

Doddridge County Sheriff
Flood Plain Ordinance Fund

1005
69-217/515

DATE July 2, 2013

PAY TO THE ORDER OF ANTERO RESOURCES

\$ 5,210.91

Five Thousand Two Hundred-Ten Dollars and 91/100-----

DOLLARS  Security features included. Details on back.



Ralph Sandorff
Beth A. Rogers
MP

MEMO #13-010 Leonard Pad reimbursement

⑈001005⑈ ⑆051502175⑆ 1196499⑈



ANTERO RESOURCES APPALACHIAN
 1625 17th STREET, SUITE 300
 DENVER, COLORADO 80202

Vendor Name	Vendor No.	Date	Check Number	Check Total
DODDRIDGE COUNTY COMMISSION	43312	Jun-18-2013	31804	\$5,432.54

VOUCHER	VENDOR INV #	INV DATE	TOTAL AMOUNT	PRIOR PMTS & DISCOUNTS	NET AMOUNT
06-AP-8203	LEONARDPAD	06/18/13	5,432.54	0.00	5,432.54
FLOOD PLAIN PERMIT - LEONARD PAD					
TOTAL INVOICES PAID					5,432.54

The Person paying Money into the Treasury shall forthwith file one of these Receipts with the County Clerk

Doddridge County, West Virginia

No. 4766

Date: June 25, 2013
 File copy

Received: #13-010 Antero Resources \$5,432.54

In Payment For: 318 Building Permits (LP)

For: 12-Flood Plain Ordinanc Fund #20 Fund

By: BH - MEH - AML
 Asst. Chief Tax Deputy

Michael Headley
 Sheriff of Doddridge County

The Person paying Money into the Treasury shall forthwith file one of these Receipts with the County Clerk

Doddridge County Flood Plain Refund Calculator (if not in Flood Plain)**Leonard Pad**

Estimated Construction Costs	786,507.00
Amount over \$100,000	686,507.00
Drilling Oil and Gas Well Fee	1,000.00
Deposit for additional charges	1,000.00
\$5 per \$1,000 over \$100,000	3,432.54
Amount Due with application	5,432.54
95% of Application Fee minus \$1,000 deposit	4,210.91
Cost for Permit	221.63
Total Refund (Includes 100% of 1,000 deposit)	\$5,210.91



June 18, 2013

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

Antero Resources
1625 17th Street
Denver, Colorado 80202
Office 303.357.7310
Fax 303.357.7315

Mr. Wellings:

Antero Resources Appalachian Corporation (Antero) would like to submit a Doddridge County Floodplain permit application for our Leonard Drill Pad. Our project is located in Doddridge County, Greenbrier District and per FIRM map #54017C0165C, this location is not within the floodplain.

Attached you will find the following:

- Doddridge County Floodplain Permit Application
- FIRM Map
- A detailed set of plans signed by a WV licensed professional engineer
- Copies of other required permits
- Site Safety Plan

If you have any questions please feel free to contact me at (303) 357-6820.

Thank you in advance for your consideration.

Sincerely,

Shauna Redican
Permit Representative
Antero Resources Appalachian Corporation

Enclosures

2013 JUN 24 PM 4:07
FIRM
SOUTH DISTRICT
GREENBRIER COUNTY, WV

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 Shauna Redican

DATE June 18, 2013

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.

Antero Resources Appalachian Corporation - Shauna Redican, Permit Representative
APPLICANT'S NAME: _____

ADDRESS: 1625 17th Street, Denver, CO 80202

TELEPHONE NUMBER: Contact Shauna Redican: 303-357-6820

BUILDER'S NAME: Antero Resources Appalachian Corporation

ADDRESS: 1625 17th Street, Denver, CO 80202

TELEPHONE NUMBER: (303) 357-7310

ENGINEER'S NAME: Allegheny Surveys, Inc. - Charles K. Wilson

ADDRESS: 172 Thompson Drive, Bridgeport, WV 26330

TELEPHONE NUMBER: 304-848-5035

PROJECT LOCATION:

NAME OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT) Please see attached Exhibit A

ADDRESS OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT) Please see attached Exhibit A

DISTRICT: Greenbrier

DATE/FROM WHOM PROPERTY

PURCHASED: N/A

LAND BOOK DESCRIPTION:

DEED BOOK REFERENCE: DB 196/182, 156/102, WB 45/151, 173/335, 140/554, 119/22, 140/54, 119/22

TAX MAP REFERENCE: TM 2 P7 & 8, TM 4 P7 & 8

EXISTING BUILDINGS/USES OF PROPERTY: None

NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY Carolyn N. Plaugher

ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY Rt. 1 Box 470A, Salem, WV 26426

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

DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)

A. STRUCTURAL DEVELOPMENT

ACTIVITY

STRUCTURAL TYPE

- New Structure
- Addition
- Alteration
- Relocation
- Demolition
- Manufactured/Mobil Home

- Residential (1 – 4 Family)
- Residential (more than 4 Family)
- Non-residential (floodproofing)
- Combined Use (res. & com.)
- Replacement

B. OTHER DEVELOPMENT ACTIVITIES:

- Fill Mining Drilling Pipelining
- Grading
- Excavation (except for STRUCTURAL DEVELOPMENT checked above)
- Watercourse Alteration (including dredging and channel modification)
- Drainage Improvements (including culvert work) *Replace existing culvert as shown on page 6 of attached Leonard Pad Design
- Road, Street, or Bridge Construction *Access Road Construction as shown on page 6 of attached Leonard Pad Design
- 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 \$ 786,507.00

*See attached Floodplain Calculation Fee

D. ADJACENT AND/OR AFFECTED LANDOWNER

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: N/A _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

NAME: _____
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: N/A _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

NAME: _____
ADDRESS: _____

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.

Doddridge County Floodplain Permit – Exhibit A

Leonard Pad Surface Owners:

Owner: David T. Gillis
Address: RR 2 Box 203
Meadowbrook, WV 26404

Owner: Walter V. Davidson and Leonard J. Davidson Heirs
c/o Marlene Davidson
Address: Rt. 1 Box 287
Salem, WV 26426

(2nd Address)
246 Buffalo Calf Rd.
Salem, WV 26426

Owner: Carolyn N. Plaughter
Address: Rt. 1 Box 407A
Salem, WV 26426

(2nd Address)
2335 Buffalo Calf Rd.
Salem, WV 26426

- (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): Anthony Smith
 SIGNATURE: [Signature] DATE: 6/24/13

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: 165
 Dated: 10/04/2011

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 *Dan Wellings*

DATE 04/24/2013

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 proffing 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 Don Welby DATE 06/24/2013

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: #13-010

PERMIT DATE: 6/24/2013

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 *Dan Wellman* DATE 06/24/2013

CLEARING & GRUBBING, EROSION & SEDIMENT CONTROLS

Leonard Pad

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
MOBILIZATION	1	EA	\$19,140.00	\$19,140.00
CONSTRUCTION ENTRANCE	1	EA	\$3,172.76	\$3,172.76
CLEARING & GRUBBING	18.18	AC	\$4,513.25	\$82,050.89
TREE REMOVAL	16.04	AC	\$2,953.00	\$47,366.12
8" COMPOST FILTER SOCK	0	LF	\$2.83	\$0.00
12" COMPOST FILTER SOCK	1,565	LF	\$3.82	\$5,978.30
18" COMPOST FILTER SOCK	1,050	LF	\$7.94	\$8,337.00
24" COMPOST FILTER SOCK	200	LF	\$9.23	\$1,846.00
32" COMPOST FILTER SOCK	1,700	LF	\$14.00	\$23,800.00
JUTE MATTING - SLOPE MATTING	10,300	SY	\$2.13	\$21,939.00
SUPER SILT FENCE	1,310	LF	\$8.48	\$11,108.80
9" STRAW WATTLES	5,000	LF	\$3.11	\$15,550.00
TOTAL				\$240,288.87

RETAINING STRUCTURES

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
CONCRETE BIN BLOCKS (2' x 2' x 6')	0	EA	\$75.00	\$0.00
GABION CAGES WITH STONE (3' X 3' X 6')	350	EA	\$175.00	\$61,250.00
HORIZONTAL REINFORCEMENT (INSTALL TENSAR TX190 GEOGRID or EQUIVALENT)	700	SY	\$0.82	\$574.00
TOTAL				\$61,824.00

SITE

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
DRILL PAD EXCAVATION	26,300	CY	\$3.75	\$98,625.00
ACCESS ROADS EXCAVATION	32,789	CY	\$4.16	\$136,402.24
TANK PAD and/or FRAC PIT EXCAVATION	15,475	CY	\$4.13	\$63,911.75
OFFLOAD PAD EXCAVATION	0	CY	\$7.00	\$0.00
SPOIL PAD EXCAVATION	0	CY	\$3.84	\$0.00
TRUCK QUEUE / TURNAROUND EXCAVATION	0	CY	\$4.13	\$0.00
TOPSOIL	7,000	CY	\$4.09	\$28,630.00
DIVERSION DITCH	0	LF	\$4.50	\$0.00
ROADSIDE DITCH	3,200	LF	\$3.99	\$12,768.00
TOTAL				\$340,336.99

SUMP(S) PER ANTERO RESOURCES STANDARD DETAIL

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
INSTALL 102" x 78" x 44" PRE CAST SUMP	4	EA	\$844.22	\$3,376.88
VALVE BOX HDPE PIPE (MINIMUM 12" DIAMETER x 48" HEIGHT)	4	EA	\$545.50	\$2,182.00
4" PVC CONNECTIVE PIPE (ANTERO SUMP DRAIN DETAIL)	120	LF	\$9.42	\$1,130.40
TOTAL				\$6,689.28

AGGREGATE SURFACING - SPREADING, COMPACTION, and/or INSTALLATION

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
DRILL PAD AASHTO #1 (8" THICK)	3,330	TON	\$2.59	\$8,624.70
DRILL PAD 1 1/2" or 3/4" CRUSHER RUN STONE (2" THICK)	830	TON	\$2.89	\$2,398.70
DRILL PAD GEOTEXTILE FABRIC (US 200)	7,525	SY	\$1.06	\$7,976.50
ACCESS ROADS 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	4,500	TON	\$2.83	\$12,735.00
ACCESS ROADS 1 1/2" OR 3/4" CRUSHER RUN STONE (2" THICK)	1,125	TON	\$2.95	\$3,318.75
ACCESS ROADS GEOTEXTILE FABRIC (US 200)	9,300	SY	\$1.02	\$9,486.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	9,300	SY	\$0.82	\$7,626.00
TANK PAD 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	3,200	TON	\$2.43	\$7,776.00
TANK PAD 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	815	TON	\$2.56	\$2,086.40
TANK PAD GEOTEXTILE FABRIC (US 200)	6,800	SY	\$1.16	\$7,888.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	6,800	SY	\$0.73	\$4,964.00
TOTAL				\$74,880.05

ROAD CULVERTS

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
15" HDPE	240	LF	\$20.11	\$4,826.40
18" HDPE	220	LF	\$23.33	\$5,132.60
24" HDPE	0	LF	\$41.20	\$0.00
30" HDPE	0	LF	\$32.50	\$0.00
36" HDPE	360	LF	\$35.00	\$12,600.00
42" HDPE	0	LF		\$0.00
48" HDPE	0	LF		\$0.00
60" HDPE	0	LF		\$0.00
R4 RIP RAP (INLETS/OUTLETS)	40	TON	\$35.69	\$1,427.60
AASHTO #1 STONE (DITCH CHECKS)	7	TON	\$61.10	\$427.70
DITCH LINING - (ACCESS ROAD) JUTE MATTING	200	SY	\$3.00	\$600.00
DITCH LINING - (ACCESS ROAD) SYNTHETIC MATTING (TRM)	2,250	SY	\$3.45	\$7,762.50
DIVERSION DITCH LINING - SYNTHETIC MATTING (TRM)	0	SY	\$3.45	\$0.00

TOTAL				\$32,776.80
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FENCING/GATES

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
4 FT WOVEN WIRE FARM FENCE w/MINIMUM 10 FT POST SPACING (WOODEN and/or "T" POST)	0	LF	\$16.50	\$0.00
16 FT DOUBLE GATE	0	EA	\$1,200.00	\$0.00
TOTAL				\$0.00

SEEDING

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
SITE SEEDING (LIME, FERTILIZER, SEEDING, AND HYDRO-MULCH w/TACK (HYC-2 OR EQUAL))	9	AC	\$3,301.25	\$29,711.25
TOTAL				\$29,711.25

UNFORESEEN SITE CONDITIONS

	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
*ROCK CLAUSE - BLASTING	0.0	CY	\$3.27	\$0.00
*ROCK CLAUSE - HOE RAMMING	0.0	CY	\$11.35	\$0.00
*FRENCH DRAINS	0.0	FT	\$10.93	\$0.00
*ORANGE SAFETY FENCE w/"T" POST (10FT CENTERS) - WETLAND PROTECTION	0.0	LF	\$10.60	\$0.00
*STEEL PANELS w/"T" POST (10 FT CENTERS) - WETLAND PROTECTION	0.0	LF	\$6.35	\$0.00
*SILT FENCE	0.0	LF	\$4.00	\$0.00
*TEMPORARY SEEDING	0.0	AC	\$2.67	\$0.00
*CONSTRUCTION STAKEOUT	0.0	HOUR	\$1,962.50	\$0.00
* JUTE MATTING - SLOPE MATTING	0.0	SY	\$2.13	\$0.00
TOTAL				\$0.00

GRAND TOTAL	\$786,507.24
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west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

June 12, 2013

WELL WORK PERMIT

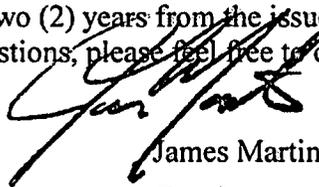
Horizontal 6A Well

This permit, API Well Number: 47-1706231, issued to ANTERO RESOURCES APPALACHIAN CORPORATION, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.



James Martin
Chief

Operator's Well No: RIKK UNIT 2H
Farm Name: WALTER DAVIDSON & LEONARD
API Well Number: 47-1706231
Permit Type: Horizontal 6A Well
Date Issued: 06/12/2013

Promoting a healthy environment.

I

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
2. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% (unless soil test results show a greater range of moisture content is appropriate and 95% compaction can still be achieved) of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
3. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
4. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
5. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

17 06231

WW - 6B
(1/12)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

17 04 596

1) Well Operator: Antero Resources Appalachian Corporation 494488557 Doddridge Greenbrier Salem
Operator ID County District Quadrangle

2) Operator's Well Number: Rikk Unit 2H Well Pad Name: Leonard Pad

3 Elevation, current ground: -1325' Elevation, proposed post-construction: 1318'

4) Well Type: (a) Gas Oil
Other
(b) If Gas: Shallow Deep
Horizontal

*DCW
5-14-2013*

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale: 7650' TVD, Anticipated Thickness- 60 Feet, Associated Pressure- 3200#

7) Proposed Total Vertical Depth: 7650' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 17,450' MD

10) Approximate Fresh Water Strata Depths: 87', 230'

11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.

12) Approximate Saltwater Depths: 842', 1768', 2051'

13) Approximate Coal Seam Depths: 263', 980', 1726'

14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

15) Does land contain coal seams tributary or adjacent to, active mine? No ✓

16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale

17) Describe fracturing/stimulating methods in detail:

Antero plans to pump slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 18.18 acres

19) Area to be disturbed for well pad only, less access road (acres): 4.51 acres Recd. Office of Oil & Gas

MAY 10

20)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	305'	305'	CTS, 424 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2570'	2570'	CTS, 1046 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17,450'	17,450'	4364 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield</u>
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

21) Describe centralizer placement for each casing string.

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

22) Describe all cement additives associated with each cement type.

Conductor: no additives, Class A cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-180 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures.

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

Rev. _____
Office of _____

MAY

WW-9
Rev. 1/12

API No. 47 - 017 - 06231
Operator's Well No. PK# Unit 2H

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

**CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE**

Operator Name Antero Resources Appalachian Corporation OP Code 494488557

Watershed Buffalo Calf Fork Quadrangle Salem

Elevation 1318' County Doddridge District Greenbrier

Description of anticipated Pit Waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be washed and hauled off site.)

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a synthetic liner be used in the pit? N/A If so, what mil.? N/A

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number Future permitted well locations when applicable. API# will be provided on Form WR-34)
- Off Site Disposal (Meadowfill Landfill Permit #SWF-1032-98)
- Other (Explain _____)

*DEW
5-14-2013*

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Slit Foam, Production - Water Based Mud
-If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used? Please See Attachment

Will closed loop system be used? Yes

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Removed offsite and taken to landfill
-If left in pit and plan to solidify what medium will be used? Cement, lime, N/A
-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98)

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature *Cole Klstrom*

Company Official (Typed Name) Cole Klstrom

Company Official Title Environmental Specialist

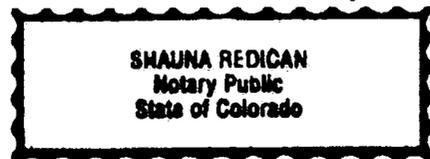
Subscribed and sworn before me this 27th day of February, 2013

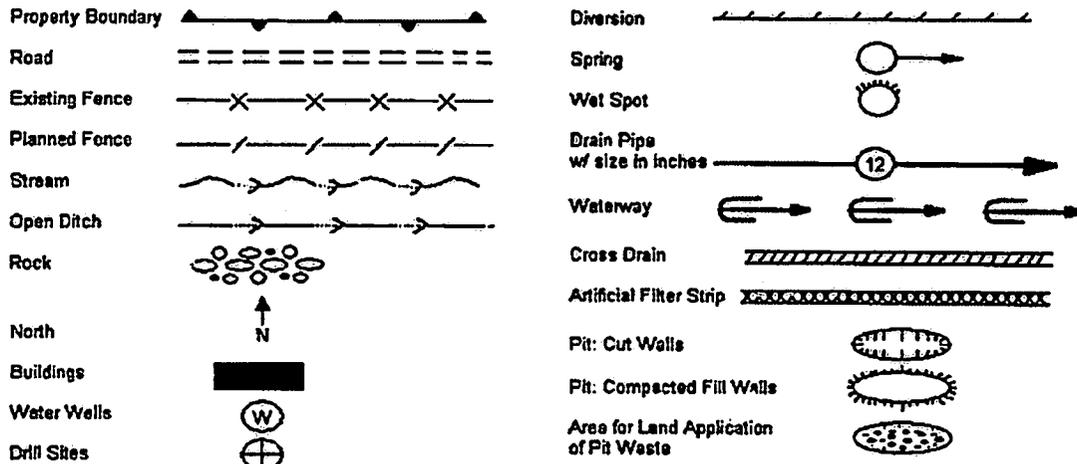
Received
Office of Oil & Gas

Shauna Redican Notary Public

MAY 16 2013

My commission expires 5/18/2015





Road A (6.79) + Road B (2.56) + Drill Pad & Tree Brush Storage (4.81) + Water Tank Pad (3.57) + Topsoil/Spoil Pile (0.45) = 18.18 Acres

Proposed Revegetation Treatment: Acres Disturbed 18.18 Prevegetation pH _____

Lime 2-4 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2-3 Tons/acre Hay or straw or Wood Fiber (will be used where needed)

Seed Mixtures

Seed Type	Area I (Temporary) lbs/acre	Seed Type	Area II (Permanent) lbs/acre
Tall Fescue	45	Tall Fescue	45
Perennial Rye Grass	20	Perennial Rye Grass	20

*or type of grass seed requested by surface owner

*or type of grass seed requested by surface owner

Attach:
Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: George Nowler

Comments: Preserved & Mulch install ETS 10 w/ Dep regulations

Title: Oil & Gas Inspector

Date: 5-14-2013

Received
Office of Oil & Gas

Field Reviewed? Yes No

MAY 16 2013

[Signature]



Water Management Plan: Primary Water Sources



WMP-01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

DEP is aware that some intake points will be used for multiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interpreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at DEP.water.use@wv.gov.

APPROVED MAY 24 2013

Source Summary

WMP-01131

API Number: 047-017-06231
Rikk Unit 2H

Operator: Antero Resources

Stream/River

Source **West Fork River @ JCP Withdrawal** Owner: **James & Brenda Raines**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.320913	-80.337572

Regulated Stream? Stonewall Jackson Dam Ref. Gauge ID: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): 2,000 Min. Gauge Reading (cfs): 175.00 Min. Passby (cfs) 146.25

DEP Comments:

Source **West Fork River @ McDonald Withdrawal** Owner: **David Shrieves**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.16761	-80.45069

Regulated Stream? Stonewall Jackson Dam Ref. Gauge ID: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): 3,000 Min. Gauge Reading (cfs): 175.00 Min. Passby (cfs) 106.30

DEP Comments:

Source **West Fork River @ GAL Withdrawal** Owner: **David Shrieves**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.16422	-80.45173

Regulated Stream? Stonewall Jackson Dam Ref. Gauge ID: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): 2,000 Min. Gauge Reading (cfs): 175.00 Min. Passby (cfs) 106.30

DEP Comments:

● Source **Middle Island Creek @ Dawson Withdrawal**

Owner: **Gary D. and Rella A. Dawson**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.379292	-80.867803

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): **3,000** Min. Gauge Reading (cfs): **76.03** Min. Passby (cfs) **28.83**

DEP Comments:

● Source **McElroy Creek @ Forest Withdrawal**

Owner: **Forest C. & Brenda L. Moore**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.39675	-80.738197

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): **1,000** Min. Gauge Reading (cfs): **74.77** Min. Passby (cfs) **13.10**

DEP Comments:

● Source **McElroy Creek @ Sweeney Withdrawal**

Owner: **Bill Sweeney**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.398123	-80.656808

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): **1,000** Min. Gauge Reading (cfs): **69.73** Min. Passby (cfs) **6.66**

DEP Comments:

Source **Meathouse Fork @ Gagnon Withdrawal**

Owner: **George L. Gagnon and Susan C. Gagnon**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.26054	-80.720998

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 Min. Gauge Reading (cfs): 71.96 Min. Passby (cfs) 13.10

DEP Comments:

Source **Meathouse Fork @ Whitehair Withdrawal**

Owner: **Elton Whitehair**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.211317	-80.679592

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 Min. Gauge Reading (cfs): 69.73 Min. Passby (cfs) 7.28

DEP Comments:

Source **Tom's Fork @ Erwin Withdrawal**

Owner: **John F. Erwin and Sandra E. Erwin**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.174306	-80.702992

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 Min. Gauge Reading (cfs): 69.73 Min. Passby (cfs) 0.59

DEP Comments:

● Source **Arnold Creek @ Davis Withdrawal** Owner: **Jonathon Davis**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.302006	-80.824561

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 Min. Gauge Reading (cfs): 69.73 Min. Passby (cfs) 3.08

DEP Comments:

● Source **Buckeye Creek @ Powell Withdrawal** Owner: **Dennis Powell**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.277142	-80.690386

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 Min. Gauge Reading (cfs): 69.73 Min. Passby (cfs) 4.59

DEP Comments:

● Source **South Fork of Hughes River @ Knight Withdrawal** Owner: **Tracy C. Knight & Stephanie C. Knight**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.198369	-80.870969

Regulated Stream? Ref. Gauge ID: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Max. Pump rate (gpm): 3,000 Min. Gauge Reading (cfs): 39.80 Min. Passby (cfs) 1.95

DEP Comments:

o Source **North Fork of Hughes River @ Davis Withdrawal** Owner: **Lewis P. Davis and Norma J. Davis**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000		39.322363	-80.936771

Regulated Stream? Ref. Gauge ID: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Max. Pump rate (gpm): **1,000** Min. Gauge Reading (cfs): **35.23** Min. Passby (cfs) **2.19**

DEP Comments:

Source Summary

WMP-01131	API Number:	047-017-06231	Operator:	Antero Resources
		Rikk Unit 2H		

Purchased Water

o Source **Middle Island Creek @ Solo Construction** Owner: **Solo Construction, LLC**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000	1,000,000	39.399094	-81.185548

Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999999 Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): Min. Gauge Reading (cfs): **6,468.00** Min. Passby (cfs)

DEP Comments: Elevation analysis indicates that this location has the same elevation as Middle Island Creek's pour point into the Ohio River. As such, it is deemed that water flow at this location is heavily influenced by the Ohio River.

o Source **Sun Valley Public Service District** Owner: **Sun Valley PSD**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/24/2014	1/24/2015	11,140,000	200,000	-	-

Regulated Stream? Stonewall Jackson Dam Ref. Gauge ID: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): Min. Gauge Reading (cfs): **171.48** Min. Passby (cfs)

DEP Comments:

Source Detail

WMP-01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Source ID: 14697 Source Name: Middle Island Creek @ Solo Construction
Solo Construction, LLC

Source Latitude: 39.399094
Source Longitude: -81.185548

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 County: Pleasants

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 11,140,000

Trout Stream? Tier 3?

Max. Pump rate (gpm):

Regulated Stream? Ohio River Min. Flow

Max. Simultaneous Trucks:

Proximate PSD? City of St. Marys

Max. Truck pump rate (gpm) 0

Gauged Stream?

Reference Gaug: 9999999 Ohio River Station: Willow Island Lock & Dam

Drainage Area (sq. mi.): 25,000.00

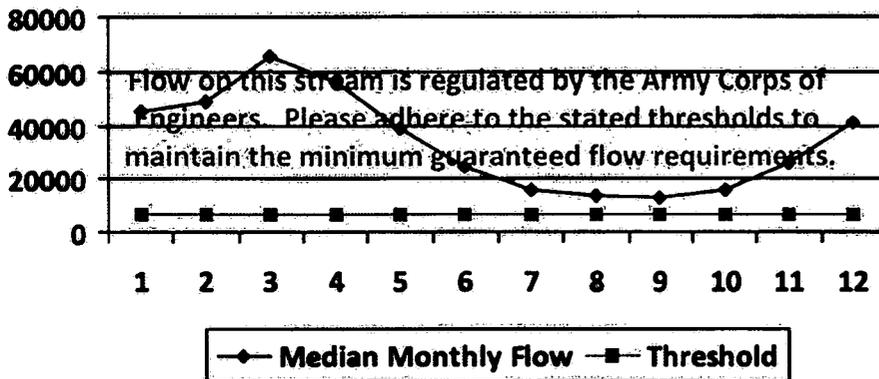
Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-

Water Availability Profile

Water Availability Assessment of Location

Base Threshold (cfs): -
 Upstream Demand (cfs): 0.00
 Downstream Demand (cfs): 0.00
 Pump rate (cfs):
 Headwater Safety (cfs): 0.00
 Ungauged Stream Safety (cfs): 0.00



Min. Gauge Reading (cfs): -
 Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Source ID: 14698 Source Name: Sun Valley Public Service District
Sun Valley PSD

Source Latitude: -
Source Longitude: -

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 391.85 County: Harrison

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

Endangered Species? Mussel Stream?

Trout Stream? Tier 3?

Regulated Stream? Stonewall Jackson Dam

Proximate PSD?

Max. Pump rate (gpm):

Gauged Stream?

Max. Simultaneous Trucks:

Max. Truck pump rate (gpm)

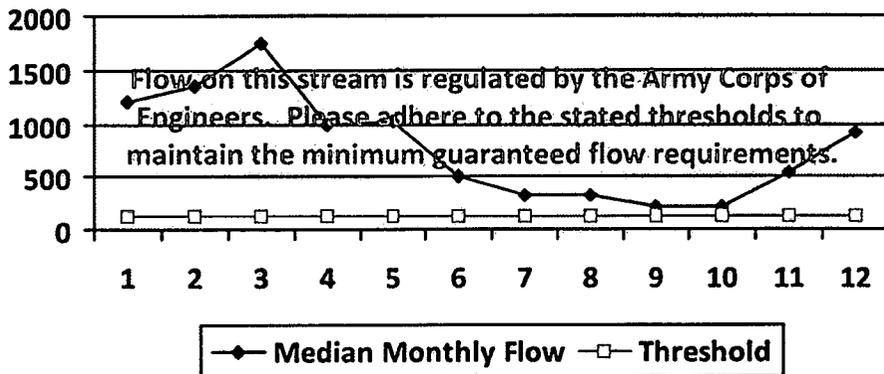
Reference Gaug: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.): 759.00

Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	1,200.75	-	-
2	1,351.92	-	-
3	1,741.33	-	-
4	995.89	-	-
5	1,022.23	-	-
6	512.21	-	-
7	331.86	-	-
8	316.87	-	-
9	220.48	-	-
10	216.17	-	-
11	542.45	-	-
12	926.12	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): -

Upstream Demand (cfs): -

Downstream Demand (cfs): -

Pump rate (cfs): -

Headwater Safety (cfs): 0.00

Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): -

Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14684 Source Name: West Fork River @ JCP Withdrawal
James & Brenda Raines

Source Latitude: 39.320913
Source Longitude: -80.337572

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 532.2 County: Harrison

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 11,140,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 2,000

Regulated Stream? Stonewall Jackson Dam

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

Gauged Stream?

Reference Gaug 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00

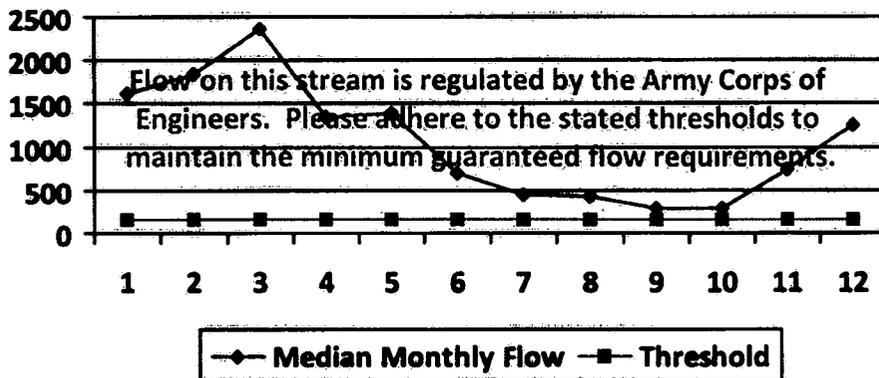
Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	1,630.82	-	-
2	1,836.14	-	-
3	2,365.03	-	-
4	1,352.59	-	-
5	1,388.37	-	-
6	695.67	-	-
7	450.73	-	-
8	430.37	-	-
9	299.45	-	-
10	293.59	-	-
11	736.74	-	-
12	1,257.84	-	-

Water Availability Profile

Water Availability Assessment of Location

Base Threshold (cfs): -
 Upstream Demand (cfs): 24.29
 Downstream Demand (cfs): 0.00
 Pump rate (cfs): 4.46
 Headwater Safety (cfs): 0.00
 Ungauged Stream Safety (cfs): 0.00



Min. Gauge Reading (cfs): -
 Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14685 Source Name: West Fork River @ McDonald Withdrawal
David Shrieves

Source Latitude: 39.16761
Source Longitude: -80.45069

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 314.91 County: Harrison

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

- Endangered Species?
- Trout Stream?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?
- Mussel Stream?
- Tier 3?
- Stonewall Jackson Dam

Total Volume from Source (gal): 11,140,000

Max. Pump rate (gpm): 3,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

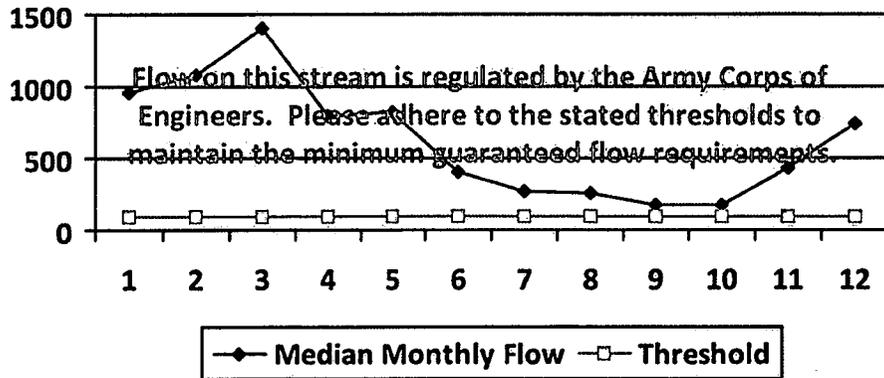
Reference Gaug 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00

Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	964.98	-	-
2	1,086.47	-	-
3	1,399.42	-	-
4	800.34	-	-
5	821.52	-	-
6	411.64	-	-
7	266.70	-	-
8	254.66	-	-
9	177.19	-	-
10	173.72	-	-
11	435.94	-	-
12	744.28	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.68
Headwater Safety (cfs):	24.27
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14686 Source Name: West Fork River @ GAL Withdrawal
David Shrieves

Source Latitude: 39.16422
Source Longitude: -80.45173

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 313.67 County: Harrison

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 11,140,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 2,000

Regulated Stream? Stonewall Jackson Dam

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

Gauged Stream?

Reference Gaug: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.): 759.00

Gauge Threshold (cfs): 234

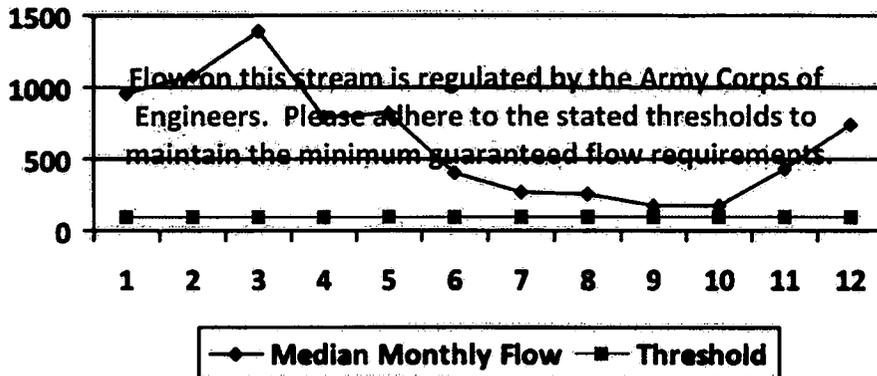
Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	961.18	-	-
2	1,082.19	-	-
3	1,393.91	-	-
4	797.19	-	-
5	818.28	-	-
6	410.02	-	-
7	265.65	-	-
8	253.65	-	-
9	176.49	-	-
10	173.04	-	-
11	434.22	-	-
12	741.35	-	-

Water Availability Profile

Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	4.46
Headwater Safety (cfs):	24.18
Ungauged Stream Safety (cfs):	0.00

Min. Gauge Reading (cfs): -
Passby at Location (cfs): -



"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14687 Source Name Middle Island Creek @ Dawson Withdrawal
Gary D. and Rella A. Dawson

Source Latitude: 39.379292
Source Longitude: -80.867803

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 181.34 County: Tyler

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

Max. Pump rate (gpm): 3,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

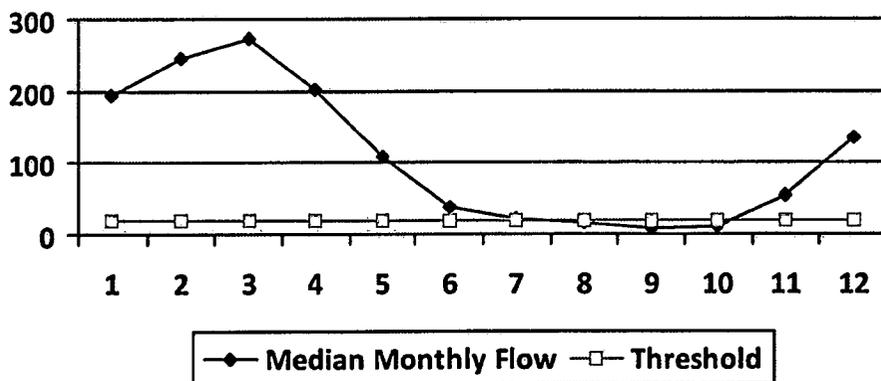
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	194.47	42.06	152.68
2	244.62	42.06	202.83
3	273.72	42.06	231.93
4	203.26	42.06	161.47
5	107.22	42.06	65.43
6	37.44	42.06	-4.35
7	21.19	42.06	-20.60
8	17.45	42.06	-24.34
9	8.94	42.06	-32.85
10	11.23	42.06	-30.56
11	54.82	42.06	13.04
12	133.96	42.06	92.17

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	17.82
Upstream Demand (cfs):	13.10
Downstream Demand (cfs):	6.55
Pump rate (cfs):	6.68
Headwater Safety (cfs):	4.45
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	76.03
Passby at Location (cfs):	28.82

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14688 Source Name: McElroy Creek @ Forest Withdrawal
Forest C. & Brenda L. Moore

Source Latitude: 39.39675
Source Longitude: -80.738197

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 88.85 County: Tyler

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

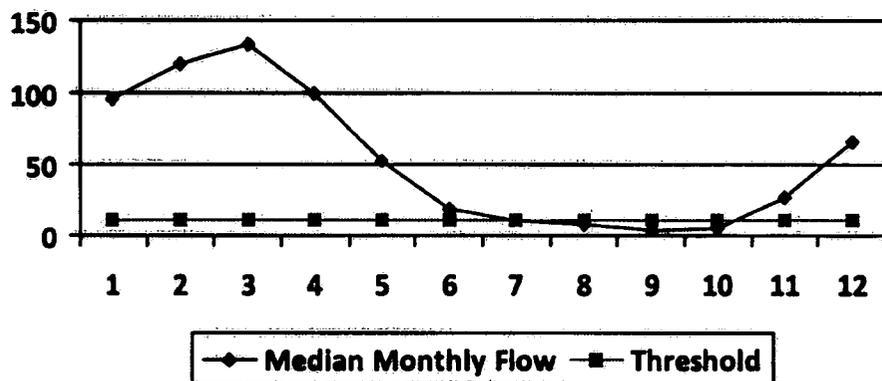
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	95.28	19.78	75.68
2	119.86	19.78	100.25
3	134.11	19.78	114.51
4	99.59	19.78	79.99
5	52.54	19.78	32.93
6	18.35	19.78	-1.26
7	10.38	19.78	-9.22
8	8.55	19.78	-11.05
9	4.38	19.78	-15.23
10	5.50	19.78	-14.10
11	26.86	19.78	7.26
12	65.63	19.78	46.03

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	8.73
Upstream Demand (cfs):	4.46
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	2.18
Ungauged Stream Safety (cfs):	2.18
<hr/>	
Min. Gauge Reading (cfs):	74.19
Passby at Location (cfs):	13.09

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Source ID: 14689 Source Name McElroy Creek @ Sweeney Withdrawal
Bill Sweeney

Source Latitude: 39.398123
Source Longitude: -80.656808

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 45.16 County: Doddridge

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

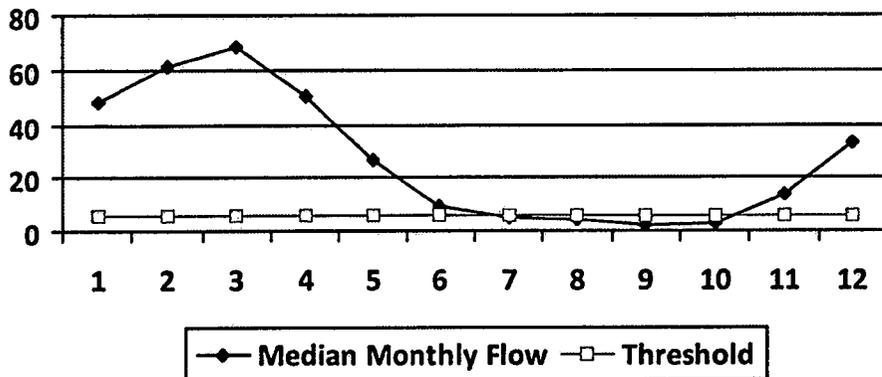
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	48.43	8.88	39.93
2	60.92	8.88	52.42
3	68.17	8.88	59.67
4	50.62	8.88	42.12
5	26.70	8.88	18.21
6	9.32	8.88	0.83
7	5.28	8.88	-3.22
8	4.34	8.88	-4.15
9	2.23	8.88	-6.27
10	2.80	8.88	-5.70
11	13.65	8.88	5.16
12	33.36	8.88	24.86

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs): 4.44
 Upstream Demand (cfs): 0.00
 Downstream Demand (cfs): 0.00
 Pump rate (cfs): 2.23
 Headwater Safety (cfs): 1.11
 Ungauged Stream Safety (cfs): 1.11

Min. Gauge Reading (cfs): 69.73
 Passby at Location (cfs): 6.66

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14690 Source Name: Meathouse Fork @ Gagnon Withdrawal
George L. Gagnon and Susan C. Gagnon

Source Latitude: 39.26054
Source Longitude: -80.720998

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 60.6 County: Doddridge

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

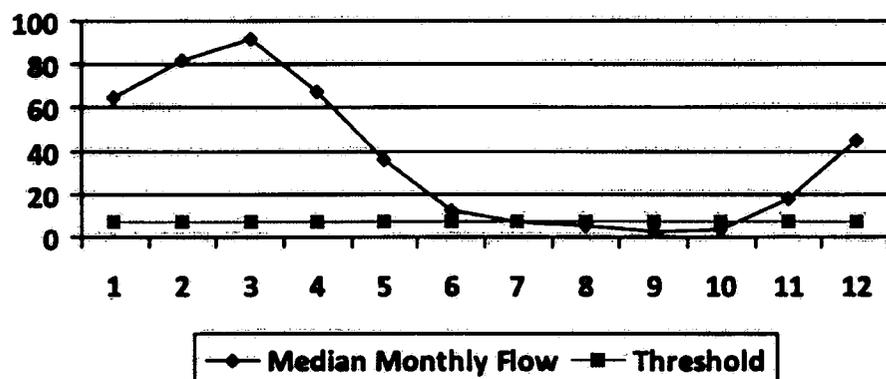
Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	<u>Median monthly flow</u> (cfs)	<u>Threshold (+ pump)</u>	<u>Estimated Available water</u> (cfs)
1	64.99	13.39	51.70
2	81.75	13.39	68.46
3	91.47	13.39	78.19
4	67.93	13.39	54.64
5	35.83	13.39	22.55
6	12.51	13.39	-0.77
7	7.08	13.39	-6.20
8	5.83	13.39	-7.45
9	2.99	13.39	-10.30
10	3.75	13.39	-9.53
11	18.32	13.39	5.04
12	44.76	13.39	31.48

Water Availability Profile

Water Availability Assessment of Location



Base Threshold (cfs):	5.95
Upstream Demand (cfs):	2.23
Downstream Demand (cfs):	2.81
Pump rate (cfs):	2.23
Headwater Safety (cfs):	1.49
Ungauged Stream Safety (cfs):	1.49
<hr/>	
Min. Gauge Reading (cfs):	71.96
Passby at Location (cfs):	11.74

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14691 Source Name Meathouse Fork @ Whitehair Withdrawal
Elton Whitehair

Source Latitude: 39.211317
Source Longitude: -80.679592

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 30.37 County: Doddridge

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

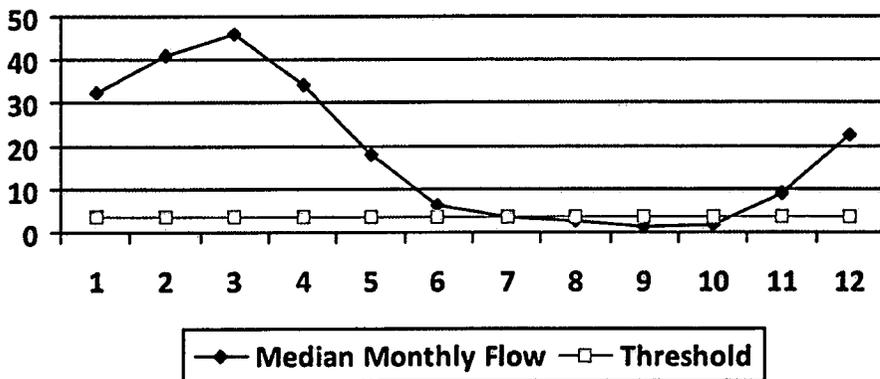
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	32.57	6.70	26.15
2	40.97	6.70	34.55
3	45.84	6.70	39.42
4	34.04	6.70	27.62
5	17.96	6.70	11.54
6	6.27	6.70	-0.15
7	3.55	6.70	-2.87
8	2.92	6.70	-3.50
9	1.50	6.70	-4.92
10	1.88	6.70	-4.54
11	9.18	6.70	2.76
12	22.43	6.70	16.01

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	2.98
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	2.81
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.75
Ungauged Stream Safety (cfs):	0.75
Min. Gauge Reading (cfs):	69.73
Passby at Location (cfs):	7.29

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14692 Source Name: Tom's Fork @ Erwin Withdrawal
 John F. Erwin and Sandra E. Erwin

Source Latitude: 39.174306
 Source Longitude: -80.702992

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 4.01 County: Doddridge

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

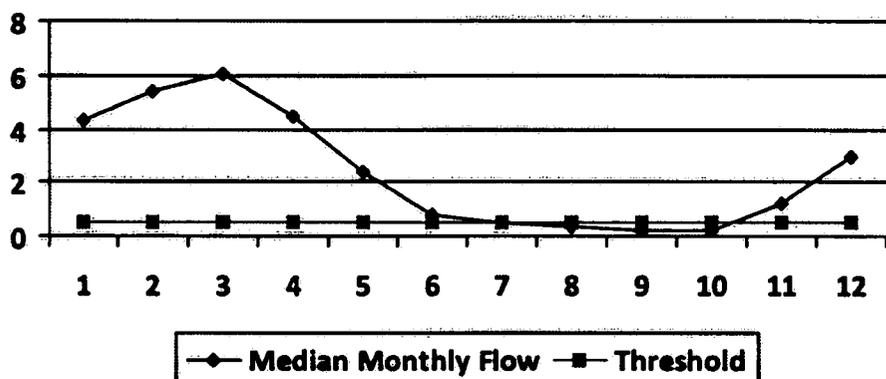
Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	4.30	2.82	1.88
2	5.41	2.82	2.98
3	6.05	2.82	3.63
4	4.49	2.82	2.07
5	2.37	2.82	-0.05
6	0.83	2.82	-1.60
7	0.47	2.82	-1.96
8	0.39	2.82	-2.04
9	0.20	2.82	-2.23
10	0.25	2.82	-2.18
11	1.21	2.82	-1.21
12	2.96	2.82	0.54

Water Availability Profile

Water Availability Assessment of Location

Base Threshold (cfs): 0.39
 Upstream Demand (cfs): 0.00
 Downstream Demand (cfs): 0.00
 Pump rate (cfs): 2.23
 Headwater Safety (cfs): 0.10
 Ungauged Stream Safety (cfs): 0.10



Min. Gauge Reading (cfs): 69.73
 Passby at Location (cfs): 0.59

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14693 Source Name: Arnold Creek @ Davis Withdrawal
Jonathon Davis

Source Latitude: 39.302006
Source Longitude: -80.824561

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 20.83 County: Doddridge

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Total Volume from Source (gal): 11,140,000

Endangered Species? Mussel Stream?

Trout Stream? Tier 3?

Regulated Stream?

Proximate PSD?

Gauged Stream?

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

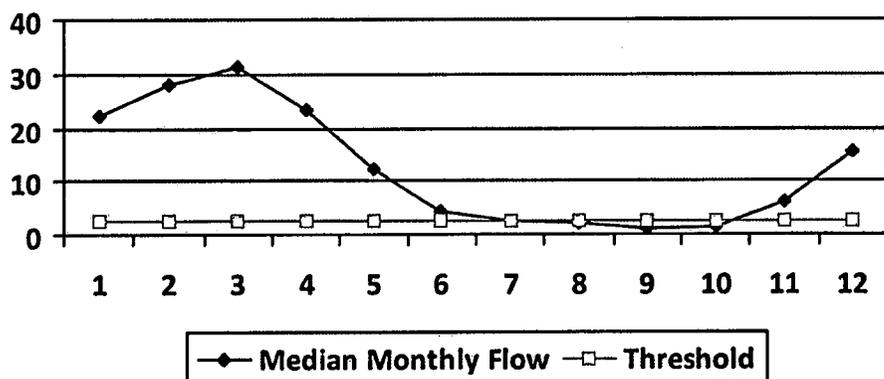
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	22.34	5.30	17.29
2	28.10	5.30	23.05
3	31.44	5.30	26.39
4	23.35	5.30	18.30
5	12.32	5.30	7.26
6	4.30	5.30	-0.75
7	2.43	5.30	-2.62
8	2.00	5.30	-3.05
9	1.03	5.30	-4.03
10	1.29	5.30	-3.76
11	6.30	5.30	1.25
12	15.39	5.30	10.34

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	2.05
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.51
Ungauged Stream Safety (cfs):	0.51
Min. Gauge Reading (cfs):	69.73
Passby at Location (cfs):	3.07

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14694 Source Name: Buckeye Creek @ Powell Withdrawal
Dennis Powell

Source Latitude: 39.277142

Source Longitude: -80.690386

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 31.15 County: Doddridge

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Total Volume from Source (gal): 11,140,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

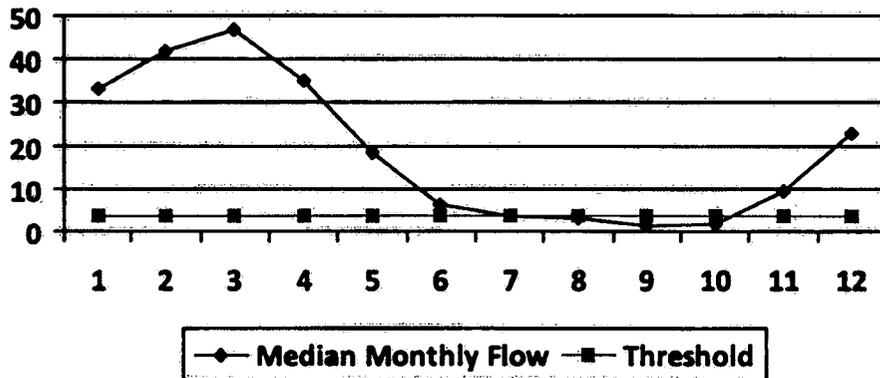
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	33.41	6.82	26.95
2	42.02	6.82	35.56
3	47.02	6.82	40.56
4	34.92	6.82	28.46
5	18.42	6.82	11.96
6	6.43	6.82	-0.03
7	3.64	6.82	-2.82
8	3.00	6.82	-3.46
9	1.53	6.82	-4.92
10	1.93	6.82	-4.53
11	9.42	6.82	2.96
12	23.01	6.82	16.55

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	3.06
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.77
Ungauged Stream Safety (cfs):	0.77
Min. Gauge Reading (cfs):	69.73
Passby at Location (cfs):	4.59

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14695 Source Name: South Fork of Hughes River @ Knight Withdrawal
Tracy C. Knight & Stephanie C. Knight

Source Latitude: 39.198369
Source Longitude: -80.870969

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 16.26 County: Ritchie

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 11,140,000

Trout Stream? Tier 3?

Max. Pump rate (gpm): 3,000

Regulated Stream?

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

Gauged Stream?

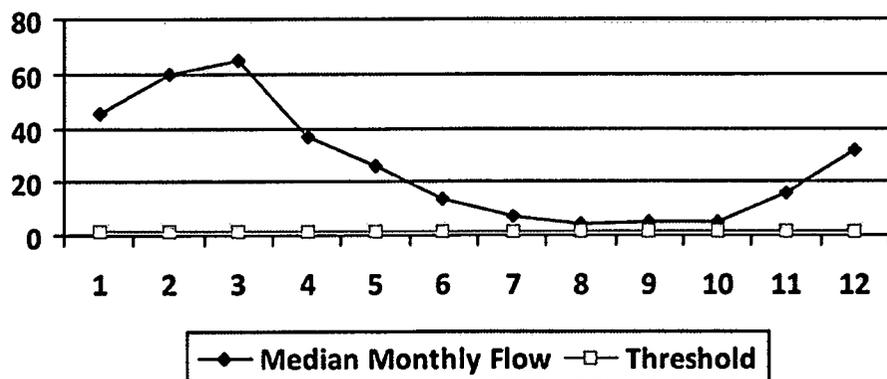
Reference Gaug: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.): 229.00

Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	45.67	14.26	31.44
2	59.55	14.26	45.31
3	65.21	14.26	50.97
4	36.87	14.26	22.63
5	25.86	14.26	11.63
6	13.90	14.26	-0.33
7	6.89	14.26	-7.34
8	3.98	14.26	-10.25
9	4.79	14.26	-9.45
10	5.20	14.26	-9.04
11	15.54	14.26	1.30
12	32.06	14.26	17.82

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	1.56
Upstream Demand (cfs):	5.62
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.68
Headwater Safety (cfs):	0.39
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	39.80
Passby at Location (cfs):	1.95

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01131

API/ID Number: 047-017-06231

Operator: Antero Resources

Rikk Unit 2H

Source ID: 14696 Source Name: North Fork of Hughes River @ Davis Withdrawal
Lewis P. Davis and Norma J. Davis

Source Latitude: 39.322363
Source Longitude: -80.936771

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 15.18 County: Ritchie

Anticipated withdrawal start date: 1/24/2014

Anticipated withdrawal end date: 1/24/2015

- Endangered Species? Mussel Stream?
- Trout Stream? Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Total Volume from Source (gal): 11,140,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

Reference Gaug 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.) 229.00

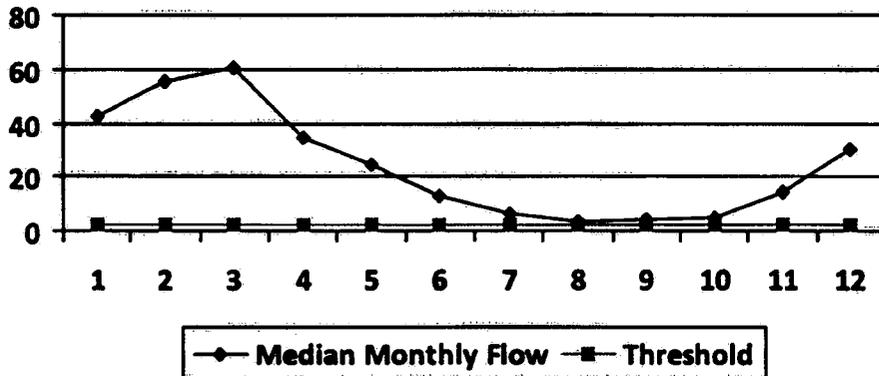
Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	42.64	4.42	38.36
2	55.59	4.42	51.32
3	60.88	4.42	56.60
4	34.42	4.42	30.14
5	24.15	4.42	19.87
6	12.98	4.42	8.70
7	6.44	4.42	2.16
8	3.72	4.42	-0.56
9	4.47	4.42	0.19
10	4.85	4.42	0.57
11	14.50	4.42	10.23
12	29.93	4.42	25.65

Water Availability Profile

Water Availability Assessment of Location

Base Threshold (cfs):	1.46
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.36
Ungauged Stream Safety (cfs):	0.36
<hr/>	
Min. Gauge Reading (cfs):	35.23
Passby at Location (cfs):	2.19



"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

west virginia department of environmental protection



Water Management Plan: Secondary Water Sources



WMP- 01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Lake/Reservoir

Source ID:	14699	Source Name	City of Salem Reservoir (Lower Dog Run)	Source start date:	1/24/2014
			Public Water Provider	Source end date:	1/24/2015
Source Lat:	39.28834	Source Long:	-80.54966	County	Harrison
Max. Daily Purchase (gal)	1,000,000	Total Volume from Source (gal):	11,140,000		

DEP Comments:

WMP-01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID:	14700	Source Name	Pennsboro Lake		Source start date:	1/24/2014	
					Source end date:	1/24/2015	
		Source Lat:	39.281689	Source Long:	-80.925526	County	Ritchie
		Max. Daily Purchase (gal)		Total Volume from Source (gal):		11,140,000	

DEP Comments:

Source ID:	14701	Source Name	Powers Lake (Wilderness Water Park Dam)		Source start date:	1/24/2014	
					Source end date:	1/24/2015	
		Source Lat:	39.255752	Source Long:	-80.463262	County	Harrison
		Max. Daily Purchase (gal)		Total Volume from Source (gal):		11,140,000	

DEP Comments:

WMP-01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID:	14702	Source Name	Powers Lake Two		Source start date:	1/24/2014	
					Source end date:	1/24/2015	
		Source Lat:	39.247604	Source Long:	-80.466642	County	Harrison
		Max. Daily Purchase (gal)		Total Volume from Source (gal):	11,140,000		

DEP Comments:

WMP-01131

API/ID Number 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Other

Source ID: 14703	Source Name	Poth Lake (Landowner Pond)	Source start date:	1/24/2014	
		Private Owner	Source end date:	1/24/2015	
Source Lat:	39.221306	Source Long:	-80.463028	County	Harrison
Max. Daily Purchase (gal)		Total Volume from Source (gal):		11,140,000	

DEP Comments:

Source ID: 14704	Source Name	Williamson Pond (Landowner Pond)	Source start date:	1/24/2014	
			Source end date:	1/24/2015	
Source Lat:	39.19924	Source Long:	-80.886161	County	Ritchie
Max. Daily Purchase (gal)		Total Volume from Source (gal):		11,140,000	

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 14705	Source Name	Eddy Pond (Landowner Pond)		Source start date:	1/24/2014
				Source end date:	1/24/2015
	Source Lat:	39.19924	Source Long:	-80.886161	County
					Ritchie
	Max. Daily Purchase (gal)			Total Volume from Source (gal):	11,140,000
DEP Comments:					

Source ID: 14706	Source Name	Hog Lick Quarry Industrial Facility		Source start date:	1/24/2014
				Source end date:	1/24/2015
	Source Lat:	39.419272	Source Long:	-80.217941	County
					Marion
	Max. Daily Purchase (gal)	1,000,000		Total Volume from Source (gal):	11,140,000
DEP Comments:					

WMP-01131

API/ID Number: 047-017-06231

Operator:

Antero Resources

Rikk Unit 2H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

•For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

•For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 14707	Source Name	Glade Fork Mine Industrial Facility	Source start date:	1/24/2014
			Source end date:	1/24/2015
Source Lat:	38.965767	Source Long:	-80.299313	County
				Upshur
Max. Daily Purchase (gal)	1,000,000	Total Volume from Source (gal):	11,140,000	

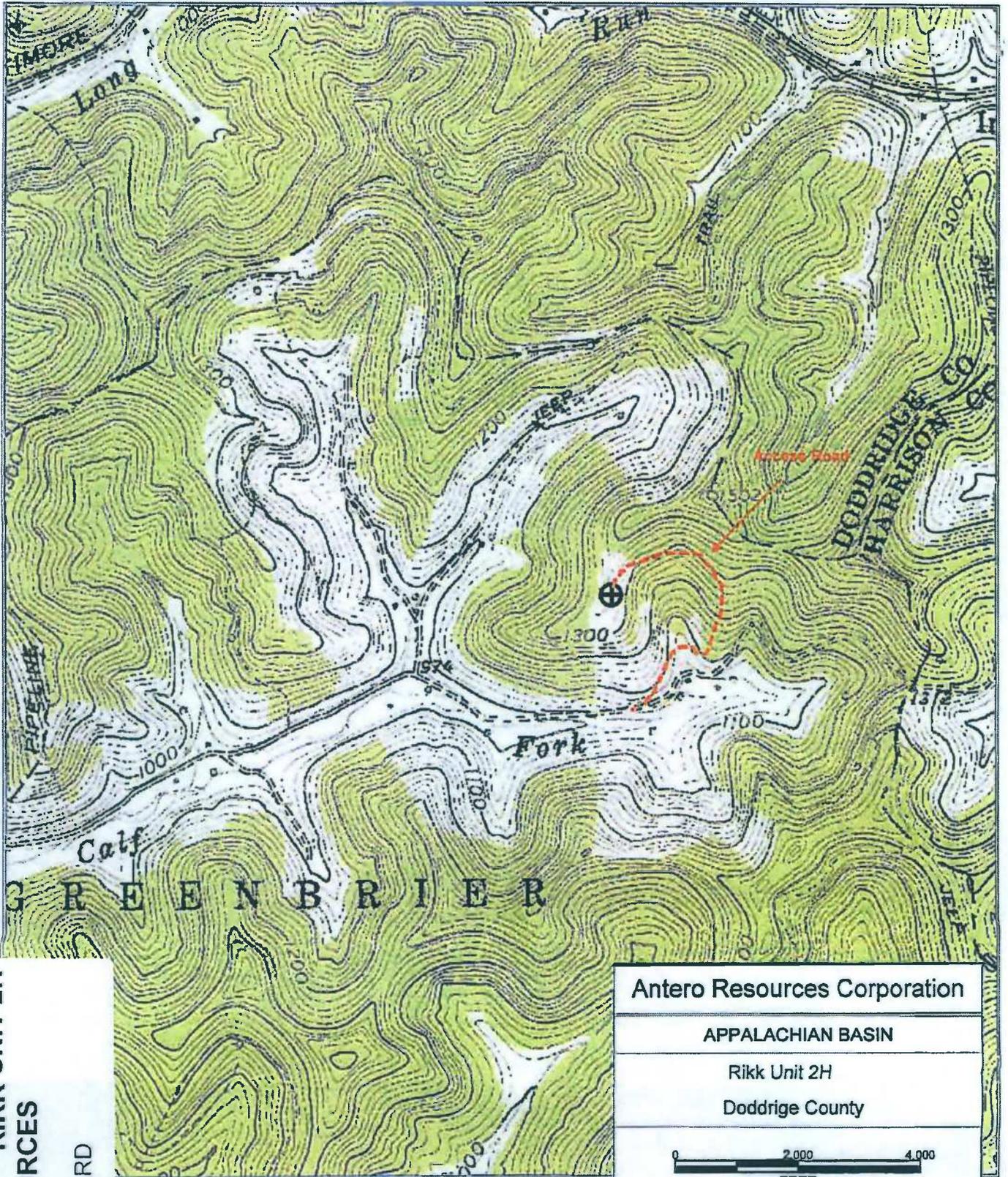
DEP Comments:

Recycled Frac Water

Source ID: 14708	Source Name	Gainer Unit 1H	Source start date:	1/24/2014
			Source end date:	1/24/2015
Source Lat:		Source Long:		County
Max. Daily Purchase (gal)		Total Volume from Source (gal):	11,140,000	

DEP Comments:

17-06231



17-06231 H6A RIKK UNIT 2H
 ANTERO RESOURCES

PAD NAME: LEONARD

Received
 Office of Oil & Gas
 MAY 16 2013
DCW
5-14-2013

Antero Resources Corporation

APPALACHIAN BASIN

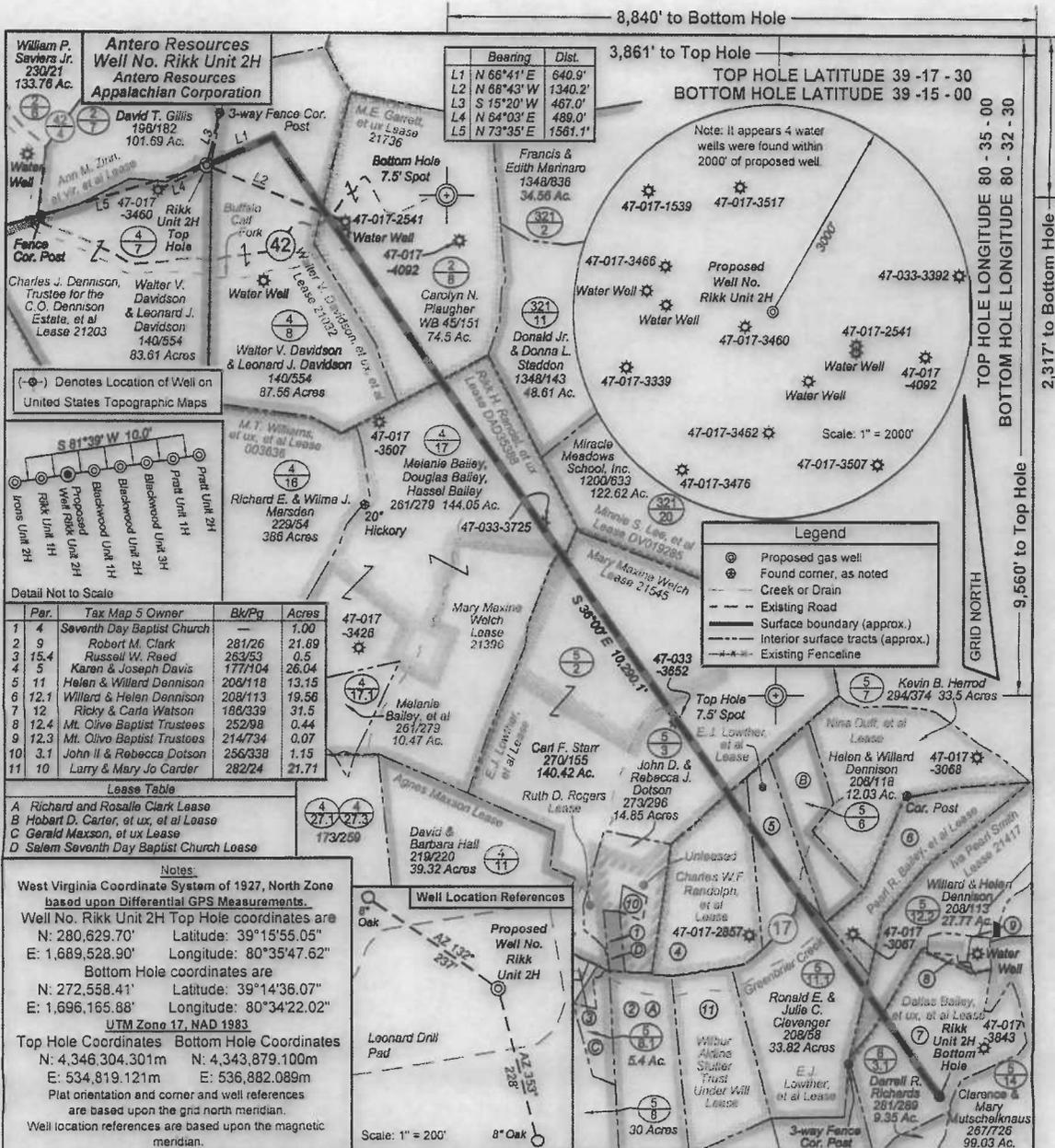
Rikk Unit 2H

Doddrige County



REMARKS
 QUADRANGLE: SALEM & BIG ISAAC
 WATERSHED: BUFFALO CALF FORK
 DISTRICT: GREENBRIER

January 9, 2009



I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Department of Environmental Protection.

Kenneth J. Plum

Kenneth J. Plum, P.S. 2216



FILE NO: 41-30-GR-13
 DRAWING NO: 41-13 Rikk 2H Well Plat
 SCALE: 1" = 1200'
 MINIMUM DEGREE OF ACCURACY: Submeter
 PROVEN SOURCE OF ELEVATION: WVDOT, Bridgeport, WV

STATE OF WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: February 22, 2013
 OPERATOR'S WELL NO. Rikk Unit 2H
 API WELL NO. **H6A**
 STATE COUNTY PERMIT **47-017-06231**

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
 LOCATION: ELEVATION: 1318' WATERSHED: Buffalo Calf Fork QUADRANGLE: Salem & Big Isaac
 DISTRICT: Greenbrier Charles W.F. Randolph, et al; E.J. Lowther, et al (3) COUNTY: Doddridge
 SURFACE OWNER: Walter V. Davidson & Leonard J. Davidson 21417 ACREAGE: 83.61 47: 47: 27: 12
 M.E. Garrett, et ux; Rikk H. Randol, et ux 21203; 21032; 21396 ACREAGE: 45.75; 92: 27
 ROYALTY OWNER: Charles J. Dennison, Trustee for the C.O. Dennison Estate, et al LEASE NO: 21798; DAD35388; 21545 ACREAGE: 84; 87; 74.5; 65; 90
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,650' TVD
 17,450' MD
 WELL OPERATOR: Antero Resources Appalachian Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
 ADDRESS: 1625 17th Street ADDRESS: 5400 D Big Tyler Road
 Denver, CO 80202 Charleston, WV 25313

17-06228



Well Site Safety Plan

Antero Resources

Well Name: Rikk Unit 1H, Rikk Unit 2H, Irons Unit 2H Pratt Unit 1H, Pratt Unit 2H, Blackwood Unit 1H, Blackwood Unit 2H, and Blackwood Unit 3H

Pad Location: LEONARD PAD
Doddridge County/ Greenbrier District

GPS Coordinates: Lat 39°15'55.35"/Long 80°35'47" (NAD83)

Driving Directions:

From the intersection of US-50 and Co Route 50/1 near the town of Salem head south on Co Route 50/1 for 0.7 miles. Turn right onto County Rd 50/73/E Main St and continue to follow County Rd 50/73/E Main St for 0.5 miles. Continue onto South St for 0.2 miles. Continue onto Patterson Rd for 0.2 miles. Continue onto Co Route 29/Patterson Fork Rd 0.2 miles. Turn right to follow Buffalo-Calf Rd (Co Route 42) for 2.6 miles, access road will be on the right.

Received
Office of Oil & Gas

*DCW
5-14-2013*

MAY 14 2013

Approval Sheet

The West Virginia Department of Environmental Protection Office of Oil and Gas has set forth minimum requirements for a Well Site Safety Plan which shall be submitted with each horizontal well application. A horizontal well shall be any well which meets the definition as provided for in Title 35, Series 8, Section 2.2 of the West Virginia Department of Environmental Protection Office of Oil and Gas.

Approved Safety Plans should be maintained and available at the drilling rig at all times and provided to the local emergency planning committee for the emergency planning district in which the well work will occur or to the county office of emergency services at least seven days before commencement of well work or site preparation work that involves any disturbance of land.

The Safety Plan, once approved, may only be modified upon approval by the West Virginia Department of Environmental Protection Office of Oil and Gas ("Office").

This plan has met the requirements of the West Virginia Department of Environmental Protection Office of Oil and Gas Well Site Safety Plan Standards.

Approved this day _____ of month _____, 20__ by

Date: _____

Date: _____

Site Specific Safety Plan

Antero Resources

1.0 Siting Requirements

1.1. Exhibit 1 provides a plan view map showing the well location, access road, pits, flare lines, dwellings, and noting the north and prevailing wind directions.

1.2. Exhibit 2 also provides an area topographical map showing the well site location

2.0 Site Safety Plan

2.1. Safety Meeting

Safety meetings will be conducted as follows:

- Pre-Drilling,
- Pre-Completion,
- Pre-Workover
- Post Accident/Near Miss, and
- As-Needed.

Safety meetings should be held on-site weekly, at a minimum, prior to the beginning of operations, and:

- Includes personnel employed and involved in the operations, and
- Includes the District Oil and Gas Inspector (or other designated Office of Oil and Gas representative, for the pre-spud meeting only).

Typically, contractor of the operator will conduct these safety meetings with Antero Resources personnel participating as needed. Please list the above personnel as a record of attendance using the form found in Appendix A, or one similar. These records may be maintained separate from this plan.

2.2 Personnel and Visitor Log

This log is intended to provide a current headcount of all persons present at the site at any given time. All personnel and visitors must sign in upon entering the site and sign out upon departure. This log, or one similar, is provided in Appendix B and will be maintained at all times by the Drilling Supervisor or Toolpusher.

2.3 Evacuation Plan

The Drilling Supervisor or Toolpusher will establish a muster point at which all persons on site will assemble for personnel safety and verification of headcount. This point will be located at the entrance to the site.

In the event of an emergency requiring the evacuation of personnel, an audible or visual alarm will be sounded. The Drilling Supervisor and/or the Toolpusher will determine if local residents should be evacuated at this time depending on the outcome of their assessment of the situation.

If local resident evacuation is indicated, the Drilling Supervisor and/or the Toolpusher will be responsible for notifying the local impacted residents, or the local authorities will take this responsibility depending on the urgency, availability and direction of the local authorities. Local authorities have indicated that they will take this responsibility typically and will notify of evacuation mandates via television and radio media announcements in addition to public address units on patrol vehicles. In the event that Antero is directed to take this responsibility, notification will be by dispatching a worker to each affected residence to inform them of evacuation requirements and procedures. See section 8.1 for additional information.

Evacuated local residents may be temporarily housed in local hotels depending on the severity and duration of the emergency. Included in Exhibits 1 & 2 are maps and drawings that may assist in the emergency response and evacuation process.

The Drilling Supervisor and/or the Toolpusher will secure the Personnel and Visitor log before evacuating the site in order to perform a headcount at the muster point.

2.4 Emergency Response Personnel

Requesting public emergency response assistance for this location would be accomplished by the Drilling Supervisor or Toolpusher via telephone to Harrison County Dispatch which can be reached by dialing 911. From there, they will dispatch the appropriate and available emergency response agencies depending on the nature and extent of the emergency.

A list of Emergency Contacts, including Antero's 24 hour emergency contact telephone number, any contractors of the operator, the Department, the local oil and gas inspector, and local emergency response units are found in Appendix C. This list will be posted at the well site.

2.5 Local Schools and Public Facilities

In the event of an emergency requiring the evacuation of schools and public facilities the Drilling Supervisor or Toolpusher will make the required notifications unless the local public emergency responders take on this responsibility. Generally, local emergency responders have stated that they will assume this responsibility. Exhibit 3 lists all schools and public facilities, with their contact information, within a one-mile radius of the horizontal well location.

2.6 Material Safety Data Sheets

The Drilling Supervisor or Contractor of the Operator will maintain Material Data Safety Sheets (MSDS) for all materials and chemicals used on the well site. The MSDS sheets should be located in the Company Representatives Office on-site. Copies of the MSDS sheets may also be obtained from the area Safety Coordinator, the operator contact for maintaining MSDSs, by calling the local Antero Resource Office at 304-622-3842.

3.0 Casing Requirements

3.1 Geologic Prognosis

A list of anticipated freshwater, saltwater, oil and gas, hydrogen sulfide, thief zones, and high pressure and high volume zones, including their expected depth are attached to this plan in Exhibit 4, WW-6B.

3.2 Casing and Cementing Program

Exhibit 4 shows the detailed casing and cementing program, which meets the standards of the American Petroleum Institute (API) and employs a minimum of three strings of casing which are of sufficient weight, quantity and quality for the anticipated conditions to be encountered. This casing and cementing program is designed to maintain well control and integrity. The casing setting depths are sufficient to cover and seal off those zones as identified in Exhibit 4.

4.0 BOP Requirements

4.1 BOP Equipment

The following is a list of all BOP equipment with types, sizes and ratings to be utilized and available during the drilling, completion and work-over of the well.

5M system:

- Annular preventer*
- Pipe ram, blind ram, and, if conditions warrant, as specified by the authorized officer, another pipe ram shall also be required*
- A second pipe ram preventer shall be used with a tapered drill string
- Drilling spool, or blowout preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter)*
- 3 inch diameter choke line
- 2 choke line valves (3 inch minimum)*
- Kill line (2 inch minimum)
- 2 chokes with 1 remotely controlled from rig floor
- 2 kill line valves and a check valve (2 inch minimum)*
- Upper kelly cock valve with handle available
- When the expected pressures approach working pressure of the system, 1 remote kill line tested to stack pressure (which shall run to the outer edge of the substructure and be unobstructed)
- Lower kelly cock valve with handle available
- Safety valve(s) and subs to fit all drill string connections in use
- Inside BOP or float sub available
- Pressure gauge on choke manifold
- All BOPE connections subjected to well pressure shall be flanged, welded, or clamped*
- Fill-up line above the uppermost preventer.

If repair or replacement of the BOPE is required after testing, this work shall be performed prior to drilling out the casing shoe.

When the BOPE cannot function to secure the hole, the hole shall be secured using cement, retrievable packer or a bridge plug packer, bridge plug, or other acceptable approved method to assure safe well conditions.

Minimum standards for choke manifold equipment.

- i. All choke lines shall be straight lines unless turns use tee blocks or are targeted with
- ii. running tees, and shall be anchored to prevent whip and reduce vibration.
- iii. ii. Choke manifold equipment configuration shall be functionally equivalent to the appropriate example diagram shown in Appendix C. The actual configuration of the chokes may vary.

All valves (except chokes) in the kill line choke manifold, and choke line shall be a type that does not restrict the flow (full opening) and that allows a straight through flow).

Pressure gauges in the well control system shall be a type designed for drilling fluid service

5M and higher system accumulator shall have sufficient capacity to open the hydraulically-controlled gate valve (if so equipped) and close all rams plus the annular preventer (for 3 ram systems add a 50 percent safety factor to compensate for any fluid loss in the control system or preventers) and retain a minimum pressure of 200 psi above precharge on the closing manifold without use of the closing unit pumps. The fluid reservoir capacity shall be double the usable fluid volume of the accumulator system capacity and the fluid level of the reservoir shall be maintained at the manufacturer's recommendations. Two independent sources of power shall be available for powering the closing unit pumps. Sufficient nitrogen bottles are suitable as a backup power source only, and shall be recharged when the pressure falls below manufacturer's specifications.

Accumulator Precharge Pressure Test

This test shall be conducted prior to connecting the closing unit to the BOP stack and at least once every 6 months. The accumulator pressure shall be corrected if the measured precharge pressure is found to be above or below the maximum or minimum limit specified below (only nitrogen gas may be used to precharge):

Power Availability

Power for the closing unit pumps shall be available to the unit at all times so that the pumps shall automatically start when the closing valve manifold pressure has decreased to the pre-set level.

Accumulator Pump Capacity

Each BOP closing unit shall be equipped with sufficient number and sizes of pumps so that, with the accumulator system isolated from service, the pumps shall be capable of opening the hydraulically-operated gate valve (if so equipped), plus closing the annular preventer on the smallest size drill pipe to be used within 2 minutes, and obtain a minimum of 200 psi above specified accumulator precharge pressure.

Locking Devices

A manual locking device (i.e., hand wheels) or automatic locking devices shall be installed on all systems of 2M or greater. A valve shall be installed in the closing line as close as possible to the annular preventer to act as a locking device. This valve shall be maintained in the open position and shall be closed only when the power source for the accumulator system is inoperative.

Accumulator working pressure rating	Minimum acceptable operating pressure	Desired precharge pressure	Maximum acceptable precharge pressure	Minimum acceptable precharge pressure
1,500 psi	1,500 psi	750 psi	800 psi	700 psi
2,000 psi	2,000 psi	1,000 psi	1,100 psi	900 psi
3,000 psi	3,000 psi	1,000 psi	1,100 psi	900 psi

Remote Controls

Remote controls shall be readily accessible to the driller. Remote controls for all 3M or greater systems shall be capable of closing all preventers. Remote controls for 5M or greater systems shall be capable of both opening and closing all preventers. Master controls shall be at the accumulator and shall be capable of opening and closing all preventers and the choke line valve (if so equipped). No remote control for a 2M system is required.

4.2 Procedure and Schedule for Testing BOP Equipment

Well Control Equipment Testing

- i. Perform all tests described below using clear water or an air..
- ii. Ram type preventers and associated equipment shall be tested to approved stack working pressure if isolated by test plug or to 80 percent of internal yield pressure of casing if BOP stack is not isolated from casing. Pressure shall be maintained for at least 10 minutes or until requirements of test are met, whichever is longer. If a test plug is utilized, no bleed-off of pressure is acceptable. For a test not utilizing a test plug, if a decline in pressure of more than 10 percent in 30 minutes occurs, the test shall be considered to have failed. Valve on casing head below test plug shall be open during test of BOP stack.
- iii. Annular type preventers shall be tested to 70 percent of rated working pressure. Pressure shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer.
- iv. As a minimum, the above test shall be performed:
 - a. when initially installed:
 - b. whenever any seal subject to test pressure is broken:
 - c. following related repairs: and
 - d. 30-day intervals.
- v. Valves shall be tested from working pressure side during BOPE tests with all downstream valves open.
- vi. When testing the kill line valve(s), the check valve shall be held open or the ball removed.
- vii. Annular preventers shall be functionally operated at least weekly.
- viii. Pipe and blind rams shall be activated each trip, however, this function need not be performed more than once a day.
- ix. A BOPE pit level drill shall be conducted weekly for each drilling crew.
- x. Pressure tests shall apply to all related well control equipment.
- xi. All of the above described tests and/or drills shall be recorded in the drilling log.
- xii. For intermediate wellbore drilling phase, the BOP equipment will be pressure and function tested upon initial installation.
- xiii. For the bottom and horizontal wellbore drilling phase, the BOP equipment will be pressure and function tested upon initial installation, weekly, and after each bit trip.

4.3 BOP Installation Schedule

The BOP will be installed after running surface casing as well as after running intermediate casing. BOP equipment shall be installed on the innermost string of casing after the surface casing.

4.4 Well Control Training

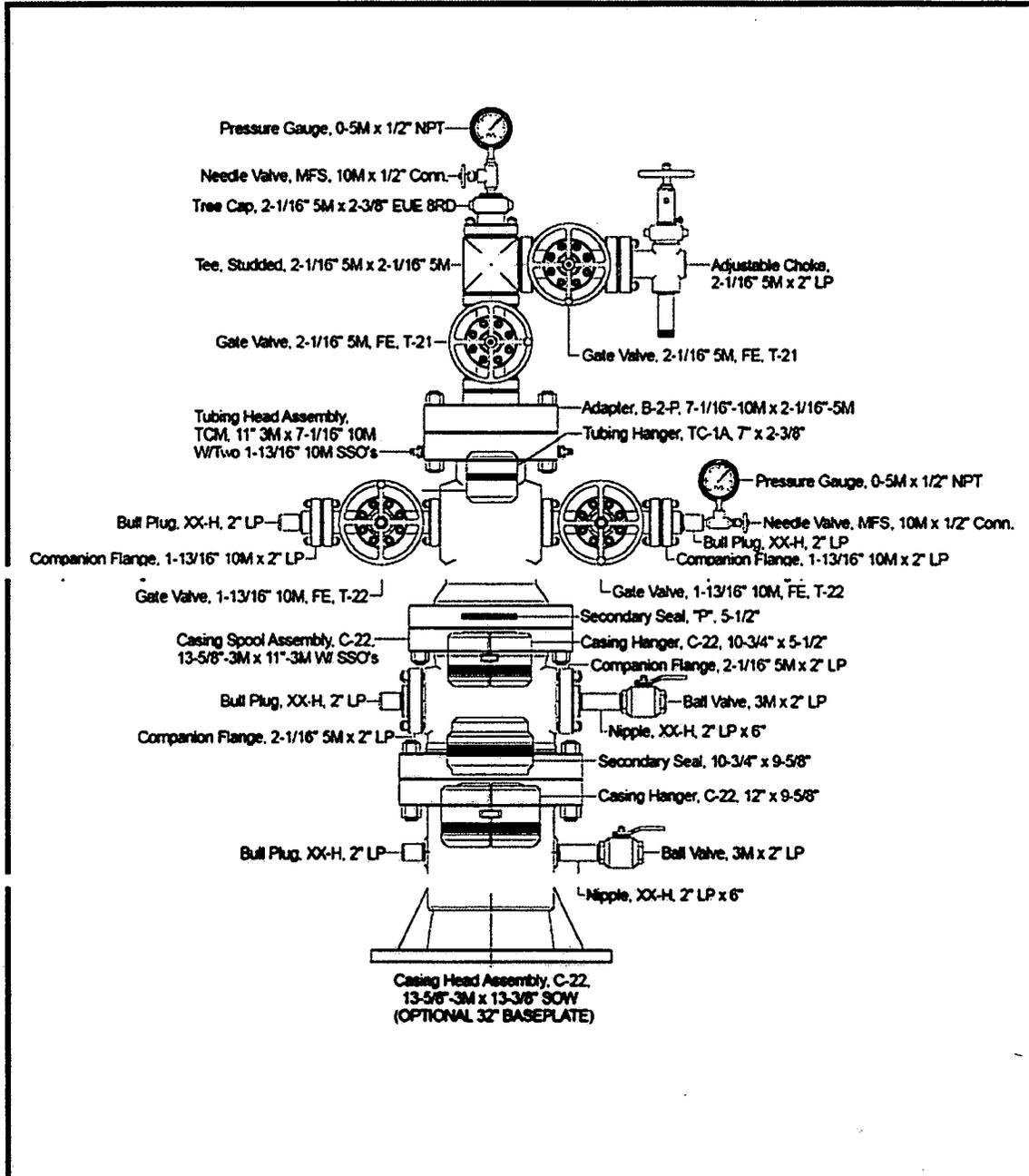
All Drilling Supervisors and Toolpushers used on this well will be IADC trained and certified. A trained person will be present during the drilling operations. Training certificates will be available for review on the location. The list of personnel with said training is provided in Appendix E.

4.5 Drilling Record

The Drilling Supervisor will maintain detailed records of significant drilling events such as lost circulation, hydrogen sulfide gas, fluid entry, kicks and abnormal pressures through the electronic data entry and recording system, Wellview. This system allows the Drilling Supervisor to enter daily reports containing the specified information. The records are then retained electronically at Antero Main Office in Denver, CO.

The Emergency Response Plan for this operating area requires the Drilling Supervisor to notify the district oil and gas inspector or the designated Office of Oil and Gas representative any unusual drilling events such as hydrogen sulfide gas or significant kicks that occur during drilling operations. Any encounter of hydrogen sulfide gas requires immediate notification of the Office of Oil and Gas.

4.6 Schematic and Description of the Wellhead Assembly



5.0 Well Flaring Operations

5.1 Size, Construction and Length of Flare Line

The flare line will be a 4" diameter, steel line that extends 50' from the well. The line will be anchored to the surface of the ground by cross pinning it in place using metal staking at multiple points along the line.

The choke assembly is described in previous section of this document and in drawing "5M Choke Manifold Equipment" BLM drawing Onshore Oil and Gas Order Number 2, Appendix D.

We do not anticipate flaring since we would first attempt to route the flow to the Gas Buster and work the gas kick off from there. Flaring would occur as a last resort or if needed.

5.2 Flare Lighting System

The system for lighting the flare will be an automatic flare igniter using a solar collector panel and battery charger system. A second igniter will be installed as a backup. Should flaring be required or needed.

The Drilling Supervisor will give notification to the local fire department prior to lighting the flare, if practicable, or as soon as possible thereafter.

5.3 Flare Safe Distances

The flare line(s) discharge shall be located not less than 50 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of rig and trailers. The flare system shall have an effective method for ignition. All flammable material beyond the end of the flare line will be cleared to a minimum distance of 50feet.

5.4 Flare Duration

The flare duration should not exceed the maximum time requirements needed to complete the operation.

6.0 Well Killing Operations

6.1 Mud Mixing Inventory

The following shows the inventory of all materials that will be on-site for the mixing of mud:

- 20 sack of Soda Ash
- 480 sacks of KCL
- 200 sacks of Biolose
- 40 sack of Xan-Plex
- 20 buckets of X-Cide 102
- 3 Drums of KD-40
- 5 Buckets of LD-S
- 15 super sack of MIL Bar
- 100 sacks of Soletex
- 40 Sacks of Graphite
- 300 Sack of Salt

Volume of mixed mud = pit volume + equivalent volume in tanks
= 500 bbls + 500 bbls
= 1000 bbls total

Mixed Mud Weight The mixed mud weight will vary depending on the bottom hole pressures and will be calculated and adjusted as we gather more information; we intend to use 12.8 lb – 13.0 lb mud but will adjust the mud weight as information becomes available

Volume of Add'l

Weighting Mat'l

Antero will have the necessary materials available to mix up enough mud to weight the mud up 1 lb more than the mud used for drilling; as an estimate, we expect to have 10 pallets of barite on site and 12 pallets of bentonite

Volume Water for Mixing

The rig has a 400 bbl rig water tank and the location will have 800 bbls additional in separate tanks.



Well Site Safety Plan

Antero Resources

Well Name: Rikk Unit 1H, Rikk Unit 2H, Irons Unit 2H Pratt Unit 1H, Pratt Unit 2H, Blackwood Unit 1H, Blackwood Unit 2H, and Blackwood Unit 3H

Pad Location: LEONARD PAD
Doddridge County/ Greenbrier District

GPS Coordinates: Lat 39°15'55.35"/Long 80°35'47" (NAD83)

Driving Directions:

From the intersection of US-50 and Co Route 50/1 near the town of Salem head south on Co Route 50/1 for 0.7 miles. Turn right onto County Rd 50/73/E Main St and continue to follow County Rd 50/73/E Main St for 0.5 miles. Continue onto South St for 0.2 miles. Continue onto Patterson Rd for 0.2 miles. Continue onto Co Route 29/Patterson Fork Rd 0.2 miles. Turn right to follow Buffalo-Calf Rd (Co Route 42) for 2.6 miles, access road will be on the right.

Approval Sheet

The West Virginia Department of Environmental Protection Office of Oil and Gas has set forth minimum requirements for a Well Site Safety Plan which shall be submitted with each horizontal well application. A horizontal well shall be any well which meets the definition as provided for in Title 35, Series 8, Section 2.2 of the West Virginia Department of Environmental Protection Office of Oil and Gas.

Approved Safety Plans should be maintained and available at the drilling rig at all times and provided to the local emergency planning committee for the emergency planning district in which the well work will occur or to the county office of emergency services at least seven days before commencement of well work or site preparation work that involves any disturbance of land.

The Safety Plan, once approved, may only be modified upon approval by the West Virginia Department of Environmental Protection Office of Oil and Gas ("Office").

This plan has met the requirements of the West Virginia Department of Environmental Protection Office of Oil and Gas Well Site Safety Plan Standards.

Approved this day _____ of month _____, 20__ by

_____ Date: _____

_____ Date: _____

Site Specific Safety Plan

Antero Resources

1.0 Siting Requirements

1.1. Exhibit 1 provides a plan view map showing the well location, access road, pits, flare lines, dwellings, and noting the north and prevailing wind directions.

1.2. Exhibit 2 also provides an area topographical map showing the well site location

2.0 Site Safety Plan

2.1. Safety Meeting

Safety meetings will be conducted as follows:

- Pre-Drilling,
- Pre-Completion,
- Pre-Workover
- Post Accident/Near Miss, and
- As-Needed.

Safety meetings should be held on-site weekly, at a minimum, prior to the beginning of operations, and:

- Includes personnel employed and involved in the operations, and
- Includes the District Oil and Gas Inspector (or other designated Office of Oil and Gas representative, for the pre-spud meeting only).

Typically, contractor of the operator will conduct these safety meetings with Antero Resources personnel participating as needed. Please list the above personnel as a record of attendance using the form found in Appendix A, or one similar. These records may be maintained separate from this plan.

2.2 Personnel and Visitor Log

This log is intended to provide a current headcount of all persons present at the site at any given time. All personnel and visitors must sign in upon entering the site and sign out upon departure. This log, or one similar, is provided in Appendix B and will be maintained at all times by the Drilling Supervisor or Toolpusher.

2.3 Evacuation Plan

The Drilling Supervisor or Toolpusher will establish a muster point at which all persons on site will assemble for personnel safety and verification of headcount. This point will be located at the entrance to the site.

In the event of an emergency requiring the evacuation of personnel, an audible or visual alarm will be sounded. The Drilling Supervisor and/or the Toolpusher will determine if local residents should be evacuated at this time depending on the outcome of their assessment of the situation.

If local resident evacuation is indicated, the Drilling Supervisor and/or the Toolpusher will be responsible for notifying the local impacted residents, or the local authorities will take this responsibility depending on the urgency, availability and direction of the local authorities. Local authorities have indicated that they will take this responsibility typically and will notify of evacuation mandates via television and radio media announcements in addition to public address units on patrol vehicles. In the event that Antero is directed to take this responsibility, notification will be by dispatching a worker to each affected residence to inform them of evacuation requirements and procedures. See section 8.1 for additional information.

Evacuated local residents may be temporarily housed in local hotels depending on the severity and duration of the emergency. Included in Exhibits 1 & 2 are maps and drawings that may assist in the emergency response and evacuation process.

The Drilling Supervisor and/or the Toolpusher will secure the Personnel and Visitor log before evacuating the site in order to perform a headcount at the muster point.

2.4 Emergency Response Personnel

Requesting public emergency response assistance for this location would be accomplished by the Drilling Supervisor or Toolpusher via telephone to Harrison County Dispatch which can be reached by dialing 911. From there, they will dispatch the appropriate and available emergency response agencies depending on the nature and extent of the emergency.

A list of Emergency Contacts, including Antero's 24 hour emergency contact telephone number, any contractors of the operator, the Department, the local oil and gas inspector, and local emergency response units are found in Appendix C. This list will be posted at the well site.

2.5 Local Schools and Public Facilities

In the event of an emergency requiring the evacuation of schools and public facilities the Drilling Supervisor or Toolpusher will make the required notifications unless the local public emergency responders take on this responsibility. Generally, local emergency responders have stated that they will assume this responsibility. Exhibit 3 lists all schools and public facilities, with their contact information, within a one-mile radius of the horizontal well location.

2.6 Material Safety Data Sheets

The Drilling Supervisor or Contractor of the Operator will maintain Material Data Safety Sheets (MSDS) for all materials and chemicals used on the well site. The MSDS sheets should be located in the Company Representatives Office on-site. Copies of the MSDS sheets may also be obtained from the area Safety Coordinator, the operator contact for maintaining MSDSs, by calling the local Antero Resource Office at 304-622-3842.

3.0 Casing Requirements

3.1 Geologic Prognosis

A list of anticipated freshwater, saltwater, oil and gas, hydrogen sulfide, thief zones, and high pressure and high volume zones, including their expected depth are attached to this plan in Exhibit 4, WW-6B.

3.2 Casing and Cementing Program

Exhibit 4 shows the detailed casing and cementing program, which meets the standards of the American Petroleum Institute (API) and employs a minimum of three strings of casing which are of sufficient weight, quantity and quality for the anticipated conditions to be encountered. This casing and cementing program is designed to maintain well control and integrity. The casing setting depths are sufficient to cover and seal off those zones as identified in Exhibit 4.

4.0 BOP Requirements

4.1 BOP Equipment

The following is a list of all BOP equipment with types, sizes and ratings to be utilized and available during the drilling, completion and work-over of the well.

5M system:

- Annular preventer*
- Pipe ram, blind ram, and, if conditions warrant, as specified by the authorized officer, another pipe ram shall also be required*
- A second pipe ram preventer shall be used with a tapered drill string
- Drilling spool, or blowout preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter)*
- 3 inch diameter choke line
- 2 choke line valves (3 inch minimum)*
- Kill line (2 inch minimum)
- 2 chokes with 1 remotely controlled from rig floor
- 2 kill line valves and a check valve (2 inch minimum)*
- Upper kelly cock valve with handle available
- When the expected pressures approach working pressure of the system, 1 remote kill line tested to stack pressure (which shall run to the outer edge of the substructure and be unobstructed)
- Lower kelly cock valve with handle available
- Safety valve(s) and subs to fit all drill string connections in use
- Inside BOP or float sub available
- Pressure gauge on choke manifold
- All BOPE connections subjected to well pressure shall be flanged, welded, or clamped*
- Fill-up line above the uppermost preventer.

If repair or replacement of the BOPE is required after testing, this work shall be performed prior to drilling out the casing shoe.

When the BOPE cannot function to secure the hole, the hole shall be secured using cement, retrievable packer or a bridge plug packer, bridge plug, or other acceptable approved method to assure safe well conditions.

Minimum standards for choke manifold equipment.

- i. All choke lines shall be straight lines unless turns use tee blocks or are targeted with running tees, and shall be anchored to prevent whip and reduce vibration.
- ii. Choke manifold equipment configuration shall be functionally equivalent to the appropriate example diagram shown in Appendix C. The actual configuration of the chokes may vary.

All valves (except chokes) in the kill line choke manifold, and choke line shall be a type that does not restrict the flow (full opening) and that allows a straight through flow).

Pressure gauges in the well control system shall be a type designed for drilling fluid service

5M and higher system accumulator shall have sufficient capacity to open the hydraulically-controlled gate valve (if so equipped) and close all rams plus the annular preventer (for 3 ram systems add a 50 percent safety factor to compensate for any fluid loss in the control system or preventers) and retain a minimum pressure of 200 psi above precharge on the closing manifold without use of the closing unit pumps. The fluid reservoir capacity shall be double the usable fluid volume of the accumulator system capacity and the fluid level of the reservoir shall be maintained at the manufacturer's recommendations. Two independent sources of power shall be available for powering the closing unit pumps. Sufficient nitrogen bottles are suitable as a backup power source only, and shall be recharged when the pressure falls below manufacturer's specifications.

Accumulator Precharge Pressure Test

This test shall be conducted prior to connecting the closing unit to the BOP stack and at least once every 6 months. The accumulator pressure shall be corrected if the measured precharge pressure is found to be above or below the maximum or minimum limit specified below (only nitrogen gas may be used to precharge):

Power Availability

Power for the closing unit pumps shall be available to the unit at all times so that the pumps shall automatically start when the closing valve manifold pressure has decreased to the pre-set level.

Accumulator Pump Capacity

Each BOP closing unit shall be equipped with sufficient number and sizes of pumps so that, with the accumulator system isolated from service, the pumps shall be capable of opening the hydraulically-operated gate valve (if so equipped), plus closing the annular preventer on the smallest size drill pipe to be used within 2 minutes, and obtain a minimum of 200 psi above specified accumulator precharge pressure.

Locking Devices

A manual locking device (i.e., hand wheels) or automatic locking devices shall be installed on all systems of 2M or greater. A valve shall be installed in the closing line as close as possible to the annular preventer to act as a locking device. This valve shall be maintained in the open position and shall be closed only when the power source for the accumulator system is inoperative.

Accumulator working pressure rating	Minimum acceptable operating pressure	Desired precharge pressure	Maximum acceptable precharge pressure	Minimum acceptable precharge pressure
1,500 psi	1,500 psi	750 psi	800 psi	700 psi
2,000 psi	2,000 psi	1,000 psi	1,100 psi	900 psi
3,000 psi	3,000 psi	1,000 psi	1,100 psi	900 psi

Remote Controls

Remote controls shall be readily accessible to the driller. Remote controls for all 3M or greater systems shall be capable of closing all preventers. Remote controls for 5M or greater systems shall be capable of both opening and closing all preventers. Master controls shall be at the accumulator and shall be capable of opening and closing all preventers and the choke line valve (if so equipped). No remote control for a 2M system is required.

4.2 Procedure and Schedule for Testing BOP Equipment

Well Control Equipment Testing

- i. Perform all tests described below using clear water or an air..
- ii. Ram type preventers and associated equipment shall be tested to approved stack working pressure if isolated by test plug or to 80 percent of internal yield pressure of casing if BOP stack is not isolated from casing. Pressure shall be maintained for at least 10 minutes or until requirements of test are met, whichever is longer. If a test plug is utilized, no bleed-off of pressure is acceptable. For a test not utilizing a test plug, if a decline in pressure of more than 10 percent in 30 minutes occurs, the test shall be considered to have failed. Valve on casing head below test plug shall be open during test of BOP stack.
- iii. Annular type preventers shall be tested to 70 percent of rated working pressure. Pressure shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer.
- iv. As a minimum, the above test shall be performed:
 - a. when initially installed:
 - b. whenever any seal subject to test pressure is broken:
 - c. following related repairs: and
 - d. 30-day intervals.
- v. Valves shall be tested from working pressure side during BOPE tests with all downstream valves open.
- vi. When testing the kill line valve(s), the check valve shall be held open or the ball removed.
- vii. Annular preventers shall be functionally operated at least weekly.
- viii. Pipe and blind rams shall be activated each trip, however, this function need not be performed more than once a day.
- ix. A BOPE pit level drill shall be conducted weekly for each drilling crew.
- x. Pressure tests shall apply to all related well control equipment.
- xi. All of the above described tests and/or drills shall be recorded in the drilling log.
- xii. For intermediate wellbore drilling phase, the BOP equipment will be pressure and function tested upon initial installation.
- xiii. For the bottom and horizontal wellbore drilling phase, the BOP equipment will be pressure and function tested upon initial installation, weekly, and after each bit trip.

4.3 BOP Installation Schedule

The BOP will be installed after running surface casing as well as after running intermediate casing. BOP equipment shall be installed on the innermost string of casing after the surface casing.

4.4 Well Control Training

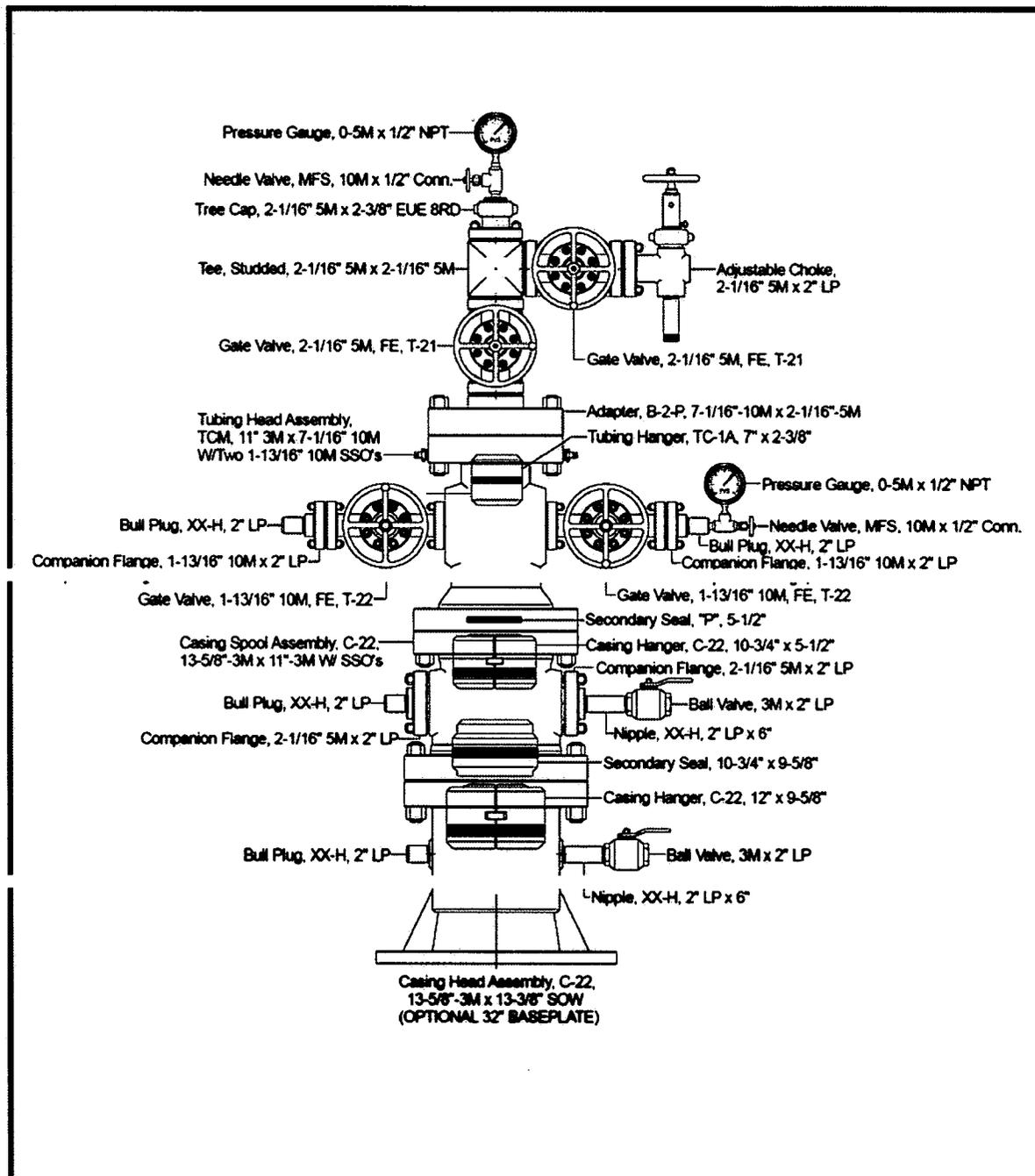
All Drilling Supervisors and Toolpushers used on this well will be IADC trained and certified. A trained person will be present during the drilling operations. Training certificates will be available for review on the location. The list of personnel with said training is provided in Appendix E.

4.5 Drilling Record

The Drilling Supervisor will maintain detailed records of significant drilling events such as lost circulation, hydrogen sulfide gas, fluid entry, kicks and abnormal pressures through the electronic data entry and recording system, Wellview. This system allows the Drilling Supervisor to enter daily reports containing the specified information. The records are then retained electronically at Antero Main Office in Denver, CO.

The Emergency Response Plan for this operating area requires the Drilling Supervisor to notify the district oil and gas inspector or the designated Office of Oil and Gas representative any unusual drilling events such as hydrogen sulfide gas or significant kicks that occur during drilling operations. Any encounter of hydrogen sulfide gas requires immediate notification of the Office of Oil and Gas.

4.6 Schematic and Description of the Wellhead Assembly



5.0 Well Flaring Operations

5.1 Size, Construction and Length of Flare Line

The flare line will be a 4" diameter, steel line that extends 50' from the well. The line will be anchored to the surface of the ground by cross pinning it in place using metal staking at multiple points along the line.

The choke assembly is described in previous section of this document and in drawing "5M Choke Manifold Equipment" BLM drawing Onshore Oil and Gas Order Number 2, Appendix D.

We do not anticipate flaring since we would first attempt to route the flow to the Gas Buster and work the gas kick off from there. Flaring would occur as a last resort or if needed.

5.2 Flare Lighting System

The system for lighting the flare will be an automatic flare igniter using a solar collector panel and battery charger system. A second igniter will be installed as a backup. Should flaring be required or needed.

The Drilling Supervisor will give notification to the local fire department prior to lighting the flare, if practicable, or as soon as possible thereafter.

5.3 Flare Safe Distances

The flare line(s) discharge shall be located not less than 50 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of rig and trailers. The flare system shall have an effective method for ignition. All flammable material beyond the end of the flare line will be cleared to a minimum distance of 50feet.

5.4 Flare Duration

The flare duration should not exceed the maximum time requirements needed to complete the operation.

6.0 Well Killing Operations

6.1 Mud Mixing Inventory

The following shows the inventory of all materials that will be on-site for the mixing of mud:

- 20 sack of Soda Ash
- 480 sacks of KCL
- 200 sacks of Biolose
- 40 sack of Xan-Plex
- 20 buckets of X-Cide 102
- 3 Drums of KD-40
- 5 Buckets of LD-S
- 15 super sack of MIL Bar
- 100 sacks of Soletex
- 40 Sacks of Graphite
- 300 Sack of Salt

Volume of mixed mud = pit volume + equivalent volume in tanks
= 500 bbls + 500 bbls
= 1000 bbls total

Mixed Mud Weight The mixed mud weight will vary depending on the bottom hole pressures and will be calculated and adjusted as we gather more information; we intend to use 12.8 lb – 13.0 lb mud but will adjust the mud weight as information becomes available

Volume of Add'l

Weighting Mat'l

Antero will have the necessary materials available to mix up enough mud to weight the mud up 1 lb more than the mud used for drilling; as an estimate, we expect to have 10 pallets of barite on site and 12 pallets of bentonite

Volume Water for Mixing

The rig has a 400 bbl rig water tank and the location will have 800 bbls additional in separate tanks.

6.2 Mud Mixing Units

The drilling rig is equipped with 2 mud tanks with agitators and jets such that it can make two pills.

6.3 Kill Procedures

The following paragraph describes the methodology and type of kill procedures that will be used if needed. These procedures are recognized by the IADC.

Once a Kick is detected a prompt shut in of the well is essential. The exact shut in method will be dictated by the operation being performed at the time of the kick, available equipment, plus other extenuating circumstance. The following types of kill operations may be performed to bring the well back under control. The different methods listed below to be used will be determined by the operation being performed at the time of the kick.

Kill Procedures

- 1.) Drillers Method
- 2.) Wait and Weight Method
- 3.) Circulate and Weight Method
- 4.) Concurrent Method
- 5.) Reverse Circulation Method
- 6.) Dynamic Kill Method
- 7.) Bullheading Method
- 8.) Volumetric Method

7.0 Hydrogen Sulfide Operations

7.1 H₂S Monitoring

The equipment and method used for the monitoring, detection and warning of the presence of hydrogen sulfide gas during drilling, completions and work-over operations will be portable electronic gas detection such as BW gas detectors or equivalent. These detectors will be

typically located near the well bore on the drilling rig, outside the data van or on the drillers stand.

7.2 H2S Training

All personnel that will be involved in the drilling operations will be trained in H2S in drilling operations to a minimum of the awareness level. Additional training will be given to the Drilling Supervisors both in H2S and emergency response duties related specifically to air toxins. All of the aforementioned training will be completed prior to spudding the well. These records may be kept separate from this plan.

7.3 Personal Protection Equipment

The following personal protection equipment will be available and in use as needed on location:

- Fire Retardant Clothing (FRC),
- Hardhats,
- safety shoes,
- safety glasses and/or safety goggles/face shields,
- hearing protection earplugs,
- cotton and chemical resistant work gloves, and
- dust mask respirators.

In the event that other hazards are identified or presented during the drilling operation, we will attempt to eliminate the hazard, and if not practical, additional PPE will be provided to mitigate the risk to the worker. In the event that H2S is detected, a hazard assessment will be performed for this exposure along with risk mitigation.

7.4 H2S Notification and Control

The emergency alarm will be audible or visual type which will be detectable by all personnel on location. If dangerous levels of H2S are detected, we will immediately implement our Emergency Response Plan which will provide for site control and evacuation as needed. Generally, the site will be secured such that access is allowed only for trained emergency response personnel. Site security will be accomplished by trained workers stationed at safe points on the perimeter and access road to the site.

If H2S is detected and confirmed, a telephonic notification will be made to the local oil and gas inspector.

8.0 Notification and Protection Zone Standards

8.1 Method of Notification

In an emergency which requires the notification of residents and emergency personnel that may be affected during drilling such as release of H₂S, flaring, etc., the emergency response plan will be immediately implemented. This plan specifies the roles and responsibilities of on-site personnel in case of emergency and addresses emergency notification of potentially affected residents and public emergency response personnel.

In general under the situation presently described, after the activation of the emergency alarm, the on-site personnel will muster for a headcount by the On-Scene Incident Commander which is usually the Drilling Supervisor or Toolpusher. After initial assessment of the situation, the OSIC will notify the public emergency response agency from which direction will be taken. If the agency directs, on-site personnel will notify all local impacted residents of the incident by dispatching a worker by truck to each potentially affected residence. If the public emergency responder does not direct this notification to be made by the operator, then the public response agency will be responsible for this notification. The local emergency responders have, in general, stated that emergency notification of local residents will be accomplished by their means including television and radio announcement as well as public address systems on patrol vehicles. Antero safety coordinators who are located in the field may assist with the notification of local residents.

8.2 Established Protection Zones

Protection zones will be established and maintained based on the nature, extent and severity of the event. These protection zones will be based on those safe distances outlined in the applicable portions of the DOT Emergency Response Guidebook.

Safety Meeting Log

Date: _____ Location(Pad): _____ Well Name: _____

	<u>Name</u>	<u>Organization</u>	<u>Job Title</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____
13.	_____	_____	_____
14.	_____	_____	_____
15.	_____	_____	_____
16.	_____	_____	_____
18.	_____	_____	_____
19.	_____	_____	_____
20.	_____	_____	_____
21.	_____	_____	_____
22.	_____	_____	_____
23.	_____	_____	_____
24.	_____	_____	_____
25.	_____	_____	_____

Appendix C.

EMERGENCY CONTACT LIST AND PHONE NUMBERS

Contact	Phone Number
<p>Designated Person and Incident Commander:</p> <p>John Kawcak, <i>Operations Manager</i> Tim Culberson, <i>Midstream Construction Manager</i> Terry Wyckoff, <i>Midstream Production Manager</i></p>	<p>817.368.1553 John 918.916.0116 Tim 304.991.0720 Terry</p>
<p>Designated Backup Person Incident Commander/Response Coordinator:</p> <p>Mike Ward Ricky Jones Norman Wood Stanley Dudley Jeff Partridge Landon West Tim Henrich Mike Alcorn James Harvey Tim Murrell Delf Martinez Ralph Ybarra Virgil Gaither James Neal</p>	<p>580.276.7484 Mike 580.927.6276 Ricky 903.353.4429 Norman 970.618.7602 Stanley 940.577.2288 Jeff 940.389.0602 Landon 720.530.3059 Tim H. 304.627.7070 Mike 918.916.4340 James 903.256.6040 Tim 970.629.0055 Delf 580.927.5606 Ralph 580.504.2366 Virgil 607.644.8701 James</p>
<p>Frontier #3 Frontier #14 Frontier #17 Frontier #8 Frontier #22 Hall Drilling #3</p>	<p>832.487.7965 Rig Sat Phone 713.758.0662 Rig Sat Phone 713,758.0730 Rig Sat Phone 832.531.7014 Rig Sat Phone 713.758.0893 Rig Sat Phone 713.758.0881 Rig Sat Phone</p>
<p>Antero Resources Denver Office 1625 17th Street, Suite 300 Denver, CO 80202</p>	<p>Office: (303) 357-7310 Fax: 303-357-7315</p>
<p>Environmental Manager Jerry Alberts</p>	<p>Direct: (303) 357-7341 Cell: 720-201-0160 24hr</p>

Contact	Phone Number
Safety Manager Rick Blankenship	Direct: (303) 357-7378 Cell: (720) 235-2775 24hr
Vice President Production Kevin Kilstrom	Direct: (303) 357-7335 Cell: (303) 808-0254 24hr
Federal and State Agencies	
National Response Center	(800) 424-8802
West Virginia Office of Water Resources' Emergency Notification Number, Oil Spill Response	1-800-642-3074
West Virginia Office of Oil and Gas Tristan Jenkins, WVDEP Inspector – Harrison County Joe Taylor, WVDEP Inspector – Tyler County David Cowan, WVDEP Inspector – Ritchie County Sam Ward, WVDEP Inspector – Doddridge County	(304) 552-3874 cell Tristan Jenkins (304) 380-7469 cell Joe Taylor (304) 389-3509 cell David Cowan (304) 389-7583 cell Sam Ward
Environmental Protection Agency (EPA) Region 3	Phone: 215-814-3231 Fax: 215-814-3163
West Virginia Worker's Compensation	1-888-4WVCOMP 1-304-926-3400
West Virginia Fish and Wildlife Service, Field Office, Elkins, WV	Phone: 304-636-6586 Fax: 304-636-7824
US OSHA Charles Green	1-800-321-OSHA (1-800-321-6742) 304.347.5937
Local Agencies and Responders	
Sheriff/Police/Fire Department	911
Harrison County LEPC	304.624.9700 John Keeling
Hospital- United Hospital Center--Clarksburg	304. 624.2121
Harrison County Emergency and Dispatch Business Office	911 304.623.6559

Contact	Phone Number
Doddridge County Emergency	911 304.873.3253
Doddridge County LEPC	304.782.2124 Roland W. Kniceley
WV Highway Patrol	304,782,2124 doddridgeoes@dishmail.net
Public Water Intakes (see App G for add'l points)	to be determined
Waste Removal	
TK Stanley—Waste Removal, Vac Truck	304.622.6677
Stallion	330.760.4248
Waste Management	
Contractors	
Hall Drilling Services MT Hall	304588 3368
TK Stanley	304.622.6677
Cleanup Crews	
Ryan Environmental	304.641.0244
Water Haulers	
TK Stanley	304.476.0396
Hall Drilling	304.483.8125
Frac Tank Suppliers	
TK Stanley—Frac Tank Rental	304.622.6677
Stallion	330.760.4248
Winch Trucks	
TK Stanley	304.476.9588

Contact	Phone Number
Water Moving/Pumping	
TK Stanley	304.476.0396
Pumping Services—Kill Fluids	
Halliburton—Jane Lew	724.743.6601 Central Dispatch
Light Plants	254.434.1469 Hot Lights- Josh
Wolfpack	304-623-1199.
BOPs	
Blue Dot	304.290.7399
Snubbing Services	Basic Energy-724-825-2548 Bryan Berlison
Cudd Well Control	713.849.2769 Houston
Wild Well Control	281.353.5481
Roustabout Crews	740.473.1305 Hall Drilling Office 304.588.66474 Hall Drilling- Jack 601.410.7440- TK Stanley Office 724.984.7626- TK Stanley- Brett

WV Emergency Reporting

In the event of a hazardous waste or hazardous material release or emergency, please contact:
1-800-642-3074.

Additional Contact Information

1-800-424-8802 National Response Center

1-304-558-5938 DEP Elkview Emergency Response Unit

Email Contacts:

Mike Dorsey Mike.H.Dorsey@wv.gov

Rusty Joins Rusty.T.Joins@wv.gov

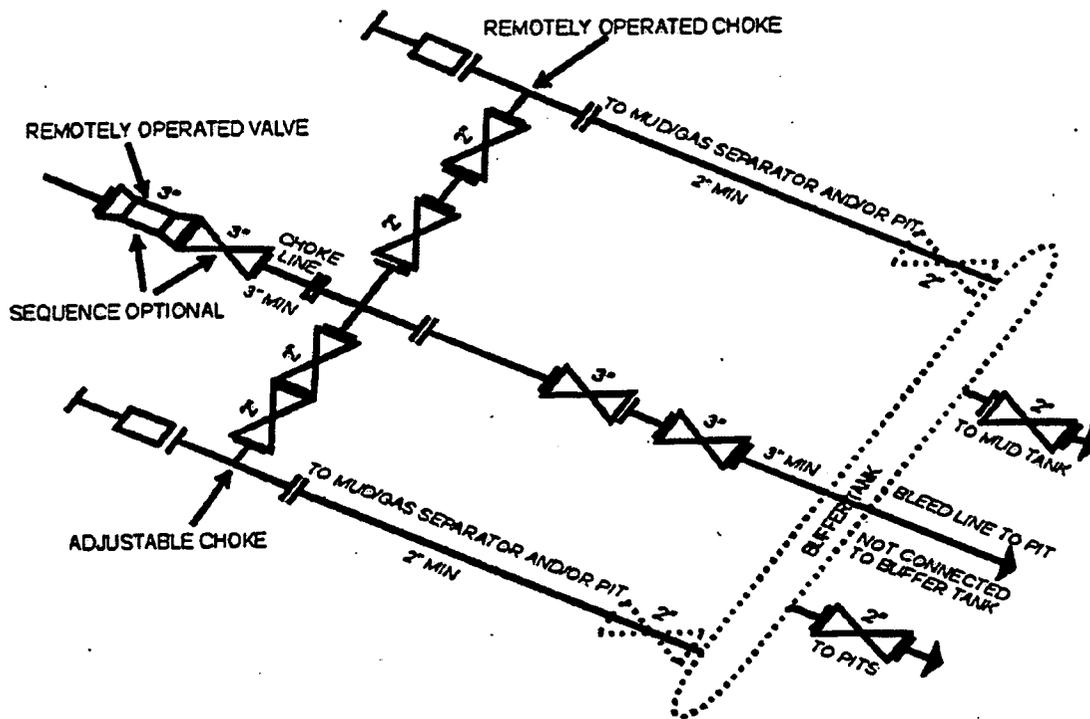
WHERE TO FIND HELP

Doddridge County:

Ambulance, Fire, Law Enforcement Emergencies **Call 911**
Poison Control Center....1-304-388-4211 or 1-800-222-1222
Emergency Alert System Radio WFBY-FM 106.5

FIRE:	
Doddridge County Ambulance Authority	304-838-5718
Greenwood V.F.D	304-873-3669
McClellan V.F.D	304-782-2774
Smithburg V.F.D	304-873-1493
West Union V.F.D	304-873-1391
B.A.N.C.S V.F.D	304-873-3722
EMS:	
Doddridge County Office of Emergency Service	304-782-2124
Doddridge County EMS	304-873-3330
LAW ENFORCEMENT:	
Doddridge County Sheriff Department	304-873-1000
West Union Police Department	304-873-1107
West Virginia State Police Doddridge County Detachment	304-873-2101
OTHER IMPORTANT NUMBERS:	
W.V. Dept. of Health & Human Resources	304-627-2295
National Response Center (Chemical, Oil Spills & Chemical/Biological Terrorism) (State Emergency Spill Notification)	1-800-424-8802 1-800-642-3074
Allegheny Power	1-800-255-3443
WV State Fire Marshal (Arson Hotline)	304-588-2191 1-800-233-3473
Dominion Hope Gas	1-800-688-4673

Appendix D: Choke Manifold Schematic



SM CHOKE MANIFOLD EQUIPMENT - CONFIGURATION OF CHOKES MAY VARY

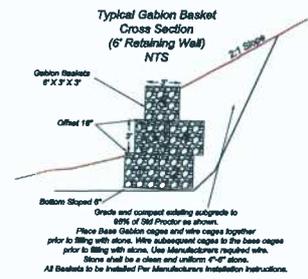
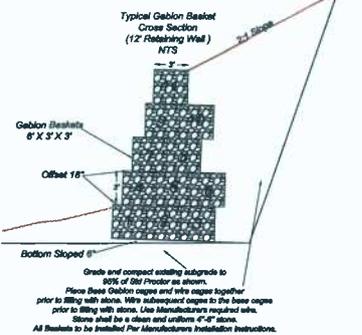
Although not required for any of the choke manifold systems, buffer tanks are sometimes installed downstream of the choke assemblies for the purpose of manifolding the bleed lines together. When buffer tanks are employed, valves shall be installed upstream to isolate a failure or malfunction without interrupting flow control. Though not shown on 2M, 3M, 10M, OR 15M drawings, it would also be applicable to those situations.

[34 FR 39528, Sept. 27, 1989]

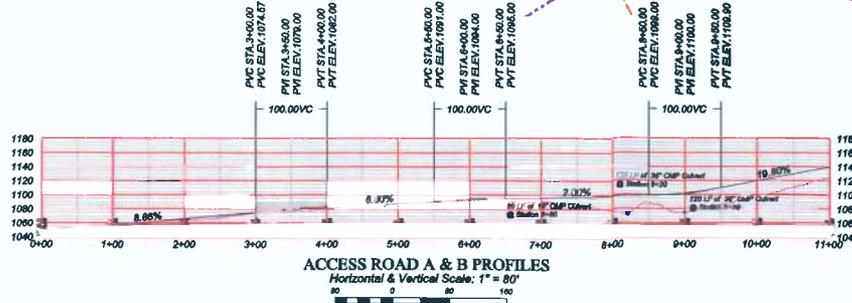
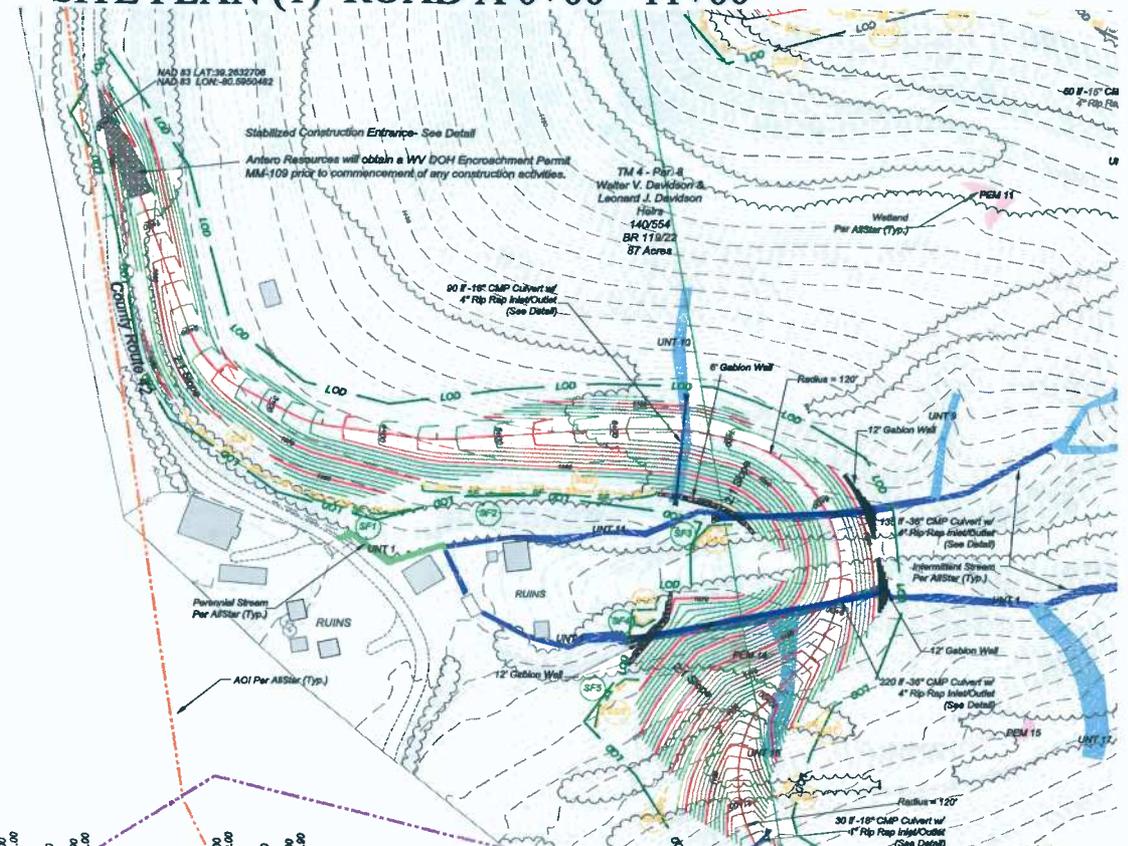
Appendix E. List of Well Control Trained Personnel

1. John Kawcak- Antero
2. Mike Ward- Drilling Consultant
3. Ricky Jones- Drilling Superintendent
4. Mike Alcorn- Drilling Superintendent
5. Landon West- Completion Consultant
6. Jeff Partridge-Completion Consultant
7. Norman Wood- Drilling Consultant
8. Delf Martinez- Drilling Consultant
9. James Harvey- Drilling Consultant
10. Steve Guffey- Drilling Consultant
11. Tim Murell- Drilling Consultant
12. James Neal-Drilling Consultant
13. Virgil Gaither-Drilling Consultant
14. Ralph Ybarra- Drilling Consultant
15. Bob Belcher- Completion Consultant (Willowbend)
16. Kris Humpert- Completion Consultant (Willowbend)
17. Ronnie Fuller- Completion Consultant (Willowbend)
18. Trevor Lively- Completion Consultant (Willowbend)
19. Trey Armstrong- Completion Consultant (Willowbend)
20. Gary Linn- Completion Consultant (Willowbend)
21. Justin Bowers- Completion Consultant (Willowbend)
22. Michael Petitt- Completion Consultant (Willowbend)
23. Stephen Sanders- Completion Consultant (Willowbend)

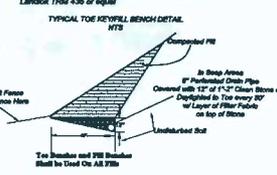
SITE PLAN (1) ROAD A 0+00 - 11+00



Typical Gabion Basket Detail
L = 6', W = 3', H = 3'



LINED DITCH TREATMENT vs SLOPE OF DITCH
 Line with Good & Much if slope is less than 3%
 Line with Little Matting if slope is greater than 3% less than 6%
 Line with Leaf reinforcement matting (TSM) if slope is greater than 6%
 *Leaf reinforcement matting shall be Easobac Fibrocubes or Landtek 1704 436 or equal



Legend	
--- (dashed)	Existing 2' Contour
--- (dotted)	Existing 10' Contour
--- (solid)	Existing Tree Line
--- (solid)	Existing Utility Line / Pole
--- (solid)	Surface Owner Property Line
--- (solid)	Existing Gas Line CL
--- (dashed)	LOD = LOD
--- (dashed)	Proposed Diversion Ditch
--- (dashed)	Proposed 2' Contour
--- (dashed)	Proposed 10' Contour
--- (dashed)	Proposed Super Silt Fence
--- (dashed)	Proposed Check Dam
--- (dashed)	Proposed Culvert W/ Inlet & Outlet Protection
--- (dashed)	Proposed Straw Wattles
--- (dashed)	Proposed Silt Sock/Silt Fence
--- (dashed)	Proposed 2' Contour
--- (dashed)	Proposed 10' Contour
--- (dashed)	Proposed Rip-Rap

DATE	REVISIONS
11/9/12	Updated per Antero/DEP comments

Allegheny Surveys, Inc.
 172 Thompson Drive
 Bridgeport, WV 26330
 (304) 646-5035



L&W ENTERPRISES, INC.
 P.O. BOX 411
 P.O. BOX 411
 FARMINGTON, WV 26434
 PHONE: 334-221-4111
 FAX: 304-221-4111
 EMAIL: INFO@LWENTR.COM

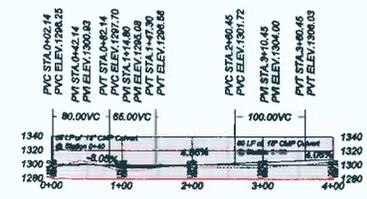
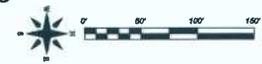
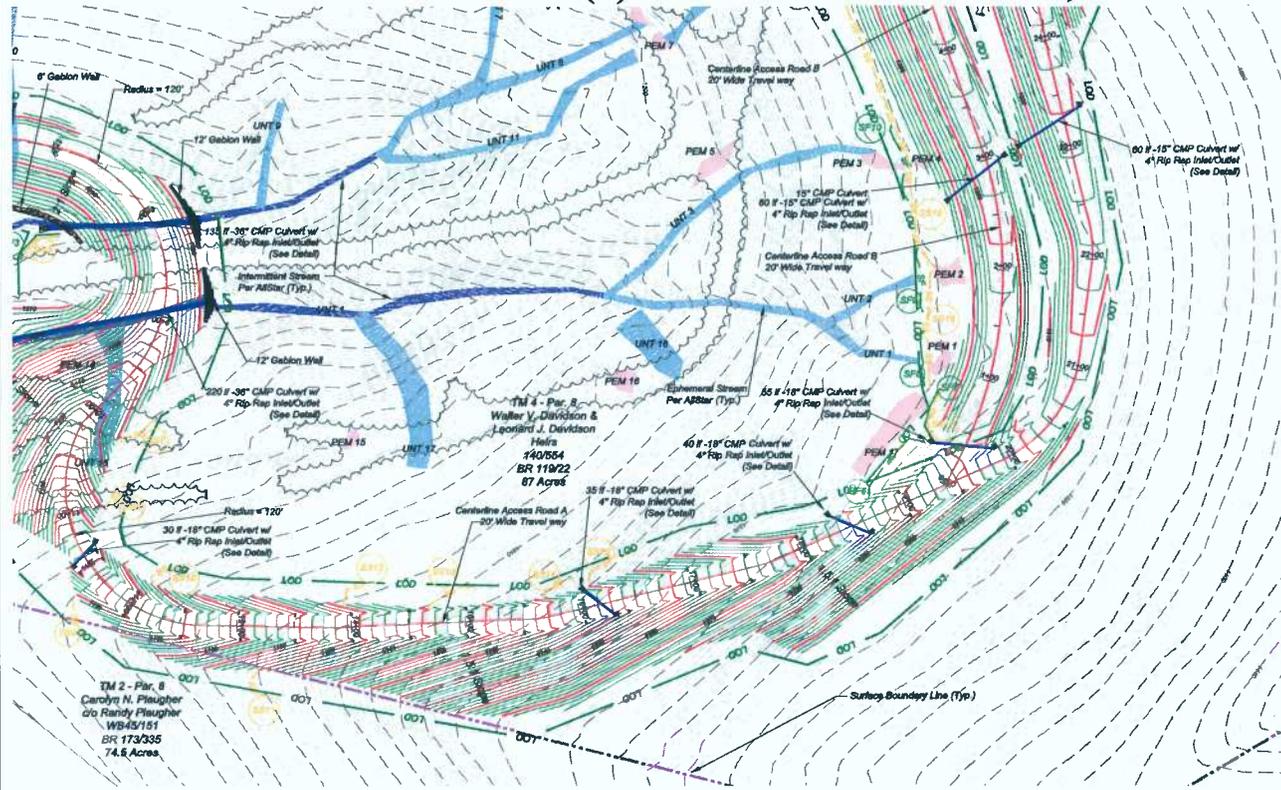


ANTERO RESOURCES
 THIS DOCUMENT PREPARED FOR
 ANTERO RESOURCES
 APRILACHAN CORP

SITE PLAN (1) ROAD A 0+00 - 11+00
 LEONARD PAD
 GREENBRIER DISTRICT
 DODDRIEGE COUNTY, WV

Date: 7/25/12
 Scale: 1" = 50'
 Drawn By: CW/WJ/CM
 File No. Antero 110-12
 Page 6 of 15

SITE PLAN (2) ROAD A 11+00 - 24+00; ROAD B 0+00 - 4+00



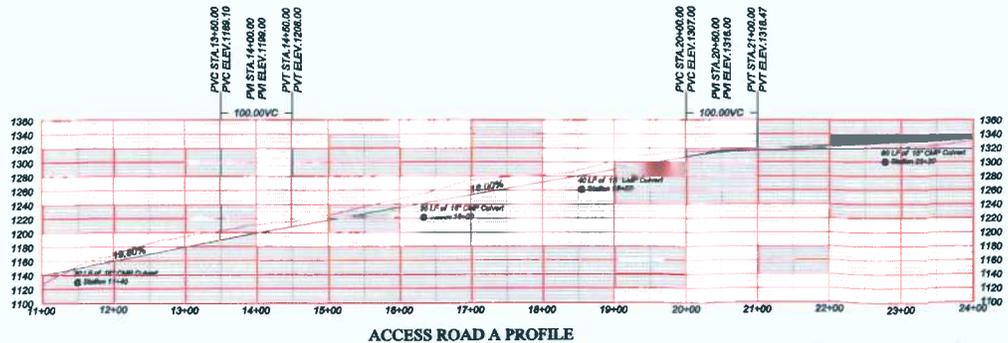
ACCESS ROAD B PROFILE

LINED DITCH TREATMENT vs. SLOPE OF DITCH
 Line with Steel & Mesh if slope is less than 2%
 Line with Gabion Matting if slope is greater than 2% but less than 9%
 Line with bar reinforcement matting (TFRG) if slope is greater than 9%
 *If bar reinforcement matting shall be Escobedo Riprap or Landfill TRM 430 or equal



ACCESS ROAD A & B PROFILES

Horizontal & Vertical Scale: 1" = 80'
 1" = 100'



ACCESS ROAD A PROFILE

Legend	
Existing 2' Contour	Proposed Check Dam
Existing 10' Contour	Proposed Culvert W/ Inlet & Outlet Protection
Existing Tree Line	Proposed Straw Mattings
Existing Utility Line / Pole	Proposed Silt Sock/Silt Fence
Surface Owner Property Line	Proposed 2' Contour
Existing Gas Line CL	Proposed 10' Contour
LOD - LOD	Proposed Rip-Rap
Limits of Disturbance	
Proposed Diversion Ditch	
Proposed 2' Contour	
Proposed 10' Contour	
Proposed Super Silt Fence	

DATE	REVISIONS	Date: 7/25/12
11/9/12	Updated per Antero/DEP comments	Scale: 1" = 50'
		Designed By: CEW/CXM
		File No. Amos 110-12
		Page 7 of 12

Allegheny Surveyors, Inc.
 172 Thompson Drive
 Bridgeport, WV 26330
 (304) 846-5035



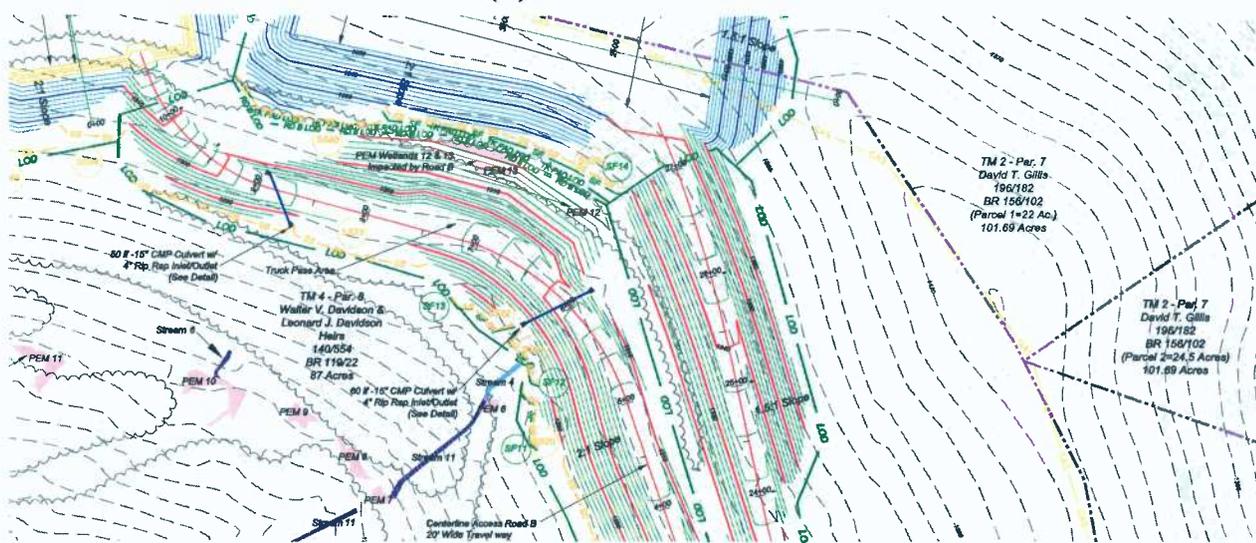
L&W ENTERPRISES, INC.
 1000 1/2 S. 10th St.
 Martinsburg, WV 26001
 (304) 263-1111



ANTERO RESOURCES
 THIS DOCUMENT
 PREPARED FOR
 ANTERO RESOURCES
 APPALACHIAN CORP

SITE PLAN (2) ROAD A 11+00 - 24+00;
 ROAD B 0+00 - 4+00
 LEONARD PAD
 GREENBRIER DISTRICT
 DODDGE COUNTY, WV

SITE PLAN (3) ROAD A 24+00 - 28+00 & ROAD B 4+00 - 11+00



Allegheny Surveys, Inc.
172 Thompson Drive
Bridgeport, WV 26330
(304) 845-5035

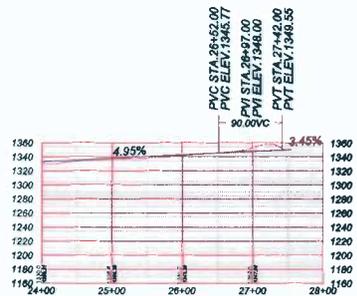


L&W ENTERPRISES, INC.
P.O. Box 68
11 WHITE OAKS BLVD.
FERRISBURGH, WV 26037
P.E. #A-237441
P.A.L. #A-237424
BIOLOGICAL ENGINEERING

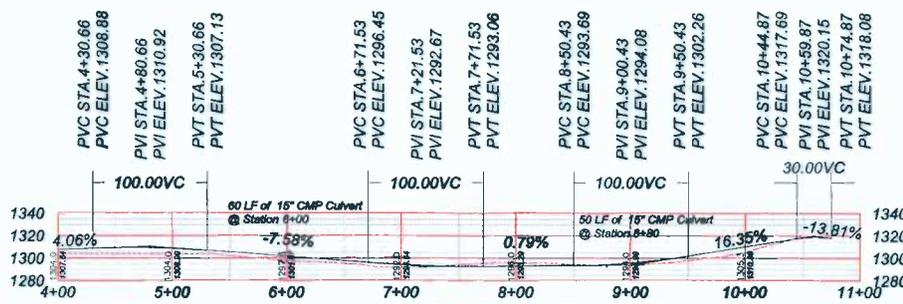


ANTERO
THIS DOCUMENT
PREPARED FOR
ANTERO RESOURCES
APPALACHIAN CORP.

SITE PLAN (3) ROAD A 24+00 - 28+00 &
ROAD B 4+00 - 11+00
LEONARD PAD
GREENSBORO DISTRICT
DODDRIEGE COUNTY, WV



ACCESS ROAD A PROFILE
Horizontal & Vertical Scale: 1" = 80'



ACCESS ROAD B PROFILE
Horizontal & Vertical Scale: 1" = 50'



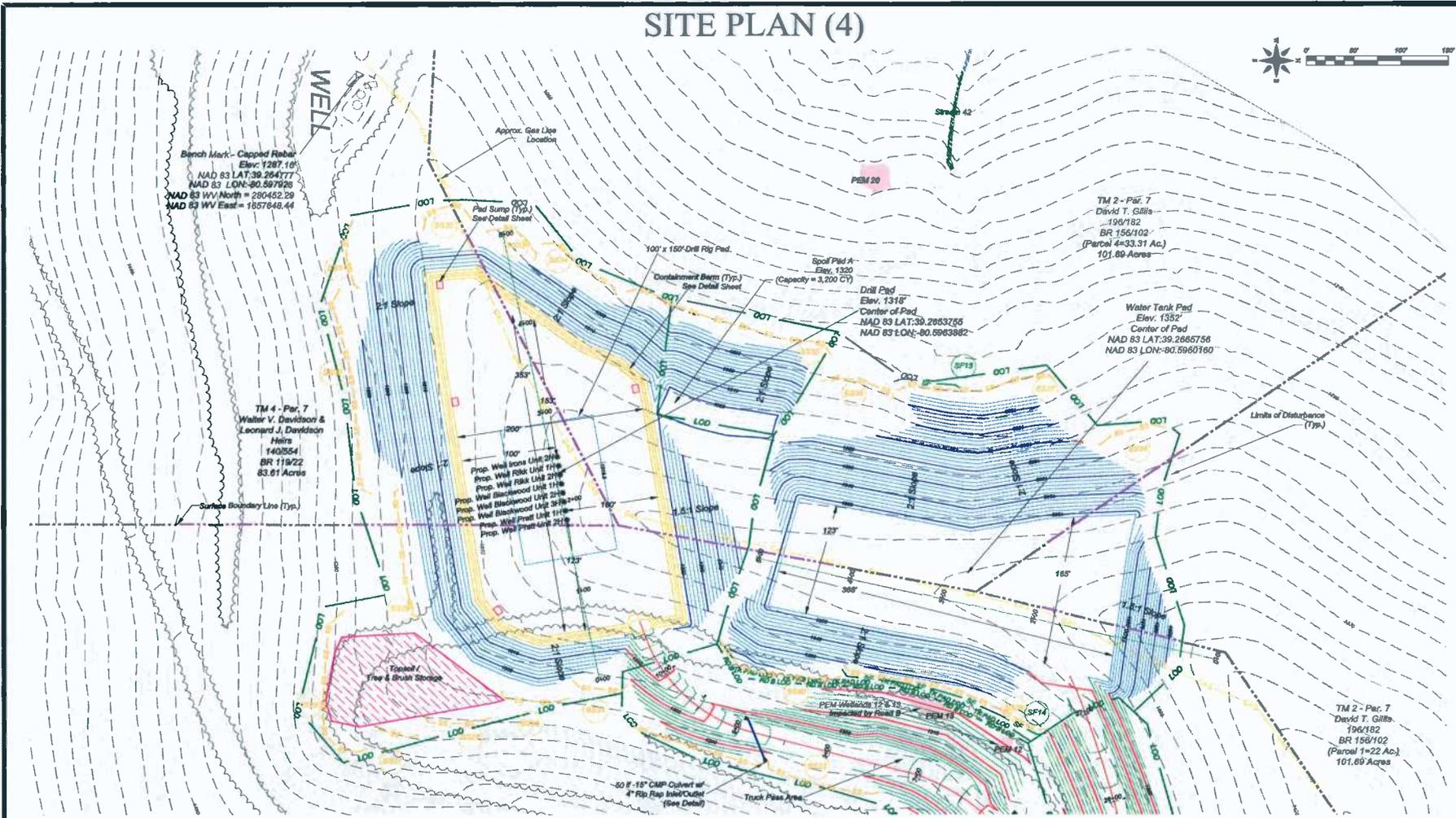
LINED DITCH TREATMENT vs SLOPE of DITCH
Line with Stone & Mesh if slope is less than 3%
Line with Ash Matting if slope is greater than 3% less than 9%
Line with Bar reinforcement matting (TRM) if slope is greater than 9%
*TRM reinforcement matting shall be Excelsior Recycled or Landform TRM 435 or equal

Legend	
---	Existing 2' Contour
---	Existing 10' Contour
---	Existing Tree Line
---	Existing Utility Line / Pole
---	Surface Owner Property Line
---	Existing Gas Line G
---	LOO - Limits of Disturbance
---	Proposed Diversion Ditch
---	Proposed 2' Contour
---	Proposed 10' Contour
---	Proposed Super Silt Fence
---	Proposed Check Dam
---	Proposed Culvert W/F
---	Inlet & Outlet Protection
---	Proposed Straw Wattles
---	Proposed Silt Stock/Silt Fence
---	Proposed 2' Contour
---	Proposed 10' Contour
---	Proposed Rip-Rap

DATE	REVISIONS
11/9/12	Updated per Antero/DEP comments
3/6/13	Updated with new Wetland Stream Data

Date: 7/25/12
Scale: 1" = 50'
Designed by: CLK/WCK/D
File No.: Antero 110-12
Page 8 of 15

SITE PLAN (4)



Bench Mark - Capped Rebar
Elev. 1287.19'
NAD 83 LAT: 39.264177
NAD 83 LON: -80.597926
NAD 83 WV North = 280452.29
NAD 83 WV East = 1857648.44

TM 4 - Par. 7
Water V. Davidson &
Leonard J. Davidson
Heirs
140354
BR 11922
83.61 Acres

TM 2 - Par. 7
David T. Gilles
196/182
BR 156/102
(Parcel 4=33.31 Ac.)
101.69 Acres

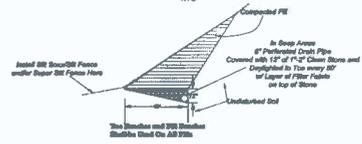
Water Tank Pad
Elev. 1332'
Center of Pad
NAD 83 LAT: 39.2665756
NAD 83 LON: -80.5960160

Drill Pad
Elev. 1318'
Center of Pad
NAD 83 LAT: 39.2663755
NAD 83 LON: -80.5963382

Prop. Well Zone Unit 2348
Prop. Well Zone Unit 2349
Prop. Well RFB Unit 2348
Prop. Well Blackwood Unit 2348
Prop. Well Blackwood Unit 2349
Prop. Well Blackwood Unit 2349
Prop. Well Pines Unit 2348
Prop. Well Pines Unit 2349

TM 2 - Par. 7
David T. Gilles
196/182
BR 156/102
(Parcel 1=22 Ac.)
101.69 Acres

TYPICAL TIE REVEAL BENCH DETAIL
N7S



Legend			
	Existing 2' Contour		Proposed Check Dam
	Existing 10' Contour		Proposed Culvert W/ Inlet & Outlet Protection
	Existing Tree Line		Proposed Straw Wattles
	Existing Utility Line / Pole		Proposed Silt Sock/Silt Fence
	Surface Owner Property Line		Proposed 2' Contour
	Existing Gas Line CL		Proposed 10' Contour
	Limits of Disturbance		Proposed Rip-Rap
	Proposed Diversion Ditch		
	Proposed 2' Contour		
	Proposed 10' Contour		
	Proposed Super Silt Fence		

DATE	REVISIONS
8-9-12	Well Layout Changes
3/6/13	Updated with new Wetland Stream Data

Appalachian Surveys, Inc.
72 Thompson Rd.
Bridgewater, WV 26330
(304) 846-5635

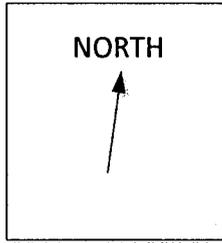
L&W ENTERPRISES, INC.
PO BOX 225
14 SOUTH HERRICK ST.
GREENSBORO, WV 26032
TEL: 304-255-4111
FAX: 304-257-2224
WWW: WWW.LANDSURVEYING.COM

ANTERO
RESOURCES

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PREPARED FOR
ANTERO RESOURCES
APPALACHIAN CORP.

SITE PLAN (4)
LEONARD PAD
GREENBRIER DISTRICT
DODDRIIDGE COUNTY, WV

Date: 7/25/12
Scale: 1" = 50'
Designed by: CLK/CKM
File No: Antero 110-11
Page 9 of 15



PREVAILING WIND
DIRECTION NNE



EXHIBIT 1
LEONARD PAD

EXHIBIT 1, PAGE 5

DRILLING LAYOUT/FLARE LINES/PREVAILING WINDS

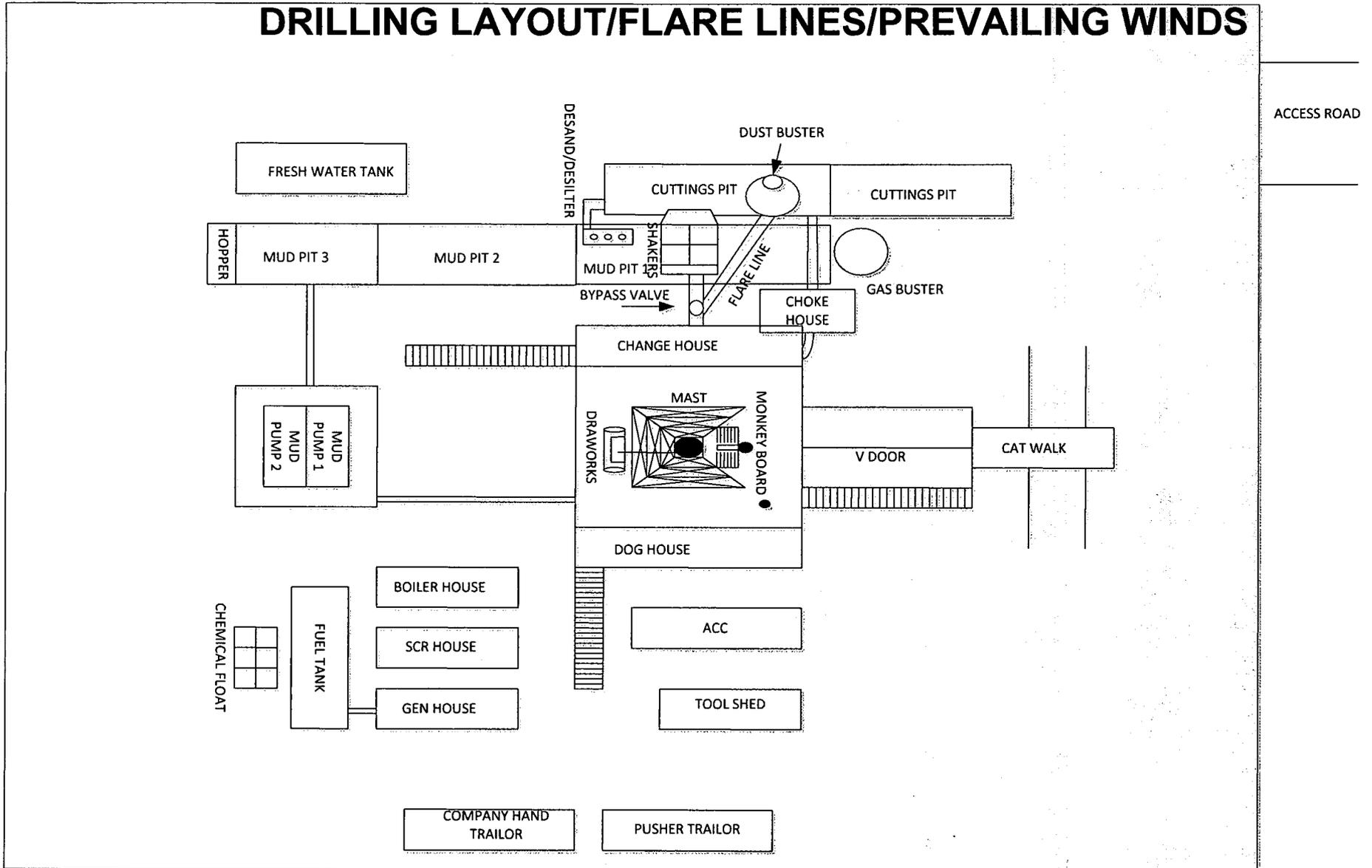
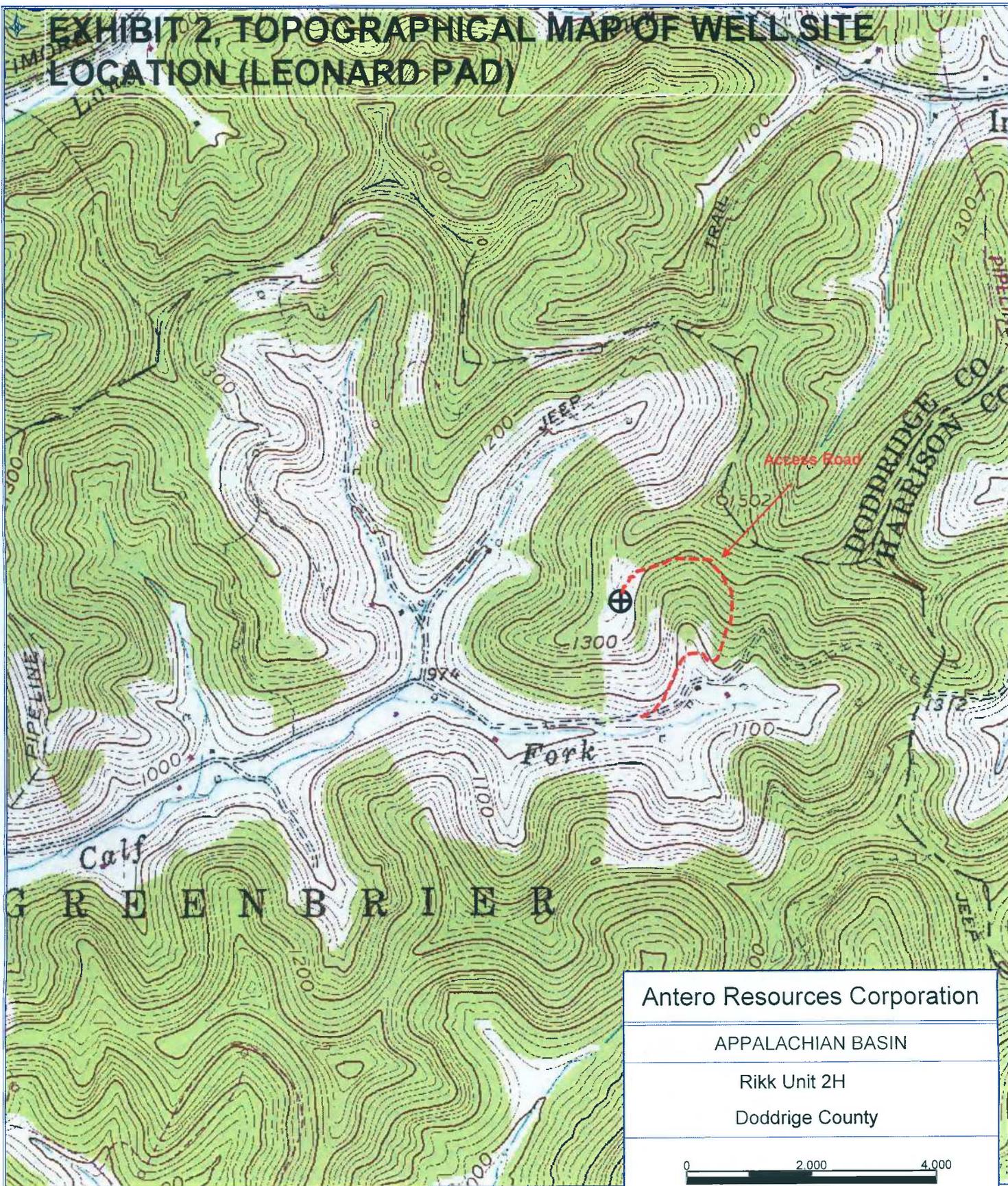


EXHIBIT 2, TOPOGRAPHICAL MAP OF WELL SITE LOCATION (LEONARD PAD)



Antero Resources Corporation

APPALACHIAN BASIN

Rikk Unit 2H

Doddridge County



REMARKS

QUADRANGLE: SALEM & BIG ISAAC
WATERSHED: BUFFALO CALF FORK
DISTRICT: GREENBRIER

January 9, 2009

EXHIBIT 3: LIST OF ALL SCHOOLS & PUBLIC FACILITIES WITHIN A ONE-MILE RADIUS OF PROPOSED WELL SITE

Map	Parcel	Name	Address	City	State	Zip	Phone	Deed Book/Page
321	20	Miracle Meadows School	RR 1 Box 289-B	Salem	WV	26426	304-782-3628	1200/633

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	300'	300'	CTS, 417 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2525'	2525'	CTS, 1028 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	16,700'	16,700'	4180 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

21) Describe centralizer placement for each casing string.

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

22) Describe all cement additives associated with each cement type.

Conductor: no additives, Class A cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures.

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

EXHIBIT 4.b to SSP- WW-6B FORM

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Appalachian Corporation 494488557 Doddridge Greenbrier Salem
Operator ID County District Quadrangle

2) Operator's Well Number: Rikk Unit 1H Well Pad Name: Leonard Pad

3 Elevation, current ground: -1325' Elevation, proposed post-construction: 1318'

4) Well Type: (a) Gas Oil
Other
(b) If Gas: Shallow Deep
Horizontal

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale: 7650' TVD, Anticipated Thickness- 50 Feet, Associated Pressure- 3200#

7) Proposed Total Vertical Depth: 7650' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 17,650' MD

10) Approximate Fresh Water Strata Depths: 87', 230'

11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.

12) Approximate Saltwater Depths: 842', 1789', 2051'

13) Approximate Coal Seam Depths: 263', 960', 1726'

14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

15) Does land contain coal seams tributary or adjacent to, active mine? No

16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale

17) Describe fracturing/stimulating methods in detail:
Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 18.18 acres

19) Area to be disturbed for well pad only, less access road (acres): 4.51 acres

WW - 6B
(1/12)

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	310'	310'	CTS, 431 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2575'	2575'	CTS, 1048 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17,650'	17,650'	4417 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

21) Describe centralizer placement for each casing string.

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

22) Describe all cement additives associated with each cement type.

Conductor: no additives, Class A cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures.

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

EXHIBIT 4.c to SSP- WW-6B FORM

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Appalachian Corporation 494488557 Doddridge Greenbrier Salem
Operator ID County District Quadrangle

2) Operator's Well Number: Rikk Unit 2H Well Pad Name: Leonard Pad

3 Elevation, current ground: -1325' Elevation, proposed post-construction: 1318'

4) Well Type: (a) Gas Oil
Other
(b) If Gas: Shallow Deep
Horizontal

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus Shale: 7650' TVD, Anticipated Thickness- 50 Feet, Associated Pressure- 3200#

7) Proposed Total Vertical Depth: 7650' TVD

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 17,450' MD

10) Approximate Fresh Water Strata Depths: 87', 230'

11) Method to Determine Fresh Water Depth: Offset well records. Depths have been adjusted according to surface elevations.

12) Approximate Saltwater Depths: 842', 1789', 2051'

13) Approximate Coal Seam Depths: 263', 960', 1726'

14) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

15) Does land contain coal seams tributary or adjacent to, active mine? No

16) Describe proposed well work: Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale

17) Describe fracturing/stimulating methods in detail:
Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 18.18 acres

19) Area to be disturbed for well pad only, less access road (acres): 4.51 acres

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	305'	305'	CTS, 424 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2570'	2570'	CTS, 1046 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17,450'	17,450'	4364 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7200'	
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

21) Describe centralizer placement for each casing string.

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

22) Describe all cement additives associated with each cement type.

Conductor: no additives, Class A cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

23) Proposed borehole conditioning procedures.

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

Office of the District Engineer/Manager
District Four

Earl Ray Tomblin
Governor

P. O. Box 4220 · Clarksburg, West Virginia 26302 · (304) 842-1500

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

September 14, 2012

Antero Resources Appalachian Division
1625 17th Street
Denver, CO 80202
Attn: Eugene Simcox

Dear Applicant:

Your approved copy of Permit Number 04-12-0716 for a Drilling Permit is enclosed. A description of the work is on the permit.

Please contact District Four office (telephone 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,

Greg Phillips
District Manager

A handwritten signature in cursive script that reads "Denise Roncone".

Denise Roncone
Permit Supervisor

GP:DR:sg
Attachments
cc: County
Charleston
Permits

E.E.O. AFFIRMATIVE ACTION EMPLOYER

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 31st day of July 20 12, between the WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, a statutory corporation hereinafter called DIVISION and Antero Resources Appalachian Division
Address: 1625 17th 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 42 DOH Project No. _____ (if applicable);
at on SLS 42, .40 miles east SLS 42 & SLS 42/4 intersection Mile Post 3.11
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: To Construct and maintain a 20' heavy hauling approach on the North side of SLS 42, approximately 4/10 of a mile east of the intersection of SLS 42 & SLS 42/4. Sight distance is 275' to the west and 250' feet to the east.
The access road goes to the Leonard Well Pad.

APPLICANT further agrees to accept the conditions hereinafter set forth:

1. 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.
2. 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
3. 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.
4. 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".
5. APPLICANT agrees to comply with all applicable state and federal laws in the performance of work under this permit.
6. Supplementary conditions cited on the reverse side of this permit are understood and agreed to be a part hereof.
7. The work authorized under this permit shall be completed on or before (Date): July 31, 2013

RECOMMENDED:
Devin Rowan
Title Permit Supv

Burt Sneyd
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:
Greg Dally
Title DISTRICT MANAGER
West Virginia Division of Highways

AUTHORIZATION NO: _____

PERMIT NO: 04 - 12 - 0716

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.

Addendum to Permit 04-12-0716

This addendum, made this 30th day of August 2012, between the West Virginia Department of Transportation, Division of Highways, a statutory company hereinafter called the Division

and **Antero Resources**

Address: 1625 17th Street, Denver, CO 80202

Phone: 303 357-7310

hereinafter called APPLICANT.

The Applicant has filed with the DIVISION a written application for the following named route and location:

Doddridge County Route 15, Long Run Road @ MP 0.00 to 3.57, Route 42, Buffalo Calf Road @ MP 0.00 to 3.11 and MP 3.11 to 3.70; Harrison Route 29/1, Buffalo Calf @ MP 0.00 to 2.09; Harrison 29, Patterson Fork @ MP 1.90 to 2.58; Harrison 50/73, Old WV 23, @ MP 1.256 to 2.88.

- ❖ Recommend repair of base failures and paved and or Full Depth Reclamation recommended on CR 42 from 0.00 to 3.70.
- ❖ CR 29/1 & 29, 50/73 & 50/28 are in excellent condition. Applicant must keep these roadways in continual repair during operation.

- After completion of the project, a joint review of roads will be filmed and evaluated to assure roads have been repaired to existing condition or better.
- No travel on School Bus Routes during their traversing operational hours on above mentioned route on bi-directional roadways where the lane widths are less than 10 ft.
- Pilot Vehicle required for all Oversized Loads on covered roads.
- Repairs that will include "Hot Mix Asphalt" will have the following testing requirement: The supplier will be responsible for testing at the plant; Compaction testing will be as per WV DOH specifications.
- The Division of Highways shall have the right at all times to inspect the work, and if such inspections should reveal that the work is not done according to specifications, upon being so advised by the Division, ANTERO Resources agrees to take immediate corrective actions.

Applicant shall properly repair and maintain any and all damages that may result to said bridges, highways, shoulders and ditches from hauling activities of Applicant, its agents, contractors and employees, to as good a condition prior to commencement of Applicant's operation or as when the permit was issued, as determined by the District Engineer/Manager of the DIVISION having jurisdiction over the work permitted, or pay damages therefore in the amount to sufficiently restore such bridges, roads, highways, shoulders and ditches to original condition; and shall reimburse the DIVISION for all inspection costs incurred by it in connection with said work and repairs of such damages and faithfully comply with all terms and conditions of said permits and save harmless the DIVISION and the State of West Virginia from all losses resulting from the conduct of said work and repairs; provided that all projects covered by this blanket bond have been restored to original or better condition; then this Bond shall be released; or otherwise will remain in full force and effect.

Bond Amount: \$1,000,000.00

Bond Number: LPM9062891 Date: 2/21/2012

Dist. Permit Number 04-12-0716

BOND Number LPM 9062891

OIL and GAS DATA INFORMATION SHEET

APPLICANT

Company Name ANTERO RESOURCES APPALCHIAN CORPORATION

Address 1625 17TH STREET

City DENVER ST CO Zip 80202

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

24/7 Road Maintenance Contact Aaron Kunzler Telephone _____ Cell (405) 227-8344

24/7 Backup Contact Dusty Wood Telephone _____ Cell (817) 771-1436

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

Site Location

Site Name Leonard Pad Road Local Name _____ Rte.# SLS 42

Approach location WGS 83 Decimal Format GPS N: 39.26334 W: 80.59484 County Harrison

Location Description _____

On Route.# SLS 42 being 4 miles N^{SE}W of Jct. of Rte.# 42 and Rte.# 42/4

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

Name & Rte.#	Beg MP	End MP	Surface Type	Condition
<i>Harrison</i> Long Run 15	0.00	3.57	HLBC	good
Buffalo Calf 42	0.00	3.11	T+C	poor
Buffalo Calf 29/1	0.00	2.09	T+C	fair
Patterson Frk (29)	1.90	2.58	HMA	excellent
Old WV 23 ^{SD} 73	1.256	2.88	HMA	good

Well location WGS 83 Decimal Format GPS N: 39.265449 W: -80.595235

WV DEP Permit Number 47 - _____ - _____

STATE _____ COUNTY _____ PERMIT NUMBER _____

4-12-716
 Applicant: Antero

Conditions and Requirements
 Repairs/Upgrades Necessary for Maintenance Permit

1d3

Well Pad: Leonard

Route No.	Route Name	Mile Post	Perform Ditching	Patch Potholes	Clean Culverts	Repair Base Failures	Slip Repair	Overlay Asphalt	Overlay S&C	Stone/Stabilize Roadway	Stone/Repair Shoulders	Bridge Concerns	Ongoing Roadway Maintained	Other	Approach Coordinates:	
															N <u>39.26334</u>	W <u>80.59484</u>
															Comments	
15	Long Run	0.00													Road in excellent condition	
		2.71				✓										
		2.81													Pipe yard	
		3.1													Surface cracking End of new Pavement	
		3.35				✓										
		3.57													Road presents cracking & base failure 3.06 to 3.57	
42	B...	0.00													Tearing on front shoulder rutting & Patching	
		0.9													Small Basin w steel plate	

RECOMMENDATIONS: Road in Excellent Condition 2.00 to 3.1 (SIS 15) from 3.1 to 3.57 needs full depth
 Reconstruction SPS 42 from 3.1 to 3.70 Road from 3.70 to 0.00 has on 29/1 to 29 Newly Paved
 S/S 29 Harrison Co Excellent Condition S/S 73 Good excellent Condition S/S 22 Harrison Co Good excellent
 Keep all Roads above Good to Excellent Condition

Above routes reviewed for necessary repairs and upgraded required for Maintenance Permit/Agreement.

Eugene Sainy
 Applicant Representative

8-30-2012
 Date

[Signature]
 DOH Representative

[Signature]
 Date

Permit: 1-10-116

Addendum Continued

2013

County: Winnemac

Applicant: _____

Conditions and Requirements

Repairs/Upgrades Necessary for Maintenance Permit

Well Pad: Leonard

Route No.	Route Name	Mile Post	Perform Ditching	Patch Potholes	Clean Culverts	Repair Base Failures	Slip Repair	Overlay Asphalt	Overlay S&C	Stone/Stabilize Roadway	Stone/Repair Shoulders	Bridge Concerns	Ongoing Roadway Maintained	Other	Approach Coordinates:		Comments
															N _____	W _____	
		0.96															Along with Harrison Co
		1.09															Tar & chip in Poor Condition
42		3.118															Entrance well Leonard Pad
																	Tar & chip road some turned back to rock
		3.70															End of Dodd Co Harrison Co
29/11	Harrison Co Buffalo Co	0.0															Harrison Co
		0.5															New shot & chipped road from Dodd Co
		0.57															Turns to Dodd Co Excellent condition on 12-14 mile
		2.09															but paved recently excellent road
29	Petterson	1.92															Excellent condition to
		2.58															50/73

RECOMMENDATIONS: _____

Above routes reviewed for necessary repairs and upgraded required for Maintenance Permit/Agreement.

Eugene Sney

Applicant Representative

8-30-2012

Date

Roger D. [Signature]

DOH Representative

8/31/12

Date

Permit: 4-12-716

Addendum Continued
Conditions and Requirements
Repairs/Upgrades Necessary for Maintenance Permit

3 of 3

County: Woodbury

Applicant: _____

Well Pad: Leavel

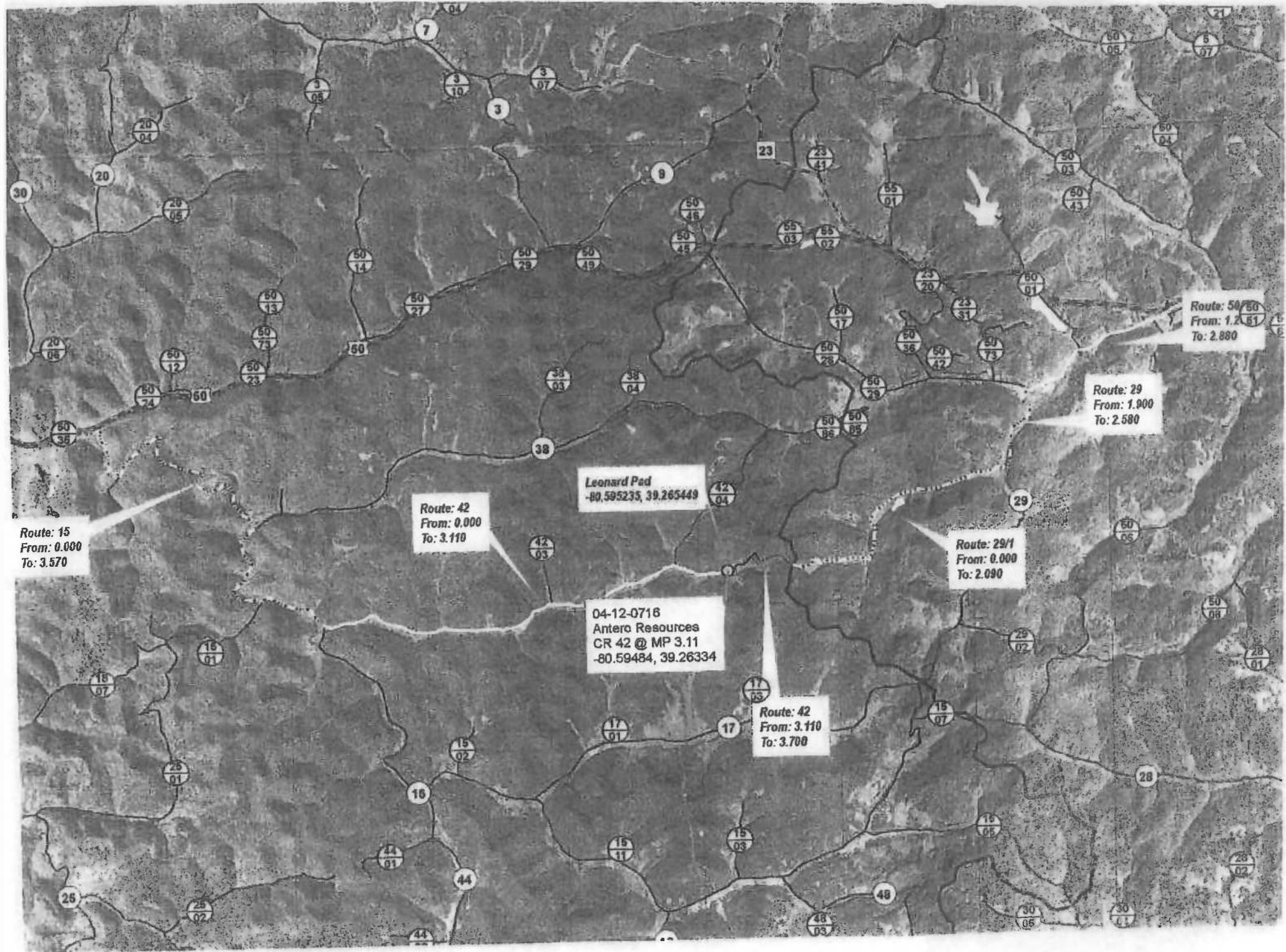
Route No.	Route Name	Mile Post	Perform Ditching	Patch Potholes	Clean Culverts	Repair Base Failures	Slip Repair	Overlay Asphalt	Overlay S&C	Stone/Stabilize Roadway	Stone/Repair Shoulders	Bridge Concerns	Ditching Roadway Maintained	Other	Approach Coordinates:	
															N _____	W _____
															Comments	
		1.30														
		1.04														
<u>5/12/12</u>		2.42														
<u>8/1/12</u>		2.0														<u>Under E line</u>

RECOMMENDATIONS: _____

Above routes reviewed for necessary repairs and upgraded required for Maintenance Permit/Agreement.

Angela Gray
Applicant Representative
8-31-2012
Date

Roger [Signature]
DOH Representative
8/31/12
Date



Route: 15
From: 0.000
To: 3.570

Route: 42
From: 0.000
To: 3.110

Leonard Pad
-80.595235, 39.265449

04-12-0716
Antero Resources
CR 42 @ MP 3.11
-80.59484, 39.26334

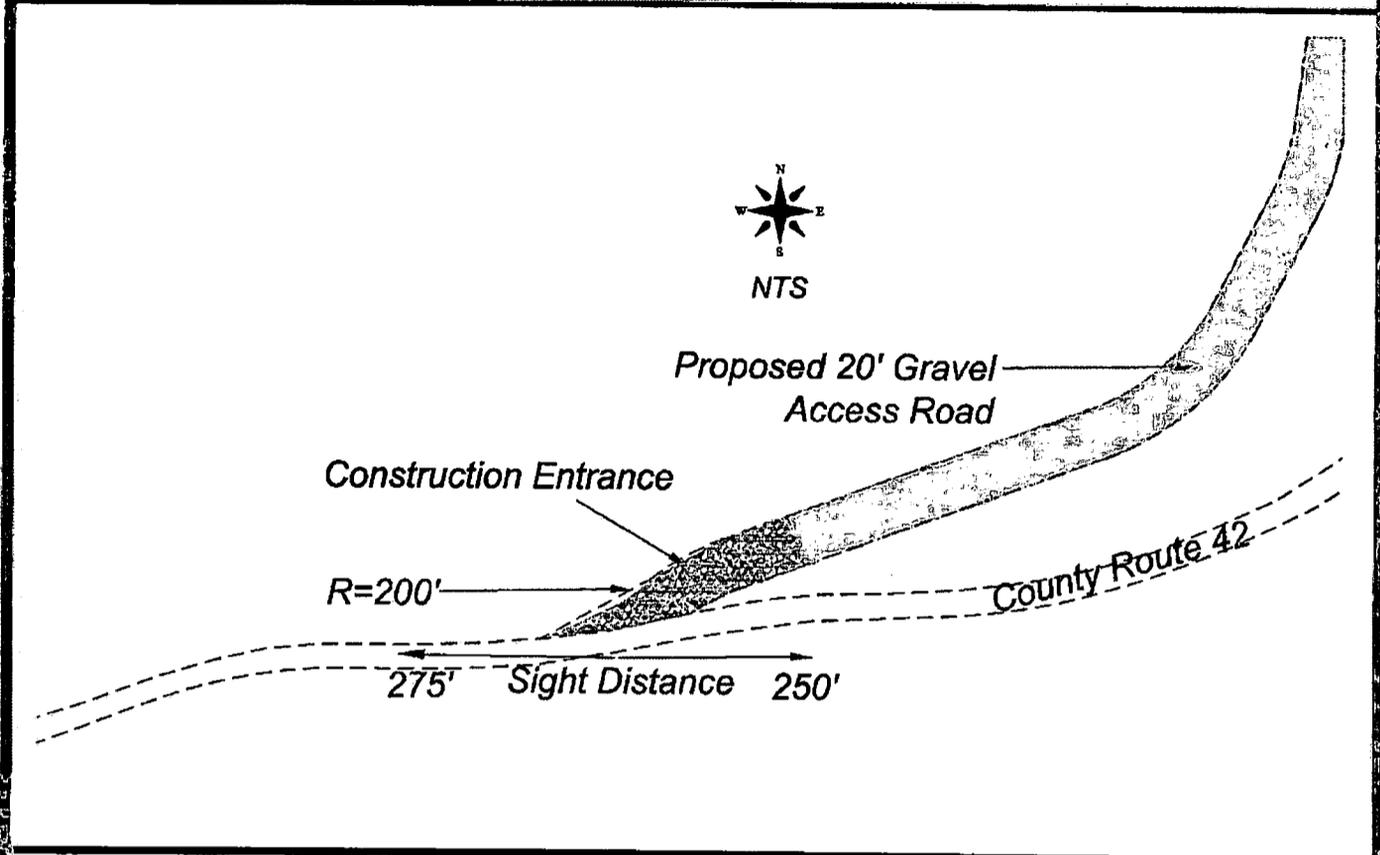
Route: 42
From: 3.110
To: 3.700

Route: 29/1
From: 0.000
To: 2.090

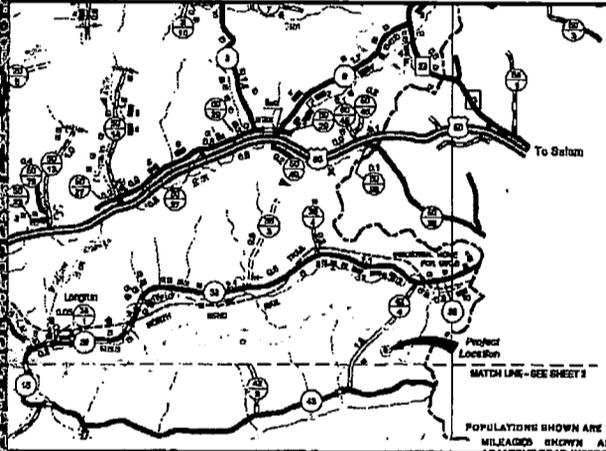
Route: 29
From: 1.900
To: 2.580

Route: 50/50
From: 1.251
To: 2.880

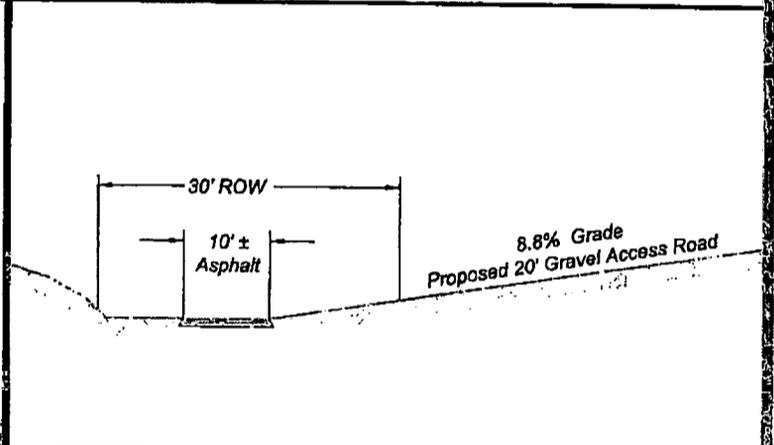
PLAN VIEW OF PROPOSED ROAD APPROACH



VICINITY MAP NTS



APPROACH PROFILE



Notes:

All specifications as set forth in the "Rules and Regulations for Construction of Driveways on State Highway Right-of-Way" which are applicable will be carried out in full.

Location:

Proposal to construct and maintain a proposed 20 ft. commercial approach on the north side of County Rt. 42, 0.40 miles east of the intersection of County Rt. 42 & County Rt.42/4 in Greenbrier District, Doddridge County, West Virginia.

DRAWN BY: K. Wilson

DATE: July 25, 2012

PROJECT NO: 110-12

FIELD REVIEW: Aerial Photography

CADD FILE: 110-12 Leonard

DRAWING NOT TO SCALE



SURVEYING AND MAPPING SERVICES PERFORMED BY:

ALLEGHENY SURVEYS, INC.

P.O. BOX 438
BIRCH RIVER, WV 26610
PH: (304) 649-8606
FAX: (304) 649-8608

1-800-482-8606

172 THOMPSON DRIVE
BRIDGEPORT, WV 26330
PH: (304) 848-5035
FAX: (304) 848-5037

PREPARED FOR:

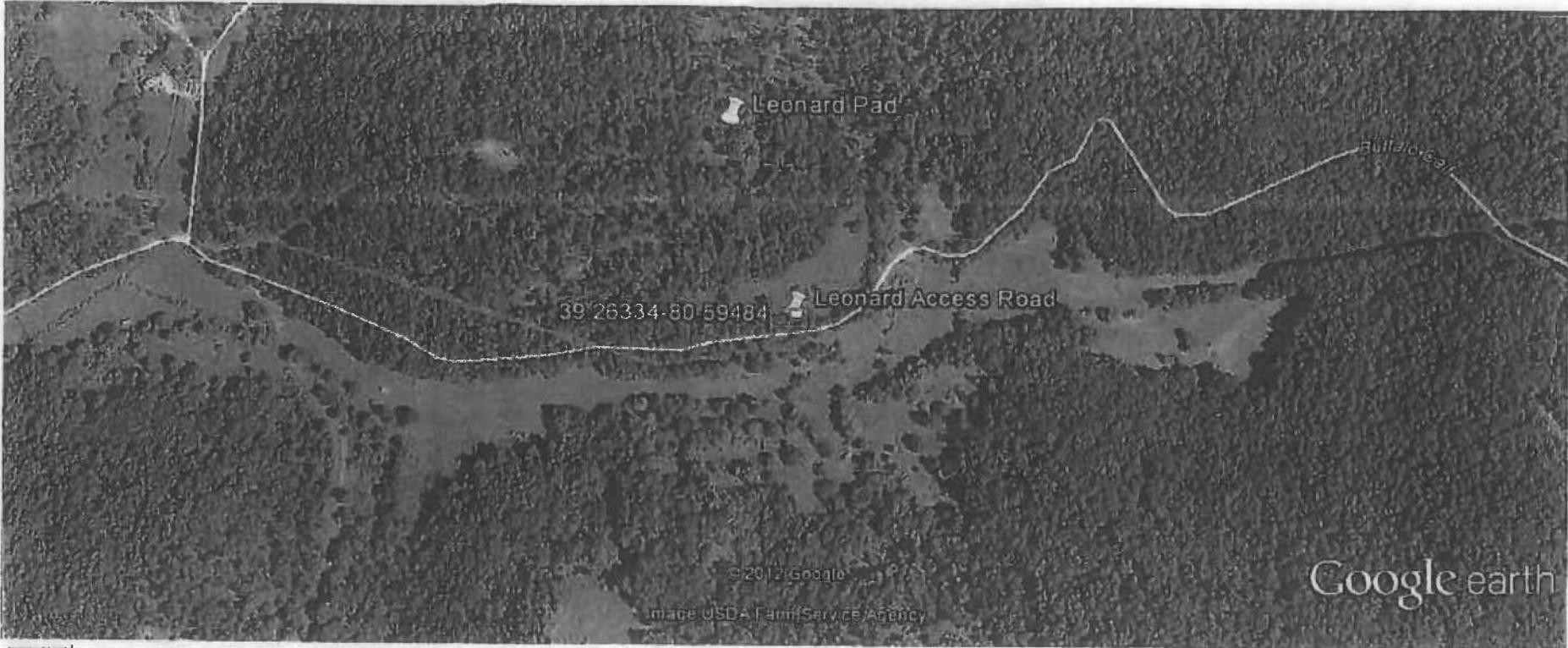
ANTERO RESOURCES

1625 17th St.
Denver, CO 80202

04 - 12 - 0716



 39.265449-80.595235



 39.26334-80.59484



04-12-0716



04-12-0416

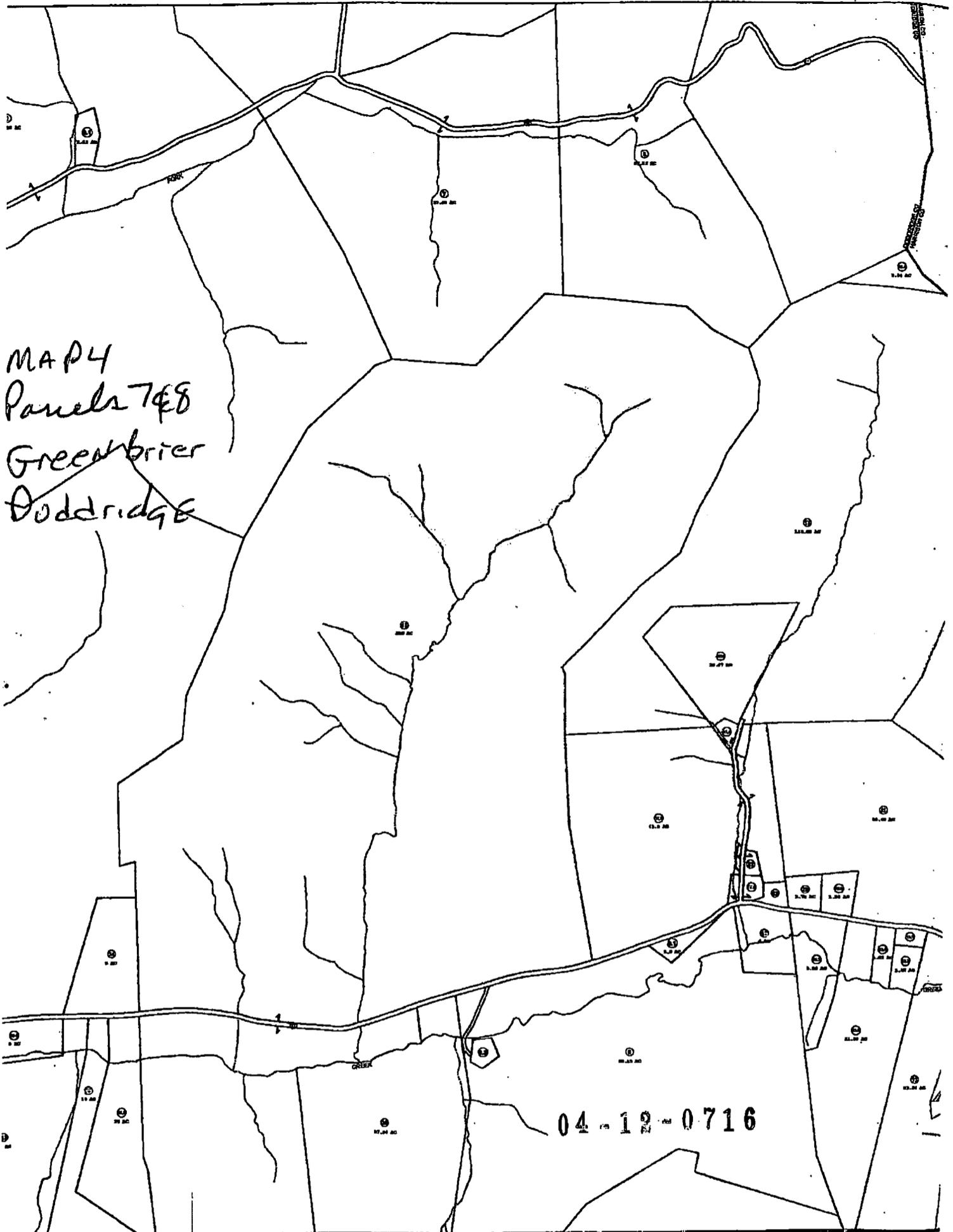


04-12-07-10



01 12-071e

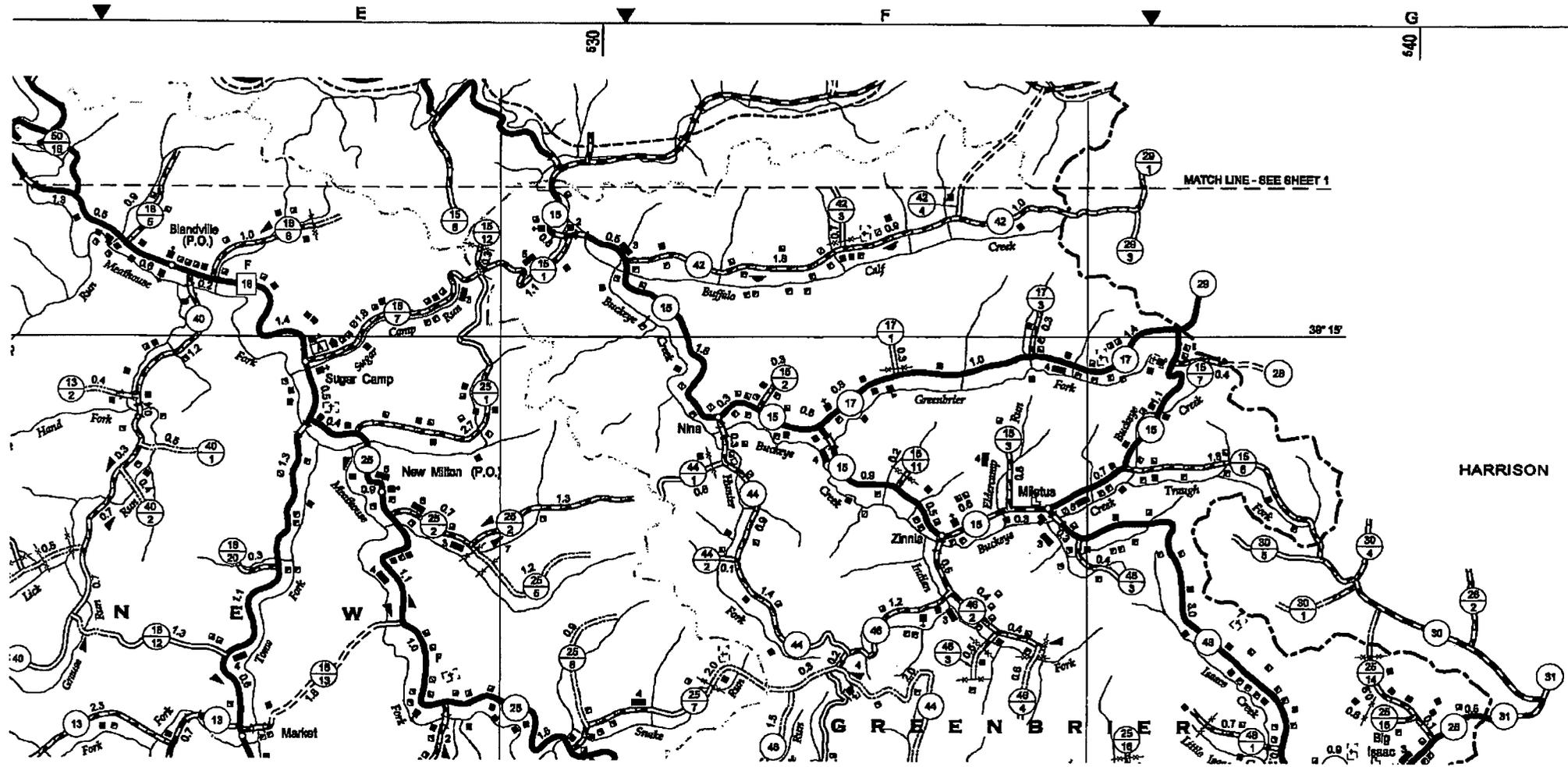
MAP 4
Panels 7 & 8
Greenbrier
Doddridge



04-12-0716

STATE OF WEST VIRGINIA

District GREENBRIER

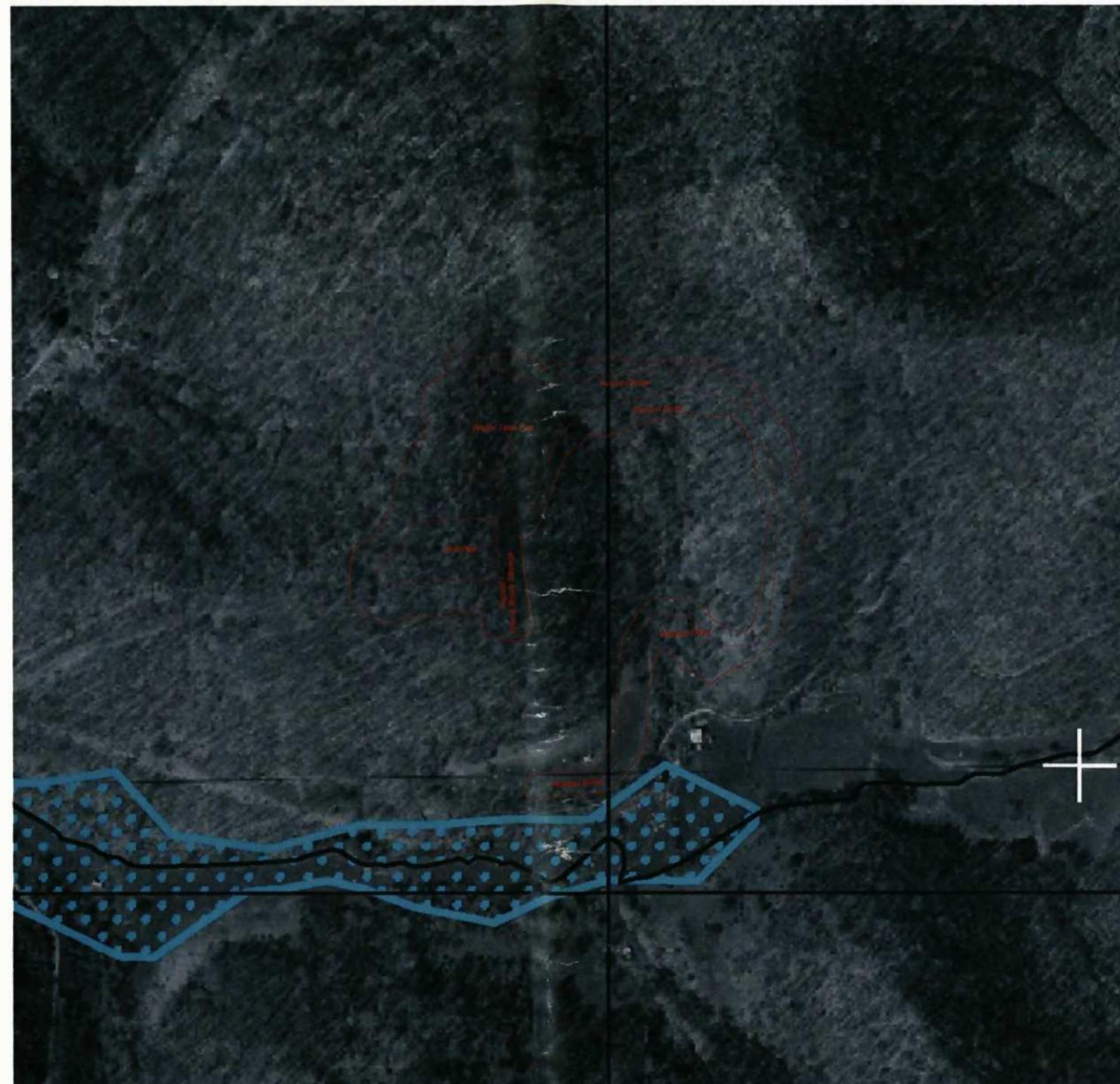
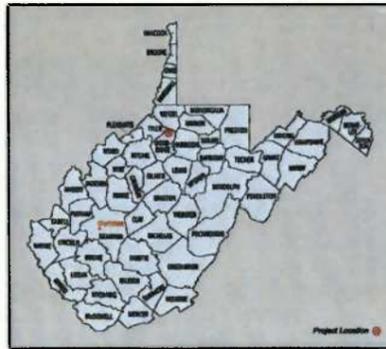


04-12-0716

LEONARD PAD

PROJECT LOD OVER FEMA FIRM MAP 54017C0165C

ANTERO RESOURCES APPALACHIAN CORPORATION



SITE LOCATIONS NAD 83		
Center of Pad (UTM Meters)	N=4346303.9 m	E=534818.6 m
East Water Tank Pad (UTM Meters)	N=4346437.2 m	E=534860.1 m
Single Access Road (UTM Meters)	N=4346070.8 m	E=534935.2 m
	LATITUDE	LONGITUDE
Center of Pad	39.2853765	-80.5903882
Center of Water Tank Pad	39.2865756	-80.5900160
Single Access Road	39.2832706	-80.5920482

GREENBRIER DISTRICT, DODDRIDGE COUNTY, WV
MIDDLE ISLAND CREEK WATERSHED

FLOODPLAIN CONDITIONS	
DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN:	NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:	NO
HBC-RAS STUDY COMPLETED:	N/A
FLOODPLAIN SHOWN ON DRAWINGS:	N/A
FIRM MAP NUMBER(S) FOR SITE:	54017C0165C
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	N/A



Allegheny Surveys, Inc.
172 Thompson Drive
Bridgeport, WV 26330
(304) 648-6036

L&W ENTERPRISES, INC.

PO BOX 836
14 SOUTH GROVE ST.
PETERSBURG, WV 26647
TEL: 304-257-4818
FAX: 304-257-2324
EMAIL: LURE@CTLINK.NET



THIS DOCUMENT
PREPARED FOR
ANTERO RESOURCES
APPALACHIAN CORP

PROJECT LOD OVER FEMA FIRM
MAP 54017C0165C
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV

Date: 6/14/13

Scale: 1" = 200'

Designed By: CKW/CKM

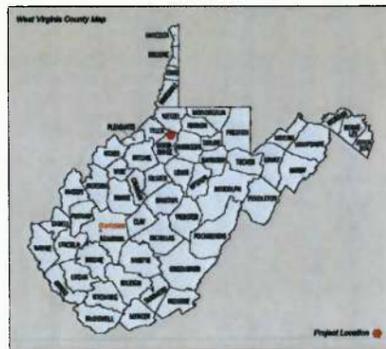
File No. Antero 110-12

Page 1 of 1

LEONARD PAD

SITE DESIGN, CONSTRUCTION PLAN, & EROSION & SEDIMENT CONTROL PLANS

ANTERO RESOURCES APPALACHIAN CORPORATION



Well Table			
Prop. Well Irons Unit 2H WV-N ADRES #E: 280863.43 WV-N ADRES #E: 188068.34 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°	Prop. Well Rikk Unit 1H WV-N ADRES #E: 280864.98 WV-N ADRES #E: 188078.23 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°	Prop. Well Rikk Unit 2H WV-N ADRES #E: 280866.33 WV-N ADRES #E: 188088.13 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°	Prop. Well Fuego Unit 1H WV-N ADRES #E: 280867.78 WV-N ADRES #E: 188098.02 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°
Prop. Well Fuego Unit 2H WV-N ADRES #E: 280869.22 WV-N ADRES #E: 188107.81 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°	Prop. Well Blackwood Unit 2H WV-N ADRES #E: 280870.88 WV-N ADRES #E: 188117.81 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°	Prop. Well Pratt Unit 1H WV-N ADRES #E: 280872.14 WV-N ADRES #E: 188127.70 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°	Prop. Well Pratt Unit 2H WV-N ADRES #E: 280873.88 WV-N ADRES #E: 188137.80 LAT NAD83: 38.2883707° LON NAD83: -80.5854617°

Project Contacts

Antero Resources

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John Kawcak, Engineer
817-368-1553

Dusty Woods
817-771-1436

Michael Ash
304-380-6181

Aaron Kuntzler, Construction Supervisor
405-227-8344

Anthony Smith, Field Engineer
304-869-3405 Off. 304-673-6196 Cell

Surveyor & Engineer

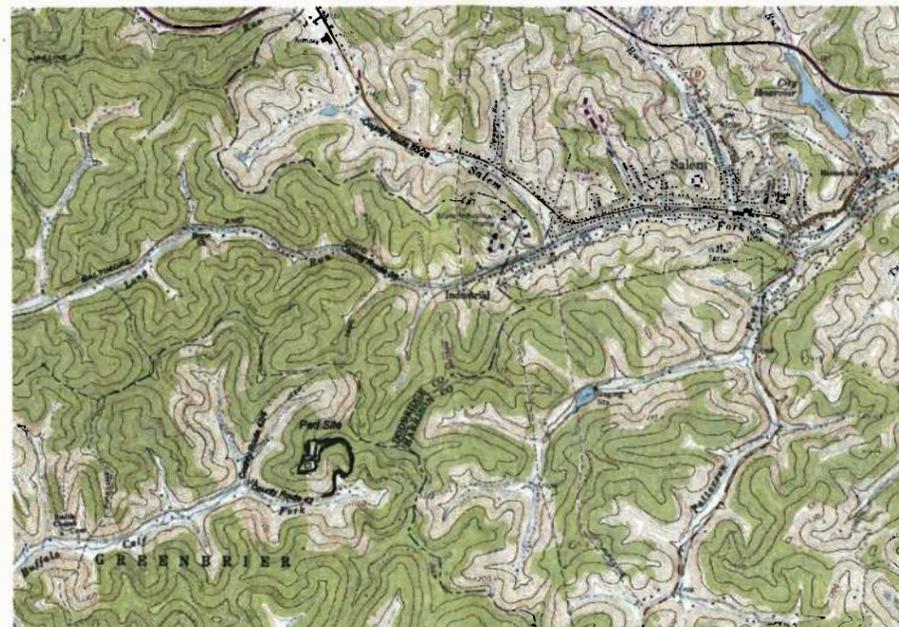
Bill Yetzer, PS, EI - Allegheny Surveys Inc.
304-848-5035 Off. 304-619-4937 Cell

Kirk Wilson, PE - L&W Enterprises, Inc
304-257-4818 Off. 304-668-0365 Cell

Well Location Restrictions:

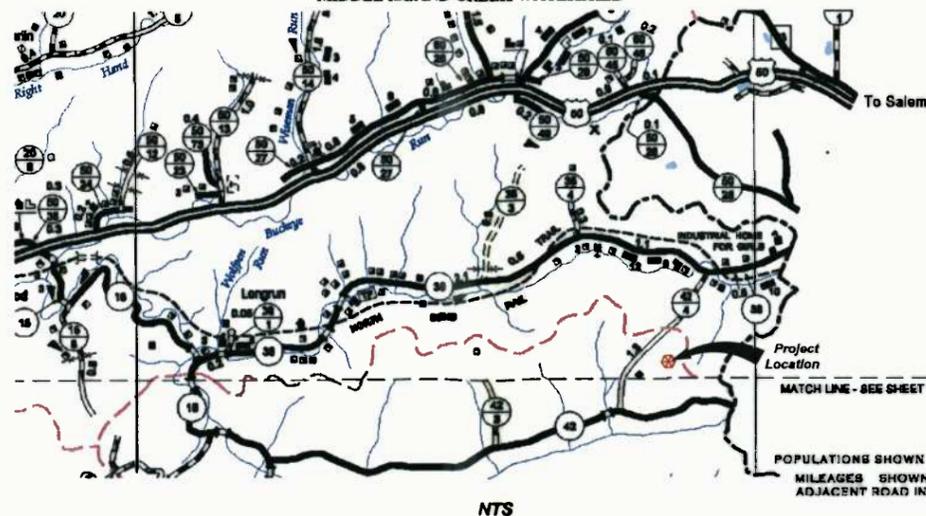
All Pad and Fracture Pit construction complies with the following restrictions.

- * 250' from an existing well or developed spring used for human or domestic animals.
- * 625' from occupied dwelling or barn greater than 2500 SF used for poultry or dairy measured from the center of the pad.
- * 100' from pad edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir. Wetlands 12 and 13 are being disturbed due to the construction of Access Road B and will require a COE Nationwide Permit
- * 300' from edge of disturbance to a naturally reproducing trout stream.
- * 1000' of a surface or ground water intake to a public water supply.



SITE LOCATIONS NAD 83	
Center of Pad (UTM Meter)	N=4346303.9 m E=534818.8 m
Dist. Water Tank Pad (UTM Meter)	N=4346437.2 m E=534850.1 m
Beginn. Access Road (UTM Meter)	N=4346070.8 m E=534935.2 m
LATITUDE LONGITUDE	
Center of Pad	38.2853755 -80.5853882
Center of Water Tank Pad	38.2865765 -80.5860150
Beginn. Access Road	38.2832708 -80.5850482

GREENBRIER DISTRICT, DODDRIDGE COUNTY, WV
MIDDLE ISLAND CREEK WATERSHED



West Virginia State Plane Coordinate System
North Zone, NAD83
Elevations Based on NAVD88
Established By Survey Grade GPS & OPUS Post-Processing

Owner Information						
Owner	TM/Parcel	Deed/Page	Total Acres	Type of Disturbance	Acres	
David T. Gillis	2/7	196/182	101.69	Drill Pad	1.23	
				Water Tank Pad	2.27	
				Spill Pad	0.45	
					Total	3.95
Carolyn N. Plaugher c/o Randy Plaugher	2/8	WB 45/151 DB 173/335	74.5	Road A	0.16	
Walter V. Davidson & Leonard J. Davidson Heirs	4/7	140/554 119/22	83.61	Drill Pad	1.66	
Walter V. Davidson & Leonard J. Davidson Heirs	4/8	140/554 119/22	87	Drill Pad	1.62	
				Road A	6.68	
				Road B	2.56	
				Water Tank Pad	1.30	
				Tree and Topsoil Storage	0.30	
					Total	12.41
					Grand Total	18.18

LOD Area (ac)	
Road A (2,745 feet)	6.79
Road B (1,064 feet)	2.56
Drill Pad & Tree Brush Storage	4.81
Water Tank Pad	3.57
Topsoil / Spill Pile	0.45
Total Affected Area	18.18
Total Wooded Acres Disturbed	16.04
Total Linear Feet of Access Road	3,809

PEM Wetland Impacts (SF)	Ephemeral Stream Impact (Linear feet)
PEM 1 (Road B)	Stream 8 (Road A)
PEM 2 (Road B)	Stream 9 (Road A)
PEM 3 (Road B)	Total
PEM 4 (Road B)	Intermittent Stream Impact (Linear feet)
PEM 12 (Road B)	Stream 11 (Road A)
PEM 13 (Road B)	Stream 1 (Road A)
PEM 14 (Road A)	Total
Total Acres	Grand Total

FLOODPLAIN CONDITIONS	
DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN:	NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:	NO
HBC-RAS STUDY COMPLETED:	N/A
FLOODPLAIN SHOWN ON DRAWINGS:	N/A
FIRM MAP NUMBER(S) FOR SITE:	54017C0165C
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	N/A

MISS Utility of West Virginia
1-800-245-4848
West Virginia State Law
(Section XIV: Chapter 24-C)
Requires that you call two
business days before you dig in
the state of West Virginia.
IT'S THE LAW!!



**Know what's below.
Call before you dig.**

DRAWING INDEX

- 1 COVER SHEET/LOCATION MAP
- 2 SCHEDULE OF QUANTITIES
- 3 CONSTRUCTION, EROSION, & SEDIMENT CONTROL NOTES
- 4 EXISTING CONDITIONS
- 5 PLAN SHEET INDEX
- 6-9 SITE PLANS
- 10 DRILL PAD BASELINE PROFILE & CROSS SECTIONS
- 11 WATER TANK PAD BASELINE PROFILE & CROSS SECTIONS
- 12 - ACCESS ROAD A CROSS SECTIONS
- 13 - ACCESS ROADS A & B CROSS SECTIONS
- 14 - DETAILS
- 15 RECLAMATION PLAN

DATE	REVISIONS
2/21/13	Updated Details/Notes per DEP
3/6/13	Updated with new Wetland Stream Data
4/12/13	Updated Per New Antero Standards
6/6/13	Updated Per DEP Comments
6/11/12	Well Layout Changes



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14 SOUTH GROVE ST.
PETERSBURG, WV 26847



THIS DOCUMENT
PREPARED FOR
ANTERO RESOURCES
APPALACHIAN CORP

COVER SHEET/LOCATION MAP
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV

Date: 7/25/12
Scale: N/A
Designed By: CKW/CKM
File No. Antero 110-12
Page 1 of 15

SCHEDULE OF QUANTITIES

Leonard Pad				
DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FINAL PRICE
CLEARING & GRUBBING; PROBE & BENCHMARK CONTROLS				
MOBILIZATION	1	EA		\$0.00
CONSTRUCTION ENTRANCE	1	EA		\$0.00
CLEARING & GRUBBING	18.18	AC		\$0.00
TREE REMOVAL	16.04	AC		\$0.00
8" COMPOST FILTER SOCK	0	LF		\$0.00
12" COMPOST FILTER SOCK	1,565	LF		\$0.00
18" COMPOST FILTER SOCK	1,050	LF		\$0.00
24" COMPOST FILTER SOCK	200	LF		\$0.00
32" COMPOST FILTER SOCK	1,700	LF		\$0.00
JUTE MATTING - SLOPE MATTING	10,300	SY		\$0.00
SUPER SILT FENCE	1,310	LF		\$0.00
9" STRAW WATTLES	5,000	LF		\$0.00
TOTAL				\$0.00
RETAINING STRUCTURES				
CONCRETE BIN BLOCKS (2' x 2' x 6')	0	EA		\$0.00
GABION CAGES WITH STONE (3' x 3' x 5')	350	EA		\$0.00
HORIZONTAL REINFORCEMENT (INSTALL TENSAR TX190 GEOGRID or EQUIVALENT)	700	SY		\$0.00
TOTAL				\$0.00
WELL				
DRILL PAD EXCAVATION	26,300	CY		\$0.00
ACCESS ROADS EXCAVATION	32,789	CY		\$0.00
TANK PAD and/or FRAC PIT EXCAVATION	15,475	CY		\$0.00
OFFLOAD PAD EXCAVATION	0	CY		\$0.00
SPOIL PAD EXCAVATION	0	CY		\$0.00
TRUCK QUEUE / TURNAROUND EXCAVATION	0	CY		\$0.00
GATHERING FACILITIES EXCAVATION	0	CY		\$0.00
TOPSOIL	7,000	CY		\$0.00
DIVERSION DITCH	0	LF		\$0.00
ROADSIDE DITCH	3,200	LF		\$0.00
TOTAL				\$0.00
SUMMARY PER ANTERO RESOURCES STANDARD DETAIL				
INSTALL 102" x 78" x 44" PRE CAST SUMP	4	EA		\$0.00
VALVE BOX HDPE PIPE (MINIMUM 12" DIAMETER x 48" HEIGHT)	4	EA		\$0.00
4" PVC CONNECTIVE PIPE (ANTERO SUMP DRAIN DETAIL)	120	LF		\$0.00
TOTAL				\$0.00
AGGREGATE SUBSTRATE - SPREADING, COMPACTION, and/or INSTALLATION				
DRILL PAD AASHTO #1 (8" THICK)	3,330	TON		\$0.00
DRILL PAD 1 1/2" or 3/4" CRUSHER RUN STONE (2" THICK)	830	TON		\$0.00
DRILL PAD GEOTEXTILE FABRIC (US 200)	7,525	SY		\$0.00
ACCESS ROADS 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	4,500	TON		\$0.00
ACCESS ROADS 1 1/2" OR 3/4" CRUSHER RUN STONE (2" THICK)	1,125	TON		\$0.00
ACCESS ROADS GEOTEXTILE FABRIC (US 200)	9,300	SY		\$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	9,300	SY		\$0.00
OFFLOAD PAD/TRUCK QUEUE/TURNAROUND 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	0	TON		\$0.00
OFFLOAD PAD/TRUCK QUEUE/TURNAROUND 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	0	TON		\$0.00
OFFLOAD PAD/TRUCK QUEUE/TURNAROUND GEOTEXTILE FABRIC (US 200)	0	SY		\$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	0	SY		\$0.00

GATHERING FACILITIES 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	0	TON		\$0.00
GATHERING FACILITIES 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	0	TON		\$0.00
GATHERING FACILITIES GEOTEXTILE FABRIC (US 200)	0	SY		\$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	0	SY		\$0.00
TOTAL				\$0.00
TANK PAD 6" OR 4" MINUS CRUSHER RUN AGGREGATE (8" THICK)	3,200	TON		\$0.00
TANK PAD 1 1/2" or 3/4" CRUSHER RUN AGGREGATE (2" THICK)	815	TON		\$0.00
TANK PAD GEOTEXTILE FABRIC (US 200)	6,800	SY		\$0.00
*INSTALL TENSAR TX190 GEOGRID or EQUIVALENT	6,800	SY		\$0.00
TOTAL				\$0.00
ROAD CULVERTS				
15" HDPE	240	LF		\$0.00
18" HDPE	220	LF		\$0.00
24" HDPE	0	LF		\$0.00
30" HDPE	0	LF		\$0.00
36" HDPE	360	LF		\$0.00
42" HDPE	0	LF		\$0.00
48" HDPE	0	LF		\$0.00
60" HDPE	0	LF		\$0.00
R4 RIP RAP (INLETS/OUTLETS)	40	TDN		\$0.00
AASHTO #1 STONE (DITCH CHECKS)	7	TON		\$0.00
DITCH LINING - (ACCESS ROAD) JUTE MATTING	200	SY		\$0.00
DITCH LINING - (ACCESS ROAD) SYNTHETIC MATTING (TRM)	2,250	SY		\$0.00
DIVERSION DITCH LINING - SYNTHETIC MATTING (TRM)	0	SY		\$0.00
TOTAL				\$0.00
FENCING/GATES				
4 FT WOVEN WIRE FARM FENCE w/MINIMUM 10 FT POST SPACING (WOODEN and/or "T" POST)	0	LF		\$0.00
16 FT DOUBLE GATE	0	EA		\$0.00
TOTAL				\$0.00
SEEDING				
SITE SEEDING (LIME, FERTILIZER, SEEDING, AND HYDRO-MULCH w/TACK (HYC-2 OR EQUAL))	9	AC		\$0.00
TOTAL				\$0.00
WETLAND/STREAM SITE CONDITIONS				
*ROCK CLAUSE - BLASTING	0.0	CY		\$0.00
*ROCK CLAUSE - HOE RAMMING	0.0	CY		\$0.00
*FRENCH DRAINS	0.0	FT		\$0.00
*ORANGE SAFETY FENCE w/"T" POST (10FT CENTERS) - WETLAND PROTECTION	0.0	LF		\$0.00
*STEEL PANELS w/"T" POST (10FT CENTERS) - WETLAND PROTECTION	0.0	LF		\$0.00
*SILT FENCE	0.0	LF		\$0.00
*TEMPORARY SEEDING	0.0	AC		\$0.00
*CONSTRUCTION STAKEOUT	0.0	HR		\$0.00
* JUTE MATTING - SLOPE MATTING	0.0	SY		\$0.00
TOTAL				\$0.00
GRAND TOTAL				\$0.00

Description	Cut (CY)	Fill (CY)	Spoil (CY)	Borrow (CY)	Max. Slope	Length Of Slope
Road A	30,507	28,839	1,668	n/a	19.80%	500 feet
Road B	2,282	7,031	n/a	4,749	16.35%	175 feet
Drill Pad	26,300	23,103	3,197	n/a	n/a	n/a
Water Tank Pad	15,475	12,613	2,862	n/a	n/a	n/a
Topsoil / Spoil Pile	0	3,209	n/a	3,209	n/a	n/a
Totals	74,564	74,795	7,727	7,958	n/a	n/a
Total Spoil (CY) =			-231			

The earthwork quantities provided are an estimate for consideration. The quantities shown may be greater or less than actually excavated. The engineer is not responsible for variances from the estimated quantities and does not certify to their accuracy.

EARTHWORK & CAPACITY REPORTS

Drill Pad Report

Top of pad elevation: 1318.0000
 Cut Slope: 60.00% 2.00:1 28.57"
 Fill Slope: 60.00% 2.00:1 28.57"
 Existing Surface: C:\arc2009\Gas Well Permits\Antero\Leonard\110-30-G-12 Antero - Leonard Pad Design\Autocad\Draw\110-12 Leonard Workmap.grd
 Grid position: 1869466.67, 279639.02 to 1869693.79, 282130.26
 X grid resolution: 60, Y grid resolution: 60
 X grid cell size: 1918.00, Y grid cell size: 49.82
 Balance Export: 86,300.2 C.F., 3,197.06 C.Y.
 Cut Swell Factor: 1.06
 Fill Shrink Factor: 1.00
 Pad Earthwork Volume
 Total cut: 710,113.8 C.F., 26,300.51 C.Y.
 Total fill: 823,793.8 C.F., 23,103.48 C.Y.
 Balance Export: 86,300.2 C.F., 3,197.06 C.Y.
 Area: 138395.8 Sq.Ft., 3.177 Acres

Water Tank Pad Report

Top of pad elevation: 1362.0000
 Cut Slope: 60.00% 1.50:1 33.69"
 Fill Slope: 60.00% 2.00:1 28.57"
 Existing Surface: C:\arc2009\Gas Well Permits\Antero\Leonard\110-30-G-12 Antero - Leonard Pad Design\Autocad\Draw\Option 3\110-12 Leonard Workmap.grd
 Grid position: 1869466.67, 279639.02 to 1869693.79, 282130.26
 X grid resolution: 60, Y grid resolution: 60
 X grid cell size: 82.74, Y grid cell size: 49.82
 Cut Swell Factor: 1.06
 Fill Shrink Factor: 1.00
 Pad Earthwork Volume
 Total cut: 417,841.3 C.F., 18,475.80 C.Y.
 Total fill: 340,552.2 C.F., 12,613.05 C.Y.
 Balance Export: 77,289.1 C.F., 2,862.56 C.Y.
 Area: 113043.2 Sq.Ft., 2.595 Acres

Spoil Pad A

Top of pad elevation: 1820.0000
 Cut slope percent grade: 66.67, slope ratio: 1.50
 Fill slope percent grade: 50.00, slope ratio: 2.00
 Existing Surface: C:\arc2009\Gas Well Permits\Antero\Leonard\110-12 Leonard Workmap.grd
 Grid position: 1869466.67, 279639.02 to 1869693.79, 282130.26
 X grid resolution: 60, Y grid resolution: 60
 X grid cell size: 82.74, Y grid cell size: 49.82
 Cut Swell Factor: 1.06
 Fill Shrink Factor: 1.00
 Pad Earthwork Volume
 Total cut: 68.7 C.F., 2.47 C.Y.
 Total fill: 66,860.4 C.F., 3,209.64 C.Y.
 Area: 17427.8 Sq.Ft., 0.400 Acres

Access Road A

Template File: C:\arc2011\Gas Well Permits\Antero\Leonard\ANTERO 2D 1-5 cut.TPL
 Profile File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road A Final Opt 3 6-8.pro
 Existing Surface File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road A Existing Opt 3 6-8.act
 Centerline File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road A Opt 3 6-8.d
 Design Section Output File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road A Proposed Opt 3 6-8.act
 Processing 0\100.000 to 27+45.000
 Cut Swell Factor: 1.050
 Fill Shrink Factor: 1.000
 Total cut: 823713.891 C.F., 30587.822 C.Y.
 Total fill: 778677.014 C.F., 28939.889 C.Y.
 Cut to Fill Ratio: 1.06

Access Road B

Template File: C:\arc2011\Gas Well Permits\Antero\Leonard\ANTERO 2D 1-5 cut.TPL
 Profile File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road B Final 6-6-12.pro
 Existing Surface File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road B 6-6 Existing.act
 Centerline File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road B 6-6.d
 Design Section Output File: C:\arc2011\Gas Well Permits\Antero\Leonard\Road B Final 6-6.act
 Processing 0\100.000 to 10+64.000
 Cut Swell Factor: 1.050
 Fill Shrink Factor: 1.000
 Total cut: 81617.832 C.F., 2282.135 C.Y.
 Total fill: 198629.845 C.F., 7031.813 C.Y.
 Cut to Fill Ratio: 0.32

DATE	REVISIONS
4/12/13	Updated Per New Antero Standards



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 172 Thompson Drive
 Bridgeport, WV 26330
 (304) 648-6035



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 PETERSBURG, WV 26647
 PHONE: 304-257-4818
 FAX: 304-257-2324
 EMAIL: NER@LWENTR.NET



ANTERO RESOURCES
 THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

SCHEDULE OF QUANTITIES
LEONARD PAD
 GREENBRIER DISTRICT
 DODDRIEGE COUNTY, WV

Date: 7/25/12
 Scale: N/A
 Designed By: CKWCKM
 File No. Antero 110-12
 Page 2 of 15

CONSTRUCTION, EROSION AND SEDIMENT NOTES



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Bridgeport, WV 26330
(304) 648-5035



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EMAIL: INFO@LWENTR.COM



ANTERO RESOURCES

THIS DOCUMENT
PREPARED FOR
ANTERO RESOURCES CORP
APPALACHIAN COAL

CONSTRUCTION, EROSION AND SEDIMENT NOTES
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV

CONSTRUCTION SPECIFICATIONS:

- THE IMPOUNDMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND THE SCOPE OF WORK SHALL CONFORM GENERALLY WITH THE GRADES, BERMS, DEPTHS AND DIMENSIONS SHOWN.
- THE CONSTRUCTION DOCUMENTS SHOW THE EXISTING AND NEW GRADES AND BERMS, ETC. THAT ALL CUT AND FILL ESTIMATES ARE BASED UPON THE ENGINEER'S ESTIMATES OF THE QUANTITIES AND MAY CHANGE BASED ON ACTUAL FIELD CONDITIONS.
- THE GRADES, BERMS, DEPTHS, AND DIMENSIONS MAY CHANGE BASED ON ACTUAL FIELD CONDITIONS. THE ENGINEER RESERVES THE RIGHT TO CHANGE GRADES, BERMS, DEPTHS AND DIMENSIONS AS NECESSARY TO MEET FIELD CONDITIONS.
- THE CONTRACTOR SHALL PROVIDE THE ENGINEER ALL REASONABLE FACILITIES AND PROVIDE INFORMATION AND SAMPLES AS REQUIRED BY THE ENGINEER FOR PROPER MONITORING AND TESTING OF MATERIAL WORKMANSHIP.
- THE CONTRACTOR SHALL HAVE ON SITE AT ALL TIMES WHEN CONSTRUCTION IS IN PROGRESS A COMPETENT SUPERINTENDENT THOROUGHLY FAMILIAR WITH THE CONSTRUCTION OF EARTH BERMS AND EMBANKMENTS, THE COMPACTION OF SOILS AND PLACEMENTS OF LINERS.
- SILT SOCKS / SUPER SILT FENCE SHALL BE INSTALLED PRIOR TO CLEARING AND GRUBBING AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH THE OFFICE OF OIL & GAS, W.V.A. EROSION & SEDIMENT CONTROL FIELD MANUAL, MAY 2012. SURFACE WATER SHALL BE DIVERTED AWAY FROM ALL EXCAVATIONS TO PREVENT FLOODING AND SOFTENING OF THE SUBGRADE OR COMPACTED MATERIALS.
- CLEARING AND GRUBBING SHALL REMOVE ALL BRUSH, TREES, ROOTS, STUMPS, FENCES, SIGNS OR ANY OTHER MATERIAL THAT IS NOT TO BE REUSED FOR THE CONSTRUCTION. SOME STUMPS MAY REMAIN AT THE APPROVAL OF THE ENGINEER. NO CLEARING DEBRIS SHALL BE BURIED ON-SITE.
- TOP SOIL SHALL BE STRIPPED AND STOCKPILED WITH APPROPRIATE STABILIZATION AND SILT FENCE TO PREVENT EROSION. THE TOP SOIL SHALL BE REUSED DURING THE RECLAMATION PROCESS OR ON THE FACE OF THE IMPOUNDMENT PRIOR TO SEEDING.
- TOE CUTS OF 10' MINIMUM WIDE SHALL BE EXCAVATED ON ALL RECEIVING SLOPES TO PROVIDE A BASE FOR THE IMPOUNDMENT BERM. ADDITIONAL TERRACING SHALL BE CONSTRUCTED FOR EACH ADDITIONAL FIFTY (50) VERTICAL FEET OF SLOPE AND SHALL BE A MINIMUM OF TEN (10) FEET WIDE.
- PRIOR TO PLACING ANY FILL, THE EXPOSED SUBGRADE SHALL BE COMPACTED AND PROOF ROLLED TO PRODUCE A STABLE AND UNYIELDING SITE.
- IMPOUNDMENT BERMS SHALL BE UNIFORMLY GRADED SOIL FREE FROM AGGREGATE EXCEEDING 6". THE FILL SHALL BE FREE OF ALL ORGANIC MATERIAL, STUMPS, BRUSH, OR OTHER DELETERIOUS MATTER.
- ALL FILL SHALL BE PLACED IN LIFTS OF UP TO 12" AND SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY OF THE SOIL PER ASTM D-698. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 2% OF THE OPTIMUM TO FACILITATE COMPACTION. CONTRACTOR IS RESPONSIBLE FOR THE ORIGINAL SOIL TEST AND PROVIDING A COPY OF THE RESULTS WITH MOISTURE-DENSITY CURVE TO THE ENGINEER. THE CONTRACTOR SHALL DO IN-PLACE DENSITY TESTS EVERY LIFT OF SOIL AND SHALL BE DONE IN TWO RANDOM PLACES ON EACH STRAIGHT SIDE OF THE IMPOUNDMENT BERM. RECORDS SHALL BE MAINTAINED OF TEST LOCATION AND RESULTS AND PROVIDED TO THE ENGINEER ON REQUEST. AREAS THAT FAIL FOR COMPACTION SHALL BE REMOVED, RE-COMPACTED AND RETESTED FOR COMPLIANCE. THE CONTRACTOR MAY PROOF-ROLL THE SOIL EVERY 12" OF SOIL LIFT WITH A LOADED 16 TON TANDEM DUMP OR LARGER TRUCK. SOIL THAT DEFLECTS UNDER THE REAR WHEELS GREATER THAN 1/2" SHALL BE REMOVED, RE-COMPACTED AND RETESTED. COMPACTION OF SOIL SHALL BE DONE WITH A 6 TON SHEEPS FOOT, OR VIBRATORY ROLLER DEPENDING ON THE TYPE OF SOIL BEING COMPACTED.
- ON-SITE FILL SHALL BE USED TO THE MAXIMUM EXTENT POSSIBLE. ANY IMPORTED FILL SHALL BE CERTIFIED BY THE CONTRACTOR TO BE CLEAR OF ALL HAZARDOUS SUBSTANCES OR MATERIALS. IF MATERIAL IS ENCOUNTERED THAT CANNOT BE RIPPED BY A CAT DR WITH A SINGLE TOOTH RIPPER, THEN THE CONTRACTOR SHALL CONTACT THE ENGINEER WHO WILL VISIT THE SITE AND DETERMINE IF THE MATERIAL MAY BE USED AS IS OR MUST BE REMOVED BY OTHER MEANS. IF UNSUITABLE SOILS IN THE SUBGRADE ARE FOUND THEY SHALL BE REMOVED AND REPLACED WITH APPROPRIATE FILL AT THE CONTRACTOR'S EXPENSE AND THE ENGINEER'S DIRECTION.
- THE INSIDE OF THE IMPOUNDMENT SHALL BE BOTH SMOOTH DRUM ROLLED AND FREE OF PROTRUDING OR SHARP ROCKS IN ORDER TO ENSURE THE LINER.
- PRIOR TO THE LINER INSTALLATION THE CONTRACTOR SHALL CONTACT THE SURVEYOR TO DO AN AS-BUILT SURVEY OF THE IMPOUNDMENT TO ENSURE CONFORMANCE WITH THE ENGINEER'S DRAWINGS. THE SURVEYOR SHALL PROVIDE THE INFORMATION TO THE ENGINEER WHO WILL MAKE DETERMINATIONS ON ANY VARIATION FROM THE DRAWINGS AND DIRECT THE CONTRACTOR TO DO CORRECTIVE WORK.
- LINER SHALL BE POLYFLEX IMPERVIOUS TEXTURED HDPE GEOMEMBRANE, 60ML, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. THE TOP OF THE LINER SHALL BE TURNED DOWN INTO A 4" ANCHOR TRENCH AT THE TOP OF THE BERM AND BACKFILLED WITH SELECT FILL AS SHOWN ON THE DRAWINGS OR AS REQUIRED BY THE LINER MANUFACTURER.
- PHOTOGRAPHIC DOCUMENTATION SHALL BE TAKEN BY THE CONTRACTOR AND PROVIDED TO THE ENGINEER OF THE FOLLOWING ACTIVITIES: 1. SITE AFTER CLEARING AND GRUBBING; 2. THE SITE AFTER TOPSOIL REMOVAL; 3. TOE KEY AND INSPECTION TRENCH CONSTRUCTION; 4. DAILY PHOTOS OF CUT AND FILL OPERATIONS; 5. PROOF-ROLLING TESTS.
- PRIOR TO AS-BUILT CERTIFICATION, THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A COMPLETE BINDER THAT INCLUDES ALL PHOTO DOCUMENTATION, ALL COMPACTION TEST REPORTS, RESULTS AND MAPS, A REPORT OF ALL CUT AND FILL VOLUMES IN CUBIC YARDS, AND A COPY OF THE AS-BUILT CONFIRMATION SURVEY PRIOR TO LINER PLACEMENT.

GENERAL NOTES

- ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER, IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH PROBLEMS. WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
- WORK ON THIS PROJECT SHALL CONFORM TO THE OFFICE OF OIL & GAS, W.V.A. EROSION & SEDIMENT CONTROL FIELD MANUAL, MAY, 2012. IN THE EVENT OF CONFLICT BETWEEN THE DESIGN, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT WILL GOVERN.
- EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED DAILY, RELOCATED WHEN NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDED AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.
- ALL DRAIN INLETS SHALL BE PROTECTED FROM SILTATION. INEFFECTIVE PROTECTION DEVICES SHALL BE REPLACED AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE MEANS OF CLEANING.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL PUBLIC OR PRIVATE UTILITIES WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR, AT HIS OR HER EXPENSE, OF ALL EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL CALL MISS UTILITY AT (800) 562-7001.
- INSTALLATION OF CONCRETE, CORRUGATED METAL, OR HDPE STORM PIPE SHALL BE IN CONFORMANCE WITH THESE DRAWINGS.
- ALL MATERIALS USED FOR FILL OR BACK FILL SHALL BE FREE OF WOOD, ROOTS, ROCKS, BouldERS OR ANY OTHER NON-COMPACTABLE SOIL TYPE MATERIALS. UNSATISFACTORY MATERIALS ALSO INCLUDE MAN MADE FILLS AND REFUSE DERIVED FROM ANY SOURCE.
- MATERIALS USED TO FILL AROUND DRAINAGE STRUCTURES IN UTILITY TRENCHES OR ANY OTHER DEPRESSION REQUIRING FILL OR BACK FILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST AS SET FORTH IN ASTM STANDARD D-698. THE CONTRACTOR SHALL, PRIOR TO ANY OPERATIONS INVOLVING FILLING OR BACK FILLING, SUBMIT THE RESULTS OF THE PROCTOR TEST TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IS REPRESENTATIVE OF THE MATERIALS TO BE USED ON THE PROJECT. THE TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND THE CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THESE TESTS AND THEIR SUBMITTALS.
- FILL SHALL BE PLACED IN LIFTS AT A MAXIMUM UNCOMPACTED DEPTH OF 12-INCHES WITH SOIL FREE FROM AGGREGATES EXCEEDING 6".
- ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER. FAILURE TO CONDUCT DENSITY TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE OF THE FACILITY. TESTS SHALL BE CONDUCTED AT THE SOLE COST OF THE CONTRACTOR OR HIS AGENT.
- A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION.
- SATISFACTORY MATERIALS FOR USE AS FILL FOR PAD AREAS INCLUDE MATERIALS CLASSIFIED IN ASTM D-2475 AS GW, GP, GM, GC, SW, SP, SM, SC, ML, AND CL GROUPS. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 2% OF THE OPTIMUM TO FACILITATE COMPACTION. GENERALLY, UNSATISFACTORY MATERIALS INCLUDE MATERIALS CLASSIFIED IN ASTM D-2475 AS FT, CH, MH, CL, OH AND ANY SOIL TOO WET TO FACILITATE COMPACTION. CH AND MH SOILS MAY BE USED SUBJECT TO APPROVAL OF THE ENGINEER. SOILS SHALL HAVE A MINIMUM DRY DENSITY OF 92.5 LBS/CF PER ASTM D-698 AND SHALL HAVE A PLASTICITY INDEX LESS THAN 17.
- CONTRACTOR SHALL SUBMIT AND ADHERE TO A GENERAL GROUNDWATER PROTECTION PLAN.

EROSION CONTROL NOTES

- THE CONTRACTOR SHALL ARRANGE FOR A PRE-CONSTRUCTION CONFERENCE WITH THE APPROPRIATE EROSION AND SEDIMENT CONTROL INSPECTOR 48 HOURS PRIOR TO BEGINNING WORK.
- ALL EROSION CONTROL DEVICES AS SHOWN OR AS REQUIRED, ARE TO BE CONSTRUCTED TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL AND ARE TO BE IN PLACE PRIOR TO ALL CONSTRUCTION.
- EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED CONTINUOUSLY, RELOCATED WHEN AND AS NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDED AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.
- ALL DISTURBED AREAS NOT PAVED OR BUILT UPON ARE TO BE FERTILIZED, SEEDED, HYDRO-SEEDING (WITH STRAW AND COTTON PRODUCT WITH TACK AGENTS) OR MULCHED BY THE CONTRACTOR IN ACCORDANCE WITH THE OFFICE OF OIL & GAS, W.V.A. EROSION & SEDIMENT CONTROL FIELD MANUAL, MAY 2012.
- ALL DRAIN INLETS SHALL BE PROTECTED FROM SILTATION. INEFFECTIVE PROTECTION DEVICES SHALL BE IMMEDIATELY REPLACED AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE METHOD OF CLEANING.
- PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 21 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN SIX MONTHS.
- DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES.
- SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.
- STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS IMPOUNDMENTS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
 - TOPSOIL - 4 INCH MINIMUM FOR PERMANENT TURF
 - FERTILIZER - 500 POUNDS PER ACRES OF 10-20-10 FERTILIZER OR EQUIVALENT POUNDAGE OF DIFFERENT ANALYSIS. WORK INTO SOIL PRIOR TO SEEDING.
 - LIME (PERMANENT SEEDING) - AGRICULTURAL LIME SPREAD AT RATE OF 4 TONS/ACRE. WORK INTO SOIL PRIOR TO SEEDING.
 - MULCH - WOOD FIBER OR CHOPPED STRAW AT RATE OF 3 TONS PER ACRE. HYDRO-MULCH (EAST COAST EROSION CONTROL HY-C1 OR EQUAL) AT MANUFACTURER'S RECOMMEND RATE OR 2500 LB/AC WHICHEVER IS GREATER.
 - SEED - 45 LBS. PER ACRE TALL RESCUE AND 20 LBS. PER ACRE PERENNIAL RYE GRASS. TO BE SEEDDED BY HAND OR HYDRO-SEEDER.

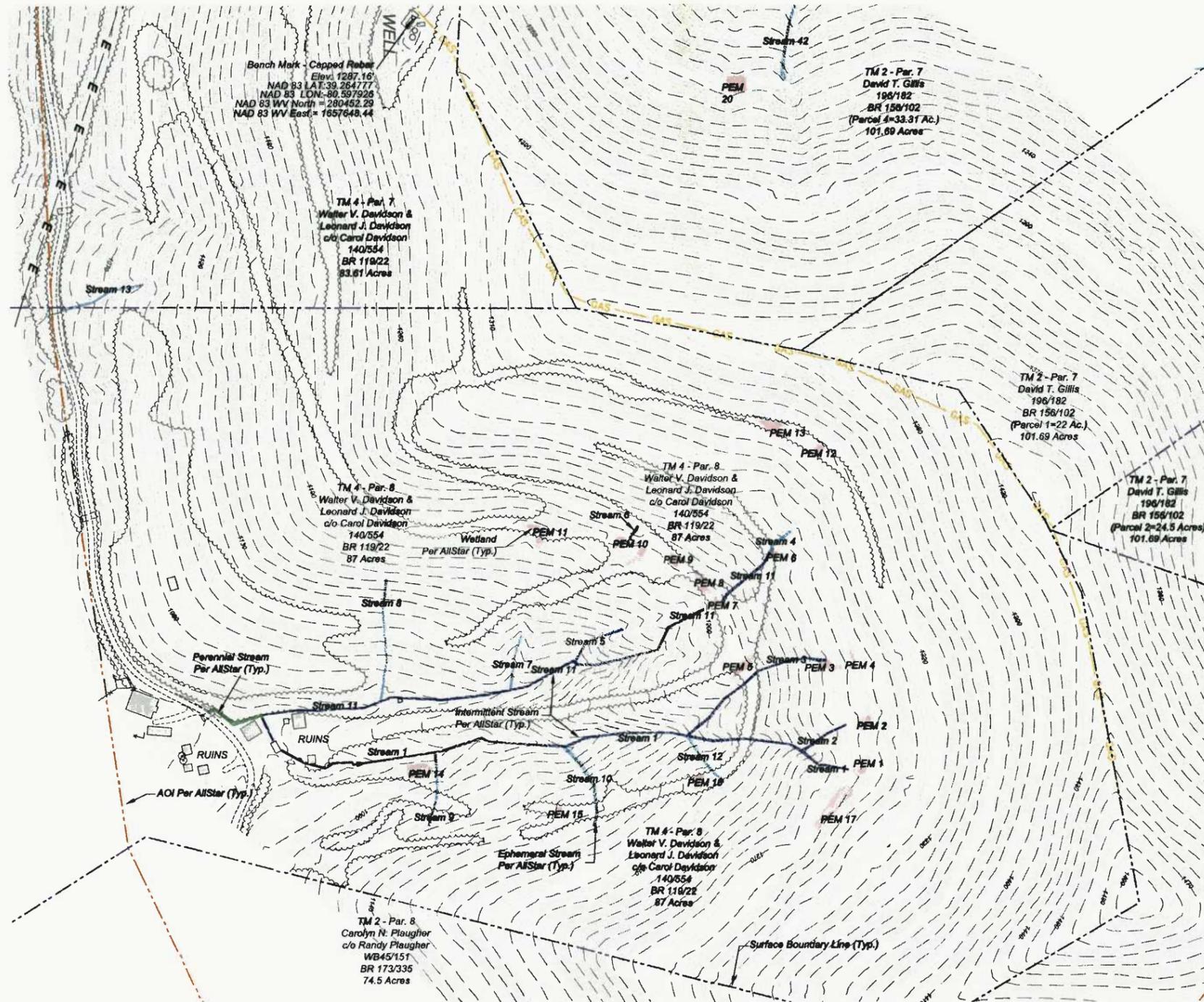
EROSION AND SEDIMENT CONTROL NARRATIVE

- PROJECT DESCRIPTION: THE PURPOSE OF THIS PROJECT IS TO GRADE AND INSTALL EROSION AND SEDIMENT CONTROL MEASURES, IN PREPARATION FOR THE CONSTRUCTION OF A GAS WELL PAD NEAR SALEN, WEST VIRGINIA, IN DODDRIDGE COUNTY. THE CONSTRUCTION INCLUDES TWO ACCESS ROADS, DRILL PAD, TOPSOIL STORAGE PAD, WATER TANK PAD, SPOIL PILES, STORM WATER CONTROLS, AND INCIDENTAL WORK. THE TOTAL APPROXIMATE LAND DISTURBANCE ASSOCIATED WITH THIS PROJECT IS 18.18 ACRES.
- EXISTING SITE CONDITIONS: THE EXISTING SITE IS UPLAND HARDWOODS WITH MODERATE TO STEEP TOPOGRAPHY WITH 6% TO 80% SLOPES. NO EROSION IS NOTICED ON SITE, ON ADJOINING PROPERTIES OR IN ANY NATURAL DRAINAGE WAYS. THE SITE IS ON ONE DRAINAGE AREA.
- ADJACENT PROPERTY: THE SITE IS BORDERED ON ALL SIDES BY UPLAND HARDWOODS.
- SOILS: NO SOIL STUDIES OR INVESTIGATIONS WERE DONE FOR THIS PROJECT.
- OFF-SITE AREAS: THERE SHALL BE NO BORROW AREA OUTSIDE OF THE PROPOSED GRADING AND CONSTRUCTION AREA.
- CRITICAL EROSION AREAS-CONTROL MAINTENANCE: ALL 3:1 SLOPES AND STEEPER, DITCHES AND OTHER CONTROLS SHALL BE CONSIDERED CRITICAL EROSION AREAS. THESE AREAS SHALL BE MONITORED & MAINTAINED DAILY AND AFTER EACH RAINFALL OF 0.5 INCHES OR GREATER. THE LOCAL GOVERNING AUTHORITY WILL HAVE THE AUTHORITY TO RECOMMEND THE PLACEMENT OF ADDITIONAL EROSION CONTROL MEASURES IN THESE AREAS IF IT BECOMES EVIDENT DURING CONSTRUCTION THAT THE ONES IN PLACE ARE NOT FUNCTIONING SUFFICIENTLY.
- EROSION AND SEDIMENT CONTROL MEASURES: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE OFFICE OF OIL & GAS, W.V.A. EROSION AND SEDIMENT CONTROL FIELD MANUAL, MAY 2012. THE CONTRACTOR SHALL OBTAIN A COPY OF THIS MANUAL FROM THE WVPDP WEBSITE AND CONSTRUCT ALL DEVICES BASED ON THIS MANUAL OR A HANDBOOK THAT IS COMPARABLE OR EXCEEDS THE SPECIFICATIONS OF THE WEST VIRGINIA MANUAL. THE MINIMUM STANDARDS OF THIS MANUAL SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE. SEE PLANS FOR ALL PROPOSED EROSION AND SEDIMENT CONTROL MEASURES.
 - STRUCTURAL PRACTICES:
 - DIVERSION DITCHES: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
 - OVERFLOW BERM: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
 - OUTLET PROTECTION: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
 - SILT SOCKS/STRAW WATTLE/SUPER SILT FENCE: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.
 - VEGETATIVE PRACTICE TOPSOILING: TOPSOIL WILL BE STRIPPED FROM THE SITE AND STOCKPILED IN AN AREA AS SHOWN ON THESE PLANS. UPON THE COMPLETION OF THE PROJECT TOPSOIL WILL BE PLACED ON ALL DISTURBED AREAS AT A MINIMUM DEPTH OF 4 INCHES. TEMPORARY SEEDING: ALL DENUDED AREAS LEFT DORMANT FOR MORE THAN 21 DAYS SHALL BE SEEDDED WITH A FAST GERMINATING SEED. THE TIME OF YEAR WILL BE THE BASIS FOR THE SEED MIXTURE. PERMANENT SEEDING: ALL SEEDDED AREAS WILL BE RESEEDDED, MULCHED AND FERTILIZED AS NEEDED TO OBTAIN AN ADEQUATE STAND OF GRASS. PERMANENT SEEDING SHALL BE PLACED WITHIN SEVEN DAYS UPON ACHIEVING FINAL GRADE. WATER, MULCH, AND RESEED AS NECESSARY TO OBTAIN AN ADEQUATE STAND OF VEGETATION, IN THE OPINION OF THE ENGINEER.
 - MANAGEMENT STRATEGIES: CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS WILL BEGIN AND END AS SOON AS POSSIBLE. THE JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES. AFTER ACHIEVING ADEQUATE STABILIZATION THE TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED DURING THIS PROCESS SHALL BE STABILIZED.
 - SEQUENCE OF EVENTS:
 - A PRE-CONSTRUCTION CONFERENCE WILL BE HELD ON SITE WITH CONTRACTOR TO REVIEW THE CONSTRUCTION DRAWINGS AND PROVIDE ANY REQUESTED GUIDANCE.
 - CONSTRUCT THE CONSTRUCTION ENTRANCE.
 - CONSTRUCT ALL PROPOSED SEDIMENT CONTROL DEVICES AS SOON AS CLEARING AND GRUBBING OPERATIONS ALLOW. DIVERSIONS AND SEDIMENT BASINS SHALL BE SEEDDED AND MULCHED IMMEDIATELY.
 - CLEAR AND GRUBB: REMOVE TOPSOIL AND PLACE AT AN AREA DETERMINED IN THE FIELD WHERE EROSION WILL NOT TAKE PLACE. TOPSOIL STOCKPILES TO BE SEEDDED AND MULCHED. SILT FENCE SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES.
 - GRADING OPERATIONS AS REQUIRED. CUT SLOPES AND FILL SLOPES SHALL BE TOPSOILED IF NEEDED. DITCH LINES SHALL BE CLEANED. ALL DITCHES WILL HAVE AT LEAST GRASS LINING PROTECTION OR GREATER BASED ON DITCH SLOPE WITH THE FOLLOWING DETERMINATION: 0 TO 3% - GRASS LINED, 3 TO 6% - JUTE MATTING, AND 6% OR GREATER - TRM.
 - CULVERT INLET AND OUTLET PROTECTION SHALL BE CONSTRUCTED IMMEDIATELY UPON PLACEMENT OF INLETS AND CULVERTS. INSTALLATION OF MATTING AND/OR RIP RAP TO OCCUR ONCE DITCHES ARE CONSTRUCTED.
 - WHEN FINAL GRADE IS ACHIEVED, TOPSOIL TO BE PLACED ON ALL DISTURBED AREAS NOT LINED. SEED ALL DISTURBED AREAS AS REQUIRED. A SOIL SAMPLE SHOULD BE TAKEN AND TESTED TO DETERMINE RECOMMENDED RATES. IF NO SOILS SAMPLE IS TAKEN THE FOLLOWING RATES SHOULD BE APPLIED AS A MINIMUM: LIME AT RATE OF 4 TONS PER ACRE. FERTILIZE AT A RATE OF 500 LBS. OF 10-20-10 PER ACRE. SEED WITH 45 LBS. PER ACRE OF TALL RESCUE AND 20 LBS. PER ACRE OF PERENNIAL RYE GRASS.
 - LIME, FERTILIZER, AND SEED WILL BE APPLIED BY HAND OR USING A HYDRO-SEEDER. HYDRO-MULCH PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 - FINAL SEEDING MUST OCCUR WITHIN 7 DAYS OF FINAL GRADING.
 - WHEN SITE IS STABILIZED WITH ESTABLISHED TURF GREATER THAN 70%, ALL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND REPAIR/STABILIZE THOSE AREAS IN ACCORDANCE WITH STATE STANDARDS.
 - MAKE MODIFICATIONS FOR PERMANENT STORM WATER MANAGEMENT.
 - FINAL SITE INSPECTION.
- PERMANENT STABILIZATION: ALL AREAS LEFT UNCOVERED BY EITHER BUILDINGS OR PAVEMENT SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING AND WITHIN 7 DAYS. AT NO TIME SHALL LAND LAY DORMANT FOR LONGER THAN 21 DAYS. SEE SEQUENCE OF EVENTS FOR RATES.
- MAINTENANCE AND OTHER CONSIDERATIONS AND GROUND WATER PROTECTION: ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH RAINFALL OF 0.5 INCHES OR MORE. THEY WILL BE INSPECTED FOR UNDERMINING, DETERIORATION, EROSION AND EXCESS DEPOSITED MATERIAL. ALL DEFICIENCIES WILL BE CORRECTED IMMEDIATELY. EXCESS MATERIAL WILL BE SPREAD ON THE SITE IN A MANNER WHERE IT IS NOT LIKELY TO ERODE IN THE FUTURE. CLEANING PROCEDURES WILL BE COMPLETED AT REGULAR INTERVALS AND AT LEAST WHEN SEDIMENT REACHES CLEAN OUT LEVELS SHOWN. RECORDS OF CLEANING AND CORRECTIONS WILL BE MAINTAINED BY THE CONTRACTOR. THE "GENERIC GROUNDWATER PROTECTION PLAN FOR CONSTRUCTION SITES" WILL BE USED AND AVAILABLE ON SITE AT ALL TIMES. AN AREA WILL BE PROVIDED FOR VEHICLE AND EQUIPMENT MAINTENANCE. MOBILE FUEL TRUCKS WITH APPROVED TANKS WILL BE USED ON THIS SITE. PORTABLE SANITARY FACILITIES WILL BE AVAILABLE FOR EMPLOYEES. IF CONCRETE IS USED, EXCESS CONCRETE WILL BE DISPOSED OF PROPERLY AND NOT ALLOWED TO REMAIN ON THIS SITE. MACHINERY WILL NOT BE ALLOWED IN LANE STREAMS. FLUIDS SUCH AS DIESEL FUEL, GAS OIL OR ANTIFREEZE WILL BE KEPT IN PROPER CONTAINERS AND ANY SPILLAGE WILL BE CLEANED AND TAKEN OFF SITE TO A PROPER FACILITY. SOLID OR HAZARDOUS WASTES WILL BE DISPOSED IN ACCORDANCE WITH APPROPRIATE STATE AND FEDERAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE CHANGES AND NOTIFY OWNER OF ANY CHANGES TO GPP. A FINAL INSPECTION WILL BE MADE AT THE CONCLUSION OF THE PROJECT AND ALL CORRECTIONS MADE BEFORE SIGN-OFF OF THE PROJECT SITE.

DATE	REVISIONS	Date: 7/25/12
2/21/13	Updated Details/Notes per DEP	Scale: N/A
4/12/13	Updated Per New Antero Standards	Designed By: CKW/CKM
		File No. Antero 110-12
		Page 3 of 15

All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011

EXISTING CONDITIONS



Legend

- - - Existing 2' Contour
- - - Existing 10' Contour
- - - Existing Tree Line
- E - Existing Utility Pole
- GAS - Existing Gas Line CL

NOTE: All surface boundary line shown hereon are based on current Deeds and boundary evidence collected with mapping grade GPS receivers.

DATE	REVISIONS	Date: 7/25/12
3/6/13	Updated with new Wetland Stream Data	Scale: 1" = 100'
4/12/13	Updated Per New Antero Standards	Designed By: CKW/CKM
		File No. Antero 110-12
		Page 4 of 15



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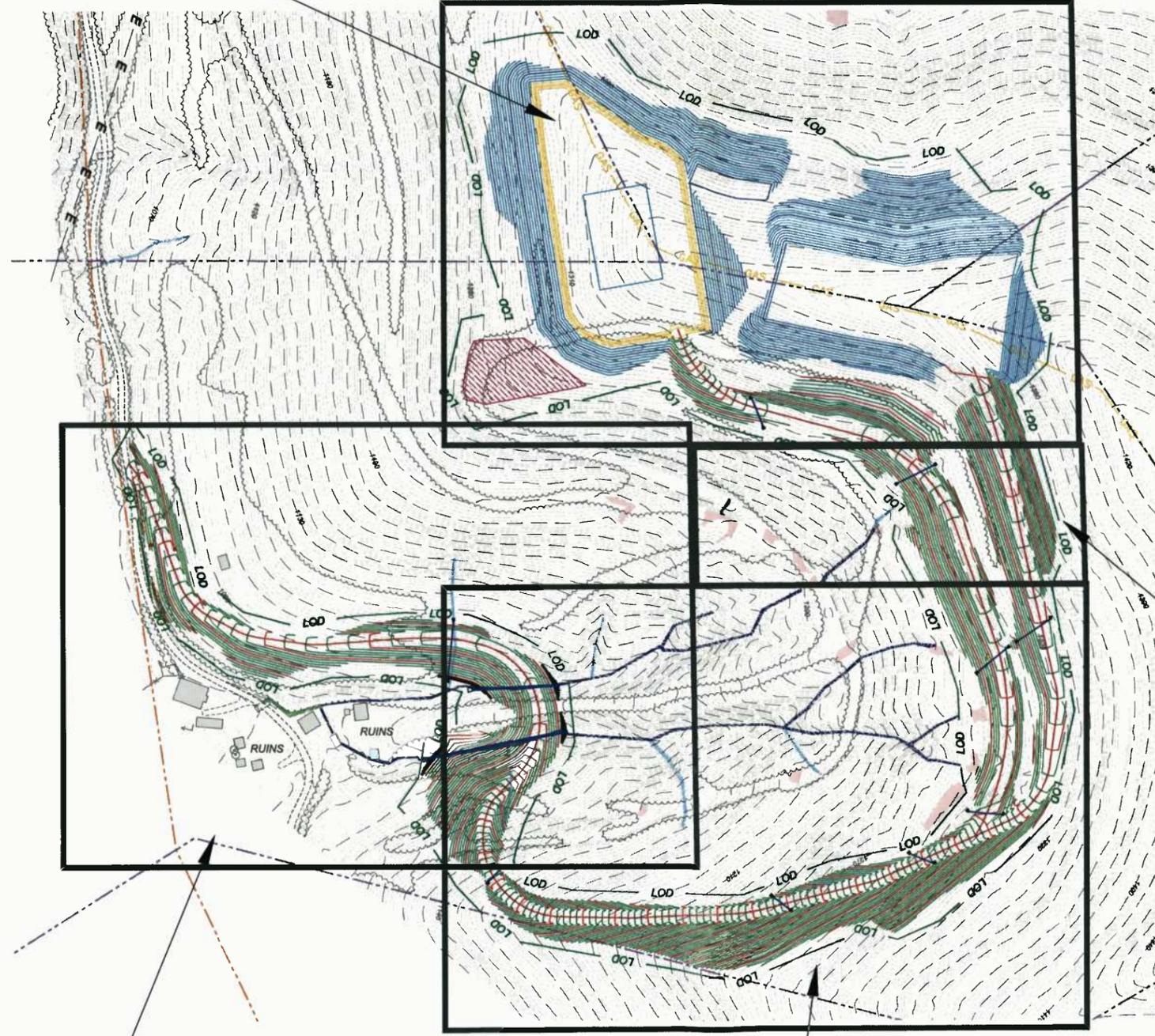
THIS DOCUMENT
PREPARED FOR
ANTERO RESOURCES
APPALACHIAN CORP

EXISTING CONDITIONS
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV

All topographic information shown hereon is based on aerial photography provided by Blue Mountain Aerial Mapping with a flight date of Spring 2011

PLAN SHEET 4 (Sheet 9 of 15)

PLAN SHEET INDEX



NOTE: All surface boundary line shown hereon are based on current Deeds and boundary evidence collected with mapping grade GPS receivers.

PLAN SHEET 1 (Sheet 6 of 15)

PLAN SHEET 2 (Sheet 7 of 15)

PLAN SHEET 3 (Sheet 8 of 15)



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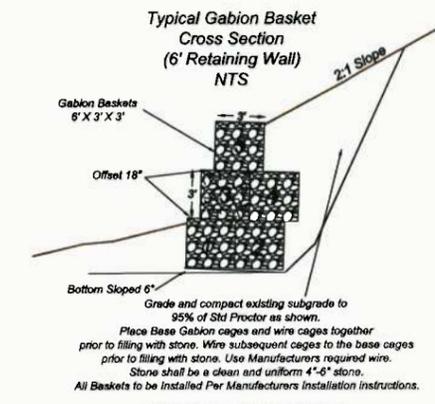
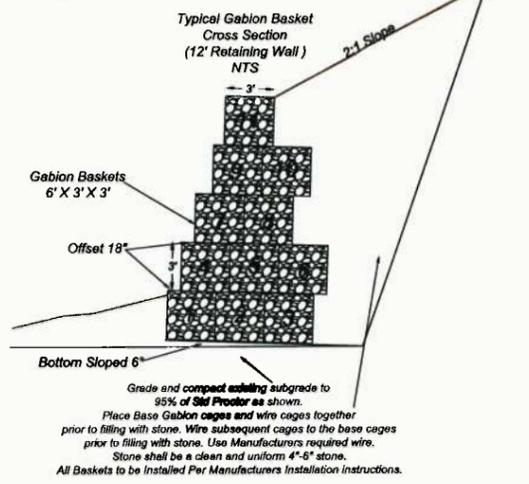


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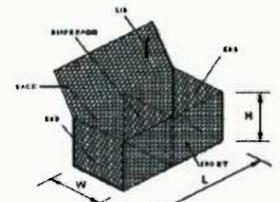
PLAN SHEET INDEX
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV

DATE	REVISIONS	Date: 7/25/12
4/12/13	Updated Per New Antero Standards	Scale: 1" = 100'
		Designed By: CKW/CKM
		File No. Antero 110-42
		Page 5 of 15

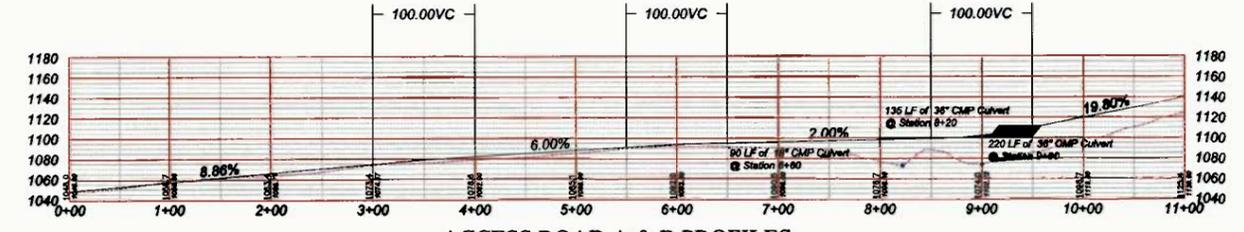
SITE PLAN (1) ROAD A 0+00 - 11+00



Typical Gabion Basket Detail
L = 6', W = 3', H = 3'

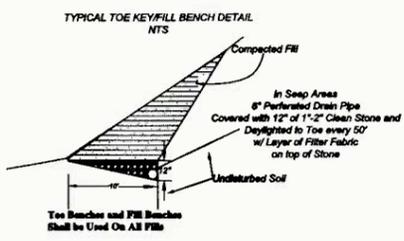
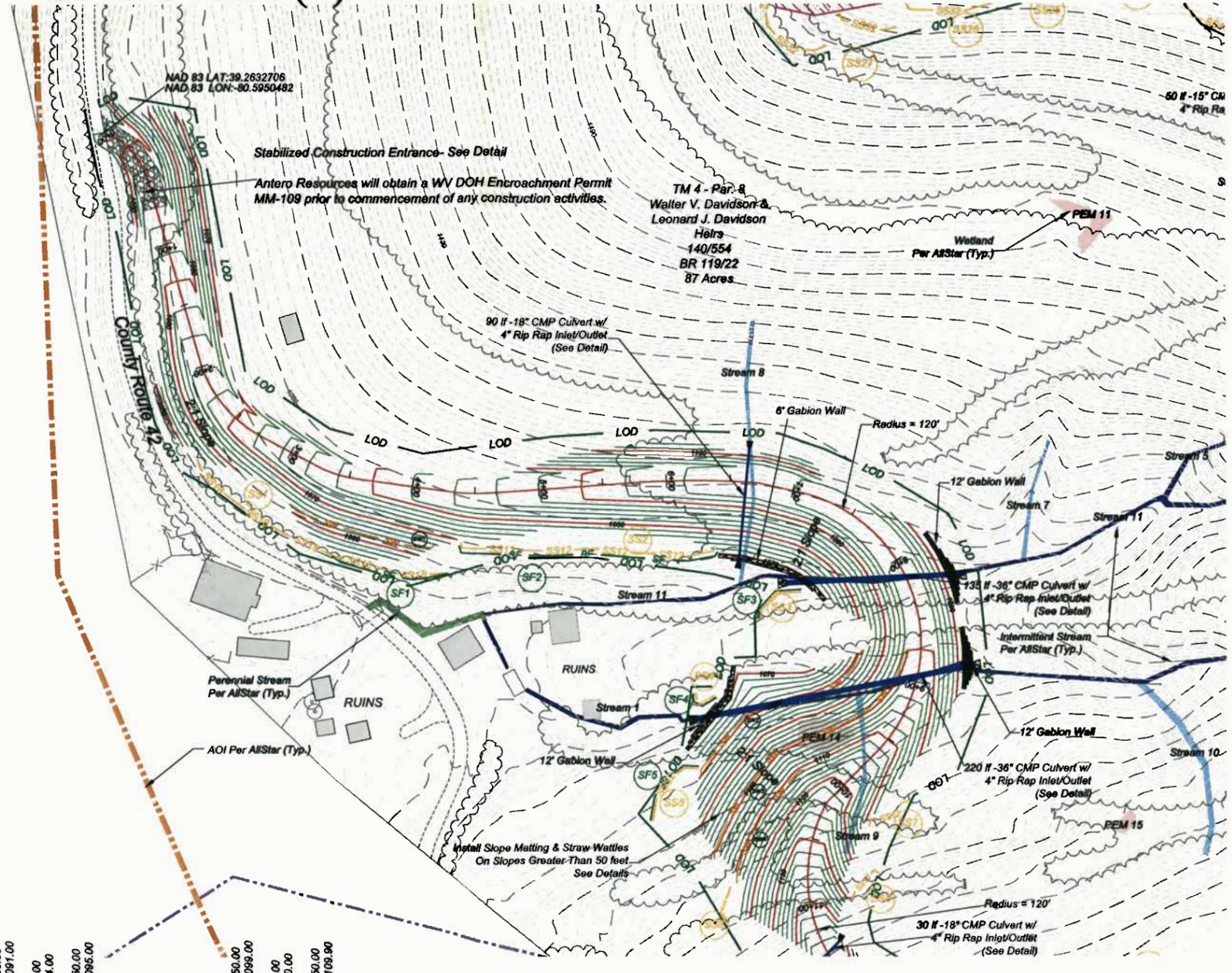


PVC STA. 3+00.00 PVC ELEV. 1074.57	PVC STA. 5+50.00 PVC ELEV. 1091.00	PVC STA. 6+00.00 PVC ELEV. 1094.00	PVC STA. 6+50.00 PVC ELEV. 1095.00	PVC STA. 8+50.00 PVC ELEV. 1098.00	PVC STA. 9+00.00 PVC ELEV. 1100.00	PVC STA. 9+50.00 PVC ELEV. 1109.90
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ACCESS ROAD A & B PROFILES
Horizontal & Vertical Scale: 1" = 80'

LINED DITCH TREATMENT vs SLOPE of DITCH
Line with Jute Matting if slope is less than 3%
Line with turf reinforcement matting (TRM) if slope is greater than 3%
*Turf reinforcement matting shall be Excelsior Recycles or



Legend

Existing 2' Contour	Proposed Check Dam
Existing 10' Contour	Proposed Culvert W/ Inlet & Outlet Protection
Existing Tree Line	SW Proposed Straw Wattles
Existing Utility Line / Pole	SSXX Proposed Silt Soxx w/ Diameter
Surface Owner Property Line	Proposed 2' Contour
Existing Gas Line CL	Proposed 10' Contour
LOD	Proposed Rip-Rap
Proposed Diversion Ditch	Proposed Super Silt Fence
Proposed 2' Contour	
Proposed 10' Contour	
Proposed Super Silt Fence	

* Silt Soxx Diameter in Inches
* Super Silt Fence can be Substituted for Silt Soxx of any Size

DATE	REVISIONS
11/9/12	Updated per Antero/DEP comments
3/6/13	Updated with new Wetland Stream Data
4/12/13	Updated Per New Antero Standards



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ANTERO RESOURCES

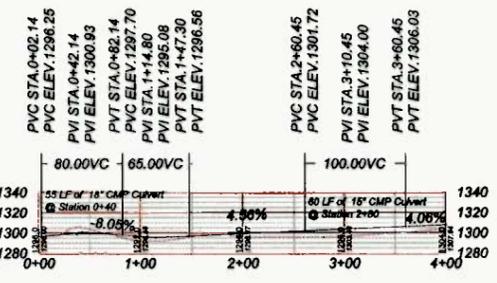
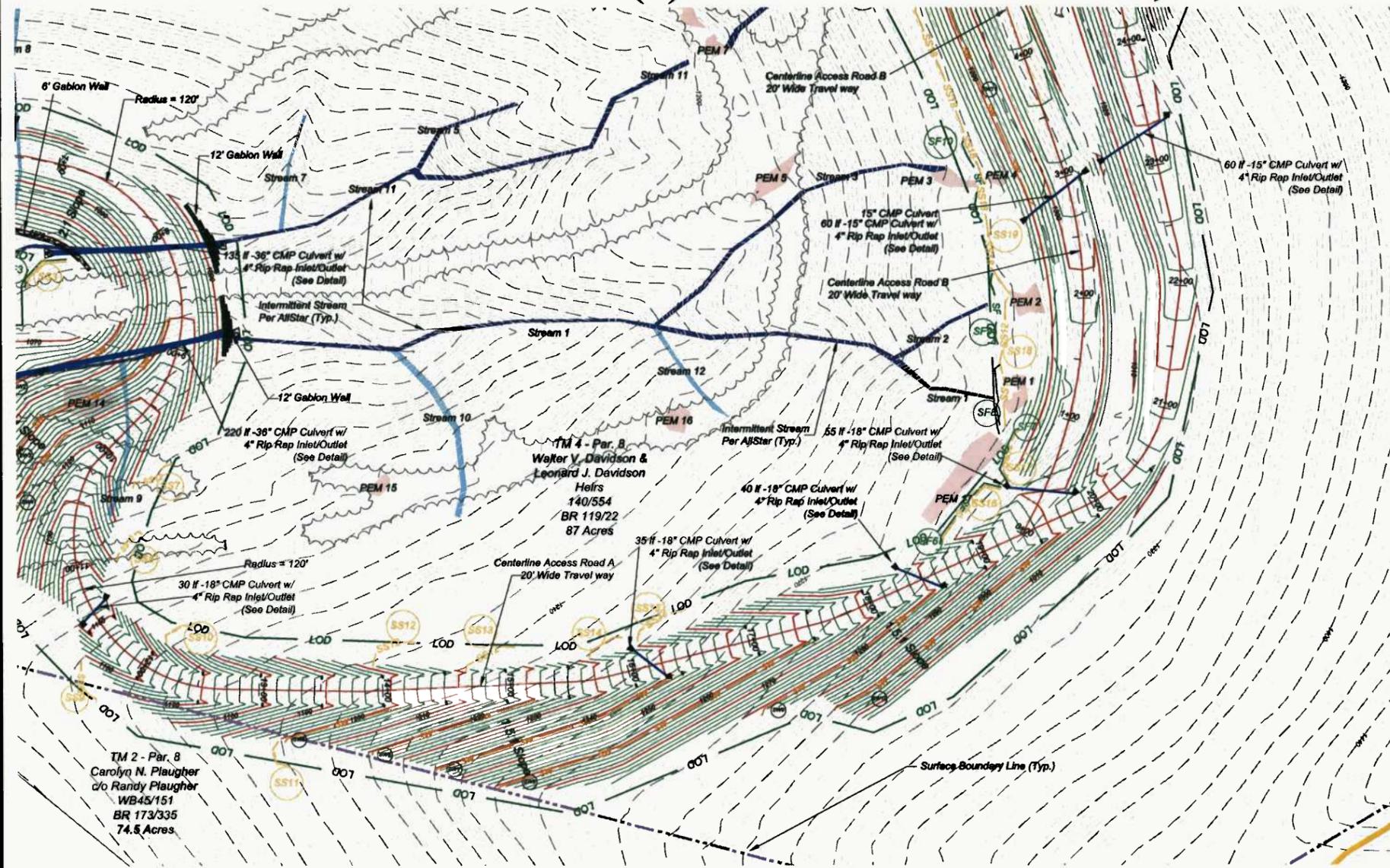
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APPALACHIAN CORP

SITE PLAN (1) ROAD A 0+00 - 11+00

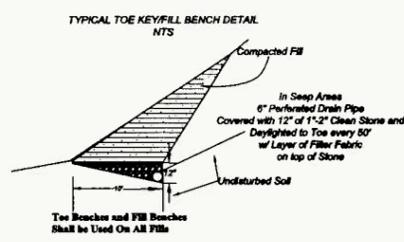
LEONARD PAD
GREENBRIER DISTRICT
DODDRIEGE COUNTY, WV

Date: 7/25/12
Scale: 1" = 50'
Designed By: CEW/KCM
File No. Antero 110-12
Page 6 of 15

SITE PLAN (2) ROAD A 11+00 - 24+00; ROAD B 0+00 - 4+00



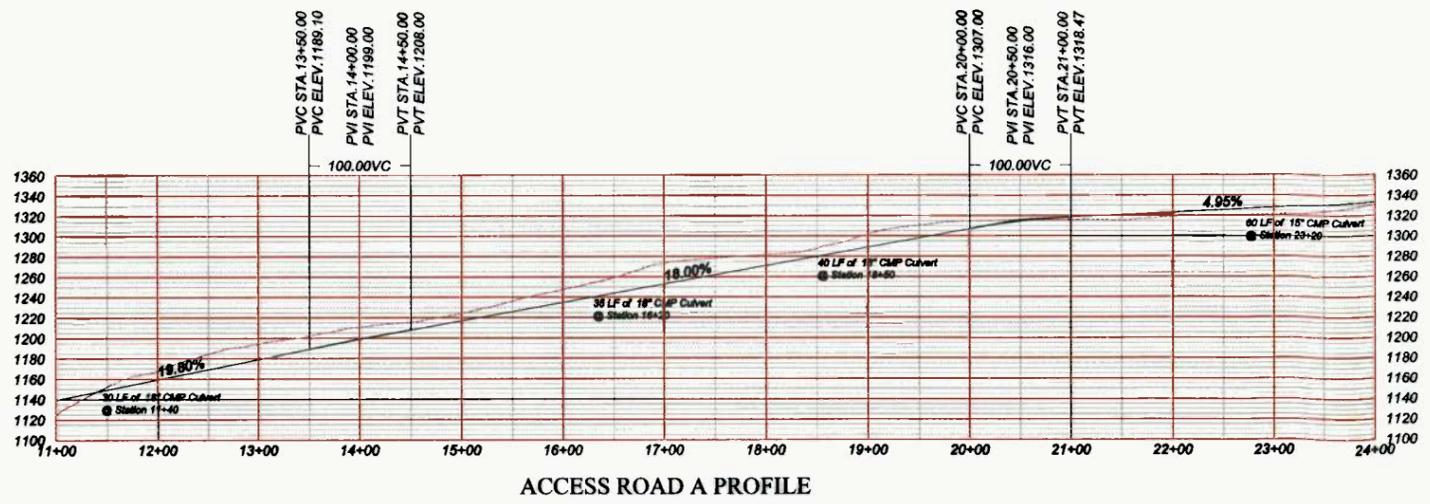
ACCESS ROAD B PROFILE



ACCESS ROAD A & B PROFILES



LINED DITCH TREATMENT vs. SLOPE OF DITCH
 Line with Jute Matting if slope is less than 3%
 Line with turf reinforcement matting (TRM) if slope is greater than 3%
 *Turf reinforcement matting shall be Excelsior Recyclex or Landlok TRM 435 or equal



ACCESS ROAD A PROFILE

Legend

--- 10' Contour	--- 10' Contour	--- Proposed Check Dam
--- Existing Tree Line	--- SW	--- Proposed Culvert w/ Inlet & Outlet Protection
--- Existing Utility Line / Pole	--- Silt Sox	--- Proposed Straw Wattles
--- Surface Owner Property Line	--- Silt Sox w/ Diameter	--- Proposed Silt Sox w/ Diameter
--- Existing Gas Line CL	--- Proposed 2' Contour	--- Proposed 2' Contour
--- LOD	--- Proposed 10' Contour	--- Proposed 10' Contour
--- Proposed Diversion Ditch	--- Proposed Rip-Rap	--- Proposed Rip-Rap
--- Proposed 2' Contour	--- Proposed Super Silt Fence	--- Proposed Super Silt Fence

DATE	REVISIONS	DATE
11/9/12	Updated per Antero/DEP comments	7/25/12
3/6/13	Updated with new Wetland Stream Data	Scale: 1" = 50'
4/12/13	Updated Per New Antero Standards	Designed By: CKW/CKM
		File No. Antero 110-12
		Page 7 of 15



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 172 Thompson Drive
 Bridgeport, WV 26330
 (304) 648-5035



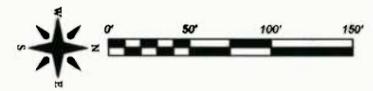
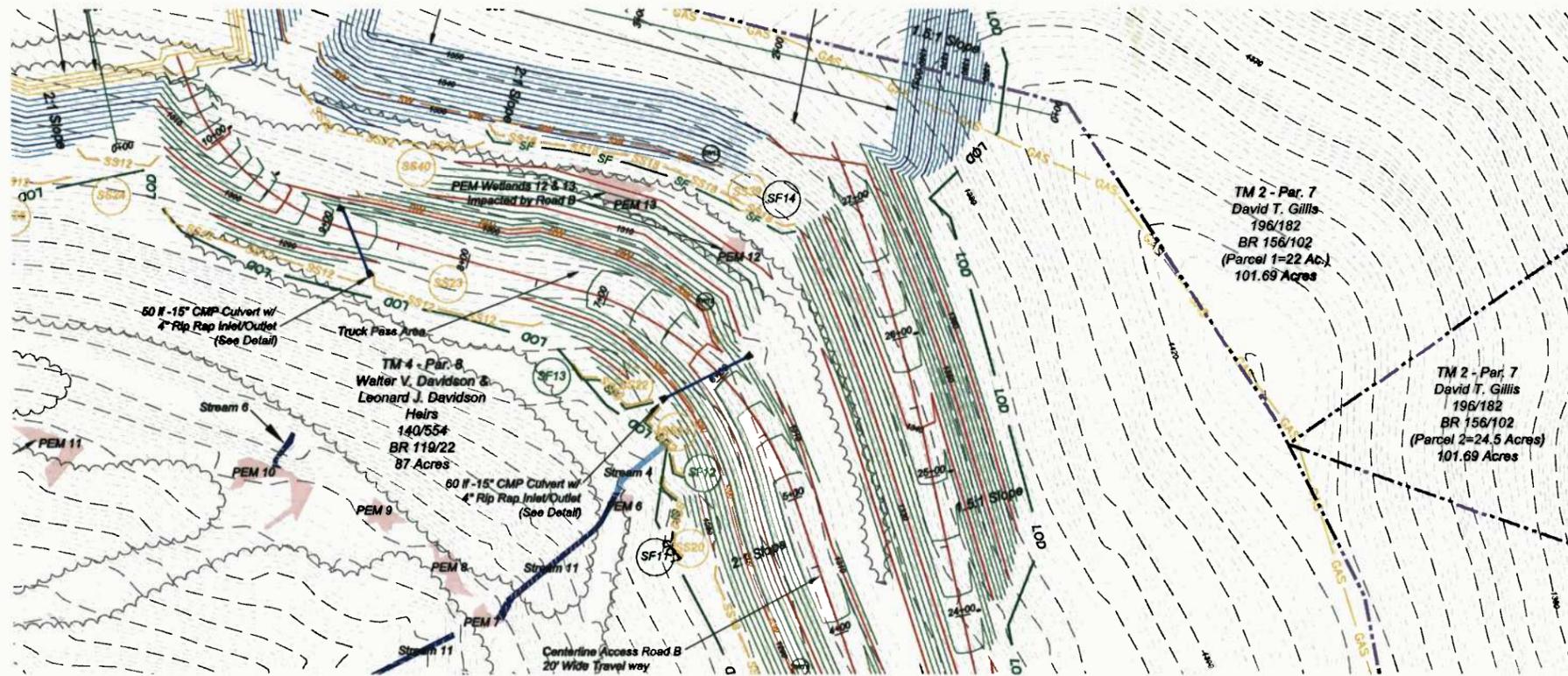
L&W ENTERPRISES, INC.
 P.E. 304-257-4818
 P.O. BOX 836
 14 SOUTH GROVE ST.
 PETERSBURG, WV 26847
 EMAIL: KIRK@CTLINK.NET



ANTERO RESOURCES
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 APPALACHIAN CORP

SITE PLAN (2) ROAD A 11+00 - 24+00;
 ROAD B 0+00 - 4+00
LEONARD PAD
 GREENBRIER DISTRICT
 DODDRIEGE COUNTY, WV

SITE PLAN (3) ROAD A 24+00 - 28+00 & ROAD B 4+00 - 11+00



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172 Thompson Drive
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(304) 848-6035

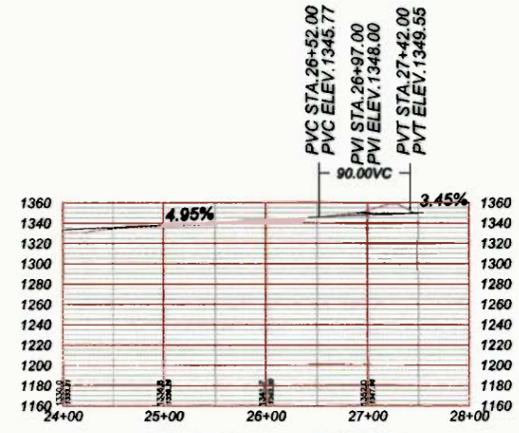


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P.O. BOX 826
14 SOUTH GROVE ST.
PETERSBURG, WV 26447
PH: 304-257-4818
FAX: 304-257-2324
EMAIL: KIRK@GILLNET

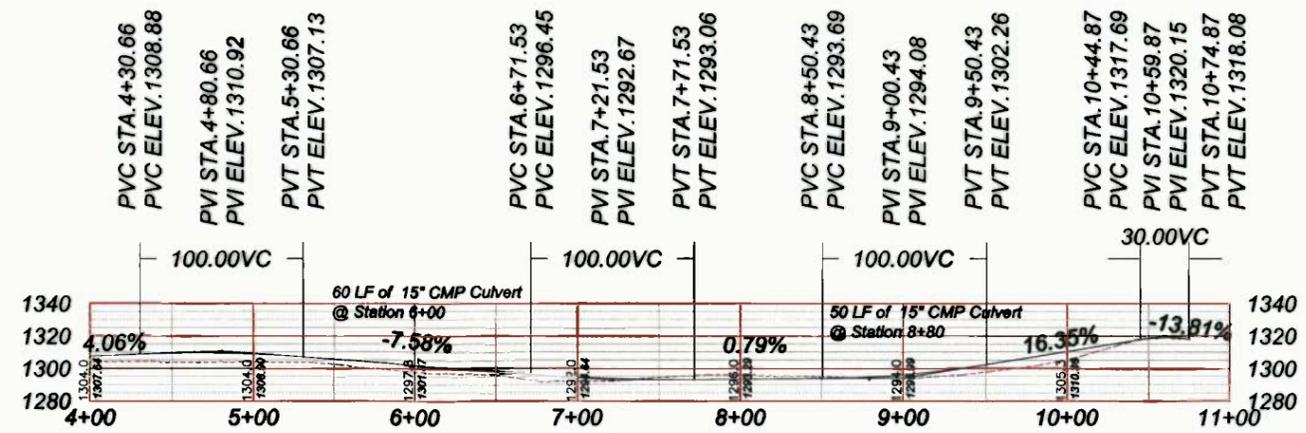


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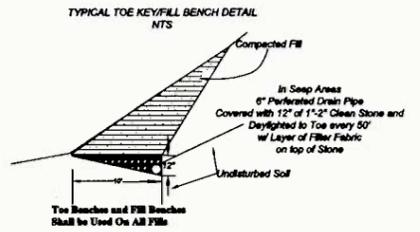
SITE PLAN (3) ROAD A 24+00 - 28+00 &
ROAD B 4+00 - 11+00
LEONARD PAD
GREENBRIER DISTRICT,
DODDRIDGE COUNTY, WV



ACCESS ROAD A PROFILE
Horizontal & Vertical Scale: 1" = 80'



ACCESS ROAD B PROFILE
Horizontal & Vertical Scale: 1" = 50'



LINED DITCH TREATMENT vs. SLOPE OF DITCH
Line with Jute Matting if slope is less than 3%
Line with turf reinforcement matting (TRM) if slope is greater than 3%
*Turf reinforced matting shall be Excellent Riprap or
Landsat TRM 435 or equal

Legend			
---	Existing 2' Contour	—	Proposed Check Dam
---	Existing 10' Contour	—	Proposed Culvert W/ Inlet & Outlet Protection
---	Existing Tree Line	—	Proposed Straw Wattles
---	Existing Utility Line / Pole	—	Proposed Silt Sox w/ Diameter
---	Surface Owner Property Line	—	Proposed 2' Contour
---	Proposed Silt Sox w/ Diameter	---	Proposed 10' Contour
---	Proposed 2' Contour	---	Proposed Rip-Rap
---	Proposed 10' Contour	---	
---	Proposed Diversion Ditch		
---	Proposed 2' Contour		
---	Proposed 10' Contour		
---	Proposed Super Silt Fence		

DATE	REVISIONS
11/9/12	Updated per Antero/DEP comments
3/6/13	Updated with new Wetland Stream Data
4/12/13	Updated Per New Antero Standards

Date: 7/25/12
Scale: 1" = 50'
Designed By: CKWCKM
File No. Antero 110-12
Page 8 of 15

SITE PLAN (4)



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(304) 848-8035

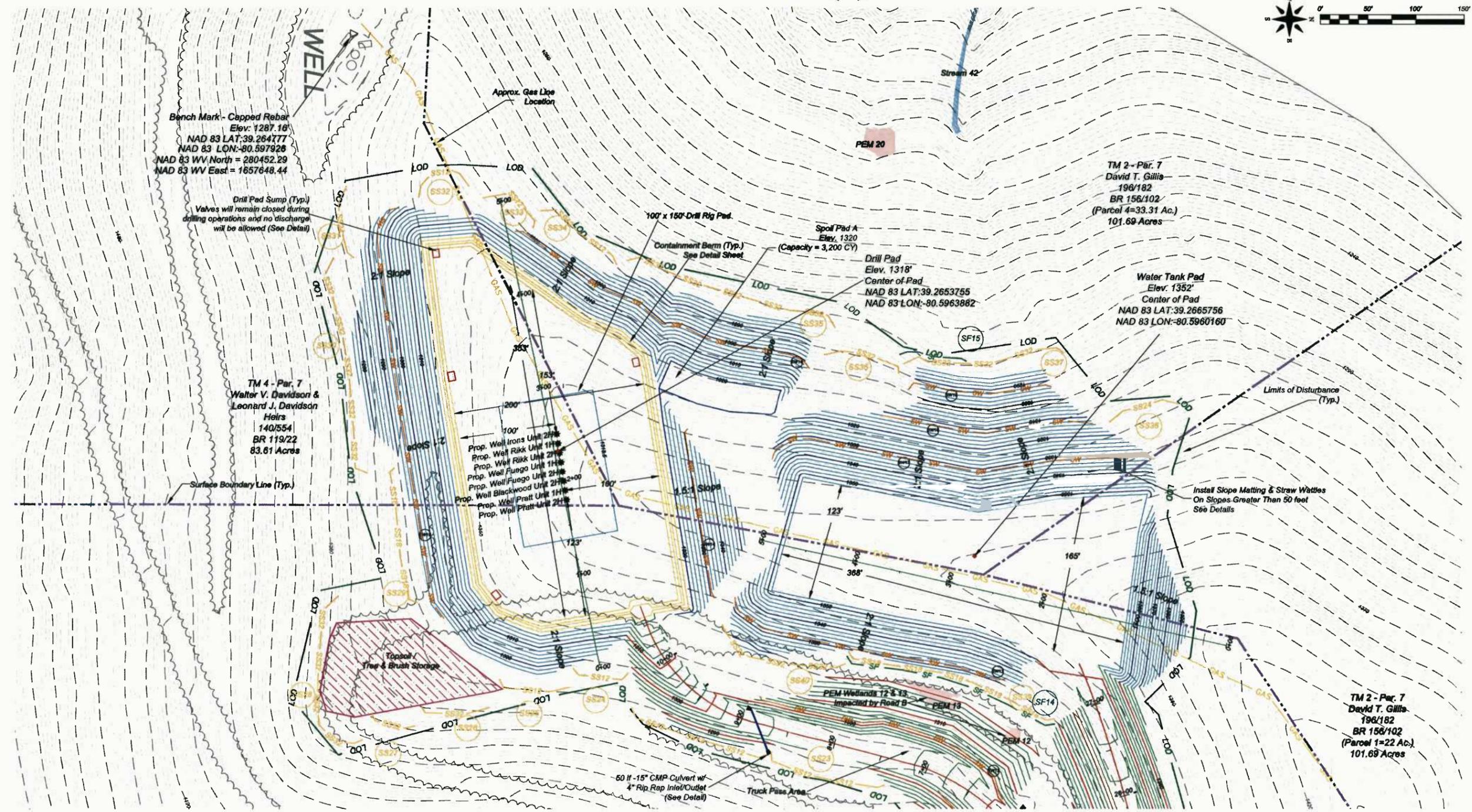


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APPALACHIAN CORP

SITE PLAN (4)
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV



Bench Mark - Capped Rebar
Elev: 1287.16
NAD 83 LAT: 39.264777
NAD 83 LON: -80.597926
NAD 83 WV North = 280452.29
NAD 83 WV East = 1657648.44

Drill Pad Sump (Typ.)
Valves will remain closed during
drilling operations and no discharge
will be allowed (See Detail)

TM 4 - Par. 7
Walter V. Davidson &
Leonard J. Davidson
Heirs
140/554
BR 119/22
83.61 Acres

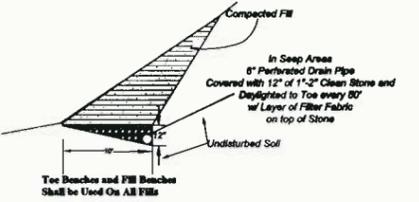
Drill Pad
Elev. 1318'
Center of Pad
NAD 83 LAT: 39.2653755
NAD 83 LON: -80.5963862

TM 2 - Par. 7
David T. Gillis
196/182
BR 156/102
(Parcel 4=33.31 Ac.)
101.69 Acres

Water Tank Pad
Elev. 1352'
Center of Pad
NAD 83 LAT: 39.2665756
NAD 83 LON: -80.5960160

TM 2 - Par. 7
David T. Gillis
196/182
BR 156/102
(Parcel 1=22 Ac.)
101.69 Acres

TYPICAL TOE KEYFILL BENCH DETAIL
NTS



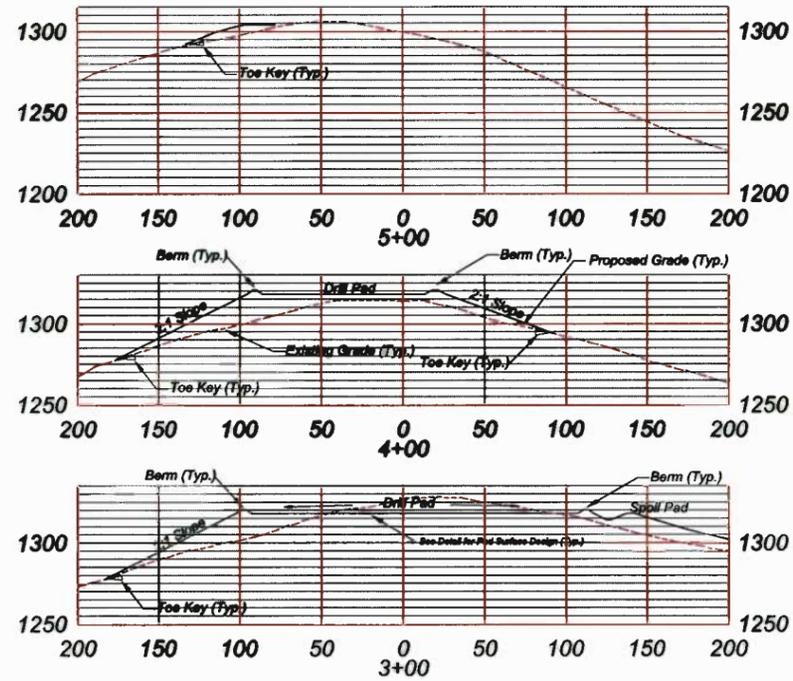
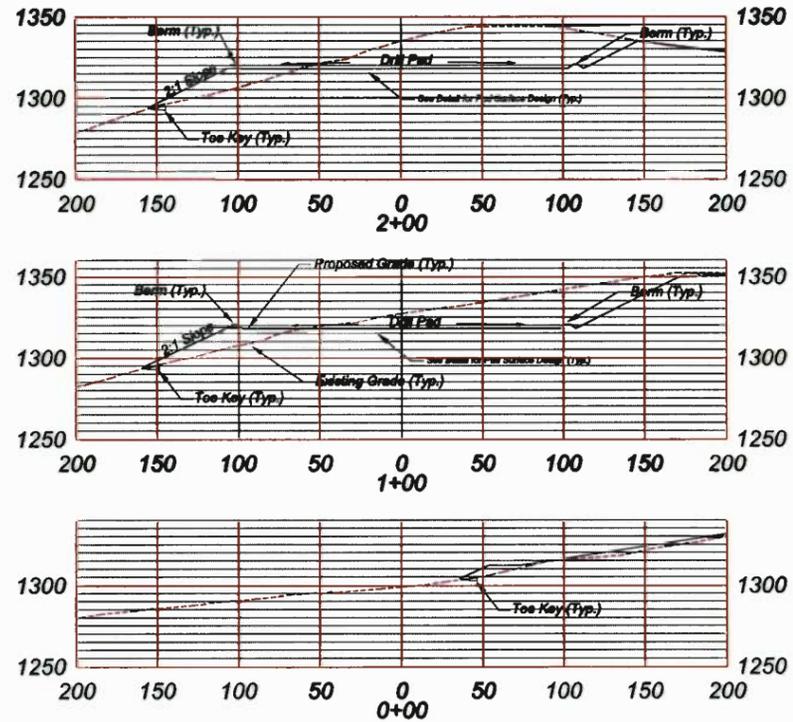
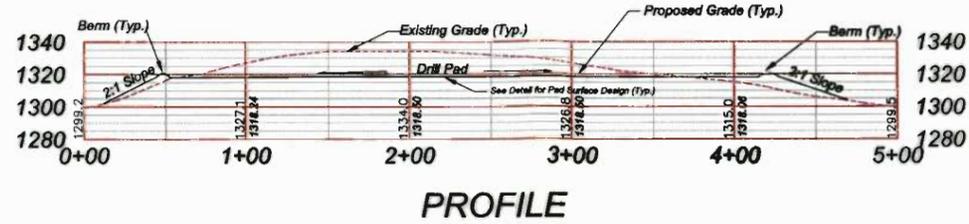
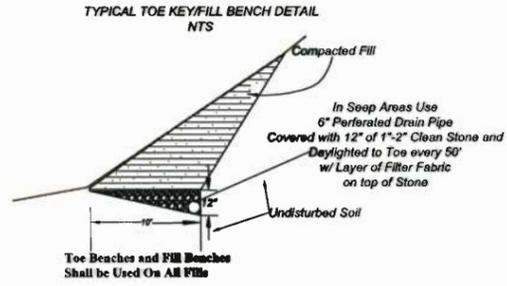
Legend			
--- 1330 ---	Existing 2' Contour	—●—	Proposed Check Dam
--- 1000 ---	Existing 10' Contour	—○—	Proposed Culvert W/ Inlet & Outlet Protection
---	Existing Tree Line	—SW—	Proposed Straw Wattles
—E—E—	Existing Utility Line / Pole	—SSXX—	Proposed Silt Soxx w/ Diameter
---	Surface Owner Property Line	--- 1030 ---	Proposed 10' Contour
---	Existing Gas Line CL	---	Proposed Rip-Rap
---	Limits of Disturbance	---	Proposed Super Silt Fence
---	Proposed Diversion Ditch		
---	Proposed 2' Contour		
---	Proposed 10' Contour		
---	Proposed Super Silt Fence		

* Silt Soxx Diameter in Inches
* Super Silt Fence Can be
Substituted for Silt Soxx of any Size

DATE	REVISIONS
8/9/12	Well Layout Changes
3/6/13	Updated with new Wetland Stream Data
4/12/13	Updated Per New Antero Standards
6/11/12	Well Layout Changes

Date: 7/25/12
Scale: 1" = 50'
Designed By: CKW/CKM
File No.: Antero 110-12
Page 9 of 15

DRILL PAD BASELINE PROFILE AND CROSS SECTIONS



CROSS SECTIONS
Horizontal & Vertical Scale: 1" = 50'
0' 50' 100' 150'

DATE	REVISIONS	Date: 7/25/12
4/12/13	Updated Per New Antero Standards	Scale: 1" = 50'
		Designed By: CKW/CKM
		File No. Antero 110-12
		Page 10 of 15



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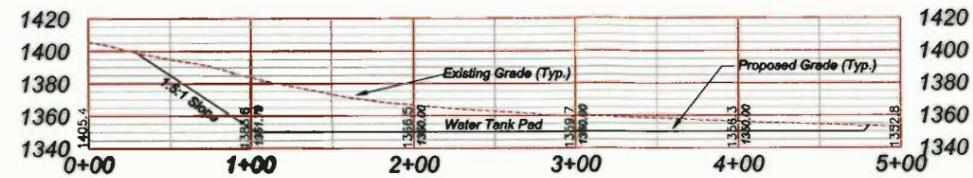
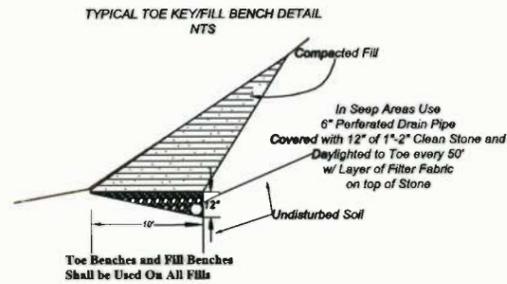
L&W ENTERPRISES, INC.
PO BOX 836
14 SOUTH GROVE ST.
PETERSBURG, WV 26647
PH: 304-237-4818
FAX: 304-237-2224
EMAIL: KURE@GTTLINE.NET



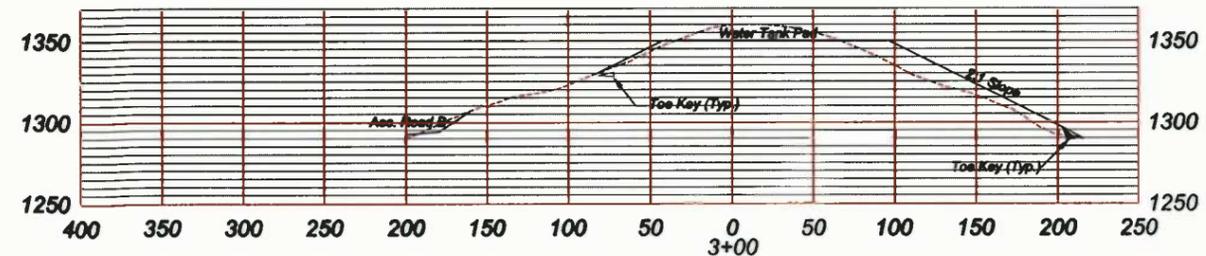
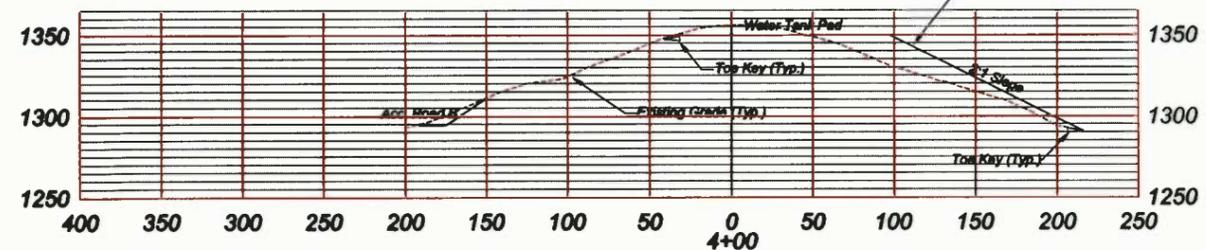
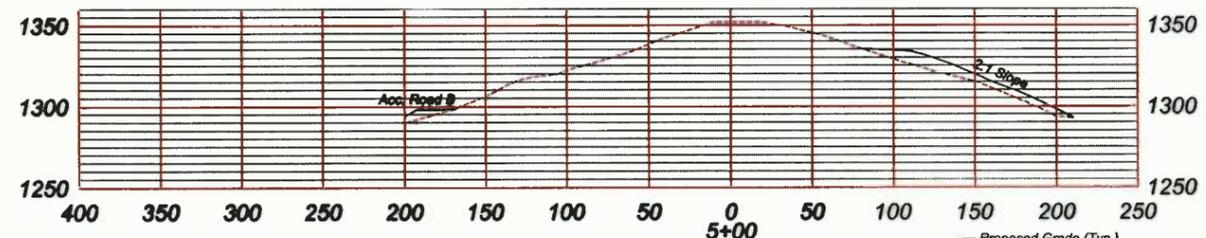
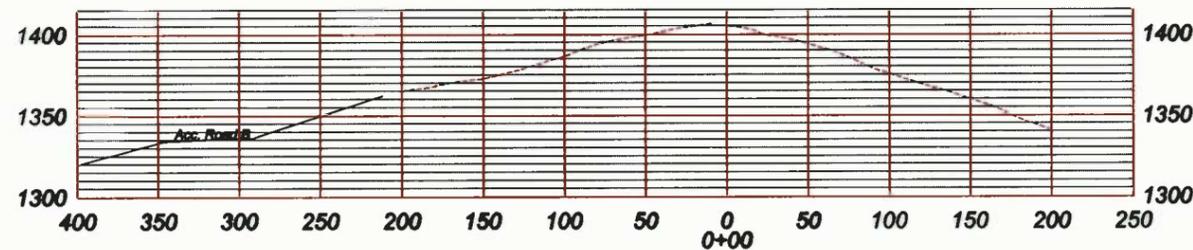
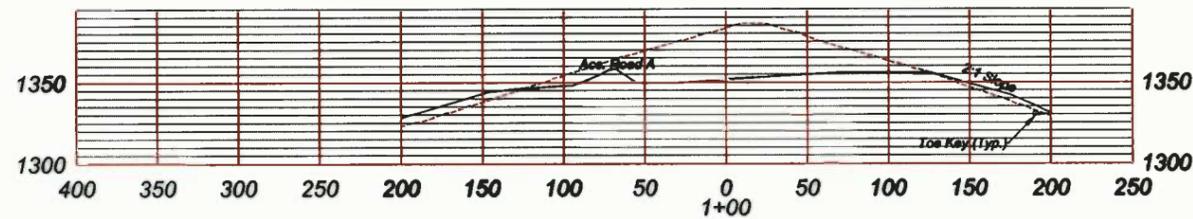
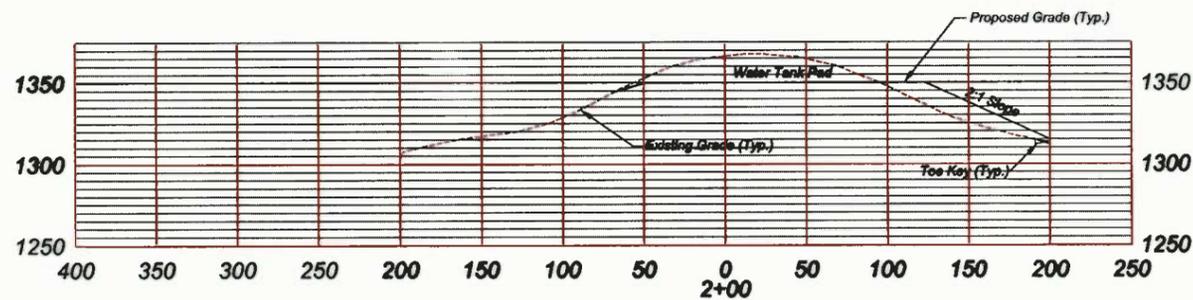
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APPALACHIAN CORP

DRILL PAD BASELINE
PROFILE AND CROSS SECTIONS
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV

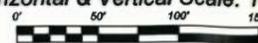
WATER TANK PAD BASELINE PROFILE AND CROSS SECTIONS



PROFILE



CROSS SECTIONS
Horizontal & Vertical Scale: 1" = 50'



DATE	REVISIONS	Date: 7/25/12
4/12/13	Updated Per New Antero Standards	Scale: 1" = 50'
		Designed By: CKW/CKM
		File No. Antero 110-12
		Page 11 of 15



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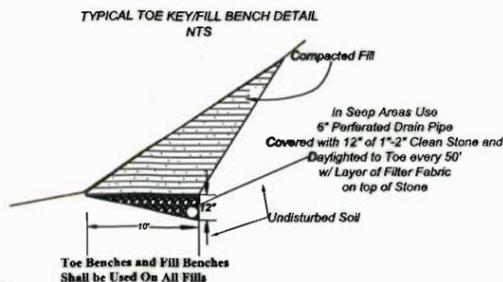
PH: 304-237-4818
FAX: 304-237-2224
EMAIL: KIRK@LWENT.COM
PO BOX 826
14 SOUTH GROVE ST.
PETERSBURG, WV 26847



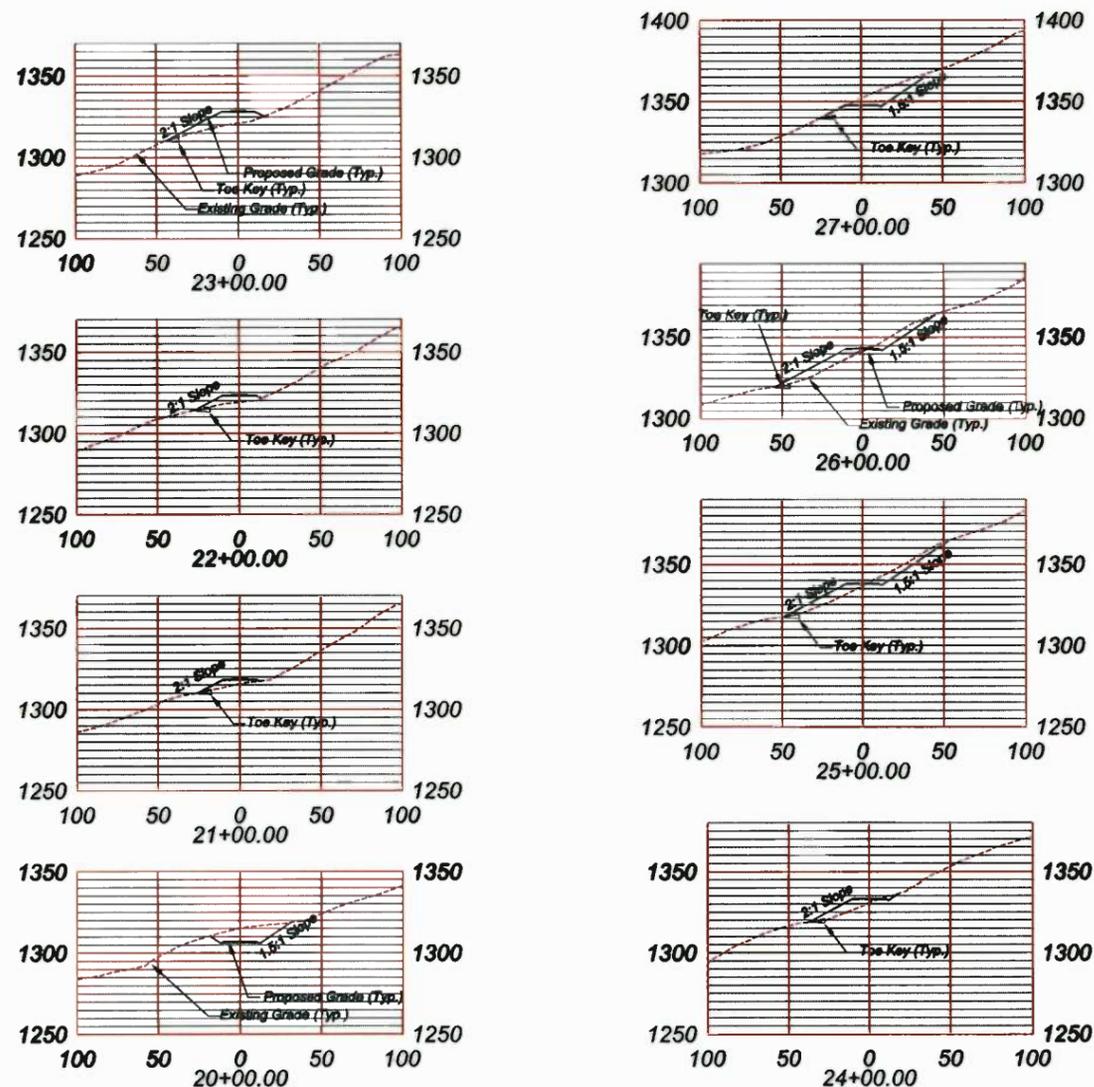
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APPALACHIAN CORP

WATER TANK PAD BASELINE
PROFILE AND CROSS SECTIONS
LEONARD PAD
GREENBRIER DISTRICT
DODDRIIDGE COUNTY, WV

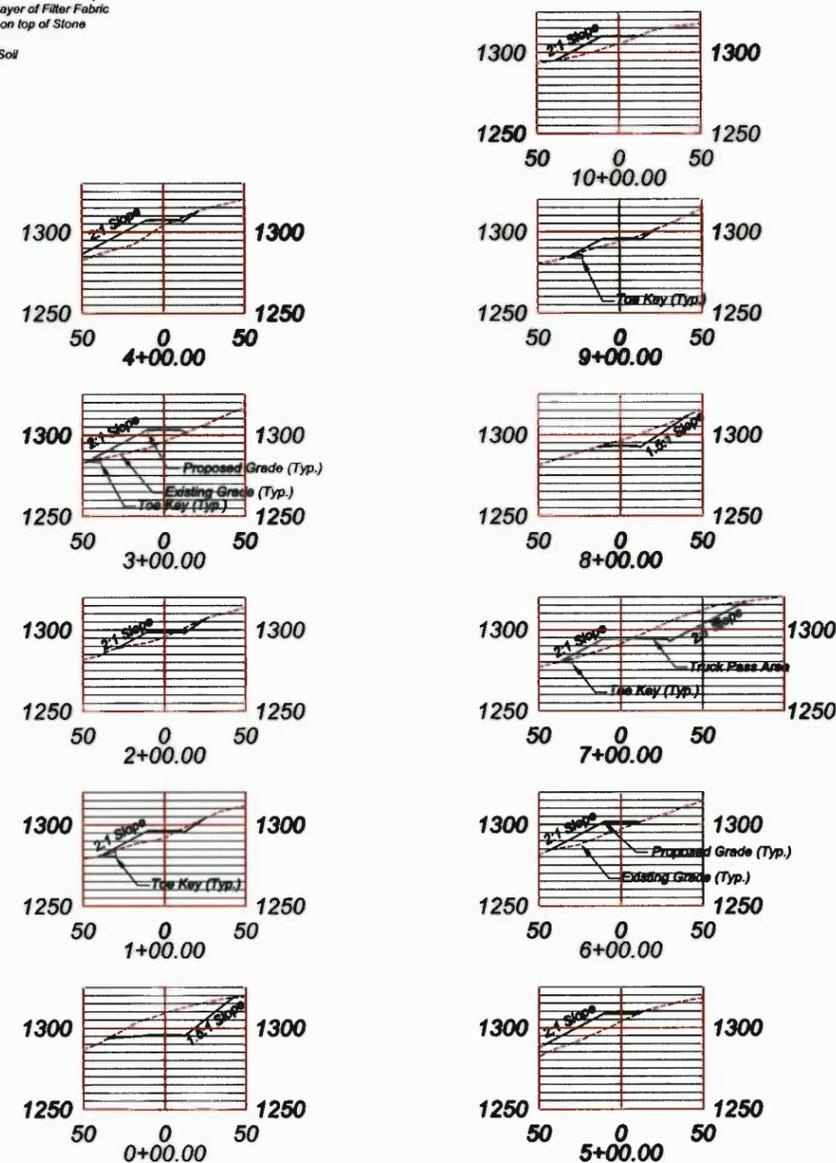
ACCESS ROAD A & B CROSS SECTIONS



ACCESS ROAD A



ACCESS ROAD B



CROSS SECTIONS
Horizontal & Vertical Scale: 1" = 50'



DATE	REVISIONS
4/12/13	Updated Per New Antero Standards



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APPALACHIAN CORP

ACCESS ROAD A & B CROSS SECTIONS
LEONARD PAD
GREENBRIER DISTRICT
DODDRIDGE COUNTY, WV

Date: 7/25/12

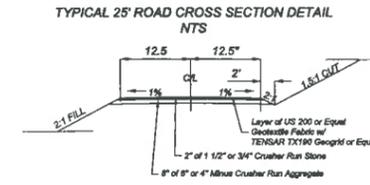
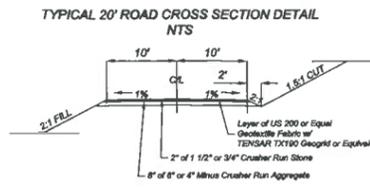
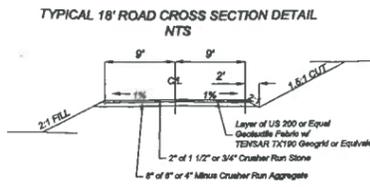
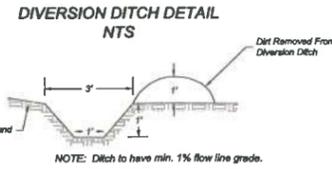
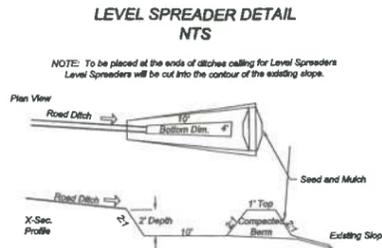
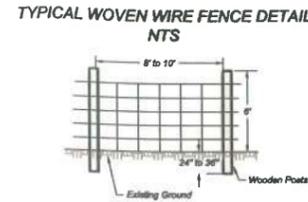
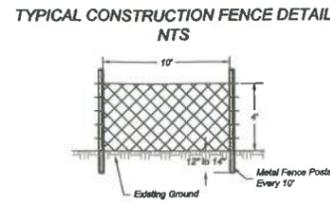
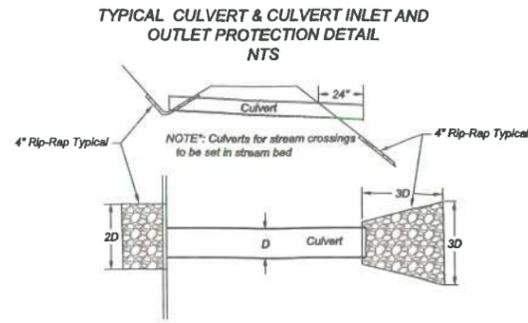
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Designed By: CKW/CKM

File No. Antero 110-12

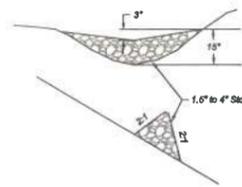
Page 13 of 15

DETAILS

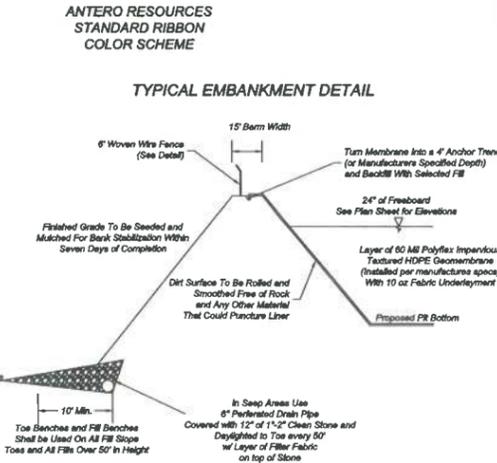
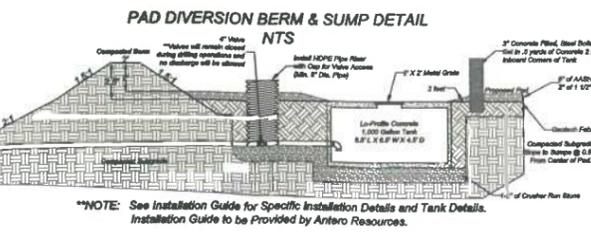
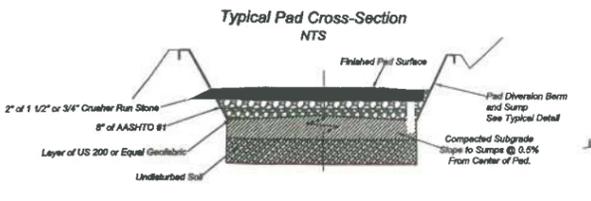
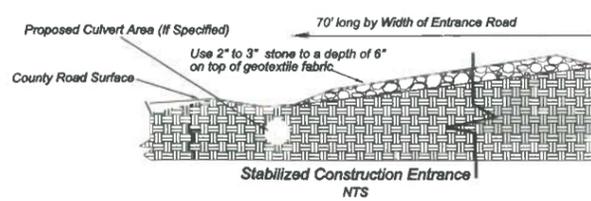
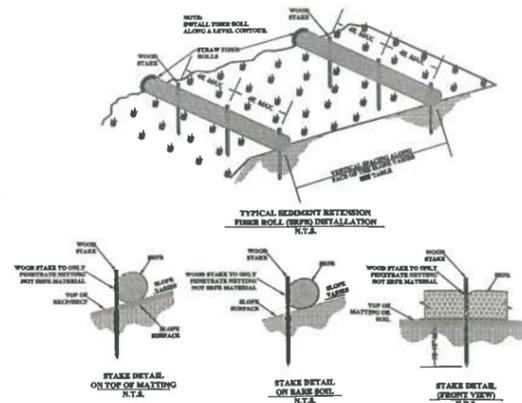


- COVER SLOPES WITH AVAILABLE TOP SOIL.
- PREP SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF FERTILIZER, LIME, AND SEED, WHEN NECESSARY.
- BEGIN AT THE TOP OF THE SLOPE BY SECURING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
- ROLL THE BLANKETS
 - DOWN OR
 - HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE.
- ALL BLANKETS MUST BE FASTENED TO SOIL SURFACE IN A SECURE MANNER BY PLACING STAPLES/STAKES IN LOCATIONS AS SHOWN IN THE PATTERN GUIDE.
- THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2'-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM POSITION, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET. FOLLOW MANUFACTURER'S RECOMMENDATIONS.
- SUCCESSIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
- IF SOIL CONDITIONS ARE LOOSE, STAKED OR STAPLED LENGTHS GREATER THAN 6" MAY BE NECESSARY TO SECURE THE BLANKETS PROPERLY.

**DITCH CHECK DAM DETAIL
SPACING AS INDICATED ON PROFILES
NTS**

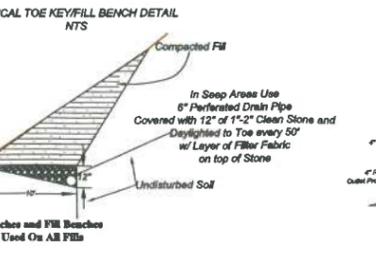
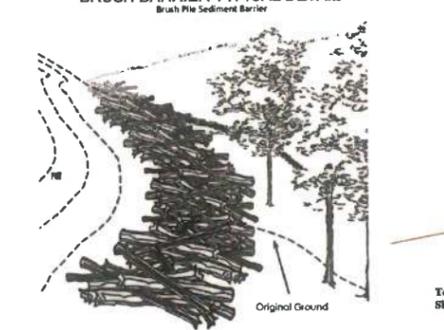
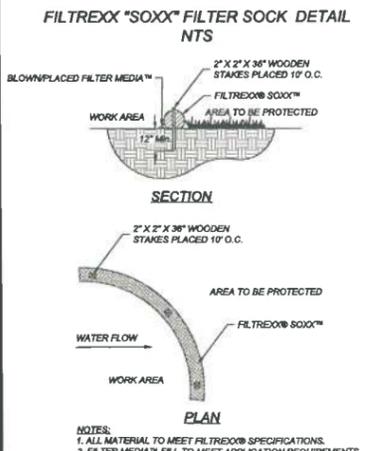
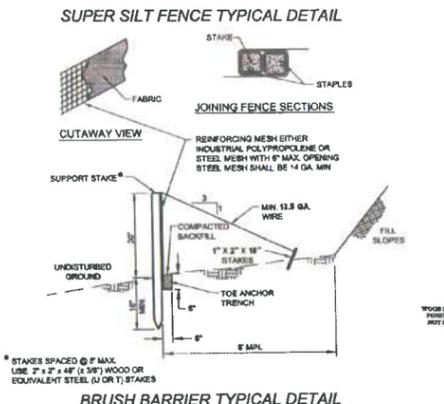
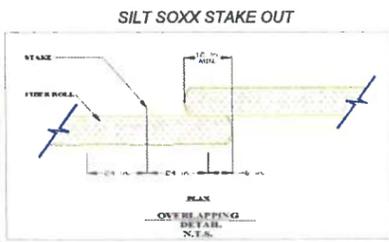


**STRAW WATTLE SEDIMENT RETENTION
FIBER ROLL (SRFR) INSTALLATION**



DATE	REVISIONS
2/21/13	Updated Sump Detail
4/12/13	Updated Per New Antero Standards

	Yellow Ribbon: Yellow Ribbon used to indicate top of Cuts (C) Cut to be determined at time of subsoil Slope determined by site design
	Yellow and Orange Ribbon: Yellow and Orange Ribbon used to indicate Grade at Top of Pad/Pond/Pit
	Orange Ribbon: Orange Ribbon used to indicate toes of Fills (F) Fill to be determined at time of subsoil Slope determined by site design
	Pink Ribbon: Pink Ribbon used to indicate Top Hole Location Pink Ribbon used to indicate Survey Control Location
	Pink & Black Stripes Ribbon: Pink & Black Stripes Ribbon used to indicate Vertical Cut (VC) at Pad/Pond/Pit corner or edge Pink & Black Stripes Ribbon used to indicate Vertical Fill (VF) at Pad/Pond/Pit corner or edge Vertical Cut/Vertical Fill to be determined at time of subsoil
	Blue & White Stripes Ribbon: Blue & White Stripes Ribbon used to indicate clearing limits/construction limits
	Orange & Black Stripes Ribbon: Orange & Black Stripes Ribbon used to indicate Vertical Cut (VC) at Centerline or edge of access road Orange & Black Stripes Ribbon used to indicate Vertical Fill (VF) at centerline or edge of access road
	Pink & White Stripes Ribbon: Pink & White Stripes Ribbon used to indicate Erosion and Sediment Control Structures Silt Fence (SF), Reinforced Filter Fence (RFF), Super Silt Fence (SSF), Filter Sock (FS)
	Orange & White Stripes Ribbon: Orange & White Stripes Ribbon used to indicate Topsoil Stockpile Locations
	Blue Ribbon: Blue Ribbon used to indicate Construction (C) Ditch Blue Ribbon used to indicate Bottom (BTM) Sediment Traps



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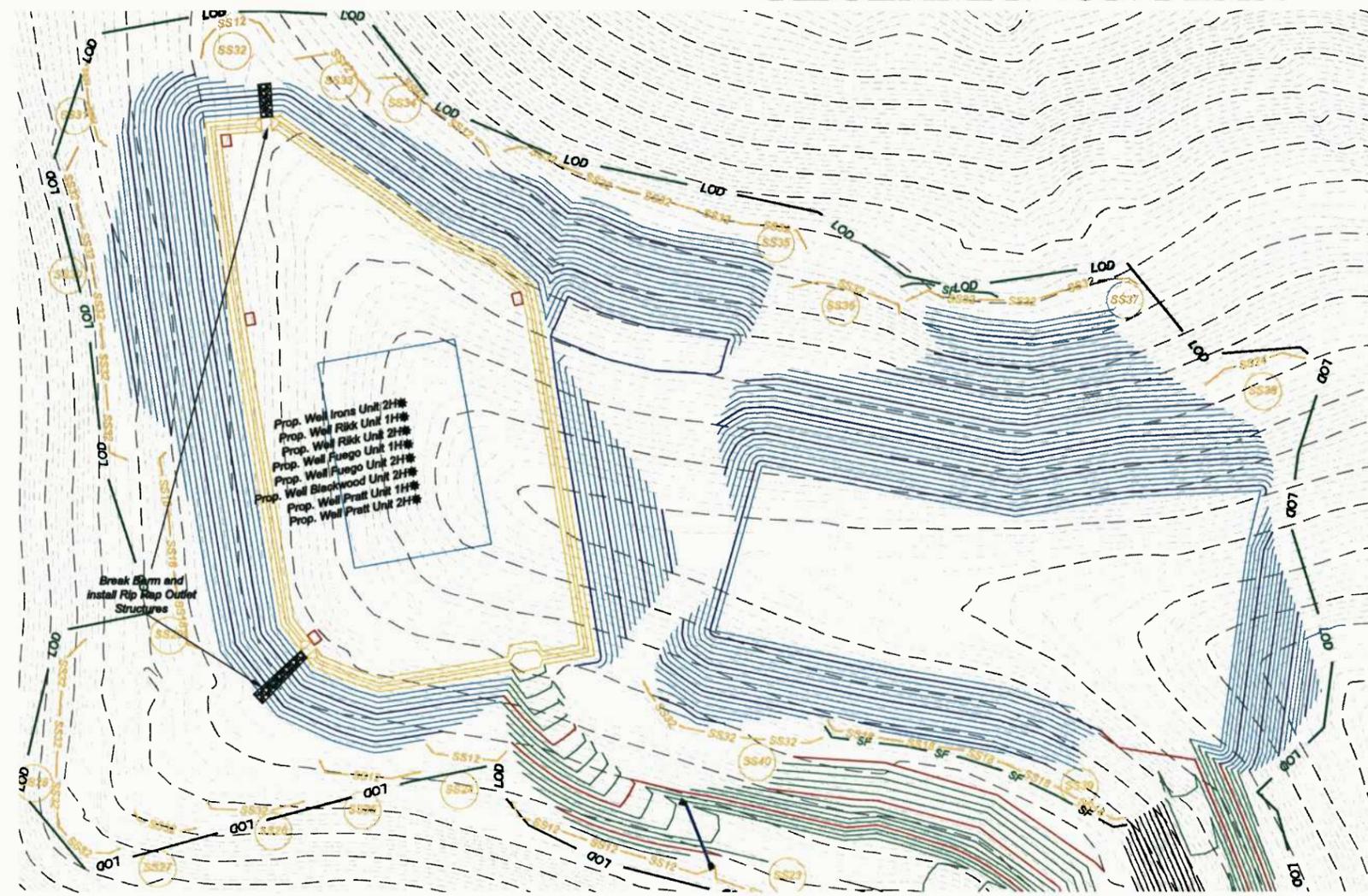
ANTERO RESOURCES
THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

LEONARD PAD
GREENER DISTRICT
DODDRIDGE COUNTY, WV

DETAILS

Date: 7/25/12
Scale: N/A
Designed By: CKW/CKM
File No. Antero 110-12
Page 14 of 15

RECLAMATION PLAN



Prop. Well Irons Unit 2H#
 Prop. Well Rock Unit 1H#
 Prop. Well Fuego Unit 2H#
 Prop. Well Fuego Unit 1H#
 Prop. Well Blackwood Unit 2H#
 Prop. Well Blackwood Unit 1H#
 Prop. Well Pratt Unit 2H#

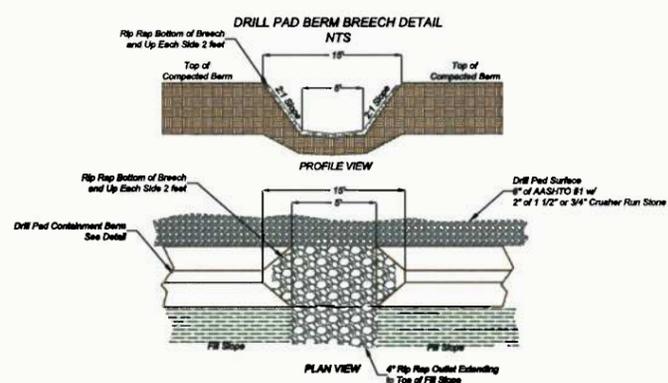
Break Berm and
 install Rip Rap Outlet
 Structures

RECLAMATION CONSTRUCTION SPECIFICATIONS:

1. THE IMPOUNDMENT SHALL BE RECLAIMED TO LANDOWNERS SPECIFICATIONS OR AS NEAR TO ORIGINAL PRE-DISTURBED GRADES AS POSSIBLE. THE LINER SHALL BE REMOVED AND DISPOSED APPROPRIATELY OR RECYCLED.
2. EROSION AND SEDIMENT CONTROLS SHALL BE REPAIRED/RE-ESTABLISHED PRIOR TO RECLAMATION WORK COMMENCEMENT.
3. THE CONTRACTOR SHALL HAVE ON SITE AT ALL TIMES WHEN CONSTRUCTION IS IN PROGRESS A COMPETENT SUPERINTENDENT THOROUGHLY FAMILIAR WITH THE CONSTRUCTION OF EARTH BERMS AND EMBANKMENTS, THE COMPACTION OF SOILS AND PLACEMENTS OF LINERS.
4. SURFACE WATER SHALL BE DIVERTED AWAY FROM ALL EXCAVATIONS TO PREVENT FLOODING AND SOFTENING OF THE SUB GRADE OR COMPACTED MATERIALS.
5. TOP SOIL SHALL BE STRIPPED AND STOCKPILED WITH APPROPRIATE STABILIZATION AND SILT FENCE TO PREVENT EROSION. THE TOP SOIL SHALL BE REUSED DURING THE RECLAMATION PROCESS OR ON THE FACE OF THE IMPOUNDMENT PRIOR TO SEEDING.
6. TOE CUTS OF 10' MINIMUM WIDE SHALL BE EXCAVATED ON ALL RECEIVING SLOPES TO PROVIDE A BASE FOR THE IMPOUNDMENT BERM. ADDITIONAL TERRACING SHALL BE CONSTRUCTED FOR EACH ADDITIONAL FIFTY (50) VERTICAL FEET OF SLOPE AND SHALL BE A MINIMUM OF TEN (10) FEET WIDE.
7. PRIOR TO PLACING ANY FILL, THE EXPOSED SUB GRADE SHALL BE COMPACTED AND PROOF ROLLED TO PRODUCE A STABLE AND UNYIELDING SITE.
8. ALL FILL SHALL BE PLACED IN LIFTS OF UP TO 18" AND SHALL BE COMPACTED TO 90% OF THE STANDARD PROCTOR DENSITY OF THE SOIL PER ASTM D-494. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 2% OF THE OPTIMUM TO FACILITATE COMPACTION. THE CONTRACTOR SHALL DO IN PLACE DENSITY TESTS. EVERY LIFT OF SOIL, AND SHALL BE DONE IN TWO RANDOM PLACES ON EACH STRAIGHT SIDE OF THE IMPOUNDMENT BERM. RECORDS SHALL BE MAINTAINED OF TEST LOCATION AND RESULTS AND PROVIDED TO THE ENGINEER ON REQUEST. AREAS THAT FAIL FOR COMPACTION SHALL BE REMOVED, RE-COMPACTED AND RETESTED FOR COMPLIANCE. IN LIEU OF MODIFIED PROCTOR TESTING, THE CONTRACTOR MAY PROOF-ROLL THE SOIL EVERY 12" OF SOIL LIFT WITH A LOADED 18 TON TANDUM DUMP TRUCK. SOIL THAT DEFLECTS UNDER THE REAR WHEELS GREATER THAN 1/2" SHALL BE REMOVED, RE-COMPACTED AND RETESTED. COMPACTION OF SOIL SHALL BE DONE WITH A 5 TON SHEEPS FOOT, OR VIBRATORY ROLLER.
9. TOP SOIL SHALL BE PLACED ON THE FINAL SURFACE AND TRACKED IN WITH DOZERS ONLY WITH FERTILIZED, LIMED, SEEDED AND MULCHED AT RATES ESTABLISHED ON SHEET 3 OF THESE PLANS. THE SITE SHALL BE MAINTAINED AND MANAGED TO ESTABLISH A UNIFORM TURF UNTIL 70% OF THE AREA IS ESTABLISHED. AFTER FINAL INSPECTION, ALL ERS CONTROLS SHALL BE REMOVED AND ANY DISTURBED AREAS RESEEDED AND MULCHED.
10. MAINTENANCE AND OTHER CONSIDERATIONS AND GROUND WATER PROTECTION: ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH RAINFALL OF 0.5 INCHES OR MORE. THEY WILL BE INSPECTED FOR UNDERMINING, DETERIORATION, EROSION AND EXCESS DEPOSITED MATERIAL. ALL DEFICIENCIES WILL BE CORRECTED IMMEDIATELY. EXCESS MATERIAL WILL BE SPREAD ON THE SITE IN A MANNER WHERE IT IS NOT LIKELY TO ERODE IN THE FUTURE. CLEANING PROCEDURES WILL BE COMPLETED AT REGULAR INTERVALS AND AT LEAST WHEN SEDIMENT REACHES CLEAN OUT LEVELS SHOWN. RECORDS OF CLEANING AND CORRECTIONS WILL BE MAINTAINED BY THE CONTRACTOR. THE "GENERIC GROUNDWATER PROTECTION PLAN FOR CONSTRUCTION SITES" WILL BE USED AND AVAILABLE ON SITE AT ALL TIMES. AN AREA WILL BE PROVIDED FOR VEHICLE AND EQUIPMENT MAINTENANCE. MOBILE FUEL TRUCKS WITH APPROVED TANKS WILL BE USED ON THIS SITE. PORTABLE SANITARY FACILITIES WILL BE AVAILABLE FOR EMPLOYEES. IF CONCRETE IS USED, EXCESS CONCRETE WILL BE DISPOSED OF PROPERLY AND NOT ALLOWED TO REMAIN ON THIS SITE. MACHINERY WILL NOT BE ALLOWED IN LIVE STREAMS. FLUIDS SUCH AS DIESEL FUEL, GAS, OIL OR ANTIFREEZE WILL BE KEPT IN PROPER CONTAINERS AND ANY SPILLAGE WILL BE CLEANED AND TAKEN OFF SITE TO A PROPER FACILITY. SOLID OR HAZARDOUS WASTES WILL BE DISPOSED IN ACCORDANCE WITH APPROPRIATE STATE AND FEDERAL REGULATIONS. IT IS THE CONTRACTORS RESPONSIBILITY TO MAKE CHANGES AND NOTIFY WVDOP OF ANY CHANGES TO GPP. A FINAL INSPECTION WILL BE MADE AT THE CONCLUSION OF THE PROJECT AND ALL CORRECTIONS MADE BEFORE SIGN-OFF OF THE PROJECT SITE.
11. SEQUENCE OF EVENTS:
 - A. A PRE-CONSTRUCTION CONFERENCE WILL BE HELD ON SITE WITH CONTRACTOR TO REVIEW THE CONSTRUCTION DRAWINGS AND PROVIDE ANY REQUESTED GUIDANCE.
 - B. CONSTRUCT THE CONSTRUCTION ENTRANCE.
 - C. CONSTRUCT ALL PROPOSED SEDIMENT CONTROL DEVICES AS SHOWN.
 - D. REMOVE TOPSOIL AND PLACE AT AN AREA DETERMINED IN THE FIELD WHERE EROSION WILL NOT TAKE PLACE. SILT FENCE SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES.
 - E. GRADING OPERATIONS AS REQUIRED. FILL SLOPES SHALL BE TOPSOILED.
 - G. WHEN FINAL GRADE IS ACHIEVED, TOPSOIL TO BE PLACED ON ALL DISTURBED AREAS NOT LINED. SEED ALL DISTURBED AREAS AS REQUIRED. A SOIL SAMPLE SHOULD BE TAKEN AND TESTED TO DETERMINE RECOMMENDED RATES. IF NO SOIL SAMPLE IS TAKEN THE FOLLOWING RATES SHOULD BE APPLIED AS A MINIMUM: LIME AT A RATE OF 4 TONS PER ACRE, FERTILIZE AT A RATE OF 600 LBS. OF 10-20-10 PER ACRE. SEED WITH 46 LBS. PER ACRE OF TALL FESCUE AND 20 LBS. PER ACRE OF PERENNIAL RYE GRASS.
 - H. LIME, FERTILIZER, AND SEED WILL BE APPLIED BY HAND OR USING A HYDRO-SEEDER. HYDRO-MULCH PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 - I. FINAL SEEDING MUST OCCUR WITHIN 7 DAYS OF FINAL GRADING.
 - J. WHEN SITE IS STABILIZED, ALL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND REPAIR/STABILIZE THOSE AREAS IN ACCORDANCE WITH STATE STANDARDS.
 - K. MAKE MODIFICATIONS FOR PERMANENT STORM WATER MANAGEMENT.
 - L. FINAL SITE INSPECTION.
12. PERMANENT STABILIZATION: ALL AREAS LEFT UNCOVERED BY EITHER BUILDINGS OR PAVEMENT SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING AND WITHIN 7 DAYS. AT NO TIME SHALL LAND LAY DORMANT FOR LONGER THAN 21 DAYS.

*NOTE: No Additional Grading is Needed for Reclamation

*NOTE: An additional 20 tons of 4" Rip Rap is required for pad outlet structures.



Legend			
--- 1336 ---	Existing 2' Contour	—●—	Proposed Check Dam
--- 1000 ---	Existing 10' Contour	—○—	Proposed Culvert W/ Inlet & Outlet Protection
—●—	Existing Tree Line	—SW—	Proposed Straw Wattles
—E—E—	Existing Utility Line / Pole	—SSXX—	Proposed Silt Soxx w/ Diameter
—GAS—	Surface Owner Property Line	—1000—	Proposed 2' Contour
—CL—	Existing Gas Line CL	—1000—	Proposed 10' Contour
—LOD—	Limits of Disturbance	—●—	Proposed Rip-Rap
—D—	Proposed Diversion Ditch	—●—	* Silt Soxx Diameter in Inches
—2'—	Proposed 2' Contour	—●—	* Super Silt Fence Can be Substituted for Silt Soxx of any Size
—10'—	Proposed 10' Contour		
—SF—	Proposed Super Silt Fence		

DATE	REVISIONS	Date: 7/25/12
8/9/12	Well Layout Changes	Scale: 1" = 50'
2/21/13	Reclamation Note Addition per WVDEP Comments	Designed By: CKW/CKM
4/12/13	Updated Per New Antero Standards	File No. Antero 110-12
6/11/12	Well Layout Changes	Page 15 of 15



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 PREPARED FOR
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 APPALACHIAN CORP

RECLAMATION PLAN
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 GREENBRIER DISTRICT
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