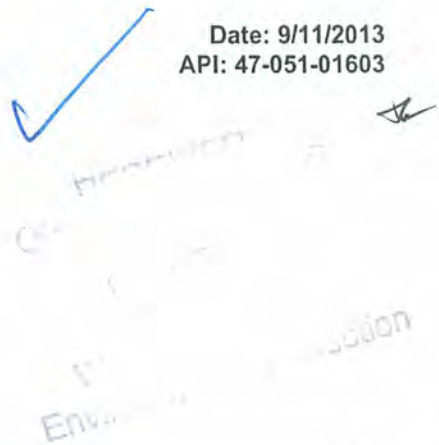


State of West Virginia
Department of Environmental Protection
Office of Oil and Gas
Well Operator's Report of Well Work

Date: 9/11/2013
API: 47-051-01603



Farm Name: Gray, John A ET UX Operator Well No: SHL-17E-HS

LOCATION: Sandhill 17 Elevation: 1,297.39 Quadrangle: Majorsville

District: Sandhill County: MARSHALL
Latitude: _____ Feet South of Deg. Min. Sec. 39.97743900
Longitude: _____ Feet South of Deg. Min. Sec. -80.52965800

Company: Noble Energy Inc	Casing & Tubing	Used in Drilling	Left in Well	Cement fill up Cu. Ft.
Address: 333 Technology Drive, Suite 116 Canonsburg, PA 15317	20	52.0	52.0	Cemented In
Agent: Steven Green	13 3/8	1,132.2	1,132.2	935 sxs - 197 bbls standard cement 20bbls return
Inspector: Bill Hendershot	9 5/8	3,135.0	3,135.0	1065 sxs - 221 bbls standard cement 32 bbls return
Date Permit Issued: 1/29/2013	5 1/2	17,247.0	17,247.0	2785 sxs (697 bbls)
Date Well Work Commenced: 3/15/2013				
Date Well Work Completed: 11/24/2013				
Verbal Plugging:				
Date Permission granted on: 3/15/2013				
Rotary Cable Rig X				
Total Vertical Depth (ft): Original Hole - 6,671.8				
Total Measured Depth (ft): 17,259.0				
Fresh Water Depth (ft): 122'				
Salt Water Depth (ft): 1540'				
Is coal being mined in the area (N/Y)? Y				
Coal Depths (ft.): 763.9'-769.5'				
Void(s) encountered (N/Y) Depth(s) N/A				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 6944
Gas: Initial open flow 1081 MCF/d Oil: Initial open flow 3 Bbl/d
Final open flow 1926 MCF/d Final open flow 31 Bbl/d
Time of open flow between initial and final tests 24 Hours
Static rock Pressure 1575 psig (surface pressure) after 24 Hours

Second producing formation _____ Pay zone depth (ft) _____
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow _____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests _____ Hours
Static rock Pressure _____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

[Signature] 2-9-14
Signature Date

03/21/2014

Were core samples taken? Yes__ No_x__

Were cuttings caught during drilling? Yes_x_ No__

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list: Bond Log, Gamma Ray Log

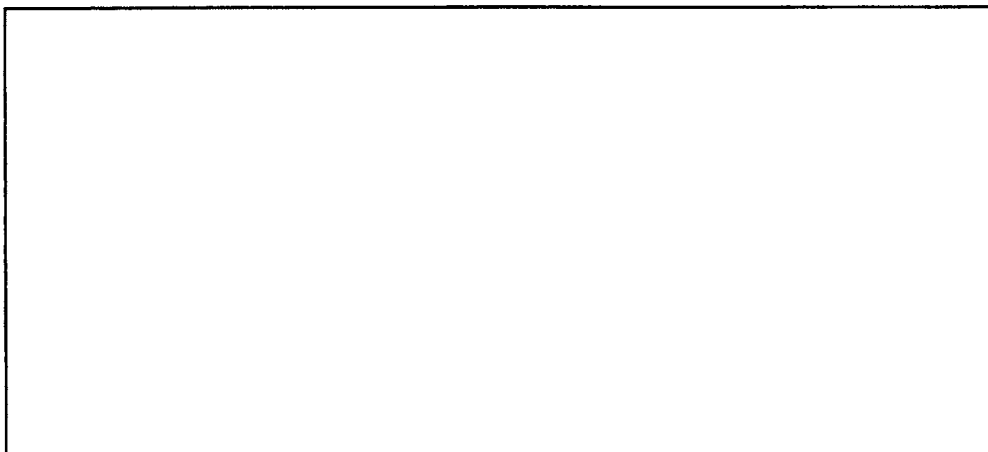
NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing or Stimulating: Please See Attached

Plug Back Details including Plug Type and Depth(s): Please See Attached

Surface:

Formations Encountered: Please see Attached



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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/15/2013
Job End Date:	11/7/2013
State:	West Virginia
County:	Marshall
API Number:	47-051-01603-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	SHL 17E
Longitude:	-80.52945000
Latitude:	39.97751000
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,671
Total Base Water Volume (gal):	15,593,381
Total Base Non Water Volume:	0



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	89.26827	Density = 8.340
SAND - PREMIUM WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00000	8.36299	
SAND - COMMON WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00000	2.15791	
FDP-S1078-12	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02365	
			Alcohols, C12-16, ethoxylated	68551-12-2	5.00000	0.00394	
			Ammonium chloride	12125-02-9	5.00000	0.00394	
			9-Octadecenamide, n,n-bis-(2-hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00394	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent	Hydrochloric acid	7647-01-0	10.00000	0.00624	
BE-9	Halliburton	Biocide	Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00377	
LP-65	Halliburton	Scale Inhibitor					

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HAL-OS ACID INHIBITOR	Haliburton	Corrosion Inhibitor	Ammonium chloride	12125-02-9	10.00000	0.00246	
			Methanol	67-56-1	60.00000	0.00160	
			Propargyl alcohol	107-19-7	10.00000	0.00027	
LoSurf-300D	Haliburton	Non-ionic Surfactant					
			Ethanol	64-17-5	60.00000	0.00065	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00033	
			Poly(oxy-1,2-ethanedyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00005	
			Naphthalene	91-20-3	5.00000	0.00005	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
FE-1A ACIDIZING COMPOSITION	Haliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00065	
			Acetic acid	64-19-7	60.00000	0.00039	
BE-9W	Haliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00037	
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		0.16535	
		Other ingredient(s)					
			Organic phosphonate	Confidential		0.01478	
		Other ingredient(s)					
			Propylene glycol	57-55-6		0.00220	
		Other ingredient(s)					
			Fatty acids, tall oil	Confidential		0.00080	
		Other ingredient(s)					
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	38527-49-1		0.00080	
		Other ingredient(s)					
			Alcohols, C14-C15, ethoxylated	68951-67-7		0.00080	
		Other ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00033	
		Other ingredient(s)					
			Formaldehyde	50-00-0		0.00025	
		Other ingredient(s)					
			Olefins	Confidential		0.00013	
		Other ingredient(s)					
			Olefins	Confidential		0.00013	
		Other ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00011	
		Other ingredient(s)					

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		Other ingredient(s)	Diefins	Confidential		0.00003	
			Diefins	Confidential		0.00003	

* 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)

SHL 17E
47-051-01603

Stimulation Summary

Date	Stage #	Formation	Frac Type	Top Perf	Bottom Perf	# of Perfs	BD Press (psi)	ATP (psi)	Avg Rate (bpm)	ISIP (psi)	Frac Gradient	Sand (lbs)	Acid (gals)	Water (gals)
10/15/2013	1	Marcellus	Slickwater	16872	17044	48	N/A	7518	71.1	3863	1.01	295926	3000	500954
10/16/2013	2	Marcellus	Slickwater	16573	16827	40	6092	8057	75.0	3708	0.99	468000	3000	474174
10/17/2013	3	Marcellus	Slickwater	16273	16527	40	4748	7734	79.0	4167	1.05	464034	3000	487903
10/17/2013	4	Marcellus	Slickwater	15973	16227	40	6331	7617	73.5	3958	1.03	466828	3000	464606
10/18/2013	5	Marcellus	Slickwater	15673	15927	40	6516	7935	78.0	4282	1.07	465187	3000	478824
10/18/2013	6	Marcellus	Slickwater	15373	15627	40	6432	8212	80.4	4520	1.11	461682	3000	462867
10/19/2013	7	Marcellus	Slickwater	15073	15327	40	6319	8054	80.6	3967	1.03	459983	3000	553112
10/20/2013	8	Marcellus	Slickwater	14773	15027	40	6284	7849	80.0	4048	1.04	464862	3000	474818
10/20/2013	9	Marcellus	Slickwater	14473	14727	40	6435	8170	80.2	4215	1.06	466991	3000	459551
10/21/2013	10	Marcellus	Slickwater	14173	14427	40	5313	8045	90.0	4065	1.04	469565	3000	455825
10/22/2013	11	Marcellus	Slickwater	13873	14127	40	4872	8075	79.2	4389	1.09	467674	3000	529033
10/22/2013	12	Marcellus	Slickwater	13573	13827	40	5917	8028	78.7	3928	1.02	465224	3000	456526
10/22/2013	13	Marcellus	Slickwater	13273	13527	40	5792	8253	79.7	4626	1.13	466970	3000	453430
10/23/2013	14	Marcellus	Slickwater	12973	13227	40	6351	8129	80.7	4276	1.07	469339	3000	468018
10/24/2013	15	Marcellus	Slickwater	12673	12927	40	6014	7809	80.2	4030	1.04	463204	3000	462814
10/24/2013	16	Marcellus	Slickwater	12373	12627	40	6146	7865	81.4	4020	1.03	466906	3000	455388
10/24/2013	17	Marcellus	Slickwater	12073	12327	40	6139	8729	82.1	4249	1.07	462793	3000	469791
10/25/2013	18	Marcellus	Slickwater	11775	12027	40	5909	7444	81.1	4145	1.05	465097	3000	442917
10/25/2013	19	Marcellus	Slickwater	11473	11727	40	5848	7575	82.1	4221	1.06	468187	3000	451134
10/26/2013	20	Marcellus	Slickwater	11173	11427	40	6030	7528	90.0	4457	1.10	390216	3000	428284
10/26/2013	21	Marcellus	Slickwater	10873	11127	40	6726	7676	82.7	3982	1.03	465317	3000	443757
10/27/2013	22	Marcellus	Slickwater	10573	10827	40	5153	7250	81.4	4298	1.08	381580	3000	421371
10/28/2013	23	Marcellus	Slickwater	10273	10527	40	6366	7564	89.7	3835	1.01	400263	3000	438317
10/30/2013	24	Marcellus	Slickwater	9973	10227	40	6411	7971	78.3	3866	1.01	375887	3000	559289
10/30/2013	25	Marcellus	Slickwater	9673	9927	40	6777	7133	84.2	4067	1.04	470101	3000	441093
11/1/2013	26	Marcellus	Slickwater	9373	9627	40	5841	7119	90.2	3580	0.97	463583	3000	442238
11/2/2013	27	Marcellus	Slickwater	9075	9325	40	6484	7095	89.4	4040	1.04	465061	3000	434810
11/3/2013	28	Marcellus	Slickwater	8773	9027	40	6358	7132	83.5	4372	1.09	445216	6000	444838
11/4/2013	29	Marcellus	Slickwater	8473	8727	40	6145	7004	83.4	3697	0.99	469011	3000	430909
11/5/2013	30	Marcellus	Slickwater	8173	8427	40	4825	7025	90.0	3966	1.03	464853	3000	431098
11/5/2013	31	Marcellus	Slickwater	7873	8127	40	6224	6889	85.3	4208	1.06	466804	3000	430593
11/6/2013	32	Marcellus	Slickwater	7573	7827	40	5593	6729	83.8	4375	1.09	465323	3000	436434
11/7/2013	33	Marcellus	Slickwater	7273	7527	40	5989	7111	84.4	5513	1.26	464607	3000	489093
11/7/2013	34	Marcellus	Slickwater	6973	7227	40	5369	7739	85.2	4075	1.04	464190	3000	424588

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Stage #	Plug Type	Plug Depth
1	Toe Sleeve	17,116.30 - 17,119.60
2	Composite Frac Plug	16,850
3	Composite Frac Plug	16,550
4	Composite Frac Plug	16,250
5	Composite Frac Plug	15,950
6	Composite Frac Plug	15,650
7	Composite Frac Plug	15,350
8	Composite Frac Plug	15,050
9	Composite Frac Plug	14,750
10	Composite Frac Plug	14,450
11	Composite Frac Plug	14,150
12	Composite Frac Plug	13,850
13	Composite Frac Plug	13,550
14	Composite Frac Plug	13,250
15	Composite Frac Plug	12,950
16	Composite Frac Plug	12,650
17	Composite Frac Plug	12,350
18	Composite Frac Plug	12,050
19	Composite Frac Plug	11,750
20	Composite Frac Plug	11,450
21	Composite Frac Plug	11,150
22	Composite Frac Plug	10,850
23	Composite Frac Plug	10,550
24	Composite Frac Plug	10,250
25	Composite Frac Plug	9,950
26	Composite Frac Plug	9,650
27	Composite Frac Plug	9,350
28	Composite Frac Plug	9,050
29	Composite Frac Plug	8,750
30	Composite Frac Plug	8,450
31	Composite Frac Plug	8,150
32	Composite Frac Plug	7,850
33	Composite Frac Plug	7,550
34	Composite Frac Plug	7,250
	Temporary Bridge Plug	6,500

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Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale	0	472	0	472	
Pittsburgh Coal	472	533	472	533	
Shale and Sandstone	533	656	533	656	
Gas Sand	656	723	656	723	
Shale	723	769	723	769	
1st Salt Sand	769	788	769	788	
Shale	788	906	788	906	
2nd Salt Sand	906	955	906	955	
Shale	955	989	955	989	
Big Lime	989	1105	989	1105	
Big Injun	1105	1150	1105	1150	
Price	1150	1270	1150	1270	
Murrysville	1270	1305	1270	1305	
Shale	1305	1463	1305	1150	
50' Sand	1150	1270	1150	1270	
Shale	1270	1305	1270	1305	
Gordon	1305	1463	1305	1463	
Shale	1463	1720	1463	1720	
Fifth Sand	1720	1910	1720	1910	
Shale	1910	1962	1910	1962	
Speechley Sand	1962	3197	1962	3197	
Shale	3197	4346	3197	4347	
Warren Sand	4346	4366	4347	4633	
Shale	4632	4703	4633	4704	
Java Shale	4703	4797	4704	4900	
Pipe Creek Shale	4899	5496	4900	5497	
Angola Shale	5496	5528	5497	5529	
Rhinstreet	5528	5762	5529	5769	
Cashaqua	5762	5804	5769	5815	
Middlesex	5804	5869	5815	5890	
West River	5869	5895	5890	5920	
Burkett	5895	5897	5920	5923	
Tully Limestone	5897	5899	5923	5925	
Hamilton	5899	5947	5925	5980	
Marcellus	5947	5952	5980	not encountered	Gas
Onondaga	5952	not encoun	not encountered	not encountered	

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Noble Energy

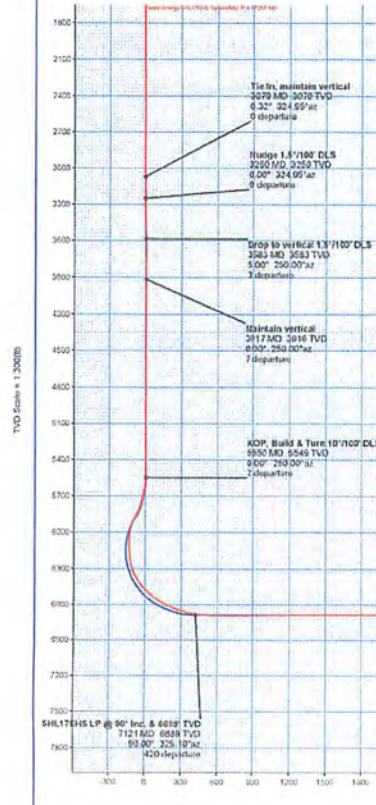
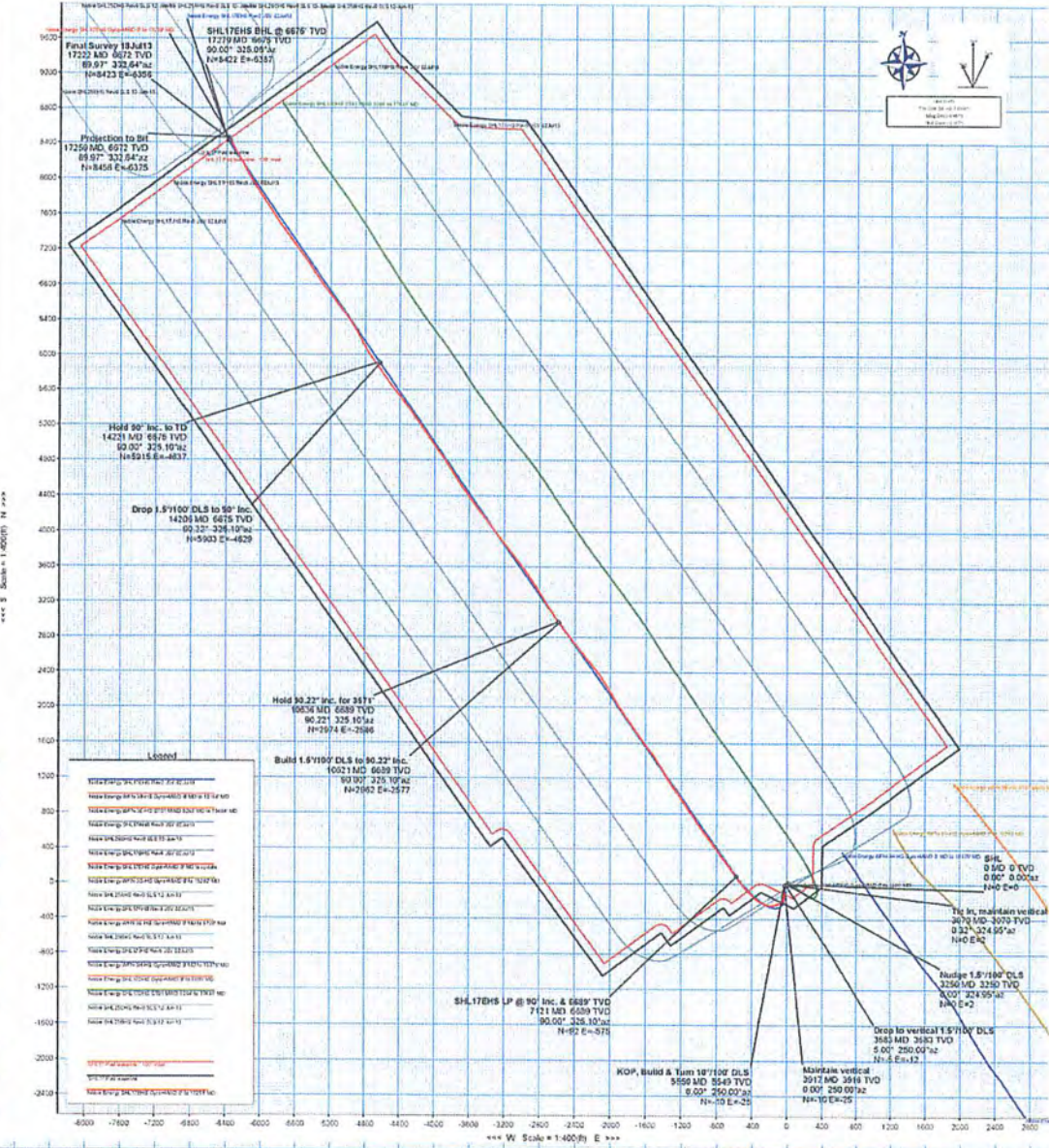


WELL	SHL17EHS	FIELD	WV Marshall County (NAD 27)	YEAR/ISSUE	Precision 543
Original Production	None	Method	Surface	Scale	1:1000
Model	RENM 2013	Date	REV 02 2013	Author	JAN 13 11:00 AM
Drawn By	AD	Checked By	AD	Approved By	AD

Depth	Tool	Remarks
0.00	1.5\"/>	

Station	From	To	Distance	Remarks
1	0+00	0+10	10.00	...

Station	From	To	Distance	Remarks
1	0+00	0+10	10.00	...



03/21/2014

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Noble Energy SHL17EHS Gyro+MWD 0' to 17259' MD Survey Report (Def Survey)

Report Date: July 18, 2012 - 09:00 AM
Client: Noble Energy
Field: WV Marston County (NAD 27)
Structure / Shot: SHL 17EHS
Well: SHL 17EHS
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Noble Energy SHL 17EHS Gyro+MWD 0' to 17259' MD
Survey Dates: July 03, 2012
Tert / AMD / DDI / ERD Rate: 344.475 / 11114.135 R / 6.004 / 1.000
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 30° 58' 38.7730" W 80° 21' 45.7729"
Location Grid N/E Y/X: N 509778 050 818, E 171443 150 818
CRS Grid Convergence Angle: -0.0547°
Grid Scale Factor: 0.9999962
Survey / DLS Computation: Vertical Section Azimuth: 332.825° (0° North)
Vertical Section Origin: 0.000 R, 0.000 H
TVD Reference Datum: KD
TVD Reference Elevation: 1250.500 R above MSL
Seabed / Ground Elevation: 1272.000 R above MSL
Magnetic Declination: -8.507°
Total Gravity Field Strength: 959.35098 m/s (0.85665 Gauss)
Total Magnetic Field Strength: 52193.781 uT
Magnetic Dip Angle: 67.549°
Declination Date: July 03, 2012
Magnetic Declination Model: IIGM 2013
North Reference: Grid North
Grid Convergence Used: -0.0547°
Total Core Mag North+Grid North: -7.8107°
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim Grid (°), TVD (ft), TVDSS (ft), VSEC (ft), NS (ft), EW (ft), DLS (ft/100ft), BR (ft/100ft), TR (ft/100ft), Northing (ft), Easting (ft), Latitude (N/S ° ° ' " ."), Longitude (E/W ° ° ' " ."), Directional Index. The table contains multiple rows of data representing well survey points.

Comments	MDI (°)	Incl (°)	Azim Grd (°)	TVD (m)	TVDSS (m)	VBEC (m)	NS (m)	EW (m)	DL8 (°/100m)	BR (°/100m)	TR (°/100m)	Northmg (m)	Easting (m)	Latitude (N/S)	Longitude (E/W)	Directional Difficulty Index
	6712.00	15 18	176.50	6707.86	4417.48	-17.38	-41.73	-38.30	5.28	1.61	10.78	628726.33	1711418.45	39 58 36.36 W	80 31 47.10 E	3.68
5758.00	19 87	178 81	6749.91	4463.41	-26.41	-54.05	-25.43	10.70	10.08	2.98	536723.11	1711417.72	39 58 38.23 W	80 31 47.00 E	3.67	
5801.00	19 45	179 54	6791.18	4510.82	-35.10	-61.04	-32.93	10.60	9.56	1.80	533726.17	1711418.86	39 58 39.12 W	80 31 42.07 E	3.76	
5840.00	20 00	177 48	6831.70	4541.20	-49.40	-69.19	-23.10	10.41	9.73	4.00	530925.87	1711420.05	39 58 37.85 W	80 31 47.00 E	3.68	
5891.00	33 02	170.02	6870.14	4578.04	-78.54	-115.50	-22.40	10.92	10.23	3.42	529682.50	1711420.75	39 58 37.63 W	80 31 47.04 E	3.99	
5930.00	35 03	183.05	6908.19	4617.05	-87.17	-130.05	-23.21	9.27	-9.93	13.30	530330.31	1711410.94	39 58 37.40 W	80 31 47.05 E	4.08	
5981.00	25 71	104.08	6947.81	4652.31	-111.75	-190.03	-26.75	15.84	-11.84	22.11	530617.53	1711418.40	39 58 37.15 W	80 31 47.03 E	4.14	
6025.00	20 10	208.00	6988.10	4607.60	-120.84	-176.74	-33.07	18.10	-10.27	31.64	530601.23	1711410.08	39 58 37.00 W	80 31 47.17 E	4.25	
6070.00	20 85	210.03	7030.24	4729.74	-128.03	-190.03	-42.00	9.12	-1.20	22.51	530586.04	1711401.15	39 58 36.80 W	80 31 47.28 E	4.30	
6115.00	26 84	226.00	7072.34	4791.83	-126.52	-201.49	-53.00	7.54	4.42	21.27	530578.58	1711390.15	39 58 36.70 W	80 31 47.42 E	4.35	
6160.00	21 29	236.63	6914.34	4823.94	-129.54	-211.28	-53.81	6.49	1.00	17.84	530566.78	1711377.32	39 58 36.68 W	80 31 47.50 E	4.39	
6204.00	22 22	230.51	6155.20	4804.70	-127.07	-210.80	-70.67	3.22	2.11	0.55	530558.17	1711363.40	39 58 36.60 W	80 31 47.70 E	4.42	
6246.00	24 80	246.17	6196.47	4806.97	-123.20	-228.02	-55.94	8.72	9.79	14.80	530550.04	1711347.91	39 58 36.51 W	80 31 47.87 E	4.47	
6294.00	25 43	251.19	6237.70	4840.20	-119.24	-235.20	-114.42	0.48	0.07	11.18	530542.77	1711328.73	39 58 36.40 W	80 31 48.21 E	4.51	
6335.00	32 16	254.04	6275.56	4865.96	-110.07	-241.40	-136.24	10.49	8.29	12.76	530538.61	1711300.01	39 58 36.30 W	80 31 48.40 E	4.56	
6384.00	35.00	265.52	6313.04	5022.54	-108.18	-245.16	-100.82	12.39	6.51	10.07	530532.69	1711282.23	39 58 36.34 W	80 31 48.80 E	4.62	
6438.00	37 85	273.43	6348.42	5057.82	-82.46	-245.20	-188.05	12.97	6.60	18.80	530532.80	1711260.20	39 58 36.28 W	80 31 48.14 E	4.67	
6473.00	38 29	282.12	6383.50	5093.00	-82.46	-241.42	-214.84	12.97	3.03	18.42	530538.75	1711228.32	39 58 36.23 W	80 31 48.00 E	4.72	
6518.00	42 27	290.02	6417.48	5129.06	-30.32	-233.11	-243.14	12.83	5.67	17.56	530534.96	1711200.07	39 58 36.45 W	80 31 48.03 E	4.77	
6560.00	44 77	297.37	6450.13	5160.83	-11.77	-220.63	-271.45	12.54	5.60	10.33	530557.43	1711171.71	39 58 36.57 W	80 31 48.23 E	4.82	
6607.00	47 68	301.40	6480.52	5190.22	17.43	-204.08	-260.14	0.79	7.07	9.36	530573.00	1711144.02	39 58 36.72 W	80 31 48.08 E	4.86	
6652.00	50 02	305.50	6510.08	5219.58	48.48	-186.10	-327.35	0.70	4.70	0.80	530591.92	1711115.81	39 58 36.90 W	80 31 48.05 E	4.90	
6697.00	52 03	309.79	6536.11	5247.81	83.49	-164.53	-385.12	0.30	6.47	8.64	530613.53	1711088.04	39 58 37.11 W	80 31 51.31 E	4.94	
6741.00	56 90	312.15	6563.36	5272.89	118.73	-140.91	-392.30	10.18	9.10	5.36	530637.18	1711060.87	39 58 37.34 W	80 31 51.60 E	4.98	
6785.00	60 43	314.28	6586.76	5302.11	168.83	-114.56	-410.29	8.80	7.71	4.06	530663.90	1710332.89	39 58 37.68 W	80 31 52.05 E	5.02	
6831.00	63 28	317.41	6607.90	5317.40	196.01	-96.00	-437.68	8.68	6.33	8.73	530692.00	1710059.29	39 58 37.89 W	80 31 52.38 E	5.00	
6878.00	67 43	318.37	6626.76	5330.26	238.76	-55.72	-465.20	9.42	9.22	2.13	530722.31	1710977.88	39 58 38.17 W	80 31 52.70 E	5.10	
6926.00	70 46	319.15	6642.56	5352.08	277.71	-24.85	-492.30	7.66	0.89	1.77	530763.21	1710800.81	39 58 38.46 W	80 31 53.08 E	5.13	
6975.00	72 19	321.03	6665.07	5365.47	320.29	7.88	-519.03	5.66	2.84	4.24	530785.81	1710923.45	39 58 38.89 W	80 31 48.24 E	5.16	
7016.00	75 07	322.19	6689.42	5378.52	303.51	41.75	-548.53	8.10	7.79	2.51	530819.81	1710959.64	39 58 39.13 W	80 31 53.80 E	5.19	
7055.00	76 20	324.84	6678.16	5389.68	407.43	77.02	-572.70	9.04	8.04	5.44	530855.08	1710870.47	39 58 39.47 W	80 31 54.14 E	5.23	
7105.00	83 77	326.89	6688.19	5395.89	451.83	113.85	-598.02	8.21	7.73	2.78	530891.60	1710843.15	39 58 39.83 W	80 31 54.47 E	5.28	
7144.00	84 49	324.00	6690.31	5405.58	500.00	146.00	-622.00	8.70	8.48	-2.29	530927.05	1710820.28	39 58 40.19 W	80 31 54.70 E	5.20	
7200.00	88 00	326.02	6692.56	5402.08	551.50	195.41	-650.02	4.31	4.30	0.21	530973.45	1710788.16	39 58 40.84 W	80 31 56.21 E	5.32	
7245.00	89 21	324.81	6693.30	5402.80	598.46	232.16	-680.05	1.14	0.69	-0.81	540010.23	1710762.23	39 58 41.00 W	80 31 55.05 E	5.35	
7334.00	90 70	323.90	6694.08	5403.58	685.43	374.30	-733.09	1.25	0.05	-1.07	540092.34	1710740.60	39 58 41.70 W	80 31 58.23 E	5.30	
7424.00	89 23	323.02	6693.76	5403.28	775.42	370.82	-780.25	0.97	0.62	0.29	540154.90	1710508.93	39 58 42.41 W	80 31 68.03 E	5.43	
7514.00	90 07	322.00	6693.06	5402.68	808.41	440.21	-839.85	1.11	-0.30	-1.04	540227.25	1710803.34	39 58 43.12 W	80 31 67.03 E	5.46	
7604.00	91 03	324.14	6693.02	5401.66	894.40	520.81	-882.71	1.00	0.89	1.30	540298.84	1710529.48	39 58 43.83 W	80 31 66.32 E	5.90	
7694.00	90 43	324.16	6693.65	5402.11	943.39	604.37	-940.21	0.87	0.92	0.30	540370.87	1710460.70	39 58 44.53 W	80 31 66.00 E	5.53	
7784.00	90 83	324.80	6693.71	5399.21	1133.32	696.23	-997.05	0.94	0.46	0.82	540444.26	1710440.14	39 58 45.25 W	80 31 59.68 E	5.95	
7874.00	91 03	327.82	6698.18	5397.88	1222.14	740.18	-1046.53	2.95	0.11	2.94	540518.20	1710388.98	39 58 45.97 W	80 32 0.32 E	5.60	
7964.00	90 24	326.60	6697.67	5397.17	1311.96	815.05	-1085.60	3.13	-1.87	-2.71	540563.87	1710248.70	39 58 46.71 W	80 32 0.88 E	5.63	
8054.00	90 50	325.57	6697.71	5396.47	1400.88	888.24	-1147.10	0.98	0.81	0.50	540626.60	1710298.10	39 58 47.43 W	80 32 1.64 E	5.65	
8144.00	90 82	326.15	6697.80	5395.73	1489.76	961.80	-1187.05	1.22	-1.03	0.65	540739.91	1710246.16	39 58 48.18 W	80 32 2.29 E	5.68	
8234.00	89 40	324.72	6698.43	5397.07	1579.83	1038.01	-1248.10	1.68	0.63	-1.50	540814.02	1710195.10	39 58 48.87 W	80 32 2.98 E	5.71	
8324.00	90 31	329.79	6698.20	5397.78	1669.83	1109.88	-1298.18	2.37	0.46	2.33	540887.58	1710145.02	39 58 49.60 W	80 32 3.61 E	5.74	
8414.00	90 34	329.14	6697.78	5397.26	1757.17	1189.02	-1349.39	2.04	0.03	2.94	540963.92	1710097.82	39 58 50.34 W	80 32 4.23 E	5.77	
8467.00	90 17	332.25	6697.30	5396.86	1840.33	1263.40	-1399.43	3.40	-0.19	3.48	541041.49	1710053.77	39 58 51.11 W	80 32 4.61 E	5.79	
8560.00	90 38	329.81	6696.93	5396.43	1934.41	1341.27	-1432.67	2.98	0.24	-2.87	541119.27	1710000.84	39 58 51.87 W	80 32 4.87 E	5.82	
8676.00	90 52	325.44	6696.22	5395.72	2024.09	1417.18	-1480.99	4.14	0.18	-4.03	541195.17	1709962.23	39 58 52.61 W	80 32 5.00 E	5.85	
8766.00	90 60	323.86	6696.62	5395.32	2113.04	1489.83	-1532.08	2.99	-0.86	-2.11	541267.02	1709910.55	39 58 53.32 W	80 32 6.88 E	5.87	
8856.00	89 90	321.47	6696.90	5395.40	2203.04	1560.18	-1580.18	0.15	-0.11	-0.11	541339.98	1709887.04	39 58 54.03 W	80 32 7.38 E	5.80	
8946.00	90 34	321.00	6696.59	5395.21	2293.26	1633.78	-1633.78	0.66	0.56	0.84	541413.74	1709864.40	39 58 54.74 W	80 32 8.06 E	5.81	
9034.00	89 87	324.26	6696.47	5395.07	2383.67	1701.03	-1684.69	0.81	0.41	0.30	541488.68	1709841.69	39 58 55.45 W	80 32 8.76 E	5.82	
9123.00	89 79	326.16	6696.65	5395.15	2473.85	1779.35	-1742.94	1.01	-0.20	0.99	541567.33	1709820.29	39 58 56.16 W	80 32 9.42 E	5.85	
9213.00	89 90	325.04	6696.90	5395.40	2564.25	1853.36	-1794.43	0.18	0.12	-0.13	541643.14	1709848.80	39 58 56.89 W			

51-01603

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVD98 (ft)	VSEC (ft)	N8 (ft)	EW (ft)	DL8 (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Nothing (ft/ft)	Easting (ft/ft)	Latitude (N/S ° ° ' '')	Longitude (E/W ° ° ' '')	Directional Difficulty Index
	14590.00	90.21	331.48	6678.98	6368.18	7027.01	6246.85	-4892.83	1.83	-0.38	-1.70	540024.84	1700500.53	N 39 50 38.95 W	80 32 50.42	8.76
	14690.00	90.45	327.68	6670.16	6365.60	6017.20	6224.44	-4938.39	4.23	0.27	-4.22	545102.23	1700514.07	N 39 50 40.71 W	80 32 51.02	8.76
	14790.00	90.41	325.02	6675.49	6364.90	6106.06	6308.52	-4917.70	2.60	-0.04	-2.56	540176.31	1700465.69	N 39 50 41.44 W	80 32 51.87	8.77
	14889.00	89.89	321.32	6675.23	6364.72	6196.07	6470.55	-5031.64	4.15	-0.53	-4.11	546248.33	1700411.72	N 39 50 42.14 W	80 32 52.37	8.76
	14948.00	90.17	321.58	6675.15	6364.65	6285.04	6540.15	-5051.10	0.40	0.20	0.20	546317.33	1700356.20	N 39 50 42.83 W	80 32 53.09	8.78
	15038.00	90.14	320.06	6674.90	6364.40	6375.03	6611.30	-5142.12	1.84	-0.03	1.04	546380.15	1700301.26	N 39 50 43.53 W	80 32 53.81	8.80
	15127.00	90.00	321.08	6674.80	6364.30	6484.03	6682.00	-5180.27	1.22	-0.10	-1.21	546459.77	1700247.10	N 39 50 44.21 W	80 32 54.62	8.81
	15217.00	100.03	322.22	6674.77	6364.27	6564.02	6763.02	-5251.88	0.27	0.03	0.27	546330.70	1700191.82	N 39 50 44.91 W	80 32 55.24	8.81
	15308.00	90.34	324.20	6674.46	6363.98	6643.02	6824.29	-5304.85	2.28	0.36	2.22	546002.00	1700136.52	N 39 50 45.61 W	80 32 55.93	8.82
	15398.00	90.03	325.42	6674.10	6363.60	6732.04	6907.84	-5355.77	1.40	-0.34	1.36	546076.00	1700080.88	N 39 50 46.33 W	80 32 56.61	8.83
	15485.00	90.07	326.47	6674.12	6363.02	6821.83	6971.56	-5406.56	1.18	0.04	1.18	546749.34	1700030.82	N 39 50 47.05 W	80 32 57.26	8.84
	15575.00	90.41	325.26	6673.74	6363.24	6911.70	7048.07	-5457.06	1.40	0.28	-1.34	546823.83	1700980.32	N 39 50 47.76 W	80 32 57.92	8.85
	15665.00	90.21	323.02	6673.25	6362.75	7001.60	7119.26	-5509.20	1.84	-0.22	-1.82	546697.03	1700930.08	N 39 50 48.50 W	80 32 58.80	8.86
	15754.00	90.10	323.05	6673.01	6362.51	6950.65	7100.87	-5562.54	0.65	-0.12	-0.64	546568.42	1700880.85	N 39 50 49.20 W	80 32 59.30	8.88
	15844.00	80.00	323.02	6673.01	6362.51	6910.65	7282.88	-5618.28	0.67	-0.22	0.03	547040.61	1700827.11	N 39 50 49.91 W	80 33 0.00	8.87
	16033.00	80.14	323.07	6672.98	6362.46	6269.64	7334.88	-5680.85	0.46	0.27	0.26	547112.64	1700774.64	N 39 50 50.61 W	80 33 0.99	8.88
	16023.00	90.03	323.03	6672.85	6362.35	6358.82	7407.26	-5722.07	0.50	-0.49	0.47	547188.00	1700721.32	N 39 50 51.33 W	80 33 1.36	8.89
	16112.00	90.17	326.17	6672.89	6362.10	6448.69	7479.58	-5773.04	1.85	0.16	1.84	547257.51	1700669.46	N 39 50 52.03 W	80 33 2.00	8.89
	16202.00	90.31	327.01	6672.31	6361.81	6538.44	7542.20	-5824.15	2.05	0.16	2.04	547332.00	1700619.28	N 39 50 52.76 W	80 33 2.71	8.90
	16291.00	89.83	326.78	6672.21	6361.71	6627.21	7628.82	-5876.78	0.80	-0.54	-0.26	547406.55	1700570.64	N 39 50 53.49 W	80 33 3.35	8.91
	16380.00	80.24	326.60	6672.15	6361.60	6710.05	7702.76	-5922.28	1.40	0.46	-1.33	547480.49	1700521.12	N 39 50 54.22 W	80 33 4.00	8.92
	16470.00	89.76	326.60	6672.16	6361.05	6805.88	7777.02	-6073.13	0.63	-0.53	-0.01	547554.76	1700470.27	N 39 50 54.95 W	80 33 4.86	8.92
	16560.00	90.31	326.34	6672.10	6361.00	6894.82	7850.77	-6022.94	1.05	0.82	0.84	547628.50	1700420.46	N 39 50 55.07 W	80 33 5.31	8.93
	16649.00	90.28	326.05	6671.83	6361.13	6954.62	7925.06	-6072.43	0.86	-0.03	0.68	547703.67	1700370.38	N 39 50 56.41 W	80 33 5.96	8.94
	16740.00	90.10	326.18	6671.33	6360.83	10075.15	8003.57	-6119.80	1.53	-0.20	3.53	547781.50	1700320.52	N 39 50 57.17 W	80 33 6.58	8.95
	16830.00	89.73	332.38	6671.46	6360.96	10103.18	8081.60	-6162.60	2.51	-0.42	2.47	547859.32	1700280.78	N 39 50 57.93 W	80 33 7.14	8.90
	16919.00	90.07	330.11	6671.88	6361.12	10252.21	8100.49	-6205.88	2.53	0.38	-2.50	547938.20	1700237.42	N 39 50 58.71 W	80 33 7.71	8.97
	17008.00	90.00	329.25	6671.57	6361.07	10340.87	8237.32	-6250.92	0.97	-0.06	-0.97	548015.02	1700192.49	N 39 50 59.49 W	80 33 8.20	8.97
	17098.00	89.93	329.01	6671.02	6361.12	10430.03	8314.57	-6287.10	0.28	-0.08	-0.27	548092.27	1700140.32	N 40 0 0.22 W	80 33 8.90	8.98
	17188.00	89.06	331.58	6671.76	6361.26	10519.26	8392.72	-6341.71	2.82	-0.03	2.82	548170.42	1700101.70	N 40 0 0.26 W	80 33 9.40	8.98
First Survey 18.Jul.13	17222.00	89.07	332.04	6671.79	6361.26	10552.81	8472.77	-6357.83	3.21	0.21	3.21	548200.47	1700065.70	N 40 0 1.28 W	80 33 9.70	8.90
Production to Bit	17250.00	89.07	332.04	6671.81	6361.31	10560.27	8456.83	-6374.63	0.00	0.00	0.00	548233.33	1700068.70	N 40 0 1.61 W	80 33 9.92	8.99

Survey Type: Def Survey

Survey Error Model: ISOWSA Rev 0 *** 3-D 0% 000%, Confidence 2.7855 sigma

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	18.600		Act Strs	30.000	30.000	61.0_NSG+MSH+NOT-Depth Only
	18.500	3070.000		Act Strs	30.000	30.000	61.0_NSG+MSH+NOT
	3070.000	3209.000		Act Strs	30.000	30.000	61.0_NSG+MSH+NOT
	3209.000	17222.000		Act Strs	30.000	30.000	61.0_NSG+MSH+NOT
	17222.000	17280.000		Act Strs	30.000	30.000	61.0_NSG+MSH+NOT

05/27/2014