

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 22
Field	WATTENBERG	Well	W OLANDER 22
Installation	Olander Pad	Wellbore	W OLANDER 22 (PWB)

East (Feet) ->

-800 0 800 1600 2400
Scale 1 cm = 400 ft

N

GRID

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	1150.00	0.00	69.86	1150.00	S 0.00	W 0.00	0.00	0.00
End of Build	2064.88	18.30	69.86	2049.40	N 49.87	E 135.99	2.00	-25.59
End of Hold	6534.07	18.30	69.86	6292.63	N 532.90	E 1453.33	0.00	-273.44
Target OLANDER 22 EP	7495.04	90.00	179.64	6897.82	S 35.61	E 1645.24	10.00	319.71
T.D. & Target OLA...2mi	17173.23	90.00	179.64	6897.82	S 9713.61	E 1706.22	0.00	9862.32

Surface 0.00 N 0.00 E

OLANDER 22 EP

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

<- North (Feet)
Scale 1 cm = 400 ft

<- True Vertical Depth (Feet)
Scale 1 cm = 400 ft

Tie on - 0.00 Inc, 17.00 MD, 17.00 TVD, 0.00 VS

3DS Kick off Point - 0.00 Inc, 1150.00 MD, 1150.00 TVD, 0.00 VS

End of Build - 18.30 Inc, 2064.88 MD, 2049.40 TVD, -25.59 VS

Created by admin
Date plotted 10-Oct-2017
Plot reference is W OLANDER 22 (PWB).
Ref wellpath is W OLANDER 22 (PWP#1).
Coordinates are in Feet reference OLANDER 22.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 5047.00 ft.
Plot North is aligned to GRID North.

OLANDER 22 BH-2mi

W OLANDER 22 (PWB)

End of Hold - 18.30 Inc, 6534.07 MD, 6292.63 TVD, -273.44 VS

OLANDER 22 EP

S/C Kick off Point - 90.00 Inc, 7495.04 MD, 6897.82 TVD, 319.71 VS

OLANDER 22 BH-2mi

W OLANDER 22 (PWB)

T.D. & End of Hold - 6897.82 TVD, 9713.61 S 1706.22 E

Scale 1 cm = 400 ft

Vertical Section (Feet) ->

Azimuth 170.04 with reference 0.00 N, 0.00 E from OLANDER 22



SYSDRILL
Well Design Combined Report
Wellbore: W OLANDER 22 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 22	40.20281000	-105.02497000	1317081.4919	3132684.9555	24.78S	134.21E	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	1317081.49	3132684.96
1150.00	0.00	69.860	1150.00	0.00N	0.00E	==>	0.00	1317081.49	3132684.96
2064.88	18.30	69.860	2049.40	49.87N	135.99E	2.00	-25.59	1317131.36	3132820.94
6534.07	18.30	69.860	6292.63	532.90N	1453.33E	==>	-273.44	1317614.37	3134138.22
7495.04	90.00	179.640	6897.82	35.61S	1645.24E	10.00	319.71	1317045.88	3134330.12
17173.23	90.00	179.640	6897.82	9713.61S	1706.22E	==>	9862.32	1307368.32	3134391.10

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	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	1.00	69.860	1200.00	0.15N	0.41E	2.00	-0.08	
1300.00	3.00	69.860	1299.93	1.35N	3.69E	2.00	-0.69	
1400.00	5.00	69.860	1399.68	3.75N	10.24E	2.00	-1.93	
1500.00	7.00	69.860	1499.13	7.35N	20.05E	2.00	-3.77	
1517.00	7.34	69.860	1516.00	8.08N	22.04E	2.00	-4.15	
1617.00	9.34	69.860	1614.93	13.07N	35.66E	2.00	-6.71	
1717.00	11.34	69.860	1713.31	19.25N	52.51E	2.00	-9.88	
1817.00	13.34	69.860	1810.99	26.61N	72.57E	2.00	-13.65	
1917.00	15.34	69.860	1907.87	35.14N	95.83E	2.00	-18.03	
2017.00	17.34	69.860	2003.83	44.82N	122.24E	2.00	-23.00	
2117.00	18.30	69.860	2098.89	55.50N	151.36E	==>	-28.48	
2217.00	18.30	69.860	2193.84	66.31N	180.83E	==>	-34.02	
2317.00	18.30	69.860	2288.78	77.12N	210.31E	==>	-39.57	
2417.00	18.30	69.860	2383.72	87.92N	239.78E	==>	-45.11	
2517.00	18.30	69.860	2478.67	98.73N	269.26E	==>	-50.66	
2617.00	18.30	69.860	2573.61	109.54N	298.74E	==>	-56.21	
2717.00	18.30	69.860	2668.56	120.35N	328.21E	==>	-61.75	
2817.00	18.30	69.860	2763.50	131.16N	357.69E	==>	-67.30	
2917.00	18.30	69.860	2858.44	141.96N	387.16E	==>	-72.84	
3017.00	18.30	69.860	2953.39	152.77N	416.64E	==>	-78.39	

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 170.040 degrees
Bottom hole distance is 9862.32 Feet on azimuth 170.04 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 10-Oct-2017



SYS DRILL
Well Design Combined Report
Wellbore: W OLANDER 22 (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	18.30	69.860	3048.33	163.58N	446.12E	==>	-83.93	
3217.00	18.30	69.860	3143.28	174.39N	475.59E	==>	-89.48	
3317.00	18.30	69.860	3238.22	185.20N	505.07E	==>	-95.03	
3417.00	18.30	69.860	3333.16	196.01N	534.55E	==>	-100.57	
3517.00	18.30	69.860	3428.11	206.81N	564.02E	==>	-106.12	
3617.00	18.30	69.860	3523.05	217.62N	593.50E	==>	-111.66	
3717.00	18.30	69.860	3618.00	228.43N	622.97E	==>	-117.21	
3817.00	18.30	69.860	3712.94	239.24N	652.45E	==>	-122.75	
3917.00	18.30	69.860	3807.88	250.05N	681.93E	==>	-128.30	
4017.00	18.30	69.860	3902.83	260.86N	711.40E	==>	-133.85	
4117.00	18.30	69.860	3997.77	271.66N	740.88E	==>	-139.39	
4217.00	18.30	69.860	4092.71	282.47N	770.35E	==>	-144.94	
4317.00	18.30	69.860	4187.66	293.28N	799.83E	==>	-150.48	
4417.00	18.30	69.860	4282.60	304.09N	829.31E	==>	-156.03	
4517.00	18.30	69.860	4377.55	314.90N	858.78E	==>	-161.58	
4617.00	18.30	69.860	4472.49	325.70N	888.26E	==>	-167.12	
4717.00	18.30	69.860	4567.43	336.51N	917.73E	==>	-172.67	
4817.00	18.30	69.860	4662.38	347.32N	947.21E	==>	-178.21	
4917.00	18.30	69.860	4757.32	358.13N	976.69E	==>	-183.76	
5017.00	18.30	69.860	4852.27	368.94N	1006.16E	==>	-189.30	
5117.00	18.30	69.860	4947.21	379.75N	1035.64E	==>	-194.85	
5217.00	18.30	69.860	5042.15	390.55N	1065.11E	==>	-200.40	
5317.00	18.30	69.860	5137.10	401.36N	1094.59E	==>	-205.94	
5417.00	18.30	69.860	5232.04	412.17N	1124.07E	==>	-211.49	
5517.00	18.30	69.860	5326.99	422.98N	1153.54E	==>	-217.03	
5617.00	18.30	69.860	5421.93	433.79N	1183.02E	==>	-222.58	
5717.00	18.30	69.860	5516.87	444.59N	1212.49E	==>	-228.12	
5817.00	18.30	69.860	5611.82	455.40N	1241.97E	==>	-233.67	
5917.00	18.30	69.860	5706.76	466.21N	1271.45E	==>	-239.22	
6017.00	18.30	69.860	5801.71	477.02N	1300.92E	==>	-244.76	
6117.00	18.30	69.860	5896.65	487.83N	1330.40E	==>	-250.31	
6217.00	18.30	69.860	5991.59	498.64N	1359.87E	==>	-255.85	
6317.00	18.30	69.860	6086.54	509.44N	1389.35E	==>	-261.40	
6417.00	18.30	69.860	6181.48	520.25N	1418.83E	==>	-266.94	
6517.00	18.30	69.860	6276.42	531.06N	1448.30E	==>	-272.49	
6617.00	17.42	96.990	6371.70	535.88N	1477.92E	10.00	-272.11	
6717.00	21.05	125.670	6466.31	523.56N	1507.44E	10.00	-254.87	
6817.00	27.86	143.580	6557.41	494.21N	1535.97E	10.00	-221.03	
6917.00	36.10	154.380	6642.23	448.73N	1562.65E	10.00	-171.62	
7017.00	44.98	161.490	6718.20	388.50N	1586.67E	10.00	-108.15	
7117.00	54.18	166.660	6783.00	315.36N	1607.29E	10.00	-32.53	
7217.00	63.55	170.730	6834.66	231.51N	1623.90E	10.00	52.92	
7317.00	73.02	174.190	6871.62	139.52N	1635.98E	10.00	145.61	
7417.00	82.55	177.310	6892.76	42.18N	1643.17E	10.00	242.74	
7517.00	90.00	179.640	6897.82	57.57S	1645.38E	==>	341.36	
7617.00	90.00	179.640	6897.82	157.57S	1646.01E	==>	439.96	
7717.00	90.00	179.640	6897.82	257.57S	1646.64E	==>	538.56	
7817.00	90.00	179.640	6897.82	357.57S	1647.27E	==>	637.16	
7917.00	90.00	179.640	6897.82	457.56S	1647.90E	==>	735.76	
8017.00	90.00	179.640	6897.82	557.56S	1648.53E	==>	834.36	
8117.00	90.00	179.640	6897.82	657.56S	1649.16E	==>	932.95	
8217.00	90.00	179.640	6897.82	757.56S	1649.79E	==>	1031.55	
8317.00	90.00	179.640	6897.82	857.56S	1650.42E	==>	1130.15	
8417.00	90.00	179.640	6897.82	957.55S	1651.05E	==>	1228.75	
8517.00	90.00	179.640	6897.82	1057.55S	1651.68E	==>	1327.35	
8617.00	90.00	179.640	6897.82	1157.55S	1652.31E	==>	1425.95	
8717.00	90.00	179.640	6897.82	1257.55S	1652.94E	==>	1524.55	
8817.00	90.00	179.640	6897.82	1357.55S	1653.57E	==>	1623.15	
8917.00	90.00	179.640	6897.82	1457.54S	1654.20E	==>	1721.75	

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 170.040 degrees
Bottom hole distance is 9862.32 Feet on azimuth 170.04 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 10-Oct-2017



SYS DRILL
Well Design Combined Report
Wellbore: W OLANDER 22 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9017.00	90.00	179.640	6897.82	1557.54S	1654.83E	==>	1820.35	
9117.00	90.00	179.640	6897.82	1657.54S	1655.46E	==>	1918.95	
9217.00	90.00	179.640	6897.82	1757.54S	1656.09E	==>	2017.55	
9317.00	90.00	179.640	6897.82	1857.54S	1656.72E	==>	2116.14	
9417.00	90.00	179.640	6897.82	1957.53S	1657.35E	==>	2214.74	
9517.00	90.00	179.640	6897.82	2057.53S	1657.98E	==>	2313.34	
9617.00	90.00	179.640	6897.82	2157.53S	1658.61E	==>	2411.94	
9717.00	90.00	179.640	6897.82	2257.53S	1659.24E	==>	2510.54	
9817.00	90.00	179.640	6897.82	2357.53S	1659.87E	==>	2609.14	
9917.00	90.00	179.640	6897.82	2457.52S	1660.50E	==>	2707.74	
10017.00	90.00	179.640	6897.82	2557.52S	1661.13E	==>	2806.34	
10117.00	90.00	179.640	6897.82	2657.52S	1661.76E	==>	2904.94	
10217.00	90.00	179.640	6897.82	2757.52S	1662.39E	==>	3003.54	
10317.00	90.00	179.640	6897.82	2857.52S	1663.02E	==>	3102.14	
10417.00	90.00	179.640	6897.82	2957.51S	1663.65E	==>	3200.74	
10517.00	90.00	179.640	6897.82	3057.51S	1664.28E	==>	3299.33	
10617.00	90.00	179.640	6897.82	3157.51S	1664.91E	==>	3397.93	
10717.00	90.00	179.640	6897.82	3257.51S	1665.54E	==>	3496.53	
10817.00	90.00	179.640	6897.82	3357.51S	1666.17E	==>	3595.13	
10917.00	90.00	179.640	6897.82	3457.50S	1666.80E	==>	3693.73	
11017.00	90.00	179.640	6897.82	3557.50S	1667.43E	==>	3792.33	
11117.00	90.00	179.640	6897.82	3657.50S	1668.06E	==>	3890.93	
11217.00	90.00	179.640	6897.82	3757.50S	1668.69E	==>	3989.53	
11317.00	90.00	179.640	6897.82	3857.50S	1669.32E	==>	4088.13	
11417.00	90.00	179.640	6897.82	3957.49S	1669.95E	==>	4186.73	
11517.00	90.00	179.640	6897.82	4057.49S	1670.58E	==>	4285.33	
11617.00	90.00	179.640	6897.82	4157.49S	1671.21E	==>	4383.93	
11717.00	90.00	179.640	6897.82	4257.49S	1671.84E	==>	4482.52	
11817.00	90.00	179.640	6897.82	4357.49S	1672.47E	==>	4581.12	
11917.00	90.00	179.640	6897.82	4457.48S	1673.10E	==>	4679.72	
12017.00	90.00	179.640	6897.82	4557.48S	1673.73E	==>	4778.32	
12117.00	90.00	179.640	6897.82	4657.48S	1674.36E	==>	4876.92	
12217.00	90.00	179.640	6897.82	4757.48S	1674.99E	==>	4975.52	
12317.00	90.00	179.640	6897.82	4857.48S	1675.62E	==>	5074.12	
12417.00	90.00	179.640	6897.82	4957.47S	1676.25E	==>	5172.72	
12517.00	90.00	179.640	6897.82	5057.47S	1676.88E	==>	5271.32	
12617.00	90.00	179.640	6897.82	5157.47S	1677.51E	==>	5369.92	
12717.00	90.00	179.640	6897.82	5257.47S	1678.14E	==>	5468.52	
12817.00	90.00	179.640	6897.82	5357.47S	1678.77E	==>	5567.12	
12917.00	90.00	179.640	6897.82	5457.46S	1679.40E	==>	5665.71	
13017.00	90.00	179.640	6897.82	5557.46S	1680.03E	==>	5764.31	
13117.00	90.00	179.640	6897.82	5657.46S	1680.66E	==>	5862.91	
13217.00	90.00	179.640	6897.82	5757.46S	1681.29E	==>	5961.51	
13317.00	90.00	179.640	6897.82	5857.46S	1681.92E	==>	6060.11	
13417.00	90.00	179.640	6897.82	5957.45S	1682.55E	==>	6158.71	
13517.00	90.00	179.640	6897.82	6057.45S	1683.18E	==>	6257.31	
13617.00	90.00	179.640	6897.82	6157.45S	1683.81E	==>	6355.91	
13717.00	90.00	179.640	6897.82	6257.45S	1684.44E	==>	6454.51	
13817.00	90.00	179.640	6897.82	6357.45S	1685.07E	==>	6553.11	
13917.00	90.00	179.640	6897.82	6457.44S	1685.70E	==>	6651.71	
14017.00	90.00	179.640	6897.82	6557.44S	1686.33E	==>	6750.31	
14117.00	90.00	179.640	6897.82	6657.44S	1686.96E	==>	6848.90	
14217.00	90.00	179.640	6897.82	6757.44S	1687.59E	==>	6947.50	
14317.00	90.00	179.640	6897.82	6857.44S	1688.22E	==>	7046.10	
14417.00	90.00	179.640	6897.82	6957.43S	1688.85E	==>	7144.70	
14517.00	90.00	179.640	6897.82	7057.43S	1689.48E	==>	7243.30	
14617.00	90.00	179.640	6897.82	7157.43S	1690.11E	==>	7341.90	
14717.00	90.00	179.640	6897.82	7257.43S	1690.74E	==>	7440.50	
14817.00	90.00	179.640	6897.82	7357.43S	1691.37E	==>	7539.10	

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Vertical Section is from 0.00N 0.00E on azimuth 170.040 degrees
Bottom hole distance is 9862.32 Feet on azimuth 170.04 degrees from Wellhead
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Well Design Combined Report
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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	179.640	6897.82	7457.42S	1692.00E	==>	7637.70	
15017.00	90.00	179.640	6897.82	7557.42S	1692.63E	==>	7736.30	
15117.00	90.00	179.640	6897.82	7657.42S	1693.26E	==>	7834.90	
15217.00	90.00	179.640	6897.82	7757.42S	1693.89E	==>	7933.50	
15317.00	90.00	179.640	6897.82	7857.42S	1694.52E	==>	8032.09	
15417.00	90.00	179.640	6897.82	7957.41S	1695.15E	==>	8130.69	
15517.00	90.00	179.640	6897.82	8057.41S	1695.78E	==>	8229.29	
15617.00	90.00	179.640	6897.82	8157.41S	1696.41E	==>	8327.89	
15717.00	90.00	179.640	6897.82	8257.41S	1697.04E	==>	8426.49	
15817.00	90.00	179.640	6897.82	8357.41S	1697.67E	==>	8525.09	
15917.00	90.00	179.640	6897.82	8457.40S	1698.30E	==>	8623.69	
16017.00	90.00	179.640	6897.82	8557.40S	1698.93E	==>	8722.29	
16117.00	90.00	179.640	6897.82	8657.40S	1699.56E	==>	8820.89	
16217.00	90.00	179.640	6897.82	8757.40S	1700.20E	==>	8919.49	
16317.00	90.00	179.640	6897.82	8857.40S	1700.83E	==>	9018.09	
16417.00	90.00	179.640	6897.82	8957.39S	1701.46E	==>	9116.69	
16517.00	90.00	179.640	6897.82	9057.39S	1702.09E	==>	9215.28	
16617.00	90.00	179.640	6897.82	9157.39S	1702.72E	==>	9313.88	
16717.00	90.00	179.640	6897.82	9257.39S	1703.35E	==>	9412.48	
16817.00	90.00	179.640	6897.82	9357.39S	1703.98E	==>	9511.08	
16917.00	90.00	179.640	6897.82	9457.38S	1704.61E	==>	9609.68	
17017.00	90.00	179.640	6897.82	9557.38S	1705.24E	==>	9708.28	
17117.00	90.00	179.640	6897.82	9657.38S	1705.87E	==>	9806.88	
17173.23	90.00	179.640	6897.82	9713.61S	1706.22E	==>	9862.32	

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 170.040 degrees
Bottom hole distance is 9862.32 Feet on azimuth 170.04 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 10-Oct-2017



SYSDRILL
Well Design Combined Report
Wellbore: W OLANDER 22 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 22 EP	35.61S	1645.24E	6897.82	40.20268790	-105.01908090	1317045.88	3134330.12
OLANDER 22 BH-2mi	9713.61S	1706.22E	6897.82	40.17612130	-105.01905050	1307368.32	3134391.10

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562588	Planned	1517.00	1516.00	WdW Rate Gyro	Standard	
562587	Planned	17173.23	6897.82	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes