



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

August 01, 2013

NOBLE ENERGY, INC.
333 TECHNOLOGY DRIVE, SUITE 110
CANONSBURG, PA 15317

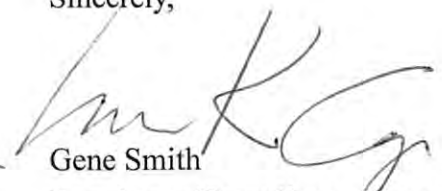
Re: Permit Modification Approval for API Number 5101609 , Well #: SHL17JHS
extended lateral

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,

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



June 13, 2013

West Virginia Department of Environmental Protection
Office of Oil and Gas,
601 57th Street, SE
Charleston, WV 25304

Re: Drilling Permit Application – “SHL17JHS API# 47-051-01609 Modification Number 2”

Dear Laura,

Enclosed please find a revised mylar extending the lateral leg. I have also included a revised WW6A1 form with the lease information listed for the tracts we are crossing. This well is located in Marshall County, WV.

If any further information or correspondence is required, please contact me at Office (724)820-3061 Cell 412-310-8967 or Dswiger@nobleenergyinc.com.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Dee Swiger', written over the word 'Sincerely'.

Dee Swiger

DS/

Enclosure(s):

Received
Office of Oil & Gas

JUN 14 2013

08/02/2013

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: Noble Energy, Inc.

494501907	Marshall	Sand Hill	Majorsville
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Operator ID County District Quadrangle

2) Operator's Well Number: SHL17JHS Well Pad Name: SHL17HS

3 Elevation, current ground: 1295.73' Elevation, proposed post-construction: 1295'

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

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Target - Marcellus, Depth - 6646', Thickness - 48', Pressure - 4418#

7) Proposed Total Vertical Depth: 6650'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 17,482'

10) Approximate Fresh Water Strata Depths: 682', 945, 1042

11) Method to Determine Fresh Water Depth: Seneca Technology data base

12) Approximate Saltwater Depths: none

13) Approximate Coal Seam Depths: Pittsburgh - 763.9' - 769.5 We will be drilling into a Pillar

14) Approximate Depth to Possible Void (coal mine, karst, other): Pittsburgh - 763.9' - 769.5 We will be drilling into a Pillar

15) Does land contain coal seams tributary or adjacent to, active mine? Yes

16) Describe proposed well work: Drill the vertical depth to the Marcellus estimated total vertical depth of approximately 6,650 feet.
Drill Horizontal leg - stimulate and produce the Marcellus Formation.
Total measured depth of 17,482 feet.
If an unanticipated void is encountered we will set place baskets at least 30' but not more than 50' below bottom of void and grout to surface.

17) Describe fracturing/stimulating methods in detail:
The stimulation will be multiple stages divided over the lateral length of the well. Stage spacing is dependent upon engineering design. Slickwater fracturing technique will be utilized on each stage using sand, water, and chemicals.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 19.4 acres

19) Area to be disturbed for well pad only, less access road (acres): 5.9 acres

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Office of Oil and Gas

AUG 01 2013

WV Department of
Environmental Protection

08/02/2013

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	N	LS	94	40'	40'	CTS
Fresh Water	13 3/8"	N	J55	54.5	1142'	1142'	CTS / 15.6 ppg Yield 1.18
Coal	13 3/8"	N	J55	54.5	1142'	1142'	CTS / 15.6 ppg Yield 1.18
Intermediate	9 5/8"	N	J55	36.0	3113'	3113'	CTS / 15.6 ppg Yield 1.19
Production	5 1/2"	N	P110	20.0	17,482'	17,482'	14.8 ppg yield 1.27 TOC 200' above 9 625 shoe
Tubing							
Liners							

We would like to drill through all the freshwater and coal bearing zones before running casing. we plan to drill no more than 100' below the deepest freshwater and/or coal bearing zone(s) and run casing which will be circulated with cement to the surface.

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	26"	.25		Type 1	CTS
Fresh Water	13 3/8"	17 1/2"	.380	2730	Type 1	1.18
Coal	13 3/8"	17 1/2"	.380	2730	Type 1	1.18
Intermediate	9 5/8"	12 3/8"	.352	3520	Class A	1.19
Production	5 1/2"	8 3/4"	.361	12,640	Class A	1.27
Tubing						
Liners						

PACKERS

Kind:				Received Office of Oil & Gas JUN 14 2013
Sizes:				
Depths Set:				

51-1609 MOD



DRILLING WELL PLAN
SHL-17J-HS (Marcellus HZ)
 Macellus Shale Horizontal
 Marshall County, WV

WELLBORE DIAGRAM		HOLE	CASING	GEOLOGY	MD	TVD	MUD	CEMENT	CENTRALIZERS	CONDITIONING	COMMENTS	
		26	20" 94#				AIR	To Surface	N/A	Ensure the hole is clean at TD.	Stabilize surface fill/soil. Conductor casing = 0.25" wall thickness	
		Conductor		40	40							
		17 1/2	13-3/8" 54.5# J-55 BTC	Sewickly Coal Seam	673	673			15.6 ppg Type 1 + 2% CaCl, 0.25# Lost Circ 30% Excess Yield = 1.18	Bow Spring on first 2 joints then every third joint to 100' from surface	Fill with KCl water once drilled to TD. Once casing is at setting depth, circulate a minimum of one hole volume prior to pumping cement.	FW shows @ 1042'. Red Rock @ 1032'. Surface casing = 0.380" wall thickness Burst=2730 psi
				Pittsburgh Coal	763	763						
				Int. Casing	1142	1142						
		12 3/8	9-5/8" 36# J-55 LTC	Big Lime	1764	1764		15.6ppg Class A + 0.4% Ret, 0.15% Disp, 0.2% AntiFoam, 0.125#/sk Lost Circ 20% Excess Yield=1.19 To Surface	Bow spring centralizers every third joint to 100' feet from surface.	Fill with KCl water once drilled to TD. Once casing is at setting depth, circulate a minimum of one hole volume prior to pumping cement.	Casing to be ran 250' below the 5th Sand. Intermediate casing = 0.352" wall thickness Burst=3520 psi	
				Big Injun	1855	1855						
				5th Sand	2823	2823						
				Top Devonian Shale	2863	2863						
				Int. Casing	3113	3113						
		8.75" Vertical	5-1/2" 20# HCP-110 TXP BTC	Warren Sand		4326	8.0ppg - 9.0ppg SOBM	14.8ppg Class A 25.75:0 System + 2.6% Cement extender, 0.7% Fluid Loss additive, 0.45% high temp retarder, 0.2% friction reducer 10% Excess Yield=1.27 TOC >= 200' above 9.625" shoe	Rigid Bow Spring every third joint from KOP to TOC			
				Java		4987						
				Angola		5219						
				Rheinstreet		5836						
				Sonyea		6272						
				Cashaqua		6290						
				Middlesex		6390						
				West River		6422						
				Burkett		6493						
				Tully Limestone		6504						
		8.75" Curve		Hamilton		6536	12.0ppg-12.5ppg SOBM		Rigid Bow Spring every joint to KOP	Once at TD, circulate at max allowable pump rate for at least 6x bottoms up. Once on bottom with casing, circulate a minimum of one hole volume prior to pumping cement.	Production casing = 0.361" wall thickness Burst=12640 psi Note: Actual centralizer schedules may be changed due to hole conditions	
				Marcellus		6646						
		8.75" - 8.5" Lateral		TD	17482	6464	12.0ppg-12.5ppg SOBM					
				Onondaga		6694						
LP @ 6560' TVD / 7571' MD		8.75 / 8.5 Hole - Cemented Long String				+/-9911 ft Lateral				TD @ +/-6464' TVD +/-17482' MD		
		5-1/2" 20# HCP-110 TXP BTC								X=centralizers		

Received
Office of Oil & Gas

JUN 11 2013

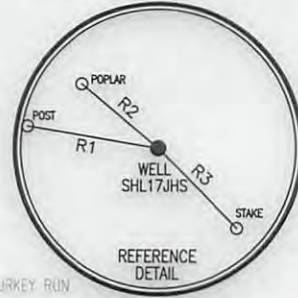
08/02/2013

Well is located on topo map 8,239' feet south of Latitude: 40° 00' 00"

SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83
 N:4425361.93
 E:540196.47
 NAD27, WV NORTH
 N:539758.857
 E:1711500.094

APPROX. LANDING POINT
UTM 17-NAD83
 N:4425181.60
 E:539597.02
 NAD27, WV NORTH
 N:539200.05
 E:1709523.18

BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83
 N:4427625.72
 E:537823.91
 NAD27, WV NORTH
 N:547317.95
 E:1703838.96



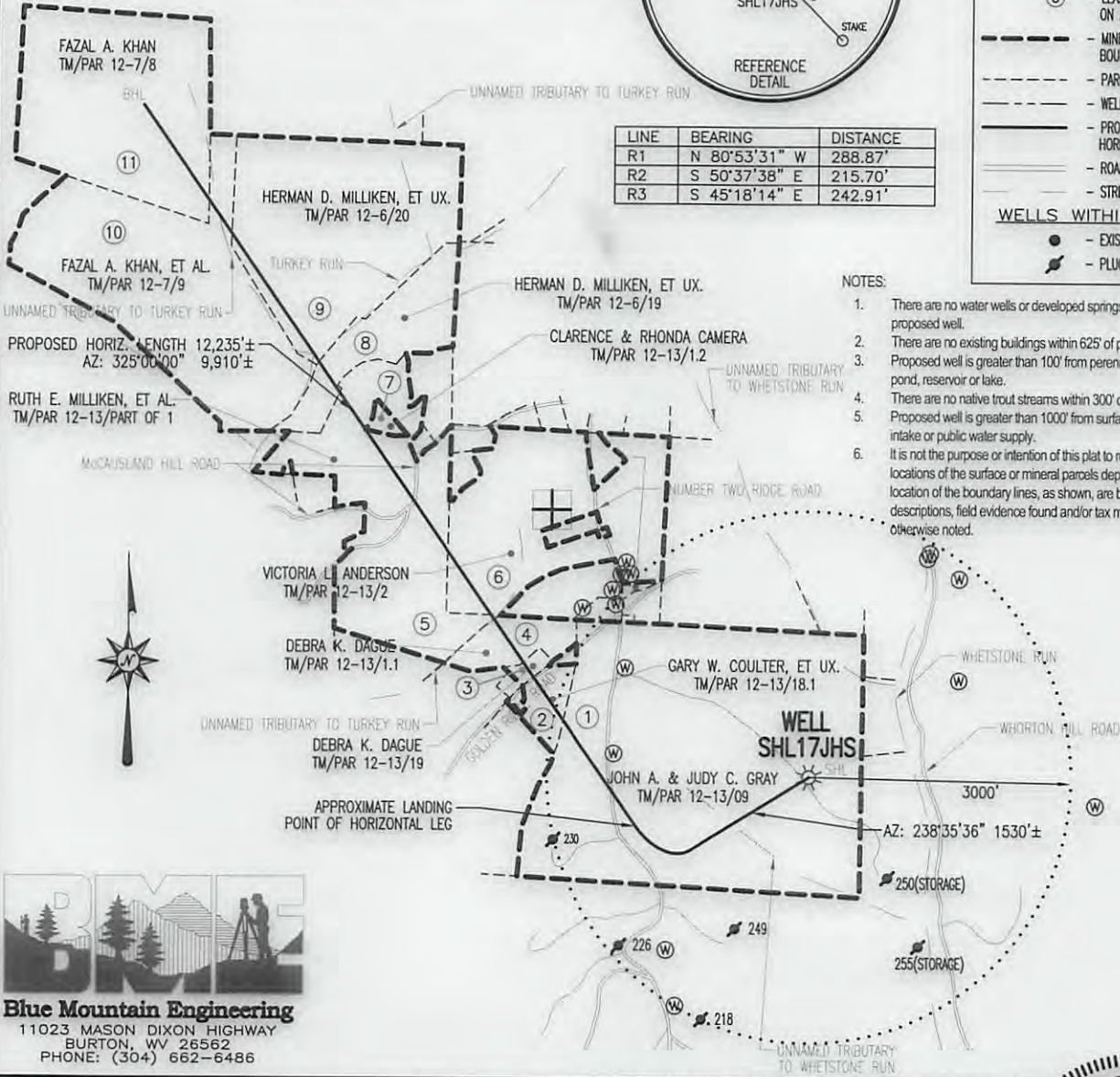
LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED.
- WATER SOURCE
- LEASE NUMBER BASED ON ATTACHED WW-6A1
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE

WELLS WITHIN 3000'

- EXISTING WELLS
- PLUGGED WELLS

LINE	BEARING	DISTANCE
R1	N 80°53'31" W	288.87'
R2	S 50°37'38" E	215.70'
R3	S 45°18'14" E	242.91'



NOTES:

- There are no water wells or developed springs within 250' of proposed well.
- There are no existing buildings within 625' of proposed well.
- Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
- There are no native trout streams within 300' of proposed well.
- Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
- It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

Blue Mountain Engineering
 11023 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

Well is located on topo map 8,239' feet west of Longitude: 80° 30' 00"

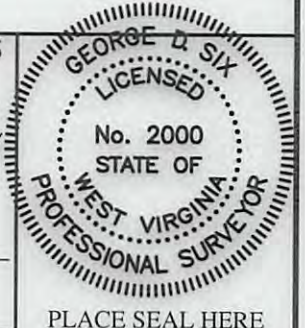
FILE #: SHL17JHS
 DRAWING #: SHL17JHS
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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 PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

R.P.E.:

L.L.S.: P.S. No. 2000



PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: MAY 21, 2013
 OPERATOR'S WELL #: SHL17JHS
 SERIAL No.: WV0510734HS
 API WELL #: 47 51 1609H6A
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: WHORTON HILL RUN ELEVATION: 1293.16'

COUNTY/DISTRICT: MARSHALL / SAND HILL QUADRANGLE: MAJORSVILLE, WV-PA 7.5'

SURFACE OWNER: JOHN A. & JUDY C. GRAY ACREAGE: 241.56±

OIL & GAS ROYALTY OWNER: SEE ATTACHED WW-6A1 ACREAGE: 813.104±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,464'± TMD: 17,482'±

WELL OPERATOR NOBLE ENERGY INC. DESIGNATED AGENT STEVEN M. GREEN
 Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590
 City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

08/02/2013