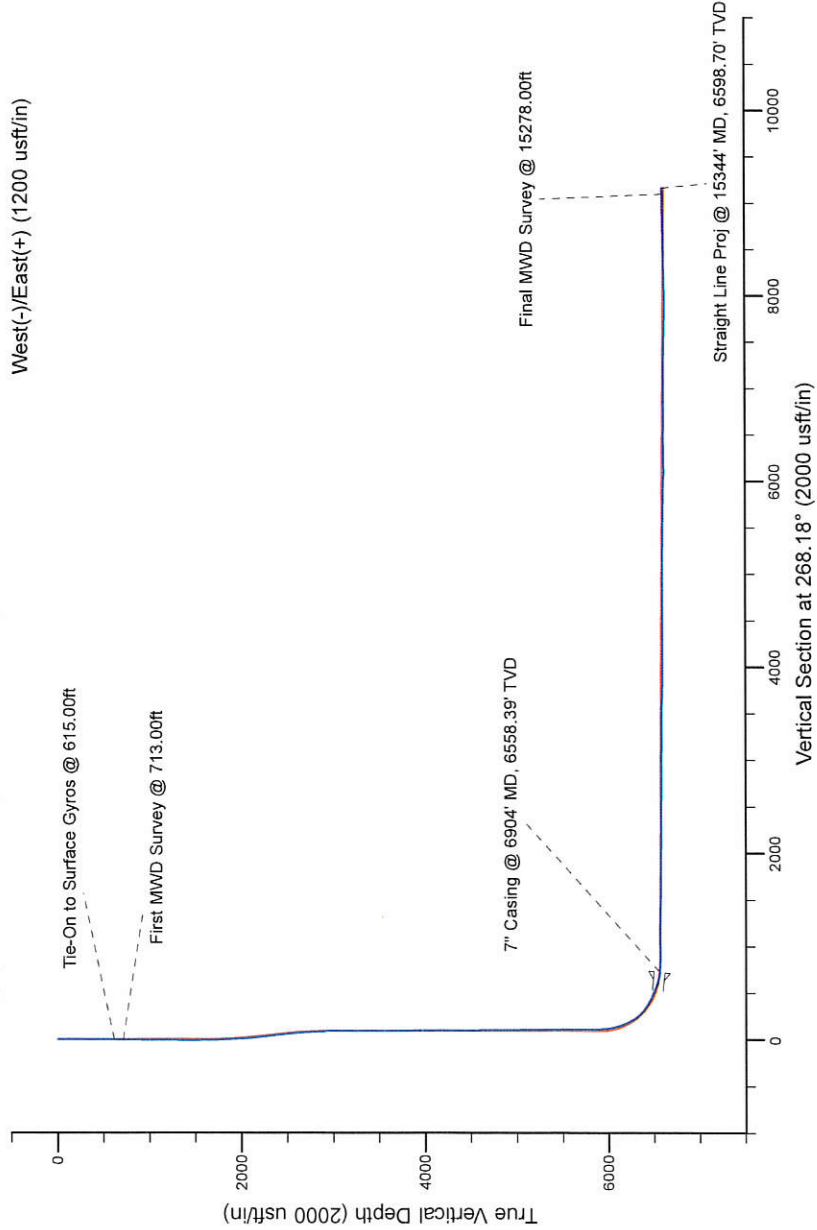
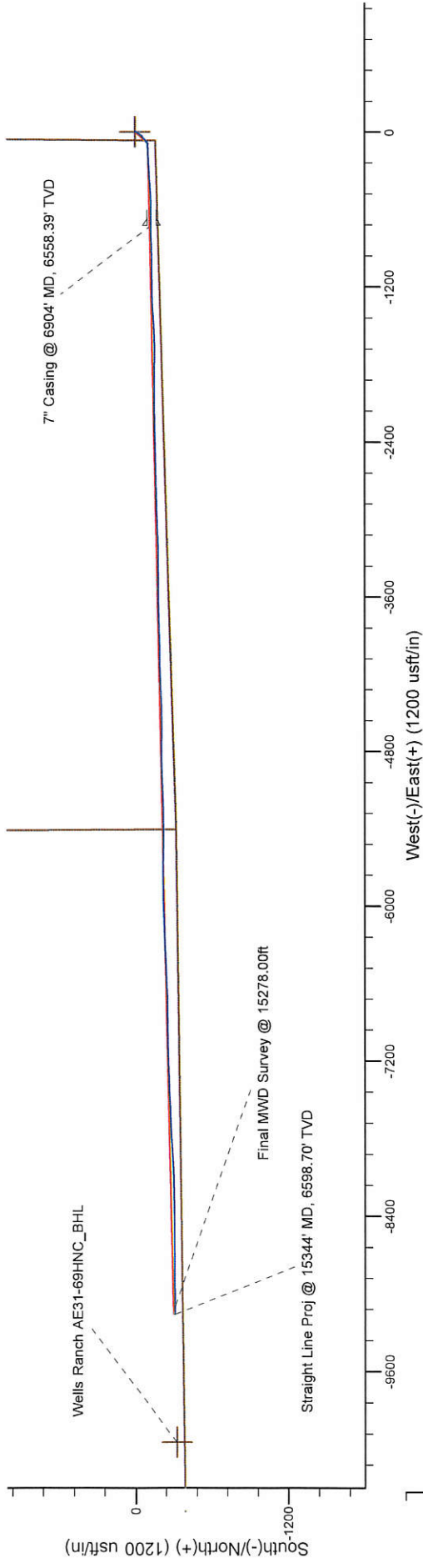


Project: Weld County, CO (NAD 83)
Site: Sec. 29-T6N-R62W (Wells Ranch AE32-30-A Pad)
Well: Wells Ranch State AE31-69HNC
Wellbore: Plan C
Design: Final Surveys

Noble Energy



LEGEND

Wells Ranch State AE31-69HNC, Plan C, Rev C0 - PROPOSAL V0
Final Surveys

Platted SHL: 155' FSL, 65' FWL
Platted Lat/Long: 40.45084 N, 104.35628 W
Location: Sec. 29-T6N-R62W

7" Casing: ~51.14' FSL, ~655.11' FEL
Lat/Long: 40.450519 N, 104.358882 W
State Planes - CO Northern: 1,409,007.65' N, 3,317,567.66' E
Location: Sec. 30-T6N-R62W

BHL: ~58.51' FSL, ~1523.37' FWL
Lat/Long: 40.450311 N, 104.389196 W
State Planes - CO Northern: 1,408,824.84' N, 3,309,132.90' E
Location: Sec. 25-T6N-R63W

WELL DETAILS: Wells Ranch State AE31-69HNC

Ground Level: 4745.00
RKB=24 @ 4769.00usft (H&P 343)

Created By: Fred Hartmann
Created On: 04/07/2014

Noble Energy

Weld County, CO (NAD 83)

Sec. 29-T6N-R62W (Wells Ranch AE32-30-A Pad)

Wells Ranch State AE31-69HNC

Design: Final Surveys

Sperry Drilling Services

Final Survey Report

07 April, 2014

Well Coordinates: 1,409,134.01 N, 3,318,290.16 E (40° 27' 03.02" N, 104° 21' 22.61" W)

Ground Level: 4,745.00 usft

Local Coordinate Origin:

Centered on Well Wells Ranch State AE31-69HNC

Viewing Datum:

RKB=24 @ 4769.00usft (H&P 343)

TVDs to System:

N

North Reference:

Grid

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Design Report for Wells Ranch State AE31-69HNC - Final 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
350.00	0.40	225.37	350.00	-0.86	-0.87	0.90	0.11
615.00	0.60	109.37	614.99	-1.97	-0.22	0.28	0.32
Tie-On to Surface Gyros @ 615.00ft							
713.00	0.55	156.65	712.99	-2.57	0.45	-0.37	0.47
First MWD Survey @ 713.00ft							
805.00	0.63	139.58	804.98	-3.36	0.95	-0.85	0.21
898.00	0.72	125.79	897.98	-4.09	1.76	-1.63	0.20
990.00	0.70	137.49	989.97	-4.84	2.61	-2.45	0.16
1,083.00	0.84	136.81	1,082.96	-5.76	3.46	-3.27	0.15
1,177.00	0.72	161.98	1,176.95	-6.82	4.11	-3.90	0.38
1,270.00	0.60	19.58	1,269.95	-6.92	4.46	-4.24	1.34
1,455.00	0.68	358.66	1,454.94	-4.91	4.76	-4.60	0.13
1,550.00	0.50	4.10	1,549.93	-3.93	4.77	-4.65	0.20
1,645.00	1.56	218.47	1,644.92	-4.53	4.00	-3.85	2.10
1,739.00	2.58	212.33	1,738.86	-7.32	2.07	-1.84	1.11
1,834.00	4.71	218.51	1,833.66	-12.18	-1.50	1.89	2.28
1,929.00	6.06	211.85	1,928.24	-19.49	-6.58	7.19	1.56
2,023.00	7.24	215.42	2,021.61	-28.54	-12.63	13.53	1.33
2,118.00	8.32	221.00	2,115.73	-38.60	-20.61	21.82	1.39
2,213.00	8.71	221.09	2,209.69	-49.21	-29.84	31.39	0.41
2,307.00	9.04	230.20	2,302.57	-59.30	-40.20	42.06	1.53
2,402.00	7.91	231.17	2,396.53	-68.18	-51.02	53.16	1.20
2,497.00	7.12	234.93	2,490.71	-75.66	-60.93	63.30	0.98
2,592.00	6.37	233.46	2,585.05	-82.18	-69.99	72.56	0.81
2,686.00	5.69	219.46	2,678.54	-88.88	-77.14	79.92	1.72
2,781.00	4.01	236.42	2,773.20	-94.36	-82.90	85.85	2.31
2,876.00	2.41	250.37	2,868.05	-96.87	-87.55	90.58	1.86
2,971.00	0.47	288.97	2,963.01	-97.41	-89.80	92.84	2.17
3,066.00	0.31	275.03	3,058.01	-97.26	-90.42	93.46	0.19
3,160.00	0.22	346.29	3,152.01	-97.06	-90.72	93.75	0.34
3,255.00	0.33	94.55	3,247.01	-96.91	-90.49	93.52	0.47
3,350.00	0.62	286.43	3,342.01	-96.78	-90.71	93.73	1.00
3,444.00	0.47	225.13	3,436.01	-96.91	-91.47	94.50	0.61
3,539.00	0.56	193.51	3,531.00	-97.64	-91.86	94.91	0.31
3,634.00	0.88	204.21	3,626.00	-98.76	-92.26	95.35	0.36
3,728.00	0.77	204.25	3,719.99	-99.99	-92.82	95.94	0.12
3,823.00	0.62	248.92	3,814.98	-100.76	-93.56	96.71	0.57
3,918.00	0.72	235.34	3,909.97	-101.28	-94.53	97.70	0.20
4,013.00	0.23	213.05	4,004.97	-101.78	-95.13	98.31	0.54
4,108.00	0.17	35.69	4,099.97	-101.83	-95.15	98.33	0.42
4,202.00	0.13	230.84	4,193.97	-101.78	-95.15	98.33	0.32
4,297.00	0.18	179.15	4,288.97	-102.00	-95.23	98.42	0.15
4,392.00	0.10	299.18	4,383.97	-102.11	-95.30	98.49	0.26
4,487.00	0.28	1.97	4,478.97	-101.83	-95.37	98.55	0.26
4,582.00	0.37	308.47	4,573.97	-101.41	-95.60	98.76	0.32
4,677.00	0.63	319.69	4,668.96	-100.82	-96.18	99.32	0.29
4,771.00	0.52	301.11	4,762.96	-100.21	-96.88	100.00	0.23
4,866.00	0.18	322.55	4,857.96	-99.87	-97.33	100.45	0.38
4,961.00	0.13	324.27	4,952.96	-99.66	-97.49	100.60	0.05

Design Report for Wells Ranch State AE31-69HNC - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,056.00	0.39	299.86	5,047.95	-99.41	-97.83	100.93	0.29
5,151.00	0.80	243.21	5,142.95	-99.55	-98.70	101.81	0.71
5,246.00	0.80	266.01	5,237.94	-99.89	-99.96	103.08	0.33
5,340.00	0.73	303.62	5,331.93	-99.61	-101.11	104.22	0.53
5,435.00	0.89	265.11	5,426.92	-99.34	-102.35	105.45	0.58
5,530.00	0.81	288.06	5,521.91	-99.19	-103.72	106.82	0.37
5,719.00	0.65	278.80	5,710.90	-98.61	-106.05	109.13	0.10
5,812.00	0.86	275.94	5,803.89	-98.46	-107.27	110.34	0.23
5,907.00	0.89	287.13	5,898.88	-98.17	-108.68	111.74	0.18
5,955.00	3.88	270.20	5,946.83	-98.05	-110.66	113.72	6.33
6,002.00	7.18	265.08	5,993.61	-98.30	-115.18	118.24	7.09
6,050.00	10.67	260.01	6,041.02	-99.33	-122.55	125.64	7.45
6,097.00	13.82	264.42	6,086.95	-100.63	-132.42	135.55	6.99
6,192.00	22.83	268.98	6,177.04	-102.06	-162.21	165.36	9.60
6,287.00	30.17	268.90	6,262.00	-102.85	-204.56	207.72	7.73
6,381.00	40.49	266.19	6,338.59	-105.34	-258.78	261.99	11.10
6,476.00	55.14	265.07	6,402.21	-110.77	-328.76	332.11	15.45
6,571.00	61.81	266.84	6,451.86	-116.43	-409.49	412.98	7.20
6,666.00	66.70	266.16	6,493.11	-121.66	-494.88	498.49	5.19
6,760.00	70.65	269.19	6,527.30	-125.18	-582.34	586.02	5.16
6,808.00	74.33	269.50	6,541.74	-125.71	-628.11	631.78	7.69
6,859.00	81.04	269.55	6,552.61	-126.12	-677.90	681.56	13.16
6,904.00	84.19	269.80	6,558.39	-126.37	-722.52	726.17	7.02
7" Casing @ 6904' MD, 6558.39' TVD							
6,946.00	87.13	270.03	6,561.57	-126.43	-764.40	768.02	7.02
7,040.00	90.99	268.80	6,563.11	-127.39	-858.36	861.97	4.31
7,135.00	89.72	268.11	6,562.52	-129.96	-953.32	956.96	1.52
7,230.00	90.09	270.00	6,562.68	-131.52	-1,048.30	1,051.95	2.03
7,325.00	88.77	270.16	6,563.63	-131.39	-1,143.30	1,146.89	1.40
7,420.00	89.72	267.84	6,564.88	-133.05	-1,238.27	1,241.86	2.64
7,515.00	89.23	266.83	6,565.75	-137.46	-1,333.16	1,336.85	1.18
7,609.00	89.32	266.50	6,566.94	-142.93	-1,426.99	1,430.81	0.36
7,704.00	89.11	266.63	6,568.24	-148.62	-1,521.81	1,525.76	0.26
7,799.00	88.61	268.32	6,570.13	-152.81	-1,616.70	1,620.73	1.85
7,894.00	91.02	269.59	6,570.44	-154.54	-1,711.67	1,715.71	2.87
7,989.00	89.04	272.65	6,570.39	-152.68	-1,806.64	1,810.57	3.84
8,083.00	89.29	270.34	6,571.76	-150.23	-1,900.59	1,904.40	2.47
8,178.00	88.12	268.67	6,573.90	-151.05	-1,995.56	1,999.34	2.15
8,272.00	89.57	269.84	6,575.80	-152.27	-2,089.53	2,093.30	1.98
8,367.00	90.80	269.84	6,575.49	-152.54	-2,184.52	2,188.26	1.29
8,462.00	88.21	268.47	6,576.31	-153.94	-2,279.50	2,283.23	3.08
8,556.00	88.92	268.85	6,578.67	-156.14	-2,373.44	2,377.20	0.86
8,651.00	89.51	268.32	6,579.97	-158.48	-2,468.40	2,472.19	0.83
8,746.00	89.75	268.59	6,580.58	-161.04	-2,563.37	2,567.18	0.38
8,841.00	89.48	267.89	6,581.22	-163.96	-2,658.32	2,662.18	0.79
8,935.00	90.74	268.69	6,581.04	-166.77	-2,752.27	2,756.18	1.59
9,030.00	89.48	269.02	6,580.86	-168.67	-2,847.25	2,851.17	1.37
9,125.00	89.63	268.56	6,581.59	-170.67	-2,942.23	2,946.16	0.51
9,220.00	89.38	266.54	6,582.42	-174.73	-3,037.13	3,041.15	2.14
9,315.00	90.96	268.32	6,582.13	-178.99	-3,132.03	3,136.13	2.51
9,410.00	90.71	270.26	6,580.75	-180.17	-3,227.01	3,231.10	2.06

Design Report for Wells Ranch State AE31-69HNC - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,505.00	87.90	269.18	6,581.90	-180.63	-3,321.99	3,326.05	3.17
9,596.00	88.30	270.01	6,584.92	-181.28	-3,412.94	3,416.97	1.01
9,688.00	89.14	269.54	6,586.97	-181.64	-3,504.91	3,508.91	1.05
9,781.00	89.88	269.25	6,587.77	-182.62	-3,597.90	3,601.88	0.85
9,873.00	88.52	267.11	6,589.05	-185.54	-3,689.84	3,693.87	2.76
9,966.00	88.43	268.29	6,591.53	-189.27	-3,782.73	3,786.83	1.27
10,059.00	89.88	268.50	6,592.90	-191.87	-3,875.68	3,879.82	1.58
10,151.00	90.99	269.31	6,592.20	-193.63	-3,967.66	3,971.80	1.49
10,243.00	89.91	270.19	6,591.48	-194.03	-4,059.65	4,063.76	1.51
10,335.00	89.41	268.82	6,592.02	-194.83	-4,151.65	4,155.74	1.59
10,428.00	89.57	266.66	6,592.85	-198.50	-4,244.56	4,248.72	2.33
10,521.00	89.54	267.24	6,593.57	-203.44	-4,337.43	4,341.70	0.62
10,614.00	90.28	268.55	6,593.72	-206.86	-4,430.36	4,434.70	1.62
10,708.00	88.49	268.97	6,594.73	-208.89	-4,524.33	4,528.68	1.96
10,801.00	90.37	269.97	6,595.66	-209.75	-4,617.32	4,621.65	2.29
10,894.00	91.20	270.77	6,594.38	-209.15	-4,710.31	4,714.57	1.24
10,986.00	89.48	270.54	6,593.83	-208.10	-4,802.29	4,806.48	1.89
11,078.00	89.78	268.42	6,594.43	-208.94	-4,894.28	4,898.45	2.33
11,172.00	89.91	266.79	6,594.68	-212.86	-4,988.20	4,992.44	1.74
11,267.00	89.63	267.65	6,595.06	-217.47	-5,083.08	5,087.42	0.95
11,361.00	89.57	268.38	6,595.72	-220.73	-5,177.03	5,181.42	0.78
11,455.00	90.03	268.44	6,596.05	-223.34	-5,270.99	5,275.42	0.49
11,550.00	89.75	269.20	6,596.23	-225.29	-5,365.97	5,370.41	0.85
11,644.00	89.41	270.73	6,596.92	-225.35	-5,459.96	5,464.36	1.67
11,739.00	90.15	270.72	6,597.29	-224.15	-5,554.95	5,559.27	0.78
11,833.00	89.08	272.27	6,597.92	-221.70	-5,648.91	5,653.10	2.00
11,928.00	87.84	269.30	6,600.47	-220.39	-5,743.86	5,747.96	3.39
12,022.00	87.81	269.12	6,604.04	-221.69	-5,837.78	5,841.88	0.19
12,116.00	88.40	269.05	6,607.15	-223.19	-5,931.72	5,935.81	0.63
12,211.00	88.52	267.53	6,609.70	-226.02	-6,026.64	6,030.78	1.60
12,306.00	90.52	268.10	6,610.50	-229.65	-6,121.56	6,125.76	2.19
12,401.00	90.28	268.13	6,609.83	-232.77	-6,216.51	6,220.76	0.25
12,495.00	90.03	267.73	6,609.58	-236.17	-6,310.45	6,314.76	0.50
12,589.00	89.88	267.38	6,609.65	-240.18	-6,404.36	6,408.75	0.41
12,684.00	90.62	266.87	6,609.24	-244.94	-6,499.24	6,503.74	0.95
12,779.00	89.63	267.86	6,609.03	-249.31	-6,594.14	6,598.72	1.47
12,874.00	89.32	267.97	6,609.90	-252.76	-6,689.07	6,693.72	0.35
12,969.00	89.63	269.54	6,610.77	-254.83	-6,784.04	6,788.71	1.68
13,064.00	89.45	269.49	6,611.53	-255.63	-6,879.03	6,883.68	0.20
13,159.00	89.29	268.93	6,612.58	-256.94	-6,974.02	6,978.66	0.61
13,254.00	89.48	268.73	6,613.60	-258.88	-7,068.99	7,073.65	0.29
13,349.00	90.03	268.74	6,614.00	-260.98	-7,163.97	7,168.64	0.58
13,443.00	89.97	267.96	6,614.00	-263.68	-7,257.93	7,262.64	0.83
13,538.00	90.22	267.58	6,613.85	-267.38	-7,352.86	7,357.64	0.48
13,633.00	89.88	267.90	6,613.76	-271.13	-7,447.78	7,452.63	0.49
13,728.00	89.26	267.49	6,614.48	-274.95	-7,542.70	7,547.63	0.78
13,823.00	89.05	268.43	6,615.88	-278.33	-7,637.63	7,642.61	1.01
13,918.00	89.14	267.29	6,617.38	-281.88	-7,732.55	7,737.60	1.20
14,013.00	88.27	265.34	6,619.53	-287.98	-7,827.32	7,832.52	2.25
14,107.00	90.28	266.47	6,620.72	-294.69	-7,921.07	7,926.43	2.45
14,202.00	90.86	267.48	6,619.77	-299.70	-8,015.93	8,021.40	1.23

Design Report for Wells Ranch State AE31-69HNC - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
14,297.00	90.80	269.50	6,618.39	-302.21	-8,110.88	8,116.39	2.13
14,392.00	91.14	268.46	6,616.79	-303.90	-8,205.85	8,211.36	1.15
14,487.00	91.57	268.35	6,614.54	-306.54	-8,300.79	8,306.34	0.47
14,582.00	91.11	269.64	6,612.32	-308.21	-8,395.75	8,401.30	1.44
14,676.00	91.11	269.41	6,610.50	-308.99	-8,489.73	8,495.25	0.24
14,771.00	90.34	270.73	6,609.29	-308.87	-8,584.71	8,590.19	1.61
14,866.00	90.59	270.41	6,608.52	-307.93	-8,679.71	8,685.11	0.43
14,961.00	90.93	269.88	6,607.26	-307.69	-8,774.70	8,780.04	0.66
15,056.00	91.48	269.31	6,605.27	-308.36	-8,869.67	8,874.99	0.83
15,151.00	90.96	270.03	6,603.24	-308.90	-8,964.65	8,969.94	0.93
15,278.00	91.54	269.86	6,600.47	-309.03	-9,091.62	9,096.85	0.48
Final MWD Survey @ 15278.00ft							
15,344.00	91.54	269.86	6,598.70	-309.19	-9,157.59	9,162.79	0.00
Straight Line Proj @ 15344' MD, 6598.70' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
615.00	614.99	-1.97	-0.22	Tie-On to Surface Gyros @ 615.00ft
713.00	712.99	-2.57	0.45	First MWD Survey @ 713.00ft
15,278.00	6,600.47	-309.03	-9,091.62	Final MWD Survey @ 15278.00ft
15,344.00	6,598.70	-309.19	-9,157.59	Straight Line Proj @ 15344' MD, 6598.70' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Wells Ranch AE31-69HNC_BHL	268.18	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
350.00	615.00	Surface Gyros	Flexi-Shot
713.00	6,859.00	MWD Surveys - Intermediate	MWD+IFR1+MS_WY
6,946.00	15,278.00	MWD Surveys - Production	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,904.00	6,558.39	7" Casing @ 6904' MD, 6558.39' TVD	7	8-3/4

Design Report for Wells Ranch State AE31-69HNC - Final 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
Wells Ranch AE31-69H	0.00	0.00	0.00	0.00	0.00	1,409,134.02	3,318,290.16	40.450840	-104.356280
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	4,928.34	-10,727.18	1,414,062.18	3,307,563.38	
Point 2				0.00	-386.85	-10,680.39	1,408,747.18	3,307,610.16	
Point 3				0.00	-320.54	-5,406.75	1,408,813.49	3,312,883.61	
Point 4				0.00	-157.54	-67.55	1,408,976.48	3,318,222.61	
Point 5				0.00	5,144.06	-38.52	1,414,277.89	3,318,251.64	
Point 6				0.00	4,983.95	-5,435.05	1,414,117.78	3,312,855.31	
Point 7				0.00	-320.54	-5,406.75	1,408,813.49	3,312,883.61	
Point 8				0.00	4,983.95	-5,435.05	1,414,117.78	3,312,855.31	
Point 9				0.00	4,928.34	-10,727.18	1,414,062.18	3,307,563.38	
Wells Ranch AE31-69H	0.00	0.00	0.00	0.00	0.00	1,409,134.02	3,318,290.16	40.450840	-104.356280
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	4,468.33	-10,267.16	1,413,602.18	3,308,023.38	
Point 2				0.00	73.16	-10,220.38	1,409,207.18	3,308,070.16	
Point 3				0.00	139.48	-5,406.75	1,409,273.49	3,312,883.61	
Point 4				0.00	302.47	-527.57	1,409,436.48	3,317,762.61	
Point 5				0.00	4,684.05	-498.54	1,413,817.89	3,317,791.64	
Point 6				0.00	4,523.93	-5,435.05	1,413,657.78	3,312,855.31	
Point 7				0.00	4,468.33	-10,267.16	1,413,602.18	3,308,023.38	
Wells Ranch AE31-69H	0.00	0.00	0.00	0.00	0.00	1,409,134.02	3,318,290.16	40.450840	-104.356280
- actual wellpath hits target center									
- Point									
Wells Ranch AE31-69H	0.00	0.00	6,625.87	-321.89	-10,146.80	1,408,812.13	3,308,143.73	40.450310	-104.392750
- actual wellpath misses target center by 989.66usft at 15344.00usft MD (6598.70 TVD, -309.19 N, -9157.59 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.56 °/100usft	Maximum Dogleg over Survey:	15.45 °/100usft at 6,476.00 usft
Net Tortousity applicable to Plans:	0.87 °/100usft	Directional Difficulty Index:	6.710

Audit Info

**North Reference Sheet for Sec. 29-T6N-R62W (Wells Ranch AE32-30-A Pad) -
Wells Ranch State AE31-69HNC**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB=24 @ 4769.00usft (H&P 343). Northing and Easting are relative to Wells Ranch State AE31-69HNC

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: 0.99996293

Grid Coordinates of Well: 1,409,134.01 usft N, 3,318,290.16 usft E

Geographical Coordinates of Well: 40° 27' 03.02" N, 104° 21' 22.61" W

Grid Convergence at Surface is: 0.74°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,344.00usft
the Bottom Hole Displacement is 9,162.81usft in the Direction of 268.07° (Grid).

Magnetic Convergence at surface is: -7.57° (29 March 2014, , BGGM2013)

