

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

PM

API 47 - 051 - 01640 County Marshall District Sandhill
Quad Valley Grove Pad Name SHL-13 Field/Pool Name _____
Farm name Paul H. and Annette Hemsley Well Number SHL13DHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4428324.16 Easting 539635.62
Landing Point of Curve Northing 4427968.45 Easting 539374.61
Bottom Hole Northing 4426722.19 Easting 540282.81

Elevation (ft) 1288.96 GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based

Date permit issued 6/19/2013 Date drilling commenced 8/20/13 Date drilling ceased 12/17/2013
Date completion activities began 5/14/2014 Date completion activities ceased 7/21/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 561', 763' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1600' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 763 - 785.04' Pittsburgh, 1266.74' - 1269.77' Mahoning Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

Reviewed by: _____

API 47-051 - 01640 Farm name Paul H. and Annette Hemsley Well number SHL13DHS

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	36	30	40	N			Y
Surface	24	20	418	N	J-55 94#		Y
Coal							
Intermediate 1	17-1/2	13-3/8	1217	N	J-55 54.5#		Y
Intermediate 2	12-3/8	9-5/8	3219	N	J-55 36#		Y
Intermediate 3							
Production	8-3/4	5-1/2	12630	N	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Type 1	517	15.6	1.19	110	0	8
Coal							
Intermediate 1	Type 1	1033	15.6	1.19	220	0	8
Intermediate 2	Type 1	1263	15.6	1.19	268	0	8
Intermediate 3							
Production	Class A	1931	14.8	1.41	495	0	8
Tubing							

Drillers TD (ft) 12645 _____ Loggers TD (ft) 12608 _____

Deepest formation penetrated Marcellus _____ Plug back to (ft) No Pilot Hole _____

Plug back procedure No Pilot Hole _____

Kick off depth (ft) 5528 _____

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

4 Centralizers on Surface (Every third joint), 10 on Intermediate 1 (Every third joint), 80 on Intermediate 2 (Every third joint), and 219 on Production casing (Every third joint, till Curve, then Every Joint).

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 051 - 01640 Farm name Paul H. and Annette Hemsley Well number SHL13DHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
		PLEASE SEE ATTACHED PERFORATION RECORD			

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
		PLEASE SEE ATTACHED STIMULATION INFORMATION PER STAGE SHEET						

Please insert additional pages as applicable.

Perforation Record

API: 47-051-01640

Farm name: Paul H & Annette A
Hemsley

Well Name: SHL-13D-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
1	5/4/2014	12276	12478	48	Marcellus
2	6/22/2014	11973	12227	50	Marcellus
3	6/25/2014	11673	11927	50	Marcellus
4	6/26/2014	11373	11627	50	Marcellus
5	6/26/2014	11073	11357	50	Marcellus
6	6/27/2014	10773	10027	50	Marcellus
7	6/27/2014	10473	10727	50	Marcellus
8	6/27/2014	10173	10427	50	Marcellus
9	6/30/2014	9873	10127	50	Marcellus
10	6/30/2014	9573	9827	50	Marcellus
11	7/1/2014	9275	9527	50	Marcellus
12	7/1/2014	9025	9227	50	Marcellus
13	7/2/2014	8775	8977	50	Marcellus
14	7/3/2014	8473	8727	50	Marcellus
15	7/3/2014	8225	8427	50	Marcellus
16	7/3/2014	7975	8177	50	Marcellus
17	7/4/2014	7673	7927	50	Marcellus
18	7/4/2014	7373	7627	50	Marcellus

STIMULATION INFORMATION PER STAGE

API: 47-051-01640

Farm name:

Paul H & Annette A Hemsley

Well Name: SHL-13D-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLs)	Amount of N ² / other
1	5/4/2014	70.1	7296	6352	8892	503309	11654.95	
Inj Test 2	5/7/2014	2.9	5413	5278	9662	0	83.69	
Inj Test 2B	6/21/2014	13.9	5816	5509	5127	0	1074.21	
2	6/25/2014	68.0	7065	6884	3644	598554	14121.07	
3	6/26/2014	68.4	6873	6819	3758	601524	13098.62	
4	6/26/2014	69.1	7306	7222	4273	598990	12343.74	
5	6/26/2014	68.7	6484	6165	4067	598010	12991.18	
6	6/27/2014	68.8	6509	7133	3988	592639	13892.19	
7	6/27/2014	68.5	6744	6313	4408	604558	11649.27	
8	6/30/2014	68.5	6974	6943	3965	600379	11073.72	
9	6/30/2014	69.4	6739	6510	4269	601916	12204.18	
10	7/1/2014	68.9	6724	7264	4390	601837	11542.98	
11	7/1/2014	68.8	6732	6629	4787	600111	10661.82	
12	7/1/2014	67.1	7092	6983	3809	498006	9711.37	
12 Inj Test	7/1/2014					0	57.28	
13	7/2/2014	69.0	6740	6860	4579	502259	11626.12	
14	7/3/2014	67.9	6926	6336	5591	600000	13521.46	
15	7/3/2014	68.2	6378	6742	4498	501653	8621.26	
16	7/3/2014	60.4	6753	7426	9821	474939	8469.57	
16 Inj Test	7/3/2014		5779			0	631.95	
17	7/4/2014	69.7	6661	6414	4727	599033	12706.51	
18	7/4/2014	68.3	6230	6454	4620	600002	10507.17	

API 47- 051 - 01640 Farm name Paul H. and Annette Hemsley Well number SHL13DHS

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6779.0</u>	<u>TVD</u>	<u>12645</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas 3408 mcfpd Oil 48 bpd NGL 233 bpd Water 432 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
	PLEASE SEE ATTACHED FORMATION SHEET				

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling
Address 5400 D Big Tyler Road City Charleston State WV Zip 25313

Logging Company Diversified Well Logging
Address 711 West 10th Street City Reserve State LA Zip 70084

Cementing Company Schlumberger
Address 4600 J. Barry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy SRCS
Address 121 Champion Way, Suite 110 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Regina A. Logue Telephone 724-820-3559
Signature Regina A. Logue Title Regulatory Analyst Date 10/6/14

SHL 13D

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Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale	0	732	0	732	
Pittsburgh Coal	732	742	732	742	
Shale and Sandstone	742	1516	742	1516	
Gas Sand	1516	1574	1516	1574	
Shale	1574	1693	1574	1693	
1st Salt Sand	1693	1756	1693	1756	
2nd Salt Sand	1756	1765	1756	1765	
3rd Salt Sand	1765	1815	1765	1815	
Shale	1815	1841	1815	1841	
Maxton Sand	1841	1958	1841	1958	
Shale	1958	1978	1958	2509	
Big Lime	1978	2023	1978	2023	
Big Injun	2023	2165	2023	2165	
Price	2165	2509	2165	2509	
Murrysville	2509	2522	2509	2872	
Shale	2522	2726	2522	2726	
50' Sand	2726	2743	2726	2743	
Shale	2743	2829	2743	2829	
Gordon Stray	2829	2841	2829	2841	
Shale	2841	2872	2841	2872	
Gordon	2872	2890	2872	2890	
Shale	2890	2985	2890	2985	
Fifth Sand	2985	3023	2985	3023	
Shale	3023	3423	3023	3423	
Speechley Sand	3423	3447	3423	3447	
Shale	3447	4331	3447	4331	
Warren Sand	4331	4345	4331	4345	
Shale	4345	5252	4345	5265	
Java Shale	5252	5322	5265	5340	
Pipe Creek Shale	5322	5366	5340	5388	
Angola Shale	5366	5992	5388	6197	
Rhinestreet	5992	6406	6197	6770	
Cashaqua	6406	6498	6770	6904	
Middlesex	6498	6535	6904	6963	
West River	6535	6576	6963	7032	
Burkett	6576	6609	7032	7092	
Tully Limestone	6609	6637	7092	7146	
Hamilton	6637	6751	7146	7494	
Marcellus	6751	6802	7494	not encountered	Gas
Onondaga	6802	6807	not encountered	not encountered	
Huntersville	6807	not encountered	not encountered	not encountered	

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/4/2014
Job End Date:	7/4/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01640-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	SHL13 D
Longitude:	-80.53584200
Latitude:	40.00410300
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,779
Total Base Water Volume (gal):	8,914,313
Total Base Non Water Volume:	0



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Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Fresh Water	7732-18-5	100.00000	87.29647	Density = 8.340
SAND - PREMIUM WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	9.62297	
SAND - COMMON WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	2.44517	
HYDROCHLORIC ACID 10-30%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	30.00000	0.05675	
FR-66	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.03050	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	10.00000	0.02739	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00331	
			Acetic acid	64-19-7	60.00000	0.00199	
BE-9	Halliburton	Biocide					

			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00413	
LP-65MC	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00244	
LoSurf-300D	Halliburton	Non-ionic Surfactant					
			Ethanol	64-17-5	60.00000	0.00067	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00033	
			Naphthalene	91-20-3	5.00000	0.00006	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00006	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00033	
			Propargyl alcohol	107-19-7	10.00000	0.00005	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
		Other Ingredient(s)					
			Water	7732-18-5		0.58000	
		Other Ingredient(s)					
			Polyacrylamide copolymer	Confidential		0.03050	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01465	
		Other Ingredient(s)					
			Alcohols, C12-16, ethoxylated	68551-12-2		0.00508	
		Other Ingredient(s)					
			Sodium chloride	7647-14-5		0.00508	
		Other Ingredient(s)					
			Fatty acid tall oil amide	Confidential		0.00508	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
		Other Ingredient(s)					
			Ammonium chloride	12125-02-9		0.00508	
		Other Ingredient(s)					
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00102	
		Other Ingredient(s)					
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00102	
		Other Ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00033	
		Other Ingredient(s)					
			Formaldehyde	50-00-0		0.00024	
		Other Ingredient(s)					

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			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		0.00016	
		Other Ingredient(s)					
			Fatty acids, tall oil	Confidential		0.00016	
		Other Ingredient(s)					
			Alcohols, C14-C15, ethoxylated	68951-67-7		0.00016	
		Other Ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00011	
		Other Ingredient(s)					
			Olefins	Confidential		0.00003	
		Other Ingredient(s)					
			Olefins	Confidential		0.00003	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	

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* Total Water Volume sources may include fresh water, produced water, and/or recycled water

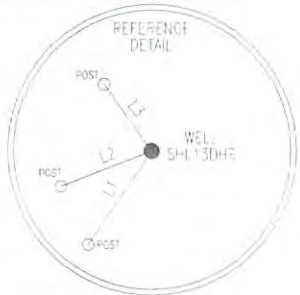
** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

Well is located on topo map 13,675' feet south of Latitude: 40° 02' 30"

Well is located on topo map 10,043' feet west of Longitude: 80° 30' 00"



APPROX LANDING POINT	
JTM 17-NAD83	
N:4427968.45	
E:539374.61	
NAD27, WV NORTH	
N:548357.42	
E:1708946.25	

NOTES:

1. There are no water wells or developed springs within 250' of proposed well.
2. There are no existing buildings within 625' of proposed well.
3. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
4. There are no native trout streams within 300' of proposed well.
5. Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
6. 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.

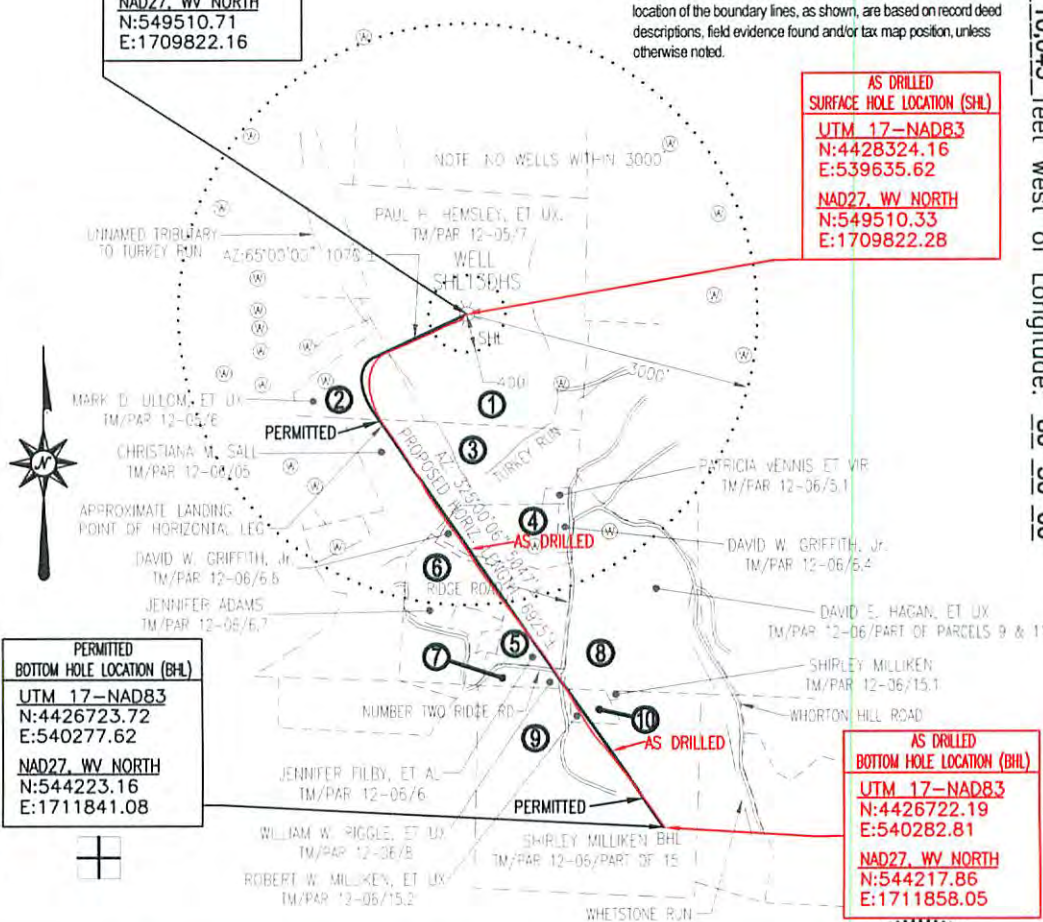
LINE	BEARING	DISTANCE
L1	S 34°17'06" W	245.16'
L2	S 69°05'51" W	211.83'
L3	N 35°55'16" W	174.88'

PERMITTED SURFACE HOLE LOCATION (SHL)	
JTM 17-NAD83	
N:4428324.28	
E:539635.59	
NAD27, WV NORTH	
N:549510.71	
E:1709822.16	

AS DRILLED SURFACE HOLE LOCATION (SHL)	
JTM 17-NAD83	
N:4428324.16	
E:539635.62	
NAD27, WV NORTH	
N:549510.33	
E:1709822.28	

LEGEND

- TOP MAP POINT
- WELL
- ALL APT. POINTS UNLESS OTHERWISE NOTED
- WATER SOURCE
- LEAST NUMBER BASED ON ATTACHED WW-6A1
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- AS DRILLED
- WELLS WITHIN 3000'
- EXISTING WELLS
- PLUGGED WELLS



PERMITTED BOTTOM HOLE LOCATION (BHL)	
JTM 17-NAD83	
N:4426723.72	
E:540277.62	
NAD27, WV NORTH	
N:544223.16	
E:1711841.08	

AS DRILLED BOTTOM HOLE LOCATION (BHL)	
JTM 17-NAD83	
N:4426722.19	
E:540282.81	
NAD27, WV NORTH	
N:544217.86	
E:1711858.05	

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

FILE #: SHL13DHS-AS DRILLED
 DRAWING #: SHL13DHS-AS DRILLED
 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: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE D. SIX
 LICENSED
 No. 2000
 STATE OF WEST VIRGINIA
 PROFESSIONAL SURVEYOR
 PLACE SEAL HERE

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

DATE: OCTOBER 2, 2014
 OPERATOR'S WELL #: SHL13DHS-AS DRILLED
 API WELL #: 47 STATE 51 COUNTY 01640 PERMIT

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

WATERSHED: TURKEY RUN ELEVATION: 1288.96'
 COUNTY/DISTRICT: MARSHALL / SAND HILL QUADRANGLE: VALLEY GROVE, WV 7.5'
 SURFACE OWNER: PAUL H. & ANNETTE A. HEMSLEY ACREAGE: 121.65±
 OIL & GAS ROYALTY OWNER: SEE ATTACHED WW-6A1 ACREAGE: 435.703±

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: 6781'± TMD: 12647'±
 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