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

API <u>47</u> <u>095 </u> 02158	County Tyler	Dis	trict McElro	ру
Quad Center Point 7.5'	Pad Name Forest		ld/Pool Nam	
Farm name Moore, Brenda & Forest				Glover Unit 1H
Operator (as registered with the OOG)	Antero Resources 0		•	
Address 1615 Wynkoop Street	City Denv		State CO	Zip 80202
	orthing 4,360,762m		522,390m	> y
_	orthing 4,361,116.01m		522,466.17m	
Bottom Hole No	orthing 4,363,346m	Easting	521,740m	
Elevation (ft) 745' GL	Type of Well	New □ Existing	Type of Re	port □Interim ■Final
Permit Type Deviated Hor	izontal 📱 Horizonta	l 6A 🛘 Vertical	Depth Typ	e 🗆 Deep 🖪 Shallow
Type of Operation □ Convert □ Dec	epen 🖪 Drill 🗆 F	Plug Back 🛮 🗆 Redrilling	g □ Rewo	ork Stimulate
Well Type □ Brine Disposal □ CBM	■ Gas ■ Oil □ Seco	ndary Recovery Solut	ion Mining	□ Storage □ Other
Type of Completion ■ Single □ Multi	ple Fluids Produce	ed □ Brine ■Gas □	NGL & C	Oil □ Other
Drilled with □ Cable ■ Rotary				
Drilling Media Surface hole Air		r Intermediate hole	: Ai r 🗆	Mud □ Fresh Water □ Brine
	Fresh Water Brine			
Mud Type(s) and Additive(s) Air- Foam & 4% KCL				
Mud- Polymer			·	
ividu- Polymer				
Date permit issued03/11/2014	Date drilling comme	enced 04/18/2014	_ Date dril	ling ceased08/17/2014
Date completion activities began	10/16/2014	Date completion activities	es ceased	02/17/2015
Verbal plugging (Y/N) N/A Da	te permission granted	N/A	Granted by_	N/A
Please note: Operator is required to sub-	nit a plugging applicat	ion within 5 days of verba	al permission	to plug
			-	
	, 329'	Open mine(s) (Y/N) deptl	hs	No
Salt water depth(s) ft 535'; 2	2,052'	Void(s) encountered (Y/N	J)_depths	None
Coal depth(s) ft None Ide			CD: —	None
Is coal being mined in area (Y/N)	No	Cavern(s) en RECELY Office of Oil 8	and Gas	
\$ \\\ \\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\		JUL 0 6		Reviewed by: Mar 7/24/15

WV Department of Environmental Protection

API 47- 095	02158	Farm name	Moore, Brend	da & Forest	Well	number_Glover U	Jnit 1H
CASING STRINGS	Hole Size	Casing Size		ew or Grade	1	Basket Did c	ement circulate (Y/N)
Conductor	24"	20"		Jsed wt/ft			ovide details below*
Surface	-				3#; J-55	N/A	Yes
Coal	17 1/2"	13 3/8"	399'	New 48	#; H-40	N/A	Yes
Intermediate 1	46.445	0.5/5	2.515:				
	12 1/4"	9 5/8"	2,543'	New 36	#; J-55	N/A	Yes
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	14,810'	New 23#	; P-110	N/A	Yes
Tubing		2 3/8"	6,828'	4.7	#; N-80	N/A	
Packer type and d	epth set	N/A					
Comment Details							
CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft²)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	50 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	482 sx	15.6	1.18	277	0'	8 Hrs.
Coal							
Intermediate I	Class A	934 sx	15.6	1.18	796	0'	8 Hrs.
Intermediate 2				1			
Intermediate 3					-		
Production	Class H	1,015 sx (Lead); 1,247 sx (Tail) 14.5 (Lead); 15.2 (Tail)	1.3 (Lead); 1.86 (Tail)	2,925	~500' into intermediate Casin	8 Hrs.
Tubing	0103311		, (aday, 10.2 (1dil)	(LUBU), 1.00 (18II)	2,320		o mis.
Deepest forma Plug back pro Kick off depth Check all wire	(ft) <u>6,463</u> '	□ caliper [density 🗆	g back to (ft) N/	ional □ in	on one well on a r #47-095-02038). submitted with Fo	quent well. Antero only runs wir multi-well pad (Ed Arnold Unit 1 Please reference the wireline Io mm WR-35 for the Ed Arnold Ur g has been included with this su
Well cored	Yes No	Conventional	Sidewall	w	ere cuttings	collected □ Yes	■ No
DESCRIBE T	HE CENTRALI	ZER PLACEMENT	T USED FOR EA	ACH CASING S	TRING		
	de shoe, 1 above insert f	loat, 1 every 4th joint to surface)				
		t collar, 1 every 4th joint to sur					
Production- 1 above f	loat joint, 1 below float c	ollar, 1 every 3rd joint to top of	cement				
WAS WELL (COMPLETED A	AS SHOT HOLE	□ Yes ■ No	DETAILS		HEC:	EIVED
WAS WELL (COMPLETED C	OPEN HOLE?	Yes 🖪 No	DETAILS			oil and Gas
WEDE TO A C	EDC LICES	3/ B 31	TABLE OF THE A				0 6 2015
WEKE TRAC	ERS USED	Yes ■ No T	YPE OF TRAC	EK(S) USED		WV Dep	artment of
						Environmen	ntal Protection 07/24/201

WR-	35	
Rev.	8/23	/13

Page of	ſ
---------	---

API 47- 095 _ 02158	Farm name_Moore, Brenda & Forest	Well number Glover Unit 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	 				
-					
		* PLEASE S	SEE ATTA	CHED EX	KHIBIT 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 (bbls)	Amount of Nitrogen/other (units)
<u></u>								
				<u> </u>				
		* P	LEASE SE	E ATTACI	HED EX	HIBIT 2	_	
		· · · · · ·	7				-	
								- FWED
							RE	CEIVED of Oil and Gas
							Office (of Oil and Gas
<u> </u>	l							ለ ይ /2በነቫ

Please insert additional pages as applicable.

JUL 0 6 2015

WR-35 Rev. 8/23/13								Page of
	_ 02158	Farm	name Moore, E	Brenda & F	orest	Well n	umber	Glover Unit 1H
PRODUCING	FORMATION(S)	DEPTHS					
Marcellus	FORWATION	<u>51</u>	6,554' (top)	TVD 6	,823' (top)	MD		
Warcenus			0,004 (10p)	_1vb _	,020 (top)	MD		
				-		_		
Please insert ad	lditional pages a	s applicable.						
GAS TEST	□ Build up	Drawdown	■ Open Flow	C	IL TEST 1	Flow 🗆	Pump	
SHUT-IN PRE								DF TEST hrs
OPEN FLOW	Gas 13,531 me	Oil pd 15	bpd					JRED BY ■ Orifice □ Pilot
LITHOLOGY/	TOP	воттом	TOP	воттом				
FORMATION	DEPTH IN FT	DEPTH IN FT		DEPTH IN FI	DESCRIBE I	ROCK TYP	E AND	RECORD QUANTITYAND
	NAME TVD	TVD	MD	MD	TYPE OF FL	UID (FRES	SHWAT	ER, BRINE, OIL, GAS, H ₂ S, ETC)
	0		0					
	*	PLEAS	E SEE A	ГТАСН	ED EXI	HIRI	r 3	
		IDEAN	L OLL A	TACI	ED EAL	ши		
					-			
Please insert ad	 ditional pages a	s applicable						
Address 562 Sp	ctor Frontier Dr	illing LLC	City	Pennsboro		State	WV	Zip 26415
	and the death							
Logging Comp Address 1560 G	any STRC Good Hope Pike		City	Clarksburg		State	wv	Zip 26301
				-		_ State		
Cementing Cor Address 1650 H	npany Nabors C lackers Creek	completion & F	Production Service	Jane Lew		State	wv	Zip 26378
			City	danc con		_ State		Zip
Stimulating Co	mpany US We	ell Services	C'h-	Jane Lew		Ct	\/\/	7: 26378
Victoria and the second	ditional pages a	s applicable.	City	Jane Lew		_ State		Zip 26378 RECEIVED
						005.5=		(0:10001703
	Megan Darling	100	Tital D	ermitting Agent	Telephone	303-357	-7230	
Signature	Megn	· wali	Title P	Similary Agent			Date _	JUL 0 6 2015
Submittal of H	ydraulic Fractur	ing Chemical	Disclosure Info	rmation	Attach copy o	f FRACF	OCUS	Registry
								WV Depoty24/201
								Environmental Protect

		FYL	IIBIT 1	- Indiliber 010	ACI OHIL TU
	Perforation	Perforated from MD	Perforated to	Number of	
Stage No.	Date	ft.	MD ft.	Perforations	Formations
1	16-Oct-14	14,549	14,715	60	Marcellus
2	4-Dec-14	14,352	14,518	60	Marcellus
3	5-Dec-14	14,155	14,321	60	Marcellus
4	5-Dec-14	13,958	14,124	60	Marcellus
5	5-Dec-14	13,761	13,927	60	Marcellus
6	5-Dec-14	13,564	13,730	60	Marcellus
7	6-Dec-14	13,367	13,534	60	Marcellus
8	6-Dec-14	13,170	13,337	60	Marcellus
9	6-Dec-14	12,973	13,140	60	Marcellus
10	7-Dec-14	12,777	12,943	60	Marcellus
11	7-Dec-14	12,580	12,746	60	Marcellus
12	7-Dec-14	12,383	12,549	60	Marcellus
13	7-Dec-14	12,186	12,352	60	Marcellus
14	8-Dec-14	11,989	12,155	60	Marcellus
15	8-Dec-14	11,792	11,958	60	Marcellus
16	9-Dec-14	11,595	11,761	60	Marcellus
17	9-Dec-14	11,398	11,564	60	Marcellus
18	9-Dec-14	11,201	11,367	60	Marcellus
19	10-Dec-14	11,004	11,170	60	Marcellus
20	10-Dec-14	10,807	10,973	60	Marcellus
21	10-Dec-14	10,610	10,776	60	Marcellus
22	11-Dec-14	10,413	10,579	60	Marcellus
23	11-Dec-14	10,216	10,382	60	Marcellus
24	11-Dec-14	10,019	10,185	60	Marcellus
25	11-Dec-14	9,822	9,988	60	Marcellus
26	12-Dec-14	9,625	9,791	60	Marcellus
27	12-Dec-14	9,428	9,594	60	Marcellus
28	12-Dec-14	9,231	9,398	60	Marcellus
29	13-Dec-14	9,034	9,201	60	Marcellus
30	13-Dec-14	8,838	9,004	60	Marcellus
31	13-Dec-14	8,641	8,807	60	Marcellus
32	14-Dec-14	8,444	8,610	60	Marcellus
33	14-Dec-14	8,247	8,413	60	Marcellus
34	15-Dec-14	8,050	8,216	60	Marcellus
35	15-Dec-14	7,853	8,019	60	Marcellus
36	15-Dec-14	7,656	7,822	60	Marcellus
37	15-Dec-14	7,459	7,625	60	Marcellus
38	16-Dec-14	7,262	7,428	60	MarcellaECEIVED
39	16-Dec-14	7,065	7,231	60	Marriellus of Oil and (
40	17-Dec-14	6,868	7,034	60	Marcellus JUL 0 6 2015

WV Department of Environmental Protection

	API <u>4.</u>	7-095-02158	Farm Name	<u> Moore, Forest</u>	& Brenda W	ell Number Glover Unit :	<u>u</u>	
				EXHIBI"	T 2			
			Avg	Max			-	Amount of
	Calination	A B	Treatment	Breakdown			Amount of	Nitrogen/
Ctogo No	Stimulations Date	Avg Pump	Pressure	Pressure	ICID (DCI)	Amount of Proppant	Water	other
Stage No.	4-Dec-14	Rate 67.3	(PSI)	(PSI) N/A	ISIP (PSI)	(lbs)	(bbls)	(units)
2	4-Dec-14 4-Dec-14	69.3	7,138		5,546	243,510	6,593	N/A
3		71.7	7,361	5,901	5,904	200,500	6,003	N/A
	5-Dec-14	69.7	7,601	5,878	5,697	243,120	6,521	N/A
5	5-Dec-14	70.3	7,382	6,048	5,823	242,920	6,557	N/A
	5-Dec-14		7,181	5,728	5,395	243,900	6,834	N/A
7	5-Dec-14	71.4	7,307	5,848	4,621	244,300	6,459	N/A
	6-Dec-14	70.5	7,188	5,882	5,636	244,060	6,459	N/A
8	6-Dec-14	68.5	7,288	6,049	5,372	200,040	6,431	N/A
9	6-Dec-14	68.8	7,598	5,985	5,704	215,100	6,830	N/A
10	7-Dec-14	71.7	7,318	5,948	5,651	244,020	6,390	N/A
11	7-Dec-14	71.2	7,234	5,842	5,329	243,550	6,393	N/A
12	7-Dec-14	72.3	7,293	5,827	5,901	244,500	6,350	N/A
13	7-Dec-14	69.7	7,255	5,933	5,440	244,350	5,801	N/A
14	8-Dec-14	70.2	7,167	5,857	5,619	244,330	6,385	N/A
15	8-Dec-14	68.7	7,197	5,819	5,600	245,130	6,285	N/A
16	9-Dec-14	70.0	7,069	5,784	5,761	233,860	6,179	N/A_
17	9-Dec-14	70.8	6,984	5,776	5,571	243,970	6,295	N/A
18	9-Dec-14	70.7	6,973	5,741	5,521	245,050	6,234	N/A
19	10-Dec-14	70.5	6,949	5,724	5,850	243,820	6,317	N/A
20	10-Dec-14	70.5	6,918	5,796	5,485	243,670	6,197	N/A
21	10-Dec-14	70.1	6,893	5,513	5,650	243,570	6,186	N/A
22	11-Dec-14	71.1	7,338	5,750	5,709	243,970	6,174	N/A
23	11-Dec-14	69.9	7,166	5,794	5,703	244,050	6,142	N/A
24	11-Dec-14	57.2	6,597	5,755	5,535	190,070	6,754	N/A
25	11-Dec-14	70.1	7,055	5,466	5,590	241,705	6,138	N/A
26	12-Dec-14	70.2	6,995	5,778	5,563	244,610	6,126	N/A
27	12-Dec-14	70.4	7,085	5,536	5,822	243,260	6,113	N/A
28	12-Dec-14	69.8	6,738	5,766	5,767	241,450	6,081	N/A
29	13-Dec-14	70.2	7,000	5,466	5,564	242,620	6,079	N/A
30	13-Dec-14	70.4	6,912	5,637	5,405	244,860	6,060	N/A
31	13-Dec-14	70.0	7,114	5,712	5,781	243,520	6,046	N/A
32	14-Dec-14	69.9	6,791	5,459	5,579	243,520	6,047	N/A
33	14-Dec-14	70.0	7,012	6,026	5,645	243,210	6,031	N/A
34	15-Dec-14	70.2	7,298	5,726	5,772	242,400	6,086	N/A
35	15-Dec-14	70.7	6,916	6,133	5,902	244,900	5,988	N/A
36	15-Dec-14	70.9	6,572	6,034	5,662	244,400	5,988	N/A
37	15-Dec-14	70.0	6,976	5,744	5,273	244,360	5,954	N/A
38	16-Dec-14	70.5	6,853	5,744	5,912	244,120	5,955	N/A
39	16-Dec-14	71.1	6,784	6,954	6,190	244,400	5,934	N/A
40	17-Dec-14	70.2	6,497	6,100	5,500	243 580	5.0480.7	MVA
	AVG=	69.9	7,075	5,832	5,624	9,572,275	e of Oil	TOTAGAS

JUL 0 6 2015



API <u>4</u>	7-095-02158 Farm Name	Moore, Forest & Brenda We	Il Number Glover Unit 1	<u>H</u>
		EXHIBIT 3		
	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
LITHOLOGY/ FORMATION	From Surface	From Surface	From Surface	From Surface
Fresh Water	89'	N/A	89'	N/A
Fresh Water	329'	N/A	329'	N/A
Shale/ Sandstone	0	149	0	149
Sandstone/ Trace Coal	est. 149	209	est. 149	209
Sandstone/ Shale	est. 209	429	est. 209	429
Limestone	est. 429	449	est. 429	449
Sandstone	est. 449	569	est. 449	569
Sandstone/ Limestone	est. 569	689	est. 569	689
Sandstone	est. 689	789	est. 689	789
Sandstone/ Trace Coal	est. 789	829	est. 789	829
Shale/ Sandstone	est. 829	929	est. 829	929
Sandstone/ Trace Coal	est. 929	1,029	est. 929	1,029
Sandstone	est. 1029	1,069	est. 1029	1,069
Coal/ Sandstone	est. 1069	1,429	est. 1069	1,429
Sandstone	est. 1429	1,721	est. 1429	1,722
Big Lime	1,721	1,872	1,722	1,873
Big Injun	1,872	2,309	1,873	2,310
Gantz Sand	2,309	2,458	2,310	2,459
Fifty Foot Sandstone	2,458	2,538	2,459	2,539
Gordon	2,538	2,819	2,539	2,820
Fifth Sandstone	2,819	2,863	2,820	2,864
Bayard	2,863	3,266	2,864	3,267
Warren	3,266	3,624	3,267	3,625
Speechley	3,624	3,928	3,625	3,929
Baltown	3,928	4,389	3,929	4,390
Bradford	4,389	4,872	4,390	4,877
Benson	4,872	5,125	4,877	5,142
Alexander	5,125	5,340	5,142	5,370
Elk	5,340	5,859	5,370	5,935
Rhinestreet	5,859	6,167	5,935	6,286
Sycamore	6,167	6,327	6,286	6,466
Middlesex	6,327	6,467	6,466	6,654
Burkett	6,467	6,495	6,654	6,701
Tully	6,495	6,554	6,701	6,823
Marcellus	6,554	NA	6,823	NA

^{*}Please note Antero determines shallow 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

JUL 0 6 2015

WV Department of Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

omposition:	Hydraulic Fracturing Fluid Composition:
485,895	Total Base Non Water Volume:
10,472,406	Total Base Water Volume (gal);
6,615	True Vertical Depth:
NO	Federal/Tribal Well:
NAD83	Datum:
39.39606400	Latitude:
-80.73996400	Longitude:
Glover Unit 1H	Well Name and Number:
Antero Resources Corporation	Operator Name:
47-095-02158-00-00	API Number:
Tyler	County:
West Virginia	State:
12/17/2014	Job End Date;
12/4/2014	Job Start Date:













HCL Acid (12.6%-18.0%)

U.S. Well Services, LLC

Bulk Acid

Suspending agent (solid)

14808-60-7 64742-47-8 0-08-0006

8439-51-0

0.0044 0.01128 0.0698 0.07373

etroleum Distillates

Surfactant

Guar Gum

_GC-15

J.S. Well Services, LC

Gelling Agents

Crystalline Silica, quartz

14808-60-7

100.00000

9.84007

50.00000 60.0000 3.00000 3.0000

Vater

Antero Resources

Base Fluid

Water

7732-18-5

100.00000

89.7833

J.S. Well Services, LC

roppant

Trade Name

Supplier

Purpose

Ingredients

Number (CAS #)

(% by mass)** Additive

(% by mass)** HF Fluid

Comments

Chemical Maximum Maximum
Chemical Ingredient Ingredient
Abstract Service Concentration in Concentration in

NFRA-405

Well Services

Friction Reduce

Hydrogen Chloride

7641-01-1

732-18-5

87.5000

18.00000

0.02103 0.08806

Water

Water

Petroleum Distillates

64742-47-8

22.00000

0.01958

0.0243

roprietary

roprietary

7732-18-5

40.00000

0.02432

Anionic Polyacrylamide

Ethoxylated alcohol blend

0.00002	5.00000	61/91-14-8	Coco amine			
000	10.00000	68603-67-8	e polyamine			
000	10.00000	7647-01-0	Hydrogen Chloride			
000	20.00000	100-97-0	Methenamine			
000	30.00000	111-46-6	Diethylene Glycol			
				Acid Corrosion Inhibitors	U.S. Well Services, LLC	AI-301
000	100.00000	7727-54-0	Ammonium Persulfate			
				Gel Breakers	U.S. Well Services, LLC	AP One
00	28.00000	7732-18-5	Deionized Water			
00	20.00000	10222-01-2	2,2-dibromo-3- nitrilopropionamide			
				Anti-Bacterial Agent	U.S. Well Services, LLC	K-BAC 1020
8	5.00000	52255-49-9	Acrylic polymer			
	10.00000	40623-75-4	bis (hexamethylene) tramine penta (methylene phosphonic acid) - phosphate acid			
	10.00000	26677-99-6	Copolymer of Maleic and Acrylic 26677-99-6 acid			
0	10.00000	38820-59-6	hexamethylenediamine tetra (methylene phosphonic acid)			
0	10.00000	37971-36-1	ane 1,2,4			
0	10.00000	15827-60-8	Potassium salt of diethylene triamine penta (methylene phosphonic acid)			
0	40.00000	107-21-1	Ethylene Glycol			
0	80.00000	7732-18-5	Di Water			
				Scale Inhibitor	U.S. Well Services	SI-1100
8	5.00000	12125-02-9	Crystalline Salt			

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)

^{*}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%

