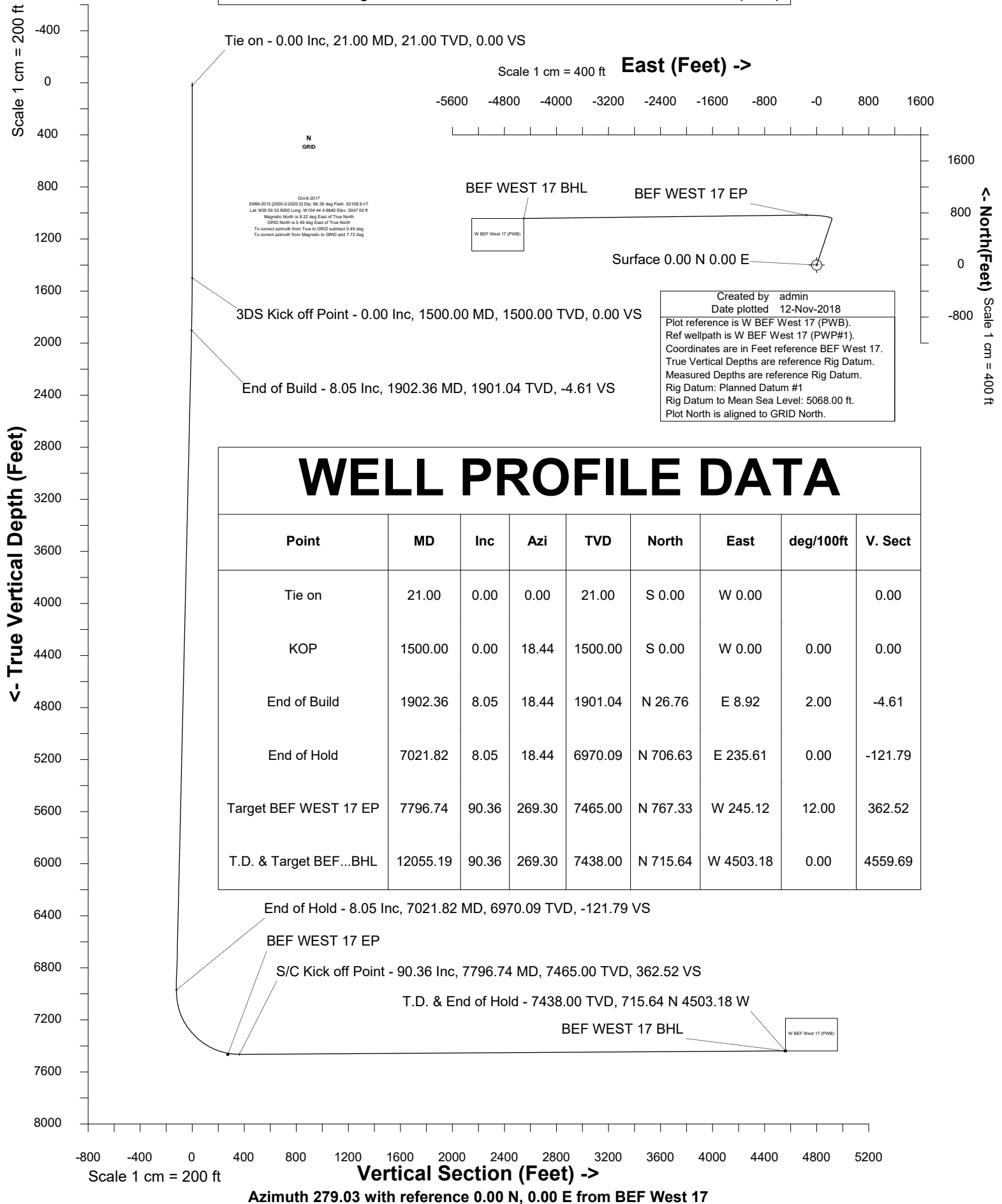


Petro Operating Company

Location	Weld County, CO	Slot	BEF West 17
Field	Wattenberg	Well	W BEF West 17
Installation	Brighton East Farm Pad	Wellbore	W BEF West 17 (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: W BEF West 17 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
BEF West 17	39.99472000	-104.73470000	1241848.7163	3214415.4808	717.59N	9.00W	0.00

Declination		
Date	Source	Time
Oct-6-2017	EMM-2015 [2000.0-2020.0]	14:35

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Brighton East Farm Pad	39.99275000	-104.73469000	1241131.1481	3214424.4758	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	Vertical Depth SS	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
21.00	0.00	0.000	21.00	-5047.00	0.00N	0.00E		0.00
1500.00	0.00	18.440	1500.00	-3568.00	0.00N	0.00E	==>	0.00
1902.36	8.05	18.440	1901.04	-3166.96	26.76N	8.92E	2.00	-4.61
7021.82	8.05	18.440	6970.09	1902.09	706.63N	235.61E	==>	-121.79
7796.74	90.36	269.300	7465.00	2397.00	767.33N	245.12W	12.00	362.52
12055.19	90.36	269.300	7438.00	2370.00	715.64N	4503.18W	==>	4559.69

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	39.99472000	-104.73470000
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
1500.00	0.00	18.440	1500.00	0.00N	0.00E	==>	0.00	39.99472000	-104.73470000
1600.00	2.00	18.440	1599.98	1.66N	0.55E	2.00	-0.29	39.99472453	-104.73469798
1700.00	4.00	18.440	1699.84	6.62N	2.21E	2.00	-1.14	39.99473812	-104.73469192
1800.00	6.00	18.440	1799.45	14.89N	4.96E	2.00	-2.57	39.99476075	-104.73468183
1900.00	8.00	18.440	1898.70	26.45N	8.82E	2.00	-4.56	39.99479239	-104.73466771
1902.36	8.05	18.440	1901.04	26.76N	8.92E	2.00	-4.61	39.99479325	-104.73466733
2000.00	8.05	18.440	1997.72	39.73N	13.25E	==>	-6.85	39.99482874	-104.73465150
2100.00	8.05	18.440	2096.73	53.01N	17.67E	==>	-9.14	39.99486509	-104.73463529
2200.00	8.05	18.440	2195.75	66.29N	22.10E	==>	-11.42	39.99490144	-104.73461908
2300.00	8.05	18.440	2294.76	79.57N	26.53E	==>	-13.71	39.99493779	-104.73460286
2400.00	8.05	18.440	2393.78	92.85N	30.96E	==>	-16.00	39.99497413	-104.73458665
2500.00	8.05	18.440	2492.79	106.13N	35.39E	==>	-18.29	39.99501048	-104.73457044
2600.00	8.05	18.440	2591.81	119.41N	39.81E	==>	-20.58	39.99504683	-104.73455423
2700.00	8.05	18.440	2690.82	132.69N	44.24E	==>	-22.87	39.99508318	-104.73453801
2800.00	8.05	18.440	2789.84	145.97N	48.67E	==>	-25.16	39.99511953	-104.73452180
2900.00	8.05	18.440	2888.85	159.25N	53.10E	==>	-27.45	39.99515588	-104.73450559

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Vertical Section is from 0.00N 0.00E on azimuth 279.030 degrees
Bottom hole distance is 4559.69 Feet on azimuth 279.03 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 12-Nov-2018

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
3000.00	8.05	18.440	2987.87	172.53N	57.53E	==>	-29.74	39.99519223	-104.73448938
3100.00	8.05	18.440	3086.89	185.81N	61.95E	==>	-32.02	39.99522858	-104.73447316
3200.00	8.05	18.440	3185.90	199.09N	66.38E	==>	-34.31	39.99526493	-104.73445695
3300.00	8.05	18.440	3284.92	212.37N	70.81E	==>	-36.60	39.99530128	-104.73444074
3400.00	8.05	18.440	3383.93	225.65N	75.24E	==>	-38.89	39.99533762	-104.73442453
3500.00	8.05	18.440	3482.95	238.93N	79.67E	==>	-41.18	39.99537397	-104.73440831
3600.00	8.05	18.440	3581.96	252.21N	84.09E	==>	-43.47	39.99541032	-104.73439210
3700.00	8.05	18.440	3680.98	265.49N	88.52E	==>	-45.76	39.99544667	-104.73437589
3800.00	8.05	18.440	3779.99	278.77N	92.95E	==>	-48.05	39.99548302	-104.73435967
3900.00	8.05	18.440	3879.01	292.05N	97.38E	==>	-50.33	39.99551937	-104.73434346
4000.00	8.05	18.440	3978.02	305.33N	101.81E	==>	-52.62	39.99555572	-104.73432725
4100.00	8.05	18.440	4077.04	318.61N	106.23E	==>	-54.91	39.99559207	-104.73431104
4200.00	8.05	18.440	4176.05	331.89N	110.66E	==>	-57.20	39.99562842	-104.73429482
4300.00	8.05	18.440	4275.07	345.17N	115.09E	==>	-59.49	39.99566477	-104.73427861
4400.00	8.05	18.440	4374.08	358.45N	119.52E	==>	-61.78	39.99570111	-104.73426240
4500.00	8.05	18.440	4473.10	371.73N	123.95E	==>	-64.07	39.99573746	-104.73424619
4600.00	8.05	18.440	4572.11	385.01N	128.37E	==>	-66.36	39.99577381	-104.73422997
4700.00	8.05	18.440	4671.13	398.29N	132.80E	==>	-68.64	39.99581016	-104.73421376
4800.00	8.05	18.440	4770.15	411.57N	137.23E	==>	-70.93	39.99584651	-104.73419755
4900.00	8.05	18.440	4869.16	424.85N	141.66E	==>	-73.22	39.99588286	-104.73418133
5000.00	8.05	18.440	4968.18	438.13N	146.09E	==>	-75.51	39.99591921	-104.73416512
5100.00	8.05	18.440	5067.19	451.41N	150.51E	==>	-77.80	39.99595556	-104.73414891
5200.00	8.05	18.440	5166.21	464.69N	154.94E	==>	-80.09	39.99599191	-104.73413270
5300.00	8.05	18.440	5265.22	477.97N	159.37E	==>	-82.38	39.99602826	-104.73411648
5400.00	8.05	18.440	5364.24	491.25N	163.80E	==>	-84.67	39.99606460	-104.73410027
5500.00	8.05	18.440	5463.25	504.53N	168.23E	==>	-86.96	39.99610095	-104.73408406
5600.00	8.05	18.440	5562.27	517.81N	172.65E	==>	-89.24	39.99613730	-104.73406784
5700.00	8.05	18.440	5661.28	531.09N	177.08E	==>	-91.53	39.99617365	-104.73405163
5800.00	8.05	18.440	5760.30	544.37N	181.51E	==>	-93.82	39.99621000	-104.73403542
5900.00	8.05	18.440	5859.31	557.65N	185.94E	==>	-96.11	39.99624635	-104.73401920
6000.00	8.05	18.440	5958.33	570.94N	190.37E	==>	-98.40	39.99628270	-104.73400299
6100.00	8.05	18.440	6057.34	584.22N	194.79E	==>	-100.69	39.99631905	-104.73398678
6200.00	8.05	18.440	6156.36	597.50N	199.22E	==>	-102.98	39.99635540	-104.73397057
6300.00	8.05	18.440	6255.37	610.78N	203.65E	==>	-105.27	39.99639175	-104.73395435
6400.00	8.05	18.440	6354.39	624.06N	208.08E	==>	-107.55	39.99642809	-104.73393814
6500.00	8.05	18.440	6453.41	637.34N	212.51E	==>	-109.84	39.99646444	-104.73392193
6600.00	8.05	18.440	6552.42	650.62N	216.93E	==>	-112.13	39.99650079	-104.73390571
6700.00	8.05	18.440	6651.44	663.90N	221.36E	==>	-114.42	39.99653714	-104.73388950
6800.00	8.05	18.440	6750.45	677.18N	225.79E	==>	-116.71	39.99657349	-104.73387329
6900.00	8.05	18.440	6849.47	690.46N	230.22E	==>	-119.00	39.99660984	-104.73385707
7000.00	8.05	18.440	6948.48	703.74N	234.65E	==>	-121.29	39.99664619	-104.73384086
7021.82	8.05	18.440	6970.09	706.63N	235.61E	==>	-121.79	39.99665412	-104.73383732
7100.00	10.16	317.530	7047.44	716.94N	232.68E	12.00	-117.27	39.99668247	-104.73384747
7200.00	20.19	290.660	7143.94	729.58N	210.49E	12.00	-93.38	39.99671770	-104.73392627
7300.00	31.60	281.900	7233.78	741.11N	168.56E	12.00	-50.15	39.99675035	-104.73407558
7400.00	43.30	277.500	7313.05	751.03N	108.71E	12.00	10.51	39.99677899	-104.73428889
7500.00	55.11	274.700	7378.27	758.89N	33.56E	12.00	85.97	39.99680236	-104.73455685
7600.00	66.97	272.610	7426.60	764.37N	53.61W	12.00	172.91	39.99681945	-104.73486778
7700.00	78.86	270.860	7455.93	767.21N	148.98W	12.00	267.54	39.99682951	-104.73520807
7796.74	90.36	269.300	7465.00	767.33N	245.12W	12.00	362.52	39.99683213	-104.73555121
7800.00	90.36	269.300	7464.98	767.30N	248.38W	==>	365.73	39.99683210	-104.73556286
7900.00	90.36	269.300	7464.35	766.08N	348.37W	==>	464.29	39.99683113	-104.73591977
8000.00	90.36	269.300	7463.71	764.87N	448.36W	==>	562.85	39.99683016	-104.73627667
8100.00	90.36	269.300	7463.08	763.65N	548.36W	==>	661.41	39.99682920	-104.73663358
8200.00	90.36	269.300	7462.44	762.44N	648.35W	==>	759.98	39.99682823	-104.73699049
8300.00	90.36	269.300	7461.81	761.23N	748.34W	==>	858.54	39.99682726	-104.73734740
8400.00	90.36	269.300	7461.18	760.01N	848.33W	==>	957.10	39.99682628	-104.73770431
8500.00	90.36	269.300	7460.54	758.80N	948.32W	==>	1055.66	39.99682531	-104.73806122

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Vertical Section is from 0.00N 0.00E on azimuth 279.030 degrees
Bottom hole distance is 4559.69 Feet on azimuth 279.03 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 12-Nov-2018



SYSDRILL
Well Design Combined Report
Wellbore: W BEF West 17 (PWB)



Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
8600.00	90.36	269.300	7459.91	757.58N	1048.31W	==>	1154.22	39.99682434	-104.73841813
8700.00	90.36	269.300	7459.27	756.37N	1148.30W	==>	1252.78	39.99682336	-104.73877503
8800.00	90.36	269.300	7458.64	755.16N	1248.29W	==>	1351.34	39.99682239	-104.73913194
8900.00	90.36	269.300	7458.00	753.94N	1348.28W	==>	1449.90	39.99682141	-104.73948885
9000.00	90.36	269.300	7457.37	752.73N	1448.27W	==>	1548.46	39.99682043	-104.73984576
9100.00	90.36	269.300	7456.74	751.52N	1548.26W	==>	1647.02	39.99681945	-104.74020267
9200.00	90.36	269.300	7456.10	750.30N	1648.25W	==>	1745.58	39.99681847	-104.74055958
9300.00	90.36	269.300	7455.47	749.09N	1748.24W	==>	1844.15	39.99681749	-104.74091648
9400.00	90.36	269.300	7454.83	747.87N	1848.23W	==>	1942.71	39.99681650	-104.74127339
9500.00	90.36	269.300	7454.20	746.66N	1948.22W	==>	2041.27	39.99681552	-104.74163030
9600.00	90.36	269.300	7453.57	745.45N	2048.21W	==>	2139.83	39.99681453	-104.74198721
9700.00	90.36	269.300	7452.93	744.23N	2148.21W	==>	2238.39	39.99681355	-104.74234412
9800.00	90.36	269.300	7452.30	743.02N	2248.20W	==>	2336.95	39.99681256	-104.74270103
9900.00	90.36	269.300	7451.66	741.80N	2348.19W	==>	2435.51	39.99681157	-104.74305793
10000.00	90.36	269.300	7451.03	740.59N	2448.18W	==>	2534.07	39.99681058	-104.74341484
10100.00	90.36	269.300	7450.40	739.38N	2548.17W	==>	2632.63	39.99680959	-104.74377175
10200.00	90.36	269.300	7449.76	738.16N	2648.16W	==>	2731.19	39.99680860	-104.74412866
10300.00	90.36	269.300	7449.13	736.95N	2748.15W	==>	2829.75	39.99680761	-104.74448557
10400.00	90.36	269.300	7448.49	735.73N	2848.14W	==>	2928.32	39.99680661	-104.74484248
10500.00	90.36	269.300	7447.86	734.52N	2948.13W	==>	3026.88	39.99680562	-104.74519938
10600.00	90.36	269.300	7447.23	733.31N	3048.12W	==>	3125.44	39.99680462	-104.74555629
10700.00	90.36	269.300	7446.59	732.09N	3148.11W	==>	3224.00	39.99680362	-104.74591320
10800.00	90.36	269.300	7445.96	730.88N	3248.10W	==>	3322.56	39.99680263	-104.74627011
10900.00	90.36	269.300	7445.32	729.67N	3348.09W	==>	3421.12	39.99680163	-104.74662702
11000.00	90.36	269.300	7444.69	728.45N	3448.08W	==>	3519.68	39.99680063	-104.74698393
11100.00	90.36	269.300	7444.06	727.24N	3548.07W	==>	3618.24	39.99679962	-104.74734083
11200.00	90.36	269.300	7443.42	726.02N	3648.06W	==>	3716.80	39.99679862	-104.74769774
11300.00	90.36	269.300	7442.79	724.81N	3748.06W	==>	3815.36	39.99679762	-104.74805465
11400.00	90.36	269.300	7442.15	723.60N	3848.05W	==>	3913.92	39.99679661	-104.74841156
11500.00	90.36	269.300	7441.52	722.38N	3948.04W	==>	4012.48	39.99679561	-104.74876847
11600.00	90.36	269.300	7440.89	721.17N	4048.03W	==>	4111.05	39.99679460	-104.74912537
11700.00	90.36	269.300	7440.25	719.95N	4148.02W	==>	4209.61	39.99679359	-104.74948228
11800.00	90.36	269.300	7439.62	718.74N	4248.01W	==>	4308.17	39.99679258	-104.74983919
11900.00	90.36	269.300	7438.98	717.53N	4348.00W	==>	4406.73	39.99679157	-104.75019610
12000.00	90.36	269.300	7438.35	716.31N	4447.99W	==>	4505.29	39.99679056	-104.75055301
12055.19	90.36	269.300	7438.00	715.64N	4503.18W	==>	4559.69	39.99679000	-104.75075000

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Vertical Section is from 0.00N 0.00E on azimuth 279.030 degrees
Bottom hole distance is 4559.69 Feet on azimuth 279.03 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 12-Nov-2018



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
BEF WEST 17 BHL	715.64N	4503.18W	7438.00	39.99679000	-104.75075000	1242564.33	3209912.46
BEF WEST 17 EP	767.33N	155.12W	7465.00	39.99683000	-104.73523000	1242616.02	3214260.36

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
577668	Planned	2000.00	1997.72	WdW Rate Gyro	Standard	
577667	Planned	12055.19	7438.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes