Floodplain Development Permit

Doddridge County, WV Floodplain Management

This permit gives approval for the development/ project listed that impacts the FEMA-designated floodplain and/or floodway of Doddridge County, WV, pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance. This permit must be posted at the site of work as to be clearly visible and must remain posted during entirety of development.

Permit: #19-553

Date Approved: July 22, 2019 **Expires: July 22, 2020**

Issued to: Sherwood Midstream, LLC **POC: Richard Lowry**

Company Address: 320South View Drive, Suite 200 Bridgeport, WV 26330

Project Address: 218 Swisher Lane West Union

Firm: 54017C0105C **Lat/Long: 39.277767N, -80.684625W**

Purpose of Development: 138kV Structures

Issued by: George C. Eidel, CFM, OEM Director/Doddridge County FPM (*or designee*)

George C Eidel

Date: July 22, 2019

For additional information regarding this permit, please contact Doddridge County Floodplain Manager at 304.873.2631, or via email at doddridgecountyfpm@gmail.com
118 East Court Street; West Union, WV 26456

7018 3090 0001 0402 5116

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee
$ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage
$ .50

Total Postage and Fees
$ 6.70

WEST UNION, WV
Postmark Here
JUN 19 2019
USPS 26456-9998

Sent To
Mark West Liberty Midstream

Street and Apt. No., or PO Box No.
1515 Arapahoe St. Tower 2 Suite 1

City, State, ZIP+4®
Denver, CO 80202 19-553

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7018 3090 0001 0402 5123

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee
$ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage
$ .50

Total Postage and Fees
$ 6.70

WEST UNION, WV
Postmark Here
JUN 19 2019
USPS 26456-9998

Sent To
Jim Powell

Street and Apt. No., or PO Box No.
304 Stuart St.

City, State, ZIP+4®
West Union, WV 26456 19-553

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7018 3090 0001 0402 5109

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee
$ 3.45

Extra Services & Fees (check box, add fee as appropriate)
- [x] Return Receipt (hardcopy) $ 2.75
- [ ] Return Receipt (electronic) $
- [ ] Certified Mail Restricted Delivery $
- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage
$ .50

Total Postage and Fees
$ 6.70

WEST UNION, WV
Postmark Here
JUN 18 2019
USPS 26456-9998

Sent To
Michael Bonnell

Street and Apt. No., or PO Box No.
3825 WV Rt. 185

City, State, ZIP+4®
West Union, WV 26456 19-553

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

FLOODPLAIN PERMIT #19-553

Sherwood Midstream LLC. 218 Swisher Ln, 138kV Structures 39.277767, -80.684625

TASK	COMPLETE (DATE)	NOTES
CHECK RECEIVED	6/14/2019	
US ARMY CORP. ENGINEERS (USACE)		
US FISH & WILDLIFE SERVICES (USFWS)		
WV DEPT. NATURAL RESOURCES (WVDNR)		
WV DEPT. ENVIROMENTAL PROTECTION (WVDEP)		
STATE HISTORIC & PRESERVATION OFFICE (SHPO)		
OFFICE of LAND & STREAM (OLS)		
DATE OF COMMISSION READING	7/22/2019	
DATE AVAILABLE TO BE GRANTED	7/22/2019	
PERMIT GRANTED		
COMPLETE		

7018 3090 0001 0402 5123

7018 3090 0001 0402 5109

7018 3090 0001 0402 5116

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

est Liberty Midstream & Resources, LLC
1515 Arapahoe St. Tower, Suite 1
Denver, CO 80202

9590 9402 4783 8344 2634 04

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☒ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of De. 6-25

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

D&M Powell. LLC
304 Stuart Street
West Union, WV 26456

9590 9402 4783 8344 2633 81

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X D M Powell LLC
☐ Agent
☒ Addressee

B. Received by *(Printed Name)* D M POWELL LLC

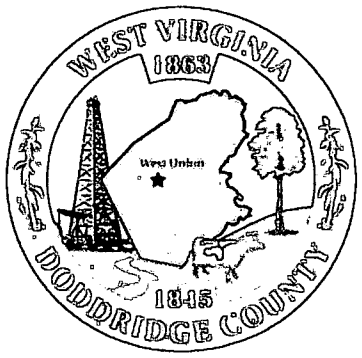
C. Date of Delivery 6/24/19

D. Is delivery address different from item 1? ☒ Yes
If YES, enter delivery address below: ☒ No

124 Stuart Ave
West Union, WV 26456

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt



Doddridge County Floodplain Permits

(Week of June 24, 2019)

Please take notice that on the **(14th)** of **(June), 2019, (Sherwood Midstream LLC.)** filed an application for a Floodplain Permit **(#19-553)** to develop land located at or about **(218 Swisher Lane, West Union); Coordinates: 39.277767, -80.684625.** The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance to WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment shall present the same in writing by **(July 27, 2019)** (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Floodplain Manager of the County at 105 Court Street, Suite #3, West Union, WV 26456. **This project is for 138kV power pole structures**

GEORGE C. EIDEL, CFM

Doddridge County Floodplain Manager

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1 Article Addressed to:

Michael Bonnell
3825 WV Rt. 18S
West Union, WV 26456

9590 9402 4783 8344 2633 98

2. Article Number *(Transfer from service label)*

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X Michael Bonnell ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Michael Bonnell

C. Date of Delivery 6-20-19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Gmail George Eidel <doddridgecountyfpm@gmail.com>

192-293 Sherwood Midstream, LLC - 138kV Powerline Construction Floodplain Permit

Celender, Rick <rcelender@cecinc.com> Mon, Jun 17, 2019 at 2:53 PM
To: George Eidel <doddridgecountyfpm@gmail.com>

George,

See responses below:

The application states that you will be "placing fill and equipment in the floodplain in order to construct the proposed 138kV structures", how much fill will be place? Is this fill permanent or temporary?

Fill operations will be only that required to get equipment in to install the structures. The fill will be temporary and sites will be restored and fill removed after the poles are constructed.

If the fill will be permanent a Letter of Map Revision based on Fill (LOMR-F) will need to be submitted to FEMA.

Fills to be temporary and areas restored, so we should not need a CLOMR-F.

The permit also states "the proposed improvements are not anticipated to have a major impact on the floodplain", how much of an impact would they have? Can we get a no rise certificate if no impact is expected?

This is basically the same work previously approved for the Mon Power/First Energy project. We are not proposing any changes to the breaker station, etc. so the flood study we prepared for that permit would be good for this too since we will be restoring the pole areas to original conditions after construction. I should be able to send the study again if you need it.

I'll give you a buzz tomorrow to discuss.

Regards,

Rick

Richard P. Celender, RLA*, C.E.T., CPESC, CPSWQ / Vice President

ASLA/FAA Remote Pilot

Civil & Environmental Consultants, Inc.

333 Baldwin Road · Pittsburgh, PA 15205-1751

Direct: 412-249-2309 · Fax: 412-429-2114

Mobile: 412-760-0136 · http://www.cecinc.com

Senior Leadership · Integrated Services · Personal Business Relationships

* Registered Landscape Architect in NY, PA, TX & WV

[Quoted text hidden]

Gmail

George Eidel <doddridgecountyfpm@gmail.com>

192-293 Sherwood Midstream, LLC - 138kV Powerline Construction Floodplain Permit

George Eidel <doddridgecountyfpm@gmail.com> Mon, Jun 17, 2019 at 9:12 AM
To: "Celender, Rick" <rcelender@cecinc.com>

Rick,

Have been going through the permit application, I had a few questions, The application states that you will be "placing fill and equipment in the floodplain in order to construct the proposed 138kV structures", how much fill will be place? Is this fill permanent or temporary? If the fill will be permanent a Letter of Map Revision based on Fill (LOMR-F) will need to be submitted to FEMA. The permit also states "the proposed improvements are not anticipated to have a major impact on the floodplain", how much of an impact would they have? Can we get a no rise certificate if no impact is expected? Otherwise a study may be needed to determine how much of an impact the project will have in the floodplain.

[Quoted text hidden]

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205-1751
Phone: (412) 429-2324 · **Toll Free:** (800) 365-2324
Fax: (412) 429-2114

Letter of Transmittal

Date: *6/26/2019* | Job No.: *192-293*

Attention: *George Eidel*

To:
Doddridge County Commission
105 Court Street, Suite #3
West Union, WV 26456

RE:
Smithburg 138kV Structures Project

We are sending you *attached* via *FedEx Standard* the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☑ *Permit package with Hydraulic Study*

Copies	Date	No.	Description
2	06/26/2019		Smithburg 138kV Structures Floodplain Permit Application

☑ For approval ☐ Approved as submitted ☐ Resubmit _ copies for approval
☑ For your use ☐ Approved as noted ☐ Submit _ copies for distribution
☑ As requested ☐ Returned for corrections ☐ Return _ prints
☐ For review and comment ☐ _
☐ For bids due ☐ Prints returned after loan to us

Remarks: *Please find included with this letter two copies of the Smithburg 138kV Structures Floodplain Permit Application with the Hydraulic Study. Please feel free to call me at 412-429-2324 if you have any questions.*

Thank You,

Copy to: -

Signed: _____
Richard P. Celender R.L.A.

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, Pennsylvania 15205
(412) 429-2324 Toll Free (800) 365-2324
Fax (412) 429-2114

TO: **Doddridge County Commission**
118 East Court Street
West Union, WV 26456

LETTER OF TRANSMITTAL

DATE:	**6/28/19**	Project No	**192-293**
ATTENTION:	**George Eidel**		
RE:	**Smithburg to Sherwood 138 kV**		
	Structures Floodplain Permit		

WE ARE SENDING YOU										
	X	ATTACHED		SEPARATE COVER	VIA	**FedEx Priority**				THE FOLLOWING ITEMS:
		SHOP DWGS		PRINTS		PLANS		SAMPLES		SPECIFICATIONS
		COPY OF LETTER				CHANGE ORDER		REPORT		

COPIES	DATE	NUMBER	DESCRIPTION
2	4/23/2019		Floodplain Development Permit Application
2	6/28/2019		Deed
2	6/28/2019		Tax Parcel Map
2	6/28/2019		Floodplain Site Plan
2	6/28/2019		H&H Report

WE ARE SENDING YOU						
	X	FOR APPROVAL		APPROVAL AS SUBMITTED		RESUBMIT ___ COPIES FOR APPROVAL
	X	FOR YOUR USE		APPROVED AS NOTED		SUBMIT ___ COPIES FOR DISTRIBUTION
	X	AS REQUESTED		RETURNED FOR CORRECTIONS		RETURN ___ PRINTS
		FOR REVIEW AND COMMENT				
		FOR BIDS DUE:				PRINTS RETURNED AFTER LOAN TO US

REMARKS

George,

Attached is the floodplain permit application for the Smithburg to Sherwood 138 kV Structures project. Please review and let me know if you need any additional information. Thank you,

COPY TO: _____

SIGNED: _____
Timothy G. Johnston, P.E.

Civil & Environmental Consultants, Inc.

June 13, 2019

JUN 14 19 12:08PM

Mr. George Eidel
Doddridge County Floodplain Manager
105 Court Street, Suite #3
West Union, WV 26456

Dear Mr. Eidel:

Subject: Floodplain Development Permit and FEMA CLOMR-F Application
Commercial/Industrial Floodplain Development Permit
Smithburg 138kV Structures
Doddridge County, West Virginia
CEC Project 192-293

On behalf of Sherwood Midstream LLC, Civil & Environmental Consultants, Inc. (CEC) is submitting a Commercial/Industrial Floodplain Development Permit associated with the Smithburg 138kV Structures project (Originally the Buckeye Run Breaker Station), located in Doddridge County, West Virginia.

Please find enclosed two (2) copies of the following information:

- Permit Application Fee in the amount of $25,000 (Construction costs approximately $18 million) (Check#151154); and
- Doddridge County Floodplain Development Permit Application.

Should you have any questions or require additional information, do not hesitate to contact us at 412-429-2324.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Joseph Ryan, P.E.
Project Manager

Richard P. Celender, RLA, C.E.T., CPESC, CPSWQ
Vice President

Enclosures

192-293-L-Floodplain Permit-6-7-19

151154

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
333 BALDWIN ROAD
PITTSBURGH, PA 15205
(412) 429-2324

PNC BANK, N.A.
Pittsburgh, PA

8-9/430

CHECK DATE 6/4/2019

PAY Twenty Five Thousand and 00/100 Dollars

AMOUNT 25,000.00

TO Doddridge County Commission
101 Church Street
Suite 102
West Union, WV 26456

AUTHORIZED SIGNATURE

Security features. Details on back.

⑈151154⑈ ⑆043000096⑆ 000227240 5⑈

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

151154

Check Date: 6/4/2019

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
06032019	6/3/2019	000000337393	25,000.00			25,000.00
Doddridge County Commission		TOTAL	25,000.00			25,000.00
- Operating Account 2		11261				

3 JUN 19 12:08PM

PRODUCT DLT141 USE WITH 91500 ENVELOPE Deluxe Corporation 1-800-328-0304 or www.deluxe.com/shop

79905911001

Permit# 19-553

Project Name: Smithburg 138kV Structures

Permittees Name: Sherwood Midstream LLC

Doddridge County, WV

Floodplain Development Permit Application

This document is to be used for projects that impact/potentially impact the FEMA---designated floodplain and/or floodway of Doddridge County, WV pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance.

SECTION 1: GENERAL PROVISIONS (APPLICANT TO READ AND SIGN)

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. The permit will expire if no work is commenced within six months of issuance.
5. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
6. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
7. I THE APPLICANT CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

APPLICANT'S SIGNATURE _____

DATE 6/13/19

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Applicant Information:

Please provide all pertinent data.

Applicant Information		
Responsible Company Name: Sherwood Midstream LLC		
Corporate Mailing Address: 4600 J. Barry Court, Suite 500		
City: Canonsburg	**State:** PA	**Zip:** 15317
Corporate Point of Contact (POC): Richard Lowry		
Corporate POC Title: Environmental Manager - New Construction		
Corporate POC Primary Phone: 724-416-0520		
Corporate POC Primary Email: ralowry@marathonpetroleum.com		
Corporate FEIN: 30-0528059	**Corporate DUNS:**	
Corporate Website:		
Local Mailing Address: 320 South View Drive, Suite 200		
City: Bridgeport	**State:** WV	**Zip:** 26330
Local Project Manager (PM):		
Local PM Primary Phone:		
Local PM Secondary Phone:		
Local PM Primary Email:		
Person Filing Application: Richard Lowry		
Applicant Title: Environmental Manager - New Construction		
Applicant Primary Phone: 724-416-0520		
Applicant Secondary Phone: 412-925-8165		
Applicant Primary Email: ralowry@marathonpetroleum.com		

Project Narrative:

Describe in detail the proposed development including project name/title, type of development, estimated start and completion timeline, and its potential impact on the floodplain. Use additional copies of this page as needed.

Project Narrative:

Sherwood Midstream LLC (Sherwood) is proposing to begin construction of the Smithburg 138kV Transmission Line Structures associated with the previously permitted Floodplain Development Permit #18-537, approved on March 12, 2019. Permit #18-537 is a part of MonPower/FirstEnergy's Buckeye Run Breaker Station project. The proposed 138kV transmission line project will include approximately 15,560 feet of line, and twenty-three (23) pole structures. Sherwood is proposing to permit the line, structures and temporary access roads to the proposed structures under this floodplain permit.

Nine (9) of the proposed structures are located near the existing Sherwood Natural Gas Processing Plant site and are located within the Buckeye Creek floodplain. The existing natural gas processing plant located approximately one-half-mile east of the intersection of U.S. Route 50 and County Route 20 along County Route 50/34 in Doddridge County, West Virginia.

The work proposes placing fill and equipment in the floodplain in order to construct the proposed 138kV structures. Construction is anticipated to begin 7/1/19 and be completed by 12/1/19. The proposed improvements are not anticipated to have a major impact on the floodplain.

Proposed Development:

Please check all elements of the proposed project that apply.

DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)

A. STRUCTURAL DEVELOPMENT

	ACTIVITY		STRUCTURAL TYPE
[X]	New Structure	[]	Residential (1 – 4 Family)
[]	Addition	[]	Residential (more than 4 Family)
[]	Alteration	[X]	Non-residential (floodproofing)
[]	Relocation	[]	Combined Use (res. & com.)
[]	Demolition	[]	Replacement
[]	Manufactured/Mobil Home		

B. OTHER DEVELOPLMENT ACTIVITIES:

[X] Fill [] Mining [] Drilling [] Pipelining
[] Grading
[] Excavation (except for STRUCTURAL DEVELOPMENT checked above)
[] Watercourse Alteration (including dredging and channel modification)
[] Drainage Improvements (including culvert work)
[] Road, Street, or Bridge Construction
[] Subdivision (including new expansion)
[] Individual Water or Sewer System
[] Other (please specify)

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Development Site/Property Information:

Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)

Property Designation: 1 of 1

Site/Property Information:		
Legal Description: See Property Description Attachment & Tax Map (Sheet No. 19)		
Physical Address/911 Address: 218 Swisher Lane		
Decimal Latitude/Longitude: 39.277767 , -80.684625		
DMS Latitude/Longitude: W80° 41' 04.65" , N39° 16' 39.96"		
District: Grant	**Map:** 19	**Parcel:** 32
Land Book Description:		
Deed Book Reference: DBV 406, PG. 133		
Tax Map Reference: Tax Map 19		
Existing Buildings/Use of Property: Parking lot for natural gas processing plant.		

Floodplain Location Data: ***(to be completed by Floodplain Manager or designee)***			
Community:	**Number:**	**Panel:**	**Suffix:**
Location (Lat/Long):		**Approximate Elevation:** **Estimated BFE:**	
Is the development in the floodway? ☐ **Yes** ☐ **No**		**Is the development in the floodplain?** ☐ **Yes** ☐ **No** **Zone:** _____	
Notes:			

QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT, MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C., a Delaware limited liability company ("Grantor"), whose address is 1515 Arapahoe Street, Tower 1, Suite 1600, Denver, Colorado 80202, for valuable consideration paid, the receipt and sufficiency of which is hereby acknowledged, does hereby remise, release, and forever quitclaim unto **SHERWOOD MIDSTREAM HOLDINGS LLC**, a Delaware limited liability company ("Grantee"), whose address is 1515 Arapahoe Street, Tower 1, Suite 1600, Denver, Colorado 80202, the following described real property (the "Property") as further shown on Exhibit "A" and Exhibit "B" attached hereto and incorporated herein by reference, together with all of Grantor's right, title and interest in and to all rights, benefits, privileges, easements, tenements, hereditaments and appurtenances thereon or in any way appertaining thereto:

DESCRIPTION OF 211.525 ACRES

GRANT DISTRICT, COUNTY OF DODDRIDGE, STATE OF WEST VIRGINIA

All that certain 211.525 acres, being Lot E of the Revised Sherwood Plant Facilities Plan (to be recorded) located within the property of now or formerly MarkWest Liberty Midstream & Resources, L.L.C., recorded in Deed Book Volume 378, Page 516, located on Tax Parcel Sheet 19, Lot 32, situate in the Grant District, County of Doddridge, State of West Virginia, more particularly bounded and described as follows:

BEGINNING FOR REFERENCE at a point on an existing stone on a northerly corner of property now or formerly Howard J. Rivers, recorded in Deed Book Volume 249, Page 356, said stone also being at a south corner of Lot E of the Revised Sherwood Plant Facilities Plan (to be recorded), said Revised Sherwood Plant Facilities Plan being property now or formerly MarkWest Liberty Midstream & Resources, L.L.C., recorded in Deed Book Volume 378, Page 516; thence along the dividing line of property of now or formerly Howard J. Rivers and property herein described, the following four (4) courses and distances, viz: North 33°17'31" East, 264.13' to a capped rebar set; thence North 57°54'19" West, 102.11' to a capped rebar set; thence North 52°54'19" West, 145.20' to a capped rebar set; thence North 73°24'19" West, 225.37' to a capped rebar set at the southeast corner of property now or formerly Dennis H. Powell; thence along the dividing line of property of now or formerly Dennis H. Powell and property herein described, the following six (6) courses and distances, viz: North 15°49'45" East, 2304.02' to a capped rebar set; thence North 02°42'33" West, 647.27' to a capped rebar set; thence North 88°57'32" East, 57.52' to a capped rebar set; thence North 76°26'19" East, 311.96' to a capped rebar set; thence South 88°02'36" East, 122.42' to a capped rebar set; thence South 75°10'25" East, 131.40' to a capped steel pipe set at a north corner of Lot D of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot D of the Revised Sherwood Plant Facilities Plan and property herein described, the following three (3) courses and distances, viz: South 40°00'30" West, 289.34' to a capped steel pipe set; thence South 04°59'30" East, 53.74' to a capped steel pipe set; thence South 49°59'30" East, 112.00' to a capped steel pipe set at a northwest corner of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C of the Revised Sherwood Plant Facilities Plan and property herein described, the following three (3) courses and distances, viz: South 40°00'30" West, 551.11' to a capped steel pipe set; thence South 49°48'52" East, 232.76' to a capped steel pipe set; thence South 40°48'51" West, 519.56' to a capped steel pipe set at an

west corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B of the Revised Sherwood Plant Facilities Plan and property herein described, the following twelve (12) courses and distances, viz: South 39°47'23" West, 254.29' to a capped steel pipe set; thence South 49°38'56" East, 1356.83' to a capped steel pipe set; thence North 39°43'10" East, 502.99' to a capped steel pipe set; thence North 50°16'50" West, 302.85' to a capped steel pipe set; thence North 39°43'10" East, 894.00' to a capped steel pipe set; thence North 50°16'50" West, 218.55' to a capped steel pipe set; thence North 39°43'10" East, 457.75' to a capped steel pipe set;

thence North 49°51'12" West, 391.08' to a capped steel pipe set; thence South 40°56'23" West, 356.29' to a capped steel pipe set; thence South 46°50'52" East, 26.12' to a capped steel pipe set; thence South 39°43'10" West, 102.89' to a capped steel pipe set; thence South 50°16'50" East, 41.70' to a capped steel pipe set at a north corner of Lot A of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot A of the Revised Sherwood Plant Facilities Plan and property herein described, South 39°43'10" West, 452.34' to a capped steel pipe set at a northwest corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B of the Revised Sherwood Plant Facilities Plan and property herein described, South 40°42'41" West, 163.87' to a capped steel pipe set at a southeast corner of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C of the Revised Sherwood Plant Facilities Plan and property herein described, the following four (4) courses and distances, viz: North 49°56'03" West, 237.73' to a capped steel pipe set; thence North 40°00'30" East, 1014.01' to a capped steel pipe set; thence North 49°59'30" West, 298.16' to a capped steel pipe set; thence South 40°00'30" West, 112.00' to a capped steel pipe set at a east corner of Lot D of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot D of the Revised Sherwood Plant Facilities Plan and property herein described, North 49°59'30" West, 300.74' to a capped steel pipe set on the line of property now or formerly Dennis H. Powell; thence along the dividing line of property of now or formerly Dennis H. Powell and property herein described, the following three (3) courses and distances, viz: South 75°10'25" East, 51.30' to a capped rebar set; thence North 89°02'55" East, 192.57' to a capped rebar set; thence North 25°07'41" East, 537.92' to a capped rebar set on the southerly right of way line of The State of West Virginia, West Virginia Railroad Maintenance Authority, as recorded in Deed Book Volume 216, Page 166; thence along the southerly right of way line of The State of West Virginia, West Virginia Railroad Maintenance Authority the following six (6) courses and distances, viz: South 20°36'12" East, 77.00' to a capped rebar set; thence North 67°29'54" East, 34.97' to a capped rebar set; thence North 65°43'48" East, 111.00' to a capped rebar set; thence North 59°34'48" East, 111.00' to a capped rebar set; thence North 55°33'48" East, 40.27' to a capped rebar set; thence North 77°19'37" East, 743.13' to a capped rebar set at the northwest corner of property of now or formerly Michael E. Bonnell, as recorded in Deed Book Volume 140, Page 190; thence along the dividing line of property of now or formerly Michael E. Bonnell and property herein described, the following eleven (11) courses and distances, viz: South 14°30'56" East, 715.45' to a capped rebar set; thence South 34°26'09" East, 107.25' to a capped rebar set; thence South 24°26'09" East, 396.00' to a capped rebar set; thence South 16°26'09" East, 198.00' to a capped rebar set; thence South 05°33'51" West, 226.88' to a capped rebar set; thence South 06°56'09" East, 247.50' to a capped rebar set; thence South 11°33'51" West, 276.37' to a capped rebar set; thence South 05°03'51" West, 478.50' to a capped rebar set; thence South 04°26'09" East, 330.00' to a capped rebar set; thence South 03°33'51" West, 222.75' to a capped rebar set; thence South 09°26'09" East, 330.00' to a capped rebar set on the northerly line of property of now or formerly Mule Tracts, LLC; thence along the dividing line of property of now or formerly Mule Tracts, LLC and property herein described, the following twelve (12) courses and distances, viz: South 89°33'51" West, 148.50' to a capped rebar set; thence South 65°24'18" West, 141.35' to a capped rebar set; thence South 35°50'50" West, 189.75' to a capped rebar set; thence South 31°05'50" West, 165.00' to a capped rebar set; thence South 18°20'50" West, 181.50' to a capped rebar set; thence South 17°50'50" West, 148.50' to a capped rebar set; thence South 25°20'50" West, 148.50' to a capped rebar set; thence South 41°50'50" West, 107.25' to a capped rebar set; thence South 41°50'50" West, 152.63' to a capped rebar set; thence

South 33°50'50" West, 297.00' to a capped rebar set; thence South 55°50'50" West, 202.13' to a capped rebar set; thence South 21°39'10" East, 123.75' to a capped rebar set at a northeast corner of property of now or formerly Howard J. Rivers; thence along the dividing line of property of now or formerly Howard J. Rivers and property herein described, the following two (2) courses and distances, viz: South 49°50'50" West, 621.33' to a capped rebar set; thence North 45°57'17" West, 1837.63' to an existing stone at the **PLACE OF BEGINNING.**

Contains 9,214,015.33 Sq. Ft. or 211.525 Acres

DESCRIPTION OF ACCESS EASEMENT (Exhibit "B" attached)

GRANT DISTRICT, COUNTY OF DODDRIDGE, STATE OF WEST VIRGINIA

All that certain Access Easement within the Revised Sherwood Plant Facilities Plan (to be recorded), said Access Easement is located within the property of now or formerly MarkWest Liberty Midstream & Resources, L.L.C., recorded in Deed Book Volume 378, Page 516, located on Tax Parcel Sheet 19, Lot 32, situate in the Grant District, County of Doddridge, State of West Virginia, more particularly bounded and described as follows:

BEGINNING FOR REFERENCE at a capped rebar set on the southerly right of way line of U.S. Route 50, said rebar being on the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan (to be recorded) and property now or formerly Dennis H. Powell, recorded in Deed Book Volume 200, Page 532; thence along the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan and property now or formerly Dennis H. Powell, South 25°07'41" West, 357.07' to a point on the line of the Access Easement, being the **TRUE PLACE OF BEGINNING;** thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following ten (10) courses and distances, viz: South 39°33'11" East, 454.78' to a point; thence by an arc of a circle deflecting to the left in a southeastwardly direction, having a radius of 975.00', an arc distance of 175.28' (chord bearing and distance, South 44°42'11" East, 175.04') to a point; thence South 49°51'12" East, 399.02' to a point; thence by an arc of a circle deflecting to the right in a southeastwardly direction, having a radius of 135.00', an arc distance of 154.93' (chord bearing and distance, South 16°58'35" East, 146.57') to a point; thence South 15°54'02" West, 613.15' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 425.00', an arc distance of 132.47' (chord bearing and distance, South 24°49'47" West, 131.93') to a point; thence South 33°45'32" West, 464.47' to a point; thence by an arc of a circle deflecting to the left in a southwestwardly direction, having a radius of 175.00', an arc distance of 71.95' (chord bearing and distance, South 21°58'51" West, 71.44') to a point; thence South 10°12'10" West, 112.18' to a point; thence North 79°47'50" West, 10.57' to a capped steel pipe set at a southeast corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 50°16'50" West, 45.32' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following two (2) courses and distances, viz: North 10°12'10" East, 71.37' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 145.00', an arc distance of 89.25' (chord bearing and distance, South 84°43'51" West, 87.85') to a point on an easterly line of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following two (2) courses and distances, viz: North 50°16'50" West, 160.24' to a point; thence North 39°43'10" East, 23.01' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following six (6) courses and distances, viz: South 56°32'29" East, 108.14' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 95.00', an arc distance of 145.18' (chord bearing and distance, North 77°32'16" East, 131.46') to a point; thence North 33°45'32" East, 411.69' to a

point; thence North 56°14'28" West, 36.00' to a point; thence by an arc of a circle deflecting to the left in a northwestwardly direction, having a radius of 125.00', an arc distance of 44.56' (chord bearing and distance, North 66°27'11" West, 44.32') to a point; thence North 76°39'54" West, 74.77' to a point on an easterly line of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 39°43'10" East, 55.81' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following eight (8) courses and distances, viz: South 76°39'54" East, 49.97' to a point; thence by an arc of a circle deflecting to the right in a southeastwardly direction, having a radius of 175.00', an arc distance of 62.38' (chord bearing and distance, South 66°27'11" East, 62.05') to a point; thence South 56°14'28" East, 36.00' to a point; thence North 33°45'32" East, 29.96' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 375.00', an arc distance of 116.88' (chord bearing and distance, North 24°49'47" East, 116.41') to a point; thence North 15°54'02" East, 613.15' to a point; thence by an arc of a circle deflecting to the left in a northwestwardly direction, having a radius of 85.00', an arc distance of 97.55' (chord bearing and distance, North 16°58'35" West, 92.28') to a point; thence North 49°51'12" West, 0.94' to a point to a capped steel pipe set at a northeast corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following four (4) courses and distances, viz: North 49°51'12" West, 391.08' to a PK nail set; thence South 40°56'23" West, 356.29' to a capped steel pipe set; thence South 46°50'52" East, 26.12' to a capped steel pipe set; thence South 39°43'10" West, 62.05' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following ten (10) courses and distances, viz: North 15°57'34" East, 67.04' to a point; thence by an arc of a circle deflecting to the right in a northeastwardly direction, having a radius of 525.00', an arc distance of 136.83' (chord bearing and distance, North 23°25'33" East, 136.44') to a point; thence South 40°09'15" West, 78.35' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 525.00', an arc distance of 85.75' (chord bearing and distance, South 44°50'00" West, 85.66') to a point; thence South 49°30'46" West, 98.45' to a point; thence by an arc of a circle deflecting to the left in a southwestwardly direction, having a radius of 475.00', an arc distance of 64.53' (chord bearing and distance, South 45°37'15" West, 64.48') to a point; thence South 41°43'44" West, 64.17' to a point; thence by an arc of a circle deflecting to the left in a southwestwardly direction, having a radius of 275.00', an arc distance of 105.18' (chord bearing and distance, South 30°46'17" West, 104.54') to a point; thence South 19°48'50" West, 7.83' to a point; thence South 50°16'50" East, 121.92' to a point on the northwesterly line of Lot A of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot A and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, South 39°43'10" West, 50.00' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following four (4) courses and distances, viz: North 50°16'50" West, 105.09' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 125.00', an arc distance of 51.39' (chord bearing and distance, South 39°32'34" West, 51.03') to a point; thence South 08°55'31" West, 162.59' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 225.00', an arc distance of 47.97' (chord bearing and distance, South 15°01'56" West, 47.87') to a point on the westerly line of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following two (2) courses and distances, viz: South 40°42'41" West, 65.59' to a capped steel pipe set; thence North 49°56'03" West, 37.25' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following three (3) courses and distances, viz: by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 175.00', an arc distance of 87.71' (chord bearing and distance, North 23°17'03" East, 86.80') to a point; thence North 08°55'31" East, 127.56' to a point; thence South 70°17'34" West, 217.42' to a point on the easterly line of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C and

Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 40°00'30" East, 99.15' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following eight (8) courses and distances, viz: North 70°17'34" East, 151.83' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 75.00', an arc distance of 66.08' (chord bearing and distance, North 45°03'12" East, 63.96') to a point; thence North 19°48'50" East, 43.28' to a point; thence by an arc of a circle deflecting to the right in a northeastwardly direction, having a radius of 325.00', an arc distance of 124.31' (chord bearing and distance, North 30°46'17" East, 123.55') to a point; thence North 41°43'44" East, 64.17' to a point; thence by an arc of a circle deflecting to the right in a northeastwardly direction, having a radius of 525.00', an arc distance of 71.32' (chord bearing and distance, North 45°37'15" East, 71.27') to a point; thence North 49°30'46" East, 31.78' to a point; thence North 49°59'30" West, 61.56' to a point on the easterly line of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 40°00'30" East, 50.00' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following nine (9) courses and distances, viz: South 49°59'30" East, 69.94' to a point; thence North 49°30'46" East, 15.97' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 475.00', an arc distance of 77.58' (chord bearing and distance, North 44°50'00" East, 77.50') to a point; thence North 40°09'15" East, 117.59' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 225.00', an arc distance of 313.01' (chord bearing and distance, North 00°18'02" East, 288.37') to a point; thence North 39°33'11" West, 229.45' to a point; thence South 25°07'41" West, 31.44' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 175.00', an arc distance of 195.23' (chord bearing and distance, South 57°05'18" West, 185.27') to a point; thence South 89°02'55" West, 63.87' to a point on the northeasterly line of Lot D of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot D and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 49°59'30" West, 76.27' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following four (4) courses and distances, viz: North 89°02'55" East, 121.47' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 125.00', an arc distance of 139.45' (chord bearing and distance, North 57°05'18" East, 132.33') to a point; thence North 25°07'41" East, 55.09' to a point; thence North 39°33'11" West, 55.31' to a point

on the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan and property now or formerly Dennis H. Powell; thence along the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan and property now or formerly Dennis H. Powell and along the Access Easement, North 25°07'41" East, 55.31' to a point at the **TRUE PLACE OF BEGINNING.**

Contains 253,923.67 Sq. Ft. or 5.829 Acres

Bearing basis is the West Virginia State Plane North Zone Grid, NAD 1983.

To have and to hold the above granted and bargained premises with the appurtenances thereunto belonging, unto the said **GRANTEE**, its successors and assigns forever.

PURSUANT to the requirement of W. Va. Code §11-22-6, the total consideration paid for this transaction is One Dollar and 00/100 ($1.00).

[*Signature Page Follows*]

GRANTOR:

MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C.

By: _____
Name: Greg S Floerke
Title: EVP Gathering & Processing

STATE OF Colorado)
) ss.
COUNTY OF Denver)

On this, the 2 day of April, 2018, before me personally appeared Greg S. Floerke, who acknowledged himself to be the EVP of MarkWest Liberty Midstream & Resources, L.L.C., and who represented that in such capacity he was authorized to execute the foregoing instrument on behalf of said limited liability company.

(SEAL)

LISA R. CRUM
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID # 20054031684
MY COMMISSION EXPIRES 07-01-2019

_____
Notary Public

My commission expires: 07/01/2019

GRANTEE:

SHERWOOD MIDSTREAM HOLDINGS LLC

By: _____
Name: Craig S. Eberle
Title: EVP, Gathering & Processing

STATE OF Colorado)
) ss.
COUNTY OF Denver)

On this, the 2 day of April, 2018, before me personally appeared Craig S Eberle, who acknowledged himself to be the EVP of Sherwood Midstream Holdings LLC, and who represented that in such capacity he was authorized to execute the foregoing instrument on behalf of said limited liability company.

(SEAL)

LISA R. CRUM
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID # 20054031684
MY COMMISSION EXPIRES 07-01-2019

_____
Notary Public

My commission expires: 07/01/2019

This instrument prepared by, and after recording, please return to:
Sherwood Midstream Holdings LLC
1515 Arapahoe Street
Tower 1, Suite 1600
Denver, Colorado 80202

Property Owner Data:

Please provide data on current site/property landowner(s), both surface and mineral rights (as applicable). Use additional copies of this page as needed. Designate each page in relation to each property listed above.

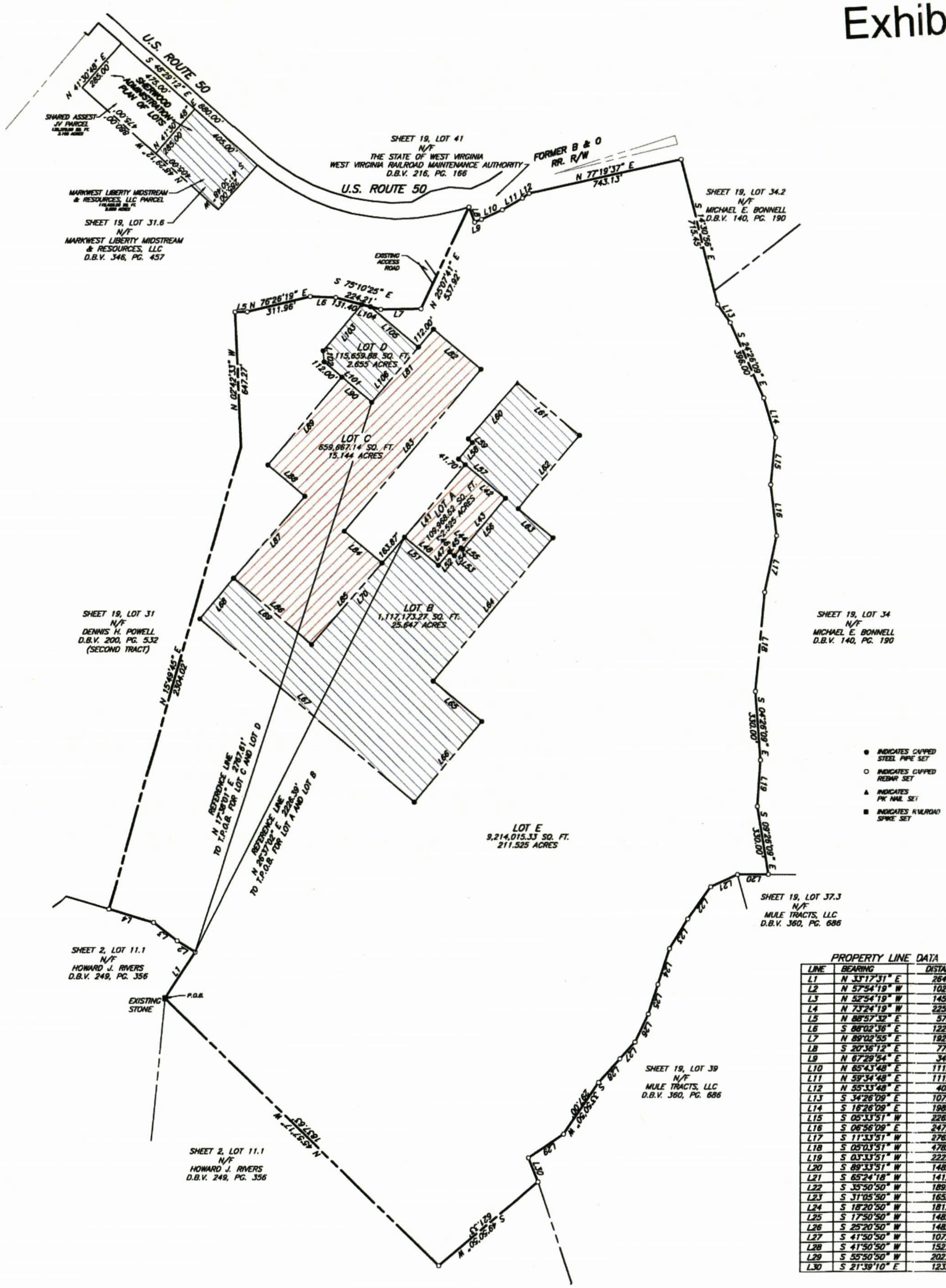
Property Designation: 1 of 1

Property Owner Data:		
Name of Primary Owner (PO): Sherwood Midstream Holdings LLC		
PO Address: 539 South Main Street		
City: Findlay	**State:** OH	**Zip:** 45840
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Surface Rights Owner Data:		
Name of Primary Owner (PO): Sherwood Midstream Holdings LLC		
PO Address: 539 South Main Street		
City: Findlay	**State:** OH	**Zip:** 45840
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Mineral Rights Owner Data: ***(As Applicable)***		
Name of Primary Owner (PO): N/A		
PO Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Exhibit "A"



LOT A

LINE	BEARING	DISTANCE
L41	N 39°43'10" E	452.34'
L42	S 50°16'50" E	251.88'
L43	S 39°43'10" W	319.00'
L44	N 50°16'50" W	11.00'
L45	S 39°43'10" W	48.60'
L46	N 50°16'50" W	29.50'
L47	S 39°43'10" W	84.74'
L48	N 50°16'50" W	211.38'

LOT B

LINE	BEARING	DISTANCE
L51	S 50°16'50" E	211.38'
L52	N 39°43'10" E	84.74'
L53	S 50°16'50" E	29.50'
L54	N 39°43'10" E	48.60'
L55	S 50°16'50" E	11.00'
L56	N 39°43'10" E	319.00'
L57	N 50°16'50" W	293.58'
L58	N 39°43'10" E	102.89'
L59	N 46°50'52" W	26.12'
L60	N 40°56'23" E	356.29'
L61	S 49°51'12" E	391.08'
L62	S 39°43'10" W	457.75'
L63	S 50°16'50" E	218.55'
L64	S 39°43'10" W	894.00'
L65	S 50°16'50" E	302.85'
L66	S 39°43'10" W	502.99'
L67	N 49°38'56" W	1356.83'
L68	N 39°47'23" E	254.29'
L69	S 49°38'42" E	492.40'
L70	N 40°42'41" E	680.97'

LOT C

LINE	BEARING	DISTANCE
L81	N 40°00'30" E	457.00'
L82	S 49°59'30" E	298.16'
L83	S 40°00'30" W	1014.01'
L84	S 49°56'03" E	237.73'
L85	S 40°42'41" W	517.10'
L86	N 49°38'42" W	492.40'
L87	N 40°48'51" E	519.56'
L88	N 49°48'52" W	232.76'
L89	N 40°00'30" E	551.11'
L90	S 49°59'30" E	188.30'

LOT D

LINE	BEARING	DISTANCE
L101	N 49°59'30" W	300.30'
L102	N 04°59'30" W	53.74'
L103	N 40°00'30" E	289.34'
L104	S 75°10'25" E	41.51'
L105	S 49°59'30" E	300.74'
L106	S 40°00'30" W	345.00'

PROPERTY LINE DATA

LINE	BEARING	DISTANCE
L1	N 33°17'31" E	264.13'
L2	N 57°54'19" W	102.11'
L3	N 52°54'19" W	145.20'
L4	N 73°24'19" W	225.37'
L5	N 88°57'32" E	57.52'
L6	S 88°02'36" E	122.42'
L7	N 89°02'55" E	192.57'
L8	S 20°36'12" E	77.00'
L9	N 67°29'54" E	34.97'
L10	N 65°43'48" E	111.00'
L11	N 59°34'48" E	111.00'
L12	N 55°33'48" E	40.27'
L13	S 34°26'09" E	107.25'
L14	S 16°26'09" E	198.00'
L15	S 05°33'51" W	226.88'
L16	S 06°56'09" E	247.50'
L17	S 11°33'51" W	276.37'
L18	S 05°03'51" W	478.50'
L19	S 03°33'51" W	222.75'
L20	S 89°33'51" W	148.50'
L21	S 65°24'18" W	141.35'
L22	S 35°50'50" W	189.75'
L23	S 31°05'50" W	165.00'
L24	S 18°20'50" W	181.50'
L25	S 17°50'50" W	148.50'
L26	S 25°20'50" W	148.50'
L27	S 41°50'50" W	107.25'
L28	S 41°50'50" W	152.63'
L29	S 55°50'50" W	202.13'
L30	S 21°39'10" E	123.75'

LEGEND

MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C.

SHERWOOD MIDSTREAM LLC

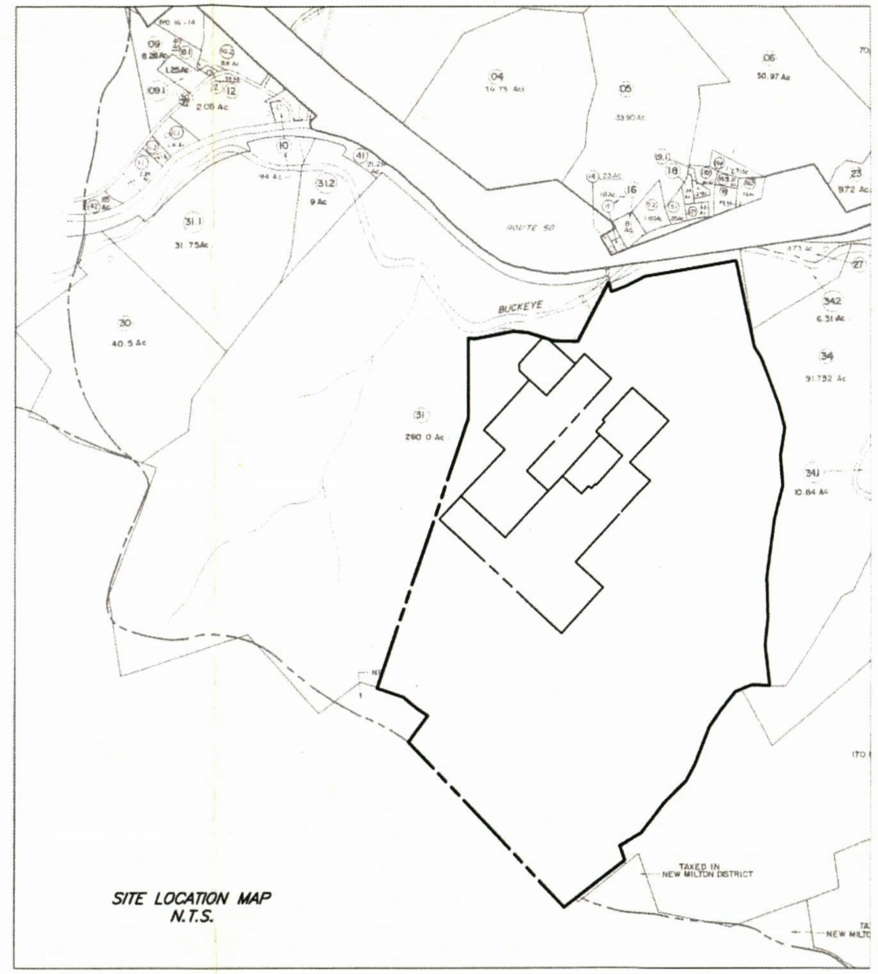
SHERWOOD MIDSTREAM HOLDINGS LLC

AREA TABULATIONS

	SQ. FT.	ACRES
LOT A	109,968.52	2.525
LOT B	1,117,173.27	25.647
LOT C	659,667.14	15.144
LOT D	115,659.88	2.655
LOT E	9,214,015.33	211.525
TOTAL LOT AREAS	11,216,484.17	257.495

NOTES:

1. THE BEARINGS SHOWN ON THIS DRAWING ARE BASED ON WEST VIRGINIA STATE PLANE NORTH GRID, NAD 1983.
2. THERE ARE NO GAS PIPELINE FACILITIES OR PLANT EQUIPMENT IMPROVEMENTS SHOWN ON THIS PLAN.
3. PROPERTY IS TAX PARCEL SHEET 19, LOT 32.
4. THIS PLAN IS A REVISION OF THE SHERWOOD PLANT FACILITIES PLAN RECORDED BY QUITCLAIM DEED, MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C. TO MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C., DATED 1/18/2017 IN D.B.V. 378, PAGE 516.



SITE LOCATION MAP
N.T.S.

REVISION RECORD		
NO	DATE	DESCRIPTION
△		
△		
△		
△		

TOTAL PLAN AREA
11,216,484.17 SQ. FT.
257.495 ACRES

SCALE IN FEET
0 300 600

JAMES R. BRUGGEMAN
LICENSED
No. 2104
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

CEC
Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

REVISED SHERWOOD PLANT FACILITIES PLAN

Situate In

GRANT DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA

Made For

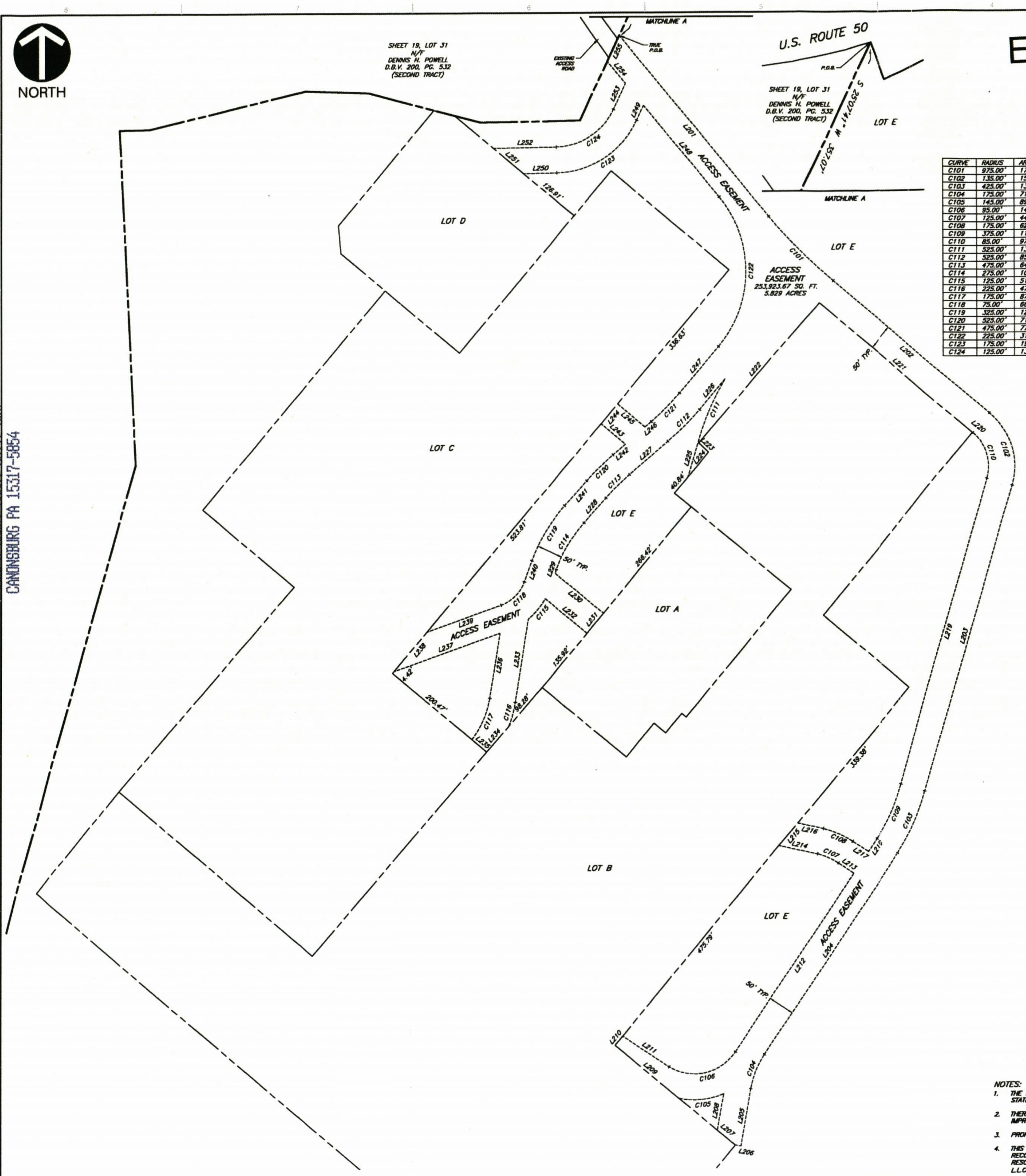
MARKWEST LIBERTY MIDSTREAM & RESOURCES, LLC.

DATE:	3/15/2018	SCALE:	1"=300'	DRAWING NO:	SUB-1
DRAWN BY:	CMM	CHECKED BY:	DGG		
PROJECT NO:	110-811	APPROVED BY:	JRB	SHEET 1 OF 2	

MARKWEST ENERGY PARTNERS, LLC
ATTN: SHANNON SCHMIDT
4600 J BARRY COURT SUITE 500
CANONSBURG PA 15317-5854

Exhibit "B"

NO	DATE	REVISION RECORD – DESCRIPTION
△		
△		
△		
△		

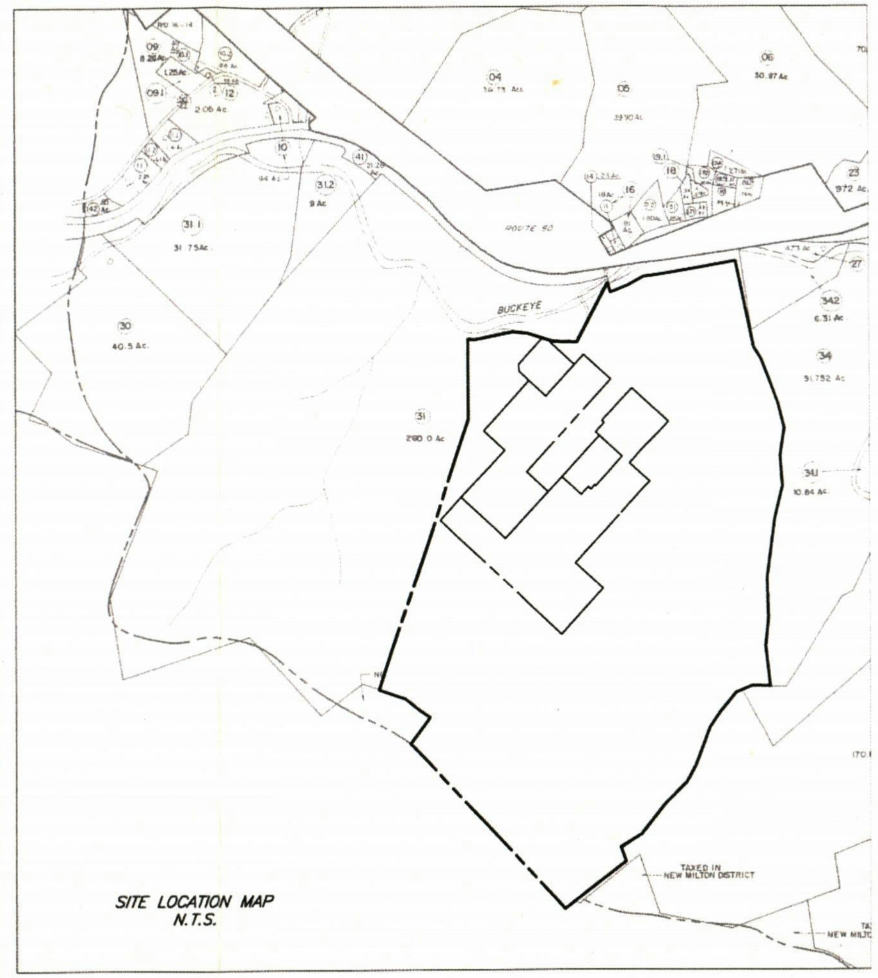


ACCESS EASEMENT DATA

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C101	975.00'	175.28'	175.04'	S 44°42'11" E	10°18'01"
C102	135.00'	154.93'	146.57'	S 16°58'35" E	65°45'14"
C103	425.00'	132.47'	131.93'	S 24°49'47" W	17°51'30"
C104	175.00'	71.95'	71.44'	S 21°58'51" W	23°33'22"
C105	145.00'	89.25'	87.85'	S 84°43'51" W	35°15'56"
C106	95.00'	145.18'	131.46'	N 77°32'16" E	87°33'27"
C107	125.00'	44.56'	44.32'	N 66°27'11" W	20°25'26"
C108	175.00'	62.38'	62.05'	S 66°27'11" E	20°25'26"
C109	375.00'	116.88'	116.41'	N 24°49'47" E	17°51'30"
C110	85.00'	97.55'	92.28'	N 16°58'35" W	65°45'14"
C111	525.00'	136.83'	136.44'	N 23°25'33" E	14°55'57"
C112	525.00'	85.75'	85.66'	S 44°50'00" W	9°21'31"
C113	475.00'	64.53'	64.48'	S 45°37'15" W	7°47'02"
C114	275.00'	105.18'	104.54'	S 30°46'17" W	21°54'54"
C115	125.00'	51.39'	51.03'	S 39°32'34" W	23°33'13"
C116	225.00'	47.97'	47.87'	S 15°01'56" W	12°12'51"
C117	175.00'	87.71'	86.80'	N 23°17'03" E	28°43'04"
C118	75.00'	66.08'	63.96'	N 45°03'12" E	50°28'43"
C119	325.00'	124.31'	123.55'	N 30°46'17" E	21°54'54"
C120	525.00'	71.32'	71.27'	N 45°37'15" E	7°47'02"
C121	475.00'	77.58'	77.50'	N 44°50'00" E	9°21'31"
C122	225.00'	313.01'	288.37'	N 00°18'02" E	79°42'26"
C123	175.00'	195.23'	185.27'	S 57°05'18" W	63°55'15"
C124	125.00'	139.45'	132.33'	N 57°05'18" E	63°55'15"

ACCESS EASEMENT DATA

LINE	BEARING	DISTANCE
L201	S 39°33'11" E	454.78'
L202	S 49°51'12" E	399.02'
L203	S 15°54'02" W	613.15'
L204	S 33°45'32" W	464.47'
L205	S 10°12'10" W	112.18'
L206	N 79°47'50" W	10.57'
L207	N 50°16'50" W	45.32'
L208	N 10°12'10" E	71.37'
L209	N 50°16'50" W	160.24'
L210	N 39°43'10" E	23.01'
L211	S 56°32'29" E	108.14'
L212	N 33°45'32" E	411.69'
L213	N 56°14'28" W	36.00'
L214	N 76°39'54" W	74.77'
L215	N 39°43'10" E	55.81'
L216	S 76°39'54" E	49.97'
L217	S 56°14'28" E	36.00'
L218	N 33°45'32" E	29.96'
L219	N 15°54'02" E	613.15'
L220	N 49°51'12" W	0.94'
L221	N 49°51'12" W	391.08'
L222	S 40°56'23" W	356.29'
L223	S 46°50'52" E	26.12'
L224	S 39°43'10" W	62.05'
L225	N 15°57'34" E	67.04'
L226	S 40°09'15" W	78.35'
L227	S 49°30'46" W	98.45'
L228	S 41°43'44" W	64.17'
L229	S 19°48'50" W	7.83'
L230	S 50°16'50" E	121.92'
L231	S 39°43'10" W	50.00'
L232	N 50°16'50" W	105.09'
L233	S 08°55'31" W	162.59'
L234	S 40°42'41" W	65.59'
L235	N 49°56'03" W	37.25'
L236	N 08°55'31" E	127.56'
L237	S 70°17'34" W	217.42'
L238	N 40°00'30" E	99.15'
L239	N 70°17'34" E	151.83'
L240	N 19°48'50" E	43.28'
L241	N 41°43'44" E	64.17'
L242	N 49°30'46" E	31.78'
L243	N 49°59'30" W	61.56'
L244	N 40°00'30" E	50.00'
L245	S 49°59'30" E	69.94'
L246	N 49°30'46" E	15.97'
L247	N 40°09'15" E	117.59'
L248	N 39°33'11" W	229.45'
L249	S 25°07'41" W	31.44'
L250	S 89°02'55" W	63.87'
L251	N 49°59'30" W	76.27'
L252	N 89°02'55" E	121.47'
L253	N 25°07'41" E	55.09'
L254	N 39°33'11" W	55.31'
L255	N 25°07'41" E	55.31'



SITE LOCATION MAP
N.T.S.

Doddridge County
Beth A Rogers, Clerk
Instrument 291623
04/24/2018 @ 12:08:52 PM
QUIT CLAIM DEED
Book 406 @ Page 133
Pages Recorded 9
Recording Cost $ 30.00

NOTES:
1. THE BEARINGS SHOWN ON THIS DRAWING ARE BASED ON WEST VIRGINIA STATE PLANE NORTH GRID, NAD 1983.
2. THERE ARE NO GAS PIPELINE FACILITIES OR PLANT EQUIPMENT IMPROVEMENTS SHOWN ON THIS PLAN.
3. PROPERTY IS TAX PARCEL SHEET 19, LOT 32.
4. THIS PLAN IS A REVISION OF THE SHERWOOD PLANT FACILITIES PLAN RECORDED BY QUITCLAIM DEED, MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C. TO MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C., DATED 1/18/2017 IN D.B.V. 378, PAGE 516.

JAMES R. BRUGGEMAN LICENSED No. 2104 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

SCALE IN FEET
0 100 200

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

REVISED SHERWOOD PLANT
FACILITIES PLAN
Situate In
GRANT DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA
Made For
MARKWEST LIBERTY MIDSTREAM
& RESOURCES, LLC.

DATE: 3/15/2018	SCALE: 1"=100'	DRAWING NO.: SUB-2
DRAWN BY: CMM	CHECKED BY: DGG	
PROJECT NO: 110-811	APPROVED BY: JRB	SHEET 2 OF 2

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Contractor Data:

Please provide all pertinent data for contractors and sub---contractors that may be participating in this project. Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 1 of 1

Contractor/Sub-Contractor (C/SC) Information:		
C/SC Company Name: TO BE DETERMINED		
C/SC WV License Number:		
C/SC FEIN:	**C/SC DUNS:**	
Local C/SC Point of Contact (POC):		
Local C/SC POC Title:		
C/SC Mailing Address:		
City:	**State:**	**Zip-Code:**
Local C/SC Office Phone:		
Local C/SC POC Phone:		
Local C/SC POC E-Mail:		

Engineer Firm Information:		
Engineer Firm Name: Civil & Environmental Consultants, Inc.		
Engineer WV License Number: 23295		
Engineer Firm FEIN: 25-1599565	**Engineer Firm DUNS:** 36-160-9878	
Engineer Firm Primary Point of Contact (POC): Joseph Ryan, P.E.		
Engineer Firm Primary POC Title: Project Manager		
Engineer Firm Mailing Address: 333 Baldwin Road		
City: Pittsburgh	**State:** PA	**Zip-Code:** 15205
Engineer Firm Office Phone: (412)-429-2324		
Engineer Firm Primary POC Phone: (412)-489-0223		
Engineer Firm Primary POC E-Mail: jryan@cecinc.com		

Adjacent and/or Affected Landowners Data

Please provide data for all adjacent and/or affected surface owners (both up and down stream) whose property may be impacted by proposed development as demonstrated by a floodplain study or survey. Use additional copies of this page as needed.

Adjacent Property Owner Data: Upstream		
Name of Primary Owner (PO): Michael Bonnell		
Physical Address: 3825 WV Route 18 S		
City: West Union	**State:** WV	**Zip:** 26456
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): Markwest Liberty Midstream & Resources, LLC		
Physical Address: 1515 Arapahoe St Tower, Suite 1		
City: Denver	**State:** CO	**Zip:** 80202
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): D&M Powell, LLC		
Physical Address: 304 Stuart Street		
City: West Union	**State:** WV	**Zip:** 26456
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO):		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Site Plan

A Site Plan is an accurate and detailed map of the proposed development for this project. It shows the size, shape, location and special features of the project property, and the size and location of any development planned to the property, especially as that development will impact the floodplain and/or floodway. Site plans show what currently exists on the project property, and any changes or improvements you are proposing to make. **A certified and licensed engineering firm should complete site plans.**

A SITE PLAN MUST CONTAIN THE FOLLOWING INFORMATION:

1. Legal description of the parcel, north arrow and scale
2. All property lines and their dimensions
3. Names of adjacent roads, location of driveways
4. Location of sloughs, tributaries, streams, rivers, wetlands, ponds, and lakes, with setbacks indicated, and including FEMA floodplain data based on most updated FIRM.
5. Location, size, shape of all buildings, existing and proposed, with elevation of lowest floor indicated.
6. Location and dimensions of existing or proposed on-site sewage systems.
7. Location of all propane tanks, fuel tanks or other liquid storage tanks whether above ground or below ground level.
8. Location and dimensions of any proposed pipeline placement(s) into floodplain/floodway.
9. Location and dimensions of any roadway development into floodplain/floodway. *(Includes initial development access roads)*
10. Location and dimensions of any bridge and/or culvert development into floodplain/floodway.
11. Location and dimensions of any storage yard or facility into the floodplain/floodway.
12. Location of any existing utilities and/or proposed utility placement and/or displacement.
13. Location, dimensions and depth of any existing or proposed fill on site.
14. A survey showing the **existing ground elevations** of at least location on the building site. **ELEVATION NOTE**: All vertical datum will reference either NGVD 29 or NAVD 88. Assumed datum will not be acceptable unless the property is located in an area where vertical datum has not been published. For those areas where vertical datum has not been established, a site plan with contours, elevations using assumed datum, high water marks and existing water levels of sloughs, rivers, lakes or streams and proposed lowest floor elevation.

Applicant

Please read print name, sign and date below:

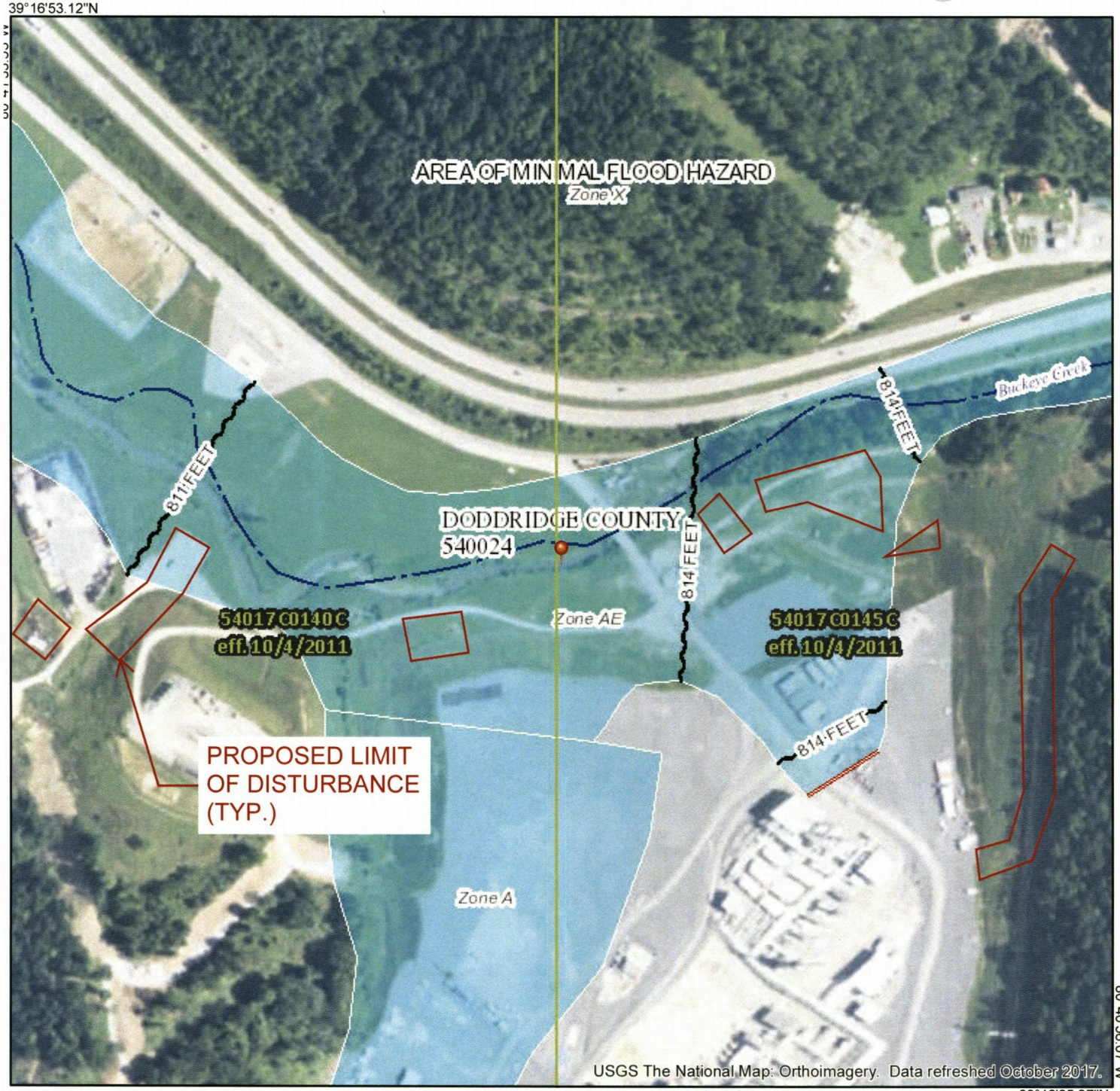
- I certify that I am authorized to submit this application for the primary project developer.
- I certify that the information included in this application is to the best of my knowledge true and complete.
- I certify that all required Federal, State, and local permits required by law and/or ordinance for the above described development of this project have will be properly attained, are current and valid, and must be presented prior to a Doddridge County Floodplain Permit being issued.
- I understand that if in the course of the development project additional permits become required that were not needed during the initial proposal, the primary developer must notify the Doddridge County Floodplain Manager within 48 hours of such need, and that a "Stop Work" order may be issued for all project work directly impacting the floodplain or floodway, until such time the required additional permits are acquired.
- I understand that once the floodplain permit is submitted, the application will be entered into official public record at the next regularly scheduled Doddridge County Commission meeting after the date of submittal.
- I understand that from the date of submittal of the fully completed permit application, the Doddridge County Floodplain Manager has ninety (90) days to make a determination to either grant or deny said permit application. During this approval period, the Doddridge County Floodplain Manager may, at his or her discretion, conduct a review and/or additional study of provided documentation by means of an independent engineering firm. All costs associated with said review and/or study must be reimbursed to the County before issuance of approved permit.
- I understand that during the approval period, the Doddridge County Floodplain Manager of designee may at his or her discretion conduct site visits and document conditions of proposed development pursuant to the permit application.
- I understand that once the Floodplain Permit is granted, the permit will be entered into official public record. Appeals to the permit may be made no later than twenty (20) days after said issuance. If a valid appeal is submitted, as determined by the Doddridge County Floodplain Manager, a "Stop Work" order will be issued for all project development directly involving the floodplain or floodway. A public hearing by the Doddridge County Appeals Board will be scheduled no less than ten (10) days after the next regularly scheduled Doddridge County Commission meeting.
- I understand that all decisions of the Doddridge County Appeals Board shall be final.
- **I understand issuance of a Floodplain Permit authorizes me to proceed with construction as proposed.**
- In signing this application, the primary developer hereby grants the Doddridge County Floodplain Manager or designee the right to enter onto the above---described location to inspect the development work proposed, in progress, and/or completed.
- I understand that if I do not follow exactly the site---plan submitted and approved by this permit that a "Stop Work" order may be issued by the Doddridge County Floodplain Manager and that I must stop all construction immediately until discrepancies of actual work vs. proposed work is resolved.

Applicant Signature: _____ Date: 6/13/19

Applicant Printed Name: Rick Lowry

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainag areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represe an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/4/2019 at 1:20:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

WV Flood Map

LOMAs
- Incorporated
- Superseded
- Not incorporated
- No Revalidation Status
- Reevaluated
- Contact Community for Revalidation Status

0.2 Pct Annual Chance Flood Hazard
- 0.2 Pct Annual Chance Flood Hazard

Cross Section (XS) Lines
- LETTERED, MAPPED
- NOT LETTERED, MAPPED

Base Flood Elevation (BFE) Lines
- Rule_1

FEMA Effective Floodplains
- Zone AE FLOODWAY
- Zone AE (AH, AO)
- Zone A
- AREA WITH REDUCED FLOOD RISK DUE TO LEVEE
- DFIRM Panel Index

Flood Depth (Ft)
- High : 864.11
- Low : 0

LOMRs
- Effective

Flood Info Location

Map created on 5/29/2019

User Notes:
Smithburg 138kV Line

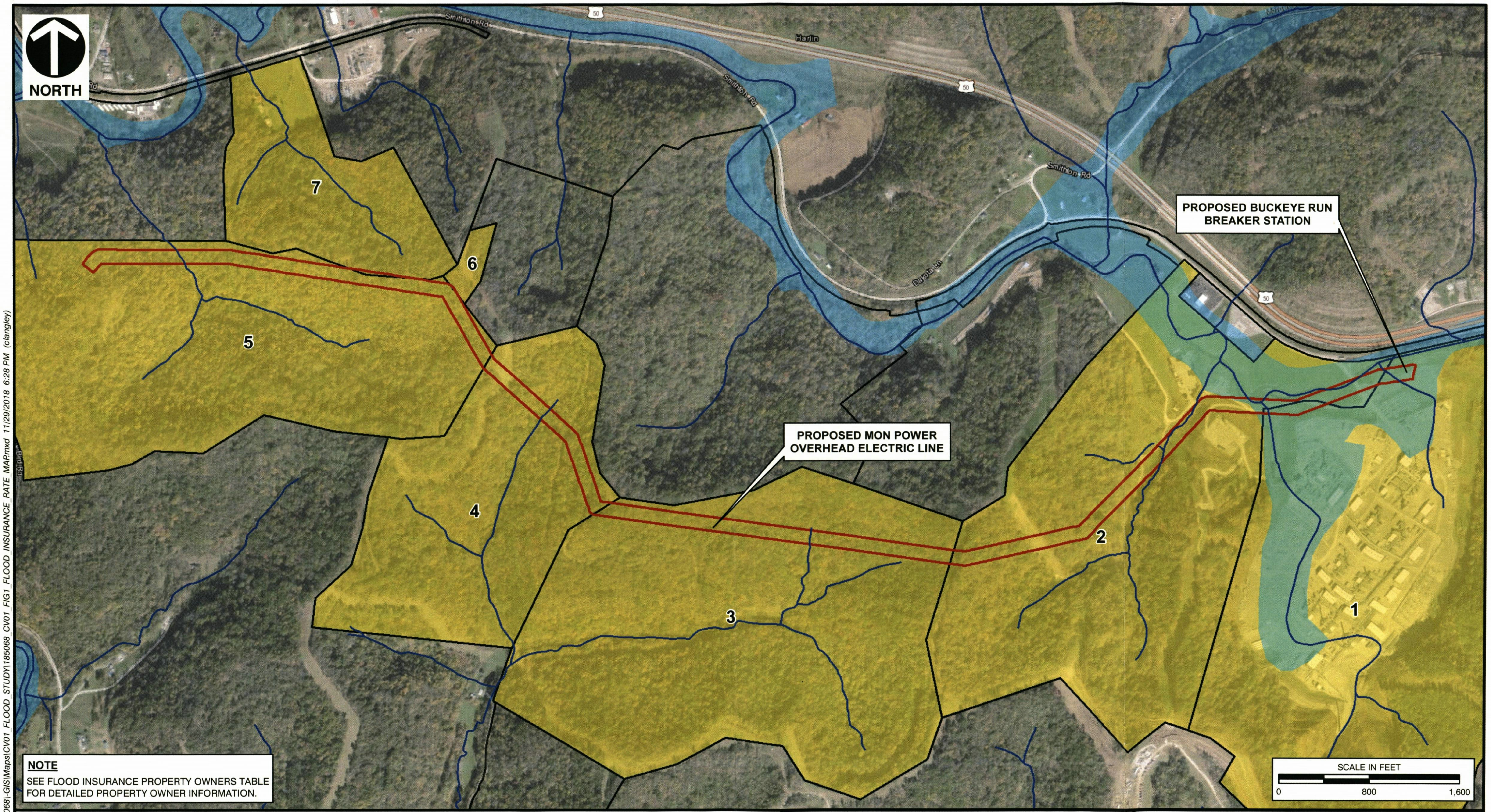
Flood Hazard Area:
Location is **WITHIN** the FEMA 100-year floodplain.

Flood Hazard Zone: AE
Stream: Buckeye Creek
Watershed (HUC8): Little Musringum-Middle Island (50302
Flood Height: Refer to FIS report for BFE
Water Depth: About 4.0 ft (Source: HAZUS)
Elevation: About 809 ft (Source: SAMS 2003)
Location (long, lat): (-80.685576, 39.278044)
Community&ID: Doddridge County (540024)

FEMA Flood Map: 54017C0145CNFHI **EFF:** 10/4/2011
Parcel Number: 09-03-0019-0032-0000
Address: multiple addresses

Disclaimer:

The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. **WV Flood Tool (*https://www.MapWV.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center**



NOTE

SEE FLOOD INSURANCE PROPERTY OWNERS TABLE FOR DETAILED PROPERTY OWNER INFORMATION.

LEGEND

- STREAM
- ELECTRIC LINE ROW
- FEMA 100 YEAR FLOODZONE
- PARCEL BOUNDARY
- PARCEL INTERSECTED BY ROW

REFERENCE

WVSAMB LiDAR-DERIVED STREAMS LAYER, 2003

FEDERAL EMERGENCY MANAGEMENT AGENCY DIGITAL FLOOD INSURANCE RATE MAP DATABASE, DODDRIDGE COUNTY, WEST VIRGINIA, 2010.

ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY, ACCESSED 11/29/2018, IMAGERY DATE: 2017.

CEC

Civil & Environmental Consultants, Inc.

333 Baldwin Road - Pittsburgh, PA 15205-9072

412-429-2324 · 800-365-2324

www.cecinc.com

ELECTRICAL CONSULTANTS, INC.
BUCKEYE RUN BREAKER
FLOOD STUDY & FLOODPLAIN PERMIT
DODDRIDGE COUNTY, WEST VIRGINIA

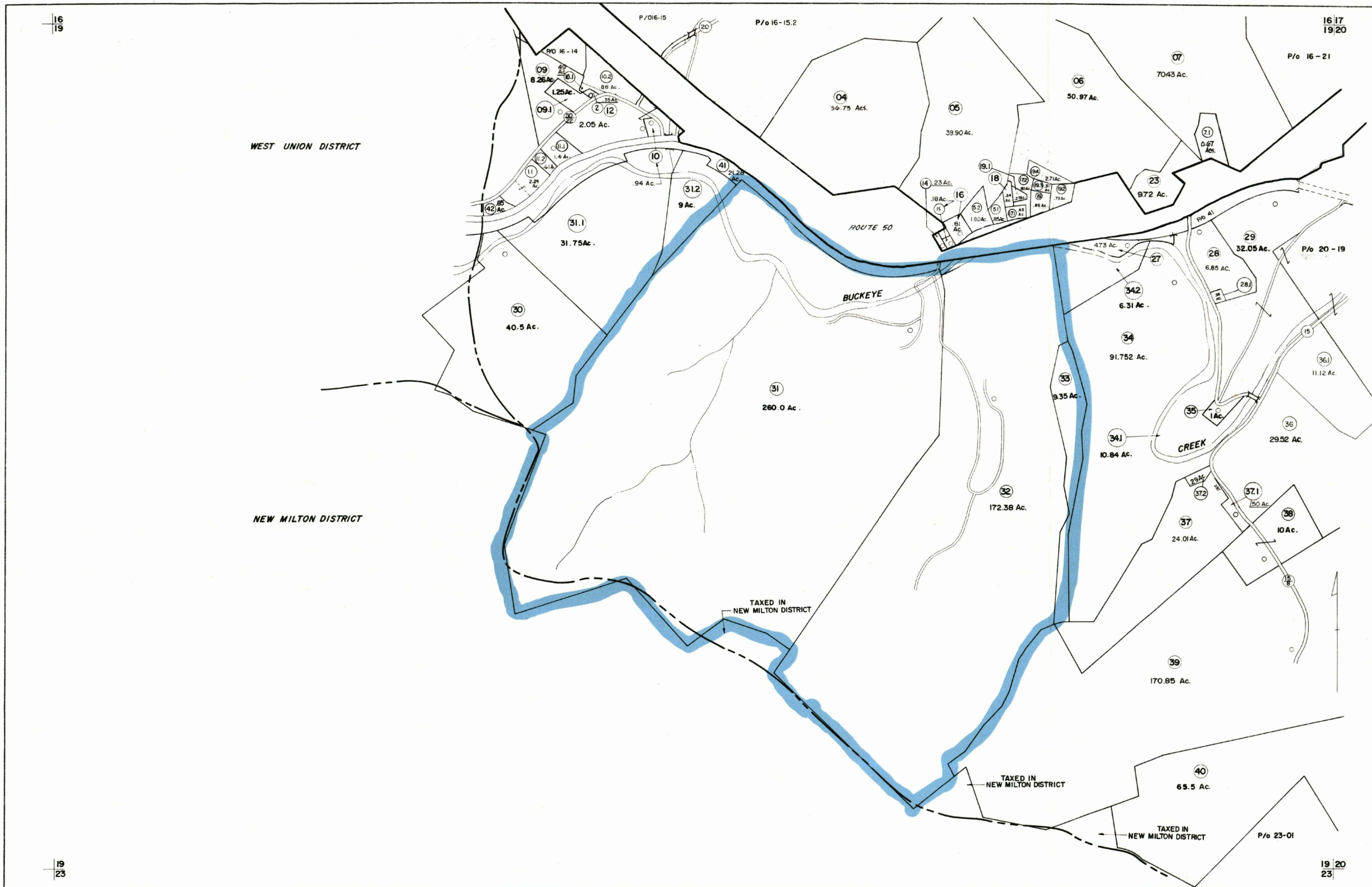
FLOOD INSURANCE LAND OWNER MAP

DRAWN BY: CBL	CHECKED BY: PJH	APPROVED BY: RPC*	* Hand signature on file	FIGURE NO:	1
DATE: 11/29/2018	SCALE: 1 " = 800 '	PROJECT NO: 185-068			

\\svr-pittsburgh\Projects\2018\185-068\-GIS\Maps\CV01_FLOOD_STUDY\185068_CV01_FIG1_FLOOD_INSURANCE_RATE_MAP.mxd 11/29/2018 6:28 PM (clangley)

FLOOD INSURANCE LAND OWNERS TABLE							
APN	APN2	OWNER	ADDR	CITY	STATE	ZIP	MAP_ID
03-19-32	09-03-0019-0032-0000-0000	MARKWEST LIBERTY MIDSTREAM & RESOURCES LLC	ROUTE 50	SALEM	WV	26426	1
03-19-31	09-03-0019-0031-0000-0000	D & M POWELL, LLC	ROUTE 50	SALEM	WV	26426	2
06-2-2	09-06-0002-0002-0000-0000	BLAND ROBERT C & ARLENE R	OFF RT 18/5 DOUGLAS RUN	NEW MILTON	WV	26411	3
06-2-1	09-06-0002-0001-0000-0000	LAW RONALD L	OFF RT 18/5 DOUGLAS RUN	NEW MILTON	WV	26411	4
08-16-15.2	09-08-0016-0015-0002-0000	MARKWEST LIBERTY MIDSTREAM & RESOURCES LLC	ROUTE 16	WEST UNION	WV	26456	5
08-17-2.1	09-08-0017-0002-0001-0000	BALLENGER, RUBY C	50 ROUTE 1 MORGANSVILLE OLD RT	WEST UNION	WV	26456	6
08-16-5	09-08-0016-0005-0000-0000	BALLENGER, RUBY C	50 ROUTE 1 MORGANSVILLE OLD RT	WEST UNION	WV	26456	7

* See Flood Insurance Land Owner Map for graphical depiction of property locations



FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number in parenthesis	(15)
Corporation line		Parcel or index number in circle	(99)
District line		Improvement	o
County line		Railroad	

Revisions

1	REVISED 3/23/64	9	Revised to 7-1-88	17	SLS INC. 3/08/00 JAW
2	1-25-72 TLM	10	Revised to 7-1-89 REB	18	ESI 3/29/01 REK
3	8-25-76 T.G.	11	OGIS 1-17-91 JB	19	2/29/04 S&H
4	REVISED 7-81 T. Groves	12	OGIS 10-24-91 NK	20	3/17/06 S&H
5	TO JULY 1982 C.P.	13	OGIS 12-8-92 JEB	21	
6	July 1985	14	OGIS 11-93 RD	22	
7	July, 1986 TRL	15	OGIS 2-95 HD	23	
8	Revised to 7-1-87	16	O.G.I.S 1-23-96 J.E.B	24	

STATE OF WEST VIRGINIA
DODDRIDGE COUNTY
Office of Assessor

GRANT DISTRICT
SHEET 19

Date, Aerial Photography APRIL, 1962
Photo No: 256; 279

Date, Map: OCT., 1963
Scale: 1" = 400'

1 | 2

WEST UNION DISTRICT

TAXED IN WEST UNION DISTRICT

01
107 Ac.

02
200 Ac.

P/o 1 - 08

RUN

18/5

03
38.35 Ac.

04
18.04 Ac.

04.1
3.36 Ac.

06
17.5 Ac.

07
16.75 Ac.

DOUGLAS

P/o 4-01.1
67.64 Total Ac.

09
56 Ac.

P/o 4 -06

P/o 4 - 07
67 Total Ac

10
12.45 Ac.

11
8.96 Ac.

11.1
136.8 Ac.

13
5.12 Ac.

GRANT DISTRICT

12
38.63 Ac.

P/o 4 - 13

EIBSCAMP RUN

1 | 2
3 | 4

P/o 3 - 05

2
4 | 5

FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number in parenthesis	(15)
Corporation line		Parcel or index number in circle	(99)
District line		Improvement	
County line		Railroad	

Revisions

1	REVISED 3/10/64	9		17	
2	REVISED 1/20/72 JHP	10		18	
3	REV. T-81 DR. 8-82 T. Groves	11		19	
4	REV. TO 7-1-85 NCS	12		20	
5	*Revised to 7-1-87* REB	13		21	
6		14		22	
7		15		23	
8		16		24	

STATE OF WEST VIRGINIA
DODDRIDGE COUNTY
Office of Assessor

NEW MILTON DISTRICT
SHEET 02

Date, Aerial Photography: APRIL, 1982
Photo No: 258 : 260

Date, Map: JULY, 1963
Scale: 1" = 400'

1|12
15|16

P/o 12-71.1

P/o 12-72.1

P/o 12-72.8

MAPPED AT 1" = 100' SHEET 28

12|18
16|17

P/o 12-93.1

1.1 .62 Ac.

16.3 1.5 Ac.

16.4 .51 Ac.

01 123.38 Ac.

21 27.27 Ac.

22 27.27 Ac.

03 10 Ac.

08 1.32 Ac.

09 1.11 Ac.

09.2 1.87 Ac.

093 1.5Ac

094 .57Ac.

09.1 2 Ac.

10 7.82 Ac.

11 1.21 Ac.

12 8 Ac.

13

14 17.36Ac.

07 192 Ac.

15 91.6 Ac.

15.1 8.99 Ac.

15.3 .20 Ac.

B & O R.R.

05 55.25 Ac.

06 9.87 Ac.

15.2 148 Ac.

20 .84Ac.

50 TF

CREEK

MEATHOUSE FORK

16 650.84 Ac.

16.1 2.17 Acs.

16.2 4.08 Acs.

16.5 2 Ac.

17 108.59 Ac.

18 3.11 Ac.

19 4.91 Ac.

BLUESTONE

NEW MILTON DISTRICT

P/o 15-08

15|16
20|21

16

FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number (in parenthesis)	(15)
Corporation line		Parcel or index number (in circle)	(99)
District line		Improvement	▭
County line		Railroad	

Revisions

1	REVISED 3/1/64		9	Revised to 7-1-88 SH		17	
2	1-26-72 ZM		10	OGIS 1-18-91 JB		18	
3	8-30-76 BAH		11	OGIS 11-93 RD		19	
4	11-17-78	JC	12	SLS INC. 3/13/00 JAW		20	
5	4-1-80	NCS	13	ESI 3/29/01 REK		21	
6	REVISED 7-81 T. Groves		14	2/27/04 SBH		22	
7	6-6-84		15			23	
8	REV. TO 7-1-85	NCS	16			24	

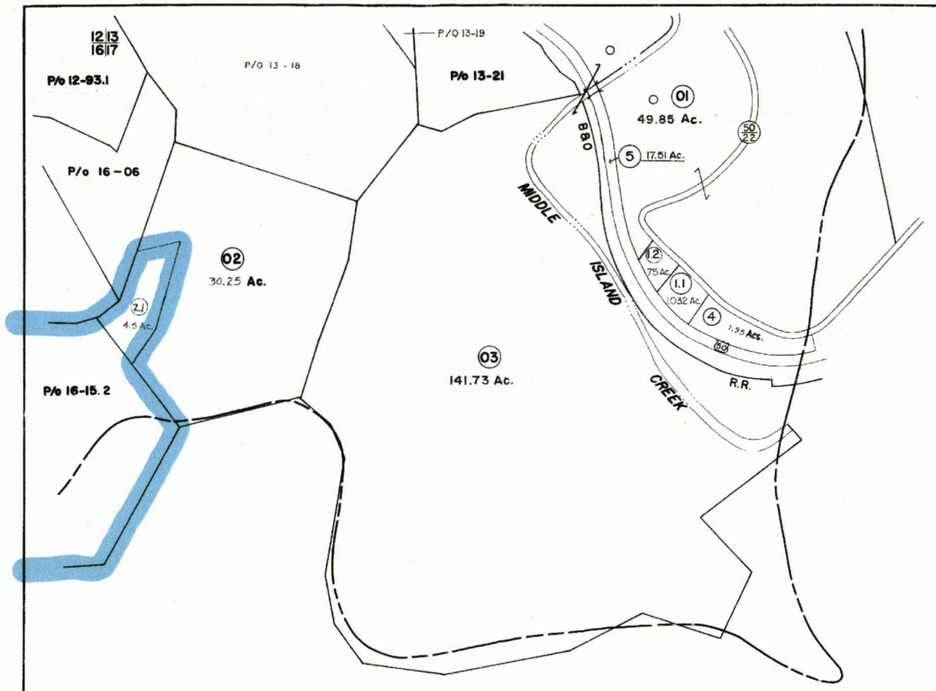
STATE OF WEST VIRGINIA
DODDRIDGE COUNTY

Office of Assessor

WEST UNION DISTRICT
SHEET 16

Date, Aerial Photography: APRIL, 1962
Photo No: 236

Date, Map: DEC., 1963
Scale: 1"=400'



NEW MILTON DISTRICT

16

FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number in parenthesis	(15)
Corporation line		Parcel or index number in circle	(99)
District line		Improvement	
County line		Railroad	

Revisions

1	REVISED 3/11/64	9	O.G.I.S 1-23-96 J.E.B	17	
2	1-26-72 T.M	10	SLS INC. 3/13/00 JAW	18	
3	8-30-76 B.A.M.	11		19	
4	REVISED 7-81 T. Groves	12		20	
5	7-1-86 S.P.H.	13		21	
6	REV. TO 7-1-89 NCS	14		22	
7	OGIS 1-18-91 JB	15		23	
8	OGIS 11-93 RD	16		24	

STATE OF WEST VIRGINIA
DODDRIDGE COUNTY
Office of Assessor

WEST UNION DISTRICT
SHEET 17

Date, Aerial Photography: APRIL, 1962
Photo No: 256

Date, Map: DEC.,1963
Scale: 1"=400'

SCALE IN FEET
0 400 800

LEGEND

- 1100 — EXISTING INDEX CONTOURS
- EXISTING INTERMEDIATE CONTOURS
- EXISTING TREELINE
- —x— EXISTING FENCE
- EXISTING UNPAVED ROAD
- EXISTING TRAIL
- EXISTING PIPELINE RIGHT OF WAY
- EXISTING PROPERTY BOUNDARY
- G — EXISTING GAS LINE
- ST — EXISTING STORM DRAIN
- OH-E — EXISTING OVERHEAD ELECTRIC LINE
- COMM — EXISTING COMMUNICATIONS LINE
- Ø EXISTING UTILITY POLE
- EXISTING GAS PIPELINE MARKER
- EXISTING WETLAND
- EXISTING STREAM
- STREAM AND WETLAND DELINEATION BOUNDARY
- ADD. STREAM AND WETLAND DELINEATION BNDY
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED TRANSMISSION LINE RIGHT OF WAY
- OH-W — PROPOSED TRANSMISSION LINE
- 13 PROPOSED TRANSMISSION LINE STRUCTURE NUMBER

SITE RESTORATION NOTE:
UPON COMPLETION OF CONSTRUCTION ACTIVITIES, CONTRACTOR TO REMOVE ANY GRAVEL PLACED FOR TEMPORARY ACCESS ROADS, TEMPORARY POLE PADS, AND TEMPORARY PULL PADS AND RESTORE AREA TO APPROXIMATE EXISTING CONTOUR AND MEADOW IN GOOD CONDITION. NO PERMANENT GRAVEL IS PROPOSED FOR THIS PROJECT.

GEOTECHNICAL SITE RESTORATION NOTE:
FILL PLACEMENT SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL NOTES PROVIDED ON PLAN SHEET C001.

REFERENCE

1. EXISTING TOPOGRAPHY IS BASED ON A COMBINATION OF ECI SURVEY DATA, MARKWEST SMITHBURG SURVEY DATA, MARKWEST SHERWOOD SURVEY DATA, AND SURVEY DATA COLLECTED BY CEC IN FEBRUARY 2019 AND MAY 2019.
2. STREAM AND WETLAND FEATURES ARE BASED ON DELINEATION SURVEY DATA COLLECTED BY CEC IN JULY 2017, JANUARY 2018, AND MAY 2019.
3. PROPERTY BOUNDARIES OBTAINED FROM AUTOCAD FILE "MARKWEST SMITHBURG – PARCEL DATA.DWG", PROVIDED BY ECI ON 02/19/2019.
4. PROPOSED ELECTRIC LINE INFORMATION PROVIDED BY FIRSTENERGY, PROVIDED 01/16/2019.
5. EXISTING UTILITIES ARE BASED ON DATA RECEIVED FROM UTILITY COMPANIES AND SUPPLEMENTED BY FIELD SURVEY PERFORMED BY CEC IN FEBRUARY 2019. CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES.

P:\2019\192-293\-CADD\Dwg\CV01\192293-C900-ESPLAN.dwg{C900}

DRAFT

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

SHERWOOD MIDSTREAM LLC
SMITHBURG 138KV STRUCTURES
DODDRIDGE COUNTY, WEST VIRGINIA

OVERALL EROSION AND SEDIMENT CONTROL PLAN

DATE:	JUNE 2019	DRAWN BY:	ABC
DWG SCALE:	1"=500'	CHECKED BY:	JWR
PROJECT NO:			192-293
APPROVED BY:			ZJC

DRAWING NO.: **C900**

SHEET 9 OF 32

HYDRAULIC STUDY OF BUCKEYE CREEK

SMITHBURG 138KV STRUCTURES PROJECT
DODDRIDGE COUNTY, WEST VIRGINIA

Prepared for:

SHERWOOD MIDSTREAM LLC

Prepared by:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
PITTSBURGH, PENNSYLVANIA

CEC Project 192-293

JUNE 2019

Civil & Environmental Consultants, Inc.

Pittsburgh

333 Baldwin Road | Pittsburgh, PA 15205 | p: 412-429-2324 f: 412-429-2114 | www.cecinc.com

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 BACKGROUND

Sherwood Midstream LLC (Sherwood) has contracted Civil & Environmental Consultants, Inc. (CEC) to perform a flood study, on their behalf, as part of the construction of the proposed Smithburg 138kV Structures project. The proposed Smithburg 138kV Structures project will begin at the previously permitted Buckeye Run Breaker Station site which currently serves as a gravel parking area for an existing natural gas processing plant located approximately one-half-mile east of the intersection of U.S. Route 50 and County Route 20 along County Route 50/34 in Doddridge County, West Virginia. The Buckeye Run Breaker Station was approved under floodplain permit #18-537 on March 12, 2019. A site location map has been provided in Appendix A.

1.2 PURPOSE

The purpose of this study is to provide a Hydraulic and Hydrologic (H&H) analysis of the existing 100-year floodplain of Buckeye Creek and the effect on the floodplain by the proposed 138kV structures and the previously permitted breaker station grading and associated structures. The H&H analysis will be used to compare the existing and proposed 100-year floodplain water surface elevations (WSELs) of Buckeye Creek upstream and downstream of the proposed 138kV structures and previously permitted breaker station. This comparison will show the theoretical impacts, if any, of the proposed 138kV structures and the previously permitted breaker station along the study area of the tributary as it relates to the 100-year floodplain WSELs.

1.3 SCOPE OF SERVICES

CEC has performed this H&H analysis of the existing and proposed conditions along a portion of Buckeye Creek upstream and downstream of the proposed 138kV structures and previously permitted breaker station for the 100-year floodplain WSELs. The following scope of services was performed in order to achieve the above-stated purpose:

- Performance of hydraulic analyses utilizing the Hydrologic Engineering Center River Analysis System (HEC-RAS) version 5.0.0 program to perform a detailed backwater analysis of Buckeye Creek for the existing and proposed conditions during the 100-year, 24-hour storm event. The study included:

    - Development of an appropriate number of stream cross-sections for use in the HEC-RAS model;
    - Development of HEC-RAS proposed cross-sections utilizing the topographic base map previously prepared for the original study, updated to include the proposed grading and structures located within the study area.
    - Development of proposed floodplain 100-year water surface elevations

- Preparation of this hydraulic analysis report that summarizes our calculations and findings.

1.4 AUTHORIZATION

This study was performed as authorized by Sherwood.

1.5 STANDARD OF CARE

The services provided by CEC were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the civil engineering profession practicing contemporaneously under similar conditions in the locality of the project. No warranty, express or implied, is made.

2.0 HYDROLOGIC ANALYSIS

2.1 METHODOLOGY

The Federal Emergency Management Agency (FEMA) conducted a Flood Insurance Study (FIS) for Doddridge County, West Virginia, October 4, 2011. According to this study, Buckeye Creek discharges 5,150 cubic feet per second (cfs) at its upstream confluence with Long Run during the 100-year, 24-hour storm event. The FEMA FIS is included in Appendix B.

In order to maintain conditions similar to the FIS, the discharge of 5,150 cfs and the known water surface elevation of 811 were used during the hydraulic analysis, as described in Section 4. The FEMA Flood Insurance Rate Map is provided in Appendix B.

3.0 HYDRAULIC ANALYSIS

The U.S. Army Corps of Engineers HEC-RAS computer software was utilized to analyze the hydraulic capacity and project water surface elevations (WSELs) along Buckeye Creek during the 100-year, 24-hour design storm evaluations. The Buckeye Creek study area boundary extended from approximately 2,460 feet downstream to approximately 1,045 feet upstream of the previously permitted bridge location. A map of the cross section locations utilized for the hydraulic analysis is located in appendix D.

3.1 EXISTING CONDITIONS

A HEC-RAS model for the existing conditions was created using survey information collected by CEC, DEM data, and the FEMA FIS for Doddridge County, WV dated October 4, 2011.

An existing bridge at Station 26+25.35, between cross-sections R and S, was previously permitted to be removed and replaced by the new bridge for the neighboring natural gas processing plant. For conservative design purposes, the existing bridge is included in the existing conditions model, however it was removed on November 13, 2013.

Topography was collected for the stream and overbanks between stations 25+54.54 (Section T) and 0+00 (Section NN) during the survey conducted in 2014. This topography is more accurate and current than the existing DEM topography available for the area, so it was used to supplement the DEM topography in the existing flood study model. The HEC-RAS input and output data for the existing conditions model is provided in Appendix C. The map in Appendix D also shows the estimated lateral extent of the floodplain resulting from the 100-year, 24-hour design storm.

Included in Appendix E is the HEC-RAS summary table for the estimated water surface elevations in Buckeye Creek resulting from the 100-year, 24-hour design storm at each analyzed cross-section based on the existing conditions.

3.2 PROPOSED CONDITIONS

The HEC-RAS model for the proposed conditions was developed by revising the existing conditions Buckeye Creek cross-sections to include the current neighboring natural gas processing plant and the previously permitted breaker station grading and proposed 138kV structures. The elevations of the substation grading and structures are shown on the map in Appendix D. The previously permitted improvements include equipment and grading to elevate the breaker station. The previously permitted grading change is located between cross-sections I (31+04.54) and O (28+04.54) and the proposed utility poles are shown on the map in Appendix D.

The HEC-RAS input and output data for the proposed conditions model have been provided in Appendix C. The HEC-RAS summary table for proposed conditions for each cross section is summarized in the hydraulic calculations in Appendix E. In addition, a summary table for the comparison of the 100-year existing and proposed water surface elevations is located at the end of Appendix E.

4.0 CONCLUSIONS

The following conclusions are presented based on the results of engineering analyses using the HEC-RAS model.

4.1 EXISTING CONDITIONS

The existing conditions, as previously described, were evaluated to estimate the WSEL near the proposed breaker station and associated structures. The water surface elevation at Station 26+03.43 (Section S), one cross section downstream of the existing bridge, is 811.11 feet, based on the HEC-RAS existing conditions model. Appendix E contains a summary table of the HEC-RAS results. Also provided are graphical results of the HEC-RAS analysis for the 100-year design storm at numerous sections along Buckeye Creek. Based on these analyses, the following conclusions were developed:

- The 100-year, 24-hour design storm will not overtop the existing bridge at Station 26+25.35 (The existing bridge was removed on 11/13/2013); and
- The 100-year, 24-hour design storm will inundate approximately 53 acres, as shown in Drawing SP01 in Appendix D.

4.2 PROPOSED CONDITIONS

The proposed HEC-RAS model was setup to analyze the previously permitted breaker station and proposed 138kV structures. The water surface elevation at Station 26+03.43 (Section S), two cross sections upstream of the neighboring natural gas processing plant bridge, is 813.43 feet. Appendix E contains a summary table of the HEC-RAS results for Buckeye Creek considering the previously permitted substation and proposed 138kV structures. Also provided are graphical results of the HEC-RAS analysis for the 100-year design storm at numerous sections along Buckeye Creek. The section locations are shown in drawing SP01 in Appendix D.

The increase in WSEL between existing and proposed conditions at Station 28+54.58 (Section N) is 0.51 feet. Station 28+54.58 (Section N) is the location of the furthest downstream cross section to be impacted by the previously permitted breaker station grading and the proposed 138kV structures. The largest increase in WSEL between existing and proposed conditions is at Station 32+04.54 (Section G) and is 0.91 feet. Station 32+04.54 (Section G) is the cross section immediately upstream of the previously permitted substation and shows that the backwater effects of the proposed structures and grading will not significantly impact the 100-year floodplain. Additionally, the increase in WSEL at the neighboring natural gas processing plant bridge will not overtop the bridge, as was shown in previous analyses.

Based on these analyses, the following conclusions were developed:

- The 100-year, 24-hour design storm will not overtop the constructed bridge at Station 24+60.04;
- The 100-year, 24-hour design storm will inundate approximately 34 acres as shown on Drawing SP01 in Appendix D;
- The 100-year, 24-hour design storm will increase the flood elevation 0.91 feet at Station 32+04.54 (Section G), one section upstream of the proposed breaker station and within the subject property; and
- The water surface elevation increase at Station 35+04.54 (Section A), approximately 315 feet downstream from the subject property line, is 0.49 feet.

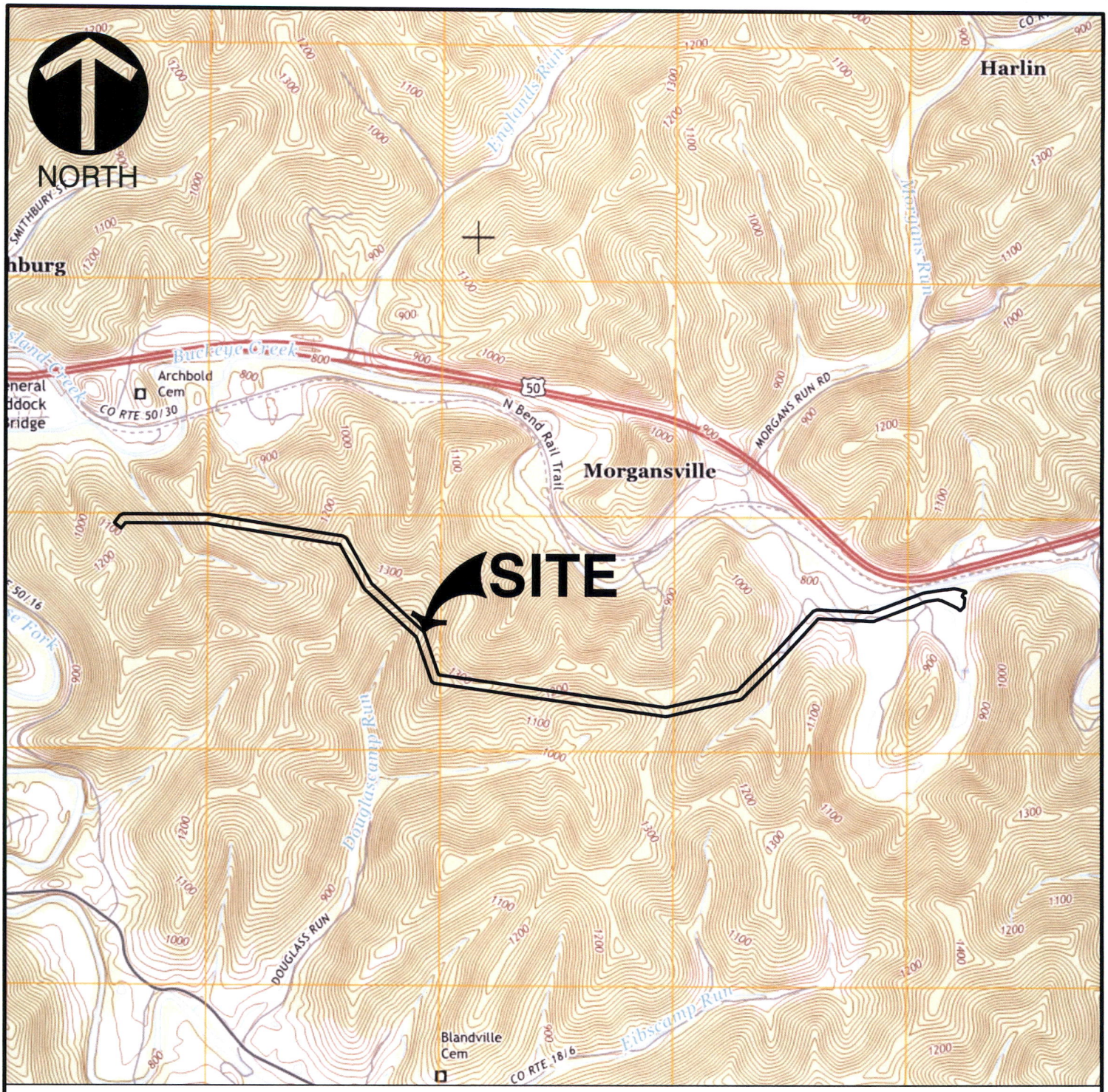
4.3 SUMMARY

The hydraulic analysis was prepared to provide a comparison between the post-development floodplain conditions along Buckeye Creek and the existing conditions. The previously permitted breaker station and proposed 138kV structures will not increase the WSEL at the constructed bridge located approximately 200 feet downstream of the previously permitted breaker station improvements. The WSEL at the cross section immediately upstream of the previously permitted substation will increase by 0.91 feet over the existing conditions. The WSEL increase at Station 35+04.54 (Section A), approximately 315 feet downstream from the

subject property line, is 0.49 feet. The previously permitted breaker station and proposed 138kV structures should not adversely impact the flooding threat to life, property, or the environment of properties upstream of the subject property.

APPENDIX A

SITE LOCATION AND SOILS MAPS



REFERENCE

1. U.S.G.S. 7.5' TOPOGRAPHIC MAP, SMITHBURG QUADRANGLE, WV DATED: 2006, PHOTOREVISED: JUNE 2014

SCALE IN FEET

0 2000 4000

Civil & Environmental Consultants, Inc.

333 Baldwin Road · Pittsburgh, PA 15205

412-429-2324 · 800-365-2324

www.cecinc.com

SMITHBURG 138KV STRUCTURES PROJECT
DODDRIDGE COUNTY, WEST VIRGINIA

SITE LOCATION MAP

DRAWN BY:	PJH	CHECKED BY:	ARC	APPROVED BY:	RPC	FIGURE NO.:
DATE:	DECEMBER 2018	DWG SCALE:	1"=2,000'	PROJECT NO:	192-293	1

P:\2019\192-293\-CADD\Dwg\CV01\192-293-CV01-FIG1.dwg[FIG1] LS:(6/24/2019 - btomiczek) - LP: 6/24/2019 5:02 PM

SCALE IN FEET
0 1000 2000

REFERENCE

1. SOIL MAP INFORMATION BASED UPON USDA WEB SOIL SURVEY; DODDRIDGE COUNTY, WV SURVEY AREA DATA: VERSION 9: NOVEMBER 27, 2018.

LEGEND

LIMIT OF DISTURBANCE
SOIL TYPE BOUNDARY
ShF SOIL TYPE

SCALE IN FEET
0 500 1000

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

SMITHBURG 138KV STRUCTURES PROJECT
DODDRIDGE COUNTY, WEST VIRGINIA

SOILS MAP

DRAWN BY:	PJH	CHECKED BY:	ARC	APPROVED BY:	RPC	FIGURE NO.:	2
DATE:	DECEMBER 2018	DWG SCALE:	1"=1000'	PROJECT NO:	192-293		

P:\2019\192-293\-CADD\Dwg\CV01\192-293-CV01-FIG2.dwg[FIG2] LS:(6/24/2019 - btomiczek) - LP: 6/24/2019 5:02 PM

APPENDIX B

FEMA FLOOD INFORMATION STUDY AND RATE MAP

SMITHBURG 138KV STRUCTURES PROJECT

Flood Info Location

Map created on 12/10/2018

User Notes:

LOMAs
- Incorporated
- Superseded
- Not incorporated
- No Revalidation Status
- Reevaluated
- Contact Community for Revalidation Status

0.2 Pct Annual Chance Flood Hazard
- 0.2 Pct Annual Chance Flood Hazard

FEMA Effective Floodplains
- Zone AE FLOODWAY
- Zone AE (AH, AO)
- Zone A
- DFIRM Panel Index

Flood Depth (Ft)
- High : 864.11
- Low : 0

LOMRs
- Effective

Flood Hazard Area:
Flood Hazard Area:

Flood Hazard Zone:
Stream:
Watershed (HUC8):
Flood Height:
Water Depth:
Elevation: (Source:)
Location (long, lat):
Community&ID: ()

FEMA Flood Map: **EFF:**
Parcel Number:
Address:

Disclaimer:

The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. **WV Flood Tool (*https://www.MapWV.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.**

MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0145C

FIRM

FLOOD INSURANCE RATE MAP

DODDRIDGE COUNTY, WEST VIRGINIA AND INCORPORATED AREAS

PANEL 145 OF 325

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

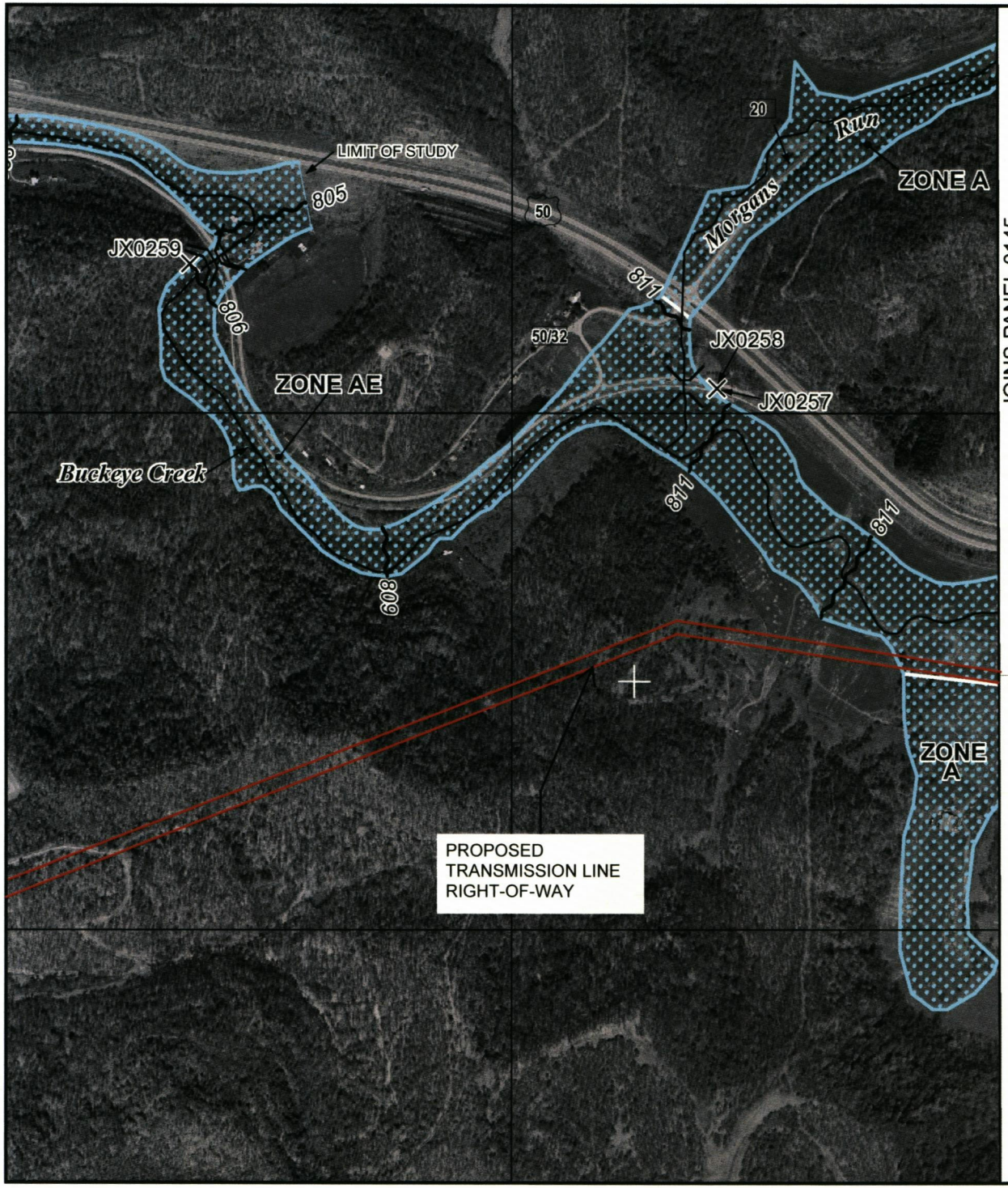
COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0145	C

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
54017C0145C

MAP REVISED
OCTOBER 4, 2011

Federal Emergency Management Agency



MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0140C

FIRM

FLOOD INSURANCE RATE MAP

DODDRIDGE COUNTY, WEST VIRGINIA AND INCORPORATED AREAS

PANEL 140 OF 325

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0140	C

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
54017C0140C

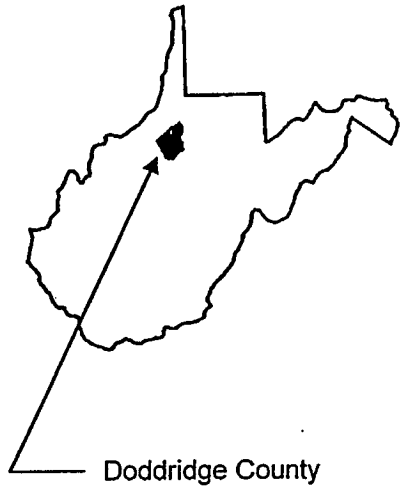
MAP REVISED
OCTOBER 4, 2011

Federal Emergency Management Agency

FLOOD INSURANCE STUDY

DODDRIDGE COUNTY, WEST VIRGINIA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
WEST UNION, TOWN OF	540025
DODDRIDGE COUNTY (UNINCORPORATED AREAS)	540024



Effective: October 4, 2011

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
54017CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Initial Countywide FIS Effective Date: March 18, 1991

Flood Insurance Study Revised: October 4, 2011

TABLE OF CONTENTS – Volume 1 – *October 4, 2011*

TABLE OF CONTENTS – Volume 1 – *October 4, 2011*

FIGURES

TABLES

EXHIBITS

FLOOD INSURANCE STUDY
DODDRIDGE COUNTY, WEST VIRGINIA
AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide format Flood Insurance Study investigates the existence and severity of flood hazards in the geographic area of Doddridge County, West Virginia, including the Town of West Union and the unincorporated areas of the county (hereinafter referred to collectively as Doddridge County); and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State or other jurisdictional agency will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses in this study were prepared by the U.S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA) under Inter-Agency Agreement No. EMW-87-E- 2512. Within the Town of West Union, the work for this study was completed in May 1988; within the unincorporated areas of the county, the work for this study was completed in June 1988.

This digital conversion was prepared by the USACE, Huntington District, for FEMA, under Inter-Agency Agreement No. HSFE03-06-X-0023.

Base map information shown on the FIRM was provided by West Virginia Statewide Addressing and Mapping Board (SAMB). Imagery was captured at a scale of 1:24,000 in the Spring of 2003 for the purpose of producing natural color digital orthophotos at a two-foot pixel resolution.

The projection used in the preparation of this map is Universal Transverse Mercator (UTM) Zone 17, and the horizontal datum used is North American Datum of 1983 (NAD 83), GRS1980 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to UTM, NAD 1983. Differences in the datum, spheroid, projection, or UTM zones used in the production of FIRMs for adjacent counties may

result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of the information shown on the FIRM.

1.3 Coordination

On January 17, 1985, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the county, and the USGS (the study contractor) to determine the streams to be studied by detailed methods. The Huntington District of the U. S. Army Corps of Engineers (USACE) and the Soil Conservation Service (SCS) were contacted for information pertinent to this study.

On April 18, 1990, a final CCO meeting was held with representatives of FEMA, the county, and the study contractor to review the results of the study. The final CCO meeting for the unincorporated areas of Doddridge County also served as the final CCO meeting for this countywide study, and was open to representatives from all communities within the county that were covered by this countywide study.

For this countywide FIS, the final CCO meeting was held on April 29, 2010, and attended by representatives of the Town of West Union and Doddridge County, West Virginia. All problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Doddridge County, West Virginia, including communities listed in Section 1.1.

Table 1, "Areas Studied by Detailed Methods" lists the streams studied by detailed methods.

Table 1 – Areas Studied by Detailed Methods

Stream	Limits of Detailed Study
Middle Island Creek	From the downstream county boundary to the confluence of Meathouse Fork and Buckeye Creek
Buckeye Creek	From the confluence with Middle Island Creek to a point approximately 240 feet upstream of the confluence of Long Run, and from the confluence of Greenbrier Creek to the confluence of Traugh Fork
Meathouse Fork	From the confluence with Middle Island Creek to County Highway 56, and from a point approximately 1,600 feet downstream of County Highway 25-13 to the confluence of Laurel Run and Big Isaac Creek
McElroy Creek	From the confluence of Flint Run to the confluence of Big Battle Run

Table 1 – Areas Studied by Detailed Methods - continued

Stream	Limits of Detailed Study
Wilhelm Run	From the confluence with Arnold Creek to a point approximately 1.2 miles upstream
Long Run	From the confluence with Buckeye Creek to a point approximately 2.4 miles upstream
Toms Fork	From the confluence with Meathouse Fork to the confluence of Little Toms Fork
Greenbrier Creek	From the confluence with Buckeye Creek to a point approximately 1.9 miles upstream
Big Isaac Creek	From the confluence with Meathouse Fork to the confluence of Little Isaac Creek
Laurel Run	From the confluence with Meathouse Fork to a point approximately 0.9 mile upstream of the confluence with Meathouse Fork

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through January 1990.

All or portions of the following streams were studied by approximate methods: Broad Run, Arnold Creek, Slaughter Run, Flint Run, Riggins Run, Robinson Fork, Big Battle Run, Skelton Run, Talkington Fork, Long Run, Bluestone Creek, Cove Creek, Indian Fork, Nutter Fork, Jockey Camp Run, Morgans Run, Buckeye Creek, Buffalo Calf Creek, Meathouse Fork, Little Toms Fork, Lick Run, Big Isaac Creek, Middle Fork, Dotson Run, Cabin Run, Leason Creek, Right Fork, Left Fork, Elk Lick Run, Pike Fork, Little Battle Run, Piggin Run, Brushy Fork, Rock Run, Wolfpen Run, Englands Run, Jockeycamp Run, Douglascamp Run, Traugh Fork, Bonnet Fork, the South Fork Hughes River, and Sycamore Fork. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Doddridge County.

No Letters of Map Revision (LOMRs) were incorporated for the October 4, 2011, revision.

2.2 Community Description

Doddridge County is located in northern West Virginia. It is bordered by the unincorporated areas of Wetzel and Tyler Counties to the north; the unincorporated areas of Ritchie County to the west; the unincorporated areas of Harrison County to the east; and the unincorporated areas of Gilmer and Lewis Counties to the south. The total land

area contained within the county is approximately 321.6 square miles. In 2000, the population of the county was 7,491 (Reference 1).

The county seat is located in the Town of West Union. The total land area of the town is approximately 0.32 square miles, and the population was 806 in 2000 (Reference 1).

The climate of Doddridge County is temperate with a seasonal variation in temperature. The county is located in a region termed humid continental: humid because of the evenly spaced precipitation, and continental because of the yearly range in temperature. Mean annual precipitation of the county is approximately 45 inches. The average monthly temperatures in degrees Fahrenheit range from the mid-30's in winter to the low 70's in summer (Reference 2).

2.3 Principal Flood Problems

The principal flood problems of Doddridge County are the overflows of Middle Island Creek, Buckeye Creek, and Meathouse Fork. The history of flooding in the county indicates that flooding can occur at any time of the year. Large frontal storms or decaying tropical storms produce the worst flooding on the larger streams, while high intensity thunderstorms produce severe flooding on smaller drainage areas. Major floods have occurred in the county in 1875, 1950, 1963, and 1985.

The mountainous topography of the county is conducive to rapid rises on streams and also to fast runoff best described as flash flooding. This condition has been aggravated by human activities such as timbering in the county.

2.4 Flood Protection Measures

No major structural flood protection measures exist or are planned for the county.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 2-, 1-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 2-, 1-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent-annual-chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the county.

Discharge-frequency curves were developed on a regional basis that applies to West Virginia (References 3 and 4). For the streams studied by detailed methods, 1-percent-annual-chance flood elevations were determined through discharge-frequency relations and the Manning equation. Within the Town of West Union, flood elevations were determined through streamflow-station data relationships and the Manning's equation.

Peak discharge-drainage area relationships for each stream studied by detailed methods are presented in Table 2, "Summary of Discharges".

Table 2 – Summary of Discharges

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS) 1-PERCENT-ANNUAL- CHANCE
MIDDLE ISLAND CREEK		
Upstream of Doddridge-Tyler County boundary	134.78	15,200
Approximately 0.1 mile downstream of confluence of Piggin Run	120.06	13,080
BUCKEYE CREEK		
At confluence with Middle Island Creek	38.62	7,350
Downstream of confluence of Long Run	22.62	5,150
Upstream of confluence of Greenbrier Creek	9.41	3,050
Downstream of confluence of Traugh Fork	1.52	1,310
MEATHOUSE FORK		
At confluence with Middle Island Creek	66.84	9,600
Downstream of confluence of Toms Fork	50.47	8,200
Downstream of confluence of Brushy Fork	29.87	6,050
Downstream of confluence of Laurel Run and Big Isaac Creek	3.76	2,230
MCELROY CREEK		
Upstream of confluence of Flint Run	61.95	9,250
Upstream of confluence of Rigging Run	51.23	8,300
Downstream of confluence of Talkington Fork	39.18	7,100
Downstream of confluence of Robinson Fork and Big Battle Run	20.75	4,900

Table 2 – Summary of Discharges

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ. MILES)	PEAK DISCHARGE (CFS) 1-PERCENT-ANNUAL- CHANCE
WILHELM RUN		
At confluence with Arnold Creek	3.29	2,070
Approximately 1.2 miles upstream of confluence with Arnold Creek	2.07	1,570
LONG RUN		
At confluence with Buckeye Creek	4.44	2,460
Approximately 2.4 miles upstream of confluence with Buckeye Creek	1.85	1,470
TOMS FORK		
At confluence with Meathouse Fork	15.27	4,100
Downstream of confluence of Little Toms Fork	12.58	3,650
GREENBRIER CREEK		
At confluence with Buckeye Creek	2.80	1,880
Approximately 1.9 miles upstream of confluence with Buckeye Creek	1.09	1,080
BIG ISAAC CREEK		
At confluence with Meathouse Fork	1.79	1,450
LAUREL RUN		
At confluence with Meathouse Fork	1.97	1,530
Upstream of confluence of Big Isaac Creek	1.57	1,340

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and the FIRM (Exhibit 2) where applicable.

Water-surface elevations of floods of the selected recurrence intervals were computed

using the USACE HEC-2 step-backwater computer program, and the results were published in a special flood hazard information report (References 5 and 6). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Channel roughness factors (Manning's "n") used in the hydraulic computations were assigned on the basis of field surveys of the stream and floodplain areas. For Middle Island Creek, channel "n" values range from 0.040 to 0.045 and overbank "n" values range from 0.050 to 0.070. For Buckeye Creek and Meathouse Fork, channel "n" values range from 0.055 to 0.080.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Qualifying benchmarks within a given jurisdiction that are catalogued by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Benchmarks catalogued by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation (e.g. mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation (e.g. concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g. concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g. concrete monument above frost line, or steel witness post)

In addition to NSRS benchmarks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for benchmarks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their Web site at www.ngs.noaa.gov.

It is important to note that temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

3.3 Vertical Datum

All elevations used in the original Doddridge county FIS reports were referenced to the National Geodetic Vertical Datum of 1929 (NGVD29), formerly referred to as Sea Level Datum of 1929. All flood elevations shown in this FIS report and on the FIRM are referenced to North American Vertical Datum of 1988 (NAVD88). Structure and ground elevations in the community must, therefore, be referenced to NAVD88. Elevation factors used to convert the NGVD29 elevation data of the previous Braxton county FIS reports to NAVD88 are summarized below. Elevation reference marks used in this study are shown on the maps.

The data points used to determine the conversion are listed in Table 3, "Vertical Datum Conversion Values".

Table 3 – Vertical Datum Conversion Values

USGS 7.5-Minute Quadrangle Name	Corner	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Conversion from NGVD29 to NAVD88 (foot)
Shirley	SE	39.375	80.750	-0.522
Center Point	SE	39.375	80.625	-0.515
Folsom	SE	39.375	80.500	-0.525
Pennsboro	SE	39.250	80.875	-0.554
West Union	SE	39.250	80.750	-0.515
Smithburg	SE	39.250	80.625	-0.502
Oxford	SE	39.125	80.750	-0.531
New Milton	SE	39.125	80.625	-0.522
			AVERAGE	**-0.500 foot**

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. A conversion factor of -.500 feet was applied to the NGVD29 elevations in Doddridge County to convert to NAVD88. Structure and ground elevations in the county must, therefore, be referenced to NAVD88. It is important to note that adjacent communities and counties may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the community and county boundaries.

For more information on NAVD88, see the FEMA publication entitled "Converting the National Flood Insurance Program to the North American Vertical Datum of 1988" (FEMA, June 1992), or contact the National Geodetic Survey Information Services, NOAA, N/NGS12, National Geodetic Survey, SSMC-3, #9202, 1315 East-West Highway, Silver Spring, MD 20910-3282 (Internet address http://www.ngs.noaa.gov).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance (100-year) flood elevations and

delineations of the 1- and 0.2-percent-annual-chance (500-year) floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles and Floodway Data Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. For the streams studied in detail, the 1-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 20 feet (Reference 7).

For the streams studied by approximate methods, the boundaries of the 1-percent-annual-chance floodplain were delineated using the Flood Hazard Boundary Map (FHBM) for the Town of West Union and the FIS for the Unincorporated Areas of Doddridge County (References 8 and 9).

The 1-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1, "Floodway Schematic".

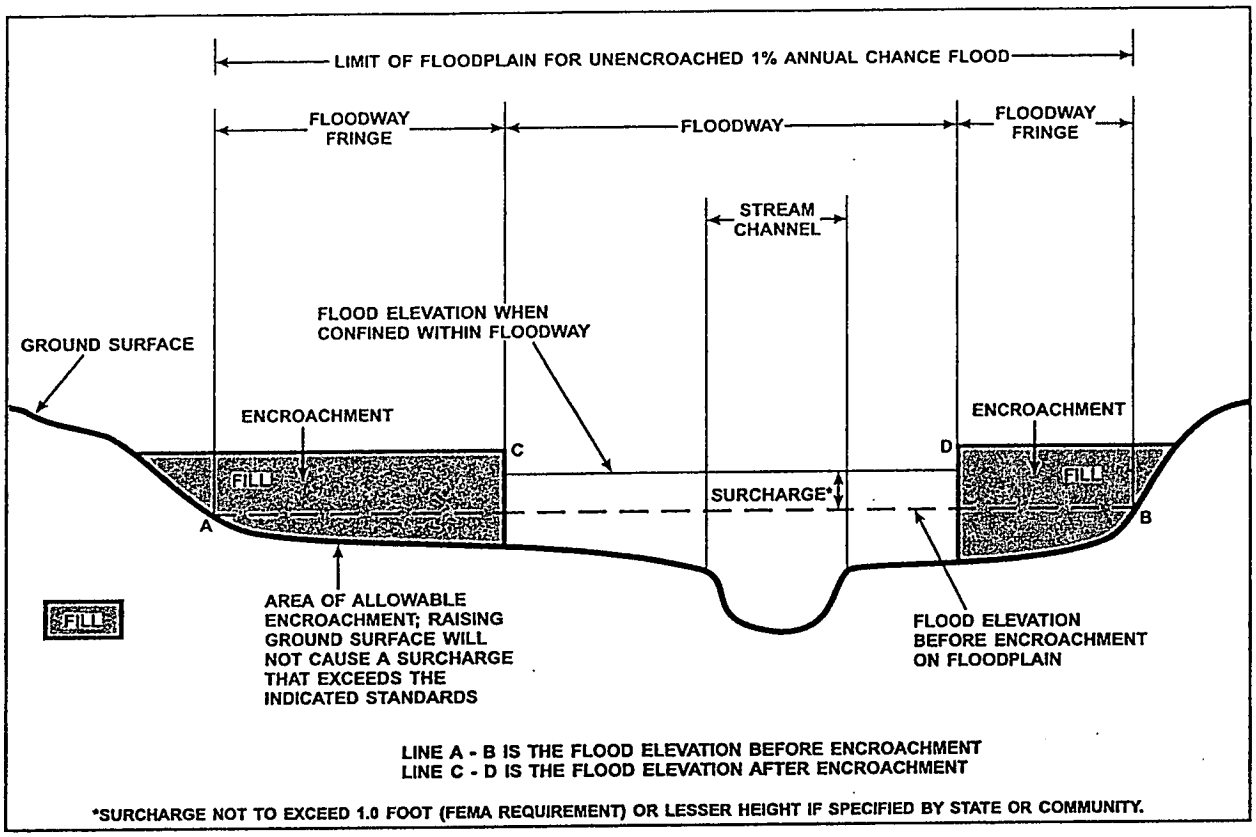


Figure 1 - Floodway Schematic

No floodways were calculated as part of this study.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no (1-percent-annual-chance) BFEs or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Zone AR is the flood insurance risk zone that corresponds to an area of special flood hazard formerly protected from the 1-percent-annual-chance flood event by a flood-control system that was subsequently decertified. Zone AR indicates that the former flood-control system is being restored to provide protection from the 1-percent-annual-chance or greater flood event.

Zone A99

Zone A99 is the flood insurance risk zone that corresponds to areas of the 1-percent-annual-chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No BFEs or depths are shown within this zone.

Zone V

Zone V is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no BFEs are shown within this zone.

Zone VE

Zone VE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1-foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

Zone X (Future Base Flood)

Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.

Zone D

Zone D is the flood insurance risk zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplain. The locations of selected cross sections used in the hydraulic analyses are shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Doddridge County. Previously, separate FHBMs and/or FIRMs were prepared for each incorporated community with identified flood hazard areas and the unincorporated areas of the County. Historical map dates relating to pre-countywide maps prepared for each community are presented in Table 4, "Community Map History".

COMMUNITY NAME	INITIAL NFIP MAP DATE	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	INITIAL FIRM DATE	FIRM REVISIONS DATE
West Union, Town of	March 29, 1974	NONE	March 18, 1991	
Doddridge County (Unincorporated Areas)	November 8, 1974	June 3, 1977	March 18, 1991	

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

Flood Insurance Studies have been prepared for the unincorporated areas of Tyler, Ritchie and Harrison Counties, and for Lewis County and Incorporated Areas (References 10, 11, 12 and 13). The results of this study are in exact agreement with the results of those studies.

A FIS is currently being prepared for Gilmer County and Incorporated Areas (Reference 14). The results of that study will be in exact agreement with the results of this study.

Because it is based on more up-to-date analyses, this study supersedes the Flood Hazard Boundary Map for the Town of West Union and the FIS for the Unincorporated Areas of Doddridge County (References 8 and 9).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region III, One Independence Mall, Sixth Floor, 615 Chestnut Street, Philadelphia, PA 19106-4404.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Holmes, Darrell E., West Virginia Blue Book, Chapman Printing, 2005.

2. U. S. Department of the Interior, Geological Survey, Hydrology of Area 8, Eastern Coal Province, West Virginia, January 1987.

3. U. S. Department of the Interior, Water-Resources Investigation 87-4111, Techniques for Estimating Flood-Depth Frequency Relations for Streams in West Virginia, by Jeffrey B. Wiley, 1987.

4. U. S. Department of the Interior, Geological Survey, in cooperation with the West Virginia Department of Highways, Runoff Studies on Small Drainage Areas by G. S. Runner, Washington, D. C., October 1980.

5. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, April 1984.

6. U. S. Army Corps of Engineers, Huntingdon District, Special Flood Hazard Information Report, Middle Island Creek and Tributaries, Doddridge County, West Virginia, October 1978.

7. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Big Isaac, West Virginia, 1964, Photorevised 1976; Center Point, West Virginia, 1961, Photorevised 1976; New Milton, West Virginia, 1965, Photorevised, 1976; Smithburg, West Virginia, 1961, Photorevised 1976; West Union, West Virginia, 1961, Photorevised 1976.

8. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Town of West Union, Doddridge County, West Virginia, April 2, 1976.

9. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Unincorporated Areas of Doddridge County, West Virginia, Washington, D.C., June 3, 1977.

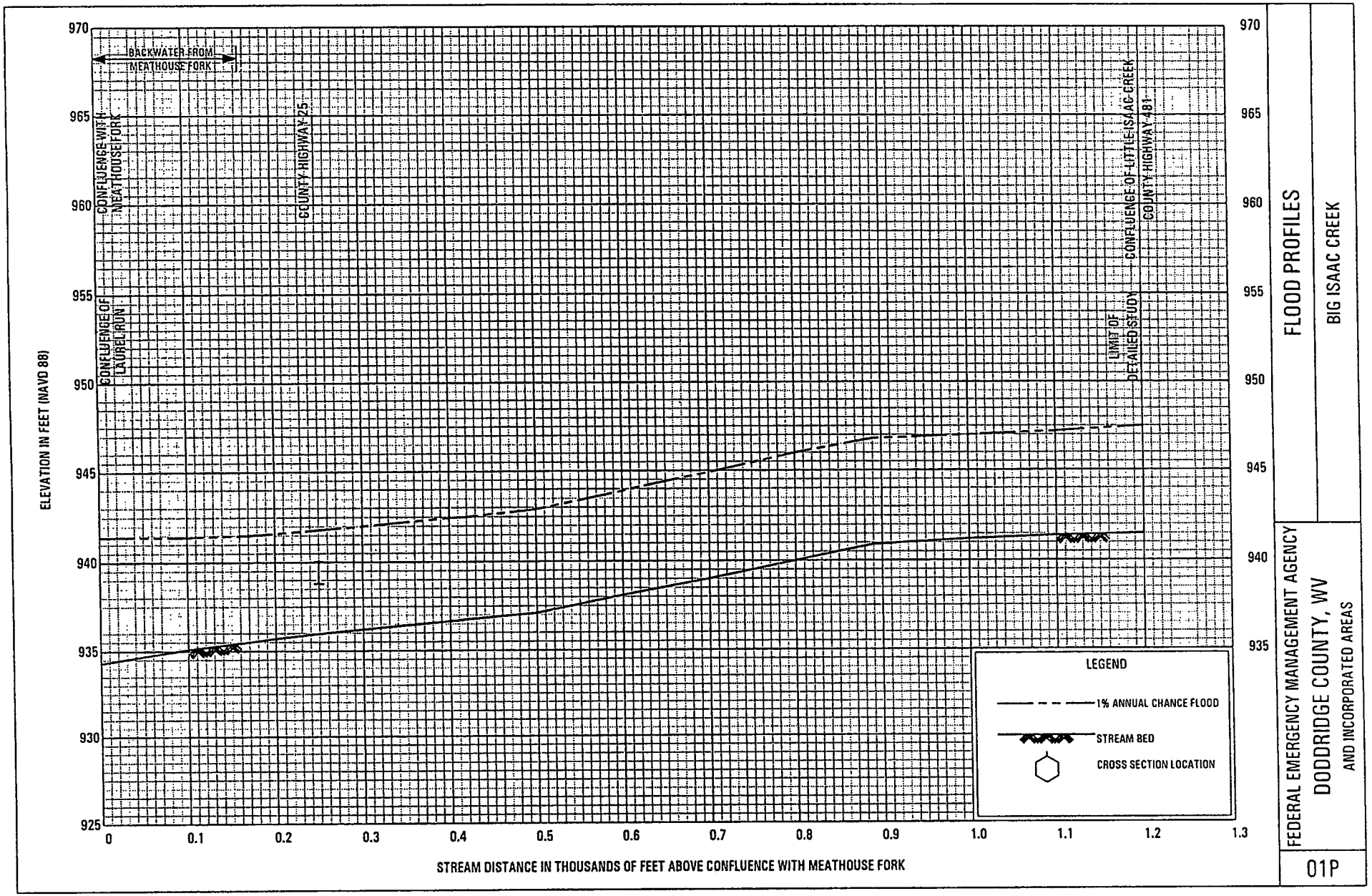
10. Federal Emergency Management Agency, Flood Insurance Study, Unincorporated Areas of Tyler County, West Virginia, Washington, D. C., November 4, 1988.

11. Federal Emergency Management Agency, Flood Insurance Study, Unincorporated Areas of Harrison County, West Virginia, Washington, D. C., July 4, 1988.

12. Federal Emergency Management Agency, Flood Insurance Study, Lewis County and Incorporated Areas, West Virginia, Washington, D.C., July 1, 1987.

13. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Unincorporated Areas of Ritchie County, West Virginia, Washington, D.C., December 11, 1981.

14. Federal Emergency Management Agency, Flood Insurance Study, Gilmer County and Incorporated Areas, West Virginia (Unpublished).



FLOOD PROFILES

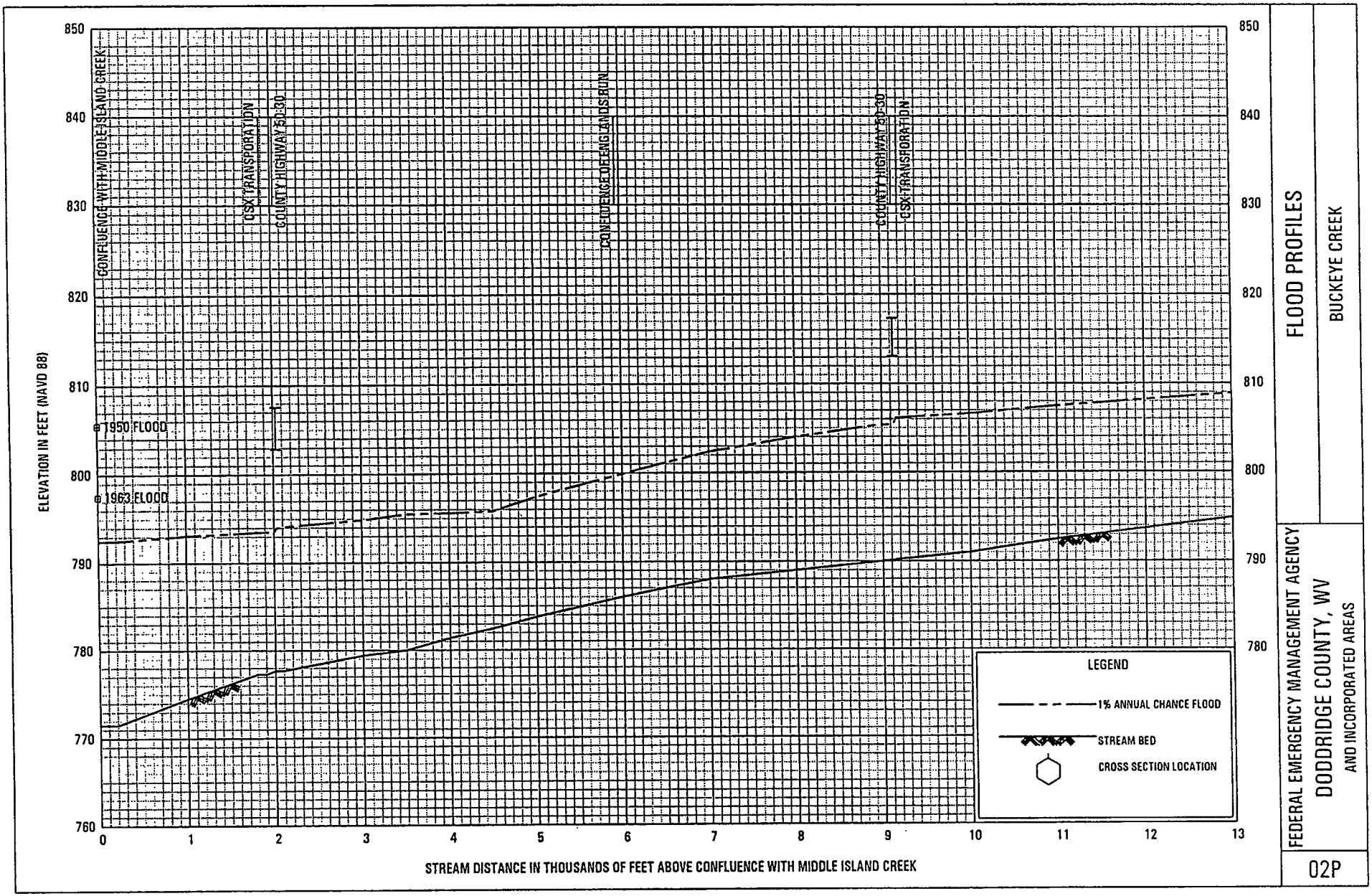
BIG ISAAC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

01P



FLOOD PROFILES

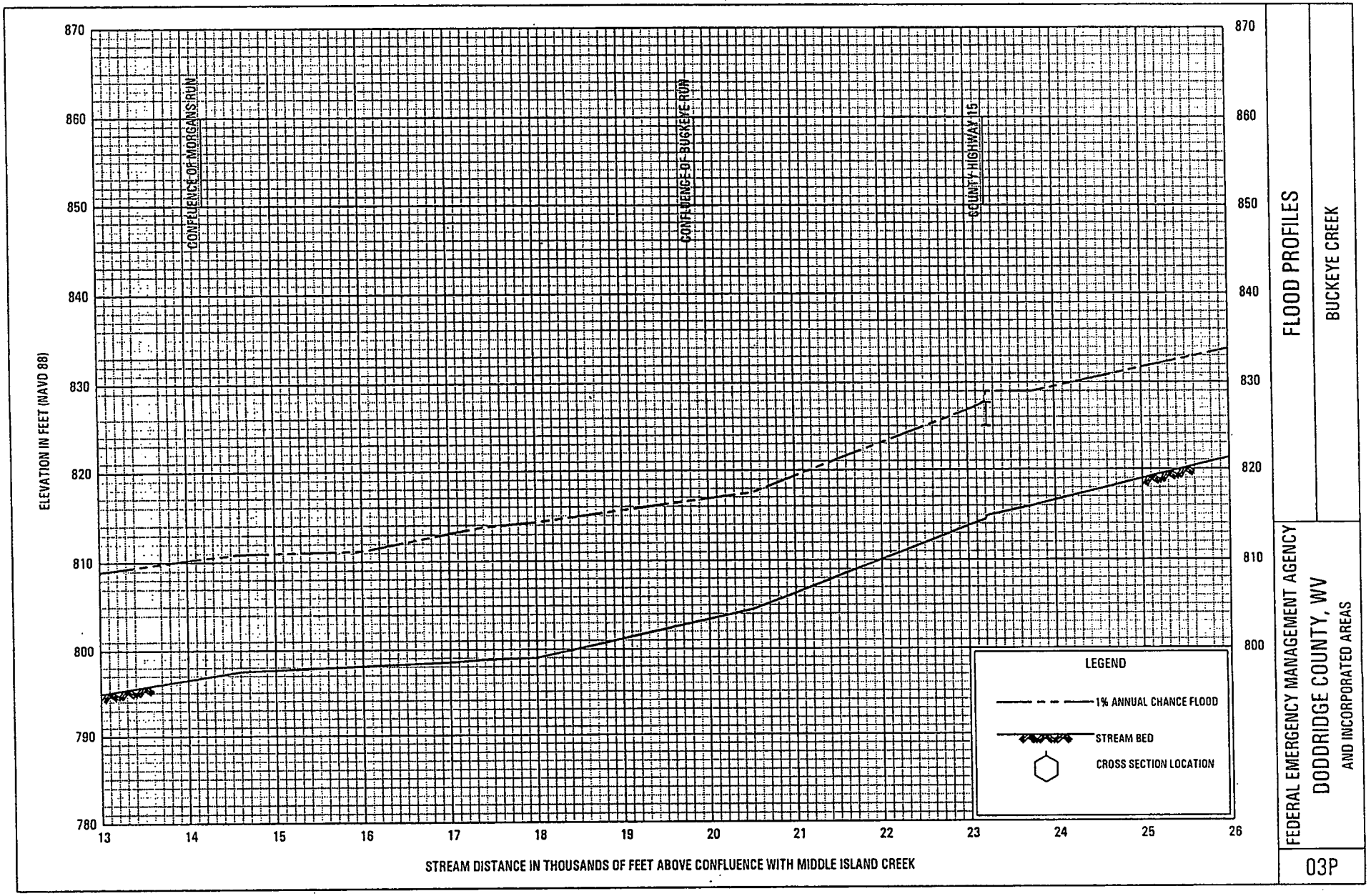
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

02P



FLOOD PROFILES

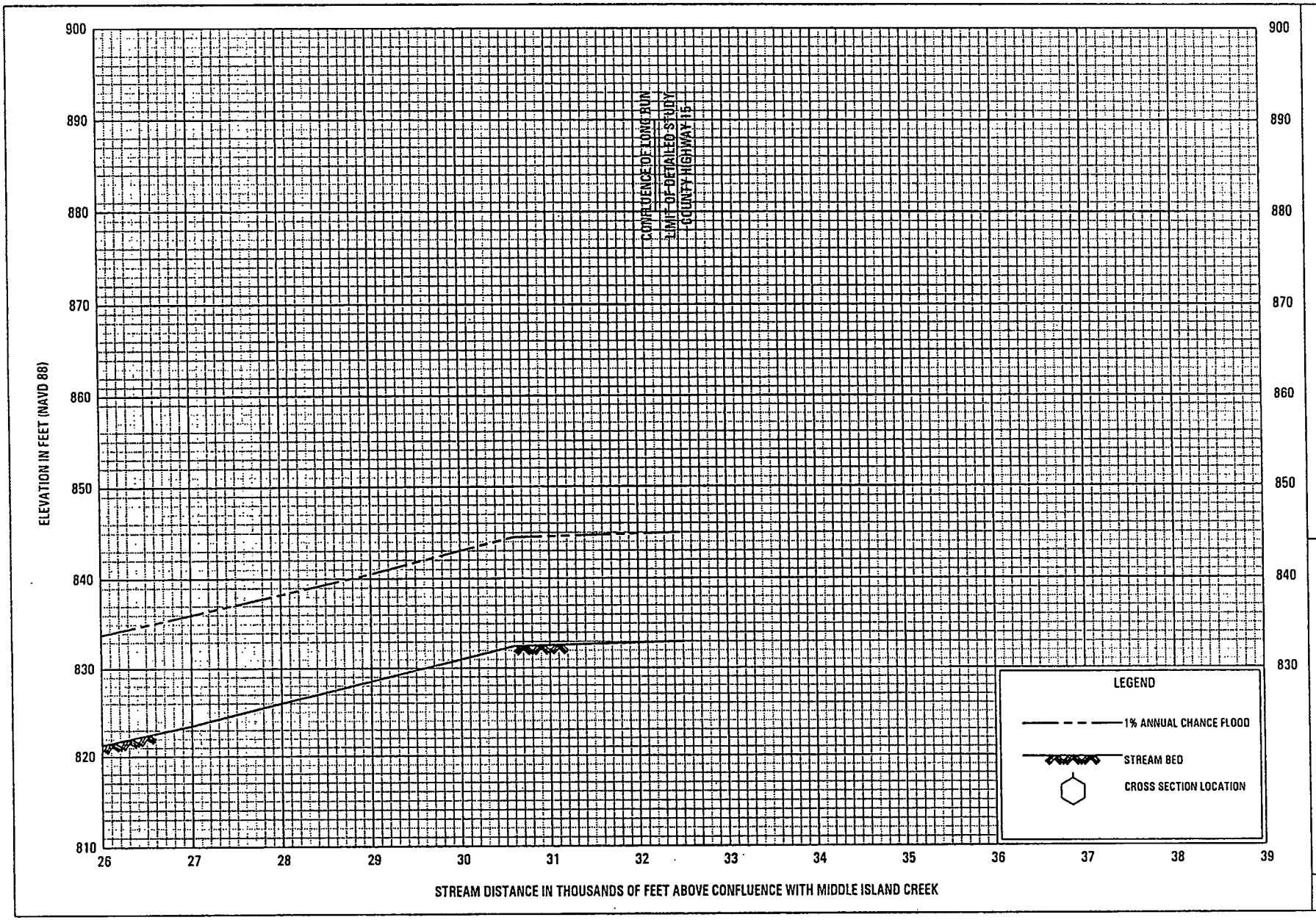
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

03P



FLOOD PROFILES

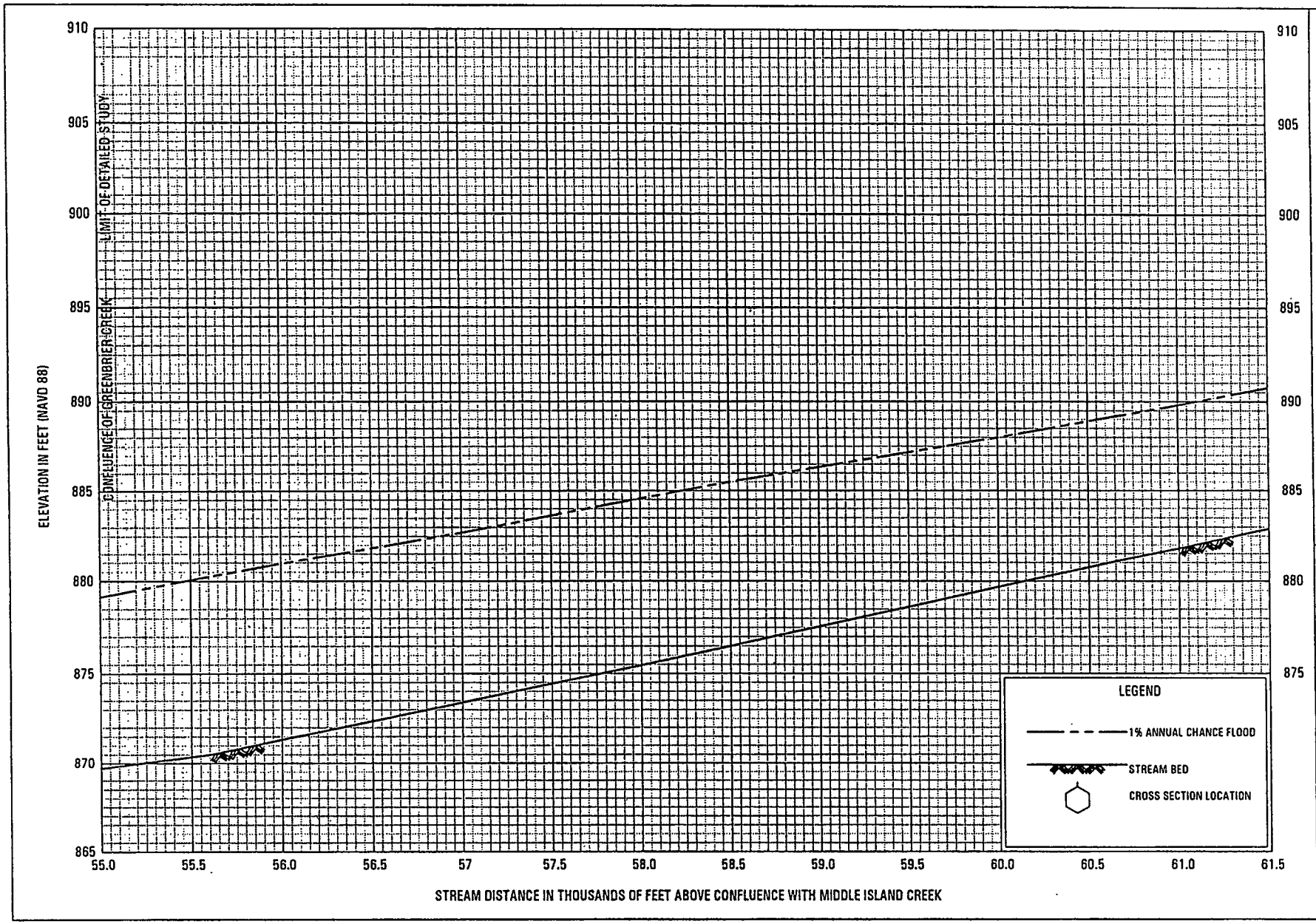
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

04P



FLOOD PROFILES

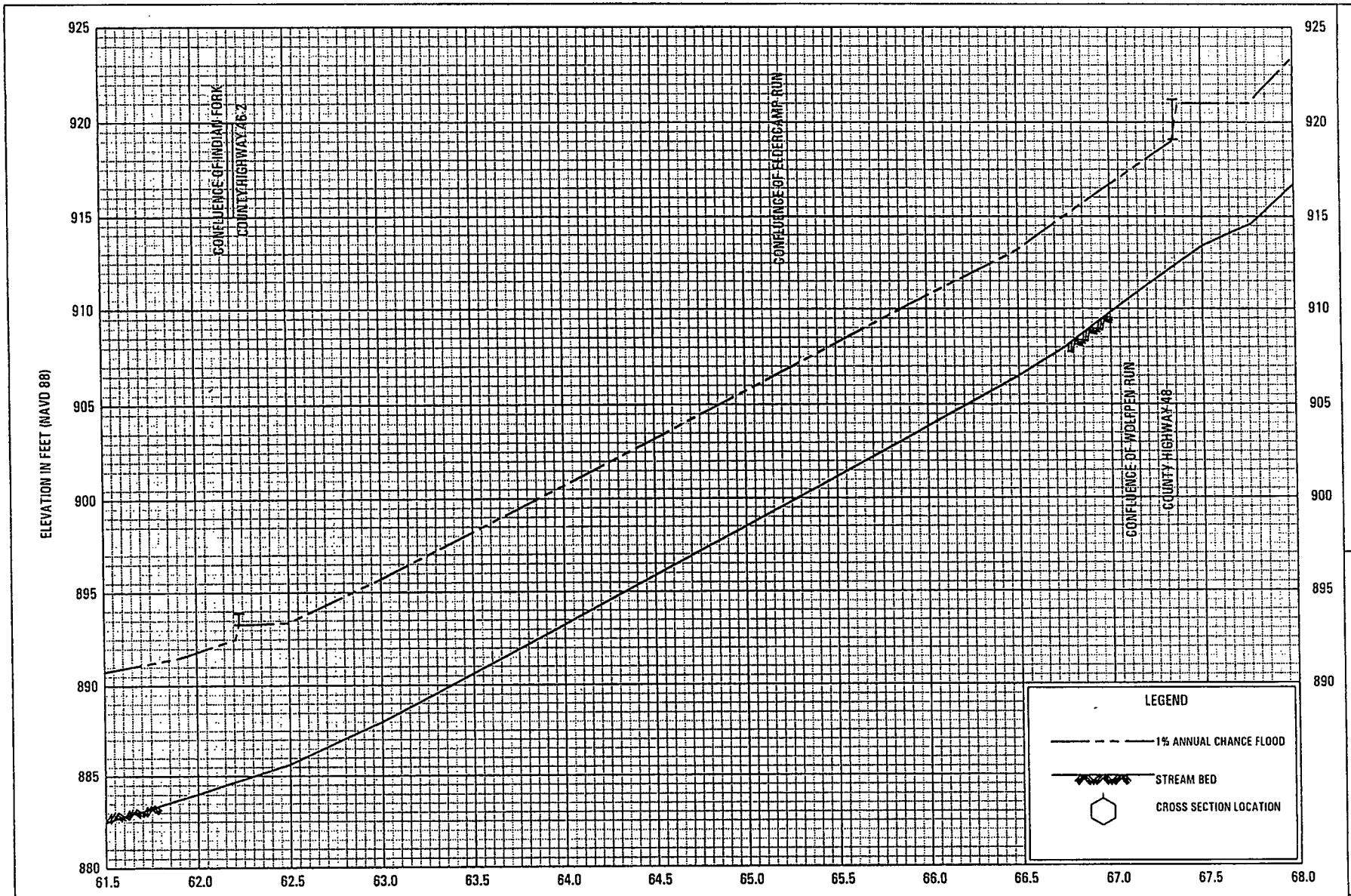
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

05P



FLOOD PROFILES

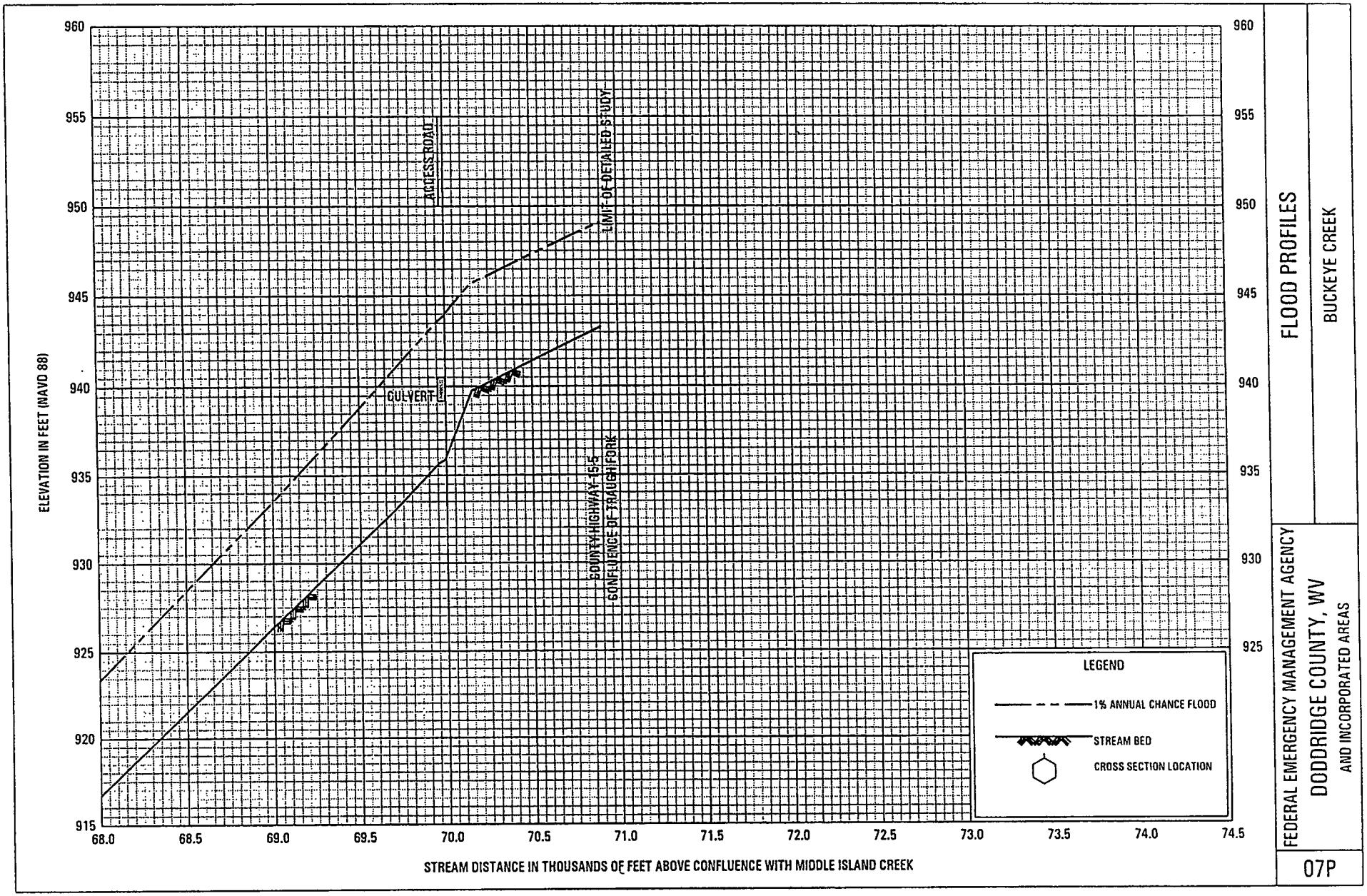
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

06P



FLOOD PROFILES

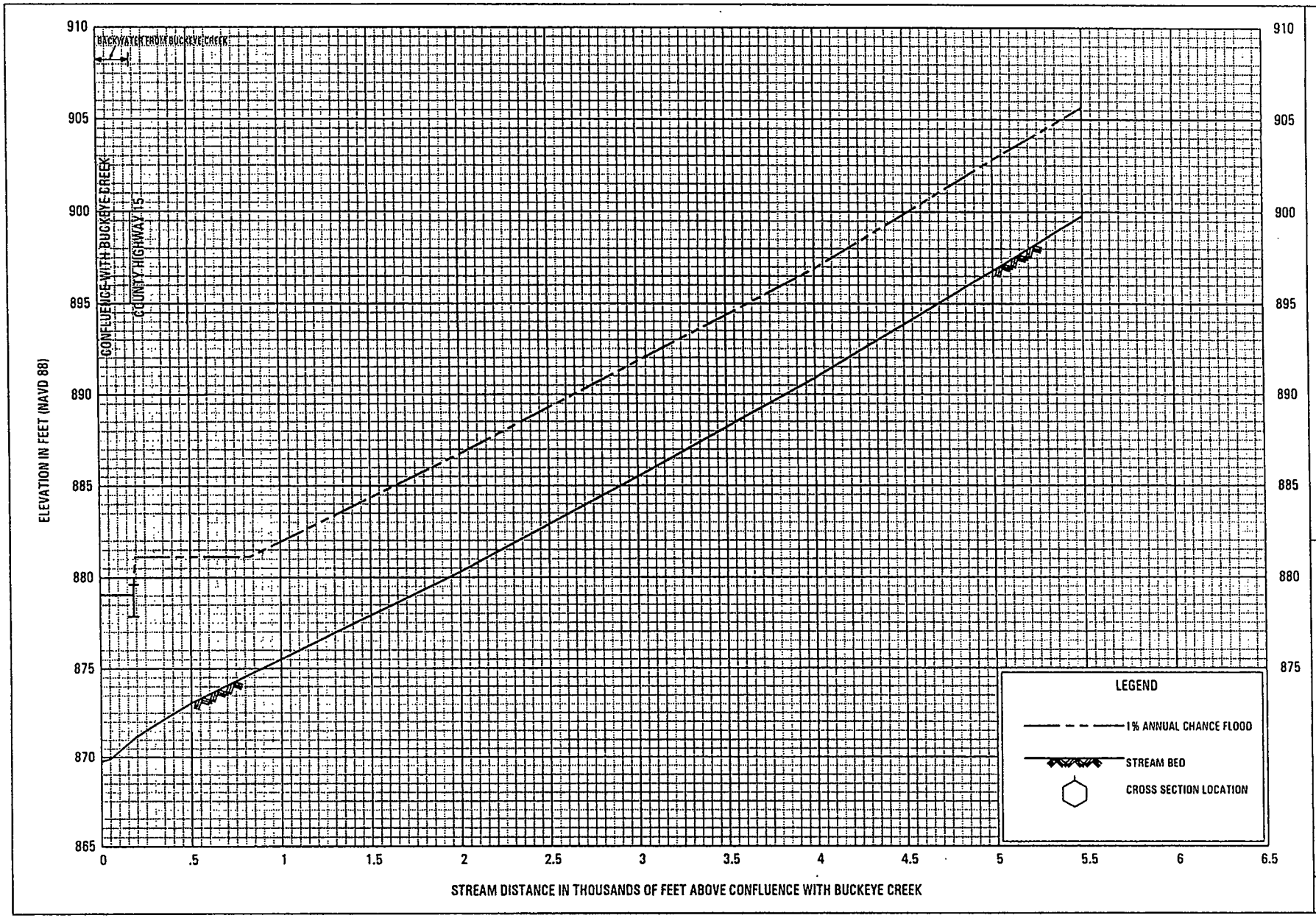
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

07P



FLOOD PROFILES

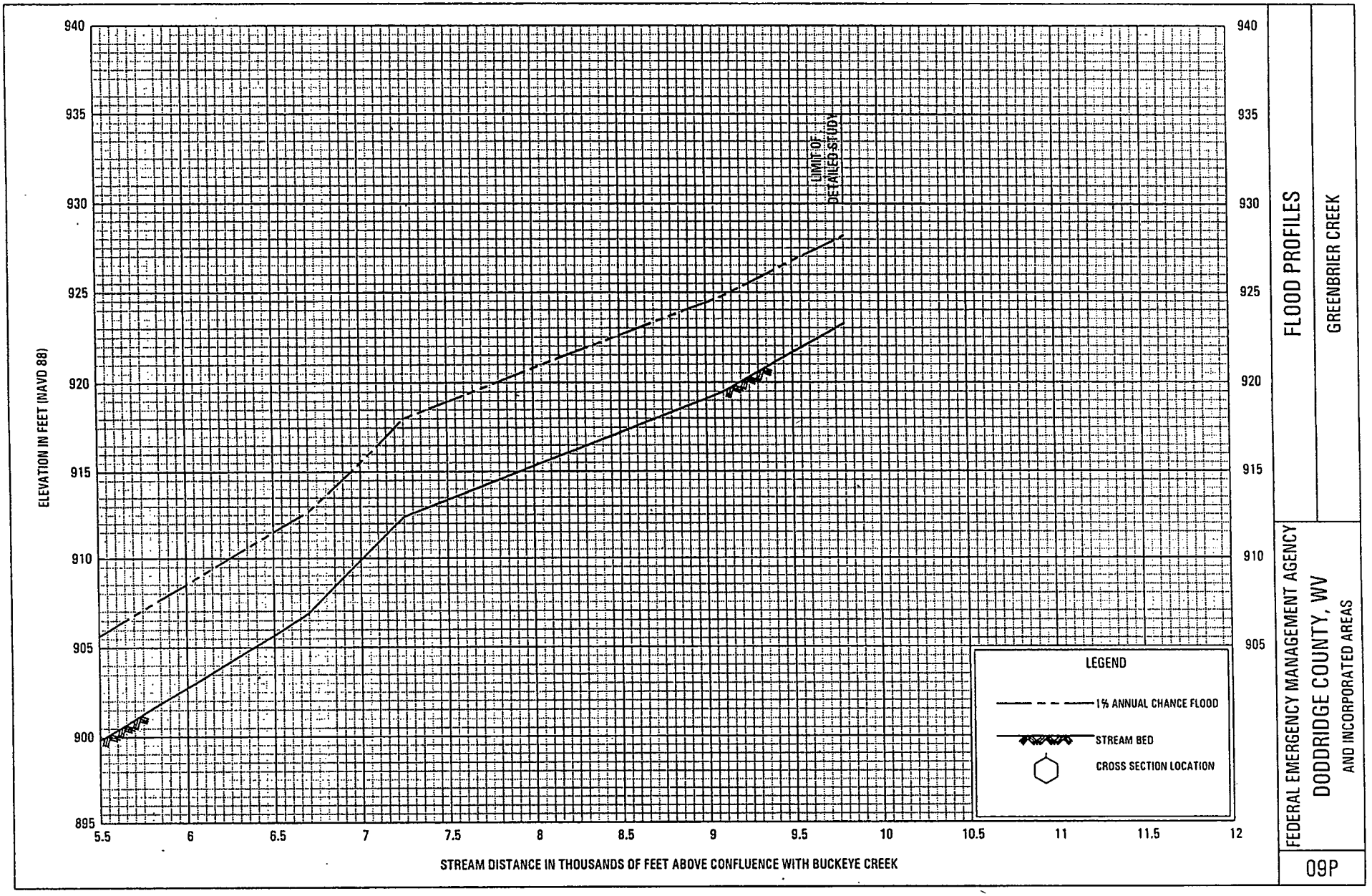
GREENBRIER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

08P



FLOOD PROFILES

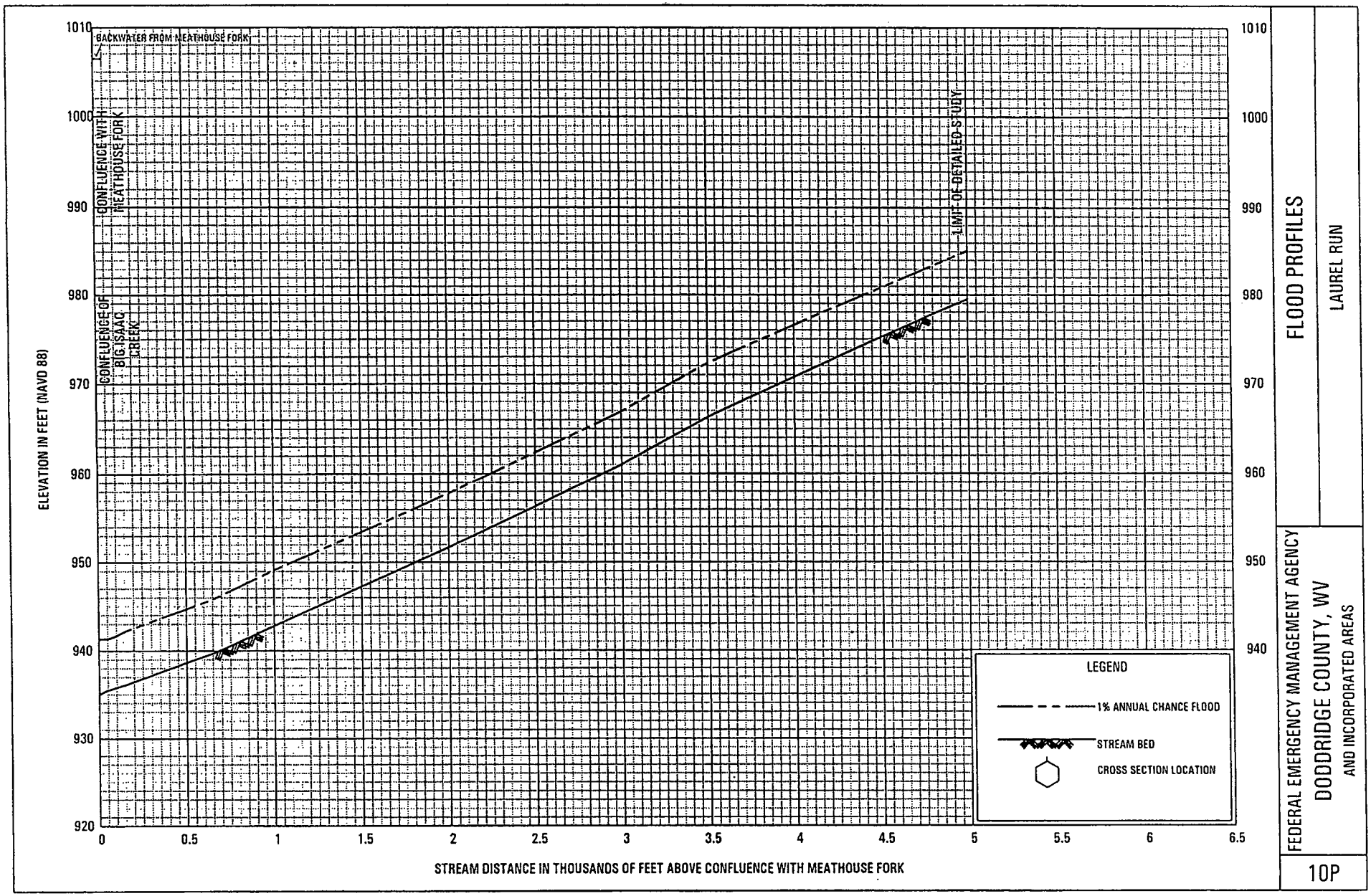
GREENBRIER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

09P



FLOOD PROFILES

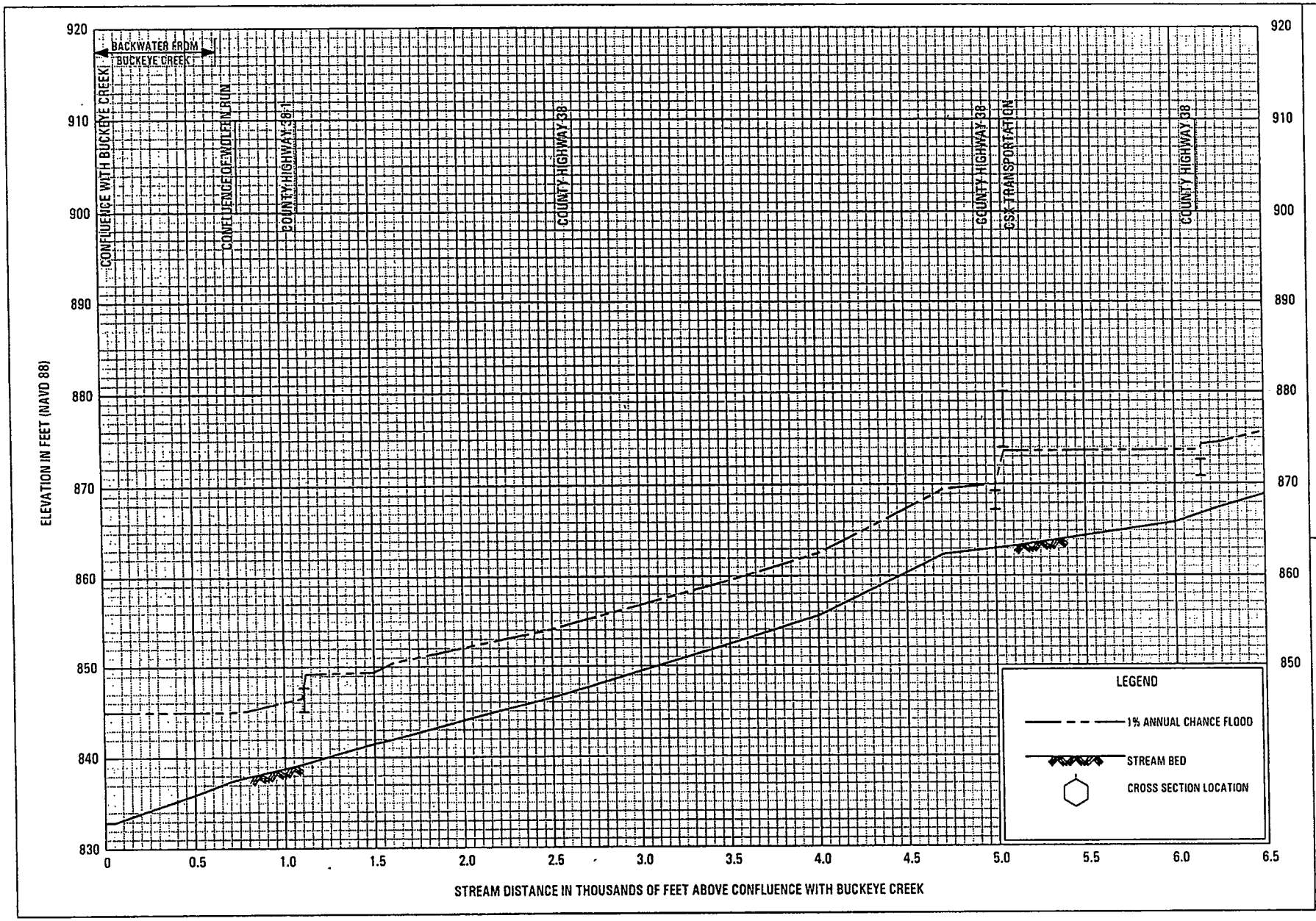
LAUREL RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

10P



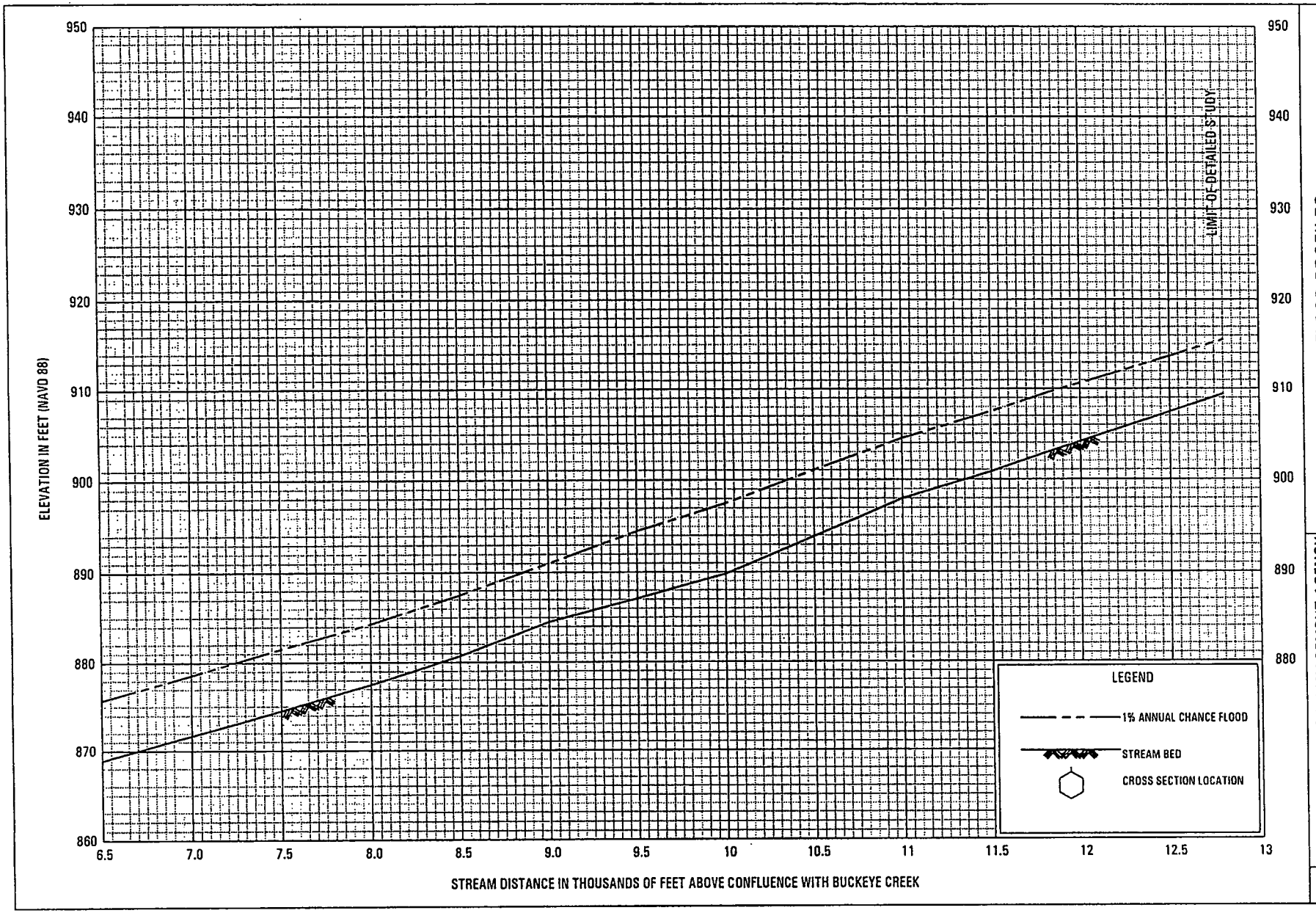
FLOOD PROFILES

LONG RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS



FLOOD PROFILES

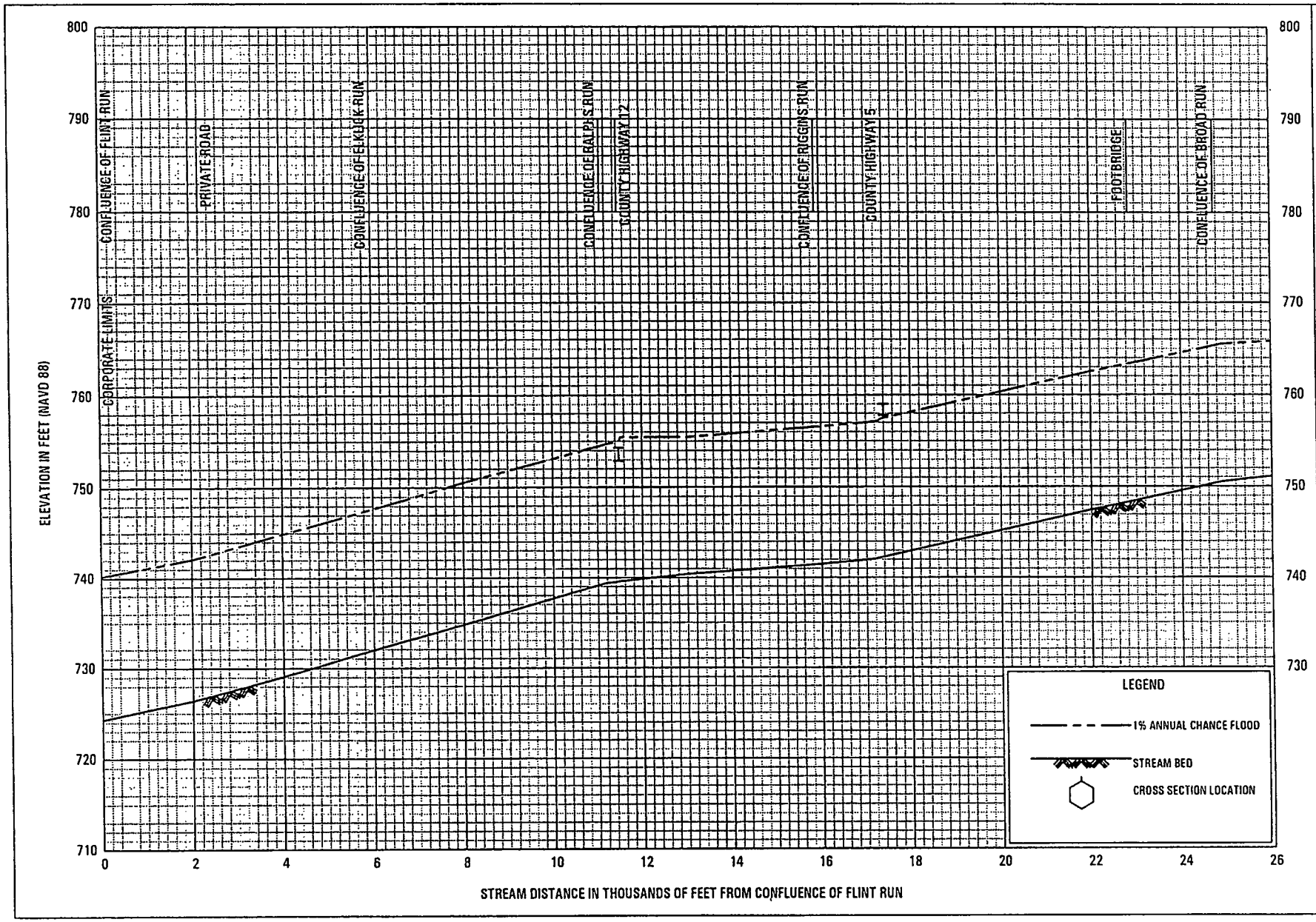
LONG RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

12P



FLOOD PROFILES

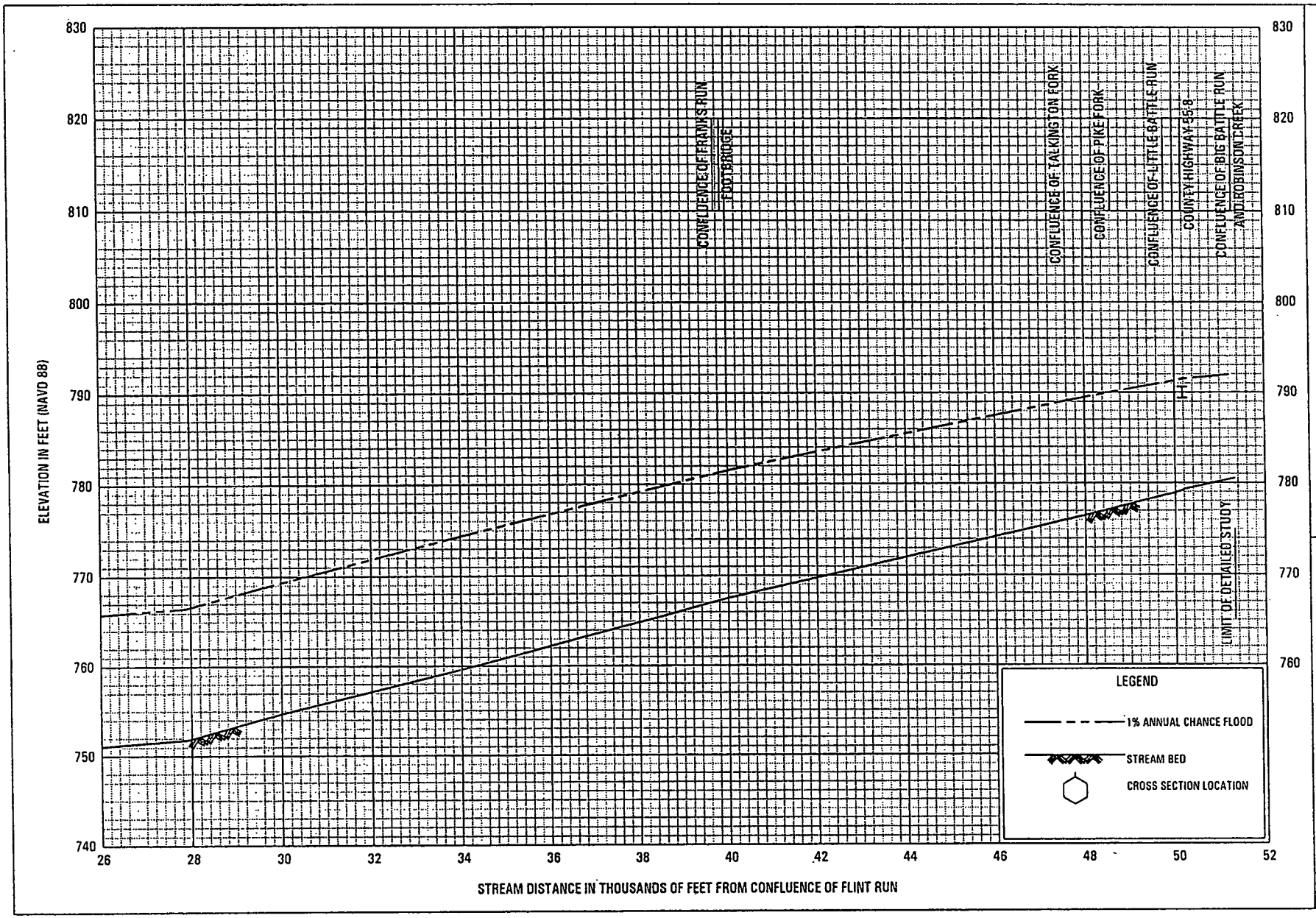
MCELROY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

13P



FLOOD PROFILES

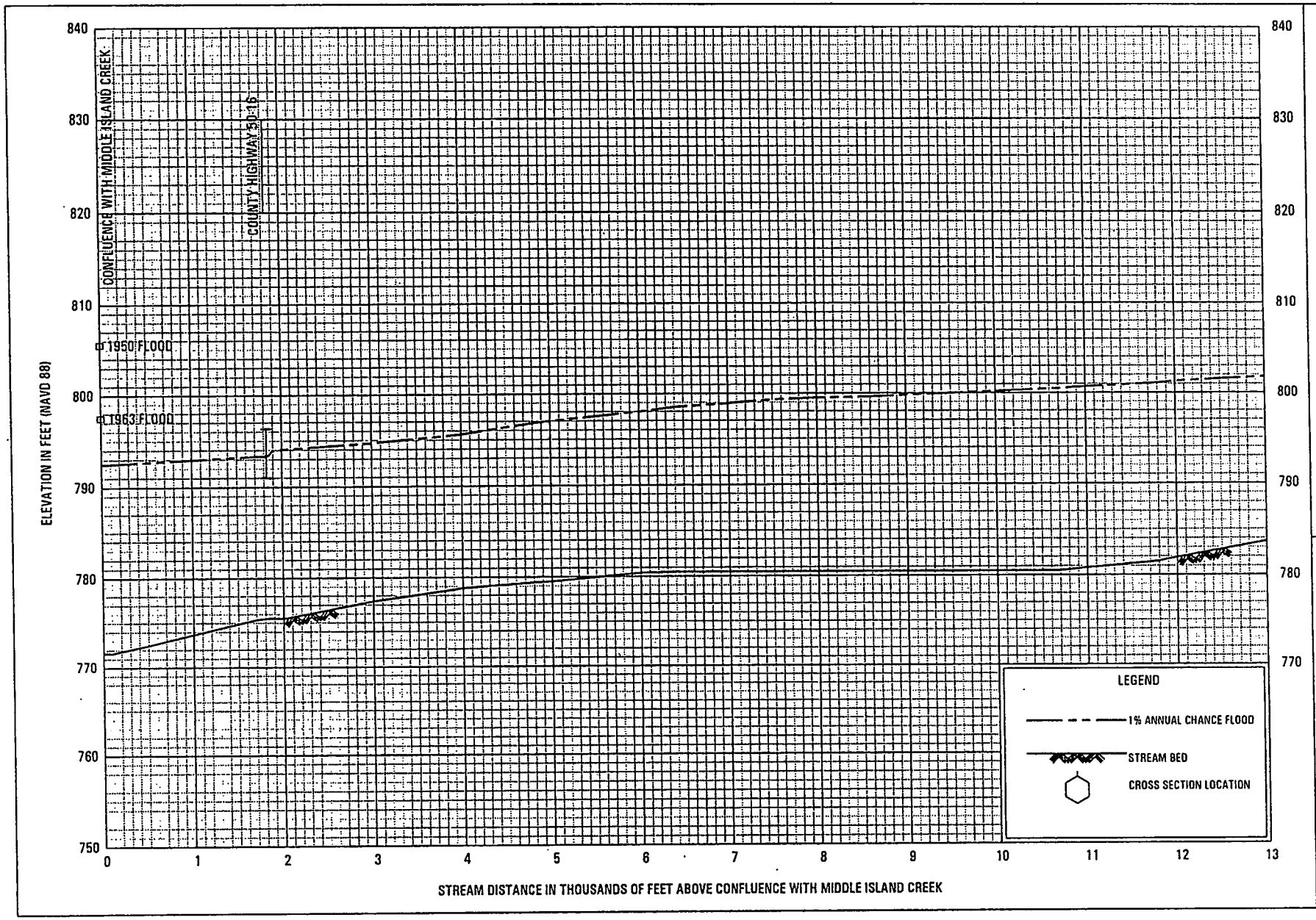
MCELROY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

14P



FLOOD PROFILES

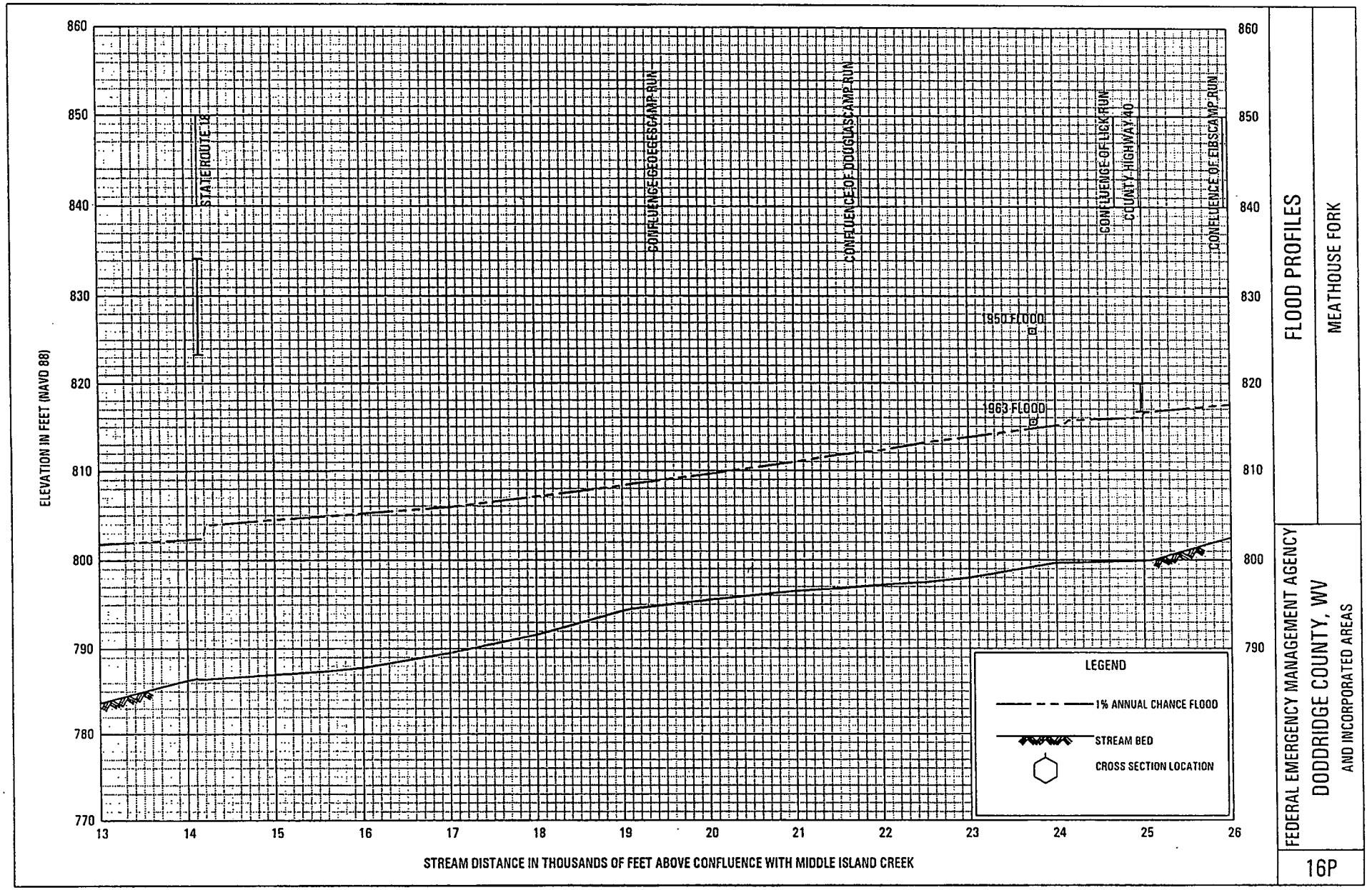
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

15P



FLOOD PROFILES

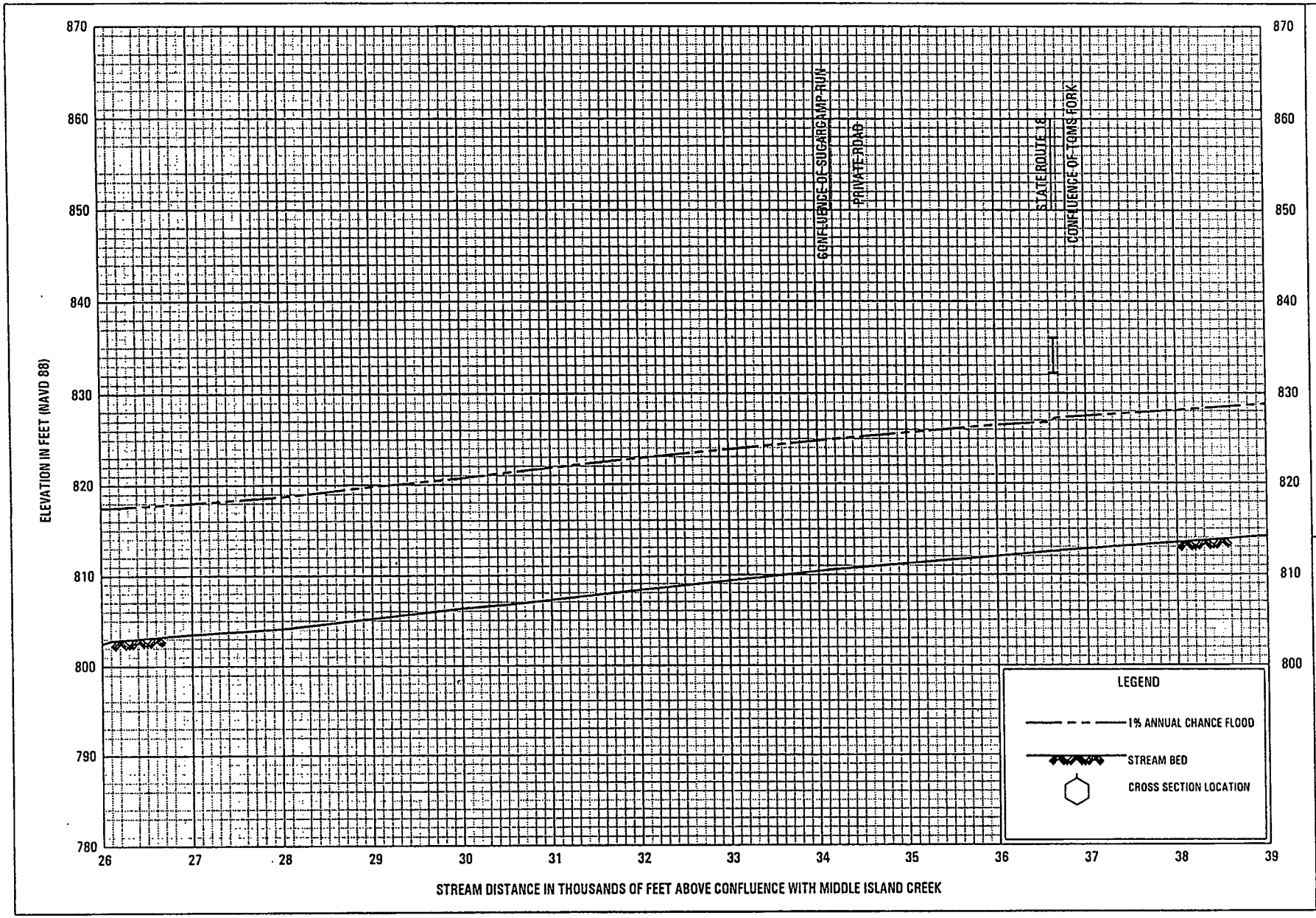
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

16P



FLOOD PROFILES

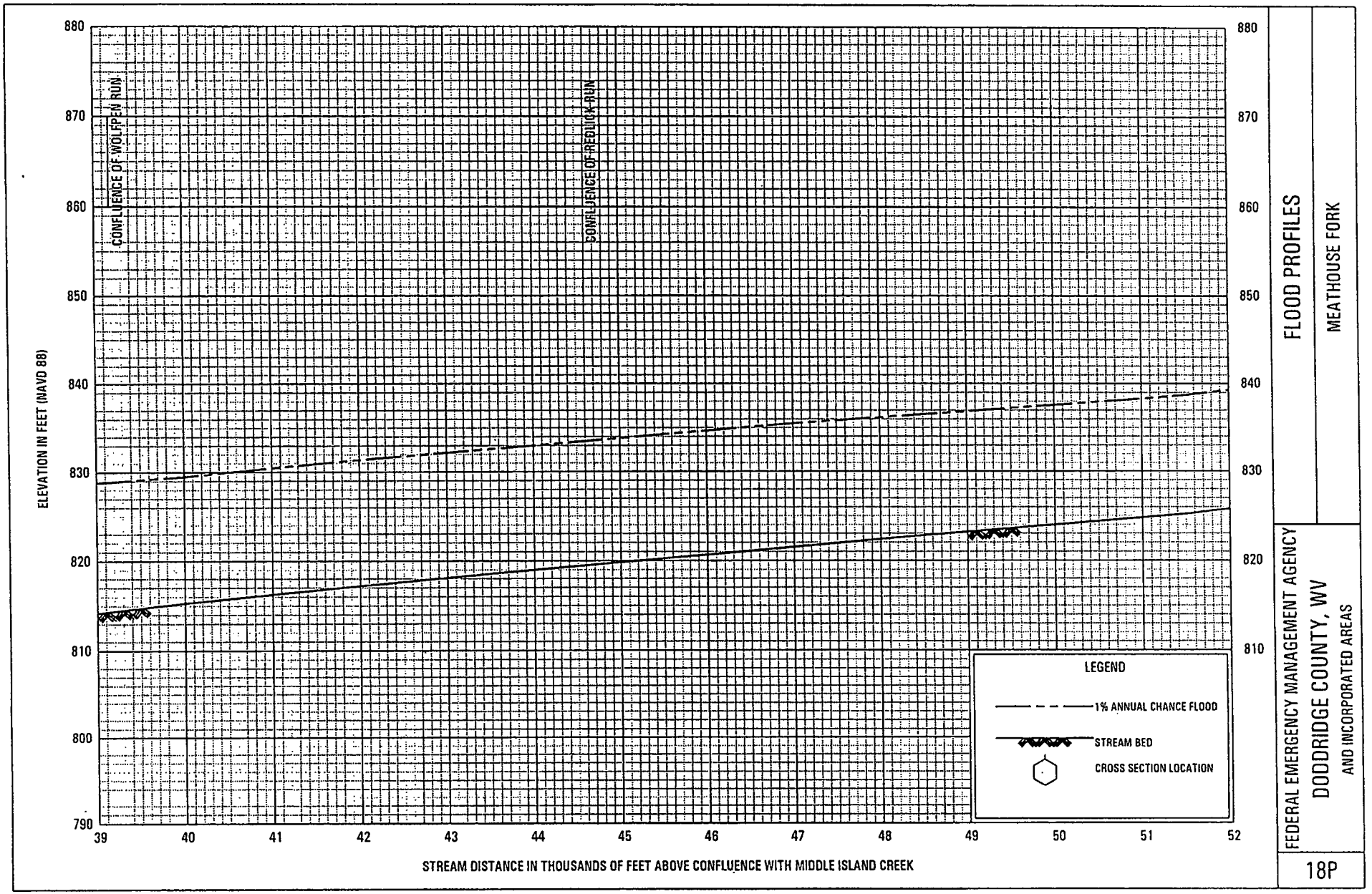
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

17P



FLOOD PROFILES

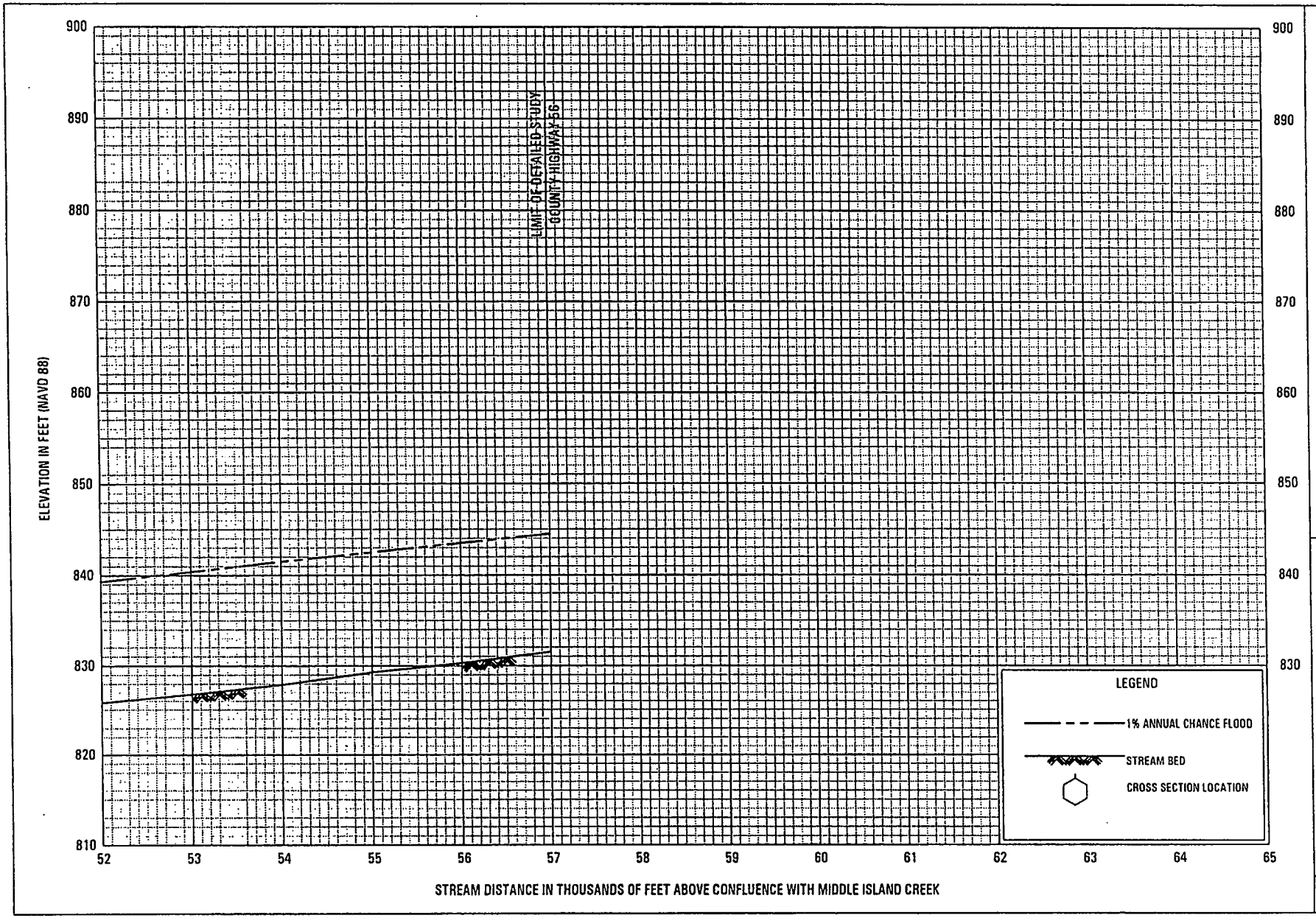
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

18P



FLOOD PROFILES

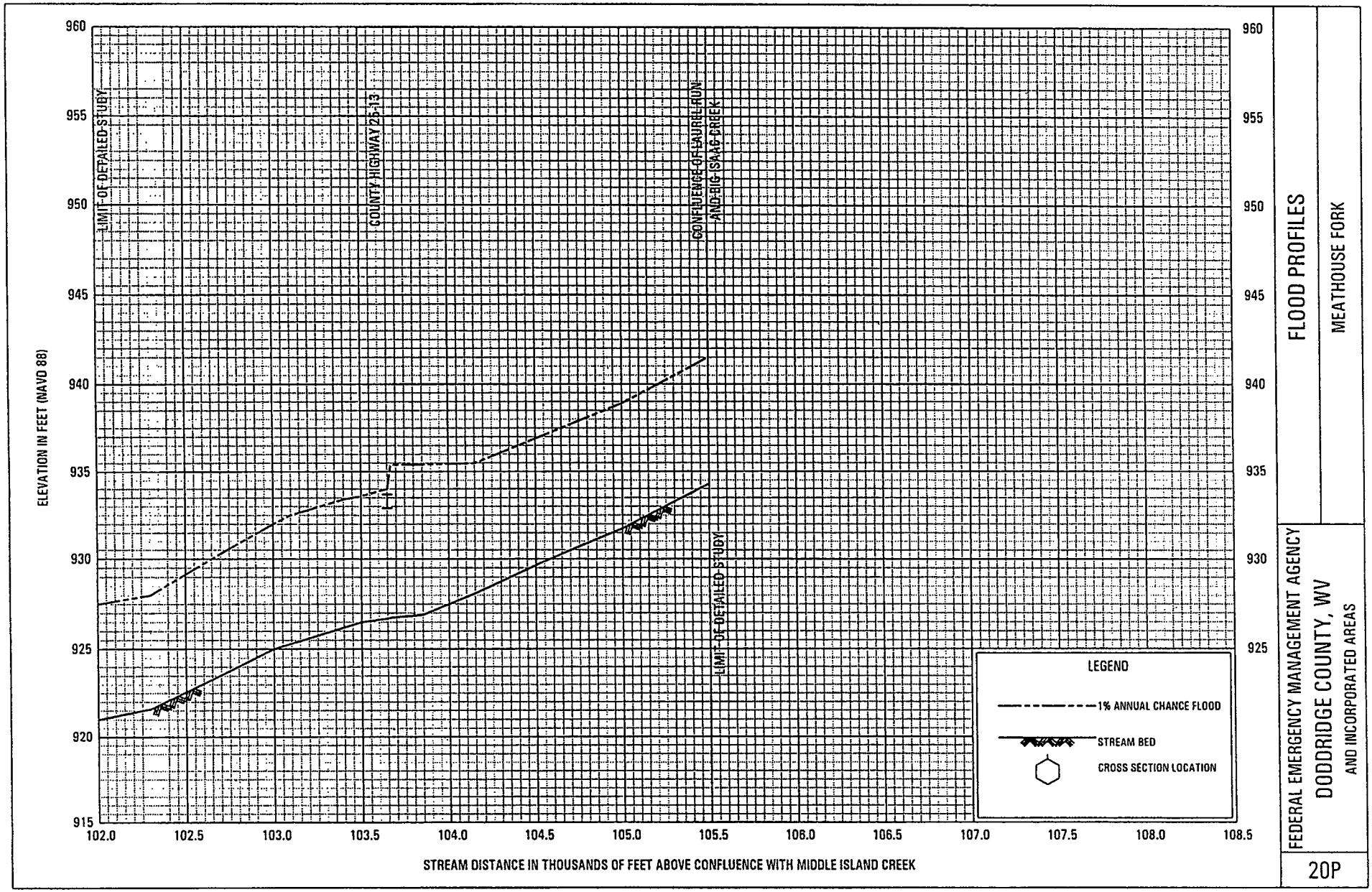
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

19P



FLOOD PROFILES

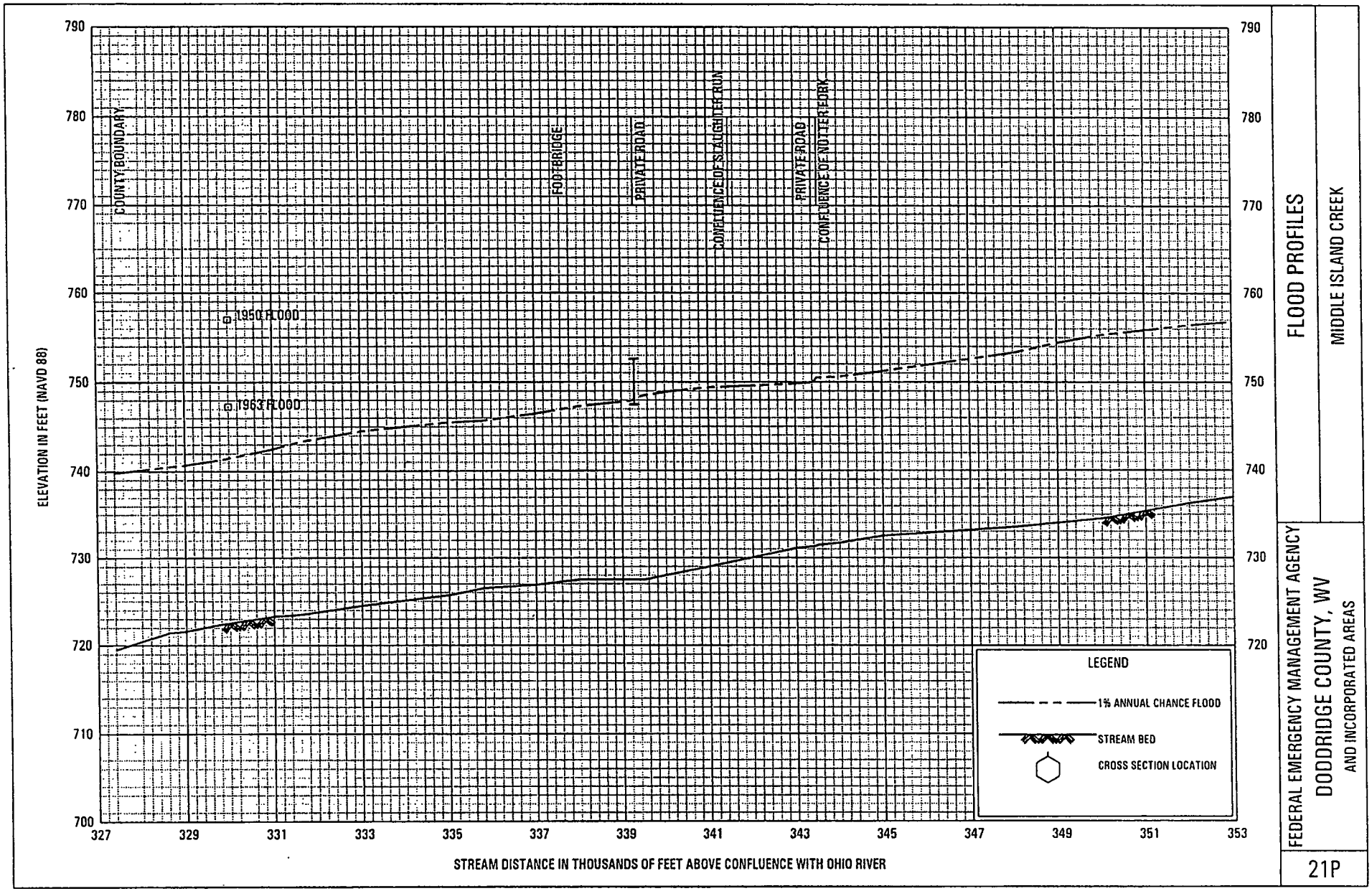
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

20P



FLOOD PROFILES

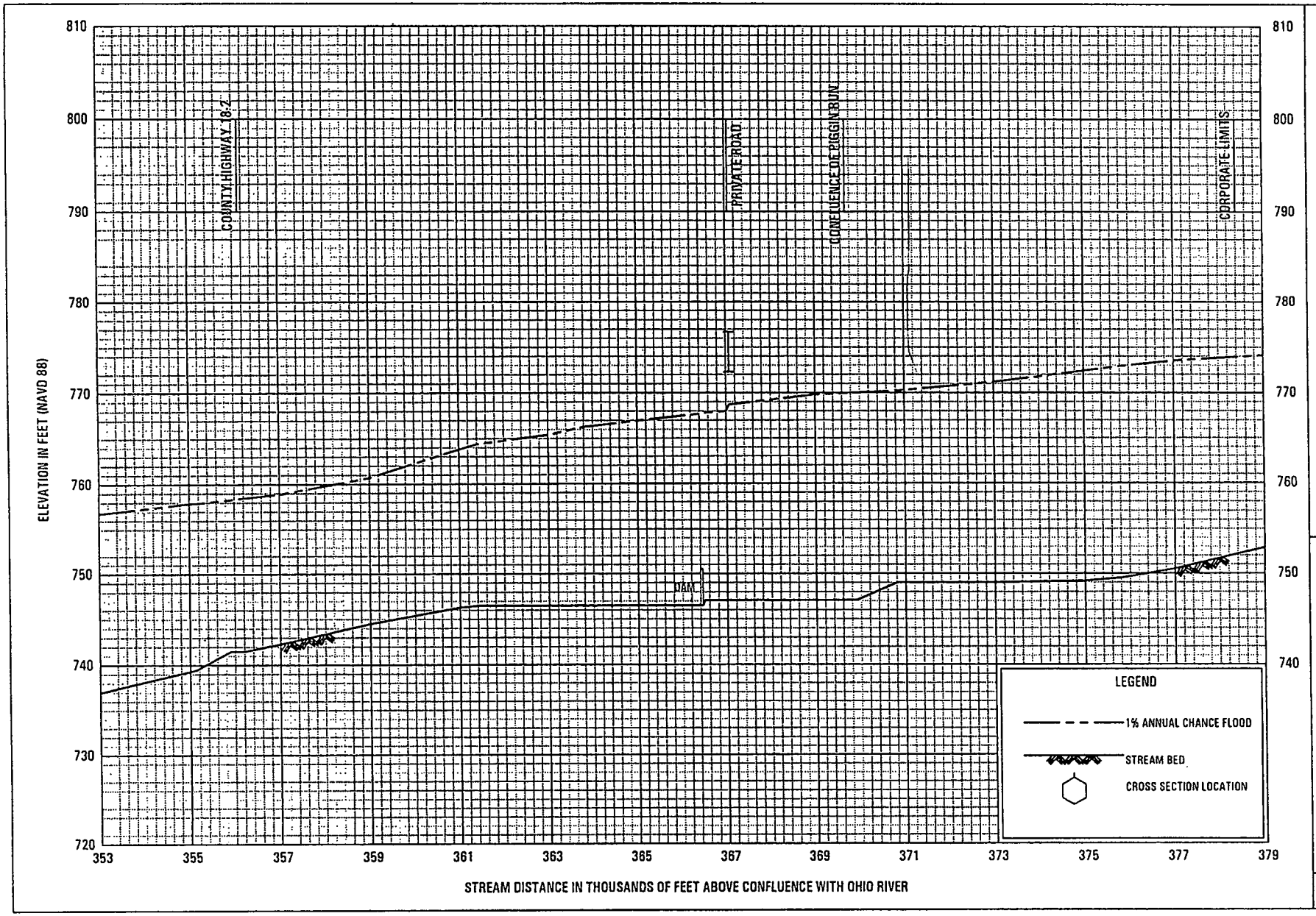
MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

21P



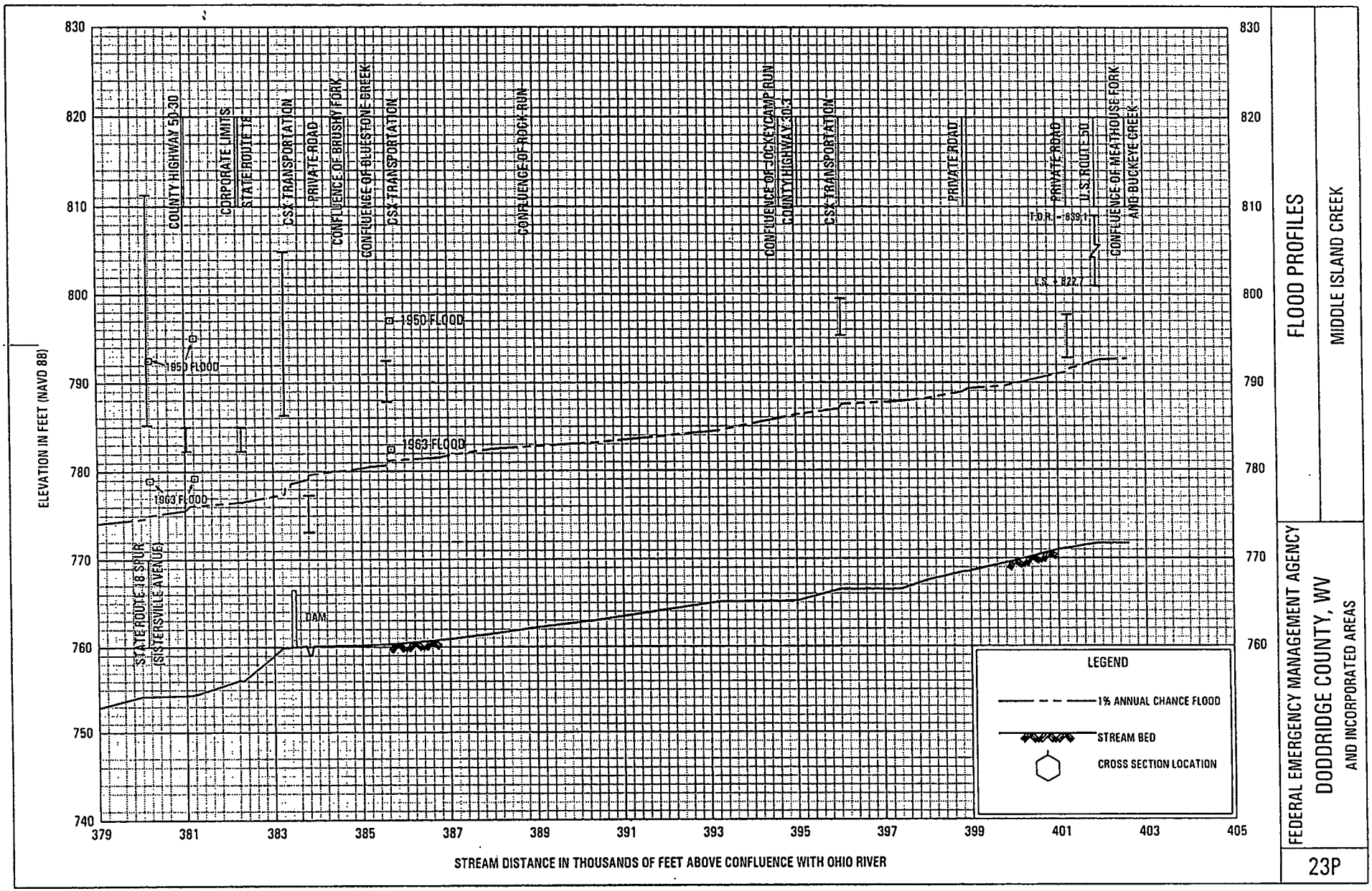
FLOOD PROFILES

MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS



FLOOD PROFILES

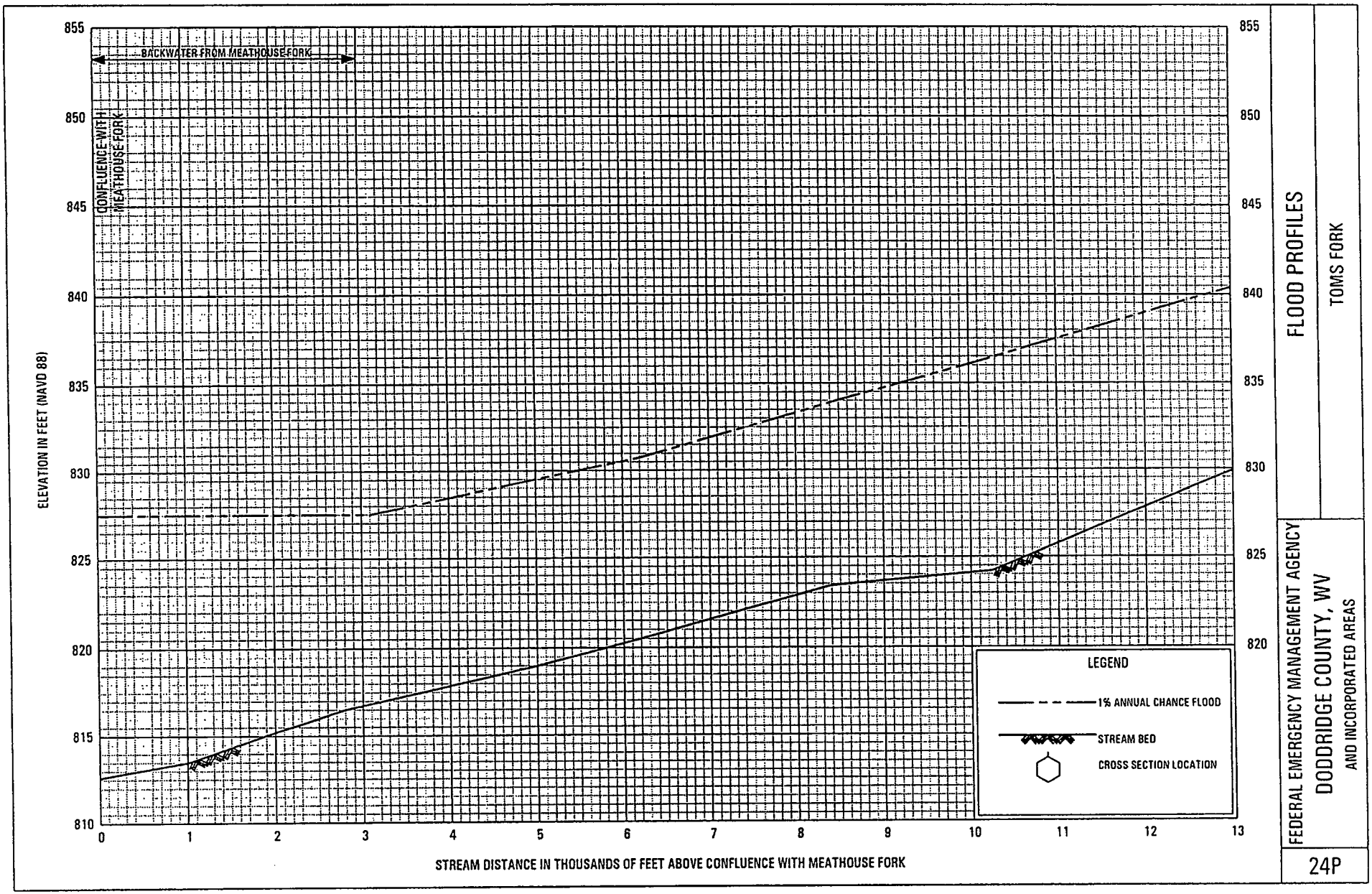
MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

23P



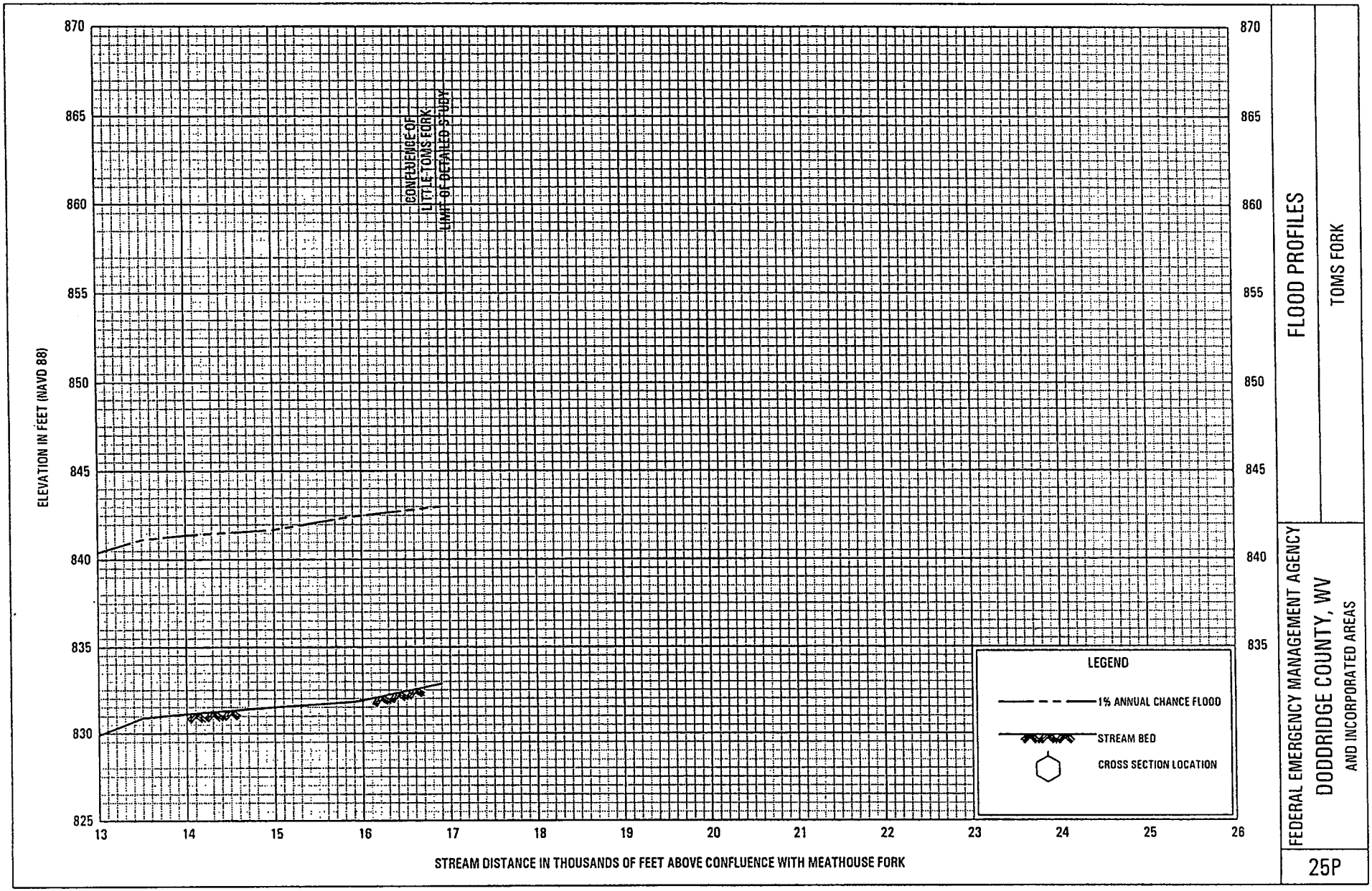
FLOOD PROFILES

TOMS FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS



FLOOD PROFILES

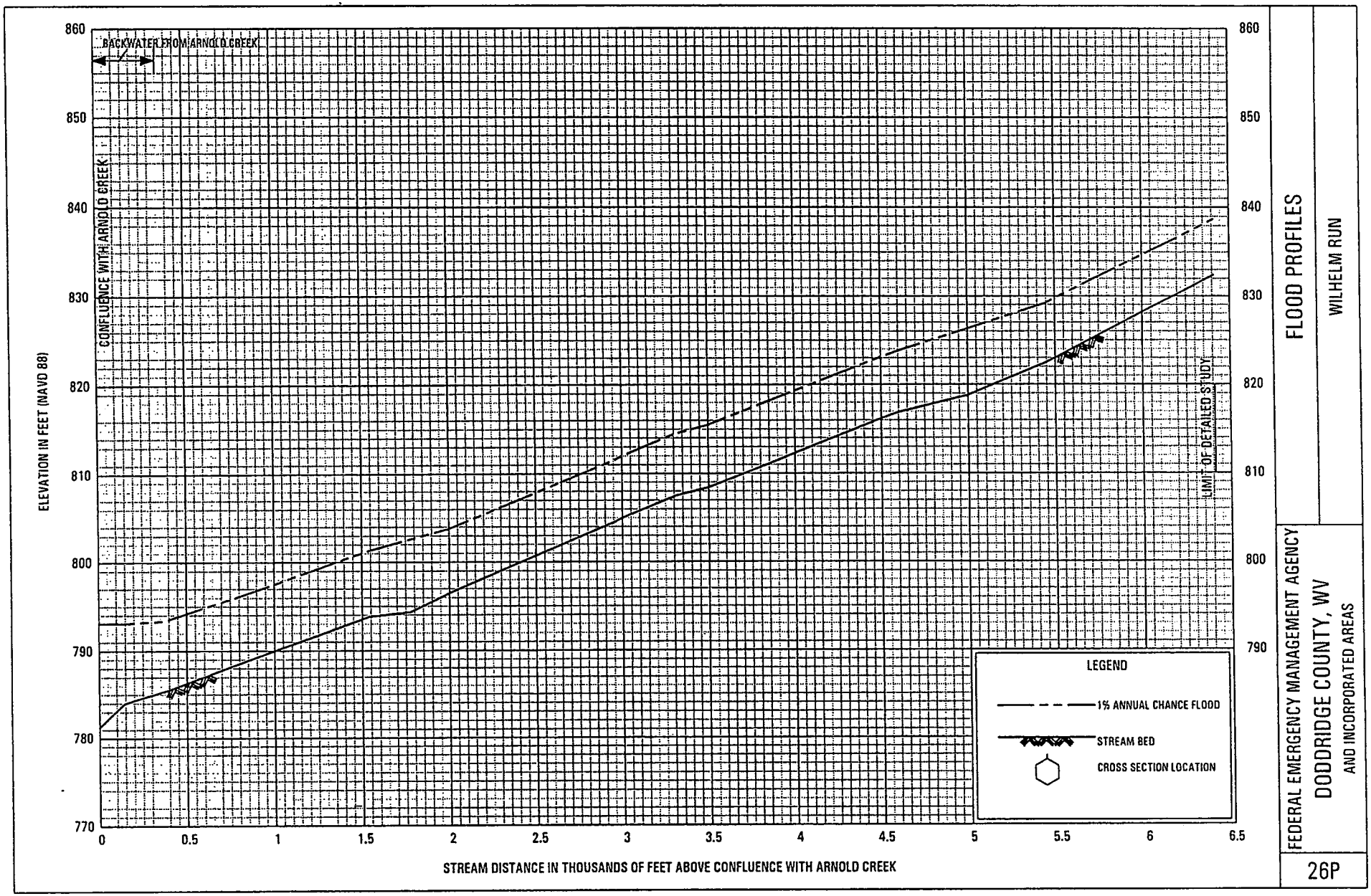
TOMS FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

25P



FLOOD PROFILES

WILHELM RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

26P

APPENDIX C

HYDRAULIC CALCULATIONS FOR EXISTING AND PROPOSED CONDITIONS

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

EXISTING

PREPARED BY: TGJ 3/25/2014
CHECKED BY: ARG 26-MAR-2014

****

PROJECT DATA
Project Title: 110-811_Sherwood FB HH
Project File : 110-811_SherwoFBHH.prj
Run Date and Time: 3/25/2014 10:33:28 AM

Project in English units

Project Description:
MarkWest Liberty Midstream & Resources, LLC
CEC #110-811
4600 J. Barry Ct., Suite 500
Canonsburg, PA 15317

January 2014
(Revised March 25, 2014)

Sherwood Gas
Processing Plant - Full Buildout - Flood Study
Construction in a Floodway
Study for Approval of final grading.

FEMA Zones A, AE, and X from the
Doddridge County Indiana FIS Study shown on FEMA FIRM Panel # 54017C0080 B,
effective October 4, 2011.

CEC Engineering Team:
Principal: Rick Celender,
C.E.T., CPESC, CPSWQ
Project Manager: Andy Gullone, P.E., CPESC
Hydraulic
Modelers: Tim Johnston
Reviewers: Andy Gullone, Rick Celender

Model
Creation:
Existing (Pre-project): CEC Created Model File, "110-811_Sherwood
FB HH," Plan File, "110-811_Existing 01-23-2014."
Proposed (Post-project):
CEC Created Model File, "110-811_Sherwood FB HH," Plan File, "110-811_Proposed
1-23-2014."
Geometry file created in HEC-RAS.
Steady flow file created from
Doddridge County FIS, October 4, 2011.

Data Sources:
Geometry - Surface
created from West Virginia Statewide Addressing and Mapping Board DEM blended with field topo survey of the bridge, existing access road from County Route 50/34, and various locations along the reach.
Flow - Total Buckeye Creek
100-year flow = 5,150 CFS.
Downstream Boundary - Known Water Surface Elevation
= 811. Approximate stream distance of 3,504 feet on profile.

****

PLAN DATA

Plan Title: 110-811_Existing 01-23-2014
Plan File : p:\2011\110-811\-Calculations\TASK 5001 PLANTS 6 AND 7\Flood Study\110-811_SherwoFBHH.p03

Geometry Title: 110-811_Existing_Rev_02-26-2014
Geometry File : p:\2011\110-811\-Calculations\TASK 5001 PLANTS 6 AND 7\Flood Study\110-811_SherwoFBHH.g02

Flow Title : 110-811_100Year
Flow File : p:\2011\110-811\-Calculations\TASK 5001 PLANTS 6 AND 7\Flood Study\110-811_SherwoFBHH.f01

Plan Description:
Existing Geometry, 100-year storm, subcritical analysis

Plan Summary Information:

Number of:	Cross Sections	= 38	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 1	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

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

****

FLOW DATA

Flow Title: 110-811_100Year
Flow File : p:\2011\110-811\-Calculations\TASK 5001 PLANTS 6 AND 7\Flood Study\110-811_SherwoFBHH.f01

Flow Data (cfs)

River	Reach	RS	100-Year

```
* Buckeye Creek   Buckeye Creek  3504.54 *           5150 *
*************************************************************

Boundary Conditions
********************************************************************************
********************
* River               Reach             Profile            *            Upstream
    Downstream    *
********************************************************************************
********************
* Buckeye Creek   Buckeye Creek   100-Year           *
   Known WS = 811 *
********************************************************************************
********************

********************************************************************************
```

GEOMETRY DATA

Geometry Title: 110-811_Existing_Rev_02-26-2014
Geometry File : p:\2011\110-811\-Calculations\TASK 5001 PLANTS 6 AND 7\Flood Study\110-811_SherwoFBHH.g02

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek   RS: 3504.54

INPUT
Description: A
Station Elevation Data   num=   147

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-100	838.81	-98.96	838.29	-98.75	838.18	-98.4	838	-96.95	837.26
-96.1	836.83	-95.4	836.48	-94.48	836	-93.69	835.59	-92.75	835.1
-91.68	834.54	-90.65	834	-89.58	833.44	-88.38	832.81	-87.57	832.38
-86.84	832	-85.95	831.54	-85.41	831.26	-84.5	830.79	-83.05	830.02
-83.01	830	-81.27	829.11	-79.1	828	-79.08	827.99	-79.07	827.99
-77.37	827.11	-75.99	826.41	-75.64	826.23	-75.18	826	-74.04	825.4
-73.22	824.97	-72.55	824.62	-71.39	824	-70.83	823.7	-70.35	823.45
-69.1	822.78	-67.62	822	-67.26	821.81	-67.01	821.68	-65.6	820.94
-64.29	820.25	-64.09	820.15	-63.81	820	-62.65	819.38	-61.84	818.95
-61.13	818.57	-60.06	818	-60.02	817.91	-59.96	817.79	-59.91	817.69
-59.87	817.59	-59.83	817.5	-59.8	817.43	-59.77	817.35	-59.73	817.28
-59.7	817.21	-59.67	817.15	-59.65	817.09	-59.62	817.04	-59.6	816.99
-59.58	816.94	-59.56	816.89	-59.54	816.85	-59.46	816.69	-59.15	815.06
-47.25	813.56	-46	813.25	-45.85	813.22	-44.79	812.96	-43.56	812.66
-42.3	812.35	-41.93	812.27	-41.36	808.97	-40.43	808	-40.31	808
-40.27	808	-40.22	808	-40.14	808	-38.54	807.48	-34.04	806
-33.41	805.89	-32.05	805.65	-25.82	804.54	-22.76	804.44	-19.68	804.44
-19.3	804.44	-14.73	804.44	-5.05	804.44	0	804.44	.9	804.44
5.75	804.44	15.3	804.44	16.43	804.44	19.72	804.44	21.76	804.67
25.81	806	28.84	806.95	32.2	808	35.74	808.98	39.4	810
43.29	811.02	47.05	812	49.55	812.68	54.41	814	56.85	814.55
63.18	816	63.21	816	63.24	816	63.62	816.01	63.71	816
63.73	816	63.9	816	64.26	816	66.98	816	71.15	816
79.48	816	89.67	816	95.77	816	97.03	816	99.05	816
101.29	816	101.88	816	102.53	816	103.1	816.19	110.92	818
112.97	819.63	113.44	820	115.04	821.27	116.39	822	119.11	823.46
119.51	824	120.78	825.71	121	826	121.65	826.89	122.64	828
123.43	828.89	124.41	830	125.72	831.48	126.18	832	126.52	832.39
127.95	834	129.37	835.19	130.09	835.93	132.25	835.95	133.34	836

134.36 836.19 136.69 836.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-100	.05	-41.93	.035	49.55	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-41.93	49.55	50	50	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	814.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.96	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)		Flow Area (sq ft)	6.21	716.90	3.01
E.G. Slope (ft/ft)	0.001962	Area (sq ft)	6.21	716.90	3.01
Q Total (cfs)	5150.00	Flow (cfs)	6.55	5140.58	2.88
Top Width (ft)	104.68	Top Width (ft)	8.49	91.48	4.71
Vel Total (ft/s)	7.09	Avg. Vel. (ft/s)	1.05	7.17	0.95
Max Chl Dpth (ft)	9.52	Hydr. Depth (ft)	0.73	7.84	0.64
Conv. Total (cfs)	116272.7	Conv. (cfs)	147.8	116060.0	64.9
Length Wtd. (ft)	50.00	Wetted Per. (ft)	8.67	96.27	4.88
Min Ch El (ft)	804.44	Shear (lb/sq ft)	0.09	0.91	0.08
Alpha	1.02	Stream Power (lb/ft s)	136.69	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	118.78	53.63	65.97
C & E Loss (ft)	0.03	Cum SA (acres)	36.21	5.02	14.49

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3454.54

INPUT
Description: B
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-106.13	826.76	-105.83	826.61	-105.52	826.46	-104.57	826	-104.45	825.95
-104.42	825.93	-103.35	825.44	-102.97	825.27	-102.28	824.95	-101.55	824.59
-101.24	824.44	-100.37	824	-100.19	823.91	-99.27	823.46	-98.9	823.29
-98.27	822.98	-97.55	822.65	-97.23	822.49	-96.16	822	-96.15	821.99
-96.14	821.99	-94.96	821.48	-94.61	821.32	-93.85	820.99	-93.19	820.71
-92.79	820.53	-91.86	820.13	-91.79	820.1	-91.59	820	-90.51	819.47

-90.04	819.26	-89.22	818.86	-88.25	818.41	-87.98	818.28	-87.37	818
-87.36	818	-87.35	818	-87.19	817.14	-86.99	814.66	-83.41	814.33
-78.27	814.15	-64.45	812.92	-42.91	811.21	-42.79	809.16	-42.41	809.13
-42.01	809.09	-41.6	809.06	-41.18	809.02	-40.66	808.97	-40.11	808.93
-39.53	808.88	-37.2	808.63	-36.6	808.56	-35.97	808.48	-35.28	808.4
-32.94	808.07	-32.49	808	-31.34	807.77	-31	807.7	-29.05	807.31
-28.01	807.09	-26.05	806.67	-25.06	806.46	-22.96	806	-22.17	805.82
-21.82	805.74	-19.4	805.19	-17.82	804.84	-16.67	804.58	-14.08	804.38
-13.68	804.38	-6.61	804.38	0	804.38	17.4	804.38	17.52	804.38
23.35	805.7	24.35	806	28.89	807.47	30.57	808	37.14	809.7
38.3	810	39.73	810.36	46.16	812	52.62	813.62	54.12	814
61.82	815.78	62.8	816	62.86	816	62.93	816	62.98	816
63.03	816	63.08	816	63.12	816	63.16	816	63.2	816
63.43	816	72.23	816	72.53	816	77.56	816	88.82	816
92.29	816	92.47	816	93.12	816	93.64	816	96.03	816
98.64	816	99.53	816	101.36	816	103.41	816	105.44	816
108.77	817.27	110.92	818	112.2	819.74	112.38	820	113.85	822
113.85	822.01	115.45	823.6	115.85	824	116.26	824.42	117.85	826
118.35	826.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-106.13	.05	-42.79	.035	30.57	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-42.79	30.57	52	50	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	814.61	Element	Left OB	Channel	Right OB				
Vel Head (ft)	1.10	Wt. n-Val.	0.050	0.035	0.050				
W.S. Elev (ft)	813.52	Reach Len. (ft)	52.00	50.00	50.00				
Crit W.S. (ft)		Flow Area (sq ft)	33.63	573.48	59.26				
E.G. Slope (ft/ft)	0.002677	Area (sq ft)	33.63	573.48	59.26				
Q Total (cfs)	5150.00	Flow (cfs)	55.34	4919.94	174.72				
Top Width (ft)	123.34	Top Width (ft)	28.35	73.36	21.63				
Vel Total (ft/s)	7.73	Avg. Vel. (ft/s)	1.65	8.58	2.95				
Max Chl Dpth (ft)	9.14	Hydr. Depth (ft)	1.19	7.82	2.74				
Conv. Total (cfs)	99529.3	Conv. (cfs)	1069.5	95083.1	3376.7				
Length Wtd. (ft)	50.02	Wetted Per. (ft)	30.38	74.31	22.32				
Min Ch El (ft)	804.38	Shear (lb/sq ft)	0.19	1.29	0.44				
Alpha	1.18	Stream Power (lb/ft s)	118.35	0.00	0.00				
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	118.76	52.89	65.94				
C & E Loss (ft)	0.02	Cum SA (acres)	36.19	4.92	14.47				

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3404.54

INPUT
Description: C
Station Elevation Data num= 120

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-130.31	819.94	-130.16	819.85	-127.95	818.4	-127.34	818	-124.36	816.46
-123.5	816	-122.92	815.91	-122.44	815.86	-122.09	815.81	-121.89	815.78
-121.74	815.75	-121.45	815.71	-121.31	815.69	-121.19	815.68	-121.09	815.66
-121	815.65	-120.93	815.64	-120.86	815.64	-120.81	815.63	-120.78	815.51
-118.73	815.9	-118.62	815.92	-118.37	815.95	-117.79	815.59	-115.95	814.65
-112.35	813.89	-102.14	815.26	-94.41	813.55	-93.69	813.6	-93.3	813.59
-91.7	813.84	-89.86	814.09	-85.86	814.99	-84.7	814.77	-82.96	814.52
-77.51	814.54	-69.06	813.8	-67.38	813.67	-52.48	812.03	-42.72	810.75
-39.01	809.99	-38.2	809.83	-38.11	809.8	-37.46	809.6	-37.3	809.57
-37.12	809.53	-36.94	809.5	-36.74	809.46	-36.53	809.42	-35.73	809.24
-35.55	809.2	-35.23	809.14	-34.89	809.07	-34.51	809	-34.1	808.92
-33.65	808.83	-33.15	808.73	-32.59	808.62	-31.98	808.5	-31.02	808.31
-30.29	808.16	-29.54	808	-29.5	808	-28.02	807.66	-20.74	806
-15	804.51	-12.96	804.32	-3.54	804.32	0	804.32	4.45	804.32
15.59	804.32	24.88	805.99	24.9	806	29.51	807.42	31.4	808
35.16	808.93	39.43	810	41.01	810.41	47.1	812	50.37	812.89
54.45	814	59.19	815.18	62.48	816	62.51	816	62.55	816
62.56	816	63.15	816	63.19	816	63.22	816	63.23	816
63.24	816	63.25	816	63.26	816	63.27	816	63.28	816
73.18	816	75.76	816	76.08	816	82.98	816	89.81	816
92.74	816	96.15	815.99	98.06	815.99	99.09	815.99	104.95	816
110.42	817.6	111.76	818	112.3	818.75	113.18	820	113.8	820.86
114.59	822	115.75	823.64	116.01	824	117.38	825.93	117.43	826
117.52	826.13	118.81	828	119.32	828.72	120.21	830	120.39	830.24

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-130.31	.05	-39.01	.035	31.4	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-39.01	31.4	55	50	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	814.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.11	Reach Len. (ft)	55.00	50.00	50.00
Crit W.S. (ft)		Flow Area (sq ft)	32.26	520.54	51.49
E.G. Slope (ft/ft)	0.003501	Area (sq ft)	32.26	520.54	51.49
Q Total (cfs)	5150.00	Flow (cfs)	70.07	4912.22	167.71
Top Width (ft)	113.48	Top Width (ft)	23.29	70.41	19.78
Vel Total (ft/s)	8.52	Avg. Vel. (ft/s)	2.17	9.44	

3.26							
* Max Chl Dpth (ft)	* 8.79	* Hydr. Depth (ft)	* 1.39	* 7.39	*		
2.60							
* Conv. Total (cfs)	* 87032.6	* Conv. (cfs)	* 1184.2	* 83014.2	*		
2834.3							
* Length Wtd. (ft)	* 50.20	* Wetted Per. (ft)	* 23.51	* 71.50	*		
20.43							
* Min Ch El (ft)	* 804.32	* Shear (lb/sq ft)	* 0.30	* 1.59	*		
0.55							
* Alpha	* 1.18	* Stream Power (lb/ft s)	* 120.39	* 0.00	*		
0.00							
* Frctn Loss (ft)	* 0.15	* Cum Volume (acre-ft)	* 118.72	* 52.26	*		
65.88							
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 36.16	* 4.84	*		
14.45							

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3354.54

INPUT
Description: D
Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-161.95	820.72	-159	819.1	-154.74	817.2	-151.93	815.9	-147.17	813.71
-145.77	813.06	-126.21	812.54	-124.87	812.51	-123.36	812.51	-123.07	812.53
-122.06	812.55	-122.03	812.53	-115.94	812.57	-115.14	812.59	-114.95	812.57
-103.12	812.35	-88.28	812.14	-82.76	812.08	-54.87	809.98	-52.64	809.81
-41.07	809.2	-39.11	809.06	-36.85	808.62	-36.78	808.61	-36.71	808.61
-36.64	808.6	-36.56	808.59	-36.14	808.54	-35.65	808.48	-35.49	808.45
-35.3	808.43	-35.09	808.4	-34.83	808.36	-34.53	808.32	-34.16	808.27
-33.7	808.2	-33.12	808.12	-32.28	808.01	-32.21	808	-31.45	807.84
-22.89	806	-21.17	805.62	-18.11	804.96	-15.26	804.34	-13.7	804.25
-13.63	804.25	-13.6	804.25	-13.5	804.25	-.57	804.25	0	804.25
4.84	804.25	8.21	804.25	16.71	804.25	17.49	804.25	26.48	806
31.46	807.35	33.9	808	38.76	809.37	40.95	810	46.89	811.73
47.8	812	48.18	812.11	54.65	814	57.78	814.8	62.56	816
62.6	816	62.66	816	62.67	816	62.73	816	62.74	816
62.91	816	63.02	816	63.12	816	63.22	816	63.3	816
63.38	816	63.45	816	63.52	816	63.58	816	63.63	816
63.69	816	63.74	816	63.78	816	63.83	816	64.54	816
66.78	816.01	67.1	816.01	67.7	816.01	68.02	816.01	68.26	816.01
71.84	816.01	73.95	816.01	74.22	816.01	85.96	816	89.03	815.99
91.01	815.98	96.63	815.95	100.33	815.97	106.93	816	112.68	817.78
113.29	818	113.56	818.18	115.15	820	116.54	821.58	116.9	822
118.58	823.91	118.65	824	118.98	824.38	119.3	824.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-161.95	.05	-36.56	.035	33.9	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.56	33.9	35	50	50	.1	.3

CROSS SECTION OUTPUT Profile #100-Year
****
****

* E.G. Elev (ft)	* 814.19	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.02	* Wt. n-Val.	* 0.050	* 0.035	* 0.050 *
* W.S. Elev (ft)	* 813.17	* Reach Len. (ft)	* 35.00	* 50.00	* 50.00 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 170.79	* 549.92	* 46.67 *
* E.G. Slope (ft/ft)	*0.002626	* Area (sq ft)	* 170.79	* 549.92	* 46.67 *
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 349.53	* 4669.44	* 131.04 *
* Top Width (ft)	* 197.82	* Top Width (ft)	* 109.45	* 70.46	* 17.91 *
* Vel Total (ft/s)	* 6.71	* Avg. Vel. (ft/s)	* 2.05	* 8.49	* 2.81 *
* Max Chl Dpth (ft)	* 8.92	* Hydr. Depth (ft)	* 1.56	* 7.80	* 2.61 *
* Conv. Total (cfs)	*100493.1	* Conv. (cfs)	* 6820.4	* 91115.7	* 2557.0 *
* Length Wtd. (ft)	* 48.95	* Wetted Per. (ft)	* 109.64	* 71.33	* 18.64 *
* Min Ch El (ft)	* 804.25	* Shear (lb/sq ft)	* 0.26	* 1.26	* 0.41 *
* Alpha	* 1.46	* Stream Power (lb/ft s)	* 119.30	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.13	* Cum Volume (acre-ft)	* 118.59	* 51.64	* 65.82 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 36.08	* 4.76	* 14.43 *

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3304.54

INPUT
Description: E
Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-193.15	818.45	-183.47	814.34	-183.16	814.28	-176.73	813.26	-163.3	813.13
-138.32	812.35	-120.78	812.28	-86.53	811.72	-71.47	811.24	-56.51	810.18
-43	809.27	-36.76	808.75	-36.03	808.62	-36	808.61	-35.97	808.61
-35.94	808.6	-35.9	808.6	-35.86	808.59	-35.82	808.58	-35.77	808.58
-35.72	808.57	-35.67	808.56	-35.62	808.55	-35.57	808.54	-35.45	808.52
-35.38	808.51	-35.31	808.49	-35.22	808.47	-35.13	808.45	-35.02	808.43
-34.88	808.4	-34.73	808.37	-34.53	808.33	-34.3	808.28	-33.99	808.22
-33.59	808.13	-33.11	808.03	-32.95	808	-29.62	807.39	-22.04	806
-15.25	804.68	-11.71	804.25	-11.66	804.25	0	804.25	11.43	804.25
12.59	804.25	14.93	804.25	22.78	805.33	26.75	806	35.39	807.94
35.56	807.97	35.68	808	36.05	808.12	42.24	810	48.06	811.81
48.44	811.93	48.47	811.94	48.67	812	48.97	812.09	55.11	814
58.52	814.76	64.02	816	64.05	816	64.06	816	64.11	816
64.12	816	64.16	816	64.18	816	64.21	816	64.23	816
64.27	816	64.29	816	64.51	816	64.55	816	64.59	816
64.63	816	64.66	816	64.7	816	64.72	816	64.98	816
65.48	816	65.86	816	66.57	816	71.47	816.01	72.7	816.02
72.75	816.02	73.29	816.02	74.51	816.02	75.35	816.02	84.84	816
93.89	815.84	94	815.84	95.83	815.82	98.76	815.86	102.88	815.92

106.57	816	109.76	817.28	111.63	818	113.65	818.64	117.46	820
123.18	821.49	124.76	821.91	125.09	822	125.17	822	125.18	822
125.45	822.01	125.65	822.02	126.04	822.04	126.82	822.08	127.57	822.09
152.93	822.56	166.8	822.78						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-193.15	.05	-36.76	.035	35.39	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.76	35.39	55	50	47	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	814.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.04	Reach Len. (ft)	55.00	50.00	47.00
Crit W.S. (ft)		Flow Area (sq ft)	184.21	546.89	42.81
E.G. Slope (ft/ft)	0.002738	Area (sq ft)	184.21	546.89	42.81
Q Total (cfs)	5150.00	Flow (cfs)	373.41	4655.25	121.33
Top Width (ft)	212.43	Top Width (ft)	123.65	72.15	16.63
Vel Total (ft/s)	6.65	Avg. Vel. (ft/s)	2.03	8.51	2.83
Max Chl Dpth (ft)	8.79	Hydr. Depth (ft)	1.49	7.58	2.57
Conv. Total (cfs)	98425.8	Conv. (cfs)	7136.6	88970.3	2318.9
Length Wtd. (ft)	50.47	Wetted Per. (ft)	123.76	72.91	17.40
Min Ch El (ft)	804.25	Shear (lb/sq ft)	0.25	1.28	0.42
Alpha	1.49	Stream Power (lb/ft s)	166.80	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	118.45	51.02	65.77
C & E Loss (ft)	0.09	Cum SA (acres)	35.98	4.68	14.41

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3254.54

INPUT
Description: F
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-240.13	819.89	-227.21	814.66	-216.19	812.98	-198.11	812.16	-175.25	811.94
-165.06	811.8	-160.59	811.79	-152.22	811.82	-122.44	811.41	-109.35	811.26
-104.94	811.11	-102.58	811.05	-67.55	810.05	-42.46	809.03	-36.68	808.81

-36.67	808.63	-36.63	808.62	-36.6	808.62	-36.56	808.61	-36.51	808.6
-36.47	808.59	-36.42	808.58	-36.36	808.57	-36.3	808.56	-36.24	808.55
-36.18	808.54	-36.1	808.52	-35.72	808.43	-35.62	808.41	-35.52	808.39
-35.41	808.37	-35.28	808.34	-35.14	808.31	-34.99	808.27	-34.82	808.23
-34.63	808.18	-34.4	808.13	-34.14	808.06	-33.88	808	-31.55	807.56
-23.17	806	-20.88	805.53	-17.84	804.92	-15.28	804.39	-13.32	804.12
-7.98	804.12	-6.03	804.12	-.01	804.12	0	804.12	4.38	804.12
7.24	804.12	15.16	804.12	15.2	804.12	15.21	804.12	15.81	804.12
16.56	804.21	16.72	804.23	28.47	806	32.29	806.81	35.63	807.52
37.86	808	42.77	809.48	44.49	810	46.47	810.68	50.28	812
53.04	812.93	56.3	814	60.48	814.91	63.23	815.52	63.61	815.59
64.3	815.74	65.6	816	65.65	816	65.74	816	65.87	816
65.99	816	66.12	816	66.23	816	66.36	816	66.47	816
66.61	816	66.72	816	66.85	816	66.96	816	67.1	816
67.21	816	67.34	816	67.45	816	67.55	816	67.63	816
67.97	816	68.02	816	68.06	816	68.1	816	68.14	816
68.72	816	68.76	816	69.87	816.02	70.51	816.02	71.52	816.02
71.91	816.03	77.35	816	78.14	816	85.05	814.92	90.53	814.08
91.07	814	91.75	814	98.34	814	102.59	815.16	106.43	816
110.08	817.66	110.84	818	113.36	819.15	115.21	820	116.17	820.22
116.63	820.29	122.85	821.87						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-240.13	.05	-36.68	.035	37.86	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.68	37.86	43	50	52	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.13	Reach Len. (ft)	43.00	50.00	52.00
Crit W.S. (ft)		Flow Area (sq ft)	350.98	581.23	41.57
E.G. Slope (ft/ft)	0.002015	Area (sq ft)	350.98	581.23	41.57
Q Total (cfs)	5150.00	Flow (cfs)	729.27	4318.44	102.30
Top Width (ft)	270.79	Top Width (ft)	180.47	74.54	15.78
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)	2.08	7.43	2.46
Max Chl Dpth (ft)	9.01	Hydr. Depth (ft)	1.94	7.80	2.63
Conv. Total (cfs)	114733.7	Conv. (cfs)	16246.9	96207.8	2279.0
Length Wtd. (ft)	48.90	Wetted Per. (ft)	180.55	75.50	16.59
Min Ch El (ft)	804.12	Shear (lb/sq ft)	0.24	0.97	0.32
Alpha	1.68	Stream Power (lb/ft s)	122.85	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	118.11	50.37	65.72
C & E Loss (ft)	0.02	Cum SA (acres)	35.79	4.59	14.39

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3204.54

INPUT
Description: G
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283.58	819.8	-266.29	814.14	-266.24	814.12	-266.23	814.12	-266.09	814.11
-217.5	811.93	-217.38	811.93	-173.11	811.45	-163.78	811.46	-160.93	811.43
-155.76	811.36	-150	811.26	-144.17	811.18	-124.33	810.91	-109.74	810.72
-100.63	810.59	-93.13	810.46	-70.42	809.9	-50.46	809.14	-38.7	808.69
-33.59	808.48	-31.92	807.96	-31.88	807.94	-31.83	807.93	-31.78	807.91
-31.73	807.89	-31.68	807.88	-31.63	807.86	-31.57	807.84	-31.51	807.81
-31.44	807.79	-31.37	807.77	-31.29	807.74	-31.2	807.71	-31.1	807.69
-30.89	807.62	-30.78	807.58	-30.66	807.54	-30.52	807.5	-30.38	807.45
-30.22	807.4	-29.76	807.22	-29.6	807.16	-29.42	807.08	-29.23	807
-28.94	806.91	-28.61	806.8	-28.23	806.67	-27.79	806.53	-27.29	806.36
-26.69	806.17	-26.19	806	-21.56	805.01	-18.47	804.35	-16.86	804.05
-8.24	804.05	-2.99	804.05	0	804.05	3.37	804.05	15.21	804.05
15.24	804.05	16.56	804.21	27.88	806	30.45	806.52	37.81	808
39.9	808.63	44.4	810	47.91	811.09	50.79	812	54.71	813.27
56.99	814	57.54	814.1	57.74	814.13	60.08	814.54	62.07	814.88
63.39	815.06	64.64	815.27	69.51	816	69.65	816	69.72	816
69.9	816	69.98	816	70.07	816	70.16	816	70.17	816
70.18	816	70.19	816	70.2	816	71.28	816	71.34	816
71.39	816	71.44	816	71.49	816	88.72	817.7	91.55	818
96.32	818.82	102.84	820	107.71	820.7	116.72	821.98		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-283.58	.05	-33.59	.035	37.81	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-33.59	37.81	44	50	51	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.09	Reach Len. (ft)	44.00	50.00	51.00
Crit W.S. (ft)		Flow Area (sq ft)	451.32	571.37	42.16
E.G. Slope (ft/ft)	0.001817	Area (sq ft)	451.32	571.37	42.16
Q Total (cfs)	5150.00	Flow (cfs)	952.68	4099.91	97.41
Top Width (ft)	297.47	Top Width (ft)	209.73	71.40	16.34
Vel Total (ft/s)	4.84	Avg. Vel. (ft/s)	2.11	7.18	2.31
Max Chl Dpth (ft)	9.04	Hydr. Depth (ft)	2.15	8.00	

```
   2.58  *
* Conv. Total (cfs)       *120822.6  * Conv. (cfs)             * 22350.6  * 96186.6  *
 2285.3  *
* Length Wtd. (ft)        *   48.76  * Wetted Per. (ft)        *  209.80  *   72.36  *
  17.11  *
* Min Ch El (ft)          *  804.05  * Shear (lb/sq ft)        *    0.24  *    0.90  *
   0.28  *
* Alpha                   *    1.79  * Stream Power (lb/ft s)  *  116.72  *    0.00  *
   0.00  *
* Frctn Loss (ft)         *    0.08  * Cum Volume (acre-ft)    *  117.72  *   49.71  *
  65.67  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   35.60  *    4.51  *
  14.37  *
*******************************************************************************
***********

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek       RS: 3154.54

INPUT
Description: H
Station Elevation Data     num=      114
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 -344.06  820.17 -341.76  819.33  -335.3  817.11  -317.4  813.56 -307.81   813.2
 -291.22  811.81 -276.12   811.8 -258.35  811.75 -229.19  811.76 -224.11  811.69
 -215.03   811.6 -171.68  811.14 -151.63  811.01 -147.14  810.92 -145.09  810.87
  -117.3  810.47 -103.72  810.29  -98.64  810.21  -79.31  809.67  -63.22  809.32
  -54.02  808.86  -34.08  808.02  -31.16  807.11  -31.09  807.09  -31.01  807.06
  -30.93  807.04  -30.84  807.02  -30.75  806.99  -30.65  806.96  -30.55  806.93
  -30.44   806.9  -30.32  806.86   -30.2  806.83  -30.06  806.79  -29.91  806.74
  -29.75   806.7  -29.57  806.66  -29.38  806.61  -28.95  806.49  -28.71  806.42
  -28.43  806.33  -28.13  806.24  -27.79  806.14   -27.4  806.02  -27.33     806
  -25.54  805.56  -19.16     804  -17.81   803.9  -14.84   803.9  -12.95   803.9
  -11.52   803.9   -10.4   803.9   -9.49   803.9   -8.03   803.9   -7.43   803.9
   -6.92   803.9   -6.49   803.9   -6.11   803.9   -5.77   803.9   -5.54   803.9
   -5.32   803.9       0   803.9    3.09   803.9    3.31   803.9    3.55   803.9
    3.82   803.9    4.15   803.9    4.52   803.9    4.96   803.9    5.47   803.9
    6.08   803.9    6.81   803.9    7.72   803.9    8.87   803.9   10.64   803.9
   13.16   803.9   14.82     804   20.71  805.01   26.47     806   34.72  807.69
   36.26     808   41.95  809.75   42.76     810   43.86  810.36   48.82     812
    51.4   812.8   55.27     814   56.44  814.25   58.83  814.76   62.79   815.6
   64.71     816   64.81     816   65.06     816   65.18     816   65.22     816
   65.34     816   66.33     816   66.69     816      71     816   71.46     816
   71.82     816   76.48  816.77   77.53  816.86   80.56  817.14    83.2  817.46
   87.71  817.86   89.18  817.99   89.27     818   89.46  818.03   100.7     820
  108.63  821.17  115.16     822  115.51     822  115.58     822

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 -344.06     .05  -34.08    .035    34.72     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -34.08   34.72                48      50      52             .1      .3

CROSS SECTION OUTPUT  Profile #100-Year
*******************************************************************************
***********
* E.G. Elev (ft)          *  813.63  * Element                *  Left OB *  Channel *
```

Right OB					
Vel Head (ft)	0.55	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.08	Reach Len. (ft)	48.00	50.00	52.00
Crit W.S. (ft)		Flow Area (sq ft)	604.09	564.34	49.05
E.G. Slope (ft/ft)	0.001571	Area (sq ft)	604.09	564.34	49.05
Q Total (cfs)	5150.00	Flow (cfs)	1209.94	3828.97	111.09
Top Width (ft)	358.66	Top Width (ft)	272.28	68.80	17.58
Vel Total (ft/s)	4.23	Avg. Vel. (ft/s)	2.00	6.78	2.26
Max Chl Dpth (ft)	9.18	Hydr. Depth (ft)	2.22	8.20	2.79
Conv. Total (cfs)	129951.7	Conv. (cfs)	30530.9	96617.7	2803.1
Length Wtd. (ft)	49.53	Wetted Per. (ft)	272.38	69.69	18.39
Min Ch El (ft)	803.90	Shear (lb/sq ft)	0.22	0.79	0.26
Alpha	1.97	Stream Power (lb/ft s)	115.58	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	117.18	49.05	65.62
C & E Loss (ft)	0.03	Cum SA (acres)	35.36	4.43	14.35

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3104.54

INPUT
Description: I
Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-383.34	816.88	-380.41	816.27	-361.18	811.96	-358.34	811.62	-338.46	811.1
-330.45	811.09	-301.63	811.16	-297.15	811.2	-278.53	811.33	-275.53	811.33
-225.16	811.18	-203.03	811.34	-171.74	811.16	-165.14	811.09	-154.69	810.93
-154.09	810.93	-138.76	810.85	-128.69	810.69	-108.79	810.52	-62.36	809.45
-61.73	809.43	-61.33	809.43	-61.1	809.42	-34.68	808.63	-32.1	807.88
-32.06	807.85	-32.01	807.83	-31.95	807.8	-31.9	807.77	-31.84	807.74
-31.78	807.71	-31.72	807.68	-31.65	807.64	-31.58	807.61	-31.5	807.57
-31.37	807.53	-31.23	807.48	-30.68	807.28	-30.54	807.22	-30.4	807.16
-30.24	807.1	-30.08	807.03	-29.9	806.95	-29.7	806.87	-29.49	806.78
-29.26	806.69	-29.02	806.58	-28.7	806.46	-28.35	806.33	-27.96	806.18
-27.52	806.01	-27.48	806	-22.31	804.38	-21.08	804	-11.63	803.47
-11.58	803.47	-11.54	803.47	-11.44	803.47	-7.05	803.47	-4.63	803.47
-2.3	803.47	-.93	803.47	0	803.47	2.92	803.47	3.66	803.47
3.67	803.47	8.94	803.47	13.25	803.47	15.58	804	23.04	805.4
26.21	806	31.87	807.14	36.15	808	38.74	808.76	43	810
46.9	811.41	48.53	812	53.61	813.61	54.83	814	54.97	814.03
55.06	814.05	64.07	816	64.37	816	64.47	816	64.78	816
64.82	816	64.83	816	64.85	816	64.86	816	64.88	816
68.81	816	71.72	816	73.12	816	74.23	816	84.17	817.64
87	818	87.13	818	91.93	818.78	99.35	820	104.37	820.67

104.41	820.68	115.25	822	115.59	822	115.69	822	124.72	822.11
135.24	822.23	144.49	822.33	144.6	822.33	151.56	822.39		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-383.34	.05	-34.68	.035	36.15	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-34.68	36.15	22	50	48	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.07	Reach Len. (ft)	22.00	50.00	48.00
Crit W.S. (ft)		Flow Area (sq ft)	745.42	587.81	41.19
E.G. Slope (ft/ft)	0.001327	Area (sq ft)	745.42	587.81	41.19
Q Total (cfs)	5150.00	Flow (cfs)	1384.72	3683.45	81.83
Top Width (ft)	418.07	Top Width (ft)	331.47	70.83	15.77
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)	1.86	6.27	1.99
Max Chl Dpth (ft)	9.60	Hydr. Depth (ft)	2.25	8.30	2.61
Conv. Total (cfs)	141367.7	Conv. (cfs)	38010.6	101111.0	2246.1
Length Wtd. (ft)	42.28	Wetted Per. (ft)	331.65	72.08	16.57
Min Ch El (ft)	803.47	Shear (lb/sq ft)	0.19	0.68	0.21
Alpha	2.07	Stream Power (lb/ft s)	151.56	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	116.44	48.39	65.57
C & E Loss (ft)	0.02	Cum SA (acres)	35.02	4.35	14.33

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3054.54

INPUT
Description: J
Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-429.24	820.02	-421.03	817.24	-412.97	815.16	-397.1	811.6	-374.14	811.01
-367.57	810.72	-352.22	810.82	-334.91	810.87	-315.95	811.01	-280.2	811.02
-262.38	810.97	-222.98	811.25	-208.79	811.28	-204.94	811.31	-200.98	811.37
-183.88	811.19	-166.39	810.98	-163.8	810.96	-152.84	810.92	-122.32	810.87
-114.52	810.84	-84.08	809.91	-75.91	809.69	-67.79	809.61	-35.1	809.26

-35.07	808.53	-34.81	808.37	-34.74	808.35	-34.67	808.33	-34.6	808.31
-34.52	808.29	-34.44	808.26	-34.36	808.24	-34.27	808.21	-34.17	808.18
-33.73	808	-33.7	808	-33.64	808	-33.6	808	-33.59	808
-33.58	808	-33.56	808	-33.54	808	-31.01	807.15	-27.53	806
-23.61	804.75	-21.27	804	-16.03	803.04	-12.18	803.04	-12.13	803.04
-12.11	803.04	-11.95	803.04	-11.89	803.04	-4.65	803.04	-2.06	803.04
0	803.04	1.54	803.04	2.63	803.04	6.59	803.04	7.86	803.04
9.9	803.04	14.57	803.48	17.29	804	21.31	804.85	26.85	806
28.59	806.34	33.57	807.34	35.91	807.81	36.86	808	38.61	808.46
44.41	810	49.01	811.58	50.23	812	51.33	812.33	57.04	814
66.81	815.06	75.8	816	75.82	816	75.86	816	75.89	816
75.91	816	75.93	816	75.94	816	75.95	816	75.96	816
77.14	816	78.3	816.19	78.68	816.24	79.1	816.3	79.86	816.42
81.74	816.76	83.22	816.97	89.82	818	93.81	818.77	99.8	820
105.59	821.09	110.84	821.97						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-429.24	.05	-35.1	.035	38.61	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.1	38.61	23	50	53	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.07	Reach Len. (ft)	23.00	50.00	53.00
Crit W.S. (ft)		Flow Area (sq ft)	832.95	622.01	36.20
E.G. Slope (ft/ft)	0.001149	Area (sq ft)	832.95	622.01	36.20
Q Total (cfs)	5150.00	Flow (cfs)	1444.53	3642.42	63.05
Top Width (ft)	457.49	Top Width (ft)	368.54	73.71	15.24
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)	1.73	5.86	1.74
Max Chl Dpth (ft)	10.03	Hydr. Depth (ft)	2.26	8.44	2.38
Conv. Total (cfs)	151934.1	Conv. (cfs)	42616.3	107457.7	1860.0
Length Wtd. (ft)	41.95	Wetted Per. (ft)	368.74	75.78	15.93
Min Ch El (ft)	803.04	Shear (lb/sq ft)	0.16	0.59	0.16
Alpha	2.11	Stream Power (lb/ft s)	110.84	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	116.04	47.70	65.52
C & E Loss (ft)	0.02	Cum SA (acres)	34.85	4.27	14.31

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3004.54

INPUT
Description: K
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-469.9	819.55	-464.82	817.83	-445.16	812.74	-439.76	811.53	-432.36	811.33
-408.99	810.29	-370.93	810.49	-362.09	810.6	-358.19	810.65	-356.83	810.66
-304.24	810.68	-285.06	810.58	-250.46	810.66	-226.31	810.87	-201.92	811.25
-180.38	811.02	-178.06	811.01	-142.44	810.98	-125	810.7	-123.4	810.68
-103.48	810.53	-85.36	810	-63.3	809.72	-38.45	809.01	-35.94	808.19
-35.5	808.15	-35.41	808.15	-35.32	808.14	-35.23	808.13	-35.07	808.12
-34.91	808.11	-34.74	808.1	-34.56	808.09	-34.37	808.07	-34.17	808.06
-33.97	808.05	-33.76	808.03	-33.54	808.02	-33.31	808.01	-33.23	808
-33.22	808	-29.25	806.47	-28.04	806	-24.92	804.84	-22.64	804
-21.26	803.52	-19.32	802.84	-16.91	802.19	-16.85	802.19	-16.82	802.19
-16.69	802.19	-5.82	802.19	-3.39	802.19	-1.15	802.19	.55	802.19
5.22	802.19	7.83	802.19	15.01	804	17.99	804.66	24.08	806
28.83	806.92	34.36	808	39.34	809.23	42.42	810	43.7	810.36
46.48	811.12	48.67	811.73	49.66	812	51.94	812.56	53.3	812.86
55.11	813.29	58.2	813.97	58.24	813.98	58.31	814	58.32	814
58.46	814	58.5	814	58.52	814	58.54	814	58.56	814
58.91	814.04	59.21	814.08	59.5	814.11	59.78	814.15	60.05	814.18
60.31	814.21	60.56	814.25	60.8	814.28	65.04	814.69	65.28	814.71
67.85	814.94	69.06	815.07	71.32	815.3	73.81	815.51	77.92	815.88
78.98	816	81.68	816.58	88.8	818	91.98	818.82	96.72	820
100.95	821.02	104.2	821.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-469.9	.05	-38.45	.035	34.36	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-38.45	34.36	36	50	48	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.08	Reach Len. (ft)	36.00	50.00	48.00
Crit W.S. (ft)		Flow Area (sq ft)	998.74	634.20	50.33
E.G. Slope (ft/ft)	0.000931	Area (sq ft)	998.74	634.20	50.33
Q Total (cfs)	5150.00	Flow (cfs)	1644.44	3422.48	83.08
Top Width (ft)	500.68	Top Width (ft)	408.01	72.81	19.86
Vel Total (ft/s)	3.06	Avg. Vel. (ft/s)	1.65	5.40	1.65
Max Chl Dpth (ft)	10.89	Hydr. Depth (ft)	2.45	8.71	2.53
Conv. Total (cfs)	168767.0	Conv. (cfs)	53888.8	112155.8	2722.4
Length Wtd. (ft)	44.84	Wetted Per. (ft)	408.25	74.60	20.50

* Min Ch El (ft)	*	802.19	* Shear (lb/sq ft)	*	0.14	*	0.49	*	0.14 *
* Alpha	*	2.16	* Stream Power (lb/ft s)	*	104.20	*	0.00	*	0.00 *
* Frctn Loss (ft)	*	0.04	* Cum Volume (acre-ft)	*	115.56	*	46.98	*	65.47 *
* C & E Loss (ft)	*	0.03	* Cum SA (acres)	*	34.64	*	4.18	*	14.29 *

****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2954.54

INPUT
Description: L
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-509.9	819.95	-504.94	818.22	-502.96	817.64	-479.97	811.59	-461.37	810.54
-447.19	809.9	-436.37	809.96	-403.73	810.08	-396.99	810.15	-359.14	810.32
-344.07	810.32	-312.63	810.14	-291.29	810.11	-285.49	810.1	-260.08	810.18
-242.17	810.32	-187.74	811.09	-186.83	811.08	-186.73	811.08	-185.37	811.08
-160.81	810.67	-133.05	810.2	-130.8	810.14	-120.98	809.94	-119.28	809.94
-113.78	809.93	-103.13	809.97	-93.69	809.92	-69.28	809.54	-67.94	809.52
-52.45	809.04	-45.11	808.85	-35.47	808.67	-31.5	808.25	-31.42	808.24
-31.35	808.22	-31.26	808.21	-31.16	808.19	-31.04	808.18	-30.92	808.16
-30.8	808.15	-30.67	808.13	-30.53	808.11	-29.89	808	-29.86	808
-29.83	808	-29.8	808	-29.75	808	-29.74	808	-29.73	808
-29.72	808	-29.7	808	-29.05	807.78	-23.67	806	-21.63	805.31
-17.79	804	-10.69	802.19	-10.66	802.19	-10.4	802.19	0	802.19
9.16	802.19	11.62	802.51	18.63	804	24.79	805.33	27.88	806
35.22	807.49	37.75	808	46.11	809.77	47.2	810	53.42	811.42
56	812	58.23	812.39	59.06	812.53	61.48	812.94	62.86	813.17
63.48	813.27	64.67	813.47	67.71	813.95	68.01	814	68.09	814
68.17	814	74.52	814.69	76.39	814.89	77.77	815.04	78.82	815.15
86.29	816	88.24	816.57	94.41	818	97.98	819.07	101.06	820
106.62	821.6	108.05	822	110.66	822.46	119.91	823.94	120.29	824
120.3	824	125.67	824.01	128.68	824.01	130.18	824.02	131.37	824.02
132.17	824.03	141.52	824.19	144.3	824.23				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-509.9	.05	-31.5	.035	35.22	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-31.5	35.22	36	50	48	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

* E.G. Elev (ft)	*	813.33	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.23	* Wt. n-Val.	*	0.050	*	0.035	*	0.050 *
* W.S. Elev (ft)	*	813.10	* Reach Len. (ft)	*	36.00	*	50.00	*	48.00 *
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	1310.63	*	598.24	*	74.34 *

* E.G. Slope (ft/ft)	*0.000725	* Area (sq ft)	* 1310.63	* 598.24	* 74.34	*			
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 2125.10	* 2910.33	* 114.58	*			
* Top Width (ft)	* 548.18	* Top Width (ft)	* 454.22	* 66.72	* 27.24	*			
* Vel Total (ft/s)	* 2.60	* Avg. Vel. (ft/s)	* 1.62	* 4.86	* 1.54	*			
* Max Chl Dpth (ft)	* 10.91	* Hydr. Depth (ft)	* 2.89	* 8.97	* 2.73	*			
* Conv. Total (cfs)	*191230.1	* Conv. (cfs)	* 78909.2	*108066.4	* 4254.5	*			
* Length Wtd. (ft)	* 44.00	* Wetted Per. (ft)	* 454.52	* 68.16	* 27.82	*			
* Min Ch El (ft)	* 802.19	* Shear (lb/sq ft)	* 0.13	* 0.40	* 0.12	*			
* Alpha	* 2.15	* Stream Power (lb/ft s)	* 144.30	* 0.00	* 0.00	*			
* Frctn Loss (ft)	* 0.03	* Cum Volume (acre-ft)	* 114.60	* 46.27	* 65.40	*			
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 34.29	* 4.10	* 14.27	*			

****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2904.54

INPUT
Description: M
Station Elevation Data num= 136

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-555.08	818.17	-551.53	817.23	-533.87	812.12	-525.42	811.56	-494.28	809.71
-465.28	809.62	-444.08	809.58	-434.14	809.66	-422.93	809.74	-392.27	810.04
-348.18	810.06	-339.93	810.08	-336.85	810.04	-323.3	810.05	-294.13	810.01
-287.65	810.03	-244.02	810.11	-235.05	810.23	-208.28	810.47	-187.1	810.73
-185.09	810.59	-179.54	810.57	-153.52	809.97	-147.04	809.8	-143.48	809.78
-131.45	809.67	-109.41	809.57	-105.87	809.47	-105.74	809.47	-73.37	809.04
-65.8	808.97	-57.78	808.78	-50.48	808.91	-36.42	808.86	-35.58	808.5
-32.25	807.93	-29.14	806.3	-25.8	805.38	-22.8	804.42	-20.89	804
-20.73	803.97	-20.58	803.93	-20.41	803.9	-20.24	803.86	-20.06	803.82
-19.87	803.78	-19.67	803.73	-19.45	803.68	-19.23	803.64	-19	803.58
-18.75	803.53	-18.49	803.47	-18.21	803.41	-18.2	803.41	-16.63	802.28
-16.25	802	-8.17	802	-3.39	802	0	802	2.06	802
10.99	802	11.25	802	11.76	802	12.15	802.07	12.83	802.2
18.97	803.35	22.4	804	25.48	804.72	30.97	806	31.31	806.08
31.62	806.15	34.08	806.73	36.43	807.28	36.84	807.37	37.52	807.53
37.56	807.54	37.59	807.55	37.62	807.55	37.65	807.56	37.68	807.56
37.7	807.57	37.94	807.62	37.96	807.63	38.35	807.71	38.38	807.71
38.4	807.72	38.42	807.72	38.87	807.81	38.9	807.82	38.92	807.83
39.41	807.93	39.44	807.93	39.96	808.04	40.52	808.15	41.11	808.27
41.15	808.28	41.79	808.41	41.84	808.42	43.87	808.86	44.37	808.96
44.9	809.07	45.41	809.17	45.95	809.28	46.53	809.39	47.15	809.52
47.83	809.65	49.22	809.95	49.46	810	51.94	810.54	58.66	812
59.36	812.09	59.65	812.13	63.68	812.64	65.81	812.9	68.23	813.21
72.37	813.72	73.02	813.8	74.71	814	79.31	814.6	82.93	815.09
86.03	815.5	89.61	816	89.68	816	93.22	817.02	96.64	818
100.75	819.42	102.44	820	107.15	821.46	108.87	822	113.42	823.17
116.74	824	116.77	824	116.78	824	116.88	824	116.89	824

117.07 824.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-555.08	.05	-36.42	.035	41.79	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.42	41.79	42	49.96	51	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.13	Reach Len. (ft)	42.00	49.96	51.00
Crit W.S. (ft)		Flow Area (sq ft)	1588.48	703.40	54.66
E.G. Slope (ft/ft)	0.000495	Area (sq ft)	1588.48	703.40	54.66
Q Total (cfs)	5150.00	Flow (cfs)	2266.53	2824.53	58.94
Top Width (ft)	604.95	Top Width (ft)	500.94	78.21	25.81
Vel Total (ft/s)	2.19	Avg. Vel. (ft/s)	1.43	4.02	1.08
Max Chl Dpth (ft)	11.13	Hydr. Depth (ft)	3.17	8.99	2.12
Conv. Total (cfs)	231441.3	Conv. (cfs)	101858.2	126934.4	2648.7
Length Wtd. (ft)	46.37	Wetted Per. (ft)	501.18	80.26	26.26
Min Ch El (ft)	802.00	Shear (lb/sq ft)	0.10	0.27	0.06
Alpha	2.02	Stream Power (lb/ft s)	117.07	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	113.40	45.52	65.33
C & E Loss (ft)	0.01	Cum SA (acres)	33.89	4.02	14.24

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2854.58

INPUT
Description: N
Station Elevation Data num= 136

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-604.74	818.03	-587.39	813.47	-585.09	812.8	-577.61	812.3	-543.57	809.78
-498.5	809.63	-494.24	809.57	-493.32	809.62	-490.35	809.6	-464.42	809.7
-449.62	809.77	-442.77	809.62	-433.61	809.82	-392.69	810.06	-389.49	810.07
-346.11	809.57	-337.27	809.58	-300.9	809.69	-284.47	809.73	-253.74	809.76
-239.62	809.94	-231.28	810.08	-222.63	810.03	-219.09	810.11	-207.99	810.26
-195.77	810.2	-192.67	809.81	-189.75	809.76	-188.94	809.79	-181.12	809.87

-161.13	809.86	-154.94	809.75	-148.17	809.64	-131.76	809.27	-129.32	809.24
-116.92	809.12	-99.47	808.99	-99.27	808.99	-99.21	808.99	-87.45	808.85
-82.36	808.91	-76.54	808.84	-69.24	808.81	-62.26	808.9	-35.56	808.9
-34.29	808.35	-33.72	808.09	-31.28	806.16	-31.27	806.16	-31.24	806.14
-27.8	804.33	-27.74	804.32	-27.67	804.3	-27.61	804.29	-27.54	804.27
-27.46	804.25	-27.39	804.23	-27.3	804.21	-27.21	804.19	-27.11	804.17
-27.01	804.14	-26.89	804.12	-26.77	804.09	-26.64	804.06	-26.49	804.02
-26.4	804	-24.06	802.5	-23.28	802	-4.28	802	0	802
14.53	802	19.83	802.93	25.91	804	26.55	804.15	26.9	804.23
26.94	804.25	26.96	804.25	27.08	804.29	27.12	804.3	27.23	804.33
27.28	804.35	27.38	804.38	27.43	804.4	27.53	804.43	27.59	804.45
28.53	804.72	28.64	804.74	28.75	804.77	28.87	804.79	29	804.82
29.39	804.91	29.49	804.94	29.6	804.97	29.75	805	29.91	805.04
30.09	805.09	30.28	805.13	30.48	805.18	30.7	805.24	30.95	805.3
31.21	805.36	31.5	805.43	31.85	805.52	32.24	805.61	32.68	805.72
33.18	805.84	34.31	806.12	34.94	806.28	35.68	806.46	36.54	806.68
37.56	806.94	38.78	807.25	40.46	807.67	42.6	808.2	45.44	808.91
49.4	809.9	49.81	810	57.71	811.96	57.86	812	66.98	813.82
67.88	814	67.97	814	68.01	814	68.24	814	87.56	815.69
88.39	815.76	90.98	816	94.53	817.23	96.75	818	100.5	819.34
102.36	820	103.49	820.39	108.11	822	109.79	822.45	115.56	824
115.88	824.04								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-604.74	.05	-35.56	.035	45.44	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.56	45.44	40	50.04	52	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.13	Reach Len. (ft)	40.00	50.04	52.00
Crit W.S. (ft)		Flow Area (sq ft)	1854.07	761.16	36.46
E.G. Slope (ft/ft)	0.000374	Area (sq ft)	1854.07	761.16	36.46
Q Total (cfs)	5150.00	Flow (cfs)	2393.81	2723.35	32.84
Top Width (ft)	649.77	Top Width (ft)	550.67	81.00	18.09
Vel Total (ft/s)	1.94	Avg. Vel. (ft/s)	1.29	3.58	0.90
Max Chl Dpth (ft)	11.13	Hydr. Depth (ft)	3.37	9.40	2.01
Conv. Total (cfs)	266224.9	Conv. (cfs)	123745.8	140781.4	1697.7
Length Wtd. (ft)	45.03	Wetted Per. (ft)	550.88	83.71	18.59
Min Ch El (ft)	802.00	Shear (lb/sq ft)	0.08	0.21	0.05
Alpha	2.00	Stream Power (lb/ft s)	115.88	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	111.74	44.68	65.28
C & E Loss (ft)	0.01	Cum SA (acres)	33.38	3.93	

14.21 *
****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2804.54

INPUT
Description: O
Station Elevation Data num= 224

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-636.99	817.78	-620.56	813.37	-593.74	811.22	-573.43	809.84	-567.39	809.75
-532.59	809.32	-523.1	809.82	-493.13	809.57	-486.12	809.6	-483.76	809.54
-473.25	809.31	-455.93	809.7	-446.03	809.76	-418.52	809.68	-391.12	809.35
-371.75	809.21	-353.59	809.07	-320.57	809.32	-310.49	809.4	-285.69	809.54
-264.41	809.57	-260.62	809.62	-252.37	809.53	-243.1	809.46	-235.49	809.62
-210.66	809.92	-203.19	809.88	-197.84	809.23	-197.64	809.22	-194.22	809.36
-191.11	809.39	-177.26	809.36	-170.33	809.28	-164.3	809.01	-153.82	808.7
-139.84	808.71	-132.13	808.6	-123.32	808.22	-121.92	808.15	-120.95	808.13
-107.12	808.07	-104.82	808.04	-97.1	807.93	-90.23	807.96	-83.62	808.09
-65.83	808.29	-65.47	808.31	-61.61	808.39	-41.95	809.2	-35.53	809.4
-35.51	809.4	-34.23	808.97	-33.63	808.75	-31.2	806.83	-31.19	806.83
-29.7	805.77	-29.59	805.69	-29.57	805.68	-25.99	803.68	-25.99	803.67
-25.98	803.66	-25.97	803.64	-25.95	803.62	-25.94	803.61	-25.92	803.59
-25.91	803.57	-25.89	803.55	-25.87	803.53	-25.85	803.5	-25.84	803.48
-25.82	803.46	-25.8	803.43	-25.78	803.4	-25.75	803.38	-25.73	803.35
-25.71	803.32	-25.68	803.29	-25.67	803.27	-23.62	802	-12.29	802
-8.16	802	-.98	802	0	802	18.54	802	18.64	802.02
18.75	802.05	18.76	802.05	18.87	802.08	18.97	802.1	19.06	802.12
19.15	802.15	19.24	802.17	19.32	802.19	19.35	802.19	19.44	802.21
19.51	802.23	19.59	802.25	19.66	802.27	19.73	802.28	19.8	802.3
19.86	802.31	19.92	802.33	19.98	802.34	20.04	802.36	20.09	802.37
20.15	802.38	20.21	802.4	20.26	802.41	20.31	802.42	20.36	802.43
20.41	802.45	20.46	802.46	20.5	802.47	20.55	802.48	20.59	802.49
20.63	802.5	20.67	802.51	20.71	802.52	20.75	802.53	20.78	802.53
20.82	802.54	20.85	802.55	20.88	802.56	20.92	802.57	20.95	802.57
20.98	802.58	21.08	802.61	21.11	802.61	21.14	802.62	21.17	802.63
21.2	802.64	21.23	802.64	21.26	802.65	21.29	802.66	21.31	802.66
21.34	802.67	21.36	802.67	21.39	802.68	21.41	802.69	21.44	802.69
21.46	802.7	21.48	802.7	21.5	802.71	21.53	802.71	21.55	802.72
21.57	802.72	21.59	802.73	21.61	802.73	21.63	802.74	21.65	802.74
21.66	802.75	21.68	802.75	21.7	802.75	21.72	802.76	21.74	802.76
21.75	802.77	21.89	802.8	21.91	802.8	23.53	803.12	23.69	803.16
23.71	803.17	23.81	803.19	24.81	805.05	24.86	805.07	25.04	805.13
25.21	805.2	25.38	805.26	25.55	805.32	25.64	805.35	26.14	805.53
37.03	807.89	42.61	809.52	47.89	809.79	48.09	809.82	48.29	809.86
49.56	810.15	49.78	810.2	50.02	810.26	50.26	810.32	50.54	810.38
50.84	810.45	51.15	810.51	51.47	810.58	51.81	810.66	52.17	810.74
52.9	810.9	53.26	810.98	53.64	811.07	54.04	811.17	54.47	811.27
55.97	811.53	56.29	811.59	56.63	811.67	57.01	811.75	57.43	811.84
57.9	811.94	58.18	812	66	813.35	69.49	813.96	69.71	814
75.94	814.59	80	814.97	82.33	815.19	83.84	815.33	85.64	815.5
87.9	815.68	88.33	815.71	90.91	815.91	91.03	815.92	92.13	816
93.67	816.33	94.43	816.53	96.39	816.99	98.88	817.68	99.33	817.79
100.04	818	105.58	819.9	105.87	820	106.47	820.21	111.67	822
117.68	823.92	117.92	824	118.6	824.19	124.8	825.92		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
*********************************************
 -636.99     .05  -35.53    .035   42.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -35.53   42.61                50      50      60            .1      .3

CROSS SECTION OUTPUT  Profile #100-Year
*****************************************************************************************
***********
* E.G. Elev (ft)         *  813.23  * Element               *  Left OB *  Channel *
Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.            *   0.050  *   0.035  *
  0.050  *
* W.S. Elev (ft)         *  813.14  * Reach Len. (ft)       *   50.00  *   50.00  *
  60.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)     * 2166.15  *  725.98  *
  45.01  *
* E.G. Slope (ft/ft)     *0.000319  * Area (sq ft)          * 2166.15  *  725.98  *
  45.01  *
* Q Total (cfs)          * 5150.00  * Flow (cfs)           * 2760.23  * 2351.84  *
  37.93  *
* Top Width (ft)         *  682.42  * Top Width (ft)       *  582.12  *   78.14  *
  22.16  *
* Vel Total (ft/s)       *    1.75  * Avg. Vel. (ft/s)     *    1.27  *    3.24  *
   0.84  *
* Max Chl Dpth (ft)      *   11.14  * Hydr. Depth (ft)     *    3.72  *    9.29  *
   2.03  *
* Conv. Total (cfs)      *288337.5  * Conv. (cfs)          *154539.3  *131674.6  *
 2123.6  *
* Length Wtd. (ft)       *   50.10  * Wetted Per. (ft)     *  582.37  *   82.21  *
  22.50  *
* Min Ch El (ft)         *  802.00  * Shear (lb/sq ft)     *    0.07  *    0.18  *
   0.04  *
* Alpha                  *    1.84  * Stream Power (lb/ft s) *  124.80  *    0.00  *
   0.00  *
* Frctn Loss (ft)        *    0.02  * Cum Volume (acre-ft) *  109.90  *   43.83  *
  65.23  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)       *   32.86  *    3.84  *
  14.19  *
*****************************************************************************************
***********

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek       RS: 2754.54

INPUT
Description: P
Station Elevation Data    num=     168
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 -699.01  815.93 -697.79  815.61 -665.41  812.92 -625.31  809.39 -622.52  809.03
 -621.43  808.74 -620.24  808.77 -617.21  808.47  -615.7  809.01 -614.94   809.2
 -612.78   809.4 -602.34  810.16 -597.05  810.51 -583.44  810.88 -579.93  811.01
 -565.86  810.75 -532.33  809.93 -525.05  809.13 -523.29     809 -520.08  809.08
 -508.02  809.38  -501.8  809.78 -500.21  809.87 -489.56   810.2 -459.58  810.12
 -459.49  810.12 -459.48  810.12 -459.41  810.12  -423.2  809.72 -415.83   809.8
 -403.62  809.88 -385.41  809.95 -375.96  810.15 -357.95  810.41 -340.63   810.6
 -319.94  811.16 -304.14  811.19 -294.46  811.26 -270.82  811.15 -265.45  810.91
 -261.08  810.78 -246.74  810.16 -241.79  810.23 -235.18  810.34 -234.12   810.4
 -231.13  810.38 -198.52  809.87 -197.68  809.58  -194.2  808.77 -193.07  808.52
```

-178.48	807.88	-177.88	807.85	-177.82	807.85	-164.45	807.34	-162.67	807.33
-155.89	807.28	-155.32	806.98	-153.6	807.57	-151.86	807.58	-138.74	807.52
-135.54	807.51	-132.75	807.16	-130.02	806.85	-127	806.75	-124.24	806.57
-118.5	806.53	-110.43	805.94	-108.29	805.37	-106.35	805.03	-104.76	805.01
-102.17	805.14	-99.69	805.76	-99.06	805.87	-98.96	805.86	-98.42	805.92
-84.59	807.47	-83.07	807.51	-83.03	807.51	-82.25	807.53	-68.99	807.62
-59.02	807.76	-50.91	807.97	-37.84	808.52	-37.49	808.63	-35.61	808.13
-29.14	805.37	-23.52	803.77	-22.8	802.87	-22.74	802.78	-22.67	802.68
-22.58	802.55	-22.48	802.41	-22.35	802.23	-22.33	802.2	-22.28	802.17
-22.01	802	-18.39	802	-17.92	802	-13.41	802	-12.3	802
-8.44	802	-6.69	802	-3.47	802	-1.09	802	0	802
2.18	802	7.06	802	9.46	802	15.81	802	16.72	802
21.18	802	21.2	802	21.25	802.02	21.31	802.03	21.36	802.04
21.41	802.05	21.46	802.07	21.51	802.08	21.55	802.09	21.6	802.1
21.65	802.11	21.69	802.12	21.73	802.13	21.78	802.14	21.82	802.15
21.86	802.16	21.89	802.17	21.93	802.18	25.86	802.95	25.9	802.96
25.91	802.96	25.93	802.96	28.32	807.37	28.33	807.37	28.38	807.39
28.42	807.41	28.47	807.42	28.51	807.44	28.53	807.45	28.66	807.49
31.44	808.11	45.69	812.31	49.98	813.62	59.57	813.62	60.31	813.64
61.18	813.66	62.21	813.69	63.5	813.72	65.11	813.76	67.15	813.81
69.83	813.88	73.34	813.96	74.76	814	74.91	814	91.42	815.35
99.32	816	102.78	816.84	107.54	818	111.72	819.44	113.34	820
114.82	820.51	119.14	822	124.37	823.8	124.94	824	126.17	824.38
131.32	826	136.21	827.34	138.39	827.91				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-699.01	.05	-37.49	.035	28.66	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-37.49	28.66	51	50	58	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	813.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	813.11	Reach Len. (ft)	51.00	50.00	58.00
Crit W.S. (ft)		Flow Area (sq ft)	2218.36	664.85	57.16
E.G. Slope (ft/ft)	0.000334	Area (sq ft)	2218.36	664.85	57.16
Q Total (cfs)	5150.00	Flow (cfs)	2786.10	2302.25	61.65
Top Width (ft)	716.03	Top Width (ft)	630.22	66.15	19.65
Vel Total (ft/s)	1.75	Avg. Vel. (ft/s)	1.26	3.46	1.08
Max Chl Dpth (ft)	11.11	Hydr. Depth (ft)	3.52	10.05	2.91
Conv. Total (cfs)	281598.4	Conv. (cfs)	152342.2	125885.2	3371.1
Length Wtd. (ft)	50.56	Wetted Per. (ft)	631.52	70.59	20.45
Min Ch El (ft)	802.00	Shear (lb/sq ft)	0.07	0.20	0.06
Alpha	2.03	Stream Power (lb/ft s)	138.39	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	107.38	43.03	

```
  65.16  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *   32.17  *    3.75  *
  14.16  *
*****************************************************************************************
***********

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 2704.54

INPUT
Description: Q
Station Elevation Data    num=     154
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 -748.45  816.02  -700.4  811.68 -692.77  810.93 -683.87  809.81 -680.17  809.65
 -677.45  809.68 -674.56  810.19 -673.33  810.49    -666  811.13 -662.97  811.41
 -637.33  811.61 -634.04  811.63 -631.87  811.61 -583.36  810.81 -582.01  810.82
 -577.31  810.68 -571.55  811.45 -562.03  811.58 -551.48  811.55    -539  811.63
 -517.08  811.43 -503.81  811.42 -480.94  811.33 -472.87  811.32 -443.55  811.19
 -439.45  811.22 -390.14   811.6 -383.12  811.66 -350.21  812.11 -346.85  812.08
 -333.68   812.1 -333.26   812.1 -319.39  812.02 -296.26  811.96 -289.76  811.86
 -274.92  811.73 -266.98  811.52 -260.88  811.65 -254.36  811.35 -248.44  811.18
 -234.05  810.76  -220.2  810.35 -189.97  809.52 -189.63  809.44 -185.63  809.13
 -184.53  808.98 -176.48  808.66 -164.04  808.06 -132.48  807.88 -131.43  807.87
 -131.03  807.87  -128.5  807.82 -127.59   807.8  -97.03  807.18  -93.87  807.15
  -65.52  808.11  -59.38  808.03  -40.14  808.49  -33.94  808.23  -32.14  808.15
  -31.27  808.03  -31.03  807.98  -30.36  807.89  -29.98  807.71  -28.02  805.88
   -27.8  805.81  -27.78   805.8  -27.75  805.79  -27.72  805.78  -27.69  805.77
   -27.6  805.74  -27.39  805.67  -27.27  805.61  -27.07  805.53   -26.7  805.38
  -25.82  805.02  -20.72  802.94  -18.43     802  -17.88     802  -17.79     802
   -12.4     802  -11.38     802    -6.9     802   -6.87     802   -4.92     802
   -1.38     802       0     802    1.76     802    4.54     802    5.55     802
    9.02     802   10.62     802   16.34     802   16.72     802   18.59     802
   19.75  802.24    20.4  802.37   21.76  802.65   22.53   802.8   23.02   802.9
   23.36  802.97   23.61  803.02    23.8  803.06   23.95  803.09   24.07  803.12
   24.17  803.14   24.26  803.16   24.33  803.17   24.39  803.19   24.45   803.2
    24.5  803.21   24.54  803.22   24.58  803.22   24.61  803.23   24.64  803.24
   24.67  803.24    24.7  803.25   24.72  803.25   24.74  803.26   24.76  803.26
   24.78  803.26    24.8  803.27   24.81  803.27   24.83  803.27   24.84  803.28
   24.85  803.28   24.86  803.28   24.88  803.28   25.13  803.34      30  808.07
   30.08  808.22   30.78  808.43    49.1  815.09  102.85  815.17   114.4     816
  114.46     816  114.54     816  114.59     816   114.7     816  115.25  816.16
   116.5  816.52  121.57     818  127.43  819.88  127.81     820  128.27  820.15
  133.84     822   139.7  823.91  139.98     824  140.39  824.13  146.22     826
   150.1  827.24  152.47     828  157.76   829.1  161.88  829.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 -748.45     .05  -33.94    .035      30     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -33.94      30                  51   43.25      43            .1      .3

CROSS SECTION OUTPUT  Profile #100-Year
*****************************************************************************************
***********
* E.G. Elev (ft)         *  813.17  * Element                *  Left OB *  Channel *
Right OB *
* Vel Head (ft)          *    0.21  * Wt. n-Val.             *   0.050  *   0.035  *
```

0.050						
* W.S. Elev (ft)	* 812.97	* Reach Len. (ft)	* 51.00	* 43.25	* 43.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1625.95	* 626.52	* 31.94	*
* E.G. Slope (ft/ft)	*0.000629	* Area (sq ft)	* 1625.95	* 626.52	* 31.94	*
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 2164.32	* 2944.78	* 40.90	*
* Top Width (ft)	* 757.90	* Top Width (ft)	* 680.70	* 63.94	* 13.26	*
* Vel Total (ft/s)	* 2.25	* Avg. Vel. (ft/s)	* 1.33	* 4.70	* 1.28	*
* Max Chl Dpth (ft)	* 10.97	* Hydr. Depth (ft)	* 2.39	* 9.80	* 2.41	*
* Conv. Total (cfs)	*205359.1	* Conv. (cfs)	* 86303.3	*117424.8	* 1631.0	*
* Length Wtd. (ft)	* 44.88	* Wetted Per. (ft)	* 681.19	* 67.54	* 14.18	*
* Min Ch El (ft)	* 802.00	* Shear (lb/sq ft)	* 0.09	* 0.36	* 0.09	*
* Alpha	* 2.63	* Stream Power (lb/ft s)	* 161.88	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.06	* Cum Volume (acre-ft)	* 105.13	* 42.29	* 65.10	*
* C & E Loss (ft)	* 0.14	* Cum SA (acres)	* 31.40	* 3.68	* 14.14	*

****

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: Buckeye Creek
REACH: Buckeye Creek RS: 2661.29

INPUT
Description: R
Station Elevation Data num= 146

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-783.32	816.92	-733.81	811.97	-729.95	811.66	-716.71	810.33	-715.94	810.19
-714.02	810.18	-707.96	809.91	-707.14	810.05	-704.49	810.53	-699.47	810.98
-692.88	811.53	-667.52	811.89	-662.99	811.93	-644.31	811.73	-617.72	811.48
-613.76	811.45	-611.42	811.47	-607.17	810.96	-602.21	811.53	-589.62	811.81
-582.69	811.99	-577.88	811.93	-553	811.55	-533.67	811.35	-517	811.32
-503.59	811.16	-484.32	811.15	-482.21	811.18	-460.37	811.51	-433.39	811.71
-408.66	811.94	-400	812.03	-396.5	812.04	-378.35	811.9	-366.17	811.81
-356.25	811.79	-352.92	811.8	-325.51	811.94	-315.59	811.84	-300.04	811.69
-296.75	811.66	-295.78	811.65	-293.27	811.68	-283.04	811.61	-275.48	811.56
-272.25	811.41	-270.84	811.41	-260.52	811.18	-255.37	811.1	-251.05	811.01
-243.46	810.92	-229.93	810.51	-225.49	810.37	-218.08	810.2	-193.64	809.53
-159.48	808.73	-159.26	808.71	-158.2	808.66	-149.61	808.37	-138.25	808.02
-108.81	808.05	-104.98	807.98	-98.95	808.1	-76.28	808.02	-66.27	807.74
-50.69	807.61	-35.72	807.37	-30.35	806.7	-28.35	806.46	-21.76	804.95
-15.72	804.22	-15.2	803.46	-14.95	803.31	-14.93	803.28	-14.91	803.25
-14.89	803.21	-14.86	803.17	-14.83	803.13	-14.8	803.08	-14.77	803.02

-14.73	802.96	-14.69	802.89	-14.63	802.8	-14.58	802.71	-14.51	802.6
-14.43	802.47	-14.33	802.31	-14.21	802.11	-14.14	802	-10.62	802
-9.76	802	-3.66	802	-1.11	802	0	802	3.28	802
7.57	802	10.21	802	16.23	802	17.12	802	20.6	802
20.72	802.01	20.95	802.03	21.16	802.04	21.36	802.06	21.55	802.07
21.72	802.09	27.88	802.57	31.67	806.67	33.46	808.35	46.36	812.63
47.42	812.95	50.63	813.48	56.04	813.65	57.86	813.75	101.72	813.93
102.64	813.94	103.63	813.96	104.68	813.97	105.74	813.98	106.86	813.99
107.53	814	107.58	814	109.13	814.12	109.42	814.15	113.04	814.43
114.04	814.51	115.48	814.62	117.7	814.79	121.05	815.06	124.84	815.34
126.67	815.49	132.02	815.89	132.34	815.91	133.53	816	136.37	816.61
137.94	816.96	139.77	817.36	142.54	818	143.12	818.18	144.56	818.64
147.7	819.64	148.85	820	152.27	821.08	155.2	822	157.11	822.61
158.68	823.11								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-783.32	.05	-28.35	.035	31.67	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-28.35	31.67	134	57.86 63	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-783.32	-26.57	812.2	T
36.35	158.68	812.2	T

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	812.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.61	Wt. n-Val.		0.035	0.050
W.S. Elev (ft)	811.37	Reach Len. (ft)	7.83	7.83	7.83
Crit W.S. (ft)	809.07	Flow Area (sq ft)		499.45	14.25
E.G. Slope (ft/ft)	0.003540	Area (sq ft)	628.70	508.55	20.66
Q Total (cfs)	5150.00	Flow (cfs)		5102.44	47.56
Top Width (ft)	416.99	Top Width (ft)	346.08	60.02	10.89
Vel Total (ft/s)	10.03	Avg. Vel. (ft/s)		10.22	3.34
Max Chl Dpth (ft)	9.37	Hydr. Depth (ft)		8.58	3.05
Conv. Total (cfs)	86563.4	Conv. (cfs)		85764.1	799.3
Length Wtd. (ft)	7.83	Wetted Per. (ft)		61.40	5.50
Min Ch El (ft)	802.00	Shear (lb/sq ft)		1.80	0.57
Alpha	1.03	Stream Power (lb/ft s)	158.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	103.81	41.73	65.07
C & E Loss (ft)		Cum SA (acres)	30.80	3.62	14.12

BRIDGE

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2625.35

INPUT
Description:
Distance from Upstream XS = 7.83
Deck/Roadway Width = 15
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 10

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
-402.08 811.37	0	-279 812.09	0	-47.53 812.2	0
-31.61 812.2	0	-26.57 812.2	810	0 812.2	810
36.35 812.2	810	39.52 812.2	0	59.65 812.2	0
110 812.2	0				

Upstream Bridge Cross Section Data
Station Elevation Data num= 146

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-783.32	816.92	-733.81	811.97	-729.95	811.66	-716.71	810.33	-715.94	810.19
-714.02	810.18	-707.96	809.91	-707.14	810.05	-704.49	810.53	-699.47	810.98
-692.88	811.53	-667.52	811.89	-662.99	811.93	-644.31	811.73	-617.72	811.48
-613.76	811.45	-611.42	811.47	-607.17	810.96	-602.21	811.53	-589.62	811.81
-582.69	811.99	-577.88	811.93	-553	811.55	-533.67	811.35	-517	811.32
-503.59	811.16	-484.32	811.15	-482.21	811.18	-460.37	811.51	-433.39	811.71
-408.66	811.94	-400	812.03	-396.5	812.04	-378.35	811.9	-366.17	811.81
-356.25	811.79	-352.92	811.8	-325.51	811.94	-315.59	811.84	-300.04	811.69
-296.75	811.66	-295.78	811.65	-293.27	811.68	-283.04	811.61	-275.48	811.56
-272.25	811.41	-270.84	811.41	-260.52	811.18	-255.37	811.1	-251.05	811.01
-243.46	810.92	-229.93	810.51	-225.49	810.37	-218.08	810.2	-193.64	809.53
-159.48	808.73	-159.26	808.71	-158.2	808.66	-149.61	808.37	-138.25	808.02
-108.81	808.05	-104.98	807.98	-98.95	808.1	-76.28	808.02	-66.27	807.74
-50.69	807.61	-35.72	807.37	-30.35	806.7	-28.35	806.46	-21.76	804.95
-15.72	804.22	-15.2	803.46	-14.95	803.31	-14.93	803.28	-14.91	803.25
-14.89	803.21	-14.86	803.17	-14.83	803.13	-14.8	803.08	-14.77	803.02
-14.73	802.96	-14.69	802.89	-14.63	802.8	-14.58	802.71	-14.51	802.6
-14.43	802.47	-14.33	802.31	-14.21	802.11	-14.14	802	-10.62	802
-9.76	802	-3.66	802	-1.11	802	0	802	3.28	802
7.57	802	10.21	802	16.23	802	17.12	802	20.6	802
20.72	802.01	20.95	802.03	21.16	802.04	21.36	802.06	21.55	802.07
21.72	802.09	27.88	802.57	31.67	806.67	33.46	808.35	46.36	812.63
47.42	812.95	50.63	813.48	56.04	813.65	57.86	813.75	101.72	813.93
102.64	813.94	103.63	813.96	104.68	813.97	105.74	813.98	106.86	813.99
107.53	814	107.58	814	109.13	814.12	109.42	814.15	113.04	814.43
114.04	814.51	115.48	814.62	117.7	814.79	121.05	815.06	124.84	815.34
126.67	815.49	132.02	815.89	132.34	815.91	133.53	816	136.37	816.61
137.94	816.96	139.77	817.36	142.54	818	143.12	818.18	144.56	818.64
147.7	819.64	148.85	820	152.27	821.08	155.2	822	157.11	822.61
158.68	823.11								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-783.32	.05	-28.35	.035	31.67	.05

Bank Sta: Left Right Coeff Contr. Expan.
-28.35 31.67 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-783.32	-26.57	812.2	T
36.35	158.68	812.2	T

Downstream Deck/Roadway Coordinates

num= 11

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-445.44	811.52	0	-304.77	812.2	0	-47.53	812.2	0
-31.61	812.2	0	-26.57	812.2	810	0	812.2	810
36.35	812.2	810	39.52	812.2	0	59.65	812.2	0
109.91	812.2	0	140	812.2	0			

Downstream Bridge Cross Section Data

Station Elevation Data num= 168

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-894.09	816.87	-876.52	814.4	-831.94	811.38	-830.85	811.3	-830.72	811.29
-823.48	810.55	-823.34	810.52	-820.05	810.19	-818.82	810.68	-818.75	810.7
-818.67	810.71	-815.87	811.16	-809.43	811	-784.07	810.46	-778.22	810.36
-745.9	810.51	-718.61	810.5	-715.28	810.48	-707.53	810.45	-704.06	810.44
-703.62	810.45	-664.69	810.04	-638.25	809.64	-625.96	809.74	-618.61	809.75
-599.23	809.86	-584.82	810.13	-569.62	810.31	-551.66	810.8	-528.92	811.45
-528.79	811.47	-527.09	811.55	-522.26	811.71	-510.94	811.18	-500.7	811.56
-476.48	811.6	-467.12	811.53	-464.76	811.52	-461.95	811.56	-432.04	811.7
-423.95	811.73	-418.48	811.69	-391.41	811.38	-372.01	811.72	-371.95	811.67
-370.07	811.7	-368.61	811.83	-363.43	811.89	-350.22	811.76	-349.4	811.76
-345.61	811.67	-321.9	811.34	-318.71	811.36	-304.07	810.9	-302.05	810.88
-294.79	810.9	-289.51	810.85	-280.21	810.76	-274.05	810.67	-272.54	810.58
-247.3	810.31	-242.95	810.26	-226.04	809.86	-208.97	809.51	-201.01	809.47
-196.58	809.5	-179.02	809.17	-163.54	808.91	-155.16	808.84	-147.64	808.66
-138.16	808.75	-136.69	808.74	-128.47	808.6	-126.5	808.4	-112.75	808.41
-101.83	808.22	-87.87	808.42	-79.46	808.57	-70.73	808.12	-56.58	807.63
-41.5	806.76	-36.54	806.63	-31.16	806.57	-28.47	806.55	-26.43	806.53
-26.25	806.42	-25.52	805.98	-22.05	802.88	-21.93	802.8	-21.2	802.12
-21.19	802.1	-21.17	802.09	-21.15	802.08	-21.12	802.07	-21.1	802.06
-21.08	802.04	-21.06	802.03	-21.03	802.02	-21.01	802	-3.33	802
0	802	8.49	802	12.86	802	19.91	802	21.64	802.22
23.61	802.46	24.81	802.61	25.62	802.71	26.21	802.79	26.65	802.84
27	802.88	27.27	802.92	27.5	802.95	27.69	802.97	27.71	802.97
27.85	802.99	27.99	803.01	28.11	803.02	28.22	803.04	28.31	803.05
28.39	803.06	28.47	803.07	28.54	803.08	28.6	803.08	28.65	803.09
28.7	803.1	28.75	803.1	28.79	803.11	28.83	803.11	28.87	803.12
28.9	803.12	28.93	803.12	28.96	803.13	28.99	803.13	29.01	803.14
29.04	803.14	29.06	803.14	29.08	803.14	29.1	803.15	29.12	803.15
29.14	803.15	29.16	803.15	29.37	803.21	29.76	803.33	29.88	803.36
35.8	806.62	35.86	806.64	36.09	806.68	36.39	806.71	46.81	807.54
52.56	807.93	59.22	809.23	65.51	809.86	65.97	809.9	73.35	810.89
79.45	811.7	80.35	811.82	80.79	811.87	94.07	812.91	95.32	813.03
98.75	813.24	107.94	813.92	114.81	814.09	117.15	814.33	128.42	814.96
128.96	814.96	139.38	815.3	141.42	815.61				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-894.09	.05	-26.43	.035	35.8	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
-26.43	35.8	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-894.09	-26.57	811	T
36.35	141.42	811	T

```
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 =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

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 #100-Year
**********************************************************************************
*********
* E.G. US. (ft)          *     812.98  * Element                *Inside BR US
*Inside BR DS *
* W.S. US. (ft)          *     811.37  * E.G. Elev (ft)         *     812.98  *
812.55  *
* Q Total (cfs)          *    5150.00  * W.S. Elev (ft)         *     811.37  *
811.37  *
* Q Bridge (cfs)         *    3745.66  * Crit W.S. (ft)         *     809.07  *
808.56  *
* Q Weir (cfs)           *    1404.34  * Max Chl Dpth (ft)      *       9.37  *
 9.37  *
* Weir Sta Lft (ft)      *    -743.89  * Vel Total (ft/s)       *       4.96  *
 3.11  *
* Weir Sta Rgt (ft)      *      47.59  * Flow Area (sq ft)      *    1039.14  *
1658.36  *
* Weir Submerg           *       0.00  * Froude # Chl           *       0.70  *
 0.61  *
* Weir Max Depth (ft)    *       0.78  * Specif Force (cu ft)  *    4101.22  *
4082.60  *
* Min El Weir Flow (ft)  *     812.21  * Hydr Depth (ft)       *             *
 5.36  *
* Min El Prs (ft)        *     810.00  * W.P. Total (ft)       *     129.82  *
444.82  *
* Delta EG (ft)          *       0.43  * Conv. Total (cfs)     *             *
       *
* Delta WS (ft)          *       0.26  * Top Width (ft)        *             *
309.33  *
* BR Open Area (sq ft)   *     427.46  * Frctn Loss (ft)       *             *
       *
* BR Open Vel (ft/s)     *       8.76  * C & E Loss (ft)       *             *
       *
* Coef of Q              *             * Shear Total (lb/sq ft) *             *
       *
```

```
* Br Sel Method          * Press/Weir  * Power Total (lb/ft s)  *    -783.32  *
-894.09  *
*********************************************************************************
*********

Note:    The downstream water surface is above the minimum elevation required for
orifice flow.  The orifice flow equation was
         used for pressure flow.
Note:    Multiple critical depths were found at this location.  The critical depth
with the lowest, valid, water surface was used.
Note:    For the cross section inside the bridge at the upstream end, the water
surface and energy have been projected from
         the upstream cross section.  The selected bridge modeling method does not
compute answers inside the bridge.
Note:    Multiple critical depths were found at this location.  The critical depth
with the lowest, valid, water surface was used.
Note:    For the cross section inside the bridge at the downstream end, the water
surface and energy have been projected from
         the downstream cross section.  The selected bridge modeling method does not
compute answers inside the bridge.

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek       RS: 2603.43

INPUT
Description: S
Station Elevation Data    num=     168
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 -894.09  816.87 -876.52   814.4 -831.94  811.38 -830.85   811.3 -830.72  811.29
 -823.48  810.55 -823.34  810.52 -820.05  810.19 -818.82  810.68 -818.75   810.7
 -818.67  810.71 -815.87  811.16 -809.43     811 -784.07  810.46 -778.22  810.36
  -745.9  810.51 -718.61   810.5 -715.28  810.48 -707.53  810.45 -704.06  810.44
 -703.62  810.45 -664.69  810.04 -638.25  809.64 -625.96  809.74 -618.61  809.75
 -599.23  809.86 -584.82  810.13 -569.62  810.31 -551.66   810.8 -528.92  811.45
 -528.79  811.47 -527.09  811.55 -522.26  811.71 -510.94  811.18  -500.7  811.56
 -476.48   811.6 -467.12  811.53 -464.76  811.52 -461.95  811.56 -432.04   811.7
 -423.95  811.73 -418.48  811.69 -391.41  811.38 -372.01  811.72 -371.95  811.67
 -370.07   811.7 -368.61  811.83 -363.43  811.89 -350.22  811.76  -349.4  811.76
 -345.61  811.67  -321.9  811.34 -318.71  811.36 -304.07   810.9 -302.05  810.88
 -294.79   810.9 -289.51  810.85 -280.21  810.76 -274.05  810.67 -272.54  810.58
  -247.3  810.31 -242.95  810.26 -226.04  809.86 -208.97  809.51 -201.01  809.47
 -196.58   809.5 -179.02  809.17 -163.54  808.91 -155.16  808.84 -147.64  808.66
 -138.16  808.75 -136.69  808.74 -128.47   808.6  -126.5   808.4 -112.75  808.41
 -101.83  808.22  -87.87  808.42  -79.46  808.57  -70.73  808.12  -56.58  807.63
   -41.5  806.76  -36.54  806.63  -31.16  806.57  -28.47  806.55  -26.43  806.53
  -26.25  806.42  -25.52  805.98  -22.05  802.88  -21.93   802.8  -21.2   802.12
  -21.19   802.1  -21.17  802.09  -21.15  802.08  -21.12  802.07  -21.1   802.06
  -21.08  802.04  -21.06  802.03  -21.03  802.02  -21.01     802  -3.33     802
       0     802    8.49     802   12.86     802   19.91     802   21.64  802.22
   23.61  802.46   24.81  802.61   25.62  802.71   26.21  802.79   26.65  802.84
      27  802.88   27.27  802.92    27.5  802.95   27.69  802.97   27.71  802.97
   27.85  802.99   27.99  803.01   28.11  803.02   28.22  803.04   28.31  803.05
   28.39  803.06   28.47  803.07   28.54  803.08    28.6  803.08   28.65  803.09
    28.7   803.1   28.75   803.1   28.79  803.11   28.83  803.11   28.87  803.12
    28.9  803.12   28.93  803.12   28.96  803.13   28.99  803.13   29.01  803.14
   29.04  803.14   29.06  803.14   29.08  803.14    29.1  803.15   29.12  803.15
   29.14  803.15   29.16  803.15   29.37  803.21   29.76  803.33   29.88  803.36
    35.8  806.62   35.86  806.64   36.09  806.68   36.39  806.71   46.81  807.54
   52.56  807.93   59.22  809.23   65.51  809.86   65.97   809.9   73.35  810.89
```

79.45	811.7	80.35	811.82	80.79	811.87	94.07	812.91	95.32	813.03
98.75	813.24	107.94	813.92	114.81	814.09	117.15	814.33	128.42	814.96
128.96	814.96	139.38	815.3	141.42	815.61				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-894.09	.05	-26.43	.035	35.8	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-26.43	35.8	66	48.89	51	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-894.09	-26.57	811	T
36.35	141.42	811	T

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	812.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.11	Reach Len. (ft)	66.00	48.89	51.00
Crit W.S. (ft)	808.56	Flow Area (sq ft)	64.38	530.49	6.82
E.G. Slope (ft/ft)	0.003137	Area (sq ft)	800.22	530.49	96.43
Q Total (cfs)	5150.00	Flow (cfs)	25.02	5121.47	3.52
Top Width (ft)	672.15	Top Width (ft)	570.68	62.23	39.24
Vel Total (ft/s)	8.56	Avg. Vel. (ft/s)	0.39	9.65	0.52
Max Chl Dpth (ft)	9.11	Hydr. Depth (ft)	0.11	8.52	0.17
Conv. Total (cfs)	91946.9	Conv. (cfs)	446.7	91437.5	62.8
Length Wtd. (ft)	49.25	Wetted Per. (ft)	570.97	64.85	39.53
Min Ch El (ft)	802.00	Shear (lb/sq ft)	0.02	1.60	0.03
Alpha	1.27	Stream Power (lb/ft s)	141.42	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	103.26	41.09	65.03
C & E Loss (ft)	0.28	Cum SA (acres)	30.36	3.59	14.11

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

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2554.54

INPUT

Description: T
Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-980.71	816.65	-966.99	815.72	-911.36	811.71	-908.48	811.07	-902.49	810.68
-900.98	810.45	-899.91	810.48	-897.13	810.75	-896.07	811.03	-892.29	811.28
-887.6	811.56	-880.22	811.58	-864.67	810.85	-857.47	811.08	-844.2	810.59
-827.89	810.55	-810.53	810.54	-808.89	810.49	-793.01	810.03	-739.04	809.86
-733.68	809.8	-724.34	809.77	-692.73	809.42	-688.21	809.41	-662.05	809.38
-655.02	809.41	-652.17	809.09	-622.65	809.43	-607.5	809.45	-561.09	809.11
-552.41	809.15	-549.56	809.18	-504.79	809.52	-502.65	809.58	-492.03	810.02
-479.47	810.44	-478.93	810.37	-477.23	810.45	-472.11	810.51	-457.61	810.92
-451.18	810.99	-440.74	811.54	-437.51	811.53	-416.3	811.75	-415.69	811.75
-415.3	811.74	-414.24	811.88	-400.27	813.22	-381.79	814.19	-377.69	814.34
-372.13	814.15	-345.57	813.99	-344.8	813.99	-331.37	813.94	-304.29	813.83
-291.47	813.82	-282.04	813.66	-265.95	813.24	-255.64	813.03	-243.09	812.44
-238.48	812.34	-220.12	812.29	-217.37	812.29	-210.91	812.01	-200.05	811.45
-195.07	811.43	-178.84	811.24	-167.69	811.33	-160.54	811.31	-139.86	811.31
-129.03	811.32	-105.31	811.26	-98.54	811.22	-75.44	810.6	-68.79	810.44
-65.81	810.3	-51.67	809.76	-46.88	809.31	-43.87	809.05	-34.16	808.14
-31.74	807.97	-30.75	807.66	-29.78	807.07	-25.71	804.6	-25.19	804.28
-24.27	803.72	-20.91	801.64	-14.53	801.01	-13.49	800.98	-4.76	801.32
-4.06	801.36	-3.06	801.36	-3.03	801.36	-2.99	801.36	-2.95	801.36
-2.9	801.36	-2.84	801.37	-2.78	801.37	-2.17	801.38	0	801.42
13.69	801.68	15.73	802.24	21.21	803.74	26.6	805.12	29.74	806
30.15	806.06	30.83	806.16	30.99	806.18	37.76	807.72	42.93	807.76
45.16	807.86	51.27	808.01	53.64	808.06	72.68	808.47	86.63	808.59
94.2	808.73	118.85	810.47	122.89	810.79	123.74	810.9	152.29	815.32
160.72	815.76	161.08	815.74	161.18	815.74	161.39	815.75	161.98	815.77
171.11	815.96	171.87	815.94	183.22	815.73	183.71	815.73	184.32	815.73
184.46	815.73	188.65	815.68	189.99	815.55	191.72	815.42	192.1	815.42
192.46	815.56	192.97	815.92	193.47	816.19	198.2	817.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-980.71	.05	-30.75	.035	37.76	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-30.75	37.76	293 200.01	191	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-950.83	-400.77	814.31	F

CROSS SECTION OUTPUT Profile #100-Year

* E.G. Elev (ft)	* 812.14	* Element	* Left OB	* Channel * Right OB *
* Vel Head (ft)	* 0.87	* Wt. n-Val.	* 0.050	* 0.035 * 0.050 *
* W.S. Elev (ft)	* 811.27	* Reach Len. (ft)	* 293.00	* 200.01 * 191.00 *
* Crit W.S. (ft)	* 809.13	* Flow Area (sq ft)	* 85.62	* 562.53 * 213.76 *
* E.G. Slope (ft/ft)	*0.002231	* Area (sq ft)	* 705.30	* 562.53 * 213.76 *
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 126.92	* 4482.87 * 540.21 *
* Top Width (ft)	* 686.37	* Top Width (ft)	* 529.49	* 68.51 * 88.37 *
* Vel Total (ft/s)	* 5.98	* Avg. Vel. (ft/s)	* 1.48	* 7.97 * 2.53 *

* Max Chl Dpth (ft)	*	10.29	* Hydr. Depth (ft)	*	1.01	*	8.21	*	2.42	*
* Conv. Total (cfs)	*	109034.1	* Conv. (cfs)	*	2687.2	*	94909.8	*	11437.1	*
* Length Wtd. (ft)	*	216.34	* Wetted Per. (ft)	*	84.95	*	71.01	*	88.49	*
* Min Ch El (ft)	*	800.98	* Shear (lb/sq ft)	*	0.14	*	1.10	*	0.34	*
* Alpha	*	1.57	* Stream Power (lb/ft s)	*	198.20	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.26	* Cum Volume (acre-ft)	*	102.12	*	40.48	*	64.85	*
* C & E Loss (ft)	*	0.18	* Cum SA (acres)	*	29.53	*	3.51	*	14.03	*

****

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2354.53

INPUT
Description: W
Station Elevation Data num= 273

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-500.98	823.09	-475.76	815.71	-473	814.91	-469.19	814.37	-464.75	813.08
-456.29	811.56	-452.29	810.91	-442.76	810.55	-436.56	810.3	-393.36	808.35
-372.59	807.93	-360.28	807.95	-359.42	807.95	-358.55	807.96	-357.68	807.96
-356.8	807.97	-355.93	807.97	-355.05	807.98	-354.16	807.98	-353.27	807.99
-352.39	807.99	-351.49	808	-350.6	808	-349.7	808.01	-348.79	808.01
-347.89	808.02	-346.98	808.02	-346.07	808.03	-345.15	808.03	-344.24	808.04
-343.31	808.04	-342.39	808.05	-341.46	808.05	-340.53	808.06	-339.59	808.06
-338.66	808.07	-337.71	808.07	-336.77	808.08	-335.82	808.08	-334.87	808.09
-333.91	808.09	-332.96	808.1	-331.99	808.1	-331.03	808.11	-330.06	808.11
-328.11	808.13	-327.13	808.13	-326.15	808.14	-325.16	808.14	-324.17	808.15
-323.17	808.15	-322.18	808.16	-321.18	808.16	-319.16	808.18	-318.15	808.18
-317.13	808.19	-316.11	808.19	-315.09	808.2	-314.06	808.2	-311.99	808.22
-310.95	808.22	-309.91	808.23	-308.86	808.23	-307.81	808.24	-306.75	808.24
-304.63	808.26	-303.56	808.26	-302.49	808.27	-301.41	808.27	-299.25	808.29
-298.16	808.29	-295.97	808.31	-294.87	808.31	-293.77	808.32	-292.66	808.32
-290.42	808.34	-289.3	808.34	-288.17	808.35	-287.04	808.35	-284.76	808.37
-283.62	808.37	-281.32	808.39	-280.16	808.39	-277.83	808.41	-276.65	808.41
-274.29	808.43	-273.11	808.43	-270.72	808.45	-269.52	808.45	-267.1	808.47
-265.89	808.47	-262.33	808.5	-261.12	808.5	-256.41	808.54	-255.17	808.54
-254.04	808.55	-253.97	808.55	-252.85	808.56	-252.78	808.56	-251.67	808.57
-251.59	808.57	-250.48	808.58	-249.3	808.58	-249.21	808.59	-248.02	808.59
-246.93	808.6	-246.82	808.6	-245.75	808.61	-245.63	808.61	-244.57	808.62
-243.51	808.62	-242.47	808.63	-242.34	808.63	-241.3	808.64	-241.16	808.64
-240.14	808.65	-239.98	808.65	-238.97	808.66	-237.62	808.66	-236.64	808.67
-236.45	808.67	-235.47	808.68	-235.27	808.68	-234.3	808.69	-233.14	808.69
-232.91	808.7	-231.73	808.7	-230.81	808.71	-230.56	808.71	-229.65	808.72

-229.38	808.72	-228.49	808.73	-227.33	808.73	-227.02	808.74	-225.84	808.74
-225.01	808.75	-224.67	808.75	-223.85	808.76	-223.49	808.76	-222.69	808.77
-221.54	808.77	-221.13	808.78	-219.96	808.78	-219.23	808.79	-218.78	808.79
-218.08	808.8	-216.93	808.8	-216.42	808.81	-215.78	808.81	-215.24	808.82
-214.07	808.82	-213.5	808.83	-212.89	808.83	-212.36	808.84	-211.22	808.84
-210.53	808.85	-210.09	808.85	-209.35	808.86	-208.18	808.86	-207.84	808.87
-206.72	808.87	-205.82	808.88	-205.62	808.88	-204.64	808.89	-204.51	808.89
-203.46	808.9	-201.16	808.9	-200.9	808.91	-198.19	808.91	-198.07	808.92
-196.33	808.92	-196.11	808.93	-194.44	808.93	-194.08	808.94	-192.3	808.94
-191.74	808.95	-190.43	808.95	-189.66	808.96	-189.04	808.96	-187.97	808.97
-187.81	808.97	-186.47	808.98	-186.13	808.98	-184.95	808.99	-184.44	808.99
-183.41	809	-182.76	809	-181.85	809.01	-181.07	809.01	-180.28	809.02
-179.38	809.02	-178.69	809.03	-177.7	809.03	-177.1	809.04	-176.01	809.04
-175.49	809.05	-174.33	809.05	-173.88	809.06	-172.64	809.07	-172.26	809.07
-170.96	809.08	-170.64	809.08	-169.27	809.09	-169.01	809.09	-167.59	809.1
-167.37	809.1	-165.9	809.11	-165.74	809.11	-164.22	809.12	-164.1	809.12
-162.53	809.13	-162.45	809.13	-159.16	809.15	-158.92	809.15	-158.11	809.16
-157.18	809.16	-156.25	809.17	-155.32	809.17	-153.5	809.19	-152.59	809.19
-151.7	809.2	-150.81	809.2	-149.92	809.21	-143.84	809.14	-140.97	809.14
-139.56	809.13	-131.4	809.13	-130.09	809.12	-122.5	809.12	-121.28	809.11
-113.06	809.11	-111.93	809.1	-103.26	809.1	-102.22	809.09	-94.24	809.09
-93.28	809.08	-72.9	809.08	-53.64	808.83	-53.3	808.83	-42.92	808.79
-36.84	808.13	-23.47	806.92	-19.51	804.16	-12.79	800.05	-10.78	799.14
-7.5	798.07	-3.16	797.95	-.23	798.13	0	798.16	7.77	799.04
12.76	799.53	14.53	799.99	19.12	802.85	22.1	804.84	29.43	805.45
40.13	805.82	47.52	806.56	48.05	806.59	49.68	806.84	53.14	806.92
59.06	807.23	74.02	807.96	88.07	809.49	111.46	811.68	126.83	812.75
130.88	812.86	132.22	812.98	148.01	813.9	183.36	815.24	188.34	815.39
189.8	815.43	195.35	815.57	196.04	814.68				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-500.98	.05	-23.47	.035	22.1	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-23.47	22.1	144	48.15	69	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.43	Reach Len. (ft)	144.00	48.15	69.00
Crit W.S. (ft)		Flow Area (sq ft)	1143.18	501.79	313.90
E.G. Slope (ft/ft)	0.000761	Area (sq ft)	1143.18	501.79	313.90
Q Total (cfs)	5150.00	Flow (cfs)	1792.52	2751.89	605.58
Top Width (ft)	564.25	Top Width (ft)	432.01	45.57	86.67
Vel Total (ft/s)	2.63	Avg. Vel. (ft/s)	1.57	5.48	1.93
Max Chl Dpth (ft)	13.48	Hydr. Depth (ft)	2.65	11.01	3.62
Conv. Total (cfs)	186678.6	Conv. (cfs)	64975.9	99751.3	21951.4
Length Wtd. (ft)	85.74	Wetted Per. (ft)	432.21	49.52	86.96

* Min Ch El (ft)	*	797.95	* Shear (lb/sq ft)	*	0.13	*	0.48	*	0.17 *
* Alpha	*	2.51	* Stream Power (lb/ft s)	*	196.04	*	0.00	*	0.00 *
* Frctn Loss (ft)	*	0.06	* Cum Volume (acre-ft)	*	95.90	*	38.04	*	63.69 *
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	26.29	*	3.25	*	13.65 *

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2306.38

INPUT
Description: X
Station Elevation Data num= 140

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-600	815.04	-596.19	813.22	-584.78	812.21	-583.55	812.22	-579.05	812
-578.87	811.96	-558.88	811.42	-541.39	811.12	-534.26	811.07	-528.51	810.88
-490.74	810.6	-487.37	810.58	-487.09	810.57	-483.51	810.51	-442.65	810.06
-413.39	808.76	-404	808.13	-396.13	807.99	-392.09	807.99	-391.95	808
-390.23	808	-390.08	808.01	-388.39	808.01	-388.23	808.02	-386.4	808.02
-386.23	808.03	-384.64	808.03	-384.45	808.04	-382.75	808.04	-382.56	808.05
-380.95	808.05	-380.74	808.06	-379.03	808.06	-378.81	808.07	-376.99	808.07
-376.75	808.08	-375.31	808.08	-375.06	808.09	-373.27	808.09	-373.01	808.1
-371.39	808.1	-371.11	808.11	-369.69	808.11	-369.4	808.12	-270.12	808.39
-269.44	808.39	-268.76	808.4	-268.07	808.4	-267.39	808.41	-266.7	808.41
-266	808.42	-265.31	808.42	-264.61	808.43	-263.21	808.43	-262.51	808.44
-261.8	808.44	-261.09	808.45	-260.38	808.45	-259.66	808.46	-258.94	808.46
-258.22	808.47	-257.5	808.47	-256.77	808.48	-256.04	808.48	-255.31	808.49
-254.57	808.49	-253.84	808.5	-252.35	808.5	-251.61	808.51	-250.86	808.51
-250.1	808.52	-249.35	808.52	-248.59	808.53	-247.83	808.53	-247.07	808.54
-246.3	808.54	-245.53	808.55	-244.76	808.55	-243.98	808.56	-243.2	808.56
-242.42	808.57	-241.63	808.57	-240.85	808.58	-240.05	808.58	-239.26	808.59
-238.46	808.59	-237.66	808.6	-221.08	808.63	-194.05	808.39	-190.81	808.4
-189.5	808.43	-176.68	808.62	-165.82	808.85	-165.44	808.85	-165.05	808.86
-163.92	808.86	-163.54	808.87	-162.06	808.87	-161.7	808.88	-160.61	808.88
-67.79	807.94	-61.68	807.94	-61.46	807.95	-55.48	807.95	-55.3	807.96
-53.7	807.96	-46.53	807.87	-42.07	807.83	-25.4	807	-23.53	805.77
-14.98	799.89	-14.31	799.59	-10.39	798.34	-9.53	798.4	-4.34	798.44
0	798.76	2.37	798.93	3.33	799.04	3.92	799.19	9.66	800.26
13.12	802.38	17.84	805.01	36.45	805.24	44.58	806.39	58.79	806.64
63.08	806.74	90.19	807.54	99.16	807.86	114.68	808.3	122.11	808.58
141.52	810.58	154.18	811.63	158.79	812.07	163.4	812.37	166.83	812.49
196.42	813.78	204.95	814.18	207.15	814.28	209.93	814.36	240.28	815.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-600	.05	-25.4	.035	17.84	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-25.4	17.84	90	51.84	42	.1	.3

CROSS SECTION OUTPUT Profile #100-Year
****
****

* E.G. Elev (ft)	*	811.61	* Element	*	Left OB	*	Channel	*	

Right OB											
* Vel Head (ft)	*	0.19	* Wt. n-Val.	*	0.050	*	0.035	*	0.050	*	
* W.S. Elev (ft)	*	811.42	* Reach Len. (ft)	*	90.00	*	51.84	*	42.00	*	
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	1354.51	*	461.50	*	516.45	*	
* E.G. Slope (ft/ft)	*	0.000648	* Area (sq ft)	*	1354.51	*	461.50	*	516.45	*	
* Q Total (cfs)	*	5150.00	* Flow (cfs)	*	1906.69	*	2283.32	*	959.99	*	
* Top Width (ft)	*	710.67	* Top Width (ft)	*	533.59	*	43.24	*	133.84	*	
* Vel Total (ft/s)	*	2.21	* Avg. Vel. (ft/s)	*	1.86	*	4.95	*	1.86	*	
* Max Chl Dpth (ft)	*	13.08	* Hydr. Depth (ft)	*	2.54	*	10.67	*	3.86	*	
* Conv. Total (cfs)	*	202300.6	* Conv. (cfs)	*	74897.8	*	89692.8	*	37710.1	*	
* Length Wtd. (ft)	*	65.18	* Wetted Per. (ft)	*	533.69	*	47.12	*	134.10	*	
* Min Ch El (ft)	*	798.34	* Shear (lb/sq ft)	*	0.10	*	0.40	*	0.16	*	
* Alpha	*	2.51	* Stream Power (lb/ft s)	*	240.28	*	0.00	*	0.00	*	
* Frctn Loss (ft)	*	0.04	* Cum Volume (acre-ft)	*	91.77	*	37.50	*	63.03	*	
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	24.70	*	3.20	*	13.47	*	

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2254.54

INPUT
Description: Y
Station Elevation Data num= 228

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-710.8	813.44	-709.97	813.28	-708.61	813.03	-707.74	812.99	-702.01	812.28
-700	811.99	-699.21	811.96	-699.07	811.96	-686.39	811.6	-681.01	811.55
-658.05	811.53	-637	811.35	-632.92	811.32	-619.88	810.88	-619.82	810.63
-610.1	808.98	-609.64	808.98	-609.18	808.97	-607.32	808.97	-606.84	808.96
-605.42	808.96	-604.93	808.95	-603.67	808.96	-603.19	808.97	-602.19	808.97
-601.67	808.98	-601.18	808.98	-600.67	808.99	-600.17	808.99	-599.67	809
-599.16	809	-598.66	809.01	-598.16	809.01	-597.66	809.02	-597.15	809.02
-595.66	809.05	-595.17	809.05	-593.69	809.08	-593.22	809.08	-592.71	809.09
-592.25	809.1	-591.73	809.11	-591.28	809.11	-590.76	809.12	-590.31	809.13
-589.23	809.15	-588.85	809.16	-588.28	809.17	-587.9	809.17	-587.32	809.18
-586.95	809.19	-586.37	809.2	-586	809.21	-585.41	809.21	-583.55	809.24
-582.89	809.26	-582.25	809.27	-579.5	809.33	-579.19	809.34	-578.43	809.36
-578.14	809.37	-577.37	809.4	-577.08	809.4	-576.3	809.43	-576	809.44
-575.19	809.46	-574.91	809.47	-574.09	809.49	-573.57	809.51	-572.68	809.53
-572.44	809.54	-571.59	809.57	-571.36	809.57	-570.49	809.6	-570.28	809.6
-569.39	809.63	-569.2	809.64	-568.29	809.66	-568.11	809.67	-567.18	809.7
-567.02	809.7	-566.07	809.73	-565.93	809.73	-564.96	809.76	-564.84	809.76
-563.85	809.79	-563.74	809.8	-562.74	809.83	-562.65	809.83	-561.62	809.86
-561.55	809.86	-560.51	809.89	-560.45	809.89	-559.39	809.92	-558.26	809.96
-558.14	809.96	-557.05	809.99	-556.82	810	-556	810	-554.99	810.01

-553.02	810.01	-552.06	810.02	-551.11	810.02	-543.84	810	-501.31	810
-501.07	809.99	-499.91	809.97	-498.78	809.94	-497.68	809.92	-496.71	809.9
-495.76	809.87	-494.82	809.85	-494.24	809.85	-493.22	809.82	-493.12	809.82
-492.13	809.79	-491.86	809.78	-490.87	809.75	-489.9	809.73	-488.97	809.7
-488.8	809.7	-487.94	809.67	-487.75	809.67	-486.9	809.65	-486.7	809.64
-485.87	809.62	-485.65	809.62	-484.82	809.6	-484.59	809.59	-483.78	809.57
-483.54	809.57	-482.73	809.55	-482.48	809.54	-481.69	809.52	-481.41	809.52
-480.63	809.5	-480.55	809.5	-480.26	809.49	-479.63	809.49	-479.33	809.48
-478.73	809.48	-478.42	809.47	-477.54	809.45	-477.22	809.44	-476.36	809.42
-476.02	809.41	-475.18	809.39	-474.82	809.39	-474	809.36	-473.62	809.36
-472.82	809.33	-472.36	809.33	-470.39	809.28	-469.96	809.28	-469.2	809.26
-468.76	809.25	-468.02	809.23	-467.57	809.23	-446.83	808.86	-445.12	808.82
-443.57	808.78	-442.84	808.76	-442.78	808.76	-423.48	808.33	-423.16	808.32
-422.85	808.32	-422.26	808.3	-421.99	808.3	-411.23	808	-355.26	808
-305.73	808.14	-305.47	808.15	-304.16	808.15	-303.9	808.16	-302.55	808.16
-302.28	808.17	-301.17	808.17	-300.89	808.18	-299.47	808.18	-299.19	808.19
-298.02	808.19	-297.73	808.2	-296.54	808.2	-296.23	808.21	-295.01	808.21
-294.7	808.22	-293.45	808.22	-293.13	808.23	-252.94	808.31	-239.24	808.19
-207.69	808.26	-176.3	808.43	-167.71	808.62	-50.35	807.51	-26.21	806.95
-22.65	804.84	-15.41	799.87	-12.68	798.81	-11.48	798.53	-7.82	799.05
-5.45	799.34	-.27	799.85	0	799.86	1.79	799.91	8.44	800.17
10.39	800.27	12.02	801.53	18.58	804.69	33.45	805.08	33.64	805.09
33.75	805.11	41.59	806.49	61.29	806.74	63.84	806.78	69.72	806.8
99.43	807.45	99.94	807.47	126.43	807.87	140.95	808.4	142.39	808.43
163.62	809.25	175.01	810.36	176.19	810.47	193.42	812.18	221.23	813.76
226.1	814.12	234.24	814.56	253.92	815.17				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-710.8	.05	-26.21	.035	18.58	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-26.21	18.58	90	50	45	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

* E.G. Elev (ft)	* 811.56	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.12	* Wt. n-Val.	* 0.050	* 0.035	* 0.050 *
* W.S. Elev (ft)	* 811.43	* Reach Len. (ft)	* 90.00	* 50.00	* 45.00 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1721.13	* 463.64	* 639.25 *
* E.G. Slope (ft/ft)	*0.000476	* Area (sq ft)	* 1721.13	* 463.64	* 639.25 *
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 2201.24	* 1937.17	* 1011.60 *
* Top Width (ft)	* 832.81	* Top Width (ft)	* 620.69	* 44.79	* 167.33 *
* Vel Total (ft/s)	* 1.82	* Avg. Vel. (ft/s)	* 1.28	* 4.18	* 1.58 *
* Max Chl Dpth (ft)	* 12.90	* Hydr. Depth (ft)	* 2.77	* 10.35	* 3.82 *
* Conv. Total (cfs)	*236093.6	* Conv. (cfs)	*100912.3	* 88806.3	* 46375.1 *
* Length Wtd. (ft)	* 68.70	* Wetted Per. (ft)	* 621.10	* 48.38	* 167.60 *
* Min Ch El (ft)	* 798.53	* Shear (lb/sq ft)	* 0.08	* 0.28	* 0.11 *
* Alpha	* 2.33	* Stream Power (lb/ft s)	* 253.92	* 0.00	*

0.00 *
* Frctn Loss (ft) * 0.02 * Cum Volume (acre-ft) * 88.59 * 36.95 *
62.48 *
* C & E Loss (ft) * 0.02 * Cum SA (acres) * 23.51 * 3.15 *
13.33 *
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2204.54

INPUT
Description: Z
Station Elevation Data num= 165

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-920.1	820.14	-896.19	814.15	-895.12	814.33	-893.31	813.88	-892.86	813.34
-892.27	813.3	-892.03	813.32	-876.99	813.58	-876.65	813.55	-876.47	813.56
-876.24	813.54	-872.18	813.51	-870.87	813.28	-869.03	813.08	-868.31	812.86
-855.14	813.35	-849.65	813.23	-812.3	812.37	-806.56	812.06	-779.56	810.8
-766.96	810.5	-766.64	810.49	-765.57	810.49	-765.2	810.48	-764.43	810.48
-764.03	810.47	-763.26	810.47	-762.89	810.46	-761.51	810.46	-758.71	810.45
-757.65	810.45	-757.1	810.44	-756.54	810.44	-755.96	810.43	-755.35	810.43
-736.34	810.09	-727.76	810	-724.67	810	-723.11	809.93	-722.72	809.9
-720.45	809.79	-720.19	809.78	-718.07	809.67	-715.71	809.55	-715.15	809.52
-713.35	809.43	-711	809.3	-710.14	809.25	-708.66	809.18	-707.65	809.11
-706.33	809.05	-705.16	808.97	-704.01	808.91	-702.67	808.83	-701.7	808.78
-700.2	808.68	-699.4	808.64	-695.15	808.37	-694.71	808.35	-692.62	808.21
-690.13	808.04	-689.45	808	-685.9	807.81	-682.12	807.6	-679.11	807.44
-677.88	807.38	-671.69	807.04	-669.67	806.94	-668.04	806.85	-665.59	806.72
-664.32	806.65	-661.42	806.5	-657.4	806.28	-657.06	806.27	-656.63	806.24
-652.82	806.04	-652.75	806.04	-652.03	806	-593.71	806	-593.13	806.02
-588.37	806.2	-584.4	806.36	-581.06	806.48	-573.44	806.78	-573.35	806.78
-572.14	806.82	-570.81	806.86	-569.34	806.9	-567.72	806.95	-565.91	807
-558.99	807.21	-557.23	807.27	-555.81	807.33	-554.58	807.37	-553.51	807.41
-552.56	807.45	-551.72	807.48	-550.97	807.51	-550.3	807.53	-550.16	807.53
-549.52	807.56	-548.94	807.58	-548.41	807.6	-547.93	807.62	-547.49	807.63
-547.14	807.65	-546.81	807.66	-546.51	807.67	-546.19	807.68	-545.62	807.7
-545.36	807.71	-536.11	808	-297.24	808	-281.9	808.03	-280.46	808.02
-277.08	808.03	-262.39	808.11	-202.84	808.29	-173.64	807.9	-170.7	807.89
-159.9	807.7	-148.14	807.54	-117.32	807.28	-93.7	807.48	-78.23	807.81
-46.46	808.15	-36.05	807.73	-24.39	806.89	-16.87	802.56	-12.29	799.9
-10.83	799.57	-3.6	798.81	-.66	799.18	0	799.22	5.47	799.58
7.65	799.65	9.47	799.75	15.49	800.09	17.16	801.36	19.95	804.35
25.2	804.7	29.78	804.99	36.45	806.08	39.89	806.63	55.27	806.92
59.82	806.89	85.88	806.81	100.95	807.11	118.08	807.56	134.44	807.79
136.61	807.85	149.16	807.76	170.32	807.81	189.32	808.47	190.53	808.49
191.3	808.57	191.95	808.65	200.96	809.38	215.3	810.83	226.77	812.05
229.06	812.33	231.06	812.53	233.55	812.84	257.98	814.32	265.36	814.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-920.1	.05	-24.39	.035	19.95	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
-24.39	19.95	74	50	44	.1	.3

CROSS SECTION OUTPUT Profile #100-Year
****

E.G. Elev (ft)	811.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.46	Reach Len. (ft)	74.00	50.00	44.00
Crit W.S. (ft)		Flow Area (sq ft)	2701.08	472.71	782.92
E.G. Slope (ft/ft)	0.000236	Area (sq ft)	2701.08	472.71	782.92
Q Total (cfs)	5150.00	Flow (cfs)	2850.12	1416.15	883.73
Top Width (ft)	1014.95	Top Width (ft)	769.33	44.34	201.28
Vel Total (ft/s)	1.30	Avg. Vel. (ft/s)	1.06	3.00	1.13
Max Chl Dpth (ft)	12.65	Hydr. Depth (ft)	3.51	10.66	3.89
Conv. Total (cfs)	334996.2	Conv. (cfs)	185394.0	92117.5	57484.7
Length Wtd. (ft)	61.88	Wetted Per. (ft)	769.55	48.07	201.61
Min Ch El (ft)	798.81	Shear (lb/sq ft)	0.05	0.15	0.06
Alpha	1.95	Stream Power (lb/ft s)	265.36	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	84.03	36.42	61.74
C & E Loss (ft)	0.00	Cum SA (acres)	22.07	3.10	13.14

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2154.54

INPUT
Description: AA
Station Elevation Data num= 240

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1050.25	820.63	-1046.01	819.69	-1013.47	813.55	-1012.08	813.09	-1010.95	813.03
-1007.66	812.6	-1006.09	811.8	-1005.58	811.43	-1004.49	811.76	-1001.75	812.04
-989.06	811.69	-985.15	811.91	-983.65	811.94	-979.51	811.82	-936.54	810.46
-928.74	810.18	-887.18	809.85	-877.57	809.89	-877.45	809.89	-874.23	809.92
-873.47	809.93	-872.44	809.95	-870.94	809.97	-868.31	810	-868.11	810
-866.76	809.98	-862.23	809.89	-861.9	809.89	-860.39	809.86	-840.5	809.5
-840.11	809.5	-839.76	809.49	-839.4	809.49	-839.03	809.48	-838.65	809.48
-838.27	809.47	-837.88	809.47	-837.48	809.46	-837.07	809.46	-836.64	809.45
-836.21	809.45	-835.29	809.43	-834.8	809.43	-834.3	809.42	-791.76	808.77
-791.35	808.77	-790.71	808.76	-790.31	808.76	-789.67	808.75	-789.27	808.75
-788.62	808.74	-788.23	808.74	-787.57	808.73	-787.19	808.73	-786.53	808.72
-786.15	808.72	-785.48	808.71	-785.12	808.71	-784.44	808.7	-784.08	808.7
-783.41	808.69	-782.8	808.69	-782.12	808.68	-781.77	808.68	-781.08	808.67
-780.73	808.67	-780.03	808.66	-779.69	808.66	-778.99	808.65	-778.65	808.65
-777.94	808.64	-777.61	808.64	-776.89	808.63	-776.56	808.63	-775.85	808.62
-775.52	808.62	-774.8	808.61	-774.49	808.61	-773.76	808.6	-773.45	808.59
-772.71	808.58	-772.41	808.58	-771.67	808.57	-771.38	808.57	-770.63	808.56
-770.34	808.56	-769.59	808.55	-769.3	808.55	-768.54	808.54	-768.27	808.54

-755.87	808.33	-754.97	808.31	-754.81	808.31	-753.89	808.29	-753.74	808.29
-752.82	808.27	-752.67	808.27	-751.74	808.25	-751.61	808.25	-750.66	808.23
-750.54	808.23	-749.59	808.21	-749.47	808.21	-748.51	808.19	-748.41	808.18
-747.01	808.18	-746.94	808.17	-745.76	808.17	-745.04	808.16	-744.9	808.16
-737.16	808	-722.98	808	-705.02	807.3	-704.02	807.25	-701.59	807.16
-700.41	807.1	-697	806.95	-695.48	806.88	-693.78	806.81	-692.11	806.73
-690.19	806.63	-688.92	806.58	-687.86	806.53	-686.95	806.5	-680.97	806.2
-677.18	806.02	-676.84	806	-628.87	806	-624.75	806.11	-623.33	806.14
-621.96	806.18	-621.8	806.18	-619.64	806.26	-617.64	806.32	-615.79	806.38
-613.24	806.47	-612.44	806.5	-612.16	806.5	-611.37	806.52	-611.08	806.53
-610.3	806.55	-610	806.55	-609.26	806.58	-608.94	806.58	-608.55	806.59
-607.55	806.62	-607.22	806.62	-606.55	806.64	-606.21	806.64	-605.55	806.66
-605.2	806.67	-604.55	806.68	-604.19	806.69	-603.55	806.7	-603.18	806.71
-602.55	806.72	-602.16	806.73	-601.54	806.74	-601.12	806.74	-600.5	806.76
-600.1	806.76	-599.49	806.78	-599.08	806.78	-598.48	806.8	-597.21	806.8
-586.51	807.05	-585.97	807.05	-585.09	807.07	-584.53	807.07	-584.1	807.08
-583.54	807.08	-583.12	807.09	-582.51	807.09	-582.08	807.1	-581.52	807.1
-581.1	807.11	-580.52	807.11	-580.11	807.12	-579.13	807.12	-578.55	807.13
-577.56	807.13	-576.79	807.15	-576.19	807.15	-575.81	807.16	-574.83	807.16
-574.23	807.17	-573.24	807.17	-572.87	807.18	-572.26	807.18	-570.36	807.19
-569.13	807.19	-543.02	808	-182.12	808	-177.95	807.96	-177.84	807.96
-139.2	807.49	-77.02	808.07	-43.93	808.02	-37.15	807.53	-21.68	806.24
-11.01	799.74	-10.69	799.54	-10.59	799.52	-5.56	798.6	-5.29	798.62
3.35	798.83	3.54	798.82	12.36	799.3	12.69	799.28	17.23	800.15
17.56	800.21	18.08	800.51	22.06	801.88	28.84	804.5	30.21	804.68
31.01	804.81	38.21	806.5	53.53	806.9	56.01	806.89	83.27	805.56
90.16	805.89	97.72	805.35	98.09	805.33	98.41	805.31	119.58	805.49
134.35	805.66	139.08	805.15	140.47	805.07	142.84	805.35	145.72	805.7
173.74	807.13	185.9	807.67	200.7	808.17	219.31	808.96	227.19	809.44
230.22	809.96	238.42	810.98	255.45	812.86	266.7	813.74	275.06	814.33

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1050.25	.05	-21.68	.035	38.21	.05

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
-21.68	38.21	63	48.8	47	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.50	Element	Left OB	Channel
Vel Head (ft)	0.04	Wt. n-Val.	0.050	0.035
W.S. Elev (ft)	811.46	Reach Len. (ft)	63.00	48.80
Crit W.S. (ft)		Flow Area (sq ft)	3182.74	603.31
E.G. Slope (ft/ft)	0.000163	Area (sq ft)	3182.74	603.31
Q Total (cfs)	5150.00	Flow (cfs)	2710.09	1474.98
Top Width (ft)	1211.03	Top Width (ft)	946.59	59.89
Vel Total (ft/s)	1.09	Avg. Vel. (ft/s)	0.85	2.44
Max Chl Dpth (ft)	12.86	Hydr. Depth (ft)	3.36	10.07
Conv. Total (cfs)	403391.3	Conv. (cfs)	212277.4	115532.4
Length Wtd. (ft)	56.27	Wetted Per. (ft)	946.79	62.98

Right OB
0.050
47.00
928.67
928.67
964.93
204.56
1.04
4.54
75581.5

204.91	*								
* Min Ch El (ft)	*	798.60	* Shear (lb/sq ft)	*	0.03	*	0.10	*	
0.05	*								
* Alpha	*	1.92	* Stream Power (lb/ft s)	*	275.06	*	0.00	*	
0.00	*								
* Frctn Loss (ft)	*	0.01	* Cum Volume (acre-ft)	*	79.03	*	35.80	*	
60.88	*								
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	20.61	*	3.04	*	
12.93	*								

****
****

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2105.74

INPUT
Description: BB
Station Elevation Data num= 200

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1284.71	828.4	-1264.69	825.28	-1263.81	824.96	-1255.01	824.13	-1251.56	823.73
-1212.64	819.73	-1195.99	817.6	-1171.48	814.52	-1154.57	811.39	-1154.51	811.39
-1152.14	811.04	-1146.22	810.54	-1138.02	810.11	-1130.04	809.79	-1118.28	809.73
-1102.85	809.11	-1094.7	808.94	-1092.67	808.85	-1081.42	809.01	-1046.4	808.93
-1040.72	808.97	-1038.97	808.94	-1035.49	808.84	-992.45	809.89	-987.58	810
-938.5	810	-913.54	809.72	-907.64	809.6	-907.57	809.6	-906.11	809.58
-904.69	809.55	-898.14	809.45	-895.76	809.41	-894.62	809.4	-891.36	809.34
-890.32	809.33	-890.09	809.32	-889.08	809.31	-887.57	809.28	-887.02	809.28
-886.05	809.26	-885.48	809.25	-884.53	809.24	-883.95	809.23	-883.02	809.21
-882.41	809.2	-881.5	809.19	-880.88	809.18	-867.82	808.94	-866.93	808.93
-865.98	808.91	-865.12	808.9	-864.15	808.88	-863.32	808.86	-862.31	808.84
-861.52	808.83	-860.39	808.81	-859.63	808.8	-858.47	808.77	-857.74	808.76
-856.55	808.74	-855.85	808.73	-854.63	808.7	-853.97	808.69	-852.7	808.66
-852.56	808.66	-850.64	808.63	-849.3	808.6	-848.72	808.59	-847.34	808.56
-846.81	808.55	-843.44	808.48	-842.97	808.48	-841.48	808.45	-841.06	808.44
-840.69	808.43	-840.29	808.42	-839.89	808.42	-839.51	808.41	-839.14	808.41
-838.43	808.39	-838.09	808.39	-837.76	808.38	-837.69	808.38	-832.66	808.3
-831.42	808.27	-827.51	808.21	-826.14	808.18	-823.27	808.14	-823.16	808.13
-821.7	808.11	-821.62	808.11	-820.13	808.08	-820.07	808.08	-818.57	808.06
-815.34	808	-742.79	808	-655.57	806.72	-655.26	806.72	-654.72	806.74
-654.43	806.75	-654.15	806.75	-645.4	807.05	-644.35	807.05	-643.86	807.06
-640.51	807.06	-640.44	807.07	-638.73	807.1	-638.13	807.12	-636.88	807.14
-636.24	807.16	-635.57	807.17	-634.89	807.19	-634.2	807.2	-632.75	807.24
-631.09	807.27	-620.02	807.57	-619.11	807.6	-618.17	807.62	-617.2	807.65
-614.9	807.71	-612.76	807.75	-610.73	807.81	-610.24	807.81	-610.12	807.82
-609.89	807.82	-602.84	808	-143.09	808	-135.89	807.88	-134.92	807.87
-134.16	807.85	-134.09	807.85	-127.27	807.75	-115.54	807.75	-111.92	807.81
-109.05	807.88	-107.52	807.88	-106.87	807.89	-105.45	807.89	-104.68	807.9
-103.86	807.9	-102.99	807.91	-101.07	807.91	-90.85	807.94	-89.1	807.94
-77.29	807.99	-69.47	807.99	-68.7	808	-60.94	808	-60.01	807.99
-57.27	807.99	-55.07	807.82	-38.23	806.81	-35.2	806.61	-34.55	806.6
-34.29	806.56	-33.82	806.54	-19.98	805.6	-19	805.03	-11.8	800.15
-7.71	799.5	-5.17	799.19	0	799.12	1.4	799.11	4.01	798.92
10.22	798.03	12.53	797.84	16.97	798.1	18.46	798.17	19.54	798.4
23.6	799.5	26.39	801.64	29.68	803.93	34.42	805.9	38.23	806.07
42.74	806.3	47.09	806.22	62.78	806.13	63.27	806.12	63.62	806.12
64.44	806.15	83.44	806.15	91.23	806.63	94.72	806.8	100.52	806.83
132.42	807.25	132.77	807.26	132.86	807.26	133.05	807.27	173.39	808.66

193.45	809.45	210.92	809.38	236.84	810.04	248.49	810.08	253.06	810.27
259.03	810.45	272.22	811.95	279.37	812.68	292.07	813.79	296.17	814.12

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1284.71	.05	-19.98	.035	34.42	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.98	34.42	190	202.35	215	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.45	Reach Len. (ft)	190.00	202.35	215.00
Crit W.S. (ft)		Flow Area (sq ft)	3589.67	607.54	787.18
E.G. Slope (ft/ft)	0.000161	Area (sq ft)	3589.67	607.54	787.18
Q Total (cfs)	5150.00	Flow (cfs)	2918.29	1563.93	667.78
Top Width (ft)	1422.68	Top Width (ft)	1134.90	54.40	233.38
Vel Total (ft/s)	1.03	Avg. Vel. (ft/s)	0.81	2.57	0.85
Max Chl Dpth (ft)	13.61	Hydr. Depth (ft)	3.16	11.17	3.37
Conv. Total (cfs)	405600.4	Conv. (cfs)	229836.4	123171.1	52592.9
Length Wtd. (ft)	196.94	Wetted Per. (ft)	1135.13	58.22	233.53
Min Ch El (ft)	797.84	Shear (lb/sq ft)	0.03	0.11	0.03
Alpha	2.32	Stream Power (lb/ft s)	296.17	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	74.13	35.12	59.95
C & E Loss (ft)	0.01	Cum SA (acres)	19.11	2.97	12.70

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1903.41

INPUT
Description: CC
Station Elevation Data num= 299

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1413.08	816.72	-1407.17	816.44	-1397.75	816.01	-1388.84	815.67	-1377.66	815.3
-1366.03	814.77	-1359.93	814.45	-1351.29	814.1	-1335.15	813.35	-1330.71	813.1
-1329.95	813.06	-1327.67	812.99	-1311.67	812.18	-1308.35	812.07	-1306.25	810.9
-1302.09	807.29	-1301.39	807.14	-1295.3	807.3	-1292.12	807.21	-1288.74	807.57
-1286.35	807.86	-1281.48	808.5	-1273.69	809.7	-1271.01	810.13	-1270.85	810.19

-1265.96	810.47	-1263.08	810.63	-1256.33	810.92	-1254.83	810.96	-1254.52	810.97
-1250.44	811.04	-1235.5	811.18	-1232.76	811.29	-1226.9	811.26	-1221.86	811.26
-1192.42	811.42	-1178.27	811.68	-1173.41	811.87	-1164.4	811.94	-1147.89	811.78
-1132.78	811.57	-1120.92	811.3	-1104.29	810.83	-1092.34	809.98	-1084.47	809.39
-1078.79	809.03	-1060.74	808.69	-1034.31	808.1	-1002.08	807.01	-988.32	806.88
-983.24	806.72	-979.96	806.54	-962.01	805.21	-957.69	804.98	-957.01	805.11
-947.73	806.94	-947.71	807.06	-945.84	807.99	-944.47	807.48	-858.15	808
-799.47	808	-736.49	807.13	-689.04	806.61	-688.74	806.61	-628.45	806.52
-628.28	806.53	-628.11	806.53	-627.93	806.54	-627.75	806.54	-627.57	806.55
-627.38	806.55	-627.19	806.56	-627	806.56	-626.8	806.57	-626.6	806.57
-626.4	806.58	-626.19	806.59	-625.97	806.59	-625.76	806.6	-625.53	806.6
-625.31	806.61	-625.07	806.62	-624.83	806.62	-624.59	806.63	-624.07	806.65
-623.81	806.65	-623.55	806.66	-622.7	806.69	-622.41	806.69	-621.8	806.71
-620.81	806.74	-619.38	806.78	-618.6	806.8	-618.2	806.82	-616.86	806.85
-616.41	806.87	-615.45	806.89	-614.95	806.91	-614.43	806.92	-613.34	806.96
-612.77	806.97	-611.56	807.01	-610.92	807.02	-609.58	807.06	-608.87	807.08
-608.13	807.11	-607.36	807.13	-606.49	807.15	-605.65	807.18	-604.78	807.2
-602.91	807.26	-601.92	807.28	-587.74	807.73	-586.05	807.79	-584.26	807.85
-582.34	807.91	-580.28	807.98	-579.52	808	-497.85	808	-489.92	807.75
-488.12	807.69	-484.48	807.58	-483.72	807.56	-482.13	807.51	-481.69	807.5
-480.17	807.45	-479.66	807.44	-478.21	807.4	-477.65	807.38	-476.26	807.34
-475.65	807.32	-474.32	807.28	-473.66	807.27	-472.47	807.23	-471.77	807.21
-468.8	807.13	-468	807.11	-466.97	807.08	-466.13	807.06	-465.15	807.03
-464.11	807.01	-461.88	806.95	-459.38	806.89	-458.02	806.86	-456.71	806.82
-455.33	806.79	-453.87	806.75	-452.92	806.72	-451.38	806.69	-450.52	806.66
-448.13	806.6	-440.76	806.39	-439.42	806.36	-439.1	806.35	-436.3	806.29
-431.15	806.17	-427.32	806.09	-425.27	806.04	-423.45	806	-374	806
-373.56	806.01	-372.23	806.02	-370.93	806.04	-369.65	806.05	-368.39	806.07
-367.15	806.08	-365.72	806.1	-365.57	806.1	-358.39	806.22	-357.27	806.23
-354.06	806.29	-342.7	806.44	-335.04	806.52	-334.69	806.53	-333.81	806.54
-333.44	806.55	-332.57	806.57	-332.19	806.57	-331.34	806.59	-330.94	806.59
-330.1	806.61	-329.69	806.61	-328.43	806.64	-327.61	806.65	-327.35	806.66
-326.9	806.66	-326.02	806.68	-325.56	806.68	-324.69	806.7	-324.22	806.71
-323.37	806.72	-322.88	806.73	-322.04	806.74	-321.54	806.75	-320.71	806.77
-320.2	806.77	-319.39	806.79	-319.27	806.79	-318.73	806.8	-317.94	806.81
-317.39	806.82	-316.6	806.83	-316.04	806.84	-315.27	806.86	-314.69	806.86
-313.94	806.88	-292.28	807.29	-291.62	807.31	-290.98	807.32	-290.48	807.33
-290	807.33	-287.07	807.39	-286.61	807.4	-286.15	807.4	-285.72	807.41
-284.96	807.43	-261.22	807.95	-261.14	807.96	-260.71	807.96	-259.22	807.99
-258.97	808	-191.55	808	-160.29	808.57	-159.61	808.57	-158.94	808.58
-154.42	808.58	-153.85	808.59	-138.43	808.58	-137.74	808.57	-135.64	808.57
-134.94	808.56	-132.25	808.56	-131.6	808.55	-129.06	808.55	-128.42	808.54
-125.81	808.54	-125.15	808.53	-122.41	808.53	-103.56	808	-61.32	808
-61.14	807.99	-60.4	808	-59.58	808	-57.87	807.98	-57.25	807.68
-56.22	807.71	-40.74	807.96	-40.56	807.88	-39.48	807.93	-39.31	807.9
-38.39	807.84	-31.6	806.91	-23.04	804.62	-18.39	802.72	-15.31	799.68
-13.61	799.14	-11.15	798.59	-8.71	798.6	-4.88	798.82	-2.24	798.91
0	799.21	2.77	799.59	5.36	799.74	15.86	800.78	19.21	801.07
25.98	801.39	28.13	801.7	34.86	801.78	40.98	802.22	64.91	803.69
67.69	803.76	85.92	804.31	102.91	804.36	107.15	804.41	109.56	804.63
123.37	806.87	124.99	806.92	138.39	807.04	154.02	807.98	175.38	808.83
193.46	809.77	211.27	810.13	232.8	810.02	248.61	809.84	261.98	809.75
286.4	809.66	312.77	809.79	322.37	809.86	329.27	809.78	332.46	809.82
341.59	809.72	361.96	809.56	373.32	809.63	394.07	809.51	398.94	809.45
403.05	809.94	422.39	812.19	432.81	813.02	439.57	813.46		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1413.08	.05	-18.39	.035	28.13	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-18.39	28.13	512 298.87	86	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.44	Reach Len. (ft)	512.00	298.87	86.00
Crit W.S. (ft)		Flow Area (sq ft)	4455.71	530.61	1318.23
E.G. Slope (ft/ft)	0.000097	Area (sq ft)	4455.71	530.61	1318.23
Q Total (cfs)	5150.00	Flow (cfs)	3175.30	1101.72	872.98
Top Width (ft)	1658.44	Top Width (ft)	1224.15	46.52	387.78
Vel Total (ft/s)	0.82	Avg. Vel. (ft/s)	0.71	2.08	0.66
Max Chl Dpth (ft)	12.85	Hydr. Depth (ft)	3.64	11.41	3.40
Conv. Total (cfs)	522094.5	Conv. (cfs)	321904.3	111689.8	88500.4
Length Wtd. (ft)	376.86	Wetted Per. (ft)	1227.59	48.06	388.23
Min Ch El (ft)	798.59	Shear (lb/sq ft)	0.02	0.07	0.02
Alpha	1.96	Stream Power (lb/ft s)	439.57	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	56.59	32.48	54.75
C & E Loss (ft)	0.00	Cum SA (acres)	13.96	2.74	11.16

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1604.54

INPUT
Description: DD
Station Elevation Data num= 120

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-254.5	820.31	-253.81	820	-249.36	818.13	-249.04	818	-248.71	817.86
-244.27	816	-241.75	814.97	-239.41	814	-235.77	812.52	-234.46	812
-232.56	811.25	-229.43	810	-228.2	809.57	-224.74	808.38	-223.94	808.1
-223.65	808	-223.48	808	-221.86	808	-221.07	808	-220.61	808.01
-220.31	808.01	-220.09	808.01	-219.93	808.01	-219.8	808.01	-219.7	808.01
-219.62	808.01	-219.56	808.01	-219.5	808.01	-219.45	808.01	-219.42	808.01
-219.4	808.01	-219.38	808.01	-219.31	808.01	-219.29	808.01	-219.27	808.01
-219.26	808.01	-219.22	808.01	-219.21	808.01	-219.2	808.01	-219.19	808.01
-219.18	808.01	-219.17	808.01	-219.17	808.05	-218.46	808.05	-218.07	808.25
-208.9	807.97	-202.66	807.8	-202.47	807.73	-199.15	806.81	-197.39	806.65
-185.15	805.67	-168.49	805.12	-165.13	805.01	-163.48	805.02	-161.69	805.03
-150.76	805.17	-148.36	804.05	-144.6	801.99	-144.14	801.94	-143.94	801.8
-140.03	799.92	-137.84	799.77	-137.23	799.58	-137.01	799.73	-134.93	801.41

-134.51	801.43	-126.72	801.94	-117.53	801.92	-102.19	801.63	-88	801.53
-78.33	801.45	-66.67	801.3	-53.5	801.47	-51.58	801.47	-36.89	801.33
-18.11	800.66	-15.8	800.56	-15.31	800.44	-11.66	798.9	-2.59	797.82
-2.27	797.8	-1.95	797.77	0	797.54	4.56	797	9.86	796.53
9.89	796.53	14.62	798.12	14.69	798.14	14.81	798.26	20.33	807.16
23.78	807.16	38.24	807.17	53.5	807.14	57.16	807.14	70.39	807.14
74	807.13	112.25	806.72	127.42	806.39	151.27	806.51	160.35	807.08
183.69	807.64	190.99	807.66	210.11	808.16	216.56	808.05	241.85	807.55
242.96	807.5	249.5	807.18	265.56	806.74	289.15	808.84	301.45	809.04
322.56	809.76	342.42	809.63	360.59	809.45	381.97	809.41	400.9	809.43
411.27	809.32	419.05	810.3	430.18	811.75	441.82	812.55	451.46	813.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-254.5	.05	-15.8	.035	20.33	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-15.8	20.33	149 184.82	41	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.35	Reach Len. (ft)	149.00	184.82	41.00
Crit W.S. (ft)		Flow Area (sq ft)	1713.42	459.70	1358.78
E.G. Slope (ft/ft)	0.000177	Area (sq ft)	1713.42	459.70	1358.78
Q Total (cfs)	5150.00	Flow (cfs)	2665.06	1284.07	1200.87
Top Width (ft)	659.94	Top Width (ft)	217.02	36.13	406.80
Vel Total (ft/s)	1.46	Avg. Vel. (ft/s)	1.56	2.79	0.88
Max Chl Dpth (ft)	14.82	Hydr. Depth (ft)	7.90	12.72	3.34
Conv. Total (cfs)	386773.2	Conv. (cfs)	200150.6	96435.3	90187.4
Length Wtd. (ft)	128.00	Wetted Per. (ft)	219.87	41.85	407.09
Min Ch El (ft)	796.53	Shear (lb/sq ft)	0.09	0.12	0.04
Alpha	1.59	Stream Power (lb/ft s)	451.46	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	20.33	29.08	52.11
C & E Loss (ft)	0.00	Cum SA (acres)	5.49	2.46	10.38

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1419.72

INPUT

Description: EE
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-133.24	824.56	-130.81	824	-124.37	822.44	-122.58	822	-118.66	821.04
-114.37	820	-112.36	819.49	-106.45	818	-101.64	816.16	-98.65	815.34
-97.21	814.61	-89.43	814.27	-83.42	814	-82.62	813.97	-80.92	813.88
-75.91	810	-75.9	810	-72.82	810.28	-72.74	810.29	-71.16	810.43
-60.51	809.88	-58.71	809.82	-58.63	809.84	-57.68	809.87	-55.63	809.3
-52.04	808.3	-48.95	808.06	-43.9	807.61	-33.31	807.36	-29.68	807.31
-18.8	797.35	-18.51	797.15	-18.37	797.12	-9.34	796.76	-8.3	796.83
-1.89	796.37	-.01	796.51	0	796.51	5.24	797.45	10.42	797.23
15.88	797.82	25.35	798.02	28.91	797.99	35.53	800.94	37.02	801.47
37.8	801.6	46.24	803.46	74.68	805.31	77.76	805.47	79.29	805.55
80.95	805.57	112.25	806.16	129.82	806.8	146.42	807.27	181.61	807.14
183.67	807.12	193.95	807.06	228.2	806.84	237.5	806.83	265.27	806.79
281.86	806.66	304.04	806.21	331.38	805.94	344.68	806.3	350.86	806.46
385.2	806.66	387.18	806.61	399.69	807.42	427.18	809.24	432.84	809.27
465.47	809.54	480.67	809.4	493.5	809.13	509.05	808.96	518.95	808.89
532.2	808.89	549.9	809.02	555.9	809.02	563.05	809.83	577.38	811.63
584.8	812.16	599.7	813.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-133.24	.05	-29.68	.035	46.24	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-29.68	46.24	173	185.67	44	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.29	Reach Len. (ft)	173.00	185.67	44.00
Crit W.S. (ft)		Flow Area (sq ft)	116.41	941.47	2092.18
E.G. Slope (ft/ft)	0.000197	Area (sq ft)	116.41	941.47	2092.18
Q Total (cfs)	5150.00	Flow (cfs)	86.90	2879.95	2183.15
Top Width (ft)	652.23	Top Width (ft)	47.89	75.92	528.42
Vel Total (ft/s)	1.63	Avg. Vel. (ft/s)	0.75	3.06	1.04
Max Chl Dpth (ft)	14.92	Hydr. Depth (ft)	2.43	12.40	3.96
Conv. Total (cfs)	366923.6	Conv. (cfs)	6191.5	205188.9	155543.3
Length Wtd. (ft)	125.81	Wetted Per. (ft)	48.62	80.94	528.76
Min Ch El (ft)	796.37	Shear (lb/sq ft)	0.03	0.14	0.05
Alpha	2.13	Stream Power (lb/ft s)	599.70	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	17.20	26.11	50.49
C & E Loss (ft)	0.01	Cum SA (acres)	5.04	2.22	9.94

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1234.05

INPUT
Description: FF
Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-206.29	819.46	-200.65	818	-197.84	817.3	-192.78	816	-189.46	815.12
-185.16	814	-177.52	812.02	-177.45	812	-177.24	811.95	-169.56	810
-163.3	808.42	-161.62	808	-160.3	807.77	-150.98	806	-149.55	805.99
-141.69	805.98	-141.5	805.98	-140.88	805.98	-133.89	805.95	-130.64	805.94
-129.27	805.94	-125.41	805.92	-125.27	805.92	-119.66	805.91	-119.47	805.91
-113.88	805.9	-113.72	805.9	-113.55	805.9	-109.15	805.89	-108.89	805.89
-108.61	805.89	-79.16	805.07	-45.36	804.14	-44.53	804.12	-43.45	804.1
-40.44	804.07	-38.68	804.06	-38.54	804.07	-38.37	804.07	-37.77	804.01
-37.24	804.01	-37.19	804	-30.78	802.5	-29.84	802	-26.29	800.22
-25.87	800	-25.24	799.69	-24.32	799.25	-21.9	798	-21.56	798
-18.9	798	-18.8	798	-18.64	798	-17.59	798	-6.79	798
-.56	798	0	798	12.11	798	12.88	798	16.74	798
19.43	799.16	21.39	800	22.15	800.53	22.62	800.82	24.24	801.82
24.53	802	24.55	802.01	24.8	802.16	25.01	802.28	25.19	802.38
25.35	802.48	25.49	802.56	25.62	802.63	25.72	802.69	25.82	802.75
25.91	802.8	25.99	802.85	26.06	802.9	26.13	802.94	26.19	802.97
26.24	803.01	26.29	803.04	26.34	803.07	26.39	803.09	26.43	803.12
26.47	803.14	26.5	803.16	26.54	803.18	26.57	803.2	26.6	803.22
26.63	803.24	26.66	803.24	54.23	804.14	56.94	804.2	74.1	806.44
77.21	806.52	80.14	806.6	85.51	806.59	126.38	806.77	130.45	806.77
167.98	806.63	179.11	806.59	180.44	806.58	215.96	806.5	220.86	806.45
248.62	806.24	255.71	806.16	256.04	806.17	276.79	805.61	282.15	805.6
287.71	805.65	319.14	806.74	339.94	807.72	355.88	808.41	377.43	808.5
408.02	808.34	427.41	808.18	441.89	808.29	466.55	808.44	473.08	808.48
487.87	810.16	499.3	811.52	507.36	812.1	507.64	812.12	523.13	813.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-206.29	.05	-37.19	.035	26.66	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-37.19	26.66	117	131.34	192.99	.1	.3

CROSS SECTION OUTPUT Profile #100-Year
****
****

* E.G. Elev (ft)	* 811.35	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.06	* Wt. n-Val.	* 0.050	* 0.035	* 0.050 *
* W.S. Elev (ft)	* 811.28	* Reach Len. (ft)	* 117.00	* 131.34	* 192.99 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 748.73	* 770.55	* 2034.00 *
* E.G. Slope (ft/ft)	*0.000169	* Area (sq ft)	* 748.73	* 770.55	* 2034.00 *
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 891.95	* 2176.63	* 2081.42 *

* Top Width (ft)	*	671.93	* Top Width (ft)	*	137.42	*	63.85	*	470.65	*	
* Vel Total (ft/s)	*	1.45	* Avg. Vel. (ft/s)	*	1.19	*	2.82	*	1.02	*	
* Max Chl Dpth (ft)	*	13.28	* Hydr. Depth (ft)	*	5.45	*	12.07	*	4.32	*	
* Conv. Total (cfs)	*396595.9		* Conv. (cfs)	*	68688.3	*167620.0			*160287.7	*	
* Length Wtd. (ft)	*	151.19	* Wetted Per. (ft)	*	138.05	*	66.44	*	471.05	*	
* Min Ch El (ft)	*	798.00	* Shear (lb/sq ft)	*	0.06	*	0.12	*	0.05	*	
* Alpha	*	1.92	* Stream Power (lb/ft s)	*	523.13	*	0.00	*	0.00	*	
* Frctn Loss (ft)	*	0.03	* Cum Volume (acre-ft)	*	15.48	*	22.46	*	48.40	*	
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	4.67	*	1.92	*	9.44	*	

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1102.70

INPUT
Description: GG
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-289.51	823.17	-284.72	822.19	-283.86	822	-283.27	821.86	-274.9	820
-267.4	818.33	-265.91	818	-264.06	817.59	-257.15	816	-249.19	814.26
-248.06	814	-239.53	812.19	-238.72	812	-237.74	811.8	-228.6	810
-224.13	809.14	-217.49	808	-212.35	807.38	-210.24	807.28	-205.93	806.82
-205.12	806.75	-199.07	806.63	-196.69	806.46	-195.3	806.37	-195.04	806.35
-193.44	806.27	-192.41	806.23	-183.22	806.24	-178.07	806.21	-172.74	806.18
-171.92	806.16	-171.25	806.15	-161.2	806.03	-158.18	806.03	-156.25	806.02
-151.54	806.03	-151.43	806.03	-146.32	806.01	-146.26	806.01	-142.51	806
-133.64	805.85	-132.12	805.82	-129.94	805.78	-114.43	805.52	-102.78	805.34
-97.86	805.26	-93.46	805.2	-90.78	805.15	-87.77	805.1	-80.07	804.98
-73.86	804.89	-67.18	804.76	-58.77	804.6	-42.37	804.25	-31.66	804.01
-31.15	804.01	-29.92	804.01	-28.29	804	-27.99	804	-27.33	804
-26.85	804	-25.69	803.66	-25.11	803.49	-22.2	802	-19.2	800.47
-18.27	800	-17.41	799.56	-14.62	798	-7.66	798	0	798
1.73	798	17.37	798	17.58	798	18.13	798	18.51	798.19
22.22	800	24.75	801.24	26.32	802	28.22	802.93	31	804
31.94	804	41.11	804.07	45.61	804.3	54.04	804.54	83.33	805.28
91.06	805.49	94.01	805.59	95.91	805.61	132.94	806.3	136.29	806.33
139.49	806.35	164.42	806.54	183.4	806.63	186.37	806.61	231.26	806.05
238.05	806.05	275.37	806.2	280.92	806.2	282.25	806.21	307.77	807.46
324.8	809.33	330.91	809.81	335.5	810.13	336.15	810.18	372.12	812.23
372.24	812.18	373.78	812.33	375.76	812.44	382.54	812.44	392.23	812.55
401.64	812.64	414.95	812.72	417.44	812.75	433.14	812.79	442.12	812.72
464.37	812.83	472.75	812.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-289.51	.05	-25.69	.035	31	.05

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

-25.69 31 138.99 130.59 147.99 .1 .3

CROSS SECTION OUTPUT Profile #100-Year

* E.G. Elev (ft)	* 811.32	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.07	* Wt. n-Val.	* 0.050	* 0.035	* 0.050 *
* W.S. Elev (ft)	* 811.25	* Reach Len. (ft)	* 138.99	* 130.59	* 147.99 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1123.69	* 678.76	* 1543.08 *
* E.G. Slope (ft/ft)	*0.000185	* Area (sq ft)	* 1123.69	* 678.76	* 1543.08 *
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 1392.40	* 1990.72	* 1766.88 *
* Top Width (ft)	* 589.97	* Top Width (ft)	* 209.28	* 56.69	* 324.00 *
* Vel Total (ft/s)	* 1.54	* Avg. Vel. (ft/s)	* 1.24	* 2.93	* 1.15 *
* Max Chl Dpth (ft)	* 13.25	* Hydr. Depth (ft)	* 5.37	* 11.97	* 4.76 *
* Conv. Total (cfs)	*378186.5	* Conv. (cfs)	*102249.7	*146187.4	*129749.4 *
* Length Wtd. (ft)	* 138.17	* Wetted Per. (ft)	* 209.73	* 59.40	* 324.23 *
* Min Ch El (ft)	* 798.00	* Shear (lb/sq ft)	* 0.06	* 0.13	* 0.06 *
* Alpha	* 1.77	* Stream Power (lb/ft s)	* 472.75	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.03	* Cum Volume (acre-ft)	* 12.97	* 20.27	* 40.48 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 4.21	* 1.74	* 7.67 *

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 972.12

INPUT
Description: HH
Station Elevation Data num= 163

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-326.96	813.78	-325.06	813.78	-324.62	813.77	-312.1	813.79	-311.71	813.79
-311.3	813.78	-310.79	813.77	-310.71	813.77	-310.04	813.76	-309.09	813.74
-299.86	813.58	-299.5	813.58	-299.13	813.57	-296.5	813.51	-289.07	813.22
-281.87	812.99	-279.84	812.9	-276.56	812.81	-272.63	812.68	-270.91	812.59
-269.58	812.52	-264.51	812.38	-258.25	812.17	-257.11	812.12	-253.96	812.01
-252.79	812	-247.85	811.77	-247.06	811.74	-246.01	811.7	-235.69	811.04
-234.51	810.98	-230.45	810.9	-224.77	810.76	-217.17	810.53	-213.54	810.36
-203.45	810	-201.81	809.91	-179	808.59	-178.36	808.56	-174.95	808.41
-168.88	808	-168.86	807.99	-167.73	807.99	-167.72	807.99	-166.02	807.98
-162.03	807.97	-158.82	807.97	-157.81	807.96	-156.68	807.96	-153.18	807.93
-152.17	807.93	-147.01	807.71	-124.98	806.82	-98.36	806.05	-98.02	806.03
-96.39	806	-96.31	806	-91.58	805.99	-90.9	805.99	-90.29	805.98
-88.68	805.98	-87.34	805.98	-85.9	805.97	-82.63	805.96	-80.47	805.95
-78.95	805.94	-77.59	805.94	-55.94	805.33	-51.01	805.29	-46.29	805.27

-42.91	805.22	-39.87	805.19	-36.91	805.19	-33.31	804.55	-30.41	804.02
-30.31	804.02	-30.21	804	-28.09	802.54	-27.19	802	-25.5	801.1
-22.96	800	-18.37	797.56	-17.49	797.56	-17.43	797.56	-17.42	797.56
-13.96	797.56	0	797.56	1.22	797.56	14.24	797.56	17.93	797.56
20.45	798	26.11	799.94	26.31	800	32.11	801.03	32.83	802
49.01	803.35	49.44	803.36	55.53	803.3	55.72	803.39	56.74	803.46
60.16	803.53	85.01	805.01	113.83	805.2	119.81	805.24	126.8	805.29
131.99	805.27	139.45	805.25	147.43	805.3	150.86	805.04	162.7	804.62
166.24	804.54	176.45	805.43	177.27	805.48	179.3	805.58	201.26	806.42
208.15	807.25	223.45	808.52	236.82	809.7	252.78	811.09	252.86	811.07
252.99	811.08	255.67	811.11	272.38	811.61	292.88	811.69	300.43	811.78
310.06	811.68	312.5	811.63	314.79	811.65	317.61	811.73	317.72	811.84
317.8	811.83	320.16	811.81	334.73	811.83	341.58	811.8	343.41	811.9
345.47	811.78	346.96	811.81	348.55	811.78	352.07	811.8	367.83	811.79
370.45	811.82	383.76	811.8	383.94	811.82	395.49	811.86	398.25	811.88
398.32	812.08	398.42	811.98	398.86	812.41	408.62	812.42	418.24	812.27
427.48	812.07	437.72	811.84	443.56	811.77	454.65	811.84	466.98	811.99
475.86	812.18	480.39	812.38	482.7	812.57	490.96	812.47	496.51	812.45
496.72	812.45	505.62	812.64	511.92	812.78				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-326.96	.05	-30.21	.035	32.83	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-30.21	32.83	168	161.32	108	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.18	Reach Len. (ft)	168.00	161.32	108.00
Crit W.S. (ft)		Flow Area (sq ft)	764.22	793.48	1203.93
E.G. Slope (ft/ft)	0.000228	Area (sq ft)	764.22	793.48	1203.93
Q Total (cfs)	5150.00	Flow (cfs)	817.49	2681.48	1651.03
Top Width (ft)	496.01	Top Width (ft)	207.71	63.04	225.26
Vel Total (ft/s)	1.86	Avg. Vel. (ft/s)	1.07	3.38	1.37
Max Chl Dpth (ft)	13.62	Hydr. Depth (ft)	3.68	12.59	5.34
Conv. Total (cfs)	340731.2	Conv. (cfs)	54086.5	177410.4	109234.3
Length Wtd. (ft)	140.95	Wetted Per. (ft)	207.94	65.65	225.68
Min Ch El (ft)	797.56	Shear (lb/sq ft)	0.05	0.17	0.08
Alpha	1.94	Stream Power (lb/ft s)	511.92	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	9.96	18.07	35.81
C & E Loss (ft)	0.00	Cum SA (acres)	3.54	1.56	6.74

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 810.82

INPUT
Description: II
Station Elevation Data num= 159

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-216.91	814	-209.47	814	-201.74	814	-195.8	813.64	-188.84	813.23
-185.45	813.15	-179.25	812.94	-152.13	813.27	-151.81	813.26	-149.47	813.17
-146.37	813.02	-146.36	813.01	-146.32	813.02	-140.6	812.84	-136.23	812.99
-129.02	812.75	-127.18	812.76	-123.2	812.8	-119.29	812.67	-118.82	812.66
-111.87	812.43	-109.55	812.36	-100.54	812.03	-99.84	812	-98.62	811.93
-97.8	811.89	-83.42	811.14	-76.85	810.72	-74.41	810.56	-73.74	810.51
-71.49	810.36	-66.78	810	-61.45	809.65	-58.64	809.44	-52.08	808.96
-50.37	808.85	-41.46	808	-38.34	807.75	-37.59	807.68	-36.09	807.5
-24.8	806	-20.35	804.6	-18.41	804	-18.33	803.94	-15.01	802
-12.97	800.82	-11.05	800	-10.24	799.15	-8.85	797.3	0	797.3
3.17	797.3	10.08	797.3	17.92	797.3	24.85	797.3	27.53	798
27.87	801.86	28.46	802.53	32.36	803.16	42.61	804.76	59.3	804.95
77.03	805.06	103.24	805.26	119.26	805.35	128.03	805.42	149.59	805.57
160.78	805.68	192.07	805.53	197.51	805.48	238.72	804.72	239.38	804.7
240.47	804.67	256.38	804.26	262.57	804.13	266.56	804.18	293.85	808.49
296.89	808.94	300.24	809.22	329.56	811.43	333.28	811.66	333.32	811.67
333.59	811.64	340.57	811.73	344.49	811.76	350.15	811.95	362.33	812.32
365.48	812.39	381.25	812.44	388.26	812.42	396.23	812.36	413.4	812.25
424.49	812.31	455.96	812.46	456.15	812.5	459.79	812.5	467.99	812.4
475.02	812.37	475.36	812.37	475.71	812.37	476.06	812.37	486.93	812.37
487.23	812.37	487.54	812.37	487.85	812.37	488.18	812.37	488.5	812.37
488.83	812.37	489.17	812.37	489.52	812.38	497.79	812.49	497.9	812.49
498.02	812.49	498.14	812.49	498.28	812.49	498.41	812.49	498.56	812.48
498.71	812.48	498.87	812.48	499.04	812.48	499.21	812.48	499.39	812.48
499.57	812.48	499.76	812.48	499.96	812.48	500.17	812.48	500.38	812.49
500.59	812.49	500.81	812.49	501.04	812.49	501.11	812.49	501.27	812.49
501.51	812.49	501.75	812.49	501.99	812.49	502.24	812.49	502.49	812.49
502.74	812.49	503	812.49	503.25	812.49	503.51	812.49	503.76	812.49
504.02	812.49	504.27	812.5	504.52	812.5	504.78	812.5	505.02	812.5
505.27	812.5	505.51	812.5	505.75	812.51	505.98	812.51	506.21	812.51
506.43	812.51	506.65	812.52	506.86	812.52	507.07	812.52	507.27	812.52
507.46	812.53	507.64	812.53	507.82	812.53	524.88	812.93		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-216.91	.05	-20.35	.035	42.61	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-20.35	42.61	200 178.48	258	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.13	Reach Len. (ft)	200.00	178.48	258.00
Crit W.S. (ft)		Flow Area (sq ft)	154.26	725.62	

1505.53	*									
* E.G. Slope (ft/ft)		*0.000312	*	Area (sq ft)		*	154.26	*	725.62	*
1505.53	*									
* Q Total (cfs)		* 5150.00	*	Flow (cfs)		*	146.49	*	2598.76	*
2404.74	*									
* Top Width (ft)		* 408.81	*	Top Width (ft)		*	62.89	*	62.96	*
282.95	*									
* Vel Total (ft/s)		* 2.16	*	Avg. Vel. (ft/s)		*	0.95	*	3.58	*
1.60	*									
* Max Chl Dpth (ft)		* 13.83	*	Hydr. Depth (ft)		*	2.45	*	11.53	*
5.32	*									
* Conv. Total (cfs)		*291710.3	*	Conv. (cfs)		*	8297.8	*147201.3		
*136211.3	*									
* Length Wtd. (ft)		* 218.44	*	Wetted Per. (ft)		*	63.35	*	69.47	*
283.43	*									
* Min Ch El (ft)		* 797.30	*	Shear (lb/sq ft)		*	0.05	*	0.20	*
0.10	*									
* Alpha		* 1.65	*	Stream Power (lb/ft s)		*	524.88	*	0.00	*
0.00	*									
* Frctn Loss (ft)		* 0.05	*	Cum Volume (acre-ft)		*	8.18	*	15.25	*
32.46	*									
* C & E Loss (ft)		* 0.02	*	Cum SA (acres)		*	3.02	*	1.33	*
6.11	*									

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 632.35

INPUT
Description: JJ
Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-233.17	814	-232.97	814	-232.29	814	-231.37	814	-229.74	814
-227.54	813.99	-224.26	813.99	-217.08	813.99	-215.69	813.99	-206.84	813.98
-205.84	813.98	-204.78	813.98	-194.69	813.99	-163.17	813.97	-158.17	813.97
-152.63	813.96	-146.75	813.97	-144.86	813.97	-139.53	813.97	-138.59	813.97
-138.16	813.97	-136.9	813.97	-134.88	813.97	-127.78	813.97	-125.89	813.97
-121.27	813.96	-116.23	813.98	-115.18	813.97	-115.16	813.97	-113.57	813.97
-103.05	813.98	-102.55	813.98	-96.44	814	-96.4	814	-96.31	814
-96.25	814	-92.59	813.97	-89.12	813.99	-89.1	813.99	-88.87	813.99
-88.46	813.99	-77.63	814	-76.17	814.02	-76.04	814.02	-75.04	814
-72.8	813.99	-71.53	814	-68.29	814.02	-67.62	814.01	-67.06	814
-63.13	813.78	-62.61	813.72	-62.43	813.69	-57.74	813.21	-57.27	813.17
-52.18	812.77	-48.03	812	-43.2	810.5	-41.72	810	-40.18	809.46
-37.42	808	-35.59	807.07	-33.62	806	-31.7	804.92	-29.9	804
-27.7	802.73	-26.29	802	-22.66	800.11	-22.45	800	-22.1	799.82
-21.65	799.6	-20.99	799.31	-19.21	798.49	-18.32	796.97	-6.82	796.97
-2.66	796.97	0	796.97	.16	796.97	11.62	796.97	15.58	798
15.79	798.01	16.67	798.01	16.75	798.07	16.96	798.08	20.03	798.26
21.03	798.28	27.17	798.57	31.86	800.77	32.51	802.17	32.91	802.6
36.36	804.21	36.53	804.25	37.02	804.34	47.09	805.42	47.49	805.46
49.7	805.63	55.05	805.93	68.74	806.02	86.07	805.93	99.48	805.93
103.38	805.75	123.57	805.98	131.93	806.3	155.1	806.45	176.93	806.19
200.24	806.3	221.51	806.49	244.67	806.72	265.49	806.59	289.74	806.31
312.41	806.09	337.11	806.03	356.2	805.86	381.78	805.86	408.47	805.68
427.73	805.75	446.84	805.64	455	805.63	460.39	805.71	465.48	805.94
478.6	806.16	486.66	806.62	496.58	808.09	504.39	809.32	521.17	811.33
528.01	812.14	528.42	812.31	528.56	812.35	529.4	812.29	529.44	812.28

529.77 812.28 529.97 812.27 537.83 812.44 544.99 812.58 545.64 812.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-233.17	.05	-52.18	.035	37.02	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-52.18	37.02	239	198.36	80	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.035	0.050
W.S. Elev (ft)	811.11	Reach Len. (ft)	239.00	198.36	80.00
Crit W.S. (ft)		Flow Area (sq ft)		888.20	2336.33
E.G. Slope (ft/ft)	0.000189	Area (sq ft)		888.20	2336.33
Q Total (cfs)	5150.00	Flow (cfs)		2418.72	2731.28
Top Width (ft)	564.55	Top Width (ft)		82.20	482.35
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)		2.72	1.17
Max Chl Dpth (ft)	14.14	Hydr. Depth (ft)		10.81	4.84
Conv. Total (cfs)	374563.3	Conv. (cfs)		175915.6	198647.7
Length Wtd. (ft)	136.17	Wetted Per. (ft)		88.15	482.78
Min Ch El (ft)	796.97	Shear (lb/sq ft)		0.12	0.06
Alpha	1.65	Stream Power (lb/ft s)	545.64	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	7.83	11.95	21.08
C & E Loss (ft)	0.00	Cum SA (acres)	2.87	1.03	3.85

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 433.99

INPUT
Description: KK
Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-229.28	815.19	-223.93	814	-216.01	812.28	-214.67	812	-213.65	811.85
-199.66	810	-199.48	810	-199.29	810	-197.88	809.99	-194.25	809.96
-194.23	809.96	-190.38	809.95	-185.59	809.93	-178.39	809.93	-174.76	809.91
-173.86	809.91	-173.11	809.91	-135.76	808.85	-130.79	808.72	-124.61	808.57
-120.21	808.48	-106.09	808.19	-104.62	808.16	-97.07	808.01	-96.21	808
-91.4	808	-90.61	808	-79.64	807.53	-70.25	807.22	-64	807.02

-57.82	806.79	-47.76	806.4	-45.29	806.3	-42.52	806.21	-41.03	806.16
-37.62	806.01	-36.96	806.01	-36.96	806	-33.53	804.27	-32.99	804
-30.1	802.54	-28.88	802	-28.63	801.88	-24.46	800	-22.46	799.07
-20.14	796.7	-12.23	796.7	-4.22	796.7	-1.01	796.7	0	796.7
12.22	796.7	14.57	799.05	16.69	800	17.49	800.3	22.91	802
23.15	802	25.9	802.22	28.38	802.57	34	802.72	35.29	802.76
46.96	803	49.07	803.48	55.32	804.73	65.63	804.46	75.14	804.3
82.19	804.93	83.76	805.01	94.64	805.48	107.93	805.05	115.02	805.14
115.99	805.19	132.95	805.87	140.41	806.12	179.17	805.81	186.1	805.75
218.99	805.95	229.65	806.12	243.46	805.89	273.03	805.79	295.71	805.5
315.95	805.54	342.46	805.87	360.5	806.18	374.77	806.1	406.56	805.76
412.8	805.7	423.66	805.74	441.5	805.56	452.35	805.52	466.16	806.57
471.85	806.85	475.67	807.36	490.39	809.41	494.83	809.91	511.44	811.92
511.84	812.08	511.9	812.12						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-229.28	.05	-36.96	.035	28.38	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.96	28.38	150.99	144.27	75.99	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.10	Reach Len. (ft)	150.99	144.27	75.99
Crit W.S. (ft)		Flow Area (sq ft)	444.32	788.87	2529.67
E.G. Slope (ft/ft)	0.000148	Area (sq ft)	444.32	788.87	2529.67
Q Total (cfs)	5150.00	Flow (cfs)	303.77	2061.26	2784.97
Top Width (ft)	712.65	Top Width (ft)	171.02	65.34	476.29
Vel Total (ft/s)	1.37	Avg. Vel. (ft/s)	0.68	2.61	1.10
Max Chl Dpth (ft)	14.40	Hydr. Depth (ft)	2.60	12.07	5.31
Conv. Total (cfs)	422843.5	Conv. (cfs)	24941.4	169240.6	228661.6
Length Wtd. (ft)	108.76	Wetted Per. (ft)	171.16	69.45	476.88
Min Ch El (ft)	796.70	Shear (lb/sq ft)	0.02	0.11	0.05
Alpha	1.82	Stream Power (lb/ft s)	511.90	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	6.61	8.13	16.61
C & E Loss (ft)	0.00	Cum SA (acres)	2.41	0.69	2.97

CROSS SECTION

RIVER: Buckeye Creek

REACH: Buckeye Creek RS: 289.71

INPUT
Description: LL
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-348.33	816.57	-348.24	816.54	-347.81	816.44	-345.95	816	-342.84	815.36
-339.64	814.72	-336.02	814	-328.13	813.43	-322.18	813.05	-305.65	812
-302.14	811.76	-298.26	811.43	-280.91	810	-279.28	809.93	-246.45	808.55
-235.55	808	-235.47	808	-231.89	808	-230.12	808	-225.75	808
-220.81	808	-220.77	808	-216.44	808	-211.33	808	-195.52	808
-194.47	808	-194.45	808	-184.64	808	-182.43	808	-178.88	808.05
-178.72	808.05	-178.43	808.06	-178.1	808.06	-172.71	808.2	-168.02	808.31
-160.86	808.55	-144.31	808.1	-141.52	808.02	-137.87	808.02	-133.47	808.03
-127.35	808.03	-116.67	808.04	-91.7	808.03	-68.94	808.02	-63.03	808.02
-59.01	808.02	-55.88	808.02	-55.76	808.02	-55.73	808.02	-53.31	808.01
-52.54	808.01	-49.34	808.01	-47.14	808.01	-46.11	808.01	-43.69	808.01
-42.03	808.01	-41.16	808	-36.46	808	-36.18	807.96	-34.84	807.82
-34.01	807.45	-33.88	807.41	-30.5	806	-28.59	805.2	-25.72	804
-24.06	803.13	-22.27	802	-20.72	801.07	-18.75	800	-17.18	799.08
-15.4	796.46	-1.4	796.46	0	796.46	1.93	796.46	6.13	796.46
16.91	796.46	18.38	798	18.87	798	19.47	798	19.95	798.46
21.23	799.6	21.7	799.87	24.37	800.38	35.61	802.38	50.22	802.63
53.88	802.69	63.02	802.91	78.8	802.53	78.99	802.53	82.81	802.65
94.02	803.02	100.69	804.05	109.95	805.3	112.56	805.37	144.08	805.37
153.1	805.31	186.57	805.2	205.42	805.47	226.33	805.61	253.41	805.45
264.38	805.23	289.6	805.11	294.8	805.28	315.35	805.29	333.93	805.43
339.25	805.41	361.21	806.06	367.63	805.99	382.77	805.65	385.82	805.7
412.49	806.66	414.12	806.72	415.41	806.89	435.44	809.42	453.47	811.42
458.91	812.07	459.37	812.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-348.33	.05	-34.84	.035	35.61	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-34.84	35.61	142	180.45	179	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.09	Reach Len. (ft)	142.00	180.45	179.00
Crit W.S. (ft)		Flow Area (sq ft)	707.26	825.10	2378.05
E.G. Slope (ft/ft)	0.000137	Area (sq ft)	707.26	825.10	2378.05
Q Total (cfs)	5150.00	Flow (cfs)	480.47	2020.46	2649.07
Top Width (ft)	744.61	Top Width (ft)	259.28	70.45	414.88
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)	0.68	2.45	1.11
Max Chl Dpth (ft)	14.63	Hydr. Depth (ft)	2.73	11.71	5.73
Conv. Total (cfs)	439699.1	Conv. (cfs)	41021.7	172504.1	226173.4

* Length Wtd. (ft)	*	174.95	* Wetted Per. (ft)	*	259.40	*	75.50	*	415.36 *
* Min Ch El (ft)	*	796.46	* Shear (lb/sq ft)	*	0.02	*	0.09	*	0.05 *
* Alpha	*	1.75	* Stream Power (lb/ft s)	*	459.37	*	0.00	*	0.00 *
* Frctn Loss (ft)	*	0.03	* Cum Volume (acre-ft)	*	4.62	*	5.46	*	12.33 *
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	1.66	*	0.47	*	2.19 *

****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 109.26

INPUT
Description: MM
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-420.57	814.39	-419.2	814	-407.77	813.42	-407.7	813.42	-379.04	812
-378.22	811.99	-334.8	811.11	-302.12	810.46	-279.5	810	-278.77	810
-199.19	808.01	-198.67	808	-196.73	808	-196.71	808	-160.16	807.18
-150.67	806.97	-143.98	806.83	-123.71	806.44	-101.58	806	-100.78	806
-92.21	805.99	-80.49	805.97	-77.36	805.97	-69.5	805.98	-53.95	806
-46.87	806	-41.13	806	-38.95	806	-35.79	806	-33.95	804.99
-32.14	804	-29.75	802.69	-28.49	802	-26.52	800.92	-25.03	800
-24.55	799.7	-20.63	798	-13.87	796.17	-7.1	796.17	-6.45	796.17
-5.34	796.17	-3.06	796.17	0	796.17	9.83	796.17	10.32	798
11.65	798	12.28	798	15.39	799.59	16.21	800	18.42	801.13
20.26	802	23.7	803.6	24.16	803.84	24.46	804	25.31	804.27
25.55	804.34	26.05	804.45	33.05	806	33.29	806	34.24	806
36.49	805.83	40.87	805.6	49.87	805.76	78.79	805.59	114.93	804.96
121.77	804.87	141.12	804.61	165.89	804.29	192.3	804.3	201.03	804.39
211.75	804.67	229.66	805	247.1	805.46	263.63	805.77	272.64	805.95
279.01	806.31	286.81	806.72	289.32	807.18	307.42	809.78	309.29	809.95
325.74	811.48	328.02	811.69	328.25	811.72	328.26	811.72	328.83	811.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-420.57	.05	-35.79	.035	33.05	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.79	33.05	105.99	109.26	120	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

****

* E.G. Elev (ft)	*	811.10	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.07	* Wt. n-Val.	*	0.050	*	0.035	*	0.050 *
* W.S. Elev (ft)	*	811.03	* Reach Len. (ft)	*	105.99	*	109.26	*	120.00 *
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	914.88	*	791.16	*	1564.78 *
* E.G. Slope (ft/ft)	*	0.000200	* Area (sq ft)	*	914.88	*	791.16	*	1564.78 *

* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 817.04	* 2302.15	* 2030.81 *
* Top Width (ft)	* 651.91	* Top Width (ft)	* 295.18	* 68.84	* 287.89 *
* Vel Total (ft/s)	* 1.57	* Avg. Vel. (ft/s)	* 0.89	* 2.91	* 1.30 *
* Max Chl Dpth (ft)	* 14.86	* Hydr. Depth (ft)	* 3.10	* 11.49	* 5.44 *
* Conv. Total (cfs)	*364262.0	* Conv. (cfs)	* 57789.4	*162832.3	*143640.3 *
* Length Wtd. (ft)	* 113.08	* Wetted Per. (ft)	* 295.24	* 74.12	* 288.24 *
* Min Ch El (ft)	* 796.17	* Shear (lb/sq ft)	* 0.04	* 0.13	* 0.07 *
* Alpha	* 1.85	* Stream Power (lb/ft s)	* 328.83	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.02	* Cum Volume (acre-ft)	* 1.97	* 2.11	* 4.23 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.76	* 0.18	* 0.74 *

****
****

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 0

INPUT
Description: NN
Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-417.03	813.82	-412.45	812.94	-406.81	812	-406.1	812	-405.22	812
-395.28	811.74	-380.91	811.39	-371.41	811.15	-364.68	810.99	-359.42	810.86
-355.34	810.77	-345.4	810.64	-340.02	810.54	-336.02	810.47	-325.13	810.34
-312.35	810.19	-297.14	810.01	-296.43	810	-296.02	810	-295.59	810
-285.2	809.91	-274.56	809.84	-274.54	809.84	-273.77	809.83	-272.94	809.82
-262.55	809.73	-253.03	809.67	-251.8	809.66	-250.49	809.65	-241.36	809.57
-232.98	809.51	-230.33	809.49	-227.4	809.46	-224.11	809.42	-220.35	809.37
-208.38	809.22	-174.4	808.34	-171.28	808.24	-167.82	808.24	-159.55	808.19
-158.48	808.19	-156.58	808.18	-145.99	808.1	-143.06	808.1	-141.48	808.1
-141.47	808.1	-141.45	808.1	-141.41	808.1	-139.97	808.09	-136.44	808.09
-134.24	808.08	-131.11	808.06	-127.77	808.05	-120.4	808.02	-118.91	808.01
-118.39	808.01	-117.91	808.01	-117.81	808.01	-115.67	808	-113.81	807.99
-106.61	807.86	-105.72	807.84	-104.61	807.82	-104.57	807.82	-102.61	807.78
-99.96	807.71	-94.79	807.56	-82.5	807.22	-39.63	806	-38.69	806
-32.64	804.46	-31.48	804	-29.07	802.86	-27.45	802	-25.43	800.91
-24.71	800.57	-23.51	800	-21.41	799	-19.3	798	-10.6	796
-.12	796	-.06	796	0	796	11.36	796	20.55	798
22.64	798.89	25.23	800	25.29	800.03	25.3	800.03	29.05	802
30.21	802.61	33.02	804	35.92	804.98	37.94	804.98	38.95	804.98
39.77	804.98	55.66	804.9	86.81	804.9	121.46	804.49	134.69	804.4
178.19	803.99	181.7	803.96	182	803.96	184.59	803.99	228.44	804.47
248.69	805.15	255.51	805.29	257.89	805.39	258.14	805.47	259.94	805.87
277.19	809.69	294.63	811.77	300.3	812.2	300.82	812.43	300.99	812.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-417.03	.05	-38.69	.035	35.92	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-38.69	35.92	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100-Year

E.G. Elev (ft)	811.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	811.00	Reach Len. (ft)			
Crit W.S. (ft)	803.91	Flow Area (sq ft)	705.56	889.77	1504.49
E.G. Slope (ft/ft)	0.000191	Area (sq ft)	705.56	889.77	1504.49
Q Total (cfs)	5150.00	Flow (cfs)	484.14	2637.88	2027.98
Top Width (ft)	653.27	Top Width (ft)	326.41	74.61	252.25
Vel Total (ft/s)	1.66	Avg. Vel. (ft/s)	0.69	2.96	1.35
Max Chl Dpth (ft)	15.00	Hydr. Depth (ft)	2.16	11.93	5.96
Conv. Total (cfs)	372848.1	Conv. (cfs)	35050.7	190976.4	146821.0
Length Wtd. (ft)		Wetted Per. (ft)	326.46	78.27	252.83
Min Ch El (ft)	796.00	Shear (lb/sq ft)	0.03	0.14	0.07
Alpha	1.91	Stream Power (lb/ft s)	300.99	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Buckeye Creek

Reach	River Sta.	n1	n2	n3
Buckeye Creek	3504.54	.05	.035	.05
Buckeye Creek	3454.54	.05	.035	.05
Buckeye Creek	3404.54	.05	.035	.05
Buckeye Creek	3354.54	.05	.035	.05
Buckeye Creek	3304.54	.05	.035	.05
Buckeye Creek	3254.54	.05	.035	.05
Buckeye Creek	3204.54	.05	.035	.05
Buckeye Creek	3154.54	.05	.035	.05
Buckeye Creek	3104.54	.05	.035	.05
Buckeye Creek	3054.54	.05	.035	.05
Buckeye Creek	3004.54	.05	.035	.05
Buckeye Creek	2954.54	.05	.035	.05
Buckeye Creek	2904.54	.05	.035	.05
Buckeye Creek	2854.58	.05	.035	.05
Buckeye Creek	2804.54	.05	.035	.05
Buckeye Creek	2754.54	.05	.035	.05

*Buckeye Creek	*	2704.54	*	.05*	.035*	.05*
*Buckeye Creek	*	2661.29	*	.05*	.035*	.05*
*Buckeye Creek	*	2625.35	*Bridge	*	*	*
*Buckeye Creek	*	2603.43	*	.05*	.035*	.05*
*Buckeye Creek	*	2554.54	*	.05*	.035*	.05*
*Buckeye Creek	*	2354.53	*	.05*	.035*	.05*
*Buckeye Creek	*	2306.38	*	.05*	.035*	.05*
*Buckeye Creek	*	2254.54	*	.05*	.035*	.05*
*Buckeye Creek	*	2204.54	*	.05*	.035*	.05*
*Buckeye Creek	*	2154.54	*	.05*	.035*	.05*
*Buckeye Creek	*	2105.74	*	.05*	.035*	.05*
*Buckeye Creek	*	1903.41	*	.05*	.035*	.05*
*Buckeye Creek	*	1604.54	*	.05*	.035*	.05*
*Buckeye Creek	*	1419.72	*	.05*	.035*	.05*
*Buckeye Creek	*	1234.05	*	.05*	.035*	.05*
*Buckeye Creek	*	1102.70	*	.05*	.035*	.05*
*Buckeye Creek	*	972.12	*	.05*	.035*	.05*
*Buckeye Creek	*	810.82	*	.05*	.035*	.05*
*Buckeye Creek	*	632.35	*	.05*	.035*	.05*
*Buckeye Creek	*	433.99	*	.05*	.035*	.05*
*Buckeye Creek	*	289.71	*	.05*	.035*	.05*
*Buckeye Creek	*	109.26	*	.05*	.035*	.05*
*Buckeye Creek	*	0	*	.05*	.035*	.05*

SUMMARY OF REACH LENGTHS

River: Buckeye Creek

Reach	River Sta.	Left	Channel	Right
*Buckeye Creek	* 3504.54	* 50*	50*	50*
*Buckeye Creek	* 3454.54	* 52*	50*	50*
*Buckeye Creek	* 3404.54	* 55*	50*	50*
*Buckeye Creek	* 3354.54	* 35*	50*	50*
*Buckeye Creek	* 3304.54	* 55*	50*	47*
*Buckeye Creek	* 3254.54	* 43*	50*	52*
*Buckeye Creek	* 3204.54	* 44*	50*	51*
*Buckeye Creek	* 3154.54	* 48*	50*	52*
*Buckeye Creek	* 3104.54	* 22*	50*	48*
*Buckeye Creek	* 3054.54	* 23*	50*	53*
*Buckeye Creek	* 3004.54	* 36*	50*	48*
*Buckeye Creek	* 2954.54	* 36*	50*	48*
*Buckeye Creek	* 2904.54	* 42*	49.96*	51*
*Buckeye Creek	* 2854.58	* 40*	50.04*	52*
*Buckeye Creek	* 2804.54	* 50*	50*	60*
*Buckeye Creek	* 2754.54	* 51*	50*	58*
*Buckeye Creek	* 2704.54	* 51*	43.25*	43*
*Buckeye Creek	* 2661.29	* 134*	57.86*	63*
*Buckeye Creek	* 2625.35	*Bridge	*	*	*
*Buckeye Creek	* 2603.43	* 66*	48.89*	51*
*Buckeye Creek	* 2554.54	* 293*	200.01*	191*
*Buckeye Creek	* 2354.53	* 144*	48.15*	69*
*Buckeye Creek	* 2306.38	* 90*	51.84*	42*
*Buckeye Creek	* 2254.54	* 90*	50*	45*
*Buckeye Creek	* 2204.54	* 74*	50*	44*
*Buckeye Creek	* 2154.54	* 63*	48.8*	47*
*Buckeye Creek	* 2105.74	* 190*	202.35*	215*
*Buckeye Creek	* 1903.41	* 512*	298.87*	86*
*Buckeye Creek	* 1604.54	* 149*	184.82*	41*
*Buckeye Creek	* 1419.72	* 173*	185.67*	44*

*Buckeye Creek	*	1234.05	* 117*	131.34*	192.99*
*Buckeye Creek	*	1102.70	* 138.99*	130.59*	147.99*
*Buckeye Creek	*	972.12	* 168*	161.32*	108*
*Buckeye Creek	*	810.82	* 200*	178.48*	258*
*Buckeye Creek	*	632.35	* 239*	198.36*	80*
*Buckeye Creek	*	433.99	* 150.99*	144.27*	75.99*
*Buckeye Creek	*	289.71	* 142*	180.45*	179*
*Buckeye Creek	*	109.26	* 105.99*	109.26*	120*
*Buckeye Creek	*	0	* 0*	0*	0*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Buckeye Creek

Reach	River Sta.	Contr.	Expan.
*Buckeye Creek	* 3504.54	* .1*	.3*
*Buckeye Creek	* 3454.54	* .1*	.3*
*Buckeye Creek	* 3404.54	* .1*	.3*
*Buckeye Creek	* 3354.54	* .1*	.3*
*Buckeye Creek	* 3304.54	* .1*	.3*
*Buckeye Creek	* 3254.54	* .1*	.3*
*Buckeye Creek	* 3204.54	* .1*	.3*
*Buckeye Creek	* 3154.54	* .1*	.3*
*Buckeye Creek	* 3104.54	* .1*	.3*
*Buckeye Creek	* 3054.54	* .1*	.3*
*Buckeye Creek	* 3004.54	* .1*	.3*
*Buckeye Creek	* 2954.54	* .1*	.3*
*Buckeye Creek	* 2904.54	* .1*	.3*
*Buckeye Creek	* 2854.58	* .1*	.3*
*Buckeye Creek	* 2804.54	* .1*	.3*
*Buckeye Creek	* 2754.54	* .1*	.3*
*Buckeye Creek	* 2704.54	* .1*	.3*
*Buckeye Creek	* 2661.29	* .3*	.5*
*Buckeye Creek	* 2625.35	*Bridge *	*
*Buckeye Creek	* 2603.43	* .3*	.5*
*Buckeye Creek	* 2554.54	* .1*	.3*
*Buckeye Creek	* 2354.53	* .1*	.3*
*Buckeye Creek	* 2306.38	* .1*	.3*
*Buckeye Creek	* 2254.54	* .1*	.3*
*Buckeye Creek	* 2204.54	* .1*	.3*
*Buckeye Creek	* 2154.54	* .1*	.3*
*Buckeye Creek	* 2105.74	* .1*	.3*
*Buckeye Creek	* 1903.41	* .1*	.3*
*Buckeye Creek	* 1604.54	* .1*	.3*
*Buckeye Creek	* 1419.72	* .1*	.3*
*Buckeye Creek	* 1234.05	* .1*	.3*
*Buckeye Creek	* 1102.70	* .1*	.3*
*Buckeye Creek	* 972.12	* .1*	.3*
*Buckeye Creek	* 810.82	* .1*	.3*
*Buckeye Creek	* 632.35	* .1*	.3*
*Buckeye Creek	* 433.99	* .1*	.3*
*Buckeye Creek	* 289.71	* .1*	.3*
*Buckeye Creek	* 109.26	* .1*	.3*
*Buckeye Creek	* 0	* .1*	.3*

HEC-RAS HEC-RAS 5.0.0 February 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PREPARED BY: PJH 2/11/2019 CHECKED BY: ARC 2/14/2019
PROPOSED
PROJECT DATA
Project Title: 110-811_Sherwood FB HH
Project File : 110-811_SherwoFBHH.prj
Run Date and Time: 6/27/2019 7:13:55 PM

Project in English units

Project Description:
Sherwood Midstream, LLC CEC #192-293
4600 J.
Barry Ct., Suite 500
Canonsburg, PA 15317

Existing -
March 2014
Proposed - February 2019

Smithburg 138 kV - Flood Study -
Updated for Smithburg 138kV Structures.
Construction in a Floodway Study for
Approval of final grading.

FEMA Zones A, AE, and X from the Doddridge
County West Virginia FIS Study shown on FEMA FIRM Panel # 54017C0080 B,
effective October 4, 2011.

CEC Engineering Team:
Principal: Rick Celender,
C.E.T., CPESC, CPSWQ

Project Manager: Andy Celender
Hydraulic Modelers: Pat Hessenius
Reviewers: Andy Celender, George Haberman, P.E.

Model Creation:
Existing (Pre-project): CEC Created Model File, "110-811_Sherwood FB HH," Plan File, "110-811_Existing 01-23-2014."
Proposed (Post-project):
CEC Created Model File, "110-811_Sherwood FB HH," Plan File, "192-293_Proposed 138 kV Structures."
Geometry file created in HEC-RAS.
Steady flow file created from Doddridge County FIS, October 4, 2011.

Data Sources:
Geometry
- Surface created from West Virginia Statewide Addressing and Mapping Board DEM blended with field topo survey of the bridge, existing access road from County Route 50/34, various locations along the reach, and breaker station grading provided by ECI & CEC.
Flow - Total Buckeye Creek 100-year flow = 5,150 CFS.
Downstream Boundary - Known Water Surface Elevation = 811. Approximate stream distance of 3,504 feet on profile.

PLAN DATA

Plan Title: 192-293_Proposed 138 kV Structures
Plan File : p:\2019\192-293\-Calculations\Flood Study\110-811_SherwoFBHH.p10

Geometry Title: 110-811_Proposed 2-8-2019
Geometry File : p:\2019\192-293\-Calculations\Flood Study\110-811_SherwoFBHH.g07

Flow Title : 110-811_100Year
Flow File : p:\2019\192-293\-Calculations\Flood Study\110-811_SherwoFBHH.f01

Plan Summary Information:

Number of:	Cross Sections	= 41	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 1	Lateral Structures	=	0

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

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

FLOW DATA

Flow Title: 110-811_100Year
Flow File : p:\2019\192-293\-Calculations\Flood Study\110-811_SherwoFBHH.f01

Flow Data (cfs)

River	Reach	RS	100-Year
Buckeye Creek	Buckeye Creek	3504.54	5150

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Buckeye Creek	Buckeye Creek	100-Year	Known WS = 811	

GEOMETRY DATA

Geometry Title: 110-811_Proposed 2-8-2019
Geometry File : p:\2019\192-293\-Calculations\Flood Study\110-811_SherwoFBHH.g07

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3504.54

INPUT
Description: A
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-100	838.81	-98.96	838.29	-98.75	838.18	-98.4	838	-96.95	837.26
-96.1	836.83	-95.4	836.48	-94.48	836	-93.69	835.59	-92.75	835.1
-91.68	834.54	-90.65	834	-89.58	833.44	-88.38	832.81	-87.57	832.38
-86.84	832	-85.95	831.54	-85.41	831.26	-84.5	830.79	-83.05	830.02
-83.01	830	-81.27	829.11	-79.1	828	-79.08	827.99	-79.07	827.99
-77.37	827.11	-75.99	826.41	-75.64	826.23	-75.18	826	-74.04	825.4
-73.22	824.97	-72.55	824.62	-71.39	824	-70.83	823.7	-70.35	823.45
-69.1	822.78	-67.62	822	-67.26	821.81	-67.01	821.68	-65.6	820.94
-64.29	820.25	-64.09	820.15	-63.81	820	-62.65	819.38	-61.84	818.95
-61.13	818.57	-60.06	818	-60.02	817.91	-59.96	817.79	-59.91	817.69
-59.87	817.59	-59.83	817.5	-59.8	817.43	-59.77	817.35	-59.73	817.28
-59.7	817.21	-59.67	817.15	-59.65	817.09	-59.62	817.04	-59.6	816.99
-59.58	816.94	-59.56	816.89	-59.54	816.85	-59.46	816.69	-59.15	815.06
-47.25	813.56	-46	813.25	-45.85	813.22	-44.79	812.96	-43.56	812.66
-42.3	812.35	-41.93	812.27	-41.36	808.97	-40.43	808	-40.14	808
-38.54	807.48	-34.04	806	-33.41	805.89	-32.05	805.65	-25.82	804.54
-22.76	804.44	19.72	804.44	21.76	804.67	25.81	806	28.84	806.95
32.2	808	35.74	808.98	39.4	810	43.29	811.02	47.05	812
49.55	812.68	54.41	814	56.85	814.55	63.18	816	63.24	816
63.62	816.01	63.71	816	102.53	816	103.1	816.19	110.92	818
112.97	819.63	113.44	820	115.04	821.27	116.39	822	119.11	823.46
119.51	824	120.78	825.71	121	826	121.65	826.89	122.64	828
123.43	828.89	124.41	830	125.72	831.48	126.18	832	126.52	832.39
127.95	834	129.37	835.19	130.09	835.93	132.25	835.95	133.34	836
134.36	836.19	136.69	836.42						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-100	.05	-41.93	.035	49.55	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-41.93	49.55	50	50	50	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3454.54

INPUT
Description: B
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-106.13	826.76	-105.83	826.61	-105.52	826.46	-104.57	826	-104.45	825.95
-104.42	825.93	-103.35	825.44	-102.97	825.27	-102.28	824.95	-101.55	824.59
-101.24	824.44	-100.37	824	-100.19	823.91	-99.27	823.46	-98.9	823.29
-98.27	822.98	-97.55	822.65	-97.23	822.49	-96.16	822	-96.15	821.99
-96.14	821.99	-94.96	821.48	-94.61	821.32	-93.85	820.99	-93.19	820.71
-92.79	820.53	-91.86	820.13	-91.79	820.1	-91.59	820	-90.51	819.47
-90.04	819.26	-89.22	818.86	-88.25	818.41	-87.98	818.28	-87.37	818
-87.35	818	-87.19	817.14	-86.99	814.66	-83.41	814.33	-78.27	814.15
-64.45	812.92	-42.91	811.21	-42.79	809.16	-42.41	809.13	-42.01	809.09
-41.6	809.06	-41.18	809.02	-40.66	808.97	-40.11	808.93	-39.53	808.88
-37.2	808.63	-36.6	808.56	-35.97	808.48	-35.28	808.4	-32.94	808.07
-32.49	808	-31.34	807.77	-31	807.7	-29.05	807.31	-28.01	807.09
-26.05	806.67	-25.06	806.46	-22.96	806	-22.17	805.82	-21.82	805.74
-19.4	805.19	-17.82	804.84	-16.67	804.58	-14.08	804.38	17.52	804.38
23.35	805.7	24.35	806	28.89	807.47	30.57	808	37.14	809.7
38.3	810	39.73	810.36	46.16	812	52.62	813.62	54.12	814
61.82	815.78	62.8	816	105.44	816	108.77	817.27	110.92	818
112.2	819.74	112.38	820	113.85	822.01	115.45	823.6	115.85	824
116.26	824.42	117.85	826	118.35	826.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-106.13	.05	-42.79	.035	30.57	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-42.79	30.57	52	50	50	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3404.54

INPUT
Description: C
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-130.31	819.94	-130.16	819.85	-127.95	818.4	-127.34	818	-124.36	816.46
-123.5	816	-122.92	815.91	-122.44	815.86	-122.09	815.81	-121.89	815.78
-121.74	815.75	-121.45	815.71	-121.31	815.69	-121.19	815.68	-121.09	815.66
-121	815.65	-120.93	815.64	-120.86	815.64	-120.81	815.63	-120.78	815.51
-118.73	815.9	-118.62	815.92	-118.37	815.95	-117.79	815.59	-115.95	814.65
-112.35	813.89	-102.14	815.26	-94.41	813.55	-93.69	813.6	-93.3	813.59
-91.7	813.84	-89.86	814.09	-85.86	814.99	-84.7	814.77	-82.96	814.52

-77.51	814.54	-69.06	813.8	-67.38	813.67	-52.48	812.03	-42.72	810.75
-39.01	809.99	-38.2	809.83	-38.11	809.8	-37.46	809.6	-37.3	809.57
-37.12	809.53	-36.94	809.5	-36.74	809.46	-36.53	809.42	-35.73	809.24
-35.55	809.2	-35.23	809.14	-34.89	809.07	-34.51	809	-34.1	808.92
-33.65	808.83	-33.15	808.73	-32.59	808.62	-31.98	808.5	-31.02	808.31
-30.29	808.16	-29.54	808	-29.5	808	-28.02	807.66	-20.74	806
-15	804.51	-12.96	804.32	15.59	804.32	24.88	805.99	24.9	806
29.51	807.42	31.4	808	35.16	808.93	39.43	810	41.01	810.41
47.1	812	50.37	812.89	54.45	814	59.19	815.18	62.48	816
92.74	816	96.15	815.99	99.09	815.99	104.95	816	110.42	817.6
111.76	818	112.3	818.75	113.18	820	113.8	820.86	114.59	822
115.75	823.64	116.01	824	117.38	825.93	117.43	826	117.52	826.13
118.81	828	119.32	828.72	120.21	830	120.39	830.24		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-130.31	.05	-39.01	.035	31.4	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-39.01	31.4	55	50	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3354.54

INPUT
Description: D
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-161.95	820.72	-159	819.1	-154.74	817.2	-151.93	815.9	-147.17	813.71
-145.77	813.06	-126.21	812.54	-124.87	812.51	-123.36	812.51	-123.07	812.53
-122.06	812.55	-122.03	812.53	-115.94	812.57	-115.14	812.59	-114.95	812.57
-103.12	812.35	-88.28	812.14	-82.76	812.08	-54.87	809.98	-52.64	809.81
-41.07	809.2	-39.11	809.06	-36.85	808.62	-36.78	808.61	-36.71	808.61
-36.64	808.6	-36.56	808.59	-36.14	808.54	-35.65	808.48	-35.49	808.45
-35.3	808.43	-35.09	808.4	-34.83	808.36	-34.53	808.32	-34.16	808.27
-33.7	808.2	-33.12	808.12	-32.28	808.01	-32.21	808	-31.45	807.84
-22.89	806	-21.17	805.62	-18.11	804.96	-15.26	804.34	-13.7	804.25
17.49	804.25	26.48	806	31.46	807.35	33.9	808	38.76	809.37
40.95	810	46.89	811.73	47.8	812	48.18	812.11	54.65	814
57.78	814.8	62.56	816	64.54	816	66.78	816.01	74.22	816.01
85.96	816	89.03	815.99	91.01	815.98	96.63	815.95	100.33	815.97
106.93	816	112.68	817.78	113.29	818	113.56	818.18	115.15	820
116.54	821.58	116.9	822	118.58	823.91	118.65	824	118.98	824.38
119.3	824.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-161.95	.05	-36.56	.035	33.9	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.56	33.9	35	50	50	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3304.54

INPUT
Description: E
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-193.15	818.45	-183.47	814.34	-183.16	814.28	-176.73	813.26	-163.3	813.13
-138.32	812.35	-120.78	812.28	-86.53	811.72	-71.47	811.24	-56.51	810.18
-43	809.27	-36.76	808.75	-36.03	808.62	-36	808.61	-35.97	808.61
-35.94	808.6	-35.9	808.6	-35.86	808.59	-35.82	808.58	-35.77	808.58
-35.72	808.57	-35.67	808.56	-35.57	808.54	-35.45	808.52	-35.38	808.51
-35.31	808.49	-35.22	808.47	-35.13	808.45	-35.02	808.43	-34.88	808.4
-34.73	808.37	-34.53	808.33	-34.3	808.28	-33.99	808.22	-33.59	808.13
-33.11	808.03	-32.95	808	-29.62	807.39	-22.04	806	-15.25	804.68
-11.71	804.25	14.93	804.25	22.78	805.33	26.75	806	35.39	807.94
35.56	807.97	35.68	808	36.05	808.12	42.24	810	48.06	811.81
48.44	811.93	48.47	811.94	48.67	812	48.97	812.09	55.11	814
58.52	814.76	64.02	816	66.57	816	71.47	816.01	72.7	816.02
75.35	816.02	84.84	816	93.89	815.84	94	815.84	95.83	815.82
98.76	815.86	102.88	815.92	106.57	816	109.76	817.28	111.63	818
113.65	818.64	117.46	820	123.18	821.49	124.76	821.91	125.09	822
125.18	822	125.45	822.01	125.65	822.02	126.04	822.04	126.82	822.08
127.57	822.09	152.93	822.56	166.8	822.78				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-193.15	.05	-36.76	.035	35.39	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.76	35.39	55	50	47	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3254.54

INPUT
Description: F
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-240.13	819.89	-227.21	814.66	-216.19	812.98	-198.11	812.16	-175.25	811.94
-165.06	811.8	-160.59	811.79	-152.22	811.82	-122.44	811.41	-109.35	811.26
-104.94	811.11	-102.58	811.05	-67.55	810.05	-42.46	809.03	-36.68	808.81
-36.67	808.63	-36.63	808.62	-36.6	808.62	-36.56	808.61	-36.51	808.6
-36.47	808.59	-36.42	808.58	-36.36	808.57	-36.3	808.56	-36.24	808.55
-36.18	808.54	-36.1	808.52	-35.72	808.43	-35.62	808.41	-35.52	808.39
-35.41	808.37	-35.28	808.34	-35.14	808.31	-34.99	808.27	-34.82	808.23
-34.63	808.18	-34.4	808.13	-34.14	808.06	-33.88	808	-31.55	807.56
-23.17	806	-20.88	805.53	-17.84	804.92	-15.28	804.39	-13.32	804.12
15.81	804.12	16.56	804.21	16.72	804.23	28.47	806	32.29	806.81
35.63	807.52	37.86	808	42.77	809.48	44.49	810	46.47	810.68
50.28	812	53.04	812.93	56.3	814	60.48	814.91	63.23	815.52
63.61	815.59	64.3	815.74	65.6	816	68.76	816	69.87	816.02
71.52	816.02	71.91	816.03	77.35	816	78.14	816	85.05	814.92
90.53	814.08	91.07	814	98.34	814	102.59	815.16	106.43	816
110.08	817.66	110.84	818	113.36	819.15	115.21	820	116.17	820.22
116.63	820.29	122.85	821.87						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-240.13	.05	-36.68	.035	37.86	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.68	37.86	43	50	52	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3204.54

INPUT
Description: G
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-283.58	819.8	-266.29	814.14	-266.24	814.12	-266.23	814.12	-266.09	814.11
-217.5	811.93	-217.38	811.93	-173.11	811.45	-163.78	811.46	-160.93	811.43
-155.76	811.36	-150	811.26	-144.17	811.18	-124.33	810.91	-109.74	810.72
-100.63	810.59	-93.13	810.46	-70.42	809.9	-50.46	809.14	-38.7	808.69
-33.59	808.48	-31.92	807.96	-31.88	807.94	-31.83	807.93	-31.78	807.91
-31.73	807.89	-31.68	807.88	-31.63	807.86	-31.57	807.84	-31.51	807.81
-31.44	807.79	-31.37	807.77	-31.29	807.74	-31.2	807.71	-31.1	807.69
-30.89	807.62	-30.78	807.58	-30.66	807.54	-30.52	807.5	-30.38	807.45
-30.22	807.4	-29.76	807.22	-29.6	807.16	-29.42	807.08	-29.23	807

-28.94	806.91	-28.61	806.8	-28.23	806.67	-27.79	806.53	-27.29	806.36
-26.69	806.17	-26.19	806	-21.56	805.01	-18.47	804.35	-16.86	804.05
15.24	804.05	16.56	804.21	27.88	806	30.45	806.52	37.81	808
39.9	808.63	44.4	810	47.91	811.09	50.79	812	54.71	813.27
56.99	814	57.54	814.1	57.74	814.13	60.08	814.54	62.07	814.88
63.39	815.06	64.64	815.27	69.51	816	71.49	816	88.72	817.7
91.55	818	96.32	818.82	102.84	820	107.71	820.7	116.72	821.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-283.58	.05	-33.59	.035	37.81	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-33.59	37.81	44	50	51	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3154.54

INPUT
Description: H
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-344.06	819.81	-341.76	819.08	-341.5	819	-341.22	818.91	-340.84	818.79
-337.9	818	-334.17	817.44	-331	817	-327.91	816.57	-323.41	816
-320.76	815.66	-315.56	815	-310.98	814.42	-307.71	814	-302.24	813.3
-299.86	813	-293.88	812.24	-292.01	812	-286.93	812	-277.22	812.32
-258.35	812.99	-258.09	813	-253.72	813.61	-245.48	813	-236.46	812.34
-231.87	812	-229.17	812	-223.28	812.4	-219.22	813	-216.77	813.02
-216.11	813	-204.16	812.31	-202.3	812.31	-190.03	812.33	-162.2	812.1
-160.46	812.1	-156.63	812.01	-153.48	812	-147.14	811.85	-136.56	811.51
-124.69	811	-103.71	810.26	-98.64	810.21	-79.31	809.67	-63.22	809.32
-54.02	808.86	-34.08	808.02	-31.24	807.13	-30.93	807.04	-30.84	807.02
-30.75	806.99	-30.65	806.96	-30.55	806.93	-30.44	806.9	-30.32	806.86
-30.2	806.83	-30.06	806.79	-29.91	806.74	-27.38	806	-27.33	806
-18.87	803.96	-18.57	803.89	0	803.89	14.2	803.9	17.29	804.43
26.47	806	26.52	806	26.53	806	35.37	807.81	36.26	808
41.95	809.75	42.76	810	43.86	810.36	48.82	812	51.4	812.8
55.27	814	56.44	814.25	58.83	814.76	62.79	815.6	64.71	816
71.82	816	76.48	816.77	77.53	816.86	80.56	817.14	83.2	817.46
87.71	817.86	89.18	817.99	89.27	818	89.46	818.03	100.7	820
108.63	821.17	115.16	822	115.58	822				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-344.06	.05	-34.08	.035	35.37	.05

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -34.08   35.37               48      50      52             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
-200.123-207.623     820 -135.22-142.527     820

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 3104.54

INPUT
Description: I
Station Elevation Data    num=     149
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-417.329     824 -414.44823.1484-413.937     823-411.735822.3507-410.545     822
-409.334821.6429 -407.77821.1818-407.258821.0185  -407.2     821-404.418820.1121
-404.067     820-402.084819.3673-400.934     819-399.805818.7803-395.986818.2408
-394.281     818-388.743817.2178-387.201     817-381.416816.1829-380.121     816
-373.916815.1235-373.042     815-369.256814.7171-365.962     814-359.188813.0528
-358.645     813 -358.56812.9986-355.992812.9878-353.521 812.997-353.281 812.997
-352.959     813-350.723813.1701-342.578     814-339.274 814.042-337.782814.0387
-334.312814.0515-333.096814.0551-332.195 814.064-331.713814.0644-330.128 814.072
-328.823814.0617  -327.6814.0576-321.637     814-319.335813.9358-315.989813.8502
-296.214813.3751-288.643813.1015-287.878813.0785-285.268     813-257.692     813
-250.563     813 -249.05     813-244.509     813-242.423813.8344-242.009     814
-241.661 814.139-239.508     815-239.183815.1301-237.007     816-236.864     816
 -236.36     816-232.577     816  -229.1     816-226.891     816-224.949     816
-223.688     816-220.829     816-219.821     816-213.353     816-212.465     816
-205.459     816-200.014     816-199.156     816-192.064     816-191.128     816
-183.432     816-182.237     816-175.422     816-172.994     816-171.904     816
-171.102     816-169.807815.5685  -168.1     815-167.713 814.871-165.098     814
-162.545813.1498-162.096     813 -161.14812.6818-159.093     812-156.872811.9703
-156.046811.9593-150.794811.9036-143.665811.9388-137.071811.4428-131.195     811
    -131810.9961-129.732810.9955-116.292810.6787-86.2772     810-68.7963809.4952
-46.9919     809-39.6367808.3302  -34.67  808.63   -31.5  807.57  -29.01  806.58
  -27.66     806  -27.48     806  -20.05  804.21  -16.97  803.47   12.55  803.47
   19.85  804.82   26.22     806   26.33     806   26.34     806   26.41     806
   34.26  807.67   34.55  807.72   34.86  807.78   35.19  807.83   35.54  807.89
   36.08     808   36.12     808   36.15     808   38.74  808.76      43     810
   46.91  811.41   48.53     812   53.61  813.61   54.83     814   54.97  814.03
   55.06  814.05   64.07     816   64.83     816   64.86     816   74.23     816
   84.17  817.64      87     818   87.13     818   91.93  818.78   99.35     820
  104.37  820.67  104.41  820.68  115.26     822  115.69     822  124.72  822.11
  135.24  822.23   144.5  822.33   144.6  822.33  151.57  822.39
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-417.329     .05  -34.67    .035   36.12     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -34.67   36.12               22      50      48             .1       .3

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 3054.54

INPUT
Description: J
Station Elevation Data    num=     184
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-448.578     828-446.007827.1566 -445.53     827-443.322826.2756-442.482     826
 -440.56825.3692-439.435     825-437.742824.4447-436.387     824-434.884823.5068
-433.339     823-431.995822.5589-430.291     822-429.082821.6032-427.244     821
-425.124820.3045-423.557     820-420.712819.6884-414.426     819-412.838818.8261
-406.959818.1823 -405.88     818-405.442817.9259-399.964     817-397.964 816.662
-394.048     816-391.201815.5187-388.132     815-384.752814.4287-382.216     814
-379.802813.5919 -378.82813.6923-375.812     814-365.438814.1324-360.733814.1222
-358.136814.1319-349.752814.0061-349.044     814-346.029 813.923-336.656813.6613
-318.868813.2051-314.089  813.09-311.601     813-289.697     813-279.308     813
-266.418     813-266.393     813-266.324     813-264.872813.5799 -263.82     814
-262.887814.3726-261.316     815-259.604815.6835-258.812     816-254.794     816
-254.049     816-251.083     816-249.475     816-247.062     816-242.789     816
-240.612     816-222.466     816 -217.93     816-217.219     816-211.376     816
-208.794     816-202.832     816-200.771     816  -199.6     816-194.572     816
-191.402     816-190.402     816 -188.84     816-185.183     816-182.088     816
-178.644     816-178.389     816-174.895     816-171.763     816-165.384     816
-165.339815.9947-165.164815.9904-165.112815.9892-165.063 815.988-165.044815.9875
-164.938815.9849-157.744815.2596-152.256815.2165-150.703815.1217-147.539815.1069
-141.757815.0799 -141.12815.0547 -138.44815.0012-133.304815.0007-133.263815.0007
-133.199815.0007-131.019815.0005-131.005815.0005-127.068815.0002-126.893     815
-126.278814.7949-123.894     814-121.111813.0722-120.895     813-120.567812.8907
-117.896     812-116.802811.6984-116.405811.5887-115.642811.3783-115.281811.2787
-115.222811.2625-115.002811.2018-109.262     811-109.211     811-97.2066810.4294
 -87.096     810-78.0588809.8239   -35.1  809.26  -35.08  808.53  -34.81  808.37
  -34.75  808.35  -34.68  808.33   -34.6  808.31  -34.53  808.29  -34.45  808.26
  -34.36  808.24  -34.27  808.21  -34.17  808.18  -33.73     808   -33.6     808
  -33.59     808  -33.55     808  -33.28  807.92  -32.95  807.81  -32.66  807.71
   -32.4  807.62  -32.22  807.55  -27.71     806  -27.59     806  -27.57     806
  -27.55     806  -27.54     806  -27.53     806  -20.47  804.38   -14.6  803.03
   -6.69  803.04       0  803.04    11.6  803.05   19.99  804.68   26.81     806
   26.83     806      27     806   27.03     806   27.17     806   33.89  807.43
```

34.15	807.48	34.43	807.53	34.73	807.58	35.05	807.64	35.73	807.77
36.09	807.85	36.49	807.92	36.86	808	38.6	808.46	44.4	810
49.01	811.58	50.22	812	51.33	812.33	57.04	814	66.81	815.06
75.79	816	75.95	816	77.14	816	78.3	816.19	78.68	816.24
79.1	816.3	79.86	816.42	81.74	816.76	83.22	816.97	89.82	818
93.81	818.77	99.8	820	105.59	821.09	110.84	821.97		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-448.578	.05	-35.1	.035	38.6	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.1	38.6	23	50	53	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3004.54

INPUT
Description: K
Station Elevation Data num= 182

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-475.655	824.207	-474.966	824	-474.833	823.9603	-471.635	823	-470.968	822.7976
-468.304	822	-467.182	821.6633	-464.973	821	-463.475	820.5505	-461.641	820
-457.027	819.3325	-454.555	819	-447.568	818.1838	-446.898	818.1127	-445.815	818
-440.634	817.4569	-436.276	817	-432.604	816.6151	-426.737	816	-423.069	815.6154
-417.199	815	-407.477	814.729	-393.167	814.1744	-392.895	814.1653	-391.714	814.0671
-389.319	814.0251	-387.931	814	-370.907	813.5486	-366.397	813.4443	-355.87	813.1658
-355.284	813.1517	-353.814	813.1124	-349.193	813	-339.989	812.985	-307.002	812.9868
-306.972	812.9868	-299.223	812.994	-299.127	812.9941	-297.949	812.9952	-293.408	812.9994
-292.984	812.9998	-292.799	813	-292.791	813	-292.732	813	-292.586	813
-291.617	813.3867	-290.079	814	-288.357	814.6867	-287.571	815	-286.78	815.3156
-285.064	816	-282.583	816	-282.198	816	-281.123	816	-276.764	816
-242.273	816	-239.159	816	-238.668	816	-234.615	816	-230.055	816
-226.379	816	-225.993	816	-221.21	816	-218.15	816	-212.797	816
-212.254	816	-209.75	816	-207.827	816	-202.669	816	-201.153	816
-201.032	816	-195.01	816	-194.329	816	-191.964	816	-190.614	815.931
-187.981	815.6649	-185.517	815.6463	-180.907	815.3642	-178.631	815.3539	-174.48	815.3352
-171.822	815.2302	-160.539	815.005	-155.82	815.0046	-155.567	815.0045	-155.168	815.0046
-153.18	815.0044	-153.069	815.0043	-148.454	815.004	-148.22	815.0038	-147.839	815.0039
-143.23	815.0035	-143.001	815.0034	-142.611	815.0035	-139.91	815.0033	-139.772	815.0032
-137.932	815.003	-137.843	815.003	-130.673	815.0024	-130.397	815.0022	-130.106	815.0023
-128.624	815.0022	-128.565	815.0021	-128.501	815.0021	-124.151	815.0018	-124	815.0017
-123.79	815.0018	-118.864	815.0014	-118.716	815.0013	-118.669	815.0013	-118.468	815.0013
-113.521	815.001	-113.398	815.0009	-112.896	815.0011	-112.007	815.001	-111.973	815.001
-111.969	815.001	-107.013	815.0006	-106.902	815.0005	-106.798	815.0006	-101.691	815.0001

```
-101.657815.0001-101.625815.0001-100.911815.0001-100.907815.0001-100.903815.0001
-99.9881     815-95.8481814.9025 -94.924814.8808-93.1271814.8385-91.5329814.3072
-90.6111     814-89.4733813.6208-87.6104     813-86.7762 812.722-84.6098     812
 -82.319811.2366-82.1032811.1646-81.7628811.0512-81.5701     811-73.1225810.7276
-72.8711810.7165-72.7648 810.712  -35.47  808.67   -31.5  808.25  -31.27  808.21
  -30.54  808.11  -29.89     808   -29.7     808  -29.38  807.86  -25.92     806
  -23.67     806   -9.97  802.18    9.69   802.2    28.6     806   35.49  807.51
   37.75     808    47.2     810   53.42  811.42      56     812   58.23  812.39
   59.06  812.53   61.47  812.95   63.47  813.27   64.67  813.47      68     814
   68.17     814   74.52  814.69   78.81  815.15   86.28     816   88.24  816.57
   94.41     818  101.05     820  106.62   821.6  108.04     822  110.65  822.46
  119.91  823.94  120.28     824  128.68  824.01  131.37  824.02  132.16  824.03
  141.52  824.19  144.29  824.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-475.655     .05  -35.47    .035   35.49     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -35.47   35.49               36      50      48             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  -208.3  -231.8     820

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 2954.54

INPUT
Description: L
Station Elevation Data    num=     172
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-515.275823.3548-515.136823.3003-514.375     823-511.947822.0432-511.837     822
-511.554821.8884-508.553     821-508.121820.8721-505.176     820-503.007819.6905
-497.805     819-492.382818.3749 -489.13     818-483.607817.3634-481.468817.1427
-480.084     817 -474.19 816.392 -470.39     816-464.516815.3941-460.695     815
-445.393814.5803-430.274     814-424.668813.8262-424.641813.8253-424.621813.8248
-408.772 813.412-402.984813.2812-392.173     813-391.208812.9985-391.073812.9984
 -390.63812.9973-379.582812.9797-351.402812.9821-351.376812.9821-344.462812.9885
-344.376812.9886-343.314812.9896-339.197812.9934 -338.81812.9938-332.388     813
-332.377     813-332.353     813-332.166     813-330.485813.5638-329.393     814
-328.822814.2281-326.889     815 -324.98815.7623-324.385     816 -323.37     816
-323.001     816-318.315     816-279.254     816-276.572     816-276.151     816
-272.696     816-267.267     816-264.464     816-257.318     816-256.143     816
-252.122     816-249.103815.9751-238.238815.8689-232.451815.8123-218.672815.6776
-217.799815.6656-193.107815.1885-186.065815.0435-185.585815.0434-183.263815.0416
```

```
 -179.65815.0424-179.576815.0424-178.536815.0416-178.343815.0416-175.946815.0397
-173.612815.0402-172.075815.0381-169.672 815.037-169.472815.0368-165.364815.0312
-164.085815.0306-163.212815.0302  -159.8815.0287 -158.99 815.028-155.422815.0231
-154.801815.0228-154.456815.0226-153.797815.0217-152.035815.0208-150.508815.0196
-148.181815.0166-146.466815.0158-145.922815.0154-145.376815.0146-143.921815.0136
-140.785815.0105-137.695815.0067-136.262815.0056-131.577815.0027-131.433815.0024
-131.388815.0022-131.048815.0022-130.315     815-128.678814.5783-123.817 814.015
-123.705     814-121.818813.3723-120.699     813-117.758812.0214-117.694     812
-117.575811.9604-114.688     811-113.307810.5403-111.683     810-111.245     810
-109.487     810-109.454     810-107.809     810-106.893     810-106.867     810
-106.297     810-92.5569809.8604-92.5009809.8594-92.4441809.8584-92.3524809.8572
-89.0032809.7986-84.7332809.7411-81.0207809.6943-73.6483809.5416-51.3877809.0032
-51.0503809.0032 -50.988     809-46.4502808.7843   -31.5  808.25  -31.27  808.21
  -30.54  808.11  -29.89     808   -29.7     808  -29.38  807.86  -25.92     806
  -23.67     806   -9.97  802.18    9.69   802.2    28.6     806   35.49  807.51
   37.75     808    47.2     810   53.42  811.42      56     812   58.23  812.39
   59.06  812.53   61.47  812.95   63.47  813.27   64.67  813.47      68     814
   68.17     814   74.52  814.69   78.81  815.15   86.28     816   88.24  816.57
   94.41     818  101.05     820  106.62   821.6  108.04     822  110.65  822.46
  119.91  823.94  120.28     824  128.68  824.01  131.37  824.02  132.16  824.03
  141.52  824.19  144.29  824.23
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-515.275	.05	-31.5	.035	35.49	.05

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

-31.5	35.49	36	50	48	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
-157.7	-271.3	817

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2904.54

INPUT
Description: M
Station Elevation Data num= 156

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
-565.214821.8954-564.121821.4353-563.087     821-560.987 820.116-560.711     820
 -555.98819.2673-554.262     819-547.337818.0805-546.732     818-539.681817.0637
-539.201     817-532.113816.0588 -531.67     816-531.288815.9493 -524.51815.3116
-522.314 815.084-521.521     815-521.206814.9971-505.969814.5293-499.438814.3381
-495.266814.2184-489.771814.0756-487.737     814-467.988813.4074-466.688813.3712
-460.595813.1942-458.423813.1323-452.666     813-452.063812.9969  -448.1812.9894
```

```
-445.433812.9902-443.006 812.984 -439.59812.9789-437.726812.9785-431.842812.9635
-429.528  812.96-422.627812.9613 -422.62812.9613-420.663812.9631-420.637812.9631
-420.326812.9634 -419.09812.9645-418.971812.9647-416.756812.9668-415.609812.9679
 -407.24812.9761-404.113812.9791-402.873812.9803-394.543812.9884-384.199     813
-382.403     813-380.081813.7741-379.404     814-378.642814.2538-376.404     815
 -374.38815.6747-373.405     816-373.358     816-367.444     816 -364.07     816
-324.029     816-322.264     816-321.985     816-319.661     816-313.198     816
-311.726     816-304.703     816-302.783815.9849-302.731815.9845 -301.62815.9734
 -250.33815.4641-204.636815.0104-204.343815.0074-203.753815.0002-203.737815.0002
-203.594     815-203.107 814.987-202.986814.9842-200.852814.9286-199.964814.9105
-199.577814.9002-185.786814.6129-174.156814.2549-169.505814.1118 -167.65814.0645
-165.874     814-163.553813.2277-162.869     813-160.625812.2531-159.864     812
-157.696811.2785-156.859     811-154.768810.3039-153.855     810-152.278809.9723
-151.983809.9673-144.118809.8337-138.161809.7326-137.956809.7291-128.689809.5851
-108.479809.3825-105.736809.3528 -100.72809.3009-74.1613809.0142-72.0717809.0128
-69.0436     809-56.7657808.6394  -36.42  808.86  -35.58   808.5  -32.25  807.93
  -29.13   806.3  -28.06     806  -18.33  803.44  -18.19  803.41  -16.24     802
   11.77     802   22.41     804   37.52  807.53   37.63  807.55   39.94  808.03
   42.23  808.53    42.4  808.57   42.61  808.61   42.76  808.65   42.95  808.69
   43.08  808.72   43.25  808.76   43.36  808.78   43.52  808.82   43.62  808.84
   43.87  808.86   47.83  809.65   49.22  809.95   49.46     810   58.67     812
   59.36  812.09   59.65  812.13   63.68  812.64   65.81  812.91   68.23  813.21
   72.37  813.72   73.02   813.8   74.71     814   79.32   814.6   82.93  815.09
   86.03   815.5   89.61     816   89.68     816   93.22  817.02   96.65     818
  102.45     820  108.88     822  113.42  823.17  116.74     824  116.89     824
  117.07  824.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-565.214     .05  -36.42    .035   42.23     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -36.42   42.23               42   49.96      51             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  -176.7  -320.2     818

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 2854.58

INPUT
Description: N
Station Elevation Data    num=     145
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -616.29820.1064-616.267820.0955-615.711     820-615.046819.9132-608.051     819
```

```
-604.576818.5464-600.453     818-598.243817.7072-592.907     817-588.874816.4656
 -585.36     816-582.376815.6046-576.385815.0435-575.851     815-563.183 814.754
-540.041     814-537.813813.9575-495.519     813-491.446812.9792-488.204812.9787
-485.636812.9704-484.793812.9689-479.594812.9679-452.139     813-447.107     813
-440.016     813-436.744     813-431.192     813-429.666813.5086-428.192     814
-426.426814.5886-425.191     815-423.414815.5923-422.191     816-418.063     816
-414.218     816-404.354     816-393.458     816-370.921     816-355.828815.7935
-353.086815.7723-341.255815.6212 -340.68815.6171-310.543815.3392-276.849815.0114
-275.297815.0102-273.569815.0063  -272.8815.0035-270.807     815-265.263814.5989
 -262.73814.5014-261.333814.4494-259.535814.4501-256.468814.3291-253.955814.3307
-251.915814.2608-250.588814.2153-234.354814.0601-228.143814.0751-225.819814.0649
-225.312814.0632-224.513814.0604-220.627814.0453-206.845     814-204.731813.1456
-204.371     813-203.434812.6209-201.594     812-200.821811.7389-198.632     811
-198.494 810.972-198.489810.9709-195.031810.6393-192.216 810.378-191.805810.3425
-191.771810.3396-191.649810.3195-191.647810.3193-191.204810.2669-190.725810.2358
-190.556810.2248-190.364810.2052-189.865810.1546-189.757810.1443-189.591810.1316
-189.507810.1252-189.471810.1221-189.299810.1089-189.242810.1018-189.189810.0996
-186.952     810 -185.95809.9761 -182.69809.8943-177.389809.8208-158.614809.4591
-122.131809.0305-117.266809.0357-102.785809.0036-101.211     809-99.8733808.9642
-99.4682808.9537-89.6794808.8518-81.0601808.8175-78.5773808.8625-73.6174808.9548
 -68.702808.9535-63.3866 808.942-60.6887808.8676-43.3031808.3808  -35.55   808.9
  -34.28  808.35  -33.72  808.09  -31.27  806.16   -27.8  804.33  -27.67   804.3
   -26.4     804  -23.28     802   14.53     802   25.91     804   26.91  804.23
   27.08  804.29    27.6  804.45   28.53  804.72      29  804.82   29.39  804.91
    29.6  804.97    31.5  805.43   33.19  805.84   34.31  806.12   38.79  807.25
   45.44  808.91   57.71  811.96   57.86     812   67.88     814   68.25     814
   87.56  815.69    88.4  815.76   90.99     816   94.53  817.23   96.75     818
  102.36     820  108.12     822  109.79  822.45  115.56     824  115.89  824.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -616.29     .05  -35.55    .035   45.44     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -35.55   45.44               40   50.04      52             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
-541.618-549.618     820  -324.5  -393.4     820

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 2804.54

INPUT
Description: O
Station Elevation Data    num=     241
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-633.362	817.7792	-633.325	817.7701	-630.251	817	-626.778	816.1299	-626.26	816
-622.377	815.0273	-622.269	815	-622.158	814.9724	-621.256	814.7464	-618.265	814.295
-612.189	814.1923	-595.427	814.9859	-586.338	815.9458	-586.044	815.9778	-585.897	815.9784
-583.865	816	-582.435	815.9124	-567.546	815	-558.283	814.7851	-553.899	814.5644
-547.346	814.1205	-538.322	814.1095	-530.424	814	-520.832	813.3625	-516.266	813.1828
-505.356	813.19	-494.516	813.188	-485.214	813.0443	-476.325	813.0279	-469.576	813.0154
-466.827	813	-456.084	812.4425	-436.331	812.4697	-428.881	812.2938	-423.767	812.2925
-420.081	812.5481	-419.866	812.5599	-419.581	812.5705	-419.231	812.5795	-418.818	812.5868
-418.349	812.5922	-417.834	812.5953	-416.954	812.5965	-413.218	812.5995	-412.074	812.6004
-393.88	812.1618	-393.467	812.1545	-392.384	812.1564	-392.383	812.1564	-392.116	812.1568
-391.035	812.1587	-391.034	812.1587	-390.709	812.1592	-390.708	812.1592	-389.632	812.161
-389.629	812.1611	-389.374	812.1615	-388.359	812.0588	-388.189	812.0415	-388.18	812.0406
-388.164	812.039	-388.162	812.0388	-388.157	812.0382	-388.085	812.0367	-377.273	812
-370.574	811.7177	-366.274	811.7215	-363.205	811.7166	-363.054	811.7167	-358.808	811.7206
-354.516	811.7245	-339.183	811.6934	-338.694	811.694	-334.281	811.6986	-329.807	811.7034
-328.872	811.7044	-324.544	811.709	-324.006	811.7048	-319.645	811.7094	-319.631	811.7089
-317.658	811.711	-311.708	811.7167	-305.813	811.7229	-298.932	811.7088	-292.947	811.0127
-291.726	811.0127	-290.208	811.0114	-286.391	811.0112	-284.754	811.6892	-284.687	811.6906
-284.649	811.69	-284.641	811.6899	-284.328	811.6842	-278.362	811.9952	-278.15	811.9954
-278.005	811.9958	-277.991	811.9962	-277.877	812	-277.194	812.3189	-275.803	813
-275.174	813.3084	-273.762	814	-273.672	814.0007	-273.047	814.0054	-271.573	814.0083
-271.106	814.0112	-270.714	814.0105	-266.967	814.0179	-265.607	814.0179	-263.923	814.0148
-263.021	814.0132	-262.619	814.014	-261.767	814.014	-259.56	814.0183	-254.895	814.0183
-249.607	814.0139	-245.053	814.0135	-244.841	814.014	-244.056	814.014	-243.736	814.0133
-239.423	814.0209	-239.089	814.0197	-234.615	814.0107	-234.311	814.0101	-233.285	814.0063
-231.927	814.0009	-231.632	814.0003	-231.588	814	-230.928	813.67	-229.588	813
-229.337	812.8747	-227.587	812	-226.073	811.2431	-225.586	811	-225.446	810.995
-225.362	810.9921	-224.961	810.9615	-224.92	810.9584	-224.362	810.8918	-223.846	810.8696
-219.36	810.6621	-216.735	810.5021	-215.672	810.2308	-207.078	810	-200.833	809.6975
-196.993	809.68	-191.263	809.5873	-180.235	809.3842	-170.993	809.1549	-160.803	809
-151.133	808.7401	-146.742	808.6874	-132.188	808.6738	-128.595	808.5122	-128.368	808.5076
-128.245	808.502	-124.143	808.4431	-118.519	808.3172	-115.351	808.2025	-110.073	808.1565
-101.008	808	-97.1308	807.9082	-90.229	807.9379	-88.1783	808	-81.3832	808.1078
-78.1601	808.1605	-54.0379	808.8069	-50.1803	808.8889	-46.874	809	-45.9753	809
-35.53	809.4	-34.23	808.97	-33.63	808.75	-31.2	806.83	-29.59	805.69
-25.99	803.67	-25.93	803.61	-25.85	803.5	-25.79	803.43	-25.75	803.38
-25.7	803.32	-23.62	802	18.54	802	18.75	802.05	19.33	802.19
19.59	802.25	20.21	802.4	20.37	802.43	20.55	802.48	20.63	802.5
20.75	802.53	20.89	802.56	20.95	802.57	21.08	802.61	21.15	802.62
21.23	802.64	21.29	802.66	21.34	802.67	21.42	802.69	21.48	802.7
21.59	802.73	21.65	802.74	21.7	802.75	21.76	802.77	21.91	802.8
23.53	803.12	23.7	803.16	23.82	803.19	24.81	805.05	25.55	805.32
26.14	805.53	37.03	807.89	42.61	809.52	47.89	809.79	48.29	809.86
49.56	810.15	50.26	810.32	52.18	810.74	52.9	810.9	54.47	811.27
55.97	811.53	58.18	812	66	813.35	69.71	814	85.64	815.5
87.9	815.68	88.33	815.71	90.91	815.91	91.03	815.92	92.13	816
93.67	816.33	94.43	816.53	96.39	816.99	98.88	817.68	99.33	817.79

100.04	818	105.58	819.9	111.67	822	117.68	823.92	117.92	824
124.8	825.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-633.362	.05	-35.53	.035	42.61	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.53	42.61	87	50	60	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-633.362	-400	815	T

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2754.54

INPUT
Description: P
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-698.23	841.94	-697.8	841.94	-697.04	841.95	-696.78	841.95	-696.02	841.96
-694.73	841.96	-693.98	841.97	-693.7	841.97	-692.96	841.98	-691.66	841.98
-690.91	841.99	-690.63	841.99	-689.89	842	-688.59	842	-687.85	842.01
-687.56	842.01	-686.83	842.02	-685.52	842.02	-684.79	842.03	-683.77	842.03
-683.47	842.04	-682.45	842.04	-681.72	842.05	-680.4	842.05	-679.68	842.06
-679.37	842.06	-678.66	842.07	-677.64	842.07	-631.16	842.29	-629.22	842.29
-627.51	842.3	-622.02	842.3	-621.1	842.31	-617.57	842.31	-612.62	844.35
-610.15	844.36	-605.2	842.38	-604.27	841.98	-602.59	841.26	-602.52	841.23
-600.9	840.54	-600.8	840.5	-599.22	839.82	-599.08	839.76	-597.53	839.1
-597.35	839.02	-595.85	838.38	-595.63	838.28	-594.17	837.66	-593.91	837.54
-592.49	836.93	-592.18	836.8	-590.8	836.21	-590.46	836.06	-589.12	835.49
-588.74	835.32	-587.44	834.76	-587.02	834.58	-585.76	834.04	-585.29	833.84
-584.07	833.32	-583.57	833.1	-582.39	832.59	-581.85	832.35	-580.71	831.86
-580.13	831.61	-579.03	831.14	-578.41	830.87	-577.34	830.41	-576.68	830.12
-575.66	829.68	-574.96	829.38	-573.98	828.95	-573.24	828.63	-572.3	828.23
-571.52	827.88	-570.62	827.5	-569.79	827.14	-568.93	826.77	-568.07	826.39
-567.25	826.04	-566.35	825.64	-565.57	825.31	-564.63	824.89	-563.89	824.57
-562.91	824.14	-562.21	823.84	-561.19	823.4	-560.53	823.11	-559.46	822.64
-558.84	822.38	-557.74	821.89	-557.16	821.64	-556.02	821.14	-555.48	820.91
-554.3	820.39	-553.8	820.18	-552.58	819.64	-552.12	819.44	-550.86	818.89
-550.44	818.7	-549.14	818.13	-548.76	817.97	-547.42	817.38	-547.08	817.23
-545.7	816.62	-545.4	816.49	-543.97	815.87	-543.72	815.76	-542.25	815.11
-542.03	815.02	-540.53	814.36	-540.35	814.28	-538.81	813.6	-538.67	813.54
-537.09	812.84	-536.99	812.8	-535.37	812.09	-535.31	812.06	-532.91	811
-472.29	810.18	-471.39	810.17	-471.33	810.17	-470.43	810.15	-469.46	810.13

-468.5	810.12	-467.53	810.1	-466.57	810.09	-464.63	810.05	-463.67	810.03
-462.74	810.02	-461.37	810	-461.32	810.13	-459.29	810.31	-458.73	810.35
-458.45	811.05	-456.78	811.38	-455.5	811.55	-455.11	811.51	-454.8	811.55
-454.43	811.52	-454.09	811.56	-453.74	811.54	-453.38	811.58	-453.05	811.57
-452.68	811.61	-446.41	813.33	-393.3	821.98	-392.25	822.16	-392.17	822.17
-372.32	822	-342.8	810	-342.53	810.1	-341.61	810.1	-340.67	810.09
-339.61	810.09	-338.8	810.08	-336.7	810.08	-335.97	810.07	-331.86	810.07
-331.24	810.06	-326.08	810.06	-325.55	810.05	-317.43	810.05	-317	810.04
-316.47	810.05	-316.04	810.04	-300.52	810.04	-294.75	810.03	-294.46	810.03
-249.98	810	-231.53	810.1	-231.27	810.1	-207.6	810	-203.84	809.83
-200.1	809.7	-196.86	809.6	-195.32	809.56	-178.49	807.88	-177.88	807.85
-177.82	807.85	-164.45	807.34	-162.67	807.33	-155.89	807.28	-155.32	806.98
-153.6	807.57	-151.86	807.58	-135.54	807.51	-132.75	807.16	-130.02	806.85
-127	806.75	-124.24	806.57	-118.5	806.53	-110.43	805.94	-108.29	805.37
-106.35	805.03	-104.76	805.01	-102.17	805.14	-99.69	805.76	-99.06	805.87
-98.96	805.86	-98.42	805.92	-84.59	807.47	-83.07	807.51	-82.26	807.53
-69	807.62	-59.03	807.76	-50.91	807.97	-37.84	808.52	-37.5	808.63
-35.61	808.13	-29.14	805.37	-23.52	803.77	-22.81	802.87	-22.74	802.78
-22.35	802.23	-22.29	802.17	-22.01	802	21.18	802	21.41	802.05
21.55	802.09	21.78	802.14	21.89	802.17	25.86	802.95	25.93	802.96
28.32	807.37	28.46	807.42	28.53	807.45	28.66	807.49	31.44	808.11
45.69	812.31	49.98	813.62	59.57	813.62	74.91	814	99.32	816
102.78	816.84	107.54	818	124.94	824	131.32	826	136.21	827.34
138.38	827.91								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-698.23	.05	-37.5	.035	28.66	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-37.5	28.66	109	50	58	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-698.23	-475	815	T

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2704.54

INPUT
Description: Q
Station Elevation Data num= 128

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-789.49	842.74	-788.7	842.74	-787.7	842.75	-787.52	842.76	-786.5	842.76
-786.33	842.77	-785.31	842.77	-785.15	842.78	-784.12	842.78	-783.96	842.79
-782.93	842.79	-782.78	842.8	-781.74	842.81	-781.59	842.81	-780.54	842.82

-780.41	842.82	-779.35	842.83	-779.22	842.83	-778.16	842.84	-778.04	842.84
-776.97	842.85	-776.85	842.85	-775.78	842.86	-775.67	842.86	-774.59	842.87
-774.49	842.87	-773.39	842.88	-773.3	842.88	-772.2	842.89	-771.01	842.89
-770.93	842.9	-769.82	842.9	-769.75	842.91	-768.56	842.91	-767.43	842.92
-767.38	842.92	-766.24	842.93	-766.19	842.93	-765.05	842.94	-762.67	842.96
-761.48	842.97	-760.28	842.98	-757.9	843	-756.73	843	-754.43	843.01
-753.28	843.02	-752.13	843.03	-750.97	843.03	-749.82	843.04	-745.22	843.06
-745.15	843.06	-595.41	843.79	-569.52	843.72	-568.9	843.72	-564.74	845.78
-562.67	845.78	-558.51	843.75	-558.34	843.66	-516.25	823.5	-515.93	823.5
-514.33	823.48	-359.7	822	-334.66	810	-334.45	810.06	-334.34	810.1
-332.68	810.1	-234.26	810	-216.12	810.1	-192.08	810	-187.27	809.67
-186.59	809.62	-185.47	809.54	-184.52	809.47	-183.67	809.41	-182.45	809.32
-181.87	809.28	-180.38	809.17	-180.08	809.15	-178.31	809.01	-178.16	809
-177.38	809	-170.27	808.22	-165.51	808	-152.11	807.93	-132.87	807.69
-126.24	807.69	-97.98	807.11	-95.16	807.09	-80.48	807.66	-65.02	808.17
-61.54	808.11	-40.15	808.52	-33.94	808.23	-32.14	808.15	-31.28	808.03
-31.03	807.98	-30.36	807.89	-29.98	807.72	-28.02	805.88	-27.8	805.81
-27.69	805.77	-27.39	805.67	-18.43	802	18.59	802	24.54	803.22
24.61	803.23	24.69	803.25	24.76	803.26	24.81	803.27	24.86	803.28
25.12	803.34	29.99	808.07	30.08	808.22	30.78	808.43	49.1	815.09
58.94	814.78	66.34	814.57	78.5	814.24	86.32	814	114.4	816
114.7	816	115.25	816.16	121.57	818	127.81	820	133.84	822
139.98	824	152.46	828	161.88	829.95				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-789.49	.05	-33.94	.035	29.99	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-33.94	29.99	52	43.25	43	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2661.29

INPUT
Description: R
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-845.31	843.49	-754.83	843.94	-754.77	843.94	-751.36	843.96	-749.04	843.97
-745.57	843.99	-744.41	843.99	-743.25	844	-742.09	844	-740.95	844.01
-739.79	844.02	-738.65	844.02	-737.5	844.03	-730.6	844.06	-651.71	844.46
-558.32	844.22	-557.61	844.22	-556.84	844.21	-556.21	844.21	-552.09	846.28
-550.03	846.28	-545.91	844.23	-503.01	823.5	-502.07	823.49	-347.88	822
-323.07	810	-322.7	810.1	-212.04	810	-209.54	810	-194.54	810.1
-173.38	810	-172.47	809.93	-172.29	809.92	-170.23	809.76	-169.59	809.72

-167.99	809.6	-166.91	809.52	-165.74	809.43	-164.23	809.33	-163.49	809.27
-161.56	809.14	-161.24	809.12	-159.55	809	-152.1	809	-136.76	808.08
-110.75	808.1	-105.69	808	-98.01	808.15	-77.01	808.06	-66.06	807.74
-50.99	807.61	-35.7	807.37	-28.35	806.46	-26	808.01	-21.76	804.95
-15.72	804.22	-15.2	803.46	-14.95	803.31	-14.91	803.25	-14.86	803.17
-14.73	802.96	-14.58	802.71	-14.51	802.6	-14.43	802.47	-14.14	802
20.6	802	27.87	802.57	31.67	806.67	33.46	808.35	46.35	812.63
47.42	812.95	50.62	813.48	56.04	813.65	57.86	813.75	101.72	813.93
107.53	814	109.42	814.15	113.04	814.43	117.7	814.79	121.05	815.06
124.84	815.34	126.67	815.49	132.02	815.89	132.34	815.91	133.53	816
136.36	816.61	137.94	816.96	139.77	817.36	142.54	818	147.7	819.64
155.2	822	158.67	823.11						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-845.31	.05	-28.35	.035	31.67	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-28.35	31.67	53	58	63	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
-100.15	-109.65	820

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2603.43

INPUT
Description: S
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-903.57	844.18	-745.6	844.93	-745.52	844.93	-733.11	844.98	-731.97	844.99
-730.84	845	-729.7	845	-728.57	845.01	-727.44	845.01	-726.31	845.02
-724.05	845.03	-720.66	845.04	-715.19	845.07	-679.35	845	-678.34	845
-677.32	844.99	-673.25	844.99	-672.23	844.98	-667.15	844.98	-665.11	844.97
-663.08	844.97	-660.03	844.96	-647.82	844.94	-644.77	844.93	-643.68	844.93
-638.66	844.92	-128.48	808.6	-126.5	808.4	-112.75	808.41	-101.83	808.22
-87.87	808.42	-79.46	808.57	-70.73	808.12	-56.58	807.63	-41.5	806.76
-35.36	806.51	-33	806.38	-27.24	806.67	-26.43	806.53	-25.52	805.98
-22.06	802.88	-21.93	802.8	-21.21	802.12	-21.13	802.07	-21.06	802.03
-21.01	802	19.91	802	27.69	802.97	28.47	803.07	28.53	803.08
28.7	803.1	28.83	803.11	28.93	803.12	28.99	803.13	29.04	803.14
29.12	803.15	29.37	803.21	29.76	803.33	29.88	803.36	35.8	806.62
35.86	806.64	36.08	806.68	46.81	807.54	52.56	807.93	59.22	809.23
65.96	809.9	80.35	811.82	80.79	811.87	94.07	812.91	95.31	813.03
98.75	813.24	107.94	813.92	114.81	814.09	117.15	814.33	128.41	814.96

128.95	814.96	139.38	815.3	141.41	815.61	145.31	815.54	148.6	815.53
151.33	815.55	160.12	815.57	160.95	815.58	165.75	815.04	166.67	814.95
167.29	815.16	171.81	816.59						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-903.57	.05	-26.43	.035	35.8	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-26.43	35.8	68	48.89	51	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2554.54

INPUT
Description: T
Station Elevation Data num= 301

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-980.71	845.06	-808.9	845.9	-710.3	845.76	-624.26	845.28	-623.85	845.28
-622.68	845.27	-621.87	845.27	-620.67	845.5	-613.51	845.5	-612.69	845.49
-609.55	845.49	-603.5	845.48	-596.4	845.48	-595.56	845.47	-592.43	845.47
-534.04	845.34	-532.68	845.33	-530.35	845.33	-528.94	845.32	-527.45	845.32
-526.7	845.31	-525.32	845.31	-521.22	847.4	-519.18	847.41	-515.08	845.33
-470.18	823.5	-316.69	822.01	-315.94	822	-291.26	810	-290.73	810.1
-278.43	810.1	-277.46	810.09	-277.36	810.09	-276.48	810.08	-275.25	810.08
-274.52	810.07	-274.2	810.07	-273.53	810.06	-272.1	810.06	-271.55	810.05
-270.01	810.05	-269.57	810.04	-267.93	810.04	-267.58	810.03	-265.59	810.03
-264.82	810.02	-262.75	810.02	-262.59	810.01	-259.59	810.01	-258.62	810
-256.57	810	-255.56	810.01	-254.54	810.01	-253.53	810.02	-252.51	810.02
-251.5	810.03	-249.47	810.04	-248.45	810.04	-247.43	810.05	-246.37	810.05
-245.4	810.06	-244.32	810.06	-243.38	810.07	-242.28	810.07	-241.34	810.08
-240.24	810.08	-239.31	810.09	-238.3	810.09	-238.2	810.1	-237.18	810.1
-236.27	810.11	-235.14	810.11	-234.24	810.12	-233.1	810.12	-232.21	810.13
-231.05	810.13	-230.17	810.14	-229.01	810.14	-228.14	810.15	-227.13	810.15
-226.97	810.16	-225.95	810.16	-225.1	810.17	-223.9	810.17	-223.06	810.18
-221.86	810.18	-221.03	810.19	-220.84	810.19	-220.02	810.2	-218.79	810.2
-217.99	810.21	-216.75	810.21	-215.95	810.22	-215.73	810.22	-214.94	810.23
-213.68	810.23	-212.9	810.24	-211.89	810.24	-211.64	810.25	-210.62	810.25
-209.86	810.26	-208.57	810.26	-207.82	810.27	-207.55	810.27	-206.81	810.28
-205.5	810.28	-204.77	810.29	-203.76	810.29	-203.46	810.3	-202.43	810.3
-201.73	810.31	-200.71	810.31	-200.38	810.32	-199.36	810.32	-198.68	810.33
-197.66	810.33	-197.31	810.34	-196.29	810.34	-195.62	810.35	-195.27	810.35
-194.61	810.36	-193.59	810.36	-193.22	810.37	-192.2	810.37	-191.56	810.38
-190.54	810.38	-190.15	810.39	-189.12	810.39	-188.51	810.4	-188.1	810.4
-187.49	810.41	-186.47	810.41	-186.05	810.42	-184.87	810.42	-184.44	810.43

-183.86	810.43	-183.42	810.44	-182.4	810.44	-181.84	810.45	-180.83	810.45
-180.37	810.46	-179.82	810.46	-179.35	810.47	-178.33	810.47	-177.8	810.48
-176.79	810.48	-176.3	810.49	-175.78	810.49	-175.28	810.5	-174.77	810.5
-174.26	810.51	-173.25	810.51	-172.75	810.52	-171.74	810.52	-171.21	810.53
-170.74	810.53	-170.19	810.54	-169.73	810.54	-169.17	810.55	-168.16	810.55
-167.71	810.56	-167.14	810.56	-166.7	810.57	-165.69	810.57	-165.1	810.58
-164.68	810.58	-164.08	810.59	-163.67	810.59	-163.07	810.6	-162.66	810.6
-162.05	810.61	-161.65	810.61	-161.03	810.62	-160.01	810.62	-159.63	810.63
-158.99	810.63	-158.62	810.64	-157.61	810.64	-156.96	810.65	-156.6	810.65
-155.94	810.66	-155.59	810.66	-154.92	810.67	-154.58	810.67	-153.9	810.68
-153.57	810.68	-152.88	810.69	-152.57	810.69	-151.86	810.7	-151.56	810.7
-150.84	810.71	-150.55	810.71	-149.82	810.72	-149.54	810.72	-148.8	810.73
-148.53	810.73	-147.78	810.74	-147.52	810.74	-146.76	810.75	-146.51	810.75
-145.75	810.76	-145.5	810.76	-144.73	810.77	-144.49	810.77	-143.71	810.78
-143.48	810.78	-142.69	810.79	-142.47	810.79	-141.67	810.8	-141.46	810.8
-140.65	810.81	-140.45	810.81	-139.63	810.82	-139.44	810.82	-138.61	810.83
-138.43	810.83	-137.59	810.84	-137.43	810.84	-136.57	810.85	-136.42	810.85
-135.55	810.86	-135.41	810.86	-134.53	810.87	-134.4	810.87	-133.51	810.88
-133.39	810.88	-132.49	810.89	-132.38	810.9	-131.47	810.91	-131.37	810.91
-130.45	810.92	-130.36	810.92	-129.43	810.93	-129.35	810.93	-128.4	810.94
-128.35	810.94	-127.38	810.95	-126.36	810.96	-125.34	810.98	-123.3	811
-122.3	811	-120.29	811.02	-119.29	811.02	-118.28	811.03	-117.28	811.03
-116.28	811.04	-114.27	811.04	-109.53	811.07	-105.31	811.26	-98.54	811.22
-75.45	810.6	-68.79	810.44	-65.82	810.3	-51.68	809.76	-46.89	809.31
-43.87	809.05	-34.16	808.14	-31.75	807.97	-30.76	807.66	-24.28	803.72
-20.91	801.64	-14.53	801.01	-13.49	800.98	-4.76	801.32	-4.06	801.36
-3	801.36	-2.78	801.37	13.68	801.68	21.2	803.74	26.6	805.12
29.73	806	30.98	806.18	37.75	807.72	41.97	808.69	42.92	807.76
45.15	807.86	51.27	808.01	72.68	808.47	86.62	808.59	94.2	808.73
118.84	810.47	122.89	810.79	123.74	810.9	152.29	815.32	160.72	815.76
161.08	815.74	161.18	815.74	161.39	815.75	161.98	815.77	171.1	815.96
171.86	815.94	183.22	815.73	184.46	815.73	188.65	815.68	189.98	815.55
191.72	815.42	192.1	815.42	192.45	815.56	192.97	815.92	193.46	816.19
198.19	817.61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-980.71	.05	-30.76	.035	37.75	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-30.76	37.75	83	59.92	60	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2494.62

INPUT
Description: U
Station Elevation Data num= 300

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-901.35	847.44	-836.62	847.05	-831.46	846.94	-831.13	846.94	-830.77	846.93
-830.61	846.93	-830.44	846.92	-823.05	846.77	-821.4	846.73	-820.78	846.71
-819.23	846.67	-818.49	846.66	-817.06	846.62	-816.2	846.6	-814.87	846.57
-813.91	846.55	-811.57	846.49	-810.48	846.47	-809.47	846.44	-808.27	846.42
-807.35	846.4	-806.06	846.37	-805.23	846.35	-803.83	846.33	-803.1	846.31
-801.6	846.28	-800.96	846.27	-799.36	846.24	-798.81	846.23	-797.11	846.2
-796.65	846.19	-794.85	846.16	-794.48	846.16	-792.59	846.12	-792.3	846.12
-790.32	846.09	-790.12	846.08	-788.05	846.05	-787.94	846.05	-785.77	846.01
-785.33	846	-770.93	845.43	-769.41	845.37	-747.43	844.59	-744.94	844.48
-740.91	844.3	-736.89	844.12	-728.85	843.72	-724.83	843.51	-720.81	843.29
-716.79	843.06	-712.77	842.83	-708.74	842.59	-704.72	842.34	-700.7	842.08
-696.68	841.82	-692.66	841.55	-688.64	841.27	-684.62	840.98	-680.59	840.69
-676.57	840.38	-534.07	829.3	-483.76	825.38	-481.77	825.22	-479.79	825.07
-439.06	821.9	-425.53	820.84	-421.51	820.54	-417.49	820.25	-413.48	819.96
-409.97	819.72	-405.45	819.41	-401.43	819.15	-397.41	818.9	-393.4	818.65
-389.38	818.42	-385.36	818.19	-381.35	817.97	-377.33	817.76	-373.32	817.56
-369.3	817.36	-365.28	817.17	-363.27	817.08	-359.26	816.91	-355.24	816.75
-351.23	816.59	-347.21	816.44	-343.19	816.3	-339.18	816.17	-331.14	815.93
-327.13	815.82	-325.12	815.77	-323.11	815.73	-319.06	815.64	-316.25	815.58
-298.91	814	-298.79	814	-297.81	813.97	-296.83	813.95	-296.78	813.95
-295.86	813.93	-295.78	813.93	-294.88	813.9	-294.78	813.9	-293.89	813.88
-293.77	813.88	-292.91	813.86	-292.77	813.86	-291.93	813.84	-291.77	813.84
-290.95	813.82	-290.77	813.82	-289.96	813.8	-289.76	813.8	-288.98	813.78
-288.76	813.78	-287.99	813.76	-287.76	813.76	-287.01	813.74	-286.75	813.74
-286.02	813.73	-285.75	813.72	-285.04	813.71	-284.74	813.71	-284.05	813.69
-283.74	813.69	-283.06	813.67	-282.73	813.67	-282.07	813.66	-281.73	813.65
-281.08	813.64	-280.72	813.64	-280.1	813.63	-279.72	813.62	-279.11	813.61
-278.71	813.61	-278.12	813.59	-277.71	813.59	-277.12	813.58	-276.7	813.58
-276.13	813.57	-275.7	813.56	-275.14	813.55	-274.69	813.55	-274.15	813.54
-273.68	813.53	-273.16	813.52	-272.68	813.52	-272.17	813.51	-271.67	813.51
-270.67	813.49	-270.18	813.48	-269.66	813.48	-269.18	813.47	-268.65	813.47
-268.19	813.46	-267.65	813.46	-267.2	813.45	-266.64	813.44	-266.2	813.44
-265.63	813.43	-265.21	813.42	-264.63	813.42	-264.21	813.41	-263.62	813.41
-263.22	813.4	-262.61	813.4	-262.22	813.39	-261.61	813.39	-261.22	813.38
-260.6	813.37	-260.23	813.37	-259.59	813.36	-259.23	813.36	-258.58	813.35
-258.23	813.35	-257.58	813.34	-257.24	813.34	-256.57	813.33	-256.24	813.33
-209.92	813	-209.17	813	-208.17	812.99	-207.18	812.98	-206.18	812.98
-205.19	812.97	-204.2	812.97	-203.2	812.96	-202.21	812.96	-201.21	812.95
-200.17	812.95	-199.23	812.94	-198.17	812.94	-197.24	812.93	-196.17	812.93
-195.25	812.92	-194.17	812.92	-193.26	812.91	-192.17	812.91	-191.27	812.9
-190.17	812.9	-189.28	812.89	-188.17	812.89	-187.29	812.88	-185.18	812.88
-184.3	812.87	-183.18	812.87	-182.32	812.86	-181.18	812.86	-180.32	812.85
-178.18	812.85	-177.34	812.84	-176.18	812.84	-175.35	812.83	-173.18	812.83
-172.36	812.82	-171.19	812.82	-170.37	812.81	-168.19	812.81	-167.39	812.8

-165.19	812.8	-164.4	812.79	-162.2	812.79	-161.41	812.78	-159.2	812.78
-158.43	812.77	-156.2	812.77	-155.44	812.76	-153.21	812.76	-152.45	812.75
-150.21	812.75	-149.47	812.74	-136.92	812.74	-129.63	812.5	-109.68	812.37
-95.7	812.25	-91.86	812.22	-69.56	811.87	-68.96	811.86	-66.88	811.84
-64.43	811.75	-59.97	811.56	-52.47	811.16	-37.57	810.15	-35.22	809.68
-24.96	807.08	-20.94	804.26	-14.73	800.23	-13.47	800	-6.97	799.17
-.36	799.4	0	799.4	2.39	799.36	7.85	799.97	11.93	800.16
12.41	800.45	18.41	802.84	21.85	805.15	24.59	805.52	32.01	807.83
33.12	808.4	33.79	808.65	34.78	808.68	36.69	808.9	48.53	811.75
50.46	811.83	59.92	810.53	61.66	810.47	75.36	808.35	91.32	808.48
107.37	808.47	128.28	808.4	135.2	808.44	140.98	808.4	144.46	808.56
161	809.23	164.1	809.39	164.55	809.45	190.55	814.5	192.97	815
193.65	815.27	197.21	815.43	197.36	815.43	204.13	815.64	209.81	815.78
210.74	815.79	211.11	815.9	217.12	815.69	223.47	815.53	226.68	815.16
226.89	815.14	226.94	815.19	227	815.15	228.76	816.23	228.83	816.26
229.7	816.54	229.79	816.57	229.86	816.6	229.94	816.63	233.03	817.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-901.35	.05	-35.22	.035	32.01	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.22	32.01	170	76.77	86	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-901.35	-25.4	812	T
21.09	233.03	812	T

BRIDGE

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2460.04

INPUT
Description:
Distance from Upstream XS = 19.58
Deck/Roadway Width = 30
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 7

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-167.99	812	0	-50.53	812	0	-21.32	812	0
-21.32	812	809.83	17.88	812	809.83	17.88	812	0
99.43	812	0						

Upstream Bridge Cross Section Data
Station Elevation Data num= 213

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-901.346	860.086	-834.88	860.631	-834.483	860.636	-833.635	860.639	-801.532	860.807
-801.242	860.812	-800.092	860.821	-799.803	860.826	-799.229	860.83	-798.939	860.835
-798.366	860.84	-798.074	860.844	-797.503	860.849	-797.21	860.854	-796.64	860.858
-796.345	860.863	-795.778	860.868	-795.481	860.873	-794.915	860.877	-794.616	860.882
-794.052	860.887	-793.752	860.892	-793.189	860.896	-792.887	860.901	-792.326	860.905
-792.023	860.911	-791.463	860.915	-791.158	860.92	-790.601	860.925	-790.293	860.93
-789.738	860.934	-789.429	860.94	-788.875	860.944	-788.564	860.949	-788.012	860.954
-787.699	860.959	-787.149	860.963	-786.834	860.969	-786.287	860.973	-785.97	860.979
-785.424	860.983	-785.105	860.988	-784.561	860.993	-784.24	860.998	-783.699	861.003
-783.375	861.008	-782.836	861.012	-782.51	861.018	-781.973	861.022	-781.645	861.028
-781.111	861.032	-780.78	861.039	-780.248	861.043	-779.915	861.049	-779.386	861.053
-779.05	861.059	-778.523	861.063	-778.185	861.069	-777.66	861.073	-777.32	861.079
-776.798	861.083	-776.455	861.09	-775.935	861.094	-775.589	861.1	-775.073	861.104
-774.724	861.111	-774.211	861.115	-773.859	861.121	-773.348	861.125	-772.993	861.132
-772.486	861.136	-772.128	861.143	-763.748	861.256	-728.288	862	-712.595	862.156
-711.745	862.165	-711.222	862.064	-710.205	861.868	-709.189	861.672	-598.823	840.399
-568.981	834.339	-559.738	832.462	-558.711	832.254	-557.685	832.045	-551.526	830.795
-549.473	830.378	-548.447	830.169	-546.395	829.753	-545.369	829.544	-544.342	829.336
-543.316	829.128	-542.29	828.919	-541.747	828.809	-541.276	828.751	-540.273	828.627
-539.271	828.503	-538.269	828.379	-536.265	828.132	-535.262	828.008	-534.26	827.885
-532.256	827.637	-531.254	827.513	-531.199	827.507	-527.246	827.019	-527.169	827.01
-525.241	826.772	-525.155	826.761	-523.237	826.524	-523.14	826.513	-514.22	825.413
-514.075	825.395	-510.213	824.919	-510.046	824.898	-502.198	823.931	-439.328	816.195
-438.688	816.118	-401.4	815.76	-386.25	815.51	-373.26	815.48	-338.72	815.07
-334.28	815	-307.86	814.49	-304.35	814.41	-304.01	814.45	-292.77	814.29
-291.75	814.28	-289.24	814.25	-239.27	813.37	-229.33	813.16	-224.65	813.15
-224.32	813.11	-219.31	812.98	-213.16	812.98	-212.61	812.99	-211.09	813.02
-185.27	813.13	-169.91	812.83	-165.7	812.79	-151.41	812.7	-129.64	812.5
-109.68	812.37	-109.31	812.37	-108.95	812.36	-108.22	812.36	-107.85	812.35
-106.76	812.35	-106.4	812.34	-105.67	812.34	-105.31	812.33	-104.59	812.33
-104.23	812.32	-103.15	812.32	-102.79	812.31	-102.08	812.31	-101.72	812.3
-101	812.3	-100.65	812.29	-99.58	812.29	-99.23	812.28	-98.52	812.28
-98.16	812.27	-97.11	812.27	-96.75	812.26	-96.05	812.26	-95.7	812.25
-95	812.25	-94.65	812.24	-93.6	812.24	-93.25	812.23	-92.56	812.23
-92.21	812.22	-91.87	812.22	-68.96	811.86	-68.67	811.86	-68.37	811.85
-67.77	811.85	-67.48	811.84	-66.88	811.84	-64.43	811.75	-59.97	811.56
-52.47	811.16	-40.27	810.34	-37.57	810.15	-35.22	809.68	-24.96	807.08
-20.95	804.26	-14.73	800.24	-13.47	800	-6.97	799.17	-.36	799.4
0	799.4	2.38	799.36	7.84	799.97	11.93	800.16	12.41	800.45
18.41	802.84	21.85	805.15	24.59	805.51	32	807.83	33.12	808.4
33.79	808.65	34.78	808.68	36.69	808.9	48.53	811.75	50.46	811.83
176.11	811.85	190.55	814.5	192.96	815	193.65	815.27	197.2	815.43
197.36	815.43	204.13	815.64	209.81	815.78				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-901.346	.035	-35.22	.035	32	.05

Bank Sta: Left Right Coeff Contr. Expan.

-35.22	32	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-901.346	-25.4	812	T
21.09	209.81	812	T

Downstream Deck/Roadway Coordinates num= 8

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-420	816	0	-276	814	0	-23.04	812	0
-23.04	812	809.83	16.16	812	809.83	16.16	812	0
99.43	812	0	164.68	812	0			

Downstream Bridge Cross Section Data

Station Elevation Data num= 168

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-477.653	831.341	-476.723	830.863	-437.449	830.649	-437.043	830.647	-426.887	827.59
-426.68	827.634	-426.599	827.651	-417.714	829.554	-417.213	829.526	-415.765	829.444
-415.696	829.44	-383.534	827.586	-382.957	827.552	-382.427	827.36	-328.369	807.782
-327.199	807.358	-326.17	807.36	-325.5	807.37	-323.36	807.43	-320.98	807.49
-319.25	807.53	-318.33	807.56	-317.38	807.58	-316.39	807.61	-315.36	807.63
-312	807.72	-309.5	807.78	-308.17	807.82	-306.77	807.85	-303.76	807.93
-300.44	808.01	-296.75	808.11	-294.75	808.16	-294.61	808.16	-291.67	808.2
-291.57	808.2	-288.52	808.25	-288.31	808.25	-285.37	808.29	-285.05	808.29
-282.23	808.33	-281.79	808.34	-279.09	808.37	-278.53	808.38	-275.96	808.41
-275.27	808.42	-269.71	808.49	-268.76	808.5	-266.59	808.53	-263.48	808.56
-262.25	808.57	-260.37	808.6	-257	808.64	-254.17	808.7	-251.68	808.76
-250.54	808.79	-248.46	808.83	-247.5	808.86	-246.15	808.86	-245.27	808.88
-243.84	808.89	-243.04	808.91	-241.53	808.92	-240.81	808.93	-239.21	808.94
-238.58	808.95	-236.88	808.96	-236.35	808.97	-234.55	808.98	-234.11	808.99
-232.22	808.99	-231.87	809	-229.88	809	-229.63	809.01	-224.18	809.01
-222.72	809	-220.7	808.98	-217.89	808.96	-216.87	808.95	-216.02	808.94
-215.31	808.94	-214.7	808.93	-214.17	808.93	-213.71	808.92	-212.62	808.92
-212.33	808.91	-211.41	808.91	-211.22	808.9	-209.11	808.9	-208.41	808.91
-206.39	808.91	-205.65	808.92	-125.39	811.11	-124.94	811.11	-124.48	811.13
-124.02	811.12	-123.56	811.14	-123.11	811.13	-122.65	811.15	-122.19	811.16
-121.73	811.16	-121.27	811.17	-119.9	811.17	-119.43	811.16	-117.53	811.16
-117.06	811.15	-113.73	811.15	-113.26	811.14	-109.94	811.14	-109.46	811.13
-106.14	811.13	-105.65	811.12	-102.34	811.12	-101.85	811.11	-99.49	811.11
-99	811.1	-95.69	811.1	-95.2	811.09	-92.84	811.09	-92.34	811.08
-89.04	811.08	-88.54	811.07	-86.19	811.07	-85.69	811.06	-83.35	811.06
-82.83	811.05	-80.5	811.05	-79.98	811.04	-76.7	811.04	-76.17	811.03
-73.85	811.03	-73.32	811.02	-72.37	811.02	-72.05	810.91	-53.17	810.86
-48.44	810.69	-37.84	809.07	-30	808.33	-25.59	807.53	-22.23	806.22
-16.85	802.25	-15.05	800.91	-13.8	799.95	-13.33	799.82	-8.16	798.5
-6.82	798.57	-.39	798.8	0	798.79	1.29	798.75	6.69	799.12

```
     8.2  799.53   13.28  800.39   15.02  801.97   21.15  805.17   21.66  805.28
   26.21  805.85   26.67  805.91   30.12   807.2    37.5  809.93   37.87  810.04
   38.14  810.11      39  810.16   69.62  812.05   85.89  812.92   93.96   813.4
   98.67  813.65  100.06  813.69  126.28  814.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
-477.653    .035  -22.23    .035   21.15     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -22.23   21.15             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
 -394.24 -126.25  812.82       F
     -50     -27  811.25       T
      25      50  811.25       T

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 =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

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

CROSS SECTION


RIVER: Buckeye Creek
```

REACH: Buckeye Creek RS: 2417.85

INPUT
Description: V
Station Elevation Data num= 253

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-477.65	851.84	-477.2	851.75	-475.32	851.36	-474.48	851.19	-472.71	850.79
-471.77	850.59	-467.08	849.46	-465.49	849.04	-464.52	848.83	-464.2	848.74
-462.9	848.39	-461.94	848.17	-461.74	848.12	-460.12	847.67	-459.35	847.49
-457.7	847.02	-456.75	846.78	-455.09	846.3	-454.13	846.05	-452.47	845.55
-451.5	845.29	-449.85	844.78	-448.85	844.5	-448.25	844.32	-447.18	844.01
-446.37	843.75	-446.19	843.69	-445.78	843.57	-444.21	843.07	-443.64	842.9
-443.51	842.86	-442.29	842.49	-440.81	842	-439.51	841.59	-438.1	841.12
-436.68	840.66	-435.37	840.21	-433.8	839.7	-432.63	839.28	-430.89	838.7
-429.89	838.34	-427.92	837.66	-427.13	837.37	-424.9	836.58	-424.65	836.49
-423.49	836.07	-423.29	836	-423.28	835.99	-423.27	835.99	-421.95	835.51
-421.81	835.46	-421.78	835.45	-421.59	835.38	-420.15	834.85	-418.87	834.68
-418.67	834.66	-418.41	834.62	-415.47	834.24	-413.31	833.96	-412.19	833.83
-410.46	833.61	-408.83	833.42	-407.57	833.26	-405.4	833.01	-404.64	832.91
-401.87	832.6	-400.42	832.44	-398.64	832.24	-398.25	832.2	-397.93	832.16
-396.05	831.96	-394.19	831.75	-393.18	831.64	-391.99	831.51	-390.9	831.39
-388.83	831.17	-384.79	830.72	-384.31	830.67	-382.96	830.52	-376.48	831.6
-372.56	832.25	-369.47	832.77	-367.6	832.56	-367.24	832.52	-366.8	832.47
-366.25	832.41	-365.55	832.33	-364.61	832.22	-363.71	832.12	-362.94	832.04
-362.6	832	-354.52	828.4	-348.15	825.57	-333.93	819.24	-313.2	810.01
-308.17	807.82	-306.77	807.85	-305.31	807.89	-303.77	807.93	-302.15	807.97
-300.45	808.01	-298.65	808.06	-296.76	808.11	-294.76	808.16	-294.61	808.16
-291.67	808.2	-291.57	808.2	-288.52	808.25	-288.31	808.25	-285.38	808.29
-285.05	808.29	-282.23	808.33	-281.79	808.34	-279.1	808.37	-278.53	808.38
-275.96	808.41	-275.27	808.42	-272.83	808.45	-272.02	808.46	-269.71	808.49
-268.76	808.5	-266.59	808.53	-265.51	808.54	-263.48	808.56	-262.26	808.57
-260.37	808.6	-258.62	808.62	-257	808.64	-255.54	808.67	-254.17	808.7
-252.89	808.73	-251.68	808.76	-250.54	808.79	-249.47	808.81	-248.46	808.83
-247.5	808.86	-246.15	808.86	-245.27	808.88	-243.84	808.89	-243.05	808.91
-241.53	808.92	-240.82	808.93	-239.21	808.94	-238.58	808.95	-236.89	808.96
-236.35	808.97	-234.56	808.98	-234.11	808.99	-232.22	808.99	-231.87	809
-229.88	809	-229.63	809.01	-224.18	809.01	-222.73	809	-220.7	808.98
-219.14	808.97	-217.89	808.96	-216.87	808.95	-216.03	808.94	-215.31	808.94
-214.7	808.93	-214.17	808.93	-213.71	808.92	-212.62	808.92	-212.33	808.91
-211.41	808.91	-211.23	808.9	-209.11	808.9	-208.41	808.91	-206.4	808.91
-205.66	808.92	-125.4	811.11	-124.94	811.11	-124.48	811.13	-124.03	811.12
-123.57	811.14	-123.11	811.13	-122.65	811.15	-122.19	811.16	-121.74	811.16
-121.28	811.17	-119.9	811.17	-119.43	811.16	-117.54	811.16	-117.06	811.15
-113.74	811.15	-113.26	811.14	-109.94	811.14	-109.46	811.13	-106.14	811.13
-105.66	811.12	-103.29	811.12	-102.81	811.11	-102.34	811.12	-101.85	811.11
-99.49	811.11	-99	811.1	-95.69	811.1	-95.2	811.09	-92.85	811.09
-92.35	811.08	-89.05	811.08	-88.54	811.07	-86.2	811.07	-85.69	811.06
-83.35	811.06	-82.84	811.05	-80.5	811.05	-79.98	811.04	-76.7	811.04

-76.18	811.03	-73.85	811.03	-73.32	811.02	-72.37	811.02	-72.05	810.91
-56.91	810.87	-53.17	810.86	-48.45	810.69	-37.84	809.07	-30	808.33
-25.59	807.53	-22.23	806.22	-16.85	802.25	-15.05	800.91	-13.81	799.95
-13.33	799.82	-8.16	798.5	-6.82	798.57	-.39	798.8	0	798.79
1.28	798.75	6.68	799.12	8.19	799.53	13.27	800.39	15.02	801.97
21.15	805.17	21.66	805.28	21.67	805.28	26.21	805.85	26.67	805.91
30.11	807.2	37.49	809.93	37.87	810.04	38.14	810.11	38.47	810.13
39	810.16	69.62	812.05	85.89	812.92	93.96	813.4	98.67	813.65
100.06	813.69	126.27	814.65	126.44	812.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-477.65	.05	-22.23	.035	21.15	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-22.23	21.15	91	63.32	62	.3	.5

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
-394.24	-126.25	812.82	F
-50	-27	811.25	T
25	50	811.25	T

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2354.53

INPUT
Description: W
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-500.98	855.44	-448.88	855.03	-445.68	855.01	-444.31	855	-433.79	854.91
-402.68	854.67	-364.42	854.37	-364.34	854.37	-362.76	854.36	-360.33	854.34
-359.39	853.96	-357.63	853.25	-327.4	841.07	-325.72	840.4	-324.48	839.87
-323.63	839.51	-322.85	839.19	-321.51	838.64	-320.39	838.18	-319.84	837.95
-319.09	837.65	-317.74	837.11	-316.74	836.71	-316.39	836.57	-315.43	836.19
-251.04	810.92	-249.43	810.28	-248.55	809.94	-245.63	808.61	-202.91	808.9
-198.95	808.91	-198.6	808.91	-189.04	808.96	-159.16	809.15	-149.92	809.21
-143.84	809.14	-84.14	809.08	-72.9	809.08	-53.64	808.83	-53.3	808.83
-42.93	808.79	-36.84	808.13	-23.47	806.92	-19.51	804.16	-12.79	800.05
-10.78	799.14	-7.5	798.07	-3.16	797.95	-.23	798.13	4.66	798.69
7.77	799.04	12.76	799.53	14.53	799.99	19.12	802.85	22.1	804.84
29.43	805.45	40.12	805.82	47.52	806.56	48.05	806.59	49.68	806.84
53.14	806.92	59.06	807.23	74.02	807.96	88.07	809.49	111.46	811.68
126.83	812.75	130.88	812.86	132.22	812.98	148.01	813.9	183.36	815.24
188.34	815.39	195.35	815.57	196.04	814.68				

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -500.98     .05  -23.47    .035    22.1     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -23.47    22.1              144   48.15      69             .1       .3

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 2306.38

INPUT
Description: X
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -600  856.84 -503.77  856.02 -501.87  856.01    -388  855.04 -387.93  855.04
 -384.15     855 -309.22  854.37 -307.96  853.77 -214.53  809.51 -194.05  808.39
 -190.81   808.4  -189.5  808.43 -176.68  808.62 -165.82  808.85 -160.61  808.88
  -67.79  807.94   -53.7  807.96  -46.53  807.87  -44.59  808.06  -42.07  807.83
   -25.4     807  -23.53  805.77  -14.98  799.89  -14.31  799.59  -10.39  798.34
   -9.53   798.4   -4.34  798.44    2.37  798.93    3.33  799.04    3.92  799.19
    9.66  800.26   13.12  802.38   17.84  805.01   36.45  805.24   44.58  806.39
   58.79  806.64   63.08  806.74   90.19  807.54   99.16  807.86  114.68   808.3
  122.11  808.58  141.52  810.58  154.18  811.63  158.79  812.07   163.4  812.37
  166.83  812.49  196.42  813.78  207.15  814.28  209.93  814.36  240.28  815.28
  244.72  813.95  245.28  813.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -600     .05   -25.4    .035   17.84     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -25.4   17.84              90   51.84      42             .1       .3

CROSS SECTION


RIVER: Buckeye Creek
REACH: Buckeye Creek      RS: 2254.54

INPUT
Description: Y
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -710.8  858.04 -710.72  858.04 -708.99  858.03 -707.26  858.01 -705.54     858
 -703.85  857.98 -698.79  857.94 -698.69  857.94 -584.12  857.02 -582.41     857
```

-580.72	856.99	-579.04	856.98	-577.35	856.96	-577.29	856.96	-462.95	856.03
-461.24	856.02	-459.54	856	-457.83	855.99	-344.7	855.01	-291.95	854.54
-291.45	854.54	-197.45	809.12	-197.4	809.09	-181.98	808.4	-176.29	808.43
-167.71	808.62	-50.35	807.51	-46.82	807.95	-46.63	807.98	-45.68	807.73
-26.21	806.95	-22.65	804.84	-15.41	799.87	-12.68	798.81	-11.48	798.53
-7.82	799.05	-5.45	799.34	-.27	799.85	1.79	799.91	8.44	800.17
10.39	800.27	12.02	801.53	18.58	804.69	33.45	805.08	33.64	805.09
33.75	805.11	41.59	806.49	61.3	806.74	63.85	806.78	69.72	806.8
99.43	807.45	99.94	807.47	126.43	807.87	140.96	808.4	142.39	808.43
163.62	809.25	176.19	810.47	193.42	812.18	214.49	813.37	221.23	813.76
226.1	814.12	234.24	814.56	253.92	815.17				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-710.8	.05	-26.21	.035	18.58	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-26.21	18.58	90	50	45	.1 .3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2204.54

INPUT
Description: Z
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-920.1	860.34	-884.38	860.02	-882.3	860.01	-880.24	859.99	-767.17	859
-765.1	858.98	-655.55	858.02	-653.44	858	-538.7	856.99	-429.7	856.01
-427.48	855.99	-316.63	855	-279.78	854.67	-185.28	808.75	-173.64	807.9
-170.7	807.89	-159.89	807.7	-148.14	807.54	-117.32	807.28	-93.7	807.48
-78.23	807.81	-46.46	808.15	-36.05	807.73	-24.39	806.89	-16.86	802.56
-12.29	799.9	-10.83	799.57	-3.6	798.81	-.66	799.18	5.47	799.58
7.65	799.65	9.48	799.75	15.49	800.09	17.16	801.36	19.95	804.35
25.2	804.7	29.78	804.99	36.45	806.08	39.89	806.63	55.28	806.92
59.83	806.89	85.88	806.81	100.95	807.11	118.08	807.56	134.44	807.79
136.61	807.85	149.16	807.76	170.32	807.81	189.32	808.47	190.53	808.49
191.3	808.57	191.95	808.65	200.96	809.38	215.3	810.83	226.77	812.05
229.07	812.33	231.06	812.53	233.55	812.84	257.98	814.32	265.36	814.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-920.1	.05	-24.39	.035	19.95	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-24.39	19.95	74	50	44	.1 .3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2154.54

INPUT
Description: AA
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1050.24	861.85	-955.01	861	-952.86	860.98	-843.3	860.01	-841.13	859.99
-730.65	859.01	-728.46	858.99	-726.28	858.97	-726.21	858.97	-617.41	858
-615.25	857.98	-506.89	857	-398.11	856.01	-267.41	854.81	-172.71	808.39
-153.54	807.66	-139.19	807.49	-77.02	808.07	-43.93	808.02	-37.15	807.53
-21.68	806.24	-11.01	799.74	-10.69	799.54	-10.59	799.52	-5.56	798.6
-5.29	798.62	3.36	798.83	3.54	798.82	12.37	799.3	12.69	799.28
17.23	800.15	17.57	800.21	18.08	800.51	22.06	801.88	28.84	804.5
30.21	804.68	31.01	804.81	38.21	806.5	53.53	806.9	56.01	806.89
83.27	805.56	90.16	805.89	97.72	805.35	98.09	805.33	98.41	805.31
119.58	805.49	134.35	805.66	139.08	805.15	140.47	805.07	145.72	805.7
173.74	807.13	185.91	807.67	200.7	808.17	219.31	808.96	227.19	809.44
230.22	809.96	238.42	810.98	255.45	812.86	266.71	813.74	275.07	814.33

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1050.24	.05	-21.68	.035	38.21	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-21.68	38.21	63	48.8	47	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2105.74

INPUT
Description: BB
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1272.85	850.6	-1201.31	850.73	-1172.62	850.74	-1171.08	851.44	-1170.94	851.51
-1168.86	852.47	-1168.51	852.63	-1166.63	853.49	-1166.08	853.75	-1164.41	854.52
-1163.66	854.87	-1162.19	855.54	-1161.23	855.99	-1159.96	856.57	-1158.81	857.11
-1157.74	857.6	-1156.38	858.23	-1155.52	858.63	-1153.95	859.36	-1153.3	859.66
-1151.53	860.48	-1151.07	860.69	-1149.1	861.61	-1148.85	861.73	-1146.68	862.74
-1146.11	863	-1024.94	862.02	-1024.88	862.02	-1022.45	862	-915.02	861.01
-912.48	860.99	-804.55	860	-802.01	859.97	-801.94	859.97	-478.51	857

-476	856.98	-475.95	856.98	-261.81	855	-261.53	855	-255.42	854.94
-160.21	808.06	-153.79	808	-143.09	808	-134.16	807.85	-134.09	807.85
-127.27	807.75	-115.54	807.75	-111.91	807.81	-109.05	807.88	-101.07	807.91
-90.85	807.94	-89.1	807.94	-77.29	807.99	-57.27	807.99	-55.07	807.82
-38.23	806.81	-35.19	806.61	-34.55	806.6	-34.29	806.56	-33.82	806.54
-29.81	806.27	-19.98	805.6	-19	805.03	-11.8	800.15	-7.71	799.5
-5.17	799.19	1.4	799.11	4.01	798.92	10.22	798.03	12.53	797.84
16.97	798.1	18.46	798.17	19.54	798.4	23.6	799.5	26.39	801.64
29.68	803.93	34.42	805.9	38.23	806.07	42.74	806.3	47.09	806.22
62.78	806.13	63.27	806.12	63.62	806.12	64.44	806.15	83.44	806.15
91.23	806.63	94.72	806.8	100.52	806.83	132.42	807.25	132.77	807.26
132.86	807.26	133.05	807.27	173.39	808.66	193.45	809.45	210.92	809.38
236.84	810.04	248.49	810.08	253.06	810.27	259.03	810.45	272.22	811.95
279.37	812.68	292.07	813.79	296.17	814.12				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1272.85	.05	-19.98	.035	34.42	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.98	34.42	190	202.35	215	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
-142.722	-151.722	820

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1903.41

INPUT
Description: CC
Station Elevation Data num= 244

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1413.07	849.43	-1398.84	849.59	-1398.03	849.6	-1397.78	849.6	-1396.96	849.61
-1396.71	849.61	-1395.89	849.62	-1395.65	849.62	-1394.82	849.63	-1394.58	849.63
-1393.75	849.64	-1393.52	849.64	-1392.68	849.65	-1392.46	849.65	-1391.62	849.66
-1391.39	849.66	-1390.55	849.67	-1390.33	849.67	-1389.48	849.68	-1389.26	849.68
-1388.41	849.69	-1388.2	849.69	-1387.34	849.7	-1387.13	849.7	-1386.27	849.71
-1386.07	849.71	-1385.2	849.72	-1385.01	849.72	-1384.13	849.73	-1383.94	849.73
-1383.06	849.74	-1382.88	849.74	-1381.99	849.75	-1381.81	849.75	-1380.92	849.76
-1380.75	849.76	-1379.85	849.77	-1379.68	849.77	-1378.78	849.78	-1378.62	849.78
-1377.71	849.79	-1377.55	849.79	-1376.64	849.8	-1376.49	849.8	-1375.57	849.81
-1375.42	849.81	-1374.5	849.82	-1373.43	849.82	-1373.3	849.83	-1372.36	849.83
-1372.23	849.84	-1371.17	849.84	-1370.21	849.85	-1370.1	849.85	-1369.14	849.86
-1369.04	849.86	-1368.07	849.87	-1367.97	849.87	-1367	849.88	-1366.91	849.88
-1365.93	849.89	-1365.84	849.89	-1364.86	849.9	-1364.78	849.9	-1363.79	849.91

-1363.71	849.91	-1362.72	849.92	-1361.58	849.92	-1360.57	849.93	-1360.52	849.93
-1359.5	849.94	-1358.43	849.95	-1357.36	849.96	-1356.29	849.97	-1355.21	849.97
-1354.14	849.98	-1352	850	-1324.05	850.2	-1295.88	850	-1294.45	849.99
-1293.01	849.98	-1197.71	849.29	-1160.16	849.28	-1053.24	849.49	-1051.38	850.42
-1051.23	850.5	-1049.3	851.46	-1048.97	851.62	-1047.22	852.5	-1046.71	852.75
-1045.14	853.54	-1044.46	853.88	-1043.06	854.58	-1042.2	855.01	-1040.98	855.63
-1039.95	856.14	-1038.89	856.67	-1037.69	857.28	-1036.81	857.72	-1035.44	858.41
-1034.73	858.76	-1033.18	859.55	-1032.65	859.81	-1030.93	860.68	-1030.57	860.86
-1028.67	861.82	-1028.49	861.91	-1026.42	862.96	-1026.33	863	-1024.14	862.98
-910.22	862.02	-907.9	862	-905.57	861.98	-905.51	861.98	-800.64	861.03
-800.58	861.02	-798.25	861	-690.93	860.03	-689.35	860.02	-687.75	860
-685.51	859.98	-577.93	859	-576.88	858.99	-469.22	858.02	-469.16	858.02
-468.21	858.01	-467.33	858	-466.46	858	-465.45	857.99	-463.43	857.99
-463.3	857.98	-462.26	857.98	-406.86	857.57	-406.51	857.56	-405.87	857.56
-405.52	857.55	-404.54	857.55	-403.9	857.54	-403.55	857.54	-402.92	857.53
-401.94	857.53	-401.57	857.52	-400.95	857.52	-400.58	857.51	-399.59	857.51
-398.98	857.5	-398.6	857.5	-398	857.49	-397.01	857.49	-396.62	857.48
-396.03	857.48	-395.63	857.47	-395.04	857.47	-394.64	857.46	-394.06	857.46
-393.65	857.45	-392.66	857.45	-392.09	857.44	-391.67	857.44	-391.11	857.43
-390.67	857.43	-390.12	857.42	-389.14	857.42	-388.69	857.41	-388.15	857.41
-387.7	857.4	-387.17	857.4	-386.71	857.39	-386.18	857.39	-298.64	856.55
-244.49	855.98	-231.47	855.86	-231.09	855.86	-230.14	855.42	-227.84	854.33
-227.55	854.21	-227.11	854.01	-226.63	853.78	-226.47	853.75	-226.28	853.66
-222.6	851.89	-216.64	848.95	-210.66	845.91	-135.81	808.57	-122.41	808.53
-103.56	808	-61.31	808	-61.14	807.99	-59.94	808	-57.87	807.98
-57.24	807.68	-56.21	807.71	-40.74	807.96	-40.56	807.88	-39.48	807.93
-39.31	807.9	-38.39	807.84	-31.59	806.91	-23.03	804.62	-18.38	802.72
-15.31	799.68	-13.6	799.14	-11.14	798.59	-8.7	798.6	-4.87	798.82
-2.24	798.91	2.77	799.59	5.37	799.74	15.86	800.78	19.21	801.07
25.98	801.39	28.13	801.7	34.86	801.78	40.99	802.22	64.91	803.69
67.69	803.76	85.92	804.31	102.91	804.36	107.15	804.41	109.56	804.63
123.37	806.87	125	806.92	138.39	807.04	154.02	807.98	175.38	808.83
193.46	809.77	211.27	810.13	232.8	810.02	248.61	809.84	261.98	809.75
286.41	809.66	312.77	809.79	322.37	809.86	329.27	809.78	332.46	809.82
341.59	809.72	361.97	809.56	373.32	809.63	394.07	809.51	398.94	809.45
403.06	809.94	422.39	812.19	432.81	813.02	439.57	813.46		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1413.07	.05	-18.38	.035	28.13	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-18.38	28.13	233	99.41	34	.1	.3

CROSS SECTION

RIVER: Buckeye Creek

REACH: Buckeye Creek RS: 1804

INPUT
Description: DD
Station Elevation Data num= 478

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1396.08	849.12	-1383.75	849.04	-1383.69	849.04	-1370.49	848.96	-1370.44	848.96
-1234.66	848.07	-1234.57	848.07	-1230.66	848.04	-1230.61	848.04	-1224.16	848
-1216.18	847.98	-1212.74	847.98	-1211.7	847.97	-1210.21	847.97	-1205.76	847.96
-1204.5	847.96	-1203.49	847.95	-1203.36	847.95	-1153.12	847.81	-1152.24	847.81
-1049.68	848.09	-1048.98	848.1	-1048.59	848.1	-1047.88	848.11	-1011.12	848.23
-1010.19	848.23	-1009.53	848.24	-1007.04	848.24	-1006.33	848.25	-1006.26	848.25
-1003.2	848.26	-1000.46	849.82	-1000.17	849.98	-997.98	851.23	-997.43	851.54
-995.51	852.64	-994.69	853.1	-993.03	854.05	-991.95	854.66	-990.55	855.46
-989.21	856.23	-978.93	862.09	-977.58	862.87	-977.22	862.82	-977.17	862.81
-888.53	852.6	-886.83	852.48	-883.74	852.37	-880.57	852.36	-877.43	852.44
-874.43	852.62	-817.9	860.3	-817.78	860.31	-815.04	860.59	-813.74	860
-813.61	859.94	-813.32	859.81	-791.73	849.66	-789.16	848.46	-787.68	847.77
-786.95	847.44	-786.87	847.4	-786.28	847.13	-785.25	846.66	-785.09	846.58
-782.97	845.62	-781	844.74	-779.14	843.91	-774.23	841.6	-772.61	840.87
-771.02	840.11	-767.18	838.26	-763.79	836.63	-760.76	835.19	-758.03	833.9
-755.57	832.73	-753.33	831.68	-751.28	830.73	-749.4	829.86	-747.66	829.06
-746.06	828.32	-744.57	827.64	-743.17	827.01	-741.87	826.43	-740.65	825.88
-739.5	825.37	-738.42	824.9	-737.4	824.45	-736.43	824.03	-735.51	823.63
-734.64	823.26	-733.81	822.91	-733.02	822.58	-732.26	822.26	-731.53	821.96
-730.84	821.68	-730.17	821.41	-729.53	821.15	-728.91	820.9	-728.31	820.67
-727.74	820.45	-727.18	820.23	-726.65	820.03	-726.13	819.83	-725.62	819.64
-725.14	819.46	-724.66	819.29	-724.2	819.12	-723.76	818.96	-723.32	818.81
-722.9	818.66	-722.48	818.52	-722.08	818.38	-721.69	818.25	-721.3	818.13
-720.93	818	-720.56	817.88	-720.2	817.77	-720.02	817.71	-719.67	817.61
-719.33	817.5	-718.99	817.4	-718.66	817.3	-718.34	817.21	-718.02	817.12
-717.71	817.03	-717.4	816.94	-717.09	816.86	-716.79	816.78	-716.5	816.71
-716.21	816.63	-715.92	816.56	-715.64	816.49	-715.5	816.46	-715.22	816.39
-714.95	816.33	-714.67	816.26	-714.4	816.21	-714.14	816.15	-713.87	816.09
-713.61	816.04	-713.35	815.99	-713.09	815.94	-712.59	815.84	-712.33	815.8
-712.08	815.75	-711.83	815.71	-711.59	815.67	-711.34	815.64	-711.09	815.6
-710.85	815.56	-710.61	815.53	-710.36	815.5	-710.12	815.47	-709.88	815.44
-709.64	815.41	-709.39	815.39	-709.15	815.37	-708.91	815.34	-708.67	815.32
-708.42	815.3	-708.16	815.28	-707.89	815.27	-707.6	815.25	-707.31	815.23
-707	815.22	-706.85	815.22	-706.69	815.21	-706.53	815.21	-706.37	815.2
-705.96	815.2	-705.23	815.18	-705.02	815.18	-704.29	815.17	-704.08	815.16
-703.35	815.15	-703.14	815.15	-702.41	815.13	-702.2	815.13	-701.38	815.11
-700.96	815.11	-700.23	815.09	-700.02	815.09	-699.28	815.08	-699.08	815.07
-698.34	815.06	-698.13	815.05	-697.4	815.04	-697.19	815.04	-696.46	815.02
-696.25	815.02	-695.52	815.01	-695.31	815	-694.57	814.99	-694.36	814.98
-691.24	814.93	-691.03	814.93	-690.06	814.91	-689.85	814.91	-689.16	814.9
-688.95	814.9	-687.97	814.88	-687.76	814.88	-687.2	814.87	-686.99	814.87
-686.3	814.86	-686.09	814.85	-685.11	814.84	-684.9	814.84	-684.03	814.82

-683.82	814.82	-683.28	814.81	-683.08	814.81	-682.2	814.79	-681.99	814.79
-681.38	814.78	-681.17	814.78	-680.29	814.76	-680.08	814.76	-679.47	814.75
-679.26	814.75	-678.17	814.73	-677.97	814.73	-677.34	814.72	-677.13	814.72
-676.61	814.71	-676.41	814.71	-675.29	814.69	-675.09	814.68	-673.83	814.65
-673.12	814.63	-672.91	814.63	-672.21	814.61	-672.08	814.6	-671.37	814.58
-671.24	814.58	-670.16	814.54	-669.33	814.5	-668.89	814.48	-668.07	814.44
-667.85	814.43	-666.84	814.37	-664.72	814.24	-663.19	814.14	-661.88	814.04
-661.43	814	-660.86	813.95	-660.48	813.92	-659.76	813.86	-659.5	813.83
-658.78	813.77	-657.98	813.69	-656.82	813.58	-655.84	813.48	-654.93	813.38
-654.35	813.31	-654.24	813.3	-653.65	813.23	-653.54	813.22	-652.88	813.14
-651.53	812.98	-651.11	812.93	-649.57	812.73	-649.43	812.71	-649.25	812.68
-647.97	812.51	-647.88	812.5	-646.99	812.38	-646.91	812.37	-646.85	812.35
-646.08	812.25	-645.38	812.14	-644.79	812.06	-644.64	812.03	-644.05	811.94
-643.48	811.85	-642.9	811.76	-642.76	811.73	-642.2	811.64	-641.63	811.56
-641.49	811.53	-641.33	811.5	-640.76	811.41	-640.19	811.32	-638.04	810.95
-637.91	810.92	-637.09	810.77	-636.97	810.75	-635.3	810.45	-635.19	810.43
-634.35	810.28	-634.24	810.25	-633.39	810.1	-633.29	810.08	-631.58	809.77
-631.48	809.75	-630.62	809.58	-630.53	809.56	-629.66	809.4	-629.58	809.38
-628.7	809.22	-626.81	808.84	-626.74	808.83	-625.73	808.62	-625.67	808.61
-624.65	808.4	-624.59	808.39	-623.56	808.18	-623.51	808.16	-614.53	806.32
-607.2	806	-605.8	806	-564.39	806.32	-561.52	806.36	-546.23	806.28
-530.19	806	-513.95	806	-510.97	805.92	-510.05	805.89	-510	805.89
-509.14	805.87	-509.08	805.87	-508.23	805.84	-508.14	805.84	-507.3	805.82
-507.21	805.82	-506.38	805.8	-506.28	805.8	-504.65	805.76	-504.53	805.76
-503.73	805.74	-503.6	805.74	-502.73	805.71	-502.59	805.71	-501.73	805.69
-501.57	805.69	-500.72	805.67	-500.56	805.67	-499.72	805.65	-499.54	805.65
-498.72	805.63	-498.53	805.63	-497.71	805.61	-497.51	805.61	-496.71	805.59
-496.49	805.59	-495.78	805.57	-495.55	805.57	-494.84	805.55	-494.61	805.55
-493.91	805.54	-493.67	805.54	-492.97	805.52	-491.94	805.53	-489.21	805.43
-412.51	804	-304.14	804	-300.51	804.06	-298.35	804.09	-298.11	804.1
-298.05	804.1	-297.62	804.12	-297.52	804.12	-297.1	804.13	-295.82	804.18
-295.67	804.19	-293.01	804.28	-283.45	804.57	-283.08	804.59	-281.52	804.62
-281.12	804.64	-280.36	804.65	-279.51	804.69	-276.38	804.77	-275.9	804.78
-275.2	804.8	-274.7	804.82	-274.02	804.84	-273.5	804.85	-272.84	804.87
-272.3	804.89	-271.65	804.9	-271.09	804.92	-270.47	804.94	-269.88	804.96
-269.28	804.97	-268.67	804.99	-268.09	805.01	-267.46	805.03	-266.89	805.04
-266.24	805.07	-265.7	805.08	-265.03	805.1	-264.56	805.11	-263.87	805.14
-263.42	805.15	-258.67	805.33	-258.29	805.34	-257.41	805.38	-257.06	805.39
-256.15	805.43	-255.82	805.44	-253.87	805.53	-245.18	806	-244.51	806
-241.38	806.28	-239.56	806.43	-233.05	807	-226.36	807.56	-224.49	807.72
-221.05	808	-204.34	810	-166.05	810	-165.66	809.96	-144.89	808
-136.39	807.52	-126.97	807.01	-124.93	806.9	-114.75	806.57	-114.5	806.58
-105.39	807.14	-105.11	807.15	-104.87	807.59	-102.72	807.59	-99.84	807.51
-96.18	807.6	-83.79	807.59	-82.74	807.43	-81.14	807.02	-74.18	807.03
-58.27	806.73	-58.03	806.72	-55.94	806.72	-39.68	806.59	-32.02	806.65
-22.12	806.46	-19.59	802.08	-16.74	798.47	-15.6	798.33	-11.62	797.78
-6.78	798.22	-4.67	798.39	2.11	799.13	4.72	799.37	6.94	799.64
17.02	800.44	27.02	801.33	28.15	801.42	29.64	801.42	42.74	801.61

46.83	801.9	63.07	802.8	64.68	803.5	88.23	808.27	88.31	808.29
91.21	808.32	108.15	808.3	130.34	808.04	140.71	807.65	154.48	807.21
177.89	807.24	180.59	807.24	189.3	807.66	204.44	808.24	220.81	808.62
241.73	808.87	253.45	808.76	272.31	809.06	295.99	809.55	339.66	809.54
343.47	809.51	348.73	809.54	406.75	809.55	410.08	809.51	417.06	810.39
430.92	812.06	444.91	813.02	449.49	813.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1396.08	.05	-19.59	.035	28.15	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.59	28.15	279	199.46	52	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-1396.08	-240	812	F

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1604.54

INPUT
Description: EE
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-254.5	820.31	-253.81	820	-249.36	818.13	-249.04	818	-248.71	817.86
-244.27	816	-241.75	814.97	-239.41	814	-235.77	812.52	-234.46	812
-232.56	811.25	-229.43	810	-228.2	809.57	-224.74	808.38	-223.94	808.1
-223.65	808	-221.07	808	-220.61	808.01	-219.17	808.01	-219.17	808.05
-218.46	808.05	-218.07	808.25	-208.9	807.97	-202.66	807.8	-202.47	807.73
-199.15	806.81	-197.39	806.65	-185.15	805.67	-168.49	805.12	-165.13	805.01
-163.48	805.02	-161.69	805.03	-150.76	805.17	-148.36	804.05	-144.6	801.99
-144.14	801.94	-143.94	801.8	-140.03	799.92	-137.84	799.77	-137.23	799.58
-137.01	799.73	-134.93	801.41	-134.51	801.43	-126.72	801.94	-117.53	801.92
-102.19	801.63	-88	801.53	-78.33	801.45	-66.67	801.3	-53.5	801.47
-51.58	801.47	-36.89	801.33	-18.11	800.66	-15.8	800.56	-15.31	800.44
-11.66	798.9	-2.59	797.82	-2.27	797.8	-1.95	797.77	0	797.54
4.56	797	9.86	796.53	9.89	796.53	14.62	798.12	14.69	798.14
14.81	798.26	20.33	807.16	23.78	807.16	38.24	807.17	53.5	807.14
70.39	807.14	74	807.13	112.25	806.72	127.42	806.39	151.27	806.51
160.35	807.08	183.69	807.64	190.99	807.66	210.11	808.16	216.56	808.05
241.85	807.55	242.96	807.5	249.5	807.18	265.56	806.74	289.15	808.84
301.45	809.04	322.56	809.76	342.42	809.63	360.59	809.45	381.97	809.41
400.9	809.43	411.27	809.32	419.05	810.3	430.18	811.75	441.82	812.55
451.46	813.19								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-254.5	.05	-15.8	.035	20.33	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-15.8	20.33	149 184.82	41	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1419.72

INPUT
Description: FF
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-133.24	824.56	-130.81	824	-124.37	822.44	-122.58	822	-118.66	821.04
-114.37	820	-112.36	819.49	-106.45	818	-101.64	816.16	-98.65	815.34
-97.21	814.61	-89.43	814.27	-83.42	814	-82.62	813.97	-80.92	813.88
-75.91	810	-75.9	810	-72.82	810.28	-72.74	810.29	-71.16	810.43
-60.51	809.88	-58.71	809.82	-58.63	809.84	-57.68	809.87	-55.63	809.3
-52.04	808.3	-48.95	808.06	-43.9	807.61	-33.31	807.36	-29.68	807.31
-18.8	797.35	-18.51	797.15	-18.37	797.12	-9.34	796.76	-8.3	796.83
-1.89	796.37	-.01	796.51	0	796.51	5.24	797.45	10.42	797.23
15.88	797.82	25.35	798.02	28.91	797.99	35.53	800.94	37.02	801.47
37.8	801.6	46.24	803.46	74.68	805.31	77.76	805.47	79.29	805.55
80.95	805.57	112.25	806.16	129.82	806.8	146.42	807.27	181.61	807.14
183.67	807.12	193.95	807.06	228.2	806.84	237.5	806.83	265.27	806.79
281.86	806.66	304.04	806.21	331.38	805.94	344.68	806.3	350.86	806.46
385.2	806.66	387.18	806.61	399.69	807.42	427.18	809.24	432.84	809.27
465.47	809.54	480.67	809.4	493.5	809.13	509.05	808.96	518.95	808.89
532.2	808.89	549.9	809.02	555.9	809.02	563.05	809.83	577.38	811.63
584.8	812.16	599.7	813.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-133.24	.05	-29.68	.035	46.24	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-29.68	46.24	173 185.67	44	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1234.05

INPUT
Description: GG
Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-206.29	819.46	-200.65	818	-197.84	817.3	-192.78	816	-189.46	815.12
-185.16	814	-177.52	812.02	-177.45	812	-177.24	811.95	-169.56	810
-163.3	808.42	-161.62	808	-160.3	807.77	-150.98	806	-149.55	805.99
-141.69	805.98	-140.88	805.98	-133.89	805.95	-130.64	805.94	-129.27	805.94
-125.41	805.92	-125.27	805.92	-119.66	805.91	-119.47	805.91	-113.88	805.9
-113.55	805.9	-109.15	805.89	-108.61	805.89	-79.16	805.07	-45.36	804.14
-44.53	804.12	-43.45	804.1	-40.44	804.07	-38.68	804.06	-38.54	804.07
-38.37	804.07	-37.77	804.01	-37.24	804.01	-37.19	804	-30.78	802.5
-29.84	802	-26.29	800.22	-25.87	800	-25.24	799.69	-24.32	799.25
-21.9	798	16.74	798	19.43	799.16	21.39	800	22.15	800.53
22.62	800.82	24.24	801.82	24.53	802	24.55	802.01	24.8	802.16
25.01	802.28	25.19	802.38	25.35	802.48	25.49	802.56	25.62	802.63
25.72	802.69	25.82	802.75	25.91	802.8	25.99	802.85	26.06	802.9
26.13	802.94	26.19	802.97	26.24	803.01	26.29	803.04	26.34	803.07
26.39	803.09	26.43	803.12	26.47	803.14	26.5	803.16	26.54	803.18
26.57	803.2	26.6	803.22	26.63	803.24	26.66	803.24	54.23	804.14
56.94	804.2	74.1	806.44	77.21	806.52	80.14	806.6	85.51	806.59
126.38	806.77	130.45	806.77	167.98	806.63	179.11	806.59	180.44	806.58
215.96	806.5	220.86	806.45	248.62	806.24	255.71	806.16	256.04	806.17
276.79	805.61	282.15	805.6	287.71	805.65	319.14	806.74	339.94	807.72
355.88	808.41	377.43	808.5	408.02	808.34	427.41	808.18	441.89	808.29
466.55	808.44	473.08	808.48	487.87	810.16	499.3	811.52	507.36	812.1
507.64	812.12	523.13	813.21						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-206.29	.05	-37.19	.035	26.66	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-37.19	26.66	117	131.34	192.99	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 1102.70

INPUT
Description: HH
Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-289.51	823.17	-284.72	822.19	-283.86	822	-283.27	821.86	-274.9	820
-267.4	818.33	-265.91	818	-264.06	817.59	-257.15	816	-249.19	814.26
-248.06	814	-239.53	812.19	-238.72	812	-237.74	811.8	-228.6	810

-224.13	809.14	-217.49	808	-212.35	807.38	-210.24	807.28	-205.93	806.82
-205.12	806.75	-199.07	806.63	-196.69	806.46	-195.3	806.37	-195.04	806.35
-193.44	806.27	-192.41	806.23	-183.22	806.24	-178.07	806.21	-172.74	806.18
-171.92	806.16	-171.25	806.15	-161.2	806.03	-158.18	806.03	-156.25	806.02
-151.54	806.03	-151.43	806.03	-146.32	806.01	-146.26	806.01	-142.51	806
-133.64	805.85	-132.12	805.82	-129.94	805.78	-114.43	805.52	-102.78	805.34
-97.86	805.26	-93.46	805.2	-90.78	805.15	-87.77	805.1	-80.07	804.98
-73.86	804.89	-67.18	804.76	-58.77	804.6	-42.37	804.25	-31.66	804.01
-29.92	804.01	-28.29	804	-26.85	804	-25.69	803.66	-25.11	803.49
-22.2	802	-19.2	800.47	-18.27	800	-17.41	799.56	-14.62	798
18.13	798	18.51	798.19	22.22	800	24.75	801.24	26.32	802
28.22	802.93	31	804	31.94	804	41.11	804.07	45.61	804.3
54.04	804.54	83.33	805.28	91.06	805.49	94.01	805.59	95.91	805.61
132.94	806.3	136.29	806.33	139.49	806.35	164.42	806.54	183.4	806.63
186.37	806.61	231.26	806.05	238.05	806.05	275.37	806.2	280.92	806.2
282.25	806.21	307.77	807.46	324.8	809.33	330.91	809.81	335.5	810.13
336.15	810.18	372.12	812.23	372.24	812.18	373.78	812.33	375.76	812.44
382.54	812.44	392.23	812.55	401.64	812.64	414.95	812.72	417.44	812.75
433.14	812.79	442.12	812.72	464.37	812.83	472.75	812.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-289.51	.05	-25.69	.035	31	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-25.69	31	138.99	130.59	147.99	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 972.12

INPUT
Description: II
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-326.96	813.78	-325.06	813.78	-324.62	813.77	-312.1	813.79	-311.71	813.79
-311.3	813.78	-310.79	813.77	-310.71	813.77	-310.04	813.76	-309.09	813.74
-299.86	813.58	-299.5	813.58	-299.13	813.57	-296.5	813.51	-289.07	813.22
-281.87	812.99	-279.84	812.9	-276.56	812.81	-272.63	812.68	-270.91	812.59
-269.58	812.52	-264.51	812.38	-258.25	812.17	-257.11	812.12	-253.96	812.01
-252.79	812	-247.85	811.77	-247.06	811.74	-246.01	811.7	-235.69	811.04
-234.51	810.98	-230.45	810.9	-224.77	810.76	-217.17	810.53	-213.54	810.36
-203.45	810	-201.81	809.91	-179	808.59	-178.36	808.56	-174.95	808.41
-168.88	808	-168.86	807.99	-167.72	807.99	-166.02	807.98	-162.03	807.97
-158.82	807.97	-157.81	807.96	-156.68	807.96	-153.18	807.93	-152.17	807.93
-147.01	807.71	-124.98	806.82	-98.36	806.05	-98.02	806.03	-96.39	806

-96.31	806	-91.58	805.99	-90.9	805.99	-90.29	805.98	-87.34	805.98
-85.9	805.97	-82.63	805.96	-80.47	805.95	-78.95	805.94	-77.59	805.94
-55.94	805.33	-51.01	805.29	-46.29	805.27	-42.91	805.22	-39.87	805.19
-36.91	805.19	-33.31	804.55	-30.41	804.02	-30.31	804.02	-30.21	804
-28.09	802.54	-27.19	802	-25.5	801.1	-22.96	800	-18.37	797.56
17.93	797.56	20.45	798	26.11	799.94	26.31	800	32.11	801.03
32.83	802	49.01	803.35	49.44	803.36	55.53	803.3	55.72	803.39
56.74	803.46	60.16	803.53	85.01	805.01	113.83	805.2	119.81	805.24
126.8	805.29	131.99	805.27	139.45	805.25	147.43	805.3	150.86	805.04
162.7	804.62	166.24	804.54	176.45	805.43	177.27	805.48	179.3	805.58
201.26	806.42	208.15	807.25	223.45	808.52	236.82	809.7	252.78	811.09
252.86	811.07	252.99	811.08	255.67	811.11	272.38	811.61	292.88	811.69
300.43	811.78	310.06	811.68	312.5	811.63	314.79	811.65	317.61	811.73
317.72	811.84	317.8	811.83	320.16	811.81	334.73	811.83	341.58	811.8
343.41	811.9	345.47	811.78	346.96	811.81	348.55	811.78	352.07	811.8
367.83	811.79	370.45	811.82	383.76	811.8	383.94	811.82	395.49	811.86
398.25	811.88	398.32	812.08	398.42	811.98	398.86	812.41	408.62	812.42
418.24	812.27	427.48	812.07	437.72	811.84	443.56	811.77	454.65	811.84
466.98	811.99	475.86	812.18	480.39	812.38	482.7	812.57	490.96	812.47
496.51	812.45	496.72	812.45	505.62	812.64	511.92	812.78		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-326.96	.05	-30.21	.035	32.83	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-30.21	32.83	168	161.32	108	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 810.82

INPUT
Description: JJ
Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-216.91	814	-201.74	814	-195.8	813.64	-188.84	813.23	-185.45	813.15
-179.25	812.94	-152.13	813.27	-151.81	813.26	-149.47	813.17	-146.37	813.02
-146.36	813.01	-146.32	813.02	-140.6	812.84	-136.23	812.99	-129.02	812.75
-127.18	812.76	-123.2	812.8	-119.29	812.67	-118.82	812.66	-111.87	812.43
-109.55	812.36	-100.54	812.03	-99.84	812	-98.62	811.93	-97.8	811.89
-83.42	811.14	-76.85	810.72	-74.41	810.56	-73.74	810.51	-71.49	810.36
-66.78	810	-61.45	809.65	-58.64	809.44	-52.08	808.96	-50.37	808.85
-41.46	808	-38.34	807.75	-37.59	807.68	-36.09	807.5	-24.8	806
-20.35	804.6	-18.41	804	-18.33	803.94	-15.01	802	-12.97	800.82
-11.05	800	-10.24	799.15	-8.85	797.3	24.85	797.3	27.53	798

27.87	801.86	28.46	802.53	32.36	803.16	42.61	804.76	59.3	804.95
77.03	805.06	103.24	805.26	119.26	805.35	128.03	805.42	149.59	805.57
160.78	805.68	192.07	805.53	197.51	805.48	238.72	804.72	239.38	804.7
240.47	804.67	256.38	804.26	262.57	804.13	266.56	804.18	293.85	808.49
296.89	808.94	300.24	809.22	329.56	811.43	333.28	811.66	333.32	811.67
333.59	811.64	340.57	811.73	344.49	811.76	350.15	811.95	362.33	812.32
365.48	812.39	381.25	812.44	388.26	812.42	396.23	812.36	413.4	812.25
424.49	812.31	455.96	812.46	456.15	812.5	459.79	812.5	467.99	812.4
475.02	812.37	489.17	812.37	489.52	812.38	497.79	812.49	498.41	812.49
498.56	812.48	500.17	812.48	500.38	812.49	504.02	812.49	504.27	812.5
505.51	812.5	505.75	812.51	506.43	812.51	506.65	812.52	507.27	812.52
507.46	812.53	507.82	812.53	524.88	812.93				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-216.91	.05	-20.35	.035	42.61	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-20.35	42.61	200	178.48	258	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
256	524.88	812	T

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 604.54

INPUT
Description: KK
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-233.17	814	-229.74	814	-227.55	813.99	-215.7	813.99	-206.84	813.98
-204.79	813.98	-194.7	813.99	-163.17	813.97	-158.18	813.97	-152.63	813.96
-146.76	813.97	-125.89	813.97	-121.27	813.96	-116.24	813.98	-115.18	813.97
-113.58	813.97	-103.05	813.98	-102.55	813.98	-96.44	814	-96.25	814
-92.59	813.97	-89.12	813.99	-88.46	813.99	-77.63	814	-76.17	814.02
-76.04	814.02	-75.05	814	-72.8	813.99	-71.53	814	-68.29	814.02
-67.62	814.01	-67.07	814	-63.14	813.78	-62.62	813.72	-62.43	813.69
-57.74	813.21	-57.28	813.17	-52.18	812.77	-48.03	812	-43.21	810.5
-41.73	810	-40.19	809.46	-37.43	808	-35.6	807.07	-33.63	806
-31.7	804.92	-29.91	804	-27.7	802.73	-26.3	802	-22.66	800.11
-22.46	800	-22.11	799.82	-21.66	799.6	-20.99	799.31	-19.22	798.49
-18.32	798	-17.81	797.64	-17.52	797.32	-17.41	797.2	-17.2	797.09
-17.13	797.06	-17.04	796.98	-14.15	796.98	-9.7	796.97	4.23	796.97
12.96	796.96	14.52	797.58	15.57	798	16.4	798.23	37.02	804.34
47.48	805.46	49.7	805.63	55.05	805.93	68.73	806.02	86.07	805.93

99.47	805.93	103.38	805.75	123.56	805.98	131.93	806.3	155.1	806.45
176.92	806.19	200.24	806.3	221.5	806.49	244.67	806.72	248.53	807.85
258.28	812.73	258.42	812.8	261.53	812.52	261.56	812.52	261.73	812.5
262.12	812.47	262.92	812.41	263.01	812.36	263.92	812.82	267.39	812.93
287.84	812.5	287.88	812.72	287.94	813	388	813	391.44	812.93
394.5	812.87	394.55	812.63	394.6	812.37	411.03	812.06	414.52	812
425.73	811.97	453.54	811.61	515.74	812.44	529.7	812.7	529.77	812.28
529.97	812.27	537.83	812.44	544.99	812.58	545.63	812.59		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-233.17	.05	-52.18	.035	37.02	.05	258.28	.01

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-52.18	37.02	239	198.36	80	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 433.99

INPUT
Description: LL
Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-229.28	815.19	-223.93	814	-216.01	812.28	-214.67	812	-213.64	811.85
-199.65	810	-199.28	810	-197.88	809.99	-194.24	809.96	-194.22	809.96
-190.38	809.95	-185.59	809.93	-178.39	809.93	-174.76	809.91	-173.1	809.91
-135.76	808.85	-130.78	808.72	-124.61	808.57	-120.21	808.48	-106.08	808.19
-104.62	808.16	-97.07	808.01	-96.21	808	-90.61	808	-79.64	807.53
-70.25	807.22	-64	807.02	-57.82	806.79	-47.76	806.4	-45.29	806.3
-42.52	806.21	-41.03	806.16	-37.62	806.01	-36.96	806.01	-36.96	806
-33.53	804.27	-32.99	804	-30.1	802.54	-28.88	802	-28.63	801.88
-24.46	800	-22.46	799.07	-20.14	798	-17.33	797.01	-16.81	796.87
-16.16	796.69	0	796.69	9.79	796.7	11.95	797.86	12.22	798
15.13	799.3	16.69	800	17.37	800.24	22.52	802	22.94	802
25.48	802.9	25.81	802.98	28.19	803.48	28.29	803.55	28.37	802.29
28.38	802.57	28.38	802.29	28.4	802.28	28.41	802.28	35.29	802.76
46.97	803	49.07	803.48	55.32	804.73	65.63	804.46	75.14	804.3
82.19	804.93	83.76	805.01	94.64	805.48	107.93	805.05	115.02	805.14
115.99	805.19	132.96	805.87	140.42	806.12	179.17	805.81	186.1	805.75
219	805.95	229.2	806.56	235.54	809.71	239.7	811.78	242.02	811.91
242.66	811.95	243.11	811.97	243.34	811.99	244.23	811.99	245.16	811.53
245.24	811.57	248.82	811.61	308.7	812.28	323.8	812.29	339.72	812.3
342.29	812.26	414.31	811.66	424.55	811.53	436.11	811.44	504.49	812.68
512.71	812.76	512.77	811.98	513.14	811.94	513.84	811.86	522.29	812.04
528.92	812.18	531.68	812.24						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-229.28	.05	-36.96	.035	28.38	.05	244.23	.01

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-36.96	28.38	150.99	144.27	75.99	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 289.71

INPUT
Description: MM
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-348.33	816.57	-348.23	816.54	-347.81	816.44	-345.95	816	-342.84	815.36
-339.64	814.72	-336.02	814	-328.13	813.43	-322.18	813.05	-305.65	812
-302.14	811.76	-298.26	811.43	-280.91	810	-279.28	809.93	-246.45	808.55
-235.55	808	-182.43	808	-178.88	808.05	-178.72	808.05	-178.43	808.06
-178.1	808.06	-172.71	808.2	-168.02	808.31	-160.86	808.55	-144.31	808.1
-141.52	808.02	-137.87	808.02	-133.47	808.03	-127.35	808.03	-116.67	808.04
-91.7	808.03	-68.94	808.02	-55.73	808.02	-53.31	808.01	-42.03	808.01
-41.16	808	-36.46	808	-36.18	807.96	-34.84	807.82	-34.01	807.45
-33.88	807.41	-30.5	806	-28.59	805.2	-25.72	804	-24.06	803.13
-22.27	802	-20.72	801.07	-18.75	800	-17.18	799.08	-15.4	798
-13.05	797.13	-12.75	797.03	-12.38	796.91	-11.91	796.75	-11.27	796.55
-11	796.46	7.88	796.46	9.3	796.47	14.72	796.47	17.91	797.5
19.47	798	19.95	798.46	20.46	798.93	20.71	799.16	20.87	799.3
20.97	799.4	21.05	799.46	21.11	799.51	21.16	799.55	21.19	799.58
21.23	799.6	21.69	799.87	21.7	799.87	24.37	800.38	35.61	802.38
50.22	802.63	53.88	802.69	63.02	802.91	78.8	802.53	78.99	802.53
82.81	802.65	94.02	803.02	100.69	804.05	109.95	805.3	112.56	805.37
144.09	805.37	153.09	805.31	168.39	806.39	175.66	809.92	181.67	812.84
183.2	812.87	183.59	812.88	183.66	812.88	185.12	812.9	185.38	812.91
185.64	812.91	185.69	812.92	185.74	812.92	186.28	812.94	186.34	812.91
187.31	812.43	194.78	812.5	226.14	812.5	226.18	812.66	226.25	813
308.22	813	308.84	812.99	314.89	812.83	314.99	812.37	319.45	812.29
335.38	812	359.91	811.87	380.54	811.73	413.84	811.94	460.55	812.15
460.69	811.73	461.27	811.49	461.46	811.41	463.36	811.45	466.38	811.51
476.79	811.74	490.56	812.04						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-348.33	.05	-34.84	.035	35.61	.05	181.67	.01

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
-34.84	35.61	142	180.45	179	.1	.3

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 109.26

INPUT
Description: NN
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-420.57	814.39	-419.2	814	-407.77	813.42	-407.7	813.42	-379.04	812
-378.22	811.99	-334.8	811.11	-302.12	810.46	-279.5	810	-278.77	810
-199.19	808.01	-198.67	808	-196.71	808	-160.16	807.18	-150.67	806.97
-143.98	806.83	-123.71	806.44	-101.58	806	-100.78	806	-92.21	805.99
-80.49	805.97	-77.36	805.97	-69.5	805.98	-53.95	806	-35.79	806
-33.95	804.99	-32.14	804	-29.75	802.69	-28.49	802	-26.52	800.92
-25.03	800	-24.55	799.7	-20.63	798	-13.87	796.17	9.83	796.17
10.32	798	12.28	798	15.39	799.59	16.21	800	18.42	801.13
20.26	802	23.7	803.6	24.16	803.84	24.46	804	25.31	804.27
25.55	804.34	26.05	804.45	33.05	806	34.24	806	36.49	805.83
40.87	805.6	49.87	805.76	78.79	805.59	114.93	804.96	121.77	804.87
141.12	804.61	165.89	804.29	192.3	804.3	201.03	804.39	211.75	804.67
229.66	805	247.1	805.46	263.63	805.77	272.64	805.95	279.01	806.31
286.81	806.72	289.32	807.18	307.42	809.78	309.29	809.95	325.74	811.48
328.02	811.69	328.25	811.72	328.26	811.72	328.83	811.89		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-420.57	.05	-35.79	.035	33.05	.05

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
-35.79	33.05	105.99	109.26	120	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
92	328.83	812	T

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 0

INPUT
Description: OO
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-417.03	813.82	-412.45	812.94	-406.81	812	-405.22	812	-395.28	811.74
-380.91	811.39	-371.41	811.15	-364.68	810.99	-359.42	810.86	-355.34	810.77
-345.4	810.64	-340.02	810.54	-336.02	810.47	-325.13	810.34	-312.35	810.19
-297.14	810.01	-296.43	810	-295.59	810	-285.2	809.91	-274.56	809.84
-274.54	809.84	-273.77	809.83	-272.94	809.82	-262.55	809.73	-253.03	809.67
-251.8	809.66	-250.49	809.65	-241.36	809.57	-232.98	809.51	-230.33	809.49
-227.4	809.46	-224.11	809.42	-220.35	809.37	-208.38	809.22	-174.4	808.34
-171.28	808.24	-167.82	808.24	-159.55	808.19	-158.48	808.19	-156.58	808.18
-145.99	808.1	-141.41	808.1	-139.97	808.09	-136.44	808.09	-134.24	808.08
-131.11	808.06	-127.77	808.05	-120.4	808.02	-118.91	808.01	-117.81	808.01
-115.67	808	-113.81	807.99	-106.61	807.86	-105.72	807.84	-104.61	807.82
-104.57	807.82	-102.61	807.78	-99.96	807.71	-94.79	807.56	-82.5	807.22
-39.63	806	-38.69	806	-32.64	804.46	-31.48	804	-29.07	802.86
-27.45	802	-25.43	800.91	-24.71	800.57	-23.51	800	-21.41	799
-19.3	798	-10.6	796	11.36	796	20.55	798	22.64	798.89
25.23	800	25.29	800.03	25.3	800.03	29.05	802	30.21	802.61
33.02	804	35.92	804.98	39.77	804.98	55.66	804.9	86.81	804.9
121.46	804.49	134.69	804.4	178.19	803.99	181.7	803.96	182	803.96
184.59	803.99	228.44	804.47	248.69	805.15	255.51	805.29	257.89	805.39
258.14	805.47	259.94	805.87	277.19	809.69	294.63	811.77	300.3	812.2
300.82	812.43	300.99	812.54						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-417.03	.05	-38.69	.035	35.92	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-38.69	35.92	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Buckeye Creek

Reach	River Sta.	n1	n2	n3	n4
Buckeye Creek	3504.54	.05	.035	.05	
Buckeye Creek	3454.54	.05	.035	.05	
Buckeye Creek	3404.54	.05	.035	.05	
Buckeye Creek	3354.54	.05	.035	.05	
Buckeye Creek	3304.54	.05	.035	.05	
Buckeye Creek	3254.54	.05	.035	.05	
Buckeye Creek	3204.54	.05	.035	.05	
Buckeye Creek	3154.54	.05	.035	.05	
Buckeye Creek	3104.54	.05	.035	.05	
Buckeye Creek	3054.54	.05	.035	.05	

Buckeye Creek	3004.54	.05	.035	.05	
Buckeye Creek	2954.54	.05	.035	.05	
Buckeye Creek	2904.54	.05	.035	.05	
Buckeye Creek	2854.58	.05	.035	.05	
Buckeye Creek	2804.54	.05	.035	.05	
Buckeye Creek	2754.54	.05	.035	.05	
Buckeye Creek	2704.54	.05	.035	.05	
Buckeye Creek	2661.29	.05	.035	.05	
Buckeye Creek	2603.43	.05	.035	.05	
Buckeye Creek	2554.54	.05	.035	.05	
Buckeye Creek	2494.62	.05	.035	.05	
Buckeye Creek	2460.04	Bridge			
Buckeye Creek	2417.85	.05	.035	.05	
Buckeye Creek	2354.53	.05	.035	.05	
Buckeye Creek	2306.38	.05	.035	.05	
Buckeye Creek	2254.54	.05	.035	.05	
Buckeye Creek	2204.54	.05	.035	.05	
Buckeye Creek	2154.54	.05	.035	.05	
Buckeye Creek	2105.74	.05	.035	.05	
Buckeye Creek	1903.41	.05	.035	.05	
Buckeye Creek	1804	.05	.035	.05	
Buckeye Creek	1604.54	.05	.035	.05	
Buckeye Creek	1419.72	.05	.035	.05	
Buckeye Creek	1234.05	.05	.035	.05	
Buckeye Creek	1102.70	.05	.035	.05	
Buckeye Creek	972.12	.05	.035	.05	
Buckeye Creek	810.82	.05	.035	.05	
Buckeye Creek	604.54	.05	.035	.05	.01
Buckeye Creek	433.99	.05	.035	.05	.01
Buckeye Creek	289.71	.05	.035	.05	.01
Buckeye Creek	109.26	.05	.035	.05	
Buckeye Creek	0	.05	.035	.05	

SUMMARY OF REACH LENGTHS

River: Buckeye Creek

Reach	River Sta.	Left	Channel	Right
Buckeye Creek	3504.54	50	50	50
Buckeye Creek	3454.54	52	50	50
Buckeye Creek	3404.54	55	50	50
Buckeye Creek	3354.54	35	50	50
Buckeye Creek	3304.54	55	50	47
Buckeye Creek	3254.54	43	50	52

Buckeye Creek	3204.54	44	50	51
Buckeye Creek	3154.54	48	50	52
Buckeye Creek	3104.54	22	50	48
Buckeye Creek	3054.54	23	50	53
Buckeye Creek	3004.54	36	50	48
Buckeye Creek	2954.54	36	50	48
Buckeye Creek	2904.54	42	49.96	51
Buckeye Creek	2854.58	40	50.04	52
Buckeye Creek	2804.54	87	50	60
Buckeye Creek	2754.54	109	50	58
Buckeye Creek	2704.54	52	43.25	43
Buckeye Creek	2661.29	53	58	63
Buckeye Creek	2603.43	68	48.89	51
Buckeye Creek	2554.54	83	59.92	60
Buckeye Creek	2494.62	170	76.77	86
Buckeye Creek	2460.04	Bridge		
Buckeye Creek	2417.85	91	63.32	62
Buckeye Creek	2354.53	144	48.15	69
Buckeye Creek	2306.38	90	51.84	42
Buckeye Creek	2254.54	90	50	45
Buckeye Creek	2204.54	74	50	44
Buckeye Creek	2154.54	63	48.8	47
Buckeye Creek	2105.74	190	202.35	215
Buckeye Creek	1903.41	233	99.41	34
Buckeye Creek	1804	279	199.46	52
Buckeye Creek	1604.54	149	184.82	41
Buckeye Creek	1419.72	173	185.67	44
Buckeye Creek	1234.05	117	131.34	192.99
Buckeye Creek	1102.70	138.99	130.59	147.99
Buckeye Creek	972.12	168	161.32	108
Buckeye Creek	810.82	200	178.48	258
Buckeye Creek	604.54	239	198.36	80
Buckeye Creek	433.99	150.99	144.27	75.99
Buckeye Creek	289.71	142	180.45	179
Buckeye Creek	109.26	105.99	109.26	120
Buckeye Creek	0	0	0	0

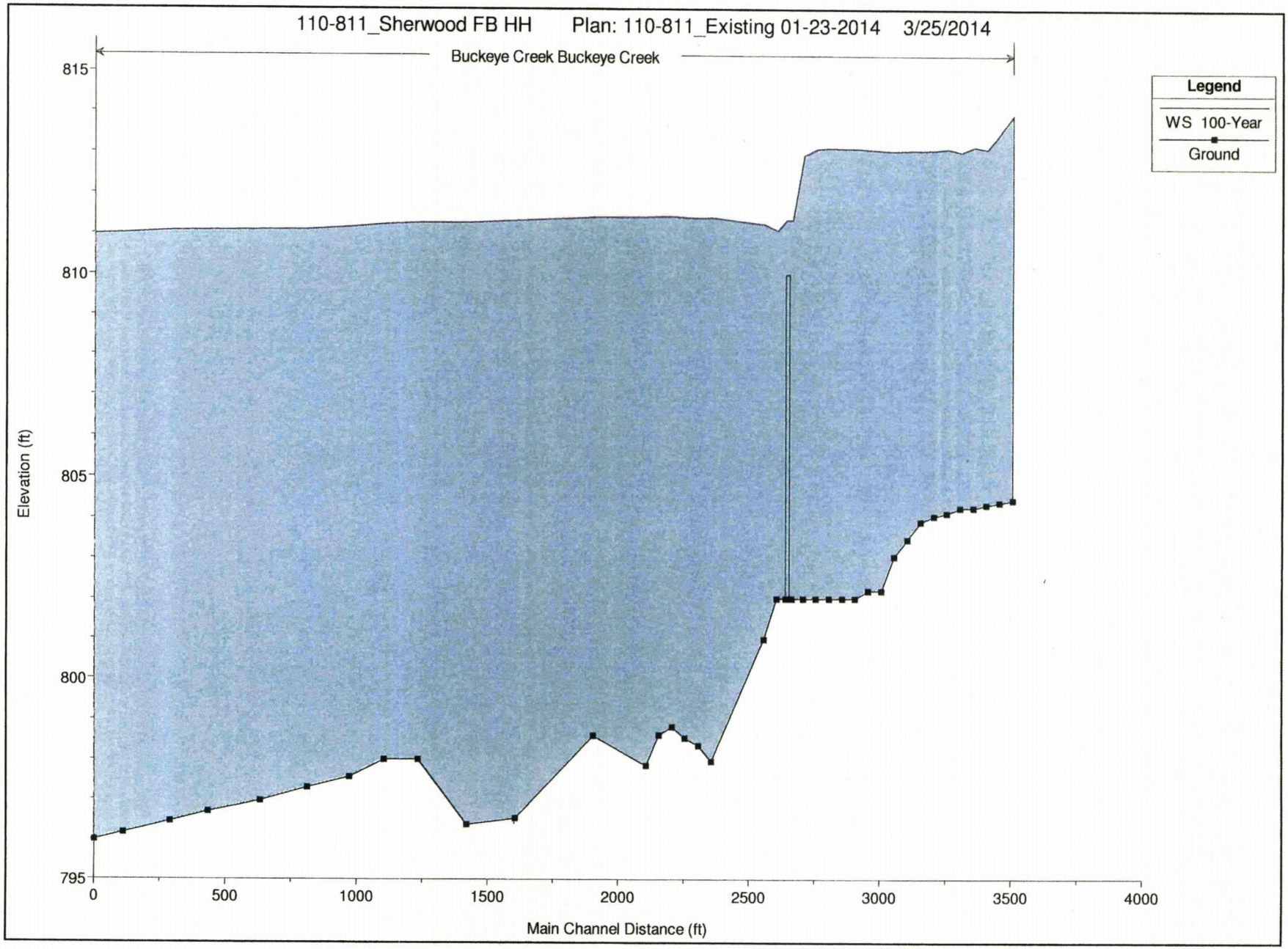
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Buckeye Creek

Reach	River Sta.	Contr.	Expan.
Buckeye Creek	3504.54	.1	.3
Buckeye Creek	3454.54	.1	.3

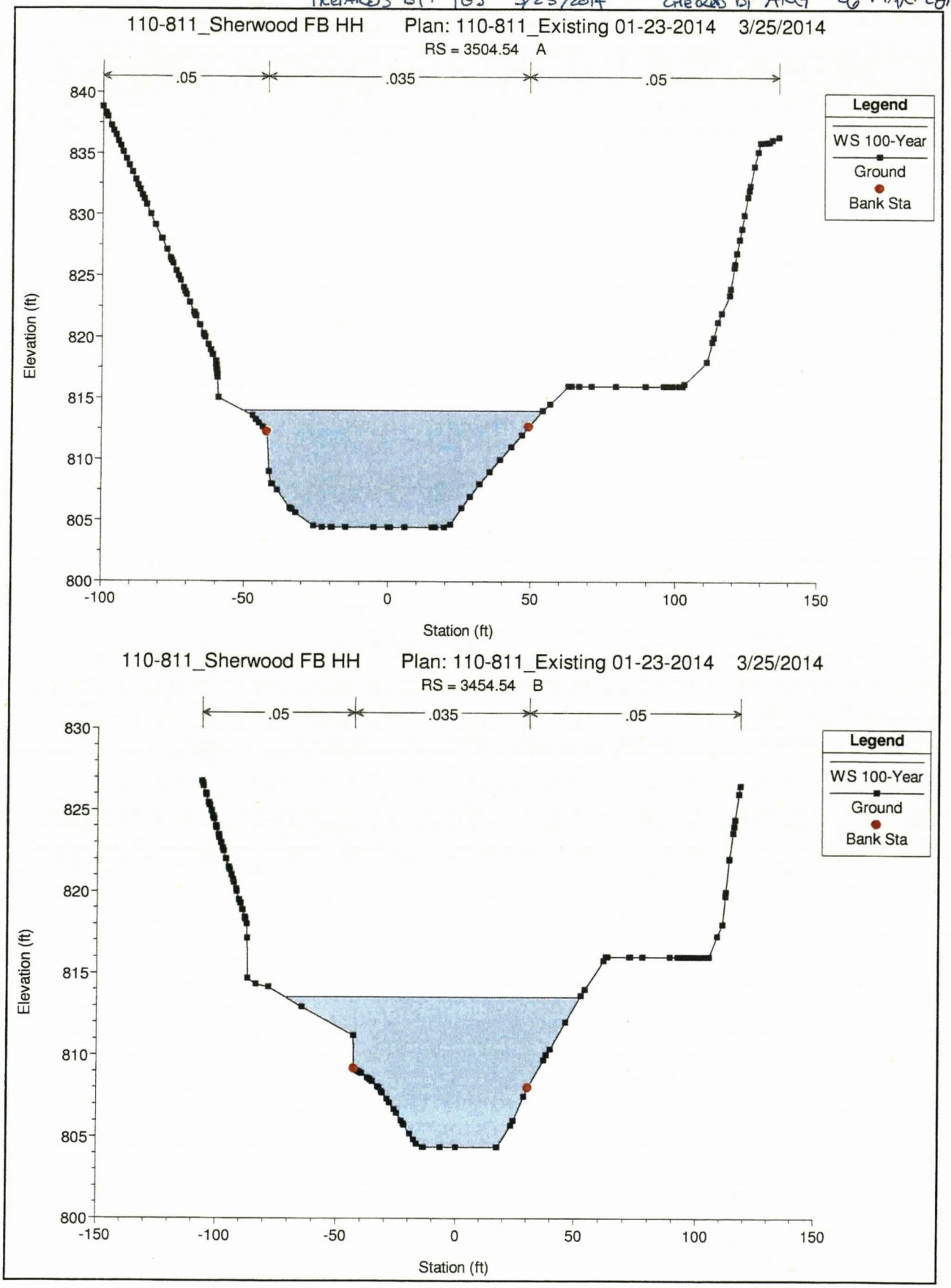
Buckeye Creek	3404.54		.1	.3
Buckeye Creek	3354.54		.1	.3
Buckeye Creek	3304.54		.1	.3
Buckeye Creek	3254.54		.1	.3
Buckeye Creek	3204.54		.1	.3
Buckeye Creek	3154.54		.1	.3
Buckeye Creek	3104.54		.1	.3
Buckeye Creek	3054.54		.1	.3
Buckeye Creek	3004.54		.1	.3
Buckeye Creek	2954.54		.1	.3
Buckeye Creek	2904.54		.1	.3
Buckeye Creek	2854.58		.1	.3
Buckeye Creek	2804.54		.1	.3
Buckeye Creek	2754.54		.1	.3
Buckeye Creek	2704.54		.1	.3
Buckeye Creek	2661.29		.1	.3
Buckeye Creek	2603.43		.1	.3
Buckeye Creek	2554.54		.1	.3
Buckeye Creek	2494.62		.3	.5
Buckeye Creek	2460.04	Bridge		
Buckeye Creek	2417.85		.3	.5
Buckeye Creek	2354.53		.1	.3
Buckeye Creek	2306.38		.1	.3
Buckeye Creek	2254.54		.1	.3
Buckeye Creek	2204.54		.1	.3
Buckeye Creek	2154.54		.1	.3
Buckeye Creek	2105.74		.1	.3
Buckeye Creek	1903.41		.1	.3
Buckeye Creek	1804		.1	.3
Buckeye Creek	1604.54		.1	.3
Buckeye Creek	1419.72		.1	.3
Buckeye Creek	1234.05		.1	.3
Buckeye Creek	1102.70		.1	.3
Buckeye Creek	972.12		.1	.3
Buckeye Creek	810.82		.1	.3
Buckeye Creek	604.54		.1	.3
Buckeye Creek	433.99		.1	.3
Buckeye Creek	289.71		.1	.3
Buckeye Creek	109.26		.1	.3
Buckeye Creek	0		.1	.3

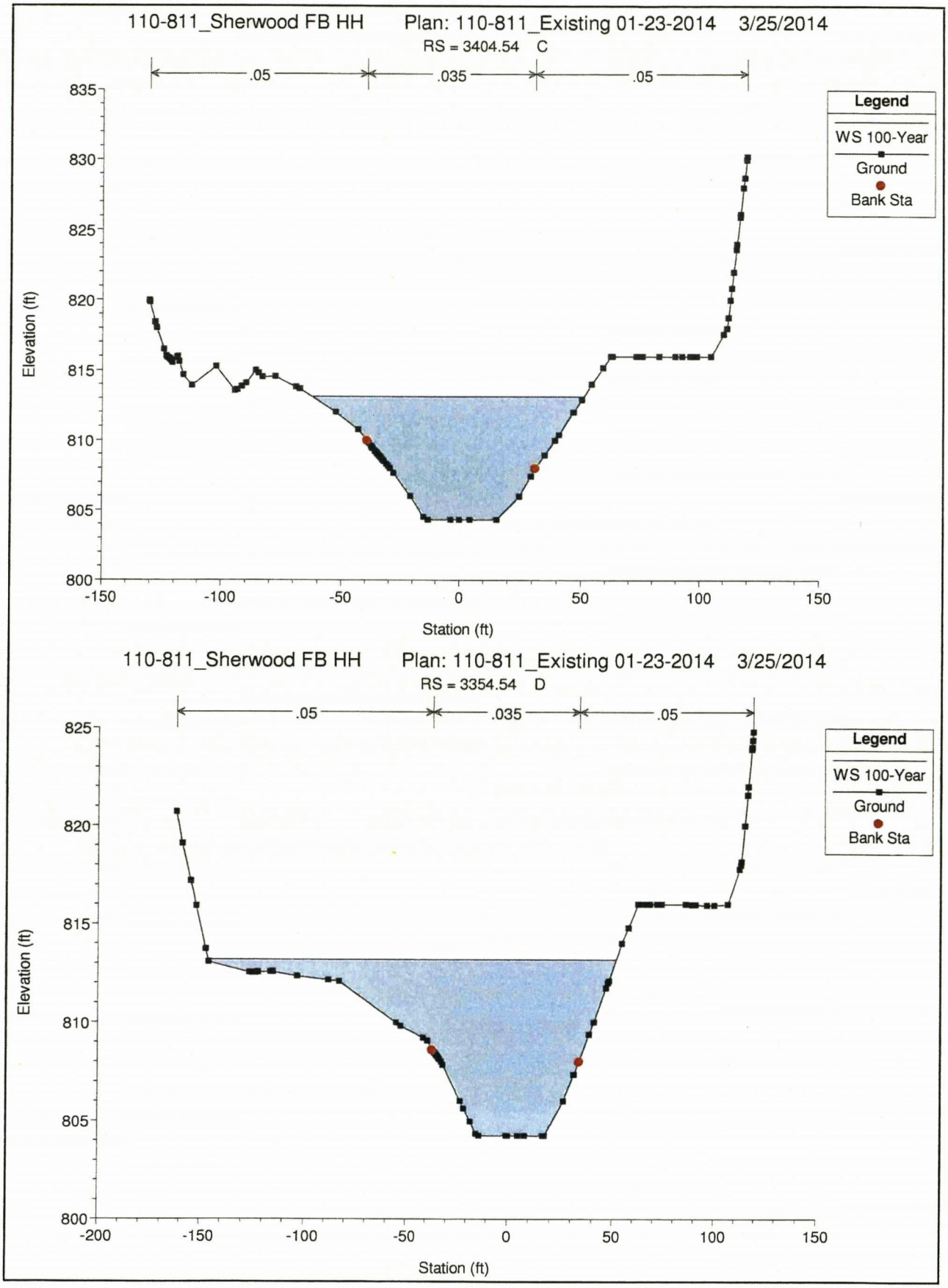
APPENDIX D

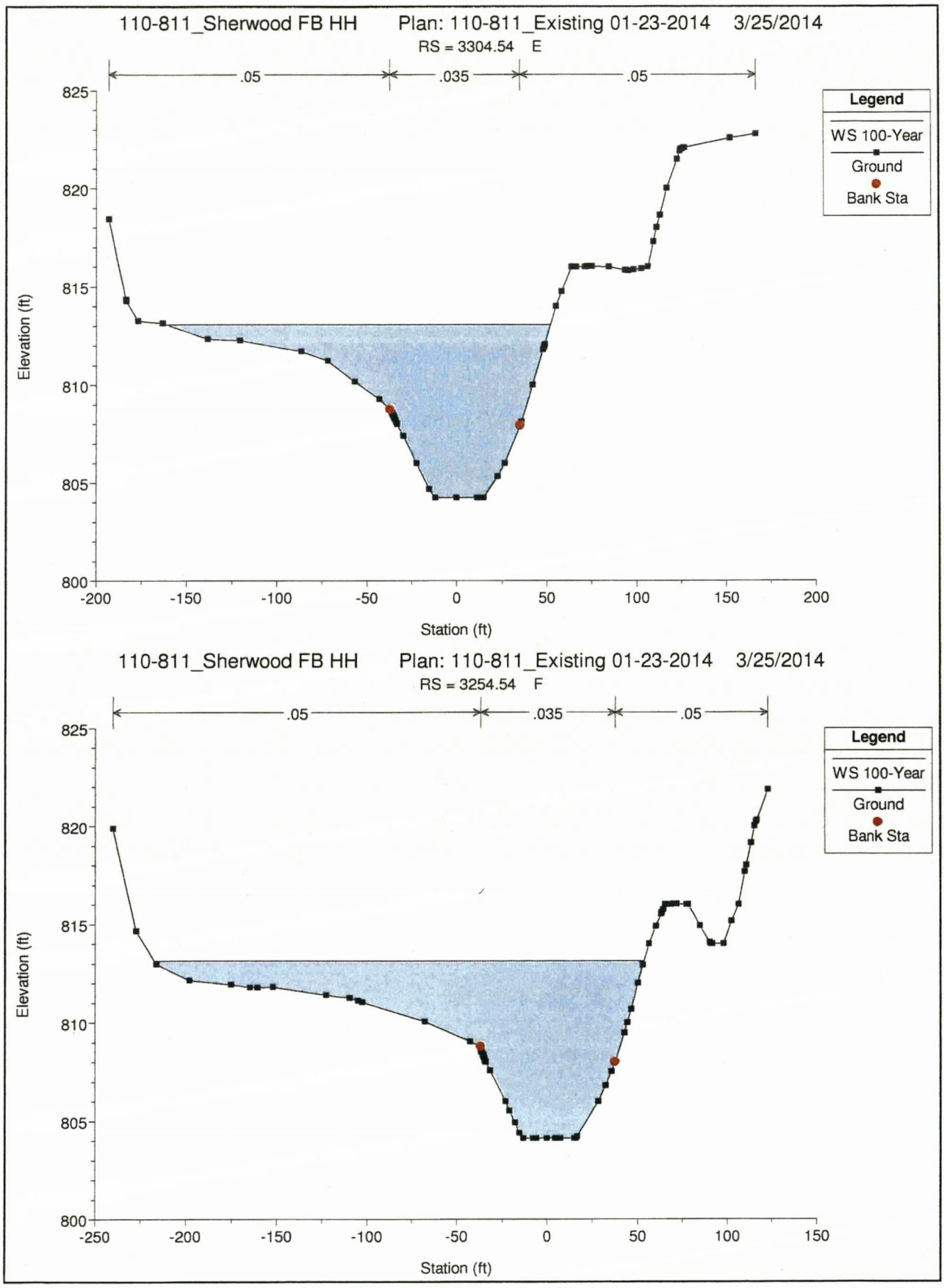
EXISTING AND PROPOSED FLOODWAY MAPS, WATER SURFACE PROFILES, AND CROSS SECTION OUTPUT

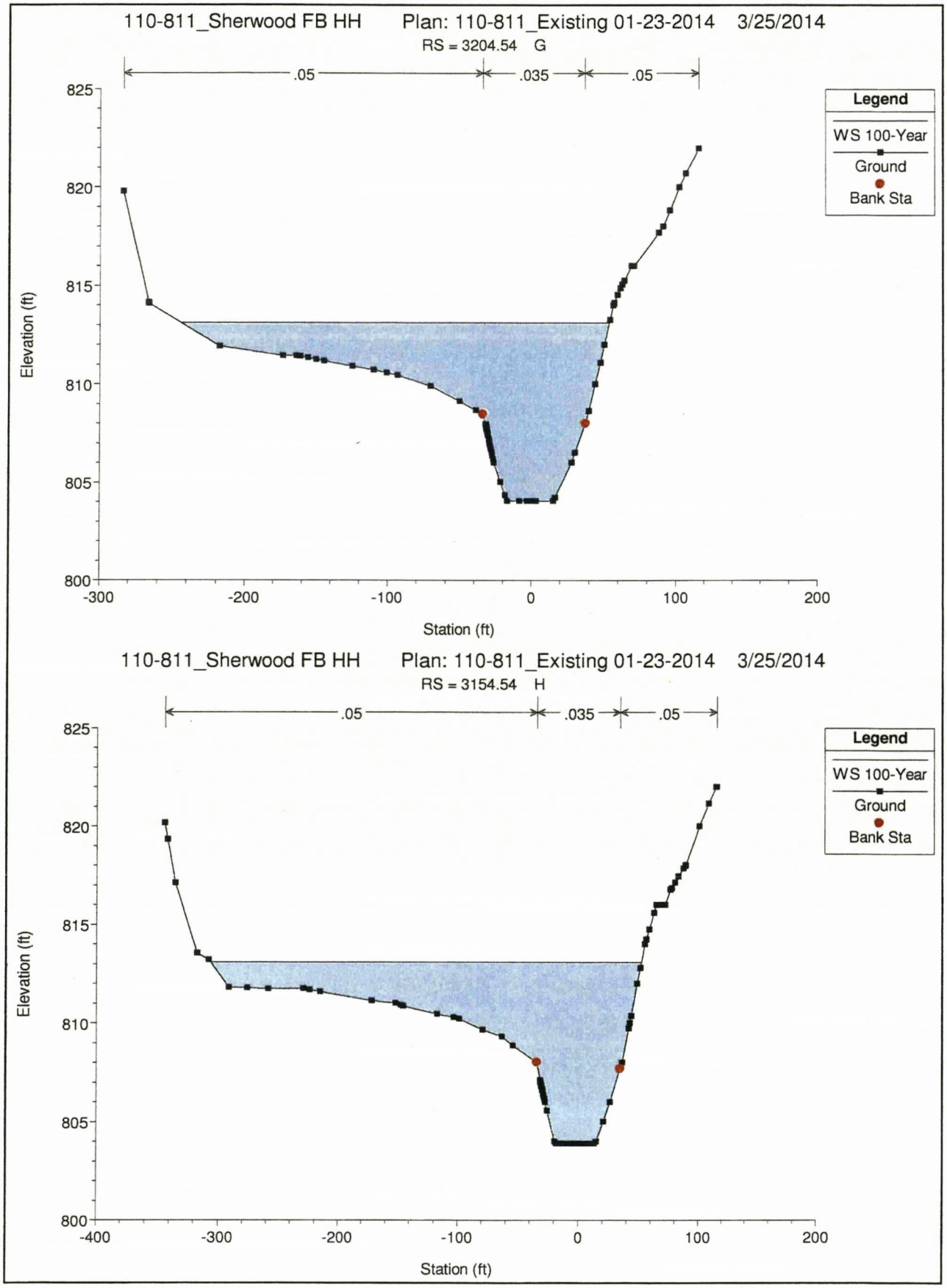

110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
Buckeye Creek Buckeye Creek
Legend
WS 100-Year
Ground
Elevation (ft)
815
810
805
800
795
0
500
1000
1500
2000
2500
3000
3500
4000
Main Channel Distance (ft)

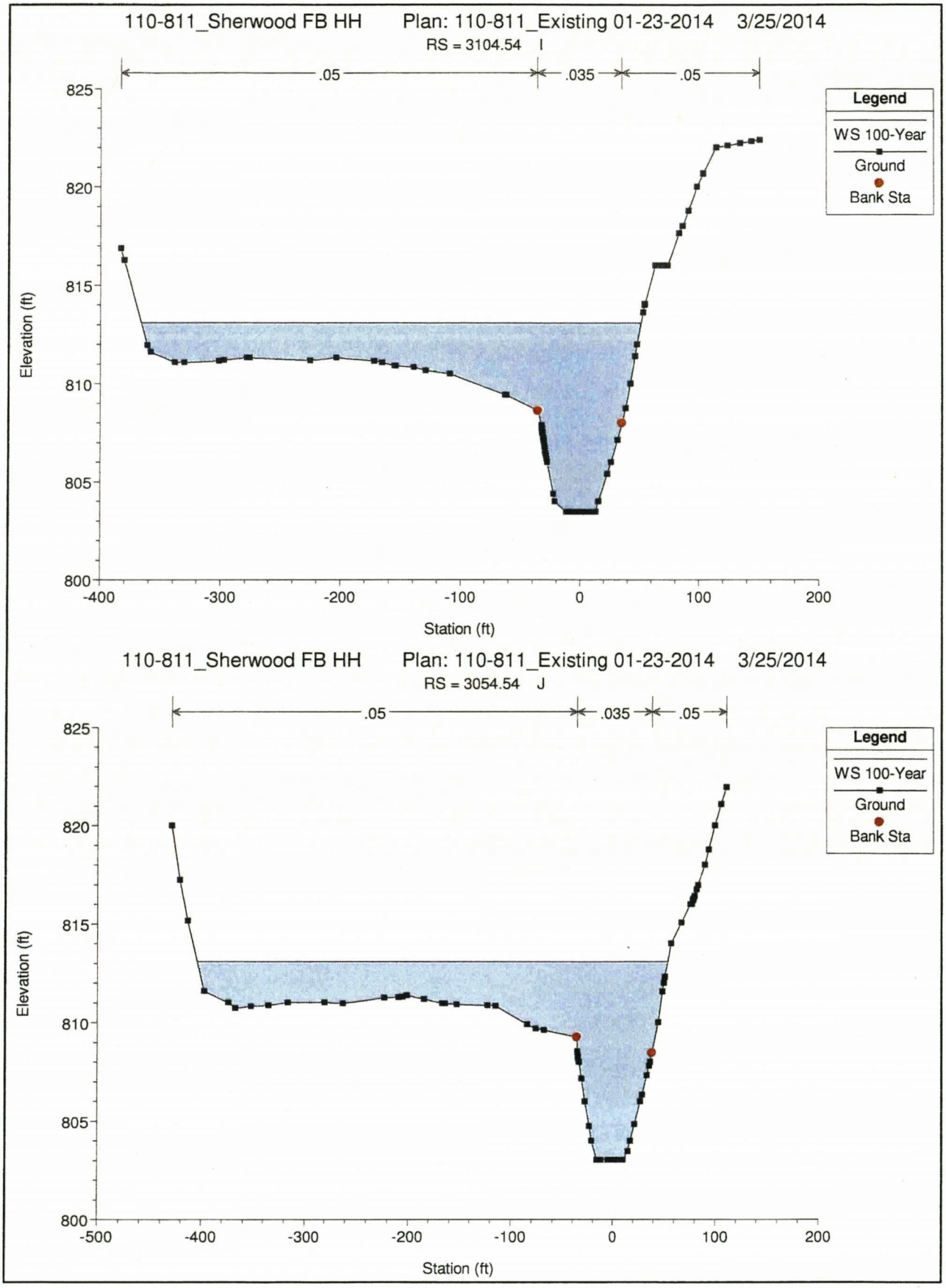
PREPARED BY: TGJ 3/25/2014 CHECKED BY: ARG 26-MAR-2014

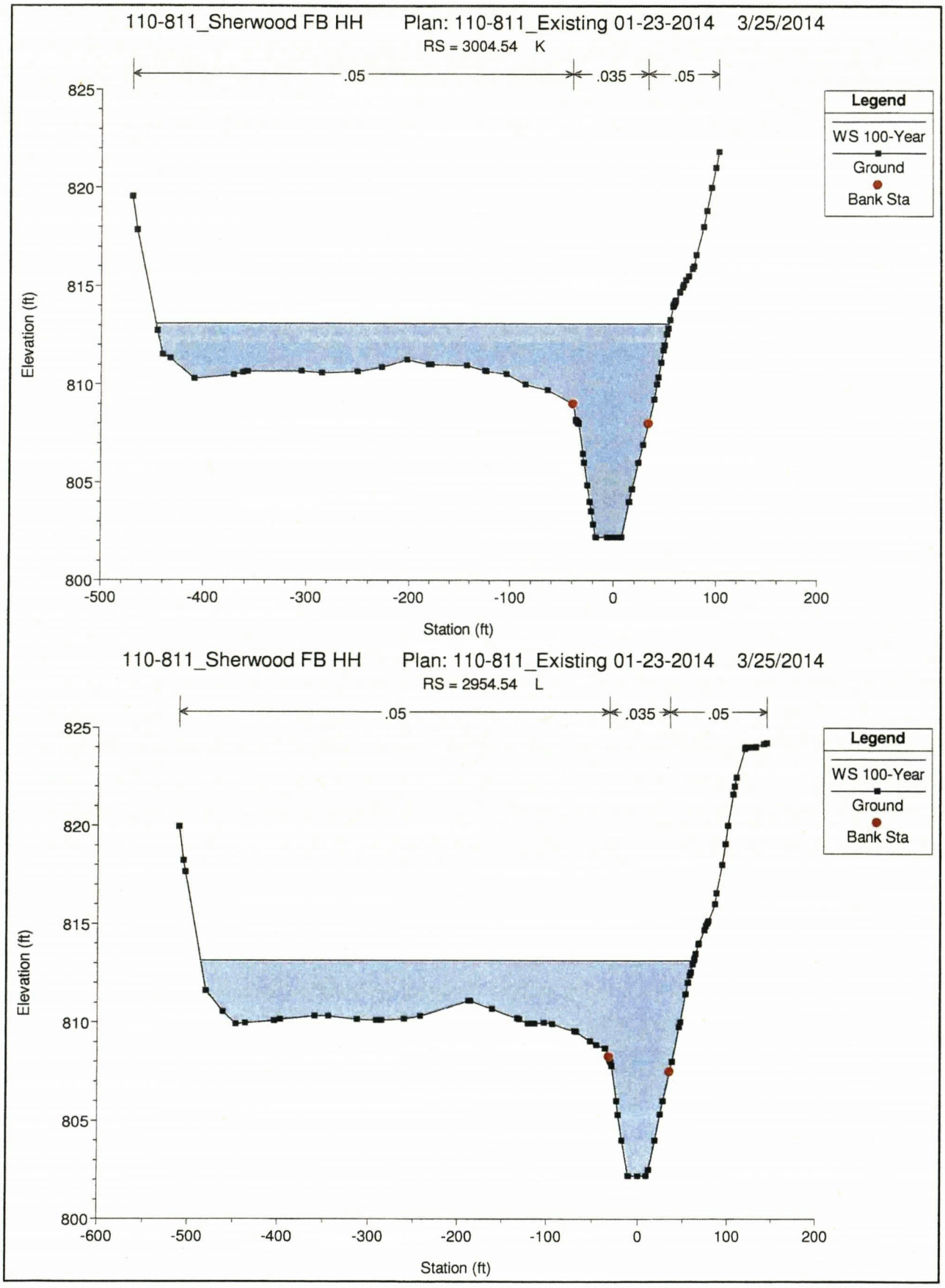


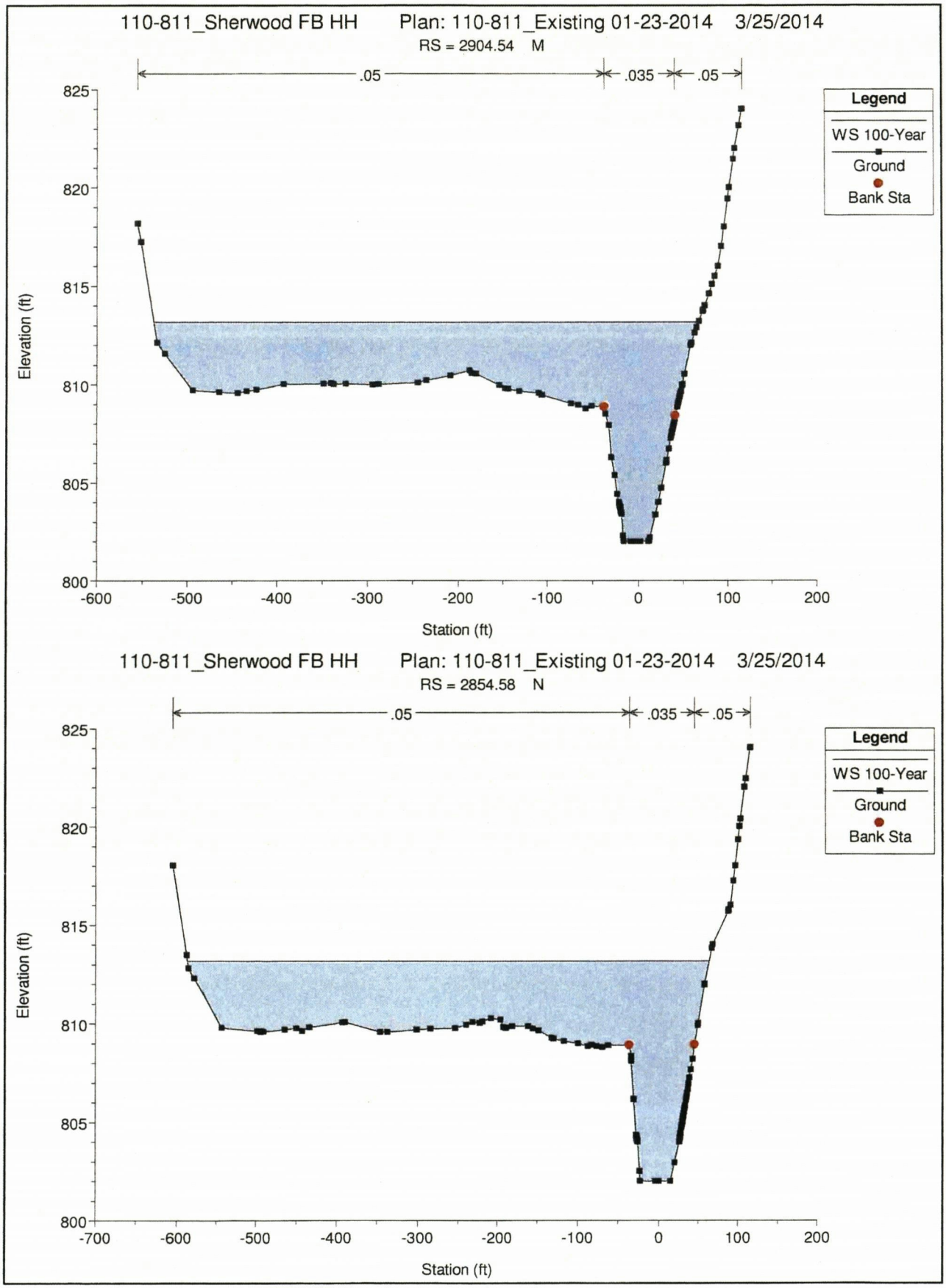

110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 3404.54 C
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 3354.54 D
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

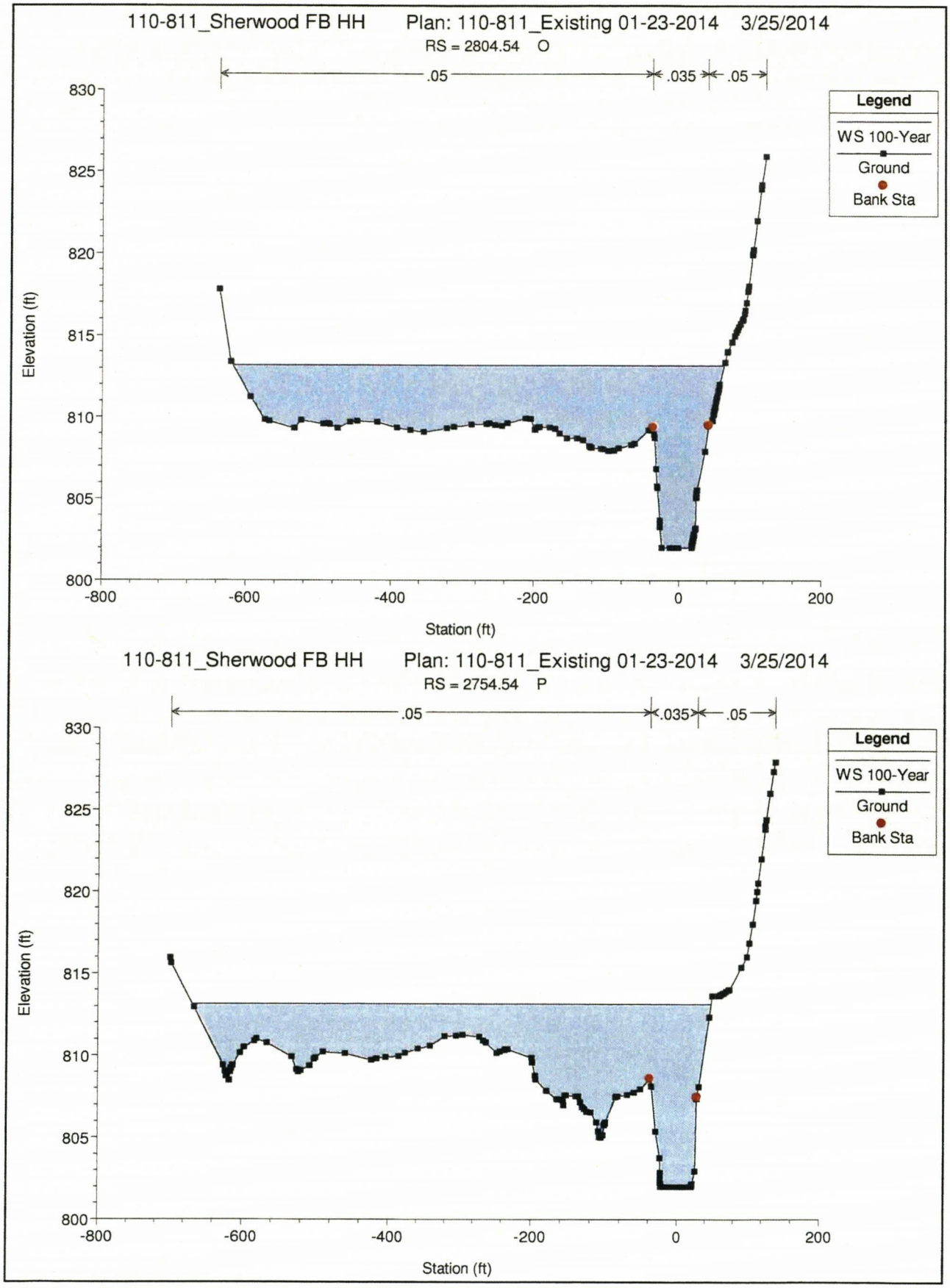

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 3304.54 E
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-200
-150
-100
-50
0
50
100
150
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 3254.54 F
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-250
-200
-150
-100
-50
0
50
100
150
Station (ft)

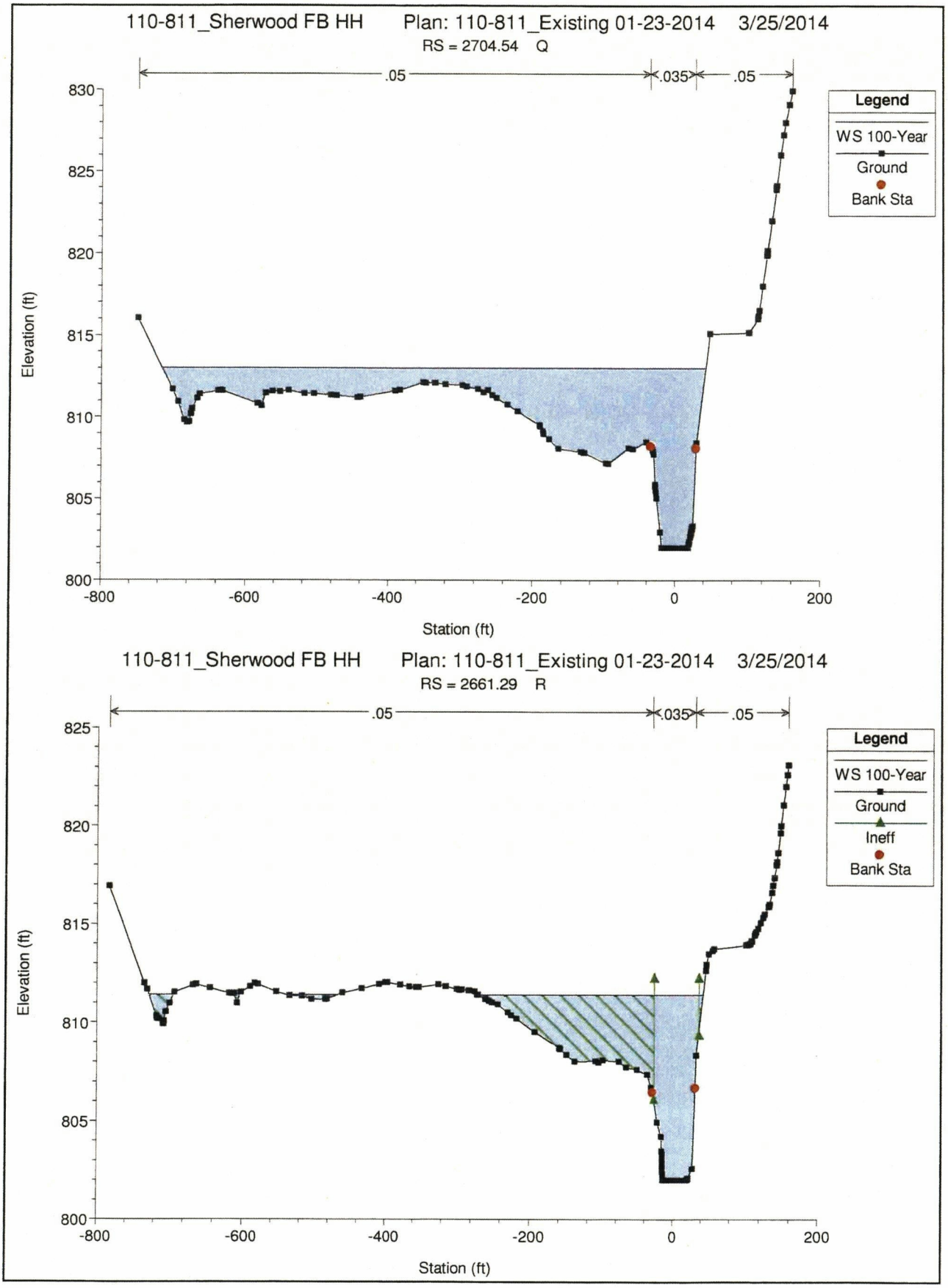

110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 3204.54 G
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 3154.54 H
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-400
-300
-200
-100
0
100
200
Station (ft)

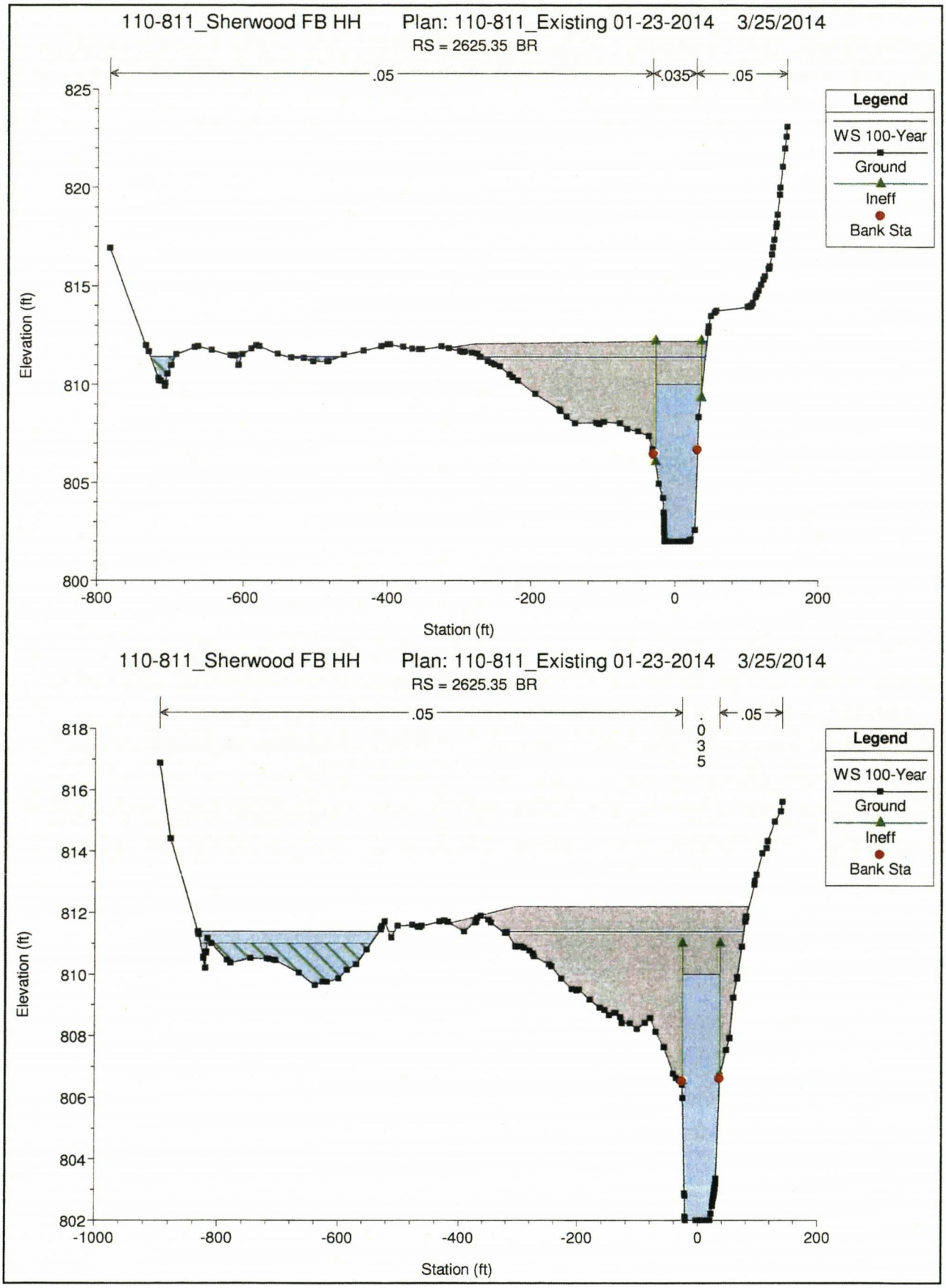

110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 3104.54 I
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 3054.54 J
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

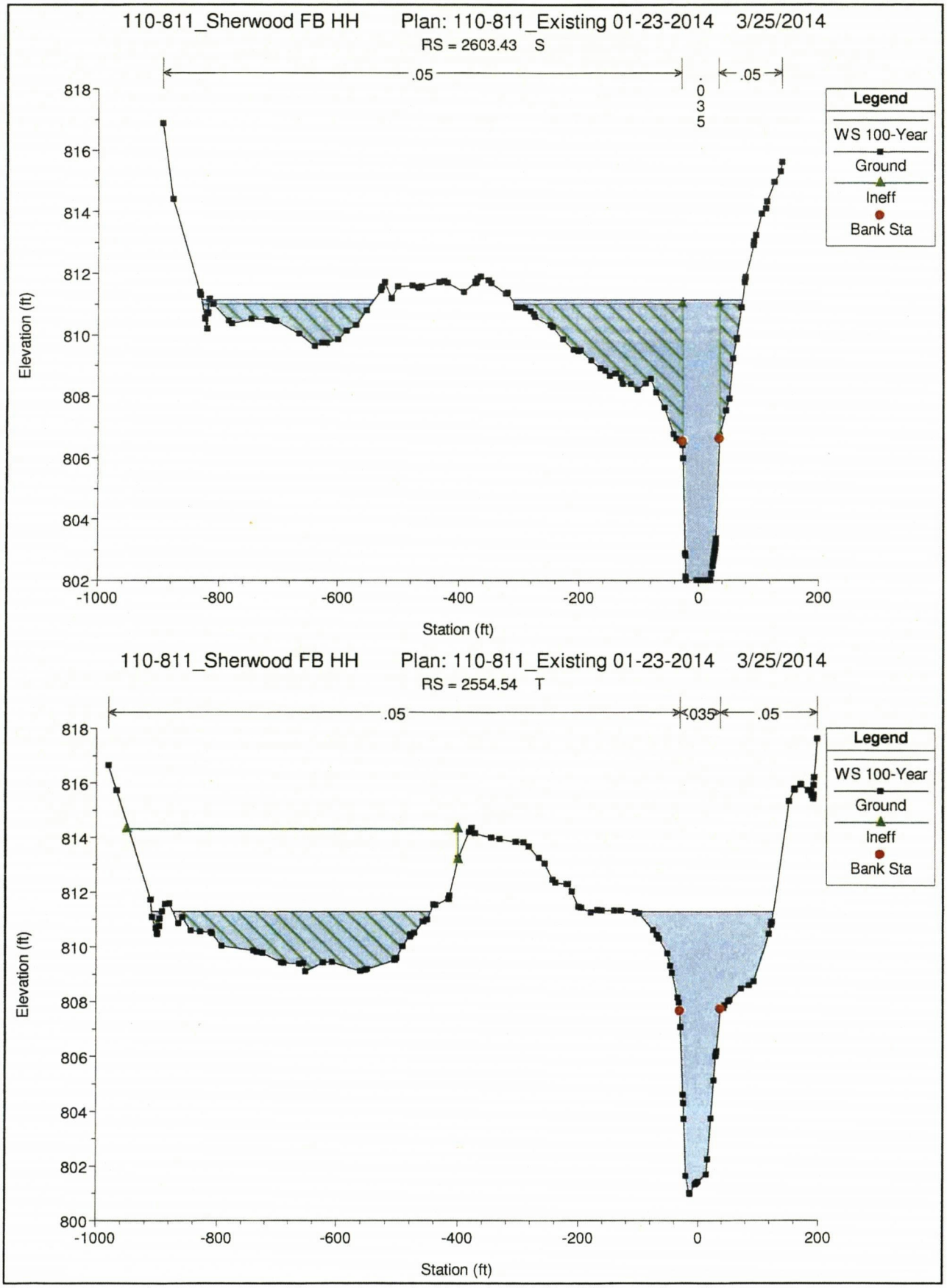

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 3004.54 K
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2954.54 L
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)

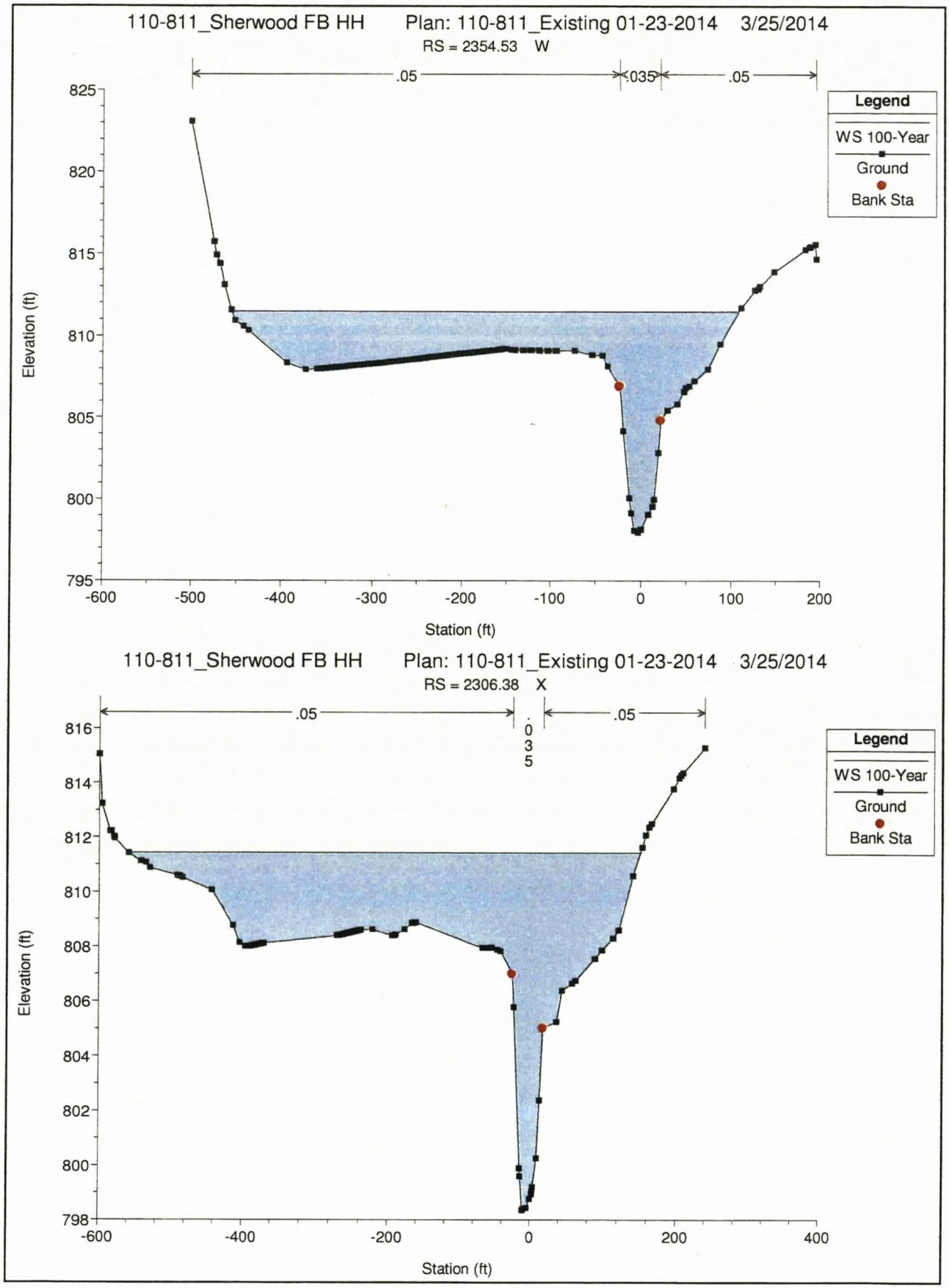

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2904.54 M
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2854.58 N
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-700
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)

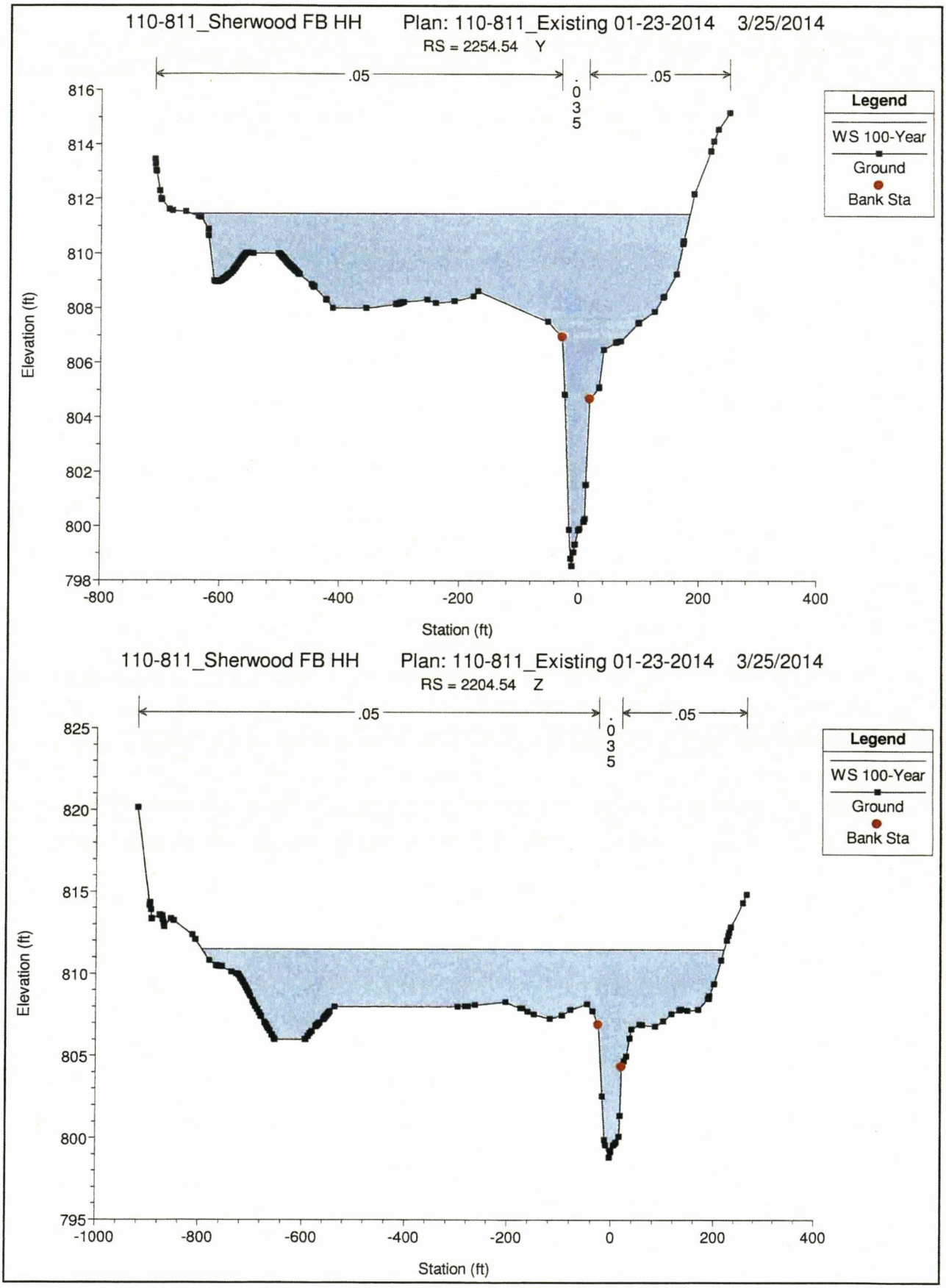

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2804.54 O
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2754.54 P
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

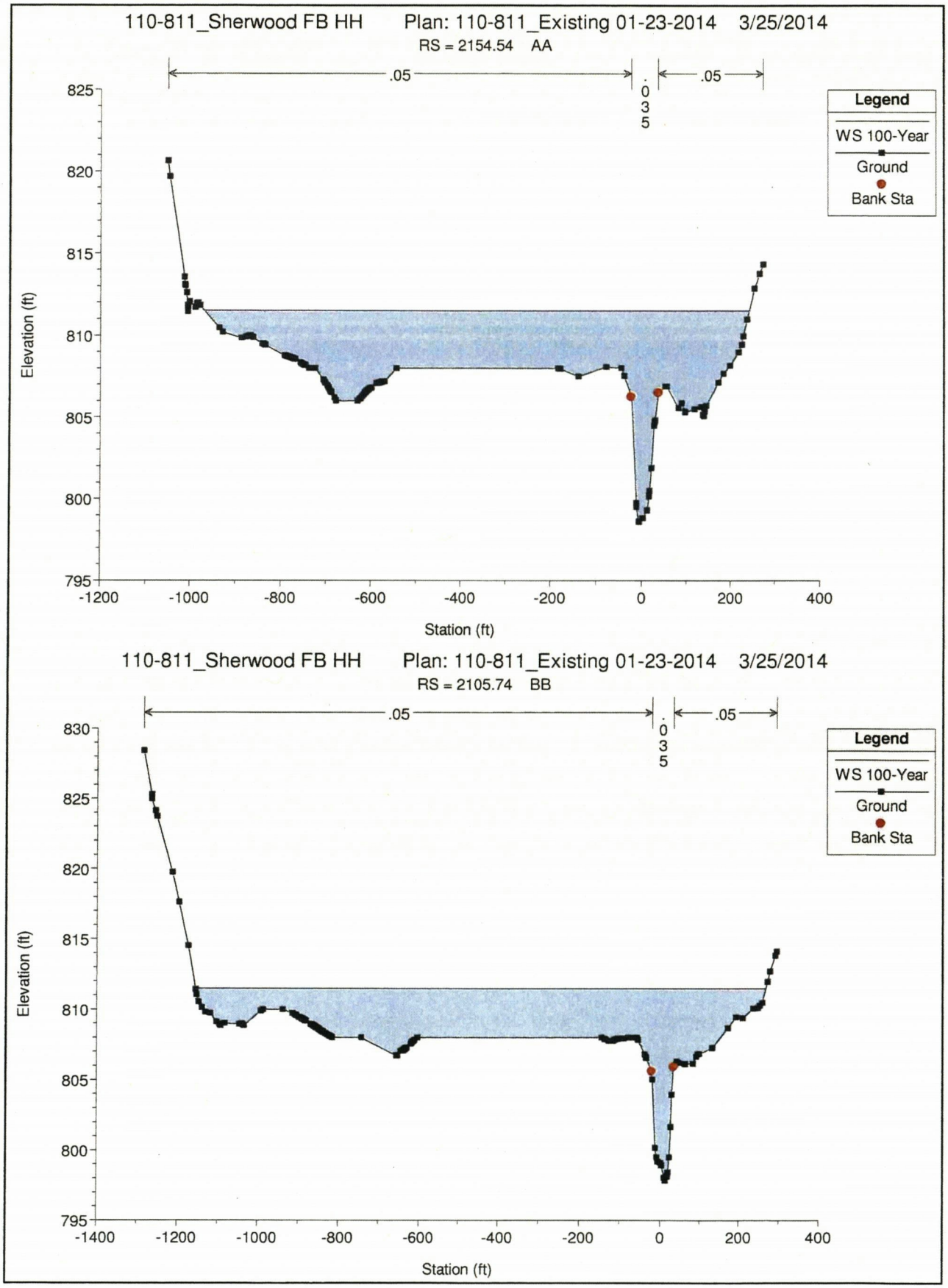

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2704.54 Q
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
830
825
820
815
810
805
800
-800
-600
-400
-200
0
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2661.29 R
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-800
-600
-400
-200
0
200
Station (ft)

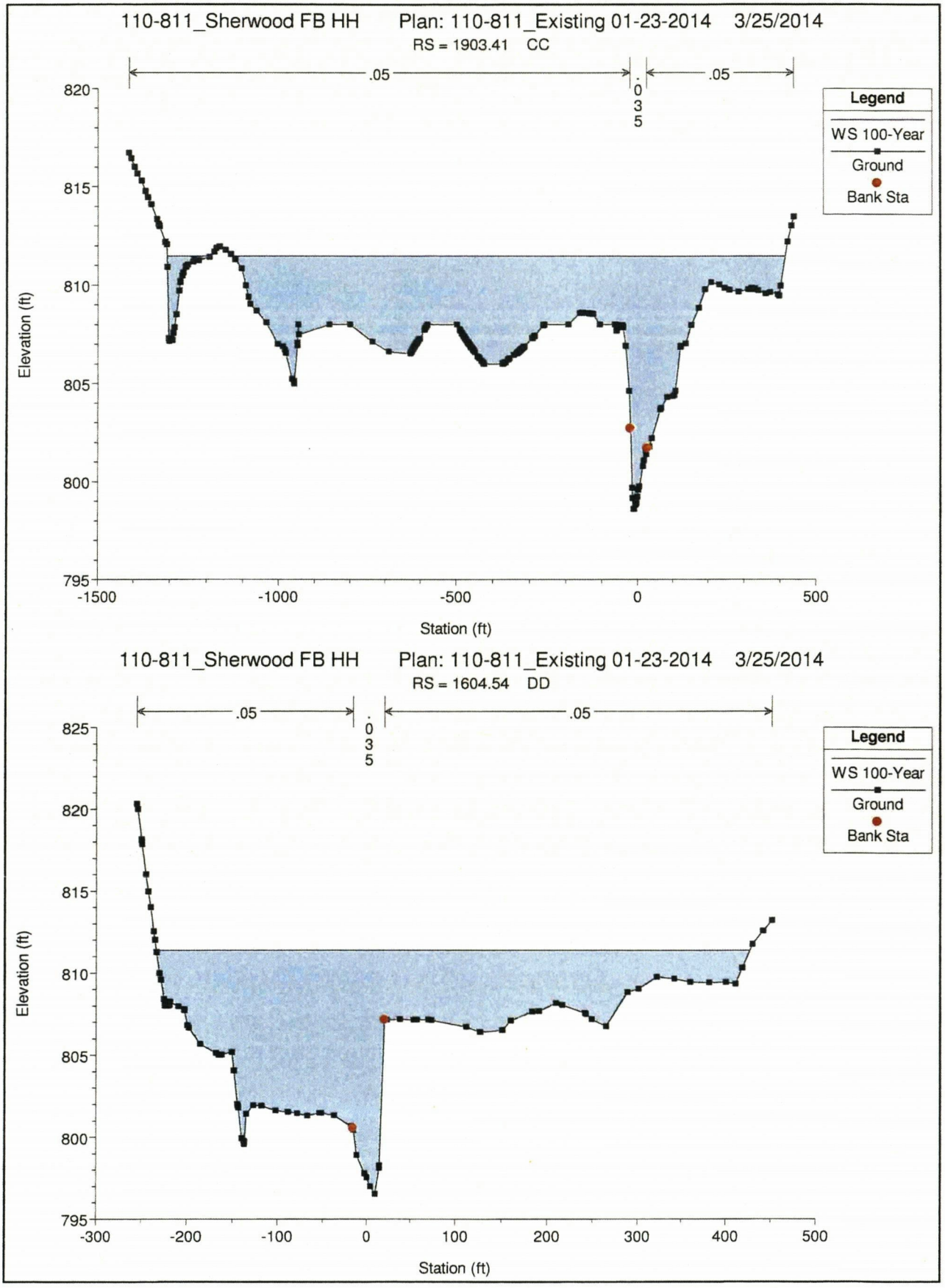

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2625.35 BR
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-800
-600
-400
-200
0
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2625.35 BR
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
818
816
814
812
810
808
806
804
802
-1000
-800
-600
-400
-200
0
200
Station (ft)

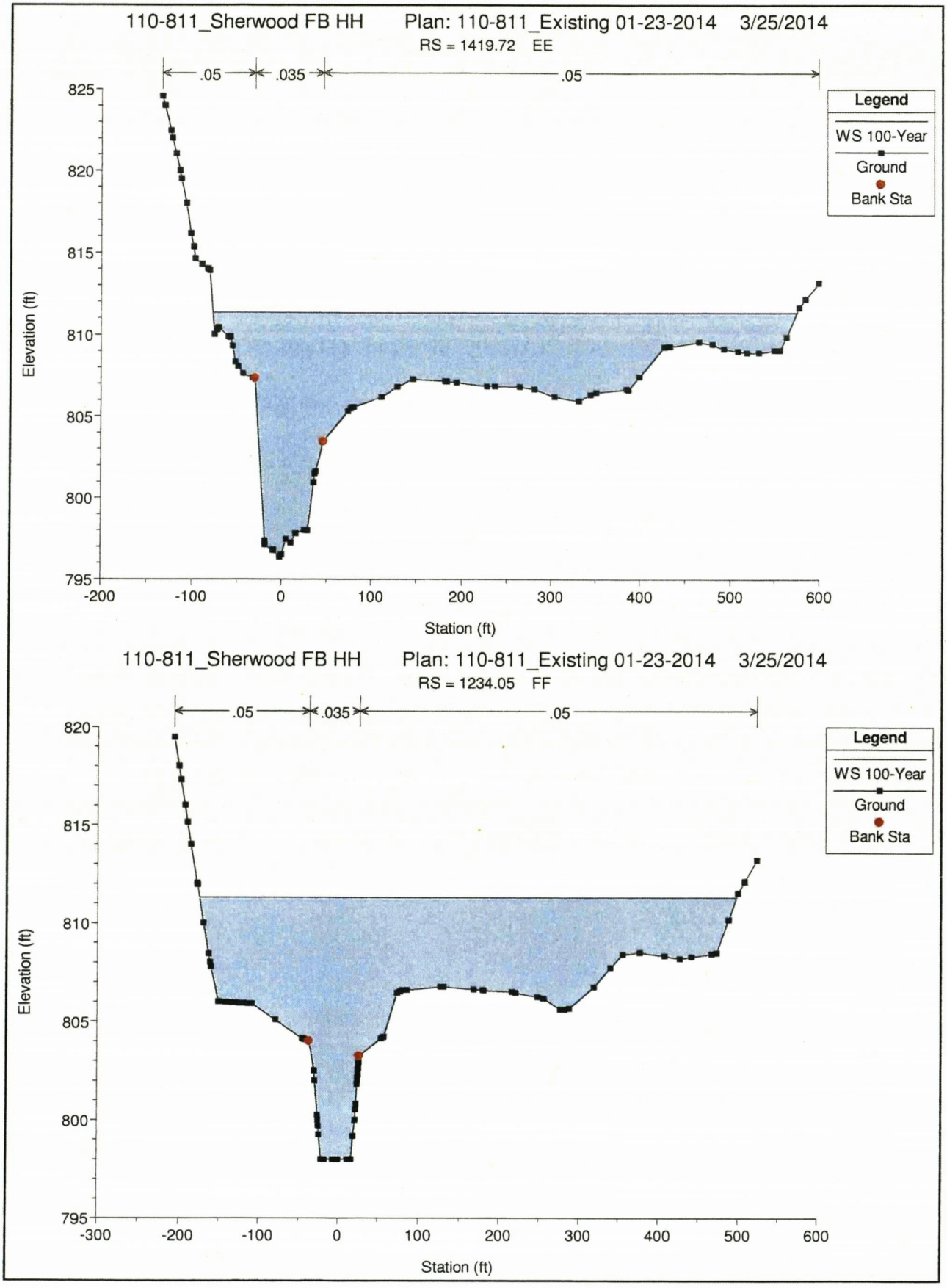

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2603.43 S
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2554.54 T
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

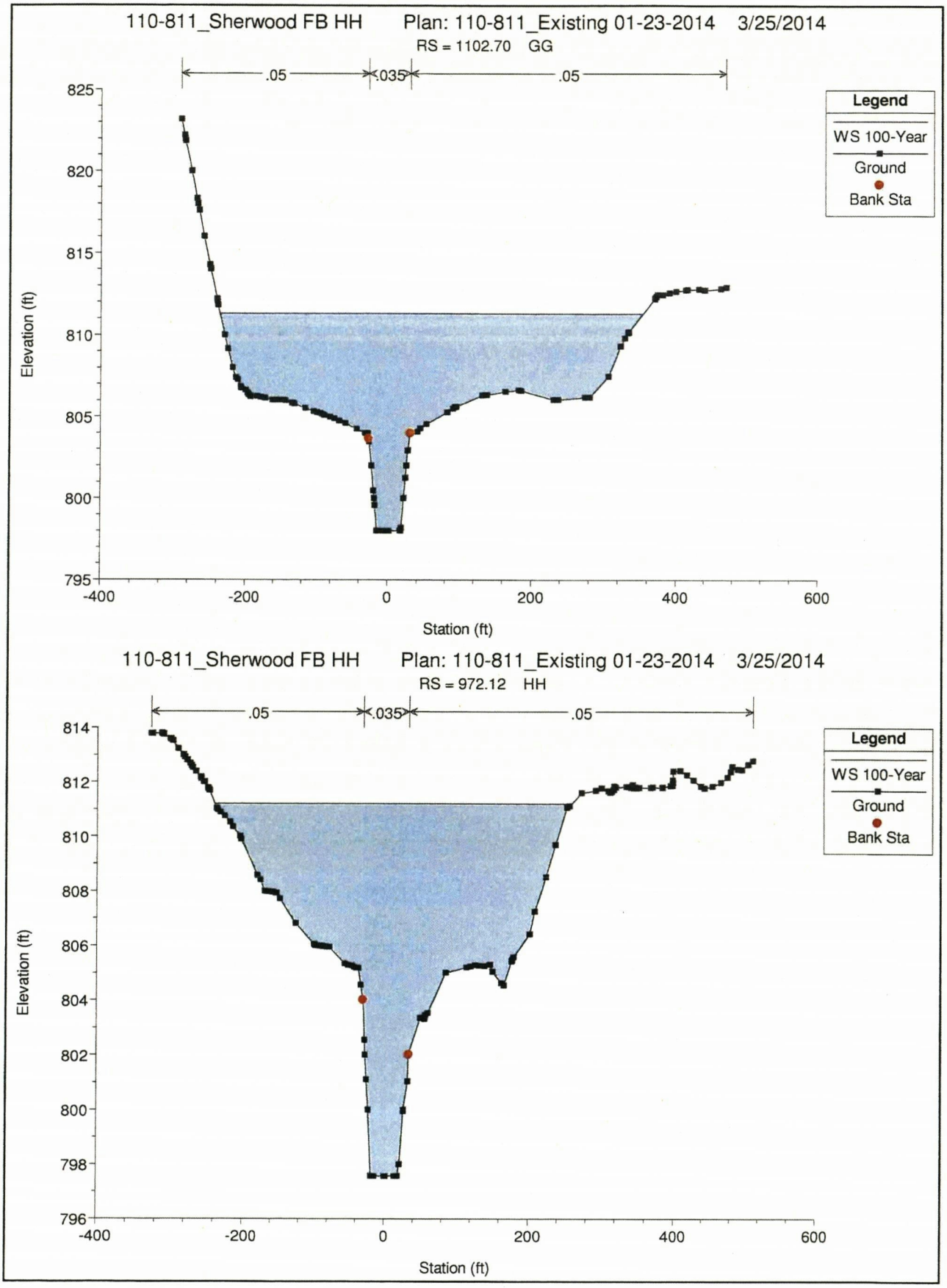

110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 2354.53 W
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 2306.38 X
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
816
814
812
810
808
806
804
802
800
798
-600
-400
-200
0
200
400
Station (ft)

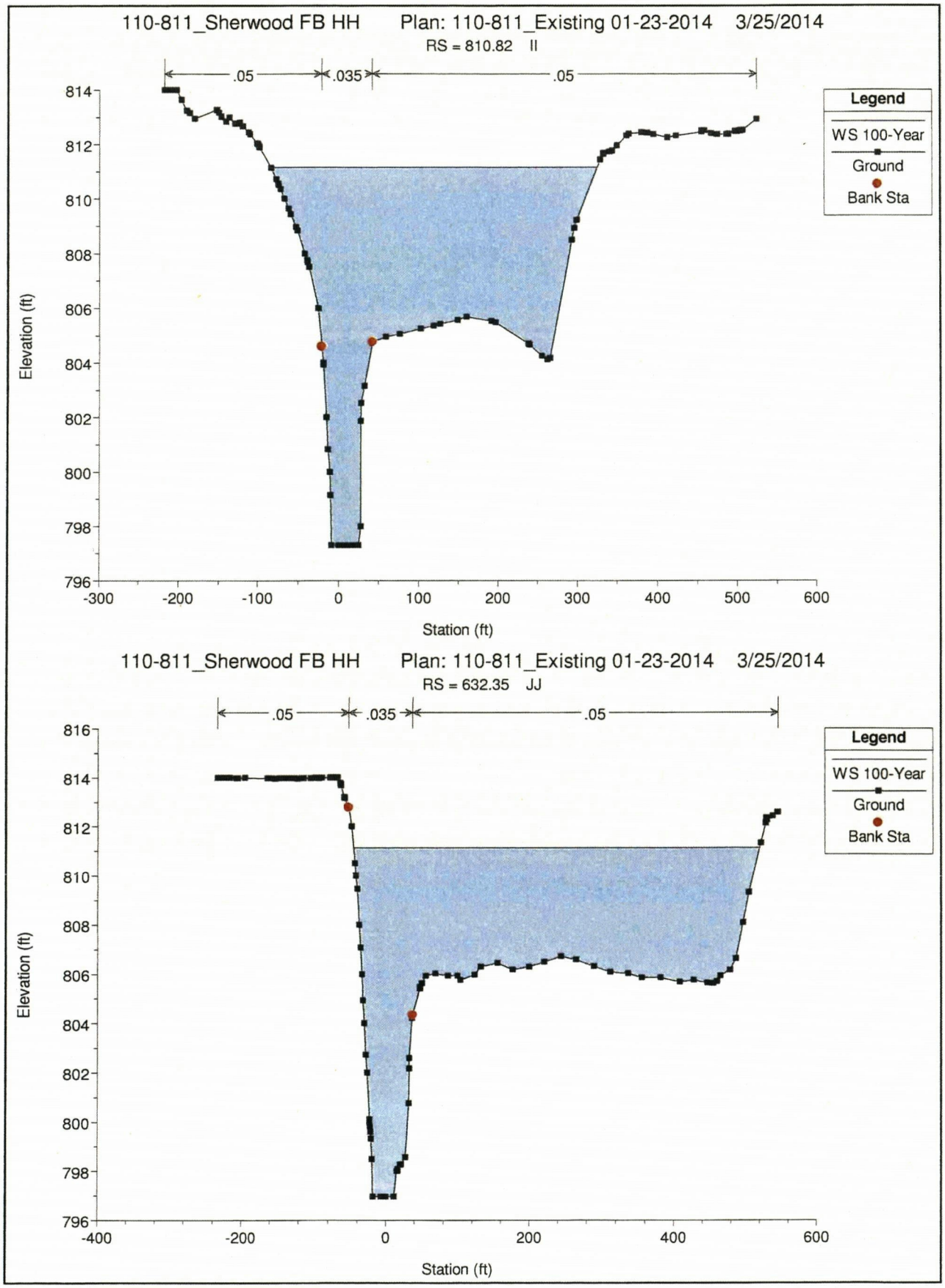

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2254.54 Y
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
816
814
812
810
808
806
804
802
800
798
-800
-600
-400
-200
0
200
400
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2204.54 Z
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-1000
-800
-600
-400
-200
0
200
400
Station (ft)

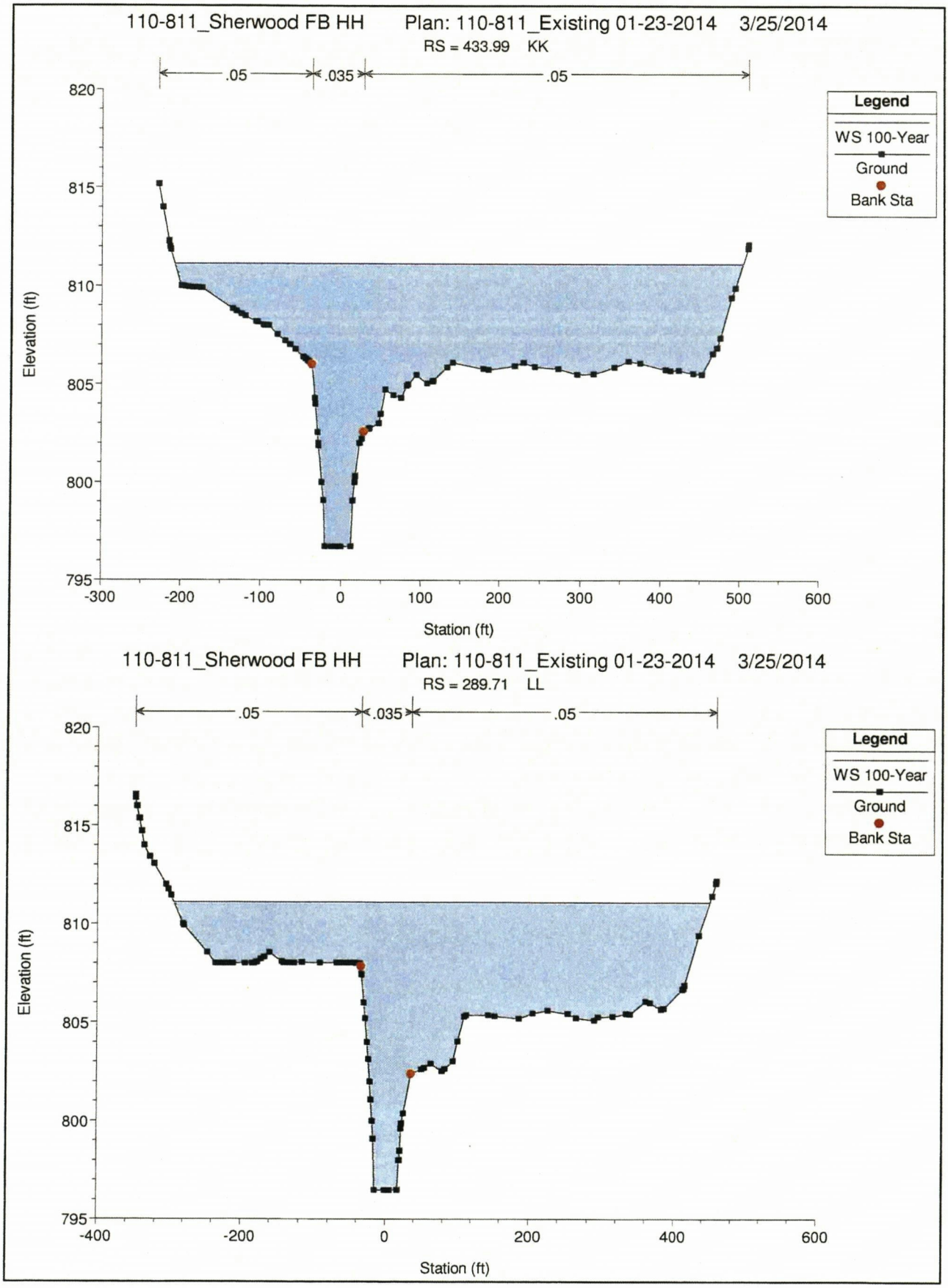

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2154.54 AA
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-1200
-1000
-800
-600
-400
-200
0
200
400
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2105.74 BB
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
830
825
820
815
810
805
800
795
-1400
-1200
-1000
-800
-600
-400
-200
0
200
400
Station (ft)

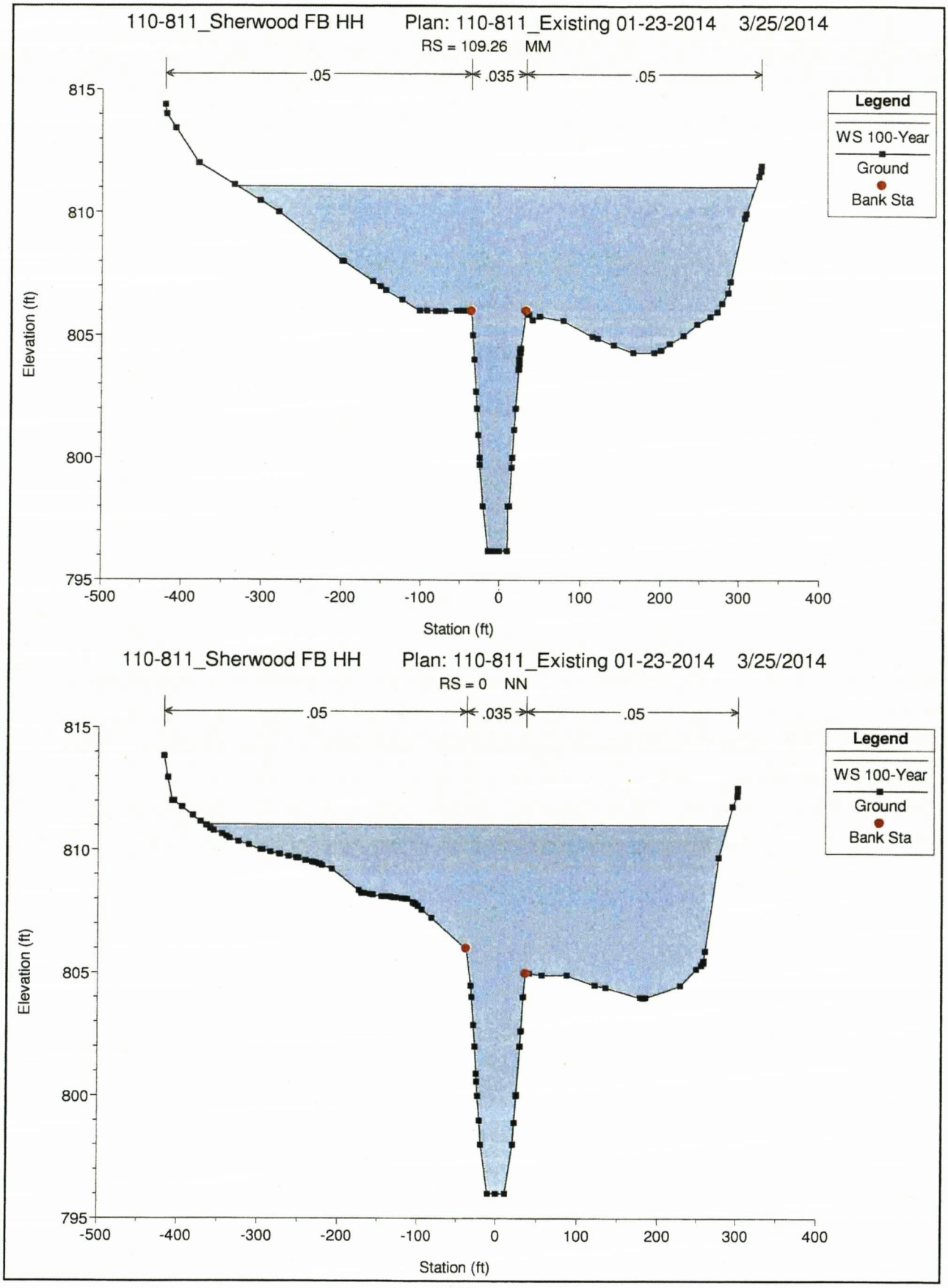

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 1903.41 CC
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
820
815
810
805
800
795
-1500
-1000
-500
0
500
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 1604.54 DD
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-300
-200
-100
0
100
200
300
400
500
Station (ft)

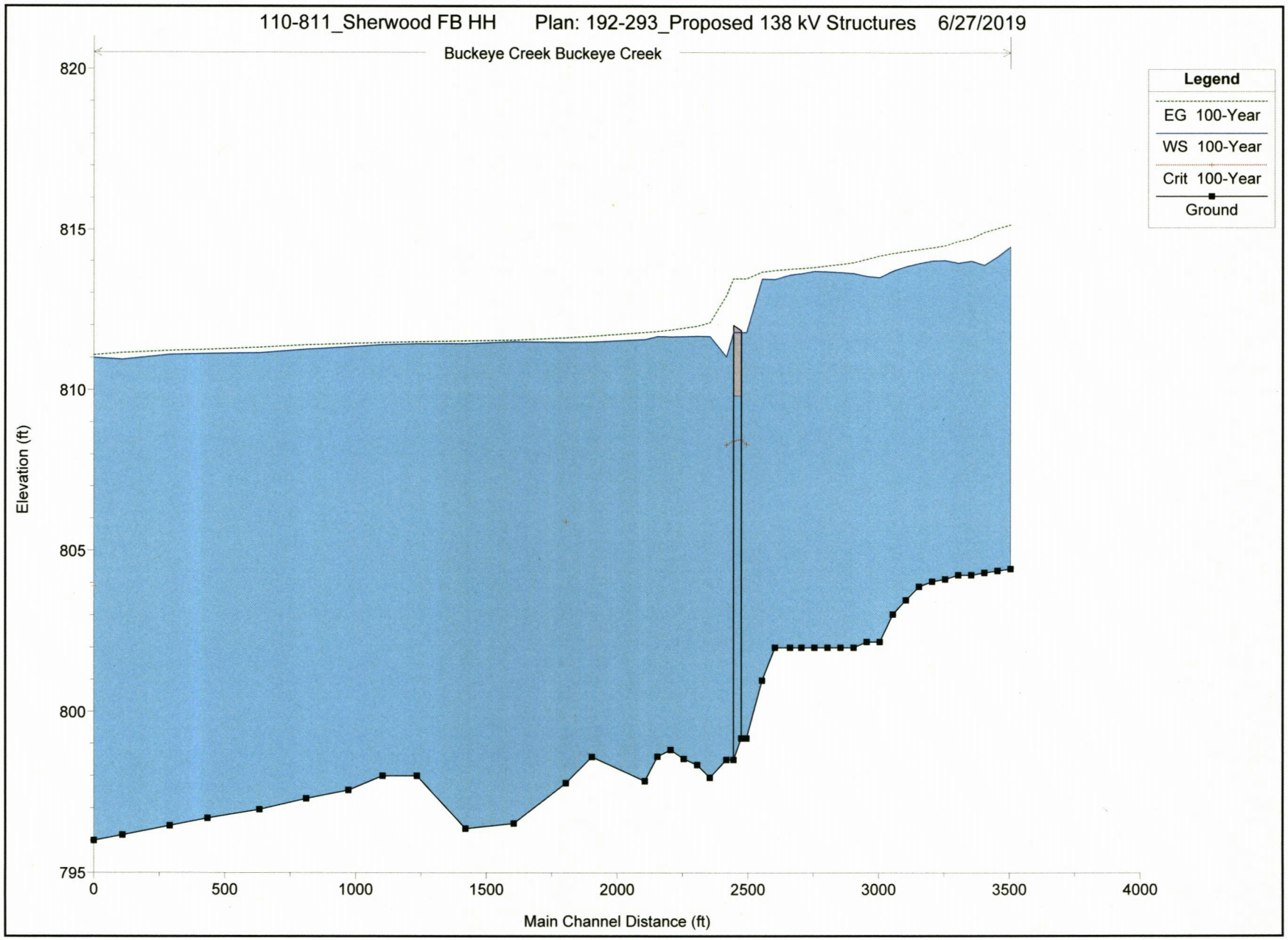

110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 1419.72 EE
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-200
-100
0
100
200
300
400
500
600
Station (ft)
110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 1234.05 FF
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
820
815
810
805
800
795
-300
-200
-100
0
100
200
300
400
500
600
Station (ft)

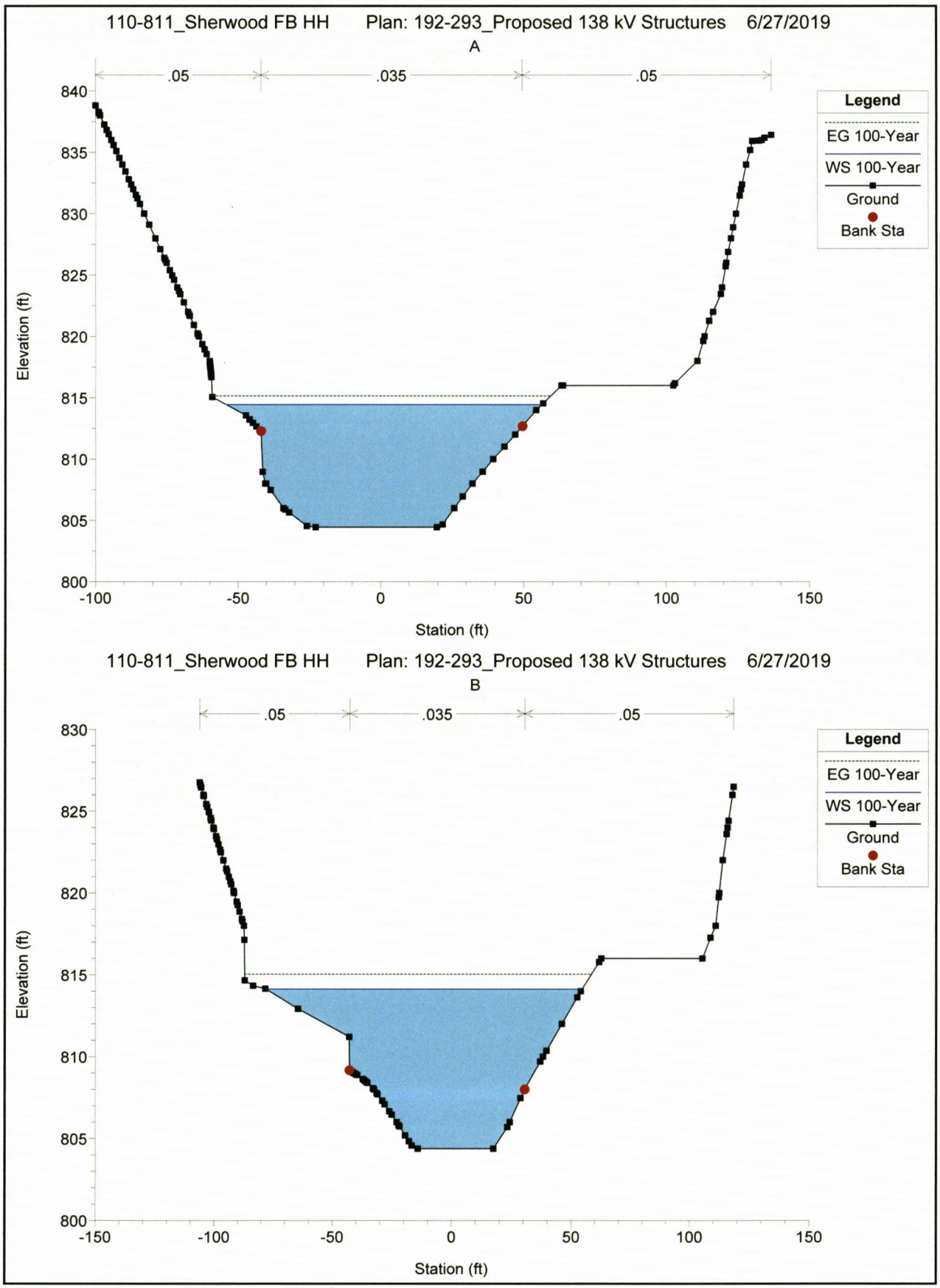

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 1102.70 GG
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-400
-200
0
200
400
600
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 972.12 HH
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
814
812
810
808
806
804
802
800
798
796
-400
-200
0
200
400
600
Station (ft)

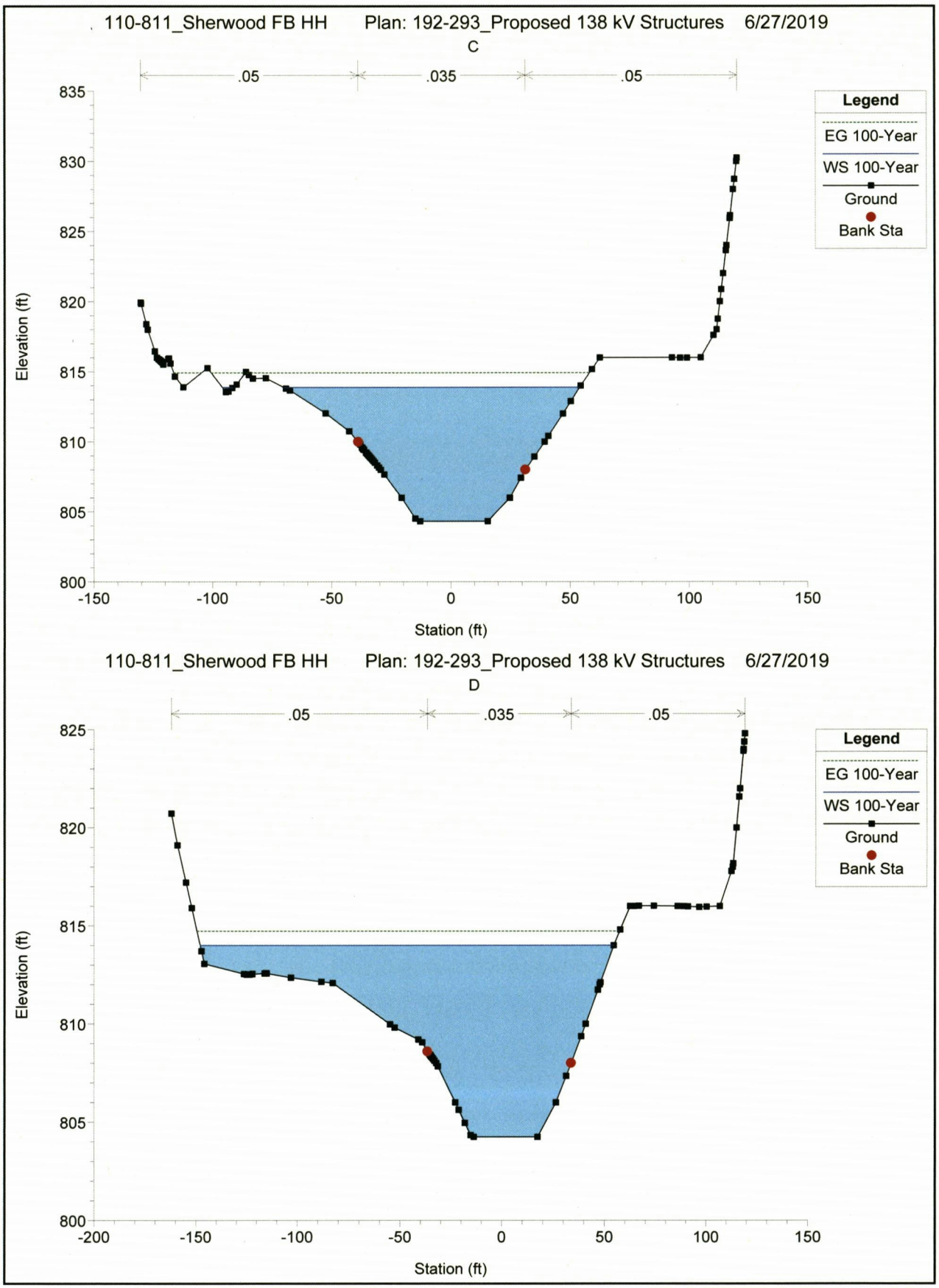

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 810.82 II
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 632.35 JJ
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

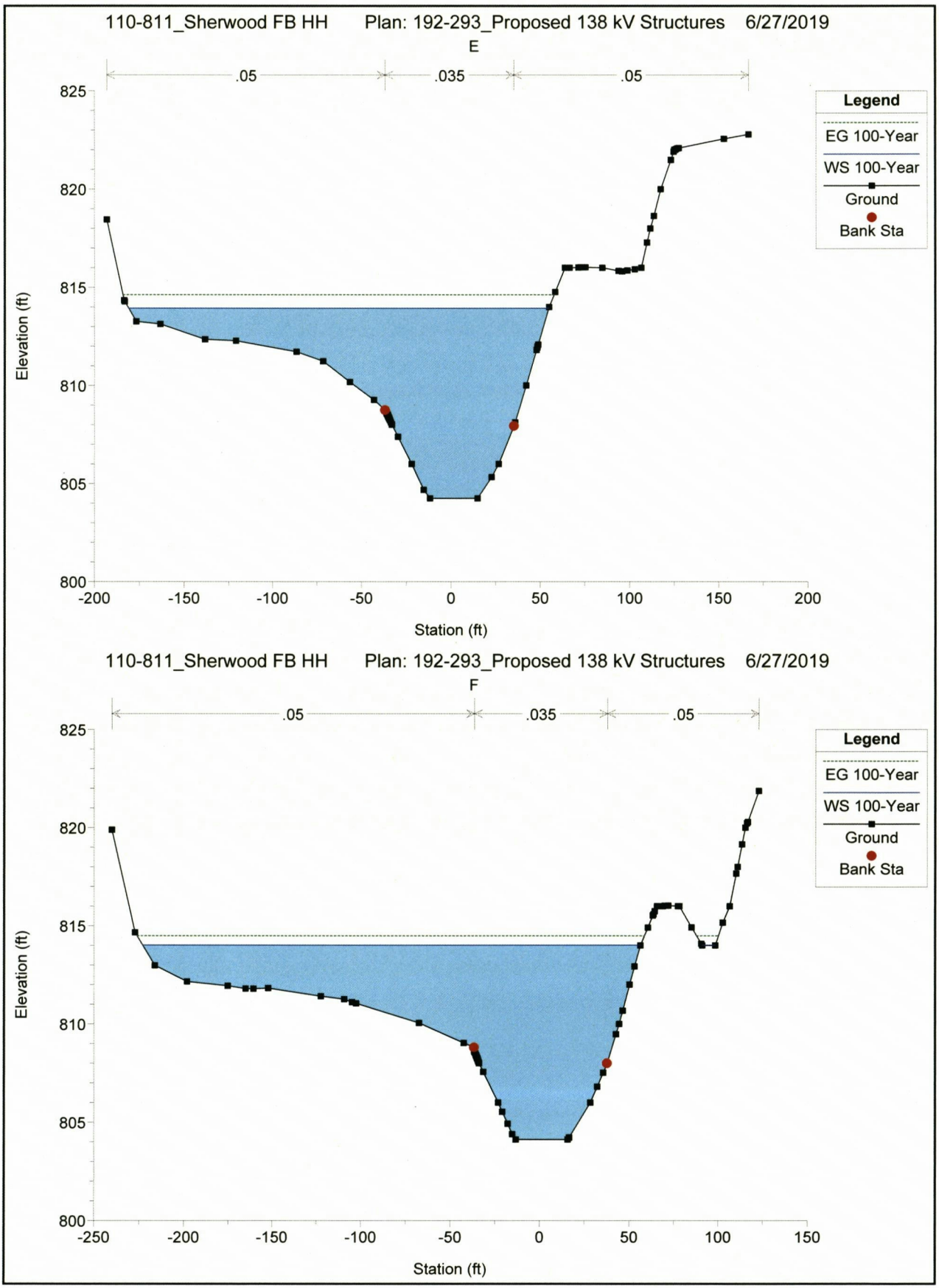

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 433.99 KK
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
820
815
810
805
800
795
-300
-200
-100
0
100
200
300
400
500
600
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 289.71 LL
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
820
815
810
805
800
795
-400
-200
0
200
400
600
Station (ft)

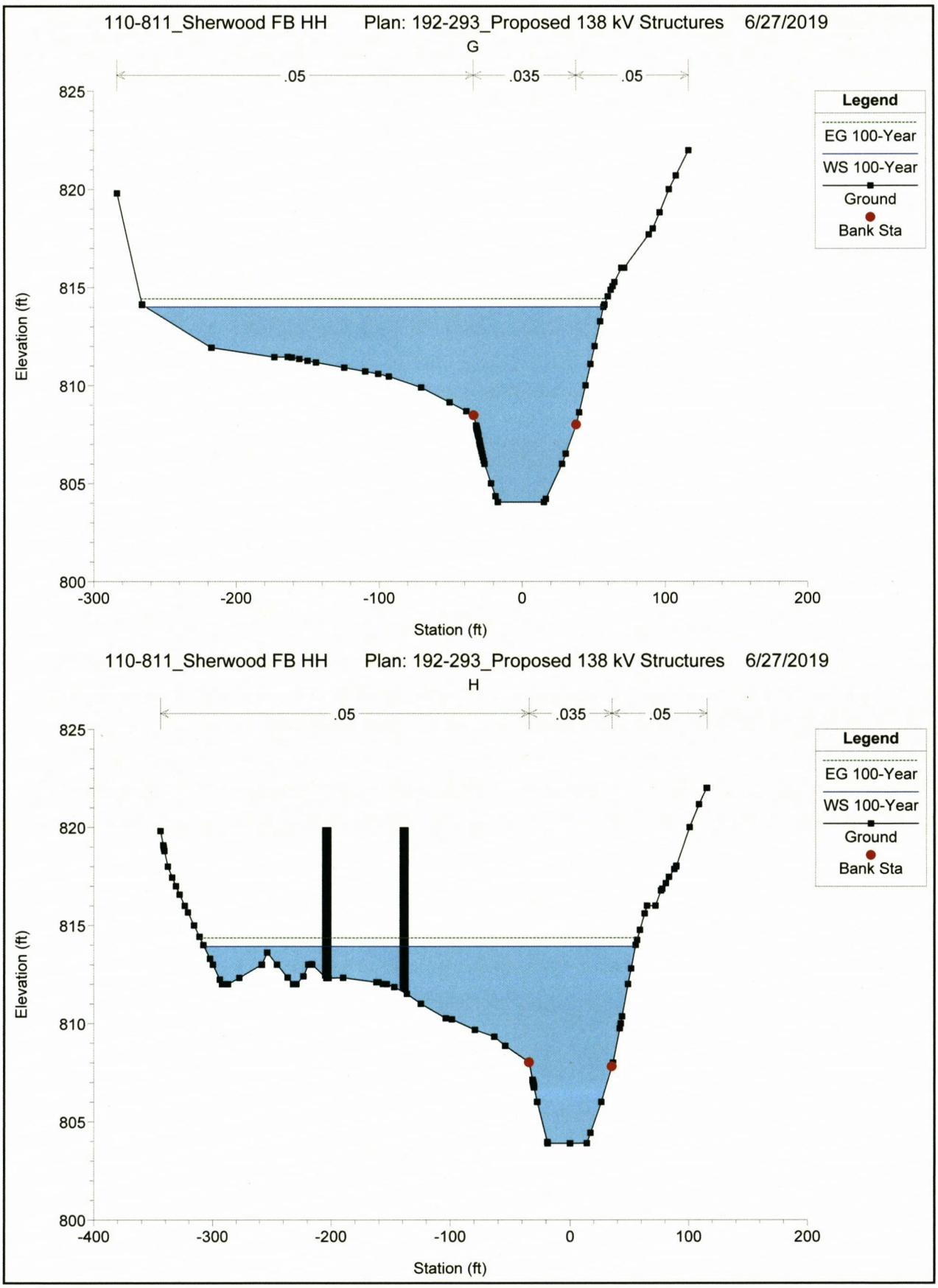

110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 109.26
MM
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH
Plan: 110-811_Existing 01-23-2014
3/25/2014
RS = 0
NN
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

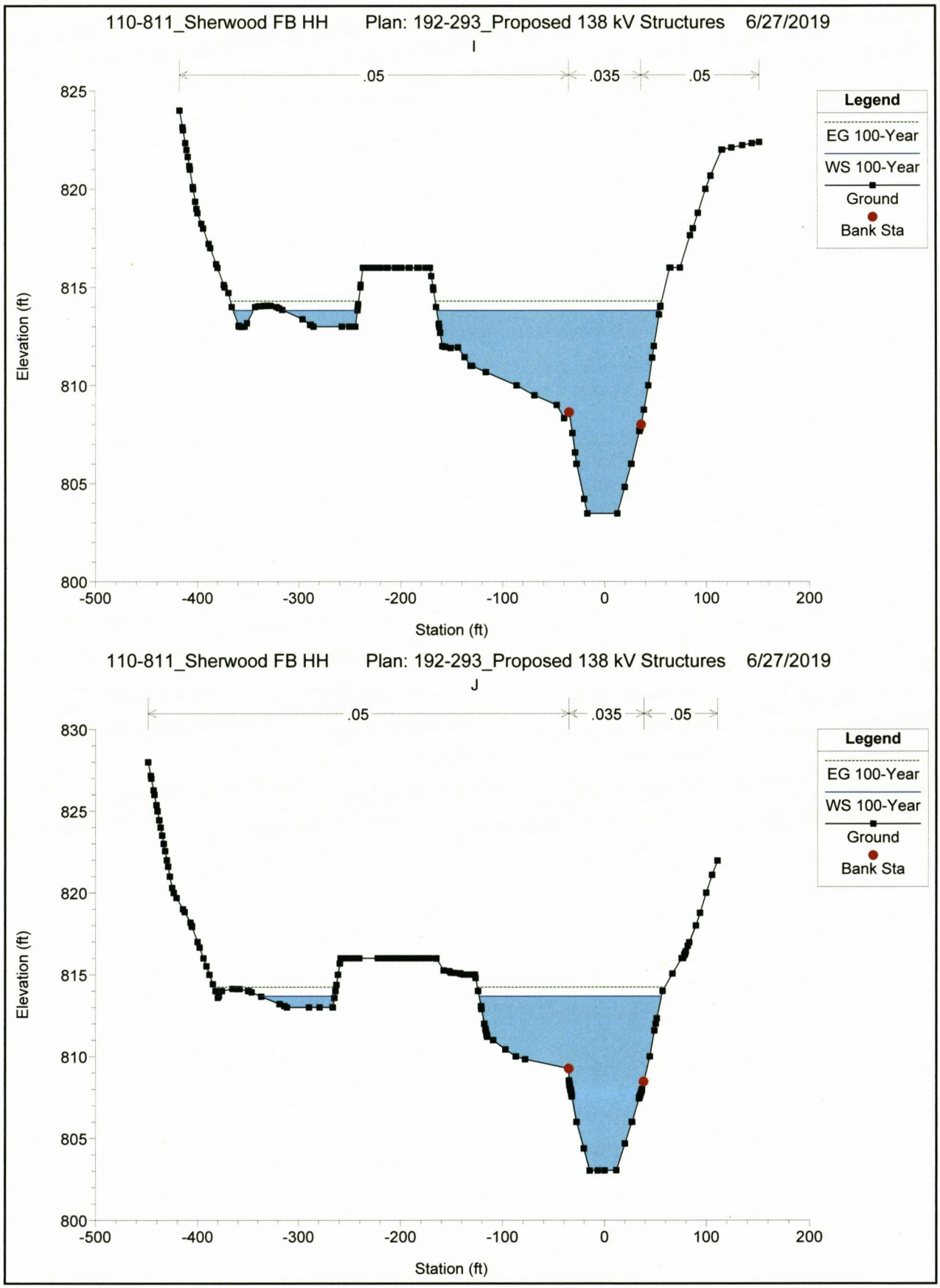

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
Buckeye Creek Buckeye Creek
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Elevation (ft)
820
815
810
805
800
795
0
500
1000
1500
2000
2500
3000
3500
4000
Main Channel Distance (ft)

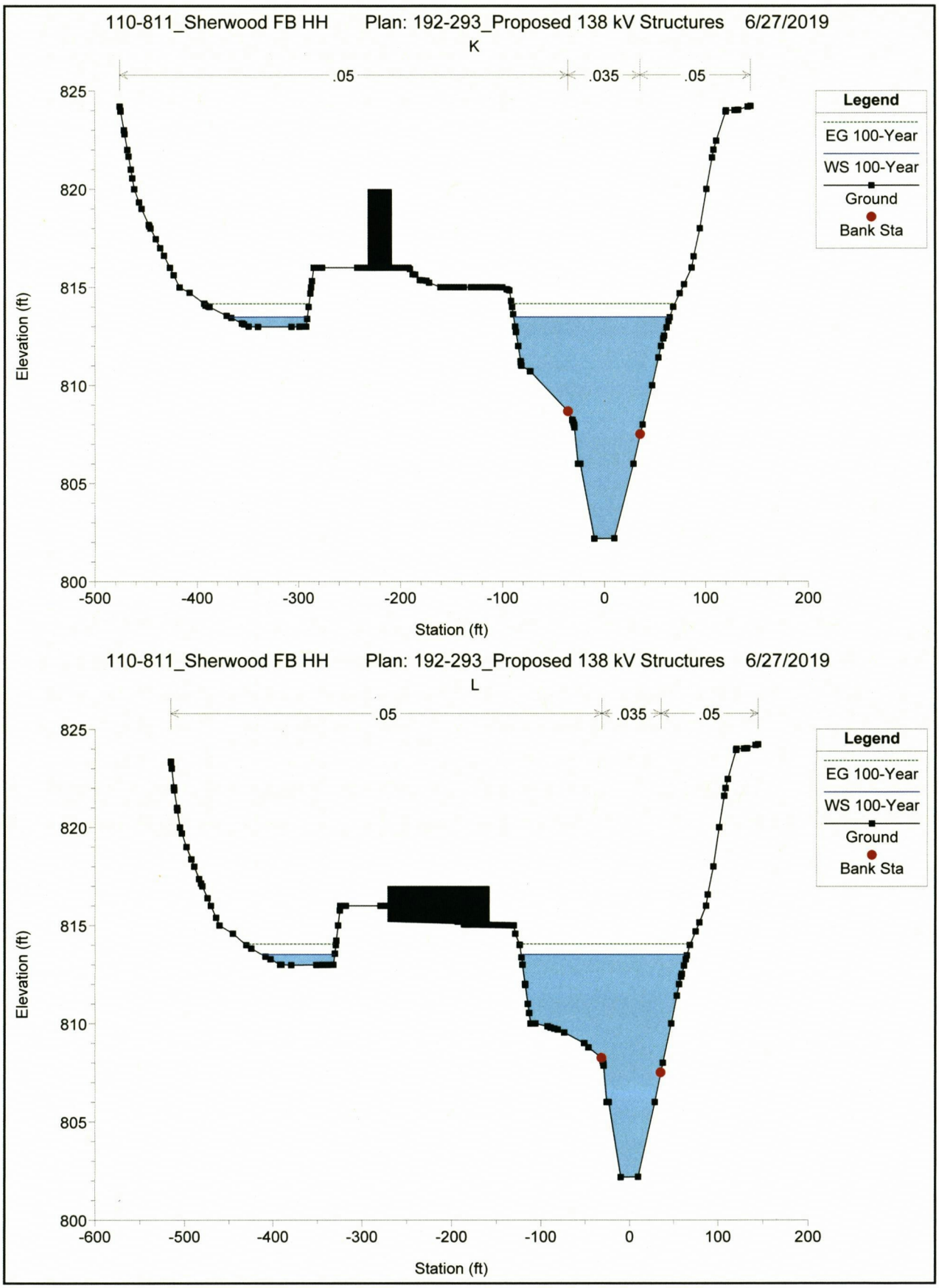

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
A
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
B
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

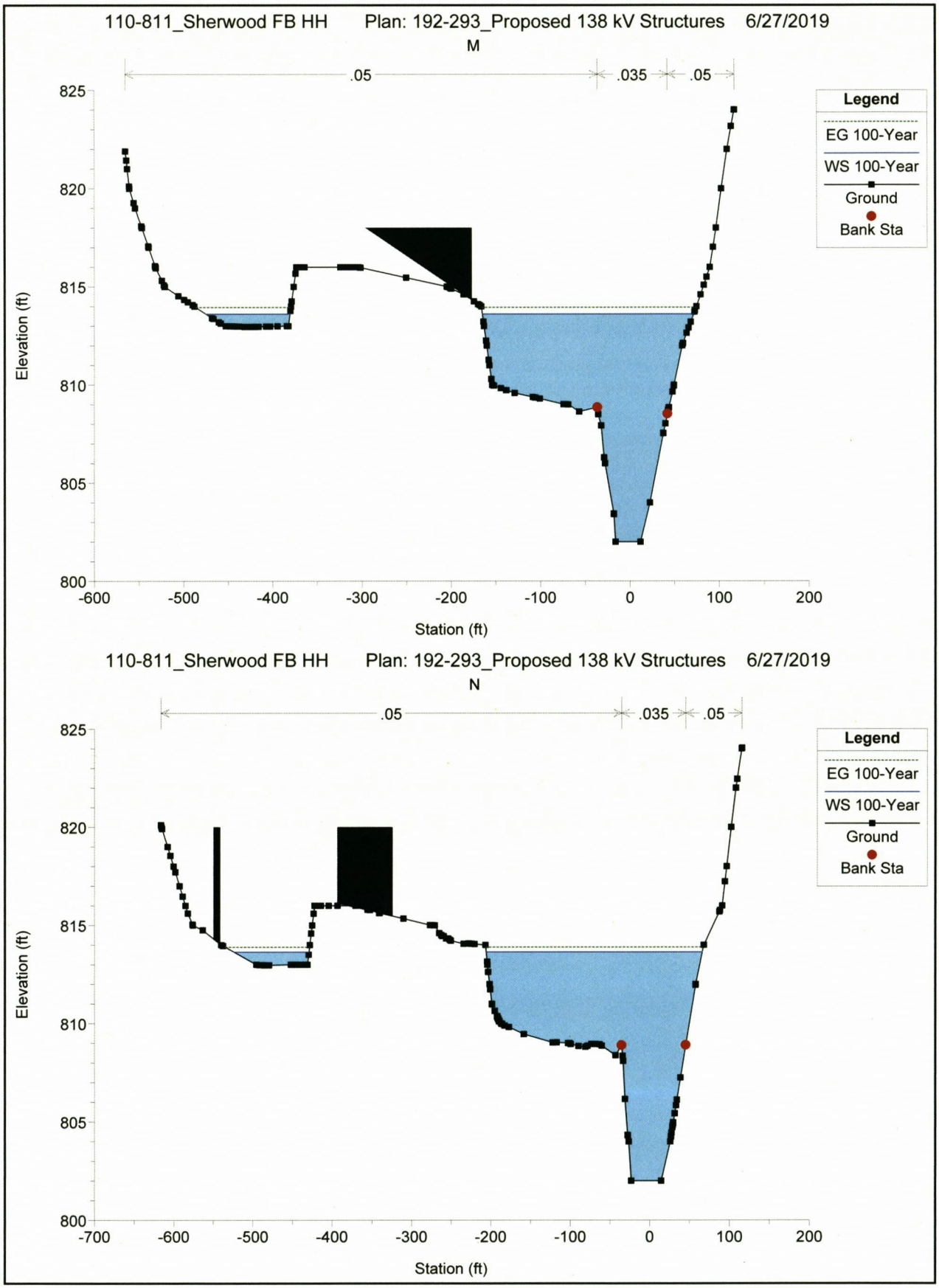

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
C
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
D
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

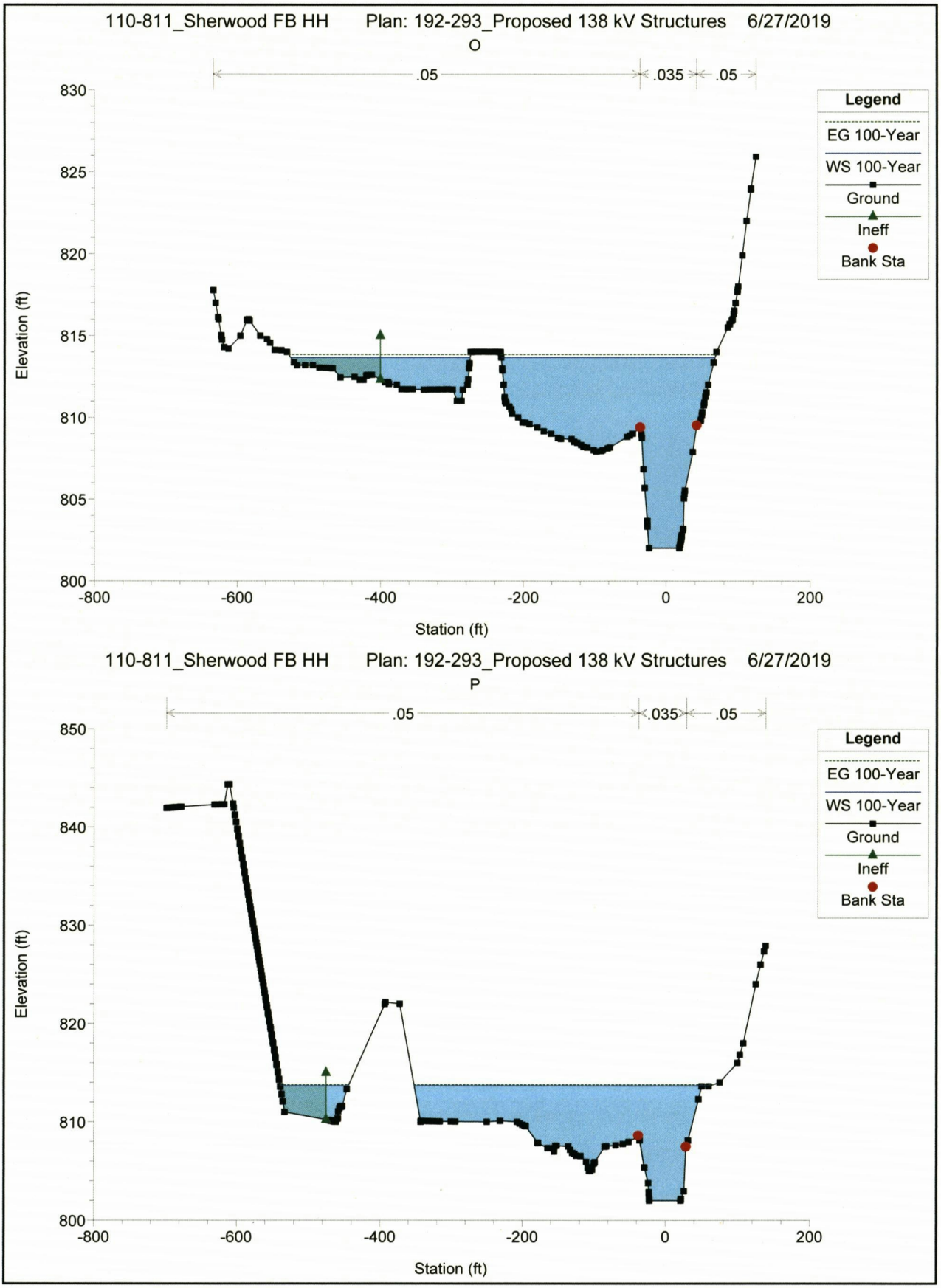

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
E
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
F
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

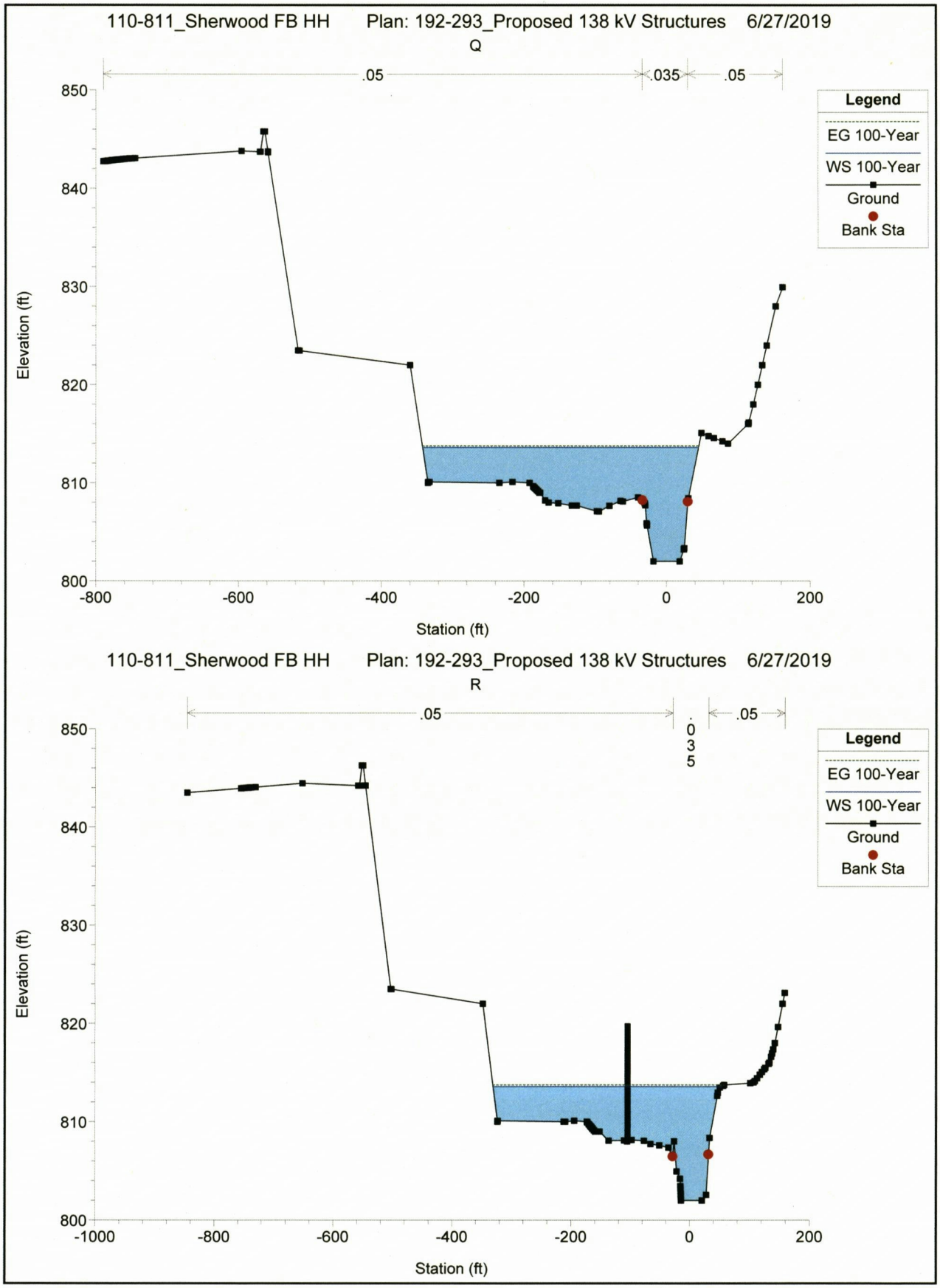

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
G
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
H
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-400
-300
-200
-100
0
100
200
Station (ft)

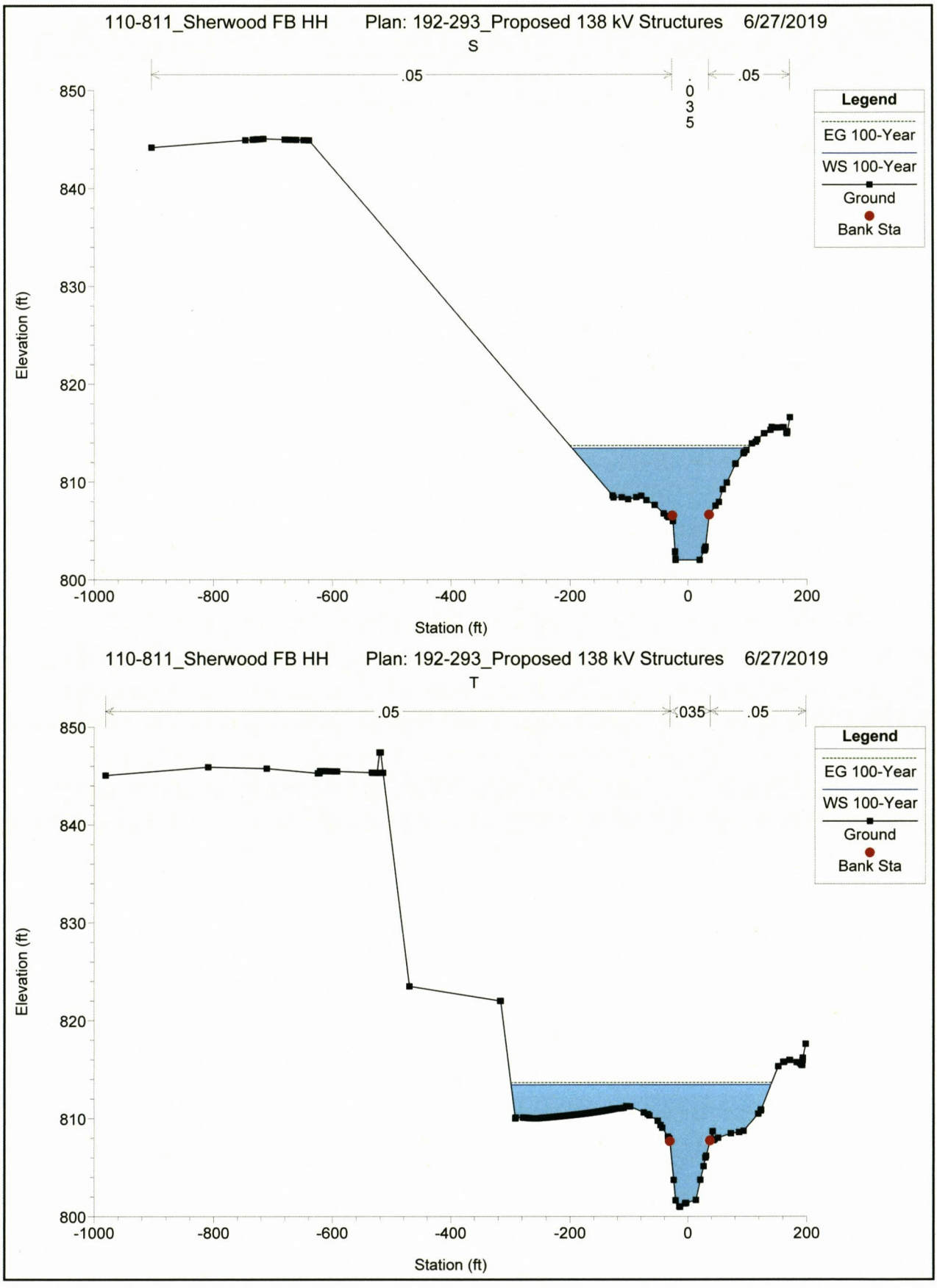

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
I
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
J
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
830
825
820
815
810
805
800
-500
-400
-300
-200
-100
0
100
200
Station (ft)

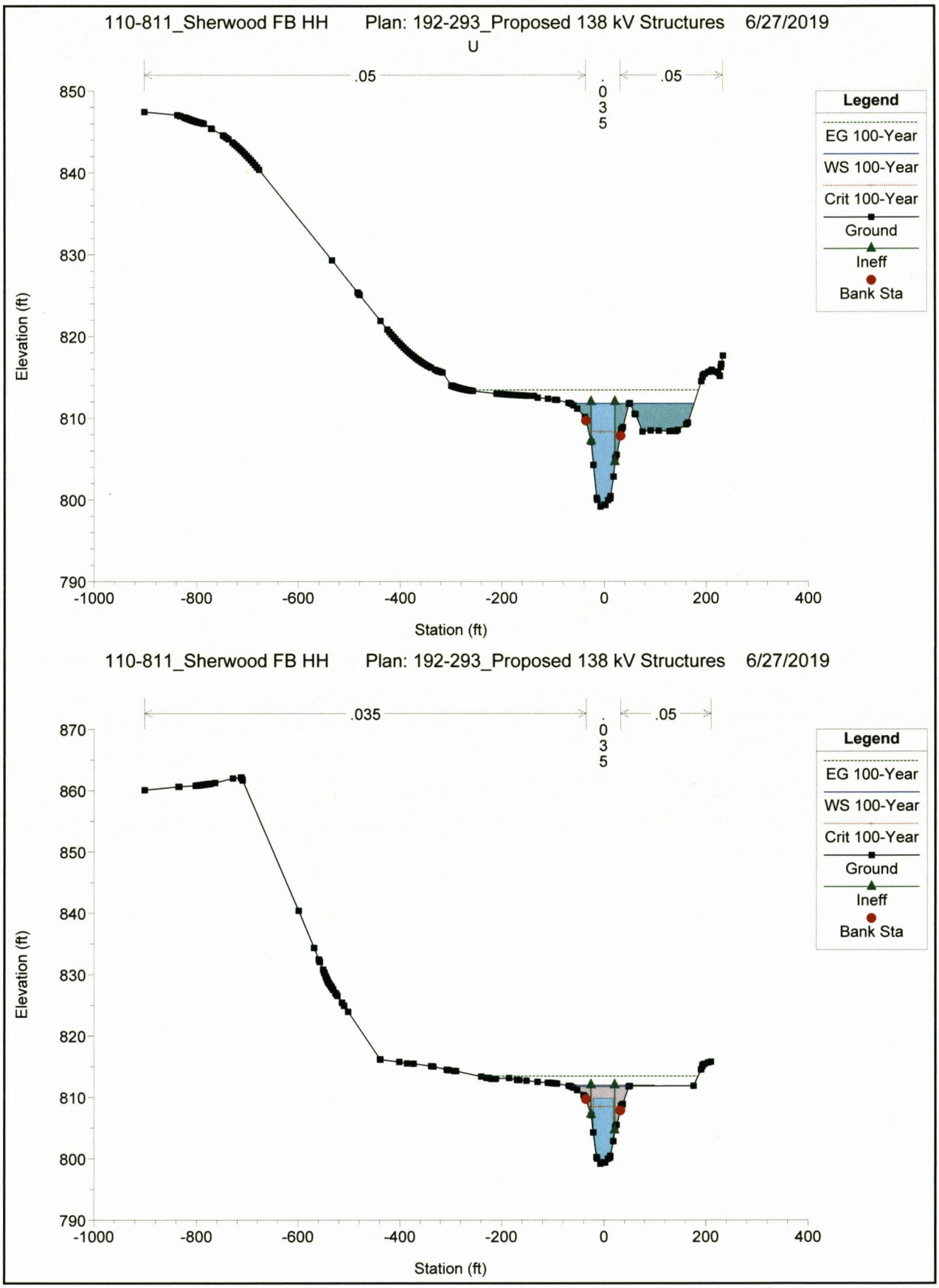

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
K
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
L
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)

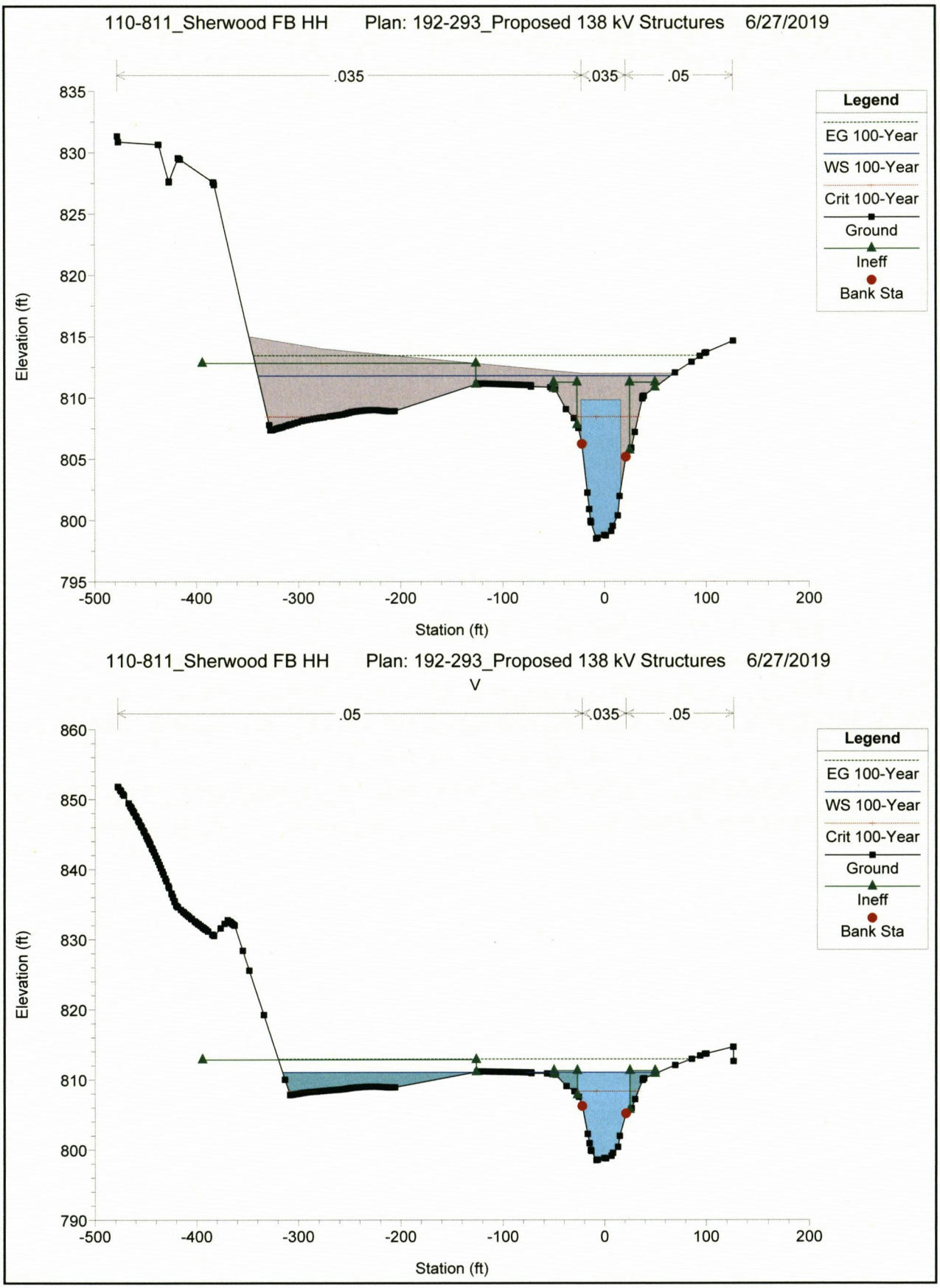

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
M
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
N
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-700
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)

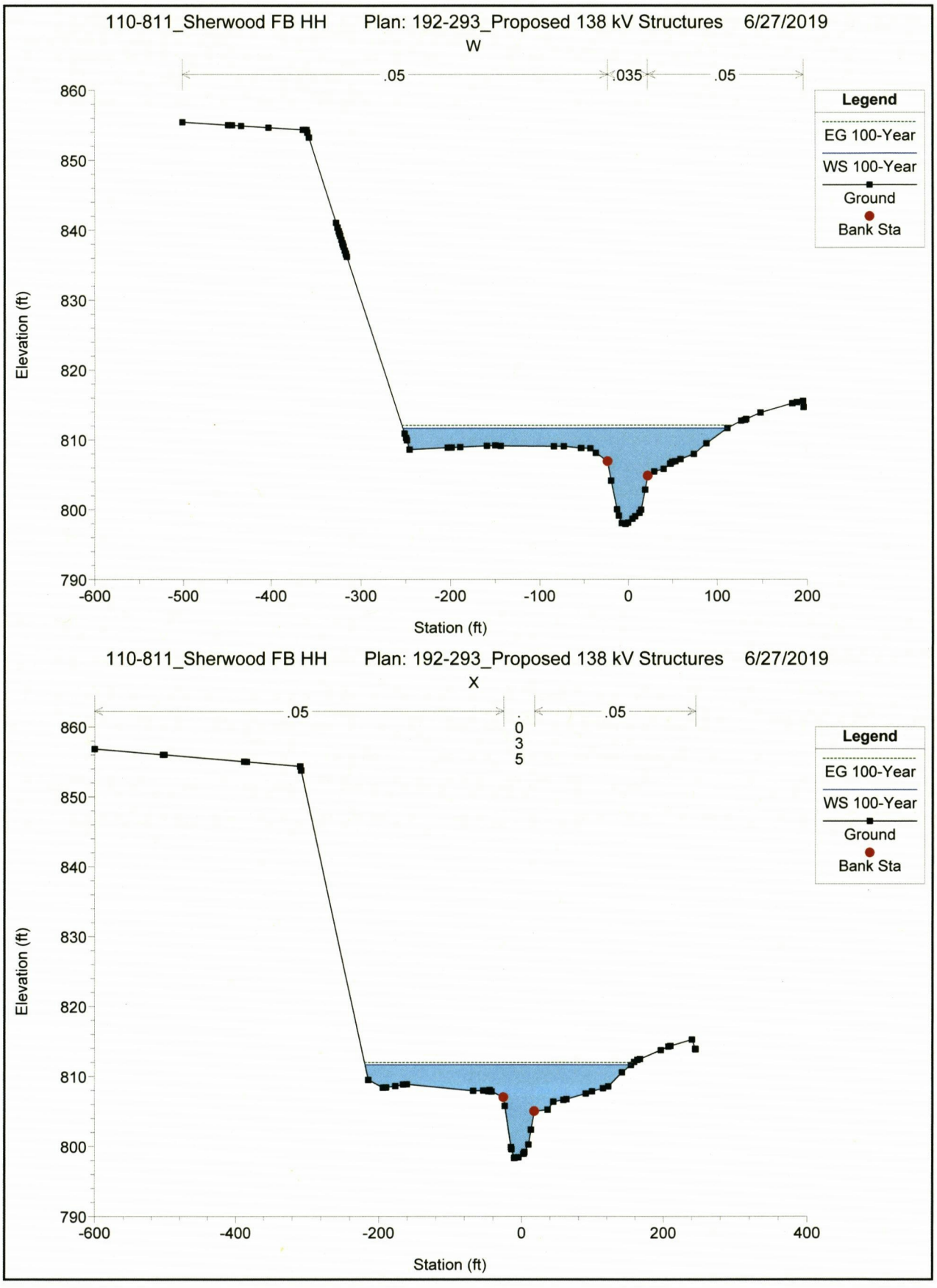

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
O
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
P
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

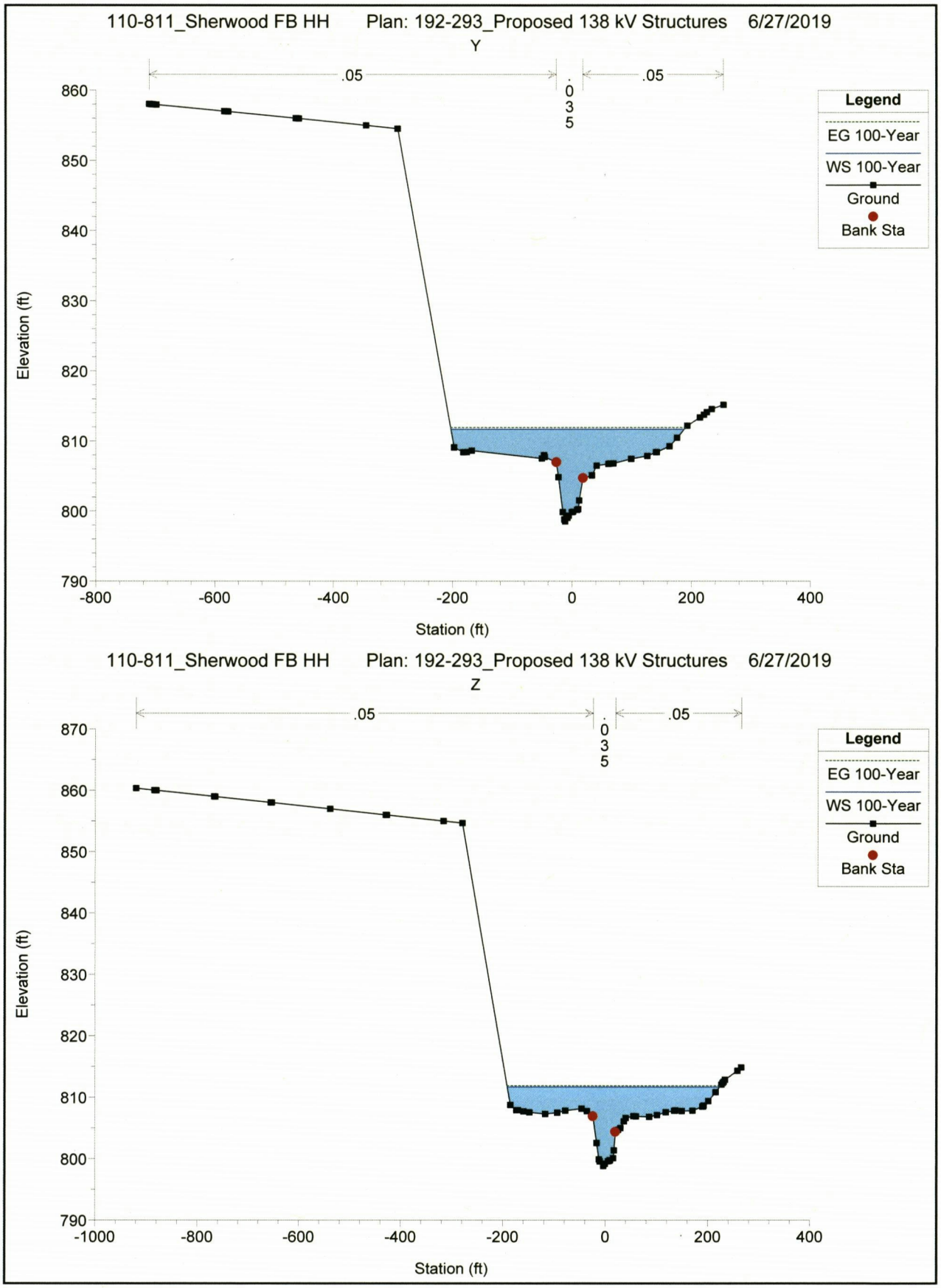

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
Q
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
850
840
830
820
810
800
-800
-600
-400
-200
0
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
R
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
850
840
830
820
810
800
-1000
-800
-600
-400
-200
0
200
Station (ft)

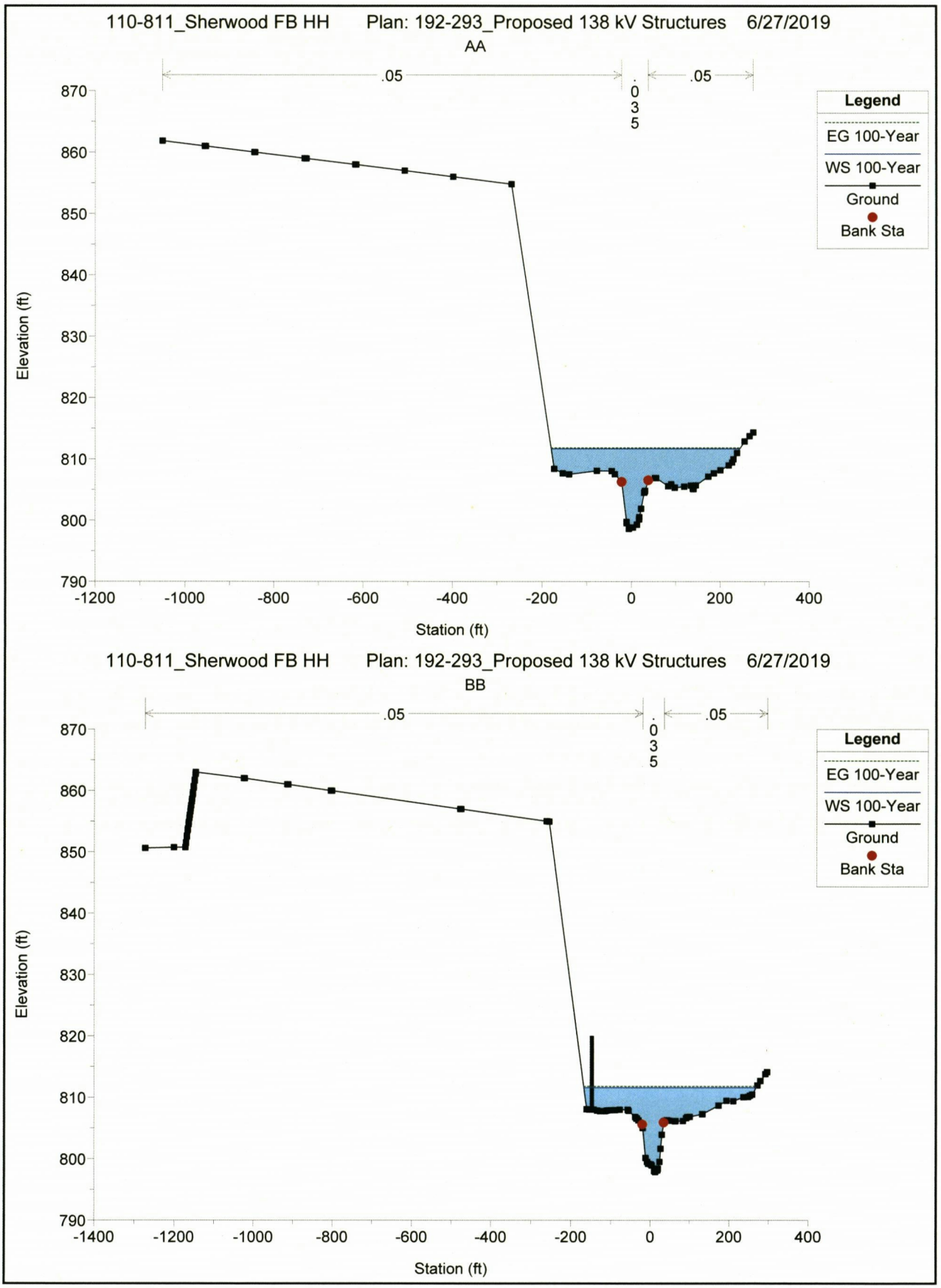

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
S
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
850
840
830
820
810
800
-1000
-800
-600
-400
-200
0
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
T
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
850
840
830
820
810
800
-1000
-800
-600
-400
-200
0
200
Station (ft)

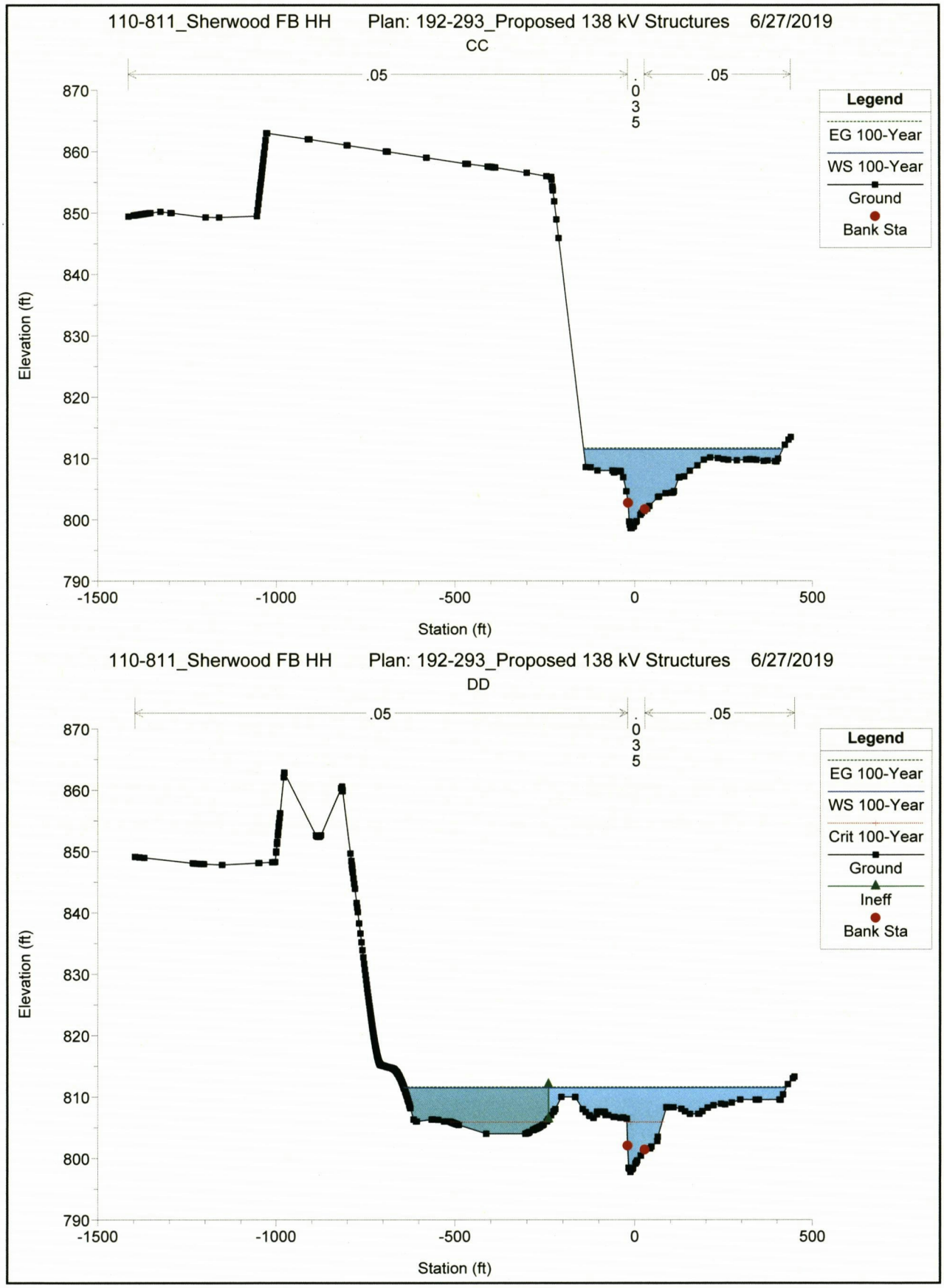

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
U
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
850
840
830
820
810
800
790
-1000
-800
-600
-400
-200
0
200
400
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
.035
.05
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
870
860
850
840
830
820
810
800
790
-1000
-800
-600
-400
-200
0
200
400

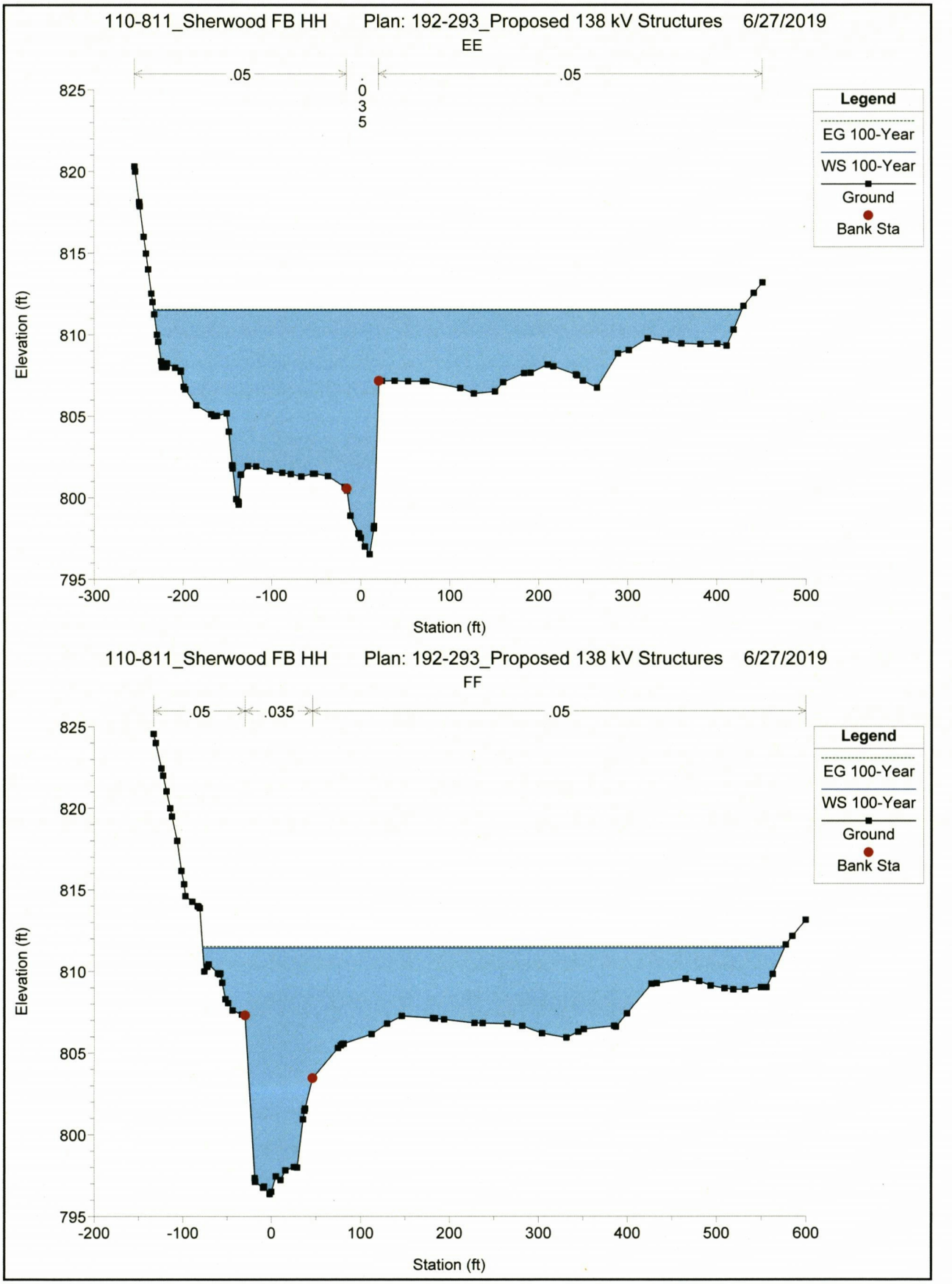

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
.035
.035
.05
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
835
830
825
820
815
810
805
800
795
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
V
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
860
850
840
830
820
810
800
790
-500
-400
-300
-200
-100
0
100
200
Station (ft)

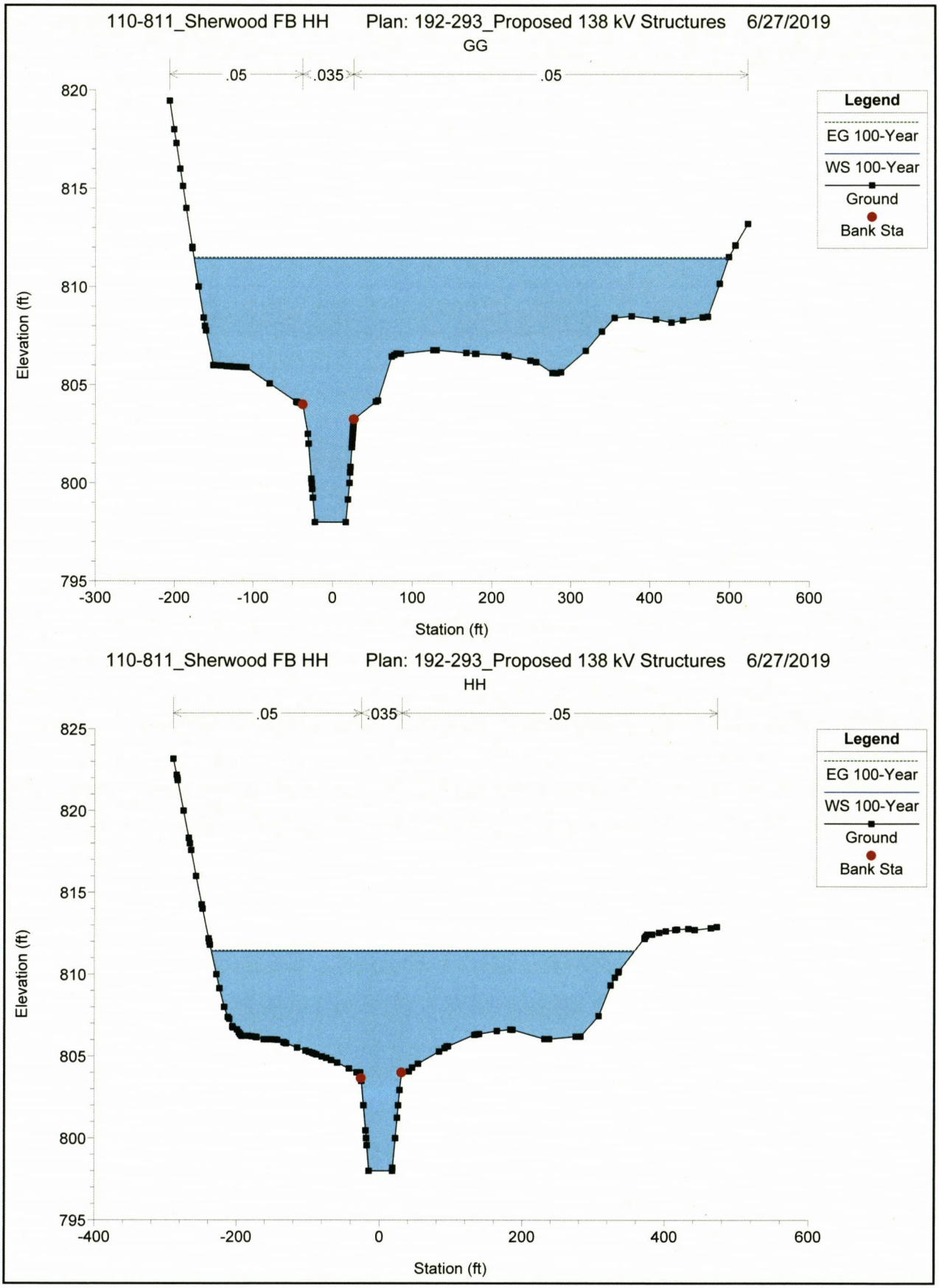

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
W
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
860
850
840
830
820
810
800
790
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
X
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
860
850
840
830
820
810
800
790
-600
-400
-200
0
200
400
Station (ft)

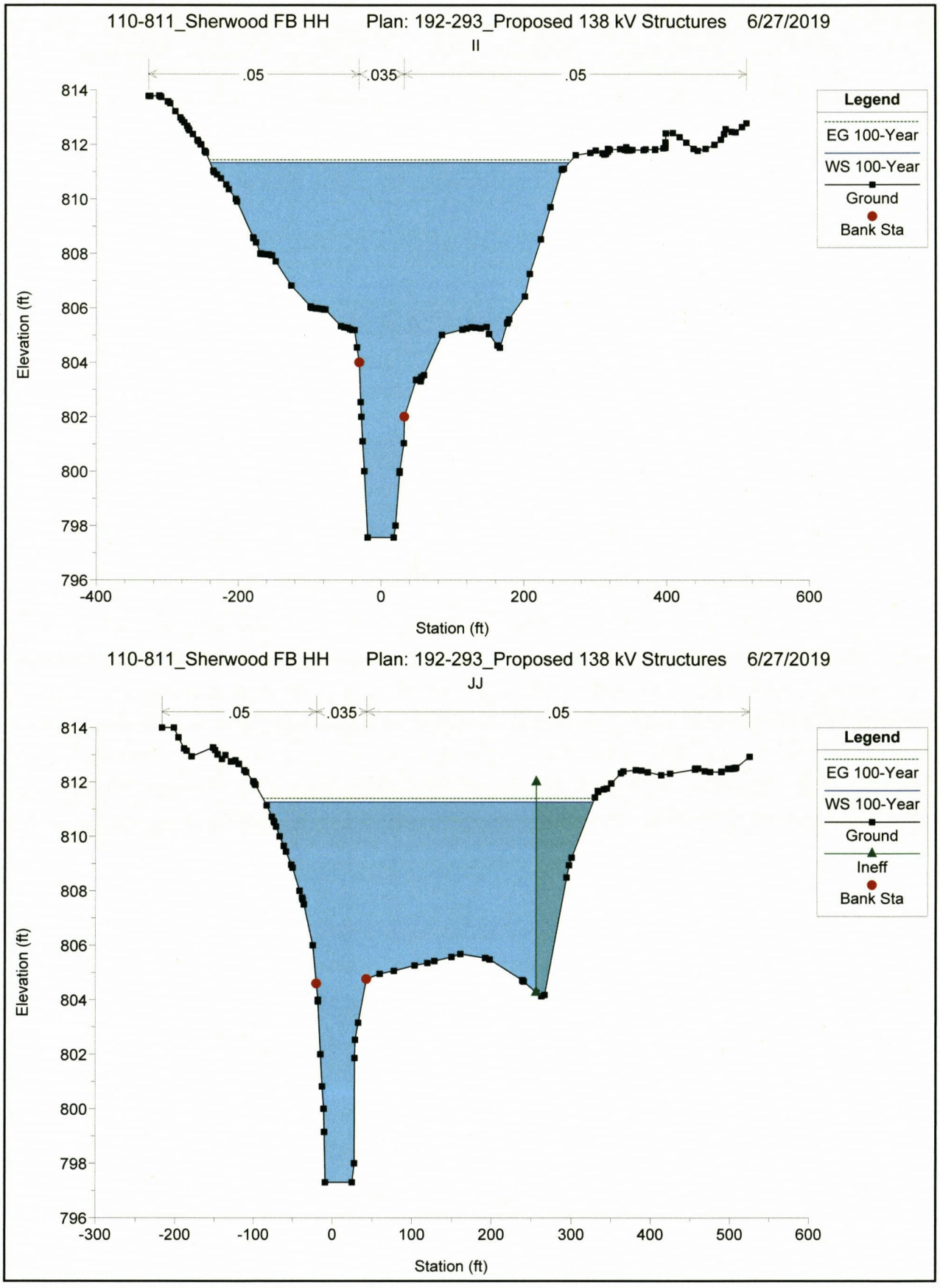

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
Y
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
Z
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

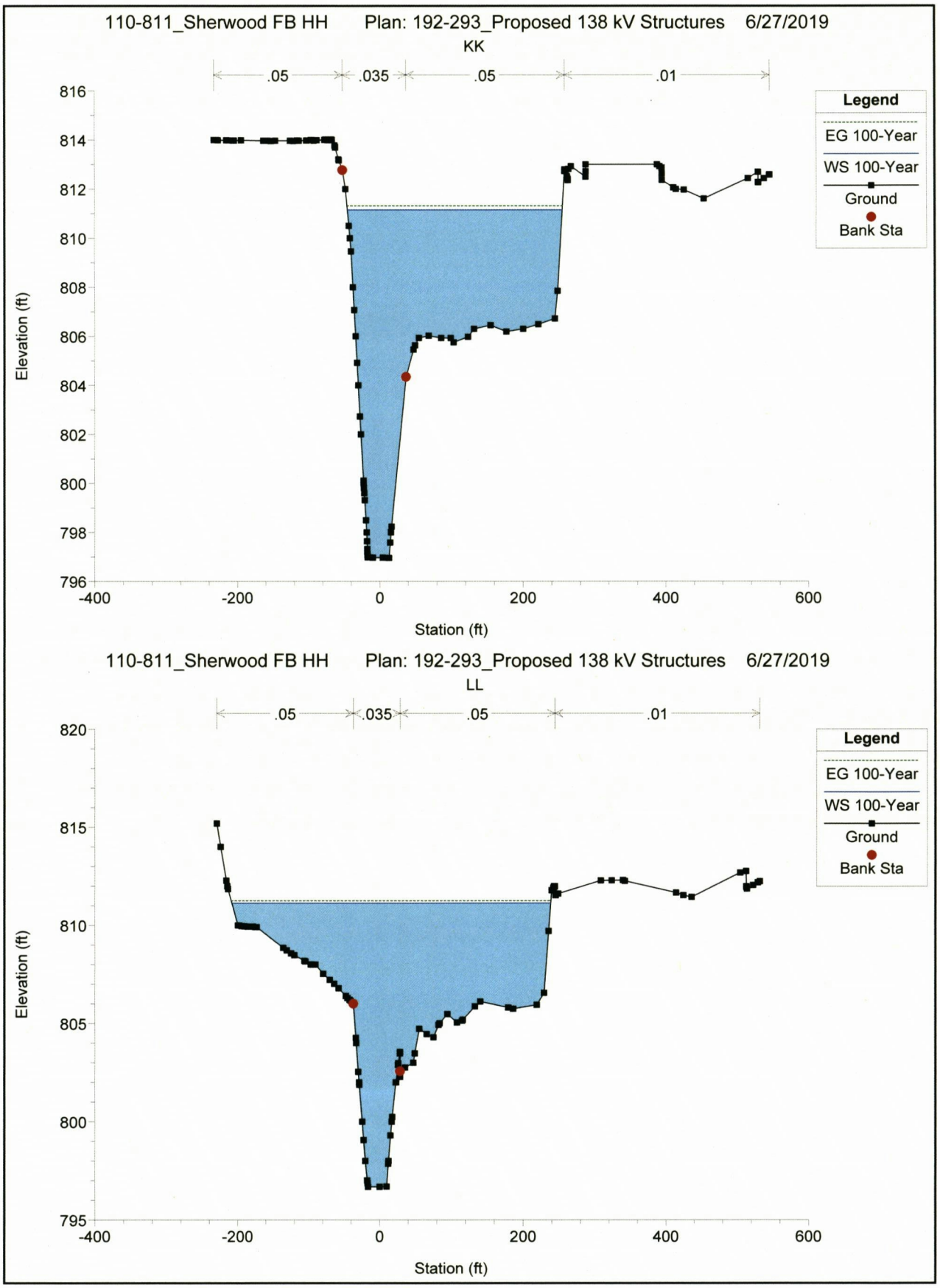

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
AA
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
870
860
850
840
830
820
810
800
790
-1200
-1000
-800
-600
-400
-200
0
200
400
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
BB
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
870
860
850
840
830
820
810
800
790
-1400
-1200
-1000
-800
-600
-400
-200
0
200
400
Station (ft)

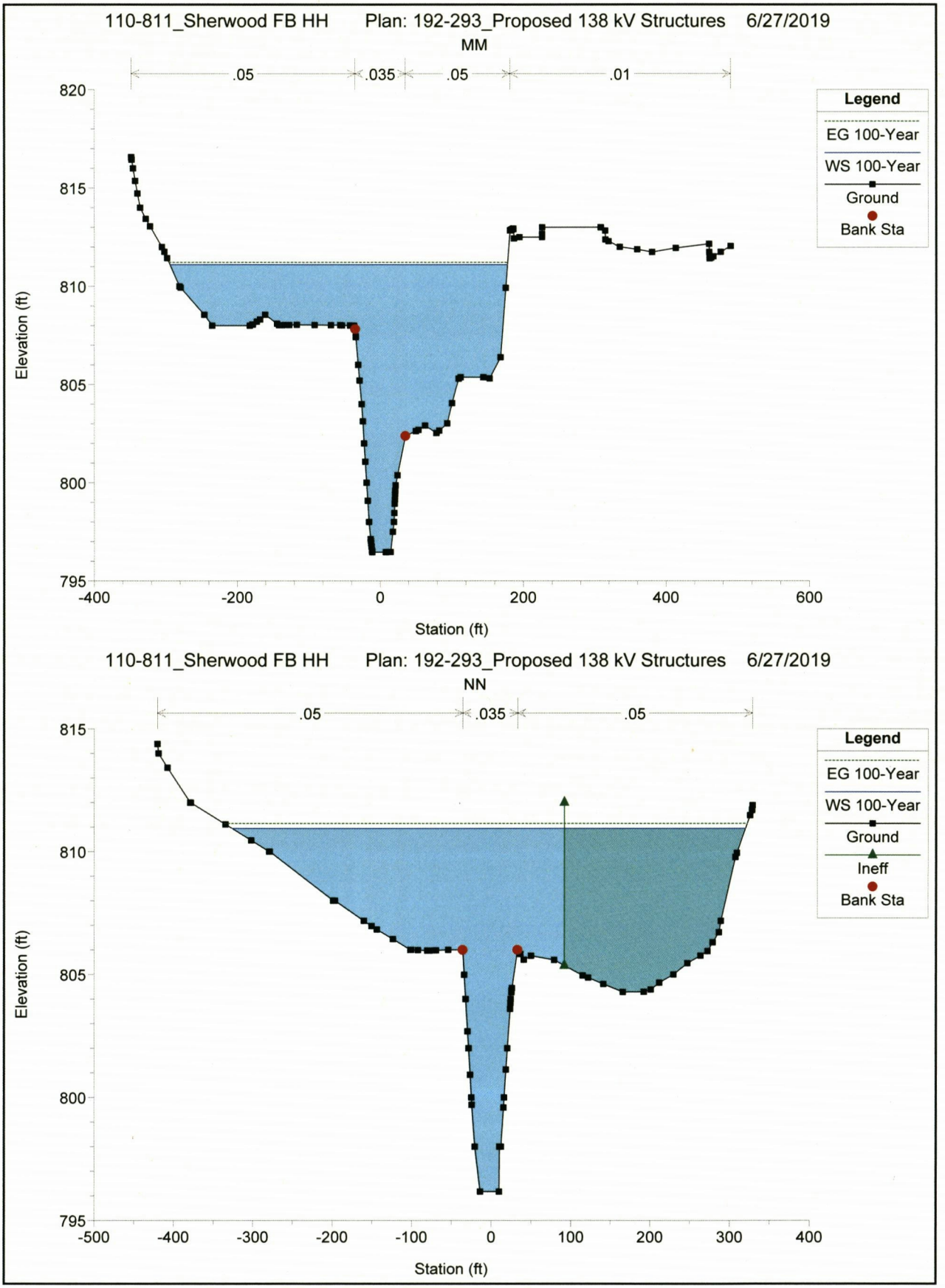

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
CC
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
870
860
850
840
830
820
810
800
790
-1500
-1000
-500
0
500
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
DD
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
870
860
850
840
830
820
810
800
790
-1500
-1000
-500
0
500
Station (ft)

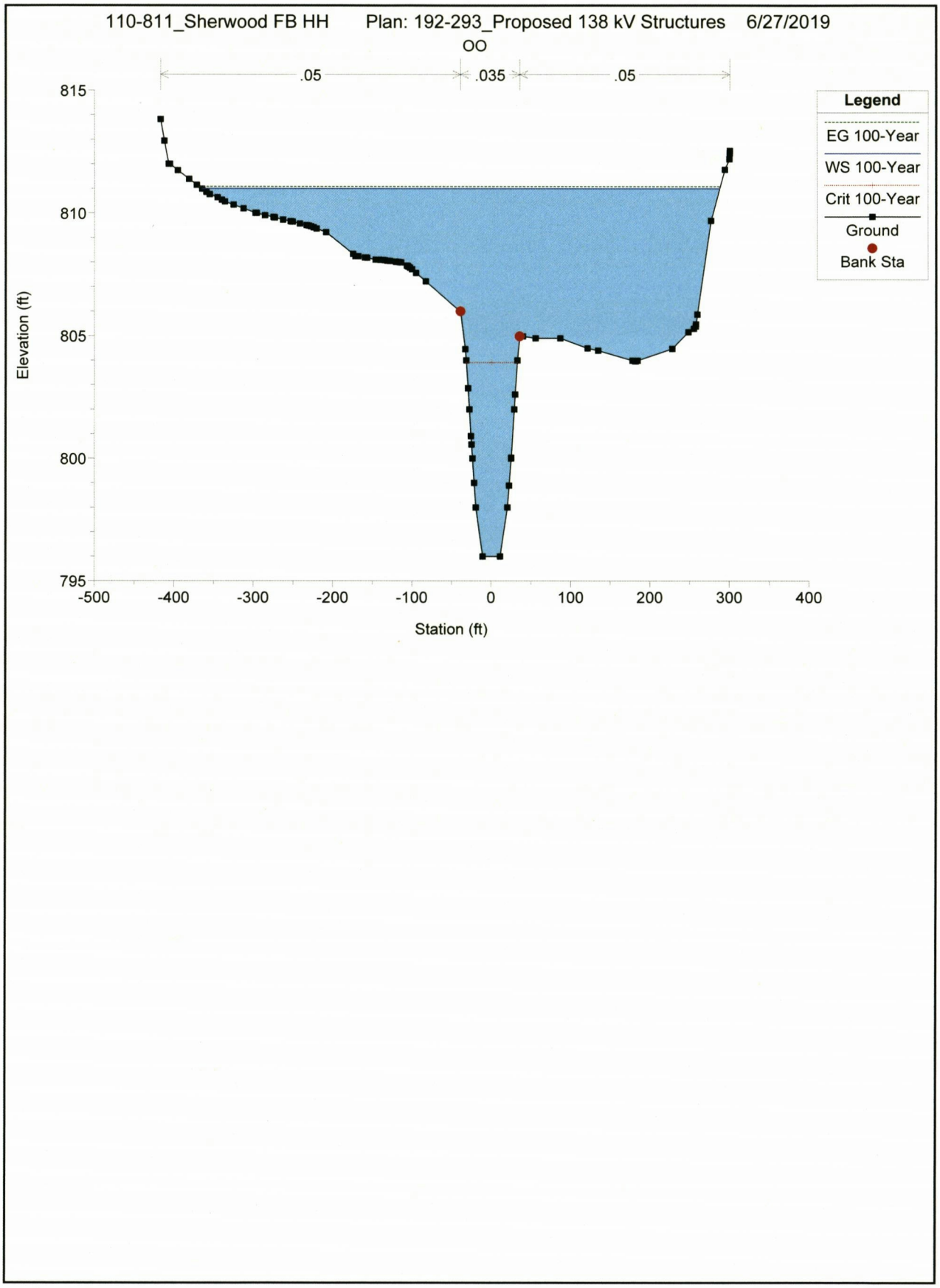

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
EE
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-300
-200
-100
0
100
200
300
400
500
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
FF
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-200
-100
0
100
200
300
400
500
600
Station (ft)

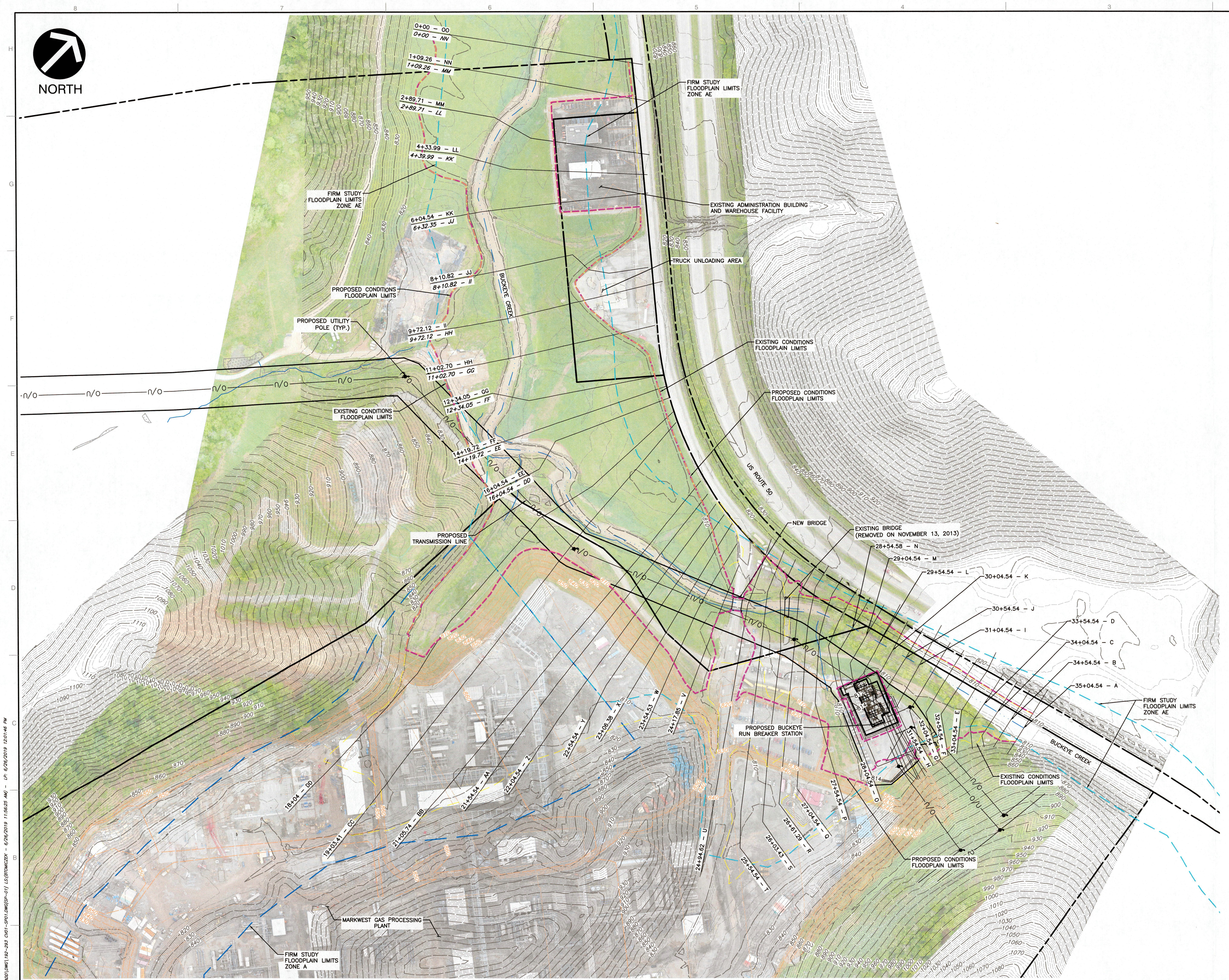

110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
GG
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
820
815
810
805
800
795
-300
-200
-100
0
100
200
300
400
500
600
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
HH
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-400
-200
0
200
400
600
Station (ft)


110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
II
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
814
812
810
808
806
804
802
800
798
796
-400
-200
0
200
400
600
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
JJ
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
814
812
810
808
806
804
802
800
798
796
-300
-200
-100
0
100
200
300
400
500
600
Station (ft)


110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
KK
.05
.035
.05
.01
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
LL
.05
.035
.05
.01
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)


110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
MM
.05
.035
.05
.01
820
815
810
805
800
795
Elevation (ft)
-400
-200
0
200
400
600
Station (ft)
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
110-811_Sherwood FB HH Plan: 192-293_Proposed 138 kV Structures 6/27/2019
NN
.05
.035
.05
815
810
805
800
795
Elevation (ft)
-500
-400
-300
-200
-100
0
100
200
300
400
Station (ft)
Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta


110-811_Sherwood FB HH
Plan: 192-293_Proposed 138 kV Structures
6/27/2019
OO
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Bank Sta
Elevation (ft)
815
810
805
800
795
-500
-400
-300
-200
-100
0
100
200
300
400
Station (ft)



LEGEND

- APPROXIMATE STREAM CENTERLINE
- 303+04.54 – K — PROPOSED CONDITIONS HEC-RAS CROSS SECTION
- 303+04.54 – K / 303+04.54 – K — EXISTING AND PROPOSED CONDITIONS HEC-RAS CROSS SECTION
- 100-YEAR FLOODPLAIN LIMITS, CURRENT CONDITIONS
- 100-YEAR FLOODPLAIN LIMITS, PROPOSED CONDITIONS
- FIRM STUDY FLOODPLAIN LIMITS ZONE AE
- FIRM STUDY FLOODPLAIN LIMITS ZONE A
- PROPERTY LINE
- 870 — EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- 870 — AS-BUILT INDEX CONTOUR
- AS-BUILT INTERMEDIATE CONTOUR
- 870 — PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- PROPOSED LOD
- O/U — PROPOSED TRANSMISSION LINE / UTILITY POLE

REFERENCE

1. EXISTING TOPOGRAPHY DEVELOPED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. (CEC) USING CEC SURVEY DATA AND DIGITAL ELEVATION MODELS (USGS 3-METER), 2003 OF THE U.S. GEOLOGICAL SURVEY (USGS) AND WEST VIRGINIA STATEWISE ADDRSSING & MAPPING BOARD (WVSAMB). ADDITIONAL EXISTING TOPOGRAPHY NEAR PROPOSED SUBSTATION PROVIDED BY ELECTRICAL CONSULTANTS, INC.
2. STREAM LOCATIONS DELINEATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
3. AERIAL IMAGERY GENERATED FROM UNMANNED AERIAL SYSTEM (UAS) RECORDED DATA COLLECTED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. (CEC) ON MAY 16, 2018.
4. PROPOSED SUBSTATION GRADING, EQUIPMENT LAYOUT, AND UTILITY POLE LOCATIONS PROVIDED BY ELECTRICAL CONSULTANTS, INC.

SCALE IN FEET: 0 150 300

* HAND SIGNATURE ON FILE

REVISION RECORD

NO	DATE	DESCRIPTION
1	2/27/19	REVISED FOR NEW SUBSTATION GRADING

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
513-985-0226 · 800-759-5614
www.cecinc.com

SHERWOOD MIDSTREAM LLC
SMITHBURG 138KV STRUCTURES
DODDRIDGE COUNTY, WEST VIRGINIA

EXISTING AND FINAL PROPOSED GRADING
100-YEAR FLOODPLAIN MAP

DATE:	12/3/2018	DRAWN BY:	PJH
DWG SCALE:	1"=150'	CHECKED BY:	ARC
PROJECT NO:	192-293		
APPROVED BY:	*RPC		

DRAWING NO.: **SP01**

APPENDIX E

HEC-RAS SUMMARY OF EXISTING AND PROPOSED HYDRAULIC CALCULATIONS

HEC-RAS Plan: Existing River: Buckeye Creek Reach: Buckeye Creek Profile: 100-Year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Buckeye Creek	3504.54	100-Year	5150.00	804.44	813.96		814.76	0.001962	7.17	726.12	104.68	0.45
Buckeye Creek	3454.54	100-Year	5150.00	804.38	813.52		814.61	0.002677	8.58	666.37	123.34	0.54
Buckeye Creek	3404.54	100-Year	5150.00	804.32	813.11		814.44	0.003501	9.44	604.30	113.48	0.61
Buckeye Creek	3354.54	100-Year	5150.00	804.25	813.17		814.19	0.002626	8.49	767.38	197.82	0.54
Buckeye Creek	3304.54	100-Year	5150.00	804.25	813.04		814.06	0.002738	8.51	773.91	212.43	0.54
Buckeye Creek	3254.54	100-Year	5150.00	804.12	813.13		813.86	0.002015	7.43	973.78	270.79	0.47
Buckeye Creek	3204.54	100-Year	5150.00	804.05	813.09		813.74	0.001817	7.18	1064.85	297.47	0.45
Buckeye Creek	3154.54	100-Year	5150.00	803.90	813.08		813.63	0.001571	6.78	1217.48	358.66	0.42
Buckeye Creek	3104.54	100-Year	5150.00	803.47	813.07		813.53	0.001327	6.27	1374.43	418.07	0.38
Buckeye Creek	3054.54	100-Year	5150.00	803.04	813.07		813.46	0.001149	5.86	1491.17	457.49	0.36
Buckeye Creek	3004.54	100-Year	5150.00	802.19	813.08		813.39	0.000931	5.40	1683.27	500.68	0.32
Buckeye Creek	2954.54	100-Year	5150.00	802.19	813.10		813.33	0.000725	4.86	1983.21	548.18	0.29
Buckeye Creek	2904.54	100-Year	5150.00	802.00	813.13		813.28	0.000495	4.02	2346.54	604.95	0.24
Buckeye Creek	2854.58	100-Year	5150.00	802.00	813.13		813.25	0.000374	3.58	2651.69	649.77	0.21
Buckeye Creek	2804.54	100-Year	5150.00	802.00	813.14		813.23	0.000319	3.24	2937.14	682.42	0.19
Buckeye Creek	2754.54	100-Year	5150.00	802.00	813.11		813.21	0.000334	3.46	2940.37	716.03	0.19
Buckeye Creek	2704.54	100-Year	5150.00	802.00	812.97		813.17	0.000629	4.70	2284.41	757.90	0.26
Buckeye Creek	2661.29	100-Year	5150.00	802.00	811.37	809.07	812.98	0.003540	10.22	513.70	416.99	0.61
Buckeye Creek	2625.35		Bridge									
Buckeye Creek	2601.43	100-Year	5150.00	802.00	811.11	808.56	812.55	0.003137	9.65	601.68	672.15	0.58
Buckeye Creek	2554.54	100-Year	5150.00	800.98	811.27	809.13	812.14	0.002231	7.97	861.91	686.37	0.49
Buckeye Creek	2504.54	100-Year	5150.00	797.95	811.43		811.70	0.000761	5.48	1958.87	564.25	0.29
Buckeye Creek	2454.54	100-Year	5150.00	798.34	811.42		811.61	0.000648	4.95	2332.46	710.67	0.27
Buckeye Creek	2404.54	100-Year	5150.00	798.53	811.43		811.56	0.000476	4.18	2824.02	832.81	0.23
Buckeye Creek	2354.54	100-Year	5150.00	798.81	811.46		811.51	0.000236	3.00	3956.71	1014.95	0.16
Buckeye Creek	2304.54	100-Year	5150.00	798.60	811.46		811.50	0.000163	2.44	4714.72	1211.03	0.14
Buckeye Creek	2254.54	100-Year	5150.00	797.84	811.45		811.49	0.000161	2.57	4984.39	1422.68	0.14
Buckeye Creek	2204.54	100-Year	5150.00	798.59	811.44		811.46	0.000097	2.08	6304.55	1658.44	0.11
Buckeye Creek	2154.54	100-Year	5150.00	796.53	811.35		811.40	0.000177	2.79	3531.91	659.94	0.14
Buckeye Creek	2104.54	100-Year	5150.00	796.37	811.29		811.38	0.000197	3.06	3150.05	652.23	0.15
Buckeye Creek	2054.54	100-Year	5150.00	798.00	811.28		811.35	0.000169	2.82	3553.28	671.93	0.14
Buckeye Creek	2004.54	100-Year	5150.00	798.00	811.25		811.32	0.000165	2.93	3345.53	589.97	0.15
Buckeye Creek	1954.54	100-Year	5150.00	797.56	811.18		811.29	0.000228	3.38	2761.62	496.01	0.17
Buckeye Creek	1904.54	100-Year	5150.00	797.30	811.13		811.25	0.000312	3.58	2385.42	408.81	0.19
Buckeye Creek	1854.54	100-Year	5150.00	796.97	811.11		811.18	0.000189	2.72	3224.53	564.55	0.15
Buckeye Creek	1804.54	100-Year	5150.00	796.70	811.10		811.15	0.000148	2.61	3762.86	712.65	0.13
Buckeye Creek	1754.54	100-Year	5150.00	796.46	811.09		811.14	0.000137	2.45	3910.40	744.61	0.13
Buckeye Creek	1704.54	100-Year	5150.00	796.17	811.03		811.10	0.000200	2.91	3270.82	651.91	0.15
Buckeye Creek	1654.54	100-Year	5150.00	796.00	811.00	803.91	811.08	0.000191	2.96	3099.82	653.27	0.15

PREPARED BY: 3/25/2014 TGJ

CHECKED BY: AJG 26-MAR-2014

PREPARED BY: PJH 2/11/2019 CHECKED BY: ARC 2/14/2019

HEC-RAS Plan: 138kV_Structures River: Buckeye Creek Reach: Buckeye Creek Profile: 100-Year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Buckeye Creek	3504.54	100-Year	5150.00	804.44	814.45		815.15	0.001598	6.74	778.76	110.69	0.41
Buckeye Creek	3454.54	100-Year	5150.00	804.38	814.13		815.04	0.002027	7.85	745.28	132.75	0.48
Buckeye Creek	3404.54	100-Year	5150.00	804.32	813.87		814.92	0.002447	8.42	695.47	128.30	0.52
Buckeye Creek	3354.54	100-Year	5150.00	804.25	814.00		814.72	0.001689	7.28	932.93	202.44	0.44
Buckeye Creek	3304.54	100-Year	5150.00	804.25	813.94		814.63	0.001670	7.16	979.62	235.90	0.43
Buckeye Creek	3254.54	100-Year	5150.00	804.12	814.02		814.49	0.001199	6.16	1218.94	286.83	0.37
Buckeye Creek	3204.54	100-Year	5150.00	804.05	814.00		814.42	0.001068	5.91	1347.55	320.72	0.35
Buckeye Creek	3154.54	100-Year	5150.00	803.89	813.93		814.36	0.001106	6.07	1364.10	362.15	0.36
Buckeye Creek	3104.54	100-Year	5150.00	803.47	813.82		814.30	0.001161	6.20	1198.04	311.68	0.36
Buckeye Creek	3054.54	100-Year	5150.00	803.03	813.69		814.24	0.001280	6.45	1057.93	253.46	0.38
Buckeye Creek	3004.54	100-Year	5150.00	802.18	813.49		814.16	0.001466	6.98	936.62	230.74	0.41
Buckeye Creek	2954.54	100-Year	5150.00	802.18	813.52		814.05	0.001210	6.46	1102.26	269.71	0.37
Buckeye Creek	2904.54	100-Year	5150.00	802.00	813.61		813.95	0.000787	5.23	1393.10	330.51	0.30
Buckeye Creek	2854.58	100-Year	5150.00	802.00	813.64		813.89	0.000576	4.60	1634.18	366.66	0.26
Buckeye Creek	2804.54	100-Year	5150.00	802.00	813.66		813.85	0.000487	4.15	1972.71	549.64	0.23
Buckeye Creek	2754.54	100-Year	5150.00	802.00	813.68		813.80	0.000340	3.62	2406.67	508.65	0.20
Buckeye Creek	2704.54	100-Year	5150.00	802.00	813.61		813.77	0.000432	4.06	2117.25	387.23	0.22
Buckeye Creek	2661.29	100-Year	5150.00	802.00	813.57		813.74	0.000495	4.33	2012.86	383.81	0.23
Buckeye Creek	2603.43	100-Year	5150.00	802.00	813.43		813.70	0.000614	5.01	1619.98	297.58	0.27
Buckeye Creek	2554.54	100-Year	5150.00	800.98	813.44		813.65	0.000532	4.55	1949.88	438.47	0.25
Buckeye Creek	2494.62	100-Year	5150.00	799.17	811.79	808.33	813.45	0.002741	10.33	498.69	240.78	0.56
Buckeye Creek	2460.04		Bridge									
Buckeye Creek	2417.85	100-Year	5150.00	798.50	811.04	808.31	812.93	0.003378	11.14	496.68	317.10	0.61
Buckeye Creek	2354.53	100-Year	5150.00	797.95	811.66		812.08	0.000991	6.35	1474.21	364.18	0.33
Buckeye Creek	2306.38	100-Year	5150.00	798.34	811.67		811.98	0.000859	5.78	1654.05	373.70	0.31
Buckeye Creek	2254.54	100-Year	5150.00	798.53	811.66		811.91	0.000774	5.40	1771.23	390.85	0.29
Buckeye Creek	2204.54	100-Year	5150.00	798.81	811.65		811.86	0.000637	4.98	1949.09	414.26	0.27
Buckeye Creek	2154.54	100-Year	5150.00	798.60	811.66		811.81	0.000447	4.10	2186.51	423.99	0.23
Buckeye Creek	2105.74	100-Year	5150.00	797.84	811.57		811.78	0.000538	4.74	1994.45	436.18	0.25
Buckeye Creek	1903.41	100-Year	5150.00	798.59	811.49		811.67	0.000480	4.63	2324.50	558.03	0.24
Buckeye Creek	1804	100-Year	5150.00	797.78	811.48	805.90	811.61	0.000356	4.08	2751.96	1067.33	0.21
Buckeye Creek	1604.54	100-Year	5150.00	796.53	811.49		811.54	0.000165	2.72	3626.18	661.40	0.13
Buckeye Creek	1419.72	100-Year	5150.00	796.37	811.44		811.52	0.000183	2.97	3246.65	653.60	0.15
Buckeye Creek	1234.05	100-Year	5150.00	798.00	811.43		811.49	0.000156	2.74	3653.16	673.76	0.14
Buckeye Creek	1102.70	100-Year	5150.00	798.00	811.40		811.47	0.000173	2.85	3434.30	593.36	0.14
Buckeye Creek	972.12	100-Year	5150.00	797.56	811.34		811.44	0.000215	3.30	2838.34	503.54	0.16
Buckeye Creek	810.82	100-Year	5150.00	797.30	811.26		811.39	0.000323	3.68	2188.45	413.11	0.19
Buckeye Creek	604.54	100-Year	5150.00	796.96	811.15		811.32	0.000392	3.88	1929.77	300.42	0.21
Buckeye Creek	433.99	100-Year	5150.00	796.69	811.13		811.25	0.000285	3.57	2437.90	446.57	0.18
Buckeye Creek	289.71	100-Year	5150.00	796.46	811.10		811.22	0.000270	3.46	2481.28	472.31	0.18
Buckeye Creek	109.26	100-Year	5150.00	796.17	810.95		811.15	0.000443	4.31	1986.74	646.59	0.23
Buckeye Creek	0	100-Year	5150.00	796.00	811.00	803.91	811.08	0.000191	2.96	3099.82	653.27	0.15

Buckeye Creek
Existing vs. Proposed HEC-RAS Models
100-Year Water Surface Elevations Summary
Smithburg 138kV Structures Project - Doddridge County, WV
Project: 192-293

PREPARED BY: PJH
DATE: 2/11/2019
CHECKED: ARC
DATE: 2/14/2019

ID	River Station	100-Year Peak Flow (cfs)	Water Surface Elevations Existing	Water Surface Elevations Proposed	Water Surface Elevations Existing vs. Proposed
A	35+04.54	5150	813.96	814.45	0.49
B	34+54.54	5150	813.52	814.13	0.61
C	34+04.54	5150	813.11	813.87	0.76
D	33+54.54	5150	813.17	814.00	0.83
E	33+04.54	5150	813.04	813.94	0.90
F	32+54.54	5150	813.13	814.02	0.89
G	32+04.54	5150	813.09	814.00	0.91
H	31+54.54	5150	813.08	813.93	0.85
I	31+04.54	5150	813.07	813.82	0.75
J	30+54.54	5150	813.07	813.69	0.62
K	30+04.54	5150	813.08	813.49	0.41
L	29+54.54	5150	813.10	813.52	0.42
M	29+04.54	5150	813.13	813.61	0.48
N	28+54.58	5150	813.13	813.64	0.51
O	28+04.54	5150	813.14	813.66	0.52
P	27+54.54	5150	813.11	813.68	0.57
Q	27+04.54	5150	812.97	813.61	0.64
R	26+61.29	5150	811.37	813.57	2.20
		Existing Bridge			
S	26+03.43	5150	811.11	813.43	2.32
T	25+54.54	5150	811.27	813.44	2.17
U	24+94.62	5150	-	811.79	N/A
		New Bridge			
V	24+17.85	5150	-	811.04	N/A
W	23+54.53	5150	811.43	811.66	0.23
X	23+06.38	5150	811.42	811.67	0.25
Y	22+54.54	5150	811.43	811.66	0.23
Z	22+04.54	5150	811.46	811.65	0.19
AA	21+54.54	5150	811.46	811.66	0.20
BB	21+05.74	5150	811.45	811.57	0.12
CC	19+03.41	5150	811.44	811.49	0.05
DD	18+04.00	5150	-	811.48	N/A
EE	16+04.54	5150	811.35	811.49	0.14
FF	14+19.72	5150	811.29	811.44	0.15
GG	12+34.05	5150	811.28	811.43	0.15
HH	11+02.70	5150	811.25	811.40	0.15
II	9+72.12	5150	811.18	811.34	0.16
JJ	8+10.82	5150	811.13	811.26	0.13
KK	6+04.54	5150	811.11	811.15	0.04
LL	433.99	5150	811.10	811.13	0.03
MM	289.71	5150	811.09	811.10	0.01
NN	109.26	5150	811.03	810.95	-0.08
OO	0	5150	811.00	811.00	0.00

APPENDIX F

DODDRIDGE COUNTY FLOODPLAIN PERMITS

June 13, 2019

Mr. George Eidel
Doddridge County Floodplain Manager
105 Court Street, Suite #3
West Union, WV 26456

Dear Mr. Eidel:

Subject: Floodplain Development Permit and FEMA CLOMR-F Application
Commercial/Industrial Floodplain Development Permit
Smithburg 138kV Structures
Doddridge County, West Virginia
CEC Project 192-293

On behalf of Sherwood Midstream LLC, Civil & Environmental Consultants, Inc. (CEC) is submitting a Commercial/Industrial Floodplain Development Permit associated with the Smithburg 138kV Structures project (Originally the Buckeye Run Breaker Station), located in Doddridge County, West Virginia.

Please find enclosed two (2) copies of the following information:

- Permit Application Fee in the amount of $25,000 (Construction costs approximately $18 million) (Check#151154); and
- Doddridge County Floodplain Development Permit Application.

Should you have any questions or require additional information, do not hesitate to contact us at 412-429-2324.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Joseph Ryan, P.E.
Project Manager

Richard P. Celender, RLA, C.E.T., CPESC, CPSWQ
Vice President

Enclosures

192-293-L-Floodplain Permit-6-7-19

151154

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
333 BALDWIN ROAD
PITTSBURGH, PA 15205
(412) 429-2324

PNC BANK, N.A.
Pittsburgh, PA

8-9/430

CHECK DATE 6/4/2019

PAY Twenty Five Thousand and 00/100 Dollars

AMOUNT 25,000.00

TO Doddridge County Commission
101 Church Street
Suite 102
West Union, WV 26456

AUTHORIZED SIGNATURE

Security features. Details on back.

⑈151154⑈ ⑆043000096⑆ 000227240 5⑈

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

151154

Check Date: 6/4/2019

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
06032019	6/3/2019	000000337393	25,000.00			25,000.00
Doddridge County Commission		TOTAL	25,000.00			25,000.00
- Operating Account 2		11261				

Permit# _____

Project Name: _____

Permittees Name: _____

Doddridge County, WV

Floodplain Development Permit Application

This document is to be used for projects that impact/potentially impact the FEMA---designated floodplain and/or floodway of Doddridge County, WV pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance.

SECTION 1: GENERAL PROVISIONS (APPLICANT TO READ AND SIGN)

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. The permit will expire if no work is commenced within six months of issuance.
5. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
6. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
7. I THE APPLICANT CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

APPLICANT'S SIGNATURE _____

DATE 6/13/19

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Applicant Information:

Please provide all pertinent data.

Applicant Information		
Responsible Company Name: Sherwood Midstream LLC		
Corporate Mailing Address: 4600 J. Barry Court, Suite 500		
City: Canonsburg	**State:** PA	**Zip:** 15317
Corporate Point of Contact (POC): Richard Lowry		
Corporate POC Title: Environmental Manager - New Construction		
Corporate POC Primary Phone: 724-416-0520		
Corporate POC Primary Email: ralowry@marathonpetroleum.com		
Corporate FEIN: 30-0528059	**Corporate DUNS:**	
Corporate Website:		
Local Mailing Address: 320 South View Drive, Suite 200		
City: Bridgeport	**State:** WV	**Zip:** 26330
Local Project Manager (PM):		
Local PM Primary Phone:		
Local PM Secondary Phone:		
Local PM Primary Email:		
Person Filing Application: Richard Lowry		
Applicant Title: Environmental Manager - New Construction		
Applicant Primary Phone: 724-416-0520		
Applicant Secondary Phone: 412-925-8165		
Applicant Primary Email: ralowry@marathonpetroleum.com		

Project Narrative:

Describe in detail the proposed development including project name/title, type of development, estimated start and completion timeline, and its potential impact on the floodplain. Use additional copies of this page as needed.

Project Narrative:

Sherwood Midstream LLC (Sherwood) is proposing to begin construction of the Smithburg 138kV Transmission Line Structures associated with the previously permitted Floodplain Development Permit #18-537, approved on March 12, 2019. Permit #18-537 is a part of MonPower/FirstEnergy's Buckeye Run Breaker Station project. The proposed 138kV transmission line project will include approximately 15,560 feet of line, and twenty-three (23) pole structures. Sherwood is proposing to permit the line, structures and temporary access roads to the proposed structures under this floodplain permit.

Nine (9) of the proposed structures are located near the existing Sherwood Natural Gas Processing Plant site and are located within the Buckeye Creek floodplain. The existing natural gas processing plant located approximately one-half-mile east of the intersection of U.S. Route 50 and County Route 20 along County Route 50/34 in Doddridge County, West Virginia.

The work proposes placing fill and equipment in the floodplain in order to construct the proposed 138kV structures. Construction is anticipated to begin 7/1/19 and be completed by 12/1/19. The proposed improvements are not anticipated to have a major impact on the floodplain.

Proposed Development:

Please check all elements of the proposed project that apply.

DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)

A. STRUCTURAL DEVELOPMENT

	ACTIVITY		STRUCTURAL TYPE
[X]	New Structure	[]	Residential (1 – 4 Family)
[]	Addition	[]	Residential (more than 4 Family)
[]	Alteration	[X]	Non-residential (floodproofing)
[]	Relocation	[]	Combined Use (res. & com.)
[]	Demolition	[]	Replacement
[]	Manufactured/Mobil Home		

B. OTHER DEVELOPLMENT ACTIVITIES:

[X] Fill [] Mining [] Drilling [] Pipelining

[] Grading

[] Excavation (except for STRUCTURAL DEVELOPMENT checked above)

[] Watercourse Alteration (including dredging and channel modification)

[] Drainage Improvements (including culvert work)

[] Road, Street, or Bridge Construction

[] Subdivision (including new expansion)

[] Individual Water or Sewer System

[] Other (please specify)

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Development Site/Property Information:

Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)

Property Designation: 1 of 1

Site/Property Information:		
Legal Description: See Property Description Attachment & Tax Map (Sheet No. 19)		
Physical Address/911 Address: 218 Swisher Lane		
Decimal Latitude/Longitude: 39.277767 , -80.684625		
DMS Latitude/Longitude: W80° 41' 04.65" , N39° 16' 39.96"		
District: Grant	**Map:** 19	**Parcel:** 32
Land Book Description:		
Deed Book Reference: DBV 406, PG. 133		
Tax Map Reference: Tax Map 19		
Existing Buildings/Use of Property: Parking lot for natural gas processing plant.		

Floodplain Location Data: *(to be completed by Floodplain Manager or designee)*			
Community:	**Number:**	**Panel:**	**Suffix:**
Location (Lat/Long):		**Approximate Elevation:** **Estimated BFE:**	
Is the development in the floodway? ☐ **Yes** ☐ **No**		**Is the development in the floodplain?** ☐ **Yes** ☐ **No** **Zone:** _____	
Notes:			

QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS:

THAT, MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C., a Delaware limited liability company ("Grantor"), whose address is 1515 Arapahoe Street, Tower 1, Suite 1600, Denver, Colorado 80202, for valuable consideration paid, the receipt and sufficiency of which is hereby acknowledged, does hereby remise, release, and forever quitclaim unto **SHERWOOD MIDSTREAM HOLDINGS LLC**, a Delaware limited liability company ("Grantee"), whose address is 1515 Arapahoe Street, Tower 1, Suite 1600, Denver, Colorado 80202, the following described real property (the "Property") as further shown on Exhibit "A" and Exhibit "B" attached hereto and incorporated herein by reference, together with all of Grantor's right, title and interest in and to all rights, benefits, privileges, easements, tenements, hereditaments and appurtenances thereon or in any way appertaining thereto:

DESCRIPTION OF 211.525 ACRES

GRANT DISTRICT, COUNTY OF DODDRIDGE, STATE OF WEST VIRGINIA

All that certain 211.525 acres, being Lot E of the Revised Sherwood Plant Facilities Plan (to be recorded) located within the property of now or formerly MarkWest Liberty Midstream & Resources, L.L.C., recorded in Deed Book Volume 378, Page 516, located on Tax Parcel Sheet 19, Lot 32, situate in the Grant District, County of Doddridge, State of West Virginia, more particularly bounded and described as follows:

BEGINNING FOR REFERENCE at a point on an existing stone on a northerly corner of property now or formerly Howard J. Rivers, recorded in Deed Book Volume 249, Page 356, said stone also being at a south corner of Lot E of the Revised Sherwood Plant Facilities Plan (to be recorded), said Revised Sherwood Plant Facilities Plan being property now or formerly MarkWest Liberty Midstream & Resources, L.L.C., recorded in Deed Book Volume 378, Page 516; thence along the dividing line of property of now or formerly Howard J. Rivers and property herein described, the following four (4) courses and distances, viz: North 33°17'31" East, 264.13' to a capped rebar set; thence North 57°54'19" West, 102.11' to a capped rebar set; thence North 52°54'19" West, 145.20' to a capped rebar set; thence North 73°24'19" West, 225.37' to a capped rebar set at the southeast corner of property now or formerly Dennis H. Powell; thence along the dividing line of property of now or formerly Dennis H. Powell and property herein described, the following six (6) courses and distances, viz: North 15°49'45" East, 2304.02' to a capped rebar set; thence North 02°42'33" West, 647.27' to a capped rebar set; thence North 88°57'32" East, 57.52' to a capped rebar set; thence North 76°26'19" East, 311.96' to a capped rebar set; thence South 88°02'36" East, 122.42' to a capped rebar set; thence South 75°10'25" East, 131.40' to a capped steel pipe set at a north corner of Lot D of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot D of the Revised Sherwood Plant Facilities Plan and property herein described, the following three (3) courses and distances, viz: South 40°00'30" West, 289.34' to a capped steel pipe set; thence South 04°59'30" East, 53.74' to a capped steel pipe set; thence South 49°59'30" East, 112.00' to a capped steel pipe set at a northwest corner of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C of the Revised Sherwood Plant Facilities Plan and property herein described, the following three (3) courses and distances, viz: South 40°00'30" West, 551.11' to a capped steel pipe set; thence South 49°48'52" East, 232.76' to a capped steel pipe set; thence South 40°48'51" West, 519.56' to a capped steel pipe set at an

west corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B of the Revised Sherwood Plant Facilities Plan and property herein described, the following twelve (12) courses and distances, viz: South 39°47'23" West, 254.29' to a capped steel pipe set; thence South 49°38'56" East, 1356.83' to a capped steel pipe set; thence North 39°43'10" East, 502.99' to a capped steel pipe set; thence North 50°16'50" West, 302.85' to a capped steel pipe set; thence North 39°43'10" East, 894.00' to a capped steel pipe set; thence North 50°16'50" West, 218.55' to a capped steel pipe set; thence North 39°43'10" East, 457.75' to a capped steel pipe set;

thence North 49°51'12" West, 391.08' to a capped steel pipe set; thence South 40°56'23" West, 356.29' to a capped steel pipe set; thence South 46°50'52" East, 26.12' to a capped steel pipe set; thence South 39°43'10" West, 102.89' to a capped steel pipe set; thence South 50°16'50" East, 41.70' to a capped steel pipe set at a north corner of Lot A of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot A of the Revised Sherwood Plant Facilities Plan and property herein described, South 39°43'10" West, 452.34' to a capped steel pipe set at a northwest corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B of the Revised Sherwood Plant Facilities Plan and property herein described, South 40°42'41" West, 163.87' to a capped steel pipe set at a southeast corner of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C of the Revised Sherwood Plant Facilities Plan and property herein described, the following four (4) courses and distances, viz: North 49°56'03" West, 237.73' to a capped steel pipe set; thence North 40°00'30" East, 1014.01' to a capped steel pipe set; thence North 49°59'30" West, 298.16' to a capped steel pipe set; thence South 40°00'30" West, 112.00' to a capped steel pipe set at a east corner of Lot D of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot D of the Revised Sherwood Plant Facilities Plan and property herein described, North 49°59'30" West, 300.74' to a capped steel pipe set on the line of property now or formerly Dennis H. Powell; thence along the dividing line of property of now or formerly Dennis H. Powell and property herein described, the following three (3) courses and distances, viz: South 75°10'25" East, 51.30' to a capped rebar set; thence North 89°02'55" East, 192.57' to a capped rebar set; thence North 25°07'41" East, 537.92' to a capped rebar set on the southerly right of way line of The State of West Virginia, West Virginia Railroad Maintenance Authority, as recorded in Deed Book Volume 216, Page 166; thence along the southerly right of way line of The State of West Virginia, West Virginia Railroad Maintenance Authority the following six (6) courses and distances, viz: South 20°36'12" East, 77.00' to a capped rebar set; thence North 67°29'54" East, 34.97' to a capped rebar set; thence North 65°43'48" East, 111.00' to a capped rebar set; thence North 59°34'48" East, 111.00' to a capped rebar set; thence North 55°33'48" East, 40.27' to a capped rebar set; thence North 77°19'37" East, 743.13' to a capped rebar set at the northwest corner of property of now or formerly Michael E. Bonnell, as recorded in Deed Book Volume 140, Page 190; thence along the dividing line of property of now or formerly Michael E. Bonnell and property herein described, the following eleven (11) courses and distances, viz: South 14°30'56" East, 715.45' to a capped rebar set; thence South 34°26'09" East, 107.25' to a capped rebar set; thence South 24°26'09" East, 396.00' to a capped rebar set; thence South 16°26'09" East, 198.00' to a capped rebar set; thence South 05°33'51" West, 226.88' to a capped rebar set; thence South 06°56'09" East, 247.50' to a capped rebar set; thence South 11°33'51" West, 276.37' to a capped rebar set; thence South 05°03'51" West, 478.50' to a capped rebar set; thence South 04°26'09" East, 330.00' to a capped rebar set; thence South 03°33'51" West, 222.75' to a capped rebar set; thence South 09°26'09" East, 330.00' to a capped rebar set on the northerly line of property of now or formerly Mule Tracts, LLC; thence along the dividing line of property of now or formerly Mule Tracts, LLC and property herein described, the following twelve (12) courses and distances, viz: South 89°33'51" West, 148.50' to a capped rebar set; thence South 65°24'18" West, 141.35' to a capped rebar set; thence South 35°50'50" West, 189.75' to a capped rebar set; thence South 31°05'50" West, 165.00' to a capped rebar set; thence South 18°20'50" West, 181.50' to a capped rebar set; thence South 17°50'50" West, 148.50' to a capped rebar set; thence South 25°20'50" West, 148.50' to a capped rebar set; thence South 41°50'50" West, 107.25' to a capped rebar set; thence South 41°50'50" West, 152.63' to a capped rebar set; thence

South 33°50'50" West, 297.00' to a capped rebar set; thence South 55°50'50" West, 202.13' to a capped rebar set; thence South 21°39'10" East, 123.75' to a capped rebar set at a northeast corner of property of now or formerly Howard J. Rivers; thence along the dividing line of property of now or formerly Howard J. Rivers and property herein described, the following two (2) courses and distances, viz: South 49°50'50" West, 621.33' to a capped rebar set; thence North 45°57'17" West, 1837.63' to an existing stone at the **PLACE OF BEGINNING.**

Contains 9,214,015.33 Sq. Ft. or 211.525 Acres

DESCRIPTION OF ACCESS EASEMENT (Exhibit "B" attached)

GRANT DISTRICT, COUNTY OF DODDRIDGE, STATE OF WEST VIRGINIA

All that certain Access Easement within the Revised Sherwood Plant Facilities Plan (to be recorded), said Access Easement is located within the property of now or formerly MarkWest Liberty Midstream & Resources, L.L.C., recorded in Deed Book Volume 378, Page 516, located on Tax Parcel Sheet 19, Lot 32, situate in the Grant District, County of Doddridge, State of West Virginia, more particularly bounded and described as follows:

BEGINNING FOR REFERENCE at a capped rebar set on the southerly right of way line of U.S. Route 50, said rebar being on the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan (to be recorded) and property now or formerly Dennis H. Powell, recorded in Deed Book Volume 200, Page 532; thence along the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan and property now or formerly Dennis H. Powell, South 25°07'41" West, 357.07' to a point on the line of the Access Easement, being the **TRUE PLACE OF BEGINNING;** thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following ten (10) courses and distances, viz: South 39°33'11" East, 454.78' to a point; thence by an arc of a circle deflecting to the left in a southeastwardly direction, having a radius of 975.00', an arc distance of 175.28' (chord bearing and distance, South 44°42'11" East, 175.04') to a point; thence South 49°51'12" East, 399.02' to a point; thence by an arc of a circle deflecting to the right in a southeastwardly direction, having a radius of 135.00', an arc distance of 154.93' (chord bearing and distance, South 16°58'35" East, 146.57') to a point; thence South 15°54'02" West, 613.15' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 425.00', an arc distance of 132.47' (chord bearing and distance, South 24°49'47" West, 131.93') to a point; thence South 33°45'32" West, 464.47' to a point; thence by an arc of a circle deflecting to the left in a southwestwardly direction, having a radius of 175.00', an arc distance of 71.95' (chord bearing and distance, South 21°58'51" West, 71.44') to a point; thence South 10°12'10" West, 112.18' to a point; thence North 79°47'50" West, 10.57' to a capped steel pipe set at a southeast corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 50°16'50" West, 45.32' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following two (2) courses and distances, viz: North 10°12'10" East, 71.37' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 145.00', an arc distance of 89.25' (chord bearing and distance, South 84°43'51" West, 87.85') to a point on an easterly line of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following two (2) courses and distances, viz: North 50°16'50" West, 160.24' to a point; thence North 39°43'10" East, 23.01' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following six (6) courses and distances, viz: South 56°32'29" East, 108.14' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 95.00', an arc distance of 145.18' (chord bearing and distance, North 77°32'16" East, 131.46') to a point; thence North 33°45'32" East, 411.69' to a

point; thence North 56°14'28" West, 36.00' to a point; thence by an arc of a circle deflecting to the left in a northwestwardly direction, having a radius of 125.00', an arc distance of 44.56' (chord bearing and distance, North 66°27'11" West, 44.32') to a point; thence North 76°39'54" West, 74.77' to a point on an easterly line of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 39°43'10" East, 55.81' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following eight (8) courses and distances, viz: South 76°39'54" East, 49.97' to a point; thence by an arc of a circle deflecting to the right in a southeastwardly direction, having a radius of 175.00', an arc distance of 62.38' (chord bearing and distance, South 66°27'11" East, 62.05') to a point; thence South 56°14'28" East, 36.00' to a point; thence North 33°45'32" East, 29.96' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 375.00', an arc distance of 116.88' (chord bearing and distance, North 24°49'47" East, 116.41') to a point; thence North 15°54'02" East, 613.15' to a point; thence by an arc of a circle deflecting to the left in a northwestwardly direction, having a radius of 85.00', an arc distance of 97.55' (chord bearing and distance, North 16°58'35" West, 92.28') to a point; thence North 49°51'12" West, 0.94' to a point to a capped steel pipe set at a northeast corner of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following four (4) courses and distances, viz: North 49°51'12" West, 391.08' to a PK nail set; thence South 40°56'23" West, 356.29' to a capped steel pipe set; thence South 46°50'52" East, 26.12' to a capped steel pipe set; thence South 39°43'10" West, 62.05' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following ten (10) courses and distances, viz: North 15°57'34" East, 67.04' to a point; thence by an arc of a circle deflecting to the right in a northeastwardly direction, having a radius of 525.00', an arc distance of 136.83' (chord bearing and distance, North 23°25'33" East, 136.44') to a point; thence South 40°09'15" West, 78.35' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 525.00', an arc distance of 85.75' (chord bearing and distance, South 44°50'00" West, 85.66') to a point; thence South 49°30'46" West, 98.45' to a point; thence by an arc of a circle deflecting to the left in a southwestwardly direction, having a radius of 475.00', an arc distance of 64.53' (chord bearing and distance, South 45°37'15" West, 64.48') to a point; thence South 41°43'44" West, 64.17' to a point; thence by an arc of a circle deflecting to the left in a southwestwardly direction, having a radius of 275.00', an arc distance of 105.18' (chord bearing and distance, South 30°46'17" West, 104.54') to a point; thence South 19°48'50" West, 7.83' to a point; thence South 50°16'50" East, 121.92' to a point on the northwesterly line of Lot A of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot A and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, South 39°43'10" West, 50.00' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following four (4) courses and distances, viz: North 50°16'50" West, 105.09' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 125.00', an arc distance of 51.39' (chord bearing and distance, South 39°32'34" West, 51.03') to a point; thence South 08°55'31" West, 162.59' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 225.00', an arc distance of 47.97' (chord bearing and distance, South 15°01'56" West, 47.87') to a point on the westerly line of Lot B of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot B and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following two (2) courses and distances, viz: South 40°42'41" West, 65.59' to a capped steel pipe set; thence North 49°56'03" West, 37.25' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following three (3) courses and distances, viz: by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 175.00', an arc distance of 87.71' (chord bearing and distance, North 23°17'03" East, 86.80') to a point; thence North 08°55'31" East, 127.56' to a point; thence South 70°17'34" West, 217.42' to a point on the easterly line of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C and

Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 40°00'30" East, 99.15' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following eight (8) courses and distances, viz: North 70°17'34" East, 151.83' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 75.00', an arc distance of 66.08' (chord bearing and distance, North 45°03'12" East, 63.96') to a point; thence North 19°48'50" East, 43.28' to a point; thence by an arc of a circle deflecting to the right in a northeastwardly direction, having a radius of 325.00', an arc distance of 124.31' (chord bearing and distance, North 30°46'17" East, 123.55') to a point; thence North 41°43'44" East, 64.17' to a point; thence by an arc of a circle deflecting to the right in a northeastwardly direction, having a radius of 525.00', an arc distance of 71.32' (chord bearing and distance, North 45°37'15" East, 71.27') to a point; thence North 49°30'46" East, 31.78' to a point; thence North 49°59'30" West, 61.56' to a point on the easterly line of Lot C of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot C and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 40°00'30" East, 50.00' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following nine (9) courses and distances, viz: South 49°59'30" East, 69.94' to a point; thence North 49°30'46" East, 15.97' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 475.00', an arc distance of 77.58' (chord bearing and distance, North 44°50'00" East, 77.50') to a point; thence North 40°09'15" East, 117.59' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 225.00', an arc distance of 313.01' (chord bearing and distance, North 00°18'02" East, 288.37') to a point; thence North 39°33'11" West, 229.45' to a point; thence South 25°07'41" West, 31.44' to a point; thence by an arc of a circle deflecting to the right in a southwestwardly direction, having a radius of 175.00', an arc distance of 195.23' (chord bearing and distance, South 57°05'18" West, 185.27') to a point; thence South 89°02'55" West, 63.87' to a point on the northeasterly line of Lot D of the Revised Sherwood Plant Facilities Plan; thence along the dividing line of Lot D and Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, North 49°59'30" West, 76.27' to a point; thence through Lot E of the Revised Sherwood Plant Facilities Plan and along the Access Easement, the following four (4) courses and distances, viz: North 89°02'55" East, 121.47' to a point; thence by an arc of a circle deflecting to the left in a northeastwardly direction, having a radius of 125.00', an arc distance of 139.45' (chord bearing and distance, North 57°05'18" East, 132.33') to a point; thence North 25°07'41" East, 55.09' to a point; thence North 39°33'11" West, 55.31' to a point

on the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan and property now or formerly Dennis H. Powell; thence along the dividing line of Lot E of the Revised Sherwood Plant Facilities Plan and property now or formerly Dennis H. Powell and along the Access Easement, North 25°07'41" East, 55.31' to a point at the **TRUE PLACE OF BEGINNING.**

Contains 253,923.67 Sq. Ft. or 5.829 Acres

Bearing basis is the West Virginia State Plane North Zone Grid, NAD 1983.

To have and to hold the above granted and bargained premises with the appurtenances thereunto belonging, unto the said **GRANTEE**, its successors and assigns forever.

PURSUANT to the requirement of W. Va. Code §11-22-6, the total consideration paid for this transaction is One Dollar and 00/100 ($1.00).

[*Signature Page Follows*]

GRANTOR:

MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C.

By: _____
Name: Greg S. Floerke
Title: EVP, Gathering & Processing

STATE OF Colorado)
) ss.
COUNTY OF Denver)

On this, the 2 day of April, 2018, before me personally appeared Greg S. Floerke, who acknowledged himself to be the EVP of MarkWest Liberty Midstream & Resources, L.L.C., and who represented that in such capacity he was authorized to execute the foregoing instrument on behalf of said limited liability company.

(SEAL)

LISA R. CRUM
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID # 20054031684
MY COMMISSION EXPIRES 07-01-2019

_____
Notary Public

My commission expires: 07/01/2019

GRANTEE:

SHERWOOD MIDSTREAM HOLDINGS LLC

By: _____
Name: Greg S. Floerke
Title: EVP, Gathering & Processing

STATE OF Colorado)
) ss.
COUNTY OF Denver)

On this, the 2 day of April, 2018, before me personally appeared Greg S. Floerke, who acknowledged himself to be the EVP of Sherwood Midstream Holdings LLC, and who represented that in such capacity he was authorized to execute the foregoing instrument on behalf of said limited liability company.

(SEAL)

LISA R. CRUM
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID # 20054031684
MY COMMISSION EXPIRES 07-01-2019

_____
Notary Public

My commission expires: 07/01/2019

This instrument prepared by, and after recording, please return to:
Sherwood Midstream Holdings LLC
1515 Arapahoe Street
Tower 1, Suite 1600
Denver, Colorado 80202

Property Owner Data:

Please provide data on current site/property landowner(s), both surface and mineral rights (as applicable). Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 1 of 1

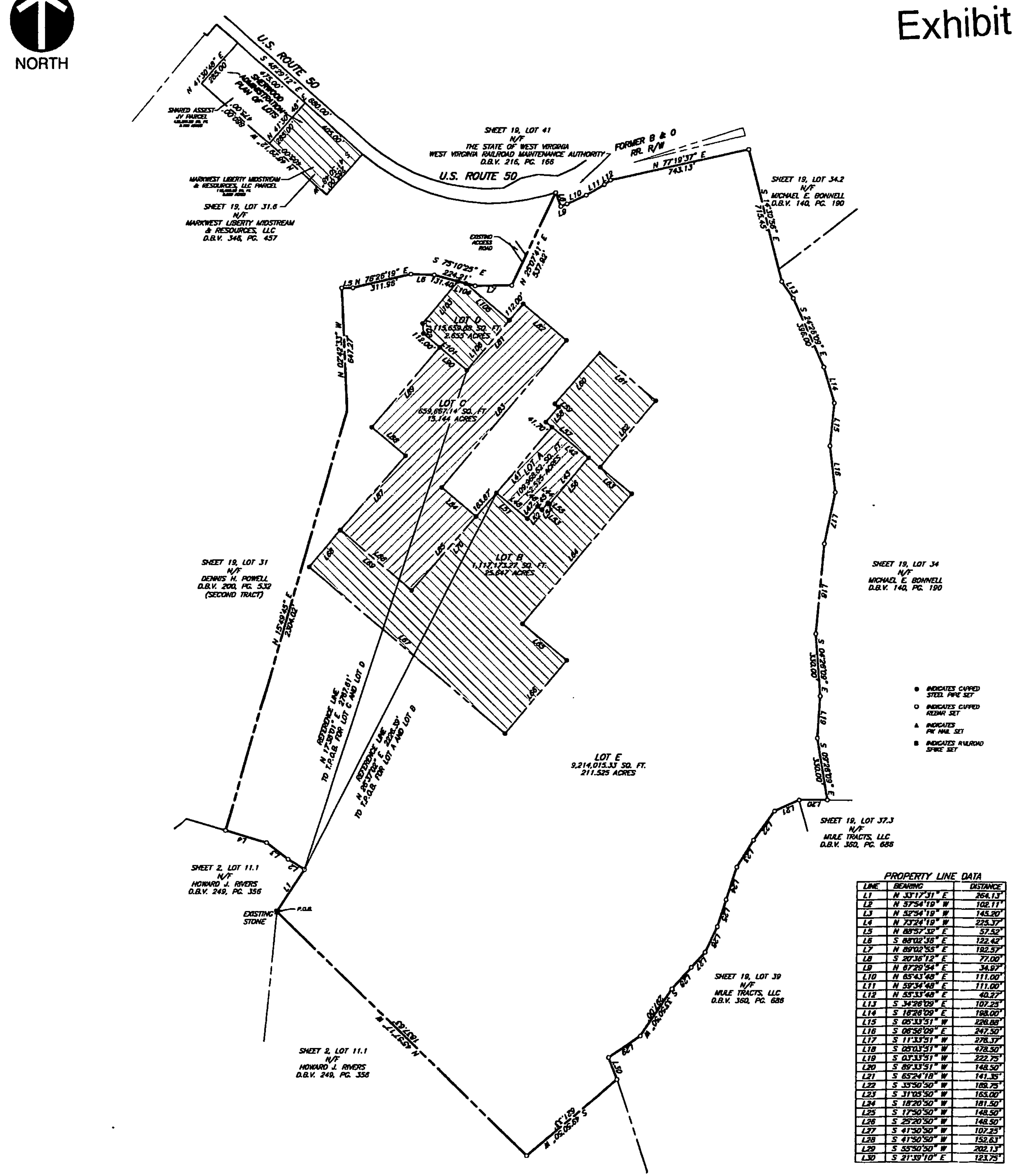
Property Owner Data:		
Name of Primary Owner (PO): Sherwood Midstream Holdings LLC		
PO Address: 539 South Main Street		
City: Findlay	**State:** OH	**Zip:** 45840
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Surface Rights Owner Data:		
Name of Primary Owner (PO): Sherwood Midstream Holdings LLC		
PO Address: 539 South Main Street		
City: Findlay	**State:** OH	**Zip:** 45840
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Mineral Rights Owner Data: ***(As Applicable)***		
Name of Primary Owner (PO): N/A		
PO Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Exhibit "A"

REVISION RECORD		
NO	DATE	DESCRIPTION
△		
△		
△		
△		



LOT A

LINE	BEARING	DISTANCE
L41	N 39°43'10" E	452.34'
L42	S 50°16'50" E	251.88'
L43	S 39°43'10" W	319.00'
L44	N 50°16'50" W	11.00'
L45	S 39°43'10" W	48.60'
L46	N 50°16'50" W	29.50'
L47	S 39°43'10" W	84.74'
L48	N 50°16'50" W	211.38'

LOT B

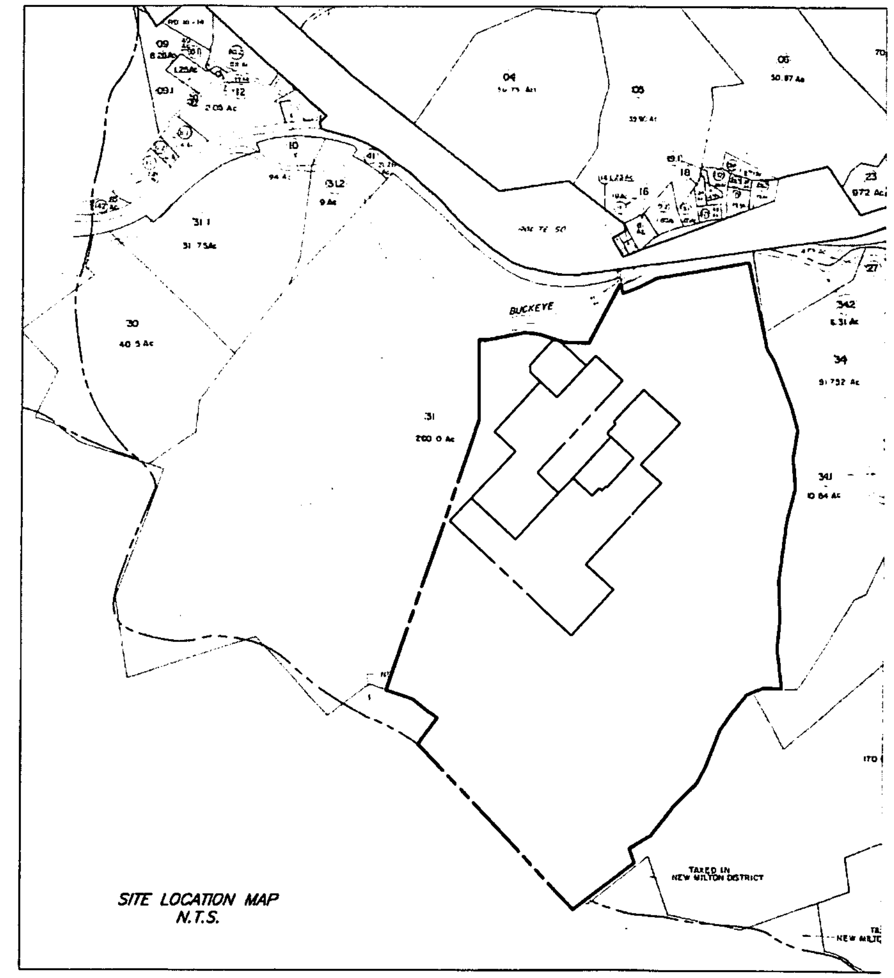
LINE	BEARING	DISTANCE
L51	S 50°16'50" E	211.38'
L52	N 39°43'10" E	84.74'
L53	S 50°16'50" E	29.50'
L54	N 39°43'10" E	48.60'
L55	S 50°16'50" E	11.00'
L56	N 39°43'10" E	319.00'
L57	N 50°16'50" W	293.56'
L58	N 39°43'10" E	102.89'
L59	N 48°50'52" W	28.12'
L60	N 40°56'23" E	358.29'
L61	S 49°51'12" E	391.08'
L62	S 39°43'10" W	457.75'
L63	S 50°16'50" E	218.55'
L64	S 39°43'10" W	694.00'
L65	S 50°16'50" E	302.85'
L66	S 39°43'10" W	502.99'
L67	N 49°38'56" W	1358.83'
L68	N 39°47'23" E	254.29'
L69	S 49°38'42" E	492.40'
L70	N 40°42'41" E	880.97'

LOT C

LINE	BEARING	DISTANCE
L81	N 40°00'30" E	457.00'
L82	S 49°59'30" E	298.16'
L83	S 40°00'30" W	1014.01'
L84	S 49°56'03" E	237.73'
L85	S 40°42'41" W	517.10'
L86	N 49°38'42" W	492.40'
L87	N 40°48'51" E	519.56'
L88	N 49°48'52" W	232.76'
L89	N 40°00'30" E	531.11'
L90	S 49°59'30" E	168.30'

LOT D

LINE	BEARING	DISTANCE
L101	N 49°59'30" W	300.30'
L102	N 04°59'30" W	53.74'
L103	N 40°00'30" E	289.34'
L104	S 75°10'25" E	41.51'
L105	S 49°59'30" E	300.74'
L106	S 40°00'30" W	345.00'



SITE LOCATION MAP
N.T.S.

PROPERTY LINE DATA

LINE	BEARING	DISTANCE
L1	N 33°17'31" E	264.13'
L2	N 57°54'19" W	102.11'
L3	N 52°54'19" W	145.20'
L4	N 73°24'19" W	225.37'
L5	N 88°57'32" E	57.52'
L6	S 88°02'38" E	122.42'
L7	N 89°02'55" E	192.57'
L8	S 20°36'12" E	77.00'
L9	N 67°29'54" E	34.97'
L10	N 65°43'48" E	111.00'
L11	N 59°34'48" E	111.00'
L12	N 55°33'48" E	40.27'
L13	S 34°26'09" E	107.25'
L14	S 16°26'09" E	198.00'
L15	S 05°33'51" W	226.88'
L16	S 06°56'09" E	247.50'
L17	S 11°33'51" W	276.37'
L18	S 05°03'51" W	478.50'
L19	S 03°33'51" W	222.75'
L20	S 89°33'51" W	148.50'
L21	S 65°24'18" W	141.35'
L22	S 33°50'50" W	169.75'
L23	S 31°05'50" W	165.00'
L24	S 18°20'50" W	181.50'
L25	S 17°50'50" W	148.50'
L26	S 25°20'50" W	148.50'
L27	S 41°50'50" W	107.25'
L28	S 41°50'50" W	152.63'
L29	S 55°50'50" W	202.13'
L30	S 21°39'10" E	123.75'

LEGEND

- ▧ MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C.
- ▨ SHERWOOD MIDSTREAM LLC
- ☐ SHERWOOD MIDSTREAM HOLDINGS LLC

AREA TABULATIONS

	SQ. FT.	ACRES
LOT A	109,968.52	2.525
LOT B	1,117,173.27	25.647
LOT C	659,687.14	15.144
LOT D	115,659.88	2.655
LOT E	9,214,015.33	211.525
TOTAL LOT AREAS	11,216,484.17	257.495

NOTES:

1. THE BEARINGS SHOWN ON THIS DRAWING ARE BASED ON WEST VIRGINIA STATE PLANE NORTH GRID, NAD 1983.
2. THERE ARE NO GAS PIPELINE FACILITIES OR PLANT EQUIPMENT IMPROVEMENTS SHOWN ON THIS PLAN.
3. PROPERTY IS TAX PARCEL SHEET 19, LOT 32.
4. THIS PLAN IS A REVISION OF THE SHERWOOD PLANT FACILITIES PLAN RECORDED BY QUITCLAIM DEED, MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C. TO MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C., DATED 1/18/2017 IN D.B.V. 378, PAGE 516.

JAMES R. BRUGGEMAN LICENSED No. 2104 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

TOTAL PLAN AREA
11,216,484.17 SQ. FT.
257.495 ACRES

SCALE IN FEET
0 300 600

CEC
Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.385.2324 · Fax: 412.429.2114
www.cecinc.com

REVISED SHERWOOD PLANT FACILITIES PLAN

Situate In

GRANT DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA

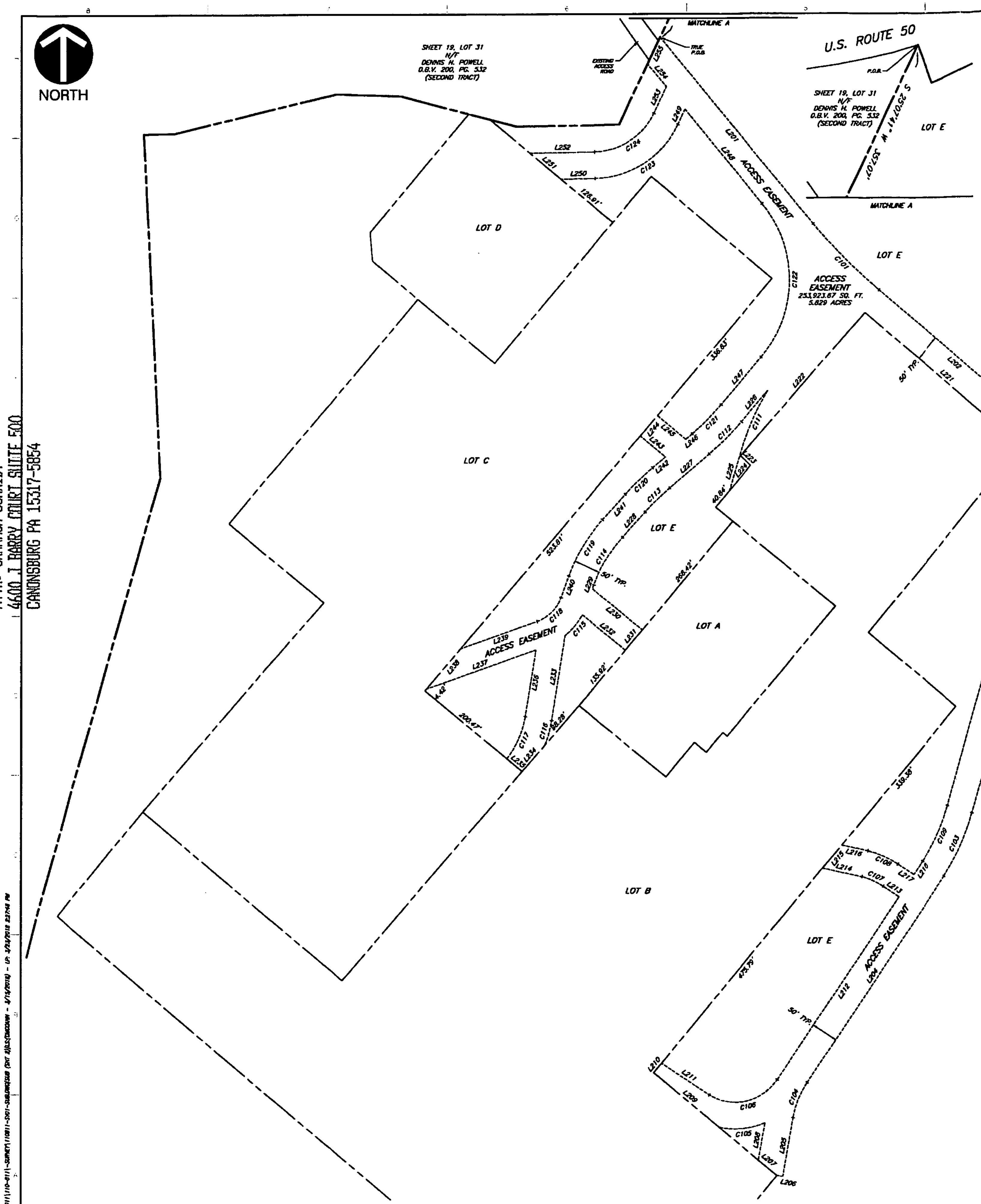
Made For

MARKWEST LIBERTY MIDSTREAM & RESOURCES, LLC.

DATE: 3/15/2018	SCALE: 1"=300'	DRAWING NO. SUB-1		
DRAWN BY: CMM	CHECKED BY: DGG			
PROJECT NO: 110-811	APPROVED BY: JRB	SHEET 1 OF 2		

MARKWEST ENERGY PARTNERS, LLC
ATTN: SHANNON SCHMIDT
4600 J BARRY COURT SUITE 500
CANONSBURG PA 15317-5854

Exhibit "B"

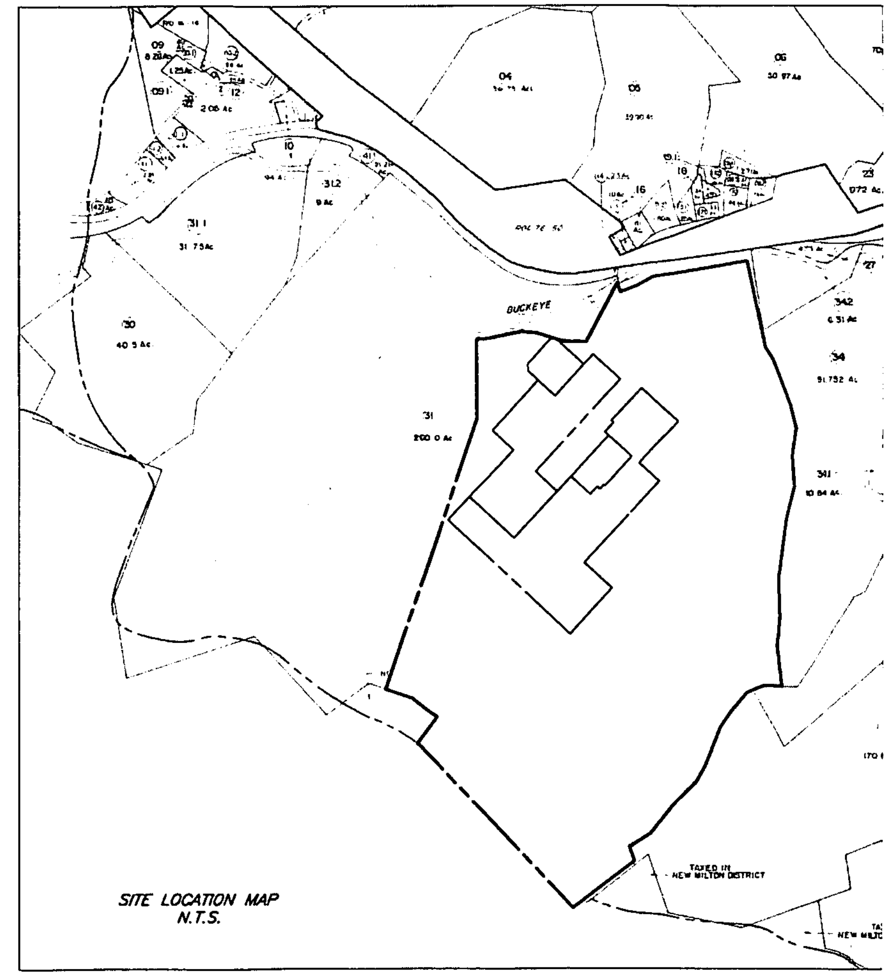


ACCESS EASEMENT DATA

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C101	975.00'	175.28'	175.04'	S 44°42'11" E	10°18'01"
C102	135.00'	154.93'	146.57'	S 16°58'35" E	65°45'14"
C103	425.00'	132.47'	131.93'	S 24°49'47" W	17°51'30"
C104	175.00'	71.95'	71.44'	S 21°58'51" W	23°33'22"
C105	145.00'	89.25'	87.85'	S 84°43'51" W	35°15'56"
C106	95.00'	145.18'	131.46'	N 77°32'16" E	87°33'27"
C107	125.00'	44.56'	44.32'	N 66°27'11" W	20°25'26"
C108	175.00'	62.38'	62.05'	S 66°27'11" E	20°25'26"
C109	375.00'	116.88'	116.41'	N 24°49'47" E	17°51'30"
C110	85.00'	97.55'	92.28'	N 16°58'35" W	65°45'14"
C111	525.00'	136.83'	136.44'	N 23°25'33" E	14°55'57"
C112	525.00'	85.75'	85.66'	S 44°50'00" W	9°21'31"
C113	475.00'	64.53'	64.48'	S 45°37'15" W	7°47'02"
C114	275.00'	105.18'	104.54'	S 30°46'17" W	21°54'54"
C115	125.00'	51.39'	51.03'	S 39°32'34" W	23°33'13"
C116	225.00'	47.97'	47.87'	S 15°01'56" W	12°12'51"
C117	175.00'	87.71'	86.80'	N 23°17'03" E	28°43'04"
C118	75.00'	66.08'	63.96'	N 45°03'12" E	50°28'43"
C119	325.00'	124.31'	123.55'	N 30°46'17" E	21°54'54"
C120	525.00'	71.32'	71.27'	N 45°37'15" E	7°47'02"
C121	475.00'	77.58'	77.50'	N 44°50'00" E	9°21'31"
C122	225.00'	313.01'	288.37'	N 00°18'02" E	79°42'26"
C123	175.00'	195.23'	185.27'	S 57°05'18" W	63°55'15"
C124	125.00'	139.45'	132.33'	N 57°05'18" E	63°55'15"

ACCESS EASEMENT DATA

LINE	BEARING	DISTANCE
L201	S 39°33'11" E	454.78'
L202	S 49°51'12" E	399.02'
L203	S 15°54'02" W	613.15'
L204	S 33°45'32" W	464.47'
L205	S 10°12'10" W	112.18'
L206	N 79°47'50" W	10.57'
L207	N 50°16'50" W	45.32'
L208	N 10°12'10" E	71.37'
L209	N 50°16'50" W	160.24'
L210	N 39°43'10" E	23.01'
L211	S 56°32'29" E	108.14'
L212	N 33°45'32" E	411.69'
L213	N 56°14'28" W	36.00'
L214	N 76°39'54" W	74.77'
L215	N 39°43'10" E	55.81'
L216	S 76°39'54" E	49.97'
L217	S 56°14'28" E	36.00'
L218	N 33°45'32" E	29.96'
L219	N 15°54'02" E	613.15'
L220	N 49°51'12" W	0.94'
L221	N 49°51'12" W	391.08'
L222	S 40°56'23" W	356.29'
L223	S 46°50'52" E	26.12'
L224	S 39°43'10" W	62.05'
L225	N 15°57'34" E	67.04'
L226	S 40°09'15" W	78.35'
L227	S 49°30'46" W	98.45'
L228	S 41°43'44" W	64.17'
L229	S 19°48'50" W	7.83'
L230	S 50°16'50" E	121.92'
L231	S 39°43'10" W	50.00'
L232	N 50°16'50" W	105.09'
L233	S 08°55'31" W	162.59'
L234	S 40°42'41" W	65.59'
L235	N 49°56'03" W	37.25'
L236	N 08°55'31" E	127.56'
L237	S 70°17'34" W	217.42'
L238	N 40°00'30" E	99.15'
L239	N 70°17'34" E	151.83'
L240	N 19°48'50" E	43.28'
L241	N 41°43'44" E	64.17'
L242	N 49°30'46" E	31.78'
L243	N 49°59'30" W	61.56'
L244	N 40°00'30" E	50.00'
L245	S 49°59'30" E	69.94'
L246	N 49°30'46" E	15.97'
L247	N 40°09'15" E	117.59'
L248	N 39°33'11" W	229.45'
L249	S 25°07'41" W	31.44'
L250	S 89°02'55" W	63.87'
L251	N 49°59'30" W	76.27'
L252	N 89°02'55" E	121.47'
L253	N 25°07'41" E	55.09'
L254	N 39°33'11" W	55.31'
L255	N 25°07'41" E	55.31'



SITE LOCATION MAP
N.T.S.

REVISION RECORD

NO	DATE	DESCRIPTION
△		
△		
△		
△		

Doddridge County
Beth A Rogers, Clerk
Instrument 291623
04/24/2018 @ 12:08:52 PM
QUIT CLAIM DEED
Book 406 @ Page 133
Pages Recorded 9
Recording Cost $ 30.00

NOTES:

1. THE BEARINGS SHOWN ON THIS DRAWING ARE BASED ON WEST VIRGINIA STATE PLANE NORTH GRID, NAD 1983.
2. THERE ARE NO GAS PIPELINE FACILITIES OR PLANT EQUIPMENT IMPROVEMENTS SHOWN ON THIS PLAN.
3. PROPERTY IS TAX PARCEL SHEET 19, LOT 32.
4. THIS PLAN IS A REVISION OF THE SHERWOOD PLANT FACILITIES PLAN RECORDED BY QUITCLAIM DEED, MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C. TO MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C., DATED 1/18/2017 IN D.B.V. 378, PAGE 516.

JAMES R. BRUGGEMAN LICENSED No. 2104 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

SCALE IN FEET
0 100 200

CEC
Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

REVISED SHERWOOD PLANT FACILITIES PLAN
Situate in
GRANT DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA
Made For
MARKWEST LIBERTY MIDSTREAM & RESOURCES, LLC.

DATE:	3/15/2018	SCALE	1"=100'	DRAWING NO.
DRAWN BY:	CMM	CHECKED BY:	DGG	SUB-2
PROJECT NO:	110-611	APPROVED BY:	JRB	SHEET 2 OF 2

Contractor Data:

Please provide all pertinent data for contractors and sub---contractors that may be participating in this project. Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 1 of 1		
Contractor/Sub-Contractor (C/SC) Information:		
C/SC Company Name: TO BE DETERMINED		
C/SC WV License Number:		
C/SC FEIN:	**C/SC DUNS:**	
Local C/SC Point of Contact (POC):		
Local C/SC POC Title:		
C/SC Mailing Address:		
City:	**State:**	**Zip-Code:**
Local C/SC Office Phone:		
Local C/SC POC Phone:		
Local C/SC POC E-Mail:		

Engineer Firm Information:		
Engineer Firm Name: Civil & Environmental Consultants, Inc.		
Engineer WV License Number: 23295		
Engineer Firm FEIN: 25-1599565	**Engineer Firm DUNS:** 36-160-9878	
Engineer Firm Primary Point of Contact (POC): Joseph Ryan, P.E.		
Engineer Firm Primary POC Title: Project Manager		
Engineer Firm Mailing Address: 333 Baldwin Road		
City: Pittsburgh	**State:** PA	**Zip-Code:** 15205
Engineer Firm Office Phone: (412)-429-2324		
Engineer Firm Primary POC Phone: (412)-489-0223		
Engineer Firm Primary POC E-Mail: jryan@cecinc.com		

Adjacent and/or Affected Landowners Data

Please provide data for all adjacent and/or affected surface owners (both up and down stream) whose property may be impacted by proposed development as demonstrated by a floodplain study or survey. Use additional copies of this page as needed.

Adjacent Property Owner Data: Upstream		
Name of Primary Owner (PO): Michael Bonnell		
Physical Address: 3825 WV Route 18 S		
City: West Union	**State:** WV	**Zip:** 26456
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): Markwest Liberty Midstream & Resources, LLC		
Physical Address: 1515 Arapahoe St Tower, Suite 1		
City: Denver	**State:** CO	**Zip:** 80202
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): D&M Powell, LLC		
Physical Address: 304 Stuart Street		
City: West Union	**State:** WV	**Zip:** 26456
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO):		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Site Plan

A Site Plan is an accurate and detailed map of the proposed development for this project. It shows the size, shape, location and special features of the project property, and the size and location of any development planned to the property, especially as that development will impact the floodplain and/or floodway. Site plans show what currently exists on the project property, and any changes or improvements you are proposing to make. **A certified and licensed engineering firm should complete site plans.**

A SITE PLAN MUST CONTAIN THE FOLLOWING INFORMATION:

1. Legal description of the parcel, north arrow and scale
2. All property lines and their dimensions
3. Names of adjacent roads, location of driveways
4. Location of sloughs, tributaries, streams, rivers, wetlands, ponds, and lakes, with setbacks indicated, and including FEMA floodplain data based on most updated FIRM.
5. Location, size, shape of all buildings, existing and proposed, with elevation of lowest floor indicated.
6. Location and dimensions of existing or proposed on-site sewage systems.
7. Location of all propane tanks, fuel tanks or other liquid storage tanks whether above ground or below ground level.
8. Location and dimensions of any proposed pipeline placement(s) into floodplain/floodway.
9. Location and dimensions of any roadway development into floodplain/floodway. *(Includes initial development access roads)*
10. Location and dimensions of any bridge and/or culvert development into floodplain/floodway.
11. Location and dimensions of any storage yard or facility into the floodplain/floodway.
12. Location of any existing utilities and/or proposed utility placement and/or displacement.
13. Location, dimensions and depth of any existing or proposed fill on site.
14. A survey showing the **existing ground elevations** of at least location on the building site. **ELEVATION NOTE**: All vertical datum will reference either NGVD 29 or NAVD 88. Assumed datum will not be acceptable unless the property is located in an area where vertical datum has not been published. For those areas where vertical datum has not been established, a site plan with contours, elevations using assumed datum, high water marks and existing water levels of sloughs, rivers, lakes or streams and proposed lowest floor elevation.

Applicant

Please read print name, sign and date below:

- I certify that I am authorized to submit this application for the primary project developer.
- I certify that the information included in this application is to the best of my knowledge true and complete.
- I certify that all required Federal, State, and local permits required by law and/or ordinance for the above described development of this project have will be properly attained, are current and valid, and must be presented prior to a Doddridge County Floodplain Permit being issued.
- I understand that if in the course of the development project additional permits become required that were not needed during the initial proposal, the primary developer must notify the Doddridge County Floodplain Manager within 48 hours of such need, and that a "Stop Work" order may be issued for all project work directly impacting the floodplain or floodway, until such time the required additional permits are acquired.
- I understand that once the floodplain permit is submitted, the application will be entered into official public record at the next regularly scheduled Doddridge County Commission meeting after the date of submittal.
- I understand that from the date of submittal of the fully completed permit application, the Doddridge County Floodplain Manager has ninety (90) days to make a determination to either grant or deny said permit application. During this approval period, the Doddridge County Floodplain Manager may, at his or her discretion, conduct a review and/or additional study of provided documentation by means of an independent engineering firm. All costs associated with said review and/or study must be reimbursed to the County before issuance of approved permit.
- I understand that during the approval period, the Doddridge County Floodplain Manager of designee may at his or her discretion conduct site visits and document conditions of proposed development pursuant to the permit application.
- I understand that once the Floodplain Permit is granted, the permit will be entered into official public record. Appeals to the permit may be made no later than twenty (20) days after said issuance. If a valid appeal is submitted, as determined by the Doddridge County Floodplain Manager, a "Stop Work" order will be issued for all project development directly involving the floodplain or floodway. A public hearing by the Doddridge County Appeals Board will be scheduled no less than ten (10) days after the next regularly scheduled Doddridge County Commission meeting.
- I understand that all decisions of the Doddridge County Appeals Board shall be final.
- **I understand issuance of a Floodplain Permit authorizes me to proceed with construction as proposed.**
- In signing this application, the primary developer hereby grants the Doddridge County Floodplain Manager or designee the right to enter onto the above---described location to inspect the development work proposed, in progress, and/or completed.
- I understand that if I do not follow exactly the site---plan submitted and approved by this permit that a "Stop Work" order may be issued by the Doddridge County Floodplain Manager and that I must stop all construction immediately until discrepancies of actual work vs. proposed work is resolved.

Applicant Signature: _____ Date: 6/13/19

Applicant Printed Name: Rick Lowry

SCALE IN FEET

0 400 800

LEGEND

- EXISTING INDEX CONTOURS
- EXISTING INTERMEDIATE CONTOURS
- EXISTING TREELINE
- EXISTING FENCE
- EXISTING UNPAVED ROAD
- EXISTING TRAIL
- EXISTING PIPELINE RIGHT OF WAY
- EXISTING PROPERTY BOUNDARY
- EXISTING GAS LINE
- EXISTING STORM DRAIN
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING COMMUNICATIONS LINE
- EXISTING UTILITY POLE
- EXISTING GAS PIPELINE MARKER
- EXISTING WETLAND
- EXISTING STREAM
- STREAM AND WETLAND DELINEATION BOUNDARY
- ADD. STREAM AND WETLAND DELINEATION BNDY
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED TRANSMISSION LINE RIGHT OF WAY
- PROPOSED TRANSMISSION LINE
- 13 PROPOSED TRANSMISSION LINE STRUCTURE NUMBER

SITE RESTORATION NOTE:
UPON COMPLETION OF CONSTRUCTION ACTIVITIES, CONTRACTOR TO REMOVE ANY GRAVEL PLACED FOR TEMPORARY ACCESS ROADS, TEMPORARY POLE PADS, AND TEMPORARY PULL PADS AND RESTORE AREA TO APPROXIMATE EXISTING CONTOUR AND MEADOW IN GOOD CONDITION. NO PERMANENT GRAVEL IS PROPOSED FOR THIS PROJECT.

GEOTECHNICAL SITE RESTORATION NOTE:
FILL PLACEMENT SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL NOTES PROVIDED ON PLAN SHEET C001.

REFERENCE

1. EXISTING TOPOGRAPHY IS BASED ON A COMBINATION OF ECI SURVEY DATA, MARKWEST SMITHBURG SURVEY DATA, MARKWEST SHERWOOD SURVEY DATA, AND SURVEY DATA COLLECTED BY CEC IN FEBRUARY 2019 AND MAY 2019.
2. STREAM AND WETLAND FEATURES ARE BASED ON DELINEATION SURVEY DATA COLLECTED BY CEC IN JULY 2017, JANUARY 2018, AND MAY 2019.
3. PROPERTY BOUNDARIES OBTAINED FROM AUTOCAD FILE "MARKWEST SMITHBURG – PARCEL DATA.DWG", PROVIDED BY ECI ON 02/19/2019.
4. PROPOSED ELECTRIC LINE INFORMATION PROVIDED BY FIRSTENERGY, PROVIDED 01/16/2019.
5. EXISTING UTILITIES ARE BASED ON DATA RECEIVED FROM UTILITY COMPANIES AND SUPPLEMENTED BY FIELD SURVEY PERFORMED BY CEC IN FEBRUARY 2019. CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES.

P:\2019\192-293\-CADD\Dwg\CV01\192293-C900-ESPLAN.dwg{C900} LS:(6/4/2019 - abromley) - LP: 6/4/2019 1:12 AM

DRAFT

REVISION RECORD		
NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

SHERWOOD MIDSTREAM LLC
SMITHBURG 138KV STRUCTURES
DODDRIDGE COUNTY, WEST VIRGINIA

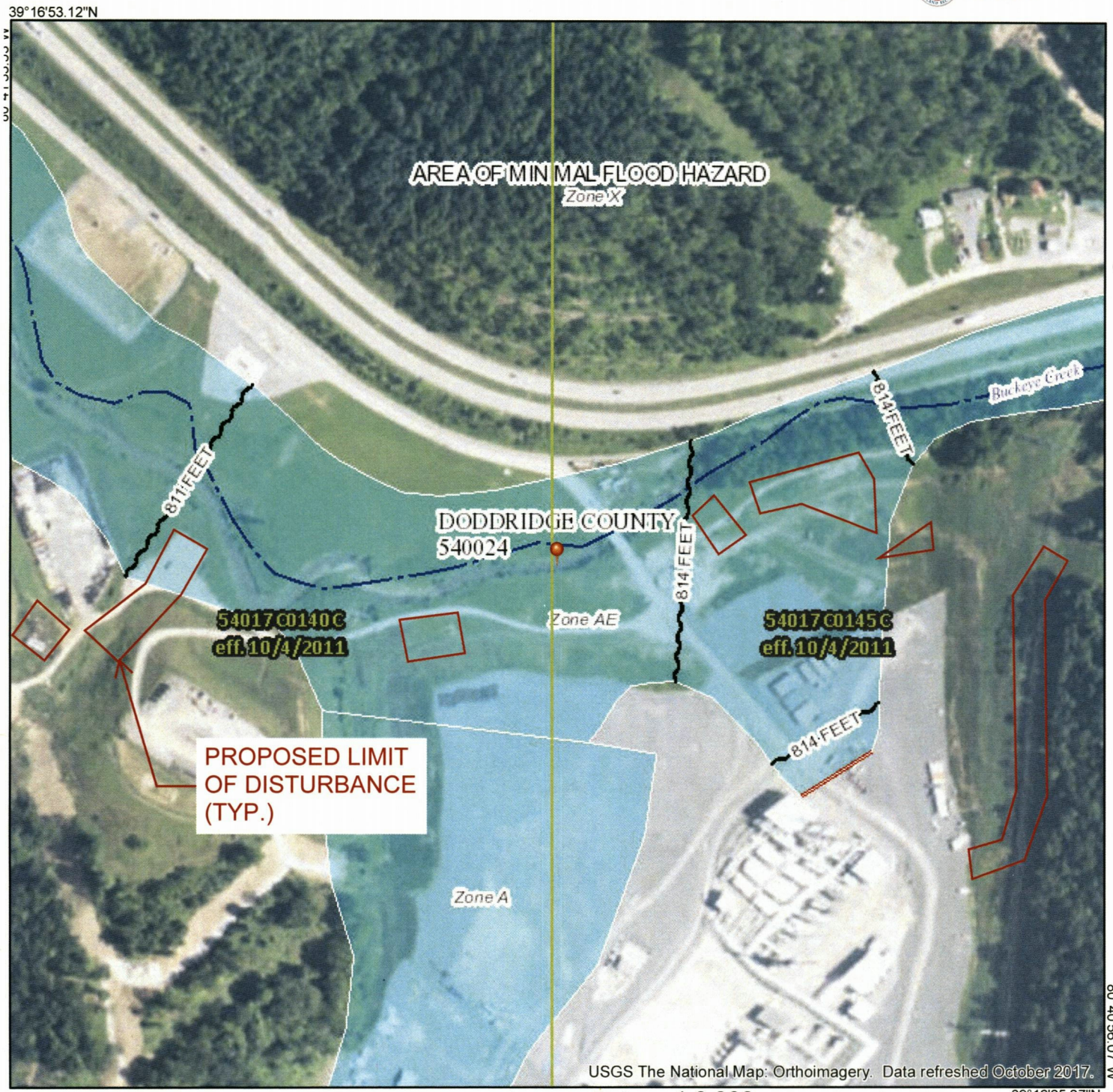
OVERALL EROSION AND SEDIMENT CONTROL PLAN

DATE:	JUNE 2019	DRAWN BY:	ABC
DWG SCALE:	1"=500'	CHECKED BY:	JWR
PROJECT NO:	192-293		
APPROVED BY:			ZJC

DRAWING NO.:
C900
SHEET 9 OF 32

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represe an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/4/2019 at 1:20:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

WV Flood Map

This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

LOMAs
- Incorporated
- Superseded
- Not incorporated
- No Revalidation Status
- Reevaluated
- Contact Community for Revalidation Status

0.2 Pct Annual Chance Flood Hazard
- 0.2 Pct Annual Chance Flood Hazard

Cross Section (XS) Lines
- LETTERED, MAPPED
- NOT LETTERED, MAPPED

Base Flood Elevation (BFE) Lines
- Rule_1

FEMA Effective Floodplains
- Zone AE FLOODWAY
- Zone AE (AH, AO)
- Zone A
- AREA WITH REDUCED FLOOD RISK DUE TO LEVEE
- DFIRM Panel Index

Flood Depth (Ft)
- High : 864.11
- Low : 0

LOMRs
- Effective

Flood Info Location

Map created on 5/29/2019

User Notes:
Smithburg 138kV Line

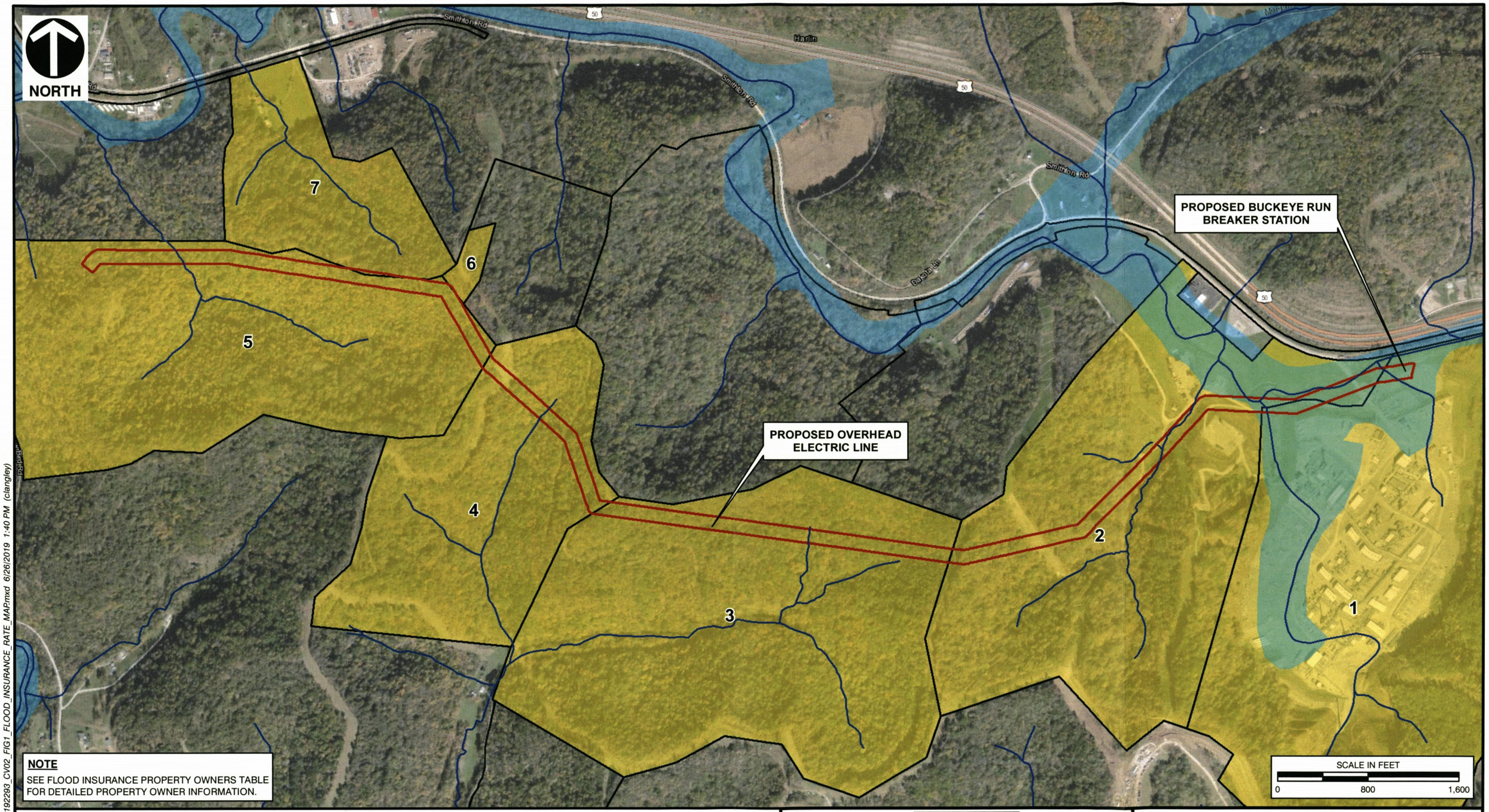
Flood Hazard Area:
Location is **WITHIN** the FEMA 100-year floodplain.

Flood Hazard Zone: AE
Stream: Buckeye Creek
Watershed (HUC8): Little Musringum-Middle Island (50302
Flood Height: Refer to FIS report for BFE
Water Depth: About 4.0 ft (Source: HAZUS)
Elevation: About 809 ft (Source: SAMS 2003)
Location (long, lat): (-80.685576, 39.278044)
Community&ID: Doddridge County (540024)

FEMA Flood Map: 54017C0145CNFHI **EFF:** 10/4/2011
Parcel Number: 09-03-0019-0032-0000
Address: multiple addresses

Disclaimer:

The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. **WV Flood Tool (*https://www.MapWV.gov/flood*) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.**



P:\2019\192-293\-GIS\Maps\CV02\192293_CV02_FIG1_FLOOD_INSURANCE_RATE_MAP.mxd 6/26/2019 1:40 PM (clangley)

LEGEND

- STREAM
- ELECTRIC LINE ROW
- FEMA 100 YEAR FLOODZONE
- PARCEL BOUNDARY
- PARCEL INTERSECTED BY ROW

REFERENCE

WVSAMB LiDAR-DERIVED STREAMS LAYER, 2003

FEDERAL EMERGENCY MANAGEMENT AGENCY DIGITAL FLOOD INSURANCE RATE MAP DATABASE, DODDRIDGE COUNTY, WEST VIRGINIA, 2010.

ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY, ACCESSED 6/26/2019, IMAGERY DATE: 2017.

Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205-9072
412-429-2324 · 800-365-2324
www.cecinc.com

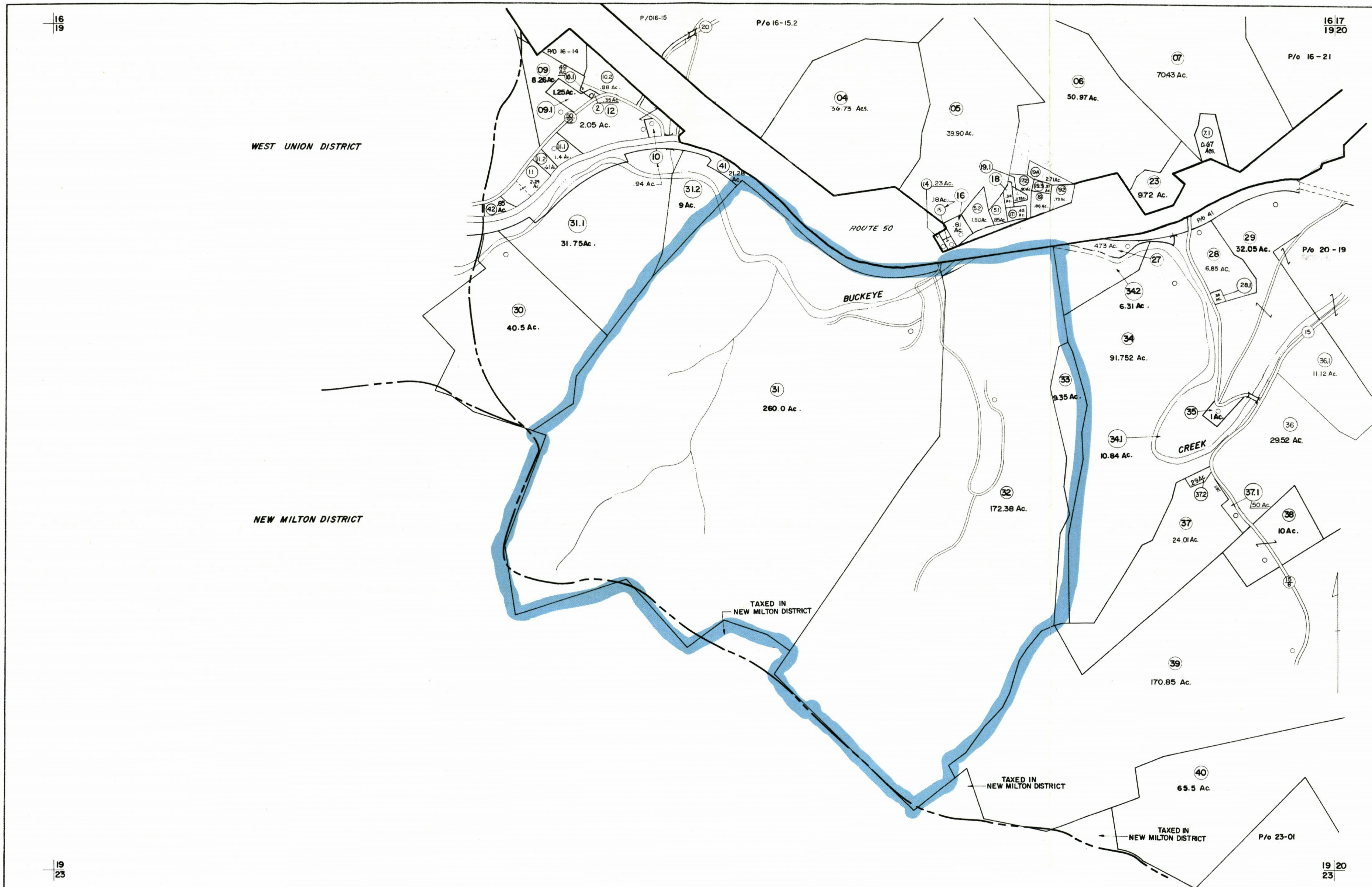
DRAWN BY:	CBL	CHECKED BY:	BRT	APPROVED BY: * Hand signature on file RPC*	FIGURE NO: 1
DATE:	6/26/2019	SCALE:	1 " = 800 '	PROJECT NO: 192-293	

SHERWOOD MIDSTREAM, LLC
SMITHBURG 138KV STRUCTURES PROJECT
DODDRIDGE COUNTY, WEST VIRGINIA

FLOOD INSURANCE LAND OWNER MAP

FLOOD INSURANCE LAND OWNERS TABLE							
APN	APN2	OWNER	ADDR	CITY	STATE	ZIP	MAP_ID
03-19-32	09-03-0019-0032-0000-0000	MARKWEST LIBERTY MIDSTREAM & RESOURCES LLC	ROUTE 50	SALEM	WV	26426	1
03-19-31	09-03-0019-0031-0000-0000	D & M POWELL, LLC	ROUTE 50	SALEM	WV	26426	2
06-2-2	09-06-0002-0002-0000-0000	BLAND ROBERT C & ARLENE R	OFF RT 18/5 DOUGLAS RUN	NEW MILTON	WV	26411	3
06-2-1	09-06-0002-0001-0000-0000	LAW RONALD L	OFF RT 18/5 DOUGLAS RUN	NEW MILTON	WV	26411	4
08-16-15.2	09-08-0016-0015-0002-0000	MARKWEST LIBERTY MIDSTREAM & RESOURCES LLC	ROUTE 16	WEST UNION	WV	26456	5
08-17-2.1	09-08-0017-0002-0001-0000	BALLENGER, RUBY C	50 ROUTE 1 MORGANSVILLE OLD RT	WEST UNION	WV	26456	6
08-16-5	09-08-0016-0005-0000-0000	BALLENGER, RUBY C	50 ROUTE 1 MORGANSVILLE OLD RT	WEST UNION	WV	26456	7

* See Flood Insurance Land Owner Map for graphical depiction of property locations



FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number in parenthesis	(15)
Corporation line		Parcel or index number in circle	(99)
District line		Improvement	o
County line		Railroad	

Revisions

1	REVISED 3/23/64	9	Revised to 7-1-88	17	SLS INC. 3/08/00 JAW
2	1-25-72 TLM	10	Revised to 7-1-89 REB	18	ESI 3/29/01 REK
3	8-25-76 T.G.	11	OGIS 1-17-91 JB	19	2/29/04 S&H
4	REVISED 7-81 T. Groves	12	OGIS 10-24-91 NK	20	3/17/06 S&H
5	TO JULY 1982 C.P.	13	OGIS 12-8-92 JEB	21	
6	July 1985	14	OGIS 11-93 RD	22	
7	July, 1986 TRL	15	OGIS 2-95 HD	23	
8	Revised to 7-1-87	16	O.G.I.S 1-23-96 J.E.B	24	

STATE OF WEST VIRGINIA
DODDRIDGE COUNTY
Office of Assessor

GRANT DISTRICT
SHEET 19

Date, Aerial Photography APRIL, 1962
Photo No: 256, 279
Date, Map: OCT., 1963
Scale: 1" = 400'

1 | 2

WEST UNION DISTRICT

TAXED IN WEST UNION DISTRICT

01
107 Ac.

02
200 Ac.

P/o 1 - 08

RUN

18
P/O

03
38.35 Ac.

04
18.04 Ac.

04.1
3.36 Ac.

06
17.5 Ac.

07
16.75 Ac.

DOUGLAS

P/o 4-01
67.64 Total Ac.

09
56 Ac.

P/o 4 -06

P/o 4 -07
67 Total Ac

GRANT DISTRICT

10
12.45 Ac.

11
8.96 Ac.

11.1
136.8 Ac.

13
5.12 Ac.

12
38.63 Ac.

P/o 4 - 13

EIBSCAMP RUN

1 | 2
3 | 4

P/o 3 - 05

2
4 | 5

FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number in parenthesis	(15)
Corporation line		Parcel or index number in circle	(99)
District line		Improvement	o
County line		Railroad	

Revisions

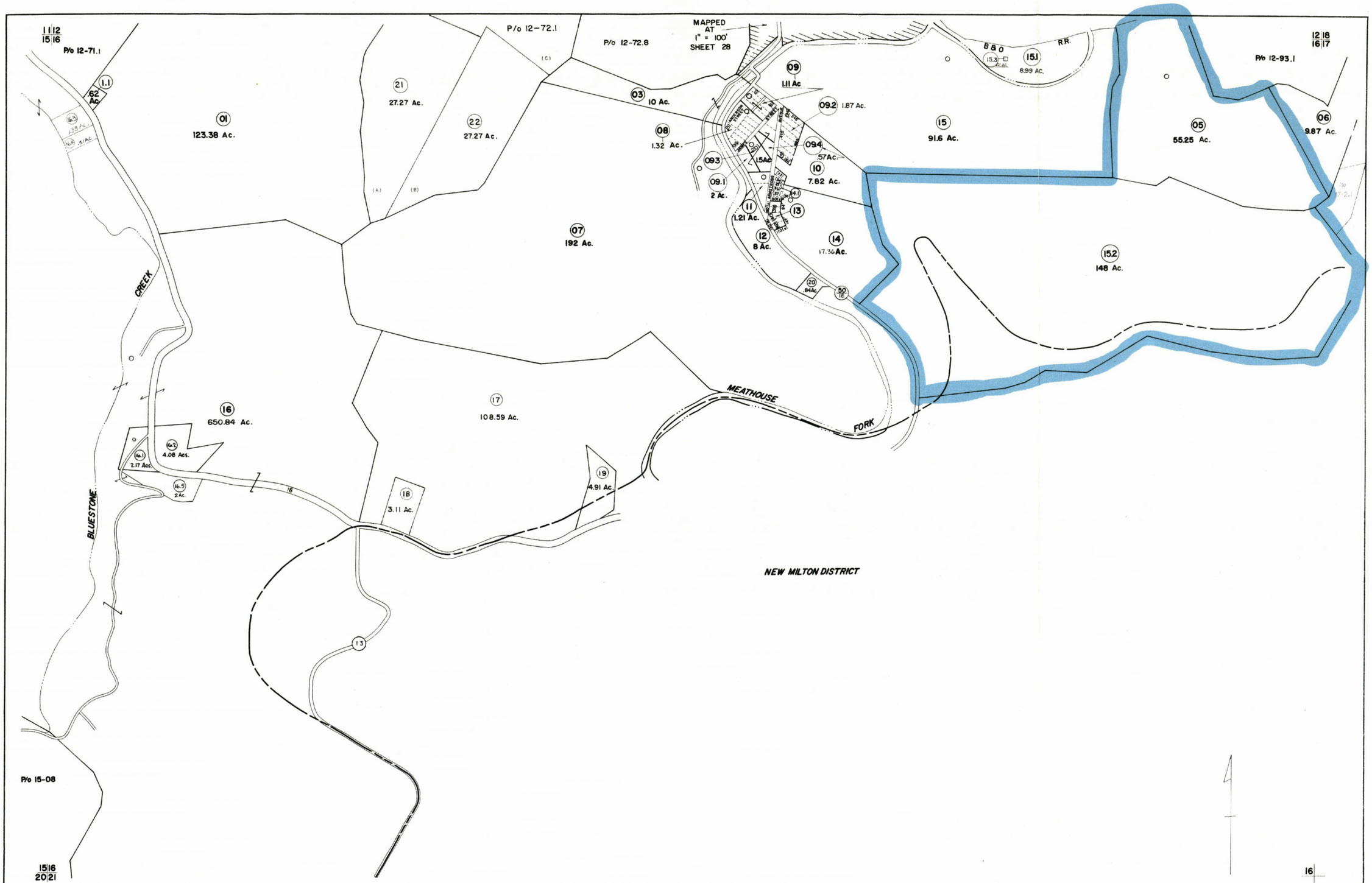
1	REVISED 3/10/64		9		17
2	REVISED 1/20/72	JHP	10		18
3	REV. 7-81 DR. 8-82	T. Groves	11		19
4	REV. TO 7-1-85	NCS	12		20
5	*Revised to 7-1-89*	*REB*	13		21
6			14		22
7			15		23
8			16		

STATE OF WEST VIRGINIA
DODDRIDGE COUNTY
Office of Assessor

NEW MILTON DISTRICT
SHEET 02

Date, Aerial Photography: APRIL, 1962
Photo No: 258 : 260

Date, Map: JULY, 1963
Scale: 1" = 400'



FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number (in parenthesis)	(15)
Corporation line		Parcel or index number (in circle)	(99)
District line		Improvement	
County line		Railroad	

Revisions

1	REVISED 3/11/64		9	Revised to 7-1-85	17
2	1-26-72 BM		10	OGIS 1-18-91 JB	18
3	8-30-76 BAH		11	OGIS 11-93 RD	19
4	12/7/94 JG		12	SLS INC. 3/13/00 JAW	20
5	6-1-80 NCS		13	ESI 3/29/01 REK	21
6	REVISED 7-81 T. Groves		14	2/27/04 S&H	22
7	July 1985 NCS		15		23
8	REV. TO 7-1-85 NCS		16		24

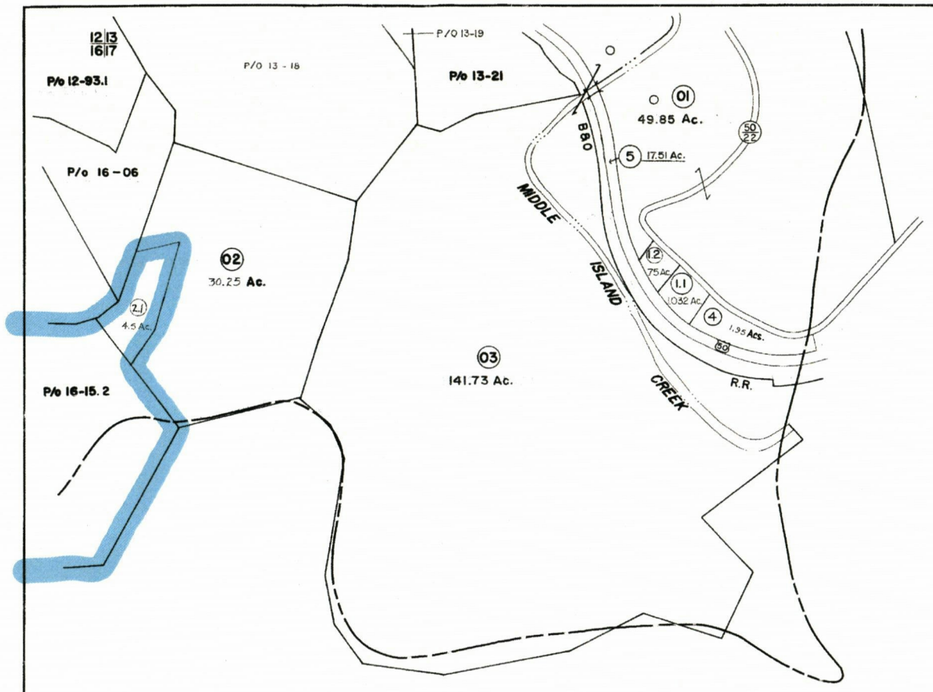
STATE OF WEST VIRGINIA
DODDRIDGE COUNTY

Office of Assessor

WEST UNION DISTRICT
SHEET 16

Date, Aerial Photography: APRIL, 1962
Photo No: 236

Date, Map: DEC., 1963
Scale: 1"=400'



NEW MILTON DISTRICT

16

FOR TAX PURPOSES ONLY

Prepared by
L. ROBERT KIMBALL
Consulting Engineer
Ebensburg, Pennsylvania

Legend

Property line		Original lot line	
Edge of pavement or roadway		Deed lot number in parentheses	(15)
Corporation line		Parcel or index number in circle	99
District line		Improvement	
County line		Railroad	

Revisions

1	REVISED 3/11/64		9	O.G.I.S 1-23-96 J.E.B	17
2	1-26-72 BM		10	SLS INC. 3/13/00 JAW	18
3	8-30-76 B.A.H.		11		19
4	REVISED 7-81 T. Groves		12		20
5	7-1-86 S.P.H.		13		21
6	REV. TO 7-1-89 NCS		14		22
7	OGIS 1-18-91 JB		15		23
8	OGIS 11-93 RD		16		24

STATE OF WEST VIRGINIA
DODDRIDGE COUNTY
Office of Assessor

WEST UNION DISTRICT
SHEET 17

Date, Aerial Photography: APRIL, 1962
Photo No: 256
Date, Map: DEC., 1963
Scale: 1"=400'

The Doddridge Independent

The Doddridge Independent

PUBLISHER'S CERTIFICATE

I, Michael D. Zorn, Publisher of The Doddridge Independent, A newspaper of general circulation published in the town of West Union, Doddridge County, West Virginia, do hereby certify that:

Please take notice that on the (14th) of (June), 2019, (Sherwood Midstream LLC.) filed an application for a Floodplain Permit (#19-553) to develop land located at or about (218 Swisher Lane, West Union); Coordinates: 39.277767, -80.684625. The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance to WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to

was published in The Doddridge Independent
2 times commencing on Friday, June 21, 2019 and
Ending on Friday, June 28, 2019 at the request of:

George Eidel, Manager, Floodplain Manager for Doddridge County Commission

Given under my hand this Friday, June 28, 2019

The publisher's fee for said publication is:

$ 31.05 1st Run/$ 23.28 Subsequent Runs

This Legal Ad Total: $ 54.33

Michael D. Zorn
Publisher of The Doddridge Independent

Subscribed to and sworn to before me on
this date: 6 / 28 / 19

Notary Public in and for Doddridge County

My Commission expires on
The 17th day of May 2024

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
Pamela R Stinespring
PO Box 81
West Union, WV 26456
My commission expires May 17, 2024

Floodplain Public Notice • Legal Notice

Please take notice that on the (14th) of (June), 2019, (Sherwood Midstream LLC.) filed an application for a Floodplain Permit (#19-553) to develop land located at or about (218 Swisher Lane, West Union); Coordinates: 39.277767, -80.684625. The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance to WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment shall present the same in writing by (July 27, 2019) (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Floodplain Manager of the County at 105 Court Street, Suite #3, West Union, 26456. This project is for 138kV power pole structures

C2 6/21-6/28