

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

API 47-085-10079 County Ritchie District Clay
Quad Pullman 7.5' Pad Name Edwin Field/Pool Name ----
Farm name Quimby, Franklin P. Well Number Moats Unit 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop St. 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 4342354m Easting 508388m
Landing Point of Curve Northing 4342126.54m Easting 507901.16m
Bottom Hole Northing 4340391m Easting 508714m

Elevation (ft) 1191' 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 12/30/2013 Date drilling commenced 12/10/2014 Date drilling ceased 9/7/2015
Date completion activities began 10/16/2015 Date completion activities ceased 2/21/2016
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

RECEIVED
Office of Oil and Gas

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

MAY 23 2016

Freshwater depth(s) ft 49' Open mine(s) (Y/N) depths No
Salt water depth(s) ft None Identified Void(s) encountered (Y/N) depths No
Coal depth(s) ft 1287' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

APPROVED

NAME: Michael Laff
DATE: 6/13/16

Reviewed by:

ADG/16/2016
RBDMS 09/16/16

API 47-085 - 10079 Farm name Quimby, Franklin P. Well number Moats 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	30"	20"	40'	New	94# H-40	N/A	Y
Surface	17- 1/2"	13- 3/8"	333'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2557'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	13615'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6950'		4.7# N-80	N/A	
Packer type and depth set		N/A					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	200 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	493 sx	15.6	1.18	231	0'	8 Hrs.
Coal							
Intermediate 1	Class A	1003 sx	15.6	1.18	801	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	953 sx (Lead) 1060 sx (Tail)	13.5 Lead 15.2 Tail	1.30 Lead 1.85 Tail	2648	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 13615' MD, 6646' TVD (BHL), 6647' (Deepest Point Drilled) Loggers TD (ft) 13566'
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6271'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Hornet Unit 1H API #47-085-10062). Please reference the wireline logs submitted with Form WR-35 for Hornet Unit 1H. A Cement Bond Log has been included with this submittal.

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

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 _____

RECEIVED
Office of Oil and Gas

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

MAY 23 2016

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

WV Department of Environmental Protection

API 47- 085 - 10079 Farm name Quimby, Franklin P. Well number Moats Unit 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
*PLEASE SEE ATTACHED EXHIBIT 1					

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbbls)	Amount of Nitrogen/other (units)
*PLEASE SEE ATTACHED EXHIBIT 2								

RECEIVED
Office of Oil and Gas
MAY 23 2016

Please insert additional pages as applicable.

WV Department of
Environmental Protection

09/16/2016

API 47- 085 - 10079 Farm name Quimby, Franklin P. Well number Moats Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6479' (top)</u> TVD	<u>7006' (top)</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

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 10737 mcfpd Oil 88 bpd NGL --- bpd Water 672 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 ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	<u>0</u>		<u>0</u>		

***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company, LP
 Address 2640 Reach Rd. City Williamsport State PA Zip 17701
 Logging Company Rush Wellsite Services
 Address 60 Alpha Dr. City Canonsburg State PA Zip 15317
 Cementing Company Allied Oil & Gas Services, LLC
 Address 1036 East Main St. City Bridgeport State WV Zip 26330
 Stimulating Company US Well Services
 Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26078

RECEIVED
Office of Oil and Gas

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
 Signature *Kara Quackenbush* Title Permit Representative Date 5/13/2016

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry
 WV Department of Environmental Protection
09/16/2016

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	49'	N/A	49'	N/A
Sandy Shale	0	187	0	187
Sandstone	est. 187	447	est. 187	447
Shale/Siltstone	est. 447	647	est. 447	647
Shaley Limestone	est. 647	727	est. 647	727
Shale/Siltstone	est. 727	1127	est. 727	1127
Shaley Limestone	est. 1127	1287	est. 1127	1287
Coal	est. 1287	1307	est. 1287	1307
Shaley Limestone (trace coal)	est. 1307	1627	est. 1307	1627
Shale/Siltstone	est. 1627	1787	est. 1627	1787
Sandstone/Siltstone	est. 1787	1827	est. 1787	1827
Sandstone/Siltstone with trace coal	est. 1827	2007	est. 1827	2007
Silty Sandstone	est. 2007	2160	est. 2007	2162
Big Lime	2160	2258	2162	2260
Big Injun	2258	2659	2260	2661
Gantz Sand	2659	2858	2661	2861
Fifty Foot Sandstone	2858	2659	2861	2922
Gordon	2659	2858	2922	3070
Fifth Sandstone	2858	2918	3070	3213
Bayard	2918	3061	3213	3659
Warren	3061	3199	3659	4116
Speechley	3199	3623	4116	4371
Baltown	3623	4038	4371	4864
Bradford	4038	4266	4864	5279
Benson	4266	4709	5279	5565
Alexander	4709	5081	5565	5804
Elk	5081	5319	5804	6209
Rhinestreet	5319	5536	6209	6542
Sycamore	5536	5918	6542	6729
Middlesex	5918	6215	6729	6892
Burkett	6215	6372	6892	6946
Tully	6372	6479	6946	7006
Marcellus	6479	NA	7006	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

RECEIVED
Office of Oil and Gas

MAY 23 2016

WV Department of
Environmental Protection

09/16/2016

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	17-Jan-16	72.0	7,085	N/A	4,210	237,820	6,339	N/A
2	17-Jan-16	72.0	7,078	5,597	4,948	236,790	6,518	N/A
3	17-Jan-16	70.4	6,886	5,728	5,119	246,620	6,429	N/A
4	17-Jan-16	70.9	6,731	5,598	4,803	247,240	6,402	N/A
5	18-Jan-16	72.0	6,737	5,515	5,249	248,635	6,377	N/A
6	18-Jan-16	71.0	6,866	5,156	4,989	245,280	6,515	N/A
7	18-Jan-16	71.6	6,881	5,385	4,763	248,500	6,356	N/A
8	19-Jan-16	65.5	7,732	5,555	4,233	105,520	6,718	N/A
9	19-Jan-16	66.0	7,434	6,134	4,052	129,210	6,740	N/A
10	20-Jan-16	71.0	7,308	5,509	5,755	238,620	6,950	N/A
11	20-Jan-16	67.0	7,370	5,434	3,744	250,300	7,207	N/A
12	25-Jan-16	59.0	7,805	5,568	6,010	66,650	5,966	N/A
13	31-Jan-16	42.2	8,511	6,955	4,724	9,550	5,134	N/A
14	31-Jan-16	71.2	6,735	6,126	4,336	248,870	6,427	N/A
15	31-Jan-16	72.6	6,485	5,762	4,294	246,910	6,265	N/A
16	1-Feb-16	72.7	6,348	5,400	4,458	249,150	6,290	N/A
17	1-Feb-16	71.1	6,344	5,312	5,156	247,290	6,226	N/A
18	1-Feb-16	64.4	6,263	5,722	5,133	222,250	7,136	N/A
19	1-Feb-16	72.0	6,252	5,370	4,471	227,190	6,317	N/A
20	1-Feb-16	72.0	6,428	5,559	4,307	226,650	6,173	N/A
21	2-Feb-16	73.0	6,437	5,559	5,353	246,010	6,203	N/A
22	2-Feb-16	71.6	6,266	5,085	4,707	247,020	6,184	N/A
23	2-Feb-16	71.7	6,137	4,977	4,327	247,490	6,190	N/A
24	2-Feb-16	71.0	5,972	5,325	3,292	152,300	4,886	N/A
25	3-Feb-16	71.8	5,923	5,113	4,161	246,870	6,188	N/A
26	3-Feb-16	71.2	6,133	5,809	3,759	247,520	6,328	N/A
27	3-Feb-16	71.2	5,884	5,465	4,918	247,350	6,250	N/A
28	3-Feb-16	73.0	6,145	5,595	4,606	246,810	6,532	N/A
29	4-Feb-16	72.0	5,997	4,853	4,930	247,960	6,069	N/A
30	4-Feb-16	72.4	6,043	4,916	5,095	247,370	6,610	N/A
31	4-Feb-16	71.7	5,906	5,580	4,969	247,120	6,101	N/A
32	4-Feb-16	73.0	5,978	5,541	4,961	246,095	6,026	N/A
33	4-Feb-16	72.0	6,079	6,657	4,459	250,710	6,851	N/A
AVG=		69.8	6,611	5,558	4,675	7,299,670	6,330	TOTAL

RECEIVED
Office of Oil and Gas

MAY 23 2016

WV Department of
Environmental Protection

09/16/2016

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	16-Oct-15	13,357	13,524	60	Marcellus
2	17-Jan-16	13,160	13,327	60	Marcellus
3	17-Jan-16	12,963	13,129	60	Marcellus
4	17-Jan-16	12,765	12,932	60	Marcellus
5	18-Jan-16	12,568	12,734	60	Marcellus
6	18-Jan-16	12,370	12,537	60	Marcellus
7	18-Jan-16	12,173	12,339	60	Marcellus
8	19-Jan-16	11,975	12,142	60	Marcellus
9	19-Jan-16	11,778	11,945	60	Marcellus
10	20-Jan-16	11,581	11,747	60	Marcellus
11	20-Jan-16	11,383	11,550	60	Marcellus
12	25-Jan-16	11,186	11,352	60	Marcellus
13	31-Jan-16	10,988	11,155	60	Marcellus
14	31-Jan-16	10,791	10,957	60	Marcellus
15	31-Jan-16	10,593	10,760	60	Marcellus
16	1-Feb-16	10,396	10,563	60	Marcellus
17	1-Feb-16	10,199	10,365	60	Marcellus
18	1-Feb-16	10,001	10,168	60	Marcellus
19	1-Feb-16	9,804	9,970	60	Marcellus
20	1-Feb-16	9,606	9,773	60	Marcellus
21	2-Feb-16	9,409	9,575	60	Marcellus
22	2-Feb-16	9,211	9,378	60	Marcellus
23	2-Feb-16	9,014	9,181	60	Marcellus
24	2-Feb-16	8,817	8,983	60	Marcellus
25	3-Feb-16	8,619	8,786	60	Marcellus
26	3-Feb-16	8,422	8,588	60	Marcellus
27	3-Feb-16	8,224	8,391	60	Marcellus
28	3-Feb-16	8,027	8,193	60	Marcellus
29	4-Feb-16	7,829	7,996	60	Marcellus
30	4-Feb-16	7,632	7,799	60	Marcellus
31	4-Feb-16	7,435	7,601	60	Marcellus
32	4-Feb-16	7,237	7,404	60	Marcellus
33	4-Feb-16	7,040	7,206	60	Marcellus

RECEIVED
Office of Oil and Gas

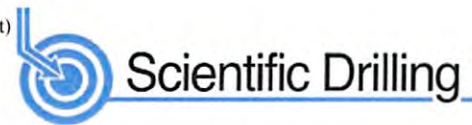
MAY 23 2016

WV Department of
Environmental Protection
09/16/2016



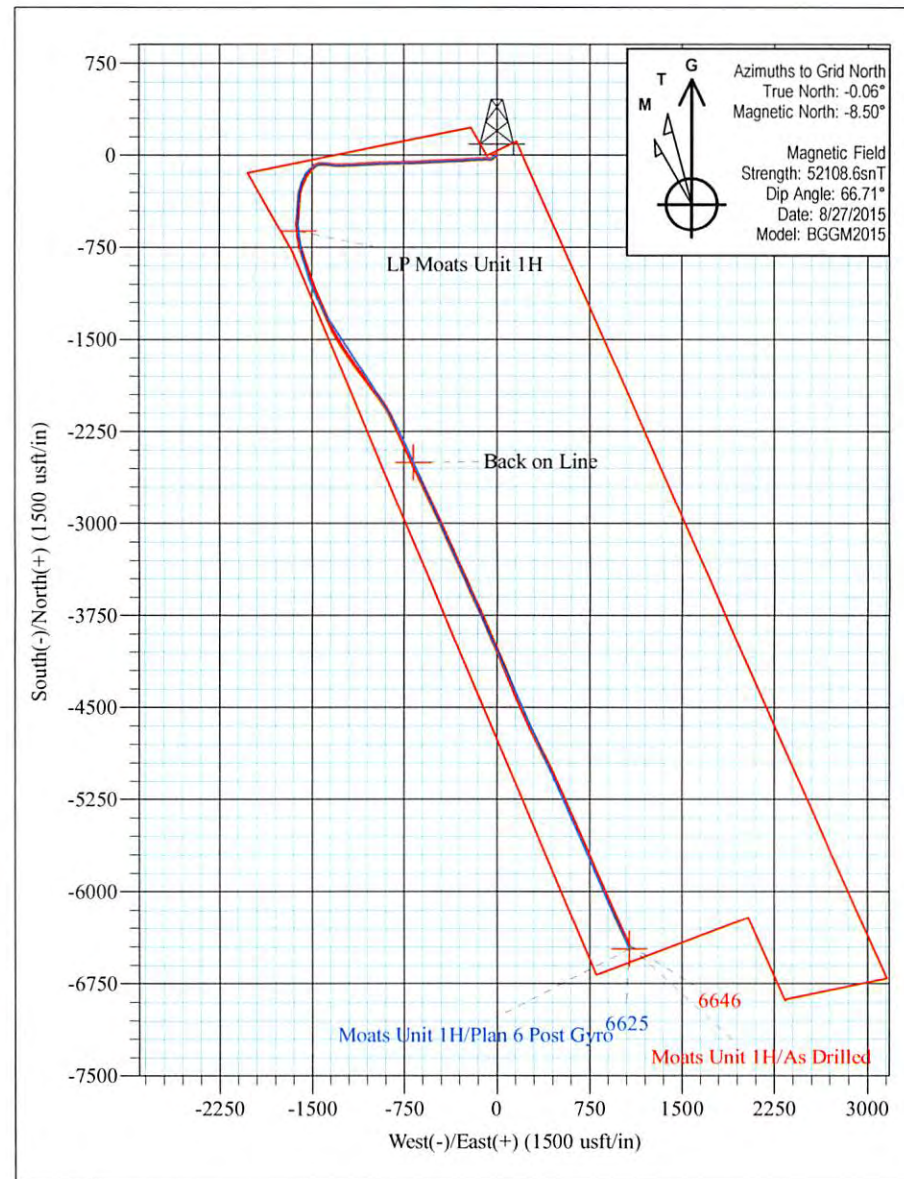
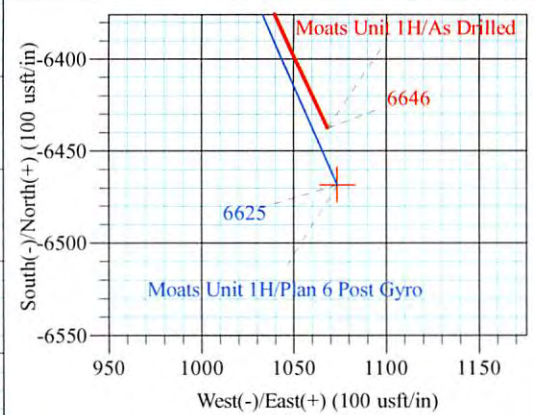
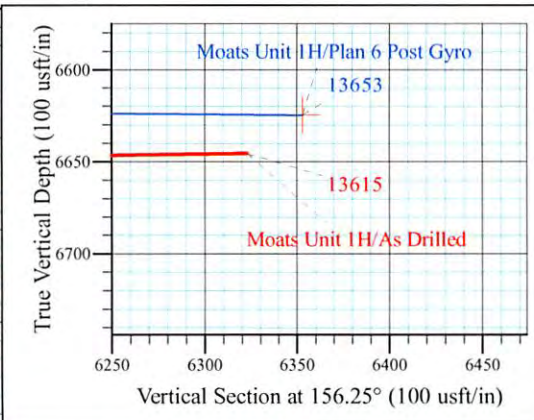
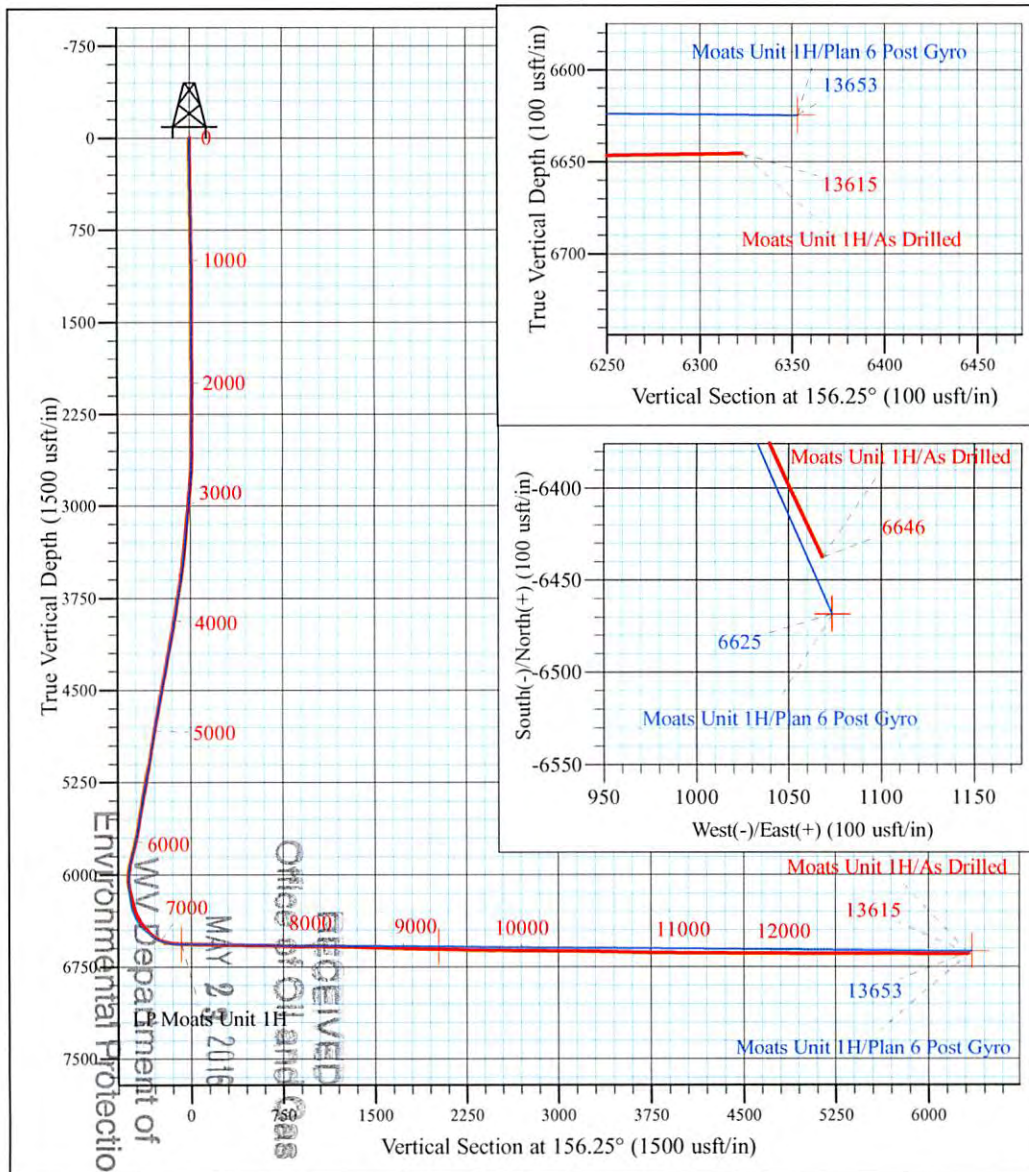
Edwin Pad: Hornet/Miracle/Moats/Myrtle
 Moats Unit 1H
 Plan 6 Post Gyro
 Precision 522: 1191' GL + 18' KB @ 1209.0usft
 Ritchie County WV

PROJECT DETAILS:
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level



WELL DETAILS: **Moats Unit 1H SHL**

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14245825.56	1667886.74	39° 13' 49.293 N	80° 54' 10.776 W



Moats Unit 1H
 Approx. BHL
39° 12' 45.626 N 80° 53' 57.285 W

Shane Rhodes
 13:51, September 09 2015
 Scientific Drilling International
 124 Vista Drive
 Charleroi, PA 15022



Antero

Ritchie County WV
Edwin Pad: Hornet/Miracle/Moats/Myrtle
Moats Unit 1H

Original Wellpath

Design: As Drilled

Standard Survey Report

09 September, 2015



www.scientificdrilling.com

RECEIVED
Office of Oil and Gas
MAY 23 2016
WV Department of
Environmental Protection

09/16/2016



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Project	Ritchie County WV, Ritchie County WV, WV North		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Edwin Pad: Hornet/Miracle/Moats/Myrtle				
Site Position:		Northing:	14,245,885.63 usft	Latitude:	39° 13' 49.887 N
From:	Map	Easting:	1,667,891.73 usft	Longitude:	80° 54' 10.711 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.06 °

Well	Moats Unit 1H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,245,825.56 usft	Latitude:	39° 13' 49.293 N
	+E/-W	0.0 usft	Easting:	1,667,886.74 usft	Longitude:	80° 54' 10.776 W
Position Uncertainty	2.0 usft		Wellhead Elevation:	1,209.0 usft	Ground Level:	1,191.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	8/27/2015	-8.44	66.71	52,109

Design	As Drilled				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	156.25	

Survey Program	Date	9/9/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
105.0	6,116.0	Survey #6 Final Gyro (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
6,209.0	13,615.0	Survey #7 SDI MWD (Original Wellpath)	MWD SDI	MWD - Standard ver 1.0.1	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
105.0	0.38	286.01	105.0	0.1	-0.3	-0.2	0.36	0.00	0.00	
First SDI Gyro @ 105 MD										
130.0	0.47	286.00	130.0	0.1	-0.5	-0.3	0.36	0.36	-0.04	
155.0	0.45	283.67	155.0	0.2	-0.7	-0.5	0.11	-0.08	-9.32	
180.0	0.38	246.13	180.0	0.2	-0.9	-0.5	1.10	0.28	150.16	
205.0	0.18	262.00	205.0	0.1	-1.0	-0.5	0.85	-0.80	63.48	
230.0	0.23	261.37	230.0	0.1	-1.1	-0.6	0.20	0.20	-2.52	
255.0	0.25	264.41	255.0	0.1	-1.2	-0.6	0.09	0.08	12.16	
280.0	0.23	260.60	280.0	0.1	-1.3	-0.6	0.10	-0.08	-15.24	

RECEIVED
Office of Oil and Gas
MAY 23 2016
WV Department of Environmental Protection



Scientific Drilling International
Survey Report



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
305.0	0.21	256.18	305.0	0.1	-1.4	-0.6	0.10	-0.08	-17.68
330.0	0.18	235.60	330.0	0.1	-1.5	-0.6	0.30	-0.12	-82.32
355.0	0.87	241.10	355.0	-0.1	-1.7	-0.6	2.76	2.76	22.00
380.0	1.46	239.42	380.0	-0.3	-2.1	-0.6	2.36	2.36	-6.72
405.0	2.16	236.05	405.0	-0.7	-2.8	-0.4	2.83	2.80	-13.48
430.0	2.79	233.99	430.0	-1.4	-3.6	-0.2	2.54	2.52	-8.24
455.0	3.45	233.32	454.9	-2.2	-4.7	0.1	2.64	2.64	-2.68
480.0	3.68	233.03	479.9	-3.1	-6.0	0.4	0.92	0.92	-1.16
505.0	4.02	231.79	504.8	-4.1	-7.3	0.8	1.40	1.36	-4.96
530.0	4.42	229.04	529.7	-5.3	-8.7	1.3	1.79	1.60	-11.00
555.0	4.54	229.81	554.7	-6.6	-10.2	1.9	0.54	0.48	3.08
580.0	4.48	229.36	579.6	-7.8	-11.7	2.5	0.28	-0.24	-1.80
605.0	4.58	229.32	604.5	-9.1	-13.2	3.0	0.40	0.40	-0.16
630.0	4.51	228.92	629.4	-10.4	-14.7	3.6	0.31	-0.28	-1.60
655.0	4.59	229.26	654.4	-11.7	-16.2	4.2	0.34	0.32	1.36
680.0	4.56	229.27	679.3	-13.0	-17.7	4.8	0.12	-0.12	0.04
705.0	4.51	229.12	704.2	-14.3	-19.2	5.4	0.21	-0.20	-0.60
730.0	4.39	228.43	729.1	-15.6	-20.7	5.9	0.53	-0.48	-2.76
755.0	4.32	228.71	754.0	-16.8	-22.1	6.5	0.29	-0.28	1.12
780.0	4.07	228.39	779.0	-18.1	-23.5	7.1	1.00	-1.00	-1.28
805.0	3.53	227.85	803.9	-19.2	-24.7	7.6	2.16	-2.16	-2.16
830.0	3.59	228.54	828.9	-20.2	-25.9	8.1	0.29	0.24	2.76
855.0	3.27	229.00	853.8	-21.2	-27.0	8.5	1.28	-1.28	1.84
880.0	3.03	230.55	878.8	-22.1	-28.0	8.9	1.02	-0.96	6.20
905.0	2.91	232.13	903.8	-22.9	-29.0	9.2	0.58	-0.48	6.32
930.0	2.84	230.95	928.7	-23.7	-30.0	9.6	0.37	-0.28	-4.72
955.0	2.73	232.72	953.7	-24.4	-31.0	9.9	0.56	-0.44	7.08
980.0	2.60	233.53	978.7	-25.1	-31.9	10.1	0.54	-0.52	3.24
1,005.0	2.51	233.49	1,003.6	-25.8	-32.8	10.4	0.36	-0.36	-0.16
1,030.0	2.34	235.24	1,028.6	-26.4	-33.7	10.6	0.74	-0.68	7.00
1,055.0	2.26	235.15	1,053.6	-27.0	-34.5	10.8	0.32	-0.32	-0.36
1,080.0	2.07	236.56	1,078.6	-27.5	-35.3	11.0	0.79	-0.76	5.64
1,105.0	1.95	235.36	1,103.6	-28.0	-36.0	11.1	0.51	-0.48	-4.80
1,130.0	2.01	237.28	1,128.6	-28.5	-36.7	11.3	0.36	0.24	7.68
1,155.0	1.94	238.41	1,153.5	-28.9	-37.4	11.4	0.32	-0.28	4.52
1,180.0	1.75	239.06	1,178.5	-29.3	-38.1	11.5	0.76	0.76	2.60
1,205.0	1.81	239.86	1,203.5	-29.7	-38.8	11.6	0.26	0.24	3.20
1,230.0	1.56	237.95	1,228.5	-30.1	-39.4	11.7	1.02	-1.02	-7.84
1,255.0	1.48	240.99	1,253.5	-30.4	-40.0	11.8	0.45	-0.32	12.16
1,280.0	1.53	244.45	1,278.5	-30.7	-40.6	11.8	0.41	0.20	13.84
1,305.0	1.37	242.88	1,303.5	-31.0	-41.2	11.8	0.66	-0.64	15.20
1,330.0	1.34	245.13	1,328.5	-31.3	-41.7	11.9	0.24	-0.12	9.00
1,355.0	1.24	243.94	1,353.5	-31.5	-42.2	11.9	0.41	-0.40	-4.76

RECEIVED
Office of Oil and Gas
DAY 23 2016
WV Department of Environmental Protection



Scientific Drilling International
Survey Report



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,380.0	1.09	245.50	1,378.5	-31.7	-42.7	11.9	0.61	-0.60	6.24	
1,405.0	0.96	243.89	1,403.5	-31.9	-43.1	11.9	0.53	-0.52	-6.44	
1,430.0	0.90	245.58	1,428.5	-32.1	-43.4	11.9	0.26	-0.24	6.76	
1,455.0	0.92	250.67	1,453.5	-32.3	-43.8	11.9	0.33	0.08	20.36	
1,480.0	0.82	248.68	1,478.5	-32.4	-44.1	11.9	0.42	-0.40	-7.96	
1,505.0	0.83	252.58	1,503.4	-32.5	-44.5	11.8	0.23	0.04	15.60	
1,530.0	0.83	252.11	1,528.4	-32.6	-44.8	11.8	0.03	0.00	-1.88	
1,555.0	0.82	252.55	1,553.4	-32.7	-45.2	11.8	0.05	-0.04	1.76	
1,580.0	0.79	252.19	1,578.4	-32.8	-45.5	11.7	0.12	-0.12	-1.44	
1,605.0	0.78	253.07	1,603.4	-32.9	-45.8	11.7	0.06	-0.04	3.52	
1,630.0	0.77	251.27	1,628.4	-33.0	-46.2	11.7	0.11	-0.04	-7.20	
1,655.0	0.78	257.95	1,653.4	-33.1	-46.5	11.6	0.36	0.04	26.72	
1,680.0	0.70	252.81	1,678.4	-33.2	-46.8	11.6	0.42	-0.32	-20.56	
1,705.0	0.69	255.74	1,703.4	-33.3	-47.1	11.5	0.15	-0.04	11.72	
1,730.0	0.71	260.69	1,728.4	-33.4	-47.4	11.4	0.25	0.08	19.80	
1,755.0	0.70	250.91	1,753.4	-33.4	-47.7	11.4	0.48	-0.04	-39.12	
1,780.0	0.73	256.57	1,778.4	-33.5	-48.0	11.4	0.31	0.12	22.64	
1,805.0	0.73	256.86	1,803.4	-33.6	-48.3	11.3	0.01	0.00	1.16	
1,830.0	0.62	255.17	1,828.4	-33.7	-48.6	11.2	0.45	-0.44	-6.76	
1,855.0	0.70	256.72	1,853.4	-33.7	-48.9	11.2	0.33	0.32	6.20	
1,880.0	0.70	260.51	1,878.4	-33.8	-49.2	11.1	0.19	0.00	15.16	
1,905.0	0.62	257.59	1,903.4	-33.8	-49.4	11.1	0.35	-0.32	-11.68	
1,930.0	0.64	261.63	1,928.4	-33.9	-49.7	11.0	0.19	0.08	16.16	
1,955.0	0.60	256.69	1,953.4	-33.9	-50.0	10.9	0.27	-0.16	-19.76	
1,980.0	0.59	260.00	1,978.4	-34.0	-50.2	10.9	0.14	-0.04	13.24	
2,005.0	0.45	257.30	2,003.4	-34.0	-50.5	10.8	0.57	-0.56	-10.80	
2,030.0	0.36	270.49	2,028.4	-34.1	-50.6	10.8	0.52	-0.36	52.76	
2,055.0	0.33	263.73	2,053.4	-34.1	-50.8	10.7	0.20	-0.12	-27.04	
2,080.0	0.30	266.83	2,078.4	-34.1	-50.9	10.7	0.14	-0.12	12.40	
2,105.0	0.38	264.74	2,103.4	-34.1	-51.1	10.6	0.32	0.32	-8.36	
2,130.0	0.38	255.80	2,128.4	-34.1	-51.2	10.6	0.24	0.00	-35.76	
2,155.0	0.37	265.26	2,153.4	-34.1	-51.4	10.6	0.25	-0.04	37.84	
2,180.0	0.37	255.10	2,178.4	-34.2	-51.5	10.5	0.26	0.00	-40.64	
2,205.0	0.36	266.23	2,203.4	-34.2	-51.7	10.5	0.29	-0.04	44.52	
2,230.0	0.25	264.78	2,228.4	-34.2	-51.8	10.4	0.44	-0.44	-5.80	
2,255.0	0.36	267.90	2,253.4	-34.2	-52.0	10.4	0.44	0.44	12.48	
2,280.0	0.28	281.37	2,278.4	-34.2	-52.1	10.3	0.44	-0.32	53.88	
2,305.0	0.34	277.64	2,303.4	-34.2	-52.2	10.3	0.25	0.24	-14.92	
2,330.0	0.37	280.86	2,328.4	-34.2	-52.4	10.2	0.14	0.12	12.88	
2,355.0	0.43	272.15	2,353.4	-34.1	-52.6	10.1	0.34	0.24	-34.84	
2,380.0	0.50	263.81	2,378.4	-34.2	-52.8	10.0	0.39	0.28	-33.36	
2,405.0	0.40	295.88	2,403.4	-34.1	-53.0	9.9	1.07	-0.40	128.28	
2,430.0	0.40	273.10	2,428.4	-34.1	-53.1	9.8	0.63	0.00	-91.12	



Scientific Drilling International
Survey Report



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,455.0	0.41	271.39	2,453.4	-34.1	-53.3	9.7	0.06	0.04	-6.84
2,480.0	0.55	293.44	2,478.4	-34.0	-53.5	9.6	0.92	0.56	88.20
2,505.0	0.52	284.54	2,503.4	-33.9	-53.7	9.4	0.35	-0.12	-35.60
2,530.0	0.51	286.77	2,528.4	-33.9	-53.9	9.3	0.09	-0.04	8.92
2,555.0	0.50	288.63	2,553.4	-33.8	-54.1	9.2	0.08	-0.04	7.44
2,580.0	0.52	273.80	2,578.4	-33.8	-54.4	9.0	0.53	0.08	-59.32
2,605.0	0.45	271.89	2,603.4	-33.8	-54.6	8.9	0.29	-0.28	-7.64
2,630.0	0.41	287.17	2,628.4	-33.7	-54.8	8.8	0.48	-0.16	61.12
2,655.0	0.96	280.85	2,653.4	-33.7	-55.0	8.7	2.22	2.20	-25.28
2,680.0	2.21	283.50	2,678.4	-33.5	-55.7	8.2	5.01	5.00	10.60
2,705.0	3.45	281.13	2,703.4	-33.3	-56.9	7.5	4.98	4.96	-9.48
2,730.0	5.13	280.62	2,728.3	-32.9	-58.8	6.5	6.72	6.72	-2.04
2,755.0	6.19	277.02	2,753.2	-32.5	-61.2	5.1	4.47	4.24	-14.40
2,780.0	7.33	274.95	2,778.0	-32.2	-64.1	3.7	4.66	4.56	-8.28
2,805.0	8.58	274.76	2,802.7	-31.9	-67.6	2.0	5.00	5.00	-0.76
2,830.0	9.54	273.40	2,827.4	-31.7	-71.5	0.2	3.93	3.84	-5.44
2,855.0	10.61	272.45	2,852.0	-31.4	-75.9	-1.8	4.33	4.28	-3.80
2,880.0	11.43	270.90	2,876.6	-31.3	-80.6	-3.8	3.49	3.28	-6.20
2,905.0	12.10	270.18	2,901.1	-31.3	-85.7	-5.9	2.74	2.68	-2.88
2,930.0	12.87	268.93	2,925.5	-31.3	-91.1	-8.1	3.26	3.08	-5.00
2,955.0	13.11	268.65	2,949.8	-31.4	-96.8	-10.2	0.99	0.96	-1.12
2,980.0	13.56	267.80	2,974.2	-31.6	-102.5	-12.4	1.96	1.80	-3.40
3,005.0	14.24	266.82	2,998.4	-31.9	-108.5	-14.5	2.88	2.72	-3.92
3,030.0	14.94	267.22	3,022.6	-32.2	-114.8	-16.8	2.83	2.80	1.60
3,055.0	15.11	267.48	3,046.8	-32.5	-121.3	-19.1	0.73	0.68	1.04
3,080.0	15.20	267.38	3,070.9	-32.8	-127.8	-21.4	0.37	0.36	-0.40
3,105.0	15.40	267.48	3,095.0	-33.1	-134.4	-23.8	0.81	0.80	0.40
3,130.0	15.27	267.13	3,119.1	-33.4	-141.0	-26.2	0.64	-0.52	-1.40
3,155.0	15.19	266.65	3,143.2	-33.8	-147.6	-28.5	0.60	-0.32	-1.92
3,180.0	15.12	266.24	3,167.4	-34.2	-154.1	-30.8	0.51	-0.28	-1.64
3,205.0	15.00	265.89	3,191.5	-34.6	-160.6	-33.0	0.60	-0.48	-1.40
3,230.0	14.68	265.16	3,215.7	-35.1	-167.0	-35.1	1.48	-1.28	-2.92
3,255.0	14.78	265.20	3,239.9	-35.7	-173.3	-37.2	0.40	0.40	0.16
3,280.0	14.90	265.90	3,264.0	-36.2	-179.7	-39.3	0.86	0.48	2.80
3,305.0	15.07	266.44	3,288.2	-36.6	-186.1	-41.5	0.88	0.68	2.16
3,330.0	15.30	267.32	3,312.3	-36.9	-192.7	-43.8	1.30	0.92	3.52
3,355.0	15.77	267.52	3,336.4	-37.2	-199.3	-46.2	1.89	1.88	0.80
3,380.0	16.22	266.69	3,360.4	-37.6	-206.2	-48.7	2.02	1.80	-3.32
3,405.0	17.06	265.59	3,384.4	-38.1	-213.4	-51.1	3.59	3.68	2.80
3,430.0	17.98	265.06	3,408.2	-38.7	-220.9	-53.5	3.73	3.68	-2.12
3,455.0	18.41	264.66	3,432.0	-39.4	-228.6	-56.0	1.79	1.72	1.60
3,480.0	19.21	264.68	3,455.6	-40.1	-236.7	-58.6	3.20	3.20	0.08
3,505.0	19.66	265.09	3,479.2	-40.9	-245.0	-61.2	1.88	1.80	1.64
3,530.0	19.99	266.17	3,502.7	-41.5	-253.4	-64.1	1.97	1.32	4.32

RECEIVED
Office of Oil and Gas
MAY 23 2016
WV Department of Environmental Protection



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,555.0	20.36	267.64	3,526.2	-42.0	-262.0	-67.1	2.51	1.48	5.88	
3,580.0	20.74	267.93	3,549.6	-42.3	-270.8	-70.3	1.57	1.52	1.16	
3,605.0	21.25	268.19	3,572.9	-42.6	-279.7	-73.6	2.07	2.04	1.04	
3,630.0	21.67	268.34	3,596.2	-42.9	-288.9	-77.1	1.69	1.68	0.60	
3,655.0	21.82	268.29	3,619.4	-43.2	-298.1	-80.6	0.60	0.60	-0.20	
3,680.0	22.16	268.07	3,642.6	-43.5	-307.5	-84.1	1.40	1.36	-0.88	
3,705.0	22.42	268.01	3,665.7	-43.8	-317.0	-87.6	1.04	1.04	-0.24	
3,730.0	22.79	267.96	3,688.8	-44.1	-326.6	-91.1	1.48	1.48	-0.20	
3,755.0	23.38	267.88	3,711.8	-44.5	-336.4	-94.7	2.36	2.36	-0.32	
3,780.0	24.14	267.83	3,734.7	-44.9	-346.4	-98.5	3.04	3.04	-0.20	
3,805.0	24.91	268.17	3,757.4	-45.2	-356.8	-102.3	3.13	3.08	1.36	
3,830.0	25.13	268.17	3,780.1	-45.6	-367.4	-106.2	0.88	0.88	0.00	
3,855.0	25.45	268.07	3,802.7	-45.9	-378.1	-110.2	1.29	1.28	-0.40	
3,880.0	24.94	267.18	3,825.3	-46.4	-388.7	-114.1	2.54	-2.04	-3.56	
3,905.0	24.88	266.60	3,848.0	-46.9	-399.2	-117.8	1.01	-0.24	-2.32	
3,930.0	25.06	266.39	3,870.7	-47.6	-409.7	-121.5	0.60	0.72	-0.84	
3,955.0	25.50	266.41	3,893.3	-48.2	-420.4	-125.1	1.76	1.76	0.08	
3,980.0	25.84	266.38	3,915.8	-48.9	-431.2	-128.9	1.36	1.36	-0.12	
4,005.0	25.98	266.51	3,938.3	-49.6	-442.1	-132.6	0.60	0.56	0.52	
4,030.0	25.74	266.03	3,960.8	-50.3	-453.0	-136.4	1.27	-0.96	-1.92	
4,055.0	25.15	265.52	3,983.3	-51.1	-463.7	-140.0	2.52	-2.36	-2.04	
4,080.0	25.26	265.40	4,006.0	-51.9	-474.3	-143.5	0.49	0.44	-0.48	
4,105.0	25.40	265.70	4,028.6	-52.8	-485.0	-147.0	0.76	0.56	1.20	
4,130.0	25.91	266.47	4,051.1	-53.5	-495.8	-150.7	2.44	2.04	3.08	
4,155.0	26.90	267.70	4,073.5	-54.1	-506.9	-154.6	4.52	3.96	4.92	
4,180.0	27.28	268.15	4,095.7	-54.5	-518.2	-158.8	1.73	1.52	1.80	
4,205.0	27.70	268.20	4,117.9	-54.9	-529.8	-163.2	1.68	1.68	0.20	
4,230.0	26.95	267.61	4,140.1	-55.3	-541.2	-167.4	3.19	-3.00	-2.36	
4,255.0	26.87	267.54	4,162.4	-55.8	-552.6	-171.5	0.34	-0.32	-0.28	
4,280.0	26.85	267.59	4,184.7	-56.2	-563.8	-175.6	0.12	-0.08	0.20	
4,305.0	27.02	267.80	4,207.0	-56.7	-575.2	-179.8	0.78	0.68	0.84	
4,330.0	26.69	268.07	4,229.3	-57.1	-586.4	-183.9	1.41	-1.32	1.08	
4,355.0	26.02	267.44	4,251.7	-57.5	-597.5	-188.0	2.90	-2.68	-2.52	
4,380.0	25.66	267.18	4,274.2	-58.0	-608.4	-191.9	1.51	-1.44	-1.04	
4,405.0	25.82	267.08	4,296.7	-58.6	-619.3	-195.8	0.66	0.64	-0.40	
4,430.0	26.14	267.16	4,319.2	-59.1	-630.2	-199.7	1.29	1.28	0.32	
4,455.0	26.18	267.43	4,341.7	-59.7	-641.2	-203.6	0.50	0.16	1.08	
4,480.0	26.13	268.09	4,364.1	-60.1	-652.2	-207.7	1.18	-0.20	2.64	
4,505.0	26.36	269.38	4,386.5	-60.3	-663.3	-211.9	2.46	0.92	5.16	
4,530.0	26.43	269.80	4,408.9	-60.4	-674.4	-216.3	0.80	0.28	1.68	
4,555.0	26.69	269.90	4,431.3	-60.4	-685.6	-220.8	1.06	1.04	0.40	
4,580.0	26.80	269.73	4,453.6	-60.5	-696.8	-225.3	0.54	0.44	-0.68	
4,605.0	26.67	269.84	4,475.9	-60.5	-708.1	-229.8	0.56	-0.52	0.44	



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,630.0	26.46	269.53	4,498.3	-60.6	-719.2	-234.2	1.01	-0.84	-1.24
4,655.0	25.92	269.06	4,520.7	-60.7	-730.3	-238.5	2.31	-2.16	-1.88
4,680.0	25.17	268.17	4,543.3	-61.0	-741.0	-242.6	3.37	-3.00	-3.56
4,705.0	25.03	267.66	4,565.9	-61.4	-751.6	-246.6	1.03	-0.56	-2.04
4,730.0	25.10	267.56	4,588.6	-61.8	-762.2	-250.4	0.33	0.28	-0.40
4,755.0	25.25	267.56	4,611.2	-62.3	-772.9	-254.3	0.60	0.60	0.00
4,780.0	25.44	267.73	4,633.8	-62.7	-783.5	-258.2	0.81	0.76	0.68
4,805.0	25.80	267.83	4,656.3	-63.1	-794.3	-262.2	1.45	1.44	0.40
4,830.0	25.90	267.85	4,678.8	-63.5	-805.2	-266.2	0.40	0.40	0.08
4,855.0	26.27	268.00	4,701.3	-63.9	-816.2	-270.2	1.50	1.48	0.60
4,880.0	26.53	268.31	4,723.7	-64.3	-827.3	-274.4	1.18	1.04	1.24
4,905.0	26.86	268.36	4,746.0	-64.6	-838.6	-278.6	1.32	1.32	0.20
4,930.0	26.67	268.26	4,768.3	-64.9	-849.8	-282.8	0.78	-0.76	-0.40
4,955.0	26.57	268.03	4,790.7	-65.3	-861.0	-287.0	0.57	-0.40	-0.92
4,980.0	26.70	268.02	4,813.0	-65.7	-872.2	-291.2	0.52	0.52	-0.04
5,005.0	26.48	267.57	4,835.4	-66.1	-883.4	-295.3	1.19	-0.88	-1.80
5,030.0	26.20	267.13	4,857.8	-66.6	-894.5	-299.3	1.37	-1.12	-1.76
5,055.0	26.32	267.10	4,880.2	-67.2	-905.5	-303.2	0.48	0.48	-0.12
5,080.0	26.64	267.17	4,902.6	-67.7	-916.7	-307.2	1.29	1.28	0.28
5,105.0	26.37	267.22	4,925.0	-68.3	-927.8	-311.2	1.08	-1.08	0.20
5,130.0	25.92	267.15	4,947.4	-68.8	-938.8	-315.1	1.80	-1.80	-0.28
5,155.0	25.62	266.78	4,969.9	-69.4	-949.7	-318.9	1.36	-1.20	-1.48
5,180.0	25.81	266.80	4,992.4	-70.0	-960.5	-322.7	0.76	0.76	0.08
5,205.0	26.01	267.28	5,014.9	-70.6	-971.4	-326.6	1.16	0.80	1.92
5,230.0	26.20	267.85	5,037.4	-71.0	-982.4	-330.6	1.26	0.76	2.28
5,255.0	26.40	267.92	5,059.8	-71.5	-993.5	-334.7	0.81	0.80	0.28
5,280.0	26.57	268.10	5,082.2	-71.8	-1,004.6	-338.8	0.75	0.68	0.72
5,305.0	26.94	267.98	5,104.5	-72.2	-1,015.8	-343.0	1.50	1.48	-0.48
5,330.0	27.06	268.02	5,126.8	-72.6	-1,027.2	-347.2	0.49	0.48	0.16
5,355.0	26.65	267.46	5,149.1	-73.1	-1,038.5	-351.4	1.93	-1.64	-2.24
5,380.0	26.29	267.17	5,171.4	-73.6	-1,049.6	-355.4	1.53	-1.44	-1.16
5,405.0	26.33	266.98	5,193.9	-74.2	-1,060.7	-359.3	0.37	0.16	-0.76
5,430.0	26.33	267.26	5,216.3	-74.7	-1,071.7	-363.3	0.50	0.00	1.12
5,455.0	26.43	267.51	5,238.7	-75.2	-1,082.8	-367.3	0.60	0.40	1.00
5,480.0	26.12	267.33	5,261.1	-75.7	-1,093.9	-371.3	1.28	-1.24	-0.72
5,505.0	26.00	267.27	5,283.5	-76.2	-1,104.9	-375.2	0.49	-0.48	-0.24
5,530.0	25.93	267.25	5,306.0	-76.8	-1,115.8	-379.1	0.28	-0.28	-0.08
5,555.0	26.46	267.39	5,328.4	-77.3	-1,126.8	-383.1	2.13	2.12	0.56
5,580.0	26.23	267.77	5,350.8	-77.7	-1,137.9	-387.1	1.14	-0.92	1.52
5,605.0	25.73	267.49	5,373.3	-78.2	-1,148.8	-391.1	2.06	-2.00	-1.12
5,630.0	25.42	267.05	5,395.9	-78.7	-1,159.6	-395.0	1.45	-1.24	-1.76
5,655.0	25.07	266.44	5,418.5	-79.3	-1,170.3	-398.7	1.74	-1.40	-2.44
5,680.0	25.44	266.70	5,441.1	-80.0	-1,180.9	-402.4	1.55	1.48	1.04



Scientific Drilling International
Survey Report



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,705.0	25.57	267.34	5,463.7	-80.5	-1,191.7	-406.2	1.22	0.52	2.56
5,730.0	24.92	269.01	5,486.3	-80.9	-1,202.3	-410.2	3.86	-2.60	6.68
5,755.0	24.46	269.45	5,509.0	-81.0	-1,212.8	-414.3	1.98	-1.84	1.76
5,780.0	24.13	269.12	5,531.8	-81.1	-1,223.1	-418.3	1.43	-1.32	-1.32
5,805.0	23.89	268.35	5,554.6	-81.3	-1,233.2	-422.2	1.58	-0.96	-3.08
5,830.0	23.20	267.23	5,577.5	-81.7	-1,243.2	-425.9	3.29	-2.76	-4.48
5,855.0	23.06	266.91	5,600.5	-82.2	-1,253.0	-429.4	0.75	-0.56	-1.28
5,880.0	23.08	267.90	5,623.5	-82.7	-1,262.8	-432.9	1.55	0.08	3.96
5,905.0	23.62	269.17	5,646.5	-82.9	-1,272.7	-436.7	2.95	2.16	5.08
5,930.0	24.23	271.13	5,669.3	-82.9	-1,282.8	-440.8	4.01	2.44	7.84
5,955.0	24.96	272.70	5,692.0	-82.5	-1,293.2	-445.3	3.92	2.92	6.28
5,980.0	25.62	274.72	5,714.7	-81.9	-1,303.9	-450.2	4.35	2.64	8.08
6,005.0	26.32	276.52	5,737.1	-80.8	-1,314.8	-455.6	4.22	2.80	7.20
6,030.0	26.94	277.64	5,759.5	-79.4	-1,325.9	-461.3	3.19	2.48	4.48
6,055.0	27.11	277.61	5,781.7	-77.9	-1,337.2	-467.2	0.68	0.68	-0.12
6,080.0	26.55	277.36	5,804.1	-76.4	-1,348.4	-473.1	2.29	-2.24	-1.00
6,105.0	26.14	276.31	5,826.5	-75.1	-1,359.4	-478.7	2.48	-1.64	-4.20
6,116.0	25.91	275.88	5,836.3	-74.6	-1,364.2	-481.1	2.70	-2.09	-3.91
Last SDI Gyro @ 6116 MD									
6,209.0	25.97	271.39	5,920.0	-72.0	-1,404.7	-499.8	2.11	0.06	-4.83
First SDI MWD @ 6209 MD									
6,240.0	25.36	269.77	5,947.9	-71.9	-1,418.2	-505.4	3.00	-1.97	-5.23
6,271.0	25.14	264.84	5,976.0	-72.5	-1,431.4	-510.1	6.82	-0.71	-15.90
6,302.0	25.36	255.97	6,004.0	-74.7	-1,444.4	-513.3	12.22	0.71	-28.61
6,333.0	25.35	245.66	6,032.0	-79.0	-1,456.9	-514.4	14.23	-0.03	-33.26
6,364.0	25.82	241.06	6,060.0	-85.0	-1,468.8	-513.7	6.58	1.52	-14.84
6,394.0	26.60	233.67	6,086.9	-92.2	-1,479.9	-511.7	11.18	2.60	-24.63
6,425.0	28.08	227.18	6,114.5	-101.3	-1,490.9	-507.8	10.73	4.77	-20.94
6,456.0	28.81	220.84	6,141.7	-111.9	-1,501.1	-502.2	10.02	2.35	-20.45
6,487.0	28.61	218.25	6,168.9	-123.4	-1,510.6	-495.5	4.06	-0.65	-8.35
6,518.0	27.93	219.59	6,196.2	-134.8	-1,519.8	-488.7	3.00	-2.19	4.32
6,549.0	27.08	218.09	6,223.7	-145.9	-1,528.8	-482.2	3.54	-2.74	-4.84
6,560.0	27.13	217.58	6,233.5	-149.9	-1,531.9	-479.8	2.18	0.45	-4.68
Sycamore @ 6560 MD									
6,579.0	27.22	216.69	6,250.4	-156.8	-1,537.1	-475.5	2.18	0.48	-4.66
6,610.0	29.09	210.30	6,277.8	-169.0	-1,545.2	-467.6	11.44	6.03	-20.61
6,641.0	31.46	206.76	6,304.5	-182.7	-1,552.6	-458.1	9.57	7.65	-11.42
6,672.0	34.31	204.65	6,330.6	-197.9	-1,559.9	-447.1	9.91	9.19	-6.81
6,703.0	36.83	203.35	6,355.8	-214.4	-1,567.2	-435.0	8.49	8.13	-4.19
6,733.0	39.87	203.30	6,379.3	-231.5	-1,574.6	-422.3	10.13	10.13	-0.17
6,747.0	41.63	203.14	6,389.9	-239.9	-1,578.2	-416.1	12.60	12.58	-1.11
Middlesex @ 6747 MD									
6,764.0	43.77	202.97	6,402.4	-250.5	-1,582.7	-408.2	12.60	12.58	-1.03
6,795.0	46.42	199.28	6,424.3	-270.9	-1,590.6	-392.6	12.00	8.55	-11.90

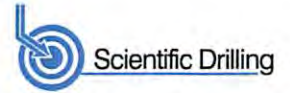


Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
6,826.0	48.50	194.00	6,445.2	-292.8	-1,597.1	-375.2	14.23	6.71	-17.03	
6,857.0	50.02	189.00	6,465.5	-315.8	-1,601.8	-356.0	13.16	4.90	-16.13	
6,888.0	53.15	186.18	6,484.7	-339.9	-1,605.0	-335.3	12.36	10.10	-9.10	
6,910.0	55.76	184.63	6,497.5	-357.7	-1,606.7	-319.7	13.16	11.85	-7.05	
Burkett @ 6910 MD										
6,918.0	56.71	184.09	6,502.0	-364.3	-1,607.2	-313.8	13.16	11.91	-6.75	
6,949.0	61.25	182.45	6,518.0	-390.9	-1,608.7	-290.1	15.33	14.65	-5.29	
6,964.0	63.39	182.11	6,524.9	-404.1	-1,609.2	-278.2	14.42	14.29	-2.24	
Tully @ 6964 MD										
6,980.0	65.68	181.77	6,531.8	-418.6	-1,609.7	-265.2	14.42	14.29	-2.15	
7,011.0	70.53	182.73	6,543.4	-447.3	-1,610.8	-239.3	15.91	15.65	3.10	
7,024.0	73.10	183.52	6,547.4	-459.6	-1,611.5	-228.3	20.61	19.79	6.08	
MRCL_HOT @ 7024 MD										
7,036.0	75.48	184.23	6,550.7	-471.2	-1,612.3	-218.1	20.61	19.81	5.92	
7,067.0	82.36	185.31	6,556.6	-501.5	-1,614.8	-191.4	22.45	22.19	3.48	
7,098.0	84.05	183.53	6,560.3	-532.1	-1,617.2	-164.2	7.89	5.45	-5.74	
7,129.0	84.05	179.92	6,563.5	-563.0	-1,618.1	-136.4	11.58	0.00	-11.65	
7,160.0	84.86	176.79	6,566.5	-593.8	-1,617.2	-107.8	10.38	2.61	-10.10	
7,191.0	88.02	175.51	6,568.4	-624.7	-1,615.2	-78.7	10.99	10.19	-4.13	
7,221.0	88.96	172.14	6,569.2	-654.5	-1,611.9	-50.2	11.66	3.13	-11.23	
7,314.0	90.24	167.12	6,569.9	-745.9	-1,595.2	40.3	5.57	1.38	-5.40	
7,407.0	88.56	161.92	6,570.8	-835.5	-1,570.4	132.3	5.88	-1.81	-5.59	
7,499.0	89.23	160.73	6,572.6	-922.6	-1,540.9	223.9	1.48	0.73	-1.29	
7,592.0	89.06	159.27	6,574.0	-1,010.0	-1,509.1	316.7	1.58	-0.18	-1.57	
7,684.0	88.79	158.04	6,575.7	-1,095.7	-1,475.6	408.6	1.37	-0.29	-1.34	
7,777.0	89.23	157.87	6,577.3	-1,181.9	-1,440.7	501.5	0.51	0.47	-0.18	
7,869.0	88.55	155.69	6,579.1	-1,266.4	-1,404.5	593.5	2.48	-0.74	-2.37	
7,962.0	89.27	156.21	6,580.9	-1,351.3	-1,366.6	686.5	0.95	0.77	0.56	
8,054.0	88.60	152.73	6,582.6	-1,434.3	-1,327.0	778.4	3.85	-0.73	-3.78	
8,147.0	88.94	149.39	6,584.6	-1,515.7	-1,282.0	871.0	3.61	0.37	-3.59	
8,240.0	90.95	147.03	6,584.7	-1,594.7	-1,233.0	963.1	3.33	2.16	-2.54	
8,332.0	89.61	144.79	6,584.2	-1,670.9	-1,181.4	1,053.6	2.84	-1.46	-2.43	
8,425.0	89.28	143.82	6,585.1	-1,746.4	-1,127.2	1,144.6	1.10	-0.35	-1.04	
8,517.0	87.56	143.01	6,587.7	-1,820.3	-1,072.4	1,234.2	2.07	-1.87	-0.88	
8,610.0	88.54	142.33	6,590.8	-1,894.2	-1,016.0	1,324.6	1.28	1.05	-0.73	
8,702.0	88.77	141.94	6,593.0	-1,966.8	-959.5	1,413.8	0.49	0.25	-0.42	
8,795.0	88.80	147.34	6,595.0	-2,042.6	-905.7	1,504.8	5.81	0.03	5.81	
8,887.0	88.30	152.94	6,597.3	-2,122.3	-860.0	1,596.2	6.11	-0.54	6.09	
8,980.0	88.23	155.54	6,600.1	-2,206.0	-819.6	1,689.1	2.80	-0.08	2.80	
9,072.0	88.34	155.46	6,602.9	-2,289.7	-781.4	1,781.1	0.15	0.12	-0.09	
9,164.0	88.27	155.49	6,605.6	-2,373.4	-743.3	1,873.0	0.08	-0.08	0.03	
9,257.0	88.34	155.35	6,608.3	-2,457.9	-704.6	1,966.0	0.17	0.08	-0.15	
9,349.0	89.08	155.66	6,610.4	-2,541.6	-666.5	2,057.9	0.87	0.80	0.34	
9,442.0	88.74	154.86	6,612.2	-2,626.0	-627.6	2,150.9	0.93	-0.37	-0.86	



Scientific Drilling International
Survey Report



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,534.0	88.37	153.65	6,614.5	-2,708.9	-587.6	2,242.8	1.37	-0.40	-1.32
9,627.0	88.51	154.20	6,617.0	-2,792.4	-546.7	2,335.7	0.61	0.15	0.59
9,719.0	89.99	155.94	6,618.2	-2,875.8	-508.0	2,427.7	2.48	1.61	1.89
9,812.0	89.32	154.93	6,618.8	-2,960.4	-469.3	2,520.6	1.30	-0.72	-1.09
9,904.0	88.68	156.13	6,620.4	-3,044.1	-431.2	2,612.6	1.48	-0.70	1.30
9,997.0	89.65	156.91	6,621.8	-3,129.4	-394.2	2,705.6	1.34	1.04	0.84
10,090.0	89.45	156.90	6,622.5	-3,214.9	-357.7	2,798.6	0.22	-0.22	-0.01
10,182.0	88.85	155.86	6,623.8	-3,299.2	-320.8	2,890.6	1.30	-0.65	-1.13
10,275.0	89.55	156.22	6,625.1	-3,384.2	-283.1	2,983.6	0.85	0.75	0.39
10,367.0	89.62	156.60	6,625.8	-3,468.5	-246.2	3,075.6	0.42	0.08	0.41
10,460.0	89.25	155.97	6,626.7	-3,553.6	-208.8	3,168.6	0.79	-0.40	-0.68
10,553.0	88.92	155.49	6,628.2	-3,638.4	-170.6	3,261.6	0.63	-0.35	-0.52
10,645.0	89.32	155.15	6,629.6	-3,722.0	-132.2	3,353.5	0.57	0.43	-0.37
10,738.0	90.06	156.88	6,630.1	-3,807.0	-94.4	3,446.5	2.02	0.80	1.86
10,830.0	87.74	157.04	6,631.9	-3,891.6	-58.4	3,538.5	2.53	-2.52	0.17
10,923.0	88.51	157.28	6,634.9	-3,977.3	-22.3	3,631.4	0.87	0.83	0.26
11,015.0	88.68	156.99	6,637.2	-4,062.0	13.4	3,723.4	0.37	0.18	-0.32
11,108.0	89.42	157.67	6,638.7	-4,147.8	49.2	3,816.4	1.08	0.80	0.73
11,200.0	89.42	157.52	6,639.7	-4,232.9	84.3	3,908.3	0.16	0.00	-0.16
11,293.0	89.96	158.27	6,640.2	-4,319.0	119.3	4,001.3	0.99	0.58	0.81
11,385.0	89.86	157.60	6,640.3	-4,404.3	153.9	4,093.3	0.74	-0.11	-0.73
11,478.0	88.31	156.09	6,641.8	-4,489.8	190.4	4,186.2	2.33	-1.67	-1.62
11,571.0	88.88	154.90	6,644.1	-4,574.4	229.0	4,279.2	1.42	0.61	-1.28
11,663.0	90.19	154.72	6,644.8	-4,657.6	268.1	4,371.2	1.44	1.42	-0.20
11,756.0	90.23	154.60	6,644.5	-4,741.7	307.9	4,464.1	0.14	0.04	-0.13
11,848.0	89.89	154.07	6,644.4	-4,824.6	347.8	4,556.1	0.68	-0.37	-0.58
11,941.0	89.66	153.61	6,644.8	-4,908.1	388.8	4,649.0	0.55	-0.25	-0.49
12,033.0	89.99	154.91	6,645.0	-4,990.9	428.7	4,740.9	1.46	0.36	1.41
12,126.0	90.53	156.23	6,644.6	-5,075.6	467.2	4,833.9	1.53	0.58	1.42
12,219.0	89.46	155.93	6,644.6	-5,160.6	504.9	4,926.9	1.19	-1.15	-0.32
12,311.0	89.52	154.88	6,645.4	-5,244.3	543.2	5,018.9	1.14	0.07	-1.14
12,404.0	89.12	156.57	6,646.5	-5,329.0	581.4	5,111.9	1.87	-0.43	1.82
12,497.0	90.13	157.05	6,647.2	-5,414.5	618.1	5,204.9	1.20	1.09	0.52
12,589.0	90.29	156.80	6,646.8	-5,499.1	654.1	5,296.9	0.32	0.17	-0.27
12,682.0	90.63	156.49	6,646.1	-5,584.5	691.0	5,389.9	0.49	0.37	-0.33
12,775.0	89.66	156.60	6,645.8	-5,669.8	728.0	5,482.9	1.05	-1.04	0.12
12,867.0	89.79	156.31	6,646.3	-5,754.2	764.7	5,574.9	0.35	0.14	-0.32
12,960.0	90.33	156.20	6,646.2	-5,839.3	802.2	5,667.9	0.59	0.58	-0.12
13,052.0	89.49	156.78	6,646.3	-5,923.7	838.9	5,759.9	1.11	-0.91	0.63
13,145.0	89.69	156.78	6,647.0	-6,009.1	875.5	5,852.8	0.22	0.22	0.00
13,237.0	90.29	156.70	6,647.0	-6,093.6	911.9	5,944.8	0.66	0.65	-0.09
13,330.0	89.62	155.86	6,647.1	-6,178.8	949.3	6,037.8	1.16	-0.72	-0.90
13,422.0	90.06	155.21	6,647.3	-6,262.5	987.4	6,129.8	0.85	0.48	-0.71
13,515.0	90.49	155.30	6,646.9	-6,347.0	1,026.3	6,222.8	0.47	0.46	0.10



Company:	Antero	Local Co-ordinate Reference:	Well Moats Unit 1H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Moats Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,548.0	90.73	155.12	6,646.5	-6,377.0	1,040.2	6,255.8	0.91	0.73	-0.55
Last SDI MWD @ 13548 MD									
13,615.0	90.73	155.12	6,645.7	-6,437.7	1,068.3	6,322.8	0.00	0.00	0.00
Projection To Bit @ 13615 MD / 6645 TVD									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,560.0	6,233.5	Sycamore @ 6560 MD		0.00		
6,747.0	6,389.9	Middlesex @ 6747 MD		0.00		
6,910.0	6,497.5	Burkett @ 6910 MD		0.00		
6,964.0	6,524.9	Tully @ 6964 MD		0.00		
7,024.0	6,547.4	MRCL_HOT @ 7024 MD		0.00		

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
105.0	105.0	0.1	-0.3	First SDI Gyro @ 105 MD	
6,116.0	5,836.3	-74.6	-1,364.2	Last SDI Gyro @ 6116 MD	
6,209.0	5,920.0	-72.0	-1,404.7	First SDI MWD @ 6209 MD	
13,548.0	6,646.5	-6,377.0	1,040.2	Last SDI MWD @ 13548 MD	
13,615.0	6,645.7	-6,437.7	1,068.3	Projection To Bit @ 13615 MD / 6645 TVD	

Checked By: _____ Approved By: _____ Date: _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/17/2016
Job End Date:	2/4/2016
State:	West Virginia
County:	Ritchie
API Number:	47-085-10079-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Moats 1H
Longitude:	-80.90281700
Latitude:	39.23044200
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,647
Total Base Water Volume (gal):	9,077,136
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Antero Resources	Base Fluid	Water	7732-18-5	100.00000	90.71367	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	8.74704	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.19655	
			Hydrogen Chloride	7647-01-0	18.00000	0.04695	
LGC-15	U.S. Well Services	Gelling Agents	Guar Gum	9000-30-0	50.00000	0.08704	
			Petroleum Distillates	64742-47-8	60.00000	0.08243	
			Suspending agent (solid)	14808-60-7	3.00000	0.01331	
			Surfactant	68439-51-0	3.00000	0.00522	
WFRA-405	U.S. Well Services	Friction Reducer	Water	7732-18-5	60.00000	0.03989	
			2-Propenoic acid, polymer with 2 propenamide	29003-06-9	30.00000	0.01994	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01605	
			Ethoxylated alcohol blend	68002-97-1	4.00000	0.00266	

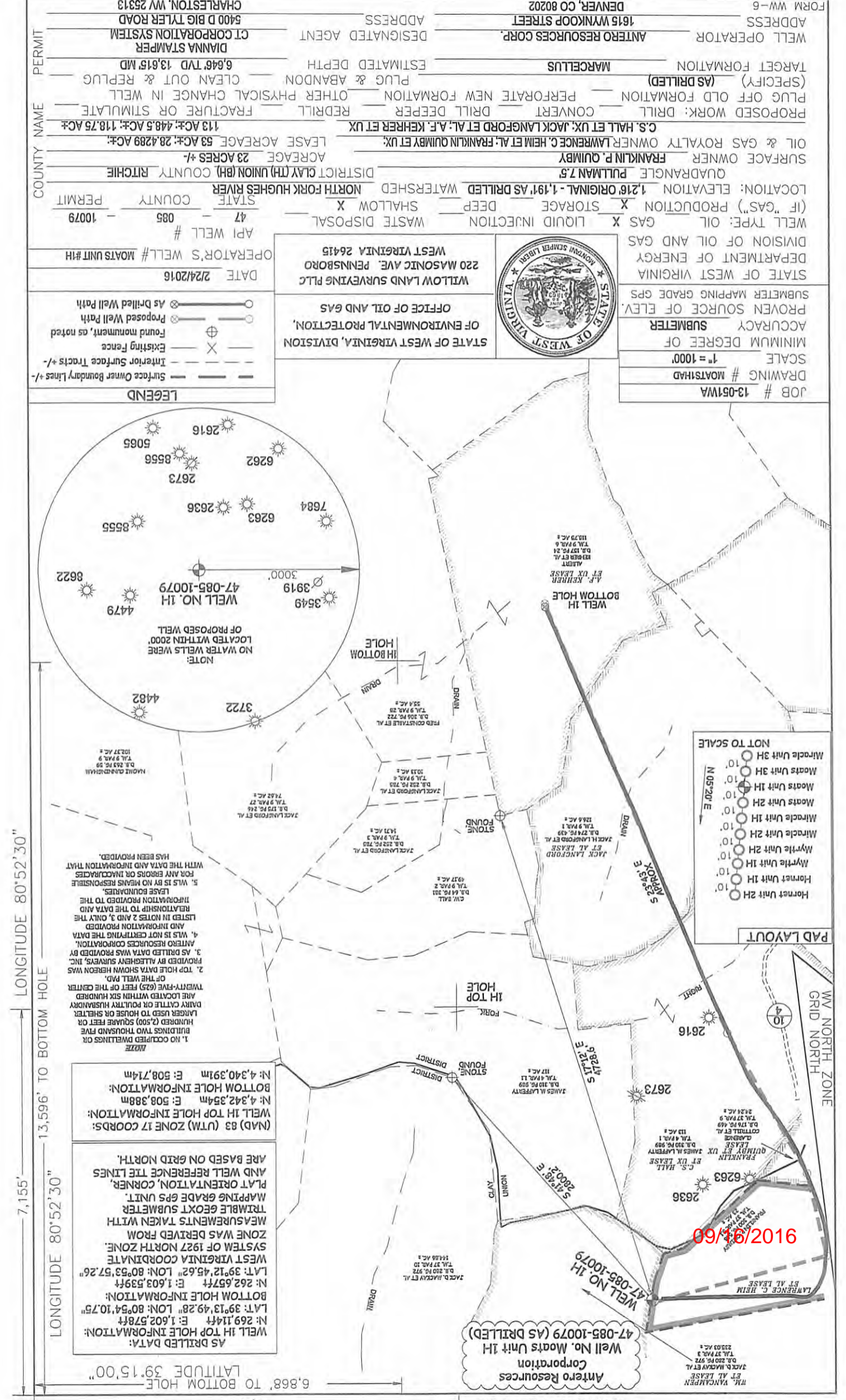
SI-1100	U.S. Well Services	Scale Inhibitor					
			Water	7732-18-5	80.00000	0.01087	
			Ethylene Glycol	107-21-1	25.00000	0.00384	
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00160	
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00138	
			Hexamethylene tramine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00088	
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00088	
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00035	
K-BAC 1020	U.S. Well Services	Anti-Bacterial Agent					
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00423	
			Deionized Water	7732-18-5	28.00000	0.00242	
AP One	U.S. Well Services	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00229	
AI-302	U.S. Well Services	Acid Corrosion Inhibitors					
			Water	7732-18-5	95.00000	0.00043	
			2-Propyn-1-olcompound with methyloxirane	38172-91-7	15.00000	0.00007	
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)



JOB # 13-051WA
DRAWING # MOATS1HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY
PROVEN SOURCE OF ELEVATION
SUBMETER
 STATE OF WEST VIRGINIA
 DEPARTMENT OF ENERGY
 DIVISION OF OIL AND GAS

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



PERMIT
WELL OPERATOR ANTERO RESOURCES CORP. ADDRESS 1615 WYNNKOP STREET DENVER, CO 80202
DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM 5400 D BIG TYLER ROAD CHARLESTON, WV 25313
TARGET FORMATION MARCELLUS
(SPECIFY) (AS DRILLED) PLUG & ABANDON
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION
DRILL DEEPER REDRILL
FRACURE OR STIMULATE OTHER PHYSICAL CHANGE IN WELL
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
LOCATION: ELEVATION 1,216 ORIGINAL - 1,191' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER DISTRICT CLAY (TH) UNION (BH) COUNTY RITCHIE ACREAGE +/- 23 ACRES +/-
LEASE ACREAGE 63 ACRES; 28,4289 ACRES; 113 ACRES; 448.5 ACRES; 118.75 ACRES
C.S. HALL ET UX; JACK LANGFORD ET AL; A.F. KEHRER ET UX
PROPOSED WORK: DRILL CONVERT
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION
(SPECIFY) (AS DRILLED) PLUG & ABANDON
TARGET FORMATION MARCELLUS
WELL OPERATOR ANTERO RESOURCES CORP.
ADDRESS 1615 WYNNKOP STREET DENVER, CO 80202

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

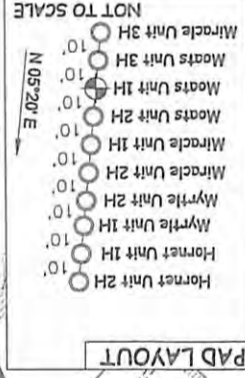


NOTE:
 NO WATER WELLS WERE LOCATED WITHIN 2000' OF PROPOSED WELL.

1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FEET OR HUNDRED (2,500) 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. PROVIDED BY ALLEGHENY SURVEYS, INC. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION, AND INFORMATION PROVIDED AND INFORMATION LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
 5. THIS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INFORMATION THAT HAS BEEN PROVIDED.

AS DRILLED DATA:
 WELL 1H TOP HOLE INFORMATION:
 N: 269.1144 E: 1.602.5784
 LAT: 39°13'49.28" LON: 80°54'10.75"
BOTTOM HOLE INFORMATION:
 N: 262.6574 E: 1.603.5394
 LAT: 39°12'45.62" LON: 80°53'57.26"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.
ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOTX 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: 4,342,354m E: 508,388m
 BOTTOM HOLE INFORMATION:
 N: 4,340,391m E: 508,714m

LONGITUDE 80°52'30" TO BOTTOM HOLE 7,155'
 LONGITUDE 80°52'30" TO BOTTOM HOLE 6,868'
 LONGITUDE 39°15'00" TO BOTTOM HOLE 7,928'
 LONGITUDE 80°52'30" TO BOTTOM HOLE 13,596'
 LONGITUDE 39°15'00" TO BOTTOM HOLE 7,928'



Antero Resources Corporation
 Well No. Moats Unit 1H
 47-085-10079 (AS DRILLED)

9102/91/60

LATITUDE 39°15'00"

7,928'

6,868' TO BOTTOM HOLE
LATITUDE 39°15'00"

LONGITUDE 80°52'30"

7,155'

13,596' TO BOTTOM HOLE

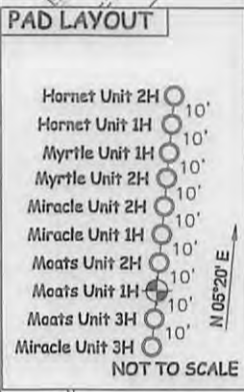
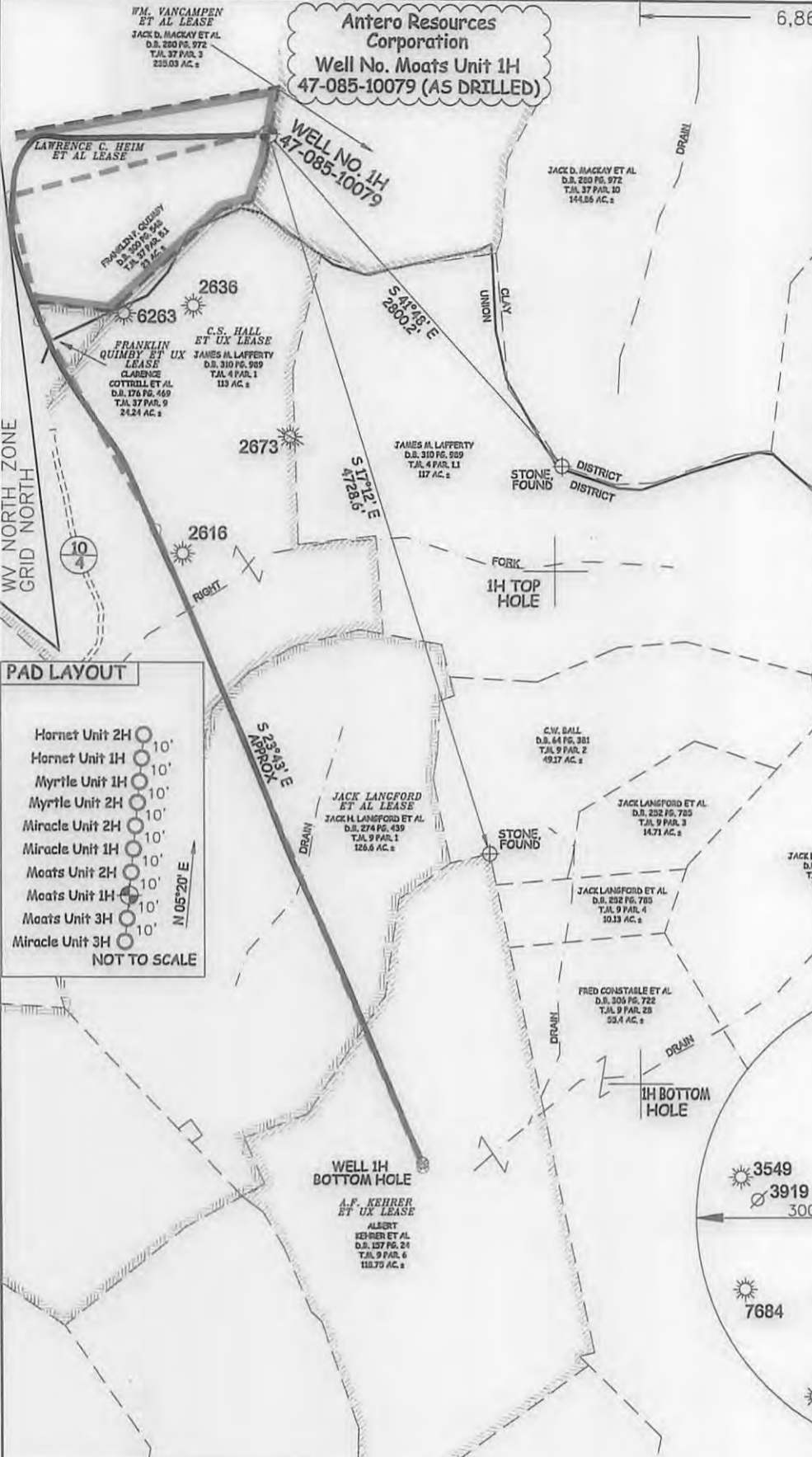
LONGITUDE 80°52'30"

Antero Resources Corporation
Well No. Moats Unit 1H
47-085-10079 (AS DRILLED)

AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
N: 269,114ft E: 1,602,578ft
LAT: 39°13'49.28" LON: 80°54'10.75"
BOTTOM HOLE INFORMATION:
N: 262,657ft E: 1,603,539ft
LAT: 39°12'45.62" LON: 80°53'57.26"
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: 4,342,354m E: 508,388m
BOTTOM HOLE INFORMATION:
N: 4,340,391m E: 508,714m

- NOTE**
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) 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.



JOB # 13-051WA
DRAWING # MOATS1HAD
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
220 MASONIC AVE. 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

DATE 2/24/2016
OPERATOR'S WELL # MOATS UNIT #1H
API WELL # 47 - 085 - 10079
STATE COUNTY PERMIT

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 1,216' ORIGINAL - 1,191' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER
 QUADRANGLE PULLMAN 7.5' DISTRICT CLAY (TH) UNION (BH) COUNTY 09/16/2016
 SURFACE OWNER FRANKLIN P. QUIMBY ACREAGE 23 ACRES +/-
 OIL & GAS ROYALTY OWNER LAWRENCE C. HEIM ET AL; FRANKLIN QUIMBY ET UX; LEASE ACREAGE 53 AC±; 28.4289 AC±; C.S. HALL ET UX; JACK LANGFORD ET AL; A.F. KEHRER ET UX 113 AC±; 448.5 AC±; 118.75 AC±
 PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
 PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (AS DRILLED) PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,646' TVD 13,615' 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