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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
fax: (304) 926-0452

Jim Justice, Governor  
Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

PERMIT MODIFICATION APPROVAL  
Horizontal 6A / Horizontal 6A Well - 1

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for O'DONNELL UNIT 2H  
47-017-06773-00-00

Change point of entry, horizontal leg length, TMD, and TVD.

ANTERO RESOURCES CORPORATION

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.



James A. Martin  
Chief

Operator's Well Number: O'DONNELL UNIT 2H  
Farm Name: MCCLOY, ALVADORE JR ET UX  
U.S. WELL NUMBER: 47-017-06773-00-00  
Horizontal 6A / Horizontal 6A Well - 1  
Date Issued: 8/4/2017

Promoting a healthy environment.

08/04/2017



July 17, 2017

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

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
Attn: Mr. Wade Stansberry  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Mr. Stansberry:

Antero Resources Corporation (Antero) would like to submit the following permit modification for one approved well on the Alvadore Pad. We are requesting to change the point of entry which will change the horizontal leg length, Total Measured Depth and Total Vertical Depth of the O'Donnell Unit 2H (API# 47-017-06773).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the revised Horizontal Leg Length, Measured Depth and Production Casing/Cement Program
- REVISED Form WW-6A1, which shows the new lease we will be drilling into
- REVISED Mylar Plats, which shows the new wellbore path

If you have any questions please feel free to contact me at (303) 357-6759.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Samantha Klaas". The signature is fluid and cursive, with a long horizontal stroke at the end.

Samantha Klaas  
Permitting Agent  
Antero Resources Corporation

Enclosures

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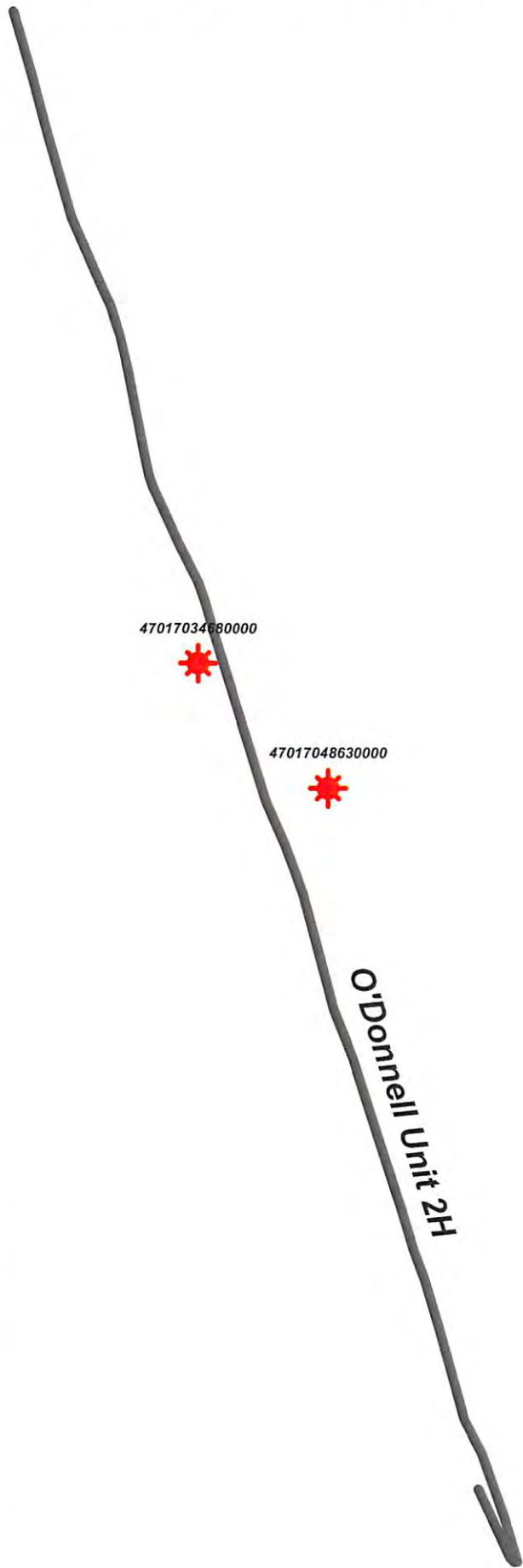
JUL 18 2017

WV Department of  
Environmental Protection

08/04/2017




17-06773 MOD



O'Donnell Unit 2H - AOR

Shallow Well Investigation



 WELL SYMBOLS  
Gas Well

July 17, 2017

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**PERMIT MODIFICATION (API# 47-017-06773)**

UWI (API#)	Well Name	Well Number	Operator	Historical Operator	TD
47017034680000	RASEY ROBERT E ETAL	JK-1186	ALLIANCE PETR CORP	J & J ENTERPRISES	5524
47017048630000	BOOTHE	2	KEY OIL COMPANY	KEY OIL COMPANY	5371
ELEV_GR	TD (SSTVD)	Approx distance to well	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
1140	-4384	146	4589-5286	Riley, Benson, Alexander	Big Injun, Weir, Balltown, Bradford
1061	-4310	369	3374-5231	Warren, Alexander	Big Injun, Weir, Balltown, Bradford, Riley, Benson

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WW-6B  
(04/15)

API NO. 47-017 - \_\_\_\_\_  
 OPERATOR WELL NO. O'Donnell Unit 2H  
 Well Pad Name: Existing Alvadore Pad

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Corporation

<u>494488557</u>	<u>017-Doddridge</u>	<u>Central</u>	<u>Pennsboro 7.5'</u>
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Operator ID County District Quadrangle

2) Operator's Well Number: O'Donnell Unit 2H Well Pad Name: Existing Alvadore Pad

3) Farm Name/Surface Owner: McCloy, Alvadore, Jr., et ux Public Road Access: CR 50/31

4) Elevation, current ground: 1057' Elevation, proposed post-construction: 1057'

5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_  
 Other \_\_\_\_\_  
 (b) If Gas Shallow  Deep \_\_\_\_\_  
 Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 6700' TVD, Anticipated Thickness- 60 feet, Associated Pressure- 3100#

8) Proposed Total Vertical Depth: 6700' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16010' MD

11) Proposed Horizontal Leg Length: 9332'

12) Approximate Fresh Water Strata Depths: 332'

13) Method to Determine Fresh Water Depths: Hudkins Unit 2H (API #47-017-06436) on same pad.

14) Approximate Saltwater Depths: 1571'

15) Approximate Coal Seam Depths: None Identified

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes \_\_\_\_\_ No

(a) If Yes, provide Mine Info: Name: \_\_\_\_\_  
 Depth: \_\_\_\_\_  
 Seam: \_\_\_\_\_  
 Owner: \_\_\_\_\_

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 Environmental Protection  
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WW-6B  
(04/15)

API NO. 47- 017 -  
OPERATOR WELL NO. O'Donnell Unit 2H  
Well Pad Name: Existing Alvadore Pad

18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	390' *see #19	390' *see #19	CTS, 542 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	23#	16010'	16010'	CTS, 3995 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	24"	0.438"	1530	50	Class A	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	2730	1000	Class A	~1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	~1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.415"	12,630	2500	Lead-H/POZ & Tail - H	H/POZ~1.44 & H~1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

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WW-6B  
(10/14)

API NO. 47- 017 - \_\_\_\_\_  
OPERATOR WELL NO. O'Donnell Unit 2H  
Well Pad Name: Existing Alvadore Pad

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.

\*Antero will be air drilling the fresh water string which makes it difficult to determine when fresh water is encountered. Therefore, we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

Anticipated Max Pressure - 9300 lbs  
Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 33.17 Existing Acres (Shared with Dotson Holland Pad)

22) Area to be disturbed for well pad only, less access road (acres): 4.35 Existing Acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers  
Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.  
Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.  
Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

24) Describe all cement additives associated with each cement type:

Conductor: no additives, Class A cement.  
Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake  
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat  
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51  
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

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25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.  
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.  
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.  
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

\*Note: Attach additional sheets as needed.

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

(1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;

(2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Brenda J. Miller Lease</u> Brenda J. Miller Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Name Change	0277/0186 Exhibit 1
<u>Dale L. Sprung Lease</u> Dale L. Sprung Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Name Change	278/282 Exhibit 1
<u>Gail Mason Lease</u> Gail Mason Lease Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Name Change	0289/0410 Exhibit 1
<u>Jerry Williamson et ux Lease</u> Jerry Williamson et ux	Antero Resources Corporation	1/8+	Exhibit 1
<u>WVSRA Lease</u> West Virginia State Rail Authority Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Name Change	0253/0409 Exhibit 1
<u>William E. Doak Lease</u> Williams E. Doak , et al C.E. Young W. Leslie Rogers Mary Elizabeth Rich D. Leslie Rich W. Kevin Snyder & Ritchie Petroleum Corp. Key Oil Company Antero Resources Appalachian Corporation	C. E. Young W. Leslie Rogers Mary Elizabeth Rich D. Leslie Rich W. Kevin Snyder & Ritchie Petroleum Corp. Key Oil Company Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Will Will Assignment Assignment *Partial Assignment Name Change	0069/0339 0090/0135 0127/0524 0178/0499 0185/0661 0187/0059 0276/0526 Exhibit 1
<u>Waco Oil &amp; Gas Company, Inc. Lease</u> Waco Oil & Gas Company, Inc. Key Oil Company Antero Resources Appalachian Corporation	Key Oil Company Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 *Partial Assignment Name Change	0198/0556 0276/0526 Exhibit 1
<u>Frederick D. Boothe et ux Lease</u> Frederick D. Boothe et ux Key Oil Company Antero Resources Appalachian Corporation	Key Oil Company Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Assignment Name Change	0195/0276 0276/0526 Exhibit 1

\*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

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\*\*CONTINUED ON NEXT PAGE



INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<b><u>Harry D. Williamson et al Lease</u></b>			
Harry D. Williamson et al	C. E. Young & L.C. Young	1/8	0069/0347
C. E. Young	L.C. Young	Assignment	0070/0076
L.C. Young	W. Leslie Rogers	Assignment	0090/0135
W. Leslie Rogers	J & J Enterprises	Assignment	0139/0570
J & J Enterprises	Eastern American Energy Corporation	Assignment	0159/0139
Eastern American Energy Corporation	Energy Corporation of America	Assignment	0240/0498
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0272/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Ora E. Doak et ux Lease</u></b>			
Ora E. Doak et ux	Eastern American Energy	1/8	0158/0085
Eastern American Energy	Energy Corporation of America	Assignment	0240/0498
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0272/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Waco Oil &amp; Gas Company, Inc. Lease</u></b>			
Waco Oil & Gas Company, Inc.	Antero Resources Appalachian Corporation	1/8+	0262/0497
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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\*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

\*\*CONTINUED ON NEXT PAGE\*\*

08/04/2017

WW-6A1  
(5/13)

Operator's Well No. O'Donnell Unit 2H

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

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- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Lonnie B Dotson Lease</u>	Lonnie B Dotson	B & M Associates	1/8	0214/0515
	B & M Associates	Key Oil Company	Assignment	0214/0691
	Key Oil Company	Antero Resources Appalachian Corp.	Partial Assignment of Oil & Gas Leases	0253/0747
	Antero Resources Appalachian Corp.	Antero Resources Corporation	Name Change	Exhibit 1

\*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

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JUL 18 2017


**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

WV Department of  
Environmental Protection

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation  
 By: Robert S. Tucker   
 Its: Vice President of Geology

FORM WW-6A1  
EXHIBIT 1

FILED

JUN 10 2013

Natalie E. Tennant  
Secretary of State  
1900 Kanawha Blvd E  
Bldg 1, Suite 157-K  
Charleston, WV 25305



Penney Barker, Manager  
Corporations Division  
Tel: (304)558-8000  
Fax: (304)558-8381  
Website: [www.wvsos.com](http://www.wvsos.com)  
E-mail: [business@wvsos.com](mailto:business@wvsos.com)

APPLICATION FOR  
AMENDED CERTIFICATE  
OF AUTHORITY

Office Hours: Monday - Friday  
8:30 a.m. - 5:00 p.m. ET

FILE ONE ORIGINAL  
(Two if you want a filed  
stamped copy returned to you)  
FEE: \$25.00

\*\*\*\* In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby \*\*\*\*  
applies for an Amended Certificate of Authority and submits the following statement:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/26/2008
- Corporate name has been changed to: Antero Resources Corporation  
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation  
(due to home state name not being available)
- Other amendments: (attach additional pages if necessary)
- Name and phone number of contact person. (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)  
Alvyn A. Schopp (303) 357-7310  
Contact Name Phone Number
- Signature information (See below \*Important Legal Notice Regarding Signature\*):  
Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person  
Signature: [Signature] Date: June 10, 2013

**\*Important Legal Notice Regarding Signature:** Per West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

Form CF-4

Issued by the Office of the Secretary of State

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Office of Oil and Gas  
Revised 4/13

JUL 18 2017

WV Department of  
Environmental Protection

08/04/2017

LATITUDE 39°17'30" 2,234'

4,994' TO BOTTOM HOLE  
LATITUDE 39°20'00"

LONGITUDE 80°52'30"

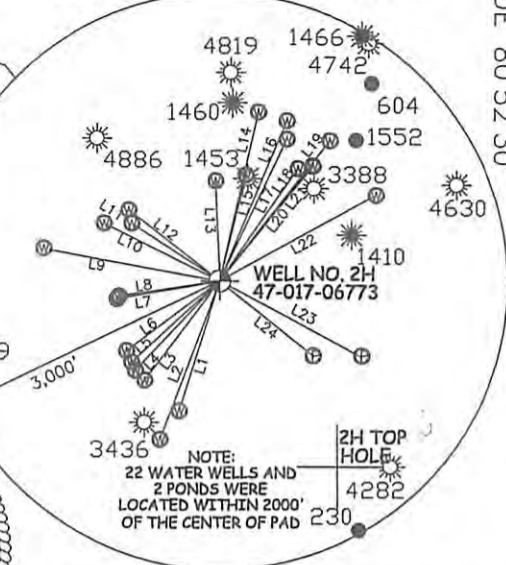
6,706'

13,101' TO BOTTOM HOLE

LONGITUDE 80°52'30"

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. THIS WELL HOLE IS SUBJECT TO THAT 80 FOOT STRIP OF GROUND KNOWN AS THE OLD NORTHWESTERN TURNPIKE.

ARTHUR G. PAYNE ET AL  
D.B. 237 PG. 502  
T.J. 8 PAR. 10  
70.5 AC. ±



NOTE:  
22 WATER WELLS AND  
2 PONDS WERE  
LOCATED WITHIN 2000'  
OF THE CENTER OF PAD

LEGEND

- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted

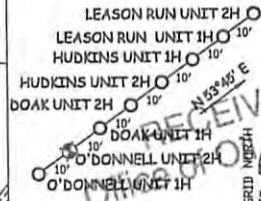
INSET



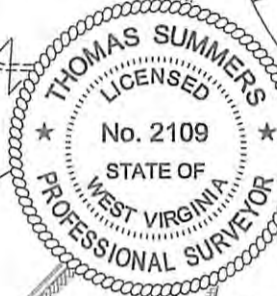
LINE	BEARING	DISTANCE
L1	S 17°08' V	1434.88'
L2	S 20°28' V	1701.77'
L3	S 36°32' V	1310.93'
L4	S 42°36' V	1294.43'
L5	S 46°24' V	1261.87'
L6	S 52°17' V	1225.91'
L7	S 57°29' V	1091.46'
L8	S 79°48' V	1063.90'
L9	N 80°55' V	1782.73'
L10	N 64°48' V	1335.52'
L11	N 58°06' V	1078.03'
L12	N 53°08' V	1182.93'
L13	N 02°11' V	1018.95'
L14	N 13°03' E	1785.65'
L15	N 14°28' E	1114.90'
L16	N 22°59' E	1792.96'
L17	N 25°40' E	1617.25'
L18	N 35°24' E	1410.38'
L19	N 38°30' E	1844.26'
L20	N 39°25' E	1527.58'
L21	N 39°40' E	1523.64'
L22	N 41°58' E	1053.25'
L23	S 61°19' E	1766.76'
L24	S 30°48' E	1341.88'

PAD LAYOUT

NOT TO SCALE



Antero Resources Corporation  
Well No. O'Donnell Unit 2H  
47-017-06773 (AS DRILLED)



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

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

THOMAS SUMMERS P.S. 2109

JOB # 16-002WA  
DRAWING # O'DONNELL2HADmod  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

DATE 06/30/17

OPERATOR'S WELL# O'DONNELL UNIT 2H

API WELL # 47-017-06773

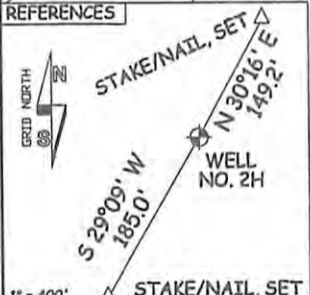
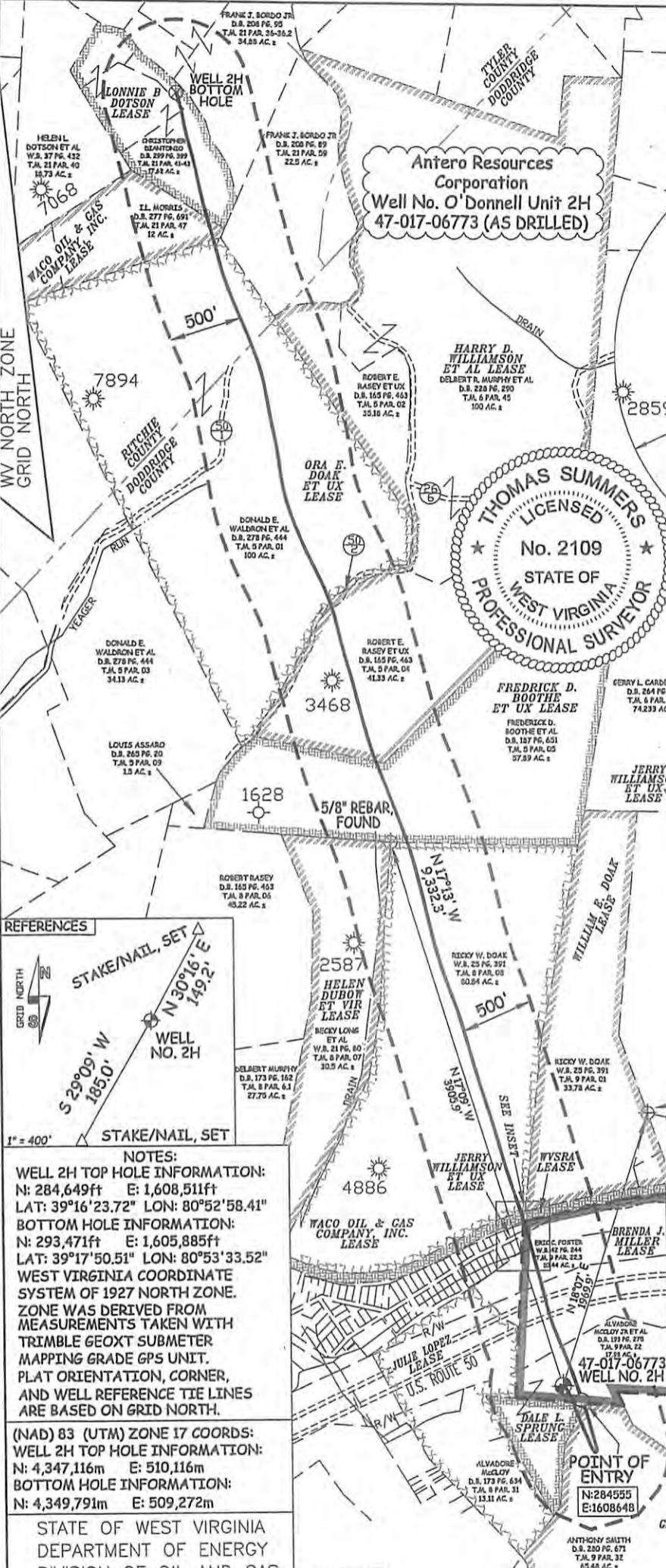
STATE COUNTY PERMIT

LEASE ACREAGE 39.15 AC. ±; 6.2 AC. ±; 148.793 AC. ±; 301.19 AC. ±; 83 AC. ±; 62 AC. ±; 176 AC. ±; 100 AC. ±; 98.3 AC. ±; 17.62 AC. ±

DIANNA STAMPER  
CT CORPORATION SYSTEM

DESIGNATED AGENT ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

WELL OPERATOR ADDRESS 1615 WYNKOOP STREET DENVER, CO 80202



NOTES:  
WELL 2H TOP HOLE INFORMATION:  
N: 284,649ft E: 1,608,511ft  
LAT: 39°16'23.72" LON: 80°52'58.41"  
BOTTOM HOLE INFORMATION:  
N: 293,471ft E: 1,605,885ft  
LAT: 39°17'50.51" LON: 80°53'33.52"  
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: 4,347,116m E: 510,116m  
BOTTOM HOLE INFORMATION:  
N: 4,349,791m E: 509,272m

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

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL DATE 06/30/17  
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X OPERATOR'S WELL# O'DONNELL UNIT 2H  
LOCATION: ELEVATION 1,057' AS BUILT WATERSHED NORTH FORK HUGHES RIVER API WELL # 47-017-06773  
QUADRANGLE PENNSBORO 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE STATE COUNTY PERMIT  
SURFACE OWNER ALVADORE MCCLOY JR ET UX ACREAGE 17.98 ACRES +/- LEASE ACREAGE 39.15 AC. ±; 6.2 AC. ±; 148.793 AC. ±; 301.19 AC. ±; 83 AC. ±; 62 AC. ±; 176 AC. ±; 100 AC. ±; 98.3 AC. ±; 17.62 AC. ±  
OIL & GAS ROYALTY OWNER BRENDA J. MILLER; DALE L. SPRUNG; GAIL MASON; WWSRA;  
WACO OIL & GAS CO. INC.; FREDRICK D. BOOTHE ET UX; HARRY D. WILLIAMSON ET AL; ORA E. DOAK ET UX; WACO OIL & GAS CO. INC.; LONNIE B. DOTSON  
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE  
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL  
(SPECIFY) POE MOD PLUG & ABANDON CLEAN OUT & REPLUG  
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,450' TVD 16,010' 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

RECEIVED  
Office of Oil and Gas  
JUL 1 2017

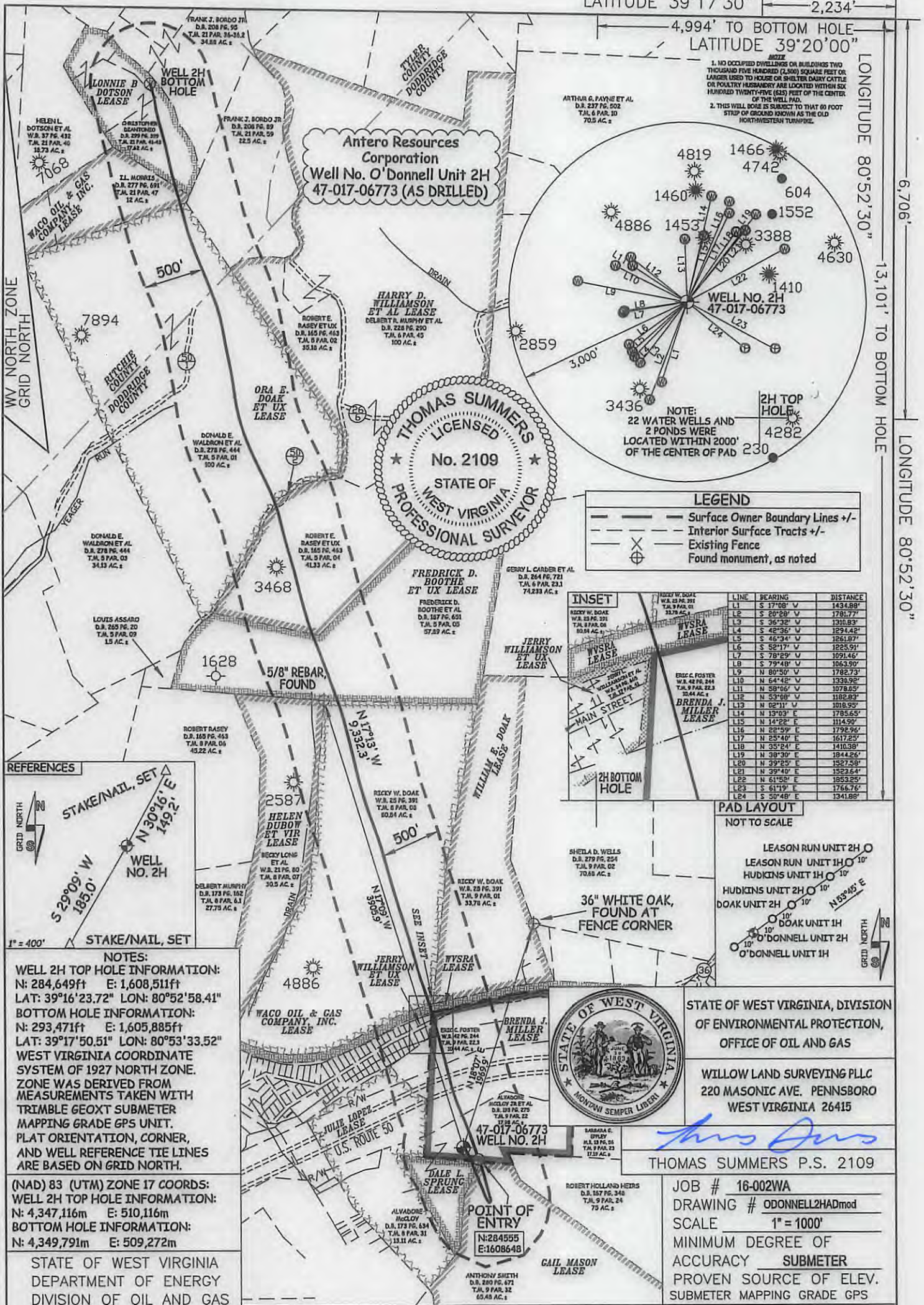
08/04/2017

LATITUDE 39°17'30" 2,234'

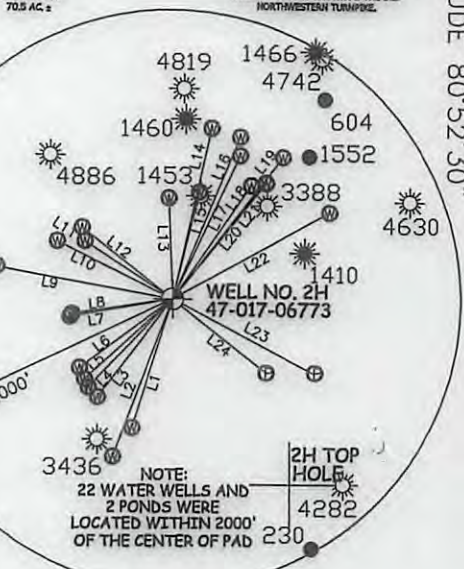
4,994' TO BOTTOM HOLE  
LATITUDE 39°20'00"

LONGITUDE 80°52'30"

6,706'  
13,101' TO BOTTOM HOLE  
LONGITUDE 80°52'30"



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. THIS WELL BOSS IS SUBJECT TO THAT 60 FOOT STRIP OF GROUND KNOWN AS THE OLD NORTHWESTERN TURNPIKE.



NOTE:  
22 WATER WELLS AND  
2 PONDS WERE  
LOCATED WITHIN 2000'  
OF THE CENTER OF PAD

**LEGEND**

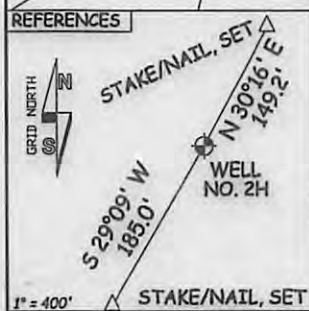
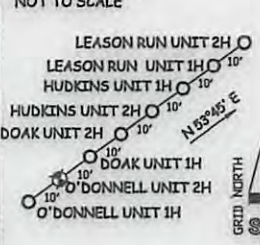
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted

**INSET**



LINE	BEARING	DISTANCE
L1	S 17°08' V	1434.89'
L2	S 20°28' V	1781.77'
L3	S 34°32' V	1318.93'
L4	S 42°36' V	1294.42'
L5	S 46°34' V	1261.87'
L6	S 52°17' V	1225.91'
L7	S 78°29' V	1091.46'
L8	S 79°48' V	1063.90'
L9	N 80°50' V	1782.73'
L10	N 64°42' V	1330.92'
L11	N 58°06' V	1079.05'
L12	N 53°08' V	1188.83'
L13	N 02°11' V	1018.93'
L14	N 13°03' E	1785.65'
L15	N 14°22' E	1114.92'
L16	N 22°59' E	1792.95'
L17	N 25°40' E	1617.25'
L18	N 35°24' E	1410.38'
L19	N 38°30' E	1844.26'
L20	N 39°25' E	1327.58'
L21	N 39°41' E	1323.64'
L22	N 61°58' E	1853.25'
L23	S 61°19' E	1766.76'
L24	S 50°48' E	1341.88'

**PAD LAYOUT**



**NOTES:**  
WELL 2H TOP HOLE INFORMATION:  
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STATE OF WEST VIRGINIA  
DEPARTMENT OF ENERGY  
DIVISION OF OIL AND GAS

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  DATE 06/30/17

(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW  OPERATOR'S WELL# O'DONNELL UNIT #2H

LOCATION: ELEVATION 1,057' AS BUILT WATERSHED NORTH FORK HUGHES RIVER API WELL # mod

QUADRANGLE PENNSBORO 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE 47 - 017

SURFACE OWNER ALVADORE MCCLOY JR ET UX ACREAGE 17.98 ACRES +/- STATE COUNTY PERMIT

OIL & GAS ROYALTY OWNER BRENDA J. MILLER; DALE L. SPRUNG; GAIL MASON; WVSRA; LEASE ACREAGE 39.15 AC±; 6.2 AC±; 148,793 AC±; 301.19 AC±;

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(SPECIFY) POE MOD PLUG & ABANDON CLEAN OUT & REPLUG

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WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM

ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD

FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

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

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



THOMAS SUMMERS P.S. 2109

JOB # 16-002WA  
DRAWING # ODONNELL2HADmod  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

08/04/2017

COUNTY NAME

PERMIT