

Noble Energy

Weld County, CO (NAD 83)
Sec. 9-T4N-R64W (Alter 9 PAD)
Alter C16-28D - A2

Sidetrack #1

Plan: Plan B - Rev 0 Proposal

Sperry Drilling Services Proposal Report

28 January, 2012

Well Coordinates: 1,361,231.63 N, 3,261,346.36 E (40° 19' 16.28" N, 104° 33' 45.72" W)

Ground Level: 4,700.00 ft

Local Coordinate Origin: Centered on Well Alter C16-28D - Slot A2

Viewing Datum: KB @ 4724.00ft (H&P 322)

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 Alter C16-28D - Plan B - Rev 0 Proposal

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)	Toolface Azimuth (°)
2,050.00	19.99	112.01	2,018.66	-75.12	242.53	253.87	0.00	0.00	0.00	0.0000
Begin Lowside Sidetrack										
2,087.42	17.00	112.00	2,054.15	-79.57	253.53	265.71	8.00	-8.00	-0.02	-179.9626
Begin 100.00ft Tangent at 2087.42ft										
2,100.00	17.00	112.00	2,066.18	-80.95	256.94	269.38	0.00	0.00	0.00	0.0000
2,187.42	17.00	112.00	2,149.78	-90.52	280.64	294.88	0.00	0.00	0.00	0.0000
Begin 2.0°/100ft Build and Turn at 2187.42ft										
2,200.00	17.22	111.59	2,161.80	-91.89	284.08	298.57	2.00	1.76	-3.26	-28.7981
2,300.00	19.00	108.67	2,256.84	-102.55	313.27	329.63	2.00	1.78	-2.92	-28.4067
2,326.53	19.48	107.98	2,281.89	-105.30	321.57	338.37	2.00	1.81	-2.59	-25.6285
Begin 3036.49ft Tangent at 2326.53ft										
2,400.00	19.48	107.98	2,351.15	-112.87	344.88	362.87	0.00	0.00	0.00	-24.9788
2,500.00	19.48	107.98	2,445.43	-123.16	376.60	396.23	0.00	0.00	0.00	0.0000
2,600.00	19.48	107.98	2,539.70	-133.46	408.32	429.58	0.00	0.00	0.00	0.0000
2,700.00	19.48	107.98	2,633.98	-143.75	440.05	462.93	0.00	0.00	0.00	0.0000
2,800.00	19.48	107.98	2,728.25	-154.05	471.77	496.28	0.00	0.00	0.00	0.0000
2,900.00	19.48	107.98	2,822.52	-164.34	503.50	529.64	0.00	0.00	0.00	0.0000
3,000.00	19.48	107.98	2,916.80	-174.64	535.22	562.99	0.00	0.00	0.00	0.0000
3,100.00	19.48	107.98	3,011.07	-184.93	566.94	596.34	0.00	0.00	0.00	0.0000
3,200.00	19.48	107.98	3,105.35	-195.23	598.67	629.70	0.00	0.00	0.00	0.0000
3,300.00	19.48	107.98	3,199.62	-205.52	630.39	663.05	0.00	0.00	0.00	0.0000
3,400.00	19.48	107.98	3,293.89	-215.82	662.12	696.40	0.00	0.00	0.00	0.0000
3,500.00	19.48	107.98	3,388.17	-226.11	693.84	729.75	0.00	0.00	0.00	0.0000
3,600.00	19.48	107.98	3,482.44	-236.41	725.56	763.11	0.00	0.00	0.00	0.0000
3,700.00	19.48	107.98	3,576.72	-246.70	757.29	796.46	0.00	0.00	0.00	0.0000
3,800.00	19.48	107.98	3,670.99	-257.00	789.01	829.81	0.00	0.00	0.00	0.0000
3,900.00	19.48	107.98	3,765.26	-267.29	820.74	863.17	0.00	0.00	0.00	0.0000
4,000.00	19.48	107.98	3,859.54	-277.59	852.46	896.52	0.00	0.00	0.00	0.0000
4,100.00	19.48	107.98	3,953.81	-287.89	884.18	929.87	0.00	0.00	0.00	0.0000
4,200.00	19.48	107.98	4,048.09	-298.18	915.91	963.22	0.00	0.00	0.00	0.0000
4,300.00	19.48	107.98	4,142.36	-308.48	947.63	996.58	0.00	0.00	0.00	0.0000
4,400.00	19.48	107.98	4,236.63	-318.77	979.36	1,029.93	0.00	0.00	0.00	0.0000
4,500.00	19.48	107.98	4,330.91	-329.07	1,011.08	1,063.28	0.00	0.00	0.00	0.0000
4,600.00	19.48	107.98	4,425.18	-339.36	1,042.80	1,096.63	0.00	0.00	0.00	0.0000
4,700.00	19.48	107.98	4,519.46	-349.66	1,074.53	1,129.99	0.00	0.00	0.00	0.0000
4,800.00	19.48	107.98	4,613.73	-359.95	1,106.25	1,163.34	0.00	0.00	0.00	0.0000
4,900.00	19.48	107.98	4,708.00	-370.25	1,137.98	1,196.69	0.00	0.00	0.00	0.0000
5,000.00	19.48	107.98	4,802.28	-380.54	1,169.70	1,230.05	0.00	0.00	0.00	0.0000
5,100.00	19.48	107.98	4,896.55	-390.84	1,201.42	1,263.40	0.00	0.00	0.00	0.0000
5,200.00	19.48	107.98	4,990.83	-401.13	1,233.15	1,296.75	0.00	0.00	0.00	0.0000
5,300.00	19.48	107.98	5,085.10	-411.43	1,264.87	1,330.10	0.00	0.00	0.00	0.0000
5,363.02	19.48	107.98	5,144.51	-417.92	1,284.87	1,351.12	0.00	0.00	0.00	0.0000
Begin 2.0°/100ft Drop to Vertical at 5363.02ft										
5,400.00	18.74	107.98	5,179.45	-421.65	1,296.38	1,363.23	2.00	-2.00	0.00	180.0000
5,500.00	16.74	107.98	5,274.69	-431.06	1,325.37	1,393.71	2.00	-2.00	0.00	180.0000
5,600.00	14.74	107.98	5,370.93	-439.44	1,351.17	1,420.84	2.00	-2.00	0.00	180.0000
5,700.00	12.74	107.98	5,468.07	-446.77	1,373.77	1,444.59	2.00	-2.00	0.00	180.0000
5,800.00	10.74	107.98	5,565.97	-453.05	1,393.13	1,464.95	2.00	-2.00	0.00	180.0000
5,900.00	8.74	107.98	5,664.52	-458.28	1,409.23	1,481.87	2.00	-2.00	0.00	180.0000
6,000.00	6.74	107.98	5,763.60	-462.43	1,422.04	1,495.34	2.00	-2.00	0.00	180.0000
6,100.00	4.74	107.98	5,863.10	-465.52	1,431.56	1,505.35	2.00	-2.00	0.00	-180.0000
6,200.00	2.74	107.98	5,962.88	-467.54	1,437.77	1,511.88	2.00	-2.00	0.00	180.0000
6,300.00	0.74	107.98	6,062.83	-468.48	1,440.66	1,514.92	2.00	-2.00	0.00	180.0000
6,337.17	0.00	107.98	6,100.00	-468.55	1,440.89	1,515.16	2.00	-2.00	0.00	-180.0000
End of Drop at 6337.17ft										
6,400.00	0.00	0.00	6,162.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	-180.0000
6,500.00	0.00	0.00	6,262.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
6,600.00	0.00	0.00	6,362.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000

Plan Report for Alter C16-28D - Plan B - Rev 0 Proposal

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)	Toolface Azimuth (°)
6,700.00	0.00	0.00	6,462.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
6,800.00	0.00	0.00	6,562.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
6,831.17	0.00	0.00	6,594.00	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
Niobrara										
6,900.00	0.00	0.00	6,662.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
7,000.00	0.00	0.00	6,762.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
7,100.00	0.00	0.00	6,862.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
7,126.17	0.00	0.00	6,889.00	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
Codell										
7,200.00	0.00	0.00	6,962.83	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
7,276.17	0.00	0.00	7,039.00	-468.55	1,440.89	1,515.16	0.00	0.00	0.00	0.0000
Total Depth at 7276.17ft										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,050.00	2,018.66	-75.12	242.53	Begin Lowside Sidetrack
2,087.42	2,054.15	-79.57	253.53	Begin 100.00ft Tangent at 2087.42ft
2,187.42	2,149.78	-90.52	280.64	Begin 2.0°/100ft Build and Turn at 2187.42ft
2,326.53	2,281.89	-105.30	321.57	Begin 3036.49ft Tangent at 2326.53ft
5,363.02	5,144.51	-417.92	1,284.87	Begin 2.0°/100ft Drop to Vertical at 5363.02ft
6,337.17	6,100.00	-468.55	1,440.89	End of Drop at 6337.17ft
7,276.17	7,039.00	-468.55	1,440.89	Total Depth at 7276.17ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Alter C16-28D_PlanB - Rev0_BHL Tgt	108.01	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
283.00	2,050.00	Original Wellbore MWD Surveys	MWD
2,050.00	7,276.17	Plan B - Rev 0 Proposal	MWD

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,831.17	6,594.00	Niobrara		0.0000	
7,126.17	6,889.00	Codell		0.0000	

Plan Report for Alter C16-28D - Plan B - Rev 0 Proposal

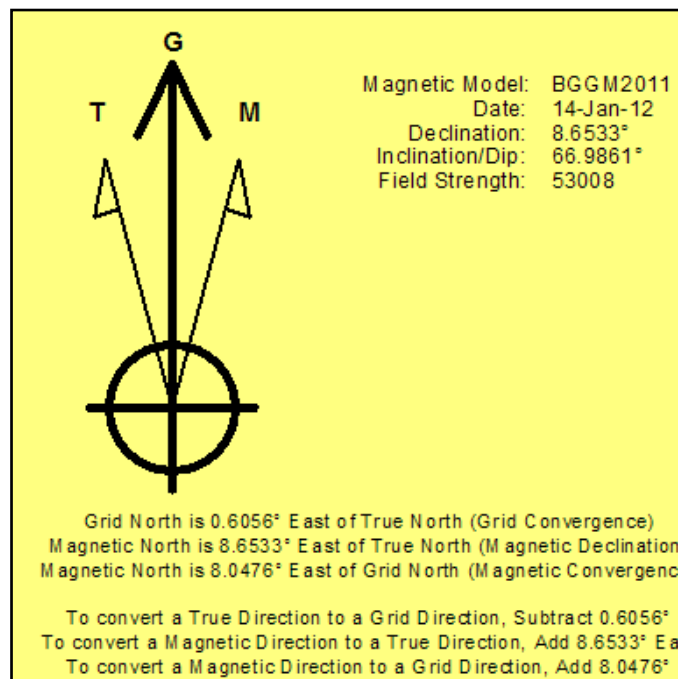
Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Alter C16-28D_PlanB - Rev0_BHL Tgt	7,039.00	-468.55	1,440.89	Point
Alter C16-28D_PlanB - Rev0_Vert Tgt	6,100.00	-468.55	1,440.89	Circle
Alter C16-29D_Sec. 9 Lines	0.00	-21.86	0.23	Polygon
Alter C16-29D_Sec. 9 460' Setbacks	0.00	-21.86	0.23	Polygon

North Reference Sheet for Sec. 9-T4N-R64W (Alter 9 PAD) - Alter C16-28D - Sidetrack #1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
Vertical Depths are relative to KB @ 4724.00ft (H&P 322). Northing and Easting are relative to Alter C16-28D - 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 -105.50°, 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: 0.99995760
Grid Coordinates of Well: 1,361,231.63 ft N, 3,261,346.36 ft E
Geographical Coordinates of Well: 40° 19' 16.28" N, 104° 33' 45.72" W
Grid Convergence at Surface is: 0.6056°

Based upon Minimum Curvature type calculations, at a Measured Depth of 7,276.17ft
the Bottom Hole Displacement is 1,515.16ft in the Direction of 108.01° (Grid).
Magnetic Convergence at surface is: -8.0500° (14 January 2012, , BGGM2011)



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	2050.00	19.99	112.01	2018.66	-75.12	242.53	0.00	0.0000	253.87	
2	2087.42	17.00	112.00	2054.14	-79.57	253.53	8.00	79.9626	265.71	
3	2187.42	17.00	112.00	2149.77	-90.52	280.64	0.00	0.0000	294.87	
4	2326.53	19.48	107.98	2281.89	-105.30	321.57	2.00	-28.7981	338.37	
5	5363.02	19.48	107.98	5144.51	-417.92	1284.87	0.00	0.0000	1351.12	
6	6337.17	0.00	0.00	6100.00	-468.55	1440.89	2.00	80.0000	1515.16	Alter C16-28D_PlanB - Rev0_Vert Tgt
7	7276.17	0.00	0.00	7039.00	-468.55	1440.89	0.00	0.0000	1515.16	Alter C16-28D_PlanB - Rev0_BHL Tgt

WELLBORE TARGET DETAILS (LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
Alter C16-29D_Sec. 9 460' Setbacks	0.00	-21.86	0.2340° 19' 16.068	N04° 33' 45.720 W	Polygon		
Alter C16-29D_Sec. 9 Lines	0.00	-21.86	0.2340° 19' 16.068	N04° 33' 45.720 W	Polygon		
Alter C16-28D_PlanB - Rev0_Vert Tgt	6100.00	-468.55	1440.8940° 19' 11.503	N04° 33' 27.183 W	Circle (Radius: 75.00)		
Alter C16-28D_PlanB - Rev0_BHL Tgt	7039.00	-468.55	1440.8940° 19' 11.503	N04° 33' 27.183 W	Point		

