

NOBLE ENERGY, INC

Location: COLORADO Slot: SLOT#19 LARSON A23-645 (2397°FNL&535°FWL,SEC.19)
Field: WELD COUNTY (NOBLE NAD 83 GRID) Well: LARSON A23-645
Facility: SEC.19-T06N-R63W Wellbore: LARSON A23-645 PWB

Plot reference wellpath is LARSON A23-645 (REV-B.0) PWP	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
True vertical depths are referenced to H&P 517 (30°KB) (RKB)	North Reference: Grid north
Measured depths are referenced to H&P 517 (30°KB) (RKB)	Scale: True distance
H&P 517 (30°KB) (RKB) to Mean Sea Level: 4679 feet	Depths are in feet
Mean Sea Level to Ground level (At Slot: SLOT#19 LARSON A23-645 (2397°FNL&535°FWL,SEC.19)): 0 feet	Created by: amurtime on 2018-06-15
Coordinates are in feet referenced to Slot	Database: WA DENVER

Location Information

Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.19-T06N-R63W			3282103.737	1414428.283	40°27'59.688"N	104°29'09.888"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#19 LARSON A23-645 (2397°FNL&535°FWL,SEC.19)	2146.88	-238.79	3281864.952	1416575.080	40°28'20.928"N	104°29'12.660"W
H&P 517 (30°KB) (RKB) to Ground level (At Slot: SLOT#19 LARSON A23-645 (2397°FNL&535°FWL,SEC.19))					4679ft	
Mean Sea Level to Ground level (At Slot: SLOT#19 LARSON A23-645 (2397°FNL&535°FWL,SEC.19))					0ft	
H&P 517 (30°KB) (RKB) to Mean Sea Level					4679ft	

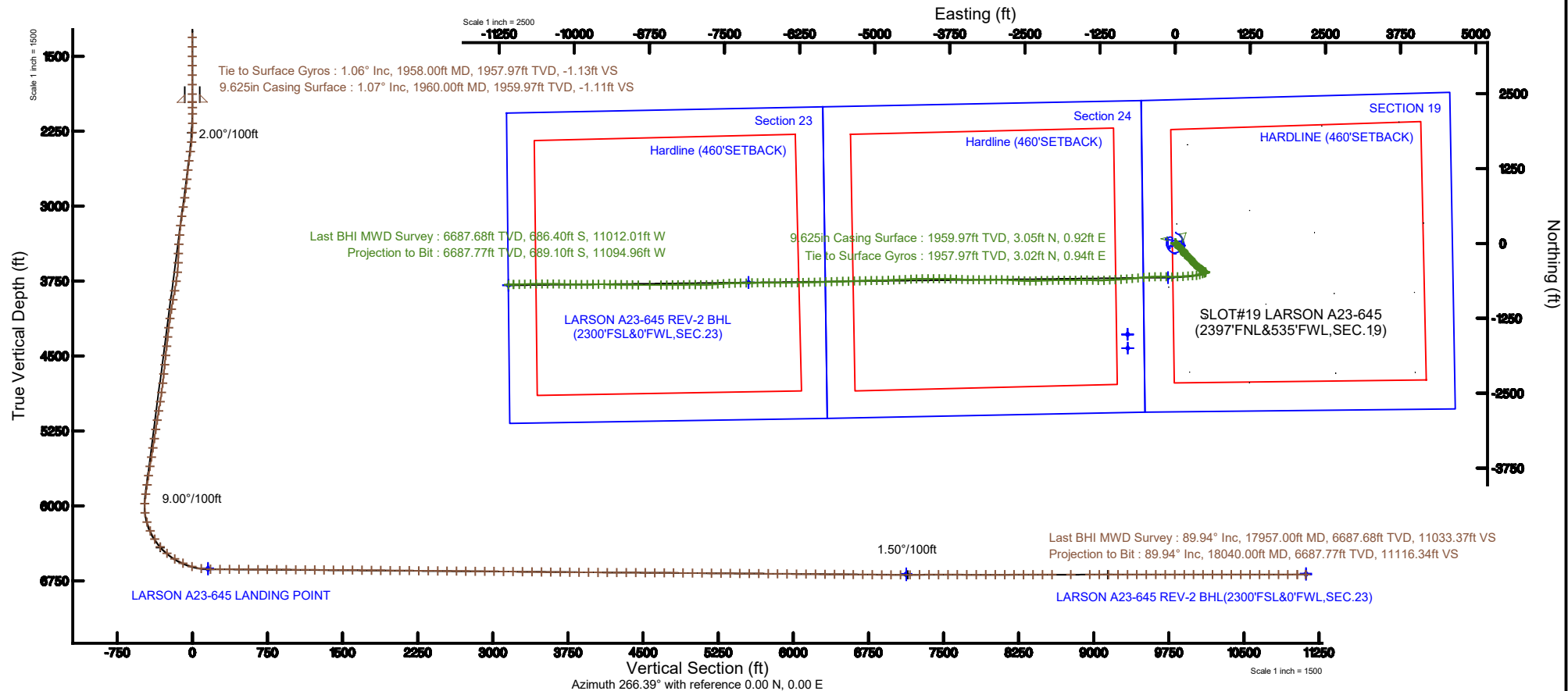


Survey Program

Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
30.00	18040.43	OWSG MWD rev2	OWSG MWD rev2 + IFR1 + Multi-Station Correction		LARSON A23-645 PWB

Comments

SURFACE LOCATION: SWNW
40.47248N
104.48685W
API: 05-123-45515





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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#19 LARSON A23-645 (2397'FNL&535'FWL,SEC.19)
Area	COLORADO	Well	LARSON A23-645
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	LARSON A23-645 AWB
Facility	SEC.19-T06N-R63W		

REPORT SETUP INFORMATION			
Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Amuntime
Scale	0.999964	Report Generated	6/15/2018 at 10:51:52 AM
Convergence at slot	0.65° East	Database/Source file	WA DENVER/LARSON_A23-645_AWP.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	2146.88	-238.79	3281864.95	1416575.08	40°28'20.928"N	104°29'12.660"W
Facility Reference Pt			3282103.74	1414428.28	40°27'59.688"N	104°29'09.888"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	4679.00ft
Horizontal Reference Pt	Slot	H&P 517 (30'KB) (RKB) to Mean Sea Level	4679.00ft
Vertical Reference Pt	H&P 517 (30'KB) (RKB)	H&P 517 (30'KB) (RKB) to Ground Level at Slot (SLOT#19 LARSON A23-645 (2397'FNL&535'FWL,SEC.19))	4679.00ft
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	266.39°



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Area	COLORADO	Well	LARSON A23-645
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	LARSON A23-645 AWP
Facility	SEC.19-T06N-R63W		

WELLPATH DATA (191 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00	0.000	104.650	0.00	0.00	0.00	0.00	40°28'20.928"N	104°29'12.660"W	0.00	
84.00	0.110	104.650	84.00	-0.08	-0.02	0.08	40°28'20.928"N	104°29'12.659"W	0.13	
180.00	0.150	140.190	180.00	-0.24	-0.14	0.25	40°28'20.927"N	104°29'12.657"W	0.09	
271.00	0.270	291.630	271.00	-0.11	-0.15	0.12	40°28'20.926"N	104°29'12.658"W	0.45	
366.00	0.100	291.400	366.00	0.16	-0.04	-0.16	40°28'20.928"N	104°29'12.662"W	0.18	
460.00	0.290	169.520	460.00	0.21	-0.24	-0.19	40°28'20.926"N	104°29'12.663"W	0.38	
555.00	0.250	162.150	555.00	0.13	-0.68	-0.09	40°28'20.921"N	104°29'12.661"W	0.06	
649.00	0.440	91.460	649.00	-0.28	-0.88	0.34	40°28'20.919"N	104°29'12.656"W	0.46	
744.00	0.340	45.220	743.99	-0.86	-0.69	0.90	40°28'20.921"N	104°29'12.648"W	0.34	
838.00	0.370	97.410	837.99	-1.36	-0.54	1.40	40°28'20.923"N	104°29'12.642"W	0.33	
933.00	0.320	35.420	932.99	-1.83	-0.36	1.86	40°28'20.924"N	104°29'12.636"W	0.38	
1028.00	0.250	55.840	1027.99	-2.18	-0.03	2.18	40°28'20.927"N	104°29'12.632"W	0.13	
1123.00	0.460	349.050	1122.99	-2.31	0.46	2.28	40°28'20.932"N	104°29'12.630"W	0.45	
1217.00	0.540	310.510	1216.99	-1.94	1.12	1.87	40°28'20.939"N	104°29'12.636"W	0.36	
1311.00	0.360	74.080	1310.98	-1.91	1.49	1.82	40°28'20.943"N	104°29'12.636"W	0.85	
1406.00	0.090	307.330	1405.98	-2.15	1.62	2.05	40°28'20.944"N	104°29'12.633"W	0.44	
1501.00	0.150	294.510	1500.98	-1.98	1.72	1.88	40°28'20.945"N	104°29'12.635"W	0.07	
1595.00	0.280	221.760	1594.98	-1.71	1.60	1.61	40°28'20.944"N	104°29'12.632"W	0.29	
1690.00	0.180	126.010	1689.98	-1.66	1.33	1.58	40°28'20.941"N	104°29'12.639"W	0.37	
1784.00	0.420	28.690	1783.98	-1.96	1.55	1.86	40°28'20.943"N	104°29'12.636"W	0.51	
1878.00	0.570	310.250	1877.98	-1.80	2.15	1.67	40°28'20.949"N	104°29'12.638"W	0.68	
1958.00	1.060	324.710	1957.97	-1.13	3.02	0.94	40°28'20.958"N	104°29'12.647"W	0.66	Tie to Surface Gyros
2013.00	1.330	302.940	2012.96	-0.35	3.78	0.11	40°28'20.965"N	104°29'12.658"W	0.95	
2076.00	0.740	232.630	2075.95	0.58	3.93	-0.83	40°28'20.967"N	104°29'12.670"W	2.04	
2171.00	1.950	177.140	2170.92	1.11	1.94	-1.23	40°28'20.947"N	104°29'12.676"W	1.73	
2265.00	3.580	141.540	2264.82	-0.55	-1.95	0.67	40°28'20.909"N	104°29'12.652"W	2.44	
2360.00	8.110	122.150	2359.31	-7.68	-7.85	8.20	40°28'20.850"N	104°29'12.555"W	5.14	
2455.00	10.770	125.470	2453.01	-20.02	-16.56	21.10	40°28'20.762"N	104°29'12.389"W	2.86	
2550.00	10.940	130.490	2546.32	-33.38	-27.57	35.18	40°28'20.652"N	104°29'12.209"W	1.01	
2644.00	10.470	137.720	2638.68	-45.12	-39.68	47.72	40°28'20.531"N	104°29'12.049"W	1.51	
2739.00	11.040	147.750	2732.02	-54.88	-53.76	58.38	40°28'20.390"N	104°29'11.913"W	2.06	
2833.00	11.100	140.970	2824.28	-64.44	-68.40	68.88	40°28'20.244"N	104°29'11.779"W	1.39	
2928.00	11.430	127.610	2917.46	-76.82	-81.25	82.10	40°28'20.116"N	104°29'11.610"W	2.76	
3022.00	10.910	121.240	3009.69	-91.13	-91.55	97.08	40°28'20.012"N	104°29'11.417"W	1.42	
3117.00	10.720	125.620	3103.00	-105.35	-101.36	111.95	40°28'19.914"N	104°29'11.227"W	0.89	
3211.00	9.940	132.880	3195.48	-117.71	-111.97	125.00	40°28'19.808"N	104°29'11.059"W	1.61	
3306.00	9.510	143.150	3289.12	-127.65	-123.83	135.72	40°28'19.689"N	104°29'10.922"W	1.88	
3400.00	8.670	149.790	3381.94	-135.08	-136.17	143.94	40°28'19.566"N	104°29'10.818"W	1.43	
3495.00	9.660	166.370	3475.75	-139.68	-150.11	149.42	40°28'19.428"N	104°29'10.749"W	2.96	
3589.00	11.710	167.140	3568.11	-142.58	-167.07	153.40	40°28'19.260"N	104°29'10.700"W	2.19	
3684.00	11.800	148.280	3661.15	-148.71	-184.74	160.66	40°28'19.084"N	104°29'10.609"W	4.03	
3778.00	12.180	126.640	3753.15	-160.82	-198.84	173.68	40°28'18.944"N	104°29'10.442"W	4.77	
3873.00	11.680	114.300	3846.11	-176.96	-208.78	190.49	40°28'18.844"N	104°29'10.226"W	2.73	
3967.00	11.470	113.780	3938.20	-193.67	-216.47	207.71	40°28'18.766"N	104°29'10.005"W	0.25	
4062.00	11.610	125.660	4031.29	-209.46	-225.85	224.12	40°28'18.671"N	104°29'09.794"W	2.50	



Actual Wellpath Report

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Operator	NOBLE ENERGY, INC	Slot	SLOT#19 LARSON A23-645 (2397'FNL&535'FWL,SEC.19)
Area	COLORADO	Well	LARSON A23-645
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	LARSON A23-645 AWP
Facility	SEC.19-T06N-R63W		

WELLPATH DATA (191 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4157.00	11.510	131.790	4124.37	-223.52	-237.74	238.96	40°28'18.552"N	104°29'09.603"W	1.30	
4251.00	11.440	137.670	4216.49	-235.93	-250.88	252.23	40°28'18.421"N	104°29'09.434"W	1.25	
4346.00	11.660	147.440	4309.58	-246.48	-265.94	263.74	40°28'18.271"N	104°29'09.287"W	2.07	
4440.00	11.690	142.780	4401.64	-256.35	-281.53	274.61	40°28'18.115"N	104°29'09.149"W	1.00	
4535.00	11.410	141.610	4494.71	-267.03	-296.56	286.27	40°28'17.965"N	104°29'09.000"W	0.38	
4630.00	11.320	149.300	4587.86	-276.64	-311.94	296.87	40°28'17.812"N	104°29'08.865"W	1.60	
4724.00	11.430	144.510	4680.01	-285.76	-327.46	306.98	40°28'17.658"N	104°29'08.737"W	1.01	
4819.00	11.530	141.130	4773.11	-296.21	-342.51	318.41	40°28'17.508"N	104°29'08.591"W	0.72	
4913.00	11.580	137.270	4865.21	-307.59	-356.76	330.70	40°28'17.366"N	104°29'08.434"W	0.82	
5007.00	11.730	125.490	4957.28	-320.96	-369.24	344.89	40°28'17.241"N	104°29'08.252"W	2.53	
5102.00	11.470	115.790	5050.35	-336.68	-378.95	361.26	40°28'17.143"N	104°29'08.042"W	2.07	
5196.00	10.950	129.710	5142.57	-351.33	-388.72	376.54	40°28'17.045"N	104°29'07.846"W	2.92	
5291.00	11.670	129.950	5235.73	-364.85	-400.66	390.85	40°28'16.925"N	104°29'07.662"W	0.76	
5385.00	11.560	123.210	5327.81	-379.28	-411.92	406.02	40°28'16.812"N	104°29'07.468"W	1.45	
5480.00	11.500	125.620	5420.89	-394.24	-422.65	421.68	40°28'16.704"N	104°29'07.267"W	0.51	
5574.00	11.690	125.560	5512.97	-408.88	-433.65	437.05	40°28'16.594"N	104°29'07.070"W	0.20	
5669.00	11.630	126.860	5606.01	-423.63	-444.99	452.54	40°28'16.480"N	104°29'06.871"W	0.28	
5763.00	11.470	129.110	5698.11	-437.70	-466.57	467.37	40°28'16.364"N	104°29'06.681"W	0.51	
5858.00	11.610	125.520	5791.19	-452.06	-468.08	482.48	40°28'16.248"N	104°29'06.487"W	0.77	
5952.00	7.950	89.110	5883.89	-465.90	-473.48	496.69	40°28'16.193"N	104°29'06.304"W	7.46	
6046.00	7.790	146.420	5977.14	-475.59	-478.70	506.73	40°28'16.141"N	104°29'06.175"W	8.01	
6141.00	8.950	238.500	6071.47	-472.27	-487.95	503.98	40°28'16.050"N	104°29'06.212"W	12.69	
6235.00	16.980	249.350	6163.02	-452.65	-496.63	484.87	40°28'15.966"N	104°29'06.460"W	8.89	
6330.00	24.510	251.400	6251.79	-420.30	-507.82	453.17	40°28'15.859"N	104°29'06.872"W	7.96	
6424.00	32.880	254.810	6334.18	-376.39	-520.75	409.98	40°28'15.736"N	104°29'07.433"W	9.07	
6519.00	41.140	259.850	6409.99	-319.97	-533.04	354.23	40°28'15.621"N	104°29'08.156"W	9.26	
6613.00	48.710	266.770	6476.54	-253.80	-540.49	288.40	40°28'15.555"N	104°29'09.009"W	9.58	
6708.00	59.830	266.420	6531.93	-176.80	-545.08	211.54	40°28'15.518"N	104°29'10.004"W	11.71	
6802.00	65.910	265.720	6574.78	-93.19	-550.83	128.12	40°28'15.471"N	104°29'11.084"W	6.50	
6897.00	73.300	266.450	6607.86	-4.20	-556.89	39.34	40°28'15.421"N	104°29'12.233"W	7.81	
6991.00	82.220	270.530	6627.78	87.48	-559.25	-52.38	40°28'15.408"N	104°29'13.420"W	10.39	
7086.00	89.480	272.090	6634.65	181.82	-557.08	-147.04	40°28'15.440"N	104°29'14.645"W	7.82	
7180.00	89.510	270.450	6635.48	275.47	-555.00	-241.01	40°28'15.471"N	104°29'15.860"W	1.74	
7275.00	89.690	268.060	6636.14	370.34	-556.23	-335.99	40°28'15.470"N	104°29'17.089"W	2.52	
7369.00	89.820	266.330	6636.54	464.33	-560.83	-429.87	40°28'15.435"N	104°29'18.305"W	1.85	
7464.00	89.600	265.190	6637.02	559.32	-567.86	-524.61	40°28'15.376"N	104°29'19.531"W	1.22	
7559.00	89.690	264.810	6637.61	654.29	-576.14	-619.25	40°28'15.305"N	104°29'20.757"W	0.41	
7653.00	89.820	264.730	6638.01	748.25	-584.71	-712.86	40°28'15.231"N	104°29'21.969"W	0.16	
7748.00	89.480	265.030	6638.59	843.22	-593.18	-807.48	40°28'15.158"N	104°29'23.195"W	0.48	
7842.00	89.630	266.790	6639.32	937.21	-599.89	-901.23	40°28'15.102"N	104°29'24.409"W	1.88	
7937.00	89.450	267.740	6640.09	1032.19	-604.42	-996.12	40°28'15.068"N	104°29'25.637"W	1.02	
8032.00	89.350	265.200	6641.08	1127.18	-610.27	-1090.92	40°28'15.021"N	104°29'26.865"W	2.68	
8126.00	89.570	266.910	6641.97	1221.17	-616.74	-1184.69	40°28'14.968"N	104°29'28.079"W	1.83	
8220.00	89.880	271.750	6642.42	1315.01	-617.83	-1278.66	40°28'14.967"N	104°29'29.295"W	5.16	
8315.00	89.570	271.430	6642.87	1409.62	-615.20	-1373.62	40°28'15.004"N	104°29'30.523"W	0.47	



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Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	LARSON A23-645 AWP
Facility	SEC.19-T06N-R63W		

WELLPATH DATA (191 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
8410.00	89.690	270.910	6643.49	1504.29	-613.26	-1468.60	40°28'15.034"N	104°29'31.752"W	0.56	
8504.00	89.540	269.820	6644.12	1598.06	-612.66	-1562.59	40°28'15.050"N	104°29'32.968"W	1.17	
8599.00	89.450	269.130	6644.96	1692.92	-613.53	-1657.58	40°28'15.052"N	104°29'34.197"W	0.73	
8694.00	89.380	269.780	6645.93	1787.78	-614.43	-1752.57	40°28'15.054"N	104°29'35.426"W	0.69	
8788.00	89.600	269.720	6646.76	1881.61	-614.84	-1846.57	40°28'15.061"N	104°29'36.642"W	0.24	
8883.00	89.320	270.050	6647.66	1976.43	-615.03	-1941.56	40°28'15.069"N	104°29'37.871"W	0.46	
8978.00	89.690	268.820	6648.48	2071.29	-615.97	-2036.55	40°28'15.071"N	104°29'39.100"W	1.35	
9072.00	89.480	268.690	6649.16	2165.21	-618.01	-2130.53	40°28'15.061"N	104°29'40.316"W	0.26	
9166.00	89.350	267.690	6650.12	2259.16	-620.98	-2224.48	40°28'15.042"N	104°29'41.532"W	1.07	
9261.00	89.420	267.770	6651.14	2354.13	-624.75	-2319.40	40°28'15.016"N	104°29'42.761"W	0.11	
9356.00	89.420	270.190	6652.10	2449.02	-626.44	-2414.37	40°28'15.010"N	104°29'43.990"W	2.55	
9450.00	89.660	272.220	6652.86	2542.68	-624.46	-2508.34	40°28'15.040"N	104°29'45.205"W	2.17	
9544.00	89.450	273.070	6653.59	2636.11	-620.12	-2602.24	40°28'15.093"N	104°29'46.420"W	0.93	
9639.00	89.570	273.520	6654.40	2730.42	-614.66	-2697.08	40°28'15.158"N	104°29'47.646"W	0.49	
9733.00	89.660	272.860	6655.03	2823.76	-609.43	-2790.93	40°28'15.220"N	104°29'48.859"W	0.71	
9828.00	89.540	270.630	6655.69	2918.33	-606.54	-2885.88	40°28'15.259"N	104°29'50.087"W	2.35	
9922.00	89.380	269.950	6656.58	3012.11	-606.06	-2979.87	40°28'15.274"N	104°29'51.303"W	0.74	
10017.00	89.290	269.410	6657.68	3106.95	-606.59	-3074.86	40°28'15.280"N	104°29'52.533"W	0.58	
10112.00	89.350	269.550	6658.81	3201.80	-607.46	-3169.85	40°28'15.282"N	104°29'53.762"W	0.16	
10206.00	89.380	270.040	6659.85	3295.63	-607.79	-3263.84	40°28'15.289"N	104°29'54.978"W	0.52	
10301.00	89.290	270.530	6660.95	3390.41	-607.32	-3358.84	40°28'15.304"N	104°29'56.207"W	0.52	
10396.00	89.230	271.850	6662.18	3485.06	-605.35	-3453.81	40°28'15.334"N	104°29'57.435"W	1.39	
10490.00	89.540	272.810	6663.19	3578.55	-601.53	-3547.72	40°28'15.382"N	104°29'58.650"W	1.07	
10585.00	89.480	272.430	6664.00	3672.99	-597.18	-3642.62	40°28'15.436"N	104°29'59.877"W	0.40	
10680.00	89.630	271.590	6664.74	3767.53	-593.85	-3737.56	40°28'15.479"N	104°30'01.105"W	0.90	
10774.00	89.350	271.340	6665.58	3861.15	-591.45	-3831.52	40°28'15.514"N	104°30'02.320"W	0.40	
10869.00	89.660	271.260	6666.40	3955.80	-589.29	-3926.49	40°28'15.545"N	104°30'03.549"W	0.34	
10963.00	89.570	269.920	6667.03	4049.55	-588.32	-4020.48	40°28'15.565"N	104°30'04.765"W	1.43	
11057.00	89.750	269.320	6667.59	4143.39	-588.95	-4114.48	40°28'15.570"N	104°30'05.981"W	0.67	
11152.00	89.660	268.280	6668.08	4238.31	-590.94	-4209.46	40°28'15.561"N	104°30'07.210"W	1.10	
11247.00	89.630	267.980	6668.66	4333.26	-594.04	-4304.40	40°28'15.541"N	104°30'08.439"W	0.32	
11341.00	89.660	267.870	6669.25	4427.23	-597.44	-4398.34	40°28'15.517"N	104°30'09.655"W	0.12	
11436.00	89.690	267.230	6669.79	4522.21	-601.50	-4493.25	40°28'15.488"N	104°30'10.883"W	0.67	
11530.00	89.570	267.120	6670.39	4616.19	-606.13	-4587.14	40°28'15.453"N	104°30'12.099"W	0.17	
11625.00	89.570	267.200	6671.11	4711.18	-610.84	-4682.02	40°28'15.417"N	104°30'13.327"W	0.08	
11719.00	89.690	267.160	6671.71	4805.17	-615.47	-4775.90	40°28'15.381"N	104°30'14.542"W	0.13	
11814.00	89.420	269.580	6672.45	4900.11	-618.17	-4870.85	40°28'15.365"N	104°30'15.771"W	2.56	
11908.00	89.600	269.780	6673.25	4993.95	-618.69	-4964.85	40°28'15.370"N	104°30'16.987"W	0.29	
12003.00	89.420	269.090	6674.07	5088.81	-619.63	-5059.84	40°28'15.372"N	104°30'18.216"W	0.75	
12097.00	89.570	268.010	6674.90	5182.74	-622.01	-5153.80	40°28'15.359"N	104°30'19.432"W	1.16	
12192.00	89.480	268.040	6675.68	5277.70	-625.28	-5248.74	40°28'15.337"N	104°30'20.661"W	0.10	
12286.00	89.480	268.120	6676.54	5371.65	-628.43	-5342.69	40°28'15.316"N	104°30'21.877"W	0.09	
12380.00	89.380	268.390	6677.47	5465.60	-631.29	-5436.64	40°28'15.298"N	104°30'23.093"W	0.31	
12475.00	89.600	268.420	6678.32	5560.53	-633.94	-5531.60	40°28'15.283"N	104°30'24.322"W	0.23	
12570.00	89.480	268.040	6679.08	5655.48	-636.87	-5626.55	40°28'15.264"N	104°30'25.551"W	0.42	



Actual Wellpath Report

LARSON A23-645 AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#19 LARSON A23-645 (2397'FNL&535'FWL,SEC.19)
Area	COLORADO	Well	LARSON A23-645
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	LARSON A23-645 AWP
Facility	SEC.19-T06N-R63W		

WELLPATH DATA (191 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
12664.00	89.480	268.300	6679.93	5749.43	-639.87	-5720.50	40°28'15.245"N	104°30'26.767"W	0.28	
12758.00	89.450	268.540	6680.81	5843.37	-642.47	-5814.46	40°28'15.230"N	104°30'27.983"W	0.26	
12853.00	89.380	268.780	6681.78	5938.29	-644.69	-5909.43	40°28'15.218"N	104°30'29.212"W	0.26	
12947.00	89.510	268.350	6682.69	6032.22	-647.04	-6003.39	40°28'15.205"N	104°30'30.428"W	0.48	
13042.00	89.480	268.600	6683.53	6127.15	-649.57	-6098.35	40°28'15.191"N	104°30'31.657"W	0.27	
13137.00	89.450	268.450	6684.42	6222.08	-652.01	-6193.32	40°28'15.177"N	104°30'32.886"W	0.16	
13231.00	89.540	269.000	6685.24	6316.00	-654.11	-6287.29	40°28'15.167"N	104°30'34.102"W	0.59	
13326.00	89.420	269.830	6686.11	6410.86	-655.08	-6382.28	40°28'15.168"N	104°30'35.331"W	0.88	
13420.00	89.480	269.480	6687.01	6504.70	-655.64	-6476.28	40°28'15.172"N	104°30'36.548"W	0.38	
13515.00	89.510	269.730	6687.85	6599.55	-656.30	-6571.27	40°28'15.176"N	104°30'37.777"W	0.27	
13609.00	89.480	269.730	6688.67	6693.39	-656.74	-6665.27	40°28'15.182"N	104°30'38.993"W	0.03	
13704.00	89.630	269.940	6689.41	6788.21	-657.01	-6760.26	40°28'15.190"N	104°30'40.222"W	0.27	
13799.00	89.420	269.660	6690.20	6883.04	-657.34	-6855.26	40°28'15.197"N	104°30'41.451"W	0.37	
13893.00	89.780	269.570	6690.86	6976.89	-657.98	-6949.25	40°28'15.201"N	104°30'42.667"W	0.39	
13988.00	90.370	269.170	6690.73	7071.76	-659.02	-7044.25	40°28'15.202"N	104°30'43.897"W	0.75	
14083.00	90.220	269.630	6690.24	7166.63	-660.02	-7139.24	40°28'15.202"N	104°30'45.126"W	0.51	
14177.00	90.310	269.210	6689.81	7260.50	-660.97	-7233.23	40°28'15.203"N	104°30'46.342"W	0.46	
14271.00	90.000	268.240	6689.55	7354.42	-663.06	-7327.21	40°28'15.193"N	104°30'47.558"W	1.08	
14366.00	90.150	267.710	6689.43	7449.38	-666.42	-7422.15	40°28'15.170"N	104°30'48.787"W	0.58	
14461.00	89.970	265.890	6689.33	7544.37	-671.72	-7517.00	40°28'15.128"N	104°30'50.015"W	1.93	
14555.00	89.850	265.530	6689.48	7638.37	-678.75	-7610.73	40°28'15.069"N	104°30'51.229"W	0.40	
14650.00	89.910	266.640	6689.68	7733.36	-685.24	-7705.51	40°28'15.015"N	104°30'52.456"W	1.17	
14744.00	89.910	268.680	6689.82	7827.34	-689.07	-7799.43	40°28'14.988"N	104°30'53.672"W	2.17	
14839.00	90.090	271.130	6689.82	7922.15	-689.23	-7894.42	40°28'14.997"N	104°30'54.901"W	2.59	
14933.00	90.000	271.140	6689.75	8015.83	-687.37	-7988.40	40°28'15.025"N	104°30'56.116"W	0.10	
15028.00	90.030	269.290	6689.72	8110.61	-687.01	-8083.40	40°28'15.039"N	104°30'57.345"W	1.95	
15122.00	90.120	268.630	6689.60	8204.52	-688.72	-8177.38	40°28'15.033"N	104°30'58.562"W	0.71	
15217.00	90.060	269.440	6689.45	8299.41	-690.32	-8272.37	40°28'15.027"N	104°30'59.791"W	0.85	
15311.00	89.910	269.160	6689.48	8393.29	-691.47	-8366.36	40°28'15.026"N	104°31'01.007"W	0.34	
15406.00	89.970	269.470	6689.58	8488.17	-692.60	-8461.35	40°28'15.025"N	104°31'02.236"W	0.33	
15501.00	90.090	270.080	6689.53	8583.00	-692.98	-8556.35	40°28'15.032"N	104°31'03.465"W	0.65	
15690.00	90.090	269.750	6689.23	8771.65	-693.26	-8745.35	40°28'15.050"N	104°31'05.911"W	0.17	
15879.00	89.940	270.600	6689.18	8960.23	-692.68	-8934.35	40°28'15.076"N	104°31'08.356"W	0.46	
15974.00	89.970	271.080	6689.26	9054.95	-691.29	-9029.34	40°28'15.101"N	104°31'09.585"W	0.51	
16068.00	90.000	271.230	6689.28	9148.62	-689.39	-9123.32	40°28'15.130"N	104°31'10.800"W	0.16	
16162.00	90.030	270.510	6689.26	9242.33	-687.96	-9217.31	40°28'15.154"N	104°31'12.016"W	0.77	
16257.00	90.090	271.010	6689.16	9337.06	-686.70	-9312.30	40°28'15.177"N	104°31'13.245"W	0.53	
16351.00	90.150	271.280	6688.96	9430.73	-684.83	-9406.28	40°28'15.206"N	104°31'14.461"W	0.29	
16446.00	90.030	270.750	6688.81	9525.42	-683.14	-9501.26	40°28'15.233"N	104°31'15.689"W	0.57	
16540.00	90.090	269.770	6688.71	9619.21	-682.72	-9595.26	40°28'15.247"N	104°31'16.905"W	1.04	
16635.00	90.030	268.810	6688.61	9714.08	-683.89	-9690.25	40°28'15.246"N	104°31'18.135"W	1.01	
16729.00	89.970	269.240	6688.61	9807.98	-685.49	-9784.24	40°28'15.240"N	104°31'19.351"W	0.46	
16824.00	90.000	269.960	6688.64	9902.84	-686.16	-9879.24	40°28'15.244"N	104°31'20.580"W	0.76	
16918.00	90.030	271.000	6688.61	9996.59	-685.37	-9973.23	40°28'15.262"N	104°31'21.796"W	1.11	
17012.00	90.060	271.230	6688.54	10090.28	-683.54	-10067.21	40°28'15.290"N	104°31'23.012"W	0.25	



Actual Wellpath Report

LARSON A23-645 AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#19 LARSON A23-645 (2397'FNL&535'FWL,SEC.19)
Area	COLORADO	Well	LARSON A23-645
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	LARSON A23-645 AWP
Facility	SEC.19-T06N-R63W		

WELLPATH DATA (191 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
17107.00	89.880	271.760	6688.59	10184.90	-681.06	-10162.18	40°28'15.325"N	104°31'24.240"W	0.59	
17201.00	90.120	271.380	6688.59	10278.51	-678.49	-10256.14	40°28'15.361"N	104°31'25.456"W	0.48	
17296.00	90.180	270.640	6688.34	10373.20	-676.81	-10351.13	40°28'15.388"N	104°31'26.684"W	0.78	
17390.00	89.970	269.980	6688.22	10466.98	-676.30	-10445.13	40°28'15.403"N	104°31'27.900"W	0.74	
17484.00	90.250	269.560	6688.04	10560.82	-676.68	-10539.13	40°28'15.409"N	104°31'29.117"W	0.54	
17579.00	90.090	269.620	6687.75	10655.67	-677.36	-10634.12	40°28'15.413"N	104°31'30.346"W	0.18	
17673.00	90.000	268.840	6687.68	10749.56	-678.62	-10728.11	40°28'15.411"N	104°31'31.562"W	0.84	
17768.00	89.970	268.380	6687.70	10844.48	-680.93	-10823.09	40°28'15.398"N	104°31'32.791"W	0.49	
17862.00	90.060	268.420	6687.68	10938.43	-683.55	-10917.05	40°28'15.383"N	104°31'34.007"W	0.10	
17957.00	89.940	268.140	6687.68	11033.37	-686.40	-11012.01	40°28'15.365"N	104°31'35.236"W	0.32	Last BHI MWD Survey
18040.00	89.940	268.140	6687.77	11116.34	-689.10	-11094.96	40°28'15.347"N	104°31'36.310"W	0.00	Projection to Bit

HOLE & CASING SECTIONS - Ref Wellbore: LARSON A23-645 AWP Ref Wellpath: LARSON A23-645 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]
13.5in Open Hole	30.00	1960.00	1930.00	30.00	1959.97	0.00	0.01	3.05	0.92
9.625in Casing Surface	30.00	1960.00	1930.00	30.00	1959.97	0.00	0.01	3.05	0.92
8.5in Open Hole	1960.00	18040.00	16080.00	1959.97	6687.77	3.05	0.92	-689.10	-11094.96



Actual Wellpath Report

LARSON A23-645 AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#19 LARSON A23-645 (2397'FNL&535'FWL,SEC.19)
Area	COLORADO	Well	LARSON A23-645
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	LARSON A23-645 AWB
Facility	SEC.19-T06N-R63W		

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
LARSON A23-639 Section 23	3.00	-1517.41	-792.39	3281072.59	1415057.73	40°28'06.024"N	104°29'23.136"W	polygon
LARSON A23-639 Section 24	3.00	-1517.41	-792.39	3281072.59	1415057.73	40°28'06.024"N	104°29'23.136"W	polygon
LARSON AA19-618 SECTION 19	3.00	-1746.91	-789.78	3281075.20	1414828.23	40°28'03.756"N	104°29'23.136"W	polygon
LARSON AA19-618 SECTION 19 HARDLINE (460'SETBACK)	3.00	-1746.91	-789.78	3281075.20	1414828.23	40°28'03.756"N	104°29'23.136"W	polygon
LARSON A23-645 LANDING POINT	6625.00	-570.00	-120.00	3281744.96	1416005.10	40°28'15.309"N	104°29'14.297"W	point
LARSON A23-645 REV-2 LANDING POINT	6635.00	-570.00	-120.00	3281744.96	1416005.10	40°28'15.309"N	104°29'14.297"W	point
LARSON A23-645 BHL (2300'FSL&0'FWL,SEC.23)	6677.65	-699.95	-11096.87	3270768.50	1415875.15	40°28'15.240"N	104°31'36.336"W	point
LARSON A23-645 TARGET 1	6681.00	-652.65	-7100.00	3274765.22	1415922.45	40°28'15.271"N	104°30'44.617"W	point
LARSON A23-645 REV-2 BHL (2300'FSL&0'FWL,SEC.23)	6687.65	-699.95	-11096.87	3270768.50	1415875.15	40°28'15.240"N	104°31'36.336"W	point
LARSON A23-645 REV-2 TARGET 1	6691.00	-652.65	-7100.00	3274765.22	1415922.45	40°28'15.271"N	104°30'44.617"W	point
LARSON A23-639 SECTION 23 Hardline (460'SETBACK)	7003.00	-1517.41	-792.39	3281072.59	1415057.73	40°28'06.024"N	104°29'23.136"W	polygon
LARSON A23-639 SECTION 24 Hardline (460'SETBACK)	7003.00	-1517.41	-792.39	3281072.59	1415057.73	40°28'06.024"N	104°29'23.136"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: LARSON A23-645 AWB					Ref Wellpath: LARSON A23-645 AWP	
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment		Wellbore	
0.00	1958.00	OWSG MWD rev2 - Standard	3rd Party Surface Surveys <84'-1958'>		LARSON A23-645 AWB	
1958.00	17957.00	OWSG MWD rev2 + IFR1 + Multi-Station Correction	BH/ATC 8.5" Hole OWSG MWD+IFR+MSA <2013'-17957'>		LARSON A23-645 AWB	
17957.00	18040.00	Blind Drilling (std)	Projection to bit		LARSON A23-645 AWB	