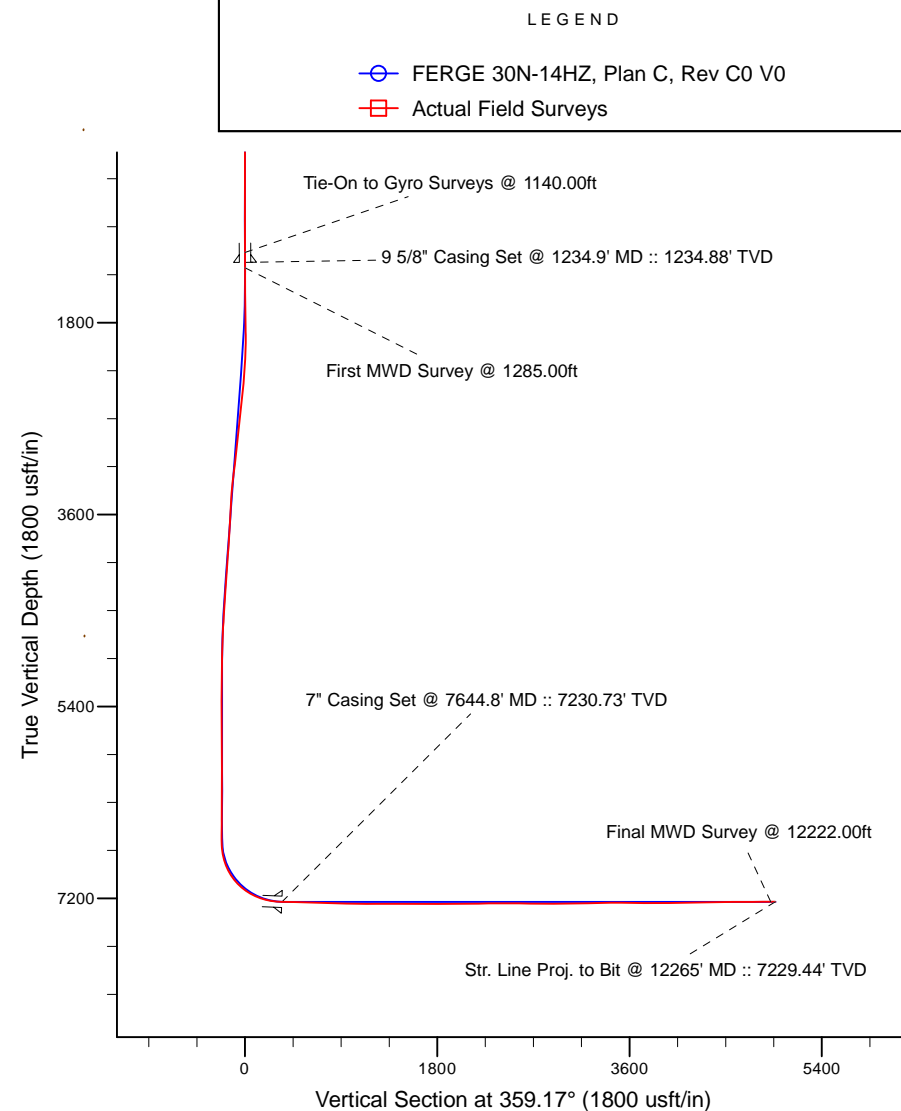
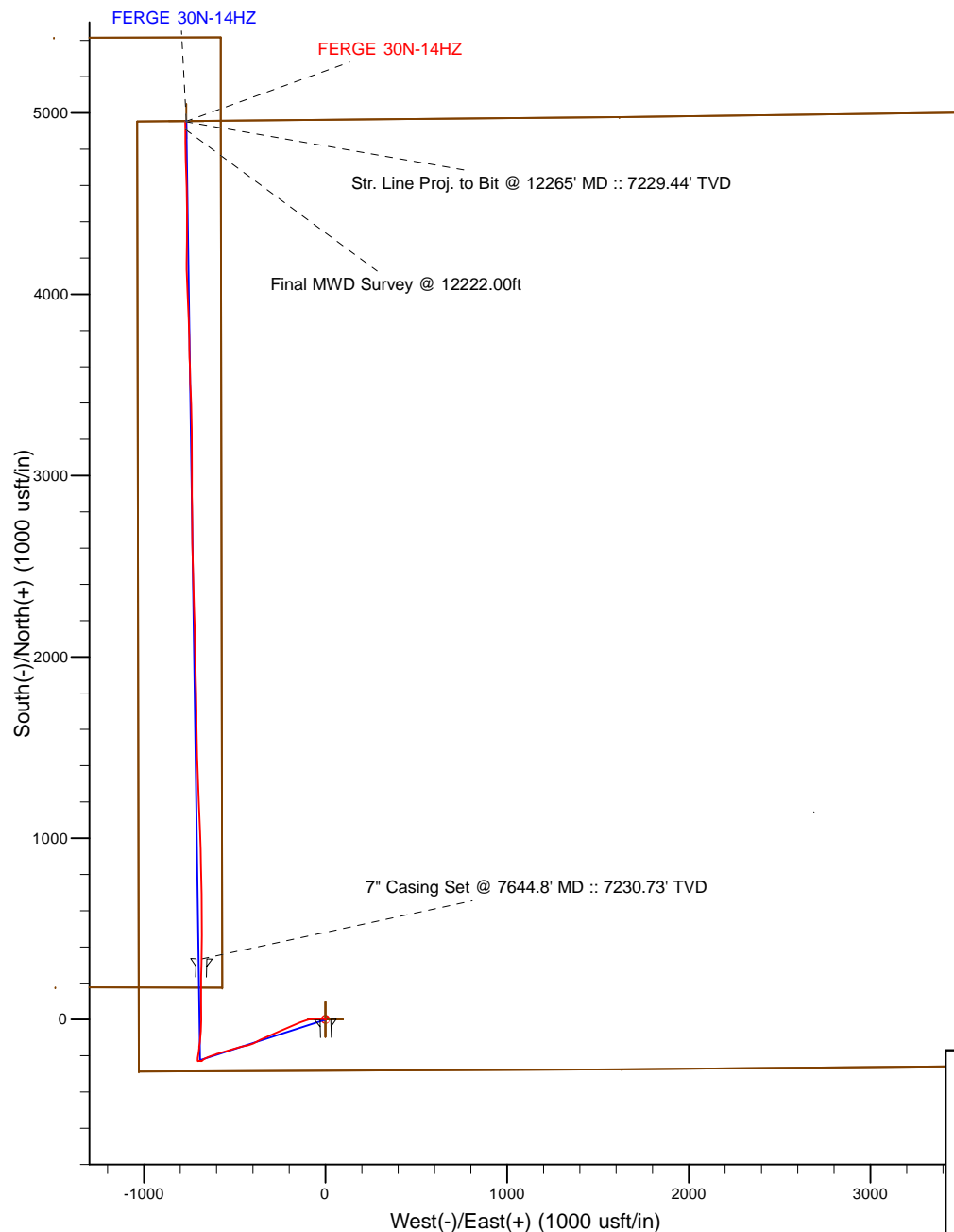


Project: Weld County, CO (NAD 83)
 Site: Sec. 14-T3N-R66W
 Well: FERGE 30N-14HZ
 Wellbore: Plan C
 Design: Actual Field Surveys



7" Casing: ~619.76' FSL, ~346.59' FWL
 Lat/Long: 40.219511 N, -104.752567 E
 State Planes - CO Northern: 1,323,689.48' N, 3,208,719.58' E
 Location: Sec. 14-T3N-R66W

BHL: ~3.02' FNL, ~264.16' FWL
 Lat/Long: 40.232188 N, -104.752890 E
 State Planes - CO Northern: 1,328,306.58' N, 3,208,590.60' E
 Location: Sec. 14-T3N-R66W

WELL DETAILS: FERGE 30N-14HZ	
Ground Level:	4913.00
RKB = 13' @ 4926.00usft (Ensign 132)	
Design: Actual Field Surveys (FERGE 30N-14HZ/Plan C)	
Created By: Clint Eshelman	Date: 4/2/2014
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 14-T3N-R66W

FERGE 30N-14HZ

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

02 April, 2014

Well Coordinates: 1,323,360.62 N, 3,209,404.58 E (40° 13' 06.93" N, 104° 45' 00.45" W)

Ground Level: 4,913.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well FERGE 30N-14HZ

RKB = 13' @ 4926.00usft (Ensign 132)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
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
113.00	0.29	358.71	113.00	0.25	-0.01	0.25	0.29
213.00	0.66	111.61	213.00	0.29	0.52	0.29	0.82
313.00	0.60	242.68	312.99	-0.16	0.59	-0.17	1.15
413.00	0.34	21.95	412.99	-0.12	0.24	-0.13	0.89
513.00	0.58	171.55	512.99	-0.35	0.43	-0.36	0.89
613.00	0.45	313.14	612.99	-0.58	0.21	-0.58	0.97
713.00	0.49	97.25	712.99	-0.37	0.35	-0.37	0.89
813.00	0.52	243.61	812.99	-0.62	0.37	-0.63	0.97
913.00	0.63	31.86	912.99	-0.36	0.25	-0.36	1.11
1,013.00	0.50	218.40	1,012.98	-0.23	0.27	-0.24	1.13
1,113.00	0.60	351.79	1,112.98	-0.06	-0.07	-0.05	1.01
1,140.00	0.61	33.08	1,139.98	0.20	-0.02	0.20	1.58
Tie-On to Gyro Surveys @ 1140.00ft							
1,234.90	0.21	358.72	1,234.88	0.80	0.26	0.80	0.48
9 5/8" Casing Set @ 1234.9' MD :: 1234.88' TVD							
1,285.00	0.19	285.65	1,284.98	0.92	0.17	0.91	0.48
First MWD Survey @ 1285.00ft							
1,380.00	0.36	300.86	1,379.98	1.11	-0.23	1.12	0.19
1,474.00	0.19	34.63	1,473.98	1.39	-0.40	1.40	0.44
1,665.00	3.56	279.93	1,664.85	2.68	-6.06	2.76	1.91
1,759.00	6.39	274.17	1,758.49	3.56	-14.16	3.76	3.05
1,853.00	8.66	277.44	1,851.68	4.86	-26.39	5.24	2.46
1,948.00	10.55	269.66	1,945.34	5.73	-42.18	6.34	2.41
2,136.00	14.00	260.37	2,129.04	1.82	-81.83	3.01	2.11
2,230.00	15.24	253.53	2,220.00	-3.58	-104.89	-2.06	2.26
2,324.00	15.72	250.97	2,310.59	-11.24	-128.78	-9.37	0.89
2,418.00	14.57	247.93	2,401.32	-19.83	-151.77	-17.63	1.49
2,512.00	13.27	243.85	2,492.56	-29.03	-172.41	-26.53	1.73
2,607.00	14.83	244.61	2,584.72	-39.05	-193.19	-36.25	1.65
2,701.00	14.74	246.08	2,675.61	-49.06	-214.99	-45.94	0.41
2,795.00	16.08	247.27	2,766.23	-58.94	-237.92	-55.48	1.46
2,889.00	17.09	247.76	2,856.31	-69.19	-262.72	-65.38	1.08
2,983.00	17.87	248.01	2,945.97	-79.82	-288.87	-75.63	0.83
3,077.00	16.66	246.19	3,035.74	-90.66	-314.58	-86.10	1.41
3,172.00	14.98	244.80	3,127.13	-101.39	-338.15	-96.48	1.81
3,266.00	14.27	243.09	3,218.09	-111.80	-359.47	-106.59	0.88
3,360.00	12.41	239.77	3,309.55	-122.13	-378.53	-116.64	2.14
3,455.00	11.86	246.13	3,402.43	-131.22	-396.28	-125.47	1.52
3,550.00	11.75	251.70	3,495.42	-138.21	-414.39	-132.20	1.20
3,645.00	12.17	259.02	3,588.37	-143.16	-433.40	-136.86	1.66
3,740.00	13.78	256.86	3,680.94	-147.64	-454.25	-141.04	1.77
3,836.00	14.71	254.15	3,773.99	-153.57	-477.11	-146.64	1.19
3,931.00	13.20	252.84	3,866.18	-160.06	-499.08	-152.81	1.62
4,026.00	14.86	253.35	3,958.34	-166.75	-521.12	-159.18	1.75
4,121.00	14.61	254.78	4,050.22	-173.39	-544.35	-165.48	0.46
4,248.00	14.01	252.30	4,173.28	-182.27	-574.45	-173.93	0.68
4,311.00	12.94	252.42	4,234.55	-186.71	-588.44	-178.17	1.70
4,406.00	11.61	249.17	4,327.37	-193.33	-607.52	-184.51	1.58

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,501.00	10.92	250.14	4,420.54	-199.78	-624.92	-190.71	0.75
4,597.00	10.22	249.74	4,514.91	-205.82	-641.46	-196.51	0.73
4,692.00	8.72	246.16	4,608.62	-211.65	-655.95	-202.13	1.70
4,787.00	7.03	240.57	4,702.72	-217.42	-667.60	-207.73	1.95
4,882.00	3.71	227.23	4,797.29	-222.36	-674.92	-212.56	3.71
4,977.00	2.75	224.14	4,892.14	-226.09	-678.77	-216.23	1.03
5,072.00	2.11	255.59	4,987.06	-228.16	-682.05	-218.25	1.53
5,168.00	1.87	253.17	5,083.00	-229.05	-685.26	-219.10	0.26
5,263.00	0.86	329.98	5,177.98	-228.88	-687.10	-218.91	1.97
5,358.00	1.21	326.28	5,272.96	-227.43	-688.01	-217.44	0.37
5,453.00	0.81	162.32	5,367.96	-227.24	-688.37	-217.24	2.11
5,580.00	0.58	154.37	5,494.95	-228.67	-687.82	-218.68	0.20
5,643.00	0.43	274.53	5,557.95	-228.94	-687.91	-218.95	1.39
5,739.00	0.57	294.15	5,653.94	-228.72	-688.71	-218.72	0.23
5,834.00	0.83	290.36	5,748.93	-228.28	-689.79	-218.27	0.28
5,929.00	0.86	267.74	5,843.92	-228.07	-691.14	-218.04	0.35
6,024.00	0.89	281.82	5,938.91	-227.95	-692.58	-217.89	0.23
6,119.00	1.11	250.63	6,033.90	-228.10	-694.17	-218.02	0.61
6,246.00	0.34	255.29	6,160.89	-228.61	-695.69	-218.51	0.61
6,309.00	0.28	2.83	6,223.89	-228.50	-695.87	-218.40	0.80
6,404.00	0.57	326.10	6,318.89	-227.88	-696.12	-217.77	0.40
6,500.00	0.86	246.24	6,414.88	-227.77	-697.04	-217.65	0.98
6,595.00	1.91	254.22	6,509.85	-228.49	-699.22	-218.34	1.12
6,690.00	1.43	246.45	6,604.81	-229.39	-701.83	-219.20	0.56
6,738.00	1.43	276.53	6,652.80	-229.56	-702.97	-219.36	1.55
6,785.00	3.74	349.11	6,699.75	-227.99	-703.85	-217.77	7.62
6,833.00	7.11	1.59	6,747.53	-223.48	-704.06	-213.26	7.40
6,880.00	11.38	7.95	6,793.91	-215.98	-703.34	-205.77	9.33
6,928.00	16.23	7.57	6,840.51	-204.63	-701.80	-194.45	10.11
6,975.00	20.61	6.65	6,885.09	-189.90	-699.97	-179.74	9.34
7,023.00	25.60	6.86	6,929.23	-171.20	-697.76	-161.07	10.40
7,070.00	30.49	6.82	6,970.70	-149.27	-695.12	-139.18	10.40
7,118.00	35.92	6.86	7,010.85	-123.18	-691.99	-113.14	11.31
7,165.00	41.59	6.29	7,047.48	-93.96	-688.64	-83.97	12.09
7,213.00	47.82	3.05	7,081.59	-60.33	-685.94	-50.38	13.82
7,260.00	53.35	0.73	7,111.42	-24.05	-684.77	-14.13	12.37
7,308.00	57.98	1.21	7,138.49	15.57	-684.10	25.47	9.68
7,355.00	61.30	359.53	7,162.24	56.11	-683.85	66.01	7.71
7,403.00	66.17	359.68	7,183.47	99.14	-684.14	109.04	10.15
7,450.00	71.92	359.17	7,200.27	143.01	-684.59	152.91	12.28
7,498.00	76.54	0.10	7,213.32	189.19	-684.88	199.09	9.80
7,545.00	81.71	0.82	7,222.18	235.33	-684.50	245.22	11.10
7,608.00	85.71	1.61	7,229.08	297.92	-683.17	307.79	6.47
7,644.80	87.71	1.33	7,231.19	334.65	-682.23	344.50	5.50
7" Casing Set @ 7644.8' MD :: 7230.73' TVD							
7,680.00	89.63	1.06	7,232.01	369.83	-681.50	379.66	5.50
7,776.00	88.74	0.26	7,233.37	465.81	-680.39	475.62	1.25
7,870.00	88.15	359.47	7,235.93	559.78	-680.61	569.58	1.05
7,966.00	88.12	359.22	7,239.05	655.72	-681.71	665.53	0.26
8,061.00	87.87	359.13	7,242.37	750.65	-683.08	760.47	0.28
8,156.00	88.37	358.42	7,245.49	845.58	-685.11	855.41	0.91

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,251.00	89.35	358.48	7,247.38	940.52	-687.68	950.39	1.03
8,346.00	89.23	357.94	7,248.56	1,035.47	-690.64	1,045.37	0.58
8,441.00	88.98	357.60	7,250.04	1,130.39	-694.34	1,140.33	0.44
8,536.00	90.37	357.94	7,250.58	1,225.31	-698.04	1,235.29	1.51
8,632.00	89.91	357.65	7,250.35	1,321.24	-701.73	1,331.26	0.57
8,727.00	90.59	357.84	7,249.93	1,416.16	-705.47	1,426.23	0.74
8,822.00	90.22	358.64	7,249.26	1,511.11	-708.39	1,521.22	0.93
8,917.00	89.48	359.52	7,249.51	1,606.10	-709.91	1,616.22	1.21
9,012.00	89.35	359.40	7,250.48	1,701.09	-710.81	1,711.21	0.19
9,107.00	90.25	358.92	7,250.81	1,796.08	-712.20	1,806.21	1.07
9,202.00	90.06	358.62	7,250.55	1,891.06	-714.24	1,901.20	0.37
9,298.00	90.43	358.90	7,250.14	1,987.03	-716.32	1,997.20	0.48
9,393.00	90.74	358.75	7,249.17	2,082.01	-718.26	2,092.19	0.36
9,488.00	90.95	358.30	7,247.77	2,176.97	-720.71	2,187.18	0.52
9,583.00	90.37	358.44	7,246.68	2,271.92	-723.41	2,282.16	0.63
9,678.00	90.12	358.37	7,246.27	2,366.88	-726.06	2,377.15	0.27
9,773.00	89.85	357.89	7,246.30	2,461.83	-729.16	2,472.14	0.58
9,868.00	89.35	358.71	7,246.96	2,556.79	-731.97	2,567.12	1.01
9,964.00	90.09	359.92	7,247.43	2,652.78	-733.12	2,663.12	1.48
10,059.00	90.00	359.81	7,247.35	2,747.78	-733.34	2,758.11	0.15
10,154.00	89.60	358.96	7,247.69	2,842.77	-734.36	2,853.11	0.99
10,249.00	89.75	359.97	7,248.22	2,937.76	-735.25	2,948.10	1.07
10,344.00	90.77	359.92	7,247.79	3,032.76	-735.34	3,043.09	1.07
10,534.00	91.66	359.59	7,243.76	3,222.71	-736.15	3,233.04	0.50
10,630.00	91.29	358.70	7,241.29	3,318.67	-737.59	3,329.01	1.00
10,725.00	90.90	357.36	7,239.48	3,413.59	-740.85	3,423.97	1.47
10,820.00	89.54	358.51	7,239.11	3,508.53	-744.28	3,518.94	1.87
10,915.00	89.11	358.25	7,240.23	3,603.48	-746.96	3,613.93	0.53
11,010.00	89.94	359.28	7,241.02	3,698.46	-749.01	3,708.92	1.39
11,201.00	89.01	357.53	7,242.77	3,889.36	-754.32	3,899.88	1.04
11,296.00	90.99	358.02	7,242.77	3,984.29	-758.01	3,994.85	2.15
11,391.00	90.56	356.77	7,241.48	4,079.18	-762.33	4,089.79	1.39
11,486.00	91.60	0.64	7,239.69	4,174.12	-764.48	4,184.75	4.22
11,581.00	91.60	0.86	7,237.04	4,269.07	-763.23	4,279.68	0.23
11,676.00	91.42	0.24	7,234.54	4,364.03	-762.32	4,374.62	0.68
11,771.00	91.33	359.80	7,232.26	4,459.01	-762.29	4,469.58	0.47
11,866.00	89.42	358.21	7,231.64	4,553.98	-763.94	4,564.57	2.62
11,961.00	90.37	358.44	7,231.81	4,648.94	-766.71	4,659.56	1.03
12,056.00	90.49	358.45	7,231.10	4,743.90	-769.29	4,754.55	0.13
12,151.00	90.40	359.34	7,230.36	4,838.88	-771.12	4,849.54	0.94
12,222.00	90.49	359.54	7,229.81	4,909.88	-771.82	4,920.54	0.31
Final MWD Survey @ 12222.00ft							
12,265.00	90.49	359.54	7,229.44	4,952.87	-772.16	4,963.54	0.00
Str. Line Proj. to Bit @ 12265' MD :: 7229.44' TVD							

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,140.00	1,139.98	0.20	-0.02	Tie-On to Gyro Surveys @ 1140.00ft
1,285.00	1,284.98	0.92	0.17	First MWD Survey @ 1285.00ft
12,222.00	7,229.81	4,909.88	-771.82	Final MWD Survey @ 12222.00ft
12,265.00	7,229.44	4,952.87	-772.16	Str. Line Proj. to Bit @ 12265' MD :: 7229.44' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.17	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	1,140.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,285.00	7,680.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,776.00	12,222.00	MWD Lateral Surveys	MWD+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,234.90	1,234.88	9 5/8" Casing Set @ 1234.9' MD :: 1234.88' TVD	9-5/8	13-1/2
7,644.80	7,231.19	7" Casing Set @ 7644.8' MD :: 7230.73' TVD	7	8-3/4

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FERGE 30N-14HZ_SE	0.00	0.00	0.00	0.00	0.00	1,323,360.62	3,209,404.58	40° 13' 6.931 N	104° 45' 0.446 W
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	4,953.49	-1,036.34	1,328,304.96	3,208,326.44	
Point 2				0.00	4,977.61	1,618.66	1,328,351.53	3,210,981.03	
Point 3				0.00	5,012.59	4,274.26	1,328,408.96	3,213,636.12	
Point 4				0.00	2,374.17	4,279.88	1,325,770.80	3,213,664.05	
Point 5				0.00	-250.53	4,291.84	1,323,146.41	3,213,698.20	
Point 6				0.00	-274.56	1,631.52	1,323,099.88	3,211,038.30	
Point 7				0.00	-286.73	-1,027.75	1,323,065.23	3,208,379.34	
Point 8				0.00	2,309.55	-1,032.29	1,325,661.26	3,208,352.85	
FERGE 30N-14HZ_LC	0.00	0.00	0.00	0.00	0.00	1,323,360.63	3,209,404.58	40° 13' 6.931 N	104° 45' 0.446 W
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	177.07	-1,488.58	1,323,525.10	3,207,914.62	
Point 2				0.00	175.33	-568.54	1,323,531.14	3,208,834.61	
Point 3				0.00	4,957.68	-576.32	1,328,313.04	3,208,786.39	
Point 4				0.00	5,417.70	-576.65	1,328,773.02	3,208,782.17	
Point 5				0.00	5,415.63	-1,496.68	1,328,763.18	3,207,862.23	
FERGE 30N-14HZ_SF	0.00	0.00	0.00	0.00	0.00	1,323,360.62	3,209,404.58	40° 13' 6.931 N	104° 45' 0.446 W
- actual wellpath hits target center									
- Point									
Ferge 30N-14HZ_BH	0.00	0.00	7,231.00	4,954.51	-766.19	1,328,308.26	3,208,596.56	40° 13' 55.891 N	104° 45' 10.325 W
- actual wellpath misses target center by 6.39usft at 12265.00usft MD (7229.44 TVD, 4952.87 N, -772.16 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.75 °/100usft	Maximum Dogleg over Survey:	13.82 °/100usft at 7,213.00 usft
Net Tortousity applicable to Plans:	0.32 °/100usft	Directional Difficulty Index:	6.334

Audit Info

North Reference Sheet for Sec. 14-T3N-R66W - FERGE 30N-14HZ - Plan C

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' @ 4926.00usft (Ensign 132). Northing and Easting are relative to FERGE 30N-14HZ

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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995700

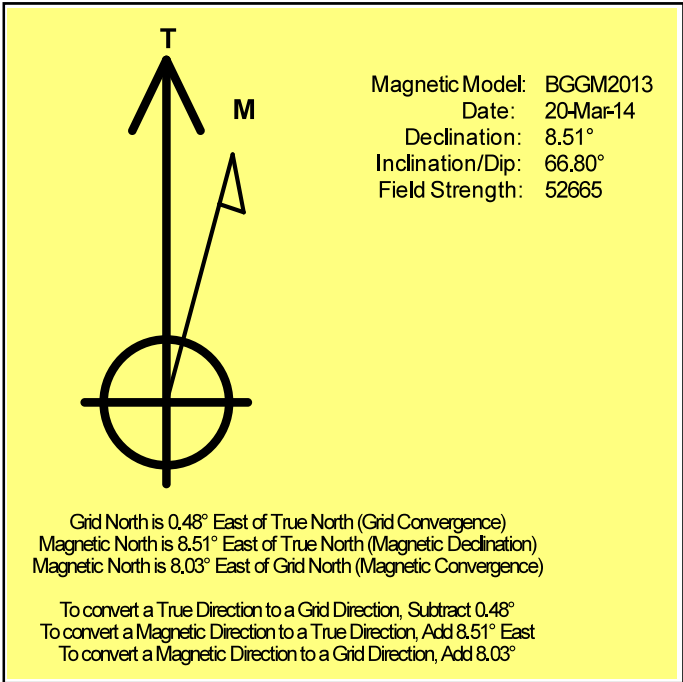
Grid Coordinates of Well: 1,323,360.62 usft N, 3,209,404.58 usft E

Geographical Coordinates of Well: 40° 13' 06.93" N, 104° 45' 00.45" W

Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,265.00usft the Bottom Hole Displacement is 5,012.70usft in the Direction of 351.14° (True).

Magnetic Convergence at surface is: -8.03° (20 March 2014, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 14-T3N-R66W

FERGE 30N-14HZ

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

02 April, 2014

Well Coordinates: 1,323,360.62 N, 3,209,404.58 E (40° 13' 06.93" N, 104° 45' 00.45" W)

Ground Level: 4,913.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well FERGE 30N-14HZ

RKB = 13' @ 4926.00usft (Ensign 132)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.218592	-104.750124	1,323,360.62	3,209,404.58
13.00	0.00	0.00	13.00	0.00	0.00	40.218592	-104.750124	1,323,360.62	3,209,404.58
113.00	0.29	358.71	113.00	0.25	-0.01	40.218593	-104.750124	1,323,360.88	3,209,404.58
213.00	0.66	111.61	213.00	0.29	0.52	40.218593	-104.750122	1,323,360.92	3,209,405.11
313.00	0.60	242.68	312.99	-0.16	0.59	40.218592	-104.750122	1,323,360.47	3,209,405.18
413.00	0.34	21.95	412.99	-0.12	0.24	40.218592	-104.750123	1,323,360.50	3,209,404.82
513.00	0.58	171.55	512.99	-0.35	0.43	40.218591	-104.750123	1,323,360.28	3,209,405.01
613.00	0.45	313.14	612.99	-0.58	0.21	40.218590	-104.750124	1,323,360.04	3,209,404.80
713.00	0.49	97.25	712.99	-0.37	0.35	40.218591	-104.750123	1,323,360.26	3,209,404.94
813.00	0.52	243.61	812.99	-0.62	0.37	40.218590	-104.750123	1,323,360.00	3,209,404.96
913.00	0.63	31.86	912.99	-0.36	0.25	40.218591	-104.750123	1,323,360.27	3,209,404.84
1,013.00	0.50	218.40	1,012.98	-0.23	0.27	40.218591	-104.750123	1,323,360.39	3,209,404.86
1,113.00	0.60	351.79	1,112.98	-0.06	-0.07	40.218592	-104.750125	1,323,360.57	3,209,404.51
1,140.00	0.61	33.08	1,139.98	0.20	-0.02	40.218593	-104.750124	1,323,360.83	3,209,404.57
1,234.90	0.21	358.72	1,234.88	0.80	0.26	40.218594	-104.750123	1,323,361.43	3,209,404.83
1,285.00	0.19	285.65	1,284.98	0.92	0.17	40.218595	-104.750124	1,323,361.54	3,209,404.75
1,380.00	0.36	300.86	1,379.98	1.11	-0.23	40.218595	-104.750125	1,323,361.73	3,209,404.34
1,474.00	0.19	34.63	1,473.98	1.39	-0.40	40.218596	-104.750126	1,323,362.01	3,209,404.17
1,665.00	3.56	279.93	1,664.85	2.68	-6.06	40.218599	-104.750146	1,323,363.25	3,209,398.50
1,759.00	6.39	274.17	1,758.49	3.56	-14.16	40.218602	-104.750175	1,323,364.06	3,209,390.40
1,853.00	8.66	277.44	1,851.68	4.86	-26.39	40.218605	-104.750219	1,323,365.26	3,209,378.15
1,948.00	10.55	269.66	1,945.34	5.73	-42.18	40.218608	-104.750275	1,323,366.00	3,209,362.36
2,136.00	14.00	260.37	2,129.04	1.82	-81.83	40.218597	-104.750417	1,323,361.75	3,209,322.75
2,230.00	15.24	253.53	2,220.00	-3.58	-104.89	40.218582	-104.750500	1,323,356.15	3,209,299.73
2,324.00	15.72	250.97	2,310.59	-11.24	-128.78	40.218561	-104.750585	1,323,348.30	3,209,275.91
2,418.00	14.57	247.93	2,401.32	-19.83	-151.77	40.218538	-104.750668	1,323,339.51	3,209,252.99
2,512.00	13.27	243.85	2,492.56	-29.03	-172.41	40.218512	-104.750742	1,323,330.14	3,209,232.43
2,607.00	14.83	244.61	2,584.72	-39.05	-193.19	40.218485	-104.750816	1,323,319.94	3,209,211.74
2,701.00	14.74	246.08	2,675.61	-49.06	-214.99	40.218457	-104.750894	1,323,309.75	3,209,190.03
2,795.00	16.08	247.27	2,766.23	-58.94	-237.92	40.218430	-104.750976	1,323,299.68	3,209,167.18
2,889.00	17.09	247.76	2,856.31	-69.19	-262.72	40.218402	-104.751065	1,323,289.21	3,209,142.47
2,983.00	17.87	248.01	2,945.97	-79.82	-288.87	40.218373	-104.751159	1,323,278.37	3,209,116.41
3,077.00	16.66	246.19	3,035.74	-90.66	-314.58	40.218343	-104.751251	1,323,267.31	3,209,090.80
3,172.00	14.98	244.80	3,127.13	-101.39	-338.15	40.218314	-104.751335	1,323,256.38	3,209,067.32
3,266.00	14.27	243.09	3,218.09	-111.80	-359.47	40.218285	-104.751411	1,323,245.79	3,209,046.09
3,360.00	12.41	239.77	3,309.55	-122.13	-378.53	40.218257	-104.751480	1,323,235.30	3,209,027.12
3,455.00	11.86	246.13	3,402.43	-131.22	-396.28	40.218232	-104.751543	1,323,226.06	3,209,009.45
3,550.00	11.75	251.70	3,495.42	-138.21	-414.39	40.218213	-104.751608	1,323,218.92	3,208,991.40
3,645.00	12.17	259.02	3,588.37	-143.16	-433.40	40.218199	-104.751676	1,323,213.81	3,208,972.42
3,740.00	13.78	256.86	3,680.94	-147.64	-454.25	40.218187	-104.751751	1,323,209.16	3,208,951.61
3,836.00	14.71	254.15	3,773.99	-153.57	-477.11	40.218170	-104.751833	1,323,203.04	3,208,928.81
3,931.00	13.20	252.84	3,866.18	-160.06	-499.08	40.218153	-104.751911	1,323,196.36	3,208,906.89

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
4,026.00	14.86	253.35	3,958.34	-166.75	-521.12	40.218134	-104.751990	1,323,189.48	3,208,884.92
4,121.00	14.61	254.78	4,050.22	-173.39	-544.35	40.218116	-104.752073	1,323,182.65	3,208,861.74
4,248.00	14.01	252.30	4,173.28	-182.27	-574.45	40.218092	-104.752181	1,323,173.51	3,208,831.72
4,311.00	12.94	252.42	4,234.55	-186.71	-588.44	40.218079	-104.752231	1,323,168.95	3,208,817.77
4,406.00	11.61	249.17	4,327.37	-193.33	-607.52	40.218061	-104.752300	1,323,162.17	3,208,798.75
4,501.00	10.92	250.14	4,420.54	-199.78	-624.92	40.218044	-104.752362	1,323,155.57	3,208,781.41
4,597.00	10.22	249.74	4,514.91	-205.82	-641.46	40.218027	-104.752421	1,323,149.39	3,208,764.92
4,692.00	8.72	246.16	4,608.62	-211.65	-655.95	40.218011	-104.752473	1,323,143.44	3,208,750.47
4,787.00	7.03	240.57	4,702.72	-217.42	-667.60	40.217995	-104.752515	1,323,137.58	3,208,738.87
4,882.00	3.71	227.23	4,797.29	-222.36	-674.92	40.217982	-104.752541	1,323,132.57	3,208,731.59
4,977.00	2.75	224.14	4,892.14	-226.09	-678.77	40.217971	-104.752555	1,323,128.82	3,208,727.78
5,072.00	2.11	255.59	4,987.06	-228.16	-682.05	40.217966	-104.752567	1,323,126.72	3,208,724.52
5,168.00	1.87	253.17	5,083.00	-229.05	-685.26	40.217963	-104.752578	1,323,125.80	3,208,721.31
5,263.00	0.86	329.98	5,177.98	-228.88	-687.10	40.217964	-104.752585	1,323,125.95	3,208,719.47
5,358.00	1.21	326.28	5,272.96	-227.43	-688.01	40.217968	-104.752588	1,323,127.39	3,208,718.55
5,453.00	0.81	162.32	5,367.96	-227.24	-688.37	40.217968	-104.752589	1,323,127.58	3,208,718.19
5,580.00	0.58	154.37	5,494.95	-228.67	-687.82	40.217964	-104.752587	1,323,126.15	3,208,718.76
5,643.00	0.43	274.53	5,557.95	-228.94	-687.91	40.217964	-104.752588	1,323,125.88	3,208,718.66
5,739.00	0.57	294.15	5,653.94	-228.72	-688.71	40.217964	-104.752590	1,323,126.10	3,208,717.86
5,834.00	0.83	290.36	5,748.93	-228.28	-689.79	40.217965	-104.752594	1,323,126.53	3,208,716.78
5,929.00	0.86	267.74	5,843.92	-228.07	-691.14	40.217966	-104.752599	1,323,126.73	3,208,715.42
6,024.00	0.89	281.82	5,938.91	-227.95	-692.58	40.217966	-104.752604	1,323,126.84	3,208,713.99
6,119.00	1.11	250.63	6,033.90	-228.10	-694.17	40.217966	-104.752610	1,323,126.67	3,208,712.40
6,246.00	0.34	255.29	6,160.89	-228.61	-695.69	40.217964	-104.752615	1,323,126.15	3,208,710.88
6,309.00	0.28	2.83	6,223.89	-228.50	-695.87	40.217965	-104.752616	1,323,126.26	3,208,710.71
6,404.00	0.57	326.10	6,318.89	-227.88	-696.12	40.217966	-104.752617	1,323,126.88	3,208,710.45
6,500.00	0.86	246.24	6,414.88	-227.77	-697.04	40.217967	-104.752620	1,323,126.98	3,208,709.52
6,595.00	1.91	254.22	6,509.85	-228.49	-699.22	40.217965	-104.752628	1,323,126.24	3,208,707.35
6,690.00	1.43	246.45	6,604.81	-229.39	-701.83	40.217962	-104.752637	1,323,125.31	3,208,704.75
6,738.00	1.43	276.53	6,652.80	-229.56	-702.97	40.217962	-104.752641	1,323,125.13	3,208,703.61
6,785.00	3.74	349.11	6,699.75	-227.99	-703.85	40.217966	-104.752645	1,323,126.70	3,208,702.72
6,833.00	7.11	1.59	6,747.53	-223.48	-704.06	40.217979	-104.752645	1,323,131.20	3,208,702.47
6,880.00	11.38	7.95	6,793.91	-215.98	-703.34	40.217999	-104.752643	1,323,138.71	3,208,703.13
6,928.00	16.23	7.57	6,840.51	-204.63	-701.80	40.218030	-104.752637	1,323,150.07	3,208,704.57
6,975.00	20.61	6.65	6,885.09	-189.90	-699.97	40.218071	-104.752631	1,323,164.82	3,208,706.27
7,023.00	25.60	6.86	6,929.23	-171.20	-697.76	40.218122	-104.752623	1,323,183.54	3,208,708.33
7,070.00	30.49	6.82	6,970.70	-149.27	-695.12	40.218182	-104.752613	1,323,205.49	3,208,710.78
7,118.00	35.92	6.86	7,010.85	-123.18	-691.99	40.218254	-104.752602	1,323,231.61	3,208,713.69
7,165.00	41.59	6.29	7,047.48	-93.96	-688.64	40.218334	-104.752590	1,323,260.85	3,208,716.80
7,213.00	47.82	3.05	7,081.59	-60.33	-685.94	40.218426	-104.752580	1,323,294.50	3,208,719.21
7,260.00	53.35	0.73	7,111.42	-24.05	-684.77	40.218526	-104.752576	1,323,330.78	3,208,720.07
7,308.00	57.98	1.21	7,138.49	15.57	-684.10	40.218635	-104.752574	1,323,370.40	3,208,720.41

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
7,355.00	61.30	359.53	7,162.24	56.11	-683.85	40.218746	-104.752573	1,323,410.95	3,208,720.32
7,403.00	66.17	359.68	7,183.47	99.14	-684.14	40.218864	-104.752574	1,323,453.97	3,208,719.66
7,450.00	71.92	359.17	7,200.27	143.01	-684.59	40.218985	-104.752576	1,323,497.84	3,208,718.84
7,498.00	76.54	0.10	7,213.32	189.19	-684.88	40.219111	-104.752577	1,323,544.01	3,208,718.16
7,545.00	81.71	0.82	7,222.18	235.33	-684.50	40.219238	-104.752575	1,323,590.15	3,208,718.14
7,608.00	85.71	1.61	7,229.08	297.92	-683.17	40.219410	-104.752571	1,323,652.75	3,208,718.94
7,644.80	87.71	1.33	7,231.19	334.65	-682.23	40.219511	-104.752567	1,323,689.48	3,208,719.58
7,680.00	89.63	1.06	7,232.01	369.83	-681.50	40.219607	-104.752565	1,323,724.66	3,208,720.01
7,776.00	88.74	0.26	7,233.37	465.81	-680.39	40.219871	-104.752561	1,323,820.65	3,208,720.31
7,870.00	88.15	359.47	7,235.93	559.78	-680.61	40.220129	-104.752561	1,323,914.60	3,208,719.29
7,966.00	88.12	359.22	7,239.05	655.72	-681.71	40.220392	-104.752565	1,324,010.53	3,208,717.38
8,061.00	87.87	359.13	7,242.37	750.65	-683.08	40.220653	-104.752570	1,324,105.44	3,208,715.21
8,156.00	88.37	358.42	7,245.49	845.58	-685.11	40.220913	-104.752578	1,324,200.34	3,208,712.38
8,251.00	89.35	358.48	7,247.38	940.52	-687.68	40.221174	-104.752587	1,324,295.26	3,208,709.01
8,346.00	89.23	357.94	7,248.56	1,035.47	-690.64	40.221434	-104.752597	1,324,390.17	3,208,705.24
8,441.00	88.98	357.60	7,250.04	1,130.39	-694.34	40.221695	-104.752611	1,324,485.05	3,208,700.74
8,536.00	90.37	357.94	7,250.58	1,225.31	-698.04	40.221955	-104.752624	1,324,579.93	3,208,696.24
8,632.00	89.91	357.65	7,250.35	1,321.24	-701.73	40.222219	-104.752637	1,324,675.82	3,208,691.74
8,727.00	90.59	357.84	7,249.93	1,416.16	-705.47	40.222479	-104.752651	1,324,770.71	3,208,687.20
8,822.00	90.22	358.64	7,249.26	1,511.11	-708.39	40.222740	-104.752661	1,324,865.63	3,208,683.48
8,917.00	89.48	359.52	7,249.51	1,606.10	-709.91	40.223001	-104.752666	1,324,960.59	3,208,681.15
9,012.00	89.35	359.40	7,250.48	1,701.09	-710.81	40.223261	-104.752670	1,325,055.57	3,208,679.45
9,107.00	90.25	358.92	7,250.81	1,796.08	-712.20	40.223522	-104.752675	1,325,150.54	3,208,677.25
9,202.00	90.06	358.62	7,250.55	1,891.06	-714.24	40.223783	-104.752682	1,325,245.49	3,208,674.41
9,298.00	90.43	358.90	7,250.14	1,987.03	-716.32	40.224046	-104.752689	1,325,341.44	3,208,671.52
9,393.00	90.74	358.75	7,249.17	2,082.01	-718.26	40.224307	-104.752696	1,325,436.39	3,208,668.77
9,488.00	90.95	358.30	7,247.77	2,176.97	-720.71	40.224568	-104.752705	1,325,531.32	3,208,665.52
9,583.00	90.37	358.44	7,246.68	2,271.92	-723.41	40.224828	-104.752715	1,325,626.25	3,208,662.02
9,678.00	90.12	358.37	7,246.27	2,366.88	-726.06	40.225089	-104.752724	1,325,721.18	3,208,658.57
9,773.00	89.85	357.89	7,246.30	2,461.83	-729.16	40.225350	-104.752735	1,325,816.10	3,208,654.67
9,868.00	89.35	358.71	7,246.96	2,556.79	-731.97	40.225610	-104.752746	1,325,911.02	3,208,651.05
9,964.00	90.09	359.92	7,247.43	2,652.78	-733.12	40.225874	-104.752750	1,326,006.99	3,208,649.09
10,059.00	90.00	359.81	7,247.35	2,747.78	-733.34	40.226135	-104.752751	1,326,101.98	3,208,648.06
10,154.00	89.60	358.96	7,247.69	2,842.77	-734.36	40.226395	-104.752754	1,326,196.96	3,208,646.24
10,249.00	89.75	359.97	7,248.22	2,937.76	-735.25	40.226656	-104.752757	1,326,291.94	3,208,644.55
10,344.00	90.77	359.92	7,247.79	3,032.76	-735.34	40.226917	-104.752758	1,326,386.93	3,208,643.65
10,534.00	91.66	359.59	7,243.76	3,222.71	-736.15	40.227438	-104.752761	1,326,576.86	3,208,641.24
10,630.00	91.29	358.70	7,241.29	3,318.67	-737.59	40.227702	-104.752766	1,326,672.79	3,208,638.99
10,725.00	90.90	357.36	7,239.48	3,413.59	-740.85	40.227962	-104.752777	1,326,767.68	3,208,634.92
10,820.00	89.54	358.51	7,239.11	3,508.53	-744.28	40.228223	-104.752790	1,326,862.58	3,208,630.70
10,915.00	89.11	358.25	7,240.23	3,603.48	-746.96	40.228484	-104.752799	1,326,957.51	3,208,627.21
11,010.00	89.94	359.28	7,241.02	3,698.46	-749.01	40.228744	-104.752807	1,327,052.45	3,208,624.36

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
11,201.00	89.01	357.53	7,242.77	3,889.36	-754.32	40.229268	-104.752826	1,327,243.30	3,208,617.43
11,296.00	90.99	358.02	7,242.77	3,984.29	-758.01	40.229529	-104.752839	1,327,338.19	3,208,612.94
11,391.00	90.56	356.77	7,241.48	4,079.18	-762.33	40.229789	-104.752854	1,327,433.03	3,208,607.82
11,486.00	91.60	0.64	7,239.69	4,174.12	-764.48	40.230050	-104.752862	1,327,527.95	3,208,604.87
11,581.00	91.60	0.86	7,237.04	4,269.07	-763.23	40.230311	-104.752858	1,327,622.91	3,208,605.31
11,676.00	91.42	0.24	7,234.54	4,364.03	-762.32	40.230571	-104.752854	1,327,717.87	3,208,605.42
11,771.00	91.33	359.80	7,232.26	4,459.01	-762.29	40.230832	-104.752854	1,327,812.83	3,208,604.65
11,866.00	89.42	358.21	7,231.64	4,553.98	-763.94	40.231093	-104.752860	1,327,907.79	3,208,602.20
11,961.00	90.37	358.44	7,231.81	4,648.94	-766.71	40.231353	-104.752870	1,328,002.72	3,208,598.62
12,056.00	90.49	358.45	7,231.10	4,743.90	-769.29	40.231614	-104.752879	1,328,097.65	3,208,595.24
12,151.00	90.40	359.34	7,230.36	4,838.88	-771.12	40.231875	-104.752886	1,328,192.60	3,208,592.60
12,222.00	90.49	359.54	7,229.81	4,909.88	-771.82	40.232070	-104.752889	1,328,263.59	3,208,591.31
12,265.00	90.49	359.54	7,229.44	4,952.87	-772.16	40.232188	-104.752890	1,328,306.58	3,208,590.60

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12,222.00	7,229.81	4,909.88	-771.82	Final MWD Survey @ 12222.00ft
12,265.00	7,229.44	4,952.87	-772.16	Str. Line Proj. to Bit @ 12265' MD :: 7229.44' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.17	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	1,140.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,285.00	7,680.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,776.00	12,222.00	MWD Lateral Surveys	MWD+SC

Design Report for FERGE 30N-14HZ - Actual Field Surveys

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,234.90	1,234.88	9 5/8" Casing Set @ 1234.9' MD :: 1234.88' TVD	9-5/8	13-1/2
7,644.80	7,231.19	7" Casing Set @ 7644.8' MD :: 7230.73' TVD	7	8-3/4

Design Targets

Shape	Target Name	TVD (')	Northing (')	Easting (')	+N/-S	+E/-W	Created	Updated
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Directional Difficulty Index

Average Dogleg over Survey:	1.75 °/100usft	Maximum Dogleg over Survey:	13.82 °/100usft at 7,213.00 usft
Net Tortousity applicable to Plans:	0.32 °/100usft	Directional Difficulty Index:	6.334

Audit Info

North Reference Sheet for Sec. 14-T3N-R66W - FERGE 30N-14HZ - Plan C

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' @ 4926.00usft (Ensign 132). Northing and Easting are relative to FERGE 30N-14HZ

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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995700

Grid Coordinates of Well: 1,323,360.62 usft N, 3,209,404.58 usft E

Geographical Coordinates of Well: 40° 13' 06.93" N, 104° 45' 00.45" W

Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,265.00usft

the Bottom Hole Displacement is 5,012.70usft in the Direction of 351.14° (True).

Magnetic Convergence at surface is: -8.03° (20 March 2014, , BGGM2013)

