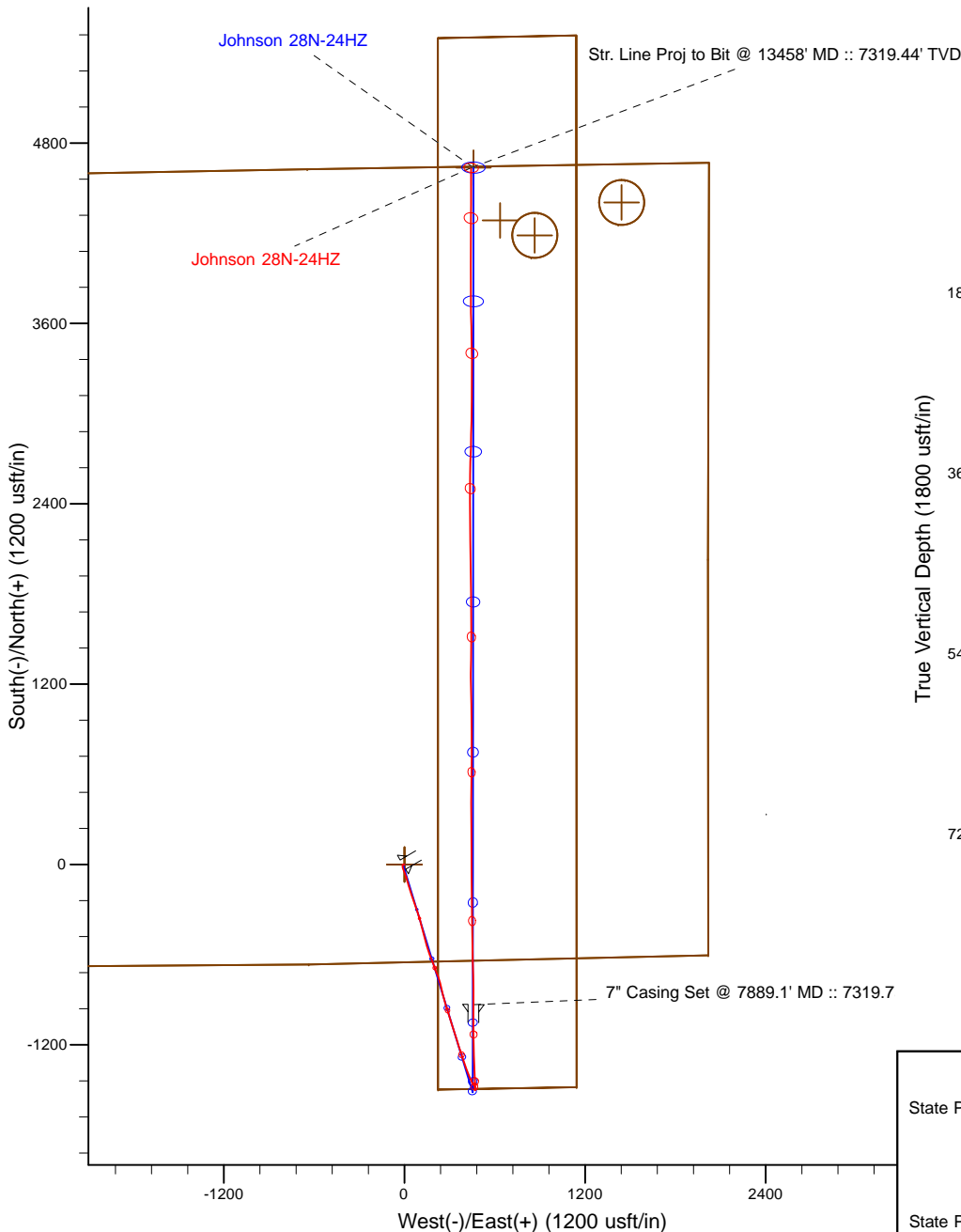
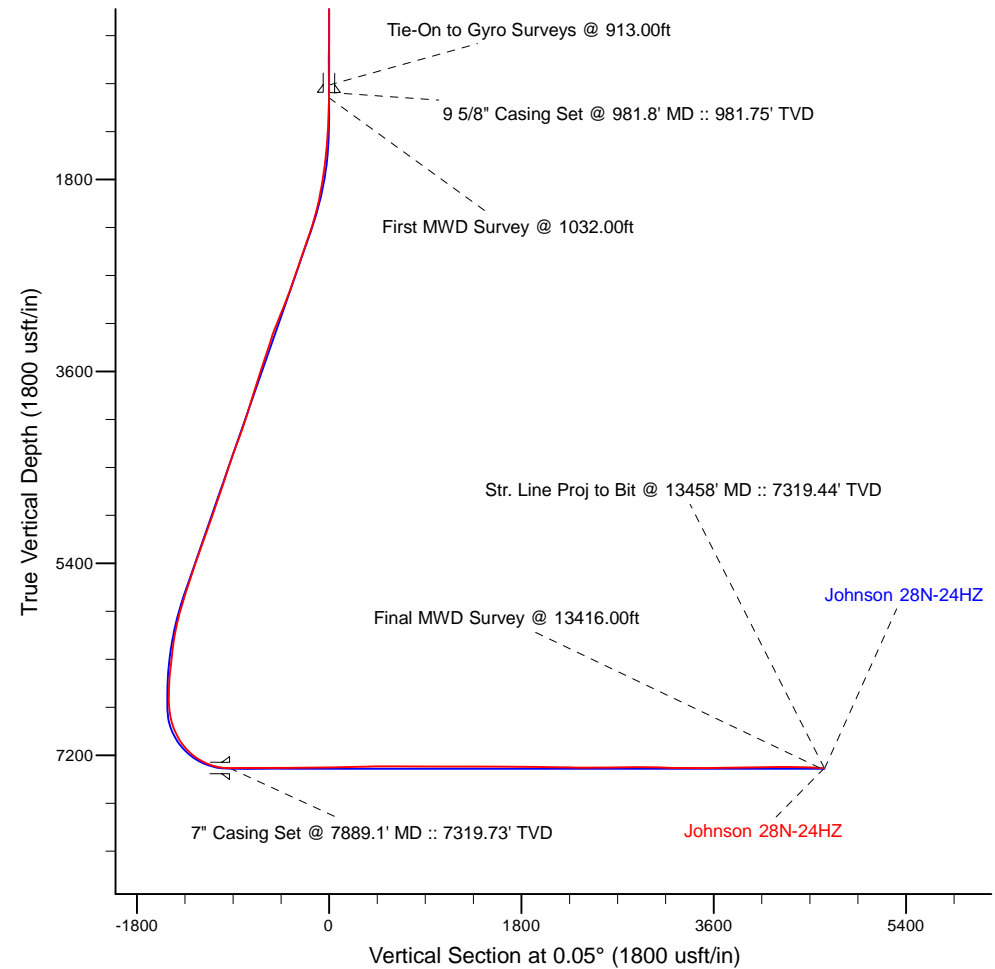


Project: Weld County, CO (NAD 83)
 Site: Sec. 24-T3N-R66W
 Well: Johnson 28N-24HZ
 Wellbore: Plan B
 Design: Actual Field Surveys



LEGEND

- + Johnson 28N-24HZ, Plan B, Rev B0 V0
- + Actual Field Surveys



7" Casing: ~290.92' FNL, ~1560.62' FEL
 Lat/Long: 40.202781 N, -104.721307 E
 State Planes - CO Northern: 1,317,670.52' N, 3,217,502.15' E
 Location: Sec. 25-T3N-R66W

BHL: ~7.94' FNL, ~1580.47' FEL
 Lat/Long: 40.218064 N, -104.721362 E
 State Planes - CO Northern: 1,323,237.56' N, 3,217,437.90' E
 Location: Sec. 24-T3N-R66W

WELL DETAILS: Johnson 28N-24HZ	
Ground Level: 5037.00	
RKB = 13' @ 5050.00usft (Ensign 145)	
Design: Actual Field Surveys (Johnson 28N-24HZ/Plan B)	
Created By: Clint Eshelman	Date: 10/9/2014
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 24-T3N-R66W

Johnson 28N-24HZ

Plan B

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

09 October, 2014

Well Coordinates: 1,318,598.66 N, 3,217,035.38 E (40° 12' 19.22" N, 104° 43' 22.62" W)

Ground Level: 5,037.00 usft

Local Coordinate Origin:

Centered on Well Johnson 28N-24HZ

Viewing Datum:

RKB = 13' @ 5050.00usft (Ensign 145)

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 Johnson 28N-24HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13.00	0.00	0.00	13.00	0.00	0.00	0.00	0.00
113.00	0.75	267.51	113.00	-0.03	-0.65	-0.03	0.75
213.00	0.66	283.99	212.99	0.08	-1.87	0.08	0.22
313.00	0.69	275.09	312.98	0.28	-3.03	0.27	0.11
413.00	0.72	259.26	412.98	0.21	-4.24	0.21	0.20
513.00	0.64	256.42	512.97	-0.04	-5.40	-0.04	0.09
613.00	0.81	256.07	612.96	-0.34	-6.63	-0.34	0.17
713.00	0.58	245.84	712.95	-0.72	-7.78	-0.72	0.26
813.00	0.37	215.09	812.95	-1.19	-8.43	-1.19	0.32
913.00	0.25	236.56	912.95	-1.57	-8.79	-1.58	0.17
Tie-On to Gyro Surveys @ 913.00ft							
981.80	0.31	239.50	981.75	-1.75	-9.08	-1.76	0.09
9 5/8" Casing Set @ 981.8' MD :: 981.75' TVD							
1,032.00	0.35	241.03	1,031.95	-1.89	-9.33	-1.90	0.09
First MWD Survey @ 1032.00ft							
1,126.00	0.43	243.08	1,125.94	-2.19	-9.89	-2.20	0.09
1,219.00	1.99	205.76	1,218.92	-3.80	-10.91	-3.81	1.79
1,281.00	2.78	203.24	1,280.87	-6.15	-11.97	-6.16	1.29
1,375.00	4.44	174.70	1,374.68	-11.87	-12.53	-11.88	2.55
1,468.00	6.38	166.04	1,467.27	-20.47	-10.95	-20.48	2.26
1,562.00	6.33	161.88	1,560.69	-30.46	-8.08	-30.47	0.49
1,656.00	7.63	162.09	1,653.99	-41.33	-4.55	-41.33	1.38
1,749.00	8.64	156.49	1,746.06	-53.61	0.13	-53.61	1.38
1,843.00	9.71	159.17	1,838.85	-67.49	5.77	-67.49	1.23
1,936.00	10.93	162.84	1,930.35	-83.25	11.16	-83.24	1.49
2,030.00	12.94	165.65	2,022.31	-101.96	16.40	-101.95	2.23
2,123.00	15.45	161.85	2,112.47	-123.82	22.84	-123.80	2.88
2,217.00	17.59	164.37	2,202.58	-149.40	30.57	-149.38	2.40
2,311.00	19.50	160.65	2,291.70	-177.89	39.59	-177.85	2.39
2,404.00	19.90	161.01	2,379.26	-207.50	49.89	-207.46	0.45
2,498.00	20.37	162.41	2,467.51	-238.22	60.04	-238.17	0.72
2,591.00	19.40	161.58	2,554.97	-268.31	69.81	-268.25	1.09
2,685.00	20.45	161.40	2,643.34	-298.68	79.98	-298.61	1.12
2,778.00	19.99	160.86	2,730.61	-329.10	90.37	-329.02	0.53
2,872.00	19.91	162.79	2,818.97	-359.57	100.38	-359.48	0.71
2,962.00	22.13	165.65	2,902.97	-390.63	109.12	-390.54	2.72
3,052.00	22.31	165.22	2,986.29	-423.57	117.67	-423.47	0.27
3,141.00	22.23	165.71	3,068.65	-456.22	126.14	-456.11	0.23
3,231.00	22.62	166.35	3,151.85	-489.54	134.43	-489.42	0.51
3,411.00	18.76	162.07	3,320.22	-550.74	151.51	-550.61	2.30
3,501.00	19.17	161.34	3,405.33	-578.51	160.70	-578.37	0.53
3,591.00	18.96	159.51	3,490.39	-606.21	170.54	-606.06	0.70
3,681.00	18.31	158.15	3,575.68	-633.03	180.92	-632.87	0.87
3,771.00	19.35	160.24	3,660.86	-660.18	191.23	-660.01	1.38
3,861.00	19.55	161.44	3,745.72	-688.49	201.06	-688.31	0.50
3,951.00	17.90	157.10	3,830.96	-715.51	211.24	-715.32	2.40
4,041.00	18.65	157.18	3,916.42	-741.51	222.20	-741.32	0.83
4,131.00	17.59	164.33	4,001.97	-767.87	231.45	-767.67	2.73
4,221.00	18.46	165.50	4,087.55	-794.76	238.70	-794.56	1.05

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,311.00	20.93	165.98	4,172.28	-824.16	246.16	-823.94	2.75
4,401.00	21.08	166.30	4,256.30	-855.48	253.89	-855.26	0.21
4,491.00	20.16	166.97	4,340.53	-886.32	261.22	-886.09	1.06
4,581.00	19.51	162.98	4,425.19	-915.80	269.11	-915.56	1.67
4,671.00	19.26	162.65	4,510.09	-944.34	277.94	-944.09	0.30
4,761.00	18.22	161.51	4,595.32	-971.85	286.83	-971.60	1.23
4,851.00	19.19	165.21	4,680.57	-999.50	295.07	-999.24	1.70
4,942.00	20.62	162.16	4,766.13	-1,029.21	303.79	-1,028.95	1.94
5,031.00	20.71	161.67	4,849.41	-1,059.07	313.54	-1,058.79	0.22
5,121.00	19.63	163.58	4,933.89	-1,088.68	322.82	-1,088.39	1.41
5,211.00	19.80	162.80	5,018.61	-1,117.74	331.60	-1,117.45	0.35
5,301.00	19.62	161.88	5,103.34	-1,146.66	340.81	-1,146.36	0.40
5,390.00	21.32	162.02	5,186.72	-1,176.25	350.45	-1,175.95	1.91
5,480.00	20.86	161.83	5,270.69	-1,207.04	360.50	-1,206.73	0.52
5,570.00	19.25	162.09	5,355.23	-1,236.38	370.06	-1,236.06	1.79
5,660.00	20.36	161.30	5,439.90	-1,265.33	379.64	-1,265.00	1.27
5,750.00	19.60	161.06	5,524.48	-1,294.44	389.56	-1,294.10	0.85
5,840.00	18.86	161.84	5,609.46	-1,322.54	398.99	-1,322.19	0.87
5,930.00	16.52	160.11	5,695.20	-1,348.40	407.88	-1,348.04	2.66
6,020.00	18.59	159.74	5,781.01	-1,373.89	417.20	-1,373.53	2.30
6,110.00	16.62	158.81	5,866.79	-1,399.35	426.83	-1,398.98	2.21
6,200.00	14.19	156.02	5,953.55	-1,421.44	435.96	-1,421.06	2.82
6,290.00	11.99	153.26	6,041.20	-1,439.87	444.65	-1,439.48	2.54
6,380.00	9.98	151.92	6,129.55	-1,455.10	452.53	-1,454.70	2.25
6,470.00	8.37	148.48	6,218.40	-1,467.56	459.63	-1,467.16	1.89
6,560.00	6.79	154.69	6,307.61	-1,477.96	465.33	-1,477.55	1.98
6,650.00	5.81	165.21	6,397.07	-1,487.17	468.76	-1,486.76	1.68
6,740.00	4.53	174.39	6,486.70	-1,495.12	470.27	-1,494.71	1.69
6,830.00	1.66	176.28	6,576.56	-1,499.95	470.71	-1,499.54	3.19
6,920.00	0.17	276.51	6,666.55	-1,501.24	470.66	-1,500.83	1.89
7,010.00	4.37	1.17	6,756.46	-1,497.80	470.60	-1,497.38	4.84
7,055.00	8.74	0.73	6,801.16	-1,492.66	470.67	-1,492.25	9.71
7,100.00	12.41	357.83	6,845.38	-1,484.41	470.53	-1,484.00	8.24
7,145.00	16.52	356.99	6,888.95	-1,473.18	470.02	-1,472.77	9.14
7,190.00	19.89	357.32	6,931.69	-1,459.14	469.32	-1,458.73	7.49
7,235.00	22.85	359.09	6,973.59	-1,442.76	468.82	-1,442.35	6.73
7,280.00	26.96	359.04	7,014.40	-1,423.81	468.51	-1,423.40	9.13
7,325.00	32.00	357.74	7,053.56	-1,401.68	467.87	-1,401.28	11.29
7,370.00	36.18	356.66	7,090.82	-1,376.50	466.63	-1,376.09	9.39
7,415.00	40.34	357.19	7,126.15	-1,348.68	465.14	-1,348.27	9.27
7,460.00	45.33	356.44	7,159.13	-1,318.14	463.43	-1,317.74	11.15
7,505.00	49.52	356.79	7,189.57	-1,285.07	461.48	-1,284.67	9.33
7,550.00	53.68	358.34	7,217.52	-1,249.84	459.99	-1,249.44	9.63
7,595.00	59.75	358.71	7,242.20	-1,212.26	459.03	-1,211.86	13.51
7,640.00	65.16	0.64	7,263.01	-1,172.38	458.82	-1,171.98	12.61
7,685.00	68.19	0.34	7,280.82	-1,131.06	459.17	-1,130.66	6.76
7,730.00	71.56	0.07	7,296.30	-1,088.81	459.32	-1,088.41	7.51
7,775.00	77.01	359.23	7,308.49	-1,045.51	459.05	-1,045.11	12.24
7,853.00	87.69	0.02	7,318.86	-968.32	458.56	-967.92	13.73
7,889.10	89.55	0.26	7,319.73	-932.23	458.64	-931.83	5.20

7" Casing Set @ 7889.1' MD :: 7319.73' TVD

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7,905.00	90.37	0.36	7,319.74	-916.33	458.73	-915.93	5.20
7,995.00	90.68	359.47	7,318.91	-826.34	458.60	-825.94	1.05
8,085.00	90.09	358.67	7,318.31	-736.35	457.13	-735.96	1.10
8,175.00	90.22	358.03	7,318.06	-646.39	454.54	-646.00	0.73
8,265.00	90.40	359.37	7,317.58	-556.42	452.50	-556.02	1.50
8,355.00	90.80	358.44	7,316.63	-466.44	450.78	-466.05	1.12
8,445.00	90.49	0.27	7,315.62	-376.46	449.77	-376.06	2.06
8,535.00	90.43	359.36	7,314.90	-286.46	449.48	-286.07	1.01
8,625.00	90.22	358.63	7,314.39	-196.48	447.90	-196.09	0.84
8,715.00	90.06	359.87	7,314.17	-106.49	446.72	-106.10	1.39
8,805.00	90.34	358.99	7,313.85	-16.49	445.83	-16.10	1.03
8,895.00	90.99	0.31	7,312.81	73.50	445.28	73.89	1.63
9,075.00	92.10	359.00	7,307.96	253.42	444.19	253.81	0.95
9,164.00	91.63	0.43	7,305.06	342.37	443.75	342.76	1.69
9,254.00	89.29	0.24	7,304.34	432.36	444.28	432.75	2.61
9,345.00	90.74	0.48	7,304.31	523.36	444.85	523.74	1.62
9,435.00	90.71	0.88	7,303.17	613.34	445.92	613.73	0.45
9,525.00	90.06	0.24	7,302.57	703.33	446.80	703.72	1.01
9,615.00	88.86	0.16	7,303.42	793.33	447.11	793.72	1.34
9,705.00	89.14	359.44	7,304.99	883.31	446.80	883.70	0.86
9,795.00	90.15	359.66	7,305.55	973.31	446.09	973.70	1.15
9,885.00	90.65	358.95	7,304.92	1,063.30	445.00	1,063.69	0.96
9,975.00	90.52	358.55	7,304.00	1,153.27	443.03	1,153.66	0.47
10,065.00	89.85	359.48	7,303.71	1,243.26	441.49	1,243.64	1.27
10,155.00	89.26	1.45	7,304.41	1,333.25	442.22	1,333.63	2.28
10,245.00	89.88	0.82	7,305.08	1,423.22	444.00	1,423.61	0.98
10,335.00	90.43	0.30	7,304.84	1,513.22	444.88	1,513.61	0.84
10,424.00	88.77	0.03	7,305.46	1,602.21	445.14	1,602.60	1.89
10,603.00	89.94	358.78	7,307.48	1,781.19	443.28	1,781.57	0.96
10,693.00	89.69	358.01	7,307.77	1,871.15	440.76	1,871.53	0.90
10,783.00	90.12	0.21	7,307.92	1,961.13	439.36	1,961.52	2.49
10,873.00	87.47	359.46	7,309.81	2,051.10	439.10	2,051.49	3.06
10,964.00	89.17	359.72	7,312.48	2,142.06	438.45	2,142.44	1.89
11,054.00	89.57	359.45	7,313.47	2,232.05	437.80	2,232.43	0.54
11,143.00	89.51	358.98	7,314.18	2,321.04	436.58	2,321.42	0.53
11,233.00	89.94	0.64	7,314.61	2,411.03	436.28	2,411.41	1.91
11,323.00	90.28	0.43	7,314.44	2,501.03	437.12	2,501.41	0.44
11,413.00	90.03	359.92	7,314.20	2,591.03	437.40	2,591.41	0.63
11,503.00	91.14	2.17	7,313.28	2,681.00	439.04	2,681.38	2.79
11,593.00	91.14	1.41	7,311.49	2,770.94	441.85	2,771.32	0.84
11,683.00	89.63	1.33	7,310.88	2,860.91	444.00	2,861.30	1.68
11,773.00	89.45	1.15	7,311.60	2,950.89	445.95	2,951.27	0.28
11,863.00	88.74	0.75	7,313.03	3,040.86	447.44	3,041.25	0.91
11,953.00	88.24	0.55	7,315.40	3,130.82	448.46	3,131.21	0.60
12,043.00	89.41	359.94	7,317.24	3,220.80	448.84	3,221.19	1.47
12,133.00	88.64	359.80	7,318.77	3,310.79	448.64	3,311.18	0.87
12,223.00	90.52	359.23	7,319.43	3,400.78	447.88	3,401.17	2.18
12,313.00	90.71	358.57	7,318.47	3,490.76	446.15	3,491.14	0.76
12,403.00	90.80	358.79	7,317.28	3,580.72	444.08	3,581.11	0.26
12,493.00	90.34	358.71	7,316.39	3,670.70	442.11	3,671.08	0.52
12,583.00	90.80	0.57	7,315.49	3,760.69	441.55	3,761.07	2.13

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,673.00	90.65	0.32	7,314.35	3,850.68	442.25	3,851.06	0.32
12,764.00	90.68	359.65	7,313.30	3,941.67	442.22	3,942.06	0.74
12,854.00	91.14	359.09	7,311.87	4,031.65	441.23	4,032.04	0.81
12,943.00	90.74	0.66	7,310.41	4,120.64	441.04	4,121.02	1.82
13,033.00	91.73	0.16	7,308.47	4,210.61	441.68	4,211.00	1.23
13,123.00	88.46	0.74	7,308.32	4,300.60	442.39	4,300.98	3.69
13,213.00	88.64	0.51	7,310.60	4,390.56	443.37	4,390.95	0.32
13,303.00	88.15	0.09	7,313.12	4,480.53	443.84	4,480.91	0.72
13,416.00	87.38	359.56	7,317.52	4,593.44	443.50	4,593.82	0.83
Final MWD Survey @ 13416.00ft							
13,458.00	87.38	359.56	7,319.44	4,635.39	443.18	4,635.78	0.00
Str. Line Proj to Bit @ 13458' MD :: 7319.44' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
913.00	912.95	-1.57	-8.79	Tie-On to Gyro Surveys @ 913.00ft
1,032.00	1,031.95	-1.89	-9.33	First MWD Survey @ 1032.00ft
13,416.00	7,317.52	4,593.44	443.50	Final MWD Survey @ 13416.00ft
13,458.00	7,319.44	4,635.39	443.18	Str. Line Proj to Bit @ 13458' MD :: 7319.44' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/_S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.05	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	913.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,032.35	7,905.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,995.00	13,416.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
981.80	981.75	9 5/8" Casing Set @ 981.8' MD :: 981.75' TVD	9-5/8	13-1/2
7,889.10	7,319.73	7" Casing Set @ 7889.1' MD :: 7319.73' TVD	7	8-3/4

Design Report for Johnson 28N-24HZ - Actual Field Surveys**Wellbore Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Johnson 28N-24HZ_S - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,318,598.66	3,217,035.38	40.205340	-104.722949
Point 1				0.00	4,576.87	-3,297.06	1,323,146.27	3,213,698.48	
Point 2				0.00	4,625.44	-644.48	1,323,218.08	3,216,350.42	
Point 3				0.00	4,669.32	2,023.81	1,323,285.34	3,219,018.11	
Point 4				0.00	2,029.94	2,016.52	1,320,646.11	3,219,033.94	
Point 5				0.00	-605.18	2,019.03	1,318,011.22	3,219,059.54	
Point 6				0.00	-666.51	-635.78	1,317,926.64	3,216,405.49	
Point 7				0.00	-684.56	-3,346.52	1,317,884.84	3,213,695.13	
Point 8				0.00	1,929.26	-3,332.78	1,320,498.56	3,213,685.96	
JOHNSON 28N-24HZ_ - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,318,598.66	3,217,035.38	40.205340	-104.722949
Johnson 28N-24HZ_LI - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,318,598.66	3,217,035.38	40.205340	-104.722949
Point 1				0.00	5,498.35	222.00	1,324,098.51	3,217,209.18	
Point 2				0.00	5,516.25	1,142.02	1,324,124.47	3,218,128.97	
Point 3				0.00	-1,481.66	1,144.38	1,317,127.15	3,218,192.65	
Point 4				0.00	-1,497.74	224.31	1,317,103.01	3,217,272.79	
HPD PLATTEVILLE 2_ - actual wellpath misses target center by 4634.98usft at 13.00usft MD (13.00 TVD, 0.00 N, 0.00 E) - Circle (radius 150.00)	0.00	0.00	23.00	4,404.43	1,443.56	1,323,015.39	3,218,440.22	40.217430	-104.717780
HPD PLATTEVILLE 1_ - actual wellpath misses target center by 4274.54usft at 16.14usft MD (16.14 TVD, 0.00 N, 0.00 E) - Circle (radius 150.00)	0.00	0.00	23.00	4,185.83	866.31	1,322,791.74	3,217,864.94	40.216830	-104.719847
JOHNSON 28N-24HZ_ - actual wellpath misses target center by 193.59usft at 13109.36usft MD (7308.01 TVD, 4286.96 N, 442.22 E) - Point	0.00	0.00	7,325.00	4,285.47	635.06	1,322,889.35	3,217,632.83	40.217104	-104.720675
JOHNSON 28N-24HZ_ - actual wellpath misses target center by 16.85usft at 13458.00usft MD (7319.44 TVD, 4635.39 N, 443.18 E) - Point	0.00	0.00	7,325.00	4,637.00	459.00	1,323,239.30	3,217,453.71	40.218068	-104.721305

Directional Difficulty Index

Average Dogleg over Survey:	1.84 °/100usft	Maximum Dogleg over Survey:	13.73 °/100usft at 7,853.00 usft
Net Tortosity applicable to Plans:	0.85 °/100usft	Directional Difficulty Index:	6.546

Audit Info

North Reference Sheet for Sec. 24-T3N-R66W - Johnson 28N-24HZ - 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 = 13' @ 5050.00usft (Ensign 145). Northing and Easting are relative to Johnson 28N-24HZ

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: 0.99995716

Grid Coordinates of Well: 1,318,598.66 usft N, 3,217,035.38 usft E

Geographical Coordinates of Well: 40° 12' 19.22" N, 104° 43' 22.62" W

Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,458.00usft the Bottom Hole Displacement is 4,656.53usft in the Direction of 5.46° (True).

Magnetic Convergence at surface is: -7.97° (30 September 2014, , BGGM2014)

Magnetic Model: BGGM2014
 Date: 30-Sep-14
 Declination: 8.47°
 Inclination/Dip: 66.78°
 Field Strength: 52579

Grid North is 0.50° East of True North (Grid Convergence)
 Magnetic North is 8.47° East of True North (Magnetic Declination)
 Magnetic North is 7.97° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.50°
 To convert a Magnetic Direction to a True Direction, Add 8.47° East
 To convert a Magnetic Direction to a Grid Direction, Add 7.97°

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 24-T3N-R66W

Johnson 28N-24HZ

Plan B

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

09 October, 2014

Well Coordinates: 1,318,598.66 N, 3,217,035.38 E (40° 12' 19.22" N, 104° 43' 22.62" W)

Ground Level: 5,037.00 usft

Local Coordinate Origin:

Centered on Well Johnson 28N-24HZ

Viewing Datum:

RKB = 13' @ 5050.00usft (Ensign 145)

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 Johnson 28N-24HZ - Actual Field Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	+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	40.205340	-104.722949	1,318,598.66	3,217,035.38
13.00	0.00	0.00	13.00	0.00	0.00	40.205340	-104.722949	1,318,598.66	3,217,035.38
113.00	0.75	267.51	113.00	-0.03	-0.65	40.205340	-104.722952	1,318,598.63	3,217,034.72
213.00	0.66	283.99	212.99	0.08	-1.87	40.205340	-104.722956	1,318,598.73	3,217,033.51
313.00	0.69	275.09	312.98	0.28	-3.03	40.205341	-104.722960	1,318,598.91	3,217,032.35
413.00	0.72	259.26	412.98	0.21	-4.24	40.205341	-104.722964	1,318,598.83	3,217,031.13
513.00	0.64	256.42	512.97	-0.04	-5.40	40.205340	-104.722969	1,318,598.58	3,217,029.97
613.00	0.81	256.07	612.96	-0.34	-6.63	40.205339	-104.722973	1,318,598.26	3,217,028.75
713.00	0.58	245.84	712.95	-0.72	-7.78	40.205338	-104.722977	1,318,597.88	3,217,027.60
813.00	0.37	215.09	812.95	-1.19	-8.43	40.205337	-104.722979	1,318,597.40	3,217,026.96
913.00	0.25	236.56	912.95	-1.57	-8.79	40.205336	-104.722981	1,318,597.01	3,217,026.60
981.80	0.31	239.50	981.75	-1.75	-9.08	40.205335	-104.722982	1,318,596.83	3,217,026.31
1,032.00	0.35	241.03	1,031.95	-1.89	-9.33	40.205335	-104.722983	1,318,596.69	3,217,026.06
1,126.00	0.43	243.08	1,125.94	-2.19	-9.89	40.205334	-104.722985	1,318,596.38	3,217,025.50
1,219.00	1.99	205.76	1,218.92	-3.80	-10.91	40.205330	-104.722988	1,318,594.76	3,217,024.50
1,281.00	2.78	203.24	1,280.87	-6.15	-11.97	40.205323	-104.722992	1,318,592.40	3,217,023.46
1,375.00	4.44	174.70	1,374.68	-11.87	-12.53	40.205307	-104.722994	1,318,586.68	3,217,022.95
1,468.00	6.38	166.04	1,467.27	-20.47	-10.95	40.205284	-104.722988	1,318,578.09	3,217,024.60
1,562.00	6.33	161.88	1,560.69	-30.46	-8.08	40.205256	-104.722978	1,318,568.13	3,217,027.56
1,656.00	7.63	162.09	1,653.99	-41.33	-4.55	40.205227	-104.722966	1,318,557.30	3,217,031.19
1,749.00	8.64	156.49	1,746.06	-53.61	0.13	40.205193	-104.722949	1,318,545.06	3,217,035.98
1,843.00	9.71	159.17	1,838.85	-67.49	5.77	40.205155	-104.722929	1,318,531.22	3,217,041.74
1,936.00	10.93	162.84	1,930.35	-83.25	11.16	40.205112	-104.722909	1,318,515.52	3,217,047.27
2,030.00	12.94	165.65	2,022.31	-101.96	16.40	40.205060	-104.722891	1,318,496.85	3,217,052.67
2,123.00	15.45	161.85	2,112.47	-123.82	22.84	40.205000	-104.722867	1,318,475.05	3,217,059.30
2,217.00	17.59	164.37	2,202.58	-149.40	30.57	40.204930	-104.722840	1,318,449.54	3,217,067.25
2,311.00	19.50	160.65	2,291.70	-177.89	39.59	40.204852	-104.722808	1,318,421.13	3,217,076.53
2,404.00	19.90	161.01	2,379.26	-207.50	49.89	40.204770	-104.722771	1,318,391.61	3,217,087.08
2,498.00	20.37	162.41	2,467.51	-238.22	60.04	40.204686	-104.722734	1,318,360.98	3,217,097.50
2,591.00	19.40	161.58	2,554.97	-268.31	69.81	40.204604	-104.722699	1,318,330.99	3,217,107.53
2,685.00	20.45	161.40	2,643.34	-298.68	79.98	40.204520	-104.722663	1,318,300.70	3,217,117.97
2,778.00	19.99	160.86	2,730.61	-329.10	90.37	40.204437	-104.722626	1,318,270.38	3,217,128.63
2,872.00	19.91	162.79	2,818.97	-359.57	100.38	40.204353	-104.722590	1,318,240.00	3,217,138.90
2,962.00	22.13	165.65	2,902.97	-390.63	109.12	40.204268	-104.722559	1,318,209.01	3,217,147.91
3,052.00	22.31	165.22	2,986.29	-423.57	117.67	40.204177	-104.722528	1,318,176.15	3,217,156.75
3,141.00	22.23	165.71	3,068.65	-456.22	126.14	40.204088	-104.722498	1,318,143.58	3,217,165.50
3,231.00	22.62	166.35	3,151.85	-489.54	134.43	40.203996	-104.722468	1,318,110.34	3,217,174.08
3,411.00	18.76	162.07	3,320.22	-550.74	151.51	40.203828	-104.722407	1,318,049.29	3,217,191.70
3,501.00	19.17	161.34	3,405.33	-578.51	160.70	40.203752	-104.722374	1,318,021.60	3,217,201.13
3,591.00	18.96	159.51	3,490.39	-606.21	170.54	40.203676	-104.722339	1,317,994.00	3,217,211.22
3,681.00	18.31	158.15	3,575.68	-633.03	180.92	40.203602	-104.722302	1,317,967.27	3,217,221.83
3,771.00	19.35	160.24	3,660.86	-660.18	191.23	40.203528	-104.722265	1,317,940.21	3,217,232.37

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
3,861.00	19.55	161.44	3,745.72	-688.49	201.06	40.203450	-104.722229	1,317,911.99	3,217,242.45
3,951.00	17.90	157.10	3,830.96	-715.51	211.24	40.203376	-104.722193	1,317,885.06	3,217,252.86
4,041.00	18.65	157.18	3,916.42	-741.51	222.20	40.203305	-104.722154	1,317,859.15	3,217,264.05
4,131.00	17.59	164.33	4,001.97	-767.87	231.45	40.203232	-104.722121	1,317,832.88	3,217,273.54
4,221.00	18.46	165.50	4,087.55	-794.76	238.70	40.203158	-104.722095	1,317,806.05	3,217,281.02
4,311.00	20.93	165.98	4,172.28	-824.16	246.16	40.203078	-104.722068	1,317,776.72	3,217,288.74
4,401.00	21.08	166.30	4,256.30	-855.48	253.89	40.202992	-104.722040	1,317,745.47	3,217,296.74
4,491.00	20.16	166.97	4,340.53	-886.32	261.22	40.202907	-104.722014	1,317,714.70	3,217,304.34
4,581.00	19.51	162.98	4,425.19	-915.80	269.11	40.202826	-104.721986	1,317,685.29	3,217,312.49
4,671.00	19.26	162.65	4,510.09	-944.34	277.94	40.202748	-104.721954	1,317,656.84	3,217,321.57
4,761.00	18.22	161.51	4,595.32	-971.85	286.83	40.202672	-104.721922	1,317,629.40	3,217,330.70
4,851.00	19.19	165.21	4,680.57	-999.50	295.07	40.202596	-104.721893	1,317,601.83	3,217,339.18
4,942.00	20.62	162.16	4,766.13	-1,029.21	303.79	40.202515	-104.721862	1,317,572.19	3,217,348.16
5,031.00	20.71	161.67	4,849.41	-1,059.07	313.54	40.202433	-104.721827	1,317,542.42	3,217,358.17
5,121.00	19.63	163.58	4,933.89	-1,088.68	322.82	40.202352	-104.721794	1,317,512.90	3,217,367.71
5,211.00	19.80	162.80	5,018.61	-1,117.74	331.60	40.202272	-104.721762	1,317,483.92	3,217,376.75
5,301.00	19.62	161.88	5,103.34	-1,146.66	340.81	40.202192	-104.721729	1,317,455.08	3,217,386.21
5,390.00	21.32	162.02	5,186.72	-1,176.25	350.45	40.202111	-104.721695	1,317,425.57	3,217,396.11
5,480.00	20.86	161.83	5,270.69	-1,207.04	360.50	40.202027	-104.721659	1,317,394.88	3,217,406.42
5,570.00	19.25	162.09	5,355.23	-1,236.38	370.06	40.201946	-104.721624	1,317,365.62	3,217,416.24
5,660.00	20.36	161.30	5,439.90	-1,265.33	379.64	40.201867	-104.721590	1,317,336.76	3,217,426.07
5,750.00	19.60	161.06	5,524.48	-1,294.44	389.56	40.201787	-104.721555	1,317,307.74	3,217,436.25
5,840.00	18.86	161.84	5,609.46	-1,322.54	398.99	40.201710	-104.721521	1,317,279.92	3,217,445.93
5,930.00	16.52	160.11	5,695.20	-1,348.40	407.88	40.201639	-104.721489	1,317,253.94	3,217,455.04
6,020.00	18.59	159.74	5,781.01	-1,373.89	417.20	40.201569	-104.721456	1,317,228.53	3,217,464.58
6,110.00	16.62	158.81	5,866.79	-1,399.35	426.83	40.201499	-104.721421	1,317,203.16	3,217,474.43
6,200.00	14.19	156.02	5,953.55	-1,421.44	435.96	40.201438	-104.721389	1,317,181.16	3,217,483.76
6,290.00	11.99	153.26	6,041.20	-1,439.87	444.65	40.201388	-104.721357	1,317,162.80	3,217,492.61
6,380.00	9.98	151.92	6,129.55	-1,455.10	452.53	40.201346	-104.721329	1,317,147.64	3,217,500.62
6,470.00	8.37	148.48	6,218.40	-1,467.56	459.63	40.201312	-104.721304	1,317,135.24	3,217,507.82
6,560.00	6.79	154.69	6,307.61	-1,477.96	465.33	40.201283	-104.721283	1,317,124.90	3,217,513.62
6,650.00	5.81	165.21	6,397.07	-1,487.17	468.76	40.201258	-104.721271	1,317,115.71	3,217,517.13
6,740.00	4.53	174.39	6,486.70	-1,495.12	470.27	40.201236	-104.721266	1,317,107.79	3,217,518.71
6,830.00	1.66	176.28	6,576.56	-1,499.95	470.71	40.201223	-104.721264	1,317,102.95	3,217,519.19
6,920.00	0.17	276.51	6,666.55	-1,501.24	470.66	40.201219	-104.721264	1,317,101.66	3,217,519.15
7,010.00	4.37	1.17	6,756.46	-1,497.80	470.60	40.201229	-104.721265	1,317,105.11	3,217,519.06
7,055.00	8.74	0.73	6,801.16	-1,492.66	470.67	40.201243	-104.721264	1,317,110.24	3,217,519.09
7,100.00	12.41	357.83	6,845.38	-1,484.41	470.53	40.201265	-104.721265	1,317,118.50	3,217,518.88
7,145.00	16.52	356.99	6,888.95	-1,473.18	470.02	40.201296	-104.721267	1,317,129.72	3,217,518.26
7,190.00	19.89	357.32	6,931.69	-1,459.14	469.32	40.201335	-104.721269	1,317,143.75	3,217,517.44
7,235.00	22.85	359.09	6,973.59	-1,442.76	468.82	40.201380	-104.721271	1,317,160.13	3,217,516.80
7,280.00	26.96	359.04	7,014.40	-1,423.81	468.51	40.201432	-104.721272	1,317,179.07	3,217,516.33

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
7,325.00	32.00	357.74	7,053.56	-1,401.68	467.87	40.201492	-104.721274	1,317,201.19	3,217,515.49
7,370.00	36.18	356.66	7,090.82	-1,376.50	466.63	40.201562	-104.721279	1,317,226.36	3,217,514.03
7,415.00	40.34	357.19	7,126.15	-1,348.68	465.14	40.201638	-104.721284	1,317,254.17	3,217,512.30
7,460.00	45.33	356.44	7,159.13	-1,318.14	463.43	40.201722	-104.721290	1,317,284.68	3,217,510.32
7,505.00	49.52	356.79	7,189.57	-1,285.07	461.48	40.201813	-104.721297	1,317,317.74	3,217,508.08
7,550.00	53.68	358.34	7,217.52	-1,249.84	459.99	40.201909	-104.721303	1,317,352.95	3,217,506.28
7,595.00	59.75	358.71	7,242.20	-1,212.26	459.03	40.202012	-104.721306	1,317,390.52	3,217,504.99
7,640.00	65.16	0.64	7,263.01	-1,172.38	458.82	40.202122	-104.721307	1,317,430.40	3,217,504.43
7,685.00	68.19	0.34	7,280.82	-1,131.06	459.17	40.202235	-104.721305	1,317,471.71	3,217,504.42
7,730.00	71.56	0.07	7,296.30	-1,088.81	459.32	40.202351	-104.721305	1,317,513.96	3,217,504.20
7,775.00	77.01	359.23	7,308.49	-1,045.51	459.05	40.202470	-104.721306	1,317,557.25	3,217,503.55
7,853.00	87.69	0.02	7,318.86	-968.32	458.56	40.202682	-104.721308	1,317,634.43	3,217,502.38
7,889.10	89.55	0.26	7,319.73	-932.23	458.64	40.202781	-104.721307	1,317,670.52	3,217,502.15
7,905.00	90.37	0.36	7,319.74	-916.33	458.73	40.202825	-104.721307	1,317,686.42	3,217,502.10
7,995.00	90.68	359.47	7,318.91	-826.34	458.60	40.203072	-104.721308	1,317,776.41	3,217,501.17
8,085.00	90.09	358.67	7,318.31	-736.35	457.13	40.203319	-104.721313	1,317,866.37	3,217,498.93
8,175.00	90.22	358.03	7,318.06	-646.39	454.54	40.203566	-104.721322	1,317,956.30	3,217,495.55
8,265.00	90.40	359.37	7,317.58	-556.42	452.50	40.203813	-104.721329	1,318,046.25	3,217,492.72
8,355.00	90.80	358.44	7,316.63	-466.44	450.78	40.204060	-104.721335	1,318,136.21	3,217,490.21
8,445.00	90.49	0.27	7,315.62	-376.46	449.77	40.204307	-104.721339	1,318,226.17	3,217,488.41
8,535.00	90.43	359.36	7,314.90	-286.46	449.48	40.204554	-104.721340	1,318,316.16	3,217,487.33
8,625.00	90.22	358.63	7,314.39	-196.48	447.90	40.204801	-104.721346	1,318,406.12	3,217,484.96
8,715.00	90.06	359.87	7,314.17	-106.49	446.72	40.205048	-104.721350	1,318,496.10	3,217,482.99
8,805.00	90.34	358.99	7,313.85	-16.49	445.83	40.205295	-104.721353	1,318,586.07	3,217,481.31
8,895.00	90.99	0.31	7,312.81	73.50	445.28	40.205542	-104.721355	1,318,676.05	3,217,479.97
9,075.00	92.10	359.00	7,307.96	253.42	444.19	40.206036	-104.721359	1,318,855.95	3,217,477.31
9,164.00	91.63	0.43	7,305.06	342.37	443.75	40.206280	-104.721361	1,318,944.89	3,217,476.09
9,254.00	89.29	0.24	7,304.34	432.36	444.28	40.206527	-104.721359	1,319,034.88	3,217,475.83
9,345.00	90.74	0.48	7,304.31	523.36	444.85	40.206777	-104.721357	1,319,125.87	3,217,475.60
9,435.00	90.71	0.88	7,303.17	613.34	445.92	40.207024	-104.721353	1,319,215.86	3,217,475.88
9,525.00	90.06	0.24	7,302.57	703.33	446.80	40.207271	-104.721350	1,319,305.85	3,217,475.97
9,615.00	88.86	0.16	7,303.42	793.33	447.11	40.207518	-104.721349	1,319,395.84	3,217,475.50
9,705.00	89.14	359.44	7,304.99	883.31	446.80	40.207765	-104.721350	1,319,485.82	3,217,474.40
9,795.00	90.15	359.66	7,305.55	973.31	446.09	40.208012	-104.721352	1,319,575.80	3,217,472.90
9,885.00	90.65	358.95	7,304.92	1,063.30	445.00	40.208259	-104.721356	1,319,665.77	3,217,471.02
9,975.00	90.52	358.55	7,304.00	1,153.27	443.03	40.208506	-104.721363	1,319,755.72	3,217,468.27
10,065.00	89.85	359.48	7,303.71	1,243.26	441.49	40.208753	-104.721369	1,319,845.68	3,217,465.93
10,155.00	89.26	1.45	7,304.41	1,333.25	442.22	40.209000	-104.721366	1,319,935.67	3,217,465.88
10,245.00	89.88	0.82	7,305.08	1,423.22	444.00	40.209247	-104.721360	1,320,025.66	3,217,466.87
10,335.00	90.43	0.30	7,304.84	1,513.22	444.88	40.209494	-104.721356	1,320,115.65	3,217,466.96
10,424.00	88.77	0.03	7,305.46	1,602.21	445.14	40.209738	-104.721356	1,320,204.64	3,217,466.44
10,603.00	89.94	358.78	7,307.48	1,781.19	443.28	40.210229	-104.721362	1,320,383.59	3,217,463.01

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
10,693.00	89.69	358.01	7,307.77	1,871.15	440.76	40.210476	-104.721371	1,320,473.52	3,217,459.70
10,783.00	90.12	0.21	7,307.92	1,961.13	439.36	40.210723	-104.721376	1,320,563.48	3,217,457.52
10,873.00	87.47	359.46	7,309.81	2,051.10	439.10	40.210970	-104.721377	1,320,653.44	3,217,456.47
10,964.00	89.17	359.72	7,312.48	2,142.06	438.45	40.211220	-104.721379	1,320,744.39	3,217,455.02
11,054.00	89.57	359.45	7,313.47	2,232.05	437.80	40.211467	-104.721382	1,320,834.37	3,217,453.58
11,143.00	89.51	358.98	7,314.18	2,321.04	436.58	40.211711	-104.721386	1,320,923.34	3,217,451.58
11,233.00	89.94	0.64	7,314.61	2,411.03	436.28	40.211958	-104.721387	1,321,013.32	3,217,450.49
11,323.00	90.28	0.43	7,314.44	2,501.03	437.12	40.212205	-104.721384	1,321,103.32	3,217,450.55
11,413.00	90.03	359.92	7,314.20	2,591.03	437.40	40.212452	-104.721383	1,321,193.31	3,217,450.03
11,503.00	91.14	2.17	7,313.28	2,681.00	439.04	40.212699	-104.721377	1,321,283.29	3,217,450.88
11,593.00	91.14	1.41	7,311.49	2,770.94	441.85	40.212946	-104.721367	1,321,373.25	3,217,452.91
11,683.00	89.63	1.33	7,310.88	2,860.91	444.00	40.213193	-104.721360	1,321,463.23	3,217,454.27
11,773.00	89.45	1.15	7,311.60	2,950.89	445.95	40.213440	-104.721353	1,321,553.21	3,217,455.43
11,863.00	88.74	0.75	7,313.03	3,040.86	447.44	40.213687	-104.721347	1,321,643.19	3,217,456.13
11,953.00	88.24	0.55	7,315.40	3,130.82	448.46	40.213934	-104.721344	1,321,733.16	3,217,456.36
12,043.00	89.41	359.94	7,317.24	3,220.80	448.84	40.214181	-104.721342	1,321,823.13	3,217,455.96
12,133.00	88.64	359.80	7,318.77	3,310.79	448.64	40.214428	-104.721343	1,321,913.11	3,217,454.97
12,223.00	90.52	359.23	7,319.43	3,400.78	447.88	40.214675	-104.721346	1,322,003.09	3,217,453.42
12,313.00	90.71	358.57	7,318.47	3,490.76	446.15	40.214922	-104.721352	1,322,093.04	3,217,450.90
12,403.00	90.80	358.79	7,317.28	3,580.72	444.08	40.215169	-104.721359	1,322,182.98	3,217,448.04
12,493.00	90.34	358.71	7,316.39	3,670.70	442.11	40.215416	-104.721366	1,322,272.93	3,217,445.29
12,583.00	90.80	0.57	7,315.49	3,760.69	441.55	40.215663	-104.721368	1,322,362.91	3,217,443.94
12,673.00	90.65	0.32	7,314.35	3,850.68	442.25	40.215910	-104.721366	1,322,452.90	3,217,443.85
12,764.00	90.68	359.65	7,313.30	3,941.67	442.22	40.216160	-104.721366	1,322,543.89	3,217,443.02
12,854.00	91.14	359.09	7,311.87	4,031.65	441.23	40.216407	-104.721369	1,322,633.85	3,217,441.25
12,943.00	90.74	0.66	7,310.41	4,120.64	441.04	40.216651	-104.721370	1,322,722.83	3,217,440.27
13,033.00	91.73	0.16	7,308.47	4,210.61	441.68	40.216898	-104.721368	1,322,812.80	3,217,440.13
13,123.00	88.46	0.74	7,308.32	4,300.60	442.39	40.217145	-104.721365	1,322,902.78	3,217,440.05
13,213.00	88.64	0.51	7,310.60	4,390.56	443.37	40.217392	-104.721362	1,322,992.75	3,217,440.24
13,303.00	88.15	0.09	7,313.12	4,480.53	443.84	40.217639	-104.721360	1,323,082.71	3,217,439.92
13,416.00	87.38	359.56	7,317.52	4,593.44	443.50	40.217949	-104.721361	1,323,195.61	3,217,438.59
13,458.00	87.38	359.56	7,319.44	4,635.39	443.18	40.218064	-104.721362	1,323,237.56	3,217,437.90

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
913.00	912.95	-1.57	-8.79	Tie-On to Gyro Surveys @ 913.00ft
1,032.00	1,031.95	-1.89	-9.33	First MWD Survey @ 1032.00ft
13,416.00	7,317.52	4,593.44	443.50	Final MWD Survey @ 13416.00ft
13,458.00	7,319.44	4,635.39	443.18	Str. Line Proj to Bit @ 13458' MD :: 7319.44' TVD

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.05	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	913.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,032.35	7,905.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,995.00	13,416.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
981.80	981.75	9 5/8" Casing Set @ 981.8' MD :: 981.75' TVD	9-5/8	13-1/2
7,889.10	7,319.73	7" Casing Set @ 7889.1' MD :: 7319.73' TVD	7	8-3/4

Design Targets

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

Directional Difficulty Index

Average Dogleg over Survey:	1.84 °/100usft	Maximum Dogleg over Survey:	13.73 °/100usft at 7,853.00 usft
Net Tortousity applicable to Plans:	0.85 °/100usft	Directional Difficulty Index:	6.546

Design Report for Johnson 28N-24HZ - Actual Field Surveys

Audit Info

North Reference Sheet for Sec. 24-T3N-R66W - Johnson 28N-24HZ - 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 = 13' @ 5050.00usft (Ensign 145). Northing and Easting are relative to Johnson 28N-24HZ

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: 0.99995716

Grid Coordinates of Well: 1,318,598.66 usft N, 3,217,035.38 usft E

Geographical Coordinates of Well: 40° 12' 19.22" N, 104° 43' 22.62" W

Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,458.00usft

the Bottom Hole Displacement is 4,656.53usft in the Direction of 5.46° (True).

Magnetic Convergence at surface is: -7.97° (30 September 2014, , BGGM2014)

