7016 2070 0000 3170 2945

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- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .50

Total Postage and Fees $ 6.70

Postmark Here
SMITHBURG, WV
DEC 2 0 2018
USPS 26136-0968

Sent To: MarkWest Liberty Midstream & Resources, LLC
Street and Apt. No., or PO Box No.: 1515 Arapahoe St. Tower, Suite 1
City, State, ZIP+4®: Denver, CO 80202 #18-537

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

7016 2070 0000 3170 2952

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- [ ] Adult Signature Required $
- [ ] Adult Signature Restricted Delivery $

Postage $ .50

Total Postage and Fees $ 6.70

Postmark Here
SMITHBURG, WV
DEC 2 0 2018
USPS 26136-0968

Sent To: D & M Powell, LLC
Street and Apt. No., or PO Box No.: 304 Stuart St.
City, State, ZIP+4®: Westunion, WV 26456 #18-537

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

7016 2070 0000 3170 2938

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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

Postmark Here
SMITHBURG, WV
DEC 2 0 2018
USPS 26136-0968

Sent To: Michael Bonnell
Street and Apt. No., or PO Box No.: 3825 WV Rt. 18 S
City, State, ZIP+4®: Westunion, WV 26456 #18-537

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

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:

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

9590 9402 3685 7335 7556 85

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 Delivery

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.

1. Article Addressed to:

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

9590 9402 4298 8190 0203 71

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 12/29/18

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

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 #: 18-537

Date Approved: March 12, 2019 **Expires: March 12, 2020**

Issued to: Mon Power/First Energy **POC: Amanda B. Habershaw**

Company Address: 800 Cabin Hill Drive, Greensburg, PA. 15601

Project Address: 218 Swisher Lane, West Union, W.V. 26456

Firm: 54017C0145C **Lat/Long: 39.277767N, -80.684525W**

Purpose of development: Buckeye Run Breaker Station

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

George C. Eidel

Date: March 12, 2019

For additional information regarding this permit, please contact Doddridge County Floodplain Manager at 304.873.1343, or via email at doddridgecountyfpm@gmail.com
101 Church Street Suite #102; West Union, WV 26456

FirstEnergy

VOID IF NOT CASHED WITHIN 90 DAYS

2856048

50-937
213

Check No. 2856048

CHECK DATE	AMOUNT
12 12 2018	*****25,000.00

PAY TO THE ORDER OF
DODDRIDGE COUNTY COMMISSION
108 COURT STREET
WEST UNION, WV 26456

EXACTLY *****25,000 DOLLARS 00 CENTS

Steven R. Staub
Treasurer
FirstEnergy Corp.

JPMorgan Chase Bank, Syracuse, NY 13206

⑈2856048⑈ ⑆021309379⑆ 601864788⑈

VENDOR NO. 0210059792 DOC NO. 2000429397

PO NO	INVOICE / RCPT #	DATE	DOCUMENT #	VENDOR INV AMT	DISCOUNT	NET AMOUNT
		12/10/2018	1902637130	25,000.00	0.00	25,000.00

FOR CHECK INQUIRY, CONTACT FIRSTENERGY ACCOUNTS PAYABLE HELP DESK AT 814-539-3200.

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

ELEVATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form must be completed for requests and must be completed and signed by a registered professional engineer or licensed land surveyor. **A DHS - FEMA National Flood Insurance Program (NFIP) Elevation Certificate may be submitted in lieu of this form for single structure requests.**

For requests to remove a structure on natural grade OR on engineered fill from the Special Flood Hazard Area (SFHA), submit the lowest adjacent grade (the lowest ground touching the structure), ***including an attached deck or garage***. For requests to remove an entire parcel of land from the SFHA, provide the lowest lot elevation; or, if the request involves an area described by metes and bounds, provide the lowest elevation within the metes and bounds description. All measurements are to be rounded to nearest tenth of a foot. In order to process your request, all information on this form must be completed ***in its entirety***. **Incomplete submissions will result in processing delays.**

1. NFIP Community Number: **540024** Property Name or Address: **218 Swisher Lane, West Union, WV 26456**

2. Are the elevations listed below based on ☐ ***existing*** or ☒ ***proposed*** conditions? (Check one)

3. For the existing or proposed structures listed below, what are the types of construction? (check all that apply)
   ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☒ other (explain) **Fill pad to be constructed for equipment.**

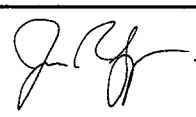
4. Has DHS - FEMA identified this area as subject to land subsidence or uplift? (see instructions) ☐ Yes ☒ No
   If yes, what is the date of the current re-leveling? / (month/year)

5. What is the elevation datum? ☐ NGVD 29 ☒ NAVD 88 ☐ Other (explain)
   If any of the elevations listed below were computed using a datum different than the datum used for the effective Flood Insurance Rate Map (FIRM) (e.g., NGVD 29 or NAVD 88), what was the conversion factor?
   Local Elevation +/- ft. = FIRM Datum

6. Please provide the Latitude and Longitude of the most upstream edge of the ***structure*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☒ NAD83 ☐ NAD27 Lat. 39.278000 Long. -80.684850 (Edge of Pad)
   Please provide the Latitude and Longitude of the most upstream edge of the ***property*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☒ NAD83 ☐ NAD27 Lat. 39.278314 Long. , -80.685628

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source
218 Swisher Lane, West Union, WV 26456	**32**	**19**	**810.0**	**815.0**	**813.71**	**HEC-RAS**

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

Certifier's Name: **James R. Bruggeman**	License No.: **2104**	Expiration Date: **June 30, 2019**
Company Name: **Civil & Environmental Consultants, Inc.**	Telephone No.: **412-429-2324**	
Email: **jbruggeman@cecinc.com**	Fax No. **412-429-2115**	
Signature: 	Date: December 12, 2018; **Revised: February 11, 2019**	

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Seal (optional)

DESCRIPTION OF
0.650 ACRES TO BE REMOVED FROM
THE DHS-FEMA 100 YEAR FLOOD ZONE AE
GRANT DISTRICT, COUNTY OF DODDRIDGE,
STATE OF WEST VIRGINIA

All that certain 0.650 acre tract of land situate in the Grant District, County of Doddridge, State of West Virginia, being part of the 211.525 acre tract of land known as Lot E of the Revised Sherwood Plant Facilities Plan, recorded in Instrument Number 291623, said 0.650 acre tract of land is located within the property of now or formerly Sherwood Midstream Holdings, LLC, recorded in Deed Book Volume 380, Page 69, located on Tax Parcel Sheet 19, Lot 32, 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, recorded in Instrument Number 291623 and property now or formerly D & M Powell, LLC, recorded in Deed Book Volume 304, Page 355; thence along a reference line, through property now or formerly The State of West Virginia, West Virginia Railroad Maintenance Authority, as recorded in Deed book Volume 216, Page 166, variable width and Lot E of the Revised Sherwood Plant Facilities Plan, South 74°02'04" East, 247.45' to a calculated point at the herein described 0.650 acre tract of land, being the **TRUE PLACE OF BEGINNING**; thence continuing through Lot E of the Revised Sherwood Plant Facilities Plan and along the revised line of Zone AE, 100 Year Floodplain, 0.650 acre tract of land, the following twelve (12) courses and distances, viz: South 67°59'24" East, 163.71' to a calculated point; thence South 57°32'46" East, 9.60' to a calculated point; thence South 67°49'43" East, 30.23' to a calculated point; thence South 23°57'11" West, 30.43' to a calculated point; thence South 13°13'16" West, 8.61' to a calculated point; thence South 24°41'16" West, 101.65' to a calculated point; thence North 65°16'37" West, 114.15' to a calculated point; thence North 64°03'39" West, 40.25' to a calculated point; thence South 25°30'41" West, 14.18' to a calculated point; thence North 65°42'04" West, 43.92' to a calculated point; thence North 21°09'17" East, 25.10' to a calculated point; thence North 22°11'32" East, 121.42' to a calculated point at the **TRUE PLACE OF BEGINNING.**

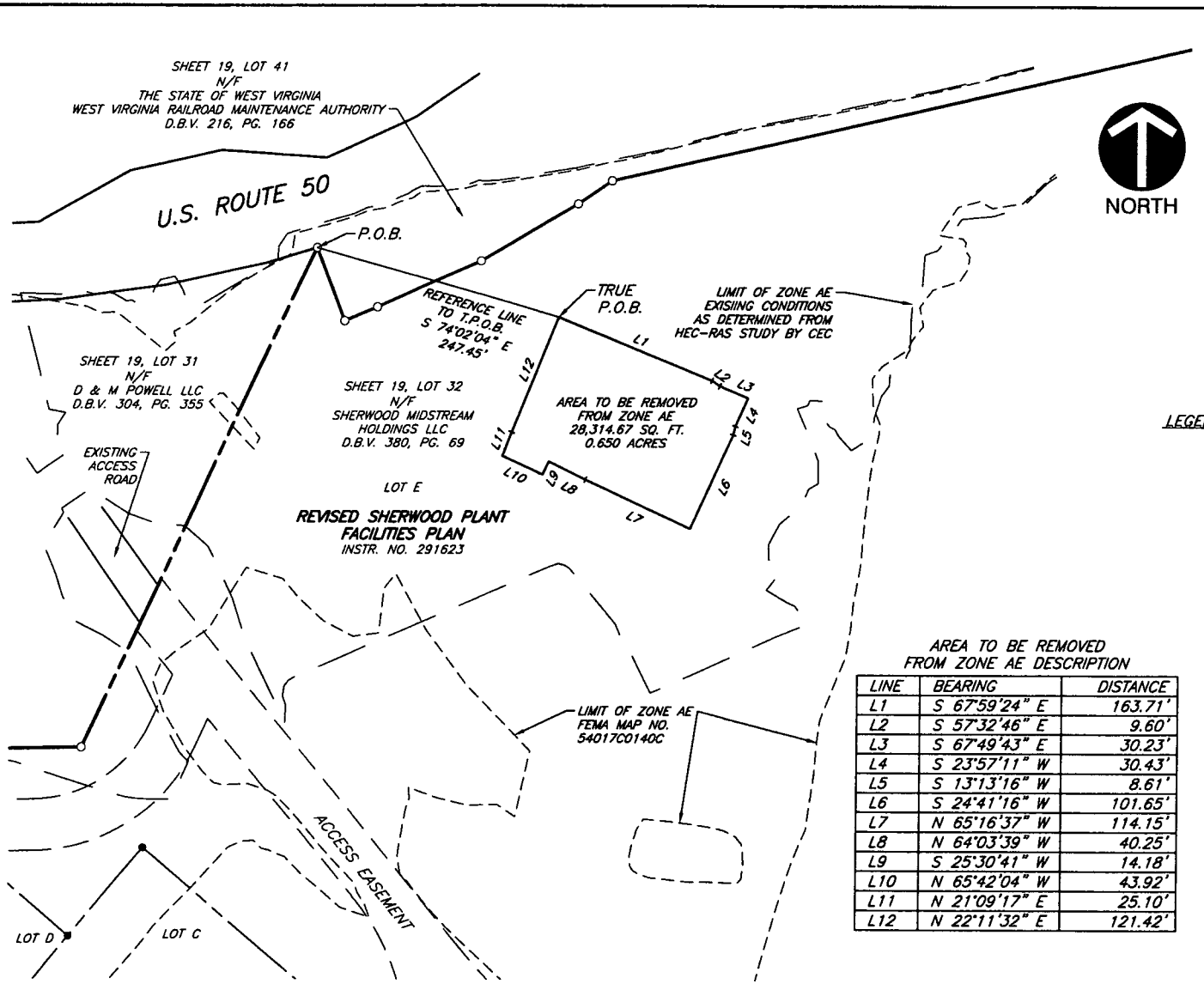
Contains 28,314.67 Sq. Ft. or 0.650 Acres

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

2/11/19

James R. Bruggeman — Date
Registered Surveyor No. 2104

Date Prepared: February 11, 2019
File Name: 185-068_LD_02-11-19_CLOMR-F_0.650Acres.docx



AREA TO BE REMOVED
FROM ZONE AE DESCRIPTION

LINE	BEARING	DISTANCE
L1	S 67°59'24" E	163.71'
L2	S 57°32'46" E	9.60'
L3	S 67°49'43" E	30.23'
L4	S 23°57'11" W	30.43'
L5	S 13°13'16" W	8.61'
L6	S 24°41'16" W	101.65'
L7	N 65°16'37" W	114.15'
L8	N 64°03'39" W	40.25'
L9	S 25°30'41" W	14.18'
L10	N 65°42'04" W	43.92'
L11	N 21°09'17" E	25.10'
L12	N 22°11'32" E	121.42'

REVISION RECORD

NO	DATE	DESCRIPTION
1		

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

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

LEGEND

- ● INDICATES CAPPED STEEL PIPE SET
- ○ INDICATES CAPPED REBAR SET

TOTAL AREA TO BE REMOVED
FROM ZONE AE
28,314.67 SQ. FT.
0.650 ACRES

SCALE IN FEET
0 100 200

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

EXHIBIT A
0.650 ACRES TO BE REMOVED FROM ZONE AE

Situate In
GRANT DISTRICT, COUNTY OF DODDRIDGE
STATE OF WEST VIRGINIA
Made For
MONONGAHELA POWER COMPANY,
a FIRST ENERGY COMPANY
BUCKEYE RUN BREAKER STATION

DATE:	2/12/2019	SCALE:	1"=100'	EXHIBIT:	A
DRAWN BY:	CMM	CHECKED BY:	JRB		
PROJECT NO:	185-068	APPROVED BY:	RPC	SHEET	1 OF 1

P:\2018\185-068\-Survey\Dwg\185068-SK01-EXH-CLOMR-F.dwg[CLOMR-F] LS(02/12/2019 - emccamy) - LP: 2/12/2019 2:04 PM

Federal Emergency Management Agency

Washington, D.C. 20472

February 20, 2019

THE HONORABLE GREGORY ROBINSON
PRESIDENT, COUNTY COMMISSION
DODDRIDGE COUNTY
105 COURT STREET, SUITE 1
WEST UNION, WV 26456

CASE NO.: 19-03-0400C
COMMUNITY: DODDRIDGE COUNTY, WEST VIRGINIA (UNINCORPORATED AREAS)
COMMUNITY NO.: 540024

DEAR MR. ROBINSON:

This is in reference to a request that the Federal Emergency Management Agency (FEMA) determine if the property described in the enclosed document is located within an identified Special Flood Hazard Area, the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), on the effective National Flood Insurance Program (NFIP) map. Using the information submitted and the effective NFIP map, our determination is shown on the attached Conditional Letter of Map Revision based on Fill (CLOMR-F) Comment Document. This comment document provides additional information regarding the effective NFIP map, the legal description of the property and our comments regarding this proposed project.

Additional documents are enclosed which provide information regarding the subject property and CLOMR-Fs. Please see the List of Enclosures below to determine which documents are enclosed. Other attachments specific to this request may be included as referenced in the Determination/Comment document. If you have any questions about this letter or any of the enclosures, please contact the FEMA Map Information eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426.

Sincerely,

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

LIST OF ENCLOSURES:

CLOMR-F-DEN COMMENT DOCUMENT

cc: Ms. Amanda Habershaw

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL COMMENT DOCUMENT

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	DODDRIDGE COUNTY, WEST VIRGINIA (Unincorporated Areas)	A portion of Lot E, Revised Sherwood Plant Facilities Plan, as described in the Quit Claim Deed recorded as Instrument No. 291623, in Book 406, Page 133, in the Office of the County Clerk, Doddridge County, West Virginia The portion of property is more particularly described by the following metes and bounds:
	COMMUNITY NO.: 540024	
AFFECTED MAP PANEL	NUMBER: 54017C0145C	
	DATE: 10/4/2011	

FLOODING SOURCE: BUCKYEYE CREEK

APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY:39.278013, -80.684879
SOURCE OF LAT & LONG: LOMA LOGIC **DATUM: NAD 83**

COMMENT TABLE REGARDING THE PROPOSED PROPERTY (PLEASE NOTE THAT THIS IS NOT A FINAL DETERMINATION. A FINAL DETERMINATION WILL BE MADE UPON RECEIPT OF AS-BUILT INFORMATION REGARDING THIS PROPERTY.)

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	**OUTCOME** WHAT WOULD NOT BE REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
E	--	Revised Sherwood Plant Facilities Plan	218 Swisher Lane	Portion of Property	AE	814.2 feet	--	810.0 feet

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

LEGAL PROPERTY DESCRIPTION
CONDITIONAL LOMR-F DETERMINATION

This document provides the Federal Emergency Management Agency's comment regarding a request for a Conditional Letter of Map Revision based on Fill for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the proposed described portion(s) of the property(ies) would be located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) if built as proposed. Therefore, flood insurance is required for the property described above. If fill is placed on the subject property to raise its elevation above the base flood elevation after the effective date of the first NFIP map showing the property in the SFHA, then, for the subject property to be outside of the SFHA, it must be demonstrated that the subject property is reasonably safe from flooding in accordance with Part 65.5(a)(4) of our regulations. Further guidance on determining if the subject property is reasonably safe from flooding may be found in FEMA Technical Bulletin 10-01. A copy of this bulletin can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at http://www.fema.gov/mit/tb1001.pdf.

This comment document is based on the flood data presently available. The enclosed documents provide additional information regarding this request and information regarding your options for obtaining a Letter of Map Revision based on Fill. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION BASED ON FILL COMMENT DOCUMENT

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

LEGAL PROPERTY DESCRIPTION (CONTINUED)

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, recorded in Instrument Number 291623 and property now or formerly D & M Powell, LLC, recorded in Deed Book Volume 304, Page 355; thence along a reference line, through property now or formerly The State of West Virginia, West Virginia Railroad Maintenance Authority, as recorded in Deed book Volume 216, Page 166, variable width and Lot E of the Revised Sherwood Plant Facilities Plan, South 74°02'04" East, 247.45' to a calculated point at the herein described 0.650 acre tract of land, being the TRUE PLACE OF BEGINNING; thence continuing through Lot E of the Revised Sherwood Plant Facilities Plan and along the revised line of Zone AE, 100 Year Floodplain, 0.650 acre tract of land, the following twelve (12) courses and distances, viz: South 67°59'24" East, 163.71' to a calculated point; thence South 57°32'46" East, 9.60' to a calculated point; thence South 67°49'43" East, 30.23' to a calculated point; thence South 23°57'11" West, 30.43' to a calculated point; thence South 13°13'16" West, 8.61' to a calculated point; thence South 24°41'16" West, 101 .65' to a calculated point; thence North 65°16'37" West, 114.15' to a calculated point; thence North 64°03'39" West, 40.25' to a calculated point; thence South 25°30'41" West, 14.18' to a calculated point; thence North 65°42'04" West, 43.92' to a calculated point; thence North 21°09'17" East, 25.10' to a calculated point; thence North 22°11'32" East, 121.42' to a calculated point at the TRUE PLACE OF BEGINNING.

CONDITIONAL LOMR-F DETERMINATION (This Additional Consideration applies to the preceding 1 Property.)

Comments regarding this conditional request are based on the flood data presently available. Our final determination will be made upon receipt of this Comment Document, certified as-built elevations and/or certified as-built survey. Since this request is for a Conditional Letter of Map Revision based on Fill, we will also require the applicable processing fee, and the "Community Acknowledgement" form. Please note that additional items may be required before a final as-built determination is issued.

This letter does not relieve Federal agencies of the need to comply with Executive Order 11988 on Floodplain Management in carrying out their responsibilities and providing Federally undertaken, financed, or assisted construction and improvements, or in their regulating or licensing activities.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Information eXchange (FMIX) toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Engineering Library, 3601 Eisenhower Ave Ste 500, Alexandria, VA 22304-6426.

Luis V. Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

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

LETTER OF TRANSMITTAL

DATE:	September 11, 2020	JOB NUMBER:	302-793
ATTENTION:	LOMC Manager		
RE:	0.393 Acres to be Removed for Zone AE Dodridge County, WV		

TO LOMC Clearinghouse
847 South Pickett Street
Alexandria, VA 22304-4605

WE ARE SENDING YOU [X] ATTACHED [ ] SEPARATE COVER VIA FedEx Express Saver THE FOLLOWING ITEMS:

[ ] SHOP DRAWINGS [ ] PRINTS [ ] PLANS [ ] SAMPLES [ ] SPECIFICATIONS

[ ] COPY OF LETTER [ ] CHANGE ORDER See list below

COPIES	DATE	NO.	DESCRIPTION
1			Property Information form
1			Elevation form
1			Community Acknowledgement form
1			FIRM map
1			Deed w/ plans
1			Exhibit A – 0.393 Acres to be Removed for Zone AE
1			Description of 0.393 Acres to be Removed for Zone AE
1			Check for fee ($325)

WE ARE SENDING YOU

[ ] FOR APPROVAL [ ] APPROVAL AS SUBMITTED [ ] RESUBMIT _____ COPIES FOR APPROVAL

[X] 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

COPY TO

SIGNED Christopher McCann

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

PROPERTY INFORMATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.63 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form may be completed by the property owner, property owner's agent, licensed land surveyor, or registered professional engineer to support a request for a Letter of Map Amendment (LOMA), Conditional Letter of Map Amendment (CLOMA), Letter of Map Revision Based on Fill (LOMR-F), or Conditional Letter of Map Revision Based on Fill (CLOMR-F) for existing or proposed, single or multiple lots/structures. In order to process your request, all information on this form must be completed ***in its entirety***, unless stated as optional. **Incomplete submissions will result in processing delays.** Please check the item below that describes your request:

☐ LOMA	A letter from DHS-FEMA stating that an existing structure or parcel of land that has not been elevated by fill (natural grade) would not be inundated by the base flood.
☐ CLOMA	A letter from DHS-FEMA stating that a proposed structure that is not to be elevated by fill (natural grade) would not be inundated by the base flood if built as proposed.
■ LOMR-F	A letter from DHS-FEMA stating that an **existing** structure or parcel of land that has been **elevated by fill** would not be inundated by the base flood.
☐ CLOMR-F	A letter from DHS-FEMA stating that a parcel of land or **proposed** structure that will be **elevated by fill** would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

Fill is defined as material from any source (including the subject property) placed that raises the ground to or above the Base Flood Elevation (BFE). The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing (natural grade) elevation, which is at or above the BFE. **Fill that is placed before the date of the first National Flood Insurance Program (NFIP) map showing the area in a Special Flood Hazard Area (SFHA) is considered natural grade.**

Has fill been placed on your property to raise ground that was previously below the BFE? ■ Yes ☐ No — If yes, when was fill placed? 03/15/2019 mm/dd/yyyy

Will fill be placed on your property to raise ground that is below the BFE? ☐ Yes* ☐ No — If yes, when will fill be placed? mm/dd/yyyy

* If yes, Endangered Species Act (ESA) compliance must be documented to FEMA prior to issuance of the CLOMR-F determination (please refer page 4 to the MT-1 Instructions).

1. Street Address of the Property (if request is for multiple structures or units, please attach additional sheet referencing each address and enter street names below):
   218 Swisher Lane, West Union, WV 26456

2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed):
   All that certain 211.525 acres, being Lot E of the Revised Sherwood Plant Facilities Plan,situate in the Grant District, Doddridge County, WV, recorded in instrument #291623

3. Are you requesting that a flood zone determination be completed for (check one):
   - ☐ Structures on the property? What are the dates of construction? _____ (MM/YYYY)
   - ☒ A portion of land within the bounds of the property? (A certified metes and bounds description and map of the area to be removed, certified by a licensed land surveyor or registered professional engineer, are **required**. For the preferred format of metes and bounds descriptions, please refer to the MT-1 Form 1 Instructions.)
   - ☐ The entire legally recorded property?

4. Is this request for a (check one):
   - ☐ Single structure
   - ☒ Single lot
   - ☐ Multiple structures (How many structures are involved in your request? List the number: _____)
   - ☐ Multiple lots (How many lots are involved in your request? List the number: _____)

In addition to this form (MT-1 Form 1), please complete the checklist below. **ALL** requests must include one copy of the following:

- ☒ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted (property inadvertently located in the NFIP regulatory floodway will require Section B of MT-1 Form 3)
- ☒ Copy of the Subdivision Plat Map for the property **(with recordation data and stamp of the Recorder's Office)**

OR

- ☐ Copy of the Property Deed **(with recordation data and stamp of the Recorder's Office)**, ***accompanied by*** a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.
- ☒ Form 2 – Elevation Form. If the request is to remove the structure, and an Elevation Certificate has already been completed for this property, it may be submitted in lieu of Form 2. If the request is to remove the entire legally recorded property, or a portion thereof, the lowest lot elevation must be provided on Form 2.
- ☒ Please include a map scale and North arrow on all maps submitted.

For LOMR-Fs and CLOMR-Fs, the following must be submitted in addition to the items listed above:

- ☒ Form 3 – Community Acknowledgment Form

For CLOMR-Fs, the following must be submitted in addition to the items listed above:

- ☐ Documented ESA compliance, which may include a copy of an Incidental Take Permit, an Incidental Take Statement, a "not likely to adversely affect" determination from the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS), or an official letter from NMFS or USFWS concurring that the project has "No Effect" on proposed or listed species or designated critical habitat. Please refer to the MT-1 instructions for additional information.

Please do *not* submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc [CD]). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-1 Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm.

Processing Fee (see instructions for appropriate mailing address; or visit http://www.fema.gov/fhm/frm_fees.shtm for the most current fee schedule)

Revised fee schedules are published periodically, but no more than once annually, as noted in the **Federal Register**. Please note: single/multiple lot(s)/structure(s) LOMAs are fee exempt. The current review and processing fees are listed below:

Check the fee that applies to your request:

- ☒ $325 (single lot/structure LOMR-F following a CLOMR-F)
- ☐ $425 (single lot/structure LOMR-F)
- ☐ $500 (single lot/structure CLOMA or CLOMR-F)
- ☐ $700 (multiple lot/structure LOMR-F following a CLOMR-F, or multiple lot/structure CLOMA)
- ☐ $800 (multiple lot/structure LOMR-F or CLOMR-F)

Please submit the Payment Information Form for remittance of applicable fees. Please make your check or money order payable to:
National Flood Insurance Program.

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

Applicant's Name (required): Amanda B. Habershaw

Company (if applicable): Monongahela Power Company, a First Energy Company

Mailing Address (required): 800 Cabin Hill Drive, Greensburg, PA 15601

Daytime Telephone No. (required): (412) 841-5545

E-Mail Address (optional): ☒ By checking here you may receive correspondence electronically at the email address provided):
Ahabers@firstenergycorp.com

Fax No. (optional):

Date (required) 07/31/2020

Signature of Applicant (required)

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

ELEVATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form must be completed for requests and must be completed and signed by a registered professional engineer or licensed land surveyor. **A DHS - FEMA National Flood Insurance Program (NFIP) Elevation Certificate may be submitted in lieu of this form for single structure requests.**

For requests to remove a structure on natural grade OR on engineered fill from the Special Flood Hazard Area (SFHA), submit the lowest adjacent grade (the lowest ground touching the structure), ***including an attached deck or garage***. For requests to remove an entire parcel of land from the SFHA, provide the lowest lot elevation; or, if the request involves an area described by metes and bounds, provide the lowest elevation within the metes and bounds description. All measurements are to be rounded to nearest tenth of a foot. In order to process your request, all information on this form must be completed ***in its entirety***. **Incomplete submissions will result in processing delays.**

1. NFIP Community Number: 540024 Property Name or Address: 218 Swisher Lane, West Union, WV
2. Are the elevations listed below based on ☒ ***existing*** or ☐ ***proposed*** conditions? (Check one)
3. For the existing or proposed structures listed below, what are the types of construction? (check all that apply)
   ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☒ other (explain) Power Substation
4. Has DHS - FEMA identified this area as subject to land subsidence or uplift? (see instructions) ☐ Yes ☒ No
   If yes, what is the date of the current re-leveling? / (month/year)
5. What is the elevation datum? ☐ NGVD 29 ☒ NAVD 88 ☐ Other (explain)
   If any of the elevations listed below were computed using a datum different than the datum used for the effective Flood Insurance Rate Map (FIRM) (e.g., NGVD 29 or NAVD 88), what was the conversion factor?
   Local Elevation +/- ft. = FIRM Datum
6. Please provide the Latitude and Longitude of the most upstream edge of the ***structure*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☒ NAD83 ☐ NAD27 Lat. 39.27888 Long. -80.68511
   Please provide the Latitude and Longitude of the most upstream edge of the ***property*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☒ NAD83 ☐ NAD27 Lat. 39.27886 Long. -80.68241

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source
218 Swisher Lane, West Union, WV 26456	32	19	814.2	N/A	813.71	HEC-RAS

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

Certifier's Name: James R. Bruggeman, P.L.S.	License No.: 2104	Expiration Date: 06/03/2021
Company Name: Civil & Environmental Consultants, Inc.	Telephone No.: 412-429-2324	
Email: jbruggeman@cecinc.com	Fax No. 412-429-2114	
Signature:	Date: 07/27/2020	

JAMES ROBERT BRUGGEMAN LICENSED PROFESSIONAL SURVEYOR

Seal (optional)

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Continued from Page 1.

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source

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

Certifier's Name:	James R. Bruggeman, P.L.S.	License No.:	2104	Expiration Date:	06-03-2021
Company Name:	Civil & Environmental Consultants, Inc.	Telephone No.:	412-429-2324		
Email:	jbruggeman@cecinc.com	Fax No.	412-429-2114		
Signature:		Date:	07/27/2020		

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Seal (optional)

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.38 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) ***OR*** to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number: 540024 Property Name or Address: 218 Swisher Lane, West Union, WV 26456

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature: (required)	Date:

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature (required):	Date:

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name:

Project Identifier:

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Please make check or money order payable to the National Flood Insurance Program.

Type of Request:

☒ MT-1 application
☐ MT-2 application

LOMC Clearinghouse
847 South Pickett Street
Alexandria, VA 22304-4605
Attn.: LOMC Manager

☐ EDR application

FEMA Project Library
847 South Pickett Street
Alexandria, VA 22304-4605
FAX (703) 212-4090

Request No. (if known): _____ **Check No.:** _____ **Amount:** $325

☐ INITIAL FEE* ☒ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☐ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

****Note: Check only if submitting a corrected fee for an ongoing request.**

COMPLETE THIS SECTION *ONLY* IF PAYING BY CREDIT CARD

CARD NUMBER EXP. DATE

				–				–				–					–		
1	2	3	4		5	6	7	8	9	10	11	12	13	14	15	16	Month		Year

_____ _____
Date Signature

NAME *(AS IT APPEARS ON CARD)*: _____
(please print or type)

ADDRESS: _____
(for your credit card receipt-please print or type) _____

DAYTIME PHONE: _____

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

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: _____
Title: _____

STATE OF Colorado)
) ss.
COUNTY OF Denver)

On this, the 2nd day of April, 2018, before me personally appeared _____, 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: _____
Title: _____

STATE OF _____)
) ss.
COUNTY OF _____)

On this, the ___ day of _____, 2018, before me personally appeared _____, who acknowledged himself to be the _____ 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: _____

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

Exhibit "A"

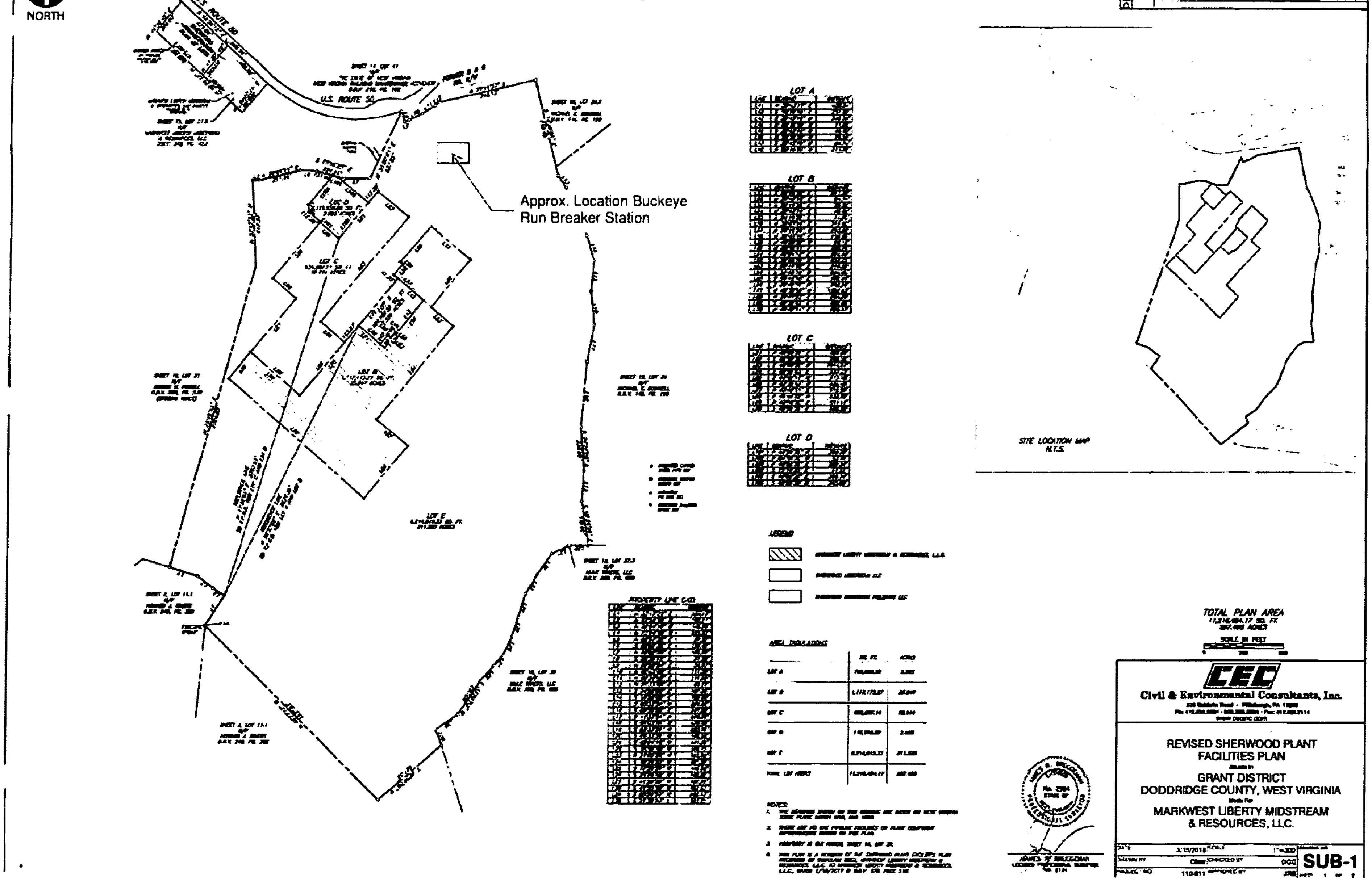
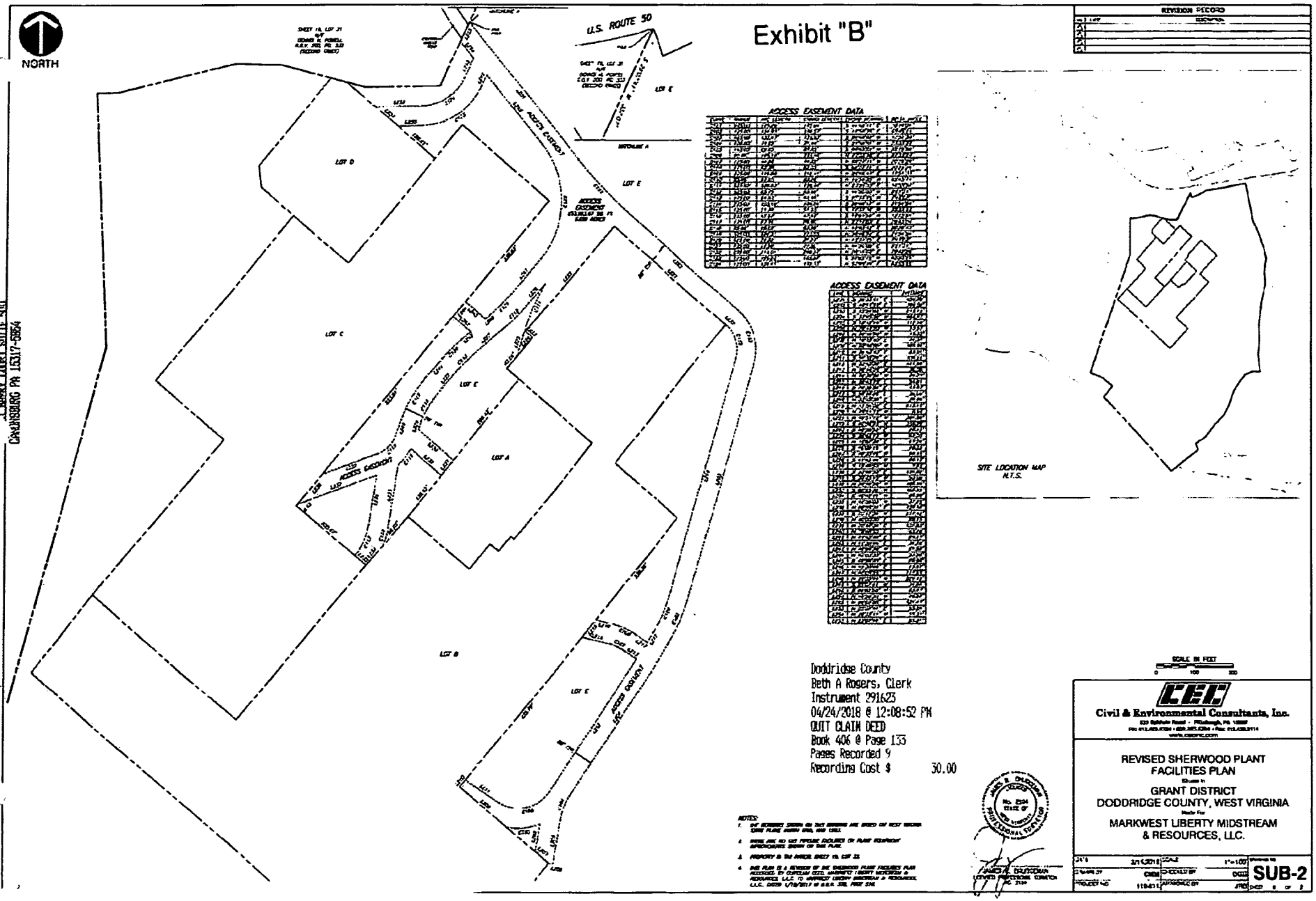

NORTH
U.S. ROUTE 50
Approx. Location Buckeye
Run Breaker Station
LOT A
LOT B
LOT C
LOT D
LOT E
SITE LOCATION MAP
N.T.S.
LEGEND
TOTAL PLAN AREA
CEC
Civil & Environmental Consultants, Inc.
REVISED SHERWOOD PLANT
FACILITIES PLAN
GRANT DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA
MARKWEST LIBERTY MIDSTREAM
& RESOURCES, LLC.
SUB-1

Exhibit "B"

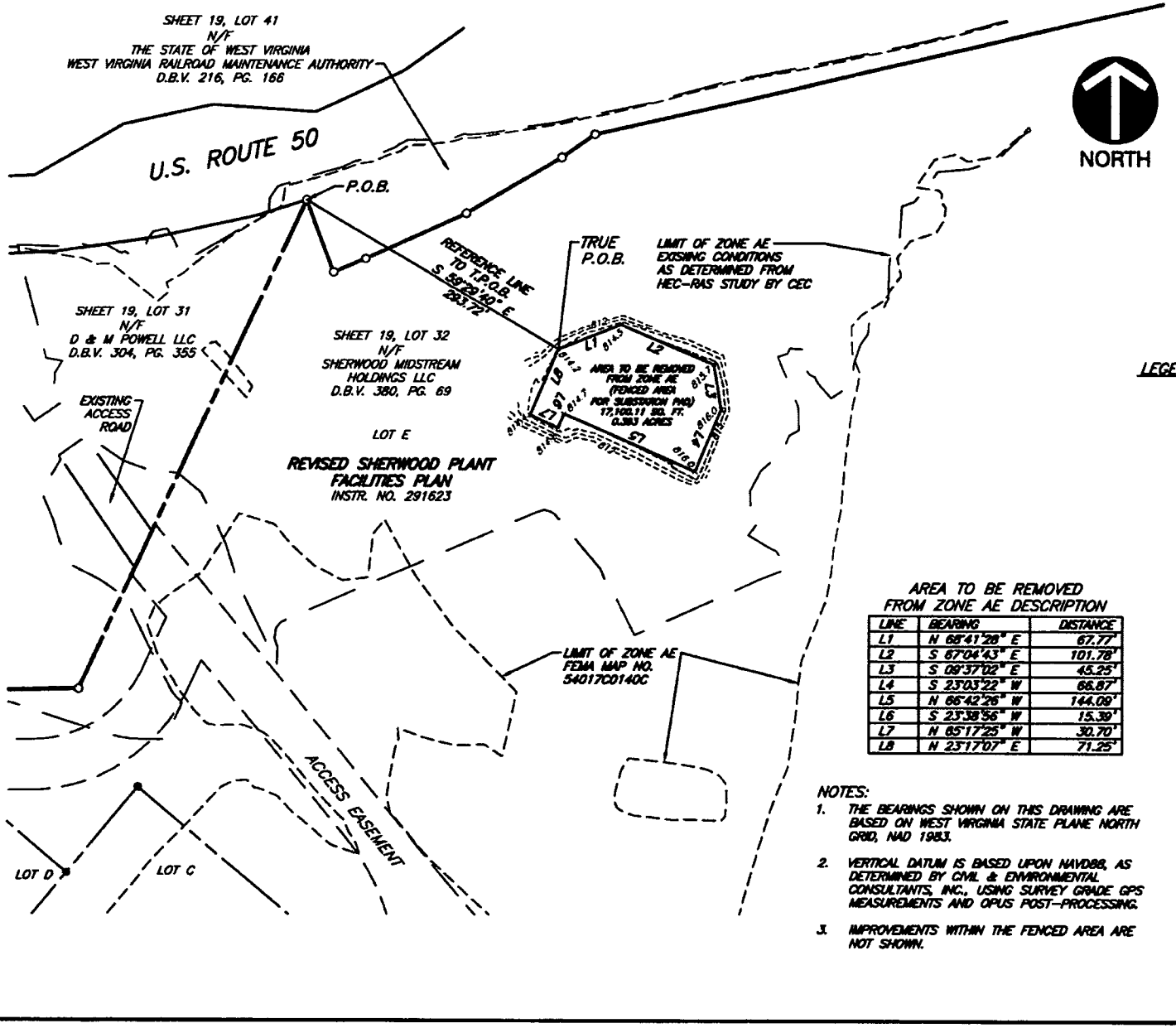


Doddridge County
Beth A Rogers, Clerk
Instrument 291623
04/24/2018 @ 12:08:52 PM
QUIT CLAIM DEED
Book 406 @ Page 133
Pages Recorded 9
Recording Cost $ 30.00

Civil & Environmental Consultants, Inc.

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

SUB-2



REVISION RECORD

NO	DATE	DESCRIPTION
1		

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

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

LEGEND

- ● INDICATES CAPPED STEEL PIPE SET
- ○ INDICATES CAPPED REBAR SET

TOTAL AREA TO BE REMOVED FROM ZONE AE
17,100.11 SQ. FT.
0.393 ACRES

SCALE IN FEET
0 100 200

AREA TO BE REMOVED FROM ZONE AE DESCRIPTION

LINE	BEARING	DISTANCE
L1	N 68°41'28" E	67.77'
L2	S 67°04'43" E	101.78'
L3	S 09°37'02" E	45.25'
L4	S 23°03'22" W	66.87'
L5	N 66°42'26" W	144.09'
L6	S 25°38'56" W	15.39'
L7	N 65°17'25" W	30.70'
L8	N 25°17'07" E	71.25'

NOTES:

1. THE BEARINGS SHOWN ON THIS DRAWING ARE BASED ON WEST VIRGINIA STATE PLANE NORTH GRID, NAD 1983.
2. VERTICAL DATUM IS BASED UPON NAVD88, AS DETERMINED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC., USING SURVEY GRADE GPS MEASUREMENTS AND OPUS POST-PROCESSING.
3. IMPROVEMENTS WITHIN THE FENCED AREA ARE NOT SHOWN.

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

EXHIBIT A
0.393 ACRES TO BE REMOVED FROM ZONE AE

Situate In
GRANT DISTRICT, COUNTY OF DODDRIDGE
STATE OF WEST VIRGINIA
Made For
MONONGAHELA POWER COMPANY,
a FIRST ENERGY COMPANY
BUCKEYE RUN BREAKER STATION

DATE:	07-28-2020	SCALE:	1"=100'
DRAWN BY:	CMM	CHECKED BY:	JRB
PROJECT NO:	302-793	APPROVED BY:	RPC

EXHIBIT: A
SHEET 1 OF 1

P:\302-000\302-793\-Survey\Dwg\302793-5401-EXH-LOMR-F.dwg (LOMR-F) LS (07/28/2020 - cmccamy) - LP: 7/28/2020 1:20 PM

DESCRIPTION OF
0.393 ACRES TO BE REMOVED FROM
THE DHS-FEMA 100 YEAR FLOOD ZONE AE
GRANT DISTRICT, COUNTY OF DODDRIDGE,
STATE OF WEST VIRGINIA

All that certain 0.393 acre tract of land situate in the Grant District, County of Doddridge, State of West Virginia, being part of the 211.525 acre tract of land known as Lot E of the Revised Sherwood Plant Facilities Plan, recorded in Instrument Number 291623, said 0.393 acre tract of land is located within the property of now or formerly Sherwood Midstream Holdings, LLC, recorded in Deed Book Volume 380, Page 69, located on Tax Parcel Sheet 19, Lot 32, 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, recorded in Instrument Number 291623 and property now or formerly D & M Powell, LLC, recorded in Deed Book Volume 304, Page 355;

thence along a reference line, through property now or formerly The State of West Virginia, West Virginia Railroad Maintenance Authority, as recorded in Deed Book Volume 216, Page 166, variable width and Lot E of the Revised Sherwood Plant Facilities Plan,
South 59°29'40" East, 293.72' to a corner of a fence at the herein described 0.393 acre tract of land, said point is the lowest elevation of the gravel pad (814.2'), being the **TRUE PLACE OF BEGINNING;**

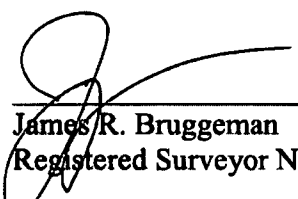
thence continuing through Lot E of the Revised Sherwood Plant Facilities Plan and along the revised line of Zone AE, 100 Year Floodplain, 0.393 acre tract of land, said line being along a fence, the following eight (8) courses and distances, viz:

1. North 68°41'28" East, 67.77' to a point;
2. South 67°04'43" East, 101.78' to a point;
3. South 09°37'02" East, 45.25' to a point;
4. South 23°03'22" West, 66.87' to a point;
5. North 66°42'26" West, 144.09' to a point;
6. South 23°38'56" West, 15.39' to a point;
7. North 65°17'25" West, 30.70' to a point;
8. North 23°17'07" East, 71.25' to a point at the **TRUE PLACE OF BEGINNING.**

Bearings based on West Virginia State Plane North Grid, NAD 1983.

Contains 17,100.11 Sq. Ft. or 0.393 Acres

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



9/11/2020

James R. Bruggeman
Registered Surveyor No. 2104

Date

Date Prepared: July 27, 2020

File Name: 302-793_LD_07-27-20_LOMR-F_0.393Acres.docx

163891

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

PNC BANK, N.A.
Pittsburgh, PA

8-9/430

CHECK DATE 8/21/2020

Security features. Details on back.

PAY Three Hundred Twenty Five and 00/100 Dollars

TO National Flood Insurance Program

AMOUNT 325.00

AUTHORIZED SIGNATURE

⑈163891⑈ ⑆043000096⑆ 000227240 5⑈

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

163891

Check Date: 8/21/2020

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
CR408	8/19/2020	000000364218	325.00			325.00
National Flood Insurance Program		TOTAL	325.00			325.00
- Operating Account	97	01294				

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.38 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) ***OR*** to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number: 540024 Property Name or Address: 218 Swisher Lane, West Union, WV 26456

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
George Eidel, CFM Emergency Management Director /Floodplain Manager		304-873-1343
Community Name:	Community Official's Signature: (required)	Date:
Doddridge County	George C Eidel	11/5/2020

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature (required):	Date:

HYDRAULIC STUDY OF BUCKEYE CREEK

BUCKEYE RUN BREAKER STATION
DODDRIDGE COUNTY, WEST VIRGINIA

Prepared for:

MON POWER

Prepared by:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
PITTSBURGH, PENNSYLVANIA

CEC Project 185-068

DECEMBER 2018

Civil & Environmental Consultants, Inc.

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

December 14, 2018

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

Dear Mr. Eidel:

DEC 17 18 1:51PM

Subject: Floodplain Development Permit and FEMA CLOMR-F Application
Commercial/Industrial Floodplain Development Permit
Buckeye Run Breaker Station, Doddridge County, West Virginia
CEC Project 185-068

On behalf of Monongahela Power Company, a FirstEnergy Company, Civil & Environmental Consultants, Inc. (CEC) is submitting a Commercial/Industrial Floodplain Development Permit and a FEMA Conditional Letter of Map Revision–Fill (CLOMR-F) Application associated with 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) to be submitted directly by Monongahela Power Company, a FirstEnergy Company, under separate cover;
- Hydraulic Study Report of Buckeye Creek;
- Doddridge County Floodplain Development Permit Application (Appendix–F in the above report);
- FEMA CLOMR-F – Application Fee: $600 to be submitted directly by Monongahela Power Company, a FirstEnergy Company, under separate cover to FEMA;
- FEMA – CLOMR-F – MT1 Application and Supporting Documents.

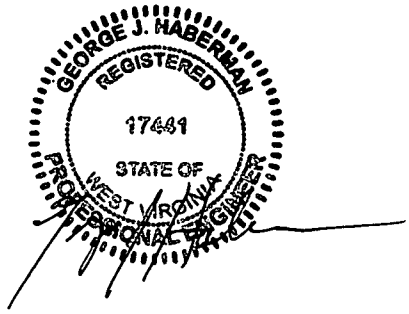
Should you have any questions or require additional information, do not hesitate to contact us at 412-429-2324.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

George J. Haberman, P.E.
Senior Consultant

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



Enclosures

185-068-L-Permit-FEMA/P

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Appendix B – FEMA Flood Information Study and Rate Map
Appendix C – Hydraulic Calculations for Existing and Proposed Conditions
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Appendix F – Doddridge County Floodplain Permits

1.0 INTRODUCTION

1.1 BACKGROUND

Electrical Consultants, Inc. (ECI) has contracted Civil & Environmental Consultants, Inc. (CEC) to perform a flood study, on behalf of Monongahela Power Company (MonPower), a First Energy Company, as part of the construction of the proposed Buckeye Run Breaker Station and Transmission Line. MonPower is overseeing the construction of the breaker station, but MonPower will not own the station. The proposed breaker station site 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. 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 breaker station grading, transmission line, 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 breaker station and utility poles associated with the transmission line. This comparison will show the theoretical impacts, if any, of the proposed 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 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) 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 ECI on behalf of Mon Power.

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.

1.6 NECESSARY PERMITS FROM GOVERNMENT AGENCIES

As a part of this floodplain permit submission, MonPower is required to obtain a WVDEP NPDES Permit prior to initiating construction. This permit approval will be forwarded to Doddridge County under separate cover upon receipt from the WVDEP.

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 proposed breaker station grading, transmission line, and associated structures. The elevations of the substation grading and structures are shown on the map in Appendix D. The proposed improvements include equipment and proposed grading to elevate the breaker station, as well as utility poles for the proposed transmission line. The proposed 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; 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 proposed breaker station, transmission line, and associated 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 proposed substation. 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 proposed breaker station grading. The largest increase in WSEL between existing and proposed conditions is at Station 32+04.54 (Section G) and is 0.83 feet. Station 32+04.54 (Section G) is the cross section immediately upstream of the proposed 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 0.83 feet at Station 32+04.54 (Section G), one section upstream of the proposed breaker station and within the subject property.
- The water surface elevation increase at Station 35+04.54 (Section A), approximately 315 feet downstream from the subject property line, is 0.43 feet.

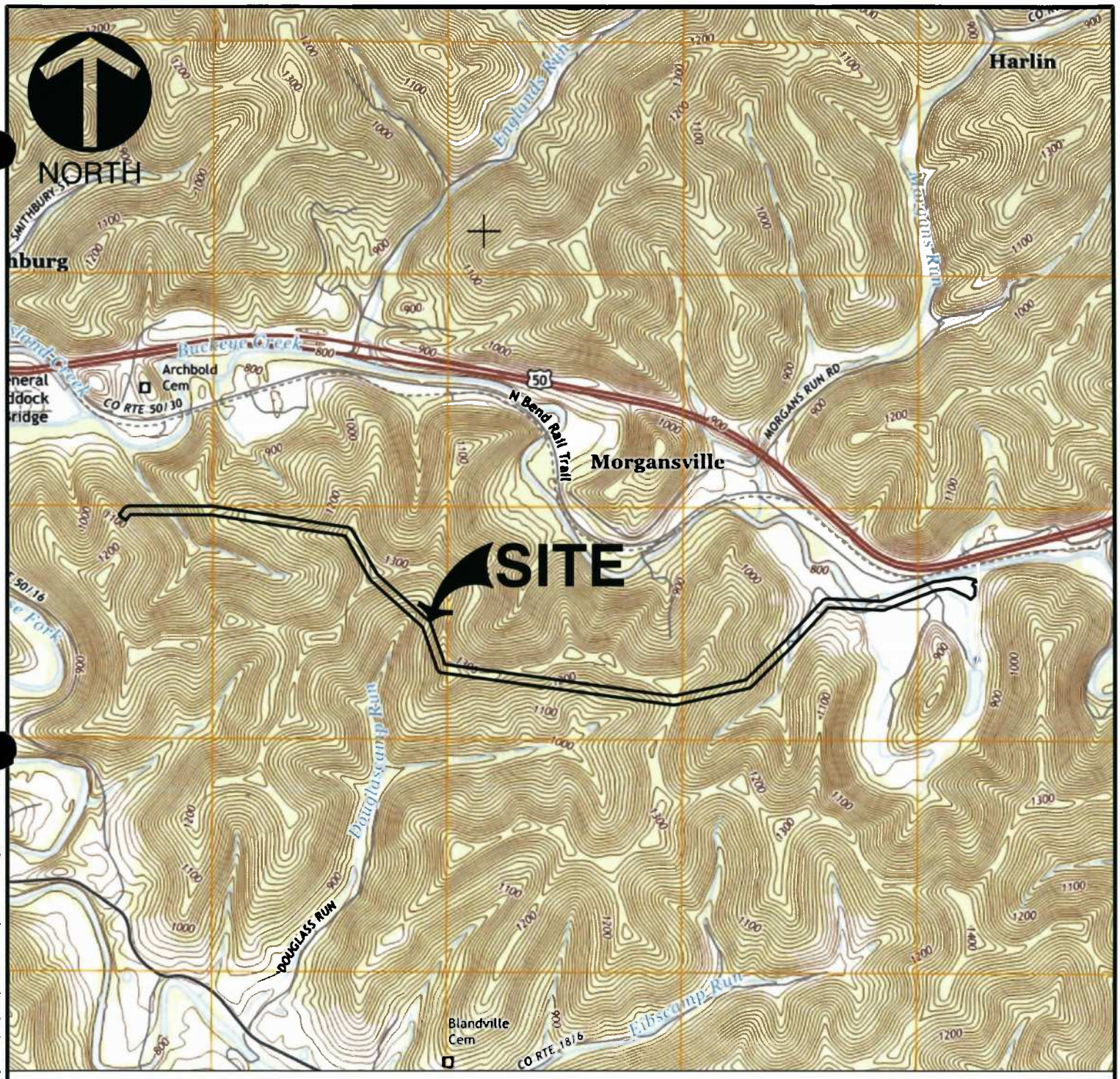
4.3 SUMMARY

The hydraulic analysis was prepared to provide a comparison between the post-development floodplain conditions along Buckeye Creek and the existing conditions. The proposed breaker station and associated structures will not increase the WSEL at the constructed bridge located approximately 200ft downstream of the proposed improvements. The WSEL at the cross section immediately upstream of the proposed substation will increase by 0.83 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 0.43 feet. The proposed breaker station and associated 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

BUCKEYE RUN BREAKER STATION
DODDRIDGE COUNTY, WEST VIRGINIA

SITE LOCATION MAP

DRAWN BY:	PJH	CHECKED BY:	ARC	APPROVED BY:	RPC	FIGURE NO.:	1
DATE:	DECEMBER 2019	DWG SCALE:	1"=2,000'	PROJECT NO:	185-068		

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

(solid black line)	LIMIT OF DISTURBANCE
(orange line)	SOIL TYPE BOUNDARY
ShF	SOIL TYPE

SCALE IN FEET

0 500 1000

CEC

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BUCKEYE RUN BREAKER STATION
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: 185-068				

APPENDIX B

FEMA FLOOD INFORMATION STUDY AND RATE MAP

Buckeye Run Breaker Station

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

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 Info Location

Map created on 12/10/2018

User Notes:

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**

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:

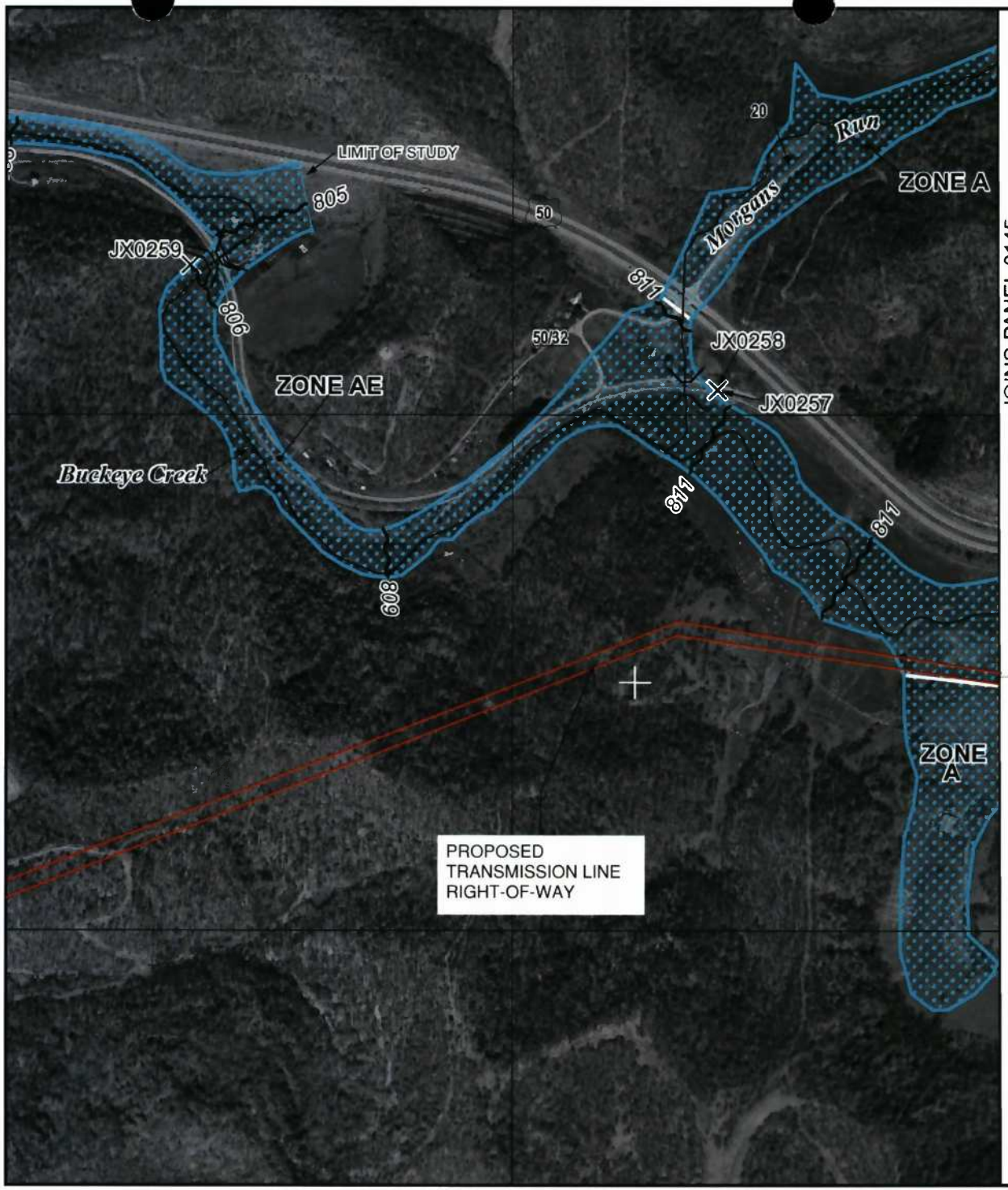
COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0145	C

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

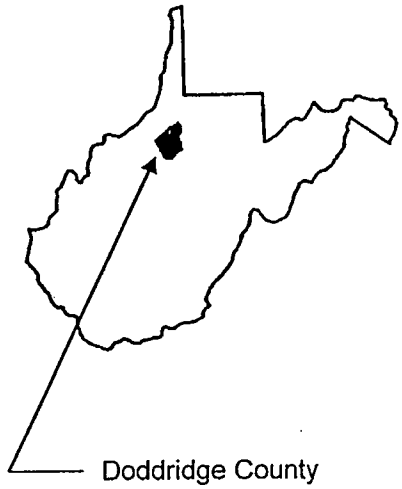
MAP REVISED
OCTOBER 4, 2011

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

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McElroy Creek	Panels 13P-14P
Meathouse Fork	Panels 15P-20P
Middle Island Creek	Panels 21P-23P
Toms Fork	Panels 24P-25P
Wilhelm Run	Panel 26P

Exhibit 2 – Flood Insurance Rate Map Index
Flood Insurance Rate Map

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".

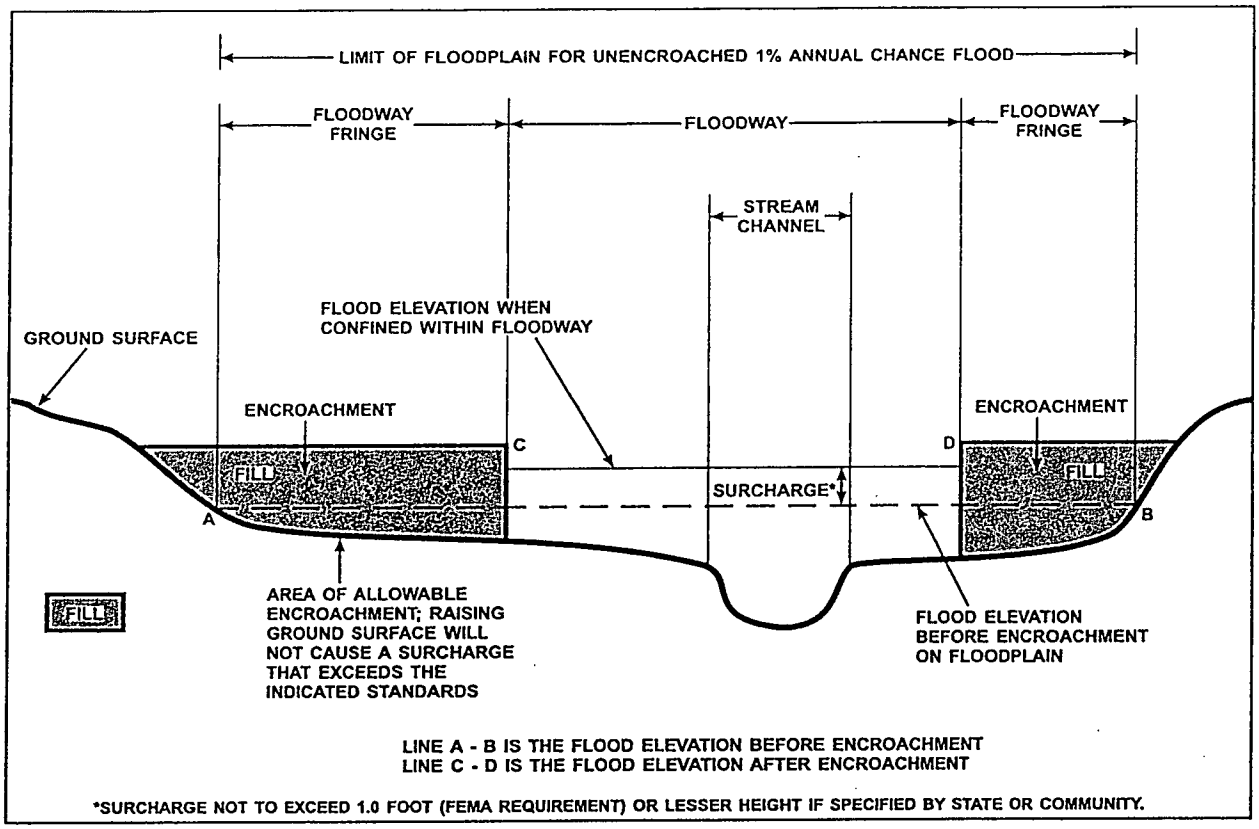

Figure 1 - Floodway Schematic

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

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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.

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

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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.

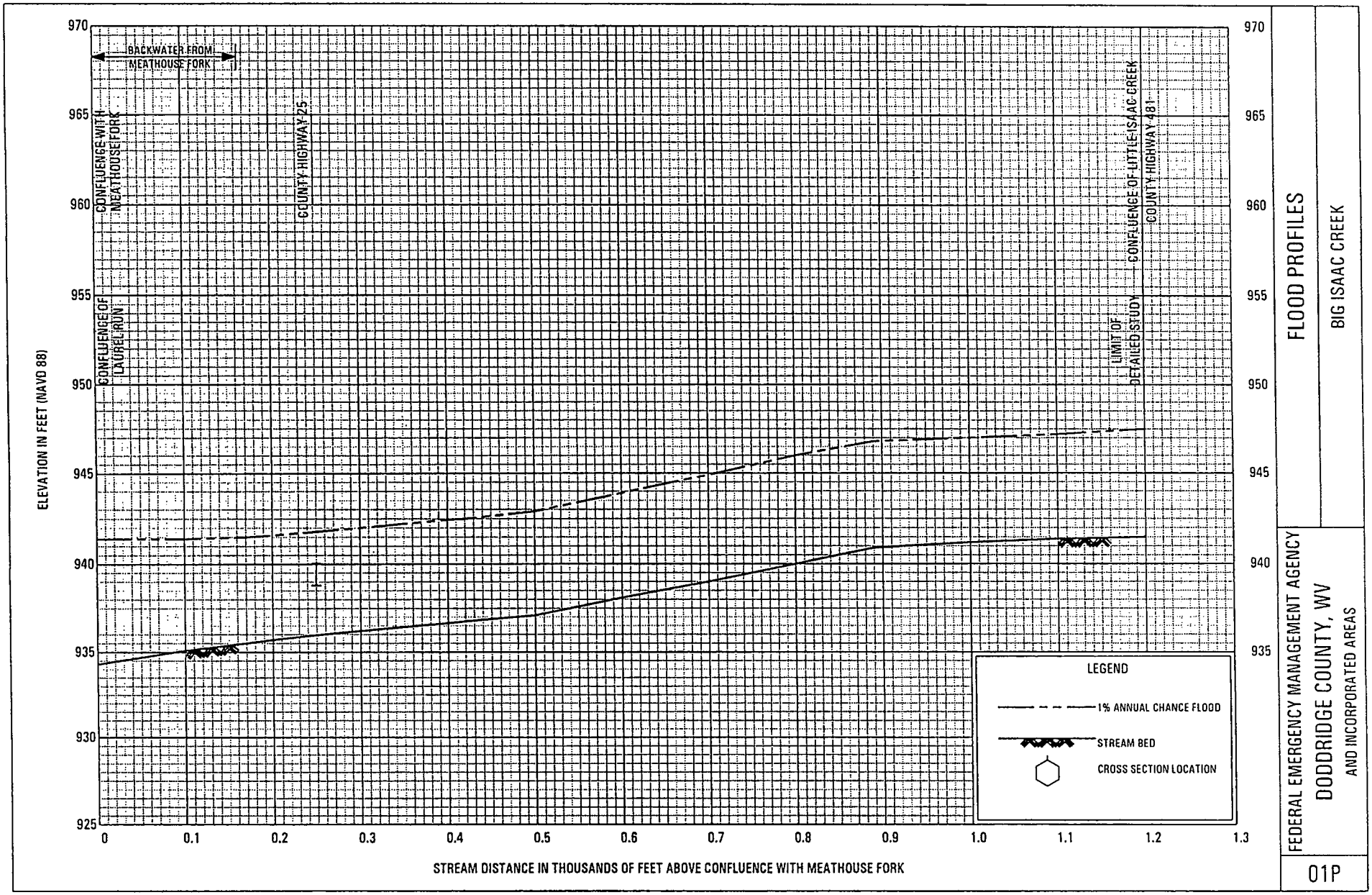
10. Federal Emergency Management Agency, Flood Insurance Study, Unincorporated Areas of Tyler County, West Virginia, Washington, D. C., November 4, 1988.

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

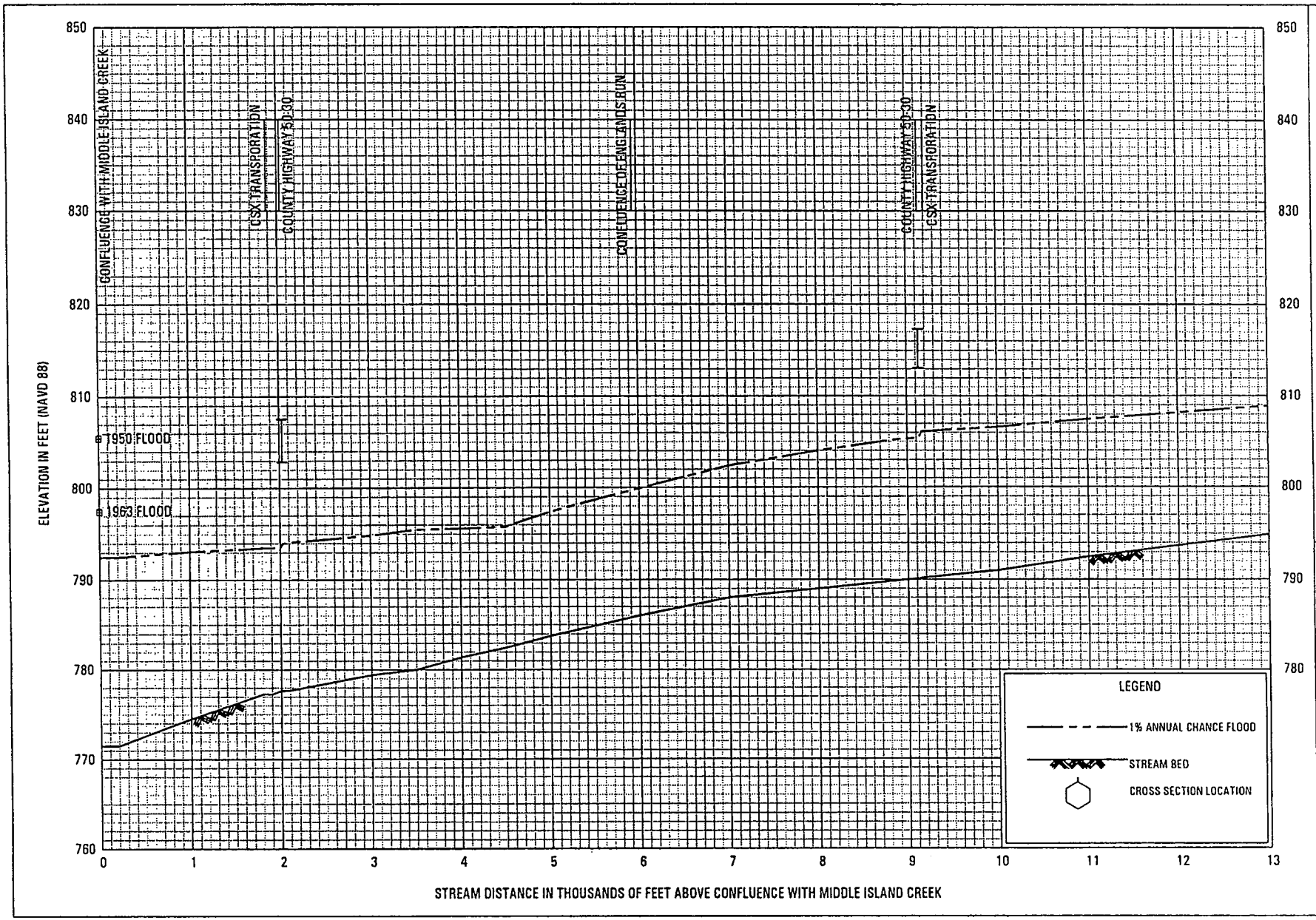
BIG ISAAC CREEK

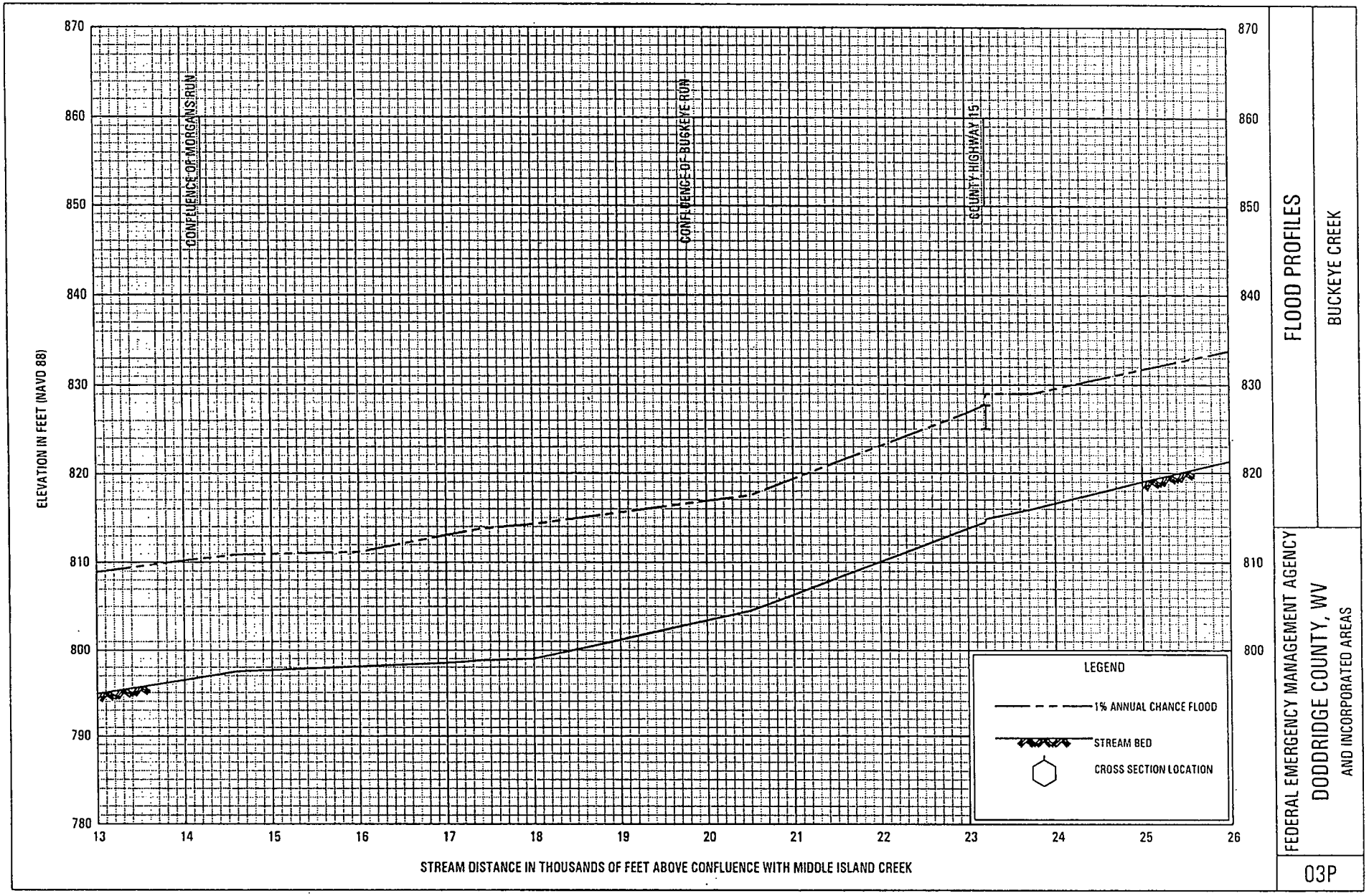
FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

01P


CONFLUENCE WITH MIDDLE ISLAND CREEK
CSX TRANSPORTATION
COUNTY HIGHWAY 50-30
CONFLUENCE OF ENGLANDS RUN
COUNTY HIGHWAY 50-30
CSX TRANSPORTATION
1950 FLOOD
1963 FLOOD
ELEVATION IN FEET (NAVD 88)
STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH MIDDLE ISLAND CREEK
LEGEND
1% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
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

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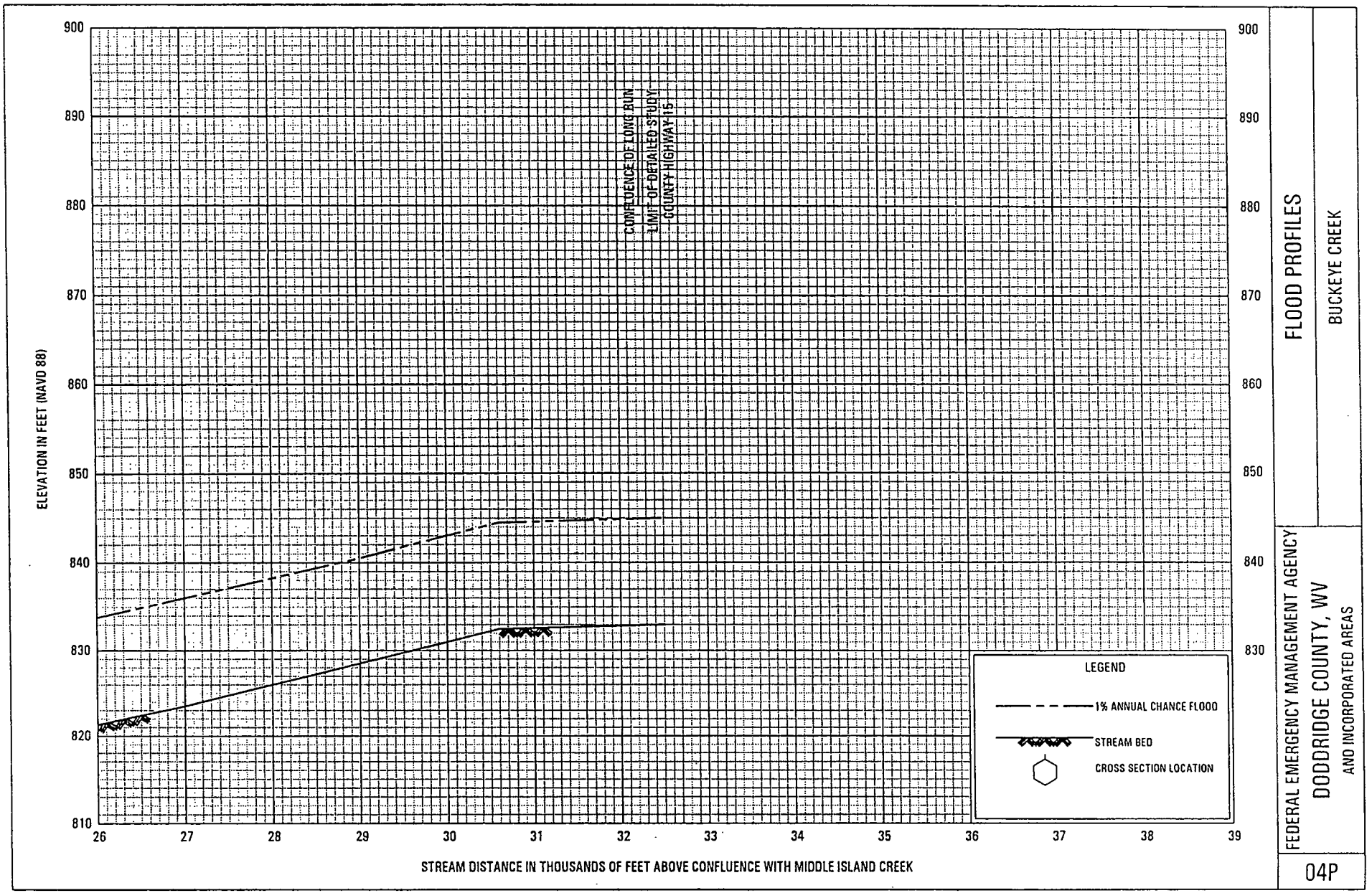


FLOOD PROFILES

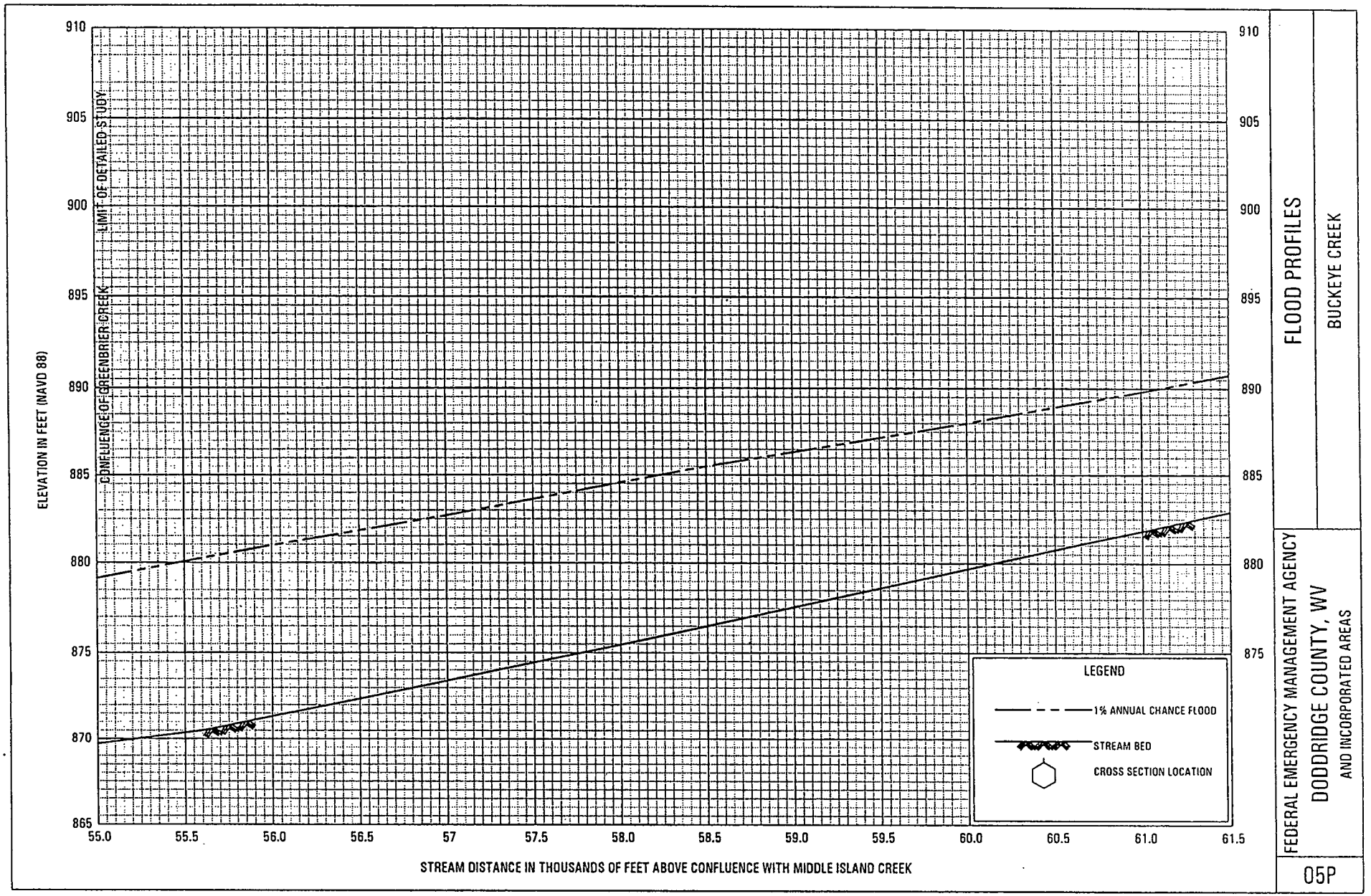
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

04P



FLOOD PROFILES

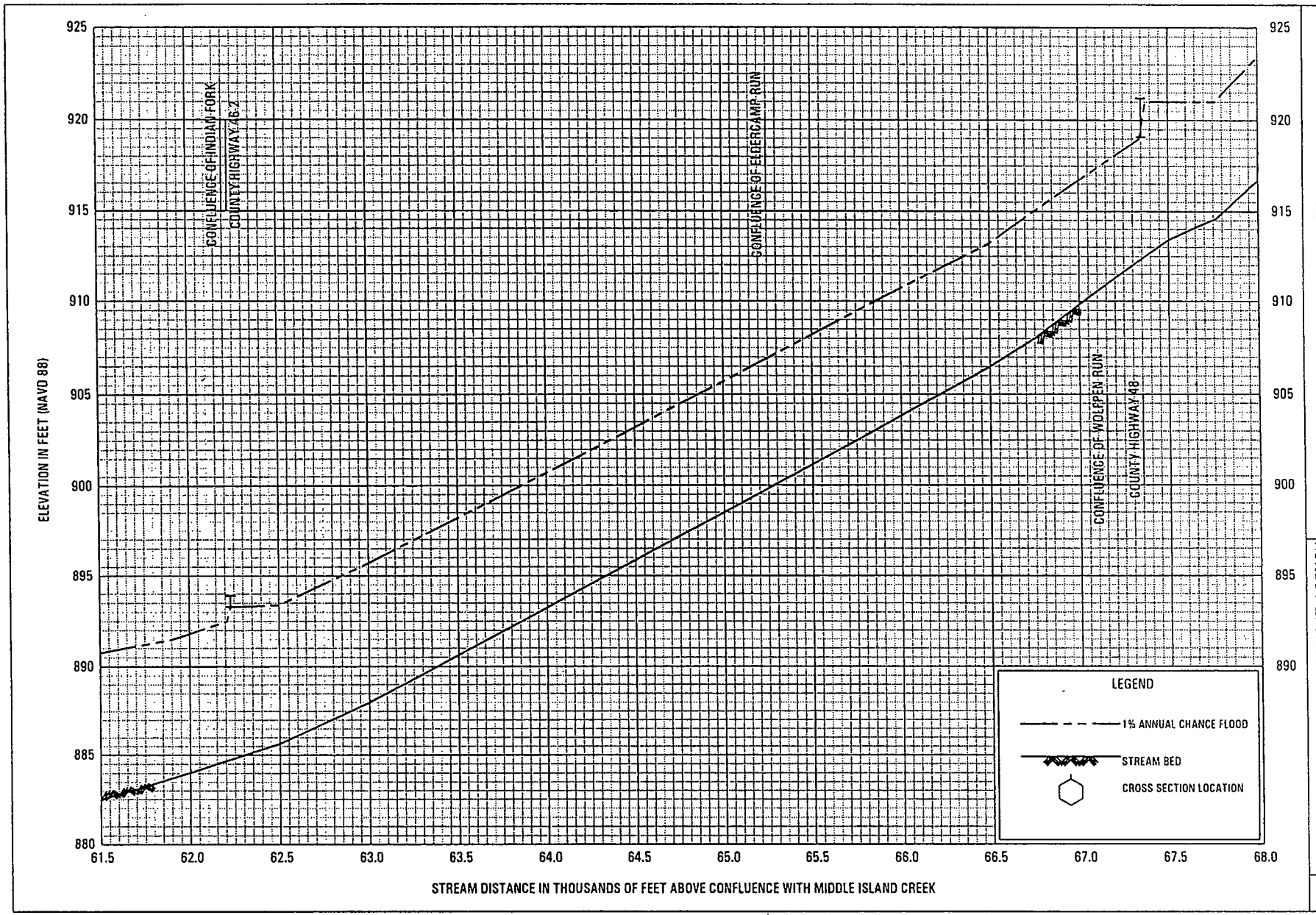
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

05P



FLOOD PROFILES

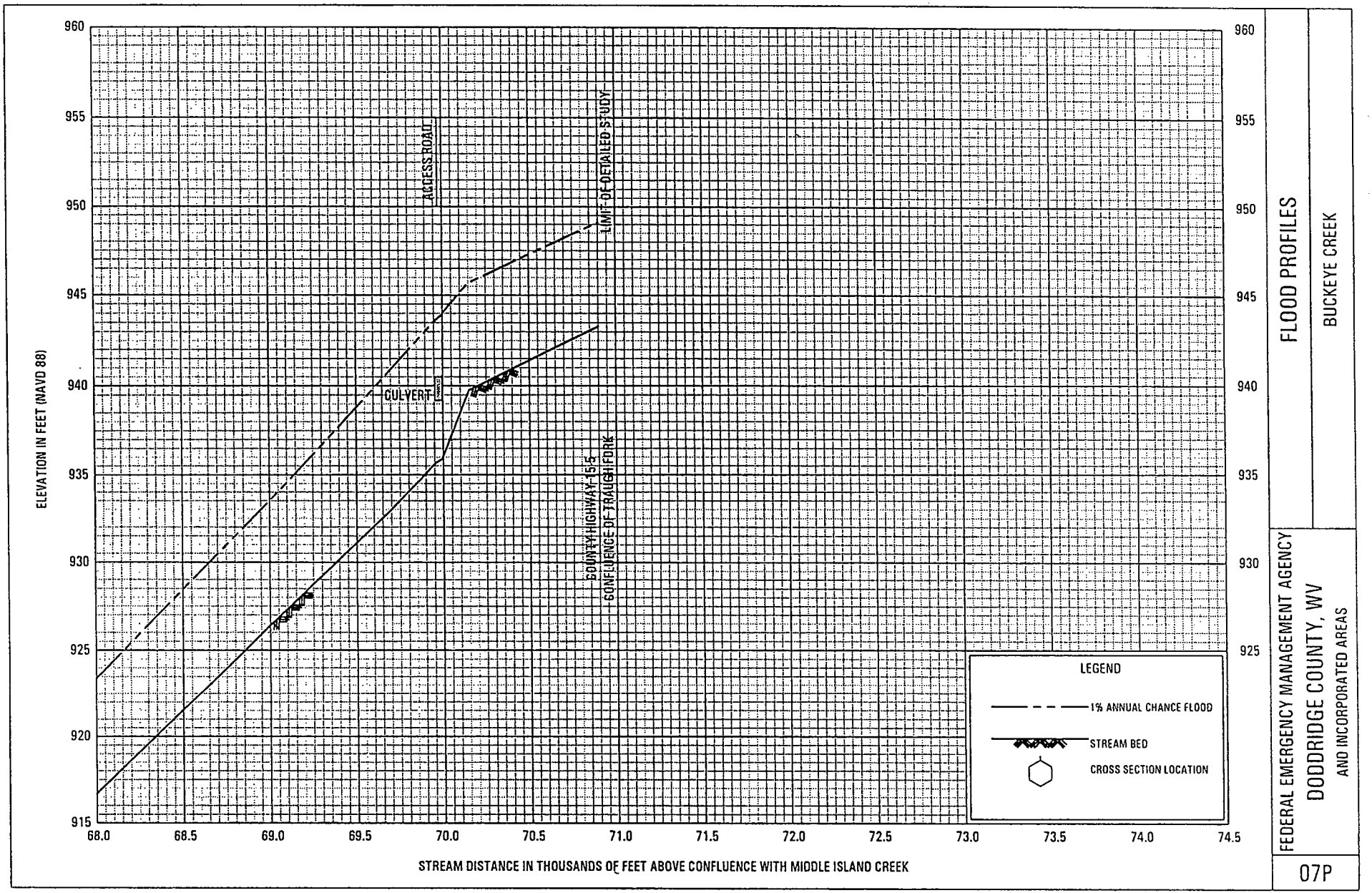
BUCKEYE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

06P



FLOOD PROFILES

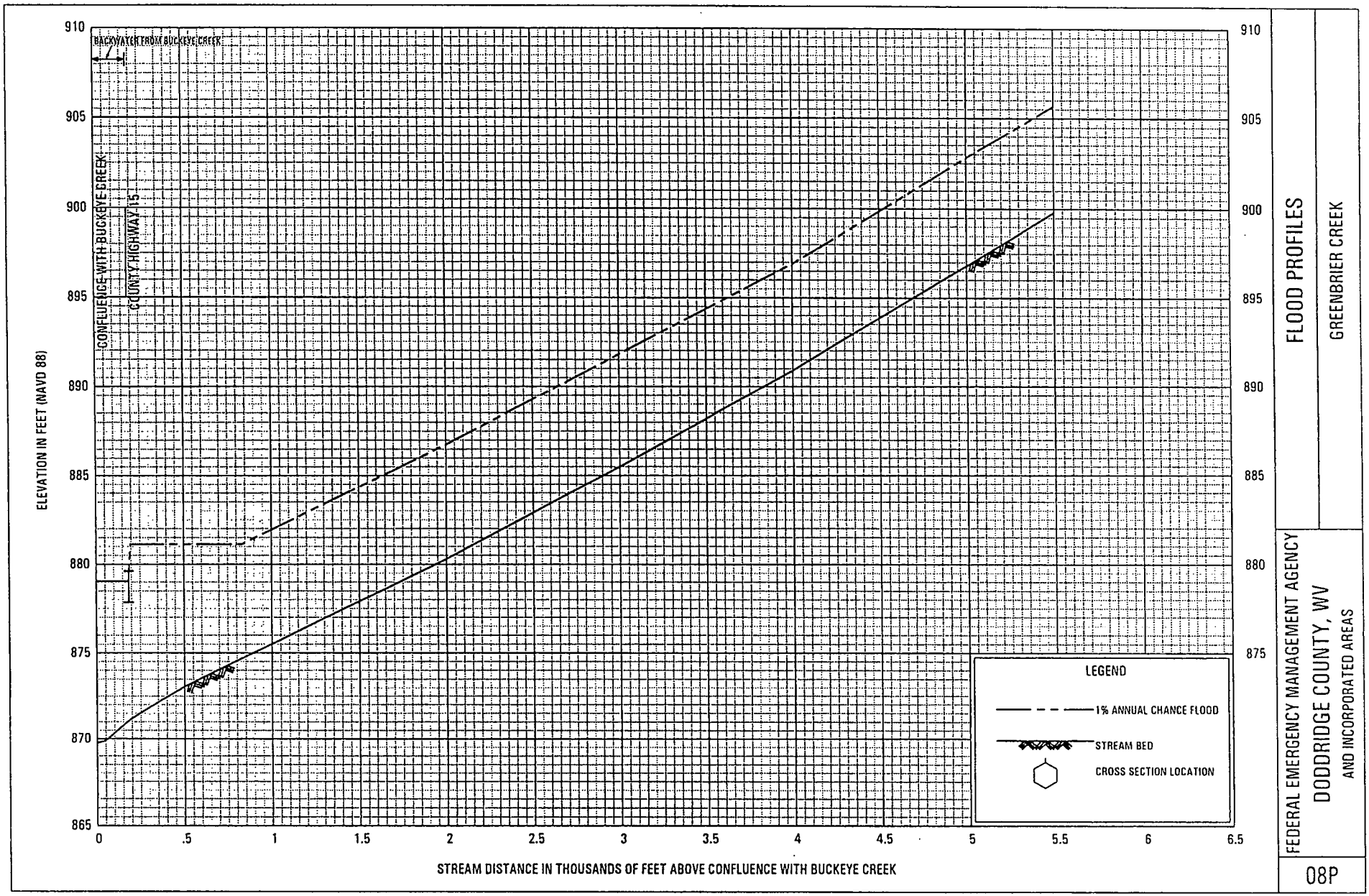
BUCKEYE CREEK

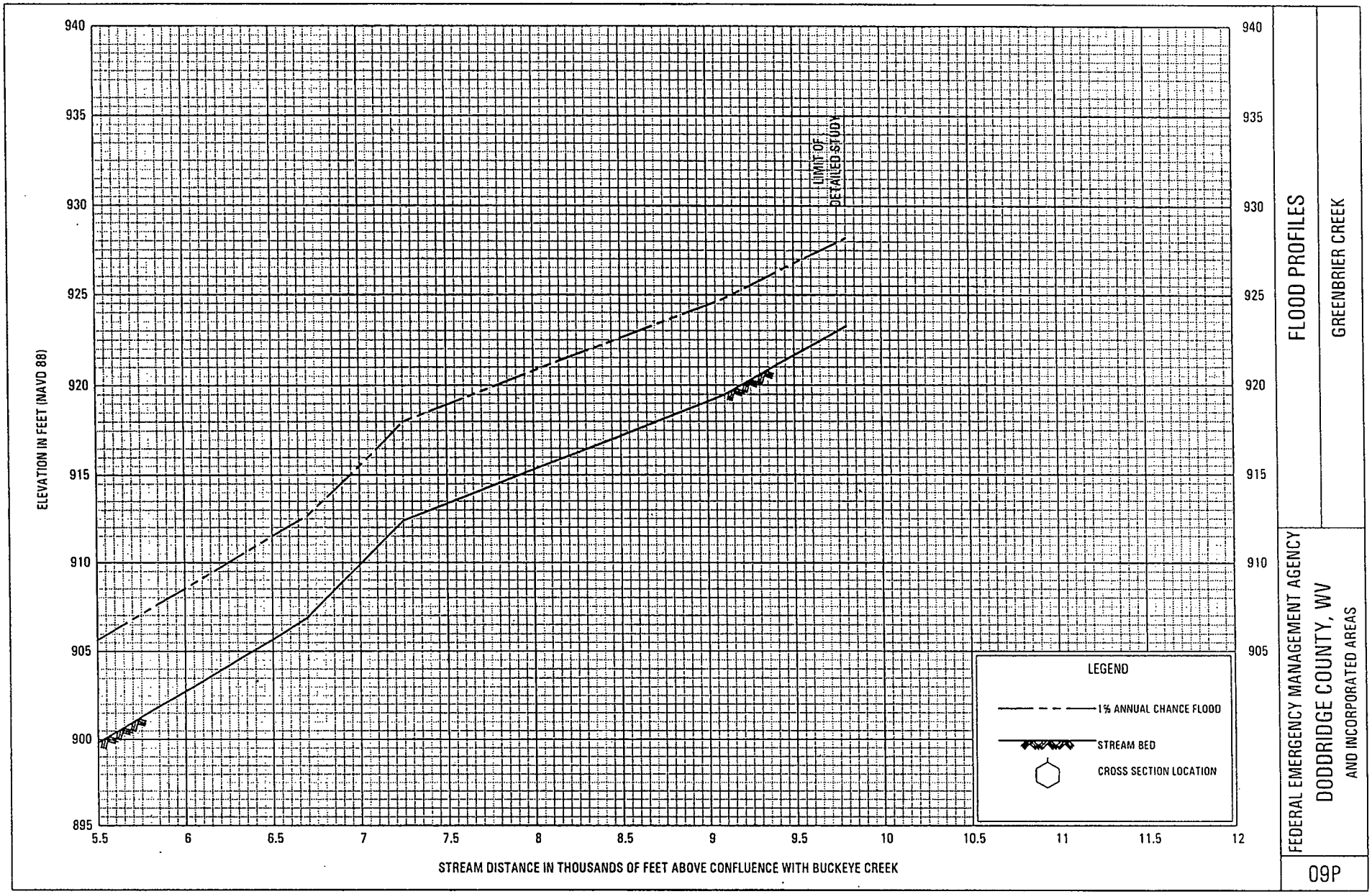
FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

07P


BACKWATER FROM BUCKEYE CREEK
CONFLUENCE WITH BUCKEYE CREEK
COUNTY HIGHWAY 15
ELEVATION IN FEET (NAVD 88)
910
905
900
895
890
885
880
875
870
865
0
.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH BUCKEYE CREEK
LEGEND
1% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
FLOOD PROFILES
GREENBRIER CREEK
FEDERAL EMERGENCY MANAGEMENT AGENCY
DODDRIDGE COUNTY, WV
AND INCORPORATED AREAS
08P



FLOOD PROFILES

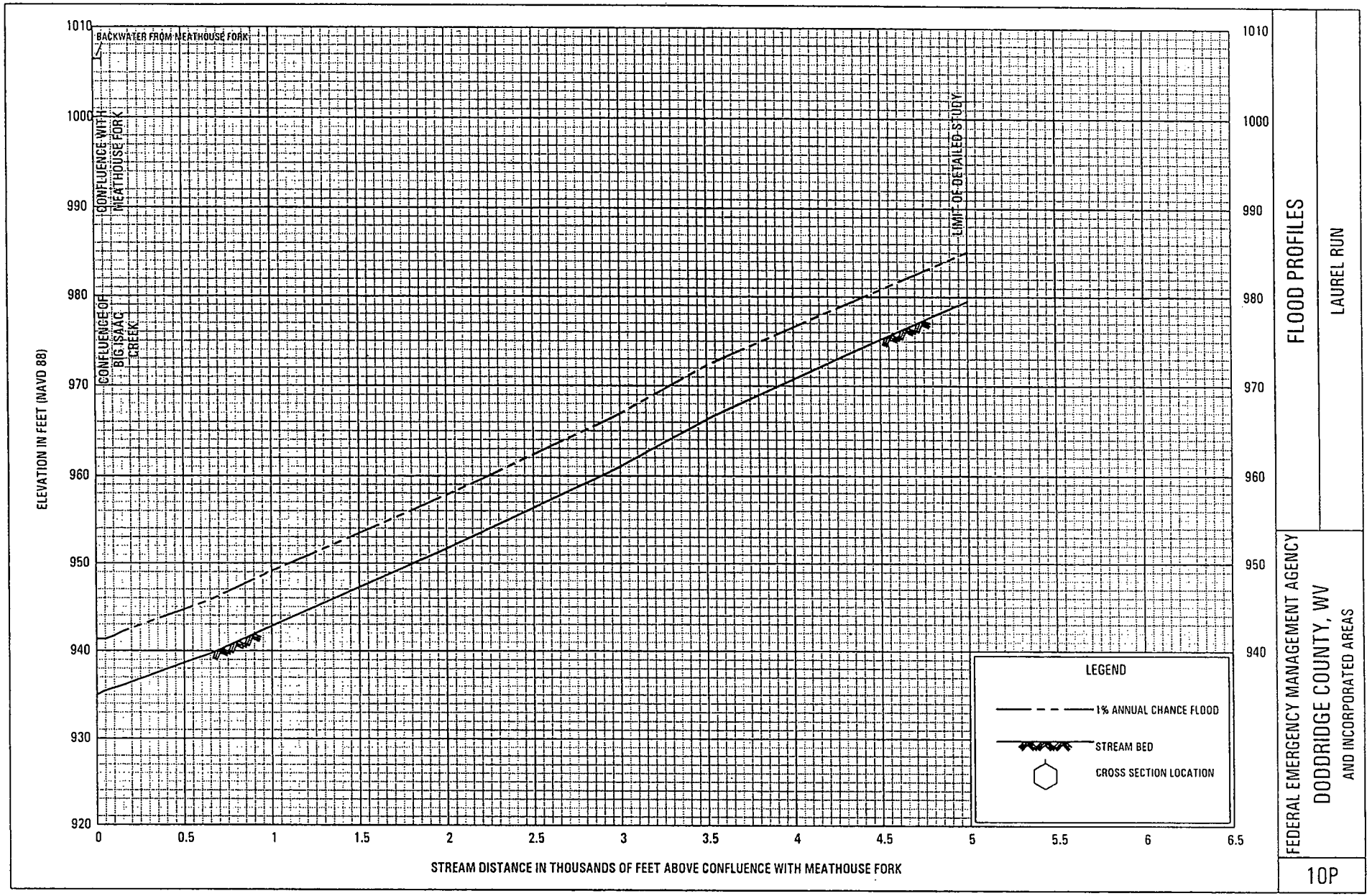
GREENBRIER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

09P



FLOOD PROFILES

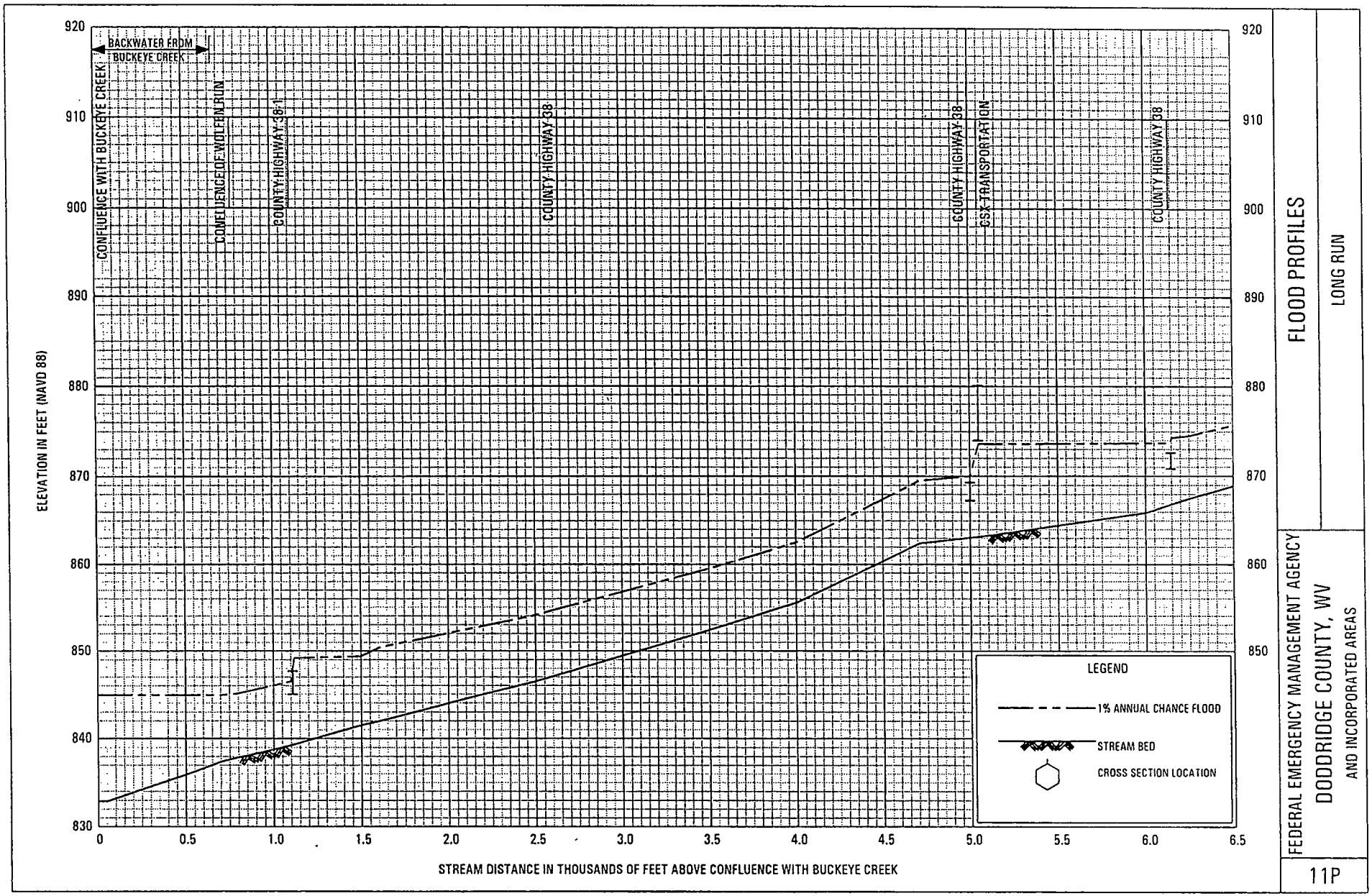
LAUREL RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

10P



FLOOD PROFILES

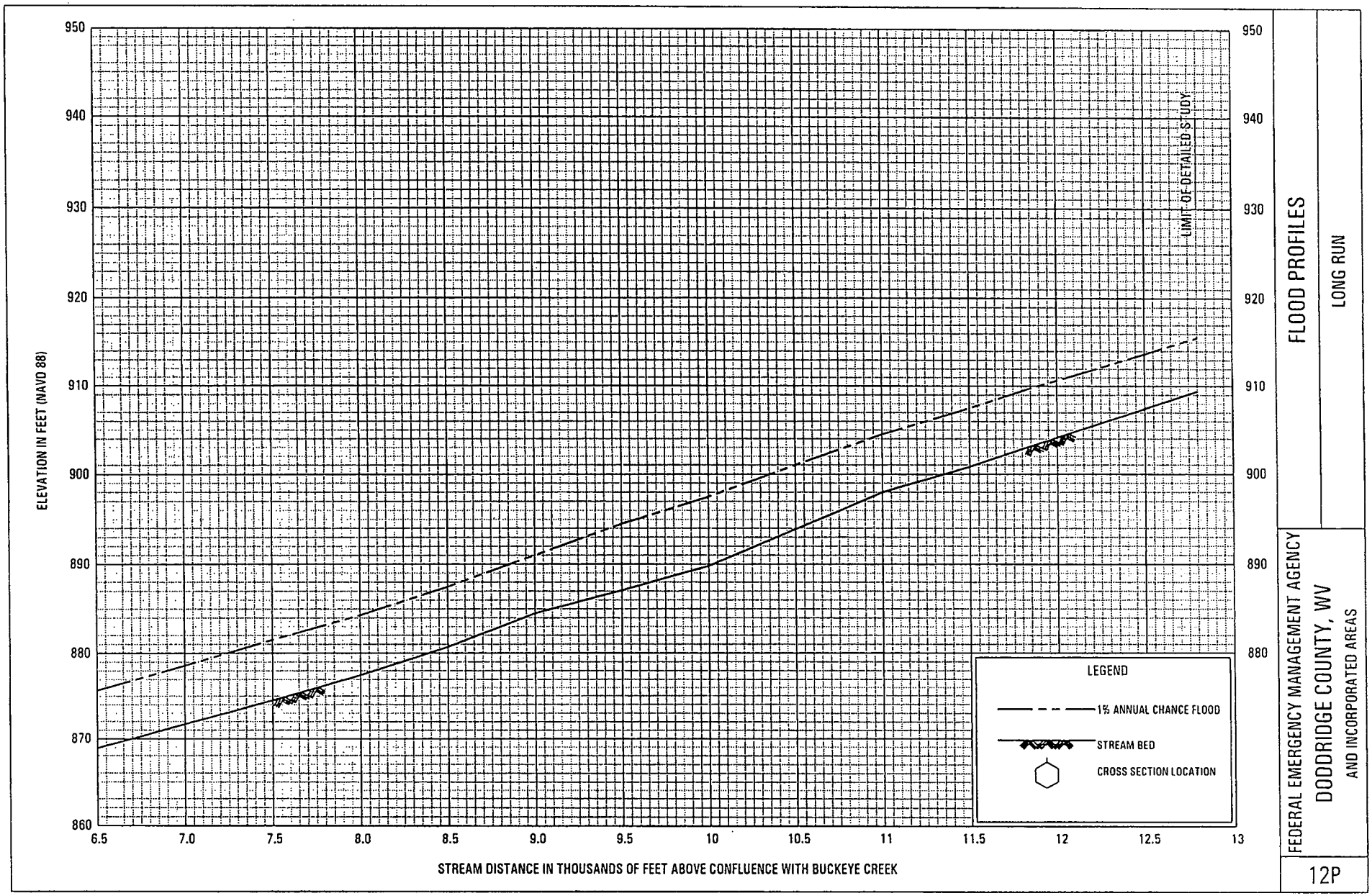
LONG RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

11P



FLOOD PROFILES

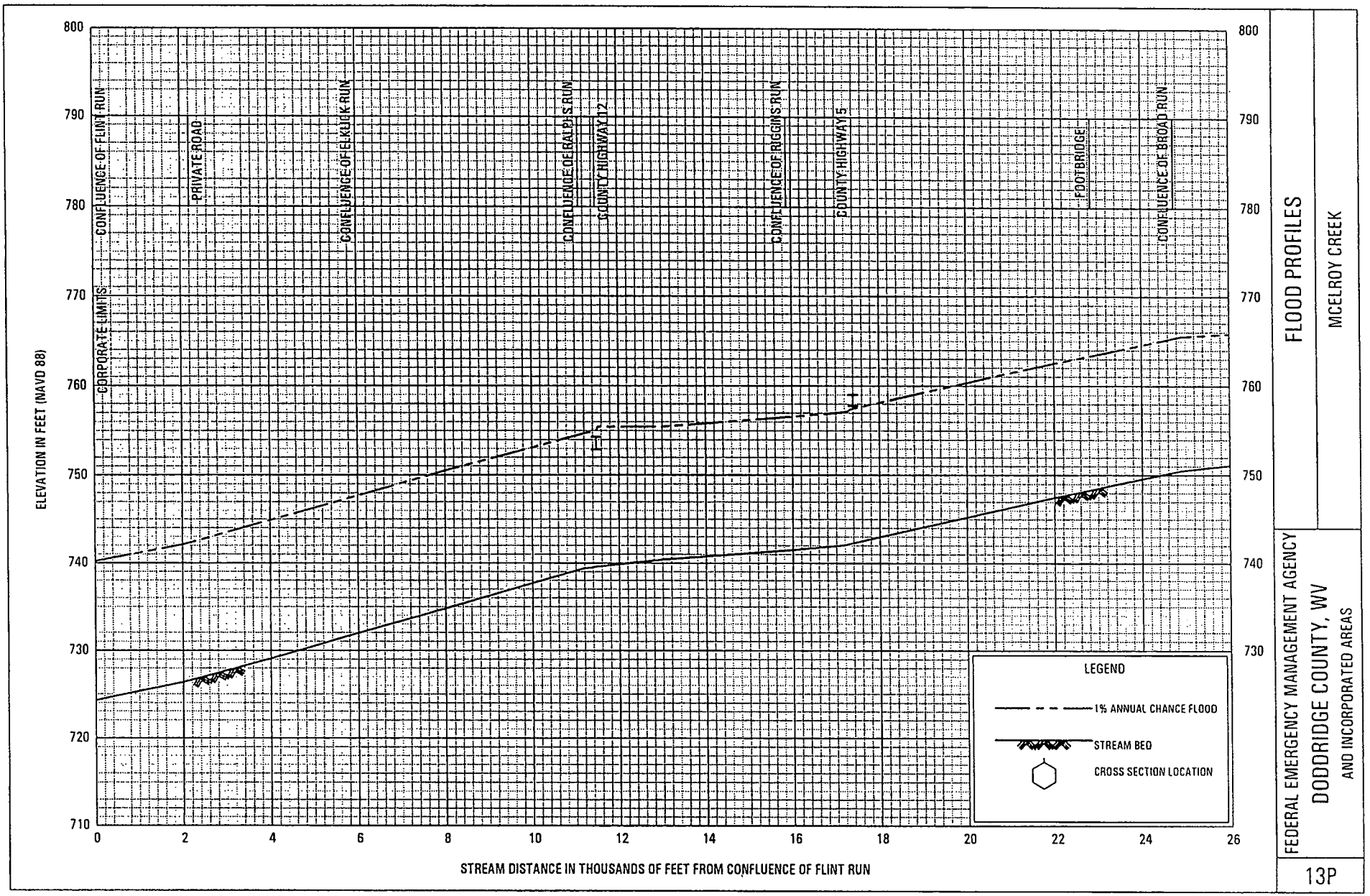
LONG RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

12P



FLOOD PROFILES

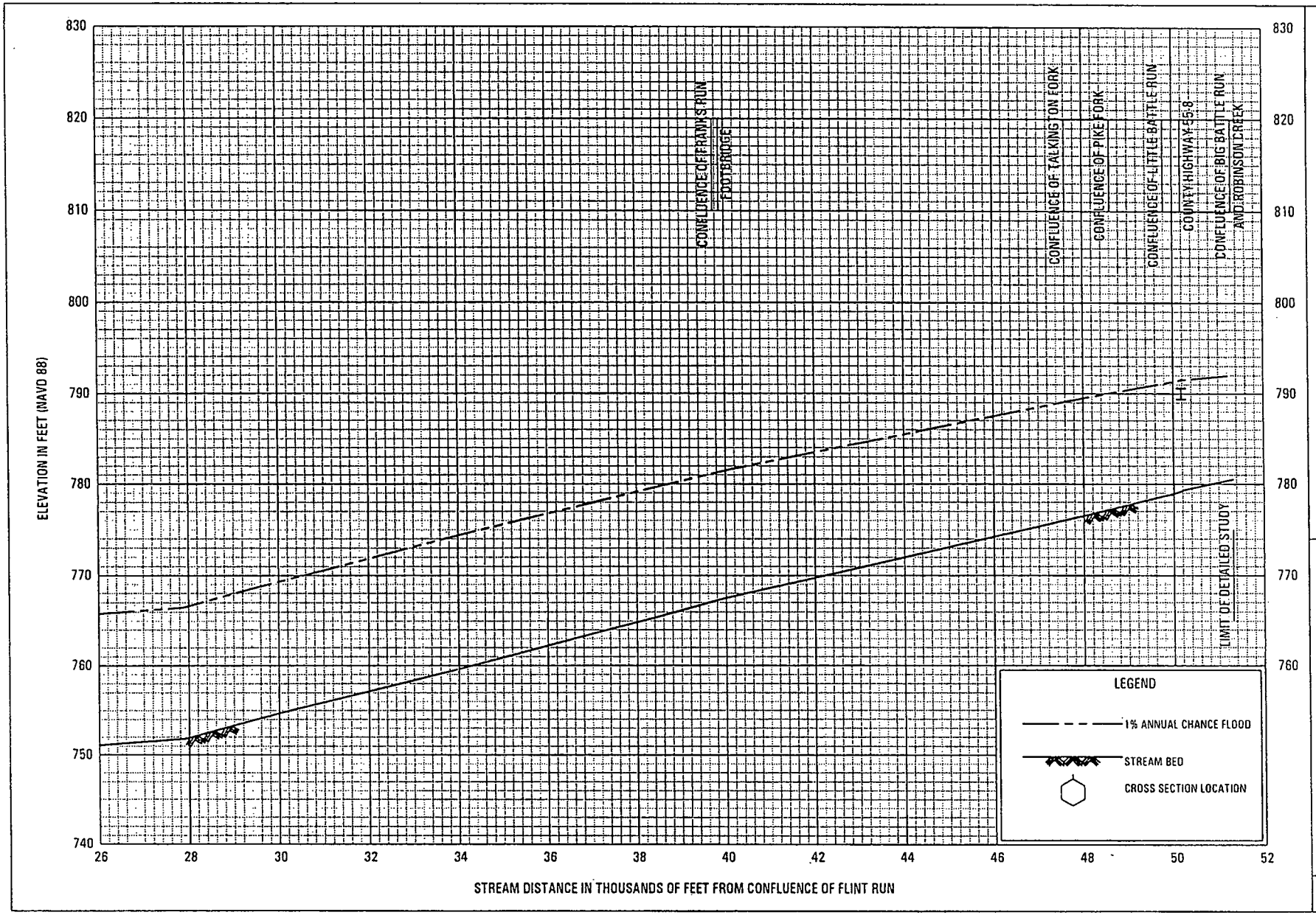
MCELROY CREEK

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

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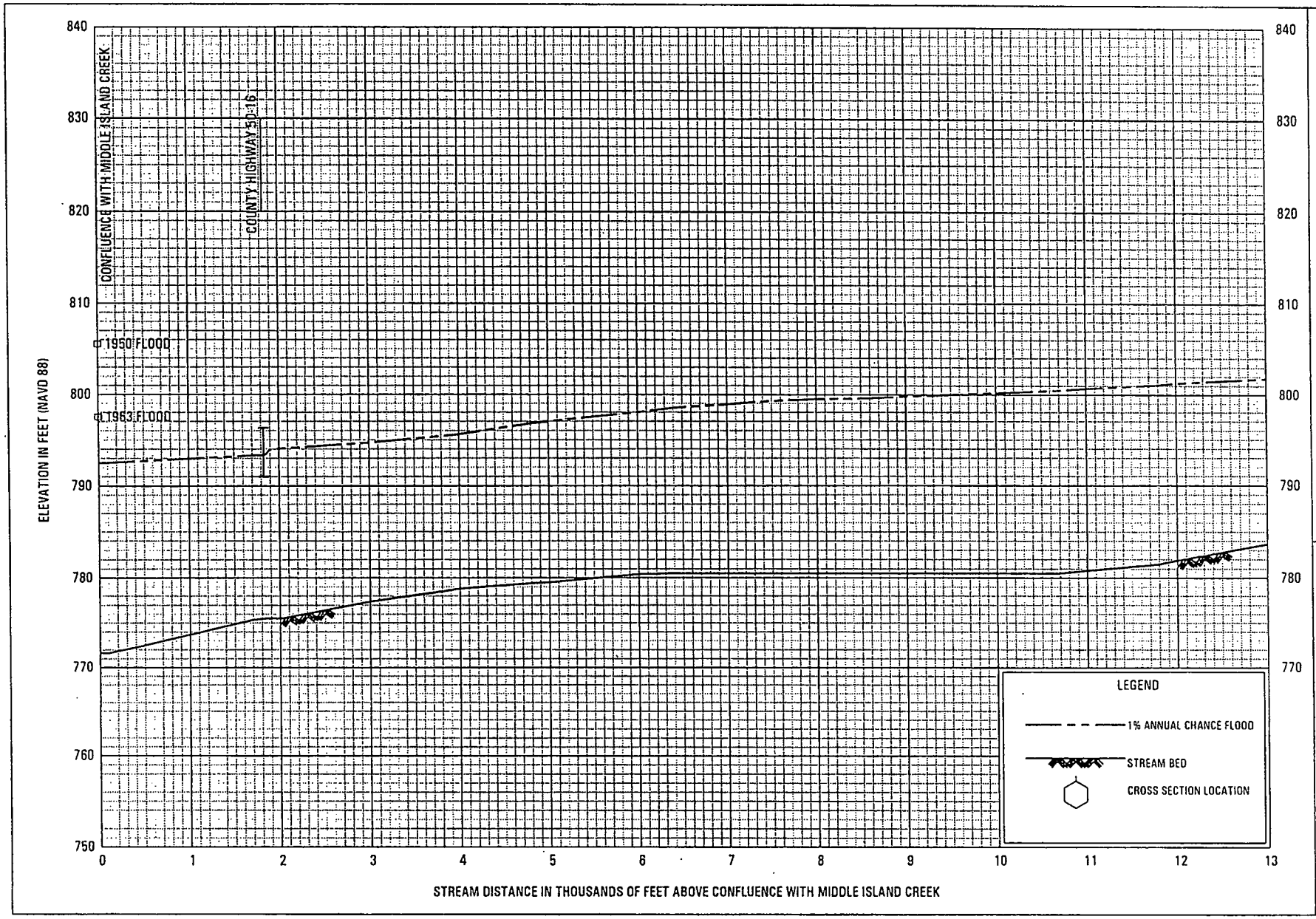

FLOOD PROFILES

MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

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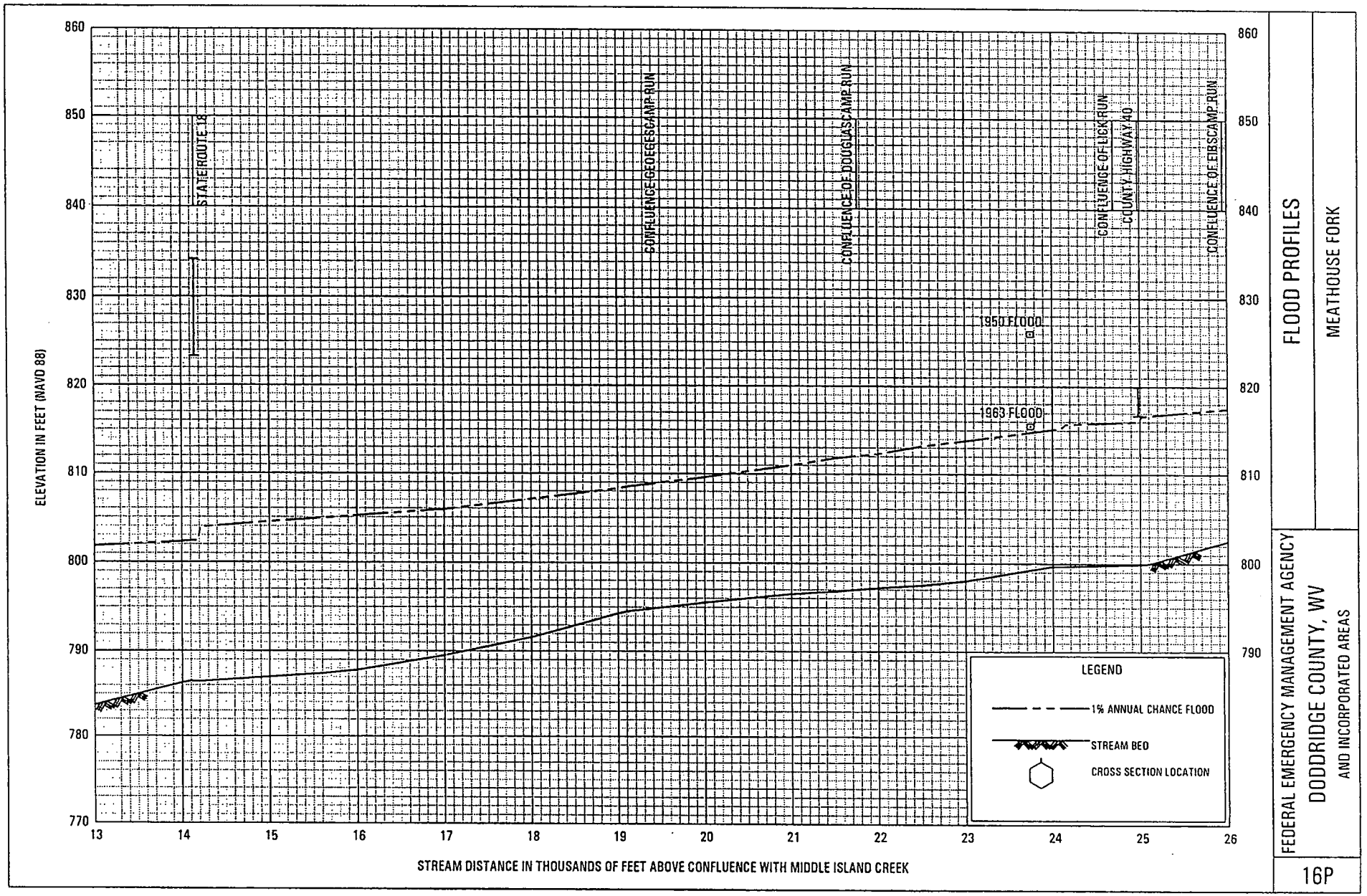

FLOOD PROFILES

MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

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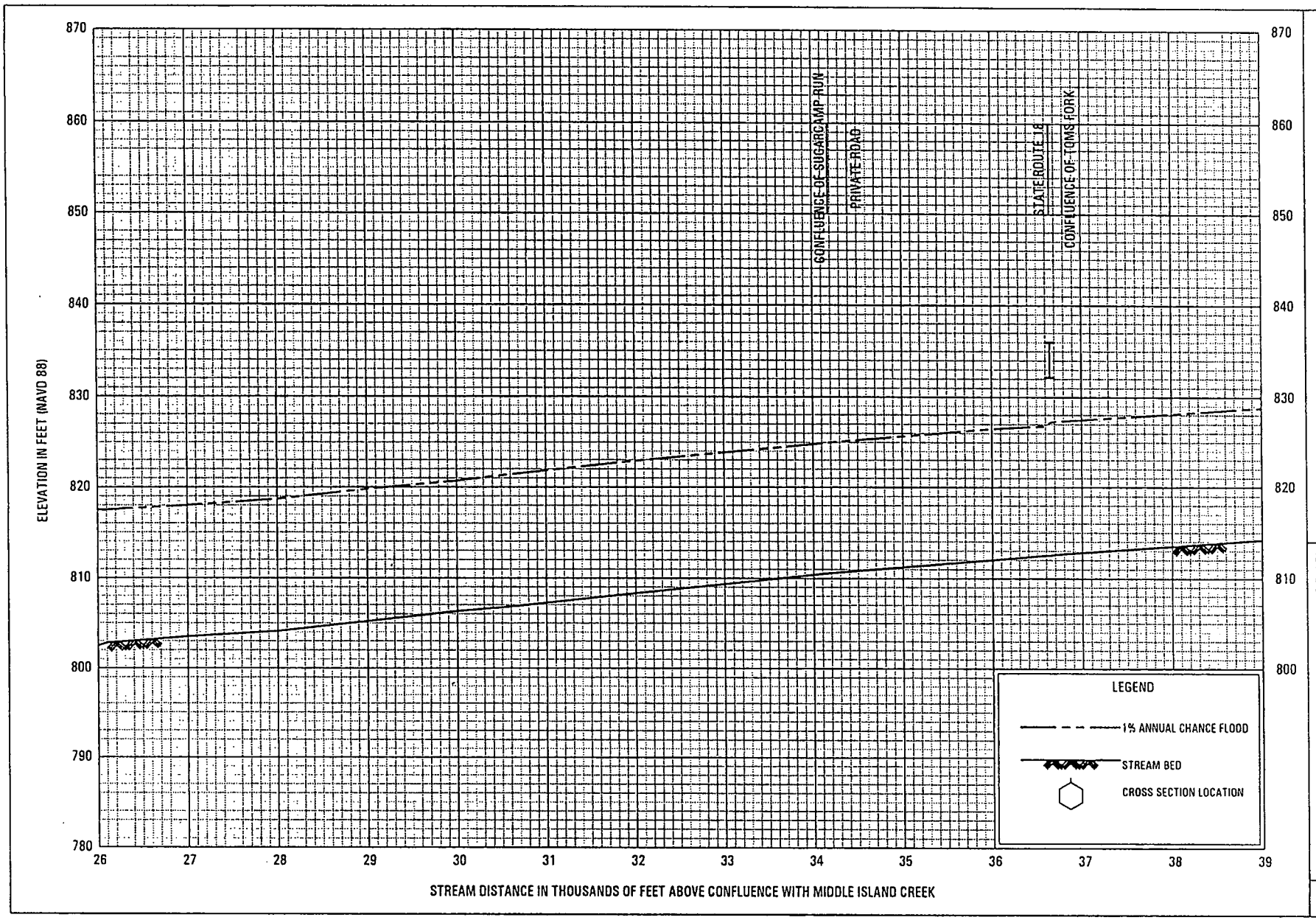


FLOOD PROFILES

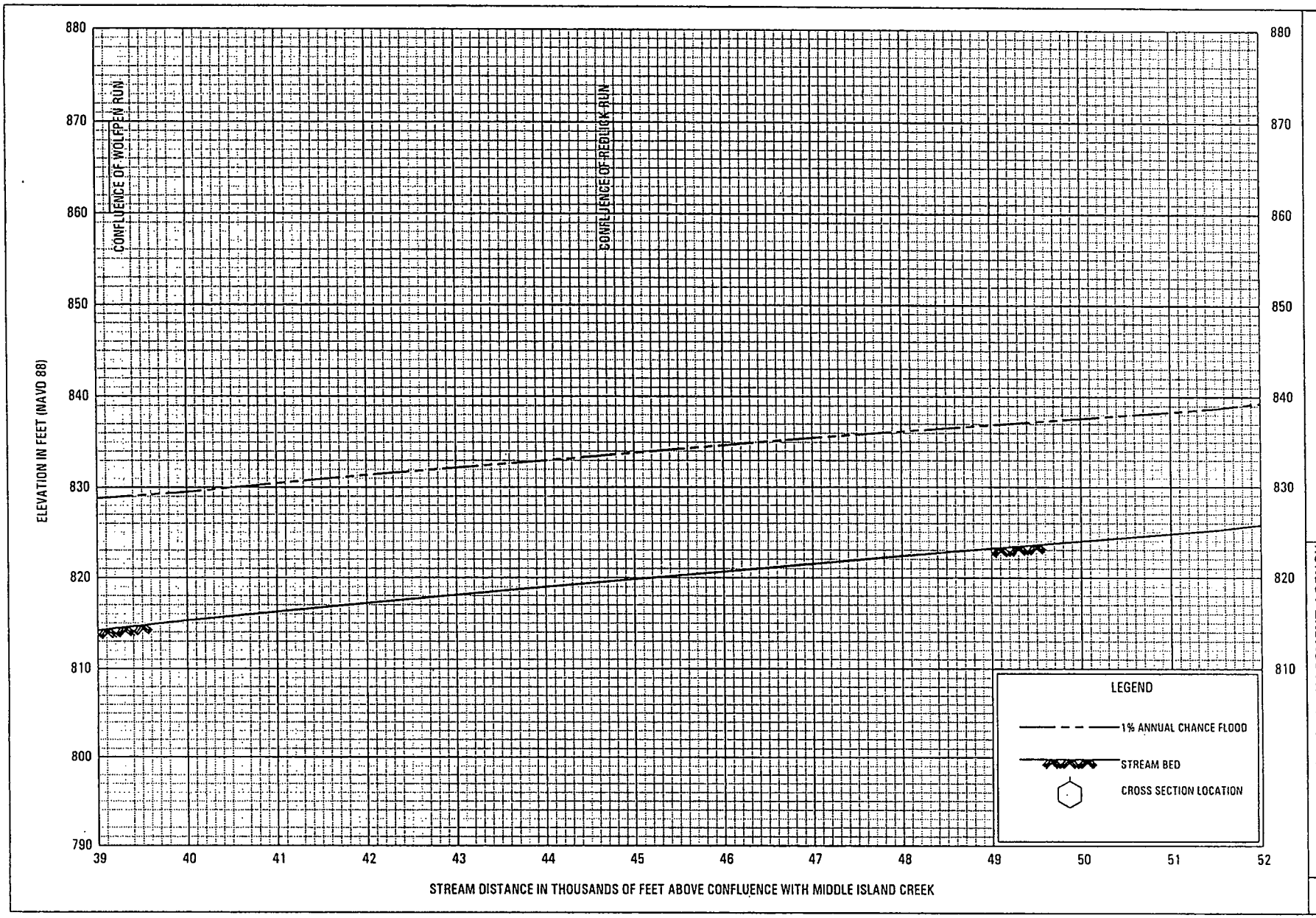
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

17P



FLOOD PROFILES

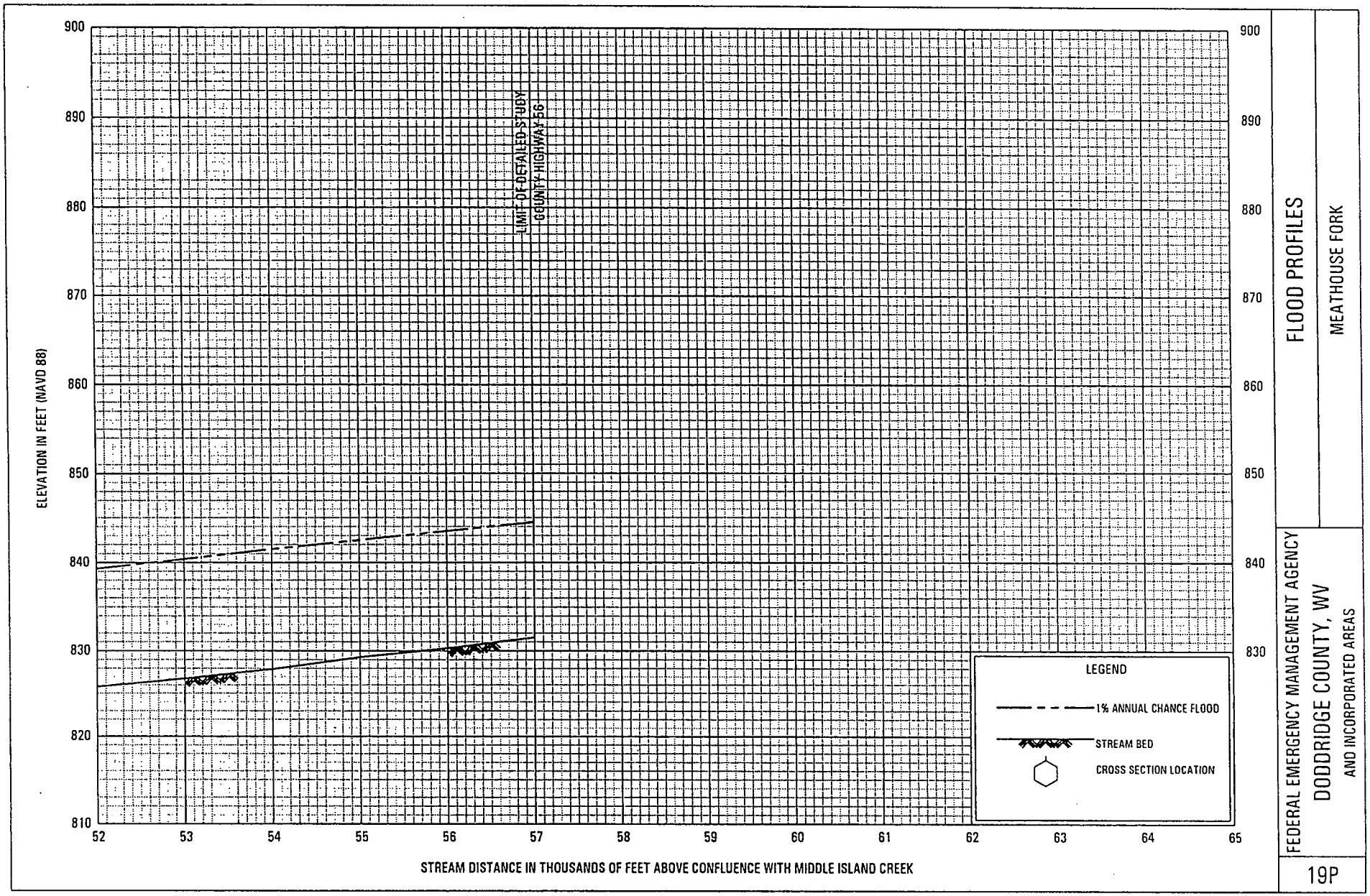
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

18P



FLOOD PROFILES

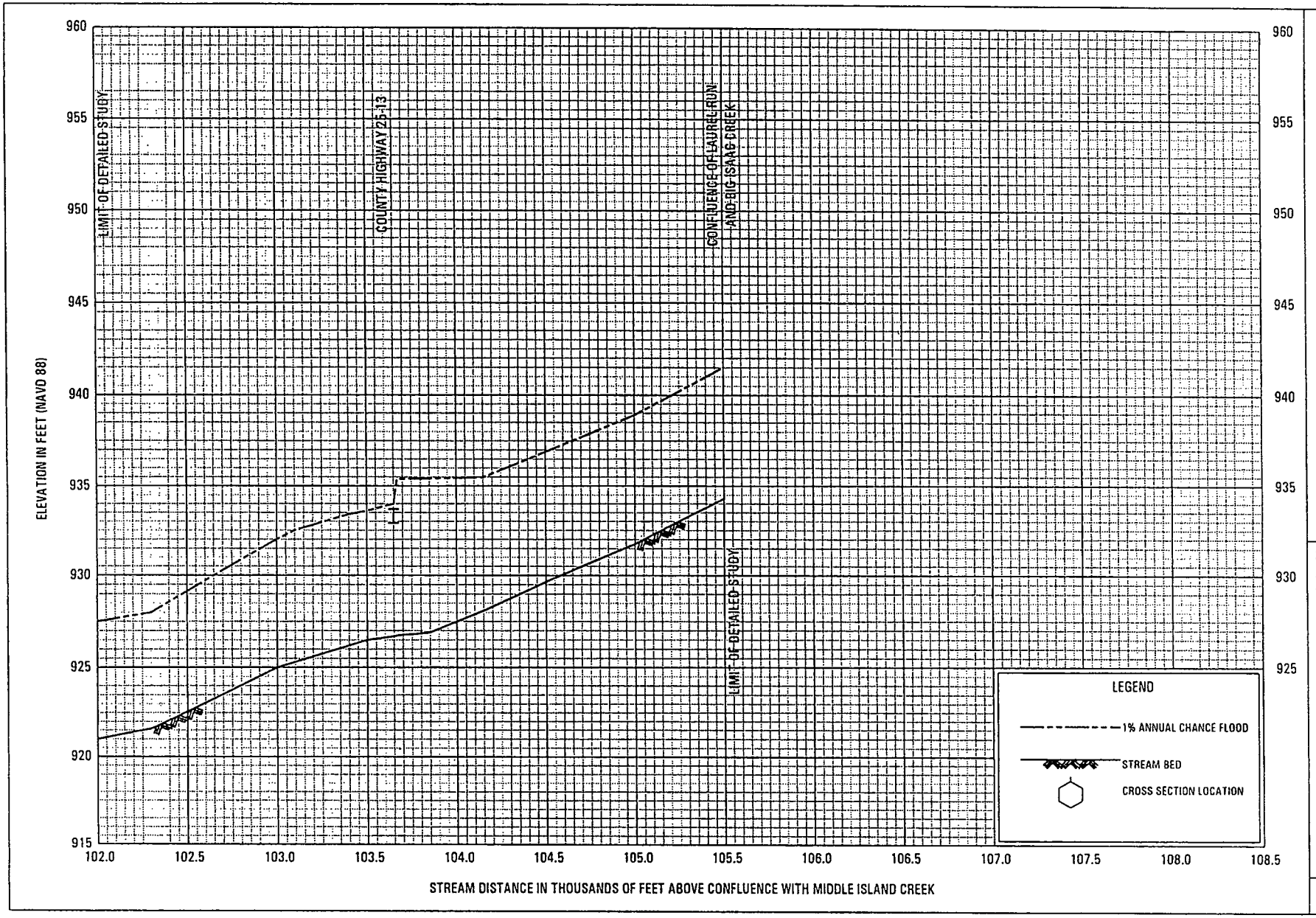
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

19P



FLOOD PROFILES

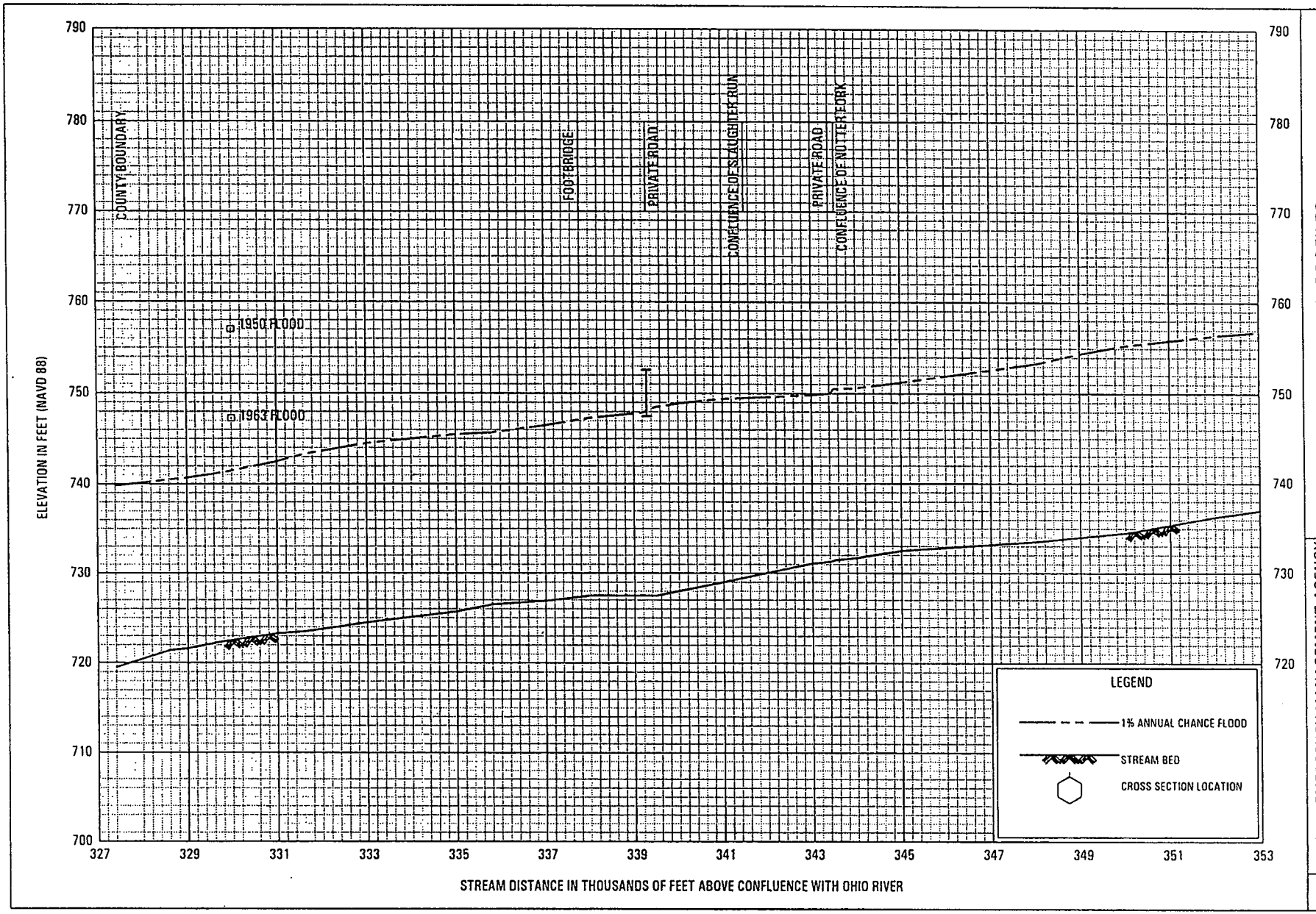
MEATHOUSE FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

20P



FLOOD PROFILES

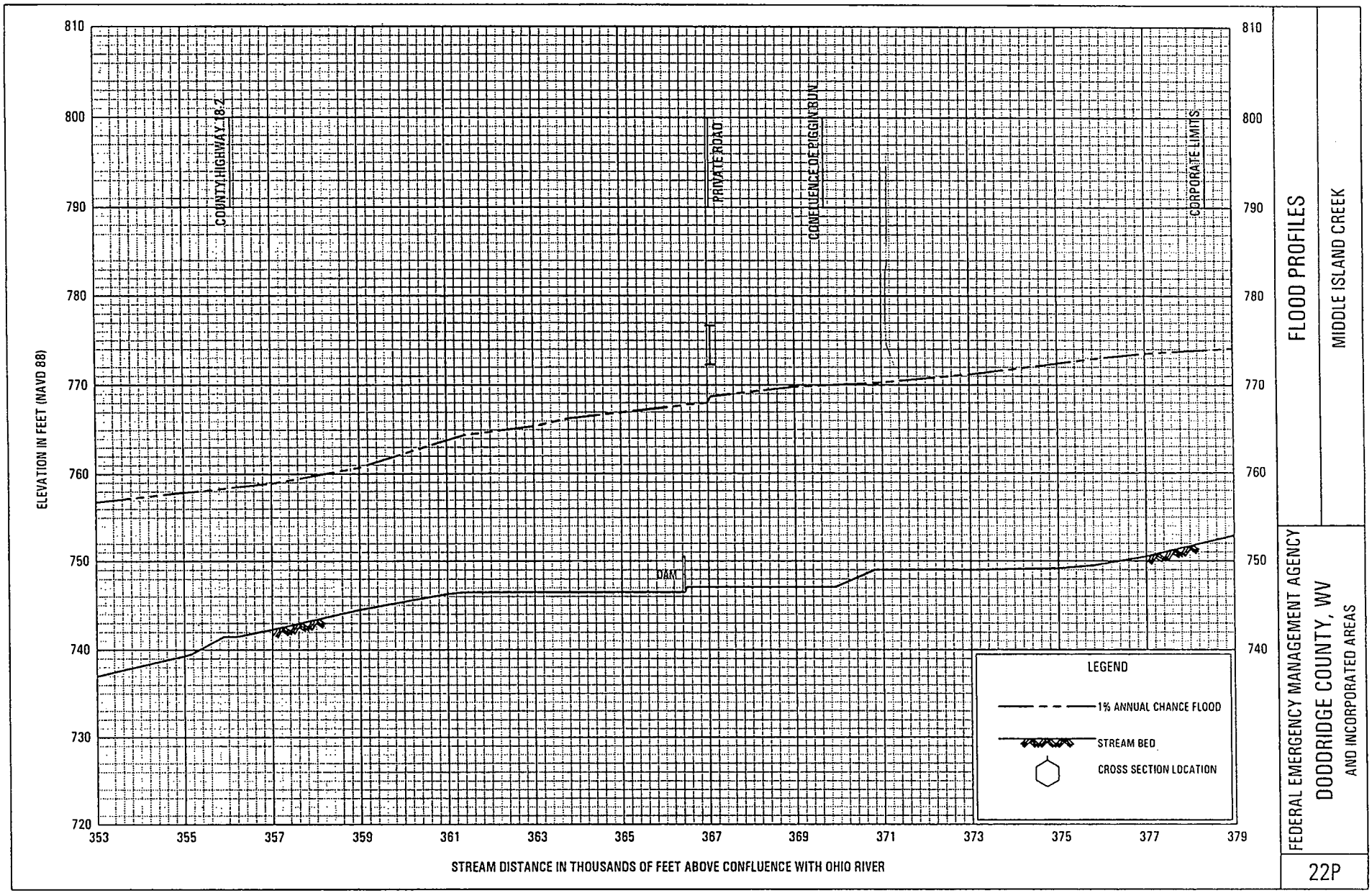
MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

21P



FLOOD PROFILES

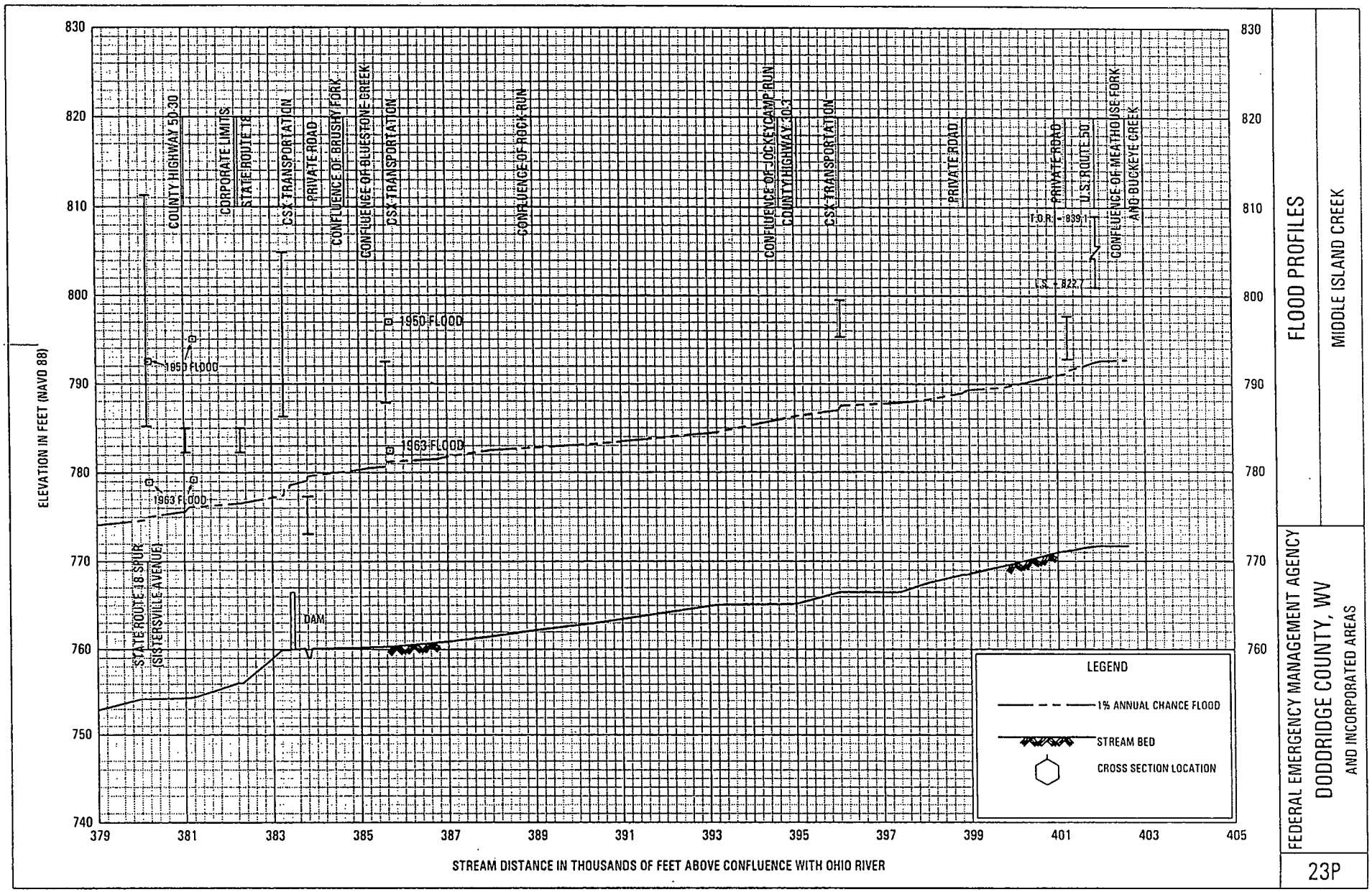
MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

22P



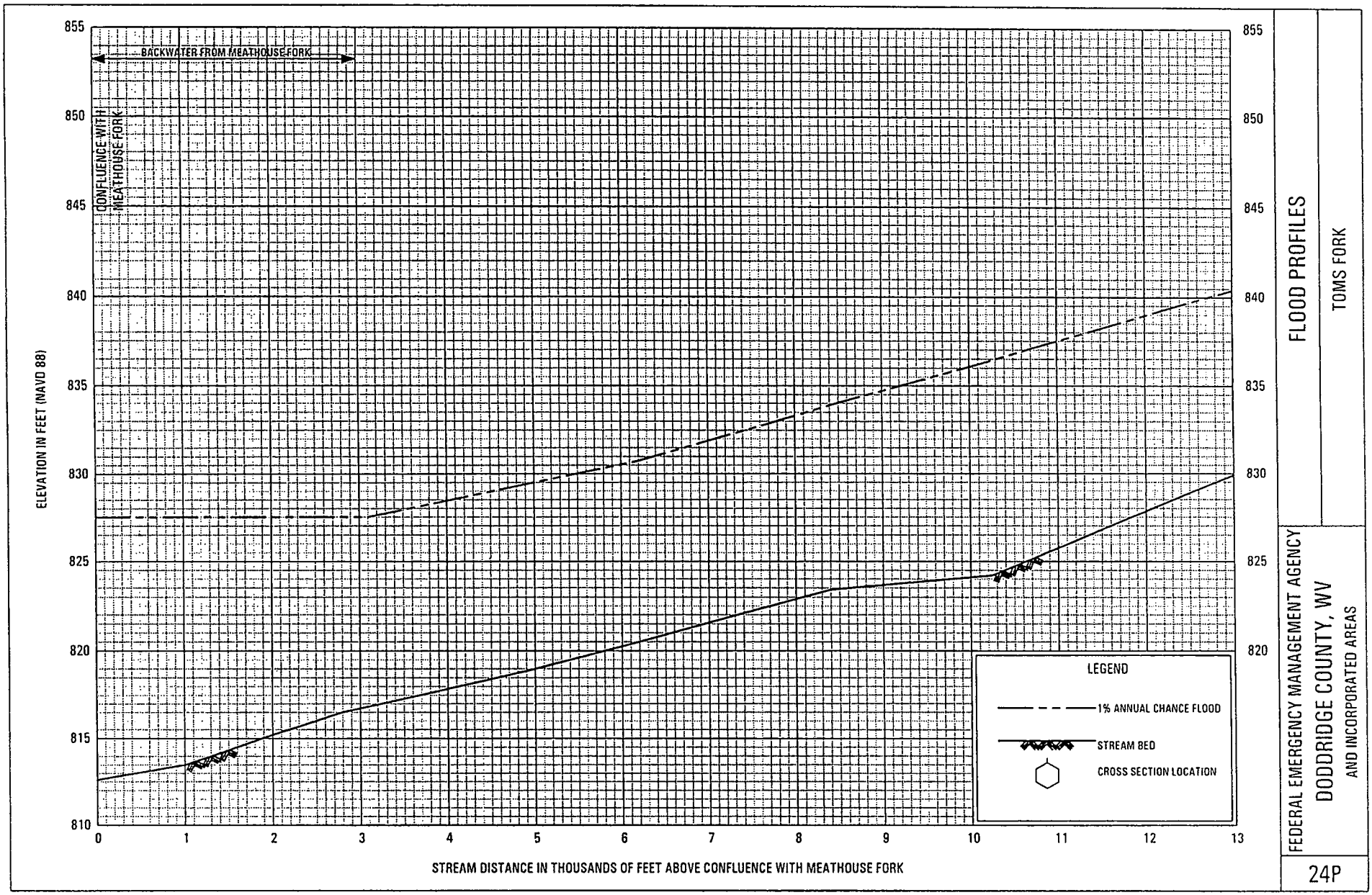
FLOOD PROFILES

MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS



FLOOD PROFILES

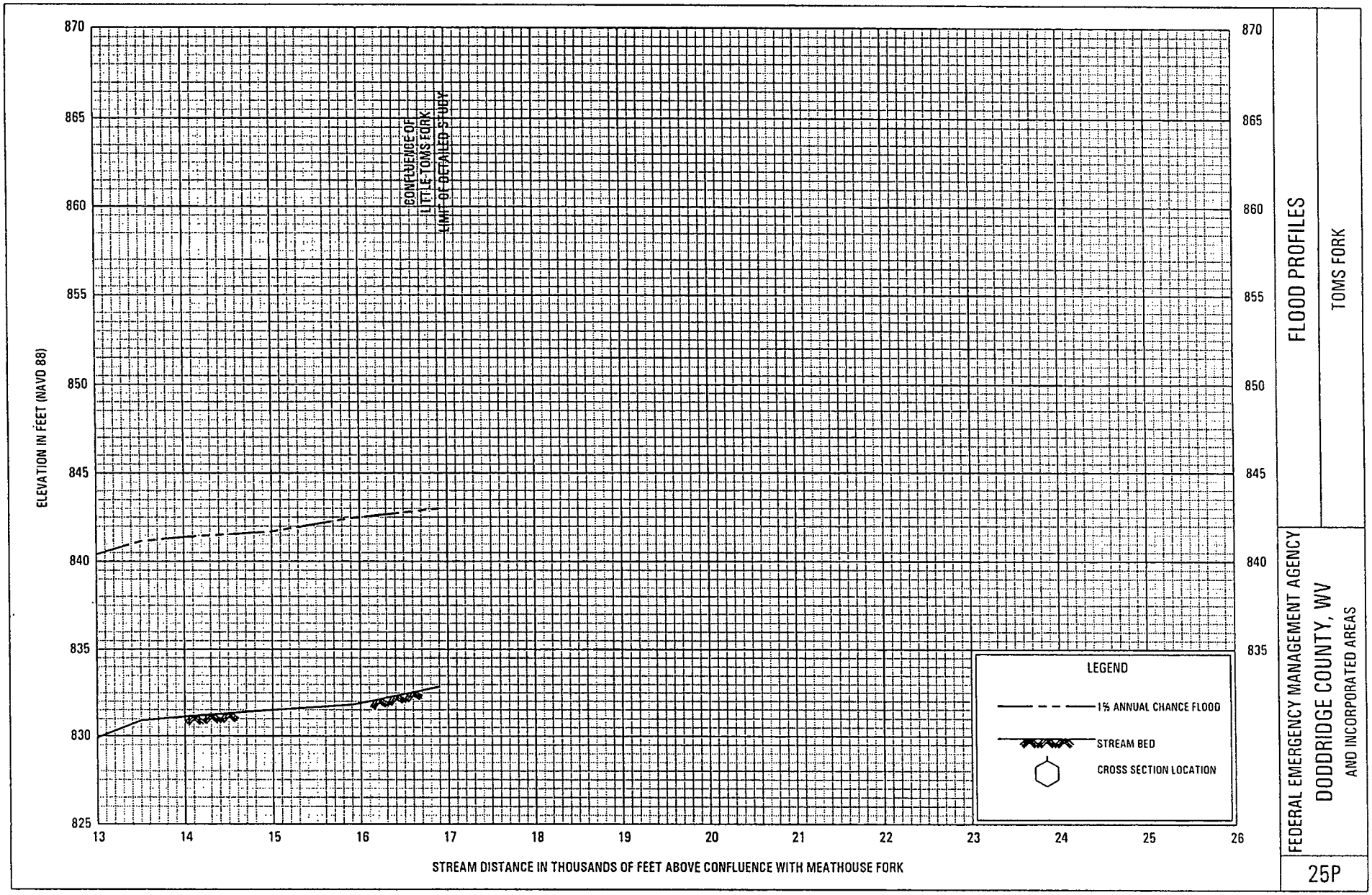
TOMS FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DODDRIDGE COUNTY, WV

AND INCORPORATED AREAS

24P



FLOOD PROFILES

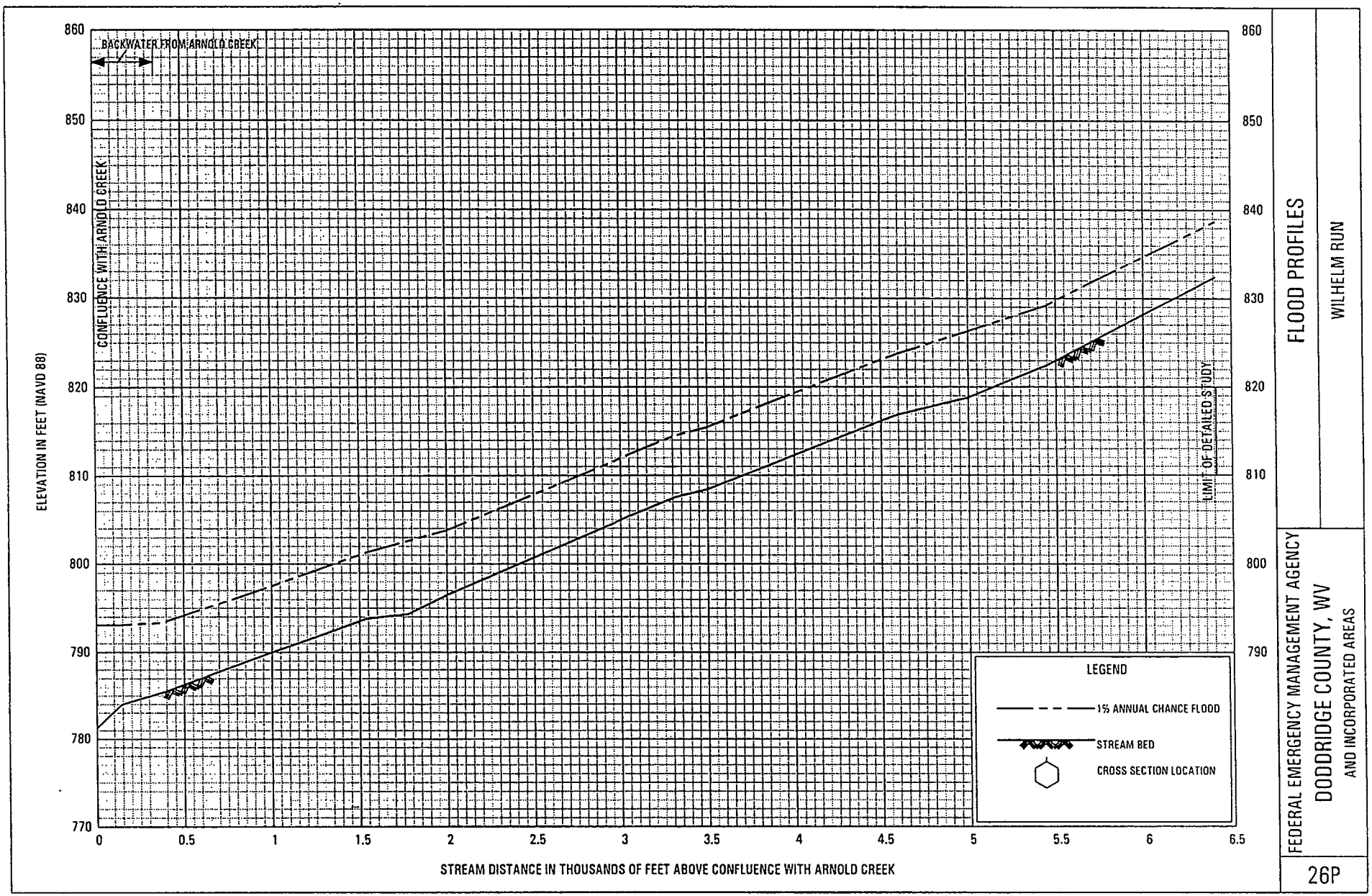
TOMS FORK

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	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	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								

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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
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* 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 *

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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 *

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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
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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	*										

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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
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* 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	

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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	*	

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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

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* 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 *

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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

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 *
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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

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 -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  *
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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
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-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	

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

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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	*		

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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
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* 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)		1.41		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	

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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		

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   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  *
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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
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* 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	* Right OB *
* Vel Head (ft)	* 0.04	* Wt. n-Val.	* 0.050	* 0.035	* 0.050 *
* W.S. Elev (ft)	* 811.46	* Reach Len. (ft)	* 63.00	* 48.80	* 47.00 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 3182.74	* 603.31	* 928.67 *
* E.G. Slope (ft/ft)	*0.000163	* Area (sq ft)	* 3182.74	* 603.31	* 928.67 *
* Q Total (cfs)	* 5150.00	* Flow (cfs)	* 2710.09	* 1474.98	* 964.93 *
* Top Width (ft)	* 1211.03	* Top Width (ft)	* 946.59	* 59.89	* 204.56 *
* Vel Total (ft/s)	* 1.09	* Avg. Vel. (ft/s)	* 0.85	* 2.44	* 1.04 *
* Max Chl Dpth (ft)	* 12.86	* Hydr. Depth (ft)	* 3.36	* 10.07	* 4.54 *
* Conv. Total (cfs)	*403391.3	* Conv. (cfs)	*212277.4	*115532.4	* 75581.5 *
* Length Wtd. (ft)	* 56.27	* Wetted Per. (ft)	* 946.79	* 62.98	*

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 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  *
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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

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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
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* 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	*

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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									

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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	*

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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 11/29/2018 CHECKED BY: ARC 11/29/2018
PROPOSED

PROJECT DATA
Project Title: 110-811_Sherwood FB HH
Project File : 110-811_SherwoFBHH.prj
Run Date and Time: 12/10/2018 11:20:16 AM

Project in English units

Project Description:
Electrical Consultants, Inc.
CEC #185-068
3521 Gabel Road
Billings, MT 59102
(On Behalf of Mon Power)

Existing - March 2014
Proposed - November 2018

Buckeye Run
Breaker Station - Flood Study
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, "110-811_Proposed 11-12-2018."
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, existing topography provided by ECI, and proposed grading provided by ECI.
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: 185-068_Proposed_11-12-2018-No_Poles
Plan File : p:\2018\185-068\-Calculations\Flood Study\110-811_SherwoFBHH.p01

Geometry Title: 110-811_Proposed 11-12-2018-No-Poles
Geometry File : p:\2018\185-068\-Calculations\Flood Study\110-811_SherwoFBHH.g06

Flow Title : 110-811_100Year
Flow File : p:\2018\185-068\-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:\2018\185-068\-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 11-12-2018-No-Poles
Geometry File : p:\2018\185-068\-Calculations\Flood Study\110-811_SherwoFBHH.g06

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	.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	.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	.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

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 3104.54

INPUT
Description: I
Station Elevation Data num= 163

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-402.442	824	-399.553	823.1484	-399.05	823	-396.848	822.3507	-395.658	822
-394.447	821.6429	-392.883	821.1818	-392.371	821.0185	-392.313	821	-389.531	820.1121
-389.18	820	-387.197	819.3673	-386.047	819	-384.918	818.7803	-381.099	818.2408
-379.394	818	-373.856	817.2178	-372.314	817	-366.529	816.1829	-365.234	816
-359.029	815.1235	-358.155	815	-354.378	814.7171	-351.075	814	-345.373	813.1666
-343.634	813	-343.298	812.9944	-340.935	812.9838	-338.812	812.9906	-338.049	812.9904
-336.922	813	-327.457	813.7289	-327.431	813.7307	-325.729	813.8358	-324.283	814.003
-324.263	814.0029	-324.248	814.0029	-324.193	814.0028	-324.078	814.0024	-324.004	814.0022
-323.279	814.0001	-323.24	814	-320.717	814.8338	-320.49	814.909	-320.204	815
-319.013	815.3795	-318.906	815.412	-318.542	815.5235	-318.414	815.5614	-318.17	815.6337
-317.994	815.6839	-317.868	815.7202	-317.743	815.7541	-317.615	815.7893	-317.528	815.812
-317.48	815.8454	-317.348	815.8602	-317.291	815.8716	-317.175	815.9006	-317.141	815.9078
-317.026	815.9347	-316.905	815.9615	-316.777	815.9909	-316.774	815.9916	-316.736	816
-316.73	816	-316.71	816	-316.621	816	-316.06	816	-311.437	816
-309.861	816	-293.835	816	-293.628	816	-289.955	816	-289.113	816
-275.755	816	-274.127	816	-255.308	816	-255.302	816	-254.083	816
-243.12	816	-239.098	815.1681	-226.057	815.1395	-225.815	815.1273	-215.667	815.1069
-210.616	815.0038	-197.397	815.0028	-197.214	815.0026	-195.769	815.0037	-186.684	815.0027
-186.467	815.0025	-175.766	815.0014	-175.629	815.0012	-163.244	815.0001	-163.236	815.0001
-163.226	815.0001	-162.543	815	-161.886	814.7824	-159.526	814	-158.107	813.5294
-156.51	813	-156.046	812.8464	-154.118	812.3355	-152.852	812	-147.612	811.9193
-143.665	811.9388	-137.071	811.4428	-131.195	811	-131	810.9961	-129.732	810.9955
-128.69	810.69	-108.79	810.52	-62.35	809.45	-61.73	809.43	-61.33	809.43
-61.1	809.42	-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
-402.442	.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= 174

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-441.587	828	-439.001	827.1344	-438.6	827	-436.318	826.2358	-435.614	826
-433.568	825.3151	-432.627	825	-430.772	824.3788	-429.64	824	-427.941	823.4311
-426.654	823	-425.085	822.4748	-423.667	822	-422.209	821.5118	-420.681	821
-418.004	820.1037	-417.49	820	-413.614	819.5593	-408.696	819	-405.341	818.6185
-399.901	818	-397.421	817.718	-391.106	817	-390.501	816.9315	-384.505	816
-384.434	815.9768	-381.439	815	-379.723	814.4401	-378.374	814	-372.691	814
-370.401	814	-369.485	813.9987	-367.924	814	-358.903	814.4972	-358.034	814.5691
-355.084	814.6954	-351.579	814.7867	-349.622	814.8299	-349.129	815	-348.57	815.1867
-346.13	816	-344.754	816	-341.528	816	-332.155	816	-329.864	816
-301.386	816	-296.839	816	-291.799	816	-291.174	816	-283.778	816
-282.967	816	-282.557	816	-278.812	816	-277.453	815.7166	-273.13	815.7105
-271.93	815.6494	-267.998	815.6443	-237.448	815.0238	-226.907	815.0233	-225.361	815.0216
-212.944	815.0321	-208.381	815.0318	-205.813	815.029	-200.462	815.0286	-197.56	815.0254
-191.399	815.0251	-188.196	815.0216	-184.423	815.0245	-180.458	815.0242	-176.539	815.02
-170.878	815.0238	-170.775	815.0238	-165.27	815.0179	-165.015	815.0181	-155.845	815.0023
-154.528	815.0011	-154.434	815	-154.108	814.86	-146.855	814.3811	-145.013	814.1338
-143.636	814	-141.968	813.5953	-139.516	813	-137.885	812.6039	-135.397	812
-135.334	812	-135.259	812	-134.311	811.9619	-134.288	811.961	-133.687	811.9369
-133.541	811.931	-133.478	811.9285	-133.446	811.9272	-133.193	811.917	-133.022	811.9089
-132.996	811.9106	-132.775	811.917	-132.772	811.917	-132.767	811.9169	-129.457	811.8443
-128.526	811.8238	-128.511	811.823	-122.323	811.5648	-109.225	811	-84.09	809.91
-75.91	809.69	-67.79	809.61	-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
-441.587	.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= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-477.698	827.45	-477.239	827.3	-476.322	827	-473.901	826.2	-473.294	826
-470.642	825.12	-470.265	825	-467.436	824.06	-467.237	824	-464.266	823.01
-464.209	823	-462.785	822.52	-461.331	822.03	-461.234	822	-458.564	821.08
-458.307	821	-457.778	820.81	-455.38	820	-449.794	819.18	-448.993	819.08
-448.259	819	-442.068	818.26	-439.79	818	-439.619	817.97	-431.27	817
-430.693	816.93	-422.75	816	-421.992	815.93	-421.731	815.9	-421.585	815.89
-421.496	815.86	-421.431	815.84	-419.097	815.07	-418.942	815.02	-418.87	815
-418.771	814.96	-415.839	814	-411.731	814	-408.213	814	-398.637	813.98
-397.265	813.98	-386.981	814	-386.058	814.07	-383.28	815	-381.597	815.56
-380.28	816	-373.75	816	-372.683	816	-328.216	816	-321.515	816
-321.454	816	-319.205	816	-317.519	815.97	-317.289	815.97	-316.67	815.97
-315.748	815.96	-315.625	815.96	-312.313	815.91	-267.392	815.05	-261.472	815.06
-257.358	815.05	-242.722	815.07	-215.791	815.01	-214.267	815.01	-212.667	815.01
-211.037	815.00	-206.313	815	-202.877	814.93	-197.993	814.85	-172.572	814
-157.496	813.09	-155.857	813	-153.952	812.79	-149.373	812.3	-147.914	812
-145.119	811.21	-143.68	811	-142.748	810.99	-127.174	810.92	-126.324	810.92
-121.613	810.95	-121.139	810.95	-119.77	810	-119.28	809.99	-113.78	809.93
-103.13	809.97	-93.69	809.92	-67.95	809.52	-52.45	809.04	-45.11	808.85
-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
-477.698	.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= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
-286.26	-299.23	817	-209.22	-265.06	817

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2954.54

INPUT
Description: L
Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-534.874	830	-534.718	829.9349	-532.749	829.1159	-532.4	829	-532.382	8.9669
-529.383	828	-528.588	827.7362	-526.367	827	-525.079	826.5731	-523.351	826
-521.697	825.4517	-520.335	825	-518.398	824.3578	-517.319	824	-515.156	823.2831
-514.302	823	-511.956	822.2222	-511.286	822	-508.787	821.1715	-508.27	821
-505.642	820.1288	-505.254	820	-501.023	819.3241	-498.874	819	-496.106	818.6736
-490.396	818	-488.075	817.7263	-481.917	817	-479.786	816.7486	-473.439	816
-472.835	815.9517	-470.779	815.7086	-469.614	815.6035	-469.559	815.5854	-469.357	815.5186
-467.787	815	-465.287	814.1738	-464.761	814	-457.604	814	-457.296	814
-456.521	813.9982	-445.18	13.9794	-443.388	813.9823	-442.093	813.9847	-433.141	814
-430.858	814.7611	-430.141	815	-429.767	815.1246	-427.142	816	-425.639	816
-425.395	816	-415.64	816	-383.111	816	-374.846	816	-371.326	816
-362.337	815.8809	-360.747	815.8743	-355.854	815.8378	-346.284	815.7542	-344.728	815.7389
-301.119	815.0845	-294.622	815.0734	-272.644	815.0093	-268.504	815	-222.036	814.2244
-219.16	814.1764	-213.91	814	-210.836	813.8157	-197.231	813	-196.693	812.9414
-195.933	812.9185	-194.604	812.8682	-188.337	812.5832	-187.308	812.5364	-176.289	812
-168.817	811.6311	-168.656	811.611	-168.281	811.5643	-166.219	811.0918	-165.926	811.0135
-153.83	811	-138.198	810.4121	-119.772	810	-119.284	809.9909	-113.78	809.93
-103.13	809.97	-93.69	809.92	-67.95	809.52	-52.45	809.04	-45.11	808.85
-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
-534.874	.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= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
-275	-375	817	-250.06	-375	817

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2904.54

INPUT
Description: M
Station Elevation Data num= 127

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-576.184	826	-575.96	825.9	-573.252	825	-572.645	824.7	932 -570.32	824
-569.408	823.6	889 -567.388	823	-566.226	822.6	037 -564.456	822	-563.086	821.5
327 -561.524	821	-559.978	820.4	727 -558.592	820	-554.508	819.3	287 -552.342	819
-545.402	818.0	856 -544.752	818	-542.88	817.7	533 -538.579	817.2	28 -536.713	817
-531.583	816.3	735 -528.525	816	-528.242	815.9	765 -522.54	815.2	777 -520.566	815.0
917 -520.338	815.0	924 -519.569	815.095	-519.279	814.9	984 -519.039	814.9	185 -518.92	814.8
791 -518.673	814.7	969 -516.279	814	-512.373	814	-509.213	814	-507.192	813.9
954 -495.446	813.9	671 -494.431	813.9	649 -491.761	813.9	692 -479.89	814	-477.77	814.7
044 -476.88	815	-475.658	815.4	061 -473.871	816	-465.13	816	-430.716	816
-430.646	816	-404.805	815.6	536 -399.899	815.6	305 -384.104	815.5	065 -349.783	815.1
97 -343.723	815.1	368 -335.121	815.014	-333.994	815.012	-329.944	815	-326.02	814.9
14 -320.016	814.8	078 -296.338	814.2	529 -287.835	814.1	418 -280.898	814.1	744 -274.722	814.1
483 -257.205	814	-243.437	813.3	784 -236.719	813	-216.898	812.0	332 -216.208	812
-215.268	811.9	531 -215.188	811.9	496 -215.086	811.9	453 -215.052	811.9	439 -192.264	811.0
094 -192.035	811	-175.377	810.3	522 -163.095	810	-163.089	809.9	999 -163.085	809.9
999 -65.8	808.97	-57.77	808.78	-50.48	808.91	-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
-576.184	.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

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-576.184	-407	815	T

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
-365.89	-438.713	817	-269.5	-299.8	817

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2854.58

INPUT
Description: N
Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-624.362	825	-623.918	824.8131	-621.986	824	-621.67	823.867	-619.61	823
-619.521	822.9626	-619.005	822.7454	-617.412	822	-617.355	821.9734	-615.275	821
-614.662	820.7128	-613.138	820	-609.509	819.5097	-606.236	819	-602.962	818.5652
-598.707	818	-593.344	817.2877	-591.178	817	-585.197	816.2055	-583.65	816
-582.313	815.8224	-573.579	815	-572.171	814.8728	-571.561	814.7814	-567.756	814.4696
-567.331	814.328	-566.347	814	-566.324	814	-559.956	814	-549.375	813.9649
-543.759	813.9469	-540.775	813.9378	-531.563	813.9643	-520.806	814	-519.195	814.5366
-517.805	815	-515.994	815.6033	-514.803	816	-512.617	816	-506.05	816
-486.79	816	-486.436	816	-441.774	815.4033	-433.503	815.3659	-407.312	815.1639
-390.625	815.0149	-385.392	815	-369.204	814.3769	-351.328	814.0809	-350.859	814.0683
-348.189	814.0064	-346.389	814.0109	-332.747	814.069	-322.426	814.0232	-319.235	814.0197
-314.822	814.0199	-305.749	814.0196	-303.068	814.0103	-299.6	814.0114	-298.449	814
-291.441	813.3758	-282.844	813.072	-281.129	813.0815	-278.942	813.0657	-273.956	813
-259.628	812.4166	-252.546	812.0493	-249.311	812	-238.39	811.5605	-225.889	811.0573
-224.493	811	-196.129	810.2378	-191.97	810.1261	-190.577	810.0806	-186.906	810
-181.11	809.87	-161.13	809.86	-148.16	809.64	-131.76	809.27	-129.32	809.24
-116.92	809.12	-99.47	808.99	-99.21	808.99	-87.44	808.85	-82.36	808.91
-76.54	808.84	-69.24	808.81	-62.25	808.9	-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
-624.362	.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

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-624.362	-400	815	T

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
-430.83	-486.528	817	-329.487	-341.341	815

CROSS SECTION

RIVER: Buckeye Creek
REACH: Buckeye Creek RS: 2804.54

INPUT
Description: O
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-636.99	817.78	-636.95	817.77	-634.08	817	-630.98	816.17	-630.35	816
-626.97	815.09	-626.62	815	-626.25	814.9	-622.89	814	-622.35	813.93
-616.17	813.67	-609.26	813.83	-606.82	814.08	-602.15	814.59	-593.08	815.07
-590.11	815.23	-583.93	815.46	-581.75	815.34	-575.63	815	-571.54	814.52
-565.54	814	-563.07	813.65	-560.88	813.47	-559.96	813.39	-559.17	813.34
-558.87	813.32	-553.59	813	-551.92	812.9	-549.63	812.76	-539.3	812.27
-533.53	812	-530.18	811.84	-529.43	811.81	-524.3	811.39	-519.46	811
-508.33	810.1	-507.11	810	-424.82	810	-416.88	810.16	-414.07	810.21
-411.1	810.23	-394.19	810.31	-378.96	810.43	-367.39	810.51	-355.79	810.57
-349.84	810.6	-344.93	810.61	-312.68	810.67	-302.9	810.67	-299.88	810.7
-291.35	810.67	-282.84	810.79	-274.96	810.27	-272.64	810.31	-266.75	810.35
-254.54	810.87	-252.37	810.91	-247.19	811	-235.23	810.68	-226.27	810.48
-225.8	810.06	-223.75	810.05	-200.27	810	-200.18	810	-197.84	809.23
-197.64	809.22	-194.22	809.36	-191.11	809.39	-177.26	809.36	-170.32	809.28
-164.3	809.01	-153.82	808.7	-139.84	808.71	-132.12	808.6	-123.32	808.22
-121.92	808.15	-120.94	808.13	-107.12	808.07	-104.81	808.04	-97.09	807.93
-90.23	807.96	-83.61	808.09	-65.83	808.29	-65.47	808.31	-61.61	808.39
-41.95	809.2	-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
-636.99	.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
-636.99	-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

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

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-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
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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

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

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.
			Flow Area	Top Width	Froude # Chl	E.G. Elev
			(cfs)	(ft)	(ft)	
(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Buckeye Creek	3504.54	100-Year	5150.00	804.44	814.39	
			772.78	110.02	0.42	815.11
			6.78			0.001634
Buckeye Creek	3454.54	100-Year	5150.00	804.38	814.07	
			736.60	131.73	0.48	814.99
			7.92			0.002086

Buckeye Creek	3404.54	100-Year	5150.00	804.32	813.80		
814.86	0.002534	8.52	685.71	126.27	0.53		
Buckeye Creek	3354.54	100-Year	5150.00	804.25	813.92		
814.66	0.001760	7.39	916.76	201.99	0.45		
Buckeye Creek	3304.54	100-Year	5150.00	804.25	813.85		
814.57	0.001750	7.28	959.51	235.09	0.44		
Buckeye Creek	3254.54	100-Year	5150.00	804.12	813.93		
814.42	0.001255	6.26	1195.70	278.55	0.38		
Buckeye Creek	3204.54	100-Year	5150.00	804.05	813.92		
814.35	0.001119	6.02	1320.60	318.57	0.36		
Buckeye Creek	3154.54	100-Year	5150.00	803.89	813.83		
814.29	0.001171	6.20	1329.95	361.11	0.37		
Buckeye Creek	3104.54	100-Year	5150.00	803.47	813.71		
814.22	0.001258	6.40	1113.03	233.87	0.38		
Buckeye Creek	3054.54	100-Year	5150.00	803.03	813.60		
814.16	0.001325	6.52	1038.07	197.64	0.39		
Buckeye Creek	3004.54	100-Year	5150.00	802.18	813.60		
814.08	0.001129	6.18	1167.91	231.38	0.36		
Buckeye Creek	2954.54	100-Year	5150.00	802.18	813.57		
814.02	0.001076	6.11	1259.80	271.99	0.35		
Buckeye Creek	2904.54	100-Year	5150.00	802.00	813.63		
813.93	0.000737	5.07	1523.26	320.63	0.29		
Buckeye Creek	2854.58	100-Year	5150.00	802.00	813.64		
813.89	0.000576	4.60	1723.18	360.47	0.26		
Buckeye Creek	2804.54	100-Year	5150.00	802.00	813.69		
813.83	0.000398	3.76	2293.13	632.86	0.21		
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

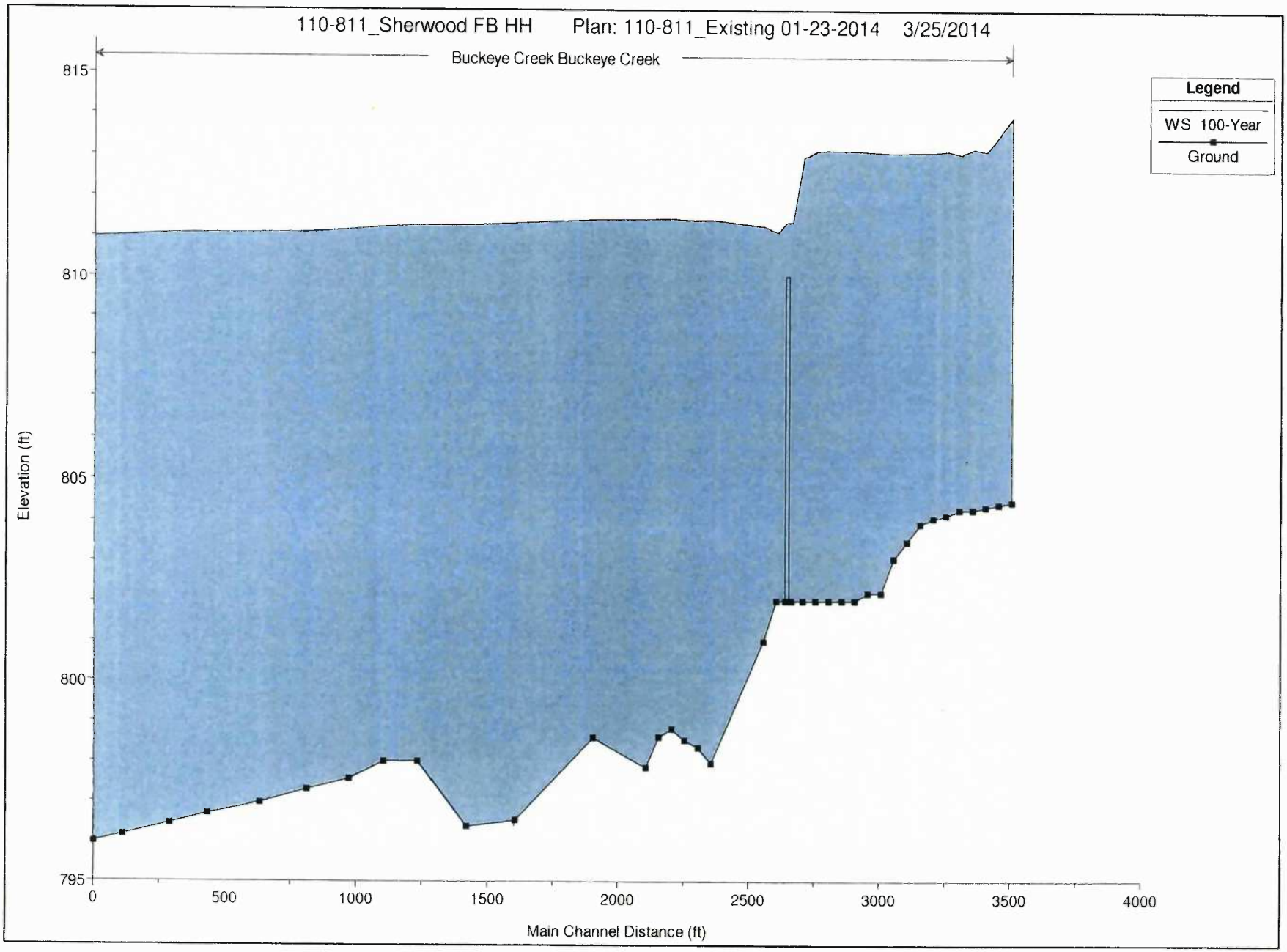
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Prop_2018_No_Poles

River: Buckeye Creek Reach: Buckeye Creek RS: 3404.54 Profile: 100-Year
  Warning:Divided flow computed for this cross-section.
River: Buckeye Creek Reach: Buckeye Creek RS: 3104.54 Profile: 100-Year
  Warning:Divided flow computed for this cross-section.
River: Buckeye Creek Reach: Buckeye Creek RS: 2804.54 Profile: 100-Year
  Warning:Divided flow computed for this cross-section.
River: Buckeye Creek Reach: Buckeye Creek RS: 2754.54 Profile: 100-Year
  Warning:Divided flow computed for this cross-section.

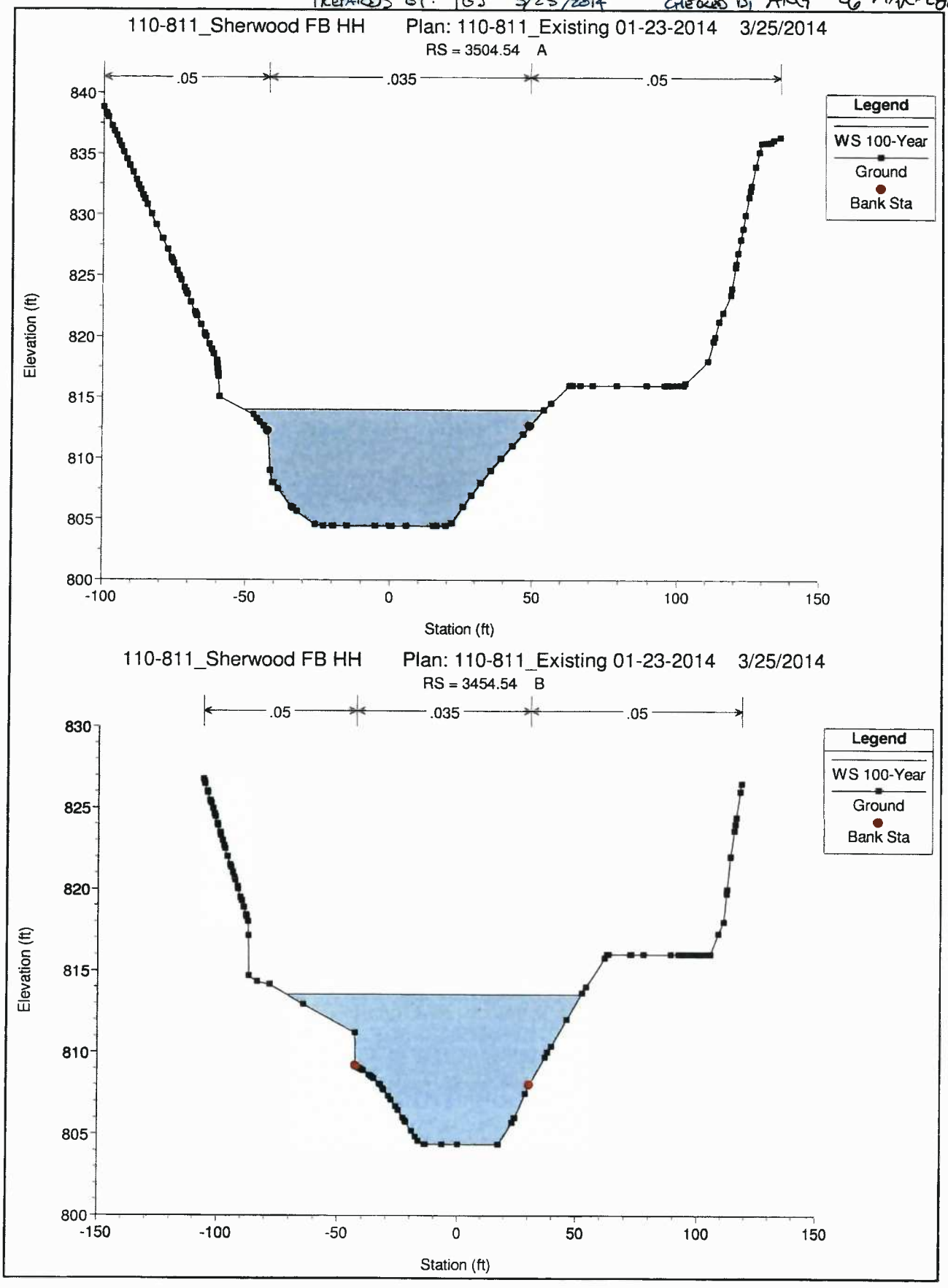
River: Buckeye Creek Reach: Buckeye Creek RS: 2554.54 Profile: 100-Year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Buckeye Creek Reach: Buckeye Creek RS: 2460.04 Profile: 100-Year
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Buckeye Creek Reach: Buckeye Creek RS: 2460.04 Profile: 100-Year Upstream
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.
River: Buckeye Creek Reach: Buckeye Creek RS: 2460.04 Profile: 100-Year Downstream
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.
River: Buckeye Creek Reach: Buckeye Creek RS: 2417.85 Profile: 100-Year
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, water surface was
used.
River: Buckeye Creek Reach: Buckeye Creek RS: 1804 Profile: 100-Year
Warning:The conveyance ratio (upstream 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.
River: Buckeye Creek Reach: Buckeye Creek RS: 109.26 Profile: 100-Year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

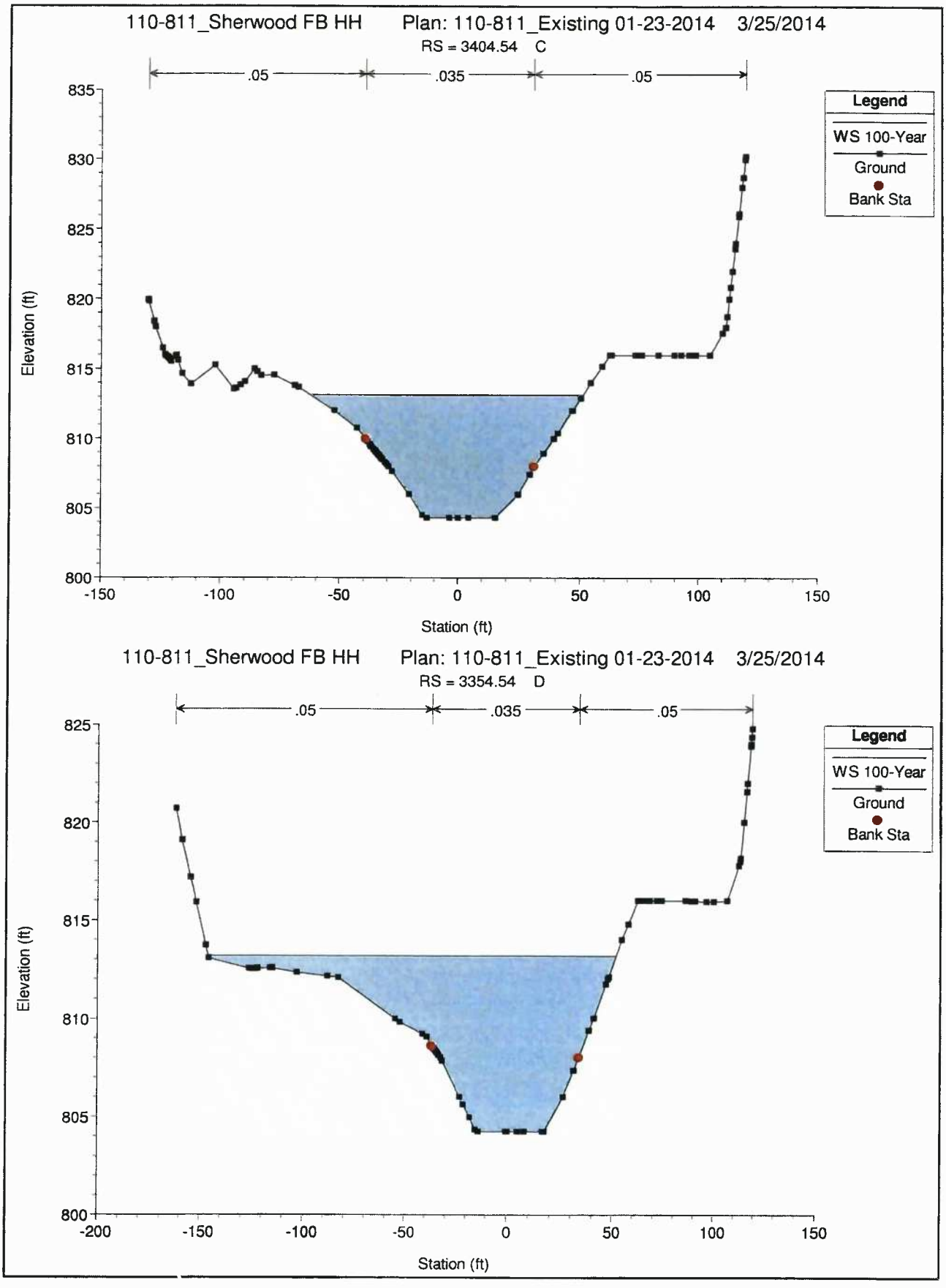
APPENDIX D

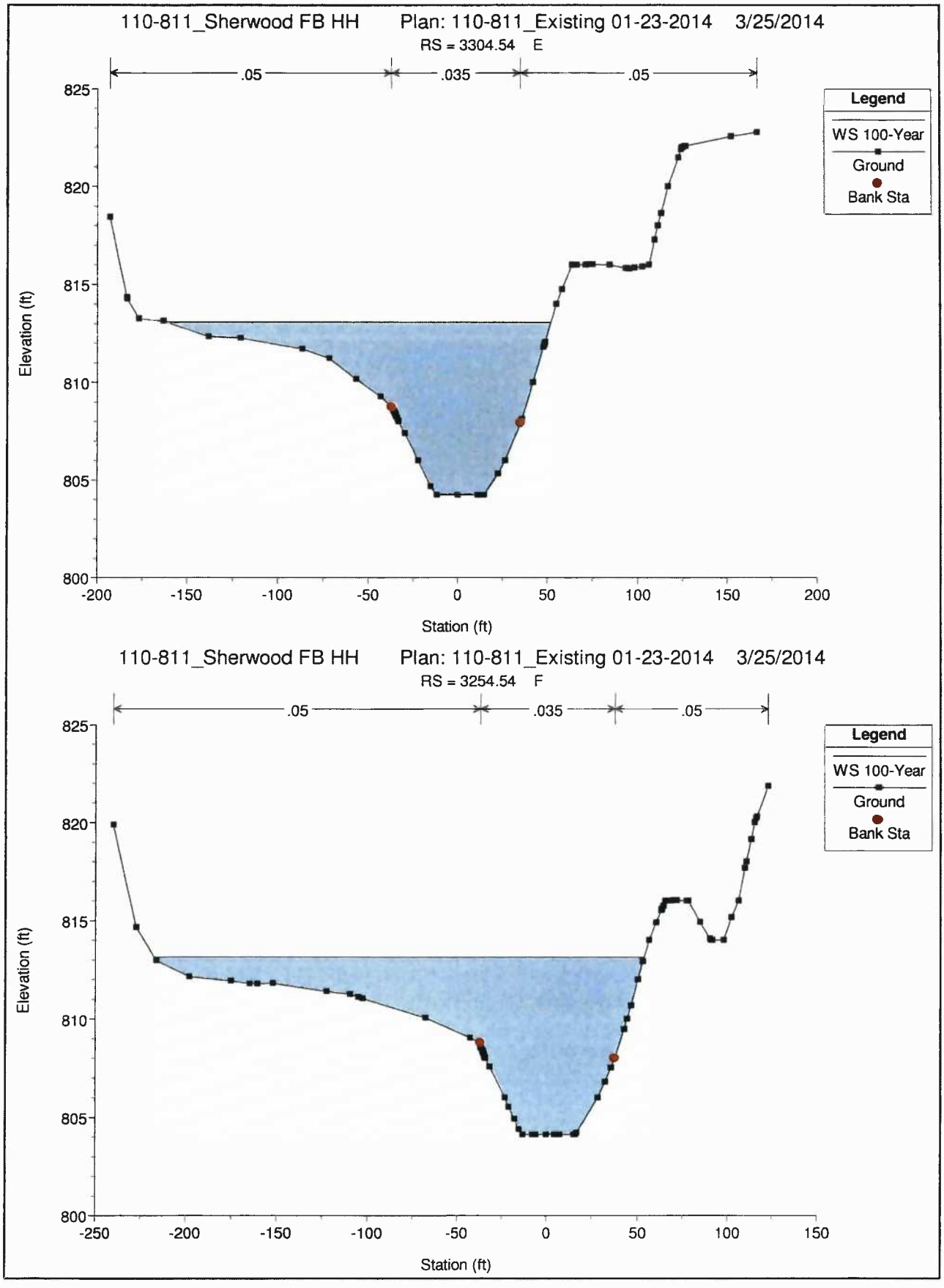
EXISTING AND PROPOSED FLOODWAY MAPS, WATER SURFACE PROFILES, AND CROSS SECTION OUTPUT

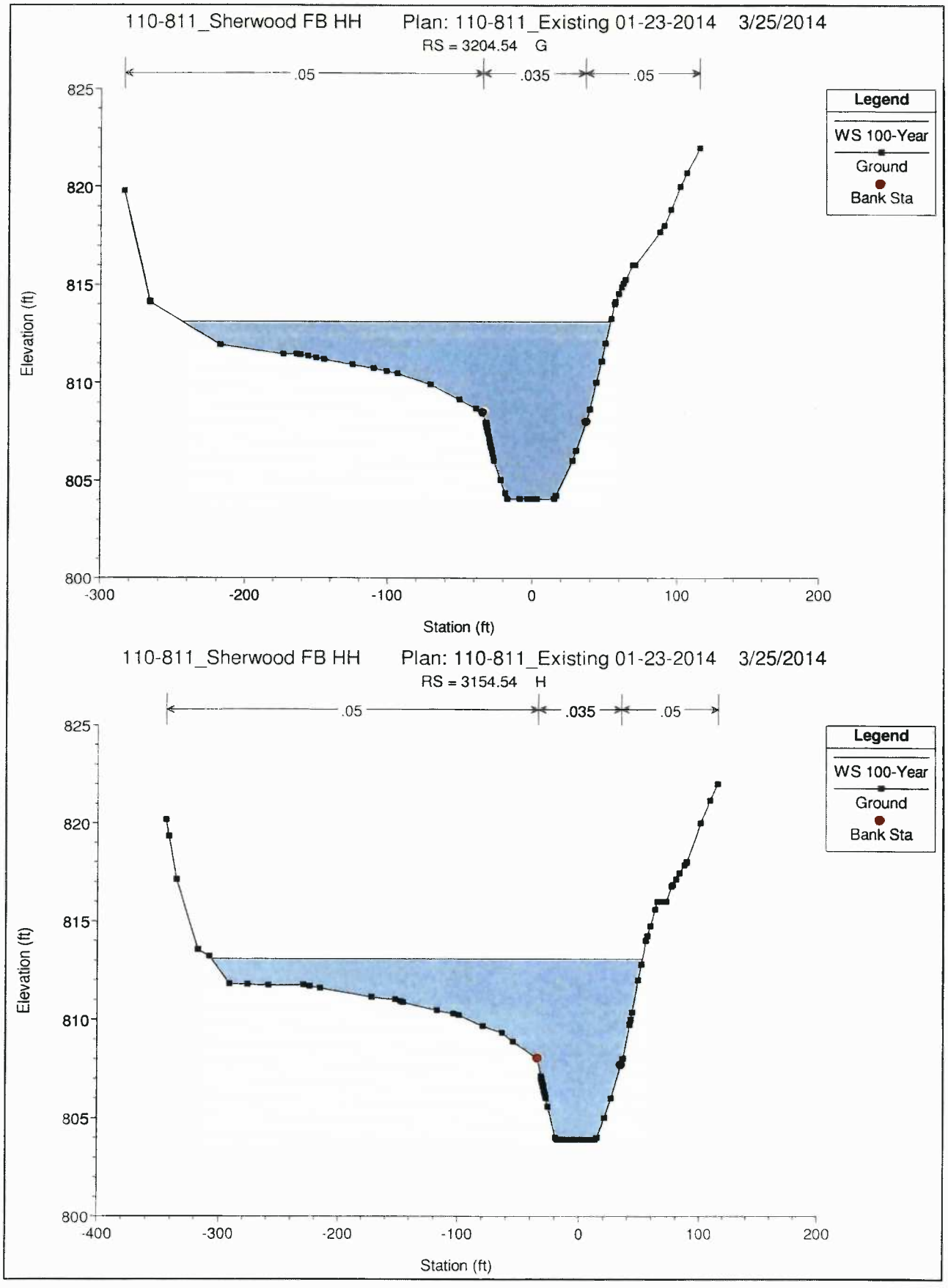

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
Buckeye Creek Buckeye Creek
Legend
WS 100-Year
Ground
Elevation (ft)
815
810
805
800
795
0
500
1000
1500
2000
2500
3000
3500
4000
Main Channel Distance (ft)

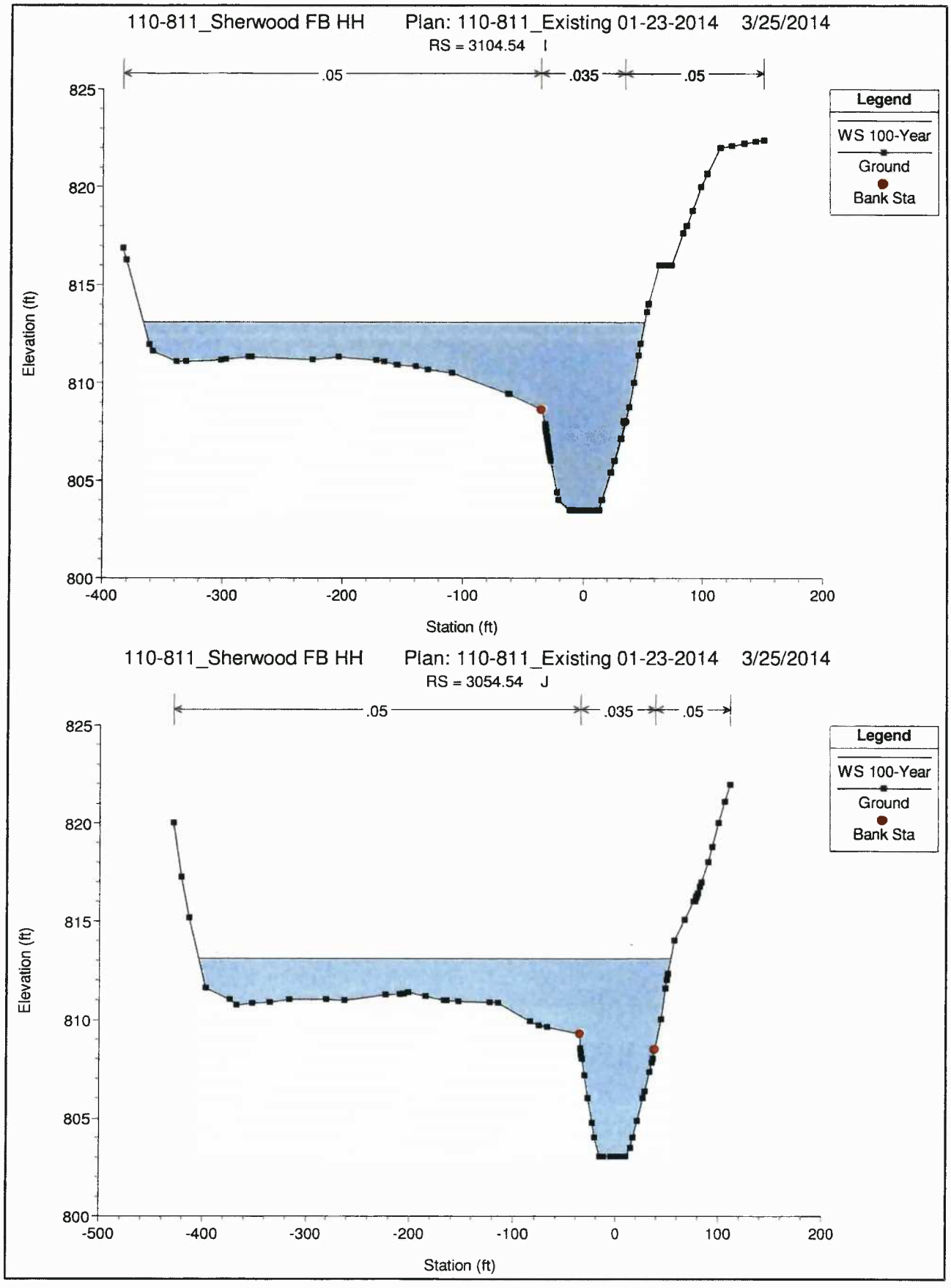
PREPARED BY: TGJ 3/25/2014 CHECKED BY: ARG 26-MAR-2014




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)
835
830
825
820
815
810
805
800
-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 = 3354.54 D
.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
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
825
820
815
810
805
800
Elevation (ft)
-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
825
820
815
810
805
800
Elevation (ft)
-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
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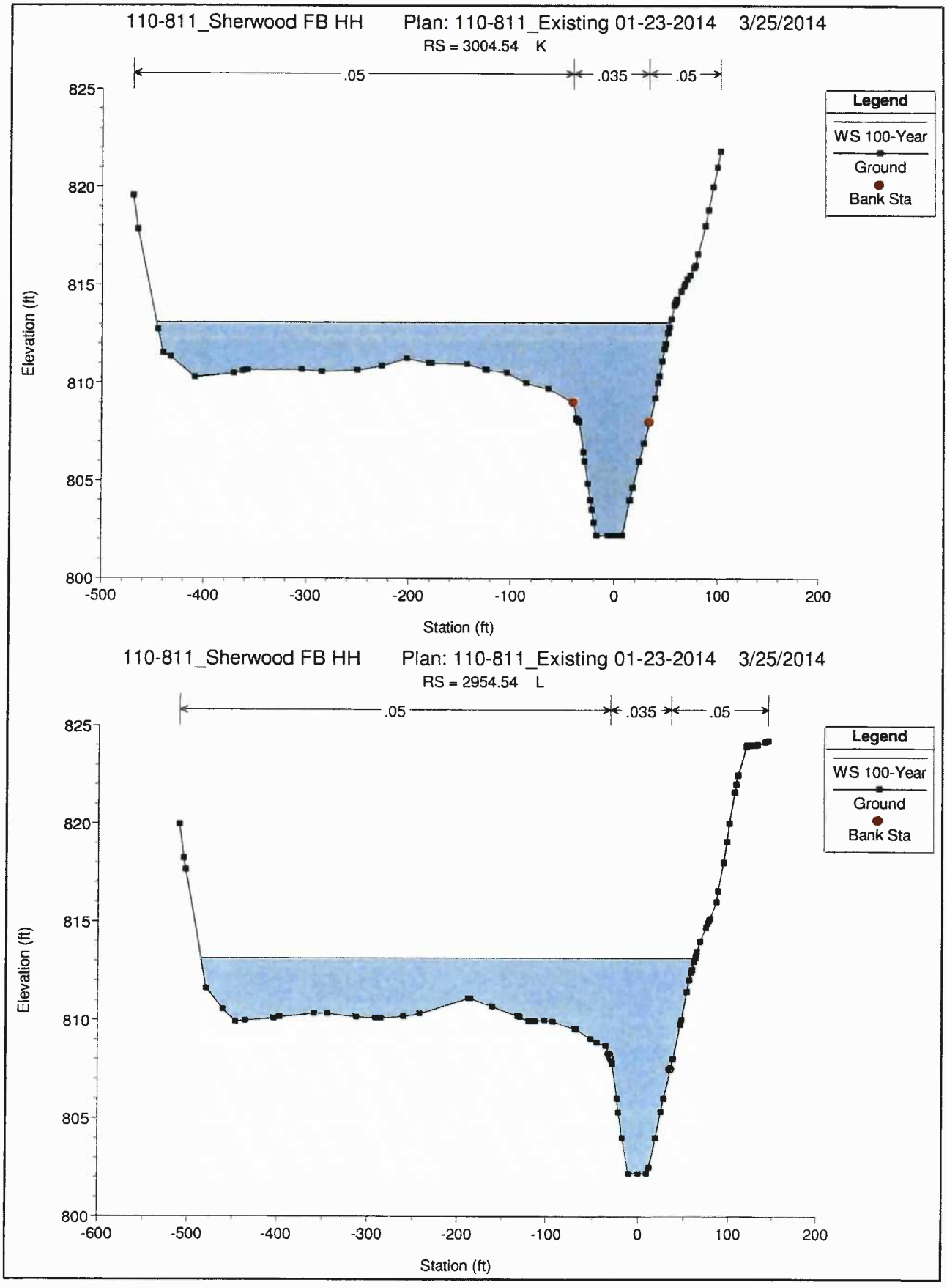
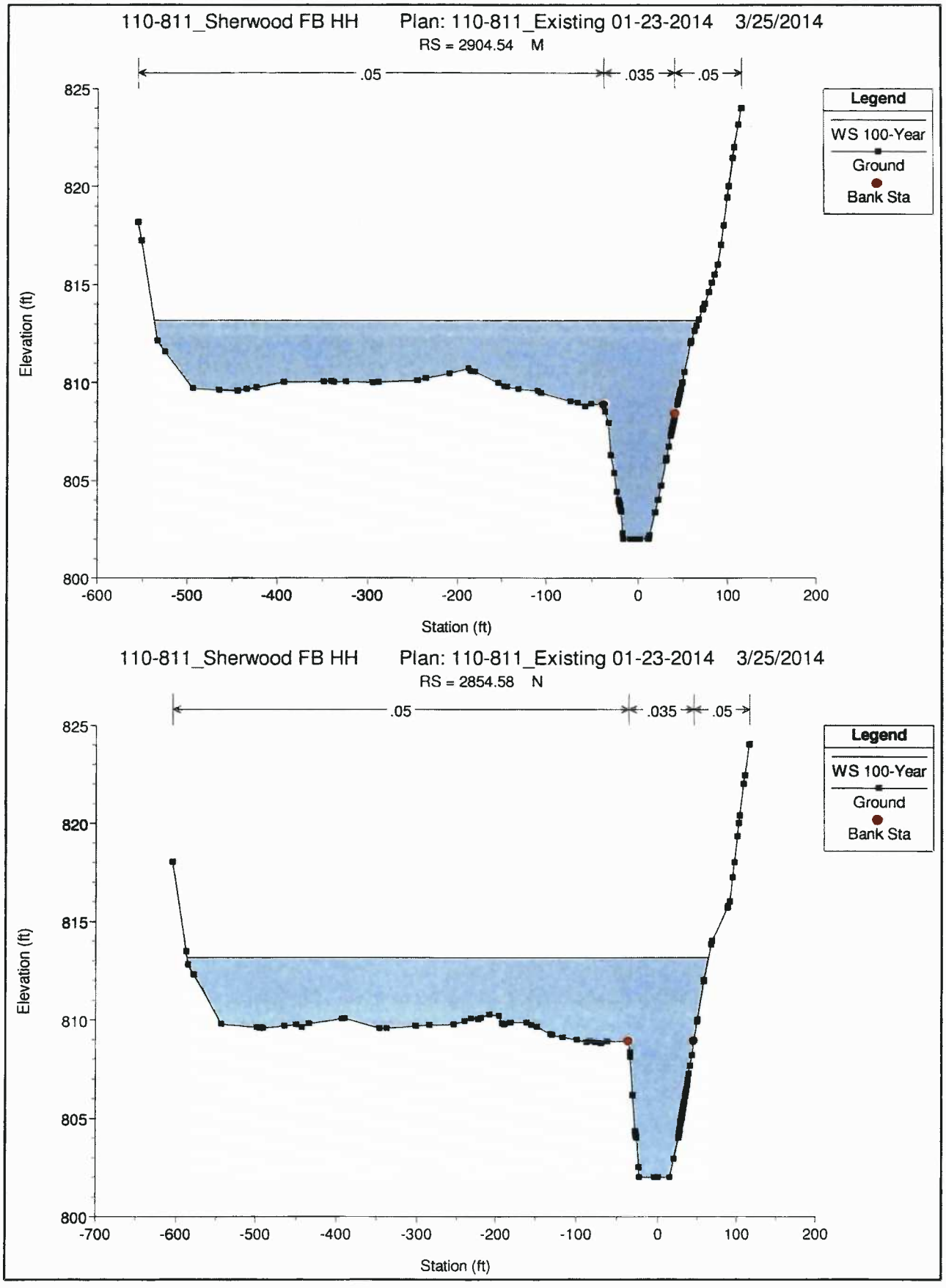
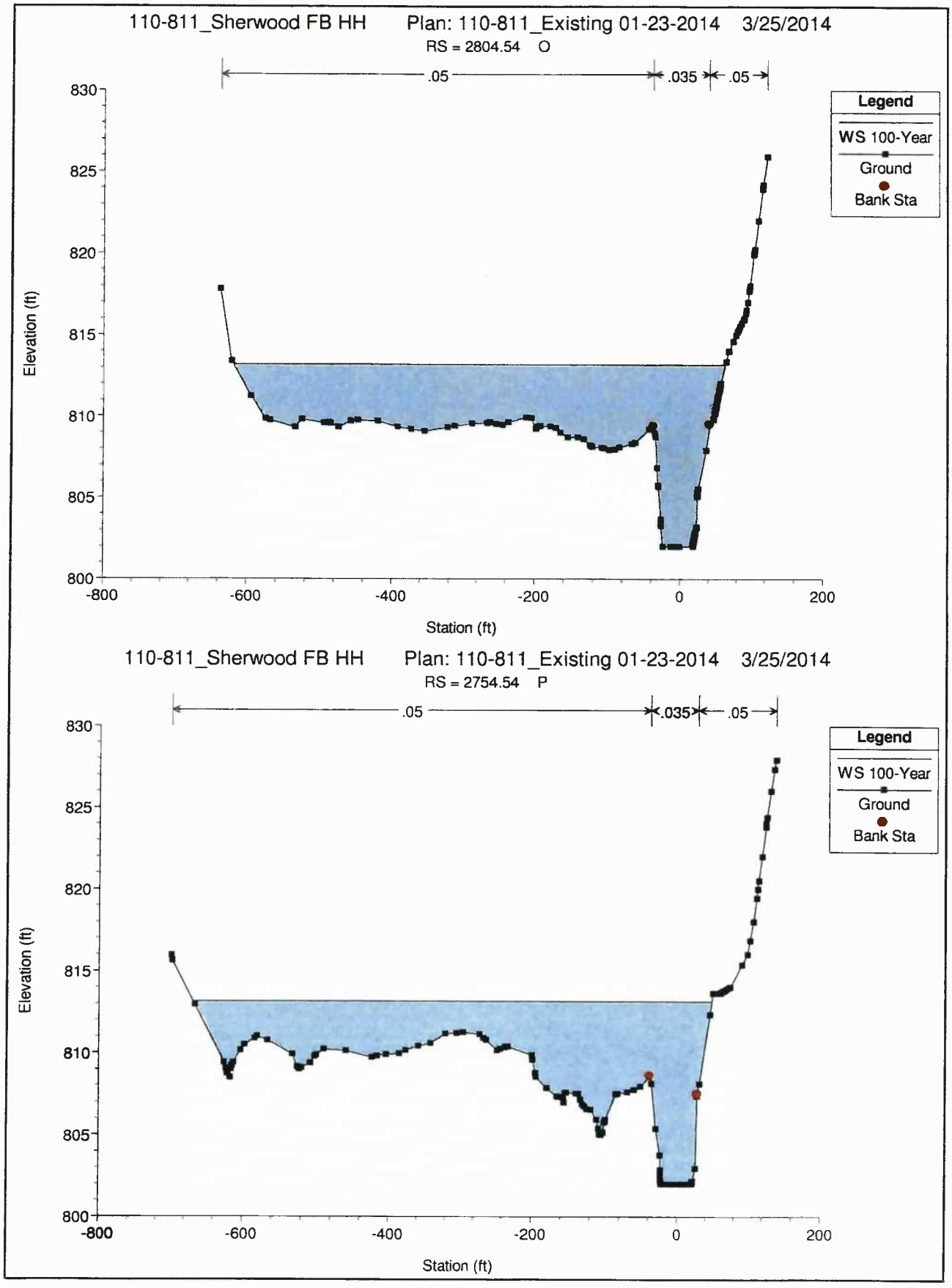
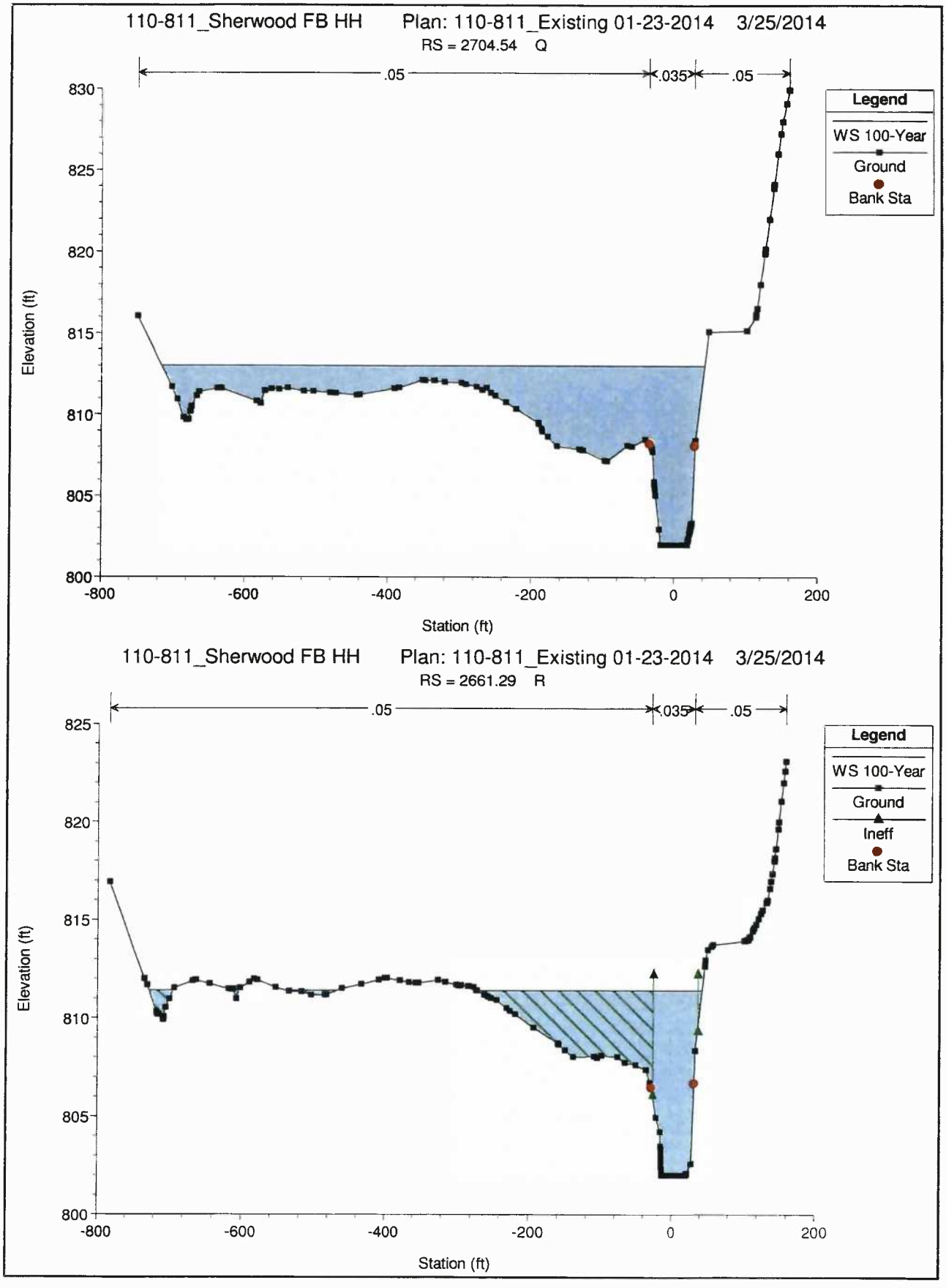
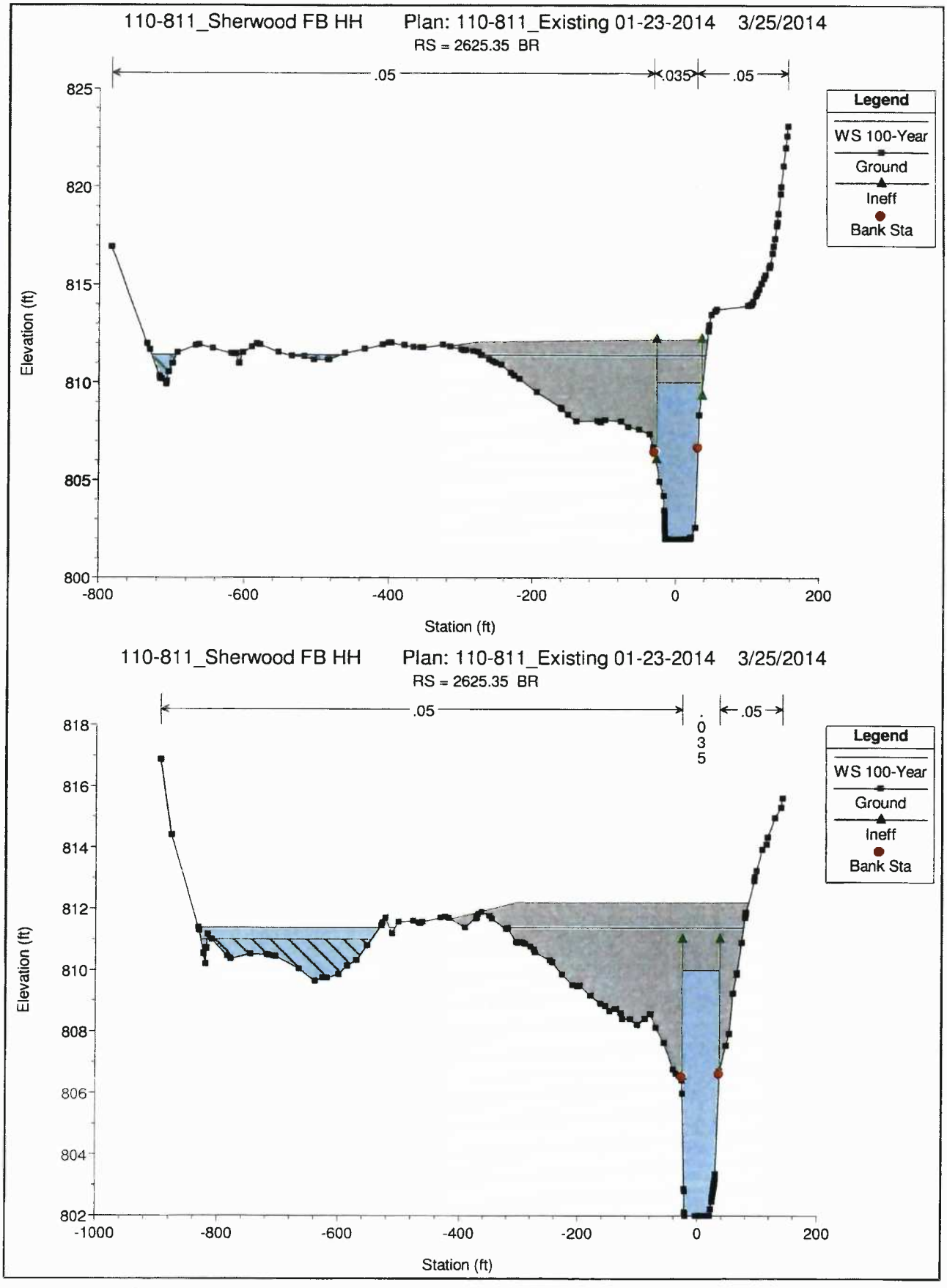
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
825
820
815
810
805
800
Elevation (ft)
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 3054.54 J
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
825
820
815
810
805
800
Elevation (ft)
-500
-400
-300
-200
-100
0
100
200
Station (ft)

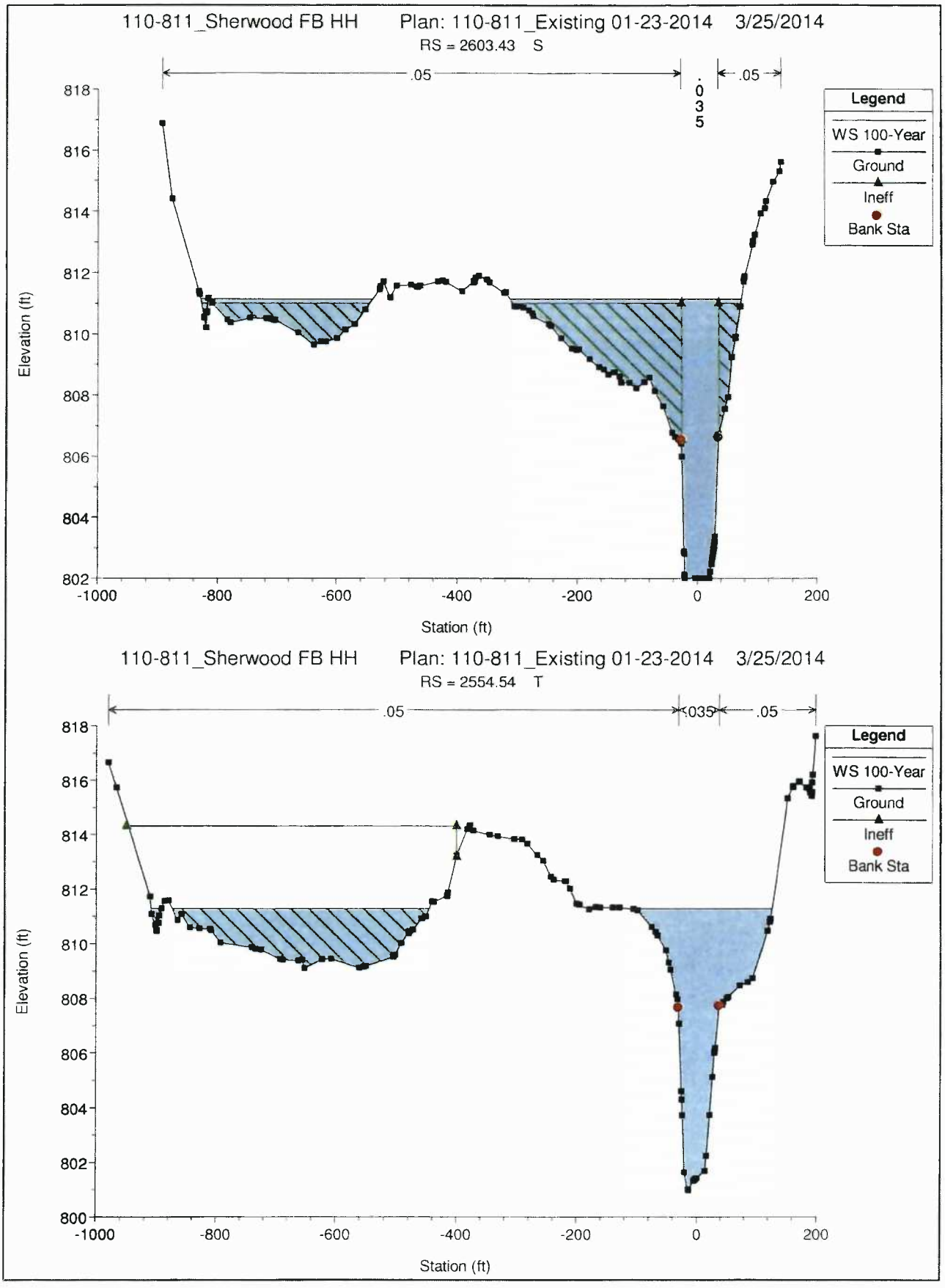

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 3004.54 K
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2954.54 L
.05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

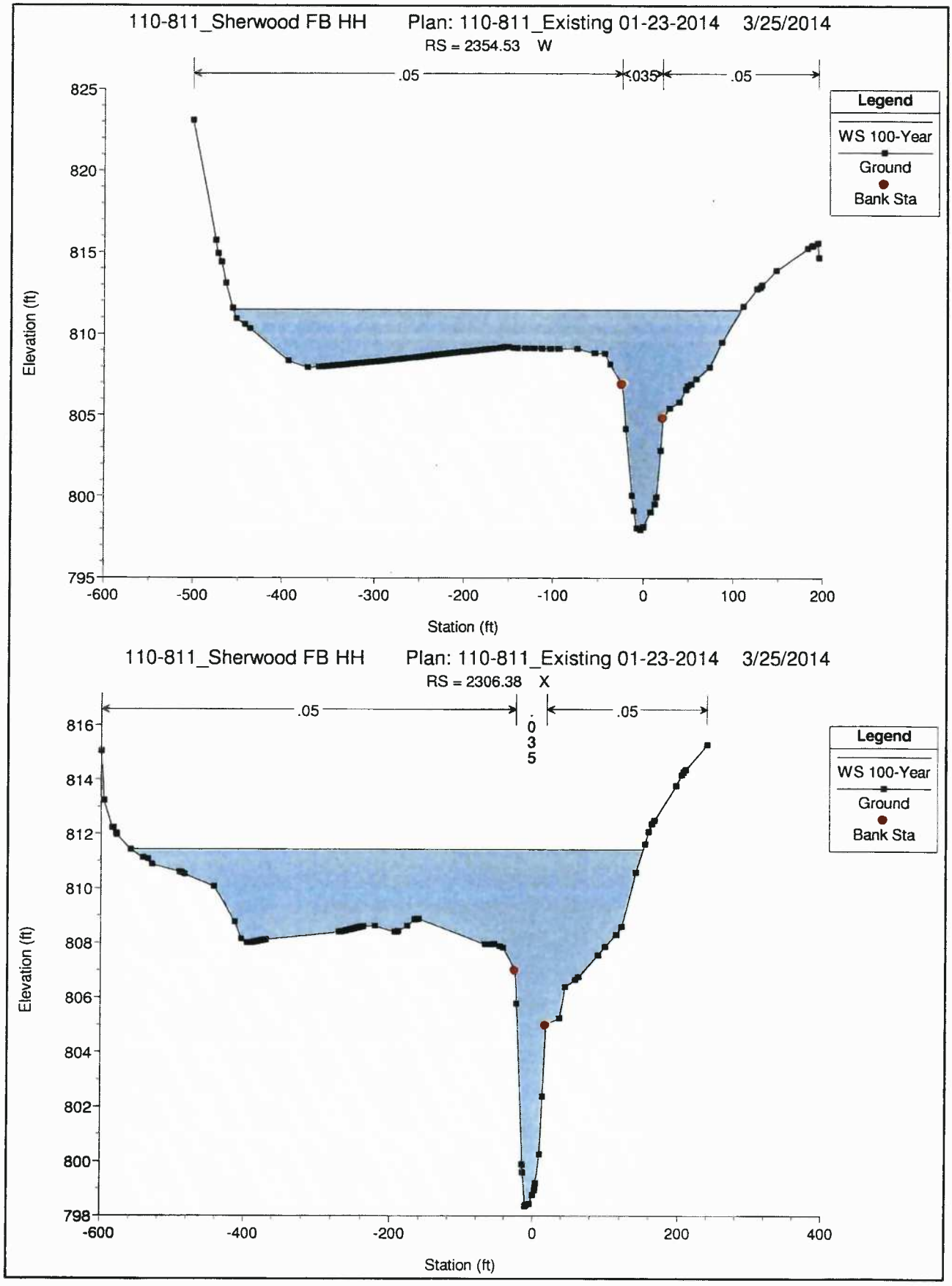

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2904.54 M
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2854.58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

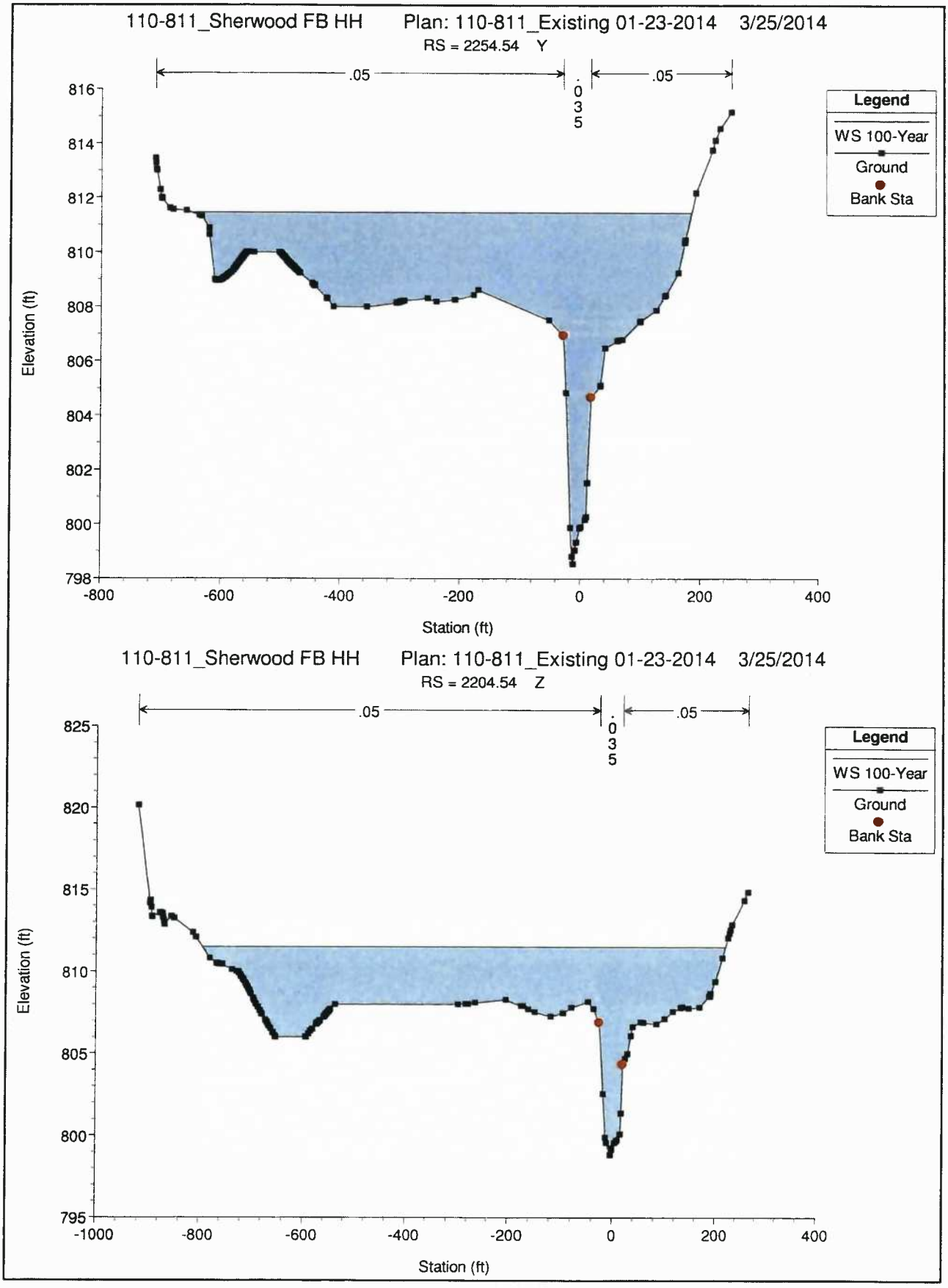

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2804.54 O
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
830
825
820
815
810
805
800
-800
-600
-400
-200
0
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2754.54 P
.05
.035
.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)

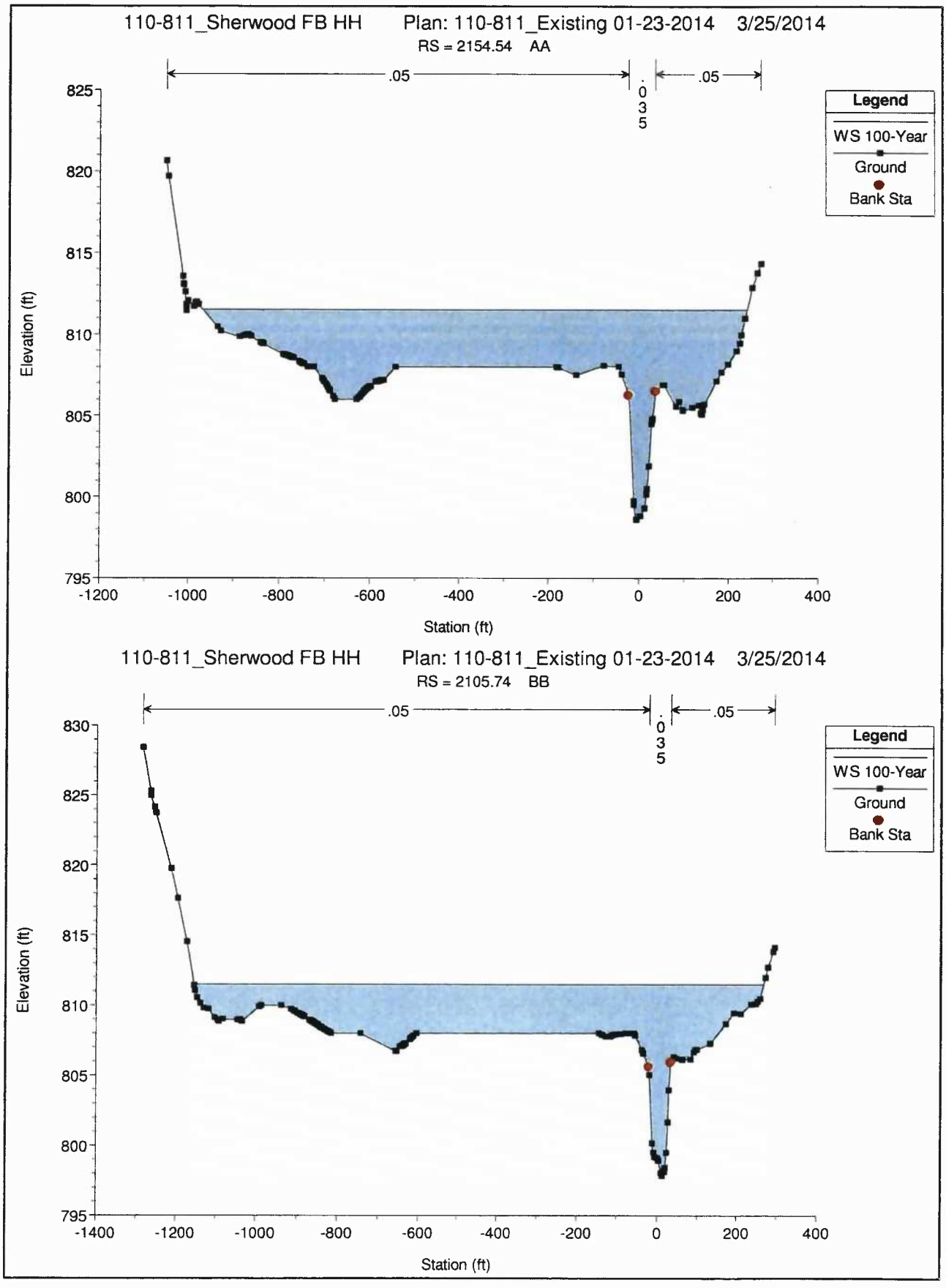

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2704.54 Q
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
830
825
820
815
810
805
800
-800
-600
-400
-200
0
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2661.29 R
.05
.035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

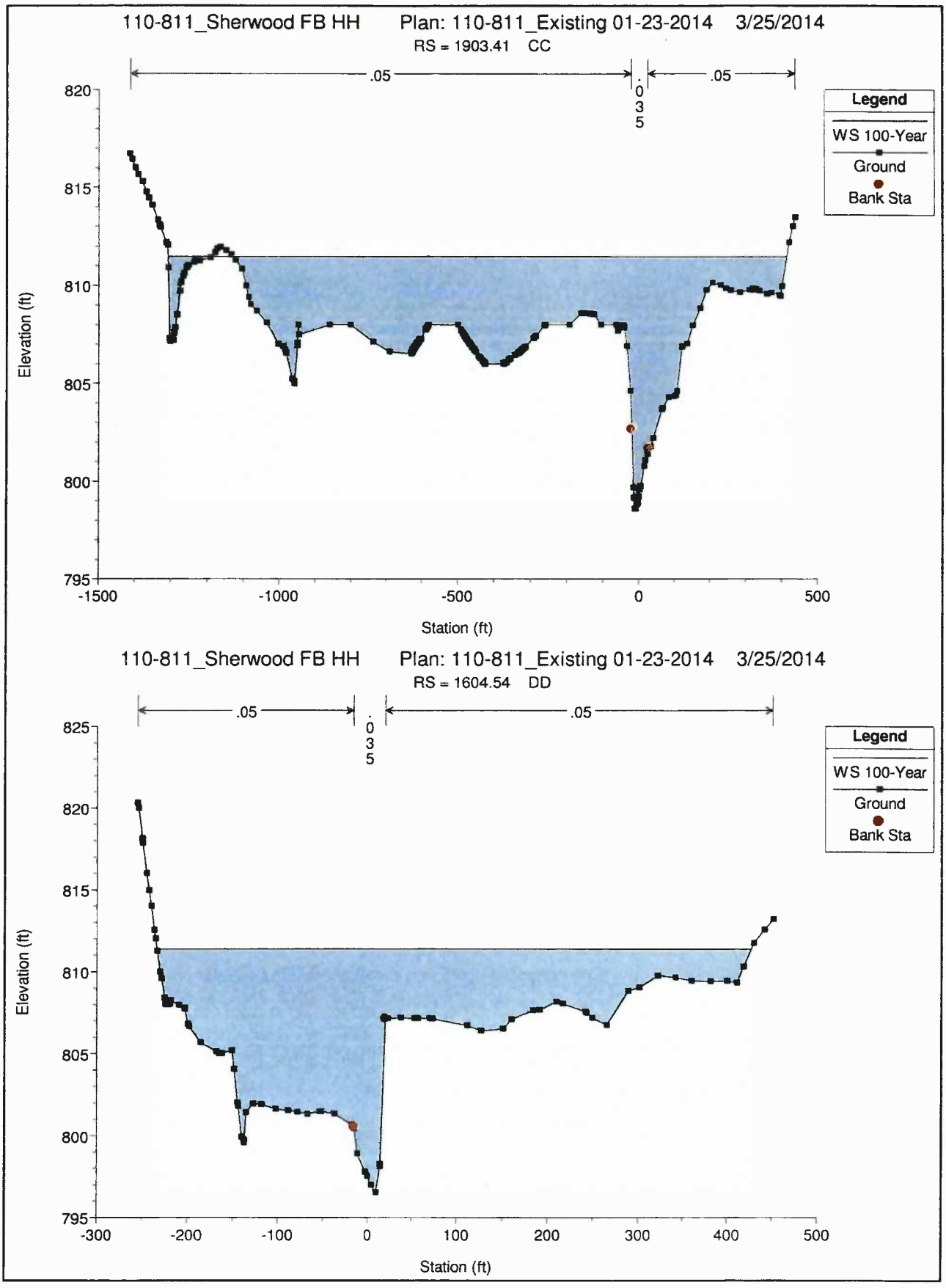

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2625.35 BR
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
825
820
815
810
805
800
-800
-600
-400
-200
0
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2625.35 BR
.05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

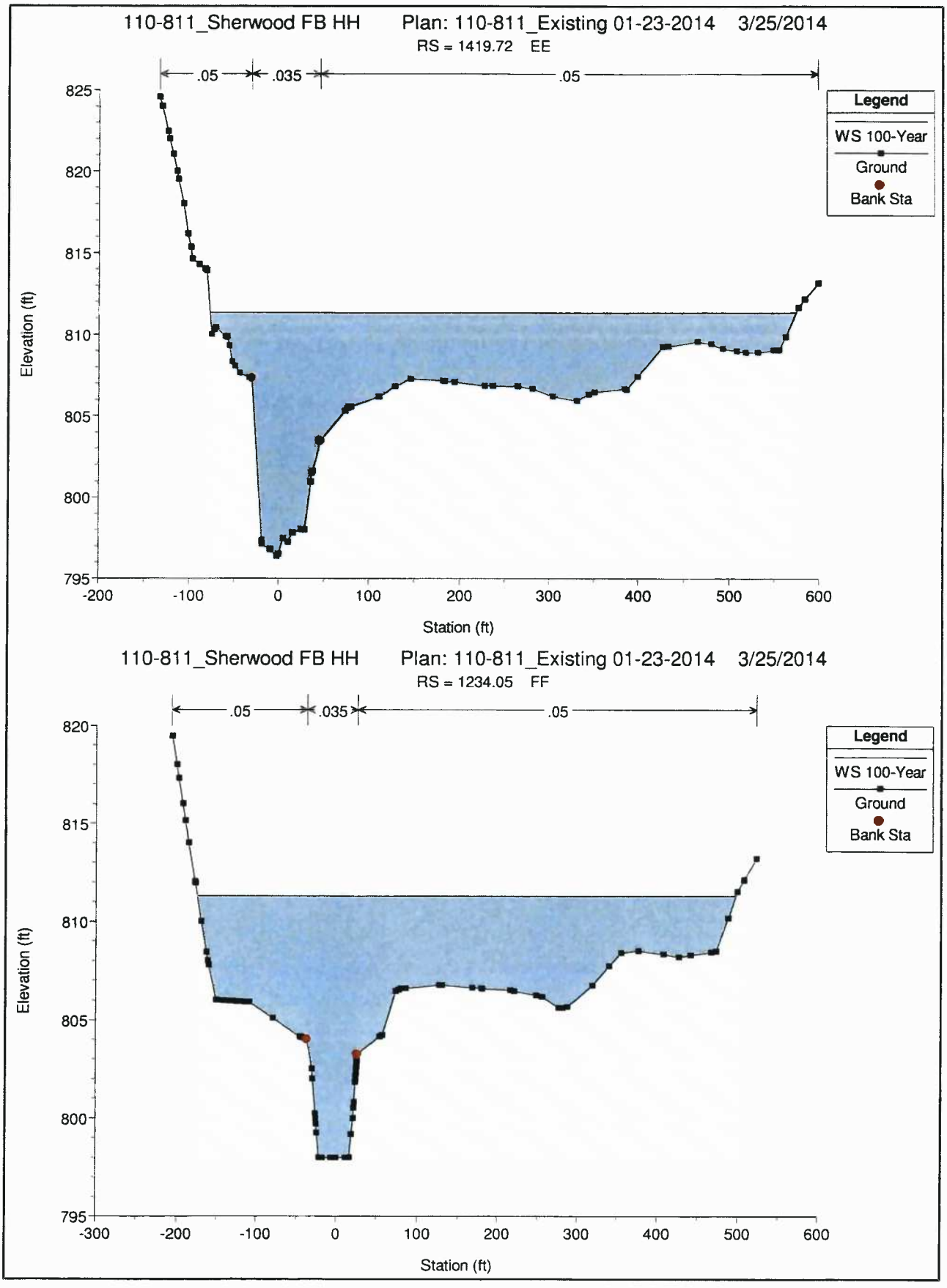

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2603.43 S
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2554.54 T
.05
.035
.05
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation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

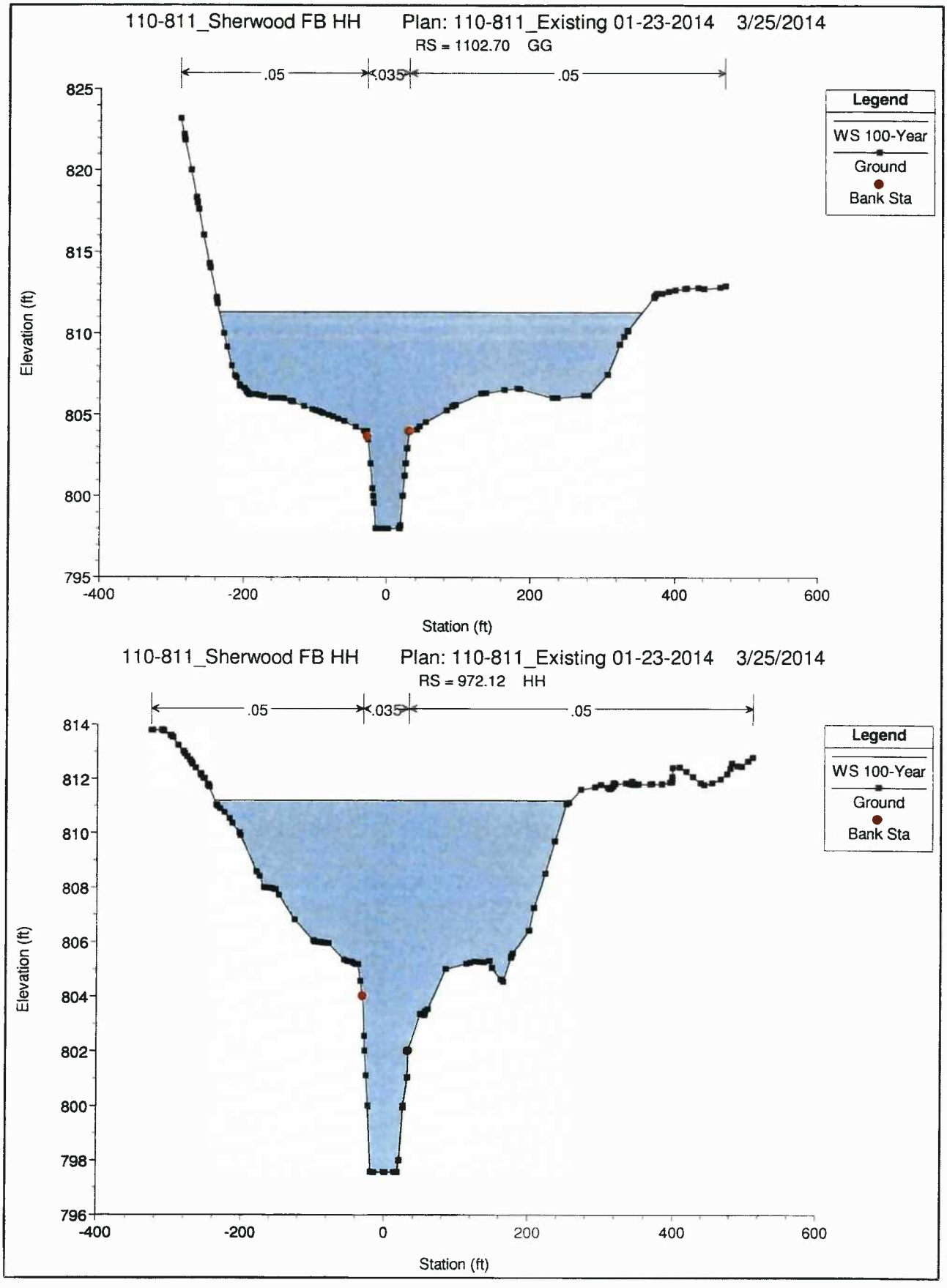

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2354.53 W
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2306.38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

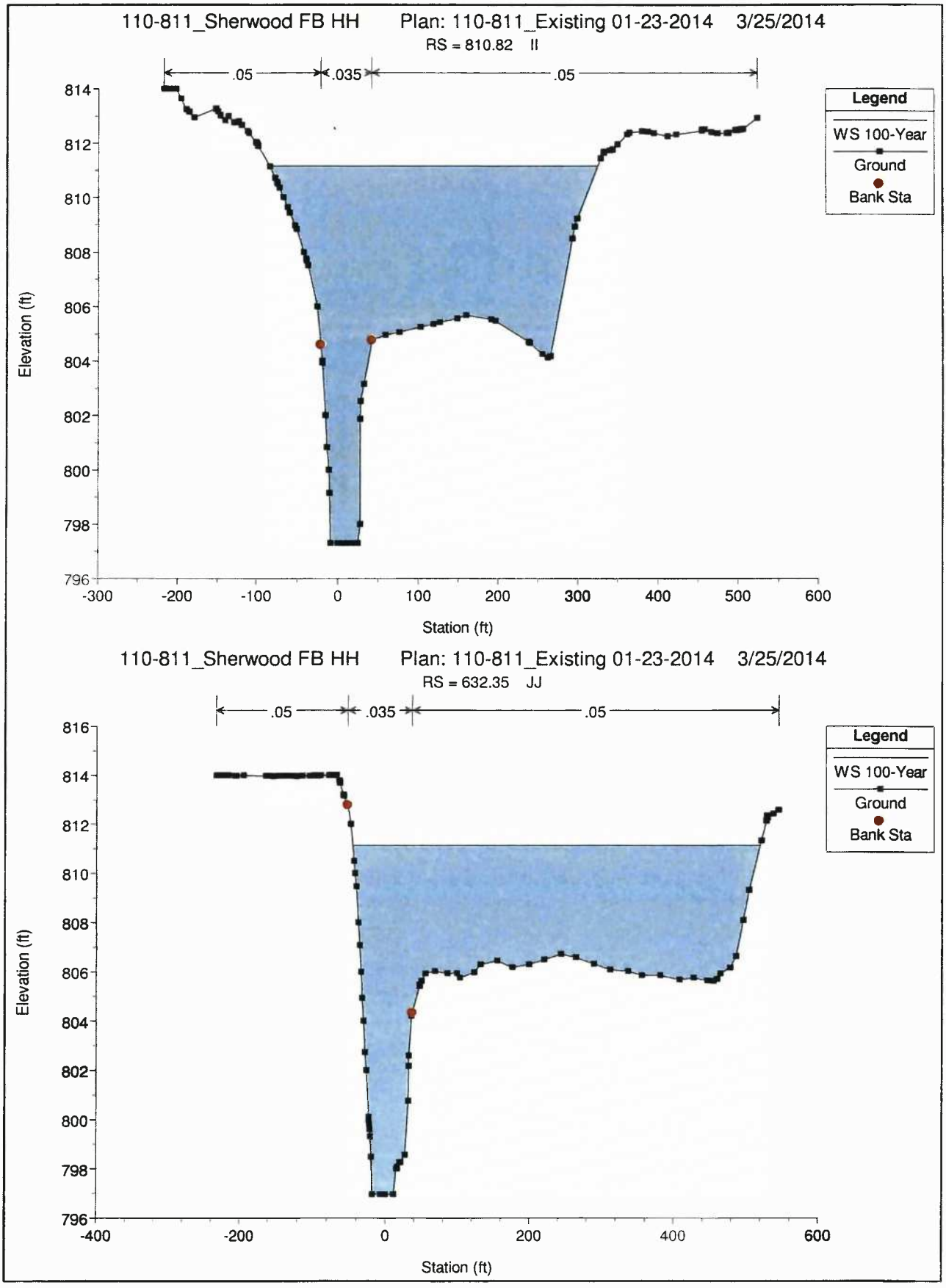

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2254.54 Y
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
816
814
812
810
808
806
804
802
800
798
-800
-600
-400
-200
0
200
400
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2204.54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

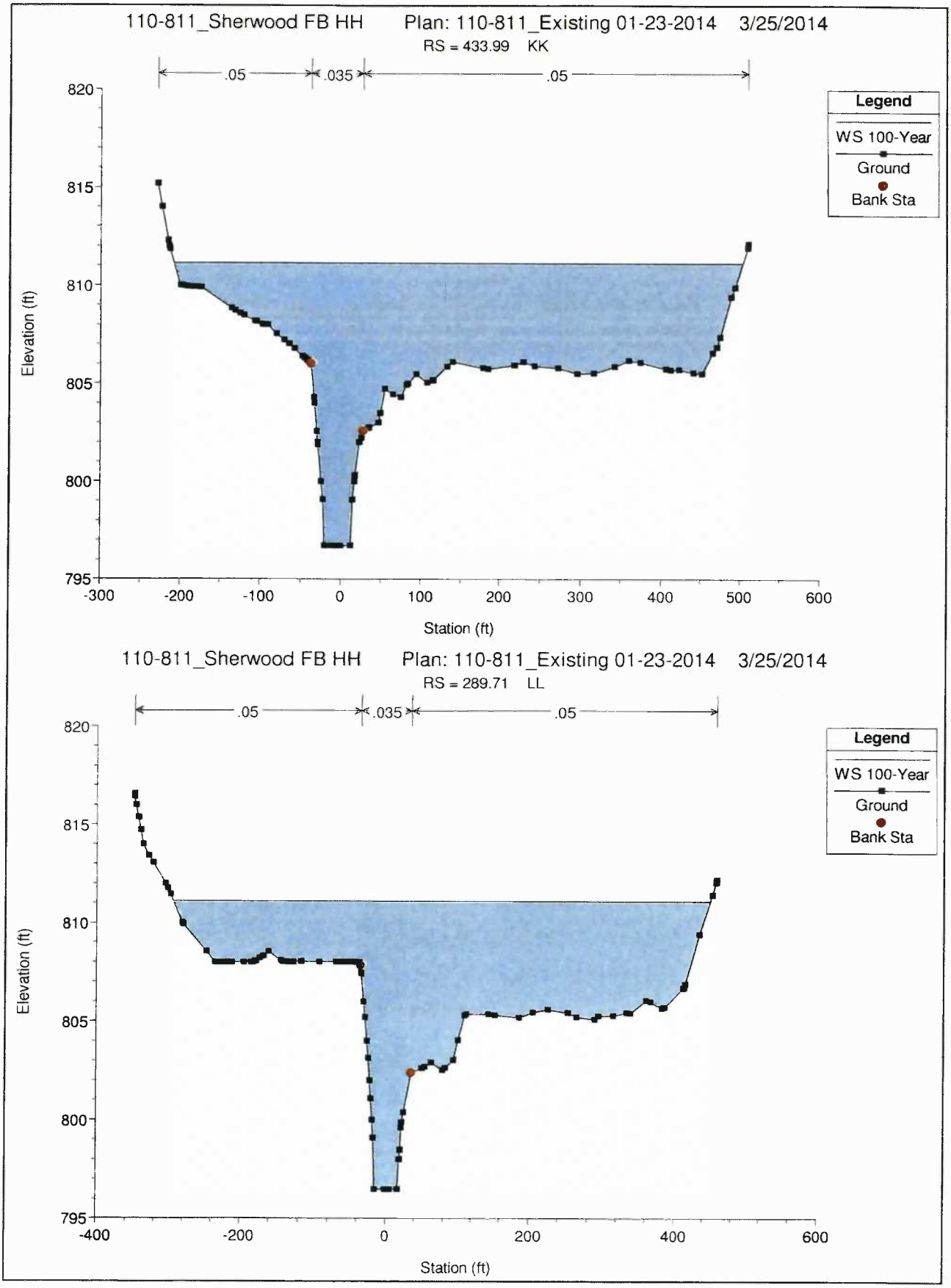

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 2154.54 AA
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-1200
-1000
-800
-600
-400
-200
0
200
400
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 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)

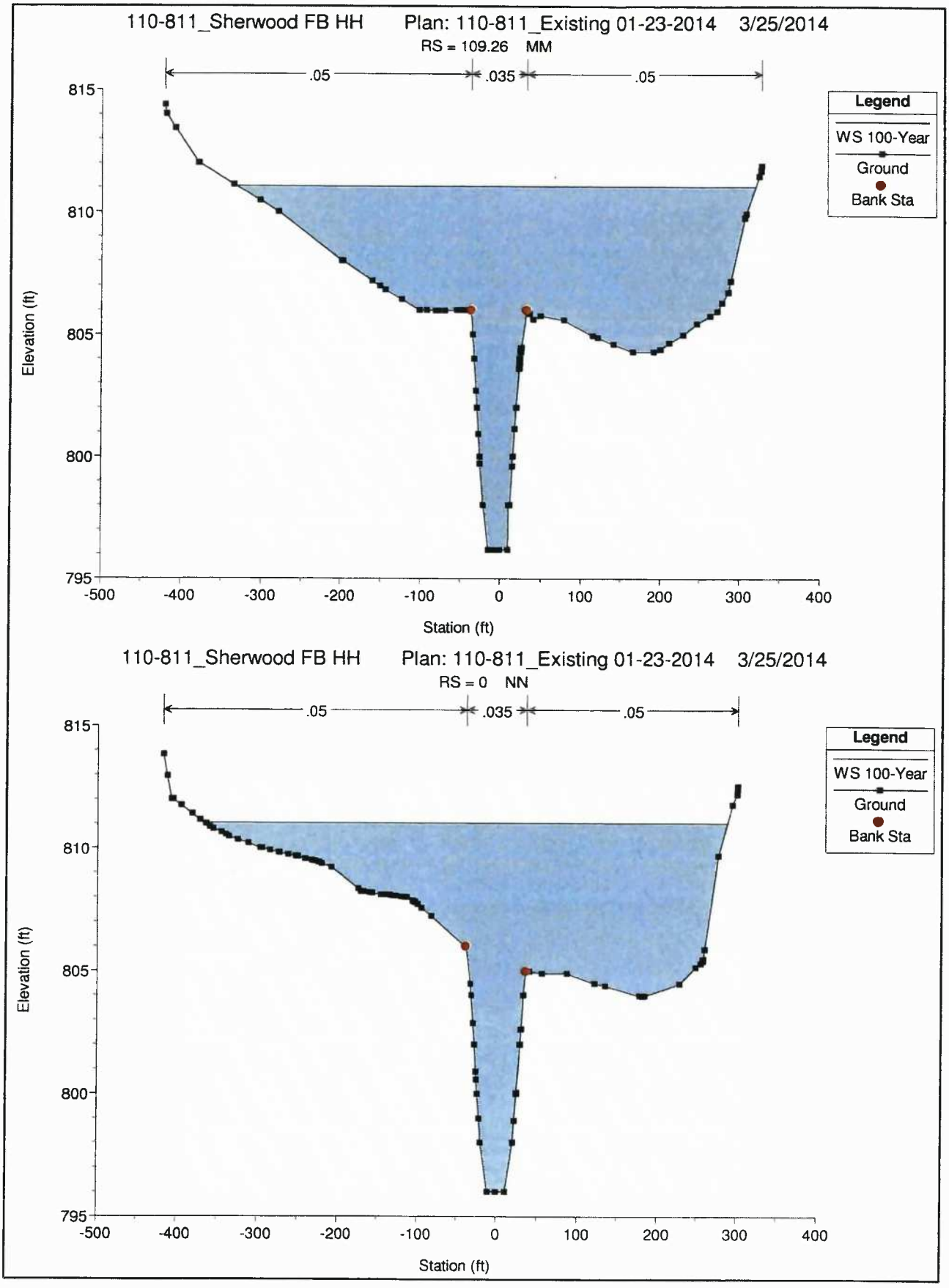

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 1903.41 CC
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
820
815
810
805
800
795
Elevation (ft)
-1500
-1000
-500
0
500
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 1604.54 DD
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
825
820
815
810
805
800
795
Elevation (ft)
-300
-200
-100
0
100
200
300
400
500
Station (ft)

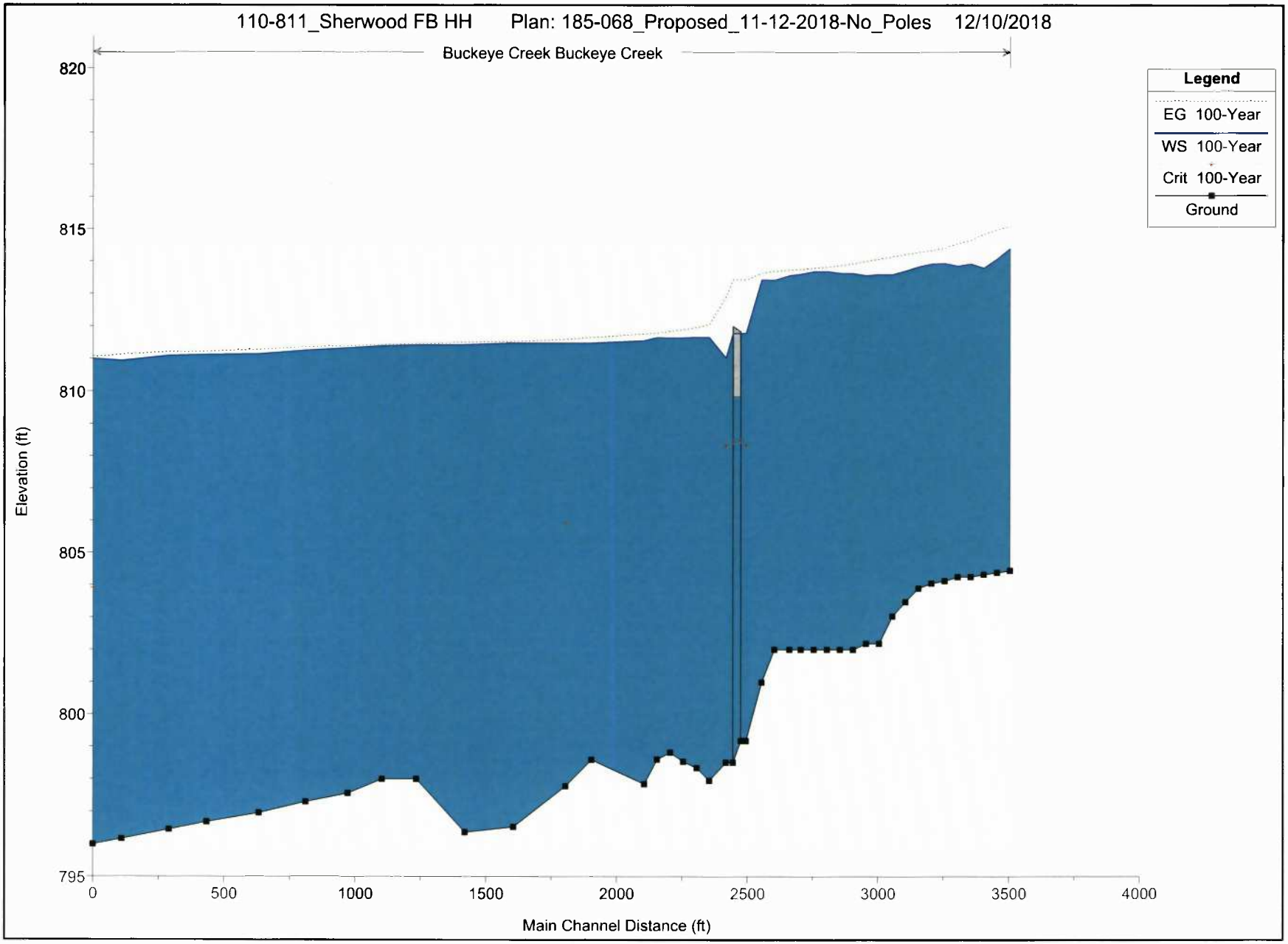

110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 1419.72 EE
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
815
810
805
800
795
-200
-100
0
100
200
300
400
500
600
Station (ft)
110-811_Sherwood FB HH Plan: 110-811_Existing 01-23-2014 3/25/2014
RS = 1234.05 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)
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: 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)
816
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 = 433.99 KK
.05
.035
.05
Legend
WS 100-Year
Ground
Bank Sta
820
815
810
805
800
795
Elevation (ft)
-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
820
815
810
805
800
795
Elevation (ft)
-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)
815
810
805
800
795
-500
-400
-300
-200
-100
0
100
200
300
400
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)
815
810
805
800
795
-500
-400
-300
-200
-100
0
100
200
300
400
Station (ft)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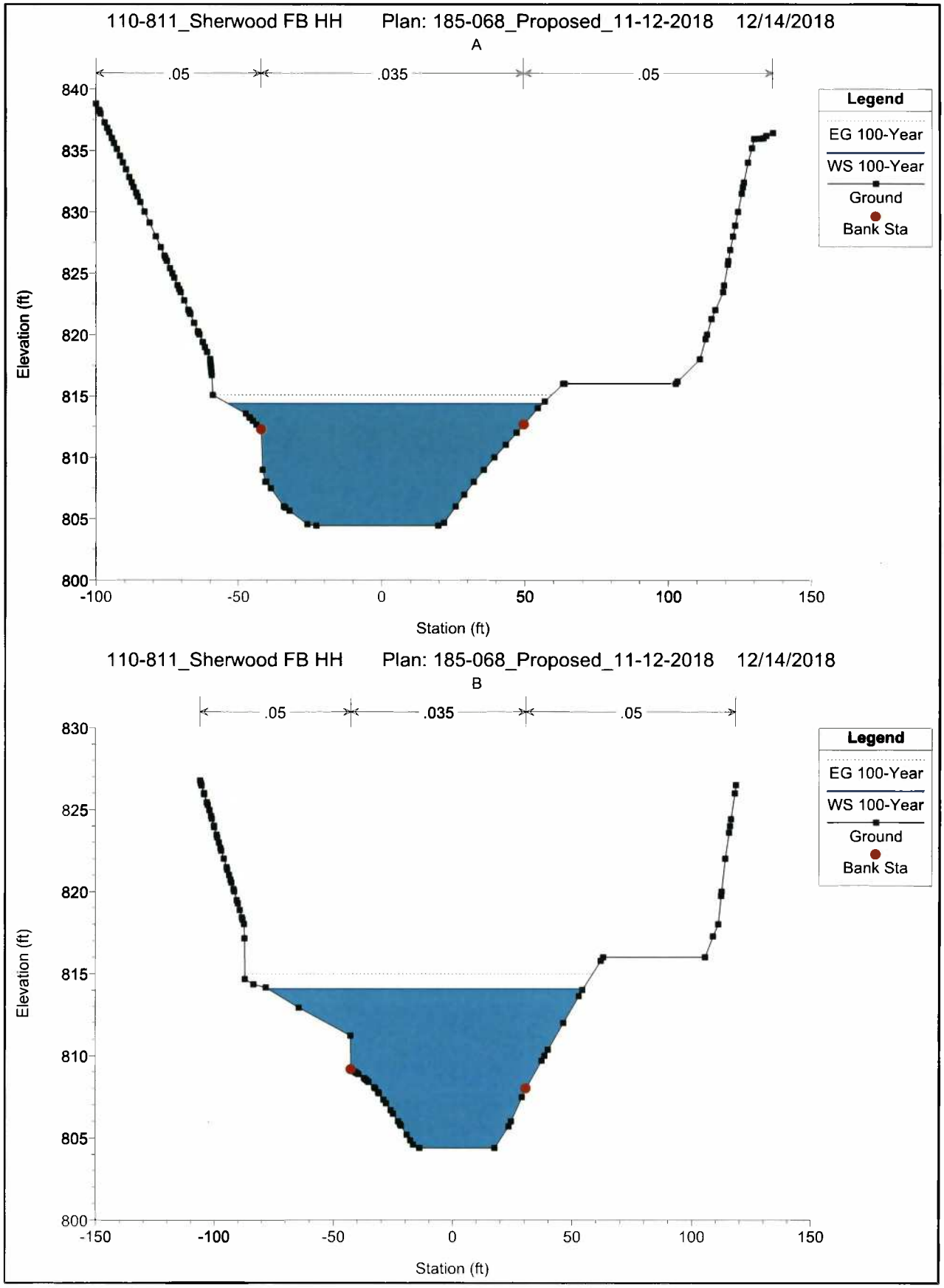
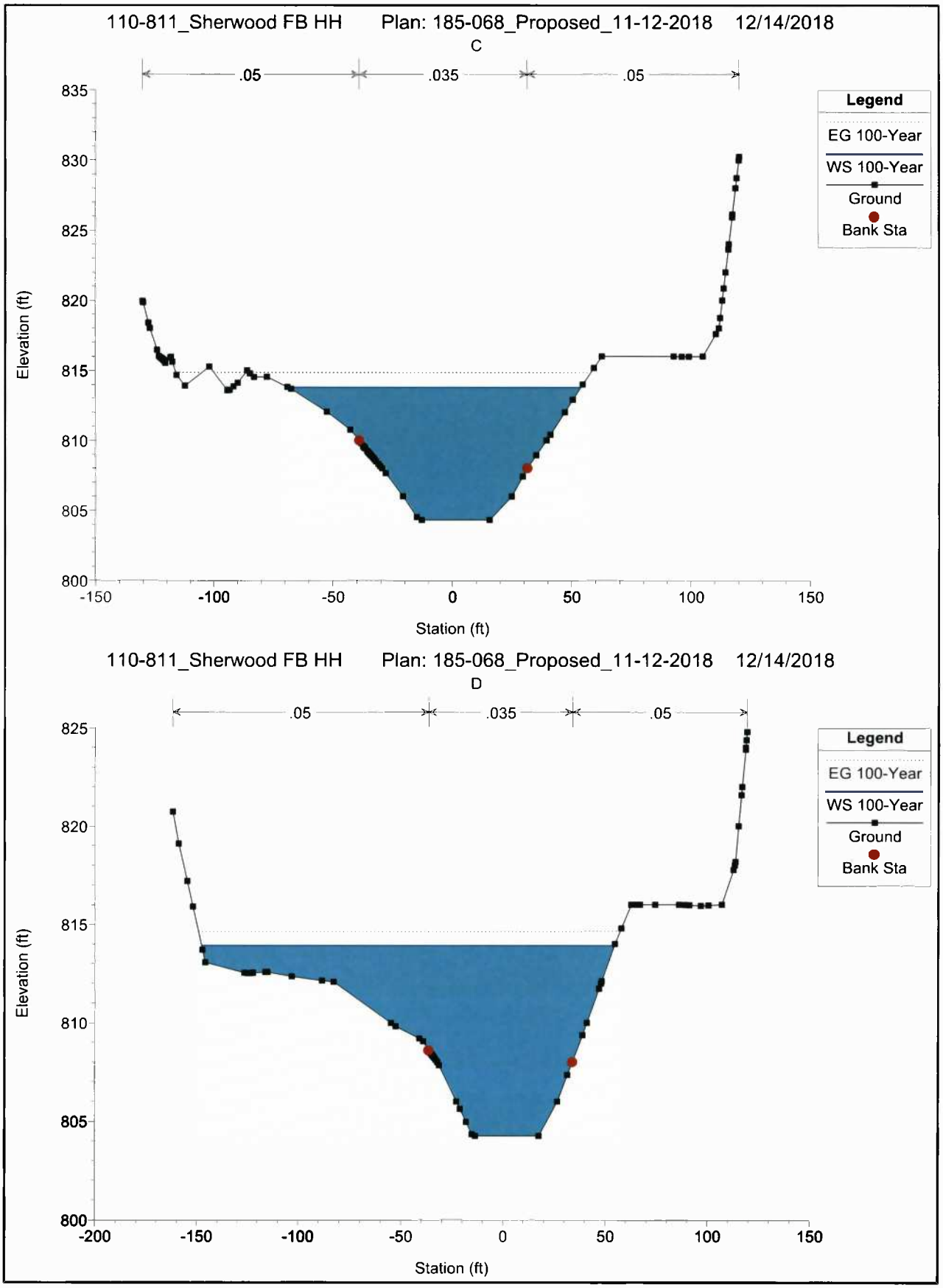
Buckeye Creek Buckeye Creek
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
820
815
810
805
800
795
Elevation (ft)
0
500
1000
1500
2000
2500
3000
3500
4000
Main Channel Distance (ft)

PREPARED BY: PJH 11/29/2018 CHECKED BY: ARC 11/29/2018




110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
C
.05
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
835
830
825
820
815
810
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800
-150
-100
-50
0
50
100
150
Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
D
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
825
820
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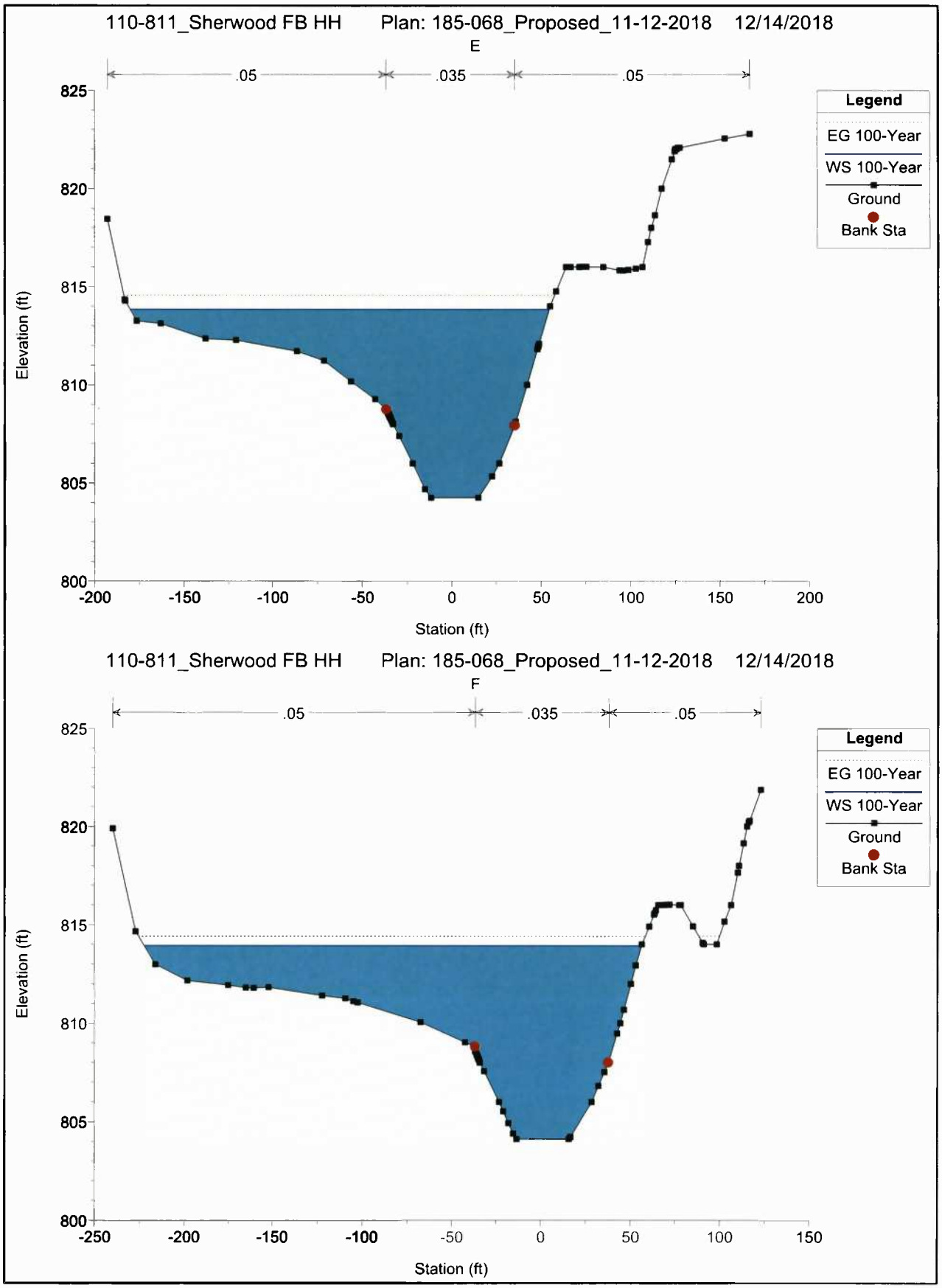
-100
-50
0
50
100
150
Station (ft)


110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
F
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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820
815
810
805
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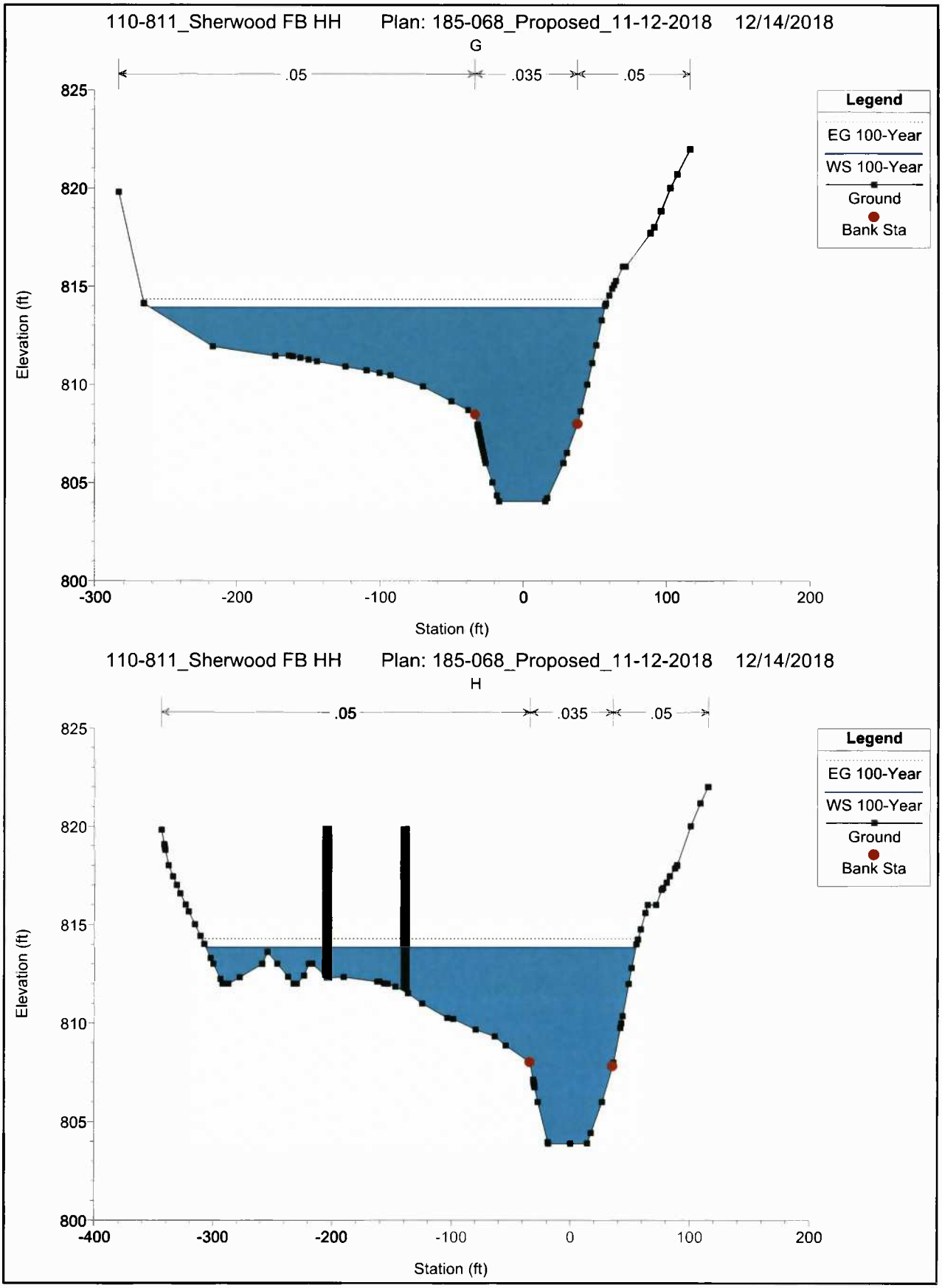
-200
-150
-100
-50
0
50
100
150
Station (ft)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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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820
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810
805
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-300
-200
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
H
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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-300
-200
-100
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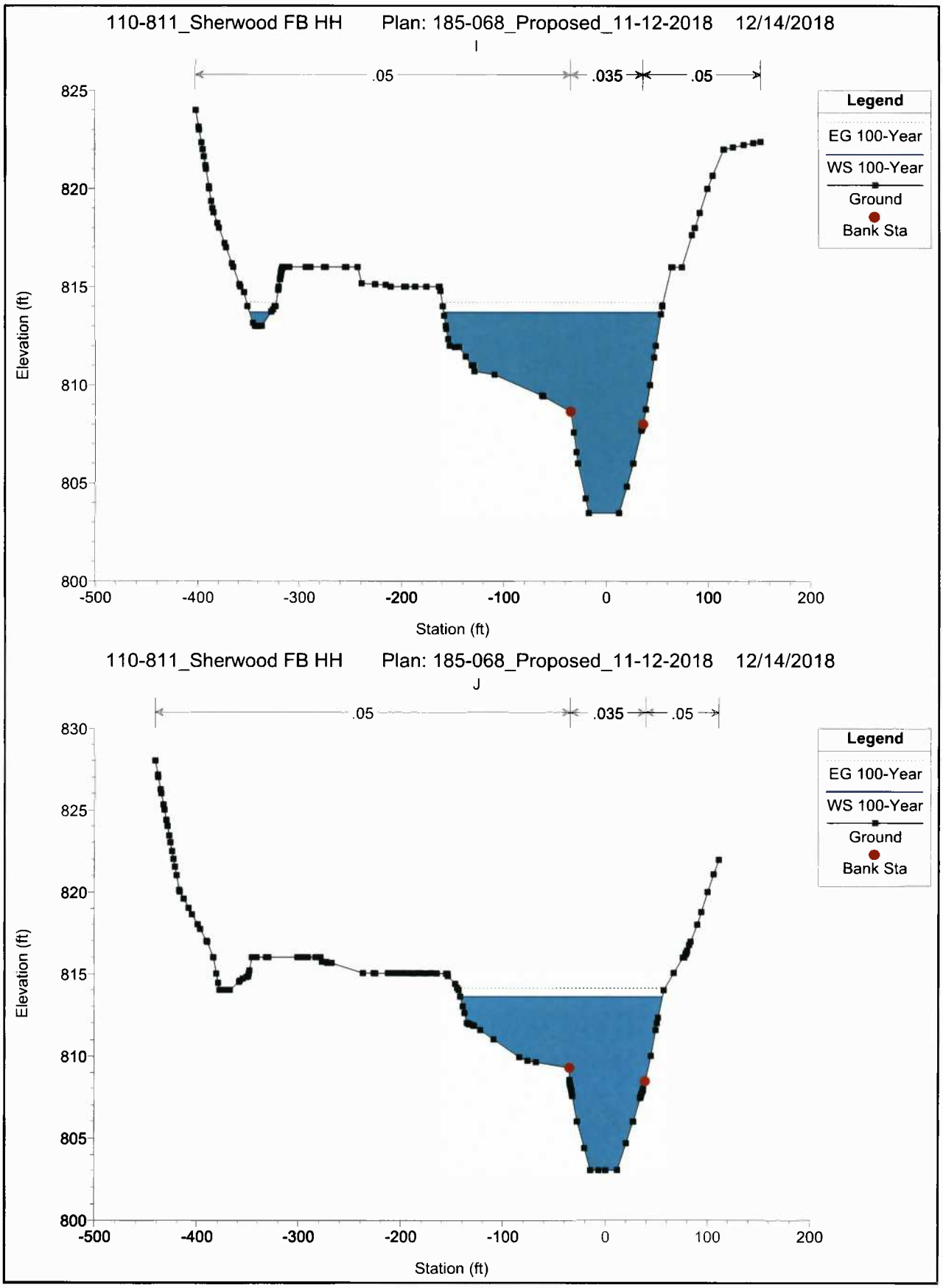
100
200
Station (ft)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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
J
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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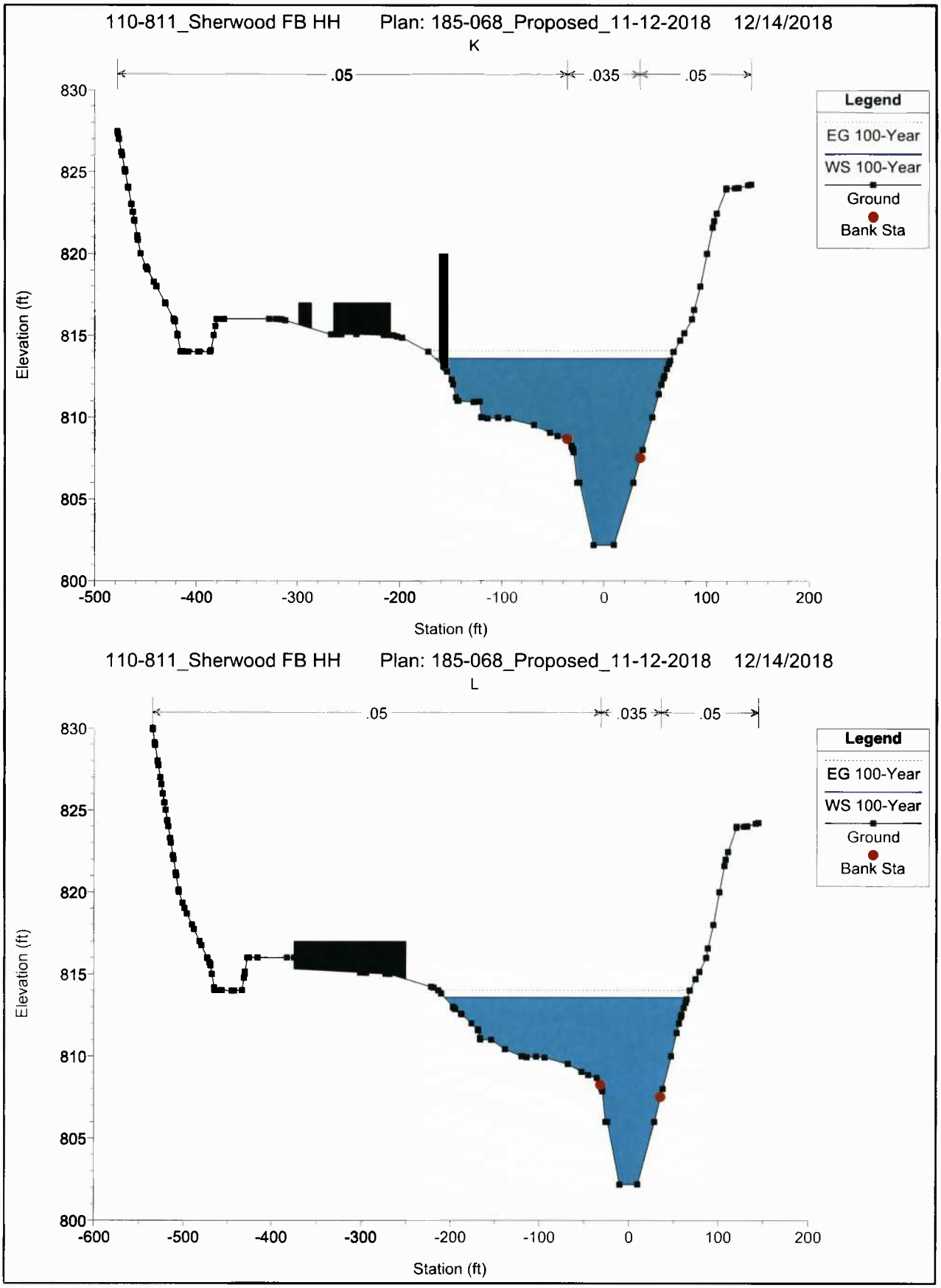
Station (ft)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K
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
L
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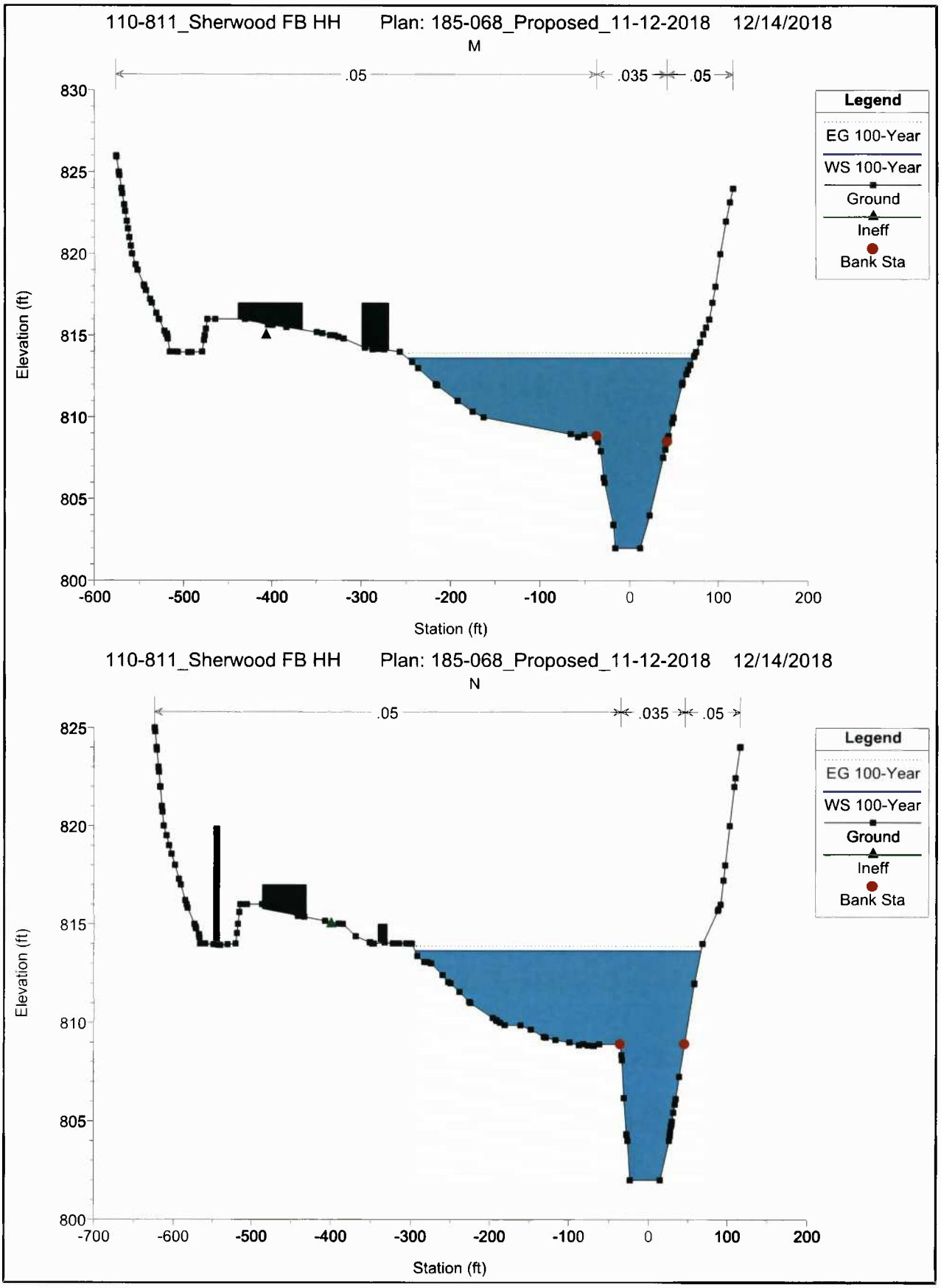
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)


110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
M
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Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
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-400
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-200
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
N
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Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
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-400
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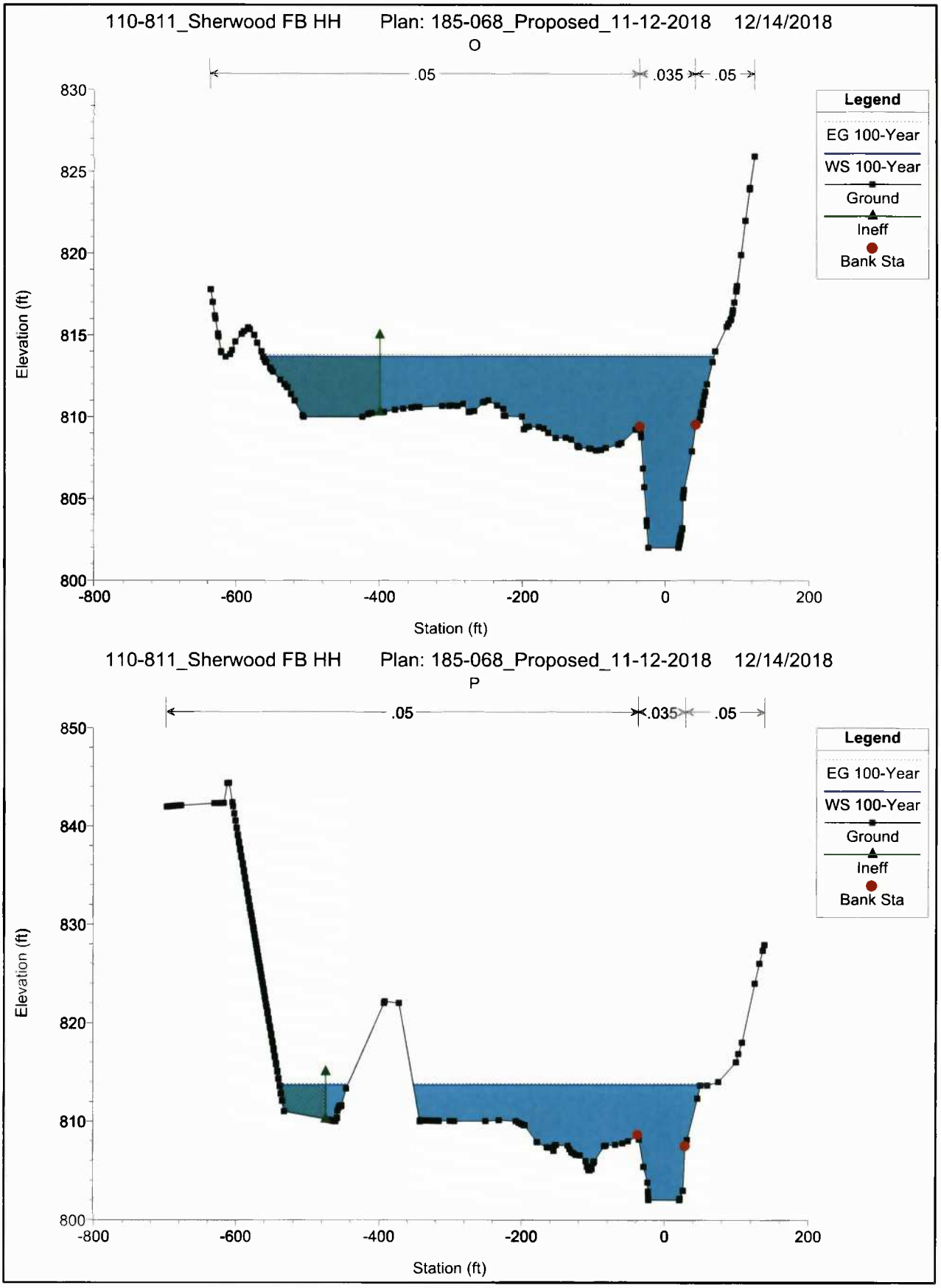
Station (ft)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Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
P
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Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
850
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830
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800
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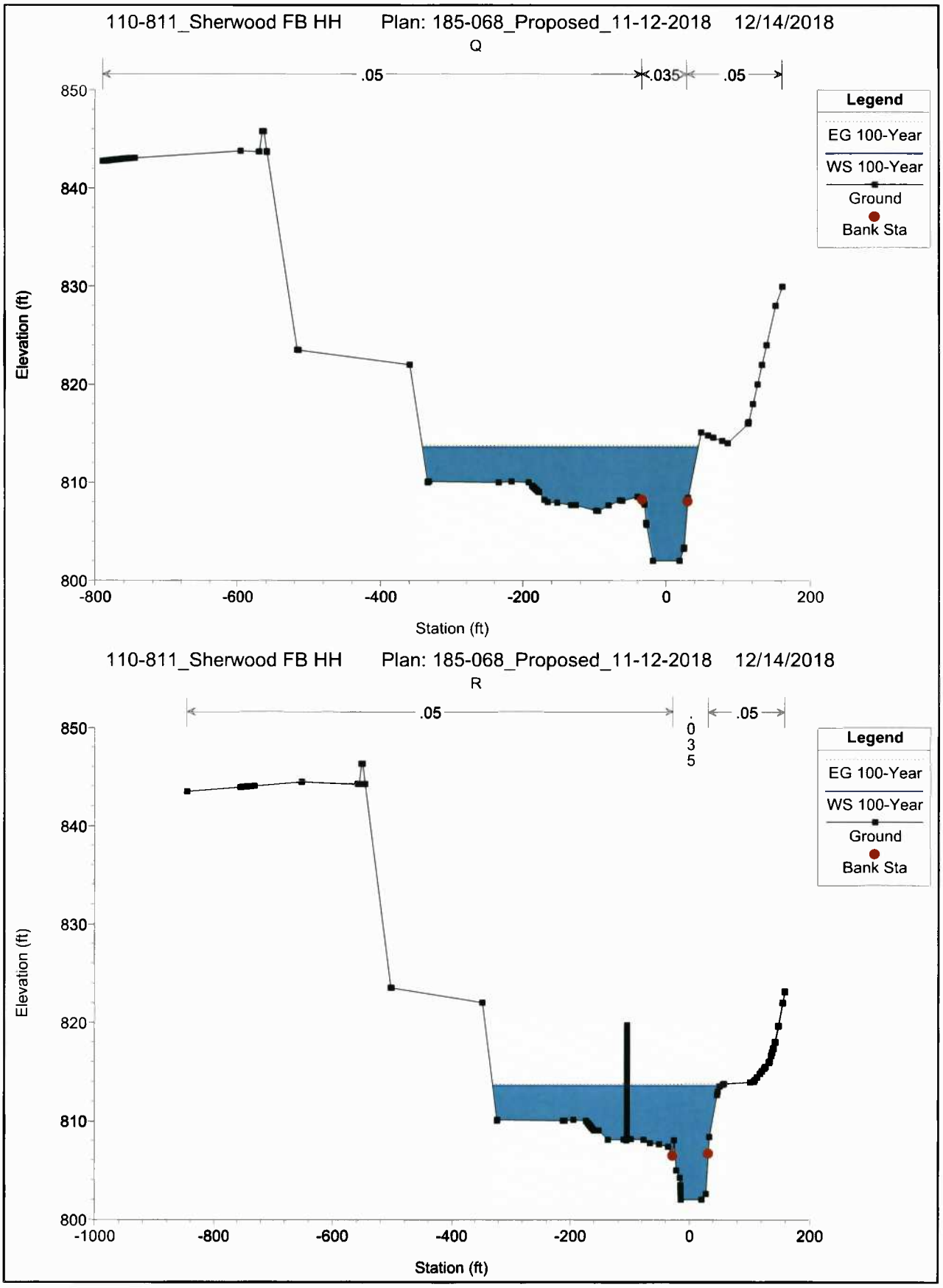
-600
-400
-200
0
200
Station (ft)


110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
Q
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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-200
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
R
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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-400
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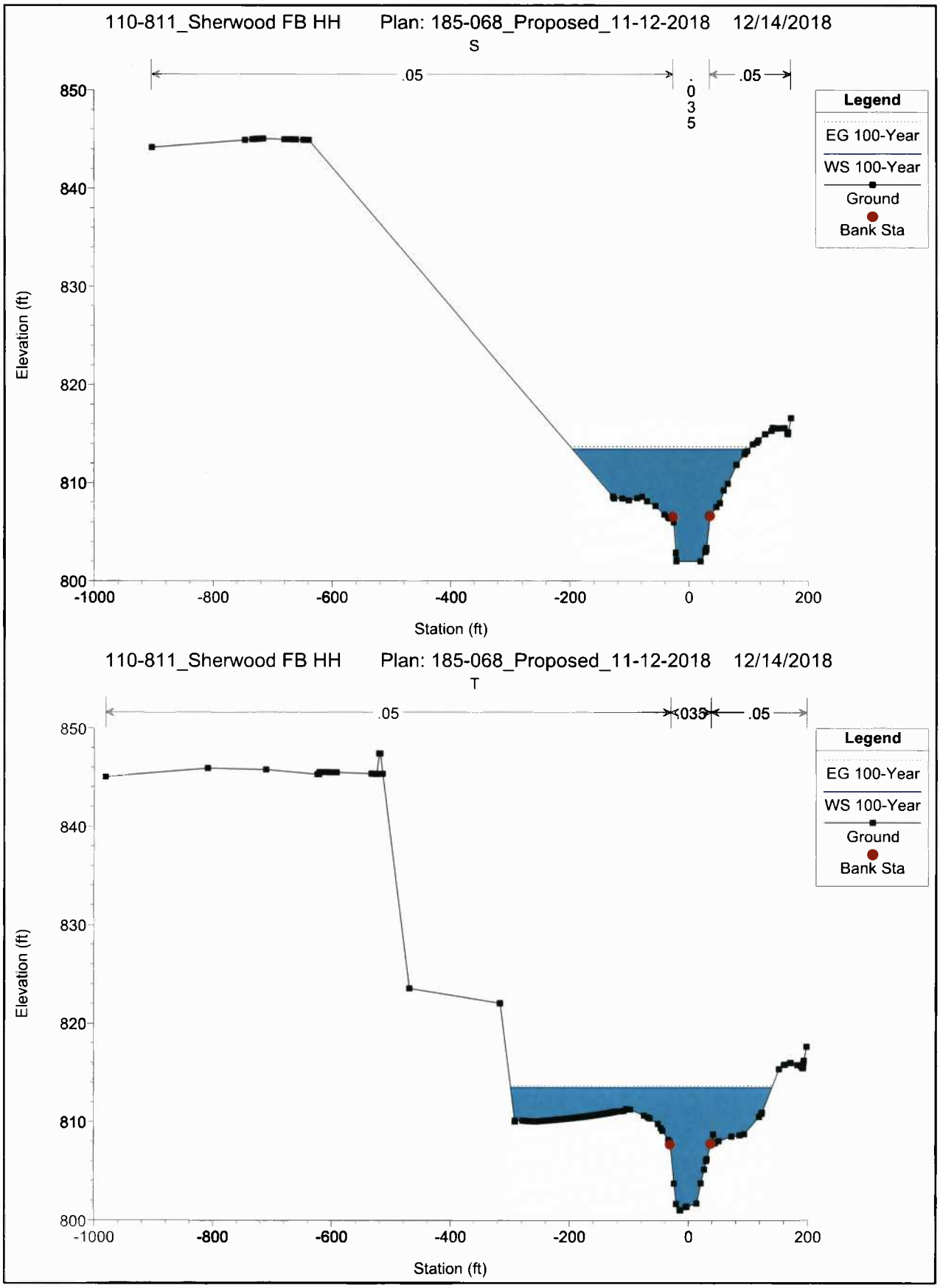
Station (ft)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S
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Legend
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WS 100-Year
Ground
Bank Sta
Elevation (ft)
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-600
-400
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
T
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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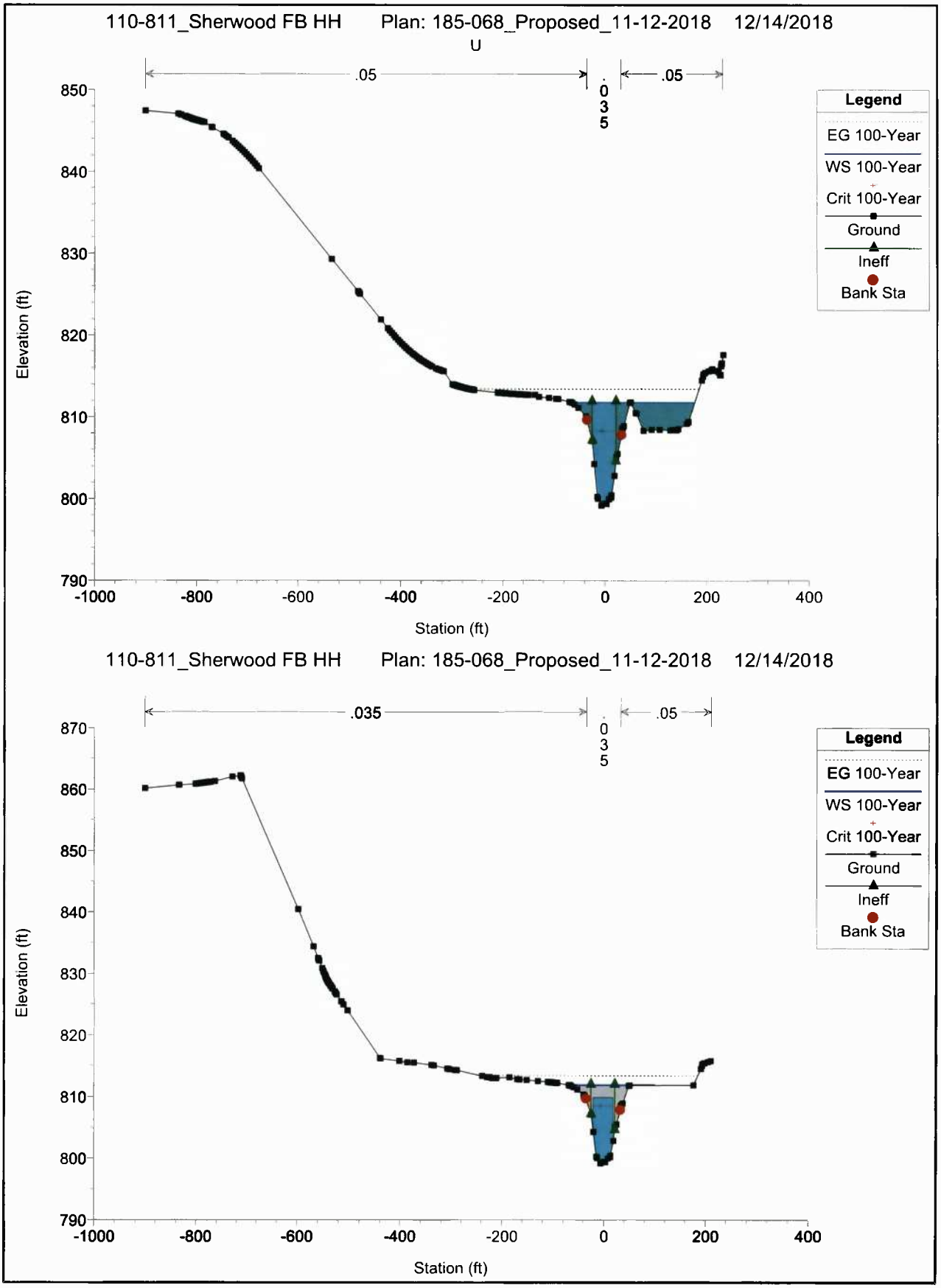
Station (ft)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U
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Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
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Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
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850
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-1000
-800
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-400
-200
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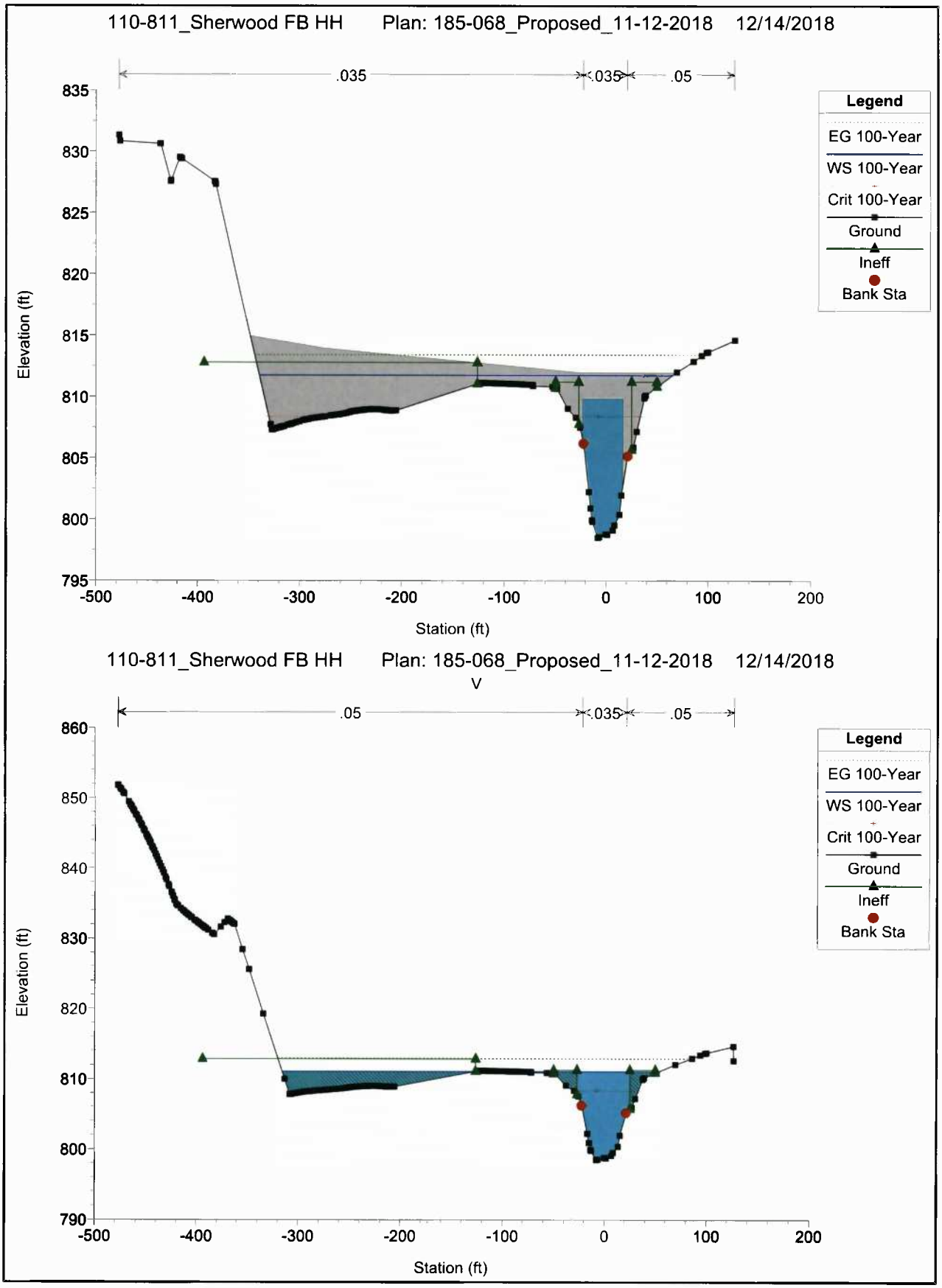
Station (ft)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.035
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Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
835
830
825
820
815
810
805
800
795
-500
-400
-300
-200
-100
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200
Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
V
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Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
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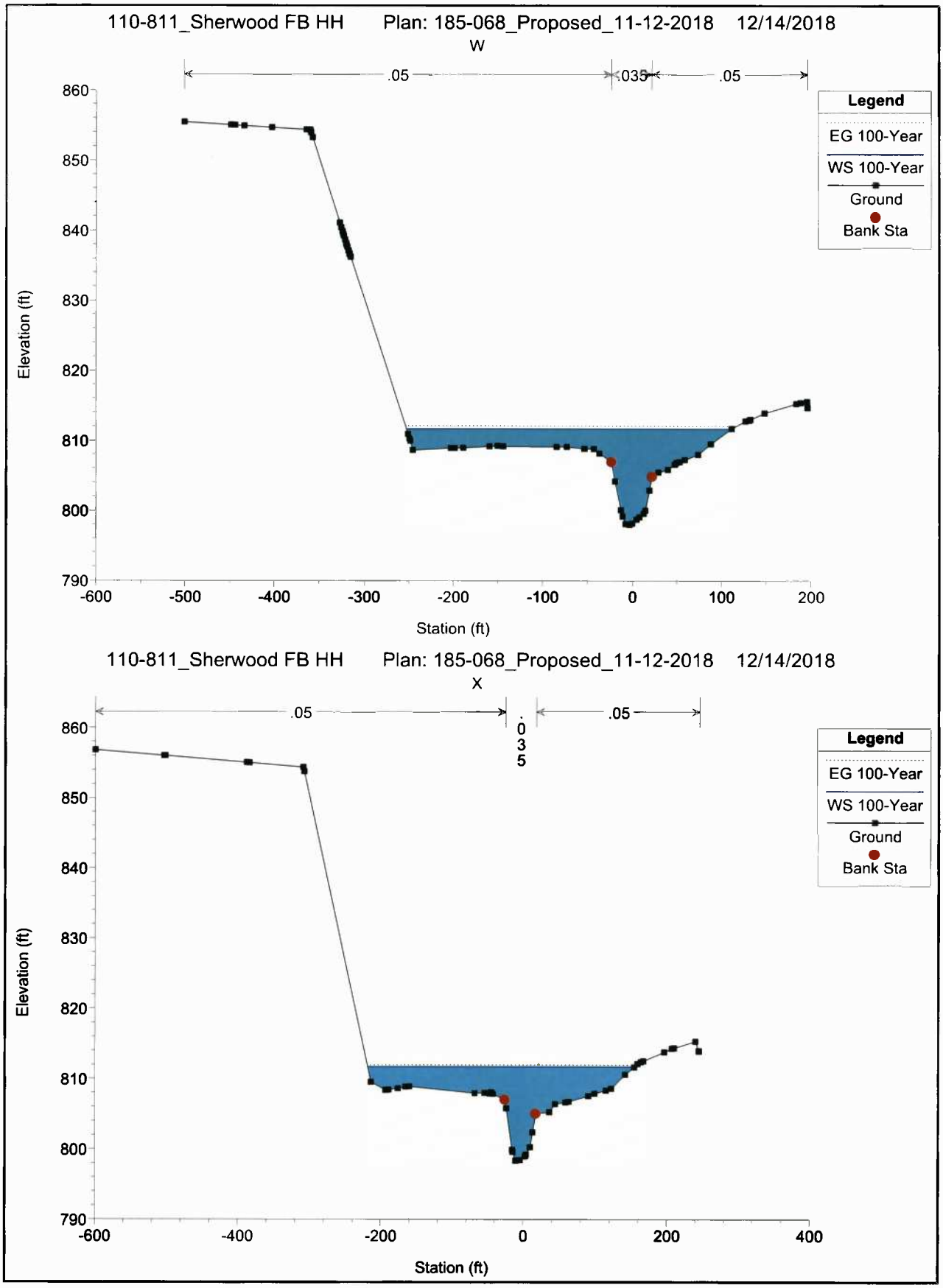
850
840
830
820
810
800
790
-500
-400
-300
-200
-100
0
100
200
Station (ft)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W
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
860
850
840
830
820
810
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790
-600
-500
-400
-300
-200
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
X
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
860
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-600
-400
-200
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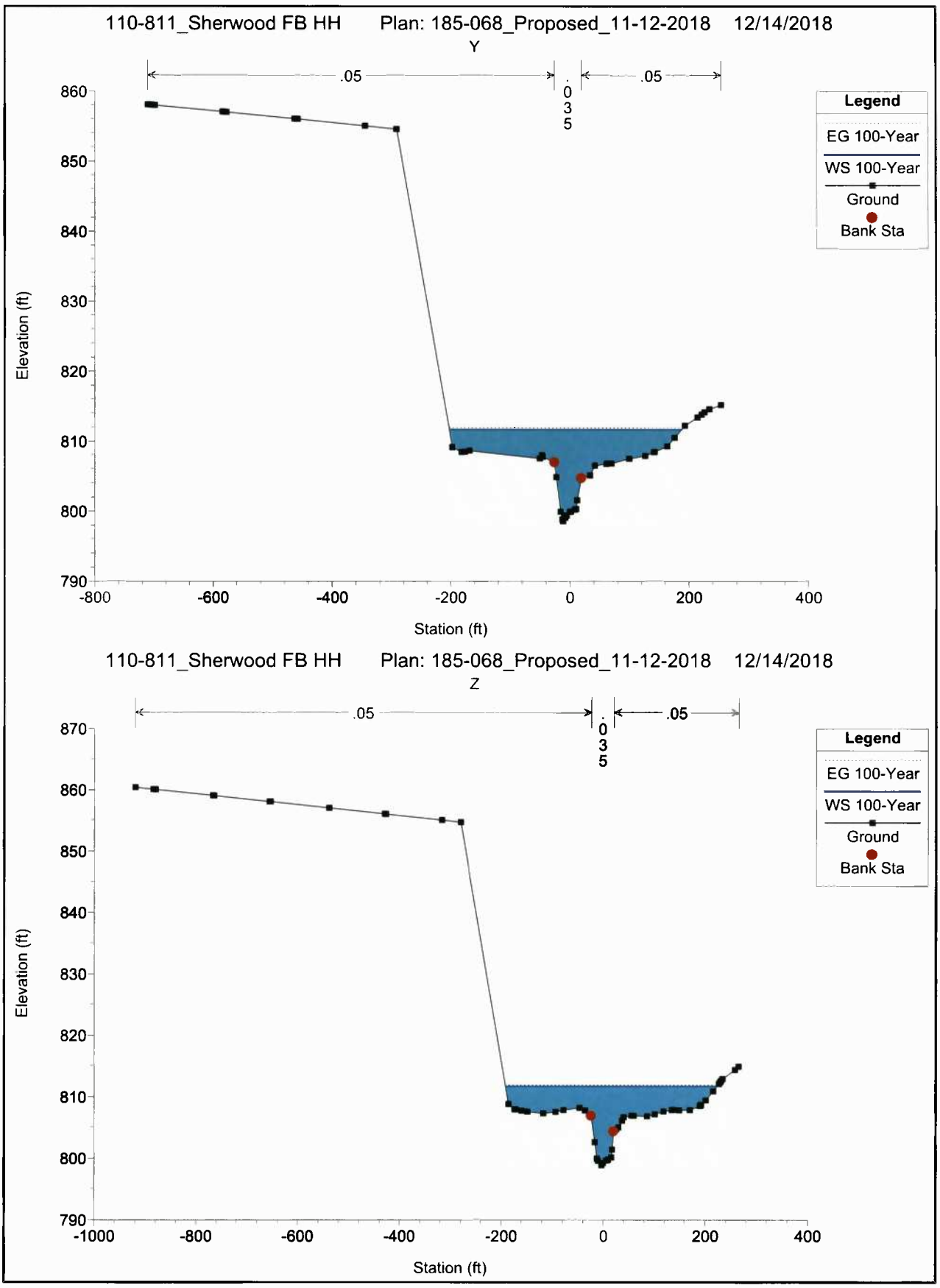
200
400
Station (ft)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Y
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
860
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
Z
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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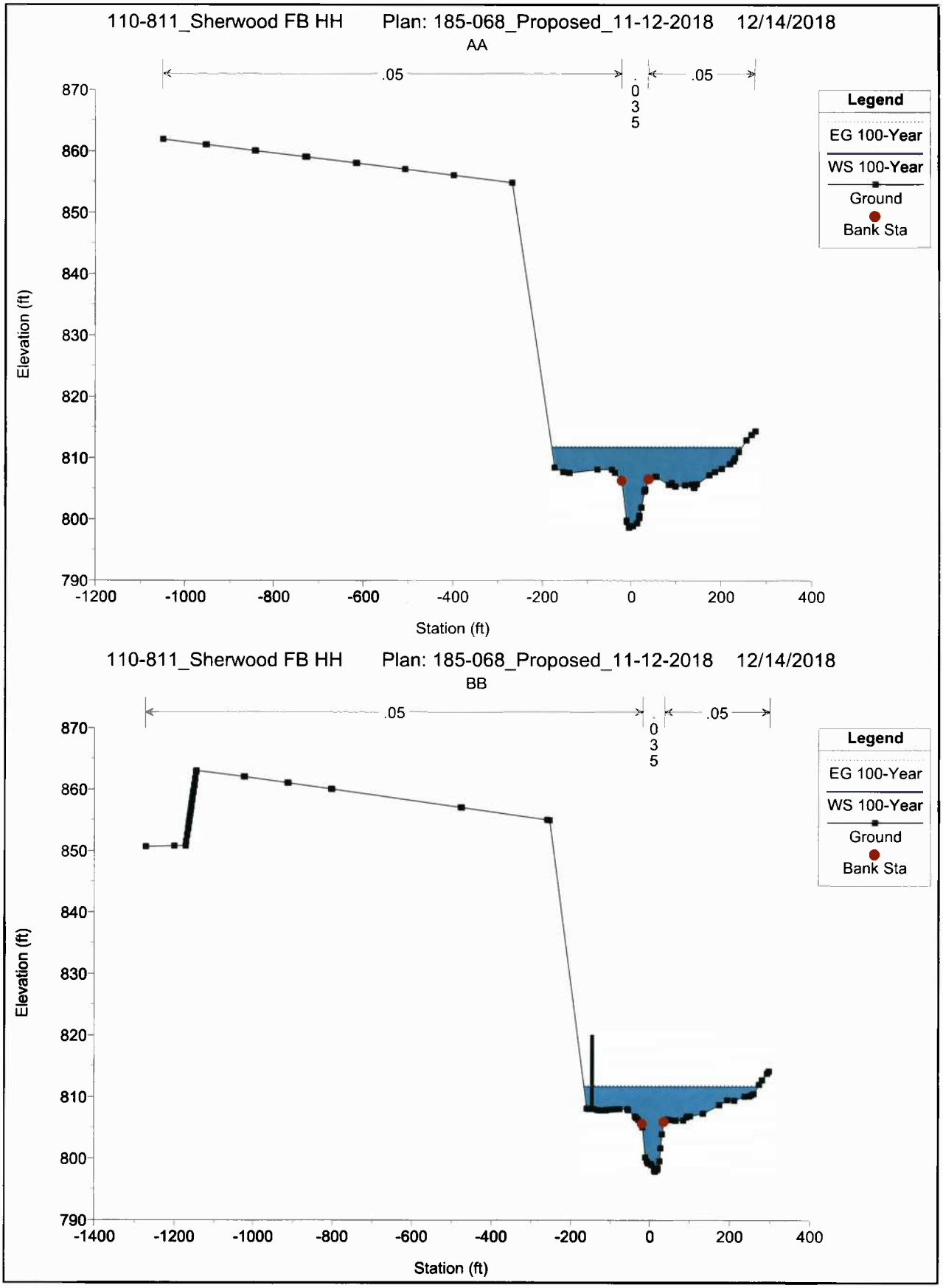
Station (ft)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AA
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
870
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850
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830
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790
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-1000
-800
-600
-400
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400
Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
BB
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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-400
-200
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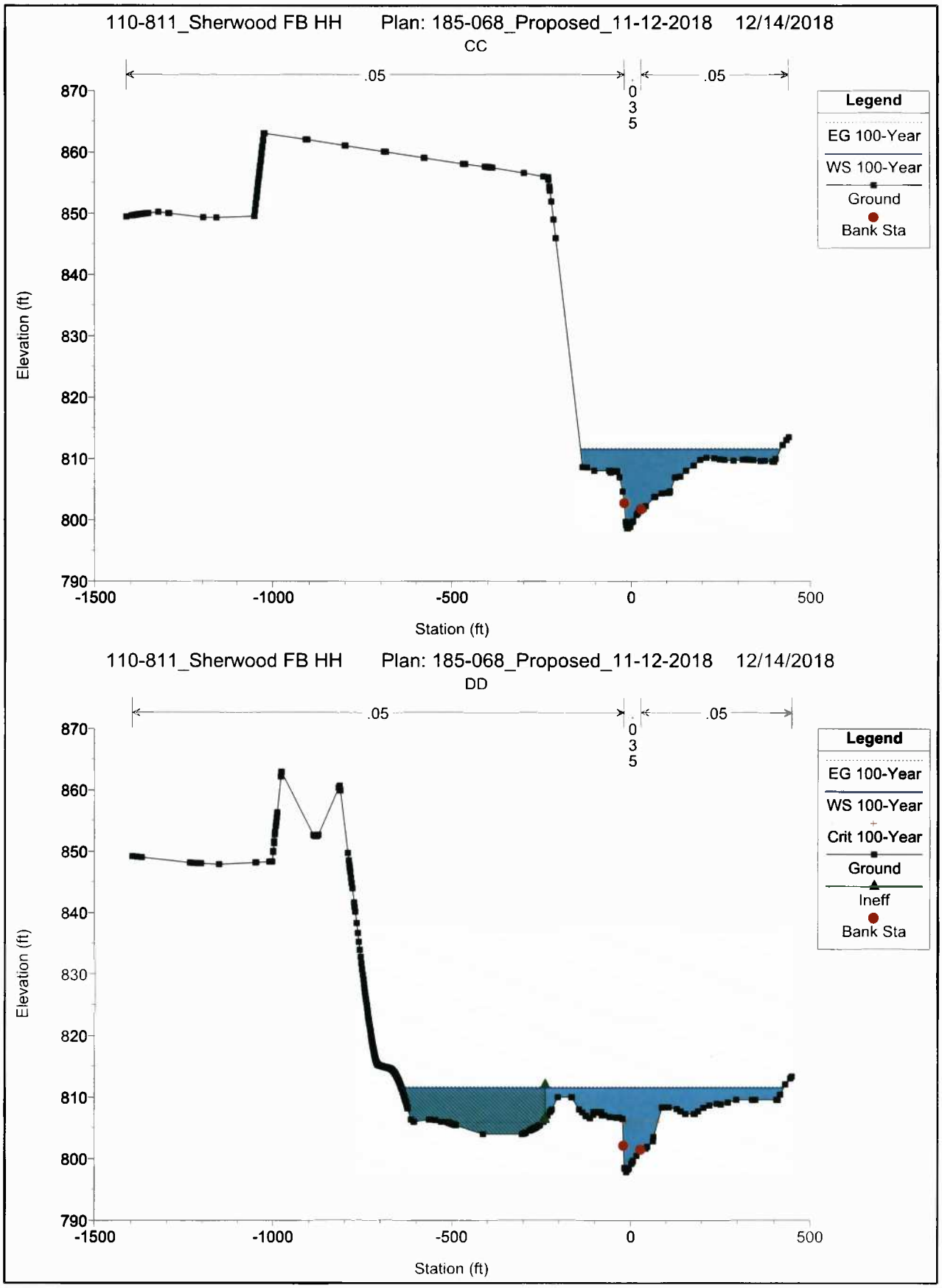
200
400
Station (ft)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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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-500
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
DD
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Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
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810
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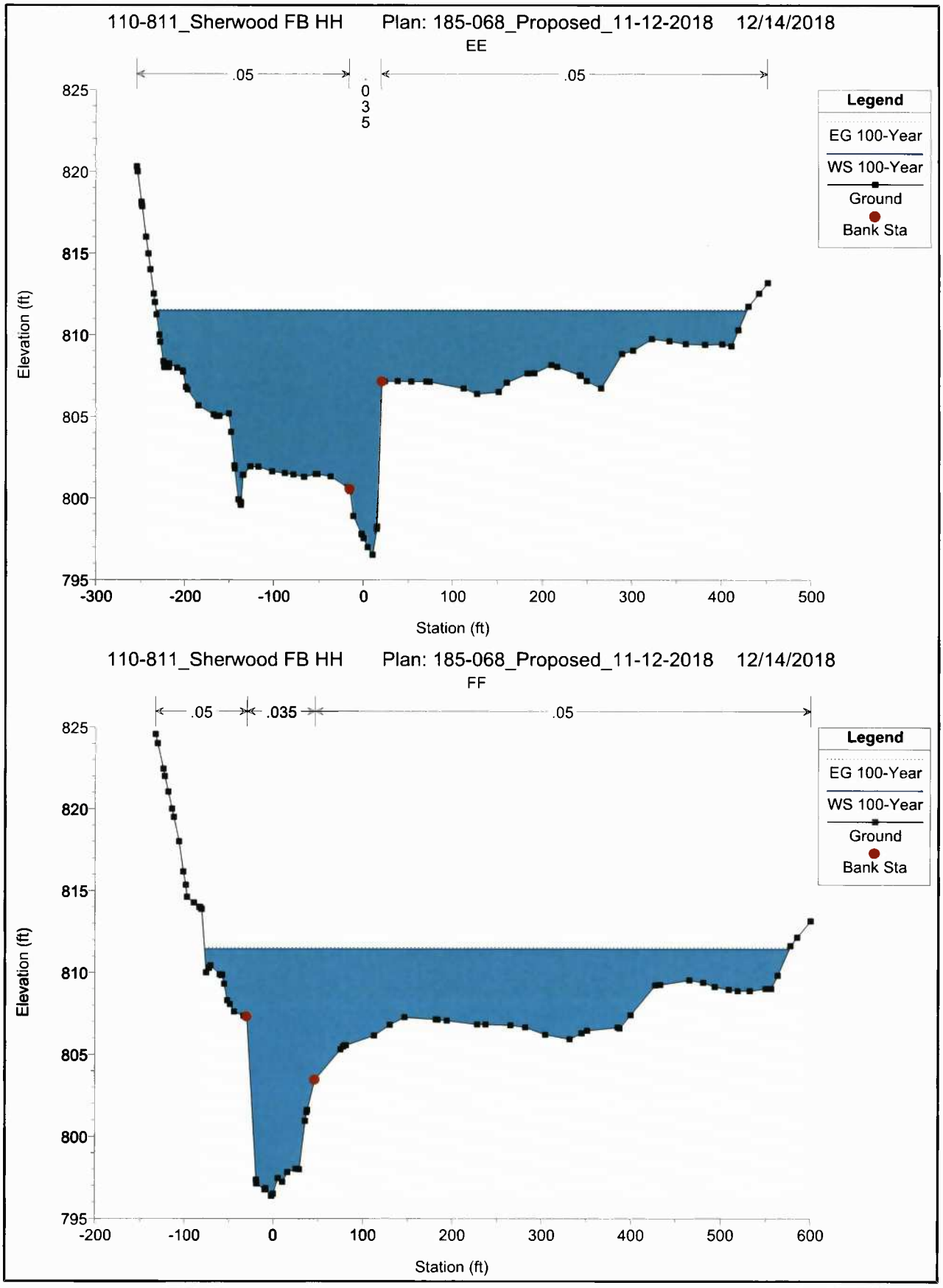
Station (ft)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EE
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
FF
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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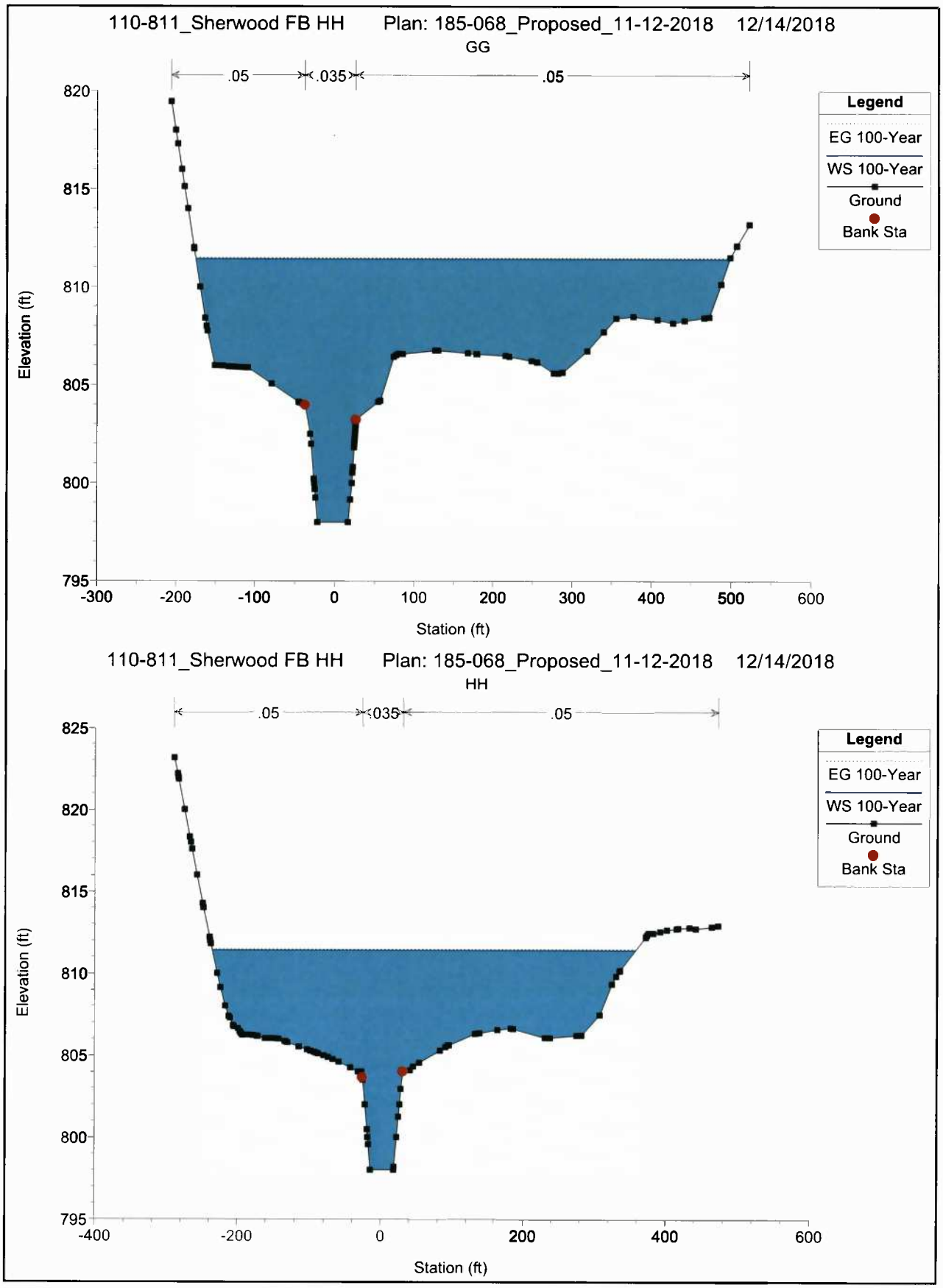
Station (ft)


110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
GG
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
HH
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Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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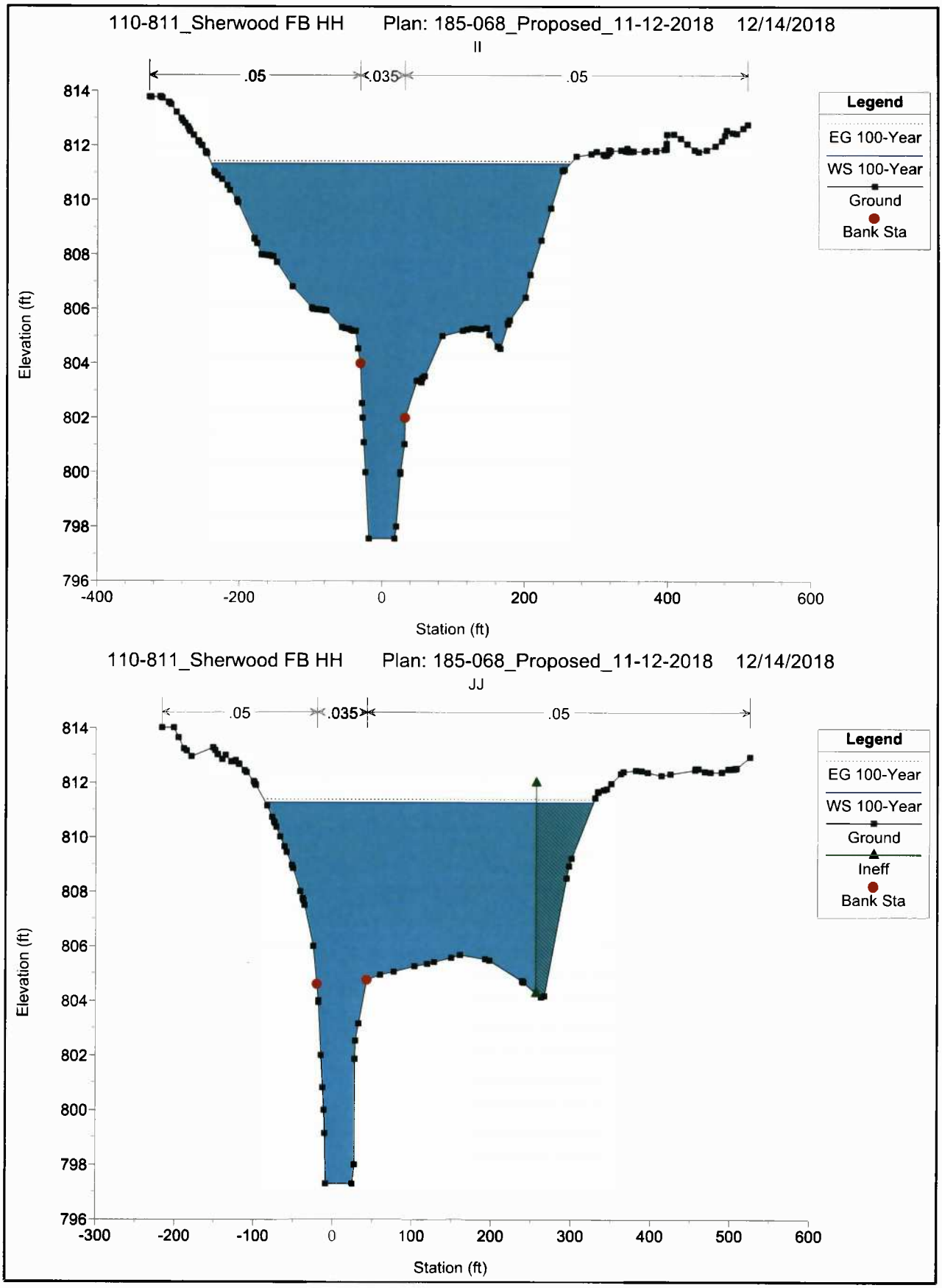
Station (ft)


110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
II
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.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
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804
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800
798
796
-400
-200
0
200
400
600
Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
JJ
.05
.035
.05
Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
814
812
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798
796
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-200
-100
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100
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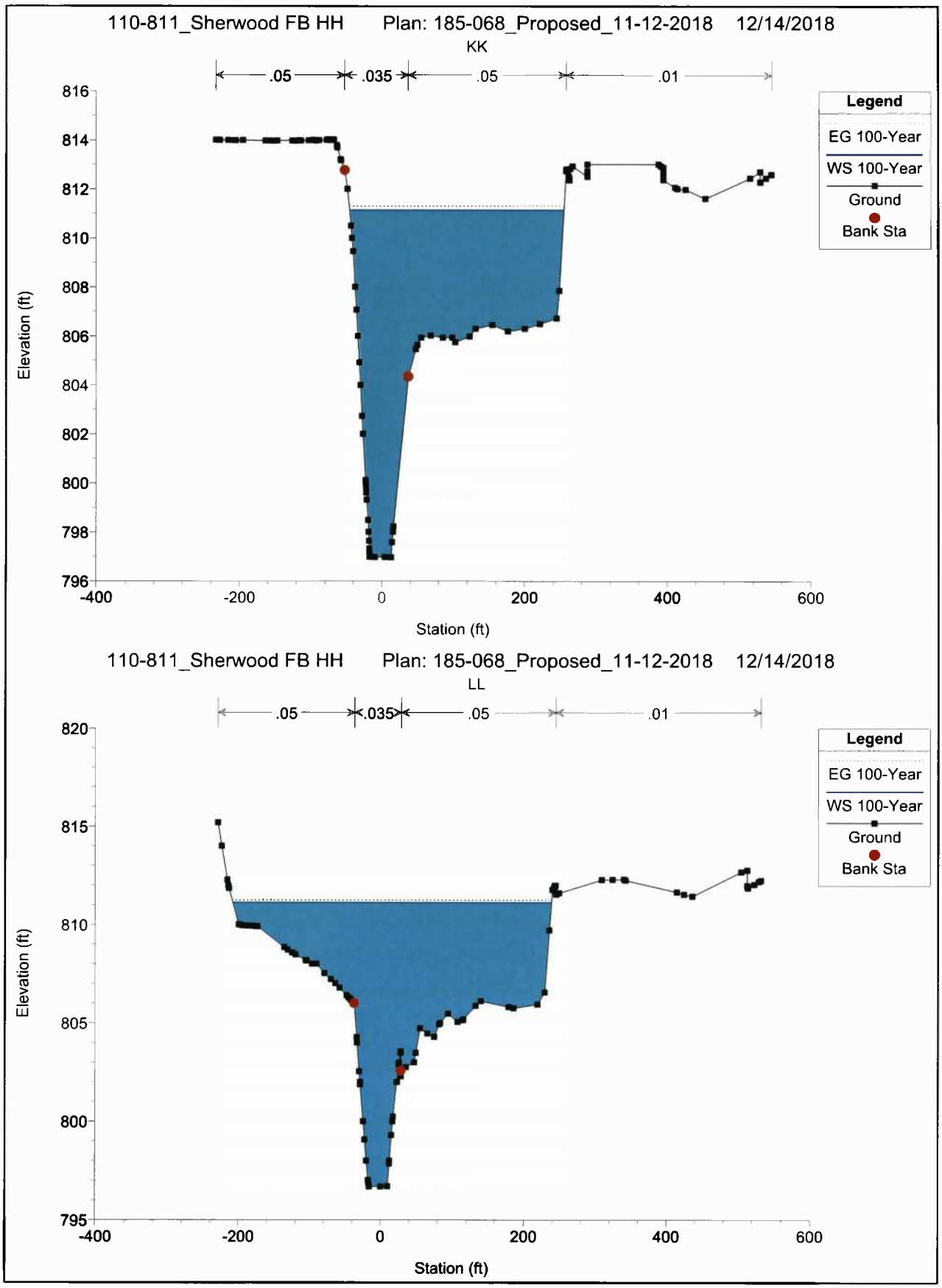
500
600
Station (ft)


110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
KK
.05
.035
.05
.01
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
Elevation (ft)
816
814
812
810
808
806
804
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800
798
796
-400
-200
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200
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600
Station (ft)
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
LL
.05
.035
.05
.01
Legend
EG 100-Year
WS 100-Year
Ground
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Elevation (ft)
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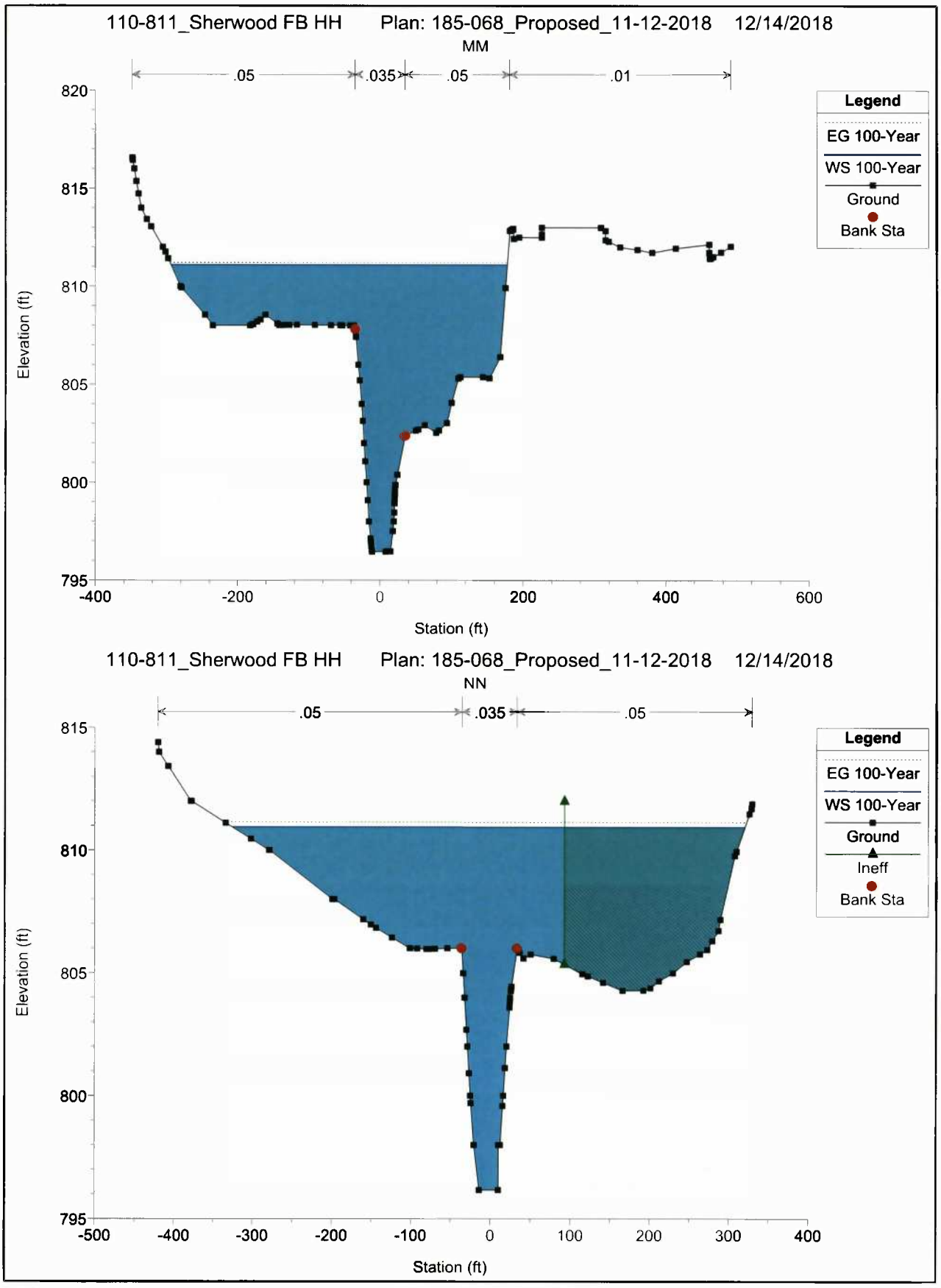
200
400
600
Station (ft)


110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
MM
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Elevation (ft)
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Station (ft)
Legend
EG 100-Year
WS 100-Year
Ground
Bank Sta
110-811_Sherwood FB HH Plan: 185-068_Proposed_11-12-2018 12/14/2018
NN
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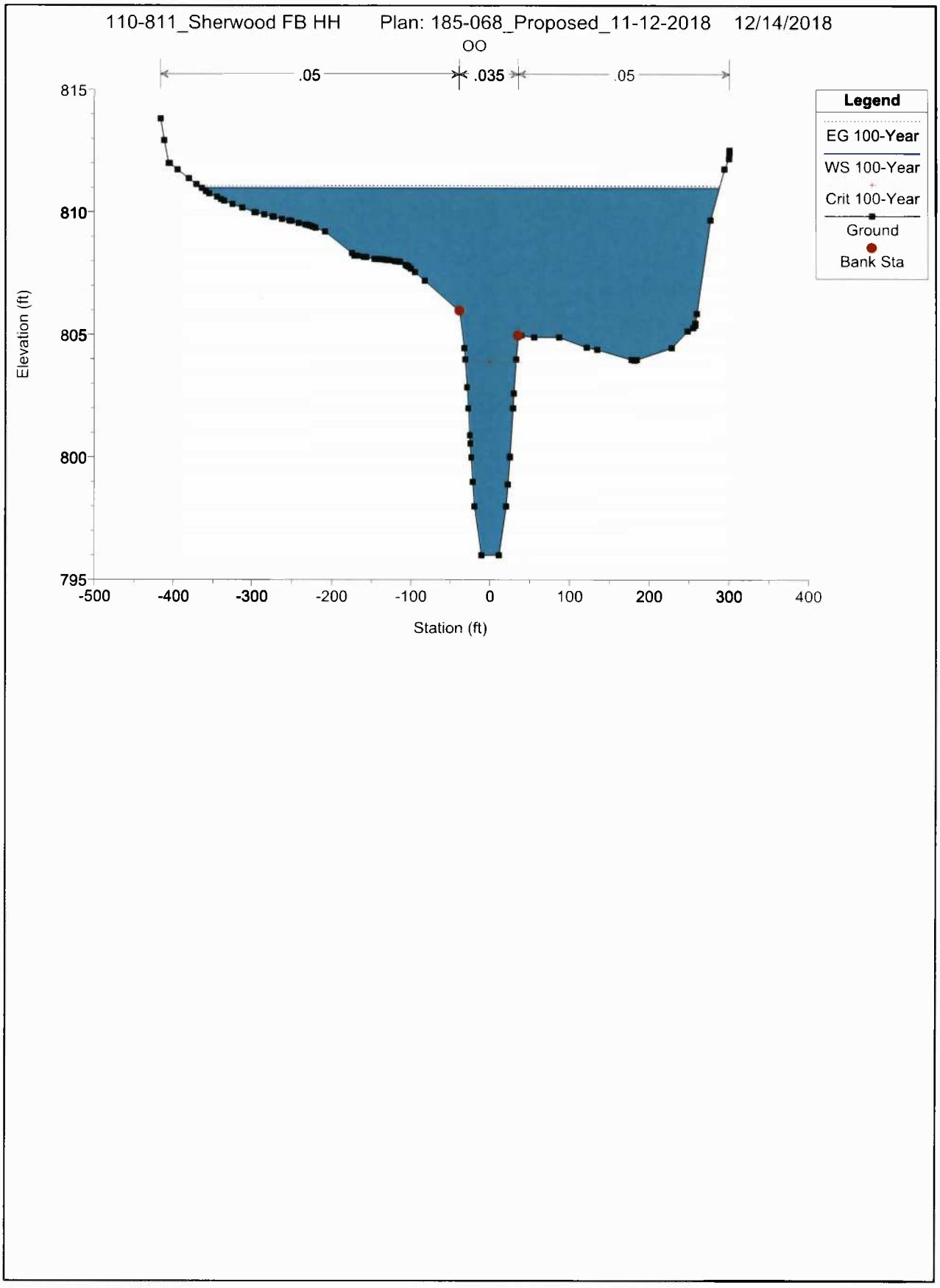
805
800
795
Elevation (ft)
-500
-400
-300
-200
-100
0
100
200
300
400
Station (ft)
Legend
EG 100-Year
WS 100-Year
Ground
Ineff
Bank Sta


110-811_Sherwood FB HH
Plan: 185-068_Proposed_11-12-2018
12/14/2018
OO
.05
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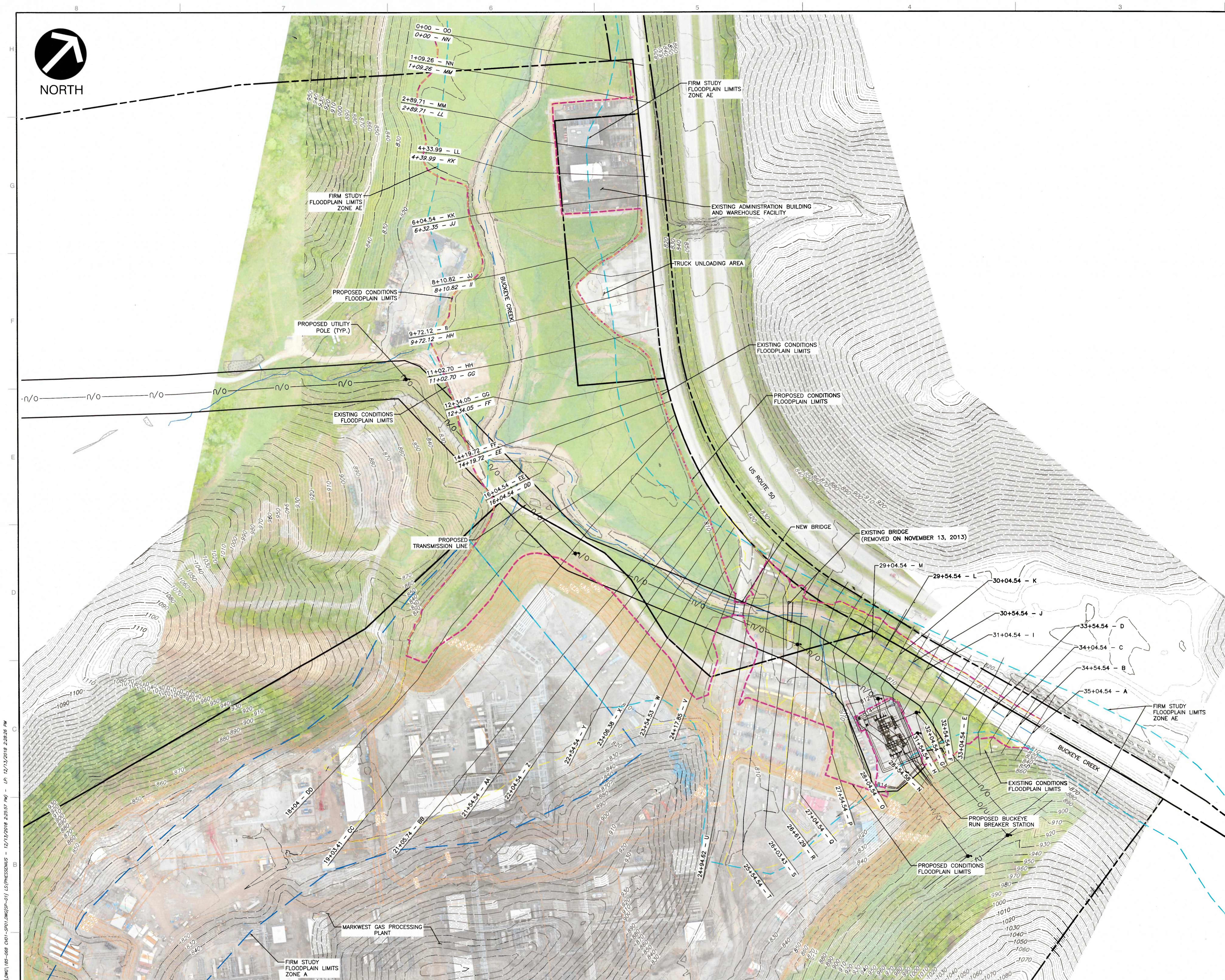
Legend
EG 100-Year
WS 100-Year
Crit 100-Year
Ground
Bank Sta
Elevation (ft)
815
810
805
800
795
-500
-400
-300
-200
-100
0
100
200
300
400
Station (ft)



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.

* HAND SIGNATURE ON FILE

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
513-985-0226 · 800-759-5614
www.cecinc.com

MONONGAHELA POWER COMPANY, A FIRSTENERGY COMPANY, BUCKEYE RUN BREAKER STATION 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:	185-068		
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	2603.43	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	2354.53	100-Year	5150.00	797.95	811.43		811.70	0.000761	5.48	1958.87	564.25	0.29
Buckeye Creek	2306.38	100-Year	5150.00	798.34	811.42		811.61	0.000648	4.95	2332.46	710.67	0.27
Buckeye Creek	2254.54	100-Year	5150.00	798.53	811.43		811.56	0.000476	4.18	2824.02	832.81	0.23
Buckeye Creek	2204.54	100-Year	5150.00	798.81	811.46		811.51	0.000236	3.00	3956.71	1014.95	0.16
Buckeye Creek	2154.54	100-Year	5150.00	798.60	811.46		811.50	0.000163	2.44	4714.72	1211.03	0.14
Buckeye Creek	2105.74	100-Year	5150.00	797.84	811.45		811.49	0.000161	2.57	4984.39	1422.68	0.14
Buckeye Creek	1903.41	100-Year	5150.00	798.59	811.44		811.46	0.000097	2.08	6304.55	1658.44	0.11
Buckeye Creek	1604.54	100-Year	5150.00	796.53	811.35		811.40	0.000177	2.79	3531.91	659.94	0.14
Buckeye Creek	1419.72	100-Year	5150.00	796.37	811.29		811.38	0.000197	3.06	3150.05	652.23	0.15
Buckeye Creek	1234.05	100-Year	5150.00	798.00	811.28		811.35	0.000169	2.82	3553.28	671.93	0.14
Buckeye Creek	1102.70	100-Year	5150.00	798.00	811.25		811.32	0.000185	2.93	3345.53	589.97	0.15
Buckeye Creek	972.12	100-Year	5150.00	797.56	811.18		811.29	0.000228	3.38	2761.62	496.01	0.17
Buckeye Creek	810.82	100-Year	5150.00	797.30	811.13		811.25	0.000312	3.58	2385.42	408.81	0.19
Buckeye Creek	632.35	100-Year	5150.00	796.97	811.11		811.18	0.000189	2.72	3224.53	564.55	0.15
Buckeye Creek	433.99	100-Year	5150.00	796.70	811.10		811.15	0.000148	2.61	3762.86	712.65	0.13
Buckeye Creek	289.71	100-Year	5150.00	796.46	811.09		811.14	0.000137	2.45	3910.40	744.61	0.13
Buckeye Creek	109.26	100-Year	5150.00	796.17	811.03		811.10	0.000200	2.91	3270.82	651.91	0.15
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

PREPARED BY: 3/25/2014 TGJ

CHECKED BY: AHG 26-MAR-2014

PREPARED BY: PJH 11/29/2018 CHECKED BY: ARC 11/29/2018

HEC-RAS Plan: Proposed_18 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	814.39		815.11	0.001634	6.78	772.78	110.02	0.42
Buckeye Creek	3454.54	100-Year	5150.00	804.38	814.07		814.99	0.002086	7.92	736.60	131.73	0.48
Buckeye Creek	3404.54	100-Year	5150.00	804.32	813.80		814.86	0.002534	8.52	685.71	126.27	0.53
Buckeye Creek	3354.54	100-Year	5150.00	804.25	813.92		814.66	0.001760	7.39	916.76	201.99	0.45
Buckeye Creek	3304.54	100-Year	5150.00	804.25	813.85		814.57	0.001750	7.28	959.51	235.09	0.44
Buckeye Creek	3254.54	100-Year	5150.00	804.12	813.93		814.42	0.001255	6.26	1195.70	278.55	0.38
Buckeye Creek	3204.54	100-Year	5150.00	804.05	813.92		814.35	0.001119	6.02	1320.60	318.57	0.36
Buckeye Creek	3154.54	100-Year	5150.00	803.89	813.83		814.29	0.001171	6.20	1329.95	361.11	0.37
Buckeye Creek	3104.54	100-Year	5150.00	803.47	813.71		814.22	0.001258	6.40	1113.03	233.87	0.38
Buckeye Creek	3054.54	100-Year	5150.00	803.03	813.60		814.16	0.001325	6.52	1038.07	197.64	0.39
Buckeye Creek	3004.54	100-Year	5150.00	802.18	813.60		814.08	0.001129	6.18	1167.91	231.38	0.36
Buckeye Creek	2954.54	100-Year	5150.00	802.18	813.57		814.02	0.001076	6.11	1259.80	271.99	0.35
Buckeye Creek	2904.54	100-Year	5150.00	802.00	813.63		813.93	0.000737	5.07	1523.26	320.63	0.29
Buckeye Creek	2854.58	100-Year	5150.00	802.00	813.64		813.89	0.000576	4.60	1723.18	360.47	0.26
Buckeye Creek	2804.54	100-Year	5150.00	802.00	813.69		813.83	0.000398	3.76	2293.13	632.86	0.21
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
Buckeye Run Breaker Station - Doddridge County, WV
Project: 185-068

PREPARED BY: PJH
DATE: 11/29/2018
CHECKED: ARC
DATE: 11/29/2018

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	814.39	0.43
B	34+54.54	5150	813.52	814.07	0.55
C	34+04.54	5150	813.11	813.80	0.69
D	33+54.54	5150	813.17	813.92	0.75
E	33+04.54	5150	813.04	813.85	0.81
F	32+54.54	5150	813.13	813.93	0.80
G	32+04.54	5150	813.09	813.92	0.83
H	31+54.54	5150	813.08	813.83	0.75
I	31+04.54	5150	813.07	813.71	0.64
J	30+54.54	5150	813.07	813.60	0.53
K	30+04.54	5150	813.08	813.60	0.52
L	29+54.54	5150	813.10	813.57	0.47
M	29+04.54	5150	813.13	813.63	0.50
N	28+54.58	5150	813.13	813.64	0.51
O	28+04.54	5150	813.14	813.69	0.55
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

Permit# 18-537

Project Name: _____

Permittees Name: _____

DEC 17 18 1:52PM

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 12/13/2018

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Applicant Information:

Please provide all pertinent data.

Applicant Information		
Responsible Company Name: Monongahela Power Company, a FirstEnergy Company		
Corporate Mailing Address: 800 Cabin Hill Drive		
City: Greensburg	**State:** PA	**Zip:** 15601
Corporate Point of Contact (POC): Amanda B. Habershaw		
Corporate POC Title: Supervisor Energy Delivery Permitting		
Corporate POC Primary Phone: 724-830-5971		
Corporate POC Primary Email: ahabers@firstenergycorp.com		
Corporate FEIN: 13-5229392	**Corporate DUNS:**	
Corporate Website: www.firstenergycorp.com/content/customer/mon_power.html		
Local Mailing Address: Same as above.		
City:	**State:**	**Zip:**
Local Project Manager (PM): Leslie J. Johns		
Local PM Primary Phone: (304) 723-6273		
Local PM Secondary Phone: (304) 266-6716		
Local PM Primary Email: ljohns@firstenergycorp.com		
Person Filing Application: Amanda B. Habershaw		
Applicant Title: Supervisor Energy Delivery Permitting		
Applicant Primary Phone: 724-830-5971		
Applicant Secondary Phone: 412-841-5545 (Mobile)		
Applicant Primary Email: ahabers@firstenergycorp.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:

Electrical Consultants, Inc. (ECI) has contracted Civil & Environmental Consultants, Inc. (CEC) to perform a flood study, on behalf of Monongahela Power Company (MonPower), a FirstEnergy Company, as part of the construction of the proposed Buckeye Run Breaker Station and associated transmission line. MonPower is overseeing the construction of the breaker station, but MonPower will not own the station. The proposed breaker station site 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 work proposes placing fill and equipment in the floodplain in order to construct the proposed breaker station. Construction is anticipated to begin 2/25/19 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: 540024	**Number:**	**Panel:**	**Suffix:**
Location (Lat/Long): See Above		**Approximate Elevation:** **Estimated BFE:** 814	
Is the development in the floodway? ☐ Yes ☒ No		**Is the development in the floodplain?** ☒ Yes ☐ No **Zone:** A/E	
Notes: *5401C0145C / 5401C0140C			

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

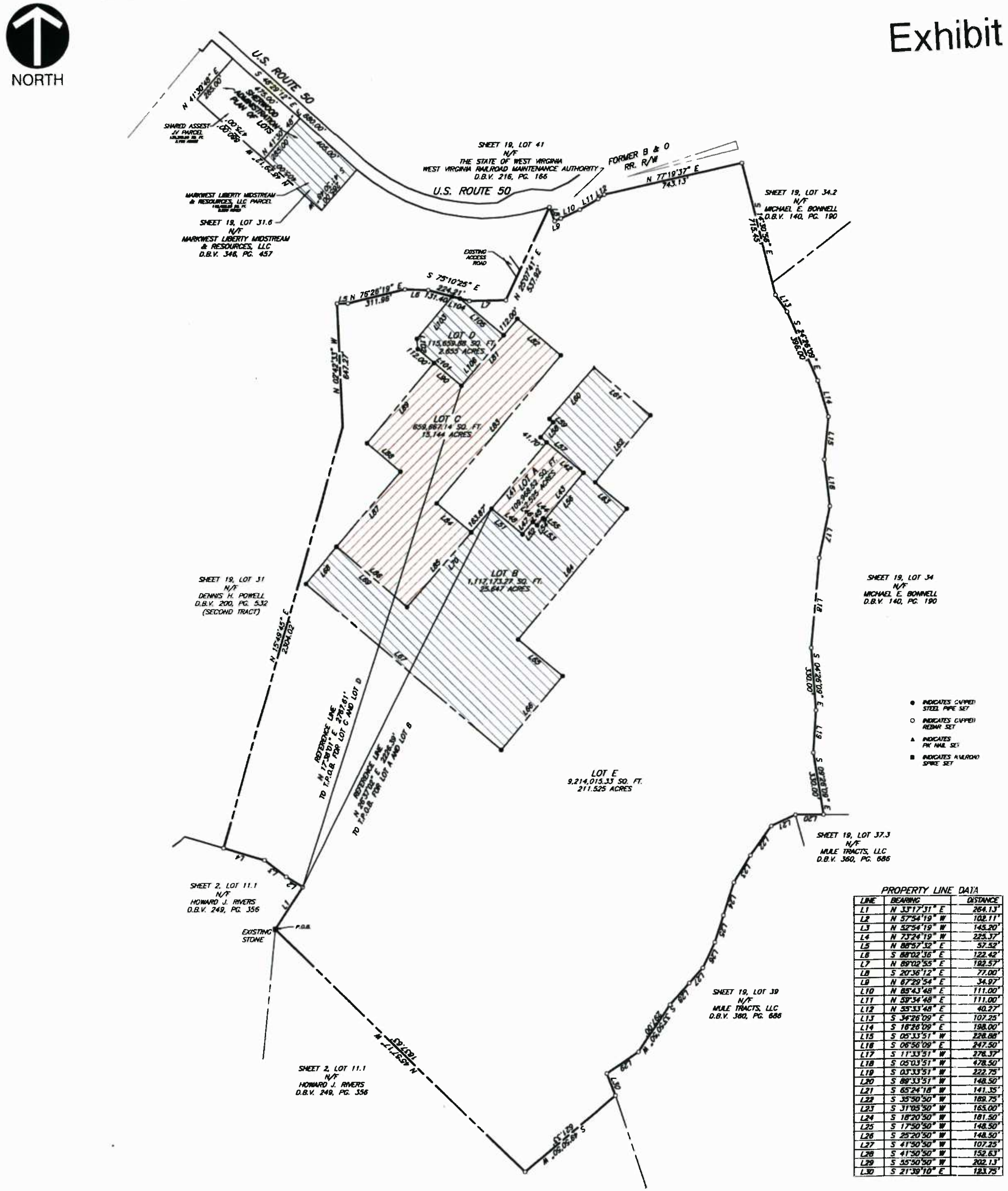
_____
Notary Public

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

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

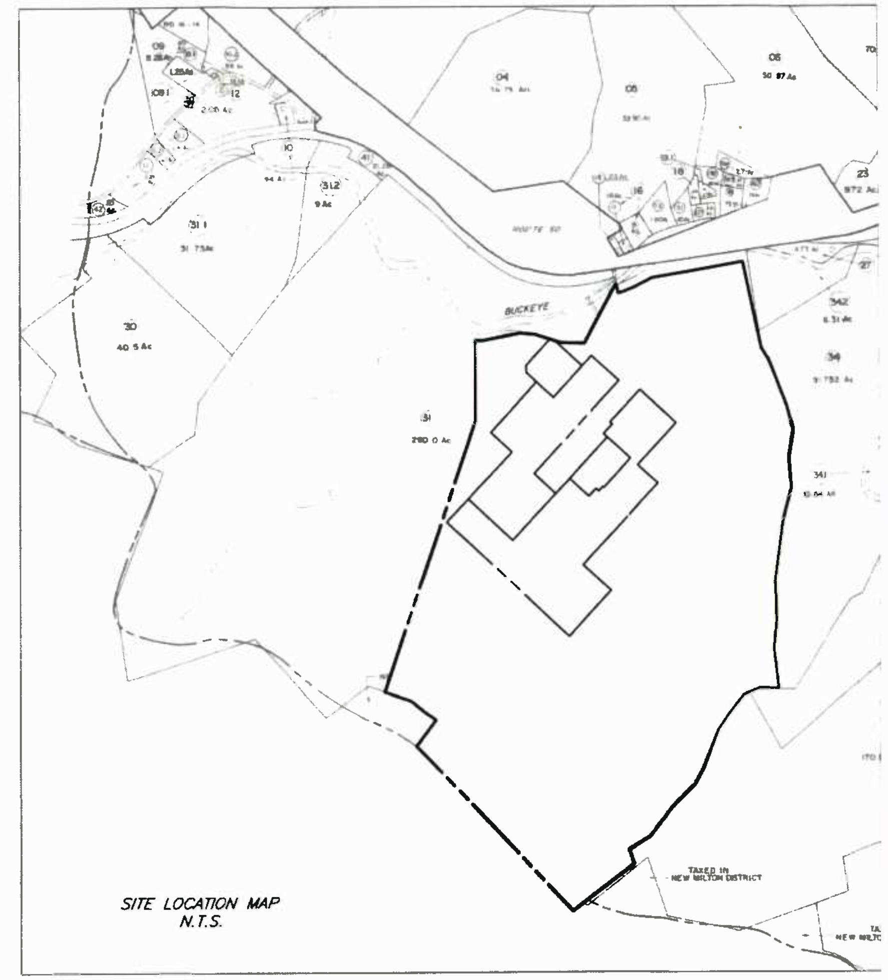
LINE	BEARING	DISTANCE
L51	S 50°16'50" E	211.38'
L52	N 39°43'10" E	84.74'
L53	S 50°16'50" E	29.50'
L54	N 39°43'10" E	48.60'
L55	S 50°16'50" E	11.00'
L56	N 39°43'10" E	319.00'
L57	N 50°16'50" W	293.58'
L58	N 39°43'10" E	102.89'
L59	N 46°50'52" W	26.12'
L60	N 40°56'23" E	356.29'
L61	S 49°51'12" E	391.08'
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	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°58'03" 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'


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°02'36" 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 85°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	228.88'
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	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

- (cross-hatched box) MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C.
- (hatched box) SHERWOOD MIDSTREAM LLC
- (open box) 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.

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

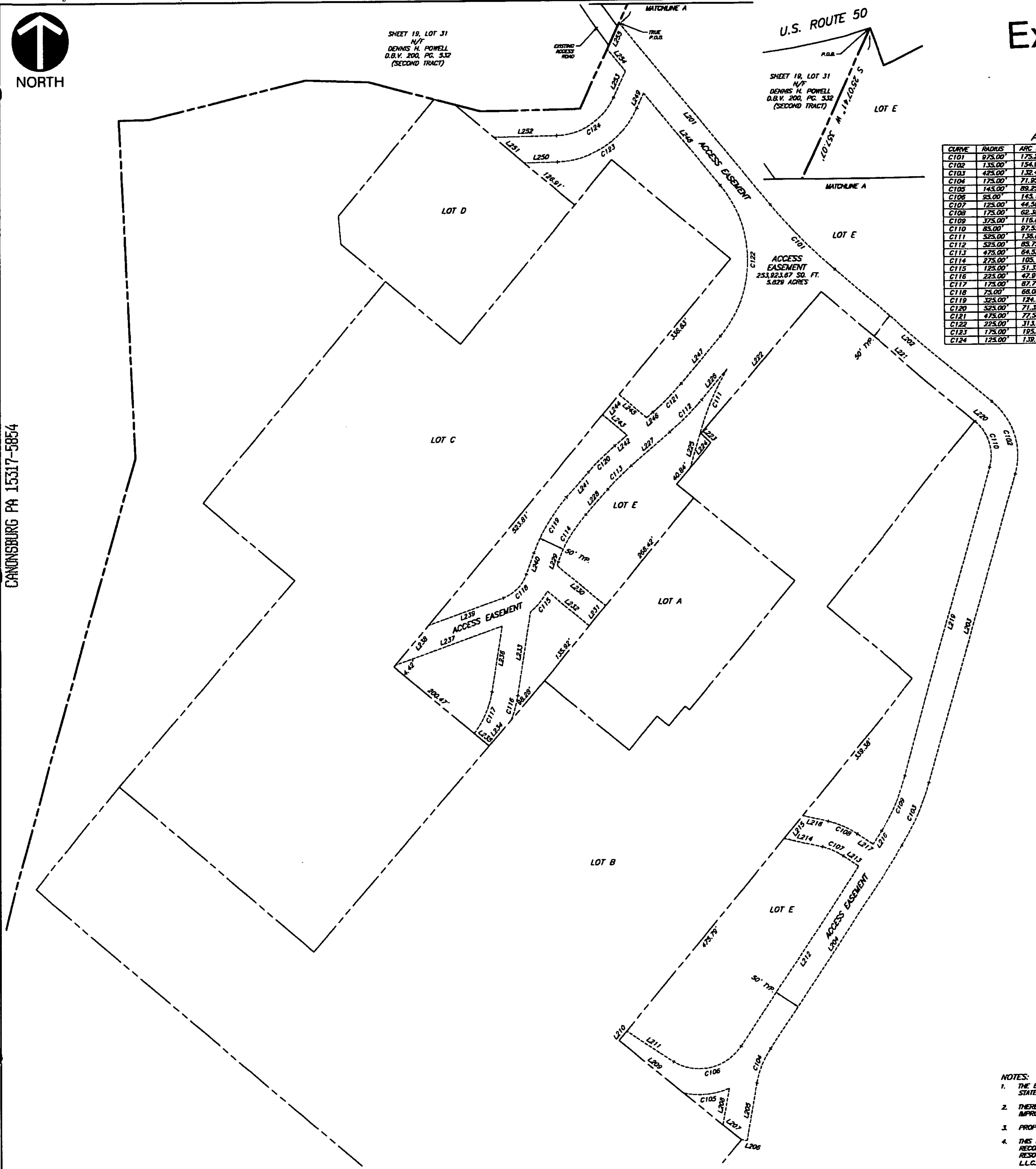
Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

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
BARRY COURT SUITE 500
CANONSBURG PA 15317-5854

Exhibit "B"



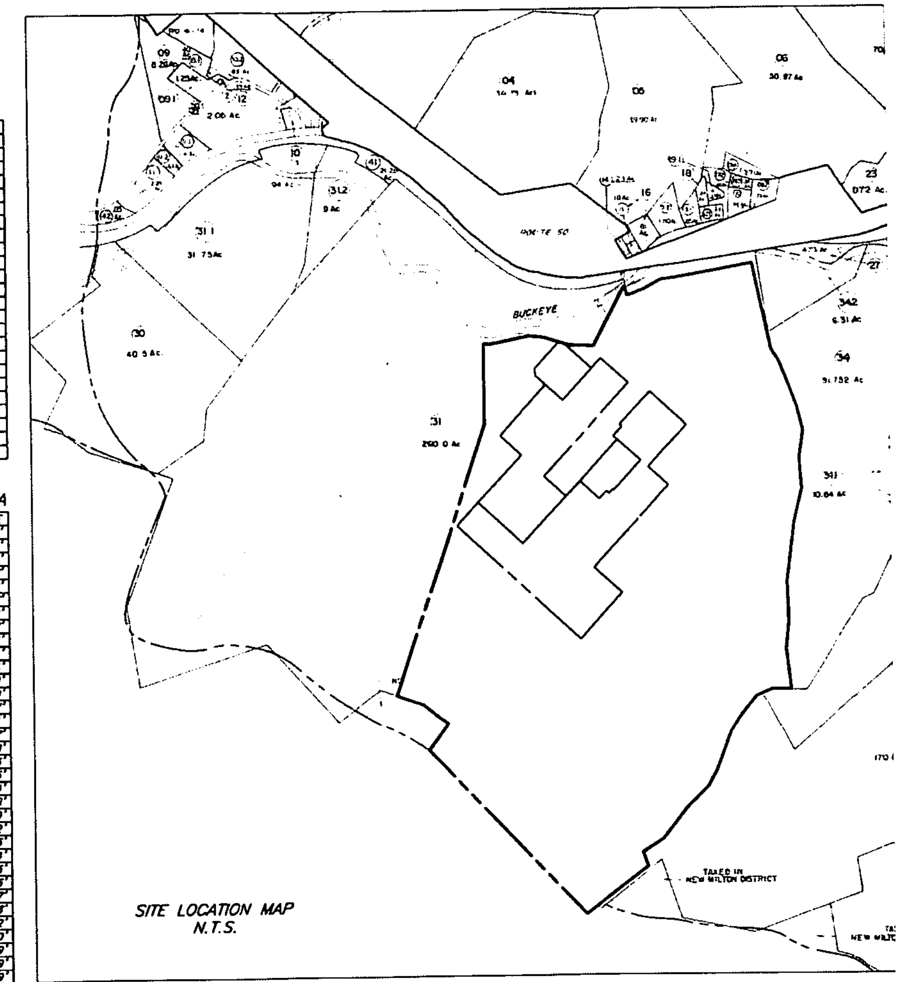
ACCESS EASEMENT DATA

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'	87.83'	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	29.86'
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'

REVISION RECORD		
NO	DATE	DESCRIPTION
△		
△		
△		
△		



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.

SCALE IN FEET
0 100 200

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"=100'	DRAWING NO.: SUB-2
DRAWN BY: CMM	CHECKED BY: DGG	
PROJECT NO: 110-811	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: ____ of ____

Contractor/Sub-Contractor (C/SC) Information:		
C/SC Company Name: N/A at this time.		
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: 17441		
Engineer Firm FEIN: 25-1599565	**Engineer Firm DUNS:** 36-160-9878	
Engineer Firm Primary Point of Contact (POC): George J. Haberman, P.E.		
Engineer Firm Primary POC Title: Senior Consultant		
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)-512-8804		
Engineer Firm Primary POC E-Mail: ghaberman@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): N/A Proposed Impacts are within subject property		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Upstream		
Name of Primary Owner (PO): N/A Proposed Impacts are within subject property		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): N/A Proposed Impacts are within subject property		
Physical Address:		
City:	**State:**	**Zip:**
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): N/A Proposed Impacts are within subject property		
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.

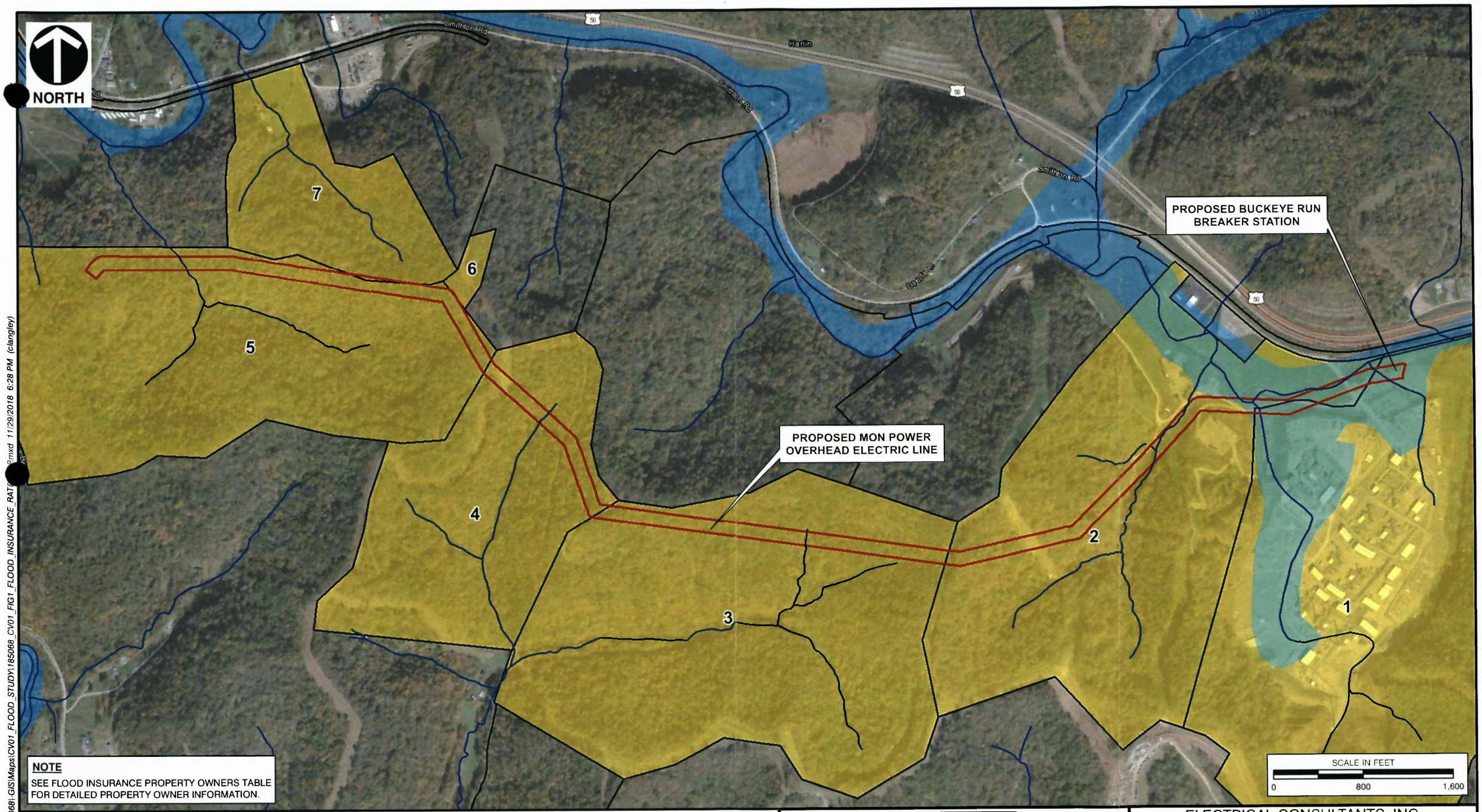
Applicant

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: 12/13/19

Applicant Printed Name: AMANDA B. HATFIELD SHAW



\\svr-pittsburgh\Projects\185-068\GIS\Maps\CV01_FLOOD_STUDY\185068_CV01_FIG1_FLOOD_INSURANCE_RATE_MAP.mxd 11/29/2018 6:28 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 11/29/2018, IMAGERY DATE: 2017.

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

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

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

PROPERTY INFORMATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.63 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form may be completed by the property owner, property owner's agent, licensed land surveyor, or registered professional engineer to support a request for a Letter of Map Amendment (LOMA), Conditional Letter of Map Amendment (CLOMA), Letter of Map Revision Based on Fill (LOMR-F), or Conditional Letter of Map Revision Based on Fill (CLOMR-F) for existing or proposed, single or multiple lots/structures. In order to process your request, all information on this form must be completed ***in its entirety***, unless stated as optional. **Incomplete submissions will result in processing delays.** Please check the item below that describes your request:

☐ LOMA	A letter from DHS-FEMA stating that an existing structure or parcel of land that has not been elevated by fill (natural grade) would not be inundated by the base flood.
☐ CLOMA	A letter from DHS-FEMA stating that a proposed structure that is not to be elevated by fill (natural grade) would not be inundated by the base flood if built as proposed.
☐ LOMR-F	A letter from DHS-FEMA stating that an **existing** structure or parcel of land that has been **elevated by fill** would not be inundated by the base flood.
☒ CLOMR-F	A letter from DHS-FEMA stating that a parcel of land or **proposed** structure that will be **elevated by fill** would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

Fill is defined as material from any source (including the subject property) placed that raises the ground to or above the Base Flood Elevation (BFE). The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing (natural grade) elevation, which is at or above the BFE. **Fill that is placed before the date of the first National Flood Insurance Program (NFIP) map showing the area in a Special Flood Hazard Area (SFHA) is considered natural grade.**

Has fill been placed on your property to raise ground that was previously below the BFE? ☐ Yes ☒ No If yes, when was fill placed? / month/year

Will fill be placed on your property to raise ground that is below the BFE? ☒ Yes* ☐ No If yes, when will fill be placed? **03/2019** month/year

* If yes, Endangered Species Act (ESA) compliance must be documented to FEMA prior to issuance of the CLOMR-F determination (please refer page 4 to the MT-1 instructions).

1. Street Address of the Property (if request is for multiple structures or units, please attach additional sheet referencing each address and enter street names below): **218 Swisher Lane, West Union, WV 26456**

2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed): **All that certain 211.525 acres, being Lot E of the Revised Sherwood Plant Facilities Plan, situated in the Grant District, Doddridge County, WV, Deed Book Volume 406, Page 133.**

3. Are you requesting that a flood zone determination be completed for (check one):

   ☐ Structures on the property? What are the dates of construction? _____ (MM/YYYY)
   ☒ A portion of land within the bounds of the property? (A certified metes and bounds description and map of the area to be removed, certified by a licensed land surveyor or registered professional engineer, are **required**. For the preferred format of metes and bounds descriptions, please refer to the MT-1 Form 1 Instructions.**) Note: A certified metes and bounds description and map of the area to be removed will be provided upon completion of fill placement/pad construction.**
   ☐ The entire legally recorded property?

4. Is this request for a (check one):

   ☐ Single structure
   ☒ Single lot
   ☐ Multiple structures (How many structures are involved in your request? List the number: 2
   ☐ Multiple lots (How many lots are involved in your request? List the number: _____)

In addition to this form (MT-1 Form 1), please complete the checklist below. **ALL** requests must include one copy of the following:

☒ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted (property inadvertently located in the NFIP regulatory floodway will require Section B of MT-1 Form 3)

☒ Copy of the Subdivision Plat Map for the property **(with recordation data and stamp of the Recorder's Office)**

OR

☐ Copy of the Property Deed **(with recordation data and stamp of the Recorder's Office)**, ***accompanied by*** a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.

☒ Form 2 – Elevation Form. If the request is to remove the structure, and an Elevation Certificate has already been completed for this property, it may be submitted in lieu of Form 2. If the request is to remove the entire legally recorded property, or a portion thereof, the lowest lot elevation must be provided on Form 2.

☒ Please include a map scale and North arrow on all maps submitted.

For LOMR-Fs and CLOMR-Fs, the following must be submitted in addition to the items listed above:

☒ Form 3 – Community Acknowledgment Form

For CLOMR-Fs, the following must be submitted in addition to the items listed above:

☒ Documented ESA compliance, which may include a copy of an Incidental Take Permit, an Incidental Take Statement, a "not likely to adversely affect" determination from the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS), or an official letter from NMFS or USFWS concurring that the project has "No Effect" on proposed or listed species or designated critical habitat. Please refer to the MT-1 instructions for additional information.

Please do *not* submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc [CD]). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-1 Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm.

Processing Fee (see instructions for appropriate mailing address; or visit http://www.fema.gov/fhm/frm_fees.shtm **for** the most current fee schedule)

Revised fee schedules are published periodically, but no more than once annually, as noted in the **Federal Register**. Please note: single/multiple lot(s)/structure(s) LOMAs are fee exempt. The current review and processing fees are listed below:

Check the fee that applies to your request:

☐ $325 (single lot/structure LOMR-F following a CLOMR-F)

☐ $425 (single lot/structure LOMR-F)

☒ ~~$500~~ **$600*** (single lot/structure CLOMA or CLOMR-F) ***Note: Fee updated based upon current FEMA Website data.**

☐ $700 (multiple lot/structure LOMR-F following a CLOMR-F, or multiple lot/structure CLOMA)

☐ $800 (multiple lot/structure LOMR-F or CLOMR-F)

Please submit the Payment Information Form for remittance of applicable fees. Please make your check or money order payable to:
National Flood Insurance Program.

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

Applicant's Name (required): **Amanda B. Habershaw**

Mailing Address (required): **Monongahela Power Company, a FirstEnergy Company, 800 Cabin Hill Drive, Greensburg, PA 15601**

Daytime Telephone No. (required): **724-830-5971**

Fax No. (optional):

E-Mail Address (optional): ☒ By checking here you may receive correspondence electronically at the email address provided):

Ahabers@firstenergycorp.com

Signature of Applicant (required)

Date (required): **December13, 2018**

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

ELEVATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form must be completed for requests and must be completed and signed by a registered professional engineer or licensed land surveyor. **A DHS - FEMA National Flood Insurance Program (NFIP) Elevation Certificate may be submitted in lieu of this form for single structure requests.**

For requests to remove a structure on natural grade OR on engineered fill from the Special Flood Hazard Area (SFHA), submit the lowest adjacent grade (the lowest ground touching the structure), ***including an attached deck or garage***. For requests to remove an entire parcel of land from the SFHA, provide the lowest lot elevation; or, if the request involves an area described by metes and bounds, provide the lowest elevation within the metes and bounds description. All measurements are to be rounded to nearest tenth of a foot. In order to process your request, all information on this form must be completed ***in its entirety***. **Incomplete submissions will result in processing delays.**

1. NFIP Community Number: **540024** Property Name or Address: **218 Swisher Lane, West Union, WV 26456**

2. Are the elevations listed below based on ☐ ***existing*** or ☒ ***proposed*** conditions? (Check one)

3. For the existing or proposed structures listed below, what are the types of construction? (check all that apply)
   ☐ crawl space ☐ slab on grade ☐ basement/enclosure ☒ other (explain) **Fill pad to be constructed for equipment.**

4. Has DHS - FEMA identified this area as subject to land subsidence or uplift? (see instructions) ☐ Yes ☒ No
   If yes, what is the date of the current re-leveling? / (month/year)

5. What is the elevation datum? ☐ NGVD 29 ☒ NAVD 88 ☐ Other (explain)
   If any of the elevations listed below were computed using a datum different than the datum used for the effective Flood Insurance Rate Map (FIRM) (e.g., NGVD 29 or NAVD 88), what was the conversion factor?
   Local Elevation +/- ft. = FIRM Datum

6. Please provide the Latitude and Longitude of the most upstream edge of the ***structure*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☒ NAD83 ☐ NAD27 Lat. 39.278000 Long. -80.684850 (Edge of Pad)
   Please provide the Latitude and Longitude of the most upstream edge of the ***property*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☒ NAD83 ☐ NAD27 Lat. 39.278314 Long. , -80.685628

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source
218 Swisher Lane, West Union, WV 26456	**32**	**19**	**TBD-After Construction**	**Equipment Pad Grade-Corner 1**	**813.71**	**HEC-RAS**

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

Certifier's Name: **James R. Bruggeman**	License No.: **2104**	Expiration Date: **June 30, 2019**
Company Name: **Civil & Environmental Consultants, Inc.**	Telephone No.: **412-429-2324**	
Email: **jbruggeman@cecinc.com**	Fax No. **412-429-2115**	
Signature:	Date: December 12, 2018	

or requests involving a portion of property, include the lowest ground elevation within
e metes and bounds description. – **Note: To be provided upon completion of pad grading.**
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Seal (optional)

Continued from Page 1.

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source
8 Swisher Lane, West Union, WV 26456	32	19	TBD-After Construction	Equipment Pad Grade-Corner 2	813.71	HEC-RAS
218 Swisher Lane, West Union, WV 26456	32	19	TBD-After Construction	Equipment Pad Grade-Corner 3	813.71	HEC-RAS
218 Swisher Lane, West Union, WV 26456	32	19	TBD-After Construction	Equipment Pad Grade-Corner 4	831.71	HEC-RAS

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

Certifier's Name: : **James R. Bruggeman**	License No.: **2104**	Expiration Date: **June 30, 2019**
Company Name: **Civil & Environmental Consultants, Inc.**	Telephone No.: **412-429-2324**	
Email: **jbruggeman@cecinc.com**	Fax No. **412-429-4115**	
Signature:	Date: December 12, 2018	

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description. – **Note: To be provided upon completion of pad grading.** Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Seal (optional)

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.38 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) ***OR*** to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number: **540024** Property Name or Address: **218 Swisher Lane, West Union, WV 26456**

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with tion 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed om the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Floodplain Manager George C. Eidel, Jr.		304-873-1343
Community Name:	Community Official's Signature: (required)	Date:
Doddridge County	George C. Eidel	12/17/2018

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
mmunity Name:	Community Official's Signature (required):	Date:

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name:

Project Identifier:

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Please make check or money order payable to the National Flood Insurance Program.

Type of Request:

☒ MT-1 application
☐ MT-2 application

LOMC Clearinghouse
847 South Pickett Street
Alexandria, VA 22304-4605
Attn.: LOMC Manager

☐ EDR application

FEMA Project Library
847 South Pickett Street
Alexandria, VA 22304-4605
FAX (703) 212-4090

Check to be submitted directly by Monongahela Power Company, a FirstEnergy Company under separate cover.

Request No. (if known): _____ **Check No.:** _____ **Amount:** **$600.00**

☐ INITIAL FEE* ☒ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☐ CHECK ☐ MONEY ORDER

Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

****Note: Check only if submitting a corrected fee for an ongoing request.**

COMPLETE THIS SECTION *ONLY* IF PAYING BY CREDIT CARD

CARD NUMBER EXP. DATE

				–				–				–				–	
1	2	3	4		5	6	7	8	9	10	11	12	13	14	15	16	

Month – Year

_____ _____

Date Signature

NAME *(AS IT APPEARS ON CARD)*: _____
(please print or type)

ADDRESS: _____
(for your credit card receipt-please print or type) _____

DAYTIME PHONE: _____

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

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

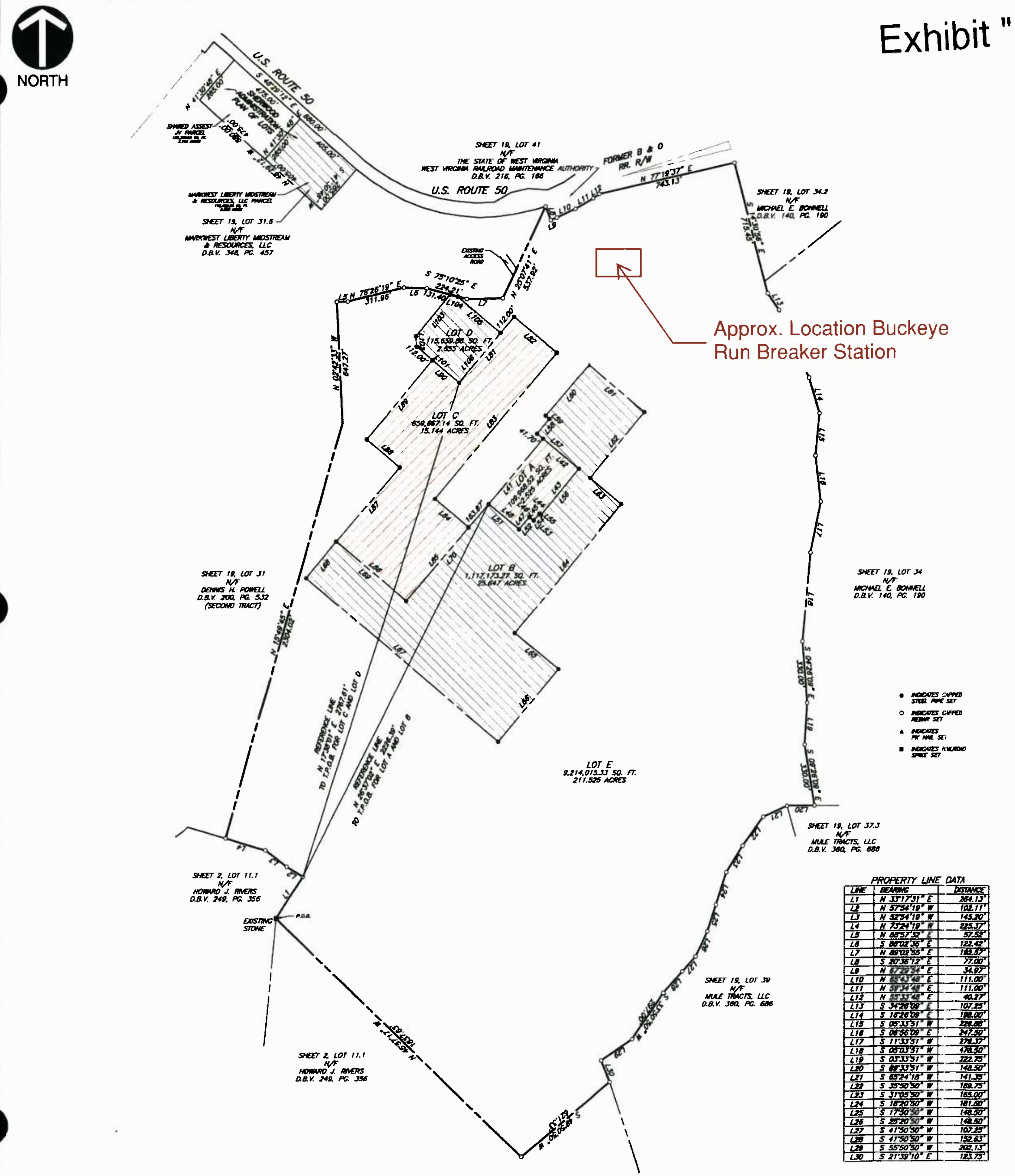
_____
Notary Public

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

Exhibit "A"

REVISION RECORD		
NO	DATE	DESCRIPTION
△		
△		
△		
△		



LOT A

LINE	BEARING	DISTANCE
L41	N 39°43'10" E	453.34'
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

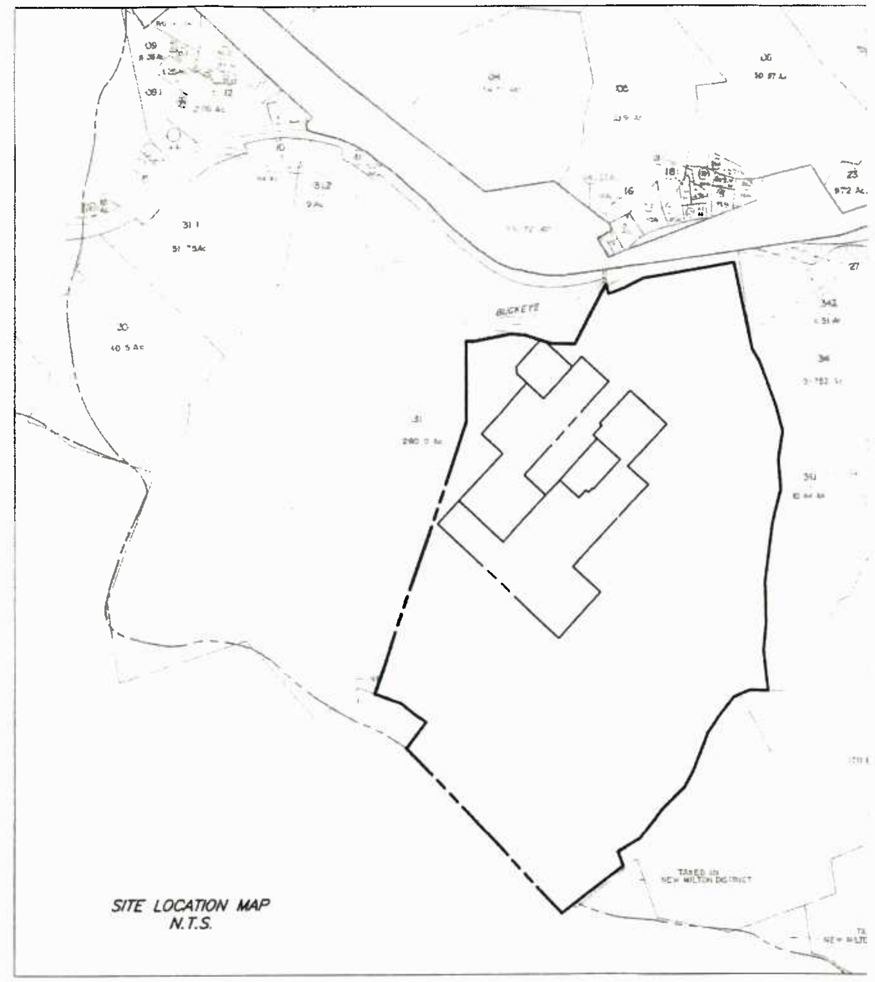
LINE	BEARING	DISTANCE
L51	S 50°16'50" E	211.38'
L52	N 39°43'10" E	84.74'
L53	S 50°16'50" E	29.50'
L54	N 39°43'10" E	48.60'
L55	S 50°16'50" E	11.00'
L56	N 39°43'10" E	319.00'
L57	N 50°16'50" W	293.58'
L58	N 39°43'10" E	102.89'
L59	N 48°50'52" W	28.12'
L60	N 40°56'23" E	356.29'
L61	S 49°31'12" E	391.08'
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°38'58" W	1,358.83'
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°48'5" E	519.56'
L88	N 49°48'52" W	232.78'
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	288.34'
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 06°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	476.50'
L19	S 03°33'51" W	222.75'
L20	S 69°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

- (hatched) MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C.
- (hatched) SHERWOOD MIDSTREAM LLC
- (blank) 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.

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

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

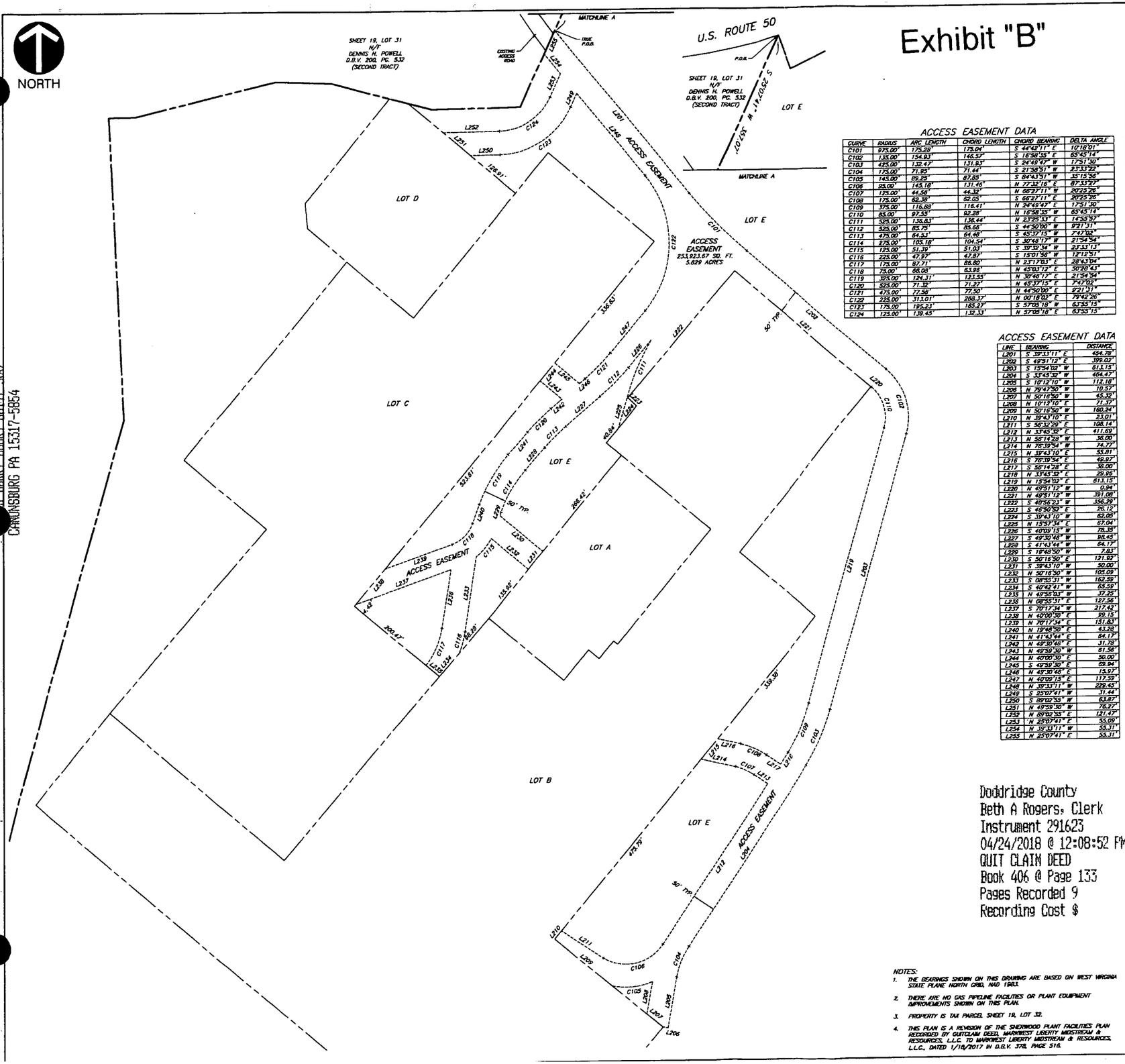
TOTAL PLAN AREA
11,216,484.17 SQ. FT.
257.495 ACRES

SCALE IN FEET
0 300 600

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
[illegible] J BARRY COURT SUITE 500
CANONSBURG PA 15317-5854

Exhibit "B"

REVISION RECORD		
NO	DATE	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'	44.58'	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 58°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 58°14'28" E	36.00'
L218	N 33°45'32" E	29.86'
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 18°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.

SCALE IN FEET
0 100 200

JAMES R. BRUGGEMAN
No. 2104

JAMES R. BRUGGEMAN
LICENSED PROFESSIONAL SURVEYOR
NO. 2104

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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

ENDANGERED SPECIES ACT CONSULTATION SUMMARY
Monongahela Power Company, a FirstEnergy Company
Proposed Buckeye Run Breaker Station
Tax Parcel No. 19-32 -- 218 Swisher Lane, West Union, WV

Civil & Environmental Consultants, Inc. (CEC) understands that Monongahela Power Company, a FirstEnergy Company, is required to document compliance with the Endangered Species Act (ESA) as part of the Conditional Letters of Map Amendment (CLOMA) application related to their proposed Buckeye Run Breaker Station Project. This project will be located on Tax Parcel 19-32, the site of the existing Sherwood Gas Processing Plant.

The proposed project will be located within areas for which ESA clearance was previously obtained to comply with federal permits for the above referenced existing gas processing plant. The U.S. Fish and Wildlife Service (USFWS) has performed multiple reviews of the project area since 2012 to determine potential impacts of the project on rare, threatened, or endangered (RTE) species or their habitats protected by the ESA.

Based on these consultations, it was determined that the project is: 1) within the range of and providing potential summer foraging and roosting habitat for the Indiana bat (*Myotis sodalis*) listed under the ESA as endangered, and 2) within a 2.5-mile buffer zone for a known maternity roost of the northern long-eared (NLE) bat (*Myotis septentrionalis*) listed as threatened. The project area was not identified as habitat for other federally listed species under the ESA, although coordination with the West Virginia Division of Natural Resources was performed to protect freshwater mussels as required by state rules when instream work was necessary.

USFWS considers all forested area containing potential roosts, i.e. live trees and/or snags ≥5 inches diameter at breast height (dbh) with exfoliating bark, cracks, crevices, and/or hollows, to be potentially suitable as summer roosting and foraging habitat (April 1 to November 14) for the Indiana bat. NLE bat habitat includes forested areas ≥3 inches diameter at breast height (dbh) as well as human-made structures, such as buildings, barns, bridges, and bat houses.

The portion of the proposed project pertaining to the CLOMA (existing gravel parking lot) is non-forested and does not contain human-made structures, and is therefore not considered to be habitat for the Indiana or NLE bats. Previous construction work at the site that affected forested areas complied with ESA requirements as part of federal Clean Water Act Section 404 permits (LRH-2011-753-OHR, LRH-2012-537-OHR, LRH-2014-528-OHR). Specifically, these permits stipulate that USFWS-recommended conservation measures including minimizing tree clearing and wintertime tree-cutting between November 15 and March 31 must be performed.

Prior to 2013, tree clearing conducted during multiple phases of construction of the Sherwood Plant did not exceed 17 acres and therefore USFWS made a "no effect determinations" as documented by letters dated April 22 and August 8, 2013. Later in 2013, unanticipated further expansion of the plant resulted in cumulative tree clearing exceeding 17 acres, as documented by information submitted to CEC on November 11, 2013. As a result, USFWS determined that "the project may affect, but is not likely to adversely affect, any federally listed threatened and endangered species," as documented by the January 16, 2014, letter. In order to avoid direct impacts to Indiana bat, USFWS recommended that any further forest clearing proposed for this project be completed seasonally when bats are in hibernation (November 15 to March 31) bats. The project complied with this recommendation. Since then, the NLE bat was listed under ESA as threatened in 2015, and the project is now located within a 2.5-mile buffer zone for the NLE bat.

Monongahela Power Company, a FirstEnergy Company, proposes to construct a breaker station adjacent to the plant. No additional tree clearing or stream or wetland impacts are required for completion of this project. No potential habitat for the Indiana or NLE bat are known to the proposed work area. Therefore no impacts to RTE species or their habitats are anticipated. In addition, the proposed action does not have the potential for a "Take" of threatened and endangered species present in Doddridge County as a result of the project.

This summary is based on our current understanding of the project and correspondence between USFWS, Monongahela Power Company, a FirstEnergy Company.

Jonathan R. Farrell, MS, PWS
CEC Project Manager

185-068-ESA-Consultation Summary