

Project: WELD-NAD83-UTMFT13N  
Site: Wagner 8-22HZ Pad - PD 46  
Well: Wagner 1N-E10HZ  
Wellbore: Original Wellbore  
Design: Final Surveys



HALLIBURTON  
Sperry Drilling

## US ROCKIES WATTENBERG PLANNING

West(-)/East(+) (1200 usft/in)

Sec. 10, T1N R67W

~177' FSL, ~430' FEL of Sec 10-T1N-R67W  
Lat: 40.058767° Long: -104.868885°  
Straight Line Projection to TD @ 14872.00' MD

~177' FSL ~419' FEL of Sec 10-1N-67W  
Wagner 1N-E10HZ PBHL\_A4

Enter 460' Rad 14506.00' MD 7446.25' TVD  
~188' FNL, ~417' FEL of Sec 15-T1N-R67W

Sec. 15, T1N R67W

~1091' FNL, ~397' FEL of Sec 22-T1N-R67W  
Exit 460' Rad 8340.00' MD 7434.27' TVD

1639' FNL & 761' FEL Sec 22  
Wagner 1N-E10HZ SHL

Landed Curve @ 7884.00' MD 85.28° INC 7432.98' TVD  
Lat: 40.039586° Long: -104.868728°  
~1546' FNL, ~405' FEL of Sec 22-T1N-R67W

First Sperry MWD+IFR+SC Survey @ 1919.00' MD

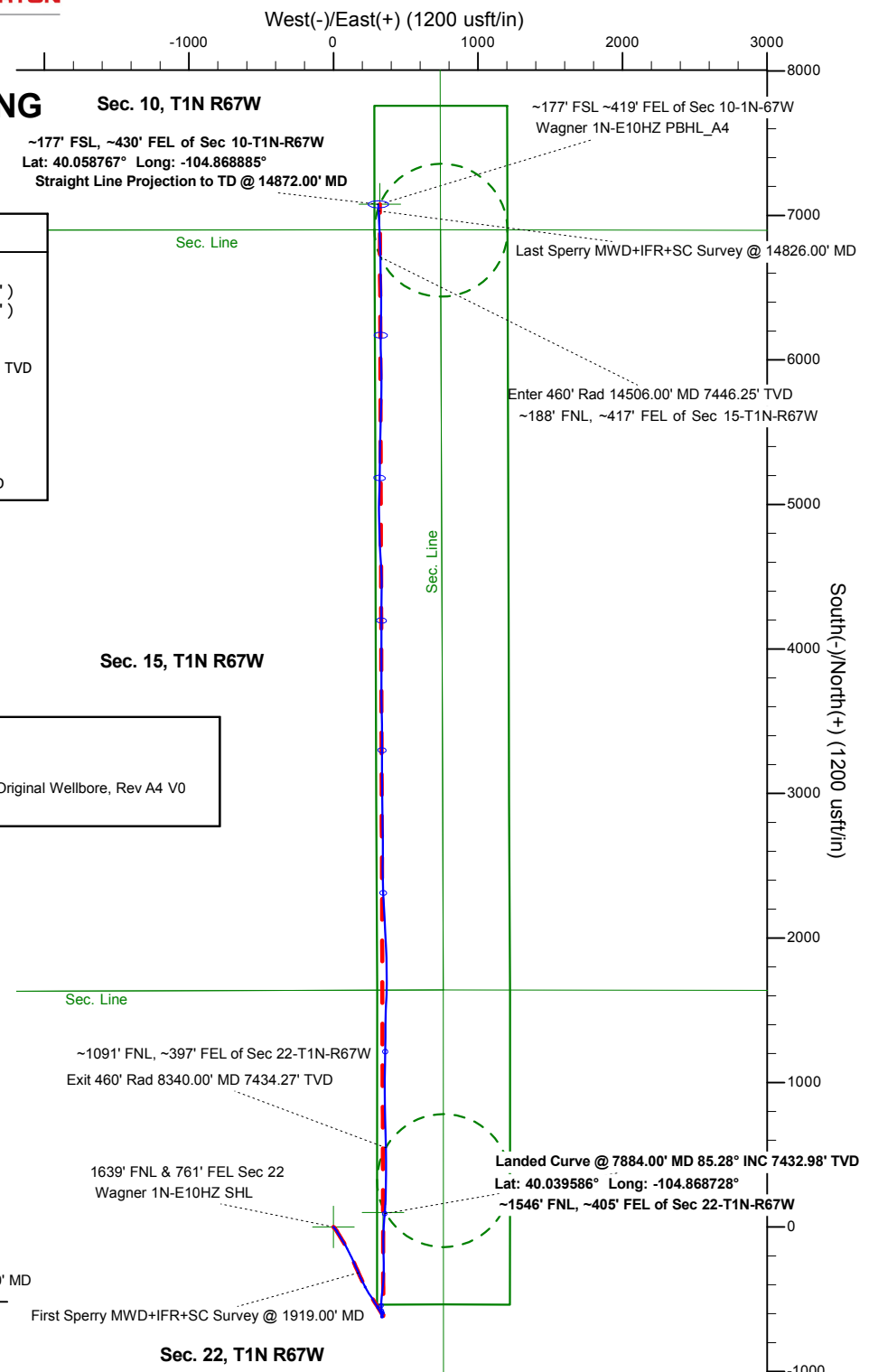
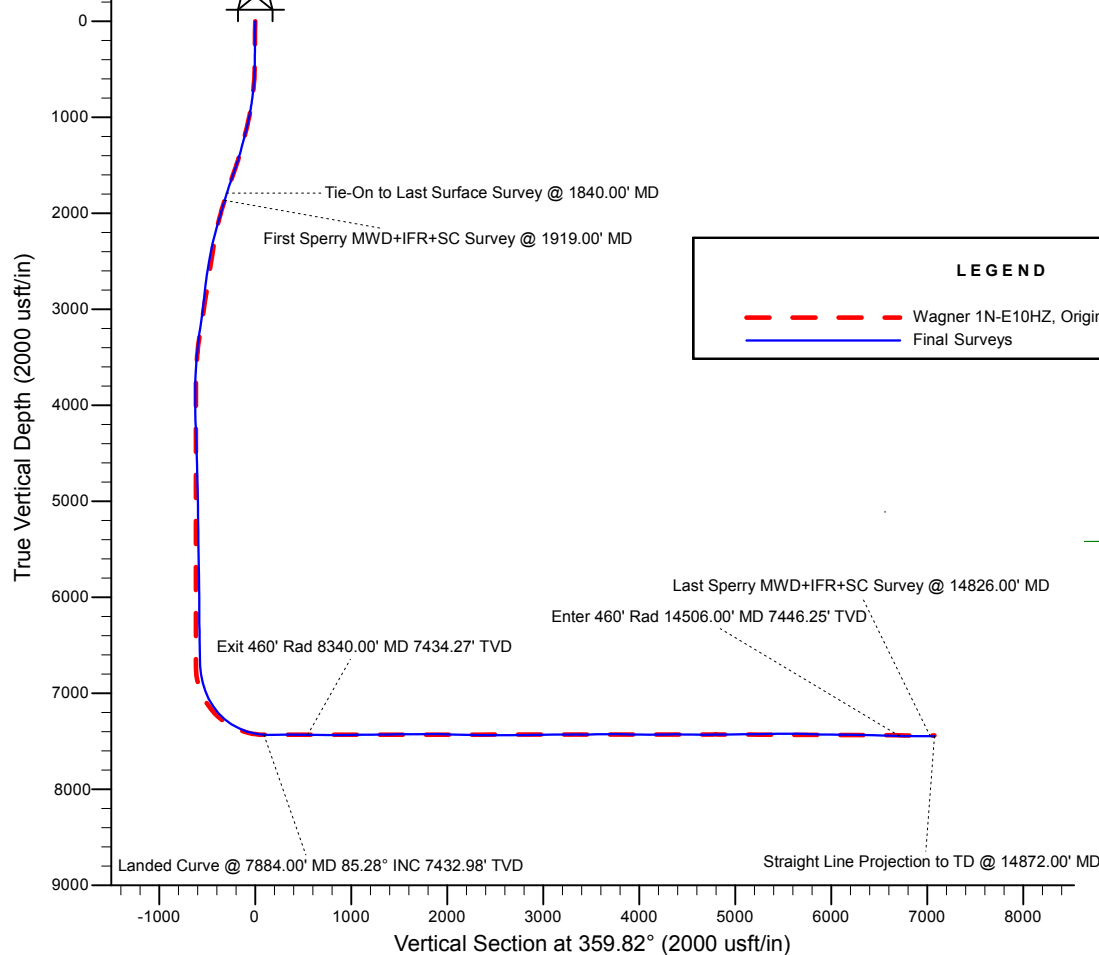
Sec. 22, T1N R67W

### ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Annotation
133.00	0.35	208.35	133.00	-0.36	-0.19	First Total MWD+IFR Survey @ 132.00' MD (KB 20')
1840.00	18.54	155.96	1791.76	-293.96	162.88	Last Total MWD+IFR Survey @ 1839.00' MD (KB 20')
1840.00	18.54	155.96	1791.76	-293.96	162.88	Tie-On to Last Surface Survey @ 1840.00' MD
1919.00	18.63	156.39	1866.64	-316.99	173.05	First Sperry MWD+IFR+SC Survey @ 1919.00' MD
7884.00	85.28	5.21	7432.98	92.45	354.68	Landed Curve @ 7884.00' MD 85.28° INC 7432.98' TVD
7884.00	85.28	5.21	7432.98	92.45	354.68	Lat: 40.039586° Long: -104.868728° @7884.00MD
8340.00	89.74	359.27	7434.27	548.08	362.94	Exit 460' Rad 8340.00' MD 7434.27' TVD
14506.00	88.87	359.33	7446.25	6711.50	324.81	Enter 460' Rad 14506.00' MD 7446.25' TVD
14826.00	90.28	357.64	7448.87	7031.22	312.48	Last Sperry MWD+IFR+SC Survey @ 14826.00' MD
14872.00	90.28	357.64	7448.64	7077.18	310.58	Straight Line Projection to TD @ 14872.00' MD
14872.00	90.28	357.64	7448.64	7077.18	310.58	Lat: 40.058767° Long: -104.868885° @14872.00MD

### LEGEND

--- Wagner 1N-E10HZ, Original Wellbore, Rev A4 V0  
— Final Surveys



Job# 904337675

Precision 464

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N Wagner 8-22HZ Pad - PD 464

API# 05-123-43475

Wagner 1N-E10HZ

Original Wellbore

Design: Final Surveys

## Sperry Drilling Services

### Combo Report

16 October, 2017

Well Coordinates: 40° 02' 21.60" N  
104° 52' 11.98" W

North American Datum 1983  
Zone 13N (108 W to 102 W)  
14,541,082.45 N  
1,676,803.80 E

Ground Level: 4,971.00 usft

Local Coordinate Origin:

Centered on Well Wagner 1N-E10HZ

Viewing Datum:

KB 21' @ 4992.00usft (Precision 464)

TVDs to System:

N

**North Reference:**

**True**

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 81D

Report Version: Midcon Combo v1.11

**HALLIBURTON**

## Design Report for Wagner 1N-E10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
0.00	0.00	0.00	-4,992.00	0.00	0.00 N	0.00 E	14,541,082.45	1,676,803.80	0.00	0.00	
133.00	0.35	208.35	-4,859.00	133.00	0.36 S	0.19 W	14,541,082.09	1,676,803.61	0.26	-0.36	First Total MWD+IFR Survey @ 132.00' MD (KB 20')
165.00	0.18	205.80	-4,827.00	165.00	0.49 S	0.26 W	14,541,081.96	1,676,803.54	0.53	-0.49	
197.00	0.35	166.07	-4,795.00	197.00	0.63 S	0.26 W	14,541,081.82	1,676,803.54	0.75	-0.63	
229.00	0.66	171.70	-4,763.00	229.00	0.91 S	0.21 W	14,541,081.54	1,676,803.59	0.98	-0.91	
260.00	0.75	162.38	-4,732.01	259.99	1.28 S	0.12 W	14,541,081.17	1,676,803.68	0.47	-1.28	
292.00	0.75	144.01	-4,700.01	291.99	1.65 S	0.06 E	14,541,080.81	1,676,803.86	0.75	-1.65	
324.00	0.88	117.03	-4,668.01	323.99	1.93 S	0.41 E	14,541,080.53	1,676,804.21	1.25	-1.93	
355.00	0.75	111.14	-4,637.01	354.99	2.11 S	0.81 E	14,541,080.34	1,676,804.61	0.50	-2.11	
387.00	1.14	113.69	-4,605.02	386.98	2.31 S	1.29 E	14,541,080.14	1,676,805.10	1.23	-2.32	
419.00	1.63	123.27	-4,573.03	418.97	2.69 S	1.97 E	14,541,079.77	1,676,805.77	1.69	-2.69	
451.00	1.93	124.41	-4,541.04	450.96	3.24 S	2.79 E	14,541,079.21	1,676,806.59	0.94	-3.25	
483.00	2.55	130.92	-4,509.07	482.93	4.01 S	3.77 E	14,541,078.44	1,676,807.58	2.09	-4.03	
514.00	3.08	132.59	-4,478.11	513.89	5.03 S	4.91 E	14,541,077.43	1,676,808.71	1.73	-5.04	
546.00	3.52	134.08	-4,446.16	545.84	6.29 S	6.25 E	14,541,076.17	1,676,810.05	1.40	-6.31	
577.00	3.82	139.18	-4,415.22	576.78	7.74 S	7.61 E	14,541,074.72	1,676,811.41	1.43	-7.76	
609.00	4.70	141.64	-4,383.31	608.69	9.57 S	9.12 E	14,541,072.89	1,676,812.93	2.81	-9.60	
640.00	5.45	142.08	-4,352.43	639.57	11.73 S	10.81 E	14,541,070.74	1,676,814.62	2.42	-11.76	
672.00	6.15	143.84	-4,320.60	671.40	14.31 S	12.75 E	14,541,068.16	1,676,816.57	2.26	-14.35	
704.00	7.03	142.69	-4,288.81	703.19	17.25 S	14.95 E	14,541,065.22	1,676,818.78	2.78	-17.30	
736.00	7.56	142.60	-4,257.07	734.93	20.48 S	17.42 E	14,541,061.99	1,676,821.25	1.66	-20.54	
767.00	8.44	145.33	-4,226.37	765.63	23.97 S	19.95 E	14,541,058.51	1,676,823.78	3.09	-24.04	
799.00	9.01	145.86	-4,194.74	797.26	27.98 S	22.69 E	14,541,054.50	1,676,826.53	1.80	-28.05	
830.00	9.98	149.90	-4,164.16	827.84	32.31 S	25.40 E	14,541,050.17	1,676,829.25	3.79	-32.39	
862.00	10.77	149.46	-4,132.69	859.31	37.29 S	28.31 E	14,541,045.20	1,676,832.16	2.48	-37.38	
894.00	10.99	149.90	-4,101.26	890.74	42.50 S	31.36 E	14,541,040.00	1,676,835.22	0.73	-42.60	
925.00	11.51	149.37	-4,070.86	921.14	47.72 S	34.42 E	14,541,034.78	1,676,838.29	1.71	-47.83	
957.00	12.52	149.11	-4,039.56	952.44	53.44 S	37.83 E	14,541,029.06	1,676,841.70	3.16	-53.56	
988.00	12.96	148.76	-4,009.32	982.68	59.30 S	41.35 E	14,541,023.21	1,676,845.24	1.44	-59.43	
1,020.00	13.36	148.14	-3,978.16	1,013.84	65.51 S	45.17 E	14,541,017.01	1,676,849.06	1.33	-65.65	
1,052.00	14.06	147.97	-3,947.08	1,044.92	71.94 S	49.18 E	14,541,010.58	1,676,853.08	2.19	-72.10	
1,083.00	15.25	148.76	-3,917.08	1,074.92	78.62 S	53.29 E	14,541,003.91	1,676,857.20	3.89	-78.79	
1,115.00	15.38	147.79	-3,886.22	1,105.78	85.81 S	57.74 E	14,540,996.73	1,676,861.66	0.90	-85.99	
1,147.00	15.69	148.14	-3,855.39	1,136.61	93.08 S	62.28 E	14,540,989.47	1,676,866.22	1.01	-93.27	
1,178.00	16.26	147.00	-3,825.59	1,166.41	100.28 S	66.86 E	14,540,982.27	1,676,870.80	2.10	-100.48	
1,210.00	17.01	149.72	-3,794.93	1,197.07	108.07 S	71.66 E	14,540,974.48	1,676,875.61	3.38	-108.30	
1,242.00	17.10	149.11	-3,764.33	1,227.67	116.15 S	76.43 E	14,540,966.41	1,676,880.40	0.63	-116.39	
1,274.00	16.79	149.90	-3,733.72	1,258.28	124.19 S	81.17 E	14,540,958.38	1,676,885.15	1.21	-124.44	
1,305.00	16.79	151.92	-3,704.04	1,287.96	132.01 S	85.52 E	14,540,950.56	1,676,889.51	1.88	-132.28	
1,337.00	16.96	151.66	-3,673.42	1,318.58	140.20 S	89.91 E	14,540,942.38	1,676,893.91	0.58	-140.48	
1,368.00	17.84	152.89	-3,643.84	1,348.16	148.41 S	94.22 E	14,540,934.18	1,676,898.24	3.08	-148.70	

## Design Report for Wagner 1N-E10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
1,400.00	18.11	153.68	-3,613.40	1,378.60	157.23 S	98.66 E	14,540,925.37	1,676,902.69	1.14	-157.54	
1,432.00	17.89	152.54	-3,582.97	1,409.03	166.05 S	103.13 E	14,540,916.56	1,676,907.17	1.30	-166.37	
1,463.00	18.37	152.80	-3,553.51	1,438.49	174.62 S	107.56 E	14,540,907.99	1,676,911.61	1.57	-174.95	
1,495.00	19.73	153.50	-3,523.26	1,468.74	183.94 S	112.28 E	14,540,898.68	1,676,916.34	4.31	-184.29	
1,527.00	20.30	155.00	-3,493.19	1,498.81	193.80 S	117.03 E	14,540,888.82	1,676,921.11	2.40	-194.17	
1,558.00	20.57	154.47	-3,464.14	1,527.86	203.59 S	121.65 E	14,540,879.04	1,676,925.75	1.06	-203.97	
1,590.00	21.18	154.38	-3,434.25	1,557.75	213.87 S	126.57 E	14,540,868.76	1,676,930.68	1.91	-214.27	
1,622.00	20.92	155.96	-3,404.38	1,587.62	224.30 S	131.40 E	14,540,858.34	1,676,935.53	1.95	-224.72	
1,652.00	21.09	155.61	-3,376.37	1,615.63	234.11 S	135.81 E	14,540,848.54	1,676,939.95	0.70	-234.54	
1,684.00	21.40	155.79	-3,346.55	1,645.45	244.68 S	140.58 E	14,540,837.98	1,676,944.74	0.99	-245.12	
1,716.00	20.87	155.79	-3,316.70	1,675.30	255.20 S	145.32 E	14,540,827.46	1,676,949.49	1.66	-255.66	
1,748.00	20.61	155.70	-3,286.78	1,705.22	265.53 S	149.97 E	14,540,817.14	1,676,954.16	0.82	-266.00	
1,780.00	20.39	154.91	-3,256.80	1,735.20	275.72 S	154.65 E	14,540,806.96	1,676,958.85	1.10	-276.20	
1,811.00	19.47	156.05	-3,227.66	1,764.34	285.33 S	159.04 E	14,540,797.36	1,676,963.25	3.22	-285.83	
1,840.00	18.54	155.96	-3,200.24	1,791.76	293.96 S	162.88 E	14,540,788.73	1,676,967.11	3.21	-294.47	Last Total MWD+IFR Survey @ 1839.00' MD (KB 20') - Tie-On to Last Surface Survey @ 1840.00' MD First Sperry MWD+IFR+SC Survey @ 1919.00' MD
1,919.00	18.63	156.39	-3,125.36	1,866.64	316.99 S	173.05 E	14,540,765.72	1,676,977.31	0.21	-317.53	
2,008.00	17.97	155.78	-3,040.86	1,951.14	342.54 S	184.38 E	14,540,740.19	1,676,988.67	0.77	-343.11	
2,098.00	17.46	154.19	-2,955.13	2,036.87	367.35 S	195.95 E	14,540,715.39	1,677,000.28	0.78	-367.97	
2,188.00	17.29	153.46	-2,869.23	2,122.77	391.47 S	207.80 E	14,540,691.28	1,677,012.17	0.31	-392.12	
2,278.00	16.77	152.47	-2,783.18	2,208.82	414.95 S	219.78 E	14,540,667.82	1,677,024.19	0.66	-415.64	
2,368.00	16.24	150.45	-2,696.89	2,295.11	437.41 S	231.99 E	14,540,645.38	1,677,036.43	0.87	-438.14	
2,457.00	13.09	148.01	-2,610.80	2,381.20	456.79 S	243.47 E	14,540,626.02	1,677,047.93	3.61	-457.55	
2,547.00	11.85	145.39	-2,522.92	2,469.08	473.04 S	254.12 E	14,540,609.78	1,677,058.61	1.51	-473.84	
2,637.00	11.44	144.49	-2,434.78	2,557.22	487.91 S	264.55 E	14,540,594.93	1,677,069.06	0.50	-488.74	
2,727.00	9.46	150.38	-2,346.27	2,645.73	501.61 S	273.39 E	14,540,581.24	1,677,077.92	2.50	-502.47	
2,816.00	7.89	151.62	-2,258.29	2,733.71	513.34 S	279.91 E	14,540,569.52	1,677,084.46	1.78	-514.22	
2,906.00	6.93	150.41	-2,169.04	2,822.96	523.50 S	285.53 E	14,540,559.37	1,677,090.09	1.08	-524.39	
2,996.00	8.17	145.60	-2,079.82	2,912.18	533.50 S	291.82 E	14,540,549.38	1,677,096.40	1.55	-534.41	
3,086.00	8.63	148.27	-1,990.79	3,001.21	544.52 S	298.99 E	14,540,538.37	1,677,103.58	0.67	-545.45	
3,176.00	9.03	150.19	-1,901.86	3,090.14	556.39 S	306.05 E	14,540,526.51	1,677,110.66	0.55	-557.35	
3,265.00	9.43	150.34	-1,814.01	3,177.99	568.79 S	313.13 E	14,540,514.12	1,677,117.76	0.45	-569.77	
3,355.00	9.24	149.72	-1,725.20	3,266.80	581.43 S	320.42 E	14,540,501.49	1,677,125.07	0.24	-582.44	
3,445.00	7.40	151.97	-1,636.15	3,355.85	592.79 S	326.79 E	14,540,490.14	1,677,131.45	2.08	-593.81	
3,535.00	6.14	153.14	-1,546.78	3,445.22	602.20 S	331.69 E	14,540,480.74	1,677,136.36	1.41	-603.24	
3,714.00	2.99	172.84	-1,368.36	3,623.64	615.37 S	336.60 E	14,540,467.57	1,677,141.29	1.94	-616.43	
3,804.00	2.58	184.37	-1,278.47	3,713.53	619.72 S	336.73 E	14,540,463.22	1,677,141.44	0.77	-620.78	
3,894.00	0.79	155.64	-1,188.51	3,803.49	622.31 S	336.84 E	14,540,460.63	1,677,141.54	2.14	-623.36	
3,983.00	0.10	66.38	-1,099.51	3,892.49	622.84 S	337.16 E	14,540,460.11	1,677,141.87	0.89	-623.89	
4,073.00	0.68	329.21	-1,009.51	3,982.49	622.35 S	336.96 E	14,540,460.60	1,677,141.66	0.78	-623.40	
4,163.00	1.02	312.94	-919.52	4,072.48	621.34 S	336.10 E	14,540,461.60	1,677,140.80	0.46	-622.39	

## Design Report for Wagner 1N-E10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
4,253.00	1.61	341.32	-829.55	4,162.45	619.60 S	335.11 E	14,540,463.34	1,677,139.81	0.96	-620.65	
4,342.00	2.05	352.04	-740.59	4,251.41	616.84 S	334.49 E	14,540,466.10	1,677,139.18	0.62	-617.89	
4,432.00	1.95	345.88	-650.65	4,341.35	613.76 S	333.89 E	14,540,469.18	1,677,138.58	0.26	-614.80	
4,522.00	2.08	326.53	-560.70	4,431.30	610.91 S	332.62 E	14,540,472.03	1,677,137.30	0.77	-611.95	
4,612.00	2.17	18.03	-470.76	4,521.24	607.93 S	332.24 E	14,540,475.01	1,677,136.93	2.05	-608.97	
4,702.00	2.16	36.69	-380.82	4,611.18	604.95 S	333.78 E	14,540,477.99	1,677,138.46	0.78	-605.99	
4,791.00	2.06	41.32	-291.88	4,700.12	602.40 S	335.84 E	14,540,480.54	1,677,140.52	0.22	-603.45	
4,881.00	1.96	46.16	-201.93	4,790.07	600.12 S	338.02 E	14,540,482.82	1,677,142.69	0.22	-601.18	
4,971.00	1.84	43.34	-111.98	4,880.02	598.00 S	340.12 E	14,540,484.94	1,677,144.79	0.17	-599.07	
5,061.00	1.10	25.33	-22.01	4,969.99	596.17 S	341.48 E	14,540,486.78	1,677,146.15	0.96	-597.24	
5,151.00	0.86	5.06	67.97	5,059.97	594.72 S	341.91 E	14,540,488.23	1,677,146.58	0.46	-595.79	
5,240.00	0.85	352.07	156.96	5,148.96	593.40 S	341.88 E	14,540,489.55	1,677,146.54	0.22	-594.47	
5,330.00	0.97	336.17	246.95	5,238.95	592.04 S	341.48 E	14,540,490.91	1,677,146.14	0.31	-593.11	
5,420.00	0.89	327.42	336.94	5,328.94	590.76 S	340.80 E	14,540,492.19	1,677,145.45	0.18	-591.82	
5,509.00	0.59	302.64	425.93	5,417.93	589.93 S	340.04 E	14,540,493.02	1,677,144.70	0.49	-590.99	
5,688.00	1.20	320.04	604.91	5,596.91	587.99 S	338.06 E	14,540,494.95	1,677,142.71	0.37	-589.05	
5,778.00	1.37	330.90	694.89	5,686.89	586.33 S	336.93 E	14,540,496.61	1,677,141.58	0.33	-587.39	
5,847.00	1.44	329.77	763.87	5,755.87	584.86 S	336.09 E	14,540,498.08	1,677,140.74	0.11	-585.91	
5,999.00	1.72	335.71	915.81	5,907.81	581.13 S	334.19 E	14,540,501.81	1,677,138.84	0.21	-582.18	
6,088.00	0.74	151.18	1,004.80	5,996.80	580.42 S	333.92 E	14,540,502.52	1,677,138.56	2.76	-581.46	
6,178.00	0.22	69.09	1,094.80	6,086.80	580.86 S	334.36 E	14,540,502.08	1,677,139.01	0.82	-581.91	
6,268.00	0.31	320.23	1,184.80	6,176.80	580.62 S	334.37 E	14,540,502.32	1,677,139.01	0.48	-581.66	
6,358.00	0.72	346.76	1,274.79	6,266.79	579.88 S	334.08 E	14,540,503.06	1,677,138.72	0.52	-580.92	
6,448.00	0.68	325.54	1,364.79	6,356.79	578.89 S	333.65 E	14,540,504.05	1,677,138.29	0.29	-579.93	
6,537.00	0.98	337.05	1,453.78	6,445.78	577.75 S	333.05 E	14,540,505.19	1,677,137.69	0.38	-578.79	
6,627.00	1.05	344.71	1,543.76	6,535.76	576.25 S	332.54 E	14,540,506.69	1,677,137.17	0.17	-577.29	
6,717.00	1.30	347.47	1,633.74	6,625.74	574.45 S	332.10 E	14,540,508.48	1,677,136.73	0.28	-575.49	
6,806.00	2.77	1.97	1,722.69	6,714.69	571.32 S	331.95 E	14,540,511.62	1,677,136.58	1.74	-572.36	
6,896.00	9.72	356.70	1,812.10	6,804.10	561.55 S	331.59 E	14,540,521.39	1,677,136.21	7.74	-562.59	
6,986.00	13.91	355.90	1,900.17	6,892.17	543.17 S	330.38 E	14,540,539.77	1,677,134.97	4.66	-544.20	
7,076.00	19.75	4.57	1,986.29	6,978.29	517.19 S	330.82 E	14,540,565.74	1,677,135.37	7.05	-518.23	
7,166.00	27.02	4.67	2,068.84	7,060.84	481.61 S	333.70 E	14,540,601.33	1,677,138.20	8.08	-482.66	
7,255.00	34.14	8.78	2,145.42	7,137.42	436.72 S	339.16 E	14,540,646.23	1,677,143.60	8.33	-437.78	
7,345.00	41.33	4.81	2,216.56	7,208.56	382.06 S	345.52 E	14,540,700.89	1,677,149.87	8.43	-383.15	
7,435.00	49.43	359.84	2,279.75	7,271.75	318.14 S	347.92 E	14,540,764.82	1,677,152.18	9.82	-319.23	
7,525.00	57.89	359.08	2,333.03	7,325.03	245.72 S	347.21 E	14,540,837.24	1,677,151.37	9.42	-246.81	
7,615.00	65.07	358.94	2,375.98	7,367.98	166.70 S	345.84 E	14,540,916.26	1,677,149.88	7.98	-167.79	
7,704.00	72.33	0.04	2,408.28	7,400.28	83.84 S	345.12 E	14,540,999.11	1,677,149.04	8.24	-84.92	
7,794.00	80.22	3.52	2,429.63	7,421.63	3.46 N	347.88 E	14,541,086.42	1,677,151.67	9.54	2.37	
7,884.00	85.28	5.21	2,440.98	7,432.98	92.45 N	354.68 E	14,541,175.42	1,677,158.34	5.92	91.34	Landed Curve @ 7884.00' MD 85.28° INC 7432.98' TVD - Lat: 40.039586° Long: -104.868728° @7884.00MD

## Design Report for Wagner 1N-E10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
7,973.00	91.97	1.93	2,443.12	7,435.12	181.19 N	360.21 E	14,541,264.17	1,677,163.75	8.37	180.06	
8,158.00	90.09	0.43	2,439.79	7,431.79	366.11 N	364.02 E	14,541,449.09	1,677,167.29	1.30	364.96	
8,252.00	88.52	359.45	2,440.93	7,432.93	460.10 N	363.92 E	14,541,543.08	1,677,167.05	1.97	458.95	
8,340.00	89.74	359.27	2,442.27	7,434.27	548.08 N	362.94 E	14,541,631.06	1,677,165.94	1.40	546.94	Exit 460' Rad 8340.00' MD 7434.27' TVD
8,346.00	89.82	359.26	2,442.29	7,434.29	554.08 N	362.87 E	14,541,637.06	1,677,165.85	1.40	552.94	
8,534.00	88.52	357.79	2,445.02	7,437.02	741.99 N	358.03 E	14,541,824.96	1,677,160.74	1.04	740.86	
8,629.00	90.80	359.40	2,445.58	7,437.58	836.95 N	355.70 E	14,541,919.92	1,677,158.27	2.94	835.83	
8,723.00	90.25	359.47	2,444.72	7,436.72	930.94 N	354.77 E	14,542,013.91	1,677,157.21	0.59	929.82	
8,817.00	91.30	0.96	2,443.45	7,435.45	1,024.93 N	355.12 E	14,542,107.89	1,677,157.43	1.94	1,023.80	
8,911.00	91.08	1.02	2,441.50	7,433.50	1,118.89 N	356.75 E	14,542,201.86	1,677,158.91	0.24	1,117.76	
9,006.00	90.62	0.47	2,440.09	7,432.09	1,213.87 N	357.98 E	14,542,296.84	1,677,160.01	0.75	1,212.74	
9,100.00	90.74	0.66	2,438.97	7,430.97	1,307.86 N	358.91 E	14,542,390.83	1,677,160.80	0.24	1,306.73	
9,194.00	90.15	0.58	2,438.24	7,430.24	1,401.85 N	359.93 E	14,542,484.83	1,677,161.68	0.63	1,400.71	
9,288.00	90.40	1.87	2,437.79	7,429.79	1,495.83 N	361.94 E	14,542,578.81	1,677,163.55	1.40	1,494.68	
9,382.00	90.59	3.36	2,436.98	7,428.98	1,589.72 N	366.23 E	14,542,672.71	1,677,167.70	1.60	1,588.56	
9,477.00	90.15	359.52	2,436.36	7,428.36	1,684.67 N	368.61 E	14,542,767.66	1,677,169.95	4.07	1,683.51	
9,656.00	90.37	359.04	2,435.55	7,427.55	1,863.66 N	366.36 E	14,542,946.64	1,677,167.44	0.29	1,862.50	
9,746.00	88.83	357.06	2,436.18	7,428.18	1,953.60 N	363.30 E	14,543,036.57	1,677,164.25	2.79	1,952.44	
9,836.00	88.40	356.65	2,438.36	7,430.36	2,043.43 N	358.36 E	14,543,126.41	1,677,159.18	0.66	2,042.30	
9,925.00	88.30	356.40	2,440.92	7,432.92	2,132.23 N	352.97 E	14,543,215.20	1,677,153.66	0.30	2,131.11	
10,105.00	88.77	358.06	2,445.52	7,437.52	2,311.96 N	344.28 E	14,543,394.91	1,677,144.70	0.96	2,310.86	
10,195.00	88.98	357.86	2,447.29	7,439.29	2,401.88 N	341.07 E	14,543,484.83	1,677,141.36	0.32	2,400.80	
10,284.00	90.31	0.84	2,447.84	7,439.84	2,490.86 N	340.06 E	14,543,573.81	1,677,140.23	3.67	2,489.78	
10,374.00	90.40	0.13	2,447.28	7,439.28	2,580.86 N	340.83 E	14,543,663.80	1,677,140.86	0.80	2,579.77	
10,464.00	90.83	359.85	2,446.32	7,438.32	2,670.85 N	340.81 E	14,543,753.80	1,677,140.71	0.57	2,669.77	
10,554.00	90.65	359.62	2,445.15	7,437.15	2,760.84 N	340.39 E	14,543,843.79	1,677,140.16	0.32	2,759.76	
10,644.00	90.59	358.97	2,444.18	7,436.18	2,850.83 N	339.29 E	14,543,933.77	1,677,138.92	0.73	2,849.75	
10,733.00	90.99	359.19	2,442.95	7,434.95	2,939.81 N	337.86 E	14,544,022.75	1,677,137.36	0.51	2,938.73	
10,823.00	91.35	358.54	2,441.11	7,433.11	3,029.77 N	336.08 E	14,544,112.71	1,677,135.45	0.83	3,028.70	
10,913.00	90.74	0.55	2,439.47	7,431.47	3,119.75 N	335.36 E	14,544,202.69	1,677,134.60	2.33	3,118.68	
11,092.00	89.72	359.82	2,438.75	7,430.75	3,298.74 N	335.94 E	14,544,381.68	1,677,134.92	0.70	3,297.67	
11,182.00	90.09	359.62	2,438.90	7,430.90	3,388.74 N	335.50 E	14,544,471.68	1,677,134.35	0.47	3,387.67	
11,272.00	90.55	359.49	2,438.40	7,430.40	3,478.74 N	334.80 E	14,544,561.67	1,677,133.52	0.53	3,477.67	
11,362.00	90.68	359.01	2,437.43	7,429.43	3,568.73 N	333.62 E	14,544,651.66	1,677,132.21	0.55	3,567.66	
11,451.00	91.02	358.73	2,436.11	7,428.11	3,657.70 N	331.87 E	14,544,740.63	1,677,130.33	0.49	3,656.64	
11,541.00	89.35	0.52	2,435.82	7,427.82	3,747.69 N	331.28 E	14,544,830.62	1,677,129.61	2.72	3,746.63	
11,631.00	89.08	359.93	2,437.06	7,429.06	3,837.68 N	331.63 E	14,544,920.61	1,677,129.83	0.72	3,836.62	
11,721.00	88.89	359.90	2,438.65	7,430.65	3,927.67 N	331.50 E	14,545,010.60	1,677,129.56	0.21	3,926.60	
11,811.00	89.44	0.00	2,439.96	7,431.96	4,017.66 N	331.42 E	14,545,100.59	1,677,129.35	0.62	4,016.59	
11,900.00	90.18	0.23	2,440.26	7,432.26	4,106.65 N	331.60 E	14,545,189.58	1,677,129.40	0.87	4,105.59	
11,990.00	90.59	0.16	2,439.65	7,431.65	4,196.65 N	331.90 E	14,545,279.58	1,677,129.58	0.46	4,195.59	

## Design Report for Wagner 1N-E10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
12,080.00	91.02	0.23	2,438.39	7,430.39	4,286.64 N	332.21 E	14,545,369.57	1,677,129.75	0.48	4,285.58	
12,169.00	89.66	1.14	2,437.86	7,429.86	4,375.63 N	333.28 E	14,545,458.56	1,677,130.69	1.84	4,374.56	
12,259.00	89.75	359.55	2,438.32	7,430.32	4,465.62 N	333.82 E	14,545,548.56	1,677,131.10	1.77	4,464.55	
12,349.00	89.26	356.44	2,439.10	7,431.10	4,555.55 N	330.67 E	14,545,638.48	1,677,127.82	3.50	4,554.49	
12,439.00	89.11	355.76	2,440.38	7,432.38	4,645.34 N	324.55 E	14,545,728.26	1,677,121.56	0.77	4,644.29	
12,529.00	90.65	358.64	2,440.57	7,432.57	4,735.22 N	320.15 E	14,545,818.13	1,677,117.04	3.63	4,734.19	
12,618.00	90.86	358.41	2,439.40	7,431.40	4,824.18 N	317.86 E	14,545,907.09	1,677,114.62	0.35	4,823.16	
12,708.00	89.85	359.04	2,438.84	7,430.84	4,914.15 N	315.86 E	14,545,997.06	1,677,112.48	1.32	4,913.14	
12,887.00	90.77	1.73	2,437.87	7,429.87	5,093.13 N	317.06 E	14,546,176.04	1,677,113.42	1.59	5,092.11	
12,977.00	90.93	1.23	2,436.54	7,428.54	5,183.09 N	319.39 E	14,546,266.00	1,677,115.62	0.58	5,182.06	
13,067.00	91.45	0.73	2,434.67	7,426.67	5,273.06 N	320.92 E	14,546,355.97	1,677,117.02	0.80	5,272.02	
13,157.00	90.95	359.99	2,432.78	7,424.78	5,363.03 N	321.49 E	14,546,445.95	1,677,117.46	0.99	5,362.00	
13,247.00	90.19	2.11	2,431.89	7,423.89	5,453.01 N	323.14 E	14,546,535.92	1,677,118.98	2.50	5,451.97	
13,426.00	90.12	1.26	2,431.40	7,423.40	5,631.93 N	328.40 E	14,546,714.85	1,677,123.98	0.48	5,630.87	
13,516.00	87.13	1.04	2,433.56	7,425.56	5,721.87 N	330.21 E	14,546,804.80	1,677,125.65	3.33	5,720.81	
13,606.00	88.92	0.87	2,436.66	7,428.66	5,811.80 N	331.71 E	14,546,894.73	1,677,127.02	2.00	5,810.73	
13,695.00	89.26	358.94	2,438.08	7,430.08	5,900.79 N	331.56 E	14,546,983.72	1,677,126.74	2.20	5,899.72	
13,785.00	89.26	358.42	2,439.24	7,431.24	5,990.76 N	329.49 E	14,547,073.68	1,677,124.54	0.58	5,989.69	
13,875.00	89.66	358.70	2,440.09	7,432.09	6,080.72 N	327.22 E	14,547,163.65	1,677,122.15	0.54	6,079.67	
13,965.00	88.40	1.07	2,441.61	7,433.61	6,170.70 N	327.04 E	14,547,253.62	1,677,121.83	2.98	6,169.65	
14,144.00	89.11	0.28	2,445.50	7,437.50	6,349.65 N	329.15 E	14,547,432.57	1,677,123.68	0.59	6,348.58	
14,234.00	88.95	359.61	2,447.02	7,439.02	6,439.63 N	329.07 E	14,547,522.56	1,677,123.46	0.77	6,438.57	
14,324.00	88.30	358.93	2,449.18	7,441.18	6,529.60 N	327.92 E	14,547,612.52	1,677,122.19	1.05	6,528.54	
14,413.00	88.21	358.88	2,451.89	7,443.89	6,618.54 N	326.22 E	14,547,701.46	1,677,120.36	0.12	6,617.48	
14,503.00	88.86	359.37	2,454.20	7,446.20	6,708.50 N	324.85 E	14,547,791.42	1,677,118.85	0.90	6,707.45	
14,506.00	88.87	359.33	2,454.25	7,446.25	6,711.50 N	324.81 E	14,547,794.42	1,677,118.81	1.48	6,710.45	Enter 460' Rad 14506.00' MD 7446.25' TVD
14,683.00	89.60	356.81	2,456.61	7,448.61	6,888.37 N	318.85 E	14,547,971.28	1,677,112.59	1.48	6,887.33	
14,772.00	89.94	357.77	2,456.97	7,448.97	6,977.27 N	314.64 E	14,548,060.17	1,677,108.25	1.14	6,976.24	
14,826.00	90.28	357.64	2,456.87	7,448.87	7,031.22 N	312.48 E	14,548,114.12	1,677,106.01	0.67	7,030.21	Last Sperry MWD+IFR+SC Survey @ 14826.00' MD
14,872.00	90.28	357.64	2,456.64	7,448.64	7,077.18 N	310.58 E	14,548,160.08	1,677,104.05	0.00	7,076.17	Straight Line Projection to TD @ 14872.00' MD - Lat: 40.058767° Long: -104.868885° @14872.00MD

## Design Report for Wagner 1N-E10HZ - Final Surveys

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
133.00	133.00	-0.36	-0.19	First Total MWD+IFR Survey @ 132.00' MD (KB 20')
1,840.00	1,791.76	-293.96	162.88	Last Total MWD+IFR Survey @ 1839.00' MD (KB 20')
1,840.00	1,791.76	-293.96	162.88	Tie-On to Last Surface Survey @ 1840.00' MD
1,919.00	1,866.64	-316.99	173.05	First Sperry MWD+IFR+SC Survey @ 1919.00' MD
7,884.00	7,432.98	92.45	354.68	Landed Curve @ 7884.00' MD 85.28° INC 7432.98' TVD
7,884.00	7,432.98	92.45	354.68	Lat: 40.039586° Long: -104.868728° @7884.00MD
8,340.00	7,434.27	548.08	362.94	Exit 460' Rad 8340.00' MD 7434.27' TVD
14,506.00	7,446.25	6,711.50	324.81	Enter 460' Rad 14506.00' MD 7446.25' TVD
14,826.00	7,448.87	7,031.22	312.48	Last Sperry MWD+IFR+SC Survey @ 14826.00' MD
14,872.00	7,448.64	7,077.18	310.58	Straight Line Projection to TD @ 14872.00' MD
14,872.00	7,448.64	7,077.18	310.58	Lat: 40.058767° Long: -104.868885° @14872.00MD

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.82	Slot	0.00	0.00	0.00

### Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
133.00	1,840.00	Total MWD+IFR Surface Surveys	APC_ISCWSA REV 2 MWD+IFR1
1,840.00	14,826.00	Sperry MWD+IFR+SC Surveys	APC_ISCWSA REV 2 MWD+IFR1+SC
14,872.00	14,872.00	PTB	APC_BLIND



## Design Report for Wagner 1N-E10HZ - Final Surveys

### Design 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
Wagner 1N-E10HZ SHL (1639' FNL & 761' FEL Sec 22)	0.00	0.00	0.00	0.00	0.00	14,541,082.45	1,676,803.80	40.039332	-104.869995
- actual wellpath hits target center									
- Point									
Wagner 1N-E10HZ LP_A4 (1696' FNL 420' FEL Sec 22)	0.00	0.00	7,434.00	100.95	342.89	14,541,183.90	1,677,146.54	40.039609	-104.868770
- actual wellpath misses target center by 12.51usft at 7891.78usft MD (7433.58 TVD, 100.17 N, 355.37 E)									
- Point									
Wagner 1N-E10HZ PBHL_A4 (178' FSL 450' FEL Sec 10)	0.00	0.00	7,442.00	7,077.41	321.21	14,548,160.32	1,677,114.68	40.058768	-104.868847
- actual wellpath misses target center by 12.54usft at 14871.82usft MD (7448.64 TVD, 7077.00 N, 310.59 E)									
- Point									

### Directional Difficulty Index

Average Dogleg over Survey:	1.67 °/100usft	Maximum Dogleg over Survey:	9.82 °/100usft at 7,435.00 usft
Net Tortousity applicable to Plans:	0.73 °/100usft	Directional Difficulty Index:	6.622

### Audit Info

## North Reference Sheet for Wagner 8-22HZ Pad - PD 464 - Wagner 1N-E10HZ - Original Wellbore

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

Vertical Depths are relative to KB 21' @ 4992.00usft (Precision 464). Northing and Easting are relative to Wagner 1N-E10HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.000000°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960151

Grid Coordinates of Well: 14,541,082.45 usft N, 1,676,803.80 usft E

Geographical Coordinates of Well: 40° 02' 21.60" N, 104° 52' 11.98" W

Grid Convergence at Surface is: 0.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,872.00usft the Bottom Hole Displacement is 7,083.99usft in the Direction of 2.51° ( True).

Magnetic Convergence at surface is: -8.31° ( 9 October 2017, , BGGM2017)

