

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

API 47 - 017 - 06264 County Doddridge District Grant  
Quad Smithburg 7.5' Pad Name Delbert Leatherman Pad Field/Pool Name \_\_\_\_\_  
Farm name Leatherman, Delbert E., et al Well Number Vanscoy 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 4,349,925m Easting 526,479m  
Landing Point of Curve Northing 4350172.51m Easting 526497.96m  
Bottom Hole Northing 4,352,061m Easting 525,851m

Elevation (ft) 1,181' 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 06/25/2013 Date drilling commenced 02/01/2014 Date drilling ceased 03/10/2014  
Date completion activities began 04/30/2014 Date completion activities ceased 06/28/2014  
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 95', 215' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1136', 1600' Void(s) encountered (Y/N) depths None  
Coal depth(s) ft 327', 1517' Cavern(s) encountered (Y/N) depths None  
Is coal being mined in area (Y/N) No

Reviewed by:  
\_\_\_\_\_

JUN 01 2015

WR-35  
Rev. 8/23/13

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

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API 47-017 - 06264 Farm name Leatherman, Delbert E., et al Well number Vanscoy 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	30"	20"	40'	New	94#; J-55	N/A	Yes
Surface	17 1/2"	13 3/8"	358'	New	48#; H-40	N/A	Yes
Coal							
Intermediate 1	12 1/4"	9 5/8"	2,578'	New	36#; J-55	N/A	Yes
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	14,184'	New	20#; P-110	N/A	Yes
Tubing		2 3/8"	6,968'		4.7#; N-80	N/A	
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	200 sx	15.6	1.18	109	0'	8 Hrs.
Surface	Class A	411 sx	15.6	1.18	249	0'	8 Hrs.
Coal							
Intermediate 1	Class A	564 sx	15.2	1.86	807	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	1,171 sx (Lead); 1,047sx (Tail)	14.5 (Lead); 15.2 (Tail)	1.3 (Lead); 1.86 (Tail)	2,773	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 14,220' MD; 7,033' TVD (BHL & Deepest Point Drilled) Loggers TD (ft) 14,220'  
Deepest formation penetrated Marcellus Plug back to (ft) N/A  
Plug back procedure N/A

Kick off depth (ft) 6,394'

\*\*This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Langfitt Unit 2H, API #47-017-06204). Please reference the wireline logs submitted with Form WR-35 for the Langfitt Unit 2H. 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 47-017-06264 Farm Name Leatherman, Delbert E. et al Well Number Vanscoy Unit 2H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	30-Apr-14	13,787	13,954	60	Marcellus
2	16-May-14	13,590	13,756	60	Marcellus
3	17-May-14	13,392	13,559	60	Marcellus
4	17-May-14	13,195	13,361	60	Marcellus
5	17-May-14	12,997	13,164	60	Marcellus
6	17-May-14	12,800	12,966	60	Marcellus
7	5/18/2014	12,602	12,769	60	Marcellus
8	18-May-14	12,405	12,571	60	Marcellus
9	18-May-14	12,207	12,374	60	Marcellus
10	18-May-14	12,010	12,176	60	Marcellus
11	19-May-14	11,812	11,979	60	Marcellus
12	19-May-14	11,615	11,782	60	Marcellus
13	19-May-14	11,417	11,584	60	Marcellus
14	19-May-14	11,220	11,387	60	Marcellus
15	20-May-14	11,022	11,189	60	Marcellus
16	20-May-14	10,825	10,992	60	Marcellus
17	20-May-14	10,627	10,794	60	Marcellus
18	20-May-14	10,430	10,597	60	Marcellus
19	21-May-14	10,233	10,399	60	Marcellus
20	21-May-14	10,035	10,202	60	Marcellus
21	21-May-14	9,838	10,004	60	Marcellus
22	21-May-14	9,640	9,807	60	Marcellus
23	22-May-14	9,443	9,609	60	Marcellus
24	22-May-14	9,245	9,412	60	Marcellus
25	22-May-14	9,048	9,214	60	Marcellus
26	22-May-14	8,850	9,017	60	Marcellus
27	22-May-14	8,653	8,819	60	Marcellus
28	23-May-14	8,455	8,622	60	Marcellus
29	23-May-14	8,258	8,424	60	Marcellus
30	23-May-14	8,060	8,227	60	Marcellus
31	23-May-14	7,863	8,029	60	Marcellus
32	23-May-14	7,665	7,832	60	Marcellus
33	24-May-14	7,468	7,634	60	Marcellus
34	24-May-14	7,270	7,437	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	16-May-14	81.0	7,648	5,700	4,935	247,120	6,397	N/A
2	16-May-14	76.5	7,563	5,958	5,164	242,900	7,195	N/A
3	17-May-14	78.5	7,495	5,718	5,261	259,700	6,585	N/A
4	17-May-14	77.0	7,273	5,522	5,311	260,140	6,638	N/A
5	17-May-14	77.0	7,395	5,515	5,636	258,880	6,560	N/A
6	17-May-14	80.0	7,583	5,701	5,847	256,600	6,492	N/A
7	5/18/2014	80.0	7,536	5,811	5,765	257,500	6,468	N/A
8	18-May-14	80.0	7,673	5,486	5,722	261,500	6,462	N/A
9	18-May-14	79.0	7,383	5,500	5,708	260,000	6,123	N/A
10	18-May-14	80.0	7,266	5,425	5,790	258,500	7,036	N/A
11	19-May-14	80.0	7,341	5,536	5,840	259,600	6,504	N/A
12	19-May-14	79.9	7,165	5,675	5,497	263,460	6,414	N/A
13	19-May-14	78.0	7,295	5,832	5,661	260,100	6,397	N/A
14	19-May-14	80.0	7,107	5,507	5,833	260,000	6,417	N/A
15	20-May-14	80.0	7,035	5,643	5,829	261,000	6,397	N/A
16	20-May-14	79.0	7,276	5,311	5,765	259,800	6,352	N/A
17	20-May-14	76.0	7,234	5,575	5,189	161,500	6,336	N/A
18	20-May-14	77.0	6,904	5,651	5,411	205,500	6,933	N/A
19	21-May-14	81.0	7,054	5,826	5,761	266,000	6,505	N/A
20	21-May-14	79.0	6,793	5,468	5,908	260,300	6,307	N/A
21	21-May-14	80.0	6,890	5,579	5,851	260,300	6,295	N/A
22	21-May-14	80.0	6,744	5,411	5,568	261,900	6,312	N/A
23	22-May-14	81.0	6,671	5,429	5,686	260,300	6,263	N/A
24	22-May-14	79.0	6,591	5,507	5,783	259,900	6,244	N/A
25	22-May-14	79.0	6,356	5,121	5,844	260,000	6,227	N/A
26	22-May-14	80.0	6,656	5,407	5,786	259,800	6,216	N/A
27	22-May-14	80.0	6,740	5,518	5,776	260,500	6,204	N/A
28	23-May-14	80.0	6,572	5,457	5,955	260,900	6,237	N/A
29	23-May-14	79.0	6,524	5,479	5,547	261,400	6,270	N/A
30	23-May-14	79.0	6,878	5,257	5,922	241,300	6,775	N/A
31	23-May-14	81.0	6,352	5,332	5,786	260,300	6,151	N/A
32	23-May-14	81.0	6,444	5,436	5,833	260,400	6,139	N/A
33	24-May-14	79.0	6,305	5,382	5,543	260,000	6,165	N/A
34	24-May-14	78.0	6,823	6,044	4,342	257,700	6,695	N/A
AVG=		79.3	7,017	5,551	5,619	8,644,800	218,711	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
Fresh Water	95'	N/A	95'	N/A
Fresh Water	215'	N/A	215'	N/A
Sandstone/Siltstone w/ trace coal	0	147	0	147
Shale	Est. 147	327	Est. 147	327
Coal	Est. 327	347	Est. 327	347
Siltstone	Est. 347	637	Est. 347	637
Siltstone/Sandstone	Est. 637	1,237	Est. 637	1,237
Sandstone	Est. 1237	1,297	Est. 1237	1,297
Shale w/ trace coal	Est. 1297	1,317	Est. 1297	1,317
Shale w/ trace coal	Est. 1317	1,337	Est. 1317	1,337
Sandstone	Est. 1337	1,517	Est. 1337	1,517
Coal	Est. 1517	1,557	Est. 1517	1,557
Siltstone	Est. 1557	1,797	Est. 1557	1,797
Sandstone	Est. 1797	1,926	Est. 1797	1,926
Big Lime	1,926	2,024	1,926	2,024
Big Injun	2,024	2,466	2,024	2,466
Gantz Sand	2,466	2,580	2,466	2,580
Fifty Foot Sandstone	2,580	2,656	2,580	2,656
Gordon	2,656	2,960	2,656	2,960
Fifth Sandstone	2,960	2,983	2,960	2,983
Bayard	2,983	3,381	2,983	3,381
Warren	3,381	3,721	3,381	3,721
Speechley	3,721	4,042	3,721	4,042
Baltown	4,042	4,517	4,042	4,517
Bradford	4,517	5,020	4,517	5,021
Benson	5,020	5,283	5,021	5,286
Alexander	5,283	5,495	5,286	5,499
Elk	5,495	6,060	5,499	6,065
Rhinestreet	6,060	6,406	6,065	6,411
Sycamore	6,406	6,645	6,411	6,670
Middlesex	6,645	6,789	6,670	6,895
Burkett	6,789	6,817	6,895	6,961
Tully	6,817	6,902	6,961	7,231
Marcellus	6,902	NA	7,231	NA

\*Please note Antero determines shallow formation tops based on mud and/or wireline 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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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/16/2014
Job End Date:	5/24/2014
State:	West Virginia
County:	Doddridge
API Number:	47-017-06264-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Vanscoy Unit 2H
Longitude:	-80.69291700
Latitude:	39.29830000
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	7,034
Total Base Water Volume (gal):	9,185,862
Total Base Non Water Volume:	425,892



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	Water	7732-18-5	100.00000	89.62345	
Sand	U.S. Well Services, LLC	Proppant					
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid	Crystalline Silica, quartz	14808-60-7	100.00000	10.11325	
			Water	7732-18-5	87.50000	0.08742	
GC-15	U.S. Well Services, LLC	Gelling Agents	Hydrogen Chloride	7641-01-1	18.00000	0.02088	
			Guar Gum	9000-30-0	50.00000	0.03428	
			Petroleum Distillates	64742-47-8	60.00000	0.03247	
			Suspending agent (solid)	14808-60-7	3.00000	0.00524	
			Surfactant	68439-51-0	3.00000	0.00206	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			Anionic Polyacrylamide	Proprietary		0.02008	
			Water	7732-18-5	40.00000	0.02008	
			Petroleum Distillates	64742-47-8	22.00000	0.01617	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00251	



SI-1000	U.S. Well Services, LLC	Scale Inhibitor	Crystalline Salt	12125-02-9	5.00000	0.00251
			Anionic Copolymer	Proprietary		0.00391
			Ethylene Glycol	107-21-1	20.00000	0.00353
			Water	7732-18-5	30.00000	0.00295
X-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00454
			Deionized Water	7732-18-5	28.00000	0.00259
AP One	U.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00154
AI-300	U.S. Well Services, LLC	Acid Corrosion Inhibitor				
			Ethylene Glycol	107-21-1	31.00000	0.00023
			N,N-Dimethylformamide	68-12-2	15.00000	0.00007
			Cinnamaldehyde	104-55-2	5.00000	0.00006
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	13.00000	0.00006
			2-Butoxyethanol	111-76-2	7.00000	0.00005
			Ethoxylated Nonylphenol	68412-54-4	5.00000	0.00002
			Water	7732-18-5	20.00000	0.00002
			Triethyl Phosphate	78-40-0	3.00000	0.00001
			Isopropyl Alcohol	67-63-0	3.00000	0.00001

Ingredients shown above are subject to 29 CFR 1910.1200(j) 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)

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LATITUDE 39°20'00"

7,478'

LATITUDE 39°20'00"

LONGITUDE 80°40'00"

12,790'

5,774' TO BOTTOM HOLE

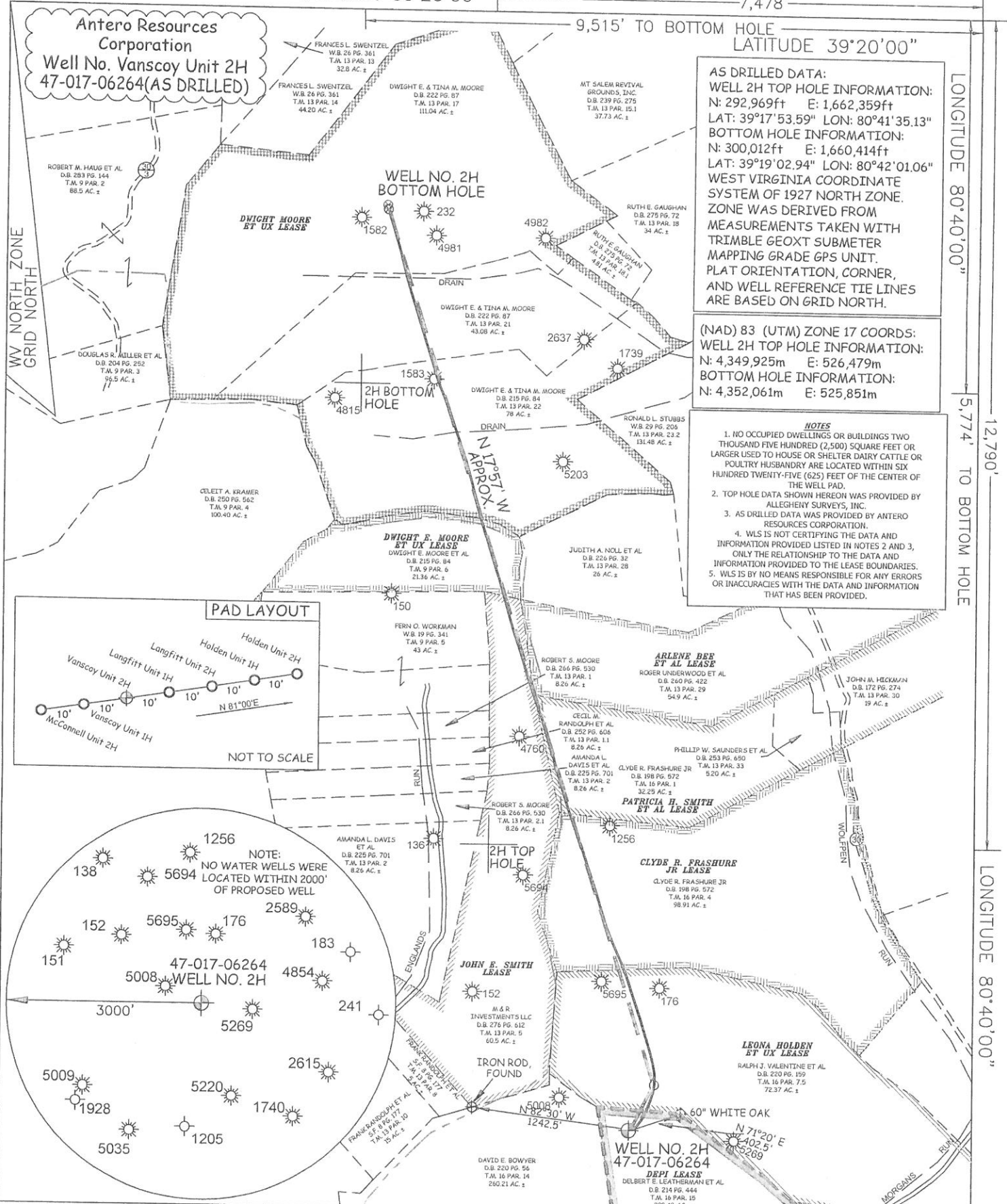
LONGITUDE 80°40'00"

Antero Resources Corporation  
Well No. Vanscoy Unit 2H  
47-017-06264 (AS DRILLED)

AS DRILLED DATA:  
WELL 2H TOP HOLE INFORMATION:  
N: 292,969ft E: 1,662,359ft  
LAT: 39°17'53.59" LON: 80°41'35.13"  
BOTTOM HOLE INFORMATION:  
N: 300,012ft E: 1,660,414ft  
LAT: 39°19'02.94" LON: 80°42'01.06"  
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:  
WELL 2H TOP HOLE INFORMATION:  
N: 4,349,925m E: 526,479m  
BOTTOM HOLE INFORMATION:  
N: 4,352,061m E: 525,851m

- NOTES
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 ALLEGHERY 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 # 12-113WA  
DRAWING # VANSCOYUNIT2HAD  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



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

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

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

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION 1,190' ORIGINAL - 1,181' AS DRILLED WATERSHED HEADWATERS OF MIDDLE ISLAND CREEK  
QUADRANGLE SMITHBURG 7.5' DISTRICT GRANT COUNTY DODDRIDGE

SURFACE OWNER DELBERT E. LEATHERMAN ET AL ACREAGE 209.48 ACRES +/-  
OIL & GAS ROYALTY OWNER DEPI; LEONA HOLDEN ET UX; CLYDE R. FRASHURE JR; PATRICIA H. SMITH ET AL; ARLENE BEE ET AL; JOHN E. SMITH; DWIGHT E. MOORE ET UX; DWIGHT MOORE ET UX 63.434 ACRES±; 55 ACRES±; 60.5 ACRES±; 21.36 ACRES±; 238 ACRES±

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  
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,033' TVD 14,220' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

DATE 04/15/2015 OPERATOR'S WELL# VANSCOY UNIT #2H  
API WELL # 47 - 017 - 06264  
STATE COUNTY PERMIT  
HEADWATERS OF MIDDLE ISLAND CREEK COUNTY DODDRIDGE