

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

API 47-085-10069 County Ritchie District Clay
Quad Pennsboro Pad Name PEN 2 Field/Pool Name NA
Farm name Terry & Helen Kiessling Well Number PEN 2 DHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 1000 Noble Energy Drive 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 4354133.13 Easting 498924.78
Landing Point of Curve Northing 4354027.27 Easting 499093.34
Bottom Hole Northing 4351949.91 Easting 500890.21

Elevation (ft) 1074.85 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 10/30/2013 Date drilling commenced 01/18/2014 Date drilling ceased 07/22/2014
Date completion activities began 12/4/2014 Date completion activities ceased 2/23/2015
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 454 Open mine(s) (Y/N) depths none
Salt water depth(s) ft None noted for Offsets Void(s) encountered (Y/N) depths none
Coal depth(s) ft no coal Cavern(s) encountered (Y/N) depths none
Is coal being mined in area (Y/N) N

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Reviewed by:
A.L. 5/26/15
W.S. 06/12/2015

API 47-085 - 10069 Farm name Terry & Helen Kiessling Well number PEN 2 DHS

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				
Surface	17 1/2	13 3/8	589.9	N	J-55 54.5#		Y
Coal							
Intermediate 1	12 3/8	9 5/8	5,414.0	N	K-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4	5 1/2	15,712.6	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	532	15.6	1.20	115	0	8
Coal							
Intermediate 1	Class A	Lead 925 Tail 292	Lead 12.0 Tail 15.6	Lead 1.93 Tail 1.19	Lead 207 Tail 167	0	8
Intermediate 2							
Intermediate 3							
Production	Class A	Lead 398 Tail 2047	Lead 13.0 Tail 14.8	Lead 1.63 Tail 1.38	Lead 167 Tail 208	5430	8
Tubing							

Drillers TD (ft) 15,727 Loggers TD (ft) 15,703
 Deepest formation penetrated Marcellus Plug back to (ft) Not a Pilot Hole
 Plug back procedure Not a Pilot Hole

Kick off depth (ft) 6907

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 Conductor - No centralizers used. Fresh Water/Surface-Surface - 5 centralizers used, one every third joint Intermediate - 66 centralizers - bow spring centralizers on every joint to KOP, on every third joint from KOP to 100' from surface.
 Production - 266 centralizers - rigid bow spring every third joint from KOP to TOC, rigid bow spring every joint to KOP.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS RECEIVED Office of Oil and Gas

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS APR 09 2015

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED WV Department of Environmental Protection

API 47- 085 - 10069 Farm name Terry & Helen Kiessler Well number PEN 2 DHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	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)
	SEE ATTACHED STIMULATION INFORMATION PER STAGE RECORD							

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Please insert additional pages as applicable.

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Perforation Record

API: 47-085-10069

Farm name: KIESSLING, TERRY & HELEN

Well Name: PEN-2D-HS

Stage No.	Perf Date	Top Perf	Bottom Perf	# of Perfs	Formation
Toe Prep Inj Test	12/4/2014	15580	15,586	-	Marcellus
1	12/4/2014	15329	15,568	50	Marcellus
2	12/5/2014	15032	15,271	50	Marcellus
3	12/5/2014	14735	14,974	50	Marcellus
4	12/5/2014	14438	14,677	50	Marcellus
5	12/6/2014	14141	14,380	50	Marcellus
6	12/7/2014	13844	14,083	50	Marcellus
7	12/7/2014	13547	13,786	50	Marcellus
8	12/8/2014	13250	13,489	50	Marcellus
9	12/9/2014	12953	13,192	50	Marcellus
10	12/10/2014	12656	12,895	50	Marcellus
11	12/11/2014	12359	12,598	50	Marcellus
12	12/11/2014	12062	12,301	50	Marcellus
13	12/12/2014	11765	12,004	50	Marcellus
14	12/13/2014	11468	11,707	50	Marcellus
15	1/4/2015	11171	11,410	50	Marcellus
16	1/4/2015	10874	11,113	50	Marcellus
17	1/5/2015	10577	10,816	50	Marcellus
18	1/5/2015	10280	10,519	50	Marcellus
19	1/5/2015	9983	10,222	50	Marcellus
20	1/6/2015	9686	9,925	50	Marcellus
21	1/7/2015	9389	9,628	50	Marcellus
22	1/8/2015	9092	9,331	50	Marcellus
23	1/9/2015	8795	9,034	50	Marcellus
24	1/9/2015	8498	8,737	50	Marcellus
25	1/9/2015	8201	8,440	50	Marcellus
26	1/10/2015	7904	8,143	50	Marcellus
27	1/10/2015	7607	7,846	50	Marcellus
28	1/10/2015	7310	7,549	50	Marcellus
29	1/11/2015	7013	7,252	50	Marcellus
30	1/11/2015	6716	6,955	50	Marcellus
31	1/11/2015	6419	6,658	50	Marcellus

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6,311</u>	<u>TVD</u>	<u>15,727</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 3569 mcfpd Oil 112 bpd NGL 411 bpd Water 992 bpd GAS MEASURED BY Estimated Orifice Pilot

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

Please insert additional pages as applicable.

Drilling Contractor NOMAC
Address 171 Locust Avenue Ext. City Mt. Morris State PA Zip 15349

Logging Company _____
Address _____ City _____ State _____ Zip _____

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

Stimulating Company U. S Well Service
Address 533 Industrial Park Drive City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

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Completed by Regina A. Logue Title Regulatory Analyst
Signature Regina A. Logue Telephone 724-830-3559
WV Department of Environmental Protection

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale and Sandstone	0	1309	0	1309	
Sandstone	1309	1433	1309	1423	
Shale and Sandstone	1423	1593	1423	1593	
Sandstone	1593	1635	1593	1635	
Shale and Sandstone	1635	1737	1635	1737	
Maxton Sand	1737	1820	1737	1820	
Shale and Sandstone	1820	1943	1820	1943	
Big Lime	1943	1998	1943	1998	
Big Injun	1998	2133	1998	2133	
Price	2133	2405	2133	2405	
Weir	2405	2444	2405	2444	
Shale	2444	2724	2444	2724	
Gordon	2724	2741	2724	6301	
Shale and Sandstone	2741	2921	2741	6302	
5th Sand	2921	2933	2921	6371	
Shale	2933	3076	2933	not encountered	
Sandstone	3076	3090	3076	not encountered	
Shale	3090	3498	3090	not encountered	
Warren	3498	3560	3500	6300	
Shale	3560	3894	3562	6301	
Sandstone	3894	3931	3900	6302	
Shale and Sandstone	3931	4925	3937	6371	
Benson	4925	4987	4941	not encountered	
Shale	4987	5147	5004	not encountered	
Alexander	5147	5215	5166	not encountered	
Shale	5215	5725	5234	not encountered	
Rheinstreet	5725	6051	5750	not encountered	
Cashaqua	6051	6143	6080	not encountered	
Middlesex	6143	6172	6176	not encountered	
West River	6172	6216	6206	not encountered	
Burkett	6216	6259	6253	not encountered	
Tully Limestone	6259	6260	6300	not encountered	
Hamilton	6260	6261	6301	6302	Gas
Marcellus	6261	6320	6302	6371	
Onondaga	6320		6371	not encountered	

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	12/4/2014
Job End Date:	1/11/2015
State:	West Virginia
County:	Ritchie
API Number:	47-085-10069-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	Pen 2 D
Longitude:	-81.01264400
Latitude:	39.33654400
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,311
Total Base Water Volume (gal):	18,055,350
Total Base Non Water Volume:	922,033



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Noble Energy	Base Fluid	Water	7732-18-5	100.00000	88.72801	
40/70 Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	7.86917	
100 Mesh Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	3.07487	
HCl Acid (12.5% - 18.0%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.14498	
FRAC-405	U.S. Well Services, LLC	Friction Reducer	Hydrogen Chloride	7647-01-0	18.00000	0.03463	
SI-1100	U.S. Well Services, LLC	Scale Inhibitor	Water	7732-18-5	40.00000	0.02705	
			Anionic Polyacrylamide	Proprietary	40.00000	0.02705	
			Petroleum Distillates	84742-47-8	40.00000	0.02177	
			Crystalline Salt	12125-02-9	5.00000	0.00338	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00338	
			Di Water	7732-18-5	80.00000	0.01363	

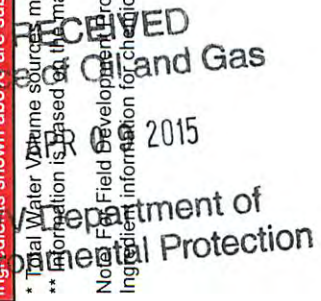
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					Ethylene Glycol	107-21-1	40.00000	0.00770
					Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	10.00000	0.00230
					2-Phosphonobutane 1,2,4 tricarboxylic salt	37971-36-1	10.00000	0.00220
					hexamethylenediamine tetra (methylene phosphonic acid)	38820-59-6	10.00000	0.00213
					Copolymer of Maleic and Acrylic acid	26677-99-6	10.00000	0.00201
					bis (hexamethylene) tramine penta (methylene phosphonic acid) - phosphate acid	40623-75-4	10.00000	0.00196
					Acrylic polymer	52255-49-9	5.00000	0.00085
WFRA-1000	U.S. Well Services, LLC	Friction Reducer						
					Water	7732-18-5	40.00000	0.00626
					Anionic Polyacrylamide	Proprietary	40.00000	0.00626
					Petroleum Distillates	84742-47-8	40.00000	0.00504
					Crystalline Salt	12125-02-9	5.00000	0.00078
					Ethoxylated alcohol blend	Proprietary	5.00000	0.00078
K-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent						
					2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00835
					Deionized Water	7732-18-5	28.00000	0.00477
AI-301	U.S. Well Services, LLC	Acid Corrosion Inhibitors						
					Diethylene Glycol	111-46-6	30.00000	0.00022
					Methanamine	100-97-0	20.00000	0.00018
					Hydrogen Chloride	7647-01-0	10.00000	0.00008
					Polyethylene polyamine	88603-67-8	10.00000	0.00007
					Coco amine	61791-14-8	5.00000	0.00003
ICA-800	U.S. Well Services, LLC	Iron Control Additive						
Env					Erythorbic Acid	89-65-6	100.00000	0.00013

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.

* 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%

Notes: FDP 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 13,972' feet south of Latitude: 39° 22' 30"

Well is located on topo map 3,538' feet west of Longitude: 81° 00' 00"

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.

AS DRILLED SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4354133.13
 E:498924.78
 NAD27_WV NORTH
 N:308288.26
 E:1572169.25
 LAT/LON DATUM-NAD83
 LAT:39.336623
 LON:-81.012476

PERMITTED SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4354132.98
 E:498924.75
 NAD27_WV NORTH
 N:308287.77
 E:1572169.15
 LAT/LON DATUM-NAD83
 LAT:39.336621
 LON:-81.012477

LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED
- LEASE NUMBER
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- AS DRILLED

EXISTING WELLS

- EXISTING WELLS
- PLUGGED WELLS

AS DRILLED PLAT

PERMITTED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4354013.28
 E:499100.01
 NAD27_WV NORTH
 N:307885.36
 E:1572737.70
 LAT/LON DATUM-NAD83
 LAT:39.335543
 LON:-81.010443

AS DRILLED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4354027.27
 E:499093.34
 NAD27_WV NORTH
 N:307931.64
 E:1572716.58
 LAT/LON DATUM-NAD83
 LAT:39.335669
 LON:-81.010520

PERMITTED BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4351942.33
 E:500897.47
 NAD27_WV NORTH
 N:300990.85
 E:1578522.70
 LAT/LON DATUM-NAD83
 LAT:39.316882
 LON:-80.989589

AS DRILLED BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4351949.91
 E:500890.21
 NAD27_WV NORTH
 N:301016.15
 E:1578499.28
 LAT/LON DATUM-NAD83
 LAT:39.316950
 LON:-80.989673

LINE	BEARING	DISTANCE
R1	N 55°36'53" W	177.40'
R2	N 67°50'43" E	237.04'
R3	S 10°34'40" E	169.78'
R4	N 58°50'37" W	1834.28'
R5	N 20°10'45" W	1831.30'
R6	N 15°07'17" E	1642.12'

LEASE	LESSORS
1	TERRY KIESSLING ET AL
2	TERRY KIESSLING ET AL
3	MARY ELLEN ADKINS HERRING ET AL
4	MARY LEE LILLY ET AL
5	DONALD HOGUE ET AL
6	JOSEPH F. SCHMIDLE ET UX
7	CHARLOTTE L. MOSS ET AL
8	DAVID B. OWINGS ET AL
9	CHARLOTTE L. MOSS ET AL
10	STEVEN VAUGHAN ET UX
11	STEVEN VAUGHAN ET UX

Blue Mountain Inc.
 10125 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: PEN 2 DHS-AS DRILLED
 DRAWING #: PEN 2 DHS-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: [Signature]
 R.P.E.: _____
 L.L.S.: P.S. No. 2000

GEORGE A SIX LICENSED PROFESSIONAL SURVEYOR
 No. 2000
 STATE OF WEST VIRGINIA
 RECEIVED
 Office of Oil and Gas
 PLACE SEAL HERE

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



DATE: FEBRUARY 9 2015
 OPERATOR'S WELL #: PEN 2 DHS-AS DRILLED
 API WELL #: 470069
 WV Department of Environmental Protection

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

STATE COUNTY PERMIT
47 085 10069

WATERSHED: NORTH FORK HUGHES RIVER ELEVATION: 1084'±
 COUNTY/DISTRICT: RITCHIE / CLAY QUADRANGLE: ELLENBORO, WV 7.5'
 SURFACE OWNER: TERRY & HELEN KIESSLING ACREAGE: 79.242±
 OIL & GAS ROYALTY OWNER: TERRY KIESSLING ET AL ACREAGE: 675.359±

06/12/2015

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: 6,324'± TMD: 15,700'±
 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