

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47-085-10098 County Ritchie District Clay  
Quad Pennsboro 7.5' Pad Name Noland Pad Field/Pool Name -----  
Farm name Darrell A. Noland, et al Well Number Knoll Unit 1H  
Operator (as registered with the OOG) Antero Resources Corporation  
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4349950m Easting 501891m  
Landing Point of Curve Northing 4350217.12m Easting 502124.10m  
Bottom Hole Northing 4352108m Easting 501350m

Elevation (ft) 1143' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
Air - Foam & 4% KCL  
Mud - Polymer

Date permit issued 6/24/2014 Date drilling commenced 4/8/2015 Date drilling ceased 7/2/2015  
Date completion activities began 4/4/2016 Date completion activities ceased 5/13/2016  
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Received  
Office of Oil & Gas  
JUL 18 2016

Freshwater depth(s) ft 124', 216' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft None Identified Void(s) encountered (Y/N) depths N  
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths N

**APPROVED**  
NAME: Michael Loff  
DATE: 12-21-2016

Reviewed by: \_\_\_\_\_

API 47-085 - 10098 Farm name Darrell A. Noland, et al Well number Knoll Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	28"	20"	40'	New	94#/J-55	N/A	Y
Surface	17-1/2"	13-3/8"	560'	New	48#/H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2521'	New	36#/J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	13,878'	New	20#/P-110	N/A	Y
Tubing		2-3/8"	6888'		4.7#/N-80		
Packer type and depth set		N/A					

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	150 sx	15.6	1.18	38 Cu. Ft.	0'	8 Hrs.
Surface	Class A	665 sx	15.6	1.18	403 Cu. Ft.	0'	8 Hrs.
Coal							
Intermediate 1	Class A	975 sx	15.6	1.18	781 Cu. Ft.	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	925 sx (Lead), 1174 sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.30 (Lead), 1.86 (Tail)	2544 Cu. Ft.	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 13594' MD, 6384' TVD (BHL), 6416' TVD (Deepest Point Drilled) Loggers TD (ft) 13,829' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5902'

Check all wireline logs run  caliper  density  deviated/directional  induction  neutron  resistivity  gamma ray  temperature

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

Conductor - 0  
Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface  
Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface  
Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED N/A

\*\* This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Penns Park Unit 2H API# 47-085-10100). Please reference the wireline logs submitted with Form WR-35 for the Penns Park Unit 2H. A Cement Bond Log has been included with this submittal.

Received  
Office of Oil & Gas  
JUL 18 2016



API 47- 085 - 10098 Farm name Darrell A. Noland, et al Well number Knoll Unit 1H

PRODUCING FORMATION(S)	DEPTHS			
	6393' (Top)	TVD	6996' (Top)	MD
Marcellus				

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 7585 mcfpd Oil 150 bpd NGL --- bpd Water 600 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
			<b>SEE ATTACHED EXHIBIT 3</b>		

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company, LP  
Address 2640 Reach Road City Williamsport State PA Zip 17701

Logging Company Rush Wellsite Services  
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Nabors Completion & Production Services, Co. (bought Superior)  
Address 1650 Hackers Creeks City Jane Lew State WV Zip 26378

Stimulating Company US Well Services  
Address 533 Industrial Park Drive City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Natalie Komp Telephone 303-357-6820  
Signature  Title Permitting Agent Date 7/12/2016

Received  
Office of Oil & Gas  
JUL 18 2016

API 47-085-10098 Farm Name Darrell A. Noland, et al Well Number Knoll Unit 1H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	4-Apr-16	13,619	13,788	60	Marcellus
2	5-Apr-16	13,418	13,587	60	Marcellus
3	5-Apr-16	13,217	13,386	60	Marcellus
4	5-Apr-16	13,016	13,185	60	Marcellus
5	5-Apr-16	12,815	12,984	60	Marcellus
6	6-Apr-16	12,614	12,783	60	Marcellus
7	6-Apr-16	12,413	12,582	60	Marcellus
8	6-Apr-16	12,212	12,381	60	Marcellus
9	6-Apr-16	12,011	12,180	60	Marcellus
10	7-Apr-16	11,810	11,979	60	Marcellus
11	7-Apr-16	11,609	11,778	60	Marcellus
12	8-Apr-16	11,408	11,577	60	Marcellus
13	8-Apr-16	11,207	11,376	60	Marcellus
14	9-Apr-16	11,006	11,175	60	Marcellus
15	9-Apr-16	10,805	10,974	60	Marcellus
16	9-Apr-16	10,604	10,773	60	Marcellus
17	9-Apr-16	10,403	10,572	60	Marcellus
18	10-Apr-16	10,202	10,371	60	Marcellus
19	10-Apr-16	10,001	10,170	60	Marcellus
20	10-Apr-16	9,800	9,969	60	Marcellus
21	10-Apr-16	9,599	9,768	60	Marcellus
22	11-Apr-16	9,398	9,567	60	Marcellus
23	11-Apr-16	9,197	9,366	60	Marcellus
24	12-Apr-16	8,996	9,165	60	Marcellus
25	12-Apr-16	8,795	8,964	60	Marcellus
26	12-Apr-16	8,594	8,763	60	Marcellus
27	12-Apr-16	8,393	8,562	60	Marcellus
28	13-Apr-16	8,192	8,361	60	Marcellus
29	13-Apr-16	7,991	8,160	60	Marcellus
30	13-Apr-16	7,790	7,959	60	Marcellus
31	13-Apr-16	7,589	7,758	60	Marcellus
32	14-Apr-16	7,388	7,557	60	Marcellus
33	14-Apr-16	7,187	7,356	60	Marcellus
34	14-Apr-16	6,986	7,155	60	Marcellus

Received  
Office of Oil & Gas

JUL 18 2016

API 47-085-10098 Farm Name Darrell A. Noland, et al Well Number Knoll Unit 1H

**EXHIBIT 2**

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	4-Apr-16	71.0	6,981	5,675	4,436	306,910	8,027	N/A
2	5-Apr-16	72.0	6,711	5,618	4,939	306,970	7,998	N/A
3	5-Apr-16	72.6	6,758	6,000	4,387	307,020	7,991	N/A
4	5-Apr-16	73.8	6,828	5,708	5,167	307,700	7,975	N/A
5	5-Apr-16	70.0	6,800	5,853	4,743	305,660	7,927	N/A
6	6-Apr-16	73.0	6,922	5,780	4,879	305,410	7,940	N/A
7	6-Apr-16	71.7	6,756	5,642	4,106	305,450	7,879	N/A
8	6-Apr-16	72.0	6,552	5,608	3,993	306,050	7,899	N/A
9	6-Apr-16	76.0	6,730	6,702	3,324	305,080	8,607	N/A
10	7-Apr-16	73.0	6,460	6,158	4,066	306,390	7,872	N/A
11	7-Apr-16	74.9	6,733	6,541	3,586	305,290	8,032	N/A
12	8-Apr-16	73.9	6,477	6,339	4,648	305,390	7,819	N/A
13	8-Apr-16	74.0	6,575	6,191	4,504	305,350	7,814	N/A
14	9-Apr-16	74.0	6,651	5,927	4,268	305,000	7,803	N/A
15	9-Apr-16	74.7	6,630	5,519	4,509	305,440	7,770	N/A
16	9-Apr-16	72.8	6,830	5,707	4,467	262,140	8,543	N/A
17	9-Apr-16	74.0	6,856	5,830	3,917	305,280	7,811	N/A
18	10-Apr-16	74.0	6,816	5,574	4,634	300,140	8,706	N/A
19	10-Apr-16	74.0	6,641	5,646	4,709	266,530	8,423	N/A
20	10-Apr-16	73.7	6,715	5,494	4,300	303,780	8,659	N/A
21	10-Apr-16	74.0	6,799	5,829	4,798	299,540	8,810	N/A
22	11-Apr-16	76.1	6,529	5,522	4,861	305,670	8,006	N/A
23	11-Apr-16	70.8	6,067	6,635	4,817	225,220	9,114	N/A
24	12-Apr-16	75.0	6,442	6,522	4,996	305,700	9,046	N/A
25	12-Apr-16	76.3	6,329	7,118	4,822	305,630	7,639	N/A
26	12-Apr-16	75.3	6,369	6,552	5,103	306,020	8,623	N/A
27	12-Apr-16	71.9	6,224	5,376	4,323	305,650	7,701	N/A
28	13-Apr-16	75.3	6,526	7,146	4,203	310,110	8,236	N/A
29	13-Apr-16	75.8	6,305	6,249	4,379	305,210	7,644	N/A
30	13-Apr-16	75.8	6,244	6,772	3,600	306,190	7,643	N/A
31	13-Apr-16	72.8	6,278	6,856	3,880	306,000	7,637	N/A
32	14-Apr-16	72.4	6,216	6,891	3,889	306,040	7,552	N/A
33	14-Apr-16	76.5	5,997	5,757	4,874	305,560	7,551	N/A
34	14-Apr-16	77.5	6,155	6,472	4,328	305,450	7,575	N/A
	<b>AVG=</b>	<b>73.8</b>	<b>6,556</b>	<b>6,094</b>	<b>4,425</b>	<b>10,224,970</b>	<b>274,272</b>	<b>TOTAL</b>

Received  
Office of Oil & Gas

JUL 18 2016

**EXHIBIT 3**

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Fresh Water	124	N/A	124	N/A
Fresh Water	216	N/A	216	N/A
Siltstone/Sandstone	0	139	0	139
Sandstone	139	219	139	219
Shale	219	359	219	359
Siltstone/Shale	359	399	359	399
Trace Coal	399	659	399	659
Siltstone	659	699	659	699
Sandstone	699	739	699	739
Siltstone/Shale	739	759	739	759
Sandstone	759	779	759	779
Shale/Limestone	779	819	779	819
Siltstone	819	879	819	879
Shale	879	959	879	959
Shale	959	999	959	999
Shale/Limestone	999	1,259	999	1,259
Siltstone/Shale	1,259	1,359	1,259	1,359
Sandstone	1,359	1,579	1,359	1,579
Sandstone	1,579	2,033	1,579	2,035
Big Lime	2,033	2,882	2,035	2,884
Fifty Foot Sandstone	2,882	3,019	2,884	3,021
Gordon	3,019	3,401	3,021	3,403
Fifth Sandstone	3,401	3,474	3,403	3,476
Bayard	3,474	3,967	3,476	3,969
Speechley	3,967	4,220	3,969	4,224
Baltown	4,220	4,671	4,224	4,690
Bradford	4,671	5,023	4,690	5,077
Benson	5,023	5,242	5,077	5,326
Alexander	5,242	6,157	5,326	6,428
Sycamore	6,157	6,253	6,428	6,576
Middlesex	6,253	6,352	6,576	6,798
Burkett	6,352	6,378	6,798	6,896
Tully	6,378	6,393	6,896	6,996
Marcellus	6,393	NA	6,996	NA

Received  
Office of Oil & Gas  
JUL 18 2016

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	4/4/2016
Job End Date	4/14/2016
State	West Virginia
County	Ritchie
API Number	47-085-10098-00-00
Operator Name	Antero Resources Corporation
Well Name and Number	Knoll 1H
Latitude	39.29892390
Longitude	-80.97806470
Datum	NAD83
Federal Well	NO
Indian Well	NO
True Vertical Depth	6,417
Total Base Water Volume (gal)	11,932,170
Total Base Non Water Volume	0



**Frac Focus**  
Chemical Disclosure Registry



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Antero Resources	Base Fluid					
Sand	J S Well Services, LLC	Proppant	Water	7732-18-5	100.00000	86.60022	
HCL Acid (12.6%-18.0%)	J S Well Services, LLC	Bulk Acid	Crystalline Silica, quartz	14808-60-7	100.00000	13.00710	
LGC-15	J.S. Well Services	Gelling Agents	Water	7732-18-5	87.50000	0.13005	
			Hydrogen Chloride	7647-01-0	18.00000	0.03107	
			Guar Gum	9000-30-0	50.00000	0.06552	
			Petroleum Distillates	64742-47-8	60.00000	0.06205	
			Suspending agent (solid)	14808-60-7	3.00000	0.01002	
			Surfactant	68439-51-0	3.00000	0.00393	
WFRA-405	J S. Well Services	Friction Reducer	Water	7732-18-5	60.00000	0.03253	
			2-Propanoic acid, polymer with propenamide	29003-06-9	30.00000	0.01626	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01309	

Received  
Oil & Gas



SI-1100	U.S. Well Services	Scale Inhibitor	Ethoxylated alcohol blend	68002-97-1	4.00000	0.00217
			Water	7732-18-5	80.00000	0.00964
			Ethylene Glycol	107-21-1	25.00000	0.00341
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00142
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00122
			Hexamethylene tramine penta (methylene phosphonic acid)	84690-00-1	5.00000	0.00078
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00078
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00031
K-BAC 1020	U.S. Well Services	Anti-Bacterial Agent				
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00389
			Deionized Water	7732-18-5	28.00000	0.00222
AP One	U.S. Well Services	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00197
AI-302	U.S. Well Services	Acid Corrosion Inhibitors				
			Water	7732-18-5	95.00000	0.00028
			2-Propyn-1-ol compound with methylloxirane	38172-91-7	15.00000	0.00004

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water  
 \*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.  
 Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)



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

July 13, 2016

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

Mr. Kearney:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report) and corresponding logs for the following well:

- Knoll Unit 1H (API# 47-085-10098) – Noland Pad
- Knoll Unit 2H (API# 47-085-10181) – Noland Pad
- Penns Park Unit 1H (API# 47-085-10099) – Noland Pad
- Penns Park Unit 2H (API# 47-085-02182) – Noland Pad
- Owo Unit 1H (API# 47-095-02179) – Coastal 1 Pad
- Owo Unit 2H (API# 47-095-02180) – Coastal 1 Pad
- James Gray Unit 1H (API# 47-095-02187) – Coastal 1 Pad

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

Sincerely,

Natalie Komp  
Permitting Agent  
Antero Resources Corporation

Enclosures

Received  
Office of Oil & Gas  
JUL 18 2016

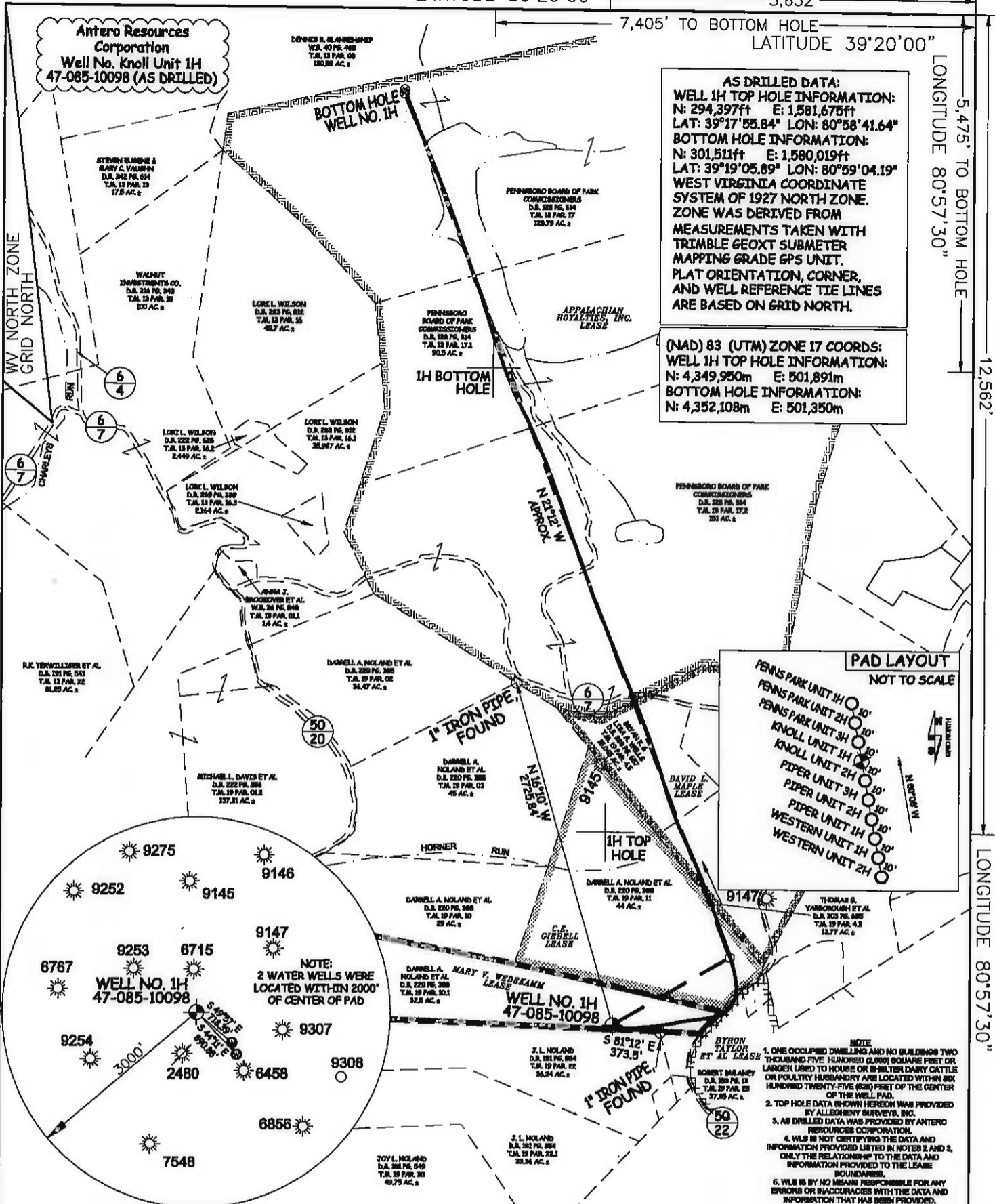
LATITUDE 39°20'00"

LATITUDE 39°20'00"

LONGITUDE 80°57'30"

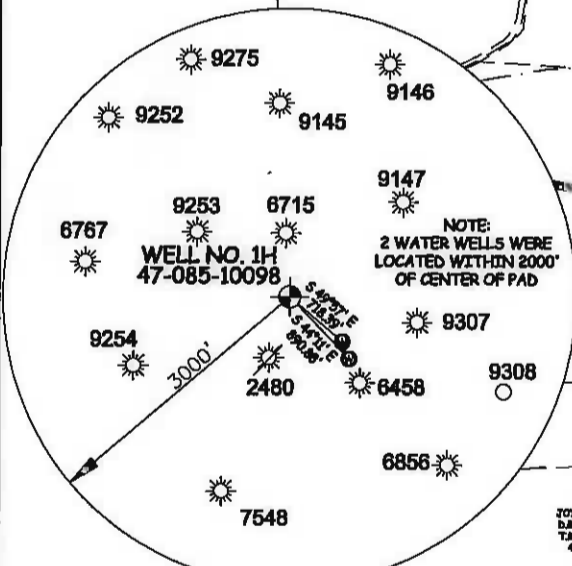
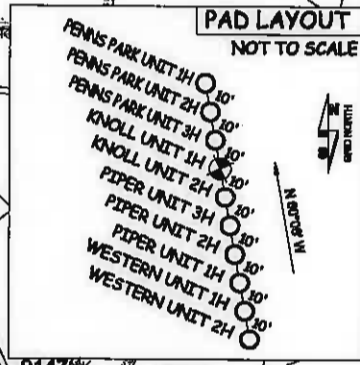
12,562'

LONGITUDE 80°57'30"




**AS DRILLED DATA:**  
**WELL 1H TOP HOLE INFORMATION:**  
 N: 294,397ft E: 1,581,675ft  
 LAT: 39°17'55.84" LON: 80°58'41.64"  
**BOTTOM HOLE INFORMATION:**  
 N: 301,511ft E: 1,580,019ft  
 LAT: 39°19'05.89" LON: 80°59'04.19"  
 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 1H TOP HOLE INFORMATION:**  
 N: 4,349,950m E: 501,891m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,352,108m E: 501,350m



NOTE:  
 2 WATER WELLS WERE LOCATED WITHIN 2000' OF CENTER OF PAD

- NOTE
1. ONE OCCUPIED DWELLING AND NO BUILDINGS TWO THOUSAND FIVE HUNDRED (2000) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN 800 HUNDRED TWENTY-FIVE (800) FEET OF THE CENTER OF THE WELL PAD.
  2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
  3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
  4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3. ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
  5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

JOB # 14-003WA DRAWING # KNOLL1HAD SCALE 1" = 1000' MINIMUM DEGREE OF ACCURACY SUBMETER PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS			STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS WILLOW LAND SURVEYING PLLC 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415		<b>LEGEND</b> - - - Surface Owner Boundary Lines +/- - - - Interior Surface Tracts +/- X Existing Fence ⊕ Found monument, as noted ○ Proposed Well Path ⊙ As Drilled Well Path
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X LOCATION: ELEVATION 1,159' ORIGINAL - 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 MARY V. WEDEKAMM; BYRON TAYLOR ET AL; C.E. GIBBELL; LEASE ACREAGE 32.5 ACRES; 37.85 ACRES; 44 ACRES; DAVID L. MAPLE; APPALACHIAN ROYALTIES, INC. 54.25 ACRES; 372.5 ACRES;			DATE 09/22/15 OPERATOR'S WELL# KNOLL UNIT 1H API WELL # 47 - 085 - 10098 STATE COUNTY PERMIT		COUNTY NAME PERMIT
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,385' TVD 13,878 MD		WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD DENVER, CO 80202 CHARLESTON, WV 25313			

LATITUDE 39°20'00"

5,632'

7,405' TO BOTTOM HOLE

LATITUDE 39°20'00"

LONGITUDE 80°57'30"

5,475' TO BOTTOM HOLE

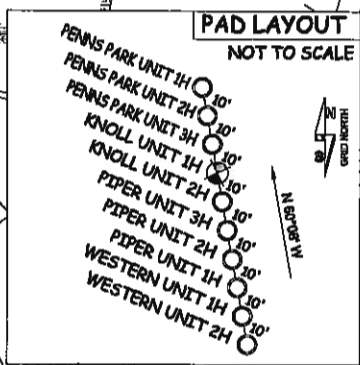
12,562'

LONGITUDE 80°57'30"

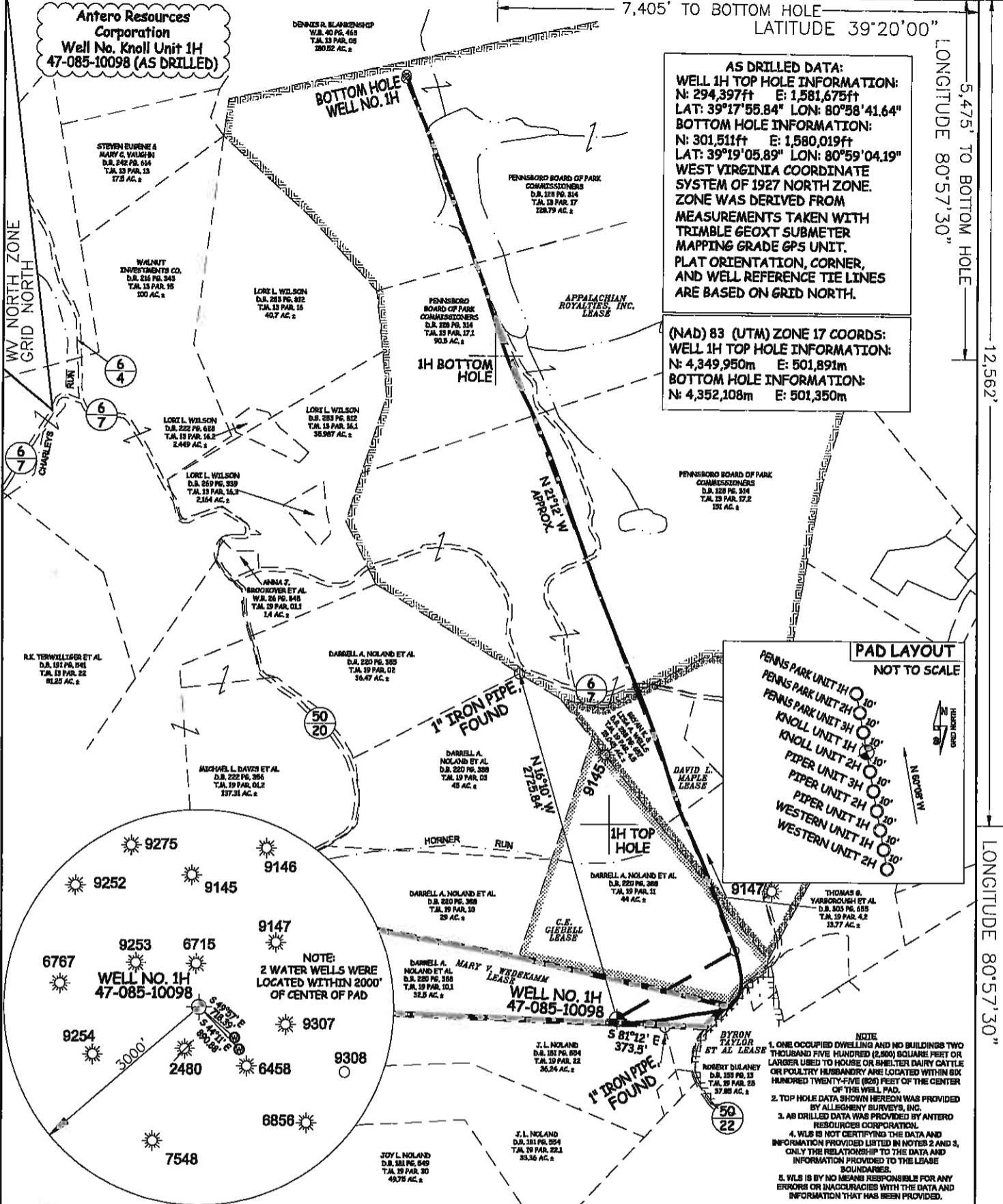
Antero Resources Corporation  
Well No. Knoll Unit 1H  
47-085-10098 (AS DRILLED)

AS DRILLED DATA:  
WELL 1H TOP HOLE INFORMATION:  
N: 294,397ft E: 1,581,675ft  
LAT: 39°17'55.84" LON: 80°58'41.64"  
BOTTOM HOLE INFORMATION:  
N: 301,511ft E: 1,580,019ft  
LAT: 39°19'05.89" LON: 80°59'04.19"  
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 1H TOP HOLE INFORMATION:  
N: 4,349,950m E: 501,891m  
BOTTOM HOLE INFORMATION:  
N: 4,352,108m E: 501,350m



- NOTE: 1. ONE OCCUPIED DWELLING AND NO BUILDINGS TWO THOUSAND FIVE HUNDRED (2,000) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
- 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
- 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
- 4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
- 5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.



WELL NO. 1H  
47-085-10098

NOTE:  
2 WATER WELLS WERE  
LOCATED WITHIN 2000'  
OF CENTER OF PAD

WELL NO. 1H  
47-085-10098

JOB # 14-003WA  
DRAWING # KNOLL1HAD  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WILLOW LAND SURVEYING PLLC  
266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415

LEGEND  
--- Surface Owner Boundary Lines +/-  
--- Interior Surface Tracts +/-  
X Existing Fence  
⊕ Found monument, as noted  
○ Proposed Well Path  
⊗ As Drilled Well Path

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS  
WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
(IF "GAS") PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW   
LOCATION: ELEVATION 1,159' ORIGINAL - 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 MARY V. WEDEKAMM; BYRON TAYLOR ET AL; C.E. GIEBELL; DAVID L. MAPLE; APPALACHIAN ROYALTIES, INC. LEASE ACREAGE 32.5 ACRES +/- 37.85 ACRES +/- 44 ACRES +/- 54.25 ACRES +/- 372.5 ACRES +/-  
PROPOSED WORK: DRILL \_\_\_ CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE \_\_\_  
PLUG OFF OLD FORMATION \_\_\_ PERFORATE NEW FORMATION \_\_\_ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG  
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,385' TVD 13,878 MD  
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313