Conoco Phillips Company

Arapahoe County, Colorado
Sec. 36-T4S-R64W
Murphy Family 4-64-36-1H

Plan A

Plan: Plan A Rev 0 (Lateral)

Sperry Drilling Services

Proposal Report

18 April, 2013

Well Coordinates: 1,665,215.50 N, 3,283,850.74 E (39° 39' 19.76" N, 104° 29' 30.65" W)
Ground Level: 5,913.00 ft

Local Coordinate Origin:	Centered on Well Murphy Family 4-64-36-1H
Viewing Datum:	RKB 24 ft @ 5937.00ft (H&P 280)
TVDs to System:	N
North Reference:	True
Unit System:	API - US Survey Feet - Custom

Version: 2003.16 Build: 43I

HALLIBURTON

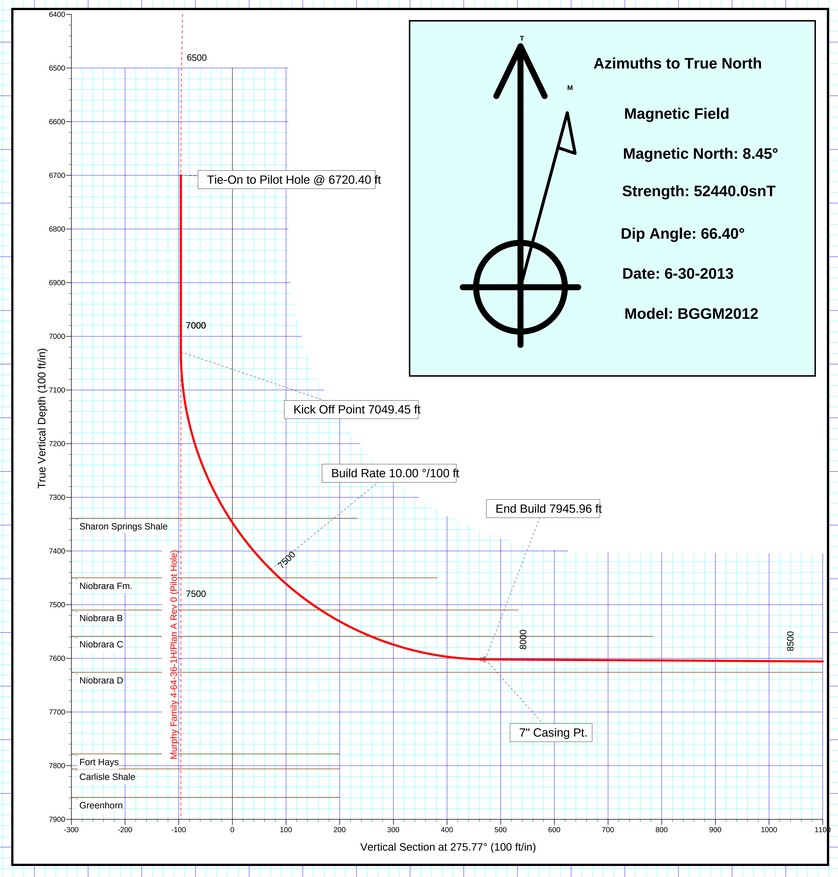
Project: Arapahoe County, Colorado
Site: Sec. 36-T4S-R64W
Well: Murphy Family 4-64-36-1H
Wellbore: Plan A
Plan: Plan A Rev 0 (Lateral)

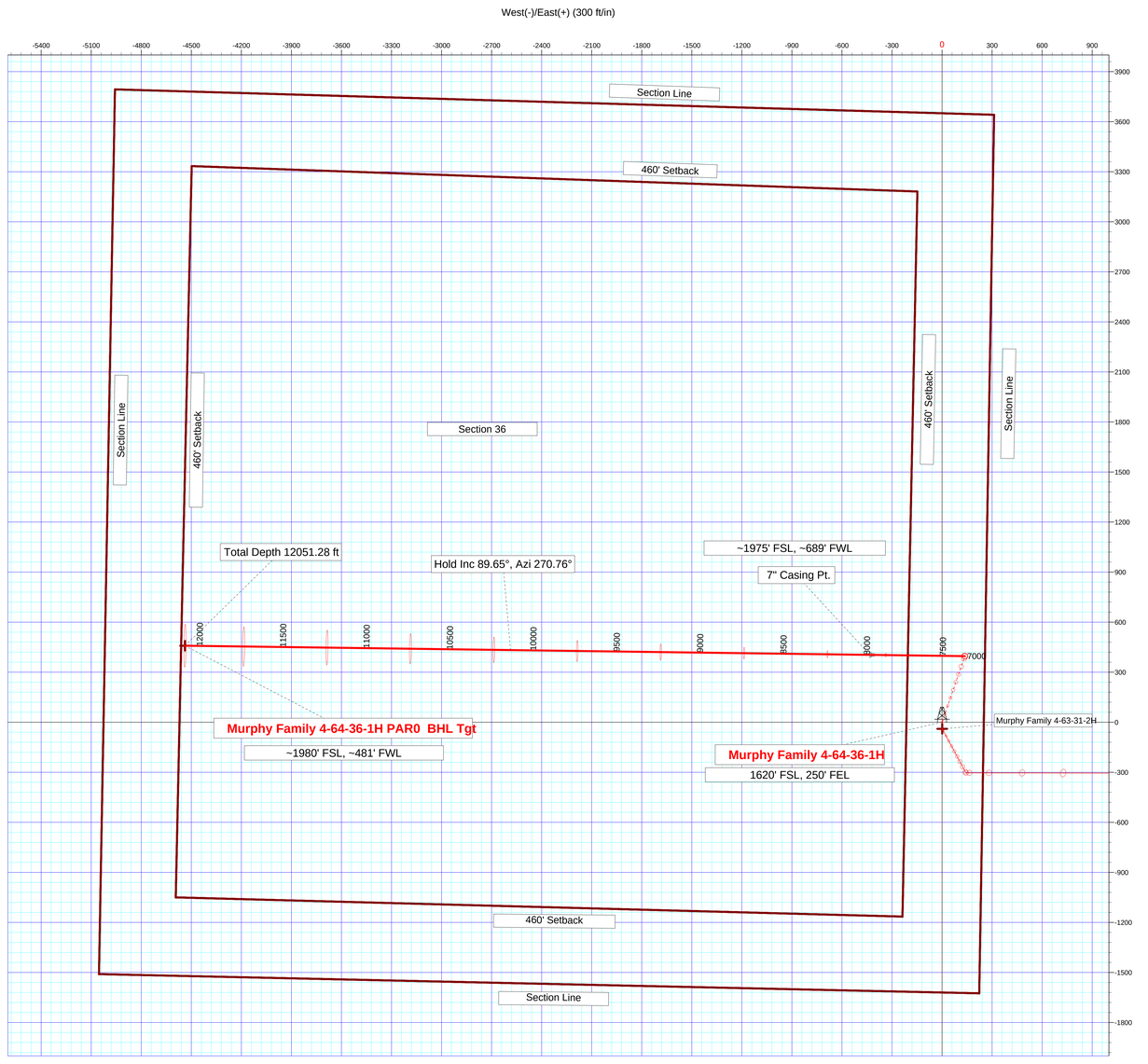
Conoco Phillips Company

HALLIBURTON
Sperry Drilling

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	6720.40	0.00	0.00	6700.00	396.31	136.46	0.00	0.00	-95.92	
2	7049.45	0.00	0.00	7029.05	396.31	136.46	0.00	0.00	-95.92	
3	7945.96	89.65	270.76	7602.00	403.90	-432.96	10.00	270.76	471.38	
4	12051.28	89.65	270.76	7627.00	458.64	-4537.84	0.00	0.00	4560.96	Murphy Family 4-64-36-1H PAR0 BHL Tgt





Plan Report for Murphy Family 4-64-36-1H - Plan A Rev 0 (Lateral)

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 (°)
6,720.40	0.00	0.00	6,700.00	396.31	136.46	-95.92	0.00	0.00	0.00	0.00
Tie-On to Pilot Hole @ 6720.40 ft										
6,800.00	0.00	0.00	6,779.60	396.31	136.46	-95.92	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,879.60	396.31	136.46	-95.92	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,979.60	396.31	136.46	-95.92	0.00	0.00	0.00	0.00
7,049.45	0.00	0.00	7,029.05	396.31	136.46	-95.92	0.00	0.00	0.00	0.00
Kick Off Point 7049.45 ft										
7,100.00	5.05	270.76	7,079.53	396.34	134.23	-93.70	10.00	10.00	0.00	270.76
7,200.00	15.05	270.76	7,177.87	396.57	116.80	-76.33	10.00	10.00	0.00	0.00
7,300.00	25.05	270.76	7,271.69	397.03	82.55	-42.21	10.00	10.00	0.00	0.00
7,376.94	32.75	270.76	7,339.00	397.52	45.39	-5.19	10.00	10.00	0.00	0.00
Sharon Springs Shale										
7,400.00	35.05	270.76	7,358.14	397.70	32.54	7.62	10.00	10.00	0.00	0.00
7,500.00	45.05	270.76	7,434.58	398.55	-31.73	71.65	10.00	10.00	0.00	0.00
Build Rate 10.00 °/100 ft										
7,522.27	47.28	270.76	7,450.00	398.77	-47.79	87.65	10.00	10.00	0.00	0.00
Niobrara Fm.										
7,600.00	55.05	270.76	7,498.70	399.57	-108.29	147.92	10.00	10.00	0.00	0.00
7,620.24	57.08	270.76	7,510.00	399.80	-125.08	164.65	10.00	10.00	0.00	0.00
Niobrara B										
7,700.00	65.05	270.76	7,548.56	400.73	-194.82	234.13	10.00	10.00	0.00	0.00
7,726.04	67.66	270.76	7,559.00	401.05	-218.67	257.89	10.00	10.00	0.00	0.00
Niobrara C										
7,800.00	75.05	270.76	7,582.63	401.98	-288.70	327.66	10.00	10.00	0.00	0.00
7,900.00	85.05	270.76	7,599.88	403.29	-387.06	425.66	10.00	10.00	0.00	0.00
7,945.96	89.65	270.76	7,602.00	403.90	-432.96	471.38	10.00	10.00	0.00	0.00
End Build 7945.96 ft - 7" Casing Pt.										
8,000.00	89.65	270.76	7,602.33	404.62	-486.99	525.21	0.00	0.00	0.00	0.00
8,100.00	89.65	270.76	7,602.94	405.96	-586.98	624.83	0.00	0.00	0.00	0.00
8,200.00	89.65	270.76	7,603.54	407.29	-686.97	724.44	0.00	0.00	0.00	0.00
8,300.00	89.65	270.76	7,604.15	408.62	-786.96	824.06	0.00	0.00	0.00	0.00
8,400.00	89.65	270.76	7,604.76	409.96	-886.95	923.68	0.00	0.00	0.00	0.00
8,500.00	89.65	270.76	7,605.37	411.29	-986.94	1,023.29	0.00	0.00	0.00	0.00
8,600.00	89.65	270.76	7,605.98	412.62	-1,086.93	1,122.91	0.00	0.00	0.00	0.00
8,700.00	89.65	270.76	7,606.59	413.96	-1,186.92	1,222.53	0.00	0.00	0.00	0.00
8,800.00	89.65	270.76	7,607.20	415.29	-1,286.91	1,322.14	0.00	0.00	0.00	0.00
8,900.00	89.65	270.76	7,607.81	416.62	-1,386.89	1,421.76	0.00	0.00	0.00	0.00
9,000.00	89.65	270.76	7,608.42	417.96	-1,486.88	1,521.38	0.00	0.00	0.00	0.00
9,100.00	89.65	270.76	7,609.03	419.29	-1,586.87	1,620.99	0.00	0.00	0.00	0.00
9,200.00	89.65	270.76	7,609.63	420.62	-1,686.86	1,720.61	0.00	0.00	0.00	0.00
9,300.00	89.65	270.76	7,610.24	421.96	-1,786.85	1,820.23	0.00	0.00	0.00	0.00
9,400.00	89.65	270.76	7,610.85	423.29	-1,886.84	1,919.84	0.00	0.00	0.00	0.00
9,500.00	89.65	270.76	7,611.46	424.62	-1,986.83	2,019.46	0.00	0.00	0.00	0.00
9,600.00	89.65	270.76	7,612.07	425.96	-2,086.82	2,119.08	0.00	0.00	0.00	0.00
9,700.00	89.65	270.76	7,612.68	427.29	-2,186.81	2,218.69	0.00	0.00	0.00	0.00
9,800.00	89.65	270.76	7,613.29	428.63	-2,286.80	2,318.31	0.00	0.00	0.00	0.00
9,900.00	89.65	270.76	7,613.90	429.96	-2,386.79	2,417.92	0.00	0.00	0.00	0.00
10,000.00	89.65	270.76	7,614.51	431.29	-2,486.78	2,517.54	0.00	0.00	0.00	0.00
10,100.00	89.65	270.76	7,615.12	432.63	-2,586.77	2,617.16	0.00	0.00	0.00	0.00
Hold Inc 89.65°, Azi 270.76°										
10,200.00	89.65	270.76	7,615.73	433.96	-2,686.75	2,716.77	0.00	0.00	0.00	0.00
10,300.00	89.65	270.76	7,616.33	435.29	-2,786.74	2,816.39	0.00	0.00	0.00	0.00
10,400.00	89.65	270.76	7,616.94	436.63	-2,886.73	2,916.01	0.00	0.00	0.00	0.00
10,500.00	89.65	270.76	7,617.55	437.96	-2,986.72	3,015.62	0.00	0.00	0.00	0.00
10,600.00	89.65	270.76	7,618.16	439.29	-3,086.71	3,115.24	0.00	0.00	0.00	0.00
10,700.00	89.65	270.76	7,618.77	440.63	-3,186.70	3,214.86	0.00	0.00	0.00	0.00
10,800.00	89.65	270.76	7,619.38	441.96	-3,286.69	3,314.47	0.00	0.00	0.00	0.00
10,900.00	89.65	270.76	7,619.99	443.29	-3,386.68	3,414.09	0.00	0.00	0.00	0.00

Plan Report for Murphy Family 4-64-36-1H - Plan A Rev 0 (Lateral)

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 (°)
11,000.00	89.65	270.76	7,620.60	444.63	-3,486.67	3,513.71	0.00	0.00	0.00	0.00
11,100.00	89.65	270.76	7,621.21	445.96	-3,586.66	3,613.32	0.00	0.00	0.00	0.00
11,200.00	89.65	270.76	7,621.82	447.29	-3,686.65	3,712.94	0.00	0.00	0.00	0.00
11,300.00	89.65	270.76	7,622.42	448.63	-3,786.64	3,812.56	0.00	0.00	0.00	0.00
11,400.00	89.65	270.76	7,623.03	449.96	-3,886.63	3,912.17	0.00	0.00	0.00	0.00
11,500.00	89.65	270.76	7,623.64	451.29	-3,986.62	4,011.79	0.00	0.00	0.00	0.00
11,600.00	89.65	270.76	7,624.25	452.63	-4,086.60	4,111.41	0.00	0.00	0.00	0.00
11,700.00	89.65	270.76	7,624.86	453.96	-4,186.59	4,211.02	0.00	0.00	0.00	0.00
11,800.00	89.65	270.76	7,625.47	455.29	-4,286.58	4,310.64	0.00	0.00	0.00	0.00
11,887.09	89.65	270.76	7,626.00	456.45	-4,373.66	4,397.39	0.00	0.00	0.00	0.00
Niobrara D										
11,900.00	89.65	270.76	7,626.08	456.63	-4,386.57	4,410.26	0.00	0.00	0.00	0.00
12,000.00	89.65	270.76	7,626.69	457.96	-4,486.56	4,509.87	0.00	0.00	0.00	0.00
12,051.28	89.65	270.76	7,627.00	458.64	-4,537.84	4,560.96	0.00	0.00	0.00	0.00
Total Depth 12051.28 ft - Murphy Family 4-64-36-1H PAR0 BHL Tgt										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
6,720.40	6,700.00	396.31	136.46	Tie-On to Pilot Hole @ 6720.40 ft
7,049.45	7,029.05	396.31	136.46	Kick Off Point 7049.45 ft
7,500.00	7,434.58	398.55	-31.73	Build Rate 10.00 °/100 ft
7,945.96	7,602.00	403.90	-432.96	End Build 7945.96 ft
10,100.00	7,615.12	432.63	-2,586.77	Hold Inc 89.65°, Azi 270.76°
12,051.28	7,627.00	458.64	-4,537.84	Total Depth 12051.28 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Murphy Family 4-64-36-1H PAR0 BHL Tgt	275.77	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
6,720.40	12,051.28	Plan A Rev 0 (Lateral)	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,945.96	7,602.00	7" Casing Pt.	7	8-3/4

Plan Report for Murphy Family 4-64-36-1H - Plan A Rev 0 (Lateral)

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	1,766.00	Fox Hills Aquifer			
	1,922.00	Pierre Shale			
	7,778.00	Fort Hays			
	7,806.00	Carlisle Shale			
	7,859.00	Greenhorn			
7,376.94	7,339.00	Sharon Springs Shale			
7,522.27	7,450.00	Niobrara Fm.			
7,620.24	7,510.00	Niobrara B			
7,726.04	7,559.00	Niobrara C			
11,887.09	7,626.00	Niobrara D			

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Sec.36-T4S-R64W SB	0.00	-39.34	0.84	Polygon
Murphy Family 4-64-36-1H PAR0 BHL Tgt	7,627.00	458.64	-4,537.84	Point
Sec.36-T4S-R64W SL	0.00	-39.34	0.84	Polygon

North Reference Sheet for Sec. 36-T4S-R64W - Murphy Family 4-64-36-1H - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
Vertical Depths are relative to RKB 24 ft @ 5937.00ft (H&P 280). Northing and Easting are relative to Murphy Family 4-64-36-1H
Coordinate System is US State Plane 1983, Colorado Central 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:0.000000°, Latitude Origin:39.750000°
False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99998267

Grid Coordinates of Well: 1,665,215.50 ft N, 3,283,850.74 ft E
Geographical Coordinates of Well: 39° 39' 19.76" N, 104° 29' 30.65" W
Grid Convergence at Surface is: 0.64°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,051.28ft
the Bottom Hole Displacement is 4,560.96ft in the Direction of 275.77° (True).

Magnetic Convergence at surface is: -7.81° (30 June 2013, , BGGM2012)