

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

API 47-095-02354 County Tyler District Meade
Quad Pennsboro 7.5' Pad Name Terry Snider Pad Field/Pool Name -----
Farm name Terry L. Snider Well Number Markle Unit 3H
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 4357630m Easting 503099m
Landing Point of Curve Northing 4357497.24m Easting 503133.12m
Bottom Hole Northing 4355001m Easting 504106m

Elevation (ft) 1146.5' 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 5/9/2016 Date drilling commenced 5/11/2016 Date drilling ceased 10/20/2016
Date completion activities began 10/3/2017 Date completion activities ceased N/A 4/17/2018
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A Office of Oil and Gas

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

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Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths No
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths No
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by: JEB
Reviewed 9/12/2018

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9/12/2018

API 47-095 - 02354 Farm name Terry L. Snider Well number Markle Unit 3H

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"	65'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	513'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2575'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15732'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6587'		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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	102 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	605 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	1000 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	777 sx (Lead) 1291 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.87 (Tail)	3774	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15732' MD, 6458' TVD (BHL), 6458' (Deepest Point Drilled) Loggers TD (ft) 15732' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5892'

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

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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 - 02354 Farm name Terry L. Snider Well number Markle Unit 3H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6408' (TOP)	TVD	6644' (TOP) MD

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 9209 mcfpd Oil 126 bpd NGL --- bpd Water 409 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	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 Patterson - UTI Drilling Company LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company Kodiak Services Int'l
Address 2219 Sawdust Road, Unit 1604-1605 City The Woodlands State TX Zip 77380

Cementing Company BJ Services
Address 1036 East Main Street City Bridgeport State WV Zip 26330

Stimulating Company Baker Hughes
Address 837 Philippi 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 8/20/2018

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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API 47-095-02354 Farm Name Terry L. Snider Well Number Markle Unit 3H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/3/2018	15462	15631	60	Marcellus
2	2/4/2018	15262	15431	60	Marcellus
3	2/5/2018	15062	15231	60	Marcellus
4	2/5/2018	14862	15031	60	Marcellus
5	2/5/2018	14662	14831	60	Marcellus
6	2/6/2018	14462	14631	60	Marcellus
7	2/6/2018	14262	14431	60	Marcellus
8	2/6/2018	14062	14231	60	Marcellus
9	2/7/2018	13863	14031	60	Marcellus
10	2/8/2018	13663	13831	60	Marcellus
11	2/8/2018	13463	13631	60	Marcellus
12	2/8/2018	13263	13431	60	Marcellus
13	2/9/2018	13063	13231	60	Marcellus
14	2/9/2018	12863	13031	60	Marcellus
15	2/9/2018	12663	12831	60	Marcellus
16	2/10/2018	12463	12631	60	Marcellus
17	2/10/2018	12263	12431	60	Marcellus
18	2/10/2018	12063	12231	60	Marcellus
19	2/10/2018	11863	12031	60	Marcellus
20	2/11/2018	11663	11831	60	Marcellus
21	2/11/2018	11463	11631	60	Marcellus
22	2/12/2018	11263	11431	60	Marcellus
23	2/12/2018	11063	11231	60	Marcellus
24	2/12/2018	10863	11031	60	Marcellus
25	2/13/2018	10663	10831	60	Marcellus
26	2/13/2018	10463	10632	60	Marcellus
27	2/14/2018	10263	10432	60	Marcellus
28	2/14/2018	10063	10232	60	Marcellus
29	2/14/2018	9863	10032	60	Marcellus
30	2/15/2018	9663	9832	60	Marcellus
31	2/15/2018	9463	9632	60	Marcellus
32	2/16/2018	9263	9432	60	Marcellus
33	2/16/2018	9063	9232	60	Marcellus
34	2/16/2018	8863	9032	60	Marcellus
35	2/16/2018	8663	8832	60	Marcellus
36	2/17/2018	8463	8632	60	Marcellus
37	2/17/2018	8263	8432	60	Marcellus
38	2/17/2018	8063	8232	60	Marcellus
39	2/18/2018	7863	8032	60	Marcellus
40	2/18/2018	7663	7832	60	Marcellus
41	2/19/2018	7463	7632	60	Marcellus
42	2/19/2018	7263	7432	60	Marcellus
43	2/19/2018	7063	7232	60	Marcellus
44	2/20/2018	6863	7032	60	Marcellus
45	2/20/2018	6663	6832	60	Marcellus

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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	2/3/2018	71.9	7838	5020	4239	17097	13607	N/A
2	2/4/2018	74.5	7375	5705	4424	17504	9651	N/A
3	2/5/2018	75.6	7472	5538	4230	17240	9808	N/A
4	2/5/2018	69.8	7263	5591	4842	17696	9456	N/A
5	2/5/2018	75.2	7388	5342	4488	17218	9258	N/A
6	2/6/2018	74.7	7255	5145	4102	16502	9303	N/A
7	2/6/2018	73.5	7249	5300	3979	16528	10540	N/A
8	2/6/2018	73.4	7412	5635	4055	17102	9474	N/A
9	2/7/2018	69.2	7153	5440	4821	17414	9010	N/A
10	2/8/2018	73.5	7298	5225	3670	16193	9178	N/A
11	2/8/2018	73.6	7341	5496	4438	17275	10084	N/A
12	2/8/2018	74.3	7270	5403	3921	16594	8898	N/A
13	2/9/2018	70.7	7321	5367	4099	16787	10373	N/A
14	2/9/2018	74.6	7226	5225	4963	17414	10988	N/A
15	2/9/2018	73.8	7174	5279	4187	16640	9163	N/A
16	2/10/2018	74.6	7102	5144	4621	16867	8826	N/A
17	2/10/2018	73	7000	5442	3899	16341	9152	N/A
18	2/10/2018	74.5	7238	5296	3662	16196	9064	N/A
19	2/10/2018	74.6	7139	5160	3777	16076	8716	N/A
20	2/11/2018	75	6967	5219	3960	16146	8965	N/A
21	2/11/2018	74.6	6992	5824	3485	16301	9099	N/A
22	2/12/2018	76	6604	5646	6844	19094	9046	N/A
23	2/12/2018	75.4	6905	6131	3823	16859	9819	N/A
24	2/12/2018	76.4	6839	6008	3785	16632	8973	N/A
25	2/13/2018	76	6684	5789	3636	16109	10022	N/A
26	2/13/2018	78.1	6730	6027	4129	16886	9125	N/A
27	2/14/2018	73.6	6975	5785	3647	16407	9439	N/A
28	2/14/2018	75	6677	5678	3576	15931	8797	N/A
29	2/14/2018	77.4	7185	6012	3915	17112	10407	N/A
30	2/15/2018	79.2	7089	5443	3596	16128	9812	N/A
31	2/15/2018	76.7	6614	5882	3674	16170	8917	N/A
32	2/16/2018	74.8	6458	6219	3631	16308	9188	N/A
33	2/16/2018	74.8	6573	6017	3561	16151	9191	N/A
34	2/16/2018	74.5	6448	5637	3630	15715	8920	N/A
35	2/16/2018	79.3	6290	6290	3747	16327	8577	N/A
36	2/17/2018	79.1	6556	5849	3954	16359	8728	N/A
37	2/17/2018	79.6	6633	5911	3653	16197	8669	N/A
38	2/17/2018	73.8	6716	6045	3820	16581	11531	N/A
39	2/18/2018	75.1	6541	5975	3754	16270	9015	N/A
40	2/18/2018	75.7	6408	5950	3730	16088	8703	N/A
41	2/19/2018	77.3	6615	5711	3669	15995	9188	N/A
42	2/19/2018	79.4	5913	5913	3716	15542	8748	N/A
43	2/19/2018	78.3	6339	5489	3611	15439	8699	N/A
44	2/20/2018	75.6	6283	5492	3719	15494	8835	N/A
45	2/20/2018	75.3	6145	5320	3642	15107	9209	N/A
	AVG=	75.1	6,904	5,623	4,007	744,032	424,171	TOTAL

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EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Sandstone	0	N/A	0	N/A
Silty Sandstone	260	N/A	260	N/A
Shale w/trace Coal	560	N/A	560	N/A
Silty Sandstone	740	N/A	740	N/A
Limey Shale	880	N/A	880	N/A
Silty Shale w/trace Coal	1,080	N/A	1,080	N/A
Silty Sandstone	1,240	N/A	1,240	N/A
Silty Shale w/trace Coal	1,380	N/A	1,380	N/A
Silty Sandstone	1,520	N/A	1,520	N/A
Sandstone w/trace Coal	1,600	N/A	1,600	N/A
Silty Sandstone	1,680	N/A	1,680	N/A
Shale w/trace Coal	1,740	N/A	1,740	N/A
Silty Sandstone	1,840	N/A	1,840	N/A
Big Lime	2,045	N/A	2,047	N/A
Big Injun	2,148	N/A	2,151	N/A
Gantz Sand	2,562	N/A	2,564	N/A
Fifty Foot Sandstone	2,847	N/A	2,849	N/A
Gordon	2,940	N/A	2,942	N/A
Fifth Sandstone	3,194	N/A	3,197	N/A
Bayard	3,281	N/A	3,283	N/A
Warren	3,666	N/A	3,668	N/A
Speechley	4,006	N/A	4,008	N/A
Balltown	4,298	N/A	4,303	N/A
Bradford	4,686	N/A	4,696	N/A
Benson	5,060	N/A	5,077	N/A
Alexander	5,295	N/A	5,316	N/A
Rhinestreet	5,855	N/A	5,882	N/A
Sycamore	6,187	N/A	6,245	N/A
Middlesex	6,279	N/A	6,370	N/A
Burkett	6,375	N/A	6,556	N/A
Tully	6,399	N/A	6,621	N/A
Marcellus	6,408	N/A	6,644	N/A

*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.

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LATITUDE 39°22'30" 1,657'

10,141' TO BOTTOM HOLE
LATITUDE 39°22'30"

LONGITUDE 80°55'00" 1,162' TO BOTTOM HOLE
LONGITUDE 80°57'30"

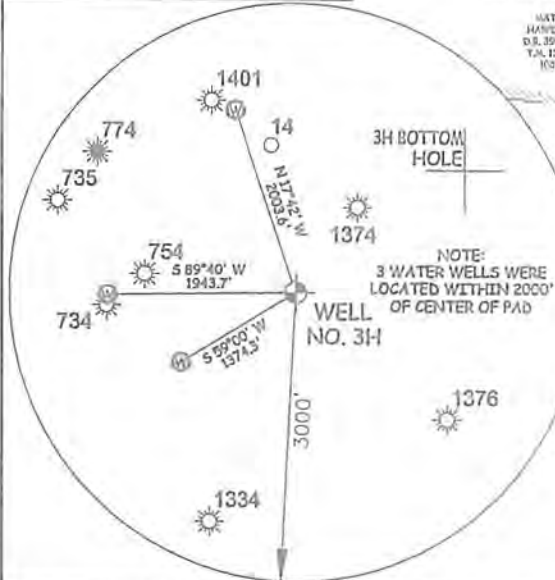
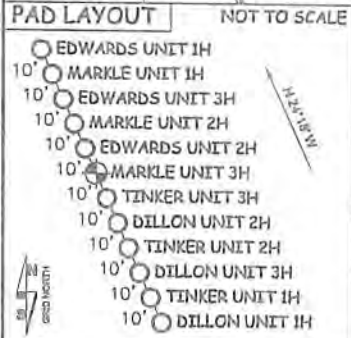
Antero Resources Corporation Well No. Markle Unit 3H

AS DRILLED DATA:
WELL 3H TOP HOLE INFORMATION:
 N: 319,534ft E: 1,586,059ft
 LAT: 39°22'04.97" LON: 80°57'51.10"
BOTTOM HOLE INFORMATION:
 N: 310,852ft E: 1,589,218ft
 LAT: 39°20'39.67" LON: 80°57'09.08"

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 3H TOP HOLE INFORMATION:
 N: 4,357,630m E: 503,099m
BOTTOM HOLE INFORMATION:
 N: 4,355,001m E: 504,106m

WV NORTH ZONE GRID NORTH



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 # 16-008VA
 DRAWING # MARKLE3HAD
 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

THOMAS SUMMERS P.S. 2109

DATE 08/01/18
 OPERATOR'S WELL# MARKLE UNIT #3H

NOTE

- 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.
- TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
- 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 47 - 095 - 02354
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: ELEVATION 1,146.5 AS-BUILT STATE COUNTY PERMIT
 QUADRANGLE PENNSBORO 7.5' DISTRICT MEADE COUNTY TYLER
 SURFACE OWNER RITCHIE PETROLEUM INC. ACREAGE 30.92 ACRES +/-
 OIL & GAS ROYALTY OWNER ASHFORD BROADWATER, TERRY L. SNIDER, HO, LLC, HI, LLC, MATTHEW B. HARPER ET UX LEASE ACREAGE 63.712 ACRES +/- 67 ACRES +/- 7.85 ACRES +/- 33 AC +/- 109 AC +/-
 FLOYD C. MARKLE ET AL; RUTH MARKLE; HATTIE JONES; NORMA MARKLE WALKER; HATTIE JONES; THE WINSTON FAMILY TRUST; BRANDON T. EDWARDS ET UX 81 ACRES +/- 44 ACRES +/- 27 ACRES +/- 2.91 AC +/- 43.57 ACRES +/- 21 ACRES +/- 52.5 ACRES +/-
 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 6,458' TVD 15,732' 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

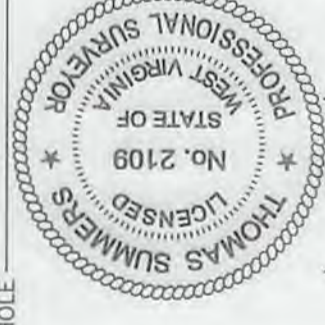
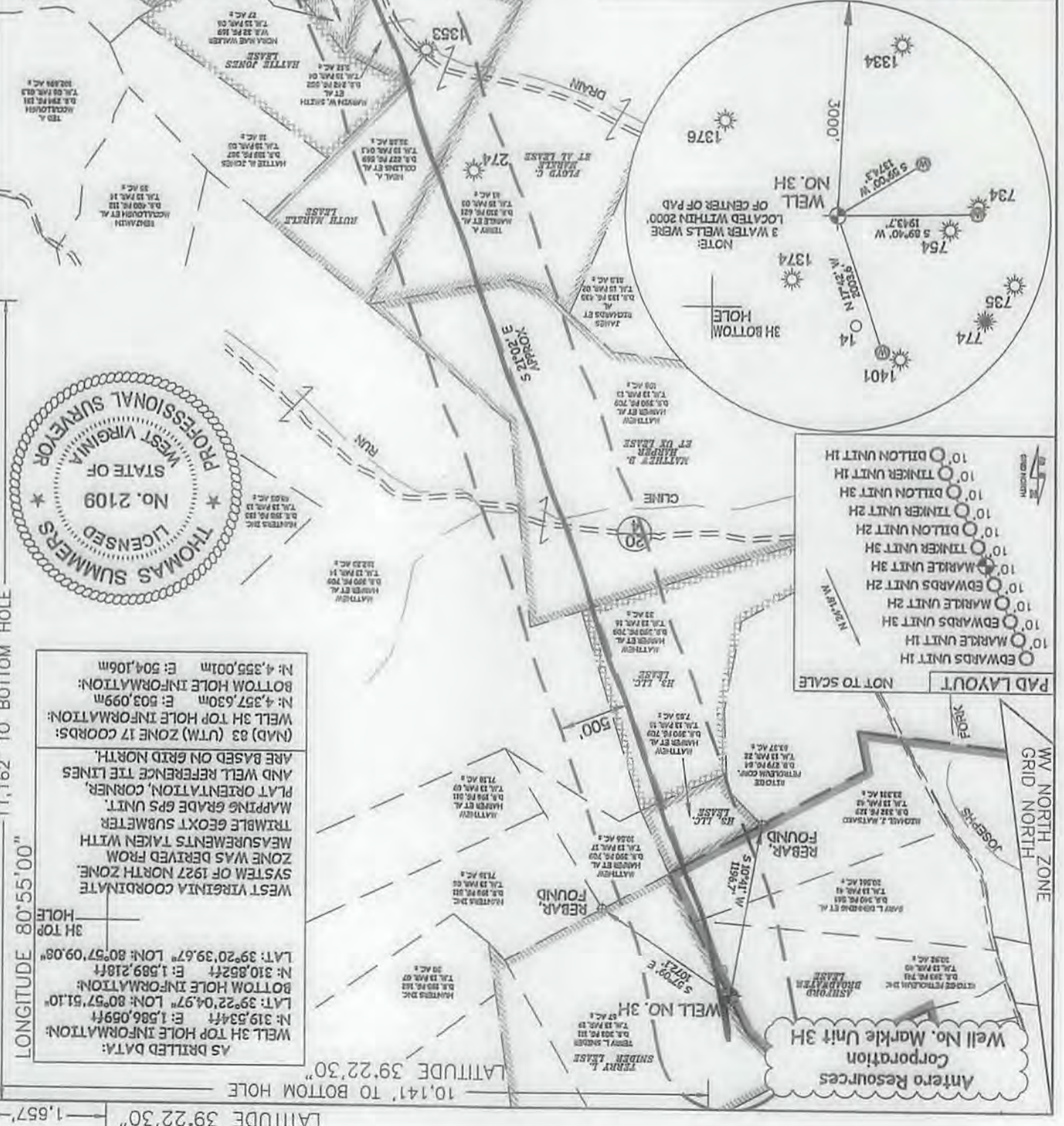


FORM WW-6
 ADDRESS 1615 WYMKOP STREET DENVER, CO 80202
 WELL OPERATOR ANTERO RESOURCES CORP.
 TARGET FORMATION MARCELLUS
 (SPECIFY) AS DRILLED
 PLUG OFF OLD FORMATION _____
 CONVERT _____
 PROPOSED WORK: DRILL DEEPER _____
 REDRILL _____
 OTHER PHYSICAL CHANGE IN WELL _____
 CLEAN OUT & REFLUG _____
 ESTIMATED DEPTH 6,450' TVD 15,732' MD
 DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313
 COUNTY NAME PERMIT
 SURFACE OWNER RITCHEE PETROLEUM INC.
 QUADRANGLE PENNSBORO 7.5
 DISTRICT MEADE
 COUNTY TYLER
 LEASE ACREAGE 30.92 ACRES +/-
 STATE COUNTY PERMIT
 47 095 02354
 WASTE DISPOSAL
 DEEP SHALLOW X
 STORAGE
 GAS X LIQUID INJECTION
 WELL TYPE: OIL
 LOCATION: ELEVATION 1,146.5' AS-BUILT
 WATERSHED OUTLET MIDDLE ISLAND CREEK
 COUNTY PERMIT
 47 095 02354

JOB # 16-008WA DRAWING # MARKLEHAD 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 OPERATOR'S WELL # MARKLE UNIT 3H	DATE 08/01/18 THOMAS SUMMERS P.S. 2109 As Drilled Well Path Proposed Well Path Interior Surface Tracts +/- Surface Owner Boundary Lines +/-
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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 P.L.C.
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415



AS DRILLED DATA:
 WELL 3H TOP HOLE INFORMATION:
 N: 319.5344ft E: 1586.059ft
 LAT: 39°22'04.97" LON: 80°57'51.10"
 BOTTOM HOLE INFORMATION:
 N: 310.8524ft E: 1589.218ft
 LAT: 39°20'39.67" LON: 80°57'09.08"
 3H TOP HOLE
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE
 ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOKT SUBMETER MAPPING GRADE GPS UNIT. AND WELL REFERENCE TIE LINES PLAT ORIENTATION, CORNER, (NAD) 83 (UTM) ZONE 17 COORDS:
 WELL 3H TOP HOLE INFORMATION:
 N: 4,357,630m E: 503,099m
 BOTTOM HOLE INFORMATION:
 N: 4,355,001m E: 504,106m

LONGITUDE 80°55'00"
 LONGITUDE 80°57'30"
 LATITUDE 39°22'30"
 LATITUDE 39°22'30"
 11,162' TO BOTTOM HOLE
 2,533'

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	2/3/2018
Job End Date:	2/21/2018
State:	West Virginia
County:	Tyler
API Number:	47-095-02354-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Markle 3H
Latitude:	39.36804722
Longitude:	-80.96419444
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,469
Total Base Water Volume (gal):	18,562,991
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	89.28402	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.16524	

HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
SCALECHEK LP-70	Halliburton	Scale Inhibitor					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			

HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				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	10.49752	
			Guar gum	9000-30-0	100.00000	0.02022	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01888	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01888	
			Inorganic salt	Proprietary	30.00000	0.01888	
			Hydrochloric acid	7647-01-0	15.00000	0.01678	
			Ethylene glycol	107-21-1	60.00000	0.00845	
			Glutaraldehyde	111-30-8	30.00000	0.00259	
			Telmer	Proprietary	10.00000	0.00141	
			Sodium persulfate	7775-27-1	100.00000	0.00051	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00043	
			Sodium polyacrylate	9003-04-7	1.00000	0.00014	
			Methanol	67-56-1	60.00000	0.00013	
			Ethanol	64-17-5	1.00000	0.00009	
			Ethoxylated alcohols	Proprietary	30.00000	0.00006	
			Modified thiourea polymer	Proprietary	30.00000	0.00006	
			Fatty acids, tall oil	Proprietary	30.00000	0.00006	
			Olefins	Proprietary	5.00000	0.00002	
			Propargyl alcohol	107-19-7	10.00000	0.00002	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Acrylic acid	79-10-7	0.01000	0.00000	

			Sodium sulfate	7757-82-6	0.10000	0.00000	
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* 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)