



Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

March 27, 2020

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
601 57<sup>th</sup> 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 off of the **Meredith Pad**:

- Horst Unit 2H-3H
- Sarahlene Unit 1H-2H
- Sterling Unit 1H-3H

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", written over a light blue horizontal 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 - 095 - 02519 County Tyler District Centerville  
Quad West Union 7.5' Pad Name Meredith Pad Field/Pool Name ----  
Farm name Roy A. Meredith Well Number Sarahlene Unit 2H  
Operator (as registered with the OOG) Antero Resources Corporation  
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4355479m Easting 511228m  
Landing Point of Curve Northing 4355370.93m Easting 511245.30m  
Bottom Hole Northing 4352877m Easting 512079m

Elevation (ft) 1111' 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)  
Air - Foam & 4% KCL  
Mud - Polymer

Date permit issued 9/21/2018 Date drilling commenced 10/7/2018 Date drilling ceased 2/17/2019  
Date completion activities began 9/4/2019 Date completion activities ceased 10/11/2019  
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 463', 683' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1521', 2109' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 63', 1239' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by:

\_\_\_\_\_

API 47- 095 - 02519 Farm name Roy A. Meredith Well number Sarahlene Unit 2H

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	24"	20"	97'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	814'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2607'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15784'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6763'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	204 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	660 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	890 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	670 sx (Lead) 1390 sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.40 (Lead), 1.26 (Tail)		~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15804' MD, 6577' TVD (BHL), 6577' (Deepest Point Drilled) Loggers TD (ft) 15804' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5850'

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 \_\_\_\_\_

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

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 N/A



API 47- 095 - 02519 Farm name Roy A. Meredith Well number Sarahlene Unit 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6498' (TOP)</u>	<u>TVD</u>	<u>6808' (TOP)</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2800 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 5578 mcfpd Oil 64 bpd NGL --- bpd Water 235 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H<sub>2</sub>S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	

**\*PLEASE SEE ATTACHED EXHIBIT 3**


Please insert additional pages as applicable.

Drilling Contractor Patterson UTI Drilling Company LLC  
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company KLX Energy Services  
Address 3040 Post Oak Boulevard City Houston State TX Zip 77056

Cementing Company C&J Energy Services  
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Baker Hughes  
Address 837 Phillippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223  
Signature  Title Permitting Agent Date 3.27.20

API 47-095-02519 Farm Name Roy A. Meredith Well Number Sarahlene Unit 2H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/19/2019	15623.7	15679.2	60	Marcellus
2	9/20/2019	15424.36591	15592.4777	60	Marcellus
3	9/20/2019	15225.03182	15393.1436	60	Marcellus
4	9/20/2019	15025.69773	15193.8095	60	Marcellus
5	9/20/2019	14826.36364	14994.4754	60	Marcellus
6	9/21/2019	14627.02955	14795.1413	60	Marcellus
7	9/21/2019	14427.69545	14595.8072	60	Marcellus
8	9/21/2019	14228.36136	14396.4731	60	Marcellus
9	9/22/2019	14029.02727	14197.139	60	Marcellus
10	9/22/2019	13829.69318	13997.8049	60	Marcellus
11	9/22/2019	13630.35909	13798.4708	60	Marcellus
12	9/22/2019	13431.025	13599.1367	60	Marcellus
13	9/23/2019	13231.69091	13399.8027	60	Marcellus
14	9/23/2019	13032.35682	13200.4686	60	Marcellus
15	9/23/2019	12833.02273	13001.1345	60	Marcellus
16	9/23/2019	12633.68864	12801.8004	60	Marcellus
17	9/24/2019	12434.35455	12602.4663	60	Marcellus
18	9/24/2019	12235.02045	12403.1322	60	Marcellus
19	9/24/2019	12035.68636	12203.7981	60	Marcellus
20	9/24/2019	11836.35227	12004.464	60	Marcellus
21	9/25/2019	11637.01818	11805.1299	60	Marcellus
22	9/25/2019	11437.68409	11605.7958	60	Marcellus
23	9/25/2019	11238.35	11406.4617	60	Marcellus
24	9/25/2019	11039.01591	11207.1277	60	Marcellus
25	9/26/2019	10839.68182	11007.7936	60	Marcellus
26	9/26/2019	10640.34773	10808.4595	60	Marcellus
27	9/26/2019	10441.01364	10609.1254	60	Marcellus
28	9/27/2019	10241.67955	10409.7913	60	Marcellus
29	9/27/2019	10042.34545	10210.4572	60	Marcellus
30	9/27/2019	9843.011364	10011.1231	60	Marcellus
31	9/27/2019	9643.677273	9811.78902	60	Marcellus
32	9/28/2019	9444.343182	9612.45492	60	Marcellus
33	9/28/2019	9245.009091	9413.12083	60	Marcellus
34	9/28/2019	9045.675	9213.78674	60	Marcellus
35	9/29/2019	8846.340909	9014.45265	60	Marcellus
36	9/29/2019	8647.006818	8815.11856	60	Marcellus
37	9/29/2019	8447.672727	8615.78447	60	Marcellus
38	9/30/2019	8248.338636	8416.45038	60	Marcellus
39	9/30/2019	8049.004545	8217.11629	60	Marcellus
40	9/30/2019	7849.670455	8017.7822	60	Marcellus
41	9/30/2019	7650.336364	7818.44811	60	Marcellus
42	10/1/2019	7451.002273	7619.11402	60	Marcellus
43	10/1/2019	7251.668182	7419.77992	60	Marcellus
44	10/1/2019	7052.334091	7220.44583	60	Marcellus
45	10/1/2019	6853	7021.11174	60	Marcellus

**API 47-095-02519 Farm Name Roy A. Meredith Well Number Sarahlene 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	9/19/2019	77.31573	7777.762	5491	4303	174350	5839.4	N/A
2	9/20/2019	80.80797	8112.472	5838	4607	401900	8672.4	N/A
3	9/20/2019	74.54056	7934.734	6084	3858	401800	8793.9	N/A
4	9/20/2019	76.29174	7818.705	5997	3890	401800	8694	N/A
5	9/20/2019	81.75923	7941.171	5864	4280	401700	8677	N/A
6	9/21/2019	85.33011	8437.792	5964	3817	401500	8812.7	N/A
7	9/21/2019	77.87041	7846.52	6324	3851	402250	8822	N/A
8	9/21/2019	85.82056	8405.554	6764	4156	402000	8744.7	N/A
9	9/22/2019	86.0821	8363.043	6393	4387	402200	8558.3	N/A
10	9/22/2019	82.27038	7986.53	6276	4094	402000	8960.5	N/A
11	9/22/2019	78.54939	7745.338	6048	4107	401900	8700	N/A
12	9/22/2019	83.38752	7991.166	5880	4260	401650	8503	N/A
13	9/23/2019	82.35795	8149.479	6265	4330	402350	8546.1	N/A
14	9/23/2019	81.30717	8114.291	6030	4080	402300	8567.5	N/A
15	9/23/2019	80.61541	7940.938	6313	3866	402000	8537.4	N/A
16	9/23/2019	86.71052	8373.145	6116	4211	401500	8604.3	N/A
17	9/24/2019	85.34686	8080.197	5320	3952	401750	8556.4	N/A
18	9/24/2019	83.85448	8024.819	6140	3879	402050	8528.3	N/A
19	9/24/2019	85.75352	8058.071	7057	3920	401850	8677.7	N/A
20	9/24/2019	86.48802	8235.501	6571	3789	402900	8552.7	N/A
21	9/25/2019	86.43086	8055.087	6200	3947	402050	8529.8	N/A
22	9/25/2019	85.75089	7953.356	5357	3783	402150	8601.3	N/A
23	9/25/2019	85.75713	7743.65	6536	3879	402050	8497.8	N/A
24	9/25/2019	82.76918	8302.73	6280	3791	402150	8678.1	N/A
25	9/26/2019	84.44764	7975.862	6138	3560	401750	8539.8	N/A
26	9/26/2019	86.44336	7834.344	6794	3812	402600	8523.5	N/A
27	9/26/2019	81.89258	7518.267	6935	3759	401750	8528.1	N/A
28	9/27/2019	85.65362	7586.161	5460	4050	401950	8482	N/A
29	9/27/2019	85.10998	7325.303	6782	3915	401750	8575.1	N/A
30	9/27/2019	85.04772	7251.196	4971	3895	402000	8527.9	N/A
31	9/27/2019	83.32915	7245.906	6443	3887	402400	8406.1	N/A
32	9/28/2019	85.81196	7215.737	6007	3805	402500	8538.7	N/A
33	9/28/2019	79.72181	7285.982	5592	4560	401750	10412.8	N/A
34	9/28/2019	85.85481	7107.174	7153	3875	402200	8522.4	N/A
35	9/29/2019	89.63835	7470.016	6649	3616	402160	8386.3	N/A
36	9/29/2019	81.81901	7281.022	6678	3993	402300	8356.5	N/A
37	9/29/2019	84.15328	7466.912	7090	3389	402250	8477.5	N/A
38	9/30/2019	87.99616	7493.066	6633	3477	402400	8498.5	N/A
39	9/30/2019	85.83859	7236.137	6416	3828	402200	8484.2	N/A
40	9/30/2019	86.56491	7046.94	6101	3609	402050	8506.8	N/A
41	9/30/2019	88.72773	6822.826	5674	3839	402100	8545.4	N/A
42	10/1/2019	89.10672	7132.646	5932	3878	401900	8485.3	N/A
43	10/1/2019	86.36554	7084.054	6714	3827	401700	8458.7	N/A
44	10/1/2019	86.93048	6749.216	6667	3867	401840	8449.7	N/A
45	10/1/2019	90.34399	7015.45	6082	3418	401780	8383	N/A
<b>AVG</b>		<b>84.1</b>	<b>7,701</b>	<b>6,223</b>	<b>3,931</b>	<b>17,863,480</b>	<b>384,744</b>	<b>TOTAL</b>

**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	85	85	85	85
Sandstone	145	145	145	145
Silty sandstone tr coal	185	185	185	185
Shaly siltstone tr coal	540	540	540	540
Shaly siltstone	655	655	655	655
Silty Sandstone	705	705	705	705
Silty sandstone	985	985	985	985
Silty Sandstone	1,035	1,035	1,035	1,035
Siltstone	1,105	1,105	1,105	1,105
Siltstone tr coal	1,285	1,285	1,285	1,285
Sandstone tr coal	1,405	1,405	1,405	1,405
Shaly siltstone tr coal	1,635	1,635	1,635	1,635
Silty sandstone tr coal	1,725	1,725	1,725	1,725
Big Lime	1,989	1,989	1,989	1,989
Fifty Foot Sandstone	2,872	2,872	2,872	2,872
Gordon	2,957	2,957	2,957	2,957
Fifth Sandstone	3,099	3,099	3,099	3,099
Bayard	3,302	3,302	3,302	3,302
Speechley	3,800	3,800	3,800	3,800
Balltown	4,085	4,085	4,085	4,085
Bradford	4,445	4,445	4,445	4,445
Benson	4,956	4,956	4,956	4,956
Alexander	5,267	5,267	5,267	5,267
Sycamore	6,191	6,191	6,191	6,191
Middlesex	6,316	6,316	6,316	6,316
Burkett	6,426	6,426	6,426	6,426
Tully	6,460	6,460	6,460	6,460
Marcellus	6,492	6,492	6,492	6,492

\*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.



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: 47-095-02519 County: Tyler  
District: Centerville Well No: Sarahlene Unit 2H  
Farm Name: Roy A. Meredith et al  
Discharge Date/s From:(MMDDYY) 10/29/19 To: (MMDDYY) 11/28/19  
Discharge Times. From: 0:00 To: 24:00  
Total Volume to be Disposed from this facility (gallons): 428,337  
Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: \_\_\_\_\_ (Include a topographical map of the Area.)  
(2) UIC: 665 Permit No. 3416729731  
(3) Offsite Disposal: \_\_\_\_\_ Site Location: \_\_\_\_\_  
(4) Reuse: 427,672 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: 3/16/20

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/Bl
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: \_\_\_\_\_

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/18/2019
Job End Date:	10/1/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02519-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Sarahlene Unit 2H
Latitude:	39.34860000
Longitude:	-80.86986900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,577
Total Base Water Volume (gal):	16,663,809
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	88.37339	
Hydrochloric Acid	CWS	Clean Perforations					
				Listed Below			



					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	11.35264	
					Illite	12173-60-3	1.00000	0.11352	
					Hydrochloric acid	7647-01-0	37.00000	0.05483	
					Polymer	26100-47-0	45.00000	0.01945	
					Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01297	
					Goethite	1310-14-1	0.10000	0.01135	
					Biotite	1302-27-8	0.10000	0.01135	
					Apatite	64476-38-6	0.10000	0.01135	
					Ilmenite	98072-94-7	0.10000	0.01135	
					Polyethylene glycol mixture	25322-68-3	54.50000	0.00744	
					Ammonium chloride	12125-02-9	11.00000	0.00476	
					Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.00315	
					Guar gum	9000-30-0	60.00000	0.00315	
					2,2-Dibromo-3-Nitrilopropanamide	10222-01-2	20.00000	0.00273	
					Sorbitan monooleate	1338-43-8	4.00000	0.00173	
					Polyethylene glycol monooleate	9004-96-0	3.00000	0.00130	
					Sorbitol tetraoleate	61723-83-9	2.00000	0.00086	
					Sodium bromide	7647-15-6	4.00000	0.00055	
					Citric acid	77-92-9	60.00000	0.00050	
					Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00043	
					Dibromoacetonitrile	3252-43-5	3.00000	0.00041	
					Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00026	

				Alkylloxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00022	
				Ammonium Persulfate	7727-54-0	100.00000	0.00009	
				Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00008	
				Acrylamide	79-06-1	0.10000	0.00004	
				Ethylene Glycol	107-21-1	40.00000	0.00003	
				Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00002	
				Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00002	
				Cinnamaldehyde	104-55-2	10.00000	0.00001	
				Isopropyl alcohol	67-63-0	5.00000	0.00001	
				Formic acid	64-18-6	10.00000	0.00001	
				Ethoxylated Alcohols	68131-39-5	10.00000	0.00001	
				Tar bases, quinolone derivs, benzyl chloride- quatenized	72480-70-7	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)

LATITUDE 39°22'30"

10,332'

LATITUDE 39°20'00"

7,552' TO BOTTOM HOLE

2,984' TO BOTTOM HOLE

9,615'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Sarahlene Unit 2H

**AS DRILLED DATA:**

**WELL 2H TOP HOLE INFORMATION:**  
N: 312,031ft E: 1,612,615ft  
LAT: 39°20'54.96" LON: 80°52'11.53"

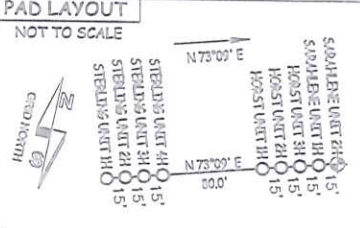
**BOTTOM HOLE INFORMATION:**  
N: 303,446ft E: 1,615,268ft  
LAT: 39°19'30.51" LON: 80°51'36.10"

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 2H TOP HOLE INFORMATION:**  
N: 4,355,479m E: 511,228m

**BOTTOM HOLE INFORMATION:**  
N: 4,352,877m E: 512,079m



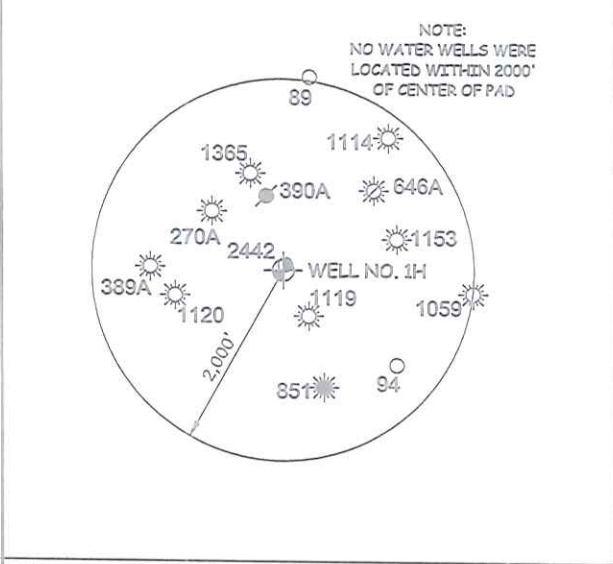
WV NORTH ZONE GRID NORTH

JOB # 17-012WA  
DRAWING # SARAHLENE2HAD  
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 02/18/20



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

- NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHEDDERS DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
- TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY
- AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
- 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.
- WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.



WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL

(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION 1,111' - AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK STATE COUNTY PERMIT

QUADRANGLE WEST UNION 7.5' DISTRICT CENTERVILLE COUNTY TYLER

SURFACE OWNER ROY A. MEREDITH ACREAGE 59.39 ACRES +/-

OIL & GAS ROYALTY OWNER ROY A. MEREDITH ET UX; O.W. GRIFFIN ET UX; LEASE ACREAGE 80 AC±; 222 AC±;

N. M. WELCH HEIRS; NATHAN CAIN ET AL; EUGENE R. WALTON ET AL 95 AC±; 278 AC±; 137 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 6,577' TVD 15,804' 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

FORM WW-6

COUNTY NAME PERMIT