

Conoco Phillips Company

Arapahoe County, Colorado

Sec. 14-T4S-R64W

Krout 14-1H

Plan B

Plan: Plan B Rev 0 (Lateral)

Sperry Drilling Services

Proposal Report

14 September, 2012

Well Coordinates: 1,684,487.04 N, 3,278,804.41 E (39° 42' 30.76" N, 104° 30' 32.48" W)

Ground Level: 5,695.00 ft

Local Coordinate Origin:

Centered on Well Krout 14-1H

Viewing Datum:

RKB 24 ft @ 5719.00ft (H&P 280)

TVDs to System:

N

North Reference:

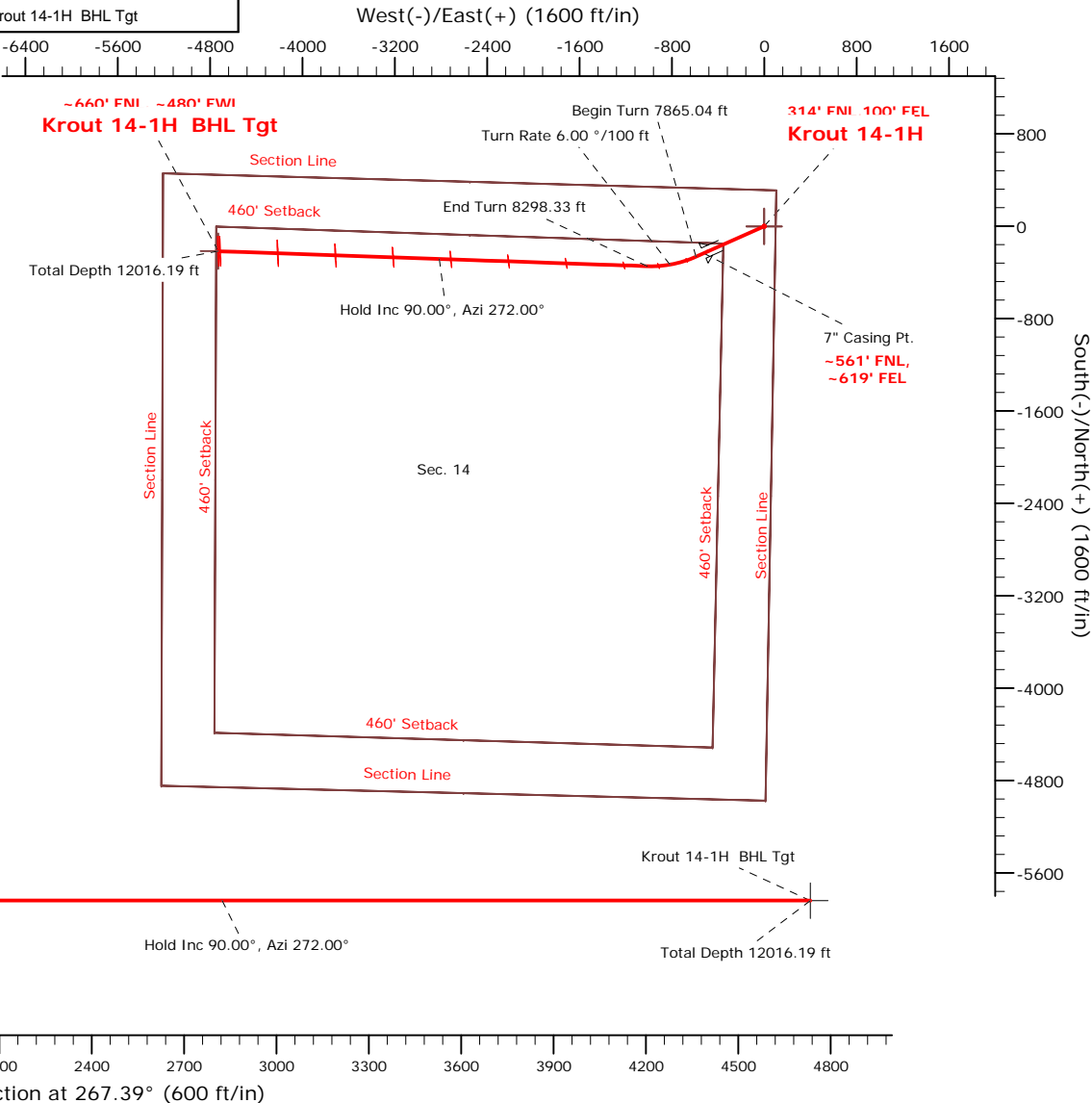
True

Unit System:

API - US Survey Feet - Custom

Version: 2003.16 Build: 43I

HALLIBURTON



Plan Report for Krout 14-1H - Plan B 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 (°)
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-On to Pilot Hole @ 6700.00 ft										
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6,890.04	0.00	0.00	6,890.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kick Off Point 6890.04 ft										
6,900.00	1.00	246.00	6,900.00	-0.04	-0.08	0.08	10.00	10.00	0.00	246.00
7,000.00	11.00	246.00	6,999.33	-4.28	-9.61	9.79	10.00	10.00	0.00	0.00
7,100.00	21.00	246.00	7,095.33	-15.47	-34.75	35.42	10.00	10.00	0.00	0.00
Build Rate 10.00 °/100 ft										
7,200.00	31.00	246.00	7,185.10	-33.28	-74.74	76.18	10.00	10.00	0.00	0.00
7,300.00	41.00	246.00	7,265.90	-57.15	-128.37	130.84	10.00	10.00	0.00	0.00
7,302.78	41.27	246.00	7,268.00	-57.90	-130.04	132.54	10.00	10.00	0.00	0.00
Sharon Springs Shale										
7,377.82	48.78	246.00	7,321.00	-79.47	-178.50	181.94	10.00	10.00	0.00	0.00
Niobrara Fm.										
7,400.00	51.00	246.00	7,335.29	-86.37	-193.99	197.73	10.00	10.00	0.00	0.00
7,500.00	61.00	246.00	7,391.14	-120.05	-269.63	274.83	10.00	10.00	0.00	0.00
7,503.86	61.38	246.00	7,393.00	-121.42	-272.72	277.97	10.00	10.00	0.00	0.00
Niobrara B										
7,600.00	71.00	246.00	7,431.77	-157.16	-352.98	359.78	10.00	10.00	0.00	0.00
7,658.66	76.86	246.00	7,448.00	-180.07	-404.45	412.24	10.00	10.00	0.00	0.00
Niobrara C Chalk										
7,700.00	81.00	246.00	7,455.94	-196.57	-441.51	450.01	10.00	10.00	0.00	0.00
7,790.04	90.00	246.00	7,463.00	-233.04	-523.42	533.51	10.00	10.00	0.00	0.00
End Build 7790.04 ft - 7" Casing Pt.										
7,800.00	90.00	246.00	7,463.00	-237.09	-532.52	542.78	0.00	0.00	0.00	0.00
7,865.04	90.00	246.00	7,463.00	-263.55	-591.94	603.34	0.00	0.00	0.00	0.00
Begin Turn 7865.04 ft										
7,900.00	90.00	248.10	7,463.00	-277.18	-624.13	636.12	6.00	0.00	6.00	90.00
8,000.00	90.00	254.10	7,463.00	-309.56	-718.69	732.07	6.00	0.00	6.00	90.00
8,100.00	90.00	260.10	7,463.00	-331.88	-816.12	830.41	6.00	0.00	6.00	90.00
Turn Rate 6.00 °/100 ft										
8,200.00	90.00	266.10	7,463.00	-343.89	-915.35	930.09	6.00	0.00	6.00	90.00
8,298.33	90.00	272.00	7,463.00	-345.53	-1,013.63	1,028.33	6.00	0.00	6.00	90.00
End Turn 8298.33 ft										
8,300.00	90.00	272.00	7,463.00	-345.47	-1,015.30	1,030.00	0.01	0.00	0.01	90.00
8,400.00	90.00	272.00	7,463.00	-341.98	-1,115.24	1,129.67	0.00	0.00	0.00	0.00
8,500.00	90.00	272.00	7,463.00	-338.50	-1,215.17	1,229.35	0.00	0.00	0.00	0.00
8,600.00	90.00	272.00	7,463.00	-335.01	-1,315.11	1,329.03	0.00	0.00	0.00	0.00
8,700.00	90.00	272.00	7,463.00	-331.53	-1,415.05	1,428.70	0.00	0.00	0.00	0.00
8,800.00	90.00	272.00	7,463.00	-328.04	-1,514.99	1,528.38	0.00	0.00	0.00	0.00
8,900.00	90.00	272.00	7,463.00	-324.55	-1,614.93	1,628.05	0.00	0.00	0.00	0.00
9,000.00	90.00	272.00	7,463.00	-321.07	-1,714.87	1,727.73	0.00	0.00	0.00	0.00
9,100.00	90.00	272.00	7,463.00	-317.58	-1,814.81	1,827.41	0.00	0.00	0.00	0.00
9,200.00	90.00	272.00	7,463.00	-314.10	-1,914.75	1,927.08	0.00	0.00	0.00	0.00
9,300.00	90.00	272.00	7,463.00	-310.61	-2,014.69	2,026.76	0.00	0.00	0.00	0.00
9,400.00	90.00	272.00	7,463.00	-307.13	-2,114.63	2,126.44	0.00	0.00	0.00	0.00
9,500.00	90.00	272.00	7,463.00	-303.64	-2,214.57	2,226.11	0.00	0.00	0.00	0.00
9,600.00	90.00	272.00	7,463.00	-300.15	-2,314.51	2,325.79	0.00	0.00	0.00	0.00
9,700.00	90.00	272.00	7,463.00	-296.67	-2,414.45	2,425.46	0.00	0.00	0.00	0.00
9,800.00	90.00	272.00	7,463.00	-293.18	-2,514.38	2,525.14	0.00	0.00	0.00	0.00
9,900.00	90.00	272.00	7,463.00	-289.70	-2,614.32	2,624.82	0.00	0.00	0.00	0.00
10,000.00	90.00	272.00	7,463.00	-286.21	-2,714.26	2,724.49	0.00	0.00	0.00	0.00
10,100.00	90.00	272.00	7,463.00	-282.73	-2,814.20	2,824.17	0.00	0.00	0.00	0.00
Hold Inc 90.00°, Azi 272.00°										
10,200.00	90.00	272.00	7,463.00	-279.24	-2,914.14	2,923.85	0.00	0.00	0.00	0.00
10,300.00	90.00	272.00	7,463.00	-275.76	-3,014.08	3,023.52	0.00	0.00	0.00	0.00

Plan Report for Krout 14-1H - Plan B 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 (°)
10,400.00	90.00	272.00	7,463.00	-272.27	-3,114.02	3,123.20	0.00	0.00	0.00	0.00
10,500.00	90.00	272.00	7,463.00	-268.78	-3,213.96	3,222.87	0.00	0.00	0.00	0.00
10,600.00	90.00	272.00	7,463.00	-265.30	-3,313.90	3,322.55	0.00	0.00	0.00	0.00
10,700.00	90.00	272.00	7,463.00	-261.81	-3,413.84	3,422.23	0.00	0.00	0.00	0.00
10,800.00	90.00	272.00	7,463.00	-258.33	-3,513.78	3,521.90	0.00	0.00	0.00	0.00
10,900.00	90.00	272.00	7,463.00	-254.84	-3,613.72	3,621.58	0.00	0.00	0.00	0.00
11,000.00	90.00	272.00	7,463.00	-251.36	-3,713.66	3,721.26	0.00	0.00	0.00	0.00
11,100.00	90.00	272.00	7,463.00	-247.87	-3,813.59	3,820.93	0.00	0.00	0.00	0.00
11,200.00	90.00	272.00	7,463.00	-244.38	-3,913.53	3,920.61	0.00	0.00	0.00	0.00
11,300.00	90.00	272.00	7,463.00	-240.90	-4,013.47	4,020.28	0.00	0.00	0.00	0.00
11,400.00	90.00	272.00	7,463.00	-237.41	-4,113.41	4,119.96	0.00	0.00	0.00	0.00
11,500.00	90.00	272.00	7,463.00	-233.93	-4,213.35	4,219.64	0.00	0.00	0.00	0.00
11,600.00	90.00	272.00	7,463.00	-230.44	-4,313.29	4,319.31	0.00	0.00	0.00	0.00
11,700.00	90.00	272.00	7,463.00	-226.96	-4,413.23	4,418.99	0.00	0.00	0.00	0.00
11,800.00	90.00	272.00	7,463.00	-223.47	-4,513.17	4,518.67	0.00	0.00	0.00	0.00
11,900.00	90.00	272.00	7,463.00	-219.99	-4,613.11	4,618.34	0.00	0.00	0.00	0.00
12,000.00	90.00	272.00	7,463.00	-216.50	-4,713.05	4,718.02	0.00	0.00	0.00	0.00
12,016.19	90.00	272.00	7,463.00	-215.94	-4,729.22	4,734.15	0.00	0.00	0.00	0.00
Krout 14-1H BHL Tgt										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,700.00	6,700.00	0.00	0.00	Tie-On to Pilot Hole @ 6700.00 ft
6,890.04	6,890.04	0.00	0.00	Kick Off Point 6890.04 ft
7,100.00	7,095.33	-15.47	-34.75	Build Rate 10.00 °/100 ft
7,790.04	7,463.00	-233.04	-523.42	End Build 7790.04 ft
7,865.04	7,463.00	-263.55	-591.94	Begin Turn 7865.04 ft
8,100.00	7,463.00	-331.88	-816.12	Turn Rate 6.00 °/100 ft
8,298.33	7,463.00	-345.53	-1,013.63	End Turn 8298.33 ft
10,100.00	7,463.00	-282.73	-2,814.20	Hold Inc 90.00°, Azi 272.00°
12,016.19	7,463.00	-215.94	-4,729.23	Total Depth 12016.19 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Krout 14-1H BHL Tgt	267.39	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
6,700.00	12,016.19	Plan B Rev 0 (Lateral)	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,790.04	7,463.00	7" Casing Pt.	7	8-3/4

Plan Report for Krout 14-1H - Plan B Rev 0 (Lateral)

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	1,725.00	Fox Hills Aquifer			
	1,852.00	Pierre Shale			
	2,050.00	(Base Fox Hills)			
	7,518.00	Niobrara D Chalk			
	7,648.00	Fort Hays Limestone			
	7,680.00	Carlisle Shale			
	7,736.00	Greenhorn			
7,302.78	7,268.00	Sharon Springs Shale			
7,377.82	7,321.00	Niobrara Fm.			
7,503.86	7,393.00	Niobrara B			
7,658.66	7,448.00	Niobrara C Chalk			

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Krout 14-1H SB	0.00	-0.01	0.00	Polygon
Krout 14-1H BHL Tgt	7,463.00	-215.94	-4,729.22	Point
Krout 14-1H SL	0.00	-0.01	0.00	Polygon

North Reference Sheet for Sec. 14-T4S-R64W - Krout 14-1H - Plan B

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 @ 5719.00ft (H&P 280). Northing and Easting are relative to Krout 14-1H
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° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°
False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99999206

Grid Coordinates of Well: 1,684,487.04 ft N, 3,278,804.41 ft E
Geographical Coordinates of Well: 39° 42' 30.76" N, 104° 30' 32.48" W
Grid Convergence at Surface is: 0.62°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,016.19ft
the Bottom Hole Displacement is 4,734.15ft in the Direction of 267.39° (True).

Magnetic Convergence at surface is: -7.93° (13 September 2012, , BGGM2012)

