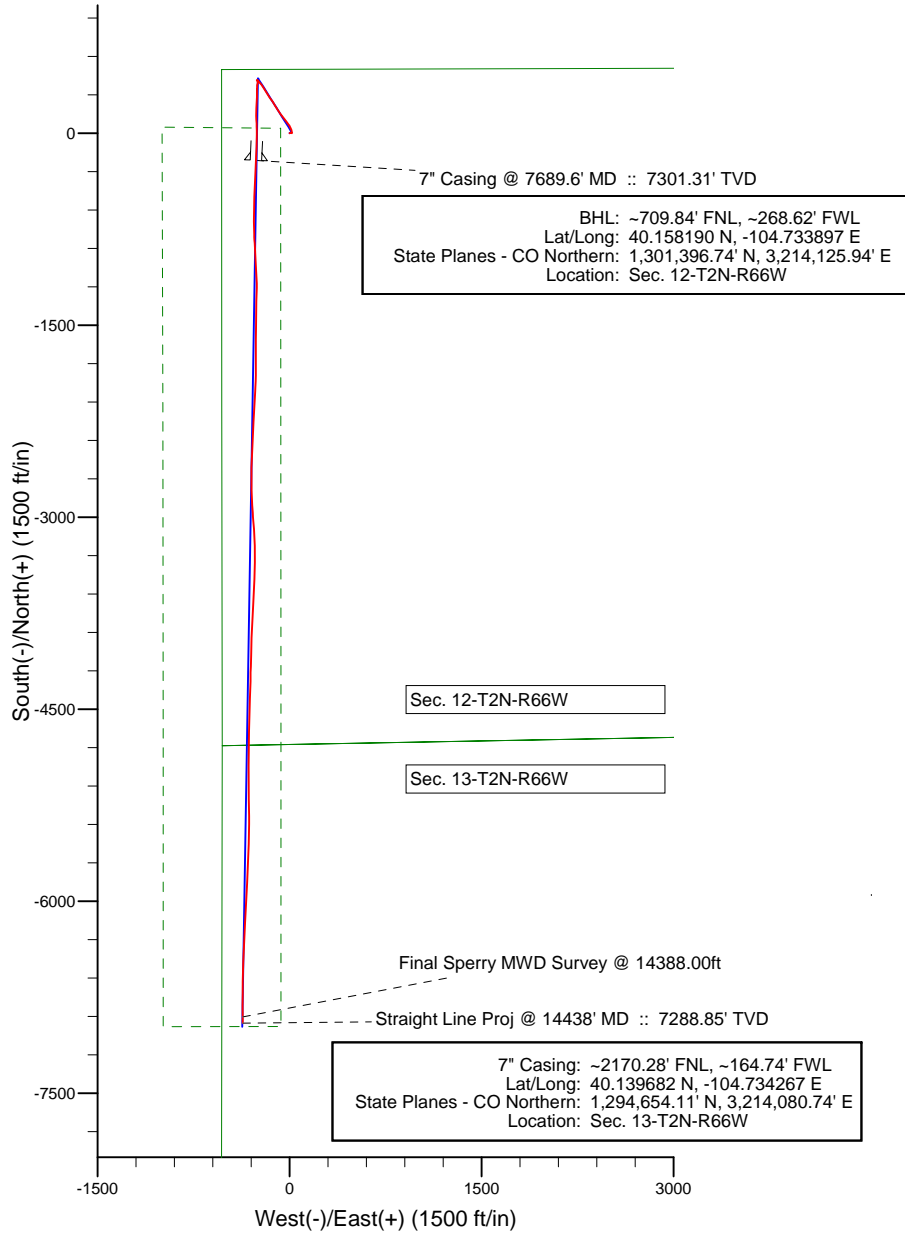
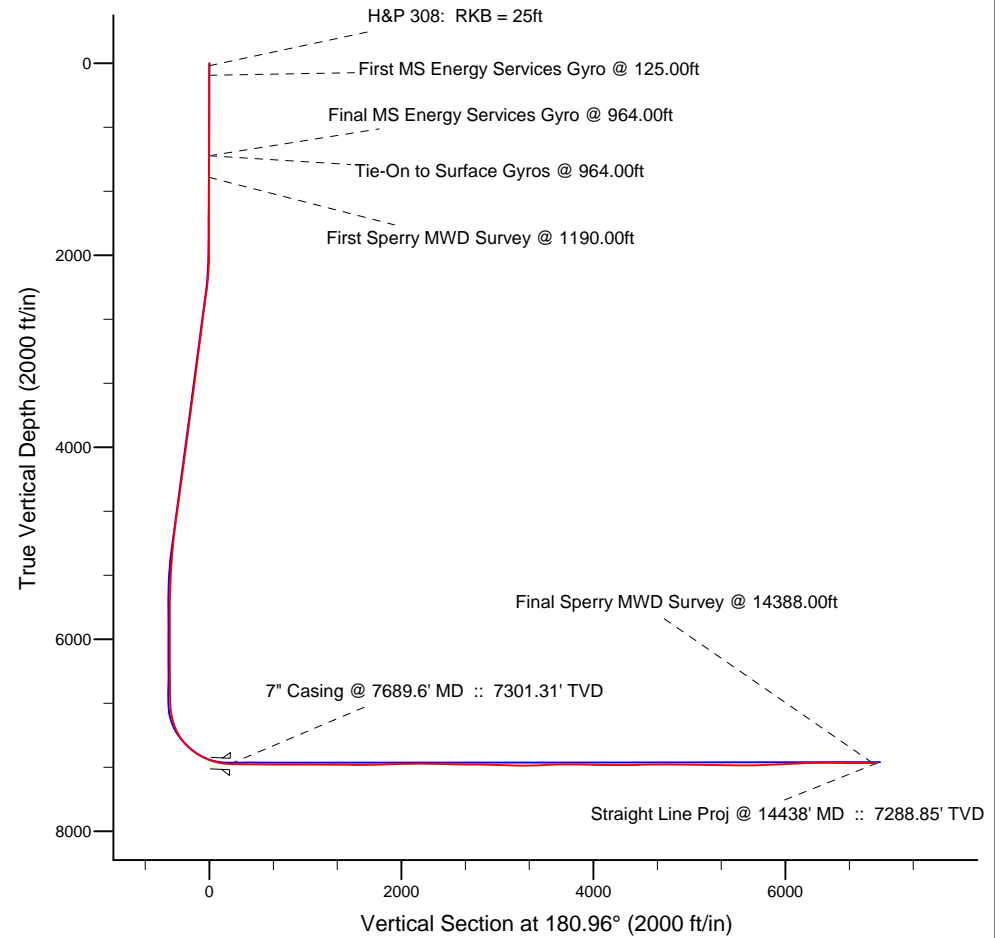


Project: Weld County, CO (NAD 83)  
 Site: Sec. 12-T2N-R66W  
 Well: Dove 32N-13HZ  
 Wellbore: Plan B Rev 0  
 Design: Actual Field Surveys



**LEGEND**

- ▲ Dove 32N-13HZ, Plan B Rev 0, Plan B Rev 0 - PROPOSAL V0
- Actual Field Surveys



WELL DETAILS: Dove 32N-13HZ	
Ground Level: 5001.00	
RKB=25 @ 5026.00ft (HP 308)	
Design: Actual Field Surveys (Dove 32N-13HZ/Plan B Rev 0)	
Created By: Fred Hartmann	Date: 05/21/2013
Reviewed: _____	Date: _____

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 12-T2N-R66W

Dove 32N-13HZ

Plan B Rev 0

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

21 May, 2013

Well Coordinates: 1,301,609.60 N, 3,214,385.50 E (40° 09' 31.56" N, 104° 43' 58.66" W)

Ground Level: 5,001.00 ft

Local Coordinate Origin:	Centered on Well Dove 32N-13HZ
Viewing Datum:	RKB=25 @ 5026.00ft (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**

**Design Report for Dove 32N-13HZ - 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
<b>H&amp;P 308: RKB = 25ft</b>							
125.00	0.45	64.83	125.00	0.17	0.36	-0.17	0.45
<b>First MS Energy Services Gyro @ 125.00ft</b>							
225.00	0.21	22.78	225.00	0.50	0.78	-0.52	0.33
325.00	0.58	33.36	324.99	1.09	1.13	-1.11	0.38
425.00	0.33	17.96	424.99	1.79	1.50	-1.82	0.28
525.00	0.18	109.07	524.99	2.01	1.74	-2.04	0.38
625.00	0.60	99.45	624.99	1.88	2.40	-1.92	0.42
725.00	0.12	344.20	724.99	1.89	2.89	-1.94	0.66
825.00	0.37	35.95	824.99	2.25	3.05	-2.30	0.31
925.00	0.82	116.56	924.98	2.20	3.88	-2.26	0.84
964.00	0.67	60.39	963.98	2.18	4.33	-2.26	1.83
<b>Final MS Energy Services Gyro @ 964.00ft - Tie-On to Surface Gyros @ 964.00ft</b>							
1,190.00	0.99	90.42	1,189.96	2.82	7.43	-2.95	0.23
<b>First Sperry MWD Survey @ 1190.00ft</b>							
1,373.00	1.45	81.60	1,372.91	3.15	11.30	-3.34	0.27
1,557.00	0.80	115.10	1,556.88	2.94	14.77	-3.19	0.49
1,649.00	0.85	127.43	1,648.87	2.26	15.89	-2.52	0.20
1,832.00	0.40	128.46	1,831.86	1.03	17.47	-1.33	0.25
1,924.00	0.51	102.86	1,923.86	0.74	18.12	-1.05	0.25
2,016.00	1.42	343.01	2,015.85	1.74	18.18	-2.05	1.88
2,107.00	2.61	3.95	2,106.79	4.89	18.00	-5.19	1.52
2,202.00	4.64	352.45	2,201.60	10.86	17.64	-11.15	2.26
2,297.00	5.98	345.91	2,296.19	19.46	15.93	-19.73	1.55
2,392.00	8.05	341.01	2,390.47	30.56	12.56	-30.76	2.27
2,487.00	9.74	333.45	2,484.33	44.04	6.81	-44.14	2.16
2,582.00	8.52	333.98	2,578.12	57.55	0.13	-57.54	1.29
2,677.00	9.61	322.15	2,671.94	70.14	-7.83	-69.99	2.27
2,771.00	8.63	320.34	2,764.75	81.76	-17.14	-81.46	1.09
2,961.00	9.73	323.30	2,952.32	105.61	-35.84	-104.99	0.63
3,151.00	9.39	323.96	3,139.68	131.01	-54.55	-130.08	0.19
3,341.00	8.84	320.96	3,327.28	154.89	-72.87	-153.64	0.38
3,530.00	10.04	327.10	3,513.72	180.00	-90.96	-178.45	0.83
3,720.00	8.29	326.84	3,701.29	205.38	-107.45	-203.55	0.92
3,910.00	9.27	333.74	3,889.07	230.57	-121.72	-228.50	0.76
4,099.00	10.05	324.09	4,075.40	257.58	-138.13	-255.23	0.95
4,289.00	8.70	322.36	4,262.86	282.39	-156.63	-279.72	0.73
4,479.00	8.59	327.09	4,450.70	305.68	-173.11	-302.73	0.38
4,668.00	9.67	331.41	4,637.30	331.47	-188.38	-328.26	0.68
4,858.00	9.11	327.10	4,824.76	358.11	-204.18	-354.64	0.47
5,048.00	7.82	321.55	5,012.69	380.86	-220.39	-377.11	0.80
5,142.00	6.99	316.98	5,105.91	390.05	-228.27	-386.17	1.08
5,237.00	5.17	315.41	5,200.37	397.33	-235.22	-393.33	1.92
5,332.00	4.43	326.51	5,295.04	403.43	-240.25	-399.35	1.25
5,427.00	3.01	322.53	5,389.83	408.47	-243.79	-404.33	1.52
5,522.00	1.32	320.77	5,484.76	411.30	-246.00	-407.12	1.78
5,617.00	1.35	323.38	5,579.74	413.05	-247.36	-408.84	0.07
5,712.00	1.34	306.73	5,674.71	414.61	-248.92	-410.38	0.41

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,901.00	0.55	290.33	5,863.68	416.25	-251.54	-411.97	0.44
6,091.00	0.80	275.57	6,053.67	416.69	-253.72	-412.38	0.16
6,281.00	0.35	235.84	6,243.66	416.49	-255.52	-412.15	0.30
6,471.00	1.10	140.30	6,433.65	414.77	-254.83	-410.44	0.62
6,629.00	1.80	119.08	6,591.60	412.39	-251.69	-408.12	0.55
6,660.00	1.78	125.44	6,622.58	411.88	-250.88	-407.62	0.64
6,692.00	2.20	125.81	6,654.56	411.23	-249.97	-406.98	1.31
6,724.00	2.84	149.27	6,686.53	410.19	-249.07	-405.96	3.75
6,756.00	4.88	173.98	6,718.46	408.15	-248.52	-403.93	8.09
6,787.00	7.65	184.29	6,749.27	404.78	-248.54	-400.56	9.61
6,819.00	9.95	184.92	6,780.90	399.90	-248.93	-395.68	7.19
6,851.00	12.84	185.23	6,812.26	393.61	-249.50	-389.37	9.03
6,882.00	15.69	189.24	6,842.30	386.04	-250.48	-381.79	9.73
6,914.00	17.33	187.93	6,872.98	377.05	-251.84	-372.77	5.26
6,945.00	20.17	183.39	6,902.34	367.14	-252.79	-362.85	10.29
6,977.00	23.51	182.27	6,932.04	355.25	-253.37	-350.95	10.52
7,009.00	25.89	180.69	6,961.11	341.88	-253.70	-337.58	7.72
7,040.00	29.24	180.09	6,988.58	327.54	-253.80	-323.24	10.84
7,072.00	32.38	179.92	7,016.06	311.15	-253.80	-306.86	9.82
7,103.00	35.38	182.13	7,041.80	293.88	-254.12	-289.58	10.46
7,135.00	38.54	182.71	7,067.36	274.66	-254.94	-270.35	9.93
7,166.00	41.60	183.07	7,091.08	254.73	-255.94	-250.41	9.90
7,198.00	45.42	182.40	7,114.29	232.73	-256.99	-228.39	12.02
7,230.00	49.07	182.52	7,136.01	209.26	-258.00	-204.90	11.41
7,261.00	52.66	181.01	7,155.57	185.23	-258.73	-180.87	12.18
7,293.00	55.67	180.37	7,174.30	159.29	-259.04	-154.93	9.54
7,324.00	57.48	179.38	7,191.38	133.42	-258.98	-129.06	6.42
7,356.00	59.66	178.64	7,208.07	106.12	-258.51	-101.77	7.09
7,387.00	62.55	178.21	7,223.04	78.99	-257.76	-74.66	9.40
7,419.00	65.49	178.22	7,237.06	50.24	-256.87	-45.93	9.19
7,451.00	67.85	178.68	7,249.73	20.87	-256.07	-16.58	7.49
7,482.00	69.63	179.45	7,260.97	-8.01	-255.60	12.29	6.19
7,514.00	71.80	180.05	7,271.54	-38.21	-255.47	42.49	7.01
7,545.00	75.28	181.40	7,280.32	-67.94	-255.85	72.21	11.98
7,577.00	78.57	182.31	7,287.56	-99.09	-256.86	103.38	10.65
7,609.00	80.57	182.23	7,293.35	-130.53	-258.11	134.84	6.25
7,652.00	84.82	182.35	7,298.82	-173.14	-259.81	177.47	9.89
7,689.60	87.59	182.52	7,301.31	-210.62	-261.41	214.97	7.39
<b>7" Casing @ 7689.6' MD :: 7301.31' TVD</b>							
7,716.00	89.54	182.64	7,301.97	-236.98	-262.59	241.35	7.39
7,808.00	89.39	183.11	7,302.83	-328.86	-267.21	333.29	0.54
7,900.00	89.91	182.73	7,303.39	-420.74	-271.89	425.24	0.70
7,992.00	89.66	181.74	7,303.73	-512.67	-275.48	517.21	1.11
8,083.00	89.20	179.88	7,304.64	-603.65	-276.77	608.20	2.11
8,175.00	89.81	179.84	7,305.43	-695.65	-276.54	700.18	0.66
8,267.00	90.92	178.89	7,304.85	-787.64	-275.52	792.14	1.59
8,359.00	89.91	176.01	7,304.18	-879.53	-271.43	883.96	3.32
8,450.00	89.45	176.55	7,304.69	-970.34	-265.53	974.65	0.78
8,542.00	89.63	177.19	7,305.43	-1,062.20	-260.50	1,066.41	0.72
8,634.00	89.20	178.21	7,306.37	-1,154.12	-256.81	1,158.26	1.20
8,726.00	90.68	181.96	7,306.46	-1,246.10	-256.95	1,250.23	4.38

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,817.00	89.75	180.76	7,306.12	-1,337.07	-259.11	1,341.22	1.67
8,909.00	89.57	180.84	7,306.67	-1,429.06	-260.39	1,433.22	0.21
9,001.00	89.04	180.76	7,307.78	-1,521.04	-261.68	1,525.21	0.58
9,093.00	89.32	180.33	7,309.10	-1,613.03	-262.55	1,617.20	0.56
9,185.00	91.94	180.76	7,308.09	-1,705.01	-263.43	1,709.18	2.89
9,277.00	91.48	179.62	7,305.34	-1,796.97	-263.73	1,801.13	1.34
9,371.00	91.73	180.61	7,302.71	-1,890.93	-263.92	1,895.09	1.09
9,466.00	92.56	181.98	7,299.16	-1,985.83	-266.07	1,990.01	1.69
9,561.00	90.15	183.59	7,296.91	-2,080.69	-270.68	2,084.93	3.05
9,656.00	90.80	183.87	7,296.12	-2,175.48	-276.86	2,179.81	0.74
9,751.00	88.06	182.93	7,297.07	-2,270.30	-282.49	2,274.71	3.05
9,845.00	88.80	182.59	7,299.64	-2,364.15	-287.02	2,368.63	0.87
9,940.00	89.26	182.59	7,301.25	-2,459.04	-291.31	2,463.58	0.48
10,035.00	88.95	181.90	7,302.73	-2,553.96	-295.03	2,558.54	0.80
10,130.00	89.35	180.75	7,304.14	-2,648.92	-297.23	2,653.53	1.28
10,225.00	89.60	178.78	7,305.01	-2,743.91	-296.84	2,748.50	2.09
10,320.00	89.54	178.44	7,305.73	-2,838.88	-294.53	2,843.42	0.36
10,415.00	88.83	176.27	7,307.08	-2,933.76	-290.15	2,938.21	2.40
10,510.00	86.52	174.85	7,310.93	-3,028.39	-282.80	3,032.70	2.85
10,604.00	88.92	176.22	7,314.67	-3,122.02	-275.49	3,126.20	2.94
10,699.00	89.35	179.10	7,316.11	-3,216.92	-271.62	3,221.02	3.06
10,794.00	91.23	180.36	7,315.63	-3,311.91	-271.17	3,315.99	2.38
10,889.00	91.82	181.28	7,313.10	-3,406.87	-272.53	3,410.96	1.15
10,984.00	93.30	182.13	7,308.85	-3,501.73	-275.35	3,505.85	1.80
11,078.00	90.56	182.60	7,305.69	-3,595.59	-279.23	3,599.76	2.96
11,173.00	91.57	182.62	7,303.92	-3,690.47	-283.55	3,694.70	1.06
11,268.00	88.86	183.02	7,303.57	-3,785.34	-288.23	3,789.64	2.88
11,363.00	89.01	182.26	7,305.33	-3,880.23	-292.60	3,884.58	0.82
11,458.00	88.67	182.39	7,307.26	-3,975.13	-296.45	3,979.54	0.38
11,553.00	88.86	181.74	7,309.30	-4,070.04	-299.88	4,074.50	0.71
11,648.00	89.94	181.29	7,310.30	-4,165.00	-302.39	4,169.49	1.23
11,742.00	88.89	180.24	7,311.26	-4,258.99	-303.64	4,263.48	1.58
11,837.00	91.05	182.83	7,311.31	-4,353.94	-306.19	4,358.46	3.55
11,932.00	92.32	182.17	7,308.51	-4,448.81	-310.33	4,453.38	1.51
12,027.00	90.52	181.91	7,306.16	-4,543.71	-313.71	4,548.33	1.91
12,122.00	91.02	181.13	7,304.88	-4,638.67	-316.23	4,643.32	0.98
12,217.00	90.09	180.57	7,303.96	-4,733.65	-317.64	4,738.31	1.14
12,312.00	89.54	180.66	7,304.27	-4,828.65	-318.66	4,833.31	0.59
12,407.00	89.72	179.56	7,304.88	-4,923.64	-318.84	4,928.30	1.17
12,502.00	88.70	180.37	7,306.19	-5,018.63	-318.78	5,023.27	1.37
12,596.00	88.89	178.92	7,308.17	-5,112.61	-318.20	5,117.22	1.56
12,691.00	89.04	179.11	7,309.89	-5,207.58	-316.57	5,212.15	0.25
12,786.00	88.80	179.49	7,311.68	-5,302.55	-315.41	5,307.09	0.47
12,881.00	89.78	181.72	7,312.85	-5,397.53	-316.41	5,402.08	2.56
12,975.00	90.28	180.50	7,312.80	-5,491.51	-318.23	5,496.08	1.40
13,070.00	90.22	180.77	7,312.39	-5,586.51	-319.28	5,591.07	0.29
13,165.00	89.78	183.35	7,312.39	-5,681.44	-322.70	5,686.05	2.75
13,260.00	92.00	182.82	7,310.91	-5,776.28	-327.81	5,780.96	2.40
13,355.00	92.69	183.02	7,307.03	-5,871.08	-332.65	5,875.83	0.76
13,449.00	93.96	182.54	7,301.58	-5,964.81	-337.20	5,969.62	1.44
13,544.00	93.05	182.86	7,295.77	-6,059.52	-341.66	6,064.40	1.02

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
13,639.00	91.11	182.79	7,292.32	-6,154.34	-346.34	6,159.28	2.04
13,733.00	91.73	183.00	7,289.99	-6,248.19	-351.09	6,253.20	0.70
13,828.00	89.51	182.64	7,288.96	-6,343.07	-355.76	6,348.14	2.37
13,923.00	90.06	182.33	7,289.32	-6,437.98	-359.88	6,443.10	0.66
14,018.00	89.51	181.32	7,289.68	-6,532.93	-362.91	6,538.09	1.21
14,112.00	89.60	180.69	7,290.41	-6,626.91	-364.56	6,632.09	0.68
14,207.00	90.12	180.46	7,290.64	-6,721.90	-365.51	6,727.08	0.60
14,302.00	90.40	180.16	7,290.21	-6,816.90	-366.02	6,822.07	0.43
14,388.00	90.65	179.25	7,289.42	-6,902.89	-365.58	6,908.05	1.10
<b>Final Sperry MWD Survey @ 14388.00ft</b>							
14,438.00	90.65	179.25	7,288.85	-6,952.89	-364.93	6,958.02	0.00
<b>Straight Line Proj @ 14438' MD :: 7288.85' TVD</b>							

**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	0.17	0.36	First MS Energy Services Gyro @ 125.00ft
964.00	963.98	2.18	4.33	Final MS Energy Services Gyro @ 964.00ft
964.00	963.98	2.18	4.33	Tie-On to Surface Gyros @ 964.00ft
1,190.00	1,189.96	2.82	7.43	First Sperry MWD Survey @ 1190.00ft
14,388.00	7,289.42	-6,902.89	-365.58	Final Sperry MWD Survey @ 14388.00ft
14,438.00	7,288.85	-6,952.89	-364.93	Straight Line Proj @ 14438' MD :: 7288.85' TVD

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	180.96	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
25.00	964.00	MS Energy Services - Surface Gyros	NS-GYRO-MS
1,190.00	7,652.00	Sperry MWD Surveys - Vert/Build	MWD+SC
7,716.00	14,388.00	Sperry MWD Surveys - Lateral	MWD+SC

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,689.60		7" Casing @ 7689.6' MD :: 7301.31' TVD	7	8-3/4

**Design Report for Dove 32N-13HZ - 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
Dove 32N-13HZ_BH	0.00	0.00	7,281.00	-6,981.35	-369.62	1,294,625.61	3,214,076.29	40.139604	-104.734284
- actual wellpath misses target center by 29.90ft at 14438.00ft MD (7288.85 TVD, -6952.89 N, -364.93 E)									
- Point									
Dove 32N-13HZ_LD	0.00	0.00	0.00	0.00	0.00	1,301,609.61	3,214,385.50	40.158768	-104.732962
- actual wellpath hits target center									
- Polygon									
Point 1				-70.10	39.73	1,301,648.73	3,214,315.06		
Point 2				-68.48	-2,138.40	1,299,470.79	3,214,335.52		
Point 3				-66.37	-4,316.41	1,297,292.97	3,214,356.47		
Point 4				-66.54	-5,236.65	1,296,372.80	3,214,364.26		
Point 5				-66.52	-6,977.67	1,294,631.92	3,214,379.34		
Point 6				-986.59	-6,979.62	1,294,622.01	3,213,459.36		
Point 7				-985.75	-4,781.17	1,296,820.29	3,213,441.18		
Point 8				-988.50	-2,139.35	1,299,461.88	3,213,415.58		
Point 9				-994.52	47.73	1,301,648.73	3,213,390.64		
Point 10				-70.10	39.73	1,301,648.73	3,214,315.06		
Dove 32N-13HZ_Se	0.00	0.00	0.00	0.00	0.00	1,301,609.61	3,214,385.50	40.158768	-104.732962
- actual wellpath hits target center									
- Polygon									
Point 1				-530.59	498.50	1,302,103.48	3,213,850.64		
Point 2				-528.50	-2,143.33	1,299,461.88	3,213,875.58		
Point 3				-525.75	-4,785.15	1,296,820.29	3,213,901.18		
Point 4				-530.56	-7,443.60	1,294,162.01	3,213,919.36		
Point 5				-534.26	-10,102.50	1,291,503.29	3,213,938.66		
Point 6				2,114.68	-10,082.64	1,291,546.06	3,216,587.22		
Point 7				4,763.28	-10,063.06	1,291,588.55	3,219,235.44		
Point 8				4,762.83	-7,375.31	1,294,276.08	3,219,211.74		
Point 9				4,767.00	-4,686.20	1,296,965.01	3,219,192.65		
Point 10				4,775.59	-2,087.06	1,299,564.02	3,219,178.76		
Point 11				4,784.25	512.87	1,302,163.82	3,219,164.93		
Point 12				2,127.06	505.86	1,302,133.83	3,216,508.01		
Point 13				-530.59	498.50	1,302,103.48	3,213,850.64		
Dove 32N-13HZ_12/	0.00	0.00	0.00	0.00	0.00	1,301,609.61	3,214,385.50	40.158768	-104.732962
- actual wellpath hits target center									
- Polygon									
Point 1				-525.75	-4,785.15	1,296,820.29	3,213,901.18		
Point 2				2,120.67	-4,735.57	1,296,892.76	3,216,546.96		
Point 3				4,766.99	-4,687.20	1,296,964.01	3,219,192.65		
Point 4				2,120.67	-4,735.57	1,296,892.76	3,216,546.96		
Point 5				-525.75	-4,785.15	1,296,820.29	3,213,901.18		
Dove 32N-13HZ_SH	0.00	0.00	0.00	0.00	0.00	1,301,609.61	3,214,385.50	40.158768	-104.732962
- actual wellpath hits target center									
- Point									

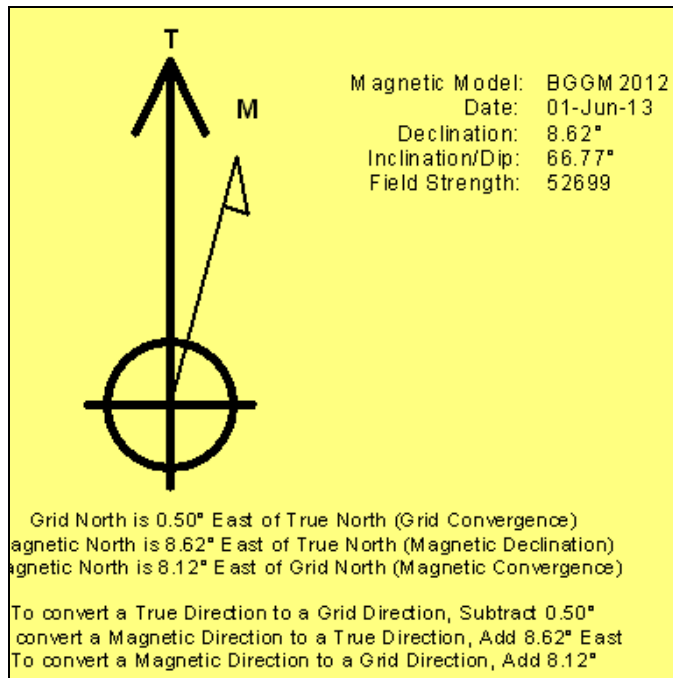
**North Reference Sheet for Sec. 12-T2N-R66W - Dove 32N-13HZ - Plan B Rev 0**

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 @ 5026.00ft (HP 308). Northing and Easting are relative to Dove 32N-13HZ  
 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: 0.99995813

Grid Coordinates of Well: 1,301,609.60 ft N, 3,214,385.50 ft E  
 Geographical Coordinates of Well: 40° 09' 31.56" N, 104° 43' 58.66" W  
 Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,438.00ft  
 the Bottom Hole Displacement is 6,962.46ft in the Direction of 183.00° (True).

Magnetic Convergence at surface is: -8.12° ( 1 June 2013, , BGGM2012)



# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 12-T2N-R66W

Dove 32N-13HZ

Plan B Rev 0

Design: Actual Field Surveys

## Sperry Drilling Services

# Geodetic Report

21 May, 2013

Well Coordinates: 1,301,609.60 N, 3,214,385.50 E (40° 09' 31.56" N, 104° 43' 58.66" W)

Ground Level: 5,001.00 ft

Local Coordinate Origin:	Centered on Well Dove 32N-13HZ
Viewing Datum:	RKB=25 @ 5026.00ft (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**

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N-S (ft)	+E-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
0.00	0.00	0.00	0.00	0.00	0.00	40.158768	-104.732962	1,301,609.60	3,214,385.50
25.00	0.00	0.00	25.00	0.00	0.00	40.158768	-104.732962	1,301,609.60	3,214,385.50
125.00	0.45	64.83	125.00	0.17	0.36	40.158768	-104.732961	1,301,609.77	3,214,385.85
225.00	0.21	22.78	225.00	0.50	0.78	40.158769	-104.732959	1,301,610.11	3,214,386.28
325.00	0.58	33.36	324.99	1.09	1.13	40.158771	-104.732958	1,301,610.71	3,214,386.62
425.00	0.33	17.96	424.99	1.79	1.50	40.158773	-104.732957	1,301,611.41	3,214,386.98
525.00	0.18	109.07	524.99	2.01	1.74	40.158774	-104.732956	1,301,611.63	3,214,387.22
625.00	0.60	99.45	624.99	1.88	2.40	40.158773	-104.732953	1,301,611.50	3,214,387.88
725.00	0.12	344.20	724.99	1.89	2.89	40.158773	-104.732952	1,301,611.52	3,214,388.37
825.00	0.37	35.95	824.99	2.25	3.05	40.158774	-104.732951	1,301,611.88	3,214,388.53
925.00	0.82	116.56	924.98	2.20	3.88	40.158774	-104.732948	1,301,611.83	3,214,389.36
964.00	0.67	60.39	963.98	2.18	4.33	40.158774	-104.732947	1,301,611.82	3,214,389.81
1,190.00	0.99	90.42	1,189.96	2.82	7.43	40.158776	-104.732935	1,301,612.49	3,214,392.90
1,373.00	1.45	81.60	1,372.91	3.15	11.30	40.158777	-104.732922	1,301,612.85	3,214,396.77
1,557.00	0.80	115.10	1,556.88	2.94	14.77	40.158776	-104.732909	1,301,612.68	3,214,400.24
1,649.00	0.85	127.43	1,648.87	2.26	15.89	40.158774	-104.732905	1,301,612.00	3,214,401.37
1,832.00	0.40	128.46	1,831.86	1.03	17.47	40.158771	-104.732900	1,301,610.79	3,214,402.96
1,924.00	0.51	102.86	1,923.86	0.74	18.12	40.158770	-104.732897	1,301,610.50	3,214,403.61
2,016.00	1.42	343.01	2,015.85	1.74	18.18	40.158773	-104.732897	1,301,611.50	3,214,403.67
2,107.00	2.61	3.95	2,106.79	4.89	18.00	40.158781	-104.732898	1,301,614.65	3,214,403.45
2,202.00	4.64	352.45	2,201.60	10.86	17.64	40.158798	-104.732899	1,301,620.61	3,214,403.05
2,297.00	5.98	345.91	2,296.19	19.46	15.93	40.158821	-104.732905	1,301,629.21	3,214,401.26
2,392.00	8.05	341.01	2,390.47	30.56	12.56	40.158852	-104.732917	1,301,640.27	3,214,397.80
2,487.00	9.74	333.45	2,484.33	44.04	6.81	40.158889	-104.732938	1,301,653.70	3,214,391.92
2,582.00	8.52	333.98	2,578.12	57.55	0.13	40.158926	-104.732962	1,301,667.15	3,214,385.13
2,677.00	9.61	322.15	2,671.94	70.14	-7.83	40.158960	-104.732990	1,301,679.67	3,214,377.07
2,771.00	8.63	320.34	2,764.75	81.76	-17.14	40.158992	-104.733023	1,301,691.21	3,214,367.65
2,961.00	9.73	323.30	2,952.32	105.61	-35.84	40.159058	-104.733090	1,301,714.89	3,214,348.75
3,151.00	9.39	323.96	3,139.68	131.01	-54.55	40.159128	-104.733157	1,301,740.14	3,214,329.82
3,341.00	8.84	320.96	3,327.28	154.89	-72.87	40.159193	-104.733223	1,301,763.85	3,214,311.30
3,530.00	10.04	327.10	3,513.72	180.00	-90.96	40.159262	-104.733287	1,301,788.80	3,214,292.99
3,720.00	8.29	326.84	3,701.29	205.38	-107.45	40.159332	-104.733346	1,301,814.03	3,214,276.28
3,910.00	9.27	333.74	3,889.07	230.57	-121.72	40.159401	-104.733397	1,301,839.10	3,214,261.80
4,099.00	10.05	324.09	4,075.40	257.58	-138.13	40.159475	-104.733456	1,301,865.97	3,214,245.16
4,289.00	8.70	322.36	4,262.86	282.39	-156.63	40.159543	-104.733522	1,301,890.61	3,214,226.44
4,479.00	8.59	327.09	4,450.70	305.68	-173.11	40.159607	-104.733581	1,301,913.76	3,214,209.76
4,668.00	9.67	331.41	4,637.30	331.47	-188.38	40.159678	-104.733636	1,301,939.41	3,214,194.27
4,858.00	9.11	327.10	4,824.76	358.11	-204.18	40.159751	-104.733693	1,301,965.92	3,214,178.23
5,048.00	7.82	321.55	5,012.69	380.86	-220.39	40.159813	-104.733750	1,301,988.53	3,214,161.83
5,142.00	6.99	316.98	5,105.91	390.05	-228.27	40.159839	-104.733779	1,301,997.65	3,214,153.87
5,237.00	5.17	315.41	5,200.37	397.33	-235.22	40.159859	-104.733804	1,302,004.86	3,214,146.86
5,332.00	4.43	326.51	5,295.04	403.43	-240.25	40.159875	-104.733822	1,302,010.93	3,214,141.78

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (ft)	+E/-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
5,427.00	3.01	322.53	5,389.83	408.47	-243.79	40.159889	-104.733834	1,302,015.94	3,214,138.19
5,522.00	1.32	320.77	5,484.76	411.30	-246.00	40.159897	-104.733842	1,302,018.75	3,214,135.96
5,617.00	1.35	323.38	5,579.74	413.05	-247.36	40.159902	-104.733847	1,302,020.48	3,214,134.59
5,712.00	1.34	306.73	5,674.71	414.61	-248.92	40.159906	-104.733853	1,302,022.03	3,214,133.01
5,901.00	0.55	290.33	5,863.68	416.25	-251.54	40.159911	-104.733862	1,302,023.64	3,214,130.38
6,091.00	0.80	275.57	6,053.67	416.69	-253.72	40.159912	-104.733870	1,302,024.07	3,214,128.20
6,281.00	0.35	235.84	6,243.66	416.49	-255.52	40.159911	-104.733876	1,302,023.86	3,214,126.40
6,471.00	1.10	140.30	6,433.65	414.77	-254.83	40.159907	-104.733874	1,302,022.13	3,214,127.10
6,629.00	1.80	119.08	6,591.60	412.39	-251.69	40.159900	-104.733862	1,302,019.79	3,214,130.26
6,660.00	1.78	125.44	6,622.58	411.88	-250.88	40.159899	-104.733860	1,302,019.28	3,214,131.08
6,692.00	2.20	125.81	6,654.56	411.23	-249.97	40.159897	-104.733856	1,302,018.64	3,214,131.99
6,724.00	2.84	149.27	6,686.53	410.19	-249.07	40.159894	-104.733853	1,302,017.61	3,214,132.90
6,756.00	4.88	173.98	6,718.46	408.15	-248.52	40.159888	-104.733851	1,302,015.58	3,214,133.47
6,787.00	7.65	184.29	6,749.27	404.78	-248.54	40.159879	-104.733851	1,302,012.21	3,214,133.48
6,819.00	9.95	184.92	6,780.90	399.90	-248.93	40.159866	-104.733853	1,302,007.32	3,214,133.13
6,851.00	12.84	185.23	6,812.26	393.61	-249.50	40.159848	-104.733855	1,302,001.02	3,214,132.62
6,882.00	15.69	189.24	6,842.30	386.04	-250.48	40.159828	-104.733858	1,301,993.45	3,214,131.70
6,914.00	17.33	187.93	6,872.98	377.05	-251.84	40.159803	-104.733863	1,301,984.44	3,214,130.42
6,945.00	20.17	183.39	6,902.34	367.14	-252.79	40.159776	-104.733866	1,301,974.52	3,214,129.55
6,977.00	23.51	182.27	6,932.04	355.25	-253.37	40.159743	-104.733868	1,301,962.63	3,214,129.08
7,009.00	25.89	180.69	6,961.11	341.88	-253.70	40.159706	-104.733870	1,301,949.27	3,214,128.86
7,040.00	29.24	180.09	6,988.58	327.54	-253.80	40.159667	-104.733870	1,301,934.92	3,214,128.89
7,072.00	32.38	179.92	7,016.06	311.15	-253.80	40.159622	-104.733870	1,301,918.54	3,214,129.03
7,103.00	35.38	182.13	7,041.80	293.88	-254.12	40.159575	-104.733871	1,301,901.26	3,214,128.86
7,135.00	38.54	182.71	7,067.36	274.66	-254.94	40.159522	-104.733874	1,301,882.03	3,214,128.21
7,166.00	41.60	183.07	7,091.08	254.73	-255.94	40.159467	-104.733878	1,301,862.10	3,214,127.37
7,198.00	45.42	182.40	7,114.29	232.73	-256.99	40.159407	-104.733881	1,301,840.09	3,214,126.52
7,230.00	49.07	182.52	7,136.01	209.26	-258.00	40.159342	-104.733885	1,301,816.61	3,214,125.71
7,261.00	52.66	181.01	7,155.57	185.23	-258.73	40.159276	-104.733888	1,301,792.58	3,214,125.18
7,293.00	55.67	180.37	7,174.30	159.29	-259.04	40.159205	-104.733889	1,301,766.64	3,214,125.10
7,324.00	57.48	179.38	7,191.38	133.42	-258.98	40.159134	-104.733889	1,301,740.77	3,214,125.38
7,356.00	59.66	178.64	7,208.07	106.12	-258.51	40.159059	-104.733887	1,301,713.48	3,214,126.09
7,387.00	62.55	178.21	7,223.04	78.99	-257.76	40.158985	-104.733884	1,301,686.36	3,214,127.07
7,419.00	65.49	178.22	7,237.06	50.24	-256.87	40.158906	-104.733881	1,301,657.62	3,214,128.22
7,451.00	67.85	178.68	7,249.73	20.87	-256.07	40.158825	-104.733878	1,301,628.26	3,214,129.27
7,482.00	69.63	179.45	7,260.97	-8.01	-255.60	40.158746	-104.733876	1,301,599.38	3,214,129.99
7,514.00	71.80	180.05	7,271.54	-38.21	-255.47	40.158663	-104.733876	1,301,569.18	3,214,130.38
7,545.00	75.28	181.40	7,280.32	-67.94	-255.85	40.158581	-104.733877	1,301,539.46	3,214,130.26
7,577.00	78.57	182.31	7,287.56	-99.09	-256.86	40.158496	-104.733881	1,301,508.31	3,214,129.51
7,609.00	80.57	182.23	7,293.35	-130.53	-258.11	40.158410	-104.733885	1,301,476.85	3,214,128.54
7,652.00	84.82	182.35	7,298.82	-173.14	-259.81	40.158293	-104.733892	1,301,434.23	3,214,127.21
7,689.60	87.59	182.52	7,301.31	-210.62	-261.41	40.158190	-104.733897	1,301,396.74	3,214,125.94

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (ft)	+E/-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
7,716.00	89.54	182.64	7,301.97	-236.98	-262.59	40.158117	-104.733901	1,301,370.37	3,214,124.98
7,808.00	89.39	183.11	7,302.83	-328.86	-267.21	40.157865	-104.733918	1,301,278.46	3,214,121.16
7,900.00	89.91	182.73	7,303.39	-420.74	-271.89	40.157613	-104.733935	1,301,186.55	3,214,117.26
7,992.00	89.66	181.74	7,303.73	-512.67	-275.48	40.157361	-104.733948	1,301,094.59	3,214,114.47
8,083.00	89.20	179.88	7,304.64	-603.65	-276.77	40.157111	-104.733952	1,301,003.61	3,214,113.97
8,175.00	89.81	179.84	7,305.43	-695.65	-276.54	40.156858	-104.733951	1,300,911.62	3,214,114.99
8,267.00	90.92	178.89	7,304.85	-787.64	-275.52	40.156606	-104.733948	1,300,819.65	3,214,116.81
8,359.00	89.91	176.01	7,304.18	-879.53	-271.43	40.156354	-104.733933	1,300,727.79	3,214,121.70
8,450.00	89.45	176.55	7,304.69	-970.34	-265.53	40.156104	-104.733912	1,300,637.05	3,214,128.38
8,542.00	89.63	177.19	7,305.43	-1,062.20	-260.50	40.155852	-104.733894	1,300,545.24	3,214,134.20
8,634.00	89.20	178.21	7,306.37	-1,154.12	-256.81	40.155600	-104.733881	1,300,453.36	3,214,138.69
8,726.00	90.68	181.96	7,306.46	-1,246.10	-256.95	40.155347	-104.733881	1,300,361.38	3,214,139.35
8,817.00	89.75	180.76	7,306.12	-1,337.07	-259.11	40.155098	-104.733889	1,300,270.40	3,214,137.98
8,909.00	89.57	180.84	7,306.67	-1,429.06	-260.39	40.154845	-104.733894	1,300,178.41	3,214,137.49
9,001.00	89.04	180.76	7,307.78	-1,521.04	-261.68	40.154593	-104.733898	1,300,086.42	3,214,137.00
9,093.00	89.32	180.33	7,309.10	-1,613.03	-262.55	40.154340	-104.733901	1,299,994.43	3,214,136.92
9,185.00	91.94	180.76	7,308.09	-1,705.01	-263.43	40.154088	-104.733904	1,299,902.45	3,214,136.84
9,277.00	91.48	179.62	7,305.34	-1,796.97	-263.73	40.153835	-104.733905	1,299,810.50	3,214,137.33
9,371.00	91.73	180.61	7,302.71	-1,890.93	-263.92	40.153577	-104.733906	1,299,716.54	3,214,137.95
9,466.00	92.56	181.98	7,299.16	-1,985.83	-266.07	40.153317	-104.733914	1,299,621.63	3,214,136.63
9,561.00	90.15	183.59	7,296.91	-2,080.69	-270.68	40.153056	-104.733930	1,299,526.74	3,214,132.84
9,656.00	90.80	183.87	7,296.12	-2,175.48	-276.86	40.152796	-104.733952	1,299,431.90	3,214,127.48
9,751.00	88.06	182.93	7,297.07	-2,270.30	-282.49	40.152536	-104.733973	1,299,337.04	3,214,122.66
9,845.00	88.80	182.59	7,299.64	-2,364.15	-287.02	40.152278	-104.733989	1,299,243.16	3,214,118.95
9,940.00	89.26	182.59	7,301.25	-2,459.04	-291.31	40.152018	-104.734004	1,299,148.24	3,214,115.48
10,035.00	88.95	181.90	7,302.73	-2,553.96	-295.03	40.151757	-104.734017	1,299,053.30	3,214,112.58
10,130.00	89.35	180.75	7,304.14	-2,648.92	-297.23	40.151497	-104.734025	1,298,958.32	3,214,111.21
10,225.00	89.60	178.78	7,305.01	-2,743.91	-296.84	40.151236	-104.734024	1,298,863.34	3,214,112.42
10,320.00	89.54	178.44	7,305.73	-2,838.88	-294.53	40.150975	-104.734016	1,298,768.40	3,214,115.54
10,415.00	88.83	176.27	7,307.08	-2,933.76	-290.15	40.150715	-104.734000	1,298,673.57	3,214,120.75
10,510.00	86.52	174.85	7,310.93	-3,028.39	-282.80	40.150455	-104.733974	1,298,579.01	3,214,128.91
10,604.00	88.92	176.22	7,314.67	-3,122.02	-275.49	40.150198	-104.733947	1,298,485.45	3,214,137.03
10,699.00	89.35	179.10	7,316.11	-3,216.92	-271.62	40.149937	-104.733934	1,298,390.59	3,214,141.73
10,794.00	91.23	180.36	7,315.63	-3,311.91	-271.17	40.149677	-104.733932	1,298,295.61	3,214,143.00
10,889.00	91.82	181.28	7,313.10	-3,406.87	-272.53	40.149416	-104.733937	1,298,200.65	3,214,142.46
10,984.00	93.30	182.13	7,308.85	-3,501.73	-275.35	40.149156	-104.733947	1,298,105.77	3,214,140.46
11,078.00	90.56	182.60	7,305.69	-3,595.59	-279.23	40.148898	-104.733961	1,298,011.89	3,214,137.39
11,173.00	91.57	182.62	7,303.92	-3,690.47	-283.55	40.148638	-104.733976	1,297,916.97	3,214,133.89
11,268.00	88.86	183.02	7,303.57	-3,785.34	-288.23	40.148377	-104.733993	1,297,822.07	3,214,130.04
11,363.00	89.01	182.26	7,305.33	-3,880.23	-292.60	40.148117	-104.734009	1,297,727.15	3,214,126.48
11,458.00	88.67	182.39	7,307.26	-3,975.13	-296.45	40.147856	-104.734022	1,297,632.23	3,214,123.45
11,553.00	88.86	181.74	7,309.30	-4,070.04	-299.88	40.147596	-104.734035	1,297,537.29	3,214,120.85

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (ft)	+E/-W (ft)	Latitude (ft)	Longitude (ft)	Northing (ft)	Easting (ft)
11,648.00	89.94	181.29	7,310.30	-4,165.00	-302.39	40.147335	-104.734044	1,297,442.31	3,214,119.16
11,742.00	88.89	180.24	7,311.26	-4,258.99	-303.64	40.147077	-104.734048	1,297,348.33	3,214,118.72
11,837.00	91.05	182.83	7,311.31	-4,353.94	-306.19	40.146816	-104.734057	1,297,253.36	3,214,117.00
11,932.00	92.32	182.17	7,308.51	-4,448.81	-310.33	40.146556	-104.734072	1,297,158.47	3,214,113.67
12,027.00	90.52	181.91	7,306.16	-4,543.71	-313.71	40.146295	-104.734084	1,297,063.54	3,214,111.11
12,122.00	91.02	181.13	7,304.88	-4,638.67	-316.23	40.146035	-104.734093	1,296,968.57	3,214,109.42
12,217.00	90.09	180.57	7,303.96	-4,733.65	-317.64	40.145774	-104.734098	1,296,873.58	3,214,108.83
12,312.00	89.54	180.66	7,304.27	-4,828.65	-318.66	40.145513	-104.734102	1,296,778.58	3,214,108.63
12,407.00	89.72	179.56	7,304.88	-4,923.64	-318.84	40.145252	-104.734102	1,296,683.59	3,214,109.27
12,502.00	88.70	180.37	7,306.19	-5,018.63	-318.78	40.144992	-104.734102	1,296,588.61	3,214,110.15
12,596.00	88.89	178.92	7,308.17	-5,112.61	-318.20	40.144734	-104.734100	1,296,494.65	3,214,111.55
12,691.00	89.04	179.11	7,309.89	-5,207.58	-316.57	40.144473	-104.734094	1,296,399.70	3,214,114.00
12,786.00	88.80	179.49	7,311.68	-5,302.55	-315.41	40.144212	-104.734090	1,296,304.74	3,214,115.98
12,881.00	89.78	181.72	7,312.85	-5,397.53	-316.41	40.143952	-104.734094	1,296,209.76	3,214,115.80
12,975.00	90.28	180.50	7,312.80	-5,491.51	-318.23	40.143694	-104.734100	1,296,115.77	3,214,114.79
13,070.00	90.22	180.77	7,312.39	-5,586.51	-319.28	40.143433	-104.734104	1,296,020.78	3,214,114.56
13,165.00	89.78	183.35	7,312.39	-5,681.44	-322.70	40.143172	-104.734116	1,295,925.83	3,214,111.97
13,260.00	92.00	182.82	7,310.91	-5,776.28	-327.81	40.142912	-104.734135	1,295,830.94	3,214,107.68
13,355.00	92.69	183.02	7,307.03	-5,871.08	-332.65	40.142652	-104.734152	1,295,736.11	3,214,103.66
13,449.00	93.96	182.54	7,301.58	-5,964.81	-337.20	40.142394	-104.734168	1,295,642.35	3,214,099.92
13,544.00	93.05	182.86	7,295.77	-6,059.52	-341.66	40.142134	-104.734184	1,295,547.61	3,214,096.27
13,639.00	91.11	182.79	7,292.32	-6,154.34	-346.34	40.141874	-104.734201	1,295,452.75	3,214,092.42
13,733.00	91.73	183.00	7,289.99	-6,248.19	-351.09	40.141617	-104.734218	1,295,358.87	3,214,088.48
13,828.00	89.51	182.64	7,288.96	-6,343.07	-355.76	40.141356	-104.734234	1,295,263.96	3,214,084.63
13,923.00	90.06	182.33	7,289.32	-6,437.98	-359.88	40.141096	-104.734249	1,295,169.03	3,214,081.33
14,018.00	89.51	181.32	7,289.68	-6,532.93	-362.91	40.140835	-104.734260	1,295,074.06	3,214,079.13
14,112.00	89.60	180.69	7,290.41	-6,626.91	-364.56	40.140577	-104.734266	1,294,980.07	3,214,078.29
14,207.00	90.12	180.46	7,290.64	-6,721.90	-365.51	40.140316	-104.734269	1,294,885.07	3,214,078.16
14,302.00	90.40	180.16	7,290.21	-6,816.90	-366.02	40.140055	-104.734271	1,294,790.08	3,214,078.47
14,388.00	90.65	179.25	7,289.42	-6,902.89	-365.58	40.139819	-104.734270	1,294,704.10	3,214,079.65
14,438.00	90.65	179.25	7,288.85	-6,952.89	-364.93	40.139682	-104.734267	1,294,654.11	3,214,080.74

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

**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	0.17	0.36	First MS Energy Services Gyro @ 125.00ft
964.00	963.98	2.18	4.33	Final MS Energy Services Gyro @ 964.00ft
964.00	963.98	2.18	4.33	Tie-On to Surface Gyros @ 964.00ft
1,190.00	1,189.96	2.82	7.43	First Sperry MWD Survey @ 1190.00ft
14,388.00	7,289.42	-6,902.89	-365.58	Final Sperry MWD Survey @ 14388.00ft
14,438.00	7,288.85	-6,952.89	-364.93	Straight Line Proj @ 14438' MD :: 7288.85' TVD

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
User	No Target (Freehand)	180.96	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
25.00	964.00	MS Energy Services - Surface Gyros	NS-GYRO-MS
1,190.00	7,652.00	Sperry MWD Surveys - Vert/Build	MWD+SC
7,716.00	14,388.00	Sperry MWD Surveys - Lateral	MWD+SC

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,689.60	7,301.31	7" Casing @ 7689.6' MD :: 7301.31' TVD	7	8-3/4

**Design Report for Dove 32N-13HZ - Actual Field Surveys**

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*Targets for Plan B Rev 0*

<b>Shape</b>	<b>Target Name</b>	<b>TVD (ft)</b>	<b>Northing (ft)</b>	<b>Easting (ft)</b>	<b>+N/-S ft</b>	<b>+E/-W ft</b>	<b>Created</b>	<b>Updated</b>
Point	Dove 32N-13HZ_BHL	7,281.00	1,294,625.61	3,214,076.29	-6,981.35	-369.62	04-18-2013	05-03-2013
Polygon	Dove 32N-13HZ_LD	0.00	1,301,609.61	3,214,385.50	0.00	0.00	04-29-2013	04-29-2013
Polygon	Dove 32N-13HZ_Sec	0.00	1,301,609.61	3,214,385.50	0.00	0.00	04-29-2013	04-29-2013
Polygon	Dove 32N-13HZ_12/13	0.00	1,301,609.61	3,214,385.50	0.00	0.00	04-29-2013	04-29-2013
Point	Dove 32N-13HZ_SHL	0.00	1,301,609.61	3,214,385.50	0.00	0.00	04-18-2013	04-18-2013

**North Reference Sheet for Sec. 12-T2N-R66W - Dove 32N-13HZ - Plan B 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 @ 5026.00ft (HP 308). Northing and Easting are relative to Dove 32N-13HZ  
 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: 0.99995813

Grid Coordinates of Well: 1,301,609.60 ft N, 3,214,385.50 ft E  
 Geographical Coordinates of Well: 40° 09' 31.56" N, 104° 43' 58.66" W  
 Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,438.00ft  
 the Bottom Hole Displacement is 6,962.46ft in the Direction of 183.00° (True).  
 Magnetic Convergence at surface is: -8.12° ( 1 June 2013, , BGGM2012)

