

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 11
Field	WATTENBERG	Well	W OLANDER 11
Installation	Olander Pad	Wellbore	W OLANDER 11 (PWB)

N
GRID

Jul-12-2017
EMM-2015 [2000.0-2020.0] Dip: 66.61 deg Field: 52203.1 nT
Lat: N40 12 10.3680 Long: W105 1 31.6200 Elev: 5033.00 ft
Magnetic North is 8.59 deg East of True North
GRID North is 0.31 deg East of True North
To correct azimuth from True to GRID subtract 0.31 deg
To correct azimuth from Magnetic to GRID add 8.28 deg

WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	17.00	0.00	0.00	17.00	S 0.00	W 0.00		-0.00
KOP	1000.00	0.00	300.50	1000.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1506.06	10.12	300.50	1503.43	N 22.63	W 38.41	2.00	-19.27
End of Hold	6574.09	10.12	300.50	6492.59	N 474.63	W 805.79	0.00	-404.32
Target OLANDER 11 EP	7525.81	90.00	179.63	7110.00	S 96.59	W 896.74	10.00	172.56
T.D. & Target OLA...2mi	17202.98	90.00	179.63	7110.00	S 9773.56	W 834.85	0.00	9809.15

East (Feet) ->

-1600 -800 0 800
Scale 1 cm = 400 ft

Surface 0.00 N 0.00 E

OLANDER 11 EP

1600

800

0

-800

-1600

-2400

-3200

-4000

-4800

-5600

-6400

-7200

-8000

-8800

-9600

-10400

-11200

-12000

-12800

-13600

-14400

-15200

-16000

-16800

-17600

-18400

-19200

-20000

-20800

-21600

-22400

-23200

-24000

-24800

-25600

-26400

-27200

-28000

-28800

-29600

-30400

-31200

-32000

-32800

-33600

-34400

-35200

-36000

-36800

-37600

-38400

-39200

-40000

-40800

-41600

-42400

-43200

-44000

-44800

-45600

-46400

-47200

-48000

-48800

-49600

-50400

-51200

-52000

-52800

-53600

-54400

-55200

-56000

-56800

-57600

-58400

-59200

-60000

-60800

-61600

-62400

-63200

-64000

-64800

-65600

-66400

-67200

-68000

-68800

-69600

-70400

-71200

-72000

-72800

-73600

-74400

-75200

-76000

-76800

-77600

-78400

-79200

-80000

-80800

-81600

-82400

-83200

-84000

-84800

-85600

-86400

-87200

-88000

-88800

-89600

-90400

-91200

-92000

-92800

-93600

-94400

-95200

-96000

-96800

-97600

-98400

-99200

-100000

-100800

-101600

-102400

-103200

-104000

-104800

-105600

-106400

-107200

-108000

-108800

-109600

-110400

-111200

-112000

-112800

-113600

-114400

-115200

-116000

-116800

-117600

-118400

-119200

-120000

-120800

-121600

-122400

-123200

-124000

-124800

-125600

-126400

-127200

-128000

-128800

-129600

-130400

-131200

-132000

-132800

-133600

-134400

-135200

-136000

-136800

-137600

-138400

-139200

-140000

-140800

-141600

-142400

-143200

-144000

-144800

-145600

-146400

-147200

-148000

-148800

-149600

-150400

-151200

-152000

-152800

-153600

-154400

-155200

-156000

-156800

-157600

-158400

-159200

-160000

-160800

-161600

-162400

-163200

-164000

-164800

-165600

-166400

-167200

-168000

-168800

-169600

-170400

-171200

-172000

-172800

-173600

-174400

-175200

-176000

-176800

-177600

-178400

-179200

-180000

-180800

-181600

-182400

-183200

-184000

-184800

-185600

-186400

-187200

-188000

-188800

-189600

-190400

-191200

-192000

-192800

-193600

-194400

-195200

-196000



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



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 11	40.20288000	-105.02492000	1317107.0662	3132698.7847	0.79N	148.04E	0.00

Declination		
Date	Source	Time
Jul-12-2017	EMM-2015 [2000.0-2020.0]	14:01

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Olander Pad	40.20288000	-105.02545000	1317106.2735	3132550.7471	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
17.00	0.00	0.000	17.00	0.00N	0.00E		0.00	1317107.07	3132698.78
1000.00	0.00	300.500	1000.00	0.00N	0.00E	==>	0.00	1317107.07	3132698.78
1506.06	10.12	300.500	1503.43	22.63N	38.41W	2.00	-19.27	1317129.69	3132660.37
6574.09	10.12	300.500	6492.59	474.63N	805.79W	==>	-404.32	1317581.67	3131893.03
7525.81	90.00	179.630	7110.00	96.59S	896.74W	10.00	172.56	1317010.48	3131802.08
17202.98	90.00	179.630	7110.00	9773.56S	834.85W	==>	9809.15	1307333.94	3131863.97

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	Rig Datum
17.00	0.00	0.000	17.00	0.00N	0.00E	==>	0.00	Slot Datum
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	300.500	1000.00	0.00N	0.00E	==>	0.00	
1100.00	2.00	300.500	1099.98	0.89N	1.50W	2.00	-0.75	
1200.00	4.00	300.500	1199.84	3.54N	6.01W	2.00	-3.02	
1300.00	6.00	300.500	1299.45	7.96N	13.52W	2.00	-6.79	
1400.00	8.00	300.500	1398.70	14.15N	24.02W	2.00	-12.05	
1500.00	10.00	300.500	1497.47	22.09N	37.50W	2.00	-18.82	
1517.00	10.12	300.500	1514.20	23.60N	40.07W	==>	-20.11	
1617.00	10.12	300.500	1612.65	32.52N	55.21W	==>	-27.70	
1717.00	10.12	300.500	1711.09	41.44N	70.35W	==>	-35.30	
1817.00	10.12	300.500	1809.53	50.36N	85.49W	==>	-42.90	
1917.00	10.12	300.500	1907.98	59.28N	100.64W	==>	-50.50	
2017.00	10.12	300.500	2006.42	68.19N	115.78W	==>	-58.09	
2117.00	10.12	300.500	2104.87	77.11N	130.92W	==>	-65.69	
2217.00	10.12	300.500	2203.31	86.03N	146.06W	==>	-73.29	
2317.00	10.12	300.500	2301.75	94.95N	161.20W	==>	-80.89	
2417.00	10.12	300.500	2400.20	103.87N	176.34W	==>	-88.48	
2517.00	10.12	300.500	2498.64	112.79N	191.49W	==>	-96.08	
2617.00	10.12	300.500	2597.08	121.71N	206.63W	==>	-103.68	
2717.00	10.12	300.500	2695.53	130.63N	221.77W	==>	-111.28	
2817.00	10.12	300.500	2793.97	139.54N	236.91W	==>	-118.87	
2917.00	10.12	300.500	2892.42	148.46N	252.05W	==>	-126.47	
3017.00	10.12	300.500	2990.86	157.38N	267.19W	==>	-134.07	

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig (Planned Datum #1 5047.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 184.880 degrees
Bottom hole distance is 9809.15 Feet on azimuth 184.88 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 8-Oct-2017



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



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3117.00	10.12	300.500	3089.30	166.30N	282.33W	==>	-141.67	
3217.00	10.12	300.500	3187.75	175.22N	297.48W	==>	-149.26	
3317.00	10.12	300.500	3286.19	184.14N	312.62W	==>	-156.86	
3417.00	10.12	300.500	3384.64	193.06N	327.76W	==>	-164.46	
3517.00	10.12	300.500	3483.08	201.97N	342.90W	==>	-172.06	
3617.00	10.12	300.500	3581.52	210.89N	358.04W	==>	-179.65	
3717.00	10.12	300.500	3679.97	219.81N	373.18W	==>	-187.25	
3817.00	10.12	300.500	3778.41	228.73N	388.33W	==>	-194.85	
3917.00	10.12	300.500	3876.85	237.65N	403.47W	==>	-202.45	
4017.00	10.12	300.500	3975.30	246.57N	418.61W	==>	-210.05	
4117.00	10.12	300.500	4073.74	255.49N	433.75W	==>	-217.64	
4217.00	10.12	300.500	4172.19	264.40N	448.89W	==>	-225.24	
4317.00	10.12	300.500	4270.63	273.32N	464.03W	==>	-232.84	
4417.00	10.12	300.500	4369.07	282.24N	479.17W	==>	-240.44	
4517.00	10.12	300.500	4467.52	291.16N	494.32W	==>	-248.03	
4617.00	10.12	300.500	4565.96	300.08N	509.46W	==>	-255.63	
4717.00	10.12	300.500	4664.41	309.00N	524.60W	==>	-263.23	
4817.00	10.12	300.500	4762.85	317.92N	539.74W	==>	-270.83	
4917.00	10.12	300.500	4861.29	326.84N	554.88W	==>	-278.42	
5017.00	10.12	300.500	4959.74	335.75N	570.02W	==>	-286.02	
5117.00	10.12	300.500	5058.18	344.67N	585.17W	==>	-293.62	
5217.00	10.12	300.500	5156.62	353.59N	600.31W	==>	-301.22	
5317.00	10.12	300.500	5255.07	362.51N	615.45W	==>	-308.81	
5417.00	10.12	300.500	5353.51	371.43N	630.59W	==>	-316.41	
5517.00	10.12	300.500	5451.96	380.35N	645.73W	==>	-324.01	
5617.00	10.12	300.500	5550.40	389.27N	660.87W	==>	-331.61	
5717.00	10.12	300.500	5648.84	398.18N	676.02W	==>	-339.20	
5817.00	10.12	300.500	5747.29	407.10N	691.16W	==>	-346.80	
5917.00	10.12	300.500	5845.73	416.02N	706.30W	==>	-354.40	
6017.00	10.12	300.500	5944.18	424.94N	721.44W	==>	-362.00	
6117.00	10.12	300.500	6042.62	433.86N	736.58W	==>	-369.59	
6217.00	10.12	300.500	6141.06	442.78N	751.72W	==>	-377.19	
6317.00	10.12	300.500	6239.51	451.70N	766.86W	==>	-384.79	
6417.00	10.12	300.500	6337.95	460.61N	782.01W	==>	-392.39	
6517.00	10.12	300.500	6436.39	469.53N	797.15W	==>	-399.99	
6617.00	8.76	275.430	6534.94	476.85N	812.29W	10.00	-405.98	
6717.00	12.59	222.970	6633.41	469.58N	827.34W	10.00	-397.46	
6817.00	20.94	203.240	6729.15	445.12N	841.85W	10.00	-371.86	
6917.00	30.28	194.840	6819.25	404.23N	855.39W	10.00	-329.96	
7017.00	39.92	190.180	6900.98	348.13N	867.56W	10.00	-273.03	
7117.00	49.69	187.100	6971.85	278.53N	877.97W	10.00	-202.80	
7217.00	59.51	184.810	7029.71	197.56N	886.32W	10.00	-121.40	
7317.00	69.37	182.940	7072.80	107.66N	892.35W	10.00	-31.32	
7417.00	79.25	181.300	7099.82	11.57N	895.87W	10.00	64.72	
7517.00	89.13	179.770	7109.93	87.78S	896.79W	10.00	163.79	
7617.00	90.00	179.630	7110.00	187.78S	896.16W	==>	263.37	
7717.00	90.00	179.630	7110.00	287.78S	895.52W	==>	362.95	
7817.00	90.00	179.630	7110.00	387.77S	894.88W	==>	462.53	
7917.00	90.00	179.630	7110.00	487.77S	894.24W	==>	562.11	
8017.00	90.00	179.630	7110.00	587.77S	893.60W	==>	661.69	
8117.00	90.00	179.630	7110.00	687.77S	892.96W	==>	761.27	
8217.00	90.00	179.630	7110.00	787.77S	892.32W	==>	860.85	
8317.00	90.00	179.630	7110.00	887.76S	891.68W	==>	960.43	
8417.00	90.00	179.630	7110.00	987.76S	891.04W	==>	1060.01	
8517.00	90.00	179.630	7110.00	1087.76S	890.40W	==>	1159.60	
8617.00	90.00	179.630	7110.00	1187.76S	889.76W	==>	1259.18	
8717.00	90.00	179.630	7110.00	1287.76S	889.12W	==>	1358.76	
8817.00	90.00	179.630	7110.00	1387.75S	888.49W	==>	1458.34	
8917.00	90.00	179.630	7110.00	1487.75S	887.85W	==>	1557.92	

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9017.00	90.00	179.630	7110.00	1587.75S	887.21W	==>	1657.50	
9117.00	90.00	179.630	7110.00	1687.75S	886.57W	==>	1757.08	
9217.00	90.00	179.630	7110.00	1787.75S	885.93W	==>	1856.66	
9317.00	90.00	179.630	7110.00	1887.74S	885.29W	==>	1956.24	
9417.00	90.00	179.630	7110.00	1987.74S	884.65W	==>	2055.82	
9517.00	90.00	179.630	7110.00	2087.74S	884.01W	==>	2155.40	
9617.00	90.00	179.630	7110.00	2187.74S	883.37W	==>	2254.98	
9717.00	90.00	179.630	7110.00	2287.74S	882.73W	==>	2354.56	
9817.00	90.00	179.630	7110.00	2387.73S	882.09W	==>	2454.14	
9917.00	90.00	179.630	7110.00	2487.73S	881.45W	==>	2553.73	
10017.00	90.00	179.630	7110.00	2587.73S	880.81W	==>	2653.31	
10117.00	90.00	179.630	7110.00	2687.73S	880.17W	==>	2752.89	
10217.00	90.00	179.630	7110.00	2787.73S	879.53W	==>	2852.47	
10317.00	90.00	179.630	7110.00	2887.72S	878.89W	==>	2952.05	
10417.00	90.00	179.630	7110.00	2987.72S	878.25W	==>	3051.63	
10517.00	90.00	179.630	7110.00	3087.72S	877.61W	==>	3151.21	
10617.00	90.00	179.630	7110.00	3187.72S	876.97W	==>	3250.79	
10717.00	90.00	179.630	7110.00	3287.72S	876.33W	==>	3350.37	
10817.00	90.00	179.630	7110.00	3387.71S	875.69W	==>	3449.95	
10917.00	90.00	179.630	7110.00	3487.71S	875.05W	==>	3549.53	
11017.00	90.00	179.630	7110.00	3587.71S	874.42W	==>	3649.11	
11117.00	90.00	179.630	7110.00	3687.71S	873.78W	==>	3748.69	
11217.00	90.00	179.630	7110.00	3787.71S	873.14W	==>	3848.27	
11317.00	90.00	179.630	7110.00	3887.70S	872.50W	==>	3947.85	
11417.00	90.00	179.630	7110.00	3987.70S	871.86W	==>	4047.44	
11517.00	90.00	179.630	7110.00	4087.70S	871.22W	==>	4147.02	
11617.00	90.00	179.630	7110.00	4187.70S	870.58W	==>	4246.60	
11717.00	90.00	179.630	7110.00	4287.69S	869.94W	==>	4346.18	
11817.00	90.00	179.630	7110.00	4387.69S	869.30W	==>	4445.76	
11917.00	90.00	179.630	7110.00	4487.69S	868.66W	==>	4545.34	
12017.00	90.00	179.630	7110.00	4587.69S	868.02W	==>	4644.92	
12117.00	90.00	179.630	7110.00	4687.69S	867.38W	==>	4744.50	
12217.00	90.00	179.630	7110.00	4787.68S	866.74W	==>	4844.08	
12317.00	90.00	179.630	7110.00	4887.68S	866.10W	==>	4943.66	
12417.00	90.00	179.630	7110.00	4987.68S	865.46W	==>	5043.24	
12517.00	90.00	179.630	7110.00	5087.68S	864.82W	==>	5142.82	
12617.00	90.00	179.630	7110.00	5187.68S	864.18W	==>	5242.40	
12717.00	90.00	179.630	7110.00	5287.67S	863.54W	==>	5341.98	
12817.00	90.00	179.630	7110.00	5387.67S	862.90W	==>	5441.57	
12917.00	90.00	179.630	7110.00	5487.67S	862.26W	==>	5541.15	
13017.00	90.00	179.630	7110.00	5587.67S	861.62W	==>	5640.73	
13117.00	90.00	179.630	7110.00	5687.67S	860.98W	==>	5740.31	
13217.00	90.00	179.630	7110.00	5787.66S	860.35W	==>	5839.89	
13317.00	90.00	179.630	7110.00	5887.66S	859.71W	==>	5939.47	
13417.00	90.00	179.630	7110.00	5987.66S	859.07W	==>	6039.05	
13517.00	90.00	179.630	7110.00	6087.66S	858.43W	==>	6138.63	
13617.00	90.00	179.630	7110.00	6187.66S	857.79W	==>	6238.21	
13717.00	90.00	179.630	7110.00	6287.65S	857.15W	==>	6337.79	
13817.00	90.00	179.630	7110.00	6387.65S	856.51W	==>	6437.37	
13917.00	90.00	179.630	7110.00	6487.65S	855.87W	==>	6536.95	
14017.00	90.00	179.630	7110.00	6587.65S	855.23W	==>	6636.53	
14117.00	90.00	179.630	7110.00	6687.65S	854.59W	==>	6736.11	
14217.00	90.00	179.630	7110.00	6787.64S	853.95W	==>	6835.69	
14317.00	90.00	179.630	7110.00	6887.64S	853.31W	==>	6935.28	
14417.00	90.00	179.630	7110.00	6987.64S	852.67W	==>	7034.86	
14517.00	90.00	179.630	7110.00	7087.64S	852.03W	==>	7134.44	
14617.00	90.00	179.630	7110.00	7187.64S	851.39W	==>	7234.02	
14717.00	90.00	179.630	7110.00	7287.63S	850.75W	==>	7333.60	
14817.00	90.00	179.630	7110.00	7387.63S	850.11W	==>	7433.18	

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 5047.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 184.880 degrees
Bottom hole distance is 9809.15 Feet on azimuth 184.88 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 8-Oct-2017



SYS DRILL
Well Design Combined Report
Wellbore: W OLANDER 11 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
14917.00	90.00	179.630	7110.00	7487.63S	849.47W	==>	7532.76	
15017.00	90.00	179.630	7110.00	7587.63S	848.83W	==>	7632.34	
15117.00	90.00	179.630	7110.00	7687.63S	848.19W	==>	7731.92	
15217.00	90.00	179.630	7110.00	7787.62S	847.55W	==>	7831.50	
15317.00	90.00	179.630	7110.00	7887.62S	846.91W	==>	7931.08	
15417.00	90.00	179.630	7110.00	7987.62S	846.28W	==>	8030.66	
15517.00	90.00	179.630	7110.00	8087.62S	845.64W	==>	8130.24	
15617.00	90.00	179.630	7110.00	8187.62S	845.00W	==>	8229.82	
15717.00	90.00	179.630	7110.00	8287.61S	844.36W	==>	8329.41	
15817.00	90.00	179.630	7110.00	8387.61S	843.72W	==>	8428.99	
15917.00	90.00	179.630	7110.00	8487.61S	843.08W	==>	8528.57	
16017.00	90.00	179.630	7110.00	8587.61S	842.44W	==>	8628.15	
16117.00	90.00	179.630	7110.00	8687.60S	841.80W	==>	8727.73	
16217.00	90.00	179.630	7110.00	8787.60S	841.16W	==>	8827.31	
16317.00	90.00	179.630	7110.00	8887.60S	840.52W	==>	8926.89	
16417.00	90.00	179.630	7110.00	8987.60S	839.88W	==>	9026.47	
16517.00	90.00	179.630	7110.00	9087.60S	839.24W	==>	9126.05	
16617.00	90.00	179.630	7110.00	9187.59S	838.60W	==>	9225.63	
16717.00	90.00	179.630	7110.00	9287.59S	837.96W	==>	9325.21	
16817.00	90.00	179.630	7110.00	9387.59S	837.32W	==>	9424.79	
16917.00	90.00	179.630	7110.00	9487.59S	836.68W	==>	9524.37	
17017.00	90.00	179.630	7110.00	9587.59S	836.04W	==>	9623.95	
17117.00	90.00	179.630	7110.00	9687.58S	835.40W	==>	9723.53	
17202.98	90.00	179.630	7110.00	9773.56S	834.85W	==>	9809.15	

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Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 11 EP	96.59S	896.74W	7110.00	40.20262800	-105.02813210	1317010.48	3131802.08
OLANDER 11 BH-2mi	9773.56S	834.85W	7110.00	40.17606420	-105.02809490	1307333.94	3131863.97

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562334	Planned	1517.00	1514.20	WdW Rate Gyro	Standard	
562333	Planned	17202.98	7110.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes