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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
fax: (304) 926-0452

Jim Justice, Governor  
Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

PERMIT MODIFICATION APPROVAL  
Horizontal 6A / Horizontal 6A Well - 1

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for WESTERN UNIT 3H  
47-085-10295-00-00

Change to wellbore location and horizontal leg length

ANTERO RESOURCES CORPORATION

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.



James A. Martin  
Chief

Operator's Well Number: WESTERN UNIT 3H  
Farm Name: DARRELL A. NOLAND ET AL  
U.S. WELL NUMBER: 47-085-10295-00-00  
Horizontal 6A / Horizontal 6A Well - 1  
Date Issued: 8/4/2017

Promoting a healthy environment.

08/04/2017



June 14, 2017

Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
Attn: Mr. Taylor Brewer  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Mr. Brewer:

Antero Resources Corporation (Antero) would like to submit the following permit modification for one approved well on the existing Noland Pad. Our wellbore location and horizontal leg length has changed from the previous modification on the Western Unit 3H (API# 47-085-10295).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the updated horizontal leg length
- REVISED Mylar Plat and Inset, which shows the new Lateral Length and BHL change
- REVISED Form WW-6A1, which shows the new lease we will be drilling into
- Area of Review showing 500' around the well bore

If you have any questions please feel free to contact me at (303) 357-7223.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "SJohnson", is written over a light blue horizontal line.

Shelby Johnson  
Permitting Agent  
Antero Resources Corporation

Enclosures

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Environmental Protection

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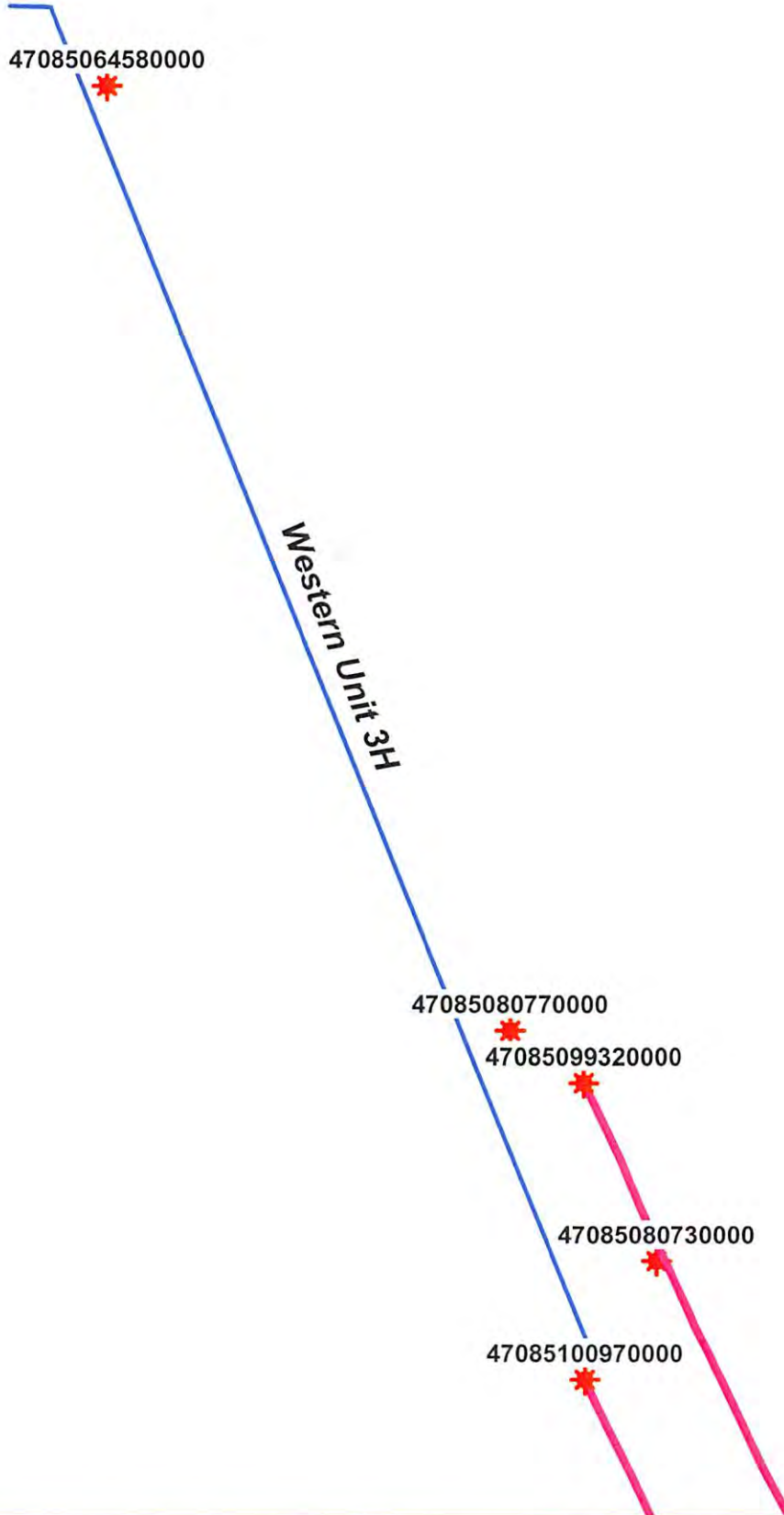


# AOR Western-Piper Units

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WESTERN UNIT 3H (NOLAND PAD) - AREA OF REVIEW 35-8-5.11 PAGE 1

UWI (APINum)	Well Name	Operator	TD	ELEV_GR	TD (SSTVD)	
47085099320000	TAYLOR	EQT PRODUCTION CO		11955	1116	-5250
47085100970000	TAYLOR	EQT PRODUCTION CO		11279	1119	-5250
47085064580000	HAZELBAKER BRENDEN	HARPER HYDN ENRGY KA		5987	1144	-4843
47085080770000	BOWMAN ROBERT & OGDEN VIOLET	ENERGY CORP OF AMER		5488	1063	-4425
47085080730000	TAYLOR ER HEIRS ETAL	ENERGY CORP OF AMER		5358	968	-4390

Perf interval	Producing Formations	Producible formations not Perf'd
6801-11873	Marcellus	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander, Riley, Benson
Not Reported	Marcellus	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander, Riley, Benson
4995-5810	Java, Angola, Rhinestreet	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander, Riley, Benson
4554--5201	Riley, Benson, Alexander	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford
4473-5124	Riley, Benson, Alexander	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford

\*ALL formations listed as "producible formations" have been filled out using data from the WVGES website near the area of interest.

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85-10295-MOD



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

1) Well Operator: Antero Resources Corporation

<u>494507062</u>	<u>085 - Ritchie</u>	<u>Clay</u>	<u>Pennsboro 7.5'</u>
Operator ID	County	District	Quadrangle

2) Operator's Well Number: Western Unit 3H Well Pad Name: Existing Noland Pad

3) Farm Name/Surface Owner: Darrell A. Noland, et al Public Road Access: CR 50/22

4) Elevation, current ground: 1143' Elevation, proposed post-construction: 1143'

5) Well Type (a) Gas  Oil  Underground Storage

Other \_\_\_\_\_

(b) If Gas Shallow  Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 6500' TVD, Anticipated Thickness- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6500' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 19600' MD

11) Proposed Horizontal Leg Length: 11651'

12) Approximate Fresh Water Strata Depths: 54', 135', 227'

13) Method to Determine Fresh Water Depths: Fresh Water Depths from Penns Park Unit 1H (API# 47-085-10099) on same pad.

14) Approximate Saltwater Depths: 1658', 1705', 1747'

15) Approximate Coal Seam Depths: 798', 1225'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes \_\_\_\_\_ No

(a) If Yes, provide Mine Info: Name: \_\_\_\_\_

Depth: \_\_\_\_\_

Seam: \_\_\_\_\_

Owner: \_\_\_\_\_

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**API# 47-085-10295 PERMIT MODIFICATION**

18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</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#	300'	300'	CTS, 417 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2400'	2400'	CTS, 977 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	19600'	19600'	5012 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

<b>TYPE</b>	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	30"	24"	0.438"	1530	50	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	1000	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12,630	2500	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

**PACKERS**

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

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

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."

Anticipated Max Pressure - 9300 lbs

Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 18.62 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.85 acres

23) 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.

24) Describe all cement additives associated with each cement type:

Conductor: no additives, Class A cement.

Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake

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% ACG-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) 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.

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\*Note: Attach additional sheets as needed.

JUN 15 2017

WW-6A1

WV Department of  
Environmental Protection

Operator's Well Number

Western Unit 3H

PERMIT MODIFICATION API# 47-085-10295

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
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
<b><u>Mary V. Wedekamm Lease</u></b>			
Mary V. Wedekamm	Kepeco, Inc.	1/8	0161/0687
Kepeco, Inc.	Union Drilling, Inc.	Merger	Corporation Record 0004/0322
Union Drilling, Inc.	Equitable Resources Exploration, Inc.	Merger	Corporation Record 0004/0673
Equitable Resources Exploration, Inc.	Equitable Resources Energy Company	Confirmatory Deed & Assignment	0230/0047
Equitable Resources Energy Company	Mike Ross, Inc.	Assignment	0223/0575
Mike Ross, Inc.	Antero Resources Appalachian Corporation	Assignment	0262/0164
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>C.E. Giebell Lease</u></b>			
C.E. Giebell	Gene Stalnaker	1/8	0161/0644
Gene Stalnaker	Angus Energy, Inc.	Assignment	0212/0137
Angus Energy, Inc.	Stalnaker Energy, Inc.	Merger/Name Change	CR 0006/0225
Stalnaker Energy, Inc.	Antero Resources Appalachian Corporation	Assignment	0263/1065
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>The Haught Family Trust Lease</u></b>			
The Haught Family Trust, Ira M. Haught, Trustee	Antero Resources Corporation	1/8+	0272/0974
<b><u>Carroll Shinn, et al Lease</u></b>			
Carroll Shinn, et al	West Virginia Energies, Inc.	1/8	0149/0398
West Virginia Energies, Inc.	C & P Oil & Gas Company, Inc.	Assignment	0157/0296
C & P Oil & Gas Company, Inc.	Rare Earth Energy, Inc.	Assignment	0191/0762
Rare Earth Energy, Inc.	Stephen L. Thompson	Assignment	0236/0001
Stephen L. Thompson	Tri-County Oil & Gas, Inc.	Assignment	0236/0237
Tri-County Oil & Gas, Inc.	May Gas, Inc.	Assignment	0239/0229
May Gas, Inc.	Harper Crosby Holdings, LLC	Assignment	0265/0872
Harper Crosby Holdings, LLC	Piney Holdings, Inc.	Assignment	0265/0910
Piney Holdings, Inc.	Antero Resources Corporation	*Partial Assignment	0275/0625
<b><u>Richard Webb Lease</u></b>			
Richard Webb	Antero Resources Corporation	1/8+	0262/0963
<b><u>John J. Meyer III, et ux Lease</u></b>			
John J. Meyer III, et ux	Antero Resources Corporation	1/8+	0263/0609
<b><u>(A) Larry Gander Lease</u></b>			
Larry Gander	Antero Resources Corporation	1/8+	0268/0559

\*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

08/04/2017

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JUN 15 2017

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Western Unit 3H

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
✓ <u>(B) City of Pennsboro Lease</u> City of Pennsboro	Antero Resources Corporation	1/8+	0282/1018
✓ <u>(C) Larry Gander Lease</u> Larry Gander	Antero Resources Corporation	1/8+	0297/0794
✓ <u>(D) Paul D. Carman Lease</u> Paul D. Carmen	Antero Resources Corporation	1/8+	300/140
✓ <u>(F) Matthew H. Rial Lease</u> Matthew H. Rial	Antero Resources Corporation	1/8+	0279/0136
✓ <u>(G) Gail B. Cogar, et ux Lease</u> Gail B. Cogar, et ux	Antero Resources Corporation	1/8+	0270/0646
✓ <u>(H) Jefferson, Boylen, et ux Lease</u> Jefferson Boylen, et ux	Antero Resources Corporation	1/8+	0277/0741
✓ <u>(I) Gail B. Cogar, et ux Lease</u> Gail B. Cogar, et ux	Antero Resources Corporation	1/8+	0270/0646
✓ <u>(J) Deward Richards Lease</u> Deward Richards	Antero Resources Corporation	1/8+	0272/0664
✓ <u>(K &amp; L) Steven Hammond Lease</u> Steven Hammond	Antero Resources Corporation	1/8+	0300/0159
✓ <u>(BJ &amp; BK) Charlene R. Sweeney Lease</u> Charlene R. Sweeney	Antero Resources Corporation	1/8+	0285/0043
✓ <u>(O, P, Q) WB Properties, LLC Lease</u> WB Properties, LLC	Antero Resources Corporation	1/8+	0301/0601
✓ <u>(T) Jay Bee Production Co. Lease</u> Jay Bee Production Co.	Antero Resources Corporation	1/8+	0303/0135
✓ <u>(U &amp; V) David A. Poling Lease</u> David A. Poling	Antero Resources Corporation	1/8+	0272/0661
✓ <u>(W) Presbyterian Church of Pennsboro Lease</u> Presbyterian Church of Pennsboro	Antero Resources Corporation	1/8+	0303/0756

\*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

08/04/2017

WW-6A1

JUN 15 2017

Operator's Well Number

Western Unit 3H

PERMIT MODIFICATION API# 47-085-10295

WV Department of  
Environmental Protection

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>(X, Y, Z) John K. Shaffer, et ux Lease</u> John K. Shaffer, et ux	Antero Resources Corporation	1/8+	0298/0604
<u>(AE, AG, AF) Charlene R. Sweeney Lease</u> Charlene R. Sweeney	Antero Resources Corporation	1/8+	0285/0043
<u>WVSRA Lease</u> West Virginia State Rail Authority	Antero Resources Corporation	1/8+	0253/0409
<u>(AH &amp; AI) Steven S. Taylor Lease</u> Steven S. Taylor	Antero Resources Corporation	1/8+	0287/0575
<u>(AN) Anne E. Robinson Lease</u> Ann E. Robinson	Antero Resources Corporation	1/8+	0300/0446
<u>(AQ) Willow Land Surveying, PLLC Lease</u> Willow Land Surveying	Antero Resources Corporation	1/8+	0301/0013
<u>(AR) Ritchie Petroleum Corporation, Inc. Lease</u> Ritchie Petroleum Corporation, Inc.	Antero Resources Corporation	1/8+	0270/0007
<u>(AY) Biff Spitz Lease</u> Biff Spitz	Antero Resources Corporation	1/8+	0283/0011
<u>(AZ) Teresa Poling, et al Lease</u> Teresa Poling, et al	Antero Resources Corporation	1/8+	0299/0520
<u>(BA) Harmony Lodge Lease</u> Harmony Lodge	Antero Resources Corporation	1/8+	0301/0827
<u>(BE) L &amp; M Investment Co. Lease</u> L & M Investment Co.	Antero Resources Corporation	1/8+	0301/0404
<u>(BF) Matthew J. Washington, et ux Lease</u> Matthew J. Washington, et ux	Antero Resources Corporation	1/8+	0302/0299
<u>(BG) Bobbie Riffle, et al Lease</u> Bobbie Riffle, et al	Antero Resources Corporation	1/8+	0282/0992
<u>(BH) Consumers Gas Utility, Co. Lease</u> Consumers Gas Utility Co.	Antero Resources Corporation	1/8+	0302/0671

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WW-6A1

JUN 15 2017

Operator's Well Number

Western Unit 3H

PERMIT MODIFICATION API# 47-085-10295

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>(B) Freda Mossor, et al Lease</u> Freda Mossor, Linda Jeannine Mossor Smith & Donald E. Mossor, Jr.	Antero Resources Corporation	1/8+	0296/0853
<u>John J. Meyer III, et ux Lease</u> John J. Meyer III, et ux	Antero Resources Corporation	1/8+	0263/0609
<u>Guy Wilson, et al Lease</u> Guy Wilson, et al H.W. Stephan O.C. Pratt Columbia I. Collins Edward E. Smyth Robert L. Williams Willard Flanagan Gary L. Riddle Ritchie Petroleum Corporation Charity Gas, Inc. Antero Resources Appalachian Corporation	H.W. Stephan O.C. Pratt Columbia I. Collins Edward E. Smyth Robert L. Williams Willard Flanagan Gary L. Riddle Ritchie Petroleum Corporation Charity Gas, Inc. Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Assignment Assignment Assignment Assignment Assignment Assignment Assignment Assignment Assignment Name Change	0046/0139 0059/0453 0069/0153 0110/0027 0112/0226 0114/0494 0193/0581 0245/0796 0222/0739 0258/0439 Exhibit 1
<u>Violet Ogden Lease</u> Violet Ogden Annie B. Haymond Eastern American Energy Corporation Energy Corporation of America Antero Resources Appalachian Corporation	Annie B. Haymond Eastern American Energy Corporation Energy Corporation of America Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Assignment Assignment Name Change	0211/0670 0217/0383 0250/0393 0257/0377 Exhibit 1
<u>Rosann Conley, et ux Lease</u> Rosann Conley, et ux	Antero Resources Corporation	1/8+	0263/0757
<u>Waco Oil &amp; Gas Company Lease</u> Waco Oil & Gas Co., Inc.	Antero Resources Corporation	1/8+	0299/0172
<u>Waco Oil &amp; Gas Company Lease</u> Waco Oil & Gas Co., Inc.	Antero Resources Corporation	1/8+	0299/0172

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\*\*CONTINUED ON NEXT PAGE\*\*

08/04/2017



JUN 15 2017

WW-6A1  
(5/13)

Operator's Well No. Western Unit 3H

**API# 47-085-10295 PERMIT MODIFICATION**

WV Department of  
Environmental Protection

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)**

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Richard Barnard Lease</u>	Richard H. Barnard	Antero Resources Corporation	1/8+	0300/0156

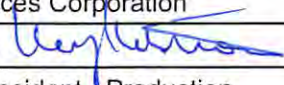
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**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

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

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: Kevin Kilstrom   
 Its: Senior Vice President - Production



LATITUDE 39°20'00"

5,642'

1,014' TO BOTTOM HOLE  
LATITUDE 39°17'30"

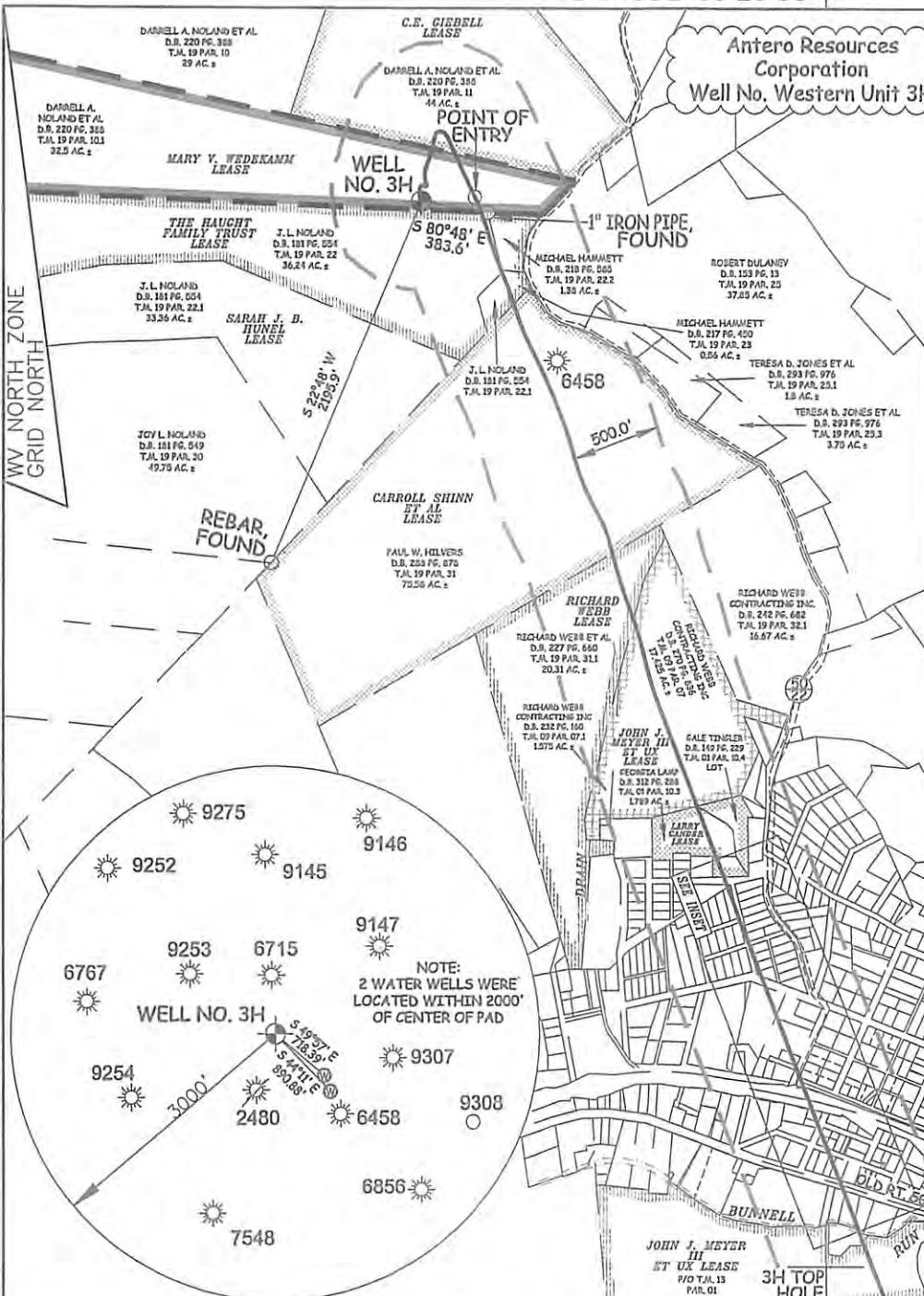
Antero Resources Corporation  
Well No. Western Unit 3H

(NAD) 27 (UTM) ZONE 17 COORDS:  
WELL 3H TOP HOLE INFORMATION:  
N: 14,270,750ft E: 1,646,565ft  
POINT OF ENTRY INFORMATION:  
N: 14,270,779ft E: 1,646,867ft  
BOTTOM HOLE INFORMATION:  
N: 14,259,967ft E: 1,651,196ft

LONGITUDE 80°57'30"

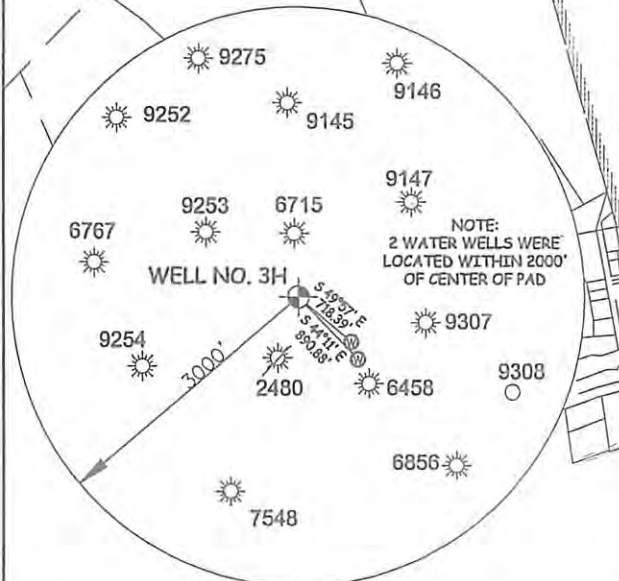
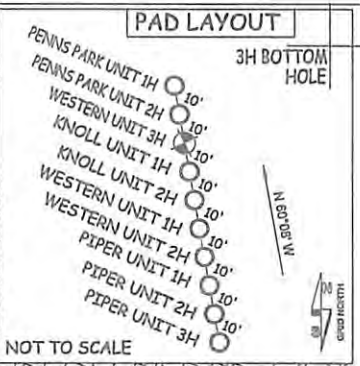
12,559'

LONGITUDE 80°57'30"



NOTES:  
WELL 3H TOP HOLE INFORMATION:  
N: 294,401ft E: 1,581,665ft  
LAT: 39°17'55.88" LON: 80°58'41.77"  
BOTTOM HOLE INFORMATION:  
N: 283,538ft E: 1,586,117ft  
LAT: 39°16'09.24" LON: 80°57'42.89"  
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

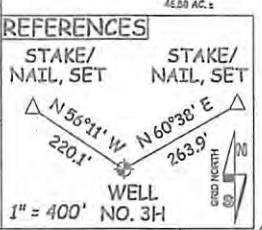
(NAD) 83 (UTM) ZONE 17 COORDS:  
WELL 3H TOP HOLE INFORMATION:  
N: 4,349,951m E: 501,888m  
BOTTOM HOLE INFORMATION:  
N: 4,346,664m E: 503,300m



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 PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WILLOW LAND SURVEYING PLLC  
220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415



47 - 085 - 10295  
STATE COUNTY PERMIT

1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER HUMAN CATTLE OR POULTRY INDEMNITY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.  
2. THIS WELL BORE IS SUBJECT TO THAT 60 FOOT STRIP OF GROUND KNOWN AS THE OLD NORTHWESTERN TURNPIKE.

JOB # 16-022WA  
DRAWING # WESTERN3HR  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND  
--- Surface Owner Boundary Lines +/-  
--- Interior Surface Tracts +/-  
⊕ Found monument, as noted  
--- 500' Wellbore Offset  
⊙ As Drilled Well Path  
THOMAS SUMMERS P.S. 2109  
DATE 06/01/17  
OPERATOR'S WELL# WESTERN UNIT #3H

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
LOCATION: ELEVATION 1,143' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER  
QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE  
SURFACE OWNER DARRELL A. NOLAND ET AL ACREAGE 32.5 ACRES +/-  
OIL & GAS ROYALTY OWNER SEE ATTACHED PAGES FOR LEASE INFORMATION  
LEASE ACREAGE SEE ATTACHED PAGES FOR LEASE ACREAGES  
PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  
PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BHL  PLUG & ABANDON  CLEAN OUT & REPLUG   
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,500' TVD 19,600' MD  
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD  
DENVER, CO 80202 CHARLESTON, WV 25313

08/04/2017



LATITUDE 39°20'00"

5,642'

1,014' TO BOTTOM HOLE  
LATITUDE 39°17'30"

LONGITUDE 80°57'30"

12,559'

LONGITUDE 80°57'30"

COUNTY NAME

PERMIT

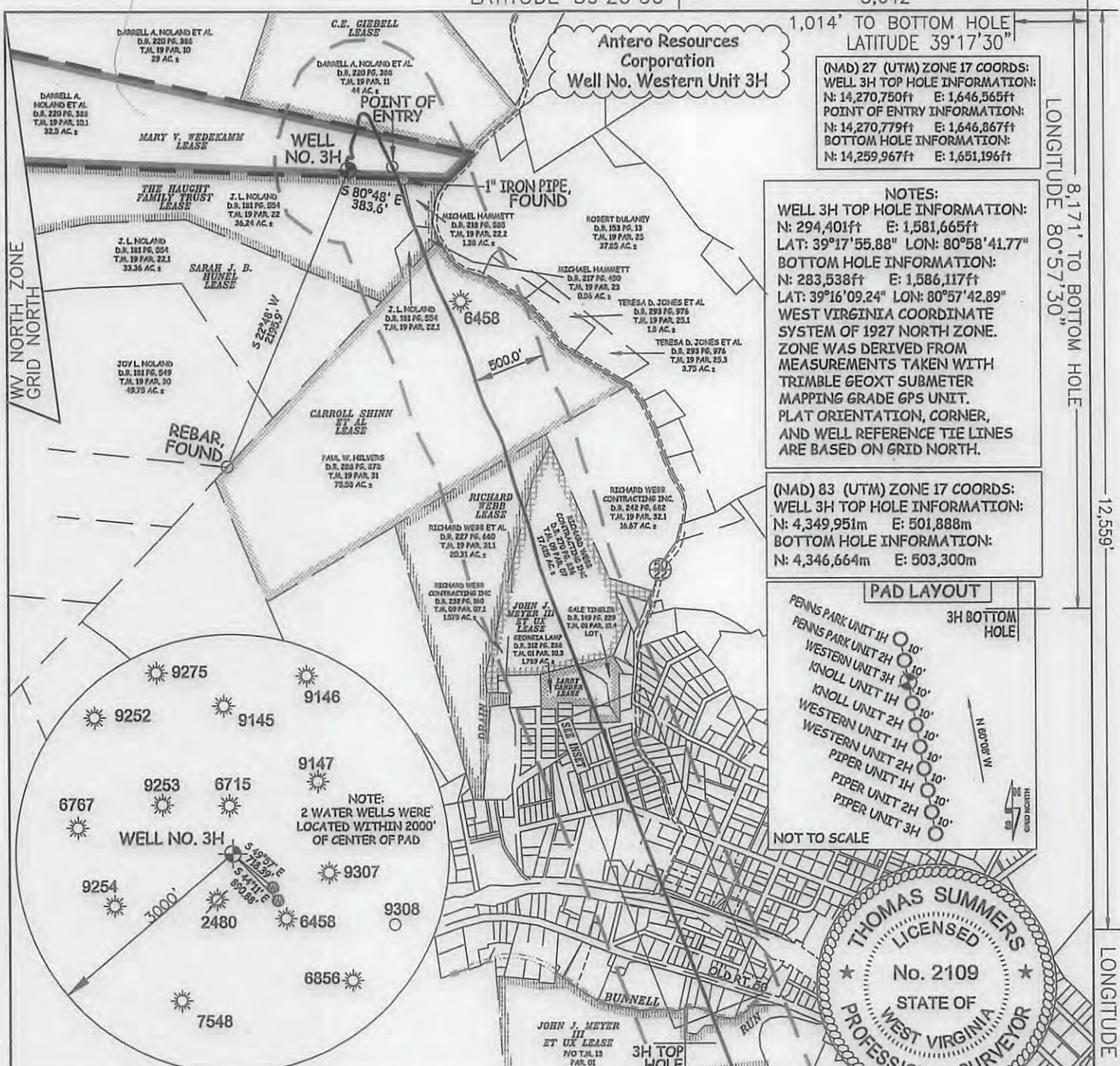
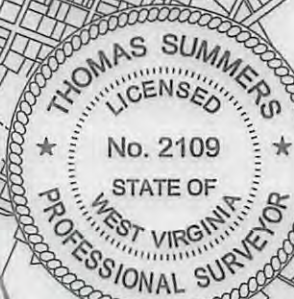
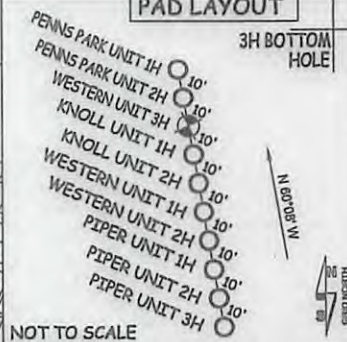
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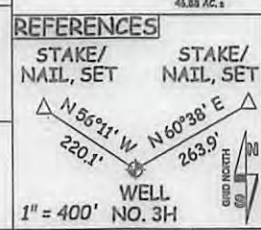
PAD LAYOUT



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47 - 085 - 10295  
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JOB # 16-022WA  
DRAWING # WESTERN3HR  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND  
--- Surface Owner Boundary Lines +/-  
--- Interior Surface Tracts +/-  
⊕ Found monument, as noted  
--- 500' Wellbore Offset  
○ As Drilled Well Path  
THOMAS SUMMERS P.S. 2109  
DATE 06/01/17  
OPERATOR'S WELL# WESTERN UNIT #3H

WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
(IF "GAS") PRODUCTION X STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X  
LOCATION: ELEVATION 1,143' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER  
QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE  
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08/04/2017



Antero Resources Corporation  
Well No. Western Unit 3H

**INSET**

WV NORTH ZONE  
GRID NORTH

Oil & Gas Royalty Owner	T.M.-Par.
A Larry Gander	1-10.5
B City of Pennsboro	1-34.1
C Larry Gander	1-33
D Paul D. Carman	1-42
E Gale Tingler	1-34
F Matthew H. Rial	1-43
G Gail B. Coqar Et Ux	1-44
H Jefferson Boylen Et Ux	1-53
I Gail B. Coqar Et Ux	1-54
J Deward Richards	1-52
K Steven Hammond	1-62
L Steven Hammond	1-63
M Gail B. Coqar Et Ux	1-63.1
N Gail B. Coqar Et Ux	1-64
O WB Properties LLC	1-65
P WB Properties LLC	1-59
Q WB Properties LLC	1-60
S George Allen	4-13
T Jay Bee Production Co.	4-51
U David A. Poling	4-52
V David A. Poling	4-54
W Presbyterian Church of Pennsboro	4-53
X John K. Schaffer Et Ux	4-110
Y John K. Schaffer Et Ux	4-111
Z John K. Schaffer Et Ux	4-115
AA Margaret Michels	4-118
AB Gary A. McDaniels	4-119
AC Gary A. McDaniels	4-120
AD Paul Dodd	4-123

EXCLUDED MINERAL

Oil & Gas Royalty Owner	T.M.-Par.
AE Charlene R. Sweeney	4-121
AF Charlene R. Sweeney	4-124.1
AG Charlene R. Sweeney	4-124
AH Stephen S. Taylor	4-214.1
AI Stephen S. Taylor	4-214
AJ Charles E. Demaree Et Ux	4-215
AK Pennsboro Vol. Fire Dept.	4-106
AL Pennsboro Vol. Fire Dept.	4-216
AM Pennsboro Vol. Fire Dept.	4-217
AN Anne E. Robinson	4-220.1
AO Popcorn Properties LLC	4-221
AP Popcorn Properties LLC	4-222
AQ Willow Land Surveying PLLC	4-220
AR Ritchie Petroleum Corporation, Inc.	4-223
AS Frederick Humphrey Et Ux	4-224
AT Frederick Humphrey Et Ux	4-225
AU Union Bank	4-226
AV Union Bank	4-228
AW Union Bank	4-227
AX Union Bank	4-229
AY Biff Spitz	4-287
AZ Teresa Poling Et Al	4-288
BA Harmony Lodge	4-289
BB Ritchie Petroleum Corporation, Inc.	4-291
BC Ritchie Petroleum Corporation, Inc.	4-292
BD Marjorie C. Mahaney	4-300
BE L & M Investment Co.	4-293
BF Matthew J. Washington Et Ux	4-295
BG Bobbie Riffle Et Al	4-296
BH Consumer Gas Utility Co.	4-305
BI Freda Mossor Et Al	4-294
BJ Charlene R. Sweeney	4-295
BK Charlene R. Sweeney	4-296
BL Board of Education	4-305
BM Board of Education	4-294



**WILLOW**  
LAND SURVEYING PLLC

P.O. BOX 17  
PENNSBORO, WV 26415  
304-659-1717

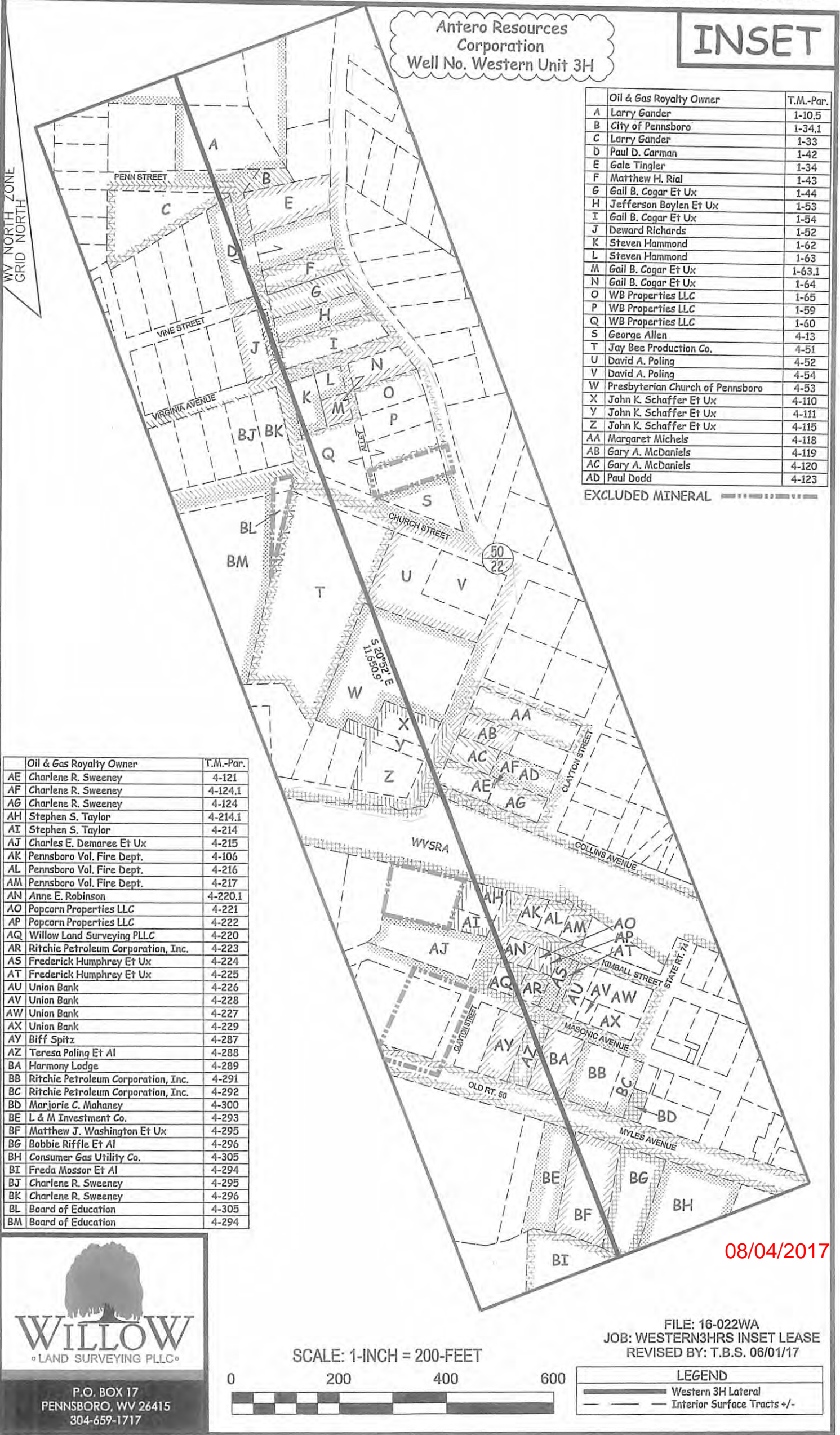
SCALE: 1-INCH = 200-FEET



LEGEND	
	Western 3H Lateral
	Interior Surface Tracts +/-

08/04/2017

FILE: 16-022WA  
JOB: WESTERN3HRS INSET LEASE  
REVISED BY: T.B.S. 06/01/17





Antero Resources Corporation  
Well No. Western Unit 3H

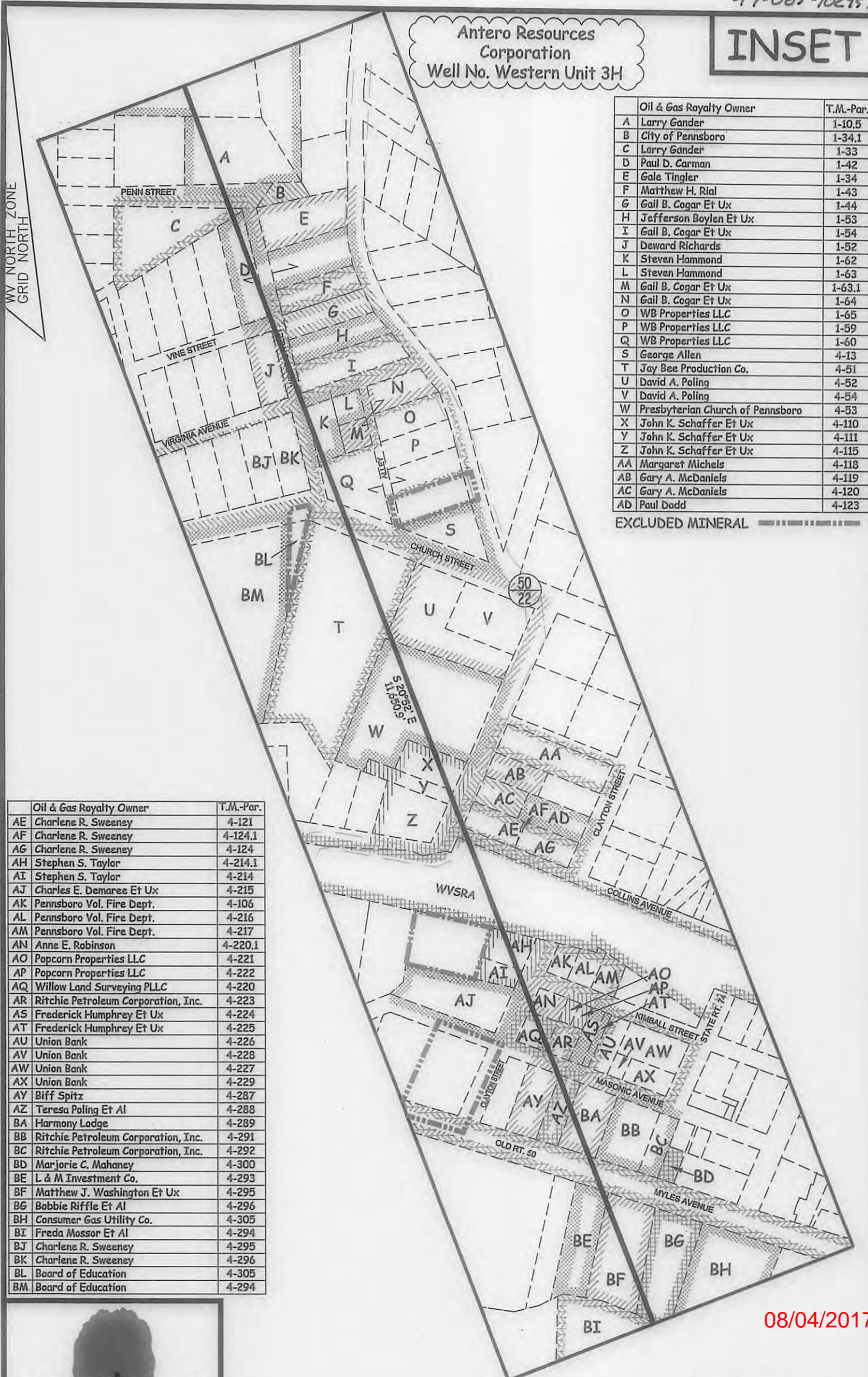
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08/04/2017



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FILE: 16-022WA  
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