

Well Name: **Phillips 23-1-20 (Dir)**

Surface Location: Phillips 23-1-21 (Dir) Pad Sec.23-T5N-R67W
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4965.0

+N/-S +E/-W
 0.0 -27.9

Northing

Easting

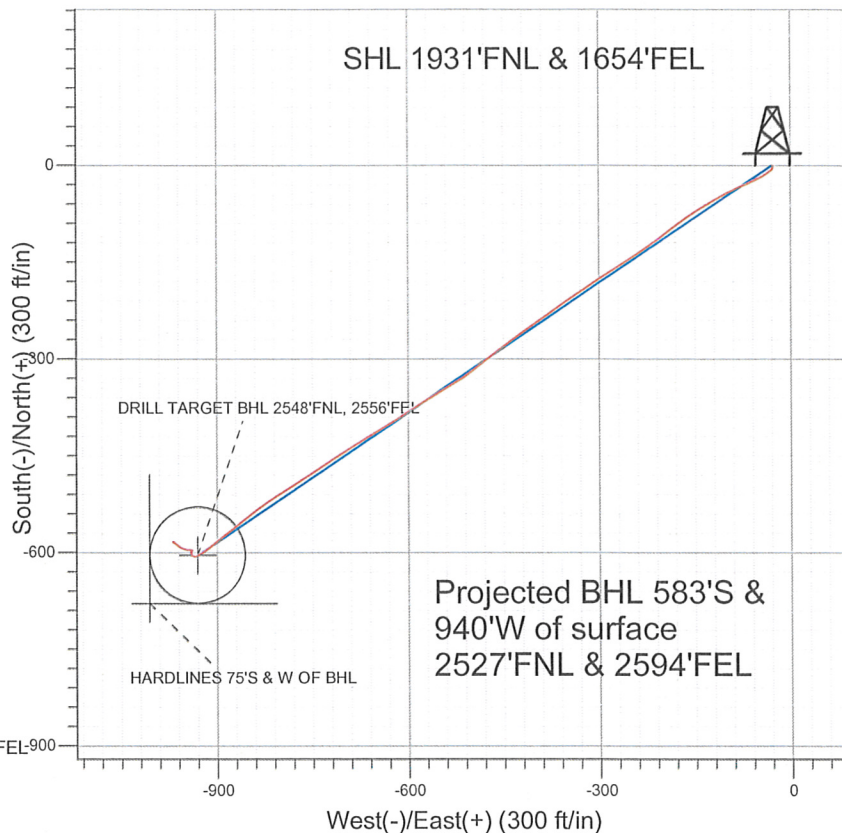
Latitude

Longitude

Slot

1384463.26 3179151.22 40° 23' 13.092 N 104° 51' 24.732 W
 Original Well Elev WELL @ 4978.0ft (Original Well Elev)

NOBLE ENERGY INC WELD COUNTY CO

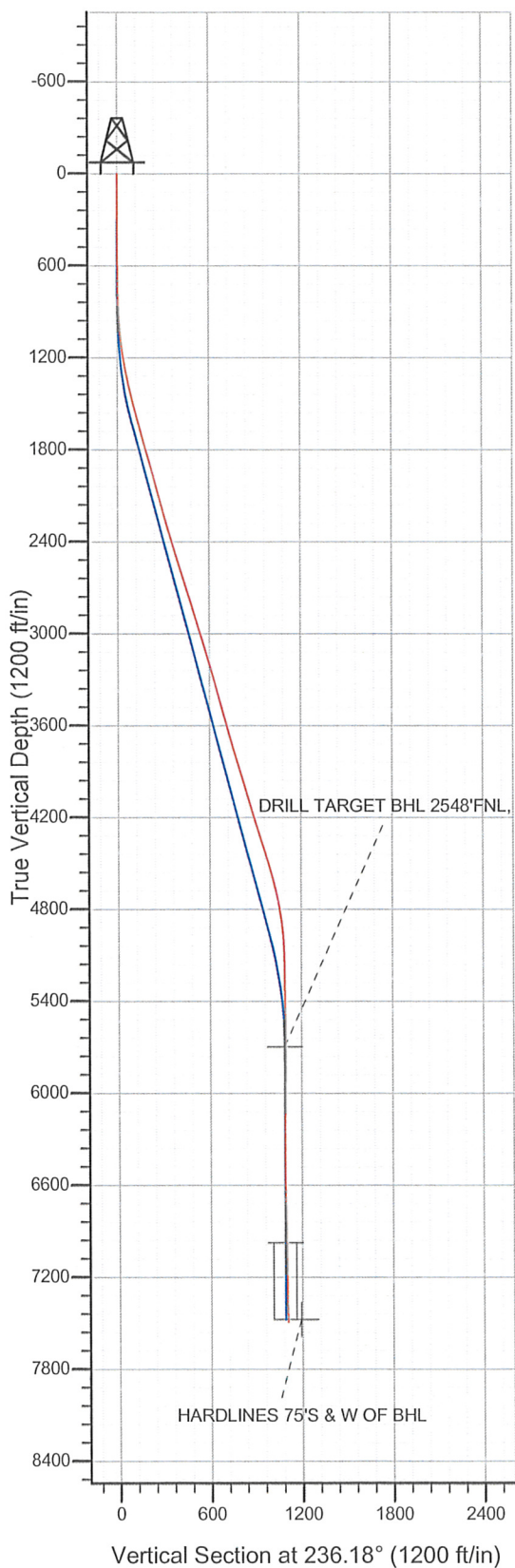


LEGEND

- Phillips 23-1-20 (Dir), Wellbore #1, Noble Phillips 23-1-20 (Dir) Plan #3 (09-17-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7639'MD & 7490'TVD @ 1106'VS
 3.6 deg Inc 304.5 deg AZ



Project: SEC.23-T5N-R67W
 Site: Phillips 23-1-21 (Dir) Pad Sec.23-T5N-R67W
 Well: Phillips 23-1-20 (Dir)
 Plan: Wellbore #1



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.23-T5N-R67W

Phillips 23-1-21 (Dir) Pad Sec.23-T5N-R67W

Phillips 23-1-20 (Dir)

Wellbore #1

Survey: Survey #1

Standard Survey Report

20 June, 2011



Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.23-T5N-R67W
Site: Phillips 23-1-21 (Dir) Pad Sec.23-T5N-R67W
Well: Phillips 23-1-20 (Dir)
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Site Phillips 23-1-21 (Dir) Pad Sec.23-T5N-R67W
TVD Reference: WELL @ 4978.0ft (Original Well Elev)
MD Reference: WELL @ 4978.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Landmark

Project	SEC.23-T5N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Phillips 23-1-21 (Dir) Pad Sec.23-T5N-R67W

Site Position:		Northing:	1,384,463.48 ft	Latitude:	40° 23' 13.092 N
From:	Lat/Long	Easting:	3,179,179.08 ft	Longitude:	104° 51' 24.372 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.42 °

Well	Phillips 23-1-20 (Dir)				
Well Position	+N/-S	0.0 ft	Northing:	1,384,463.26 ft	Latitude:
	+E/-W	-27.9 ft	Easting:	3,179,151.22 ft	Longitude:
Position Uncertainty	0.0 ft		Wellhead Elevation:	ft	Ground Level:
					4,965.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/17/2010	9.01	67.05	53,192

Design Wellbore #1

Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
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Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	5,700.0	0.0	-27.9	236.18

Survey Program Date 6/20/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
597.0	7,639.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	-27.9	0.0	0.00	0.00	0.00
597.0	0.40	166.10	597.0	-2.0	-27.4	0.7	0.07	0.07	0.00
725.0	0.40	169.00	725.0	-2.9	-27.2	1.0	0.02	0.00	2.27
854.0	1.80	209.40	854.0	-5.1	-28.1	3.0	1.18	1.09	31.32
982.0	4.70	236.70	981.8	-9.7	-33.4	10.1	2.51	2.27	21.33
1,111.0	7.60	238.90	1,110.0	-17.1	-45.2	23.9	2.26	2.25	1.71
1,239.0	10.30	246.70	1,236.4	-26.0	-62.9	43.6	2.31	2.11	6.09
1,367.0	13.00	244.40	1,361.8	-36.7	-86.4	69.1	2.14	2.11	-1.80
1,496.0	14.60	241.00	1,487.1	-50.9	-113.7	99.6	1.39	1.24	-2.64
1,624.0	15.70	238.80	1,610.6	-67.7	-142.7	133.0	0.97	0.86	-1.72
1,753.0	15.90	233.10	1,734.7	-87.3	-171.7	168.1	1.21	0.16	-4.42
1,881.0	15.80	233.10	1,857.9	-108.3	-199.7	203.0	0.08	-0.08	0.00

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Well: Phillips 23-1-20 (Dir)
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Site Phillips 23-1-21 (Dir) Pad
Sec.23-T5N-R67W
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MD Reference: WELL @ 4978.0ft (Original Well Elev)
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Survey Calculation Method: Minimum Curvature
Database: Landmark

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,009.0	15.10	235.80	1,981.3	-128.1	-227.4	237.1	0.78	-0.55	2.11
2,138.0	15.80	236.20	2,105.6	-147.3	-255.9	271.5	0.55	0.54	0.31
2,266.0	15.80	238.40	2,228.8	-166.2	-285.2	306.3	0.47	0.00	1.72
2,395.0	16.30	234.80	2,352.7	-185.8	-315.0	341.9	0.86	0.39	-2.79
2,523.0	16.70	236.90	2,475.5	-206.2	-345.1	378.3	0.56	0.31	1.64
2,651.0	17.20	234.80	2,597.9	-227.2	-375.9	415.6	0.62	0.39	-1.64
2,780.0	17.70	234.60	2,721.0	-249.5	-407.5	454.3	0.39	0.39	-0.16
2,908.0	17.20	233.50	2,843.1	-272.0	-438.6	492.6	0.47	-0.39	-0.86
3,037.0	17.60	232.00	2,966.2	-295.4	-469.3	531.1	0.47	0.31	-1.16
3,165.0	16.40	232.30	3,088.6	-318.4	-498.8	568.5	0.94	-0.94	0.23
3,293.0	16.10	239.30	3,211.5	-338.5	-528.4	604.2	1.55	-0.23	5.47
3,422.0	16.20	239.90	3,335.4	-356.6	-559.3	640.0	0.15	0.08	0.47
3,550.0	15.60	236.30	3,458.5	-375.1	-589.1	675.1	0.90	-0.47	-2.81
3,679.0	15.60	238.40	3,582.7	-393.8	-618.3	709.7	0.44	0.00	1.63
3,807.0	16.60	239.30	3,705.7	-412.2	-648.7	745.2	0.81	0.78	0.70
3,935.0	17.40	238.10	3,828.1	-431.6	-680.7	782.6	0.68	0.63	-0.94
4,064.0	17.40	236.90	3,951.2	-452.4	-713.2	821.1	0.28	0.00	-0.93
4,192.0	15.60	235.40	4,073.9	-472.6	-743.4	857.5	1.44	-1.41	-1.17
4,321.0	16.60	238.90	4,197.9	-492.0	-773.4	893.2	1.08	0.78	2.71
4,449.0	17.50	237.30	4,320.3	-511.8	-805.3	930.7	0.79	0.70	-1.25
4,577.0	18.20	232.70	4,442.1	-534.3	-837.4	969.9	1.23	0.55	-3.59
4,706.0	15.50	232.20	4,565.6	-557.1	-867.0	1,007.3	2.10	-2.09	-0.39
4,834.0	12.20	232.10	4,689.8	-575.9	-891.2	1,037.8	2.58	-2.58	-0.08
4,963.0	9.50	230.70	4,816.5	-591.0	-910.2	1,062.0	2.10	-2.09	-1.09
5,091.0	5.10	240.40	4,943.4	-600.5	-923.4	1,078.2	3.56	-3.44	7.58
5,219.0	2.30	239.70	5,071.2	-604.6	-930.5	1,086.5	2.19	-2.19	-0.55
5,348.0	0.70	284.60	5,200.1	-605.7	-933.5	1,089.6	1.45	-1.24	34.81
5,476.0	1.40	291.70	5,328.1	-605.0	-935.7	1,091.0	0.56	0.55	5.55
5,605.0	1.10	296.90	5,457.1	-603.8	-938.3	1,092.5	0.25	-0.23	4.03
5,733.0	1.30	272.30	5,585.0	-603.2	-940.9	1,094.2	0.43	0.16	-19.22
5,848.0	1.13	75.68	5,700.0	-602.9	-941.1	1,094.2	2.09	-0.15	142.08
DRILL TARGET BHL 2548'FNL, 2556'FEL									
5,861.0	1.40	77.40	5,713.0	-602.8	-940.8	1,093.9	2.09	2.07	13.24
5,990.0	1.30	5.90	5,842.0	-601.0	-939.1	1,091.5	1.22	-0.08	-55.43
6,118.0	1.10	277.70	5,970.0	-599.4	-940.2	1,091.5	1.31	-0.16	-68.91
6,247.0	1.10	20.50	6,099.0	-598.1	-941.0	1,091.5	1.33	0.00	79.69
6,503.0	0.70	107.90	6,354.9	-596.2	-938.6	1,088.5	0.50	-0.16	34.14
6,632.0	1.00	261.50	6,483.9	-596.7	-939.0	1,089.0	1.28	0.23	119.07
6,760.0	1.40	306.80	6,611.9	-595.9	-941.3	1,090.6	0.78	0.31	35.39
6,889.0	0.90	229.90	6,740.9	-595.6	-943.4	1,092.1	1.15	-0.39	-59.61
7,017.0	2.30	290.20	6,868.8	-595.4	-946.5	1,094.6	1.57	1.09	47.11
7,125.3	2.30	288.42	6,977.1	-593.9	-950.6	1,097.2	0.07	0.00	-1.64
TARGET CIRCLE 2548'FNL, 2556'FEL									
7,145.0	2.30	288.10	6,996.7	-593.7	-951.4	1,097.7	0.07	0.00	-1.64
7,274.0	1.00	292.20	7,125.7	-592.4	-954.9	1,099.9	1.01	-1.01	3.18
7,402.0	2.30	308.10	7,253.6	-590.4	-957.9	1,101.3	1.07	1.02	12.42
7,531.0	3.00	304.00	7,382.5	-586.9	-962.8	1,103.4	0.56	0.54	-3.18
7,589.0	3.50	304.50	7,440.4	-585.1	-965.5	1,104.6	0.86	0.86	0.86
7,625.3	3.57	304.50	7,476.6	-583.8	-967.3	1,105.5	0.20	0.20	0.00
HARDLINES 75'S & W OF BHL									
7,639.0	3.60	304.50	7,490.3	-583.3	-968.1	1,105.8	0.20	0.20	0.00