

30-005-64152

Mack Energy Corporation

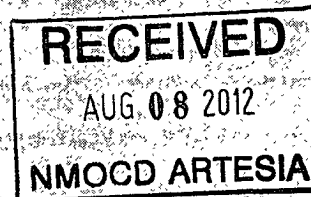
CHAVES COUNTY, NEW MEXICO

Sec. 25-T15S-R28E

Calgary Federal #3

Plan A Rev 1

Survey: Sperry MWD Surveys



Sperry Drilling Services Standard Report

09 April, 2012

Well Coordinates: 724,439 17 N, 578,531.26 E (32° 59' 28.64" N, 104° 04' 37.95" W)
Ground Level: 3,697.00 ft

Local Coordinate Origin:	Centered on Well Calgary Federal #3
Viewing Datum:	RKB 17.5 ft @ 3714.50ft (Silver Oak Rig 2)
TVDs to System:	N
North Reference:	Grid
Unit System:	API - US Survey Feet - Custom
Geodetic Scale Factor Applied	
Version: 2003.16 Build: 431	

HALLIBURTON

Survey Report for Calgary Federal #3 - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
516.00	2.25	70.15	515.87	3.44	9.53	-9.48	0.44
546.00	2.71	68.51	545.84	3.90	10.74	-10.68	1.55
577.00	2.88	66.61	576.80	4.48	12.14	-12.07	0.62
639.00	2.83	70.37	638.73	5.61	15.01	-14.92	0.31
732.00	2.73	70.47	731.62	7.12	19.26	-19.15	0.11
824.00	1.69	76.62	823.55	8.17	22.84	-22.52	1.16
917.00	1.37	88.76	916.51	8.51	25.09	-24.96	0.49
1,009.00	1.31	93.02	1,008.49	8.48	27.24	-27.11	0.13
1,102.00	1.45	90.32	1,101.46	8.42	29.48	-29.35	0.17
1,193.00	1.52	81.45	1,192.43	8.59	31.82	-31.89	0.26
1,287.00	1.50	78.60	1,286.40	9.02	34.26	-34.12	0.08
1,379.00	0.79	41.93	1,378.38	9.73	35.87	-35.72	1.07
1,472.00	0.78	9.03	1,471.37	10.83	36.39	-36.23	0.48
1,564.00	1.08	341.43	1,563.36	12.27	38.22	-38.03	0.58
1,657.00	1.67	326.54	1,656.33	14.23	35.19	-34.97	0.74
1,749.00	1.86	327.46	1,748.29	16.61	33.65	-33.39	0.21
1,842.00	2.07	301.71	1,841.24	18.76	31.41	-31.12	0.97
1,935.00	2.08	278.63	1,934.18	19.90	28.31	-28.01	0.89
2,027.00	2.21	270.71	2,026.11	20.17	24.89	-24.58	0.35
2,120.00	2.16	267.54	2,119.05	20.12	21.34	-21.04	0.14
2,212.00	2.36	274.89	2,210.97	20.21	17.72	-17.42	0.38
2,304.00	2.28	277.82	2,302.90	20.62	14.02	-13.71	0.16
2,397.00	2.30	275.72	2,395.82	21.05	10.33	-10.01	0.09
2,459.00	2.42	283.34	2,457.77	21.48	7.82	-7.50	0.54
2,490.00	3.68	273.25	2,488.73	21.69	6.19	-5.86	4.40
2,521.00	5.27	275.12	2,519.63	21.87	3.78	-3.45	5.15
2,552.00	6.70	269.93	2,550.48	22.00	0.55	-0.22	4.93
2,583.00	8.81	266.75	2,581.18	21.86	-3.63	3.95	6.94
2,614.00	11.45	269.24	2,611.69	21.68	-9.07	9.40	8.63
2,645.00	14.34	268.23	2,641.91	21.52	-15.99	16.31	9.35
2,675.00	16.77	267.22	2,670.81	21.20	-24.03	24.34	8.15
2,706.00	20.09	267.85	2,700.21	20.78	-33.82	34.13	10.73
2,737.00	23.26	267.40	2,728.02	20.30	-45.26	45.56	10.24
2,768.00	26.60	267.75	2,757.12	19.75	-58.31	58.60	10.78
2,799.00	30.01	267.39	2,784.41	19.13	-72.99	73.27	11.01
2,814.00	31.64	267.56	2,797.29	18.79	-80.67	80.94	10.88
2,830.00	33.53	267.61	2,810.77	18.43	-89.28	89.55	11.81
2,860.00	36.94	267.56	2,835.28	17.70	-106.57	106.82	11.37
2,891.00	40.46	267.91	2,859.46	16.93	-125.93	126.17	11.38
2,922.00	44.50	267.64	2,882.32	16.12	-146.85	147.07	13.05
2,953.00	48.83	267.72	2,903.59	15.21	-169.37	169.58	13.97
2,984.00	53.08	267.04	2,923.12	14.10	-193.42	193.61	13.81
3,015.00	57.41	267.63	2,940.78	12.92	-218.85	219.02	14.05
3,046.00	61.80	267.70	2,956.46	11.83	-245.56	245.71	14.16
3,077.00	66.15	268.30	2,970.06	10.86	-273.40	273.53	14.14
3,108.00	69.85	269.08	2,981.67	10.21	-302.13	302.25	12.16
3,139.00	73.79	270.29	2,991.34	10.05	-331.57	331.69	13.24
3,170.00	76.52	270.98	2,999.29	10.38	-361.53	361.65	9.07
3,201.00	79.50	270.97	3,005.73	10.90	-391.85	391.97	9.61

Survey Report for Calgary Federal #3 - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
3,232.00	82.40	271.53	3,010.60	11.57	-422.45	422.58	9.52
3,260.00	85.30	269.64	3,013.60	11.85	-450.29	450.41	12.34
3,274.00	87.34	270.04	3,014.50	11.81	-464.26	464.38	14.85
3,306.00	89.82	270.18	3,015.29	11.87	-498.24	496.37	7.76
3,336.00	89.75	270.36	3,015.40	12.02	-526.24	526.36	0.64
3,367.00	89.88	270.91	3,015.50	12.36	-557.24	557.36	1.82
3,398.00	89.82	271.37	3,015.59	12.98	-588.24	588.36	1.50
3,429.00	89.51	271.82	3,015.77	13.84	-619.22	619.36	1.76
3,460.00	89.07	272.03	3,016.15	14.88	-650.20	650.35	1.57
3,491.00	89.44	272.40	3,016.55	16.08	-681.18	681.34	1.69
3,522.00	89.88	272.47	3,016.74	17.40	-712.15	712.33	1.44
3,552.00	89.88	272.32	3,016.80	18.65	-742.12	742.32	0.50
3,583.00	90.68	272.31	3,016.65	19.90	-773.10	773.31	2.58
3,614.00	91.17	272.20	3,016.15	21.12	-804.07	804.29	1.62
3,645.00	91.24	272.23	3,015.50	22.32	-835.04	835.28	0.25
3,737.00	90.80	272.14	3,013.86	25.83	-926.96	927.24	0.49
3,829.00	90.43	271.90	3,012.87	29.07	-1,018.89	1,019.21	0.48
3,891.00	90.37	272.01	3,012.44	31.18	-1,080.88	1,081.20	0.20
3,922.00	90.31	271.95	3,012.26	32.25	-1,111.84	1,112.20	0.27
3,983.00	90.25	271.47	3,011.96	34.07	-1,172.81	1,173.19	0.79
4,076.00	89.81	271.55	3,011.91	36.53	-1,265.78	1,266.18	0.48
4,107.00	89.51	271.58	3,012.09	37.37	-1,296.76	1,297.18	0.97
4,169.00	89.94	273.27	3,012.39	40.00	-1,358.71	1,359.15	2.81
4,261.00	90.43	272.32	3,012.09	44.48	-1,450.59	1,451.10	1.16
4,323.00	91.17	271.49	3,011.23	46.54	-1,512.55	1,513.08	1.79
4,416.00	91.54	270.80	3,009.03	48.40	-1,605.51	1,606.05	0.84
4,478.00	91.48	270.98	3,007.39	49.36	-1,667.48	1,668.03	0.31
4,571.00	91.05	270.52	3,005.34	50.58	-1,760.45	1,761.01	0.68
4,633.00	90.99	271.02	3,004.24	51.41	-1,822.43	1,823.00	0.81
4,695.00	90.99	271.11	3,003.17	52.57	-1,884.41	1,884.99	0.15
4,757.00	90.43	270.55	3,002.40	53.46	-1,946.40	1,946.98	1.28
4,820.00	89.51	270.44	3,002.43	54.01	-2,009.40	2,009.98	1.47
4,883.00	88.77	270.56	3,003.38	54.56	-2,072.39	2,072.97	1.19
4,946.00	88.58	270.68	3,004.83	55.24	-2,135.37	2,135.95	0.36
5,010.00	88.77	271.30	3,008.31	56.34	-2,199.34	2,199.94	1.01
5,073.00	88.83	271.67	3,007.63	57.98	-2,262.30	2,262.92	0.59
5,169.00	88.83	271.29	3,009.59	60.46	-2,358.25	2,358.89	0.40
5,264.00	88.52	270.50	3,011.79	61.94	-2,453.21	2,453.87	0.89
5,359.00	88.21	269.61	3,014.50	62.03	-2,548.17	2,548.82	0.99
5,454.00	88.95	269.59	3,016.85	61.37	-2,643.14	2,643.77	0.78
5,518.00	89.51	269.36	3,017.71	60.78	-2,707.13	2,707.74	0.95
5,581.00	89.81	269.28	3,018.09	60.03	-2,770.13	2,770.72	0.49
5,645.00	89.69	269.31	3,018.37	59.25	-2,834.12	2,834.69	0.19
5,708.00	89.57	269.44	3,018.77	58.56	-2,897.12	2,897.67	0.28
5,772.00	90.25	269.83	3,018.87	58.15	-2,961.12	2,961.65	1.22
5,835.00	90.12	270.07	3,018.67	58.10	-3,024.12	3,024.65	0.43
5,899.00	89.88	270.18	3,018.67	58.24	-3,088.11	3,088.64	0.41
5,962.00	89.63	270.25	3,018.94	58.47	-3,151.11	3,151.64	0.41
6,060.00	89.26	270.66	3,019.89	59.25	-3,249.11	3,249.63	0.56
6,131.00	89.26	270.66	3,020.81	60.07	-3,320.10	3,320.62	0.00

Survey Report for Calgary Federal #3 - Sperry MWD Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Calgary Federal #3 Plan A Rev 1 (BHL)	270.86	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
516.00	6,131.00	Sperry MWD Surveys	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
Calgary Federal #3 Pla	0.00	0.00	3,010.50	15.00	-999.89	724,454.17	577,531.45	32° 59' 28.813 N	104° 4' 49.691 W
- survey misses target center by 13.66ft at 3809.54ft MD (3013.03 TVD, 28.41 N, -999.44 E)									
- Point									
Calgary Federal #3 Se	0.00	0.00	0.00	0.00	0.00	724,439.17	578,531.26	32° 59' 28.640 N	104° 4' 37.952 W
- survey hits target center									
- Polygon									
Calgary Federal #3 Pla	0.00	0.00	3,015.00	45.00	-2,999.66	724,484.17	576,531.85	32° 59' 29.157 N	104° 5' 13.187 W
- survey misses target center by 13.61ft at 5810.57ft MD (3018.73 TVD, 58.09 N, -2999.68 E)									
- Point									
Calgary Federal #3 Pla	0.00	0.00	3,011.00	7.50	-499.94	724,446.67	578,031.36	32° 59' 28.727 N	104° 4' 43.822 W
- survey misses target center by 6.15ft at 3309.66ft MD (3015.30 TVD, 11.89 N, -499.90 E)									
- Point									
Calgary Federal #3 Pla	0.00	0.00	3,016.00	49.63	-3,307.94	724,488.80	575,223.60	32° 59' 29.209 N	104° 5' 16.786 W
- survey misses target center by 11.30ft at 6118.66ft MD (3020.65 TVD, 59.93 N, -3307.76 E)									
- Point									
Calgary Federal #3 Pla	0.00	0.00	3,011.00	30.00	-1,999.77	724,469.17	576,531.66	32° 59' 28.985 N	104° 5' 1.429 W
- survey misses target center by 25.44ft at 4810.17ft MD (3002.36 TVD, 53.93 N, -1999.57 E)									
- Point									
Calgary Federal #3 Se	0.00	0.00	0.00	0.00	0.00	724,439.17	578,531.26	32° 59' 28.640 N	104° 4' 37.952 W
- survey hits target center									
- Polygon									

North Reference Sheet for Sec. 25-T15S-R28E - Calgary Federal #3 - Plan A Rev 1

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

Vertical Depths are relative to RKB 17.5 ft. @ 3714.50ft (Silver Oak Rig 2). Northing and Easting are relative to Calgary Federal #3

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 3001 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is 104° 20' 0.000 W, Longitude Origin: 0° 0' 0.000 E, Latitude Origin: 0° 0' 0.000 N

False Easting: 500,000.00ft, False Northing: 0.00ft, Scale Reduction: 0.99991615

Grid Coordinates of Well: 724,439.17 ft N, 578,531.26 ft E

Geographical Coordinates of Well: 32° 59' 28.64" N, 104° 04' 37.95" W

Grid Convergence at Surface is: 0.14°

Based upon Minimum Curvature type calculations, at a Measured Depth of 6,131.00ft
the Bottom Hole Displacement is 3,320.64ft in the Direction of 271.04° (Grid)

Magnetic Convergence at surface is: -7.73° (2 April 2012, BGGM2011)

