

Noble Energy

Weld County, CO (NAD 83)

Sec. 36-T6N-R65W (Bill Mansfield 36 PAD)

Mansfield E36-65HN - A2

Plan A

Plan: Plan A - Rev 2 Side Track Proposal

Sperry Drilling Services

Standard Report

25 February, 2012

for 05-123-34611-01

Well Coordinates: 1,405,426.33 N, 3,244,963.18 E (40° 26' 34.66" N, 104° 37' 11.57" W)

Ground Level: 4,654.00 ft

Local Coordinate Origin: Centered on Well Mansfield E36-65HN - Slot A2

Viewing Datum: KB @ 4678.00ft (H&P 343)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Plan Report for Mansfield E36-65HN - Plan A - Rev 2 Side Track Proposal

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,309.00	90.43	83.17	6,743.77	-347.07	640.86	652.95	0.00
Start DLS 1.06 TFO 142.50							
7,350.00	90.08	83.44	6,743.58	-342.29	681.58	693.47	1.06
7,360.00	90.00	83.50	6,743.58	-341.15	691.52	703.36	1.06
Start of side track							
7,400.00	89.43	84.79	6,743.78	-337.07	731.31	742.98	3.52
7,450.00	88.71	86.39	6,744.59	-333.23	781.15	792.65	3.52
7,500.00	88.00	88.00	6,746.02	-330.78	831.07	842.45	3.52
Start DLS 0.59 TFO 0.00							
7,550.00	88.29	88.00	6,747.64	-329.04	881.01	892.29	0.59
7,600.00	88.59	88.00	6,749.00	-327.29	930.96	942.15	0.59
7,650.00	88.88	88.00	6,750.10	-325.55	980.92	992.01	0.59
7,700.00	89.18	88.00	6,750.95	-323.80	1,030.88	1,041.88	0.59
7,750.00	89.47	88.00	6,751.54	-322.06	1,080.85	1,091.75	0.59
7,800.00	89.76	88.00	6,751.87	-320.31	1,130.82	1,141.62	0.59
7,840.00	90.00	88.00	6,751.95	-318.92	1,170.79	1,181.52	0.59
Start DLS 2.50 TFO 0.00							
7,850.00	90.25	88.00	6,751.93	-318.57	1,180.79	1,191.50	2.50
7,900.00	91.50	88.00	6,751.17	-316.82	1,230.75	1,241.36	2.50
Start DLS 1.02 TFO -151.63							
7,950.00	91.05	87.76	6,750.06	-314.97	1,280.70	1,291.22	1.02
8,000.00	90.60	87.51	6,749.34	-312.91	1,330.66	1,341.06	1.02
8,050.00	90.15	87.27	6,749.01	-310.64	1,380.60	1,390.90	1.02
8,066.67	90.00	87.19	6,748.99	-309.83	1,397.25	1,407.51	1.02
Start 3114.96 hold at 8066.67 MD							
8,100.00	90.00	87.19	6,748.99	-308.20	1,430.54	1,440.72	0.00
8,150.00	90.00	87.19	6,748.99	-305.74	1,480.48	1,490.54	0.00
8,200.00	90.00	87.19	6,748.99	-303.29	1,530.42	1,540.35	0.00
8,250.00	90.00	87.19	6,748.99	-300.84	1,580.36	1,590.17	0.00
8,300.00	90.00	87.19	6,748.99	-298.39	1,630.30	1,639.99	0.00
8,350.00	90.00	87.19	6,748.99	-295.94	1,680.24	1,689.81	0.00
8,400.00	90.00	87.19	6,748.99	-293.49	1,730.18	1,739.63	0.00
8,450.00	90.00	87.19	6,748.99	-291.04	1,780.12	1,789.45	0.00
8,500.00	90.00	87.19	6,748.99	-288.59	1,830.06	1,839.27	0.00
8,550.00	90.00	87.19	6,748.99	-286.14	1,880.00	1,889.09	0.00
8,600.00	90.00	87.19	6,748.99	-283.68	1,929.94	1,938.91	0.00
8,650.00	90.00	87.19	6,748.99	-281.23	1,979.88	1,988.73	0.00
8,700.00	90.00	87.19	6,748.99	-278.78	2,029.82	2,038.55	0.00
8,750.00	90.00	87.19	6,748.99	-276.33	2,079.76	2,088.37	0.00
8,800.00	90.00	87.19	6,748.99	-273.88	2,129.70	2,138.18	0.00
8,850.00	90.00	87.19	6,748.99	-271.43	2,179.64	2,188.00	0.00
8,900.00	90.00	87.19	6,748.99	-268.98	2,229.58	2,237.82	0.00
8,950.00	90.00	87.19	6,748.99	-266.53	2,279.52	2,287.64	0.00
9,000.00	90.00	87.19	6,748.99	-264.07	2,329.46	2,337.46	0.00
9,050.00	90.00	87.19	6,748.99	-261.62	2,379.40	2,387.28	0.00
9,100.00	90.00	87.19	6,748.99	-259.17	2,429.34	2,437.10	0.00
9,150.00	90.00	87.19	6,748.99	-256.72	2,479.28	2,486.92	0.00
9,200.00	90.00	87.19	6,748.99	-254.27	2,529.22	2,536.74	0.00
9,250.00	90.00	87.19	6,748.99	-251.82	2,579.16	2,586.56	0.00
9,300.00	90.00	87.19	6,748.99	-249.37	2,629.10	2,636.38	0.00

Plan Report for Mansfield E36-65HN - Plan A - Rev 2 Side Track Proposal

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
9,350.00	90.00	87.19	6,748.99	-246.92	2,679.04	2,686.20	0.00
9,400.00	90.00	87.19	6,748.99	-244.46	2,728.98	2,736.01	0.00
9,450.00	90.00	87.19	6,748.99	-242.01	2,778.92	2,785.83	0.00
9,500.00	90.00	87.19	6,748.99	-239.56	2,828.86	2,835.65	0.00
9,550.00	90.00	87.19	6,748.99	-237.11	2,878.80	2,885.47	0.00
9,600.00	90.00	87.19	6,748.99	-234.66	2,928.74	2,935.29	0.00
9,650.00	90.00	87.19	6,748.99	-232.21	2,978.68	2,985.11	0.00
9,700.00	90.00	87.19	6,748.99	-229.76	3,028.62	3,034.93	0.00
9,750.00	90.00	87.19	6,748.99	-227.31	3,078.56	3,084.75	0.00
9,800.00	90.00	87.19	6,748.99	-224.86	3,128.50	3,134.57	0.00
9,850.00	90.00	87.19	6,748.99	-222.40	3,178.44	3,184.39	0.00
9,900.00	90.00	87.19	6,748.99	-219.95	3,228.38	3,234.21	0.00
9,950.00	90.00	87.19	6,748.99	-217.50	3,278.32	3,284.03	0.00
10,000.00	90.00	87.19	6,748.99	-215.05	3,328.26	3,333.84	0.00
10,050.00	90.00	87.19	6,748.99	-212.60	3,378.20	3,383.66	0.00
10,100.00	90.00	87.19	6,748.99	-210.15	3,428.14	3,433.48	0.00
10,150.00	90.00	87.19	6,748.99	-207.70	3,478.08	3,483.30	0.00
10,200.00	90.00	87.19	6,748.99	-205.25	3,528.02	3,533.12	0.00
10,250.00	90.00	87.19	6,748.99	-202.79	3,577.96	3,582.94	0.00
10,300.00	90.00	87.19	6,748.99	-200.34	3,627.90	3,632.76	0.00
10,350.00	90.00	87.19	6,748.99	-197.89	3,677.84	3,682.58	0.00
10,400.00	90.00	87.19	6,748.99	-195.44	3,727.78	3,732.40	0.00
10,450.00	90.00	87.19	6,748.99	-192.99	3,777.72	3,782.22	0.00
10,500.00	90.00	87.19	6,748.99	-190.54	3,827.66	3,832.04	0.00
10,550.00	90.00	87.19	6,748.99	-188.09	3,877.60	3,881.86	0.00
10,600.00	90.00	87.19	6,748.99	-185.64	3,927.54	3,931.67	0.00
10,650.00	90.00	87.19	6,748.99	-183.18	3,977.48	3,981.49	0.00
10,700.00	90.00	87.19	6,748.99	-180.73	4,027.42	4,031.31	0.00
10,750.00	90.00	87.19	6,748.99	-178.28	4,077.36	4,081.13	0.00
10,800.00	90.00	87.19	6,748.99	-175.83	4,127.30	4,130.95	0.00
10,850.00	90.00	87.19	6,748.99	-173.38	4,177.24	4,180.77	0.00
10,900.00	90.00	87.19	6,748.99	-170.93	4,227.18	4,230.59	0.00
10,950.00	90.00	87.19	6,748.99	-168.48	4,277.12	4,280.41	0.00
11,000.00	90.00	87.19	6,748.99	-166.03	4,327.06	4,330.23	0.00
11,050.00	90.00	87.19	6,748.99	-163.58	4,377.00	4,380.05	0.00
11,100.00	90.00	87.19	6,748.99	-161.12	4,426.94	4,429.87	0.00
11,150.00	90.00	87.19	6,748.99	-158.67	4,476.88	4,479.69	0.00
11,181.62	90.00	87.19	6,748.99	-157.12	4,508.46	4,511.19	0.00

TD at 11181.62

Plan Report for Mansfield E36-65HN - Plan A - Rev 2 Side Track Proposal

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
7,309.00	6,743.77	-347.07	640.86	Start DLS 1.06 TFO 142.50
7,360.00	6,743.58	-341.15	691.52	Start of side track
7,500.00	6,746.02	-330.78	831.07	Start DLS 0.59 TFO 0.00
7,840.00	6,751.95	-322.41	1,070.86	Start DLS 2.50 TFO 0.00
7,900.00	6,751.17	-319.62	1,150.81	Start DLS 1.02 TFO -151.63
8,066.67	6,748.99	-318.92	1,170.79	Start 3114.96 hold at 8066.67 MD
11,181.62	6,748.99	-316.82	1,230.75	TD at 11181.62

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	+E/-W (ft)	Start TVD (ft)
Target	Mansfield E36-65HN_PlanA - Rev1_BHL Tgt	92.06	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
610.00	7,309.00	Sperry MWD Surveys	MWD
7,309.00	11,181.37	Plan A - Rev 2 Side Track Proposal	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,133.00	6,738.20	7" Csg	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	TVDSS (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,712.97	6,586.00	1,908.00	Sharon Springs Mrkr		0.00	359.41
6,732.34	6,597.00	1,919.00	Niobrara		0.00	359.41
6,761.30	6,613.00	1,935.00	Niobrara A		0.00	359.41
6,800.88	6,634.00	1,956.00	Niobrara A Marl		0.00	359.41
7,056.92	6,729.00	2,051.00	Niobrara B		0.00	359.41
7,499.41	6,746.00	2,068.00	Nio B Top Target		0.00	

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Mansfield E36-65HN	0.00	0.00	6,748.00	-162.51	4,508.27	1,405,263.83	3,249,471.28	40° 26' 32.604 N	104° 36' 13.284 W
- plan misses target center by 5.46ft at 11181.17ft MD (6748.99 TVD, -157.14 N, 4508.00 E)									
- Point									
Bill E36-67HN_Sec.	0.00	0.00	0.00	40.07	-0.40	1,405,466.40	3,244,962.78	40° 26' 35.052 N	104° 37' 11.568 W
- plan misses target center by 6785.24ft at 7309.00ft MD (6743.77 TVD, -347.07 N, 640.86 E)									
- Polygon									
Bill E36-67HN_Sec.	0.00	0.00	0.00	40.07	-0.40	1,405,466.40	3,244,962.78	40° 26' 35.052 N	104° 37' 11.568 W
- plan misses target center by 6785.24ft at 7309.00ft MD (6743.77 TVD, -347.07 N, 640.86 E)									
- Polygon									

North Reference Sheet for Sec. 36-T6N-R65W (Bill Mansfield 36 PAD) - Mansfield E36-65HN - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to KB @ 4678.00ft (H&P 343). Northing and Easting are relative to Mansfield E36-65HN - Slot A2

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 40° 47' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996246

Grid Coordinates of Well: 1,405,426.33 ft N, 3,244,963.18 ft E

Geographical Coordinates of Well: 40° 26' 34.66" N, 104° 37' 11.57" W

Grid Convergence at Surface is: 0.57°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,181.62ft
the Bottom Hole Displacement is 4,511.19ft in the Direction of 92.00° (Grid).

Magnetic Convergence at surface is: -8.11° (12 February 2012, , BGGM2011)

