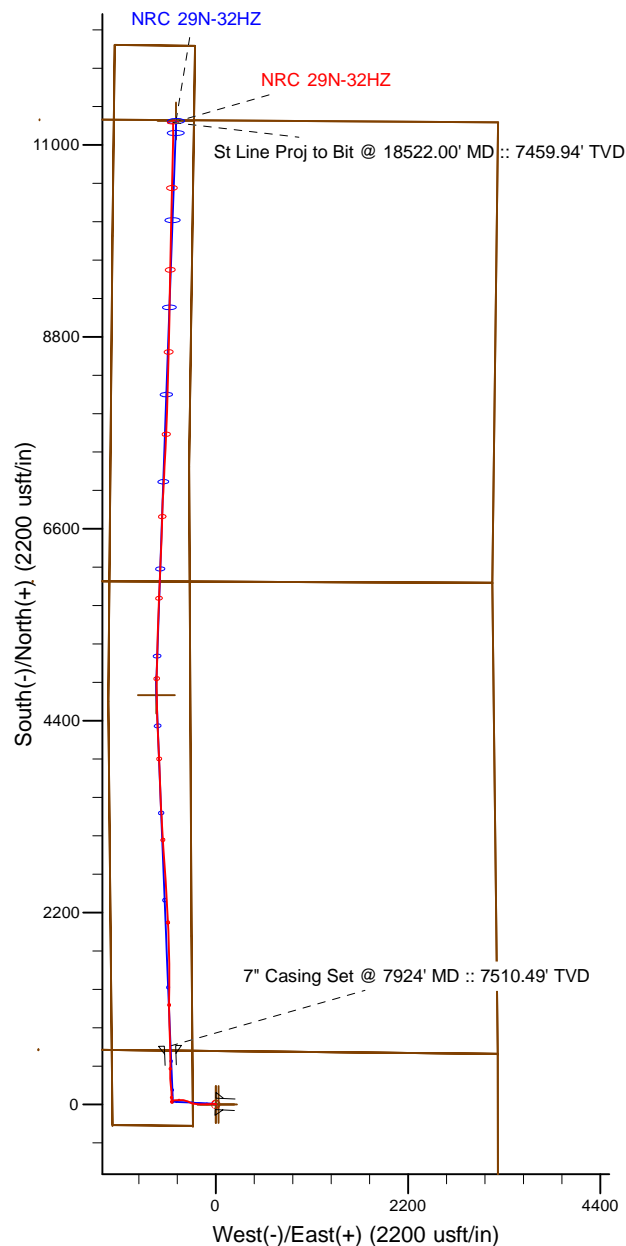
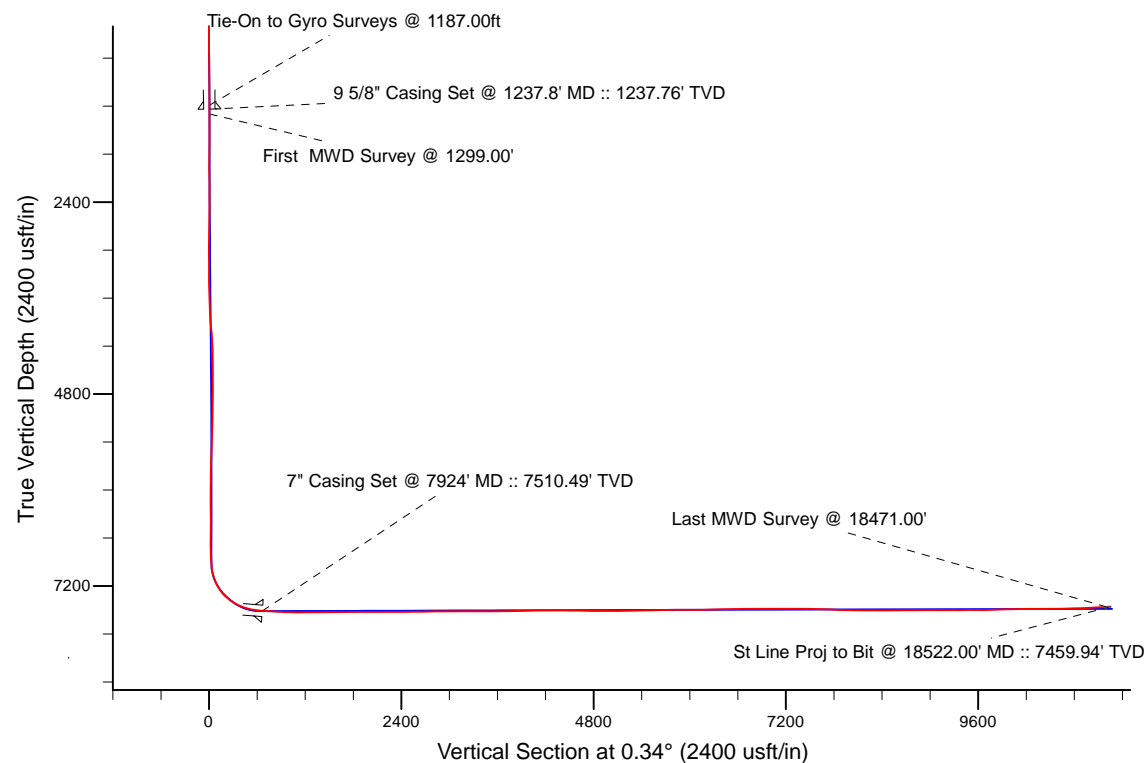


Project: Weld County, CO (NAD 83)
 Site: Sec. 8-T1N-R67W
 Well: NRC 29N-32HZ
 Wellbore: Plan B
 Design: Actual Surveys



LEGEND

- NRC 29N-32HZ, Plan B, Rev B0 V0
- Actual Surveys



7" Casing: ~52.09' FSL, ~1509.64' FWL
 Lat/Long: 40.073006 N, -104.918511 E
 State Planes - CO Northern: 1,269,974.65' N, 3,162,730.84' E
 Location: Sec. 5-T1N-R67W

BHL: ~16.78' FNL, ~1530.85' FWL
 Lat/Long: 40.102071 N, -104.918390 E
 State Planes - CO Northern: 1,280,562.50' N, 3,162,695.17' E
 Location: Sec. 32-T2N-R67W

WELL DETAILS: NRC 29N-32HZ

Ground Level: 5035.00
 RKB = 25' @ 5060.00usft (H&P 308)

Design: Actual Surveys (NRC 29N-32HZ/Plan B)

Created By: Clint Eshelman Date: 6/10/2014
 Reviewed: Date:

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T1N-R67W

NRC 29N-32HZ

Plan B

Design: Actual Surveys

Sperry Drilling Services

Standard Report

10 June, 2014

Well Coordinates: 1,269,308.21 N, 3,163,259.23 E (40° 04' 16.20" N, 104° 54' 59.90" W)

Ground Level: 5,035.00 usft

Local Coordinate Origin:

Centered on Well NRC 29N-32HZ

Viewing Datum:

RKB = 25' @ 5060.00usft (H&P 308)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Design Report for NRC 29N-32HZ - Actual 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
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
125.00	0.20	84.95	125.00	0.02	0.17	0.02	0.20
225.00	0.41	58.80	225.00	0.22	0.65	0.22	0.25
325.00	0.37	22.50	325.00	0.70	1.08	0.71	0.25
425.00	0.33	15.41	424.99	1.28	1.28	1.28	0.06
525.00	0.37	336.64	524.99	1.85	1.23	1.86	0.24
625.00	0.41	333.99	624.99	2.47	0.95	2.47	0.04
725.00	0.46	342.91	724.99	3.17	0.67	3.18	0.08
825.00	0.51	316.35	824.98	3.88	0.25	3.88	0.23
925.00	0.66	304.39	924.98	4.53	-0.54	4.52	0.19
1,025.00	0.58	303.75	1,024.97	5.13	-1.43	5.12	0.08
1,125.00	0.61	296.15	1,124.97	5.65	-2.33	5.63	0.08
1,187.00	0.68	283.52	1,186.96	5.88	-2.98	5.86	0.25
Tie-On to Gyro Surveys @ 1187.00ft							
1,237.80	0.37	272.34	1,237.76	5.96	-3.44	5.94	0.63
9 5/8" Casing Set @ 1237.8' MD :: 1237.76' TVD							
1,299.00	0.16	189.40	1,298.96	5.88	-3.66	5.86	0.63
First MWD Survey @ 1299.00'							
1,394.00	0.39	263.11	1,393.96	5.71	-4.00	5.69	0.40
1,491.00	0.55	226.75	1,490.96	5.35	-4.67	5.32	0.34
1,583.00	0.55	262.00	1,582.95	4.99	-5.42	4.96	0.36
1,675.00	0.33	277.03	1,674.95	4.96	-6.12	4.92	0.27
1,768.00	0.53	243.99	1,767.95	4.80	-6.78	4.76	0.33
1,860.00	0.48	239.12	1,859.94	4.42	-7.49	4.37	0.07
1,952.00	0.48	268.80	1,951.94	4.21	-8.21	4.16	0.27
2,046.00	3.43	281.32	2,045.88	4.76	-11.36	4.69	3.15
2,139.00	5.21	276.99	2,138.61	5.82	-18.28	5.71	1.94
2,230.00	4.48	280.08	2,229.28	6.94	-25.88	6.79	0.85
2,321.00	4.97	271.12	2,319.97	7.64	-33.32	7.44	0.97
2,414.00	7.41	266.93	2,412.43	7.40	-43.34	7.14	2.67
2,507.00	8.70	258.03	2,504.51	5.62	-56.21	5.29	1.93
2,599.00	9.59	262.82	2,595.34	3.22	-70.62	2.80	1.27
2,690.00	10.62	267.67	2,684.93	1.93	-86.52	1.42	1.47
2,783.00	9.17	266.70	2,776.54	1.15	-102.48	0.55	1.57
2,875.00	10.54	271.87	2,867.19	1.01	-118.21	0.31	1.77
2,967.00	9.69	268.60	2,957.76	1.09	-134.36	0.30	1.11
3,060.00	10.99	273.30	3,049.25	1.41	-151.03	0.52	1.67
3,153.00	10.09	271.10	3,140.68	2.08	-168.03	1.08	1.06
3,246.00	8.40	269.74	3,232.46	2.20	-182.97	1.12	1.83
3,339.00	9.87	273.69	3,324.28	2.69	-197.72	1.51	1.72
3,431.00	9.18	272.65	3,415.01	3.53	-212.92	2.27	0.77
3,523.00	10.98	281.12	3,505.60	5.56	-228.85	4.20	2.53
3,615.00	9.53	278.70	3,596.12	8.40	-244.97	6.95	1.64
3,706.00	8.89	278.36	3,685.95	10.57	-259.38	9.03	0.71
3,798.00	8.61	285.10	3,776.88	13.39	-273.06	11.77	1.15
3,890.00	13.06	297.19	3,867.23	19.94	-288.96	18.23	5.41
3,982.00	13.38	292.94	3,956.79	28.84	-308.01	27.01	1.11
4,073.00	11.59	289.75	4,045.64	36.03	-326.31	34.10	2.11
4,165.00	10.73	285.47	4,135.90	41.44	-343.27	39.40	1.30

Design Report for NRC 29N-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,257.00	10.02	284.11	4,226.40	45.68	-359.28	43.54	0.82
4,352.00	9.28	281.83	4,320.05	49.26	-374.80	47.04	0.88
4,446.00	10.18	271.17	4,412.71	50.99	-390.52	48.67	2.14
4,540.00	9.97	269.56	4,505.26	51.09	-406.96	48.68	0.37
4,635.00	8.24	269.53	4,599.06	50.97	-421.99	48.47	1.82
4,729.00	7.28	265.40	4,692.20	50.44	-434.67	47.86	1.18
4,824.00	6.83	266.16	4,786.48	49.58	-446.30	46.93	0.48
4,918.00	6.64	263.82	4,879.83	48.62	-457.28	45.91	0.36
5,012.00	6.19	269.20	4,973.24	47.96	-467.75	45.19	0.80
5,107.00	5.61	261.56	5,067.74	47.21	-477.47	44.38	1.03
5,201.00	4.32	258.96	5,161.38	45.86	-485.49	42.98	1.39
5,296.00	4.40	253.37	5,256.11	44.13	-492.49	41.21	0.46
5,390.00	4.17	230.79	5,349.85	40.94	-498.60	37.98	1.80
5,484.00	3.59	228.01	5,443.64	36.81	-503.43	33.82	0.65
5,579.00	3.52	221.10	5,538.45	32.62	-507.56	29.61	0.46
5,673.00	1.37	216.18	5,632.36	29.54	-510.12	26.51	2.30
5,767.00	1.85	134.57	5,726.34	27.57	-509.70	24.54	2.27
5,861.00	1.32	128.57	5,820.30	25.83	-507.77	22.81	0.59
5,956.00	1.05	127.79	5,915.28	24.61	-506.23	21.61	0.28
6,050.00	0.83	114.55	6,009.27	23.80	-504.93	20.80	0.33
6,144.00	0.76	105.36	6,103.26	23.35	-503.71	20.36	0.15
6,238.00	0.68	111.91	6,197.25	22.98	-502.59	20.00	0.12
6,333.00	0.25	75.75	6,292.25	22.82	-501.87	19.84	0.53
6,427.00	0.74	6.54	6,386.24	23.47	-501.60	20.50	0.74
6,522.00	0.75	355.53	6,481.24	24.70	-501.58	21.73	0.15
6,616.00	0.63	307.75	6,575.23	25.63	-502.04	22.65	0.61
6,711.00	0.51	310.62	6,670.22	26.23	-502.77	23.24	0.13
6,806.00	0.34	342.60	6,765.22	26.77	-503.17	23.79	0.30
6,900.00	1.73	342.43	6,859.20	28.39	-503.69	25.40	1.48
6,947.00	3.81	347.62	6,906.15	30.59	-504.24	27.60	4.45
6,995.00	6.53	355.29	6,953.95	34.87	-504.80	31.88	5.83
7,042.00	9.28	356.04	7,000.50	41.32	-505.28	38.32	5.86
7,089.00	14.08	354.85	7,046.51	50.80	-506.06	47.79	10.23
7,136.00	18.16	358.51	7,091.65	63.82	-506.76	60.81	8.94
7,184.00	21.92	357.39	7,136.74	80.25	-507.36	77.24	7.87
7,231.00	26.25	1.70	7,179.64	99.42	-507.46	96.40	9.94
7,279.00	31.05	0.01	7,221.75	122.42	-507.14	119.41	10.14
7,326.00	36.47	356.08	7,260.82	148.50	-508.09	145.48	12.43
7,373.00	41.90	351.57	7,297.24	177.99	-511.35	174.95	13.04
7,420.00	47.54	354.14	7,330.63	210.79	-515.43	207.72	12.60
7,468.00	51.71	356.60	7,361.72	247.22	-518.35	244.14	9.52
7,515.00	54.14	357.99	7,390.05	284.68	-520.11	281.59	5.68
7,562.00	59.25	358.32	7,415.85	323.92	-521.38	320.82	10.89
7,609.00	65.00	359.97	7,437.81	365.45	-521.98	362.34	12.62
7,657.00	68.86	0.18	7,456.62	409.60	-521.92	406.50	8.05
7,704.00	72.37	0.85	7,472.22	453.93	-521.52	450.82	7.59
7,752.00	75.78	0.09	7,485.39	500.08	-521.14	496.97	7.27
7,799.00	79.13	359.60	7,495.59	545.95	-521.27	542.84	7.20
7,846.00	82.49	359.69	7,503.10	592.34	-521.56	589.23	7.15
7,887.00	85.13	357.61	7,507.52	633.08	-522.52	629.97	8.18
7,924.00	85.66	357.71	7,510.49	669.93	-524.02	666.81	1.45

Design Report for NRC 29N-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7" Casing Set @ 7924' MD :: 7510.49' TVD							
8,017.00	86.98	357.96	7,516.46	762.67	-527.53	759.52	1.45
8,111.00	86.70	358.39	7,521.65	856.48	-530.52	853.31	0.55
8,206.00	88.24	359.00	7,525.84	951.36	-532.68	948.18	1.74
8,300.00	88.06	359.16	7,528.87	1,045.30	-534.19	1,042.11	0.26
8,395.00	89.88	359.94	7,530.58	1,140.27	-534.93	1,137.08	2.08
8,489.00	90.86	0.36	7,529.97	1,234.27	-534.69	1,231.07	1.13
8,584.00	91.08	0.64	7,528.37	1,329.25	-533.86	1,326.06	0.37
8,678.00	91.32	1.07	7,526.40	1,423.22	-532.46	1,420.04	0.52
8,773.00	90.15	0.07	7,525.18	1,518.21	-531.51	1,515.02	1.62
8,867.00	89.67	358.08	7,525.33	1,612.19	-533.03	1,609.00	2.18
8,962.00	89.85	358.45	7,525.72	1,707.14	-535.91	1,703.93	0.43
9,057.00	90.25	359.07	7,525.64	1,802.12	-537.96	1,798.90	0.78
9,152.00	90.68	358.33	7,524.87	1,897.09	-540.12	1,893.85	0.90
9,247.00	90.25	357.10	7,524.10	1,992.01	-543.90	1,988.75	1.37
9,341.00	89.75	356.86	7,524.10	2,085.88	-548.86	2,082.59	0.59
9,436.00	89.88	357.13	7,524.41	2,180.75	-553.84	2,177.42	0.32
9,531.00	90.40	356.93	7,524.17	2,275.62	-558.76	2,272.27	0.59
9,626.00	90.46	357.19	7,523.46	2,370.49	-563.63	2,367.11	0.28
9,721.00	90.52	356.74	7,522.65	2,465.36	-568.66	2,461.94	0.48
9,815.00	90.12	356.37	7,522.12	2,559.18	-574.31	2,555.73	0.58
9,910.00	91.27	356.25	7,520.97	2,653.98	-580.42	2,650.49	1.22
10,005.00	90.68	355.96	7,519.35	2,748.75	-586.87	2,745.21	0.69
10,100.00	90.03	355.68	7,518.77	2,843.49	-593.80	2,839.92	0.74
10,194.00	90.15	355.98	7,518.62	2,937.24	-600.63	2,933.63	0.34
10,289.00	90.62	356.73	7,517.98	3,032.05	-606.67	3,028.39	0.93
10,383.00	90.68	357.17	7,516.91	3,125.91	-611.67	3,122.22	0.47
10,478.00	90.25	356.87	7,516.14	3,220.77	-616.61	3,217.06	0.55
10,572.00	89.60	356.41	7,516.27	3,314.61	-622.12	3,310.86	0.85
10,665.00	89.57	356.57	7,516.94	3,407.44	-627.82	3,403.65	0.18
10,757.00	89.75	356.80	7,517.49	3,499.28	-633.14	3,495.46	0.32
10,850.00	90.92	358.05	7,516.94	3,592.18	-637.31	3,588.34	1.84
10,942.00	91.14	358.31	7,515.29	3,684.12	-640.24	3,680.25	0.37
11,034.00	91.23	358.41	7,513.39	3,776.06	-642.87	3,772.18	0.15
11,127.00	91.08	358.19	7,511.51	3,869.00	-645.63	3,865.10	0.29
11,220.00	91.51	357.51	7,509.41	3,961.91	-649.11	3,957.99	0.86
11,312.00	91.60	357.51	7,506.91	4,053.79	-653.11	4,049.84	0.10
11,403.00	90.49	356.76	7,505.25	4,144.66	-657.66	4,140.68	1.47
11,496.00	90.09	357.55	7,504.78	4,237.54	-662.27	4,233.54	0.95
11,589.00	89.82	357.67	7,504.85	4,330.46	-666.15	4,326.43	0.32
11,681.00	89.41	357.53	7,505.47	4,422.38	-670.00	4,418.33	0.47
11,772.00	89.23	357.42	7,506.55	4,513.28	-674.01	4,509.21	0.23
11,864.00	89.48	358.18	7,507.59	4,605.21	-677.54	4,601.11	0.87
11,956.00	88.92	359.62	7,508.87	4,697.18	-679.31	4,693.07	1.68
12,049.00	89.26	0.98	7,510.35	4,790.17	-678.82	4,786.05	1.51
12,141.00	90.00	1.16	7,510.94	4,882.15	-677.11	4,878.04	0.83
12,235.00	89.75	1.11	7,511.15	4,976.13	-675.24	4,972.03	0.27
12,328.00	89.91	1.87	7,511.43	5,069.10	-672.83	5,065.01	0.84
12,421.00	90.68	1.66	7,510.95	5,162.05	-669.96	5,157.98	0.86
12,513.00	90.28	1.44	7,510.18	5,254.01	-667.47	5,249.96	0.50
12,605.00	91.66	1.39	7,508.62	5,345.97	-665.20	5,341.93	1.50

Design Report for NRC 29N-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,696.00	91.88	1.76	7,505.81	5,436.89	-662.70	5,432.86	0.47
12,788.00	91.97	1.88	7,502.72	5,528.79	-659.78	5,524.78	0.16
12,880.00	92.25	1.66	7,499.33	5,620.69	-656.94	5,616.69	0.39
12,972.00	89.97	1.84	7,497.55	5,712.62	-654.13	5,708.64	2.49
13,063.00	90.12	2.06	7,497.48	5,803.57	-651.04	5,799.60	0.29
13,155.00	89.78	1.87	7,497.56	5,895.51	-647.88	5,891.57	0.42
13,247.00	90.34	2.43	7,497.46	5,987.45	-644.43	5,983.52	0.86
13,339.00	90.00	2.89	7,497.19	6,079.35	-640.16	6,075.44	0.62
13,433.00	91.26	2.91	7,496.15	6,173.22	-635.40	6,169.34	1.34
13,528.00	91.57	2.47	7,493.81	6,268.09	-630.95	6,264.23	0.57
13,622.00	91.73	2.60	7,491.10	6,361.96	-626.79	6,358.12	0.22
13,717.00	91.51	2.07	7,488.42	6,456.84	-622.92	6,453.03	0.60
13,811.00	91.48	2.36	7,485.96	6,550.74	-619.29	6,546.95	0.31
13,905.00	89.26	1.28	7,485.36	6,644.68	-616.31	6,640.90	2.63
14,000.00	89.97	1.70	7,485.99	6,739.64	-613.84	6,735.88	0.87
14,094.00	89.41	2.04	7,486.50	6,833.59	-610.77	6,829.85	0.70
14,189.00	89.14	2.37	7,487.71	6,928.51	-607.11	6,924.79	0.45
14,283.00	90.37	3.22	7,488.11	7,022.40	-602.53	7,018.70	1.59
14,378.00	92.00	3.37	7,486.14	7,117.22	-597.07	7,113.55	1.72
14,472.00	91.63	2.57	7,483.17	7,211.04	-592.20	7,207.40	0.94
14,567.00	90.22	2.71	7,481.63	7,305.93	-587.83	7,302.31	1.49
14,661.00	89.01	2.74	7,482.26	7,399.82	-583.36	7,396.23	1.29
14,756.00	88.52	3.06	7,484.31	7,494.67	-578.55	7,491.11	0.62
14,850.00	88.05	3.05	7,487.12	7,588.50	-573.55	7,584.96	0.50
14,945.00	87.50	3.28	7,490.81	7,683.28	-568.31	7,679.77	0.63
15,039.00	87.26	2.10	7,495.11	7,777.08	-563.90	7,773.59	1.28
15,133.00	88.21	1.93	7,498.82	7,870.94	-560.60	7,867.48	1.03
15,228.00	88.06	2.01	7,501.92	7,965.84	-557.33	7,962.39	0.18
15,322.00	89.04	1.39	7,504.29	8,059.77	-554.54	8,056.33	1.23
15,417.00	89.29	1.10	7,505.68	8,154.73	-552.48	8,151.31	0.40
15,511.00	89.41	0.87	7,506.75	8,248.71	-550.87	8,245.30	0.28
15,606.00	90.74	1.54	7,506.62	8,343.69	-548.87	8,340.28	1.57
15,700.00	91.17	1.90	7,505.05	8,437.63	-546.05	8,434.24	0.60
15,794.00	90.56	1.70	7,503.64	8,531.58	-543.09	8,528.20	0.68
15,889.00	90.62	1.53	7,502.66	8,626.53	-540.42	8,623.17	0.19
15,983.00	90.46	1.51	7,501.77	8,720.50	-537.92	8,717.15	0.17
16,078.00	89.66	1.13	7,501.67	8,815.47	-535.74	8,812.13	0.93
16,172.00	89.54	1.23	7,502.33	8,909.45	-533.80	8,906.12	0.17
16,267.00	89.23	1.05	7,503.35	9,004.42	-531.91	9,001.11	0.38
16,361.00	89.94	1.25	7,504.03	9,098.40	-530.02	9,095.09	0.78
16,455.00	90.28	0.70	7,503.85	9,192.39	-528.42	9,189.09	0.69
16,550.00	90.65	0.63	7,503.08	9,287.38	-527.32	9,284.08	0.40
16,644.00	90.99	1.10	7,501.73	9,381.36	-525.90	9,378.07	0.62
16,739.00	90.37	1.14	7,500.60	9,476.33	-524.05	9,473.05	0.65
16,831.00	89.60	1.03	7,500.63	9,568.31	-522.30	9,565.05	0.85
16,921.00	90.37	0.83	7,500.65	9,658.30	-520.84	9,655.04	0.88
17,015.00	91.88	1.21	7,498.81	9,752.26	-519.17	9,749.01	1.66
17,110.00	92.16	0.82	7,495.46	9,847.19	-517.49	9,843.95	0.51
17,204.00	91.48	2.06	7,492.47	9,941.11	-515.13	9,937.88	1.50
17,298.00	92.22	1.57	7,489.44	10,035.01	-512.15	10,031.80	0.94
17,393.00	90.65	1.39	7,487.06	10,129.95	-509.70	10,126.75	1.66

Design Report for NRC 29N-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
17,487.00	91.26	0.84	7,485.49	10,223.92	-507.87	10,220.72	0.87
17,582.00	89.35	1.33	7,484.99	10,318.89	-506.07	10,315.71	2.08
17,676.00	89.38	1.01	7,486.03	10,412.87	-504.15	10,409.69	0.34
17,770.00	90.74	0.83	7,485.93	10,506.85	-502.64	10,503.69	1.46
17,863.00	90.74	1.64	7,484.73	10,599.82	-500.64	10,596.67	0.87
17,958.00	91.48	1.69	7,482.89	10,694.77	-497.88	10,691.62	0.78
18,052.00	91.79	1.61	7,480.21	10,788.69	-495.17	10,785.56	0.34
18,146.00	92.28	1.21	7,476.87	10,882.60	-492.86	10,879.48	0.67
18,240.00	93.21	0.90	7,472.37	10,976.48	-491.13	10,973.37	1.04
18,334.00	92.00	0.56	7,468.09	11,070.37	-489.94	11,067.27	1.34
18,428.00	92.74	0.04	7,464.21	11,164.29	-489.44	11,161.19	0.96
18,471.00	92.56	359.52	7,462.22	11,207.24	-489.61	11,204.14	1.28
Last MWD Survey @ 18471.00'							
18,522.00	92.56	359.52	7,459.94	11,258.19	-490.04	11,255.08	0.00
St Line Proj to Bit @ 18522.00' MD :: 7459.94' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
1,187.00	1,186.96	5.88	-2.98	Tie-On to Gyro Surveys @ 1187.00ft
1,299.00	1,298.96	5.88	-3.66	First MWD Survey @ 1299.00'
18,471.00	7,462.22	11,207.24	-489.61	Last MWD Survey @ 18471.00'
18,522.00	7,459.94	11,258.19	-490.04	St Line Proj to Bit @ 18522.00' MD :: 7459.94' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.34	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
25.00	1,187.00	MS Energy Gyros	NS-GYRO-MS
1,299.00	7,887.00	MWD Surveys-Intermediate	MWD+IFR1+SC
8,017.00	18,471.00	MWD Surveys- Lateral	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,237.80	1,237.76	9 5/8" Casing Set @ 1237.8' MD :: 1237.76' TVD	9-5/8	13-1/2
7,924.00	7,510.49	7" Casing Set @ 7924' MD :: 7510.49' TVD	7	8-3/4

Design Report for NRC 29N-32HZ - Actual 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
NRC 29N-32HZ_LD	0.00	0.00	0.00	0.00	0.00	1,269,308.22	3,163,259.23	40.071167	-104.916638
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	12,145.68	-1,158.41	1,281,445.55	3,162,020.99	
Point 2				0.00	12,134.56	-238.40	1,281,440.48	3,162,941.02	
Point 3				0.00	7,316.24	-306.56	1,276,622.00	3,162,904.56	
Point 4				0.00	1,938.50	-278.15	1,271,244.77	3,162,968.35	
Point 5				0.00	-245.49	-262.72	1,269,061.01	3,162,998.14	
Point 6				0.00	-236.40	-1,182.75	1,269,064.05	3,162,078.11	
Point 7				0.00	4,625.77	-1,231.53	1,273,925.61	3,161,997.35	
Point 8				0.00	9,963.12	-1,183.08	1,279,262.96	3,162,010.68	
NRC 29N-32HZ_SHL	0.00	0.00	0.00	0.00	0.00	1,269,308.22	3,163,259.23	40.071167	-104.916638
- actual wellpath hits target center									
- Point									
NRC 3C-32HZ_SEC	0.00	0.00	1.00	0.00	30.23	1,269,308.41	3,163,289.46	40.071167	-104.916530
- actual wellpath misses target center by 30.23usft at 1.00usft MD (1.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				1.00	11,293.42	-2,050.80	1,280,587.66	3,161,164.49	
Point 2				1.00	11,260.35	3,198.39	1,280,589.12	3,166,413.58	
Point 3				1.00	5,979.69	3,131.48	1,275,308.34	3,166,381.41	
Point 4				1.00	6,000.34	-2,130.33	1,275,294.37	3,161,119.78	
Point 5				1.00	5,979.69	3,131.48	1,275,308.34	3,166,381.41	
Point 6				1.00	5,979.69	3,131.48	1,275,308.34	3,166,381.41	
Point 7				1.00	579.61	3,193.66	1,269,908.99	3,166,479.11	
Point 8				1.00	-4,699.49	3,201.68	1,264,630.26	3,166,521.86	
Point 9				1.00	-4,652.02	-2,076.92	1,264,643.00	3,161,243.27	
Point 10				1.00	633.15	-2,063.69	1,269,927.94	3,161,221.73	
Point 11				1.00	579.64	3,193.62	1,269,909.02	3,166,479.07	
Point 12				1.00	633.15	-2,063.69	1,269,927.94	3,161,221.73	
Point 13				1.00	6,000.34	-2,130.33	1,275,294.37	3,161,119.78	
NRC 29N-32HZ_BHL	0.00	0.00	7,484.00	11,274.10	-455.64	1,280,578.64	3,162,729.46	40.102115	-104.918267
- actual wellpath misses target center by 44.89usft at 18522.00usft MD (7459.94 TVD, 11258.19 N, -490.04 E)									
- Point									
NRC 29N-32HZ_Tgt 1	0.00	0.00	7,502.46	4,691.88	-680.10	1,273,995.34	3,162,548.31	40.084046	-104.919068
- actual wellpath misses target center by 6.37usft at 11950.63usft MD (7508.77 TVD, 4691.81 N, -679.27 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.31 °/100usft	Maximum Dogleg over Survey:	13.04 °/100usft at 7,373.00 usft
Net Tortousity applicable to Plans:	0.45 °/100usft	Directional Difficulty Index:	6.847

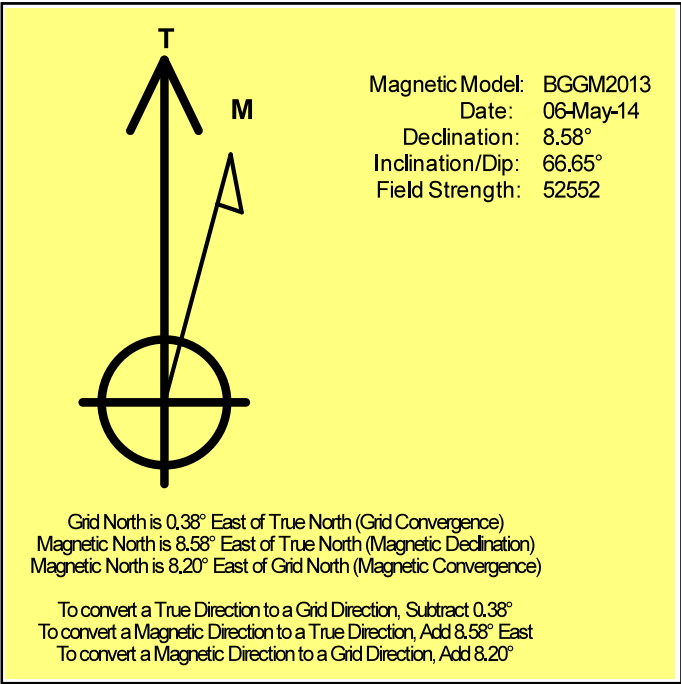
Audit Info

North Reference Sheet for Sec. 8-T1N-R67W - NRC 29N-32HZ - Plan B

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' @ 5060.00usft (H&P 308). Northing and Easting are relative to NRC 29N-32HZ
 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: 0.99996173

Grid Coordinates of Well: 1,269,308.21 usft N, 3,163,259.23 usft E
 Geographical Coordinates of Well: 40° 04' 16.20" N, 104° 54' 59.90" W
 Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 18,522.00usft
 the Bottom Hole Displacement is 11,268.85usft in the Direction of 357.51° (True).
 Magnetic Convergence at surface is: -8.20° (6 May 2014, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T1N-R67W

NRC 29N-32HZ

Plan B

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

10 June, 2014

Well Coordinates: 1,269,308.21 N, 3,163,259.23 E (40° 04' 16.20" N, 104° 54' 59.90" W)

Ground Level: 5,035.00 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 NRC 29N-32HZ

RKB = 25' @ 5060.00usft (H&P 308)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for NRC 29N-32HZ - Actual 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	40.071167	-104.916638	1,269,308.21	3,163,259.23
25.00	0.00	0.00	25.00	0.00	0.00	40.071167	-104.916638	1,269,308.21	3,163,259.23
125.00	0.20	84.95	125.00	0.02	0.17	40.071167	-104.916638	1,269,308.23	3,163,259.41
225.00	0.41	58.80	225.00	0.22	0.65	40.071168	-104.916636	1,269,308.43	3,163,259.89
325.00	0.37	22.50	325.00	0.70	1.08	40.071169	-104.916634	1,269,308.92	3,163,260.31
425.00	0.33	15.41	424.99	1.28	1.28	40.071171	-104.916634	1,269,309.50	3,163,260.51
525.00	0.37	336.64	524.99	1.85	1.23	40.071172	-104.916634	1,269,310.07	3,163,260.45
625.00	0.41	333.99	624.99	2.47	0.95	40.071174	-104.916635	1,269,310.69	3,163,260.16
725.00	0.46	342.91	724.99	3.17	0.67	40.071176	-104.916636	1,269,311.39	3,163,259.89
825.00	0.51	316.35	824.98	3.88	0.25	40.071178	-104.916637	1,269,312.09	3,163,259.46
925.00	0.66	304.39	924.98	4.53	-0.54	40.071179	-104.916640	1,269,312.74	3,163,258.67
1,025.00	0.58	303.75	1,024.97	5.13	-1.43	40.071181	-104.916643	1,269,313.34	3,163,257.77
1,125.00	0.61	296.15	1,124.97	5.65	-2.33	40.071183	-104.916647	1,269,313.85	3,163,256.87
1,187.00	0.68	283.52	1,186.96	5.88	-2.98	40.071183	-104.916649	1,269,314.07	3,163,256.21
1,237.80	0.37	272.34	1,237.76	5.96	-3.44	40.071183	-104.916651	1,269,314.15	3,163,255.75
1,299.00	0.16	189.40	1,298.96	5.88	-3.66	40.071183	-104.916651	1,269,314.07	3,163,255.54
1,394.00	0.39	263.11	1,393.96	5.71	-4.00	40.071183	-104.916653	1,269,313.90	3,163,255.20
1,491.00	0.55	226.75	1,490.96	5.35	-4.67	40.071182	-104.916655	1,269,313.53	3,163,254.53
1,583.00	0.55	262.00	1,582.95	4.99	-5.42	40.071181	-104.916658	1,269,313.17	3,163,253.78
1,675.00	0.33	277.03	1,674.95	4.96	-6.12	40.071181	-104.916660	1,269,313.13	3,163,253.08
1,768.00	0.53	243.99	1,767.95	4.80	-6.78	40.071180	-104.916662	1,269,312.97	3,163,252.43
1,860.00	0.48	239.12	1,859.94	4.42	-7.49	40.071179	-104.916665	1,269,312.58	3,163,251.72
1,952.00	0.48	268.80	1,951.94	4.21	-8.21	40.071179	-104.916668	1,269,312.37	3,163,251.00
2,046.00	3.43	281.32	2,045.88	4.76	-11.36	40.071180	-104.916679	1,269,312.90	3,163,247.85
2,139.00	5.21	276.99	2,138.61	5.82	-18.28	40.071183	-104.916704	1,269,313.91	3,163,240.92
2,230.00	4.48	280.08	2,229.28	6.94	-25.88	40.071186	-104.916731	1,269,314.98	3,163,233.31
2,321.00	4.97	271.12	2,319.97	7.64	-33.32	40.071188	-104.916757	1,269,315.63	3,163,225.87
2,414.00	7.41	266.93	2,412.43	7.40	-43.34	40.071187	-104.916793	1,269,315.33	3,163,215.85
2,507.00	8.70	258.03	2,504.51	5.62	-56.21	40.071182	-104.916839	1,269,313.46	3,163,202.99
2,599.00	9.59	262.82	2,595.34	3.22	-70.62	40.071176	-104.916891	1,269,310.97	3,163,188.60
2,690.00	10.62	267.67	2,684.93	1.93	-86.52	40.071172	-104.916947	1,269,309.57	3,163,172.71
2,783.00	9.17	266.70	2,776.54	1.15	-102.48	40.071170	-104.917004	1,269,308.69	3,163,156.75
2,875.00	10.54	271.87	2,867.19	1.01	-118.21	40.071170	-104.917061	1,269,308.44	3,163,141.03
2,967.00	9.69	268.60	2,957.76	1.09	-134.36	40.071170	-104.917118	1,269,308.42	3,163,124.88
3,060.00	10.99	273.30	3,049.25	1.41	-151.03	40.071171	-104.917178	1,269,308.63	3,163,108.20
3,153.00	10.09	271.10	3,140.68	2.08	-168.03	40.071173	-104.917239	1,269,309.19	3,163,091.20
3,246.00	8.40	269.74	3,232.46	2.20	-182.97	40.071173	-104.917292	1,269,309.21	3,163,076.26
3,339.00	9.87	273.69	3,324.28	2.69	-197.72	40.071174	-104.917345	1,269,309.60	3,163,061.51
3,431.00	9.18	272.65	3,415.01	3.53	-212.92	40.071177	-104.917399	1,269,310.35	3,163,046.31
3,523.00	10.98	281.12	3,505.60	5.56	-228.85	40.071182	-104.917456	1,269,312.27	3,163,030.37
3,615.00	9.53	278.70	3,596.12	8.40	-244.97	40.071190	-104.917514	1,269,315.01	3,163,014.22
3,706.00	8.89	278.36	3,685.95	10.57	-259.38	40.071196	-104.917565	1,269,317.07	3,162,999.80

Design Report for NRC 29N-32HZ - Actual 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)
3,798.00	8.61	285.10	3,776.88	13.39	-273.06	40.071204	-104.917614	1,269,319.81	3,162,986.10
3,890.00	13.06	297.19	3,867.23	19.94	-288.96	40.071222	-104.917671	1,269,326.25	3,162,970.16
3,982.00	13.38	292.94	3,956.79	28.84	-308.01	40.071246	-104.917739	1,269,335.03	3,162,951.05
4,073.00	11.59	289.75	4,045.64	36.03	-326.31	40.071266	-104.917804	1,269,342.10	3,162,932.70
4,165.00	10.73	285.47	4,135.90	41.44	-343.27	40.071281	-104.917865	1,269,347.39	3,162,915.72
4,257.00	10.02	284.11	4,226.40	45.68	-359.28	40.071292	-104.917922	1,269,351.52	3,162,899.67
4,352.00	9.28	281.83	4,320.05	49.26	-374.80	40.071302	-104.917977	1,269,355.01	3,162,884.14
4,446.00	10.18	271.17	4,412.71	50.99	-390.52	40.071307	-104.918034	1,269,356.63	3,162,868.40
4,540.00	9.97	269.56	4,505.26	51.09	-406.96	40.071307	-104.918092	1,269,356.63	3,162,851.96
4,635.00	8.24	269.53	4,599.06	50.97	-421.99	40.071307	-104.918146	1,269,356.41	3,162,836.93
4,729.00	7.28	265.40	4,692.20	50.44	-434.67	40.071306	-104.918191	1,269,355.79	3,162,824.26
4,824.00	6.83	266.16	4,786.48	49.58	-446.30	40.071303	-104.918233	1,269,354.85	3,162,812.63
4,918.00	6.64	263.82	4,879.83	48.62	-457.28	40.071301	-104.918272	1,269,353.82	3,162,801.66
5,012.00	6.19	269.20	4,973.24	47.96	-467.75	40.071299	-104.918310	1,269,353.10	3,162,791.19
5,107.00	5.61	261.56	5,067.74	47.21	-477.47	40.071297	-104.918344	1,269,352.28	3,162,781.48
5,201.00	4.32	258.96	5,161.38	45.86	-485.49	40.071293	-104.918373	1,269,350.88	3,162,773.47
5,296.00	4.40	253.37	5,256.11	44.13	-492.49	40.071288	-104.918398	1,269,349.10	3,162,766.48
5,390.00	4.17	230.79	5,349.85	40.94	-498.60	40.071279	-104.918420	1,269,345.87	3,162,760.40
5,484.00	3.59	228.01	5,443.64	36.81	-503.43	40.071268	-104.918437	1,269,341.71	3,162,755.59
5,579.00	3.52	221.10	5,538.45	32.62	-507.56	40.071257	-104.918452	1,269,337.49	3,162,751.49
5,673.00	1.37	216.18	5,632.36	29.54	-510.12	40.071248	-104.918461	1,269,334.40	3,162,748.95
5,767.00	1.85	134.57	5,726.34	27.57	-509.70	40.071243	-104.918459	1,269,332.43	3,162,749.38
5,861.00	1.32	128.57	5,820.30	25.83	-507.77	40.071238	-104.918453	1,269,330.70	3,162,751.32
5,956.00	1.05	127.79	5,915.28	24.61	-506.23	40.071235	-104.918447	1,269,329.49	3,162,752.87
6,050.00	0.83	114.55	6,009.27	23.80	-504.93	40.071232	-104.918442	1,269,328.69	3,162,754.18
6,144.00	0.76	105.36	6,103.26	23.35	-503.71	40.071231	-104.918438	1,269,328.25	3,162,755.40
6,238.00	0.68	111.91	6,197.25	22.98	-502.59	40.071230	-104.918434	1,269,327.89	3,162,756.52
6,333.00	0.25	75.75	6,292.25	22.82	-501.87	40.071230	-104.918431	1,269,327.73	3,162,757.25
6,427.00	0.74	6.54	6,386.24	23.47	-501.60	40.071231	-104.918431	1,269,328.39	3,162,757.51
6,522.00	0.75	355.53	6,481.24	24.70	-501.58	40.071235	-104.918430	1,269,329.62	3,162,757.52
6,616.00	0.63	307.75	6,575.23	25.63	-502.04	40.071237	-104.918432	1,269,330.54	3,162,757.06
6,711.00	0.51	310.62	6,670.22	26.23	-502.77	40.071239	-104.918435	1,269,331.13	3,162,756.32
6,806.00	0.34	342.60	6,765.22	26.77	-503.17	40.071241	-104.918436	1,269,331.67	3,162,755.91
6,900.00	1.73	342.43	6,859.20	28.39	-503.69	40.071245	-104.918438	1,269,333.29	3,162,755.39
6,947.00	3.81	347.62	6,906.15	30.59	-504.24	40.071251	-104.918440	1,269,335.49	3,162,754.83
6,995.00	6.53	355.29	6,953.95	34.87	-504.80	40.071263	-104.918442	1,269,339.76	3,162,754.23
7,042.00	9.28	356.04	7,000.50	41.32	-505.28	40.071280	-104.918444	1,269,346.20	3,162,753.71
7,089.00	14.08	354.85	7,046.51	50.80	-506.06	40.071306	-104.918446	1,269,355.68	3,162,752.87
7,136.00	18.16	358.51	7,091.65	63.82	-506.76	40.071342	-104.918449	1,269,368.69	3,162,752.08
7,184.00	21.92	357.39	7,136.74	80.25	-507.36	40.071387	-104.918451	1,269,385.12	3,162,751.37
7,231.00	26.25	1.70	7,179.64	99.42	-507.46	40.071440	-104.918451	1,269,404.29	3,162,751.15
7,279.00	31.05	0.01	7,221.75	122.42	-507.14	40.071503	-104.918450	1,269,427.29	3,162,751.32

Design Report for NRC 29N-32HZ - Actual 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)
7,326.00	36.47	356.08	7,260.82	148.50	-508.09	40.071575	-104.918454	1,269,453.36	3,162,750.20
7,373.00	41.90	351.57	7,297.24	177.99	-511.35	40.071656	-104.918465	1,269,482.83	3,162,746.74
7,420.00	47.54	354.14	7,330.63	210.79	-515.43	40.071746	-104.918480	1,269,515.60	3,162,742.45
7,468.00	51.71	356.60	7,361.72	247.22	-518.35	40.071846	-104.918490	1,269,552.01	3,162,739.29
7,515.00	54.14	357.99	7,390.05	284.68	-520.11	40.071949	-104.918497	1,269,589.45	3,162,737.28
7,562.00	59.25	358.32	7,415.85	323.92	-521.38	40.072056	-104.918501	1,269,628.69	3,162,735.76
7,609.00	65.00	359.97	7,437.81	365.45	-521.98	40.072170	-104.918503	1,269,670.20	3,162,734.88
7,657.00	68.86	0.18	7,456.62	409.60	-521.92	40.072291	-104.918503	1,269,714.36	3,162,734.65
7,704.00	72.37	0.85	7,472.22	453.93	-521.52	40.072413	-104.918502	1,269,758.68	3,162,734.76
7,752.00	75.78	0.09	7,485.39	500.08	-521.14	40.072540	-104.918500	1,269,804.83	3,162,734.83
7,799.00	79.13	359.60	7,495.59	545.95	-521.27	40.072666	-104.918501	1,269,850.70	3,162,734.41
7,846.00	82.49	359.69	7,503.10	592.34	-521.56	40.072793	-104.918502	1,269,897.08	3,162,733.81
7,887.00	85.13	357.61	7,507.52	633.08	-522.52	40.072905	-104.918505	1,269,937.82	3,162,732.58
7,924.00	85.66	357.71	7,510.49	669.93	-524.02	40.073006	-104.918511	1,269,974.65	3,162,730.84
8,017.00	86.98	357.96	7,516.46	762.67	-527.53	40.073261	-104.918523	1,270,067.37	3,162,726.72
8,111.00	86.70	358.39	7,521.65	856.48	-530.52	40.073518	-104.918534	1,270,161.15	3,162,723.11
8,206.00	88.24	359.00	7,525.84	951.36	-532.68	40.073779	-104.918542	1,270,256.01	3,162,720.33
8,300.00	88.06	359.16	7,528.87	1,045.30	-534.19	40.074036	-104.918547	1,270,349.93	3,162,718.20
8,395.00	89.88	359.94	7,530.58	1,140.27	-534.93	40.074297	-104.918550	1,270,444.90	3,162,716.83
8,489.00	90.86	0.36	7,529.97	1,234.27	-534.69	40.074555	-104.918549	1,270,538.89	3,162,716.46
8,584.00	91.08	0.64	7,528.37	1,329.25	-533.86	40.074816	-104.918546	1,270,633.87	3,162,716.66
8,678.00	91.32	1.07	7,526.40	1,423.22	-532.46	40.075074	-104.918541	1,270,727.85	3,162,717.45
8,773.00	90.15	0.07	7,525.18	1,518.21	-531.51	40.075335	-104.918538	1,270,822.83	3,162,717.77
8,867.00	89.67	358.08	7,525.33	1,612.19	-533.03	40.075593	-104.918543	1,270,916.80	3,162,715.63
8,962.00	89.85	358.45	7,525.72	1,707.14	-535.91	40.075853	-104.918553	1,271,011.73	3,162,712.13
9,057.00	90.25	359.07	7,525.64	1,802.12	-537.96	40.076114	-104.918561	1,271,106.69	3,162,709.45
9,152.00	90.68	358.33	7,524.87	1,897.09	-540.12	40.076375	-104.918568	1,271,201.64	3,162,706.67
9,247.00	90.25	357.10	7,524.10	1,992.01	-543.90	40.076635	-104.918582	1,271,296.53	3,162,702.26
9,341.00	89.75	356.86	7,524.10	2,085.88	-548.86	40.076893	-104.918600	1,271,390.36	3,162,696.69
9,436.00	89.88	357.13	7,524.41	2,180.75	-553.84	40.077153	-104.918617	1,271,485.19	3,162,691.09
9,531.00	90.40	356.93	7,524.17	2,275.62	-558.76	40.077414	-104.918635	1,271,580.02	3,162,685.54
9,626.00	90.46	357.19	7,523.46	2,370.49	-563.63	40.077674	-104.918652	1,271,674.86	3,162,680.04
9,721.00	90.52	356.74	7,522.65	2,465.36	-568.66	40.077935	-104.918670	1,271,769.68	3,162,674.39
9,815.00	90.12	356.37	7,522.12	2,559.18	-574.31	40.078192	-104.918691	1,271,863.47	3,162,668.12
9,910.00	91.27	356.25	7,520.97	2,653.98	-580.42	40.078452	-104.918712	1,271,958.21	3,162,661.39
10,005.00	90.68	355.96	7,519.35	2,748.75	-586.87	40.078713	-104.918735	1,272,052.93	3,162,654.31
10,100.00	90.03	355.68	7,518.77	2,843.49	-593.80	40.078973	-104.918760	1,272,147.63	3,162,646.77
10,194.00	90.15	355.98	7,518.62	2,937.24	-600.63	40.079230	-104.918785	1,272,241.33	3,162,639.31
10,289.00	90.62	356.73	7,517.98	3,032.05	-606.67	40.079490	-104.918806	1,272,336.09	3,162,632.65
10,383.00	90.68	357.17	7,516.91	3,125.91	-611.67	40.079748	-104.918824	1,272,429.91	3,162,627.03
10,478.00	90.25	356.87	7,516.14	3,220.77	-616.61	40.080008	-104.918842	1,272,524.74	3,162,621.47
10,572.00	89.60	356.41	7,516.27	3,314.61	-622.12	40.080266	-104.918861	1,272,618.53	3,162,615.34



Design Report for NRC 29N-32HZ - Actual 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)
10,665.00	89.57	356.57	7,516.94	3,407.44	-627.82	40.080521	-104.918882	1,272,711.31	3,162,609.04
10,757.00	89.75	356.80	7,517.49	3,499.28	-633.14	40.080773	-104.918901	1,272,803.12	3,162,603.12
10,850.00	90.92	358.05	7,516.94	3,592.18	-637.31	40.081028	-104.918916	1,272,895.99	3,162,598.33
10,942.00	91.14	358.31	7,515.29	3,684.12	-640.24	40.081280	-104.918926	1,272,987.90	3,162,594.80
11,034.00	91.23	358.41	7,513.39	3,776.06	-642.87	40.081533	-104.918936	1,273,079.82	3,162,591.56
11,127.00	91.08	358.19	7,511.51	3,869.00	-645.63	40.081788	-104.918945	1,273,172.74	3,162,588.19
11,220.00	91.51	357.51	7,509.41	3,961.91	-649.11	40.082043	-104.918958	1,273,265.62	3,162,584.10
11,312.00	91.60	357.51	7,506.91	4,053.79	-653.11	40.082295	-104.918972	1,273,357.47	3,162,579.50
11,403.00	90.49	356.76	7,505.25	4,144.66	-657.66	40.082544	-104.918989	1,273,448.30	3,162,574.35
11,496.00	90.09	357.55	7,504.78	4,237.54	-662.27	40.082799	-104.919005	1,273,541.15	3,162,569.12
11,589.00	89.82	357.67	7,504.85	4,330.46	-666.15	40.083054	-104.919019	1,273,634.03	3,162,564.63
11,681.00	89.41	357.53	7,505.47	4,422.38	-670.00	40.083307	-104.919033	1,273,725.92	3,162,560.18
11,772.00	89.23	357.42	7,506.55	4,513.28	-674.01	40.083556	-104.919047	1,273,816.79	3,162,555.57
11,864.00	89.48	358.18	7,507.59	4,605.21	-677.54	40.083809	-104.919060	1,273,908.69	3,162,551.44
11,956.00	88.92	359.62	7,508.87	4,697.18	-679.31	40.084061	-104.919066	1,274,000.64	3,162,549.06
12,049.00	89.26	0.98	7,510.35	4,790.17	-678.82	40.084316	-104.919064	1,274,093.63	3,162,548.94
12,141.00	90.00	1.16	7,510.94	4,882.15	-677.11	40.084569	-104.919058	1,274,185.61	3,162,550.05
12,235.00	89.75	1.11	7,511.15	4,976.13	-675.24	40.084827	-104.919051	1,274,279.60	3,162,551.30
12,328.00	89.91	1.87	7,511.43	5,069.10	-672.83	40.085082	-104.919043	1,274,372.58	3,162,553.10
12,421.00	90.68	1.66	7,510.95	5,162.05	-669.96	40.085337	-104.919033	1,274,465.55	3,162,555.36
12,513.00	90.28	1.44	7,510.18	5,254.01	-667.47	40.085590	-104.919024	1,274,557.52	3,162,557.24
12,605.00	91.66	1.39	7,508.62	5,345.97	-665.20	40.085842	-104.919016	1,274,649.49	3,162,558.91
12,696.00	91.88	1.76	7,505.81	5,436.89	-662.70	40.086092	-104.919007	1,274,740.42	3,162,560.81
12,788.00	91.97	1.88	7,502.72	5,528.79	-659.78	40.086344	-104.918996	1,274,832.33	3,162,563.12
12,880.00	92.25	1.66	7,499.33	5,620.69	-656.94	40.086596	-104.918986	1,274,924.24	3,162,565.36
12,972.00	89.97	1.84	7,497.55	5,712.62	-654.13	40.086849	-104.918976	1,275,016.19	3,162,567.56
13,063.00	90.12	2.06	7,497.48	5,803.57	-651.04	40.087098	-104.918965	1,275,107.15	3,162,570.06
13,155.00	89.78	1.87	7,497.56	5,895.51	-647.88	40.087351	-104.918954	1,275,199.11	3,162,572.61
13,247.00	90.34	2.43	7,497.46	5,987.45	-644.43	40.087603	-104.918941	1,275,291.06	3,162,575.46
13,339.00	90.00	2.89	7,497.19	6,079.35	-640.16	40.087855	-104.918926	1,275,382.99	3,162,579.12
13,433.00	91.26	2.91	7,496.15	6,173.22	-635.40	40.088113	-104.918909	1,275,476.88	3,162,583.26
13,528.00	91.57	2.47	7,493.81	6,268.09	-630.95	40.088373	-104.918893	1,275,571.77	3,162,587.09
13,622.00	91.73	2.60	7,491.10	6,361.96	-626.79	40.088631	-104.918878	1,275,665.66	3,162,590.63
13,717.00	91.51	2.07	7,488.42	6,456.84	-622.92	40.088891	-104.918865	1,275,760.57	3,162,593.87
13,811.00	91.48	2.36	7,485.96	6,550.74	-619.29	40.089149	-104.918852	1,275,854.48	3,162,596.89
13,905.00	89.26	1.28	7,485.36	6,644.68	-616.31	40.089407	-104.918841	1,275,948.44	3,162,599.25
14,000.00	89.97	1.70	7,485.99	6,739.64	-613.84	40.089668	-104.918832	1,276,043.42	3,162,601.10
14,094.00	89.41	2.04	7,486.50	6,833.59	-610.77	40.089926	-104.918821	1,276,137.38	3,162,603.55
14,189.00	89.14	2.37	7,487.71	6,928.51	-607.11	40.090186	-104.918808	1,276,232.32	3,162,606.58
14,283.00	90.37	3.22	7,488.11	7,022.40	-602.53	40.090444	-104.918792	1,276,326.23	3,162,610.54
14,378.00	92.00	3.37	7,486.14	7,117.22	-597.07	40.090704	-104.918772	1,276,421.08	3,162,615.38
14,472.00	91.63	2.57	7,483.17	7,211.04	-592.20	40.090962	-104.918755	1,276,514.93	3,162,619.63

Design Report for NRC 29N-32HZ - Actual 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)
14,567.00	90.22	2.71	7,481.63	7,305.93	-587.83	40.091222	-104.918739	1,276,609.84	3,162,623.38
14,661.00	89.01	2.74	7,482.26	7,399.82	-583.36	40.091480	-104.918723	1,276,703.75	3,162,627.23
14,756.00	88.52	3.06	7,484.31	7,494.67	-578.55	40.091740	-104.918706	1,276,798.63	3,162,631.41
14,850.00	88.05	3.05	7,487.12	7,588.50	-573.55	40.091998	-104.918688	1,276,892.48	3,162,635.80
14,945.00	87.50	3.28	7,490.81	7,683.28	-568.31	40.092258	-104.918669	1,276,987.30	3,162,640.42
15,039.00	87.26	2.10	7,495.11	7,777.08	-563.90	40.092516	-104.918654	1,277,081.12	3,162,644.21
15,133.00	88.21	1.93	7,498.82	7,870.94	-560.60	40.092773	-104.918642	1,277,175.00	3,162,646.89
15,228.00	88.06	2.01	7,501.92	7,965.84	-557.33	40.093034	-104.918630	1,277,269.91	3,162,649.53
15,322.00	89.04	1.39	7,504.29	8,059.77	-554.54	40.093292	-104.918620	1,277,363.85	3,162,651.70
15,417.00	89.29	1.10	7,505.68	8,154.73	-552.48	40.093552	-104.918613	1,277,458.82	3,162,653.14
15,511.00	89.41	0.87	7,506.75	8,248.71	-550.87	40.093810	-104.918607	1,277,552.81	3,162,654.14
15,606.00	90.74	1.54	7,506.62	8,343.69	-548.87	40.094071	-104.918600	1,277,647.79	3,162,655.51
15,700.00	91.17	1.90	7,505.05	8,437.63	-546.05	40.094329	-104.918590	1,277,741.75	3,162,657.71
15,794.00	90.56	1.70	7,503.64	8,531.58	-543.09	40.094587	-104.918579	1,277,835.70	3,162,660.05
15,889.00	90.62	1.53	7,502.66	8,626.53	-540.42	40.094847	-104.918570	1,277,930.67	3,162,662.10
15,983.00	90.46	1.51	7,501.77	8,720.50	-537.92	40.095105	-104.918561	1,278,024.65	3,162,663.98
16,078.00	89.66	1.13	7,501.67	8,815.47	-535.74	40.095366	-104.918553	1,278,119.63	3,162,665.54
16,172.00	89.54	1.23	7,502.33	8,909.45	-533.80	40.095624	-104.918546	1,278,213.61	3,162,666.86
16,267.00	89.23	1.05	7,503.35	9,004.42	-531.91	40.095885	-104.918540	1,278,308.60	3,162,668.12
16,361.00	89.94	1.25	7,504.03	9,098.40	-530.02	40.096143	-104.918533	1,278,402.58	3,162,669.39
16,455.00	90.28	0.70	7,503.85	9,192.39	-528.42	40.096401	-104.918527	1,278,496.57	3,162,670.37
16,550.00	90.65	0.63	7,503.08	9,287.38	-527.32	40.096661	-104.918523	1,278,591.56	3,162,670.85
16,644.00	90.99	1.10	7,501.73	9,381.36	-525.90	40.096919	-104.918518	1,278,685.55	3,162,671.65
16,739.00	90.37	1.14	7,500.60	9,476.33	-524.05	40.097180	-104.918511	1,278,780.53	3,162,672.88
16,831.00	89.60	1.03	7,500.63	9,568.31	-522.30	40.097433	-104.918505	1,278,872.52	3,162,674.02
16,921.00	90.37	0.83	7,500.65	9,658.30	-520.84	40.097680	-104.918500	1,278,962.51	3,162,674.89
17,015.00	91.88	1.21	7,498.81	9,752.26	-519.17	40.097938	-104.918494	1,279,056.48	3,162,675.94
17,110.00	92.16	0.82	7,495.46	9,847.19	-517.49	40.098198	-104.918488	1,279,151.41	3,162,677.00
17,204.00	91.48	2.06	7,492.47	9,941.11	-515.13	40.098456	-104.918480	1,279,245.34	3,162,678.74
17,298.00	92.22	1.57	7,489.44	10,035.01	-512.15	40.098714	-104.918469	1,279,339.26	3,162,681.10
17,393.00	90.65	1.39	7,487.06	10,129.95	-509.70	40.098974	-104.918460	1,279,434.20	3,162,682.93
17,487.00	91.26	0.84	7,485.49	10,223.92	-507.87	40.099232	-104.918454	1,279,528.18	3,162,684.14
17,582.00	89.35	1.33	7,484.99	10,318.89	-506.07	40.099493	-104.918447	1,279,623.16	3,162,685.31
17,676.00	89.38	1.01	7,486.03	10,412.87	-504.15	40.099751	-104.918440	1,279,717.14	3,162,686.61
17,770.00	90.74	0.83	7,485.93	10,506.85	-502.64	40.100009	-104.918435	1,279,811.13	3,162,687.50
17,863.00	90.74	1.64	7,484.73	10,599.82	-500.64	40.100264	-104.918428	1,279,904.11	3,162,688.90
17,958.00	91.48	1.69	7,482.89	10,694.77	-497.88	40.100525	-104.918418	1,279,999.06	3,162,691.03
18,052.00	91.79	1.61	7,480.21	10,788.69	-495.17	40.100783	-104.918408	1,280,093.00	3,162,693.12
18,146.00	92.28	1.21	7,476.87	10,882.60	-492.86	40.101040	-104.918400	1,280,186.92	3,162,694.81
18,240.00	93.21	0.90	7,472.37	10,976.48	-491.13	40.101298	-104.918394	1,280,280.80	3,162,695.92
18,334.00	92.00	0.56	7,468.09	11,070.37	-489.94	40.101556	-104.918390	1,280,374.70	3,162,696.50
18,428.00	92.74	0.04	7,464.21	11,164.29	-489.44	40.101814	-104.918388	1,280,468.61	3,162,696.38

Design Report for NRC 29N-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Geographic Coordinates Latitude (usft)	Longitude (usft)	UTM Coordinates Northing (usft)	Easting (usft)
18,471.00	92.56	359.52	7,462.22	11,207.24	-489.61	40.101932	-104.918388	1,280,511.56	3,162,695.93
18,522.00	92.56	359.52	7,459.94	11,258.19	-490.04	40.102071	-104.918390	1,280,562.50	3,162,695.17

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
1,299.00	1,298.96	5.88	-3.66	First MWD Surveys @ 1299.00'
18,471.00	7,462.22	11,207.24	-489.61	Last MWD Survey @ 18471.00'
18,522.00	7,459.94	11,258.19	-490.04	St Line Proj to Bit @ 18522.00' MD :: 7459.94' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.34	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
25.00	1,187.00	MS Energy Gyros	NS-GYRO-MS
1,299.00	7,887.00	MWD Surveys-Intermediate	MWD+IFR1+SC
8,017.00	18,471.00	MWD Surveys- Lateral	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,237.80	1,237.76	9 5/8" Casing Set @ 1237.8' MD :: 1237.76' TVD	9-5/8	13-1/2
7,924.00	7,510.49	7" Casing Set @ 7924' MD :: 7510.49' TVD	7	8-3/4

Design Report for NRC 29N-32HZ - Actual Surveys

Design Targets

Shape	Target Name	TVD (usft)	Northing (usft)	Easting (usft)	+N/-S usft	+E/-W usft	Created	Updated
Polygon	NRC 29N-32HZ_LD	0.00	1,269,308.22	3,163,259.23	0.00	0.00	1/7/2014	5/5/2014

Directional Difficulty Index

Average Dogleg over Survey:	1.31 °/100usft	Maximum Dogleg over Survey:	13.04 °/100usft at 7,373.00 usft
Net Tortousity applicable to Plans:	0.45 °/100usft	Directional Difficulty Index:	6.847

Audit Info

North Reference Sheet for Sec. 8-T1N-R67W - NRC 29N-32HZ - Plan B

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' @ 5060.00usft (H&P 308). Northing and Easting are relative to NRC 29N-32HZ

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: 0.99996173

Grid Coordinates of Well: 1,269,308.21 usft N, 3,163,259.23 usft E

Geographical Coordinates of Well: 40° 04' 16.20" N, 104° 54' 59.90" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 18,522.00usft

the Bottom Hole Displacement is 11,268.85usft in the Direction of 357.51° (True).

Magnetic Convergence at surface is: -8.20° (6 May 2014, , BGGM2013)

