

### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot D
Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

### REPORT SETUP INFORMATION

Projection System	NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet	Software System	WellArchitect@ 4.0.1
North Reference	Grid	User	Edsaryar
Scale	0.999963	Report Generated	06/Aug/2015 at 07:52
Convergence at slot	0.69° West	Database/Source file	WellArchitectEasternDB/SHL-22D-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	42.20	42.63	1698355.47	552100.63	40°00'39.036"N	80°34'36.777"W
Facility Reference Pt			1698312.84	552058.43	40°00'38.614"N	80°34'37.318"W
Field Reference Pt			609601.22	0.00	38°23'48.753"N	84°21'09.765"W

### WELLPATH DATUM

Calculation method	Minimum curvature	Precision 584 (RKB) to Facility Vertical Datum	1342.08ft
Horizontal Reference Pt	Slot	Precision 584 (RKB) to Mean Sea Level	1342.08ft
Vertical Reference Pt	Precision 584 (RKB)	Precision 584 (RKB) to Mud Line at Slot (Slot D)	19.40ft
MD Reference Pt	Precision 584 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	145.00°



# Actual Wellpath Report

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## WELLPATH DATA (184 stations) † = interpolated/extrapolated station

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 [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
0.00†	0.000	227.100	0.00	0.00	0.00	0.00	1698355.47	552100.63	40°00'39.036"N	80°34'36.777"W	0.00	0.000	0.00	0.00	0.00
19.40	0.000	227.100	19.40	0.00	0.00	0.00	1698355.47	552100.63	40°00'39.036"N	80°34'36.777"W	0.00	0.000	0.00	0.00	0.00
107.40	0.340	227.100	107.40	0.04	-0.18	-0.19	1698355.28	552100.45	40°00'39.035"N	80°34'36.779"W	0.26	227.100	0.39	0.39	0.00
207.40	0.400	274.360	207.40	-0.14	-0.35	-0.76	1698354.71	552100.28	40°00'39.033"N	80°34'36.787"W	0.84	244.979	0.30	0.06	47.26
307.40	0.450	347.210	307.40	-0.73	0.06	-1.19	1698354.28	552100.69	40°00'39.037"N	80°34'36.792"W	1.19	272.706	0.51	0.05	72.85
407.40	0.650	314.820	407.39	-1.65	0.84	-1.68	1698353.79	552101.47	40°00'39.044"N	80°34'36.799"W	1.88	296.528	0.36	0.20	-32.39
507.40	0.680	352.870	507.38	-2.73	1.83	-2.16	1698353.31	552102.46	40°00'39.054"N	80°34'36.805"W	2.83	310.277	0.43	0.03	38.05
607.40	0.550	337.850	607.38	-3.73	2.86	-2.41	1698353.06	552103.49	40°00'39.064"N	80°34'36.808"W	3.74	319.873	0.21	-0.13	-15.02
707.40	0.120	300.110	707.38	-4.29	3.36	-2.68	1698352.79	552103.99	40°00'39.069"N	80°34'36.812"W	4.30	321.376	0.46	-0.43	-37.74
807.40	0.470	35.930	807.38	-4.52	3.74	-2.53	1698352.94	552104.37	40°00'39.073"N	80°34'36.810"W	4.52	325.911	0.50	0.35	95.82
907.40	0.080	338.640	907.37	-4.72	4.14	-2.32	1698353.15	552104.77	40°00'39.077"N	80°34'36.807"W	4.74	330.757	0.43	-0.39	-57.29
1007.40	0.420	42.470	1007.37	-4.87	4.48	-2.10	1698353.37	552105.11	40°00'39.080"N	80°34'36.805"W	4.94	334.907	0.39	0.34	63.83
1107.40	0.230	108.320	1107.37	-4.79	4.68	-1.66	1698353.81	552105.31	40°00'39.082"N	80°34'36.799"W	4.97	340.505	0.39	-0.19	65.85
1207.40	0.170	62.590	1207.37	-4.61	4.69	-1.34	1698354.13	552105.32	40°00'39.083"N	80°34'36.795"W	4.87	344.099	0.16	-0.06	-45.73
1307.40	0.590	92.210	1307.37	-4.28	4.74	-0.69	1698354.78	552105.37	40°00'39.085"N	80°34'36.787"W	4.79	351.720	0.45	0.42	29.62
1407.40	0.460	134.110	1407.37	-3.57	4.44	0.11	1698355.58	552105.07	40°00'39.080"N	80°34'36.776"W	4.44	1.464	0.39	-0.13	41.90
1507.40	0.590	66.960	1507.36	-3.07	4.36	0.88	1698356.35	552104.99	40°00'39.080"N	80°34'36.766"W	4.45	11.356	0.59	0.13	-67.15
1607.40	0.380	114.640	1607.36	-2.68	4.42	1.65	1698357.12	552105.05	40°00'39.080"N	80°34'36.756"W	4.72	20.468	0.44	-0.21	47.68
1707.40	0.330	48.810	1707.36	-2.42	4.47	2.17	1698357.64	552105.10	40°00'39.081"N	80°34'36.750"W	4.97	25.863	0.39	-0.05	-65.83
1807.40	0.180	68.770	1807.36	-2.41	4.72	2.53	1698358.00	552105.35	40°00'39.083"N	80°34'36.745"W	5.36	28.209	0.17	-0.15	19.96
1907.40	0.060	306.360	1907.36	-2.43	4.81	2.64	1698358.11	552105.44	40°00'39.084"N	80°34'36.744"W	5.48	28.735	0.22	-0.12	-122.41
2007.40	0.210	10.750	2007.36	-2.60	5.02	2.63	1698358.10	552105.65	40°00'39.086"N	80°34'36.744"W	5.67	27.638	0.19	0.15	64.39
2107.40	0.230	153.620	2107.36	-2.53	5.02	2.75	1698358.22	552105.65	40°00'39.086"N	80°34'36.742"W	5.72	28.730	0.42	0.02	142.87
2207.40	0.500	273.250	2207.35	-2.61	4.86	2.41	1698357.88	552105.49	40°00'39.085"N	80°34'36.747"W	5.43	26.309	0.65	0.27	119.63
2307.40	0.220	295.680	2307.35	-3.04	4.97	1.80	1698357.27	552105.60	40°00'39.086"N	80°34'36.755"W	5.29	19.864	0.31	-0.28	22.43
2407.40	0.320	238.400	2407.35	-3.23	4.91	1.39	1698356.86	552105.54	40°00'39.085"N	80°34'36.760"W	5.10	15.761	0.27	0.10	-57.28
2507.40	0.430	305.780	2507.35	-3.60	4.98	0.84	1698356.31	552105.61	40°00'39.086"N	80°34'36.767"W	5.05	9.607	0.43	0.11	67.38
2607.40	0.120	10.530	2607.35	-4.03	5.30	0.56	1698356.03	552105.93	40°00'39.089"N	80°34'36.771"W	5.33	6.005	0.39	-0.31	64.75
2707.40	0.270	211.980	2707.35	-4.01	5.21	0.45	1698355.92	552105.84	40°00'39.088"N	80°34'36.772"W	5.23	4.965	0.38	0.15	-158.55
2807.40	0.370	286.750	2807.35	-4.17	5.10	0.02	1698355.49	552105.73	40°00'39.087"N	80°34'36.777"W	5.10	0.207	0.40	0.10	74.77

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Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

## WELLPATH DATA (184 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 [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
2907.40	0.070	332.550	2907.35	-4.48	5.25	-0.32	1698355.15	552105.88	40°00'39.088"N	80°34'36.782"W	5.26	356.522	0.33	-0.30	45.80
3007.40	0.320	253.290	3007.35	-4.63	5.22	-0.61	1698354.86	552105.85	40°00'39.088"N	80°34'36.786"W	5.26	353.288	0.31	0.25	-79.26
3107.40	0.380	283.860	3107.34	-4.97	5.22	-1.20	1698354.27	552105.85	40°00'39.088"N	80°34'36.793"W	5.36	347.015	0.19	0.06	30.57
3190.00	0.100	274.550	3189.94	-5.22	5.29	-1.54	1698353.93	552105.92	40°00'39.089"N	80°34'36.798"W	5.51	343.759	0.34	-0.34	-11.27
3215.00	0.290	319.490	3214.94	-5.30	5.34	-1.60	1698353.87	552105.97	40°00'39.089"N	80°34'36.798"W	5.58	343.282	0.92	0.76	179.76
3305.00	5.080	341.740	3304.82	-9.34	9.30	-3.00	1698352.47	552109.93	40°00'39.128"N	80°34'36.817"W	9.77	342.114	5.35	5.32	24.72
3394.00	5.930	340.680	3393.41	-17.54	17.38	-5.76	1698349.71	552118.01	40°00'39.207"N	80°34'36.854"W	18.31	341.674	0.96	0.96	-1.19
3484.00	7.120	328.890	3482.83	-27.58	26.55	-10.18	1698345.29	552127.17	40°00'39.298"N	80°34'36.912"W	28.43	339.023	1.98	1.32	-13.10
3574.00	8.940	308.160	3571.96	-39.84	35.64	-18.56	1698336.91	552136.27	40°00'39.386"N	80°34'37.021"W	40.19	332.493	3.77	2.02	-23.03
3663.00	9.460	292.310	3659.83	-52.62	42.70	-30.77	1698324.70	552143.32	40°00'39.455"N	80°34'37.179"W	52.63	324.223	2.90	0.58	-17.81
3753.00	12.870	278.080	3748.13	-65.70	46.91	-47.54	1698307.93	552147.54	40°00'39.494"N	80°34'37.395"W	66.79	314.619	4.84	3.79	-15.81
3843.00	18.380	271.410	3834.78	-80.98	48.67	-71.67	1698283.80	552149.30	40°00'39.509"N	80°34'37.705"W	86.64	304.181	6.43	6.12	-7.41
3932.00	19.140	268.650	3919.05	-97.39	48.67	-100.29	1698255.19	552149.30	40°00'39.505"N	80°34'38.073"W	111.47	295.890	1.31	0.85	-3.10
4022.00	25.440	269.900	4002.28	-116.65	48.29	-134.40	1698221.07	552148.92	40°00'39.498"N	80°34'38.511"W	142.81	289.764	7.02	7.00	1.39
4111.00	28.380	271.250	4081.64	-140.10	48.72	-174.67	1698180.80	552149.35	40°00'39.497"N	80°34'39.029"W	181.34	285.585	3.37	3.30	1.52
4201.00	33.640	276.020	4158.76	-169.13	51.80	-220.89	1698134.59	552152.43	40°00'39.522"N	80°34'39.623"W	226.88	283.199	6.45	5.84	5.30
4291.00	37.550	274.820	4231.93	-203.07	56.73	-273.03	1698082.45	552157.35	40°00'39.565"N	80°34'40.294"W	278.86	281.737	4.41	4.34	-1.33
4380.00	40.760	272.510	4300.94	-238.14	60.28	-329.10	1698026.39	552160.91	40°00'39.593"N	80°34'41.015"W	334.57	280.379	3.96	3.61	-2.60
4470.00	40.680	272.280	4369.15	-273.80	62.73	-387.76	1697967.73	552163.36	40°00'39.610"N	80°34'41.769"W	392.80	279.190	0.19	-0.09	-0.26
4560.00	41.040	272.360	4437.22	-309.49	65.12	-446.59	1697908.90	552165.74	40°00'39.627"N	80°34'42.526"W	451.31	278.296	0.40	0.40	0.09
4649.00	41.020	272.770	4504.36	-345.11	67.73	-504.95	1697850.54	552168.36	40°00'39.646"N	80°34'43.276"W	509.48	277.640	0.30	-0.02	0.46
4739.00	41.140	272.260	4572.20	-381.12	70.32	-564.04	1697791.46	552170.95	40°00'39.664"N	80°34'44.036"W	568.40	277.107	0.40	0.13	-0.57
4828.00	41.090	270.000	4639.25	-415.63	71.48	-622.54	1697732.95	552172.11	40°00'39.669"N	80°34'44.788"W	626.63	276.550	1.67	-0.06	-2.54
4918.00	41.090	269.700	4707.08	-449.43	71.82	-681.69	1697673.80	552171.95	40°00'39.660"N	80°34'45.548"W	685.41	275.973	0.22	0.00	-0.33
5008.00	41.050	270.020	4774.94	-483.22	71.18	-740.82	1697614.68	552171.81	40°00'39.652"N	80°34'46.308"W	744.23	275.488	0.24	-0.04	0.36
5097.00	40.980	271.550	4842.09	-517.37	71.98	-799.22	1697556.28	552172.61	40°00'39.653"N	80°34'47.058"W	802.45	275.146	1.13	-0.08	1.72
5187.00	40.060	271.930	4910.51	-552.35	73.75	-857.66	1697497.84	552174.38	40°00'39.663"N	80°34'47.810"W	860.83	274.915	1.06	-1.02	0.42
5276.00	40.880	274.180	4978.22	-587.96	76.84	-915.34	1697440.17	552177.47	40°00'39.687"N	80°34'48.551"W	918.56	274.799	1.88	0.92	2.53
5366.00	40.990	273.560	5046.21	-624.97	80.82	-974.17	1697381.34	552181.45	40°00'39.719"N	80°34'49.308"W	977.52	274.743	0.47	0.12	-0.69
5456.00	39.860	271.620	5114.72	-660.57	83.47	-1032.47	1697323.04	552184.10	40°00'39.739"N	80°34'50.057"W	1035.83	274.622	1.88	-1.26	-2.16

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5545.00	39.790	271.950	5183.07	-694.70	85.24	-1089.44	1697266.07	552185.87	40°00'39.749"N	80°34'50.790"W	1092.77	274.474	0.25	-0.08	0.37
5635.00	39.470	272.170	5252.39	-729.30	87.31	-1146.80	1697208.71	552187.93	40°00'39.763"N	80°34'51.527"W	1150.12	274.354	0.39	-0.36	0.24
5724.00	39.420	271.060	5321.12	-763.02	88.90	-1203.33	1697152.19	552189.53	40°00'39.772"N	80°34'52.254"W	1206.60	274.225	0.79	-0.06	-1.25
5814.00	40.050	269.240	5390.33	-796.14	89.05	-1260.85	1697094.67	552189.67	40°00'39.767"N	80°34'52.993"W	1263.99	274.040	1.47	0.70	-2.02
5903.00	40.090	266.470	5458.45	-827.21	86.90	-1318.09	1697037.43	552187.53	40°00'39.739"N	80°34'53.728"W	1320.95	273.772	2.00	0.04	-3.11
5993.00	40.410	268.510	5527.14	-858.45	84.36	-1376.18	1696979.34	552184.98	40°00'39.707"N	80°34'54.474"W	1378.76	273.508	1.51	0.36	2.27
6083.00	40.280	270.840	5595.74	-891.59	84.03	-1434.43	1696921.09	552184.65	40°00'39.696"N	80°34'55.223"W	1436.89	273.352	1.68	-0.14	2.59
6172.00	40.040	271.550	5663.76	-925.48	85.22	-1491.82	1696863.71	552185.85	40°00'39.701"N	80°34'55.961"W	1494.25	273.270	0.58	-0.27	0.80
6262.00	40.030	271.330	5732.67	-959.87	86.68	-1549.69	1696805.84	552187.30	40°00'39.709"N	80°34'56.705"W	1552.12	273.201	0.16	-0.01	-0.24
6351.00	40.000	270.540	5800.83	-993.45	87.61	-1606.91	1696748.62	552188.24	40°00'39.711"N	80°34'57.440"W	1609.30	273.121	0.57	-0.03	-0.89
6441.00	40.040	272.050	5869.75	-1027.71	88.92	-1664.77	1696690.77	552189.55	40°00'39.717"N	80°34'58.184"W	1667.14	273.057	1.08	0.04	1.68
6478.00	39.820	272.090	5898.13	-1042.02	89.78	-1688.50	1696667.03	552190.40	40°00'39.723"N	80°34'58.489"W	1690.89	273.044	0.60	-0.59	0.11
6568.00	40.210	273.010	5967.06	-1077.29	92.35	-1746.31	1696609.23	552192.98	40°00'39.742"N	80°34'59.232"W	1748.75	273.027	0.79	0.43	1.02
6658.00	42.490	260.240	6034.74	-1108.20	88.72	-1805.39	1696550.15	552189.35	40°00'39.699"N	80°34'59.991"W	1807.57	272.813	9.70	2.53	-14.19
6747.00	46.060	251.300	6098.51	-1130.04	73.33	-1865.45	1696490.10	552173.96	40°00'39.539"N	80°35'00.760"W	1866.89	272.251	8.07	4.01	-10.04
6837.00	49.230	250.610	6159.14	-1148.31	51.62	-1928.30	1696427.24	552152.25	40°00'39.317"N	80°35'01.564"W	1928.99	271.533	3.57	3.52	-0.77
6926.00	54.000	242.870	6214.44	-1162.33	23.97	-1992.23	1696363.32	552124.60	40°00'39.037"N	80°35'02.382"W	1992.37	270.689	8.67	5.36	-8.70
7016.00	57.440	238.980	6265.14	-1169.95	-12.19	-2057.17	1696298.38	552088.44	40°00'38.671"N	80°35'03.210"W	2057.20	269.660	5.23	3.82	-4.32
7106.00	61.360	235.450	6310.95	-1172.90	-54.16	-2122.24	1696233.31	552046.47	40°00'38.249"N	80°35'04.040"W	2122.93	268.538	5.51	4.36	-3.92
7195.00	64.110	230.360	6351.74	-1169.97	-101.89	-2185.28	1696170.27	551998.75	40°00'37.770"N	80°35'04.843"W	2187.66	267.331	5.95	3.09	-5.72
7285.00	64.990	220.050	6390.50	-1156.14	-159.06	-2242.82	1696112.73	551941.58	40°00'37.198"N	80°35'05.573"W	2248.46	265.943	10.39	0.98	-11.46
7374.00	67.200	209.040	6426.66	-1127.70	-225.97	-2288.81	1696066.75	551874.67	40°00'36.531"N	80°35'06.154"W	2299.94	264.361	11.58	2.48	-12.37
7464.00	72.180	200.700	6457.93	-1085.31	-302.48	-2324.17	1696031.39	551798.16	40°00'35.771"N	80°35'06.596"W	2343.77	262.585	10.30	5.53	-9.27
7553.00	71.840	192.090	6485.47	-1032.56	-383.60	-2348.04	1696007.52	551717.05	40°00'34.967"N	80°35'06.891"W	2379.17	260.722	9.21	-0.38	-9.67
7643.00	72.470	181.990	6513.11	-969.02	-468.49	-2358.51	1695997.05	551632.16	40°00'34.126"N	80°35'07.012"W	2404.59	258.765	10.70	0.70	-11.22
7733.00	74.060	172.400	6539.08	-896.17	-554.46	-2354.27	1696001.29	551546.20	40°00'33.277"N	80°35'06.944"W	2418.68	256.748	10.35	1.77	-10.66
7822.00	77.560	163.890	6560.94	-816.90	-638.79	-2336.52	1696019.05	551461.87	40°00'32.446"N	80°35'06.703"W	2422.26	254.709	10.07	3.93	-9.56
7912.00	81.570	158.950	6577.24	-732.04	-722.64	-2308.30	1696047.25	551378.02	40°00'31.621"N	80°35'06.327"W	2418.77	252.617	7.00	4.46	-5.49
8002.00	87.540	151.290	6585.79	-643.94	-803.80	-2270.63	1696084.93	551296.86	40°00'30.823"N	80°35'05.831"W	2408.70	250.506	10.76	6.63	-8.51
8091.00	90.220	147.030	6587.53	-555.22	-880.18	-2225.03	1696130.53	551220.49	40°00'30.074"N	80°35'05.233"W	2392.79	248.417	5.65	3.01	-4.79

05/26/2017



# Actual Wellpath Report

SHL-22D-HS AWP Proj: 16417'  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot D
Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

## WELLPATH DATA (184 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 [°]	DL'S [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
8181.00	90.280	145.670	6587.14	-465.25	-955.10	-2175.16	1696180.40	551145.57	40°00'29.340"N	80°35'04.580"W	2375.61	246.294	1.51	0.07	-1.51
8270.00	90.460	144.810	6586.56	-376.25	-1028.21	-2124.42	1696231.14	551072.46	40°00'28.623"N	80°35'03.917"W	2360.16	244.173	0.99	0.20	-0.97
8360.00	90.120	142.500	6586.11	-286.29	-1100.70	-2071.08	1696284.47	550999.98	40°00'27.913"N	80°35'03.220"W	2345.40	242.011	2.59	-0.38	-2.57
8450.00	89.970	140.130	6586.04	-196.48	-1170.95	-2014.83	1696340.71	550929.73	40°00'27.226"N	80°35'02.487"W	2330.38	239.836	2.64	-0.17	-2.63
8539.00	89.420	142.970	6586.51	-107.65	-1240.64	-1959.50	1696396.05	550860.04	40°00'26.544"N	80°35'01.765"W	2319.23	237.660	3.25	-0.62	3.19
8629.00	89.540	144.500	6587.33	-17.68	-1313.20	-1906.26	1696449.28	550787.48	40°00'25.833"N	80°35'01.070"W	2314.81	235.438	1.71	0.13	1.70
8719.00	89.750	141.820	6587.89	72.26	-1385.22	-1852.31	1696503.23	550715.47	40°00'25.128"N	80°35'00.365"W	2312.98	233.210	2.99	0.23	-2.98
8808.00	89.630	140.080	6588.37	161.04	-1454.33	-1796.24	1696559.30	550646.35	40°00'24.452"N	80°34'59.634"W	2311.18	231.005	1.96	-0.13	-1.96
8898.00	89.510	141.880	6589.04	250.81	-1524.25	-1739.58	1696615.96	550576.44	40°00'23.767"N	80°34'58.895"W	2312.89	228.775	2.00	-0.13	2.00
8988.00	89.630	144.580	6589.72	340.76	-1596.34	-1685.71	1696669.82	550504.36	40°00'23.062"N	80°34'58.192"W	2321.62	226.560	3.00	0.13	3.00
9077.00	89.630	145.020	6590.29	429.75	-1669.06	-1634.41	1696721.12	550431.63	40°00'22.349"N	80°34'57.521"W	2336.04	224.399	0.49	0.00	0.49
9167.00	89.570	148.180	6590.92	519.71	-1744.18	-1584.88	1696770.66	550356.51	40°00'21.613"N	80°34'56.873"W	2356.70	222.260	3.51	-0.07	3.51
9256.00	89.450	148.080	6591.68	608.57	-1819.77	-1537.89	1696817.64	550280.94	40°00'20.871"N	80°34'56.258"W	2382.57	220.201	0.18	-0.13	-0.11
9346.00	89.450	148.830	6592.55	698.40	-1896.46	-1490.80	1696864.72	550204.24	40°00'20.119"N	80°34'55.641"W	2412.27	218.171	0.83	0.00	0.83
9436.00	89.660	148.620	6593.25	788.21	-1973.38	-1444.08	1696911.44	550127.33	40°00'19.364"N	80°34'55.029"W	2445.32	216.196	0.33	0.23	-0.23
9525.00	89.660	146.070	6593.77	877.12	-2048.31	-1396.06	1696959.46	550052.40	40°00'18.630"N	80°34'54.400"W	2478.82	214.277	2.87	0.00	-2.87
9615.00	89.780	141.970	6594.21	967.09	-2121.12	-1343.20	1697012.32	549979.59	40°00'17.917"N	80°34'53.709"W	2510.64	212.344	4.56	0.13	-4.56
9704.00	89.690	141.510	6594.63	1055.95	-2191.00	-1288.09	1697067.43	549909.71	40°00'17.232"N	80°34'52.990"W	2541.59	210.451	0.53	-0.10	-0.52
9794.00	89.780	141.160	6595.04	1145.76	-2261.27	-1231.86	1697123.66	549839.44	40°00'16.545"N	80°34'52.257"W	2575.04	208.580	0.40	0.10	-0.39
9883.00	89.910	144.270	6595.28	1234.68	-2332.08	-1177.95	1697177.56	549768.64	40°00'15.852"N	80°34'51.553"W	2612.69	206.799	3.50	0.15	3.49
9973.00	89.940	146.450	6595.40	1324.67	-2406.12	-1126.80	1697228.71	549694.60	40°00'15.126"N	80°34'50.885"W	2656.89	205.094	2.42	0.03	2.42
10062.00	89.910	147.040	6595.52	1413.63	-2480.54	-1078.00	1697277.52	549620.18	40°00'14.396"N	80°34'50.246"W	2704.66	203.489	0.66	-0.03	0.66
10152.00	89.940	147.540	6595.64	1503.56	-2556.27	-1029.36	1697326.15	549544.46	40°00'13.654"N	80°34'49.610"W	2755.74	201.934	0.56	0.03	0.56
10242.00	90.000	146.800	6595.68	1593.49	-2631.90	-980.57	1697374.94	549468.84	40°00'12.912"N	80°34'48.971"W	2808.63	200.434	0.82	0.07	-0.82
10331.00	89.970	147.350	6595.71	1682.43	-2706.60	-932.19	1697423.31	549394.13	40°00'12.180"N	80°34'48.338"W	2862.63	199.004	0.62	-0.03	0.62
10421.00	90.090	147.440	6595.66	1772.35	-2782.42	-883.70	1697471.81	549318.32	40°00'11.436"N	80°34'47.703"W	2919.38	197.620	0.17	0.13	0.10
10510.00	90.340	146.530	6595.32	1861.30	-2857.04	-835.20	1697520.30	549243.70	40°00'10.705"N	80°34'47.068"W	2976.62	196.295	1.06	0.28	-1.02
10600.00	90.250	145.770	6594.86	1951.28	-2931.79	-785.07	1697570.43	549168.96	40°00'09.972"N	80°34'46.413"W	3035.08	194.991	0.85	-0.10	-0.84
10689.00	89.820	142.880	6594.81	2040.26	-3004.08	-733.18	1697622.32	549096.67	40°00'09.264"N	80°34'45.735"W	3092.25	193.716	3.28	-0.48	-3.25
10779.00	89.690	140.750	6595.19	2130.12	-3074.81	-677.54	1697677.95	549025.93	40°00'08.571"N	80°34'45.009"W	3148.58	192.427	2.37	-0.14	-2.37

05/26/2017

## REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot D
Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

## WELLPATH DATA (184 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 [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
10869.00	89.690	139.550	6595.68	2219.79	-3143.91	-619.87	1697735.62	548956.84	40°00'07.895"N	80°34'44.257"W	3204.43	191.154	1.33	0.00	-1.33
10958.00	88.150	139.070	6597.36	2308.34	-3211.38	-561.86	1697793.63	548889.38	40°00'07.236"N	80°34'43.502"W	3260.16	189.924	1.81	-1.73	-0.54
11048.00	87.010	143.870	6601.16	2398.06	-3281.70	-505.86	1697849.63	548819.06	40°00'06.547"N	80°34'42.771"W	3320.46	188.763	5.48	-1.27	5.33
11137.00	89.850	149.300	6603.60	2486.95	-3355.92	-456.90	1697898.59	548744.84	40°00'05.820"N	80°34'42.131"W	3386.88	187.753	6.88	3.19	6.10
11227.00	89.820	147.790	6603.86	2576.77	-3432.70	-409.93	1697945.55	548668.07	40°00'05.067"N	80°34'41.515"W	3457.09	186.810	1.68	-0.03	-1.68
11316.00	90.060	147.200	6603.95	2665.69	-3507.75	-362.11	1697993.38	548593.01	40°00'04.331"N	80°34'40.889"W	3526.39	185.894	0.72	0.27	-0.66
11406.00	90.090	146.340	6603.83	2755.64	-3583.04	-312.79	1698042.69	548517.73	40°00'03.593"N	80°34'40.244"W	3596.66	184.989	0.96	0.03	-0.96
11496.00	90.000	147.520	6603.76	2845.59	-3658.45	-263.68	1698091.80	548442.32	40°00'02.853"N	80°34'39.601"W	3667.94	184.122	1.31	-0.10	1.31
11585.00	89.940	147.710	6603.81	2934.50	-3733.61	-216.01	1698139.47	548367.16	40°00'02.116"N	80°34'38.977"W	3739.86	183.311	0.22	-0.07	0.21
11675.00	89.540	153.110	6604.22	3024.06	-3811.84	-171.59	1698183.89	548288.93	40°00'01.348"N	80°34'38.394"W	3815.70	182.577	6.02	-0.44	6.00
11764.00	89.750	158.500	6604.77	3111.45	-3893.00	-135.12	1698220.35	548207.79	40°00'00.551"N	80°34'37.913"W	3895.34	181.988	6.06	0.24	6.06
11854.00	89.750	152.580	6605.16	3199.89	-3974.88	-97.88	1698257.60	548125.90	39°59'59.746"N	80°34'37.422"W	3976.09	181.411	6.58	0.00	-6.58
11944.00	89.630	151.190	6605.65	3289.24	-4054.26	-55.47	1698300.01	548046.53	39°59'58.967"N	80°34'36.865"W	4054.64	180.784	1.55	-0.13	-1.54
12033.00	89.600	150.760	6606.25	3377.75	-4132.08	-12.28	1698343.19	547968.71	39°59'58.203"N	80°34'36.298"W	4132.10	180.170	0.48	-0.03	-0.48
12123.00	89.910	146.860	6606.63	3467.54	-4209.05	34.32	1698389.78	547891.74	39°59'57.447"N	80°34'35.688"W	4209.19	179.533	4.35	0.34	-4.33
12212.00	89.940	142.930	6606.75	3556.52	-4281.85	85.49	1698440.95	547818.95	39°59'56.734"N	80°34'35.019"W	4282.70	178.856	4.42	0.03	-4.42
12302.00	89.940	140.190	6606.84	3646.35	-4352.34	141.43	1698496.90	547748.46	39°59'56.044"N	80°34'34.289"W	4354.63	178.139	3.04	0.00	-3.04
12391.00	89.910	136.670	6606.96	3734.75	-4418.91	200.48	1698555.94	547681.89	39°59'55.393"N	80°34'33.521"W	4423.46	177.402	3.96	-0.03	-3.96
12481.00	89.780	138.280	6607.20	3823.97	-4485.24	261.31	1698616.77	547615.57	39°59'54.745"N	80°34'32.729"W	4492.84	176.666	1.79	-0.14	1.79
12571.00	89.750	142.970	6607.57	3913.68	-4554.79	318.39	1698673.85	547546.02	39°59'54.065"N	80°34'31.985"W	4565.90	176.001	5.21	-0.03	5.21
12660.00	89.660	140.680	6608.03	4002.54	-4624.75	373.39	1698728.85	547476.06	39°59'53.380"N	80°34'31.267"W	4639.80	175.384	2.57	-0.10	-2.57
12750.00	89.690	139.410	6608.54	4092.20	-4693.73	431.19	1698786.64	547407.08	39°59'52.705"N	80°34'30.514"W	4713.50	174.751	1.41	0.03	-1.41
12839.00	89.200	137.990	6609.40	4180.66	-4760.59	489.92	1698845.37	547340.22	39°59'52.051"N	80°34'29.749"W	4785.74	174.124	1.69	-0.55	-1.60
12929.00	89.200	136.270	6610.59	4269.80	-4826.54	551.14	1698906.59	547274.27	39°59'51.407"N	80°34'28.952"W	4857.91	173.486	1.91	0.10	-1.91
13018.00	89.170	142.630	6611.79	4358.33	-4894.13	608.97	1698964.42	547206.69	39°59'50.746"N	80°34'28.199"W	4931.87	172.907	7.15	-0.13	7.15
13108.00	89.200	145.220	6613.07	4448.29	-4966.86	661.96	1699017.40	547133.96	39°59'50.033"N	80°34'27.507"W	5010.77	172.409	2.88	0.03	2.88
13198.00	89.720	149.910	6613.92	4538.17	-5042.79	710.21	1699065.65	547058.03	39°59'49.289"N	80°34'26.876"W	5092.56	171.983	5.24	0.58	5.21
13287.00	89.600	152.990	6614.44	4626.60	-5120.96	752.74	1699108.18	546979.87	39°59'48.521"N	80°34'26.317"W	5175.99	171.638	3.46	-0.13	3.46
13377.00	90.150	152.940	6614.64	4715.73	-5201.13	793.65	1699149.09	546899.71	39°59'47.734"N	80°34'25.779"W	5261.33	171.324	0.61	0.61	-0.06
13466.00	89.970	148.110	6614.55	4804.29	-5278.58	837.43	1699192.86	546822.25	39°59'46.974"N	80°34'25.205"W	5344.60	170.985	5.43	-0.20	-5.43

## REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot D
Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

## WELLPATH DATA (184 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 [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
1356.00	89.880	142.570	6614.67	4894.25	-5352.58	888.59	1699244.03	546748.25	39°59'46.248"N	80°34'24.536"W	5425.84	170.574	6.16	-0.10	-6.16
13645.00	90.000	140.870	6614.76	4983.10	-5422.44	943.72	1699299.16	546678.40	39°59'45.565"N	80°34'23.817"W	5503.96	170.127	1.91	0.13	-1.91
13735.00	89.850	140.860	6614.88	5072.87	-5492.25	1000.53	1699355.96	546608.59	39°59'44.881"N	80°34'23.077"W	5582.64	169.676	0.17	-0.17	-0.01
13825.00	89.910	142.710	6615.06	5162.72	-5562.96	1056.20	1699411.63	546537.88	39°59'44.189"N	80°34'22.351"W	5662.34	169.250	2.06	0.07	2.06
13914.00	89.940	144.900	6615.18	5251.70	-5634.78	1108.75	1699464.18	546466.07	39°59'43.486"N	80°34'21.664"W	5742.83	168.868	2.46	0.03	2.46
14004.00	90.150	146.430	6615.11	5341.69	-5709.10	1159.52	1699514.94	546391.75	39°59'42.757"N	80°34'21.001"W	5825.66	168.519	1.72	0.23	1.70
14094.00	90.250	146.130	6614.80	5431.67	-5783.96	1209.48	1699564.90	546316.90	39°59'42.023"N	80°34'20.347"W	5909.06	168.189	0.35	0.11	-0.33
14183.00	90.150	146.240	6614.49	5520.65	-5857.90	1259.01	1699614.43	546242.96	39°59'41.299"N	80°34'19.700"W	5991.67	167.870	0.17	-0.11	0.12
14273.00	89.480	144.860	6614.78	5610.64	-5932.11	1309.92	1699665.34	546168.75	39°59'40.571"N	80°34'19.034"W	6075.02	167.548	1.70	-0.74	-1.53
14362.00	88.920	143.660	6616.02	5699.62	-6004.34	1361.90	1699717.31	546096.52	39°59'39.864"N	80°34'18.355"W	6156.86	167.220	1.49	-0.63	-1.35
14452.00	89.020	143.200	6617.64	5789.57	-6076.61	1415.51	1699770.93	546024.25	39°59'39.156"N	80°34'17.656"W	6239.30	166.887	0.52	0.11	-0.51
14542.00	89.020	142.270	6619.18	5879.49	-6148.23	1470.00	1699825.41	545952.64	39°59'38.455"N	80°34'16.945"W	6321.52	166.553	1.03	0.00	-1.03
14631.00	88.920	142.440	6620.78	5968.38	-6218.69	1524.35	1699879.76	545882.18	39°59'37.765"N	80°34'16.236"W	6402.79	166.227	0.22	-0.11	0.19
14721.00	88.950	143.490	6622.45	6058.31	-6290.52	1578.54	1699933.95	545810.35	39°59'37.061"N	80°34'15.528"W	6485.56	165.913	1.17	0.03	1.17
14810.00	88.490	143.750	6624.44	6147.26	-6362.16	1631.32	1699986.73	545738.72	39°59'36.360"N	80°34'14.839"W	6567.97	165.619	0.59	-0.52	0.29
14900.00	88.520	142.510	6626.79	6237.18	-6434.13	1685.30	1700040.70	545666.75	39°59'35.655"N	80°34'14.135"W	6651.18	165.322	1.38	0.03	-1.38
14990.00	88.340	142.480	6629.25	6327.06	-6505.50	1740.07	1700095.48	545595.38	39°59'34.956"N	80°34'13.420"W	6734.19	165.025	0.20	-0.20	-0.03
15079.00	88.770	143.970	6631.50	6415.98	-6576.76	1793.34	1700148.74	545524.12	39°59'34.258"N	80°34'12.725"W	6816.88	164.748	1.74	0.48	1.67
15169.00	89.510	145.160	6632.85	6505.97	-6650.08	1845.51	1700200.91	545450.81	39°59'33.540"N	80°34'12.043"W	6901.41	164.490	1.56	0.82	1.32
15258.00	89.420	146.210	6633.68	6594.96	-6723.59	1895.68	1700251.08	545377.30	39°59'32.819"N	80°34'11.388"W	6985.72	164.254	1.18	-0.10	1.18
15348.00	89.510	147.000	6634.52	6684.92	-6798.72	1945.21	1700300.61	545302.17	39°59'32.082"N	80°34'10.740"W	7071.53	164.033	0.88	0.10	0.88
15437.00	89.910	145.470	6634.97	6773.89	-6872.71	1994.68	1700350.07	545228.19	39°59'31.357"N	80°34'10.093"W	7156.32	163.816	1.78	0.45	-1.72
15527.00	89.940	145.590	6635.09	6863.89	-6946.91	2045.62	1700401.01	545153.99	39°59'30.630"N	80°34'09.427"W	7241.83	163.592	0.14	0.03	0.13
15616.00	89.880	143.950	6635.23	6952.89	-7019.60	2096.95	1700452.34	545081.30	39°59'29.918"N	80°34'08.757"W	7326.12	163.368	1.84	-0.07	-1.84
15706.00	89.850	143.430	6635.44	7042.86	-7092.13	2150.25	1700505.63	545008.78	39°59'29.207"N	80°34'08.061"W	7410.93	163.133	0.58	-0.03	-0.58
15796.00	89.290	144.120	6636.11	7132.84	-7164.73	2203.43	1700558.82	544936.18	39°59'28.496"N	80°34'07.367"W	7495.89	162.905	0.99	-0.62	0.77
15885.00	89.450	146.670	6637.09	7221.82	-7237.97	2253.97	1700609.35	544862.94	39°59'27.778"N	80°34'06.706"W	7580.81	162.703	2.87	0.18	2.87
15975.00	89.350	146.760	6638.03	7311.78	-7313.20	2303.36	1700658.74	544787.71	39°59'27.041"N	80°34'06.060"W	7667.36	162.518	0.15	-0.11	0.10
16064.00	89.480	146.650	6638.94	7400.73	-7387.59	2352.21	1700707.59	544713.33	39°59'26.311"N	80°34'05.421"W	7753.03	162.338	0.19	0.15	-0.12
16154.00	89.480	148.540	6639.76	7490.63	-7463.57	2400.44	1700755.82	544637.35	39°59'25.566"N	80°34'04.790"W	7840.09	162.171	2.10	0.00	2.10

### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot D
Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

### WELLPATH DATA (184 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 [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
16243.00	89.780	148.070	6640.34	7579.48	-7539.29	2447.20	1700802.57	544561.63	39°59'24.823"N	80°34'04.178"W	7926.52	162.017	0.63	0.34	-0.53
16333.00	89.820	147.460	6640.65	7669.38	-7615.42	2495.20	1700850.58	544485.50	39°59'24.077"N	80°34'03.549"W	8013.78	161.859	0.68	0.04	-0.68
16392.00	89.880	146.050	6640.80	7728.35	-7664.76	2527.55	1700882.92	544436.16	39°59'23.593"N	80°34'03.126"W	8070.76	161.749	2.39	0.10	-2.39
16417.00	89.880	146.050	6640.86	7753.34	-7685.50	2541.51	1700896.88	544415.43	39°59'23.390"N	80°34'02.944"W	8094.83	161.702	0.00	0.00	0.00

### HOLE & CASING SECTIONS - Ref Wellbore: SHL-22D-HS AWB Ref Wellpath: SHL-22D-HS AWP Proj: 16417'

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
30in Conductor	19.40	59.40	40.00	19.40	59.40	0.00	0.00	-0.04	-0.04
20in Casing Surface	19.40	361.40	342.00	19.40	361.39	0.00	0.00	0.47	-1.38
13.375in Casing Intermediate	19.40	1181.40	1162.00	19.40	1181.37	0.00	0.00	4.66	-1.41



### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY	Slot	Slot D
Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

### TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SHL-22D-HS LP Rev-3		6585.00	-852.82	-2232.67	1696122.89	551247.84	40°00'30.344"N	80°35'05.335"W	point
SHL-22D-HS LP Plat		6595.08	-668.27	-2361.90	1695993.66	551432.39	40°00'32.152"N	80°35'07.025"W	point
SHL-22D-HS BHL Rev-3		6657.75	-7681.23	2548.65	1700904.02	544419.70	39°59'23.433"N	80°34'02.853"W	point
SHL-22 Pad LL		7002.08	-42.20	-42.63	1698312.84	552058.43	40°00'38.614"N	80°34'37.318"W	polygon

### WELLPATH COMPOSITION - Ref Wellbore: SHL-22D-HS AWB Ref Wellpath: SHL-22D-HS AWP Proj: 16417'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
19.40	3107.40	Generic gyro - northseeking (Standard)	01_MS Gyro <12-1/4"> (100'-3100')	SHL-22D-HS AWB
3107.40	16392.00	NaviTrak (AT Curve Short Spaced)	02_BHI AT Curve <8-3/4"> (3107.4')(3190'-16392')	SHL-22D-HS AWB
16392.00	16417.00	Blind Drilling (std)	Projection to bit	SHL-22D-HS AWB

**REFERENCE WELLPATH IDENTIFICATION**

Operator	NOBLE ENERGY	Slot	Slot D
Area	Marshall County, WV	Well	SHL-22D-HS
Field	Marshall	Wellbore	SHL-22D-HS AWB
Facility	SHL-22 Pad		

**COMMENTS**

Wellpath general comments  
 API: 47-051-01809-0000  
 BHI Job #: 7372098  
 Rig: Precision 584  
 Duration: 7/18/2015-7/24/2015  
 MS Gyro <12-1/4"> (100'-3100')  
 BHI AT Curve <8-3/4"> (3107.4')(3190'-16392')  
 Projected MD at TD: 16417'

Plot reference wgs84 is SHL-22D-HS FWP Row 0

True vertical depths are referenced to Precision 584 (RKB)

Measured depths are referenced to Precision 584 (RKB)

Precision 584 (RKB) to Mean Sea Level: 1342.08 ft

Mean Sea Level to Mud line (At Slot: Slot D): -1327.08 ft

Coordinates are in feet referenced to Slot

Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (2011) US feet

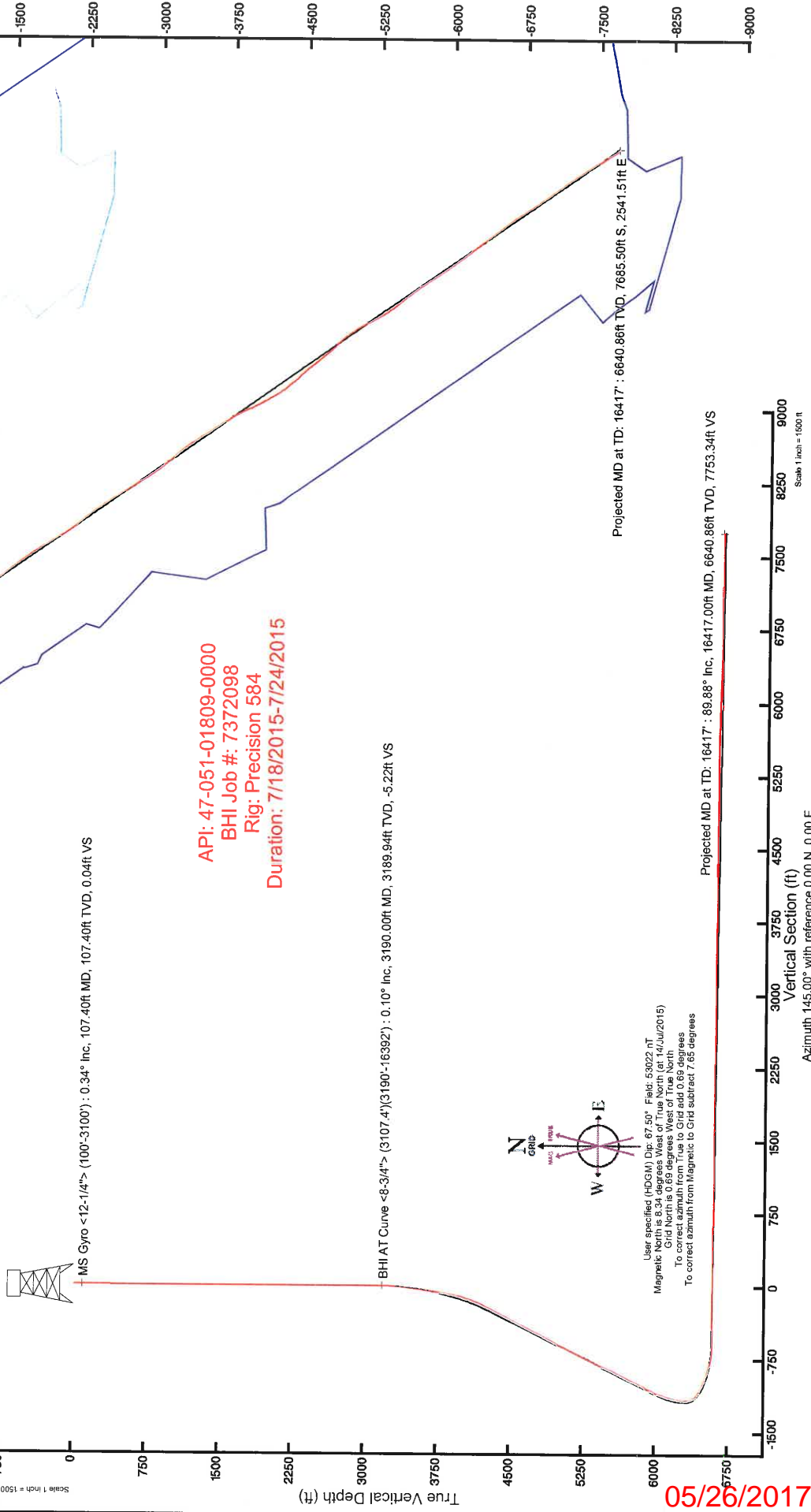
North Reference: Grid North

Scale: True distance

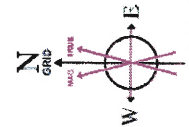
Digits are in feet

Created by: odaynne on 09/Aug/2015

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
SHL-22 Pad	1698312.840	552058.430	80°34'37.316"W
Slot	Local N (ft)	Grid East (US ft)	Longitude
Slot D	42.20	1698355.470	80°34'36.777"W
Comment	July 15, 2015 - PD 584 KB Adjusted from 19.4' to 28'		
Precision 584 (RKB) to Mud line (At Slot: Slot D)	19.4ft		
Mean Sea Level to Mud line (At Slot: Slot D)	-1327.68ft		
Precision 584 (RKB) to Mean Sea Level	1342.08ft		



API: 47-051-01809-0000  
 BHI Job #: 7372098  
 Rig: Precision 584  
 Duration: 7/18/2015-7/24/2015



User specified (HDGM) Dip: 67.50° Field: 53022 nT  
 Magnetic North is 8.34 degrees West of True North (at 14/Jul/2015)  
 Grid North is 0.69 degrees West of True North  
 To correct azimuth from Magnetic to Grid subtract 7.65 degrees  
 To correct azimuth from Magnetic to Grid subtract 7.65 degrees

05/29/2017