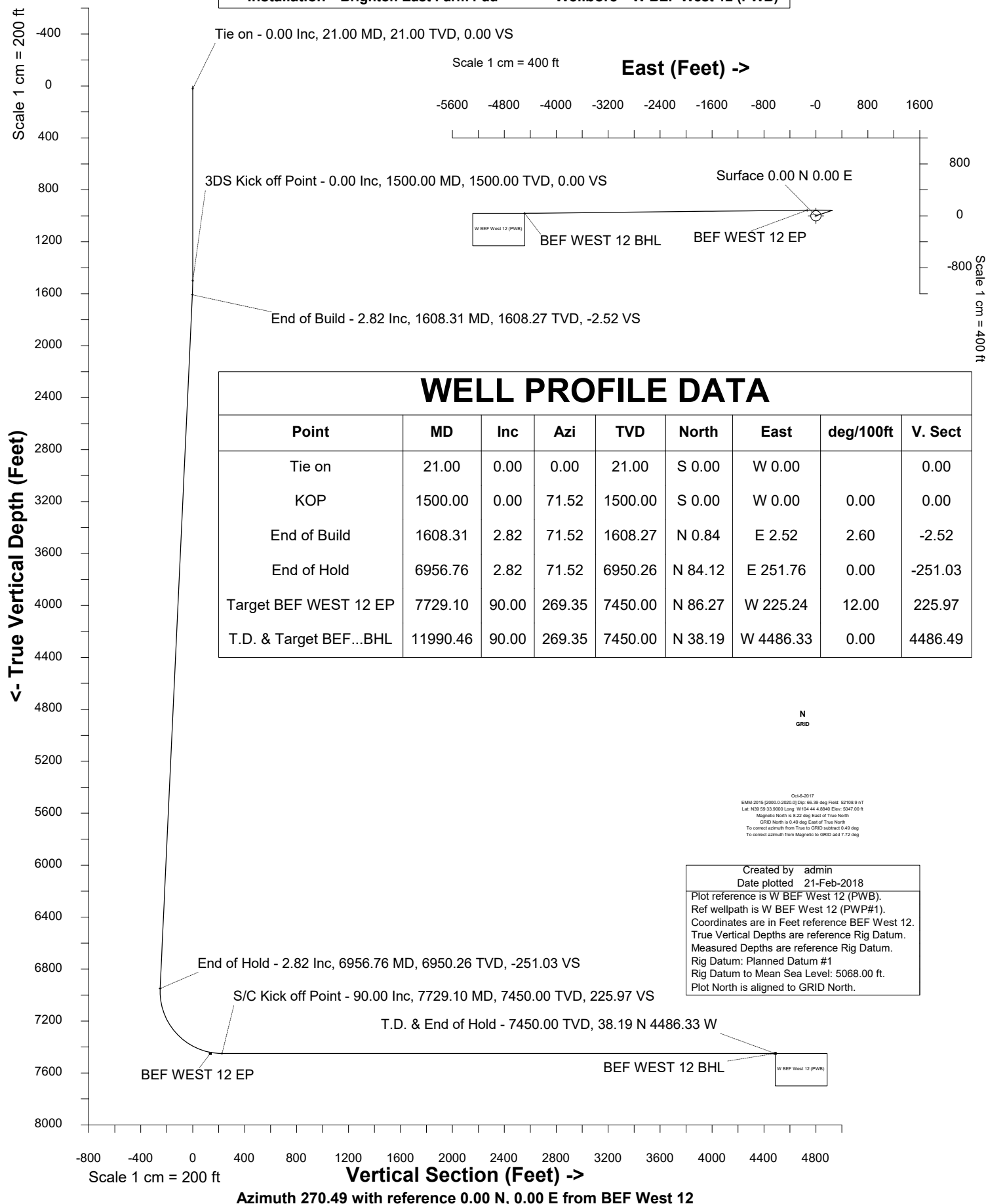


Petro Operating Company

Location	Weld County, CO	Slot	BEF West 12
Field	Wattenberg	Well	W BEF West 12
Installation	Brighton East Farm Pad	Wellbore	W BEF West 12 (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: W BEF West 12 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
BEF West 12	39.99349000	-104.73470000	1241400.6764	3214419.3476	269.54N	5.13W	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	71.520	1500.00	-3568.00	0.00N	0.00E	==>	0.00
1608.31	2.82	71.520	1608.27	-3459.73	0.84N	2.52E	2.60	-2.52
6956.76	2.82	71.520	6950.26	1882.26	84.12N	251.76E	==>	-251.03
7729.10	90.00	269.350	7450.00	2382.00	86.27N	225.24W	12.00	225.97
11990.46	90.00	269.350	7450.00	2382.00	38.19N	4486.33W	==>	4486.49

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	39.99349000	-104.73470000
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
1500.00	0.00	71.520	1500.00	0.00N	0.00E	==>	0.00	39.99349000	-104.73470000
1600.00	2.60	71.520	1599.97	0.72N	2.15E	2.60	-2.15	39.99349192	-104.73469230
1700.00	2.82	71.520	1699.85	2.27N	6.80E	==>	-6.78	39.99349607	-104.73467567
1800.00	2.82	71.520	1799.72	3.83N	11.46E	==>	-11.42	39.99350024	-104.73465900
1900.00	2.82	71.520	1899.60	5.39N	16.12E	==>	-16.07	39.99350440	-104.73464232
2000.00	2.82	71.520	1999.48	6.94N	20.78E	==>	-20.72	39.99350856	-104.73462564
2100.00	2.82	71.520	2099.36	8.50N	25.44E	==>	-25.36	39.99351273	-104.73460896
2200.00	2.82	71.520	2199.24	10.06N	30.10E	==>	-30.01	39.99351689	-104.73459228
2300.00	2.82	71.520	2299.12	11.61N	34.76E	==>	-34.66	39.99352105	-104.73457560
2400.00	2.82	71.520	2399.00	13.17N	39.42E	==>	-39.30	39.99352522	-104.73455892
2500.00	2.82	71.520	2498.88	14.73N	44.08E	==>	-43.95	39.99352938	-104.73454225
2600.00	2.82	71.520	2598.76	16.28N	48.74E	==>	-48.60	39.99353355	-104.73452557
2700.00	2.82	71.520	2698.64	17.84N	53.40E	==>	-53.24	39.99353771	-104.73450889
2800.00	2.82	71.520	2798.52	19.40N	58.06E	==>	-57.89	39.99354187	-104.73449221
2900.00	2.82	71.520	2898.40	20.96N	62.72E	==>	-62.53	39.99354604	-104.73447553
3000.00	2.82	71.520	2998.28	22.51N	67.38E	==>	-67.18	39.99355020	-104.73445885
3100.00	2.82	71.520	3098.15	24.07N	72.04E	==>	-71.83	39.99355436	-104.73444217
3200.00	2.82	71.520	3198.03	25.63N	76.70E	==>	-76.47	39.99355853	-104.73442550

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5068.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 270.490 degrees
Bottom hole distance is 4486.49 Feet on azimuth 270.49 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 21-Feb-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)
3300.00	2.82	71.520	3297.91	27.18N	81.36E	==>	-81.12	39.99356269	-104.73440882
3400.00	2.82	71.520	3397.79	28.74N	86.01E	==>	-85.77	39.99356685	-104.73439214
3500.00	2.82	71.520	3497.67	30.30N	90.67E	==>	-90.41	39.99357102	-104.73437546
3600.00	2.82	71.520	3597.55	31.85N	95.33E	==>	-95.06	39.99357518	-104.73435878
3700.00	2.82	71.520	3697.43	33.41N	99.99E	==>	-99.71	39.99357934	-104.73434210
3800.00	2.82	71.520	3797.31	34.97N	104.65E	==>	-104.35	39.99358351	-104.73432542
3900.00	2.82	71.520	3897.19	36.53N	109.31E	==>	-109.00	39.99358767	-104.73430875
4000.00	2.82	71.520	3997.07	38.08N	113.97E	==>	-113.65	39.99359183	-104.73429207
4100.00	2.82	71.520	4096.95	39.64N	118.63E	==>	-118.29	39.99359600	-104.73427539
4200.00	2.82	71.520	4196.83	41.20N	123.29E	==>	-122.94	39.99360016	-104.73425871
4300.00	2.82	71.520	4296.71	42.75N	127.95E	==>	-127.59	39.99360433	-104.73424203
4400.00	2.82	71.520	4396.58	44.31N	132.61E	==>	-132.23	39.99360849	-104.73422535
4500.00	2.82	71.520	4496.46	45.87N	137.27E	==>	-136.88	39.99361265	-104.73420867
4600.00	2.82	71.520	4596.34	47.42N	141.93E	==>	-141.52	39.99361682	-104.73419199
4700.00	2.82	71.520	4696.22	48.98N	146.59E	==>	-146.17	39.99362098	-104.73417532
4800.00	2.82	71.520	4796.10	50.54N	151.25E	==>	-150.82	39.99362514	-104.73415864
4900.00	2.82	71.520	4895.98	52.10N	155.91E	==>	-155.46	39.99362931	-104.73414196
5000.00	2.82	71.520	4995.86	53.65N	160.57E	==>	-160.11	39.99363347	-104.73412528
5100.00	2.82	71.520	5095.74	55.21N	165.23E	==>	-164.76	39.99363763	-104.73410860
5200.00	2.82	71.520	5195.62	56.77N	169.89E	==>	-169.40	39.99364180	-104.73409192
5300.00	2.82	71.520	5295.50	58.32N	174.55E	==>	-174.05	39.99364596	-104.73407524
5400.00	2.82	71.520	5395.38	59.88N	179.21E	==>	-178.70	39.99365012	-104.73405857
5500.00	2.82	71.520	5495.26	61.44N	183.87E	==>	-183.34	39.99365429	-104.73404189
5600.00	2.82	71.520	5595.14	62.99N	188.53E	==>	-187.99	39.99365845	-104.73402521
5700.00	2.82	71.520	5695.01	64.55N	193.19E	==>	-192.64	39.99366261	-104.73400853
5800.00	2.82	71.520	5794.89	66.11N	197.85E	==>	-197.28	39.99366678	-104.73399185
5900.00	2.82	71.520	5894.77	67.67N	202.51E	==>	-201.93	39.99367094	-104.73397517
6000.00	2.82	71.520	5994.65	69.22N	207.17E	==>	-206.58	39.99367511	-104.73395849
6100.00	2.82	71.520	6094.53	70.78N	211.83E	==>	-211.22	39.99367927	-104.73394182
6200.00	2.82	71.520	6194.41	72.34N	216.49E	==>	-215.87	39.99368343	-104.73392514
6300.00	2.82	71.520	6294.29	73.89N	221.15E	==>	-220.52	39.99368760	-104.73390846
6400.00	2.82	71.520	6394.17	75.45N	225.81E	==>	-225.16	39.99369176	-104.73389178
6500.00	2.82	71.520	6494.05	77.01N	230.47E	==>	-229.81	39.99369592	-104.73387510
6600.00	2.82	71.520	6593.93	78.56N	235.13E	==>	-234.45	39.99370009	-104.73385842
6700.00	2.82	71.520	6693.81	80.12N	239.79E	==>	-239.10	39.99370425	-104.73384174
6800.00	2.82	71.520	6793.69	81.68N	244.45E	==>	-243.75	39.99370841	-104.73382506
6900.00	2.82	71.520	6893.57	83.24N	249.11E	==>	-248.39	39.99371258	-104.73380839
7000.00	2.65	288.330	6993.48	84.77N	251.81E	12.00	-251.08	39.99371673	-104.73379171
7100.00	14.53	272.680	7092.19	86.09N	237.03E	12.00	-236.29	39.99372070	-104.73385141
7200.00	26.52	271.080	7185.67	87.10N	202.05E	12.00	-201.30	39.99372431	-104.73397623
7300.00	38.52	270.440	7269.83	87.77N	148.39E	12.00	-147.64	39.99372740	-104.73416769
7400.00	50.51	270.060	7341.01	88.05N	78.41E	12.00	-77.66	39.99372984	-104.73441744
7500.00	62.51	269.800	7396.09	87.94N	4.83W	12.00	5.58	39.99373151	-104.73471454
7600.00	74.51	269.590	7432.65	87.44N	97.71W	12.00	98.45	39.99373234	-104.73504602
7700.00	86.51	269.410	7449.11	86.58N	196.16W	12.00	196.89	39.99373231	-104.73539740
7800.00	90.00	269.350	7450.00	85.47N	296.13W	==>	296.85	39.99373161	-104.73575423
7900.00	90.00	269.350	7450.00	84.34N	396.13W	==>	396.83	39.99373088	-104.73611113
8000.00	90.00	269.350	7450.00	83.21N	496.12W	==>	496.81	39.99373015	-104.73646803
8100.00	90.00	269.350	7450.00	82.08N	596.11W	==>	596.79	39.99372941	-104.73682493
8200.00	90.00	269.350	7450.00	80.95N	696.11W	==>	696.77	39.99372868	-104.73718183
8300.00	90.00	269.350	7450.00	79.82N	796.10W	==>	796.75	39.99372794	-104.73753873
8400.00	90.00	269.350	7450.00	78.70N	896.09W	==>	896.73	39.99372720	-104.73789563
8500.00	90.00	269.350	7450.00	77.57N	996.09W	==>	996.71	39.99372647	-104.73825253
8600.00	90.00	269.350	7450.00	76.44N	1096.08W	==>	1096.69	39.99372573	-104.73860943
8700.00	90.00	269.350	7450.00	75.31N	1196.08W	==>	1196.67	39.99372499	-104.73896634
8800.00	90.00	269.350	7450.00	74.18N	1296.07W	==>	1296.65	39.99372424	-104.73932324
8900.00	90.00	269.350	7450.00	73.06N	1396.06W	==>	1396.63	39.99372350	-104.73968014
9000.00	90.00	269.350	7450.00	71.93N	1496.06W	==>	1496.61	39.99372276	-104.74003704

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5068.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 270.490 degrees
Bottom hole distance is 4486.49 Feet on azimuth 270.49 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 21-Feb-2018



SYSDRILL
Well Design Combined Report
Wellbore: W BEF West 12 (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)
9100.00	90.00	269.350	7450.00	70.80N	1596.05W	==>	1596.59	39.99372201	-104.74039394
9200.00	90.00	269.350	7450.00	69.67N	1696.04W	==>	1696.58	39.99372127	-104.74075084
9300.00	90.00	269.350	7450.00	68.54N	1796.04W	==>	1796.56	39.99372052	-104.74110774
9400.00	90.00	269.350	7450.00	67.41N	1896.03W	==>	1896.54	39.99371977	-104.74146464
9500.00	90.00	269.350	7450.00	66.29N	1996.02W	==>	1996.52	39.99371902	-104.74182154
9600.00	90.00	269.350	7450.00	65.16N	2096.02W	==>	2096.50	39.99371827	-104.74217844
9700.00	90.00	269.350	7450.00	64.03N	2196.01W	==>	2196.48	39.99371752	-104.74253534
9800.00	90.00	269.350	7450.00	62.90N	2296.01W	==>	2296.46	39.99371677	-104.74289224
9900.00	90.00	269.350	7450.00	61.77N	2396.00W	==>	2396.44	39.99371601	-104.74324914
10000.00	90.00	269.350	7450.00	60.64N	2495.99W	==>	2496.42	39.99371526	-104.74360604
10100.00	90.00	269.350	7450.00	59.52N	2595.99W	==>	2596.40	39.99371450	-104.74396294
10200.00	90.00	269.350	7450.00	58.39N	2695.98W	==>	2696.38	39.99371374	-104.74431984
10300.00	90.00	269.350	7450.00	57.26N	2795.97W	==>	2796.36	39.99371299	-104.74467674
10400.00	90.00	269.350	7450.00	56.13N	2895.97W	==>	2896.34	39.99371223	-104.74503364
10500.00	90.00	269.350	7450.00	55.00N	2995.96W	==>	2996.32	39.99371147	-104.74539054
10600.00	90.00	269.350	7450.00	53.88N	3095.95W	==>	3096.30	39.99371070	-104.74574744
10700.00	90.00	269.350	7450.00	52.75N	3195.95W	==>	3196.28	39.99370994	-104.74610434
10800.00	90.00	269.350	7450.00	51.62N	3295.94W	==>	3296.26	39.99370918	-104.74646124
10900.00	90.00	269.350	7450.00	50.49N	3395.94W	==>	3396.24	39.99370841	-104.74681814
11000.00	90.00	269.350	7450.00	49.36N	3495.93W	==>	3496.22	39.99370765	-104.74717504
11100.00	90.00	269.350	7450.00	48.23N	3595.92W	==>	3596.20	39.99370688	-104.74753194
11200.00	90.00	269.350	7450.00	47.11N	3695.92W	==>	3696.18	39.99370611	-104.74788884
11300.00	90.00	269.350	7450.00	45.98N	3795.91W	==>	3796.16	39.99370534	-104.74824574
11400.00	90.00	269.350	7450.00	44.85N	3895.90W	==>	3896.14	39.99370457	-104.74860264
11500.00	90.00	269.350	7450.00	43.72N	3995.90W	==>	3996.12	39.99370380	-104.74895954
11600.00	90.00	269.350	7450.00	42.59N	4095.89W	==>	4096.11	39.99370303	-104.74931644
11700.00	90.00	269.350	7450.00	41.47N	4195.88W	==>	4196.09	39.99370225	-104.74967334
11800.00	90.00	269.350	7450.00	40.34N	4295.88W	==>	4296.07	39.99370148	-104.75003024
11900.00	90.00	269.350	7450.00	39.21N	4395.87W	==>	4396.05	39.99370070	-104.75038714
11990.46	90.00	269.350	7450.00	38.19N	4486.33W	==>	4486.49	39.99370000	-104.75071000

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Bottom hole distance is 4486.49 Feet on azimuth 270.49 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 21-Feb-2018



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
BEF WEST 12 BHL	38.19N	4486.33W	7450.00	39.99370000	-104.75071000	1241438.86	3209933.18
BEF WEST 12 EP	86.27N	135.24W	7450.00	39.99373000	-104.73518000	1241486.94	3214284.11

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
577633	Planned	2000.00	1999.48	WdW Rate Gyro	Standard	
577632	Planned	11990.46	7450.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes