



Actual Wellpath Report

PEN-20H-HS AWP Proj: 13272'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot H
Area	Richie County, WV	Well	PEN-20H-HS
Field	Richie	Wellbore	PEN-20H-HS AWB
Facility	PEN-20 Pad		

REPORT SETUP INFORMATION			
Projection System	NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet	Software System	WellArchiect® 4.0.1
North Reference	Grid	User	Goffbral
Scale	0.999954	Report Generated	10/16/2014 at 9:23:15 AM
Convergence at slot	0.97° West	Database/Source file	WANorthEast/PEN-20H-HS_AWB.xml

WELLPATH LOCATION							
	Local coordinates			Grid coordinates		Geographic coordinates	
	North [ft]	East [ft]	Easting [US ft]	Northing [US ft]	Latitude	Longitude	
Slot Location	-95.00	102.79	1568308.59	305180.58	39°19'40.202"N	81°01'33.978"W	
Facility Reference Pt			1568205.80	305275.58	39°19'41.124"N	81°01'35.306"W	
Field Reference Pt			0.00	0.00	38°17'12.460"N	86°28'23.077"W	

WELLPATH DATUM			
Calculation method	Minimum curvature	Nomac 78 (RKB) to Facility Vertical Datum	
Horizontal Reference Pt	Slot	Nomac 78 (RKB) to Mean Sea Level	
Vertical Reference Pt	Nomac 78 (RKB)	Nomac 78 (RKB) to Mud Line at Slot (Slot H)	
MD Reference Pt	Nomac 78 (RKB)	Section Origin	
Field Vertical Reference	Mean Sea Level	Section Azimuth	
			1055.00ft
			1055.00ft
			26.00ft
			N 0.00, E 0.00 ft
			140.00°

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PEN-20H-HIS AWP Proj: 13272'

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REFERENCE WELLPATH IDENTIFICATION		Slot H
Operator	NOBLE ENERGY	PEN-20H-HIS
Area	Ritchie County, WV	PEN-20H-HIS AWB
Field	Ritchie	
Facility	PEN-20 Pad	

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS P/[100ft]
0.00	0.000	237.780	0.00	0.00	0.00	0.00	1568308.59	305180.58	39°19'40.202"N	81°01'33.978"W	0.00	0.000	0.00
26.00	0.000	237.780	26.00	0.00	0.00	0.00	1568308.59	305180.58	39°19'40.202"N	81°01'33.978"W	0.00	0.000	0.00
100.00	0.280	237.780	100.00	-0.02	-0.10	-0.15	1568308.44	305180.48	39°19'40.201"N	81°01'33.980"W	0.18	237.780	0.38
200.00	0.050	234.210	200.00	-0.06	-0.25	-0.40	1568308.19	305180.33	39°19'40.200"N	81°01'33.983"W	0.47	237.448	0.23
300.00	0.020	222.540	300.00	-0.06	-0.29	-0.44	1568308.15	305180.29	39°19'40.199"N	81°01'33.984"W	0.53	236.695	0.03
400.00	0.070	289.580	400.00	-0.11	-0.28	-0.51	1568308.08	305180.30	39°19'40.200"N	81°01'33.984"W	0.58	241.054	0.06
500.00	0.100	292.790	500.00	-0.24	-0.23	-0.65	1568307.94	305180.35	39°19'40.200"N	81°01'33.986"W	0.69	250.606	0.03
600.00	0.070	200.610	600.00	-0.29	-0.25	-0.75	1568307.84	305180.33	39°19'40.200"N	81°01'33.987"W	0.79	251.460	0.12
700.00	0.140	192.260	700.00	-0.19	-0.43	-0.80	1568307.79	305180.15	39°19'40.198"N	81°01'33.988"W	0.91	241.790	0.07
800.00	0.090	69.650	800.00	-0.08	-0.52	-0.75	1568307.84	305180.06	39°19'40.197"N	81°01'33.987"W	0.91	235.277	0.20
900.00	0.210	91.580	900.00	0.06	-0.50	-0.49	1568308.10	305180.08	39°19'40.197"N	81°01'33.984"W	0.70	224.774	0.13
1000.00	0.290	100.240	1000.00	0.38	-0.55	-0.06	1568308.53	305180.03	39°19'40.197"N	81°01'33.979"W	0.55	186.479	0.09
1100.00	0.290	98.380	1100.00	0.76	-0.63	0.44	1568309.03	305179.95	39°19'40.196"N	81°01'33.972"W	0.77	145.261	0.01
1200.00	0.250	47.680	1200.00	0.94	-0.52	0.85	1568309.44	305180.06	39°19'40.197"N	81°01'33.967"W	1.00	121.510	0.23
1300.00	0.420	51.640	1299.99	0.95	-0.15	1.30	1568309.89	305180.43	39°19'40.201"N	81°01'33.961"W	1.31	96.421	0.17
1400.00	0.460	65.080	1399.99	1.06	0.25	1.95	1568310.54	305180.83	39°19'40.205"N	81°01'33.953"W	1.96	82.673	0.11
1500.00	0.460	52.980	1499.99	1.19	0.66	2.63	1568311.22	305181.24	39°19'40.209"N	81°01'33.945"W	2.72	75.901	0.10
1600.00	0.410	74.170	1599.98	1.35	1.00	3.30	1568311.89	305181.58	39°19'40.213"N	81°01'33.936"W	3.45	73.122	0.17
1700.00	0.300	79.550	1699.98	1.63	1.15	3.90	1568312.49	305181.73	39°19'40.214"N	81°01'33.929"W	4.06	73.627	0.11
1800.00	0.280	93.290	1799.98	1.93	1.18	4.40	1568312.99	305181.76	39°19'40.215"N	81°01'33.922"W	4.56	75.001	0.07
1900.00	0.450	95.450	1899.98	2.37	1.13	5.04	1568313.63	305181.71	39°19'40.214"N	81°01'33.914"W	5.16	77.376	0.17
2000.00	0.280	108.420	1999.98	2.86	1.01	5.66	1568314.25	305181.59	39°19'40.213"N	81°01'33.906"W	5.75	79.847	0.19
2100.00	0.300	134.300	2099.98	3.33	0.75	6.08	1568314.67	305181.33	39°19'40.211"N	81°01'33.901"W	6.12	82.934	0.13
2200.00	0.130	101.390	2199.98	3.68	0.55	6.38	1568314.97	305181.13	39°19'40.209"N	81°01'33.897"W	6.40	85.087	0.20
2300.00	0.180	66.700	2299.97	3.81	0.59	6.63	1568315.22	305181.17	39°19'40.209"N	81°01'33.894"W	6.66	84.935	0.10
2400.00	0.130	61.060	2399.97	3.88	0.70	6.88	1568315.47	305181.28	39°19'40.211"N	81°01'33.891"W	6.91	84.147	0.05
2500.00	0.070	32.230	2499.97	3.88	0.81	7.01	1568315.60	305181.39	39°19'40.212"N	81°01'33.889"W	7.05	83.395	0.08
2600.00	0.040	225.120	2599.97	3.87	0.84	7.02	1568315.61	305181.42	39°19'40.212"N	81°01'33.889"W	7.07	83.184	0.11
2700.00	0.130	136.070	2699.97	3.98	0.73	7.07	1568315.66	305181.31	39°19'40.211"N	81°01'33.888"W	7.11	84.087	0.14
2800.00	0.170	185.750	2799.97	4.20	0.50	7.13	1568315.72	305181.08	39°19'40.209"N	81°01'33.887"W	7.15	85.968	0.13

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Operator	NOBLE ENERGY	Slot	Slot H
Area	Ritchie County, WV	Well	PEN-20H-HIS
Field	Ritchie	Wellbore	PEN-20H-HIS AWB
Facility	PEN-20 Pad		

WELLPATH DATA (139 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [ft/100ft]
2900.00	0.150	216.150	2899.97	4.33	0.25	7.04	1568315.63	305180.83	39°19'40.206"N	81°01'33.888"W	7.05	87.970	0.09
3000.00	0.190	201.560	2999.97	4.45	-0.01	6.90	1568315.49	305180.57	39°19'40.203"N	81°01'33.890"W	6.90	90.086	0.06
3100.00	0.270	165.370	3099.97	4.74	-0.39	6.00	1568315.49	305180.19	39°19'40.200"N	81°01'33.890"W	6.91	93.255	0.16
3200.00	0.260	159.560	3199.97	5.16	-0.83	7.04	1568315.63	305179.75	39°19'40.195"N	81°01'33.888"W	7.09	96.749	0.03
3300.00	0.190	135.510	3299.97	5.54	-1.16	7.24	1568315.83	305179.42	39°19'40.192"N	81°01'33.886"W	7.33	99.139	0.12
3400.00	0.230	114.340	3399.97	5.89	-1.37	7.53	1568316.12	305179.22	39°19'40.190"N	81°01'33.882"W	7.66	100.268	0.09
3500.00	0.200	109.670	3499.97	6.22	-1.51	7.88	1568316.47	305179.07	39°19'40.189"N	81°01'33.877"W	8.02	100.830	0.03
3600.00	0.300	110.040	3599.97	6.60	-1.65	8.29	1568316.88	305178.93	39°19'40.187"N	81°01'33.872"W	8.46	101.286	0.10
3700.00	0.290	109.000	3699.97	7.04	-1.83	8.78	1568317.37	305178.75	39°19'40.186"N	81°01'33.866"W	8.97	101.758	0.01
3800.00	0.250	119.040	3799.97	7.46	-2.02	9.21	1568317.80	305178.56	39°19'40.184"N	81°01'33.860"W	9.43	102.346	0.06
3900.00	0.170	70.120	3899.97	7.72	-2.07	9.54	1568318.13	305178.51	39°19'40.184"N	81°01'33.856"W	9.76	102.250	0.19
4000.00	0.110	143.420	3999.96	7.86	-2.01	9.73	1568318.32	305178.48	39°19'40.183"N	81°01'33.854"W	9.96	102.159	0.17
4100.00	0.110	63.630	4099.96	7.98	-2.13	9.88	1568318.47	305178.45	39°19'40.183"N	81°01'33.852"W	10.11	102.179	0.14
4200.00	0.240	111.730	4199.96	7.88	-1.88	10.01	1568318.60	305178.70	39°19'40.185"N	81°01'33.850"W	10.18	100.664	0.19
4300.00	0.270	355.490	4299.96	7.55	-1.44	10.03	1568318.62	305179.14	39°19'40.190"N	81°01'33.850"W	10.13	98.193	0.08
4400.00	0.300	341.790	4399.96	7.12	-0.96	9.93	1568318.52	305179.62	39°19'40.195"N	81°01'33.851"W	9.98	95.526	0.07
4500.00	0.410	332.490	4499.96	6.53	-0.39	9.68	1568318.27	305180.19	39°19'40.200"N	81°01'33.855"W	9.69	92.334	0.12
4600.00	0.500	326.580	4599.96	5.74	0.29	9.28	1568317.87	305180.87	39°19'40.207"N	81°01'33.860"W	9.28	88.229	0.10
4700.00	0.580	324.280	4699.95	4.81	1.06	8.74	1568317.33	305181.64	39°19'40.214"N	81°01'33.867"W	8.81	83.073	0.08
4800.00	0.840	323.300	4799.94	3.57	2.06	8.01	1568316.60	305182.64	39°19'40.224"N	81°01'33.877"W	8.27	75.570	0.26
4900.00	0.920	326.870	4899.93	2.04	3.32	7.13	1568315.72	305183.90	39°19'40.236"N	81°01'33.888"W	7.87	65.031	0.10
5000.00	1.110	322.690	4999.92	0.28	4.76	6.11	1568314.70	305185.34	39°19'40.250"N	81°01'33.901"W	7.74	52.039	0.20
5100.00	1.170	322.000	5099.90	-1.71	6.34	4.89	1568313.48	305186.92	39°19'40.266"N	81°01'33.917"W	8.01	37.649	0.06
5200.00	0.280	331.330	5279.88	-3.98	8.17	3.55	1568312.14	305188.75	39°19'40.284"N	81°01'33.935"W	8.91	23.464	0.50
5375.00	7.890	58.930	5374.58	-3.19	11.75	9.03	1568317.62	305192.33	39°19'40.320"N	81°01'33.866"W	14.82	37.549	8.30
5471.00	13.640	63.480	5468.85	0.47	20.21	24.82	1568333.40	305200.79	39°19'40.406"N	81°01'33.667"W	32.00	50.842	6.05
5566.00	17.110	69.700	5560.45	7.79	30.06	47.95	1568356.54	305210.64	39°19'40.508"N	81°01'33.374"W	56.60	57.916	4.04
5662.00	22.410	72.370	5650.76	19.53	40.51	78.66	1568387.25	305221.09	39°19'40.616"N	81°01'32.986"W	88.48	62.751	5.60
5758.00	27.530	83.450	5737.81	38.75	48.59	118.19	1568426.77	305229.17	39°19'40.702"N	81°01'32.485"W	127.79	67.650	7.20
5853.00	31.210	83.870	5820.59	65.28	52.87	164.57	1568473.15	305233.45	39°19'40.753"N	81°01'31.895"W	172.85	72.189	4.07

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot H
Area	Ritchie County, WV	Well	PEN-201H-HS
Field	Ritchie	Wellbore	PEN-201H-HS AWB
Facility	PEN-20 Pad		

WELLPATH DATA (139 stations)

MID [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sec [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS P/[100ft]
5949.00	33.880	95.640	5901.56	99.01	52.03	216.05	1568524.63	305232.61	39°19'40.753"N	81°01'31.240"W	222.23	76.459	6.13
6043.00	42.320	106.310	5975.55	144.21	40.54	272.66	1568581.23	305221.12	39°19'40.649"N	81°01'30.518"W	275.65	81.543	11.36
6139.00	53.080	114.140	6040.12	205.86	15.68	338.94	1568647.52	305196.25	39°19'40.414"N	81°01'29.669"W	339.31	87.332	12.71
6235.00	61.160	120.100	6092.22	280.10	-21.19	410.50	1568719.07	305159.39	39°19'40.062"N	81°01'28.750"W	411.05	92.955	9.90
6330.00	64.760	121.250	6135.40	359.94	-64.36	483.26	1568791.83	305116.22	39°19'39.647"N	81°01'27.815"W	487.53	97.586	3.94
6426.00	69.840	123.740	6172.44	444.37	-111.95	557.91	1568866.47	305068.64	39°19'39.190"N	81°01'26.855"W	569.03	101.346	5.81
6521.00	75.540	131.650	6200.74	532.89	-167.41	629.52	1568938.08	305013.18	39°19'38.654"N	81°01'25.932"W	651.40	104.892	9.96
6617.00	82.100	141.710	6219.39	626.73	-235.86	693.94	1569002.49	304944.73	39°19'37.988"N	81°01'25.098"W	732.92	108.772	12.34
6712.00	88.800	143.210	6226.92	721.29	-310.91	751.60	1569060.15	304869.69	39°19'37.256"N	81°01'24.348"W	813.37	112.473	7.23
6808.00	88.860	142.550	6228.88	817.15	-387.44	809.52	1569118.07	304793.16	39°19'36.509"N	81°01'23.594"W	897.46	115.576	0.69
6903.00	88.280	141.310	6231.25	912.06	-462.21	868.08	1569176.63	304718.40	39°19'35.780"N	81°01'22.833"W	983.46	118.033	1.44
6999.00	88.280	140.200	6234.13	1008.01	-536.52	928.79	1569237.33	304644.09	39°19'35.056"N	81°01'22.045"W	1072.61	120.013	1.16
7094.00	89.320	140.040	6236.12	1102.99	-609.40	989.68	1569298.23	304571.21	39°19'34.346"N	81°01'21.254"W	1162.26	121.623	1.11
7189.00	90.400	139.450	6236.36	1197.98	-681.90	1051.07	1569359.61	304498.71	39°19'33.640"N	81°01'20.458"W	1252.89	122.974	1.30
7285.00	90.340	141.800	6235.74	1293.97	-756.10	1117.97	1569420.50	304424.51	39°19'32.917"N	81°01'19.667"W	1344.68	124.215	2.45
7380.00	89.940	141.700	6235.50	1388.92	-830.71	1170.78	1569479.32	304349.91	39°19'32.189"N	81°01'18.902"W	1435.55	125.337	0.43
7476.00	89.510	139.090	6235.96	1484.91	-904.67	1231.97	1569540.51	304275.96	39°19'31.469"N	81°01'18.108"W	1528.46	126.291	2.76
7571.00	89.350	139.240	6236.91	1579.90	-976.54	1294.09	1569602.62	304204.09	39°19'30.769"N	81°01'17.302"W	1621.20	127.039	0.23
7666.00	88.770	138.200	6238.47	1674.86	-1047.92	1356.76	1569665.18	304132.71	39°19'30.074"N	81°01'16.489"W	1714.33	127.682	1.25
7760.00	88.950	141.080	6240.34	1768.83	-1119.53	1417.61	1569726.13	304061.11	39°19'29.377"N	81°01'15.700"W	1806.37	128.299	3.07
7855.00	89.940	145.080	6241.26	1863.67	-1195.46	1474.66	1569783.18	303985.18	39°19'28.636"N	81°01'14.957"W	1898.35	129.030	4.34
7949.00	89.850	144.600	6241.43	1957.33	-1272.31	1528.79	1569837.31	303908.34	39°19'27.885"N	81°01'14.252"W	1988.96	129.768	0.52
8045.00	89.940	142.620	6241.61	2053.14	-1349.58	1585.74	1569894.26	303831.06	39°19'27.131"N	81°01'13.511"W	2082.29	130.400	2.06
8139.00	90.000	143.380	6241.66	2147.01	-1424.65	1642.31	1569950.83	303756.00	39°19'26.399"N	81°01'12.775"W	2174.13	130.941	0.81
8233.00	90.220	142.440	6241.48	2240.88	-1499.63	1699.00	1570007.51	303681.02	39°19'25.667"N	81°01'12.038"W	2266.17	131.433	1.03
8327.00	90.180	139.760	6241.15	2334.86	-1572.78	1758.02	1570066.51	303607.87	39°19'24.954"N	81°01'11.271"W	2358.88	131.817	2.85
8422.00	89.480	141.290	6241.43	2429.85	-1646.11	1818.42	1570126.92	303534.55	39°19'24.240"N	81°01'10.487"W	2452.82	132.153	1.72
8516.00	89.720	139.410	6242.09	2523.84	-1718.48	1878.39	1570186.89	303462.18	39°19'23.535"N	81°01'09.708"W	2545.89	132.454	2.02
8611.00	90.340	135.250	6242.04	2618.72	-1788.32	1942.77	1570251.27	303392.35	39°19'22.855"N	81°01'08.874"W	2640.53	132.630	4.43
8705.00	89.850	132.490	6241.88	2712.17	-1853.45	2010.53	1570319.02	303327.22	39°19'22.223"N	81°01'07.998"W	2734.50	132.672	2.98

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REFERENCE WELLPATH IDENTIFICATION		Slot	Slot H
Operator	NOBLE ENERGY	Well	PEN-20H-HIS
Area	Ritchie County, WV	Wellbore	PEN-20H-HIS AWB
Field	Ritchie		
Facility	PEN-20 Pad		

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS P/[ft] [ft]
8801.00	89.910	133.300	6242.08	2807.43	-1918.80	2080.86	1570389.35	303261.88	39°19'21.589"N	81°01'07.089"W	2830.50	132.680	0.85
8895.00	89.850	135.240	6242.28	2900.36	-1984.41	2148.16	1570456.65	303196.27	39°19'20.952"N	81°01'06.219"W	2924.46	132.731	2.06
8990.00	90.250	139.760	6242.20	2995.84	-2054.43	2212.33	1570520.81	303126.25	39°19'20.270"N	81°01'05.387"W	3019.12	132.881	4.78
9085.00	90.090	143.290	6241.91	3090.79	-2128.79	2271.42	1570579.91	303051.89	39°19'19.545"N	81°01'04.620"W	3113.06	133.143	3.72
9180.00	90.090	142.390	6241.76	3185.67	-2204.50	2328.81	1570637.29	302976.18	39°19'18.807"N	81°01'03.873"W	3206.74	133.459	0.95
9274.00	90.060	142.620	6241.64	3279.58	-2279.08	2386.02	1570694.50	302901.61	39°19'18.079"N	81°01'03.129"W	3299.59	133.687	0.25
9368.00	90.150	144.220	6241.47	3373.41	-2354.56	2442.04	1570750.51	302826.13	39°19'17.343"N	81°01'02.400"W	3392.28	133.955	1.70
9464.00	90.180	142.780	6241.19	3469.23	-2431.73	2499.14	1570807.61	302748.96	39°19'16.590"N	81°01'01.657"W	3486.98	134.217	1.50
9558.00	90.180	140.400	6240.90	3563.19	-2505.38	2557.54	1570866.01	302673.32	39°19'15.872"N	81°01'00.899"W	3580.22	134.410	2.53
9652.00	90.060	138.100	6240.70	3657.17	-2576.59	2618.89	1570927.36	302604.11	39°19'15.178"N	81°01'00.103"W	3673.88	134.533	2.45
9746.00	89.480	138.450	6241.08	3751.13	-2646.74	2681.46	1570989.92	302533.96	39°19'14.495"N	81°00'59.292"W	3767.69	134.627	0.72
9841.00	89.570	138.920	6241.87	3846.10	-2718.10	2744.17	1571052.61	302462.61	39°19'13.801"N	81°00'58.478"W	3862.45	134.726	0.50
9936.00	89.540	139.040	6242.60	3941.08	-2789.77	2806.52	1571114.98	302390.94	39°19'13.103"N	81°00'57.670"W	3957.19	134.828	0.13
10031.00	89.600	139.050	6243.32	4036.07	-2861.51	2868.79	1571177.24	302319.20	39°19'12.404"N	81°00'56.862"W	4051.94	134.927	0.06
10125.00	89.850	138.650	6243.77	4130.05	-2932.29	2930.64	1571239.09	302248.43	39°19'11.715"N	81°00'56.060"W	4145.72	135.016	0.50
10219.00	89.850	140.860	6244.01	4224.04	-3004.04	2991.37	1571299.81	302176.69	39°19'11.016"N	81°00'55.272"W	4239.40	135.121	2.35
10314.00	89.910	143.310	6244.21	4318.97	-3078.98	3049.74	1571358.18	302101.75	39°19'10.285"N	81°00'54.513"W	4333.71	135.273	2.58
10409.00	89.850	143.760	6244.41	4413.79	-3155.38	3106.20	1571414.64	302025.35	39°19'09.540"N	81°00'53.779"W	4427.74	135.450	0.48
10504.00	89.940	142.340	6244.59	4508.65	-3231.30	3163.31	1571471.74	301949.44	39°19'08.799"N	81°00'53.036"W	4521.92	135.609	1.50
10599.00	89.720	141.100	6244.87	4603.61	-3305.87	3222.16	1571530.59	301874.87	39°19'08.072"N	81°00'52.271"W	4616.39	135.735	1.33
10694.00	89.850	141.570	6245.22	4698.58	-3380.05	3281.51	1571589.94	301800.69	39°19'07.349"N	81°00'51.500"W	4710.95	135.847	0.51
10789.00	89.720	139.760	6245.38	4793.57	-3453.52	3341.72	1571650.15	301727.22	39°19'06.633"N	81°00'50.719"W	4805.61	135.943	1.91
10884.00	89.630	138.410	6246.12	4888.55	-3525.31	3403.94	1571712.37	301655.44	39°19'05.934"N	81°00'49.912"W	4900.47	136.003	1.42
10978.00	89.540	141.320	6246.80	4982.54	-3597.16	3464.52	1571772.95	301583.59	39°19'05.234"N	81°00'49.126"W	4994.25	136.076	3.10
11073.00	89.600	142.390	6247.51	5077.49	-3671.87	3523.20	1571831.62	301508.88	39°19'04.505"N	81°00'48.363"W	5088.77	136.184	1.13
11168.00	89.720	141.270	6248.08	5172.43	-3746.56	3581.90	1571890.32	301434.20	39°19'03.777"N	81°00'47.600"W	5183.31	136.287	1.19
11263.00	89.570	139.570	6248.67	5267.43	-3819.77	3642.43	1571950.85	301360.99	39°19'03.063"N	81°00'46.814"W	5278.07	136.361	1.80
11358.00	90.030	141.720	6249.00	5362.41	-3893.23	3702.67	1572011.08	301287.54	39°19'02.347"N	81°00'46.032"W	5372.80	136.437	2.31
11453.00	89.940	140.740	6249.02	5457.39	-3967.29	3762.16	1572070.57	301213.48	39°19'01.625"N	81°00'45.260"W	5467.47	136.520	1.04
11549.00	90.090	139.450	6249.00	5553.39	-4040.94	3823.74	1572132.15	301139.84	39°19'00.908"N	81°00'44.461"W	5563.29	136.582	1.35

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Actual Wellpath Report
PEN-20H-HS AWP Proj: 13272'

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REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot H
Area	Richie County, WV	Well	PEN-20H-HS
Field	Richie	Wellbore	PEN-20H-HS AWB
Facility	PEN-20 Pad		

WELLPATH DATA (139 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DIS P/[100ft]
11645.00	89.430	136.810	6248.36	5649.33	-4112.42	3887.81	1572196.21	301068.36	39°19'00.212"N	81°00'43.630"W	5659.24	136.608	2.77
11741.00	89.880	137.100	6248.30	5745.19	-4182.37	3953.34	1572261.74	300998.21	39°18'59.530"N	81°00'42.782"W	5755.24	136.614	0.65
11836.00	90.090	136.010	6248.33	5840.02	-4251.55	4018.66	1572327.06	300929.24	39°18'58.859"N	81°00'41.936"W	5850.24	136.613	1.17
11932.00	89.820	136.040	6248.40	5935.79	-4320.63	4085.32	1572393.71	300860.16	39°18'58.187"N	81°00'41.073"W	5946.23	136.603	0.28
12027.00	89.940	135.560	6248.60	6030.53	-4388.74	4151.55	1572459.94	300792.05	39°18'57.525"N	81°00'40.216"W	6041.22	136.591	0.52
12123.00	90.150	134.240	6248.53	6126.15	-4456.50	4219.55	1572527.94	300724.29	39°18'56.867"N	81°00'39.336"W	6137.18	136.564	1.39
12218.00	89.750	135.420	6248.61	6220.76	-4523.47	4286.92	1572595.31	300657.32	39°18'56.216"N	81°00'38.465"W	6232.14	136.538	1.31
12314.00	89.880	139.230	6248.92	6316.64	-4594.04	4351.98	1572660.36	300586.76	39°18'55.530"N	81°00'37.622"W	6328.11	136.550	3.97
12409.00	89.850	143.210	6249.14	6411.60	-4668.08	4411.47	1572719.85	300512.72	39°18'54.808"N	81°00'36.850"W	6422.78	136.619	4.19
12505.00	89.910	145.900	6249.34	6507.29	-4746.28	4467.14	1572775.51	300434.52	39°18'54.044"N	81°00'36.125"W	6517.86	136.735	2.80
12600.00	90.340	147.160	6249.14	6601.67	-4825.53	4519.53	1572827.90	300355.28	39°18'53.270"N	81°00'35.441"W	6611.50	136.875	1.40
12696.00	90.280	146.380	6248.62	6697.00	-4905.83	4572.14	1572880.51	300274.99	39°18'52.485"N	81°00'34.755"W	6706.09	137.016	0.81
12792.00	90.220	144.030	6248.20	6792.59	-4984.66	4626.91	1572935.28	300196.16	39°18'51.715"N	81°00'34.041"W	6801.11	137.132	2.45
12887.00	90.120	138.470	6247.92	6887.53	-5058.72	4686.35	1572994.72	300122.10	39°18'50.993"N	81°00'33.269"W	6895.83	137.188	5.85
12983.00	89.940	135.150	6247.87	6983.37	-5128.70	4752.05	1573060.41	300052.12	39°18'50.313"N	81°00'32.419"W	6991.82	137.183	3.46
13078.00	89.630	133.820	6248.22	7077.93	-5195.27	4819.82	1573128.18	299985.56	39°18'49.666"N	81°00'31.542"W	7086.71	137.147	1.44
13174.00	89.110	137.350	6249.28	7173.62	-5263.82	4886.99	1573195.35	299917.01	39°18'49.000"N	81°00'30.673"W	7182.65	137.126	3.72
13270.00	89.110	140.630	6250.41	7246.59	-5318.89	4934.88	1573243.24	299861.94	39°18'48.463"N	81°00'30.052"W	7255.60	137.145	4.49
13272.00	89.110	140.630	6250.80	7271.59	-5338.22	4950.74	1573259.09	299842.62	39°18'48.275"N	81°00'29.846"W	7280.55	137.157	0.00

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PEN-20H-HS AWP Proj: 13272'

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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot H
NOBLE ENERGY	Well	PEN-20H-HS
Area	Wellbore	PEN-20H-HS AWB
Field		
Facility		

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
PEN-20H-HS BHL Rev-2		6195.00	-5328.97	4922.79	1573231.14	299851.86	39°18'48.362"N	81°00'30.204"W	point
PEN-20H-HS LP Rev-2		6195.00	-275.00	681.99	1568990.55	304905.59	39°19'37.599"N	81°01'25.241"W	point
PEN-20 ALT Vertices		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 Cokely Tract 1		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 Cokely Tract 2		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 LL		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon
PEN-20 Parcel 3.12-1.2		6948.00	23.60	-59.87	1568248.72	305204.18	39°19'40.426"N	81°01'34.745"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: PEN-20H-HS AWB Ref Wellpath: PEN-20H-HS AWP Proj: 13272'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	5100.00	Generic gyro - northseeking (Standard)	01 Gyro <1/2-1/4"> (1000-5100')	PEN-20H-HS AWB
5100.00	13247.00	NavTrak (AT Curve Short Spaced)	02 BHT AT Curve <-8-3/4"> (5100)(5280'-13247')	PEN-20H-HS AWB
13247.00	13272.00	Blind Drilling (std)	Projection to bit	PEN-20H-HS AWB

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY	Slot	Slot H
Area	Ritchie County, WV	Well	PEN-20H-HS
Field	Ritchie	Wellbore	PEN-20H-HS AWB
Facility	PEN-20 Pad		

COMMENTS
<p>Wellpath general comments API: 47-085-10090-0000 Rig: Nomac 78 BHI Job #: 6697476 Duration: 10.10.2014 – 10.13.2014 Gyro <12-1/4"> (100'-5100') BHI AT Curve <8-3/4"> (5100')(5280'-13247') TD Projected: 13272'</p>

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NOBLE ENERGY



Location: Ritchie County, WV
 Field: Ritchie
 Facility: PEN-20 Pad

Slot: Slot H
 Well: PEN-20H-HS
 Wellbore: PEN-20H-HS PWB

Plot reference wellpath is PEN-20H-HS PWB Rev-A-D	
True vertical depths are referenced to Normac 78 (RKB)	Grid System: NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet
Measured depths are referenced to Normac 78 (RKB)	North Reference: Grid north
Normac 78 (RKB) to Mean Sea Level: 1055 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot H) -1029 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: goffral on 10/16/2014

Location Information					
Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
PEN-20 Pad		1568205.800	305275.580	39°18'41.124"N	81°01'35.306"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude
Slot H	-95.00	102.79	1568308.590	305180.580	39°19'40.202"N
Normac 78 (RKB) to Mud line (At Slot: Slot H)				28ft	
Mean Sea Level to Mud line (At Slot: Slot H)				-1029ft	
Normac 78 (RKB) to Mean Sea Level				1055ft	

