

Commercial/Industrial Floodplain Development Permit

Doddridge County, WV Floodplain Management

This permit has been issued to **Antero Resources**, and is for the approved commercial and/or industrial development project associated with this permit 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: #15-348 ~ Antero Resources ~
Nutter Fork Road Upgrade (CR 28)**

Date Approved: 06/12/2015

Expires: 06/12/2015

Issued to: Antero Resources

**POC: Rachel Grzybek
304-842-4008**

**Company Address: 535 White Oaks Blvd
Bridgeport, WV 26330**

**Project Address: West Union District
Lat/Long: 39.328711N/80.808739W to 39.330881N/80.739817W**

Purpose of development: Road upgrade project.

Issued by: Edwin L. "Bo" Wriston, Doddridge County FPM (or designee)

Date: 06/12/2015

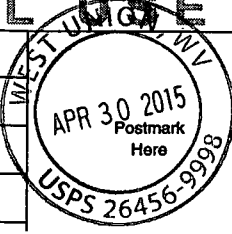
For additional information regarding this permit, please contact
Doddridge County Floodplain Manager at 304.873.2631, or via email at
doddridgecountyfpm@gmail.com
118 East Court Street; West Union, WV 26456

7014 0150 0001 7356 8587

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48	
Certified Fee	3.30	
Return Receipt Fee (Endorsement Required)	2.70	
Restricted Delivery Fee (Endorsement Required)		
	6.48	

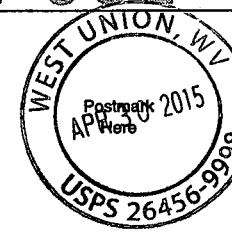
Si Lois Arcuri
 Si 9142 Chatham Cir
 Ci North Ridgeville, OH 44039
 PS See Reverse for Instructions

7014 0150 0001 7356 8589

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48	
Certified Fee	3.30	
Return Receipt Fee (Endorsement Required)	2.70	
Restricted Delivery Fee (Endorsement Required)		
	6.48	

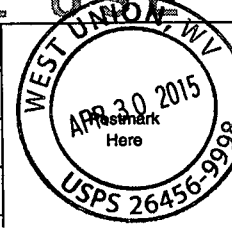
Si Cathleen Schultz
 Si 1106 Golf Course Dr
 Ci Searcy, AZ 72143
 PS See Reverse for Instructions

7014 0150 0001 7356 8501

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48	
Certified Fee	3.30	
Return Receipt Fee (Endorsement Required)	2.70	
Restricted Delivery Fee (Endorsement Required)		
	6.48	

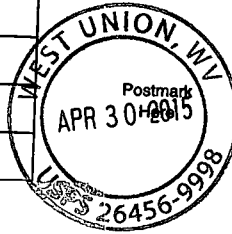
Si John Paul Strickling (et al)
 Si HC 69 Box 34
 Ci West Union, WV 26456
 PS See Reverse for Instructions

7014 0150 0001 7356 8570

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48	
Certified Fee	3.30	
Return Receipt Fee (Endorsement Required)	2.70	
Restricted Delivery Fee (Endorsement Required)		
	6.48	

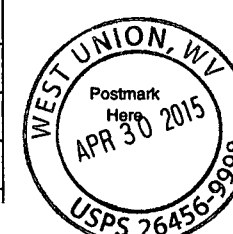
Si Colin Goddard
 Si 48560 Spruce Ct
 Ci East Liverpool, OH 43920
 PS See Reverse for Instructions

7014 0150 0001 7356 8556

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48	
Certified Fee	3.30	
Return Receipt Fee (Endorsement Required)	2.70	
Restricted Delivery Fee (Endorsement Required)		
	6.48	

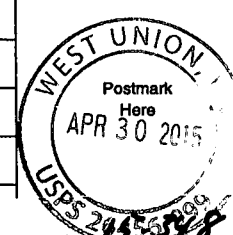
Si Robert Goddard
 Si 507 Peterson Ct
 Ci Inverness, FL 34450
 PS See Reverse for Instructions

7014 0150 0001 7356 8518

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$	
Certified Fee		
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		

Si Skylar, Ora, Montgomery & Clifford Warren
 Si 1607 Rayon Drive
 Ci Parkersburg, WV 26101
 PS See Reverse for Instructions

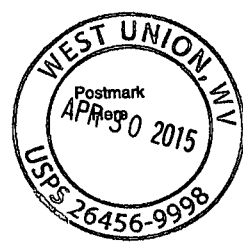
7014 0150 0001 7356 8525

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only, No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
6.48	



Randall Lynch & Dixie Craig
5534 WW RT 18 N
West Union, WV 26456

See Reverse for Instructions

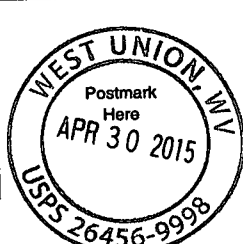
7014 0150 0001 7356 8525

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only, No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
6.48	



Addie Marie Leadmon
RT 3 Box 341 B
Elizabeth, WV 26143

See Reverse for Instructions

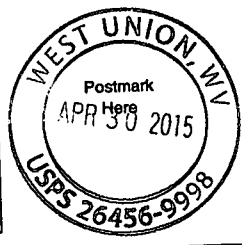
7014 0150 0001 7356 8549

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only, No Insurance Coverage Provided)

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

OFFICIAL USE

Postage	\$.48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
6.48	



Bonnie Persohn
1214 Mick Rd
Wellsville, OH 43968

See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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: 15-348

John Paul Strickling (et al)
HC 69 Box 34
West Union, WV 26456

2. Article Number (Transfer from service label) 7014 0150 0001 7356 8501

COMPLETE THIS SECTION ON DELIVERY

A. Signature Addressee Agent
 B. Received by (Printed Name) JOHN STRICKLING C. Date of Delivery 5-5-15
 D. Is delivery address different from item 1? Yes No
 If YES, enter delivery address below:

3. Service Type
 Certified Mail Express Mail
 Registered Return Receipt for Merchandise
 Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee) Yes

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Cathleen Schultz
1106 Golf Course Dr
Searcy, AZ 72143

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X *Debra Brayton* Agent
 Addressee

B. Received by (Printed Name)

DEBRA BRAYTON Yes
5-4-15 No

C. Date of Delivery

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

3. Service Type

Certified Mail Express Mail
 Registered Return Receipt for Merchandise
 Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

2. Article Number

(Transfer from service label)

7014 0150 0001 7356 8563

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Randall Lynch & Dixie Craig
5534 WW RT 18 N
West Union, WV 26456

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X *Randall Lynch* Agent
 Addressee

B. Received by (Printed Name)

C. Date of Delivery

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

3. Service Type

Certified Mail Express Mail
 Registered Return Receipt for Merchandise
 Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

2. Article Number

(Transfer from service label)

7014 0150 0001 7356 8525

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Lois Arcuri
9142 Chatham Cir
North Ridgeville, OH 44039

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X *Lois Arcuri* Agent
 Addressee

B. Received by (Printed Name)

C. Date of Delivery

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

3. Service Type

Certified Mail Express Mail
 Registered Return Receipt for Merchandise
 Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

2. Article Number

(Transfer from service label)

7014 0150 0001 7356 8587

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Colin Goddard
 48560 Spruce Ct
 East Liverpool, OH 43920

2. Article Number:

*(Transfer from service label)***7014 0150 0001 7356 8570****COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X Agent AddresseeB. Received by (*Printed Name*)

C. Date of Delivery

5-2-05D. Is delivery address different from item 1? Yes

If YES, enter delivery address below:

 No

3. Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.4. Restricted Delivery? (*Extra Fee*) Yes

UNITED STATES POSTAL SERVICE

PA 150

02 MAY '15

PN 31



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

- Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM
118 East Street STE 102
West Union, WV 26456-1262

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Bonnie Persohn
 1214 Mick Rd
 Wellsville, OH 43968

2. Article Number

(Transfer from service label)

7014 0150 0001 7356 8549

COMPLETE THIS SECTION ON DELIVERY

A. Signature

Bonnie C. Persohn Agent
 Addressee

B. Received by (Printed Name)

B. Persohn

C. Date of Delivery

5/2/15

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

3. Service Type

- Certified Mail Express Mail
 Registered Return Receipt for Merchandise
 Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

UNITED STATES POSTAL SERVICE

PA 150

02 MAY '15

PH 3 L



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

- Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM
118 East Street STE 102
West Union, WV 26456-1262

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Addie Marie Leadmon
 RT 3 Box 341 B
 Elizabeth, WV 26143

2. Article Number


(Transfer from service label)

7014 0150 0001 7356 8532

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X


 Agent AddresseeB. Received by (*Printed Name*)

C. Date of Delivery

8-25

D. Is delivery address different from item 1? Yes

If YES, enter delivery address below:

 No

3. Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.4. Restricted Delivery? (*Extra Fee*) Yes

UNITED STATES POSTAL SERVICE

CHARLESTON
WV 250

02 MAY '15

PM 11



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

- Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM
118 East Street STE 102
West Union, WV 26456-1262

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Skylar, Ora, Montgomery & Clifford Warren
 1607 Rayon Drive
 Parkersburg, WV 26101

2. Article Number


(Transfer from service label)

7014 0150 0001 7356 8518

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X


 Agent
 Addressee

B. Received by (Printed Name)

C. Date of Delivery

5-4

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

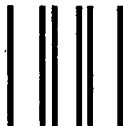
Service Type

-
- Certified Mail
-
- Express Mail
-
-
- Registered
-
- Return Receipt for Merchandise
-
-
- Insured Mail
-
- C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

UNITED STATES POSTAL SERVICE



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

- Sender: Please print your name, address, and ZIP+4 in this box •

2015 MAR 08 AM 11:08
DEEDRIDGE COUNTY FPM
148 East Street STE 102
West Union, WV 26456-1262

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- 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:

15-348

Robert Goddard
507 Peterson Ct
Inverness, FL 34450

2. Article Number

(Transfer from service label)

7014 0150 0001 7356 8556

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X *Katherine C. Goddard* Agent Addressee

B. Received by (Printed Name)

Katherine C. Goddard

C. Date of Delivery

*5-5-15*D. Is delivery address different from item 1? Yes

If YES, enter delivery address below:

 No

3. Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

UNITED STATES POSTAL SERVICE



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

- Sender: Please print your name, address, and ZIP+4 in this box •

FILED

2015 MAY -8 AM 11:00

W. VA. R.
DODDGE COUNTY
DODGE COUNTY, WV



Dodge County FPM
18 East Street STE 102
West Union, WV 26456-1262

Legal Advertisement:
Doddridge County
Floodplain Permit Application

Please take notice that on the 25th day of March, 2015

Antero Resources

filed an application for a Floodplain Permit to develop land located at or about:

West Union District

39.328711N/80.808739W to 39.330881N/80.739817W

Permit #15-348 Nutter Fork Road Upgrade (CR 28)

The Application is on file with the Clerk of the County Court and may be inspected or copied during regular business hours. Any interested persons who desire to comment shall present the same in writing by **April 27, 2015**, delivered to:

Clerk of the County Court

118 E. Court Street, West Union, WV 26456

Beth A Rogers, Doddridge County Clerk

Edwin L. "Bo" Wriston, Doddridge County Flood Plain Manager



Vendor Name	Vendor No.	Date	Check Number	Check Total
DODDRIDGE COUNTY COMMISSION	43312	Mar-30-2015	86871	\$500.00

VOUCHER	VENDOR INV #	INV DATE	TOTAL AMOUNT	PRIOR PMTS & DISCOUNTS	NET AMOUNT
03-AP-16544	KAD3252015N	03/25/15	500.00	0.00	500.00
Permit Fee - Nutter Fork Rd - <i>up, road</i>					500.00
TOTAL INVOICES PAID					

FILED

2015 APR 23 PM 2:00

COUNTY CLERK
 DODDRIDGE COUNTY, WV

#15-348

DETACH AND RETAIN FOR TAX PURPOSES

Doddridge County, West Virginia

RECEIPT NO: 4553

DATE: 2015/04/23

FROM: ANTERO RESOURCES

AMOUNT: \$ 500.00

FIVE HUNDRED DOLLARS AND 00 CENTS

FOR: FP BUILDING PERMITS 15-348

00000086871 FP-BUILDING PERMITS

020-318

TOTAL: \$500.00

MICHAEL HEADLEY

SHERIFF & TREASURER

PMS

CLERK



Antero Resources
535 White Oaks Blvd.
Bridgeport, WV 26330
Office 304.842.4100
Fax 304.842.4102

March 25, 2015

Doddridge County Commission
Attn: Bo Wriston, Doddridge County Floodplain Manager
118 East Court Street, Room 102
West Union, WV 26456

Mr. Wriston:

Antero Resources Corporation (Antero) would like to submit a Doddridge County Floodplain permit application for our Nutter Fork Road Upgrade (CR 28). Our project is located in Doddridge County, West Union District where the project will begin at coordinates 39.328711 N, 80.808739 W, and will continue to coordinates 39.330881 N, 80.739817 W. Per the FIRM Maps #54017C0110C and #54017C0130C this location is in the floodplain.

Attached you will find the following:

- Doddridge County Floodplain Permit Application
- FIRM Maps
- Property Owner Information
- Bid Sheet
- Design Plans
- HEC-RAS Study

If you have any questions please feel free to contact me at (304) 842-4008.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in cursive script, appearing to read "Rachel Grzybek".

Rachel Grzybek
Floodplain Engineer
Antero Resources Appalachian Corporation

Enclosures

DODDRIDGE COUNTY FLOODPLAIN DEVELOPMENT PERMIT APPLICATION

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. Development shall not be used or occupied until a Certificate of Compliance is issued.
5. The permit will expire if no work is commenced within six months of issuance.
6. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
7. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
8. **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 March 25, 2015

SECTION 2: PROPOSE DEVELOPMENT (TO BE COMPLETED BY APPLICANT).

IF THE APPLICANT IS NOT A NATURAL PERSON, THE NAME, ADDRESS, AND TELEPHONE NUMBER OF A NATURAL PERSON WHO SHALL BE APPOINTED BY THE APPLICANT TO RECEIVE NOTICE PURSUANT TO ANY PROVISION OF THE CURRENT DODDRIDGE COUNTY FLOODPLAIN ORDINANCE.

APPLICANT'S NAME: Antero Resources Corporation

ADDRESS: 535 White Oaks Boulevard, Bridgeport, WV 26330

TELEPHONE NUMBER: (304) 842-4100

BUILDER'S NAME: Antero Resources Corporation

ADDRESS: 535 White Oaks Boulevard, Bridgeport, WV 26330

TELEPHONE NUMBER: (304) 842-4100

ENGINEER'S NAME: Civil & Environmental Consultants, Inc.

ADDRESS: 99 Cambridge Place, Bridgeport, WV 26330

TELEPHONE NUMBER: (304) 933-3119

PROJECT LOCATION: N 39° 19' 50.57", W 80° 46' 29.30" (approximate center of project)

NAME OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT): See Exhibit A

ADDRESS OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT):

DISTRICT:

DATE/FROM WHOM PROPERTY PURCHASED:

LAND BOOK DESCRIPTION:

DEED BOOK REFERENCE:

TAX MAP REFERENCE:

EXISTING BUILDINGS/USES OF PROPERTY:

NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY:

ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY:

To avoid delay in processing the application, please provide enough information to easily identify the project location.

From the intersection of U.S. Route 50 and WV Route 18 – Turn onto WV Route 18 and travel northwest for 6.1 miles. Turn onto County Route 28 and travel east for 2.3 miles to reach the approximate center of the project.

DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)

A. STRUCTURAL DEVELOPMENT

<u>ACTIVITY</u>	<u>STRUCTURAL TYPE</u>
<input type="checkbox"/> New Structure	<input type="checkbox"/> Residential (1 – 4 Family)
<input type="checkbox"/> Addition	<input type="checkbox"/> Residential (more than 4 Family)
<input type="checkbox"/> Alteration	<input type="checkbox"/> Non-residential (floodproofing)
<input type="checkbox"/> Relocation	<input type="checkbox"/> Combined Use (res. & com.)
<input type="checkbox"/> Demolition	<input type="checkbox"/> Replacement
<input type="checkbox"/> Manufactured/Mobil Home	

B. OTHER DEVELOPMENT ACTIVITIES:

- Fill Mining Drilling Pipelining
- Grading
- Excavation (except for STRUCTURAL DEVELOPMENT checked above)
- Watercourse Altercation (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)
-

C. STANDARD SITE PLAN OR SKETCH

- 1. SUBMIT ALL STANDARD SITE PLANS, IF ANY HAVE BEEN PREPARED.**
- 2. IF STANDARD SITE PLANS HAVE NOT BEEN PREPARED:**
SKETCH ON A SEPARATE 8 ½ X 11 INCH SHEET OF PAPER THE SHAPE AND LOCATION OF THE LOT. SHOW THE LOCATION OF THE INTENDED CONSTRUCTION OR LAND USE INDICATING BUILDING SETBACKS, SIZE & HEIGHT. IDENTIFY EXISTING BUILDINGS, STRUCTURES OR LAND USES ON THE PROPERTY.
- 3. SIGN AND DATE THE SKETCH.**

ACTUAL TOTAL CONSTRUCTION COSTS OF THE COMPLETE DEVELOPMENT IRRESPECTIVE OF WHETHER ALL OR ANY PART OF THE SUBJECT PROPOSED CONSTRUCTION PROJECT IS WITHIN THE FLOODPLAIN \$ 55,006

D. ADJACENT AND/OR AFFECTED LANDOWNERS:

1. NAME AND ADDRESS OF ALL OWNERS OF SURFACE TRACTS ADJACENT TO THE AREA OF THE SURFACE TRACT (UP & DOWN STREAM) UPON WHICH THE PROPOSED ACTIVITY WILL OCCUR AND ALL OTHER SURFACE OWNERS UP & DOWN STREAM) WHO OWN PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY (IF ONE HAS BEEN COMPLETED).

NAME: See Exhibit A

NAME: _____

ADDRESS: _____

ADDRESS: _____

NAME: _____

NAME: _____

ADDRESS: _____

ADDRESS: _____

1. NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON ANY ADJACENT PROPERTY AT THE TIME THE FLOODPLAIN PERMIT APPLICATION IS FILED AND THE NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN ANY HOME ON ANY PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY.

NAME: Skylar Montgomery
ADDRESS: 1607 Rayon Dr.
Parkersburg, WV 26101

NAME: Addie Marie Leadmon
ADDRESS: Rt. 3 Box 341 B
Elizabeth, WV 26143

NAME: John Paul Strickling
ADDRESS: HC 69 Box 34
West Union, WV 26456

NAME:
ADDRESS:

EXHIBIT A – County Route 28 Improvement				
Property Owner Name	Mailing Address	Tax Map	Deed Book Reference	Land Book Description
HOST PROPERTIES				
PROPERTY OWNERS ABUTTING HOST PROPERTIES INSIDE FLOODPLAIN				
Skylar Ora Montgomery & Clifford Warren ET AL	1607 Rayon Dr., Parkersburg, WV 26101	8-3-19	WB47/333	21.64 AC Homesite/Tillable/Pasture/Woodland
Lois Arcuri (1/5 INT), Colin Goddard (1/5 INT), Cathleen Shultz (1/5 INT), Robert Goddard (1/5 INT), & Bonnie Persohn (1/5 INT)	9142 Chatham Cir., North Ridgeville, OH 44039 48560 Spruce Ct., East Liverpool, OH 43920 1106 Golf Course Dr., Searcy, AR 72143 507 Peterson Ct., Inverness, FL 34450 1214 Mick Rd., Wellsville, OH 43968	8-3-20	AP41/150	25.5 AC Woodland
Addie Marie Leadmon	Rt. 3 Box 341 B, Elizabeth, WV 26143	8-3-21	250/84	19.84 AC Homesite/Pasture/Woodland
Randall Lynch & Dixie Craig (SURV)	5534 WV RT 18 N, West Union, WV 26456	8-6-1	258/546	80.4 AC Tillable/Woodland
John Paul Strickling ET AL	HC 69 Box 34, West Union, WV 26456	8-4-28	WB28/314	357.75 AC Homesite/Tillable/Pasture/Woodland

E. CONFIRMATION FORM

THE APPLICANT ACKNOWLEDGES, AGREES, AND CONFIRMS THAT HE/IT WILL PAY WITHIN 30 DAYS OF RECEIPT OF INVOICE BY THE COUNTY FOR ALL EXPENSES RELATIVE TO THE PERMIT APPLICATION PROCESS GREATER THAN THE REQUIRED DEPOSIT FOR EXPENSES INCLUDING:

- (A) PERSONAL SERVICE OF PROCESS BY THE DODDRIDGE COUNTY SHERIFF AT THE RATES PERMITTED BY LAW FOR SUCH SERVICE.
- (B) SERVICE BY CERTIFIED MAIL RETURN RECEIPT REQUESTED.
- (C) PUBLICATION.
- (D) COURT REPORTING SERVICES AT ANY HEARINGS REQUESTED BY THE APPLICANT.
- (E) CONSULTANTS AND/OR HEARING EXPERTS UTILIZED BY DODDRIDGE COUNTY FLOODPLAIN ADMINISTRATOR/MANAGER OR FLOODPLAIN APPEALS BOARD FOR REVIEW OF MATERIALS AND/OR TESTIMONY REGARDING THE EFFICACY OF GRANTING OR DENYING THE APPLICANT'S FLOODPLAIN PERMIT.

NAME (PRINT): Randy Kloberdanz

SIGNATURE:  **DATE:** March 25, 2015

After completing SECTION 2, APPLICANT should submit form to Floodplain Administrator/Manager or his/her representative for review.

SECTION 3: FLOODPLAIN DETERMINATION (to be completed by Floodplain Administrator/Manager or his/her representative)

THE PROPOSED DEVELOPMENT:

THE PROPOSED DEVELOPMENT IS LOCATED ON:

FIRM Panel: _____

Dated: _____

Is **NOT** located in a Specific Flood Hazard Area (Notify applicant that the application review is complete and **NO FLOODPLAIN DEVELOPMENT PERMIT IS REQUIRED**).

Is located in Special Flood Hazard Area.

FIRM zone designation _____
100-Year flood elevation is: _____ NGVD (MSL)

- Unavailable
- The proposed development is located in a floodway.
FBFM Panel No. _____ Dated _____
- See section 4 for additional instructions.

SIGNED _____ **DATE** _____

**SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by
Floodplain Administrator/Manager or his/her representative)**

The applicant must submit the documents checked below before the application can be processed.

- A plan showing the location of all existing structures, water bodies, adjacent roads, lot dimensions and proposed development.
- Development plans, drawn to scale, and specifications, including where applicable: details for anchoring structures, storage tanks, proposed elevation of lowest floor, (including basement or crawl space), types of water resistant materials used below the first floor, details of flood proofing of utilities located below the first floor and details of enclosures below the first floor. Also _____

- Subdivision or other development plans (If the subdivision or development exceeds 50 lots or 5 acres, whichever is the lesser, the applicant must provide 100-year flood elevations if they are not otherwise available).
- Plans showing the extent of watercourse relocation and/or landform alterations.
- Top of new fill elevation _____ Ft. NGVD (MSL).

For floodproofing structures applicant must attach certification from registered engineer or architect.

- Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood. A copy of all data and calculations supporting this finding must also be submitted.

- Manufactured homes located in a floodplain area must have a West Virginia Contractor's License and a Manufactured Home Installation License as required by the Federal Emergency Management Agency (FEMA).

- Other:

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Administrator/Manager or his/her representative)

I have determined that the proposed activity **(type is or is not)** in conformance with provisions of the Floodplain Ordinance adopted by the County Commission of Doddridge County on May 21, 2013. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED _____ DATE _____

If the Floodplain Administrator/Manager found that the above was not in conformance with the provisions of the Doddridge County Floodplain Ordinance and/or denied that application, the applicant may complete an appealing process below.

APPEALS: Appealed to the County Commission of Doddridge County? Yes {} No
 Hearing Date: _____
 County Commission Decision - Approved Yes No

CONDITIONS: _____

SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Compliance is issued).

The following information must be provided for project structures. This section must be completed by a registered professional engineer or a licensed land surveyor (or attach a certification to this application).

COMPLETE 1 OR 2 BELOW:

- 1 Actual (As-Built) Elevation of the top of the lowest floor (including basement or crawl space is _____ FT. NGVD (MSL)
- 2 Actual (As Built) elevation of floodproofing is _____ FT. NGVD (MSL)

Note: Any work performed prior to submittal of the above information is at risk of the applicant.

SECTION 7: COMPLIANCE ACTION (To be completed by the Floodplain Administrator/Manager or his/her representative).

The Floodplain Administrator/Manager or his/her representative will complete this section as applicable based on inspection of the project to ensure compliance with the Doddridge County Floodplain Ordinance.

INSPECTIONS:

DATE: _____ BY: _____
DEFICIENCIES ? Y/N

COMMENTS _____

SECTION 8: CERTIFICATE OF COMPLIANCE (To be completed by Floodplain Administrator/Manager or his/her representative).

Certificate of Compliance issued: DATE: _____ BY: _____

**CERTIFICATE OF COMPLIANCE
FOR DEVELOPMENT IN SPECIAL FLOOD HAZARD AREA
(OWNER MUST RETAIN)**

PERMIT NUMBER: _____

PERMIT DATE: _____

PURPOSE –

CONSTRUCTION LOCATION: _____

OWNER'S ADDRESS: _____

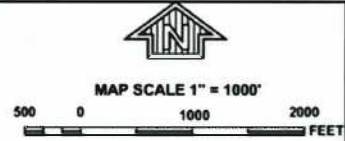
THE FOLLOWING MUST BE COMPLETED BY THE FLOODPLAIN ADMINISTRATOR/MANAGER OR HIS/HER AGENT.

COMPLIANCE IS HEREBY CERTIFIED WITH THE REQUIREMENT OF THE FLOODPLAIN ORDINANCE ADOPTED BY THE COUNTY COMMISSION OF DODDRIDGE COUNTY ON MAY 21, 2013.

SIGNED _____ DATE _____

ANTERO RESOURCES CORPORATION
County Route 28 Improvement

Type of Construction	Quantity	Construction in Floodplain (Y/N)	Unit Cost	Total
Fill	24 yd ³	Yes	\$8/yd ³	\$192
Guardrail	337 LF	Yes	\$12/LF	\$4,044
Full Depth Replacement	5,077 yd ²	Yes	\$10/yd ²	\$50,770
Total Floodplain Construction Cost Estimate =				\$55,006



305000 FT

300000 FT

39° 18' 45"
80° 45' 00"

JOINS PANEL 0120


NFIP PANEL 0110C

FIRM
FLOOD INSURANCE RATE MAP
DODDRIDGE COUNTY,
WEST VIRGINIA
AND INCORPORATED AREAS

PANEL 110 OF 325
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COUNTY	SUBMER	RESL	RATES
DODDRIDGE COUNTY	00224	0110	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
54017C0110C
MAP REVISED
OCTOBER 4, 2011
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using FIRM On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.fema.gov.



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

**DODDRIDGE COUNTY
UNINCORPORATED AREAS
540024**

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0110C

FIRM

FLOOD INSURANCE RATE MAP
DODDRIDGE COUNTY,
WEST VIRGINIA
AND INCORPORATED AREAS

PANEL 110 OF 325
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY: 540024
COMMUNITY NUMBER: 540024

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
54017C0110C**

**MAP REVISED
OCTOBER 4, 2011**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced Flood Map. It was extracted using FIRM On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program Flood Maps, check the FEMA Flood Map Store at www.fema.gov



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET


NFP PANEL 0130C

FIRM
 FLOOD INSURANCE RATE MAP
 DODDRIDGE COUNTY,
 WEST VIRGINIA
 AND INCORPORATED AREAS

PANEL 130 OF 325
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY	NUMBER	MODEL	EFFECTIVE DATE
(SEE MAP INDEX)	N/A	130	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
 54017C0130C
 MAP REVISED
 OCTOBER 4, 2011
 Federal Emergency Management Agency

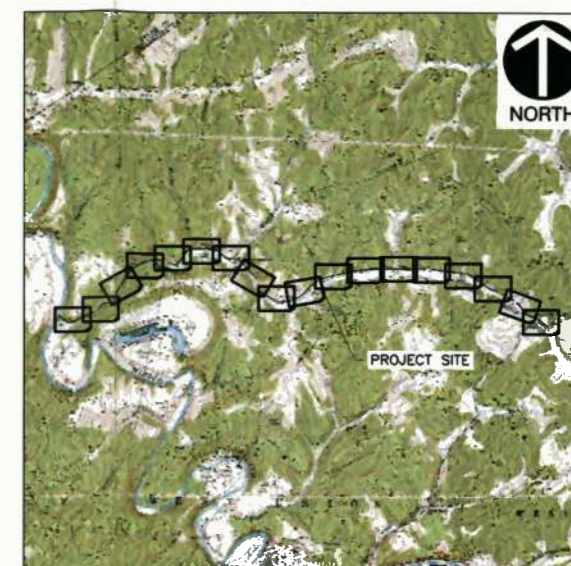
This is an official copy of a portion of the above referenced flood map. It was extracted using FIRM On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.nrc.fema.gov.

JOINS PANEL 0140

CONSTRUCTION PLANS ANTERO RESOURCES CORPORATION COUNTY ROUTE 28 IMPROVEMENT DODDRIDGE COUNTY, WEST VIRGINIA



VICINITY MAP
SCALE: 1 INCH = 1 MILE



LOCATION MAP
SCALE: 1 INCH = 4000 FEET

BEGIN PROJECT: N 039°19'43.36", W 080°48'31.46"
END PROJECT: N 039°19'51.17", W 080°44'23.34"

UTILITY CONTACTS

FIRST ENERGY
2 POWER STATION BLVD.
WILLOW ISLAND, WV 26134
PH: 304-665-3100

HARRISON RURAL ELECTRIFICATION ASSOCIATION INC.
SUN VALLEY ROAD
CLARKSBURG, WV 26301
PH: 304-624-6365

FRONTIER COMMUNICATIONS
428 W. MAIN ST
CLARKSBURG, WV 26301
PH: 304-935-3120

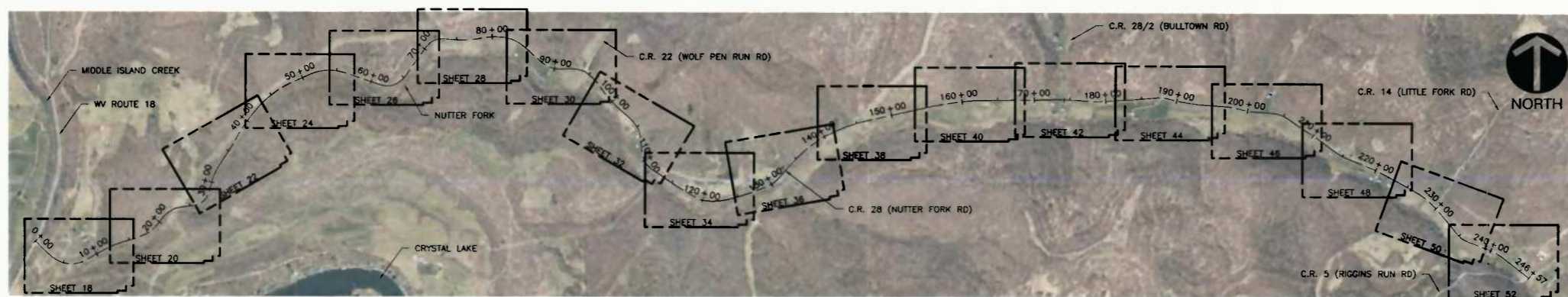
CABOT OIL & GAS CORPORATION
2567 W. LITTLE KANAWHA HWY
GRANTSVILLE, WV 26147
PH: 304-354-8644
CONTACT: BILL STALNAKER

DOMINION TRANSMISSION CORPORATION, SALEM G&P
2397 DAVISSON RUN RD.
CLARKSBURG, WV 2631
PH: 304-627-3013
CONTACT: STEVE GUM

CONSOL ENERGY
1 ENERGY DRIVE
JANE LEW, WV 26378
PH: 304-692-4321

ENERGY CORPORATION OF AMERICA
2316 WV HWY 5 EAST
GLENVILLE, WV 26351
PH: 304-462-5781
CONTACT: SHANE LUCAS

EQT GATHERING, LLC
115 PROFESSIONAL PL
BRIDGEPORT, WV 26330
PH: 304-848-0000



LAYOUT
1" = 1000'

DISTURBED ACREAGE
0.14 ACRES

FLOOD PANEL INFORMATION
BY GRAPHICAL PLOTTING ONLY, THE WIDENING FROM STA. 25+60.55 TO STA. 28+83.50 IS LOCATED IN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA, ZONE A, ACCORDING TO THE FLOOD INSURANCE RATE MAPS FOR DODDRIDGE COUNTY, MAP # 54017C0110C AND MAP # 54017C0130C, BOTH WITH AN EFFECTIVE DATE OF 10/04/2011.

INDEX TO SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	SUMMARY OF ESTIMATED QUANTITIES
3	GENERAL NOTES & TYPICAL SECTION
4-5	SURVEY REFERENCE POINTS
6-14	GEOMETRIC LAYOUT
15-17	TEMPORARY TRAFFIC CONTROL PLAN
18-53	PLAN AND PROFILE SHEETS
54	DRAINAGE TABULATION
55	PIPE PROFILES
56-57	MULTI-PLATE SINGLE PLATE ARCH DETAILS
58-60	EROSION & SEDIMENT CONTROL PLAN
61	OWNERSHIP INDEX
62-138	CROSS SECTIONS

WELL PADS
STRICKLING, ALEXANDER,
LORELEI AND ADDIE

REFERENCE
1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

NO.	DATE	DESCRIPTION

C&E
Civil & Environmental Consultants, Inc.
99 Cambridge Place - Bridgeport, WV 26330
PH: 304-933-3119 • 855-486-9539 • Fax: 304-933-3327
www.candinc.com

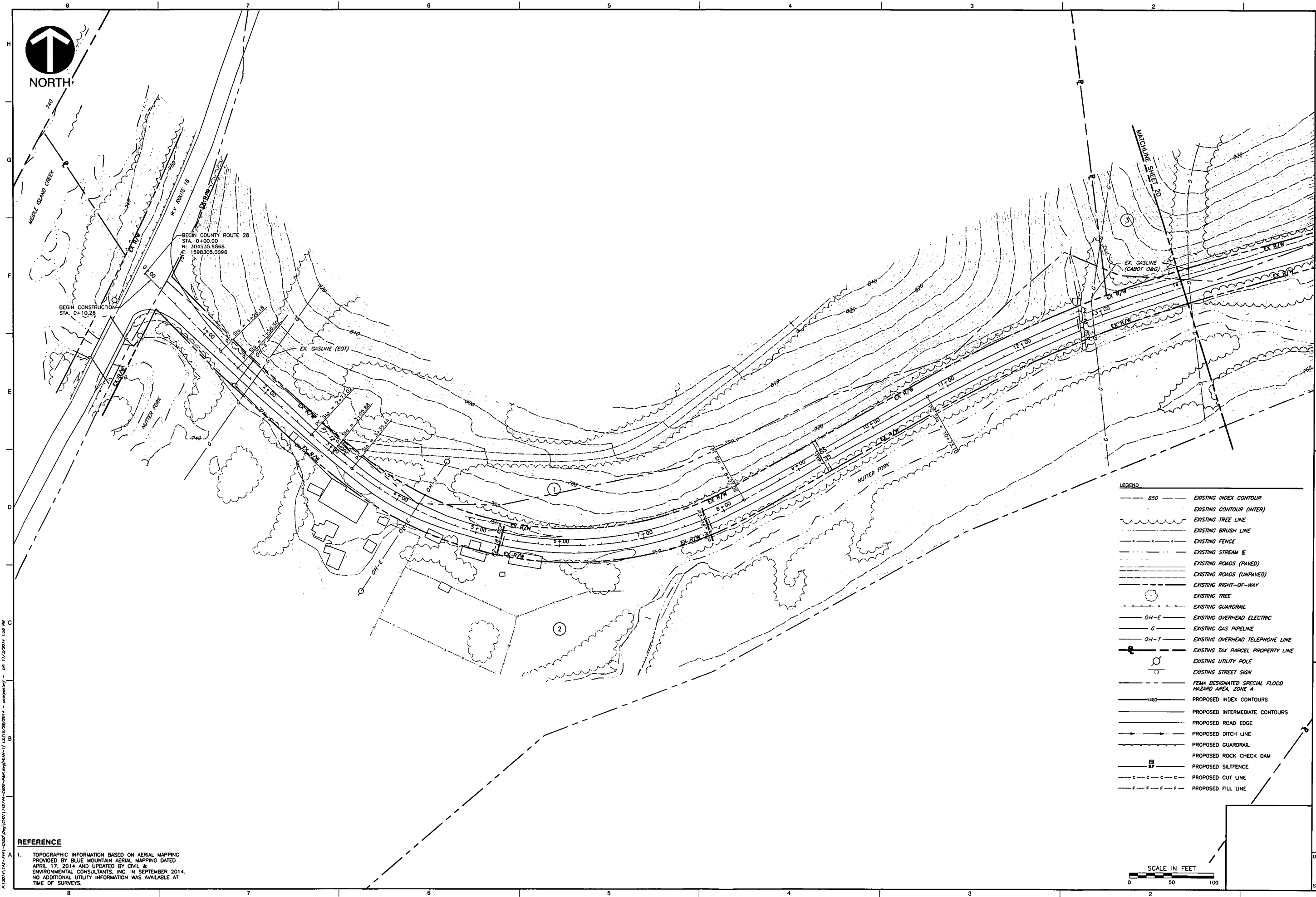
ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

TITLE SHEET
DATE: OCTOBER 29, 2014 | DRAWN BY: PWC | GSL
AS SHOWN | CHECKED BY: AS SHOWN | 142-744
PROJECT NO: 142-744
APPROVED BY: DEM
DRAWING NO: **1**
SHEET 1 OF 138





NORTH

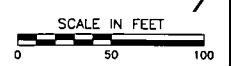


BEGIN CONSTRUCTION STA. 0+10.26

BEGIN COUNTY ROUTE 28 STA. 0+00.00
N: 304535.9868
E: 1598305.0096

LEGEND

- 850 EXISTING INDEX CONTOUR
- EXISTING CONTOUR (INTER)
- EXISTING TREE LINE
- EXISTING BRUSH LINE
- EXISTING FENCE
- EXISTING STREAM
- EXISTING ROADS (PAVED)
- EXISTING ROADS (UNPAVED)
- EXISTING RIGHT-OF-WAY
- EXISTING TREE
- EXISTING GUARDRAIL
- OH-E EXISTING OVERHEAD ELECTRIC
- G EXISTING GAS PIPELINE
- OH-T EXISTING OVERHEAD TELEPHONE LINE
- EXISTING TAX PARCEL PROPERTY LINE
- EXISTING UTILITY POLE
- EXISTING STREET SIGN
- FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA, ZONE A
- 1480 PROPOSED INDEX CONTOURS
- PROPOSED INTERMEDIATE CONTOURS
- PROPOSED ROAD EDGE
- PROPOSED DITCH LINE
- PROPOSED GUARDRAIL
- PROPOSED ROCK CHECK DAM
- PROPOSED SILTFENCE
- PROPOSED CUT LINE
- PROPOSED FILL LINE



REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

REVISION RECORD

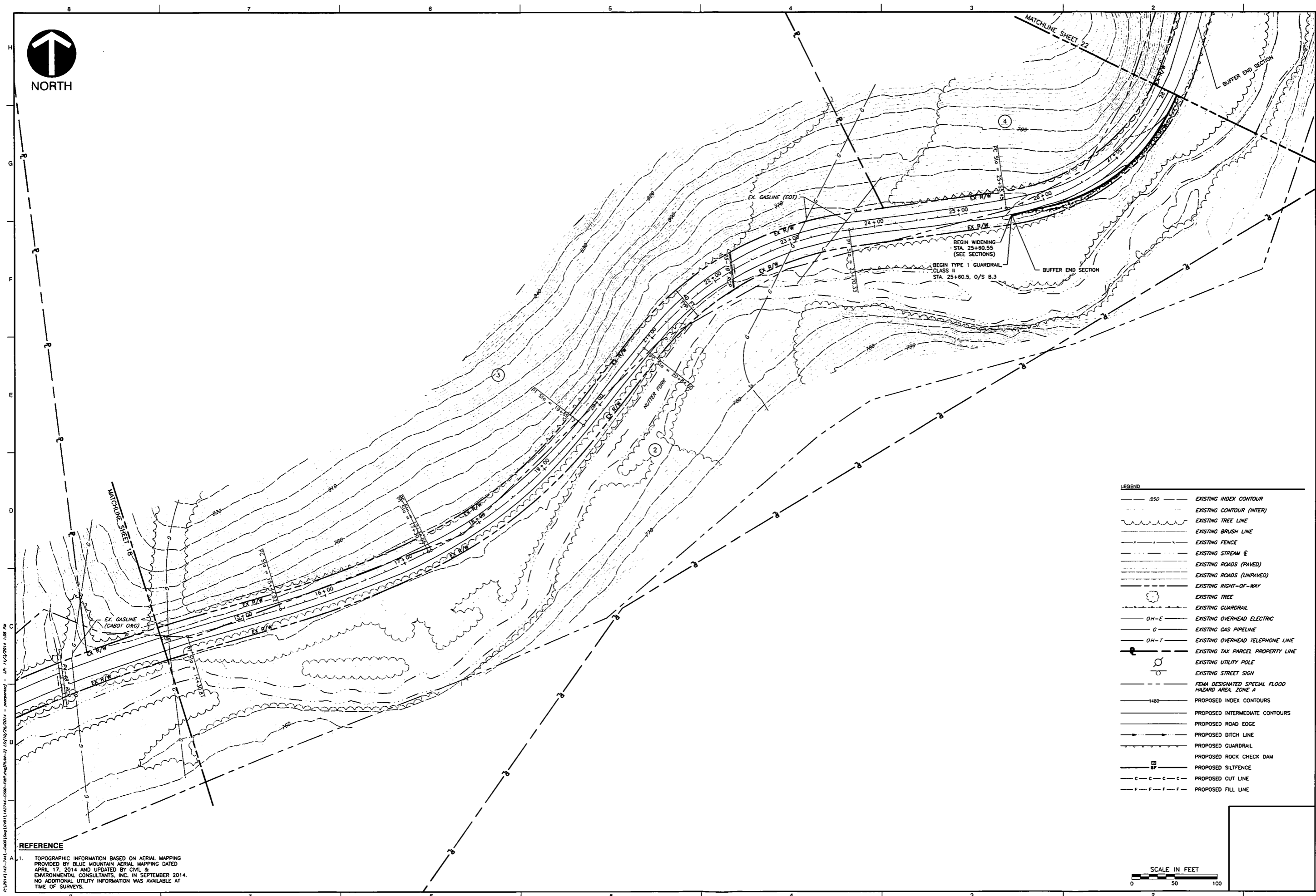
NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.ceciinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28
STA. 0+00 TO STA. 14+00

DATE: OCTOBER 26, 2014 DRAWN BY: PWC
 PROJECT NO: 142-744 CHECKED BY: GSL
 APPROVED BY: DEM



NO.	DATE	DESCRIPTION

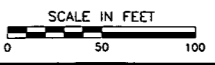
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.cecinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28
STA. 14+00 TO STA. 28+00

DATE: OCTOBER 28, 2014 DRAWN BY: PWC
 DWG SCALE: 1"=50' CHECKED BY: GSL
 PROJECT NO: 142-744
 APPROVED BY: DEM

- LEGEND**
- 550 --- EXISTING INDEX CONTOUR
 - --- EXISTING CONTOUR (INTER)
 - --- EXISTING TREE LINE
 - --- EXISTING BRUSH LINE
 - --- EXISTING FENCE
 - --- EXISTING STREAM @
 - --- EXISTING ROADS (PAVED)
 - --- EXISTING ROADS (UNPAVED)
 - --- EXISTING RIGHT-OF-WAY
 - --- EXISTING TREE
 - --- EXISTING GUARDRAIL
 - OH-E --- EXISTING OVERHEAD ELECTRIC
 - G --- EXISTING GAS PIPELINE
 - OH-T --- EXISTING OVERHEAD TELEPHONE LINE
 - --- EXISTING TAX PARCEL PROPERTY LINE
 - --- EXISTING UTILITY POLE
 - --- EXISTING STREET SIGN
 - --- FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA ZONE A
 - 1480 --- PROPOSED INDEX CONTOURS
 - --- PROPOSED INTERMEDIATE CONTOURS
 - --- PROPOSED ROAD EDGE
 - --- PROPOSED DITCH LINE
 - --- PROPOSED GUARDRAIL
 - --- PROPOSED ROCK CHECK DAM
 - --- PROPOSED SILTFENCE
 - C-C-C-C --- PROPOSED CUT LINE
 - F-F-F-F --- PROPOSED FILL LINE

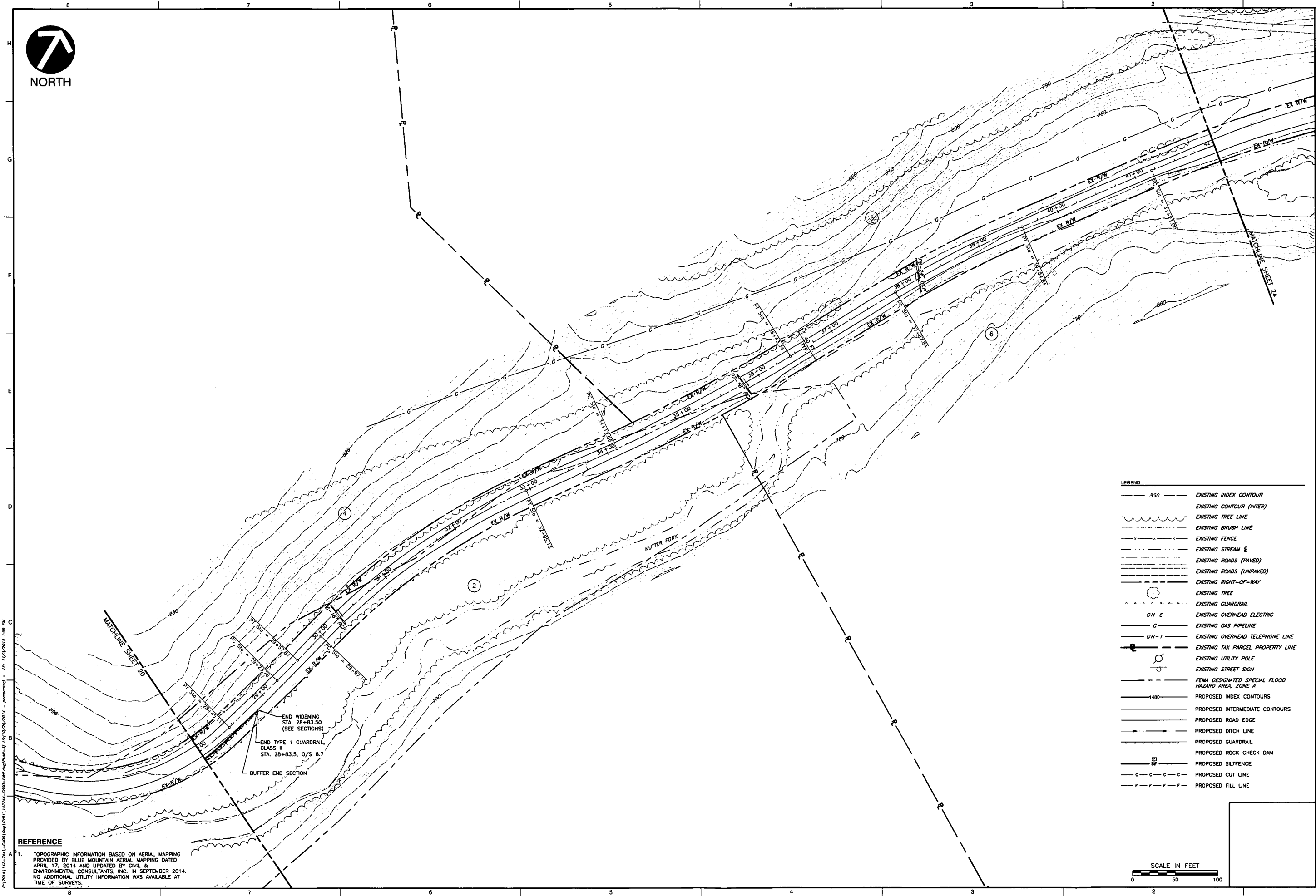


REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.



NORTH



NO	DATE	DESCRIPTION

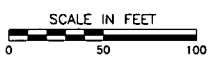
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.cedinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28
STA. 28+00 TO STA. 42+00

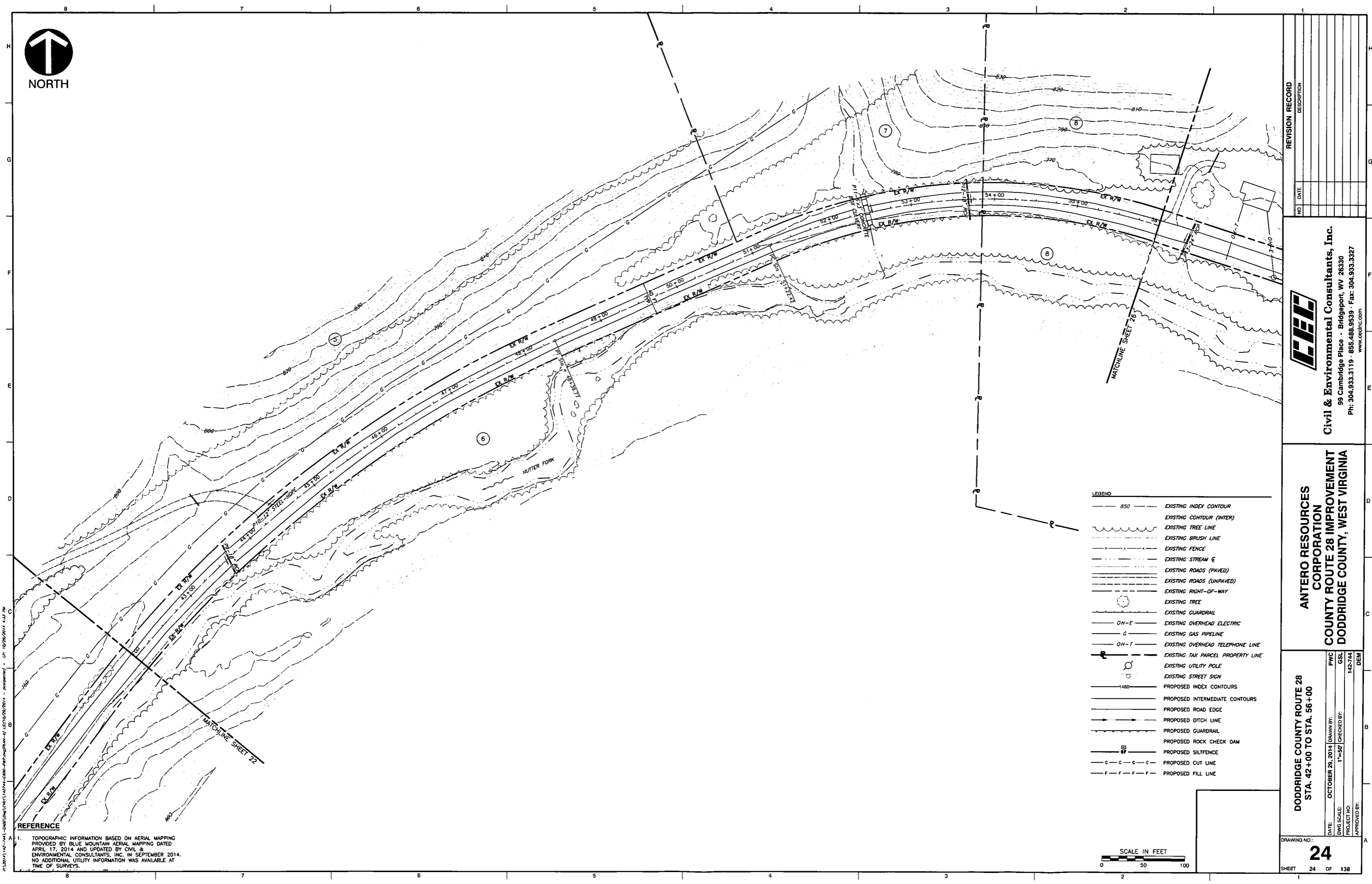
DATE: OCTOBER 28, 2014 DRAWN BY: PWC
 DWG SCALE: 1"=50' CHECKED BY: GSL
 PROJECT NO.: 142-744
 APPROVED BY: DEM

LEGEND	
---	EXISTING INDEX CONTOUR
---	EXISTING CONTOUR (INTER)
---	EXISTING TREE LINE
---	EXISTING BRUSH LINE
---	EXISTING FENCE
---	EXISTING STREAM &
---	EXISTING ROADS (PAVED)
---	EXISTING ROADS (UNPAVED)
---	EXISTING RIGHT-OF-WAY
---	EXISTING TREE
---	EXISTING GUARDRAIL
OH-E	EXISTING OVERHEAD ELECTRIC
G	EXISTING GAS PIPELINE
OH-T	EXISTING OVERHEAD TELEPHONE LINE
---	EXISTING TAX PARCEL PROPERTY LINE
---	EXISTING UTILITY POLE
---	EXISTING STREET SIGN
---	FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA, ZONE A
---	PROPOSED INDEX CONTOURS
---	PROPOSED INTERMEDIATE CONTOURS
---	PROPOSED ROAD EDGE
---	PROPOSED DITCH LINE
---	PROPOSED GUARDRAIL
---	PROPOSED ROCK CHECK DAM
---	PROPOSED SILTFENCE
---	PROPOSED CUT LINE
---	PROPOSED FILL LINE



REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEY.



REVISION RECORD	
NO.	DATE

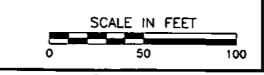
Antero Resources
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 • 855.486.9539 • Fax: 304.933.3927
 www.aecinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28
STA. 42+00 TO STA. 56+00

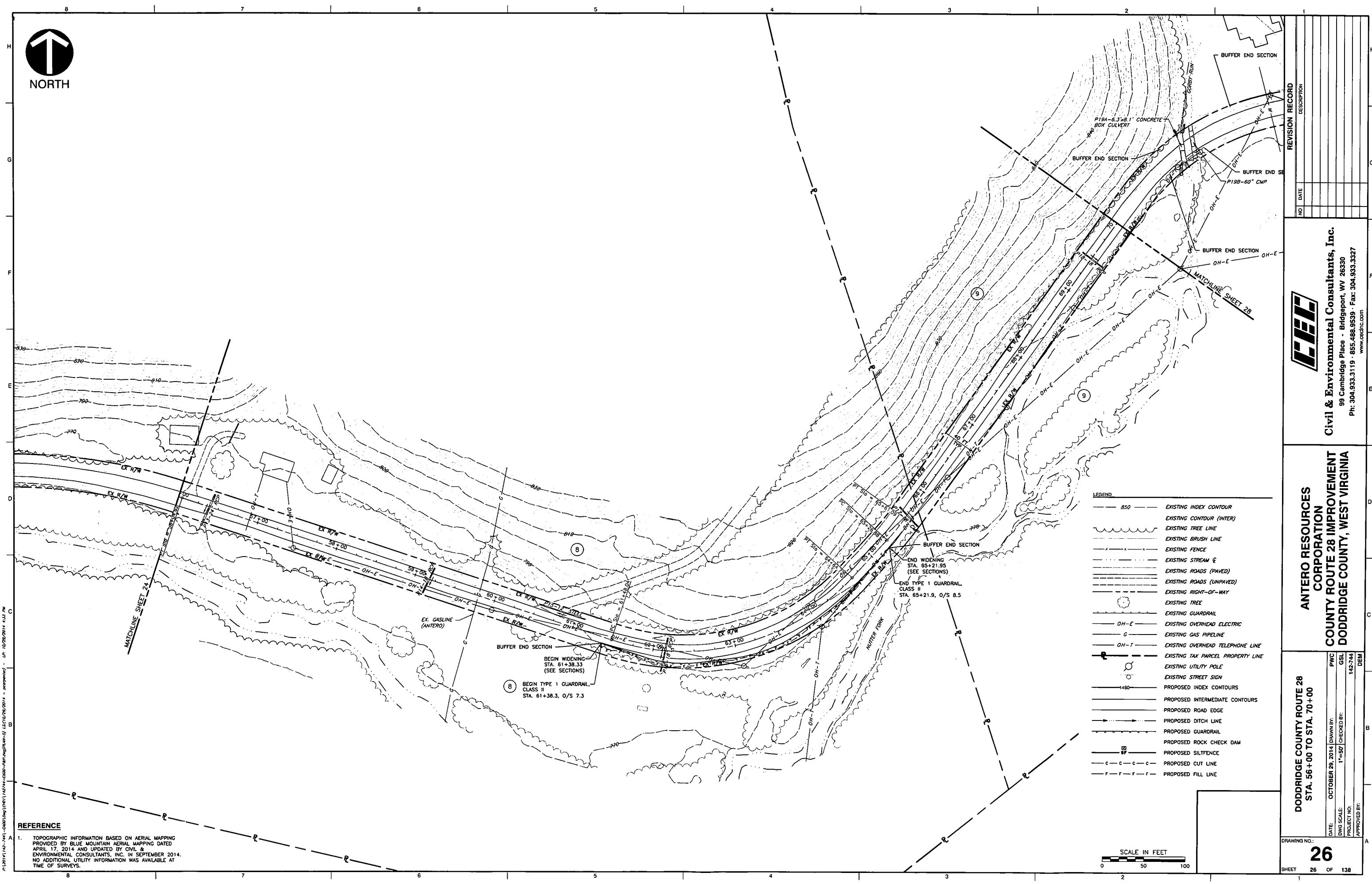
DATE: OCTOBER 28, 2014
 DRAWN BY: PWC
 PROJECT NO.: 142744
 CHECKED BY: GSB
 APPROVED BY: DEM

- LEGEND**
- 850 ——— EXISTING INDEX CONTOUR
 - EXISTING CONTOUR (INTER)
 - ~~~~~ EXISTING TREE LINE
 - ~~~~~ EXISTING BRUSH LINE
 - - - - - EXISTING FENCE
 - - - - - EXISTING STREAM &
 - EXISTING ROADS (PAVED)
 - - - - - EXISTING ROADS (UNPAVED)
 - - - - - EXISTING RIGHT-OF-WAY
 - EXISTING TREE
 - EXISTING GUARDRAIL
 - OH-E ——— EXISTING OVERHEAD ELECTRIC
 - G ——— EXISTING GAS PIPELINE
 - OH-T ——— EXISTING OVERHEAD TELEPHONE LINE
 - EXISTING TAX PARCEL PROPERTY LINE
 - EXISTING UTILITY POLE
 - EXISTING STREET SIGN
 - PROPOSED INDEX CONTOURS
 - PROPOSED INTERMEDIATE CONTOURS
 - PROPOSED ROAD EDGE
 - PROPOSED DITCH LINE
 - PROPOSED GUARDRAIL
 - PROPOSED ROCK CHECK DAM
 - PROPOSED SILTFENCE
 - - - - - PROPOSED CUT LINE
 - - - - - PROPOSED FILL LINE



REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.



REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 • 855.488.9539 • Fax: 304.933.3327
 www.cedinc.com

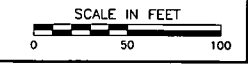
ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28
STA. 56+00 TO STA. 70+00

DATE: OCTOBER 28, 2014 (DRAWN BY: PWC) (CHECKED BY: GSL)
 DWG SCALE: 1"=50' (PROJECT NO: 142-744)
 APPROVED BY: DEM

DRAWING NO: **26**
 SHEET 26 OF 138

- LEGEND**
- 850 ——— EXISTING INDEX CONTOUR
 - EXISTING CONTOUR (INTER)
 - ~~~~~ EXISTING TREE LINE
 - ~~~~~ EXISTING BRUSH LINE
 - EXISTING FENCE
 - EXISTING STREAM &
 - EXISTING ROADS (PAVED)
 - EXISTING ROADS (UNPAVED)
 - EXISTING RIGHT-OF-WAY
 - EXISTING TREE
 - EXISTING GUARDRAIL
 - OH-E EXISTING OVERHEAD ELECTRIC
 - G EXISTING GAS PIPELINE
 - OH-T EXISTING OVERHEAD TELEPHONE LINE
 - EXISTING TAX PARCEL PROPERTY LINE
 - EXISTING UTILITY POLE
 - EXISTING STREET SIGN
 - 1480 ——— PROPOSED INDEX CONTOURS
 - PROPOSED INTERMEDIATE CONTOURS
 - PROPOSED ROAD EDGE
 - PROPOSED DITCH LINE
 - PROPOSED GUARDRAIL
 - PROPOSED ROCK CHECK DAM
 - PROPOSED SILTFENCE
 - PROPOSED CUT LINE
 - PROPOSED FILL LINE



REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.



- NOTES**
- CONTRACTOR TO REMOVE EXISTING CULVERT P198-60" CMP, REPLACE WITH 46" L.F. OF 60" HDPE. PLACE FILL ON THE OUTLET SIDE OF THE ROAD TO PROVIDE A 2:1 SLOPE FROM THE EXISTING EDGE OF PAVEMENT DOWN TO EXISTING GROUND AND PLACE G-OUTED RIP RAP TO STABILIZE SLOPE AND PIPE OUTFALL. SEE PIPE PROFILE ON SHEET 55.
 - GUARDRAIL TO BE MOUNTED TO THE CONCRETE BOX CULVERT WITH INSERTS PER WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD DETAILS BOOK, VOLUME 3, BRIDGES AND MISCELLANEOUS STRUCTURES, STANDARD SHEET BR-8104.

NO.	DATE	DESCRIPTION

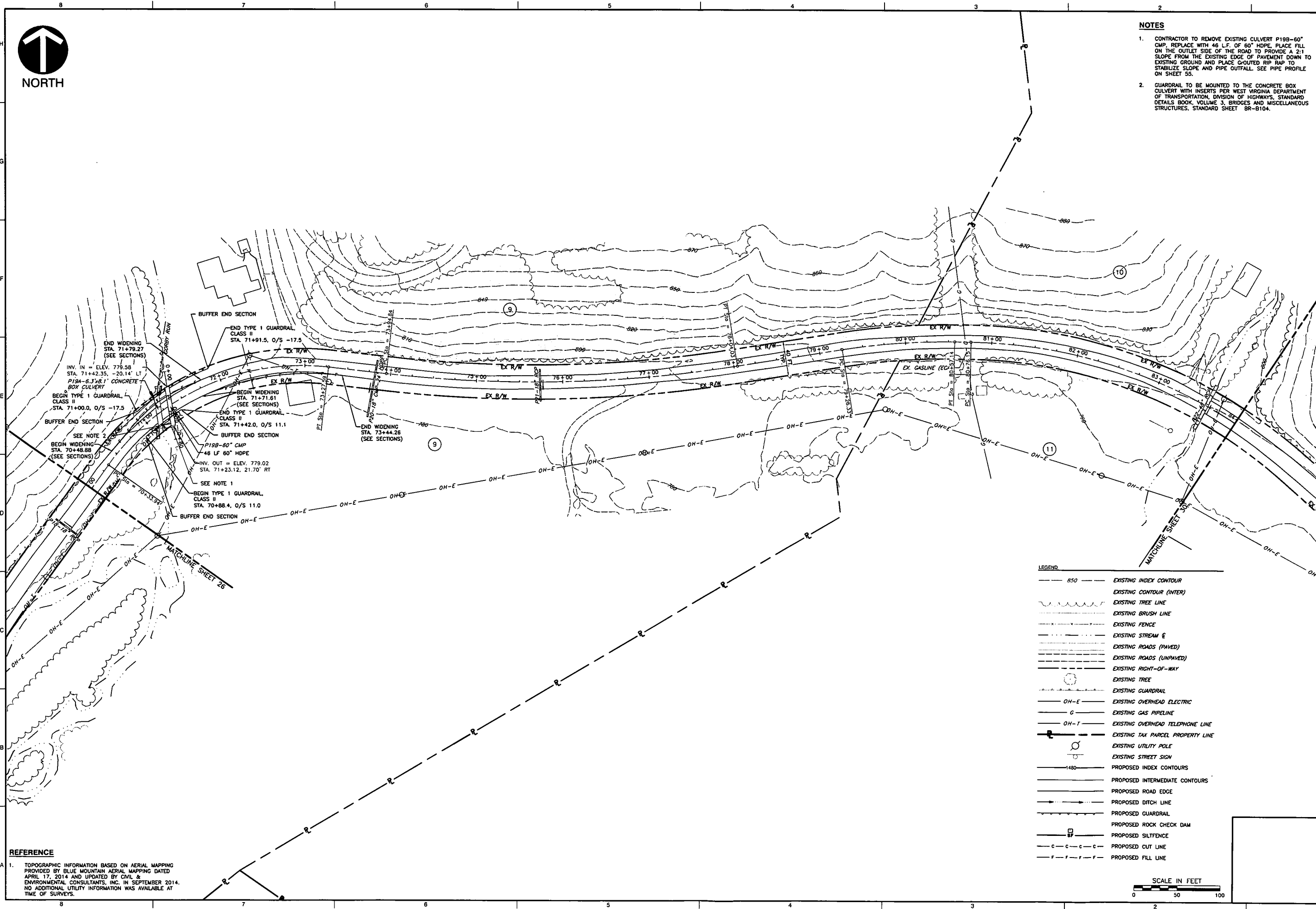
Antero Resources Corporation
 Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 • 855.488.9539 • Fax: 304.933.3327
 www.artero.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

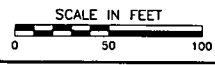
DODDRIDGE COUNTY ROUTE 28
STA. 70+00 TO STA. 84+00

DATE: OCTOBER 20, 2014
 DRAWN BY: PWC
 PROJECT NO: 1425744
 CHECKED BY: GSL
 APPROVED BY: DEM

DRAWING NO.: **28**
 SHEET 28 OF 138



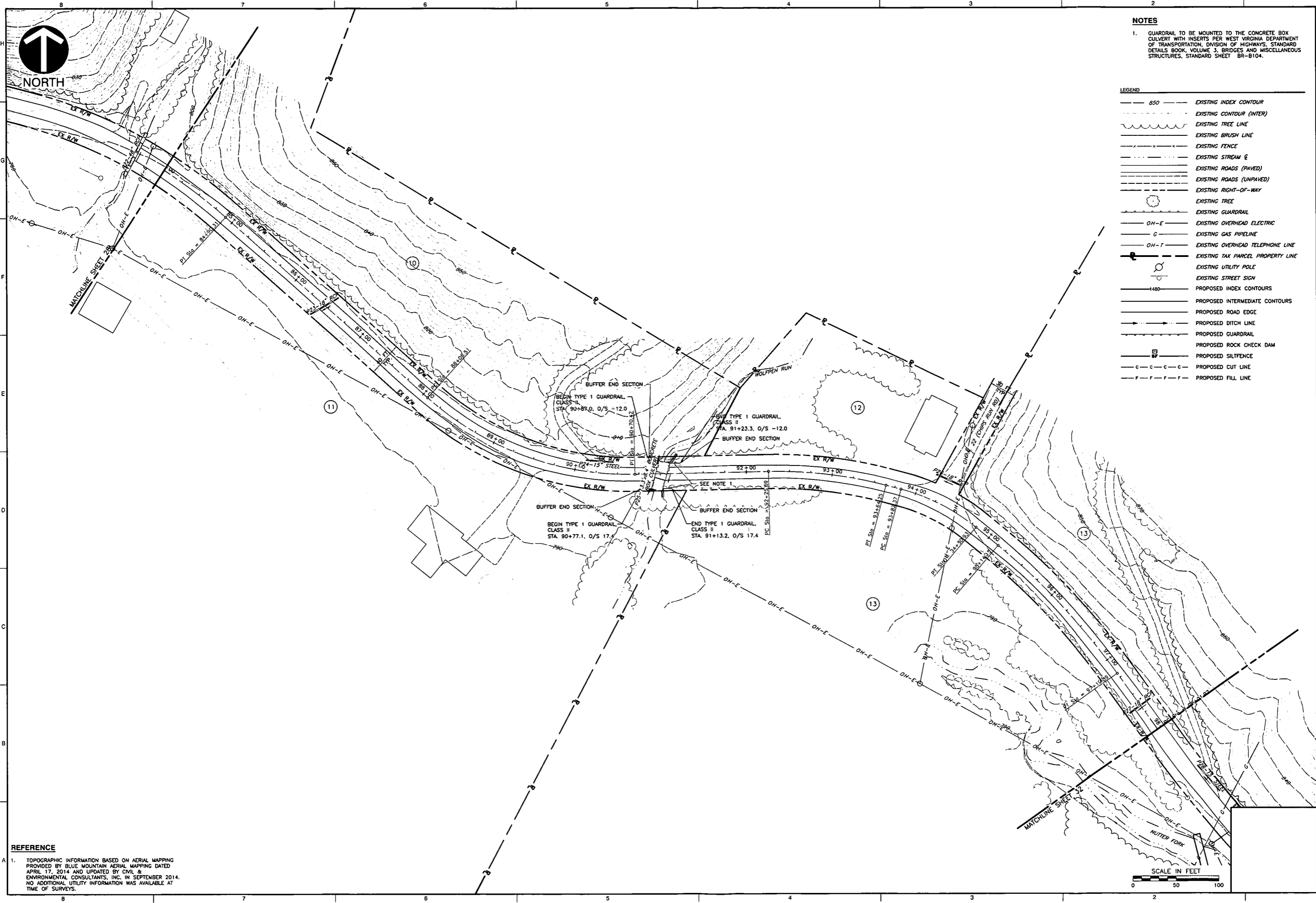
- LEGEND**
- 850 --- EXISTING INDEX CONTOUR
 - EXISTING CONTOUR (INTER)
 - EXISTING TREE LINE
 - EXISTING BRUSH LINE
 - EXISTING FENCE
 - EXISTING STREAM
 - EXISTING ROADS (PAVED)
 - EXISTING ROADS (UNPAVED)
 - EXISTING RIGHT-OF-WAY
 - EXISTING TREE
 - EXISTING GUARDRAIL
 - OH-E --- EXISTING OVERHEAD ELECTRIC
 - G --- EXISTING GAS PIPELINE
 - OH-T --- EXISTING OVERHEAD TELEPHONE LINE
 - EXISTING TAX PARCEL PROPERTY LINE
 - EXISTING UTILITY POLE
 - EXISTING STREET SIGN
 - 1480 --- PROPOSED INDEX CONTOURS
 - PROPOSED INTERMEDIATE CONTOURS
 - PROPOSED ROAD EDGE
 - PROPOSED DITCH LINE
 - PROPOSED GUARDRAIL
 - PROPOSED ROCK CHECK DAM
 - PROPOSED SILTFENCE
 - PROPOSED CUT LINE
 - PROPOSED FILL LINE



REFERENCE

- TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

A:\2014\1425744\1425744.dwg (11/14/2014 10:05:00 AM) - PLOT DATE: 10/20/2014 10:05 AM



NOTES

- GUARDRAIL TO BE MOUNTED TO THE CONCRETE BOX CULVERT WITH INSERTS PER WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD DETAILS BOOK, VOLUME 3, BRIDGES AND MISCELLANEOUS STRUCTURES, STANDARD SHEET BR-B104.

LEGEND

- 850 ——— EXISTING INDEX CONTOUR
- EXISTING CONTOUR (INTER)
- ~~~~~ EXISTING TREE LINE
- ~~~~~ EXISTING BRUSH LINE
- EXISTING FENCE
- EXISTING STREAM &
- EXISTING ROADS (PAVED)
- EXISTING ROADS (UNPAVED)
- EXISTING RIGHT-OF-WAY
- EXISTING TREE
- EXISTING GUARDRAIL
- OH-E EXISTING OVERHEAD ELECTRIC
- G EXISTING GAS PIPELINE
- OH-T EXISTING OVERHEAD TELEPHONE LINE
- EXISTING TAX PARCEL PROPERTY LINE
- EXISTING UTILITY POLE
- EXISTING STREET SIGN
- 1480 ——— PROPOSED INDEX CONTOURS
- PROPOSED INTERMEDIATE CONTOURS
- PROPOSED ROAD EDGE
- PROPOSED DITCH LINE
- PROPOSED GUARDRAIL
- PROPOSED ROCK CHECK DAM
- PROPOSED SILTFENCE
- PROPOSED CUT LINE
- PROPOSED FILL LINE

REVISION RECORD	
NO.	DESCRIPTION

Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.cedinc.com

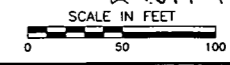
ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

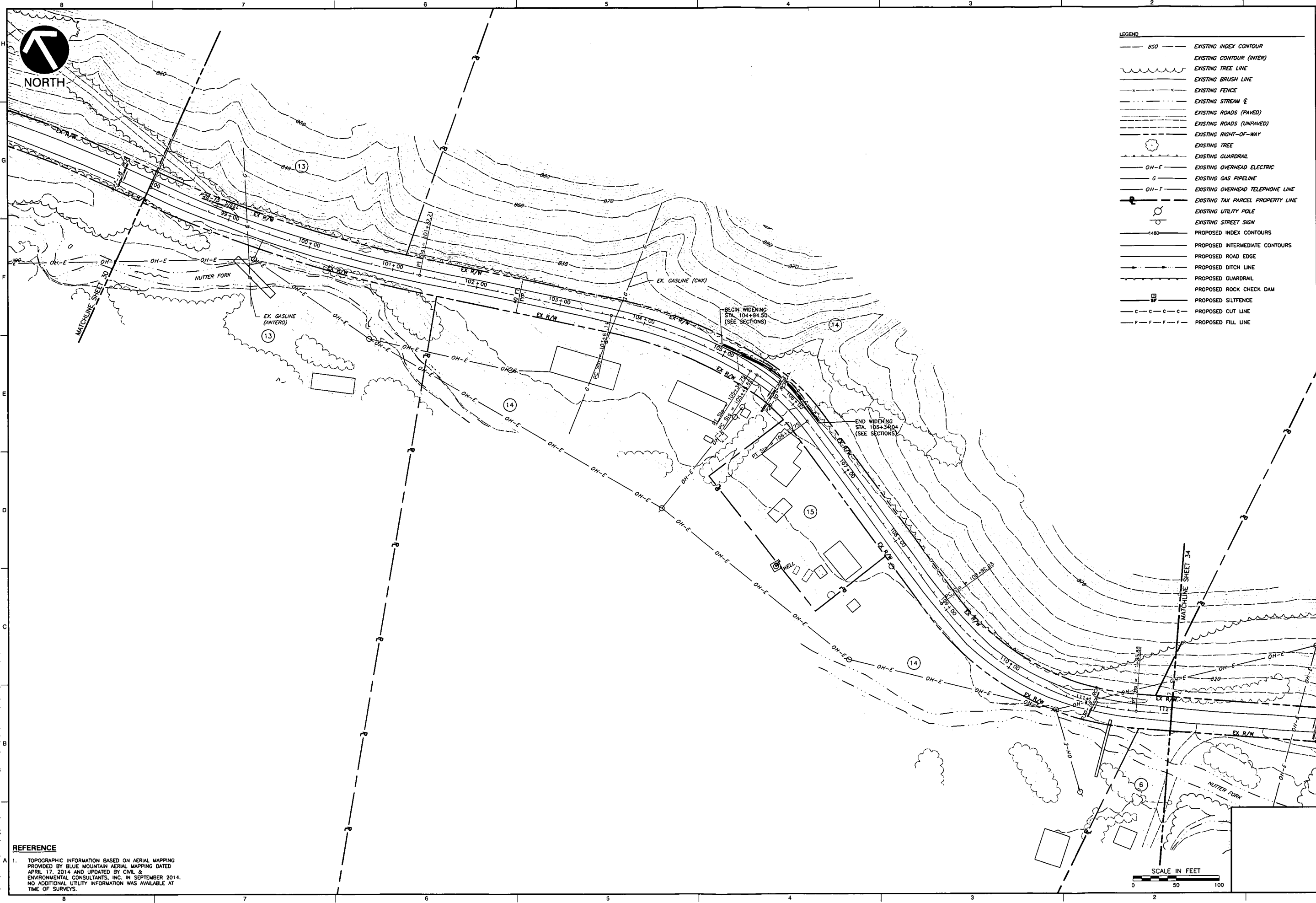
DODDRIDGE COUNTY ROUTE 28		PWC
STA. 84+00 TO STA. 98+00		GSL
DATE: OCTOBER 28, 2014	DRAWN BY:	142-741
DWG SCALE: 1"=50'	CHECKED BY:	DEM
PROJECT NO:	APPROVED BY:	

DRAWING NO.: **30**
 SHEET 30 OF 138

REFERENCE

- TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.





LEGEND

	EXISTING INDEX CONTOUR
	EXISTING CONTOUR (INTER)
	EXISTING TREE LINE
	EXISTING BRUSH LINE
	EXISTING FENCE
	EXISTING STREAM
	EXISTING ROADS (PAVED)
	EXISTING ROADS (UNPAVED)
	EXISTING RIGHT-OF-WAY
	EXISTING TREE
	EXISTING GUARDRAIL
	EXISTING OVERHEAD ELECTRIC
	EXISTING GAS PIPELINE
	EXISTING OVERHEAD TELEPHONE LINE
	EXISTING TAX PARCEL PROPERTY LINE
	EXISTING UTILITY POLE
	EXISTING STREET SIGN
	PROPOSED INDEX CONTOURS
	PROPOSED INTERMEDIATE CONTOURS
	PROPOSED ROAD EDGE
	PROPOSED DITCH LINE
	PROPOSED GUARDRAIL
	PROPOSED ROCK CHECK DAM
	PROPOSED SILT FENCE
	PROPOSED CUT LINE
	PROPOSED FILL LINE

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 • 855.488.9539 • Fax: 304.933.3327
 www.cedcinc.com

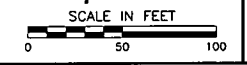
ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

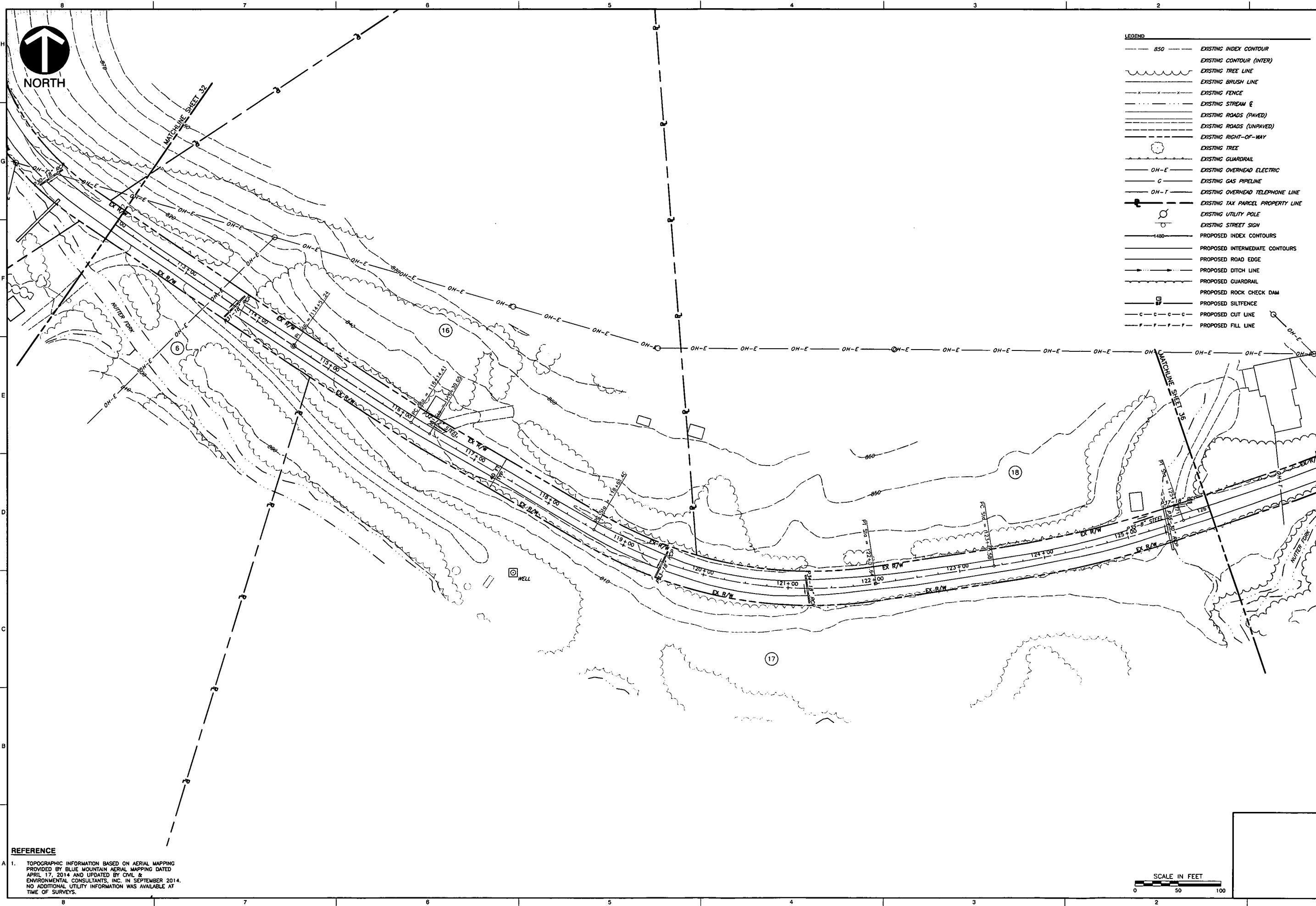
DODDRIDGE COUNTY ROUTE 28
STA. 98+00 TO STA. 112+00

DATE:	OCTOBER 28, 2014	DRAWN BY:	PWC
DWG SCALE:	1"=50'	CHECKED BY:	GSL
PROJECT NO.:	142-744	APPROVED BY:	DEM

REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.





LEGEND

	EXISTING INDEX CONTOUR
	EXISTING CONTOUR (INTER)
	EXISTING TREE LINE
	EXISTING BRUSH LINE
	EXISTING FENCE
	EXISTING STREAM
	EXISTING ROADS (PAVED)
	EXISTING ROADS (UNPAVED)
	EXISTING RIGHT-OF-WAY
	EXISTING TREE
	EXISTING GUARDRAIL
	EXISTING OVERHEAD ELECTRIC
	EXISTING GAS PIPELINE
	EXISTING OVERHEAD TELEPHONE LINE
	EXISTING TAX PARCEL PROPERTY LINE
	EXISTING UTILITY POLE
	EXISTING STREET SIGN
	PROPOSED INDEX CONTOURS
	PROPOSED INTERMEDIATE CONTOURS
	PROPOSED ROAD EDGE
	PROPOSED DITCH LINE
	PROPOSED GUARDRAIL
	PROPOSED ROCK CHECK DAM
	PROPOSED SILTFENCE
	PROPOSED CUT LINE
	PROPOSED FILL LINE

REVISION RECORD

NO.	DATE	DESCRIPTION

C&E
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.486.9539 · Fax: 304.933.3327
 www.cedinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

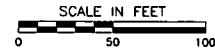
DODDRIDGE COUNTY ROUTE 28
STA. 112+00 TO STA. 126+00

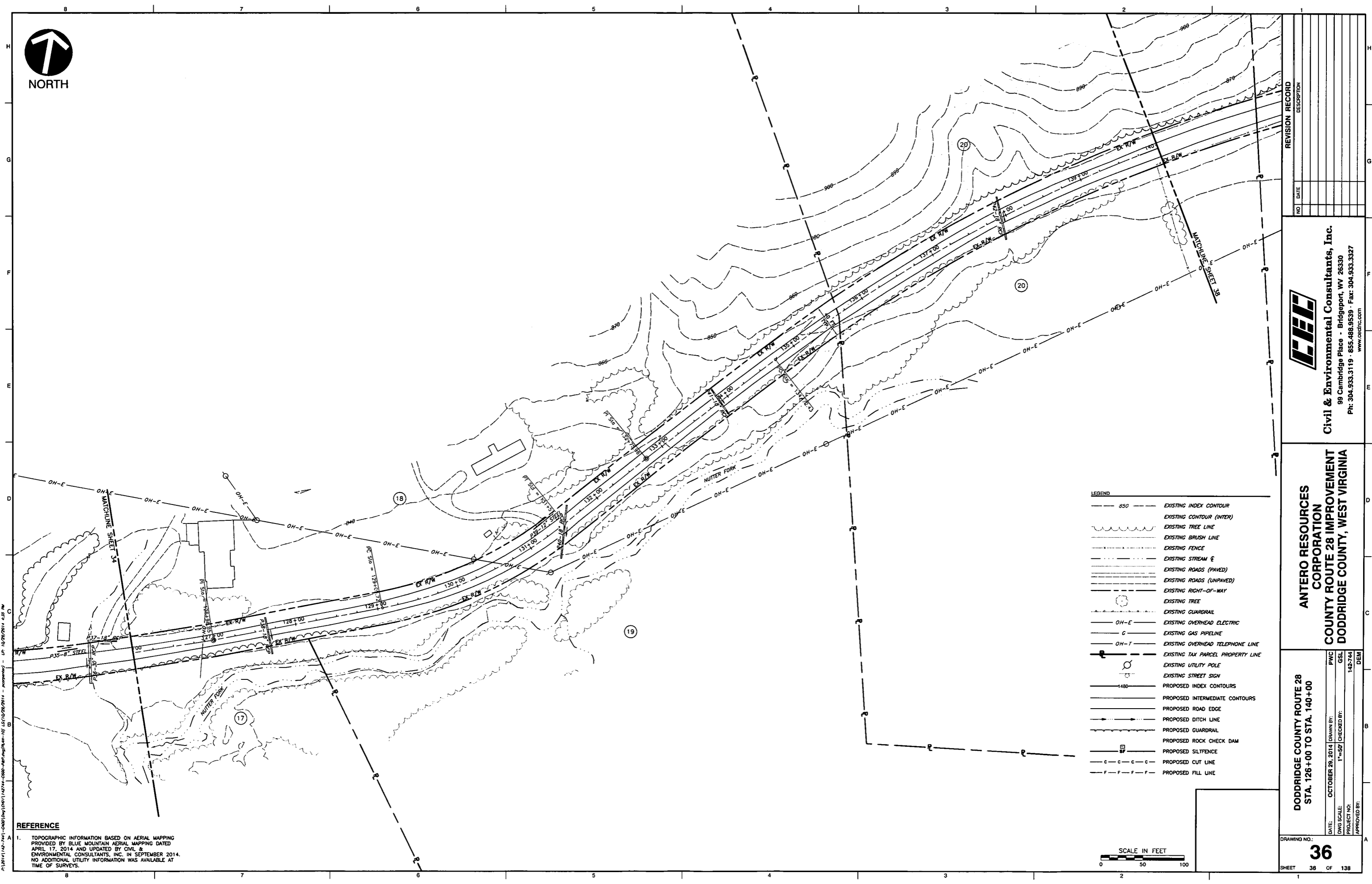
DATE: OCTOBER 28, 2014
 DWG. SCALE: 1"=50'
 PROJECT NO: 142744
 APPROVED BY: DEM

DRAWING NO: **34**
 SHEET 34 OF 138

REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.





NO.	DATE	DESCRIPTION

C&E
Civil & Environmental Consultants, Inc.
 99 Cambridge Place • Bridgeport, WV 26330
 Ph: 304.933.3119 • 855.486.9539 • Fax: 304.933.3327
 www.candc.com

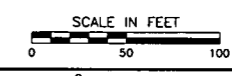
ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28
STA. 126+00 TO STA. 140+00

DATE: OCTOBER 29, 2014 DRAWN BY: PWC
 DWS SCALE: 1"=50' CHECKED BY: GSL
 PROJECT NO: 142744
 APPROVED BY: DEM

DRAWING NO.: **36**
 SHEET 36 OF 138

- LEGEND**
- 850 --- EXISTING INDEX CONTOUR
 - EXISTING CONTOUR (INTER)
 - EXISTING TREE LINE
 - EXISTING BRUSH LINE
 - EXISTING FENCE
 - EXISTING STREAM &
 - EXISTING ROADS (PAVED)
 - EXISTING ROADS (UNPAVED)
 - EXISTING RIGHT-OF-WAY
 - EXISTING TREE
 - EXISTING GUARDRAIL
 - OH-E --- EXISTING OVERHEAD ELECTRIC
 - G --- EXISTING GAS PIPELINE
 - OH-T --- EXISTING OVERHEAD TELEPHONE LINE
 - EXISTING TAX PARCEL PROPERTY LINE
 - EXISTING UTILITY POLE
 - EXISTING STREET SIGN
 - 1480 --- PROPOSED INDEX CONTOURS
 - PROPOSED INTERMEDIATE CONTOURS
 - PROPOSED ROAD EDGE
 - PROPOSED DITCH LINE
 - PROPOSED GUARDRAIL
 - PROPOSED ROCK CHECK DAM
 - PROPOSED SILTFENCE
 - C C C C --- PROPOSED CUT LINE
 - F F F F --- PROPOSED FILL LINE



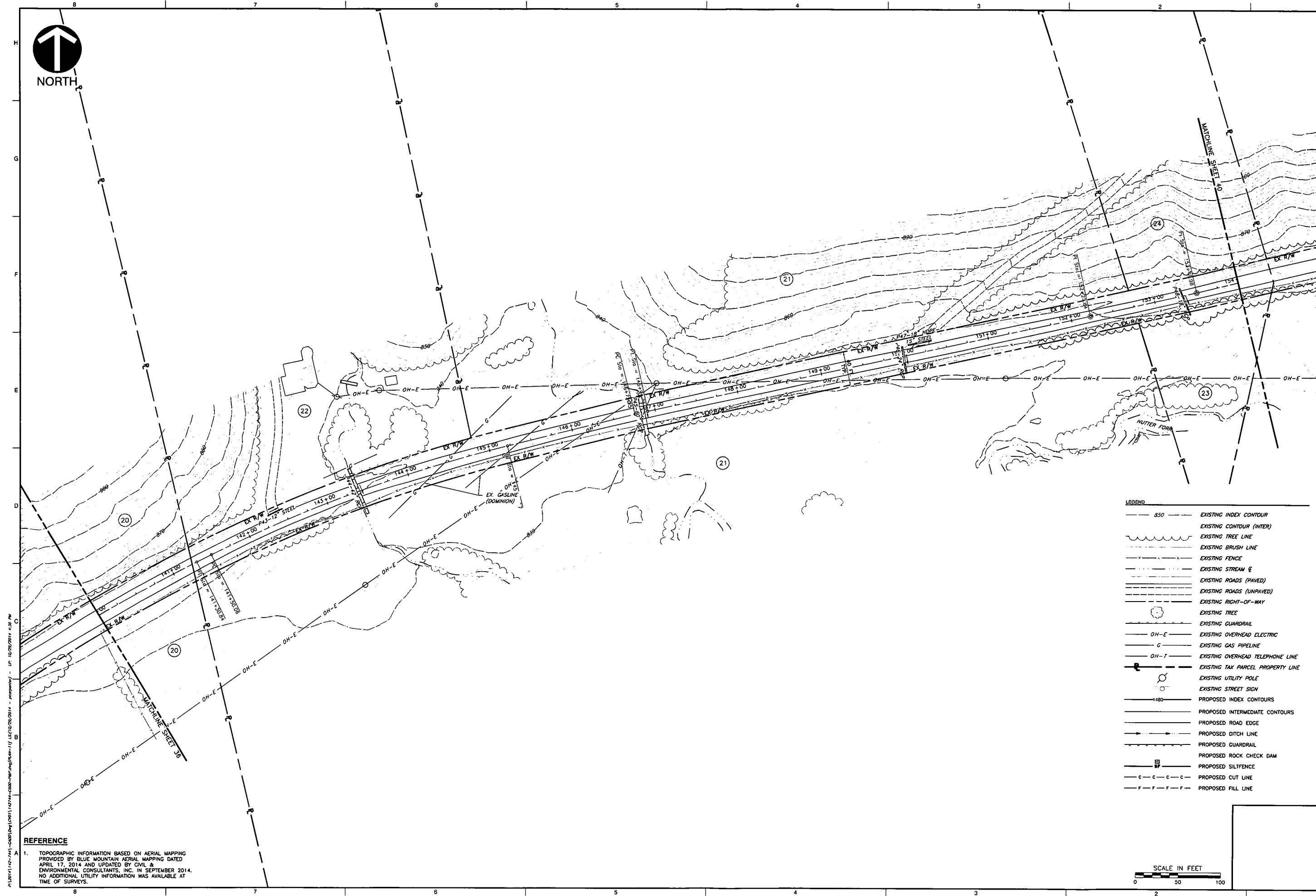
REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

P:\1014\142744\142744-0000\DWG\142744-0000-0000-0000.dwg
 10/29/2014 10:52 AM
 142744-0000-0000-0000.dwg
 10/29/2014 10:52 AM
 142744-0000-0000-0000.dwg
 10/29/2014 10:52 AM



NORTH



REVISION RECORD	
NO.	DATE

Civil & Environmental Consultants, Inc.
 89 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 • 855.486.9539 • Fax: 304.933.3327
 www.cecinc.com

**ANTERO RESOURCES CORPORATION
 COUNTY ROUTE 28 IMPROVEMENT
 DODDRIDGE COUNTY, WEST VIRGINIA**

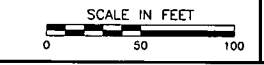
**DODDRIDGE COUNTY ROUTE 28
 STA. 140+00 TO STA. 154+00**

DWG SCALE: OCTOBER 28, 2014 [DRAWN BY: PWC] [CHECKED BY: GSJ]
 PROJECT NO.: 142744 [APPROVED BY: DEM]

DRAWING NO.: **38**
 SHEET 38 OF 138

LEGEND

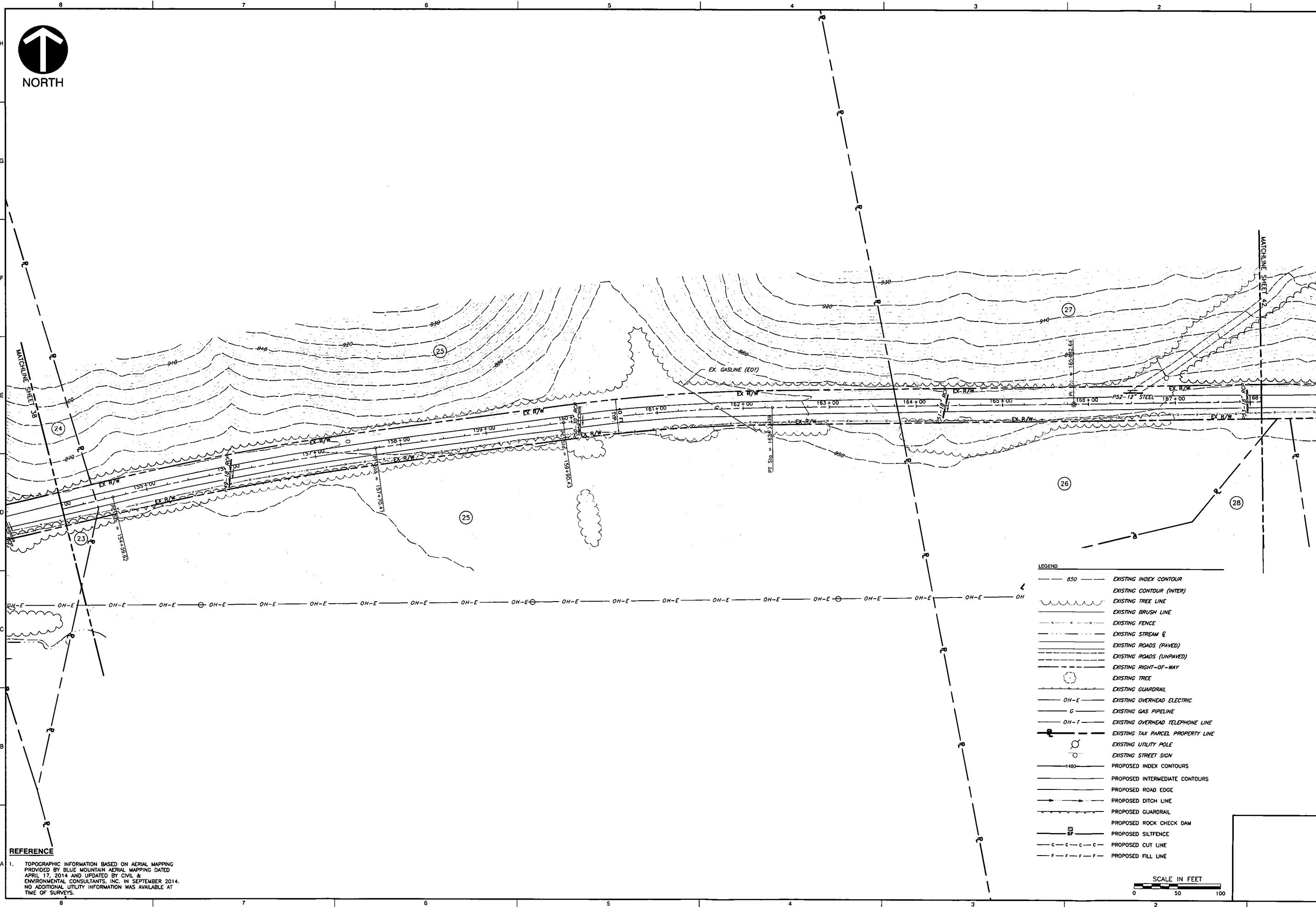
	850	EXISTING INDEX CONTOUR
		EXISTING CONTOUR (INTER)
		EXISTING TREE LINE
		EXISTING BRUSH LINE
		EXISTING FENCE
		EXISTING STREAM
		EXISTING ROADS (PAVED)
		EXISTING ROADS (UNPAVED)
		EXISTING RIGHT-OF-WAY
		EXISTING TREE
		EXISTING GUARDRAIL
	OH-E	EXISTING OVERHEAD ELECTRIC
	G	EXISTING GAS PIPELINE
	OH-T	EXISTING OVERHEAD TELEPHONE LINE
		EXISTING TAX PARCEL PROPERTY LINE
		EXISTING UTILITY POLE
		EXISTING STREET SIGN
	1480	PROPOSED INDEX CONTOURS
		PROPOSED INTERMEDIATE CONTOURS
		PROPOSED ROAD EDGE
		PROPOSED DITCH LINE
		PROPOSED GUARDRAIL
		PROPOSED ROCK CHECK DAM
		PROPOSED SILTFENCE
	C	PROPOSED CUT LINE
	F	PROPOSED FILL LINE



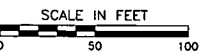
REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

A:\2014\142744\DWG\142744-0001\142744-0001.dwg (R:\44-11) 142744-0001.dwg - 10/28/2014 4:52 PM
 US 10/28/2014 4:52 PM



- LEGEND**
- 850 ——— EXISTING INDEX CONTOUR
 - EXISTING CONTOUR (INTER)
 - ~~~~~ EXISTING TREE LINE
 - ~~~~~ EXISTING BRUSH LINE
 - - - - - EXISTING FENCE
 - ~~~~~ EXISTING STREAM
 - EXISTING ROADS (PAVED)
 - EXISTING ROADS (UNPAVED)
 - EXISTING RIGHT-OF-WAY
 - EXISTING TREE
 - EXISTING GUARDRAIL
 - OH-E ——— EXISTING OVERHEAD ELECTRIC
 - G ——— EXISTING GAS PIPELINE
 - OH-T ——— EXISTING OVERHEAD TELEPHONE LINE
 - EXISTING TAX PARCEL PROPERTY LINE
 - EXISTING UTILITY POLE
 - EXISTING STREET SIGN
 - PROPOSED INDEX CONTOURS
 - PROPOSED INTERMEDIATE CONTOURS
 - PROPOSED ROAD EDGE
 - PROPOSED DITCH LINE
 - PROPOSED GUARDRAIL
 - PROPOSED ROCK CHECK DAM
 - PROPOSED SILTFENCE
 - - - - - PROPOSED CUT LINE
 - - - - - PROPOSED FILL LINE



REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

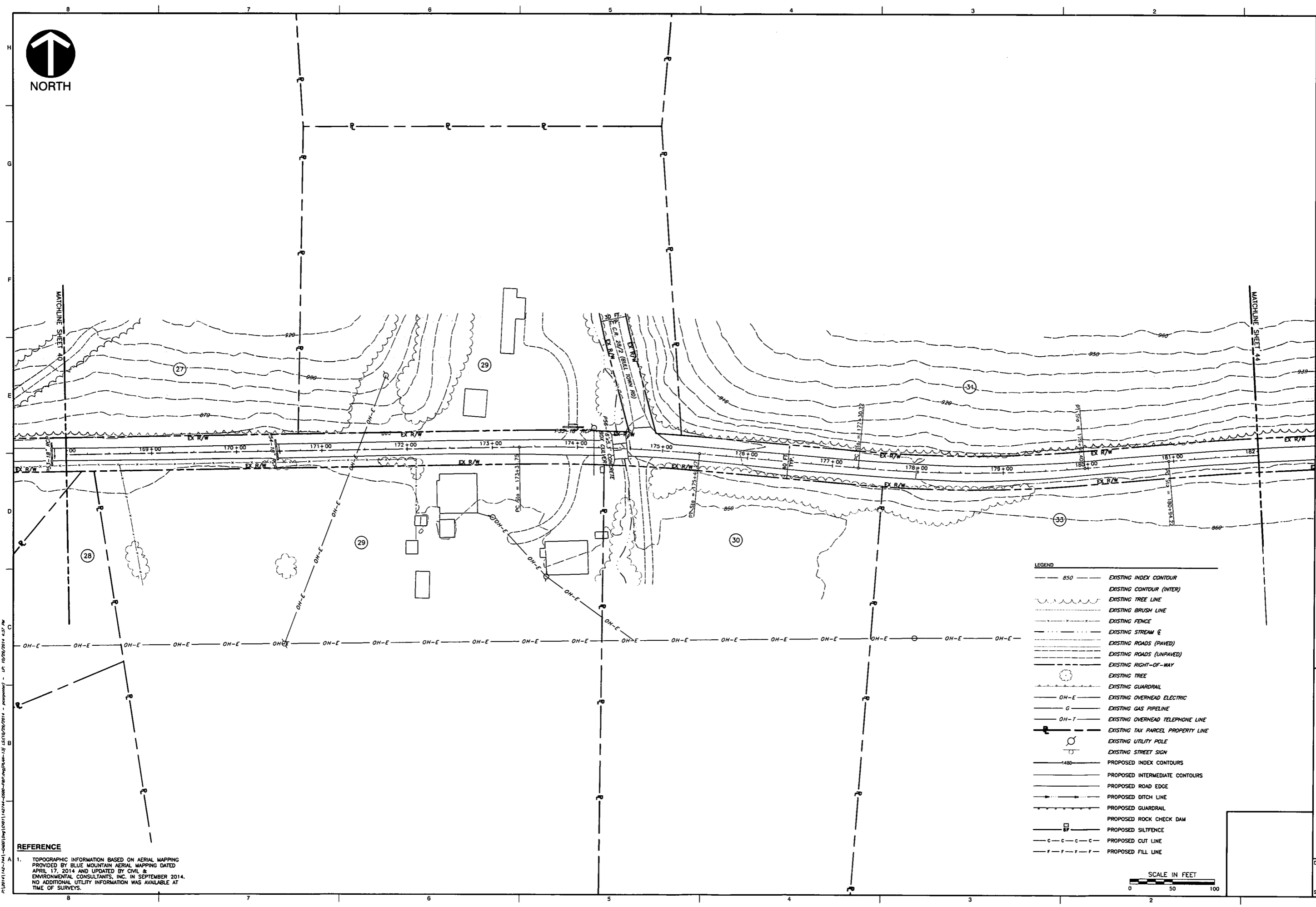
A:\15041\15041.dwg (1/1) 10/29/2014 10:29:00 AM - 10/29/2014 10:29:00 AM - 10/29/2014 10:29:00 AM
 15041.dwg (1/1) 10/29/2014 10:29:00 AM - 10/29/2014 10:29:00 AM - 10/29/2014 10:29:00 AM

REVISION RECORD	
NO	DESCRIPTION

CEE
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.cecinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28 STA. 154+00 TO STA. 168+00	PWC
DATE: OCTOBER 29, 2014	DESIGNED BY: GBL
DWG SCALE: 1"=50'	CHECKED BY: 145-744
PROJECT NO:	APPROVED BY: DEM
DRAWING NO.: 40	
SHEET 40 OF 138	



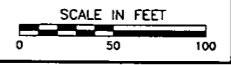
P:\2014\142-744-0405\DWG\DWG1\142744-0405-0405-0405.dwg - 142744-0405-0405.dwg - 142744-0405-0405.dwg - 142744-0405-0405.dwg - 142744-0405-0405.dwg

REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

LEGEND

	EXISTING INDEX CONTOUR
	EXISTING CONTOUR (INTER)
	EXISTING TREE LINE
	EXISTING BRUSH LINE
	EXISTING FENCE
	EXISTING STREAM
	EXISTING ROADS (PAVED)
	EXISTING ROADS (UNPAVED)
	EXISTING RIGHT-OF-WAY
	EXISTING TREE
	EXISTING GUARDRAIL
	EXISTING OVERHEAD ELECTRIC
	EXISTING GAS PIPELINE
	EXISTING OVERHEAD TELEPHONE LINE
	EXISTING TAX PARCEL PROPERTY LINE
	EXISTING UTILITY POLE
	EXISTING STREET SIGN
	PROPOSED INDEX CONTOURS
	PROPOSED INTERMEDIATE CONTOURS
	PROPOSED ROAD EDGE
	PROPOSED DITCH LINE
	PROPOSED GUARDRAIL
	PROPOSED ROCK CHECK DAM
	PROPOSED SILTFENCE
	PROPOSED CUT LINE
	PROPOSED FILL LINE



REVISION RECORD	
NO	DATE

Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 PH: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327
 www.cecinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28	
STA. 168+00 TO STA. 182+00	
DATE:	OCTOBER 28, 2014
DWG SCALE:	1"=50'
PROJECT NO.:	142-744
APPROVED BY:	DEM
DRAWN BY:	PNC
CHECKED BY:	GSL

DRAWING NO.: **42**
 SHEET 42 OF 138



NOTES

- CONTRACTOR IS ADVISED THAT THE EXISTING RETAINING WALL HAS DEADMAN ANCHORS THAT APPEAR TO RUN UNDER THE ROADWAY SURFACE. CARE SHALL BE TAKEN TO AVOID THESE DEADMAN ANCHORS.

NO	DATE	DESCRIPTION

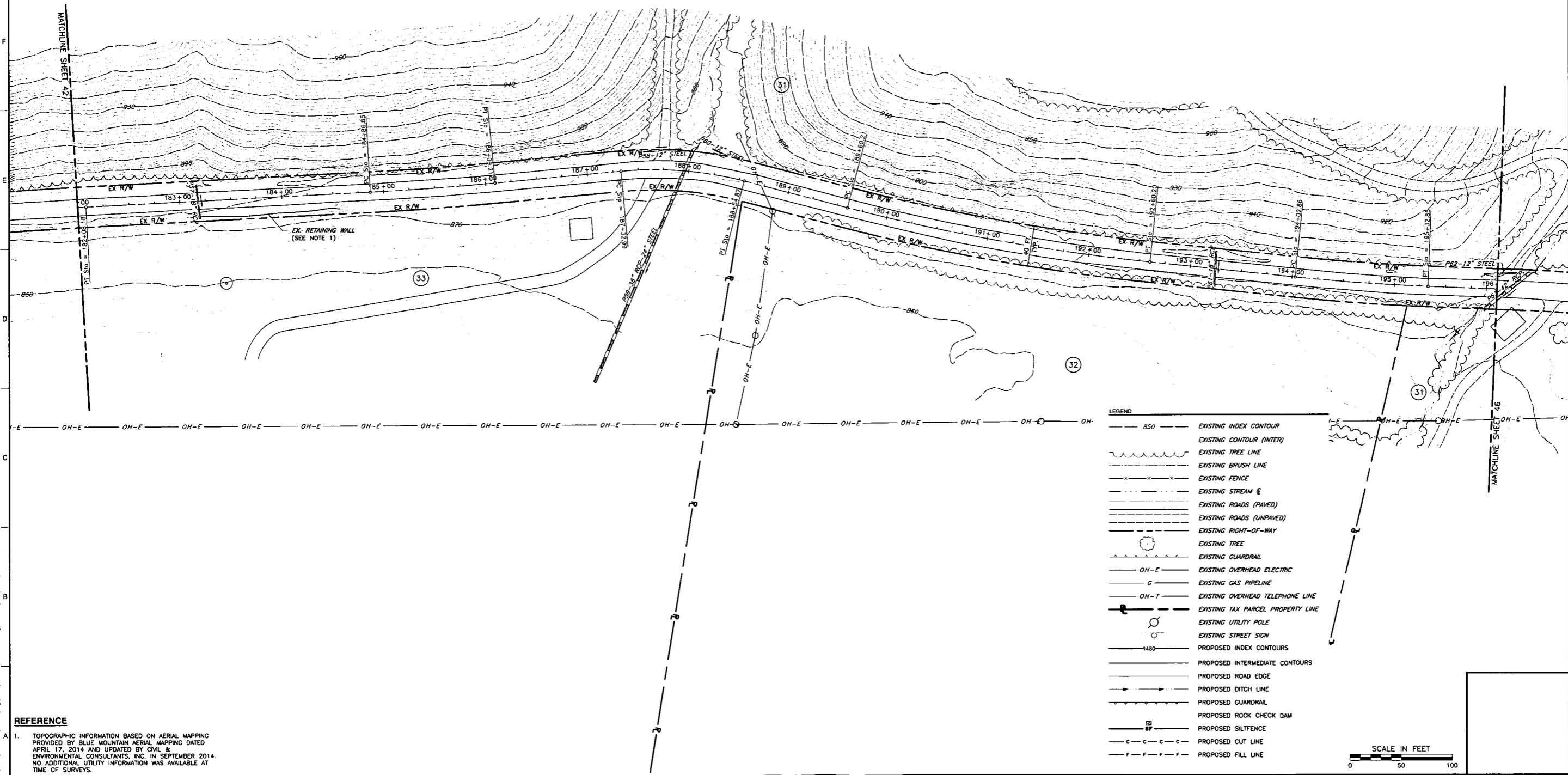
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327
 www.cecinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

DODDRIDGE COUNTY ROUTE 28
STA. 182+00 TO STA. 196+00

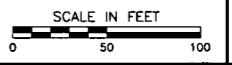
DATE:	OCTOBER 29, 2014	DRAWN BY:	PWC
DWG SCALE:	1"=50'	CHECKED BY:	GSL
PROJECT NO.:	142-744	APPROVED BY:	DEMI

DRAWING NO. **44**
 SHEET 44 OF 138



LEGEND

	EXISTING INDEX CONTOUR
	EXISTING CONTOUR (INTER)
	EXISTING TREE LINE
	EXISTING BRUSH LINE
	EXISTING FENCE
	EXISTING STREAM
	EXISTING ROADS (PAVED)
	EXISTING ROADS (UNPAVED)
	EXISTING RIGHT-OF-WAY
	EXISTING TREE
	EXISTING GUARDRAIL
	EXISTING OVERHEAD ELECTRIC
	EXISTING GAS PIPELINE
	EXISTING OVERHEAD TELEPHONE LINE
	EXISTING TAX PARCEL PROPERTY LINE
	EXISTING UTILITY POLE
	EXISTING STREET SIGN
	PROPOSED INDEX CONTOURS
	PROPOSED INTERMEDIATE CONTOURS
	PROPOSED ROAD EDGE
	PROPOSED DITCH LINE
	PROPOSED GUARDRAIL
	PROPOSED ROCK CHECK DAM
	PROPOSED SILTFENCE
	PROPOSED CUT LINE
	PROPOSED FILL LINE



REFERENCE

- TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.

P:\130141\142-744\142-744-000\142-744-000-142-744-000.dwg - 10/29/2014 4:37 PM



LEGEND

---	850	EXISTING INDEX CONTOUR
---		EXISTING CONTOUR (INTER)
~		EXISTING TREE LINE
-x-x-		EXISTING BRUSH LINE
-x-x-		EXISTING FENCE
-x-x-		EXISTING STREAM &
---		EXISTING ROADS (PAVED)
---		EXISTING ROADS (UNPAVED)
---		EXISTING RIGHT-OF-WAY
○		EXISTING TREE
---		EXISTING GUARDRAIL
OH-E		EXISTING OVERHEAD ELECTRIC
G		EXISTING GAS PIPELINE
OH-T		EXISTING OVERHEAD TELEPHONE LINE
---		EXISTING TAX PARCEL PROPERTY LINE
○		EXISTING UTILITY POLE
○		EXISTING STREET SIGN
---	1480	PROPOSED INDEX CONTOURS
---		PROPOSED INTERMEDIATE CONTOURS
---		PROPOSED ROAD EDGE
---		PROPOSED DITCH LINE
---		PROPOSED GUARDRAIL
---		PROPOSED ROCK CHECK DAM
---		PROPOSED SILTFENCE
-c-c-c-		PROPOSED CUT LINE
-f-f-f-		PROPOSED FILL LINE

REVISION RECORD

NO.	DATE	DESCRIPTION

C&E

Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327
 www.cesepc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

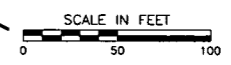
DODDRIDGE COUNTY ROUTE 28
STA. 196+00 TO STA. 210+00

DATE: OCTOBER 28, 2014 DRAWN BY: PWC
 DWG SCALE: 1"=50' CHECKED BY: GSL
 PROJECT NO: 142-744
 APPROVED BY: DEM

DRAWING NO.: **46**
 SHEET 46 OF 138

REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.



P:\142-744\142-744-0001\DWG\142744-0001-0001-0001.dwg - 12/10/2014 10:58:00 AM - 142-744-0001.dwg - 12/10/2014 10:58:00 AM



LEGEND

	EXISTING INDEX CONTOUR
	EXISTING CONTOUR (INTER)
	EXISTING TREE LINE
	EXISTING BRUSH LINE
	EXISTING FENCE
	EXISTING STREAM
	EXISTING ROADS (PAVED)
	EXISTING ROADS (UNPAVED)
	EXISTING RIGHT-OF-WAY
	EXISTING TREE
	EXISTING GUARDRAIL
	EXISTING OVERHEAD ELECTRIC
	EXISTING GAS PIPELINE
	EXISTING OVERHEAD TELEPHONE LINE
	EXISTING TAX PARCEL PROPERTY LINE
	EXISTING UTILITY POLE
	EXISTING STREET SIGN
	PROPOSED INDEX CONTOURS
	PROPOSED INTERMEDIATE CONTOURS
	PROPOSED ROAD EDGE
	PROPOSED DITCH LINE
	PROPOSED GUARDRAIL
	PROPOSED ROCK CHECK DAM
	PROPOSED SILTFENCE
	PROPOSED CUT LINE
	PROPOSED FILL LINE

REVISION RECORD

NO.	DATE	DESCRIPTION

C&E
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.ceshinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

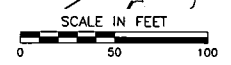
DODDRIDGE COUNTY ROUTE 28
STA. 210+00 TO STA. 224+00

DATE:	OCTOBER 29, 2014	DRAWN BY:	PWC
DATE:	OCTOBER 29, 2014	CHECKED BY:	GSL
PROJECT NO.:	11-38F	PROJECT NO.:	142-744
APPROVED BY:		APPROVED BY:	DEM

DRAWING NO.: **48**
 SHEET 48 OF 138

REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.



A:\1014\142-744-0001\Drawings\DWG\11-38F\11-38F-0001.dwg - US - 10/29/2014 4:58 PM
 A:\1014\142-744-0001\Drawings\DWG\11-38F\11-38F-0001.dwg - 10/29/2014 4:58 PM



LEGEND

	850	EXISTING INDEX CONTOUR
	500	EXISTING CONTOUR (INTER)
		EXISTING TREE LINE
		EXISTING BRUSH LINE
		EXISTING FENCE
		EXISTING STREAM &
		EXISTING ROADS (PAVED)
		EXISTING ROADS (UNPAVED)
		EXISTING RIGHT-OF-WAY
		EXISTING TREE
		EXISTING GUARDRAIL
	OH-E	EXISTING OVERHEAD ELECTRIC
	G	EXISTING GAS PIPELINE
	OH-T	EXISTING OVERHEAD TELEPHONE LINE
		EXISTING TAX PARCEL PROPERTY LINE
		EXISTING UTILITY POLE
		EXISTING STREET SIGN
	1480	PROPOSED INDEX CONTOURS
		PROPOSED INTERMEDIATE CONTOURS
		PROPOSED ROAD EDGE
		PROPOSED DITCH LINE
		PROPOSED GUARDRAIL
		PROPOSED ROCK CHECK DAM
		PROPOSED SILTFENCE
	C-C-C-C	PROPOSED CUT LINE
	F-F-F-F	PROPOSED FILL LINE



REVISION RECORD

NO	DATE	DESCRIPTION

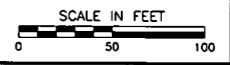
Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.cedinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

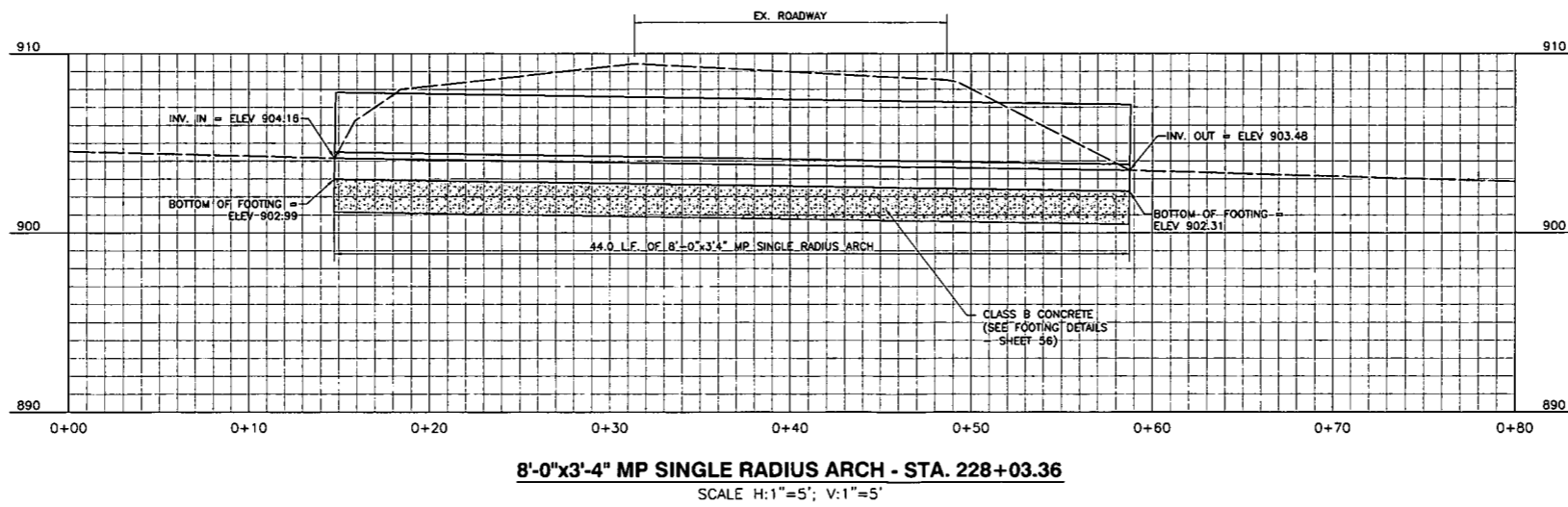
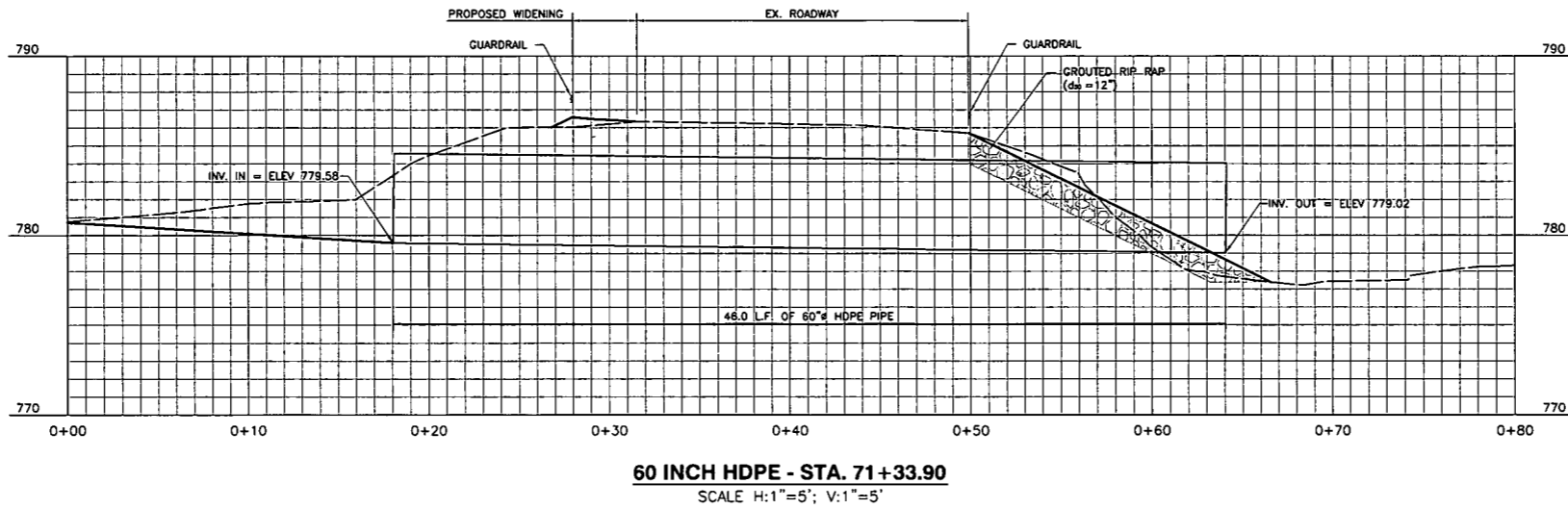
DODDRIDGE COUNTY ROUTE 28	
STA. 224+00 TO STA. 238+00	
DATE: OCTOBER 20, 2014	DRAWN BY: PWC
DWG SCALE: 1"=50'	CHECKED BY: GSL
PROJECT NO: 1425-744	DEM
APPROVED BY:	

DRAWING NO: **50**
 SHEET 50 OF 138

REFERENCE
 1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEYS.



P:\1014\1425-744\1425-744-001\DWG\COPY\1425-744-000-IMP-PLAN-17.dwg (10/20/2014 4:52 PM) - CP: 10/20/2014 4:52 PM



A: 10/21/14 142-744-0000 (imp) 10/21/14 142-744-0000 (imp) 15/10/20/2014 - 10/20/2014 4:10 PM

NO.	DATE	DESCRIPTION

C&E
Civil & Environmental Consultants, Inc.
99 Cambridge Place - Bridgeport, WV 26330
Ph: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327
www.ceninc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

PIPE PROFILES	
DATE:	OCTOBER 29, 2014
DWG SCALE:	1"=200'
PROJECT NO.:	142-744
APPROVED BY:	
PWC:	
GSL:	
DEM:	

DRAWING NO. **55**
SHEET 55 OF 138

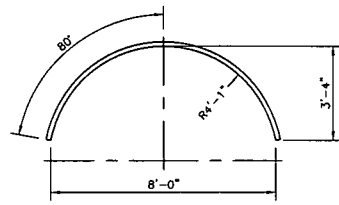
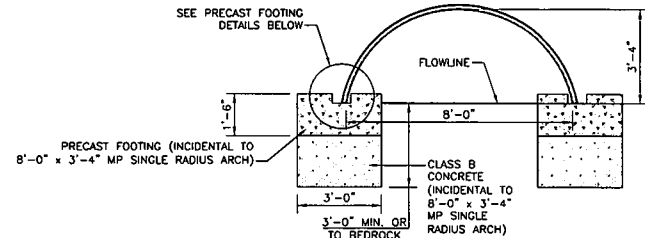


PLATE MAKE-UP: 1 @ 18PI, 1 @ 24PI
42 PI Total
AREA= 20.3 SF

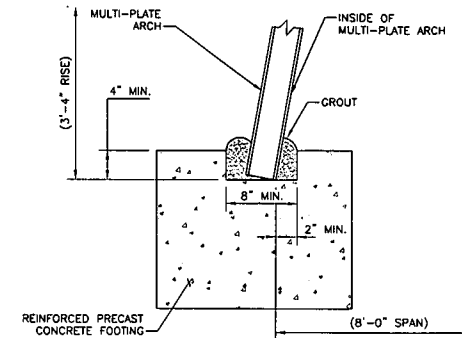
NOTES:

1. ALL DIMENSIONS ARE TO INSIDE OF CORRUGATION CREST, UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

PLATE DETAILS
N.T.S.



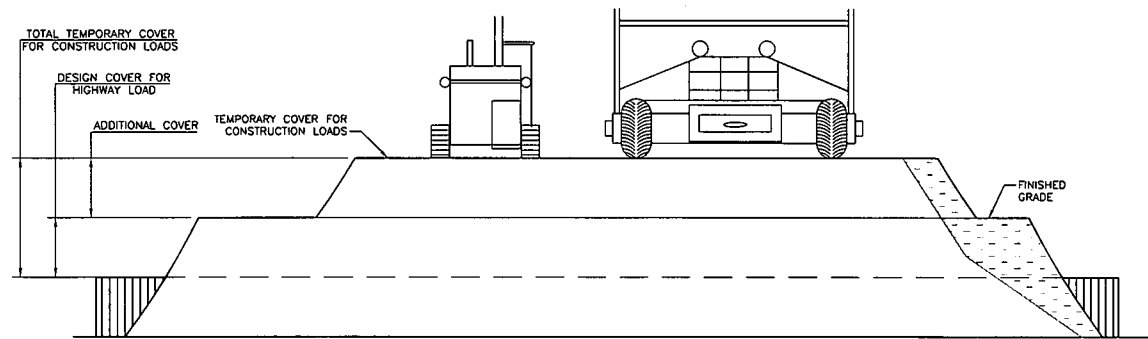
PRECAST CONCRETE FOOTING DETAILS
N.T.S.



SLOTTED CONCRETE FOOTING < 180 DEGREES
N.T.S.

NOTES:

1. SIZE AND REINFORCING OF PRECAST CONCRETE FOOTING BASED ON 3,000 PSF NET ALLOWABLE SOIL-BEARING CAPACITY, 2' MAXIMUM COVER HEIGHT, AND HS-20 LOADING CONDITIONS. STAMPED DESIGN TO BE PROVIDED BY MULTI-PLATE ARCH BRIDGE MANUFACTURER.
2. CONTRACTOR SHALL CONTACT ENGINEER OF RECORD TO HAVE A GEOTECHNICAL ENGINEER EVALUATE THE FOUNDATION SUBGRADE TO ASSURE A 3,000 PSF NET ALLOWABLE SOIL BEARING CAPACITY BEFORE PLACING THE FOOTINGS.
3. BLOCKING OR SHIMMING SIDE PLATES TO ACHIEVE AND MAINTAIN PROPER BOTTOM SPAN AND SIDE RETURN ANGLE MAY BE REQUIRED.
4. GROUT SHOULD BE NON-METALLIC, NON-SHRINK MATERIAL.
5. GROUT AND SHIMMING MATERIAL SHOULD NOT CONTAIN ANY CORROSION-PROMOTING AGENTS.



CONSTRUCTION LOADS: FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

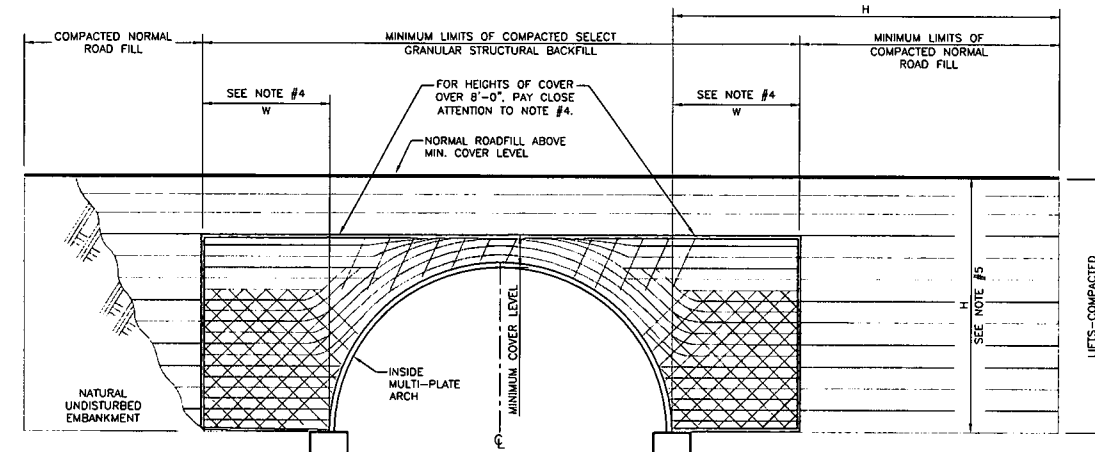
HEAVY WHEEL LOAD TABLE
MINIMUM COVER FOR OFF HIGHWAY EQUIPMENT UP TO 450 TONS GVW

DIAMETER (OR SPAN) IN FEET	WALL THICKNESS, IN INCHES						
	0.109" (12 GA.)	0.136" (10 GA.)	0.168" (8 GA.)	0.188" (7 GA.)	0.218" (5 GA.)	0.249" (3 GA.)	0.280" (1 GA.)
5' TO 10'	2.5'	2.5'	2.5'	2.5'	2.5'	2.5'	2.5'
11' TO 12'	3.0'	3.0'	3.0'	3.0'	3.0'	3.0'	3.0'
13' TO 14'	3.5'	3.5'	3.5'	3.5'	3.5'	3.5'	3.5'
15' TO 16'	4.0'	4.0'	4.0'	4.0'	4.0'	4.0'	4.0'
17' TO 18'	-	4.5'	4.5'	4.5'	4.5'	4.5'	4.5'
19' TO 20'	-	-	5.0'	5.0'	5.0'	5.0'	5.0'

BACKFILL SHALL BE EXCELLENT QUALITY COMPACTED TO 90% PROCTOR AASHTO T-99
ADD 2 FEET FOR RUTTING IN UN-MAINTAINED AREAS
REF: NCSPA TECHNICAL LETTER 1

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE STRUCTURE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE STRUCTURE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOAD DETAILS
N.T.S.



SECTION

CRITICAL BACKFILL ZONE, PRESSURE ON SOIL GREATEST HERE. SELECT GRANULAR STRUCTURAL BACKFILL LIMITS.

INITIAL LIFTS OVER CROWN OF STRUCTURE AS INDICATED BY SHADED AREA TO BE COMPACTED TO REQUIRED DENSITY WITH HAND OPERATED EQUIPMENT OR WITH SMALL TRACTOR (D-4 OR SMALLER) DRAWN EQUIPMENT.

NOTES:

1. ALL SELECT GRANULAR BACKFILL TO BE PLACED IN A BALANCED FASHION IN THIN LIFTS (6"-8" LOOSE TYPICALLY) AND COMPACTED TO 90 PERCENT DENSITY PER AASHTO T-99.
2. COMPLETE AND REGULAR MONITORING OF THE ARCH IS NECESSARY DURING ALL BACKFILLING STEPS.
3. PREVENT EXCESSIVE DISTORTION OF SHAPE AS NECESSARY BY VARYING COMPACTION METHODS AND EQUIPMENT.
4. TRENCH WIDTH AND / OR SELECT FILL ENVELOPE WIDTH SHALL BE BY DIRECTION OF THE ENGINEER OF RECORD. A TYPICAL WIDTH OF 4' FEET IS DEPICTED, BUT GREATER OR LESSER DISTANCE MAY BE REQUIRED DEPENDING UPON SITE-SPECIFIC CONDITIONS. THIS WIDTH DEPENDS ON FACTORS SUCH AS THE LATERAL PRESSURES EXERTED BY THE STRUCTURE ONTO THE ADJACENT SOIL FOR THE GIVEN LOADING CONDITIONS, THE STRUCTURE SHAPE, THE QUALITY OF THE SELECT FILL MATERIAL AND THE STRENGTH OF THE IN SITU EMBANKMENT / TRENCH MATERIAL. THESE FACTORS MUST BE EVALUATED BY THE PROJECT ENGINEER FOR EACH SPECIFIC SITUATION.
5. H = STRUCTURE RISE + COVER.

ADDITIONAL BACKFILL NOTES:

SATISFACTORY BACKFILL MATERIAL, PROPER PLACEMENT, AND COMPACTION ARE KEY FACTORS IN OBTAINING MAXIMUM STRENGTH AND STABILITY.

THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATERIAL THAT COULD CAUSE HARD SPOTS OR DECOMPOSE TO CREATE VOIDS. BACKFILL MATERIAL SHOULD BE WELL GRADED GRANULAR MATERIAL THAT MEETS THE REQUIREMENTS OF AASHTO M-145 FOR SOIL CLASSIFICATIONS A-1, A-2, A-3. BACKFILL MUST BE REPLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN 6" LOOSE LIFTS. EACH LIFT IS TO BE COMPACTED TO A MINIMUM OF 90% DENSITY PER AASHTO T-99.

A HIGH PERCENTAGE OF SILT OR FINE SAND IN THE NATIVE SOILS SUGGESTS THE NEED FOR A WELL GRADED GRANULAR BACKFILL MATERIAL TO PREVENT SOIL MIGRATION.

DURING BACKFILL, ONLY SMALL TRACKED VEHICLES (D-4 OR SMALLER) SHOULD BE NEAR THE STRUCTURE AS FILL PROGRESSES ABOVE THE CROWN AND TO THE FINISHED GRADE.

BACKFILL DETAILS
N.T.S.

NO.	DATE	DESCRIPTION

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

Civil & Environmental Consultants, Inc.
99 Cambridge Place • Bridgeport, WV 26330
Ph: 304.933.3119 • 855.488.9539 • Fax: 304.933.3327
www.pecinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

MULTI-PLATE SINGLE RADIUS ARCH DETAILS

DATE: OCTOBER 28, 2014
DRAWN BY: PWC
DWG SCALE: AS SHOWN
PROJECT NO: 142-744
CHECKED BY: GSL
APPROVED BY: DEM

P:\2014\142-744-0001\04\10\2014\142-744-0001-0001.dwg (10/29/2014 4:02 PM) - PLOT - 10/29/2014 4:02 PM

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	DEED BOOK	PAGE NUMBER	DISTRICT	TAX MAP	TAX PARCEL
1	1	SKYLAR ORA MONTGOMERY & CLIFFORD WARREN ET AL	WB47	333	WEST UNION	3	19
2	1,2,3	RANDALL LYNCH & CRAIG DIXIE	258	546	WEST UNION	6	1
3	1,2	LOIS ARCURI ET AL	AP41	150	WEST UNION	3	20
4	2,3	ADDIE MARIE LEADMON	250	84	WEST UNION	3	21
5	3,4	GARY M & MARY ANN EIFF	302	640	WEST UNION	4	22
6	3,4,8,9	JOHN PAUL STRICKLING ET AL	WB28	314	WEST UNION	4	28
7	4	ROBERT J HAUGHT ET AL	WB19	308	WEST UNION	4	6
8	4,5	THEODORE R & KAREN L WIGAL	264	468	WEST UNION	4	13
9	5,6	DONLEY KENT SHULTZ & JEANNETTE L LOWTHER SHULTZ	270	415	WEST UNION	4	7
10	6,7	THEODORE R WIGAL	198	144	WEST UNION	4	14
11	6,7	JOHN M & ANDREA FITZGERALD	282	418	WEST UNION	4	14.1
12	7	NUTTERS FORK CHRISTIAN CHURCH	49	72	WEST UNION	4	23
13	7,8	KAREN ANN SMITH	248	254	WEST UNION	4	24
14	8	PHILLIP S UNDERWOOD ET AL	211	302	WEST UNION	4	30
15	8	PHILLIP S UNDERWOOD ET AL	WB51	709	WEST UNION	4	29
16	9	MATTHEW ALEXANDER	276	1	WEST UNION	4	35
17	9,10	JOHN PAUL STRICKLING ET AL	WB28	314	WEST UNION	4	36
18	9,10	MATTHEW W ALEXANDER & LINDA MARIE MUHLY	241	412	WEST UNION	4	32
19	10	ALLEN KENDALL JONES	167	68	WEST UNION	4	37
20	10,11	ALLEN KENDALL JONES	167	68	WEST UNION	4	34.3
21	11	LARRY WILLIAMS	260	226	WEST UNION	4	34
22	11	WALTER J & LORETTA FOX	206	555	WEST UNION	4	34.2
23	11,12	LARRY WILLIAMS	260	226	WEST UNION	4	34.1
24	11,12	LARRY WILLIAMS	260	226	WEST UNION	4	26
25	12	LARRY WILLIAMS	260	226	WEST UNION	4	37.1
26	12	LARRY WILLIAMS	302	410	WEST UNION	4	38
27	12,13	LARRY WILLIAMS	260	226	WEST UNION	4	37.5
28	12,13	LARRY WILLIAMS	302	410	WEST UNION	4	37.4
29	13	LARRY WILLIAMS	260	226	WEST UNION	5	3
30	13	LARRY WILLIAMS	260	226	WEST UNION	4	37.3
31	13,14,15	LARRY WILLIAMS	260	226	WEST UNION	5	4
32	14	LARRY WILLIAMS	260	226	WEST UNION	5	11
33	13,14	FRANCIS J NOLL	282	684	WEST UNION	5	10
34	15,16	ROBERT ANDREW & DIANA KNIGHT	250	99	WEST UNION	5	7
35	16	ROGER L & PEGGY L BACOT	262	593	WEST UNION	5	7.4
36	16	ROBERT ANDREW & DIANA KNIGHT	303	627	WEST UNION	5	7.5
37	16	LISA D NICHOLSON	272	604	WEST UNION	5	7.3
38	16,17				WEST UNION	5	7.2
39	16,17	WORTHY C UNDERWOOD JR	WB32	389	WEST UNION	5	7.1
40	16,17	PHILIP & SURRETT WILLIAMS	236	514	WEST UNION	5	13
41	17,18	JAMES EDWARD FORD ET AL	WB35	725	WEST UNION	5	16
42	17	JAMES EDWARD FORD ET AL	WB35	725	WEST UNION	5	5
43	17,18	CLEM L MURPHY JR	296	415	WEST UNION	5	14
44	18	JERRY A & SUE L CHIO	236	334	WEST UNION	5	15

REVISION RECORD

NO. DATE DESCRIPTION

Civil & Environmental Consultants, Inc.
99 Cambridge Place - Bridgeport, WV 26330
Ph: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327
www.cesinc.com

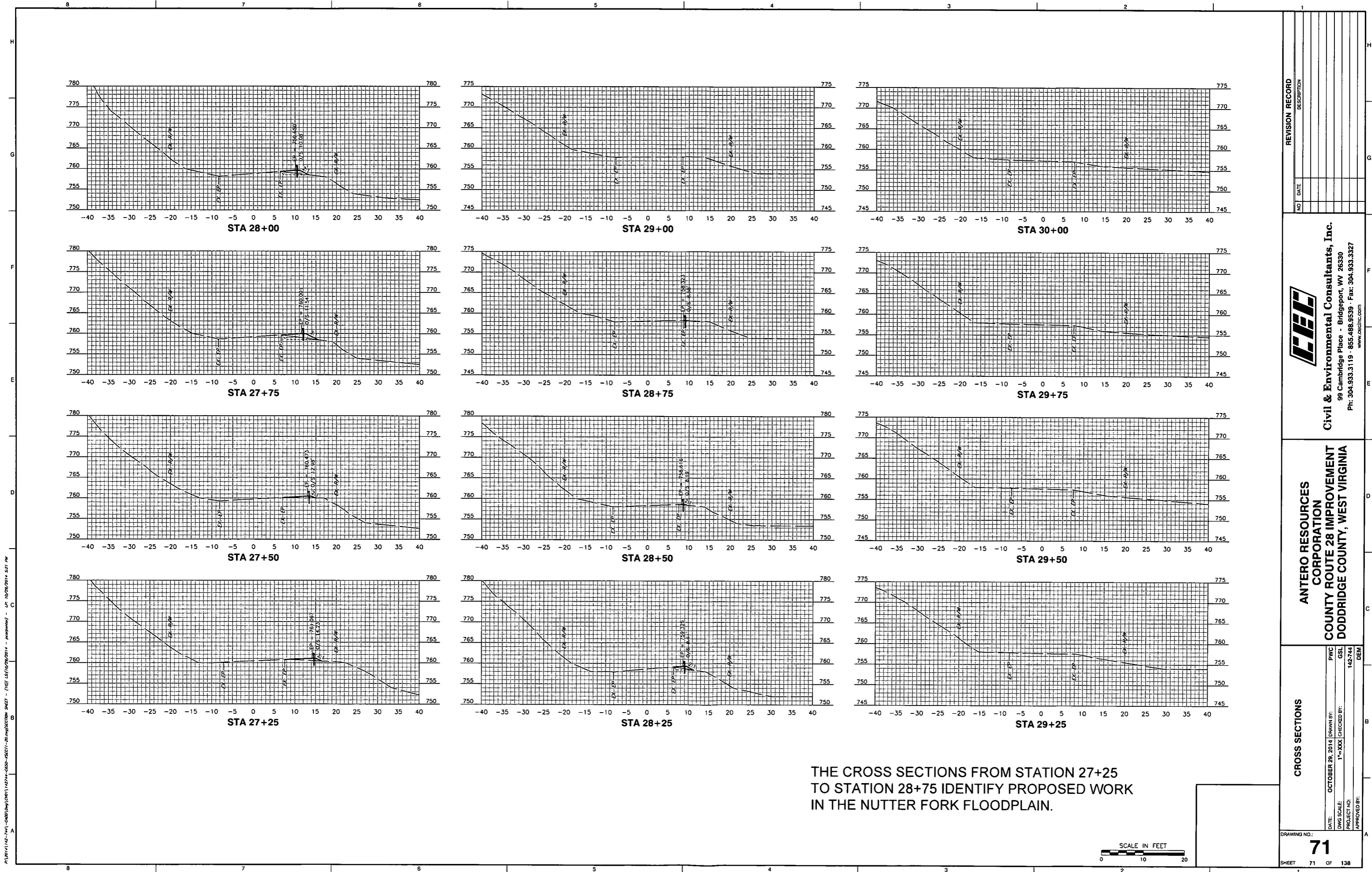
ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

OWNERSHIP INDEX

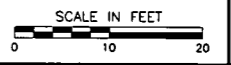
DRAWING NO. 61

DATE: OCTOBER 28, 2014 DRAWN BY: PWC
DWG SCALE: AS SHOWN CHECKED BY: GSL
PROJECT NO: 142-744
APPROVED BY: DEM

SHEET 61 OF 138



THE CROSS SECTIONS FROM STATION 27+25 TO STATION 28+75 IDENTIFY PROPOSED WORK IN THE NUTTER FORK FLOODPLAIN.



REVISION RECORD	
NO.	DATE

Civil & Environmental Consultants, Inc.
 99 Cambridge Place - Bridgeport, WV 26330
 Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327
 www.ceinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

CROSS SECTIONS	
DATE:	OCTOBER 28, 2014
DWG SCALE:	1"=50'
PROJECT NO.:	142764
APPROVED BY:	DEM
DRAWING NO.:	71
SHEET	71 OF 138

P:\2014\142764\Drawings\20141028\28-00-0001-0001-0001-0001.dwg - 10/28/2014 5:21 PM



Edwin Wriston <doddridgecountyfpm@gmail.com>

Nutter Fork Road Upgrade (CR28)-Antero

1 message

Rachel Grzybek <rgrzybek@anteroresources.com>
To: Edwin Wriston <doddridgecountyfpm@gmail.com>
Cc: Ashlie Steele <asteele@anteroresources.com>

Wed, Mar 25, 2015 at 11:31 AM

Hi Bo,

Please find the attached floodplain permit application for the Nutter Fork Road Upgrade (CR 28) in Doddridge County. Please note this project is in the floodplain. I will be sure to send you the additional permits and check once I receive them.

Let me know if you need any additional information to approve this permit.

Thank You!

Rachel Grzybek

Floodplain Engineer

Antero Resources Corporation

535 White Oaks Boulevard

Bridgeport, WV 26330

Phone: (304) 842-4008

Cell: (304) 641-2396

Fax: (304) 842-4102

rgrzybek@anteroresources.com



Reduced CR28 Upgrade FP App.pdf
14413K

Nutter Fork Road Upgrade - Antero

Form MM-109
Rev. 05-19-05

PERMIT NO. 0420140929

PERMIT TO ENTER UPON, UNDER, OVER OR ACROSS THE STATE ROADS OF THE STATE OF WEST VIRGINIA, AS PROVIDED FOR IN SECTION 6, ARTICLE 16, CHAPTER 17; SECTION 9, ARTICLE 16, CHAPTER 17; SECTION 8, ARTICLE 4, CHAPTER 17, WEST VIRGINIA CODE, 1931, AS AMENDED.

THIS PERMIT, Made this 4th day of August 20 14, between the WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, a statutory corporation hereinafter called DIVISION and Antero Resources Corporation

Address: 1615 Wynkoop Street, Denver, CO 80202 Phone No: 303) 357-7310
hereinafter called APPLICANT.

WITNESSETH

In consideration of the hereinafter set out covenants and in accordance with Section 6, Article 16, Chapter 17; or Section 9, Article 16, Chapter 17; or Section 8, Article 4, Chapter 17, of the Official Code of West Virginia, 1931, as amended, and the rules and regulations promulgated thereunder, APPLICANT does hereby apply to enter

Route Type & No. SLS 28 DOH Project No. _____ (if applicable);
the coordinates for the mid point of the road length are 39.331553-
at 80.777799 Mile Post 4.69

in Doddridge County, for the purposes hereinafter set forth and in accordance with the plans and specifications which are attached hereto and made a part hereof: Pavement samples will be performed at approximately 1/4 mile intervals along the road, (SLS 28-Nutter Fork Road). The test pits will be approximately 2 feet deep. Traffic Control will be provided by a flagger. See attached Case A-5 traffic control plan. Test pits will be backfilled with appropriate soils.

APPLICANT further agrees to accept the conditions hereinafter set forth:

- APPLICANT shall deposit with DIVISION the sum of \$ 1,000,000 in the form of an official, certified or cashier's check, or executed bond with surety satisfactory to DIVISION to cover any damage and inspection costs DIVISION may sustain by reason of the granting of this permit, including any expense incurred in restoring said highway to its original condition or the proper repair of any and all damages that may result within one (1) year from the date of the completion of said work.
- APPLICANT agrees to reimburse DIVISION for inspection costs as follows:
 - A. For any inspection costs incurred under this permit.
 - B. At \$ _____ per linear foot for _____ feet of water line installed under this permit
 - C. At \$ _____ per linear foot for _____ feet of sewer line installed under this permit
- APPLICANT shall notify DIVISION at least 48 hours in advance of the date the work will begin. Failure to comply will be cause for cancellation of this permit.
- APPLICANT agrees to protect its employees, equipment and users of the highway at all times in accordance with the current Division of Highways manual "Traffic Control For Street and Highway Construction and Maintenance Operations".
- APPLICANT agrees to comply with all applicable state and federal laws in the performance of work under this permit.
- Supplementary conditions cited on the reverse side of this permit are understood and agreed to be a part hereof.
- The work authorized under this permit shall be completed on or before (Date): August 4, 2015

RECOMMENDED:

[Signature]
Title HWY ADM 3

[Signature]
Signature and Title of Applicant

BOND REQUIREMENT:

BOND NO. LPM 9062891 /DATE 2/21/2012

Attached On File

INSPECTION: Owner/Consultant

Full Time Part Time

Periodic Reimbursable No Cost

APPROVED:

[Signature]

ACTING MAINTENANCE ENGINEER
Title _____
West Virginia Division of Highways

AUTHORIZATION NO: _____

PERMIT NO: 0420140929

CHAPTER 17 WEST VIRGINIA CODE, 1931

§17-4-8. Use of roadbed by railroad, telephone company, etc.

No railroad or electric or other railway shall be constructed upon the roadbed of any state road, except to cross the same, nor shall any person, firm or corporation enter upon or construct any works in or upon such road, or lay or maintain thereon or thereunder any drainage, sewer or water pipes, gas pipes, electric conduits or other pipes, nor shall any telephone, telegraph or electric line or power pole, or any other structure whatsoever, be erected upon, in or over any portion of a state road, except under such restrictions, conditions and regulations as may be prescribed by the state road commissioner. Whenever any railroad or electric or other railway, heretofore or hereafter constructed, shall cross any state road, it shall be required to keep its own roadbed, and the bed of the road or highway at such crossing, in proper repair, or else to construct and maintain an overhead or undergrade crossing, subject to the approval of the state road commissioner; and the tracks of such railroad or railway at grade crossings shall be so constructed as to give a safe and easy approach to and across the same, and when the construction of such approaches is made necessary by a change in the railroad grade at the grade crossing, the cost shall be upon the railway company.

§17-16-6. Permit by commission or county court for openings in or structures on public roads; franchises and easements of oil, etc., transportation companies.

No opening shall be made in any state or county-district road or highway, nor shall any structure be placed therein or thereover, nor shall any structure, which has been so placed, be changed or removed, except in accordance with a permit from the state road commission or county court, as the case may be. No road or highway shall be dug up for laying or placing pipes, sewers, poles or wires, or for other purposes, and no trees shall be planted or removed or obstructions placed thereon, without the written permit of the commission or county court, or its duly authorized agent, and then only in accordance with the regulations of the commission or court. The work shall be done under the supervision and to the satisfaction of the commission or court; and the entire expense of replacing the highway in as good condition as before shall be paid by the persons to whom the permit was given, or by whom the work was done: **Provided, however,** That nothing herein contained shall be so construed as to prevent any oil or gas company or person having a proper permit or franchise from transporting oil or gasoline along any of the public highways of this State, nor to give such company a franchise without paying to the landowners through whose lands such road passes the usual and customary compensation paid or to be paid to the landowners for such right of way. Any grant or franchise when made shall be construed to give to such company or person only the right to use the easement in such public road.

A violation of any provision of this section shall be a misdemeanor, and the person or corporation violating the same shall, upon conviction thereof, be fined not less than twenty-five nor more than one hundred dollars for each offense.

§17-16-9. Private driveways or approaches to roads; obstruction of ditches.

The owner or tenant of land fronting on any state road shall construct and keep in repair all approaches or driveways to and from the same, under the direction of the state road commission, and, likewise, the owner or tenant of land fronting on any county-district road shall construct and keep in repair approaches or driveways to and from the same, under the direction of the county road engineer, and it shall be unlawful for such owner or tenant to fill up any ditch, or place any material of any kind or character in any ditch, so as in any manner to obstruct or interfere with the purposes for which it was made.

SUPPLEMENTARY CONDITIONS

1. The person, firm or corporation to whom a permit is issued agrees to hold the State of West Virginia and DIVISION harmless on account of any damages to persons or property which may arise during the process of the work authorized by this permit or by reason thereof.
2. Applications for permission to perform work within highway rights of way shall be made on DIVISION'S standard permit form and shall be signed by the authorized representative of the person, firm or corporation applying.
3. The APPLICANT shall give detailed information concerning the work to be performed and the application must include a sketch sufficient to show the nature of the work performed.
4. APPLICANT, his agents, successor, heirs or assigns, contractors or any other person, firm or corporation working under APPLICANT'S real or apparent authority, shall perform the work in a manner satisfactory to DIVISION. Damage to the road resulting at any time from work authorized under this permit shall be repaired by APPLICANT. Unsatisfactory repairs may be corrected by DIVISION or its authorized agent and the cost thereof paid by APPLICANT.
5. DIVISION assumes no liability for damage to the proposed work by reason of construction or maintenance work on the road.
6. This permit is granted subject to removal of the authorized installation by APPLICANT at no cost to DIVISION when required for improvement of the road, and subject to all regulations now or hereafter adopted by DIVISION.
7. Utility installation shall be in accordance with the current manual, "Accommodation of Utilities on Highway Right of Way".
8. Driveways shall be in accordance with the current manual, "Rules and Regulations for Constructing Driveways on State Highway Rights-of-Way."
9. DIVISION reserves the right to cancel this permit at any time, should APPLICANT fail to comply with the terms and conditions under which it is granted.
10. This permit is granted only insofar as the DIVISION has a right to do so.

0420140929

Dist. Permit Number 0420140929

BOND Number LPM 9062891

OIL and GAS DATA INFORMATION SHEET

APPLICANT

Company Name ANTERO RESOURCES CORPORATION

Address 1615 Wynkoop Street

City DENVER ST CO Zip 80202

Contact Person Permit Burt Simcox Telephone (304) 282-9372

24/7 Road Maintenance Contact Shawn Flanagan Telephone _____ Cell (304) 476-8508

24/7 Backup Contact Shelton Barger Telephone _____ Cell (304) 203-4022

Drilling/Fracking will require N/A Less than 5000 Barrels of fluids N/A 5000/+

Site Location

Site Name SLS 28 Road Local Name Nutter Fork Road Route # SLS 28

Mid-Point of road length WGS 83 Decimal Format GPS 39.331553 W: 80.777799 County Doddridge

Location Description

On Route.# SLS 28 being _____ N S E W of Jct. of Rte.# _____ and Rte.# _____

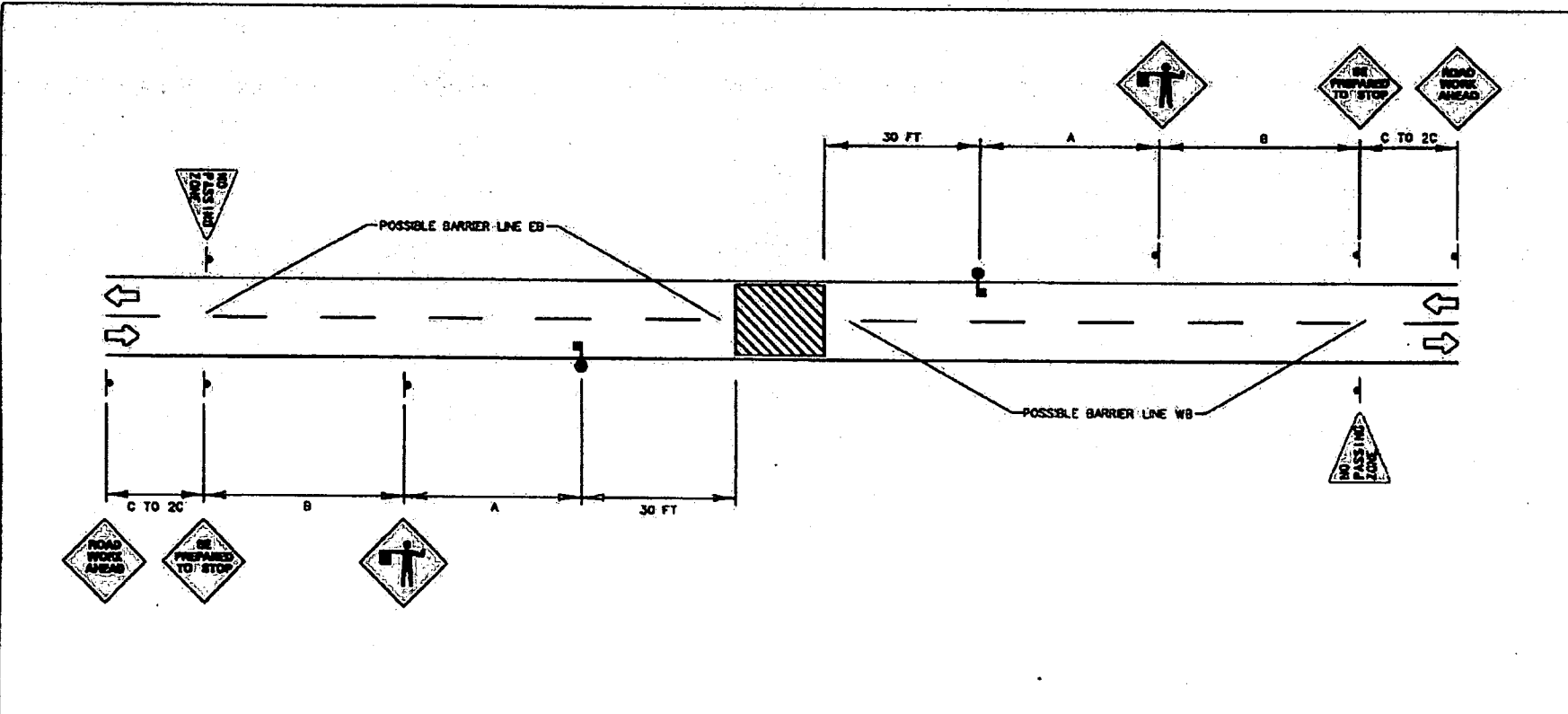
DOH USE ONLY HAULING ROUTE From US or WV Route (Attach Map)

Name & Rte.#	Beg MP	End MP	Surface Type	Condition
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____




Well location WGS 83 Decimal Format GPS _____ N: _____ W: _____

WV DEP Permit Number 47 - _____ - _____

STATE COUNTY PERMIT NUMBER



SYMBOLS

-  WORK AREA
-  SIGN ON PORTABLE OR PERMANENT SUPPORT.
-  FLAGGER WITH PADDLE.

GENERAL NOTES

1. CONDITIONS REPRESENTED ARE FOR A PLANNED CLOSURE NOT EXCEEDING 30 MINUTES DURING THE DAYTIME.
2. THE FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
3. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS NEEDED ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN LOW SPEED*	100	100	100
URBAN HIGH SPEED*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,500	2,040

*SPEED CATEGORY TO BE DETERMINED BY WY DCH

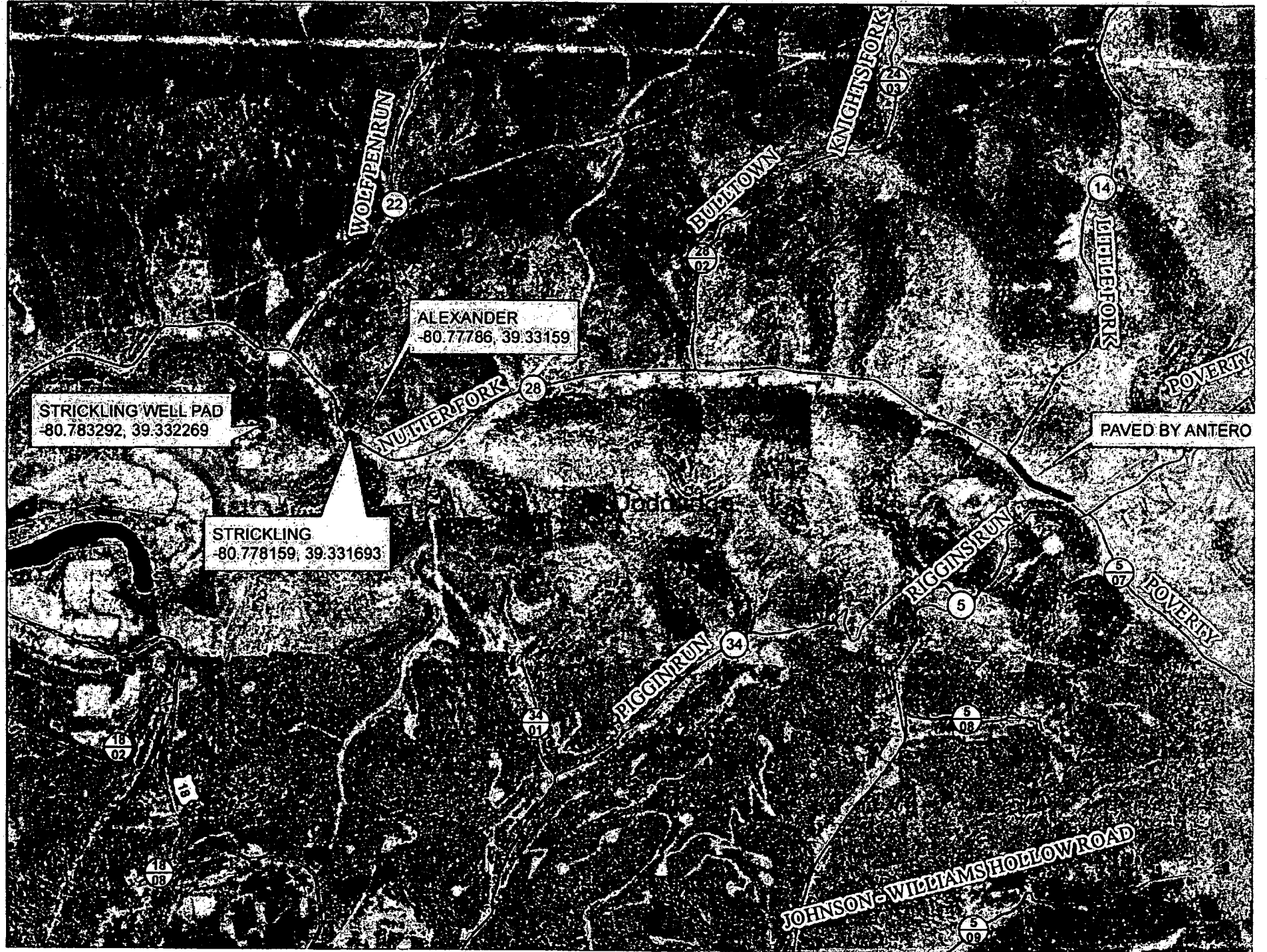
TYPICAL APPLICATIONS

- SHORT TERM CLOSING
- SHORT TERM UTILITY CROSSING FOR TWO OR THREE LANE ROADWAYS
- HAUL ROADS

CASE A5

TWO-LANE, TWO-WAY TRAFFIC.
SHORT TERM OPERATIONS.
DAYTIME ONLY.

0420140929





WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

Earl Ray Tomblin
Governor

Office of the District Engineer/Manager
District Four
PO Box 4220 (EXIT 121, I-79) * Clarksburg, WV 26302 * 304-842-1550
August 6, 2014

Paul A. Mattox, Jr., P. E.
Secretary of Transportation /
Commissioner of Highways

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, CO 80202

Dear Applicant:

Your approved copy of Permit Number 04-2014-0929 for a MS - Miscellaneous
permit type is enclosed. A description of the work is on the permit.

Please contact the District Four office:

Denise Roncone 304-842-1575

at least 48 hours in advance of the date you plan to begin work so arrangements can be made to inspect the work authorized
by the permit.

Failure to comply will result in cancellation of your permit.

A copy of this permit is to be available on the job at all times while the work is in progress for inspection by the
West Virginia Division of Highways' personnel.

Sincerely,

District Engineer / District Manager

Permit Supervisor

Initials: TC

Attachments: Yes

Enclosure: No

cc:0409 Charleston Permits

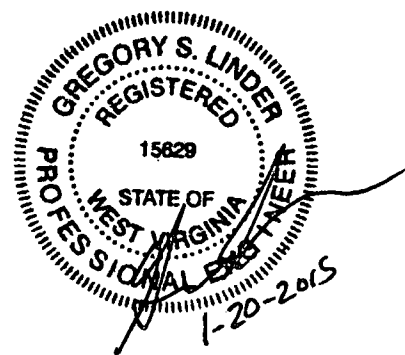
E.E.O./AFFIRMATIVE ACTION EMPLOYER

HYDRAULIC EVALUATION NUTTER FORK

***County Route 28 Improvement
Doddridge County, West Virginia***

Prepared For:

***Antero Resources Corporation
535 White Oaks Boulevard
Bridgeport, West Virginia***



January 2015



**Civil & Environmental
Consultants, Inc.**

TABLE OF CONTENTS

I. <u>PROJECT DESCRIPTION</u>	
A. Narrative	2
B. Location Maps	3
C. Field Observation	5
D. Pictures	7
II. <u>SUMMARY OF RESULTS</u>	
A. Analyses Performed	7
B. Water Surface Elevation Table	8
C. Compliance with FEMA Criteria	8
D. Recommendation	9
E. Signature Block, Consultant, or In-House Designers	9
III. <u>AVAILABLE DATA</u>	
A. Flood Insurance Study	9
B. Existing Hydrologic Data	9
C. Existing Hydraulic Model	9
IV. <u>HYDROLOGY</u>	
A. Design Discharge Based on USGS Regression Equation	10
B. Boundary Conditions	10
V. <u>HYDRAULIC MODELING</u>	
A. Source of Model	10
B. Site Map with Cross-Sections	11
C. Explanation of Data and Methods	11
D. HEC-RAS Generated Tables	12
VI. <u>APPENDICES</u>	
APPENDIX A	Site Plans
APPENDIX B	FEMA Flood Insurance Study (FIS) Data
APPENDIX C	Flood Insurance Rate Map and West Virginia Flood Tool Map
APPENDIX D	Design Discharge Calculations
APPENDIX E	HEC-RAS Profile Summary Tables
APPENDIX F	HEC-RAS Cross-Section Reports
APPENDIX G	HEC-RAS Output Files

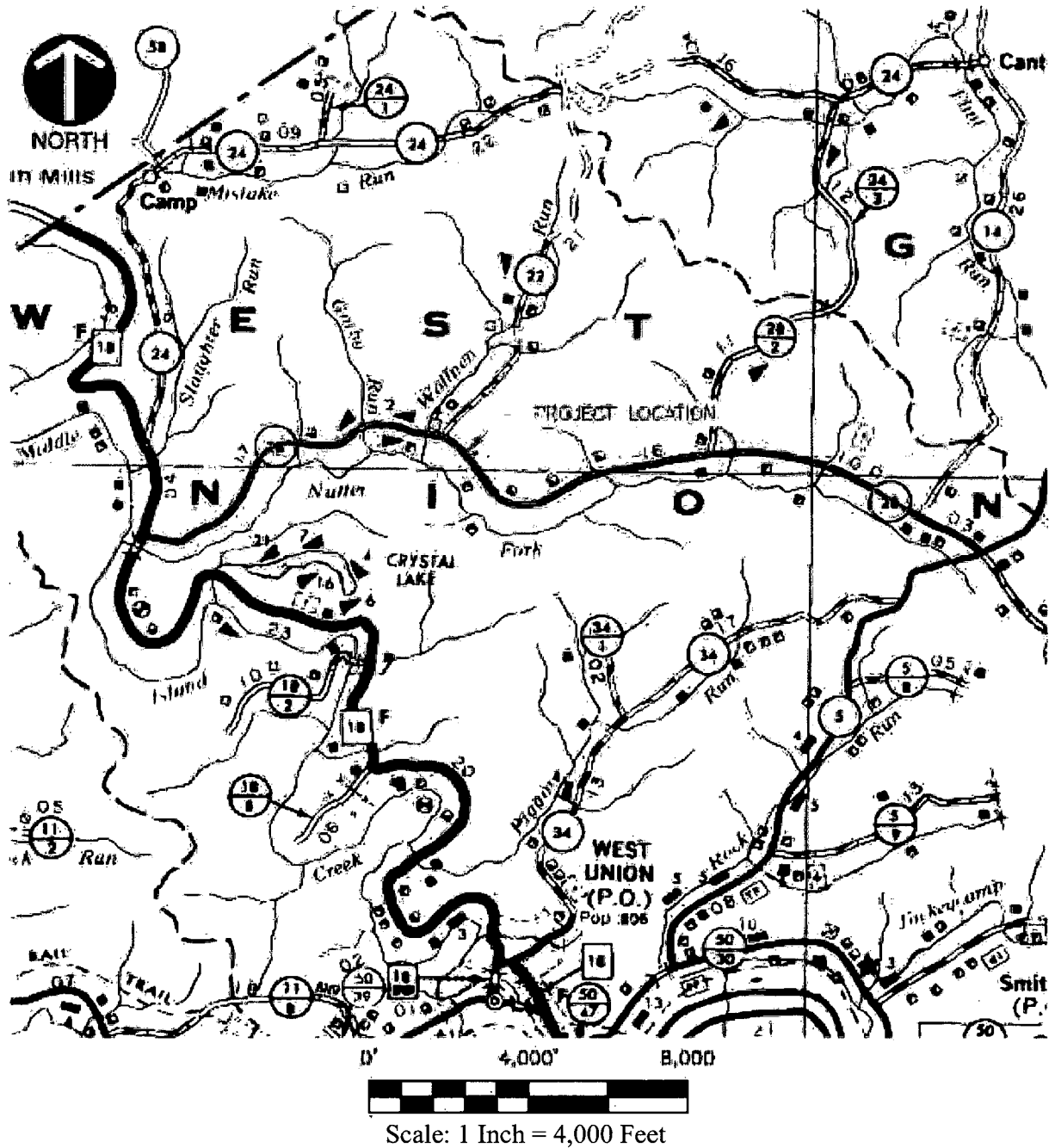
I. PROJECT DESCRIPTION

A. Narrative

The proposed roadway improvement is located on Nutter Fork Road (Doddridge County Route 28), approximately five miles northwest of West Union, WV. This hydraulic study is for the proposed County Route 28 improvement for Antero Resources Corporation. County Route 28 is located along Nutter Fork, which is a tributary of Middle Island Creek in Doddridge County, WV. According to the Federal Emergency Management Agency (FEMA), portions of the proposed roadway improvement are located within a Zone A Floodplain as designated on the Doddridge County Flood Insurance Rate Map (FIRM) Panels 54017C0110C and 54017C0130C. The purpose of this hydraulic study is not to investigate the existence or severity of flood hazards in the study area. The purpose of this hydraulic study is to determine the effects caused by the improvement of County Route 28 and the potential impacts to the water levels and floodplain of Nutter Fork.

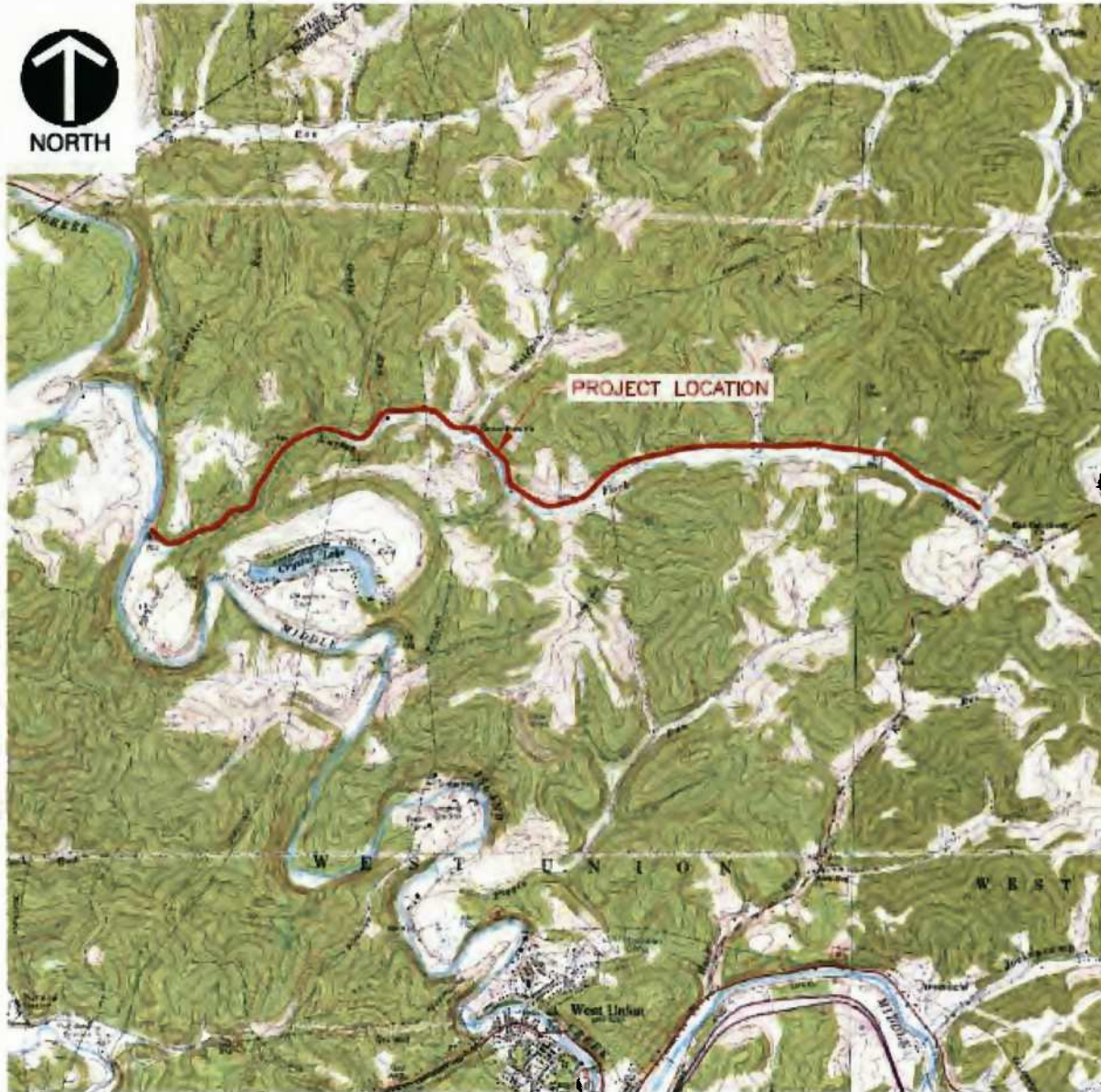
B. Location Maps

1. County Map



2. USGS Topographic Map

USGS 7¹/₂ Minute Topographic Map – West Union and Smithburg Quadrangles



0' 4,000' 8,000'



Scale: 1 Inch = 4,000 Feet

3. Situation Plan

See Appendix A – Site Plans

C. Field Observations

1. High Water Marks

There are no established landmarks in the project vicinity to determine a historic high water mark for Nutter Fork.

2. Features Relevant to the Hydraulic Analysis

There are no bridges located within the study area. A buried EQT gas line crosses Nutter Fork at approximately Station 461.

3. Verification of Manning's "n" Values

Manning's roughness coefficients were determined based on a site visit and photographs of the project site:

From Table 3.1 of the HEC-RAS Hydraulic Reference Manual:

Main Channel:

- Clean, straight, full, no rifts or deep pools: 'n' value 0.030
- Same as above, but more stones and weeds: 'n' value 0.035
- Clean, winding, some pools and shoals: 'n' value 0.040
- Same as above, but some weeds and stones: 'n' value 0.045

Floodplain:

- Pasture, no brush, high grass: 'n' value 0.035
- Scattered brush, heavy weeds: 'n' value 0.050
- Light brush and trees, in winter: 'n' value 0.050
- Medium to dense brush, in winter: 'n' value 0.070
- Heavy stand of timber, few down trees, little undergrowth, flow below branches: 'n' value 0.100

The Manning's "n" values assigned to the left overbank (LOB), channel, and right overbank (ROB) for each cross-section are shown in the following table.

Cross-Section	River Station	Friction (n/K)	LOB	Channel	ROB
1	2253.15	n	0.100	0.035	0.050
2	2137.23	n	0.100	0.030	0.050
3	2037.52	n	0.100	0.035	0.050
4	1948.71	n	0.100	0.040	0.070
5	1858.54	n	0.100	0.040	0.070
6	1761.23	n	0.100	0.035	0.070
7	1660.52	n	0.100	0.035	0.070
8	1550.83	n	0.100	0.035	0.070
9	1462.99	n	0.100	0.040	0.100
10	1359.11	n	0.100	0.040	0.100
11	1277.06	n	0.100	0.040	0.100
12	1171.00	n	0.100	0.035	0.100
13	1063.85	n	0.100	0.040	0.100
14	978.95	n	0.100	0.040	0.100
15	912.17	n	0.100	0.040	0.100
16	829.81	n	0.100	0.040	0.100
17	748.05	n	0.100	0.040	0.100
18	659.88	n	0.100	0.045	0.100
19	541.04	n	0.100	0.035	0.035
20	446.11	n	0.035	0.035	0.035
21	362.26	n	0.050	0.030	0.100
22	280.10	n	0.100	0.035	0.100
23	195.89	n	0.100	0.040	0.100
24	95.84	n	0.100	0.040	0.100

D. Pictures



Station 1858.54 – East side of stream



Station 1858.54 – West side of stream



Station 1858.54 – Stream



Station 2253.15 – Existing road and stream

II. SUMMARY OF RESULTS

A. Analyses Performed:

Two HEC-RAS geometry files were created to analyze the existing and proposed conditions. The existing conditions were modeled based on existing topographic data of the study area, and the proposed conditions incorporated the proposed grading for widening sections of County Route 28. The proposed widening is proposed at HEC-RAS river stations 1171.00, 1063.85, 978.95, 912.71, and 829.81. The 100-year storm event (one (1) percent annual chance occurrence) is analyzed for comparison to the existing base flood elevation.

B. Water Surface Elevation Table, Including Existing and Proposed Analyses

Cross-Section	River Station	100-Year Storm Event (2,120 cfs)	
		Existing (ft)	Proposed (ft)
1	2253.15	760.41	760.41
2	2137.23	760.32	760.32
3	2037.52	760.20	760.20
4	1948.71	759.85	759.85
5	1858.54	759.92	759.92
6	1761.23	758.79	758.79
7	1660.52	757.51	757.51
8	1550.83	757.41	757.41
9	1462.99	757.43	757.43
10	1359.11	757.13	757.13
11	1277.06	756.67	756.67
12	1171.00	756.21	756.21
13	1063.85	754.97	754.97
14	978.95	754.77	754.77
15	912.17	754.64	754.64
16	829.81	754.47	754.47
17	748.05	754.21	754.21
18	659.88	754.03	754.03
19	541.04	752.84	752.84
20	446.11	752.70	752.70
21	362.26	751.79	751.79
22	280.10	751.85	751.85
23	195.89	751.35	751.35
24	95.84	751.06	751.06

See Appendix E – HEC-RAS Profile Summary Tables.

C. Compliance with FEMA Criteria

FEMA permits the 100-year flood elevation to increase in surcharge up to one (1) foot in elevation. Based on the HEC-RAS results, the proposed conditions at the site will not increase the 100-year water surface elevation.

D. Recommendation

The proposed County Route 28 improvement for Antero Resources Corporation involves construction within the floodplain established by FEMA. Based on the results of the hydraulic study, the roadway improvement will not increase the water surface elevation of Nutter Fork during the peak discharge resulting from the 100-year flood event.

E. Signature Block

1. Preparer

Andrew P. Darnell, E.I.T. (West Virginia Engineer Intern No. 9156)

2. Reviewer

Gregory S. Linder, P.E. (West Virginia Registered Professional Engineer No. 15629)

3. Date

January 2015

4. Engineer's Seal on Final Report

Gregory S. Linder, P.E. (West Virginia Registered Professional Engineer No. 15629)

III. AVAILABLE DATA

A. Flood Insurance Study

A Flood Insurance Study (FIS) for Doddridge County was initiated in January 1985 and completed in April 1990. A revision to the FIS was completed in October 2011. Nutter Fork was included among the areas studied by approximate methods, with no Base Flood Elevations (BFEs) or flood depths listed.

See Appendix B – FEMA Flood Insurance Study (FIS) Data.

B. Existing Hydrologic Data

No detailed hydrologic evaluation has been performed within the boundaries of this project site.

C. Existing Hydraulic Model from FEMA, USACE, NRCS, others

There is no existing hydraulic model for this project site.

IV. HYDROLOGY

A. Design Discharge Based on USGS Regression Equation

Since no detailed hydrology has been performed within the boundaries of this project, the design discharges of the 2-year, 10-year, 25-year, 50-year, and 100-year storm events were calculated using the USGS regression equations for the North Region of West Virginia. The hydraulic analyses were performed for the 2-year-24 hour, 10-year-24 hour, 25-year-24 hour, 50-year-24 hour, and 100-year-24 hour peak discharges. The 100-year flood has been adopted by FEMA as the base flood for floodplain management purposes.

See Appendix D – Design Discharge Calculations.

Frequency	Discharge
2-year	513 cfs
10-year	1,114 cfs
25-year	1,487 cfs
50-year	1,792 cfs
100-year	2,120 cfs

B. Boundary Conditions

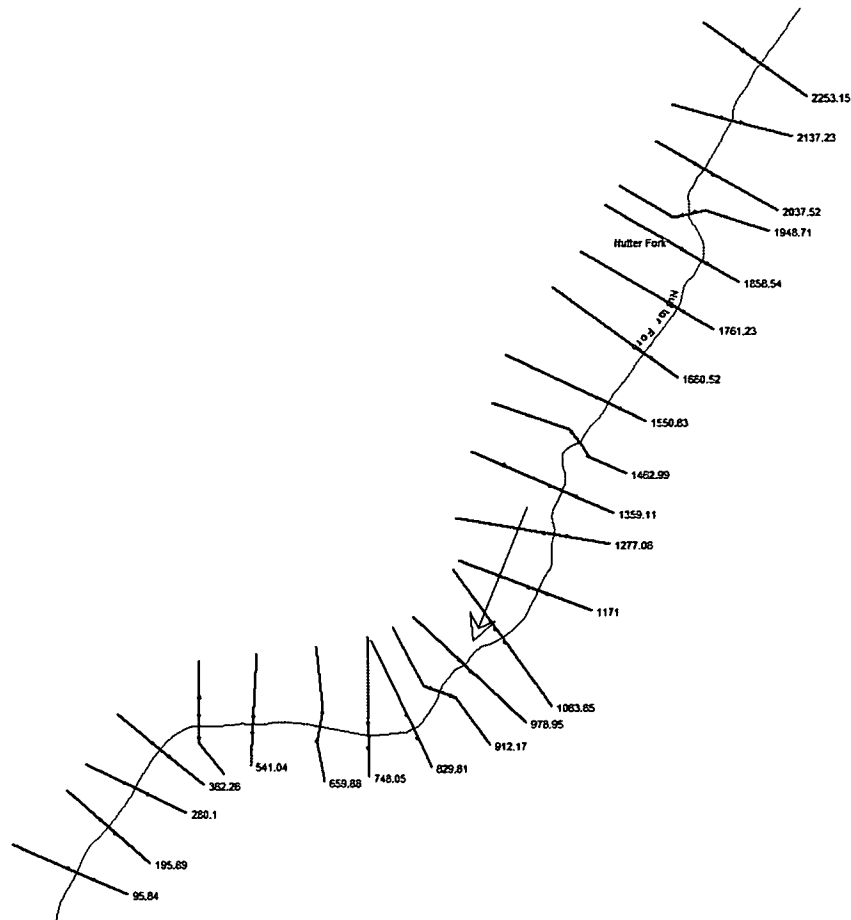
The boundary condition applicable to this hydraulic analysis is the Normal Depth slope at Cross-Section 24 (most downstream station), which is approximately 0.0044 ft/ft.

V. HYDRAULIC MODELING

A. Source of Model

HEC-RAS Version 4.1.0 was used to perform hydraulic analyses to determine the effects caused by the improvement of County Route 28 and the potential impacts to the water levels and floodplain of Nutter Fork. HEC-RAS 4.1.0 is the most current version of the river analysis software available from the Hydraulic Engineering Center of the U.S. Army Corps of Engineers.

B. Site Map with Cross-Sections



C. Explanation of Data and Methods

1. Manning's Values

Manning's roughness coefficients were determined based on a site visit and photographs of the project site. See Section I.C.3. for a detailed description of the Manning's values used.

2. Ineffective Flow Areas

Ineffective flow areas were incorporated to account for areas in the cross-sectional geometry where ponded water will not be actively conveyed downstream.

3. Any Unusual Circumstances

There are no unusual circumstances specified in correlation with the hydraulic analyses of this project.

4. Table of HEC-RAS Plan Files

Filename	Description
Nutter Fork Existing	Existing Conditions Analysis
Nutter Fork Proposed	Proposed Conditions Analysis

See Appendix G - HEC-RAS Output Files

D. HEC-RAS Generated Tables

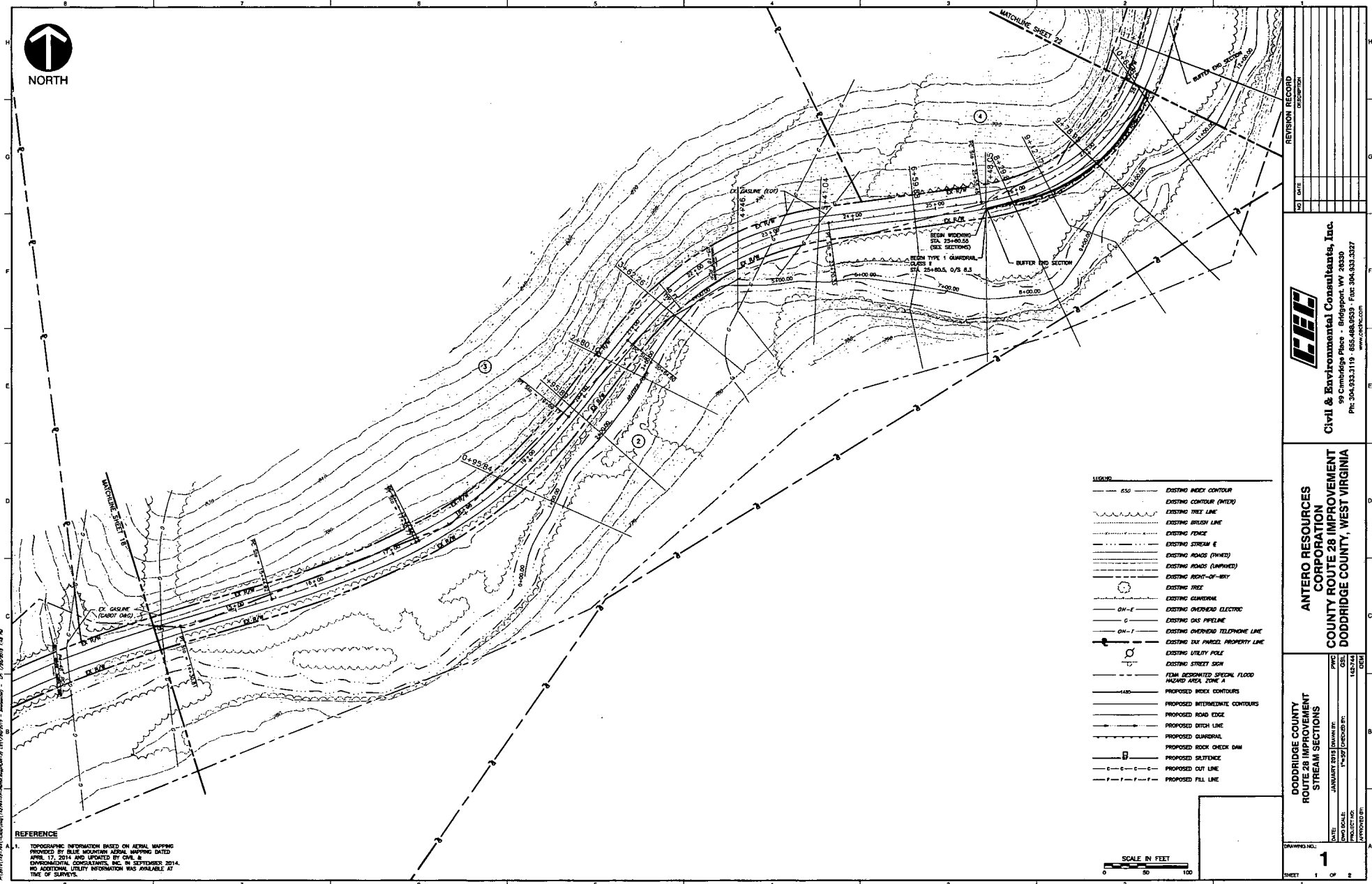
1. Profile Summary with Existing and Proposed Conditions

See Appendix E – HEC-RAS Profile Summary Tables.

2. Detailed Output Tables

See Appendix G – HEC-RAS Output Files

APPENDIX A
Site Plans



REFERENCE

1. TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 17, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. ON SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEY.

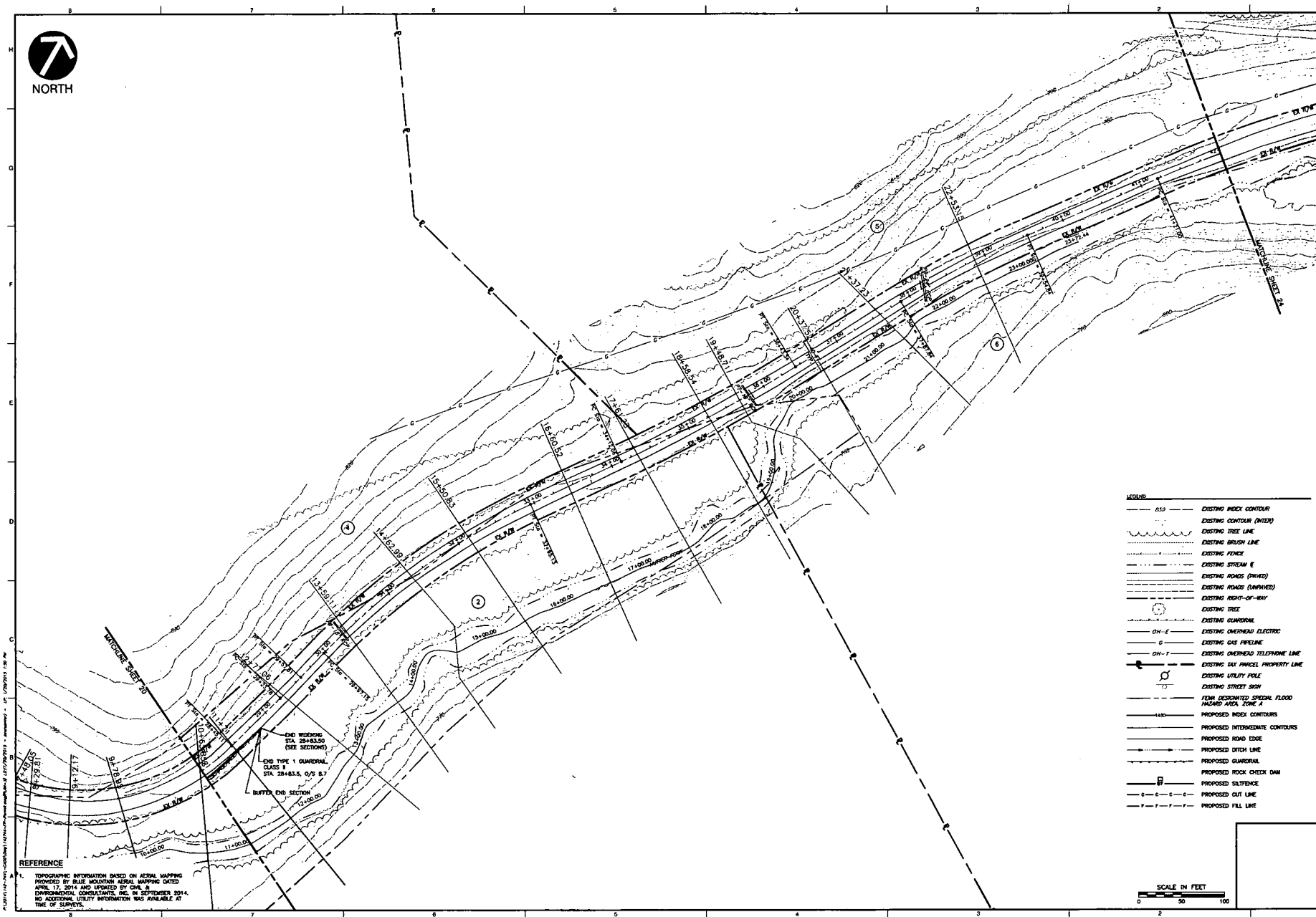
CEC
Civil & Environmental Consultants, Inc.
99 Cambridge Place • Bridgeport, WV 26330
PH: 304.933.3119 • 855.468.9539 • Fax: 304.933.3327
www.cecinc.com

ANTERO RESOURCES CORPORATION
COUNTY ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

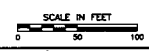
DODDRIDGE COUNTY ROUTE 28 IMPROVEMENT STREAM SECTIONS

DATE	REVISED BY	SCALE	CHECKED BY	DATE
JANUARY 2015		1"=50'		

DRAWING NO. **1**
SHEET 1 OF 2



- LEGEND**
- EXISTING INDEX CONTOUR
 - EXISTING CONTOUR (INTER)
 - EXISTING TREE LINE
 - EXISTING BRUSH LINE
 - EXISTING FENCE
 - EXISTING STREAM E
 - EXISTING ROADS (DRIVED)
 - EXISTING ROADS (UNPAVED)
 - EXISTING RIGHT-OF-WAY
 - EXISTING TREE
 - EXISTING GUARDRAIL
 - OH-E EXISTING OVERHEAD ELECTRIC
 - EXISTING GAS PIPELINE
 - OH-T EXISTING OVERHEAD TELEPHONE LINE
 - EXISTING TAX PARCEL PROPERTY LINE
 - EXISTING UTILITY POLE
 - EXISTING STREET SIGN
 - FEMA DESIGNATED SPECIAL FLOOD HAZARDOUS ZONE A
 - PROPOSED INDEX CONTOURS
 - PROPOSED INTERMEDIATE CONTOURS
 - PROPOSED ROAD EDGE
 - PROPOSED DITCH LINE
 - PROPOSED GUARDRAIL
 - PROPOSED ROCK CHECK DAM
 - PROPOSED SALT FENCE
 - PROPOSED CUT LINE
 - PROPOSED FILL LINE



REFERENCE

TOPOGRAPHIC INFORMATION BASED ON AERIAL MAPPING PROVIDED BY BLUE MOUNTAIN AERIAL MAPPING DATED APRIL 12, 2014 AND UPDATED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. IN SEPTEMBER 2014. NO ADDITIONAL UTILITY INFORMATION WAS AVAILABLE AT TIME OF SURVEY.

NO.	DATE	REVISION RECORD DESCRIPTION

C&E

Civil & Environmental Consultants, Inc.
 99 Cambridge Place • Bridgeport, WV 26330
 Ph: 304.833.3119 • 855-484-9539 • Fax: 304.833.3327
 www.candec.com

ANTERO RESOURCES CORPORATION
ROUTE 28 IMPROVEMENT
DODDRIDGE COUNTY, WEST VIRGINIA

NO.	DATE	REVISION RECORD DESCRIPTION

DRAWING NO: **2**

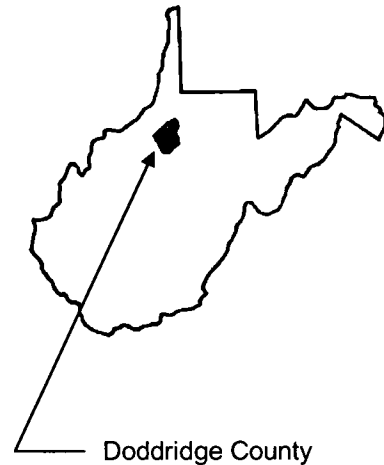
SHEET **2** OF **2**

APPENDIX B
FEMA Flood Insurance Study (FIS) Data

FLOOD INSURANCE STUDY



DODDRIDGE COUNTY, WEST VIRGINIA AND INCORPORATED AREAS



COMMUNITY NAME

WEST UNION, TOWN OF
DODDRIDGE COUNTY (UNINCORPORATED
AREAS)

COMMUNITY NUMBER

540025
540024



Effective: October 4, 2011

Federal Emergency Management Agency

**FLOOD INSURANCE STUDY NUMBER
54017CV000A**

**NOTICE TO
FLOOD INSURANCE STUDY USERS**

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

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

Initial Countywide FIS Effective Date: March 18, 1991

Flood Insurance Study Revised: October 4, 2011

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

1.0	INTRODUCTION.....	1
1.1	Purpose of Study	1
1.2	Authority and Acknowledgments.....	1
1.3	Coordination.....	2
2.0	AREA STUDIED.....	2
2.1	Scope of Study	2
2.2	Community Description.....	3
2.3	Principal Flood Problems.....	4
2.4	Flood Protection Measures	4
3.0	ENGINEERING METHODS	4
3.1	Hydrologic Analyses	5
3.2	Hydraulic Analyses	6
3.3	Vertical Datum	8
4.0	FLOODPLAIN MANAGEMENT APPLICATIONS	8
4.1	Floodplain Boundaries.....	9
4.2	Floodways	9
5.0	INSURANCE APPLICATIONS	11
6.0	FLOOD INSURANCE RATE MAP	12
7.0	OTHER STUDIES	14
8.0	LOCATION OF DATA.....	14
9.0	BIBLIOGRAPHY AND REFERENCES.....	14

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

FIGURES

Figure 1 – Floodway Schematic 10

TABLES

Table 1 – Areas Studied by Detailed Methods 2
Table 2 – Summary of Discharges 5
Table 3 – Vertical Datum Conversion Values 8
Table 4 – Community Map History 13

EXHIBITS

Exhibit 1 – Flood Profiles	
Big Isaac Creek	Panel 01P
Buckeye Creek	Panels 02P-07P
Greenbrier Creek	Panels 08P-09P
Laurel Run	Panel 10P
Long Run	Panels 11P-12P
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

<u>Stream</u>	<u>Limits of Detailed Study</u>
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

<u>Stream</u>	<u>Limits of Detailed Study</u>
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, Piggins 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

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE AREA (SQ. MILES)</u>	<u>PEAK DISCHARGE (CFS) 1-PERCENT-ANNUAL-CHANCE</u>
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

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE AREA (SQ. MILES)</u>	<u>PEAK DISCHARGE (CFS) 1-PERCENT-ANNUAL- CHANCE</u>
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

<u>USGS 7.5-Minute Quadrangle Name</u>	<u>Corner</u>	<u>Latitude (Decimal Degrees)</u>	<u>Longitude (Decimal Degrees)</u>	<u>Conversion from NGVD29 to NAVD88 (foot)</u>
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".

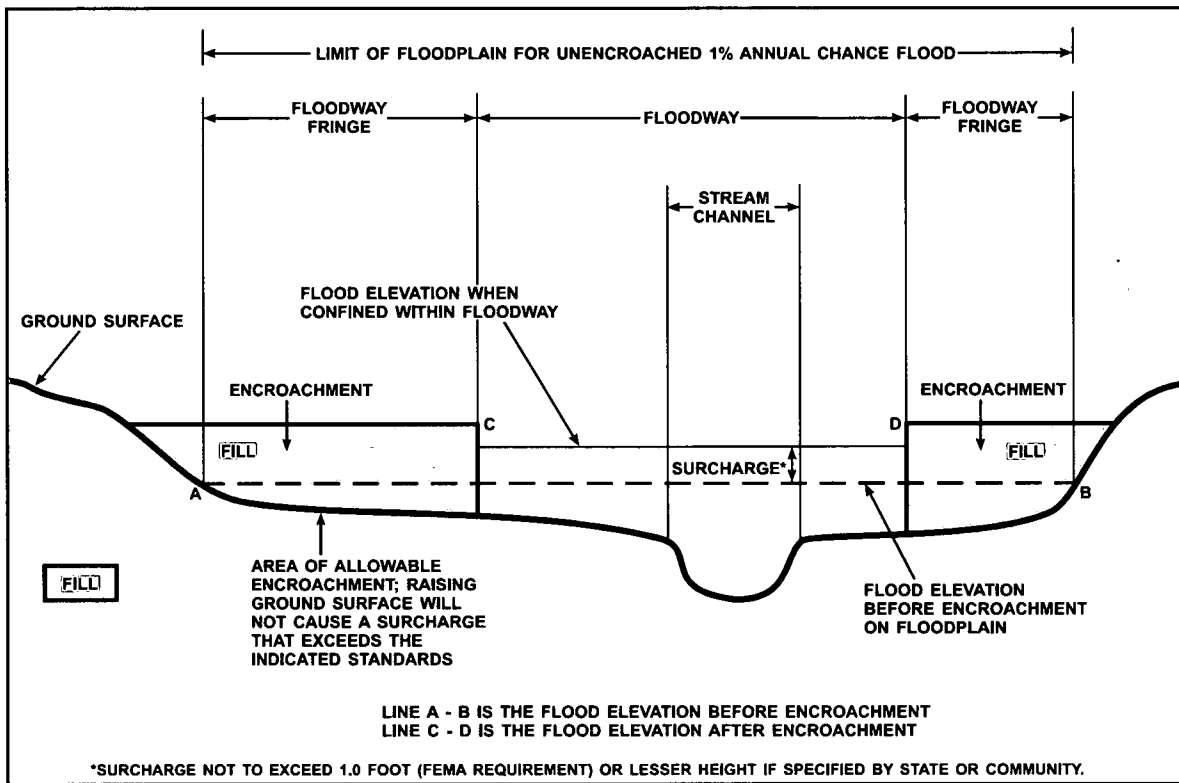


Figure 1 - Floodway Schematic

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	
Doddrige County (Unincorporated Areas)	November 8, 1974	June 3, 1977	March 18, 1991	

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

**DODDRIDGE COUNTY, WV
AND INCORPORATED AREAS**

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

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

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

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

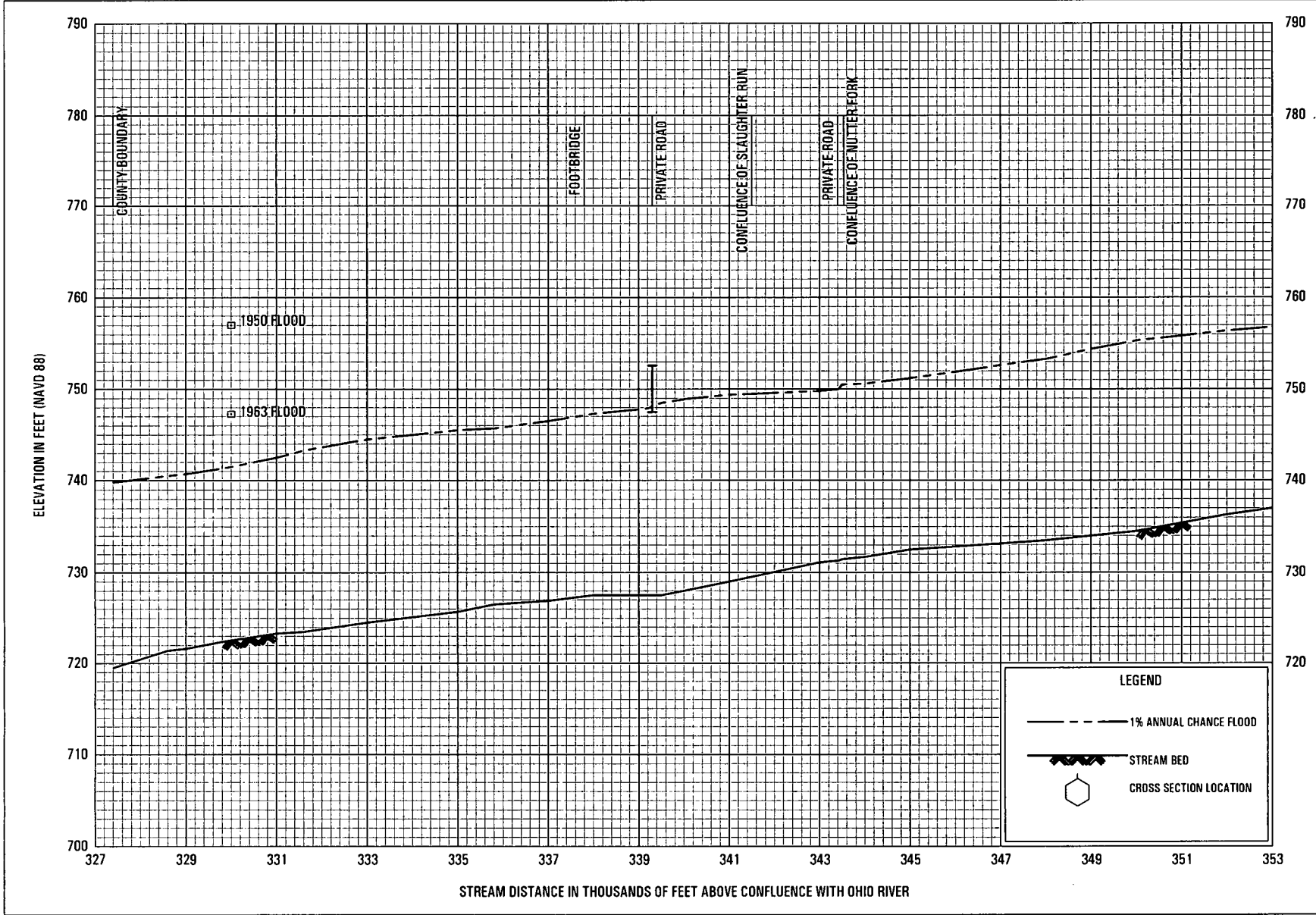
8.0 LOCATION OF DATA

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

9.0 BIBLIOGRAPHY AND REFERENCES

1. Holmes, Darrell E., West Virginia Blue Book, Chapman Printing, 2005.
2. U. S. Department of the Interior, Geological Survey, Hydrology of Area 8, Eastern Coal Province, West Virginia, January 1987.
3. U. S. Department of the Interior, Water-Resources Investigation 87-4111, Techniques for Estimating Flood-Depth Frequency Relations for Streams in West Virginia, by Jeffrey B. Wiley, 1987.
4. U. S. Department of the Interior, Geological Survey, in cooperation with the West Virginia Department of Highways, Runoff Studies on Small Drainage Areas by G. S. Runner, Washington, D. C., October 1980.
5. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, April 1984.
6. U. S. Army Corps of Engineers, Huntingdon District, Special Flood Hazard Information Report, Middle Island Creek and Tributaries, Doddridge County, West Virginia, October 1978.
7. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Big Isaac, West Virginia, 1964, Photorevised 1976; Center Point, West Virginia, 1961, Photorevised 1976; New Milton, West Virginia, 1965, Photorevised, 1976; Smithburg, West Virginia, 1961, Photorevised 1976; West Union, West Virginia, 1961, Photorevised 1976.

8. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Town of West Union, Doddridge County, West Virginia, April 2, 1976.
9. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Unincorporated Areas of Doddridge County, West Virginia, Washington, D.C., June 3, 1977.
10. Federal Emergency Management Agency, Flood Insurance Study, Unincorporated Areas of Tyler County, West Virginia, Washington, D. C., November 4, 1988.
11. Federal Emergency Management Agency, Flood Insurance Study, Unincorporated Areas of Harrison County, West Virginia, Washington, D. C., July 4, 1988.
12. Federal Emergency Management Agency, Flood Insurance Study, Lewis County and Incorporated Areas, West Virginia, Washington, D.C., July 1, 1987.
13. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Unincorporated Areas of Ritchie County, West Virginia, Washington, D.C., December 11, 1981.
14. Federal Emergency Management Agency, Flood Insurance Study, Gilmer County and Incorporated Areas, West Virginia (Unpublished).

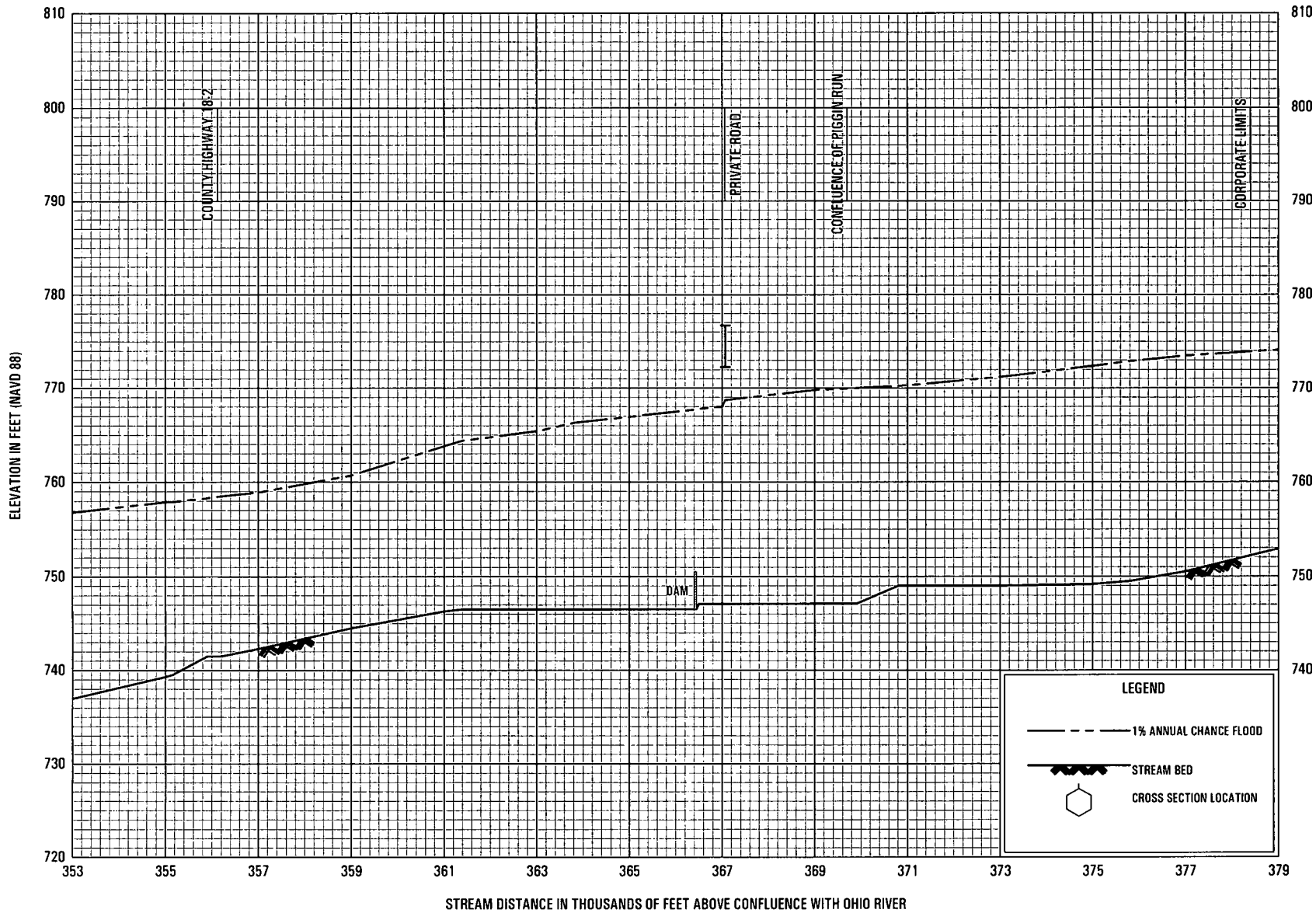


FLOOD PROFILES

MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
DODDRIDGE COUNTY, WV
AND INCORPORATED AREAS

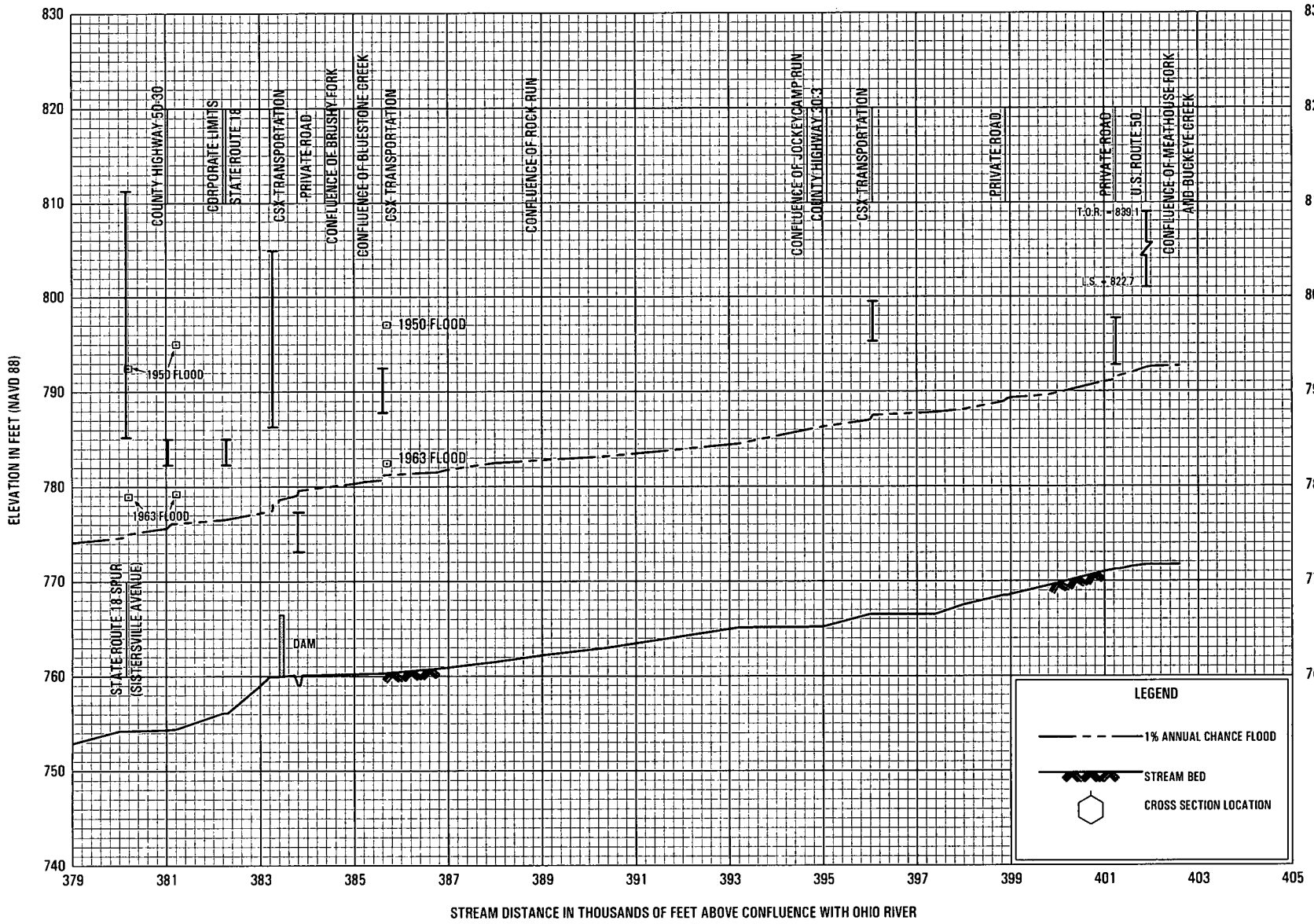
21P



FLOOD PROFILES

MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
 DODDRIDGE COUNTY, WV
 AND INCORPORATED AREAS



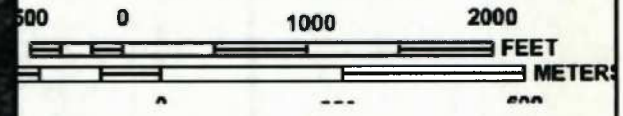
FLOOD PROFILES
MIDDLE ISLAND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
DODDRIDGE COUNTY, WV
AND INCORPORATED AREAS

APPENDIX C
Flood Insurance Rate Map and West Virginia Flood Tool Map



MAP SCALE 1" = 1000'



NATIONAL FLOOD INSURANCE PROGRAM
 FIP

PANEL 0110C

FIRM
FLOOD INSURANCE RATE MAP
DODDRIDGE COUNTY,
WEST VIRGINIA
AND INCORPORATED AREAS

PANEL 110 OF 325
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0110	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.

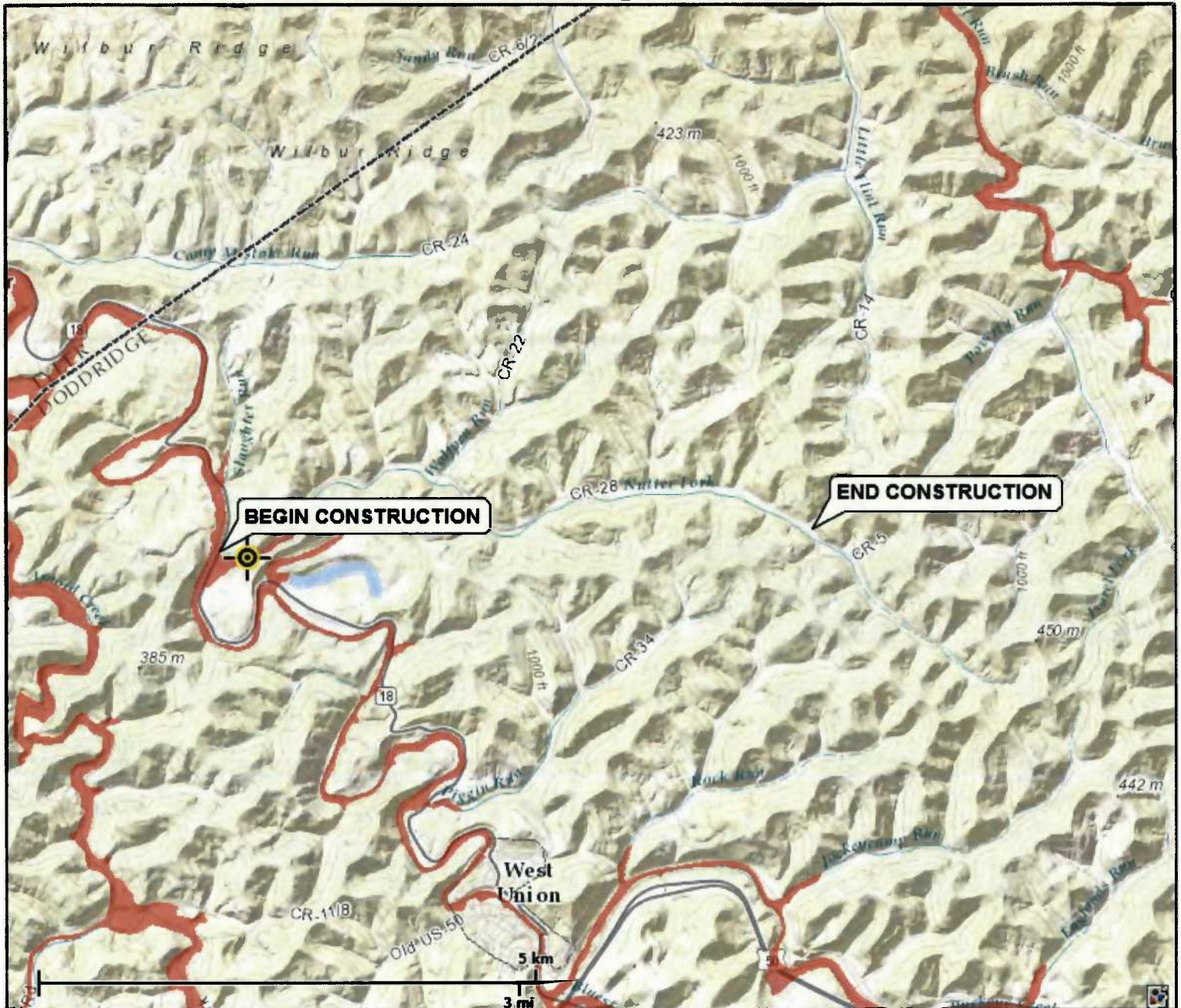


MAP NUMBER
54017C0110C
MAP REVISED
OCTOBER 4, 2011

Federal Emergency Management Agency


This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


CR28 Road Improvement



This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

Map Created on 1/20/2015

 **Location of the mouse click**

 **Flood Hazard Zone (1% annual chance floodplain)**

User Notes:

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. To obtain more detailed information in areas where Base Flood Elevations have been determined, users are encouraged to consult the latest Flood Profile data contained in the official flood insurance study. These studies are available online at www.msc.fema.gov.

WV Flood Tool is supported by FEMA, WV NFIP Office, and WV GIS Technical Center (<http://www.MapWV.gov/flood>)

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

Elevation: About 741 feet

Location (long, lat): 80.805332 W, 39.328249 N

Location (UTM 17N): (516778, 4353222)

FEMA Issued Flood Map: 54017C0110C

Contacts: Doddridge County

CRS Information: N/A

Parcel Number:

APPENDIX D
Design Discharge Calculations

Nutter Fork Discharge

Project No. 142-744

Checked By: GCL 1/12/15

USGS Regression Equation

$$DA = 6.13 \text{ mi}^2$$

$$Q(2) = 138 A^{0.724} = (138)(6.13)^{0.724} = 513 \text{ cfs}$$

$$Q(10) = 341 A^{0.653} = (341)(6.13)^{0.653} = 1,114 \text{ cfs}$$

$$Q(25) = 478 A^{0.626} = (478)(6.13)^{0.626} = 1,487 \text{ cfs}$$

$$Q(50) = 594 A^{0.609} = (594)(6.13)^{0.609} = 1,792 \text{ cfs}$$

$$Q(100) = 722 A^{0.594} = (722)(6.13)^{0.594} = 2,120 \text{ cfs}$$



DA = 6.13 SQ. MILES

0' 3,000' 6,000'



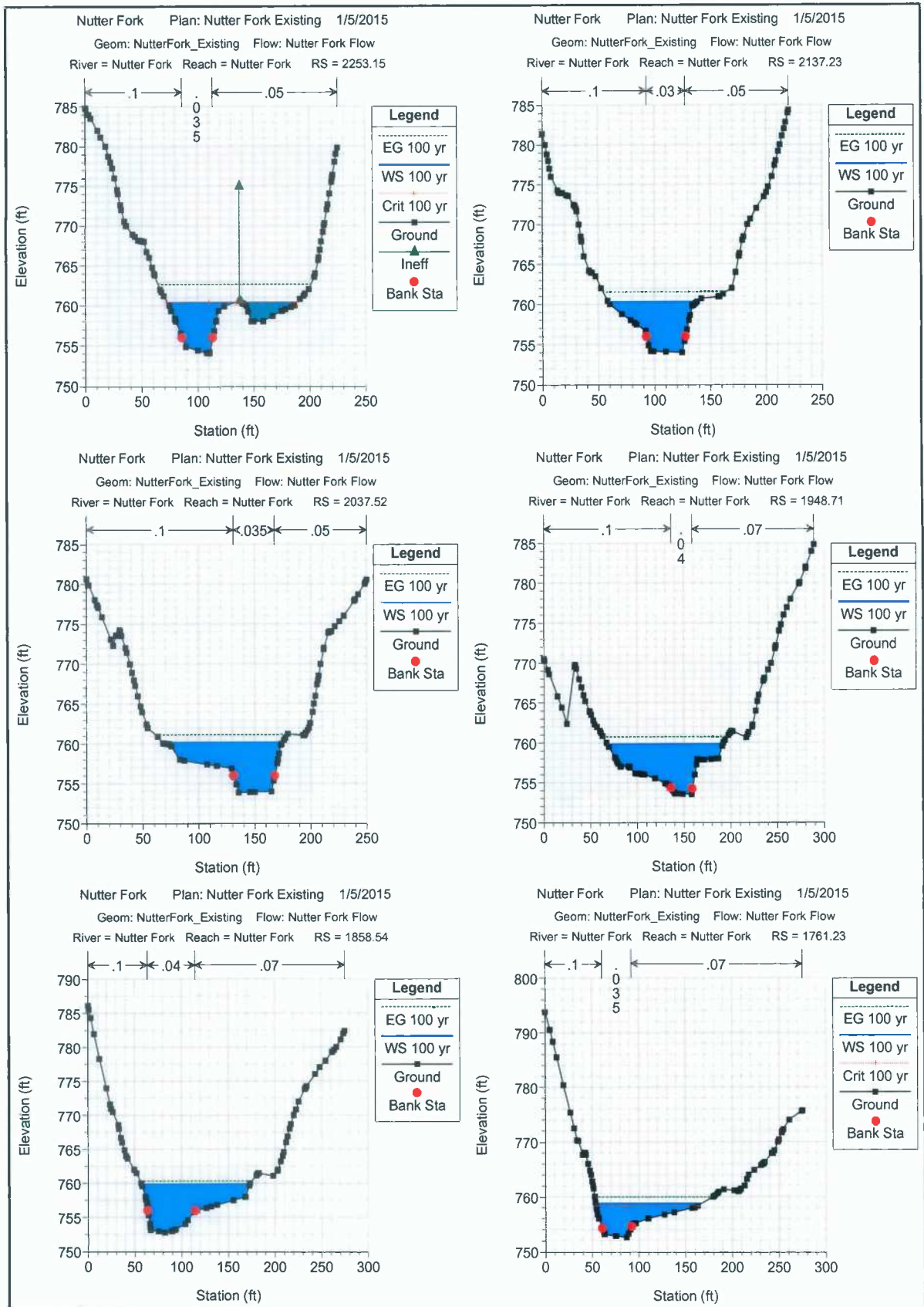
SCALE: 1"=3,000'

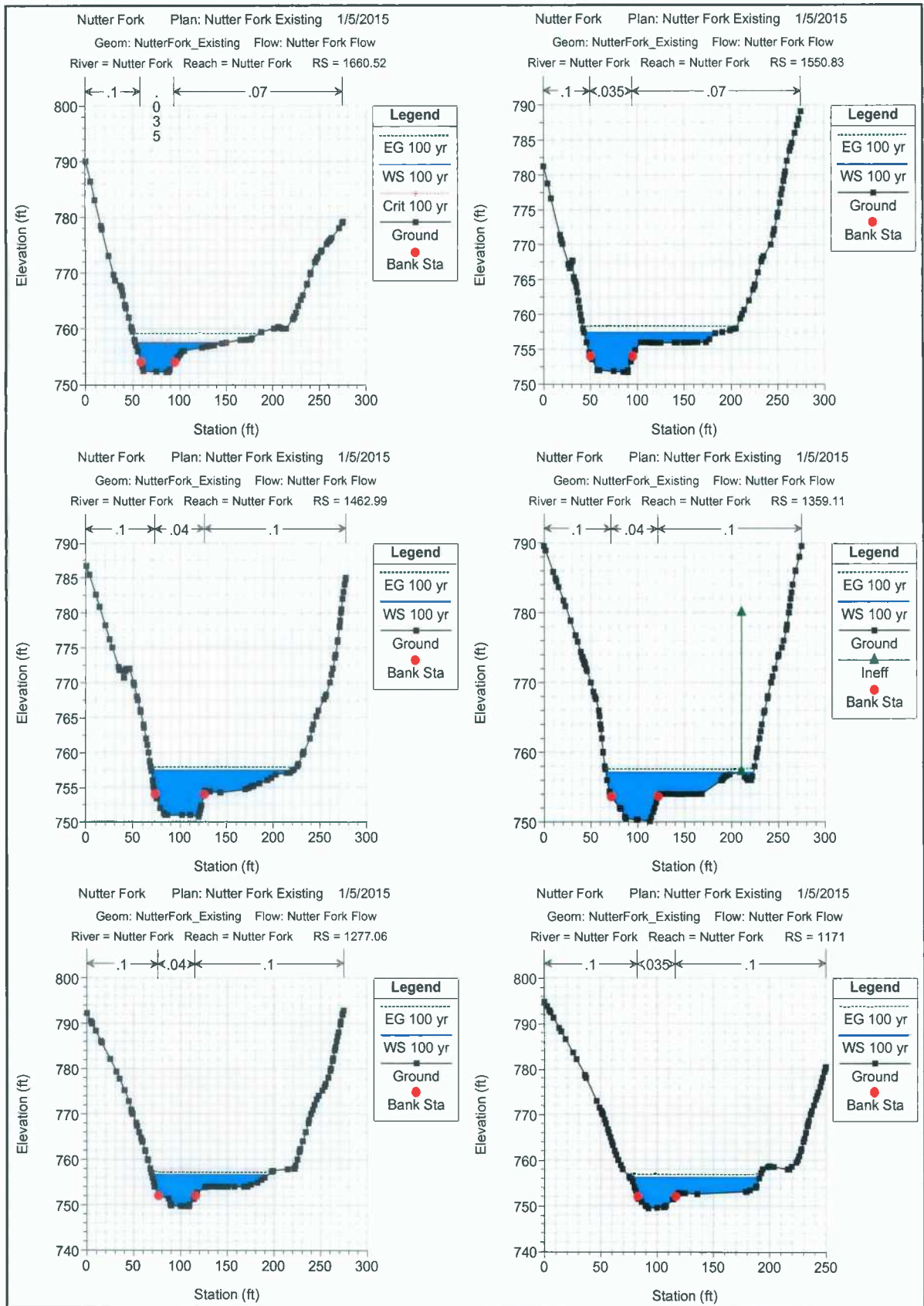
APPENDIX E
HEC-RAS Profile Summary Tables

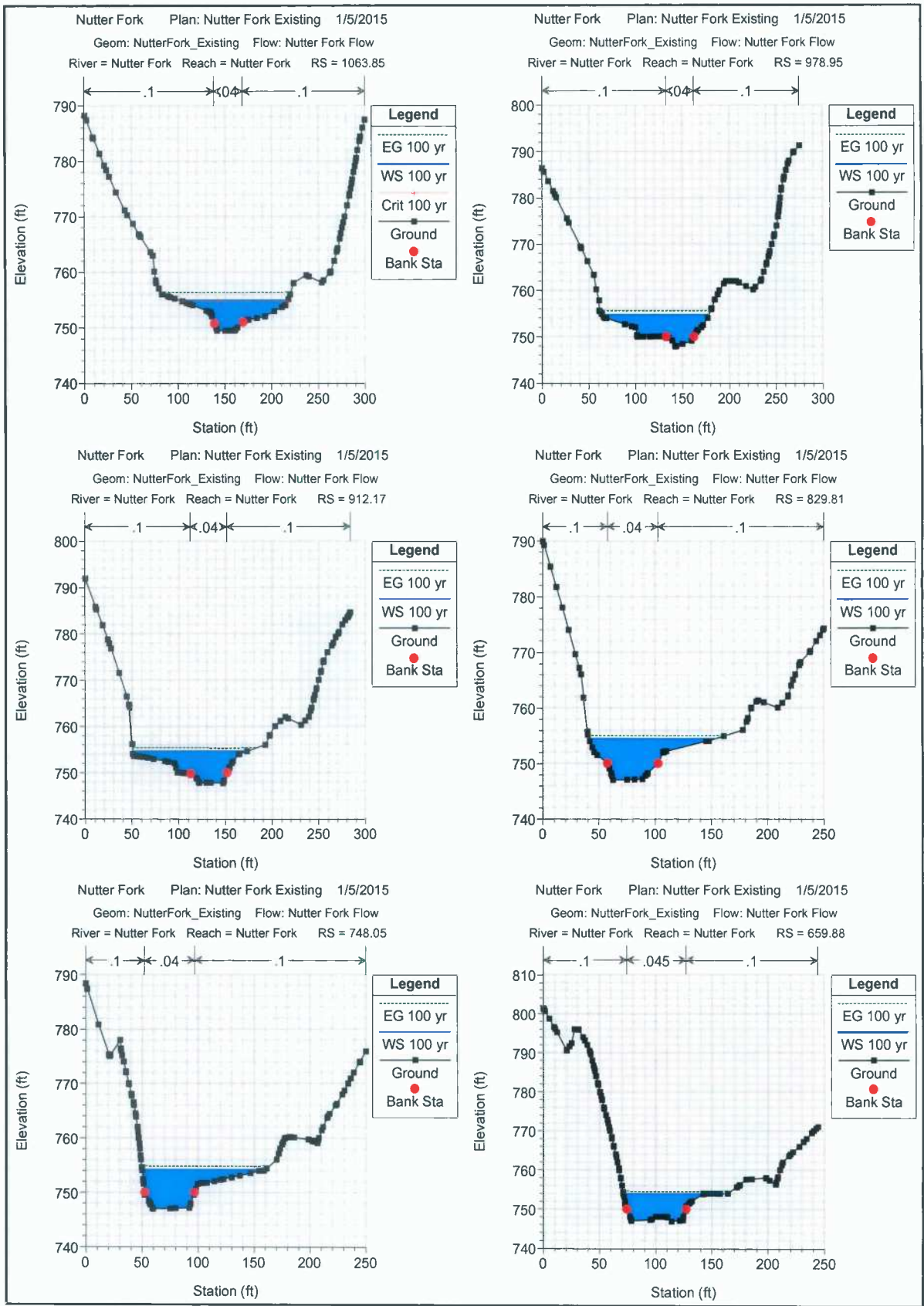
HEC-RAS River: Nutter Fork Reach: Nutter Fork Profile: 100 yr

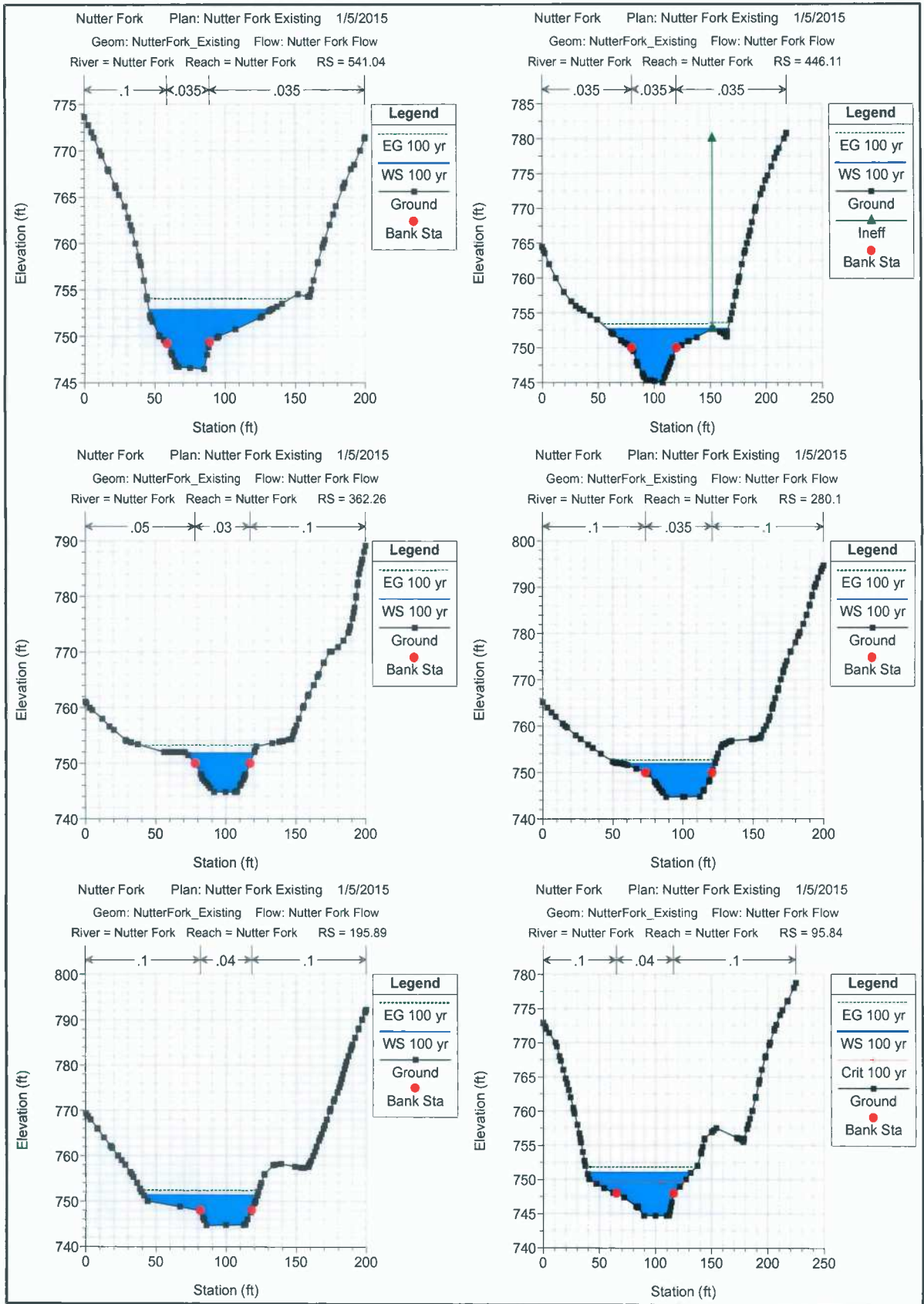
Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Nutter Fork	2253.15	100 yr	Existing	2120.00	753.99	760.41	760.41	762.72	0.008873	12.55	208.97	111.78	0.92
Nutter Fork	2253.15	100 yr	Proposed	2120.00	753.99	760.41	760.41	762.72	0.008873	12.55	208.97	111.78	0.92
Nutter Fork	2137.23	100 yr	Existing	2120.00	753.99	760.32		761.62	0.003414	9.44	295.98	79.71	0.68
Nutter Fork	2137.23	100 yr	Proposed	2120.00	753.99	760.32		761.62	0.003414	9.44	295.98	79.71	0.68
Nutter Fork	2037.52	100 yr	Existing	2120.00	753.87	760.20		761.17	0.003675	8.39	380.66	107.27	0.60
Nutter Fork	2037.52	100 yr	Proposed	2120.00	753.87	760.20		761.17	0.003675	8.39	380.66	107.27	0.60
Nutter Fork	1948.71	100 yr	Existing	2120.00	753.52	759.85		760.77	0.005875	9.51	445.31	123.87	0.67
Nutter Fork	1948.71	100 yr	Proposed	2120.00	753.52	759.85		760.77	0.005875	9.51	445.31	123.87	0.67
Nutter Fork	1858.54	100 yr	Existing	2120.00	752.76	759.92		760.34	0.002030	5.60	496.50	116.38	0.39
Nutter Fork	1858.54	100 yr	Proposed	2120.00	752.76	759.92		760.34	0.002030	5.60	496.50	116.38	0.39
Nutter Fork	1761.23	100 yr	Existing	2120.00	752.57	758.79	758.31	759.97	0.005063	9.58	350.28	114.17	0.70
Nutter Fork	1761.23	100 yr	Proposed	2120.00	752.57	758.79	758.31	759.97	0.005063	9.58	350.28	114.17	0.70
Nutter Fork	1660.52	100 yr	Existing	2120.00	752.21	757.51	757.51	759.28	0.008108	11.03	249.76	98.90	0.87
Nutter Fork	1660.52	100 yr	Proposed	2120.00	752.21	757.51	757.51	759.28	0.008108	11.03	249.76	98.90	0.87
Nutter Fork	1550.83	100 yr	Existing	2120.00	751.72	757.41		758.30	0.003992	8.00	377.54	145.18	0.62
Nutter Fork	1550.83	100 yr	Proposed	2120.00	751.72	757.41		758.30	0.003992	8.00	377.54	145.18	0.62
Nutter Fork	1462.99	100 yr	Existing	2120.00	750.78	757.43		757.92	0.002410	5.94	522.19	151.08	0.43
Nutter Fork	1462.99	100 yr	Proposed	2120.00	750.78	757.43		757.92	0.002410	5.94	522.19	151.08	0.43
Nutter Fork	1359.11	100 yr	Existing	2120.00	750.11	757.13		757.65	0.002634	6.19	507.85	154.06	0.45
Nutter Fork	1359.11	100 yr	Proposed	2120.00	750.11	757.13		757.65	0.002634	6.19	507.84	154.06	0.45
Nutter Fork	1277.06	100 yr	Existing	2120.00	749.65	756.67		757.38	0.003532	7.32	455.19	124.79	0.52
Nutter Fork	1277.06	100 yr	Proposed	2120.00	749.65	756.67		757.38	0.003533	7.32	455.17	124.79	0.52
Nutter Fork	1171	100 yr	Existing	2120.00	749.44	756.21		757.01	0.003443	8.10	458.36	115.57	0.58
Nutter Fork	1171	100 yr	Proposed	2120.00	749.44	756.21		757.01	0.003443	8.10	458.36	115.57	0.58
Nutter Fork	1063.85	100 yr	Existing	2120.00	749.44	754.97	754.73	756.40	0.009235	10.65	335.49	117.75	0.82
Nutter Fork	1063.85	100 yr	Proposed	2120.00	749.44	754.97	754.73	756.40	0.009234	10.65	335.49	117.75	0.82
Nutter Fork	978.95	100 yr	Existing	2120.00	747.88	754.77		755.67	0.005305	8.79	431.03	114.28	0.63
Nutter Fork	978.95	100 yr	Proposed	2120.00	747.88	754.77		755.67	0.005305	8.79	431.03	114.28	0.63
Nutter Fork	912.17	100 yr	Existing	2120.00	747.66	754.64		755.34	0.003208	7.22	444.68	123.85	0.50
Nutter Fork	912.17	100 yr	Proposed	2120.00	747.66	754.64		755.34	0.003208	7.22	444.68	123.85	0.50
Nutter Fork	829.81	100 yr	Existing	2120.00	746.94	754.47		755.08	0.002444	6.47	428.60	113.56	0.44
Nutter Fork	829.81	100 yr	Proposed	2120.00	746.94	754.47		755.08	0.002444	6.47	428.60	113.56	0.44
Nutter Fork	748.05	100 yr	Existing	2120.00	746.94	754.21		754.87	0.002648	6.70	404.16	110.10	0.45
Nutter Fork	748.05	100 yr	Proposed	2120.00	746.94	754.21		754.87	0.002648	6.70	404.16	110.10	0.45
Nutter Fork	659.88	100 yr	Existing	2120.00	746.81	754.03		754.60	0.002951	6.08	378.89	93.43	0.42
Nutter Fork	659.88	100 yr	Proposed	2120.00	746.81	754.03		754.60	0.002951	6.08	378.89	93.43	0.42
Nutter Fork	541.04	100 yr	Existing	2120.00	746.46	752.84		754.07	0.005382	9.71	284.44	88.97	0.71
Nutter Fork	541.04	100 yr	Proposed	2120.00	746.46	752.84		754.07	0.005382	9.71	284.44	88.97	0.71
Nutter Fork	446.11	100 yr	Existing	2120.00	745.01	752.70		753.57	0.003270	7.82	317.28	107.73	0.58
Nutter Fork	446.11	100 yr	Proposed	2120.00	745.01	752.70		753.57	0.003270	7.82	317.28	107.73	0.58
Nutter Fork	362.26	100 yr	Existing	2120.00	744.77	751.79		753.21	0.004055	9.59	228.04	48.37	0.71
Nutter Fork	362.26	100 yr	Proposed	2120.00	744.77	751.79		753.21	0.004055	9.59	228.04	48.37	0.71
Nutter Fork	280.1	100 yr	Existing	2120.00	744.69	751.85		752.75	0.003290	7.62	292.84	65.17	0.58
Nutter Fork	280.1	100 yr	Proposed	2120.00	744.69	751.85		752.75	0.003290	7.62	292.84	65.17	0.58
Nutter Fork	195.89	100 yr	Existing	2120.00	744.69	751.35		752.39	0.004971	8.54	327.05	81.34	0.60
Nutter Fork	195.89	100 yr	Proposed	2120.00	744.69	751.35		752.39	0.004971	8.54	327.05	81.34	0.60
Nutter Fork	95.84	100 yr	Existing	2120.00	744.68	751.06	749.58	751.86	0.004403	7.37	351.78	92.97	0.58
Nutter Fork	95.84	100 yr	Proposed	2120.00	744.68	751.06	749.58	751.86	0.004403	7.37	351.78	92.97	0.58

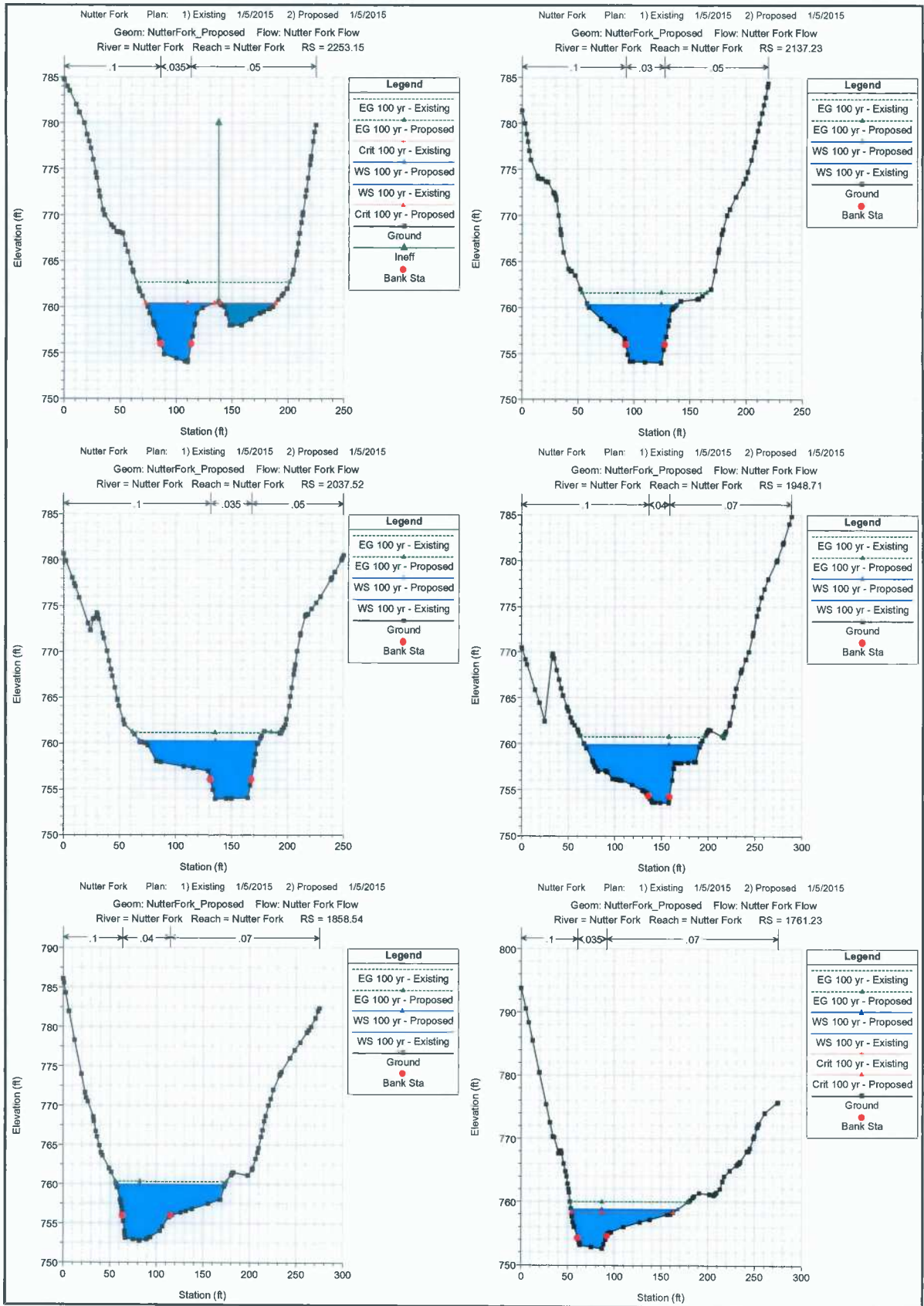
APPENDIX F
HEC-RAS Cross-Section Reports

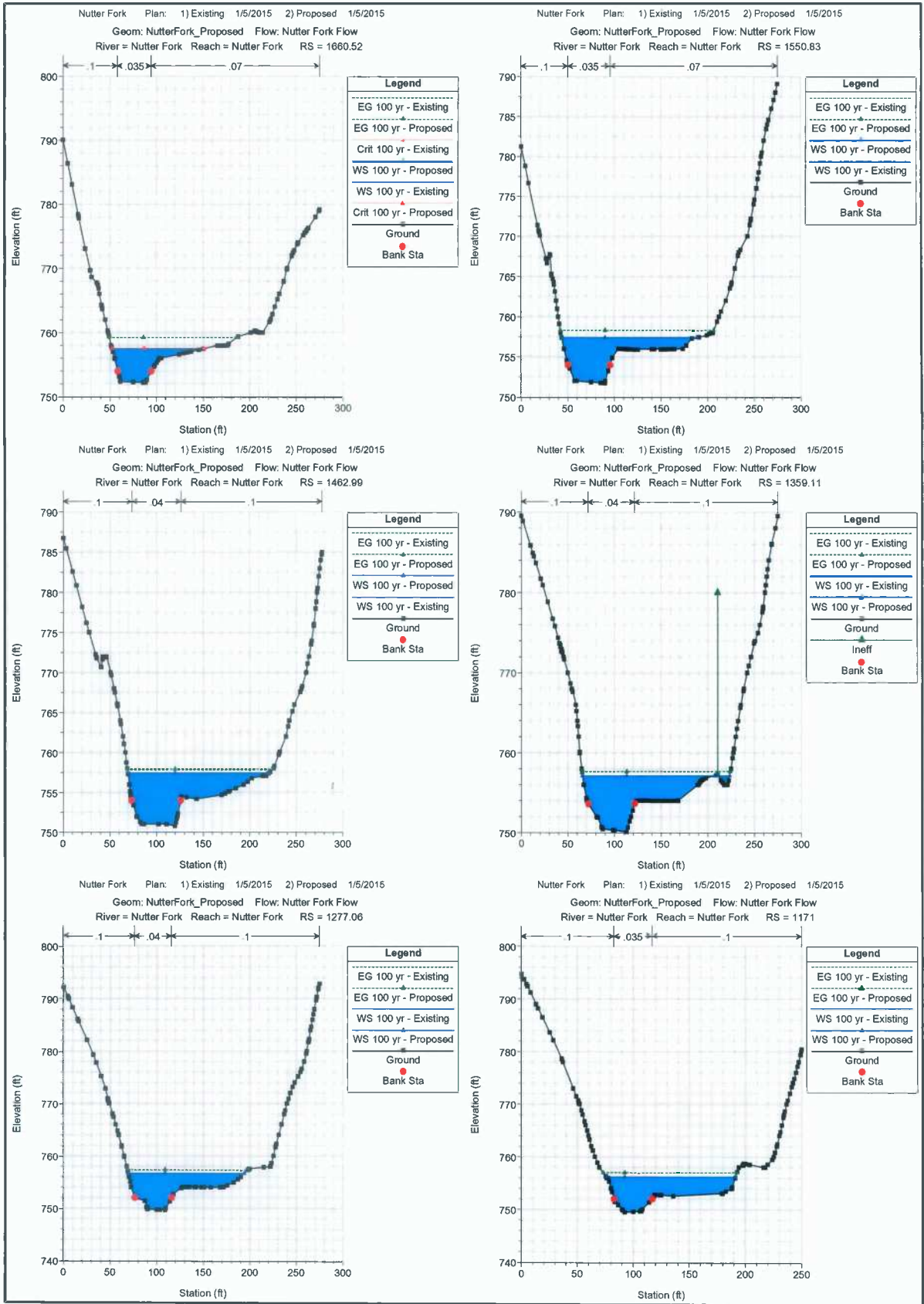


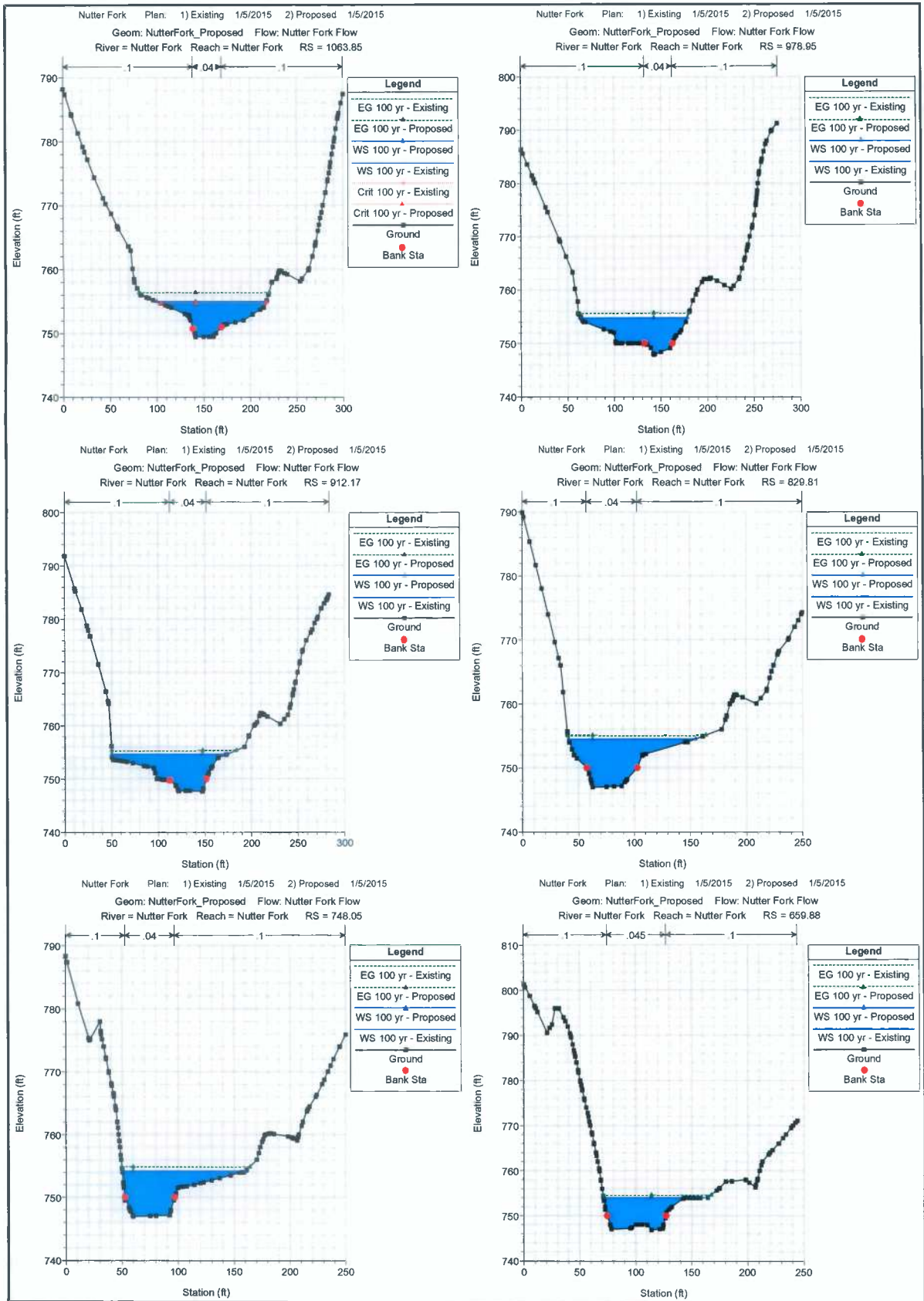


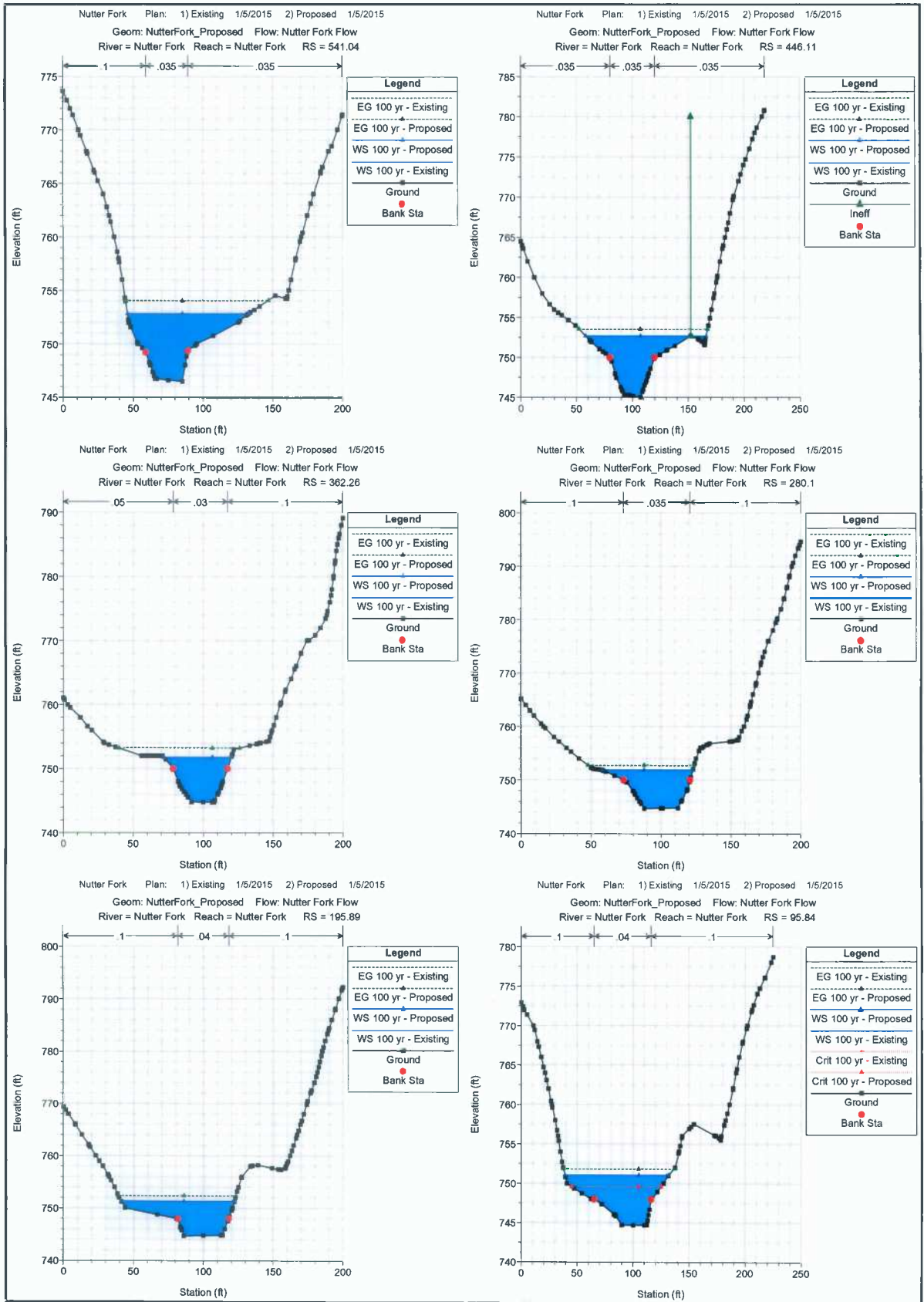












APPENDIX G
HEC-RAS Output Files

NutterFork.rep

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
XXXXXXXX XXXX      X      XXX XXXX      XXXXXX      XXXX
X      X  X          X          X      X      X      X
X      X  X          X      X      X      X      X
X      X  XXXXXX      XXXX      X      X      X      X
```

PROJECT DATA

Project Title: Nutter Fork
Project File : NutterFork.prj
Run Date and Time: 1/5/2015 1:29:14 PM

Project in English units

PLAN DATA

Plan Title: Nutter Fork Existing
Plan File : p:\2014\142-744\Calculations\Hydraulic Study\NutterFork.p01

Geometry Title: NutterFork_Existing
Geometry File : p:\2014\142-744\Calculations\Hydraulic
Study\NutterFork.g01

Flow Title : Nutter Fork Flow
Flow File : p:\2014\142-744\Calculations\Hydraulic
Study\NutterFork.f01

Plan Summary Information:

Number of: Cross Sections	=	24	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	0	Lateral Structures	=	0

Computational Information

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

Computation Options

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

FLOW DATA

NutterFork.rep

Flow Title: Nutter Fork Flow

Flow File : p:\2014\142-744\Calculations\Hydraulic Study\NutterFork.f01

Flow Data (cfs)

River	Reach	RS	2 yr	10 yr
25 yr Nutter Fork 1487	50 yr Nutter Fork 1792	100 yr 2253.15 2120	513	1114

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Nutter Fork	Nutter Fork	2 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	10 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	25 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	50 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	100 yr	
Normal S = 0.0044			

GEOMETRY DATA

Geometry Title: NutterFork_Existing

Geometry File : p:\2014\142-744\Calculations\Hydraulic Study\NutterFork.g01

CROSS SECTION

RIVER: Nutter Fork
REACH: Nutter Fork RS: 2253.15

INPUT

Description:

Station	Elevation	Data	num=	96						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
0	784.82	3800049	784.723	059998	7844.929993	783.52	10.86	782		
13.57001	781.14	17.99001	780	20.37	778.73	22.27	778	23.78	777.25	
25.77	776	28.16	774.56	28.84	774	30.95	772.61	31.74001	772	
34.53	770.55	35.75	770	36.12	769.98	41.94	768.92	44.03999	768.64	
46.89	768.17	48.12	768.15	49.37	768.1	50.19	768.09	52.02	768	
52.08	768	54.36	766.75	56.61	766	59.27	764.76	60.97	764	
61.5	763.79	66.37	762	67.33	761.69	69.60001	761.18	74.28	760	
76.03	759.31	79.38	758.34	79.64999	758.24	80.24001	758.84	67999	756.49	
86	756	86.25	755.98	91.79999	754.83	100	754.39	107.93	754.06	
110.31	753.99	110.57	754.19	113.39	756	114.59	756.78	116.49	758	
116.68	758.12	118.52	759.31	123.54	759.87	123.6	759.88	123.63	759.88	
123.78	759.89	137.97	760.58	139.64	760.29	141.11	760.2	143.39	760	

NutterFork.rep

145.03	759.24	147.95	758	150.25	758	158.4	758	158.42	758
158.48	758	158.52	758.01	158.62	758.02	166.93	758.67	175.16	759.29
178.32	759.49	183.28	759.79	186.08	759.99	186.57	760	191.24	760.79
194.36	761.2	195.81	761.45	199.23	762	204.18	763.56	205.01	764
207.7	765.66	208.25	766	209.28	766.94	210.39	768	211.95	769.17
213.01	770	213.37	770.3	215.55	772	216.29	772.64	217.87	774
219.61	775.45	220.28	776	220.67	776.37	222.6	778	223.76	779.01
225	779.78								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 86 .035 113.39 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 86 113.39 101.2 115.92 128.19 .1 .3
 Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 137.97 225 775 T

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 2137.23

INPUT

Description:

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	781.392	.559998	780.179993	778.825	.300003	7786.509995	777.01		
7.820007	776	13.73	774.28	14.48	774	16.16	773.97	16.84	773.95
18.08	773.96	21.28	773.68	23.25	773.6	28.17	772.4828	.57001	772.42
29.38	772.26	30.17	772	30.64	771.67	32.64	77034.32001		768.48
34.85001	768	35.02	767.89	37.11	766	41.61	764.2243	.10001	764
43.41	763.9943	.75999	763.9644	.35001	763.9547	.53999	763.49	52.27	762
58.22	760.46	59.94	760	70.67	758.7778	.50999	75882.10001		757.67
83.82001	757.48	91.8	756.67	92.45	756.25	92.89	756	94.53	754.9
96.51	754.16	99.18	754.14	110	754.07	124.47	753.99	126.67	755.41
127.59	756	128.9	756.85	130.75	758	131.77	758.63	133.61	759.78
134.67	759.9	135.55	760	136.61	760.13	138.09	760.28	141.78	760.7
156.98	760.92	157.53	760.93	157.71	760.95	157.84	760.96	158.14	760.99
161.09	761.27	168.92	762	172.55	763.99	172.57	764	172.58	764.01
175.45	766	176.1	766.36	178.56	768	179.76	768.46	183.19	770
185.83	770.66	191.27	772	197.92	773.47	200.14	774	201.81	774.71
205.15	776	207.7	777.41	208.78	778	210.85	779.19	212.27	780
214.39	781.11	216.1	782	217.49	782.83	219.45	784	220	784.36

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 92.89 .03 127.59 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 92.89 127.59 109.88 99.71 90.23 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 2037.52

INPUT

Description:

Station Elevation Data num= 90

NutterFork.rep

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	780.662	100006	779.897	539993	778.059	350006	777.421	1035001	777.08
13.78	775.88	21.58	773.123	85001	772.31	26.28	773.56	29.05	773.78
29.38	774.23	30.12	774.03	30.19	774	31.23	773.55	34.69	772
35.67999	771.46	38.75	77040	49001	768.934	2.25999	768	43.45	767.28
45.77	766	48.14	764.714	9.50999	764	53.5	762.475	4.49001	762
63.47	760.92	68.16	760.08	68.92	760.066	9.50999	760.04	70.06	760.04
73.00999	76073	35001	759.98	75.37	759.72	83.06	758	87.08	757.89
107.55	757.41	116.06	757.23	129.32	756.91	130.83	756.16	131.16	756
133.52	754.88	135.61	753.87	145.59	753.92	150	753.93	164.73	753.99
166.77	755.36	167.85	756	170.08	757.55	170.65	758	171.62	758.77
173.03	759.89	173.2	759.87	173.59	759.95	173.86	760	175.99	760.48
177.15	760.74	179.42	761.26	193.16	761.05	194.01	761.02	194.71	761.17
195.24	761.37	196.8	761.66	198.38	762	199.29	762.58	201.65	764
202.72	765.03	203.9	766	205.66	767.45	206.31	768	206.98	768.52
208.66	770	211.45	771.83	211.73	772	215.71	773.89	216.19	774
216.58	774.02	217.15	774.04	217.64	774.07	218.37	774.08	221.57	774.67
225.65	775.33	229.48	776	238.67	777.87	238.96	777.93	239.33	778
239.75	778.09	242.36	778.68	248.21	780	248.92	780.21	250	780.53

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .1 131.16	.035 167.85	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
131.16	167.85	60.01	88.81 103.28	.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1948.71

INPUT

Description:

Station	Elevation	Data	num=	113					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	770.54	6900024	770.32	4.25	769.17	5.77002	768.63	14.53	765.85
19.25	764.44	24.81	762.423	2.80002	769.55	33.41	769.81	33.42	769.81
33.81	769.68	34.82001	769.273	7.76001	768	40.33	766.974	2.43001	766
44.51001	765.22	48.8	764	49.42	763.845	0.57001	763.53	53	762.81
54.40001	762.31	56.93001	76260	2.23001	761.52	61.16	761.256	2.84001	760.84
67.05	76069	6.2001	759.49	76.06	758.17	76.72	75878	0.7001	757.65
79.35001	757.48	1.65001	757.058	2.10001	756.978	2.49001	756.989	0.18001	757.05
91.53	756.95	91.98001	756.88	97.61	756.149	9.87001	756.13	101.75	756.09
102.75	756.08	103.47	756.07	103.9	756.07	105.2	756.02	105.85	756.01
106.31	756	107.69	755.99	118.79	755.51	129.7	754.91	131.08	754.85
133.65	754.69	134.27	754.61	135.01	754.51	136.26	754.32	137.93	754
139.65	753.72	140.37	753.59	143.35	753.58	148.79	753.56	158.12	753.52
158.24	753.8	158.4	754	158.75	754.22	161.6	756	163.39	757.28
164.25	757.92	164.51	757.87	165.23	757.88	166.12	757.86	167.48	757.86
169.44	757.86	171.57	757.86	178.79	757.91	185.21	757.98	186.26	758
186.86	758	190.92	759.6	192.12	760	193.89	760.31	197.6	760.93
198.84	761.18	199.41	761.27	200.53	761.49	202.44	761.43	216.76	760.66
218.21	761.05	219.34	761.31	223.11	762	223.47	762.23	226.96	764
228.71	765.19	230	766	234.99	767.73	235.75	768	236.17	768.1
240.26	769.16	243.45	770	247.46	771.81	247.81	772	248.19	772.18
251.83	774	253.76	774.79	256.72	776	260	776.93	263.95	778
273.07	779.9	273.55	780	273.87	780.09	279.86	781.84	280.41	782
280.44	782.01	286.57	784	289.13	784.83				

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val

NutterFork.rep

0 .1 136.26 .04 158.75 .07
 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 136.26 158.75 95.93 90.17 53.52 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1858.54

INPUT

Description:

Station Elevation Data			num= 84								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	786.1	9400024	785.562	829987	784.31	6.23999	781.97	12.19	778.31		
19.57001	773.98	23.44	771.63	24.56	770.98	26.38	770.51	32.42	768.56		
33.05	768	35.06	766.7	36.3	766	39	764.8840	71001	764		
42.16	763.64	49.23	76251.60001	761.556	71001	76057.67999	759.57				
60.87	75861.60001	757.6262	67999	757.08	63.16	756.4763	67999	756			
64.42	755.29	65.91	754	66.22	753.57	66.69	753.12	75	752.93		
81.7	752.77	82.08	752.76	89.22	752.95	89.7	753.0192	96001	753.18		
92.97	753.18	92.98	753.1892	99001	753.1893	60001	753.23	103.82	754		
106.42	754.58	113.44	755.76	114.09	755.88	114.86	756	116.64	756.01		
126.21	756.37	131.56	756.56	138.13	756.81	155.52	757.49	167.91	758		
168.74	758	172.6	759.66	173.49	760	180.12	761.16	181.23	761.34		
181.55	761.39	181.71	761.42	182.12	761.49	182.77	761.48	198.21	761.1		
202.74	761.82	203.26	762	206.46	763.22	208.54	764	209.52	764.57		
212.23	766	213.87	766.87	215.69	768	217.15	768.67	220.24	770		
222.75	770.83	225.44	772	232.13	773.81	232.97	774	234.22	774.25		
243.3	776	248.29	777.01	254.4	778	261.37	779.26	263.56	779.58		
265.93	780	270.78	781.09	273.7	782	275	782.36				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.163	67999	.04	114.86	.07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 63.67999 114.86 95.11 97.31 94.39 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1761.23

INPUT

Description:

Station Elevation Data			num= 86								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	793.775	079987	790.538	230011	788.34	12.31	785.48	19.53	780.4		
26.75999	775.36	30.84	772.5133	99001	770.2835	24001	770.1740	03999	767.62		
41.31	768.05	42.02	768.0442	10001	768.04	42.31	768.02	42.77	768		
43.33	767.6345	64999	76647.46001	764.8	48.77	764	49.98	762.84			
50.92	76251.39999	761.45	52.61	760	53.56	758.94	54.31	758			
54.60001	757.6555	35001	756.77	56.86	756.09	57.06	756	60.83	754.24		
61.36	754	62.37	753.48	63.12	753.12	75	752.84	75.38	752.83		
86.69	752.57	88.55	753.26	90.55	75492.07001	754.57	93.05	754.91			
93.25	754.97	94.11	755.04	95.31	755.11	96.39	755.17	109.66	756		
110.1	756.01	127.31	756.73	137.84	757.15	156.74	757.96	159.93	758		
163.03	758.3	179.67	760	181.39	760.23	184.04	760.63	185.46	760.88		
190.78	761.36	201.98	761.15	206.55	760.99	207.54	761.17	208.24	761.26		
209.4	761.45	213.14	762	215.63	763.19	217.54	764	223.63	764.89		

NutterFork.rep

230.87	765.76	232.41	765.96	232.52	765.96	232.94	765.99	233.29	766
233.83	766.13	234.74	766.31	242.07	767.92	243.15	767.93	243.41	767.95
243.47	767.96	243.63	768	245	768.43	248.93	770	249.85	770.41
252.78	771.71	253.47	772	254.46	772.29	260.78	774	274.19	775.61
275	775.71								

Manning's n Values

num=	3		
Sta	n Val	Sta	n Val
0	.1	60.83	.07

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

60.83	92.07	001	103.05	100.71	94.04	.1	.3
-------	-------	-----	--------	--------	-------	----	----

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1660.52

INPUT
 Description:
 Station Elevation Data

num=	103								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	790.06	5.01	786.49	6.00	783.08	16.14	778.45	16.67	778.07
17.04	777.81	23.73	773.07	29.06	769.69	30.8	768.65	36.10	767.76
37.42	767.45	37.46	767.39	38.17	766.87	39.03	766	41.25	764.28
41.66	764.42	42.10	763.67	45.25	762	47.94	760.31	48.37	760
49.23	759.5	51.3	758.51	51.78	757.7	53.17	756.98	54.85	756.02
54.89	756	55.05	755.91	58.46	754	59.86	753.26	60.71	752.65
61.05	752.36	74.73	752.28	75	752.28	85.55	752.21	87.72	752.21
88.37	752.4	89.33	752.65	94.46	754	97.09	754.69	97.81	754.88
100	755.28	101.46	755.7	102.7	756	102.88	756	103.07	756
103.3	756	103.68	756.01	104.27	756.01	104.7	756.01	123.91	756.61
128.95	756.78	132.73	756.9	136.73	757.02	145.07	757.3	149.67	757.46
165.1	757.96	168.51	757.96	169.76	757.96	170.9	757.96	170.95	757.96
171.78	757.97	172.24	757.97	173.49	757.98	175.41	758	176.07	758
177.38	758.25	187.43	759.36	200.94	760	204.79	760.18	205.88	760.31
207.93	760.1	208.34	760.08	210.32	760	211.57	760	211.64	760
211.7	760	213.11	760	214.02	760	221.03	761.67	222.43	762
222.68	762.13	224.36	762.86	226.86	764	229.73	765.17	231.68	766
236.29	767.89	236.57	768	239.85	769.81	240.26	770	244.94	771.88
245.22	772	246.58	772.43	247.86	772.81	251.02	773.75	252	774
257.39	775.14	259.33	775.54	260.74	775.82	261.61	776	262.91	776.28
270.78	778	274.27	778.95	275	779.17				

Manning's n Values

num=	3		
Sta	n Val	Sta	n Val
0	.158	46.00	.07

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

58.46	001	94.46	001	104.94	109.69	121.52	.1	.3
-------	-----	-------	-----	--------	--------	--------	----	----

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1550.83

INPUT
 Description:
 Station Elevation Data

num=	104								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	781.23	4.38	778.79	7.95	776.65	17.60	771.41	18.79	770.75

NutterFork.rep											
19.23	770.53	20.17	999	770.11	26.64	999	767.21	27.86	766.65	29.75	767.31
30.8	767.72	31.11	767.63	32.45	765.33	32.57	7001	765.27	32.71	7001	765.1
33.89	764.74	34.92	764.31	35.23	764	36.34	763.14	37.47	763.14	37.47	762
38.58	760.98	39.72	760	40.78	759.11	42.22	758	43.31	758	43.31	757.42
45.89999	756	48.87	754.55	50.02	754.03	50.16	754.01	50.28	754.01	50.28	754
51.88	753.56	57.39	752	58.42	752	59.47	751.99	75	751.99	75	751.85
85.35001	751.76	89.85	001	751.72	90.03	999	751.84	90.25	999	752	93.38
95.36	754	97.8	754.87	97.81	754.88	97.82	001	754.88	97.82	001	754.88
97.89999	754.89	104.15	756	107.56	756	109.47	756	110.74	756	110.74	755.98
113.35	755.97	114.83	755.95	115.25	755.95	115.97	755.94	116.59	755.94	116.59	755.93
121.28	755.91	122.68	755.91	125.27	755.91	140.22	755.96	142.77	755.96	142.77	755.96
149.87	755.94	153.66	755.95	154.84	755.95	159.76	755.97	164.39	755.97	164.39	755.98
173.46	756	177.1	756.42	183.2	757.3	190.8	757.46	199.2	757.46	199.2	757.69
201.78	757.88	204.35	757.95	205.56	758	210.2	759.39	212.11	759.39	212.11	760
214.43	760.64	219.62	762	224.11	763.54	225.54	764	226.05	764	226.05	764.25
229.25	766	232.87	767.57	233.66	768	235.34	768.32	243.19	768.32	243.19	770
245.53	771.41	246.55	772	246.89	772.2	249.86	774	250.57	774	250.57	774.58
252.81	776	254.11	777.18	255.2	778	256.61	779.13	257.8	779.13	257.8	780
258.48	780.47	260.47	782	263.21	783.45	264.17	784	265.57	784	265.57	784.58
268.69	786	271.17	787.08	273.05	788	275	789.09		789.09		

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.1	50.28	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	50.28	95.36		101.06	87.84		.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1462.99

INPUT

Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	786.74	3.16	983	785.45	9.88	005	782.59	13.92	999
24.69	776.22	27.63	775.04	34.3	772.27	35.09	999	771.94	35.45
40.14	770.68	41.73	771.64	42.03	771.94	42.19	771.95	42.23	999
42.63	771.96	42.64	771.96	43.86	771.96	44.34	999	771.96	44.61
45.92	772	45.94	772	46.11	771.92	50.33	770	51.03	769.64
54.06	768.55	55.00	999	767.51	57.53	999	766.15	57.70	999
60.88	764	61.59	763.55	63.89	999	762.65	63.03	999	761.08
67.70	758.75	68.67	999	758	69.59	757.33	70.84	999	756.71
72.19	754.68	72.78	999	754.26	73.45	754.03	75.23	753.41	78.78
82.67	751.29	84.12	751.04	84.22	751.04	86.48	999	751.02	102.19
110.77	751.02	119.86	750.78	120.7	751.25	121.69	751.73	122.24	752
123.05	752.39	125.91	754	126.01	754.1	126.24	754.31	126.37	754.5
132.19	754.4	142.8	754.22	143.22	754.22	169.78	754.69	173.42	754.88
176.64	755.09	177.02	755.1	178.62	755.19	184.99	755.52	193.2	755.99
193.46	756	197.89	756.35	202.15	756.8	213.81	757.07	217.63	757.07
220.04	757.38	221.85	757.57	225.53	758	226.42	758.31	231.04	759.72
231.81	759.96	231.96	760	232.25	760.09	238.86	762	241.24	763.26
242.51	764	245.79	765.15	247.94	766	254.08	767.59	255.51	768
256.28	768.28	260.49	770	262.12	771.12	263.51	772	265.87	773.56
266.46	774	268.7	775.87	268.85	776	268.92	776.07	270.81	778
271.56	778.84	272.33	780	272.86	780.5	274.16	782	275.17	782.98
276.23	784	277.22	784.71	277.56	784.98				

Manning's n Values		num=	3
Sta	n Val	Sta	n Val

NutterFork.rep

0 .1 73.45 .04 125.91 .1
 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 73.45 125.91 75.28 103.88 103.13 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1359.11

INPUT

Description:

Station Elevation Data num= 131

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	789.54	1.67	788.99	13	785.84	12.35	784.92	13.37	784.54
15.73	783.66	20.88	781.73	23.05	780.94	28.39	778.85	33.74	776.76
35.89	775.85	39.42	774.38	40.89	773.7	41.69	773.32	41.86	773.46
42.67	772.69	43.03	772.98	43.55	772.81	44.17	772.55	45.19	772
45.2	772.45	45.92	771.67	49.94	770.52	52.82	768.66	54.23	768
55.22	767.63	58.59	766.59	59.28	765.2	60.2	764	60.78	763.34
61.60	762	62.88	760.08	62.92	760.62	62.96	759.97	64.88	758
65.34	757.58	67.11	756	69.84	754.35	70.41	754	71.95	753.64
80.84	752.81	81.42	751.93	82.07	751.89	86.23	750.73	87.24	750.48
98.69	750.33	100	750.31	113.21	750.11	114.48	750.66	116.4	751.43
117.81	752	119.58	752.77	121.81	753.67	122.78	753.84	123.69	754
127.22	754.03	131.53	754.05	134.6	754.03	136.47	754.02	139.68	754
142.05	754	143.3	753.99	144.73	753.99	146.69	753.99	147.67	753.99
150.33	754	152.65	754	154.03	754	154.8	754	155.37	754
158.52	754	159.09	754	159.9	754	162.22	754	163.76	754
166.28	754	167.76	754	167.88	754	168.02	754	168.07	754
168.29	754.02	168.58	754.04	189.03	755.97	189.67	755.98	190.06	756
191.16	756.27	192.11	756.43	192.74	756.51	193.71	756.6	194.25	756.63
195.12	756.69	198.19	756.83	210.58	757.23	214.03	756.54	215.82	756.3
217.56	756	218.16	756	221.16	756	222.54	756.56	224.84	758
226.61	759.33	227.39	760	228.11	760.54	230.08	762	231.32	763.02
232.47	764	234.86	765.65	235.44	766	238.32	767.75	238.72	768
238.8	768.04	242.16	770	243.95	770.89	246.31	772	249.63	773.72
250.41	774	253.76	775.01	255.82	776	258.57	777.57	259.19	778
259.43	778.27	261.34	780	262.3	780.93	263.26	782	264.3	782.9
265.47	784	268.46	785.96	268.52	786	268.62	786.04	272.64	788
275	789.53								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 71.95 .04 121.81 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 71.95 121.81 71.16 82.05 93.82 .1 .3

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 210.58 275 780 T

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1277.06

INPUT

Description:

Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

NutterFork.rep

0	792.244	.269989	790.55	.059998	790.175	.649994	789.94	9.48999	788.36
15.01999	786.1116	.01001	785.71	24.98	782.14	31.58	779.31	34.94	777.79
40.23	775.1944	.89999	772.84	47.31	770.95	47.81	770.5648	.50999	770.13
48.62	770.06	48.7	770.02	48.78	770.0148	.96001	770	52.45	768.09
52.60001	76853	.57001	767.4	55.83	766	57.87	764.77	58.98	764.1
59.13	764	59.27	763.9162	.00999	76262	.28999	761.8	64.8	760
65.06	759.8	67.61	758	68.78	757.11	69.91	756	71.2	755.03
72.09	754	76.27	752.09	76.45	75276	.57001	751.99	87.08	751.4
88.98	750.2	89.53	750	89.95	749.87	90.03	749.8590	.10001	749.79
100	749.72	103.4	749.7	108.75	749.65	108.84	749.69	109.6	749.97
109.69	750	113.97	751.29	115.98	752	116.97	752.36	117.77	752.69
126.09	753.85	127.27	754	129.1	754.02	132.99	754.04	134.6	754.04
140.35	754	141.11	754	141.66	754	147.56	753.99	150.6	753.99
157.7	753.98	167.92	754	170.15	754	170.24	754.01	170.38	754.01
170.95	754.04	171.68	754.06	175.58	754.4	182.43	754.92	186.87	755.53
190.06	756	197.86	757.33	198.49	757.44	199.01	757.54	199.03	757.54
199.37	757.54	214.73	757.86	221.54	757.98	222.18	758	223.16	758.64
225.28	760	227.4	761.65	227.91	762	228.37	762.32	231.02	764
234.12	766	234.13	766	234.15	766.02	236.89	768	237.87	768.67
239.9	770	241.59	770.92	243.58	772	246.02	773.19	248.17	774
251.89	775.17	254.43	776	255.59	776.6	258.43	778	260.58	779.54
261.15	780	262.92	781.69	263.27	782	263.66	782.29	265.19	784
265.97	784.66	267.17	786	268.35	787.05	269.41	788	271.21	789.71
271.55	790	271.86	790.32	273.6	791.83	273.8	792	273.88	792.05
275	792.81								

Manning's n Values

num=	3				
Sta	n Val	Sta	n Val		
0	.1	76.45	.04	115.98	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	76.45	115.98		110.21	106.06		.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1171

INPUT

Description:

Station	Elevation	Data	num=	105					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	794.752	.309998	793.754	.389999	792.855	.360001	792.438	.050003	791.23
13.05	789	14.86	788.22	18.72	786.51	25.33	783.6228	.42999	782.15
35.8	778.65	36.12	778.4936	.99001	778.01	46.27	772.95	48.97	771.49
50.71001	770.7251	.00999	770.3451	.03999	770.34	51.12	770.3	51.52	770.08
51.62	770.03	52.03	770	53.61	768.83	54.7	768	56.39	766.72
57.31	766	58.7	764.9959	.92999	764	60.8	763.29	62.41	762
63.72	761.17	65.62	760	67.83	758.8769	.50999	75875	.25999	756.32
76.31	756	76.36	75676	.85001	756.01	77.37	755.99	78.3	755.31
79.92	754	80.92	753.33	82.88	752	83.39	751.5683	.39999	751.47
83.48	751.48	86.3	750.8589	.85001	75090	.53999	749.8592	.35001	749.44
100	749.55	105.87	749.64	106.86	749.65	106.91	749.69	107.02	749.77
108	750	113.99	751.36	116.73	752	118.74	752.61	119.35	752.8
123.67	752.74	124.79	752.72	135.65	752.55	178.84	753.07	179.58	753.01
182.59	753.41	187.68	753.95	187.71	753.95	188.05	754	188.39	754.27
190.88	756	192.63	757.12	193.89	758	198.41	758.45	199.88	758.61
200.36	758.65	203.71	758.52	216.09	758	216.29	758	216.8	758
217.45	758	219.67	758.54	223.83	759.47	225.06	760	226.27	760.84
227.78	762	228.33	762.4	230.06	764	230.97	764.72	232.25	766
233.64	767.45	234.17	768	234.83	768.62	236.5	770	237.49	770.71
239.42	772	241.07	773.28	242.27	774	243.38	774.82	245.04	776

NutterFork.rep

246.24	777.12	247.24	778	248.9	779.35	249.6	780	250	780.4
--------	--------	--------	-----	-------	--------	-------	-----	-----	-------

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	82.88	.035	116.73	.1

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

	82.88	116.73		130.47	107.15		75.81		.1	.3
--	-------	--------	--	--------	--------	--	-------	--	----	----

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1063.85

INPUT

Description:

Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	788.211	959991	787.368	799988	784.3	9	784.229	279999	784.1
16.04999	781.31	21	779.21	23.09	778.3925	95001	777.1833	20001	774.39
42.62	771.1545	39999	770.26	51.27	768.72	57.61	766.7958	32001	766.62
59.28999	766.33	69.81	763.6	72.41	762.96	73.81	760.175	39999	758.49
75.78999	758	78.78	757.04	82.05	756	82.89	755.98	88.58	755.63
90.84	755.5	95.67	755.2	103.97	754.73	108.85	754.4	111.88	754.23
115.16	754	129.95	753.03	132.88	752.86	133.71	752.81	134.21	752.8
134.27	752.8	134.36	752.8	134.59	752.6	134.97	752.4	135.73	752
138.63	750.74	140.26	750	140.96	749.64	141.33	749.44	150	749.45
155.93	749.46	160.14	749.46	161.03	749.62	163.26	750	169.16	751.01
170.49	751.25	172.76	751.34	175.19	751.41	184.07	751.71	192.8	752
202.75	752.93	210.78	753.66	214.08	753.97	214.79	754	217.82	755.1
219.68	756	223.39	757.97	223.44	758	223.54	758.01	236.93	759.41
239.86	759.19	253.7	758.11	255.71	758.51	262.25	759.84	262.88	759.94
262.91	759.95	263.11	760	263.29	760.1	266.96	762	269.75	763.69
270.28	764	270.7	764.24	273.08	766	274.12	766.94	275.46	768
276.7	768.88	278.21	770	281.03	772	281.04	772	281.04	772.01
283.2	773.77	283.55	774	284.82	775.06	285.88	776	286.48	776.71
288.01	778	289.31	779.1	290.28	780	290.92	780.55	292.24	782
294.18	783.59	294.77	784	295.35	784.42	297.72	786	299.94	787.38
300	787.42								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	138.63	.04	169.16	.1

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

	138.63	169.16		72.69	84.9		91.41		.1	.3
--	--------	--------	--	-------	------	--	-------	--	----	----

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 978.95

INPUT

Description:

Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	786.4	1.73999	785.626	.480011	783.6111	1.67001	781.4913	1.45001	780.79
15.09	780.1126	2.4001	775.53	28.44	774.6440	8.2001	769.4641	1.78999	769.06
48.3	766.28	55.14	763.36	55.27	763.3157	6.7999	760.19	60.8	757.83
60.96001	755.5861	1.75999	755.44	63.62	755.64	0.3999	754.79	65.67	754.28
67.00999	754	68.66	753.9788	.49001	752.6595	1.64999	752.21	99.5	752

NutterFork.rep										
101.23	750.28	101.66	750	103.22	750	106.79	750	108.06	750	
108.24	750	115.05	750	118.55	750.01	123.5	750.03	126.21	750.02	
128.86	750.01	131.75	750.01	132.54	750	133.86	749.89	135.03	749.76	
139.13	749.14	141.85	748.03	142.32	747.88	143.63	747.94	150	748.39	
159.84	749.09	161.94	749.91	162.17	750	163.3	750.47	164.84	751.04	
165.87	751.34	166.58	751.46	170.18	752	171.94	752.47	176.91	754	
180.6	755.91	180.82	756	181.01	756.1	184.41	758	187.51	759.12	
189.28	760	194.28	761.44	196.35	762	200.72	762	201.99	762	
205.03	762	207.18	762	210.12	761.69	210.35	761.67	218.14	760.89	
225.54	760.14	228.01	760.72	233.83	762	234.38	762.34	237.15	764	
239.64	765.56	240.32	766	242.2	767.33	243.15	768	243.7	768.46	
245.67	770	247.92	771.62	248.45	772	248.55	772.11	250.74	774	
252.1	775.93	252.14	776	252.3	776.26	252.98	777.16	253.44	778	
253.79	778.65	254.38	780	255.39	781.73	255.6	782	255.8	782.2	
257.98	784	258.71	784.6	260.53	786	262.55	787.35	263.85	788	
268.58	789.79	269.33	790	275	791.26					

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.1	132.54	.04
			162.17
			.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	132.54	162.17		56.24	66.78	70.61	.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 912.17

INPUT

Description:

Station Elevation Data											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	791.87	10.73	785.78	11.64	785.29	18.30	781.86	23.84	778.77		
25.34	777.98	27.39	776.81	36.04	771.54	44.06	766.45	46.48	764.67		
47.12	764.24	9.02	756.15	50.35	754.51	6.20	753.58	51.80	753.58		
54.16	753.54	57.00	753.49	58.74	753.44	61.92	753.35	66.44	753.21		
72.64	752.95	84.86	752.44	88.38	752.39	95.07	752.96	57.00	751.09		
98.35	750	100.29	749.99	101.02	749.98	103.88	749.88	106.45	749.82		
112.38	749.74	118.52	748.78	118.93	748.68	120.99	748	121.08	747.94		
121.75	747.68	129.31	747.79	133.88	747.76	147.25	747.66	147.91	748		
147.97	748.03	148.38	748.25	151.67	750	152.53	750.39	153.47	750.82		
153.55	750.85	153.6	750.88	154.21	751.16	156.67	752	158.1	752.36		
163.88	753.93	164.15	754	164.41	754.01	164.45	754.01	164.69	754.02		
172.92	754.55	192.62	756	196.94	757.95	197.07	758	197.4	758.11		
202.9	760	208.84	761.12	213.93	762.01	213.94	762.02	217.04	761.69		
230.96	760.3	235.16	761.2	239.24	762	241.08	763.33	242.06	764		
244.29	765.73	244.65	766	245.63	766.77	247.22	768	247.51	768.24		
249.75	770	251.89	771.68	252.36	772	254.71	773.88	254.91	774		
255.38	774.19	259.2	776	263.93	777.44	265.56	778	268.06	779.23		
270.73	780	271.47	780.34	275.26	782	278.42	782.9	280.79	783.5		
281.65	783.76	282.35	784	283.64	784.59						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.1	112.38	.04
			151.67
			.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	112.38	151.67		98.48	82.36	53.47	.1	.3

CROSS SECTION

NutterFork.rep

RIVER: Nutter Fork
 REACH: Nutter Fork

RS: 829.81

INPUT

Description:

Station Elevation Data

num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	789.931	050003	789.236	630005	785.35	12.03	781.69	17.3	778.03
23.00999	774	28.88	769.66	32.3	767.1733	33.99001	766.0136	36.10001	761.85
39.78999	755.7	39.88	755.6	40.14	755.1441	41.74001	754	43.98	752.87
45.64999	752	48.31	751.4757	57.10001	750.06	57.45	750.01	57.52	749.91
59.22	749.06	60.73	748.21	61.08	748	61.55	747.6562	62.49001	746.94
75	747.0381	71001	747.08	88.55	747.13	91.27	747.73	92.77	748
93.17	748.13	93.19	748.13	93.5	748.19	102.62	750	106.91	751.89
107.16	752	107.95	752.06	110.08	752.16	145.32	753.99	145.57	753.99
147.62	754	161.06	754.91	178	756	181.29	757.48	182.4	758
182.6	758.15	185.3	759.91	185.43	760	185.51	760.02	189.98	761.11
191.57	761.34	196.72	761	209.08	760.02	213.03	760.88	218.02	762
218.4	762.25	221.05	764	222.65	765.05	224.52	766	227.98	767.65
228.82	768	229.43	768.21	237.46	770	238.18	770.24	243.29	772
246.5	773.02	249.19	774	250	774.25				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	57.45	.04	102.62	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	57.45	102.62		91.7	81.76	56.18	.1
							.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork

RS: 748.05

INPUT

Description:

Station Elevation Data

num= 106

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	788.381	300003	787.411	369995	787.3611	1.14999	780.85	20.41	775.34
20.99001	775	21.88	775.21	30.58	778	31.11	776.47	31.38	776
32.28	775.19	33.73	774.35	49001	772.23	35.77	772	38.08	770.01
38.09	770	38.27	769.8540	39999	768.0940	50999	768	40.75	767.77
42.3	766.52	42.61	766.33	42.8	766	44.12	764.49	44.62	764
44.73	763.85	45.94	762	46.53	761.09	47.03	760	47.7	758.96
48.13	758	48.69	756.77	49.03	75649.85001	754.6	50.16	754	754
50.89999	752.3951	07001	752	51.34	751.56	52.17	750.2	52.45	749.52
52.53999	749.82	52.59	750.55	99001	748.4	56.83	748	57.59	747.76
59.14999	747.18	59.77	746.94	75	747.04	80.13	747.07	92.28	747.13
93.14	747.7893	42999	748	96.13	749.5496	99001	750	98.03	750.6
99.64	751.52	101.93	751.66	104.11	751.68	107.78	751.75	114.38	752
119.9	752.29	122.78	752.41	130	752.73	137.34	753.08	146.92	753.51
154.56	753.96	156.92	753.98	157.94	753.98	158.63	754	158.85	754.02
161.34	754.38	170.36	756	172.14	757.08	173.41	758	175.1	758.84
176.19	759.24	177.25	759.84	178.22	760	180.71	760.1	182.12	760.18
182.58	760.19	182.79	760.2	182.85	760.19	185.84	760.09	198.5	759.71
201.92	759.55	202.49	759.43	204.03	759.34	206.58	759.06	207.31	759.57
207.99	760	210.48	761.39	211.58	762	215.36	763.68	216.04	764
217.5	764.45	223.09	766	224.04	766.3	228.84	768	230.83	768.7
234.17	770	236.4	770.93	239.1	772	244.46	773.91	244.72	774
250	775.9								

NutterFork.rep
 Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .1 52.59 .0496.99001 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 52.5996.99001 91.77 88.17 82.52 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 659.88

INPUT

Description:

Station Elevation Data num= 135
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 801.36.4899902 801.141.409988 800.655.319992 798.769.599991 796.55
 10.59999 796.09 12.22 795.2420.70999 790.5823.12999 791.6525.14999 792.44
 27.78999 79628.04999 79628.17999 796 28.87 79630.03999 796
 30.51999 79631.17999 79631.37999 795.91 35.45 79437.09999 793.17
 39.14 79241.09999 790.4841.75999 790 42.2 789.55 43.5 788
 44.62 786.68 45.28 786 45.81 785.32 46.92 78448.37999 782.32
 48.62999 782 48.84 781.7650.26999 78050.40999 779.8351.28999 778.94
 52.12999 778 52.28 777.8453.84999 77654.25999 775.6255.76999 774
 56.98999 772.83 57.73 77258.53999 770.9 59.28 77060.67999 768.45
 61.04999 76862.54999 766.1362.65999 76662.73999 765.89 64.42 764
 64.97 763.3265.98999 762 67.19 760.46 67.5 760 67.56 759.89
 68.84 75868.95999 757.78 70.03 756 70.94 754.3571.12999 754
 71.19 753.93 71.64 753.2972.53999 752 72.56 751.9172.56999 751.37
 72.61 751.6 74.37 750.0174.37999 75074.48999 749.92 77.12 748
 77.84999 747.3978.20999 747.0978.39999 746.94 95.22 747.1995.50999 747.19
 95.59 747.21 95.64 747.22 96.58 747.3999.89999 748 101.19 748
 105.61 748 110.03 748 110.37 747.91 114.09 746.81 121.47 747.03
 124.31 747.13 124.59 747.63 124.84 748 126.62 749.51 127.17 750
 127.33 750.42 127.57 750.77 129.67 751.36 131.19 751.73 132.34 752
 142.38 753.8 143.01 753.91 144.22 754 145.46 754.01 146.89 754
 148.02 753.99 148.2 753.99 150.48 753.98 150.87 753.98 153.29 753.96
 156.45 753.93 157.59 753.94 164.39 754 172.38 755.58 174.39 756
 175.07 756.16 180.61 757.61 180.64 757.59 185.82 757.66 198.23 758.02
 198.43 757.92 201.43 757.35 206.85 756.33 207.35 756.85 208.53 757.84
 208.69 758 208.9 758.24 210.7 760 212.1 761.2 213.13 762
 218.54 763.58 219.88 764 222.06 764.54 227.57 766 231.35 767.2
 234 768 238.58 769.48 240.25 770 242.42 770.59 244.12 771.04

Manning's n Values num= 3
 Sta n Val Sta n Val
 0 .174.37999 .045 127.17 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 74.37999 127.17 115.1 118.84 119.69 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 541.04

INPUT

Description:

Station Elevation Data num= 81
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 773.642.740005 772.775.039993 7726.850006 771.410.85001 770

NutterFork.rep

12.25999	769.4916	64999	76816.74001	767.97	17.23	767.821	74001	766.24
22.48	766	24.63	765.24	28.52	76431.03999	762.832	67999	762
33.66	761.4236	17999	760	38.44	758.6239	42999	758	39.84
41.94	75643	96001	754.3	44.28	754	46.27	752.27	46.59
46.7	751.9647	96001	751.57	52.64	750.1353	00999	750	56.22
58.7	749.24	61.45	748.2462	07001	748	63.89	747.3464	89999
65.50999	746.71	65.52	746.7365	92999	746.71	66.98	746.7	75
85.12	746.46	87.18	747.99	87.2	748	88.17	748.81	89.04
94.46	749.84	95.51	750	107.41	750.74	125.31	752	126.62
131.07	752.68	132.06	752.77	132.6	752.84	133.95	752.95	136.84
140.63	753.5	151.81	754.51	159.12	754.26	160.05	754.23	160.08
160.14	754.23	160.54	754.45	161.49	755.01	162.99	756	166.12
166.36	758	169.52	759.58	170.36	760	171.22	760.38	174.58
177.11	763.12	179.13	764	184.09	765.96	184.18	766	184.4
185.6	766.51	189.99	768	192.27	768.47	196.45	770	199.63
200	771.42							771.29

Manning's n Values

num=	3				
Sta	n Val	Sta	n Val		
0	.1	58.7	.035	89.04	.035

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

58.7	89.04	92.02	94.93	96.69	.1	.3
------	-------	-------	-------	-------	----	----

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 446.11

INPUT

Description:

Station Elevation Data

num=	87								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	764.491	270004	7642.340012	763.596	190002	762	12.16	760	
12.17001	760	12.18001	760	19.27	75825.95001	756.6529	92001	756	
33.62001	755.636	73001	755.3	42.8	754.67	48.94	754.0149	23001	754
61.69	752.18	62.89	752	63.44	751.93	70.39	751.0573	71001	750.72
76.08	750.4879	95001	750	81.3	749.5284	42001	74884.49001	747.96	
85.46001	747.45	89.41	746.31	90.37	74691.06001	745.77	92.73	745.32	
96.67001	745.31	100.39	745.21	107.38	745.01	108.9	745.7	109.67	746
111.06	746.52	112.05	746.91	112.79	747.16	113.82	747.64	114.73	748
116.19	748.61	120	750	124.54	750.34	130.39	750.88	131.1	750.95
138.06	751.47	152.05	752.69	158.46	752.34	159.65	752.24	162.09	752
162.84	752	163.95	751.65	164.3	751.63	164.58	751.62	164.69	751.55
164.79	751.63	165.12	751.88	165.25	752.33	167.89	754	169.2	754.93
170.65	756	172.47	757.43	173.17	758	174.96	759.41	175.72	760
175.95	760.19	178.24	762	180.41	763.6	181.22	764	182.85	765.01
184.45	766	185.76	766.83	187.32	768	189.89	769.66	190.39	770
190.72	770.16	194.92	772	196.9	772.85	199.37	774	201.27	774.69
204.82	776	207.58	777.21	209.57	778	211.43	778.61	216.08	780
218.08	780.71	218.35	780.82						

Manning's n Values

num=	3				
Sta	n Val	Sta	n Val		
0	.03579	95001	.035	120	.035

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

79.95001	120	54.09	83.85	111.7	.1	.3
----------	-----	-------	-------	-------	----	----

Ineffective Flow

num=	1		
Sta L	Sta R	Elev	Permanent
152.05	218.35	780	T

NutterFork.rep

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 362.26

INPUT

Description:

Station Elevation Data			num=	102					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	761.06	.7599945	760.783	.139999	7604.83	0002	759.56	12.09	758
17.14	756.63	20.3	756	28.61	754.17	29.3	754	32.63	753.74
37.41	753.39	56.11	752	56.44	752	57.19	752	57.8	752
58.91	752	59.59	752	61.7	752	62.95	752	63.53999	752
64.42	752	66.21001	752	66.83	752	69.94	752	70.91	752
73.17	751.44	78.45	750	82.19	748.01	82.22	748	82.23	747.99
82.99	747.55	83.45	747.26	84.8	746.85	86.3	746.41	87.71	746
89.23	745.54	91.76	744.81	100	744.79	106.53	744.77	107.68	744.78
107.91	744.89	108.28	745.06	110.39	746	111.15	746.33	112.62	747
113.11	747.39	113.65	747.72	114.1	748	117.51	749.99	117.52	750
117.53	750.01	120.46	752	120.89	752.27	121.89	752.98	133.16	753.59
138.11	753.83	138.55	753.88	140.31	753.96	141.05	754	145.15	754.2
147.05	754.3	147.83	754.93	148.82	755.62	149.36	756	150.47	756.76
152.25	758	155.1	759.93	155.23	760	155.68	760.29	158.54	762
159.14	762.33	162.9	764	165.49	765.51	166.54	766	170.02	767.99
170.04	768	170.06	768.01	170.11	768.03	174.42	770	174.8	770.02
175.38	770.05	175.42	770.05	175.93	770.05	180.31	770.85	184.06	772
187.62	773.43	188.48	774	188.97	774.6	190.68	776	191.57	777.07
192.15	778	193.18	779.74	193.31	780	193.36	780.08	194.27	782
194.5	782.49	195.29	784	196.16	785.01	197.01	786	197.66	786.63
198.92	788	200	789.09						

Manning's n Values			num=	3		
Sta	n Val	Sta	n Val	Sta	n Val	
0	.05	78.45	.03	117.52	.1	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	78.45	117.52		74.17	82.16	89.53	.1
							.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 280.1

INPUT

Description:

Station Elevation Data			num=	108					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	765.16	.00999	765.16	3.25	7646.19	0002	762.969	100006	762
14.23	760.53	15.99001	760	17.3	759.65	23.47	758	27.07001	757.17
32.39	756	35.62	755.27	41.37	754	49.78999	752.33	51.13	752.18
52.28	752.02	52.75	752.02	54.23	752	54.61	751.98	55.36	751.99
55.63	751.99	56.02	751.95	57.39999	751.88	58.09	751.82	58.67999	751.76
60.42	751.57	66.74001	750.8	72.99	750.03	73.36	750	75.32	749.6
79.85	748	80.11	747.92	80.98	747.52	81.54	747.3	82.95	746.65
84.61	746	85.69	745.59	87.98	744.69	100	744.73	101.24	744.73
112.09	744.78	114.57	745.97	114.63	746	115.09	746.25	118.43	748
118.91	748.29	119.05	748.26	120.56	749.67	120.88	750	121.37	750.46
123.04	752	124.14	753.12	125.13	754	127.31	755.43	128.2	756
128.43	756.01	128.66	756.02	129.54	756.05	130.64	756.27	132.78	756.58
133.61	756.65	134.88	756.81	149.24	757.16	150.36	757.2	150.43	757.2
151.3	757.23	154.34	757.42	155.4	757.48	155.42	757.47	155.47	757.54

NutterFork.rep

156.05	758	157.82	759.16	159.49	760	161.25	761.29	162.07	762
163.74	763.71	164.01	764	164.56	764.63	165.88	766	167.73	767.69
168.09	768	168.23	768.15	169.87	770	171.46	771.56	171.89	772
172.97	772.99	174.16	774	176.79	775.97	176.84	776	176.97	776.07
180.18	778	182.19	779.4	183.1	780	183.32	780.24	185.85	782
188.01	783.89	188.13	784	190.11	785.98	190.13	786	190.28	786.16
191.85	788	192.13	788.29	193.71	790	194.66	790.7	196.17	792
198.17	793.38	199.12	794	200	794.66				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 73.36 .035 120.88 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 73.36 120.88 92.74 84.21 75.19 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 195.89

INPUT

Description:

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	769.351	460007	768.753	360001	7688.02	9999	766.068	160004	766
8.339996	765.921	2.85001	76417.53999	762.16	17.94	762	18.73	761.68	761.68
22.74001	760	25.27	759.012	7.89999	758	31.48	756.39	32.39	756
33.66	755.323	36.24001	754	38.34	752.71	39.56	752	41.27	751.21
43.85001	750	66.92	748.75	80.61	748	80.68	748.01	81.68	747.99
83.36	746.42	84.06	746	84.44	745.8	85.99	744.69	100	744.73
112.46	744.77	113.67	744.78	113.71	744.8	113.88	744.93	115.33	746
117.58	747.54	118.23	748	118.72	748.37	120.29	749.54	120.87	749.96
120.98	749.93	121.01	750.04	122.16	751.21	122.97	752	124.13	753.18
124.93	754	127.26	755.81	127.5	756	133.56	757.93	133.77	758
135.08	758.09	139.09	758.23	149.2	757.64	153.49	757.41	155.64	757.35
158.59	757.75	158.63	757.59	159.11	758.01	159.84	758.48	160.6	758.93
162.08	760	163.4	760.98	164.52	762	166.27	763.35	167.09	764
168.11	764.8	169.53	766	170.42	766.68	171.83	768	173.91	769.8
174.14	770	174.64	770.42	176.71	772	177.36	772.51	179.51	774
180.74	775.12	181.66	776	182.49	776.96	183.36	778	184.51	779.12
185.16	780	185.93	780.77	187.24	782	188.78	783.33	189.6	784
190.09	784.49	191.92	786	194.41	787.89	194.53	788	194.65	788.1
196.97	790	197.01	790.03	199.07	791.61	199.57	791.99	199.57	792
199.59	792.01	200	792.19						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 81.68 .04 118.23 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 81.68 118.23 88.84 100.05 110.91 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 95.84

INPUT

Description:

Station Elevation Data num= 97

NutterFork.rep

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	772.931	1.559998	772.392	3.60001	772.508	5.00002	771.410	7.75999	770
11.88	769.43	14.31	768	15.45	767.31	17.69	766	19.77	764.73
21.14999	764.22	20.0001	763.07	24.19	762	26.45	760.45	27.14	760
27.60001	759.62	30.14999	758.31	31.96001	756.71	32.74001	756	33.36	755.39
34.92	754	36.38	752.72	37.25999	752	39.36	750.78	40.67	750
47.14999	749.36	54.05	748.71	62.06	748.03	63.14	748.02	63.42	748.01
63.64	748.01	64.82001	748	64.91	748	65.17	748	71.84	747.35
82.74001	746.07	83.32001	746	83.63	746.03	83.92999	746.04	84.49	745.84
89.83	744.69	100	744.68	110.02	744.68	112.05	744.69	112.41	744.89
113.02	745.31	113.74	746	114.65	746.67	116.09	747.97	116.36	747.97
116.88	748	121.67	748.93	127.21	750	131.28	750.96	137.35	752
140.57	753.81	140.89	754	141.02	754.1	142	754.76	143.48	755.81
143.8	756	150.03	756.92	151.81	757.17	154.27	757.52	172.62	756.1
173.55	756.03	173.56	756.03	173.97	756	174.07	755.99	176.83	755.77
178.2	755.68	178.29	755.5	178.47	755.76	178.83	756	181.39	757.38
182.59	758	184.14	758.86	186.12	760	189.18	761.9	189.33	762
189.4	762.06	192	764	192.65	764.5	194.63	766	197.57	767.78
197.93	768	201.21	769.61	202.03	770	205.6	771.74	206.16	772
207.63	772.58	210.9	774	213.12	774.7	217.48	776	217.8	776.09
223.33	778	225	778.69						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	65.17	.04	116.09	.1

Bank Sta: Left Right Coeff Contr. Expan.

65.17	116.09	.1	.3
-------	--------	----	----

SUMMARY OF MANNING'S N VALUES

River:Nutter Fork

Reach	River Sta.	n1	n2	n3
Nutter Fork	2253.15	.1	.035	.05
Nutter Fork	2137.23	.1	.03	.05
Nutter Fork	2037.52	.1	.035	.05
Nutter Fork	1948.71	.1	.04	.07
Nutter Fork	1858.54	.1	.04	.07
Nutter Fork	1761.23	.1	.035	.07
Nutter Fork	1660.52	.1	.035	.07
Nutter Fork	1550.83	.1	.035	.07
Nutter Fork	1462.99	.1	.04	.1
Nutter Fork	1359.11	.1	.04	.1
Nutter Fork	1277.06	.1	.04	.1
Nutter Fork	1171	.1	.035	.1
Nutter Fork	1063.85	.1	.04	.1
Nutter Fork	978.95	.1	.04	.1
Nutter Fork	912.17	.1	.04	.1
Nutter Fork	829.81	.1	.04	.1
Nutter Fork	748.05	.1	.04	.1
Nutter Fork	659.88	.1	.045	.1
Nutter Fork	541.04	.1	.035	.035
Nutter Fork	446.11	.035	.035	.035
Nutter Fork	362.26	.05	.03	.1
Nutter Fork	280.1	.1	.035	.1
Nutter Fork	195.89	.1	.04	.1
Nutter Fork	95.84	.1	.04	.1

NutterFork.rep

SUMMARY OF REACH LENGTHS

River: Nutter Fork

Reach	River Sta.	Left	Channel	Right
Nutter Fork	2253.15	101.2	115.92	128.19
Nutter Fork	2137.23	109.88	99.71	90.23
Nutter Fork	2037.52	60.01	88.81	103.28
Nutter Fork	1948.71	95.93	90.17	53.52
Nutter Fork	1858.54	95.11	97.31	94.39
Nutter Fork	1761.23	103.05	100.71	94.04
Nutter Fork	1660.52	104.94	109.69	121.52
Nutter Fork	1550.83	101.06	87.84	74.77
Nutter Fork	1462.99	75.28	103.88	103.13
Nutter Fork	1359.11	71.16	82.05	93.82
Nutter Fork	1277.06	110.21	106.06	93.42
Nutter Fork	1171	130.47	107.15	75.81
Nutter Fork	1063.85	72.69	84.9	91.41
Nutter Fork	978.95	56.24	66.78	70.61
Nutter Fork	912.17	98.48	82.36	53.47
Nutter Fork	829.81	91.7	81.76	56.18
Nutter Fork	748.05	91.77	88.17	82.52
Nutter Fork	659.88	115.1	118.84	119.69
Nutter Fork	541.04	92.02	94.93	96.69
Nutter Fork	446.11	54.09	83.85	111.7
Nutter Fork	362.26	74.17	82.16	89.53
Nutter Fork	280.1	92.74	84.21	75.19
Nutter Fork	195.89	88.84	100.05	110.91
Nutter Fork	95.84			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Nutter Fork

Reach	River Sta.	Contr.	Expan.
Nutter Fork	2253.15	.1	.3
Nutter Fork	2137.23	.1	.3
Nutter Fork	2037.52	.1	.3
Nutter Fork	1948.71	.1	.3
Nutter Fork	1858.54	.1	.3
Nutter Fork	1761.23	.1	.3
Nutter Fork	1660.52	.1	.3
Nutter Fork	1550.83	.1	.3
Nutter Fork	1462.99	.1	.3
Nutter Fork	1359.11	.1	.3
Nutter Fork	1277.06	.1	.3
Nutter Fork	1171	.1	.3
Nutter Fork	1063.85	.1	.3
Nutter Fork	978.95	.1	.3
Nutter Fork	912.17	.1	.3
Nutter Fork	829.81	.1	.3
Nutter Fork	748.05	.1	.3
Nutter Fork	659.88	.1	.3
Nutter Fork	541.04	.1	.3
Nutter Fork	446.11	.1	.3
Nutter Fork	362.26	.1	.3

		NutterFork.rep	
Nutter Fork	280.1	.1	.3
Nutter Fork	195.89	.1	.3
Nutter Fork	95.84	.1	.3

Profile Output Table - Standard Table 1

Reach E.G. Elev (ft)	River Sta E.G. Slope (ft/ft)	Profile Vel Chnl (ft/s)	Q Total Flow Area (cfs) (sq ft)	Min Ch El Top Width (ft)	W.S. Elev Froude # Chl (ft)	Crit W.S. (ft)
Nutter Fork 758.20	2253.15 0.004798	2 yr 6.06	513.00 89.36	753.99 34.61	757.64 0.61	
Nutter Fork 760.19	2253.15 0.006262	10 yr 8.88	1114.00 141.19	753.99 66.87	759.01 0.74	
Nutter Fork 761.17	2253.15 0.007850	25 yr 10.63	1487.00 161.21	753.99 78.18	759.48 0.85	759.09
Nutter Fork 761.93	2253.15 0.009444	50 yr 12.09	1792.00 173.73	753.99 86.38	759.75 0.94	759.66
Nutter Fork 762.72	2253.15 0.008673	100 yr 12.55	2120.00 208.97	753.99 111.78	760.41 0.92	760.41
Nutter Fork 757.80	2137.23 0.001818	2 yr 4.53	513.00 118.68	753.99 46.15	757.49 0.44	
Nutter Fork 759.62	2137.23 0.002326	10 yr 6.59	1114.00 199.84	753.99 63.34	758.97 0.53	
Nutter Fork 760.43	2137.23 0.002765	25 yr 7.75	1487.00 237.46	753.99 69.20	759.53 0.59	
Nutter Fork 761.02	2137.23 0.003103	50 yr 8.61	1792.00 265.81	753.99 74.38	759.93 0.64	
Nutter Fork 761.62	2137.23 0.003414	100 yr 9.44	2120.00 295.98	753.99 79.71	760.32 0.68	
Nutter Fork 757.59	2037.52 0.002471	2 yr 4.44	513.00 120.72	753.87 56.20	757.28 0.44	
Nutter Fork 759.33	2037.52 0.002788	10 yr 6.12	1114.00 243.29	753.87 92.10	758.79 0.50	
Nutter Fork 760.07	2037.52 0.003149	25 yr 7.04	1487.00 298.14	753.87 95.45	759.37 0.54	
Nutter Fork 760.62	2037.52 0.003388	50 yr 7.69	1792.00 339.12	753.87 98.13	759.80 0.57	
Nutter Fork 761.17	2037.52 0.003675	100 yr 8.39	2120.00 380.66	753.87 107.27	760.20 0.60	
Nutter Fork 757.16	1948.71 0.009821	2 yr 7.23	513.00 103.48	753.52 66.88	756.44 0.76	756.25
Nutter Fork 758.92	1948.71 0.007812	10 yr 8.67	1114.00 230.44	753.52 110.22	758.01 0.73	757.64
Nutter Fork 759.68	1948.71 0.006575	25 yr 8.89	1487.00 320.06	753.52 115.94	758.81 0.69	
Nutter Fork 760.24	1948.71 0.006067	50 yr 9.14	1792.00 384.98	753.52 120.02	759.36 0.67	
Nutter Fork 760.77	1948.71 0.005875	100 yr 9.51	2120.00 445.31	753.52 123.87	759.85 0.67	
Nutter Fork	1858.54	2 yr	513.00	752.76	756.40	

NutterFork.rep						
756.61	0.002505	3.61	144.85	63.96	0.38	
Nutter Fork	1858.54	10 yr	1114.00	752.76	758.10	
758.41	0.002136	4.58	292.72	108.32	0.38	
Nutter Fork	1858.54	25 yr	1487.00	752.76	758.88	
759.23	0.002027	4.96	378.28	111.71	0.38	
Nutter Fork	1858.54	50 yr	1792.00	752.76	759.42	
759.80	0.001998	5.26	439.67	114.08	0.39	
Nutter Fork	1858.54	100 yr	2120.00	752.76	759.92	
760.34	0.002030	5.60	496.50	116.38	0.39	
Nutter Fork	1761.23	2 yr	513.00	752.57	755.50	
756.17	0.007459	6.61	81.75	43.46	0.74	
Nutter Fork	1761.23	10 yr	1114.00	752.57	756.82	756.54
757.97	0.007554	8.86	158.20	74.32	0.80	
Nutter Fork	1761.23	25 yr	1487.00	752.57	757.59	757.28
758.81	0.006569	9.34	223.06	93.54	0.77	
Nutter Fork	1761.23	50 yr	1792.00	752.57	758.25	757.76
759.42	0.005500	9.36	290.39	108.46	0.72	
Nutter Fork	1761.23	100 yr	2120.00	752.57	758.79	758.31
759.97	0.005063	9.58	350.28	114.17	0.70	
Nutter Fork	1660.52	2 yr	513.00	752.21	754.90	
755.44	0.006228	5.92	88.57	41.08	0.67	
Nutter Fork	1660.52	10 yr	1114.00	752.21	756.13	755.62
757.21	0.007183	8.39	144.49	54.03	0.78	
Nutter Fork	1660.52	25 yr	1487.00	752.21	756.68	756.31
758.07	0.007852	9.62	178.74	72.18	0.83	
Nutter Fork	1660.52	50 yr	1792.00	752.21	756.99	756.92
758.69	0.008782	10.67	202.61	82.43	0.89	
Nutter Fork	1660.52	100 yr	2120.00	752.21	757.51	757.51
759.28	0.008108	11.03	249.76	98.90	0.87	
Nutter Fork	1550.83	2 yr	513.00	751.72	754.32	
754.76	0.005726	5.29	97.22	46.89	0.64	
Nutter Fork	1550.83	10 yr	1114.00	751.72	755.72	754.84
756.45	0.005023	6.92	168.32	56.07	0.65	
Nutter Fork	1550.83	25 yr	1487.00	751.72	756.37	755.42
757.25	0.004883	7.63	235.24	131.42	0.66	
Nutter Fork	1550.83	50 yr	1792.00	751.72	756.89	755.80
757.78	0.004406	7.84	304.81	136.06	0.64	
Nutter Fork	1550.83	100 yr	2120.00	751.72	757.41	
758.30	0.003992	8.00	377.54	145.18	0.62	
Nutter Fork	1462.99	2 yr	513.00	750.78	754.18	
754.38	0.002392	3.53	145.45	53.09	0.37	
Nutter Fork	1462.99	10 yr	1114.00	750.78	755.71	
756.04	0.002379	4.71	294.03	117.21	0.40	
Nutter Fork	1462.99	25 yr	1487.00	750.78	756.42	
756.81	0.002376	5.22	381.77	128.10	0.41	
Nutter Fork	1462.99	50 yr	1792.00	750.78	756.92	
757.37	0.002404	5.59	447.89	137.54	0.42	
Nutter Fork	1462.99	100 yr	2120.00	750.78	757.43	
757.92	0.002410	5.94	522.19	151.06	0.43	
Nutter Fork	1359.11	2 yr	513.00	750.11	753.88	
754.10	0.002782	3.77	136.25	52.12	0.40	
Nutter Fork	1359.11	10 yr	1114.00	750.11	755.43	
755.78	0.002581	4.90	294.10	115.23	0.42	

						NutterFork.rep			
Nutter Fork	1359.11	25 yr	1487.00	750.11	756.14				
756.55	0.002556	5.40	379.47	128.46	0.43				
Nutter Fork	1359.11	50 yr	1792.00	750.11	756.65				
757.11	0.002564	5.77	442.86	137.30	0.43				
Nutter Fork	1359.11	100 yr	2120.00	750.11	757.13				
757.65	0.002634	6.19	507.85	154.06	0.45				
Nutter Fork	1277.06	2 yr	513.00	749.65	753.60				
753.87	0.002874	4.16	130.05	51.34	0.42				
Nutter Fork	1277.06	10 yr	1114.00	749.65	755.03				
755.52	0.003374	5.82	260.00	112.04	0.48				
Nutter Fork	1277.06	25 yr	1487.00	749.65	755.72				
756.29	0.003423	6.44	338.92	117.85	0.50				
Nutter Fork	1277.06	50 yr	1792.00	749.65	756.20				
756.84	0.003486	6.89	396.58	121.52	0.51				
Nutter Fork	1277.06	100 yr	2120.00	749.65	756.67				
757.38	0.003532	7.32	455.19	124.79	0.52				
Nutter Fork	1171	2 yr	513.00	749.44	753.12				
753.52	0.003561	5.09	122.39	99.21	0.53				
Nutter Fork	1171	10 yr	1114.00	749.44	754.62				
755.17	0.003224	6.39	281.02	109.75	0.54				
Nutter Fork	1171	25 yr	1487.00	749.44	755.31				
755.94	0.003214	7.03	356.95	111.58	0.55				
Nutter Fork	1171	50 yr	1792.00	749.44	755.77				
756.48	0.003320	7.56	408.15	112.86	0.57				
Nutter Fork	1171	100 yr	2120.00	749.44	756.21				
757.01	0.003443	8.10	458.36	115.57	0.58				
Nutter Fork	1063.85	2 yr	513.00	749.44	751.96	751.85			
752.80	0.014024	7.42	78.12	55.88	0.88				
Nutter Fork	1063.85	10 yr	1114.00	749.44	753.25	753.18			
754.51	0.012317	9.43	163.22	79.74	0.89				
Nutter Fork	1063.85	25 yr	1487.00	749.44	753.97	753.83			
755.32	0.010739	9.97	227.22	98.48	0.85				
Nutter Fork	1063.85	50 yr	1792.00	749.44	754.48	754.34			
755.87	0.009841	10.30	280.32	108.49	0.83				
Nutter Fork	1063.85	100 yr	2120.00	749.44	754.97	754.73			
756.40	0.009235	10.65	335.49	117.75	0.82				
Nutter Fork	978.95	2 yr	513.00	747.88	751.21				
751.76	0.009301	6.35	110.92	65.13	0.72				
Nutter Fork	978.95	10 yr	1114.00	747.88	752.96				
753.64	0.005964	7.32	241.55	89.66	0.63				
Nutter Fork	978.95	25 yr	1487.00	747.88	753.74				
754.51	0.005572	7.94	316.92	103.89	0.63				
Nutter Fork	978.95	50 yr	1792.00	747.88	754.25				
755.10	0.005480	8.41	373.08	111.61	0.64				
Nutter Fork	978.95	100 yr	2120.00	747.88	754.77				
755.67	0.005305	8.79	431.03	114.28	0.63				
Nutter Fork	912.17	2 yr	513.00	747.66	751.06				
751.34	0.003342	4.33	133.59	57.36	0.45				
Nutter Fork	912.17	10 yr	1114.00	747.66	752.84				
753.30	0.003034	5.66	250.67	84.48	0.46				
Nutter Fork	912.17	25 yr	1487.00	747.66	753.61				
754.18	0.003132	6.36	324.68	111.14	0.48				
Nutter Fork	912.17	50 yr	1792.00	747.66	754.13				

		NutterFork.rep					
754.77	0.003162	6.80	384.12	116.08		0.49	
Nutter Fork	912.17	100 yr	2120.00	747.66	754.64		
755.34	0.003208	7.22	444.68	123.85		0.50	
Nutter Fork	829.81	2 yr	513.00	746.94	750.91		
751.10	0.001952	3.52	148.96	52.90		0.35	
Nutter Fork	829.81	10 yr	1114.00	746.94	752.72		
753.07	0.002003	4.80	260.83	76.53		0.38	
Nutter Fork	829.81	25 yr	1487.00	746.94	753.49		
753.93	0.002149	5.46	325.92	92.85		0.40	
Nutter Fork	829.81	50 yr	1792.00	746.94	753.99		
754.52	0.002302	5.98	375.53	103.97		0.42	
Nutter Fork	829.81	100 yr	2120.00	746.94	754.47		
755.08	0.002444	6.47	428.60	113.56		0.44	
Nutter Fork	748.05	2 yr	513.00	746.94	750.76		
750.95	0.001828	3.47	148.88	46.48		0.33	
Nutter Fork	748.05	10 yr	1114.00	746.94	752.54		
752.90	0.002034	4.86	248.60	74.82		0.38	
Nutter Fork	748.05	25 yr	1487.00	746.94	753.28		
753.75	0.002243	5.59	310.05	91.24		0.41	
Nutter Fork	748.05	50 yr	1792.00	746.94	753.75		
754.32	0.002448	6.15	355.99	100.79		0.43	
Nutter Fork	748.05	100 yr	2120.00	746.94	754.21		
754.87	0.002648	6.70	404.16	110.10		0.45	
Nutter Fork	659.88	2 yr	513.00	746.81	750.61		
750.76	0.002083	3.12	164.83	53.76		0.31	
Nutter Fork	659.88	10 yr	1114.00	746.81	752.41		
752.69	0.002135	4.27	268.38	62.38		0.34	
Nutter Fork	659.88	25 yr	1487.00	746.81	753.14		
753.52	0.002375	4.95	315.68	66.97		0.37	
Nutter Fork	659.88	50 yr	1792.00	746.81	753.60		
754.07	0.002636	5.49	347.27	69.87		0.39	
Nutter Fork	659.88	100 yr	2120.00	746.81	754.03		
754.60	0.002951	6.08	378.89	93.43		0.42	
Nutter Fork	541.04	2 yr	513.00	746.46	749.31		749.12
750.20	0.011631	7.59	67.60	30.68		0.89	
Nutter Fork	541.04	10 yr	1114.00	746.46	750.80		750.74
752.13	0.009099	9.43	133.13	57.81		0.86	
Nutter Fork	541.04	25 yr	1487.00	746.46	751.55		751.47
752.95	0.007846	9.90	181.46	70.92		0.82	
Nutter Fork	541.04	50 yr	1792.00	746.46	752.18		752.02
753.51	0.006551	9.88	229.41	80.50		0.77	
Nutter Fork	541.04	100 yr	2120.00	746.46	752.84		
754.07	0.005382	9.71	284.44	86.97		0.71	
Nutter Fork	446.11	2 yr	513.00	745.01	748.98		
749.43	0.004346	5.35	95.87	34.81		0.57	
Nutter Fork	446.11	10 yr	1114.00	745.01	750.58		
751.35	0.004752	7.06	160.61	52.06		0.63	
Nutter Fork	446.11	25 yr	1487.00	745.01	751.36		
752.25	0.004422	7.68	207.31	68.56		0.62	
Nutter Fork	446.11	50 yr	1792.00	745.01	752.00		
752.91	0.003882	7.85	256.01	84.45		0.60	
Nutter Fork	446.11	100 yr	2120.00	745.01	752.70		
753.57	0.003270	7.82	317.28	107.73		0.56	

NutterFork.rep

Nutter Fork	362.26	2 yr	513.00	744.77	748.77
749.14	0.002398	4.90	104.61	34.65	0.50
Nutter Fork	362.26	10 yr	1114.00	744.77	750.27
751.02	0.003214	6.93	160.93	40.47	0.60
Nutter Fork	362.26	25 yr	1487.00	744.77	750.92
751.91	0.003513	7.99	188.15	43.79	0.64
Nutter Fork	362.26	50 yr	1792.00	744.77	751.36
752.56	0.003780	8.79	208.02	46.07	0.68
Nutter Fork	362.26	100 yr	2120.00	744.77	751.79
753.21	0.004055	9.59	228.04	48.37	0.71

Nutter Fork	280.1	2 yr	513.00	744.69	748.68
748.92	0.001981	3.94	130.35	41.58	0.39
Nutter Fork	280.1	10 yr	1114.00	744.69	750.21
750.70	0.002776	5.61	198.86	49.57	0.48
Nutter Fork	280.1	25 yr	1487.00	744.69	750.90
751.54	0.002963	6.42	235.33	55.93	0.51
Nutter Fork	280.1	50 yr	1792.00	744.69	751.38
752.15	0.003129	7.02	263.37	60.41	0.53
Nutter Fork	280.1	100 yr	2120.00	744.69	751.85
752.75	0.003290	7.62	292.84	65.17	0.56

Nutter Fork	195.89	2 yr	513.00	744.69	748.45
748.72	0.002780	4.21	124.26	46.41	0.41
Nutter Fork	195.89	10 yr	1114.00	744.69	749.80
750.41	0.004003	6.33	205.01	73.12	0.52
Nutter Fork	195.89	25 yr	1487.00	744.69	750.44
751.22	0.004426	7.26	254.58	78.51	0.55
Nutter Fork	195.89	50 yr	1792.00	744.69	750.90
751.81	0.004717	7.91	290.68	79.93	0.58
Nutter Fork	195.89	100 yr	2120.00	744.69	751.35
752.39	0.004971	8.54	327.05	81.34	0.60

Nutter Fork	95.84	2 yr	513.00	744.68	748.09	746.97
748.38	0.004402	4.28	120.22	56.03	0.49	
Nutter Fork	95.84	10 yr	1114.00	744.68	749.45	748.21
749.96	0.004402	5.80	211.36	78.08	0.53	
Nutter Fork	95.84	25 yr	1487.00	744.68	750.11	748.75
750.74	0.004401	6.46	266.27	87.18	0.54	
Nutter Fork	95.84	50 yr	1792.00	744.68	750.58	749.17
751.30	0.004407	6.93	308.41	90.00	0.55	
Nutter Fork	95.84	100 yr	2120.00	744.68	751.06	749.58
751.86	0.004403	7.37	351.78	92.97	0.56	

Profile Output Table - Standard Table 2

Reach Loss (ft)	C & E Loss (ft)	River Sta Q Left (cfs)	Profile Q Channel (cfs)	E.G. Elev Q Right (ft) (cfs)	w.S. Elev Top width (ft) (ft)	Vel Head (ft)	Frctn
Nutter Fork	0.32	2253.15	2 yr	758.20	757.64	0.56	
	0.07	3.22	506.48	3.30	34.61		
Nutter Fork		2253.15	10 yr	760.19	759.01	1.18	

NutterFork.rep						
0.42	0.16	18.89	1075.83	19.28	66.87	
Nutter Fork	2253.15		25 yr	761.17	759.48	1.69
0.50	0.24	31.66	1426.45	28.89	78.18	
Nutter Fork	2253.15		50 yr	761.93	759.75	2.17
0.58	0.32	42.97	1712.06	36.97	86.38	
Nutter Fork	2253.15		100 yr	762.72	760.41	2.31
0.60	0.30	62.83	2000.47	56.70	111.78	
Nutter Fork	2137.23		2 yr	757.80	757.49	0.32
0.21	0.00	1.78	509.65	1.58	46.15	
Nutter Fork	2137.23		10 yr	759.62	758.97	0.65
0.25	0.03	23.59	1078.92	11.49	63.34	
Nutter Fork	2137.23		25 yr	760.43	759.53	0.89
0.30	0.06	45.36	1421.57	20.07	69.20	
Nutter Fork	2137.23		50 yr	761.02	759.93	1.09
0.32	0.08	66.86	1698.95	26.19	74.38	
Nutter Fork	2137.23		100 yr	761.62	760.32	1.30
0.36	0.10	95.71	1991.13	33.16	79.71	
Nutter Fork	2037.52		2 yr	757.59	757.28	0.30
0.38	0.04	1.30	510.56	1.14	56.20	
Nutter Fork	2037.52		10 yr	759.33	758.79	0.54
0.37	0.04	63.23	1041.33	9.44	92.10	
Nutter Fork	2037.52		25 yr	760.07	759.37	0.70
0.37	0.02	121.81	1348.76	16.43	95.45	
Nutter Fork	2037.52		50 yr	760.62	759.80	0.82
0.37	0.01	175.55	1593.30	23.15	98.13	
Nutter Fork	2037.52		100 yr	761.17	760.20	0.96
0.38	0.01	228.13	1862.80	29.08	107.27	
Nutter Fork	1948.71		2 yr	757.16	756.44	0.72
0.40	0.16	49.90	455.10	8.00	66.88	
Nutter Fork	1948.71		10 yr	758.92	758.01	0.91
0.33	0.18	245.66	853.13	15.21	110.22	
Nutter Fork	1948.71		25 yr	759.68	758.81	0.88
0.30	0.16	383.79	1033.30	69.91	115.94	
Nutter Fork	1948.71		50 yr	760.24	759.36	0.88
0.28	0.15	494.31	1174.94	122.74	120.02	
Nutter Fork	1948.71		100 yr	760.77	759.85	0.92
0.28	0.15	611.16	1327.80	181.04	123.87	
Nutter Fork	1858.54		2 yr	756.61	756.40	0.20
0.39	0.05	0.02	511.88	1.10	63.96	
Nutter Fork	1858.54		10 yr	758.41	758.10	0.31
0.35	0.08	1.44	1047.43	65.13	108.32	
Nutter Fork	1858.54		25 yr	759.23	758.88	0.35
0.33	0.09	3.80	1333.26	149.94	111.71	
Nutter Fork	1858.54		50 yr	759.80	759.42	0.38
0.30	0.08	6.48	1559.96	225.56	114.08	
Nutter Fork	1858.54		100 yr	760.34	759.92	0.42
0.29	0.08	9.85	1801.80	308.35	116.38	
Nutter Fork	1761.23		2 yr	756.17	755.50	0.67
0.68	0.04	1.49	508.96	2.55	43.46	
Nutter Fork	1761.23		10 yr	757.97	756.82	1.15
0.74	0.02	10.30	1049.19	54.51	74.32	
Nutter Fork	1761.23		25 yr	758.81	757.59	1.22
0.72	0.02	19.57	1332.03	135.40	93.54	

			NutterFork.rep			
Nutter Fork	1761.23		50 yr	759.42	758.25	1.17
0.69	0.05	27.90		1527.16	236.93	108.46
Nutter Fork	1761.23		100 yr	759.97	758.79	1.18
0.63	0.06	35.97		1725.19	358.84	114.17
Nutter Fork	1660.52		2 yr	755.44	754.90	0.54
0.65	0.03	0.46		511.06	1.49	41.08
Nutter Fork	1660.52		10 yr	757.21	756.13	1.07
0.65	0.10	4.88		1095.56	13.56	54.03
Nutter Fork	1660.52		25 yr	758.07	756.68	1.40
0.67	0.16	9.34		1444.73	32.93	72.18
Nutter Fork	1660.52		50 yr	758.69	756.99	1.70
0.67	0.24	13.22		1721.27	57.51	82.43
Nutter Fork	1660.52		100 yr	759.28	757.51	1.77
0.61	0.26	19.38		1985.70	114.91	98.90
Nutter Fork	1550.83		2 yr	754.76	754.32	0.43
0.31	0.07	0.06		512.87	0.07	46.89
Nutter Fork	1550.83		10 yr	756.45	755.72	0.74
0.29	0.12	3.24		1104.73	6.04	56.07
Nutter Fork	1550.83		25 yr	757.25	756.37	0.88
0.29	0.15	7.21		1443.21	36.57	131.42
Nutter Fork	1550.83		50 yr	757.78	756.89	0.89
0.28	0.13	11.33		1665.73	114.94	136.06
Nutter Fork	1550.83		100 yr	758.30	757.41	0.89
0.26	0.12	16.41		1889.81	213.77	145.18
Nutter Fork	1462.99		2 yr	754.38	754.18	0.19
0.27	0.00	0.00		512.99	0.00	53.09
Nutter Fork	1462.99		10 yr	756.04	755.71	0.33
0.26	0.00	1.56		1062.75	49.69	117.21
Nutter Fork	1462.99		25 yr	756.81	756.42	0.39
0.26	0.00	3.39		1371.46	112.16	128.10
Nutter Fork	1462.99		50 yr	757.37	756.92	0.44
0.26	0.00	5.19		1618.40	168.41	137.54
Nutter Fork	1462.99		100 yr	757.92	757.43	0.49
0.26	0.00	7.43		1875.74	236.83	151.06
Nutter Fork	1359.11		2 yr	754.10	753.88	0.22
0.23	0.00	0.02		512.95	0.02	52.12
Nutter Fork	1359.11		10 yr	755.78	755.43	0.35
0.24	0.01	3.05		1043.57	67.39	115.23
Nutter Fork	1359.11		25 yr	756.55	756.14	0.41
0.24	0.02	6.57		1343.50	136.92	128.46
Nutter Fork	1359.11		50 yr	757.11	756.65	0.46
0.25	0.02	10.15		1580.44	201.41	137.30
Nutter Fork	1359.11		100 yr	757.65	757.13	0.52
0.25	0.02	14.48		1844.05	261.47	154.06
Nutter Fork	1277.06		2 yr	753.87	753.60	0.27
0.34	0.01	1.79		508.19	3.02	51.34
Nutter Fork	1277.06		10 yr	755.52	755.03	0.49
0.35	0.01	10.56		1038.32	65.12	112.04
Nutter Fork	1277.06		25 yr	756.29	755.72	0.58
0.35	0.01	17.06		1323.85	146.09	117.85
Nutter Fork	1277.06		50 yr	756.84	756.20	0.64
0.35	0.01	22.95		1548.29	220.77	121.52
Nutter Fork	1277.06		100 yr	757.38	756.67	0.71

				NutterFork.rep			
0.36	0.01	29.80	1782.13	308.07	124.79		
Nutter Fork	1171		2 yr	753.52	753.12	0.39	
0.67	0.04	0.49	502.33	10.18	99.21		
Nutter Fork	1171		10 yr	755.17	754.62	0.55	
0.59	0.07	4.54	954.74	154.72	109.75		
Nutter Fork	1171		25 yr	755.94	755.31	0.63	
0.55	0.07	8.29	1212.91	265.80	111.58		
Nutter Fork	1171		50 yr	756.48	755.77	0.71	
0.54	0.07	11.72	1421.87	358.41	112.86		
Nutter Fork	1171		100 yr	757.01	756.21	0.80	
0.54	0.06	14.57	1644.29	461.14	115.57		
Nutter Fork	1063.85		2 yr	752.80	751.96	0.84	
0.95	0.09	2.06	502.99	7.95	55.88		
Nutter Fork	1063.85		10 yr	754.51	753.25	1.26	
0.70	0.17	10.99	1010.97	92.04	79.74		
Nutter Fork	1063.85		25 yr	755.32	753.97	1.35	
0.63	0.17	30.41	1287.29	169.30	98.48		
Nutter Fork	1063.85		50 yr	755.87	754.48	1.39	
0.60	0.16	55.21	1490.96	245.83	108.49		
Nutter Fork	1063.85		100 yr	756.40	754.97	1.43	
0.58	0.16	89.11	1700.75	330.14	117.75		
Nutter Fork	978.95		2 yr	751.76	751.21	0.55	
0.34	0.08	60.17	451.09	1.74	65.13		
Nutter Fork	978.95		10 yr	753.64	752.96	0.68	
0.27	0.06	193.30	899.40	21.30	89.66		
Nutter Fork	978.95		25 yr	754.51	753.74	0.77	
0.27	0.06	287.98	1158.21	40.82	103.89		
Nutter Fork	978.95		50 yr	755.10	754.25	0.85	
0.27	0.06	376.49	1356.74	58.77	111.61		
Nutter Fork	978.95		100 yr	755.67	754.77	0.90	
0.26	0.06	489.23	1551.10	79.67	114.28		
Nutter Fork	912.17		2 yr	751.34	751.06	0.28	
0.21	0.03	16.13	496.22	0.65	57.36		
Nutter Fork	912.17		10 yr	753.30	752.84	0.47	
0.20	0.04	59.47	1045.26	9.26	84.48		
Nutter Fork	912.17		25 yr	754.18	753.61	0.58	
0.21	0.04	100.57	1367.19	19.24	111.14		
Nutter Fork	912.17		50 yr	754.77	754.13	0.64	
0.22	0.03	164.35	1600.72	26.94	116.08		
Nutter Fork	912.17		100 yr	755.34	754.64	0.71	
0.23	0.03	239.28	1844.77	35.95	123.85		
Nutter Fork	829.81		2 yr	751.10	750.91	0.19	
0.15	0.00	0.99	511.67	0.35	52.90		
Nutter Fork	829.81		10 yr	753.07	752.72	0.35	
0.16	0.00	19.03	1088.49	6.47	76.53		
Nutter Fork	829.81		25 yr	753.93	753.49	0.45	
0.18	0.00	36.01	1429.26	21.72	92.85		
Nutter Fork	829.81		50 yr	754.52	753.99	0.53	
0.19	0.00	50.90	1700.19	40.91	103.97		
Nutter Fork	829.81		100 yr	755.08	754.47	0.61	
0.21	0.01	68.37	1981.99	69.65	113.56		

				NutterFork.rep			
Nutter Fork	748.05		2 yr	750.95	750.76		0.19
0.17	0.01	0.13		512.72	0.15	46.48	
Nutter Fork	748.05		10 yr	752.90	752.54		0.36
0.18	0.02	1.48		1102.90	9.62	74.82	
Nutter Fork	748.05		25 yr	753.75	753.28		0.47
0.20	0.03	2.73		1451.25	33.02	91.24	
Nutter Fork	748.05		50 yr	754.32	753.75		0.57
0.22	0.03	3.86		1727.46	60.68	100.79	
Nutter Fork	748.05		100 yr	754.87	754.21		0.66
0.25	0.03	5.19		2016.87	97.94	110.10	

Nutter Fork	659.88		2 yr	750.76	750.61		0.15
0.49	0.07	0.05		512.94	0.01	53.76	
Nutter Fork	659.88		10 yr	752.69	752.41		0.28
0.46	0.10	1.74		1108.87	3.39	62.38	
Nutter Fork	659.88		25 yr	753.52	753.14		0.38
0.47	0.10	3.44		1473.81	9.75	66.97	
Nutter Fork	659.88		50 yr	754.07	753.60		0.46
0.47	0.09	5.02		1770.08	16.90	69.87	
Nutter Fork	659.88		100 yr	754.60	754.03		0.57
0.46	0.07	6.96		2096.11	16.94	93.43	

Nutter Fork	541.04		2 yr	750.20	749.31		0.89
0.64	0.13	0.00		513.00	30.68		
Nutter Fork	541.04		10 yr	752.13	750.80		1.33
0.61	0.17	10.02		1065.66	38.32	57.81	
Nutter Fork	541.04		25 yr	752.95	751.55		1.40
0.55	0.15	23.48		1344.14	119.38	70.92	
Nutter Fork	541.04		50 yr	753.51	752.18		1.33
0.47	0.13	38.10		1529.45	224.45	80.50	
Nutter Fork	541.04		100 yr	754.07	752.84		1.23
0.39	0.11	56.12		1696.52	367.36	86.97	

Nutter Fork	446.11		2 yr	749.43	748.98		0.44
0.26	0.02			513.00	34.81		
Nutter Fork	446.11		10 yr	751.35	750.58		0.77
0.32	0.01	1.71		1109.41	2.88	52.06	
Nutter Fork	446.11		25 yr	752.25	751.36		0.89
0.33	0.01	17.33		1445.47	24.19	68.56	
Nutter Fork	446.11		50 yr	752.91	752.00		0.90
0.32	0.03	46.70		1680.40	64.91	84.45	
Nutter Fork	446.11		100 yr	753.57	752.70		0.86
0.30	0.06	94.91		1892.79	132.31	107.73	

Nutter Fork	362.26		2 yr	749.14	748.77		0.37
0.18	0.04			513.00	34.65		
Nutter Fork	362.26		10 yr	751.02	750.27		0.75
0.25	0.08	0.06		1113.93	0.01	40.47	
Nutter Fork	362.26		25 yr	751.91	750.92		0.99
0.26	0.11	1.59		1485.12	0.29	43.79	
Nutter Fork	362.26		50 yr	752.56	751.36		1.20
0.28	0.13	4.70		1786.46	0.85	46.07	
Nutter Fork	362.26		100 yr	753.21	751.79		1.42
0.30	0.16	9.97		2108.23	1.81	48.37	

Nutter Fork	280.1		2 yr	748.92	748.68		0.24
0.20	0.00			513.00	41.58		
Nutter Fork	280.1		10 yr	750.70	750.21		0.49

NutterFork.rep						
0.28	0.01	0.04	1113.96	0.00	49.57	
Nutter Fork	280.1		25 yr	751.54	750.90	0.64
0.30	0.01	1.63	1485.21	0.17	55.93	
Nutter Fork	280.1		50 yr	752.15	751.38	0.76
0.32	0.01	5.17	1786.29	0.54	60.41	
Nutter Fork	280.1		100 yr	752.75	751.85	0.90
0.34	0.01	11.36	2107.42	1.21	65.17	
Nutter Fork	195.89		2 yr	748.72	748.45	0.27
0.35	0.00	0.72	512.25	0.03	46.41	
Nutter Fork	195.89		10 yr	750.41	749.80	0.61
0.42	0.03	28.23	1084.14	1.63	73.12	
Nutter Fork	195.89		25 yr	751.22	750.44	0.78
0.44	0.04	70.18	1412.92	3.90	78.51	
Nutter Fork	195.89		50 yr	751.81	750.90	0.91
0.45	0.06	113.10	1672.60	6.30	79.93	
Nutter Fork	195.89		100 yr	752.39	751.35	1.04
0.47	0.07	164.64	1946.00	9.36	81.34	
Nutter Fork	95.84		2 yr	748.38	748.09	0.28
	0.05		512.93	0.02	56.03	
Nutter Fork	95.84		10 yr	749.96	749.45	0.51
	14.04		1094.48	5.48	78.08	
Nutter Fork	95.84		25 yr	750.74	750.11	0.63
	34.75		1438.32	13.93	87.18	
Nutter Fork	95.84		50 yr	751.30	750.58	0.71
	58.72		1709.89	23.39	90.00	
Nutter Fork	95.84		100 yr	751.86	751.06	0.80
	87.44		1997.10	35.46	92.97	

NutterFork.rep

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
XXXXXXXX XXXX      X          XXX XXXX      XXXXXX      XXXX
X      X  X          X          X      X      X      X
X      X  X          X          X      X      X      X
X      X  XXXXXX      XXXX      X      X      X      X

```

PROJECT DATA

Project Title: Nutter Fork
Project File : NutterFork.prj
Run Date and Time: 1/5/2015 1:28:59 PM

Project in English units

PLAN DATA

Plan Title: Nutter Fork Proposed
Plan File : p:\2014\142-744\Calculations\Hydraulic Study\NutterFork.p02

Geometry Title: NutterFork_Proposed
Geometry File : p:\2014\142-744\Calculations\Hydraulic
Study\NutterFork.g02

Flow Title : Nutter Fork Flow
Flow File : p:\2014\142-744\Calculations\Hydraulic
Study\NutterFork.f01

Plan Summary Information:

Number of:	Cross Sections =	24	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

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

Computation Options

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

FLOW DATA

NutterFork.rep

Flow Title: Nutter Fork Flow

Flow File : p:\2014\142-744\Calculations\Hydraulic Study\NutterFork.f01

Flow Data (cfs)

River	Reach	RS	2 yr	10 yr
25 yr Nutter Fork 1487	50 yr Nutter Fork 1792	100 yr 2253.15 2120	513	1114

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Nutter Fork	Nutter Fork	2 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	10 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	25 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	50 yr	
Normal S = 0.0044			
Nutter Fork	Nutter Fork	100 yr	
Normal S = 0.0044			

GEOMETRY DATA

Geometry Title: NutterFork_Proposed

Geometry File : p:\2014\142-744\Calculations\Hydraulic Study\NutterFork.g02

CROSS SECTION

RIVER: Nutter Fork
REACH: Nutter Fork RS: 2253.15

INPUT

Description:

Station	Elevation	Data	num=	96	Sta	Elev	Sta	Elev	Sta	Elev
0	784.82	.3800049	784.723	.059998	7844.929993	783.52	10.86	782		
13.57001	781.1417	.99001	780	20.37	778.73	22.27	778	23.78	777.25	
25.77	776	28.16	774.56	28.84	774	30.95	772.6131	74001	772	
34.53	770.55	35.75	770	36.12	769.98	41.94	768.9244	.03999	768.64	
46.89	768.17	48.12	768.15	49.37	768.1	50.19	768.09	52.02	768	
52.08	768	54.36	766.75	56.61	766	59.27	764.76	60.97	764	
61.5	763.79	66.37	762	67.33	761.6969	.60001	761.18	74.28	760	
76.03	759.31	79.38	758.3479	.64999	758.2480	.24001	75884.67999		756.49	
86	756	86.25	755.989	.17999	754.83	100	754.39	107.93	754.06	
110.31	753.99	110.57	754.19	113.39	756	114.59	756.78	116.49	758	
116.68	758.12	118.52	759.31	123.54	759.87	123.6	759.88	123.63	759.88	
123.78	759.89	137.97	760.58	139.64	760.29	141.11	760.2	143.39	760	

NutterFork.rep

145.03	759.24	147.95	758	150.25	758	158.4	758	158.42	758
158.48	758	158.52	758.01	158.62	758.02	166.93	758.67	175.16	759.29
178.32	759.49	183.28	759.79	186.08	759.99	186.57	760	191.24	760.79
194.36	761.2	195.81	761.45	199.23	762	204.18	763.56	205.01	764
207.7	765.66	208.25	766	209.28	766.94	210.39	768	211.95	769.17
213.01	770	213.37	770.3	215.55	772	216.29	772.64	217.87	774
219.61	775.45	220.28	776	220.67	776.37	222.6	778	223.76	779.01
225	779.78								

Manning's n values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 86 .035 113.39 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 86 113.39 101.2 115.92 128.19 .1 .3
 Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 137.97 225 780 T

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 2137.23

INPUT

Description:

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	781.392	559998	7804.179993	778.825	300003	7786.509995	777.01		
7.820007	776	13.73	774.28	14.48	774	16.16	773.97	16.84	773.95
18.08	773.96	21.28	773.68	23.25	773.6	28.17	772.4828	57001	772.42
29.38	772.26	30.17	772	30.64	771.67	32.64	77034	32001	768.48
34.85001	768	35.02	767.89	37.11	766	41.61	764.2243	10001	764
43.41	763.9943	75999	763.9644	35001	763.9547	53999	763.49	52.27	762
58.22	760.46	59.94	760	70.67	758.7778	50999	75882	10001	757.67
83.82001	757.48	91.8	756.67	92.45	756.25	92.89	756	94.53	754.9
96.51	754.16	99.18	754.14	110	754.07	124.47	753.99	126.67	755.41
127.59	756	128.9	756.85	130.75	758	131.77	758.63	133.61	759.78
134.67	759.9	135.55	760	136.61	760.13	138.09	760.28	141.78	760.7
156.98	760.92	157.53	760.93	157.71	760.95	157.84	760.96	158.14	760.99
161.09	761.27	168.92	762	172.55	763.99	172.57	764	172.58	764.01
175.45	766	176.1	766.36	178.56	768	179.76	768.46	183.19	770
185.83	770.66	191.27	772	197.92	773.47	200.14	774	201.81	774.71
205.15	776	207.7	777.41	208.78	778	210.85	779.19	212.27	780
214.39	781.11	216.1	782	217.49	782.83	219.45	784	220	784.36

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 92.89 .03 127.59 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 92.89 127.59 109.88 99.71 90.23 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 2037.52

INPUT

Description:

Station Elevation Data num= 90

NutterFork.rep

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	780.662	100006	779.897	539993	778.059	350006	777.421	1035001	777.08
13.78	775.88	21.58	773.123	85001	772.31	26.28	773.56	29.05	773.78
29.38	774.23	30.12	774.03	30.19	774	31.23	773.55	34.69	772
35.67999	771.46	38.75	77040	49001	768.934	2.25999	768	43.45	767.28
45.77	766	48.14	764.714	9.50999	764	53.5	762.475	4.49001	762
63.47	760.92	68.16	760.08	68.92	760.066	9.50999	760.04	70.06	760.04
73.00999	76073	35001	759.98	75.37	759.72	83.06	758	87.08	757.89
107.55	757.41	116.06	757.23	129.32	756.91	130.83	756.16	131.16	756
133.52	754.88	135.61	753.87	145.59	753.92	150	753.93	164.73	753.99
166.77	755.36	167.85	756	170.08	757.55	170.65	758	171.62	758.77
173.03	759.89	173.2	759.87	173.59	759.95	173.86	760	175.99	760.48
177.15	760.74	179.42	761.26	193.16	761.05	194.01	761.02	194.71	761.17
195.24	761.37	196.8	761.66	198.38	762	199.29	762.58	201.65	764
202.72	765.03	203.9	766	205.66	767.45	206.31	768	206.98	768.52
208.66	770	211.45	771.83	211.73	772	215.71	773.89	216.19	774
216.58	774.02	217.15	774.04	217.64	774.07	218.37	774.08	221.57	774.67
225.65	775.33	229.48	776	238.67	777.87	238.96	777.93	239.33	778
239.75	778.09	242.36	778.68	248.21	780	248.92	780.21	250	780.53

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .1 131.16	.035 167.85	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
131.16	167.85	60.01	88.81	103.28	.1	.3	

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1948.71

INPUT

Description:

Station	Elevation	Data	num=	113					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	770.54	6900024	770.32	4.25	769.17	5.77002	768.63	14.53	765.85
19.25	764.44	24.81	762.423	2.80002	769.55	33.41	769.81	33.42	769.81
33.81	769.683	4.82001	769.273	7.76001	768	40.33	766.974	2.43001	766
44.51001	765.22	48.8	764	49.42	763.845	0.57001	763.53	53	762.81
54.40001	762.315	6.93001	76260	2.3001	761.52	61.16	761.256	2.84001	760.84
67.05	76069	6.2001	759.49	76.06	758.17	76.72	75878	0.7001	757.65
79.35001	757.481	6.5001	757.058	2.10001	756.978	2.49001	756.989	0.18001	757.05
91.53	756.959	1.98001	756.88	97.61	756.149	9.87001	756.13	101.75	756.09
102.75	756.08	103.47	756.07	103.9	756.07	105.2	756.02	105.85	756.01
106.31	756	107.69	755.99	118.79	755.51	129.7	754.91	131.08	754.85
133.65	754.69	134.27	754.61	135.01	754.51	136.26	754.32	137.93	754
139.65	753.72	140.37	753.59	143.35	753.58	148.79	753.56	158.12	753.52
158.24	753.8	158.4	754	158.75	754.22	161.6	756	163.39	757.28
164.25	757.92	164.51	757.87	165.23	757.88	166.12	757.86	167.48	757.86
169.44	757.86	171.57	757.86	178.79	757.91	185.21	757.98	186.26	758
186.86	758	190.92	759.6	192.12	760	193.89	760.31	197.6	760.93
198.84	761.18	199.41	761.27	200.53	761.49	202.44	761.43	216.76	760.66
218.21	761.05	219.34	761.31	223.11	762	223.47	762.23	226.96	764
228.71	765.19	230	766	234.99	767.73	235.75	768	236.17	768.1
240.26	769.16	243.45	770	247.46	771.81	247.81	772	248.19	772.18
251.83	774	253.76	774.79	256.72	776	260	776.93	263.95	778
273.07	779.9	273.55	780	273.87	780.09	279.86	781.84	280.41	782
280.44	782.01	286.57	784	289.13	784.83				

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val

NutterFork.rep

0 .1 136.26 .04 158.75 .07

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 136.26 158.75 95.93 90.17 53.52 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1858.54

INPUT

Description:

Station Elevation Data			num=	84					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	786.1	9400024	785.562	829987	784.31	6.23999	781.97	12.19	778.31
19.57001	773.98	23.44	771.63	24.56	770.98	26.38	770.51	32.42	768.56
33.05	768	35.06	766.7	36.3	766	39	764.8840	71001	764
42.16	763.64	49.23	76251.60001	761.556	71001	76057.67999	759.57		
60.87	75861.60001	757.6262	67999	757.08	63.16	756.4763	67999	756	
64.42	755.29	65.91	754	66.22	753.57	66.69	753.12	75	752.93
81.7	752.77	82.08	752.76	89.22	752.95	89.7	753.0192	96001	753.18
92.97	753.18	92.98	753.1892	99001	753.1893	60001	753.23	103.82	754
106.42	754.58	113.44	755.76	114.09	755.88	114.86	756	116.64	756.01
126.21	756.37	131.56	756.56	138.13	756.81	155.52	757.49	167.91	758
168.74	758	172.6	759.66	173.49	760	180.12	761.16	181.23	761.34
181.55	761.39	181.71	761.42	182.12	761.49	182.77	761.48	198.21	761.1
202.74	761.82	203.26	762	206.46	763.22	208.54	764	209.52	764.57
212.23	766	213.87	766.87	215.69	768	217.15	768.67	220.24	770
222.75	770.83	225.44	772	232.13	773.81	232.97	774	234.22	774.25
243.3	776	248.29	777.01	254.4	778	261.37	779.26	263.56	779.58
265.93	780	270.78	781.09	273.7	782	275	782.36		

Manning's n Values			num=	3		
Sta	n Val	Sta	n Val	Sta	n Val	
0	.163	67999	.04	114.86	.07	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 63.67999 114.86 95.11 97.31 94.39 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1761.23

INPUT

Description:

Station Elevation Data			num=	86					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	793.775	079987	790.538	230011	788.34	12.31	785.48	19.53	780.4
26.75999	775.36	30.84	772.5133	99001	770.2835	24001	770.1740	03999	767.62
41.31	768.05	42.02	768.0442	10001	768.04	42.31	768.02	42.77	768
43.33	767.6345	64999	76647.46001	764.8	48.77	764	49.98	762.84	
50.92	76251.39999	761.45	52.61	760	53.56	758.94	54.31	758	
54.60001	757.6555	35001	756.77	56.86	756.09	57.06	756	60.83	754.24
61.36	754	62.37	753.48	63.12	753.12	75	752.84	75.38	752.83
86.69	752.57	88.55	753.26	90.55	75492.07001	754.57	93.05	754.91	
93.25	754.97	94.11	755.04	95.31	755.11	96.39	755.17	109.66	756
110.1	756.01	127.31	756.73	137.84	757.15	156.74	757.96	159.93	758
163.03	758.3	179.67	760	181.39	760.23	184.04	760.63	185.46	760.88
190.78	761.36	201.98	761.15	206.55	760.99	207.54	761.17	208.24	761.26
209.4	761.45	213.14	762	215.63	763.19	217.54	764	223.63	764.89

NutterFork.rep

230.87	765.76	232.41	765.96	232.52	765.96	232.94	765.99	233.29	766
233.83	766.13	234.74	766.31	242.07	767.92	243.15	767.93	243.41	767.95
243.47	767.96	243.63	768	245	768.43	248.93	770	249.85	770.41
252.78	771.71	253.47	772	254.46	772.29	260.78	774	274.19	775.61
275	775.71								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	60.83	.03592	07001	.07

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

60.83	92.07	001	103.05	100.71	94.04	.1	.3
-------	-------	-----	--------	--------	-------	----	----

CROSS SECTION

RIVER: Nutter Fork
REACH: Nutter Fork RS: 1660.52

INPUT

Description: Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	790.06	5.01001	786.49	6.00006	783.08	16.14001	778.45	16.67001	778.07
17.04001	777.81	23.73	773.07	29.06	769.69	30.8	768.65	36.10001	767.76
37.42	767.45	37.46001	767.39	38.17999	766.87	39.03999	766	41.25	764.28
41.66	764	42.21001	763.67	45.25999	762	47.94	760.31	48.37	760
49.23	759.5	51.3	758	51.78999	757.7	53.17	756.98	54.85001	756.02
54.89	756	55.05	755.91	58.46001	754	59.86	753.26	60.71001	752.65
61.05	752.36	74.73	752.28	75	752.28	85.55	752.21	87.72	752.21
88.37	752.4	89.33	752.65	94.46001	754	97.09	754.69	97.81	754.88
100	755.28	101.46	755.7	102.7	756	102.88	756	103.07	756
103.3	756	103.68	756.01	104.27	756.01	104.7	756.01	123.91	756.61
128.95	756.78	132.73	756.9	136.73	757.02	145.07	757.3	149.67	757.46
165.1	757.96	168.51	757.96	169.76	757.96	170.9	757.96	170.95	757.96
171.78	757.97	172.24	757.97	173.49	757.98	175.41	758	176.07	758
177.38	758.25	187.43	759.36	200.94	760	204.79	760.18	205.88	760.31
207.93	760.1	208.34	760.08	210.32	760	211.57	760	211.64	760
211.7	760	213.11	760	214.02	760	221.03	761.67	222.43	762
222.68	762.13	224.36	762.86	226.86	764	229.73	765.17	231.68	766
236.29	767.89	236.57	768	239.85	769.81	240.26	770	244.94	771.88
245.22	772	246.58	772.43	247.86	772.81	251.02	773.75	252	774
257.39	775.14	259.33	775.54	260.74	775.82	261.61	776	262.91	776.28
270.78	778	274.27	778.95	275	779.17				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.158	46001	.03594	46001	.07

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

58.46	00194	46001	104.94	109.69	121.52	.1	.3
-------	-------	-------	--------	--------	--------	----	----

CROSS SECTION

RIVER: Nutter Fork
REACH: Nutter Fork RS: 1550.83

INPUT

Description: Station Elevation Data num= 104

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	781.23	4.380005	778.79	7.959991	776.65	17.60999	771.41	18.79001	770.75

NutterFork.rep												
19.23	770.53	20.17	999	770.11	26.64	999	767.21	27.86	766.65	29.75	767.31	
30.8	767.72	31.11	767.63	32.45	765.33	32.57	7001	765.27	32.71	1001	765.1	
33.89	764.74	34.92	764.31	35.23	764	36.34	763.14	37.47	762	762	762	
38.58	760.98	39.72	760	40.78	759.11	42.22	758	43.31	757.42	757.42	757.42	
45.89999	756	48.87	754.55	50.02	754.03	50.16	754.01	50.28	754	754	754	
51.88	753.56	57.39	752	58.42	752	59.47	751.99	75	751.85	751.85	751.85	
85.35001	751.76	89.85	5001	751.72	90.03	999	751.84	90.25	999	752	93.38	753.25
95.36	754	97.8	754.87	97.81	754.88	97.82	001	754.88	97.85	001	754.88	754.88
97.89999	754.89	104.15	756	107.56	756	109.47	756	110.74	755.98	755.98	755.98	755.98
113.35	755.97	114.83	755.95	115.25	755.95	115.97	755.94	116.59	755.93	755.93	755.93	755.93
121.28	755.91	122.68	755.91	125.27	755.91	140.22	755.96	142.77	755.96	755.96	755.96	755.96
149.87	755.94	153.66	755.95	154.84	755.95	159.76	755.97	164.39	755.98	755.98	755.98	755.98
173.46	756	177.1	756.42	183.2	757.3	190.8	757.46	199.2	757.69	757.69	757.69	757.69
201.78	757.88	204.35	757.95	205.56	758	210.2	759.39	212.11	760	760	760	760
214.43	760.64	219.62	762	224.11	763.54	225.54	764	226.05	764.25	764.25	764.25	764.25
229.25	766	232.87	767.57	233.66	768	235.34	768.32	243.19	770	770	770	770
245.53	771.41	246.55	772	246.89	772.2	249.86	774	250.57	774.58	774.58	774.58	774.58
252.81	776	254.11	777.18	255.2	778	256.61	779.13	257.8	780	780	780	780
258.48	780.47	260.47	782	263.21	783.45	264.17	784	265.57	784.58	784.58	784.58	784.58
268.69	786	271.17	787.08	273.05	788	275	789.09					

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.1	50.28	.035
		95.36	.07

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	50.28	95.36		101.06	87.84		.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1462.99

INPUT

Description:

Station Elevation Data												
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	786.74	3.16	983	785.45	9.88	005	782.59	13.92	999	780.87	20.16	778.21
24.69	776.22	27.63	775.04	34.3	772.27	35.09	999	771.94	35.45	771.8	771.8	771.8
40.14999	770.68	41.73	771.64	42.03	771.94	42.19	771.95	42.23	999	771.95	771.95	771.95
42.63	771.96	42.64	771.96	43.86	771.96	44.34	999	771.96	44.61	771.97	771.97	771.97
45.92	772	45.94	772	46.11	771.92	50.33	770	51.03	769.64	769.64	769.64	769.64
54.06	768.55	55.00	999	767.51	57.53	999	766.15	57.70	999	766	58.05	765.79
60.88	764	61.59	763.55	63.89	999	762.65	65.03	999	761.08	66.61	760	760
67.70999	758.75	68.67	999	758	69.59	757.33	70.84	999	756.71	50	999	755.12
72.19	754.68	72.78	999	754.26	73.45	754.03	75.23	753.41	78.78	999	752	752
82.67	751.29	84.12	751.04	84.22	751.04	86.48	999	751.02	102.19	751.02	751.02	751.02
110.77	751.02	119.86	750.78	120.7	751.25	121.69	751.73	122.24	752	752	752	752
123.05	752.39	125.91	754	126.01	754.1	126.24	754.31	126.37	754.5	754.5	754.5	754.5
132.19	754.4	142.8	754.22	143.22	754.22	169.78	754.69	173.42	754.88	754.88	754.88	754.88
176.64	755.09	177.02	755.1	178.62	755.19	184.99	755.52	193.2	755.99	755.99	755.99	755.99
193.46	756	197.89	756.35	202.15	756.8	213.81	757.07	217.63	757.07	757.07	757.07	757.07
220.04	757.38	221.85	757.57	225.53	758	226.42	758.31	231.04	759.72	759.72	759.72	759.72
231.81	759.96	231.96	760	232.25	760.09	238.86	762	241.24	763.26	763.26	763.26	763.26
242.51	764	245.79	765.15	247.94	766	254.08	767.59	255.51	768	768	768	768
256.28	768.28	260.49	770	262.12	771.12	263.51	772	265.87	773.56	773.56	773.56	773.56
266.46	774	268.7	775.87	268.85	776	268.92	776.07	270.81	778	778	778	778
271.56	778.84	272.33	780	272.86	780.5	274.16	782	275.17	782.98	782.98	782.98	782.98
276.23	784	277.22	784.71	277.56	784.98							

Manning's n Values		num=	3
Sta	n Val	Sta	n Val

NutterFork.rep

0 .1 73.45 .04 125.91 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 73.45 125.91 75.28 103.88 103.13 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1359.11

INPUT

Description:

Station Elevation Data			num=	131					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	789.54	1.67	788.99	89	785.84	12.35	784.92	13.37	784.54
15.73	783.66	20.88	781.73	23.05	780.94	28.39	778.85	33.74	776.76
35.89	775.85	39.42	774.38	40.89	773.7	41.69	773.32	41.86	773.46
42.67	772.69	43.03	772.98	43.55	772.81	44.17	772.55	45.19	772
45.2	772.45	45.92	771.67	49.94	770.52	82.00	768.66	54.23	768
55.22	767.63	58.59	766.59	59.28	765.2	60.2	764	60.78	763.34
61.60	762	62.88	760.08	62.92	760.62	96.00	759.97	64.88	758
65.34	757.58	67.11	756	69.84	754.35	70.41	754	71.95	753.64
80.84	752.81	81.42	751.93	82.07	751.89	86.23	750.73	87.24	750.48
98.69	750.33	100	750.31	113.21	750.11	114.48	750.66	116.4	751.43
117.81	752	119.58	752.77	121.81	753.67	122.78	753.84	123.69	754
127.22	754.03	131.53	754.05	134.6	754.03	136.47	754.02	139.68	754
142.05	754	143.3	753.99	144.73	753.99	146.69	753.99	147.67	753.99
150.33	754	152.65	754	154.03	754	154.8	754	155.37	754
158.52	754	159.09	754	159.9	754	162.22	754	163.76	754
166.28	754	167.76	754	167.88	754	168.02	754	168.07	754
168.29	754.02	168.58	754.04	189.03	755.97	189.67	755.98	190.06	756
191.16	756.27	192.11	756.43	192.74	756.51	193.71	756.6	194.25	756.63
195.12	756.69	198.19	756.83	210.58	757.23	214.03	756.54	215.82	756.3
217.56	756	218.16	756	221.16	756	222.54	756.56	224.84	758
226.61	759.33	227.39	760	228.11	760.54	230.08	762	231.32	763.02
232.47	764	234.86	765.65	235.44	766	238.32	767.75	238.72	768
238.8	768.04	242.16	770	243.95	770.89	246.31	772	249.63	773.72
250.41	774	253.76	775.01	255.82	776	258.57	777.57	259.19	778
259.43	778.27	261.34	780	262.3	780.93	263.26	782	264.3	782.9
265.47	784	268.46	785.96	268.52	786	268.62	786.04	272.64	788
275	789.53								

Manning's n Values			num=	3		
Sta	n Val	Sta	n Val	Sta	n Val	Sta
0	.1	71.95	.04	121.81	.1	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 71.95 121.81 71.16 82.05 93.82 .1 .3

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 210.58 275 780 T

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1277.06

INPUT

Description:

Station Elevation Data			num=	121					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

NutterFork.rep

0	792.244	.269989	790.55	.059998	790.175	.649994	789.94	9.48999	788.36
15.01999	786.1116	.01001	785.71	24.98	782.14	31.58	779.31	34.94	777.79
40.23	775.1944	.89999	772.84	47.31	770.95	47.81	770.5648	.50999	770.13
48.62	770.06	48.7	770.02	48.78	770.0148	.96001	770	52.45	768.09
52.60001	76853	.57001	767.4	55.83	766	57.87	764.77	58.98	764.1
59.13	764	59.27	763.9162	.00999	76262	.28999	761.8	64.8	760
65.06	759.8	67.61	758	68.78	757.11	69.91	756	71.2	755.03
72.09	754	76.27	752.09	76.45	75276	.57001	751.99	87.08	751.4
88.98	750.2	89.53	750	89.95	749.87	90.03	749.8590	.10001	749.79
100	749.72	103.4	749.7	108.75	749.65	108.84	749.69	109.6	749.97
109.69	750	113.97	751.29	115.98	752	116.97	752.36	117.77	752.69
126.09	753.85	127.27	754	129.1	754.02	132.99	754.04	134.6	754.04
140.35	754	141.11	754	141.66	754	147.56	753.99	150.6	753.99
157.7	753.98	167.92	754	170.15	754	170.24	754.01	170.38	754.01
170.95	754.04	171.68	754.06	175.58	754.4	182.43	754.92	186.87	755.53
190.06	756	197.86	757.33	198.49	757.44	199.01	757.54	199.03	757.54
199.37	757.54	214.73	757.86	221.54	757.98	222.18	758	223.16	758.64
225.28	760	227.4	761.65	227.91	762	228.37	762.32	231.02	764
234.12	766	234.13	766	234.15	766.02	236.89	768	237.87	768.67
239.9	770	241.59	770.92	243.58	772	246.02	773.19	248.17	774
251.89	775.17	254.43	776	255.59	776.6	258.43	778	260.58	779.54
261.15	780	262.92	781.69	263.27	782	263.66	782.29	265.19	784
265.97	784.66	267.17	786	268.35	787.05	269.41	788	271.21	789.71
271.55	790	271.86	790.32	273.6	791.83	273.8	792	273.88	792.05
275	792.81								

Manning's n Values

num=	3				
Sta	n Val	Sta	n Val		
0	.1	76.45	.04	115.98	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	76.45	115.98		110.21	106.06	93.42		.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 1171

INPUT

Description:

Station	Elevation	Data	num=	110					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	794.752	.309998	793.754	.389999	792.855	.360001	792.438	.050003	791.23
13.05	789	14.86	788.22	18.72	786.51	25.33	783.6228	.42999	782.15
35.8	778.65	36.12	778.4936	.99001	778.01	46.27	772.95	48.97	771.49
50.71001	770.7251	.00999	770.3451	.03999	770.34	51.12	770.3	51.52	770.08
51.62	770.03	52.03	770	53.61	768.83	54.7	768	56.39	766.72
57.31	766	58.7	764.9959	.92999	764	60.8	763.29	62.41	762
63.72	761.17	65.62	760	67.83	758.8769	.50999	75875	.25999	756.32
76.31	756	76.36	75676	.85001	756.01	77.37	755.99	78.3	755.31
79.92	754	80.92	753.33	82.88	752	83.39	751.5683	.39999	751.47
83.48	751.48	86.3	750.8589	.85001	75090	.53999	749.8592	.35001	749.44
100	749.55	105.87	749.64	106.86	749.65	106.91	749.69	107.02	749.77
108	750	113.99	751.36	116.73	752	118.74	752.61	119.35	752.8
123.67	752.74	124.79	752.72	135.65	752.55	178.84	753.07	179.58	753.01
182.59	753.41	187.68	753.95	187.71	753.95	188.05	754	188.39	754.27
190.88	756	192.63	757.12	193.89	758	197.58	758.37	197.84	758.4
197.96	758.46	198.47	758.71	199.27	758.74	199.48	758.75	200.26	758.65
200.36	758.65	203.71	758.52	216.09	758	216.29	758	216.8	758
217.45	758	219.67	758.54	223.83	759.47	225.06	760	226.27	760.84
227.78	762	228.33	762.4	230.06	764	230.97	764.72	232.25	766
233.64	767.45	234.17	768	234.83	768.62	236.5	770	237.49	770.71

NutterFork.rep

239.42	772	241.07	773.28	242.27	774	243.38	774.82	245.04	776
246.24	777.12	247.24	778	248.9	779.35	249.6	780	250	780.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	82.88	.035	116.73	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	82.88	116.73		130.47	107.15	75.81	.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 1063.85

INPUT

Description:

Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	788.211	959991	787.368	799988	784.3	9	784.229	279999	784.1
16.04999	781.31	21	779.21	23.09	778.3925	95001	777.1833	20001	774.39
42.62	771.1545	39999	770.26	51.27	768.72	57.61	766.7958	32001	766.62
59.28999	766.33	69.81	763.6	72.41	762.96	73.81	760.175	39999	758.49
75.78999	758	78.78	757.04	82.05	756	82.89	755.98	88.58	755.63
90.84	755.5	95.67	755.2	103.97	754.73	108.85	754.4	111.88	754.23
115.16	754	129.95	753.03	132.88	752.86	133.71	752.81	134.21	752.8
134.27	752.8	134.36	752.8	134.59	752.6	134.97	752.4	135.73	752
138.63	750.74	140.26	750	140.96	749.64	141.33	749.44	150	749.45
155.93	749.46	160.14	749.46	161.03	749.62	163.26	750	169.16	751.01
170.49	751.25	172.76	751.34	175.19	751.41	184.07	751.71	192.8	752
202.75	752.93	210.78	753.66	214.08	753.97	214.79	754	217.81	755.1
219.68	756	223.39	757.97	223.44	758	223.54	758.01	228.38	758.51
228.91	758.75	230.39	759.38	231.21	759.73	231.34	759.73	232.37	759.76
233.53	759.67	236.93	759.41	239.86	759.19	253.7	758.11	255.71	758.51
262.25	759.84	262.88	759.94	262.91	759.95	263.11	760	263.29	760.1
266.96	762	269.75	763.69	270.28	764	270.7	764.24	273.08	766
274.12	766.94	275.46	768	276.7	768.88	278.21	770	281.03	772
281.04	772	281.04	772.01	283.2	773.77	283.55	774	284.82	775.06
285.88	776	286.48	776.71	288.01	778	289.31	779.1	290.28	780
290.92	780.55	292.24	782	294.18	783.59	294.77	784	295.35	784.42
297.72	786	299.94	787.38	300	787.42				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	138.63	.04	169.16	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	138.63	169.16		72.69	84.9	91.41	.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 978.95

INPUT

Description:

Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	786.4	1.73999	785.626	480011	783.6111	67001	781.4913	45001	780.79
15.09	780.1126	24001	775.53	28.44	774.6440	82001	769.4641	78999	769.06
48.3	766.28	55.14	763.36	55.27	763.3157	67999	760.19	60.8	757.83

NutterFork.rep									
60.96001	755.5861	75999	755.44	63.62	75564.03999	754.79	65.67	754.28	
67.00999	754	68.66	753.9788	49001	752.6595	64999	752.21	99.5	752
101.23	750.28	101.66	750	103.22	750	106.79	750	108.06	750
108.24	750	115.05	750	118.55	750.01	123.5	750.03	126.21	750.02
128.86	750.01	131.75	750.01	132.54	750	133.86	749.89	135.03	749.76
139.13	749.14	141.85	748.03	142.32	747.88	143.63	747.94	150	748.39
159.84	749.09	161.94	749.91	162.17	750	163.3	750.47	164.84	751.04
165.87	751.34	166.58	751.46	170.18	752	171.94	752.47	176.91	754
180.6	755.91	180.82	756	181.01	756.1	184.41	758	187.51	759.12
189.28	760	194.28	761.44	196.35	762	200.72	762	201.91	762
201.99	762	202.39	762	202.53	762.07	202.81	762.21	203.4	762.23
203.82	762.25	210.15	761.68	210.35	761.67	218.14	760.89	225.54	760.14
228.01	760.72	233.83	762	234.38	762.34	237.15	764	239.64	765.56
240.32	766	242.2	767.33	243.15	768	243.7	768.46	245.67	770
247.92	771.62	248.45	772	248.55	772.11	250.74	774	252.1	775.93
252.14	776	252.3	776.26	252.98	777.16	253.44	778	253.79	778.65
254.38	780	255.39	781.73	255.6	782	255.8	782.2	257.98	784
258.71	784.6	260.53	786	262.55	787.35	263.85	788	268.58	789.79
269.33	790	275	791.26						

Manning's n Values	num=	3
Sta n Val Sta	n Val Sta n Val	
0 .1 132.54	.04 162.17	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
132.54	162.17	56.24	66.78	70.61	.1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork
 RS: 912.17

INPUT

Description:

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	791.87	10.73	8001	785.78	11.64	001	785.29	18.30	002
25.34	777.98	27.39	001	776.81	36.04	001	771.54	44.06	001
47.12	764.24	49.92	001	756.15	50.35	002	754.51	62.00	001
54.16	753.54	57.00	002	753.49	58.74	002	753.44	61.92	001
72.64	752.95	84.86	002	752.44	88.38	002	752.39	95.07	001
98.35	750	100.29	749.99	101.02	749.98	103.88	749.88	106.45	749.82
112.38	749.74	118.52	748.78	118.93	748.68	120.99	748	121.08	747.94
121.75	747.68	129.31	747.79	133.88	747.76	147.25	747.66	147.91	748
147.97	748.03	148.38	748.25	151.67	750	152.53	750.39	153.47	750.82
153.55	750.85	153.6	750.88	154.21	751.16	156.67	752	158.1	752.36
163.88	753.93	164.15	754	164.41	754.01	164.45	754.01	164.69	754.02
172.92	754.55	192.62	756	196.94	757.95	197.07	758	197.4	758.11
202.9	760	204.28	760.26	206.13	760.61	208.5	761.78	209.54	762.3
210.24	762.33	210.55	762.34	211.78	762.23	212.91	762.12	213.94	762.02
217.04	761.69	230.96	760.3	235.16	761.2	239.24	762	241.08	763.33
242.06	764	244.29	765.73	244.65	766	245.63	766.77	247.22	768
247.51	768.24	249.75	770	251.89	771.68	252.36	772	254.71	773.88
254.91	774	255.38	774.19	259.2	776	263.93	777.44	265.56	778
268.06	779.23	270.73	780	271.47	780.34	275.26	782	278.42	782.9
280.79	783.5	281.65	783.76	282.35	784	283.64	784.59		

Manning's n Values	num=	3
Sta n Val Sta	n Val Sta n Val	
0 .1 112.38	.04 151.67	.1

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

112.38 151.67

NutterFork.rep
98.48 82.36 53.47

.1 .3

CROSS SECTION

RIVER: Nutter Fork
REACH: Nutter Fork RS: 829.81

INPUT

Description:

Station Elevation Data		num= 76		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	789.931	0.050003	789.236	630005	785.35	12.03	781.69	17.3	778.03		
23.00999	774	28.88	769.66	32.3	767.1733	33.99001	766.0136	36.10001	761.85		
39.78999	755.7	39.88	755.6	40.14	755.1441	41.74001	754	43.98	752.87		
45.64999	752	48.31	751.4757	57.10001	750.06	57.45	750.01	57.52	749.91		
59.22	749.06	60.73	748.21	61.08	748	61.55	747.6562	62.49001	746.94		
75	747.0381	71001	747.08	88.55	747.13	91.27	747.73	92.77	748		
93.17	748.13	93.19	748.13	93.5	748.19	102.62	750	106.91	751.89		
107.16	752	107.95	752.06	110.08	752.16	145.32	753.99	145.57	753.99		
147.62	754	161.06	754.91	178	756	181.29	757.48	182.4	758		
182.6	758.15	185.3	759.91	185.43	760	185.51	760.02	187.22	760.44		
187.79	760.57	188.68	761	189.32	761.31	189.41	761.35	189.55	761.42		
189.89	761.43	190.58	761.45	190.63	761.44	191.57	761.34	196.72	761		
209.08	760.02	213.03	760.88	218.02	762	218.4	762.25	221.05	764		
222.65	765.05	224.52	766	227.98	767.65	228.82	768	229.43	768.21		
237.46	770	238.18	770.24	243.29	772	246.5	773.02	249.19	774		
250	774.25										

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.1	57.45	.04	102.62	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	57.45	102.62		91.7	81.76	56.18	.1	.3

CROSS SECTION

RIVER: Nutter Fork
REACH: Nutter Fork RS: 748.05

INPUT

Description:

Station Elevation Data		num= 106		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	788.381	300003	787.411	369995	787.3611	11.14999	780.85	20.41	775.34		
20.99001	775	21.88	775.21	30.58	778	31.11	776.47	31.38	776		
32.28	775.19	33.73	774	35.49001	772.23	35.77	772	38.08	770.01		
38.09	770	38.27	769.8540	39999	768.0940	40.50999	768	40.75	767.77		
42.3	766.52	42.61	766.33	42.8	766	44.12	764.49	44.62	764		
44.73	763.85	45.94	762	46.53	761.09	47.03	760	47.7	758.96		
48.13	758	48.69	756.77	49.03	756	49.85001	754.6	50.16	754		
50.89999	752.3951	07001	752	51.34	751.56	52.17	750.2	52.45	749.52		
52.53999	749.82	52.59	750	55.99001	748.4	56.83	748	57.59	747.76		
59.14999	747.18	59.77	746.94	75	747.04	80.13	747.07	92.28	747.13		
93.14	747.7893	42999	748	96.13	749.5496	99001	750	98.03	750.6		
99.64	751.52	101.93	751.66	104.11	751.68	107.78	751.75	114.38	752		
119.9	752.29	122.78	752.41	130	752.73	137.34	753.08	146.92	753.51		
154.56	753.96	156.92	753.98	157.94	753.98	158.63	754	158.85	754.02		
161.34	754.38	170.36	756	172.14	757.08	173.41	758	175.1	758.84		
176.19	759.24	177.25	759.84	178.22	760	180.71	760.1	182.12	760.18		
182.58	760.19	182.79	760.2	182.85	760.19	185.84	760.09	198.5	759.71		

NutterFork.rep

201.92	759.55	202.49	759.43	204.03	759.34	206.58	759.06	207.31	759.57
207.99	760	210.48	761.39	211.58	762	215.36	763.68	216.04	764
217.5	764.45	223.09	766	224.04	766.3	228.84	768	230.83	768.7
234.17	770	236.4	770.93	239.1	772	244.46	773.91	244.72	774
250	775.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	52.59	.0496	99001	.1

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

52.59	99.00	91.77	88.17	82.52	.1	.3
-------	-------	-------	-------	-------	----	----

CROSS SECTION

RIVER: Nutter Fork RS: 659.88
 REACH: Nutter Fork

INPUT
 Description:
 Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	801.36	4899902	801.14	1409988	800.65	5319992	798.76	9599991	796.55
10.59999	796.09	12.22	795.24	2070999	790.58	2312999	791.65	2514999	792.44
27.78999	79628.04	999	79628.17	999	796	28.87	79630.03	999	796
30.51999	79631.17	999	79631.37	999	795.91	35.45	79437.09	999	793.17
39.14	79241.09	999	790.48	4175999	790	42.2	789.55	43.5	788
44.62	786.68	45.28	786	45.81	785.32	46.92	78448.37	999	782.32
48.62999	782	48.84	781.76	5026999	78050.40	999	779.83	5128999	778.94
52.12999	778	52.28	777.84	5384999	77654.25	999	775.62	5576999	774
56.98999	772.83	57.73	77258.53	999	770.9	59.28	77060.67	999	768.45
61.04999	76862.54	999	766.13	6265999	76662.73	999	765.89	64.42	764
64.97	763.32	65.98	762	67.19	760.46	67.5	760	67.56	759.89
68.84	75868.95	999	757.78	70.03	756	70.94	754.35	71.12	754
71.19	753.93	71.64	753.29	72.53	752	72.56	751.91	72.56	751.37
72.61	751.6	74.37	750.01	74.37	75074.48	999	749.92	77.12	748
77.84999	747.39	78.20	747.09	78.39	746.94	95.22	747.19	95.50	747.19
95.59	747.21	95.64	747.22	96.58	747.39	99.89	748	101.19	748
105.61	748	110.03	748	110.37	747.91	114.09	746.81	121.47	747.03
124.31	747.13	124.59	747.63	124.84	748	126.62	749.51	127.17	750
127.33	750.42	127.57	750.77	129.67	751.36	131.19	751.73	132.34	752
142.38	753.8	143.01	753.91	144.22	754	145.46	754.01	146.89	754
148.02	753.99	148.2	753.99	150.48	753.98	150.87	753.98	153.29	753.96
156.45	753.93	157.59	753.94	164.39	754	172.38	755.58	174.39	756
175.07	756.16	180.61	757.61	180.64	757.59	185.82	757.66	198.23	758.02
198.43	757.92	201.43	757.35	206.85	756.33	207.35	756.85	208.53	757.84
208.69	758	208.9	758.24	210.7	760	212.1	761.2	213.13	762
218.54	763.58	219.88	764	222.06	764.54	227.57	766	231.35	767.2
234	768	238.58	769.48	240.25	770	242.42	770.59	244.12	771.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.174	37999	.045	127.17	.1

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

74.37	99.9	115.1	118.84	119.69	.1	.3
-------	------	-------	--------	--------	----	----

CROSS SECTION

RIVER: Nutter Fork RS: 541.04
 REACH: Nutter Fork

NutterFork.rep

INPUT

Description:

Station Elevation Data			num=	81					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	773.642	740005	772.775	039993	7726.850006	771.410	850001	770	
12.25999	769.4916	64999	76816.74001		767.97	17.23	767.821	74001	766.24
22.48	766	24.63	765.24	28.52	76431.03999		762.832	67999	762
33.66	761.4236	17999	760	38.44	758.6239	42999	758	39.84	757.63
41.94	75643.96001		754.3	44.28	754	46.27	752.27	46.59	752
46.7	751.9647	96001	751.57	52.64	750.1353	00999	750	56.22	749.62
58.7	749.24	61.45	748.2462	07001	748	63.89	747.3464	89999	746.98
65.50999	746.71	65.52	746.7365	92999	746.71	66.98	746.7	75	746.59
85.12	746.46	87.18	747.99	87.2	748	88.17	748.81	89.04	749.36
94.46	749.84	95.51	750	107.41	750.74	125.31	752	126.62	752.15
131.07	752.68	132.06	752.77	132.6	752.84	133.95	752.95	136.84	753.17
140.63	753.5	151.81	754.51	159.12	754.26	160.05	754.23	160.08	754.24
160.14	754.23	160.54	754.45	161.49	755.01	162.99	756	166.12	757.85
166.36	758	169.52	759.58	170.36	760	171.22	760.38	174.58	762
177.11	763.12	179.13	764	184.09	765.96	184.18	766	184.4	766.1
185.6	766.51	189.99	768	192.27	768.47	196.45	770	199.63	771.29
200	771.42								

Manning's n Values			num=	3		
Sta	n Val	Sta	n Val	Sta	n Val	
0	.1	58.7	.035	89.04	.035	

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	58.7	89.04		92.02	94.93	96.69		.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 446.11

INPUT

Description:

Station Elevation Data			num=	87					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	764.491	270004	7642.340012		763.596	190002	762	12.16	760
12.17001	76012.18001		760	19.27	75825.95001		756.6529	92001	756
33.62001	755.636	73001	755.3	42.8	754.67	48.94	754.0149	23001	754
61.69	752.18	62.89	752	63.44	751.93	70.39	751.0573	71001	750.72
76.08	750.4879	95001	750	81.3	749.5284	42001	74884.49001		747.96
85.46001	747.45	89.41	746.31	90.37	74691.06001		745.77	92.73	745.32
96.67001	745.31	100.39	745.21	107.38	745.01	108.9	745.7	109.67	746
111.06	746.52	112.05	746.91	112.79	747.16	113.82	747.64	114.73	748
116.19	748.61	120	750	124.54	750.34	130.39	750.88	131.1	750.95
138.06	751.47	152.05	752.69	158.46	752.34	159.65	752.24	162.09	752
162.84	752	163.95	751.65	164.3	751.63	164.58	751.62	164.69	751.55
164.79	751.63	165.12	751.88	165.25	752.33	167.89	754	169.2	754.93
170.65	756	172.47	757.43	173.17	758	174.96	759.41	175.72	760
175.95	760.19	178.24	762	180.41	763.6	181.22	764	182.85	765.01
184.45	766	185.76	766.83	187.32	768	189.89	769.66	190.39	770
190.72	770.16	194.92	772	196.9	772.85	199.37	774	201.27	774.69
204.82	776	207.58	777.21	209.57	778	211.43	778.61	216.08	780
218.08	780.71	218.35	780.82						

Manning's n Values			num=	3		
Sta	n Val	Sta	n Val	Sta	n Val	
0	.03579	95001	.035	120	.035	

NutterFork.rep

Bank Sta: Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
79.95001	120	54.09	83.85	111.7	.1	.3
Ineffective Flow	num=	1				
Sta L Sta R	Elev	Permanent				
152.05 218.35	780	T				

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 362.26

INPUT

Description:

Station Elevation Data	num=	102							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
0 761.06 7599945 760.783 139999 7604.830002 759.56 12.09 758									
17.14 756.63 20.3 756 28.61 754.17 29.3 754 32.63 753.74									
37.41 753.39 56.11 752 56.44 752 57.19 752 57.8 752									
58.91 752 59.59 752 61.7 752 62.95 75263.53999 752									
64.42 75266.21001 752 66.83 752 69.94 752 70.91 752									
73.17 751.44 78.45 750 82.19 748.01 82.22 748 82.23 747.99									
82.99 747.55 83.45 747.26 84.8 746.85 86.3 746.41 87.71 746									
89.23 745.54 91.76 744.81 100 744.79 106.53 744.77 107.68 744.78									
107.91 744.89 108.28 745.06 110.39 746 111.15 746.33 112.62 747									
113.11 747.39 113.65 747.72 114.1 748 117.51 749.99 117.52 750									
117.53 750.01 120.46 752 120.89 752.27 121.89 752.98 133.16 753.59									
138.11 753.83 138.55 753.88 140.31 753.96 141.05 754 145.15 754.2									
147.05 754.3 147.83 754.93 148.82 755.62 149.36 756 150.47 756.76									
152.25 758 155.1 759.93 155.23 760 155.68 760.29 158.54 762									
159.14 762.33 162.9 764 165.49 765.51 166.54 766 170.02 767.99									
170.04 768 170.06 768.01 170.11 768.03 174.42 770 174.8 770.02									
175.38 770.05 175.42 770.05 175.93 770.05 180.31 770.85 184.06 772									
187.62 773.43 188.48 774 188.97 774.6 190.68 776 191.57 777.07									
192.15 778 193.18 779.74 193.31 780 193.36 780.08 194.27 782									
194.5 782.49 195.29 784 196.16 785.01 197.01 786 197.66 786.63									
198.92 788 200 789.09									

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .05 78.45 .03 117.52 .1		

Bank Sta: Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
78.45	117.52	74.17	82.16	89.53	.1	.3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 280.1

INPUT

Description:

Station Elevation Data	num=	108							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
0 765.16 .00999 765.16 3.25 7646.190002 762.969 100006 762									
14.23 760.5315.99001 760 17.3 759.65 23.47 75827.07001 757.17									
32.39 756 35.62 755.27 41.37 75449.78999 752.33 51.13 752.18									
52.28 752.02 52.75 752.02 54.23 752 54.61 751.98 55.36 751.99									
55.63 751.99 56.02 751.9557.39999 751.88 58.09 751.8258.67999 751.76									
60.42 751.5766.74001 750.8 72.99 750.03 73.36 750 75.32 749.6									
79.85 748 80.11 747.92 80.98 747.52 81.54 747.3 82.95 746.65									
84.61 746 85.69 745.59 87.98 744.69 100 744.73 101.24 744.73									

NutterFork.rep										
112.09	744.78	114.57	745.97	114.63	746	115.09	746.25	118.43	748	
118.91	748.29	119.05	748.26	120.56	749.67	120.88	750	121.37	750.46	
123.04	752	124.14	753.12	125.13	754	127.31	755.43	128.2	756	
128.43	756.01	128.66	756.02	129.54	756.05	130.64	756.27	132.78	756.58	
133.61	756.65	134.88	756.81	149.24	757.16	150.36	757.2	150.43	757.2	
151.3	757.23	154.34	757.42	155.4	757.48	155.42	757.47	155.47	757.54	
156.05	758	157.82	759.16	159.49	760	161.25	761.29	162.07	762	
163.74	763.71	164.01	764	164.56	764.63	165.88	766	167.73	767.69	
168.09	768	168.23	768.15	169.87	770	171.46	771.56	171.89	772	
172.97	772.99	174.16	774	176.79	775.97	176.84	776	176.97	776.07	
180.18	778	182.19	779.4	183.1	780	183.32	780.24	185.85	782	
188.01	783.89	188.13	784	190.11	785.98	190.13	786	190.28	786.16	
191.85	788	192.13	788.29	193.71	790	194.66	790.7	196.17	792	
198.17	793.38	199.12	794	200	794.66					

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 73.36 .035 120.88 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 73.36 120.88 92.74 84.21 75.19 .1 .3

CROSS SECTION

RIVER: Nutter Fork
 REACH: Nutter Fork RS: 195.89

INPUT

Description:

Station Elevation Data num= 97											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	769.351	460007	768.753	360001	7688.029999	766.068	160004	766			
8.339996	765.9212	85001	76417.53999	762.16	17.94	762	18.73	761.68			
22.74001	760	25.27	759.0127	89999	758	31.48	756.39	32.39	756		
33.66	755.3236	24001	754	38.34	752.71	39.56	752	41.27	751.21		
43.85001	750	66.92	748.75	80.61	748	80.68	748.01	81.68	747.99		
83.36	746.42	84.06	746	84.44	745.8	85.99	744.69	100	744.73		
112.46	744.77	113.67	744.78	113.71	744.8	113.88	744.93	115.33	746		
117.58	747.54	118.23	748	118.72	748.37	120.29	749.54	120.87	749.96		
120.98	749.93	121.01	750.04	122.16	751.21	122.97	752	124.13	753.18		
124.93	754	127.26	755.81	127.5	756	133.56	757.93	133.77	758		
135.08	758.09	139.09	758.23	149.2	757.64	153.49	757.41	155.64	757.35		
158.59	757.75	158.63	757.59	159.11	758.01	159.84	758.48	160.6	758.93		
162.08	760	163.4	760.98	164.52	762	166.27	763.35	167.09	764		
168.11	764.8	169.53	766	170.42	766.68	171.83	768	173.91	769.8		
174.14	770	174.64	770.42	176.71	772	177.36	772.51	179.51	774		
180.74	775.12	181.66	776	182.49	776.96	183.36	778	184.51	779.12		
185.16	780	185.93	780.77	187.24	782	188.78	783.33	189.6	784		
190.09	784.49	191.92	786	194.41	787.89	194.53	788	194.65	788.1		
196.97	790	197.01	790.03	199.07	791.61	199.57	791.99	199.57	792		
199.59	792.01	200	792.19								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .1 81.68 .04 118.23 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 81.68 118.23 88.84 100.05 110.91 .1 .3

CROSS SECTION

NutterFork.rep

RIVER: Nutter Fork
 REACH: Nutter Fork

RS: 95.84

INPUT

Description:

Station Elevation Data		num= 97		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	772.931	559998	772.392	360001	7725.080	002	771.410	75999	770		
11.88	769.43	14.31	768	15.45	767.31	17.69	766	19.77	764.73		
21.14999	764	22.60001	763.07	24.19	762	26.45	760.45	27.14	760		
27.60001	759.62	30.14999	758	31.96001	756.71	32.74001	756	33.36	755.39		
34.92	754	36.38	752.72	37.25999	752	39.36	750.78	40.67	750		
47.14999	749.36	54.05	748.71	62.06	748.03	63.14	748.02	63.42999	748.01		
63.64	748.01	64.82001	748	64.91	748	65.17	748	71.84	747.35		
82.74001	746.07	83.32001	746	83.63	746.03	83.92999	746.04	84.49001	745.84		
89.83	744.69	100	744.68	110.02	744.68	112.05	744.69	112.41	744.89		
113.02	745.31	113.74	746	114.65	746.67	116.09	747.97	116.36	747.97		
116.88	748	121.67	748.93	127.21	750	131.28	750.96	137.35	752		
140.57	753.81	140.89	754	141.02	754.1	142	754.76	143.48	755.81		
143.8	756	150.03	756.92	151.81	757.17	154.27	757.52	172.62	756.1		
173.55	756.03	173.56	756.03	173.97	756	174.07	755.99	176.83	755.77		
178.2	755.68	178.29	755.5	178.47	755.76	178.83	756	181.39	757.38		
182.59	758	184.14	758.86	186.12	760	189.18	761.9	189.33	762		
189.4	762.06	192	764	192.65	764.5	194.63	766	197.57	767.78		
197.93	768	201.21	769.61	202.03	770	205.6	771.74	206.16	772		
207.63	772.58	210.9	774	213.12	774.7	217.48	776	217.8	776.09		
223.33	778	225	778.69								

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	65.17	.04	116.09	.1

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	65.17	116.09	.1	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Nutter Fork

Reach	River Sta.	n1	n2	n3
Nutter Fork	2253.15	.1	.035	.05
Nutter Fork	2137.23	.1	.03	.05
Nutter Fork	2037.52	.1	.035	.05
Nutter Fork	1948.71	.1	.04	.07
Nutter Fork	1858.54	.1	.04	.07
Nutter Fork	1761.23	.1	.035	.07
Nutter Fork	1660.52	.1	.035	.07
Nutter Fork	1550.83	.1	.035	.07
Nutter Fork	1462.99	.1	.04	.1
Nutter Fork	1359.11	.1	.04	.1
Nutter Fork	1277.06	.1	.04	.1
Nutter Fork	1171	.1	.035	.1
Nutter Fork	1063.85	.1	.04	.1
Nutter Fork	978.95	.1	.04	.1
Nutter Fork	912.17	.1	.04	.1
Nutter Fork	829.81	.1	.04	.1
Nutter Fork	748.05	.1	.04	.1
Nutter Fork	659.88	.1	.045	.1
Nutter Fork	541.04	.1	.035	.035
Nutter Fork	446.11	.035	.035	.035

		NutterFork.rep			
Nutter Fork	362.26	.05	.03	.1	
Nutter Fork	280.1	.1	.035	.1	
Nutter Fork	195.89	.1	.04	.1	
Nutter Fork	95.84	.1	.04	.1	

SUMMARY OF REACH LENGTHS

River: Nutter Fork

Reach	River Sta.	Left	Channel	Right
Nutter Fork	2253.15	101.2	115.92	128.19
Nutter Fork	2137.23	109.88	99.71	90.23
Nutter Fork	2037.52	60.01	88.81	103.28
Nutter Fork	1948.71	95.93	90.17	53.52
Nutter Fork	1858.54	95.11	97.31	94.39
Nutter Fork	1761.23	103.05	100.71	94.04
Nutter Fork	1660.52	104.94	109.69	121.52
Nutter Fork	1550.83	101.06	87.84	74.77
Nutter Fork	1462.99	75.28	103.88	103.13
Nutter Fork	1359.11	71.16	82.05	93.82
Nutter Fork	1277.06	110.21	106.06	93.42
Nutter Fork	1171	130.47	107.15	75.81
Nutter Fork	1063.85	72.69	84.9	91.41
Nutter Fork	978.95	56.24	66.78	70.61
Nutter Fork	912.17	98.48	82.36	53.47
Nutter Fork	829.81	91.7	81.76	56.18
Nutter Fork	748.05	91.77	88.17	82.52
Nutter Fork	659.88	115.1	118.84	119.69
Nutter Fork	541.04	92.02	94.93	96.69
Nutter Fork	446.11	54.09	83.85	111.7
Nutter Fork	362.26	74.17	82.16	89.53
Nutter Fork	280.1	92.74	84.21	75.19
Nutter Fork	195.89	88.84	100.05	110.91
Nutter Fork	95.84			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Nutter Fork

Reach	River Sta.	Contr.	Expan.
Nutter Fork	2253.15	.1	.3
Nutter Fork	2137.23	.1	.3
Nutter Fork	2037.52	.1	.3
Nutter Fork	1948.71	.1	.3
Nutter Fork	1858.54	.1	.3
Nutter Fork	1761.23	.1	.3
Nutter Fork	1660.52	.1	.3
Nutter Fork	1550.83	.1	.3
Nutter Fork	1462.99	.1	.3
Nutter Fork	1359.11	.1	.3
Nutter Fork	1277.06	.1	.3
Nutter Fork	1171	.1	.3
Nutter Fork	1063.85	.1	.3
Nutter Fork	978.95	.1	.3
Nutter Fork	912.17	.1	.3

NutterFork.rep

Nutter Fork	829.81	.1	.3
Nutter Fork	748.05	.1	.3
Nutter Fork	659.88	.1	.3
Nutter Fork	541.04	.1	.3
Nutter Fork	446.11	.1	.3
Nutter Fork	362.26	.1	.3
Nutter Fork	280.1	.1	.3
Nutter Fork	195.89	.1	.3
Nutter Fork	95.84	.1	.3

Profile Output Table - Standard Table 1

Reach E.G. Elev (ft)	River Sta E.G. Slope (ft/ft)	Profile Vel Chnl (ft/s)	Q Total Flow Area (sq ft)	Min Ch El Top width (ft)	W.S. Elev Froude # Chl (ft)	Crit W.S. (ft)
Nutter Fork	2253.15	2 yr	513.00	753.99	757.64	
758.20	0.004798	6.06	89.36	34.61	0.61	
Nutter Fork	2253.15	10 yr	1114.00	753.99	759.01	
760.19	0.006262	8.88	141.19	66.87	0.74	
Nutter Fork	2253.15	25 yr	1487.00	753.99	759.48	759.09
761.17	0.007850	10.63	161.21	78.18	0.85	
Nutter Fork	2253.15	50 yr	1792.00	753.99	759.75	759.66
761.93	0.009444	12.09	173.73	86.38	0.94	
Nutter Fork	2253.15	100 yr	2120.00	753.99	760.41	760.41
762.72	0.008673	12.55	208.97	111.78	0.92	
Nutter Fork	2137.23	2 yr	513.00	753.99	757.49	
757.80	0.001818	4.53	118.68	46.15	0.44	
Nutter Fork	2137.23	10 yr	1114.00	753.99	758.97	
759.62	0.002326	6.59	199.84	63.34	0.53	
Nutter Fork	2137.23	25 yr	1487.00	753.99	759.53	
760.43	0.002765	7.75	237.46	69.20	0.59	
Nutter Fork	2137.23	50 yr	1792.00	753.99	759.93	
761.02	0.003103	8.61	265.81	74.38	0.64	
Nutter Fork	2137.23	100 yr	2120.00	753.99	760.32	
761.62	0.003414	9.44	295.98	79.71	0.68	
Nutter Fork	2037.52	2 yr	513.00	753.87	757.28	
757.59	0.002471	4.44	120.72	56.20	0.44	
Nutter Fork	2037.52	10 yr	1114.00	753.87	758.79	
759.33	0.002788	6.12	243.29	92.10	0.50	
Nutter Fork	2037.52	25 yr	1487.00	753.87	759.37	
760.07	0.003149	7.04	298.14	95.45	0.54	
Nutter Fork	2037.52	50 yr	1792.00	753.87	759.80	
760.62	0.003388	7.69	339.12	98.13	0.57	
Nutter Fork	2037.52	100 yr	2120.00	753.87	760.20	
761.17	0.003675	8.39	380.66	107.27	0.60	
Nutter Fork	1948.71	2 yr	513.00	753.52	756.44	756.25
757.16	0.009821	7.23	103.48	66.88	0.76	
Nutter Fork	1948.71	10 yr	1114.00	753.52	758.01	757.64
758.92	0.007812	8.67	230.44	110.22	0.73	
Nutter Fork	1948.71	25 yr	1487.00	753.52	758.81	
759.68	0.006575	8.89	320.06	115.94	0.69	
Nutter Fork	1948.71	50 yr	1792.00	753.52	759.36	

		NutterFork.rep			
760.24	0.006067	9.14	384.98	120.02	0.67
Nutter Fork	1948.71	100 yr	2120.00	753.52	759.85
760.77	0.005875	9.51	445.31	123.87	0.67
Nutter Fork	1858.54	2 yr	513.00	752.76	756.40
756.61	0.002505	3.61	144.85	63.96	0.38
Nutter Fork	1858.54	10 yr	1114.00	752.76	758.10
758.41	0.002136	4.58	292.72	108.32	0.38
Nutter Fork	1858.54	25 yr	1487.00	752.76	758.88
759.23	0.002027	4.96	378.28	111.71	0.38
Nutter Fork	1858.54	50 yr	1792.00	752.76	759.42
759.80	0.001998	5.26	439.67	114.08	0.39
Nutter Fork	1858.54	100 yr	2120.00	752.76	759.92
760.34	0.002030	5.60	496.50	116.38	0.39
Nutter Fork	1761.23	2 yr	513.00	752.57	755.50
756.17	0.007459	6.61	81.75	43.46	0.74
Nutter Fork	1761.23	10 yr	1114.00	752.57	756.82
757.97	0.007554	8.86	158.20	74.32	0.80
Nutter Fork	1761.23	25 yr	1487.00	752.57	757.59
758.81	0.006569	9.34	223.06	93.54	0.77
Nutter Fork	1761.23	50 yr	1792.00	752.57	758.25
759.42	0.005500	9.36	290.40	108.46	0.72
Nutter Fork	1761.23	100 yr	2120.00	752.57	758.79
759.97	0.005063	9.58	350.28	114.17	0.70
Nutter Fork	1660.52	2 yr	513.00	752.21	754.90
755.44	0.006228	5.92	88.57	41.08	0.67
Nutter Fork	1660.52	10 yr	1114.00	752.21	756.13
757.21	0.007183	8.39	144.49	54.03	0.78
Nutter Fork	1660.52	25 yr	1487.00	752.21	756.68
758.07	0.007852	9.62	178.74	72.18	0.83
Nutter Fork	1660.52	50 yr	1792.00	752.21	756.99
758.69	0.008782	10.67	202.61	82.43	0.89
Nutter Fork	1660.52	100 yr	2120.00	752.21	757.51
759.28	0.008108	11.03	249.76	98.90	0.87
Nutter Fork	1550.83	2 yr	513.00	751.72	754.32
754.76	0.005726	5.29	97.22	46.89	0.64
Nutter Fork	1550.83	10 yr	1114.00	751.72	755.72
756.45	0.005023	6.92	168.32	56.07	0.65
Nutter Fork	1550.83	25 yr	1487.00	751.72	756.37
757.25	0.004883	7.63	235.24	131.42	0.66
Nutter Fork	1550.83	50 yr	1792.00	751.72	756.89
757.78	0.004407	7.84	304.80	136.06	0.64
Nutter Fork	1550.83	100 yr	2120.00	751.72	757.41
758.30	0.003992	8.00	377.54	145.18	0.62
Nutter Fork	1462.99	2 yr	513.00	750.78	754.18
754.38	0.002392	3.53	145.45	53.09	0.37
Nutter Fork	1462.99	10 yr	1114.00	750.78	755.71
756.04	0.002379	4.71	294.03	117.21	0.40
Nutter Fork	1462.99	25 yr	1487.00	750.78	756.42
756.81	0.002376	5.22	381.77	128.10	0.41
Nutter Fork	1462.99	50 yr	1792.00	750.78	756.92
757.36	0.002404	5.59	447.88	137.54	0.42
Nutter Fork	1462.99	100 yr	2120.00	750.78	757.43
757.92	0.002410	5.94	522.19	151.06	0.43

NutterFork.rep

Nutter Fork	1359.11	2 yr	513.00	750.11	753.88	
754.10	0.002782	3.77	136.25	52.12	0.40	
Nutter Fork	1359.11	10 yr	1114.00	750.11	755.43	
755.78	0.002581	4.90	294.10	115.23	0.42	
Nutter Fork	1359.11	25 yr	1487.00	750.11	756.14	
756.55	0.002556	5.40	379.47	128.46	0.43	
Nutter Fork	1359.11	50 yr	1792.00	750.11	756.65	
757.11	0.002564	5.77	442.85	137.30	0.43	
Nutter Fork	1359.11	100 yr	2120.00	750.11	757.13	
757.65	0.002634	6.19	507.84	154.06	0.45	
Nutter Fork	1277.06	2 yr	513.00	749.65	753.60	
753.87	0.002874	4.16	130.05	51.34	0.42	
Nutter Fork	1277.06	10 yr	1114.00	749.65	755.03	
755.52	0.003374	5.82	260.00	112.04	0.48	
Nutter Fork	1277.06	25 yr	1487.00	749.65	755.72	
756.29	0.003423	6.44	338.92	117.85	0.50	
Nutter Fork	1277.06	50 yr	1792.00	749.65	756.20	
756.84	0.003486	6.89	396.57	121.52	0.51	
Nutter Fork	1277.06	100 yr	2120.00	749.65	756.67	
757.38	0.003533	7.32	455.17	124.79	0.52	
Nutter Fork	1171	2 yr	513.00	749.44	753.12	
753.52	0.003561	5.09	122.39	99.21	0.53	
Nutter Fork	1171	10 yr	1114.00	749.44	754.62	
755.17	0.003224	6.39	281.02	109.75	0.54	
Nutter Fork	1171	25 yr	1487.00	749.44	755.31	
755.94	0.003214	7.03	356.95	111.58	0.55	
Nutter Fork	1171	50 yr	1792.00	749.44	755.77	
756.48	0.003320	7.56	408.15	112.86	0.57	
Nutter Fork	1171	100 yr	2120.00	749.44	756.21	
757.01	0.003443	8.10	458.36	115.57	0.58	
Nutter Fork	1063.85	2 yr	513.00	749.44	751.96	751.85
752.80	0.014024	7.42	78.12	55.88	0.88	
Nutter Fork	1063.85	10 yr	1114.00	749.44	753.25	753.18
754.51	0.012317	9.43	163.22	79.74	0.89	
Nutter Fork	1063.85	25 yr	1487.00	749.44	753.97	753.83
755.32	0.010739	9.97	227.22	98.48	0.85	
Nutter Fork	1063.85	50 yr	1792.00	749.44	754.48	754.34
755.87	0.009840	10.30	280.33	108.49	0.83	
Nutter Fork	1063.85	100 yr	2120.00	749.44	754.97	754.73
756.40	0.009234	10.65	335.49	117.75	0.82	
Nutter Fork	978.95	2 yr	513.00	747.88	751.21	
751.76	0.009301	6.35	110.92	65.13	0.72	
Nutter Fork	978.95	10 yr	1114.00	747.88	752.96	
753.64	0.005964	7.32	241.55	89.66	0.63	
Nutter Fork	978.95	25 yr	1487.00	747.88	753.74	
754.51	0.005572	7.94	316.92	103.89	0.63	
Nutter Fork	978.95	50 yr	1792.00	747.88	754.25	
755.10	0.005480	8.41	373.08	111.61	0.64	
Nutter Fork	978.95	100 yr	2120.00	747.88	754.77	
755.67	0.005305	8.79	431.03	114.28	0.63	
Nutter Fork	912.17	2 yr	513.00	747.66	751.06	

NutterFork.rep					
751.34	0.003342	4.33	133.59	57.36	0.45
Nutter Fork	912.17	10 yr	1114.00	747.66	752.84
753.30	0.003034	5.66	250.67	84.48	0.46
Nutter Fork	912.17	25 yr	1487.00	747.66	753.61
754.18	0.003132	6.36	324.68	111.14	0.48
Nutter Fork	912.17	50 yr	1792.00	747.66	754.13
754.77	0.003162	6.80	384.12	116.08	0.49
Nutter Fork	912.17	100 yr	2120.00	747.66	754.64
755.34	0.003208	7.22	444.68	123.85	0.50
Nutter Fork	829.81	2 yr	513.00	746.94	750.91
751.10	0.001952	3.52	148.96	52.90	0.35
Nutter Fork	829.81	10 yr	1114.00	746.94	752.72
753.07	0.002003	4.80	260.83	76.53	0.38
Nutter Fork	829.81	25 yr	1487.00	746.94	753.49
753.93	0.002149	5.46	325.92	92.85	0.40
Nutter Fork	829.81	50 yr	1792.00	746.94	753.99
754.52	0.002302	5.98	375.53	103.97	0.42
Nutter Fork	829.81	100 yr	2120.00	746.94	754.47
755.08	0.002444	6.47	428.60	113.56	0.44
Nutter Fork	748.05	2 yr	513.00	746.94	750.76
750.95	0.001828	3.47	148.88	46.48	0.33
Nutter Fork	748.05	10 yr	1114.00	746.94	752.54
752.90	0.002034	4.86	248.60	74.82	0.38
Nutter Fork	748.05	25 yr	1487.00	746.94	753.28
753.75	0.002243	5.59	310.05	91.24	0.41
Nutter Fork	748.05	50 yr	1792.00	746.94	753.75
754.32	0.002448	6.15	355.99	100.79	0.43
Nutter Fork	748.05	100 yr	2120.00	746.94	754.21
754.87	0.002648	6.70	404.16	110.10	0.45
Nutter Fork	659.88	2 yr	513.00	746.81	750.61
750.76	0.002083	3.12	164.83	53.76	0.31
Nutter Fork	659.88	10 yr	1114.00	746.81	752.41
752.69	0.002135	4.27	268.38	62.38	0.34
Nutter Fork	659.88	25 yr	1487.00	746.81	753.14
753.52	0.002375	4.95	315.68	66.97	0.37
Nutter Fork	659.88	50 yr	1792.00	746.81	753.60
754.07	0.002636	5.49	347.27	69.87	0.39
Nutter Fork	659.88	100 yr	2120.00	746.81	754.03
754.60	0.002951	6.08	378.89	93.43	0.42
Nutter Fork	541.04	2 yr	513.00	746.46	749.31
750.20	0.011631	7.59	67.60	30.68	0.89
Nutter Fork	541.04	10 yr	1114.00	746.46	750.80
752.13	0.009099	9.43	133.13	57.81	0.86
Nutter Fork	541.04	25 yr	1487.00	746.46	751.55
752.95	0.007846	9.90	181.46	70.92	0.82
Nutter Fork	541.04	50 yr	1792.00	746.46	752.18
753.51	0.006551	9.88	229.41	80.50	0.77
Nutter Fork	541.04	100 yr	2120.00	746.46	752.84
754.07	0.005382	9.71	284.44	86.97	0.71
Nutter Fork	446.11	2 yr	513.00	745.01	748.98
749.43	0.004346	5.35	95.87	34.81	0.57
Nutter Fork	446.11	10 yr	1114.00	745.01	750.58
751.35	0.004752	7.06	160.61	52.06	0.63

		NutterFork.rep					
Nutter Fork	446.11	25 yr	1487.00	745.01	751.36		
752.25	0.004422	7.68	207.31	68.56	0.62		
Nutter Fork	446.11	50 yr	1792.00	745.01	752.00		
752.91	0.003882	7.85	256.01	84.45	0.60		
Nutter Fork	446.11	100 yr	2120.00	745.01	752.70		
753.57	0.003270	7.82	317.28	107.73	0.56		
Nutter Fork	362.26	2 yr	513.00	744.77	748.77		
749.14	0.002398	4.90	104.61	34.65	0.50		
Nutter Fork	362.26	10 yr	1114.00	744.77	750.27		
751.02	0.003214	6.93	160.93	40.47	0.60		
Nutter Fork	362.26	25 yr	1487.00	744.77	750.92		
751.91	0.003513	7.99	188.15	43.79	0.64		
Nutter Fork	362.26	50 yr	1792.00	744.77	751.36		
752.56	0.003780	8.79	208.02	46.07	0.68		
Nutter Fork	362.26	100 yr	2120.00	744.77	751.79		
753.21	0.004055	9.59	228.04	48.37	0.71		
Nutter Fork	280.1	2 yr	513.00	744.69	748.68		
748.92	0.001981	3.94	130.35	41.58	0.39		
Nutter Fork	280.1	10 yr	1114.00	744.69	750.21		
750.70	0.002776	5.61	198.86	49.57	0.48		
Nutter Fork	280.1	25 yr	1487.00	744.69	750.90		
751.54	0.002963	6.42	235.33	55.93	0.51		
Nutter Fork	280.1	50 yr	1792.00	744.69	751.38		
752.15	0.003129	7.02	263.37	60.41	0.53		
Nutter Fork	280.1	100 yr	2120.00	744.69	751.85		
752.75	0.003290	7.62	292.84	65.17	0.56		
Nutter Fork	195.89	2 yr	513.00	744.69	748.45		
748.72	0.002780	4.21	124.26	46.41	0.41		
Nutter Fork	195.89	10 yr	1114.00	744.69	749.80		
750.41	0.004003	6.33	205.01	73.12	0.52		
Nutter Fork	195.89	25 yr	1487.00	744.69	750.44		
751.22	0.004426	7.26	254.58	78.51	0.55		
Nutter Fork	195.89	50 yr	1792.00	744.69	750.90		
751.81	0.004717	7.91	290.68	79.93	0.58		
Nutter Fork	195.89	100 yr	2120.00	744.69	751.35		
752.39	0.004971	8.54	327.05	81.34	0.60		
Nutter Fork	95.84	2 yr	513.00	744.68	748.09	746.97	
748.38	0.004402	4.28	120.22	56.03	0.49		
Nutter Fork	95.84	10 yr	1114.00	744.68	749.45	748.21	
749.96	0.004402	5.80	211.36	78.08	0.53		
Nutter Fork	95.84	25 yr	1487.00	744.68	750.11	748.75	
750.74	0.004401	6.46	266.27	87.18	0.54		
Nutter Fork	95.84	50 yr	1792.00	744.68	750.58	749.17	
751.30	0.004407	6.93	308.41	90.00	0.55		
Nutter Fork	95.84	100 yr	2120.00	744.68	751.06	749.58	
751.86	0.004403	7.37	351.78	92.97	0.56		

Profile Output Table - Standard Table 2

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn
Loss	C & E Loss	Q Channel	Q Right	Top width	(ft)	
			(ft)	(ft)		

(ft)	(ft)	(cfs)	NutterFork.rep		(ft)	
			(cfs)	(cfs)		
Nutter Fork	2253.15		2 yr	758.20	757.64	0.56
0.32	0.07	3.22	506.48	3.30	34.61	
Nutter Fork	2253.15		10 yr	760.19	759.01	1.18
0.42	0.16	18.89	1075.83	19.28	66.87	
Nutter Fork	2253.15		25 yr	761.17	759.48	1.69
0.50	0.24	31.66	1426.45	28.89	78.18	
Nutter Fork	2253.15		50 yr	761.93	759.75	2.17
0.58	0.32	42.97	1712.06	36.97	86.38	
Nutter Fork	2253.15		100 yr	762.72	760.41	2.31
0.60	0.30	62.83	2000.47	56.70	111.78	
Nutter Fork	2137.23		2 yr	757.80	757.49	0.32
0.21	0.00	1.78	509.65	1.58	46.15	
Nutter Fork	2137.23		10 yr	759.62	758.97	0.65
0.25	0.03	23.59	1078.92	11.49	63.34	
Nutter Fork	2137.23		25 yr	760.43	759.53	0.89
0.30	0.06	45.36	1421.57	20.07	69.20	
Nutter Fork	2137.23		50 yr	761.02	759.93	1.09
0.32	0.08	66.86	1698.95	26.19	74.38	
Nutter Fork	2137.23		100 yr	761.62	760.32	1.30
0.36	0.10	95.71	1991.13	33.16	79.71	
Nutter Fork	2037.52		2 yr	757.59	757.28	0.30
0.38	0.04	1.30	510.56	1.14	56.20	
Nutter Fork	2037.52		10 yr	759.33	758.79	0.54
0.37	0.04	63.23	1041.33	9.44	92.10	
Nutter Fork	2037.52		25 yr	760.07	759.37	0.70
0.37	0.02	121.81	1348.76	16.43	95.45	
Nutter Fork	2037.52		50 yr	760.62	759.80	0.82
0.37	0.01	175.55	1593.30	23.15	98.13	
Nutter Fork	2037.52		100 yr	761.17	760.20	0.96
0.38	0.01	228.13	1862.80	29.08	107.27	
Nutter Fork	1948.71		2 yr	757.16	756.44	0.72
0.40	0.16	49.90	455.10	8.00	66.88	
Nutter Fork	1948.71		10 yr	758.92	758.01	0.91
0.33	0.18	245.66	853.13	15.21	110.22	
Nutter Fork	1948.71		25 yr	759.68	758.81	0.88
0.30	0.16	383.79	1033.30	69.91	115.94	
Nutter Fork	1948.71		50 yr	760.24	759.36	0.88
0.28	0.15	494.31	1174.94	122.74	120.02	
Nutter Fork	1948.71		100 yr	760.77	759.85	0.92
0.28	0.15	611.16	1327.80	181.04	123.87	
Nutter Fork	1858.54		2 yr	756.61	756.40	0.20
0.39	0.05	0.02	511.88	1.10	63.96	
Nutter Fork	1858.54		10 yr	758.41	758.10	0.31
0.35	0.08	1.44	1047.43	65.13	108.32	
Nutter Fork	1858.54		25 yr	759.23	758.88	0.35
0.33	0.09	3.80	1333.26	149.94	111.71	
Nutter Fork	1858.54		50 yr	759.80	759.42	0.38
0.30	0.08	6.48	1559.96	225.56	114.08	
Nutter Fork	1858.54		100 yr	760.34	759.92	0.42
0.29	0.08	9.85	1801.80	308.35	116.38	

				NutterFork.rep		
Nutter Fork	1761.23	2 yr	756.17	755.50	0.67	
0.68	0.04 1.49	508.96	2.55	43.46		
Nutter Fork	1761.23	10 yr	757.97	756.82	1.15	
0.74	0.02 10.30	1049.19	54.51	74.32		
Nutter Fork	1761.23	25 yr	758.81	757.59	1.22	
0.72	0.02 19.57	1332.03	135.40	93.54		
Nutter Fork	1761.23	50 yr	759.42	758.25	1.17	
0.69	0.05 27.90	1527.16	236.94	108.46		
Nutter Fork	1761.23	100 yr	759.97	758.79	1.18	
0.63	0.06 35.97	1725.19	358.84	114.17		

Nutter Fork	1660.52	2 yr	755.44	754.90	0.54
0.65	0.03 0.46	511.06	1.49	41.08	
Nutter Fork	1660.52	10 yr	757.21	756.13	1.07
0.65	0.10 4.88	1095.56	13.56	54.03	
Nutter Fork	1660.52	25 yr	758.07	756.68	1.40
0.67	0.16 9.34	1444.73	32.93	72.18	
Nutter Fork	1660.52	50 yr	758.69	756.99	1.70
0.67	0.24 13.22	1721.27	57.51	82.43	
Nutter Fork	1660.52	100 yr	759.28	757.51	1.77
0.61	0.26 19.38	1985.70	114.91	98.90	

Nutter Fork	1550.83	2 yr	754.76	754.32	0.43
0.31	0.07 0.06	512.87	0.07	46.89	
Nutter Fork	1550.83	10 yr	756.45	755.72	0.74
0.29	0.12 3.24	1104.73	6.04	56.07	
Nutter Fork	1550.83	25 yr	757.25	756.37	0.88
0.29	0.15 7.21	1443.21	36.57	131.42	
Nutter Fork	1550.83	50 yr	757.78	756.89	0.89
0.28	0.13 11.33	1665.74	114.93	136.06	
Nutter Fork	1550.83	100 yr	758.30	757.41	0.89
0.26	0.12 16.41	1889.81	213.77	145.18	

Nutter Fork	1462.99	2 yr	754.38	754.18	0.19
0.27	0.00 0.00	512.99	0.00	53.09	
Nutter Fork	1462.99	10 yr	756.04	755.71	0.33
0.26	0.00 1.56	1062.75	49.69	117.21	
Nutter Fork	1462.99	25 yr	756.81	756.42	0.39
0.26	0.00 3.39	1371.46	112.16	128.10	
Nutter Fork	1462.99	50 yr	757.36	756.92	0.44
0.26	0.00 5.19	1618.40	168.41	137.54	
Nutter Fork	1462.99	100 yr	757.92	757.43	0.49
0.26	0.00 7.43	1875.74	236.83	151.06	

Nutter Fork	1359.11	2 yr	754.10	753.88	0.22
0.23	0.00 0.02	512.95	0.02	52.12	
Nutter Fork	1359.11	10 yr	755.78	755.43	0.35
0.24	0.01 3.05	1043.57	67.39	115.23	
Nutter Fork	1359.11	25 yr	756.55	756.14	0.41
0.24	0.02 6.57	1343.50	136.92	128.46	
Nutter Fork	1359.11	50 yr	757.11	756.65	0.46
0.25	0.02 10.15	1580.45	201.41	137.30	
Nutter Fork	1359.11	100 yr	757.65	757.13	0.52
0.25	0.02 14.48	1844.05	261.46	154.06	

Nutter Fork	1277.06	2 yr	753.87	753.60	0.27
0.34	0.01 1.79	508.19	3.02	51.34	
Nutter Fork	1277.06	10 yr	755.52	755.03	0.49

			NutterFork.rep			
0.35	0.01	10.56	1038.32	65.12	112.04	
Nutter Fork		1277.06	25 yr	756.29	755.72	0.58
0.35	0.01	17.06	1323.85	146.09	117.85	
Nutter Fork		1277.06	50 yr	756.84	756.20	0.64
0.35	0.01	22.95	1548.29	220.76	121.52	
Nutter Fork		1277.06	100 yr	757.38	756.67	0.71
0.36	0.01	29.80	1782.14	308.06	124.79	
Nutter Fork		1171	2 yr	753.52	753.12	0.39
0.67	0.04	0.49	502.33	10.18	99.21	
Nutter Fork		1171	10 yr	755.17	754.62	0.55
0.59	0.07	4.54	954.74	154.72	109.75	
Nutter Fork		1171	25 yr	755.94	755.31	0.63
0.55	0.07	8.29	1212.91	265.80	111.58	
Nutter Fork		1171	50 yr	756.48	755.77	0.71
0.54	0.07	11.72	1421.87	358.41	112.86	
Nutter Fork		1171	100 yr	757.01	756.21	0.80
0.54	0.06	14.57	1644.29	461.14	115.57	
Nutter Fork		1063.85	2 yr	752.80	751.96	0.84
0.95	0.09	2.06	502.99	7.95	55.88	
Nutter Fork		1063.85	10 yr	754.51	753.25	1.26
0.70	0.17	10.99	1010.97	92.04	79.74	
Nutter Fork		1063.85	25 yr	755.32	753.97	1.35
0.63	0.17	30.41	1287.29	169.30	98.48	
Nutter Fork		1063.85	50 yr	755.87	754.48	1.39
0.60	0.16	55.21	1490.95	245.84	108.49	
Nutter Fork		1063.85	100 yr	756.40	754.97	1.43
0.58	0.16	89.11	1700.73	330.16	117.75	
Nutter Fork		978.95	2 yr	751.76	751.21	0.55
0.34	0.08	60.17	451.09	1.74	65.13	
Nutter Fork		978.95	10 yr	753.64	752.96	0.68
0.27	0.06	193.30	899.40	21.30	89.66	
Nutter Fork		978.95	25 yr	754.51	753.74	0.77
0.27	0.06	287.98	1158.21	40.82	103.89	
Nutter Fork		978.95	50 yr	755.10	754.25	0.85
0.27	0.06	376.49	1356.74	58.77	111.61	
Nutter Fork		978.95	100 yr	755.67	754.77	0.90
0.26	0.06	489.23	1551.10	79.67	114.28	
Nutter Fork		912.17	2 yr	751.34	751.06	0.28
0.21	0.03	16.13	496.22	0.65	57.36	
Nutter Fork		912.17	10 yr	753.30	752.84	0.47
0.20	0.04	59.47	1045.26	9.26	84.48	
Nutter Fork		912.17	25 yr	754.18	753.61	0.58
0.21	0.04	100.57	1367.19	19.24	111.14	
Nutter Fork		912.17	50 yr	754.77	754.13	0.64
0.22	0.03	164.35	1600.72	26.94	116.08	
Nutter Fork		912.17	100 yr	755.34	754.64	0.71
0.23	0.03	239.28	1844.77	35.95	123.85	
Nutter Fork		829.81	2 yr	751.10	750.91	0.19
0.15	0.00	0.99	511.67	0.35	52.90	
Nutter Fork		829.81	10 yr	753.07	752.72	0.35
0.16	0.00	19.03	1088.49	6.47	76.53	
Nutter Fork		829.81	25 yr	753.93	753.49	0.45
0.18	0.00	36.01	1429.26	21.72	92.85	

				NutterFork.rep			
Nutter Fork	829.81	50 yr	754.52	753.99	0.53		
0.19	0.00 50.90	1700.19	40.91	103.97			
Nutter Fork	829.81	100 yr	755.08	754.47	0.61		
0.21	0.01 68.37	1981.99	69.65	113.56			
Nutter Fork	748.05	2 yr	750.95	750.76	0.19		
0.17	0.01 0.13	512.72	0.15	46.48			
Nutter Fork	748.05	10 yr	752.90	752.54	0.36		
0.18	0.02 1.48	1102.90	9.62	74.82			
Nutter Fork	748.05	25 yr	753.75	753.28	0.47		
0.20	0.03 2.73	1451.25	33.02	91.24			
Nutter Fork	748.05	50 yr	754.32	753.75	0.57		
0.22	0.03 3.86	1727.46	60.68	100.79			
Nutter Fork	748.05	100 yr	754.87	754.21	0.66		
0.25	0.03 5.19	2016.87	97.94	110.10			
Nutter Fork	659.88	2 yr	750.76	750.61	0.15		
0.49	0.07 0.05	512.94	0.01	53.76			
Nutter Fork	659.88	10 yr	752.69	752.41	0.28		
0.46	0.10 1.74	1108.87	3.39	62.38			
Nutter Fork	659.88	25 yr	753.52	753.14	0.38		
0.47	0.10 3.44	1473.81	9.75	66.97			
Nutter Fork	659.88	50 yr	754.07	753.60	0.46		
0.47	0.09 5.02	1770.08	16.90	69.87			
Nutter Fork	659.88	100 yr	754.60	754.03	0.57		
0.46	0.07 6.96	2096.11	16.94	93.43			
Nutter Fork	541.04	2 yr	750.20	749.31	0.89		
0.64	0.13 0.00	513.00		30.68			
Nutter Fork	541.04	10 yr	752.13	750.80	1.33		
0.61	0.17 10.02	1065.66	38.32	57.81			
Nutter Fork	541.04	25 yr	752.95	751.55	1.40		
0.55	0.15 23.48	1344.14	119.38	70.92			
Nutter Fork	541.04	50 yr	753.51	752.18	1.33		
0.47	0.13 38.10	1529.45	224.45	80.50			
Nutter Fork	541.04	100 yr	754.07	752.84	1.23		
0.39	0.11 56.12	1696.52	367.36	86.97			
Nutter Fork	446.11	2 yr	749.43	748.98	0.44		
0.26	0.02	513.00		34.81			
Nutter Fork	446.11	10 yr	751.35	750.58	0.77		
0.32	0.01 1.71	1109.41	2.88	52.06			
Nutter Fork	446.11	25 yr	752.25	751.36	0.89		
0.33	0.01 17.33	1445.47	24.19	68.56			
Nutter Fork	446.11	50 yr	752.91	752.00	0.90		
0.32	0.03 46.70	1680.40	64.91	84.45			
Nutter Fork	446.11	100 yr	753.57	752.70	0.86		
0.30	0.06 94.91	1892.79	132.31	107.73			
Nutter Fork	362.26	2 yr	749.14	748.77	0.37		
0.18	0.04	513.00		34.65			
Nutter Fork	362.26	10 yr	751.02	750.27	0.75		
0.25	0.08 0.06	1113.93	0.01	40.47			
Nutter Fork	362.26	25 yr	751.91	750.92	0.99		
0.26	0.11 1.59	1485.12	0.29	43.79			
Nutter Fork	362.26	50 yr	752.56	751.36	1.20		
0.28	0.13 4.70	1786.46	0.85	46.07			
Nutter Fork	362.26	100 yr	753.21	751.79	1.42		

NutterFork.rep						
0.30	0.16	9.97	2108.23	1.81	48.37	
Nutter Fork	280.1		2 yr	748.92	748.68	0.24
0.20	0.00		513.00		41.58	
Nutter Fork	280.1		10 yr	750.70	750.21	0.49
0.28	0.01	0.04	1113.96	0.00	49.57	
Nutter Fork	280.1		25 yr	751.54	750.90	0.64
0.30	0.01	1.63	1485.21	0.17	55.93	
Nutter Fork	280.1		50 yr	752.15	751.38	0.76
0.32	0.01	5.17	1786.29	0.54	60.41	
Nutter Fork	280.1		100 yr	752.75	751.85	0.90
0.34	0.01	11.36	2107.42	1.21	65.17	
Nutter Fork	195.89		2 yr	748.72	748.45	0.27
0.35	0.00	0.72	512.25	0.03	46.41	
Nutter Fork	195.89		10 yr	750.41	749.80	0.61
0.42	0.03	28.23	1084.14	1.63	73.12	
Nutter Fork	195.89		25 yr	751.22	750.44	0.78
0.44	0.04	70.18	1412.92	3.90	78.51	
Nutter Fork	195.89		50 yr	751.81	750.90	0.91
0.45	0.06	113.10	1672.60	6.30	79.93	
Nutter Fork	195.89		100 yr	752.39	751.35	1.04
0.47	0.07	164.64	1946.00	9.36	81.34	
Nutter Fork	95.84		2 yr	748.38	748.09	0.28
	0.05		512.93	0.02	56.03	
Nutter Fork	95.84		10 yr	749.96	749.45	0.51
	14.04		1094.48	5.48	78.08	
Nutter Fork	95.84		25 yr	750.74	750.11	0.63
	34.75		1438.32	13.93	87.18	
Nutter Fork	95.84		50 yr	751.30	750.58	0.71
	58.72		1709.89	23.39	90.00	
Nutter Fork	95.84		100 yr	751.86	751.06	0.80
	87.44		1997.10	35.46	92.97	

STATE OF WEST VIRGINIA,
COUNTY OF DODDRIDGE, TO WIT

I, Virginia Nicholson, Editor of THE
HERALD RECORD, a weekly newspaper
published regularly, in Doddridge County,
West Virginia, Do Hereby Certify
That the Accompanying Legal Notice
Entitled:

Floodplain Permit
15-348

was published in said paper for *2*

successive weeks beginning with the issue

of *April 7th* 2015 and

ending with the issue of

April 14th 2015 and

that said notice contains *189*

WORD SPACE at *.115* cents a word

amounts to the sum of \$ *21.94*

FOR FIRST PUBLICATION, SECOND
PUBLICATION IS 75% OF THE FIRST
PUBLICATION

\$ *16.31*

and each publication thereafter

\$ *38.05* TOTAL

EDITOR

Virginia Nicholson

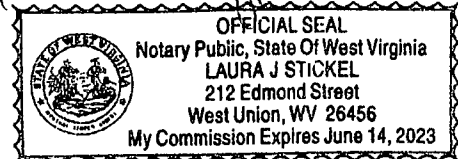
SWORN TO AND SUBSCRIBED

BEFORE ME THIS THE *14th* DAY

OF *April* 2015

NOTARY PUBLIC

Laura J SticKel



LEGAL ADVERTISEMENT:
Doddridge County
Floodplain Permit Application

Please take notice that on the 25th day of March, 2015
Antero Resources filed an application for a Floodplain
Permit to develop land located at or about: West Union
District 39.328711N/80.808739W to
39.330881N/80.739817W Permit: #15-348 Nutter Fork
Road Upgrade (CR 28). The Application is on file with
the Clerk of the County Court and may be inspected or
copied during regular business hours. Any interested
persons who desire to comment shall present the same in
writing by April 27, 2015.

Delivered to the:

Clerk of the County Court
118 E. Court Street, West Union, WV 26456
Beth A. Rogers, Doddridge County Clerk
Edwin L. "Bo" Wriston, Doddridge County Flood Plain
Manager

4-7-2xb

The Doddridge Independent

The Doddridge Independent PUBLISHER'S CERTIFICATE

I, Michael D. Zorn, Publisher of The Doddridge Independent, A newspaper of general circulation published in the town of West Union, Doddridge County, West Virginia, do hereby certify that:

Antero Resources

filed an application for a Floodplain Permit to develop land located at or about:

West Union District

39.328711N/80.808739W to 39.330881N/80.739817W
Permit #15-348 Nutter Fork Road Upgrade (CR 28)

was published in The Doddridge Independent
2 times commencing on Friday, April 17, 2015 and
Ending on Friday, April 24, 2015 at the request of:

**Edwin Wriston, Doddridge County Floodplain
Manager & Doddridge County Commission**

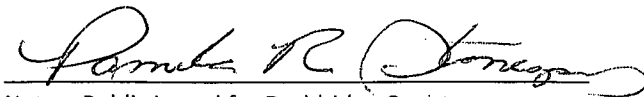
Given under my hand this Friday, April 24, 2015

The publisher's fee for said publication is:

\$ 25.27 1st Run/\$ 18.95 Subsequent Runs
This Legal Ad Total: \$ 44.22


Michael D. Zorn
Publisher of The Doddridge Independent

Subscribed to and sworn to before me on
this date: 4/27/15


Notary Public in and for Doddridge County
My Commission expires on

The 17th day of May 2019

Legal Advertisement: 4/13 - 4/20
Doddridge County
Floodplain Permit Application

Please take notice that on the 25th day of March, 2015
Antero Resources
filed an application for a Floodplain Permit to develop land located at or
about:

West Union District
39.328711N/80.808739W to 39.330881N/80.739817W
Permit #15-348 Nutter Fork Road Upgrade (CR 28)

The Application is on file with the Clerk of the County Court and may
be inspected or copied during regular business hours. As this project is
outside the FEMA identified floodplain of Doddridge County, Doddridge
County Floodplain Management has no regulatory authority. Any
interested persons who desire to comment shall present the same in
writing by April 27, 2015, delivered to:

Clerk of the County Court
118 E. Court Street, West Union, WV 26456
Beth A Rogers, Doddridge County Clerk
Edwin L. "Bo" Wriston, Doddridge County Flood Plain Manager

