

Project: Weld County, CO (NAD 83)  
Site: Sec. 8-T4N-R66W (Five Rivers K09-25-A)  
Well: Five Rivers K07-65-1BHN  
Wellbore: Plan A  
Design: Actual Surveys

# Noble Energy



Platted SHL: 2234' FSL, 55' FEL  
Platted Lat/Long: 40.32505 N, 104.79277 W  
Location: Sec. 8-T4N-R66W

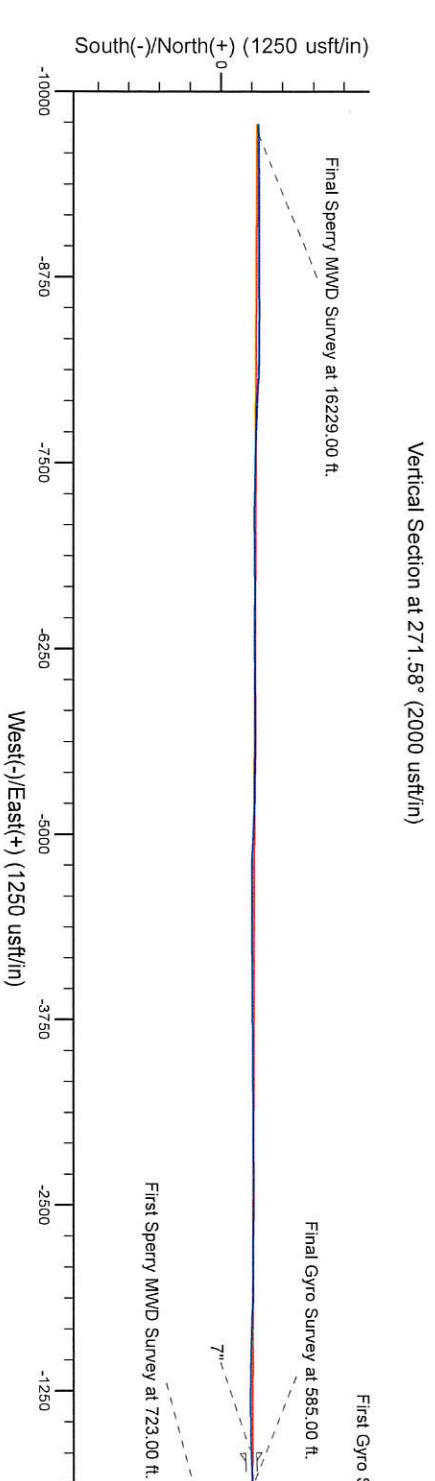
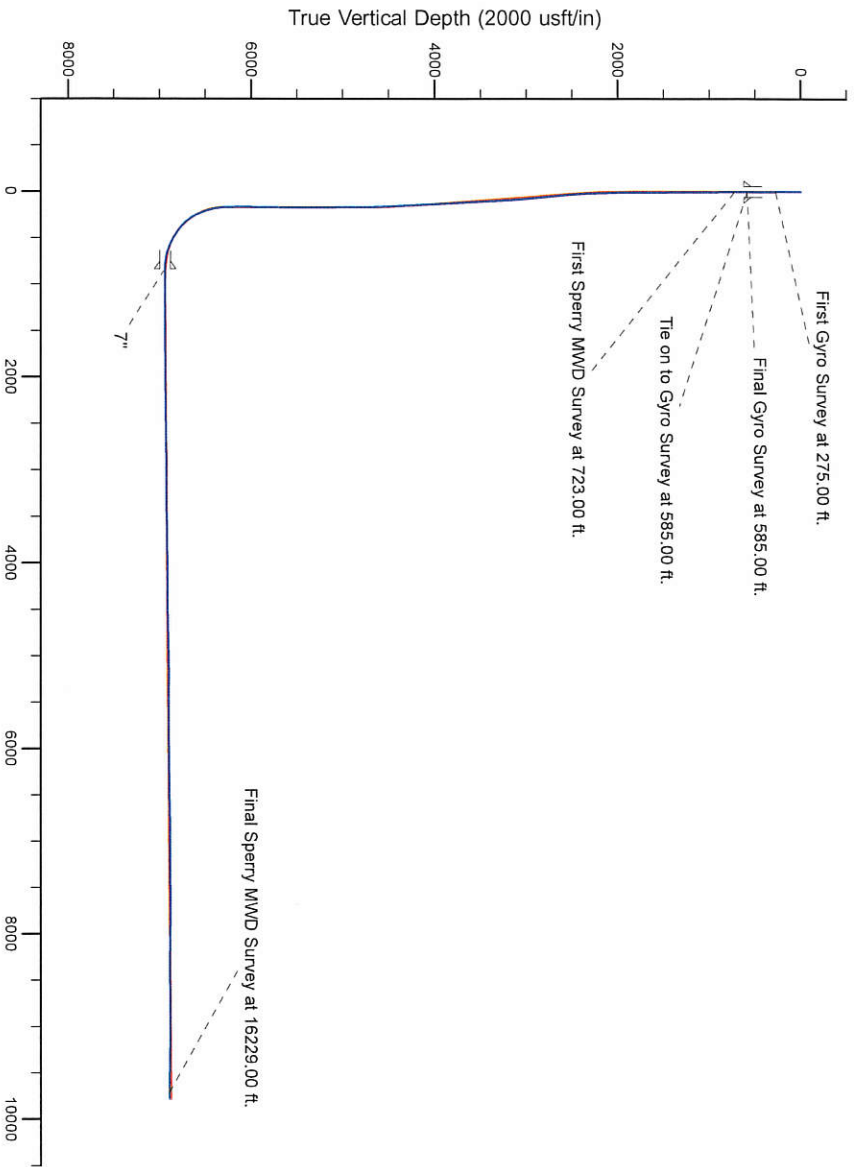
~7" Casing: 2245' FSL, 866' FEL  
Location: Sec. 7-T4N-R66W

Platted BHL: 2475' FSL, 535' FWL  
Location: Sec. 7-T4N-R66W

LEGEND

Five Rivers K07-65-1BHN, Plan A, Rev A1 - PROPOSAL V0

Actual Surveys



WELL DETAILS: Five Rivers K07-65-1BHN		
Ground Level:	4700.00	
RKB=24ft @ 4724.00usft (H&P 315)		
Created By:	Tatiana Gomez	
Created On:	08/27/2014	

# Noble Energy

Weld County, CO (NAD 83)

Sec. 8-T4N-R66W (Five Rivers K09-25-A)

Five Rivers K07-65-1BHN

Job# 901434895:: API: 05-123-39477

Plan A

Design: Actual Surveys

## Sperry Drilling Services

### Final Survey Report

03 September, 2014

Surface UWI : Job# 901434895:: API: 05-123-39477

Well Coordinates: 1,362,042.88 N, 3,197,186.55 E (40° 19' 30.18" N, 104° 47' 33.97" W)

Ground Level: 4,700.00 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 Five Rivers K07-65-1BHN

RKB=24ft @ 4724.00usft (H&P 315)

N

Grid

API - US Survey Feet - Custom

**HALLIBURTON**

## Design Report for Five Rivers K07-65-1BHN - 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
UPRR PAN AM #01-61 SHL Uncertainty							
275.00	0.70	290.55	274.99	0.59	-1.57	1.59	0.25
First Gyro Survey at 275.00 ft.							
585.00	0.70	300.15	584.97	2.21	-4.98	5.04	0.04
Final Gyro Survey at 585.00 ft. - Tie on to Gyro Survey at 585.00 ft.							
625.00	0.57	288.79	624.97	2.39	-5.38	5.45	0.45
9 5/8"							
723.00	0.45	240.13	722.96	2.36	-6.18	6.25	0.45
First Sperry MWD Survey at 723.00 ft.							
816.00	0.34	259.57	815.96	2.13	-6.77	6.83	0.18
907.00	0.28	213.92	906.96	1.89	-7.16	7.21	0.27
1,000.00	0.48	228.33	999.96	1.45	-7.58	7.61	0.24
1,093.00	0.25	202.06	1,092.96	1.00	-7.95	7.97	0.30
1,277.00	0.40	262.62	1,276.95	0.54	-8.73	8.74	0.19
1,370.00	1.81	3.49	1,369.94	1.97	-8.97	9.02	2.07
1,463.00	1.82	351.40	1,462.89	4.90	-9.10	9.23	0.41
1,557.00	2.10	347.05	1,556.84	8.05	-9.71	9.92	0.34
1,649.00	2.22	346.60	1,648.77	11.43	-10.50	10.81	0.13
1,742.00	0.73	306.19	1,741.74	13.53	-11.39	11.76	1.86
1,834.00	0.60	313.17	1,833.73	14.20	-12.22	12.60	0.17
1,927.00	0.64	321.77	1,926.73	14.94	-12.89	13.30	0.11
2,022.00	0.59	346.61	2,021.72	15.84	-13.33	13.77	0.28
2,116.00	1.70	334.12	2,115.70	17.56	-14.06	14.53	1.20
2,211.00	3.50	326.88	2,210.60	21.26	-16.26	16.84	1.92
2,306.00	5.34	332.11	2,305.32	27.60	-19.91	20.66	1.98
2,401.00	6.52	326.34	2,399.81	35.99	-24.97	25.95	1.39
2,496.00	7.24	324.71	2,494.12	45.37	-31.41	32.65	0.79
2,591.00	8.08	322.92	2,588.27	55.58	-38.90	40.42	0.92
2,686.00	8.73	323.34	2,682.25	66.69	-47.23	49.05	0.69
2,781.00	8.76	323.13	2,776.15	78.26	-55.87	58.01	0.05
2,875.00	8.11	319.82	2,869.13	89.05	-64.44	66.88	0.86
2,970.00	8.30	319.41	2,963.16	99.38	-73.23	75.95	0.21
3,065.00	7.81	324.75	3,057.22	109.86	-81.42	84.42	0.94
3,160.00	7.06	327.80	3,151.42	120.07	-88.25	91.53	0.89
3,255.00	6.61	329.01	3,245.75	129.70	-94.18	97.72	0.50
3,350.00	5.53	329.15	3,340.21	138.32	-99.34	103.12	1.14
3,445.00	4.80	331.93	3,434.83	145.75	-103.56	107.54	0.81
3,540.00	4.45	321.55	3,529.52	152.15	-107.72	111.88	0.95
3,635.00	4.65	322.72	3,624.22	158.10	-112.35	116.67	0.23
3,730.00	5.42	327.00	3,718.85	164.92	-117.12	121.63	0.90
3,825.00	5.81	326.91	3,813.40	172.71	-122.19	126.91	0.41
3,920.00	6.36	326.00	3,907.86	181.11	-127.76	132.71	0.59
4,015.00	5.82	327.76	4,002.33	189.54	-133.27	138.45	0.60
4,110.00	4.76	325.72	4,096.92	196.87	-138.06	143.44	1.13
4,205.00	4.59	327.92	4,191.60	203.35	-142.30	147.86	0.26
4,300.00	4.58	328.16	4,286.30	209.79	-146.32	152.06	0.02
4,394.00	4.55	324.43	4,380.00	216.02	-150.47	156.37	0.32
4,489.00	4.52	326.71	4,474.70	222.21	-154.71	160.79	0.19
4,584.00	3.82	320.41	4,569.45	227.78	-158.79	165.01	0.88

## Design Report for Five Rivers K07-65-1BHN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,679.00	3.00	338.61	4,664.29	232.53	-161.71	168.07	1.42
4,774.00	2.48	311.25	4,759.18	236.20	-164.16	170.62	1.46
4,869.00	0.28	306.28	4,854.15	237.69	-165.89	172.39	2.32
4,964.00	0.12	206.30	4,949.15	237.74	-166.13	172.63	0.34
5,058.00	0.52	151.39	5,043.15	237.28	-165.96	172.45	0.49
5,153.00	0.55	188.79	5,138.14	236.45	-165.83	172.29	0.36
5,248.00	0.37	172.34	5,233.14	235.70	-165.86	172.30	0.23
5,343.00	0.22	188.38	5,328.14	235.21	-165.84	172.27	0.18
5,438.00	0.48	188.90	5,423.14	234.64	-165.93	172.35	0.27
5,533.00	0.29	160.53	5,518.13	234.02	-165.91	172.31	0.28
5,628.00	0.39	154.44	5,613.13	233.50	-165.69	172.08	0.11
5,722.00	0.82	135.18	5,707.13	232.73	-165.08	171.44	0.50
5,817.00	0.29	105.64	5,802.12	232.19	-164.37	170.72	0.62
5,912.00	0.19	86.95	5,897.12	232.13	-163.98	170.33	0.13
6,007.00	0.48	126.67	5,992.12	231.90	-163.50	169.84	0.37
6,102.00	0.28	137.16	6,087.12	231.49	-163.03	169.36	0.22
6,196.00	0.28	165.41	6,181.12	231.10	-162.81	169.13	0.15
6,252.00	0.58	135.04	6,237.12	230.77	-162.58	168.89	0.66
6,386.00	8.20	268.17	6,370.68	229.98	-171.67	177.95	6.42
6,434.00	12.92	268.11	6,417.85	229.70	-180.46	186.73	9.83
6,481.00	16.63	270.37	6,463.29	229.57	-192.44	198.70	7.99
6,529.00	19.88	271.33	6,508.87	229.80	-207.47	213.74	6.80
6,576.00	21.06	272.55	6,552.90	230.36	-223.90	230.17	2.67
6,624.00	25.41	270.55	6,597.00	230.84	-242.82	249.10	9.21
6,671.00	29.53	269.36	6,638.69	230.81	-264.49	270.76	8.84
6,766.00	42.91	271.54	6,715.16	231.42	-320.49	326.76	14.15
6,861.00	51.03	272.69	6,779.93	234.03	-389.82	396.14	8.59
6,909.00	53.97	273.48	6,809.15	236.08	-427.85	434.20	6.26
6,956.00	57.33	272.63	6,835.67	238.14	-466.59	472.98	7.30
7,004.00	61.37	271.73	6,860.13	239.71	-507.84	514.27	8.57
7,051.00	64.00	271.18	6,881.70	240.77	-549.59	556.02	5.69
7,145.00	71.07	267.59	6,917.60	239.77	-636.37	642.75	8.31
7,240.00	84.42	266.36	6,937.72	234.85	-728.87	735.07	14.11
7,291.00	89.45	266.47	6,940.45	231.67	-779.68	785.78	9.87
7,345.00	89.56	267.78	6,940.92	228.96	-833.61	839.61	2.43
7"							
7,407.00	89.69	269.28	6,941.32	227.37	-895.58	901.52	2.43
7,502.00	88.77	269.15	6,942.60	226.07	-990.56	996.43	0.98
7,597.00	90.06	269.54	6,943.57	224.98	-1,085.55	1,091.35	1.42
7,692.00	90.25	269.69	6,943.31	224.34	-1,180.55	1,186.29	0.25
7,787.00	89.57	270.86	6,943.46	224.80	-1,275.54	1,281.26	1.42
7,882.00	90.43	271.48	6,943.46	226.74	-1,370.52	1,376.26	1.12
7,977.00	89.29	271.27	6,943.69	229.02	-1,465.49	1,471.26	1.22
8,071.00	89.88	270.56	6,944.37	230.52	-1,559.48	1,565.25	0.98
8,166.00	90.83	272.68	6,943.78	233.20	-1,654.43	1,660.24	2.45
8,261.00	90.77	272.98	6,942.46	237.89	-1,749.31	1,755.21	0.32
8,356.00	90.68	271.17	6,941.26	241.33	-1,844.23	1,850.19	1.91
8,451.00	91.39	269.91	6,939.54	242.23	-1,939.21	1,945.16	1.52
8,546.00	89.48	269.59	6,938.82	241.81	-2,034.20	2,040.10	2.04
8,641.00	91.63	270.48	6,937.90	241.87	-2,129.19	2,135.06	2.45
8,735.00	90.12	269.16	6,936.46	241.58	-2,223.18	2,229.00	2.13



## Design Report for Five Rivers K07-65-1BHN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,830.00	91.54	271.88	6,935.09	242.44	-2,318.15	2,323.96	3.23
8,925.00	91.66	272.15	6,932.43	245.78	-2,413.05	2,418.92	0.31
9,020.00	89.08	270.15	6,931.82	247.68	-2,508.02	2,513.90	3.44
9,115.00	90.46	269.43	6,932.20	247.34	-2,603.02	2,608.85	1.64
9,210.00	90.31	269.33	6,931.56	246.31	-2,698.01	2,703.78	0.19
9,305.00	89.60	269.13	6,931.64	245.03	-2,793.00	2,798.70	0.78
9,400.00	91.36	269.82	6,930.84	244.16	-2,887.99	2,893.63	1.99
9,495.00	91.36	270.02	6,928.59	244.03	-2,982.96	2,988.56	0.21
9,587.00	90.71	270.08	6,926.93	244.11	-3,074.94	3,080.51	0.71
9,679.00	89.85	269.91	6,926.48	244.10	-3,166.94	3,172.47	0.95
9,773.00	88.98	269.92	6,927.44	243.96	-3,260.94	3,266.43	0.93
9,865.00	90.65	269.73	6,927.73	243.68	-3,352.93	3,358.38	1.83
9,957.00	91.08	269.81	6,926.34	243.31	-3,444.92	3,450.33	0.48
10,050.00	90.43	269.89	6,925.12	243.07	-3,537.91	3,543.27	0.70
10,142.00	89.66	269.73	6,925.05	242.76	-3,629.91	3,635.23	0.85
10,235.00	91.33	269.85	6,924.24	242.42	-3,722.90	3,728.18	1.80
10,327.00	91.45	269.71	6,922.01	242.07	-3,814.88	3,820.10	0.20
10,420.00	91.26	269.72	6,919.81	241.61	-3,907.85	3,913.03	0.20
10,512.00	90.68	269.50	6,918.25	240.98	-3,999.83	4,004.96	0.67
10,607.00	90.55	269.71	6,917.24	240.32	-4,094.83	4,099.90	0.26
10,699.00	90.52	269.83	6,916.38	239.95	-4,186.82	4,191.85	0.13
10,792.00	89.85	269.83	6,916.08	239.68	-4,279.82	4,284.80	0.72
10,884.00	88.98	269.48	6,917.02	239.12	-4,371.81	4,376.75	1.02
10,977.00	90.65	269.51	6,917.32	238.31	-4,464.80	4,469.68	1.80
11,070.00	90.46	269.16	6,916.41	237.23	-4,557.79	4,562.61	0.43
11,163.00	91.79	269.96	6,914.59	236.51	-4,650.77	4,655.53	1.67
11,256.00	92.25	270.98	6,911.31	237.27	-4,743.71	4,748.45	1.20
11,349.00	92.07	271.95	6,907.81	239.65	-4,836.61	4,841.38	1.06
11,444.00	91.05	272.57	6,905.22	243.40	-4,931.50	4,936.34	1.26
11,539.00	90.80	272.35	6,903.69	247.47	-5,026.40	5,031.32	0.35
11,634.00	90.43	272.10	6,902.67	251.16	-5,121.32	5,126.30	0.47
11,729.00	89.94	271.20	6,902.36	253.90	-5,216.28	5,221.30	1.08
11,823.00	89.75	270.95	6,902.61	255.66	-5,310.26	5,315.30	0.33
11,918.00	89.11	270.12	6,903.56	256.55	-5,405.25	5,410.28	1.10
12,013.00	88.83	270.63	6,905.27	257.17	-5,500.24	5,505.24	0.61
12,108.00	89.04	270.17	6,907.03	257.83	-5,595.22	5,600.20	0.53
12,203.00	90.86	270.29	6,907.11	258.21	-5,690.21	5,695.17	1.92
12,298.00	90.71	269.96	6,905.81	258.42	-5,785.20	5,790.13	0.38
12,392.00	90.52	269.61	6,904.80	258.07	-5,879.20	5,884.08	0.42
12,487.00	90.56	269.43	6,903.91	257.27	-5,974.19	5,979.01	0.19
12,582.00	91.23	269.32	6,902.42	256.23	-6,069.17	6,073.93	0.71
12,677.00	91.05	268.77	6,900.53	254.65	-6,164.14	6,168.82	0.61
12,772.00	91.14	270.17	6,898.72	253.77	-6,259.11	6,263.73	1.48
12,867.00	90.93	270.28	6,897.00	254.15	-6,354.10	6,358.69	0.25
12,962.00	91.17	269.80	6,895.26	254.21	-6,449.08	6,453.64	0.56
13,057.00	90.03	270.39	6,894.27	254.37	-6,544.07	6,548.60	1.35
13,151.00	90.15	270.58	6,894.12	255.17	-6,638.07	6,642.59	0.24
13,247.00	90.40	270.38	6,893.66	255.97	-6,734.07	6,738.57	0.33
13,341.00	90.22	269.75	6,893.15	256.08	-6,828.06	6,832.53	0.70
13,436.00	89.72	269.41	6,893.20	255.38	-6,923.06	6,927.47	0.64
13,531.00	89.32	268.91	6,894.00	253.99	-7,018.05	7,022.38	0.67

## Design Report for Five Rivers K07-65-1BHN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
13,626.00	90.31	269.81	6,894.30	252.93	-7,113.04	7,117.31	1.41
13,721.00	90.74	270.83	6,893.43	253.46	-7,208.03	7,212.28	1.17
13,816.00	90.62	270.95	6,892.30	254.93	-7,303.01	7,307.27	0.18
13,911.00	90.86	271.47	6,891.08	256.94	-7,397.98	7,402.26	0.60
14,005.00	90.52	271.30	6,889.95	259.21	-7,491.95	7,496.25	0.40
14,100.00	90.68	271.39	6,888.95	261.44	-7,586.92	7,591.24	0.19
14,195.00	89.35	271.72	6,888.93	264.02	-7,681.88	7,686.24	1.44
14,290.00	89.48	271.55	6,889.90	266.73	-7,776.84	7,781.24	0.23
14,385.00	89.66	272.00	6,890.61	269.67	-7,871.79	7,876.23	0.51
14,480.00	89.17	272.87	6,891.58	273.71	-7,966.70	7,971.22	1.05
14,575.00	89.63	272.37	6,892.57	278.05	-8,061.59	8,066.20	0.72
14,670.00	89.44	271.94	6,893.34	281.62	-8,156.52	8,161.19	0.49
14,765.00	88.33	270.05	6,895.19	283.27	-8,251.48	8,256.16	2.31
14,860.00	90.03	270.40	6,896.55	283.64	-8,346.47	8,351.12	1.83
14,954.00	90.86	270.21	6,895.82	284.14	-8,440.46	8,445.09	0.91
15,049.00	91.02	270.24	6,894.26	284.52	-8,535.45	8,540.05	0.17
15,144.00	91.76	270.38	6,891.96	285.03	-8,630.42	8,635.00	0.79
15,238.00	91.02	269.86	6,889.68	285.23	-8,724.39	8,728.94	0.96
15,333.00	89.91	269.39	6,888.91	284.61	-8,819.38	8,823.88	1.27
15,428.00	89.60	269.72	6,889.32	283.87	-8,914.38	8,918.82	0.48
15,523.00	88.67	269.42	6,890.75	283.16	-9,009.37	9,013.75	1.03
15,618.00	88.98	269.61	6,892.70	282.35	-9,104.34	9,108.67	0.38
15,713.00	89.20	269.52	6,894.21	281.63	-9,199.33	9,203.60	0.25
15,807.00	88.27	269.54	6,896.28	280.86	-9,293.30	9,297.51	0.99
15,902.00	88.86	270.55	6,898.66	280.93	-9,388.27	9,392.45	1.23
15,997.00	89.78	269.64	6,899.79	281.09	-9,483.26	9,487.41	1.36
16,092.00	89.88	269.32	6,900.07	280.23	-9,578.26	9,582.34	0.35
16,187.00	89.97	269.18	6,900.19	278.99	-9,673.25	9,677.26	0.18
16,229.00	90.52	269.23	6,900.01	278.40	-9,715.24	9,719.23	1.31
Final Sperry MWD Survey at 16229.00 ft.							
16,291.00	90.52	269.23	6,899.45	277.57	-9,777.23	9,781.17	0.00
Five Rivers K07-65-1BHN_BHL							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
275.00	274.99	0.59	-1.57	First Gyro Survey at 275.00 ft.
585.00	584.97	2.21	-4.98	Final Gyro Survey at 585.00 ft.
585.00	584.97	2.21	-4.98	Tie on to Gyro Survey at 585.00 ft.
723.00	722.96	2.36	-6.18	First Sperry MWD Survey at 723.00 ft.
16,229.00	6,900.01	278.40	-9,715.24	Final Sperry MWD Survey at 16229.00 ft.

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Five Rivers K07-65-1BHN_BHL	271.58	Slot	0.00	0.00	0.00

## Design Report for Five Rivers K07-65-1BHN - Actual Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
275.00	585.00	Surface Gyros	Flexi-Shot
723.00	7,291.00	MWD Surveys - Intermediate	MWD+IFR1+MS_WY
7,407.00	16,291.00	MWD Surveys - Production	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
625.00	624.97	9 5/8"	9-5/8	13-3/4
7,345.00	6,940.92	7"	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
Five Rivers K07-65-1B	0.00	0.00	0.00	0.01	0.00	1,362,042.89	3,197,186.55	40° 19' 30.180 N	104° 47' 33.972 W
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
Five Rivers K07-65-1B	0.00	0.00	0.00	0.01	0.00	1,362,042.89	3,197,186.55	40° 19' 30.180 N	104° 47' 33.972 W
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	3,114.73	-10,343.34	1,365,157.49	3,186,843.65	
Point 2				0.00	-2,211.12	-10,283.57	1,359,831.86	3,186,903.42	
Point 3				0.00	-2,139.05	-5,155.84	1,359,903.93	3,192,030.93	
Point 4				0.00	3,280.07	-5,404.24	1,365,322.82	3,191,782.54	
Point 5				0.00	-2,139.05	-5,155.84	1,359,903.93	3,192,030.93	
Point 6				0.00	-2,234.99	240.92	1,359,808.00	3,197,427.46	
Point 7				0.00	3,131.50	-206.20	1,365,174.26	3,196,980.36	
Point 8				0.00	3,280.07	-5,404.24	1,365,322.82	3,191,782.54	
Point 9				0.00	3,114.73	-10,343.34	1,365,157.49	3,186,843.65	
Five Rivers K07-65-1B	0.00	0.00	0.00	0.01	0.00	1,362,042.89	3,197,186.55	40° 19' 30.180 N	104° 47' 33.972 W
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	2,654.71	-9,883.32	1,364,697.49	3,187,303.65	
Point 2				0.00	-1,751.11	-9,823.55	1,360,291.86	3,187,363.42	
Point 3				0.00	-1,679.03	-5,155.84	1,360,363.93	3,192,030.93	
Point 4				0.00	-1,774.97	-219.10	1,360,268.00	3,196,967.46	
Point 5				0.00	2,671.48	-666.22	1,364,714.26	3,196,520.36	
Point 6				0.00	2,820.05	-5,404.24	1,364,862.82	3,191,782.54	
Point 7				0.00	2,654.71	-9,883.32	1,364,697.49	3,187,303.65	
UPRR PAN AM #01-61	0.00	0.00	-3.00	-301.56	740.78	1,361,741.33	3,197,927.30	40° 19' 27.141 N	104° 47' 24.439 W
- actual wellpath misses target center by 799.81usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 300.00)									
Five Rivers K07-65-1B	0.00	0.00	6,880.71	270.06	-9,778.11	1,362,312.93	3,187,408.86	40° 19' 33.600 N	104° 49' 40.188 W
- actual wellpath misses target center by 20.21usft at 16291.00usft MD (6899.45 TVD, 277.57 N, -9777.23 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.32 °/100usft	Maximum Dogleg over Survey:	14.15 °/100usft at 6,766.00 usft
Net Tortousity applicable to Plans:	0.68 °/100usft	Directional Difficulty Index:	6.700

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**Design Report for Five Rivers K07-65-1BHN - Actual Surveys**

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*Audit Info*



**North Reference Sheet for Sec. 8-T4N-R66W (Five Rivers K09-25-A) - Five Rivers  
K07-65-1BHN - Plan A**

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

Vertical Depths are relative to RKB=24ft @ 4724.00usft (H&P 315). Northing and Easting are relative to Five Rivers K07-65-1BHN

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: 0.99995768

Grid Coordinates of Well: 1,362,042.88 usft N, 3,197,186.55 usft E

Geographical Coordinates of Well: 40° 19' 30.18" N, 104° 47' 33.97" W

Grid Convergence at Surface is: 0.46°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,291.00usft  
the Bottom Hole Displacement is 9,781.17usft in the Direction of 271.63° (Grid).

Magnetic Convergence at surface is: -8.08° (10 August 2014, , BGGM2014)

