

Project: WELD-NAD83-UTMFT13N
Site: 1N-67W-22 Wagner 7-22HZ Pad
Well: WAGNER 28N-E10HZ
Wellbore: Original Wellbore
Design: Final Surveys



HALLIBURTON
Sperry Drilling

US ROCKIES WATTENBERG PLANNING

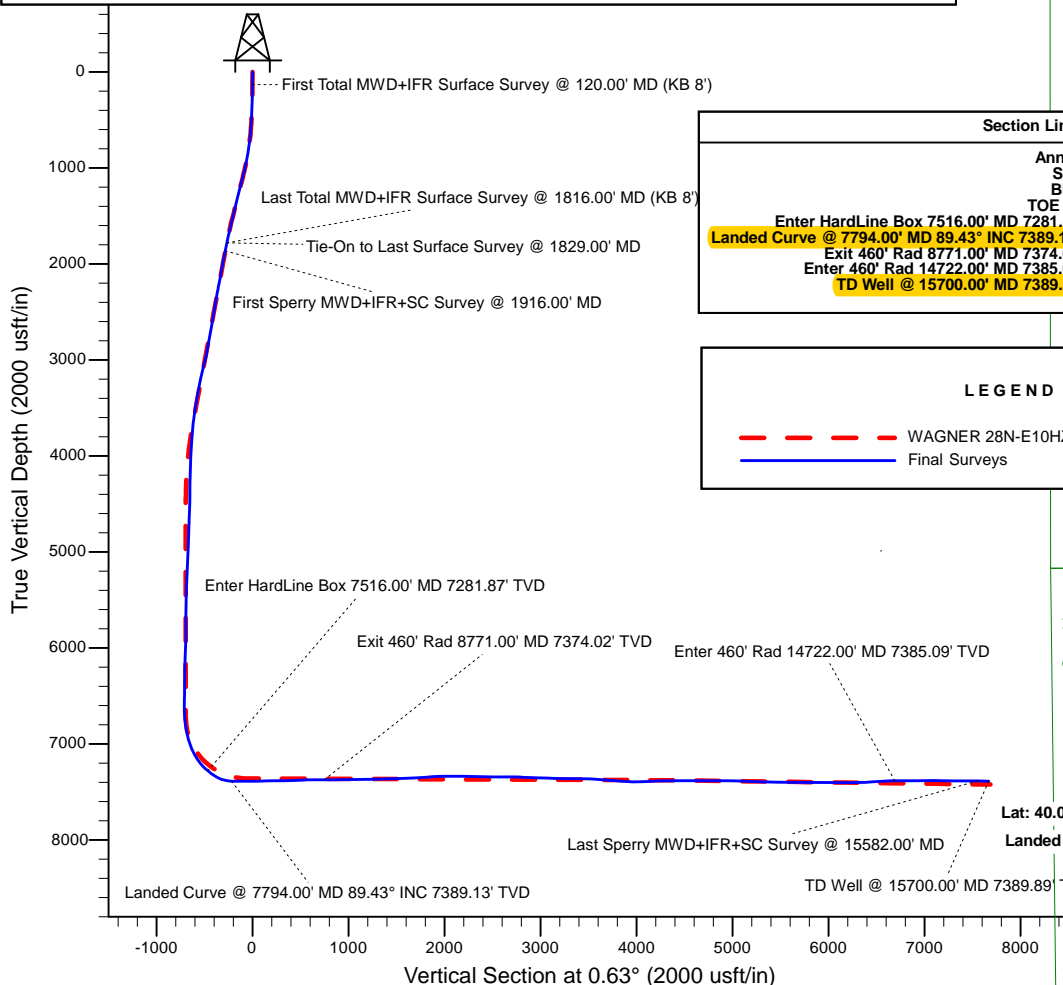
West(-)/East(+) (1200 usft/in)

WAGNER 28N-E10HZ__TOE B3

WELL DETAILS: WAGNER 28N-E10HZ		Design: Final Surveys (WAGNER 28N-E10HZ/Original Wellbore)	
Ground Level: 4974.00 RKB 21' @ 4995.00usft (Precision 464)		Created By: Jerry Popp	Date: 11:44, November 16 2017

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Annotation
13.00	0.00	0.00	13.00	0.00	0.00	KB 8'
133.00	0.22	239.81	133.00	-0.12	-0.20	First Total MWD+IFR Surface Survey @ 120.00' MD (KB 8')
1829.00	17.27	231.81	1781.80	-263.41	-220.91	Last Total MWD+IFR Surface Survey @ 1816.00' MD (KB 8')
1829.00	17.27	231.81	1781.80	-263.41	-220.91	Tie-On to Last Surface Survey @ 1829.00' MD
1916.00	17.24	231.26	1864.89	-279.46	-241.11	First Sperry MWD+IFR+SC Survey @ 1916.00' MD
7516.00	53.35	23.25	7281.87	-457.51	-630.61	Enter HardLine Box 7516.00' MD 7281.87' TVD
7794.00	89.43	349.81	7389.13	-210.63	-626.58	Landed Curve @ 7794.00' MD 89.43° INC 7389.13' TVD
7794.00	89.43	349.81	7389.13	-210.63	-626.58	Lat: 40.038518° Long: -104.875245° @7794.00MD
8771.00	89.63	356.99	7374.02	755.35	-761.04	Exit 460' Rad 8771.00' MD 7374.02' TVD
14722.00	90.74	3.54	7385.09	6699.25	-705.99	Enter 460' Rad 14722.00' MD 7385.09' TVD
15582.00	89.01	0.44	7387.85	7558.59	-677.40	Last Sperry MWD+IFR+SC Survey @ 15582.00' MD
15700.00	89.01	0.44	7389.89	7676.57	-676.50	TD Well @ 15700.00' MD 7389.89' TVD
15700.00	89.01	0.44	7389.89	7676.57	-676.50	Lat: 40.060177° Long: -104.875424° @15700.00MD



Section Line FOOTAGE CALLS

Annotation	Section Line Footage Calls
SHL Plat	1722' FNL, 1604' FEL of Sec 22-T1N-R67W
BHL Plat	800' FSL, 2263' FEL of Sec 10-T1N-R67W
TOE Rev B3	~710' FSL, ~2266' FEL of Sec 10-T1N-R67W
Enter HardLine Box 7516.00' MD 7281.87' TVD	~2177' FNL, ~2234' FEL of Sec 22-T1N-R67W
Landed Curve @ 7794.00' MD 89.43° INC 7389.13' TVD	~1930' FNL, ~2230' FEL of Sec 22-T1N-R67W
Exit 460' Rad 8771.00' MD 7374.02' TVD	~963' FNL, ~2364' FEL of Sec 22-T1N-R67W
Enter 460' Rad 14722.00' MD 7385.09' TVD	~286' FNL, ~2291' FEL of Sec 15-T1N-R67W
TD Well @ 15700.00' MD 7389.89' TVD	~692' FSL, ~2259' FEL of Sec 10-T1N-R67W

LEGEND

- WAGNER 28N-E10HZ, Original Wellbore, Rev B3 V0
- Final Surveys

Sec. 10, T1N R67W

Sec. 15, T1N R67W

Sec. 22, T1N R67W

South(-)/North(+) (1200 usft/in)

Lat: 40.038518° Long: -104.875245° @7794.00MD

Landed Curve @ 7794.00' MD 89.43° INC 7389.13' TVD

Enter HardLine Box 7516.00' MD 7281.87' TVD

Job# 904405885

Precision 464

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N 1N-67W-22 Wagner 7-22HZ Pad (PD 464)

API# 05-123-43469

WAGNER 28N-E10HZ

Original Wellbore

Design: Final Surveys

Sperry Drilling Services

Combo Report

16 November, 2017

Well Coordinates: 40° 02' 20.75" N
104° 52' 22.82" W

North American Datum 1983
Zone 13N (108 W to 102 W)
14,540,995.30 N
1,675,961.17 E

Ground Level: 4,974.00 usft

Local Coordinate Origin:

Centered on Well WAGNER 28N-E10HZ

Viewing Datum:

RKB 21' @ 4995.00usft (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 28N-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	-4,995.00	0.00	0.00 N	0.00 E	14,540,995.30	1,675,961.17	0.00	0.00	
13.00	0.00	0.00	-4,982.00	13.00	0.00 N	0.00 E	14,540,995.30	1,675,961.17	0.00	0.00	KB 8'
133.00	0.22	239.81	-4,862.00	133.00	0.12 S	0.20 W	14,540,995.18	1,675,960.97	0.18	-0.12	First Total MWD+IFR Surface Survey @ 120.00' MD (KB 8')
165.00	0.70	160.62	-4,830.00	165.00	0.33 S	0.19 W	14,540,994.97	1,675,960.98	2.17	-0.33	
197.00	0.75	213.01	-4,798.00	197.00	0.69 S	0.24 W	14,540,994.61	1,675,960.93	2.01	-0.69	
228.00	1.63	198.68	-4,767.01	227.99	1.28 S	0.49 W	14,540,994.02	1,675,960.68	2.97	-1.28	
260.00	2.20	198.77	-4,735.03	259.97	2.29 S	0.83 W	14,540,993.00	1,675,960.34	1.78	-2.30	
323.00	1.85	202.90	-4,672.07	322.93	4.37 S	1.62 W	14,540,990.92	1,675,959.56	0.60	-4.39	
355.00	2.07	213.27	-4,640.09	354.91	5.33 S	2.13 W	14,540,989.96	1,675,959.04	1.30	-5.36	
387.00	2.20	213.01	-4,608.11	386.89	6.33 S	2.79 W	14,540,988.96	1,675,958.39	0.41	-6.36	
419.00	2.90	223.90	-4,576.14	418.86	7.43 S	3.68 W	14,540,987.86	1,675,957.50	2.65	-7.47	
450.00	3.21	230.41	-4,545.18	449.82	8.55 S	4.89 W	14,540,986.74	1,675,956.29	1.50	-8.60	
482.00	4.13	233.75	-4,513.25	481.75	9.80 S	6.51 W	14,540,985.49	1,675,954.67	2.95	-9.87	
514.00	4.26	236.12	-4,481.34	513.66	11.14 S	8.43 W	14,540,984.14	1,675,952.76	0.68	-11.24	
546.00	4.48	226.89	-4,449.43	545.57	12.66 S	10.33 W	14,540,982.62	1,675,950.86	2.30	-12.77	
577.00	5.19	219.68	-4,418.54	576.46	14.57 S	12.11 W	14,540,980.71	1,675,949.08	3.01	-14.70	
608.00	5.71	216.96	-4,387.68	607.32	16.88 S	13.93 W	14,540,978.40	1,675,947.26	1.87	-17.03	
640.00	6.33	220.21	-4,355.86	639.14	19.50 S	16.03 W	14,540,975.78	1,675,945.17	2.21	-19.67	
672.00	7.56	214.06	-4,324.09	670.91	22.59 S	18.35 W	14,540,972.68	1,675,942.86	4.49	-22.79	
703.00	8.35	212.92	-4,293.39	701.61	26.17 S	20.71 W	14,540,969.10	1,675,940.50	2.60	-26.39	
735.00	9.05	211.77	-4,261.76	733.24	30.26 S	23.30 W	14,540,965.01	1,675,937.92	2.25	-30.51	
767.00	9.54	214.32	-4,230.18	764.82	34.59 S	26.12 W	14,540,960.67	1,675,935.10	2.00	-34.87	
798.00	10.77	211.95	-4,199.66	795.34	39.17 S	29.10 W	14,540,956.09	1,675,932.13	4.19	-39.48	
830.00	11.87	213.80	-4,168.29	826.71	44.44 S	32.51 W	14,540,950.81	1,675,928.72	3.62	-44.79	
862.00	12.08	213.80	-4,136.98	858.02	49.96 S	36.21 W	14,540,945.29	1,675,925.04	0.66	-50.35	
893.00	12.17	214.15	-4,106.67	888.33	55.36 S	39.85 W	14,540,939.88	1,675,921.40	0.37	-55.79	
925.00	13.14	213.97	-4,075.45	919.55	61.16 S	43.77 W	14,540,934.07	1,675,917.49	3.03	-61.64	
957.00	13.58	216.17	-4,044.32	950.68	67.21 S	48.02 W	14,540,928.02	1,675,913.25	2.10	-67.74	
988.00	13.89	213.62	-4,014.20	980.80	73.25 S	52.23 W	14,540,921.97	1,675,909.05	2.19	-73.82	
1,020.00	14.55	215.55	-3,983.18	1,011.82	79.72 S	56.69 W	14,540,915.50	1,675,904.59	2.54	-80.34	
1,051.00	15.60	216.08	-3,953.25	1,041.75	86.26 S	61.41 W	14,540,908.95	1,675,899.88	3.42	-86.93	
1,083.00	16.39	216.35	-3,922.49	1,072.51	93.37 S	66.62 W	14,540,901.83	1,675,894.68	2.48	-94.10	
1,114.00	16.35	217.31	-3,892.75	1,102.25	100.36 S	71.86 W	14,540,894.83	1,675,889.45	0.88	-101.15	
1,146.00	16.83	215.99	-3,862.08	1,132.92	107.69 S	77.31 W	14,540,887.49	1,675,884.01	1.91	-108.54	
1,178.00	17.93	215.03	-3,831.54	1,163.46	115.48 S	82.86 W	14,540,879.70	1,675,878.47	3.55	-116.38	
1,210.00	18.15	214.94	-3,801.11	1,193.89	123.59 S	88.54 W	14,540,871.58	1,675,872.80	0.69	-124.56	
1,241.00	18.06	213.18	-3,771.65	1,223.35	131.57 S	93.94 W	14,540,863.59	1,675,867.42	1.79	-132.60	
1,305.00	17.75	216.17	-3,710.75	1,284.25	147.75 S	105.13 W	14,540,847.39	1,675,856.26	1.52	-148.90	
1,336.00	17.80	216.96	-3,681.23	1,313.77	155.35 S	110.76 W	14,540,839.79	1,675,850.63	0.79	-156.56	
1,368.00	17.53	219.33	-3,650.74	1,344.26	162.99 S	116.76 W	14,540,832.14	1,675,844.64	2.40	-164.26	

Design Report for WAGNER 28N-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	17.71	219.60	-3,620.24	1,374.76	170.47 S	122.92 W	14,540,824.65	1,675,838.50	0.62	-171.81	
1,431.00	18.28	221.53	-3,590.75	1,404.25	177.74 S	129.14 W	14,540,817.37	1,675,832.28	2.66	-179.15	
1,463.00	18.02	222.15	-3,560.35	1,434.65	185.17 S	135.79 W	14,540,809.94	1,675,825.64	1.01	-186.65	
1,494.00	18.37	222.85	-3,530.90	1,464.10	192.30 S	142.33 W	14,540,802.79	1,675,819.11	1.33	-193.86	
1,526.00	18.94	221.62	-3,500.58	1,494.42	199.88 S	149.21 W	14,540,795.20	1,675,812.24	2.16	-201.51	
1,558.00	19.07	222.59	-3,470.32	1,524.68	207.61 S	156.20 W	14,540,787.46	1,675,805.27	1.07	-209.32	
1,590.00	19.38	225.31	-3,440.10	1,554.90	215.20 S	163.51 W	14,540,779.87	1,675,797.97	2.96	-216.98	
1,621.00	19.16	226.80	-3,410.84	1,584.16	222.30 S	170.88 W	14,540,772.76	1,675,790.61	1.74	-224.16	
1,652.00	19.03	228.30	-3,381.55	1,613.45	229.14 S	178.36 W	14,540,765.90	1,675,783.14	1.64	-231.09	
1,684.00	18.28	230.93	-3,351.23	1,643.77	235.77 S	186.15 W	14,540,759.26	1,675,775.36	3.52	-237.81	
1,715.00	18.06	232.34	-3,321.77	1,673.23	241.77 S	193.73 W	14,540,753.25	1,675,767.79	1.59	-243.89	
1,747.00	17.62	231.02	-3,291.31	1,703.69	247.85 S	201.42 W	14,540,747.16	1,675,760.10	1.87	-250.05	
1,779.00	17.80	230.93	-3,260.83	1,734.17	253.98 S	208.98 W	14,540,741.02	1,675,752.55	0.57	-256.26	
1,811.00	17.80	232.08	-3,230.36	1,764.64	260.07 S	216.64 W	14,540,734.92	1,675,744.90	1.10	-262.44	
1,829.00	17.27	231.81	-3,213.20	1,781.80	263.41 S	220.91 W	14,540,731.57	1,675,740.64	2.98	-265.83	Last Total MWD+IFR Surface Survey @ 1816.00' MD (KB 8') - Tie-On to Last Surface Survey @ 1829.00' MD
1,916.00	17.24	231.26	-3,130.11	1,864.89	279.46 S	241.11 W	14,540,715.49	1,675,720.45	0.19	-282.10	First Sperry MWD+IFR+SC Survey @ 1916.00' MD
2,006.00	16.48	230.35	-3,043.98	1,951.02	295.96 S	261.35 W	14,540,698.97	1,675,700.25	0.89	-298.81	
2,096.00	16.02	228.13	-2,957.58	2,037.42	312.39 S	280.42 W	14,540,682.51	1,675,681.19	0.86	-315.46	
2,186.00	15.31	225.43	-2,870.92	2,124.08	329.02 S	298.14 W	14,540,665.85	1,675,663.50	1.13	-332.28	
2,276.00	15.82	228.81	-2,784.22	2,210.78	345.44 S	315.83 W	14,540,649.41	1,675,645.83	1.16	-348.89	
2,365.00	18.03	235.25	-2,699.07	2,295.93	361.28 S	336.28 W	14,540,633.54	1,675,625.40	3.25	-364.96	
2,455.00	17.28	236.33	-2,613.31	2,381.69	376.63 S	358.85 W	14,540,618.16	1,675,602.85	0.91	-380.55	
2,545.00	15.41	232.38	-2,526.95	2,468.05	391.34 S	379.45 W	14,540,603.41	1,675,582.28	2.42	-395.49	
2,635.00	15.99	234.32	-2,440.31	2,554.69	405.87 S	398.99 W	14,540,588.86	1,675,562.76	0.87	-410.23	
2,724.00	17.15	237.02	-2,355.00	2,640.00	420.17 S	419.96 W	14,540,574.53	1,675,541.81	1.56	-424.76	
2,814.00	15.98	235.77	-2,268.74	2,726.26	434.36 S	441.33 W	14,540,560.31	1,675,520.46	1.36	-439.18	
2,904.00	16.79	232.48	-2,182.39	2,812.61	449.24 S	461.89 W	14,540,545.40	1,675,499.93	1.37	-454.30	
2,994.00	15.57	228.69	-2,095.96	2,899.04	465.14 S	481.27 W	14,540,529.48	1,675,480.56	1.79	-470.40	
3,083.00	19.13	224.69	-2,011.02	2,983.98	483.39 S	500.51 W	14,540,511.19	1,675,461.36	4.22	-488.87	
3,173.00	18.86	223.85	-1,925.92	3,069.08	504.37 S	520.95 W	14,540,490.19	1,675,440.94	0.43	-510.07	
3,263.00	18.80	229.09	-1,840.73	3,154.27	524.36 S	541.99 W	14,540,470.17	1,675,419.93	1.88	-530.29	
3,353.00	17.05	227.64	-1,755.10	3,239.90	542.75 S	562.70 W	14,540,451.75	1,675,399.24	2.01	-548.90	
3,443.00	17.28	233.89	-1,669.10	3,325.90	559.52 S	583.25 W	14,540,434.95	1,675,378.72	2.06	-565.89	
3,532.00	16.31	235.83	-1,583.90	3,411.10	574.32 S	604.27 W	14,540,420.11	1,675,357.72	1.26	-580.93	
3,622.00	14.10	232.63	-1,497.05	3,497.95	588.08 S	623.44 W	14,540,406.33	1,675,338.57	2.63	-594.90	
3,711.00	11.64	227.98	-1,410.29	3,584.71	600.67 S	638.73 W	14,540,393.72	1,675,323.29	3.00	-607.66	
3,801.00	9.43	228.48	-1,321.81	3,673.19	611.64 S	651.00 W	14,540,382.73	1,675,311.04	2.46	-618.76	
3,891.00	7.71	231.63	-1,232.82	3,762.18	620.27 S	661.25 W	14,540,374.08	1,675,300.80	1.98	-627.51	
3,981.00	6.00	238.04	-1,143.47	3,851.53	626.51 S	669.98 W	14,540,367.83	1,675,292.09	2.08	-633.84	
4,071.00	7.19	243.88	-1,054.06	3,940.94	631.48 S	679.03 W	14,540,362.85	1,675,283.04	1.52	-638.91	

Design Report for WAGNER 28N-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)			
4,160.00	6.86	247.06	-965.73	4,029.27	636.00 S	688.92 W	14,540,358.31	1,675,273.16	0.57	-643.54	
4,250.00	5.59	249.79	-876.26	4,118.74	639.61 S	697.99 W	14,540,354.69	1,675,264.10	1.45	-647.25	
4,340.00	4.90	253.52	-786.64	4,208.36	642.22 S	705.79 W	14,540,352.07	1,675,256.30	0.85	-649.94	
4,430.00	4.52	256.88	-696.94	4,298.06	644.11 S	712.93 W	14,540,350.17	1,675,249.16	0.52	-651.91	
4,519.00	4.34	261.75	-608.21	4,386.79	645.39 S	719.67 W	14,540,348.88	1,675,242.42	0.47	-653.27	
4,609.00	3.99	267.66	-518.45	4,476.55	646.01 S	726.17 W	14,540,348.25	1,675,235.92	0.61	-653.95	
4,699.00	4.02	249.78	-428.66	4,566.34	647.23 S	732.26 W	14,540,347.03	1,675,229.83	1.38	-655.24	
4,789.00	3.42	228.18	-338.85	4,656.15	650.11 S	737.22 W	14,540,344.14	1,675,224.88	1.68	-658.17	
4,878.00	3.82	237.00	-250.03	4,744.97	653.49 S	741.69 W	14,540,340.75	1,675,220.42	0.77	-661.61	
5,058.00	3.23	231.50	-70.37	4,924.63	659.92 S	750.69 W	14,540,334.31	1,675,211.43	0.38	-668.13	
5,148.00	2.90	214.07	19.51	5,014.51	663.38 S	753.94 W	14,540,330.84	1,675,208.17	1.09	-671.63	
5,237.00	3.17	198.66	108.38	5,103.38	667.58 S	755.99 W	14,540,326.64	1,675,206.13	0.96	-675.85	
5,327.00	2.79	193.29	198.26	5,193.26	672.07 S	757.29 W	14,540,322.15	1,675,204.84	0.52	-680.35	
5,417.00	3.07	207.73	288.14	5,283.14	676.33 S	758.92 W	14,540,317.89	1,675,203.22	0.87	-684.63	
5,507.00	2.62	228.14	378.03	5,373.03	679.84 S	761.57 W	14,540,314.38	1,675,200.57	1.22	-688.17	
5,596.00	2.57	242.14	466.94	5,461.94	682.13 S	764.85 W	14,540,312.08	1,675,197.29	0.71	-690.50	
5,686.00	2.59	254.82	556.85	5,551.85	683.60 S	768.60 W	14,540,310.60	1,675,193.55	0.63	-692.01	
5,776.00	2.36	256.13	646.77	5,641.77	684.58 S	772.36 W	14,540,309.62	1,675,189.79	0.26	-693.03	
5,866.00	2.13	261.13	736.70	5,731.70	685.28 S	775.81 W	14,540,308.91	1,675,186.34	0.34	-693.77	
5,933.00	2.25	273.99	803.65	5,798.65	685.38 S	778.35 W	14,540,308.81	1,675,183.80	0.75	-693.90	
5,999.00	2.64	279.39	869.59	5,864.59	685.04 S	781.14 W	14,540,309.14	1,675,181.00	0.69	-693.59	
6,088.00	3.47	239.27	958.47	5,953.47	686.09 S	785.48 W	14,540,308.09	1,675,176.67	2.51	-694.68	
6,178.00	3.23	205.61	1,048.33	6,043.33	689.76 S	788.92 W	14,540,304.41	1,675,173.23	2.17	-698.40	
6,268.00	2.11	210.85	1,138.23	6,133.23	693.47 S	790.87 W	14,540,300.70	1,675,171.29	1.27	-702.13	
6,358.00	1.67	240.25	1,228.18	6,223.18	695.55 S	792.85 W	14,540,298.62	1,675,169.31	1.17	-704.22	
6,447.00	1.82	246.63	1,317.14	6,312.14	696.75 S	795.28 W	14,540,297.41	1,675,166.89	0.28	-705.45	
6,537.00	1.61	250.70	1,407.10	6,402.10	697.73 S	797.78 W	14,540,296.43	1,675,164.38	0.27	-706.46	
6,627.00	1.20	235.00	1,497.07	6,492.07	698.69 S	799.75 W	14,540,295.46	1,675,162.42	0.62	-707.44	
6,717.00	1.08	251.19	1,587.06	6,582.06	699.51 S	801.32 W	14,540,294.65	1,675,160.85	0.38	-708.28	
6,806.00	0.95	237.91	1,676.04	6,671.04	700.17 S	802.74 W	14,540,293.98	1,675,159.43	0.30	-708.95	
6,896.00	6.74	14.55	1,765.85	6,760.85	695.45 S	802.05 W	14,540,298.71	1,675,160.12	8.29	-704.22	
6,986.00	11.70	26.61	1,854.67	6,849.67	682.17 S	796.63 W	14,540,312.00	1,675,165.52	5.89	-690.89	
7,075.00	18.57	30.83	1,940.53	6,935.53	661.91 S	785.31 W	14,540,332.27	1,675,176.81	7.81	-670.50	
7,165.00	23.60	33.98	2,024.48	7,019.48	634.64 S	767.88 W	14,540,359.56	1,675,194.19	5.73	-643.05	
7,255.00	31.50	37.29	2,104.22	7,099.22	600.94 S	743.53 W	14,540,393.30	1,675,218.50	8.94	-609.08	
7,298.00	37.31	41.22	2,139.69	7,134.69	582.18 S	728.12 W	14,540,412.08	1,675,233.88	14.46	-590.15	
7,345.00	41.71	45.54	2,175.95	7,170.95	560.50 S	707.56 W	14,540,433.79	1,675,254.41	11.03	-568.25	
7,390.00	46.48	44.81	2,208.26	7,203.26	538.43 S	685.36 W	14,540,455.89	1,675,276.57	10.66	-545.93	
7,434.00	51.35	38.82	2,237.18	7,232.18	513.70 S	663.33 W	14,540,480.65	1,675,298.58	15.08	-520.96	
7,479.00	53.22	28.67	2,264.75	7,259.75	484.14 S	643.63 W	14,540,510.24	1,675,318.23	18.31	-491.19	
7,509.00	53.36	24.47	2,282.69	7,277.69	462.64 S	632.88 W	14,540,531.75	1,675,328.95	11.23	-469.57	

Design Report for WAGNER 28N-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
Depth (usft)	Inclination (°)	Azimuth (°)	System (usft)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
7,516.00	53.35	23.25	2,286.87	7,281.87	457.51 S	630.61 W	14,540,536.89	1,675,331.22	13.98	-464.41	Enter HardLine Box 7516.00' MD 7281.87' TVD
7,538.00	53.41	19.42	2,299.99	7,294.99	441.06 S	624.18 W	14,540,553.34	1,675,337.62	13.98	-447.90	
7,568.00	55.34	13.81	2,317.47	7,312.47	417.71 S	617.23 W	14,540,576.71	1,675,344.54	16.50	-424.47	
7,598.00	58.02	7.88	2,333.96	7,328.96	393.10 S	612.54 W	14,540,601.32	1,675,349.19	18.77	-399.81	
7,628.00	60.02	1.27	2,349.42	7,344.42	367.49 S	610.50 W	14,540,626.94	1,675,351.19	20.03	-374.18	
7,658.00	64.53	357.13	2,363.37	7,358.37	340.95 S	610.89 W	14,540,653.48	1,675,350.76	19.37	-347.65	
7,688.00	69.54	355.10	2,375.08	7,370.08	313.40 S	612.77 W	14,540,681.02	1,675,348.84	17.82	-320.12	
7,757.00	82.71	351.55	2,391.59	7,386.59	247.03 S	620.60 W	14,540,747.38	1,675,340.92	19.73	-253.84	Landed Curve @ 7794.00' MD 89.43° INC 7389.13' TVD - Lat: 40.038518° Long: -104.875245° @7794.00MD
7,794.00	89.43	349.81	2,394.13	7,389.13	210.63 S	626.58 W	14,540,783.77	1,675,334.89	18.76	-217.51	
7,883.00	90.15	349.21	2,394.45	7,389.45	123.12 S	642.78 W	14,540,871.26	1,675,318.57	1.05	-130.18	
7,973.00	89.98	348.66	2,394.35	7,389.35	34.79 S	660.05 W	14,540,959.56	1,675,301.17	0.64	-42.05	Exit 460' Rad 8771.00' MD 7374.02' TVD
8,063.00	91.57	350.33	2,393.13	7,388.13	53.68 N	676.46 W	14,541,048.02	1,675,284.64	2.56	46.24	
8,153.00	90.82	350.67	2,391.26	7,386.26	142.43 N	691.31 W	14,541,136.74	1,675,269.66	0.91	134.82	
8,243.00	90.19	349.50	2,390.46	7,385.46	231.08 N	706.81 W	14,541,225.37	1,675,254.04	1.48	223.29	
8,333.00	90.73	349.77	2,389.74	7,384.74	319.61 N	723.00 W	14,541,313.87	1,675,237.72	0.67	311.64	
8,422.00	92.16	352.28	2,387.50	7,382.50	407.48 N	736.88 W	14,541,401.73	1,675,223.71	3.24	399.35	
8,512.00	93.17	355.54	2,383.31	7,378.31	496.86 N	746.41 W	14,541,491.10	1,675,214.05	3.79	488.63	
8,602.00	91.49	357.35	2,379.65	7,374.65	586.61 N	751.99 W	14,541,580.83	1,675,208.35	2.74	578.30	
8,692.00	89.81	356.68	2,378.63	7,373.63	676.48 N	756.68 W	14,541,670.69	1,675,203.53	2.01	668.12	
8,771.00	89.63	356.99	2,379.02	7,374.02	755.35 N	761.04 W	14,541,749.57	1,675,199.05	0.45	746.94	
8,782.00	89.60	357.03	2,379.09	7,374.09	766.34 N	761.61 W	14,541,760.55	1,675,198.47	0.45	757.92	
8,876.00	90.23	359.73	2,379.23	7,374.23	860.29 N	764.27 W	14,541,854.50	1,675,195.67	2.95	851.84	
8,970.00	89.94	358.32	2,379.09	7,374.09	954.28 N	765.87 W	14,541,948.48	1,675,193.94	1.53	945.80	
9,064.00	91.57	358.61	2,377.86	7,372.86	1,048.23 N	768.39 W	14,542,042.43	1,675,191.29	1.76	1,039.72	
9,159.00	91.36	358.32	2,375.43	7,370.43	1,143.17 N	770.93 W	14,542,137.36	1,675,188.61	0.38	1,134.62	
9,253.00	90.40	358.30	2,373.98	7,368.98	1,237.11 N	773.70 W	14,542,231.31	1,675,185.70	1.02	1,228.53	
9,347.00	91.92	0.70	2,372.08	7,367.08	1,331.08 N	774.52 W	14,542,325.27	1,675,184.75	3.02	1,322.48	
9,442.00	91.70	0.22	2,369.08	7,364.08	1,426.03 N	773.76 W	14,542,420.22	1,675,185.38	0.56	1,417.44	
9,536.00	90.82	359.43	2,367.01	7,362.01	1,520.01 N	774.05 W	14,542,514.20	1,675,184.95	1.26	1,511.40	
9,630.00	91.78	358.88	2,364.88	7,359.88	1,613.97 N	775.43 W	14,542,608.16	1,675,183.43	1.18	1,605.35	
9,725.00	93.38	0.83	2,360.60	7,355.60	1,708.86 N	775.68 W	14,542,703.05	1,675,183.06	2.65	1,700.23	
9,819.00	95.20	2.86	2,353.57	7,348.57	1,802.54 N	772.66 W	14,542,796.74	1,675,185.94	2.90	1,793.94	
9,913.00	93.84	4.42	2,346.16	7,341.16	1,896.06 N	766.71 W	14,542,890.26	1,675,191.76	2.20	1,887.51	
10,007.00	91.66	2.87	2,341.65	7,336.65	1,989.75 N	760.74 W	14,542,983.96	1,675,197.59	2.84	1,981.27	
10,102.00	89.18	1.83	2,340.96	7,335.96	2,084.66 N	756.85 W	14,543,078.88	1,675,201.35	2.83	2,076.21	
10,196.00	87.67	0.22	2,343.54	7,338.54	2,178.60 N	755.17 W	14,543,172.82	1,675,202.90	2.35	2,170.17	
10,286.00	88.76	359.43	2,346.34	7,341.34	2,268.56 N	755.44 W	14,543,262.78	1,675,202.49	1.50	2,260.11	
10,375.00	90.40	358.88	2,347.00	7,342.00	2,357.54 N	756.75 W	14,543,351.76	1,675,201.06	1.94	2,349.08	
10,465.00	89.43	358.44	2,347.13	7,342.13	2,447.52 N	758.86 W	14,543,441.73	1,675,198.82	1.18	2,439.02	
10,555.00	89.43	359.38	2,348.02	7,343.02	2,537.49 N	760.57 W	14,543,531.70	1,675,196.98	1.04	2,528.98	

Design Report for WAGNER 28N-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)			
10,645.00	89.68	359.97	2,348.72	7,343.72	2,627.49 N	761.08 W	14,543,621.70	1,675,196.34	0.71	2,618.96	
10,734.00	89.14	2.51	2,349.64	7,344.64	2,716.46 N	759.16 W	14,543,710.67	1,675,198.14	2.92	2,707.94	
10,914.00	86.83	2.59	2,355.97	7,350.97	2,896.15 N	751.15 W	14,543,890.38	1,675,205.89	1.28	2,887.72	
11,004.00	88.47	1.61	2,359.66	7,354.66	2,986.01 N	747.86 W	14,543,980.24	1,675,209.05	2.12	2,977.61	
11,093.00	88.47	1.33	2,362.04	7,357.04	3,074.95 N	745.58 W	14,544,069.18	1,675,211.21	0.31	3,066.57	
11,183.00	88.43	1.14	2,364.47	7,359.47	3,164.90 N	743.64 W	14,544,159.13	1,675,213.02	0.22	3,156.53	
11,273.00	88.80	0.75	2,366.65	7,361.65	3,254.86 N	742.15 W	14,544,249.10	1,675,214.38	0.60	3,246.50	
11,363.00	89.85	3.20	2,367.71	7,362.71	3,344.79 N	739.05 W	14,544,339.03	1,675,217.35	2.96	3,336.46	
11,542.00	88.13	5.79	2,370.86	7,365.86	3,523.19 N	725.03 W	14,544,517.45	1,675,231.12	1.74	3,515.01	
11,632.00	86.06	3.25	2,375.42	7,370.42	3,612.78 N	717.94 W	14,544,607.05	1,675,238.08	3.64	3,604.67	
11,812.00	85.23	0.97	2,389.09	7,384.09	3,792.13 N	711.33 W	14,544,786.41	1,675,244.43	1.34	3,784.08	
11,901.00	85.45	359.55	2,396.32	7,391.32	3,880.83 N	710.93 W	14,544,875.11	1,675,244.71	1.61	3,872.78	
11,991.00	87.92	358.18	2,401.53	7,396.53	3,970.66 N	712.71 W	14,544,964.93	1,675,242.80	3.14	3,962.58	
12,081.00	93.00	355.47	2,400.81	7,395.81	4,060.48 N	717.69 W	14,545,054.75	1,675,237.69	6.40	4,052.34	
12,171.00	93.13	356.31	2,395.99	7,390.99	4,150.12 N	724.14 W	14,545,144.38	1,675,231.12	0.94	4,141.90	
12,261.00	91.82	358.61	2,392.11	7,387.11	4,239.94 N	728.12 W	14,545,234.19	1,675,227.01	2.94	4,231.67	
12,350.00	90.57	359.94	2,390.25	7,385.25	4,328.91 N	729.24 W	14,545,323.16	1,675,225.75	2.05	4,320.63	
12,440.00	90.31	359.65	2,389.56	7,384.56	4,418.90 N	729.57 W	14,545,413.15	1,675,225.30	0.43	4,410.61	
12,530.00	89.77	359.11	2,389.50	7,384.50	4,508.90 N	730.54 W	14,545,503.15	1,675,224.20	0.85	4,500.59	
12,620.00	89.68	358.26	2,389.93	7,384.93	4,598.87 N	732.61 W	14,545,593.12	1,675,222.01	0.95	4,590.54	
12,710.00	89.77	359.54	2,390.36	7,385.36	4,688.85 N	734.33 W	14,545,683.10	1,675,220.15	1.43	4,680.49	
12,799.00	90.86	359.93	2,389.87	7,384.87	4,777.85 N	734.75 W	14,545,772.09	1,675,219.61	1.30	4,769.48	
12,889.00	89.22	359.79	2,389.81	7,384.81	4,867.84 N	734.97 W	14,545,862.09	1,675,219.26	1.83	4,859.47	
12,979.00	89.47	2.24	2,390.84	7,385.84	4,957.82 N	733.37 W	14,545,952.06	1,675,220.73	2.74	4,949.45	
13,069.00	88.93	1.49	2,392.09	7,387.09	5,047.76 N	730.44 W	14,546,042.01	1,675,223.53	1.03	5,039.42	
13,159.00	88.59	1.32	2,394.04	7,389.04	5,137.71 N	728.24 W	14,546,131.96	1,675,225.61	0.42	5,129.39	
13,248.00	88.34	1.09	2,396.43	7,391.43	5,226.66 N	726.37 W	14,546,220.92	1,675,227.35	0.38	5,218.36	
13,338.00	87.32	0.67	2,399.83	7,394.83	5,316.58 N	724.98 W	14,546,310.84	1,675,228.61	1.23	5,308.29	
13,428.00	87.63	0.86	2,403.80	7,398.80	5,406.49 N	723.78 W	14,546,400.75	1,675,229.68	0.40	5,398.20	
13,518.00	89.27	1.26	2,406.23	7,401.23	5,496.44 N	722.12 W	14,546,490.70	1,675,231.21	1.88	5,488.16	
13,607.00	90.52	2.49	2,406.40	7,401.40	5,585.38 N	719.21 W	14,546,579.65	1,675,234.00	1.97	5,577.14	
13,697.00	90.02	1.89	2,405.97	7,400.97	5,675.32 N	715.77 W	14,546,669.59	1,675,237.31	0.87	5,667.10	
13,787.00	89.85	1.57	2,406.07	7,401.07	5,765.28 N	713.05 W	14,546,759.55	1,675,239.90	0.40	5,757.09	
13,877.00	89.64	1.04	2,406.47	7,401.47	5,855.25 N	711.00 W	14,546,849.53	1,675,241.82	0.63	5,847.08	
13,967.00	89.39	359.63	2,407.24	7,402.24	5,945.24 N	710.47 W	14,546,939.52	1,675,242.22	1.59	5,937.07	
14,056.00	89.31	359.26	2,408.25	7,403.25	6,034.23 N	711.34 W	14,547,028.51	1,675,241.23	0.43	6,026.05	
14,146.00	88.97	358.45	2,409.60	7,404.60	6,124.20 N	713.14 W	14,547,118.48	1,675,239.30	0.98	6,115.99	
14,236.00	90.52	358.20	2,410.00	7,405.00	6,214.16 N	715.77 W	14,547,208.43	1,675,236.54	1.74	6,205.92	
14,326.00	91.03	358.37	2,408.78	7,403.78	6,304.11 N	718.46 W	14,547,298.38	1,675,233.72	0.60	6,295.83	
14,416.00	93.13	0.05	2,405.51	7,400.51	6,394.04 N	719.70 W	14,547,388.30	1,675,232.35	2.99	6,385.74	
14,505.00	93.93	2.46	2,400.03	7,395.03	6,482.84 N	717.76 W	14,547,477.11	1,675,234.17	2.85	6,474.56	

Design Report for WAGNER 28N-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)			
14,595.00	93.34	3.08	2,394.33	7,389.33	6,572.55 N	713.41 W	14,547,566.83	1,675,238.38	0.95	6,564.31	
14,685.00	91.24	3.49	2,390.73	7,385.73	6,662.33 N	708.26 W	14,547,656.61	1,675,243.41	2.38	6,654.14	
14,722.00	90.74	3.54	2,390.09	7,385.09	6,699.25 N	705.99 W	14,547,693.54	1,675,245.62	1.36	6,691.09	Enter 460' Rad 14722.00' MD 7385.09' TVD
14,775.00	90.02	3.61	2,389.74	7,384.74	6,752.15 N	702.69 W	14,547,746.44	1,675,248.85	1.36	6,744.01	
14,864.00	89.98	2.89	2,389.74	7,384.74	6,841.00 N	697.64 W	14,547,835.30	1,675,253.77	0.81	6,832.92	
14,954.00	90.31	2.29	2,389.51	7,384.51	6,930.91 N	693.58 W	14,547,925.21	1,675,257.71	0.76	6,922.87	
15,044.00	90.90	1.36	2,388.56	7,383.56	7,020.86 N	690.71 W	14,548,015.17	1,675,260.45	1.22	7,012.84	
15,134.00	89.56	2.96	2,388.20	7,383.20	7,110.79 N	687.32 W	14,548,105.10	1,675,263.71	2.32	7,102.80	
15,224.00	88.43	2.45	2,389.78	7,384.78	7,200.67 N	683.07 W	14,548,194.99	1,675,267.83	1.38	7,192.73	
15,313.00	89.73	1.05	2,391.21	7,386.21	7,289.62 N	680.35 W	14,548,283.94	1,675,270.42	2.15	7,281.70	
15,403.00	89.77	0.66	2,391.60	7,386.60	7,379.61 N	679.01 W	14,548,373.93	1,675,271.64	0.44	7,371.69	
15,493.00	89.81	0.48	2,391.93	7,386.93	7,469.60 N	678.12 W	14,548,463.92	1,675,272.40	0.20	7,461.69	
15,582.00	89.01	0.44	2,392.85	7,387.85	7,558.59 N	677.40 W	14,548,552.92	1,675,272.99	0.90	7,550.69	Last Sperry MWD+IFR+SC Survey @ 15582.00' MD
15,700.00	89.01	0.44	2,394.89	7,389.89	7,676.57 N	676.50 W	14,548,670.90	1,675,273.73	0.00	7,668.67	TD Well @ 15700.00' MD 7389.89' TVD - Lat: 40.060177° Long: -104.875424° @15700.00MD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
13.00	13.00	0.00	0.00	KB 8'
133.00	133.00	-0.12	-0.20	First Total MWD+IFR Surface Survey @ 120.00' MD (KB 8')
1,829.00	1,781.80	-263.41	-220.91	Last Total MWD+IFR Surface Survey @ 1816.00' MD (KB 8')
1,829.00	1,781.80	-263.41	-220.91	Tie-On to Last Surface Survey @ 1829.00' MD
1,916.00	1,864.89	-279.46	-241.11	First Sperry MWD+IFR+SC Survey @ 1916.00' MD
7,516.00	7,281.87	-457.51	-630.61	Enter HardLine Box 7516.00' MD 7281.87' TVD
7,794.00	7,389.13	-210.63	-626.58	Landed Curve @ 7794.00' MD 89.43° INC 7389.13' TVD
7,794.00	7,389.13	-210.63	-626.58	Lat: 40.038518° Long: -104.875245° @7794.00MD
8,771.00	7,374.02	755.35	-761.04	Exit 460' Rad 8771.00' MD 7374.02' TVD
14,722.00	7,385.09	6,699.25	-705.99	Enter 460' Rad 14722.00' MD 7385.09' TVD
15,582.00	7,387.85	7,558.59	-677.40	Last Sperry MWD+IFR+SC Survey @ 15582.00' MD
15,700.00	7,389.89	7,676.57	-676.50	TD Well @ 15700.00' MD 7389.89' TVD
15,700.00	7,389.89	7,676.57	-676.50	Lat: 40.060177° Long: -104.875424° @15700.00MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.63	Slot	0.00	0.00	0.00

Design Report for WAGNER 28N-E10HZ - Final Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	1,829.00	Total MWD+IFR Surface Surveys	APC_ISCWSA REV 2 MWD+IFR1
1,829.00	15,582.00	Sperry MWD+IFR+SC Surveys	APC_ISCWSA REV 2 MWD+IFR1+SC
15,700.00	15,700.00	PTB	APC_BLIND

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,850.00	~ 9 5/8"		9-5/8	13-1/2

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 28N-E10HZ__SHL ()	0.00	0.00	0.00	0.00	0.00	14,540,995.30	1,675,961.17	40.039096	-104.873006
- actual wellpath hits target center									
- Point									
WAGNER 28N-E10HZ__BHL PLAT ()	0.00	0.00	0.00	7,784.68	-680.15	14,548,779.00	1,675,269.92	40.060474	-104.875437
- actual wellpath misses target center by 7390.65usft at 15680.38usft MD (7389.55 TVD, 7656.95 N, -676.65 E)									
- Point									
WAGNER 28N-E10HZ__INT 4300VS B3 ()	0.00	0.00	7,379.00	4,308.16	-718.20	14,545,302.43	1,675,236.83	40.050927	-104.875572
- actual wellpath misses target center by 12.76usft at 12329.25usft MD (7385.51 TVD, 4308.16 N, -729.17 E)									
- Point									
WAGNER 28N-E10HZ__TOE B3 ()	0.00	0.00	7,423.81	7,694.99	-684.40	14,548,689.31	1,675,265.80	40.060228	-104.875452
- actual wellpath misses target center by 39.40usft at 15700.00usft MD (7389.89 TVD, 7676.57 N, -676.50 E)									
- Point									

Design Report for WAGNER 28N-E10HZ - Final Surveys

Directional Difficulty Index

Average Dogleg over Survey: 2.17 °/100usft

Maximum Dogleg over Survey: 20.03 °/100usft at 7,628.00
usft

Net Tortosity applicable to Plans: 1.27 °/100usft

Directional Difficulty Index: 6.839

Audit Info

North Reference Sheet for 1N-67W-22 Wagner 7-22HZ Pad (PD 464) - WAGNER 28N-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 RKB 21' @ 4995.00usft (Precision 464). Northing and Easting are relative to WAGNER 28N-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: 0.99960144

Grid Coordinates of Well: 14,540,995.30 usft N, 1,675,961.17 usft E

Geographical Coordinates of Well: 40° 02' 20.75" N, 104° 52' 22.82" W

Grid Convergence at Surface is: 0.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,700.00usft the Bottom Hole Displacement is 7,706.32usft in the Direction of 354.96° (True).

Magnetic Convergence at surface is: -8.30° (21 November 2017, , BGGM2017)

