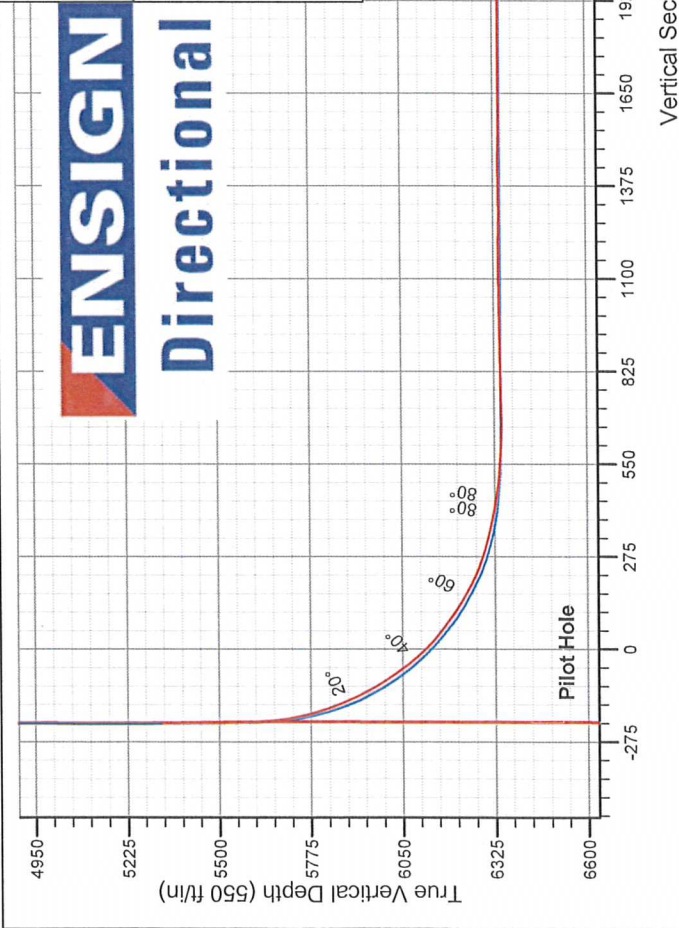
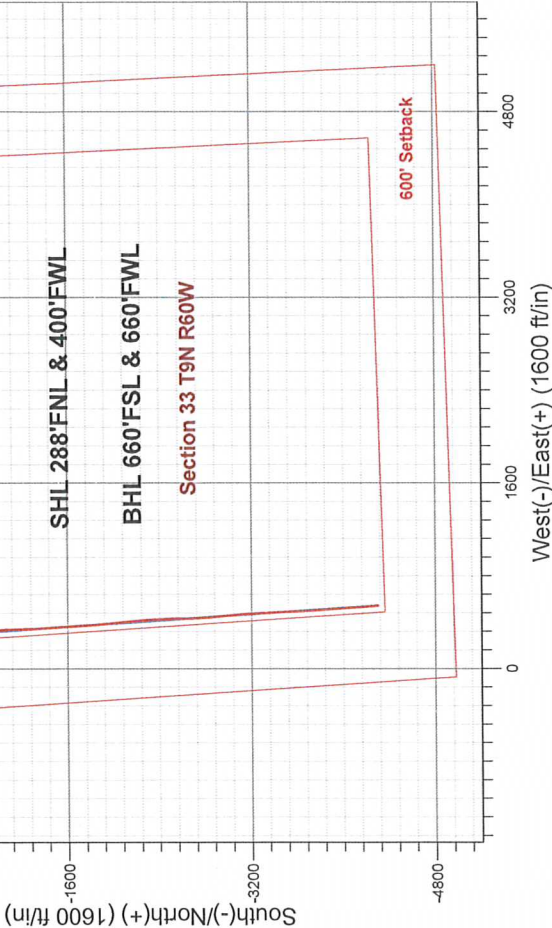


Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Shable Federal LB33-78HN**
Surface Location: Shable Pad Sec.33-T9N-R60W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4940.0
+N/-S +E/-W Northing Easting Longitude Latitude
0.0 0.0 1505412.22 3386475.19 40.712408 -104.105867
Precision 828 RKB - 16' WELL @ 4956.0ft (Precision 828 RKB - 16')

FINAL SURVEY

Projected Bottom Hole Location
10621' MD 6344' TVD 4302' S & 543' E of SHL
89.9 degree Incl @ 174.9 degree AZM



Shable Pad Sec.33-T9N-R60W Shable Federal LB33-78HN Wellbore #2 7.41, April 12 2013		ANNOTATIONS	
		No annotation data is available.	
		LEGEND	
		* Shable Federal LB33-78HN, Wellbore #2, Sidetrack Plan A - Rev 1 V0	
		△ Shable Federal LB33-78HN, Wellbore #1, Wellbore #1 V0	
		□ Wellbore #2	
		○ Survey #1	



Directional

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

SEC.33-T9N-R60W

Shable Pad Sec.33-T9N-R60W

Shable Federal LB33-78HN

Wellbore #2

Survey: Survey #1

Standard Survey Report

12 April, 2013

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Shable Federal LB33-78HN
Project:	SEC.33-T9N-R60W	TVD Reference:	WELL @ 4956.0ft (Precision 828 RKB - 16')
Site:	Shable Pad Sec.33-T9N-R60W	MD Reference:	WELL @ 4956.0ft (Precision 828 RKB - 16')
Well:	Shable Federal LB33-78HN	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2	Database:	Landmark

Project	SEC.33-T9N-R60W, Weld County, CO		
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		Shable Pad Sec.33-T9N-R60W			
Site Position:		Northing:	1,505,412.23 ft	Latitude:	40.712408
From:	Lat/Long	Easting:	3,386,475.19 ft	Longitude:	-104.105867
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.90 °

Well	Shable Federal LB33-78HN					
Well Position	+N/-S	0.0 ft	Northing:	1,505,412.22 ft	Latitude:	40.712408
	+E/-W	0.0 ft	Easting:	3,386,475.19 ft	Longitude:	-104.105867
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,940.0 ft	

Wellbore	Wellbore #2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/4/2013	8.29	67.35	53,171

Design	Wellbore #2				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	5,362.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	171.96	

Survey Program	Date 4/12/2013				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
642.0	5,362.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	
5,497.0	10,621.0	Survey #1 (Wellbore #2)	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)	
5,362.0	1.10	224.30	5,329.6	259.7	264.3	-220.2	0.00	0.00	0.00	
5,497.0	3.10	71.60	5,464.5	259.9	266.8	-220.0	3.04	1.48	-113.11	
5,587.0	6.30	100.20	5,554.2	259.8	274.0	-218.9	4.30	3.56	31.78	
5,677.0	5.70	129.40	5,643.8	256.1	282.3	-214.1	3.42	-0.67	32.44	
5,722.0	7.40	156.50	5,688.5	252.0	285.2	-209.6	7.73	3.78	60.22	
5,767.0	11.70	160.30	5,732.8	245.0	287.9	-202.4	9.65	9.56	8.44	
5,812.0	15.40	165.10	5,776.6	235.0	291.0	-192.0	8.59	8.22	10.67	
5,857.0	18.50	169.80	5,819.6	222.2	293.8	-178.9	7.53	6.89	10.44	
5,901.0	21.50	172.60	5,861.0	207.3	296.0	-163.8	7.16	6.82	6.36	
5,946.0	24.40	176.90	5,902.4	189.8	297.6	-146.3	7.44	6.44	9.56	
5,991.0	27.80	177.20	5,942.8	170.1	298.6	-126.6	7.56	7.56	0.67	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Shable Federal LB33-78HN
Project:	SEC.33-T9N-R60W	TVD Reference:	WELL @ 4956.0ft (Precision 828 RKB - 16')
Site:	Shable Pad Sec.33-T9N-R60W	MD Reference:	WELL @ 4956.0ft (Precision 828 RKB - 16')
Well:	Shable Federal LB33-78HN	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2	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)
6,036.0	31.70	179.50	5,981.9	147.8	299.2	-104.4	9.03	8.67	5.11
6,081.0	34.90	183.20	6,019.5	123.1	298.6	-80.1	8.42	7.11	8.22
6,126.0	37.60	184.40	6,055.8	96.5	296.9	-54.0	6.20	6.00	2.67
6,171.0	41.30	185.80	6,090.5	68.1	294.3	-26.2	8.46	8.22	3.11
6,216.0	45.30	185.10	6,123.3	37.3	291.4	3.8	8.95	8.89	-1.56
6,261.0	50.40	184.80	6,153.4	4.1	288.5	36.3	11.34	11.33	-0.67
6,306.0	55.10	185.10	6,180.7	-31.6	285.4	71.2	10.46	10.44	0.67
6,351.0	56.70	185.80	6,205.9	-68.7	281.9	107.4	3.78	3.56	1.56
6,396.0	59.00	184.20	6,229.8	-106.6	278.6	144.5	5.93	5.11	-3.56
6,440.0	62.40	182.30	6,251.4	-144.9	276.4	182.2	8.60	7.73	-4.32
6,485.0	67.40	179.00	6,270.5	-185.6	276.0	222.4	12.94	11.11	-7.33
6,530.0	71.10	176.20	6,286.4	-227.7	277.7	264.3	10.07	8.22	-6.22
6,575.0	73.80	175.40	6,300.0	-270.5	280.9	307.1	6.23	6.00	-1.78
6,620.0	76.60	175.40	6,311.5	-313.8	284.4	350.5	6.22	6.22	0.00
6,665.0	78.60	175.80	6,321.1	-357.6	287.7	394.4	4.53	4.44	0.89
6,692.0	80.10	176.20	6,326.1	-384.1	289.6	420.8	5.74	5.56	1.48
6,781.0	84.50	178.30	6,338.0	-472.2	293.8	508.6	5.47	4.94	2.36
6,845.1	86.71	176.37	6,343.0	-536.0	296.8	572.3	4.56	3.44	-3.00
Shable Federal LB33-78HN Landing Pt.									
6,871.0	87.60	175.60	6,344.2	-561.8	298.6	598.1	4.56	3.45	-2.99
6,961.0	90.50	176.70	6,345.7	-651.6	304.6	687.8	3.45	3.22	1.22
7,051.0	90.90	174.00	6,344.6	-741.3	311.9	777.6	3.03	0.44	-3.00
7,141.0	90.60	176.90	6,343.5	-831.0	319.1	867.4	3.24	-0.33	3.22
7,231.0	91.20	176.50	6,342.0	-920.8	324.2	957.1	0.80	0.67	-0.44
7,321.0	90.60	175.40	6,340.6	-1,010.6	330.6	1,046.9	1.39	-0.67	-1.22
7,411.0	90.30	176.50	6,339.9	-1,100.4	336.9	1,136.7	1.27	-0.33	1.22
7,500.0	89.10	178.80	6,340.4	-1,189.3	340.6	1,225.2	2.91	-1.35	2.58
7,590.0	90.30	180.00	6,340.9	-1,279.3	341.5	1,314.5	1.89	1.33	1.33
7,680.0	90.70	176.00	6,340.1	-1,369.2	344.7	1,403.9	4.47	0.44	-4.44
7,770.0	88.80	176.70	6,340.5	-1,459.0	350.4	1,493.7	2.25	-2.11	0.78
7,860.0	89.30	176.10	6,342.0	-1,548.8	356.1	1,583.4	0.87	0.56	-0.67
7,950.0	90.40	176.50	6,342.2	-1,638.6	361.9	1,673.1	1.30	1.22	0.44
8,040.0	90.80	176.30	6,341.3	-1,728.4	367.5	1,762.8	0.50	0.44	-0.22
8,129.0	89.30	175.60	6,341.2	-1,817.2	373.8	1,851.6	1.86	-1.69	-0.79
8,219.0	89.30	174.00	6,342.3	-1,906.8	382.0	1,941.5	1.78	0.00	-1.78
8,309.0	89.80	174.90	6,343.0	-1,996.4	390.7	2,031.4	1.14	0.56	1.00
8,399.0	90.00	174.40	6,343.1	-2,086.0	399.1	2,121.3	0.60	0.22	-0.56
8,489.0	90.40	174.60	6,342.8	-2,175.6	407.7	2,211.2	0.50	0.44	0.22
8,579.0	89.80	173.90	6,342.7	-2,265.1	416.7	2,301.2	1.02	-0.67	-0.78
8,669.0	89.30	175.60	6,343.4	-2,354.8	424.9	2,391.0	1.97	-0.56	1.89
8,758.0	89.90	179.00	6,344.0	-2,443.6	429.1	2,479.6	3.88	0.67	3.82
8,848.0	90.70	180.50	6,343.5	-2,533.6	429.5	2,568.8	1.89	0.89	1.67
8,938.0	90.50	179.10	6,342.6	-2,623.6	429.8	2,658.0	1.57	-0.22	-1.56
9,028.0	88.60	176.50	6,343.3	-2,713.5	433.3	2,747.5	3.58	-2.11	-2.89
9,118.0	89.50	175.80	6,344.8	-2,803.3	439.3	2,837.2	1.27	1.00	-0.78
9,208.0	89.40	176.50	6,345.6	-2,893.1	445.4	2,927.0	0.79	-0.11	0.78
9,297.0	89.10	173.50	6,346.8	-2,981.8	453.1	3,015.8	3.39	-0.34	-3.37
9,387.0	89.10	174.20	6,348.2	-3,071.2	462.8	3,105.8	0.78	0.00	0.78
9,477.0	89.70	175.60	6,349.2	-3,160.9	470.8	3,195.6	1.69	0.67	1.56
9,567.0	90.00	177.40	6,349.4	-3,250.7	476.3	3,285.4	2.03	0.33	2.00
9,657.0	90.60	177.60	6,348.9	-3,340.6	480.2	3,374.9	0.70	0.67	0.22
9,747.0	89.90	179.00	6,348.5	-3,430.6	482.9	3,464.4	1.74	-0.78	1.56
9,837.0	89.60	177.40	6,348.9	-3,520.5	485.7	3,553.8	1.81	-0.33	-1.78

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Shable Federal LB33-78HN
Project:	SEC.33-T9N-R60W	TVD Reference:	WELL @ 4956.0ft (Precision 828 RKB - 16')
Site:	Shable Pad Sec.33-T9N-R60W	MD Reference:	WELL @ 4956.0ft (Precision 828 RKB - 16')
Well:	Shable Federal LB33-78HN	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #2	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)
9,926.0	89.40	175.10	6,349.7	-3,609.3	491.5	3,642.6	2.59	-0.22	-2.58
10,016.0	90.70	177.00	6,349.6	-3,699.1	497.7	3,732.4	2.56	1.44	2.11
10,106.0	91.60	177.20	6,347.8	-3,789.0	502.3	3,822.0	1.02	1.00	0.22
10,196.0	90.30	176.30	6,346.3	-3,878.8	507.4	3,911.6	1.76	-1.44	-1.00
10,286.0	90.40	174.00	6,345.8	-3,968.5	515.0	4,001.5	2.56	0.11	-2.56
10,376.0	90.40	176.30	6,345.2	-4,058.1	522.6	4,091.3	2.56	0.00	2.56
10,466.0	90.80	174.90	6,344.2	-4,147.9	529.5	4,181.2	1.62	0.44	-1.56
10,566.0	89.90	174.90	6,343.6	-4,247.5	538.4	4,281.0	0.90	-0.90	0.00
10,620.7	89.90	174.90	6,343.7	-4,302.0	543.2	4,335.7	0.00	0.00	0.00
Shable Federal LB33-78HN BHL 660'FSL & 660'FWL									
10,621.0	89.90	174.90	6,343.7	-4,302.3	543.3	4,335.9	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____