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

API 47 017 0619	O County Doddri	dge D	istrict Central	
Quad Oxford 7.5'	Pad Name Prim		ield/Pool Name	
Farm name Primm, Olin E. &	Mary		Vell Number Ahouse	Unit 1H
Operator (as registered with the		s Corportion		
Address 1615 Wynkoop St.	City De		State CO	Zip80202
As Drilled location NAD 83/0 Top hole	Northing 4343587m	led plat, profile view, and o	deviation survey	
Landing Point of Curve		Eastin	g 512783.28m	
Bottom Hole	Northing 4345422m	Eastin	g <u>512007m</u>	
Elevation (ft) 1008' Permit Type Deviated	GL Type of Well Horizontal Horizon	■New □ Existing	Type of Report □I Depth Type □	nterim Final Deep Shallow
				Deep a Shallow
Type of Operation □ Convert	□ Deepen ■ Drill	□ Plug Back □ Redrilli	ng 🗆 Rework 🗂	Stimulate
Well Type Brine Disposal	CBM ■ Gas ■ Oil □ Se	econdary Recovery Solu	ition Mining Storage	te 🗆 Other
Type of Completion Single Drilled with Cable Rot Drilling Media Surface hole Production hole Air Mu Mud Type(s) and Additive(s) Air-Foam & 4% KCL	ary ■ Air □ Mud □Fresh W			Other n Fresh Water □ Brine
Mud- Polymer				
Date permit issued3/1/20 Date completion activities began Verbal plugging (Y/N)N/A	6/4/2014	_ Date completion activi	Date drilling ceas ties ceased 8/1 Granted by	eed 4/13/2014 2/2014 N/A
Please note: Operator is require	d to submit a plugging appli	cation within 5 days of ver	bal permission to plug	
Freshwater depth(s) ft	225'	Open mine(s) (Y/N) der	GEIVED	No
Salt water depth(s) ft	743', 2147'	Void(s) encountered (Y	NOil and Gas	No
Coal depth(s) ft	437'	Cavern(s) encountered		No
Is coal being mined in area (Y/N	n No	AU	G. A. 2. E. 6.12	
			epartment of ental Protection	Reviewed by:

□ Yes 🖪 No

DETAILS

TYPE OF TRACER(S) USED

WAS WELL COMPLETED OPEN HOLE?

WERE TRACERS USED □ Yes ■ No

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WR-	35	
Rev	8/23/13	

Page	of
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API 47- 017 - 06190 Farm name Primm, Olin E. & Mary Well number Ahouse Unit 1H	PI 47- 017 - 06	Farm nam	e_Primm, Olin E. & Mary	Ahouse Unit 1H _Well number
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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
		PLEASE S	SEE ATT	ACHED I	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 (bbls)	Amount of Nitrogen/other (units)
					:			
		*PLE	ASE SEE	ATTAC	HED EX	KHIBIT :	2	
					-			
							REC	FIVED
							Office of	EIVED Oil and Gas
								0 3 2015
	<u> </u>					<u></u>	WV Don	<u> </u>

Please insert additional pages as applicable.

WV Department of Environmental Protection

WR-35 Rev. 8/23/13								ra	ge of
API 47- 017	_ 06190	Farm	name Primm, Oli	in E. & Mary	Y	Well nun	ber_Ahou	se Unit 1H	
PRODUCING	FORMATION(S)	DEPTHS						
Marcellus			6538' (TOP)	TVD	6901' (TOP)	MD			
	1.0. 1					_			
	lditional pages a								
GAS TEST	□ Build up □	Drawdown	Open Flow	(DIL TEST 1	Flow □ Pu	ımp		
SHUT-IN PRE	SSURE Surf	face 3600	psi Botto	m Hole	psi	DURATIO	N OF TE	ST	_ hrs
OPEN FLOW		Oil fpd <u>56</u>	bpd	bpd 2		GAS MEA			ilot
ITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	MD	BOTTOM DEPTH IN F MD				RD QUANTITY	
		li .							
	0		0						
	0		0						
	0		0						
		FASE		ГТАСІ	HED EX	(HIRIT	7	1	
		LEASE	SEE A	ГТАСІ	HED EX	(НІВІТ	3	1	
		LEASE		ГТАСІ	HED EX	(HIBIT	3]	
		LEASE		ГТАСІ	HED EX	(HIBIT	3		
		LEASE		ΓΤΑCΙ	HED EX	(HIBIT	3		
		LEASE		ΓΤΑCΙ	HED EX	(НІВІТ	3		
lease insert ad				ΓΤΑCΙ	HED EX	(HIBIT	3		
Orilling Contra	*P dditional pages a actor Precision D	as applicable.	SEE A	TTACI	HED EX	(HIBIT			
	*P dditional pages a actor Precision D	as applicable.	SEE A	Villiamsport		CHIBIT		p_17701	
Orilling Contra Address 2640 R Logging Comp	dditional pages a actor Precision Exeach Rd.	as applicable.	SEE A	Williamsport		State P	AZi		
Orilling Contra Address 2640 R Logging Comp Address 600 Alp	*P dditional pages a actor Precision Deach Rd. any Rush Wells pha Drive	as applicable. Drilling Companite Services	E SEE AT				AZi	p 17701 p 15317	
Orilling Contra Address 2640 R Logging Comp Address 600 Alp Cementing Cor	*P Additional pages a actor Precision Deceach Rd. Bany Rush Wells pha Drive mpany Allied Oil	as applicable. Drilling Companite Services	ny, LP City City es, LLC	Williamsport		_State P	A Zi	p_15317	
Orilling Contra Address 2640 R Logging Comp Address 600 Alp Cementing Cor Address 1036 E	*P Additional pages a actor Precision December Rd. Precision December Rush Wells pha Drive Additional pages and pages and precision December Rd. Precision December Rush Wells pha Drive Additional pages and pages	as applicable. Drilling Companite Services	E SEE AT	Williamsport		State P	A Zi	p 15317 p 26330	
Orilling Contra Address 2640 R Logging Comp Address 600 Alp Cementing Cor Address 1036 E	dditional pages a actor Precision D Reach Rd. Pany Rush Wells pha Drive Precision D Reach Rd. Precision D Reach	as applicable. Drilling Companite Services	Div, LP City City es, LLC City	Williamsport		_State P	A Zi	p_15317	CEIVED

Title Permit Representative

Date 7/27/2015

<i>P</i>	PI <u>47-017-0619</u>	<u> 0</u> Farm Name <u>Primm, C</u>		ell Number Ahou	se Unit 1H
		EXH	IIBIT 1		
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	4-Jun-14	12,813	12,984	60	Marcellus
2	11-Jul-14	12,663	12,790	60	Marcellus
3	12-Jul-14	12,512	12,639	60	Marcellus
4	12-Jul-14	12,361	12,489	60	Marcellus
5	12-Jul-14	12,211	12,338	60	Marcellus
6	12-Jul-14	12,060	12,188	60	Marcellus
7	12-Jul-14	11,909	12,037	60	Marcellus
8	13-Jul-14	11,759	11,886	60	Marcellus
9	13-Jul-14	11,608	11,736	60	Marcellus
10	13-Jul-14	11,458	11,585	60	Marcellus
11	13-Jul-14	11,307	11,434	60	Marcellus
12	14-Jul-14	11,156	11,284	60	Marcellus
13	14-Jul-14	11,006	11,133	60	Marcellus
14	14-Jul-14	10,855	10,983	60	Marcellus
15	14-Jul-14	10,704	10,832	60	Marcellus
16	15-Jul-14	70,554	10,681	60	Marcellus
17	15-Jul-14	10,403	10,531	60	Marcellus
18	15-Jul-14	10,252	10,380	60	Marcellus
19	15-Jul-14	10,102	10,229	60	Marcellus
20	15-Jul-14	9,951	10,079	60	Marcellus
21	16-Jul-14	9,801	9,928	60	Marcellus
22	16-Jul-14	9,650	9,777	60	Marcellus
23	16-Jul-14	9,499	9,627	60	Marcellus
24	16-Jul-14	9,349	9,476	60	Marcellus
25	16-Jul-14	9,198	9,326	60	Marcellus
26	16-Jul-14	9,047	9,175	60	Marcellus
27	17-Jul-14	8,897	9,024	60	Marcellus
28	17-Jul-14	8,746	8,874	60	Marcellus
29	17-Jul-14	8,596	8,723	60	Marcellus
30	18-Jul-14	8,445	8,572	60	Marcellus
31	18-Jul-14	8,294	8,422	60	Marcellus
32	18-Jul-14	8,144	8,271	60	Marcellus
33	18-Jul-14	7,993	8,121	60	Marcellus
34	18-Jul-14	7,842	7,970	60	Marcellus
35	18-Jul-14	7,692	7,819	60	Marcellus
36	19-Jul-14	7,541	7,669	60	Marcellus
37	19-Jul-14	7,391	7,518	60	Marcellus
38	19-Jul-14	7,240	7,367	60	Marcellus
39	19-Jul-14	7,089	7,217	60	Marcellus PECEIVE
40	19-Jul-14	6,939	7,066	60	Marcellus EECEIVED

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	API <u>4</u>	7-017-061 <u>9</u> 0	Farm Name	Primm, Olin E.	& Mary Wel	l Number Ahouse Unit 1	<u>H</u>	
				EXHIBIT	Γ2			-
			Avg	Max				Amount of
	Calmandations	A a. D	Treatment	Breakdown	1	American of December	Amount of	Nitrogen/
Stage No	Stimulations Date	Avg Pump Rate	Pressure (PSI)	Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Water (bbls)	other (units)
Stage No. 1	11-Jul-14	81.0	7,335	N/A	4,016	224,100	6,034	N/A
2	11-Jul-14 11-Jul-14	80.0	7,333	6,162	3,649	225,400	5,994	N/A
	11-Jul-14 12-Jul-14	75.0	7,499	6,112				N/A
3		77.0		5,869	4,649	209,400	6,413 5,996	N/A
5	12-Jul-14 12-Jul-14	79.0	7,276 7,479	6,133	3,580	224,000 211,600	6,136	N/A
6		82.0	7,479	5,590	4,524 5,193	·	6,418	N/A
	12-Jul-14	82.0	7,595	6,005		184,500	5,945	N/A
7	12-Jul-14				3,601	227,300		N/A
8	13-Jul-14	75.0	7,413	6,123 5,077	3,730	224,300	5,741	
9	13-Jul-14	77.0	7,226	5,977	4,511	170,800	6,327	N/A
10	13-Jul-14	77.0	7,444	5,847	4,960	223,850	6,197	N/A
11	13-Jul-14	81.0	7,492	5,647	5,021	198,800	6,360	N/A
12	14-Jul-14	76.0	7,323	5,407	5,128	211,100	5,712	N/A
13	14-Jul-14	79.0	7,141	5,364	5,121	223,000	5,646	N/A
14	14-Jul-14	79.4	7,650	5,350	3,499	221,951	5,856	N/A
15	14-Jul-14	79.7	7,144	5,568	3,741	224,504	5,866	N/A
16	15-Jul-14	80.0	7,173	5,822	3,830	224,600	5,865	N/A
17	15-Jul-14	80.0	6,942	5,432	3,576	224,100	5,906	N/A
18	15-Jul-14	79.0	6,990	5,740	4,070	219,208	5,843	N/A
19	15-Jul-14	79.5	7,410	5,533	3,819	221,100	6,030	N/A
20	15-Jul-14	75.4	7,240	5,450	4,520	150,950	6,008	N/A
21	16-Jul-14	78.0	7,320	5,625	5,307	183,500	6,024	N/A
22	16-Jul-14	74.0	7,265	5,590	3,798	223,700	5,799	N/A
23	16-Jul-14	79.0	7,158	5,879	4,613	221,100	5,773	N/A
24	16-Jul-14	75.0	7,325	5,633	4,674	158,940	6,035	N/A
25	16-Jul-14	79.0	6,673	5,232	4,377	220,800	5,772	N/A
26	16-Jul-14	79.0	6,815	5,425	5,500	222,450	5,733	N/A
27	17-Jul-14	80.0	6,656	5,347	4,138	223,300	5,746	N/A
28	17-Jul-14	80.0	6,663	5,654	4,320	224,450	5,737	N/A
29	17-Jul-14	79.0	6,679	5,375	5,829	222,370	5,731	N/A
30	18-Jul-14	80.0	7,255	5,647	5,525	151,270	6,030	N/A
31	18-Jul-14	80.0	6,927	5,407	5,196	225,600	5,702	N/A
32	18-Jul-14	80.0	6,629	5,250	4,413	224,300	5,691	N/A
33	18-Jul-14	80.0	6,819	5,897	4,263	224,400	5,686	N/A
34	18-Jul-14	79.0	6,912	6,047	3,805	216,550	5,532	N/A
35	18-Jul-14	79.0	6,778	5,651	5,765	218,140	5,516	N/A
36	7/19/204	80.0	6,750	5,490	4,277	199,000	6,061	N/A
37	7/19/204	80.0	6,896	5,572	3,948	225,300	5,655	N/A
38	7/19/204	80.0	6,996	5,744	5,050	208,200	5,627	N/A
39	7/19/204	79.0	6,872	5,472	4,456	216,550	REWEI	
40	7/19/204	79.0	6,740	6,648	5,586			AMM Gas
1	AVG=	78.8	7,127	5,685	4,489	8,408,683	235,087	TOTAL

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API_4	7-017-06190 Farm Nam	e Primm, Olin E. & Mary Well	Number Ahouse Unit 11	<u> </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	225'	N/A	225'	N/A
Shale	0	227	0	227
Sandstone	est. 227	437	est. 227	437
Coal	est. 437	457	est. 437	457
Sandy shale	est. 457	477	est. 457	477
Shale	est. 477	595	est. 477	595
Sandstone	est. 595	605	est. 595	605
Shale	est. 605	625	est. 605	625
Sandstone	est. 625	638	est. 625	638
Shale	est. 638	659	est. 638	659
Sandstone	est. 659	808	est. 659	808
Shale	est. 808	1175	est. 808	1175
Sandy shale	est. 1175	1235	est. 1175	1235
Trace coal	est. 1235	1257	est. 1235	1257
Shale	est. 1257	1421	est. 1257	1421
Sandstone	est. 1421	1445	est. 1421	1445
Sandy shale	est. 1445	1477	est. 1445	1477
Trace Coal/shale	est. 1477	1542	est. 1477	1542
Sandstone	est. 1542	1683	est. 1542	1683
Sandy shale	est. 1683	2017	est. 1683	2017
Big Lime	2017	2014	2017	2014
Big Injun	2014	2309	2014	2309
Weir	2309	2617	2309	2617
Fifty Foot Sandstone	2617	2771	2617	2771
Gordon	2771	3054	2771	3054
Fifth Sandstone	3054	3074	3054	3074
Bayard	3074	3387	3074	3387
Speechley	3387	4096	3387	4096
Baltown	4096	4542	4096	4542
Bradford	4542	4954	4542	4954
Benson	4954	5220	4954	5220
Alexander	5220	6186	5220	6217
Sycamore	6186	6357	6217	6471
Middlesex	6357	6481	6471	6721
Burkett	6481	6508	6721	6795
Tully	6508	6538	6795	6901
Marcellus	6538	NA	6901	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 ECEIVED

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Hydraulic Fracturing Fluid Product Component Information Disclosure

mposition:	Hydraulic Fracturing Fluid Composition:
422,797	Total Base Non Water Volume:
9,873,654	Total Base Water Volume (gal):
6,579	True Vertical Depth:
NO	Federal/Tribal Well:
NAD27	Datum:
39.24150000	Latitude:
-80.85256700	Longitude:
Ahouse Unit 1H	Well Name and Number:
Antero Resources Corporation	Operator Name:
47-017-06190-00-00	API Number:
Doddridge	County:
West Virginia	State:
7/19/2014	Job End Date:
7/11/2014	Job Start Date:





in Comments		061		15		80:	47		90:	72	774	164		185	85	61	36
Maximum Ingredient Concentration in HF Fluid (% by mass)**		90.44490		9.24115		0.09408	0.02247		0.04405	0.04172	0.00674	0.00264		0.02685	0.02685	0.02161	0.00336
Maximum Ingredient Concentration in Additive (% by mass)***		100.0000		100.0000		87.50000	18.0000		20.0000	00000.09	3.0000	3.0000		40.0000		22.0000	20000
Chemical Abstract Service Number (CAS #)		7732-18-5		14808-60-7		7732-18-5	7641-01-1		0-02-0006	64742-47-8	14808-60-7	68439-51-0		7732-18-5	Proprietary	64742-47-8	Proprietary
Ingredients		Water		Crystalline Silica, quartz		Water	Hydrogen Chloride		Guar Gum	Petroleum Distillates	Suspending agent (solid)	Surfactant		Water	Anionic Polyacrylamide	Petroleum Distillates	Ethoxylated alcohol blend
Purpose	Base Fluid		Proppant		Bulk Acid			Gelling Agents					Friction Reducer				
Supplier	Antero Resources		U.S. Well Services, LLC		U.S. Well Services, LLC			U.S. Well Services, LLC			60		U.S. Well Services, LLC				
Trade Name	Water		Sand		HCL Acid (12.6%- 18.0%)			LGC-15 O	fiic	e A	U(0	WFRA-405	in i		32	

Environmental Projection 09/25/2015

0.00336		0.00424	0.00383	0.00319		0.00434	0.00248		0.00155		0.00025	0.00008	0.00007	0.00007	900000	0.00002	0.00002	0.00001	0.00001	MSDS.
5.00000			20.00000	30.0000		20.0000	28.00000		100.00000		31.00000	15.0000	13.00000	2.00000	2.00000	20.0000	2.00000	3.00000	3.00000	ts shown below are Non-
12125-02-9		Proprietary	107-21-1	7732-18-5		10222-01-2	7732-18-5		7727-54-0		107-21-1	68-12-2	72480-70-7	104-55-2	111-76-2	7732-18-5	68412-54-4	67-63-0	78-40-0	neets (MSDS). Ingredien
Crystalline Salt		Anionic Copolymer	Ethylene Glycol	Water		2,2-dibromo-3- nitrilopropionamide	Deionized Water		Ammonium Persulfate		Ethylene Glycol	N,N-Dimethylformamide	Tar bases, quinoline derivs, benzyl chloride-quaternized	Cinnamaldehyde	2-Butoxyethanol	Water	Ethoxylated Nonylphenol	sopropyl Alcohol	Triethyl Phosphate	opear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS
	Scale Inhibitor				Anti-Bacterial Agent			Gel Breakers		Acid Corrosion Inhibitors										R 1910.1200(i) and app
	U.S. Well Services, LLC				U.S. Well Services, LLC			U.S. Well Services, LLC		U.S. Well Services, LLC										Ingredients shown above are subject to 29 CFR 1910.1200(i) and ap-
	SI-1000				K-BAC 1020			AP One		AI-300										Ingredients shown abo

* 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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