



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Monday, June 25, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for JAMESON UNIT 2H
47-095-02470-00-00

Lateral Extension

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: JAMESON UNIT 2H
Farm Name: ROGER R. WEESE
U.S. WELL NUMBER: 47-095-02470-00-00
Horizontal 6A New Drill
Date Modification Issued: 6/25/2018

Promoting a healthy environment.

06/29/2018

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

1) Well Operator: Antero Resources Corporation 494507062 095 - Tyler Meade Middlebourne 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Jameson Unit 2H Well Pad Name: Neat Pad

3) Farm Name/Surface Owner: Roger R. Weese Public Road Access: CR 7

4) Elevation, current ground: 1005' Elevation, proposed post-construction: _____

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: 6600' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6600' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 20700' MD

11) Proposed Horizontal Leg Length: 11673'

12) Approximate Fresh Water Strata Depths: 100', 121', 166'

13) Method to Determine Fresh Water Depths: Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: None Identified

15) Approximate Coal Seam Depths: 1441'

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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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#	80'	80'	CTS, 218 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	300'	300'	CTS, 271 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#	20700'	20700'	4844 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	20"	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				RECEIVED Office of Oil and Gas MAY 10 2018 WV Department of Environmental Protection
Sizes:	N/A				
Depths Set:	N/A				

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.

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): 26.74 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.95 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>Roger R. Weese Lease</u>			
Roger R. Weese	Antero Resources Corporation	1/8+	0435/0766
<u>James E. Smith Lease</u>			
James E. Smith	Antero Resources Appalachian Corporation	1/8+	0420/0406
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Steven P. Carse Lease</u>			
Steven P. Carse	Antero Resources Corporation	1/8+	0449/0036
<u>Larry S. Stathers Lease</u>			
Larry S. Stathers	Antero Resources Corporation	1/8+	0457/0663
<u>Trustees of Long's Mount Pleasant Cemetery Lease</u>			
Trustees of Long's Mount Pleasant Cemetery	Antero Resources Corporation	1/8+	0471/0776
<u>Rogers R. Weese Lease</u>			
Roger R. Weese	Antero Resources Appalachian Corporation	1/8+	0435/0673
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Roy Hadley et ux Lease</u>			
Roy Hadley et ux	Sancho Oil and Gas Corporation	1/8	0359/0219
Sancho Oil and Gas Corporation	Antero Resources Corporation	Assignment	0436/0177
<u>Wanda D. Spencer Lease</u>			
Wanda D. Spencer	Antero Resources Corporation	1/8+	0456/0029
<u>Amy B. Paris Lease</u>			
Amy B. Paris	Antero Resources Corporation	1/8+	0529/0590
<u>Charlotte M. Adams Lease</u>			
Charlotte M. Adams	Blue Shale, LLC	1/8+	0402/0274
Blue Shale, LLC	Antero Resources Corporation	Assignment	0436/0274

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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.

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Golden Eagle Resources Lease	Golden Eagle Resources	Antero Resources Corporation	1/8	0597/0790

*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.

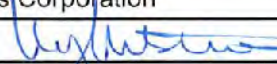
**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

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

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The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, 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: Kevin Kilstrom 
Its: Senior VP - Production

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



Penny Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvsos.com
E-mail: 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: 6/25/2008
- 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)

6. 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.)

Alwyn A. Schopp (303) 367-7310
Contact Name Phone Number

7. Signature information (See below Important Legal Notice Regarding Signature):

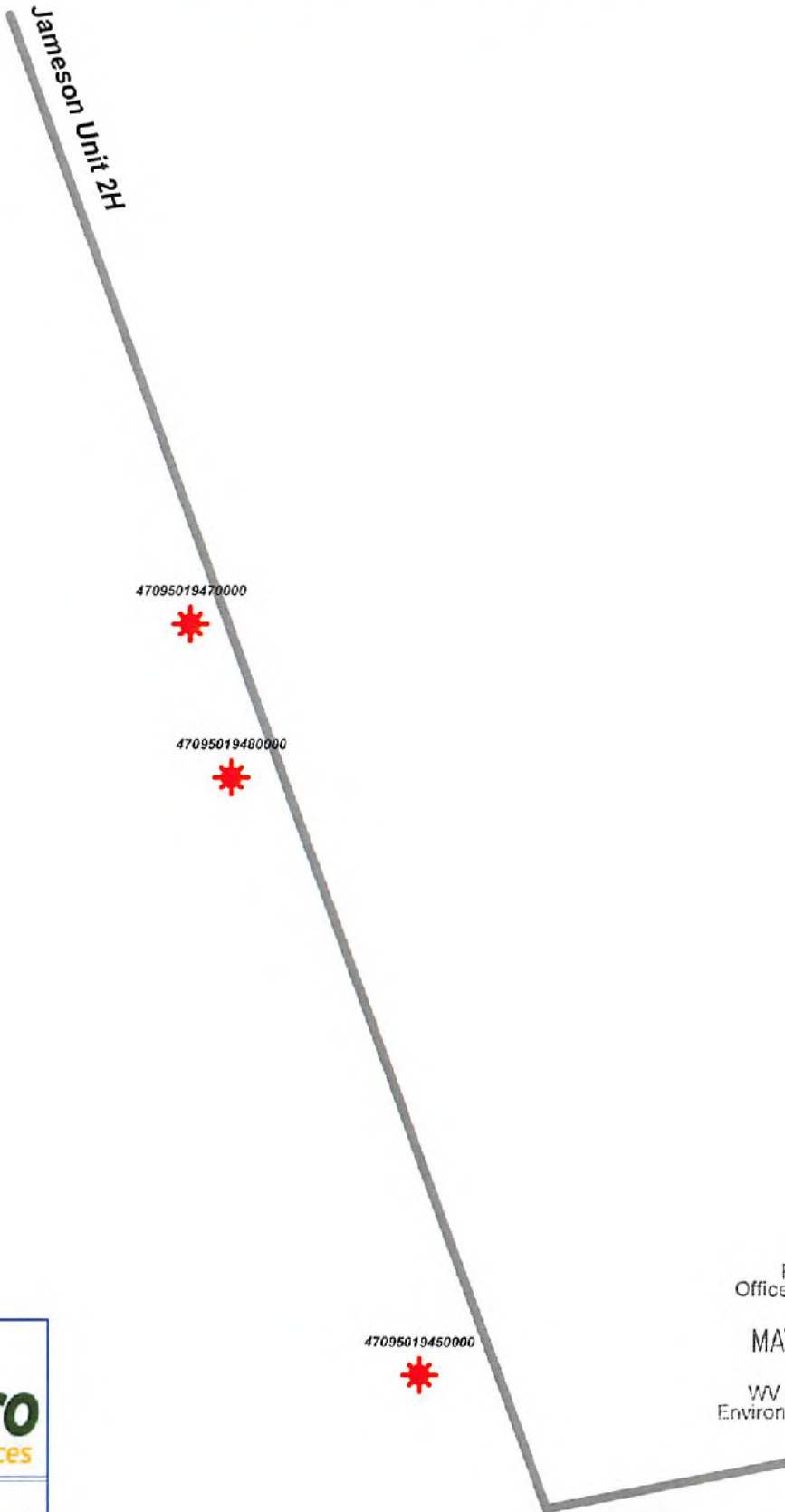
Print Name of Signer: Alwyn A. Schopp Title/Capacity: Authorized Person
Signature: [Handwritten Signature] Date: June 10, 2013

Important Legal Notice Regarding Signature: For 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.

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Jameson Unit 2H - AOR



WELL SYMBOLS
Gas Well

June 26, 2017

06/29/2018

UWI (API Num)	Well Name	Well Number	Operator	Historical Operator	TD
47095019450000	STEVENS D	1	SANCHO OIL & GAS	SANCHO OIL & GAS	5361
47095019480000	STEVENS J F	3	SANCHO OIL & GAS	SANCHO OIL & GAS	5361
47095019470000	STEVENS J F	2	SANCHO OIL & GAS	SANCHO OIL & GAS	5444

ELEV_GR	TD (SSTVD)	Approx Distance to well (ft)	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
950	-4411	500	1832-5097	Keener, Riley, Benson, Alexander, Elk	Fifth, Riley
1069	-4292	364	4900-5183	Benson, Brallier	Weir, Fifth, Warren, Riley, Elk
1249	-4195	269	5108-5330	Benson, Elk	Weir, Fifth, Warren, Alexander

LATITUDE 39°27'30"

5,969'

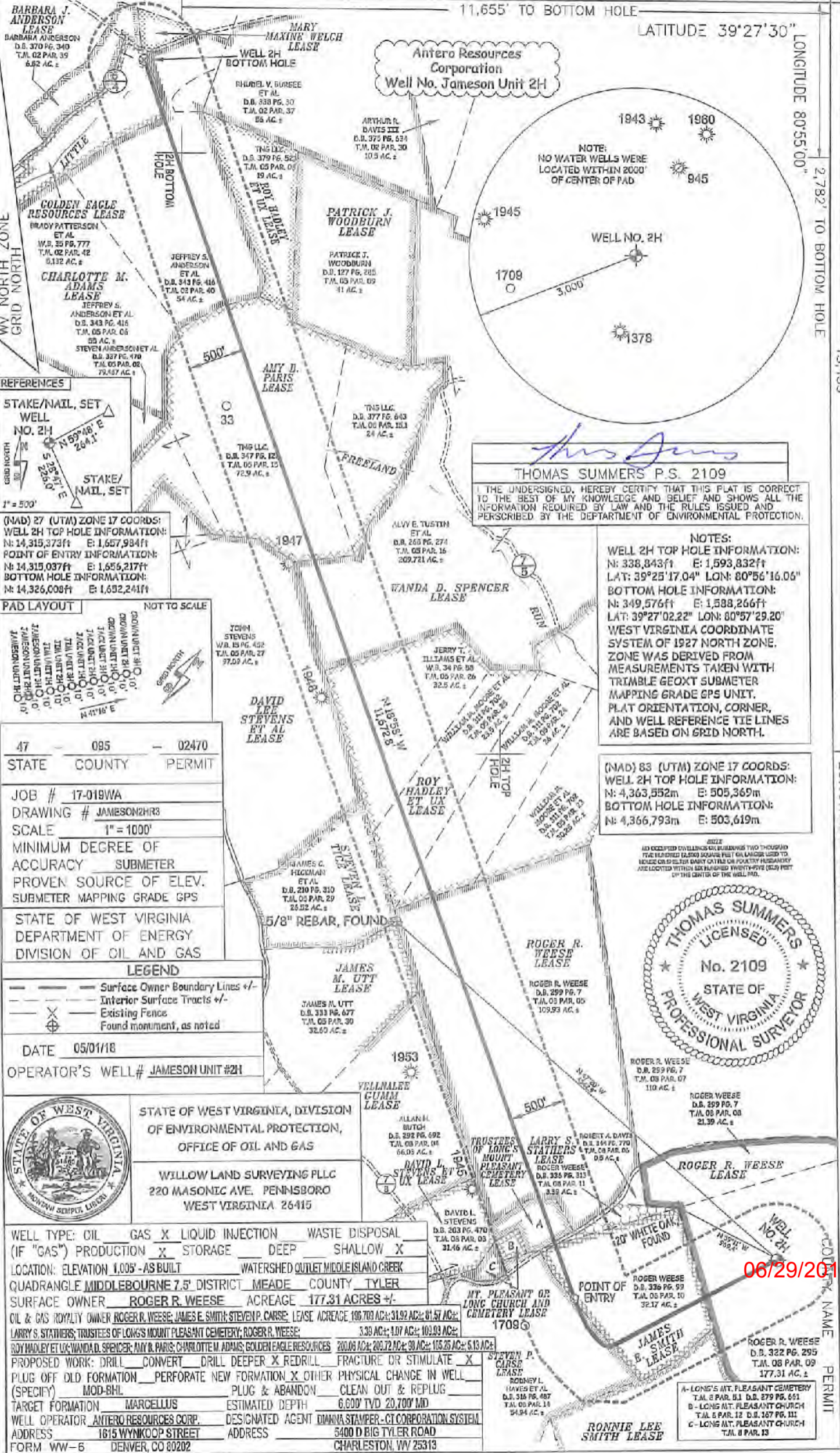
11,655' TO BOTTOM HOLE

LATITUDE 39°27'30"

LONGITUDE 80°55'00"

2,782' TO BOTTOM HOLE

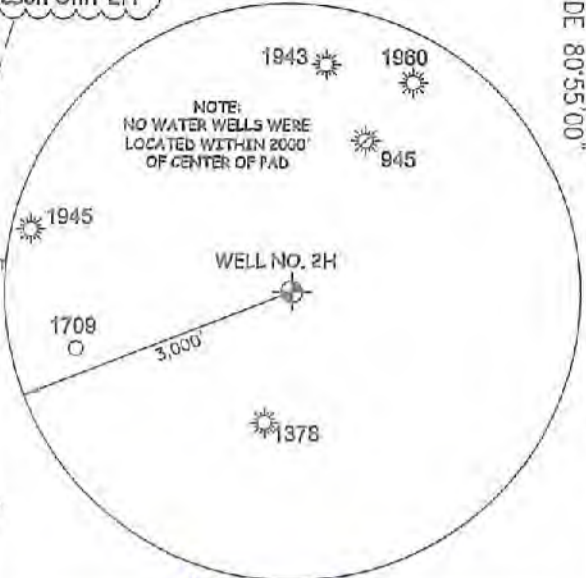
LONGITUDE 80°55'00"



BARBARA J. ANDERSON LEASE
 BARBARA ANDERSON
 D.B. 370 PG. 340
 T.M. 02 PAR. 39
 6.62 AC. ±

MARY MAXINE WELCH LEASE
 WELLS 2H
 BOTTOM HOLE

Antero Resources Corporation
Well No. Jameson Unit 2H

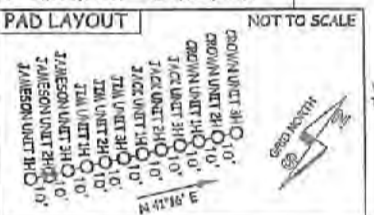


GOLDEN EAGLE RESOURCES LEASE
 BRADY PATTERSON
 ET AL
 W.B. 35 PG. 777
 T.M. 02 PAR. 42
 0.132 AC. ±

CHARLOTTE M. ADAMS LEASE
 JEFFREY S. ANDERSON ET AL
 D.B. 343 PG. 415
 T.M. 05 PAR. 05
 58 AC. ±



(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
 N: 14,315,373ft E: 1,657,984ft
POINT OF ENTRY INFORMATION:
 N: 14,315,037ft E: 1,655,217ft
BOTTOM HOLE INFORMATION:
 N: 14,326,008ft E: 1,632,241ft



47 — 095 — 02470
 STATE COUNTY PERMIT

JOB # 17-019WA
 DRAWING # JAMESON2HR3
 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 +/-
- Existing Fence
- Found monument, as noted

DATE 05/01/18
 OPERATOR'S WELL # JAMESON UNIT #2H



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

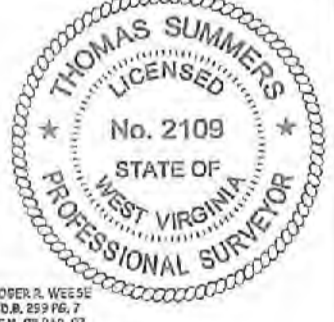
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
 LOCATION: ELEVATION 1,005' - AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK
 QUADRANGLE MIDDLEBOURNE 7.5' DISTRICT MEADE COUNTY TYLER
 SURFACE OWNER ROGER R. WEESE ACREAGE 177.31 ACRES +/-
 OIL & GAS ROYALTY OWNER ROGER R. WEESE; JAMES E. SMITH; STEVEN P. CARSE; LEASE ACREAGE 196.703 AC. ±; 31.92 AC. ±; 81.57 AC. ±;
 LARRY S. STATHERS; TRUSTEES OF LONG'S MOUNT PLEASANT CEMETERY; ROGER R. WEESE; 3.39 AC. ±; 1.07 AC. ±; 103.93 AC. ±;
 ROY HADLEY ET UX; WANDA D. SPENCER; AMY B. PARIS; CHARLOTTE M. ADAMS; GOLDEN EAGLE RESOURCES 200.06 AC. ±; 203.72 AC. ±; 30 AC. ±; 165.25 AC. ±; 6.13 AC. ±;
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER X REDRILL FRACTURE DR STIMULATE X
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL
 (SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,600' TVD 20,700' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CIT CORPORATION SYSTEM
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

THOMAS SUMMERS P.S. 2109
 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.

NOTES:
WELL 2H TOP HOLE INFORMATION:
 N: 338,843ft E: 1,593,832ft
 LAT: 39°25'17.04" LON: 80°56'16.06"
BOTTOM HOLE INFORMATION:
 N: 349,576ft E: 1,588,266ft
 LAT: 39°27'02.22" LON: 80°57'29.20"
 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: 4,363,552m E: 505,369m
BOTTOM HOLE INFORMATION:
 N: 4,366,793m E: 503,619m

WELL HAS OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2000) SQUARE FEET OR LARGER USED TO HOUSE OR FEEDER BARNY CATTLE OR HORSE OR FEEDSTOCK AND LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.



06/29/2018

WELL NAME PERMIT

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11,655' TO BOTTOM HOLE

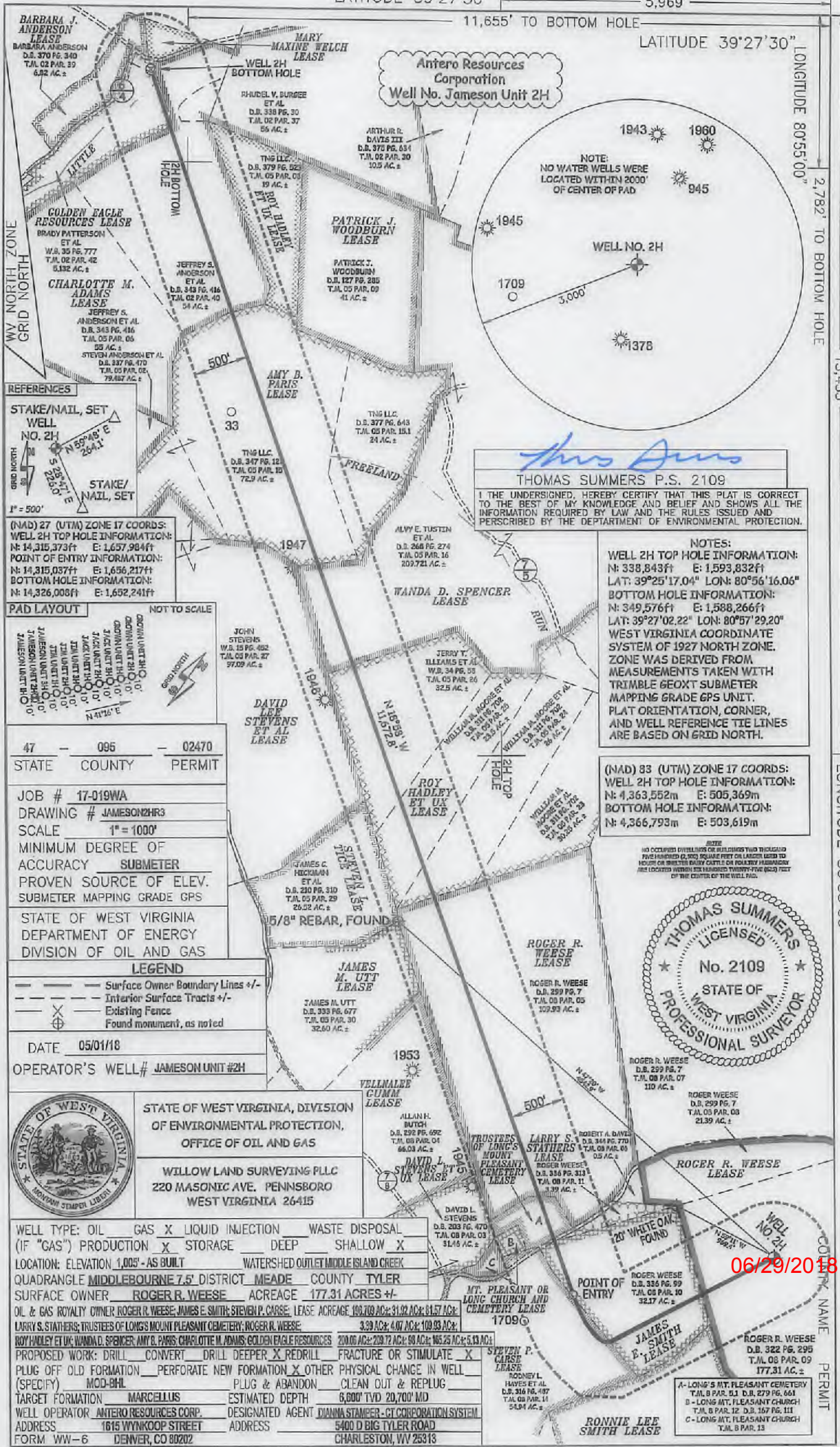
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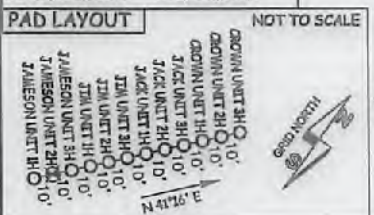
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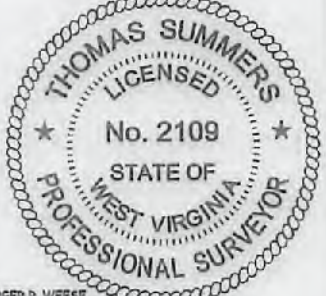
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 BOTTOM HOLE INFORMATION:
 N: 4,366,793m E: 503,619m

NOTE: NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER LEASD TO HOUSE OR BUILTEN ENJOY CATTLE OR POLICRY PASTURE ARE LOCATED WITHIN SIX HUNDRED TWENTY-TWO (622) FEET OF THE CENTER OF THE WELL PAD.



ROGER R. WEESE
 D.B. 259 PG. 7
 T.M. 08 PAR. 07
 110 AC. ±
 ROGER WEESE
 D.B. 259 PG. 7
 T.M. 05 PAR. 03
 21.39 AC. ±
 ROGER R. WEESE
 D.B. 259 PG. 7
 T.M. 08 PAR. 05
 177.31 AC. ±
 ROGER R. WEESE
 D.B. 322 PG. 295
 T.M. 08 PAR. 09
 177.31 AC. ±
 A - LONG'S MT. PLEASANT CEMETERY
 T.M. 8 PAR. 11 D.B. 279 PG. 661
 B - LONG MT. PLEASANT CHURCH
 T.M. 5 PAR. 12 D.B. 167 PG. 111
 C - LONG MT. PLEASANT CHURCH
 T.M. 8 PAR. 13

06/29/2018



May 9, 2018

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: Ms. Laura Adkins
601 57th Street
Charleston, WV 25304

Ms. Laura Adkins:

Antero Resources Corporation (Antero) would like to submit the following permit modifications for two approved wells on the existing Neat Pad. We are requesting to extend the lateral lengths which will change the bottom hold location for the Jameson Unit 1H (API# 47-095-02469) and Jameson Unit 2H (API# 47-095-02470).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the updated BHL and Measured Depth
- REVISED Form WW-6A1, which shows the new leases we will be drilling into
- REVISED Mylar Plat, which shows the new Lateral Length and Estimated Measured Depth
- As-Built Design

If you have any questions please feel free to contact me at (303) 357-7182.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "M Stanton", is written over a light blue horizontal line.

Mallory Stanton
Permitting Supervisor
Antero Resources Corporation

Enclosures

RECEIVED
Office of Oil and Gas

MAY 10 2018

WV Department of
Environmental Protection

06/29/2018