

HALLIBURTON

Sperry Drilling

END OF WELL REPORT

For

Anadarko Petroleum Corp.

*Gobbler 2C-23HZ
Sec. 23-T2N-R66W
Weld County, CO*

Job #900275968

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CERTIFIED SURVEY WORK SHEET

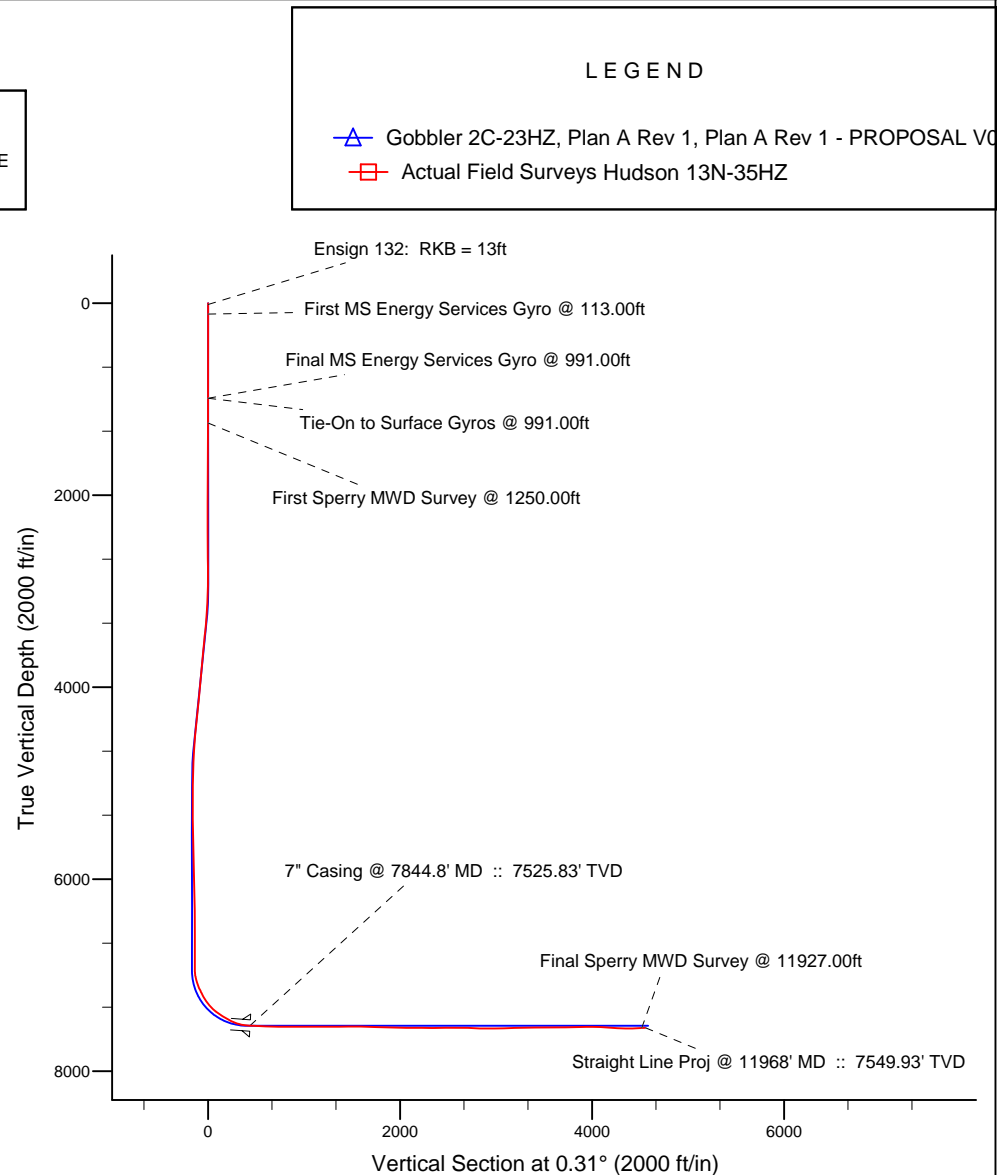
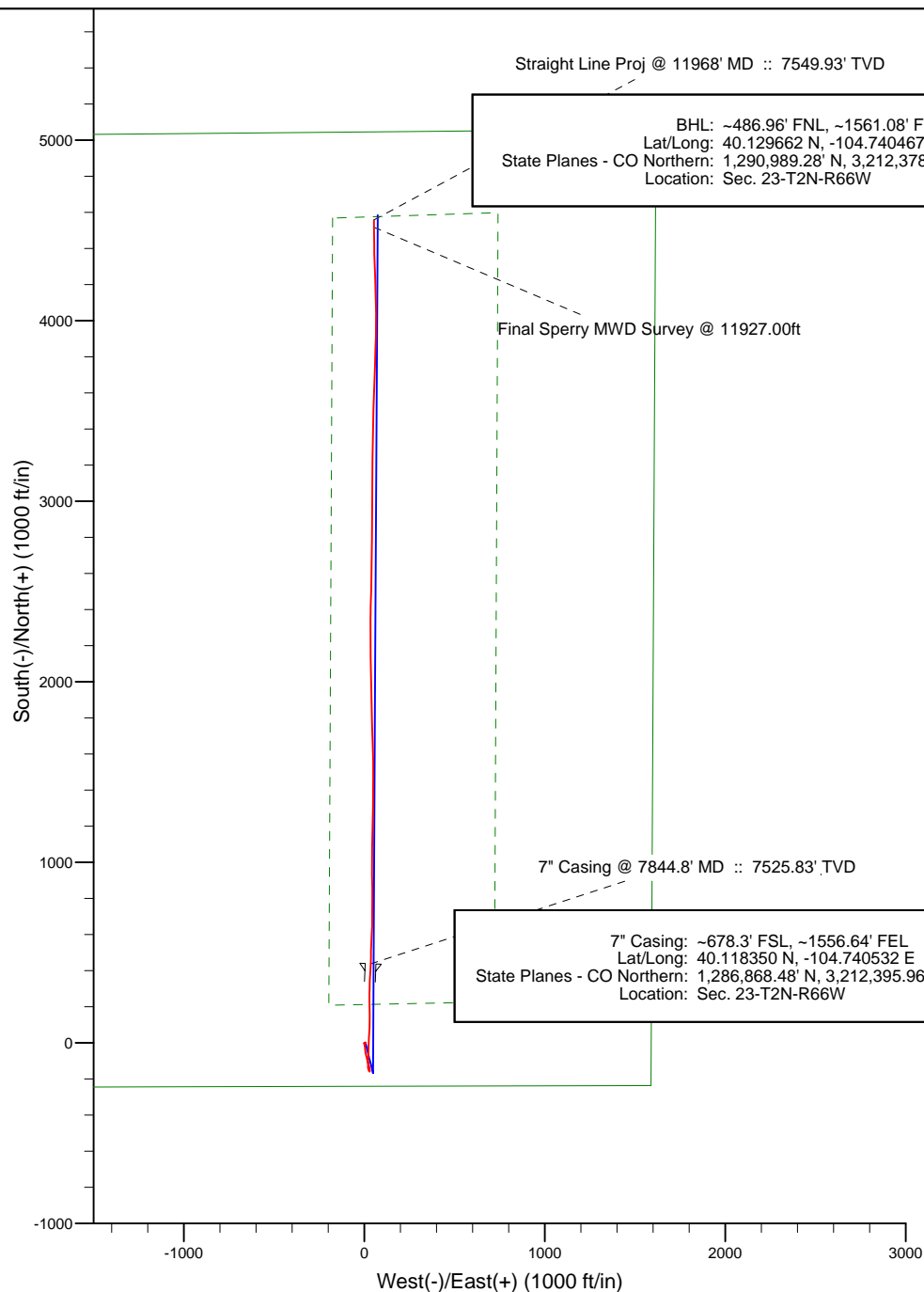
SSDS Job Number :	CA-MJ-900275968
Start Date of Job :	05/02/13
End Date of Job :	05/11/13
Lead Directional Driller:	Justin Lee Groom
	Michael Coker
Other SSDS DD's :	
SSDS MWD Engineers :	Joshua Huckeby
	Patrick Megee
	Evan LeBlanc

Examples of Survey Types:

Project: Weld County, CO (NAD 83)
Site: Sec. 23-T2N-R66W
Well: Gobbler 2C-23HZ
Wellbore: Plan A Rev 1
Design: Actual Field Surveys



HALLIBURTON
Sperry Drilling



WELL DETAILS: Gobbler 2C-23HZ	
Ground Level:	5094.00
RKB=13 @ 5107.00ft (Ensign 132)	
Design: Actual Field Surveys (Gobbler 2C-23HZ/Plan A Rev 1)	
Created By: Fred Hartmann	Date: 05/15/2013
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 23-T2N-R66W

Gobbler 2C-23HZ

Plan A Rev 1

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

15 May, 2013

Well Coordinates: 1,286,429.60 N, 3,212,364.65 E (40° 07' 01.73" N, 104° 44' 26.37" W)

Ground Level: 5,094.00 ft

Local Coordinate Origin:

Centered on Well Gobbler 2C-23HZ

Viewing Datum:

RKB=13 @ 5107.00ft (Ensign 132)

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 Gobbler 2C-23HZ - 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
13.00	0.00	0.00	13.00	0.00	0.00	0.00	0.00
Ensign 132: RKB = 13ft							
113.00	0.45	31.95	113.00	0.33	0.21	0.33	0.45
First MS Energy Services Gyro @ 113.00ft							
213.00	0.41	64.87	213.00	0.82	0.74	0.82	0.25
313.00	0.48	96.11	312.99	0.93	1.48	0.93	0.25
413.00	0.78	71.53	412.99	1.10	2.54	1.11	0.40
513.00	0.68	83.70	512.98	1.38	3.78	1.40	0.18
613.00	0.56	74.24	612.97	1.58	4.84	1.60	0.16
713.00	0.43	83.04	712.97	1.75	5.68	1.78	0.15
813.00	0.50	86.49	812.97	1.83	6.49	1.86	0.08
913.00	0.19	75.53	912.96	1.89	7.08	1.93	0.32
991.00	0.02	278.40	990.96	1.93	7.20	1.97	0.27
Final MS Energy Services Gyro @ 991.00ft - Tie-On to Surface Gyros @ 991.00ft							
1,250.00	0.46	212.75	1,249.96	1.06	6.59	1.10	0.17
First Sperry MWD Survey @ 1250.00ft							
1,526.00	0.36	183.19	1,525.95	-0.74	5.94	-0.70	0.08
1,802.00	0.33	200.38	1,801.95	-2.35	5.62	-2.32	0.04
2,086.00	0.77	265.44	2,085.94	-3.27	3.43	-3.25	0.25
2,373.00	0.44	331.46	2,372.92	-2.45	0.98	-2.45	0.25
2,660.00	0.41	352.54	2,659.92	-0.47	0.32	-0.46	0.06
2,946.00	0.45	196.97	2,945.91	-0.52	-0.14	-0.53	0.29
3,041.00	1.64	165.58	3,040.90	-2.20	0.09	-2.20	1.34
3,137.00	2.98	173.45	3,136.82	-6.01	0.72	-6.00	1.43
3,233.00	4.39	169.26	3,232.62	-12.10	1.69	-12.09	1.49
3,330.00	5.17	170.19	3,329.28	-20.05	3.12	-20.03	0.81
3,425.00	6.55	174.44	3,423.78	-29.66	4.38	-29.64	1.52
3,520.00	5.35	177.91	3,518.27	-39.48	5.06	-39.45	1.32
3,615.00	5.17	168.85	3,612.87	-48.11	6.05	-48.07	0.89
3,710.00	5.12	169.35	3,707.49	-56.47	7.66	-56.43	0.07
3,806.00	5.17	162.03	3,803.10	-64.80	9.79	-64.74	0.69
3,901.00	5.75	173.20	3,897.67	-73.59	11.67	-73.53	1.27
3,996.00	5.39	169.86	3,992.22	-82.71	13.02	-82.64	0.51
4,092.00	5.80	164.32	4,087.77	-91.82	15.13	-91.74	0.71
4,188.00	5.53	159.28	4,183.30	-100.82	18.08	-100.72	0.59
4,284.00	6.59	162.12	4,278.76	-110.39	21.40	-110.27	1.15
4,379.00	6.56	165.51	4,373.14	-120.83	24.43	-120.69	0.41
4,475.00	5.65	162.29	4,468.59	-130.64	27.24	-130.49	1.01
4,570.00	4.28	168.10	4,563.23	-138.56	29.40	-138.40	1.53
4,666.00	4.01	174.57	4,658.98	-145.41	30.45	-145.24	0.56
4,762.00	2.80	178.06	4,754.81	-151.10	30.85	-150.93	1.28
4,857.00	1.63	182.35	4,849.74	-154.77	30.87	-154.60	1.24
4,953.00	1.30	201.03	4,945.71	-157.15	30.43	-156.98	0.60
5,048.00	0.71	226.85	5,040.69	-158.55	29.61	-158.39	0.77
5,144.00	0.32	305.72	5,136.69	-158.80	28.96	-158.65	0.75
5,428.00	1.14	336.80	5,420.66	-155.74	27.20	-155.60	0.31
5,811.00	0.97	328.02	5,803.60	-149.49	23.99	-149.36	0.06
6,193.00	1.23	3.71	6,185.53	-142.66	22.54	-142.53	0.19
6,573.00	0.69	31.45	6,565.48	-136.64	24.00	-136.51	0.18

Design Report for Gobbler 2C-23HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,885.00	1.26	230.05	6,877.46	-137.24	22.35	-137.11	0.62
6,955.00	1.52	310.92	6,947.45	-137.12	21.05	-137.01	2.59
7,003.00	8.14	1.23	6,995.26	-133.30	20.65	-133.19	15.13
7,051.00	14.41	2.07	7,042.31	-123.93	20.93	-123.81	13.07
7,096.00	18.91	3.78	7,085.41	-111.05	21.62	-110.93	10.06
7,146.00	23.22	0.23	7,132.06	-93.10	22.19	-92.98	8.99
7,194.00	26.12	0.94	7,175.67	-73.07	22.40	-72.95	6.07
7,241.00	28.73	1.55	7,217.39	-51.43	22.88	-51.30	5.59
7,289.00	33.02	1.98	7,258.58	-26.81	23.64	-26.69	8.95
7,336.00	37.95	2.19	7,296.84	0.44	24.64	0.58	10.49
7,385.00	43.02	3.40	7,334.09	32.21	26.21	32.35	10.47
7,432.00	49.27	3.76	7,366.64	66.01	28.33	66.17	13.31
7,480.00	55.63	0.74	7,395.88	104.01	29.78	104.17	14.16
7,527.00	58.90	0.04	7,421.29	143.54	30.04	143.70	7.07
7,576.00	58.75	358.80	7,446.66	185.46	29.62	185.62	2.19
7,623.00	61.09	358.68	7,470.22	226.12	28.72	226.27	4.98
7,671.00	67.65	0.91	7,490.97	269.37	28.59	269.52	14.29
7,719.00	74.27	2.48	7,506.62	314.70	29.95	314.85	14.13
7,767.00	79.35	2.90	7,517.57	361.36	32.14	361.53	10.62
7,809.00	85.31	1.81	7,523.17	402.93	33.85	403.11	14.42
7,844.80	86.19	2.12	7,525.83	438.61	35.07	438.80	2.60
7" Casing @ 7844.8' MD :: 7525.83' TVD							
7,912.00	87.84	2.70	7,529.33	505.66	37.89	505.86	2.60
8,007.00	88.02	2.04	7,532.76	600.52	41.82	600.73	0.72
8,103.00	88.89	0.50	7,535.35	696.45	43.95	696.68	1.84
8,199.00	88.46	359.75	7,537.57	792.43	44.15	792.66	0.90
8,295.00	91.05	0.15	7,537.98	888.42	44.07	888.64	2.73
8,391.00	90.56	358.86	7,536.63	984.40	43.24	984.62	1.44
8,487.00	89.07	1.49	7,536.94	1,080.39	43.53	1,080.61	3.15
8,582.00	90.31	0.84	7,537.45	1,175.37	45.47	1,175.60	1.47
8,678.00	90.49	1.81	7,536.78	1,271.34	47.69	1,271.58	1.03
8,773.00	90.37	0.34	7,536.07	1,366.32	49.47	1,366.56	1.55
8,869.00	90.43	359.95	7,535.40	1,462.31	49.71	1,462.56	0.41
8,965.00	90.19	359.45	7,534.88	1,558.31	49.21	1,558.55	0.58
9,060.00	87.77	357.86	7,536.57	1,653.26	46.98	1,653.49	3.05
9,155.00	88.08	358.88	7,540.01	1,748.16	44.28	1,748.37	1.12
9,251.00	87.47	358.38	7,543.74	1,844.06	41.99	1,844.26	0.82
9,346.00	89.44	357.97	7,546.30	1,938.97	38.96	1,939.15	2.12
9,442.00	89.57	359.20	7,547.13	2,034.93	36.59	2,035.10	1.29
9,537.00	89.26	0.21	7,548.10	2,129.93	36.10	2,130.09	1.11
9,633.00	89.07	359.13	7,549.50	2,225.91	35.55	2,226.07	1.14
9,729.00	89.63	359.89	7,550.58	2,321.90	34.73	2,322.06	0.98
9,824.00	90.74	1.63	7,550.28	2,416.89	35.99	2,417.05	2.17
9,919.00	91.30	1.37	7,548.59	2,511.84	38.47	2,512.01	0.65
10,015.00	89.88	0.96	7,547.60	2,607.81	40.43	2,607.99	1.54
10,111.00	87.28	0.28	7,549.98	2,703.77	41.46	2,703.95	2.80
10,206.00	88.33	0.86	7,553.62	2,798.69	42.41	2,798.88	1.26
10,302.00	90.31	0.19	7,554.75	2,894.68	43.29	2,894.87	2.18
10,397.00	90.49	0.66	7,554.09	2,989.67	43.99	2,989.87	0.53
10,492.00	91.36	0.08	7,552.56	3,084.66	44.61	3,084.85	1.10
10,588.00	91.61	0.97	7,550.07	3,180.62	45.49	3,180.82	0.96

Design Report for Gobbler 2C-23HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,683.00	90.93	0.49	7,547.96	3,275.59	46.70	3,275.79	0.88
10,778.00	90.87	0.71	7,546.47	3,370.57	47.69	3,370.78	0.24
10,873.00	90.99	1.99	7,544.93	3,465.53	49.93	3,465.75	1.35
10,969.00	90.49	2.19	7,543.69	3,561.46	53.43	3,561.69	0.56
11,064.00	89.57	1.65	7,543.64	3,656.40	56.61	3,656.66	1.12
11,160.00	91.11	1.88	7,543.07	3,752.35	59.57	3,752.62	1.62
11,256.00	90.99	1.49	7,541.31	3,848.29	62.39	3,848.58	0.42
11,351.00	91.24	1.08	7,539.46	3,943.25	64.52	3,943.54	0.51
11,446.00	89.14	359.92	7,539.15	4,038.24	65.35	4,038.54	2.53
11,542.00	85.42	358.21	7,543.70	4,134.10	63.79	4,134.38	4.26
11,637.00	87.03	357.87	7,549.96	4,228.83	60.55	4,229.10	1.73
11,733.00	88.33	358.15	7,553.84	4,324.70	57.21	4,324.94	1.39
11,829.00	91.42	359.54	7,554.05	4,420.66	55.28	4,420.90	3.53
11,927.00	91.85	358.82	7,551.26	4,518.61	53.88	4,518.84	0.86
Final Sperry MWD Survey @ 11927.00ft							
11,968.00	91.85	358.82	7,549.93	4,559.58	53.03	4,559.80	0.00
Straight Line Proj @ 11968' MD :: 7549.93' TVD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
13.00	13.00	0.00	0.00	Ensign 132: RKB = 13ft
113.00	113.00	0.33	0.21	First MS Energy Services Gyro @ 113.00ft
991.00	990.96	1.93	7.20	Final MS Energy Services Gyro @ 991.00ft
991.00	990.96	1.93	7.20	Tie-On to Surface Gyros @ 991.00ft
1,250.00	1,249.96	1.06	6.59	First Sperry MWD Survey @ 1250.00ft
11,927.00	7,551.26	4,518.61	53.88	Final Sperry MWD Survey @ 11927.00ft
11,968.00	7,549.93	4,559.58	53.03	Straight Line Proj @ 11968' MD :: 7549.93' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.31	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
13.00	991.00	MS Energy Services - Surface Gyros	NS-GYRO-MS
1,250.00	7,809.00	Sperry MWD Surveys - Vert/Build	MWD+IFR1+SC
7,912.00	11,927.00	Sperry MWD Surveys - Lateral	MWD+IFR1+SC

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,844.80		7" Casing @ 7844.8' MD :: 7525.83' TVD	7	8-3/4

Design Report for Gobbler 2C-23HZ - 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
Gobbler 2C-23HZ_S - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,286,429.60	3,212,364.65	40.117146	-104.740657
Gobbler 2C-23HZ_L - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,286,429.60	3,212,364.65	40.117146	-104.740657
Point 1				-175.42	4,569.41	1,290,997.16	3,212,150.12		
Point 2				-196.20	209.56	1,286,637.46	3,212,166.67		
Point 3				721.02	227.06	1,286,662.82	3,213,083.67		
Point 4				741.91	4,599.82	1,291,035.42	3,213,067.12		
Point 5				-175.42	4,569.41	1,290,997.16	3,212,150.12		
Gobbler 2C-23HZ_S - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,286,429.60	3,212,364.65	40.117146	-104.740657
Point 1				-3,699.92	5,013.57	1,291,411.10	3,208,622.09		
Point 2				-3,716.05	2,381.40	1,288,779.00	3,208,628.50		
Point 3				-3,733.07	-250.83	1,286,146.82	3,208,634.02		
Point 4				-1,072.23	-242.99	1,286,177.45	3,211,294.58		
Point 5				1,588.13	-235.11	1,286,208.11	3,213,954.67		
Point 6				1,602.53	2,412.65	1,288,855.79	3,213,946.40		
Point 7				1,616.93	5,060.41	1,291,503.46	3,213,938.12		
Point 8				-1,040.93	5,036.90	1,291,457.20	3,211,280.67		
Point 9				-3,699.92	5,013.57	1,291,411.10	3,208,622.09		
Gobbler 2C-23HZ_B - actual wellpath misses target center by 40.27ft at 11968.00ft MD (7549.93 TVD, 4559.58 N, 53.03 E) - Point	0.00	0.00	7,527.00	4,585.00	74.23	1,291,014.88	3,212,399.61	40.129732	-104.740392
Gobbler 15E-23HZ F - actual wellpath misses target center by 256.07ft at 11270.97ft MD (7541.05 TVD, 3863.26 N, 62.77 E) - Circle (radius 150.00)	0.00	0.00	7,391.00	3,855.69	270.13	1,290,287.30	3,212,601.75	40.127730	-104.739691

North Reference Sheet for Sec. 23-T2N-R66W - Gobbler 2C-23HZ - Plan A Rev 1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
 Vertical Depths are relative to RKB=13 @ 5107.00ft (Ensign 132). Northing and Easting are relative to Gobbler 2C-23HZ
 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: 0.99995955

Grid Coordinates of Well: 1,286,429.60 ft N, 3,212,364.65 ft E
 Geographical Coordinates of Well: 40° 07' 01.73" N, 104° 44' 26.37" W
 Grid Convergence at Surface is: 0.49°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,968.00ft
 the Bottom Hole Displacement is 4,559.89ft in the Direction of 0.67° (True).

Magnetic Convergence at surface is: -8.14° (21 April 2013, , BGGM2012)

