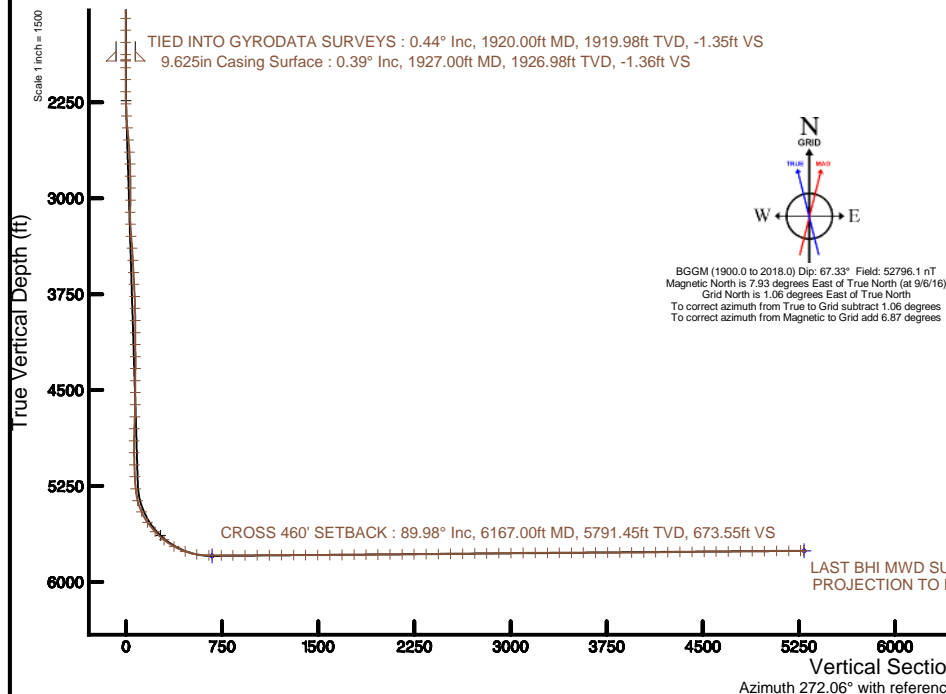


# NOBLE ENERGY, INC

Location: COLORADO Slot: SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)  
Field: WELD COUNTY (NOBLE NAD 83 GRID) Well: HARPER LD21-668  
Facility: SEC.22-T09N-R58W Wellbore: HARPER LD21-668 PWB

Plot reference wellpath is HARPER LD21-668 (REV-C.O, 8-MARIL NIO) PWP	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
True vertical depths are referenced to H&P 517 (30KB) (RKB)	* = Wellpath was transformed from a different geodetic datum
Measured depths are referenced to H&P 517 (30KB) (RKB)	North Reference: Grid north
H&P 517 (30KB) (RKB) to Mean Sea Level: 4806 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: cookdanm on 2016-09-23
	Database: WA_DEN_Denver_Defn



### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY, INC	Slot	SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-668
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-668 AWP
Facility	SEC.22-T09N-R58W		

### REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Cookdanm
Scale	0.999993	Report Generated	9/23/16 at 1:04:32 PM
Convergence at slot	1.07° East	Database/Source file	WA_DEN_Denver_Defn/HARPER_LD21-668_AWP.xml

### WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	3041.80	-1032.07	3454902.44	1516364.38	40°44'21.300"N	103°51'30.060"W
Facility Reference Pt			3455934.50	1513322.61	40°43'51.060"N	103°51'17.388"W
Field Reference Pt			3000000.00	4454105.15	48°46'34.315"N	105°30'00.000"W

### WELLPATH DATUM

Calculation method	Minimum curvature	H&P 517 (30'KB) (RKB) to Facility Vertical Datum	4806.00ft
Horizontal Reference Pt	Slot	H&P 517 (30'KB) (RKB) to Mean Sea Level	4806.00ft
Vertical Reference Pt	H&P 517 (30'KB) (RKB)	H&P 517 (30'KB) (RKB) to Mud Line at Slot (SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22))	4806.00ft
MD Reference Pt	H&P 517 (30'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	272.06°

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-668
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-668 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH DATA (97 stations)								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
1920.00	0.440	161.410	1919.98	-1.35	-1.86	1.28	0.10	TIED INTO GYRODATA SURVEYS
1980.00	0.040	149.420	1979.98	-1.44	-2.10	1.36	0.67	
2074.00	0.130	6.480	2073.98	-1.46	-2.02	1.39	0.17	
2169.00	0.030	59.100	2168.98	-1.49	-1.90	1.43	0.12	
2263.00	1.940	234.560	2262.96	-0.25	-2.81	0.15	2.10	
2358.00	3.810	257.100	2357.84	4.07	-4.45	-4.24	2.26	
2452.00	5.750	283.740	2451.52	11.70	-4.03	-11.86	3.08	
2547.00	5.480	301.290	2546.07	20.32	-0.54	-20.36	1.82	
2641.00	5.510	320.160	2639.65	27.26	5.26	-27.08	1.91	
2736.00	6.510	344.120	2734.14	31.96	13.94	-31.48	2.82	
2830.00	6.240	354.570	2827.56	34.27	24.15	-33.42	1.27	
2925.00	6.100	357.770	2922.01	35.32	34.34	-34.11	0.39	
3019.00	6.270	10.130	3015.47	34.97	44.38	-33.40	1.43	
3114.00	6.230	7.420	3109.90	33.77	54.60	-31.82	0.31	
3208.00	6.360	339.460	3203.36	35.29	64.53	-32.99	3.23	
3303.00	6.250	314.450	3297.80	41.13	73.08	-38.53	2.87	
3397.00	6.350	323.370	3391.24	48.16	80.84	-45.28	1.05	
3492.00	6.110	330.550	3485.68	54.09	89.46	-50.90	0.86	
3587.00	6.250	333.790	3580.12	59.18	98.50	-55.67	0.40	
3681.00	6.120	334.220	3673.58	63.95	107.60	-60.11	0.15	
3776.00	6.240	338.260	3768.02	68.40	116.96	-64.23	0.47	
3870.00	6.140	353.470	3861.48	71.21	126.70	-66.69	1.74	
3965.00	6.060	0.710	3955.95	72.09	136.76	-67.20	0.81	
4060.00	6.010	357.680	4050.42	72.59	146.74	-67.34	0.34	
4154.00	6.680	355.100	4143.84	73.63	157.11	-68.01	0.77	
4249.00	6.290	358.480	4238.24	74.62	167.82	-68.62	0.57	
4343.00	6.330	8.140	4331.67	74.39	178.09	-68.02	1.13	
4438.00	5.950	3.860	4426.13	73.69	188.19	-66.95	0.63	
4532.00	5.960	8.320	4519.62	73.00	197.88	-65.92	0.49	
4627.00	6.480	6.320	4614.06	72.07	208.09	-64.61	0.59	

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-668
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-668 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH DATA (97 stations) † = interpolated/extrapolated station								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
4722.00	6.180	26.900	4708.49	69.52	217.98	-61.71	2.40	
4816.00	6.650	20.730	4801.90	65.65	227.58	-57.49	0.89	
4911.00	6.690	5.850	4896.27	63.53	238.23	-54.98	1.81	
5005.00	6.570	354.500	4989.64	63.87	249.03	-54.94	1.40	
5100.00	6.540	344.870	5084.03	66.19	259.66	-56.87	1.16	
5194.00	6.450	343.510	5177.42	69.45	269.89	-59.77	0.19	
5289.00	8.290	320.740	5271.65	75.67	280.32	-65.62	3.60	
5383.00	15.860	303.200	5363.53	91.17	292.62	-80.68	8.86	
5478.00	24.780	283.760	5452.63	121.87	304.50	-110.97	11.66	
5572.00	34.900	280.080	5534.07	167.91	313.92	-156.71	10.94	
5667.00	44.020	280.300	5607.34	227.62	324.60	-216.07	9.60	
5761.00	51.800	270.840	5670.38	297.06	331.00	-285.32	11.13	
5856.00	61.280	264.340	5722.73	375.90	327.42	-364.34	11.49	
5951.00	71.260	263.820	5760.92	461.91	318.45	-450.73	10.52	
6045.00	80.690	266.040	5783.67	552.30	310.44	-541.47	10.29	
6140.00	89.940	269.080	5791.43	646.58	306.43	-635.95	10.24	
6167.00†	89.981	269.358	5791.45	673.55	306.06	-662.95	1.04	CROSS 460' SETBACK
6238.00	90.090	270.090	5791.40	744.49	305.72	-733.95	1.04	
6329.00	90.150	269.770	5791.21	835.42	305.61	-824.95	0.36	
6423.00	90.030	268.820	5791.06	929.31	304.45	-918.94	1.02	
6518.00	90.280	268.050	5790.81	1024.12	301.86	-1013.90	0.85	
6612.00	90.250	268.300	5790.37	1117.90	298.86	-1107.86	0.27	
6707.00	90.060	268.740	5790.11	1212.72	296.41	-1202.82	0.50	
6802.00	90.150	269.200	5789.94	1307.58	294.70	-1297.81	0.49	
6896.00	89.970	269.580	5789.84	1401.48	293.70	-1391.80	0.45	
6991.00	90.310	271.020	5789.61	1496.43	294.20	-1486.80	1.56	
7085.00	90.580	271.760	5788.88	1590.42	296.48	-1580.77	0.84	
7180.00	90.490	266.390	5787.99	1685.25	294.95	-1675.71	5.65	
7275.00	90.620	263.350	5787.07	1779.49	286.45	-1770.32	3.20	
7369.00	90.340	262.740	5786.28	1872.32	275.07	-1863.62	0.71	

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-668
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-668 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH DATA (97 stations)									
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments	
7464.00	90.490	263.400	5785.60	1966.15	263.61	-1957.93	0.71		
7559.00	90.430	265.180	5784.83	2060.27	254.16	-2052.45	1.87		
7653.00	90.400	266.900	5784.15	2153.75	247.67	-2146.22	1.83		
7748.00	90.490	270.040	5783.41	2248.55	245.13	-2241.17	3.31		
7842.00	90.740	271.130	5782.40	2342.51	246.09	-2335.16	1.19		
7937.00	90.680	272.670	5781.23	2437.50	249.24	-2430.09	1.62		
8032.00	90.740	274.890	5780.05	2532.44	255.50	-2524.87	2.34		
8126.00	90.680	275.870	5778.89	2626.27	264.31	-2618.45	1.04		
8221.00	90.740	275.130	5777.71	2721.10	273.42	-2713.01	0.78		
8315.00	90.860	273.660	5776.40	2815.01	280.62	-2806.72	1.57		
8410.00	90.650	270.740	5775.14	2909.99	284.27	-2901.63	3.08		
8504.00	90.770	268.930	5773.98	3003.91	284.00	-2995.62	1.93		
8599.00	90.180	267.880	5773.19	3098.71	281.35	-3090.58	1.27		
8694.00	90.370	267.670	5772.73	3193.44	277.66	-3185.50	0.30		
8789.00	90.310	265.730	5772.17	3288.02	272.20	-3280.34	2.04		
8883.00	90.150	264.380	5771.79	3381.31	264.09	-3373.99	1.45		
8978.00	90.370	264.660	5771.36	3475.49	255.02	-3468.55	0.37		
9072.00	90.280	265.420	5770.83	3568.78	246.89	-3562.20	0.81		
9167.00	90.120	266.050	5770.50	3663.20	239.83	-3656.93	0.68		
9261.00	90.310	267.120	5770.15	3756.77	234.23	-3750.77	1.16		
9356.00	90.490	265.600	5769.48	3851.29	228.20	-3845.57	1.61		
9450.00	90.180	266.350	5768.93	3944.76	221.60	-3939.33	0.86		
9545.00	90.650	267.620	5768.24	4039.38	216.60	-4034.20	1.43		
9639.00	90.490	267.410	5767.31	4133.08	212.53	-4128.10	0.28		
9734.00	90.920	267.310	5766.14	4227.75	208.15	-4223.00	0.46		
9829.00	90.590	267.060	5764.89	4322.40	203.49	-4317.87	0.44		
9923.00	90.550	267.800	5763.95	4416.09	199.27	-4411.77	0.79		
10018.00	90.580	268.420	5763.02	4510.86	196.14	-4506.72	0.65		
10112.00	90.490	267.300	5762.14	4604.60	192.63	-4600.65	1.20		
10207.00	90.400	266.370	5761.40	4699.20	187.39	-4695.50	0.98		

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-668
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-668 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH DATA (97 stations)								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
10301.00	90.400	263.750	5760.74	4792.49	179.29	-4789.14	2.79	
10396.00	90.650	264.990	5759.87	4886.63	169.97	-4883.67	1.33	
10491.00	90.740	267.830	5758.72	4981.15	164.02	-4978.47	2.99	
10585.00	90.580	270.290	5757.64	5075.00	162.48	-5072.44	2.62	
10680.00	90.650	272.840	5756.62	5169.99	165.08	-5167.40	2.69	
10774.00	90.430	271.610	5755.73	5263.98	168.73	-5261.32	1.33	LAST BHI MWD SURVEY
10798.00	90.430	271.610	5755.55	5287.98	169.40	-5285.31	0.00	PROJECTION TO BIT

HOLE & CASING SECTIONS - Ref Wellbore: HARPER LD21-668 AWB      Ref Wellpath: HARPER LD21-668 AWP									
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]
9.625in Casing Surface	0.00	1927.00	1927.00	0.00	1926.98	0.00	0.00	-1.91	1.30
8.5in Open Hole	1927.00	10798.00	8871.00	1926.98	5755.55	-1.91	1.30	169.40	-5285.31

### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY, INC	Slot	SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-668
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-668 AWB
Facility	SEC.22-T09N-R58W		

### TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.21-T09N-R58W	-1.00	-72.91	-1.42	3454901.02	1516291.47	40°44'20.580"N	103°51'30.096"W	polygon
HARPER LD21-668 BHL ON PLAT REV-2 (1430'FNL & 330'FWL, SEC.21)	5755.76	190.56	-5286.26	3449616.23	1516554.94	40°44'24.144"N	103°52'38.676"W	point
HARPER LD21-668 BHL ON PLAT REV-1 (1430'FNL & 330'FWL, SEC.21)	5781.76	190.56	-5286.26	3449616.23	1516554.94	40°44'24.144"N	103°52'38.676"W	point
HARPER LD21-668 LANDING POINT REV-3 (1430'FNL & 330'FEL, SEC.21)	5796.13	316.00	-662.00	3454240.45	1516680.38	40°44'24.543"N	103°51'38.583"W	point
HARPER LD21-668 LANDING POINT (1430'FNL & 330'FEL, SEC.21)	5810.76	316.00	-660.00	3454242.45	1516680.38	40°44'24.543"N	103°51'38.557"W	point
HARPER LD21-668 LANDING POINT REV-2 (1430'FNL & 330'FEL, SEC.21)	5822.13	316.00	-662.00	3454240.45	1516680.38	40°44'24.543"N	103°51'38.583"W	point
SEC.21-T09N-R58W HARDLINES (330' SETBACKS)	5826.00	-72.91	-1.42	3454901.02	1516291.47	40°44'20.580"N	103°51'30.096"W	polygon

### WELLPATH COMPOSITION - Ref Wellbore: HARPER LD21-668 AWB Ref Wellpath: HARPER LD21-668 AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
0.00	1920.00	Approximation of GYD GC+DROP+OH	13 1/2" GYRODATA SURFACE SURVEYS <78 - 1920>	HARPER LD21-668 AWB
1920.00	10774.00	OWSG MWD rev2 + IFR1 + Multi-Station Correction	8 1/2" BHI MWD AUTOTRAK CURVE MONOBORE (MSA CORRECTED) <1920 - 10774>	HARPER LD21-668 AWB
10774.00	10798.00	Blind Drilling (std)	Projection to bit	HARPER LD21-668 AWB

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#05 HARPER LD21-668 (1745'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-668
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-668 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1920.00	0.440	161.410	1919.98	TIED INTO GYRODATA SURVEYS
6167.00	89.981	269.358	5791.45	CROSS 460' SETBACK
10774.00	90.430	271.610	5755.73	LAST BHI MWD SURVEY
10798.00	90.430	271.610	5755.55	PROJECTION TO BIT