

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

API 47 - 033 - 05687 County Harrison District Tenmile  
Quad Salem & Big Isaac 7.5' Pad Name Hubert Pad Field/Pool Name -----  
Farm name Hubert Jr. & Lorena Bland Well Number Nellie Unit 2H  
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 4344999.777m Easting 537949.548m  
Landing Point of Curve Northing 4345042.344m Easting 538455.169m  
Bottom Hole Northing 4343082.005m Easting 540523.140m

Elevation (ft) 1376' 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

**APPROVED**

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NAME: [Signature]  
DATE: 11/13/2017

Date permit issued 12/07/2012 Date drilling commenced 03/22/2014 Date drilling ceased 06/10/2014  
Date completion activities began 09/13/2014 Date completion activities ceased 06/15/2017  
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

Freshwater depth(s) ft 364', 367' 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 1737' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

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

API 47-033 - 05687 Farm name Hubert Jr. & Lorena Bland Well number Nellie Unit 2H

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	24"	20"	40'	New	48#,H-40	N/A	Y
Surface	17-1/2"	13-3/8"	483'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2525'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	17443**	New	23#, P-110	N/A	Y*
Tubing		2-3/8"	7820'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details \*Please note this well was drilled to 17455', however casing was only ran to 17443'. Also note, cement squeezes were successful on 4/29/2014 and 5/1/2014, Sam Ward left word with WVDEP.

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	185 sx	15.6	1.18	218	0'	8 Hrs.
Surface	Class A	588 sx	15.6	1.18	694	0'	8 Hrs.
Coal							
Intermediate 1	Class A	943 sx	15.6	1.18	1113	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	1258 sx (Lead), 1486 sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.3 (Lead), 1.86 (Tail)	4399	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17455' MD, 7429' TVD (BHL) & 7485' TVD (Deepest Point Drilled) Loggers TD (ft) 17397' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 7444'

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

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API 47-033 - 05687

Farm name Hubert Jr. & Lorena Bland

Well number Nellie Unit 2H

PERFORATION RECORD

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

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 (bbls)	Amount of Nitrogen/other (units)
<b>*PLEASE SEE ATTACHED EXHIBIT 2</b>								

Please insert additional pages as applicable.

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 Department of Environmental Protection

API 47- 033 - 05687 Farm name Hubert Jr. & Lorena Bland Well number Nellie Unit 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>7424' (TOP)</u>	<u>TVD</u>	<u>7865' (TOP)</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 11086 mcfpd Oil 2 bpd NGL --- bpd Water 240 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	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	

**\*PLEASE SEE ATTACHED EXHIBIT 3**


Please insert additional pages as applicable.

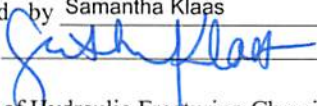
Drilling Contractor Patterson – UTI Drilling Company LLC  
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company STRC  
Address 1560 Good Hope Pike City Clarksburg State WV Zip 26301

Cementing Company Nabors Completion & Production Services, Co.  
Address 1650 Hackers Creek 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 Samantha Klaas Telephone 303-357-6759  
Signature  Title Permitting Agent Date 09/27/2017

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/13/2014	17355	17175	60	Marcellus
2	5/3/2017	17144	16975	60	Marcellus
3	5/3/2017	16943	16774	60	Marcellus
4	5/4/2017	16743	16574	60	Marcellus
5	5/4/2017	16542	16373	60	Marcellus
6	5/4/2017	16342	16173	60	Marcellus
7	5/4/2017	16142	15973	60	Marcellus
8	5/5/2017	15941	15772	60	Marcellus
9	5/5/2017	15741	15572	60	Marcellus
10	5/6/2017	15540	15371	60	Marcellus
11	5/6/2017	15340	15171	60	Marcellus
12	5/6/2017	15140	14971	60	Marcellus
13	5/6/2017	14939	14770	60	Marcellus
14	5/7/2017	14739	14570	60	Marcellus
15	5/7/2017	14538	14369	60	Marcellus
16	5/7/2017	14338	14169	60	Marcellus
17	5/8/2017	14138	13969	60	Marcellus
18	5/8/2017	13937	13768	60	Marcellus
19	5/8/2017	13737	13568	60	Marcellus
20	5/8/2017	13536	13367	60	Marcellus
21	5/8/2017	13336	13167	60	Marcellus
22	5/9/2017	13136	12967	60	Marcellus
23	5/9/2017	12738	12567	60	Marcellus
24	5/9/2017	12535	12365	60	Marcellus
25	5/10/2017	12333	12162	60	Marcellus
26	5/10/2017	12130	11960	60	Marcellus
27	5/10/2017	11928	11757	60	Marcellus
28	5/10/2017	11725	11554	60	Marcellus
29	5/10/2017	11523	11352	60	Marcellus
30	5/11/2017	11320	11149	60	Marcellus
31	5/11/2017	11118	10947	60	Marcellus
32	5/11/2017	10915	10744	60	Marcellus
33	5/11/2017	10712	10542	60	Marcellus
34	5/11/2017	10510	10339	60	Marcellus
35	5/12/2017	10307	10136	60	Marcellus
36	5/12/2017	10105	9934	60	Marcellus
37	5/12/2017	9902	9731	60	Marcellus
38	5/12/2017	9700	9529	60	Marcellus
39	5/12/2017	9497	9326	60	Marcellus
40	5/13/2017	9294	9124	60	Marcellus
41	5/13/2017	9092	8921	60	Marcellus
42	5/13/2017	8889	8719	60	Marcellus
43	5/14/2017	8687	8516	60	Marcellus
44	5/14/2017	8484	8313	60	Marcellus
45	5/14/2017	8282	8111	60	Marcellus
46	5/14/2017	8079	7908	60	Marcellus

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**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	5/3/2017	70.0	7542	5288	3596	358150	8821	N/A
2	5/3/2017	73.9	7990	5927	4441	352390	7482	N/A
3	5/3/2017	71.5	7949	6246	5039	357130	7443	N/A
4	5/4/2017	76.0	8027	6595	4697	356650	7491	N/A
5	5/4/2017	76.0	8017	6600	4109	356740	9026	N/A
6	5/4/2017	73.0	7614	6345	4841	355740	7820	N/A
7	5/4/2017	73.8	7875	6618	4955	356320	7415	N/A
8	5/5/2017	78.0	7835	6194	4943	355480	7497	N/A
9	5/5/2017	79.1	7852	6462	4925	353390	7397	N/A
10	5/6/2017	80.3	7778	5992	4688	359100	7384	N/A
11	5/6/2017	73.0	7522	6382	4548	356660	7385	N/A
12	5/6/2017	72.0	7702	6608	4669	355480	7372	N/A
13	5/6/2017	76.1	7903	6928	4616	357390	7360	N/A
14	5/7/2017	76.8	7661	6556	4382	355850	7352	N/A
15	5/7/2017	72.0	7830	6640	3586	355800	12555	N/A
16	5/7/2017	76.4	7970	6890	4889	358810	7356	N/A
17	5/8/2017	72.6	7777	6769	5214	359090	8791	N/A
18	5/8/2017	78.0	7795	6658	4891	356850	7327	N/A
19	5/8/2017	76.0	7686	6632	5202	357490	7300	N/A
20	5/8/2017	74.5	7588	6913	5037	358700	7306	N/A
21	5/8/2017	75.1	7264	6207	4961	358400	7293	N/A
22	5/9/2017	75.0	7365	6857	4719	358440	7295	N/A
23	5/9/2017	76.0	7100	6037	4391	357340	7278	N/A
24	5/9/2017	75.7	7303	5920	4887	356080	7271	N/A
25	5/10/2017	74.7	7477	6540	5059	355330	7248	N/A
26	5/10/2017	75.0	7203	6766	4526	356250	7267	N/A
27	5/10/2017	75.0	7319	6334	4856	355850	7225	N/A
28	5/10/2017	74.7	7116	5971	4724	358160	7227	N/A
29	5/10/2017	74.3	7412	6326	4192	358470	7635	N/A
30	5/11/2017	74.8	7407	6217	4795	358030	7182	N/A
31	5/11/2017	75.0	7522	6753	4734	356770	7230	N/A
32	5/11/2017	75.0	7170	6279	4840	357710	7196	N/A
33	5/11/2017	75.0	7469	6701	4979	357180	7185	N/A
34	5/11/2017	75.8	7116	6552	4873	357260	7093	N/A
35	5/12/2017	75.4	7155	6206	4321	358170	7163	N/A
36	5/12/2017	75.0	7139	6290	4256	356760	7270	N/A
37	5/12/2017	75.0	6878	6152	4445	356670	7271	N/A
38	5/12/2017	74.7	6944	6018	4370	357460	8529	N/A
39	5/12/2017	75.6	6870	6016	4171	357490	7155	N/A
40	5/13/2017	76.0	6885	6230	4692	356260	7241	N/A
41	5/13/2017	76.0	6972	6689	5194	356580	7205	N/A
42	5/13/2017	71.4	7052	6667	5173	358460	7203	N/A
43	5/14/2017	75.2	6970	7335	5100	344930	7001	N/A
44	5/14/2017	75.0	6708	6449	4795	357340	7194	N/A
45	5/14/2017	75.0	6416	6433	5041	356990	7186	N/A
46	5/14/2017	75.2	6556	6045	4866	358200	7289	N/A
<b>AVG=</b>		<b>75.0</b>	<b>7,407</b>	<b>6,418</b>	<b>4,701</b>	<b>16,409,790</b>	<b>347,212</b>	<b>TOTAL</b>

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## 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	364'	N/A	364'	N/A
Fresh Water	367'	N/A	367'	N/A
Siltstone	0	97	0	97
Sandy shale	est. 97	317	est. 97	317
Sandstone	est. 317	507	est. 317	507
Silty Sandstone	est. 507	657	est. 507	657
Sandstone	est. 657	1027	est. 657	1027
Limestone/Dolomite	est. 1027	1117	est. 1027	1117
Siltstone	est. 1117	1297	est. 1117	1297
Sandstone	est. 1297	1327	est. 1297	1327
Limey siltstone	est. 1327	1477	est. 1327	1477
Sandstone	est. 1477	1597	est. 1477	1597
Sandy Siltstone	est. 1597	1737	est. 1597	1737
Coal	est. 1737	1757	est. 1737	1757
Sandstone	est. 1757	1797	est. 1757	1797
Siltstone	est. 1797	1817	est. 1797	1817
Sandstone	est. 1817	2097	est. 1817	2097
Limey Shale	est. 2097	2280	est. 2097	2280
Big Lime	2280	2394	2280	2394
Big Injun	2394	2782	2394	2782
Gantz Sand	2782	2880	2782	2880
Fifty Foot Sandstone	2880	2991	2880	2991
Gordon	2991	3315	2991	3315
Fifth Sandstone	3315	3350	3315	3350
Bayard	3350	3679	3350	3679
Warren	3679	3920	3679	3920
Speechley	3920	4430	3920	4437
Baltown	4430	4760	4437	4787
Bradford	4760	5281	4787	5354
Benson	5281	5559	5354	5659
Alexander	5559	5789	5659	5907
Elk	5789	6404	5907	6586
Rhinestreet	6404	6876	6586	7123
Sycamore	6876	7089	7123	7356
Middlesex	7089	7250	7356	7544
Burkett	7250	7271	7544	7573
Tully	7271	7424	7573	7865
Marcellus	7424	NA	7865	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.

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Antero Resources  
 Nellie Unit 2H  
 Harrison County West Virginia  
 Northing: 14254504.12  
 Easting: 1764874.96  
 As Drilled

WELL DETAILS Nellie Unit 2H

Ground Level	1376.0	Slot	
+N/-S	+E/W	Northing	Longitude
0.0	0.0	14254504.12	1764874.96
		30° 15' 12.202" N	80° 33' 37.250" W

REFERENCE INFORMATION  
 Coordinates (N/E) Reference: Well Nellie Unit 2H, USGS North  
 True North (T/N) Reference: Well Nellie Unit 2H, USGS North  
 Section (V/S) Reference: State - (02°N, 03°E)  
 Magnetic North (M/N) Reference: Well Nellie Unit 2H, USGS North  
 Calculation Method: North Magnetic Component



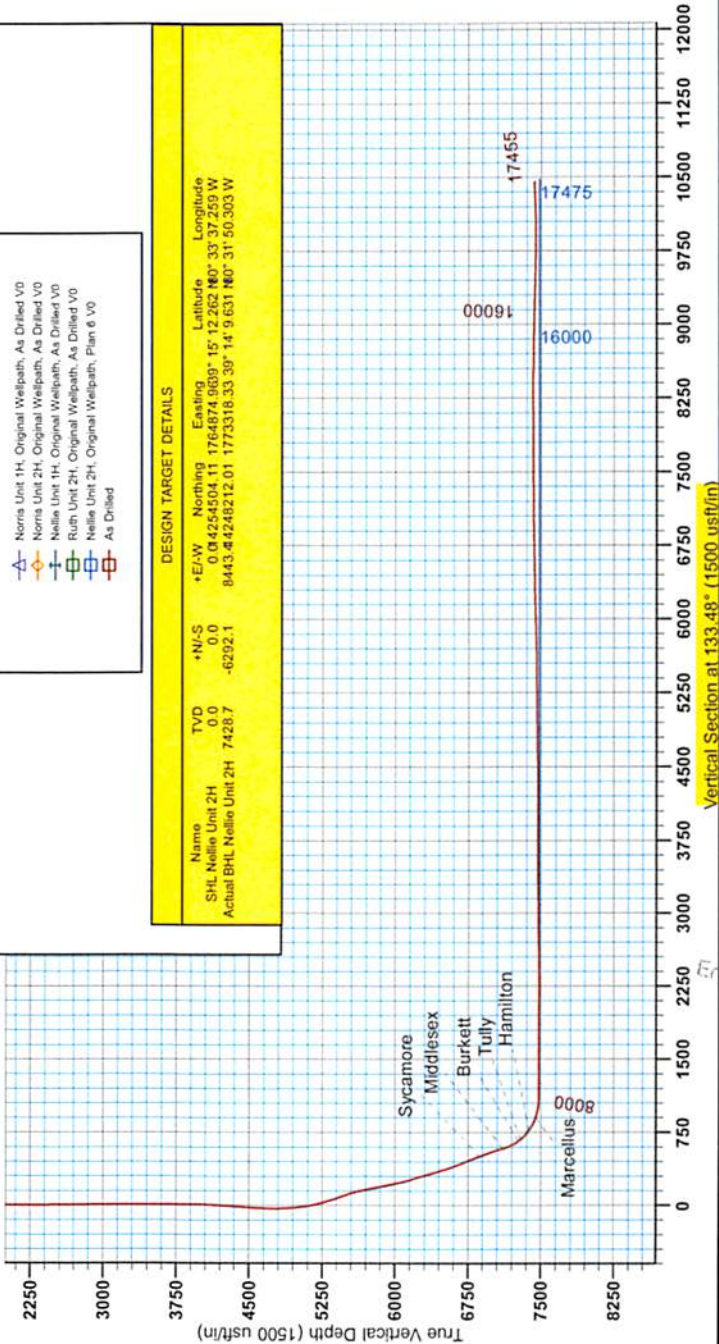
Genie Lightfoot  
 Scientific Drilling  
 421 South Eagle Lane  
 Oklahoma City, Oklahoma  
 405-787-3663

LEGEND

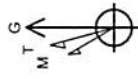
- Nellis Unit 1H, Original Wellpath, As Drilled V0
- Norris Unit 2H, Original Wellpath, As Drilled V0
- Nellis Unit 1H, Original Wellpath, As Drilled V0
- Ruth Unit 2H, Original Wellpath, As Drilled V0
- Nellis Unit 2H, Original Wellpath, Plan 6, V0
- As Drilled

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/W	Northing	Easting	Latitude	Longitude
SHL Nellie Unit 2H	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual BHL Nellie Unit 2H	7428.7	-6292.1	8443.4	4248212.01	1773319.33	39° 14' 9.631" N	01° 31' 50.303" W

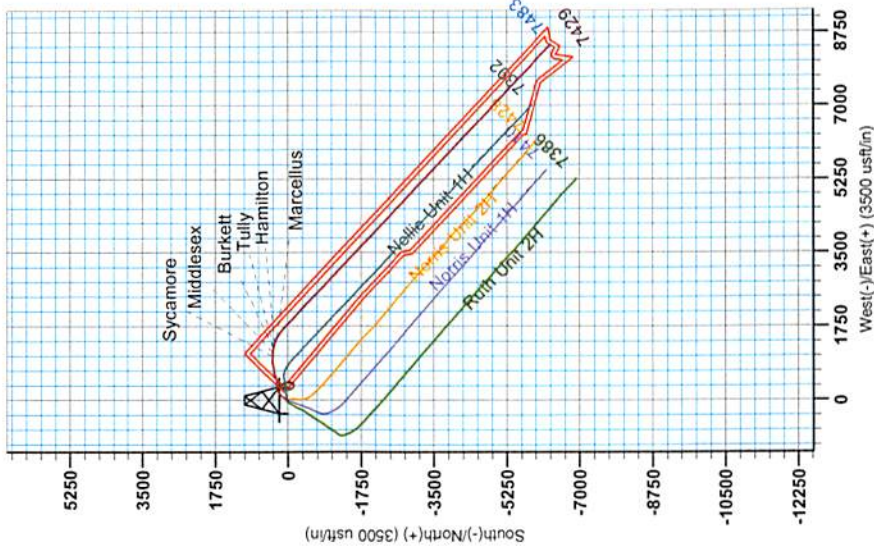


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To convert Magnetic North to Grid, Subtract 8.87°  
 To convert True North to Grid, Subtract 0.28°

Magnetic Field  
 Strength: 52348.7 nT  
 Dip Angle: 61.62°  
 Year: 1912-2013  
 Model: IGRF2010







<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Nellie Unit 2H
<b>Project:</b>	Harrison County West Virginia	<b>TVD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Site:</b>	Ruth/Norris/Nellie/Ford Pad	<b>MD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Well:</b>	Nellie Unit 2H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Oklahoma District

<b>Project</b>	Harrison County West Virginia, Harrison County, USA		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Ruth/Norris/Nellie/Ford Pad				
<b>Site Position:</b>		<b>Northing:</b>	14,254,530.66 usft	<b>Latitude:</b>	39° 15' 12.526 N
<b>From:</b>	Map	<b>Easting:</b>	1,764,845.07 usft	<b>Longitude:</b>	80° 33' 37.638 W
<b>Position Uncertainty:</b>	2.0 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b>	0.28 °

<b>Well</b>	Nellie Unit 2H, Marcellus					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	14,254,504.12 usft	<b>Latitude:</b>	39° 15' 12.262 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,764,874.96 usft	<b>Longitude:</b>	80° 33' 37.259 W
<b>Position Uncertainty</b>	2.0 usft		<b>Wellhead Elevation:</b>	1,400.0 usft	<b>Ground Level:</b>	1,376.0 usft

<b>Wellbore</b>	Original Wellpath				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/19/2013	-8.59	66.83	52,349

<b>Design</b>	As Drilled				
---------------	------------	--	--	--	--

<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0

<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	133.48

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<b>Survey Program</b>	Date 6/13/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	7,087.0	Survey #6 Def Gyro To KOP (Original Wellbore)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
7,200.0	17,455.0	Survey #7 MWD (Original Wellpath)	MWD SDI	MWD - Standard ver 1.0.1	

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
100.0	0.09	347.92	100.0	0.1	0.0	-0.1	0.09
200.0	0.05	89.10	200.0	0.2	0.0	-0.1	0.11
300.0	0.05	131.40	300.0	0.1	0.1	0.0	0.04
400.0	0.13	148.48	400.0	0.0	0.2	0.1	0.08
500.0	0.10	118.20	500.0	-0.1	0.3	0.3	0.07
600.0	0.11	134.89	600.0	-0.2	0.5	0.5	0.03
700.0	0.13	174.85	700.0	-0.4	0.5	0.7	0.08
800.0	0.06	182.23	800.0	-0.6	0.5	0.8	0.07
900.0	0.09	209.30	900.0	-0.7	0.5	0.9	0.05
1,000.0	0.11	137.53	1,000.0	-0.9	0.5	1.0	0.12



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Nellie Unit 2H
<b>Project:</b>	Harrison County West Virginia	<b>TVD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Site:</b>	Ruth/Norris/Nellie/Ford Pad	<b>MD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Well:</b>	Nellie Unit 2H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Oklahoma District

Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	
1,100.0	0.15	145.29	1,100.0	-1.0	0.7	1.2	0.04	
1,200.0	0.13	152.65	1,200.0	-1.2	0.8	1.4	0.03	
1,300.0	0.15	165.42	1,300.0	-1.5	0.9	1.7	0.04	
1,400.0	0.15	155.67	1,400.0	-1.7	1.0	1.9	0.03	
1,500.0	0.18	163.89	1,500.0	-2.0	1.1	2.1	0.04	
1,600.0	0.20	153.80	1,600.0	-2.3	1.2	2.4	0.04	
1,700.0	0.10	155.51	1,700.0	-2.5	1.3	2.7	0.10	
1,800.0	0.13	188.17	1,800.0	-2.7	1.3	2.8	0.07	
1,900.0	0.25	173.47	1,900.0	-3.0	1.3	3.1	0.13	
2,000.0	0.20	192.31	2,000.0	-3.4	1.3	3.3	0.09	
2,100.0	0.24	170.41	2,100.0	-3.8	1.3	3.6	0.09	
2,200.0	0.10	174.12	2,200.0	-4.1	1.4	3.8	0.14	
2,300.0	0.32	173.29	2,300.0	-4.5	1.4	4.1	0.22	
2,400.0	0.09	149.17	2,400.0	-4.8	1.5	4.4	0.24	
2,500.0	0.15	139.35	2,500.0	-5.0	1.6	4.6	0.06	
2,600.0	0.26	101.13	2,600.0	-5.1	1.9	4.9	0.17	
2,700.0	0.61	85.42	2,700.0	-5.1	2.7	5.5	0.37	
2,800.0	0.45	83.06	2,800.0	-5.0	3.6	6.1	0.16	
2,900.0	0.38	97.52	2,900.0	-5.0	4.3	6.6	0.13	
3,000.0	0.58	88.24	3,000.0	-5.1	5.1	7.2	0.21	
3,100.0	0.39	111.13	3,100.0	-5.2	6.0	7.9	0.27	
3,200.0	0.16	119.87	3,200.0	-5.4	6.4	8.3	0.23	
3,300.0	0.29	102.94	3,300.0	-5.5	6.8	8.7	0.14	
3,400.0	0.22	141.48	3,400.0	-5.7	7.1	9.1	0.18	
3,500.0	0.22	141.84	3,500.0	-6.0	7.4	9.5	0.00	
3,600.0	0.14	174.38	3,600.0	-6.3	7.5	9.8	0.13	
3,700.0	0.13	142.69	3,700.0	-6.5	7.6	10.0	0.07	
3,800.0	0.20	104.65	3,800.0	-6.6	7.8	10.2	0.13	
3,900.0	0.18	76.57	3,900.0	-6.6	8.1	10.5	0.09	
4,000.0	2.95	8.98	3,999.9	-4.0	8.7	9.1	2.89	
4,100.0	6.35	12.26	4,099.6	3.9	10.3	4.8	3.41	
4,200.0	9.33	20.90	4,198.6	16.9	14.3	-1.2	3.20	
4,300.0	12.02	29.23	4,296.9	33.6	22.3	-6.9	3.09	
4,400.0	15.44	30.45	4,394.0	54.1	34.1	-12.5	3.43	
4,500.0	18.58	31.10	4,489.6	79.2	49.1	-18.9	3.15	
4,600.0	19.39	31.73	4,584.2	107.0	66.1	-25.7	0.84	
4,700.0	19.32	37.66	4,678.6	134.2	84.9	-30.7	1.97	
4,800.0	20.43	43.82	4,772.6	159.9	107.1	-32.3	2.37	
4,900.0	21.74	48.98	4,865.9	184.7	133.2	-30.4	2.27	
5,000.0	23.08	53.91	4,958.4	208.4	163.0	-25.1	2.31	
5,100.0	23.73	61.24	5,050.2	229.6	196.5	-15.4	2.98	
5,200.0	24.00	71.34	5,141.7	245.8	233.4	0.2	4.09	
5,300.0	25.95	78.37	5,232.3	256.7	274.1	22.3	3.55	
5,400.0	25.29	83.88	5,322.5	263.4	316.8	48.6	2.47	





<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Nellie Unit 2H
<b>Project:</b>	Harrison County West Virginia	<b>TVD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Site:</b>	Ruth/Norris/Nellie/Ford Pad	<b>MD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Well:</b>	Nellie Unit 2H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Oklahoma District

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,500.0	23.99	89.27	5,413.4	265.9	358.4	77.0	2.59
5,600.0	24.17	93.67	5,504.7	264.9	399.1	107.3	1.80
5,700.0	22.47	85.41	5,596.6	265.1	438.6	135.8	3.68
5,800.0	21.88	74.52	5,689.2	271.6	475.6	158.2	4.15
5,900.0	20.73	72.57	5,782.4	281.9	510.5	176.4	1.35
6,000.0	22.58	71.82	5,875.3	293.2	545.6	194.2	1.87
6,100.0	22.59	73.02	5,967.6	304.8	582.2	212.8	0.46
6,200.0	23.90	75.53	6,059.5	315.5	620.2	233.0	1.64
6,300.0	26.16	81.79	6,150.1	323.7	661.7	257.4	3.48
6,400.0	28.18	81.50	6,239.1	330.3	706.8	285.6	2.02
6,500.0	28.13	76.49	6,327.3	339.3	753.1	313.0	2.36
6,600.0	28.10	74.92	6,415.5	350.9	798.8	338.1	0.74
6,700.0	28.20	77.20	6,503.7	362.3	844.6	363.5	1.08
6,800.0	28.54	84.18	6,591.7	370.0	891.4	392.2	3.33
6,900.0	28.48	91.31	6,679.6	371.8	939.0	425.5	3.40
7,000.0	26.48	95.36	6,768.3	369.2	985.0	460.7	2.74
7,087.0	26.70	94.00	6,846.1	366.0	1,023.8	491.0	0.74
7,120.0	26.41	92.88	6,875.6	365.1	1,038.6	502.3	1.75
<b>Sycamore</b>							
7,200.0	25.76	90.07	6,947.5	364.2	1,073.7	528.5	1.75
7,273.0	24.18	92.62	7,013.6	363.5	1,104.5	551.3	2.62
7,320.0	22.34	94.20	7,056.8	362.4	1,123.1	565.5	4.13
7,367.0	22.25	94.90	7,100.3	361.0	1,140.8	579.4	0.60
7,379.0	22.59	94.57	7,111.4	360.6	1,145.4	583.0	2.99
<b>Middlesex</b>							
7,414.0	23.57	93.67	7,143.6	359.7	1,159.1	593.6	2.99
7,444.0	27.35	94.73	7,170.7	358.7	1,171.9	603.5	12.69
7,474.0	30.60	97.28	7,196.9	357.2	1,186.4	615.1	11.59
7,504.0	33.68	98.16	7,222.3	355.0	1,202.2	628.0	10.38
7,534.0	37.46	99.21	7,246.7	352.4	1,219.4	642.4	12.76
7,564.0	39.57	102.64	7,270.2	348.8	1,237.8	658.1	10.01
7,567.0	39.80	102.90	7,272.5	348.4	1,239.6	659.8	9.32
<b>Burkett</b>							
7,594.0	41.86	105.10	7,292.9	344.1	1,256.8	675.1	9.32
7,596.0	42.07	105.34	7,294.4	343.8	1,258.0	676.3	13.27
<b>Tully</b>							
7,624.0	45.11	108.44	7,314.7	338.2	1,276.5	693.6	13.27
7,654.0	49.33	106.15	7,335.1	331.6	1,297.5	713.3	15.14
7,684.0	52.32	105.80	7,354.0	325.2	1,319.9	733.9	10.01
7,714.0	55.22	105.36	7,371.8	318.7	1,343.2	755.3	9.74
7,730.0	56.91	106.65	7,380.7	315.1	1,356.0	767.1	12.48
<b>Hamilton</b>							
7,744.0	58.39	107.74	7,388.2	311.6	1,367.3	777.7	12.48
7,774.0	62.17	109.76	7,403.0	303.2	1,391.9	801.4	13.89
7,804.0	64.81	112.48	7,416.4	293.5	1,416.9	826.2	11.97

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Office of Oil and Gas



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Nellie Unit 2H
<b>Project:</b>	Harrison County West Virginia	<b>TVD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Site:</b>	Ruth/Norris/Nellie/Ford Pad	<b>MD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Well:</b>	Nellie Unit 2H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Oklahoma District

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,834.0	67.01	112.66	7,428.7	283.0	1,442.2	851.8	7.35
7,864.0	70.08	115.21	7,439.7	271.7	1,467.7	878.1	12.93
7,888.0	71.83	118.88	7,447.5	261.4	1,487.9	899.8	16.18
<b>Marcellus</b>							
7,894.0	72.28	119.78	7,449.3	258.6	1,492.9	905.4	16.18
7,924.0	75.27	121.10	7,457.7	244.0	1,517.8	933.4	10.82
7,954.0	77.47	123.47	7,464.8	228.4	1,542.4	962.0	10.62
7,984.0	80.46	124.17	7,470.5	212.0	1,566.9	991.1	10.23
8,014.0	82.39	125.84	7,475.0	195.0	1,591.2	1,020.4	8.47
8,044.0	85.65	128.39	7,478.1	177.0	1,614.9	1,050.0	13.77
8,102.0	91.45	132.96	7,479.6	139.2	1,658.9	1,107.9	12.73
8,166.0	90.84	130.50	7,478.3	96.6	1,706.6	1,171.9	3.96
8,260.0	89.25	133.05	7,478.2	34.0	1,776.7	1,265.8	3.20
8,354.0	89.34	132.43	7,479.4	-29.8	1,845.8	1,359.8	0.67
8,448.0	89.60	133.58	7,480.3	-93.9	1,914.5	1,453.8	1.25
8,542.0	89.96	134.37	7,480.6	-159.2	1,982.1	1,547.8	0.92
8,636.0	89.87	133.31	7,480.8	-224.3	2,049.9	1,641.8	1.13
8,730.0	90.40	131.20	7,480.6	-287.5	2,119.5	1,735.7	2.31
8,824.0	90.22	131.82	7,480.0	-349.8	2,189.9	1,829.7	0.69
8,918.0	89.52	131.82	7,480.3	-412.4	2,260.0	1,923.7	0.74
9,012.0	89.78	133.23	7,480.8	-476.0	2,329.2	2,017.6	1.53
9,106.0	88.90	135.42	7,481.9	-541.6	2,396.5	2,111.6	2.51
9,200.0	88.46	135.16	7,484.1	-608.4	2,462.6	2,205.5	0.54
9,294.0	89.87	136.21	7,485.4	-675.7	2,528.2	2,299.5	1.87
9,388.0	91.80	138.15	7,484.1	-744.6	2,592.1	2,393.2	2.91
9,482.0	91.71	134.63	7,481.2	-812.6	2,656.9	2,487.1	3.74
9,576.0	91.01	132.52	7,479.0	-877.4	2,725.0	2,581.0	2.36
9,670.0	91.10	132.08	7,477.2	-940.7	2,794.5	2,675.0	0.48
9,764.0	91.10	131.20	7,475.4	-1,003.1	2,864.7	2,768.9	0.94
9,858.0	90.48	132.96	7,474.1	-1,066.1	2,934.5	2,862.9	1.98
9,952.0	89.60	131.82	7,474.1	-1,129.5	3,003.9	2,956.9	1.53
10,046.0	91.10	134.19	7,473.5	-1,193.6	3,072.6	3,050.9	2.98
10,140.0	91.63	132.79	7,471.3	-1,258.2	3,140.8	3,144.8	1.59
10,231.0	90.57	134.90	7,469.5	-1,321.3	3,206.4	3,235.8	2.59
10,321.0	90.57	134.37	7,468.6	-1,384.5	3,270.5	3,325.8	0.59
10,412.0	90.84	134.28	7,467.5	-1,448.1	3,335.6	3,416.8	0.31
10,503.0	90.57	133.40	7,466.4	-1,511.1	3,401.2	3,507.7	1.01
10,594.0	90.31	134.72	7,465.7	-1,574.4	3,466.6	3,598.7	1.48
10,684.0	90.31	134.37	7,465.2	-1,637.5	3,530.7	3,688.7	0.39
10,775.0	89.43	131.38	7,465.4	-1,699.4	3,597.4	3,779.7	3.43
10,866.0	89.69	131.20	7,466.1	-1,759.5	3,665.8	3,870.6	0.35
10,957.0	89.69	134.10	7,466.6	-1,821.1	3,732.7	3,961.6	3.19
11,048.0	89.78	136.13	7,467.0	-1,885.6	3,796.9	4,052.6	2.23
11,139.0	89.43	135.60	7,467.6	-1,950.9	3,860.3	4,143.5	0.70
11,230.0	90.04	135.25	7,468.1	-2,015.7	3,924.2	4,234.4	0.77





EOW Completion Report



<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Nellie Unit 2H
<b>Project:</b>	Harrison County West Virginia	<b>TVD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Site:</b>	Ruth/Norris/Nellie/Ford Pad	<b>MD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Well:</b>	Nellie Unit 2H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (%/100usft)
11,324.0	90.57	131.29	7,467.6	-2,080.1	3,992.6	4,328.4	4.25
11,418.0	90.92	130.41	7,466.3	-2,141.6	4,063.7	4,422.3	1.01
11,512.0	91.28	132.70	7,464.5	-2,203.9	4,134.0	4,516.2	2.47
11,606.0	91.01	134.54	7,462.7	-2,268.8	4,202.0	4,610.2	1.98
11,698.0	91.01	133.58	7,461.0	-2,332.7	4,268.1	4,702.2	1.04
11,791.0	90.40	132.50	7,459.9	-2,396.2	4,336.1	4,795.2	1.33
11,885.0	90.92	133.49	7,458.8	-2,460.3	4,404.9	4,889.2	1.19
11,980.0	91.10	133.49	7,457.1	-2,525.7	4,473.8	4,984.1	0.19
12,074.0	89.96	134.02	7,456.3	-2,590.7	4,541.7	5,078.1	1.34
12,168.0	90.22	134.98	7,456.1	-2,656.6	4,608.7	5,172.1	1.06
12,262.0	90.40	135.07	7,455.6	-2,723.1	4,675.1	5,266.1	0.21
12,356.0	90.84	134.98	7,454.6	-2,789.5	4,741.6	5,360.1	0.48
12,450.0	90.92	130.32	7,453.1	-2,853.2	4,810.7	5,454.0	4.96
12,543.0	90.84	129.45	7,451.7	-2,912.8	4,882.0	5,546.8	0.94
12,637.0	90.75	130.32	7,450.4	-2,973.1	4,954.2	5,640.6	0.93
12,731.0	90.40	134.19	7,449.5	-3,036.3	5,023.7	5,734.6	4.13
12,825.0	89.34	135.86	7,449.7	-3,102.8	5,090.2	5,828.5	2.10
12,919.0	91.98	135.69	7,448.6	-3,170.1	5,155.7	5,922.4	2.81
13,013.0	92.59	136.30	7,444.8	-3,237.7	5,221.0	6,016.3	0.92
13,107.0	92.15	133.40	7,441.0	-3,303.9	5,287.5	6,110.2	3.12
13,201.0	91.98	132.43	7,437.6	-3,367.9	5,356.3	6,204.1	1.05
13,295.0	91.63	131.82	7,434.6	-3,430.9	5,426.0	6,298.0	0.75
13,388.0	90.48	132.61	7,432.9	-3,493.4	5,494.9	6,391.0	1.50
13,482.0	91.45	133.93	7,431.3	-3,557.8	5,563.3	6,485.0	1.74
13,576.0	91.19	132.87	7,429.1	-3,622.4	5,631.6	6,578.9	1.16
13,670.0	90.48	132.35	7,427.8	-3,686.0	5,700.8	6,672.9	0.94
13,764.0	91.54	133.75	7,426.1	-3,750.2	5,769.4	6,766.9	1.87
13,858.0	91.45	133.23	7,423.7	-3,814.8	5,837.6	6,860.9	0.56
13,953.0	90.48	134.37	7,422.1	-3,880.6	5,906.2	6,955.8	1.58
14,047.0	90.75	134.19	7,421.1	-3,946.2	5,973.5	7,049.8	0.35
14,141.0	91.01	132.52	7,419.6	-4,010.7	6,041.8	7,143.8	1.80
14,235.0	89.69	133.84	7,419.0	-4,075.0	6,110.3	7,237.8	1.99
14,329.0	90.13	133.66	7,419.2	-4,140.0	6,178.2	7,331.8	0.51
14,423.0	90.40	134.10	7,418.8	-4,205.2	6,246.0	7,425.8	0.55
14,517.0	90.48	133.49	7,418.0	-4,270.3	6,313.9	7,519.8	0.65
14,612.0	90.75	133.93	7,417.0	-4,335.9	6,382.5	7,614.8	0.54
14,705.0	88.81	133.84	7,417.4	-4,400.4	6,449.5	7,707.8	2.09
14,799.0	90.04	134.46	7,418.3	-4,465.8	6,517.0	7,801.8	1.47
14,893.0	90.57	135.25	7,417.8	-4,532.1	6,583.6	7,895.7	1.01
14,987.0	89.87	133.58	7,417.5	-4,597.9	6,650.8	7,989.7	1.93
15,081.0	90.57	132.70	7,417.1	-4,662.2	6,719.3	8,083.7	1.20
15,175.0	90.75	131.56	7,416.0	-4,725.2	6,789.1	8,177.7	1.23
15,269.0	90.31	133.23	7,415.1	-4,788.6	6,858.5	8,271.7	1.84
15,364.0	91.28	134.24	7,413.8	-4,854.3	6,927.1	8,366.6	1.47

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<b>Company:</b>	Antero Resources	<b>Local Co-ordinate Reference:</b>	Well Nellie Unit 2H
<b>Project:</b>	Harrison County West Virginia	<b>TVD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Site:</b>	Ruth/Norris/Nellie/Ford Pad	<b>MD Reference:</b>	Nellie Unit 2H GL 1376' + 24' RKB @ 1400.0usft
<b>Well:</b>	Nellie Unit 2H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Wellpath	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	As Drilled	<b>Database:</b>	Oklahoma District

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
15,456.0	87.28	130.82	7,415.0	-4,916.4	6,994.9	8,458.6	5.72
15,551.0	88.56	131.93	7,418.4	-4,979.2	7,066.1	8,553.5	1.78
15,644.0	88.49	133.57	7,420.8	-5,042.3	7,134.4	8,646.4	1.76
15,738.0	89.87	133.66	7,422.2	-5,107.1	7,202.4	8,740.4	1.47
15,832.0	89.96	131.99	7,422.3	-5,171.0	7,271.4	8,834.4	1.78
15,926.0	88.69	130.75	7,423.4	-5,233.2	7,341.9	8,928.3	1.89
16,020.0	88.42	131.68	7,425.8	-5,295.1	7,412.6	9,022.2	1.03
16,114.0	88.25	134.82	7,428.5	-5,359.4	7,481.0	9,116.2	3.34
16,208.0	87.79	134.94	7,431.8	-5,425.7	7,547.6	9,210.1	0.51
16,303.0	88.29	135.51	7,435.0	-5,493.1	7,614.5	9,305.0	0.80
16,396.0	88.81	134.63	7,437.4	-5,558.9	7,680.1	9,397.9	1.10
16,490.0	89.09	132.97	7,439.1	-5,624.0	7,747.9	9,491.9	1.79
16,585.0	89.70	133.65	7,440.1	-5,689.2	7,817.1	9,586.9	0.96
16,678.0	90.03	133.63	7,440.3	-5,753.3	7,884.4	9,679.9	0.36
16,772.0	88.99	133.70	7,441.1	-5,818.2	7,952.4	9,773.9	1.11
16,866.0	89.09	133.79	7,442.7	-5,883.2	8,020.3	9,867.9	0.14
16,960.0	90.44	133.75	7,443.1	-5,948.2	8,088.1	9,961.9	1.44
17,053.0	90.60	133.43	7,442.2	-6,012.4	8,155.5	10,054.9	0.38
17,147.0	91.24	132.77	7,440.7	-6,076.6	8,224.1	10,148.8	0.98
17,241.0	91.68	132.96	7,438.3	-6,140.5	8,293.0	10,242.8	0.51
17,336.0	93.02	134.01	7,434.4	-6,205.8	8,361.9	10,337.7	1.79
17,397.0	93.09	134.48	7,431.2	-6,248.3	8,405.5	10,398.6	0.78
17,455.0	91.85	143.80	7,428.7	-6,292.1	8,443.4	10,456.2	16.20

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,120.0	6,875.6	365.1	1,038.6	Sycamore
7,379.0	7,111.4	360.6	1,145.4	Middlesex
7,567.0	7,272.5	348.4	1,239.6	Burkett
7,596.0	7,294.4	343.8	1,258.0	Tully
7,730.0	7,380.7	315.1	1,356.0	Hamilton
7,888.0	7,447.5	261.4	1,487.9	Marcellus

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

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SEP 29 2017

# Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	5/3/2017
Job End Date:	5/14/2017
State:	West Virginia
County:	Harrison
API Number:	47-033-05687-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Nellie 2H
Latitude:	39.25344167
Longitude:	-80.56040278
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,484
Total Base Water Volume (gal):	15,126,302
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	Carrier/Base Fluid	Water	7732-18-5	100.00000	88.28611	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	11.48409	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.13505	
			Hydrogen Chloride	7647-01-0	17.50000	0.03140	
WFRA-500	U.S. Well Services, LLC	Friction Reducer	2-Propenoic acid, polymer with 2-propenamide	9003-06-9	30.00000	0.01662	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01338	
			Guar Gum	9000-30-0	50.00000	0.01190	
LGC-15	U.S. Well Services, LLC	Gelling Agents	Petroleum Distillates	64742-47-8	60.00000	0.01127	
			Suspending agent (solid)	14808-60-7	3.00000	0.00182	
			Surfactant	68439-51-0	3.00000	0.00071	

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Bioclear 2000	U.S. Well Services, LLC	Anti-Bacterial Agent					
			2,2-dibromo-3-nitripropionamide	10222-01-2	20.00000	0.00403	
			Deionized Water	7732-18-5	28.00000	0.00230	
SI-1200s	U.S. Well Services, LLC	Scale Inhibitor					
			Alkyl Phosphonic Acid	Proprietary	5.00000	0.00061	
			Ammonia	7664-41-7	0.50000	0.00009	
AP One	U.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00050	
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors					
			Ethylene glycol	107-21-1	40.00000	0.00004	
			Cinnamaldehyde	104-55-2	20.00000	0.00002	
			Formic acid	64-18-6	20.00000	0.00002	
			Butyl cellosolve	111-76-2	20.00000	0.00001	
			Polyether	60828-78-6	10.00000	0.00001	
			Acetophenone, thiourea, formaldehyde polymer	68527-49-1	5.00000	0.00000	

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

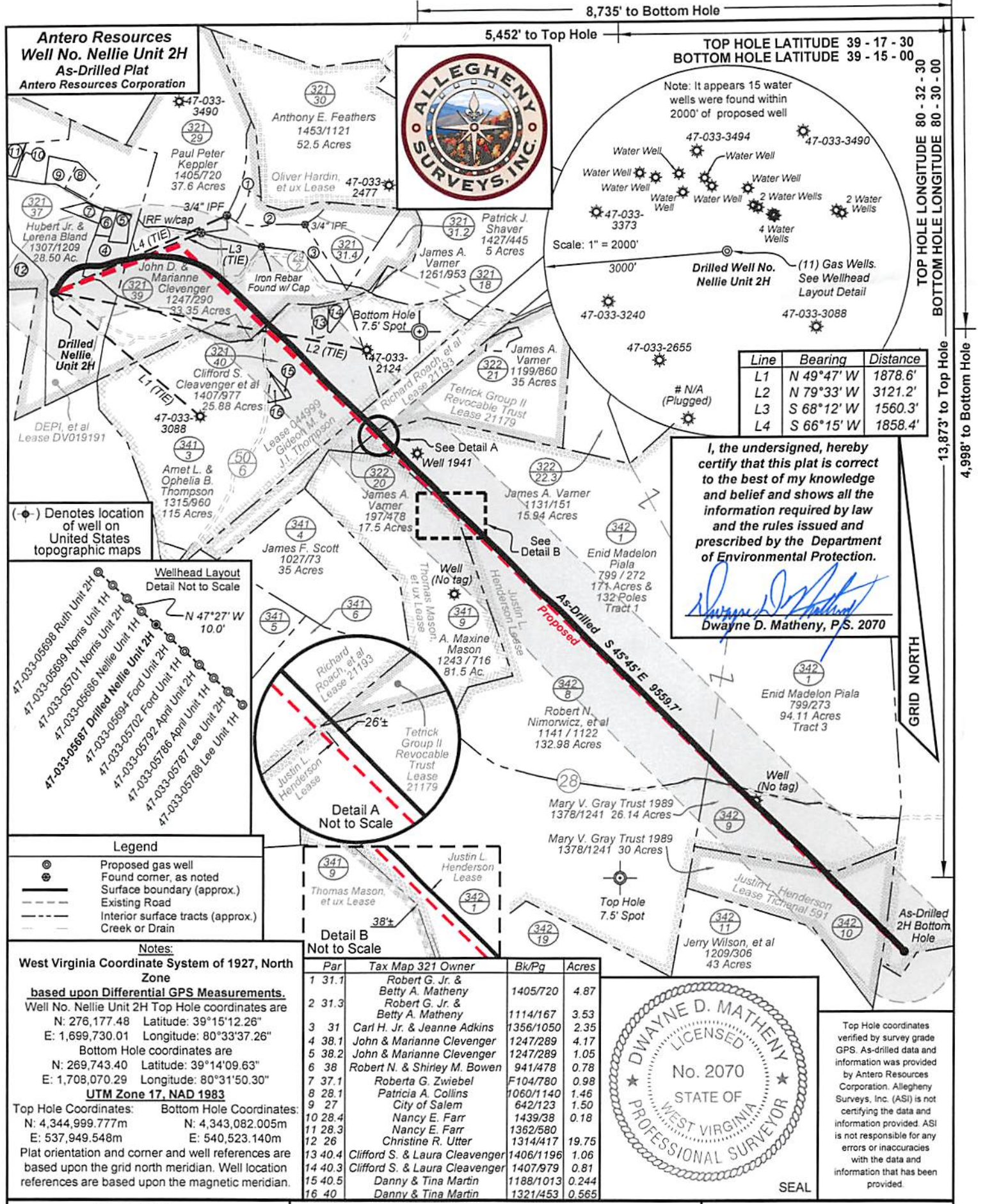
\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

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)

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SEP 29 2017  
WV Department of  
Environmental Protection





FILE NO: 70-36-U-12  
 DRAWING NO: 70-12 Nellie Drilled 2H  
 SCALE: 1" = 1200'  
 MINIMUM DEGREE OF ACCURACY: Submeter  
 PROVEN SOURCE OF ELEVATION: WVDOT, Bridgeport, WV

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

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DATE: August 28 2017  
 OPERATOR'S WELL NO. Nellie Unit 2H  
 API WELL NO  
 STATE 47 - COUNTY 033 - PERMIT 05687

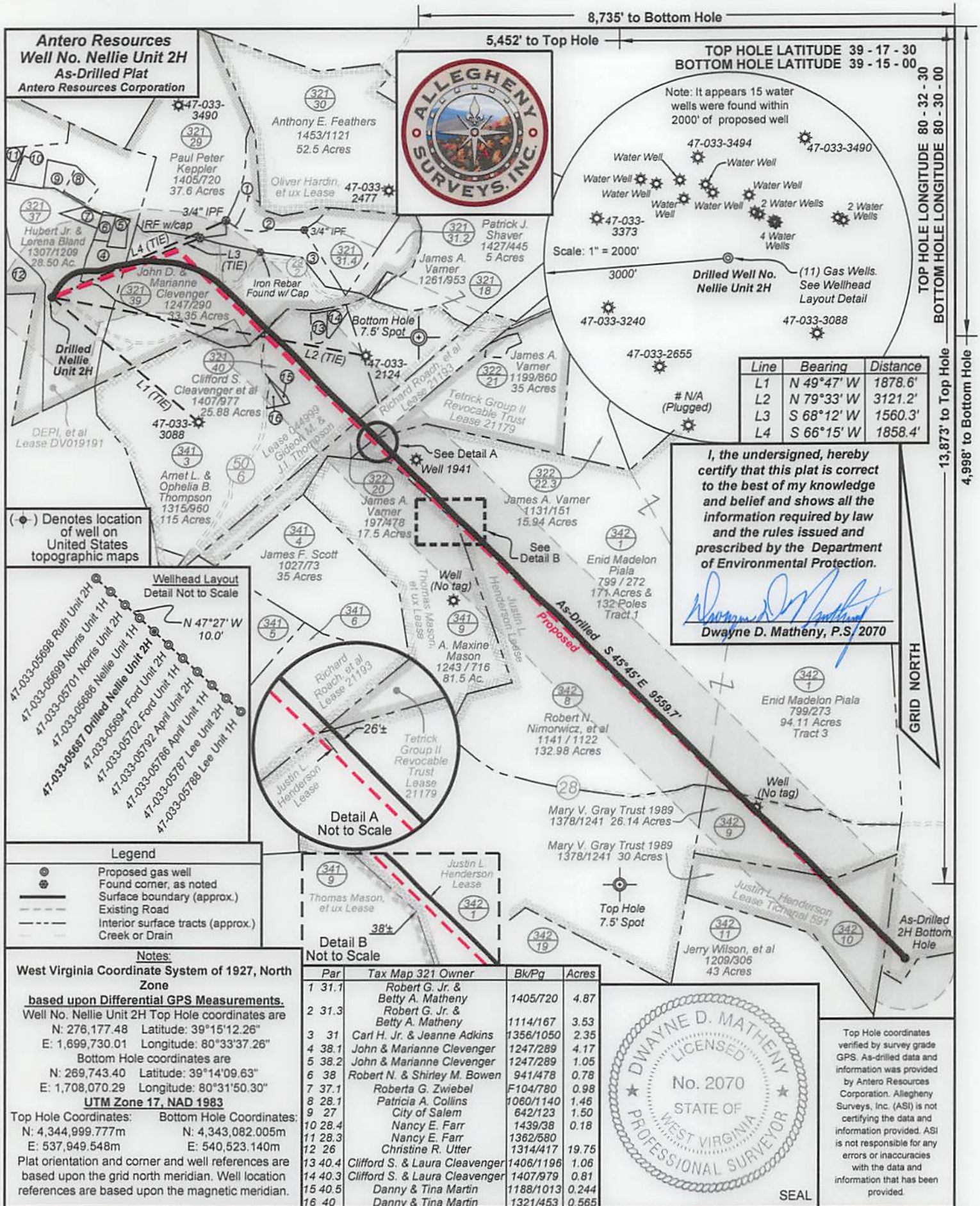
WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
 (IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION: Original - 1398' Existing - 1376' WATERSHED: Tenmile Creek QUADRANGLE: Salem & Big Isaac  
 DISTRICT: Tenmile COUNTY: Harrison

SURFACE OWNER: Hubert Jr. & Lorena Bland Justin L. Henderson; Tetrick Group II Revocable Trust; ACREAGE: 28.50 283;  
 ROYALTY OWNER: DEPI, et al; Gideon M. & J.I. Thompson; Richard Roach, et al LEASE NO: DV019191; 044999; ACREAGE: 30; 144; 1026.936  
 PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TVD 7,429'  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale DEPTH: MD 17,455'

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





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

*Dwayne D. Matheny*  
**Dwayne D. Matheny, P.S. 2070**

- Wellhead Layout**  
 Detail Not to Scale
- 47-033-05688 Ruth Unit 2H
  - 47-033-05699 Norris Unit 1H
  - 47-033-05701 Norris Unit 2H
  - 47-033-05686 Nellie Unit 1H
  - 47-033-05687 Drilled Nellie Unit 2H
  - 47-033-05694 Ford Unit 2H
  - 47-033-05702 Ford Unit 1H
  - 47-033-05782 April Unit 1H
  - 47-033-05786 April Unit 2H
  - 47-033-05787 Lee Unit 2H
  - 47-033-05788 Lee Unit 1H

**Legend**

- Proposed gas well
- Found corner, as noted
- Surface boundary (approx.)
- Existing Road
- Interior surface tracts (approx.)
- Creek or Drain

**Notes:**  
 West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.  
 Well No. Nellie Unit 2H Top Hole coordinates are  
 N: 276,177.48    Latitude: 39°15'12.26"  
 E: 1,699,730.01    Longitude: 80°33'37.26"  
 Bottom Hole coordinates are  
 N: 269,743.40    Latitude: 39°14'09.63"  
 E: 1,708,070.29    Longitude: 80°31'50.30"  
**UTM Zone 17, NAD 1983**  
 Top Hole Coordinates:    Bottom Hole Coordinates:  
 N: 4,344,999.777m    N: 4,343,082.005m  
 E: 537,949.548m    E: 540,523.140m  
 Plat orientation and corner and well references are based upon the grid north meridian. Well location references are based upon the magnetic meridian.

Par	Tax Map	321 Owner	Bk/Pg	Acres
1	31.1	Robert G. Jr. & Betty A. Matheny	1405/720	4.87
2	31.3	Robert G. Jr. & Betty A. Matheny	1114/167	3.53
3	31	Carl H. Jr. & Jeanne Adkins	1356/1050	2.35
4	38.1	John & Marianne Clevenger	1247/289	4.17
5	38.2	John & Marianne Clevenger	1247/289	1.05
6	38	Robert N. & Shirley M. Bowen	941/478	0.78
7	37.1	Roberta G. Zwiebel	F104/780	0.98
8	28.1	Patricia A. Collins	1060/1140	1.46
9	27	City of Salem	642/123	1.50
10	28.4	Nancy E. Farr	1439/38	0.18
11	28.3	Nancy E. Farr	1362/580	
12	26	Christine R. Utter	1314/417	19.75
13	40.4	Clifford S. & Laura Clevenger	1406/1196	1.06
14	40.3	Clifford S. & Laura Clevenger	1407/979	0.81
15	40.5	Danny & Tina Martin	1188/1013	0.244
16	40	Danny & Tina Martin	1321/453	0.565



Top Hole coordinates verified by survey grade GPS. As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys, Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

FILE NO: 70-36-U-12  
 DRAWING NO: 70-12 Nellie Drilled 2H  
 SCALE: 1" = 1200'  
 MINIMUM DEGREE OF ACCURACY: Submeter  
 PROVEN SOURCE OF ELEVATION: WVDOT, Bridgeport, WV

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

DATE: August 28 2017  
 OPERATOR'S WELL NO. Nellie Unit 2H  
 API WELL NO  
 47 - 033 - 05687  
 STATE COUNTY PERMIT

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 (IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
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 Tetchen 591; 21193; 36; 17.50;  
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