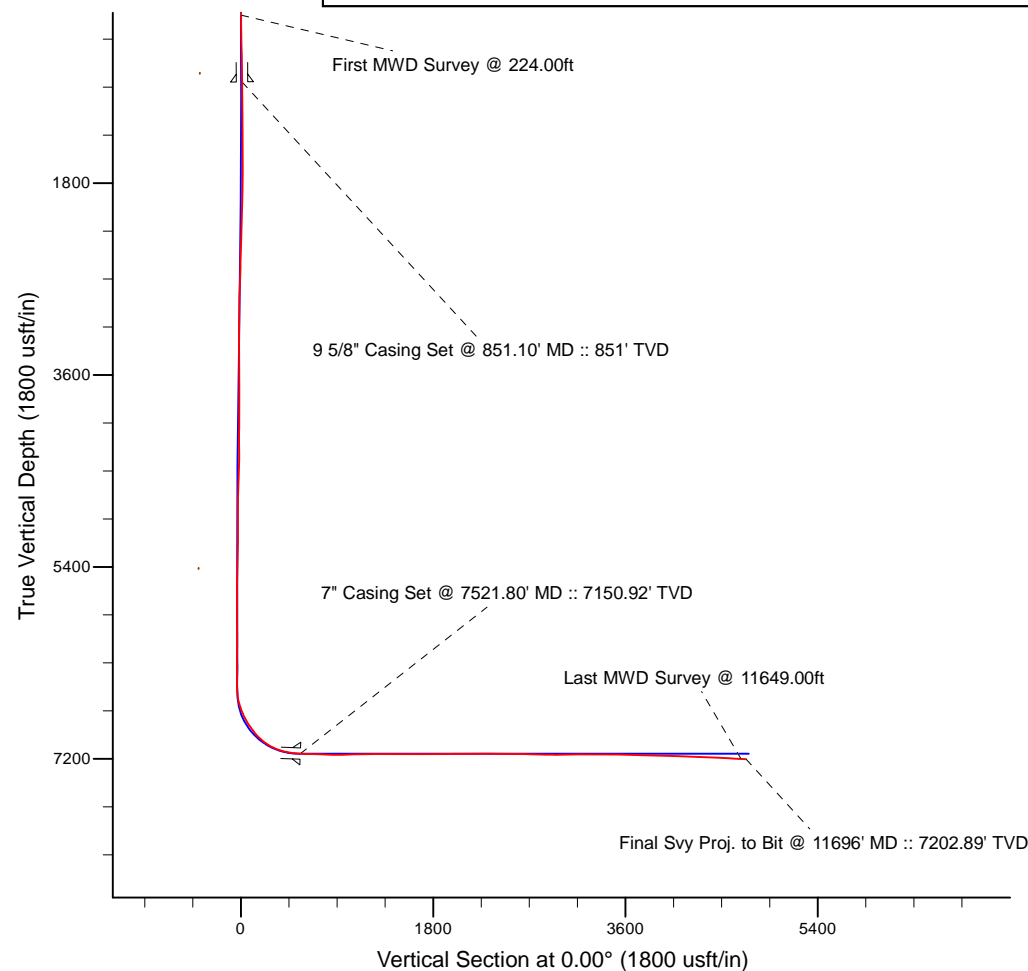
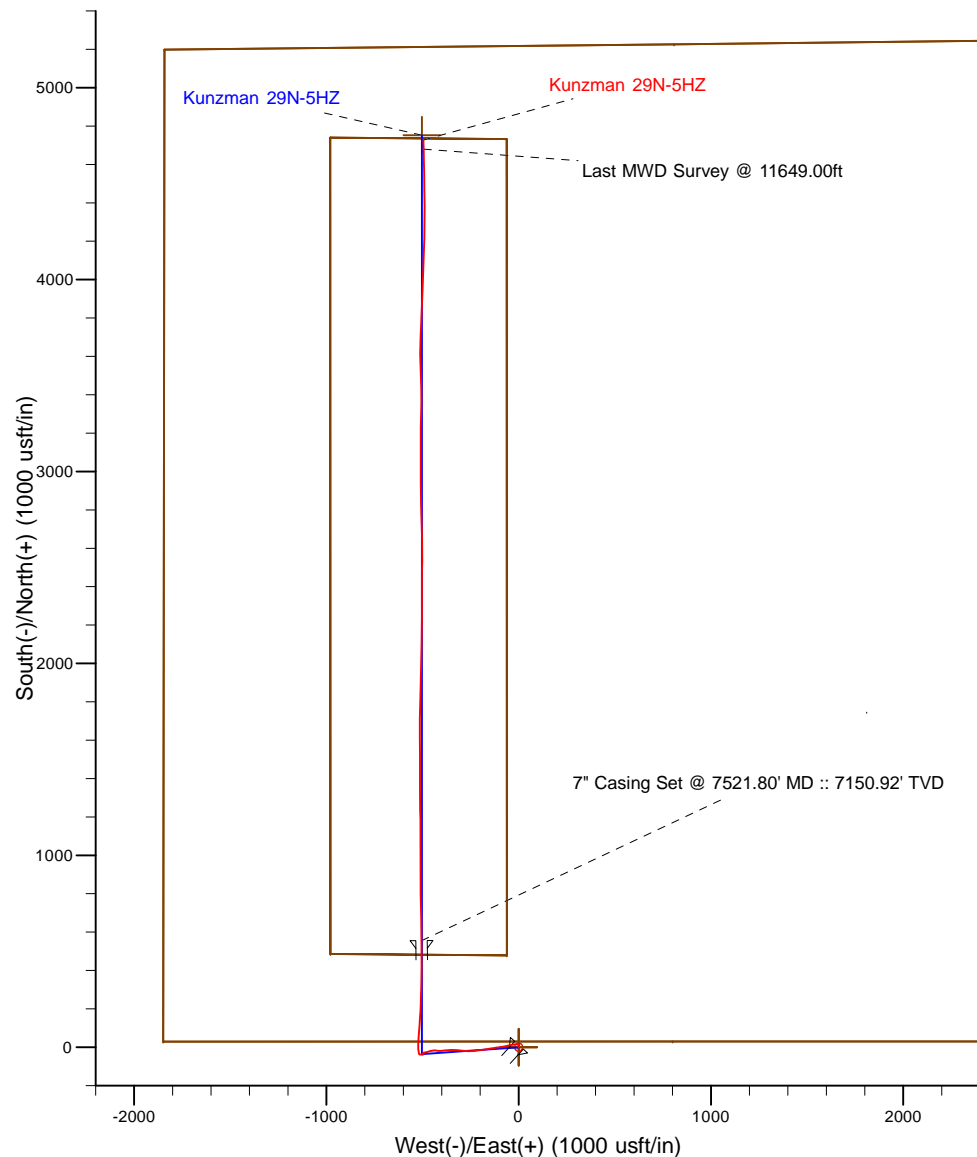


Project: Weld County, CO (NAD 83)
 Site: Sec. 8-T2N-R66W
 Well: Kunzman 29N-5HZ
 Wellbore: Plan A
 Design: Actual Field Surveys



LEGEND

- Kunzman 29N-5HZ, Plan A, Rev A0 V0
- Actual Field Surveys



7" Casing: ~526.05' FSL, ~1342.64' FWL
 Lat/Long: 40.161287 N, -104.805817 E
 State Planes - CO Northern: 1,302,359.46' N, 3,194,016.08' E
 Location: Sec. 5-T2N-R66W

BHL: ~484.88' FNL, ~1346.74' FWL
 Lat/Long: 40.172739 N, -104.805783 E
 State Planes - CO Northern: 1,306,531.10' N, 3,193,992.85' E
 Location: Sec. 5-T2N-R66W

WELL DETAILS: Kunzman 29N-5HZ	
Ground Level:	4858.00
RKB = 13' @ 4871.00usft (Ensign 132)	
Design: Actual Field Surveys (Kunzman 29N-5HZ/Plan A)	
Created By: Clint Eshelman	Date: 11/13/2013
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T2N-R66W

Kunzman 29N-5HZ

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

09 November, 2013

Well Coordinates: 1,301,807.51 N, 3,194,525.32 E (40° 09' 35.14" N, 104° 48' 14.44" W)

Ground Level: 4,858.00 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 Kunzman 29N-5HZ

RKB = 13' @ 4871.00usft (Ensign 132)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Kunzman 29N-5HZ - 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
224.00	0.66	334.56	224.00	1.17	-0.55	1.17	0.29
First MWD Survey @ 224.00ft							
317.00	0.76	351.78	316.99	2.26	-0.87	2.26	0.25
503.00	0.94	17.88	502.97	4.93	-0.58	4.93	0.23
596.00	1.23	20.21	595.95	6.59	0.00	6.59	0.32
689.00	1.24	33.17	688.93	8.37	0.89	8.37	0.30
805.00	0.94	53.97	804.91	9.98	2.35	9.98	0.42
851.10	0.77	42.35	851.00	10.44	2.86	10.44	0.53
9 5/8" Casing Set @ 851.10' MD :: 851' TVD							
882.00	0.68	31.60	881.90	10.74	3.10	10.74	0.53
973.00	0.51	7.69	972.90	11.61	3.44	11.61	0.33
1,066.00	0.63	341.04	1,065.89	12.50	3.33	12.50	0.31
1,157.00	0.80	13.96	1,156.89	13.59	3.32	13.59	0.48
1,249.00	0.71	348.26	1,248.88	14.77	3.36	14.77	0.38
1,341.00	0.88	354.96	1,340.87	16.03	3.18	16.03	0.21
1,432.00	0.50	262.51	1,431.86	16.68	2.72	16.68	1.13
1,524.00	1.14	261.33	1,523.85	16.49	1.42	16.49	0.70
1,616.00	2.79	268.44	1,615.80	16.29	-1.72	16.29	1.81
1,708.00	5.24	272.58	1,707.56	16.42	-8.16	16.42	2.68
1,799.00	5.64	260.94	1,798.16	15.90	-16.73	15.90	1.29
1,890.00	7.21	267.29	1,888.58	14.92	-26.85	14.92	1.89
1,985.00	7.69	253.83	1,982.79	12.87	-38.91	12.87	1.90
2,081.00	8.94	256.39	2,077.78	9.33	-52.33	9.33	1.36
2,176.00	9.54	258.91	2,171.55	6.08	-67.23	6.08	0.76
2,271.00	9.14	256.44	2,265.29	2.79	-82.29	2.79	0.60
2,366.00	9.37	265.74	2,359.06	0.45	-97.33	0.45	1.59
2,461.00	8.33	262.64	2,452.92	-1.01	-111.87	-1.01	1.20
2,556.00	10.54	261.32	2,546.63	-3.20	-127.29	-3.20	2.34
2,651.00	8.74	259.30	2,640.29	-5.85	-142.97	-5.85	1.93
2,747.00	10.69	261.70	2,734.91	-8.49	-158.95	-8.49	2.07
2,842.00	10.18	260.52	2,828.34	-11.15	-175.95	-11.15	0.58
2,937.00	8.74	261.95	2,922.04	-13.54	-191.38	-13.54	1.54
3,032.00	10.97	264.58	3,015.63	-15.40	-207.52	-15.40	2.39
3,127.00	9.95	262.80	3,109.05	-17.29	-224.67	-17.29	1.13
3,222.00	8.52	262.09	3,202.82	-19.28	-239.78	-19.28	1.51
3,317.00	10.03	271.18	3,296.58	-20.08	-255.02	-20.08	2.21
3,413.00	7.91	271.92	3,391.40	-19.69	-269.99	-19.69	2.21
3,508.00	11.42	276.36	3,485.04	-18.43	-285.87	-18.43	3.77
3,603.00	9.72	276.42	3,578.42	-16.49	-303.19	-16.49	1.79
3,698.00	10.92	275.81	3,671.89	-14.68	-320.11	-14.68	1.27
3,793.00	10.35	268.47	3,765.26	-14.00	-337.59	-14.00	1.55
3,888.00	8.45	268.87	3,858.98	-14.36	-353.11	-14.36	2.00
3,983.00	10.44	265.03	3,952.69	-15.25	-368.66	-15.25	2.20
4,079.00	10.37	266.00	4,047.11	-16.60	-385.94	-16.60	0.20
4,174.00	8.96	263.50	4,140.76	-18.04	-401.83	-18.04	1.55
4,269.00	10.17	274.13	4,234.44	-18.27	-417.54	-18.27	2.25
4,364.00	8.38	276.55	4,328.20	-16.88	-432.79	-16.88	1.93
4,459.00	9.57	259.97	4,422.05	-17.46	-447.44	-17.46	2.98
4,554.00	8.61	255.16	4,515.85	-20.66	-462.09	-20.66	1.29

Design Report for Kunzman 29N-5HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,650.00	8.01	256.61	4,610.85	-24.05	-475.55	-24.05	0.66
4,745.00	5.44	255.64	4,705.18	-26.70	-486.35	-26.70	2.71
4,840.00	2.69	259.71	4,799.94	-28.21	-492.91	-28.21	2.91
4,935.00	0.18	78.27	4,894.90	-28.58	-494.96	-28.58	3.02
5,030.00	0.68	96.20	4,989.90	-28.61	-494.25	-28.61	0.54
5,125.00	0.52	93.97	5,084.90	-28.70	-493.26	-28.70	0.17
5,220.00	0.92	106.90	5,179.89	-28.95	-492.10	-28.95	0.45
5,316.00	2.19	217.31	5,275.86	-30.64	-492.47	-30.64	2.77
5,411.00	2.18	217.43	5,370.80	-33.52	-494.67	-33.52	0.01
5,506.00	0.61	180.97	5,465.77	-35.46	-495.78	-35.46	1.82
5,601.00	0.48	221.74	5,560.76	-36.26	-496.05	-36.26	0.42
5,696.00	0.82	225.94	5,655.76	-37.03	-496.81	-37.03	0.36
5,791.00	0.58	251.60	5,750.75	-37.65	-497.75	-37.65	0.41
5,886.00	0.65	267.98	5,845.74	-37.82	-498.74	-37.82	0.20
5,982.00	1.45	285.57	5,941.73	-37.52	-500.46	-37.52	0.89
6,077.00	1.60	271.70	6,036.69	-37.16	-502.94	-37.16	0.42
6,172.00	1.55	267.95	6,131.66	-37.16	-505.55	-37.16	0.12
6,267.00	1.25	269.42	6,226.63	-37.22	-507.87	-37.22	0.32
6,362.00	1.68	269.26	6,321.60	-37.25	-510.30	-37.25	0.45
6,457.00	1.68	271.52	6,416.56	-37.23	-513.09	-37.23	0.07
6,552.00	1.70	308.40	6,511.52	-36.32	-515.58	-36.32	1.13
6,600.00	2.60	312.44	6,559.48	-35.14	-516.94	-35.14	1.90
6,647.00	7.56	348.70	6,606.29	-31.38	-518.34	-31.38	12.07
6,695.00	13.27	352.26	6,653.48	-22.82	-519.70	-22.82	11.97
6,742.00	17.71	354.94	6,698.77	-10.35	-521.06	-10.35	9.57
6,790.00	20.42	359.63	6,744.13	5.30	-521.75	5.30	6.48
6,838.00	24.12	1.73	6,788.54	23.48	-521.51	23.48	7.88
6,886.00	28.73	4.25	6,831.52	44.80	-520.36	44.80	9.88
6,932.00	32.71	4.27	6,871.06	68.23	-518.62	68.23	8.65
6,980.00	35.54	4.02	6,910.79	95.09	-516.67	95.09	5.90
7,027.00	38.76	4.58	6,948.24	123.39	-514.54	123.39	6.89
7,075.00	43.16	4.29	6,984.48	154.75	-512.11	154.75	9.18
7,122.00	47.68	2.80	7,017.46	188.15	-510.06	188.15	9.88
7,170.00	52.91	1.21	7,048.12	225.04	-508.78	225.04	11.19
7,219.00	59.67	1.50	7,075.30	265.77	-507.82	265.77	13.80
7,266.00	66.20	1.55	7,096.67	307.59	-506.70	307.59	13.89
7,313.00	70.68	1.43	7,113.94	351.27	-505.57	351.27	9.53
7,361.00	75.12	0.99	7,128.05	397.13	-504.60	397.13	9.29
7,408.00	79.75	0.04	7,138.27	442.99	-504.19	442.99	10.05
7,456.00	82.19	359.80	7,145.80	490.39	-504.26	490.39	5.11
7,486.00	85.89	359.38	7,148.92	520.22	-504.47	520.22	12.41
7,521.80	87.71	359.20	7,150.92	555.96	-504.92	555.96	5.10
7" Casing Set @ 7521.80' MD :: 7150.92' TVD							
7,536.00	88.43	359.13	7,151.40	570.15	-505.12	570.15	5.10
7,631.00	87.41	359.03	7,154.84	665.07	-506.65	665.07	1.08
7,725.00	88.18	358.96	7,158.46	758.99	-508.29	758.99	0.82
7,820.00	88.64	359.22	7,161.10	853.94	-509.80	853.94	0.56
7,915.00	91.57	0.53	7,160.92	948.93	-510.01	948.93	3.38
8,011.00	91.51	359.11	7,158.34	1,044.89	-510.31	1,044.89	1.48
8,106.00	90.37	0.24	7,156.78	1,139.87	-510.85	1,139.87	1.69
8,201.00	90.77	358.94	7,155.84	1,234.86	-511.53	1,234.86	1.43

Design Report for Kunzman 29N-5HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,296.00	90.37	359.75	7,154.89	1,329.85	-512.62	1,329.85	0.95
8,391.00	89.72	0.62	7,154.82	1,424.85	-512.31	1,424.85	1.14
8,486.00	90.62	359.32	7,154.54	1,519.85	-512.36	1,519.85	1.66
8,581.00	88.61	359.38	7,155.17	1,614.83	-513.44	1,614.83	2.12
8,676.00	89.32	0.47	7,156.89	1,709.82	-513.56	1,709.82	1.37
8,771.00	91.30	1.97	7,156.38	1,804.79	-511.54	1,804.79	2.61
8,867.00	91.97	1.28	7,153.64	1,900.71	-508.82	1,900.71	1.00
8,962.00	90.00	1.40	7,152.00	1,995.66	-506.60	1,995.66	2.08
9,057.00	90.09	0.88	7,151.93	2,090.64	-504.71	2,090.64	0.56
9,152.00	90.12	0.82	7,151.76	2,185.63	-503.30	2,185.63	0.07
9,247.00	89.94	0.25	7,151.71	2,280.63	-502.41	2,280.63	0.63
9,342.00	90.59	359.41	7,151.27	2,375.62	-502.69	2,375.62	1.12
9,437.00	88.55	0.67	7,151.98	2,470.62	-502.62	2,470.62	2.52
9,532.00	88.49	0.25	7,154.43	2,565.58	-501.86	2,565.58	0.45
9,627.00	89.29	359.20	7,156.27	2,660.56	-502.32	2,660.56	1.39
9,722.00	89.45	358.27	7,157.32	2,755.53	-504.42	2,755.53	0.99
9,818.00	88.33	358.40	7,159.18	2,851.47	-507.20	2,851.47	1.17
9,913.00	89.88	359.92	7,160.66	2,946.44	-508.60	2,946.44	2.29
10,008.00	90.86	0.67	7,160.05	3,041.44	-508.11	3,041.44	1.30
10,103.00	90.65	359.37	7,158.80	3,136.43	-508.07	3,136.43	1.39
10,198.00	90.40	0.58	7,157.93	3,231.42	-508.12	3,231.42	1.30
10,293.00	90.22	1.10	7,157.41	3,326.41	-506.72	3,326.41	0.58
10,388.00	89.75	359.56	7,157.44	3,421.40	-506.18	3,421.40	1.69
10,483.00	88.52	357.33	7,158.87	3,516.35	-508.75	3,516.35	2.68
10,578.00	88.18	359.35	7,161.61	3,611.27	-511.50	3,611.27	2.16
10,673.00	89.45	2.85	7,163.57	3,706.21	-509.68	3,706.21	3.92
10,768.00	89.60	2.46	7,164.36	3,801.11	-505.28	3,801.11	0.44
10,864.00	86.67	1.90	7,167.48	3,896.97	-501.63	3,896.97	3.11
10,959.00	87.34	2.27	7,172.45	3,991.78	-498.18	3,991.78	0.81
11,054.00	87.99	2.42	7,176.32	4,086.62	-494.29	4,086.62	0.70
11,149.00	88.37	1.64	7,179.34	4,181.51	-490.93	4,181.51	0.91
11,244.00	89.60	0.34	7,181.02	4,276.48	-489.29	4,276.48	1.88
11,339.00	87.66	0.01	7,183.29	4,371.45	-489.00	4,371.45	2.07
11,434.00	86.39	358.73	7,188.22	4,466.31	-490.04	4,466.31	1.90
11,529.00	86.14	359.41	7,194.41	4,561.10	-491.58	4,561.10	0.76
Last MWD Survey @ 11529.00ft							
11,649.00	87.62	358.28	7,200.94	4,680.89	-494.00	4,680.89	1.55
11,696.00	87.62	358.28	7,202.89	4,727.83	-495.41	4,727.83	0.00
Final Svy Proj. to Bit @ 11696' MD :: 7202.89' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
224.00	224.00	1.17	-0.55	First MWD Survey @ 224.00ft
11,529.00	7,194.41	4,561.10	-491.58	Last MWD Survey @ 11529.00ft
11,696.00	7,202.89	4,727.83	-495.41	Final Svy Proj. to Bit @ 11696' MD :: 7202.89' TVD

Design Report for Kunzman 29N-5HZ - Actual Field Surveys

Vertical Section Information

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

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
224.00	805.00	MWD Surface Surveys	MWD+SC
882.00	7,536.00	MWD Vertical/Build Svys	MWD+SC
7,631.00	11,649.00	MWD Lateral Surveys	MWD+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
851.10	851.00	9 5/8" Casing Set @ 851.10' MD :: 851' TVD	9-5/8	13-1/2
7,521.80	7,150.92	7" Casing Set @ 7521.80' MD :: 7150.92' TVD	7	8-3/4

Design Report for Kunzman 29N-5HZ - 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
Kunzman 29N-5HZ_LI	0.00	0.00	0.00	0.01	-52.27	1,301,807.10	3,194,473.06	40° 9' 35.140 N	104° 48' 15.109 W
- actual wellpath misses target center by 52.27usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	4,740.07	-923.89	1,306,539.58	3,193,512.03	
Point 2				0.00	4,752.82	-5.73	1,306,559.53	3,194,430.03	
Point 3				0.00	478.14	-11.41	1,302,285.12	3,194,457.90	
Point 4				0.00	486.35	-930.19	1,302,286.12	3,193,539.12	
Point 5				0.00	4,740.07	-923.89	1,306,539.58	3,193,512.03	
Kunzman 29N-5HZ_LI	0.00	0.00	0.00	0.00	0.00	1,301,807.51	3,194,525.32	40° 9' 35.139 N	104° 48' 14.436 W
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	4,740.10	-979.12	1,306,539.58	3,193,509.07	
Point 2				0.00	486.33	-978.65	1,302,286.12	3,193,542.93	
Point 3				0.00	479.13	-60.64	1,302,286.12	3,194,460.93	
Point 4				0.00	4,732.90	-61.11	1,306,539.58	3,194,427.07	
Point 5				0.00	4,740.10	-979.12	1,306,539.58	3,193,509.07	
Kunzman 29N-5HZ_SI	0.00	0.00	0.00	0.01	-52.27	1,301,807.10	3,194,473.06	40° 9' 35.140 N	104° 48' 15.109 W
- actual wellpath misses target center by 52.27usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	5,198.42	-1,789.32	1,306,991.10	3,192,643.07	
Point 2				0.00	5,226.63	861.23	1,307,040.11	3,195,293.21	
Point 3				0.00	5,255.03	3,511.75	1,307,089.31	3,197,943.31	
Point 4				0.00	2,675.77	3,506.25	1,304,510.20	3,197,958.05	
Point 5				0.00	30.49	3,502.70	1,301,865.08	3,197,975.26	
Point 6				0.00	30.41	853.45	1,301,844.21	3,195,326.21	
Point 7				0.00	29.32	-1,796.03	1,301,822.33	3,192,676.93	
Point 8				0.00	30.41	853.45	1,301,844.21	3,195,326.21	
Point 9				0.00	30.49	3,502.70	1,301,865.08	3,197,975.26	
Point 10				0.00	-5,246.75	3,489.00	1,296,588.12	3,198,002.98	
Point 11				0.00	-5,251.38	-1,778.40	1,296,542.15	3,192,736.00	
Point 12				0.00	-2,610.49	-1,787.25	1,299,182.78	3,192,706.43	
Point 13				0.00	29.32	-1,796.03	1,301,822.33	3,192,676.93	
Point 14				0.00	5,198.42	-1,789.32	1,306,991.10	3,192,643.07	
Kunzman 29N-5HZ_SI	0.00	0.00	0.00	0.00	0.00	1,301,807.51	3,194,525.32	40° 9' 35.140 N	104° 48' 14.436 W
- actual wellpath hits target center									
- Point									
Kunzman 29N-5HZ_SI	0.00	0.00	0.00	0.00	0.00	1,301,807.51	3,194,525.32	40° 9' 35.139 N	104° 48' 14.436 W
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	5,198.43	-1,841.59	1,306,991.10	3,192,643.07	
Point 2				0.00	29.33	-1,848.30	1,301,822.33	3,192,676.93	
Point 3				0.00	30.42	801.18	1,301,844.21	3,195,326.21	
Point 4				0.00	30.50	3,450.43	1,301,865.08	3,197,975.26	
Point 5				0.00	2,675.78	3,453.98	1,304,510.20	3,197,958.05	
Point 6				0.00	5,255.04	3,459.48	1,307,089.31	3,197,943.31	
Point 7				0.00	5,226.64	808.97	1,307,040.11	3,195,293.21	
Point 8				0.00	5,198.43	-1,841.59	1,306,991.10	3,192,643.07	
Kunzman 29N-5HZ_BI	0.00	0.00	7,151.00	4,752.62	-502.18	1,306,555.84	3,193,985.88	40° 10' 22.105 N	104° 48' 20.905 W
- actual wellpath misses target center by 57.91usft at 11696.00usft MD (7202.89 TVD, 4727.83 N, -495.41 E)									
- Point									
Edmiston #W05-04 - 1	0.00	0.00	7,151.00	4,256.10	-755.38	1,306,057.36	3,193,736.59	40° 10' 17.198 N	104° 48' 24.167 W
- actual wellpath misses target center by 267.57usft at 11218.49usft MD (7180.77 TVD, 4250.98 N, -489.52 E)									
- Circle (radius 150.00)									

Design Report for Kunzman 29N-5HZ - Actual Field Surveys

Directional Difficulty Index

Average Dogleg over Survey:	1.94 °/100usft	Maximum Dogleg over Survey:	13.89 °/100usft at 7,266.00 usft
Net Tortosity applicable to Plans:	0.99 °/100usft	Directional Difficulty Index:	6.293

Audit Info

North Reference Sheet for Sec. 8-T2N-R66W - Kunzman 29N-5HZ - Plan A

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' @ 4871.00usft (Ensign 132). Northing and Easting are relative to Kunzman 29N-5HZ

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: 0.99995810

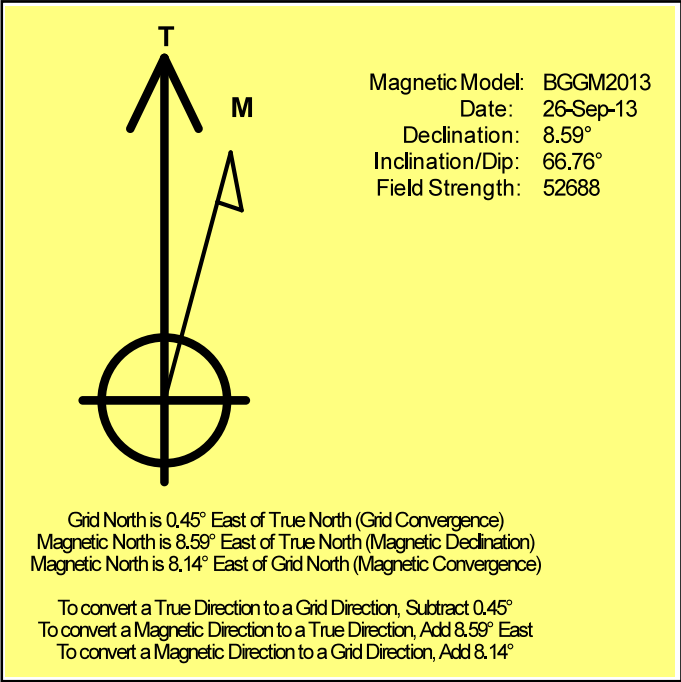
Grid Coordinates of Well: 1,301,807.51 usft N, 3,194,525.32 usft E

Geographical Coordinates of Well: 40° 09' 35.14" N, 104° 48' 14.44" W

Grid Convergence at Surface is: 0.45°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,696.00usft the Bottom Hole Displacement is 4,753.71usft in the Direction of 354.02° (True).

Magnetic Convergence at surface is: -8.14° (26 September 2013, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T2N-R66W

Kunzman 29N-5HZ

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

09 November, 2013

Well Coordinates: 1,301,807.51 N, 3,194,525.32 E (40° 09' 35.14" N, 104° 48' 14.44" W)

Ground Level: 4,858.00 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 Kunzman 29N-5HZ

RKB = 13' @ 4871.00usft (Ensign 132)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Kunzman 29N-5HZ - 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° 9' 35.139 N	104° 48' 14.436 W	1,301,807.51	3,194,525.32
224.00	0.66	334.56	224.00	1.17	-0.55	40° 9' 35.151 N	104° 48' 14.443 W	1,301,808.67	3,194,524.76
317.00	0.76	351.78	316.99	2.26	-0.87	40° 9' 35.162 N	104° 48' 14.447 W	1,301,809.76	3,194,524.43
503.00	0.94	17.88	502.97	4.93	-0.58	40° 9' 35.188 N	104° 48' 14.443 W	1,301,812.43	3,194,524.70
596.00	1.23	20.21	595.95	6.59	0.00	40° 9' 35.205 N	104° 48' 14.436 W	1,301,814.10	3,194,525.27
689.00	1.24	33.17	688.93	8.37	0.89	40° 9' 35.222 N	104° 48' 14.424 W	1,301,815.89	3,194,526.15
805.00	0.94	53.97	804.91	9.98	2.35	40° 9' 35.238 N	104° 48' 14.406 W	1,301,817.51	3,194,527.59
851.10	0.77	42.35	851.00	10.44	2.86	40° 9' 35.243 N	104° 48' 14.399 W	1,301,817.96	3,194,528.11
882.00	0.68	31.60	881.90	10.74	3.10	40° 9' 35.246 N	104° 48' 14.396 W	1,301,818.27	3,194,528.34
973.00	0.51	7.69	972.90	11.61	3.44	40° 9' 35.254 N	104° 48' 14.392 W	1,301,819.14	3,194,528.67
1,066.00	0.63	341.04	1,065.89	12.50	3.33	40° 9' 35.263 N	104° 48' 14.393 W	1,301,820.03	3,194,528.55
1,157.00	0.80	13.96	1,156.89	13.59	3.32	40° 9' 35.274 N	104° 48' 14.393 W	1,301,821.12	3,194,528.53
1,249.00	0.71	348.26	1,248.88	14.77	3.36	40° 9' 35.285 N	104° 48' 14.393 W	1,301,822.30	3,194,528.56
1,341.00	0.88	354.96	1,340.87	16.03	3.18	40° 9' 35.298 N	104° 48' 14.395 W	1,301,823.56	3,194,528.38
1,432.00	0.50	262.51	1,431.86	16.68	2.72	40° 9' 35.304 N	104° 48' 14.401 W	1,301,824.20	3,194,527.92
1,524.00	1.14	261.33	1,523.85	16.49	1.42	40° 9' 35.302 N	104° 48' 14.418 W	1,301,824.00	3,194,526.61
1,616.00	2.79	268.44	1,615.80	16.29	-1.72	40° 9' 35.300 N	104° 48' 14.458 W	1,301,823.78	3,194,523.47
1,708.00	5.24	272.58	1,707.56	16.42	-8.16	40° 9' 35.302 N	104° 48' 14.541 W	1,301,823.86	3,194,517.04
1,799.00	5.64	260.94	1,798.16	15.90	-16.73	40° 9' 35.297 N	104° 48' 14.651 W	1,301,823.27	3,194,508.47
1,890.00	7.21	267.29	1,888.58	14.92	-26.85	40° 9' 35.287 N	104° 48' 14.782 W	1,301,822.22	3,194,498.36
1,985.00	7.69	253.83	1,982.79	12.87	-38.91	40° 9' 35.267 N	104° 48' 14.937 W	1,301,820.07	3,194,486.32
2,081.00	8.94	256.39	2,077.78	9.33	-52.33	40° 9' 35.232 N	104° 48' 15.110 W	1,301,816.42	3,194,472.93
2,176.00	9.54	258.91	2,171.55	6.08	-67.23	40° 9' 35.200 N	104° 48' 15.302 W	1,301,813.05	3,194,458.05
2,271.00	9.14	256.44	2,265.29	2.79	-82.29	40° 9' 35.167 N	104° 48' 15.496 W	1,301,809.65	3,194,443.02
2,366.00	9.37	265.74	2,359.06	0.45	-97.33	40° 9' 35.144 N	104° 48' 15.690 W	1,301,807.19	3,194,427.99
2,461.00	8.33	262.64	2,452.92	-1.01	-111.87	40° 9' 35.130 N	104° 48' 15.877 W	1,301,805.62	3,194,413.47
2,556.00	10.54	261.32	2,546.63	-3.20	-127.29	40° 9' 35.108 N	104° 48' 16.075 W	1,301,803.31	3,194,398.07
2,651.00	8.74	259.30	2,640.29	-5.85	-142.97	40° 9' 35.082 N	104° 48' 16.277 W	1,301,800.53	3,194,382.41
2,747.00	10.69	261.70	2,734.91	-8.49	-158.95	40° 9' 35.056 N	104° 48' 16.483 W	1,301,797.77	3,194,366.45
2,842.00	10.18	260.52	2,828.34	-11.15	-175.95	40° 9' 35.029 N	104° 48' 16.702 W	1,301,794.98	3,194,349.47
2,937.00	8.74	261.95	2,922.04	-13.54	-191.38	40° 9' 35.006 N	104° 48' 16.901 W	1,301,792.47	3,194,334.07
3,032.00	10.97	264.58	3,015.63	-15.40	-207.52	40° 9' 34.987 N	104° 48' 17.109 W	1,301,790.47	3,194,317.93
3,127.00	9.95	262.80	3,109.05	-17.29	-224.67	40° 9' 34.969 N	104° 48' 17.330 W	1,301,788.46	3,194,300.81
3,222.00	8.52	262.09	3,202.82	-19.28	-239.78	40° 9' 34.949 N	104° 48' 17.524 W	1,301,786.34	3,194,285.71
3,317.00	10.03	271.18	3,296.58	-20.08	-255.02	40° 9' 34.941 N	104° 48' 17.721 W	1,301,785.42	3,194,270.48
3,413.00	7.91	271.92	3,391.40	-19.69	-269.99	40° 9' 34.945 N	104° 48' 17.913 W	1,301,785.70	3,194,255.51
3,508.00	11.42	276.36	3,485.04	-18.43	-285.87	40° 9' 34.957 N	104° 48' 18.118 W	1,301,786.84	3,194,239.62
3,603.00	9.72	276.42	3,578.42	-16.49	-303.19	40° 9' 34.977 N	104° 48' 18.341 W	1,301,788.64	3,194,222.29
3,698.00	10.92	275.81	3,671.89	-14.68	-320.11	40° 9' 34.994 N	104° 48' 18.559 W	1,301,790.31	3,194,205.35
3,793.00	10.35	268.47	3,765.26	-14.00	-337.59	40° 9' 35.001 N	104° 48' 18.784 W	1,301,790.86	3,194,187.86
3,888.00	8.45	268.87	3,858.98	-14.36	-353.11	40° 9' 34.998 N	104° 48' 18.984 W	1,301,790.37	3,194,172.36
3,983.00	10.44	265.03	3,952.69	-15.25	-368.66	40° 9' 34.989 N	104° 48' 19.184 W	1,301,789.37	3,194,156.81

Design Report for Kunzman 29N-5HZ - 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)
4,079.00	10.37	266.00	4,047.11	-16.60	-385.94	40° 9' 34.975 N	104° 48' 19.407 W	1,301,787.88	3,194,139.54
4,174.00	8.96	263.50	4,140.76	-18.04	-401.83	40° 9' 34.961 N	104° 48' 19.611 W	1,301,786.32	3,194,123.67
4,269.00	10.17	274.13	4,234.44	-18.27	-417.54	40° 9' 34.959 N	104° 48' 19.814 W	1,301,785.96	3,194,107.95
4,364.00	8.38	276.55	4,328.20	-16.88	-432.79	40° 9' 34.973 N	104° 48' 20.010 W	1,301,787.23	3,194,092.70
4,459.00	9.57	259.97	4,422.05	-17.46	-447.44	40° 9' 34.967 N	104° 48' 20.199 W	1,301,786.53	3,194,078.05
4,554.00	8.61	255.16	4,515.85	-20.66	-462.09	40° 9' 34.935 N	104° 48' 20.388 W	1,301,783.22	3,194,063.42
4,650.00	8.01	256.61	4,610.85	-24.05	-475.55	40° 9' 34.902 N	104° 48' 20.561 W	1,301,779.73	3,194,050.00
4,745.00	5.44	255.64	4,705.18	-26.70	-486.35	40° 9' 34.876 N	104° 48' 20.700 W	1,301,776.99	3,194,039.22
4,840.00	2.69	259.71	4,799.94	-28.21	-492.91	40° 9' 34.861 N	104° 48' 20.785 W	1,301,775.43	3,194,032.67
4,935.00	0.18	78.27	4,894.90	-28.58	-494.96	40° 9' 34.857 N	104° 48' 20.811 W	1,301,775.04	3,194,030.63
5,030.00	0.68	96.20	4,989.90	-28.61	-494.25	40° 9' 34.857 N	104° 48' 20.802 W	1,301,775.02	3,194,031.33
5,125.00	0.52	93.97	5,084.90	-28.70	-493.26	40° 9' 34.856 N	104° 48' 20.789 W	1,301,774.93	3,194,032.33
5,220.00	0.92	106.90	5,179.89	-28.95	-492.10	40° 9' 34.853 N	104° 48' 20.774 W	1,301,774.69	3,194,033.49
5,316.00	2.19	217.31	5,275.86	-30.64	-492.47	40° 9' 34.837 N	104° 48' 20.779 W	1,301,773.01	3,194,033.13
5,411.00	2.18	217.43	5,370.80	-33.52	-494.67	40° 9' 34.808 N	104° 48' 20.807 W	1,301,770.11	3,194,030.95
5,506.00	0.61	180.97	5,465.77	-35.46	-495.78	40° 9' 34.789 N	104° 48' 20.821 W	1,301,768.16	3,194,029.86
5,601.00	0.48	221.74	5,560.76	-36.26	-496.05	40° 9' 34.781 N	104° 48' 20.825 W	1,301,767.36	3,194,029.59
5,696.00	0.82	225.94	5,655.76	-37.03	-496.81	40° 9' 34.774 N	104° 48' 20.835 W	1,301,766.58	3,194,028.84
5,791.00	0.58	251.60	5,750.75	-37.65	-497.75	40° 9' 34.767 N	104° 48' 20.847 W	1,301,765.95	3,194,027.90
5,886.00	0.65	267.98	5,845.74	-37.82	-498.74	40° 9' 34.766 N	104° 48' 20.860 W	1,301,765.77	3,194,026.91
5,982.00	1.45	285.57	5,941.73	-37.52	-500.46	40° 9' 34.769 N	104° 48' 20.882 W	1,301,766.06	3,194,025.19
6,077.00	1.60	271.70	6,036.69	-37.16	-502.94	40° 9' 34.772 N	104° 48' 20.914 W	1,301,766.41	3,194,022.71
6,172.00	1.55	267.95	6,131.66	-37.16	-505.55	40° 9' 34.772 N	104° 48' 20.947 W	1,301,766.38	3,194,020.10
6,267.00	1.25	269.42	6,226.63	-37.22	-507.87	40° 9' 34.772 N	104° 48' 20.977 W	1,301,766.30	3,194,017.78
6,362.00	1.68	269.26	6,321.60	-37.25	-510.30	40° 9' 34.771 N	104° 48' 21.009 W	1,301,766.26	3,194,015.35
6,457.00	1.68	271.52	6,416.56	-37.23	-513.09	40° 9' 34.772 N	104° 48' 21.044 W	1,301,766.25	3,194,012.57
6,552.00	1.70	308.40	6,511.52	-36.32	-515.58	40° 9' 34.781 N	104° 48' 21.077 W	1,301,767.15	3,194,010.06
6,600.00	2.60	312.44	6,559.48	-35.14	-516.94	40° 9' 34.792 N	104° 48' 21.094 W	1,301,768.31	3,194,008.69
6,647.00	7.56	348.70	6,606.29	-31.38	-518.34	40° 9' 34.829 N	104° 48' 21.112 W	1,301,772.06	3,194,007.27
6,695.00	13.27	352.26	6,653.48	-22.82	-519.70	40° 9' 34.914 N	104° 48' 21.130 W	1,301,780.61	3,194,005.84
6,742.00	17.71	354.94	6,698.77	-10.35	-521.06	40° 9' 35.037 N	104° 48' 21.147 W	1,301,793.07	3,194,004.39
6,790.00	20.42	359.63	6,744.13	5.30	-521.75	40° 9' 35.192 N	104° 48' 21.156 W	1,301,808.71	3,194,003.56
6,838.00	24.12	1.73	6,788.54	23.48	-521.51	40° 9' 35.371 N	104° 48' 21.153 W	1,301,826.89	3,194,003.66
6,886.00	28.73	4.25	6,831.52	44.80	-520.36	40° 9' 35.582 N	104° 48' 21.138 W	1,301,848.22	3,194,004.65
6,932.00	32.71	4.27	6,871.06	68.23	-518.62	40° 9' 35.814 N	104° 48' 21.116 W	1,301,871.66	3,194,006.21
6,980.00	35.54	4.02	6,910.79	95.09	-516.67	40° 9' 36.079 N	104° 48' 21.091 W	1,301,898.53	3,194,007.94
7,027.00	38.76	4.58	6,948.24	123.39	-514.54	40° 9' 36.359 N	104° 48' 21.063 W	1,301,926.84	3,194,009.85
7,075.00	43.16	4.29	6,984.48	154.75	-512.11	40° 9' 36.669 N	104° 48' 21.032 W	1,301,958.22	3,194,012.04
7,122.00	47.68	2.80	7,017.46	188.15	-510.06	40° 9' 36.999 N	104° 48' 21.005 W	1,301,991.64	3,194,013.83
7,170.00	52.91	1.21	7,048.12	225.04	-508.78	40° 9' 37.363 N	104° 48' 20.989 W	1,302,028.54	3,194,014.81
7,219.00	59.67	1.50	7,075.30	265.77	-507.82	40° 9' 37.766 N	104° 48' 20.977 W	1,302,069.27	3,194,015.46
7,266.00	66.20	1.55	7,096.67	307.59	-506.70	40° 9' 38.179 N	104° 48' 20.962 W	1,302,111.09	3,194,016.24

Design Report for Kunzman 29N-5HZ - 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)
7,313.00	70.68	1.43	7,113.94	351.27	-505.57	40° 9' 38.611 N	104° 48' 20.948 W	1,302,154.78	3,194,017.03
7,361.00	75.12	0.99	7,128.05	397.13	-504.60	40° 9' 39.064 N	104° 48' 20.935 W	1,302,200.64	3,194,017.64
7,408.00	79.75	0.04	7,138.27	442.99	-504.19	40° 9' 39.517 N	104° 48' 20.930 W	1,302,246.50	3,194,017.69
7,456.00	82.19	359.80	7,145.80	490.39	-504.26	40° 9' 39.985 N	104° 48' 20.931 W	1,302,293.90	3,194,017.25
7,486.00	85.89	359.38	7,148.92	520.22	-504.47	40° 9' 40.280 N	104° 48' 20.934 W	1,302,323.73	3,194,016.80
7,521.80	87.71	359.20	7,150.92	555.96	-504.92	40° 9' 40.633 N	104° 48' 20.939 W	1,302,359.46	3,194,016.08
7,536.00	88.43	359.13	7,151.40	570.15	-505.12	40° 9' 40.774 N	104° 48' 20.942 W	1,302,373.65	3,194,015.76
7,631.00	87.41	359.03	7,154.84	665.07	-506.65	40° 9' 41.712 N	104° 48' 20.962 W	1,302,468.56	3,194,013.49
7,725.00	88.18	358.96	7,158.46	758.99	-508.29	40° 9' 42.640 N	104° 48' 20.983 W	1,302,562.45	3,194,011.11
7,820.00	88.64	359.22	7,161.10	853.94	-509.80	40° 9' 43.578 N	104° 48' 21.002 W	1,302,657.38	3,194,008.86
7,915.00	91.57	0.53	7,160.92	948.93	-510.01	40° 9' 44.517 N	104° 48' 21.005 W	1,302,752.36	3,194,007.90
8,011.00	91.51	359.11	7,158.34	1,044.89	-510.31	40° 9' 45.465 N	104° 48' 21.009 W	1,302,848.32	3,194,006.85
8,106.00	90.37	0.24	7,156.78	1,139.87	-510.85	40° 9' 46.404 N	104° 48' 21.016 W	1,302,943.29	3,194,005.56
8,201.00	90.77	358.94	7,155.84	1,234.86	-511.53	40° 9' 47.342 N	104° 48' 21.025 W	1,303,038.27	3,194,004.14
8,296.00	90.37	359.75	7,154.89	1,329.85	-512.62	40° 9' 48.281 N	104° 48' 21.039 W	1,303,133.24	3,194,002.31
8,391.00	89.72	0.62	7,154.82	1,424.85	-512.31	40° 9' 49.220 N	104° 48' 21.035 W	1,303,228.23	3,194,001.87
8,486.00	90.62	359.32	7,154.54	1,519.85	-512.36	40° 9' 50.159 N	104° 48' 21.035 W	1,303,323.22	3,194,001.07
8,581.00	88.61	359.38	7,155.17	1,614.83	-513.44	40° 9' 51.097 N	104° 48' 21.049 W	1,303,418.19	3,193,999.25
8,676.00	89.32	0.47	7,156.89	1,709.82	-513.56	40° 9' 52.036 N	104° 48' 21.051 W	1,303,513.17	3,193,998.38
8,771.00	91.30	1.97	7,156.38	1,804.79	-511.54	40° 9' 52.974 N	104° 48' 21.025 W	1,303,608.15	3,193,999.66
8,867.00	91.97	1.28	7,153.64	1,900.71	-508.82	40° 9' 53.922 N	104° 48' 20.990 W	1,303,704.08	3,194,001.63
8,962.00	90.00	1.40	7,152.00	1,995.66	-506.60	40° 9' 54.861 N	104° 48' 20.961 W	1,303,799.05	3,194,003.10
9,057.00	90.09	0.88	7,151.93	2,090.64	-504.71	40° 9' 55.799 N	104° 48' 20.937 W	1,303,894.04	3,194,004.25
9,152.00	90.12	0.82	7,151.76	2,185.63	-503.30	40° 9' 56.738 N	104° 48' 20.919 W	1,303,989.03	3,194,004.91
9,247.00	89.94	0.25	7,151.71	2,280.63	-502.41	40° 9' 57.677 N	104° 48' 20.907 W	1,304,084.02	3,194,005.05
9,342.00	90.59	359.41	7,151.27	2,375.62	-502.69	40° 9' 58.616 N	104° 48' 20.911 W	1,304,179.01	3,194,004.02
9,437.00	88.55	0.67	7,151.98	2,470.62	-502.62	40° 9' 59.554 N	104° 48' 20.910 W	1,304,274.00	3,194,003.34
9,532.00	88.49	0.25	7,154.43	2,565.58	-501.86	40° 10' 0.493 N	104° 48' 20.901 W	1,304,368.96	3,194,003.36
9,627.00	89.29	359.20	7,156.27	2,660.56	-502.32	40° 10' 1.431 N	104° 48' 20.906 W	1,304,463.93	3,194,002.16
9,722.00	89.45	358.27	7,157.32	2,755.53	-504.42	40° 10' 2.370 N	104° 48' 20.933 W	1,304,558.88	3,193,999.32
9,818.00	88.33	358.40	7,159.18	2,851.47	-507.20	40° 10' 3.318 N	104° 48' 20.969 W	1,304,654.79	3,193,995.78
9,913.00	89.88	359.92	7,160.66	2,946.44	-508.60	40° 10' 4.256 N	104° 48' 20.987 W	1,304,749.74	3,193,993.64
10,008.00	90.86	0.67	7,160.05	3,041.44	-508.11	40° 10' 5.195 N	104° 48' 20.981 W	1,304,844.73	3,193,993.38
10,103.00	90.65	359.37	7,158.80	3,136.43	-508.07	40° 10' 6.134 N	104° 48' 20.981 W	1,304,939.72	3,193,992.67
10,198.00	90.40	0.58	7,157.93	3,231.42	-508.12	40° 10' 7.073 N	104° 48' 20.981 W	1,305,034.70	3,193,991.88
10,293.00	90.22	1.10	7,157.41	3,326.41	-506.72	40° 10' 8.011 N	104° 48' 20.963 W	1,305,129.70	3,193,992.53
10,388.00	89.75	359.56	7,157.44	3,421.40	-506.18	40° 10' 8.950 N	104° 48' 20.956 W	1,305,224.69	3,193,992.33
10,483.00	88.52	357.33	7,158.87	3,516.35	-508.75	40° 10' 9.888 N	104° 48' 20.990 W	1,305,319.61	3,193,989.01
10,578.00	88.18	359.35	7,161.61	3,611.27	-511.50	40° 10' 10.826 N	104° 48' 21.025 W	1,305,414.49	3,193,985.51
10,673.00	89.45	2.85	7,163.57	3,706.21	-509.68	40° 10' 11.764 N	104° 48' 21.002 W	1,305,509.45	3,193,986.59
10,768.00	89.60	2.46	7,164.36	3,801.11	-505.28	40° 10' 12.702 N	104° 48' 20.945 W	1,305,604.37	3,193,990.25
10,864.00	86.67	1.90	7,167.48	3,896.97	-501.63	40° 10' 13.650 N	104° 48' 20.898 W	1,305,700.26	3,193,993.14

Design Report for Kunzman 29N-5HZ - 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)
10,959.00	87.34	2.27	7,172.45	3,991.78	-498.18	40° 10' 14.586 N	104° 48' 20.853 W	1,305,795.09	3,193,995.85
11,054.00	87.99	2.42	7,176.32	4,086.62	-494.29	40° 10' 15.524 N	104° 48' 20.803 W	1,305,889.95	3,193,998.99
11,149.00	88.37	1.64	7,179.34	4,181.51	-490.93	40° 10' 16.461 N	104° 48' 20.760 W	1,305,984.86	3,194,001.61
11,244.00	89.60	0.34	7,181.02	4,276.48	-489.29	40° 10' 17.400 N	104° 48' 20.739 W	1,306,079.84	3,194,002.50
11,339.00	87.66	0.01	7,183.29	4,371.45	-489.00	40° 10' 18.338 N	104° 48' 20.735 W	1,306,174.80	3,194,002.05
11,434.00	86.39	358.73	7,188.22	4,466.31	-490.04	40° 10' 19.276 N	104° 48' 20.749 W	1,306,269.65	3,194,000.26
11,529.00	86.14	359.41	7,194.41	4,561.10	-491.58	40° 10' 20.212 N	104° 48' 20.769 W	1,306,364.41	3,193,997.98
11,649.00	87.62	358.28	7,200.94	4,680.89	-494.00	40° 10' 21.396 N	104° 48' 20.800 W	1,306,484.18	3,193,994.62
11,696.00	87.62	358.28	7,202.89	4,727.83	-495.41	40° 10' 21.860 N	104° 48' 20.818 W	1,306,531.10	3,193,992.85

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
224.00	224.00	1.17	-0.55	First MWD Survey @ 224.00ft
11,529.00	7,194.41	4,561.10	-491.58	Last MWD Survey @ 11529.00ft
11,696.00	7,202.89	4,727.83	-495.41	Final Svy Proj. to Bit @ 11696' MD :: 7202.89' TVD

Vertical Section Information

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

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
224.00	805.00	MWD Surface Surveys	MWD+SC
882.00	7,536.00	MWD Vertical/Build Svys	MWD+SC
7,631.00	11,649.00	MWD Lateral Surveys	MWD+SC

Design Report for Kunzman 29N-5HZ - Actual Field Surveys

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
851.10	851.00	9 5/8" Casing Set @ 851.10' MD :: 851' TVD	9-5/8	13-1/2
7,521.80	7,150.92	7" Casing Set @ 7521.80' MD :: 7150.92' 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:	1.94 °/100usft	Maximum Dogleg over Survey:	13.89 °/100usft at 7,266.00 usft
Net Tortosity applicable to Plans:	0.99 °/100usft	Directional Difficulty Index:	6.293

Audit Info

North Reference Sheet for Sec. 8-T2N-R66W - Kunzman 29N-5HZ - Plan A

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' @ 4871.00usft (Ensign 132). Northing and Easting are relative to Kunzman 29N-5HZ

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: 0.99995810

Grid Coordinates of Well: 1,301,807.51 usft N, 3,194,525.32 usft E

Geographical Coordinates of Well: 40° 09' 35.14" N, 104° 48' 14.44" W

Grid Convergence at Surface is: 0.45°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,696.00usft

the Bottom Hole Displacement is 4,753.71usft in the Direction of 354.02° (True).

Magnetic Convergence at surface is: -8.14° (26 September 2013, , BGGM2013)

