



west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

March 31, 2014

ANTERO RESOURCES APPALACHIAN CORPORATION
1625 17TH STREET, SUITE 300
DENVER, CO 80202

Re: Permit Modification Approval for API Number 8510042 , Well #: SCHMIDLE UNIT 1H
Moved Lateral

Oil and Gas Operator:

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.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas



Antero Resources
1625 17th Street
Denver, Colorado 80202
Office 303.357.7310
Fax 303.357.7315

January 28, 2014

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Ms. Laura Cooper
601 57th Street
Charleston, WV 25304

Ms. Laura Cooper:

Antero Resources Corporation (Antero) would like to submit the following permit modification for an approved well on the Walnut West Pad. We are requesting to move the horizontal lateral which will change the bottom hole location of the Schmidle Unit 1H (API# 47-085-10042).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the revised MD and Production Casing/Cement program
- REVISED Form WW-6A1, which shows the leases we will be drilling into
- REVISED Mylar Plat, which shows the new bottom hole location

If you have any questions please feel free to contact me at (303) 357-7323.

Thank you in advance for your consideration.

Sincerely,

Ashlie Mihalcin
Permit Representative
Antero Resources Corporation

Enclosures

Received
JAN 31 2014
Office of Oil and Gas
WV Dept. of Environmental Protection

04/04/2014

WW-6B
(9/13)

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

1) Well Operator: Antero Resources Corporation 494488557 085-Ritchie Clay Pennsboro 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Schmidle Unit 1H Well Pad Name: Walnut West Pad

3) Farm Name/Surface Owner: Walnut Investments Co. Public Road Access: CR 6/4 +

4) Elevation, current ground: ~1140' Elevation, proposed post-construction: 1120'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus Shale: 6500' TVD, Anticipated Thickness- 75 Feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6500' TVD

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 15,900' MD

11) Proposed Horizontal Leg Length: 8917'

12) Approximate Fresh Water Strata Depths: 73', 251'

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

14) Approximate Saltwater Depths: 969', 1578'

15) Approximate Coal Seam Depths: None reported

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: _____

*M DG
1-30-2014*

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JAN 3 2014
Office of Oil and Gas
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WW-6B
(9/13)

18) CASING AND TUBING PROGRAM

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|--------------|---------|-------------|-----------|------------------------|-----------------------|-------------------------|---------------------------|
| Conductor | 20" | New | H-40 | 94# | 40' | 40' | CTS, 38 Cu. Ft. |
| Fresh Water | 13-3/8" | New | J-55/H-40 | 54.5#/ 48# | 310' | 310' | CTS, 431 Cu. Ft. |
| Coal | 9-5/8" | New | J-55 | 36# | 2510' | 2510' | CTS, 1022 Cu. Ft. |
| Intermediate | | | | | | | |
| Production | 5-1/2" | New | P-110 | 20# | 15900' | 15900' | 3948 Cu. Ft. |
| Tubing | 2-3/8" | New | N-80 | 4.7# | | 6600' | |
| Liners | | | | | | | |

MAG
1-30-2014

| TYPE | Size | Wellbore Diameter | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./k) |
|--------------|---------|-------------------|----------------|----------------|-----------------------|--------------------------|
| Conductor | 20" | 24" | 0.438" | 1530 | Class A | 1.18 |
| Fresh Water | 13-3/8" | 17-1/2" | 0.38"/0.33" | 2730/1730 | Class A | 1.18 |
| Coal | 9-5/8" | 12-1/4" | 0.352" | 3520 | Class A | 1.18 |
| Intermediate | | | | | | |
| Production | 5-1/2" | 8-3/4" & 8-1/2" | 0.361" | 12630 | Lead-H/POZ & Tail - H | H/POZ-1.44 & H-1.8 |
| Tubing | 2-3/8" | 4.778" | 0.19" | 11200 | | |
| Liners | | | | | | |

PACKERS

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

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WW-6B
(9/13)

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."

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 14.01 acres

22) Area to be disturbed for well pad only, less access road (acres): 3.49 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.

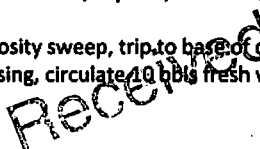
24) Describe all cement additives associated with each cement type:

Conductor: no additives, Class A cement.
 Surface: Class A cement with 2-3% calcium chloride
 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

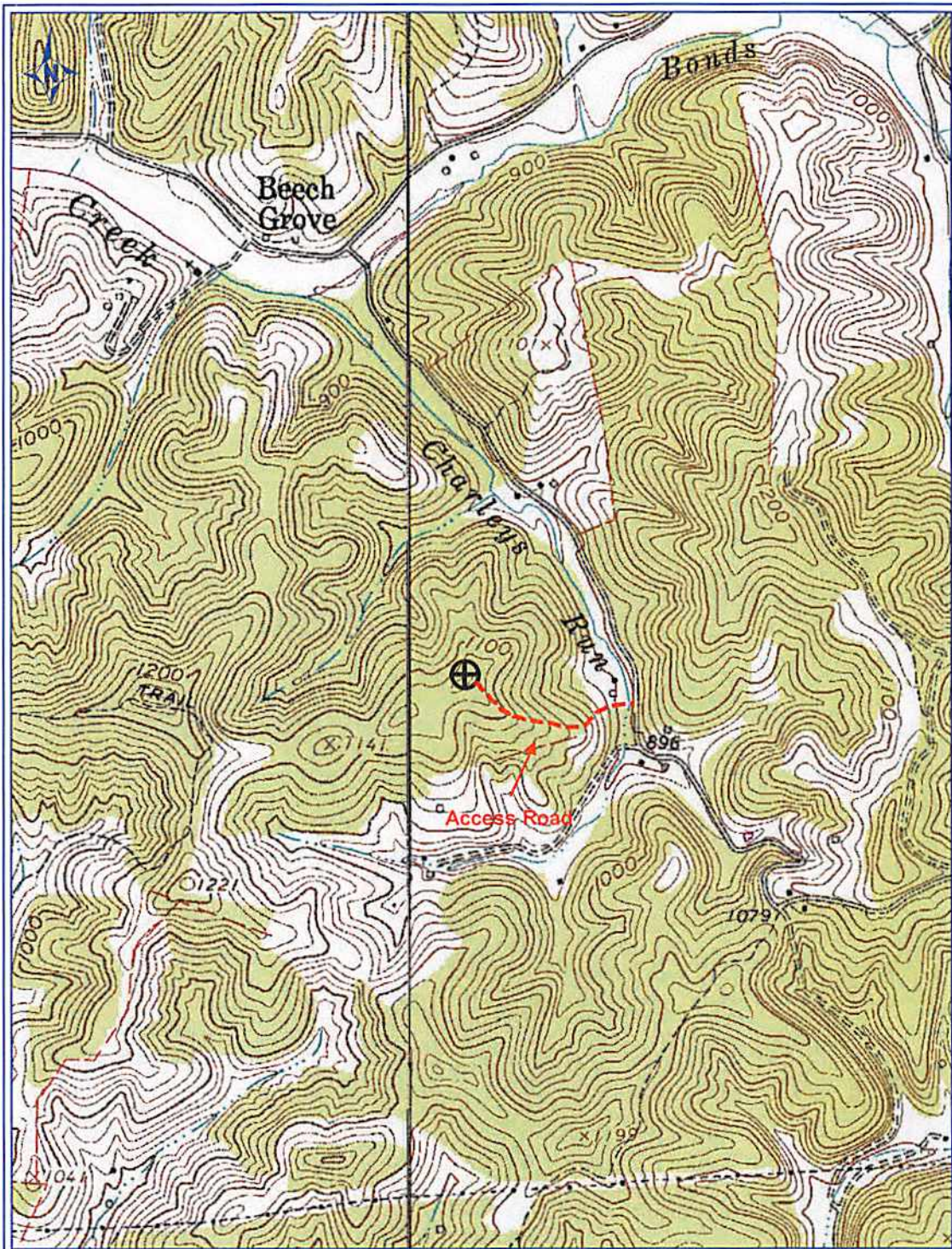
25) Proposed borehole conditioning procedures:

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.


 Office of Oil and Gas
 Department of Environmental Protection
 Page 3 of 3
 04/04/2014

plat spotted



PETRA 4/20/2013 3:44:04 PM

Antero Resources Corp

APPALACHIAN BASIN

Schmidle Unit 1H

Ritchie County

REMARKS
 QUADRANGLE: PENNSBORO
 WATERSHED: CHARLEYS RUN
 DISTRICT: CLAY

By: ECM

04/04/2014



85-10042 H6A SCHMIDLE UNIT 1H
 ANTERO RESOURCES

PAD NAME: WALNUT WEST

LATITUDE 39°20'00"

11,260'

7,595' TO BOTTOM HOLE

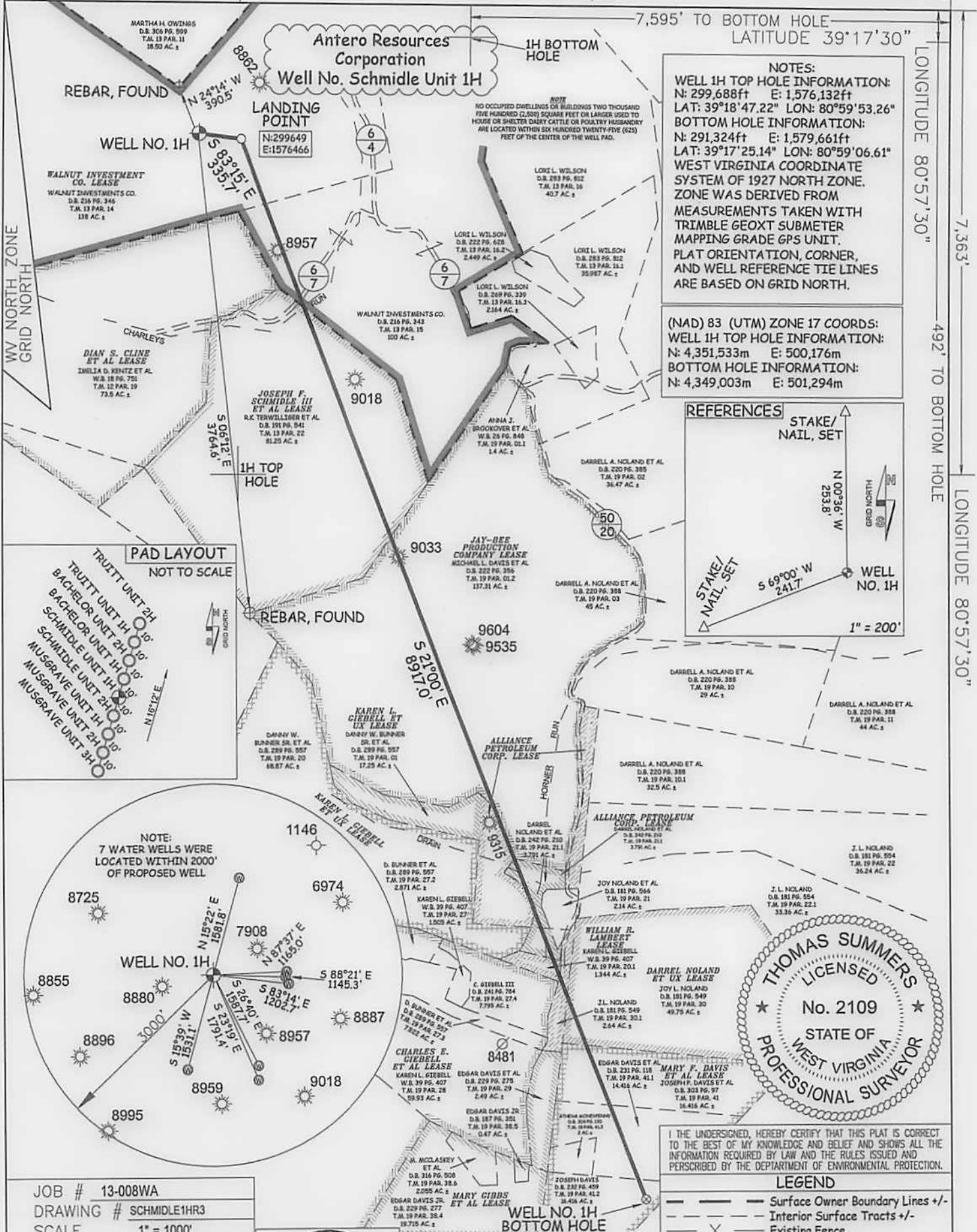
LATITUDE 39°17'30"

LONGITUDE 80°57'30"

7,363'

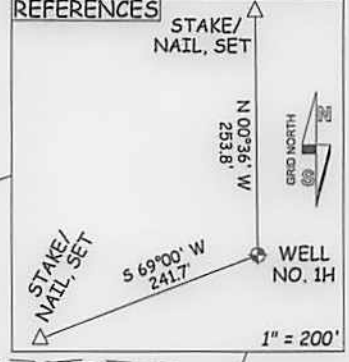
492' TO BOTTOM HOLE

LONGITUDE 80°57'30"



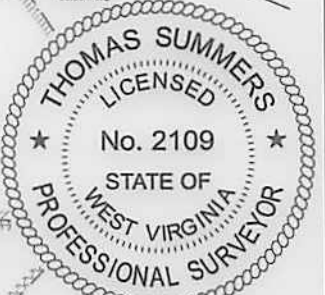
NOTES:
WELL 1H TOP HOLE INFORMATION:
 N: 299,688ft E: 1,576,132ft
 LAT: 39°18'47.22" LON: 80°59'53.26"
BOTTOM HOLE INFORMATION:
 N: 291,324ft E: 1,579,661ft
 LAT: 39°17'25.14" LON: 80°59'06.61"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE 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: 4,351,533m E: 500,176m
BOTTOM HOLE INFORMATION:
 N: 4,349,003m E: 501,294m



PAD LAYOUT
 NOT TO SCALE

NOTE:
 7 WATER WELLS WERE LOCATED WITHIN 2000' OF PROPOSED WELL



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.

LEGEND

- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- X Existing Fence
- ⊕ Rebar, Found

THOMAS SUMMERS P.S. 2109

DATE 01/22/14
 OPERATOR'S WELL# SCHMIDLE UNIT#1H
 API WELL # 47 - 085 - 10042 MOD H6A
 STATE COUNTY PERMIT

04/04/2014

JOB # 13-008WA
 DRAWING # SCHMIDLE1HR3
 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
 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
 LOCATION: ELEVATION 1,120' WATERSHED CHARLEYS RUN
 QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE
 SURFACE OWNER WALNUT INVESTMENTS CO. ACREAGE 138 ACRES +/-
 OIL & GAS ROYALTY OWNER WALNUT INVESTMENT CO.; JOSEPH F. SCHMIDLE III ET AL.; JAY-BEE PRODUCTION CO.; LEASE ACREAGE 238 AC+; 76.8 AC+; 137.31 AC+;
 ALLIANCE PETROLEUM CO.; ALLIANCE PETROLEUM CO.; WILLIAM R. LAMBERT; DARREL NOLAND ET UX; MARY F. DAVIS ET AL 16 AC+; 3,791 AC+; 5,944 AC+; 48.5 AC+; 49.75 AC+
 PROPOSED WORK: DRILL X CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE X
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL
 (SPECIFY) Modification - PHL PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,500' TVD 15,900' MD
 WELL OPERATOR ANTERO RESOURCES CORPORATION DESIGNATED AGENT CT CORPORATION SYSTEM
 ADDRESS 1625 17TH STREET ADDRESS 5400 D BIG TYLER ROAD
 DENVER, CO 80202 CHARLESTON, WV 25313