

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

API 47 - 085 - 10155 County Ritchie District Clay
Quad Pullman 7.5' Pad Name Mackay Pad Field/Pool Name -----
Farm name Jack D. Mackay, et al Well Number Greenback Unit 1H
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 4343236m Easting 508884m
Landing Point of Curve Northing 4343492.50m Easting 509274.75m
Bottom Hole Northing 4346252m Easting 507975m

Elevation (ft) 1100' 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

RECEIVED
Office of Oil and Gas

MAR 28 2017

WV Department of
Environmental Protection

Date permit issued 9/26/2014 Date drilling commenced 5/16/2015 Date drilling ceased 11/9/2015
Date completion activities began 1/30/2016 Date completion activities ceased 9/20/2016
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 434' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1966' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 301' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

APPROVED

Reviewed by: _____

NAME: Michael Laff

05/26/2017

DATE: 5-10-2017

API 47-085 - 10155 Farm name Jack D. Mackay, et al Well number Greenback Unit 1H

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"	40'	New	94# H-40	N/A	Y
Surface	17-1/2"	13-3/8"	523'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2503'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	17202'	New	23# P-110	N/A	Y
Tubing		2-3/8"	6966'		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	100 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	622 sx	15.6	1.18	363	0'	8 Hrs.
Coal							
Intermediate 1	Class A	969 sx	15.6	1.18	784	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	940 sx (Lead) 1617 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.83 (Tail)	3482	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17202' MD, 6441' TVD (BHL); 6555' TVD (Deepest Point Drilled) Loggers TD (ft) 17153' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6482'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (McNabb Unit 1H API #47-085-10196). Please reference the wireline logs submitted with Form WR-35 for McNabb Unit 1H. 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 _____
 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 _____

API 47- 085 - 10155 Farm name Jack D. Mackay, et al Well number Greenback Unit 1H

PRODUCING FORMATION(S)	DEPTHS
Marcellus	6533' (Top) TVD 7047' (Top) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 14426 mcfpd Oil 85 bpd NGL --- bpd Water 568 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 Precision Drilling Company, LP
Address 2640 Reach Rd. City Williamsport State PA Zip 17701

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

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

Stimulating Company US Well Services
Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature  Title Permitting Agent Date 3/21/2017

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

05/26/2017

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	30-Jan-16	16,945	17,112	60	Marcellus
2	29-Apr-16	16,748	16,914	60	Marcellus
3	29-Apr-16	16,550	16,717	60	Marcellus
4	29-Apr-16	16,353	16,519	60	Marcellus
5	29-Apr-16	16,155	16,322	60	Marcellus
6	30-Apr-16	15,958	16,124	60	Marcellus
7	30-Apr-16	15,760	15,927	60	Marcellus
8	30-Apr-16	15,562	15,729	60	Marcellus
9	30-Apr-16	15,365	15,531	60	Marcellus
10	1-May-16	15,167	15,334	60	Marcellus
11	1-May-16	14,970	15,136	60	Marcellus
12	2-May-16	14,772	14,939	60	Marcellus
13	2-May-16	14,575	14,741	60	Marcellus
14	2-May-16	14,377	14,544	60	Marcellus
15	3-May-16	14,179	14,346	60	Marcellus
16	3-May-16	13,982	14,148	60	Marcellus
17	3-May-16	13,784	13,951	60	Marcellus
18	3-May-16	13,587	13,753	60	Marcellus
19	4-May-16	13,389	13,556	60	Marcellus
20	4-May-16	13,192	13,358	60	Marcellus
21	4-May-16	12,994	13,161	60	Marcellus
22	4-May-16	12,796	12,963	60	Marcellus
23	5-May-16	12,599	12,766	60	Marcellus
24	5-May-16	12,401	12,568	60	Marcellus
25	5-May-16	12,204	12,370	60	Marcellus
26	5-May-16	12,006	12,173	60	Marcellus
27	6-May-16	11,809	11,975	60	Marcellus
28	6-May-16	11,611	11,778	60	Marcellus
29	6-May-16	11,413	11,580	60	Marcellus
30	6-May-16	11,216	11,383	60	Marcellus
31	6-May-16	11,018	11,185	60	Marcellus
32	7-May-16	10,821	10,987	60	Marcellus
33	7-May-16	10,623	10,790	60	Marcellus
34	7-May-16	10,426	10,592	60	Marcellus
35	7-May-16	10,228	10,395	60	Marcellus
36	8-May-16	10,030	10,197	60	Marcellus
37	8-May-16	9,833	10,000	60	Marcellus
38	9-May-16	9,635	9,802	60	Marcellus
39	9-May-16	9,438	9,604	60	Marcellus
40	9-May-16	9,240	9,407	60	Marcellus
41	12-May-16	9,043	9,209	60	Marcellus
42	12-May-16	8,845	9,012	60	Marcellus
43	13-May-16	8,648	8,814	60	Marcellus
44	13-May-16	8,450	8,617	60	Marcellus
45	13-May-16	8,252	8,419	60	Marcellus
46	14-May-16	8,055	8,221	60	Marcellus
47	14-May-16	7,857	8,024	60	Marcellus
48	14-May-16	7,660	7,826	60	Marcellus
49	14-May-16	7,462	7,629	60	Marcellus
50	14-May-16	7,265	7,431	60	Marcellus
51	15-May-16	7,067	7,234	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	28-Apr-16	62.0	6,617	0	5,189	272,710	9,292	N/A
2	29-Apr-16	65.0	6,794	6,489	5,078	297,800	7,961	N/A
3	29-Apr-16	73.0	6,491	5,667	4,961	307,380	7,934	N/A
4	29-Apr-16	75.0	6,757	5,638	4,860	308,540	7,885	N/A
5	29-Apr-16	70.0	7,092	6,026	5,087	304,440	7,857	N/A
6	30-Apr-16	72.0	7,229	6,238	5,302	309,010	7,841	N/A
7	30-Apr-16	69.0	7,250	5,637	5,428	308,410	8,184	N/A
8	30-Apr-16	72.0	7,241	6,107	5,022	315,140	7,843	N/A
9	30-Apr-16	72.0	7,405	6,228	5,006	312,115	7,853	N/A
10	1-May-16	69.0	6,970	6,003	4,962	308,310	8,738	N/A
11	1-May-16	71.0	7,117	5,920	5,093	312,890	7,786	N/A
12	2-May-16	72.4	7,065	6,102	4,972	312,300	8,250	N/A
13	2-May-16	69.3	7,048	5,914	4,591	311,390	8,358	N/A
14	2-May-16	69.0	7,234	6,773	4,159	309,720	7,863	N/A
15	3-May-16	73.0	6,938	6,226	5,126	224,830	9,208	N/A
16	3-May-16	67.9	6,802	6,290	5,139	309,670	7,906	N/A
17	3-May-16	68.7	6,933	6,133	4,295	309,390	7,888	N/A
18	3-May-16	70.0	6,860	6,961	5,211	308,100	7,611	N/A
19	4-May-16	73.0	6,719	6,219	4,761	302,710	9,187	N/A
20	4-May-16	75.3	6,863	5,918	4,485	310,750	7,699	N/A
21	4-May-16	73.3	6,905	6,747	4,939	312,220	7,719	N/A
22	4-May-16	72.0	7,117	6,768	5,065	309,140	8,467	N/A
23	5-May-16	72.0	6,831	6,369	5,283	308,130	7,638	N/A
24	5-May-16	75.9	6,995	5,631	5,144	309,740	7,673	N/A
25	5-May-16	74.1	6,813	5,727	4,877	309,750	7,724	N/A
26	5-May-16	75.0	6,975	5,892	3,548	299,670	7,526	N/A
27	6-May-16	75.0	6,861	6,186	4,657	309,990	7,579	N/A
28	6-May-16	75.9	6,916	5,457	4,919	309,870	7,595	N/A
29	6-May-16	75.6	6,945	5,783	3,682	309,960	7,693	N/A
30	6-May-16	75.0	7,020	5,781	3,910	308,520	7,596	N/A
31	6-May-16	76.0	7,305	5,796	4,811	282,350	8,829	N/A
32	7-May-16	73.2	6,786	5,726	4,674	310,050	7,720	N/A
33	7-May-16	73.4	6,862	6,115	4,521	308,310	7,565	N/A
34	7-May-16	73.7	6,706	5,569	4,229	308,860	7,529	N/A
35	7-May-16	72.0	6,708	6,242	4,025	268,000	6,632	N/A
36	8-May-16	72.9	6,673	5,582	4,942	308,270	7,487	N/A
37	8-May-16	72.0	6,768	5,983	4,673	307,130	7,449	N/A
38	9-May-16	73.0	6,497	5,745	4,778	305,000	7,385	N/A
39	9-May-16	73.9	6,604	5,716	4,510	311,690	7,480	N/A
40	9-May-16	72.2	6,610	5,619	4,615	75,740	12,903	N/A
41	12-May-16	74.3	6,172	5,565	4,650	306,440	7,811	N/A
42	12-May-16	66.1	6,707	6,190	4,955	291,020	7,558	N/A
43	13-May-16	66.3	6,689	5,757	3,485	309,410	7,466	N/A
44	13-May-16	62.5	7,017	5,928	4,581	308,420	11,409	N/A
45	13-May-16	65.4	6,040	5,486	5,303	307,600	7,364	N/A
46	14-May-16	65.2	5,895	5,358	5,051	310,310	7,350	N/A
47	14-May-16	69.2	6,061	6,167	4,662	309,540	7,417	N/A
48	14-May-16	71.3	6,075	5,123	4,796	308,700	7,366	N/A
49	14-May-16	71.5	6,063	5,325	4,796	310,290	7,364	N/A
50	14-May-16	66.0	6,357	5,443	4,380	309,240	7,295	N/A
51	15-May-16	67.0	5,980	5,897	3,890	309,200	7,287	N/A
AVG=		71.2	6,772	5,943	4,727	15,308,165	7,981	TOTAL

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	434'	N/A	434'	N/A
Shale	0	201	0	201
Sandstone	est. 201	281	est. 201	281
Siltstone	est. 281	301	est. 281	301
Coal "Washington Coal"	est. 301	361	est. 301	361
Sandstone	est. 361	581	est. 361	581
Shale	est. 581	1241	est. 581	1241
Sandstone	est. 1241	1321	est. 1241	1321
Siltstone/ sandstone	est. 1321	1401	est. 1321	1401
Sandstone	est. 1401	1721	est. 1401	1721
Shale	est. 1721	1821	est. 1721	1821
Siltstone	est. 1821	1981	est. 1821	1981
Limestone	est. 1981	2074	est. 1981	2075
Big Lime	2074	2760	2075	2761
Fifty Foot Sandstone	2760	2806	2761	2807
Gordon	2806	2984	2807	2986
Fifth Sandstone	2984	3093	2986	3095
Bayard	3093	3923	3095	3960
Speechley	3923	4185	3960	4255
Baltown	4185	4632	4255	4758
Bradford	4632	5025	4758	5206
Benson	5025	5276	5206	5489
Alexander	5276	6210	5489	6524
Sycamore	6210	6371	6524	6726
Middlesex	6371	6479	6726	6904
Burkett	6479	6509	6904	6975
Tully	6509	6533	6975	7047
Marcellus	6533	NA	7047	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:	4/28/2016
Job End Date:	5/15/2016
State:	West Virginia
County:	Ritchie
API Number:	47-085-10155-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Greenback 1H
Latitude:	39.14178900
Longitude:	-80.53500300
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,555
Total Base Water Volume (gal):	17,684,806
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	Base Fluid					
Sand	J.S. Well Services, LLC	Proppant					
HCL Acid (12.6%-18.0%)	J.S. Well Services, LLC	Bulk Acid	Crystalline Silica, quartz	14808-60-7	100.00000	9.36305	
LGC-15	J.S. Well Services	Gelling Agents					
			Water	7732-18-5	87.50000	0.13600	
			Hydrogen Chloride	7647-01-0	18.00000	0.03249	
			Guar Gum	9000-30-0	50.00000	0.06505	
			Petroleum Distillates	64742-47-8	60.00000	0.06161	
			Suspending agent (solid)	14808-60-7	3.00000	0.00995	
			Surfactant	68439-51-0	3.00000	0.00390	
WFRA-405	J.S. Well Services	Friction Reducer					
			Water	7732-18-5	60.00000	0.04730	
			2-Propanoic acid, polymer with 29003-06-9 propenamide	29003-06-9	30.00000	0.02365	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01904	

SI-1100s	J.S. Well Services	Scale Inhibitor	Ethoxylated alcohol blend	68002-97-1	4.00000	0.00315
			Water	7732-18-5	80.00000	0.01028
			Copolymer of Maleic and Acrylic acid	62255-49-9	10.00000	0.00152
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00130
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00083
			Hexamethylene tramine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00083
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00033
K-BAC 1020	J.S. Well Services	Anti-Bacterial Agent	2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00396
			Deionized Water	7732-18-5	28.00000	0.00226
AP One	J.S. Well Services	Gel Breakers	Ammonium Persulfate	7727-54-0	100.00000	0.00189
AI-302	J.S. Well Services	Acid Corrosion Inhibitors	Water	7732-18-5	95.00000	0.00030
			2-Propyn-1-ol compound with methoxytrane	38172-91-7	15.00000	0.00009

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)

LATITUDE 39°15'00"

6,296'

9,265' TO BOTTOM HOLE

LATITUDE 39°17'30"

LONGITUDE 80°52'30"

4,260'

9,535' TO BOTTOM HOLE

LONGITUDE 80°52'30"

Antero Resources Corporation
Well No. Greenback Unit 1H
A.P.I. #47-085-10155

NOTE:
NO WATER WELLS WERE
LOCATED WITHIN 2000'
OF PROPOSED WELL

47-085-10155
WELL NO. 1H

1H TOP HOLE

1H BOTTOM HOLE

AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
N: 271,983ft E: 1,604,254ft
LAT: 39°14'17.90" LON: 80°53'50.02"
BOTTOM HOLE INFORMATION:
N: 281,929ft E: 1,601,437ft
LAT: 39°15'55.76" LON: 80°54'27.81"
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: 4,343,236m E: 508,884m
BOTTOM HOLE INFORMATION:
N: 4,346,252m E: 507,975m

- 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 ALLEGHENY SURVEYS, INC.
 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.

JOB # 14-065WA
DRAWING # GREENBACK1HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

- LEGEND**
- Surface Owner Boundary Lines +/-
 - - - Interior Surface Tracts +/-
 - ⊕ Found monument, as noted
 - Proposed Well Path
 - ⊗ As Drilled Well Path

DATE 12/22/16
OPERATOR'S WELL # GREENBACK UNIT #1H
API WELL # 47 - 085 - 10155
STATE COUNTY PERMIT



STATE OF WEST VIRGINIA, DIVISION
OF ENVIRONMENTAL PROTECTION,
OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415

STATE OF WEST VIRGINIA DEPT. OF ENERGY DIVISION OF OIL AND GAS
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION ___ STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,100' (AS DRILLED) WATERSHED NORTH FORK HUGHES RIVER

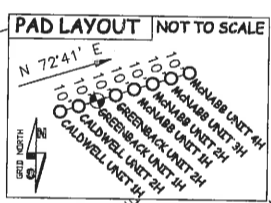
QUADRANGLE PULLMAN 7.5' (TH) PENNSBORO 7.5' (BH) DISTRICT CLAY COUNTY RITCHIE

SURFACE OWNER JACK D. MACKAY ET AL ACREAGE 235.03 ACRES +/-

OIL & GAS ROYALTY OWNER WM. VANCAMPEN; ANN BATTA ET AL; LEASE ACREAGE 312 AC±; 111 AC±;
HATTIE DOTSON; M.B. NUTTER; EILEEN SHERRER ET AL; LETHA ZINN 240 AC±; 400 AC±; 500 AC±; 55.5 AC±

PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL
(SPECIFY) (X) AS DRILLED PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,441' TVD 17,202' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
DENVER, CO 80202 ADDRESS 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313



05/26/2017

LATITUDE 39°15'00"

6,296'

9,265' TO BOTTOM HOLE

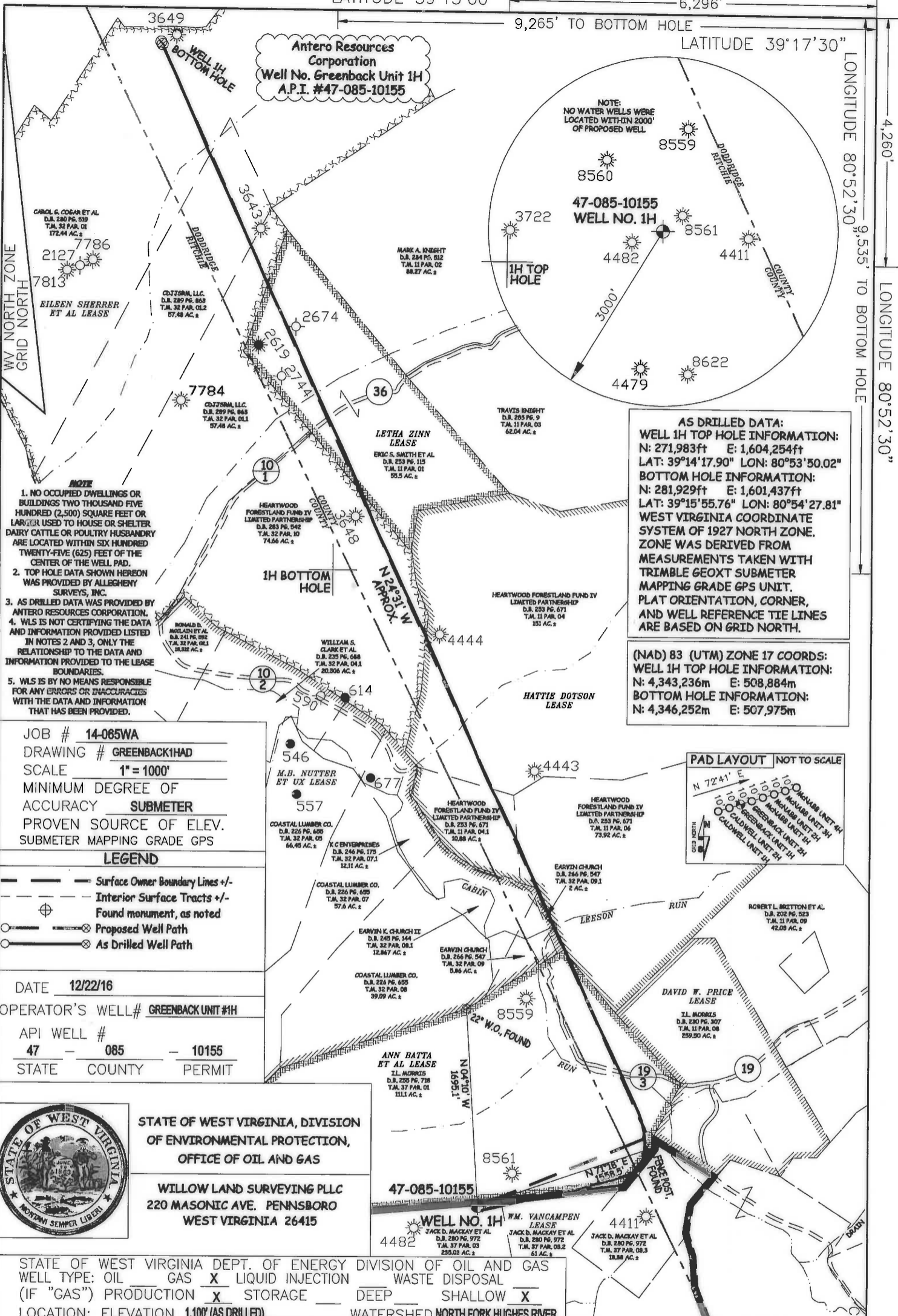
LATITUDE 39°17'30"

LONGITUDE 80°52'30"

4,260'

9,535' TO BOTTOM HOLE

LONGITUDE 80°52'30"



AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
 N: 271,983ft E: 1,604,254ft
 LAT: 39°14'17.90" LON: 80°53'50.02"
BOTTOM HOLE INFORMATION:
 N: 281,929ft E: 1,601,437ft
 LAT: 39°15'55.76" LON: 80°54'27.81"
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: 4,343,236m E: 508,884m
BOTTOM HOLE INFORMATION:
 N: 4,346,252m E: 507,975m

- 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 ALLEGHENY SURVEYS, INC.
 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.

JOB # 14-085WA
 DRAWING # GREENBACK1HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND

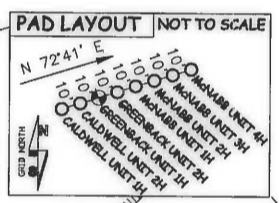
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

DATE 12/22/16
 OPERATOR'S WELL # GREENBACK UNIT #1H
 API WELL # 47 - 085 - 10155
 STATE COUNTY PERMIT



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

STATE OF WEST VIRGINIA DEPT. OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: ELEVATION 1,100' (AS DRILLED) WATERSHED NORTH FORK HUGHES RIVER
 QUADRANGLE PULLMAN 7.5' (TH) PENNSBORO 7.5' (BH) DISTRICT CLAY COUNTY RITCHIE
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