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

API <u>47</u> - 017 - 06395	County Doddridge	District Grant	
Quad Smithburg 7.5'	Pad Name Revival Pad	Field/Pool Name	
Farm name Williams, Larry et al		Well Number Gai	ns Unit 1H
Operator (as registered with the OOG)	Antero Resources Corpo	ration	
Address 1615 Wynkoop Street	City Denver	State CO	Zip 80202
Landing Point of Curve N Bottom Hole N	Attach an as-drilled plat, p Northing 4,352,804m Northing 4,352,496.63m Northing 4,350,655m	Easting 526,712m Easting 526,557.50m Easting 527,169m	
Elevation (ft) 1,376' GL	Type of Well ■New	□ Existing Type of Report	□Interim ■Final
Permit Type Deviated Ho	rizontal Horizontal 6A	□ Vertical Depth Type	□ Deep ■ Shallow
Type of Operation □ Convert □ D	eepen 🖪 Drill 🗆 Plug B	ack Redrilling Rework	■ Stimulate
Well Type □ Brine Disposal □ CBM	■ Gas ■ Oil □ Secondary	Recovery - Solution Mining - St	orage Other
Type of Completion ■ Single □ Mul Drilled with □ Cable ■ Rotary Drilling Media Surface hole ■ Air		Brine	□ Other
	Fresh Water	Intellinediate note 1111 1 1114	2 Litton water Library
Mud Type(s) and Additive(s) Air- Foam & 4% KCL			
Mud- Polymer			
Date permit issued11/26/2013	_ Date drilling commenced_		ceased10/17/2014 01/23/2015
Date completion activities began	Dute	NIA	N/A
Verbal plugging (Y/N) N/A I	Date permission granted	N/A Granted by	
Please note: Operator is required to su	bmit a plugging application wi	thin 5 days of verbal permission to p	plug
Freshwater depth(s) ft	427' Open	mine(s) (Y/N) depths	No
Salt water depth(s) ft1	687' Void(s	s) encountered (X/N) depths	None
Coal depth(s) ft None Ic	1°C1	n(s) Officer of (VIII) & pths as—	None
Is coal being mined in area (Y/N)		- AUG 1 7 2015	Reviewed hv

WR-35 Rev. 8/23/13								Page of
API 47- 017	06395	Farm na	_{ne} V	Villiams, Larr	y et al	Well	number_Gains	Unit 1H
M1 4/		raiii iiai	шс		<u> </u>	W CII	number	
CASING	Hole	Casing			w or Grade			oid cement circulate (Y/N)
STRINGS Conductor	Size 24*	Size 20"		 	sed wt/ft		- ` ` ` 	Provide details below*
Surface	17 1/2"	13 3/8"				; H-40 ; H-40	N/A N/A	Yes Yes
Coal	17 172	13 3/6		100	lew 48#	, 11-10	N/A	165
Intermediate 1	12 1/4"	9 5/8"		550' N	lew 36#	t; J-55	N/A	Yes
Intermediate 2	12 1/4	9 3/6		330 1	iew 30n	r, u-uu	INA	165
Intermediate 3	+				<u> </u>			
Production	8 3/4" & 8 1/2"	5 1/2"	14	,070' N	Jan. 20#	P-110	N/A	Yes
Tubing	0 3/4 & 0 1/2			·		-		Tes
Packer type and d	lenth set	2 3/8"		381' N	lew 4.7#	#; N-80	N/A	
Comment Details								
CEMENT DATA	Class/Type of Cement	Number of Sacks		Slurry wt (ppg)	Yield (ft ³/sks)	Volume	Cement Top (MD)	WOC (hrs)
Conductor	Class A	100 sx		15.6	1.18	38	0'	8 Hrs.
Surface	Class A	590 sx		15.6	1.18	335	0'	8 Hrs.
Coal								
Intermediate 1	Class A	939 sx		15.6	1.18	799	0'	8 Hrs.
Intermediate 2								
Intermediate 3								
Production	Class H	1,141 sx (Lead); 1,059	sx (Tail)	14.2 (Lead); 15.2 (Tail)	1.3 (Lead); 1.86 (Tail)	2,754	-500' into Intermediate	Casing 8 Hrs.
Tubing								
	14,070' MD, 7,196' TV ation penetrated		epest F		gers TD (ft) 14.			
Kick off depth	n (ft) 6,882* eline logs run **	□ caliper □ neutron			deviated/directi gamma ray		on one well 1H, API #47 logs submit Unit 1H. A nduction submittal.	subsequent well. Antero only run: l on a multi-well pad (Mt. Salem R 7-017-06269). Please reference to tied with Form WR-35 for the Mt. Cement Bond Log has been inclu
Well cored	⊐Yes ■ No	Conventio	nal	Sidewall	w	ere cuttings	s collected DY	es No
DESCRIBE T	HE CENTRALL	ZER PLACEME	NT L	JSED FOR EA	CH CASING S	TRING _		
Surface- 1 above gui	de shoe, 1 above insert flo							
	re float joint, 1 above float float joint, 1 below float co							
	COMPLETED A			Yes No	DETAILS			
	COMPLETED A				DETAILS _			ceived f Oil & Gas
							_	17 2015

TYPE OF TRACER(S) USED _

WERE TRACERS USED □ Yes ■ No

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API 47- 017 - 06395	Farm name_Williams, Larry et al	Well number_Gains Unit 1H
		

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	<u> </u>				
	;	* PLEASE S	SEE ATTA	CHED EX	CHIBIT 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)
		:				ļ		
		i				-		
		* P	LEASE SE	E ATTAC	HED EX	HIBIT 2		
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Please insert additional pages as applicable.

WR-35 Rev. 8/23/13								Page of
API 47- 017 - 063	395	Farm	name_Williams	, Larry e	t al	Well n	umber	Gains Unit 1H
PRODUCING FORM Marcellus	IATION(S	<u> </u>	<u>DEPTHS</u> 7,172' (top)	_ TVD —	7,444' (top)	MD		
Please insert additiona	al pages as	applicable.		-		_		
GAS TEST □ Bui	ld up □	Drawdown	■ Open Flow		OIL TEST	Flow 🗆	Pump	
SHUT-IN PRESSUR	E Surfa	ce 3,550	_psi Botto	m Hole	psi	DURAT	ION O	F TESThrs
OPEN FLOW Ga 8,434	mefp	Oil 3	bpd NGL	bpd	Water 1 bpd	GAS M	EASU nated	RED BY ■ Orifice □ Pilot
FORMATION DEP	TOP TH IN FT ME TVD 0	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD 0	BOTTOM DEPTH IN MD	FT DESCRIBE			RECORD QUANTITYAND ER, BRINE, OIL, GAS, H₂S, ETC)
	*	PLEAS	E SEE A	ГТАС	HED EX	HIBIT	Г 3	
Please insert addition	al pages as	s applicable.						
Drilling Contractor F Address 207 Carlton Dr	atterson- L	JTI Drilling Co	mpany, LLC City	Eighty Fo	ur	State	PA	Zip 15330
Logging Company S Address 1560 Good Ho	TRC ope Pike		City	Clarksbur	g	State	wv	Zip <u>26301</u>
Cementing Company Address _1650 Hackers	Nabors C Creek	ompletion & F	roduction Service City	Jane Lew		State	wv	Zip <u>26378</u>
Stimulating Company Address 837 Philippi Pi	ike		City	Clarksbur	9	State	wv	Zip 26301 Received
Please insert addition		s аррисавіе.			<u></u>	202 257	7220	Office of Oil & Gas
Completed by Mega		Darle	Title P	ermitting Ag	Telephone	e_303-357	Date 0	AUG 17 2015
Submittal of Hydraul		ng Chemical	Disclosure Info	rmation	Attach copy	of FRACE	OCUS	Registry

API 47-017-06395 Farm Name Williams, Larry et al Well Number Gains Unit 1H								
EXHIBIT 1								
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations			
1	11-Nov-14	13,806	13,972	60	Marcellus			
2	11-Dec-14	13,608	13,775	60	Marcellus			
3	11-Dec-14	13,411	13,577	60	Marcellus			
4	12-Dec-14	13,213	13,380	60	Marcellus			
5	12-Dec-14	13,016	13,183	60	Marcellus			
6	12-Dec-14	12,819	12,985	60	Marcellus			
7	13-Dec-14	12,621	12,788	60	Marcellus			
8	13-Dec-14	12,424	12,590	60	Marcellus			
9	13-Dec-14	12,226	12,393	60	Marcellus			
10	13-Dec-14	12,029	12,195	60	Marcellus			
11	14-Dec-14	11,831	11,998	60	Marcellus			
12	14-Dec-14	11,634	11,800	60	Marcellus			
13	14-Dec-14	11,436	11,603	60	Marcellus			
14	14-Dec-14	11,239	11,405	60	Marcellus			
15	15-Dec-14	11,041	11,208	60	Marcellus			
16	15-Dec-14	10,844	11,011	60	Marcellus			
17	16-Dec-14	10,646	10,813	60	Marcellus			
18	16-Dec-14	10,449	10,616	60	Marcellus			
19	16-Dec-14	10,252	10,418	60	Marcellus			
20	17-Dec-14	10,054	10,221	60	Marcellus			
21	17-Dec-14	9,857	10,023	60	Marcellus			
22	17-Dec-14	9,659	9,826	60	Marcellus			
23	17-Dec-14	9,462	9,628	60	Marcellus			
24	18-Dec-14	9,264	9,431	60	Marcellus			
25	18-Dec-14	9,067	9,233	60	Marcellus			
26	18-Dec-14	8,869	9,036	60	Marcellus			
27	18-Dec-14	8,672	8,838	60	Marcellus			
28	19-Dec-14	8,474	8,641	60	Marcellus			
29	19-Dec-14	8,277	8,444	60	Marcellus			
30	19-Dec-14	8,080	8,246	60	Marcellus			
31	19-Dec-14	7,882	8,049	60	Marcellus			
32	20-Dec-14	7,685	7,851	60	Marcellus			
33	20-Dec-14	7,487	7,654	60	Marcellus			

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	API 47-017-06395 Farm Name Williams, Larry et al Well Number Gains Unit 1H								
	EXHIBIT 2								
	Avg Max Amount of								
			Treatment	Breakdown			Amount of	Nitrogen/	
	Stimulations	Avg Pump	Pressure	Pressure		Amount of Proppant	Water	other	
Stage No.	Date	Rate	(PSI)	(PSI)	ISIP (PSI)	(lbs)	(bbls)	(units)	
1	11-Dec-14	63.0	6,648	0	5,022	212,557	7,013	N/A	
2	11-Dec-14	64.0	7,151	6,310	5,662	244,640	6,603	N/A	
3	11-Dec-14	65.8	6,798	5,599	5,354	242,697	6,561	N/A	
4	12-Dec-14	64.0	6,647	5,706	5,406	241,354	6,482	N/A	
5	12-Dec-14	65.0	6,885	5,900	5,551	242,024	6,397	N/A	
6	12-Dec-14	65.0	6,804	5,747	5,207	240,867	6,451	N/A	
7	13-Dec-14	65.0	6,466	5,670	5,310	243,016	6,728	N/A	
8	13-Dec-14	64.0	6,699	5,918	5,214	241,793	6,360	N/A	
9	13-Dec-14	64.0	6,736	5,785	5,299	241,517	6,350	N/A	
10	13-Dec-14	64.0	6,318	5,515	5,240	241,522	6,328	N/A	
11	14-Dec-14	64.0	6,671	5,683	5,108	241,451	6,305	N/A	
12	14-Dec-14	64.0	6,612	5,852	5,299	242,840	6,296	N/A	
13	14-Dec-14	65.0	6,590	5,774	4,990	241,970	6,265	N/A	
14	14-Dec-14	64.0	6,618	5,720	5,166	242,908	6,323	N/A	
15	15-Dec-14	63.0	6,820	5,576	5,271	242,665	6,239	N/A	
16	15-Dec-14	63.0	6,618	5,446	5,607	247,110	6,313	N/A	
17	16-Dec-14	60.0	6,138	5,612	5,269	112,843	6,789	N/A	
18	16-Dec-14	63.0	6,535	5,523	5,252	242,933	6,226	N/A	
19	16-Dec-14	64.0	6,431	6,321	5,158	244,128	6,209	N/A	
20	17-Dec-14	64.0	6,182	5,160	6,214	260,354	6,473	N/A	
21	17-Dec-14	64.0	6,482	5,472	5,453	241,627	6,125	N/A	
22	17-Dec-14	65.0	6,199	5,310	5,325	246,401	6,139	N/A	
23	17-Dec-14	63.3	6,247	5,278	5,155	244,114	6,194	N/A	
24	18-Dec-14	63.5	6,312	5,405	5,137	241,449	6,397	N/A	
25	18-Dec-14	64.0	6,258	5,394	5,212	240,864	6,102	N/A	
26	18-Dec-14	65.0	6,369	5,493	4,850	243,243	6,061	N/A	
27	18-Dec-14	64.0	6,114	5,246	5,255	240,962	6,216	N/A	
28	19-Dec-14	64.0	6,517	5,365	5,090	241,413	6,160	N/A	
29	19-Dec-14	64.0	6,189	5,468	4,933	243,100	6,082	N/A	
30	19-Dec-14	64.0	6,202	5,301	5,345	240,929	6,017	N/A	
31	19-Dec-14	64.0	6,104	5,302	5,338	244,109	6,124	N/A	
32	20-Dec-14	64.0	6,231	5,360	5,401	243,967	6,076	N/A	
33	20-Dec-14	64.0	6,055	5,959	4,436	241,083	5,971	N/A	
	AVG=	64.0	6,474	5,429	5,258	7,864,450	208,374	TOTAL	

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AUG 17 2015

	API <u>47-017-06395</u> Farn	n Name Williams, Larry et al	Well Number Gains Unit	<u>1H</u>		
EXHIBIT 3						
	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD) From		
LITHOLOGY/ FORMATION	From Surface	From Surface	From Surface	Surface		
Fresh Water	427'	N/A	427'	N/A		
Shale	0	337	0	337		
Siltstone/ Sandstone	Est. 337	597	Est. 337	597		
Shale	Est. 597	707	Est. 597	707		
Sandstone	Est. 707	837	Est. 707	837		
Siltstone/ Shale	Est. 837	917	Est. 837	917		
Shale	Est. 917	1,727	Est. 917	1,727		
Sandstone	Est. 1727	1,787	Est. 1727	1,787		
Shale	Est. 1787	1,907	Est. 1787	1,907		
Sandstone/ Trace Coal	Est. 1907	1,987	Est. 1907	1,987		
Sandstone	Est. 1987	2,127	Est. 1987	2,127		
Sandstone/ Trace Coal	Est. 2127	2,147	Est. 2127	2,147		
Shale/ Sandstone	Est. 2147	2,221	Est. 2147	2,221		
Big Lime	2,221	2,316	2,221	2,316		
Big Injun	2,316	2,787	2,316	2,787		
Gantz Sand	2,787	2,957	2,787	2,957		
Fifty Foot Sandstone	2,957	2,991	2,957	2,991		
Gordon	2,991	3,316	2,991	3,316		
Fifth Sandstone	3,316	3,381	3,316	3,381		
Bayard	3,381	3,738	3,381	3,738		
Warren	3,738	4,100	3,738	4,100		
Speechley	4,100	4,393	4,100	4,396		
Baltown	4,393	4,857	4,396	4,870		
Bradford	4,857	5,323	4,870	5,371		
Benson	5,323	5,587	5,371	5,640		
Alexander	5,587	5,731	5,640	5,786		
Elk	5,731	6,488	5,786	6,553		
Rhinestreet	6,488	6,689	6,553	6,761		
Sycamore	6,689	6,920	6,761	7,011		
Middlesex	6,920	7,065	7,011	7,212		
Burkett	7,065	7,092	7,212	7,261		
Tully	7,092	7,172	7,261	7,444		
Marcellus	7,172	NA	7,444	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.

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Hydraulic Fracturing Fluid Product Component Information Disclosure

12/11/2014
12/20/2014
West Virginia
Doddridge
47-017-06395-00-00
Antero Resources Corporation
Gains Unit 1H
-80.69010000
39.32423300
NAD83
NO
7,236
7,246,134
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	Operator	Carrier					
			Water	7732-18-5	100.00000	88.08365	
Sand, White, 40/70	Baker Hughes	Proppant					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		6.41063	
Sand, White, 20/40	Baker Hughes	Proppant					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		4.17522	
Sand, White, 100 nesh	Baker Hughes	Proppant					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.85560	
HCI, 10.1 - 15%	Baker Hughes	Acidizing					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.26744	SmartCare Product
FRW-18	Baker Hughes	Friction Reducer					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.07221	SmartCare Product
GW-3	Baker Hughes	Gelling Agent					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.05760	
Scaletrol 720	Baker Hughes	Scale Inhibitor					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.01978	SmartCare Product

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Enzyme G-NE	Baker Hughes	Breaker					75
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.01949	SmartCare Product
Alpha 1427	Baker Hughes	Biocide					16
			MSDS and Non-MSDS Ingredients Listed Below	N/A _.		0.01087	SmartCare Product
GW-3LDF	Baker Hughes	Gelling Agent					0 0 0
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00610	SmartCare Product
errotrol 300L	Baker Hughes	Iron Control					Defense.
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00185	SmartCare Produc
CI-14	Baker Hughes	Corrosion Inhibitor	Ingredients cisted below				
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00039	SmartCare Product
I-39	Baker Hughes	Corrosion Inhibitor	rigicalcitis Listed Below				
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00005	
agredients shown abo	ove are subject to 29	CER 1910 1200(i) and ar	ppear on Material Safety Data She	ets (MSDS) Ingred	lients shown below are Non-	MSDS	
gredients in Additive		See Trade Name(s)	Joen of Material Safety Data Sile	inglet	alcinio chovin below die 140111	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
(MSDS and non-	Daker Flugiles	List					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	11.43898	
			Water	7732-18-5	95.00000	0.29201	
			Guar Gum	9000-30-0	100.00000	0.06124	
			Hydrochloric Acid	7647-01-0	15.00000	0.04011	
			Poly (acrylamide-co-acrylic acid) partial sodium salt	62649-23-4	30.00000	0.02166	
			Hydrotreated Light Distillate	64742-47-8	30.00000	0.02166	
			Ethylene Glycol	107-21-1	45.00000	0.00890	
			Mineral Oil	8042-47-5	70.00000	0.00427	
			2-Propenoic, Polymer with Sodium Phosphinate, Sodium Salt	71050-62-9	20.00000	0.00395	
			Sodium Chloride	7647-14-5	5.00000	0.00381	
			Glutaraldehyde	111-30-8	30.00000	0.00326	
			Ammonium Chloride	12125-02-9	3.00000	0.00217	
			Paraffinic Petroleum Distillate	64742-55-8	30.00000	0.00183	
			Petroleum Distillates	64742-47-8	30.00000	0.00183	
			Oleamide DEA	93-83-4	2.00000	0.00144	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00144	
	1		Citric Acid	77-92-9	60.00000	0.00111	
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10.00000	0.00109	
			Calcium Chloride	10043-52-4	5.00000	0.00099	
			Hemicellulase Enzyme Concentrate	9025-56-3	5.00000	0.00097	
			Quaternary Ammonium Compound	68424-85-1	5.00000	0.00055	
			Ethanol	64-17-5	5.00000	0.00054	
			Methanol	67-56-1	100.00000	0.00039	

Sorbitan Monooleate	1338-43-8	0.50000	0.00036	0
Polyoxythylene Sorbitan Monooleate	9005-65-6	0.50000	0.00036	9d 8, 2015
1-butoxy-2-propanol	5131-66-8	5.00000	0.00030	25 -
sotridecanol, ethoxylated	9043-30-5	5.00000	0.00030	00
Crystalline Silica: Quartz	14808-60-7	5.00000	0.00030	9 G
Potassium Chloride	7447-40-7	1.00000	0.00020	A S A
Polyoxyalkylenes	68951-67-7	30.00000	0.00012	1
Fatty Acids	61790-12-3	10.00000	0.00004	Ö
Modified Thiourea Polymer	68527-49-1	7.00000	0.00003	
Oxyalkylated Fatty Acid	61791-002	40.00000	0.00002	
Propargyl Alcohol	107-19-7	5.00000	0.00002	
Olefin	64743-02-8	5.00000	0.00002	
Tar Bases, Quinoline Derivs., Benzyl Chloride-Quaternized	72480-70-7	30.00000	0.00002	
Aldehyde	104-55-2	30.00000	0.00002	
Formic Acid	64-18-6	30.00000	0.00002	
2-butoxy-1-propanol	15821-83-7	0.10000	0.00001	
Formaldehyde	50-00-0	1.00000	0.00000	
sopropanol	67-63-0	5.00000	0.00000	
Sulfurized polyolefin	68037-13-8	5.00000	0.00000	
Potassium Iodide	7681-11-0	2.00000	0.00000	
Polyaklylene	7756-94-7	1.00000	0.00000	
Potassium Acetate	127-08-2	0.50000	0.00000	

^{*} 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)

