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 04, 2015

WELL WORK PERMIT

Vertical Well

This permit, API Well Number: 47-3305868, issued to ANTERO RESOURCES 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: SPERRY DEEP 1
Farm Name: SPERRY, CLARENCE E.
API Well Number: 47-3305868
Permit Type: Vertical Well
Date Issued: 06/04/2015

Promoting a healthy environment.

06/05/2015

3305868

PERMIT CONDITIONS

West Virginia Code §22-6-11 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 §22-6-20, 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. Pursuant to 35 CSR 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.

3. Pursuant to 35 CSR 4-19.1.c, if the operator is unable to sample and analyze any water well or spring with one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.

4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

5. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.

6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours

7. Well work activities shall not constitute a hazard to the safety of persons.

8. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

06/05/2015

3305868

west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street, SE Charleston, WV 25304
(304)926-0499, Ext 1656

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

May 15, 2015

Department of Environmental Protection
Office of Oil and Gas
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-033-05868

COMPANY: Antero Resources Corporation

FARM: Sperry Deep #1

COUNTY Harrison DISTRICT: Union QUAD: West Milford

The application for the above company is **approved to drill to Helderberg (with Oriskany completion).**

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners; n/a

2. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells, well name, and the name and address of the operator; none

3. Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest **lease line** or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Cindy Raines

Cindy Raines
Executive Assistant

06/05/2015

3305868

WW-2A
(Rev. 6-14)

1). Date: April 16, 2015

2.) Operator's Well Number Sperry Deep #1

3.) API Well No.: State 47- County 033 - Permit

CK# 88019
$650.00

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE AND APPLICATION FOR A WELL WORK PERMIT

4) Surface Owner(s) to be served:
(a) Name PLEASE SEE ATTACHMENT
Address

(b) Name
Address

(c) Name
Address

6) Inspector Sam Ward
Address 601 57th Street, SE
Charleston, WV 25304
Telephone 304-389-7583

5) (a) Coal Operator
Name PLEASE SEE ATTACHMENT
Address

(b) Coal Owner(s) with Declaration
Name PLEASE SEE ATTACHMENT
Address

Name
Address

(c) Coal Lessee with Declaration
Name
Address

Received
APR 20 2015
Office of Oil and Gas
WV Dept. of Environmental Protection

TO THE PERSONS NAMED ABOVE TAKE NOTICE THAT:

___ Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas

OR

X Included is the information required by Chapter 22, Article 6, Section 8(d) of the Code of West Virginia (see page 2)

I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through ___ on the above named parties by:

___ Personal Service (Affidavit attached)
X Certified Mail (Postmarked postal receipt attached)
___ Publication (Notice of Publication attached)

I have read and understand Chapter 22-6 and 35 CSR 4, and I agree to the terms and conditions of any permit issued under this application.

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, 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 and imprisonment.

MEGAN DARLING
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028112
MY COMMISSION EXPIRES JULY 17, 2018

Well Operator Antero Resources Corporation
By: Mark Mauz
Its: Vice President - Gathering, Marketing & Transportation
Address: 1615 Wynkoop Street
Denver, CO 80202
Telephone: 303-357-7310
Email:

Subscribed and sworn before me this 16th day of April, 2015

Megan C. Darling
Notary Public

My Commission Expires July 17, 2018

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at deprivacyofficer@wv.gov

06/05/2015

3305868

WW-2A Notice of Application Attachment:

Surface Owners:

Owner: Clarence E. Sperry, Janet L. Sperry & L. Diane Sperry
Address: 169 Keyes Avenue
Philippi, WV 26416

Owner: Josephine H. Sperry
Address: 169 Keyes Avenue
Philippi, WV 26416

Coal Operators & Owners:

Operator: Consolidation Coal Company
Consol Energy, Inc.
CNX Center
Engineering & Operations Support – Coal
Attn: Analyst
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

Owner: International Coal Group, Inc.
c/o Corporation Service Company
Address: 63 Corporate Centre Drive
Scott Depot, WV 25560

Owner: Anker West Virginia Mining Co., Inc.
Wolf Run Mining Company
c/o Corporation Service Company
Address: 99 Edmiston Way
Buckhannon, WV 26201

Owner: Anker Energy Corporation
Hunter Ridge Coal Company
c/o Corporation Service Company
Address: 2708 Cranberry Square
Morgantown, WV 26508

Owner: Patriot Mining Company
Hunter Ridge Coal Company
c/o Corporation Service Company
Address: 2708 Cranberry Square
Morgantown, WV 26508

Operator: Sycamore Valley Coal Company
Address: 721 Goff Building
Clarksburg, WV 26301

Operator: Summit Energy Group, LLC
Address: 1543 Fairmont Avenue
Fairmont, WV 26554

Operator: Fairfax Mining Company
Address: 1723 Grant Building
Pittsburg, PA 15219

Note: One water source owner was identified, but they are located greater than 1000 feet from the subject pad location.

06/05/2015

3305868

WW-2A1
(Rev. 1/11)

Operator's Well Number Sperry Deep #1

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

(1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;

(2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
AA. Post, et ex Lease 052934			
A.A. Post, et ux	Reserve Gas Company	Flat Rate	0193/0437
Reserve Gas Company	Hope Natural Gas Company	Merger	AOI 0037/0350
Hope Natural Gas Company	Consolidated Gas Supply Corporation	Confirmatory Deed	0903/0179
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Agreement	1136/0250
Consolidated Gas Transmission Corporation	CNG Transmission Corporation	Merger	AOI 0051/0795
CNG Transmission Corporation	Dominion Transmission, Inc.	Merger	AOI 0058/0362
Dominion Transmission, Inc., Dominion E&P, Inc. & DAD, LLC	Antero Resources Appalachian Corporation	Assignment	1423/1068
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

Acknowledgement of Possible Permitting/Approval In Addition to the Office of Oil and Gas

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources
- WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

Received

APR 20 2015

Office of Oil and Gas
WV Dept. of Environmental Protection

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation
By: Its: Mark Mauz, Vice President - Gathering, Marketing & Transportation

06/05/2015

3305868

FORM WW-2A1
EXHIBIT 1

RECEIVED
Office of Oil and Gas
APR 20 2015
WV Department of
Environmental Protection

FILED
JUN 10 2013
IN THE OFFICE OF
SECRETARY OF STATE

Natalie E. Tennant
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-K
Charleston, WV 25305

FILE ONE ORIGINAL
(Two if you want a filed stamped copy returned to you)
FEE: $25.00

APPLICATION FOR AMENDED CERTIFICATE OF AUTHORITY

Penney Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvsos.com
E-mail: business@wvsos.com

Office Hours: Monday – Friday
8:30 a.m. – 5:00 p.m. ET

**** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby **** applies for an Amended Certificate of Authority and submits the following statement:

1. Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation

2. Date Certificate of Authority was issued in West Virginia: 6/25/2008

3. Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)

4. Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)

5. Other amendments:
(attach additional pages if necessary)

6. Name and phone number of contact person. (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

Alvyn A. Schopp — (303) 357-7310
Contact Name — Phone Number

7. Signature information (See below *Important Legal Notice Regarding Signature):

Print Name of Signer: Alvyn A. Schopp — Title/Capacity: Authorized Person

Signature: [signature] — Date: June 10, 2013

*Important Legal Notice Regarding Signature: Per West Virginia Code §31D-1-129, Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

06/05/2015

3305868

WW-2B1
(5-12)

Well No. Sperry Deep #1

West Virginia Department of Environmental Protection
Office of Oil and Gas

NOTICE TO SURFACE OWNERS

The well operator named below is preparing to file for a permit from the state to drill a new well. Before a well work permit can be filed with the Chief of the Office of Oil and Gas, the well operator is required to have given notice of the right to request water well or spring analytical testing. This notice shall be given to the owners or occupants of land which have a water well or spring being utilized for human consumption, domestic animals, or other general use and which is located within 1000 feet of the proposed well site.

With this form, the operator is giving you notice of your right to request analytical testing. The operator is required to sample and analyze the water wells or springs of all owners or occupants who request it. Therefore, if you wish to have your water well or spring tested, contact the operator named below.

All sampling shall be completed prior to drilling. Within thirty (30) days of the receipt of such sample analyses the operator shall submit the results to the Chief of the Office of Oil and Gas and to the owners or occupants who may have requested them.

Be advised, you have the right to sample and analyze any water supply at your own expense.

Listed below is the laboratory chosen by operator to perform analysis, and contactor chosen to collect sample.

Certified Laboratory Name: Pace Analytical
Sampling Contractor: Conestoga-Rovers & Associates

Well Operator: Antero Resources Corporation
Address: 1615 Wynkoop Street
Denver, CO 80212
Telephone:

FOR OPERATOR'S USE ONLY: Below, or on an attached page, list those persons which were given this notice. Place an asterisk beside the one(s) that contacted you and requested sampling and analyses. If there were no requests made, indicate by underling which one you have selected to sample and analyze. If there are no water wells or springs within 1000 feet of the proposed site, the Chief may require the operator to test wells up to 2000 feet from the proposed site.

No water sources are identified within 1,000' of this well site, however please be advised that Antero Resources Corporation will attempt sampling of the water source identified on the surface owner's property listed below.
Clarence E. Sperry, Janet L. Sperry & L. Diane Sperry 169 Keyes Avenue, Philippi, WV 26426

06/05/2015

33-05868

WW - 2B
(Rev. 8/10)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Corporation	494507062	033 - Harrison	Union	West Milford
	Operator ID	County	District	Quadrangle

2) Operator's Well Number: Sperry Deep #1 3) Elevation: 1168'

4) Well Type: (a) Oil _____ or Gas X

(b) If Gas: Production X / Underground Storage _____

Deep X / Shallow _____

5) Proposed Target Formation(s): Huntersville & Oriskany Proposed Target Depth: 7000' & 7300'

6) Proposed Total Depth: 7800' TVD Feet Formation at Proposed Total Depth: Helderberg Limestone

7) Approximate fresh water strata depths: 80' (Isaac Unit 1H API# 47-033 located on the same pad)

8) Approximate salt water depths: 2101'

9) Approximate coal seam depths: 107', 797', 857'

SDW 4/29/2015

10) Approximate void depths,(coal, Karst, other): None Anticipated

11) Does land contain coal seams tributary to active mine? No

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)

Drill, perforate, fracture a new vertical deep well and complete the Huntersville & Oriskany formations. (No formation below the Oriskany will be perforated or stimulated in any manner.) *CR

*Antero will be air drilling the fresh water string which makes it difficult to determine when freshwater is encountered, therefore we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

13) **CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS Size	Grade	Weight per ft	FOOTAGE INTERVALS For Drilling	Left in Well	CEMENT Fill -up (Cu. Ft.)
Conductor	20"	J-55	106.5#	40'	40'	46 Cu. Ft - CTS
Fresh Water	13-3/8"	H-40	48#	340'	340' *see #12	472 Cu. Ft. - CTS
Coal	9-5/8"	J-55	36#	2510'	2510'	1022 Cu. Ft. - CTS
Intermediate						
Production	5-1/2"	P-110	20#	7700'	7700'	1725 Cu Ft.
Tubing	2-7/8"	L-80	6.5#	6900'		
Liners						

Packers: Kind: N/A

Sizes: N/A

Depths Set N/A

06/05/2015

3305868

WW-9
(5/13)

Page _____ of _____

API Number 47 - 033 - _____

Operator's Well No. Sperry Deep #1

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062

Watershed (HUC 10) Middle Wset Fork River Quadrangle West Milford

Elevation 1168' County Harrison District Union

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

Will a pit be used for drill cuttings? Yes _____ No X

If so, please describe anticipated pit waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be tanked and hauled off site.)

Will a synthetic liner be used in the pit? Yes _____ No X If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:

SDW
4/29/2015

_____ 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 (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98)
_____ Other (Explain _____

Will closed loop system be used? Yes

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Stiff Foam, Production - Water Based Mud

-If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Stored in tanks, removed offsite and taken to landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) 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 _____

Company Official (Typed Name) Evan Foster

Company Official Title Environmental Representative - Water Quality

MEGAN DARLING
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028112
MY COMMISSION EXPIRES JULY 17, 2018

Subscribed and sworn before me this 16th day of April, 2015

Megan C. Darling Notary Public

My commission expires July 17, 2018

06/05/2015

3305868

Form WW-9

Operator's Well No. Sperry Deep #1

Existing Access Road (0.52) + Existing Well Pad (1.75) + Reclaimed Pit (2.22) + Existing E&S Controls (1.43) = 5.92 Existing Acres

Proposed Revegetation Treatment: Acres Disturbed 5.92 (Existing) 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

Area I		Area II	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Fox Tail/Grassy	40
		Perennial Rye	30
		Crown Vetch	20

*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: Sarl D Wood II

Comments: Existing Location. Upgrade E+S as needed per WV DEP E+S Manual.

Title: OOG Inspector Date: 4/29/2015

Field Reviewed? ( ) Yes (X) No

06/05/2015

3305868

Form WW-9 Additives Attachment

SURFACE INTERVAL

1. Fresh Water
2. Soap –Foamer AC
3. Air

INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
2) 1 ppb Conqor 404 (11.76 ppg) / Corrosion Inhibitor
3) 4 ppb KLA-Gard (9.17 ppg) / Amine Acid Complex-Shale Stabilizer
4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
5) 12 ppb KCL / Potassium Chloride-inorganic Salt
6) Fresh Water 80 bbls
7) Air

PRODUCTION INTERVAL

1. Alpha 1655
   Salt Inhibitor
2. Mil-Carb
   Calcium Carbonate
3. Cottonseed Hulls
   Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal
   Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol
   Amine Acid Complex – Shale Stabilizer
6. Xan-Plex
   Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)
   Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill
   Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda
   Sodium Hydroxide – Alkalinity Control
10. Mil-Lime
    Calcium Hydroxide – Lime
11. LD-9
    Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica
    Hydro-Biotite Mica – LCM

3305868

13. Escaid 110
    Drilling Fluild Solvent – Aliphatic Hydrocarbon
14. Ligco
    Highly Oxidized Leonardite – Filteration Control Agent
15. Super Sweep
    Polypropylene – Hole Cleaning Agent
16. Sulfatrol K
    Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous
    Inorganic Salt
18. D-D
    Drilling Detergent – Surfactant
19. Terra-Rate
    Organic Surfactant Blend
20. W.O. Defoam
    Alcohol-Based Defoamer
21. Perma-Lose HT
    Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D
    Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells
    Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite
    Natural Graphite – LCM
25. Mil Bar
    Barite – Weighting Agent
26. X-Cide 102
    Biocide
27. Soda Ash
    Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol
    Amine Acid complex – Shale Stabilizer
29. Sulfatrol
    Sulfonated Asphalt – Shale Control Additive
30. Xanvis
    Viscosifier For Water-Based Muds
31. Milstarch
    Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube
    Drilling Fluid Lubricant

3305868

Antero Resources Corp

APPALACHIAN BASIN

Sperry Deep #1

Harrison County

0 1,000

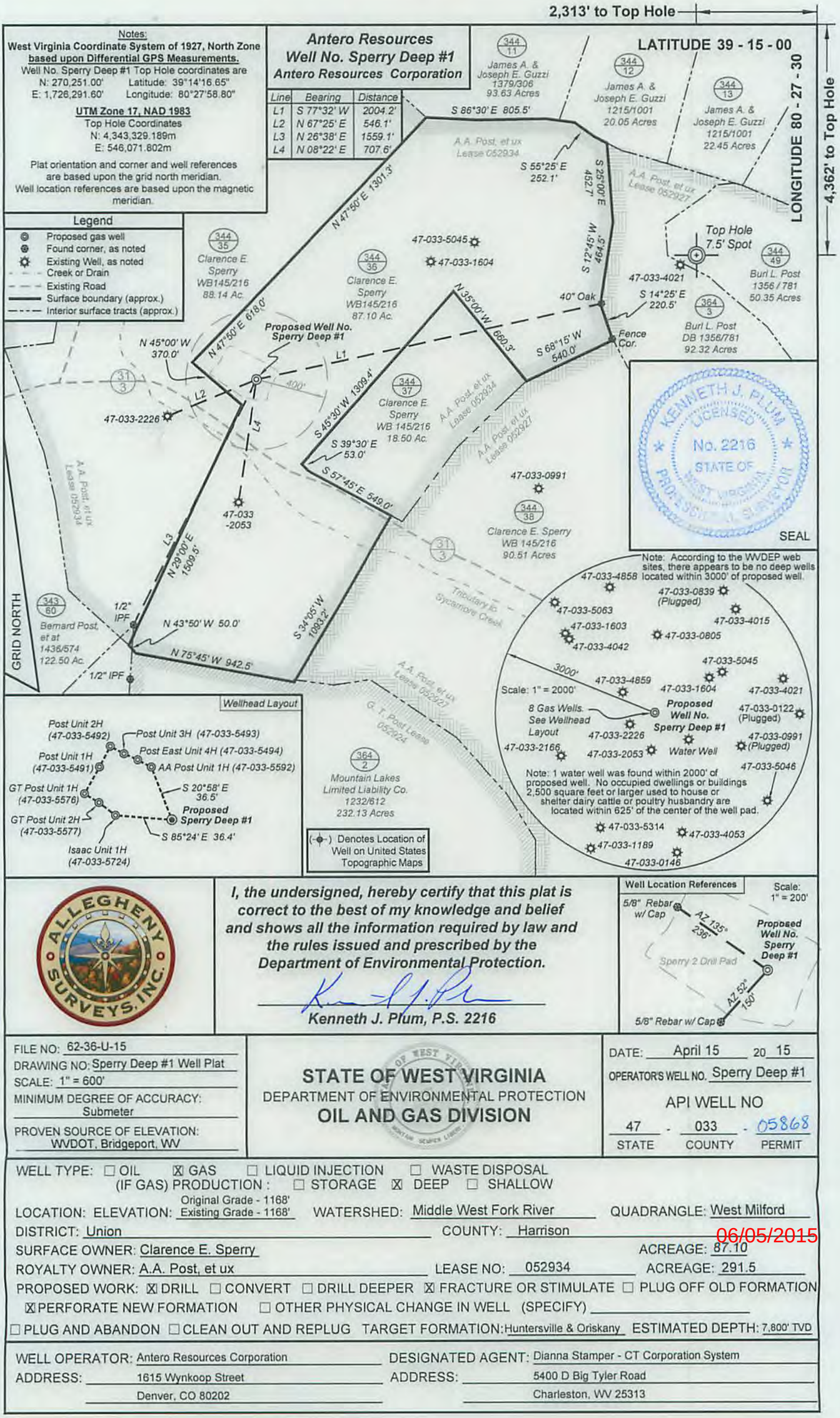
FEET

REMARKS

QUADRANGLE: WEST MILFORD
WATERSHED: WEST FORK
DISTRICT: UNION

By: ECM 06/05/2015

December 21, 2012



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 rules issued and prescribed by the Department of Environmental Protection.

Kenneth J. Plum, P.S. 2216

FILE NO: 62-36-U-15
DRAWING NO: Sperry Deep #1 Well Plat
SCALE: 1" = 600'
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: April 15 20 15
OPERATOR'S WELL NO. Sperry Deep #1
API WELL NO
47 - 033 - 05868
STATE COUNTY PERMIT

WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL
(IF GAS) PRODUCTION : ☐ STORAGE ☒ DEEP ☐ SHALLOW
LOCATION: ELEVATION: Original Grade - 1168' / Existing Grade - 1168' WATERSHED: Middle West Fork River QUADRANGLE: West Milford
DISTRICT: Union COUNTY: Harrison
SURFACE OWNER: Clarence E. Sperry ACREAGE: 87.10
ROYALTY OWNER: A.A. Post, et ux LEASE NO: 052934 ACREAGE: 291.5
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: Huntersville & Oriskany ESTIMATED DEPTH: 7,800' TVD

06/05/2015

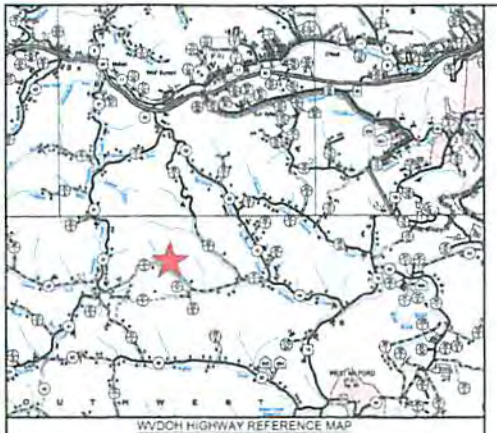
WELL OPERATOR: Antero Resources Corporation
ADDRESS: 1615 Wynkoop Street, Denver, CO 80202
DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 5400 D Big Tyler Road, Charleston, WV 25313

3305868

ANTERO RESOURCES
SPERRY 2
AS-BUILT FOR PROPOSED
DEEP VERTICAL WELL

UNION DISTRICT, HARRISON COUNTY, WEST VIRGINIA

WEST MILFORD 7.5 MINUTE QUAD MAP



WVDOH HIGHWAY REFERENCE MAP
1 inch = 1 mile

WV COUNTY REFERENCE MAP

GENERAL DESCRIPTION

AS-BUILT OF THE SPERRY 2 FOR PROPOSED DEEP VERTICAL WELL

PROJECT CONTACTS

OPERATOR:

ANTERO RESOURCES CORPORATION
535 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE: (304) 842-4100
FAX: (304) 842-4102
www.anteroresources.com

PROJECT COORDINATOR:

ROBERT WIRKS
535 WHITE OAKS BLVD.
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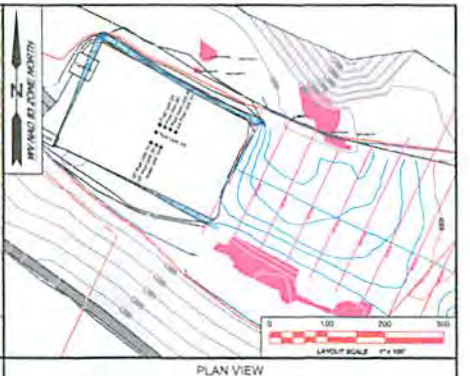
CELL: (304) 627-7405
FAX: (304) 842-4102
EMAIL: twirks@anteroresources.com

CONSTRUCTION COORDINATOR:

SHAWN BENNETT
535 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE: (304) 842-4100
CELL: (304) 641-0071
FAX: (304) 842-4102
EMAIL: sbennett@anteroresources.com

WEST MILFORD 7.5 MINUTE QUADRANGLE REFERENCE



PLAN VIEW

ENGINEER / SURVEYOR

KELLY SURVEYING PLLC.
P.O.BOX 254
DAILEY, WV 26259
PHONE: (304) 338-6985
FAX: (304) 304-338-6081

PROJECT MANAGER

JOHN P. SEE PE 8051
KENNETH KELLY PSSU 973
ZACK SUMMERFIELD EIT

SDW 4/29/2015

TOPOGRAPHIC INFORMATION:

THE TOPOGRAPHIC INFORMATION SHOWN HEREIN IS BASED ON AERIAL PHOTOGRAPHY BY BLUE MOUNTAIN AERIAL MAPPING, BURTON, WV

EXISTING DISTURBED ACREAGE	5.92 AC.

NO	INDEX TO SHEETS
COVER	COVER
1	SPERRY 2 AS-BUILT

Floodplain Conditions	
Do site construction activities take place in a floodplain:	NO
Permit needed from county floodplain coordinator:	NO
Flood Hazard Zone	X
HEC-RAS Study completed:	N/A
Floodplain shown on drawings:	N/A
FIRM Map Number(s) for site:	54033C0230D
Acreages of construction in floodplain:	N/A

MISS UTILITY OF WEST VIRGINIA 1-800-245-4848 — IT'S THE LAW
811 Know what's below. Call before you dig.

Kelly Surveying
P.O. Box 254
Dailey, WV 26259
(304)338-6985

REVISIONS | DATE

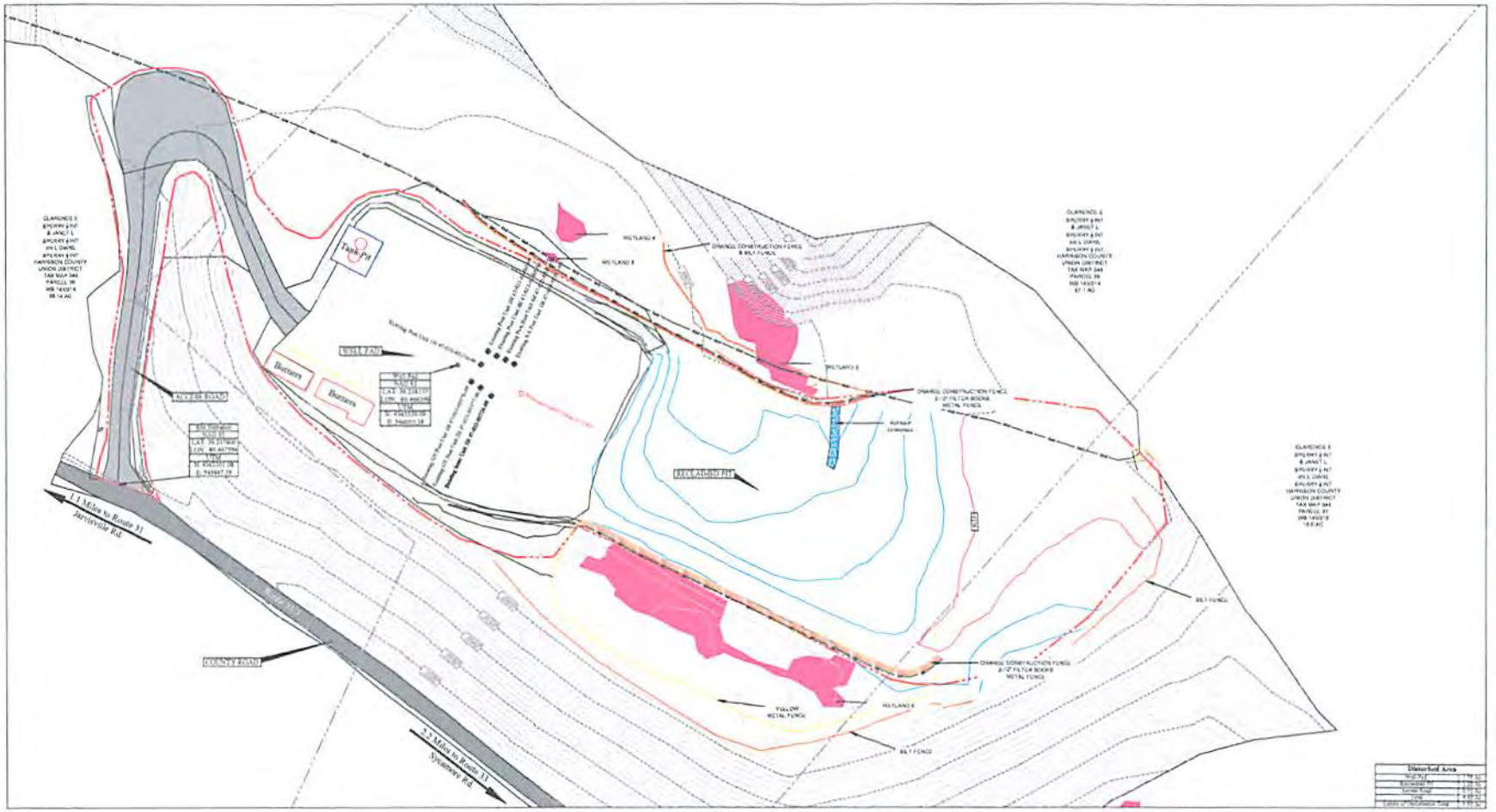
Antero Resources

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

COVER SHEET
SPERRY 2
AS-BUILT FOR PROPOSED
DEEP VERTICAL WELL
UNION DISTRICT,
HARRISON COUNTY, WEST VIRGINIA

Date: 04/13/2015
Scale: AS NOTED
Designed By: KK SW
File No.
Page: COVER

2305868



SPERRY 2 AS-BUILT FOR PROPOSED DEEP VERTICAL WELL

LEGEND EXISTING SITE CONDITIONS BASE MAPPING

LEGEND

NORTH

MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
West Virginia State Law Section 24-C requires that you call two business days before you dig in the state of West Virginia
IT'S THE LAW

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

NOTES:

Kelly Surveying
P.O. Box 324
Buckhannon, WV 26201
(304)338-0985

REVISIONS | DATE

Antero Resources

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

PLAN VIEW
SPERRY 2
AS-BUILT FOR PROPOSED
DEEP VERTICAL WELL
UNION DISTRICT,
HARRISON COUNTY, WEST VIRGINIA

Date: 04/13/2015
Scale: 1"=50'
Designed By: KK DC
File No.
Page: 1 of 1

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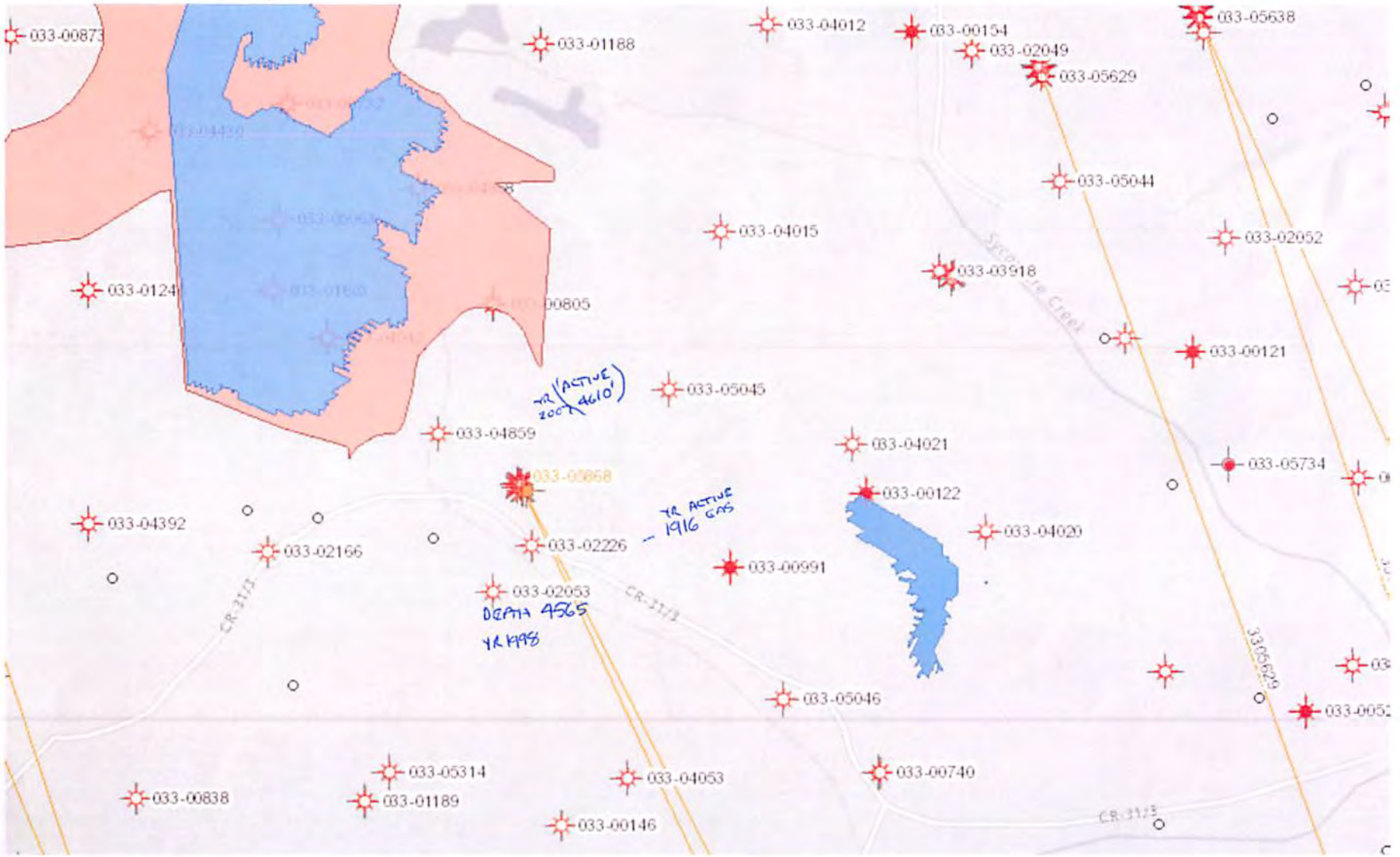
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YR (ACTIVE 2007 4610'
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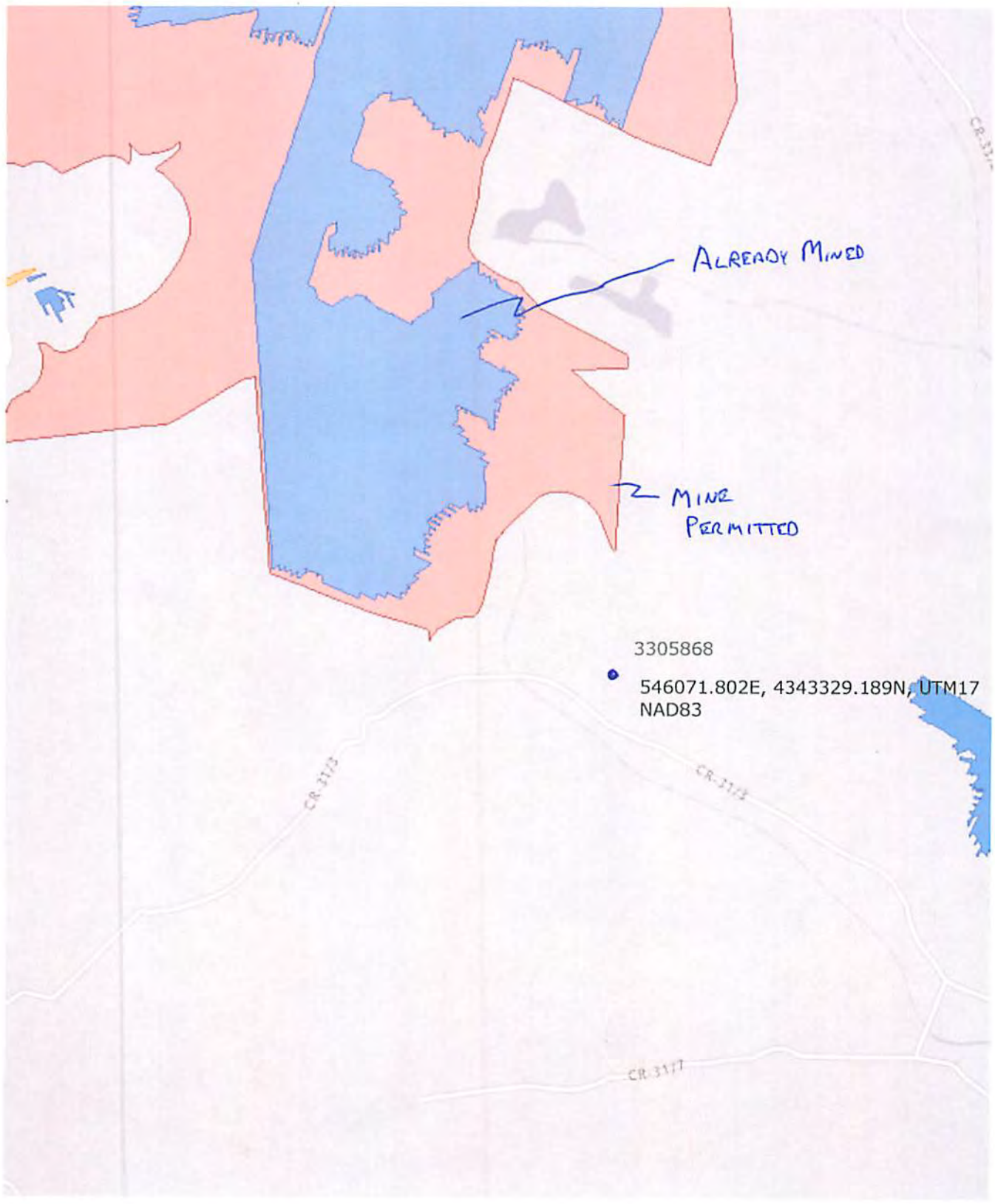


06/05/2015

3305868

911 ADDRESS
718 Jarvis Station Road
Salem, WV 26426

Well Site Safety Plan
Antero Resources

SDW
4/24/2015

Well Name: Sperry Deep #1 (Deep Well)

Pad Location: SPERRY 2 PAD
Harrison County/ Union District

GPS Coordinates: Lat 39°14'17.3"/Long -80°27'58.8" (NAD83)

Driving Directions:

From the intersection of US 50 W and Co Route 33 near the town of Wolf Summit head West on US 50 for 1 mile. Take the 1st left onto Co Route 31/ Jarvisville-Makin Rd and follow for 4.7 miles. Turn Left onto Co Route 31/3 for 423 feet. Turn Left to stay on Co Route 31/3 for 33 ft. Take the 1st right to stay on Co Route 31/3 for 1 mile, lease road will be on the right.

EMERGENCY (24 HOUR) CONTACT 1-800-878-1373

06/05/2015

3305868

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: _____

Plan Modification*

Revision No.	Description of Revision	Antero Preparer	Antero Reviewer/Approver	Agency Approval	Date

*The Office of Oil and Gas must approve all changes and modifications to previously approved plans.

WVDEP Site Safety Plan-- TABLE OF CONTENTS

WVDEP Site Safety Plan-- TABLE OF CONTENTS

Received

APR 20 2015

06/05/2015

WV Department of Environmental Protection

WVDEP Site Safety Plan-- TABLE OF CONTENTS

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 Local 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 304-842-4100. See Appendix F for a list of hazardous chemicals used during phases of operation.

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-2B.

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 etting 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.

Remote Controls

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 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

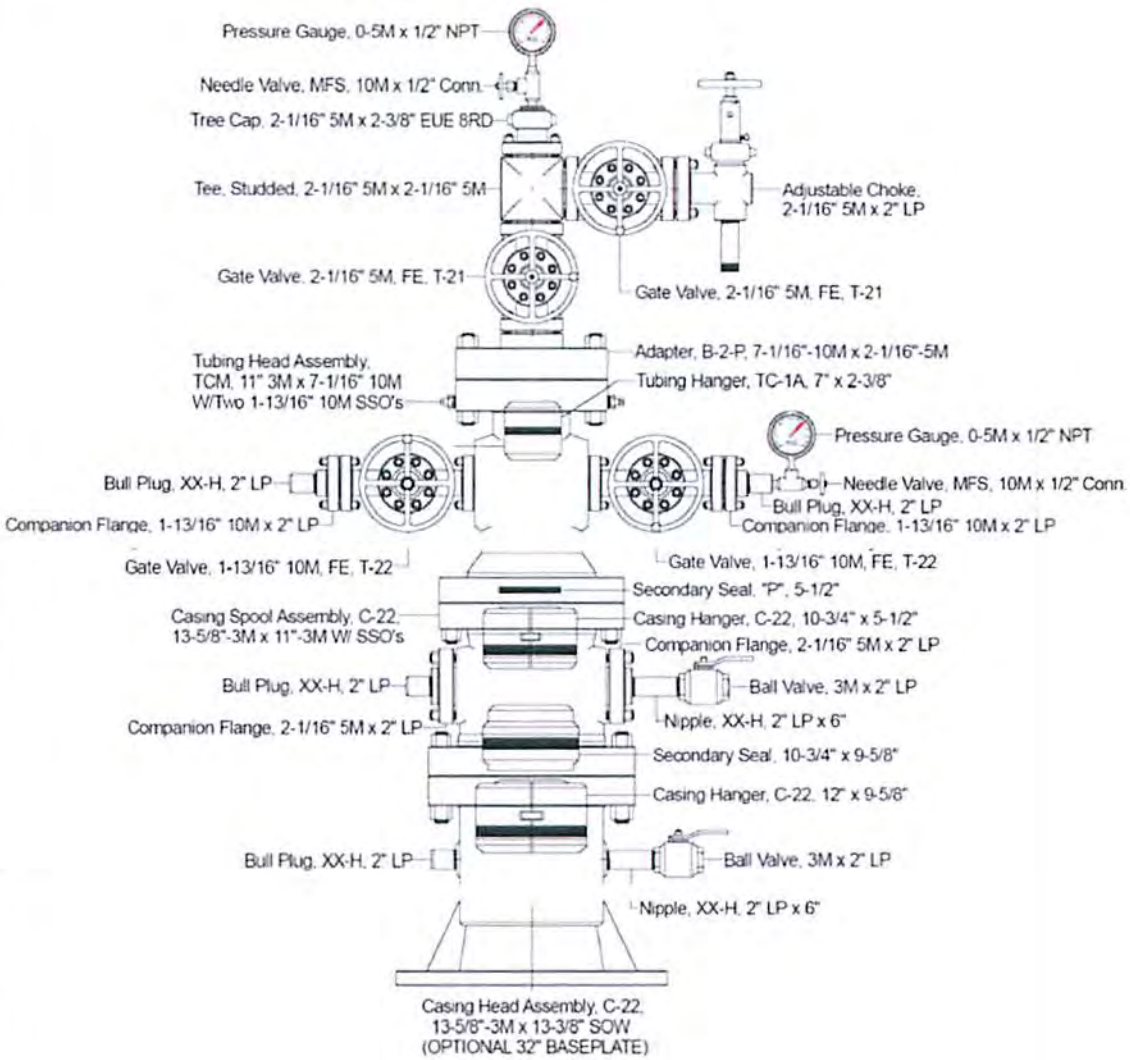
All Drilling Supervisors and Toolpushers used on this well will be IADC trained and certified. A trained person will be present during the drilling operations. Training certificates will be available for review on the location. The list of personnel with said training is provided in Appendix E.

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's 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 50 feet.

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 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.

9.0 Collision Avoidance Protocol

To avoid collision with other wells on the same pad the utilization of a gyro will be used at 30' intervals until a separation factor of 1.5 or greater is achieved. These surveys are within +- .5 degrees of accuracy. To determine the separation factor, the inclination and azimuth reading will be entered into a program utilizing the 3D Closest Approach Scan Method ,and the tool positional uncertainty model will be entered that reflects the tool used. No well will be allowed to cross under a separation factor of 1.0 with an offset well within the program. (A separation factor of 1.0 indicates the possibility for collision between the wells). If a well approaches a separation factor of 1.0 corrective action will be taken to increase the distance between the two imposing wellbores by utilizing a steerable motor and steering away from the wellbore and getting back to a separation factor of 1.5. When a separation factor of 1.5 occurs then survey stations are to be taken to 250' as long as the separation factor is above 1.5.

Appendix A: Safety Meeting Log, Personnel and Visitor Log & Emergency Contacts

In addition to the above procedure, a policy has been added to visually verify MULESHOE ALIGNMENT and Azimuthal direction the tools when in a slide in the critical area of the wellbore. When directional tools are picked up for well bore separation, and the separation factor is at a 1.5, it is the responsibility of Company Man, MWD or Gyro Employee and Directional Driller to verify, visually the high side mark and the alignment of the Muleshoe inside the hang-off sub. The directional hand, gyro hand and company man will also agree of the Azimuth direction of the well path to be taken for sliding once on bottom.

A copy of the verification form outlined in the next page must be printed, and the MWD employee and Directional Driller, as well as Company Man on duty must sign and date the form and put in the well file on location.

Muleshoe High Side Verification

This form is to provide verification on multiple levels for Muleshoe High Side and azimuthal direction to slide when in critical areas. The standard practice of verification should be a visual check of the high side mark and alignment of Muleshoe inside the hang-off sub. Azimuthal direction that the slide will occur toward.

VISUAL INSPECTION _X

AZMTHUAL DIRECTION TO SLIDE____320azm_____

DIRECTIONAL DRILLER:_____

DATE:_____

MWD EMPLOYEE OR GYRO HAND:_____

DATE:_____

COMPANY MAN:_____

DATE:_____

Appendix A: Safety Meeting Log, Personnel and Visitor Log & Emergency Contacts

Safety Meeting Log

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

	Name	Organization	Job Title
1.			
2.			
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Appendix B.

Daily Personal and Visitor Log

DATE	TIME IN	TIME OUT	NAME	ORGANIZATION

Appendix C.

EMERGENCY CONTACT LIST AND PHONE NUMBERS

Contact	Phone Number
Designated Person and Incident Commander:	
John Kawcak, *Operations Manager*	817.368.1553 John
Tim Culberson, Midstream Construction Manager	918.916.0116 Tim
Terry Wyckoff, Midstream Production Manager	304.203.5517 Terry
Antero Resources Emergency (24 Hour) Contact	**1.800.878.1373**
Designated Backup Person Incident Commander/Response Coordinator:	
Mike Ward	580.276.7484 Mike
Ricky Jones	580.927.6276 Ricky
Norman Wood	903.353.4429 Norman
Stanley Dudley	970.618.7602 Stanley
Jeff Partridge	940.577.2288 Jeff
Landon West	940.389.0602 Landon
Tim Henrich	720.530.3059 Tim H.
Mike Alcorn	304.627.7070 Mike
James Harvey	918.916.4340 James
Tim Murrell	903.256.6040 Tim
Delf Martinez	970.629.0055 Delf
Ralph Ybarra	580.927.5606 Ralph
Virgil Gaither	580.504.2366 Virgil
James Neal	607.644.8701 James
Frontier #3	832.487.7965 Rig Sat Phone
Frontier #14	713.758.0662 Rig Sat Phone
Frontier #17	713.758.0730 Rig Sat Phone
Frontier #8	832.531.7014 Rig Sat Phone
Frontier #22	713.758.0893 Rig Sat Phone
Hall Drilling #3	713.758.0881 Rig Sat Phone
Antero Resources Denver Office 1615 Wynkoop Street Denver, CO 80202	Office: 303.357.7310 Fax: 303.357.7315
Environmental Manager Jerry Alberts	Direct: 303.357.7341 Cell: 720.201.0160 24hr

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	1.800.424.8802
West Virginia Office of Water Resources' Emergency Notification Number, Oil Spill Response	1.800.642.3074
West Virginia Office of Oil and Gas Sam Ward, WVDEP Inspector – Harrison County Joe Taylor, WVDEP Inspector – Tyler County David Cowan, WVDEP Inspector – Ritchie County Douglas Newlon, WVDEP Inspector – Doddridge County	 304.389.7583 cell Sam Ward 304.380.7469 cell Joe Taylor 304.389.3509 cell David Cowan 3040.932.8049 cell Douglas Newlon
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
Hospital- United Hospital Center--Clarksburg	304.624.2121
Harrison County Emergency and Dispatch Business Office	911 304.623.6559
Harrison County LEPC	304.624.9700 John Keeling
Doddridge County Emergency and Dispatch Business Office	911 304.873.3253

Contact	Phone Number
Doddridge County LEPC	304.782.2124 Roland W. Kniceley
Ritchie County Emergency and Dispatch Business Office	911 304.659.3770
Ritchie County LEPC	304.869.3231 Bill Bayless
Tyler County Emergency and Dispatch Business Office	911 or 304.758.2911 304.758.4275
Tyler County LEPC	304.652.6932 Pat Walsh
WV Highway Patrol	304.782.2124 doddridgeoes@dishmail.net
Public Water Intakes	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	304.588.3368
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

Contact	Phone Number
Winch Trucks	
TK Stanley	304.476.9588
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 304.588.6674 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

Harrison County

Ambulance, Fire, Law Enforcement Emergencies **Call 911**

Poison Control Center....1-304-388-4211 or 1-800-222-1222

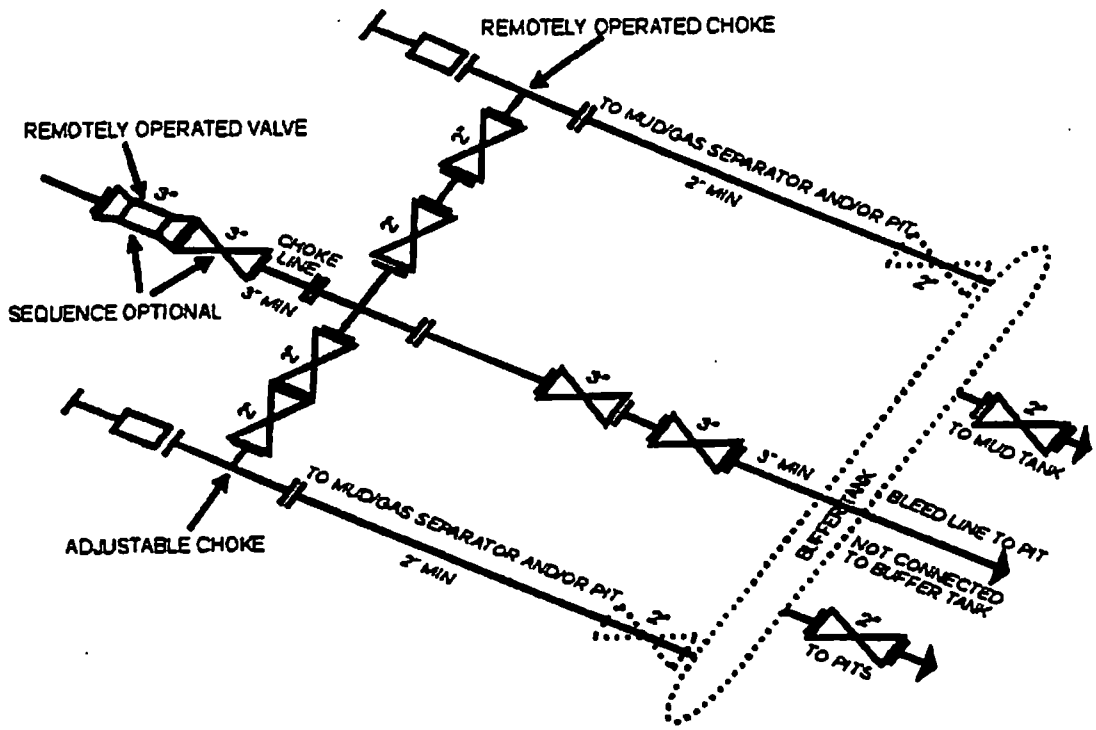
Emergency Alert System Radio WFBY-FM 106.5

Non-emergencies:	
Harrison County Emergency Communications Center	304-623-6559
Harrison County Office of Emergency Management	304-623-4115
American Red Cross, Harrison County Chapter (Disaster Preparedness and Shelter information)	304-624-7689
Salvation Army (Clarksburg Corps)	304-622-2360
Law Enforcement:	
W.V. State Police, Bridgeport	304-627-2300
W.V. State Police, Shinnston	304-624-7573
Harrison County Sheriff's Dept.	304-623-6655*
Anmoore Police Dept.	304-622-6250*
Bridgeport Police Dept.	304-842-8260*
Clarksburg Police Dept.	304-624-1610*
Lumberport Police Dept.	304-584-4517*
Nutter Fort Police Dept.	304-622-6351*
Salem Police Dept.	304-782-1313*
Shinnston Police Dept.	304-592-2121*
Stonewood Police Dept.	304-623-2919*
West Milford Police Dept.	304-745-4371*
West Virginia Division of Natural Resources	304-627-2188
FBI	304-624-6200
Bureau of Alcohol, Tobacco and Firearms	304-347-5249
Drug Enforcement Administration (DEA)	304-623-3700
Domestic Violence Hotline	304-428-2333
U.S. Marshal Service	304-623-0486
U.S. Secret Service	304-347-5188
Health:	
Harrison/Clarksburg Health Department	304-623-9308*
United Hospital Center (Clarksburg)	304-624-2121
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

Fire & Rescue:	
Harrison County Bureau of Emergency Services	304-623-6559
Anmoore Fire Dept.	304-622-5649
Bridgeport Fire Dept.	304-842-8252*
Clarksburg Fire Dept.	304-624-1645*
Johnstown Fire Dept.	304-624-9382*
Lost Creek Fire Dept.	304-745-4004*
Lumberport Fire Dept.	304-584-4721*
Mount Clare Fire Dept.	304-623-9625*
Nutter Fort Fire Dept.	304-622-5001*
Reynoldsville Fire Dept.	304-623-3754*
Salem Fire Dept.	304-782-3333*
Shinnston Fire Dept.	304-592-1851*
Spelter Fire Dept.	304-622-8256*
Stonewood Fire Dept.	304-622-1199*
Summit Park Fire Dept.	304-622-3363*
Wallace Fire Dept.	304-796-4014*
West Milford Fire Dept.	304-745-3355*
Flemington Volunteer Fire Dept (Taylor Co.)	304-739-2211*
W.V. State Fire Marshals (Arson Hotline)	304-558-2191 1-800-233-3473
Other important numbers:	
Allegheny Power	1-800-255-3443
Dominion Hope Gas	1-800-688-4673

*phone not manned 24 hours. If no answer call 623-6559

Appendix D: Choke Manifold Schematic



5M 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.

[54 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)

Appendix F. **Anticipated List of Hazardous Chemicals used during Phases of Operation:**

Chemical Name	Daily Qty. on Location	Storage Container
	Construction	
Diesel Fuel Oil	2000 Gallons	Double Walled Tank
	Drilling	
Airfoam HD	275 gallons	Drum
Aluminum Stearate	150 lbs.	Bag
Caustic Soda	1500 lbs.	Bag
Chek-Loss	1250 lbs.	Bag
Claytrol	440 gallons	Drum
Conqor 404	55 gallons	Drum
Diesel Fuel Oil	8000 gallons	Double Walled Tank
Gear Oil	250 gallons	Double Walled Tank
Hydraulic Fluid	250 gallons	Double Walled Tank
LD-9	100 gallons	Bucket
Mil-Bar	80000 lbs.	Super Sack
Mil-Bar 410	10000 lbs.	Bag
Mil-Carb	5000 lbs.	Bag
Mil-Carb 150	2500 lbs.	Bag
Mil-Graphite	5000 lbs.	Bag
Mil-Lime	10000 lbs.	Bag
Mil-Lube	220 gallons	Drum
Milmica	2500 lbs.	Bag
Mil-Pac LV	2500 lbs.	Bag
Mil-Pac LV Plus	2500 lbs.	Bag
Mil-Pac R	2500 lbs.	Bag
Mil-Plug (Pecan Shells)	5000 lbs.	Bag
Mil-Seal	5000 lbs.	Bag
Mil-Sorb	5000 lbs.	Bag
Milstarch	10000 lbs.	Bag
New-Drill	160 gallons	Bucket
Potassium Chloride	15000 lbs.	Bag
Perma-Lose HT	10000 lbs.	Bag
Soda Ash	1000 lbs.	Bag
Sodium Chloride	30000 lbs.	Bag
SWF (Salt Water Foamer)	265 gallons	Drum
Walnut Shells	2500 lbs.	Bag
W.O. Defoam	160 gallons	Bucket
Xan-Plex D	1200 lbs.	Bag
X-Cide 102	160 gallons	Bucket
	Completions	
AI-300 (Corrosion Inhibitor)	1 gallon	Tote
AP-One	25 lbs	Tote
Bio Clear	22 gallons	Tote
Frac Sand	174,450 lbs	Sand Truck
LGC-15	137 gallons	Tote
Mineral Oil Flush	10 gallons	Tote
Off Road Diesel	8000 gallons	Fuel Truck

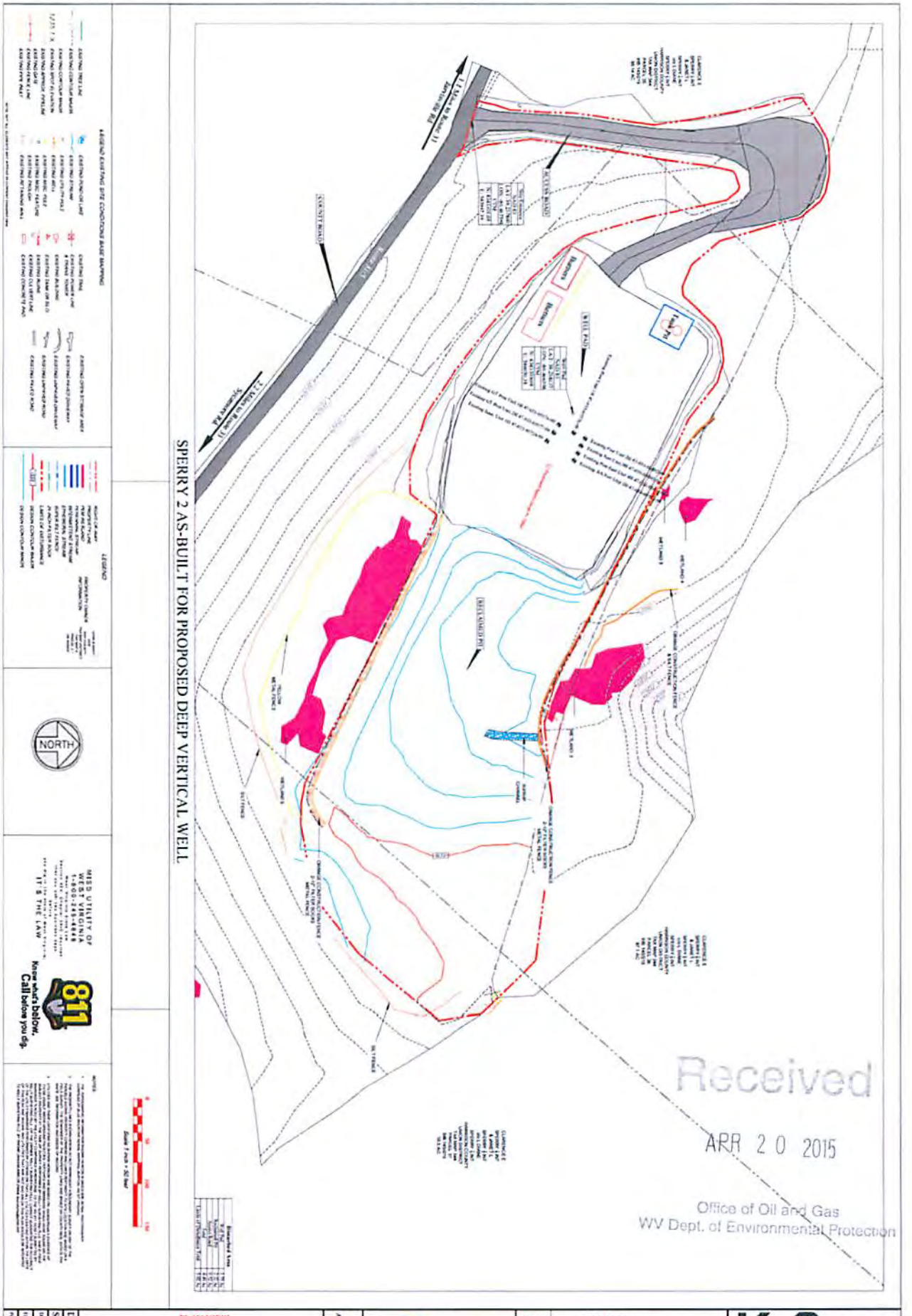
Appendix F. **Anticipated List of Hazardous Chemicals used during Phases of Operation:**

Chemical Name	Daily Qty. on Location	Storage Container
	Completions (CONTINUED)	
SI-1000 (Scale Inhibitor)	34 gallons	Tote
WFRA-405	184 gallons	Tote
09-HCl All Grades	500 gallons	Acid Tanker
	Service/Work over	
Antifreeze (NAPA)	2 gallons	Jug
Antifreeze/Coolant (Prestone)	30 gallons	Jug
Conoco Honey Oil	11000 gallons	Drum
DEF Fluid	75 gallons	Jug
Detcord	360 feet	Spool
Detonators	180 each	Box
Diesel	7200 gallons	Aux Tank
Diesel	290 gallons	Tanks
Dry Moly	60 oz.	Can
FR-1205(Pipe on Pipe)	270	Tote
FR-1405 (Gel Sweep)	270	Tote
FR-1400(Gel Sweep/Friction Reducer)	540	Tote
Lithium Grease	8 oz.	Can
LOCTITE	12 oz.	Tube
Lubriplate	72 oz.	Tube
Motor Oil 15w-40	5 gallons	Jug
Premium Hydraulic Oil	30 gallons	Bucket
Power Charge Ignitors	180 each	Box
Power Charge Cartridges	20 each	Box
Shaped Charge	1200 each	Box
Transmission fluid	20 gallons	Bucket
WD-40	36 oz.	Can
ZEP 45	25 gallons	Jug
ZEP Brake Flush	25 gallons	Jug
ZEP Dry Molly	10 gallons	Jug
ZEP REDI-GREASE	16 oz.	Tube
	Reclamation	
Diesel Fuel Oil	2000 gallons	Double Walled Bulk Tank

Note: The attached list represents anticipated materials used for planned operations on the well site. In the event of an unplanned event on the well site, additional materials may be required. Additional MSDS for any unplanned events will be maintained on the well site in accordance with OSHA CFR 1910.1200 standards.

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 in accordance with OSHA CFR 1910.1200 standards. The MSDS should be located in the Company Representative's Office on-site. Copies of the MSDS may also be obtained from the area Safety Coordinator, the operator contact for maintaining MSDS, by calling the local Antero Resource Office at 304-842-4100 or 800-878-1373.

EXHIBIT 1. PAGE 1



Antero Resources

EXHIBIT 1

Sperry 2 Pad

NORTH

PREVAILING WIND DIRECTION NNE

EXHIBIT 1, PAGE 2

DRILLING LAYOUT/FLARE LINES/PREVAILING WINDS

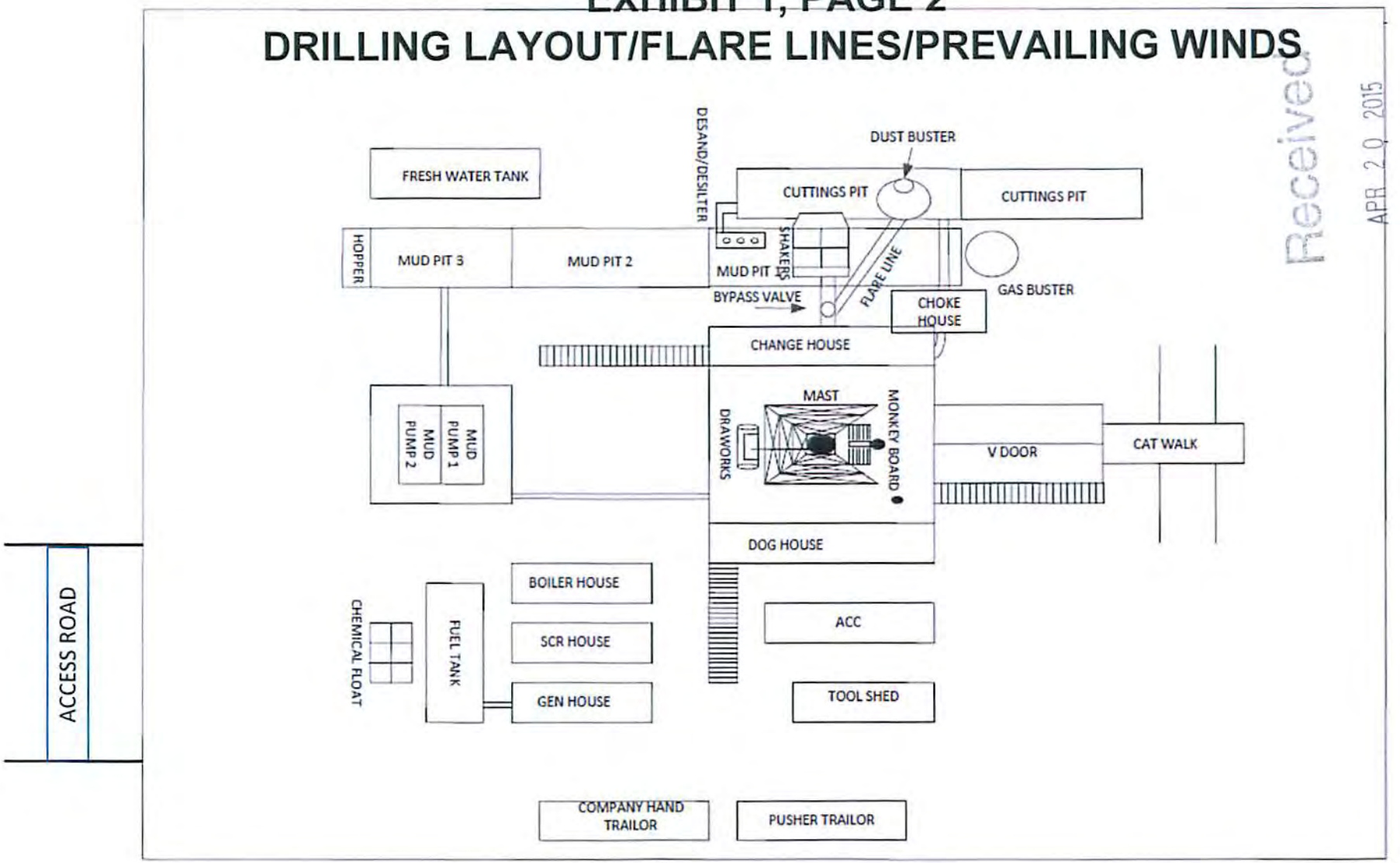
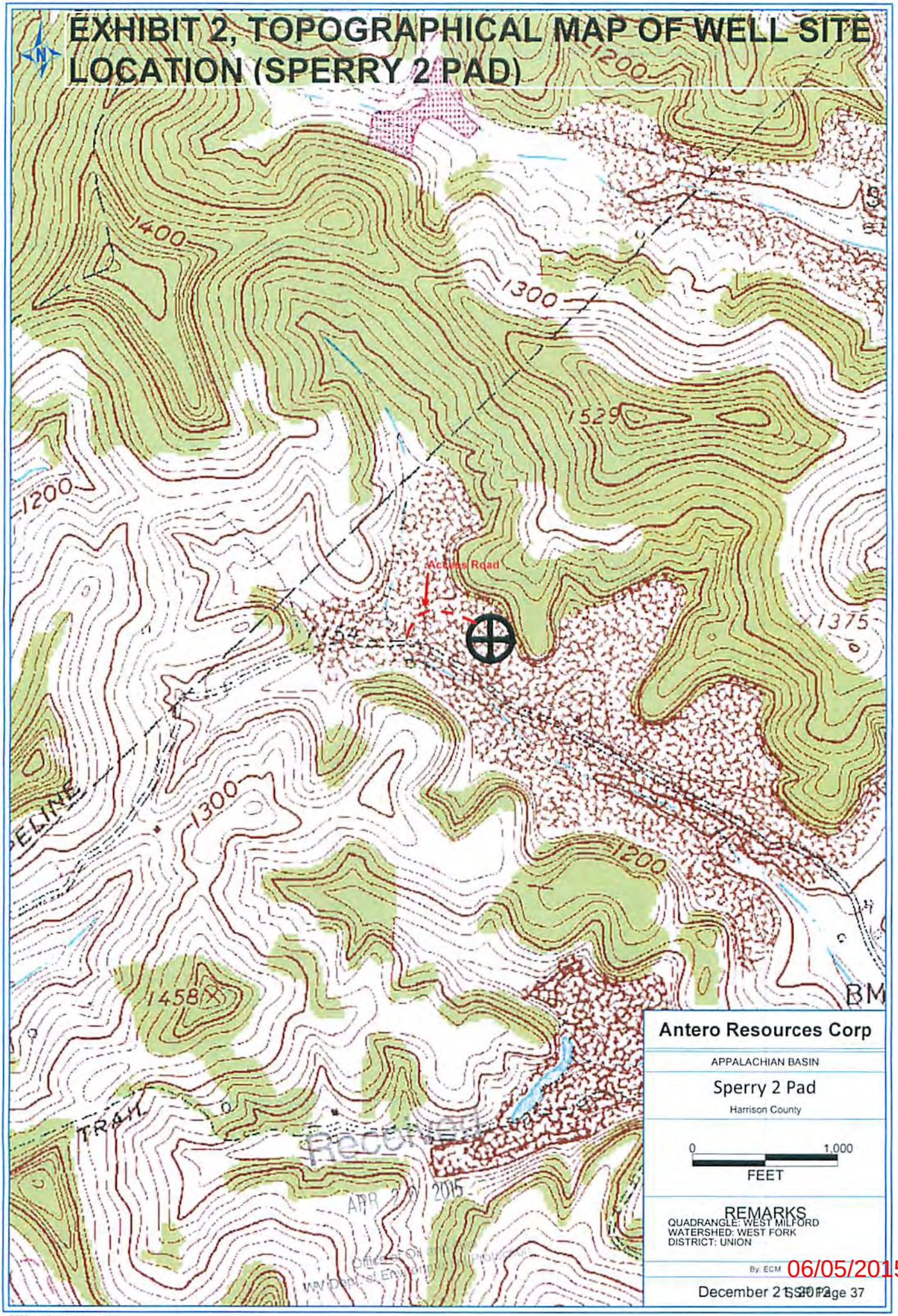
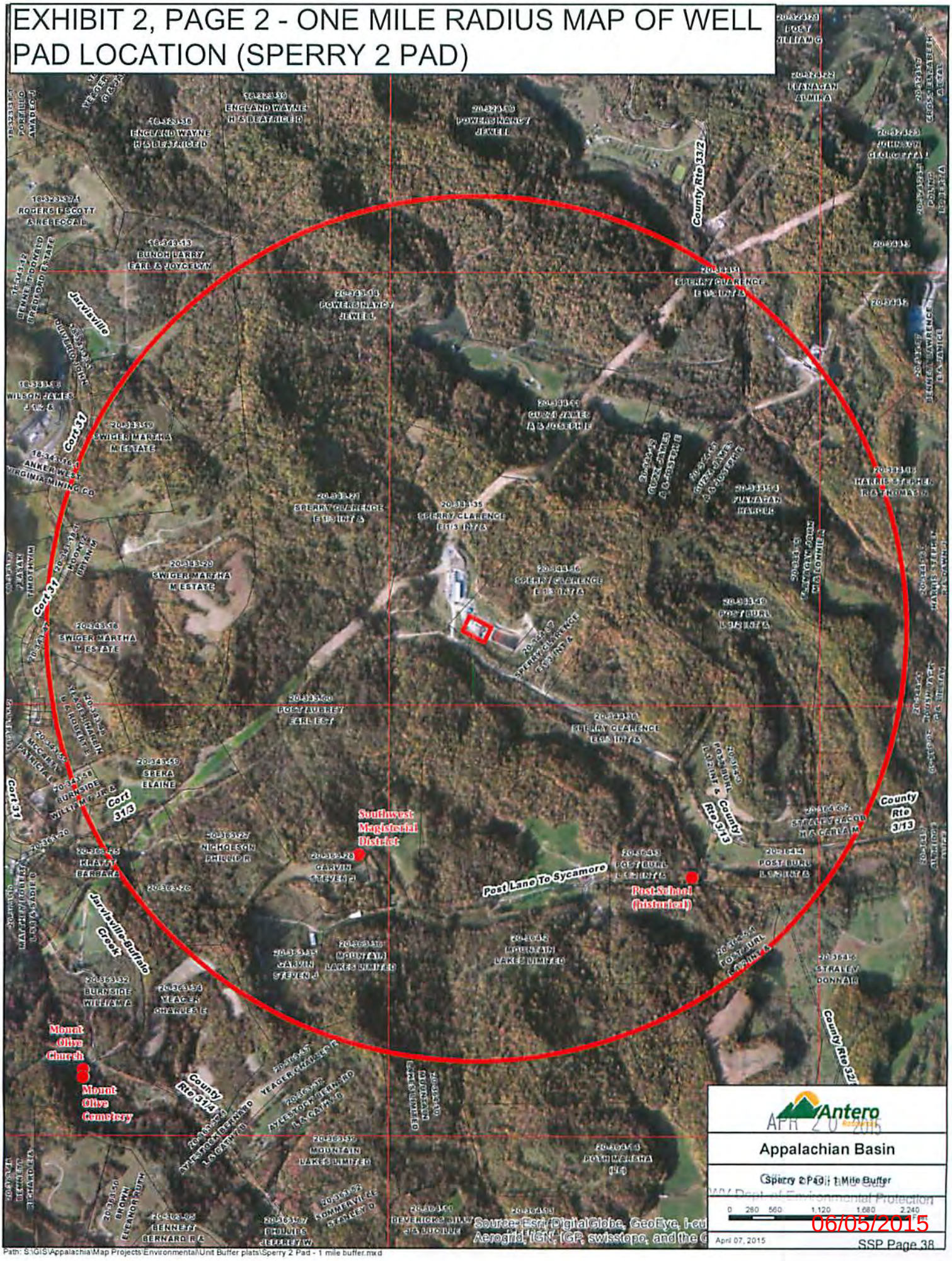


EXHIBIT 2, TOPOGRAPHICAL MAP OF WELL SITE LOCATION (SPERRY 2 PAD)



06/05/2015

EXHIBIT 2, PAGE 2 - ONE MILE RADIUS MAP OF WELL PAD LOCATION (SPERRY 2 PAD)



Path: S:\GIS\Appalachia\Map Projects\Environmental\Unit Buffer plats\Sperry 2 Pad - 1 mile buffer.mxd

EXHIBIT 3: LIST OF ALL RESIDENTS, SCHOOLS & PUBLIC FACILITIES WIHTIN A ONE MILE RADIUS OF PROPOSED WELLSITE

District	Map	Parcel	Name	Address	City	St	Zip	Phone	Deed Book/Page	Pad
Union	363	35	Steven J. Garvin	RR 4 Box 930	Salem	WV	26426	304-624-1009	1246-1149	Sperry 2
Union	363	36	Mountain Lakes Limited Liability Co	RR 4 Box 936	Salem	WV	26426	304-622-6760	1232-612	Sperry 2
Union	363	28	Steven J. Garvin	RR 4 Box 930	Salem	WV	26426	304-624-1009	1246/1149	Sperry 2
Union	363	25	Barbara Krafft	96 Nicholson Dr	Salem	WV	26426	304-745-3034	1451/686	Sperry 2
Union	363	27	Phillip R. Nicholson	96 Nicholson Dri	Salem	WV	26426	Unknown	1473/753	Sperry 2
Union	364	2	Mountain Lakes Limited Liability Co	RR 4 Box 935	Salem	WV	26426	304-622-6760	1232-612	Sperry 2
Union	364	3	Burl L. Post, Susan Lee Carr Est	RR 4 Box 920	Salem	WV	26426	304-622-0071	1356/781	Sperry 2
Union	364	4	Burl L. Post, Susan Lee Carr Est	RR 4 Box 920	Salem	WV	26426	304-622-0071	1356/781	Sperry 2
Union	364	5.1	Burl L. Post, Susan Lee Carr Est	RR 4 Box 920	Salem	WV	26426	304-622-0071	1356/781	Sperry 2
Union	364	6	Blue Heron Property Management LLC	2462 Buffalo Creek Rd	Lost Creek	WV	26385	304-745-4906	1441/1049	Sperry 2
Union	364	6.2	Jacob H. Straley	RR 4 Box 910	Salem	WV	26426	304-623-2702	1410/1175	Sperry 2
Union	343	21	Clarence E. Sperry/Janet L. Sperry	112 Keyes Ave	Philippi	WV	26416	304-457-2366	W145/219	Sperry 2
Union	343	60	Bernard Post et al	RR 1 Box 44-B	Lost Creek	WV	26385	Unknown	1436/574	Sperry 2
Union	343	20	Martha M. Swiger Estate	RR 4 Box 620	Salem	WV	26426	Unknown		Sperry 2
Union	343	18	Martha M. Swiger Estate	RR 4 Box 620	Salem	WV	26426	Unknown		Sperry 2
Union	343	48	Harlin B. and Robert E. Yeager	RR 4 Box 636	Salem	WV	26426	304-745-3516	1294/1259	Sperry 2
Union	343	18.1	Brian M. Koontz	RR 1 Box 135	Salem	WV	26426	304-782-1181	1329/639	Sperry 2
Union	343	19	Martha M. Swiger Estate	RR 4 Box 620	Salem	WV	26426	Unknown		
Union	343	16.1	Anker West Virginia Mining Co. Inc	300 Corporation	Scott Depot	WV	25560	304-473-1676	1343/709	Sperry 2
Union	343	13	Julian and Lisa Galford	3316 Jarvisville Rd	Salem	WV	26426	Unknown	1486/967	Sperry 2
Union	343	14	Nancy Jewell Powers	2606 Waterslide Rd	Salem	WV	26426	304-782-4541	1053/144	Sperry 2
Union	324	19	Nancy Jewell Powers	2606 Waterslide Rd	Salem	WV	26426	304-782-4541	1053/144	Sperry 2
Union	344	1	Clarence E. Sperry/Janet L. Sperry	112 Keyes Ave	Philippi	WV	26416	304-457-2366	W145/219	Sperry 2
Union	344	16	Stephen R. and Thomas N. Harris	RR 4 Box 882	Salem	WV	26426	304-677-0766	1191/384	Sperry 2
Union	344	15	John N. Flanagan	PO Box 603	Lumberport	WV	26386	Unknown	1493/337	Sperry 2
Union	344	14	Harold Flanagan	RR 1 Box 74	Bridgeport	WV	26330	Unknown	752/276	Sperry 2
Union	344	13	James A and Joseph E. Guzzi	2491 Waterslide Rd	Salem	WV	26426	304-622-5999	1215/1001	Sperry 2
Union	344	12	James A and Joseph E. Guzzi	2491 Waterslide Rd	Salem	WV	26426	304-622-5999	1215/1001	Sperry 2
Union	344	11	James A and Joseph E. Guzzi	2491 Waterslide Rd	Salem	WV	26426	304-622-5999	1215/1001	Sperry 2
Union	344	35	Clarence E. Sperry/Janet L. Sperry	112 Keyes Ave	Philippi	WV	26416	304-457-2366	W145/219	Sperry 2
Union	344	36	Clarence E. Sperry/Janet L. Sperry	112 Keyes Ave	Philippi	WV	26416	304-457-2366	W145/219	Sperry 2
Union	344	37	Clarence E. Sperry/Janet L. Sperry	112 Keyes Ave	Philippi	WV	26416	304-457-2366	W145/219	Sperry 2
Union	344	38	Clarence E. Sperry/Janet L. Sperry	112 Keyes Ave	Philippi	WV	26416	304-457-2366	W145/219	Sperry 2
Union	344	49	Burl L. Post, Susan Lee Carr Est	RR 4 Box 920	Salem	WV	26426	304-622-0071	1356/781	Sperry 2

WW - 2B
(Rev. 8/10)

EXHIBIT 4 to SSP- WW-6B FORM

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Corporation

494507062	033 - Harrison	Union	West Milford
Operator ID	County	District	Quadrangle

2) Operator's Well Number: Sperry Deep #1 3) Elevation: 1168'

4) Well Type: (a) Oil_____ or Gas X

(b) If Gas: Production X / Underground Storage _____

Deep X / Shallow _____

5) Proposed Target Formation(s): Huntersville & Oriskany Proposed Target Depth: 7000' & 7300'
6) Proposed Total Depth: 7800' TVD Feet Formation at Proposed Total Depth: Helderberg Limestone
7) Approximate fresh water strata depths: 80' (Isaac Unit 1H API# 47-033 located on the same pad)
8) Approximate salt water depths: 2101'

9) Approximate coal seam depths: 107', 797', 857'

10) Approximate void depths,(coal, Karst, other): None Anticipated

11) Does land contain coal seams tributary to active mine? No

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)
Drill, perforate, fracture a new vertical deep well and complete the Huntersville & Oriskany formations. NO FORMATION BELOW ORISKANY WILL BE COMPLETED.
*Antero will be air drilling the fresh water string which makes it difficult to determine when freshwater is encountered, therefore we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

13) **CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS			FOOTAGE	INTERVALS	CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	Fill -up (Cu. Ft.)
Conductor	20"	J-55	106.5#	40'	40'	46 Cu. Ft - CTS
Fresh Water	13-3/8"	H-40	48#	340'	340' *see #12	472 Cu. Ft. - CTS
Coal	9-5/8"	J-55	36#	2510'	2510'	1022 Cu. Ft. - CTS
Intermediate						
Production	5-1/2"	P-110	20#	7700'	7700'	1725 Cu Ft.
Tubing	2-7/8"	L-80	6.5#	6900'		
Liners						

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

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WV Dept. of Environmental Protection

06/05/2015

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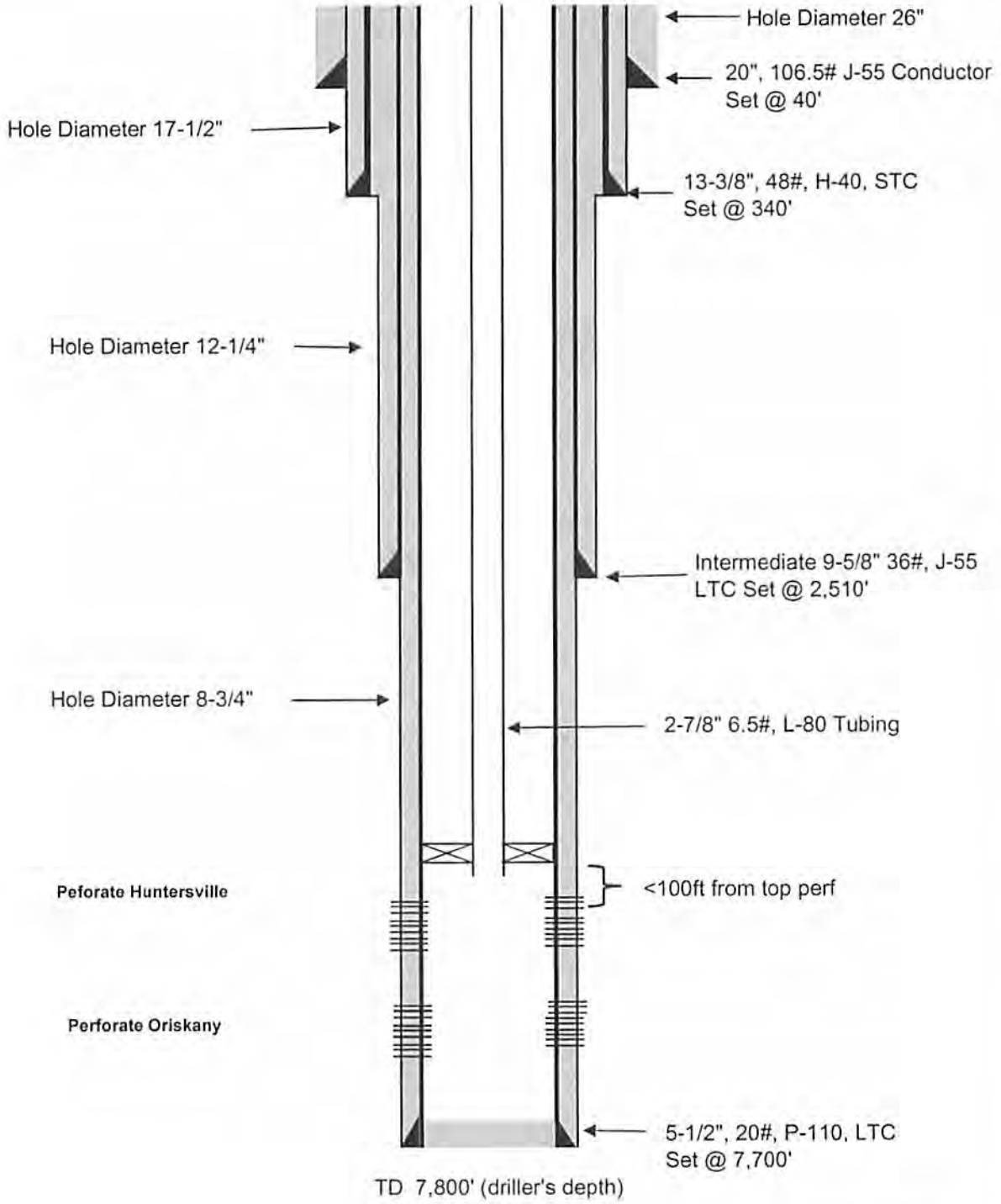
WELLBORE SCHEMATIC: EXHIBIT 5

Proposed Sperry Deep #1 Wellbore Diagram

Proposed



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APR 20 2015

Antero Resources Corporation

Proposed Sperry Deep #1

Harrison County, West Virginia

06/05/2015