



Antero Resources
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July 26, 2019

West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street
Charleston, WV 25304

To Whom It May Concern:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report), Discharge Monitoring Report Form WR-34 and corresponding logs for the following wells:

- Bill Unit 1H (API # 47-085-10240)—Bison Pad
- Bill Unit 2H (API # 47-085-10241)—Bison Pad
- Bill Unit 3H (API # 47-085-10257)—Bison Pad
- Buffalo Unit 1H (API # 47-085-10249)—Bison Pad
- Buffalo Unit 2H (API # 47-085-10243)—Bison Pad

If you have any questions please feel free to contact me at (303) 357-7223.

Sincerely,

A handwritten signature in black ink, appearing to read "Megan Griffith", with a horizontal line extending to the right.

Megan Griffith
Permitting Agent
Antero Resources Corporation

Enclosures

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

API 47- _____ - _____ County _____ District _____
Quad _____ Pad Name _____ Field/Pool Name _____
Farm name _____ Well Number _____
Operator (as registered with the OOG) _____
Address _____ City _____ State _____ Zip _____

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing _____ Easting _____
Landing Point of Curve Northing _____ Easting _____
Bottom Hole Northing _____ Easting _____

Elevation (ft) _____ 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)

Date permit issued _____ Date drilling commenced _____ Date drilling ceased _____
Date completion activities began _____ Date completion activities ceased _____
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft _____ Open mine(s) (Y/N) depths _____
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths _____
Coal depth(s) ft _____ Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) _____

Reviewed by:

API 47- _____ - _____ Farm name _____ Well number _____

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							
Surface							
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
Tubing							
Packer type and depth set							

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							
Surface							
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) _____ Loggers TD (ft) _____
 Deepest formation penetrated _____ Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) _____

** This is a subsequent Well. Antero only runs wireline logs on one well on a multi-well pad (Bill Unit 3H API#47-085-10257). 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 _____

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 _____

API 47- _____ - _____ Farm name _____ Well number _____

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>
_____	_____ TVD _____ MD
_____	_____
_____	_____
_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs
 OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY
 Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
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***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor _____
 Address _____ City _____ State _____ Zip _____
 Logging Company _____
 Address _____ City _____ State _____ Zip _____
 Cementing Company _____
 Address _____ City _____ State _____ Zip _____
 Stimulating Company _____
 Address _____ City _____ State _____ Zip _____

Please insert additional pages as applicable.

Completed by _____ Telephone _____
 Signature _____ Title _____ Date _____

API 47-085-10243 Farm Name Donald L. Costilow Well Number Buffalo Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/4/2019	14018.5	13974	60	Marcellus
2	2/5/2019	13935.18	13769.08	60	Marcellus
3	2/5/2019	13733.46	13567.36	60	Marcellus
4	2/6/2019	13531.74	13365.64	60	Marcellus
5	2/6/2019	13330.02	13163.92	60	Marcellus
6	2/7/2019	13128.3	12962.2	60	Marcellus
7	2/7/2019	12926.58	12760.48	60	Marcellus
8	2/8/2019	12724.86	12558.76	60	Marcellus
9	2/9/2019	12523.14	12357.04	60	Marcellus
10	2/9/2019	12321.42	12155.32	60	Marcellus
11	2/10/2019	12119.7	11953.6	60	Marcellus
12	2/11/2019	11917.98	11751.88	60	Marcellus
13	2/11/2019	11716.26	11550.16	60	Marcellus
14	2/12/2019	11514.54	11348.44	60	Marcellus
15	2/12/2019	11312.82	11146.72	60	Marcellus
16	2/13/2019	11111.1	10945	60	Marcellus
17	2/13/2019	10909.38	10743.28	60	Marcellus
18	2/15/2019	10707.66	10541.56	60	Marcellus
19	2/16/2019	10505.94	10339.84	60	Marcellus
20	2/16/2019	10304.22	10138.12	60	Marcellus
21	2/16/2019	10102.5	9936.4	60	Marcellus
22	2/17/2019	9900.78	9734.68	60	Marcellus
23	2/17/2019	9699.06	9532.96	60	Marcellus
24	2/18/2019	9497.34	9331.24	60	Marcellus
25	2/18/2019	9295.62	9129.52	60	Marcellus
26	2/19/2019	9093.9	8927.8	60	Marcellus
27	2/19/2019	8892.18	8726.08	60	Marcellus
28	2/20/2019	8690.46	8524.36	60	Marcellus
29	2/20/2019	8488.74	8322.64	60	Marcellus
30	2/21/2019	8287.02	8120.92	60	Marcellus
31	2/21/2019	8085.3	7919.2	60	Marcellus
32	2/22/2019	7883.58	7717.48	60	Marcellus
33	2/22/2019	7681.86	7515.76	60	Marcellus

API 47-085-10243 Farm Name Donald L. Costilow Well Number Buffalo Unit 2H

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	2/4/2019	74.4	7350	5913	4144	157144	4869	N/A
2	2/5/2019	74.1	7384	6194	4466	402680	8447	N/A
3	2/5/2019	85.2	8203	5130	4034	401600	8520	N/A
4	2/6/2019	82.8	7902	6134	4541	401330	8537	N/A
5	2/6/2019	84.9	8061	5267	4565	401000	8569	N/A
6	2/7/2019	86.4	8031	4833	3563	399400	8708	N/A
7	2/7/2019	76.1	7520	4730	3692	401750	8266	N/A
8	2/8/2019	84	8045	4823	4504	404350	9261	N/A
9	2/9/2019	78.1	8040	4550	3750	401850	8699	N/A
10	2/9/2019	81.4	8118	5017	4497	402020	8325	N/A
11	2/10/2019	81	7831	3808	3756	403360	8362	N/A
12	2/11/2019	81.4	8118	5017	4497	401750	8078	N/A
13	2/11/2019	77.9	7522	4896	3821	399160	8181	N/A
14	2/12/2019	86.6	7999	5070	3676	403190	8541	N/A
15	2/12/2019	85.2	7570	3920	3781	400670	8469	N/A
16	2/13/2019	79.5	8212	4034	4530	406510	9839	N/A
17	2/13/2019	82	7723	4960	3451	402030	8278	N/A
18	2/15/2019	88.1	7490	3724	5030	399600	9696	N/A
19	2/16/2019	84.4	7638	5507	3768	401700	8474	N/A
20	2/16/2019	87.8	7551	5145	3745	402650	8584	N/A
21	2/16/2019	84.9	7538	4774	3934	401850	8944	N/A
22	2/17/2019	88.4	8142	4998	4155	399750	8206	N/A
23	2/17/2019	85.2	7796	4885	4479	401040	8411	N/A
24	2/18/2019	89.15137	7989.081	4675	5066	400550	8120	N/A
25	2/18/2019	88.21765	8015.79	4802	4251	401130	8124	N/A
26	2/19/2019	88.4	7689	4850	3986	402950	8174	N/A
27	2/19/2019	88.07916	7372.242	5215	3901	403050	7827	N/A
28	2/20/2019	88.64746	7724.053	5657	3575	398270	8114	N/A
29	2/20/2019	88.62637	7434.615	5511	3951	401300	8157	N/A
30	2/21/2019	84.70403	7518.078	5317	3868	405800	8248	N/A
31	2/21/2019	87.81924	7317.472	5510	3947	401240	8432	N/A
32	2/22/2019	81.81937	7402.966	6090	4255	401030	8474	N/A
33	2/22/2019	79.29973	6815.365	5287	4239	400190	8233	N/A
	AVG=	84	7,729	5,038	4,104	13,011,894	276,167	TOTAL

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Silty Sandstone	0	190	0	190
Sandy siltstone	est 190	290	est 190	290
Sandstone	est 290	600	est 290	600
Silty Sandstone	est 600	870	est 600	870
limey siltstone	est 870	945	est 870	945
silty sandstone, tr. coal	est 945	1,095	est 945	1,095
silty sandstone	est 1095	1,490	est 1095	1,490
silty shale	est 1490	1,620	est 1490	1,620
sandstone, tr coal	est 1620	1,630	est 1620	1,630
silty sandstone	est 1630	1,670	est 1630	1,670
sandstone	est 1670	1,745	est 1670	1,745
sandy shale	est 1745	1,770	est 1745	1,770
shaly sand	est 1770	2,033	est 1770	2,047
Big Lime	2,033	2,899	2,047	2,945
Fifty Foot Sandstone	2,899	3,011	2,945	3,062
Gordon	3,011	3,176	3,062	3,234
Fifth Sandstone	3,176	3,434	3,234	3,503
Bayard	3,434	3,914	3,503	4,003
Speechley	3,914	4,147	4,003	4,248
Balltown	4,147	4,643	4,248	4,767
Bradford	4,643	5,021	4,767	5,161
Benson	5,021	5,294	5,161	5,446
Alexander	5,294	6,262	5,446	6,482
Sycamore	6,262	6,374	6,482	6,629
Middlesex	6,374	6,484	6,629	6,818
Burkett	6,484	6,518	6,818	6,900
Tully	6,518	6,546	6,900	6,993
Marcellus	6,546	NA	6,993	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.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	2/4/2019
Job End Date:	2/22/2019
State:	West Virginia
County:	Ritchie
API Number:	47-085-10249-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Buffalo Unit 1H
Latitude:	39.29520400
Longitude:	-80.90143100
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,578
Total Base Water Volume (gal):	12,148,706
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	Supplied by Operator	Base Fluid					
			Water	7732-18-5	100.00000	88.68408	
DAP-902	CWS	Scale Inhibitor					
				Listed Below			

DAP-103	CWS	Iron Control					
				Listed Below			
Sand (Proppant)	CWS	Propping Agent					
				Listed Below			
CI-9100G	CWS	Corrosion Inhibitor					
				Listed Below			
Calbreak 5501	CWS	Breaker					
				Listed Below			
15% HCl Acid	CWS	Clean Perforations					
				Listed Below			
DWP-641	CWS	Friction Reducer					
				Listed Below			
SaniFrac 8844	CWS	Biocide					
				Listed Below			
CalGel 4000	CWS	Gel Slurry					
				Listed Below			
Other Chemical (s)	Listed Above	See Trade Name (s) List					

				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline silica (Quartz)	14808-60-7	100.00000	10.86851	
			Hydrochloric acid	7647-01-0	37.00000	0.09869	
			Calcite	471-34-1	1.00000	0.07526	
			Guar gum	9000-30-0	60.00000	0.06284	
			Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.06284	
			Illite	12173-60-3	1.00000	0.03338	
			Polymer	26100-47-0	45.00000	0.02784	
			Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01856	
			Goethite	1310-14-1	0.10000	0.01086	
			Apatite	64476-38-6	0.10000	0.01086	
			Biotite	1302-27-8	0.10000	0.01086	
			Ammonium chloride	12125-02-9	11.00000	0.00681	
			Polyethylene glycol mixture	25322-68-3	54.50000	0.00618	
			Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00524	
			Ilmenite	98072-94-7	0.10000	0.00334	
			Sorbitan monooleate	1338-43-8	4.00000	0.00247	
			2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	20.00000	0.00227	
			Polyethylene glycol monooleate	9004-96-0	3.00000	0.00186	
			Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00157	
			Ammonium Persulfate	7727-54-0	100.00000	0.00136	
			Sorbitol tetraoleate	61723-83-9	2.00000	0.00124	
			Citric acid	77-92-9	60.00000	0.00089	

			Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00062	
			Sodium bromide	7647-15-6	4.00000	0.00045	
			Dibromoacetonitrile	3252-43-5	3.00000	0.00034	
			Alkyloxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00031	
			Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00027	
			Acrylamide	79-06-1	0.10000	0.00006	
			Ethylene Glycol	107-21-1	40.00000	0.00005	
			Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00003	
			Tar bases, quinolone derivs, benzyl chloride- quatenized	72480-70-7	10.00000	0.00001	
			Ethoxylated Alcohols	68131-39-5	10.00000	0.00001	
			Formic acid	64-18-6	10.00000	0.00001	
			Isopropyl alcohol	67-63-0	5.00000	0.00001	
			Cinnamaldehyde	104-55-2	10.00000	0.00001	
			Organic Acid Salts	9003-04-7			Proprietary Additive Concentration
			Glycol	57-55-6			Proprietary Additive Concentration

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

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

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Discharge Monitoring Report
Oil and Gas General Permit

Company Name: Antero Resources Corporation
API No: 47-085-10249 County: Ritchie
District: Clay Well No: Buffalo Unit 1H
Farm Name: Antero Resources Corporation
Discharge Date/s From:(MMDDYY) 05/06/19 To: (MMDDYY) 06/05/19
Discharge Times. From: 0:00 To: 24:00
Total Volume to be Disposed from this facility (gallons): 593,873

Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: _____ (Include a topographical map of the Area.)
(2) UIC: 104,515 Permit No. 3416729731, 3400923821
(3) Offsite Disposal: _____ Site Location: _____
(4) Reuse: 489,359 Alternate Permit Number: _____
(5) Centralized Facility: _____ Permit No. _____
(6) Other method: _____ (Include an explanation)

Follow Instructions below to determine your treatment category:

Optional Pretreatment test: n/a Cl- mg/l n/a DO mg/l

1. Do you have permission to use expedited treatment from the Director or his representative?
(Y/N) n/a If yes, who? _____ and place a four (4) on line 7.
If not go to line 2
2. Was Frac Fluid or flowback put into the pit? (Y/N) n/a If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) n/a If yes, go to line 4
If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) n/a If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) n/a If yes, go to line 6
If not, enter a three (3) in line 7.
6. Is the DO level greater than 2.5 mg/l?(Y/N) n/a If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. n/a is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: _____
n/a No pit on site.

Name of Principal Exec. Officer: Gretchen Kohler
Title of Officer: Senior Environmental and Regulatory Manager
Date Completed: 7/12/19

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



Signature of a Principal Exec. Officer or Authorized agent.

Category 1
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	5	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl	5,000	_____	5,000	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**			Monitor	_____	mg/l
Oil and Grease			Monitor	_____	mg/l
Total Al***			Monitor	_____	mg/l
TSS			Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume			Monitor	_____	Gal
Flow			Monitor	_____	Gal/min
Disposal Area			Monitor	_____	Acres

*** Al is only reported if the pH is above 9.0

Category 2
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	10	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**			Monitor	_____	mg/l
Oil and Grease			Monitor	_____	mg/l
Total Al***			Monitor	_____	mg/l
TSS			Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume			Monitor	_____	Gal
Flow			Monitor	_____	Gal/min
Disposal Area			Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0

Category 3
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	20	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0.

Category 4
Sampling Results
API No: _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	1	_____	N/A	N/A	Days
Fe	Monitor	_____	Monitor	_____	mg/l
D.O.	Monitor	_____	Monitor	_____	mg/l
Settleable Sol.	Monitor	_____	Monitor	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Activated Carbon (0.175)		_____	N/A	N/A	lb/B1
Date Site Reclaimed	N/A	N/A		_____	10 days from dis.
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

LATITUDE 39°20'00"

7,490'

8,493' TO BOTTOM HOLE

LATITUDE 39°20'00"

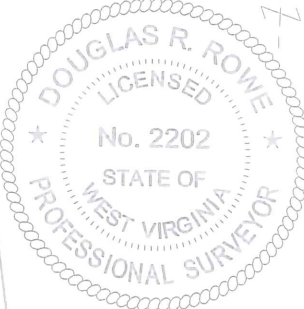
LONGITUDE 80°52'30"

7,154' TO BOTTOM HOLE

13,888'

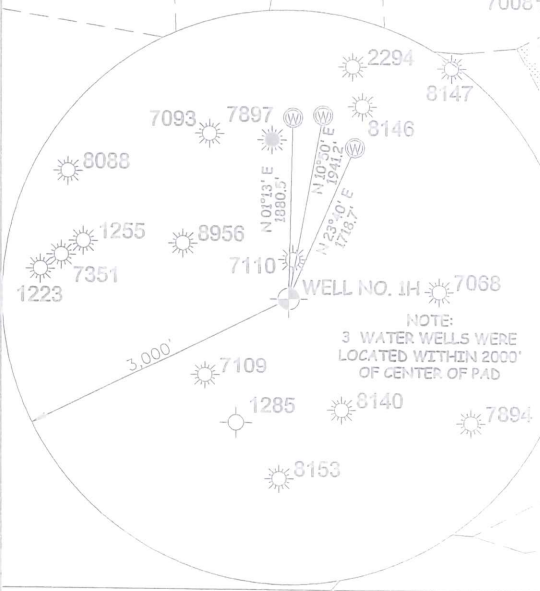
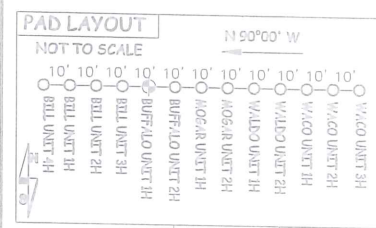
LONGITUDE 80°52'30"

Antero Resources Corporation
Well No. Buffalo Unit 1H
API 47-085-10249



AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
N: 292,723ft E: 1,603,377ft
LAT: 39°17'42.74" LON: 80°54'05.27"
BOTTOM HOLE INFORMATION:
N: 299,472ft E: 1,602,477ft
LAT: 39°18'49.30" LON: 80°54'18.06"
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: 4,349,550m E: 508,511m
BOTTOM HOLE INFORMATION:
N: 4,351,602m E: 508,203m



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 PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION



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

JOB # 15-030WA
DRAWING # BUFFALO1HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND
--- Surface Owner Boundary Lines +/-
--- Interior Surface Tracts +/-
--- Proposed Well Path
--- As Drilled Well Path
DOUGLAS R. ROWE P.S. 2202
DATE 06/26/19
OPERATOR'S WELL# BUFFALO UNIT 1H

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
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.

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 - 085 - 10249
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X STATE COUNTY PERMIT
LOCATION: ELEVATION 1,221' - AS DRILLED WATERSHED NORTH FORK HUGHES RIVER
QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE
SURFACE OWNER DONALD L. COSTILOW ACREAGE 50.13 ACRES +/-
OIL & GAS ROYALTY OWNER BERTHA D. FERREBEE; DONALD L. COSTILOW ET UX; LEASE ACREAGE 67 AC.±; 13.05 AC.±;
DAVID W. DOTSON, MICHAEL F. QUINN; DAVID W. DOTSON; KARL K. HICKMAN ET UX; L. A. GARNER ET AL; 21.42 AC.±; 24.5 AC.±; 10.65 AC.±; 14.52 AC.±; 99 AC.±;
EUGENE COSTILOW ET UX; F. M. FERREBEE ET AL; MAX D. JEWELL ET UX; MARY FERREBEE ET AL 54 AC.±; 56 AC.±; 36 AC.±; 72 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 6,579' TVD 13,610' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313