
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.32	Reach Len. (ft)	14.40	14.40	14.40
Crit W.S. (ft)	1613.37	Flow Area (sq ft)		545.74	
E.G. Slope (ft/ft)	0.006377	Area (sq ft)		545.74	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	21.07	Avg. Vel. (ft/s)		21.07	
Max Chl Dpth (ft)	5.51	Hydr. Depth (ft)		4.62	
Conv. Total (cfs)	144005.3	Conv. (cfs)		144005.3	
Length Wtd. (ft)	14.40	Wetted Per. (ft)		125.53	
Min Ch El (ft)	1605.81	Shear (lb/sq ft)		1.73	
Alpha	1.00	Stream Power (lb/ft s)		36.47	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		4.15	
C & E Loss (ft)	0.00	Cum SA (acres)		0.73	

Warning: The cross section had to be extended vertically during the critical depth calculations.

BRIDGE RIVER: Duckcreek
REACH: DUCKDOWN RS: 8202.6

INPUT
Description: broadbent bridge
Distance from Upstream XS = 14.4
Deck/Roadway Width = 119.6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
1007	1620 1615.31	1125	1620 1615.31

Upstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1615.1	1007	1607.58	1066	1605.81	1125	1607.58	1125	1615.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
1007	1125	.1	.2

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
1007	1620 1614.69	1125	1620 1614.69

Downstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1614.69	1007	1606.96	1066	1605.19	1125	1606.96	1125	1614.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
1007	1125	.1	.2

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 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 Piers = 3

Pier Data
Pier Station Upstream=1036.125 Downstream=1036.125
Upstream num= 2

Width	Elev	Width	Elev
2.5	1600	2.5	1616

Downstream num= 2

Width	Elev	Width	Elev
2.5	1600	2.5	1616

Pier Data
Pier Station Upstream= 1066 Downstream= 1066
Upstream num= 2

Width	Elev	Width	Elev
2.5	1600	2.5	1616

Downstream num= 2

Width	Elev	Width	Elev
2.5	1600	2.5	1616

Pier Data
Pier Station Upstream=1095.875 Downstream=1095.875
Upstream num= 2

Width	Elev	Width	Elev
2.5	1600	2.5	1616

Downstream num= 2

Width	Elev	Width	Elev
2.5	1600	2.5	1616

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 1.33
Selected Low Flow Methods = Momentum

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream water surface

BRIDGE OUTPUT Profile #PF 1
Opening : Single BR

			Inside BR US	Inside BR DS
E.G. US. (ft)	1618.22	Element		
W.S. US. (ft)	1611.32	E.G. Elev (ft)	1617.91	1617.12
Q Total (cfs)	11500.00	W.S. Elev (ft)	1612.09	1611.62
Q Bridge (cfs)	11500.00	Crit W.S. (ft)	1613.68	1613.07
Q Weir (cfs)		Max Chl Dpth (ft)	6.24	6.40
Weir Sta Lft (ft)		Vel Total (ft/s)	19.36	18.82
Weir Sta Rgt (ft)		Flow Area (sq ft)	593.87	611.06
Weir Submerg		Froude # Chl	1.47	1.41
Weir Max Depth (ft)		Specif Force (cu ft)	8526.15	8425.37
Min El Weir Flow (ft)	1620.01	Hydr Depth (ft)	5.37	5.53
Min El Prs (ft)	1615.31	W.P. Total (ft)	153.58	154.82
Delta EG (ft)	1.18	Conv. Total (cfs)	144935.6	151177.2
Delta WS (ft)	0.29	Top Width (ft)	110.50	110.50
BR Open Area (sq ft)	949.83	Frctn Loss (ft)	0.09	0.72
BR Open Vel (ft/s)	19.36	C & E Loss (ft)	0.21	0.06
Coef of Q		Shear Total (lb/sq ft)	1.52	1.43
Br Sel Method	Energy only	Power Total (lb/ft s)	29.43	26.83

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8118.7

INPUT
Description: downstream of bbent bridge
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1614.69	1007	1606.96	1066	1605.19	1125	1606.96	1125	1614.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	53.5	53.5	.1	.2

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1617.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.01	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.03	Reach Len. (ft)	53.50	53.50	53.50
Crit W.S. (ft)	1612.73	Flow Area (sq ft)		584.77	
E.G. Slope (ft/ft)	0.005101	Area (sq ft)		584.77	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	19.67	Avg. Vel. (ft/s)		19.67	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	161010.3	Conv. (cfs)		161010.3	
Length Wtd. (ft)		Wetted Per. (ft)		126.19	
Min Ch El (ft)	1605.19	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)		29.02	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		2.21	
C & E Loss (ft)	0.05	Cum SA (acres)		0.37	

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 cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 8065.2

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1007	1615.98	1007	1606.72	1066	1604.95	1125	1606.72	1125	1615.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1007	.015	1007	.015	1125	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1007	1125	78.99	78.99	78.99	0	0

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1615.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.88	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.00	Reach Len. (ft)	78.99	78.99	78.99
Crit W.S. (ft)	1612.49	Flow Area (sq ft)		727.47	
E.G. Slope (ft/ft)	0.002527	Area (sq ft)		727.47	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	118.00	Top Width (ft)		118.00	
Vel Total (ft/s)	15.81	Avg. Vel. (ft/s)		15.81	
Max Chl Dpth (ft)	7.05	Hydr. Depth (ft)		6.17	
Conv. Total (cfs)	228775.8	Conv. (cfs)		228775.8	
Length Wtd. (ft)		Wetted Per. (ft)		128.61	
Min Ch El (ft)	1604.95	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)		14.11	
Frctn Loss (ft)		Cum Volume (acre-ft)		1.40	
C & E Loss (ft)		Cum SA (acres)		0.23	

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.
Note: The user has entered a known water surface elevation at this cross section.

CROSS SECTION RIVER: Duckcreek
REACH: DUCKDOWN RS: 7986.2

INPUT
Description: END CONCRETE CHANNEL
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
990	1613.15	990	1606.52	1066	1604.59	1125	1606.36	1125	1612.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
990	.015	990	.015	1125	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
990	1125	.1	.2

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1614.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.05	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.60	Reach Len. (ft)			
Crit W.S. (ft)	1611.60	Flow Area (sq ft)		821.01	
E.G. Slope (ft/ft)	0.001988	Area (sq ft)		821.01	
Q Total (cfs)	11500.00	Flow (cfs)		11500.00	
Top Width (ft)	135.00	Top Width (ft)		135.00	
Vel Total (ft/s)	14.01	Avg. Vel. (ft/s)		14.01	
Max Chl Dpth (ft)	7.01	Hydr. Depth (ft)		6.08	
Conv. Total (cfs)	257923.7	Conv. (cfs)		257923.7	
Length Wtd. (ft)		Wetted Per. (ft)		145.37	
Min Ch El (ft)	1604.59	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		9.82	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.

SUMMARY OF MANNING'S N VALUES

River:Duckcreek

Reach	River Sta.	n1	n2	n3
DUCKDOWN	11785.87	.015	.015	.015
DUCKDOWN	11769.1*	.015	.015	.015
DUCKDOWN	11752.3*	.015	.015	.015
DUCKDOWN	11735.6*	.015	.015	.015
DUCKDOWN	11718.8*	.015	.015	.015
DUCKDOWN	11702.1*	.015	.015	.015
DUCKDOWN	11685.3*	.015	.015	.015
DUCKDOWN	11668.62	.015	.015	.015
DUCKDOWN	11578.0*	.015	.015	.015
DUCKDOWN	11487.4*	.015	.015	.015
DUCKDOWN	11396.8*	.015	.015	.015
DUCKDOWN	11306.2*	.015	.015	.015
DUCKDOWN	11215.68	.015	.015	.015
DUCKDOWN	11128.7*	.015	.015	.015
DUCKDOWN	11041.8*	.015	.015	.015
DUCKDOWN	10954.8*	.015	.015	.015
DUCKDOWN	10867.92	.015	.015	.015
DUCKDOWN	10774.3*	.015	.015	.015
DUCKDOWN	10680.8*	.015	.015	.015
DUCKDOWN	10587.2*	.015	.015	.015
DUCKDOWN	10493.7*	.015	.015	.015
DUCKDOWN	10400.2*	.015	.015	.015
DUCKDOWN	10306.6*	.015	.015	.015
DUCKDOWN	10213.13	.015	.015	.015
DUCKDOWN	10114.1	.015	.015	.015
DUCKDOWN	10040.2*	.015	.015	.015
DUCKDOWN	9966.33	.015	.015	.015
DUCKDOWN	9916.64*	.015	.015	.015
DUCKDOWN	9866.96*	.015	.015	.015
DUCKDOWN	9817.27*	.015	.015	.015
DUCKDOWN	9767.59*	.015	.015	.015
DUCKDOWN	9717.90*	.015	.015	.015
DUCKDOWN	9668.22*	.015	.015	.015
DUCKDOWN	9618.53*	.015	.015	.015
DUCKDOWN	9568.85*	.015	.015	.015
DUCKDOWN	9519.17*	.015	.015	.015
DUCKDOWN	9469.48*	.015	.015	.015
DUCKDOWN	9419.80*	.015	.015	.015
DUCKDOWN	9370.11*	.015	.015	.015
DUCKDOWN	9320.43*	.015	.015	.015
DUCKDOWN	9270.74*	.015	.015	.015
DUCKDOWN	9221.06*	.015	.015	.015
DUCKDOWN	9171.38*	.015	.015	.015
DUCKDOWN	9121.69*	.015	.015	.015
DUCKDOWN	9072.01*	.015	.015	.015
DUCKDOWN	9022.32*	.015	.015	.015
DUCKDOWN	8972.64*	.015	.015	.015
DUCKDOWN	8922.95*	.015	.015	.015
DUCKDOWN	8873.27*	.015	.015	.015
DUCKDOWN	8823.59	.015	.015	.015
DUCKDOWN	8808.96*	.015	.015	.015
DUCKDOWN	8794.33*	.015	.015	.015
DUCKDOWN	8779.70*	.015	.015	.015
DUCKDOWN	8765.07*	.015	.015	.015
DUCKDOWN	8750.43*	.015	.015	.015
DUCKDOWN	8735.81*	.015	.015	.015
DUCKDOWN	8721.18*	.015	.015	.015
DUCKDOWN	8706.55	.015	.015	.015
DUCKDOWN	8327.98	.015	.015	.015
DUCKDOWN	8273.9	.015	.015	.015
DUCKDOWN	8259.5	.015	.015	.015
DUCKDOWN	8202.6	Bridge		
DUCKDOWN	8118.7	.015	.015	.015
DUCKDOWN	8065.2	.015	.015	.015
DUCKDOWN	7986.2	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Duckcreek

Reach	River Sta.	Left	Channel	Right
DUCKDOWN	11785.87	16.75	16.75	16.75
DUCKDOWN	11769.1*	16.75	16.75	16.75
DUCKDOWN	11752.3*	16.75	16.75	16.75
DUCKDOWN	11735.6*	16.75	16.75	16.75
DUCKDOWN	11718.8*	16.75	16.75	16.75
DUCKDOWN	11702.1*	16.75	16.75	16.75
DUCKDOWN	11685.3*	16.75	16.75	16.75
DUCKDOWN	11668.62	90.59	90.59	90.59
DUCKDOWN	11578.0*	90.59	90.59	90.59
DUCKDOWN	11487.4*	90.59	90.59	90.59
DUCKDOWN	11396.8*	90.59	90.59	90.59
DUCKDOWN	11306.2*	90.59	90.59	90.59
DUCKDOWN	11215.68	86.94	86.94	86.94
DUCKDOWN	11128.7*	86.94	86.94	86.94
DUCKDOWN	11041.8*	86.94	86.94	86.94
DUCKDOWN	10954.8*	86.94	86.94	86.94
DUCKDOWN	10867.92	93.54	93.54	93.54
DUCKDOWN	10774.3*	93.54	93.54	93.54
DUCKDOWN	10680.8*	93.54	93.54	93.54
DUCKDOWN	10587.2*	93.54	93.54	93.54
DUCKDOWN	10493.7*	93.54	93.54	93.54
DUCKDOWN	10400.2*	93.54	93.54	93.54
DUCKDOWN	10306.6*	93.54	93.54	93.54

DUCKDOWN	10213.13	98.96	98.96	98.96
DUCKDOWN	10114.1	73.93	73.93	73.93
DUCKDOWN	10040.2*	73.93	73.93	73.93
DUCKDOWN	9966.33	49.69	49.69	49.69
DUCKDOWN	9916.64*	49.69	49.69	49.69
DUCKDOWN	9866.96*	49.69	49.69	49.69
DUCKDOWN	9817.27*	49.69	49.69	49.69
DUCKDOWN	9767.59*	49.69	49.69	49.69
DUCKDOWN	9717.90*	49.69	49.69	49.69
DUCKDOWN	9668.22*	49.69	49.69	49.69
DUCKDOWN	9618.53*	49.69	49.69	49.69
DUCKDOWN	9568.85*	49.69	49.69	49.69
DUCKDOWN	9519.17*	49.69	49.69	49.69
DUCKDOWN	9469.48*	49.69	49.69	49.69
DUCKDOWN	9419.80*	49.69	49.69	49.69
DUCKDOWN	9370.11*	49.69	49.69	49.69
DUCKDOWN	9320.43*	49.69	49.69	49.69
DUCKDOWN	9270.74*	49.69	49.69	49.69
DUCKDOWN	9221.06*	49.69	49.69	49.69
DUCKDOWN	9171.38*	49.69	49.69	49.69
DUCKDOWN	9121.69*	49.69	49.69	49.69
DUCKDOWN	9072.01*	49.69	49.69	49.69
DUCKDOWN	9022.32*	49.69	49.69	49.69
DUCKDOWN	8972.64*	49.69	49.69	49.69
DUCKDOWN	8922.95*	49.69	49.69	49.69
DUCKDOWN	8873.27*	49.69	49.69	49.69
DUCKDOWN	8823.59	14.63	14.63	14.63
DUCKDOWN	8808.96*	14.63	14.63	14.63
DUCKDOWN	8794.33*	14.63	14.63	14.63
DUCKDOWN	8779.70*	14.63	14.63	14.63
DUCKDOWN	8765.07*	14.63	14.63	14.63
DUCKDOWN	8750.43*	14.63	14.63	14.63
DUCKDOWN	8735.81*	14.63	14.63	14.63
DUCKDOWN	8721.18*	14.63	14.63	14.63
DUCKDOWN	8706.55	378.56	378.56	378.56
DUCKDOWN	8327.98	54.08	54.08	54.08
DUCKDOWN	8273.9	14.4	14.4	14.4
DUCKDOWN	8259.5	140.8	140.8	140.8
DUCKDOWN	8202.6	Bridge		
DUCKDOWN	8118.7	53.5	53.5	53.5
DUCKDOWN	8065.2	78.99	78.99	78.99
DUCKDOWN	7986.2			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Duckcreek

Reach	River Sta.	Contr.	Expan.
DUCKDOWN	11785.87	.05	.1
DUCKDOWN	11769.1*	.05	.1
DUCKDOWN	11752.3*	.05	.1
DUCKDOWN	11735.6*	.05	.1
DUCKDOWN	11718.8*	.05	.1
DUCKDOWN	11702.1*	.05	.1
DUCKDOWN	11685.3*	.05	.1
DUCKDOWN	11668.62	0	0
DUCKDOWN	11578.0*	0	0
DUCKDOWN	11487.4*	0	0
DUCKDOWN	11396.8*	0	0
DUCKDOWN	11306.2*	0	0
DUCKDOWN	11215.68	0	0
DUCKDOWN	11128.7*	0	0
DUCKDOWN	11041.8*	0	0
DUCKDOWN	10954.8*	0	0
DUCKDOWN	10867.92	0	0
DUCKDOWN	10774.3*	0	0
DUCKDOWN	10680.8*	0	0
DUCKDOWN	10587.2*	0	0
DUCKDOWN	10493.7*	0	0
DUCKDOWN	10400.2*	0	0
DUCKDOWN	10306.6*	0	0
DUCKDOWN	10213.13	0	0
DUCKDOWN	10114.1	0	0
DUCKDOWN	10040.2*	0	0
DUCKDOWN	9966.33	0	0
DUCKDOWN	9916.64*	0	0
DUCKDOWN	9866.96*	0	0
DUCKDOWN	9817.27*	0	0
DUCKDOWN	9767.59*	0	0
DUCKDOWN	9717.90*	0	0
DUCKDOWN	9668.22*	0	0
DUCKDOWN	9618.53*	0	0
DUCKDOWN	9568.85*	0	0
DUCKDOWN	9519.17*	0	0
DUCKDOWN	9469.48*	0	0
DUCKDOWN	9419.80*	0	0
DUCKDOWN	9370.11*	0	0
DUCKDOWN	9320.43*	0	0
DUCKDOWN	9270.74*	0	0
DUCKDOWN	9221.06*	0	0
DUCKDOWN	9171.38*	0	0
DUCKDOWN	9121.69*	0	0
DUCKDOWN	9072.01*	0	0
DUCKDOWN	9022.32*	0	0
DUCKDOWN	8972.64*	0	0
DUCKDOWN	8922.95*	0	0
DUCKDOWN	8873.27*	0	0
DUCKDOWN	8823.59	.05	.1
DUCKDOWN	8808.96*	.05	.1
DUCKDOWN	8794.33*	.05	.1

DUCKDOWN	8779.70*	.05	.1
DUCKDOWN	8765.07*	.05	.1
DUCKDOWN	8750.43*	.05	.1
DUCKDOWN	8735.81*	.05	.1
DUCKDOWN	8721.18*	.05	.1
DUCKDOWN	8706.55	0	0
DUCKDOWN	8327.98	0	0
DUCKDOWN	8273.9	0	0
DUCKDOWN	8259.5	.1	.2
DUCKDOWN	8202.6	Bridge	
DUCKDOWN	8118.7	.1	.2
DUCKDOWN	8065.2	0	0
DUCKDOWN	7986.2	.1	.2

Profile Output Table - Standard Table 1

Reach	River Sta	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
DUCKDOWN	11785.87	11500.00	1621.67	1627.60	1630.19	1636.28	0.007107	23.64	486.39	93.00	1.82
DUCKDOWN	11769.1*	11500.00	1621.59	1627.80	1630.36	1636.13	0.006416	23.17	496.32	89.71	1.74
DUCKDOWN	11752.3*	11500.00	1621.52	1628.04	1630.46	1636.00	0.005840	22.63	508.07	88.67	1.67
DUCKDOWN	11735.6*	11500.00	1621.44	1628.22	1630.58	1635.88	0.005497	22.21	517.79	90.11	1.63
DUCKDOWN	11718.8*	11500.00	1621.37	1628.34	1630.63	1635.77	0.005219	21.87	525.81	91.35	1.61
DUCKDOWN	11702.1*	11500.00	1621.29	1628.37	1630.62	1635.68	0.005043	21.68	530.34	92.25	1.59
DUCKDOWN	11685.3*	11500.00	1621.22	1628.35	1630.56	1635.59	0.004923	21.59	532.74	92.96	1.59
DUCKDOWN	11668.62	11500.00	1621.14	1628.26	1630.48	1635.50	0.004867	21.60	532.44	93.36	1.59
DUCKDOWN	11578.0*	11500.00	1620.73	1627.82	1630.05	1635.06	0.004903	21.59	532.77	94.17	1.60
DUCKDOWN	11487.4*	11500.00	1620.32	1627.43	1629.64	1634.62	0.004855	21.51	534.54	94.25	1.59
DUCKDOWN	11396.8*	11500.00	1619.92	1627.06	1629.24	1634.18	0.004794	21.42	536.82	94.34	1.58
DUCKDOWN	11306.2*	11500.00	1619.51	1626.66	1628.83	1633.75	0.004757	21.37	538.22	94.40	1.58
DUCKDOWN	11215.68	11500.00	1619.10	1626.31	1628.44	1633.33	0.004640	21.26	540.98	93.72	1.56
DUCKDOWN	11128.7*	11500.00	1618.71	1625.93	1628.05	1632.93	0.004621	21.23	541.73	93.75	1.56
DUCKDOWN	11041.8*	11500.00	1618.31	1625.53	1627.65	1632.52	0.004617	21.22	541.86	93.73	1.56
DUCKDOWN	10954.8*	11500.00	1617.92	1625.15	1627.27	1632.12	0.004602	21.20	542.50	93.78	1.55
DUCKDOWN	10867.92	11500.00	1617.53	1624.76	1626.87	1631.73	0.004588	21.18	543.06	93.80	1.55
DUCKDOWN	10774.3*	11500.00	1617.11	1624.29	1626.41	1631.31	0.004575	21.25	541.15	92.54	1.55
DUCKDOWN	10680.8*	11500.00	1616.69	1623.89	1626.01	1630.88	0.004552	21.22	542.00	92.55	1.55
DUCKDOWN	10587.2*	11500.00	1616.27	1623.50	1625.60	1630.46	0.004529	21.18	542.85	92.56	1.54
DUCKDOWN	10493.7*	11500.00	1615.85	1623.11	1625.20	1630.04	0.004492	21.13	544.24	92.57	1.54
DUCKDOWN	10400.2*	11500.00	1615.43	1622.71	1624.77	1629.62	0.004471	21.10	545.01	92.57	1.53
DUCKDOWN	10306.6*	11500.00	1615.01	1622.31	1624.38	1629.21	0.004450	21.07	545.78	92.57	1.53
DUCKDOWN	10213.13	11500.00	1614.59	1621.91	1623.96	1628.79	0.004429	21.04	546.56	92.58	1.53
DUCKDOWN	10114.1	11500.00	1614.14	1621.37	1623.48	1628.34	0.004590	21.18	542.97	93.80	1.55
DUCKDOWN	10040.2*	11500.00	1613.81	1621.13	1623.20	1628.00	0.004425	21.04	546.71	92.58	1.53
DUCKDOWN	9966.33	11500.00	1613.48	1620.72	1622.83	1627.67	0.004573	21.15	543.69	93.85	1.55
DUCKDOWN	9916.64*	11500.00	1613.26	1620.59	1622.63	1627.44	0.004406	21.00	547.51	92.61	1.52
DUCKDOWN	9866.96*	11500.00	1613.03	1620.36	1622.42	1627.22	0.004422	21.03	546.95	92.59	1.52
DUCKDOWN	9817.27*	11500.00	1612.81	1620.13	1622.20	1627.00	0.004423	21.03	546.81	92.59	1.53
DUCKDOWN	9767.59*	11500.00	1612.59	1619.91	1621.96	1626.78	0.004424	21.03	546.77	92.59	1.53
DUCKDOWN	9717.90*	11500.00	1612.36	1619.68	1621.73	1626.56	0.004441	21.06	546.06	92.56	1.53
DUCKDOWN	9668.22*	11500.00	1612.14	1619.46	1621.53	1626.34	0.004441	21.06	546.08	92.56	1.53
DUCKDOWN	9618.53*	11500.00	1611.92	1619.24	1621.31	1626.12	0.004440	21.06	546.11	92.56	1.53
DUCKDOWN	9568.85*	11500.00	1611.69	1619.00	1621.06	1625.90	0.004456	21.08	545.46	92.53	1.53
DUCKDOWN	9519.17*	11500.00	1611.47	1618.78	1620.84	1625.68	0.004454	21.08	545.54	92.54	1.53
DUCKDOWN	9469.48*	11500.00	1611.25	1618.56	1620.62	1625.46	0.004452	21.08	545.61	92.54	1.53
DUCKDOWN	9419.80*	11500.00	1611.02	1618.33	1620.41	1625.24	0.004467	21.10	545.01	92.52	1.53
DUCKDOWN	9370.11*	11500.00	1610.80	1618.11	1620.19	1625.02	0.004464	21.10	545.11	92.52	1.53
DUCKDOWN	9320.43*	11500.00	1610.57	1617.87	1619.94	1624.80	0.004478	21.12	544.55	92.50	1.53
DUCKDOWN	9270.74*	11500.00	1610.35	1617.65	1619.72	1624.57	0.004474	21.11	544.70	92.51	1.53
DUCKDOWN	9221.06*	11500.00	1610.13	1617.43	1619.50	1624.35	0.004471	21.11	544.85	92.51	1.53
DUCKDOWN	9171.38*	11500.00	1609.90	1617.20	1619.29	1624.13	0.004484	21.13	544.30	92.49	1.53
DUCKDOWN	9121.69*	11500.00	1609.68	1616.98	1619.07	1623.91	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	9072.01*	11500.00	1609.46	1616.76	1618.83	1623.68	0.004476	21.11	544.64	92.50	1.53
DUCKDOWN	9022.32*	11500.00	1609.23	1616.53	1618.60	1623.46	0.004489	21.13	544.12	92.48	1.54
DUCKDOWN	8972.64*	11500.00	1609.01	1616.31	1618.38	1623.24	0.004485	21.13	544.29	92.49	1.53
DUCKDOWN	8922.95*	11500.00	1608.79	1616.09	1618.18	1623.02	0.004480	21.12	544.47	92.50	1.53
DUCKDOWN	8873.27*	11500.00	1608.56	1615.85	1617.95	1622.79	0.004492	21.14	543.97	92.48	1.54
DUCKDOWN	8823.59	11500.00	1608.34	1615.50	1617.66	1622.56	0.004728	21.32	539.29	94.45	1.57
DUCKDOWN	8808.96*	11500.00	1608.27	1615.11	1617.36	1622.48	0.005068	21.78	528.08	93.97	1.62
DUCKDOWN	8794.33*	11500.00	1608.21	1614.67	1617.03	1622.38	0.005648	22.29	515.96	96.11	1.70
DUCKDOWN	8779.70*	11500.00	1608.14	1614.25	1616.72	1622.28	0.006269	22.74	505.78	98.79	1.77
DUCKDOWN	8765.07*	11500.00	1608.07	1613.88	1616.41	1622.18	0.006917	23.11	497.55	101.92	1.84
DUCKDOWN	8750.43*	11500.00	1608.01	1613.57	1616.13	1622.06	0.007560	23.39	491.59	105.47	1.91
DUCKDOWN	8735.81*	11500.00	1607.94	1613.27	1615.83	1621.94	0.008245	23.63	486.58	109.36	1.97
DUCKDOWN	8721.18*	11500.00	1607.88	1613.01	1615.61	1621.82	0.008946	23.82	482.81	113.55	2.04
DUCKDOWN	8706.55	11500.00	1607.81	1612.76	1615.36	1621.68	0.009669	23.96	479.97	118.00	2.09
DUCKDOWN	8327.98	11500.00	1606.11	1611.55	1613.65	1618.66	0.006696	21.39	537.57	118.00	1.77
DUCKDOWN	8273.9	11500.00	1605.86	1611.35	1613.40	1618.31	0.006473	21.17	543.24	118.00	1.74
DUCKDOWN	8259.5	11500.00	1605.81	1611.32	1613.37	1618.22	0.006377	21.07	545.74	118.00	1.73
DUCKDOWN	8202.6	Bridge									
DUCKDOWN	8118.7	11500.00	1605.19	1611.03	1612.73	1617.04	0.005101	19.67	584.77	118.00	1.56
DUCKDOWN	8065.2	11500.00	1604.95	1612.00	1612.49	1615.88	0.002527	15.81	727.47	118.00	1.12
DUCKDOWN	7986.2	11500.00	1604.59	1611.60	1611.60	1614.65	0.001988	14.01	821.01	135.00	1.00

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
DUCKDOWN	11785.87	1636.28	1627.60	8.68				11500.00		93.00
DUCKDOWN	11769.1*	1636.13	1627.80	8.34	0.11	0.03		11500.00		89.71
DUCKDOWN	11752.3*	1636.00	1628.04	7.96	0.10	0.04		11500.00		88.67
DUCKDOWN	11735.6*	1635.88	1628.22	7.66	0.09	0.03		11500.00		90.11
DUCKDOWN	11718.8*	1635.77	1628.34	7.43	0.09	0.02		11500.00		91.35
DUCKDOWN	11702.1*	1635.68	1628.37	7.30	0.09	0.01		11500.00		92.25
DUCKDOWN	11685.3*	1635.59	1628.35	7.24	0.08	0.01		11500.00		92.96
DUCKDOWN	11668.62	1635.50	1628.26	7.24	0.08	0.00		11500.00		93.36
DUCKDOWN	11578.0*	1635.06	1627.82	7.23	0.44	0.00		11500.00		94.17
DUCKDOWN	11487.4*	1634.62	1627.43	7.19	0.44	0.00		11500.00		94.25
DUCKDOWN	11396.8*	1634.18	1627.06	7.13	0.44	0.00		11500.00		94.34
DUCKDOWN	11306.2*	1633.75	1626.66	7.09	0.43	0.00		11500.00		94.40

DUCKDOWN	11215.68	1633.33	1626.31	7.02	0.43	0.00	11500.00	93.72
DUCKDOWN	11128.7*	1632.93	1625.93	7.00	0.40	0.00	11500.00	93.75
DUCKDOWN	11041.8*	1632.52	1625.53	6.99	0.40	0.00	11500.00	93.73
DUCKDOWN	10954.8*	1632.12	1625.15	6.98	0.40	0.00	11500.00	93.78
DUCKDOWN	10867.92	1631.73	1624.76	6.96	0.40	0.00	11500.00	93.80
DUCKDOWN	10774.3*	1631.31	1624.29	7.01	0.43	0.00	11500.00	92.54
DUCKDOWN	10680.8*	1630.88	1623.89	6.99	0.43	0.00	11500.00	92.55
DUCKDOWN	10587.2*	1630.46	1623.50	6.97	0.42	0.00	11500.00	92.56
DUCKDOWN	10493.7*	1630.04	1623.11	6.93	0.42	0.00	11500.00	92.57
DUCKDOWN	10400.2*	1629.62	1622.71	6.91	0.42	0.00	11500.00	92.57
DUCKDOWN	10306.6*	1629.21	1622.31	6.89	0.42	0.00	11500.00	92.57
DUCKDOWN	10213.13	1628.79	1621.91	6.87	0.42	0.00	11500.00	92.58
DUCKDOWN	10114.1	1628.34	1621.37	6.97	0.45	0.00	11500.00	93.80
DUCKDOWN	10040.2*	1628.00	1621.13	6.87	0.33	0.00	11500.00	92.58
DUCKDOWN	9966.33	1627.67	1620.72	6.95	0.33	0.00	11500.00	93.85
DUCKDOWN	9916.64*	1627.44	1620.59	6.85	0.22	0.00	11500.00	92.61
DUCKDOWN	9866.96*	1627.22	1620.36	6.87	0.22	0.00	11500.00	92.59
DUCKDOWN	9817.27*	1627.00	1620.13	6.87	0.22	0.00	11500.00	92.59
DUCKDOWN	9767.59*	1626.78	1619.91	6.87	0.22	0.00	11500.00	92.59
DUCKDOWN	9717.90*	1626.56	1619.68	6.89	0.22	0.00	11500.00	92.56
DUCKDOWN	9668.22*	1626.34	1619.46	6.89	0.22	0.00	11500.00	92.56
DUCKDOWN	9618.53*	1626.12	1619.24	6.89	0.22	0.00	11500.00	92.56
DUCKDOWN	9568.85*	1625.90	1619.00	6.90	0.22	0.00	11500.00	92.53
DUCKDOWN	9519.17*	1625.68	1618.78	6.90	0.22	0.00	11500.00	92.54
DUCKDOWN	9469.48*	1625.46	1618.56	6.90	0.22	0.00	11500.00	92.54
DUCKDOWN	9419.80*	1625.24	1618.33	6.91	0.22	0.00	11500.00	92.52
DUCKDOWN	9370.11*	1625.02	1618.11	6.91	0.22	0.00	11500.00	92.52
DUCKDOWN	9320.43*	1624.80	1617.87	6.93	0.22	0.00	11500.00	92.50
DUCKDOWN	9270.74*	1624.57	1617.65	6.92	0.22	0.00	11500.00	92.51
DUCKDOWN	9221.06*	1624.35	1617.43	6.92	0.22	0.00	11500.00	92.51
DUCKDOWN	9171.38*	1624.13	1617.20	6.93	0.22	0.00	11500.00	92.49
DUCKDOWN	9121.69*	1623.91	1616.98	6.93	0.22	0.00	11500.00	92.50
DUCKDOWN	9072.01*	1623.68	1616.76	6.92	0.22	0.00	11500.00	92.50
DUCKDOWN	9022.32*	1623.46	1616.53	6.94	0.22	0.00	11500.00	92.48
DUCKDOWN	8972.64*	1623.24	1616.31	6.93	0.22	0.00	11500.00	92.49
DUCKDOWN	8922.95*	1623.02	1616.09	6.93	0.22	0.00	11500.00	92.50
DUCKDOWN	8873.27*	1622.79	1615.85	6.94	0.22	0.00	11500.00	92.48
DUCKDOWN	8823.59	1622.56	1615.50	7.06	0.23	0.00	11500.00	94.45
DUCKDOWN	8808.96*	1622.48	1615.11	7.36	0.07	0.02	11500.00	93.97
DUCKDOWN	8794.33*	1622.38	1614.67	7.71	0.08	0.02	11500.00	96.11
DUCKDOWN	8779.70*	1622.28	1614.25	8.03	0.09	0.02	11500.00	98.79
DUCKDOWN	8765.07*	1622.18	1613.88	8.30	0.10	0.01	11500.00	101.92
DUCKDOWN	8750.43*	1622.06	1613.57	8.50	0.11	0.01	11500.00	105.47
DUCKDOWN	8735.81*	1621.94	1613.27	8.67	0.12	0.01	11500.00	109.36
DUCKDOWN	8721.18*	1621.82	1613.01	8.81	0.13	0.01	11500.00	113.55
DUCKDOWN	8706.55	1621.68	1612.76	8.91	0.14	0.01	11500.00	118.00
DUCKDOWN	8327.98	1618.66	1611.55	7.11	3.02	0.00	11500.00	118.00
DUCKDOWN	8273.9	1618.31	1611.35	6.96	0.36	0.00	11500.00	118.00
DUCKDOWN	8259.5	1618.22	1611.32	6.89	0.09	0.00	11500.00	118.00
DUCKDOWN	8202.6	Bridge						
DUCKDOWN	8118.7	1617.04	1611.03	6.01	0.04	0.05	11500.00	118.00
DUCKDOWN	8065.2	1615.88	1612.00	3.88			11500.00	118.00
DUCKDOWN	7986.2	1614.65	1611.60	3.05			11500.00	135.00

Profile Output Table - Six XS Bridge

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Frctn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)
DUCKDOWN	8273.9	1618.31	1611.35	1613.40	0.36	0.00	118.00		11500.00		21.17
DUCKDOWN	8259.5	1618.22	1611.32	1613.37	0.09	0.00	118.00		11500.00		21.07
DUCKDOWN	8202.6 BR U	1617.91	1612.09	1613.68	0.09	0.21	110.50		11500.00		19.36
DUCKDOWN	8202.6 BR D	1617.12	1611.62	1613.07	0.72	0.06	110.50		11500.00		18.82
DUCKDOWN	8118.7	1617.04	1611.03	1612.72	0.04	0.05	118.00		11500.00		19.67
DUCKDOWN	8065.2	1615.88	1612.00	1612.49			118.00		11500.00		15.81

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : IS, n=.015

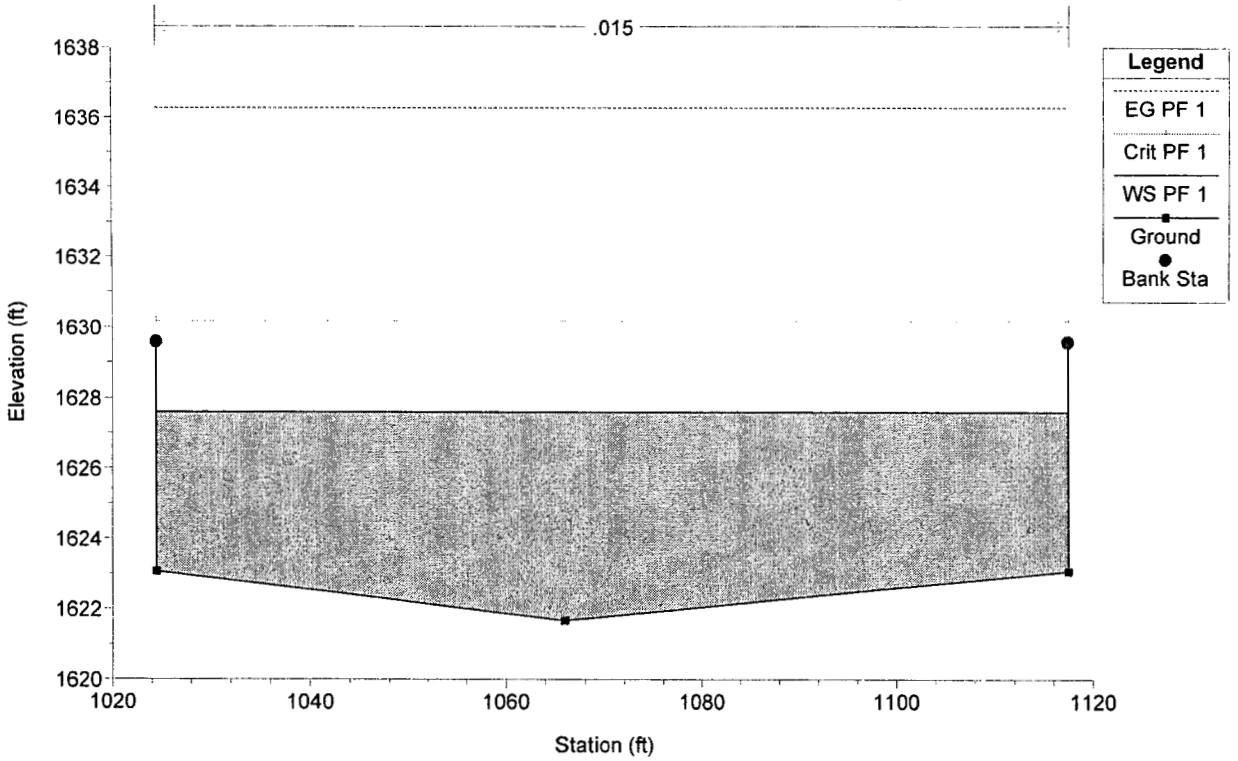
River: Duckcreek Reach: DUCKDOWN RS: 11785.87 Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11769.1* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11752.3* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11735.6* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11718.8* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11702.1* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11685.3* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11668.62 Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11578.0* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11487.4* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11396.8* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11306.2* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11215.68 Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11128.7* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 11041.8* Profile: PF 1
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek Reach: DUCKDOWN RS: 10954.8* Profile: PF 1

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     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10867.92     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10774.3*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10680.8*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10587.2*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10493.7*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10400.2*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10306.6*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10213.13     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10114.1     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 10040.2*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9966.33     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9916.64*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9866.96*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9817.27*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9767.59*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9717.90*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9668.22*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9618.53*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9568.85*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9519.17*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9469.48*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9419.80*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9370.11*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9320.43*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9270.74*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9221.06*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9171.38*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9121.69*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9072.01*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 9022.32*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8972.64*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8922.95*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8873.27*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8823.59     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8808.96*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8794.33*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8779.70*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8765.07*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8750.43*     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8327.98     Profile: PF 1
     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.
River: Duckcreek  Reach: DUCKDOWN     RS: 8273.9     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8259.5     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8202.6     Profile: PF 1 Upstream
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
River: Duckcreek  Reach: DUCKDOWN     RS: 8118.7     Profile: PF 1
     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 cross section had to be extended vertically during the critical depth calculations.
River: Duckcreek  Reach: DUCKDOWN     RS: 8065.2     Profile: PF 1
     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.
     Note:   The user has entered a known water surface elevation at this cross section.
River: Duckcreek  Reach: DUCKDOWN     RS: 7986.2     Profile: PF 1
     Warning:The cross section had to be extended vertically during the critical depth calculations.
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Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

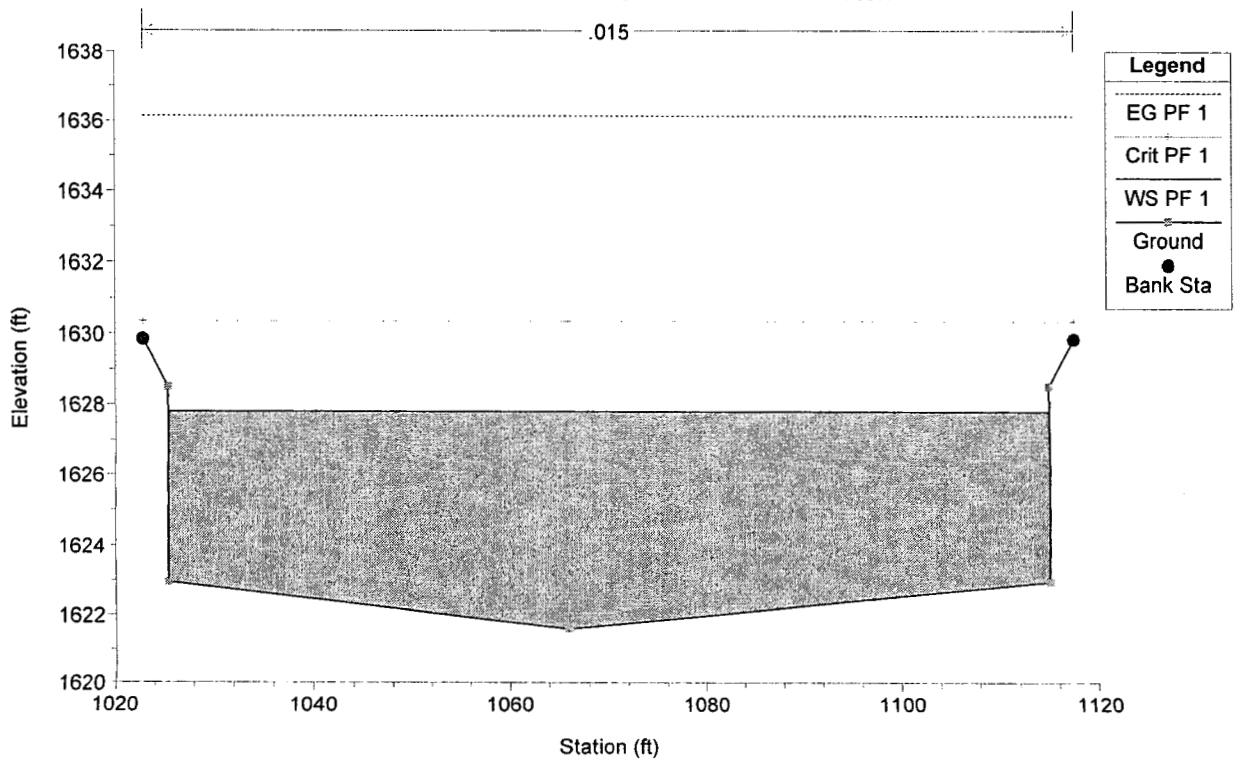
River = Duckcreek Reach = DUCKDOWN RS = 11785.87 Transition Begins at 150+87.74



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

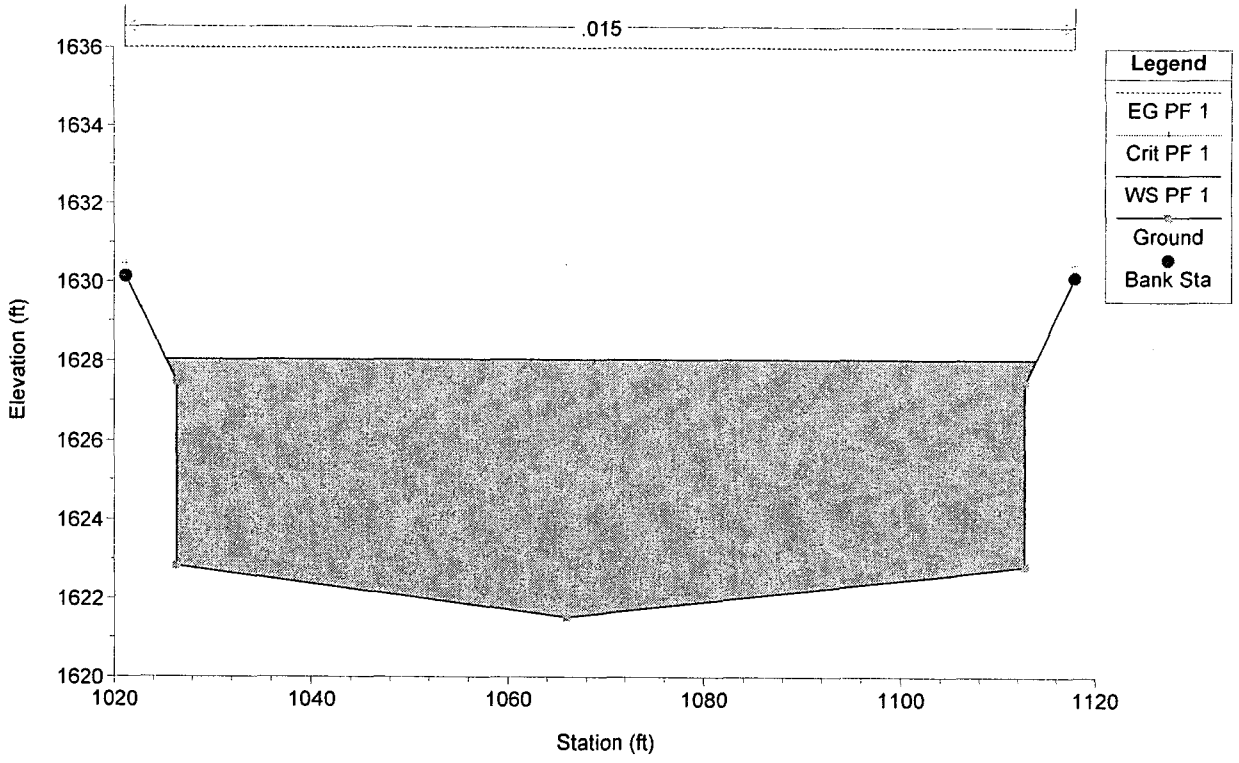
River = Duckcreek Reach = DUCKDOWN RS = 11769.1*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

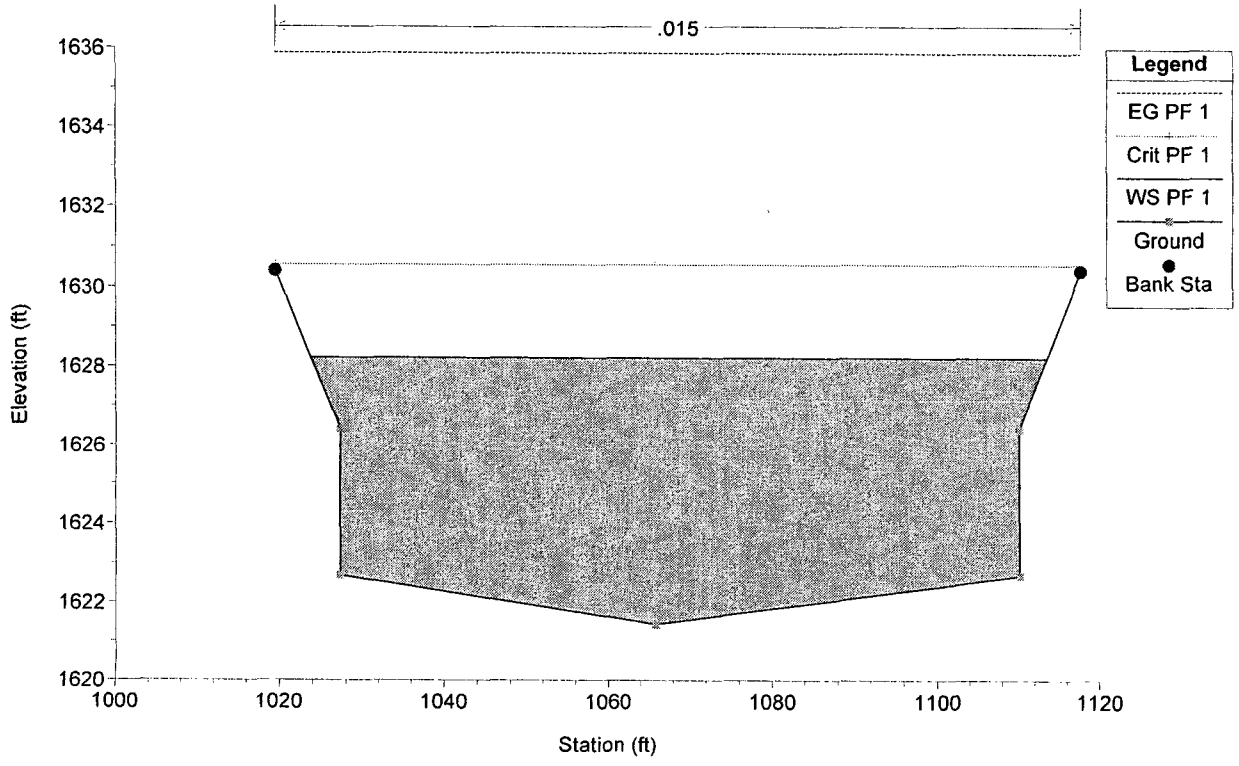
River = Duckcreek Reach = DUCKDOWN RS = 11752.3*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

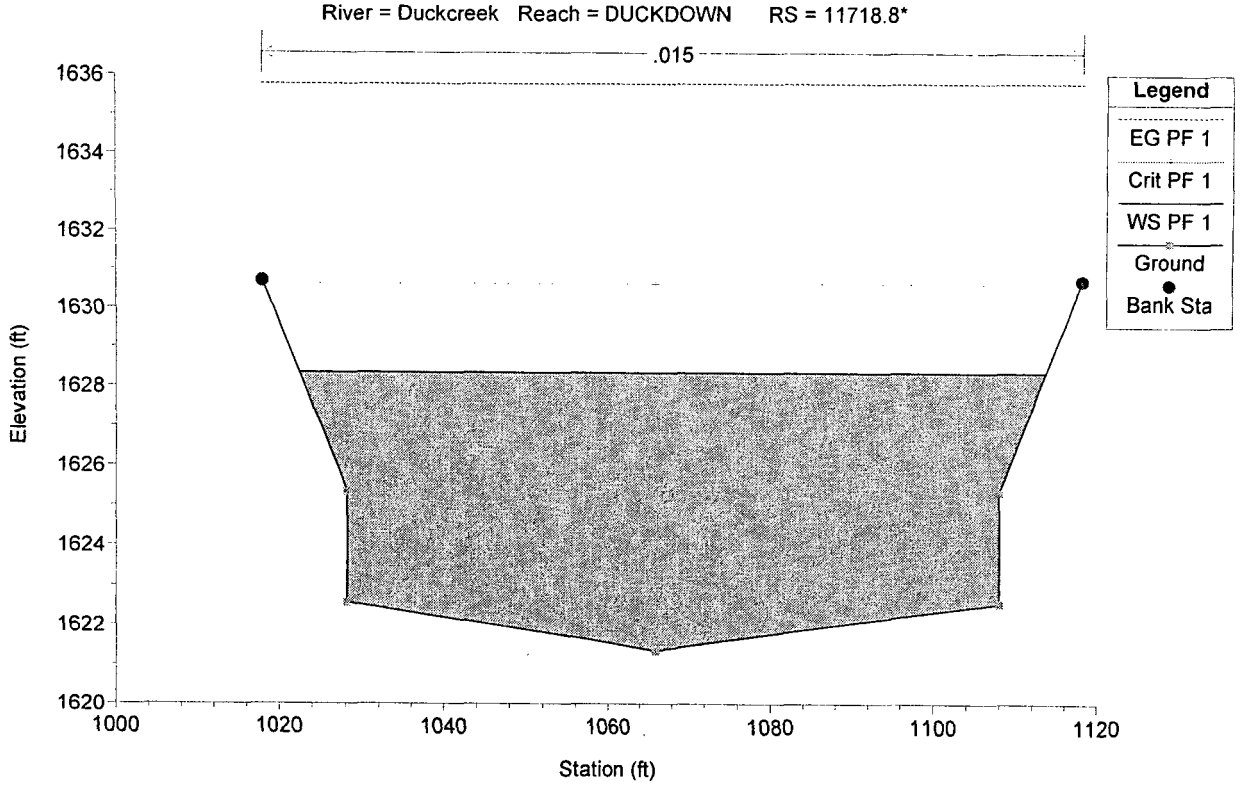
River = Duckcreek Reach = DUCKDOWN RS = 11735.6*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

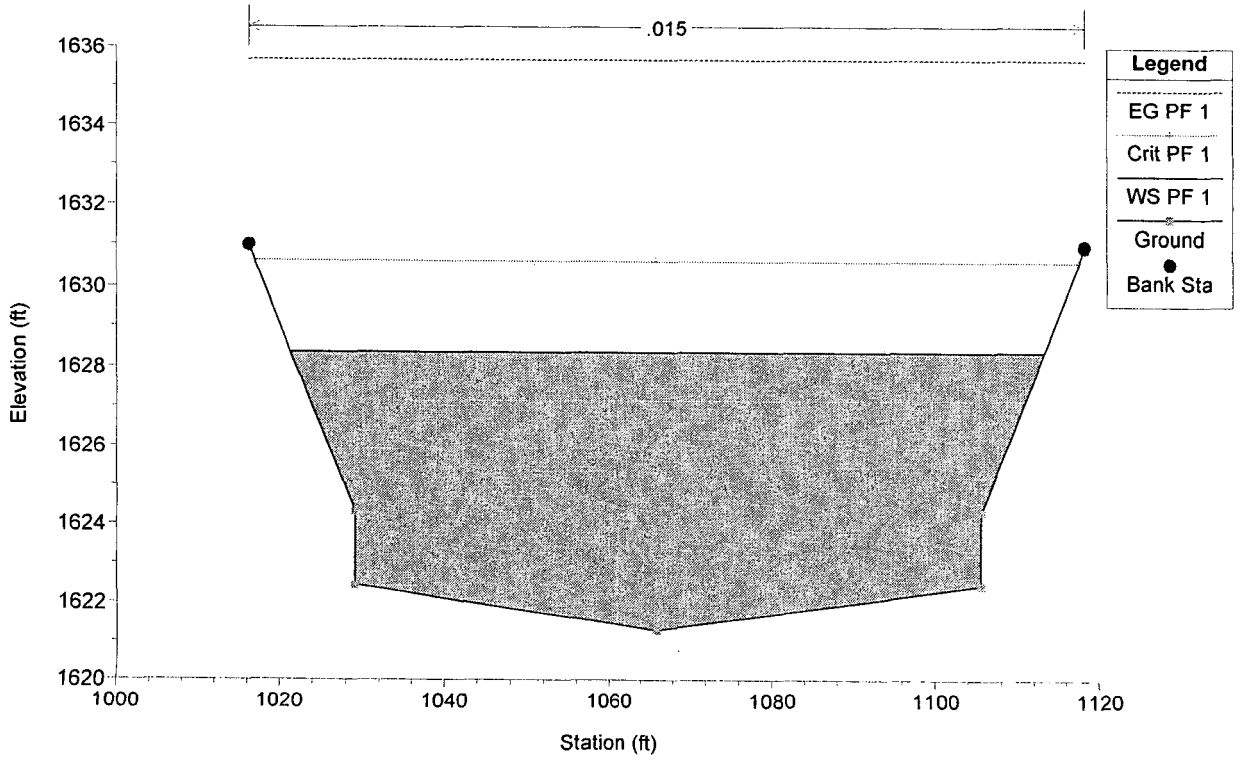
River = Duckcreek Reach = DUCKDOWN RS = 11718.8*

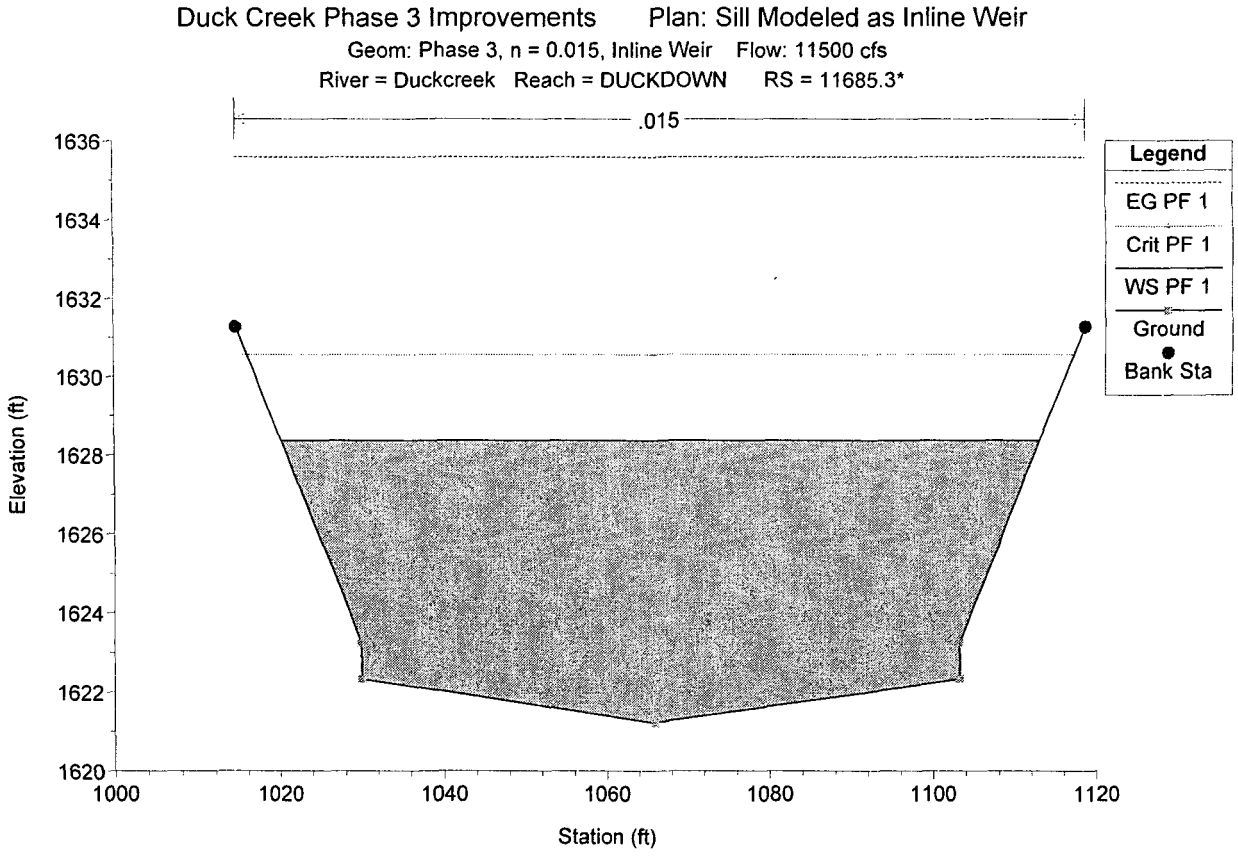


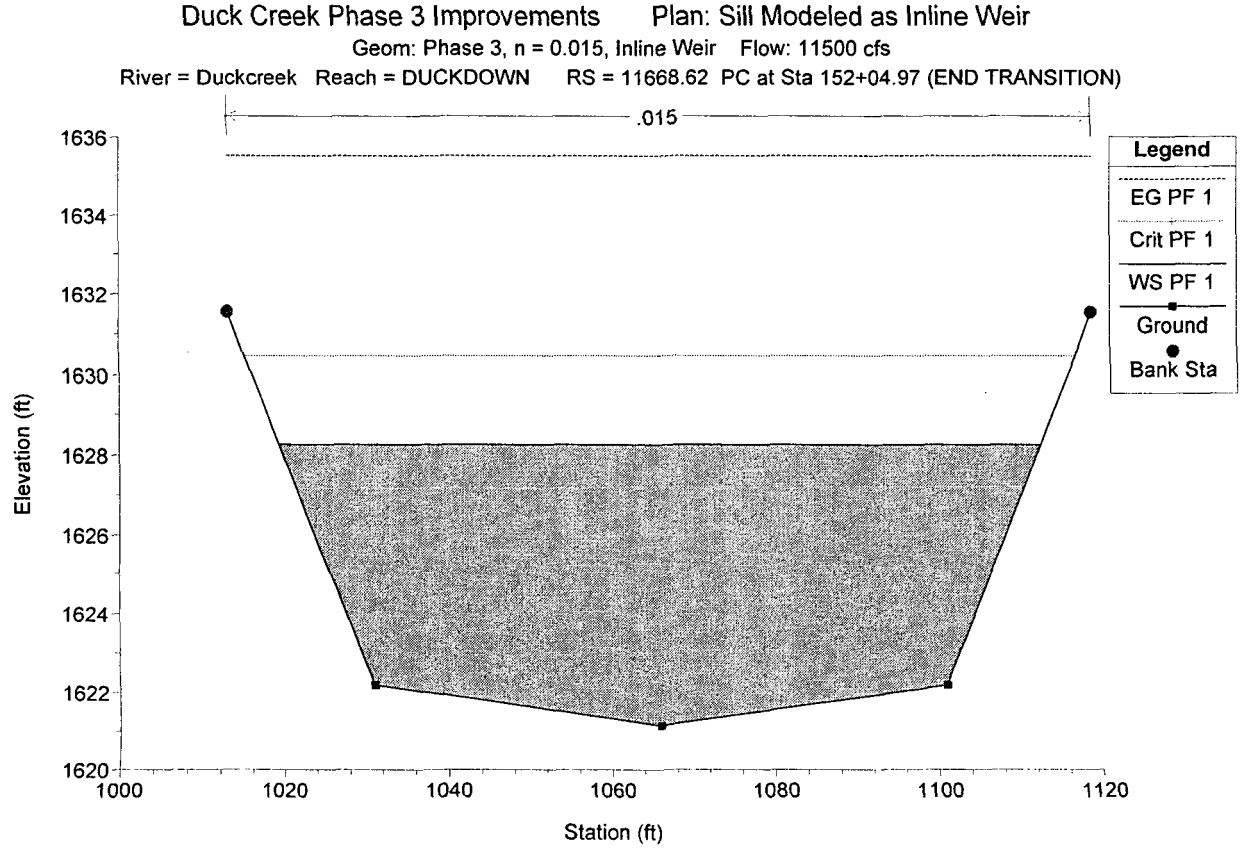
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

River = Duckcreek Reach = DUCKDOWN RS = 11702.1*



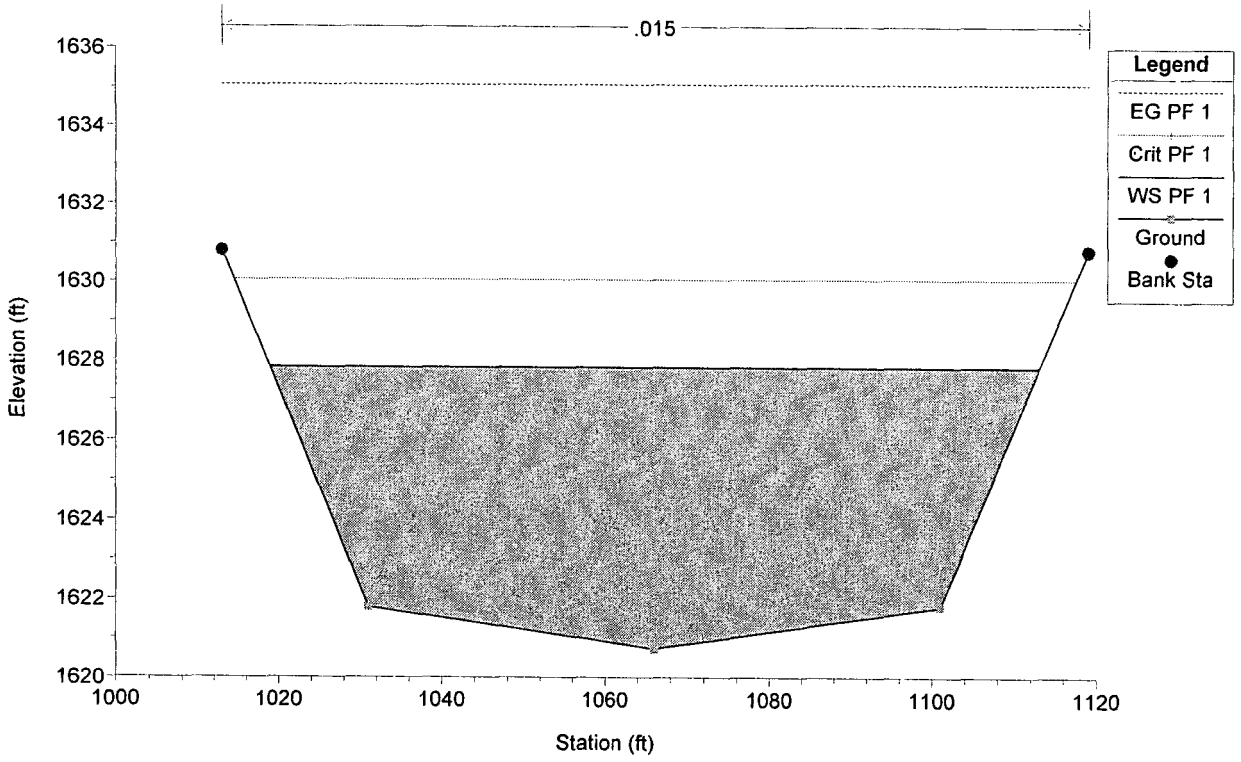

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11685.3*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11668.62 PC at Sta 152+04.97 (END TRANSITION)
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1000
1020
1040
1060
1080
1100
1120

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

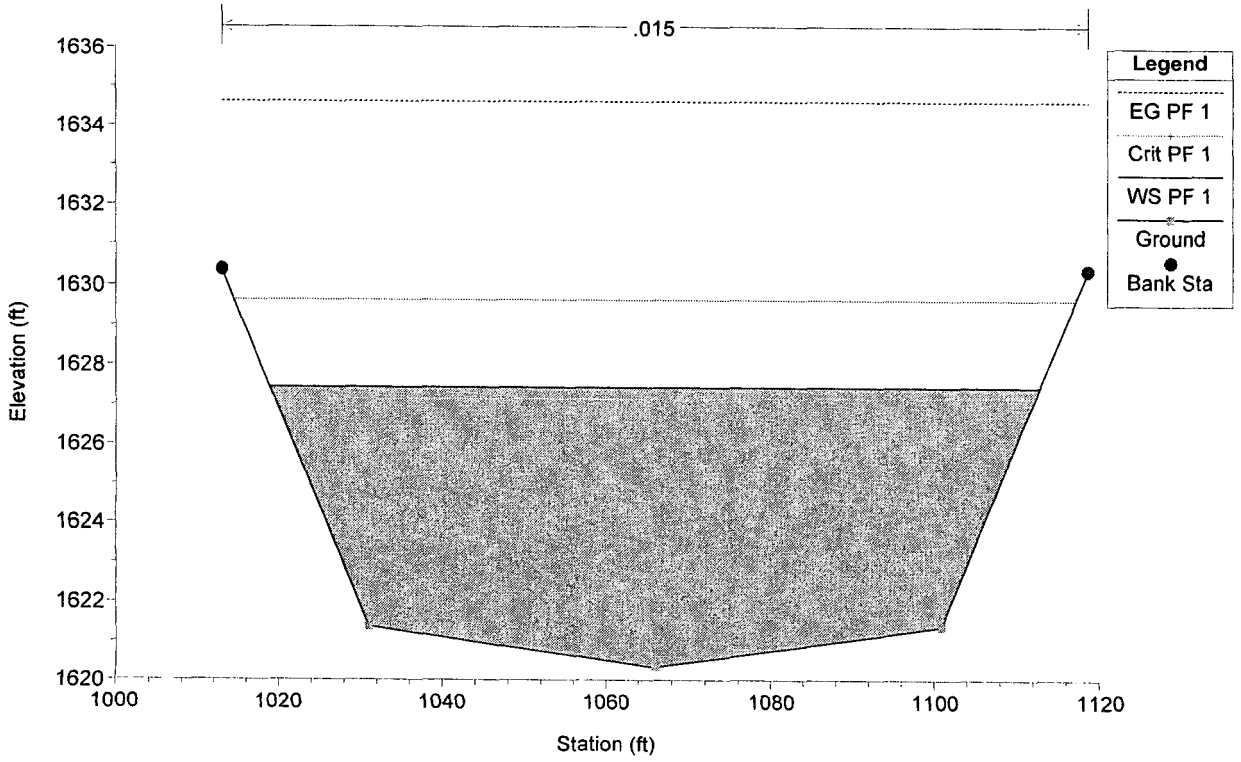
River = Duckcreek Reach = DUCKDOWN RS = 11578.0*

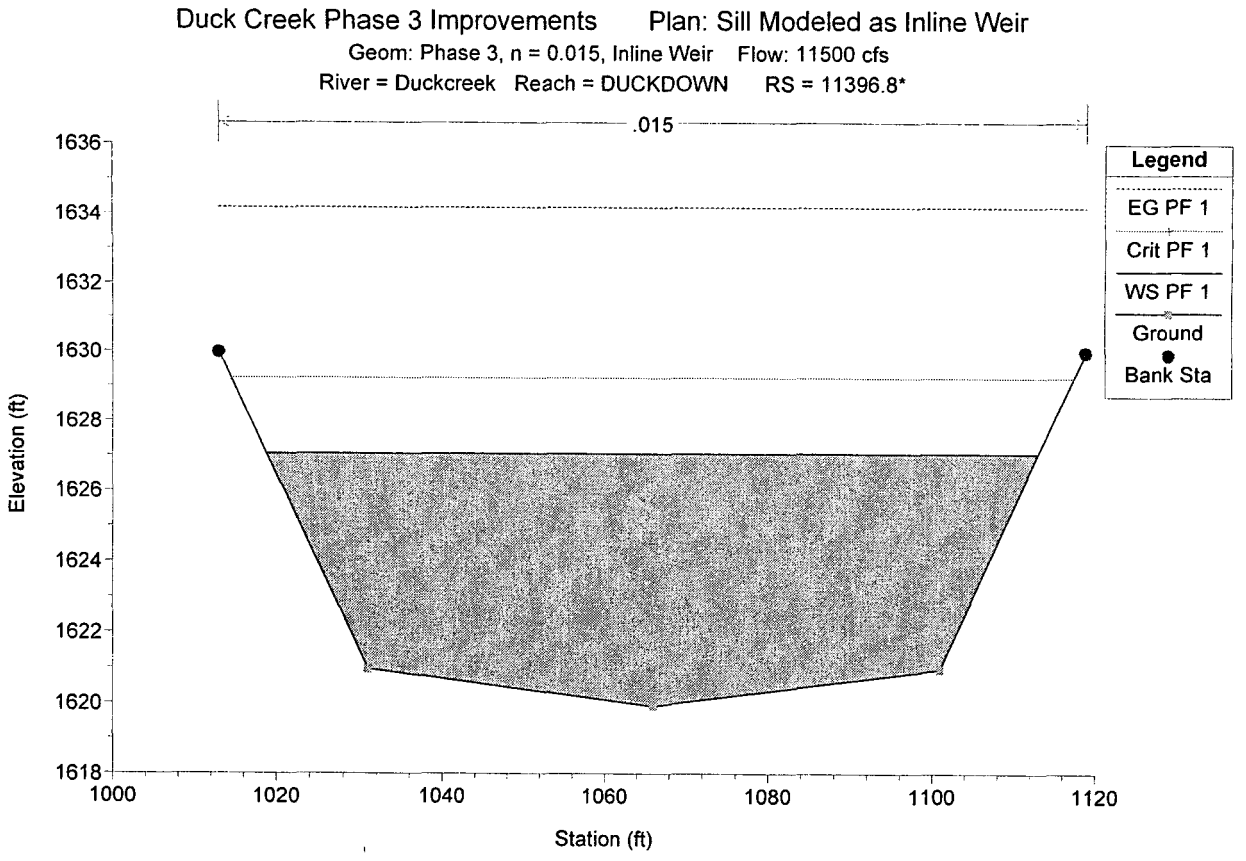


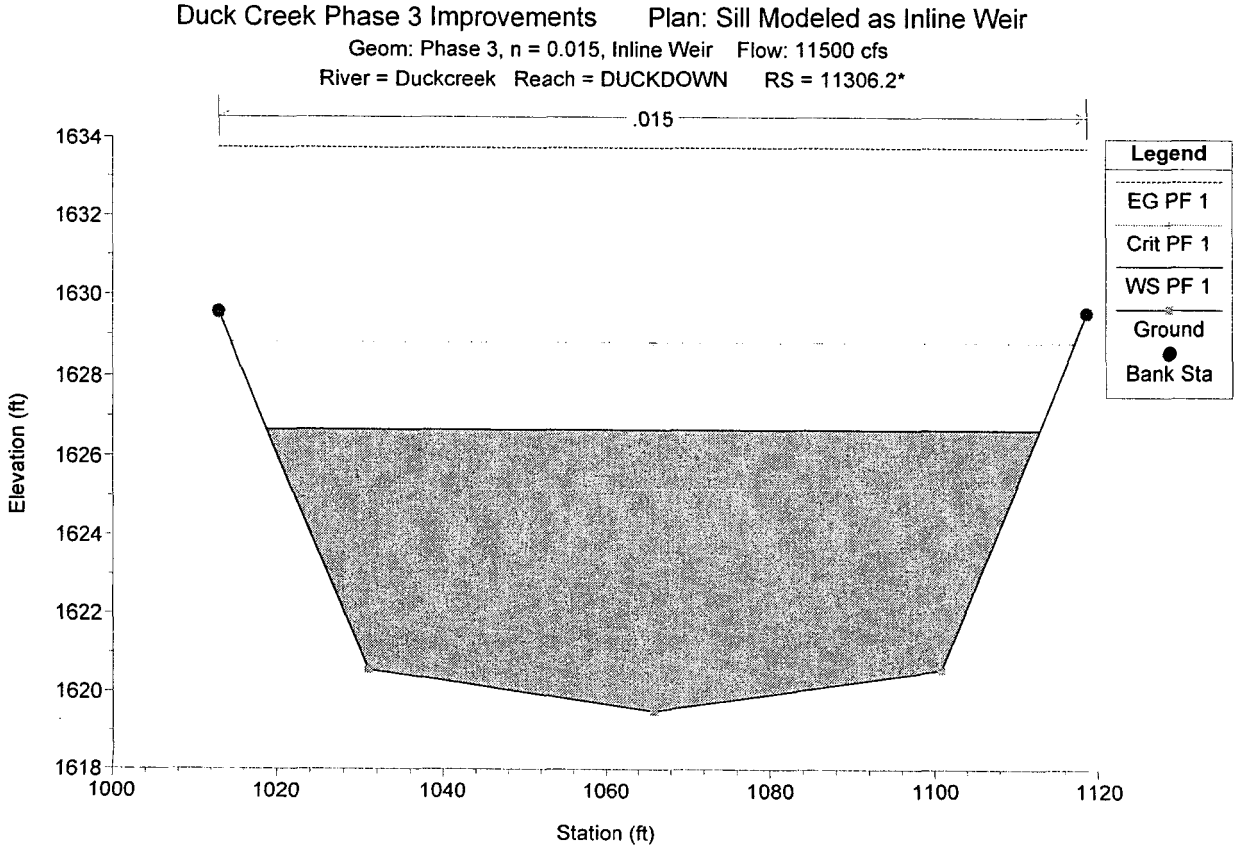
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

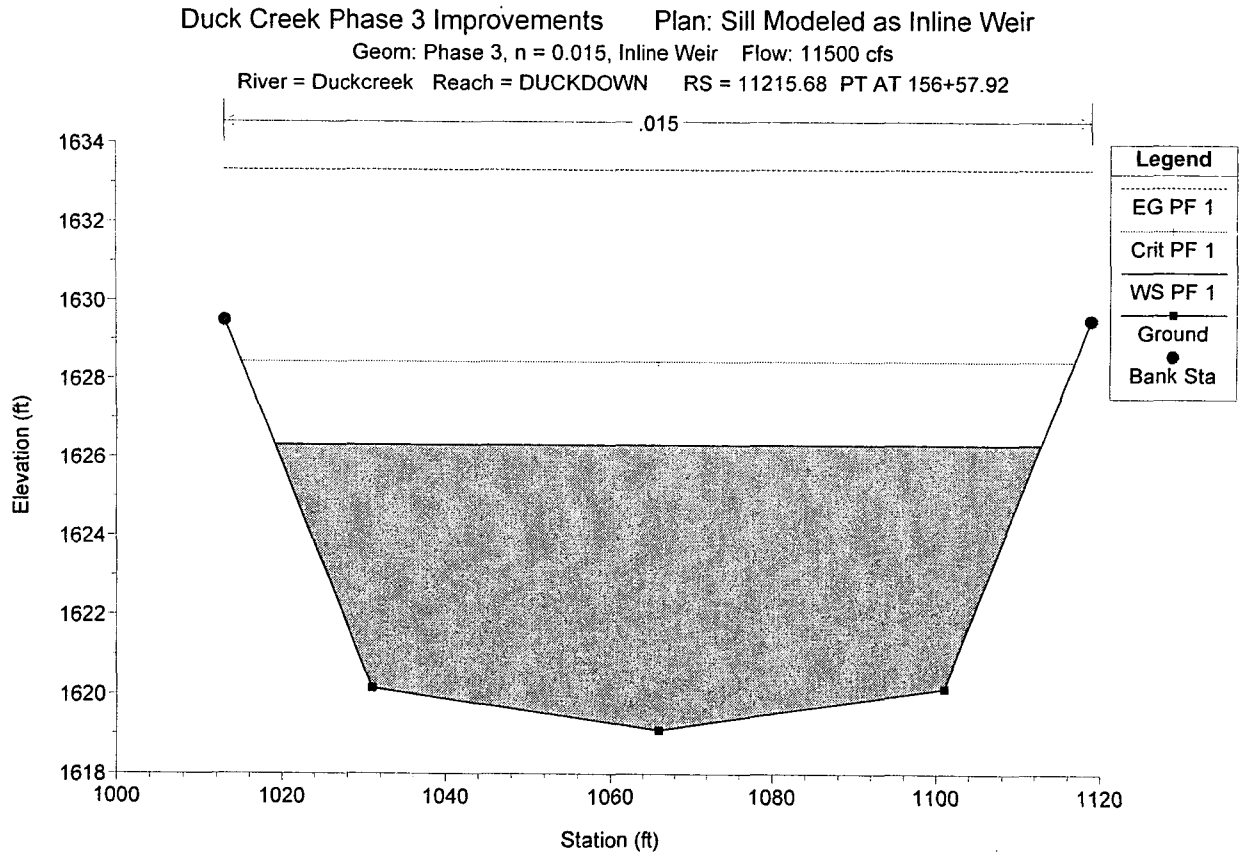
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

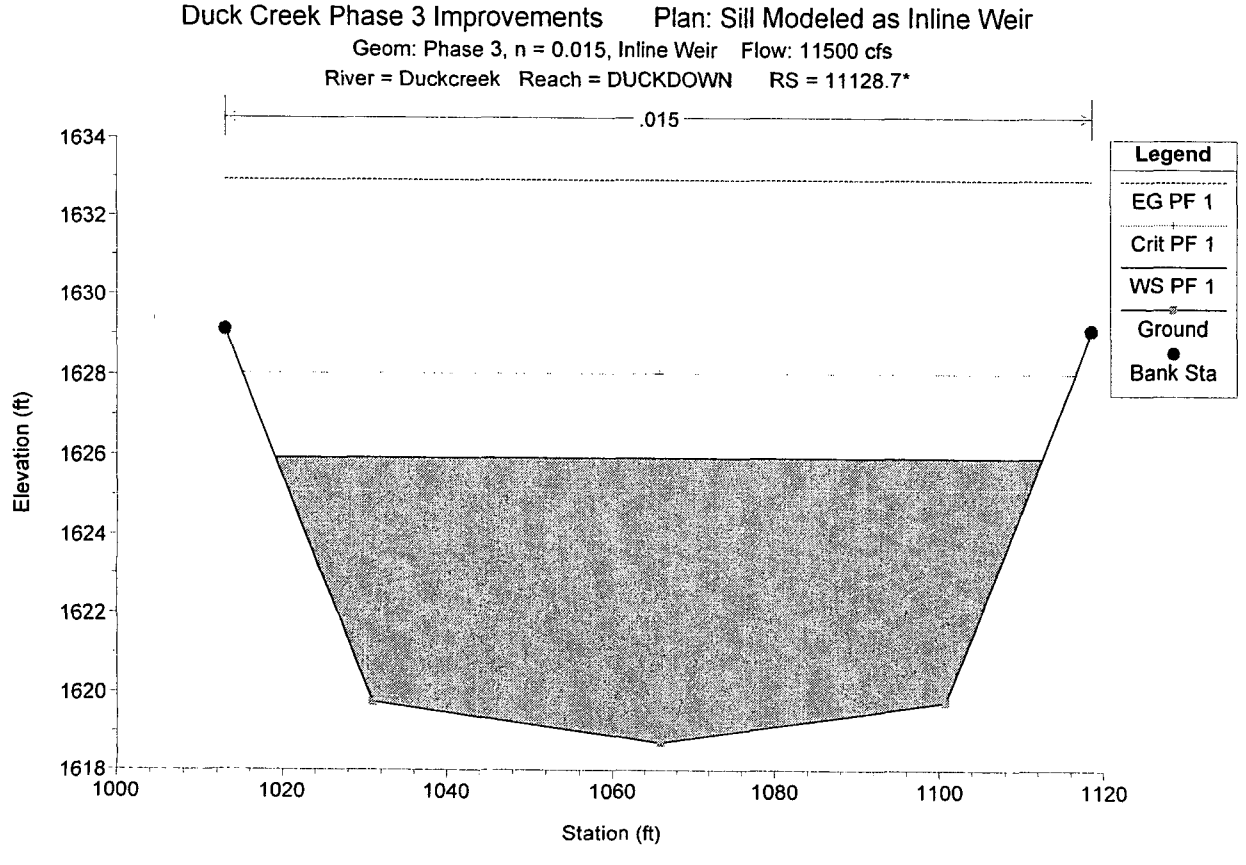
River = Duckcreek Reach = DUCKDOWN RS = 11487.4*




Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11396.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11306.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120
Station (ft)

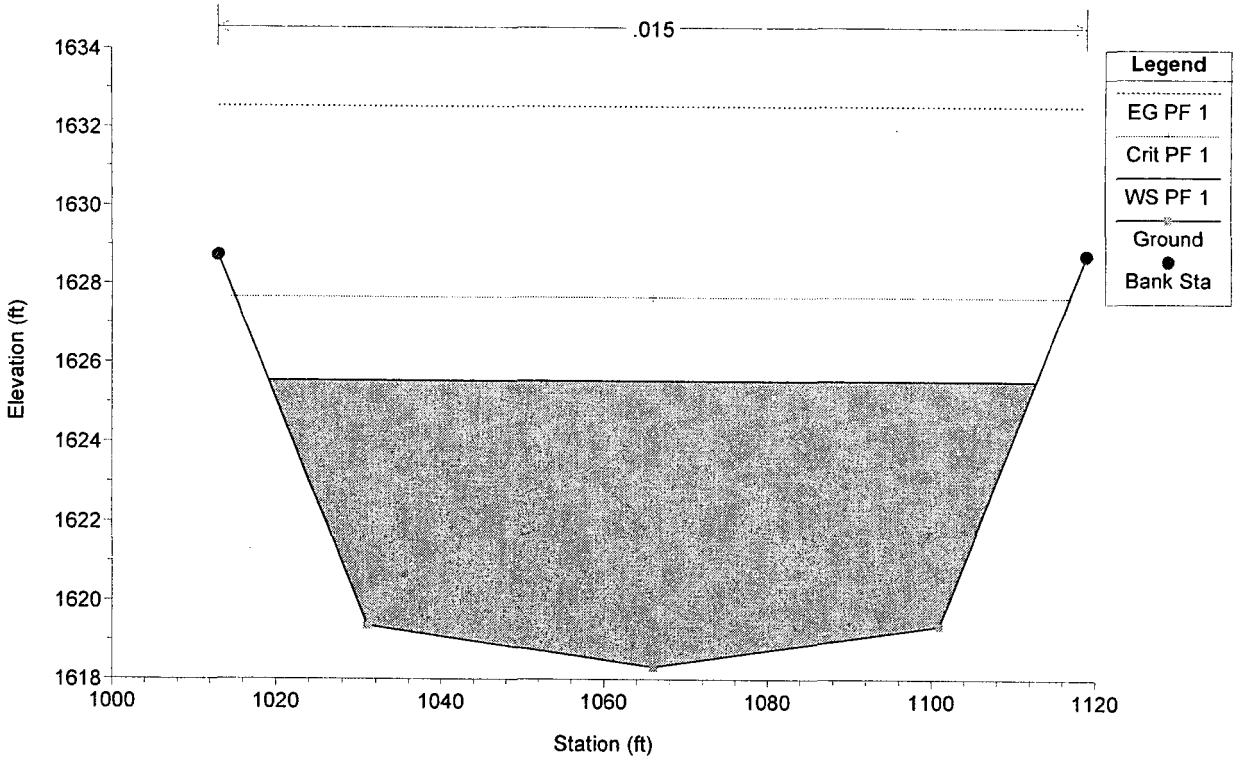

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11215.68 PT AT 156+57.92
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 11128.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1634
1632
1630
1628
1626
1624
1622
1620
1618
1000
1020
1040
1060
1080
1100
1120

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

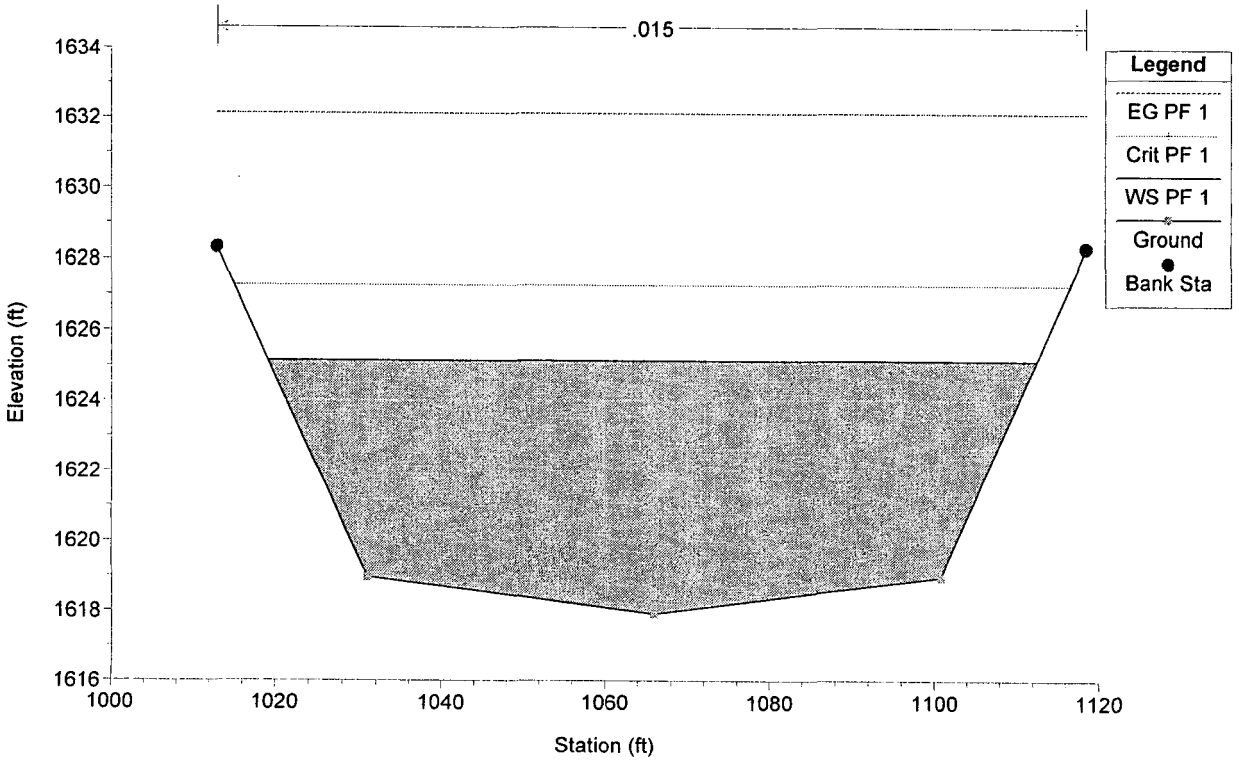
River = Duckcreek Reach = DUCKDOWN RS = 11041.8*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

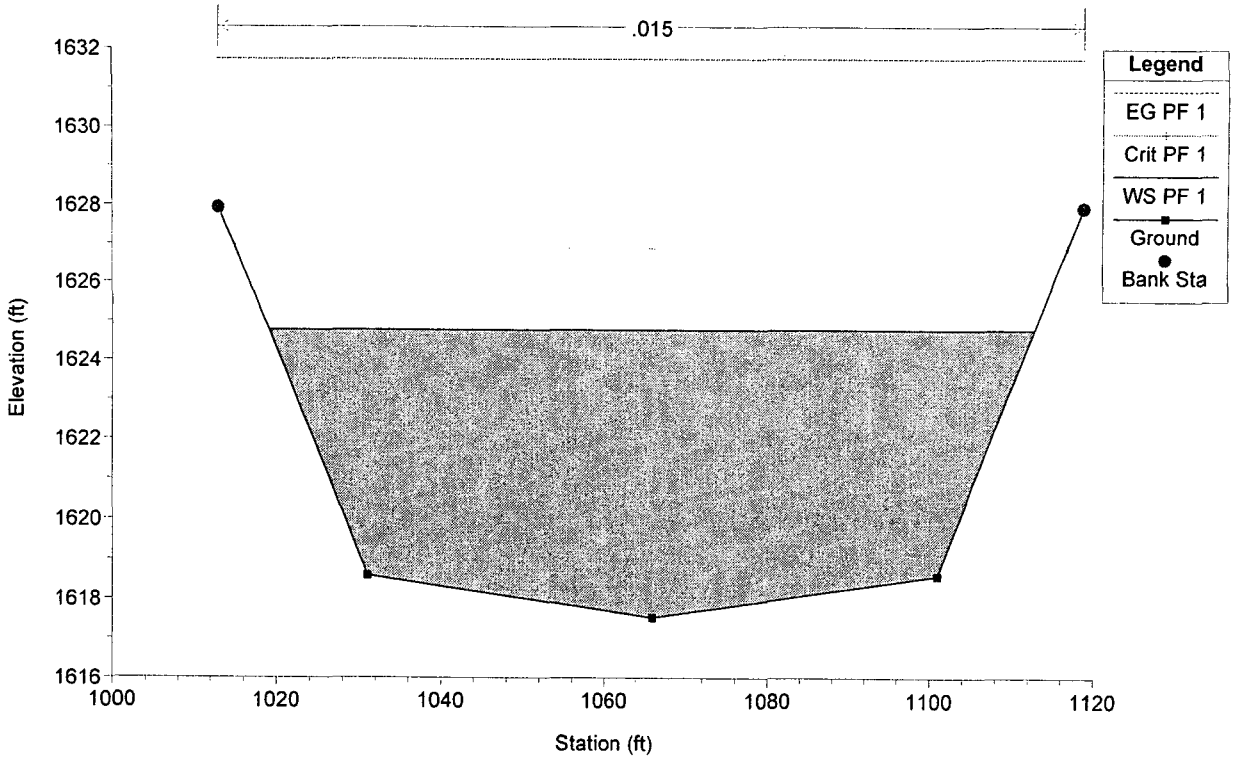
River = Duckcreek Reach = DUCKDOWN RS = 10954.8*



Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

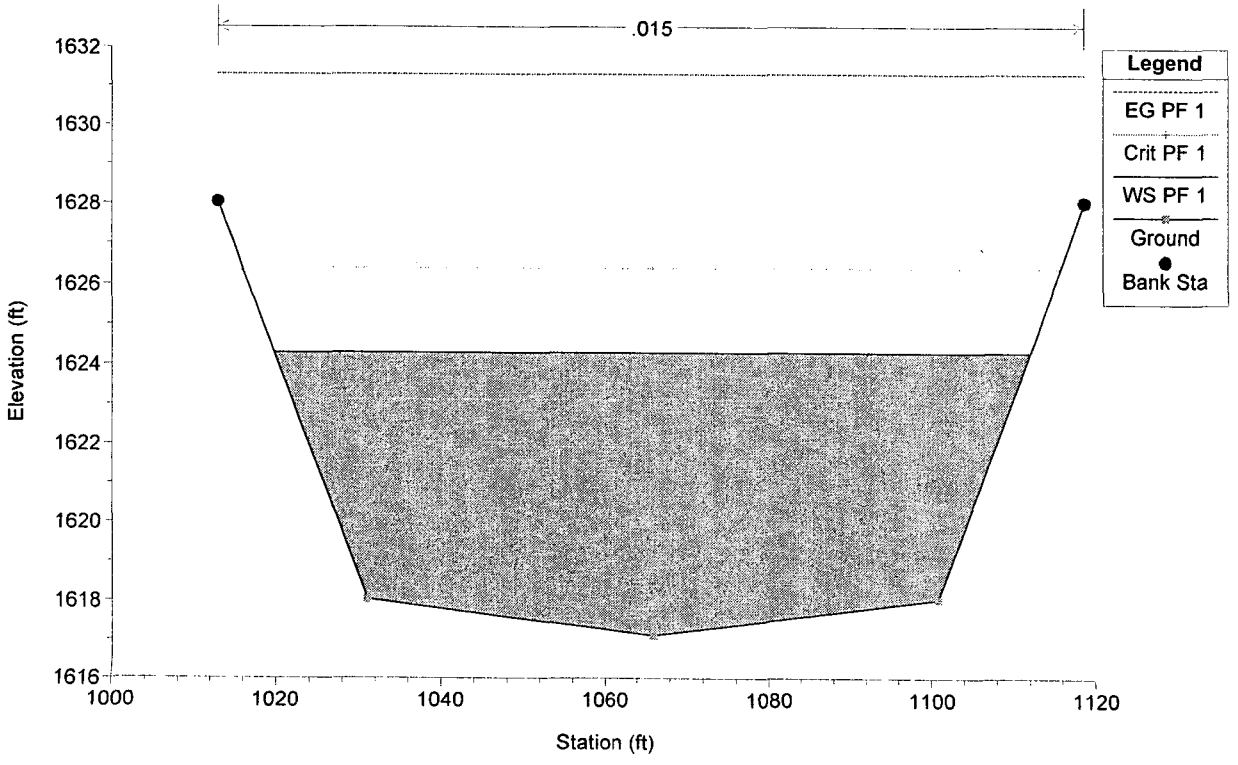
River = Duckcreek Reach = DUCKDOWN RS = 10867.92 PC at STA 160+05.69

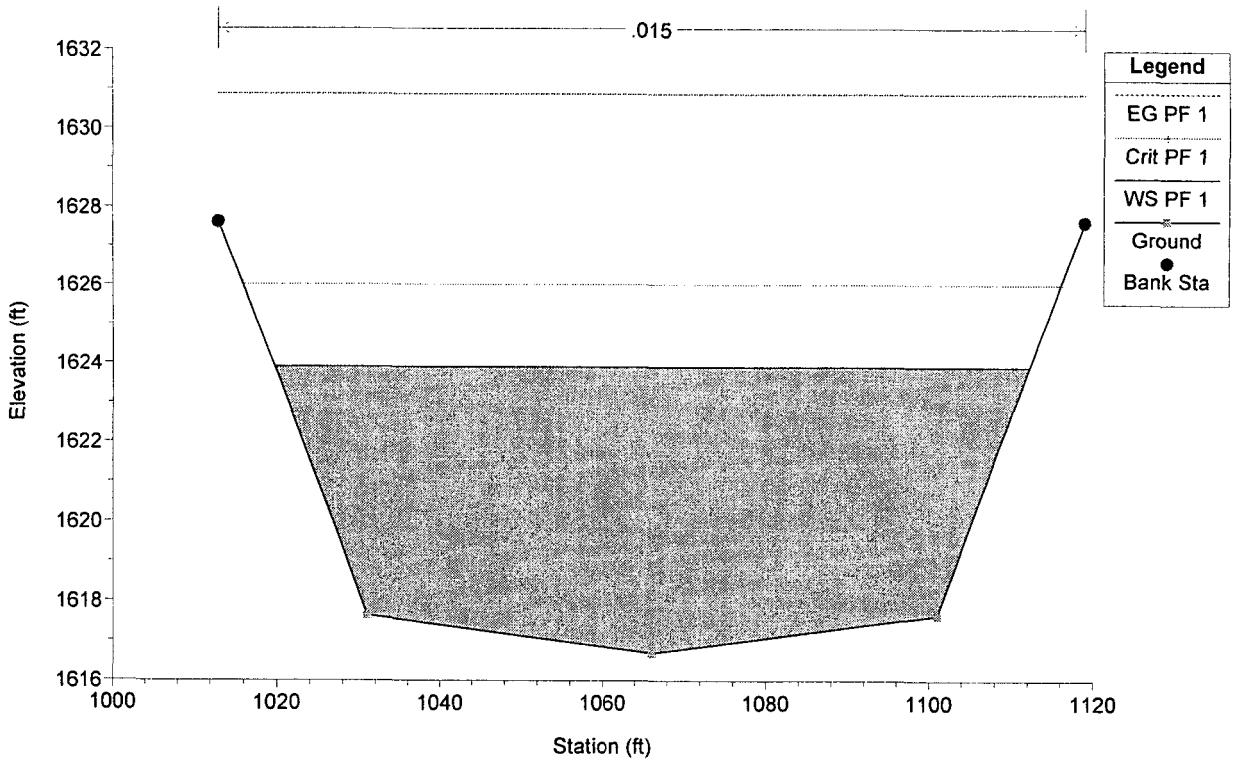


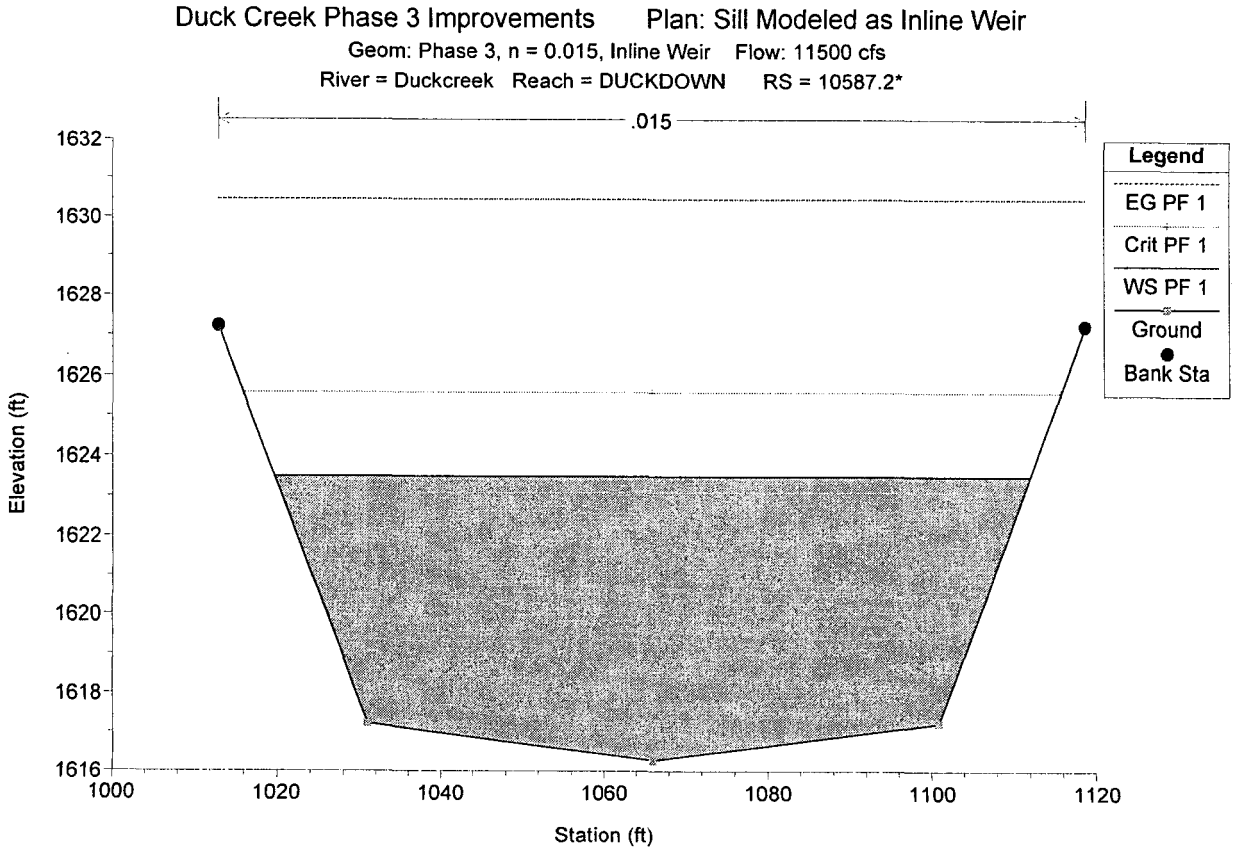
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

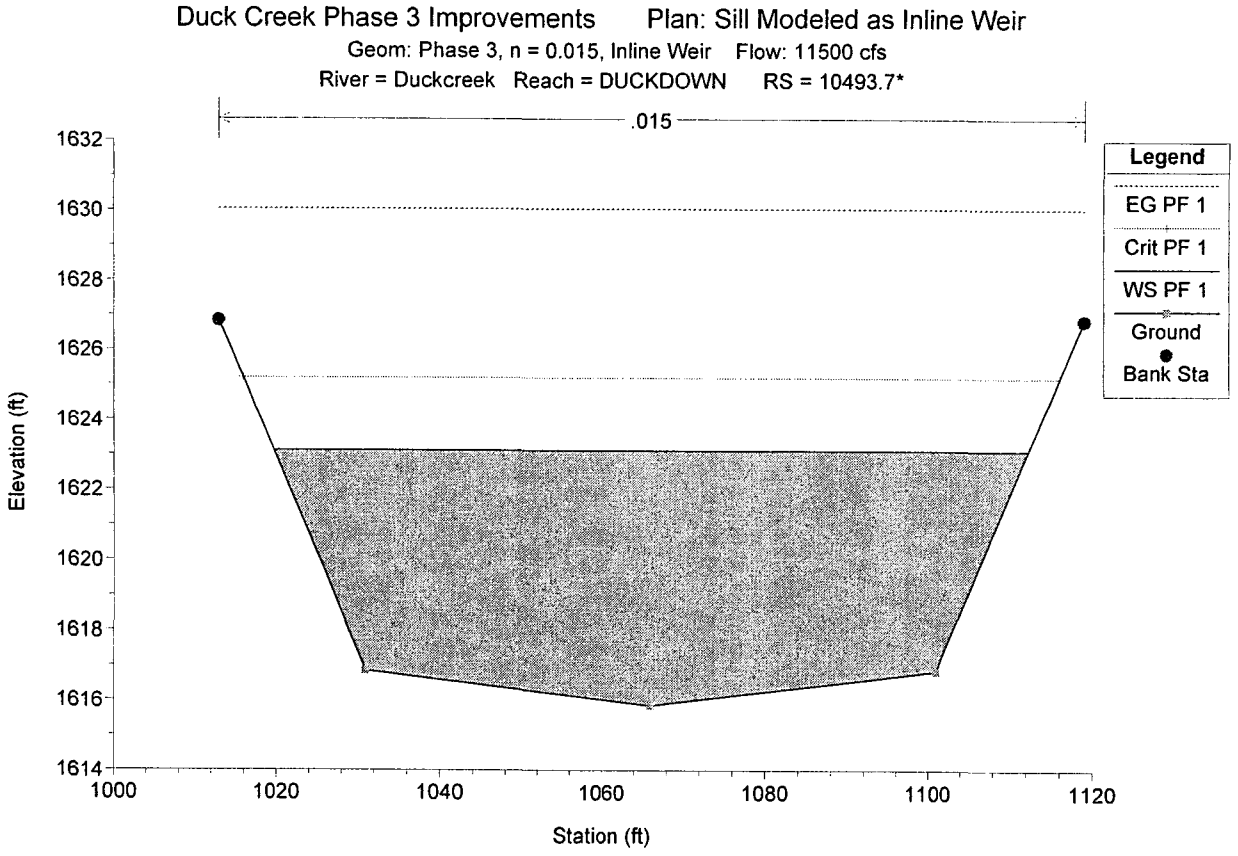
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

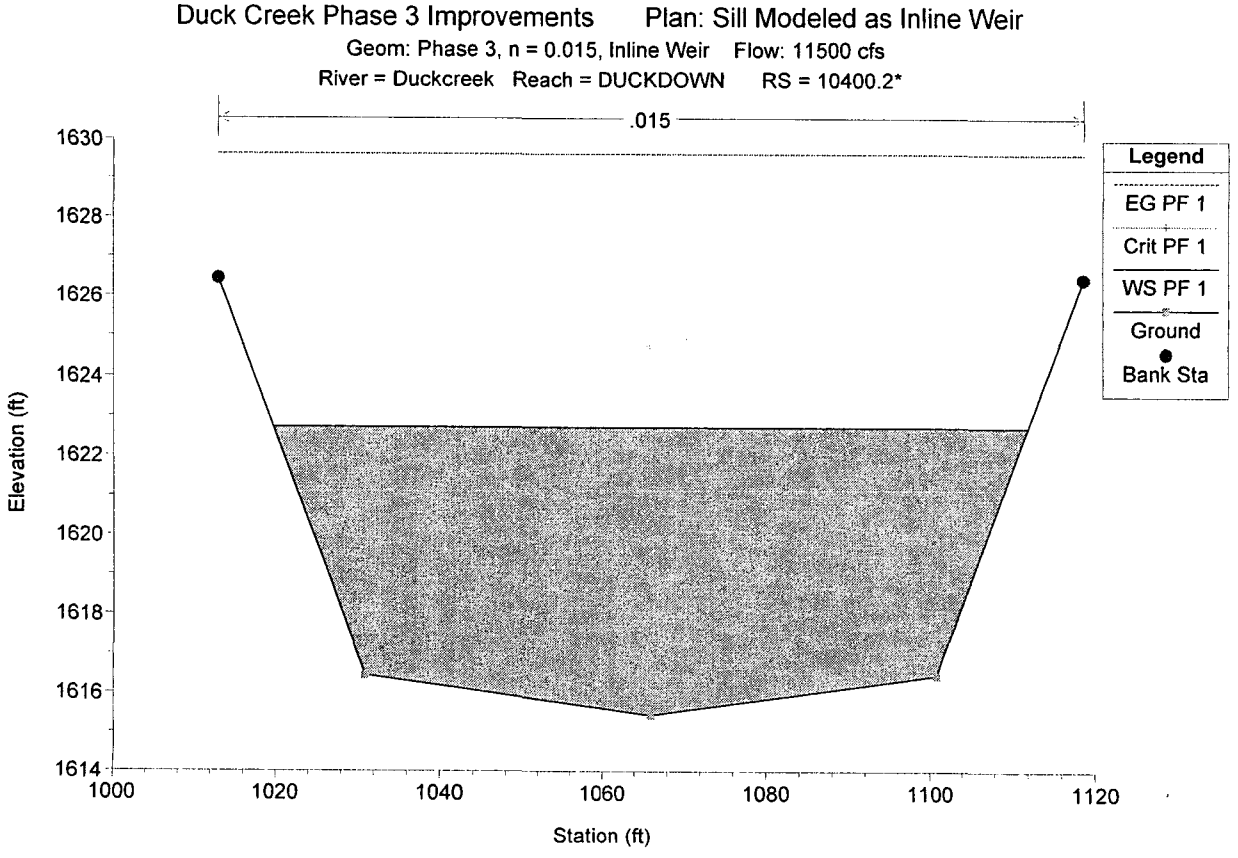
River = Duckcreek Reach = DUCKDOWN RS = 10774.3*

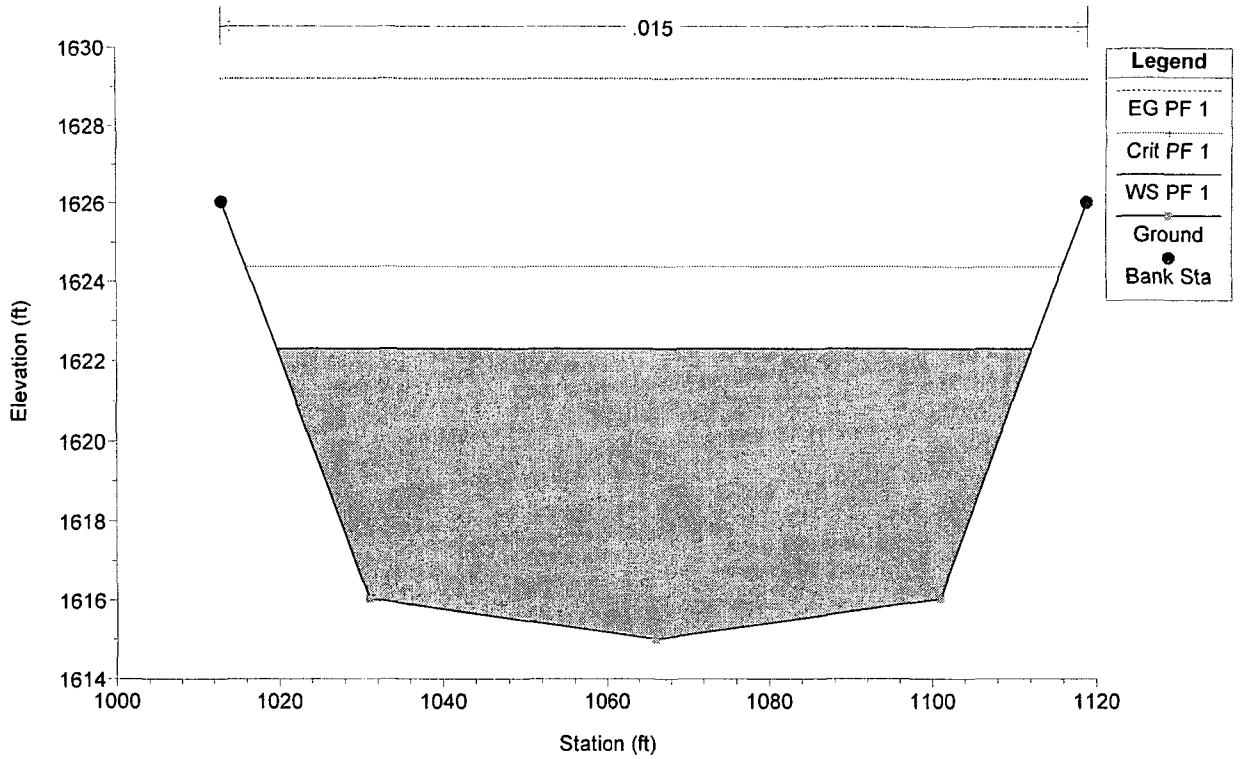


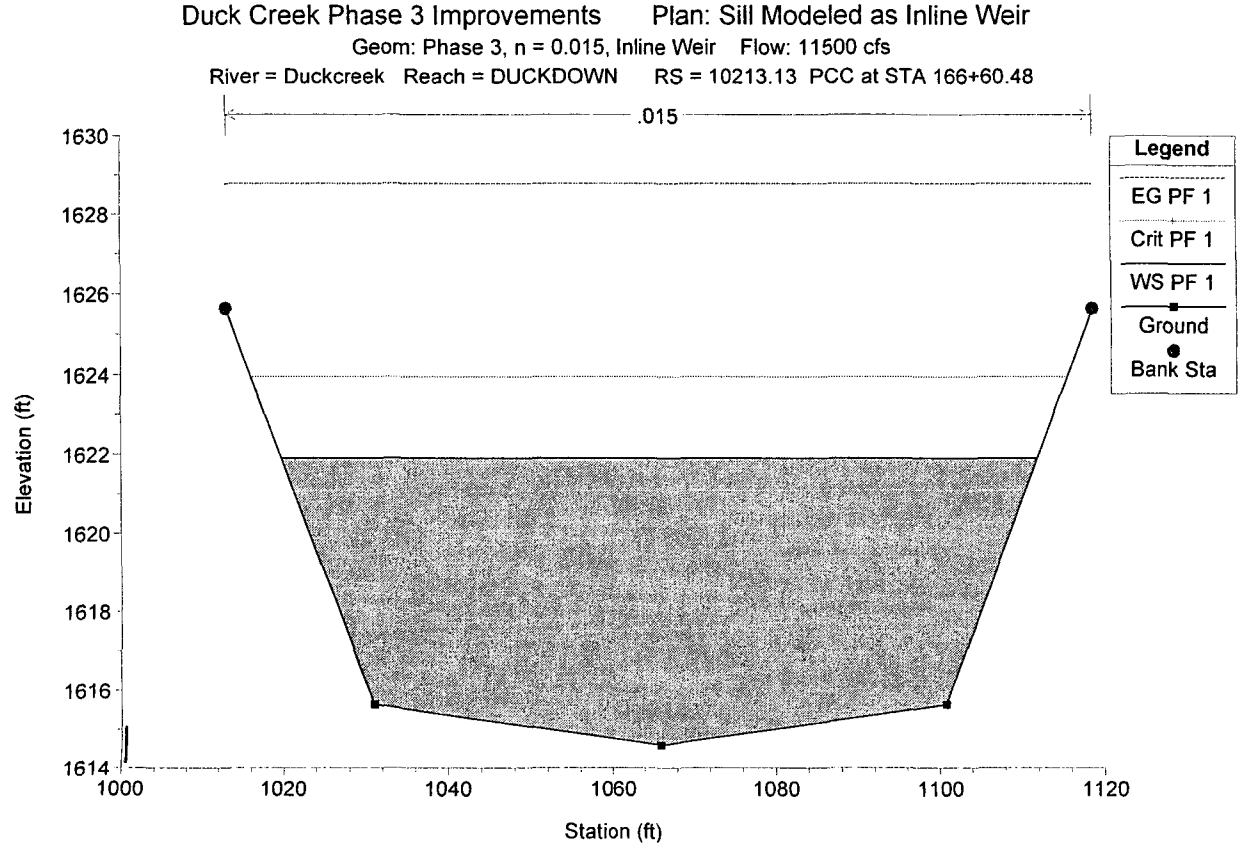

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10680.8*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1632
1630
1628
1626
1624
1622
1620
1618
1616
1000
1020
1040
1060
1080
1100
1120

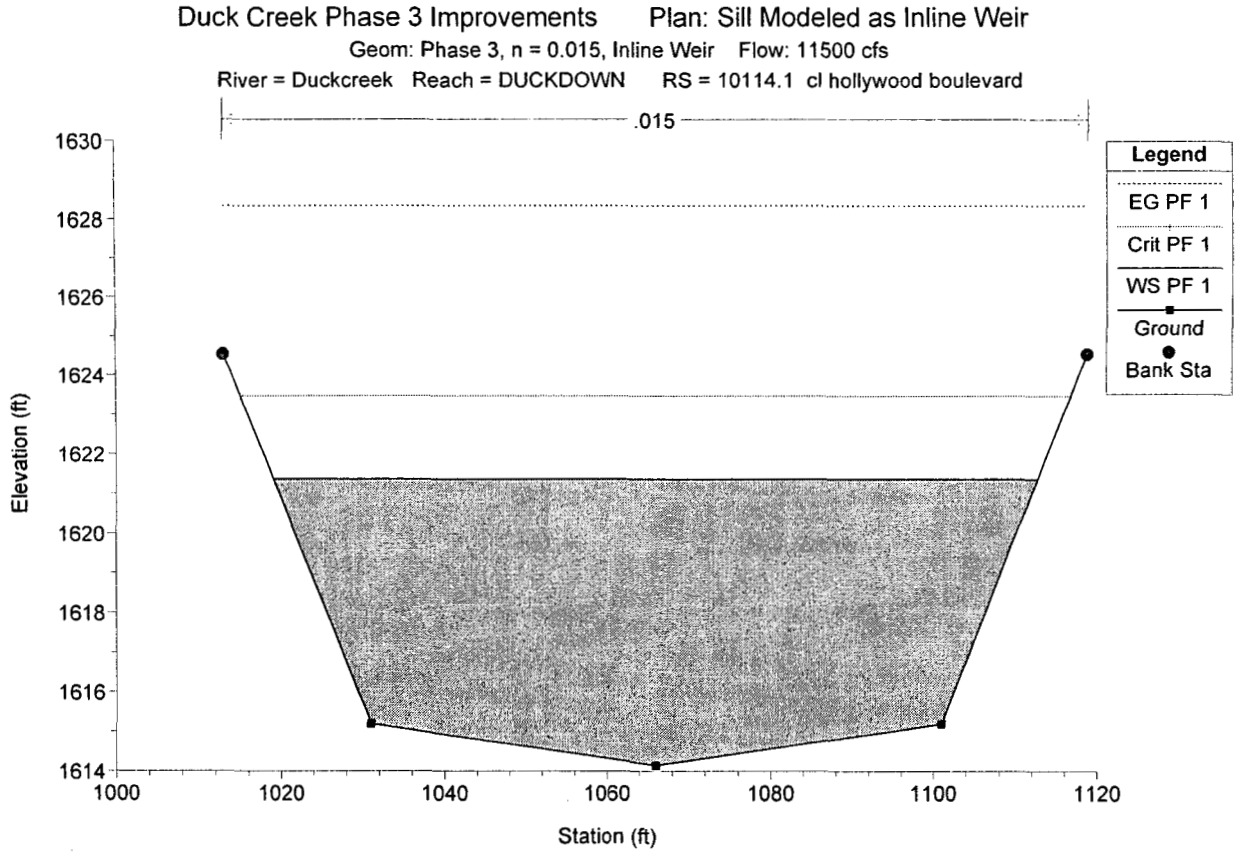

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10587.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1632
1630
1628
1626
1624
1622
1620
1618
1616
1000
1020
1040
1060
1080
1100
1120

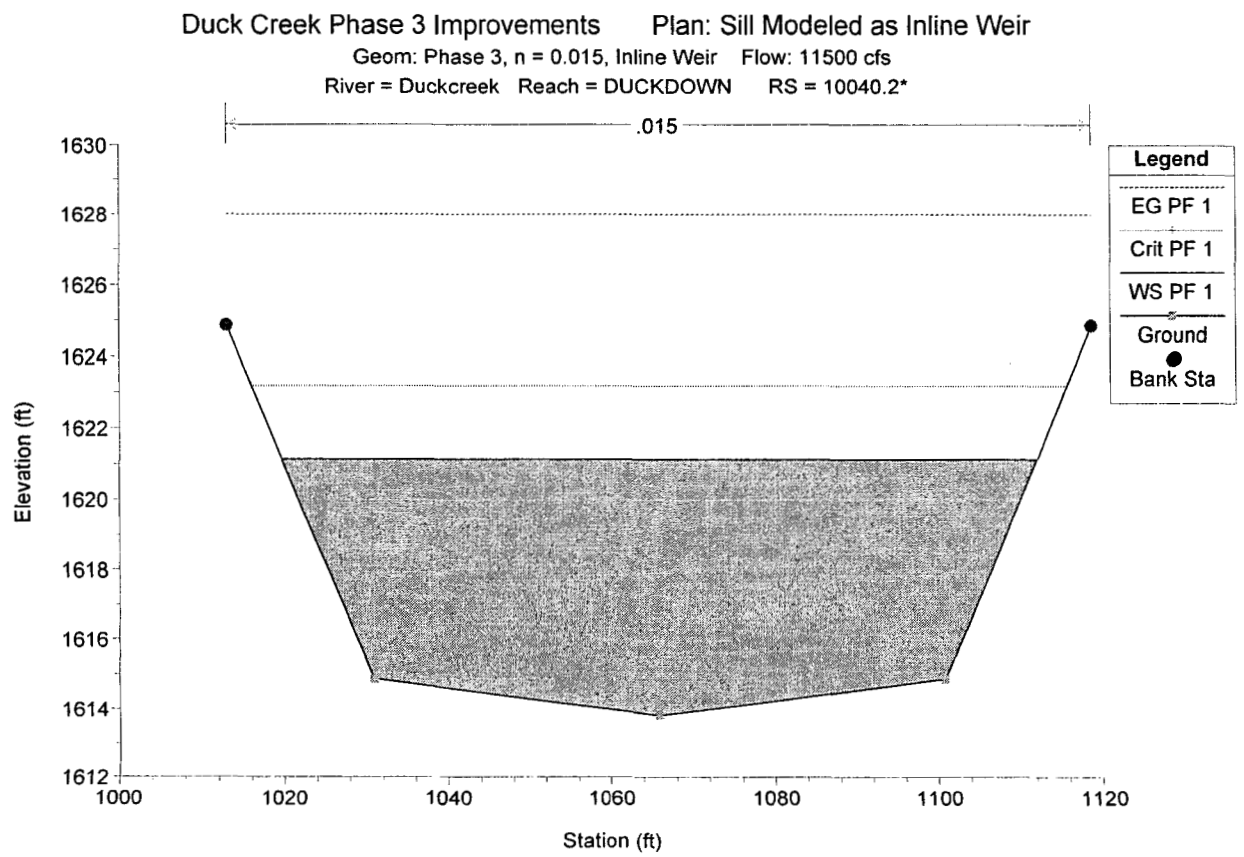

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10493.7*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1632
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120
Station (ft)

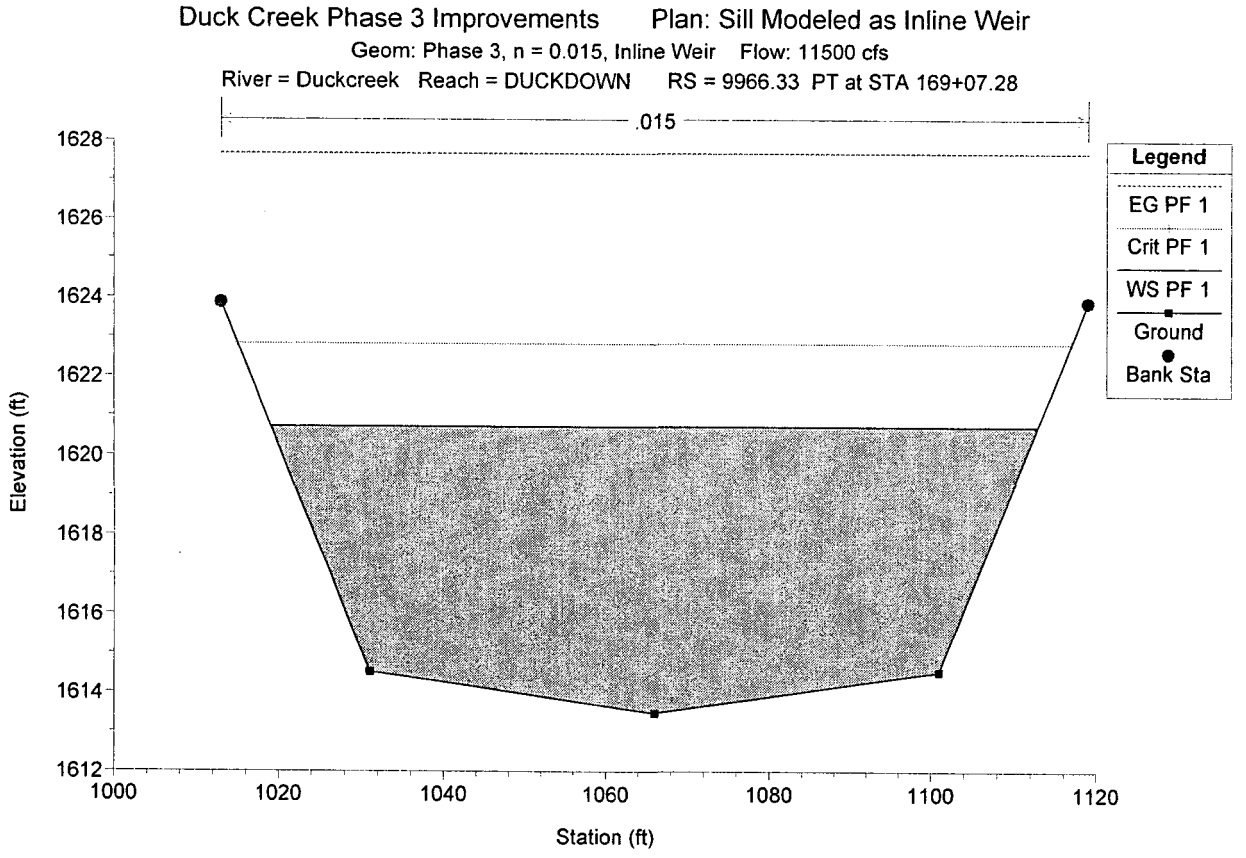

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10400.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120
Station (ft)

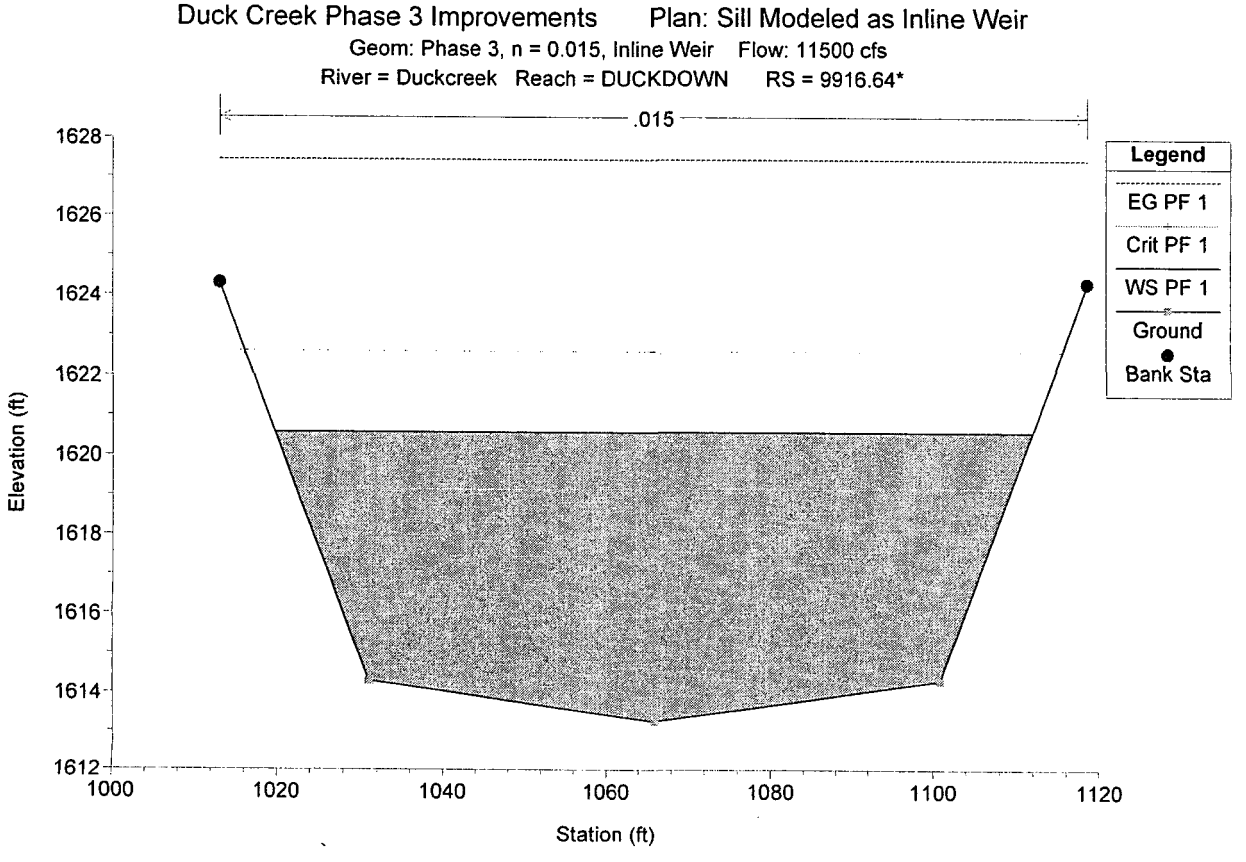

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10306.6*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10213.13 PCC at STA 166+60.48
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10114.1 cl hollywood boulevard
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1000
1020
1040
1060
1080
1100
1120


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 10040.2*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1630
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120

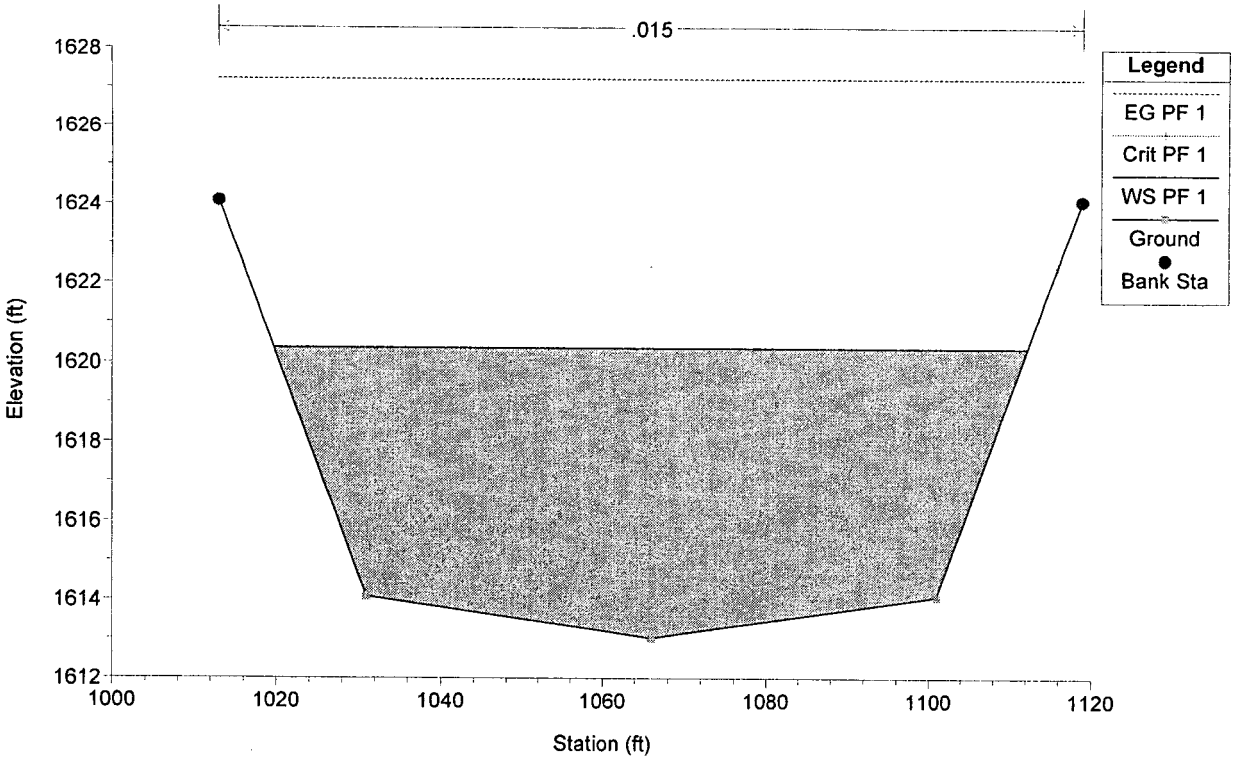

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9966.33 PT at STA 169+07.28
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9916.64*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

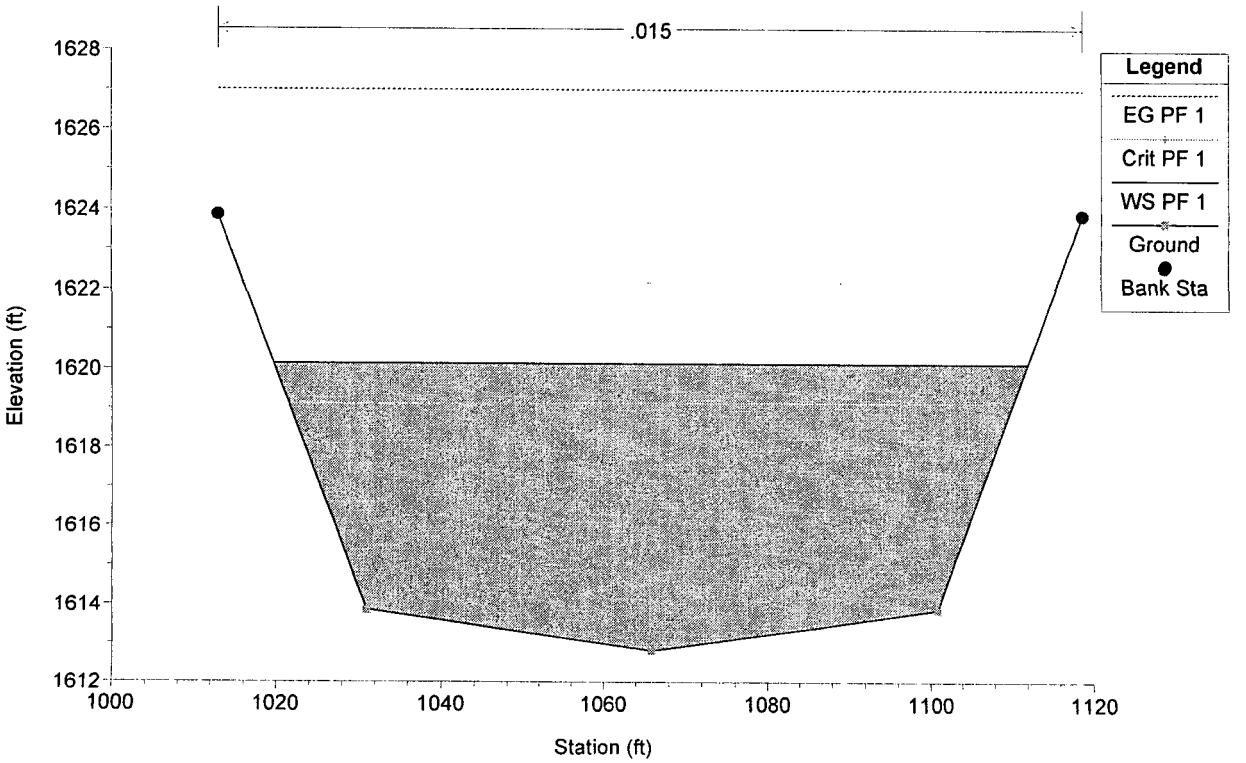
River = Duckcreek Reach = DUCKDOWN RS = 9866.96*

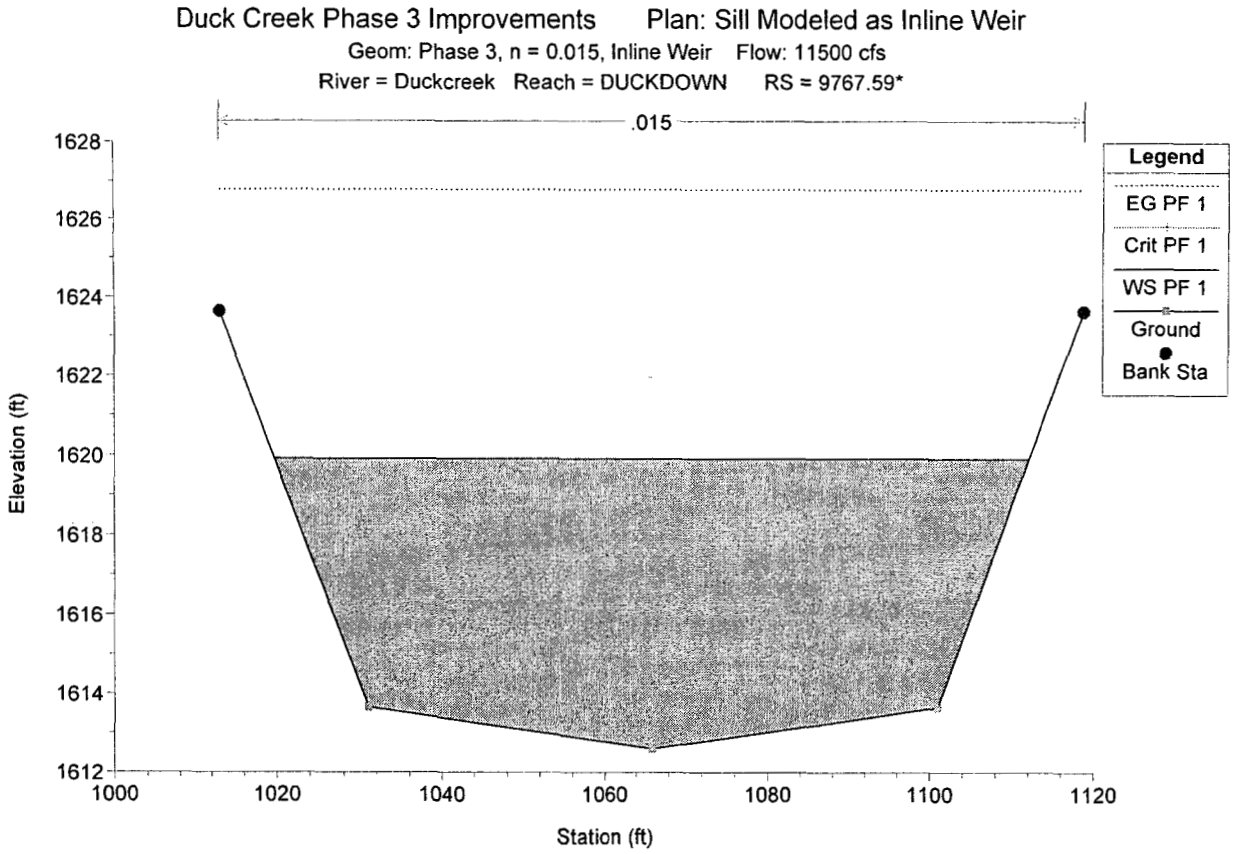


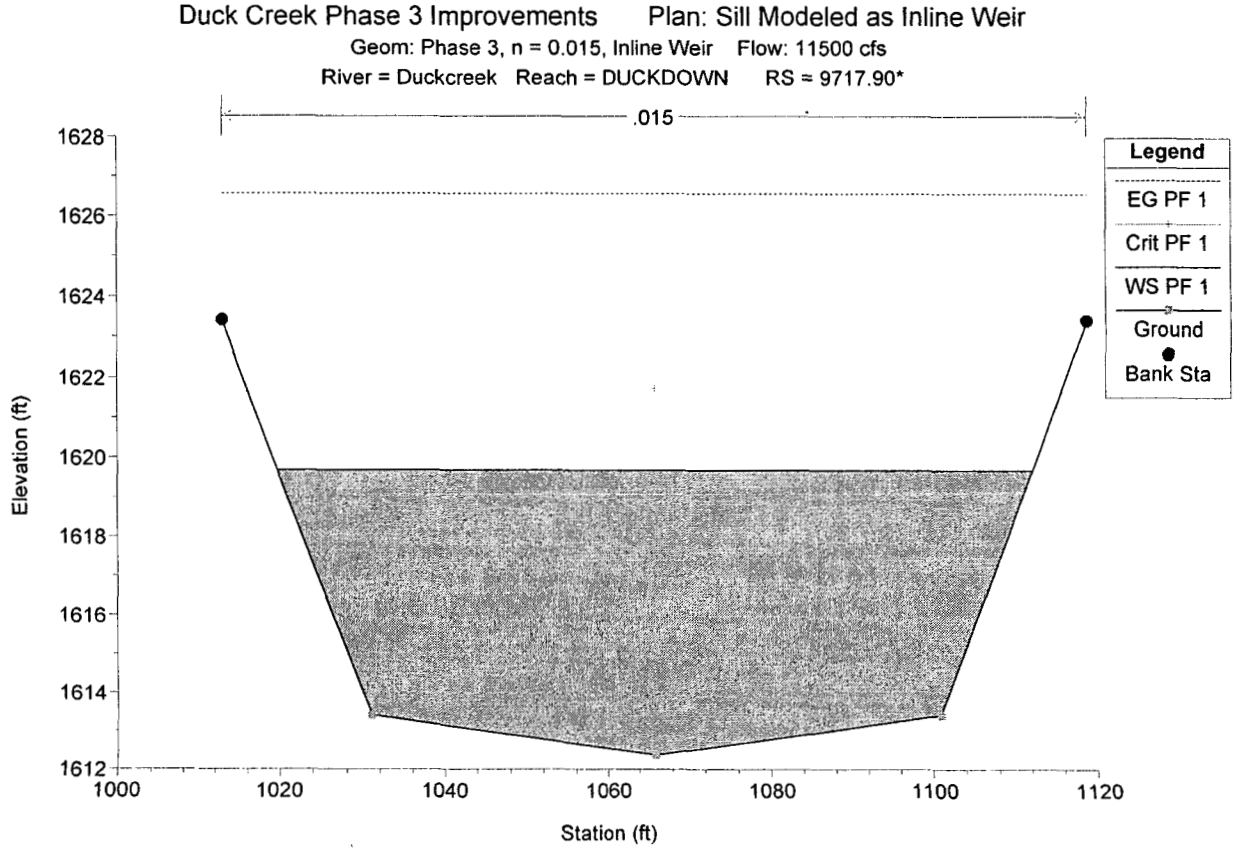
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

River = Duckcreek Reach = DUCKDOWN RS = 9817.27*



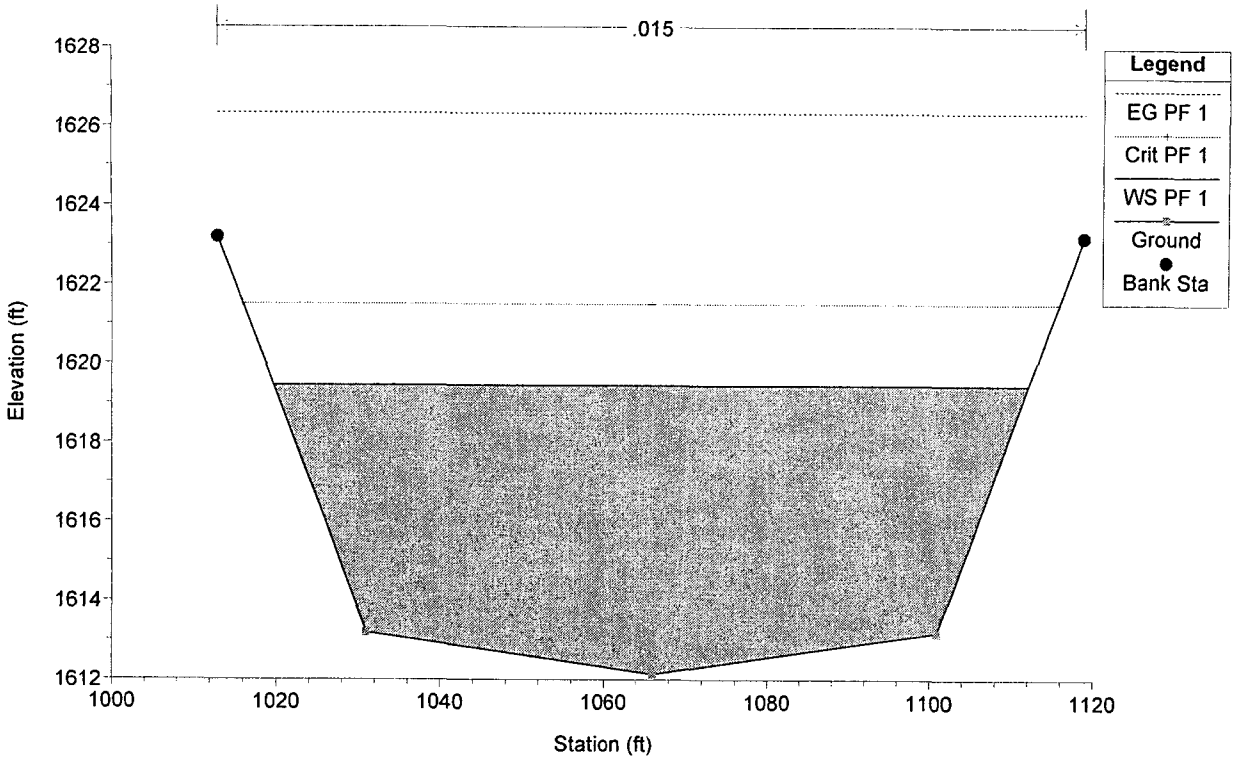

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9767.59*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9717.90*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1628
1626
1624
1622
1620
1618
1616
1614
1612
1000
1020
1040
1060
1080
1100
1120
Station (ft)

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

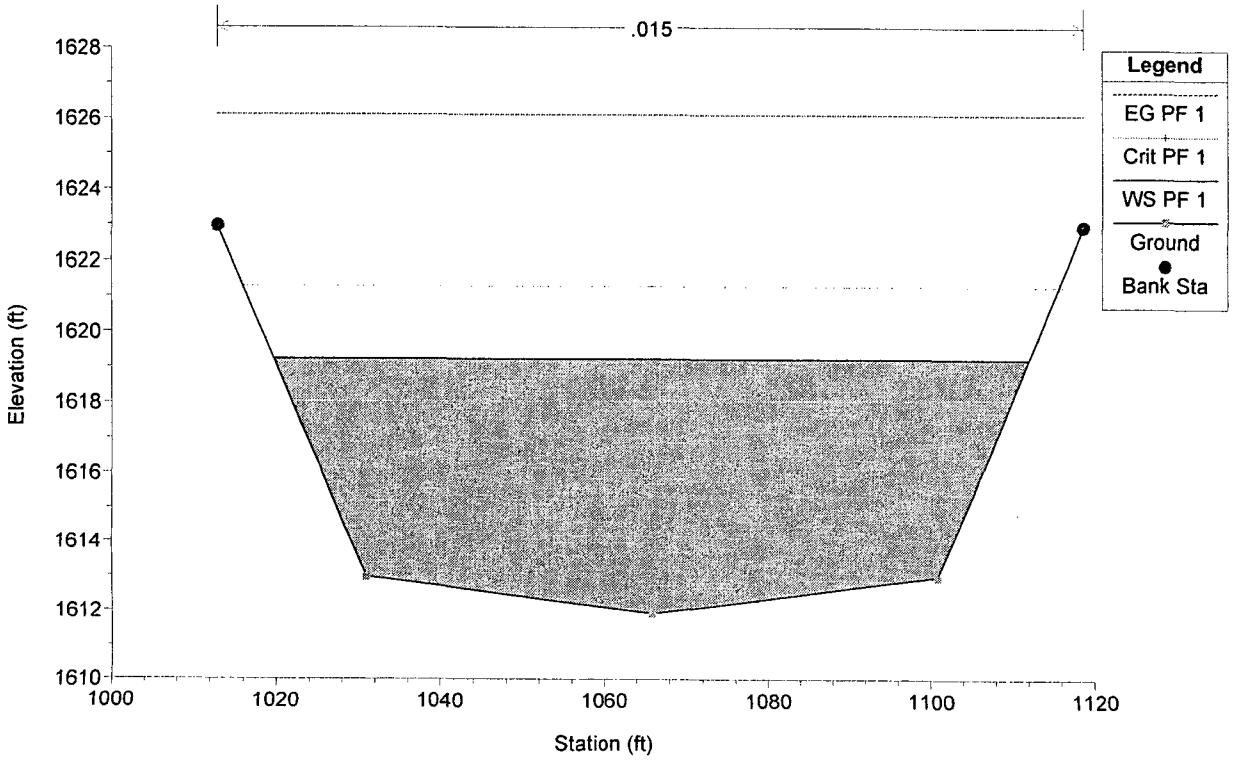
River = Duckcreek Reach = DUCKDOWN RS = 9668.22*

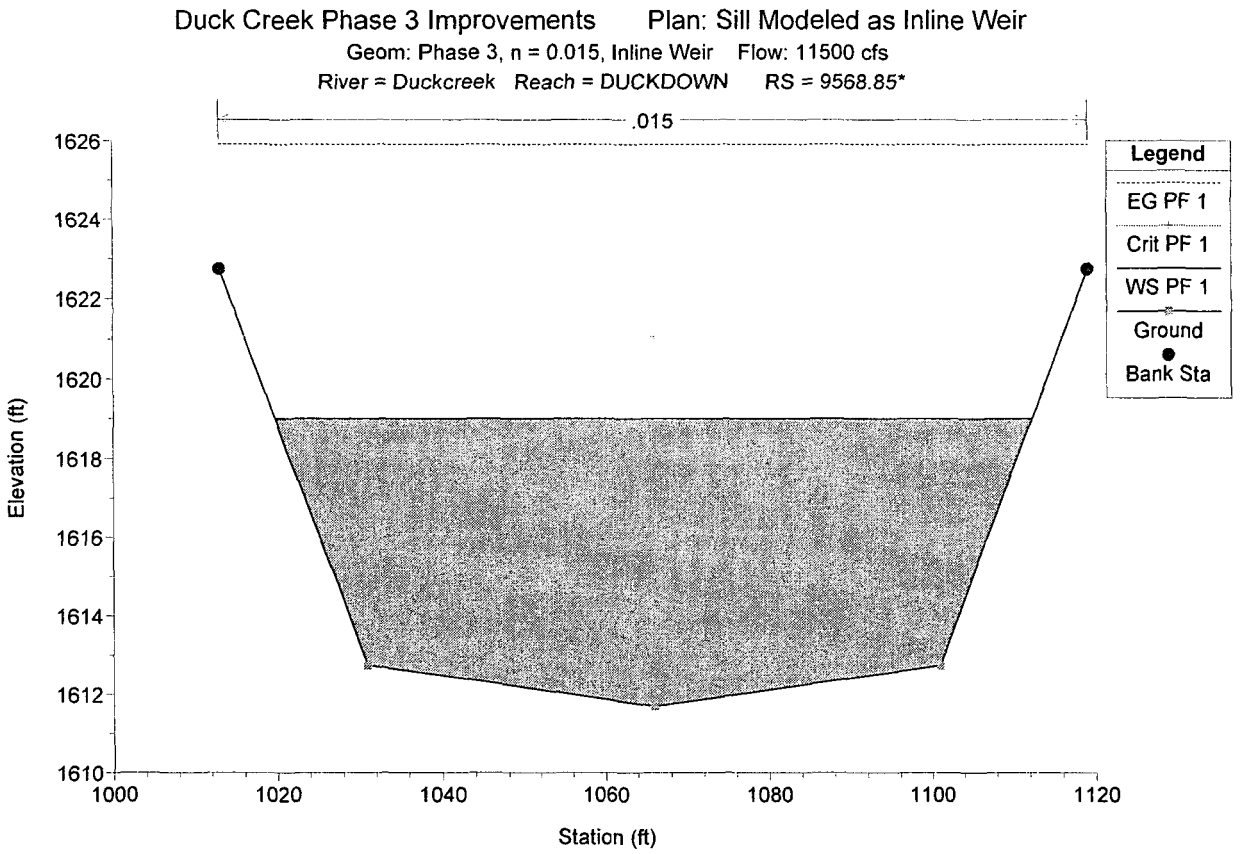


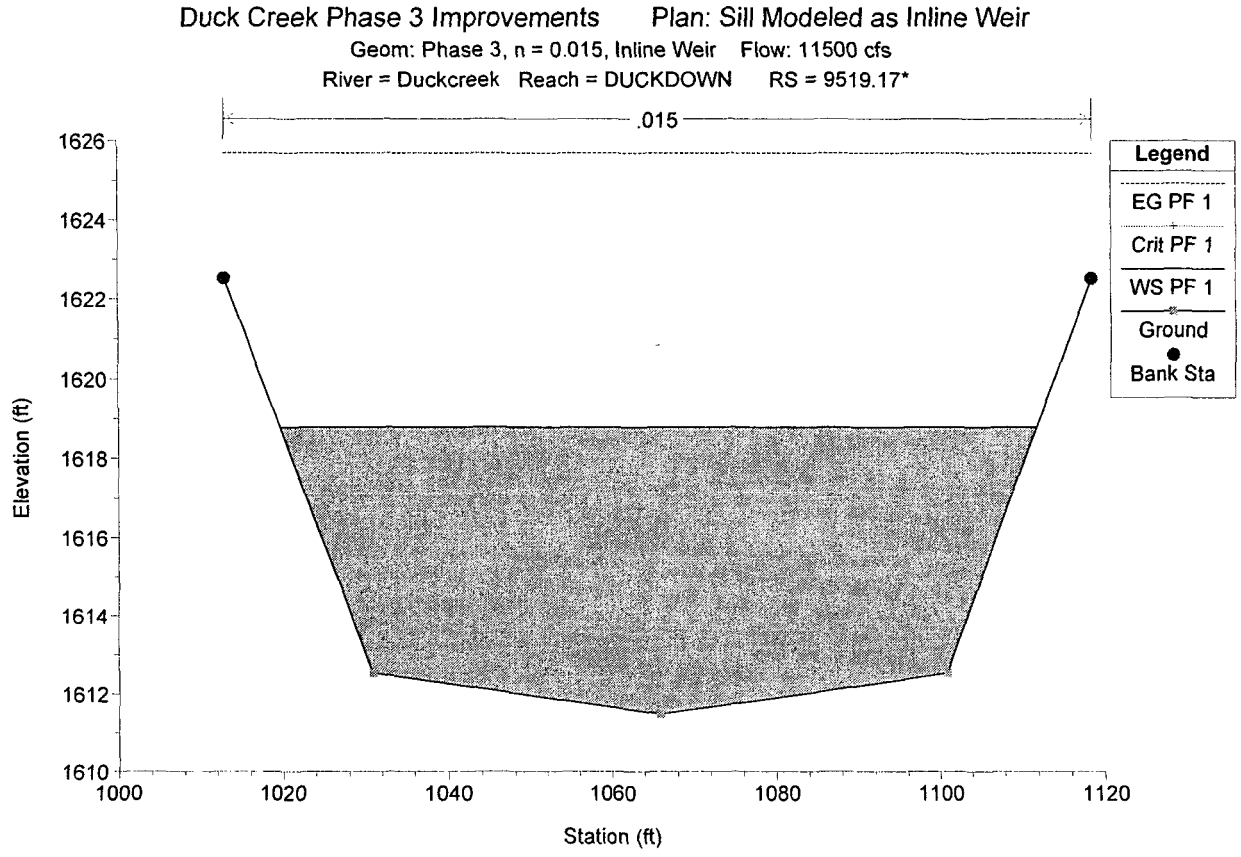
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

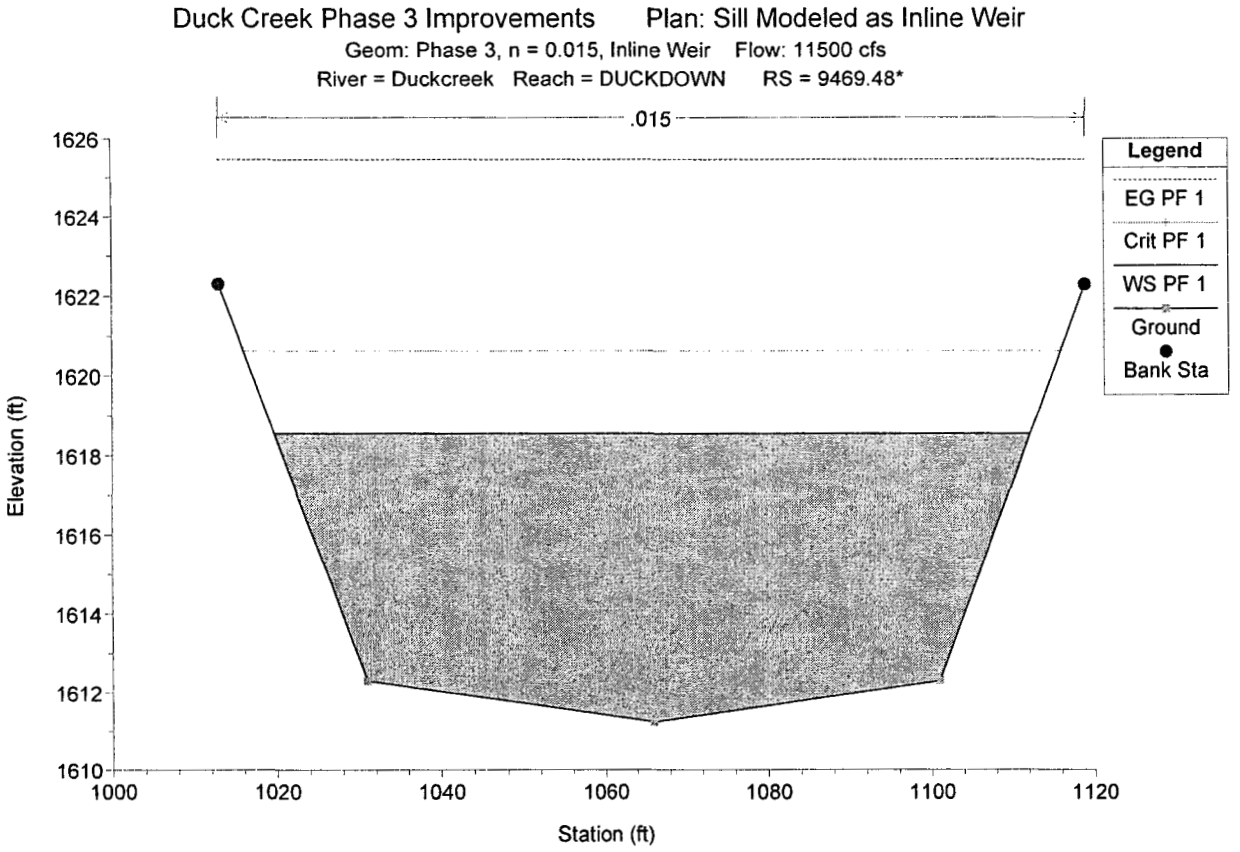
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

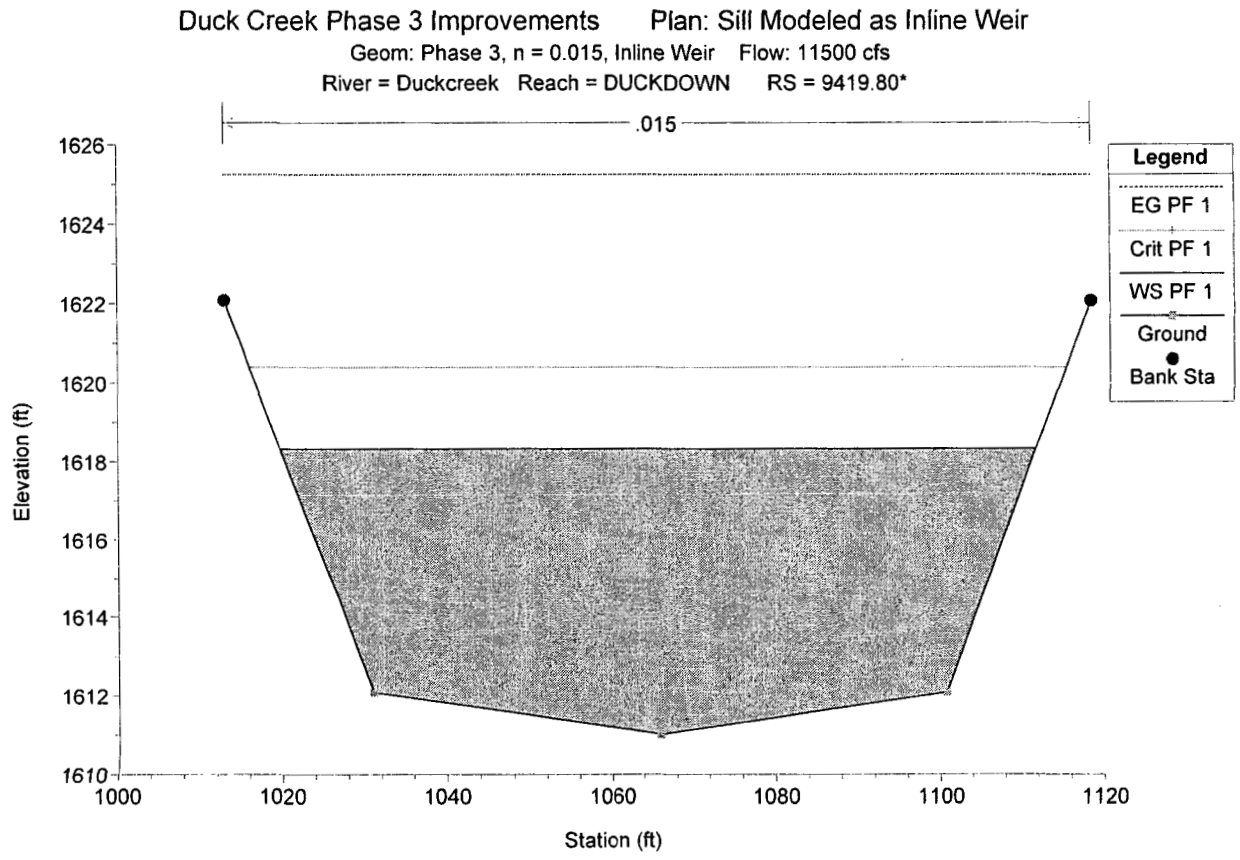
River = Duckcreek Reach = DUCKDOWN RS = 9618.53*

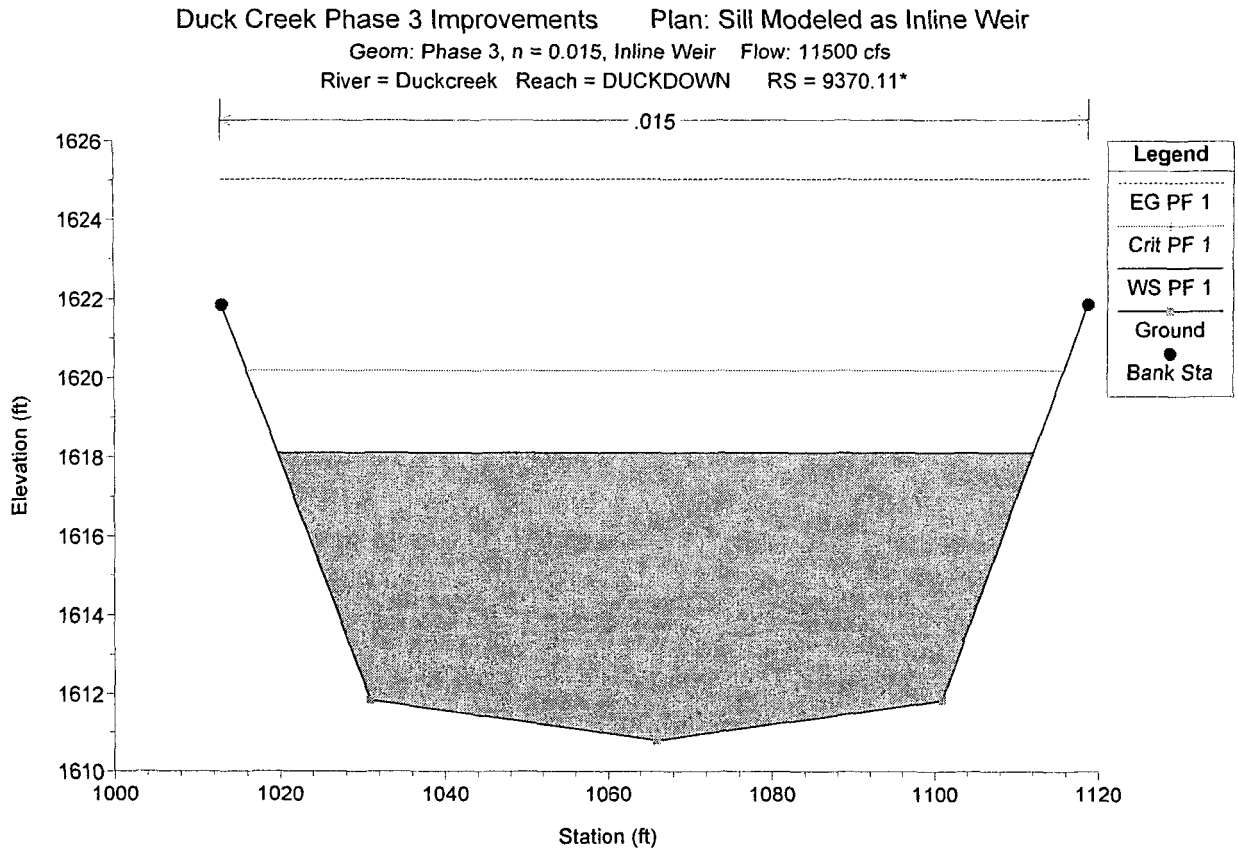


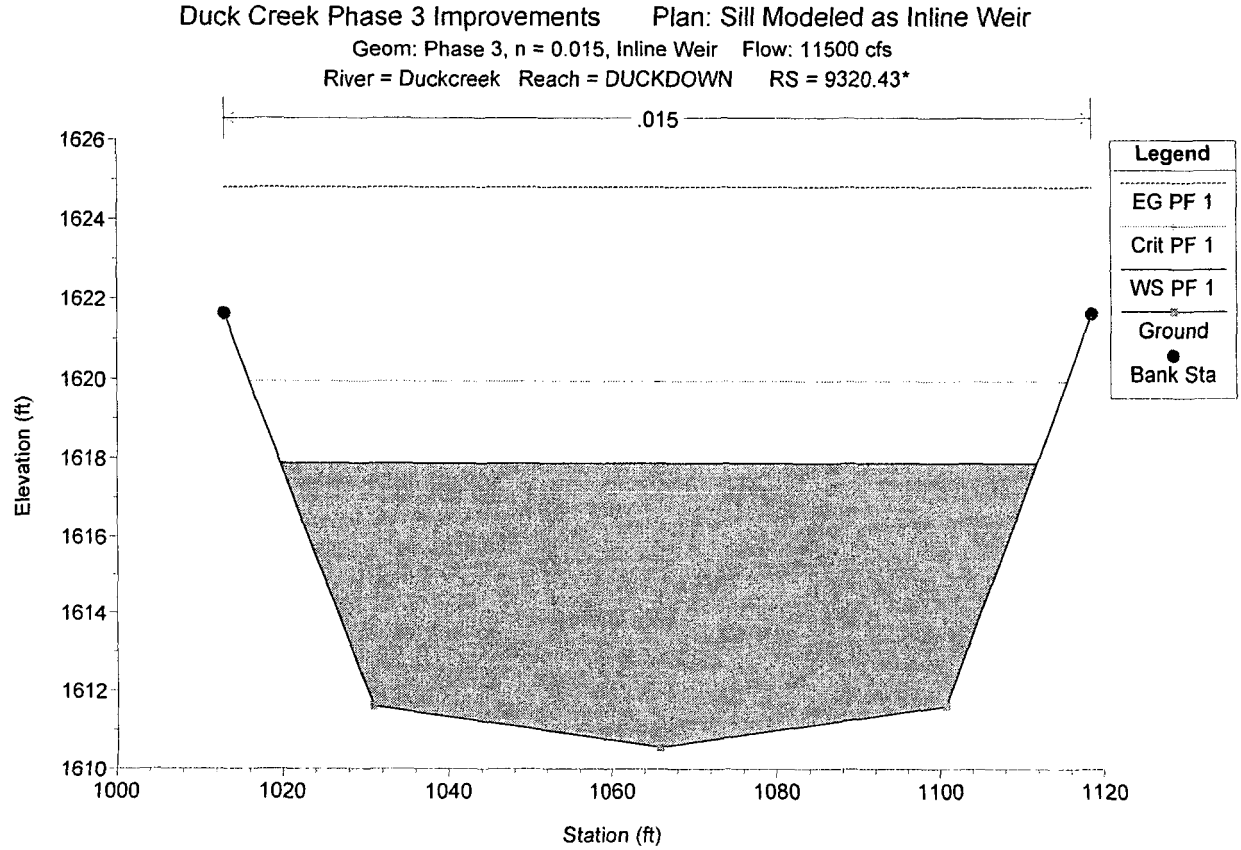

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9568.85*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)

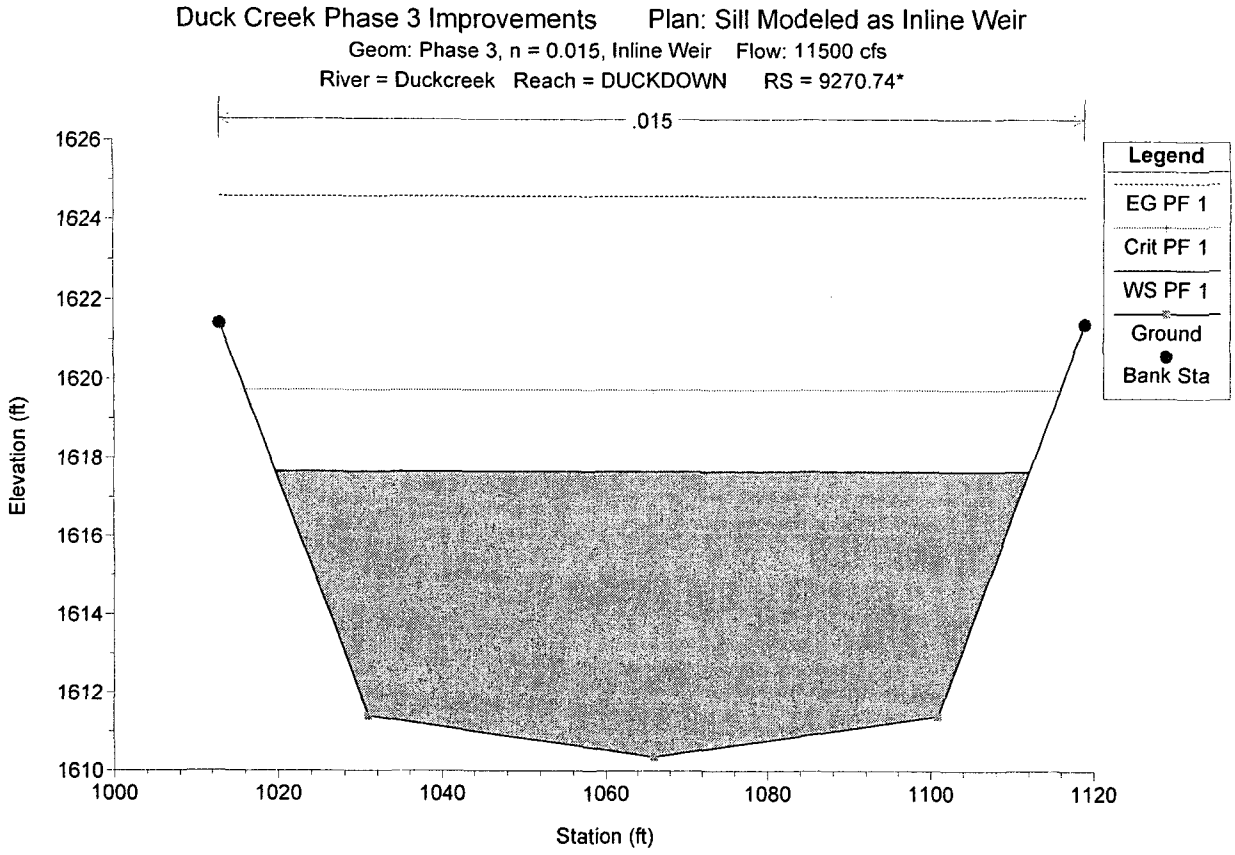

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9519.17*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)

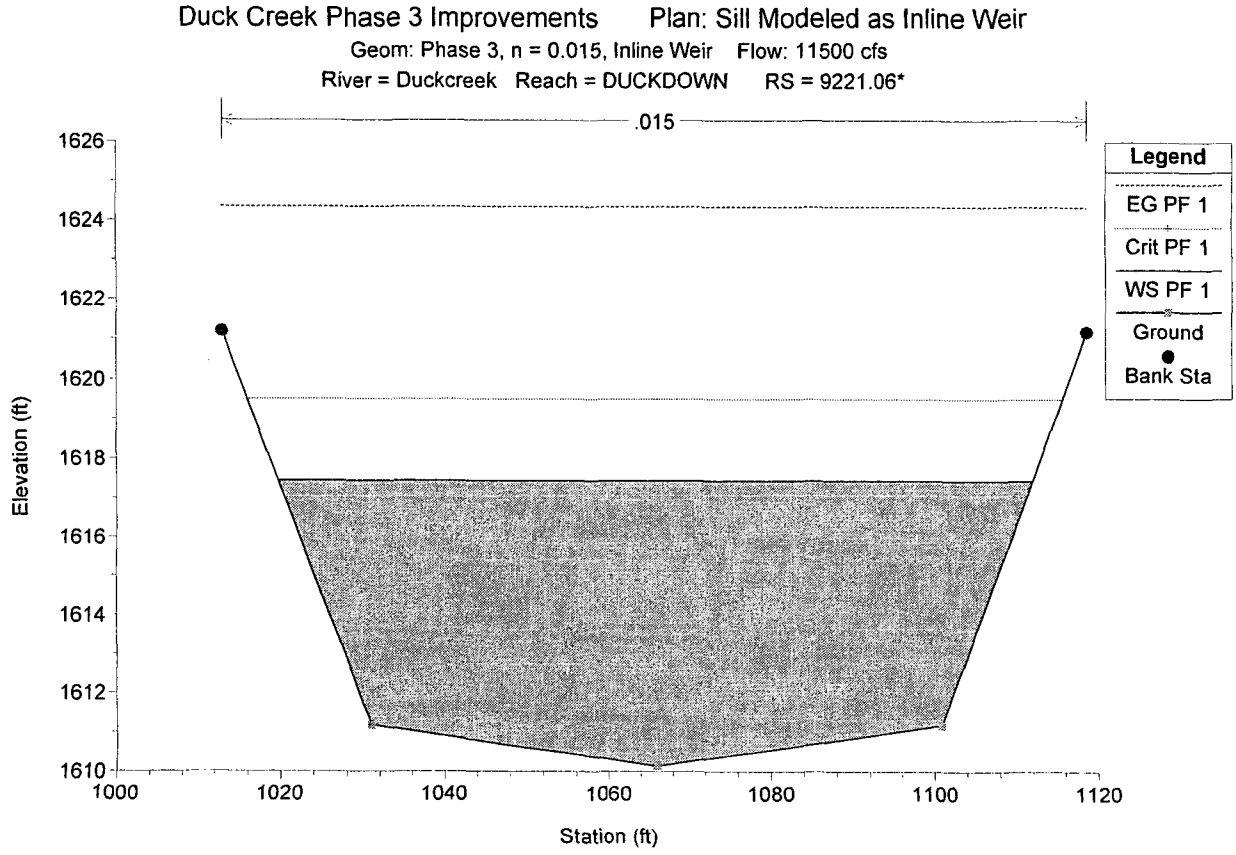

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9469.48*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)

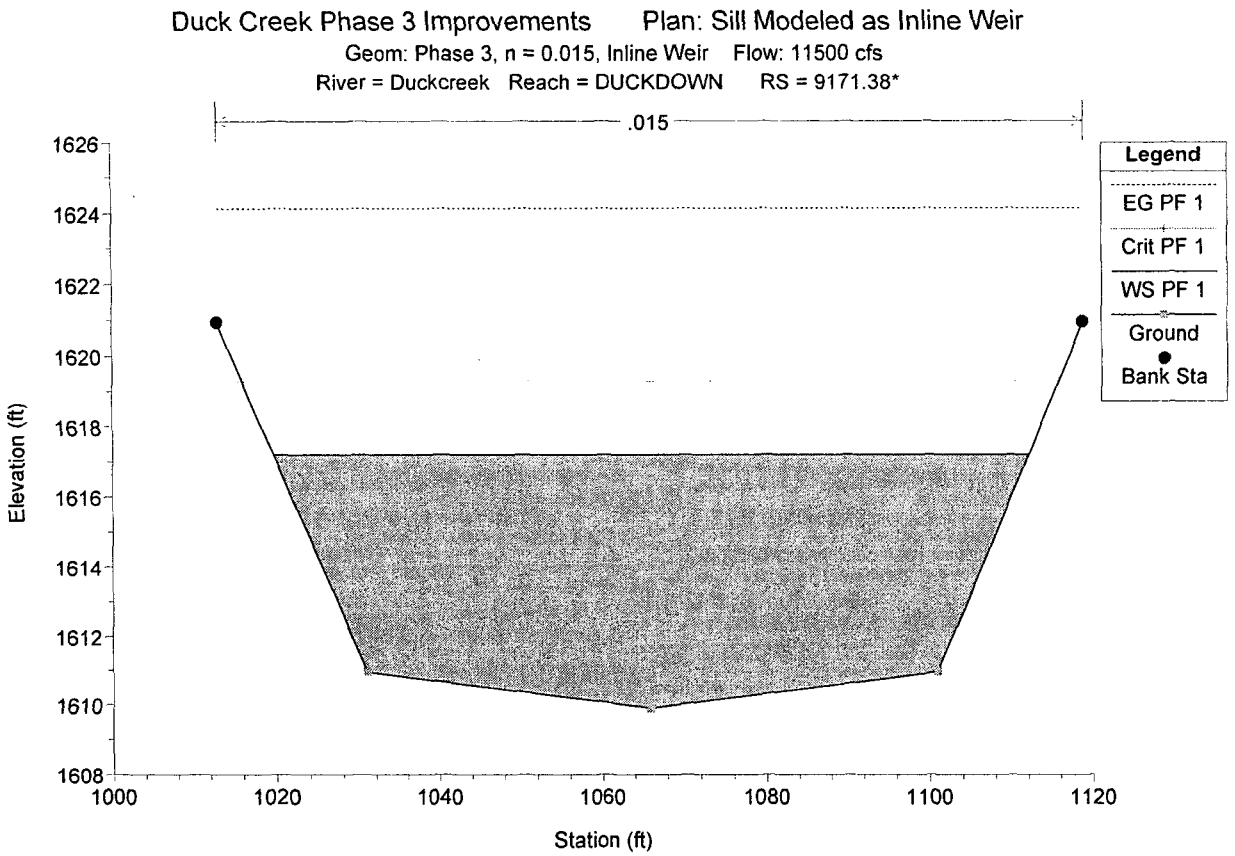

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9419.80*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120
Station (ft)

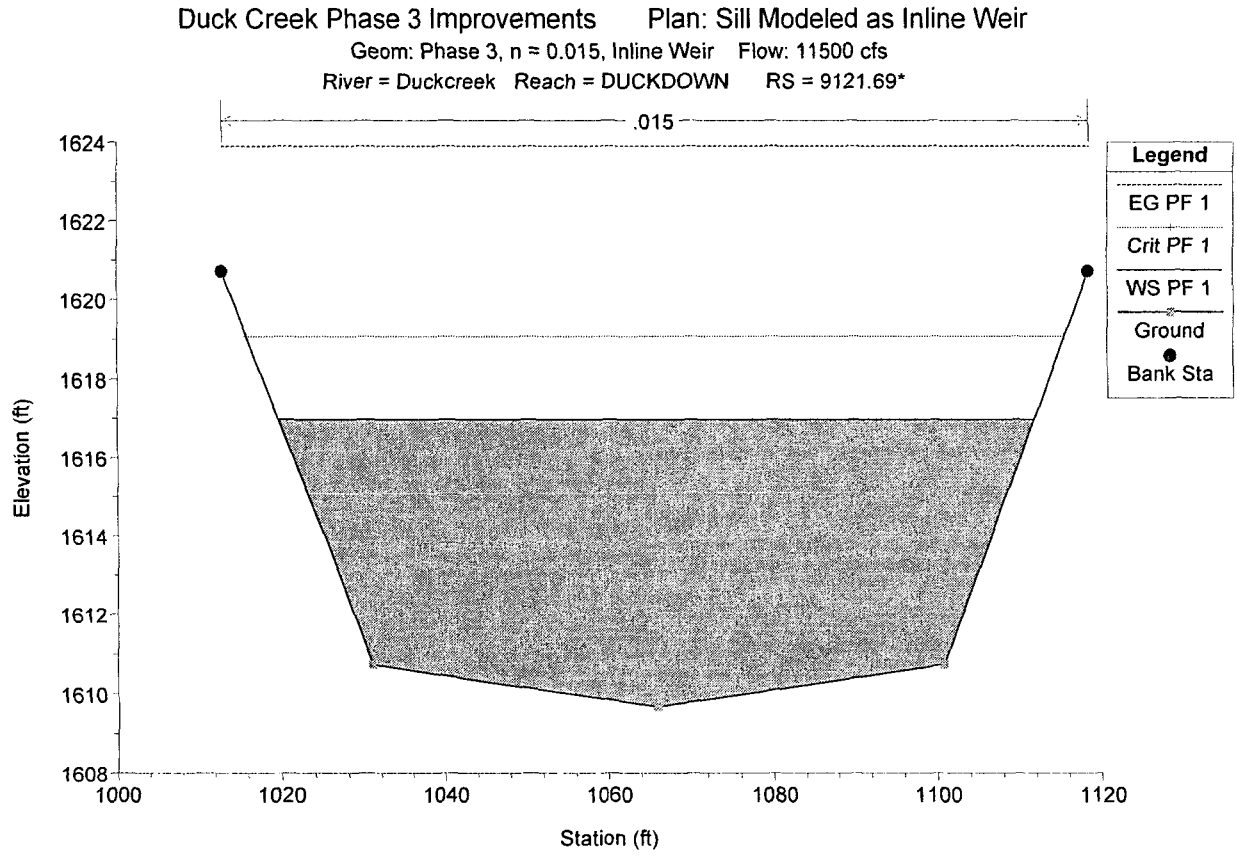

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9370.11*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120

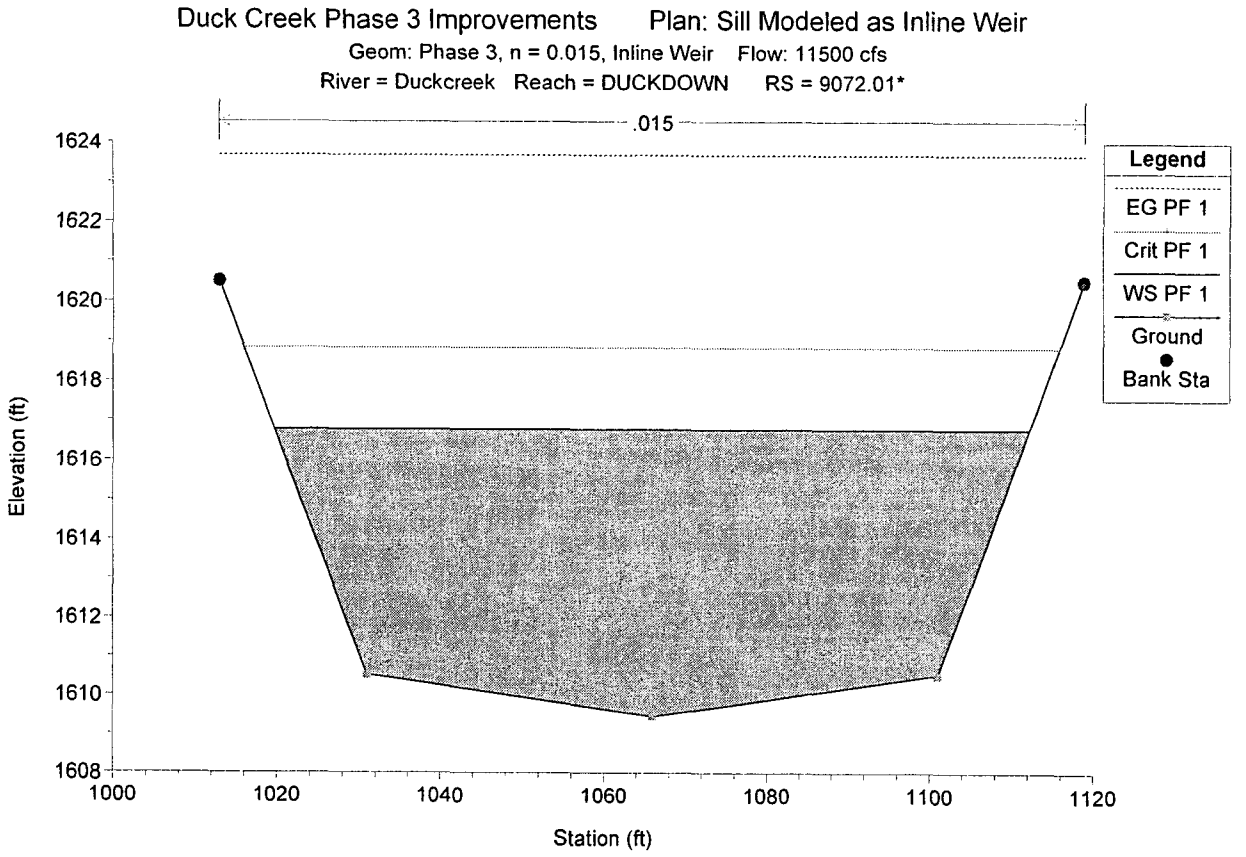

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9320.43*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120

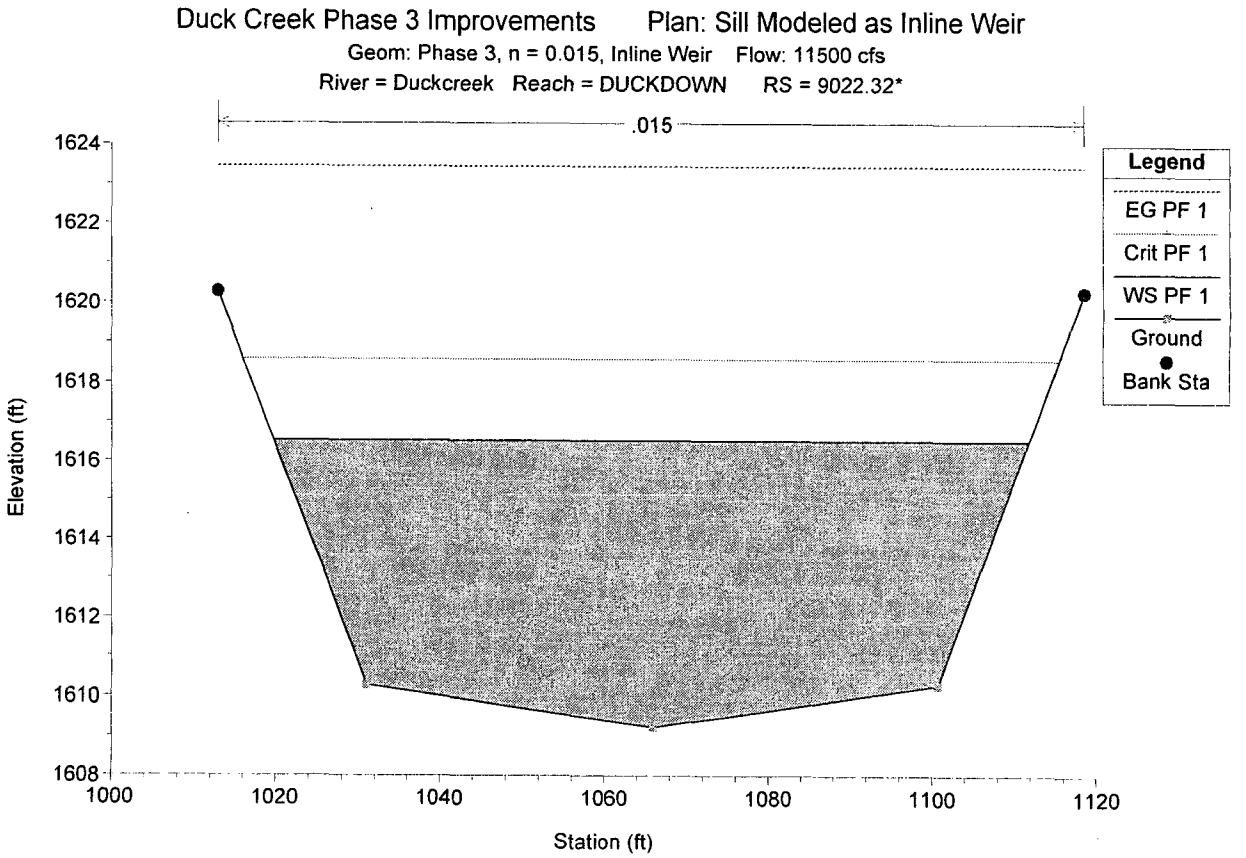

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9270.74*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120

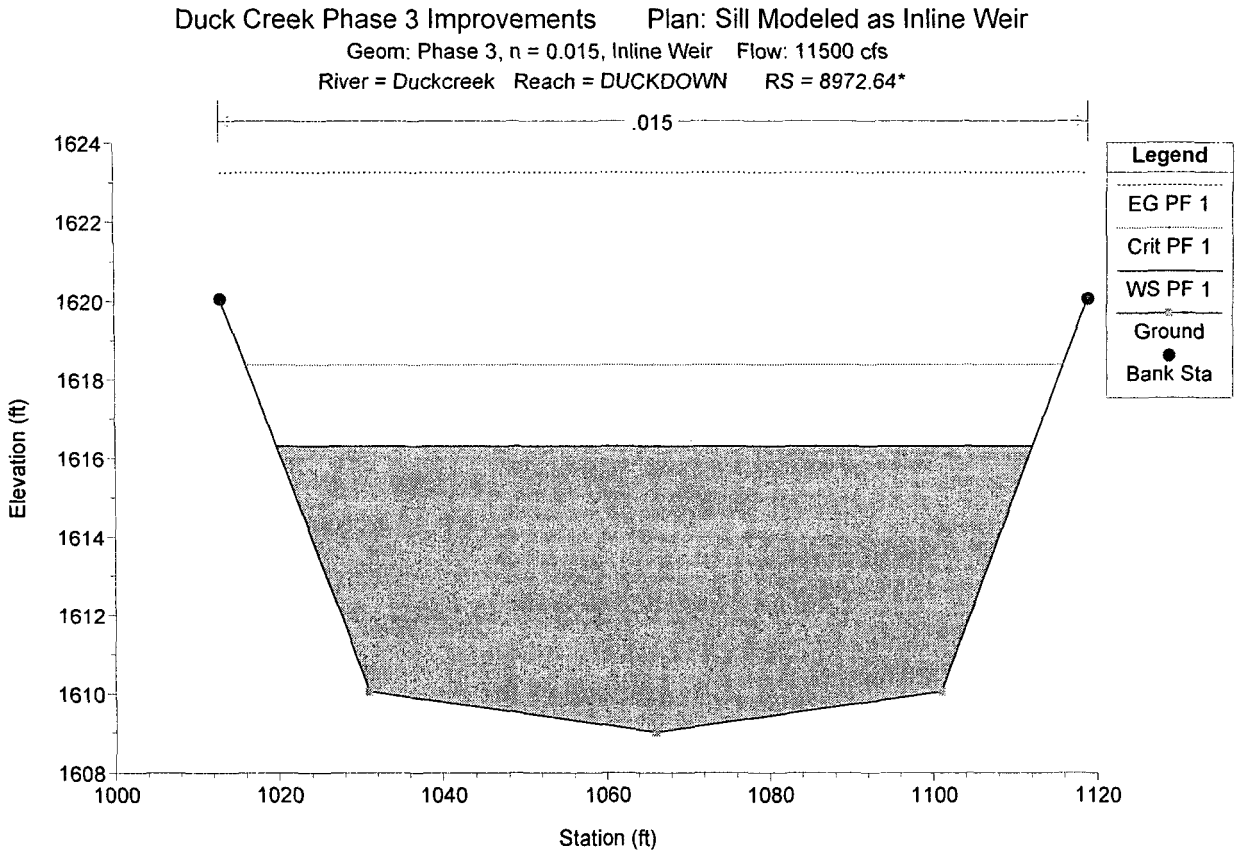

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9221.06*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1000
1020
1040
1060
1080
1100
1120

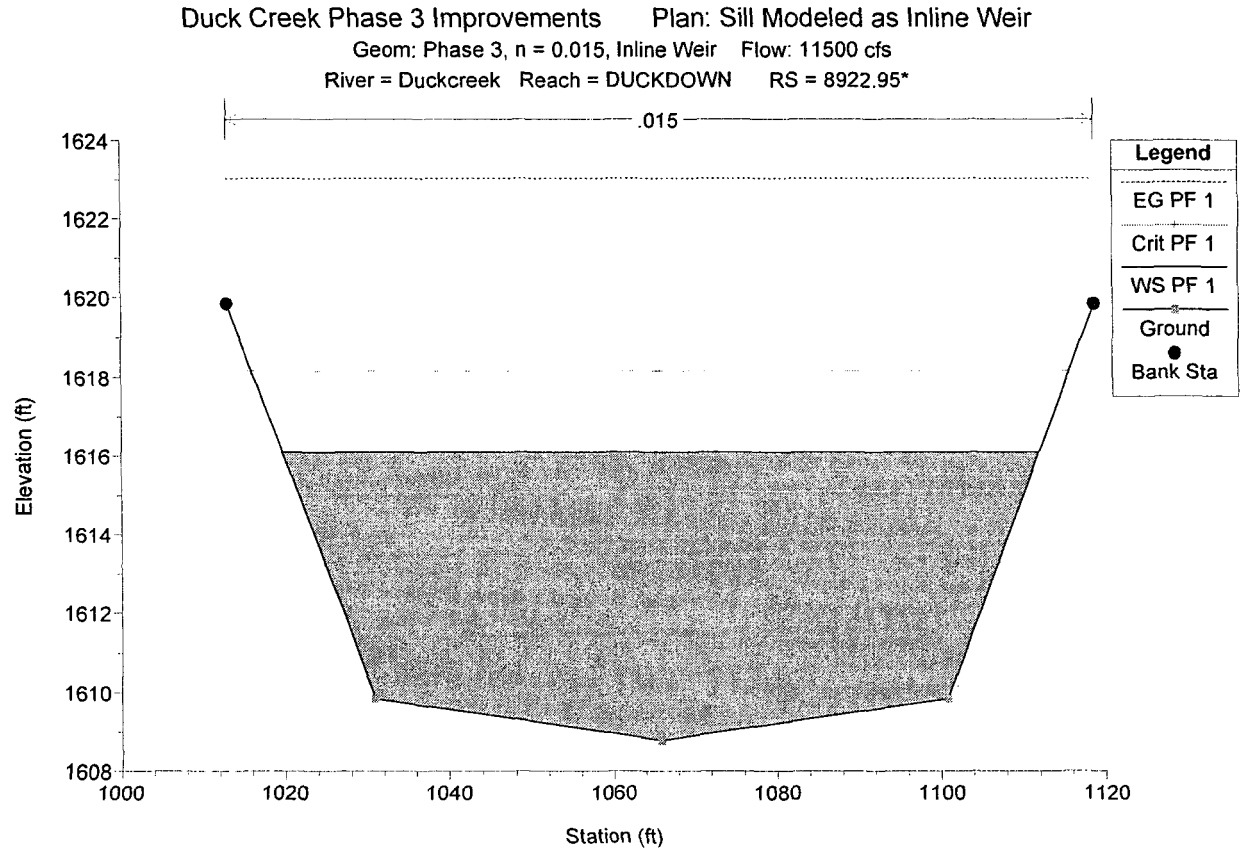

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9171.38*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1626
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120

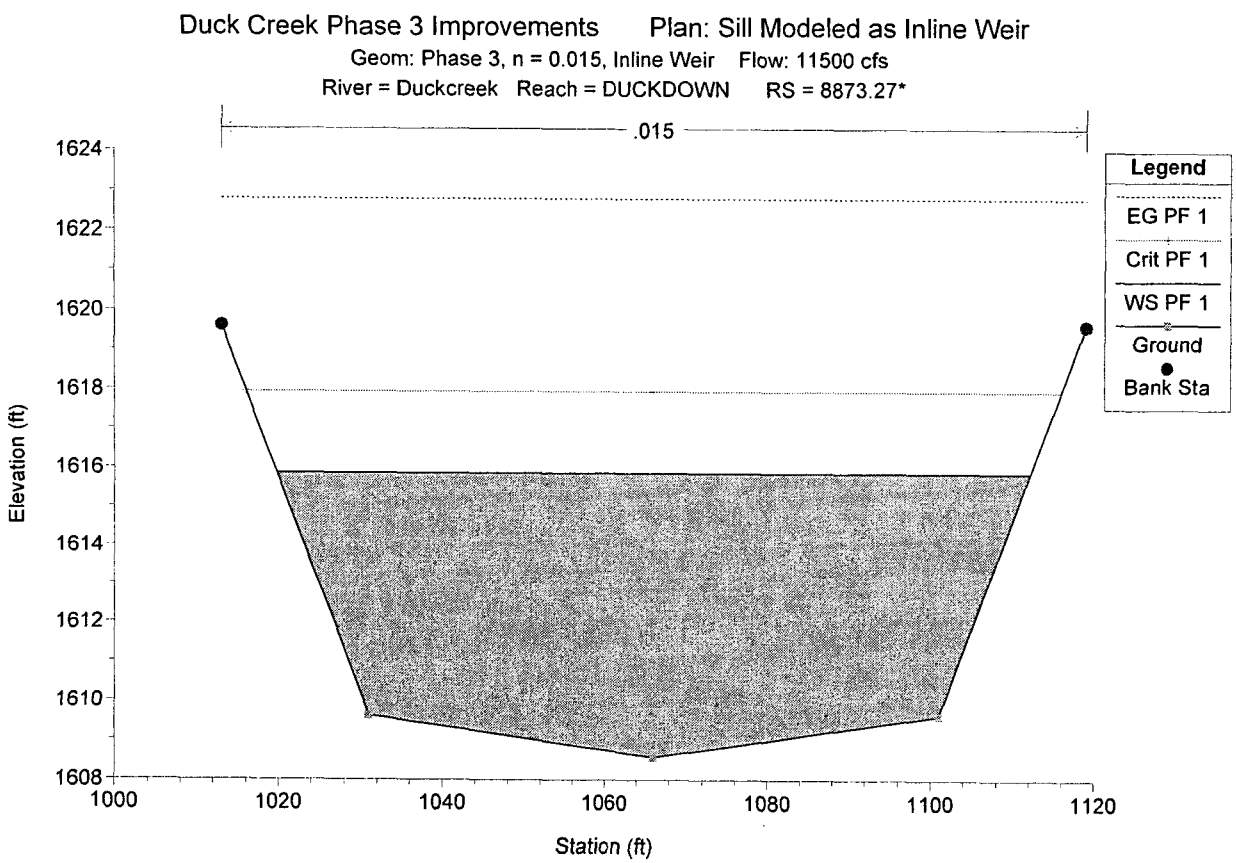

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9121.69*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120

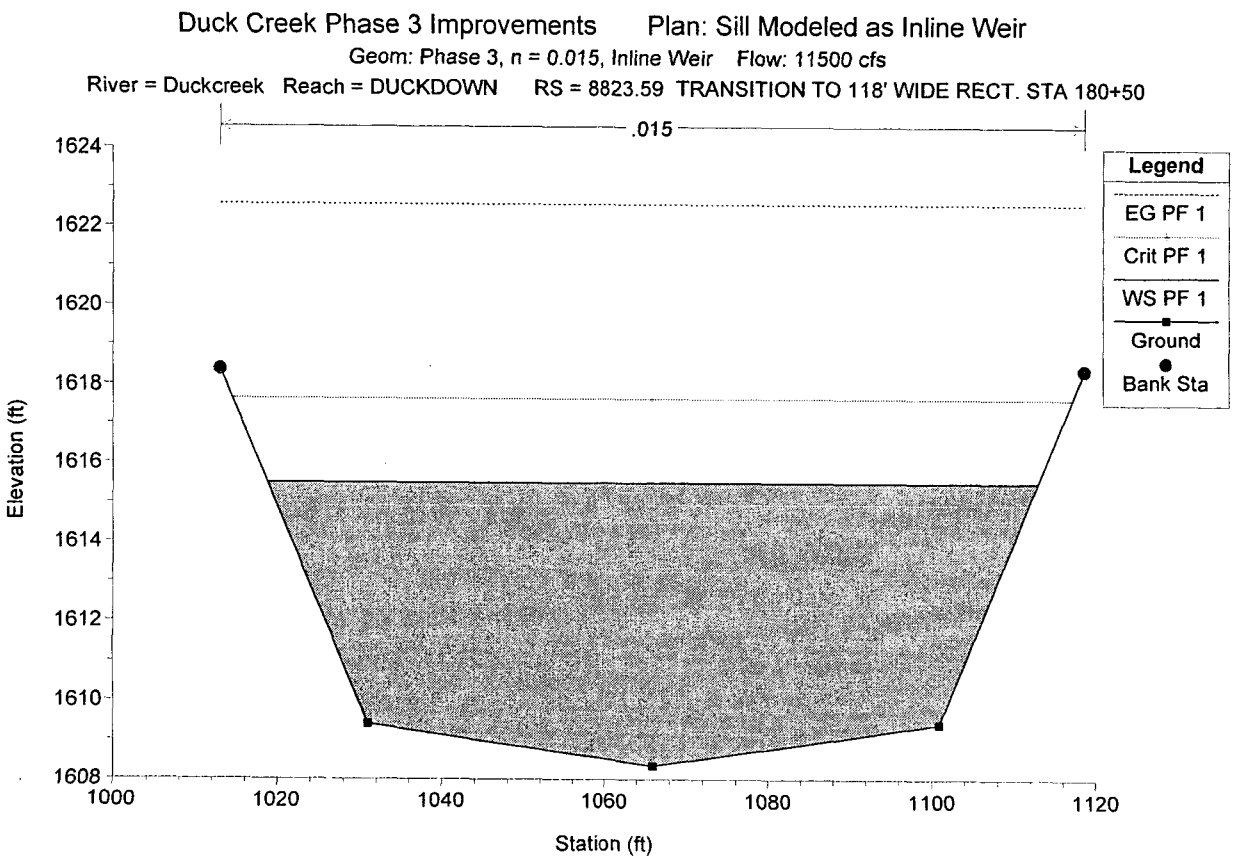

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9072.01*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

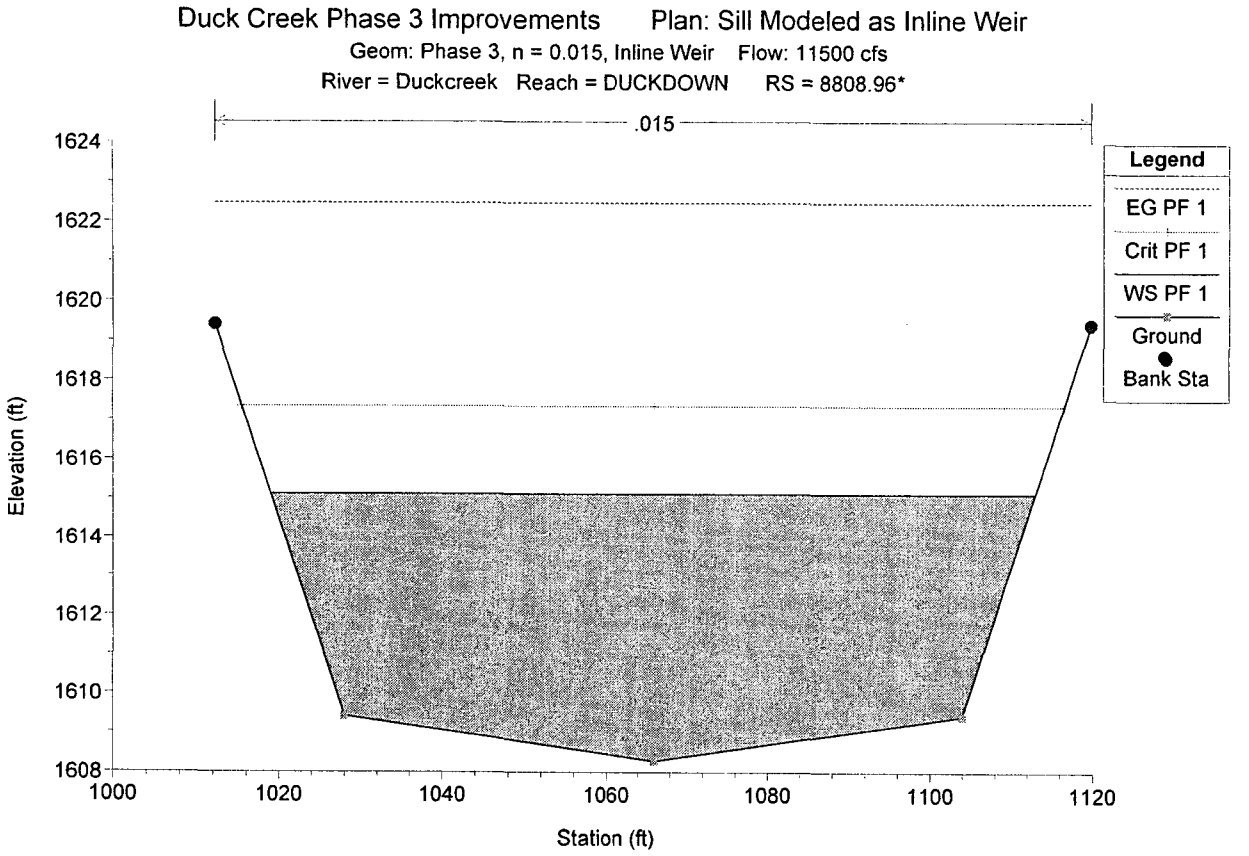

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 9022.32*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

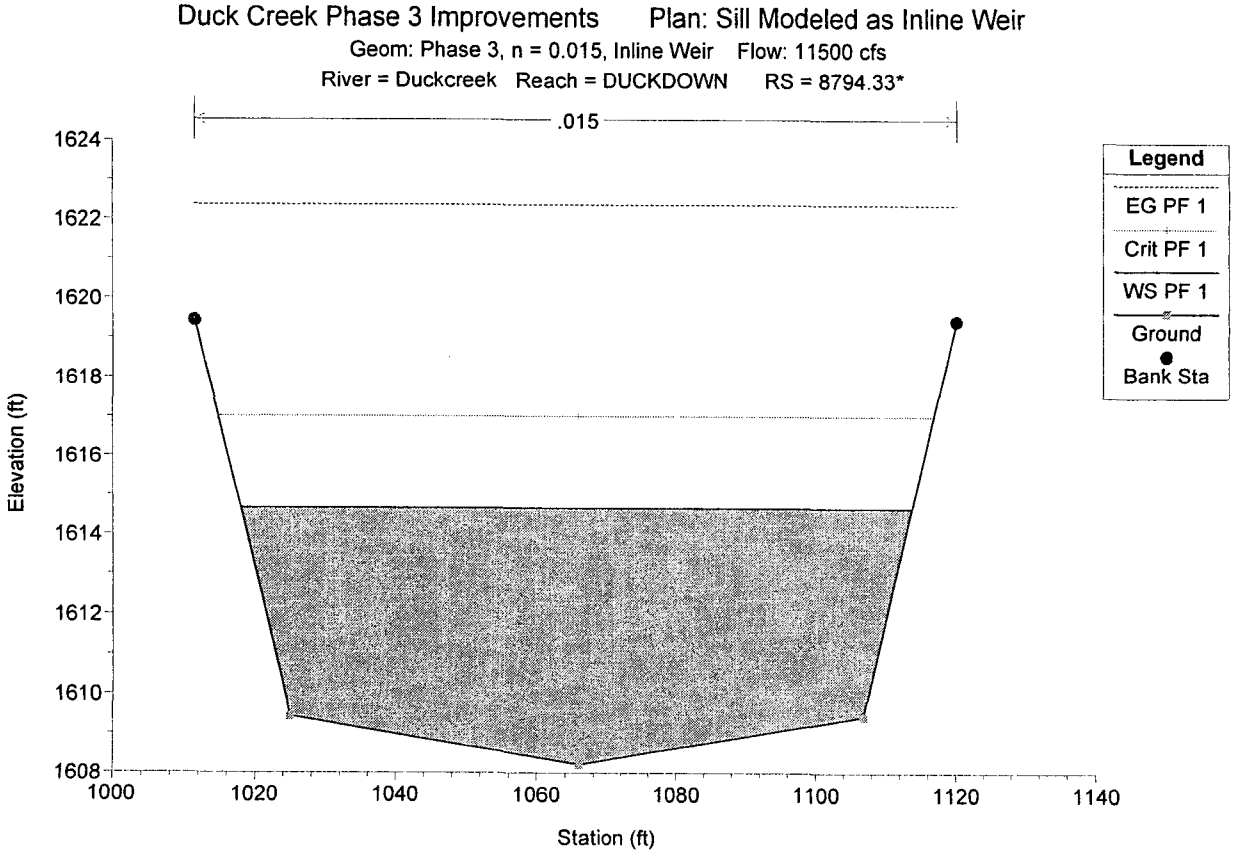

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8972.64*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

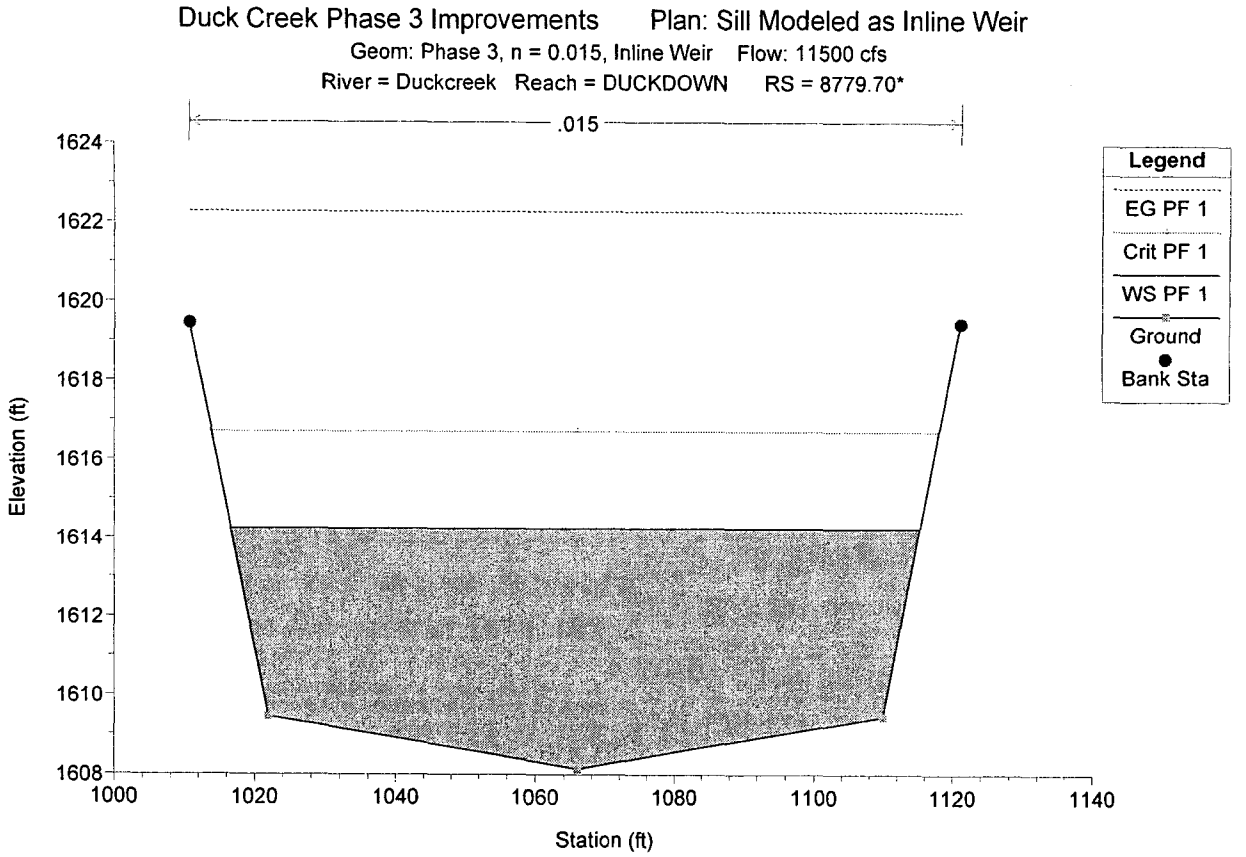

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8922.95*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

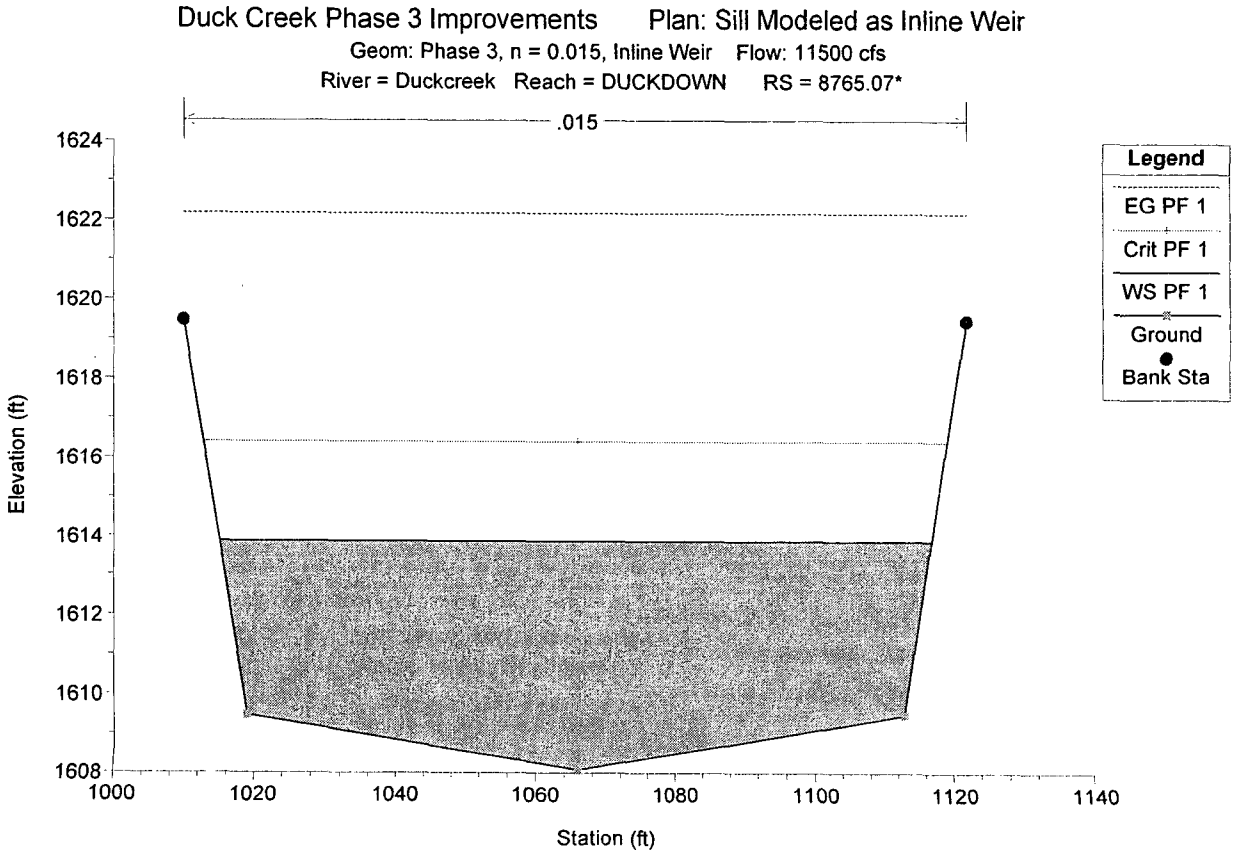

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8873.27*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

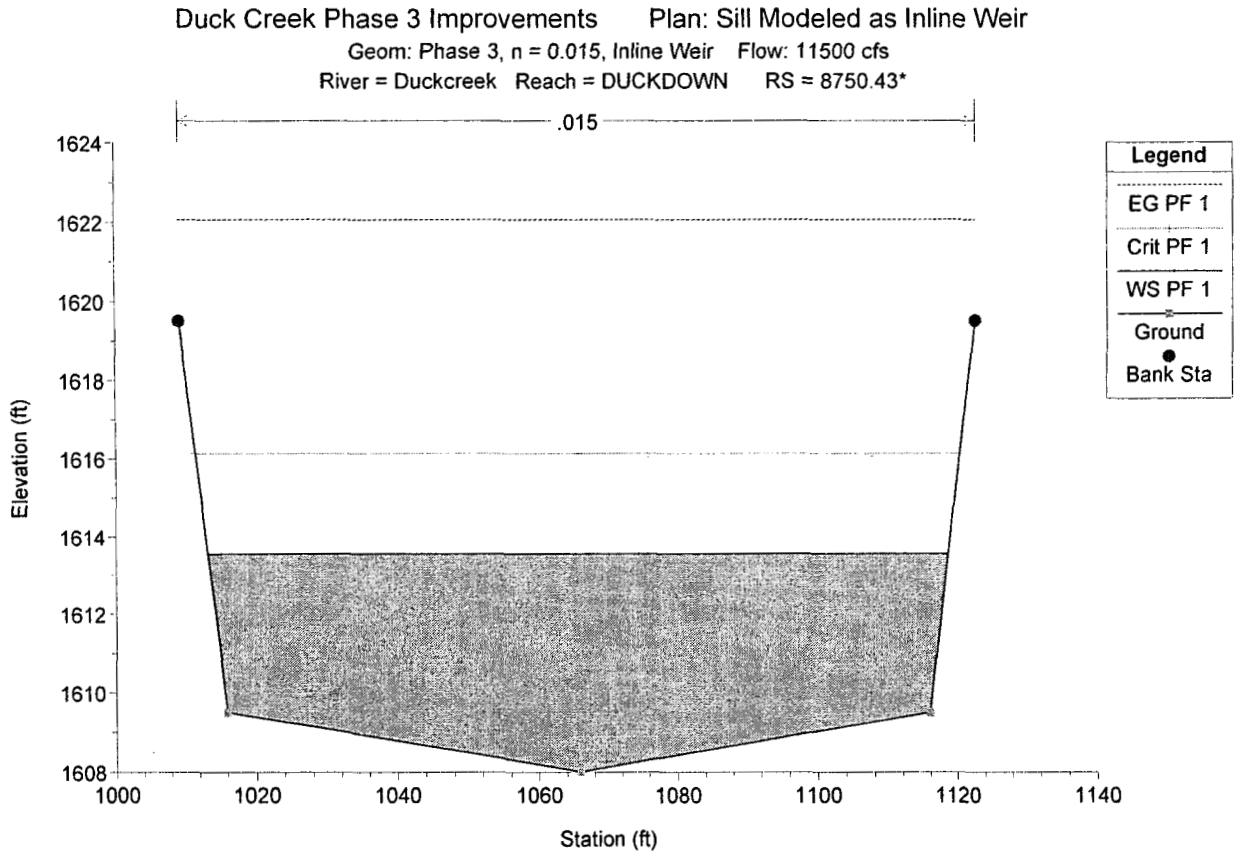

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8823.59 TRANSITION TO 118' WIDE RECT. STA 180+50
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
Station (ft)

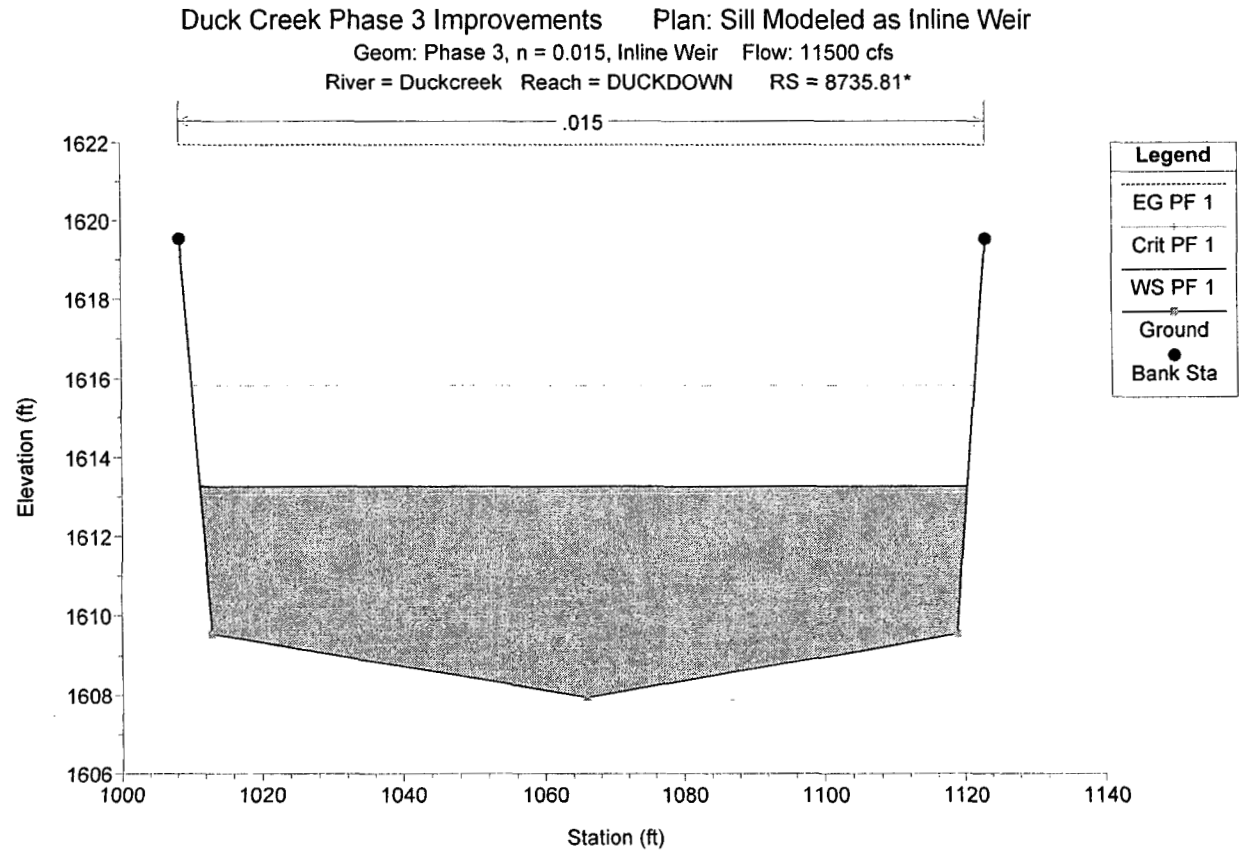

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8808.96*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120

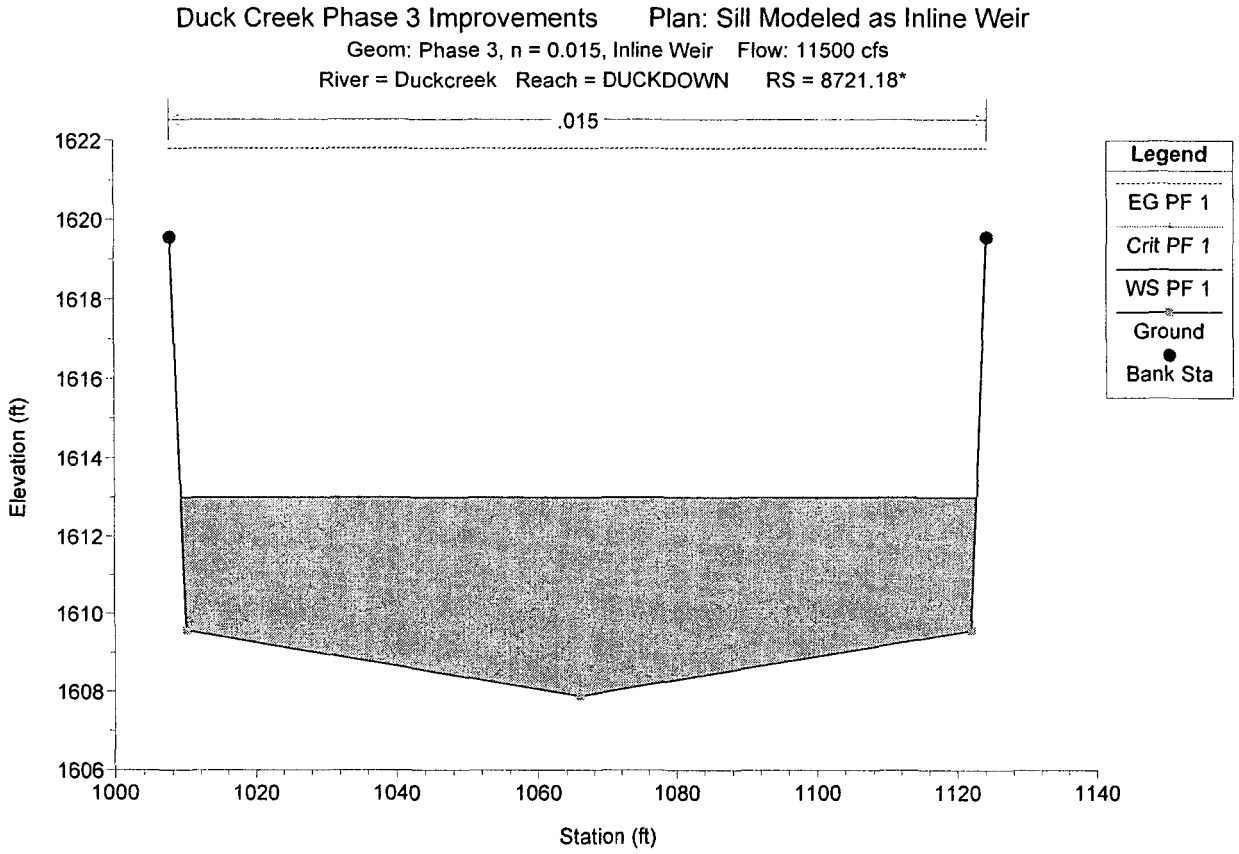

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8794.33*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140

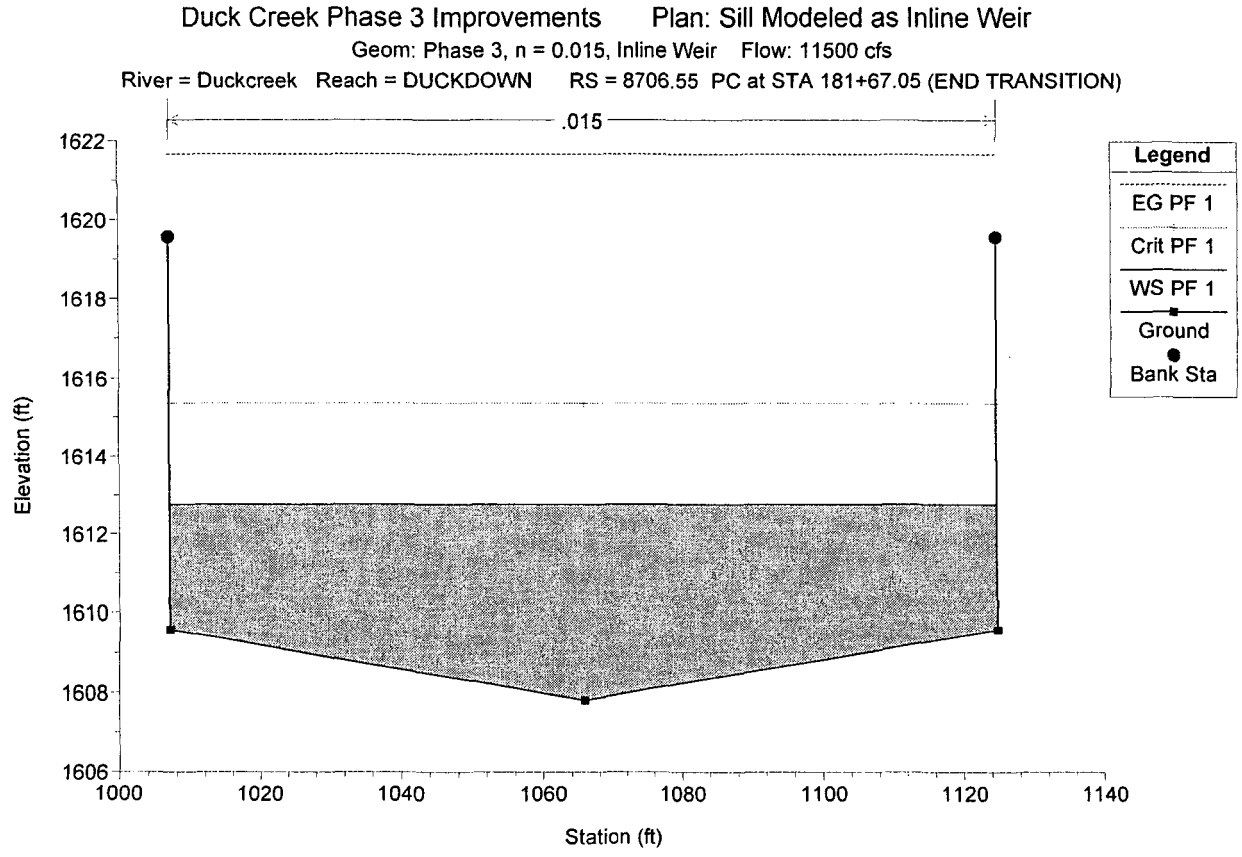

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8779.70*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

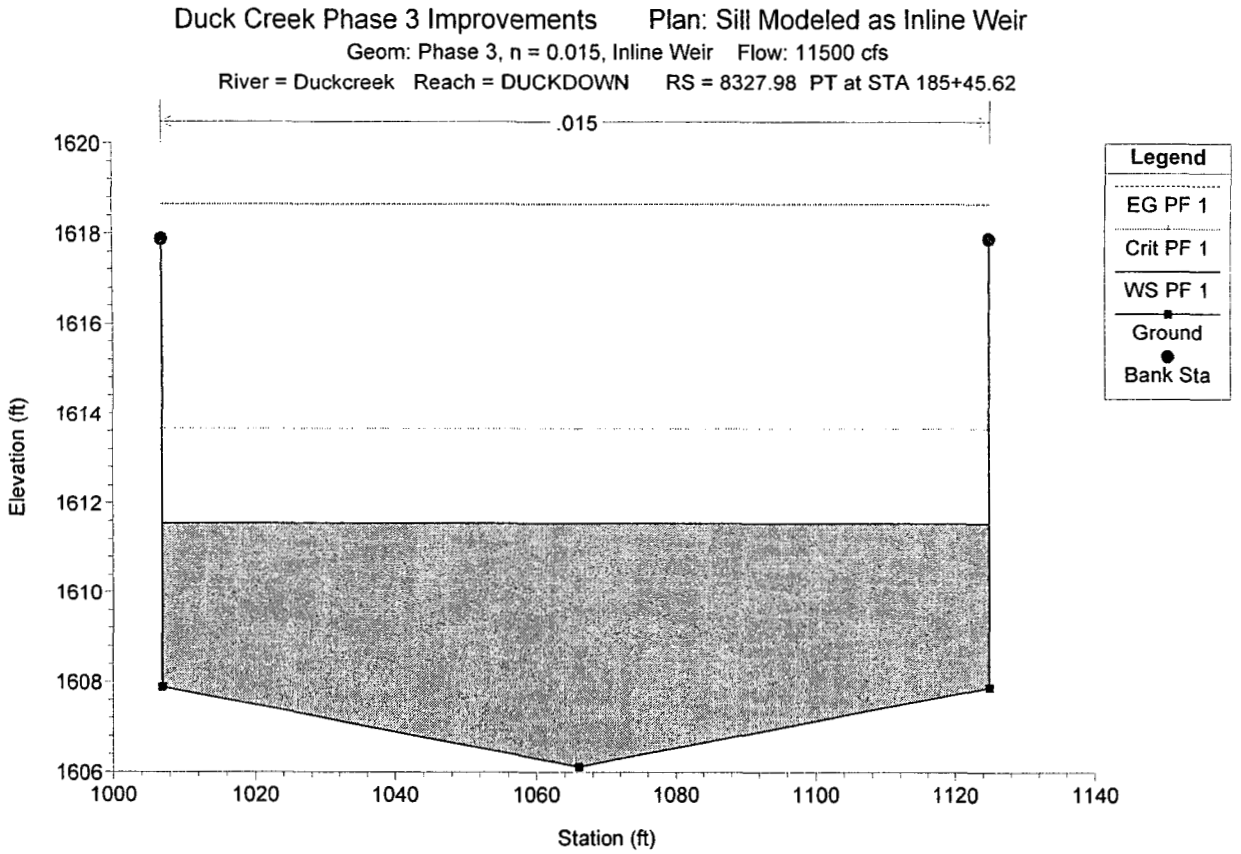

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8765.07*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

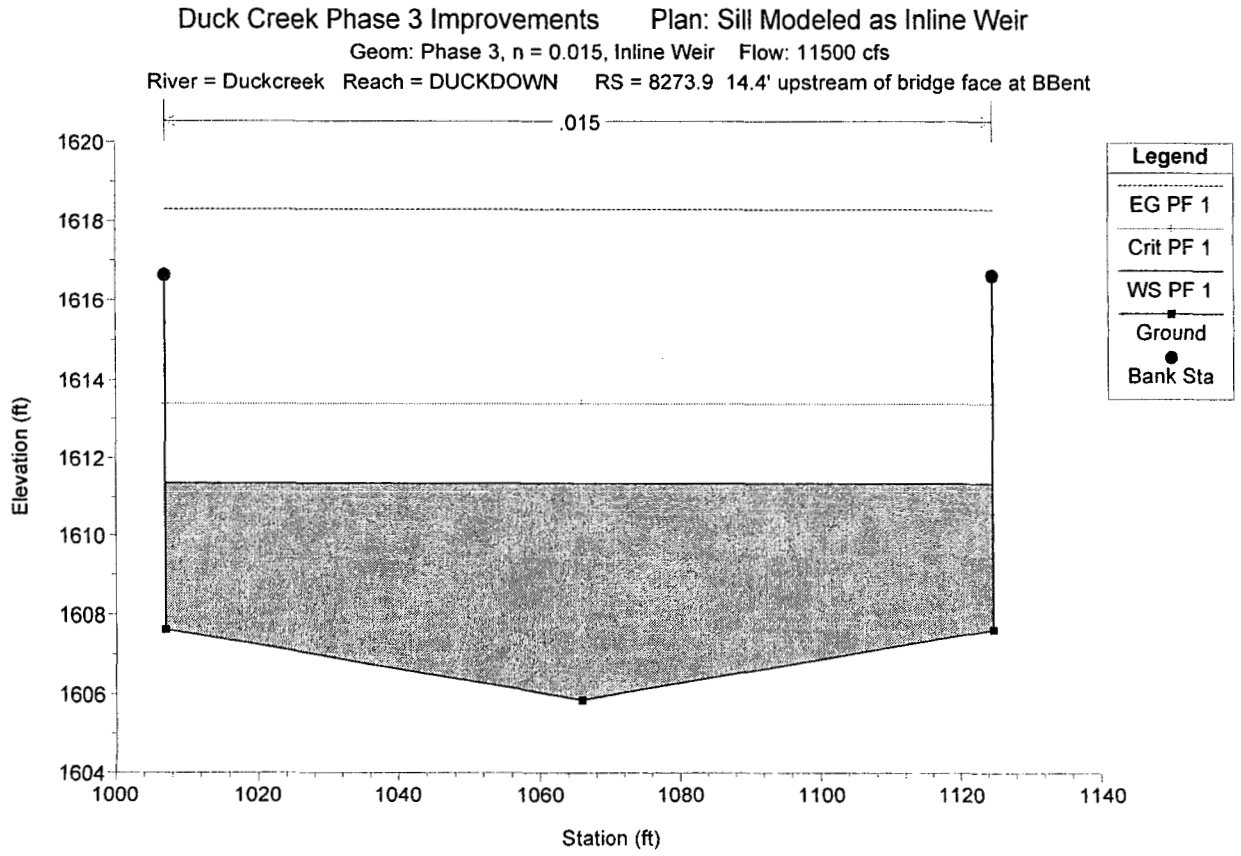

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8750.43*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1624
1622
1620
1618
1616
1614
1612
1610
1608
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

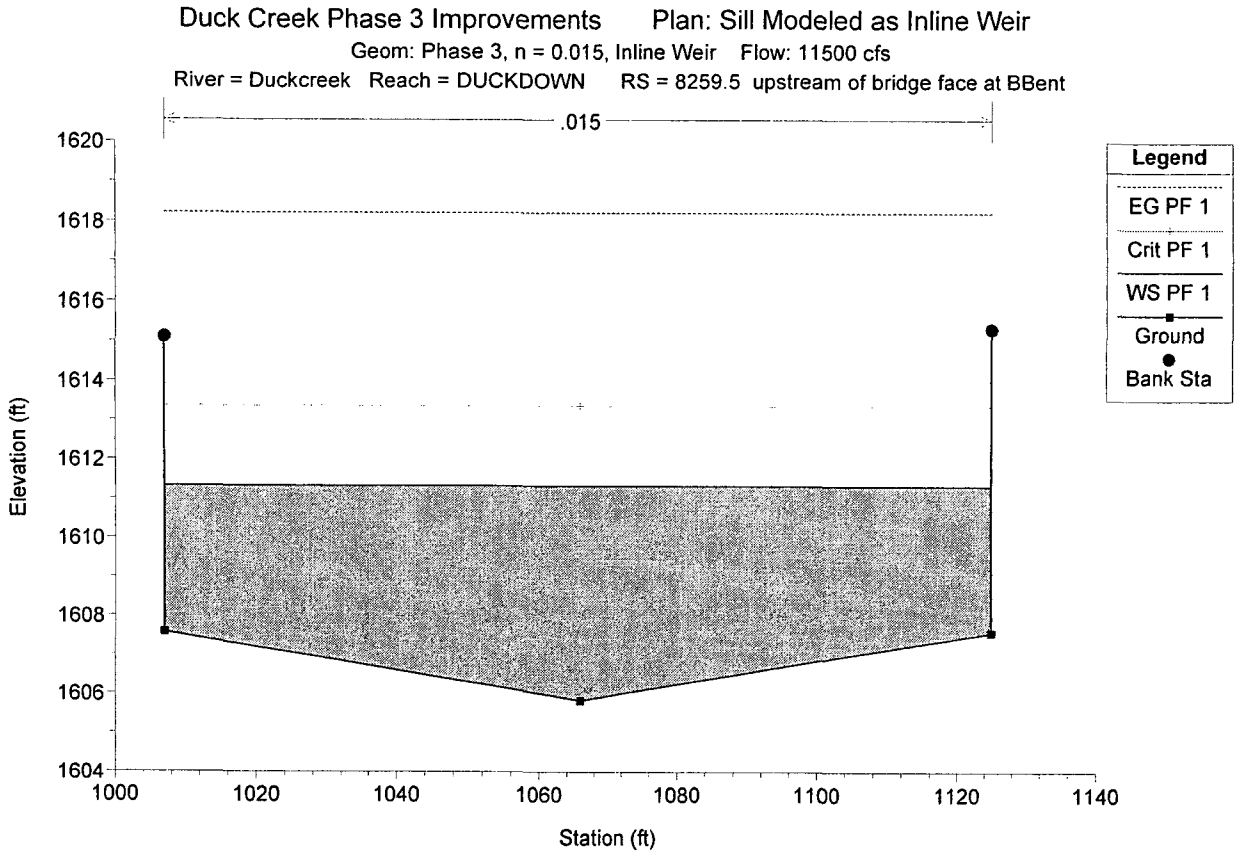

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8735.81*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1622
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

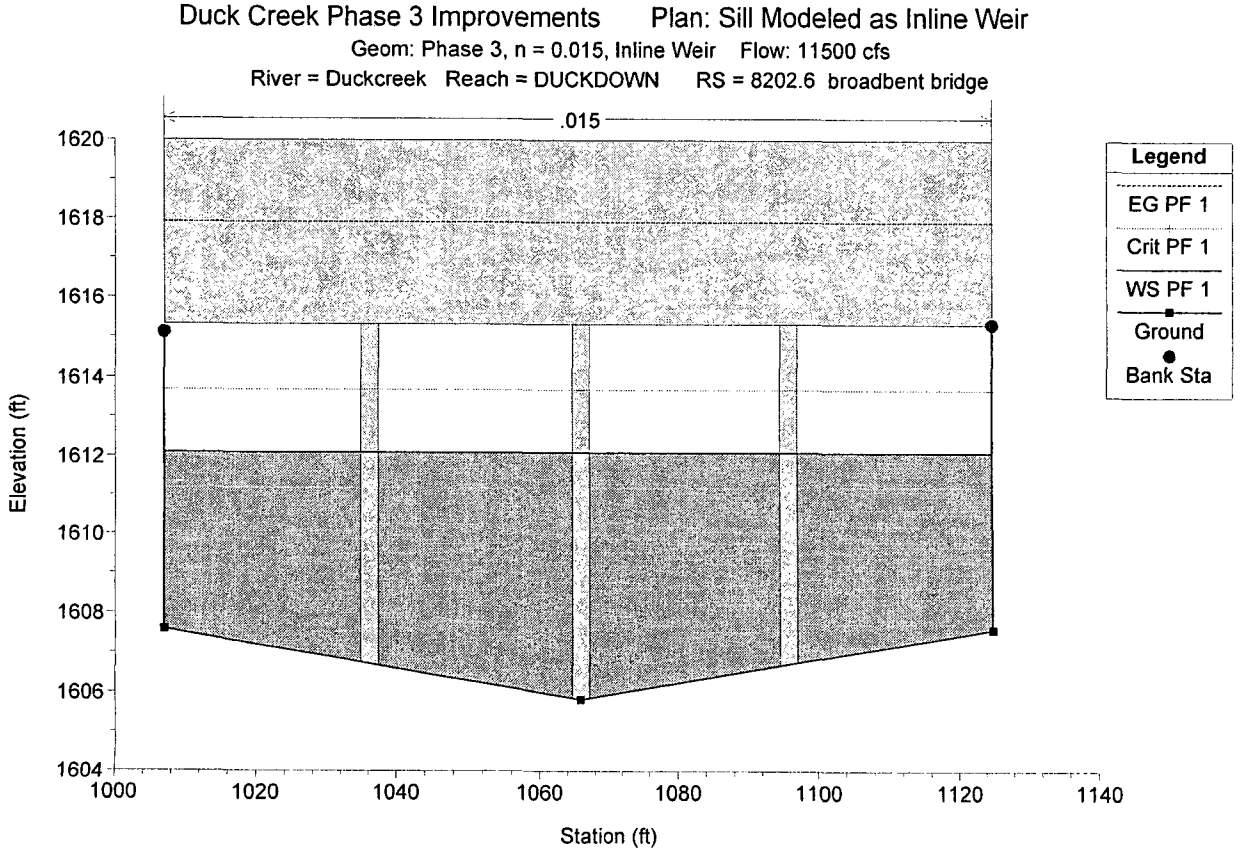

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8721.18*
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1622
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8706.55 PC at STA 181+67.05 (END TRANSITION)
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1622
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8327.98 PT at STA 185+45.62
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1000
1020
1040
1060
1080
1100
1120
1140


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8273.9 14.4' upstream of bridge face at BBent
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140

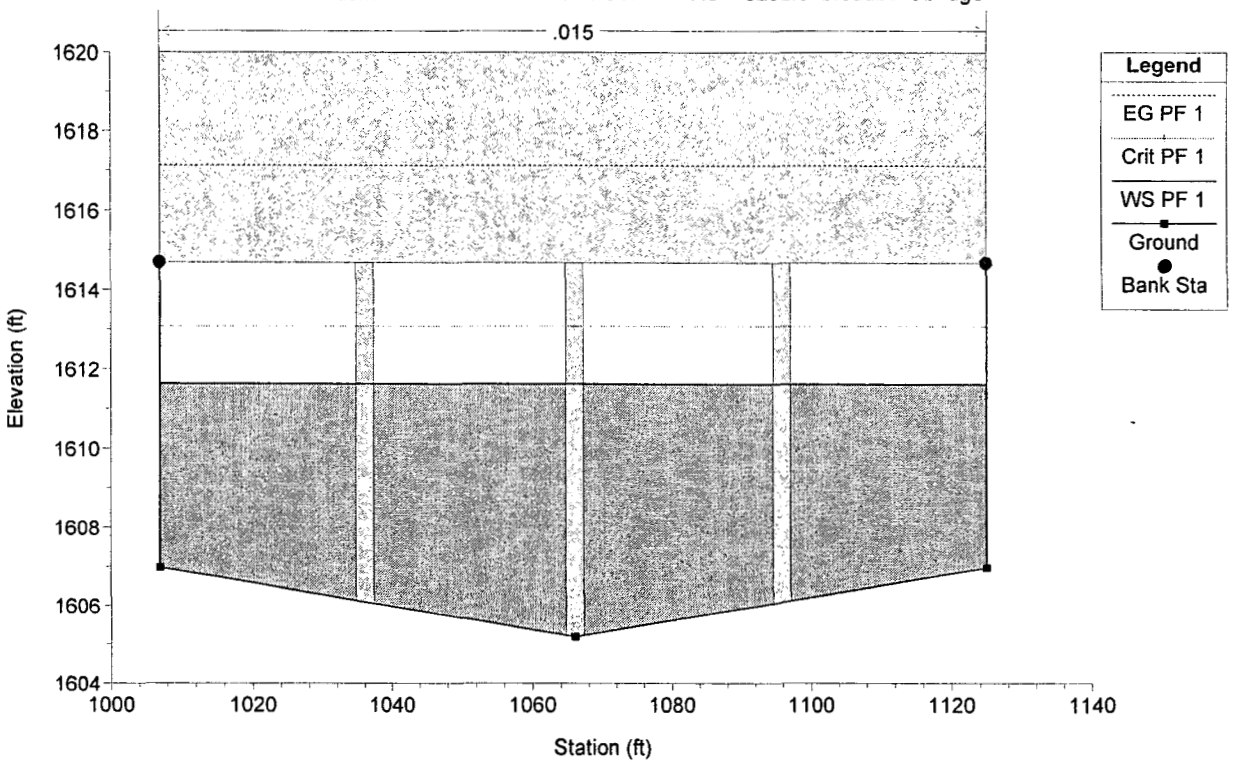

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8259.5 upstream of bridge face at BBent
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)


Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8202.6 broadbent bridge
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1620
1618
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

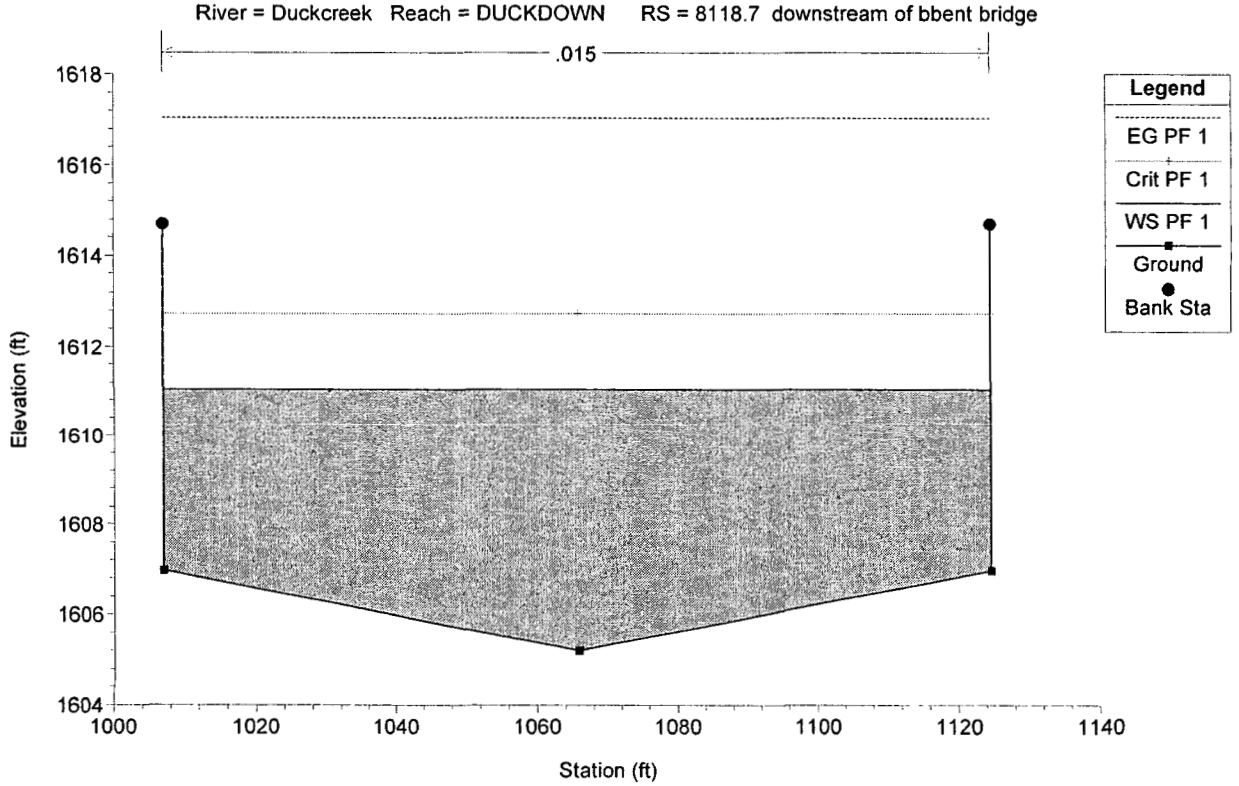
River = Duckcreek Reach = DUCKDOWN RS = 8202.6 broadbent bridge

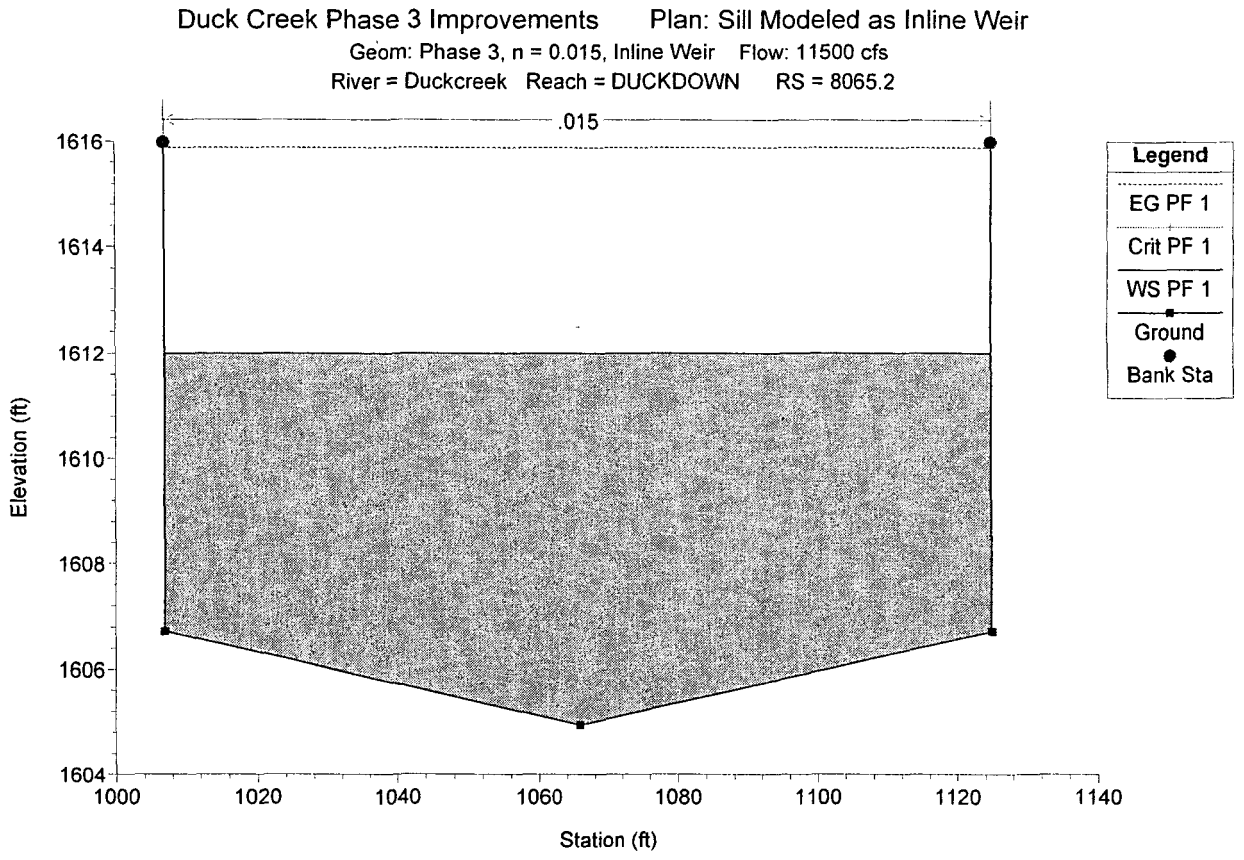


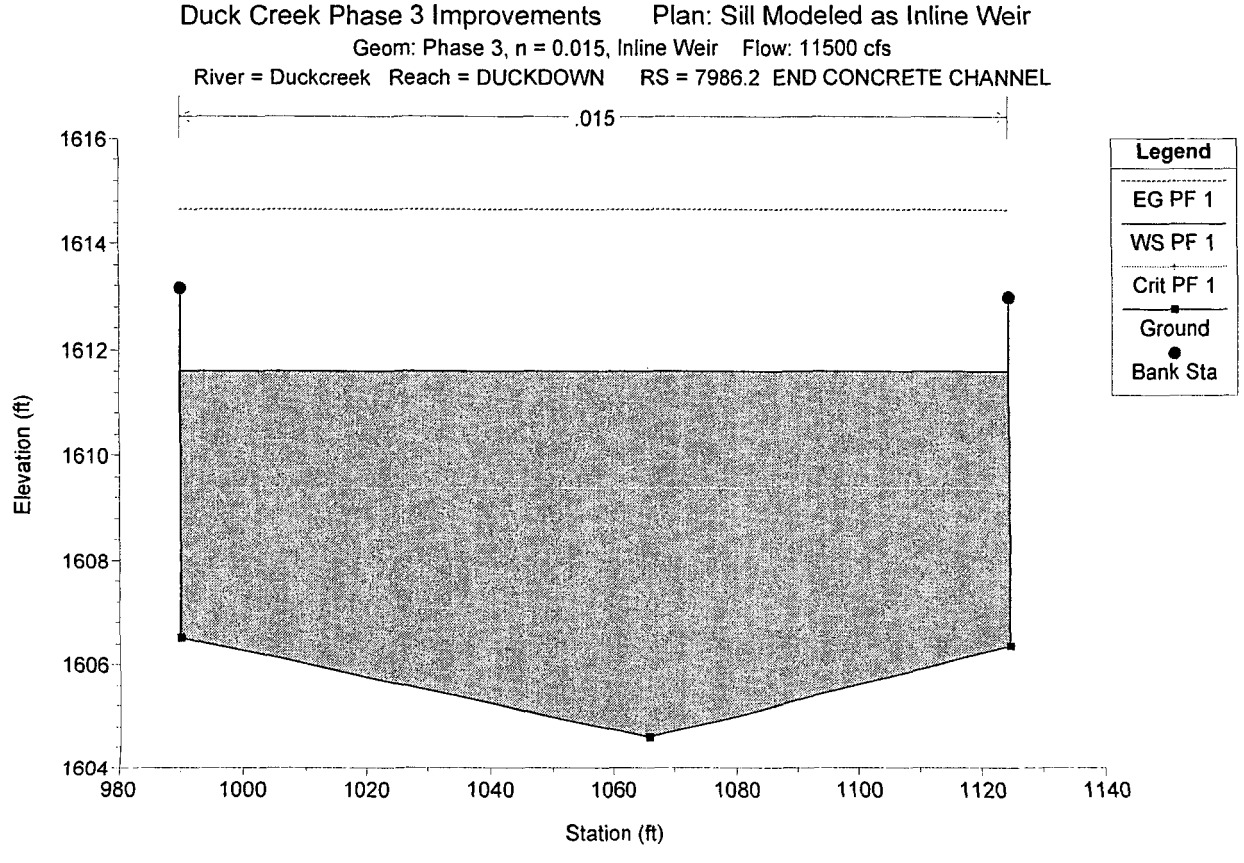
Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir

Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs

River = Duckcreek Reach = DUCKDOWN RS = 8118.7 downstream of bbent bridge




Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 8065.2
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1616
1614
1612
1610
1608
1606
1604
1000
1020
1040
1060
1080
1100
1120
1140

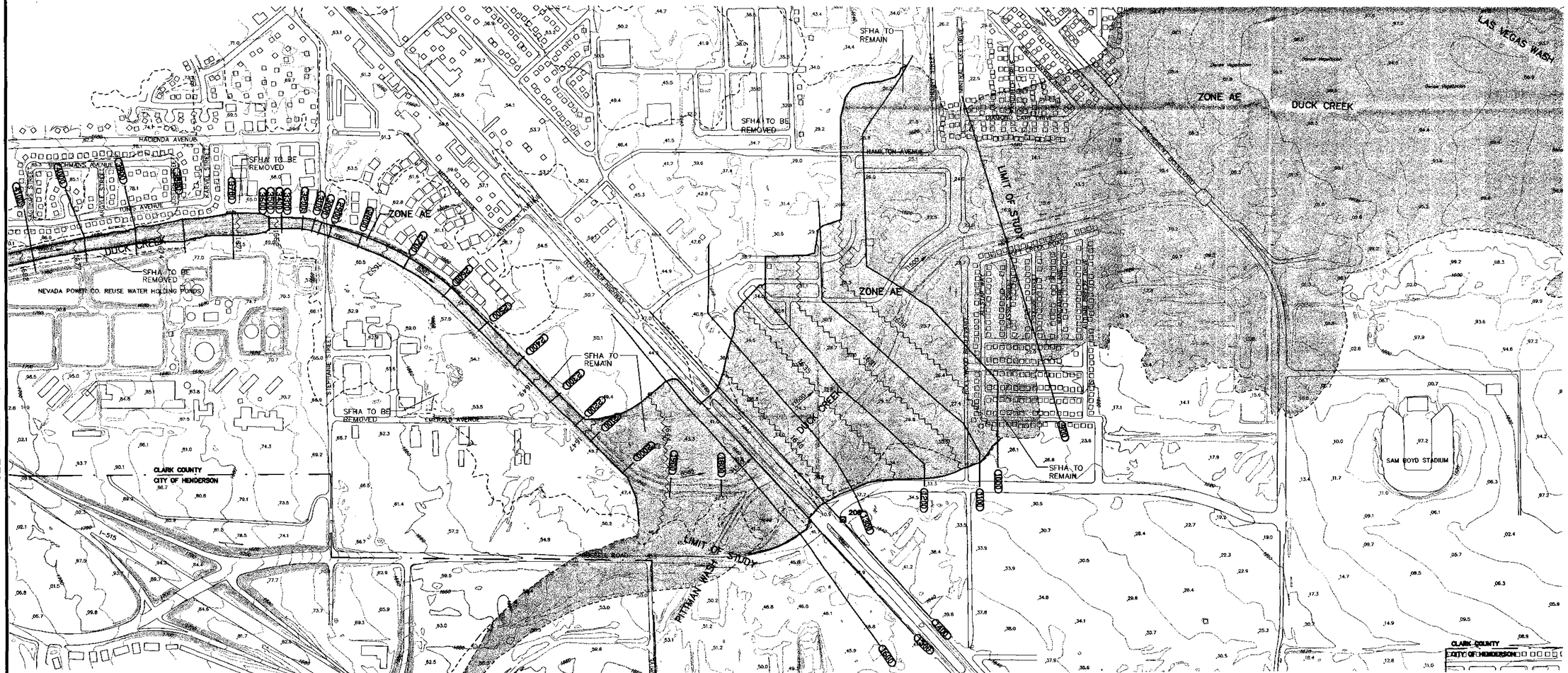

Duck Creek Phase 3 Improvements Plan: Sill Modeled as Inline Weir
Geom: Phase 3, n = 0.015, Inline Weir Flow: 11500 cfs
River = Duckcreek Reach = DUCKDOWN RS = 7986.2 END CONCRETE CHANNEL
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1616
1614
1612
1610
1608
1606
1604
980
1000
1020
1040
1060
1080
1100
1120
1140

REFERENCED INFORMATION

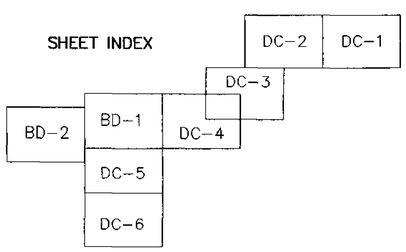
HEC-2 SUMMARY TABLE – 2002 FIS RESTUDY
CROSS SECTION EXHIBIT – 2002 FIS RESTUDY

HEC-2 SUMMARY TABLE

GENERAL				FLOODPLAIN		FLOODWAY	
HEC-2 XS	STREAM NAME	HEC-2 MODEL	FLOW REGIME	Q (CFS)	WSE (FT)	Q (CFS)	WSE (FT)
900	DUCK CREEK	DCL6SUBB	SUB	11500	1620.1	--	--
1000	DUCK CREEK	DCL6SUBB	SUB	11500	1625.8	--	--
1100	DUCK CREEK	DCL6SUBB	SUB	11500	1629.4	--	--
1200	DUCK CREEK	DCL6SUBB	SUB	11500	1633.2	--	--
1300	DUCK CREEK	DCL6SUBB	SUB	11500	1637.5	--	--
1400	DUCK CREEK	DCL6SUBB	SUB	11500	1641.4	--	--
1500	DUCK CREEK	DCL6SUBB	SUB	11500	1641.4	--	--
1600	DUCK CREEK	DCL6SUBB	SUB	11500	1642.0	--	--
1700	NO SECTION						
1800	DUCK CREEK	DCL1SUBC	SUB	8562	1642.4	--	--
1900	DUCK CREEK	DCL1SUBC	SUB	8562	1645.1	--	--
2000	DUCK CREEK	DCL1SUBC	SUB	8562	1646.3	--	--
2100	DUCK CREEK	DCL1SUBC	SUB	8562	1648.3	--	--
2200	DUCK CREEK	DCL1SUBC	SUB	8562	1648.7	--	--
2300	DUCK CREEK	DCL1SPRC	SUPER	8562	1648.2	--	--
2400	DUCK CREEK	DCL1SPRC	SUPER	8562	1649.6	--	--
2500	DUCK CREEK	DCL1SPRC	SUPER	8562	1651.9	--	--
2600	DUCK CREEK	DCL1SPRC	SUPER	8562	1651.7	--	--
2700	DUCK CREEK	DCL1SPRC	SUPER	8562	1652.9	--	--
2800	DUCK CREEK	DCL1SPRC	SUPER	8562	1653.4	--	--
2900	DUCK CREEK	DCL1SPRC	SUPER	8562	1653.3	--	--
3000	DUCK CREEK	DCL1SPRC	SUPER	8562	1653.6	--	--
3100	DUCK CREEK	DCL1SPRC	SUPER	8562	1654.5	--	--
3200	DUCK CREEK	DCL1SPRC	SUPER	8562	1655.0	--	--
3300	DUCK CREEK	DCL1SPRC	SUPER	8562	1655.4	--	--
3400	DUCK CREEK	DCL1SUBC	SUB	8562	1663.1	--	--
3500	DUCK CREEK	DCL1SUBC	SUB	8562	1664.9	--	--
3600	DUCK CREEK	DCL1SUBC	SUB	8562	1667.7	--	--
3700	DUCK CREEK	DCL1SUBC	SUB	8562	1671.3	--	--
3800	DUCK CREEK	DCL1SUBC	SUB	8562	1672.4	--	--
3900	DUCK CREEK	DCL1SUBC	SUB	8562	1675.4	--	--
4000	DUCK CREEK	DCL1SUBC	SUB	8562	1676.4	--	--



SHEET INDEX



NOTES

FLOODING SOURCE: DUCK CREEK
CLARK COUNTY, NEVADA

MAP BASED ON 1-INCH = 400 FEET TOPOGRAPHIC MAPPING
CONTOUR INTERVAL = 4 FEET
FLIGHT DATE: JULY 18, 2000
BY KENNEY AERIAL MAPPING, INC.

FIRM PANEL(S) AFFECTED: 32003C2585 D, DATED AUGUST 16, 1995

ELEVATION REFERENCE MARKERS (ERM)

REFERENCE NUMBER	ELEVATION REFERENCE MARKER ID	ELEVATION (FT, NGVD 29)	LOCATION DESCRIPTION
206	CCBM 6C13 34NNE6	1638.18	RIVET AND SQUARE ALUMINUM PLATE IN HEADWALL AT NORTHEAST CORNER OF BOULDER HIGHWAY AND RUSSELL ROAD.
210	CCBM 6C12 28NE6	1665.41	RIVET AND SQUARE ALUMINUM PLATE AT SOUTHEAST CORNER OF BOULDER HIGHWAY AND ENGLISH AVENUE.

NAVD 88 = NGVD 29 + 2.37 FT

NORTH

SCALE 1" = 400'

400 0 400 800

SCALE FEET

LEGEND

- 206 — ELEVATION REFERENCE MARKER
- ----- — EFFECTIVE 100-YR FLOODPLAIN AND FLOODWAY BOUNDARY
- REVISED 100-YR FLOODPLAIN BOUNDARY
- REVISED 100-YR FLOODWAY BOUNDARY
- SHADED ZONE X
- ZONE AE — REVISED FLOOD ZONE DESIGNATION
- (6510) — HEC-2 CROSS SECTION
- 2058 — BASE FLOOD ELEVATION
- 8562 — 100-YEAR FLOW(CFS, FLOODPLAIN ONLY)

REVISED: DECEMBER 2002

DUCK CREEK/ BLUE DIAMOND WASHES FRS RESTUDY

DUCK CREEK FROM DENNING STREET TO HOLLYWOOD BLVD.

CROSS SECTION EXHIBIT

SHEET DC-1

1 OF 8 SHTS

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89145
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2222

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 12-23-02
PLOT TIME: 15:28:49

REV.	DATE	DESCRIPTION	DATE	GEN. APP.	DATE	CITY APP.	DATE

F:\550-039\r12202\xsmap\dc-1.dwg mlu.dwg 12-23-02 15:28:49

HYDROLOGIC ANALYSIS MEMORANDUM OF THE LOWER DUCK CREEK DETENTION BASIN

550.042

September 2004

RECD
2004 NOV -9 PM 3:20

Prepared for:

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
600 South Grand Central Parkway, Suite 300
Las Vegas, Nevada 89155
Phone: (702) 455-3139
Fax: (702) 444-3870

Prepared By:

G. C. WALLACE, INC.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2297



G. C. WALLACE, INC.
Engineers/Planners/Surveyors

Purpose and Authorization

The area tributary to the Lower Duck Creek Detention Basin has experienced rapid growth in recent years, and additional developments are planned in the near future. The general development trend of this area is moving toward high density residential. The purpose of this analysis is to evaluate the near future operation of the Lower Duck Creek Detention Basin and to determine downstream impacts based on different outlet scenarios.

The existing Lower Duck Creek Detention Basin is a 1,235 acre-foot, above-grade basin with labyrinth spillway. The outlet consists of five 8-foot wide by 8.15-foot high openings at the bottom of the labyrinth spillway. The multiple outlets are designed to be closed off in the future as required by increased development upstream of the detention basin. Record drawings and site photographs of the Lower Duck Creek Detention Basin are attached.

G. C. Wallace, Inc. (GCW) was authorized by the Clark County Regional Flood Control District (CCRFCD) to perform this analysis under contract, *First Supplemental Agreement for Professional Services for Upper Duck Creek/ Blue Diamond Watershed Master Plan*, dated August 16, 2004.

Assumptions and Procedure

A current, existing condition HEC-1 model was based on the HEC-1 modeling from the *Duck Creek/ Blue Diamond Washes FIS Restudy* (hereafter referred to as the *2002 FIS Restudy).* See the attached drainage basin map, Exhibit A. The following assumptions were incorporated into the HEC-1 modeling and detention basin analysis:

- HEC-1 modeling based from 2002 FIS Restudy.
- High density residential CN values for area east of UPRR and west of I-15.
- Upper Duck Creek Detention Basin is completed and operational.
- Central Duck Creek Detention Basin – Phase 1 is completed and operational.
- Mountain's Edge Master Plan development completed.
- Southern Highlands Master Plan development completed.

The HEC-1 modeling stage/ storage/ discharge parameters for the Lower Duck Creek Detention Basin were referenced from the 2002 MPU and are consistent with the attached record drawings. Note that the proposed Green Park development and flood control facilities were not incorporated into this analysis per direction of CCRFCD.

HEC-1 Modeling Alternatives

A series of HEC-1 models were run for each of the following alternatives, varying the number of openings (8-foot wide by 8.15-foot high) from five (5) openings to one (1) opening. The results from these models were used to evaluate the operation of the Lower Duck Creek Detention Basin and determine an optimum outlet configuration.

- Alternative 1: Muskingum routing with Starr Channel

  The HEC-1 model, A1M5–*.OUT, assumes the runoff from Basins D06, D2B2, and D3A (see attached Exhibit A) is collected into the Central Duck Creek Detention Basin via the Starr Channel (Facilities DCWA 1959 to 1818) and existing berm located east of the UPRR. The Mountain's Edge outflow was routed from the UPRR to I-15 along the Pyle Avenue alignment using a Muskingum routing to model an unimproved reach.

- Alternative 2: Muskingum routing without Starr Channel

  The HEC-1 model, A2M5–*.OUT, assumes the runoff from Basins D06, D2B2, and D3A (see attached Exhibit A) will bypass the Central Duck Creek Detention Basin and combine with runoff from the Mountain's Edge development. The Mountain's Edge outflow was routed from the UPRR to I-15 along the Pyle Avenue alignment using a Muskingum routing to model an unimproved reach. Alternative 2B acts as a storm centering model for Alternative 2. Results are based on a smaller tributary area and DARF.

Summary and Recommendations

The following summary is based on the results of the HEC-1 modeling. See Table 1 for a HEC-1 summary of the area upstream of the Lower Duck Creek Detention Basin. Table 2 summarizes the results of the HEC-1 modeling downstream of the Lower Duck Creek Detention Basin. Table 3 summarizes the detention basin operation using different outlet scenarios. Additional information supporting these conclusions is also attached.

- The HEC-1 model for Alternative 2B generated the worst case peak inflow to the Lower Duck Creek Detention Basin of 7,233 cfs and larger storage volume in every outlet scenario.

- The outfall of the Mountain's Edge development is routed from the UPRR to I-15 along the Pyle Avenue alignment. A Muskingum routing was used to model an unimproved reach (A1M5−5.OUT). A Muskingum-Cunge routing was used to model an improved conveyance facility (5K−5.OUT). The modeling results show a negligible difference between the inflow of the Muskingum routing to the Muskingum-Cunge routing (3,532 cfs vs. 3,502 cfs, or +/-1%). The inflow from the Muskingum routing is slightly larger due to the timing of the inflow hydrographs entering the Lower Duck Creek Detention Basin. Therefore, whether or not the reach from the UPRR to I-15 is improved, it should not adversely impact the operation of the Lower Duck Creek Detention Basin.

- In the 2002 FIS Restudy the outfall from the Lower Duck Creek Detention Basin is 7,500 cfs. Under Alternative 2B, five openings scenario, the outfall will be 4,933 cfs or a 33 percent reduction.

- It is the recommendation of this analysis to close off two out of the five openings of the Lower Duck Creek Detention Basin. Modeling results show that the operation of the detention basin will not be adversely affected, producing a water surface elevation of 2203.5 feet (NAVD 88) vs. the spillway crest of 2204.0 feet (NAVD 88) with a peak outflow of 3,666 cfs. This outlet scenario will reduce the 100-year flows from the current Effective flows downstream of the detention basin. The outflow from the Lower Duck Creek Detention Basin will be reduced by 50 percent, from 7,261 cfs to 3,666 cfs. The 100-year flow for the downstream reach of Duck Creek to Boulder Highway will be reduced approximately 34 percent from 8,562 cfs to 5,690 cfs. The downstream limit of this analysis was set at Boulder Highway, just upstream of confluence with the Pittman Wash. Therefore, no flow reduction is identified downstream of the Pittman Wash confluence. See Alternative 2B, three (3) openings, for the recommended 100-year flows at various downstream locations.

TABLE 1: UPSTREAM HEC-1 SUMMARY OF LOWER DUCK CREEK DETENTION BASIN

LOCATION/ COMB. POINT	ALTERNATIVE 1						ALTERNATIVE 2						ALTERNATIVE 2B					
	AREA (SQ MI)	SDN	DARF	PEAK (CFS)	TIME (HRS)	VOL (AC-FT)	AREA (SQ MI)	SDN	DARF	PEAK (CFS)	TIME (HRS)	VOL (AC-FT)	AREA (SQ MI)	SDN	DARF	PEAK (CFS)	TIME (HRS)	VOL (AC-FT)
CDWD200	58.40	5	0.64	2891	3.92	538	58.4	5	0.64	2891	3.92	538	9.48	4	0.87	5918	3.92	1344
RCDWD200	58.40	5	0.64	2613	4.50	522	73.86	5	0.64	4284	5.75	1098	24.94	5	0.77	5730	5.67	1491
PT14W	61.33	5	0.64	2899	4.50	592	76.79	5	0.64	4576	5.75	1168	27.87	5	0.77	6158	5.67	1595
PT14	87.80	5	0.64	2920	4.50	597	87.8	5	0.64	4577	5.75	1172	38.88	5	0.73	5642	5.67	1455
RDVI153	87.80	5	0.64	1379	4.67	427	87.8	5	0.64	2163	5.83	671	38.88	5	0.73	2890	5.67	821
PT25	117.75	5	0.58	3682	5.58	1238	117.75	5	0.58	4158	5.83	1378	68.83	5	0.64	4920	5.75	1611
RPT25	117.75	5	0.58	3674	5.75	1232	117.75	5	0.58	4147	5.92	1372	68.83	5	0.64	4909	5.83	1605
PT26	119.78	5	0.58	3721	5.67	1294	119.78	5	0.58	4181	5.92	1434	70.86	5	0.64	4951	5.83	1679
RPT26	119.78	5	0.58	3717	5.75	1288	119.78	5	0.58	4172	6.00	1428	70.86	5	0.64	4943	5.83	1673
PT27	94.15	5	0.64	1706	5.17	286	94.15	5	0.64	2282	5.50	567	45.23	5	0.70	2601	5.42	665
RPT27	94.15	5	0.64	1697	5.17	286	94.15	5	0.64	2281	5.50	567	45.23	5	0.70	2598	5.50	665
PT28 (IN)	132.50	5	0.58	4989	5.25	1540	132.50	5	0.58	6135	6.00	1922	83.58	5	0.64	7233	5.92	2285
LDCDB (OUT)	132.50	5	0.58	3532	6.83	435	132.50	5	0.58	4290	7.25	600	83.58	5	0.64	4933	7.25	1947

TABLE 2: DOWNSTREAM HEC-1 SUMMARY OF LOWER DUCK CREEK DETENTION BASIN

ALTERNATIVE 1: BASINS D06, D2B2, AND D3A INTO CENTRAL DUCK CREEK DETENTION BASIN

LOCATION	AREA (SQ MI)	SDN	DARF	NUMBER OF OPENINGS AT OUTLET OF LDCDB						
				5	4	3	2	1	2002 MPU	2002 FIS
LDCDB (OUT)	132.50	5	0.58	3532	3168	2705	2067	1215	725	7261
PT29	133.86	5	0.58	3948	3567	3091	2430	1535	1247	7484
PT39	149.06	5	0.58	5535	5178	4757	4260	3680	4445	8562
PT41	151.47	5	0.53	4922*	4646*	4312*	3915*	3450*	4831	8562
PT45	155.99	5	0.53	5138*	4867*	4548*	4177*	3750	5743	8562
PT48	163.44	5	0.53	5367*	5117*	4827	4501	4138	5826	8562
PT51	164.76	5	0.53	5390*	5142*	4852*	4528	4172	6774	8562

ALTERNATIVE 2: BASINS D06, D2B2, AND D3A BYPASS CENTRAL DUCK CREEK DETENTION BASIN

LOCATION	AREA (SQ MI)	SDN	DARF	NUMBER OF OPENINGS AT OUTLET OF LDCDB						
				5	4	3	2	1	2002 MPU	2002 FIS
LDCDB (OUT)	132.50	5	0.58	4290	3847	3240	2458	1407	725	7261
PT29	133.86	5	0.58	4677	4220	3582	2771	1689	1247	7484
PT39	149.06	5	0.58	5825	5351	4828	4292	3691	4445	8562
PT41	151.47	5	0.53	5200*	4760*	4358*	3941*	3461*	4831	8562
PT45	155.99	5	0.53	5323*	4934*	4587*	4195*	3756	5743	8562
PT48	163.44	5	0.53	5439*	5163*	4852	4512	4142	5826	8562
PT51	164.76	5	0.53	5464*	5188*	4877	4539	4177	6774	8562

* FLOW RATE TAKEN FROM HEC-1 OUTPUT, BASED ON DARF. HIGHER UPSTREAM FLOW CONTROLS.

ALTERNATIVE 2B: STORM CENTERING MODEL

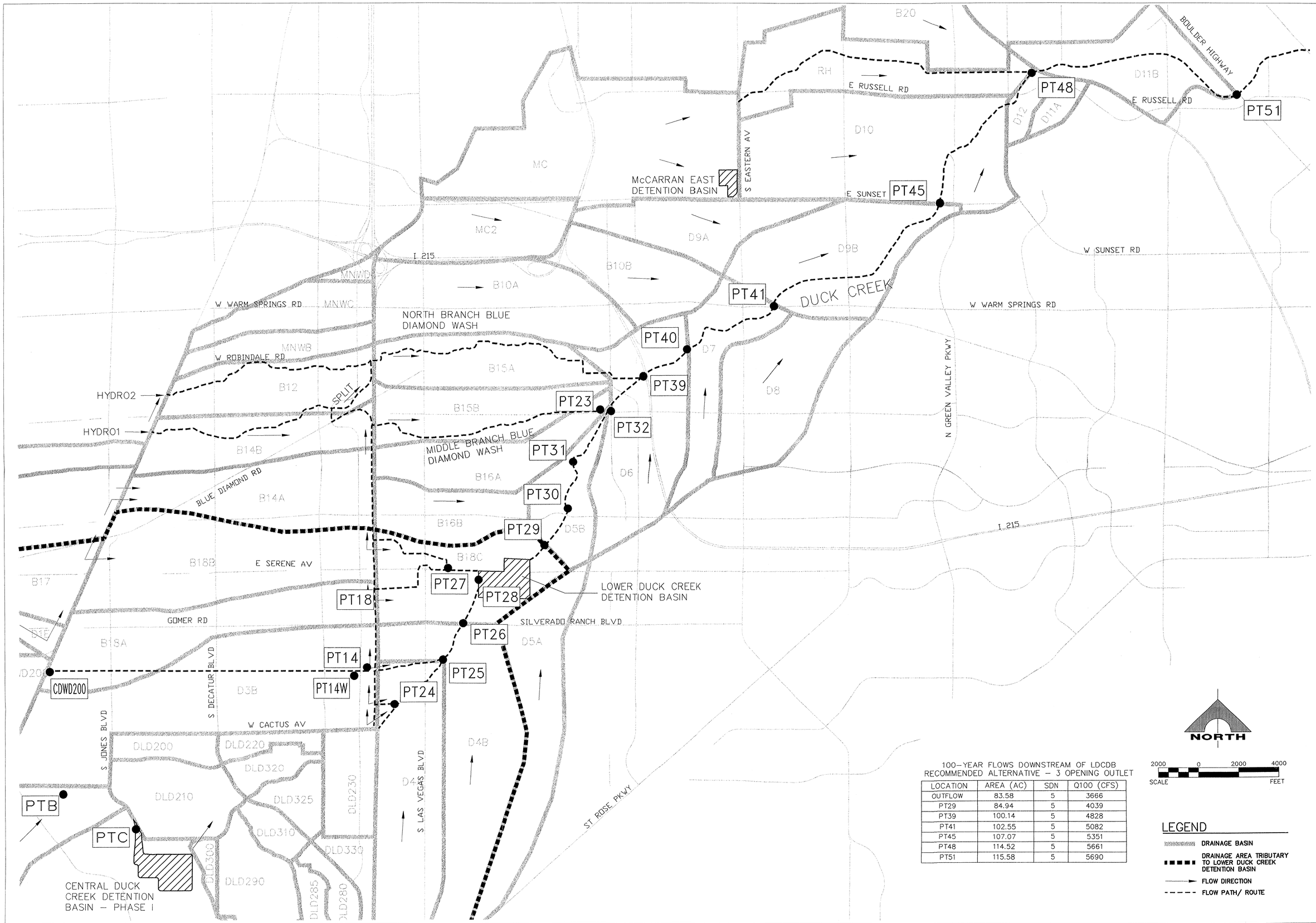
LOCATION/ HEC-1 POINT	ALTERNATIVE 2B							2002 MPU	2002 FIS	SC MODEL 2004 MPA		
	AREA (SQ MI)	SDN	FLOW; # OPENINGS IN LDCDB							AREA (SQ MI)	SDN	FLOW (CFS)
			5	4	3	2	1					
LDCDB (OUT)	83.58	5	4933	4362	3666	2738	1576	725	7261	--	--	--
PT29	84.94	5	5323	4754	4039	3070	1877	1247	7484	--	--	--
PT39	100.14	5	5824	5351	4828	4292	3691	4445	8562	12.39	5	3988
PT41	102.55	5	5924	5528	5082	4573	3989	4831	8562	14.81	5	4759
PT45	107.07	5	6156	5776	5351	4882	4353	5743	8562	19.32	5	5200
PT48	114.52	5	6387	6042	5661	5246	4799	5826	8562	26.78	5	5564
PT51	115.84	5	6416	6069	5690	5279	4839	6774	8562	--	--	--

TABLE 3: LOWER DUCK CREEK DETENTION BASIN

NUMBER OF OPENINGS	ALTERNATIVE 1						
	AREA (SQ MI)	SDN	DARF	OUTFLOW (CFS)	TIME (HRS)	VOL (AC-FT)	STAGE (FT)
5	132.50	5	0.58	3532	6.83	435	2193.3
4	132.50	5	0.58	3168	7.00	524	2194.9
3	132.50	5	0.58	2705	7.25	638	2196.7
2	132.50	5	0.58	2067	7.75	800	2199.3
1	132.50	5	0.58	1215	8.83	1058	2203.3

NUMBER OF OPENINGS	ALTERNATIVE 2						
	AREA (SQ MI)	SDN	DARF	OUTFLOW (CFS)	TIME (HRS)	VOL (AC-FT)	STAGE (FT)
5	132.50	5	0.58	4290	7.25	600	2196.0
4	132.50	5	0.58	3847	7.42	714	2197.9
3	132.50	5	0.58	3240	7.75	869	2200.3
2	132.50	5	0.58	2458	8.17	1084	2203.7
1	132.50	5	0.58	1407	8.83	1394	2208.3

NUMBER OF OPENINGS	ALTERNATIVE 2B						
	AREA (SQ MI)	SDN	DARF	OUTFLOW (CFS)	TIME (HRS)	VOL (AC-FT)	STAGE (FT)
5	83.58	5	0.64	4433	7.25	743	2198.3
4	83.58	5	0.64	4362	7.50	885	2200.5
3	83.58	5	0.64	3666	7.75	1071	2203.5
2	83.58	5	0.64	2738	8.25	1328	2207.3
1	83.58	5	0.64	1576	8.92	1688	2212.8



100-YEAR FLOWS DOWNSTREAM OF LDCDB
RECOMMENDED ALTERNATIVE – 3 OPENING OUTLET

LOCATION	AREA (AC)	SDN	Q100 (CFS)
OUTFLOW	83.58	5	3666
PT29	84.94	5	4039
PT39	100.14	5	4828
PT41	102.55	5	5082
PT45	107.07	5	5351
PT48	114.52	5	5661
PT51	115.58	5	5690

NORTH

2000 0 2000 4000
SCALE FEET

LEGEND

- DRAINAGE BASIN
- DRAINAGE AREA TRIBUTARY TO LOWER DUCK CREEK DETENTION BASIN
- FLOW DIRECTION
- FLOW PATH/ ROUTE

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 11-04-04
PLOT TIME: 10:58:22

REV	DATE	DESCRIPTION	DATE	AGEN. APP	DATE	CCW. APP	DATE

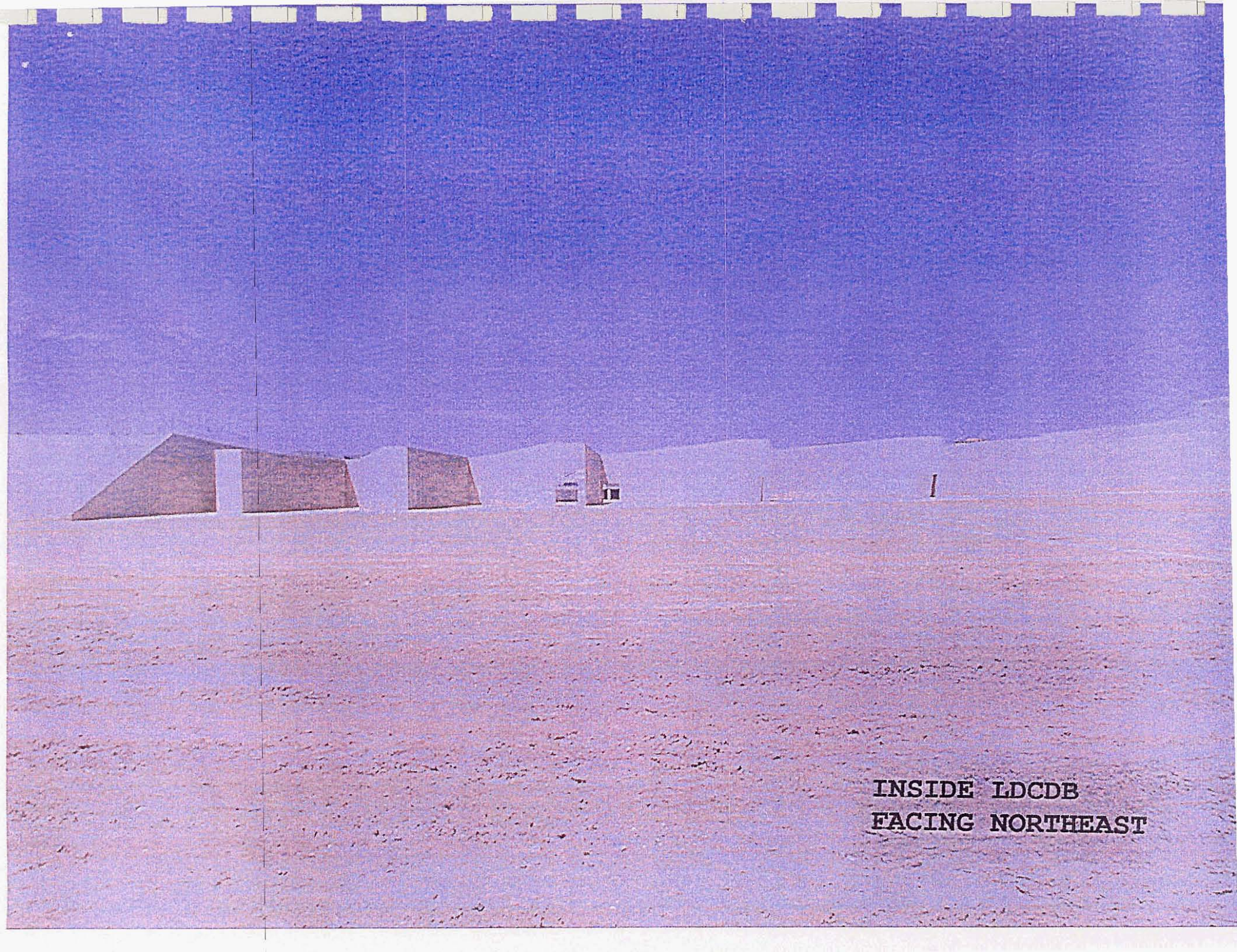
G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
F:\550-042\lowerduck\EXHIBIT2.dwg
mlusdwg

LOWER DUCK CREEK DETENTION BASIN ANALYSIS

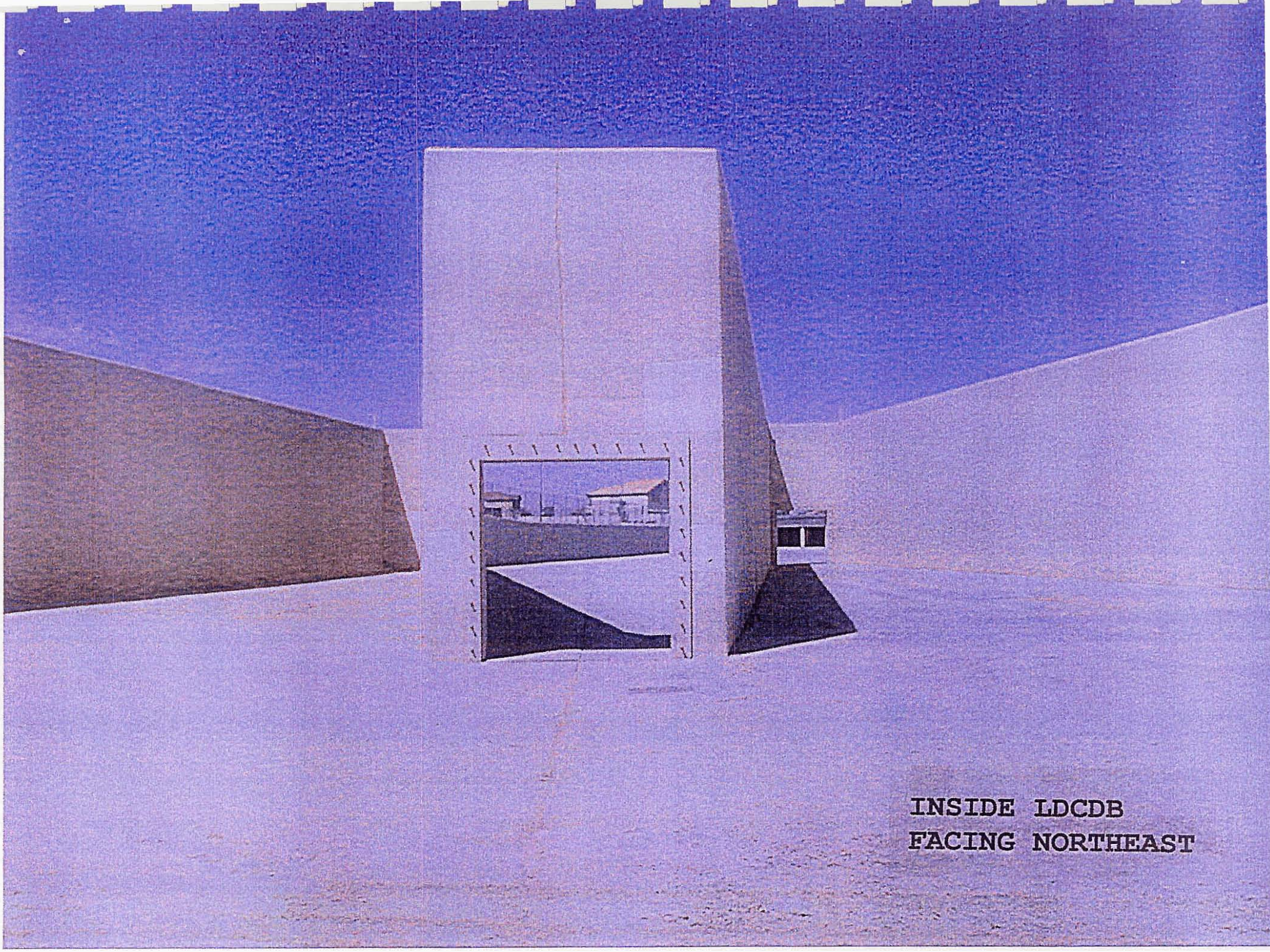
EXHIBIT A

DRAINAGE BASIN EXHIBIT

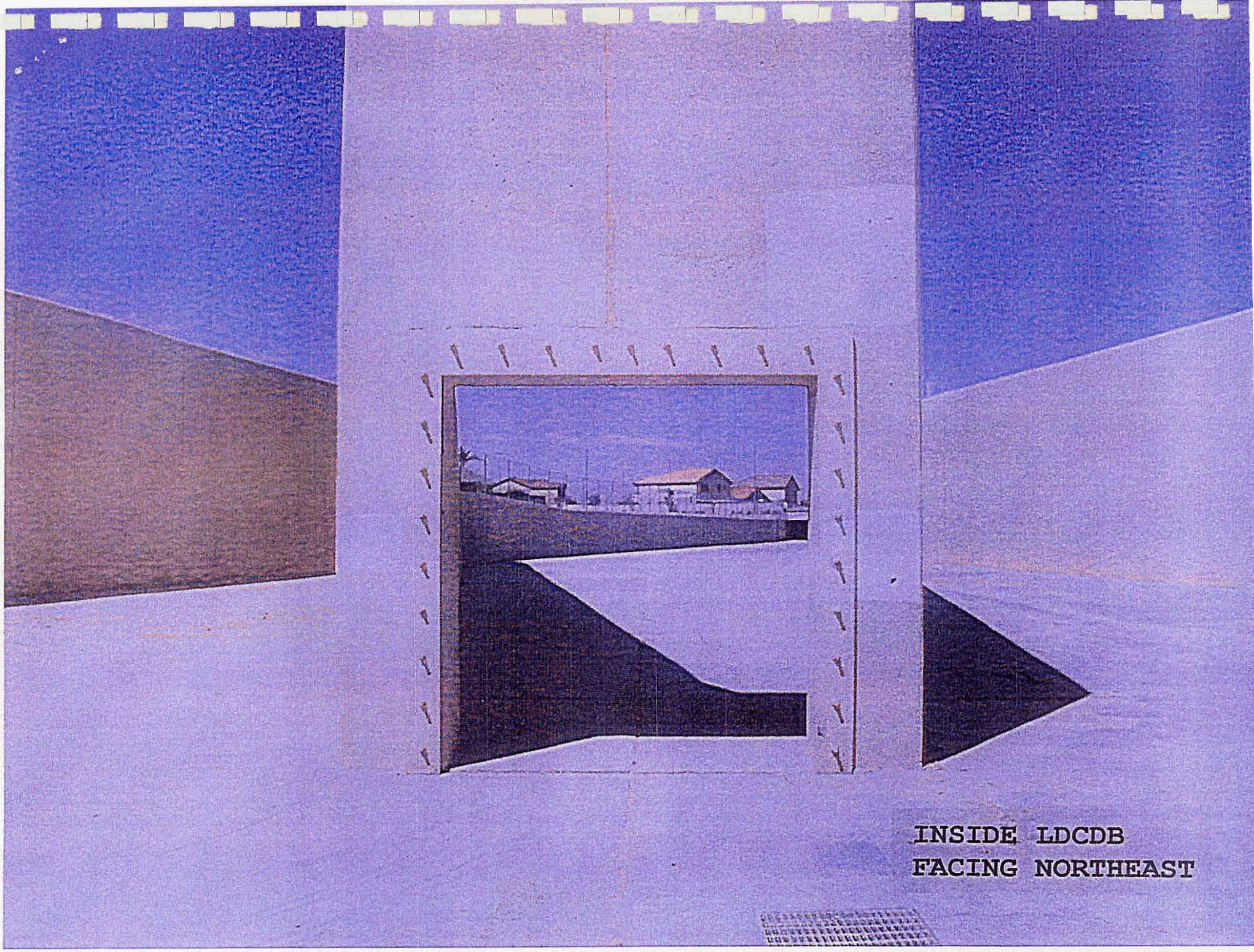
SHEET
EX. A
SHT OF SHTS



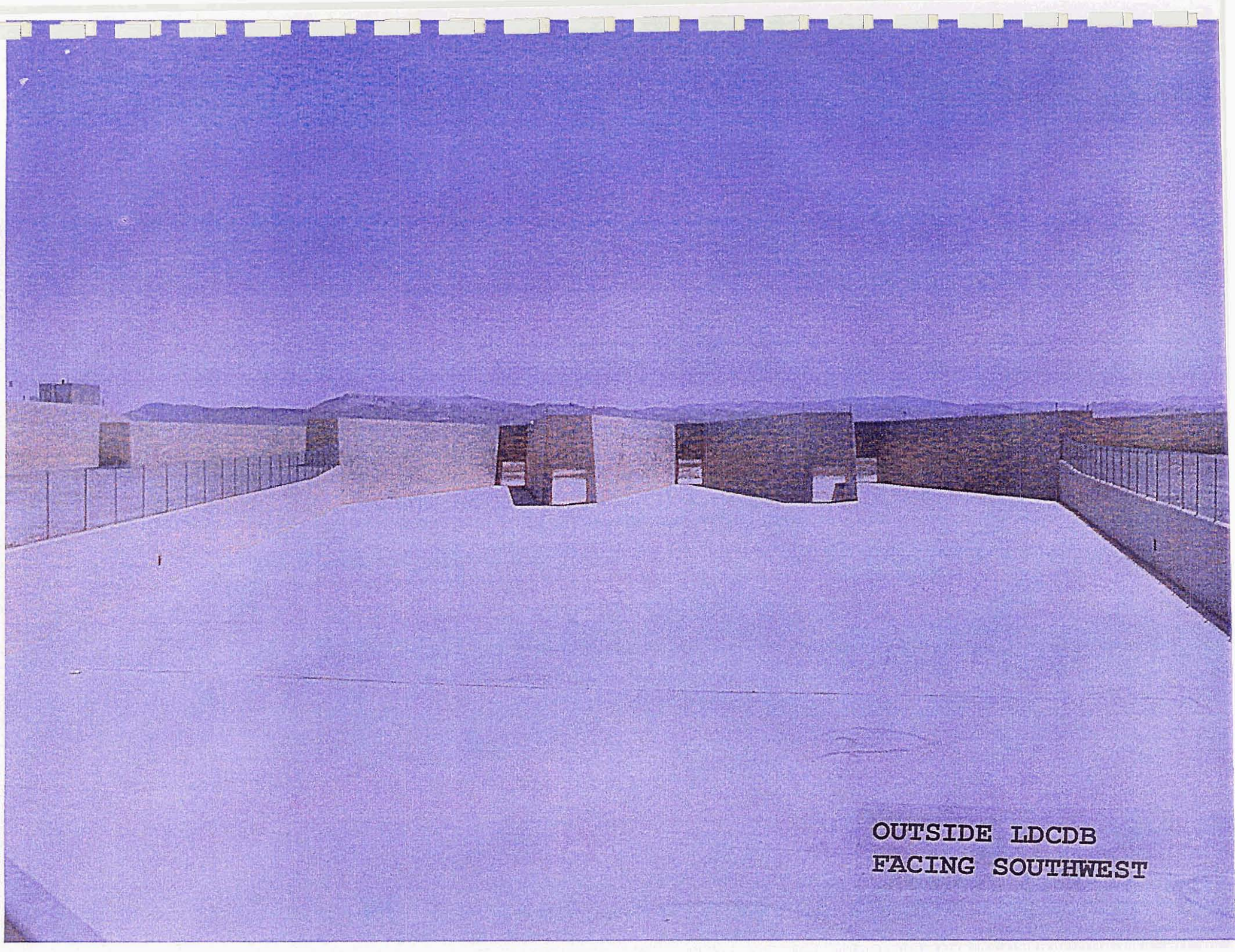
INSIDE LDCDB
FACING NORTHEAST



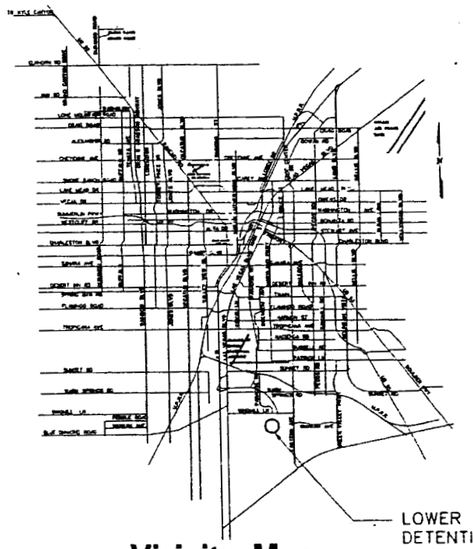
INSIDE LDCDB
FACING NORTHEAST



INSIDE LDCDB
FACING NORTHEAST


OUTSIDE LDCDB
FACING SOUTHWEST

DEPARTMENT OF PUBLIC WORKS



Vicinity Map
NOT TO SCALE

CLARK COUNTY NEVADA

"Progress as Promised"

County Manager
Dale W. Askew

Director of Public Works
Approved:
M.J. Manning R.P.E. 7299

Clark County Regional Flood Control District
General Manager / Chief Engineer
Approved:
GALE WM. FRASER II, PE

Clark County Regional Transportation Commission
Director
Approved:
KURT WEINRICH, PE 3/1/99

County Commissioners

Bruce L. Woodbury, Chair
Erin Kenny, Vice Chair
Yvonne Atkinson Gates
Dario Herrera
Mary J. Kincaid
Lance M. Malone
Myrna Williams

1999

IMPROVEMENT PLANS FOR

LOWER DUCK CREEK DETENTION BASIN

FUNDED BY
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
CLARK COUNTY REGIONAL TRANSPORTATION COMMISSION

RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

DESIGNED BY: **MONTGOMERY WATSON**
Las Vegas, Nevada

MONTGOMERY WATSON
3014 WEST CHARLESTON BLVD
LAS VEGAS, NV 89102
(702) 878-8010

ISSUED FOR CONSTRUCTION

2/12/99

AGENCY	PLANS REVIEWED BY	DATE
SPRINT		1-28-99
LAS VEGAS VALLEY WATER DISTRICT		4-19-99
SOUTHWEST GAS COMPANY		1-28-99
NEVADA POWER COMPANY		1-28-99
CLARK COUNTY SANITATION DISTRICT		9-22-98
COX COMMUNICATIONS LAS VEGAS, INC.		1/28/99
CLARK COUNTY FIRE DEPARTMENT		2-24-99

DEPARTMENT OF PUBLIC WORKS	BY	DATE
DEPUTY DIRECTOR		4-20-99
COMMUNITY DEVELOPMENT DIVISION		4/20/99
CONSTRUCTION MANAGEMENT DIVISION		4/20/99
DESIGN ENGINEERING DIVISION		4-20-99
MAINTENANCE MANAGEMENT DIVISION		4-20-99
TRAFFIC MANAGEMENT DIVISION		4-20-99
COUNTY SURVEYOR'S OFFICE		4-20-99

REVISIONS NUMBER	DESCRIPTION	DATE

L–1592

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5. HORIZONTAL CONTROL PLAN #2
6. CAPACITY CURVE AND HYDROLOGIC INFORMATION
7. GEOTECHNICAL EXPLORATION - LOCATIONS PLAN VIEW
8. GEOTECHNICAL EXPLORATION PROFILE #1
9. GEOTECHNICAL EXPLORATION PROFILE #2
10. GEOTECHNICAL EXPLORATION PROFILE #2 (CONTINUED)
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12. DETENTION BASIN GRADING PLAN - SOUTH
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14R. LOW LEVEL OUTLET PLAN & PROFILE
15. EMBANKMENT CENTERLINE PROFILE
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17. PLAN VIEW CROSS-SECTION CONTROL
18. DETENTION BASIN TYPICAL CROSS-SECTION
19. CROSS-SECTIONS STA. 13+00 TO STA. 15+00
20. CROSS-SECTIONS STA. 16+00 TO STA. 18+00
21. CROSS-SECTIONS STA. 19+00 TO STA. 21+00
22. CROSS-SECTIONS STA. 22+00 TO STA. 23+00
23. CROSS-SECTIONS STA. 24+00 TO STA. 26+00
24. CROSS-SECTIONS STA. 27+00 TO STA. 29+00
25. CROSS-SECTIONS STA. 30+00 TO STA. 31+00
26. CROSS-SECTIONS STA. 32+00 TO STA. 33+00
27. CROSS-SECTIONS STA. 41+00 TO STA. 50+00
28. CROSS-SECTIONS STA. 51+00 TO STA. 58+00
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32. 24" GAS LINE PLAN & PROFILE
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35. STRUCTURAL STANDARD DETAILS # 1
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37R. TYPICAL CHANNEL SECTIONS
38R. LABYRINTH SPILLWAY - PLAN
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41R. LABYRINTH SPILLWAY - UPSTREAM SECTIONS AND DETAILS
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57R. NUISANCE FLOW NORTHERN STORM DRAIN - PL. & PRO. STA. 10+00 TO 21+00
58R. NUISANCE FLOW NORTHERN STORM DRAIN - PL. & PRO. STA. 21+00 TO 28+00
59R. NUISANCE FLOW NORTHERN STORM DRAIN - PL. & PRO. STA. 28+00 TO 37+28.67
60. NUISANCE FLOW SOUTHERN STORM DRAIN - PL. & PRO. STA. 10+00 TO 17+00
61. NUISANCE FLOW SOUTHERN STORM DRAIN - PL. & PRO. STA. 17+00 TO 26+00
62R. NUISANCE FLOW SOUTHERN STORM DRAIN - PL. & PRO. STA. 26+00 TO 33+32.94

GENERAL NOTES

1 ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE UNIFORM STANDARD DRAWINGS AND "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" CLARK COUNTY AREA, NEVADA LATEST EDITION AND DEPARTMENT OF PUBLIC WORKS CLARK COUNTY, NEVADA, "IMPROVEMENT STANDARDS 1983, REVISED MAY 1990," UNLESS OTHERWISE SPECIFIED BY NOTE ON THE PLANS AND/OR SPECIAL PROVISIONS. THE IMPROVEMENT STANDARDS WILL HEREINAFTER BE REFERRED TO AS "CLARK COUNTY STANDARD DRAWINGS".

2 TRAFFIC SIGNAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA VOLUME II" LATEST EDITION.

3 WHENEVER ANY ITEM OF WORK IS SPECIFIED FOR CONSTRUCTION IN ACCORDANCE WITH "UNIFORM STANDARD DRAWINGS" IT WILL BE A REFERENCE TO THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS' CONSTRUCTION OFFSITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA 1983".

4 ALL UTILITIES SHOWN ARE BELIEVED TO BE ACCURATELY LOCATED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UTILITIES LIKELY TO BE AFFECTED. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND DEPTH OF SUSPECTED UTILITY INTERFERENCES, AND SHALL FURNISH INFORMATION ON THE SAME TO THE ENGINEER, NOT LESS THAN TEN (10) DAYS PRIOR TO THE ANTICIPATED IMPACT OF THESE SUSPECTED INTERFERENCES ON HIS WORK. IF CONFLICTS EXIST, THE CONTRACTOR WILL IMMEDIATELY CONTACT THE ENGINEER AND PROVIDE THE ENGINEER WITH ALL THE NECESSARY DATA SUCH AS ELEVATIONS, HORIZONTAL LOCATIONS, ETC., AND PROVIDE THE ENGINEER WITH SKETCHES INDICATING THE PROPOSED IMPROVEMENT AND THE UTILITY CONFLICT. THE ENGINEER WILL EXAMINE AND REVIEW ALL THE DATA AND SKETCHES PROVIDED, AND WILL PROVIDE THE CONTRACTOR WITH AN ALTERNATIVE DESIGN WITHIN FIVE (5) DAYS AFTER RECEIPT OF DATA AND SKETCHES.

5 CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO BEGINNING CONSTRUCTION.

6 THE SOUTHWEST GAS COMPANY SHALL BE RESPONSIBLE FOR THE REMOVAL, RELOCATION OR ADJUSTMENT OF ALL GAS LINES AND APPURTENANCES THAT INTERFERE WITH THE REQUIRED IMPROVEMENTS AS SHOWN ON THE PLANS.

7 THE SPRINT CENTRAL TELEPHONE COMPANY SHALL BE RESPONSIBLE FOR THE ADJUSTMENT OF TELEPHONE MANHOLES AND RELOCATIONS OF TELEPHONE POLES AND UNDERGROUND TELEPHONE LINES THAT INTERFERE WITH THE REQUIRED IMPROVEMENTS AS SHOWN ON THE PLANS.

8 THE NEVADA POWER COMPANY SHALL BE RESPONSIBLE FOR THE RELOCATION OF UNDERGROUND OR OVERHEAD POWER LINES THAT INTERFERE WITH THE REQUIRED IMPROVEMENTS AS SHOWN ON THE PLANS.

9 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF ALL LAS VEGAS VALLEY WATER DISTRICT FACILITIES AND CLARK COUNTY SANITATION DISTRICT MANHOLES AS INDICATED ON THE PLANS OR IN THE SPECIAL PROVISIONS UNLESS OTHERWISE INDICATED.

10 THE CONTRACTOR SHALL NOT REMOVE TREES, SHRUBS, LAWNS, WALL, FENCES, SIGNS, STRUCTURES, LIGHTS OR ANY OTHER IMPROVEMENTS OUTSIDE THE RIGHT-OF-WAY EXCEPT WHERE REQUIRED TO DO SO BY THE CONTRACT DRAWINGS OR AS DIRECTED BY THE ENGINEER.

11 EXACT LOCATIONS OF ALL SAWCUT LINES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. THOSE SAWCUTS THAT ARE LONGITUDINAL TO THE ROADWAY MAY BE WHEEL CUT WITH EQUIPMENT AS APPROVED BY THE ENGINEER. ALL OTHER SAWCUTS SHALL BE MADE BY A ROTARY SAW.

12 IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL, OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING REQUIRED TO REMAIN, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE COUNTY TRAFFIC MANAGER.

13 CONTRACTOR MUST CONTACT CLARK COUNTY TRAFFIC MANAGEMENT DIVISION OPERATIONS UNIT AT (702) 455-7511 FOR LOCATIONS OF STREET LIGHTING, TRAFFIC SIGNALS, LAS VEGAS AREA COMPUTER TRAFFIC SYSTEM (LVACTS) INTERCONNECT CABLE AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO WORKING IN THE AREA. CLARK COUNTY IS NOT A MEMBER OF CALL BEFORE YOU DIG (UNDERGROUND SERVICE ALERT) AND A CALL TO THAT ORGANIZATION DOES NOT RELIEVE THE CONTRACTOR OF LIABILITY FOR CLARK COUNTY FACILITIES.

BASIS OF BEARING

S 00°29'11"W BEING THE EAST LINE OF THE NE 1/4 OF THE SE1/4 OF SECTION 21, T. 22 S., R. 61 E., M.D.M., AS RECORDED IN FILE 74 PAGE 05 OF SURVEYS

BENCHMARKS

BENCHMARK NO. OC31 4E4 DESCRIBED AS:
N.D.O.T. BRASS CAP HIGHWAY MARKER, STAMPED 68+78.21 POT 12-20-56, NORTH SIDE OF LAKE MEAD DR. NEAR MILE MARKER 1.50, 250 FT. WEST OF BERMUDA RD.
EL 2376.24 (NAVD-88)
EL 724.279 (METRIC) (2)

CLARK COUNTY FIRE DEPARTMENT — 8-16-99 DATE
*Fire Flow N/A

LVVWD — 8-17-99 DATE
1st Approval 4-19-99

Call before you Overhead 1-702-643-6111

Call before you Dig. 1-800-227-2600

LOWER DUCK CREEK DETENTION BASIN

LVVWD STANDARD NOTES

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN RELEASED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, 48 HOUR NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) PRIOR TO THE START OF CONSTRUCTION. NOTICE MUST BE GIVEN BY 2:00 PM THE BUSINESS DAY PRIOR TO A LVVWD INSPECTION.
2. ALL WORK SHALL CONFORM TO "UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS, 1ST EDITION, 1995" (LVVWD STANDARDS AND SPECIFICATIONS).
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2, SHALL BE DONE IN ACCORDANCE WITH THE MOST CURRENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. THE FOLLOWING REQUIREMENTS MUST BE MET IN THE EVENT A WATER LINE AND SANITARY OR STORM SEWER LINE CROSS:

   A MINIMUM EIGHTEEN (18) INCH VERTICAL SEPARATION (OUTSIDE TO OUTSIDE) MUST BE MAINTAINED WHEN THE WATER LINE IS INSTALLED OVER THE SANITARY OR STORM SEWER LINE. IF THE VERTICAL SEPARATION CANNOT BE MAINTAINED OR THE WATER LINE MUST BE PLACED UNDER THE SANITARY OR STORM SEWER LINE, THE SANITARY OR STORM SEWER LINE MUST BE CONSTRUCTED WITH ONE OF THE FOLLOWING OR, AS SHOWN ON THESE PLANS:

   A. POTABLE WATER SUPPLY QUALITY MATERIAL,
   B. ENCASEMENT, WITH FOUR (4) INCH CONCRETE (MINIMUM),
   C. SLEEVING WITH POTABLE WATER SUPPLY QUALITY PIPE.

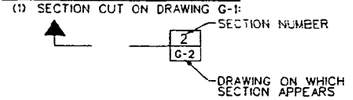
   EACH PROVISION MUST EXTEND ALONG THE SANITARY OR STORM SEWER, ON EITHER SIDE OF THE MAIN, A MINIMUM 10 FOOT DISTANCE PERPENDICULAR TO THE WATER MAIN EXTERIOR.
9. WARNING TAPE SHALL BE REQUIRED OVER ALL MAINS, ALL SIX (6) INCH DIAMETER AND LARGER SERVICE LATERALS, AND ANY SERVICE LATERAL NOT INSTALLED PERPENDICULAR TO THE MAIN IN ACCORDANCE WITH STANDARD PLATE NO. 27.
10. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD'S DISTRIBUTION SYSTEM.
11. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 FORTY-EIGHT (48) HOURS PRIOR TO PICKUP.
12. CONSTRUCTION MAY INTERRUPT SERVICE, WITH LVVWD APPROVAL AND PROPER NOTIFICATION, BETWEEN THE HOURS OF 10 PM AND 6 AM, SUNDAY THROUGH THURSDAY. CIRCUMSTANCES MAY REQUIRE TEMPORARY SERVICE FEEDS BE INSTALLED, WITHOUT LVVWD REIMBURSEMENT. ANY TEMPORARY SERVICE FEED MUST HAVE PRIOR LVVWD APPROVAL.
13. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD'S PRE-APPROVED MATERIALS AND MANUFACTURERS LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
14. ADJUST VALVE BOX TO FINISHED GRADE. VALVE SHALL BE ACCESSIBLE AT ALL TIMES.

DETAIL IDENTIFICATION IN NOTES

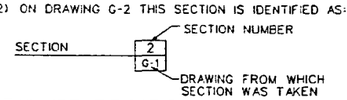
DETAIL LETTER — D/32 — DRAWING ON WHICH DETAIL APPEARS

SECTION IDENTIFICATION

(1) SECTION CUT ON DRAWING G-1:

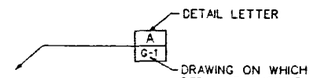


(2) ON DRAWING G-2 THIS SECTION IS IDENTIFIED AS:

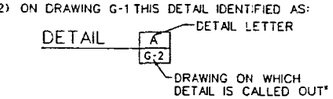


DETAIL IDENTIFICATION IN CALL-OUTS

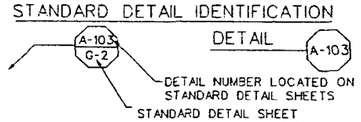
(1) DETAIL CALL-OUT ON DRAWING G-2 AS:



(2) ON DRAWING G-1 THIS DETAIL IDENTIFIED AS:



STANDARD DETAIL IDENTIFICATION



NOTE:
IF PLAN AND SECTION (OR DETAIL CALL-OUT AND DETAIL) ARE SHOWN ON SAME DRAWING, DRAWING NUMBER IS REPLACED BY A LINE.

ABBREVIATIONS

ACP	ASBESTOS CEMENT PIPE
AGG	AGGREGATE
BC	BACK OF CURB
CC	CLARK COUNTY
C&G	CURB AND GUTTER
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
COMM DWY	COMMERCIAL DRIVEWAY
CONC	CONCRETE
CONST	CONSTRUCTION OR CONSTRUCT
DI	DROP INLET
DIA	DIAMETER
DIAG	DIAGONAL
DWG	DRAWING
DWY	DRIVEWAY
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EXIST	EXISTING
FG	FINISHED GRADE
FL	FLOW LINE
G	NATURAL GAS
GB	GRADE BREAK
HPS	HIGH PRESSURE SODIUM
INV	INVERT
LF	LINEAR FEET
LVVWD	LAS VEGAS VALLEY WATER DISTRICT
LT	LEFT
MAT'L	MATERIAL
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
NTS	NOT TO SCALE
OC	ON CENTER
PVMT	PAVEMENT
PBS	PLANTMIX BITUMINOUS SURFACE
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PT	POINT OF TANGENCY
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
ROFC	RATE OF FLOW CONTROL
RP	RADIUS POINT
RT	RIGHT
R/W	RIGHT OF WAY
SD	STORM DRAIN
SPEC'S	PROJECT SPECIFICATIONS
STD	STANDARD
SW	SIDEWALK
TC	TOP OF CURB
T.O.W.	TOP OF WALL
TRANS	TRANSITION
(TYP)	TYPICAL
USD	UNIFORM STANDARD DRAWING
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VG	VALLEY GUTTER
VPI	VERTICAL POINT OF INTERSECTION
VPC	VERTICAL POINT OF CURVE
VPT	VERTICAL POINT OF TANGENCY

RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

LEGEND

- A (1) (1) REMOVAL ITEM, CONSTRUCTION ITEM, TRAFFIC ITEM
- (1) / (1) EXISTING/PROPOSED CONDUIT RUN NUMBER
- SDW — CENTERLINE W/STATION
- RIGHT-OF-WAY LINE
- PROPERTY LINE
- PROPOSED 100 W HPS STREETLIGHT
- PROPOSED 250 W HPS STREETLIGHT
- EXISTING/PROPOSED/FUTURE DROP INLET
- EXISTING/PROPOSED CURB & GUTTER
- SEWER / SEWER EXISTING/PROPOSED UNDERGROUND UTILITY
- EXISTING/PROPOSED/ADJUST MANHOLE
- EXISTING/PROPOSED/ADJUST PULLBOX
- EXISTING/PROPOSED/ADJUST WATER OR GAS VALVE
- EXISTING/PROPOSED EDGE OF PAVEMENT
- EXISTING/PROPOSED DRIVEWAY
- EXISTING BLOCKWALL/FENCE
- 992.321/99.32 EXISTING/PROPOSED ELEVATION
- (3) CURVE DATA NOTATION
- EXISTING TELEPHONE AND/OR POWER POLE
- EXISTING/PROPOSED FIRE HYDRANT
- EXISTING/PROPOSED SERVICE PEDESTAL
- PAVEMENT TRANSITION
- EXISTING MAILBOX
- BENCHMARK
- POTHOLE NUMBER
- EXISTING/ADJUST WATER METER
- SAWCUT LINE
- EXISTING/PROPOSED 1-1/4" PVC STREETLIGHT CONDUIT
- EXISTING/PROPOSED CONTROLLER CABINET
- EXISTING/PROPOSED SIDEWALK RAMP
- TOP OF SLOPE
- FILL SLOPE
- CUT SLOPE
- DAYLIGHT LINE

ISSUED FOR CONSTRUCTION

REV No	DATE	DESCRIPTION	APPROVED
1	6/3/99	PER CONSTRUCTION SET REVISIONS	

MONTGOMERY WATSON
Las Vegas, Nevada
MONTGOMERY WATSON
3014 WEST CHARLESTON BLVD
LAS VEGAS, NV 89102
(702) 878-8010

LOWER DUCK CREEK DETENTION BASIN

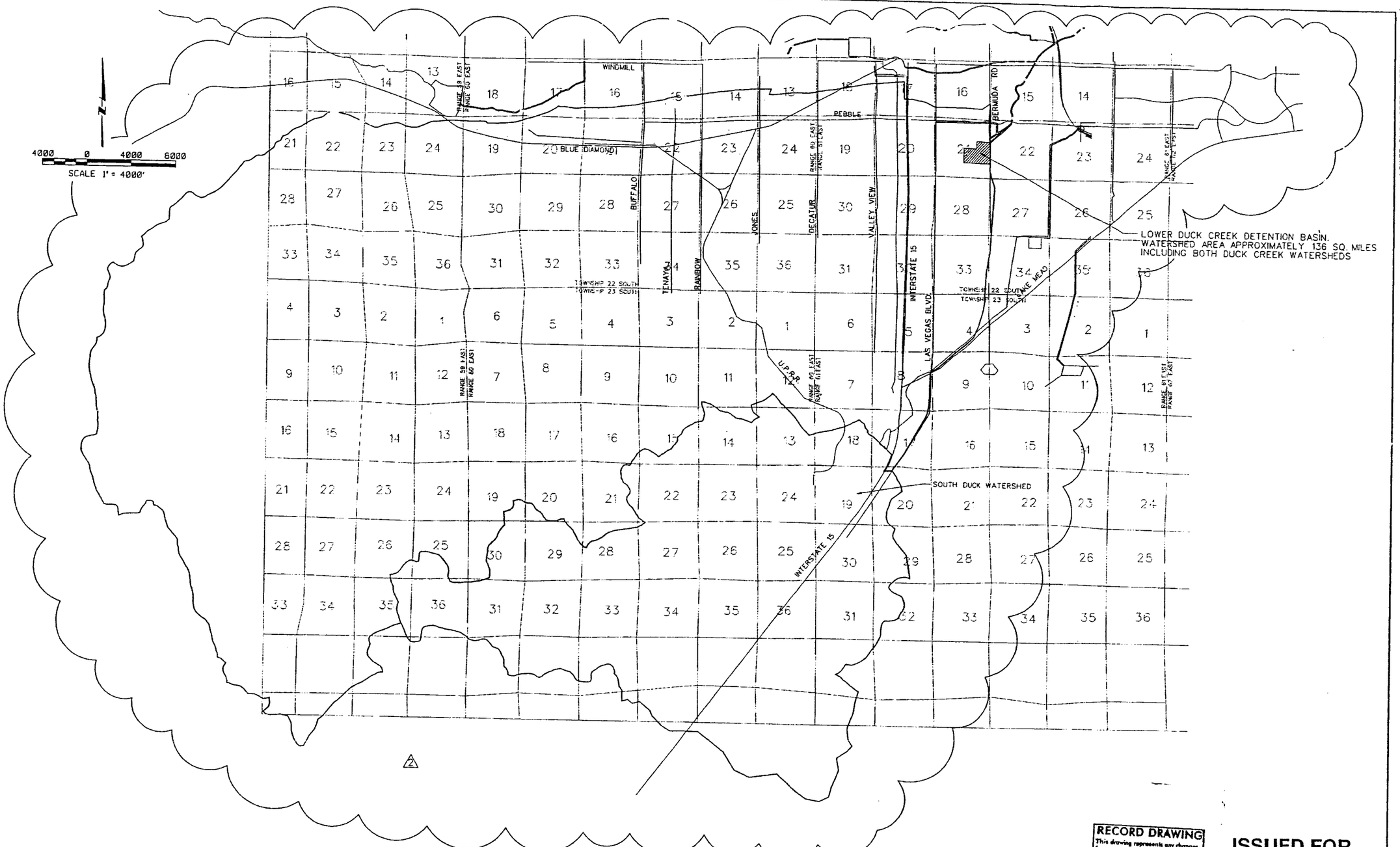
BENCHMARK, GENERAL & CONSTRUCTION NOTES
BASIS OF BEARING, LEGEND & ABBREVIATIONS
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

JANELL COOK — CIVIL — No. 10106 — STATE OF NEVADA — PROFESSIONAL ENGINEER — 8/16/99

DESIGNED BY:	LMO
DRAWN BY:	PGK
CHECKED BY:	JPC
DATE:	JUNE 4, 1999

SCALE:	
HORIZ:	N/A
VERT:	N/A
SHEET No	2
	L-1592

13-AUG-1999 11:37
g:\corp\duckcrk\planshts\002 planshts\construction\sh02cs.dgn



LOWER DUCK CREEK DETENTION BASIN

RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

ISSUED FOR CONSTRUCTION

REV No	DATE	DESCRIPTION	APPROVED
2	6/3/99	PER CONSTRUCTION SET REVISIONS	

MONTGOMERY WATSON
Las Vegas, Nevada

MONTGOMERY WATSON
3014 WEST CHARLESTON BLVD
LAS VEGAS, NV 89102
(702) 878-8010

LOWER DUCK CREEK DETENTION BASIN

WATERSHED BOUNDARY MAP

CLARK COUNTY, NEVADA. DEPARTMENT OF PUBLIC WORKS

JANELL COOK CIVIL No. 10106 — 8/17/99

DESIGNED BY: LMO
DRAWN BY: JGJ
CHECKED BY: JPC
DATE: JUNE 4, 1999

SCALE:
HORIZ: 1" = 4000'
VERT: N/A

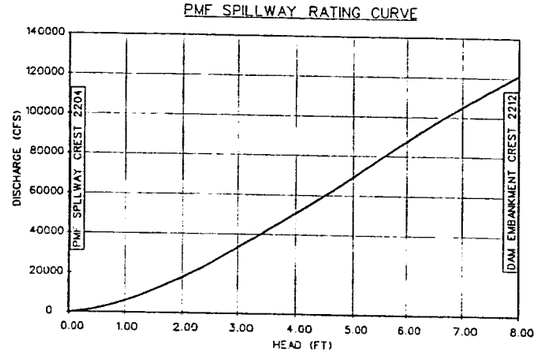
SHEET No 3

L-1592

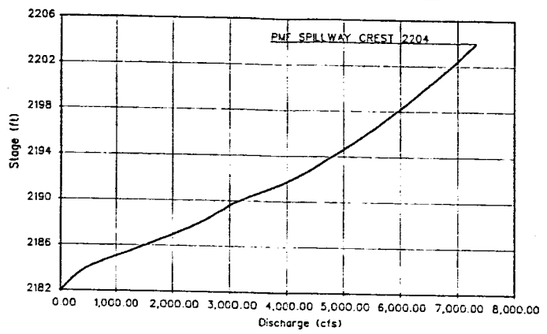
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LOWER DUCK CREEK DETENTION BASIN

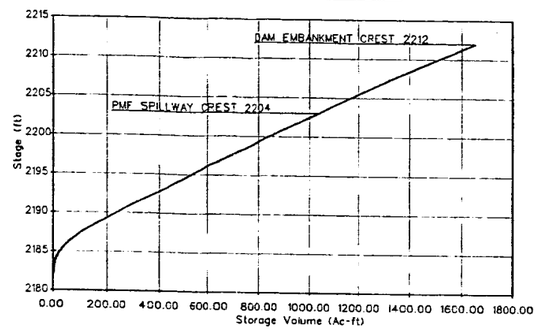
PMF SPILLWAY RATING CURVE



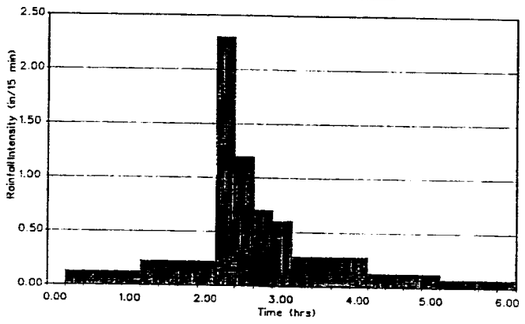
FIS LOW LEVEL OUTLET RATING CURVE



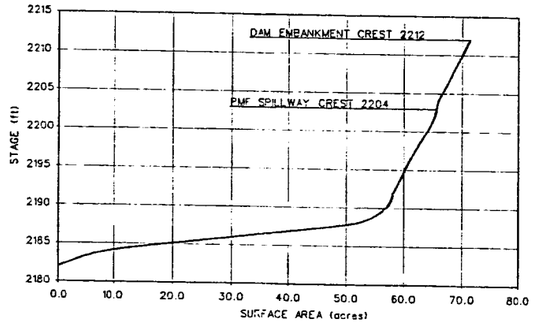
STAGE-STORAGE CAPACITY



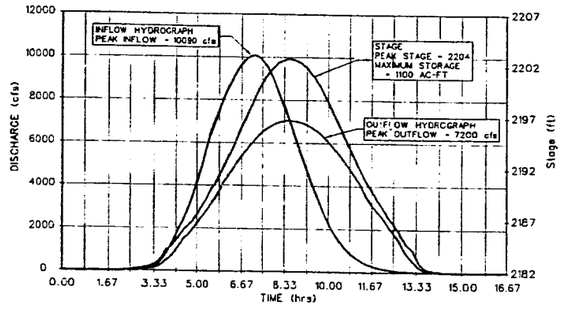
PMP RAINFALL - 6 HOUR STORM



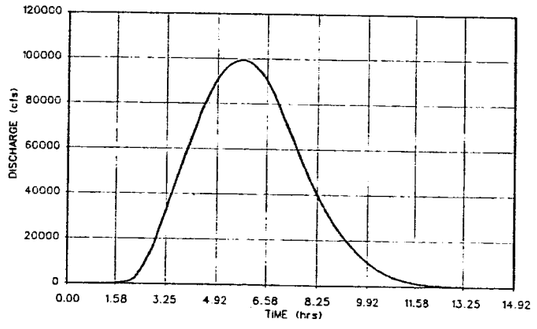
STAGE VS SURFACE AREA



LOWER DUCK CREEK DETENTION BASIN



PMF INFLOW HYDROGRAPH



PMF SPILLWAY DATA

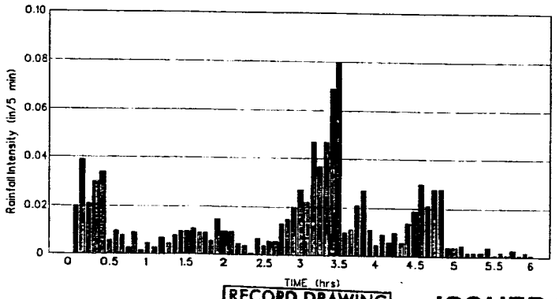
TYPE	7 CYCLE LABYRINTH
DESIGN HEAD (H)	7 FT
DESIGN DISCHARGE AT DESIGN HEAD	103,000 cfs
EFFECTIVE CREST LENGTH	2186 FT
TOTAL CREST LENGTH	2208 FT
ALPHA FOR SPILLWAY	8°
DESIGN DISCHARGE COEFICENT	VARIES WITH HEAD
SPILLWAY APPROACH DEPTH (P)	22 FT
DESIGN H/P RATIO	0.32

LOW LEVEL OUTLET DATA

	DESIGN	MPU
TYPE	(5) 8.0 x 9.4 RECTANGULAR ORIFICE	(1) 54" DIA. ORIFICE
DESIGN HEAD (H)	7.8 FT TO CENTER	17.0 FT TO CENTER
DESIGN DISCHARGE AT DESIGN HEAD	7332 cfs	340 cfs
DESIGN DISCHARGE COEFICENT	0.65	0.65

NOTE:
AS UPSTREAM MASTER PLAN FACILITIES ARE CONSTRUCTED, THE PEAK DISCHARGE AND VOLUME AT THE LOWER DUCK CREEK DETENTION BASIN WILL BE REDUCED. TO MAXIMIZE THE STORAGE VOLUME AVAILABLE, THE DESIGN DISCHARGE FROM THE BASIN CAN BE REDUCED BY PLACING PLATES OVER ORIFICES. 2

DESIGN RAINFALL DISTRIBUTION - 6 HOUR STORM



RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

ISSUED FOR CONSTRUCTION

REV No	DATE	DESCRIPTION	APPROVED
2	6/3/99	PER CONSTRUCTION SET REVISIONS	

MONTGOMERY WATSON
Las Vegas, Nevada

MONTGOMERY WATSON
3014 WEST CHARLESTON BLVD
LAS VEGAS, NV. 89102
(702) 878-8010

LOWER DUCK CREEK DETENTION BASIN

CAPACITY CURVE AND HYDROLOGIC INFORMATION

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER — JANELL COOK — CIVIL — No. 10106 — STATE OF NEVADA

DESIGNED BY:	JGJ
DRAWN BY:	RGK
CHECKED BY:	JPC
DATE:	JUNE 4, 1999

SCALE:
HORIZ: N/A
VERT: N/A

SHEET No 6

L-1592

13-AUG-1999 13:42 g:\ccpw\duckcrk\planshts\100yr planshets\construction\sht06ca.dgn

SCALE: 1" = 100'-0"

SEE SHEET 13 FOR CHANNEL DETAILS & R.C.B. PLAN AND PROFILE

SEE STRUCTURAL SHEETS FOR SPILLWAY DETAILS

℄ ACCESS ROAD & GATE STA 11+27.29 BERMUDA ROAD ℄ N 10,729.470 E 9,835.224

BERMUDA ROAD

BLOCK RETAINING WALL

END CHAIN LINK FENCE AT BLOCK WALL

C-951 PLACE WARNING SIGN 34

DRAIN TO OUTLET STRUCTURE

C-949 STAFF GAUGE 34

N 10,523.1596 E 9,507.9705

N 10,488.4607 E 9,467.7728

N 10,546.2944 E 9,537.5611

N 10,532.9405 E 9,514.8475

STAFF GAUGE C-949 34

LABYRINTH FILL SEE SPECIFICATIONS

N 10,241.1976 E 9,838.0107

N 10,227.6335 E 9,851.3455

C-949 34

GAUGING STATION SEE DETAILS ON SHEET 30

℄ CONDUIT STA 33+00 N 10,214.987 E 9,862.8601

℄ ACCESS ROAD & GATE STA ~~47+63.32~~ BERMUDA ROAD ℄ N ~~10,003.08~~ E ~~9,930.833~~

24"

SERENE AVENUE

18" RCP STORM SEWER SEE SHEETS 60 THROUGH 62

CHAIN LINK FENCE C-101 33

GILESPIE STREET

SEE SHEET 16 FOR GILESPIE INLET PLAN & PROFILE

END CHAIN LINK FENCE AT BLOCK WALL

STA 80+37.00 DETENTION BASIN STAFF GAUGE SLAB

18" RCP STORM SEWER SEE SHEET 57

24"S

TOP OF DAM EL=2212 (TYP)

C-951 PLACE WARNING SIGN 34

C-950 SEDIMENT GAUGE 34

N 9,187.5864 E 7,595.4991

C-101 CHAIN LINK FENCE 33

N 9,894.3672 E 7,712.8618

N 9,833.9055 E 7,744.0187

2 C-949 34 SIM. C-109 35 CUTOFF DEPTH-1.0'

N 9,608.735 E 7,598.271

N 9,776.2151 E 7,692.3704

N 9,603.931 E 7,609.267

N 9,849.0012 E 8,604.1661

OUTLET WITH NDOT STANDARD HEADWALL PER DETAIL R.2.5.1 (502) AND HYDROGATE MODEL 10C FLAP GATE

INLET WITH NDOT STANDARD HEADWALL PER DETAIL R.2.5.1 (502) AND ~~NDOT STANDARD SAFETY GRATE PER DETAIL R.2.5.11 (534)~~

N 10,428.6472 E 9,006.2714

N 10,500.0248 E 9,454.4380

N 10,261.6563 E 9,584.2654

INV = 2182.50 SPILLWAY

N 10,341.5645 E 8,924.7463

SEDIMENT GAUGE

N 10,282.4106 E 9,426.7399

N 10,139.3278 E 8,918.4591

C-950 34 N 10,194.9279 E 9,790.9455

SEDIMENT GAUGE N 10,102.9542 E 9,610.3367

N 10,181.1678 E 9,804.2864

C-951 PLACE WARNING SIGN 34

2 C-949 34 SIM. C-109 35 CUTOFF DEPTH-1.0'

N 9,613.142 E 9,693.006

N 9,608.4127 E 9,681.980

CAUTION 24" DIA. NATURAL GAS LINE SEE SHEET 32 FOR GASLINE DETAILS

MATCHLINE SEE SHEET 12 FOR DETENTION BASIN GRADING PLAN -- SOUTH

SEE SHEETS 52 & 53 FOR BERMUDA ROAD PLAN & PROFILE

LOWER DUCK CREEK DETENTION BASIN

RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

ISSUED FOR CONSTRUCTION

REV No.	DATE	DESCRIPTION	APPROVED
3	9/7/00	PER AS-BUILT	
2	6/3/99	PER CONSTRUCTION SET REVISIONS	
1	6/3/99	PER ADDENDUM 2	

MONTGOMERY WATSON
Las Vegas, Nevada

MONTGOMERY WATSON
3014 WEST CHARLESTON BLVD
LAS VEGAS, NV 89102
(702) 878-8010

CLARK COUNTY NEVADA

LOWER DUCK CREEK DETENTION BASIN

DETENTION BASIN GRADING PLAN - NORTH

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

REGISTERED ENGINEER JACELL COOK CIVIL No. 10106 STATE OF NEVADA

DESIGNED BY: RGK
DRAWN BY: JCJ
CHECKED BY: JPC
DATE: JUNE 4, 1999

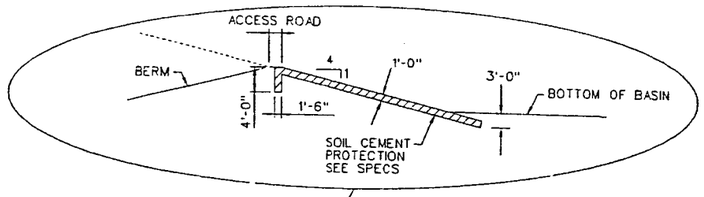
SCALE:
HORIZ: 1" = 100'
VERT: NONE

SHEET No 11

L-1592

13-AUG-1999 13:49 g:\cepw\duckcrk\plansheets\1007 plansheets\construction\sht11cs.dgn

LOWER DUCK CREEK DETENTION BASIN



0 100 200
SCALE: 1" = 100'-0"

APPROXIMATE LOCATION OF ABANDONED SEWAGE LAGOON SEE SPECIFICATIONS FOR MATERIAL HANDLING REQUIREMENTS

SEE SHEETS 52 & 53 FOR BERMUDA RD. PLAN & PROFILE

SOIL CEMENT TO RAMP EDGE

MATCHLINE SEE SHEET 11 FOR DETENTION BASIN GRADING PLAN -- NORTH

N 9,387,988
E 7,586,198

℄ ACCESS GATE
STA 14+38.05
BERM ℄
N 9,358,844
E 7,444,370

N 9,393,164
E 7,517,195
SOIL CEMENT PROTECTION

N 9,064,640
E 7,596,250

CHAIN LINK FENCE

N 8,975,052
E 7,694,367

SOIL CEMENT PROTECTION

2 / 34 C-949 S-109 / 35 SIM. CUTOFF DEPTH=1.0'

TOP OF DAM EL. 2212 (TYP.)

DETENTION BASIN STAFF GAUGE SLAB STA 27+93.00

℄ ACCESS GATE
STA 22+53.61
BERM ℄
N 8,779,288
E 8,606,513

N 8,859,500
E 8,677,669

N 8,951,299
E 8,940,205
N 8,940,137
E 8,941,611

C-950 SEDIMENT GAUGE 1 / 34

SOIL CEMENT PROTECTION 2 / 30

N 9,033,554
E 9,155,484

N 9,021,579
E 9,268,468

N 8,916,529
E 9,606,600

N 8,848,358
E 8,682,076

1 / 30

℄ 33+00 TO STA 35+55 GROUTED RIP RAP D50=12"

18" RCP STORM DRAIN SEE SHEETS 60 THROUGH 62

LVVWD ROFC STATION
THE CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS IN PLACE

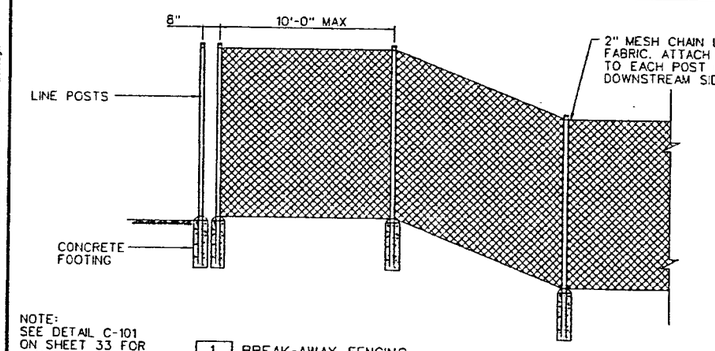
N 8,988,829
E 9,693,575

BERMUDA ROAD

N 9,355,614
E 9,802,912

℄ ACCESS GATE AND ROAD

N 9,350,904
E 9,791,875



NOTE:
SEE DETAIL C-101 ON SHEET 33 FOR FENCE POST DETAIL

1 BREAK-AWAY FENCING
-- NOT TO SCALE

LEGEND:

SOIL CEMENT AREA

RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

ISSUED FOR CONSTRUCTION

REV No	DATE	DESCRIPTION	APPROVED
3	9/7/00	PER AS-BUILT	
2	6/3/99	PER CONSTRUCTION SET REVISIONS	
1	6/3/99	PER ADDENDUM 2	

MONTGOMERY WATSON
Las Vegas, Nevada

MONTGOMERY WATSON
3014 WEST CHARLESTON BLVD
LAS VEGAS, NV 89102
(702) 878-8010

CLARK COUNTY NEVADA

LOWER DUCK CREEK DETENTION BASIN

DETENTION BASIN GRADING PLAN - SOUTH

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER STATE OF NEVADA JANELL COOK CIVIL No. 10106 8/17/99

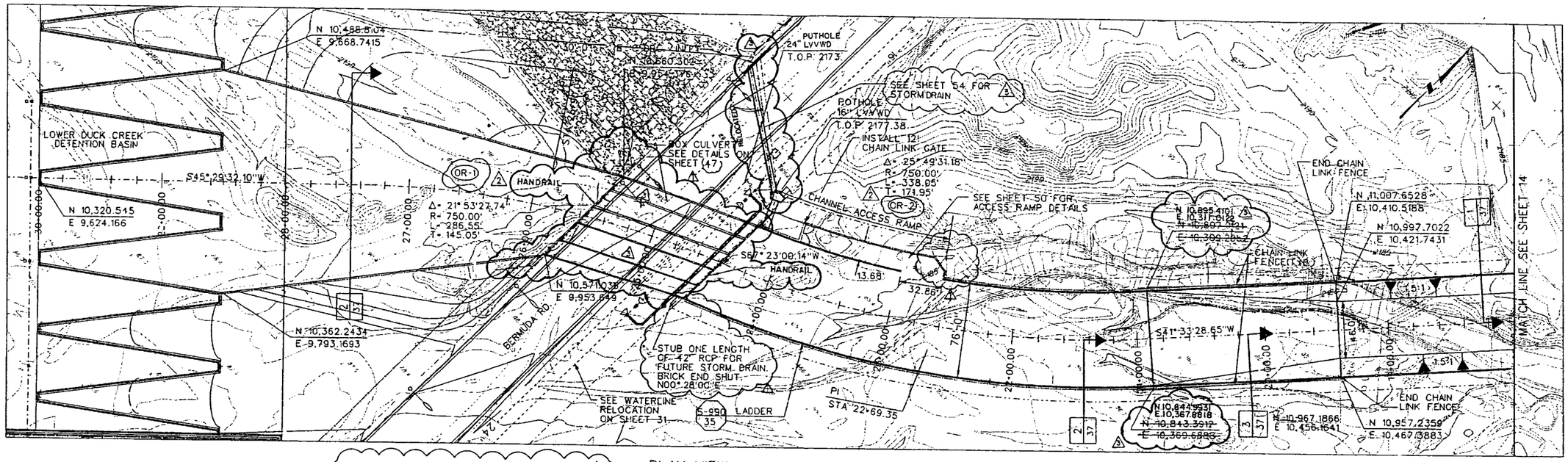
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DRAWN BY: RGK
CHECKED BY: JPC
DATE: JUNE 4, 1999

SCALE:
HORIZ: 1" = 100'
VERT: NONE

SHEET No 12

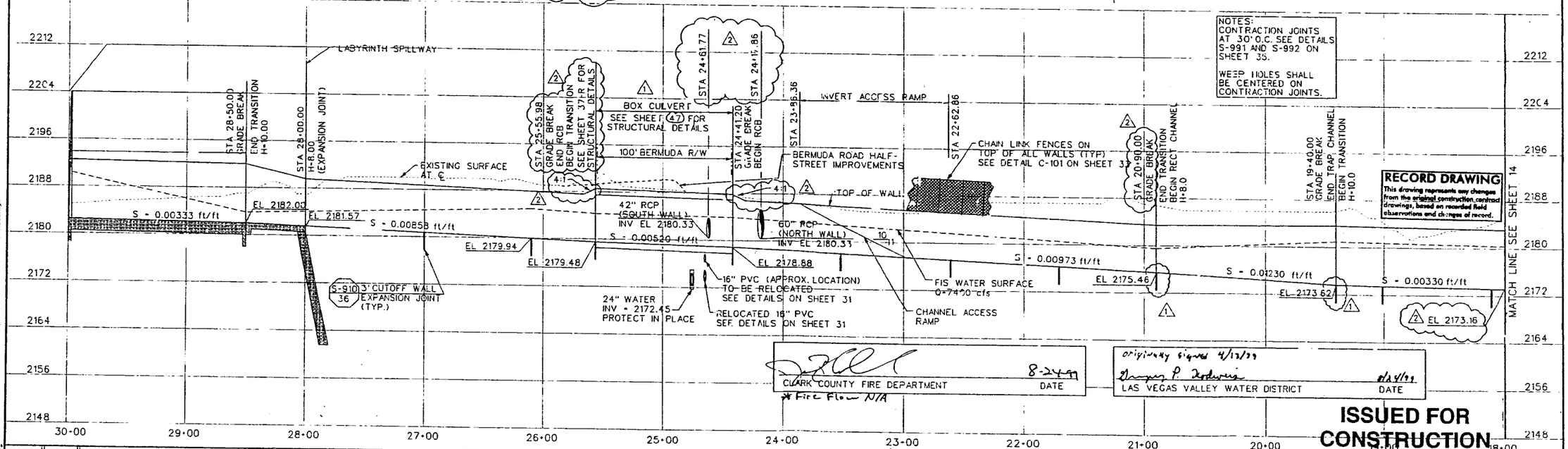
L-1592

13-AUG-1999 13:52 G:\Comm\ducker\plansheets\100% plansheets\construction\sht12cen.dgn



NOTE: PCs AND PTs ARE SHOWN ON SHEET 4 (2)

PLAN VIEW



NOTES:
CONTRACTION JOINTS AT 30' O.C. SEE DETAILS S-991 AND S-992 ON SHEET 35.

WEEP HOLES SHALL BE CENTERED ON CONTRACTION JOINTS.

RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

CLARK COUNTY FIRE DEPARTMENT — 8-24-99 DATE
* Fire Flow N/A

originally signed 4/13/99
LAS VEGAS VALLEY WATER DISTRICT — 4/13/99 DATE

ISSUED FOR CONSTRUCTION

REV No	DATE	DESCRIPTION	APPROVED
2	9/7/00	PER AS-BUILT	
1	6/3/99	PER CONSTRUCTION SET REVISIONS	
0	6/3/99	PER ADDENDUM 2	

MONTGOMERY WATSON
Las Vegas Nevada
MONTGOMERY WATSON
3011 WEST CHARLESTON BLVD
LAS VEGAS, NV. 89102
(702) 878-8010

LOWER DUCK CREEK DETENTION BASIN
LOW LEVEL OUTLET
PLAN & PROFILE
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA - JANELL COOK - CIVIL - No. 10106 - 8/24/99

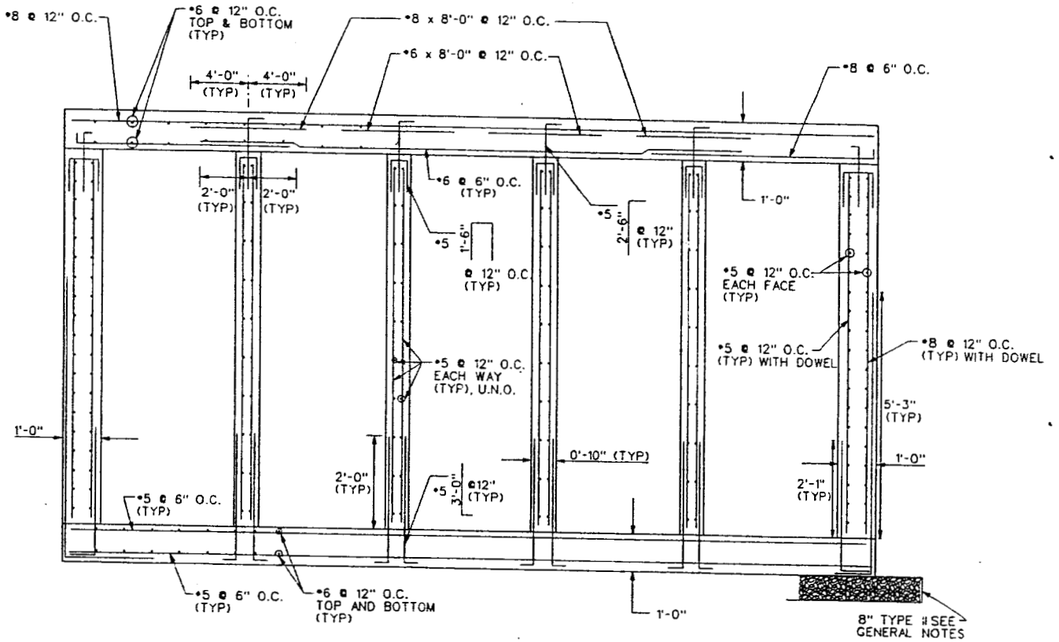
DESIGNED BY: JGJ
DRAWN BY: JGJ
CHECKED BY: JPC
DATE: JUNE 4, '99

SCALE:
HORIZ: 1" = 40'
VERT: 1" = 8'

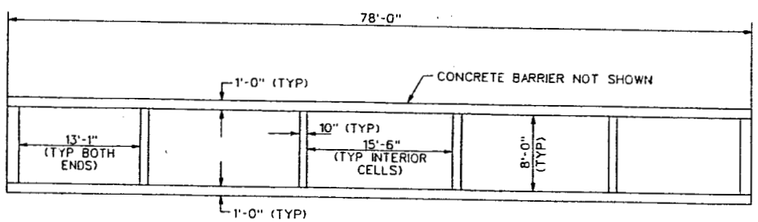
SHEET No 13

L-1592

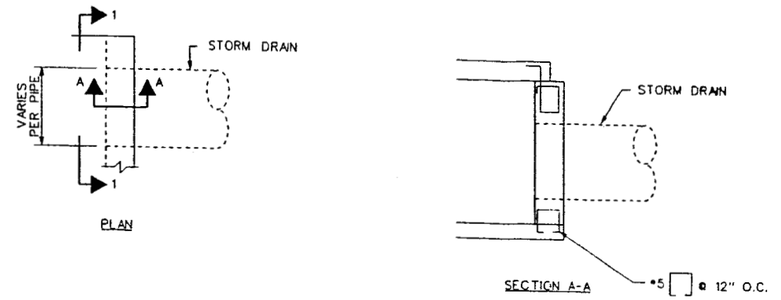
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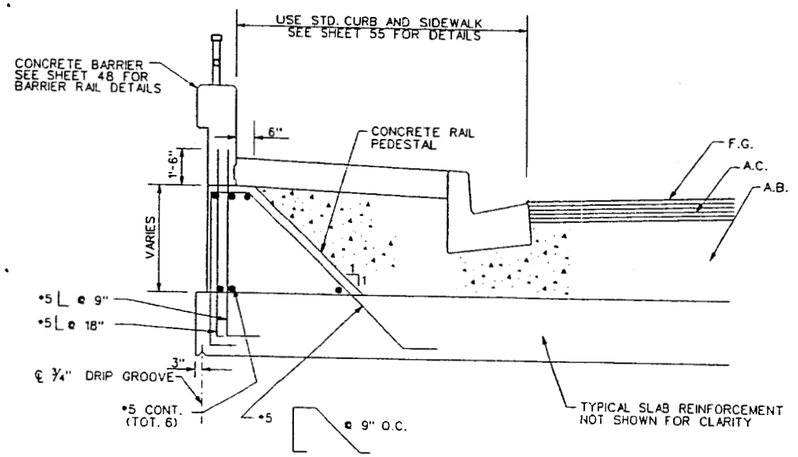
RCB REINFORCING DETAIL



RCB SECTION



RCB WALL PENETRATION DETAILS



BARRIER RAIL CONNECTION DETAIL

RECORD DRAWING
This drawing represents any changes from the original construction contract drawings, based on recorded field observations and changes of record.

ISSUED FOR CONSTRUCTION

LOWER DUCK CREEK DETENTION BASIN

REV No	DATE	DESCRIPTION	APPROVED

MONTGOMERY WATSON
Las Vegas, Nevada

MONTGOMERY WATSON
3014 WEST CHARLESTON BLVD
LAS VEGAS, NV. 89102
(702) 878-8010

LOWER DUCK CREEK DETENTION BASIN

BERMUDA ROAD BOX CULVERT DETAILS

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER STATE OF NEVADA JOSEPH E. FARRE CIVIL No. 13678 4/21/99

DESIGNED BY: JEF
DRAWN BY: JGJ
CHECKED BY: JEF
DATE: APRIL 19, 1999

SCALE:
HORIZ: NONE
VERT: NONE

SHEET No 47

L-1592

LOWER DUCK CREEK DETENTION BASIN

22-APR-1999 14:49 \\lasl_fileserver\design_files\scpw\ducker\planshts\1007 planshts\structure\sht47.dgn