

Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Reliance E23-64-1HNC**

Surface Location: Reliance E23-66-1HN Pad Sec.23-T6N-R65W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4695.0

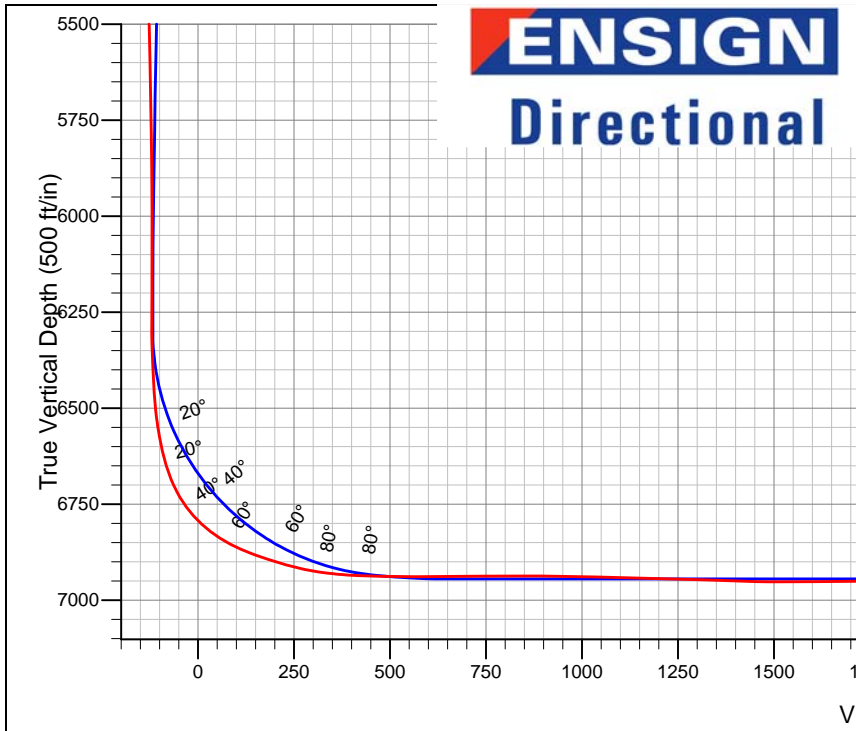
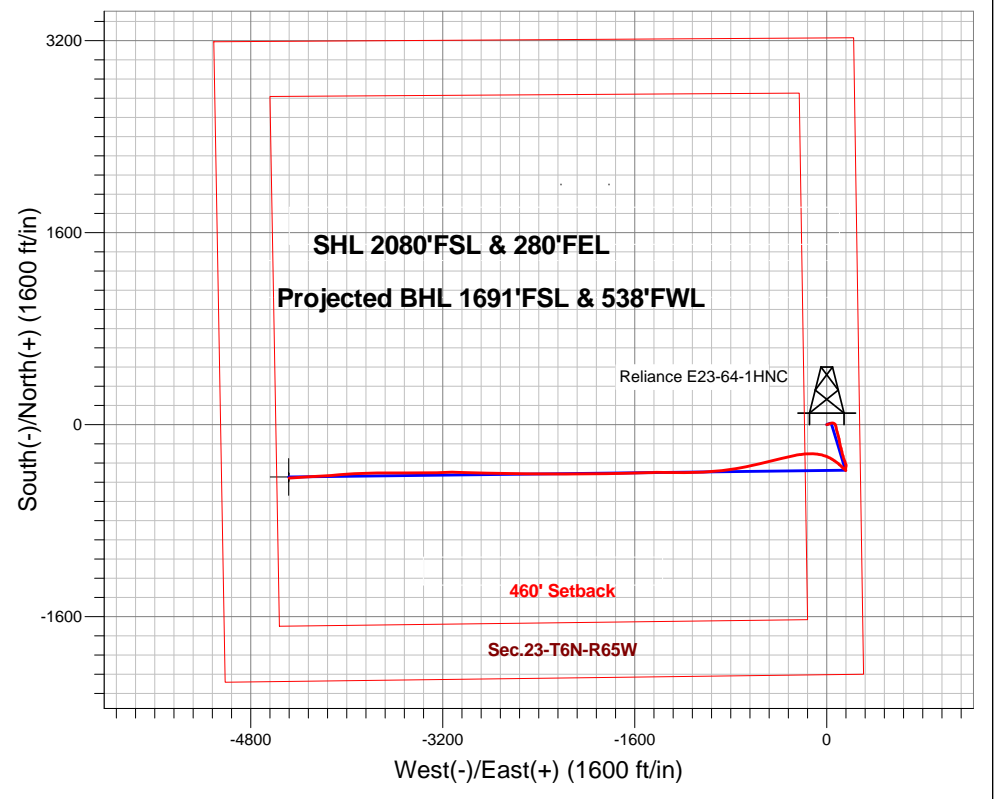
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1415241.96	3244317.63	40.469920	-104.621850	

 H&P 326 RKB - 30' WELL @ 4725.0ft (H&P 326 RKB - 30')

FINAL SURVEY

API# 05-123-37602

Projected Bottom Hole Location
 11420'MD 6933'TVD 446'S & 4481'W of SHL
 89.4 degree Incl @ 266.2 degree AZM



Reliance E23-66-1HN Pad Sec.23-T6N-R65W
 Reliance E23-64-1HNC
 Wellbore #1

ANNOTATIONS
 No annotation data is available.

LEGEND
 ■ Reliance E23-64-1HNC, Wellbore #1, Plan B - Rev 0 V0
 ■ Wellbore #1

Vertical Section at 264.43° (500 ft/in)



Noble Energy Inc.- Weld County, CO (Grid North)

Sec.23-T6N-R65W

Reliance E23-66-1HN Pad Sec.23-T6N-R65W

Reliance E23-64-1HNC

Wellbore #1

Design: Wellbore #1

Final Survey

03 March, 2015

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Reliance E23-64-1HNC
Project:	Sec.23-T6N-R65W	TVD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Site:	Reliance E23-66-1HN Pad Sec.23-T6N-R65W	MD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Well:	Reliance E23-64-1HNC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	landmark

Project	Sec.23-T6N-R65W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Reliance E23-66-1HN Pad Sec.23-T6N-R65W				
Site Position:		Northing:	1,415,220.13ft	Latitude:	40.469860
From:	Lat/Long	Easting:	3,244,317.84ft	Longitude:	-104.621850
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.57 °

Well	Reliance E23-64-1HNC					
Well Position	+N/-S	0.0 ft	Northing:	1,415,241.96 ft	Latitude:	40.469920
	+E/-W	0.0 ft	Easting:	3,244,317.63 ft	Longitude:	-104.621850
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,695.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/12/2015	8.30	67.00	52,798

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	264.43	

Survey Program	Date	3/3/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
167.0	747.0	Survey #1 (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
905.0	7,211.0	Survey #2 (Wellbore #1)	MWD	MWD - Standard	
7,290.0	11,420.0	Survey #3 (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)		
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00
167.0	0.80	77.70	167.0	0.2	1.1	-1.2	0.48		
258.0	1.40	74.90	258.0	0.7	2.8	-2.9	0.66		
350.0	1.70	81.50	349.9	1.2	5.3	-5.4	0.38		
443.0	2.20	79.60	442.9	1.7	8.4	-8.5	0.54		
536.0	2.90	73.50	535.8	2.7	12.4	-12.6	0.81		
628.0	3.80	72.10	627.6	4.3	17.5	-17.9	0.98		
747.0	5.40	63.60	746.3	8.0	26.3	-27.0	1.46		
905.0	7.10	83.78	903.3	12.3	42.7	-43.7	1.74		
998.0	6.50	102.56	995.7	11.8	53.5	-54.4	2.46		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Reliance E23-64-1HNC
Project:	Sec.23-T6N-R65W	TVD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Site:	Reliance E23-66-1HN Pad Sec.23-T6N-R65W	MD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Well:	Reliance E23-64-1HNC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	landmark

Survey								
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	
1,114.0	6.40	127.75	1,111.0	6.4	65.0	-65.4	2.42	
1,205.0	5.70	156.02	1,201.5	-0.8	70.9	-70.5	3.33	
1,298.0	5.40	155.90	1,294.0	-9.0	74.6	-73.3	0.32	
1,391.0	4.10	181.11	1,386.7	-16.3	76.3	-74.3	2.61	
1,483.0	6.20	167.42	1,478.4	-24.5	77.3	-74.6	2.63	
1,576.0	5.30	170.83	1,570.9	-33.6	79.1	-75.4	1.03	
1,668.0	5.40	167.15	1,662.5	-42.0	80.7	-76.3	0.39	
1,761.0	5.30	162.85	1,755.1	-50.4	83.0	-77.7	0.44	
1,854.0	5.10	158.67	1,847.7	-58.4	85.7	-79.7	0.46	
1,948.0	5.40	171.30	1,941.3	-66.6	87.9	-81.0	1.27	
2,040.0	5.30	161.95	2,032.9	-74.9	89.9	-82.2	0.95	
2,132.0	5.10	164.24	2,124.5	-82.9	92.3	-83.8	0.31	
2,224.0	5.30	160.15	2,216.2	-90.8	94.9	-85.6	0.46	
2,316.0	4.70	169.97	2,307.8	-98.6	97.0	-86.9	1.13	
2,409.0	4.60	164.97	2,400.5	-105.9	98.6	-87.8	0.45	
2,502.0	4.60	163.77	2,493.2	-113.1	100.6	-89.2	0.10	
2,595.0	4.40	164.96	2,585.9	-120.1	102.6	-90.4	0.24	
2,688.0	5.20	173.12	2,678.6	-127.7	104.0	-91.1	1.13	
2,780.0	5.20	171.49	2,770.2	-136.0	105.1	-91.4	0.16	
2,875.0	5.60	171.51	2,864.8	-144.8	106.4	-91.9	0.42	
2,969.0	5.40	173.82	2,958.4	-153.8	107.6	-92.2	0.32	
3,064.0	5.40	168.52	3,052.9	-162.6	109.0	-92.7	0.52	
3,158.0	5.00	166.80	3,146.6	-170.9	110.8	-93.7	0.46	
3,253.0	4.80	162.86	3,241.2	-178.8	112.9	-95.0	0.41	
3,347.0	5.10	163.86	3,334.9	-186.5	115.2	-96.6	0.33	
3,441.0	5.00	155.36	3,428.5	-194.3	118.1	-98.7	0.80	
3,536.0	4.80	171.93	3,523.1	-202.0	120.4	-100.2	1.50	
3,630.0	4.90	168.79	3,616.8	-209.8	121.7	-100.8	0.30	
3,725.0	5.20	165.46	3,711.4	-217.9	123.6	-101.8	0.44	
3,819.0	5.10	170.83	3,805.1	-226.2	125.3	-102.8	0.52	
3,914.0	5.10	168.07	3,899.7	-234.5	126.9	-103.5	0.26	
4,008.0	5.00	163.11	3,993.3	-242.5	128.9	-104.8	0.48	
4,103.0	4.30	161.84	4,088.0	-249.8	131.2	-106.3	0.74	
4,197.0	2.90	154.57	4,181.8	-255.3	133.3	-107.9	1.56	
4,292.0	3.30	169.67	4,276.7	-260.2	134.9	-109.0	0.95	
4,386.0	4.00	164.31	4,370.5	-266.0	136.2	-109.8	0.83	
4,481.0	4.60	172.88	4,465.2	-273.0	137.6	-110.4	0.92	
4,575.0	4.10	161.21	4,559.0	-279.9	139.2	-111.3	1.08	
4,670.0	4.80	160.01	4,653.7	-286.9	141.6	-113.1	0.74	
4,765.0	4.90	160.14	4,748.3	-294.4	144.3	-115.1	0.11	
4,859.0	3.60	142.77	4,842.1	-300.5	147.5	-117.6	1.93	
4,954.0	4.90	162.39	4,936.8	-306.8	150.5	-120.0	2.03	
5,048.0	4.50	168.40	5,030.5	-314.2	152.5	-121.3	0.67	
5,143.0	4.30	163.54	5,125.2	-321.3	154.2	-122.3	0.45	
5,238.0	4.00	156.25	5,220.0	-327.7	156.6	-124.0	0.64	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Reliance E23-64-1HNC
Project:	Sec.23-T6N-R65W	TVD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Site:	Reliance E23-66-1HN Pad Sec.23-T6N-R65W	MD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Well:	Reliance E23-64-1HNC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	landmark

Survey							
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,332.0	2.90	151.11	5,313.8	-332.8	159.1	-126.0	1.21
5,427.0	3.70	165.81	5,408.6	-337.9	161.0	-127.4	1.22
5,521.0	3.00	201.52	5,502.5	-343.1	160.8	-126.7	2.30
5,616.0	3.60	187.46	5,597.3	-348.4	159.5	-124.9	1.06
5,710.0	4.40	191.25	5,691.1	-354.9	158.4	-123.2	0.90
5,805.0	3.60	189.26	5,785.9	-361.4	157.2	-121.4	0.85
5,899.0	3.90	182.50	5,879.7	-367.5	156.6	-120.2	0.57
5,993.0	2.60	179.93	5,973.5	-372.8	156.5	-119.5	1.39
6,088.0	1.60	187.69	6,068.5	-376.3	156.3	-119.0	1.09
6,182.0	1.20	155.35	6,162.4	-378.5	156.5	-119.1	0.92
6,277.0	1.10	131.20	6,257.4	-380.0	157.6	-120.0	0.52
6,372.0	2.60	300.91	6,352.4	-379.5	156.5	-118.9	3.88
6,467.0	4.50	310.32	6,447.2	-375.9	151.8	-114.6	2.09
6,560.0	11.10	310.45	6,539.3	-367.8	142.2	-105.8	7.10
6,655.0	22.00	314.31	6,630.2	-349.4	122.4	-87.9	11.53
6,749.0	35.10	309.16	6,712.6	-319.9	88.7	-57.2	14.17
6,844.0	48.30	300.14	6,783.5	-284.6	36.6	-8.8	15.23
6,938.0	59.70	285.61	6,838.8	-255.9	-33.3	58.0	17.37
7,033.0	69.90	271.51	6,879.4	-243.6	-118.0	141.1	17.17
7,128.0	74.20	263.11	6,908.7	-247.9	-208.1	231.2	9.55
7,211.0	81.30	257.51	6,926.3	-261.6	-288.0	312.0	10.80
7,290.0	86.40	256.40	6,934.8	-279.3	-364.5	389.9	6.61
7,385.0	89.50	256.05	6,938.2	-301.9	-456.7	483.8	3.28
7,479.0	89.90	256.64	6,938.7	-324.1	-548.0	576.9	0.76
7,573.0	90.10	258.15	6,938.7	-344.6	-639.7	670.2	1.62
7,668.0	90.90	259.85	6,937.8	-362.7	-733.0	764.7	1.98
7,762.0	90.00	261.93	6,937.1	-377.6	-825.8	858.6	2.41
7,856.0	88.50	266.16	6,938.3	-387.4	-919.3	952.5	4.77
7,950.0	89.10	265.57	6,940.3	-394.2	-1,013.0	1,046.5	0.90
8,044.0	88.50	268.37	6,942.3	-399.1	-1,106.8	1,140.4	3.05
8,139.0	88.30	270.87	6,944.9	-399.8	-1,201.8	1,234.9	2.64
8,234.0	88.10	270.18	6,947.9	-398.9	-1,296.7	1,329.3	0.76
8,328.0	88.30	269.96	6,950.8	-398.8	-1,390.7	1,422.8	0.32
8,423.0	90.00	268.37	6,952.3	-400.2	-1,485.7	1,517.5	2.45
8,517.0	90.40	268.14	6,951.9	-403.0	-1,579.6	1,611.3	0.49
8,612.0	90.60	267.88	6,951.1	-406.3	-1,674.5	1,706.1	0.35
8,707.0	91.50	269.03	6,949.4	-408.9	-1,769.5	1,800.8	1.54
8,801.0	90.00	269.50	6,948.1	-410.1	-1,863.5	1,894.5	1.67
8,896.0	90.60	269.75	6,947.6	-410.7	-1,958.5	1,989.1	0.68
8,990.0	90.90	270.15	6,946.4	-410.8	-2,052.5	2,082.7	0.53
9,084.0	91.00	270.18	6,944.8	-410.5	-2,146.5	2,176.2	0.11
9,179.0	91.30	269.97	6,942.9	-410.4	-2,241.4	2,270.7	0.39
9,273.0	89.80	269.98	6,942.0	-410.4	-2,335.4	2,364.2	1.60
9,368.0	90.50	270.43	6,941.8	-410.1	-2,430.4	2,458.8	0.88

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Reliance E23-64-1HNC
Project:	Sec.23-T6N-R65W	TVD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Site:	Reliance E23-66-1HN Pad Sec.23-T6N-R65W	MD Reference:	WELL @ 4725.0ft (H&P 326 RKB - 30')
Well:	Reliance E23-64-1HNC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	landmark

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,463.0	91.10	270.43	6,940.5	-409.4	-2,525.4	2,553.2	0.63
9,557.0	89.60	270.68	6,939.9	-408.5	-2,619.4	2,646.7	1.62
9,651.0	90.70	270.50	6,939.6	-407.5	-2,713.4	2,740.1	1.19
9,746.0	89.70	271.40	6,939.3	-405.9	-2,808.4	2,834.5	1.42
9,840.0	90.50	271.82	6,939.1	-403.3	-2,902.3	2,927.8	0.96
9,935.0	89.20	271.86	6,939.4	-400.2	-2,997.3	3,022.0	1.37
10,029.0	89.70	271.05	6,940.3	-397.8	-3,091.3	3,115.3	1.01
10,124.0	91.20	268.79	6,939.5	-398.0	-3,186.2	3,209.8	2.86
10,219.0	90.80	268.20	6,937.9	-400.5	-3,281.2	3,304.6	0.75
10,313.0	91.60	268.60	6,935.9	-403.1	-3,375.1	3,398.3	0.95
10,407.0	92.70	270.38	6,932.4	-403.9	-3,469.1	3,491.9	2.22
10,502.0	91.60	270.92	6,928.8	-402.9	-3,564.0	3,586.3	1.29
10,596.0	89.50	270.38	6,927.9	-401.8	-3,658.0	3,679.7	2.31
10,690.0	88.20	267.93	6,929.8	-403.2	-3,751.9	3,773.4	2.95
10,785.0	89.70	267.50	6,931.6	-407.0	-3,846.8	3,868.2	1.64
10,879.0	90.00	266.80	6,931.8	-411.6	-3,940.7	3,962.1	0.81
10,974.0	88.80	266.26	6,932.8	-417.4	-4,035.5	4,057.0	1.39
11,069.0	90.70	265.92	6,933.2	-423.9	-4,130.3	4,152.0	2.03
11,163.0	90.00	266.73	6,932.6	-429.9	-4,224.1	4,245.9	1.14
11,257.0	90.40	266.44	6,932.3	-435.5	-4,317.9	4,339.8	0.53
11,358.0	89.40	266.18	6,932.5	-442.0	-4,418.7	4,440.8	1.02
11,420.0	89.40	266.18	6,933.1	-446.1	-4,480.6	4,502.7	0.00

Reliance E23-64-1HNC BHL 1700'FSL & 535'FWL

Checked By: _____ Approved By: _____ Date: _____