

Conoco Phillips Company

Arapahoe County, Colorado

Sec. 12-T4S-R64W

Walker 12-1H

Plan C

Survey: Sperry MWD Surveys (Pilot Hole)

Sperry Drilling Services

Standard Report

01 August, 2013

Well Coordinates: 1,685,367.52 N, 3,283,932.62 E (39° 42' 38.90" N, 104° 29' 26.74" W)

Ground Level: 5,712.00 ft

Local Coordinate Origin:

Centered on Well Walker 12-1H

Viewing Datum:

RKB 24 ft @ 5736.00ft (H&P 280)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Version: 2003.16 Build: 43I

HALLIBURTON

Survey Report for Walker 12-1H - Sperry MWD Surveys (Pilot Hole)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
1,956.00	6.820	130.02	1,954.13	-18.43	57.52	-58.02	0.00
Tie-On to Surface Gyro Surveys @ 1956.00 ft							
1,999.00	6.530	127.73	1,996.84	-21.57	61.41	-62.00	0.92
First Sperry MWD Survey (Pilot Hole)@ 1999.00 ft							
2,094.00	5.230	125.26	2,091.34	-27.38	69.22	-69.97	1.39
2,157.00	4.740	120.07	2,154.10	-30.34	73.81	-74.65	1.06
2,189.00	4.730	117.71	2,185.99	-31.61	76.13	-77.00	0.61
2,284.00	3.400	109.53	2,280.75	-34.38	82.25	-83.20	1.52
2,347.00	2.600	109.63	2,343.66	-35.48	85.36	-86.34	1.27
2,379.00	2.410	109.54	2,375.63	-35.95	86.67	-87.67	0.59
2,474.00	0.980	89.47	2,470.59	-36.61	89.37	-90.38	1.61
2,537.00	0.980	40.78	2,533.58	-36.20	90.26	-91.26	1.28
2,569.00	0.760	55.24	2,565.58	-35.87	90.61	-91.60	0.97
2,632.00	0.730	306.59	2,628.57	-35.39	90.63	-91.61	1.92
2,664.00	0.890	271.65	2,660.57	-35.26	90.22	-91.19	1.59
2,727.00	2.120	294.08	2,723.55	-34.77	88.67	-89.63	2.13
2,758.00	2.030	300.86	2,754.53	-34.26	87.67	-88.62	0.84
2,822.00	2.870	297.01	2,818.47	-32.95	85.27	-86.18	1.34
2,853.00	3.150	294.60	2,849.43	-32.24	83.81	-84.70	0.99
2,948.00	3.420	290.93	2,944.27	-30.14	78.79	-79.62	0.36
3,043.00	2.810	289.39	3,039.13	-28.36	73.94	-74.73	0.65
3,138.00	2.280	284.75	3,134.04	-27.10	69.92	-70.67	0.60
3,233.00	2.120	286.86	3,228.97	-26.11	66.41	-67.13	0.19
3,328.00	1.550	286.95	3,323.92	-25.23	63.50	-64.20	0.60
3,423.00	1.460	299.46	3,418.88	-24.26	61.22	-61.89	0.36
3,517.00	1.080	290.86	3,512.86	-23.35	59.35	-59.99	0.45
3,611.00	0.830	310.55	3,606.85	-22.60	58.00	-58.63	0.44
3,706.00	0.140	344.44	3,701.84	-22.04	57.45	-58.06	0.76
3,770.00	1.160	323.45	3,765.84	-21.44	57.04	-57.63	1.61
3,801.00	1.020	327.31	3,796.83	-20.96	56.71	-57.28	0.51
3,896.00	1.850	315.66	3,891.80	-19.15	55.18	-55.70	0.92
3,991.00	1.800	325.47	3,986.75	-16.82	53.26	-53.72	0.33
4,086.00	1.680	322.96	4,081.71	-14.48	51.57	-51.97	0.15
4,181.00	1.180	311.79	4,176.68	-12.72	50.01	-50.35	0.60
4,276.00	1.280	292.74	4,271.66	-11.66	48.30	-48.61	0.44
4,371.00	1.120	293.32	4,366.64	-10.88	46.47	-46.76	0.17
4,466.00	0.790	274.47	4,461.63	-10.46	44.96	-45.24	0.48
4,560.00	0.780	292.38	4,555.62	-10.17	43.72	-44.00	0.26
4,655.00	1.200	325.03	4,650.60	-9.11	42.56	-42.80	0.72
4,750.00	0.910	318.71	4,745.59	-7.72	41.49	-41.69	0.33
4,845.00	1.000	327.18	4,840.57	-6.46	40.54	-40.71	0.18
4,940.00	0.610	320.69	4,935.56	-5.37	39.77	-39.91	0.42
5,035.00	0.540	325.52	5,030.56	-4.61	39.20	-39.31	0.09
5,130.00	0.560	316.98	5,125.56	-3.90	38.63	-38.72	0.09
5,225.00	0.850	325.76	5,220.55	-2.98	37.91	-37.98	0.32
5,320.00	0.520	296.41	5,315.54	-2.21	37.13	-37.18	0.50
5,415.00	0.220	325.72	5,410.54	-1.86	36.64	-36.68	0.36
5,510.00	0.850	285.88	5,505.53	-1.52	35.86	-35.89	0.73
5,605.00	1.240	297.82	5,600.52	-0.85	34.28	-34.29	0.47
5,700.00	1.020	303.11	5,695.50	0.09	32.66	-32.64	0.26

Survey Report for Walker 12-1H - Sperry MWD Surveys (Pilot Hole)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,795.00	1.080	272.10	5,790.49	0.59	31.05	-31.03	0.59
5,890.00	0.880	254.41	5,885.47	0.42	29.46	-29.43	0.38
5,984.00	0.700	233.74	5,979.46	-0.11	28.30	-28.29	0.36
6,079.00	1.270	198.75	6,074.45	-1.45	27.49	-27.52	0.85
6,174.00	0.400	264.05	6,169.44	-2.48	26.82	-26.88	1.22
6,269.00	0.710	329.22	6,264.44	-2.01	26.19	-26.24	0.69
6,364.00	1.830	337.32	6,359.41	-0.10	25.31	-25.30	1.19
6,459.00	2.840	328.59	6,454.33	3.30	23.50	-23.39	1.12
6,523.00	2.210	342.96	6,518.27	5.84	22.31	-22.13	1.39
6,554.00	1.700	348.19	6,549.25	6.86	22.04	-21.83	1.74
6,586.00	1.250	5.63	6,581.24	7.67	21.98	-21.75	1.97
6,617.00	0.850	7.56	6,612.24	8.24	22.04	-21.79	1.30
6,649.00	0.590	104.57	6,644.23	8.43	22.23	-21.98	3.41
6,681.00	1.060	155.25	6,676.23	8.12	22.51	-22.27	2.58
6,744.00	1.330	148.89	6,739.22	6.96	23.14	-22.93	0.48
6,776.00	1.340	164.31	6,771.21	6.29	23.43	-23.24	1.12
6,839.00	1.330	154.55	6,834.19	4.92	23.94	-23.79	0.36
6,933.00	1.090	150.20	6,928.17	3.16	24.85	-24.75	0.27
7,028.00	1.420	153.24	7,023.15	1.32	25.83	-25.79	0.35
7,123.00	1.270	154.78	7,118.12	-0.68	26.81	-26.82	0.16
7,218.00	1.020	137.99	7,213.10	-2.26	27.83	-27.88	0.44
7,313.00	1.090	149.17	7,308.09	-3.67	28.86	-28.95	0.23
7,408.00	1.360	143.04	7,403.06	-5.34	30.00	-30.14	0.32
7,503.00	1.020	137.58	7,498.04	-6.87	31.25	-31.43	0.38
7,598.00	1.050	141.75	7,593.03	-8.18	32.35	-32.58	0.09
7,693.00	1.220	135.38	7,688.01	-9.58	33.60	-33.86	0.22
7,721.00	0.970	145.54	7,716.00	-9.99	33.95	-34.22	1.13
Final Sperry MWD Survey (Pilot Hole) @ 7721.00 ft							
7,780.00	0.970	145.54	7,775.00	-10.81	34.51	-34.81	0.00
Straight Line Projection to TD (Pilot Hole) @ 7780.00 ft							

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,956.00	1,954.13	-18.43	57.52	Tie-On to Surface Gyro Surveys @ 1956.00 ft
1,999.00	1,996.84	-21.57	61.41	First Sperry MWD Survey (Pilot Hole) @ 1999.00 ft
7,721.00	7,716.00	-9.99	33.95	Final Sperry MWD Survey (Pilot Hole) @ 7721.00 ft
7,780.00	7,775.00	-10.81	34.51	Straight Line Projection to TD (Pilot Hole) @ 7780.00 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
TD	No Target (Freehand)	271.64	Slot	0.00	0.00	0.00

Survey Report for Walker 12-1H - Sperry MWD Surveys (Pilot Hole)

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
80.65	1,956.00	Surface Casing Gyro Surveys	SRG-GYRO-MS
1,999.00	6,776.00	Sperry MWD Surveys (Pilot Hole)	MWD
6,895.00	11,725.00	Sperry MWD Survey (Lateral)	MWD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Walker 12-1H SB	0.00	0.00	0.00	0.00	0.00	1,685,367.52	3,283,932.62	39° 42' 38.902 N	104° 29' 26.740 W
- survey misses target center by 1955.06ft at 1956.00ft MD (1954.13 TVD, -18.43 N, 57.52 E)									
- Polygon									
Walker 12-1H SL	0.00	0.00	0.00	0.00	0.00	1,685,367.52	3,283,932.62	39° 42' 38.902 N	104° 29' 26.740 W
- survey misses target center by 1955.06ft at 1956.00ft MD (1954.13 TVD, -18.43 N, 57.52 E)									
- Polygon									
Walker 12-1H PBR0	0.00	0.00	7,456.00	132.63	-4,544.42	1,685,449.66	3,279,387.01	39° 42' 40.208 N	104° 30' 24.890 W
- survey misses target center by 4576.79ft at 7403.55ft MD (7398.62 TVD, -5.26 N, 29.93 E)									
- Point									

North Reference Sheet for Sec. 12-T4S-R64W - Walker 12-1H - Plan C

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 @ 5736.00ft (H&P 280). Northing and Easting are relative to Walker 12-1H
 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° 30' 0.000 W°, 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: 0.99999248

Grid Coordinates of Well: 1,685,367.52 ft N, 3,283,932.62 ft E
 Geographical Coordinates of Well: 39° 42' 38.90" N, 104° 29' 26.74" W
 Grid Convergence at Surface is: 0.64°

Based upon Minimum Curvature type calculations, at a Measured Depth of 7,780.00ft
 the Bottom Hole Displacement is 36.17ft in the Direction of 107.39° (True).
 Magnetic Convergence at surface is: -7.83° (15 May 2013, , BGGM2012)

