

# Cub Creek Energy, LLC

<b>Location</b>	<b>Weld County, CO</b>	<b>Slot</b>	<b>OLANDER 8</b>
<b>Field</b>	<b>WATTENBERG</b>	<b>Well</b>	<b>W OLANDER 8</b>
<b>Installation</b>	<b>Olander Pad</b>	<b>Wellbore</b>	<b>W OLANDER 8 (PWB)</b>

**East (Feet) ->**

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

**N**

GRID

## WELL PROFILE DATA

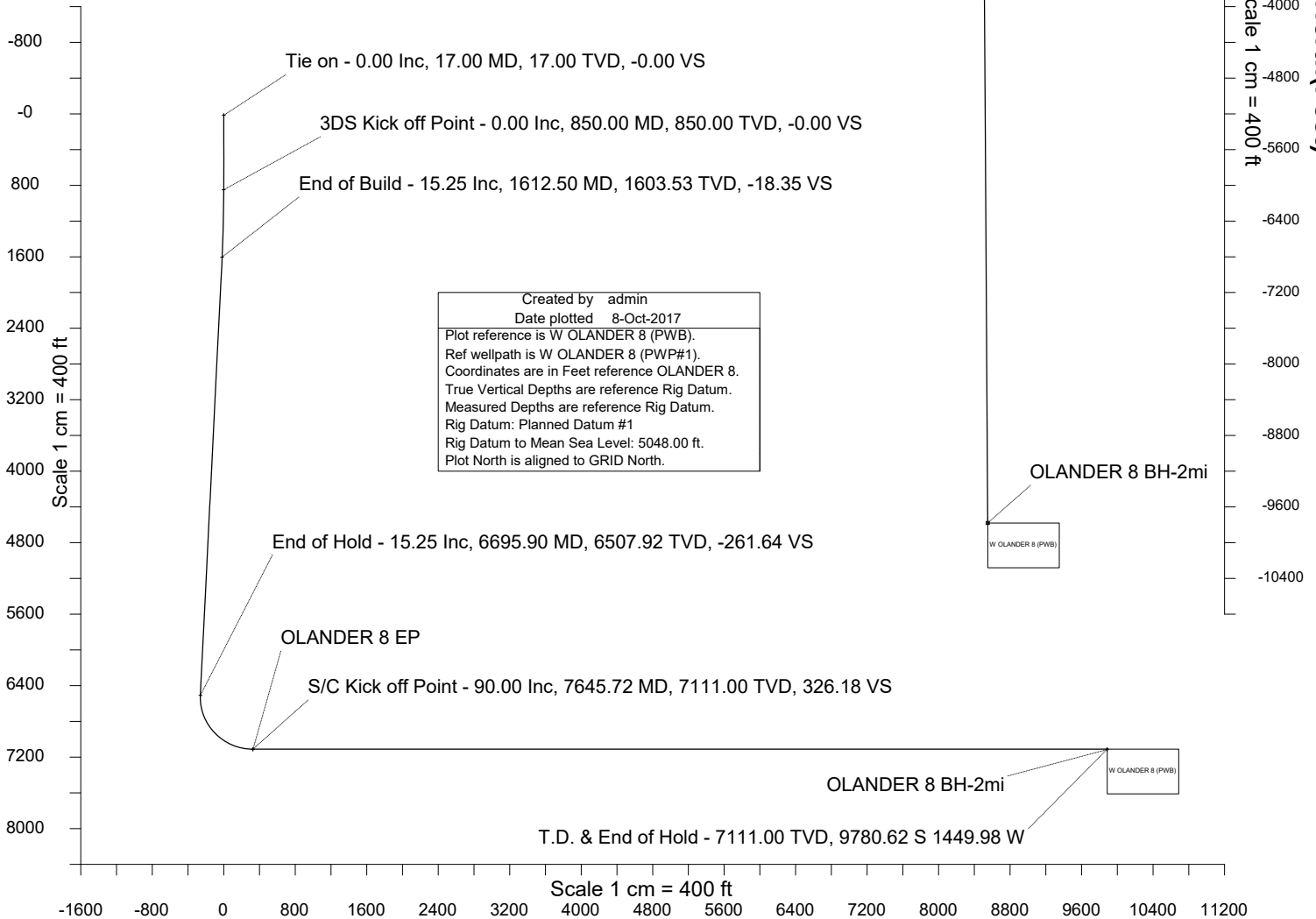
Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	17.00	0.00	0.00	17.00	S 0.00	W 0.00		-0.00
KOP	850.00	0.00	288.92	850.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1612.50	15.25	288.92	1603.53	N 32.70	W 95.43	2.00	-18.35
End of Hold	6695.90	15.25	288.92	6507.92	N 466.16	W 1360.31	0.00	-261.64
Target OLANDER 8 EP	7645.72	90.00	179.63	7111.00	S 105.61	W 1511.85	10.00	326.18
T.D. & Target OLA...2mi	17320.93	90.00	179.63	7111.00	S 9780.62	W 1449.98	0.00	9887.51

Surface 0.00 N 0.00 E

OLANDER 8 EP

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

**<- True Vertical Depth (Feet)**



**Vertical Section (Feet) ->**

**Azimuth 188.43 with reference 0.00 N, 0.00 E from OLANDER 8**

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

Created by admin  
Date plotted 8-Oct-2017  
Plot reference is W OLANDER 8 (PWB).  
Ref wellpath is W OLANDER 8 (PWP#1).  
Coordinates are in Feet reference OLANDER 8.  
True Vertical Depths are reference Rig Datum.  
Measured Depths are reference Rig Datum.  
Rig Datum: Planned Datum #1  
Rig Datum to Mean Sea Level: 5048.00 ft.  
Plot North is aligned to GRID North.



SYSDRILL  
Well Design Combined Report  
Wellbore: W OLANDER 8 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 8	40.20288000	-105.02508000	1317106.8268	3132654.0941	0.55N	103.35E	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	1317106.83	3132654.09
850.00	0.00	288.920	850.00	0.00N	0.00E	==>	0.00	1317106.83	3132654.09
1612.50	15.25	288.920	1603.53	32.70N	95.43W	2.00	-18.35	1317139.53	3132558.67
6695.90	15.25	288.920	6507.92	466.16N	1360.31W	==>	-261.64	1317572.97	3131293.84
7645.72	90.00	179.630	7111.00	105.61S	1511.85W	10.00	326.18	1317001.22	3131142.31
17320.93	90.00	179.630	7111.00	9780.62S	1449.98W	==>	9887.51	1307326.65	3131204.18

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	1.00	288.920	900.00	0.14N	0.41W	2.00	-0.08	
1000.00	3.00	288.920	999.93	1.27N	3.71W	2.00	-0.71	
1100.00	5.00	288.920	1099.68	3.53N	10.31W	2.00	-1.98	
1200.00	7.00	288.920	1199.13	6.92N	20.20W	2.00	-3.89	
1300.00	9.00	288.920	1298.15	11.43N	33.37W	2.00	-6.42	
1400.00	11.00	288.920	1396.63	17.06N	49.79W	2.00	-9.58	
1500.00	13.00	288.920	1494.44	23.80N	69.46W	2.00	-13.36	
1517.00	13.34	288.920	1510.99	25.06N	73.12W	2.00	-14.06	
1617.00	15.25	288.920	1607.87	33.09N	96.55W	==>	-18.57	
1717.00	15.25	288.920	1704.35	41.61N	121.43W	==>	-23.36	
1817.00	15.25	288.920	1800.83	50.14N	146.31W	==>	-28.14	
1917.00	15.25	288.920	1897.31	58.67N	171.20W	==>	-32.93	
2017.00	15.25	288.920	1993.79	67.19N	196.08W	==>	-37.71	
2117.00	15.25	288.920	2090.26	75.72N	220.96W	==>	-42.50	
2217.00	15.25	288.920	2186.74	84.25N	245.84W	==>	-47.28	
2317.00	15.25	288.920	2283.22	92.77N	270.73W	==>	-52.07	
2417.00	15.25	288.920	2379.70	101.30N	295.61W	==>	-56.86	
2517.00	15.25	288.920	2476.18	109.83N	320.49W	==>	-61.64	
2617.00	15.25	288.920	2572.66	118.36N	345.38W	==>	-66.43	
2717.00	15.25	288.920	2669.14	126.88N	370.26W	==>	-71.21	
2817.00	15.25	288.920	2765.62	135.41N	395.14W	==>	-76.00	
2917.00	15.25	288.920	2862.09	143.94N	420.02W	==>	-80.78	
3017.00	15.25	288.920	2958.57	152.46N	444.91W	==>	-85.57	

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 5048.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 188.430 degrees  
Bottom hole distance is 9887.51 Feet on azimuth 188.43 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 8 (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	15.25	288.920	3055.05	160.99N	469.79W	==>	-90.36	
3217.00	15.25	288.920	3151.53	169.52N	494.67W	==>	-95.14	
3317.00	15.25	288.920	3248.01	178.04N	519.55W	==>	-99.93	
3417.00	15.25	288.920	3344.49	186.57N	544.44W	==>	-104.71	
3517.00	15.25	288.920	3440.97	195.10N	569.32W	==>	-109.50	
3617.00	15.25	288.920	3537.45	203.63N	594.20W	==>	-114.29	
3717.00	15.25	288.920	3633.92	212.15N	619.08W	==>	-119.07	
3817.00	15.25	288.920	3730.40	220.68N	643.97W	==>	-123.86	
3917.00	15.25	288.920	3826.88	229.21N	668.85W	==>	-128.64	
4017.00	15.25	288.920	3923.36	237.73N	693.73W	==>	-133.43	
4117.00	15.25	288.920	4019.84	246.26N	718.61W	==>	-138.21	
4217.00	15.25	288.920	4116.32	254.79N	743.50W	==>	-143.00	
4317.00	15.25	288.920	4212.80	263.31N	768.38W	==>	-147.79	
4417.00	15.25	288.920	4309.27	271.84N	793.26W	==>	-152.57	
4517.00	15.25	288.920	4405.75	280.37N	818.15W	==>	-157.36	
4617.00	15.25	288.920	4502.23	288.89N	843.03W	==>	-162.14	
4717.00	15.25	288.920	4598.71	297.42N	867.91W	==>	-166.93	
4817.00	15.25	288.920	4695.19	305.95N	892.79W	==>	-171.72	
4917.00	15.25	288.920	4791.67	314.48N	917.68W	==>	-176.50	
5017.00	15.25	288.920	4888.15	323.00N	942.56W	==>	-181.29	
5117.00	15.25	288.920	4984.63	331.53N	967.44W	==>	-186.07	
5217.00	15.25	288.920	5081.10	340.06N	992.32W	==>	-190.86	
5317.00	15.25	288.920	5177.58	348.58N	1017.21W	==>	-195.64	
5417.00	15.25	288.920	5274.06	357.11N	1042.09W	==>	-200.43	
5517.00	15.25	288.920	5370.54	365.64N	1066.97W	==>	-205.22	
5617.00	15.25	288.920	5467.02	374.16N	1091.85W	==>	-210.00	
5717.00	15.25	288.920	5563.50	382.69N	1116.74W	==>	-214.79	
5817.00	15.25	288.920	5659.98	391.22N	1141.62W	==>	-219.57	
5917.00	15.25	288.920	5756.46	399.75N	1166.50W	==>	-224.36	
6017.00	15.25	288.920	5852.93	408.27N	1191.39W	==>	-229.14	
6117.00	15.25	288.920	5949.41	416.80N	1216.27W	==>	-233.93	
6217.00	15.25	288.920	6045.89	425.33N	1241.15W	==>	-238.72	
6317.00	15.25	288.920	6142.37	433.85N	1266.03W	==>	-243.50	
6417.00	15.25	288.920	6238.85	442.38N	1290.92W	==>	-248.29	
6517.00	15.25	288.920	6335.33	450.91N	1315.80W	==>	-253.07	
6617.00	15.25	288.920	6431.81	459.43N	1340.68W	==>	-257.86	
6717.00	14.71	281.020	6528.31	467.57N	1365.57W	10.00	-262.26	
6817.00	16.06	242.990	6624.97	463.71N	1390.42W	10.00	-254.79	
6917.00	22.26	218.600	6719.53	442.57N	1414.62W	10.00	-230.33	
7017.00	30.47	205.570	6809.13	404.80N	1437.43W	10.00	-189.63	
7117.00	39.45	197.850	6891.04	351.56N	1458.17W	10.00	-133.92	
7217.00	48.78	192.660	6962.77	284.45N	1476.20W	10.00	-64.89	
7317.00	58.29	188.780	7022.15	205.51N	1490.98W	10.00	15.36	
7417.00	67.89	185.640	7067.37	117.15N	1502.05W	10.00	104.39	
7517.00	77.54	182.890	7097.05	22.05N	1509.08W	10.00	199.49	
7617.00	87.22	180.350	7110.30	76.90S	1511.86W	10.00	297.78	
7717.00	90.00	179.630	7111.00	176.89S	1511.40W	==>	396.62	
7817.00	90.00	179.630	7111.00	276.88S	1510.76W	==>	495.44	
7917.00	90.00	179.630	7111.00	376.88S	1510.12W	==>	594.26	
8017.00	90.00	179.630	7111.00	476.88S	1509.48W	==>	693.09	
8117.00	90.00	179.630	7111.00	576.88S	1508.84W	==>	791.91	
8217.00	90.00	179.630	7111.00	676.88S	1508.20W	==>	890.73	
8317.00	90.00	179.630	7111.00	776.87S	1507.56W	==>	989.55	
8417.00	90.00	179.630	7111.00	876.87S	1506.92W	==>	1088.38	
8517.00	90.00	179.630	7111.00	976.87S	1506.28W	==>	1187.20	
8617.00	90.00	179.630	7111.00	1076.87S	1505.64W	==>	1286.02	
8717.00	90.00	179.630	7111.00	1176.87S	1505.00W	==>	1384.85	
8817.00	90.00	179.630	7111.00	1276.86S	1504.36W	==>	1483.67	
8917.00	90.00	179.630	7111.00	1376.86S	1503.72W	==>	1582.49	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig ( Planned Datum #1 5048.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 188.430 degrees  
Bottom hole distance is 9887.51 Feet on azimuth 188.43 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 8 (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	179.630	7111.00	1476.86S	1503.08W	==>	1681.32	
9117.00	90.00	179.630	7111.00	1576.86S	1502.44W	==>	1780.14	
9217.00	90.00	179.630	7111.00	1676.85S	1501.80W	==>	1878.96	
9317.00	90.00	179.630	7111.00	1776.85S	1501.16W	==>	1977.79	
9417.00	90.00	179.630	7111.00	1876.85S	1500.53W	==>	2076.61	
9517.00	90.00	179.630	7111.00	1976.85S	1499.89W	==>	2175.43	
9617.00	90.00	179.630	7111.00	2076.85S	1499.25W	==>	2274.25	
9717.00	90.00	179.630	7111.00	2176.84S	1498.61W	==>	2373.08	
9817.00	90.00	179.630	7111.00	2276.84S	1497.97W	==>	2471.90	
9917.00	90.00	179.630	7111.00	2376.84S	1497.33W	==>	2570.72	
10017.00	90.00	179.630	7111.00	2476.84S	1496.69W	==>	2669.55	
10117.00	90.00	179.630	7111.00	2576.84S	1496.05W	==>	2768.37	
10217.00	90.00	179.630	7111.00	2676.83S	1495.41W	==>	2867.19	
10317.00	90.00	179.630	7111.00	2776.83S	1494.77W	==>	2966.02	
10417.00	90.00	179.630	7111.00	2876.83S	1494.13W	==>	3064.84	
10517.00	90.00	179.630	7111.00	2976.83S	1493.49W	==>	3163.66	
10617.00	90.00	179.630	7111.00	3076.83S	1492.85W	==>	3262.49	
10717.00	90.00	179.630	7111.00	3176.82S	1492.21W	==>	3361.31	
10817.00	90.00	179.630	7111.00	3276.82S	1491.57W	==>	3460.13	
10917.00	90.00	179.630	7111.00	3376.82S	1490.93W	==>	3558.95	
11017.00	90.00	179.630	7111.00	3476.82S	1490.29W	==>	3657.78	
11117.00	90.00	179.630	7111.00	3576.82S	1489.65W	==>	3756.60	
11217.00	90.00	179.630	7111.00	3676.81S	1489.01W	==>	3855.42	
11317.00	90.00	179.630	7111.00	3776.81S	1488.37W	==>	3954.25	
11417.00	90.00	179.630	7111.00	3876.81S	1487.74W	==>	4053.07	
11517.00	90.00	179.630	7111.00	3976.81S	1487.10W	==>	4151.89	
11617.00	90.00	179.630	7111.00	4076.81S	1486.46W	==>	4250.72	
11717.00	90.00	179.630	7111.00	4176.80S	1485.82W	==>	4349.54	
11817.00	90.00	179.630	7111.00	4276.80S	1485.18W	==>	4448.36	
11917.00	90.00	179.630	7111.00	4376.80S	1484.54W	==>	4547.19	
12017.00	90.00	179.630	7111.00	4476.80S	1483.90W	==>	4646.01	
12117.00	90.00	179.630	7111.00	4576.80S	1483.26W	==>	4744.83	
12217.00	90.00	179.630	7111.00	4676.79S	1482.62W	==>	4843.65	
12317.00	90.00	179.630	7111.00	4776.79S	1481.98W	==>	4942.48	
12417.00	90.00	179.630	7111.00	4876.79S	1481.34W	==>	5041.30	
12517.00	90.00	179.630	7111.00	4976.79S	1480.70W	==>	5140.12	
12617.00	90.00	179.630	7111.00	5076.79S	1480.06W	==>	5238.95	
12717.00	90.00	179.630	7111.00	5176.78S	1479.42W	==>	5337.77	
12817.00	90.00	179.630	7111.00	5276.78S	1478.78W	==>	5436.59	
12917.00	90.00	179.630	7111.00	5376.78S	1478.14W	==>	5535.42	
13017.00	90.00	179.630	7111.00	5476.78S	1477.50W	==>	5634.24	
13117.00	90.00	179.630	7111.00	5576.78S	1476.86W	==>	5733.06	
13217.00	90.00	179.630	7111.00	5676.77S	1476.22W	==>	5831.89	
13317.00	90.00	179.630	7111.00	5776.77S	1475.58W	==>	5930.71	
13417.00	90.00	179.630	7111.00	5876.77S	1474.95W	==>	6029.53	
13517.00	90.00	179.630	7111.00	5976.77S	1474.31W	==>	6128.35	
13617.00	90.00	179.630	7111.00	6076.76S	1473.67W	==>	6227.18	
13717.00	90.00	179.630	7111.00	6176.76S	1473.03W	==>	6326.00	
13817.00	90.00	179.630	7111.00	6276.76S	1472.39W	==>	6424.82	
13917.00	90.00	179.630	7111.00	6376.76S	1471.75W	==>	6523.65	
14017.00	90.00	179.630	7111.00	6476.76S	1471.11W	==>	6622.47	
14117.00	90.00	179.630	7111.00	6576.75S	1470.47W	==>	6721.29	
14217.00	90.00	179.630	7111.00	6676.75S	1469.83W	==>	6820.12	
14317.00	90.00	179.630	7111.00	6776.75S	1469.19W	==>	6918.94	
14417.00	90.00	179.630	7111.00	6876.75S	1468.55W	==>	7017.76	
14517.00	90.00	179.630	7111.00	6976.75S	1467.91W	==>	7116.59	
14617.00	90.00	179.630	7111.00	7076.74S	1467.27W	==>	7215.41	
14717.00	90.00	179.630	7111.00	7176.74S	1466.63W	==>	7314.23	
14817.00	90.00	179.630	7111.00	7276.74S	1465.99W	==>	7413.05	

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Vertical Section is from 0.00N 0.00E on azimuth 188.430 degrees  
Bottom hole distance is 9887.51 Feet on azimuth 188.43 degrees from Wellhead  
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Date Printed: 8-Oct-2017



SYS DRILL  
Well Design Combined Report  
Wellbore: W OLANDER 8 (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	7111.00	7376.74S	1465.35W	==>	7511.88	
15017.00	90.00	179.630	7111.00	7476.74S	1464.71W	==>	7610.70	
15117.00	90.00	179.630	7111.00	7576.73S	1464.07W	==>	7709.52	
15217.00	90.00	179.630	7111.00	7676.73S	1463.43W	==>	7808.35	
15317.00	90.00	179.630	7111.00	7776.73S	1462.79W	==>	7907.17	
15417.00	90.00	179.630	7111.00	7876.73S	1462.16W	==>	8005.99	
15517.00	90.00	179.630	7111.00	7976.73S	1461.52W	==>	8104.82	
15617.00	90.00	179.630	7111.00	8076.72S	1460.88W	==>	8203.64	
15717.00	90.00	179.630	7111.00	8176.72S	1460.24W	==>	8302.46	
15817.00	90.00	179.630	7111.00	8276.72S	1459.60W	==>	8401.29	
15917.00	90.00	179.630	7111.00	8376.72S	1458.96W	==>	8500.11	
16017.00	90.00	179.630	7111.00	8476.72S	1458.32W	==>	8598.93	
16117.00	90.00	179.630	7111.00	8576.71S	1457.68W	==>	8697.75	
16217.00	90.00	179.630	7111.00	8676.71S	1457.04W	==>	8796.58	
16317.00	90.00	179.630	7111.00	8776.71S	1456.40W	==>	8895.40	
16417.00	90.00	179.630	7111.00	8876.71S	1455.76W	==>	8994.22	
16517.00	90.00	179.630	7111.00	8976.71S	1455.12W	==>	9093.05	
16617.00	90.00	179.630	7111.00	9076.70S	1454.48W	==>	9191.87	
16717.00	90.00	179.630	7111.00	9176.70S	1453.84W	==>	9290.69	
16817.00	90.00	179.630	7111.00	9276.70S	1453.20W	==>	9389.52	
16917.00	90.00	179.630	7111.00	9376.70S	1452.56W	==>	9488.34	
17017.00	90.00	179.630	7111.00	9476.70S	1451.92W	==>	9587.16	
17117.00	90.00	179.630	7111.00	9576.69S	1451.28W	==>	9685.99	
17217.00	90.00	179.630	7111.00	9676.69S	1450.64W	==>	9784.81	
17317.00	90.00	179.630	7111.00	9776.69S	1450.00W	==>	9883.63	
17320.93	90.00	179.630	7111.00	9780.62S	1449.98W	==>	9887.51	

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 5048.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 188.430 degrees  
Bottom hole distance is 9887.51 Feet on azimuth 188.43 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Microsoft  
Date Printed: 8-Oct-2017



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 8 EP	105.61S	1511.85W	7111.00	40.20261220	-105.03049430	1317001.22	3131142.31
OLANDER 8 BH-2mi	9780.62S	1449.98W	7111.00	40.17605380	-105.03045620	1307326.65	3131204.18

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562268	Planned	1517.00	1510.99	WdW Rate Gyro	Standard	
562267	Planned	17320.93	7111.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes