

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 14
Field	WATTENBERG	Well	W OLANDER 14
Installation	Olander Pad	Wellbore	W OLANDER 14 (PWB)

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	1550.00	0.00	354.73	1550.00	S 0.00	W 0.00	0.00	0.00
End of Build	1855.63	6.11	354.73	1855.05	N 16.22	W 1.50	2.00	-16.22
End of Hold	6506.59	6.11	354.73	6479.57	N 509.38	W 46.97	0.00	-509.43
Target OLANDER 14 EP	7467.50	90.00	179.64	7113.29	S 60.37	W 49.18	10.00	60.31
T.D. & Target OLA...2mi	17145.65	90.00	179.64	7113.29	S 9738.33	E 11.88	0.00	9738.34

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

<- West (Feet) : East (Feet) ->

-800 0 800
 Scale 1 cm = 400 ft

Surface 0.00 N 0.00 E

OLANDER 14 EP

1600

800

0

-800

-1600

-2400

-3200

-4000

-4800

-5600

-6400

-7200

-8000

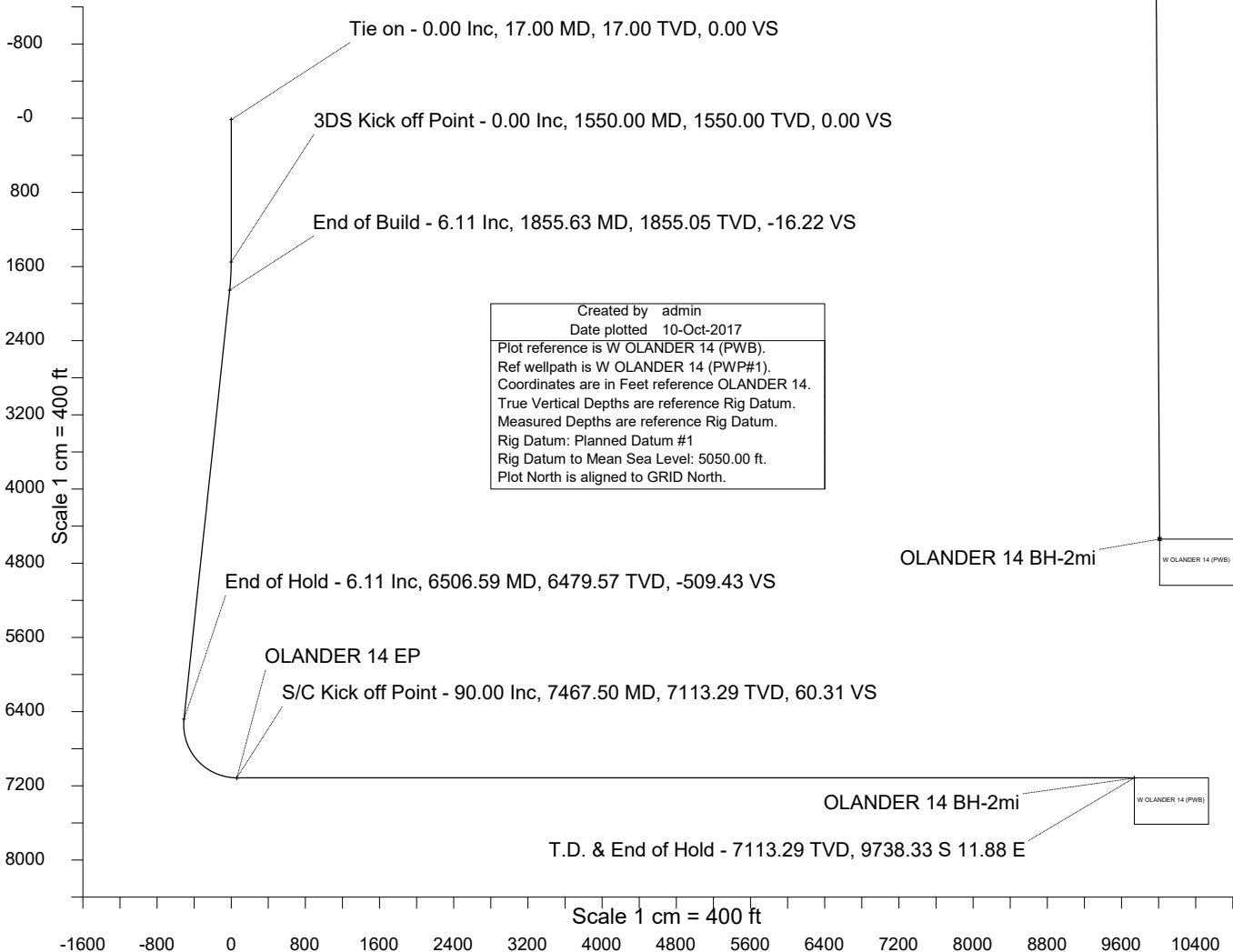
-8800

-9600

-10400

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

<- True Vertical Depth (Feet)



Created by admin
 Date plotted 10-Oct-2017
 Plot reference is W OLANDER 14 (PWB).
 Ref wellpath is W OLANDER 14 (PWP#1).
 Coordinates are in Feet reference OLANDER 14.
 True Vertical Depths are reference Rig Datum.
 Measured Depths are reference Rig Datum.
 Rig Datum: Planned Datum #1
 Rig Datum to Mean Sea Level: 5050.00 ft.
 Plot North is aligned to GRID North.

Vertical Section (Feet) ->

Azimuth 179.93 with reference 0.00 N, 0.00 E from OLANDER 14



SYSDRILL
Well Design Combined Report
Wellbore: W OLANDER 14 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 14	40.20281000	-105.02540000	1317080.8488	3132564.8494	25.43S	14.10E	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	1317080.85	3132564.85
1550.00	0.00	354.730	1550.00	0.00N	0.00E	==>	0.00	1317080.85	3132564.85
1855.63	6.11	354.730	1855.05	16.22N	1.50W	2.00	-16.22	1317097.07	3132563.35
6506.59	6.11	354.730	6479.57	509.38N	46.97W	==>	-509.43	1317590.20	3132517.89
7467.50	90.00	179.640	7113.29	60.37S	49.18W	10.00	60.31	1317020.48	3132515.68
17145.65	90.00	179.640	7113.29	9738.33S	11.88E	==>	9738.34	1307342.95	3132576.73

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	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	
1500.00	0.00	0.000	1500.00	0.00N	0.00E	==>	0.00	
1517.00	0.00	0.000	1517.00	0.00N	0.00E	==>	0.00	
1617.00	1.34	354.730	1616.99	0.78N	0.07W	2.00	-0.78	
1717.00	3.34	354.730	1716.91	4.85N	0.45W	2.00	-4.85	
1817.00	5.34	354.730	1816.61	12.38N	1.14W	2.00	-12.38	
1917.00	6.11	354.730	1916.07	22.73N	2.10W	==>	-22.73	
2017.00	6.11	354.730	2015.50	33.33N	3.07W	==>	-33.33	
2117.00	6.11	354.730	2114.93	43.93N	4.05W	==>	-43.94	
2217.00	6.11	354.730	2214.37	54.54N	5.03W	==>	-54.54	
2317.00	6.11	354.730	2313.80	65.14N	6.01W	==>	-65.15	
2417.00	6.11	354.730	2413.23	75.74N	6.98W	==>	-75.75	
2517.00	6.11	354.730	2512.66	86.35N	7.96W	==>	-86.36	
2617.00	6.11	354.730	2612.09	96.95N	8.94W	==>	-96.96	
2717.00	6.11	354.730	2711.52	107.55N	9.92W	==>	-107.56	
2817.00	6.11	354.730	2810.95	118.16N	10.89W	==>	-118.17	
2917.00	6.11	354.730	2910.39	128.76N	11.87W	==>	-128.77	
3017.00	6.11	354.730	3009.82	139.36N	12.85W	==>	-139.38	

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Coordinates are from Slot MD's are from Rig (Planned Datum #1 5050.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 179.930 degrees
Bottom hole distance is 9738.34 Feet on azimuth 179.93 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 14 (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	6.11	354.730	3109.25	149.97N	13.83W	==>	-149.98	
3217.00	6.11	354.730	3208.68	160.57N	14.80W	==>	-160.59	
3317.00	6.11	354.730	3308.11	171.17N	15.78W	==>	-171.19	
3417.00	6.11	354.730	3407.54	181.78N	16.76W	==>	-181.80	
3517.00	6.11	354.730	3506.97	192.38N	17.74W	==>	-192.40	
3617.00	6.11	354.730	3606.41	202.98N	18.72W	==>	-203.01	
3717.00	6.11	354.730	3705.84	213.59N	19.69W	==>	-213.61	
3817.00	6.11	354.730	3805.27	224.19N	20.67W	==>	-224.21	
3917.00	6.11	354.730	3904.70	234.79N	21.65W	==>	-234.82	
4017.00	6.11	354.730	4004.13	245.40N	22.63W	==>	-245.42	
4117.00	6.11	354.730	4103.56	256.00N	23.60W	==>	-256.03	
4217.00	6.11	354.730	4203.00	266.60N	24.58W	==>	-266.63	
4317.00	6.11	354.730	4302.43	277.21N	25.56W	==>	-277.24	
4417.00	6.11	354.730	4401.86	287.81N	26.54W	==>	-287.84	
4517.00	6.11	354.730	4501.29	298.41N	27.51W	==>	-298.45	
4617.00	6.11	354.730	4600.72	309.02N	28.49W	==>	-309.05	
4717.00	6.11	354.730	4700.15	319.62N	29.47W	==>	-319.65	
4817.00	6.11	354.730	4799.58	330.22N	30.45W	==>	-330.26	
4917.00	6.11	354.730	4899.02	340.83N	31.42W	==>	-340.86	
5017.00	6.11	354.730	4998.45	351.43N	32.40W	==>	-351.47	
5117.00	6.11	354.730	5097.88	362.03N	33.38W	==>	-362.07	
5217.00	6.11	354.730	5197.31	372.64N	34.36W	==>	-372.68	
5317.00	6.11	354.730	5296.74	383.24N	35.34W	==>	-383.28	
5417.00	6.11	354.730	5396.17	393.84N	36.31W	==>	-393.89	
5517.00	6.11	354.730	5495.60	404.45N	37.29W	==>	-404.49	
5617.00	6.11	354.730	5595.04	415.05N	38.27W	==>	-415.10	
5717.00	6.11	354.730	5694.47	425.65N	39.25W	==>	-425.70	
5817.00	6.11	354.730	5793.90	436.26N	40.22W	==>	-436.30	
5917.00	6.11	354.730	5893.33	446.86N	41.20W	==>	-446.91	
6017.00	6.11	354.730	5992.76	457.46N	42.18W	==>	-457.51	
6117.00	6.11	354.730	6092.19	468.07N	43.16W	==>	-468.12	
6217.00	6.11	354.730	6191.62	478.67N	44.13W	==>	-478.72	
6317.00	6.11	354.730	6291.06	489.27N	45.11W	==>	-489.33	
6417.00	6.11	354.730	6390.49	499.88N	46.09W	==>	-499.93	
6517.00	5.08	353.720	6489.93	510.39N	47.07W	10.00	-510.44	
6617.00	4.98	185.670	6589.80	510.47N	47.98W	10.00	-510.52	
6717.00	14.96	181.600	6688.16	493.20N	48.77W	10.00	-493.26	
6817.00	24.96	180.770	6782.04	459.12N	49.42W	10.00	-459.18	
6917.00	34.95	180.390	6868.57	409.25N	49.90W	10.00	-409.32	
7017.00	44.95	180.160	6945.13	345.12N	50.19W	10.00	-345.18	
7117.00	54.95	180.010	7009.39	268.67N	50.30W	10.00	-268.73	
7217.00	64.95	179.880	7059.40	182.22N	50.21W	10.00	-182.28	
7317.00	74.95	179.780	7093.64	88.40N	49.93W	10.00	-88.46	
7417.00	84.95	179.680	7111.07	9.94S	49.47W	10.00	9.88	
7517.00	90.00	179.640	7113.29	109.88S	48.86W	==>	109.82	
7617.00	90.00	179.640	7113.29	209.87S	48.23W	==>	209.82	
7717.00	90.00	179.640	7113.29	309.87S	47.60W	==>	309.81	
7817.00	90.00	179.640	7113.29	409.87S	46.97W	==>	409.81	
7917.00	90.00	179.640	7113.29	509.87S	46.34W	==>	509.81	
8017.00	90.00	179.640	7113.29	609.87S	45.71W	==>	609.81	
8117.00	90.00	179.640	7113.29	709.86S	45.08W	==>	709.81	
8217.00	90.00	179.640	7113.29	809.86S	44.45W	==>	809.81	
8317.00	90.00	179.640	7113.29	909.86S	43.82W	==>	909.81	
8417.00	90.00	179.640	7113.29	1009.86S	43.19W	==>	1009.81	
8517.00	90.00	179.640	7113.29	1109.86S	42.55W	==>	1109.80	
8617.00	90.00	179.640	7113.29	1209.85S	41.92W	==>	1209.80	
8717.00	90.00	179.640	7113.29	1309.85S	41.29W	==>	1309.80	
8817.00	90.00	179.640	7113.29	1409.85S	40.66W	==>	1409.80	
8917.00	90.00	179.640	7113.29	1509.85S	40.03W	==>	1509.80	

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Coordinates are from Slot MD's are from Rig (Planned Datum #1 5050.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 179.930 degrees
Bottom hole distance is 9738.34 Feet on azimuth 179.93 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 14 (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	7113.29	1609.85S	39.40W	==>	1609.80	
9117.00	90.00	179.640	7113.29	1709.85S	38.77W	==>	1709.80	
9217.00	90.00	179.640	7113.29	1809.84S	38.14W	==>	1809.80	
9317.00	90.00	179.640	7113.29	1909.84S	37.51W	==>	1909.79	
9417.00	90.00	179.640	7113.29	2009.84S	36.88W	==>	2009.79	
9517.00	90.00	179.640	7113.29	2109.84S	36.25W	==>	2109.79	
9617.00	90.00	179.640	7113.29	2209.84S	35.61W	==>	2209.79	
9717.00	90.00	179.640	7113.29	2309.83S	34.98W	==>	2309.79	
9817.00	90.00	179.640	7113.29	2409.83S	34.35W	==>	2409.79	
9917.00	90.00	179.640	7113.29	2509.83S	33.72W	==>	2509.79	
10017.00	90.00	179.640	7113.29	2609.83S	33.09W	==>	2609.78	
10117.00	90.00	179.640	7113.29	2709.83S	32.46W	==>	2709.78	
10217.00	90.00	179.640	7113.29	2809.82S	31.83W	==>	2809.78	
10317.00	90.00	179.640	7113.29	2909.82S	31.20W	==>	2909.78	
10417.00	90.00	179.640	7113.29	3009.82S	30.57W	==>	3009.78	
10517.00	90.00	179.640	7113.29	3109.82S	29.94W	==>	3109.78	
10617.00	90.00	179.640	7113.29	3209.82S	29.31W	==>	3209.78	
10717.00	90.00	179.640	7113.29	3309.81S	28.68W	==>	3309.78	
10817.00	90.00	179.640	7113.29	3409.81S	28.04W	==>	3409.77	
10917.00	90.00	179.640	7113.29	3509.81S	27.41W	==>	3509.77	
11017.00	90.00	179.640	7113.29	3609.81S	26.78W	==>	3609.77	
11117.00	90.00	179.640	7113.29	3709.81S	26.15W	==>	3709.77	
11217.00	90.00	179.640	7113.29	3809.80S	25.52W	==>	3809.77	
11317.00	90.00	179.640	7113.29	3909.80S	24.89W	==>	3909.77	
11417.00	90.00	179.640	7113.29	4009.80S	24.26W	==>	4009.77	
11517.00	90.00	179.640	7113.29	4109.80S	23.63W	==>	4109.77	
11617.00	90.00	179.640	7113.29	4209.80S	23.00W	==>	4209.76	
11717.00	90.00	179.640	7113.29	4309.79S	22.37W	==>	4309.76	
11817.00	90.00	179.640	7113.29	4409.79S	21.74W	==>	4409.76	
11917.00	90.00	179.640	7113.29	4509.79S	21.10W	==>	4509.76	
12017.00	90.00	179.640	7113.29	4609.79S	20.47W	==>	4609.76	
12117.00	90.00	179.640	7113.29	4709.79S	19.84W	==>	4709.76	
12217.00	90.00	179.640	7113.29	4809.78S	19.21W	==>	4809.76	
12317.00	90.00	179.640	7113.29	4909.78S	18.58W	==>	4909.75	
12417.00	90.00	179.640	7113.29	5009.78S	17.95W	==>	5009.75	
12517.00	90.00	179.640	7113.29	5109.78S	17.32W	==>	5109.75	
12617.00	90.00	179.640	7113.29	5209.78S	16.69W	==>	5209.75	
12717.00	90.00	179.640	7113.29	5309.77S	16.06W	==>	5309.75	
12817.00	90.00	179.640	7113.29	5409.77S	15.43W	==>	5409.75	
12917.00	90.00	179.640	7113.29	5509.77S	14.80W	==>	5509.75	
13017.00	90.00	179.640	7113.29	5609.77S	14.17W	==>	5609.75	
13117.00	90.00	179.640	7113.29	5709.77S	13.53W	==>	5709.74	
13217.00	90.00	179.640	7113.29	5809.76S	12.90W	==>	5809.74	
13317.00	90.00	179.640	7113.29	5909.76S	12.27W	==>	5909.74	
13417.00	90.00	179.640	7113.29	6009.76S	11.64W	==>	6009.74	
13517.00	90.00	179.640	7113.29	6109.76S	11.01W	==>	6109.74	
13617.00	90.00	179.640	7113.29	6209.76S	10.38W	==>	6209.74	
13717.00	90.00	179.640	7113.29	6309.75S	9.75W	==>	6309.74	
13817.00	90.00	179.640	7113.29	6409.75S	9.12W	==>	6409.74	
13917.00	90.00	179.640	7113.29	6509.75S	8.49W	==>	6509.73	
14017.00	90.00	179.640	7113.29	6609.75S	7.86W	==>	6609.73	
14117.00	90.00	179.640	7113.29	6709.75S	7.23W	==>	6709.73	
14217.00	90.00	179.640	7113.29	6809.74S	6.59W	==>	6809.73	
14317.00	90.00	179.640	7113.29	6909.74S	5.96W	==>	6909.73	
14417.00	90.00	179.640	7113.29	7009.74S	5.33W	==>	7009.73	
14517.00	90.00	179.640	7113.29	7109.74S	4.70W	==>	7109.73	
14617.00	90.00	179.640	7113.29	7209.74S	4.07W	==>	7209.73	
14717.00	90.00	179.640	7113.29	7309.73S	3.44W	==>	7309.72	
14817.00	90.00	179.640	7113.29	7409.73S	2.81W	==>	7409.72	

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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	7113.29	7509.73S	2.18W	==>	7509.72	
15017.00	90.00	179.640	7113.29	7609.73S	1.55W	==>	7609.72	
15117.00	90.00	179.640	7113.29	7709.73S	0.92W	==>	7709.72	
15217.00	90.00	179.640	7113.29	7809.72S	0.29W	==>	7809.72	
15317.00	90.00	179.640	7113.29	7909.72S	0.34E	==>	7909.72	
15417.00	90.00	179.640	7113.29	8009.72S	0.98E	==>	8009.71	
15517.00	90.00	179.640	7113.29	8109.72S	1.61E	==>	8109.71	
15617.00	90.00	179.640	7113.29	8209.72S	2.24E	==>	8209.71	
15717.00	90.00	179.640	7113.29	8309.71S	2.87E	==>	8309.71	
15817.00	90.00	179.640	7113.29	8409.71S	3.50E	==>	8409.71	
15917.00	90.00	179.640	7113.29	8509.71S	4.13E	==>	8509.71	
16017.00	90.00	179.640	7113.29	8609.71S	4.76E	==>	8609.71	
16117.00	90.00	179.640	7113.29	8709.71S	5.39E	==>	8709.71	
16217.00	90.00	179.640	7113.29	8809.70S	6.02E	==>	8809.70	
16317.00	90.00	179.640	7113.29	8909.70S	6.65E	==>	8909.70	
16417.00	90.00	179.640	7113.29	9009.70S	7.28E	==>	9009.70	
16517.00	90.00	179.640	7113.29	9109.70S	7.92E	==>	9109.70	
16617.00	90.00	179.640	7113.29	9209.70S	8.55E	==>	9209.70	
16717.00	90.00	179.640	7113.29	9309.69S	9.18E	==>	9309.70	
16817.00	90.00	179.640	7113.29	9409.69S	9.81E	==>	9409.70	
16917.00	90.00	179.640	7113.29	9509.69S	10.44E	==>	9509.70	
17017.00	90.00	179.640	7113.29	9609.69S	11.07E	==>	9609.69	
17117.00	90.00	179.640	7113.29	9709.69S	11.70E	==>	9709.69	
17145.65	90.00	179.640	7113.29	9738.33S	11.88E	==>	9738.34	

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 5050.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 179.930 degrees
Bottom hole distance is 9738.34 Feet on azimuth 179.93 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 14 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 14 EP	60.37S	49.18W	7113.29	40.20264500	-105.02557720	1317020.48	3132515.68
OLANDER 14 BH-2mi	9738.33S	11.88E	7113.29	40.17607850	-105.02554400	1307342.95	3132576.73

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562412	Planned	1517.00	1517.00	WdW Rate Gyro	Standard	
562411	Planned	17145.65	7113.29	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes