



Antero Resources
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August 9, 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:

- Beem Unit 3H (API # 47-095-02474)—Pyle Run Pad
- Heintzman Unit 1H (API # 47-095-02526)—Pyle Run Pad
- Heintzman Unit 2H (API # 47-095-02527)—Pyle Run Pad
- Heintzman Unit 3H (API # 47-095-02528)—Pyle Run Pad
- Spock Unit 1H (API # 47-095-02478)—Pyle Run Pad
- Spock Unit 2H (API # 47-095-02427)—Pyle Run Pad
- Spock Unit 3H (API # 47-095-02428)—Pyle Run 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 "MGriffith", is written over a horizontal dotted line.

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) _____

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 _____

PRODUCING FORMATION(S)

DEPTHS

_____	_____ 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	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ 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 _____
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 47-095-02478 Farm Name Tyrone L. Beem et al Well Number Spock Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/16/2019	16378		60	Marcellus
2	2/16/2019	16250.492	16084.952	60	Marcellus
3	2/16/2019	16049.444	15883.904	60	Marcellus
4	2/16/2019	15848.396	15682.856	60	Marcellus
5	2/17/2019	15647.348	15481.808	60	Marcellus
6	2/17/2019	15446.3	15280.76	60	Marcellus
7	2/17/2019	15245.252	15079.712	60	Marcellus
8	2/18/2019	15044.204	14878.664	60	Marcellus
9	2/18/2019	14843.156	14677.616	60	Marcellus
10	2/18/2019	14642.108	14476.568	60	Marcellus
11	2/24/2019	14441.06	14275.52	60	Marcellus
12	3/7/2019	14240.012	14074.472	60	Marcellus
13	3/7/2019	14038.964	13873.424	60	Marcellus
14	3/8/2019	13837.916	13672.376	60	Marcellus
15	3/8/2019	13636.868	13471.328	60	Marcellus
16	3/9/2019	13435.82	13270.28	60	Marcellus
17	3/9/2019	13234.772	13069.232	60	Marcellus
18	3/9/2019	13033.724	12868.184	60	Marcellus
19	3/10/2019	12832.676	12667.136	60	Marcellus
20	3/10/2019	12631.628	12466.088	60	Marcellus
21	3/10/2019	12430.58	12265.04	60	Marcellus
22	3/11/2019	12229.532	12063.992	60	Marcellus
23	3/11/2019	12028.484	11862.944	60	Marcellus
24	3/11/2019	11827.436	11661.896	60	Marcellus
25	3/11/2019	11626.388	11460.848	60	Marcellus
26	3/12/2019	11425.34	11259.8	60	Marcellus
27	3/12/2019	11224.292	11058.752	60	Marcellus
28	3/12/2019	11023.244	10857.704	60	Marcellus
29	3/13/2019	10822.196	10656.656	60	Marcellus
30	3/13/2019	10621.148	10455.608	60	Marcellus
31	3/13/2019	10420.1	10254.56	60	Marcellus
32	3/14/2019	10219.052	10053.512	60	Marcellus
33	3/14/2019	10018.004	9852.464	60	Marcellus
34	3/15/2019	9816.956	9651.416	60	Marcellus
35	3/15/2019	9615.908	9450.368	60	Marcellus
36	3/16/2019	9414.86	9249.32	60	Marcellus
37	3/16/2019	9213.812	9048.272	60	Marcellus
38	3/16/2019	9012.764	8847.224	60	Marcellus
39	3/17/2019	8811.716	8646.176	60	Marcellus
40	3/17/2019	8610.668	8445.128	60	Marcellus
41	3/17/2019	8409.62	8244.08	60	Marcellus
42	3/17/2019	8208.572	8043.032	60	Marcellus
43	3/18/2019	8007.524	7841.984	60	Marcellus
44	3/18/2019	7806.476	7640.936	60	Marcellus
45	3/18/2019	7605.428	7439.888	60	Marcellus
46	3/18/2019	7404.38	7238.84	60	Marcellus
47	3/19/2019	7203.332	7037.792	60	Marcellus
48	3/19/2019	7002.284	6836.744	60	Marcellus



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	2/16/2019	78.2886	7693.25	6479	3082	260900	6845	N/A
2	2/16/2019	76.3858	7890.231	5602	3497	408000	8292	N/A
3	2/16/2019	76.095	8083.844	5681	3602	405770	8165	N/A
4	2/16/2019	77.0038	8131.515	5412	4346	403560	8244	N/A
5	2/17/2019	77.7267	8158.02	5303	4089	407800	8282	N/A
6	2/17/2019	76.2274	8123.773	5349	4134	409600	8204	N/A
7	2/17/2019	79.5734	7967.495	4999	4306	401800	8197	N/A
8	2/18/2019	78.6753	8301.555	5629	3990	406020	8758	N/A
9	2/18/2019	74.5825	7935.976	5604	3357	406500	8215	N/A
10	2/18/2019	79.2666	7998.419	5816	4048	403560	8152	N/A
11	2/24/2019	78.3162	7977.119	5313	3914	408160	8214	N/A
12	3/7/2019	72.9685	8184.448	5419	3980	411560	8459	N/A
13	3/7/2019	69.6488	8121.672	5459	4105	409800	8760	N/A
14	3/8/2019	76.6871	7737.715	5447	3987	408460	11090	N/A
15	3/8/2019	76.2301	7919.579	5506	3788	410200	8136	N/A
16	3/9/2019	74.8626	7606.129	5463	4012	407840	8111	N/A
17	3/9/2019	76.0045	7687.775	5356	4405	408340	8230	N/A
18	3/9/2019	78.2328	7984.013	5524	4469	407200	8001	N/A
19	3/10/2019	77.1994	7429.524	6122	5026	406360	9445	N/A
20	3/10/2019	78.7723	7638.561	5707	4122	410740	8276	N/A
21	3/10/2019	79.1819	8034.182	5750	3652	410000	8036	N/A
22	3/11/2019	75.2304	8110.258	6221	3620	410200	7993	N/A
23	3/11/2019	77.655	7559.089	6135	3822	410100	8228	N/A
24	3/11/2019	76.9521	7537.006	5914	3900	412300	8121	N/A
25	3/11/2019	76.8915	7643.567	5697	3617	406900	7940	N/A
26	3/12/2019	77.9781	7681.606	6262	3824	407300	7987	N/A
27	3/12/2019	79.7117	7874.51	6069	3935	407960	8116	N/A
28	3/12/2019	71.2723	7999.144	5480	3639	410000	7946	N/A
29	3/13/2019	75.0815	7631.595	6906	3635	407500	7796	N/A
30	3/13/2019	79.1477	7569.849	6303	3828	407200	8001	N/A
31	3/13/2019	79.4815	7714.179	6153	3972	406880	8130	N/A
32	3/14/2019	77.3169	7716.198	6009	4191	410210	9333	N/A
33	3/14/2019	69.9269	8057.836	5505	3889	404780	9201	N/A
34	3/15/2019	53.8	7905.156	6411	3991	407250	10379	N/A
35	3/15/2019	76.9702	7867.257	5854	3425	409160	9101	N/A
36	3/16/2019	66.7476	7458.571	5667	4361	403560	11005	N/A
37	3/16/2019	72.6663	6761.029	5631	4786	408700	9566	N/A
38	3/16/2019	80.1568	7316.498	5829	3800	407440	7833	N/A
39	3/17/2019	77.6969	7853.484	6275	3825	406220	7916	N/A
40	3/17/2019	77.2533	6975.566	5670	3902	403800	7673	N/A
41	3/17/2019	77.1589	6949.963	5417	3785	411040	7822	N/A
42	3/17/2019	80.5876	6946.752	5159	3505	407800	8007	N/A
43	3/18/2019	80.3439	7161.71	6166	3971	410520	7885	N/A
44	3/18/2019	76.501	7399.646	5619	3815	410020	7787	N/A
45	3/18/2019	76.8839	7018.404	6307	4753	405780	7865	N/A
46	3/18/2019	80.3706	7272.243	5744	4030	407460	8058	N/A
47	3/19/2019	80.0068	7212.457	5659	3704	409820	7885	N/A
48	3/19/2019	79.1499	6741.709	6299	4344	417600	7820	N/A
		76.1	7,718	5,769	3,949	18,204,790	377,743	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	75	175	75	175
Silty Shale	175	335	175	335
shaly sand	335	425	335	425
Shale	425	855	425	855
Dolomitic Shale	855	1,005	855	1,005
Shaly Siltstone	1,005	1,105	1,005	1,105
Silty Sandstone	1,105	1,325	1,105	1,325
Shaly Sand	1,325	1,475	1,325	1,475
Sandstone	1,475	1,725	1,475	1,725
Silty, Shaly, Sandstone	1,725	1,765	1,725	1,765
Sandstone, Tr Shale, Tr Coal	1,765	1,805	1,765	1,805
Silty Sandstone	1,805	1,885	1,805	1,885
Shaly Siltstone	1,885	1,939	1,885	1,940
Big Lime	1,964	2,890	1,965	2,892
Fifty Foot Sandstone	2,890	2,998	2,892	3,001
Gordon	2,998	3,161	3,001	3,166
Fifth Sandstone	3,161	3,437	3,166	3,446
Bayard	3,437	3,940	3,446	3,961
Speechley	3,940	4,190	3,961	4,215
Balltown	4,190	4,698	4,215	4,733
Bradford	4,698	5,118	4,733	5,163
Benson	5,118	5,356	5,163	5,406
Alexander	5,356	6,348	5,406	6,485
Sycamore	6,203	6,323	6,298	6,460
Middlesex	6,323	6,418	6,460	6,632
Burkett	6,418	6,450	6,632	6,706
Tully	6,450	6,477	6,706	6,790
Marcellus	6,477	NA	6,790	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:	2/16/2019
Job End Date:	3/19/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02478-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Spock 1H
Latitude:	39.40020300
Longitude:	-80.90395600
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,559
Total Base Water Volume (gal):	17,338,310
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	87.91808	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	11.81931	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.40000	0.13725	
			Hydrogen Chloride	7647-01-0	17.50000	0.03191	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.01703	
			Petroleum Distillates	64742-47-8	60.00000	0.01613	
			Suspending agent (solid)	14808-60-7	3.00000	0.00260	
			Surfactant	68439-51-0	3.00000	0.00102	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01818	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01464	

SI-1200	U.S. Well Services, LLC	Scale Inhibitor				
			Water	7732-18-5	80.00000	0.01015
			Ethylene Glycol	107-21-1	40.00000	0.00726
			Sodium Salt of Diethylenetriaminepenta (methylenephosphonic acid)	68155-78-2	10.00000	0.00127
			Sodium Chloride	7647-14-5	10.00000	0.00127
Bioclear 2000	U.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00209
			Deionized Water	7732-18-5	28.00000	0.00119
AP One	U.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00052
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Ethylene glycol	107-21-1	40.00000	0.00005
			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)

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: 47-095-02478 County: Tyler
District: Centerville Well No: Spock Unit 1H
Farm Name: Tyrone L. Beem et al
Discharge Date/s From:(MMDDYY) 05/31/19 To: (MMDDYY) 05/31/19
Discharge Times. From: 0:00 To: 24:00
Total Volume to be Disposed from this facility (gallons): 996,304
Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: _____ (Include a topographical map of the Area.)
(2) UIC: 130,517 Permit No. 3400923821, 3400923823, 3400923824, 3416729731, 3416729543, 3416729464, 3416729445
(3) Offsite Disposal: _____ Site Location: _____
(4) Reuse: 865,787 Alternate Permit Number: _____
(5) Centralized Facility: _____ Permit No. _____
(6) Other method: _____ (Include an explanation)

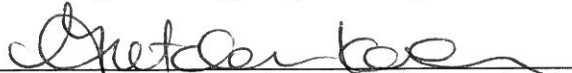
Follow Instructions below to determine your treatment category:

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: 8/9/19

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°25'00"

8,183'

4,330' TO BOTTOM HOLE
LATITUDE 39°25'00"

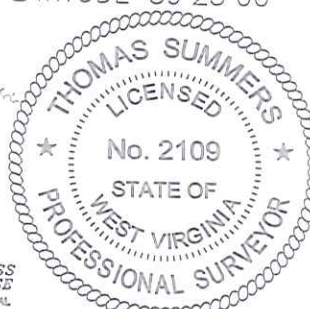
LONGITUDE 80°52'30"

5,998'

LONGITUDE 80°52'30"

15,077' TO BOTTOM HOLE

Antero Resources Corporation
Well No. Spock Unit 1H
47-095-02478



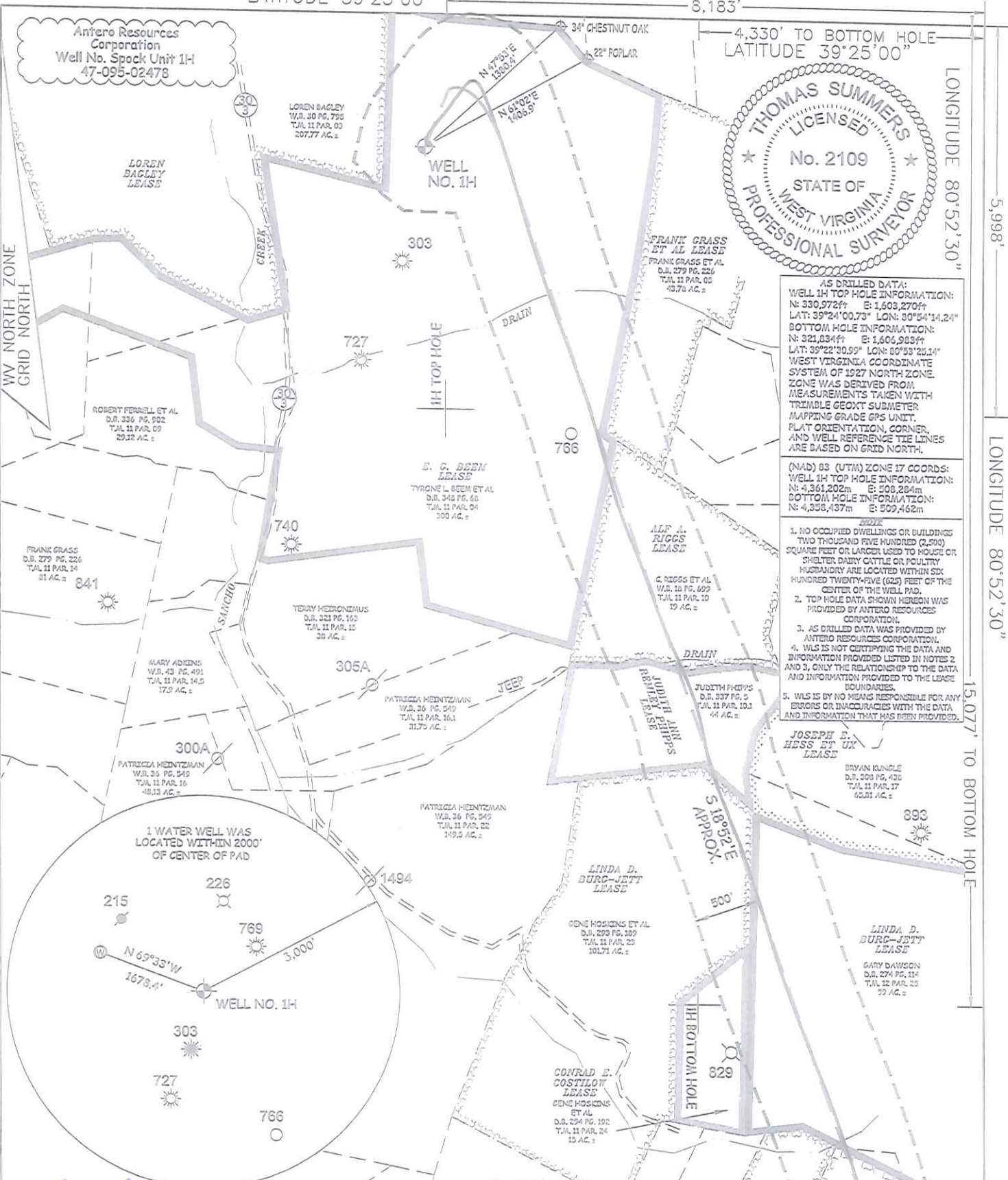
AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
N: 330,972ft E: 1,603,270ft
LAT: 39°24'00.73" LON: 80°54'14.24"
BOTTOM HOLE INFORMATION:
N: 321,834ft E: 1,606,983ft
LAT: 39°22'30.99" LON: 80°53'25.14"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT 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: 4,361,202m E: 508,284m
BOTTOM HOLE INFORMATION:
N: 4,358,437m E: 509,462m

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 ANTERO RESOURCES CORPORATION.
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.

JOSEPH E. HESS ET UX LEASE
BRYAN KUNCLE D.B. 308 PG. 435 T.J. 11 PAR. 17 65.91 AC.±
LINDA D. BURG-JETT LEASE
GARY DAWSON D.B. 274 PG. 114 T.J. 12 PAR. 25 59 AC.±

WV NORTH ZONE GRID NORTH



Thomas Summers P.S. 2109
DATE 08/08/19
OPERATOR'S WELL# SPOCK UNIT 1H

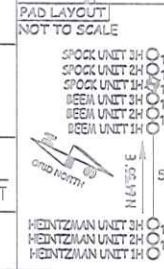
I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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 # 10-017WA
DRAWING # SPOCK1HAD
SCALE 1"=1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SURFACE OWNER TYRONE L. BEEM ET AL
SUBMETER MAPPING GRADE GPS
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
LOCATION: ELEVATION 1,115 - AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK QUADRANGLE MIDDLEBOURNE (7.5TH) PENNSBORO (7.0TH) DISTRICT CENTERVILLE COUNTY TYLER
SURFACE OWNER TYRONE L. BEEM ET AL ACREAGE 300 AC.±
OIL & GAS ROYALTY OWNER E.G. BEEM; ALF A. RIGGS; JUDITH ANN REMLEY PHIPPS; LINDA D. BURG-JETT; LINDA D. BURG-JETT; CARL W. ASH; HAESSLEY LAND & TIMBER, LLC

47 - 095 - 02478
STATE COUNTY PERMIT
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
HEINTZMAN UNIT 3H
HEINTZMAN UNIT 2H
HEINTZMAN UNIT 1H



WILSON HOSKINS ET UX LEASE
CLIFFORD LOCKWOOD D.B. 259 PG. 115 T.J. 4 PAR. 11 62.533 AC.±

LEGEND
- - - Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
- - - Proposed Well Path
○ As Drilled Well Path

LEASE ACREAGE 317 AC.±; 19.1 AC.±; 44 AC.±; 101.7 AC.±; 178 AC.±; 18 AC.±; 26.75 AC.±
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,557' TWD 16,500' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D. BIG TYLER ROAD
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL
FRACTURE OR STIMULATE PERFORATE NEW FORMATION PLUG OFF
OLD FORMATION PLUG & ABANDON CLEAN OUT & REPLUG
OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED