



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

December 16, 2013

HG ENERGY, LLC
5260 DUPONT ROAD
PARKERSBURG, WV 26101

Re: Permit Modification Approval for API Number 10302883, Well #: 409 S-6H

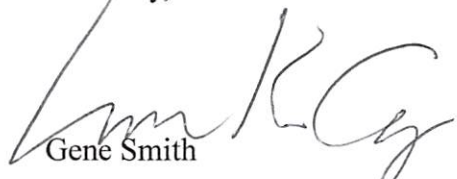
Drilling pilot hole

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,

for 
Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas



HG Energy, LLC
5260 Dupont Road
Parkersburg, WV 26101
(304) 420-1100 - Office
(304) 863-3172 - Fax

November 4, 2013

Ms. Laura K. Cooper
WVDEP
Division of Oil & Gas
601 57th Street
Charleston, West Virginia 25304

RE: Request for Revision
Long 409 S – 6H (47-103-2883)
Grant District, Wetzel County
West Virginia

Dear Ms. Cooper:

HG Energy is requesting a permit modification for the Long 409 S-6H well to drill a pilot hole to the Onondaga and log the Marcellus formation before drilling the horizontal well. Enclosed are the revised casing program (WW-6B) and the casing schematic identifying the scope of work.

The approach for the requested modification was discussed and tentatively agreed upon by Tim Roush of HG Energy and Gene Smith, DEP on July 23, 2013, resulting in the attached revised forms.

Should you have any questions please call me at (304) 420-1119 or you can reach me at dwhite@hgenergyllc.com.

Very truly yours,

Diane C White

Diane C. White

Enclosures

cc: Gene Smith – DEP Oil & Gas Chief
Tim Roush – HG Energy, LLC
Derek Haught – DEP Inspector

RECEIVED
Office of Oil and Gas

NOV 05 2013

WV Department of
Environmental Protection

12/20/2013

103-02883 MOD

11/4/13

WW - 6B
(1/12)

Permit Modification for 409 S-6H
TO DRILL PILOT HOLE TO THE ONONDAGA
AND LOG MARCELLUS FORMATION BEFORE
DRILLING HORIZONTAL WELL.

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: HG Energy, LLC 494497948 Wetzel Grant Pino Grove 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: 409-S-6H Well Pad Name: Long 409

3 Elevation, current ground: 1360' Elevation, proposed post-construction: 1340'

4) Well Type: (a) Gas Oil
Other
(b) If Gas: Shallow Deep
Horizontal

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus, Approximate TVD 7300 feet, approximate thickness 50 feet.

7) Proposed Total Vertical Depth: Pilot Hole - 7,450'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 13,116 feet - TMD

10) Approximate Fresh Water Strata Depths: 470'

11) Method to Determine Fresh Water Depth: Best judgement based on drilling history in nearby wells

12) Approximate Saltwater Depths: 2000'

13) Approximate Coal Seam Depths: 1180'

14) Approximate Depth to Possible Void (coal mine, karst, other): N/A

15) Does land contain coal seams tributary or adjacent to, active mine? N/A

16) Describe proposed well work: Drill, case, cement and complete a horizontal Marcellus well.
Before drilling horizontal section, drill 8 1/2" vertical pilot hole to a depth not greater than 100' into the
Onondaga Group (~7,450' TVD). Log well and then plug back pilot hole with solid cement plug to K.O.P. (4,500').

17) Describe fracturing/stimulating methods in detail:
Plan to hydraulically fracture/stimulate the well with "slickwater" frac technique. Will utilize a plug and perforation technique through cased hole.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 10.0 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.4 acres

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Environmental Protection

DH
3-7-13

12/20/2013

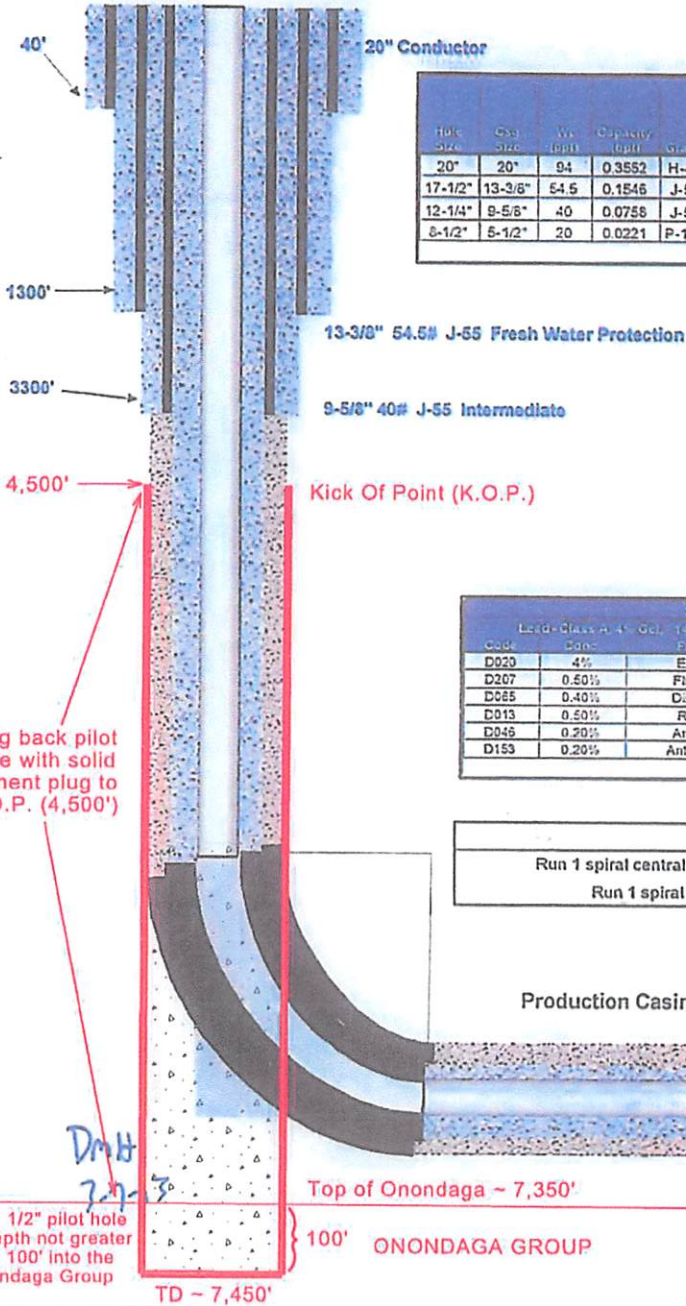
103-02883/Mod

WELL: Long 409 S - 6H

Horizontal Marcellus Casing Schematic

DRAWING NOT TO SCALE

11/4/13
Permit Modification for 409 S-6H
 TO DRILL PILOT HOLE TO THE ONONDAGA
 AND LOG MARCELLUS FORMATION BEFORE
 DRILLING HORIZONTAL WELL.



Hole Size	CSS Size	Wt (ppg)	Capacity (bbl)	Grade	Conn. Type	New D. (ft)	Old D. (ft)	Bank (ft)	Collar (ft)	Tube (ft)	Conn. (ft)
20"	20"	94	0.3552	H-40	weld	19.12	18.94	1530	520		
17-1/2"	13-3/8"	54.5	0.1546	J-55	STC	12.62	12.46	2730	1130	853	514
12-1/4"	9-5/8"	40	0.0758	J-55	LTC	8.835	8.679	3950	2570	630	520
8-1/2"	5-1/2"	20	0.0221	P-110	ITRS1	4.778	4.653	12640	11080	641	667

Casing	Hole Size	Top of Cement	Cement Type	Float Equipment
20"	20"	N/A	Sanded in/ Drilled in (dual rotary)	N/A
			Gas Block + 2% CaCl ₂ + .3% CR-2 + .25 lb/sx Uniceal cemented with 50% excess	Cement nosed guide shoe, centralizer every 3 joints or 120', insert gas in top of first joint in hole
13-3/8"	17-1/2"	surface		
			Gas Block + 2% CaCl ₂ + .3% CR-3 + .25 lb/sx Uniceal cemented with 50% excess	Cement nosed guide shoe, centralizer every 3 joints or 120', insert gas in top of first joint in hole
9-5/8"	12-1/4"	surface		

S-112 Production casing cement plan					
Lead-Class #4 Gel: 14.5 ppg			Tail-Acid Soluble: 14.5 ppg, 10% ORE		
Code	Conc	Function	Code	Conc	Function
D020	4%	Extender	D151	30%	CaCO ₃ Weight
D207	0.50%	Fluid Loss	D207	0.50%	Fluid Loss
D585	0.40%	Dispersant	D046	0.20%	Anti-Foam
D013	0.50%	Retarder	D013	0.50%	Retarder
D046	0.20%	Anti-Foam	D065	0.40%	Dispersant
D153	0.20%	Anti-Settling			

Production Centralizer Program
 Run 1 spiral centralizer every 120' from the 1st 5.5' long joint to the top of the curve.
 Run 1 spiral centralizer every 200' from the top of the curve to surface.

Production Casing: **Approx. 11,616' of 5-1/2" 20# P-110 Production**

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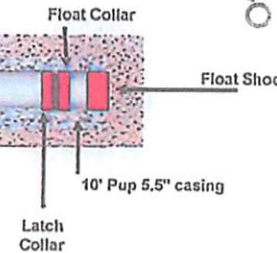
WV Department of
 Environmental Protection

Drill 8 1/2" pilot hole to a depth not greater than 100' into the Onondaga Group

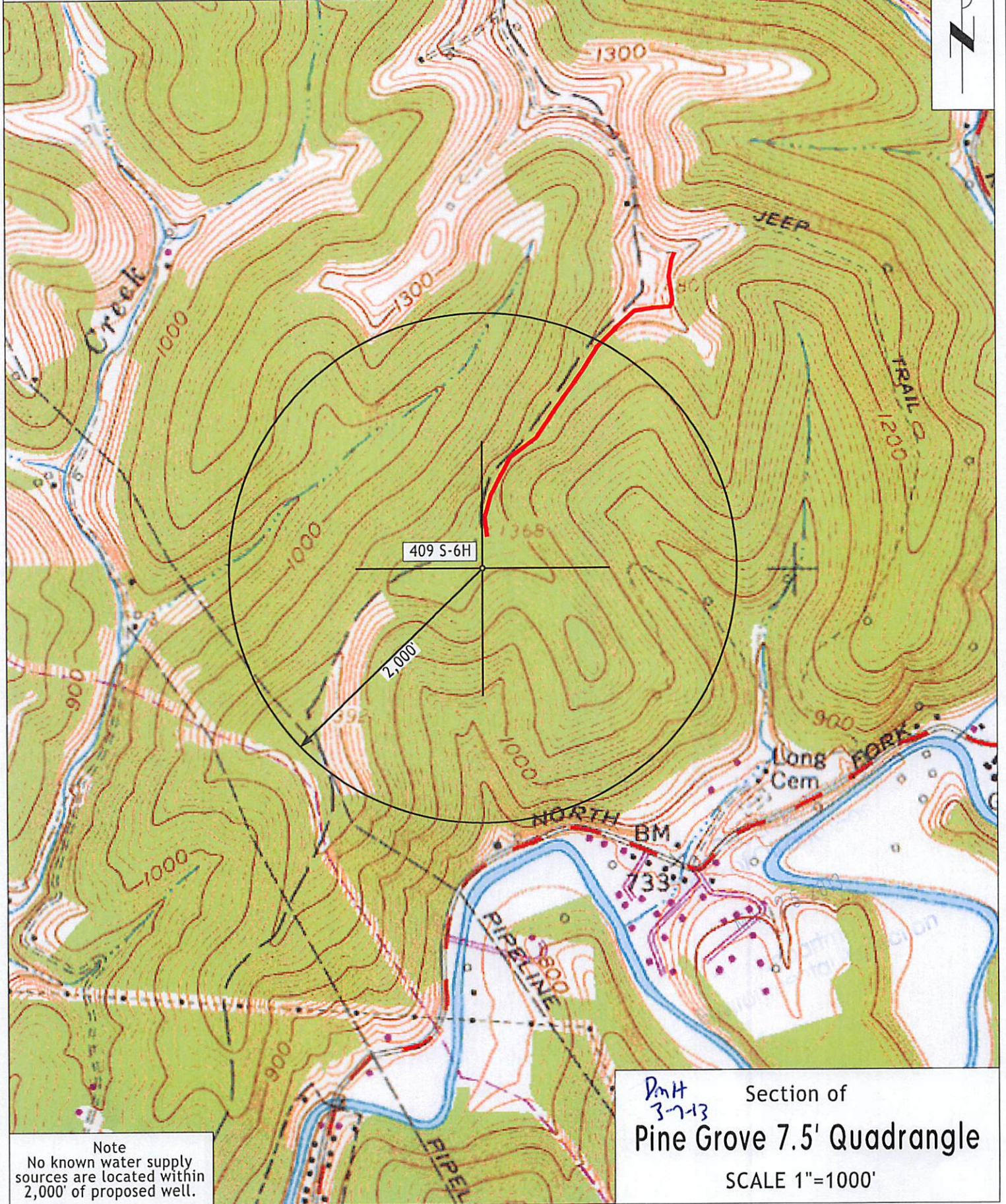
TD ~ 7,450'

Top of Onondaga ~ 7,350'

100' ONONDAGA GROUP



SUBJECT WELL
Long 409 S-6H



Note
No known water supply
sources are located within
2,000' of proposed well.

DmH
3-7-13
Section of
Pine Grove 7.5' Quadrangle
SCALE 1"=1000'

103-02883 12/20/2013

(BOTTOM HOLE: 80°39'27.0")

LON: -80°40'32.6" 2551'

LAT: 39°37'30"

LON: 80°40'00"

15,007'

LAT: 39°35'01.7"

(BOTTOM HOLE: 39°34'27.7")

COUNTY NAME

PERMIT

1 - Well ties and Latitude and Longitude were measured by DGPS (Sub-meter Mapping Grade). Bearings are referenced to UTM Grid North (Zone 17 North - NAD 1927).

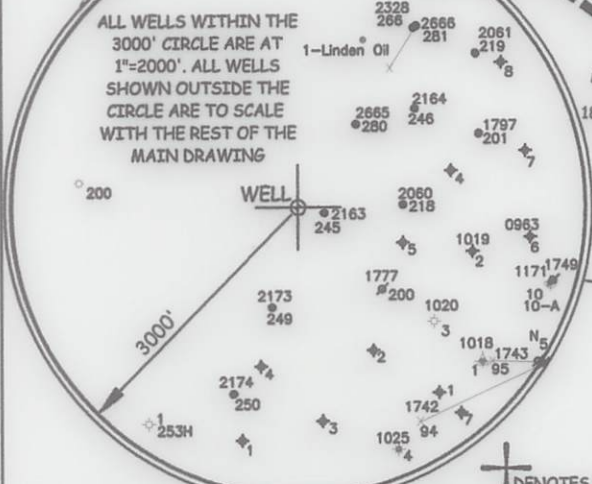
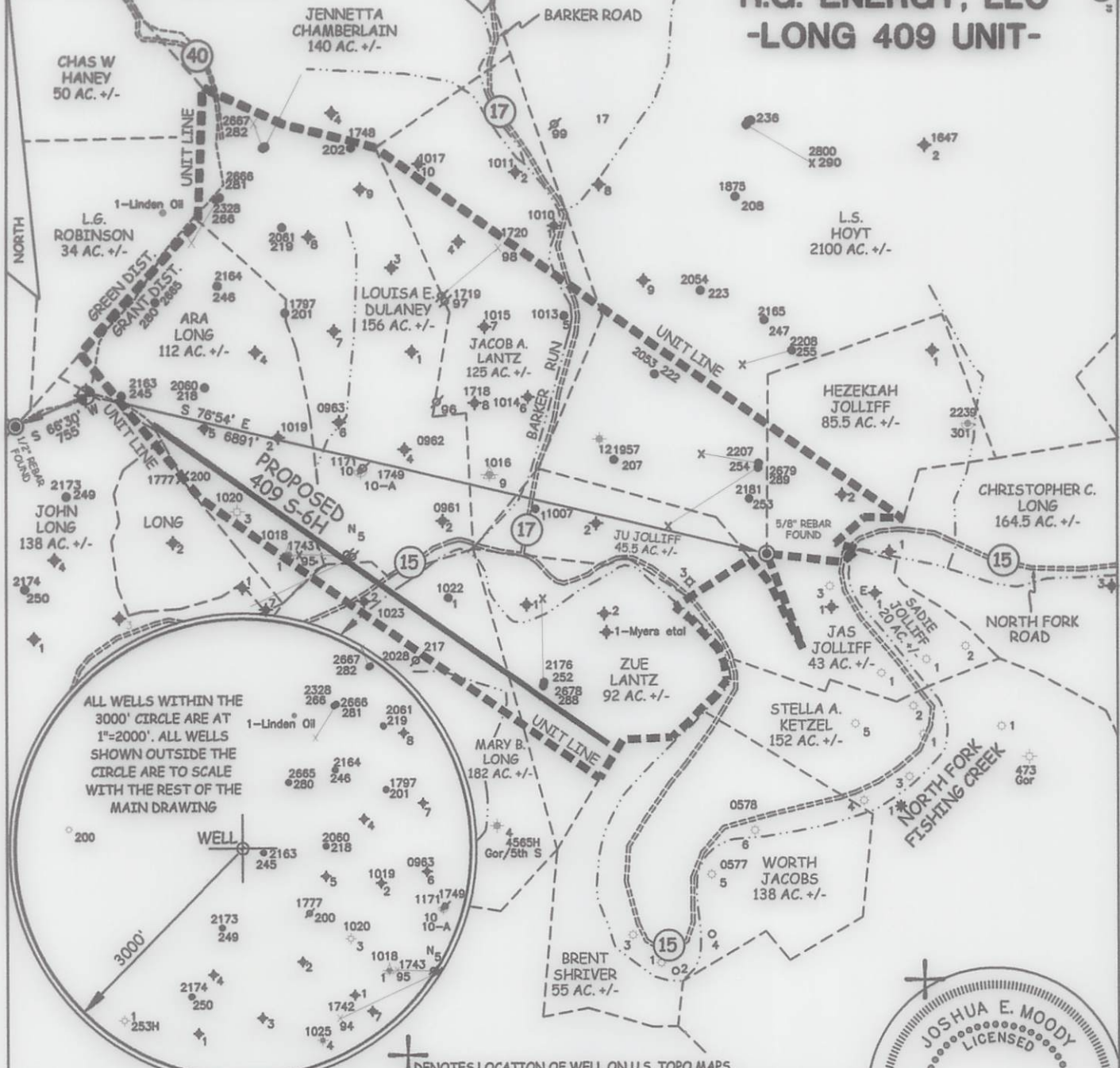
2 - Surface owners and adjoiners information obtained from the Wetzel County Assessor's tax records.

3 - No Title Opinion was provided to the Surveyor during this survey. This survey is subject to a complete Title Opinion.

UTM Coordinates (Zone 17N-NAD 1983)	
Surface	N-4,381,626m. E-527,864m.
Bottom Hole	N-4,380,582m. E-529,431m.

LOCATION REFERENCES	
NAD 1983	
N 84°19' W 284' UTILITY POLE	
N 44°33' E 192' SPIKE	

MAP OF H.G. ENERGY, LLC -LONG 409 UNIT-



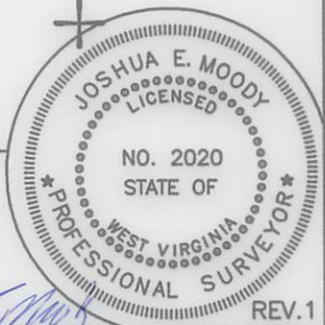
+ DENOTES LOCATION OF WELL ON U.S. TOPO MAPS.

JOB # 12-025
DRAWING # 12HG409FOLDER
SCALE 1" = 1500'
MINIMUM DEGREE OF ACCURACY SUB-METER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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 REGULATIONS ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
MOODY LAND SURVEYING, LLC
ST. MARYS, WV 26170



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS

REV.1
JOSHUA E. MOODY, P.S. 2020
DATE 10/30/12
OPERATOR'S WELL # 409 S-6H

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___ HORIZONTAL
(IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW
LOCATION: ELEVATION 1340' WATERSHED NORTH FOR, FISHING CREEK
DISTRICT GRANT COUNTY WETZEL
QUADRANGLE PINE GROVE 7.5'

SURFACE OWNER FRANCIS D. & FREEDA M. BROWN (surface hole) ACREAGE 103 ACRES +/-
OIL & GAS ROYALTY OWNER ROBERT B. MYERS ET AL LEASE ACREAGE 580 ACRES +/-
PROPOSED WORK: DRILL CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR
STIMULATE PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___
OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS
WELL OPERATOR H.G. ENERGY, LLC
ADDRESS 5260 DuPONT ROAD PARKERSBURG, WV 26101
ESTIMATED DEPTH TVD= 7,300' MD= 13,116'
DESIGNATED AGENT MIKE KIRSCH
ADDRESS 5260 DuPONT ROAD PARKERSBURG, WV 26101

FORM WW-6 LEASE # 31950-50 et al

12/20/2013