

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 22 T2N-R66W

Gobbler 16N-27HZ

Plan A Rev 3

Survey: Sperry MWD Surveys

Sperry Drilling Services

Standard Report

01 April, 2012

Well Coordinates: 1,291,105.36 N, 3,207,963.03 E (40° 07' 48.30" N, 104° 45' 22.52" W)

Ground Level: 5,077.00 ft

Local Coordinate Origin:

Centered on Well Gobbler 16N-27HZ

Viewing Datum:

RKB - 25ft @ 5102.00ft (HP 308)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Survey Report for Gobbler 16N-27HZ - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
985.00	0.40	146.19	984.97	5.12	1.79	-5.11	0.00
1,106.00	0.21	326.97	1,105.97	4.95	1.90	-4.95	0.50
1,198.00	2.28	279.79	1,197.95	5.40	0.01	-5.40	2.33
1,289.00	0.51	83.27	1,288.93	5.76	-1.37	-5.76	3.05
1,381.00	3.90	90.29	1,380.84	5.79	2.16	-5.79	3.69
1,473.00	3.48	91.81	1,472.65	5.69	8.08	-5.67	0.47
1,565.00	3.18	85.33	1,564.50	5.81	13.42	-5.77	0.52
1,656.00	2.95	87.70	1,655.37	6.11	18.27	-6.06	0.29
1,748.00	2.68	83.05	1,747.26	6.46	22.77	-6.40	0.38
1,840.00	2.47	89.05	1,839.16	6.75	26.89	-6.68	0.37
1,932.00	2.45	83.13	1,931.08	7.02	30.82	-6.94	0.28
2,024.00	2.55	84.14	2,022.99	7.47	34.81	-7.38	0.12
2,115.00	0.83	103.53	2,113.95	7.52	37.47	-7.42	1.97
2,207.00	0.78	106.89	2,205.94	7.18	38.71	-7.08	0.07
2,299.00	0.87	141.76	2,297.93	6.45	39.75	-6.35	0.55
2,394.00	0.59	312.95	2,392.93	6.22	39.83	-6.11	1.53
2,489.00	0.41	9.02	2,487.93	6.89	39.53	-6.78	0.52
2,584.00	0.82	321.85	2,582.92	7.76	39.16	-7.65	0.65
2,679.00	0.25	277.54	2,677.92	8.32	38.54	-8.22	0.70
2,774.00	1.05	317.05	2,772.91	8.98	37.74	-8.88	0.92
2,870.00	1.11	273.59	2,868.89	9.69	36.21	-9.59	0.84
2,965.00	0.84	283.95	2,963.88	9.91	34.62	-9.82	0.34
3,060.00	1.24	261.00	3,058.86	9.92	32.93	-9.83	0.60
3,155.00	0.52	329.99	3,153.86	10.13	31.70	-10.05	1.22
3,251.00	1.11	335.44	3,249.84	11.35	31.09	-11.27	0.62
3,346.00	0.94	155.05	3,344.84	11.48	31.04	-11.40	2.16
3,441.00	0.58	206.91	3,439.83	10.35	31.15	-10.27	0.78
3,536.00	0.62	346.53	3,534.83	10.42	30.81	-10.34	1.19
3,632.00	0.66	6.24	3,630.82	11.47	30.75	-11.39	0.23
3,727.00	1.08	355.95	3,725.81	12.91	30.75	-12.83	0.47
3,822.00	1.21	358.52	3,820.79	14.81	30.66	-14.73	0.15
3,917.00	1.08	66.92	3,915.78	16.16	31.46	-16.08	1.36
4,012.00	0.42	105.28	4,010.77	16.42	32.61	-16.33	0.84
4,107.00	1.61	62.08	4,105.76	16.95	34.13	-16.86	1.41
4,202.00	1.64	53.71	4,200.72	18.38	36.41	-18.29	0.25
4,298.00	2.55	31.55	4,296.65	21.02	38.63	-20.91	1.25
4,393.00	2.66	20.14	4,391.56	24.89	40.49	-24.78	0.56
4,489.00	1.06	279.00	4,487.52	27.12	40.38	-27.01	3.17
4,584.00	1.85	320.65	4,582.49	28.44	38.54	-28.34	1.34
4,679.00	1.62	301.33	4,677.45	30.32	36.43	-30.23	0.66
4,774.00	1.01	280.79	4,772.42	31.18	34.46	-31.09	0.80
4,869.00	1.19	297.13	4,867.40	31.79	32.76	-31.70	0.38
4,964.00	1.25	182.86	4,962.39	31.20	31.83	-31.12	2.16
5,060.00	1.77	163.76	5,058.36	28.73	32.19	-28.65	0.75
5,154.00	1.55	170.75	5,152.32	26.08	32.80	-26.00	0.32
5,249.00	0.67	153.19	5,247.30	24.32	33.26	-24.23	0.98
5,344.00	0.72	150.17	5,342.30	23.31	33.80	-23.22	0.07
5,438.00	0.55	238.78	5,436.29	22.56	33.71	-22.47	0.95
5,533.00	1.14	198.23	5,531.28	21.43	33.02	-21.34	0.85
5,627.00	1.24	227.81	5,625.26	19.85	31.98	-19.77	0.65

Survey Report for Gobbler 16N-27HZ - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,722.00	0.60	115.38	5,720.25	18.95	31.67	-18.87	1.65
5,817.00	1.41	62.47	5,815.24	19.28	33.15	-19.19	1.21
5,911.00	0.86	35.32	5,909.22	20.39	34.59	-20.30	0.80
6,006.00	1.37	347.85	6,004.21	22.08	34.76	-21.99	1.06
6,100.00	0.63	16.66	6,098.19	23.67	34.67	-23.58	0.93
6,194.00	0.72	222.55	6,192.19	23.73	34.42	-23.64	1.40
6,289.00	1.30	154.02	6,287.18	22.32	34.49	-22.23	1.30
6,384.00	1.69	170.47	6,382.14	19.97	35.19	-19.88	0.61
6,478.00	1.40	174.05	6,476.11	17.47	35.54	-17.37	0.33
6,574.00	1.08	205.63	6,572.09	15.48	35.27	-15.39	0.77
6,669.00	0.54	180.05	6,667.08	14.23	34.88	-14.14	0.67
6,764.00	0.29	134.88	6,762.08	13.61	35.05	-13.52	0.41
6,792.00	0.61	195.08	6,790.08	13.42	35.06	-13.32	1.90
KOP 6792							
6,796.00	0.68	198.11	6,794.08	13.37	35.05	-13.28	1.90
6,828.00	1.76	166.83	6,826.07	12.71	35.10	-12.62	3.85
6,859.00	2.36	181.43	6,857.05	11.61	35.20	-11.52	2.56
6,891.00	2.51	180.21	6,889.02	10.25	35.18	-10.16	0.50
6,923.00	3.36	167.35	6,920.98	8.64	35.38	-8.55	3.34
6,955.00	4.51	159.98	6,952.90	6.54	36.02	-6.45	3.92
6,986.00	6.65	159.22	6,983.75	3.72	37.07	-3.62	6.91
7,018.00	10.70	160.39	7,015.38	-0.82	38.73	0.92	12.67
7,050.00	14.27	156.73	7,046.62	-7.24	41.28	7.35	11.42
7,081.00	18.55	156.24	7,076.35	-15.27	44.78	15.38	13.81
7,113.00	22.24	158.26	7,106.34	-25.55	49.08	25.68	11.74
7,145.00	25.72	160.82	7,135.57	-37.74	53.60	37.88	11.35
7,176.00	30.28	161.17	7,162.94	-51.50	58.34	51.65	14.72
7,208.00	33.94	163.09	7,190.04	-67.69	63.54	67.85	11.87
7,240.00	37.50	162.83	7,216.01	-85.55	69.02	85.73	11.14
7,272.00	41.78	163.34	7,240.65	-105.07	74.95	105.27	13.41
7,304.00	45.69	165.56	7,263.77	-126.38	80.86	126.60	13.12
7,335.00	49.12	166.43	7,284.75	-148.52	86.38	148.75	11.26
7,367.00	53.77	167.20	7,304.69	-172.88	92.08	173.12	14.65
7,398.00	57.68	168.25	7,322.14	-197.91	97.52	198.16	12.92
7,430.00	60.66	170.74	7,338.54	-224.92	102.52	225.19	11.46
7,462.00	64.85	173.87	7,353.19	-253.11	106.31	253.38	15.72
7,494.00	69.17	174.99	7,365.69	-282.42	109.17	282.70	13.88
7,526.00	72.69	177.18	7,376.14	-312.59	111.23	312.88	12.76
7,557.00	74.44	177.87	7,384.91	-342.29	112.51	342.58	6.04
7,589.00	73.93	177.66	7,393.63	-373.05	113.71	373.35	1.71
7,621.00	76.28	177.87	7,401.86	-403.95	114.92	404.25	7.37
7,653.00	81.35	178.96	7,408.06	-435.32	115.78	435.63	16.19
7,684.00	84.04	179.69	7,412.00	-466.07	116.14	466.37	8.99
7,720.00	85.25	178.91	7,415.36	-501.91	116.58	502.21	3.98
7720 7" Casing							
7,755.00	86.42	178.16	7,417.91	-536.80	117.47	537.11	3.98
7,850.00	87.59	178.32	7,422.87	-631.62	120.39	631.94	1.24
7,945.00	89.44	179.62	7,425.33	-726.57	122.09	726.89	2.38
8,040.00	89.32	178.16	7,426.36	-821.55	123.93	821.87	1.54
8,136.00	90.68	179.36	7,426.36	-917.52	126.01	917.85	1.89
8,230.00	91.30	178.97	7,424.74	-1,011.49	127.38	1,011.82	0.78

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,325.00	91.67	179.08	7,422.28	-1,106.45	129.00	1,106.78	0.41
8,420.00	91.54	180.89	7,419.61	-1,201.41	129.02	1,201.74	1.91
8,515.00	92.04	180.28	7,416.65	-1,296.36	128.05	1,296.69	0.83
8,611.00	90.62	180.66	7,414.42	-1,392.32	127.26	1,392.65	1.53
8,706.00	91.11	180.17	7,412.98	-1,487.31	126.58	1,487.64	0.73
8,801.00	90.12	179.51	7,411.96	-1,582.30	126.84	1,582.63	1.25
8,896.00	90.37	179.62	7,411.56	-1,677.30	127.56	1,677.63	0.29
8,991.00	90.93	178.76	7,410.48	-1,772.28	128.91	1,772.61	1.08
9,086.00	92.29	180.86	7,407.81	-1,867.24	129.22	1,867.57	2.63
9,181.00	90.99	181.58	7,405.09	-1,962.17	127.20	1,962.50	1.56
9,277.00	92.35	181.42	7,402.29	-2,058.10	124.69	2,058.42	1.43
9,371.00	91.55	180.56	7,399.10	-2,152.03	123.06	2,152.34	1.25
9,467.00	90.80	182.21	7,397.13	-2,247.97	120.74	2,248.28	1.89
9,562.00	91.67	181.15	7,395.08	-2,342.91	117.96	2,343.21	1.44
9,657.00	91.54	181.30	7,392.42	-2,437.85	115.93	2,438.15	0.21
9,752.00	93.22	182.16	7,388.47	-2,532.72	113.06	2,533.01	1.99
9,847.00	90.68	182.68	7,385.24	-2,627.57	109.05	2,627.85	2.73
9,942.00	91.48	182.36	7,383.45	-2,722.46	104.88	2,722.73	0.91
10,037.00	91.85	181.46	7,380.69	-2,817.37	101.71	2,817.63	1.02
10,132.00	91.61	182.26	7,377.82	-2,912.28	98.63	2,912.52	0.88
10,227.00	90.06	182.91	7,376.44	-3,007.17	94.35	3,007.40	1.77
10,319.00	90.86	182.49	7,375.70	-3,099.06	90.01	3,099.28	0.98
10,410.00	89.75	181.81	7,375.22	-3,189.99	86.60	3,190.21	1.43
10,502.00	90.06	182.28	7,375.37	-3,281.93	83.32	3,282.14	0.61
10,594.00	88.70	182.02	7,376.36	-3,373.86	79.87	3,374.06	1.51
10,685.00	88.82	182.42	7,378.33	-3,464.77	76.34	3,464.96	0.46
10,777.00	89.44	182.30	7,379.73	-3,556.68	72.55	3,556.86	0.69
10,869.00	89.50	182.20	7,380.58	-3,648.61	68.94	3,648.77	0.13
10,960.00	89.63	182.12	7,381.27	-3,739.54	65.51	3,739.70	0.17
11,052.00	89.57	181.01	7,381.91	-3,831.50	63.00	3,831.65	1.21
11,144.00	90.00	181.80	7,382.26	-3,923.47	60.74	3,923.62	0.98
11,236.00	90.56	181.37	7,381.81	-4,015.44	58.20	4,015.57	0.77
11,328.00	92.04	182.00	7,379.72	-4,107.37	55.50	4,107.50	1.75
11,420.00	90.12	182.09	7,377.99	-4,199.29	52.21	4,199.41	2.09
11,511.00	90.56	182.73	7,377.45	-4,290.21	48.39	4,290.32	0.85
11,603.00	91.24	183.18	7,376.00	-4,382.07	43.64	4,382.17	0.89
11,686.00	90.93	182.64	7,374.43	-4,464.95	39.43	4,465.04	0.75
11,781.00	90.99	182.52	7,372.84	-4,559.84	35.16	4,559.92	0.14
11,876.00	89.88	182.28	7,372.12	-4,654.75	31.18	4,654.82	1.20
11,971.00	90.56	182.25	7,371.75	-4,749.68	27.42	4,749.73	0.72
12,067.00	88.83	181.65	7,372.26	-4,845.62	24.16	4,845.66	1.91
12,161.00	90.37	181.83	7,372.92	-4,939.57	21.30	4,939.61	1.65
12,257.00	89.44	181.79	7,373.08	-5,035.52	18.27	5,035.55	0.97
12,352.00	90.62	181.33	7,373.03	-5,130.48	15.68	5,130.50	1.33
12,447.00	91.98	181.14	7,370.88	-5,225.43	13.64	5,225.45	1.45
12,542.00	90.00	180.12	7,369.23	-5,320.41	12.59	5,320.42	2.34
12,637.00	90.37	179.65	7,368.93	-5,415.41	12.78	5,415.42	0.63
12,732.00	90.19	178.91	7,368.46	-5,510.40	13.98	5,510.41	0.80
12,827.00	90.37	178.71	7,368.00	-5,605.37	15.95	5,605.40	0.28
12,922.00	90.74	178.16	7,367.08	-5,700.33	18.55	5,700.36	0.70
13,017.00	91.36	177.87	7,365.34	-5,795.26	21.84	5,795.30	0.72

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
13,112.00	89.44	178.59	7,364.67	-5,890.21	24.77	5,890.25	2.16
13,207.00	89.50	177.44	7,365.55	-5,985.15	28.06	5,985.20	1.21
13,303.00	89.63	176.61	7,366.28	-6,081.01	33.04	6,081.08	0.88
13,398.00	89.20	175.76	7,367.25	-6,175.80	39.36	6,175.88	1.00
13,493.00	88.70	175.21	7,368.99	-6,270.48	46.84	6,270.59	0.78
13,588.00	88.27	174.46	7,371.50	-6,365.06	55.39	6,365.19	0.91
13,683.00	89.14	175.91	7,373.65	-6,459.70	63.36	6,459.85	1.78
13,779.00	89.57	177.08	7,374.73	-6,555.51	69.23	6,555.67	1.30
13,874.00	91.48	179.69	7,373.86	-6,650.46	71.91	6,650.63	3.40
13,969.00	91.36	180.90	7,371.51	-6,745.43	71.42	6,745.59	1.28
14,064.00	90.43	183.08	7,370.02	-6,840.35	68.12	6,840.51	2.49
14,159.00	90.80	181.73	7,369.00	-6,935.26	64.13	6,935.40	1.47
14,255.00	91.05	181.37	7,367.45	-7,031.21	61.54	7,031.35	0.46
14,350.00	91.79	181.29	7,365.10	-7,126.16	59.33	7,126.29	0.78
14,445.00	90.56	181.43	7,363.15	-7,221.11	57.08	7,221.23	1.30
14,541.00	90.93	181.62	7,361.90	-7,317.07	54.52	7,317.18	0.43
14,636.00	90.87	181.17	7,360.41	-7,412.03	52.21	7,412.14	0.48
14,731.00	90.99	180.41	7,358.87	-7,507.00	50.90	7,507.11	0.81
14,826.00	90.31	180.46	7,357.79	-7,601.99	50.18	7,602.10	0.72
14,921.00	89.94	179.61	7,357.58	-7,696.99	50.12	7,697.10	0.98
15,016.00	89.63	181.31	7,357.94	-7,791.99	49.36	7,792.09	1.82
15,111.00	89.94	178.66	7,358.30	-7,886.98	49.38	7,887.08	2.81
15,206.00	91.18	178.57	7,357.37	-7,981.94	51.68	7,982.05	1.31
15,301.00	91.67	178.12	7,355.01	-8,076.87	54.42	8,076.99	0.70
15,396.00	91.42	179.83	7,352.44	-8,171.82	56.12	8,171.94	1.82
15,492.00	89.81	179.25	7,351.41	-8,267.81	56.89	8,267.93	1.78
15,587.00	88.95	177.01	7,352.44	-8,362.74	59.99	8,362.87	2.53
15,682.00	89.69	177.96	7,353.57	-8,457.64	64.16	8,457.78	1.27
15,777.00	90.00	178.48	7,353.83	-8,552.60	67.11	8,552.74	0.64
15,872.00	90.49	179.75	7,353.42	-8,647.58	68.58	8,647.73	1.43
15,967.00	91.11	180.19	7,352.09	-8,742.57	68.63	8,742.72	0.80
16,062.00	91.30	179.66	7,350.10	-8,837.55	68.75	8,837.70	0.59
16,157.00	91.92	179.57	7,347.43	-8,932.51	69.39	8,932.66	0.66
16,252.00	91.67	179.99	7,344.45	-9,027.46	69.75	9,027.62	0.51
16,347.00	91.92	179.73	7,341.48	-9,122.42	69.99	9,122.57	0.38
16,443.00	90.49	179.77	7,339.46	-9,218.39	70.40	9,218.55	1.49
16,538.00	89.69	178.88	7,339.31	-9,313.38	71.52	9,313.54	1.26
16,634.00	90.25	178.20	7,339.36	-9,409.35	73.97	9,409.51	0.92
16,728.00	90.37	177.23	7,338.85	-9,503.27	77.72	9,503.45	1.04
16,822.00	90.49	177.94	7,338.14	-9,597.19	81.68	9,597.37	0.77
16,917.00	90.19	175.99	7,337.58	-9,692.05	86.71	9,692.24	2.08
16,974.00	90.19	175.99	7,337.39	-9,748.91	90.69	9,749.11	0.00
16974 Projection to Bit							

Survey Report for Gobbler 16N-27HZ - Sperry MWD Surveys

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,792.00	6,790.08	13.42	35.06	KOP 6792
7,720.00	7,415.36	-501.91	116.58	7720 7" Casing
16,974.00	7,337.39	-9,748.91	90.69	16974 Projection to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	179.85	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
125.00	985.00	Anadarko Supplied Surveys	NS-GYRO-MS
1,085.00	16,974.00	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
Weld County Sec 22-2 - survey misses target center by 984.99ft at 985.00ft MD (984.97 TVD, 5.12 N, 1.79 E) - Polygon	0.00	0.00	0.00	0.00	0.00	1,291,105.36	3,207,963.03	40° 7' 48.301 N	104° 45' 22.517 W
Gobbler 16N-27HZ_BH - survey misses target center by 75.36ft at 16974.00ft MD (7337.39 TVD, -9748.91 N, 90.69 E) - Point	0.00	0.00	7,317.00	-9,780.88	25.57	1,281,325.44	3,208,070.62	40° 6' 11.645 N	104° 45' 22.188 W
Gobbler 16N-27HZ_SH - survey misses target center by 984.99ft at 985.00ft MD (984.97 TVD, 5.12 N, 1.79 E) - Point	0.00	0.00	0.00	0.00	0.00	1,291,105.36	3,207,963.03	40° 7' 48.301 N	104° 45' 22.517 W
Weld County Sec 22-2 - survey misses target center by 984.99ft at 985.00ft MD (984.97 TVD, 5.12 N, 1.79 E) - Polygon	0.00	0.00	0.00	0.00	0.00	1,291,105.36	3,207,963.03	40° 7' 48.301 N	104° 45' 22.517 W

North Reference Sheet for Sec. 22 T2N-R66W - Gobbler 16N-27HZ - Plan A Rev 3

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
Vertical Depths are relative to RKB - 25ft @ 5102.00ft (HP 308). Northing and Easting are relative to Gobbler 16N-27HZ
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° 30' 0.000 W°, 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: 0.99995905

Grid Coordinates of Well: 1,291,105.36 ft N, 3,207,963.03 ft E
Geographical Coordinates of Well: 40° 07' 48.30" N, 104° 45' 22.52" W
Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,974.00ft
the Bottom Hole Displacement is 9,749.33ft in the Direction of 179.47° (True).
Magnetic Convergence at surface is: -8.24° (15 March 2012, , BGGM2011)

