

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 34-T2N-R65W

Sparboe 8C-3HZ

Plan C Rev 0

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

27 February, 2013

Well Coordinates: 1,281,026.35 N, 3,239,662.69 E (40° 06' 05.87" N, 104° 38' 35.67" W)

Ground Level: 4,970.00 ft

Local Coordinate Origin:

Centered on Well Sparboe 8C-3HZ

Viewing Datum:

RKB=25 @ 4995.00ft (HP 308)

TVDs to System:

N

North Reference:

True

Unit System:

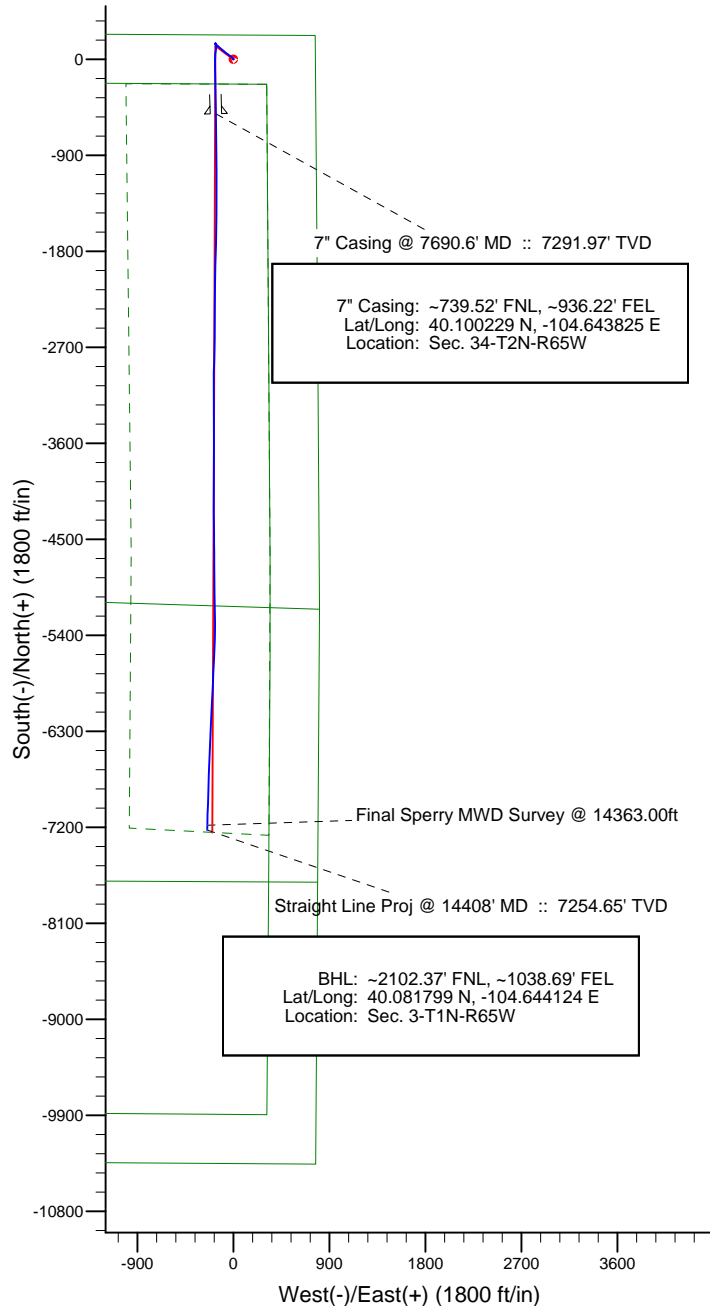
API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

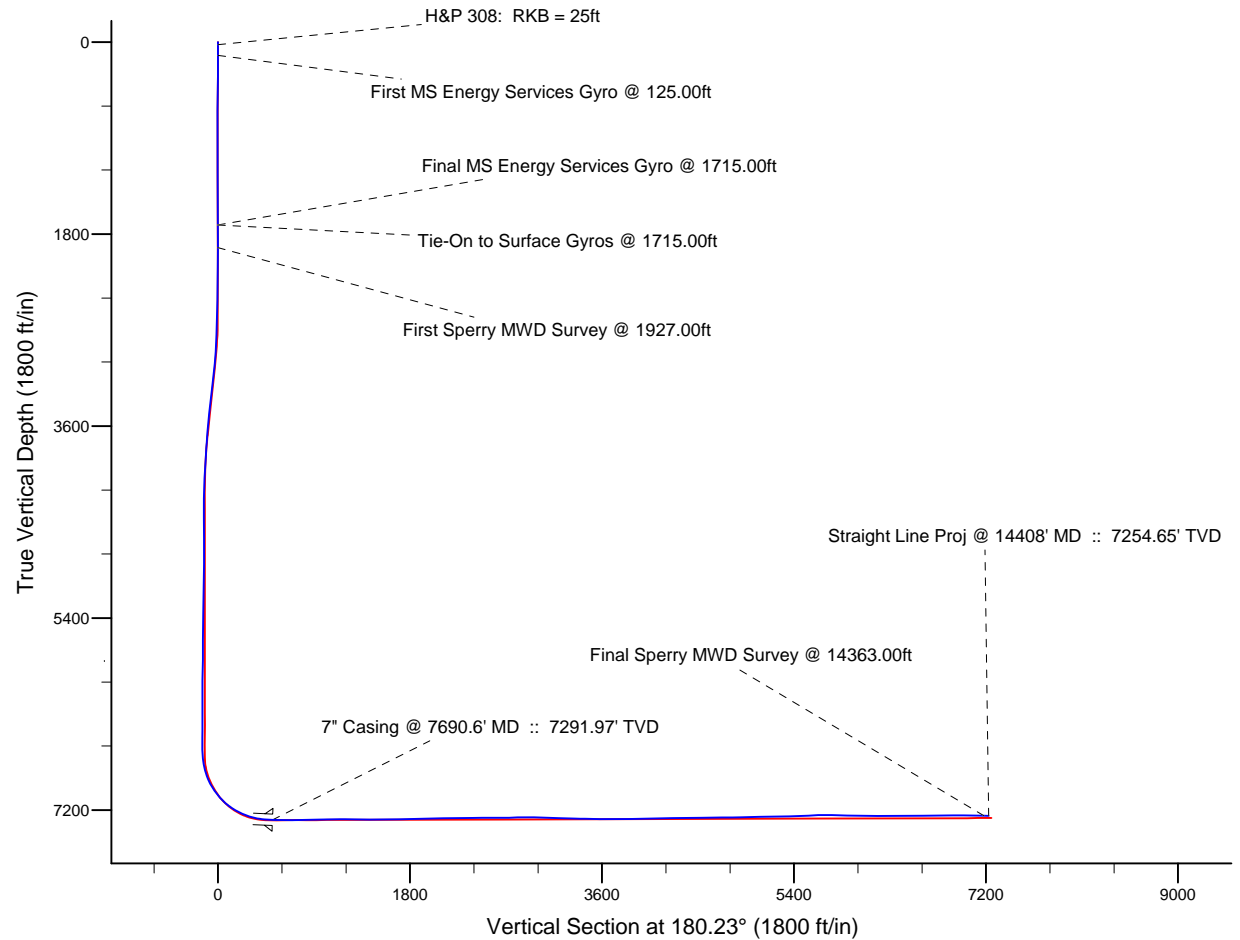
HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 34-T2N-R65W
 Well: Sparboe 8C-3HZ
 Wellbore: Plan C Rev 0
 Design: Actual Field Surveys



LEGEND

◆ Sparboe 8C-3HZ, Plan C Rev 0, Plan C Rev 0 Proposal V0
■ Actual Field Surveys



WELL DETAILS: Sparboe 8C-3HZ	
Ground Level:	4970.00
RKB=25 @ 4995.00ft (HP 308)	
Design: Actual Field Surveys (Sparboe 8C-3HZ/Plan C Rev 0)	
Created By: Fred Hartmann	Date: 02/27/2013
Reviewed: _____	Date: _____

Design Report for Sparboe 8C-3HZ - Actual Field 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
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
H&P 308: RKB = 25ft							
125.00	0.24	279.88	125.00	0.04	-0.21	-0.04	0.24
First MS Energy Services Gyro @ 125.00ft							
225.00	0.34	268.54	225.00	0.06	-0.71	-0.06	0.11
325.00	0.56	305.56	325.00	0.34	-1.40	-0.34	0.35
425.00	0.64	324.99	424.99	1.08	-2.12	-1.07	0.22
525.00	0.67	327.98	524.98	2.04	-2.75	-2.02	0.05
625.00	0.19	266.37	624.98	2.52	-3.23	-2.51	0.60
725.00	0.40	18.65	724.98	2.84	-3.28	-2.83	0.50
825.00	0.31	233.17	824.98	3.01	-3.39	-3.00	0.68
925.00	0.30	32.93	924.98	3.07	-3.46	-3.05	0.60
1,025.00	0.28	26.91	1,024.98	3.50	-3.21	-3.49	0.04
1,125.00	0.28	98.41	1,124.98	3.69	-2.86	-3.68	0.33
1,225.00	0.30	0.09	1,224.98	3.91	-2.61	-3.90	0.44
1,325.00	0.30	182.32	1,324.98	3.91	-2.62	-3.90	0.60
1,425.00	0.23	70.50	1,424.97	3.72	-2.44	-3.71	0.44
1,525.00	0.34	288.67	1,524.97	3.88	-2.54	-3.87	0.54
1,625.00	0.29	26.41	1,624.97	4.20	-2.70	-4.19	0.48
1,715.00	0.29	166.81	1,714.97	4.18	-2.55	-4.17	0.61
Final MS Energy Services Gyro @ 1715.00ft - Tie-On to Surface Gyros @ 1715.00ft							
1,927.00	0.69	120.78	1,926.97	3.01	-1.33	-3.00	0.25
First Sperry MWD Survey @ 1927.00ft							
2,018.00	0.09	328.97	2,017.96	2.79	-0.90	-2.79	0.85
2,110.00	0.51	98.29	2,109.96	2.79	-0.53	-2.79	0.62
2,205.00	0.31	57.64	2,204.96	2.87	0.10	-2.87	0.36
2,300.00	0.29	34.93	2,299.96	3.20	0.46	-3.21	0.13
2,395.00	0.40	332.94	2,394.96	3.70	0.45	-3.70	0.39
2,489.00	2.68	323.77	2,488.92	5.76	-1.00	-5.76	2.43
2,584.00	2.63	313.88	2,583.82	9.06	-3.89	-9.05	0.48
2,678.00	2.44	296.92	2,677.72	11.46	-7.22	-11.44	0.82
2,773.00	3.81	309.78	2,772.58	14.40	-11.45	-14.35	1.61
2,868.00	5.51	312.43	2,867.26	19.50	-17.25	-19.43	1.80
3,057.00	9.73	304.97	3,054.56	34.78	-37.04	-34.63	2.29
3,152.00	11.03	308.78	3,148.00	45.07	-50.70	-44.87	1.55
3,247.00	9.66	307.14	3,241.46	55.58	-64.14	-55.32	1.47
3,342.00	10.08	313.23	3,335.05	66.09	-76.55	-65.78	1.18
3,437.00	10.86	307.16	3,428.47	77.19	-89.74	-76.83	1.42
3,531.00	9.39	309.41	3,521.01	87.40	-102.73	-86.99	1.62
3,626.00	7.84	308.32	3,614.93	96.34	-113.80	-95.88	1.64
3,721.00	7.07	309.51	3,709.13	104.08	-123.39	-103.58	0.83
3,816.00	5.42	311.79	3,803.56	110.79	-131.25	-110.26	1.76
3,911.00	4.92	310.74	3,898.17	116.44	-137.68	-115.88	0.54
4,006.00	4.39	310.26	3,992.86	121.45	-143.54	-120.87	0.56
4,101.00	3.89	314.63	4,087.61	126.06	-148.61	-125.46	0.62
4,195.00	3.93	317.73	4,181.39	130.68	-153.05	-130.07	0.23
4,290.00	2.58	295.53	4,276.24	134.01	-157.17	-133.38	1.92
4,385.00	1.75	266.27	4,371.18	134.84	-160.54	-134.20	1.43
4,480.00	1.07	235.30	4,466.15	134.24	-162.72	-133.59	1.05

Design Report for Sparboe 8C-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,671.00	0.66	222.21	4,657.13	132.41	-164.93	-131.75	0.24
4,860.00	0.47	289.96	4,846.12	131.87	-166.39	-131.20	0.34
5,049.00	1.23	340.13	5,035.10	134.04	-167.80	-133.37	0.53
5,240.00	0.92	337.29	5,226.07	137.39	-169.09	-136.71	0.16
5,429.00	0.80	10.15	5,415.04	140.08	-169.45	-139.40	0.26
5,618.00	0.46	1.23	5,604.03	142.14	-169.20	-141.46	0.19
5,808.00	0.50	354.65	5,794.03	143.73	-169.26	-143.05	0.04
5,997.00	1.31	2.08	5,983.00	146.71	-169.26	-146.03	0.43
6,092.00	0.52	210.34	6,077.99	147.42	-169.43	-146.74	1.88
6,187.00	0.78	212.75	6,172.99	146.51	-170.00	-145.82	0.28
6,282.00	0.96	311.81	6,267.98	146.49	-170.94	-145.81	1.40
6,472.00	0.85	100.55	6,457.97	147.30	-170.75	-146.61	0.92
6,567.00	1.34	74.90	6,552.96	147.46	-168.98	-146.78	0.72
6,661.00	2.29	100.98	6,646.91	147.39	-166.08	-146.72	1.31
6,693.00	4.13	154.72	6,678.86	146.22	-164.96	-145.56	10.42
6,725.00	6.48	171.28	6,710.73	143.39	-164.19	-142.73	8.69
6,756.00	8.27	175.52	6,741.47	139.44	-163.75	-138.78	6.03
6,788.00	10.34	172.53	6,773.05	134.30	-163.20	-133.64	6.64
6,819.00	13.26	172.32	6,803.39	128.02	-162.36	-127.36	9.42
6,851.00	15.80	179.76	6,834.36	120.02	-161.85	-119.37	9.84
6,882.00	17.89	187.13	6,864.04	111.07	-162.42	-110.42	9.63
6,914.00	21.05	189.53	6,894.20	100.53	-163.99	-99.87	10.18
6,946.00	24.45	189.25	6,923.71	88.32	-166.00	-87.65	10.63
6,977.00	28.17	187.11	6,951.49	74.72	-167.94	-74.05	12.38
7,009.00	31.44	184.62	6,979.26	58.90	-169.55	-58.22	10.92
7,041.00	34.40	183.83	7,006.12	41.56	-170.82	-40.87	9.35
7,072.00	36.32	182.91	7,031.40	23.65	-171.88	-22.96	6.43
7,104.00	38.12	182.47	7,056.88	4.32	-172.78	-3.62	5.69
7,136.00	40.86	181.10	7,081.57	-16.02	-173.41	16.71	8.98
7,167.00	43.72	179.85	7,104.50	-36.87	-173.58	37.57	9.62
7,199.00	47.18	177.52	7,126.95	-59.67	-173.04	60.36	11.99
7,230.00	50.66	178.00	7,147.32	-83.01	-172.13	83.70	11.29
7,262.00	54.15	179.41	7,166.84	-108.36	-171.56	109.04	11.45
7,293.00	57.39	180.05	7,184.27	-133.98	-171.45	134.67	10.59
7,325.00	59.52	180.49	7,201.01	-161.25	-171.57	161.94	6.76
7,357.00	62.28	179.36	7,216.57	-189.21	-171.53	189.90	9.16
7,388.00	65.65	179.47	7,230.18	-217.06	-171.25	217.74	10.88
7,420.00	68.09	179.10	7,242.75	-246.48	-170.88	247.16	7.70
7,452.00	69.84	178.99	7,254.23	-276.34	-170.38	277.02	5.48
7,483.00	73.07	179.20	7,264.09	-305.73	-169.92	306.41	10.44
7,515.00	76.58	178.71	7,272.47	-336.60	-169.36	337.28	11.07
7,546.00	79.87	178.28	7,278.79	-366.93	-168.56	367.61	10.70
7,578.00	82.81	178.19	7,283.61	-398.55	-167.58	399.22	9.19
7,609.00	84.90	177.76	7,286.93	-429.35	-166.50	430.02	6.88
7,653.00	86.80	177.64	7,290.11	-473.20	-164.73	473.86	4.33
7,690.60	87.55	178.36	7,291.97	-510.73	-163.42	511.38	2.76
7" Casing @ 7690.6' MD :: 7291.97' TVD							
7,727.00	88.27	179.06	7,293.30	-547.09	-162.61	547.74	2.76
7,819.00	89.88	179.18	7,294.78	-639.07	-161.19	639.71	1.75
7,911.00	90.80	179.65	7,294.23	-731.06	-160.25	731.70	1.12
8,003.00	91.23	180.31	7,292.61	-823.05	-160.22	823.68	0.86

Design Report for Sparboe 8C-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,095.00	91.67	180.16	7,290.28	-915.02	-160.60	915.65	0.51
8,187.00	91.29	180.22	7,287.90	-1,006.98	-160.90	1,007.62	0.42
8,278.00	90.80	179.82	7,286.24	-1,097.97	-160.94	1,098.61	0.70
8,370.00	89.32	178.87	7,286.14	-1,189.96	-159.88	1,190.59	1.91
8,462.00	89.94	179.69	7,286.74	-1,281.95	-158.73	1,282.58	1.12
8,553.00	89.14	180.20	7,287.47	-1,372.94	-158.64	1,373.57	1.04
8,645.00	89.69	180.54	7,288.41	-1,464.94	-159.23	1,465.56	0.70
8,737.00	90.74	181.38	7,288.06	-1,556.92	-160.78	1,557.55	1.46
8,829.00	90.80	181.38	7,286.83	-1,648.89	-162.99	1,649.53	0.07
8,921.00	90.31	181.09	7,285.94	-1,740.86	-164.97	1,741.51	0.62
9,012.00	91.98	181.92	7,284.12	-1,831.81	-167.36	1,832.46	2.05
9,104.00	91.92	181.48	7,280.99	-1,923.71	-170.09	1,924.38	0.48
9,196.00	91.05	180.49	7,278.60	-2,015.67	-171.67	2,016.34	1.43
9,288.00	90.99	180.99	7,276.97	-2,107.64	-172.86	2,108.32	0.55
9,380.00	90.43	180.43	7,275.83	-2,199.63	-174.00	2,200.31	0.86
9,472.00	90.62	180.74	7,274.98	-2,291.62	-174.94	2,292.30	0.40
9,564.00	90.49	180.45	7,274.09	-2,383.61	-175.89	2,384.30	0.35
9,656.00	90.31	180.24	7,273.45	-2,475.61	-176.45	2,476.30	0.30
9,748.00	89.88	180.42	7,273.30	-2,567.60	-176.98	2,568.29	0.51
9,840.00	89.94	179.88	7,273.44	-2,659.60	-177.22	2,660.29	0.59
9,932.00	92.35	182.33	7,271.60	-2,751.55	-178.99	2,752.25	3.73
10,024.00	91.92	182.39	7,268.17	-2,843.41	-182.78	2,844.12	0.47
10,116.00	89.20	180.85	7,267.28	-2,935.36	-185.38	2,936.08	3.40
10,208.00	87.96	179.40	7,269.56	-3,027.33	-185.58	3,028.05	2.07
10,300.00	87.28	180.41	7,273.38	-3,119.25	-185.43	3,119.97	1.32
10,392.00	88.64	180.63	7,276.65	-3,211.18	-186.26	3,211.90	1.50
10,483.00	88.15	179.55	7,279.20	-3,302.14	-186.40	3,302.87	1.30
10,575.00	89.38	179.49	7,281.18	-3,394.12	-185.63	3,394.84	1.34
10,670.00	88.33	179.25	7,283.08	-3,489.09	-184.59	3,489.81	1.13
10,765.00	89.69	179.22	7,284.72	-3,584.07	-183.32	3,584.77	1.43
10,860.00	89.75	180.05	7,285.19	-3,679.06	-182.72	3,679.77	0.88
10,955.00	91.24	180.47	7,284.37	-3,774.06	-183.15	3,774.76	1.63
11,050.00	90.74	180.64	7,282.72	-3,869.04	-184.07	3,869.74	0.56
11,145.00	90.80	180.42	7,281.45	-3,964.02	-184.95	3,964.73	0.24
11,240.00	91.05	180.32	7,279.91	-4,059.01	-185.56	4,059.72	0.28
11,335.00	90.93	180.36	7,278.27	-4,153.99	-186.12	4,154.71	0.13
11,430.00	90.87	179.27	7,276.78	-4,248.98	-185.82	4,249.69	1.15
11,525.00	90.99	179.11	7,275.24	-4,343.96	-184.47	4,344.66	0.21
11,620.00	91.11	179.11	7,273.50	-4,438.93	-183.00	4,439.63	0.13
11,715.00	90.74	179.39	7,271.96	-4,533.91	-181.75	4,534.60	0.49
11,810.00	90.68	179.47	7,270.79	-4,628.90	-180.81	4,629.59	0.11
11,905.00	90.80	179.76	7,269.56	-4,723.89	-180.17	4,724.57	0.33
12,000.00	90.31	179.24	7,268.64	-4,818.88	-179.34	4,819.56	0.75
12,080.00	90.71	179.56	7,267.93	-4,898.87	-178.50	4,899.55	0.64
12,175.00	91.29	179.39	7,266.27	-4,993.85	-177.63	4,994.53	0.64
12,270.00	92.03	179.00	7,263.52	-5,088.80	-176.30	5,089.47	0.88
12,365.00	90.65	179.41	7,261.30	-5,183.76	-174.98	5,184.43	1.52
12,460.00	90.74	178.80	7,260.14	-5,278.75	-173.50	5,279.40	0.65
12,555.00	91.95	181.57	7,257.91	-5,373.71	-173.80	5,374.36	3.18
12,650.00	92.91	181.92	7,253.89	-5,468.58	-176.69	5,469.24	1.08
12,745.00	92.04	182.24	7,249.78	-5,563.43	-180.14	5,564.10	0.98

Design Report for Sparboe 8C-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
12,840.00	90.00	182.91	7,248.09	-5,658.31	-184.41	5,659.00	2.26
12,935.00	89.88	182.13	7,248.19	-5,753.22	-188.58	5,753.93	0.83
13,030.00	89.44	182.96	7,248.76	-5,848.12	-192.80	5,848.85	0.99
13,125.00	88.53	182.28	7,250.44	-5,943.00	-197.14	5,943.75	1.20
13,220.00	88.58	183.40	7,252.83	-6,037.86	-201.85	6,038.62	1.18
13,315.00	88.70	182.33	7,255.09	-6,132.71	-206.60	6,133.49	1.13
13,410.00	89.14	182.55	7,256.88	-6,227.61	-210.64	6,228.40	0.52
13,505.00	90.89	183.72	7,256.85	-6,322.46	-215.84	6,323.27	2.22
13,600.00	90.68	182.14	7,255.55	-6,417.32	-220.69	6,418.16	1.68
13,695.00	91.42	182.42	7,253.81	-6,512.23	-224.47	6,513.08	0.83
13,790.00	90.90	181.90	7,251.89	-6,607.14	-228.05	6,608.00	0.77
13,885.00	90.43	181.40	7,250.79	-6,702.10	-230.78	6,702.97	0.72
13,980.00	90.22	181.26	7,250.25	-6,797.07	-232.99	6,797.95	0.27
14,075.00	90.55	182.90	7,249.61	-6,892.00	-236.44	6,892.89	1.76
14,170.00	89.35	181.65	7,249.69	-6,986.92	-240.21	6,987.83	1.82
14,265.00	88.70	181.46	7,251.31	-7,081.87	-242.79	7,082.79	0.71
14,363.00	88.64	181.81	7,253.58	-7,179.81	-245.58	7,180.73	0.36
Final Sperry MWD Survey @ 14363.00ft							
14,408.00	88.64	181.81	7,254.65	-7,224.77	-247.00	7,225.70	0.00
Straight Line Proj @ 14408' MD :: 7254.65' TVD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
25.00	25.00	0.00	0.00	H&P 308: RKB = 25ft
125.00	125.00	0.04	-0.21	First MS Energy Services Gyro @ 125.00ft
1,715.00	1,714.97	4.18	-2.55	Final MS Energy Services Gyro @ 1715.00ft
1,715.00	1,714.97	4.18	-2.55	Tie-On to Surface Gyros @ 1715.00ft
1,927.00	1,926.97	3.01	-1.33	First Sperry MWD Survey @ 1927.00ft
14,363.00	7,253.58	-7,179.81	-245.58	Final Sperry MWD Survey @ 14363.00ft
14,408.00	7,254.65	-7,224.77	-247.00	Straight Line Proj @ 14408' MD :: 7254.65' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	180.23	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
25.00	1,715.00	MS Energy Services - Surface Gyros	NS-GYRO-MS
1,927.00	7,653.00	Sperry MWD Surveys - Vert/Build	MWD+IFR1+SC
7,727.00	14,363.00	Sperry MWD Surveys - Lateral	MWD+IFR1+SC

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,690.60	7,291.97	7" Casing @ 7690.6' MD :: 7291.97' TVD	7	8-3/4

Design Report for Sparboe 8C-3HZ - Actual Field Surveys

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
Sparboe 8C-3HZ_BI - actual wellpath misses target center by 57.93ft at 14408.00ft MD (7254.65 TVD, -7224.77 N, -247.00 E) - Point	0.00	0.00	7,275.00	-7,249.41	-198.68	1,273,775.64	3,239,534.06	40.081731	-104.643951
Sparboe 8C-3HZ_1I - actual wellpath hits target center - Polygon Point 1 Point 2	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,508.10 788.23	-7,687.41 -7,714.31	1,273,296.05 1,273,320.32	3,235,229.25 3,240,525.38		
Sparboe 8C-3HZ_34 - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,474.82 -1,835.22 806.24	-4,995.44 -5,072.57 -5,154.06	1,275,988.11 1,275,936.49 1,275,880.52	3,235,236.51 3,237,876.63 3,240,518.65		
Sparboe 8C-3HZ_St - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10 Point 11 Point 12 Point 13 Point 14	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,019.34 -4,018.28 -4,015.40 -4,020.63 -4,048.10 -4,067.70 -1,885.36 312.52 328.22 343.08 342.86 327.20 310.74 -1,854.29	-209.94 -2,376.79 -4,548.65 -5,468.93 -7,692.32 -9,862.57 -9,878.32 -9,893.11 -7,712.01 -5,600.28 -4,679.78 -2,457.51 -233.97 -221.12	1,280,777.59 1,278,610.94 1,276,439.30 1,275,519.05 1,273,295.58 1,271,125.33 1,271,130.67 1,271,137.11 1,273,318.17 1,275,429.87 1,276,350.28 1,278,572.21 1,280,795.40 1,280,787.33	3,235,645.72 3,235,667.72 3,235,691.58 3,235,695.24 3,235,689.25 3,235,690.62 3,237,872.93 3,240,070.76 3,240,065.38 3,240,059.84 3,240,050.73 3,240,013.60 3,239,975.66 3,237,810.69		
Sparboe 8C-3HZ_St - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Sparboe 8C-3HZ_LL - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				310.74 -1,008.14 -959.76 -978.01 332.44 342.86	-233.97 -229.30 -4,620.77 -7,206.03 -7,274.99 -4,679.78	1,280,795.40 1,280,787.33 1,276,396.70 1,273,811.49 1,273,755.20 1,276,350.28	3,239,975.66 3,238,656.85 3,238,747.65 3,238,754.38 3,240,065.38 3,240,050.73		
Sparboe 8C-3HZ_Sc - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10 Point 11 Point 12	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,479.58 -4,478.30 -4,474.82 -4,508.10 -4,531.87 -1,888.63 769.22 788.23 806.24 787.29 767.39 -1,856.11	252.45 -2,368.25 -4,995.44 -7,687.41 -10,319.43 -10,338.32 -10,356.20 -7,714.31 -5,154.38 -2,466.06 223.35 238.92	1,281,235.50 1,278,615.04 1,275,988.11 1,273,296.05 1,270,664.03 1,270,670.67 1,270,678.47 1,273,320.32 1,275,880.20 1,278,568.11 1,281,257.09 1,281,247.31	3,235,181.05 3,235,207.65 3,235,236.51 3,235,229.25 3,235,230.91 3,237,874.10 3,240,531.89 3,240,525.38 3,240,518.65 3,240,473.73 3,240,427.85 3,237,804.43		

North Reference Sheet for Sec. 34-T2N-R65W - Sparboe 8C-3HZ - Plan C Rev 0

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

Vertical Depths are relative to RKB=25 @ 4995.00ft (HP 308). Northing and Easting are relative to Sparboe 8C-3HZ

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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996022

Grid Coordinates of Well: 1,281,026.35 ft N, 3,239,662.69 ft E

Geographical Coordinates of Well: 40° 06' 05.87" N, 104° 38' 35.67" W

Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,408.00ft
the Bottom Hole Displacement is 7,228.99ft in the Direction of 181.96° (True).

Magnetic Convergence at surface is: -8.05° (15 February 2013, , BGGM2012)

