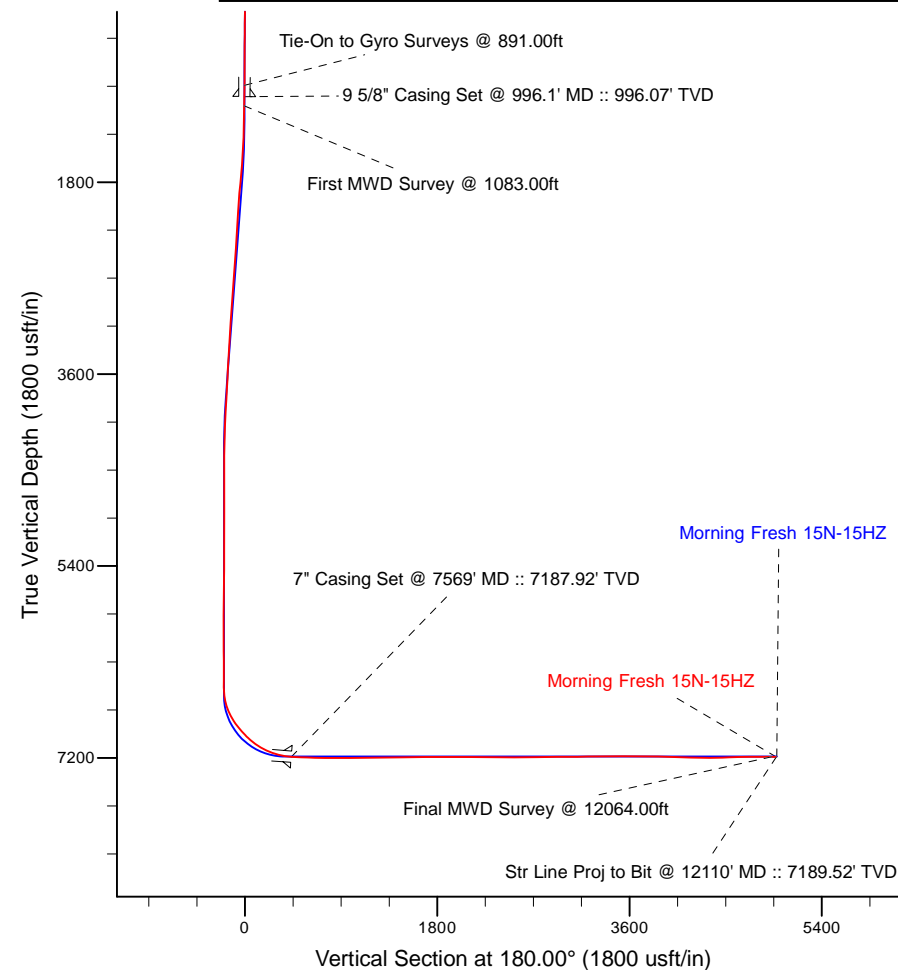
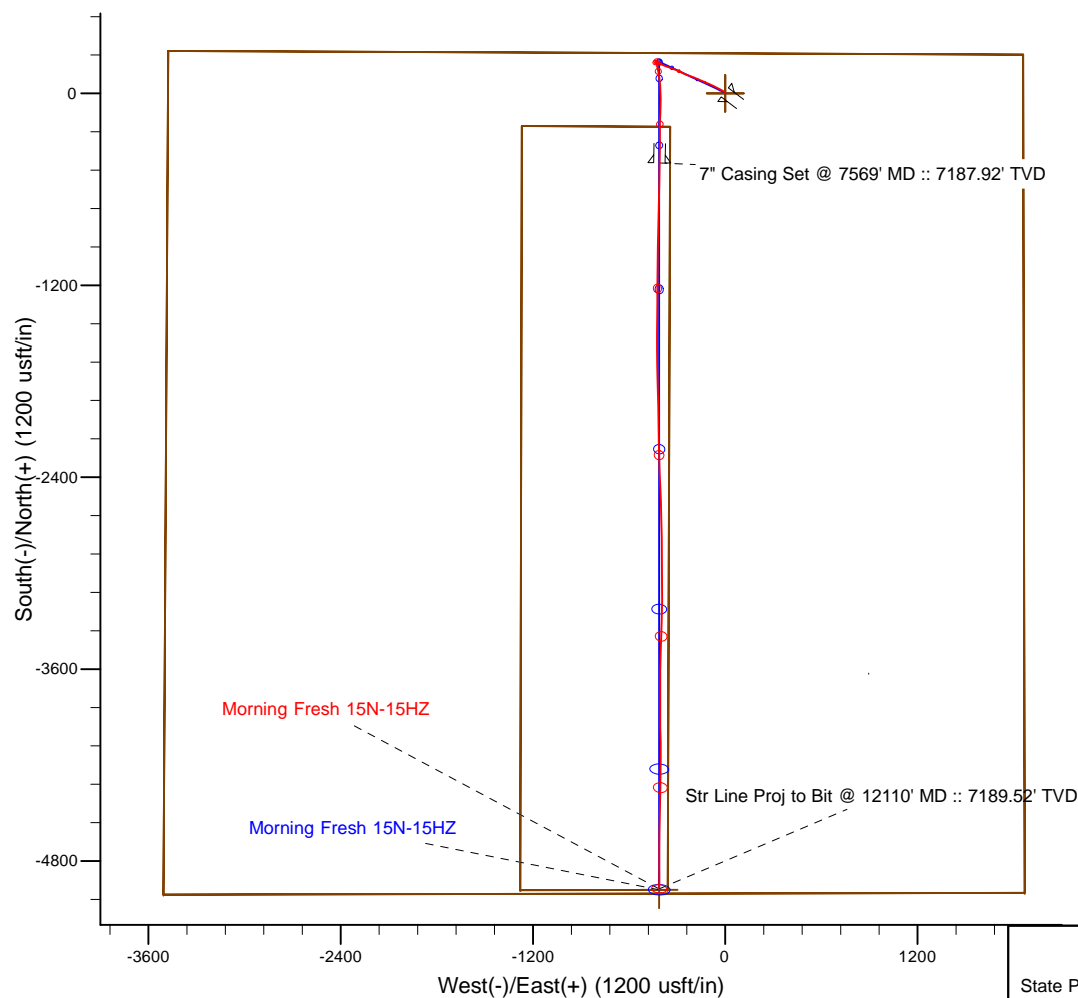


Project: Weld County, CO (NAD 83)
 Site: Sec. 15-T3N-R66W
 Well: Morning Fresh 15N-15HZ
 Wellbore: Plan A
 Design: Actual Surveys



LEGEND

- ◆ Morning Fresh 15N-15HZ, Plan A, Rev A0 V0
- ▣ Actual Surveys



7" Casing: ~686.01' FNL, ~2269.72' FEL
 Lat/Long: 40.230334 N, -104.761961 E
 State Planes - CO Northern: 1,327,610.26' N, 3,206,063.55' E
 Location: Sec. 15-T3N-R66W

BHL: ~6.69' FSL, ~2280.01' FEL
 Lat/Long: 40.217874 N, -104.761969 E
 State Planes - CO Northern: 1,323,071.16' N, 3,206,099.04' E
 Location: Sec. 15-T3N-R66W

WELL DETAILS: Morning Fresh 15N-15HZ	
Ground Level:	4884.00
RKB = 13' @ 4897.00usft (Ensign 138)	
Design: Actual Surveys (Morning Fresh 15N-15HZ/Plan A)	
Created By: Clint Eshelman	Date: 7/2/2014
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 15-T3N-R66W

Morning Fresh 15N-15HZ

05-123-37010

Plan A

Design: Actual Surveys

Sperry Drilling Services

Standard Report

07 July, 2014

Surface UWI : 05-123-37010

Well Coordinates: 1,328,047.78 N, 3,206,469.23 E (40° 13' 53.49" N, 104° 45' 37.78" W)

Ground Level: 4,884.00 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 Morning Fresh 15N-15HZ

RKB = 13' @ 4897.00usft (Ensign 138)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Morning Fresh 15N-15HZ - 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
13.00	0.00	0.00	13.00	0.00	0.00	0.00	0.00
113.00	0.26	88.71	113.00	0.01	0.23	-0.01	0.26
213.00	0.63	353.06	213.00	0.56	0.39	-0.56	0.70
313.00	0.60	5.53	312.99	1.62	0.37	-1.62	0.14
413.00	0.78	347.73	412.98	2.81	0.28	-2.81	0.28
513.00	0.51	344.73	512.98	3.90	0.02	-3.90	0.27
613.00	0.49	321.89	612.97	4.67	-0.37	-4.67	0.20
713.00	0.24	343.21	712.97	5.21	-0.69	-5.21	0.28
813.00	0.45	299.56	812.97	5.60	-1.09	-5.60	0.32
891.00	0.28	304.33	890.97	5.86	-1.52	-5.86	0.22
Tie-On to Gyro Surveys @ 891.00ft							
996.10	0.39	307.18	996.07	6.22	-2.01	-6.22	0.11
9 5/8" Casing Set @ 996.1' MD :: 996.07' TVD							
1,083.00	0.48	308.55	1,082.96	6.62	-2.53	-6.62	0.11
First MWD Survey @ 1083.00ft							
1,267.00	1.81	310.73	1,266.92	9.00	-5.34	-9.00	0.72
1,358.00	4.56	302.59	1,357.77	11.89	-9.48	-11.89	3.05
1,449.00	6.49	302.89	1,448.35	16.63	-16.84	-16.63	2.12
1,541.00	7.93	298.09	1,539.62	22.44	-26.81	-22.44	1.70
1,724.00	10.88	297.30	1,720.14	36.31	-53.30	-36.31	1.61
1,815.00	11.27	298.50	1,809.44	44.49	-68.74	-44.49	0.50
1,998.00	9.96	292.12	1,989.31	58.98	-99.12	-58.98	0.96
2,090.00	9.35	292.82	2,080.01	64.88	-113.38	-64.88	0.68
2,181.00	8.88	292.72	2,169.86	70.46	-126.67	-70.46	0.52
2,364.00	9.20	294.81	2,350.59	82.05	-152.98	-82.05	0.25
2,455.00	8.61	292.52	2,440.49	87.71	-165.88	-87.71	0.76
2,546.00	8.76	293.24	2,530.45	93.06	-178.54	-93.06	0.20
2,638.00	11.94	290.48	2,620.94	99.15	-193.89	-99.15	3.50
2,729.00	11.72	290.52	2,710.01	105.69	-211.37	-105.69	0.24
2,824.00	11.39	290.00	2,803.08	112.28	-229.22	-112.28	0.36
2,919.00	9.89	293.67	2,896.45	118.76	-245.51	-118.76	1.73
3,013.00	9.83	294.43	2,989.06	125.32	-260.21	-125.32	0.15
3,107.00	9.69	295.97	3,081.70	132.10	-274.62	-132.10	0.32
3,203.00	9.44	293.56	3,176.36	138.79	-289.10	-138.79	0.49
3,299.00	8.66	292.98	3,271.17	144.76	-302.97	-144.76	0.82
3,394.00	7.46	293.62	3,365.23	150.02	-315.21	-150.02	1.27
3,487.00	8.55	293.14	3,457.32	155.16	-327.10	-155.16	1.17
3,582.00	9.16	288.19	3,551.19	160.29	-340.78	-160.29	1.03
3,676.00	8.38	284.03	3,644.09	164.29	-354.53	-164.29	1.07
3,771.00	8.88	291.73	3,738.02	168.68	-368.06	-168.68	1.32
3,865.00	7.93	295.41	3,831.01	174.15	-380.65	-174.15	1.16
3,961.00	7.08	294.26	3,926.18	179.42	-392.03	-179.42	0.90
4,055.00	6.61	297.85	4,019.51	184.33	-402.10	-184.33	0.68
4,150.00	4.71	303.73	4,114.05	189.05	-410.17	-189.05	2.09
4,244.00	3.38	282.06	4,207.82	191.77	-416.09	-191.77	2.13
4,339.00	2.27	291.33	4,302.70	193.04	-420.59	-193.04	1.26
4,433.00	2.81	282.38	4,396.61	194.21	-424.57	-194.21	0.71
4,527.00	3.33	285.11	4,490.47	195.42	-429.46	-195.42	0.57
4,622.00	2.03	267.23	4,585.37	196.06	-433.80	-196.06	1.61

Design Report for Morning Fresh 15N-15HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,717.00	0.60	155.00	4,680.35	195.53	-435.27	-195.53	2.45
4,811.00	0.39	198.10	4,774.35	194.77	-435.16	-194.77	0.44
4,906.00	0.19	217.28	4,869.35	194.34	-435.36	-194.34	0.23
5,001.00	0.68	246.26	4,964.34	193.99	-435.97	-193.99	0.55
5,095.00	1.00	236.70	5,058.33	193.32	-437.17	-193.32	0.37
5,191.00	0.85	50.05	5,154.33	193.31	-437.32	-193.31	1.92
5,285.00	0.42	38.59	5,248.32	194.03	-436.57	-194.03	0.47
5,380.00	0.35	343.90	5,343.32	194.58	-436.44	-194.58	0.38
5,474.00	1.22	52.76	5,437.31	195.46	-435.72	-195.46	1.21
5,569.00	1.57	44.99	5,532.28	196.99	-433.99	-196.99	0.42
5,664.00	0.97	20.35	5,627.26	198.67	-432.79	-198.67	0.84
5,758.00	0.61	7.56	5,721.25	199.91	-432.45	-199.91	0.42
5,853.00	2.00	94.44	5,816.23	200.28	-430.73	-200.28	2.17
5,948.00	0.92	93.57	5,911.20	200.11	-428.32	-200.11	1.14
6,043.00	0.23	110.24	6,006.19	199.99	-427.38	-199.99	0.74
6,137.00	0.19	141.35	6,100.19	199.81	-427.10	-199.81	0.13
6,231.00	0.25	189.51	6,194.19	199.48	-427.04	-199.48	0.20
6,325.00	0.39	180.53	6,288.19	198.96	-427.08	-198.96	0.16
6,514.00	0.47	222.82	6,477.18	197.75	-427.61	-197.75	0.17
6,609.00	0.76	220.89	6,572.18	196.99	-428.29	-196.99	0.31
6,656.00	7.39	178.41	6,619.04	193.73	-428.41	-193.73	14.57
6,703.00	14.19	173.00	6,665.18	184.98	-427.62	-184.98	14.61
6,750.00	17.63	166.59	6,710.38	172.33	-425.27	-172.33	8.21
6,798.00	21.37	166.32	6,755.62	156.76	-421.51	-156.76	7.79
6,845.00	28.23	167.85	6,798.26	137.55	-417.14	-137.55	14.66
6,892.00	31.79	171.17	6,838.95	114.44	-412.90	-114.44	8.36
6,939.00	34.63	174.53	6,878.27	88.90	-409.72	-88.90	7.20
6,987.00	38.50	174.93	6,916.82	60.43	-407.10	-60.43	8.08
7,034.00	42.61	175.40	6,952.52	29.99	-404.53	-29.99	8.77
7,081.00	45.30	178.49	6,986.36	-2.58	-402.82	2.58	7.32
7,128.00	48.02	180.36	7,018.61	-36.75	-402.49	36.75	6.47
7,176.00	51.24	181.94	7,049.70	-73.31	-403.23	73.31	7.16
7,223.00	54.47	182.44	7,078.08	-110.74	-404.67	110.74	6.92
7,271.00	60.17	182.17	7,103.98	-151.09	-406.29	151.09	11.88
7,318.00	64.69	180.86	7,125.73	-192.73	-407.38	192.73	9.93
7,365.00	68.98	179.56	7,144.22	-235.93	-407.53	235.93	9.48
7,412.00	71.66	179.97	7,160.04	-280.18	-407.35	280.18	5.76
7,460.00	76.25	181.00	7,173.31	-326.29	-407.75	326.29	9.78
7,533.00	85.19	180.75	7,185.07	-398.25	-408.84	398.25	12.25
7,569.00	85.73	180.83	7,187.92	-434.14	-409.34	434.14	1.53
7" Casing Set @ 7569' MD :: 7187.92' TVD							
7,788.00	89.04	181.33	7,197.90	-652.84	-413.47	652.84	1.53
7,882.00	89.51	181.09	7,199.09	-746.81	-415.45	746.81	0.56
7,977.00	89.97	180.77	7,199.52	-841.80	-416.99	841.80	0.59
8,072.00	90.18	180.96	7,199.40	-936.79	-418.43	936.79	0.30
8,261.00	90.59	180.80	7,198.13	-1,125.76	-421.33	1,125.76	0.23
8,355.00	90.68	180.70	7,197.08	-1,219.75	-422.56	1,219.75	0.14
8,450.00	90.37	180.19	7,196.21	-1,314.74	-423.30	1,314.74	0.63
8,639.00	91.23	180.86	7,193.58	-1,503.71	-425.03	1,503.71	0.58
8,734.00	91.05	179.33	7,191.69	-1,598.69	-425.19	1,598.69	1.62
8,828.00	90.34	178.98	7,190.54	-1,692.67	-423.80	1,692.67	0.84

Design Report for Morning Fresh 15N-15HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,923.00	90.22	178.65	7,190.08	-1,787.65	-421.84	1,787.65	0.37
9,018.00	90.12	178.26	7,189.80	-1,882.61	-419.27	1,882.61	0.42
9,112.00	89.60	179.32	7,190.03	-1,976.59	-417.29	1,976.59	1.26
9,208.00	89.38	179.33	7,190.88	-2,072.58	-416.16	2,072.58	0.23
9,302.00	89.32	179.04	7,191.95	-2,166.56	-414.82	2,166.56	0.32
9,397.00	89.54	178.34	7,192.89	-2,261.53	-412.65	2,261.53	0.77
9,586.00	90.03	177.13	7,193.60	-2,450.38	-405.18	2,450.38	0.69
9,681.00	90.09	178.26	7,193.50	-2,545.30	-401.36	2,545.30	1.19
9,775.00	90.00	178.61	7,193.43	-2,639.27	-398.79	2,639.27	0.38
9,870.00	91.39	179.24	7,192.28	-2,734.24	-397.01	2,734.24	1.61
10,060.00	90.52	179.82	7,189.11	-2,924.20	-395.45	2,924.20	0.55
10,154.00	89.69	179.30	7,188.94	-3,018.20	-394.73	3,018.20	1.04
10,248.00	90.89	179.16	7,188.46	-3,112.19	-393.47	3,112.19	1.29
10,342.00	90.96	181.29	7,186.95	-3,206.17	-393.84	3,206.17	2.27
10,437.00	89.75	181.67	7,186.36	-3,301.13	-396.29	3,301.13	1.34
10,531.00	91.02	182.14	7,185.73	-3,395.08	-399.41	3,395.08	1.44
10,626.00	90.25	181.68	7,184.67	-3,490.02	-402.58	3,490.02	0.94
10,720.00	89.60	180.43	7,184.80	-3,584.00	-404.31	3,584.00	1.50
10,815.00	90.49	179.95	7,184.72	-3,679.00	-404.63	3,679.00	1.06
10,909.00	89.48	180.07	7,184.75	-3,773.00	-404.64	3,773.00	1.08
11,004.00	88.37	180.29	7,186.53	-3,867.98	-404.94	3,867.98	1.19
11,098.00	88.27	179.21	7,189.28	-3,961.94	-404.53	3,961.94	1.15
11,193.00	87.91	178.97	7,192.45	-4,056.87	-403.02	4,056.87	0.46
11,288.00	88.95	180.65	7,195.05	-4,151.83	-402.71	4,151.83	2.08
11,382.00	88.74	179.90	7,196.95	-4,245.81	-403.16	4,245.81	0.83
11,477.00	89.78	181.74	7,198.17	-4,340.79	-404.52	4,340.79	2.22
11,571.00	91.57	180.86	7,197.07	-4,434.75	-406.65	4,434.75	2.12
11,666.00	92.43	180.86	7,193.75	-4,529.68	-408.08	4,529.68	0.91
11,760.00	91.76	180.79	7,190.32	-4,623.61	-409.43	4,623.61	0.72
11,855.00	90.40	180.43	7,188.53	-4,718.58	-410.44	4,718.58	1.48
11,951.00	89.72	180.18	7,188.42	-4,814.58	-410.95	4,814.58	0.75
12,064.00	89.54	180.32	7,189.15	-4,927.58	-411.44	4,927.58	0.20
Final MWD Survey @ 12064.00ft							
12,110.00	89.54	180.32	7,189.52	-4,973.58	-411.70	4,973.58	0.00
Str Line Proj to Bit @ 12110' MD :: 7189.52' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
891.00	890.97	5.86	-1.52	Tie-On to Gyro Surveys @ 891.00ft
1,083.00	1,082.96	6.62	-2.53	First MWD Survey @ 1083.00ft
12,064.00	7,189.15	-4,927.58	-411.44	Final MWD Survey @ 12064.00ft
12,110.00	7,189.52	-4,973.58	-411.70	Str Line Proj to Bit @ 12110' MD :: 7189.52' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

Design Report for Morning Fresh 15N-15HZ - Actual Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	891.00	MS Energy Gyros	NS-GYRO-MS
1,083.00	7,788.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,882.00	12,064.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
996.10	996.07	9 5/8" Casing Set @ 996.1' MD :: 996.07' TVD	9-5/8	13-1/2
7,569.00	7,187.92	7" Casing Set @ 7569' MD :: 7187.92' TVD	7	8-3/4

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
Morning Fresh 15N-15 - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,328,047.78	3,206,469.23	40° 13' 53.493 N	104° 45' 37.782 W
Point 1				0.00	-204.33	-1,269.50	1,327,832.88	3,205,201.54	
Point 2				0.00	-208.44	-343.88	1,327,836.49	3,206,127.12	
Point 3				0.00	-4,980.55	-358.60	1,323,064.63	3,206,152.19	
Point 4				0.00	-4,982.50	-1,278.64	1,323,055.01	3,205,232.24	
Morning Fresh 15N-15 - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,328,047.78	3,206,469.23	40° 13' 53.493 N	104° 45' 37.782 W
Point 1				0.00	265.53	-3,476.18	1,328,284.30	3,202,991.11	
Point 2				0.00	242.00	1,859.30	1,328,305.27	3,208,326.37	
Point 3				0.00	-4,998.52	1,868.45	1,323,065.23	3,208,379.22	
Point 4				0.00	-5,009.97	-3,506.38	1,323,008.96	3,203,004.91	
Morning Fresh 15N-15 - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,328,047.78	3,206,469.23	40° 13' 53.493 N	104° 45' 37.782 W
Morning Fresh 15N-15 - actual wellpath misses target center by 6.19usft at 12110.00usft MD (7189.52 TVD, -4973.58 N, -411.70 E) - Point	0.00	0.00	7,187.00	-4,979.22	-411.64	1,323,065.51	3,206,099.14	40° 13' 4.289 N	104° 45' 43.088 W

Directional Difficulty Index

Average Dogleg over Survey:	1.54 °/100usft	Maximum Dogleg over Survey:	14.66 °/100usft at 6,845.00 usft
Net Tortosity applicable to Plans:	0.31 °/100usft	Directional Difficulty Index:	6.250

Audit Info

North Reference Sheet for Sec. 15-T3N-R66W - Morning Fresh 15N-15HZ - 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' @ 4897.00usft (Ensign 138). Northing and Easting are relative to Morning Fresh 15N-15HZ

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: 0.99995690

Grid Coordinates of Well: 1,328,047.78 usft N, 3,206,469.23 usft E

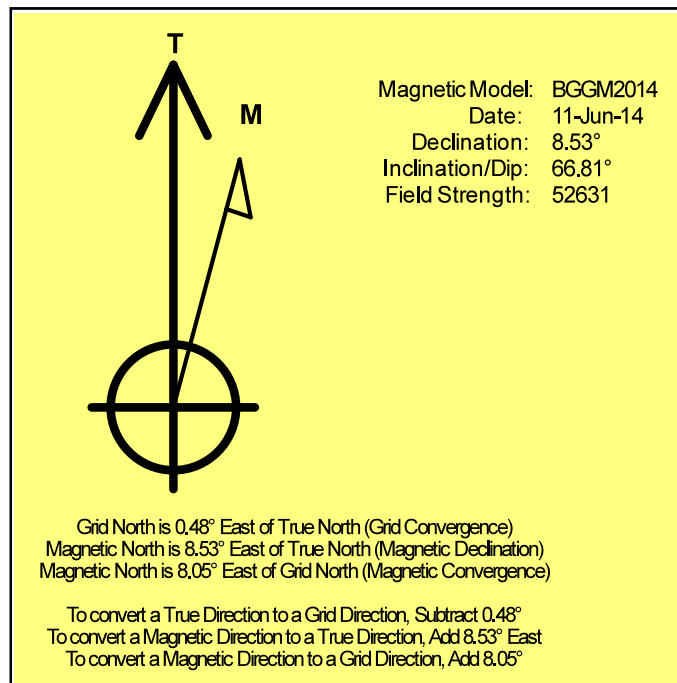
Geographical Coordinates of Well: 40° 13' 53.49" N, 104° 45' 37.78" W

Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,110.00usft

the Bottom Hole Displacement is 4,990.59usft in the Direction of 184.73° (True).

Magnetic Convergence at surface is: -8.05° (11 June 2014, , BGGM2014)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 15-T3N-R66W

Morning Fresh 15N-15HZ

05-123-37010

Plan A

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

07 July, 2014

Well Coordinates: 1,328,047.78 N, 3,206,469.23 E (40° 13' 53.49" N, 104° 45' 37.78" W)

Ground Level: 4,884.00 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 Morning Fresh 15N-15HZ

RKB = 13' @ 4897.00usft (Ensign 138)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Morning Fresh 15N-15HZ - 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	40.231526	-104.760495	1,328,047.78	3,206,469.23
13.00	0.00	0.00	13.00	0.00	0.00	40.231526	-104.760495	1,328,047.78	3,206,469.23
113.00	0.26	88.71	113.00	0.01	0.23	40.231526	-104.760494	1,328,047.79	3,206,469.46
213.00	0.63	353.06	213.00	0.56	0.39	40.231528	-104.760494	1,328,048.34	3,206,469.62
313.00	0.60	5.53	312.99	1.62	0.37	40.231530	-104.760494	1,328,049.41	3,206,469.59
413.00	0.78	347.73	412.98	2.81	0.28	40.231534	-104.760494	1,328,050.59	3,206,469.49
513.00	0.51	344.73	512.98	3.90	0.02	40.231537	-104.760495	1,328,051.69	3,206,469.22
613.00	0.49	321.89	612.97	4.67	-0.37	40.231539	-104.760497	1,328,052.45	3,206,468.83
713.00	0.24	343.21	712.97	5.21	-0.69	40.231540	-104.760498	1,328,052.98	3,206,468.50
813.00	0.45	299.56	812.97	5.60	-1.09	40.231541	-104.760499	1,328,053.37	3,206,468.09
891.00	0.28	304.33	890.97	5.86	-1.52	40.231542	-104.760501	1,328,053.63	3,206,467.67
996.10	0.39	307.18	996.07	6.22	-2.01	40.231543	-104.760502	1,328,053.98	3,206,467.17
1,083.00	0.48	308.55	1,082.96	6.62	-2.53	40.231544	-104.760504	1,328,054.39	3,206,466.65
1,267.00	1.81	310.73	1,266.92	9.00	-5.34	40.231551	-104.760514	1,328,056.74	3,206,463.82
1,358.00	4.56	302.59	1,357.77	11.89	-9.48	40.231559	-104.760529	1,328,059.59	3,206,459.66
1,449.00	6.49	302.89	1,448.35	16.63	-16.84	40.231572	-104.760556	1,328,064.27	3,206,452.25
1,541.00	7.93	298.09	1,539.62	22.44	-26.81	40.231588	-104.760591	1,328,070.00	3,206,442.24
1,724.00	10.88	297.30	1,720.14	36.31	-53.30	40.231626	-104.760686	1,328,083.64	3,206,415.64
1,815.00	11.27	298.50	1,809.44	44.49	-68.74	40.231648	-104.760741	1,328,091.70	3,206,400.12
1,998.00	9.96	292.12	1,989.31	58.98	-99.12	40.231688	-104.760850	1,328,105.94	3,206,369.63
2,090.00	9.35	292.82	2,080.01	64.88	-113.38	40.231704	-104.760901	1,328,111.71	3,206,355.32
2,181.00	8.88	292.72	2,169.86	70.46	-126.67	40.231719	-104.760949	1,328,117.18	3,206,341.98
2,364.00	9.20	294.81	2,350.59	82.05	-152.98	40.231751	-104.761043	1,328,128.55	3,206,315.58
2,455.00	8.61	292.52	2,440.49	87.71	-165.88	40.231767	-104.761089	1,328,134.11	3,206,302.64
2,546.00	8.76	293.24	2,530.45	93.06	-178.54	40.231781	-104.761135	1,328,139.34	3,206,289.94
2,638.00	11.94	290.48	2,620.94	99.15	-193.89	40.231798	-104.761190	1,328,145.31	3,206,274.53
2,729.00	11.72	290.52	2,710.01	105.69	-211.37	40.231816	-104.761252	1,328,151.70	3,206,257.00
2,824.00	11.39	290.00	2,803.08	112.28	-229.22	40.231834	-104.761316	1,328,158.14	3,206,239.10
2,919.00	9.89	293.67	2,896.45	118.76	-245.51	40.231852	-104.761375	1,328,164.49	3,206,222.76
3,013.00	9.83	294.43	2,989.06	125.32	-260.21	40.231870	-104.761427	1,328,170.92	3,206,208.00
3,107.00	9.69	295.97	3,081.70	132.10	-274.62	40.231889	-104.761479	1,328,177.59	3,206,193.53
3,203.00	9.44	293.56	3,176.36	138.79	-289.10	40.231907	-104.761531	1,328,184.15	3,206,179.00
3,299.00	8.66	292.98	3,271.17	144.76	-302.97	40.231923	-104.761580	1,328,190.00	3,206,165.08
3,394.00	7.46	293.62	3,365.23	150.02	-315.21	40.231938	-104.761624	1,328,195.16	3,206,152.80
3,487.00	8.55	293.14	3,457.32	155.16	-327.10	40.231952	-104.761667	1,328,200.20	3,206,140.87
3,582.00	9.16	288.19	3,551.19	160.29	-340.78	40.231966	-104.761716	1,328,205.22	3,206,127.15
3,676.00	8.38	284.03	3,644.09	164.29	-354.53	40.231977	-104.761765	1,328,209.10	3,206,113.36
3,771.00	8.88	291.73	3,738.02	168.68	-368.06	40.231989	-104.761813	1,328,213.38	3,206,099.80
3,865.00	7.93	295.41	3,831.01	174.15	-380.65	40.232004	-104.761859	1,328,218.74	3,206,087.16
3,961.00	7.08	294.26	3,926.18	179.42	-392.03	40.232019	-104.761899	1,328,223.92	3,206,075.74
4,055.00	6.61	297.85	4,019.51	184.33	-402.10	40.232032	-104.761935	1,328,228.74	3,206,065.63
4,150.00	4.71	303.73	4,114.05	189.05	-410.17	40.232045	-104.761964	1,328,233.40	3,206,057.51

Design Report for Morning Fresh 15N-15HZ - 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)
4,244.00	3.38	282.06	4,207.82	191.77	-416.09	40.232052	-104.761986	1,328,236.07	3,206,051.57
4,339.00	2.27	291.33	4,302.70	193.04	-420.59	40.232056	-104.762002	1,328,237.30	3,206,047.07
4,433.00	2.81	282.38	4,396.61	194.21	-424.57	40.232059	-104.762016	1,328,238.44	3,206,043.08
4,527.00	3.33	285.11	4,490.47	195.42	-429.46	40.232062	-104.762033	1,328,239.60	3,206,038.18
4,622.00	2.03	267.23	4,585.37	196.06	-433.80	40.232064	-104.762049	1,328,240.21	3,206,033.83
4,717.00	0.60	155.00	4,680.35	195.53	-435.27	40.232063	-104.762054	1,328,239.66	3,206,032.36
4,811.00	0.39	198.10	4,774.35	194.77	-435.16	40.232061	-104.762054	1,328,238.91	3,206,032.48
4,906.00	0.19	217.28	4,869.35	194.34	-435.36	40.232059	-104.762055	1,328,238.48	3,206,032.29
5,001.00	0.68	246.26	4,964.34	193.99	-435.97	40.232058	-104.762057	1,328,238.12	3,206,031.68
5,095.00	1.00	236.70	5,058.33	193.32	-437.17	40.232057	-104.762061	1,328,237.44	3,206,030.49
5,191.00	0.85	50.05	5,154.33	193.31	-437.32	40.232057	-104.762062	1,328,237.43	3,206,030.33
5,285.00	0.42	38.59	5,248.32	194.03	-436.57	40.232059	-104.762059	1,328,238.16	3,206,031.08
5,380.00	0.35	343.90	5,343.32	194.58	-436.44	40.232060	-104.762058	1,328,238.71	3,206,031.21
5,474.00	1.22	52.76	5,437.31	195.46	-435.72	40.232063	-104.762056	1,328,239.60	3,206,031.92
5,569.00	1.57	44.99	5,532.28	196.99	-433.99	40.232067	-104.762050	1,328,241.14	3,206,033.63
5,664.00	0.97	20.35	5,627.26	198.67	-432.79	40.232071	-104.762045	1,328,242.83	3,206,034.82
5,758.00	0.61	7.56	5,721.25	199.91	-432.45	40.232075	-104.762044	1,328,244.07	3,206,035.15
5,853.00	2.00	94.44	5,816.23	200.28	-430.73	40.232076	-104.762038	1,328,244.46	3,206,036.87
5,948.00	0.92	93.57	5,911.20	200.11	-428.32	40.232075	-104.762029	1,328,244.30	3,206,039.28
6,043.00	0.23	110.24	6,006.19	199.99	-427.38	40.232075	-104.762026	1,328,244.20	3,206,040.22
6,137.00	0.19	141.35	6,100.19	199.81	-427.10	40.232074	-104.762025	1,328,244.01	3,206,040.50
6,231.00	0.25	189.51	6,194.19	199.48	-427.04	40.232074	-104.762025	1,328,243.69	3,206,040.56
6,325.00	0.39	180.53	6,288.19	198.96	-427.08	40.232072	-104.762025	1,328,243.17	3,206,040.53
6,514.00	0.47	222.82	6,477.18	197.75	-427.61	40.232069	-104.762027	1,328,241.95	3,206,040.01
6,609.00	0.76	220.89	6,572.18	196.99	-428.29	40.232067	-104.762029	1,328,241.18	3,206,039.34
6,656.00	7.39	178.41	6,619.04	193.73	-428.41	40.232058	-104.762030	1,328,237.92	3,206,039.24
6,703.00	14.19	173.00	6,665.18	184.98	-427.62	40.232034	-104.762027	1,328,229.18	3,206,040.10
6,750.00	17.63	166.59	6,710.38	172.33	-425.27	40.231999	-104.762018	1,328,216.55	3,206,042.56
6,798.00	21.37	166.32	6,755.62	156.76	-421.51	40.231956	-104.762005	1,328,201.01	3,206,046.45
6,845.00	28.23	167.85	6,798.26	137.55	-417.14	40.231904	-104.761989	1,328,181.84	3,206,050.98
6,892.00	31.79	171.17	6,838.95	114.44	-412.90	40.231840	-104.761974	1,328,158.77	3,206,055.41
6,939.00	34.63	174.53	6,878.27	88.90	-409.72	40.231770	-104.761963	1,328,133.26	3,206,058.80
6,987.00	38.50	174.93	6,916.82	60.43	-407.10	40.231692	-104.761953	1,328,104.82	3,206,061.66
7,034.00	42.61	175.40	6,952.52	29.99	-404.53	40.231608	-104.761944	1,328,074.40	3,206,064.48
7,081.00	45.30	178.49	6,986.36	-2.58	-402.82	40.231519	-104.761938	1,328,041.85	3,206,066.47
7,128.00	48.02	180.36	7,018.61	-36.75	-402.49	40.231425	-104.761937	1,328,007.68	3,206,067.08
7,176.00	51.24	181.94	7,049.70	-73.31	-403.23	40.231325	-104.761939	1,327,971.12	3,206,066.64
7,223.00	54.47	182.44	7,078.08	-110.74	-404.67	40.231222	-104.761945	1,327,933.68	3,206,065.52
7,271.00	60.17	182.17	7,103.98	-151.09	-406.29	40.231111	-104.761950	1,327,893.32	3,206,064.24
7,318.00	64.69	180.86	7,125.73	-192.73	-407.38	40.230997	-104.761954	1,327,851.67	3,206,063.49
7,365.00	68.98	179.56	7,144.22	-235.93	-407.53	40.230878	-104.761955	1,327,808.48	3,206,063.70
7,412.00	71.66	179.97	7,160.04	-280.18	-407.35	40.230757	-104.761954	1,327,764.23	3,206,064.25

Design Report for Morning Fresh 15N-15HZ - 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)
7,460.00	76.25	181.00	7,173.31	-326.29	-407.75	40.230630	-104.761956	1,327,718.12	3,206,064.24
7,533.00	85.19	180.75	7,185.07	-398.25	-408.84	40.230433	-104.761960	1,327,646.15	3,206,063.74
7,569.00	85.73	180.83	7,187.92	-434.14	-409.34	40.230334	-104.761961	1,327,610.26	3,206,063.55
7,788.00	89.04	181.33	7,197.90	-652.84	-413.47	40.229734	-104.761976	1,327,391.55	3,206,061.24
7,882.00	89.51	181.09	7,199.09	-746.81	-415.45	40.229476	-104.761983	1,327,297.56	3,206,060.04
7,977.00	89.97	180.77	7,199.52	-841.80	-416.99	40.229215	-104.761989	1,327,202.57	3,206,059.29
8,072.00	90.18	180.96	7,199.40	-936.79	-418.43	40.228955	-104.761994	1,327,107.58	3,206,058.65
8,261.00	90.59	180.80	7,198.13	-1,125.76	-421.33	40.228436	-104.762004	1,326,918.60	3,206,057.32
8,355.00	90.68	180.70	7,197.08	-1,219.75	-422.56	40.228178	-104.762009	1,326,824.61	3,206,056.88
8,450.00	90.37	180.19	7,196.21	-1,314.74	-423.30	40.227917	-104.762011	1,326,729.62	3,206,056.93
8,639.00	91.23	180.86	7,193.58	-1,503.71	-425.03	40.227398	-104.762017	1,326,540.65	3,206,056.78
8,734.00	91.05	179.33	7,191.69	-1,598.69	-425.19	40.227138	-104.762018	1,326,445.67	3,206,057.41
8,828.00	90.34	178.98	7,190.54	-1,692.67	-423.80	40.226880	-104.762013	1,326,351.71	3,206,059.58
8,923.00	90.22	178.65	7,190.08	-1,787.65	-421.84	40.226619	-104.762006	1,326,256.76	3,206,062.34
9,018.00	90.12	178.26	7,189.80	-1,882.61	-419.27	40.226358	-104.761997	1,326,161.82	3,206,065.69
9,112.00	89.60	179.32	7,190.03	-1,976.59	-417.29	40.226100	-104.761990	1,326,067.87	3,206,068.46
9,208.00	89.38	179.33	7,190.88	-2,072.58	-416.16	40.225837	-104.761986	1,325,971.89	3,206,070.39
9,302.00	89.32	179.04	7,191.95	-2,166.56	-414.82	40.225579	-104.761981	1,325,877.93	3,206,072.51
9,397.00	89.54	178.34	7,192.89	-2,261.53	-412.65	40.225318	-104.761973	1,325,782.98	3,206,075.47
9,586.00	90.03	177.13	7,193.60	-2,450.38	-405.18	40.224800	-104.761946	1,325,594.21	3,206,084.52
9,681.00	90.09	178.26	7,193.50	-2,545.30	-401.36	40.224539	-104.761933	1,325,499.33	3,206,089.13
9,775.00	90.00	178.61	7,193.43	-2,639.27	-398.79	40.224281	-104.761923	1,325,405.40	3,206,092.48
9,870.00	91.39	179.24	7,192.28	-2,734.24	-397.01	40.224021	-104.761917	1,325,310.44	3,206,095.06
10,060.00	90.52	179.82	7,189.11	-2,924.20	-395.45	40.223499	-104.761911	1,325,120.51	3,206,098.20
10,154.00	89.69	179.30	7,188.94	-3,018.20	-394.73	40.223241	-104.761909	1,325,026.53	3,206,099.70
10,248.00	90.89	179.16	7,188.46	-3,112.19	-393.47	40.222983	-104.761904	1,324,932.55	3,206,101.75
10,342.00	90.96	181.29	7,186.95	-3,206.17	-393.84	40.222725	-104.761906	1,324,838.58	3,206,102.16
10,437.00	89.75	181.67	7,186.36	-3,301.13	-396.29	40.222464	-104.761914	1,324,743.60	3,206,100.50
10,531.00	91.02	182.14	7,185.73	-3,395.08	-399.41	40.222207	-104.761926	1,324,649.64	3,206,098.16
10,626.00	90.25	181.68	7,184.67	-3,490.02	-402.58	40.221946	-104.761937	1,324,554.68	3,206,095.79
10,720.00	89.60	180.43	7,184.80	-3,584.00	-404.31	40.221688	-104.761943	1,324,460.69	3,206,094.84
10,815.00	90.49	179.95	7,184.72	-3,679.00	-404.63	40.221427	-104.761944	1,324,365.70	3,206,095.32
10,909.00	89.48	180.07	7,184.75	-3,773.00	-404.64	40.221169	-104.761944	1,324,271.70	3,206,096.09
11,004.00	88.37	180.29	7,186.53	-3,867.98	-404.94	40.220908	-104.761945	1,324,176.73	3,206,096.58
11,098.00	88.27	179.21	7,189.28	-3,961.94	-404.53	40.220651	-104.761944	1,324,082.78	3,206,097.77
11,193.00	87.91	178.97	7,192.45	-4,056.87	-403.02	40.220390	-104.761938	1,323,987.87	3,206,100.07
11,288.00	88.95	180.65	7,195.05	-4,151.83	-402.71	40.220129	-104.761937	1,323,892.92	3,206,101.18
11,382.00	88.74	179.90	7,196.95	-4,245.81	-403.16	40.219871	-104.761939	1,323,798.94	3,206,101.51
11,477.00	89.78	181.74	7,198.17	-4,340.79	-404.52	40.219611	-104.761944	1,323,703.96	3,206,100.94
11,571.00	91.57	180.86	7,197.07	-4,434.75	-406.65	40.219353	-104.761951	1,323,609.99	3,206,099.60
11,666.00	92.43	180.86	7,193.75	-4,529.68	-408.08	40.219092	-104.761957	1,323,515.05	3,206,098.96
11,760.00	91.76	180.79	7,190.32	-4,623.61	-409.43	40.218834	-104.761961	1,323,421.12	3,206,098.39

Design Report for Morning Fresh 15N-15HZ - 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)
11,855.00	90.40	180.43	7,188.53	-4,718.58	-410.44	40.218574	-104.761965	1,323,326.14	3,206,098.17
11,951.00	89.72	180.18	7,188.42	-4,814.58	-410.95	40.218310	-104.761967	1,323,230.15	3,206,098.46
12,064.00	89.54	180.32	7,189.15	-4,927.58	-411.44	40.218000	-104.761969	1,323,117.16	3,206,098.91
12,110.00	89.54	180.32	7,189.52	-4,973.58	-411.70	40.217874	-104.761969	1,323,071.16	3,206,099.04

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
891.00	890.97	5.86	-1.52	Tie-On to Gyro Surveys @ 891.00ft
1,083.00	1,082.96	6.62	-2.53	First MWD Survey @ 1083.00ft
12,064.00	7,189.15	-4,927.58	-411.44	Final MWD Survey @ 12064.00ft
12,110.00	7,189.52	-4,973.58	-411.70	Str Line Proj to Bit @ 12110' MD :: 7189.52' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	891.00	MS Energy Gyros	NS-GYRO-MS
1,083.00	7,788.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,882.00	12,064.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
996.10	996.07	9 5/8" Casing Set @ 996.1' MD :: 996.07' TVD	9-5/8	13-1/2
7,569.00	7,187.92	7" Casing Set @ 7569' MD :: 7187.92' TVD	7	8-3/4

Design Report for Morning Fresh 15N-15HZ - Actual Surveys

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:	1.54 °/100usft	Maximum Dogleg over Survey:	14.66 °/100usft at 6,845.00 usft
Net Tortousity applicable to Plans:	0.31 °/100usft	Directional Difficulty Index:	6.250

Audit Info

North Reference Sheet for Sec. 15-T3N-R66W - Morning Fresh 15N-15HZ - 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' @ 4897.00usft (Ensign 138). Northing and Easting are relative to Morning Fresh 15N-15HZ

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: 0.99995690

Grid Coordinates of Well: 1,328,047.78 usft N, 3,206,469.23 usft E

Geographical Coordinates of Well: 40° 13' 53.49" N, 104° 45' 37.78" W

Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,110.00usft

the Bottom Hole Displacement is 4,990.59usft in the Direction of 184.73° (True).

Magnetic Convergence at surface is: -8.05° (11 June 2014, , BGGM2014)

