

# Petro Operating Company

Location Weld County, CO Slot BEF West 11  
Field Wattenberg Well W BEF West 11  
Installation Brighton East Farm Pad Wellbore W BEF West 11 (PWB)

Tie on - 0.00 Inc, 21.00 MD, 21.00 TVD, -0.00 VS

Scale 1 cm = 400 ft

East (Feet) ->

-5600 -4800 -4000 -3200 -2400 -1600 -800 -0 800 1600

3DS Kick off Point - 0.00 Inc, 1500.00 MD, 1500.00 TVD, -0.00 VS

BEF WEST 11 BHL

BEF WEST 11 EP

Surface 0.00 N 0.00 E

W BEF West 11 (PWB)

End of Build - 2.67 Inc, 1611.37 MD, 1611.33 TVD, -2.53 VS

Scale 1 cm = 400 ft  
800  
0  
-800

## WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	21.00	0.00	0.00	21.00	S 0.00	W 0.00		-0.00
KOP	1500.00	0.00	101.65	1500.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1611.37	2.67	101.65	1611.33	S 0.52	E 2.54	2.40	-2.53
End of Hold	7154.88	2.67	101.65	7148.80	S 52.72	E 255.73	0.00	-254.35
Target BEF WEST 11 EP	7926.64	90.00	269.35	7648.00	S 63.06	W 221.15	12.00	222.65
T.D. & Target BEF...BHL	12188.03	90.00	269.35	7648.00	S 111.14	W 4482.27	0.00	4483.64

N  
GRID

Oct-6-2017  
EMMA-2015 (2000.0-2020.0) Dip: 98.39 deg Field: 52108.9 nT  
Lat: N39 59 33.9000 Long: W104 44 4.8840 Elev: 5047.00 ft  
Magnetic North is 8.22 deg East of True North  
GRID North is 0.49 deg East of True North  
To correct azimuth from True to GRID subtract 0.49 deg  
To correct azimuth from Magnetic to GRID add 7.72 deg

Created by admin  
Date plotted 21-Feb-2018

Plot reference is W BEF West 11 (PWB).  
Ref wellpath is W BEF West 11 (PWP#1).  
Coordinates are in Feet reference BEF West 11.  
True Vertical Depths are reference Rig Datum.  
Measured Depths are reference Rig Datum.  
Rig Datum: Planned Datum #1  
Rig Datum to Mean Sea Level: 5068.00 ft.  
Plot North is aligned to GRID North.

End of Hold - 2.67 Inc, 7154.88 MD, 7148.80 TVD, -254.35 VS

S/C Kick off Point - 90.00 Inc, 7926.64 MD, 7648.00 TVD, 222.65 VS

T.D. & End of Hold - 7648.00 TVD, 111.14 S 4482.27 W

BEF WEST 11 EP

BEF WEST 11 BHL

W BEF West 11 (PWB)

Scale 1 cm = 200 ft  
-400  
0  
400  
800  
1200  
1600  
2000  
2400  
2800  
3200  
3600  
4000  
4400  
4800  
5200  
5600  
6000  
6400  
6800  
7200  
7600  
8000

<- True Vertical Depth (Feet)

-800 -400 0 400 800 1200 1600 2000 2400 2800 3200 3600 4000 4400 4800

Scale 1 cm = 200 ft

Vertical Section (Feet) ->

Azimuth 268.58 with reference 0.00 N, 0.00 E from BEF West 11



SYSDRILL  
Well Design Combined Report  
Wellbore: W BEF West 11 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
BEF West 11	39.99345000	-104.73470000	1241386.1060	3214419.4734	254.97N	5.00W	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	101.650	1500.00	-3568.00	0.00N	0.00E	==>	0.00
1611.37	2.67	101.650	1611.33	-3456.67	0.52S	2.54E	2.40	-2.53
7154.88	2.67	101.650	7148.80	2080.80	52.72S	255.73E	==>	-254.35
7926.64	90.00	269.350	7648.00	2580.00	63.06S	221.15W	12.00	222.65
12188.03	90.00	269.350	7648.00	2580.00	111.14S	4482.27W	==>	4483.64

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	39.99345000	-104.73470000
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
1500.00	0.00	101.650	1500.00	0.00N	0.00E	==>	0.00	39.99345000	-104.73470000
1600.00	2.40	101.650	1599.97	0.42S	2.05E	2.40	-2.04	39.99344879	-104.73469269
1700.00	2.67	101.650	1699.86	1.36S	6.59E	==>	-6.56	39.99344611	-104.73467652
1800.00	2.67	101.650	1799.75	2.30S	11.16E	==>	-11.10	39.99344342	-104.73466025
1900.00	2.67	101.650	1899.65	3.24S	15.73E	==>	-15.64	39.99344073	-104.73464397
2000.00	2.67	101.650	1999.54	4.18S	20.29E	==>	-20.18	39.99343804	-104.73462770
2100.00	2.67	101.650	2099.43	5.13S	24.86E	==>	-24.73	39.99343534	-104.73461143
2200.00	2.67	101.650	2199.32	6.07S	29.43E	==>	-29.27	39.99343265	-104.73459516
2300.00	2.67	101.650	2299.21	7.01S	34.00E	==>	-33.81	39.99342996	-104.73457889
2400.00	2.67	101.650	2399.10	7.95S	38.56E	==>	-38.35	39.99342726	-104.73456262
2500.00	2.67	101.650	2498.99	8.89S	43.13E	==>	-42.90	39.99342457	-104.73454635
2600.00	2.67	101.650	2598.88	9.83S	47.70E	==>	-47.44	39.99342188	-104.73453008
2700.00	2.67	101.650	2698.78	10.77S	52.26E	==>	-51.98	39.99341919	-104.73451381
2800.00	2.67	101.650	2798.67	11.72S	56.83E	==>	-56.52	39.99341649	-104.73449753
2900.00	2.67	101.650	2898.56	12.66S	61.40E	==>	-61.07	39.99341380	-104.73448126
3000.00	2.67	101.650	2998.45	13.60S	65.97E	==>	-65.61	39.99341111	-104.73446499
3100.00	2.67	101.650	3098.34	14.54S	70.53E	==>	-70.15	39.99340842	-104.73444872

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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 268.580 degrees  
Bottom hole distance is 4483.64 Feet on azimuth 268.58 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)
3200.00	2.67	101.650	3198.23	15.48S	75.10E	==>	-74.69	39.99340572	-104.73443245
3300.00	2.67	101.650	3298.12	16.42S	79.67E	==>	-79.24	39.99340303	-104.73441618
3400.00	2.67	101.650	3398.01	17.37S	84.24E	==>	-83.78	39.99340034	-104.73439991
3500.00	2.67	101.650	3497.90	18.31S	88.80E	==>	-88.32	39.99339764	-104.73438364
3600.00	2.67	101.650	3597.80	19.25S	93.37E	==>	-92.86	39.99339495	-104.73436737
3700.00	2.67	101.650	3697.69	20.19S	97.94E	==>	-97.41	39.99339226	-104.73435110
3800.00	2.67	101.650	3797.58	21.13S	102.51E	==>	-101.95	39.99338957	-104.73433482
3900.00	2.67	101.650	3897.47	22.07S	107.07E	==>	-106.49	39.99338687	-104.73431855
4000.00	2.67	101.650	3997.36	23.01S	111.64E	==>	-111.03	39.99338418	-104.73430228
4100.00	2.67	101.650	4097.25	23.96S	116.21E	==>	-115.58	39.99338149	-104.73428601
4200.00	2.67	101.650	4197.14	24.90S	120.77E	==>	-120.12	39.99337879	-104.73426974
4300.00	2.67	101.650	4297.03	25.84S	125.34E	==>	-124.66	39.99337610	-104.73425347
4400.00	2.67	101.650	4396.93	26.78S	129.91E	==>	-129.21	39.99337341	-104.73423720
4500.00	2.67	101.650	4496.82	27.72S	134.48E	==>	-133.75	39.99337072	-104.73422093
4600.00	2.67	101.650	4596.71	28.66S	139.04E	==>	-138.29	39.99336802	-104.73420466
4700.00	2.67	101.650	4696.60	29.61S	143.61E	==>	-142.83	39.99336533	-104.73418838
4800.00	2.67	101.650	4796.49	30.55S	148.18E	==>	-147.38	39.99336264	-104.73417211
4900.00	2.67	101.650	4896.38	31.49S	152.75E	==>	-151.92	39.99335994	-104.73415584
5000.00	2.67	101.650	4996.27	32.43S	157.31E	==>	-156.46	39.99335725	-104.73413957
5100.00	2.67	101.650	5096.16	33.37S	161.88E	==>	-161.00	39.99335456	-104.73412330
5200.00	2.67	101.650	5196.06	34.31S	166.45E	==>	-165.55	39.99335187	-104.73410703
5300.00	2.67	101.650	5295.95	35.25S	171.01E	==>	-170.09	39.99334917	-104.73409076
5400.00	2.67	101.650	5395.84	36.20S	175.58E	==>	-174.63	39.99334648	-104.73407449
5500.00	2.67	101.650	5495.73	37.14S	180.15E	==>	-179.17	39.99334379	-104.73405822
5600.00	2.67	101.650	5595.62	38.08S	184.72E	==>	-183.72	39.99334109	-104.73404195
5700.00	2.67	101.650	5695.51	39.02S	189.28E	==>	-188.26	39.99333840	-104.73402567
5800.00	2.67	101.650	5795.40	39.96S	193.85E	==>	-192.80	39.99333571	-104.73400940
5900.00	2.67	101.650	5895.29	40.90S	198.42E	==>	-197.34	39.99333302	-104.73399313
6000.00	2.67	101.650	5995.19	41.85S	202.99E	==>	-201.89	39.99333032	-104.73397686
6100.00	2.67	101.650	6095.08	42.79S	207.55E	==>	-206.43	39.99332763	-104.73396059
6200.00	2.67	101.650	6194.97	43.73S	212.12E	==>	-210.97	39.99332494	-104.73394432
6300.00	2.67	101.650	6294.86	44.67S	216.69E	==>	-215.51	39.99332224	-104.73392805
6400.00	2.67	101.650	6394.75	45.61S	221.25E	==>	-220.06	39.99331955	-104.73391178
6500.00	2.67	101.650	6494.64	46.55S	225.82E	==>	-224.60	39.99331686	-104.73389551
6600.00	2.67	101.650	6594.53	47.49S	230.39E	==>	-229.14	39.99331417	-104.73387923
6700.00	2.67	101.650	6694.42	48.44S	234.96E	==>	-233.68	39.99331147	-104.73386296
6800.00	2.67	101.650	6794.31	49.38S	239.52E	==>	-238.23	39.99330878	-104.73384669
6900.00	2.67	101.650	6894.21	50.32S	244.09E	==>	-242.77	39.99330609	-104.73383042
7000.00	2.67	101.650	6994.10	51.26S	248.66E	==>	-247.31	39.99330339	-104.73381415
7100.00	2.67	101.650	7093.99	52.20S	253.23E	==>	-251.85	39.99330070	-104.73379788
7200.00	2.86	257.880	7193.91	53.17S	255.66E	12.00	-254.27	39.99329799	-104.73378161
7300.00	14.81	267.200	7292.55	54.32S	240.40E	12.00	-238.98	39.99329519	-104.73384373
7400.00	26.81	268.230	7385.85	55.65S	204.96E	12.00	-203.52	39.99329239	-104.73397024
7500.00	38.81	268.650	7469.75	57.09S	150.89E	12.00	-149.43	39.99328971	-104.73416324
7600.00	50.81	268.890	7540.57	58.59S	80.57E	12.00	-79.09	39.99328726	-104.73441427
7700.00	62.80	269.060	7595.22	60.08S	2.95W	12.00	4.44	39.99328516	-104.73471237
7800.00	74.80	269.200	7631.30	61.48S	96.00W	12.00	97.50	39.99328350	-104.73504451
7900.00	86.80	269.320	7647.26	62.75S	194.53W	12.00	196.02	39.99328235	-104.73539617
8000.00	90.00	269.350	7648.00	63.89S	294.51W	==>	296.00	39.99328159	-104.73575302
8100.00	90.00	269.350	7648.00	65.02S	394.50W	==>	395.99	39.99328086	-104.73610992
8200.00	90.00	269.350	7648.00	66.15S	494.49W	==>	495.98	39.99328013	-104.73646682
8300.00	90.00	269.350	7648.00	67.27S	594.49W	==>	595.97	39.99327940	-104.73682372
8400.00	90.00	269.350	7648.00	68.40S	694.48W	==>	695.96	39.99327866	-104.73718061
8500.00	90.00	269.350	7648.00	69.53S	794.48W	==>	795.95	39.99327792	-104.73753751
8600.00	90.00	269.350	7648.00	70.66S	894.47W	==>	895.95	39.99327719	-104.73789441
8700.00	90.00	269.350	7648.00	71.79S	994.46W	==>	995.94	39.99327645	-104.73825131
8800.00	90.00	269.350	7648.00	72.92S	1094.46W	==>	1095.93	39.99327571	-104.73860821
8900.00	90.00	269.350	7648.00	74.04S	1194.45W	==>	1195.92	39.99327497	-104.73896510

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Vertical Section is from 0.00N 0.00E on azimuth 268.580 degrees  
Bottom hole distance is 4483.64 Feet on azimuth 268.58 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 11 (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)
9000.00	90.00	269.350	7648.00	75.17S	1294.44W	==>	1295.91	39.99327423	-104.73932200
9100.00	90.00	269.350	7648.00	76.30S	1394.44W	==>	1395.90	39.99327348	-104.73967890
9200.00	90.00	269.350	7648.00	77.43S	1494.43W	==>	1495.89	39.99327274	-104.74003580
9300.00	90.00	269.350	7648.00	78.56S	1594.42W	==>	1595.88	39.99327199	-104.74039270
9400.00	90.00	269.350	7648.00	79.69S	1694.42W	==>	1695.87	39.99327125	-104.74074959
9500.00	90.00	269.350	7648.00	80.81S	1794.41W	==>	1795.86	39.99327050	-104.74110649
9600.00	90.00	269.350	7648.00	81.94S	1894.41W	==>	1895.85	39.99326975	-104.74146339
9700.00	90.00	269.350	7648.00	83.07S	1994.40W	==>	1995.85	39.99326900	-104.74182029
9800.00	90.00	269.350	7648.00	84.20S	2094.39W	==>	2095.84	39.99326825	-104.74217719
9900.00	90.00	269.350	7648.00	85.33S	2194.39W	==>	2195.83	39.99326750	-104.74253408
10000.00	90.00	269.350	7648.00	86.45S	2294.38W	==>	2295.82	39.99326675	-104.74289098
10100.00	90.00	269.350	7648.00	87.58S	2394.37W	==>	2395.81	39.99326599	-104.74324788
10200.00	90.00	269.350	7648.00	88.71S	2494.37W	==>	2495.80	39.99326524	-104.74360478
10300.00	90.00	269.350	7648.00	89.84S	2594.36W	==>	2595.79	39.99326448	-104.74396168
10400.00	90.00	269.350	7648.00	90.97S	2694.35W	==>	2695.78	39.99326373	-104.74431857
10500.00	90.00	269.350	7648.00	92.10S	2794.35W	==>	2795.77	39.99326297	-104.74467547
10600.00	90.00	269.350	7648.00	93.22S	2894.34W	==>	2895.76	39.99326221	-104.74503237
10700.00	90.00	269.350	7648.00	94.35S	2994.34W	==>	2995.75	39.99326145	-104.74538927
10800.00	90.00	269.350	7648.00	95.48S	3094.33W	==>	3095.74	39.99326069	-104.74574617
10900.00	90.00	269.350	7648.00	96.61S	3194.32W	==>	3195.74	39.99325992	-104.74610306
11000.00	90.00	269.350	7648.00	97.74S	3294.32W	==>	3295.73	39.99325916	-104.74645996
11100.00	90.00	269.350	7648.00	98.86S	3394.31W	==>	3395.72	39.99325839	-104.74681686
11200.00	90.00	269.350	7648.00	99.99S	3494.30W	==>	3495.71	39.99325763	-104.74717376
11300.00	90.00	269.350	7648.00	101.12S	3594.30W	==>	3595.70	39.99325686	-104.74753066
11400.00	90.00	269.350	7648.00	102.25S	3694.29W	==>	3695.69	39.99325609	-104.74788755
11500.00	90.00	269.350	7648.00	103.38S	3794.28W	==>	3795.68	39.99325532	-104.74824445
11600.00	90.00	269.350	7648.00	104.51S	3894.28W	==>	3895.67	39.99325455	-104.74860135
11700.00	90.00	269.350	7648.00	105.63S	3994.27W	==>	3995.66	39.99325378	-104.74895825
11800.00	90.00	269.350	7648.00	106.76S	4094.27W	==>	4095.65	39.99325301	-104.74931514
11900.00	90.00	269.350	7648.00	107.89S	4194.26W	==>	4195.64	39.99325223	-104.74967204
12000.00	90.00	269.350	7648.00	109.02S	4294.25W	==>	4295.64	39.99325146	-104.75002894
12100.00	90.00	269.350	7648.00	110.15S	4394.25W	==>	4395.63	39.99325068	-104.75038584
12188.03	90.00	269.350	7648.00	111.14S	4482.27W	==>	4483.64	39.99325000	-104.75070000

All data is in Feet unless otherwise stated  
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 268.580 degrees  
Bottom hole distance is 4483.64 Feet on azimuth 268.58 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 11 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
BEF WEST 11 BHL	111.14S	4482.27W	7648.00	39.99325000	-104.75070000	1241274.97	3209937.36
BEF WEST 11 EP	63.06S	131.15W	7648.00	39.99328000	-104.73517000	1241323.05	3214288.33

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
577626	Planned	2000.00	1999.54	WdW Rate Gyro	Standard	
577625	Planned	12188.03	7648.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes