

Cub Creek Energy, LLC

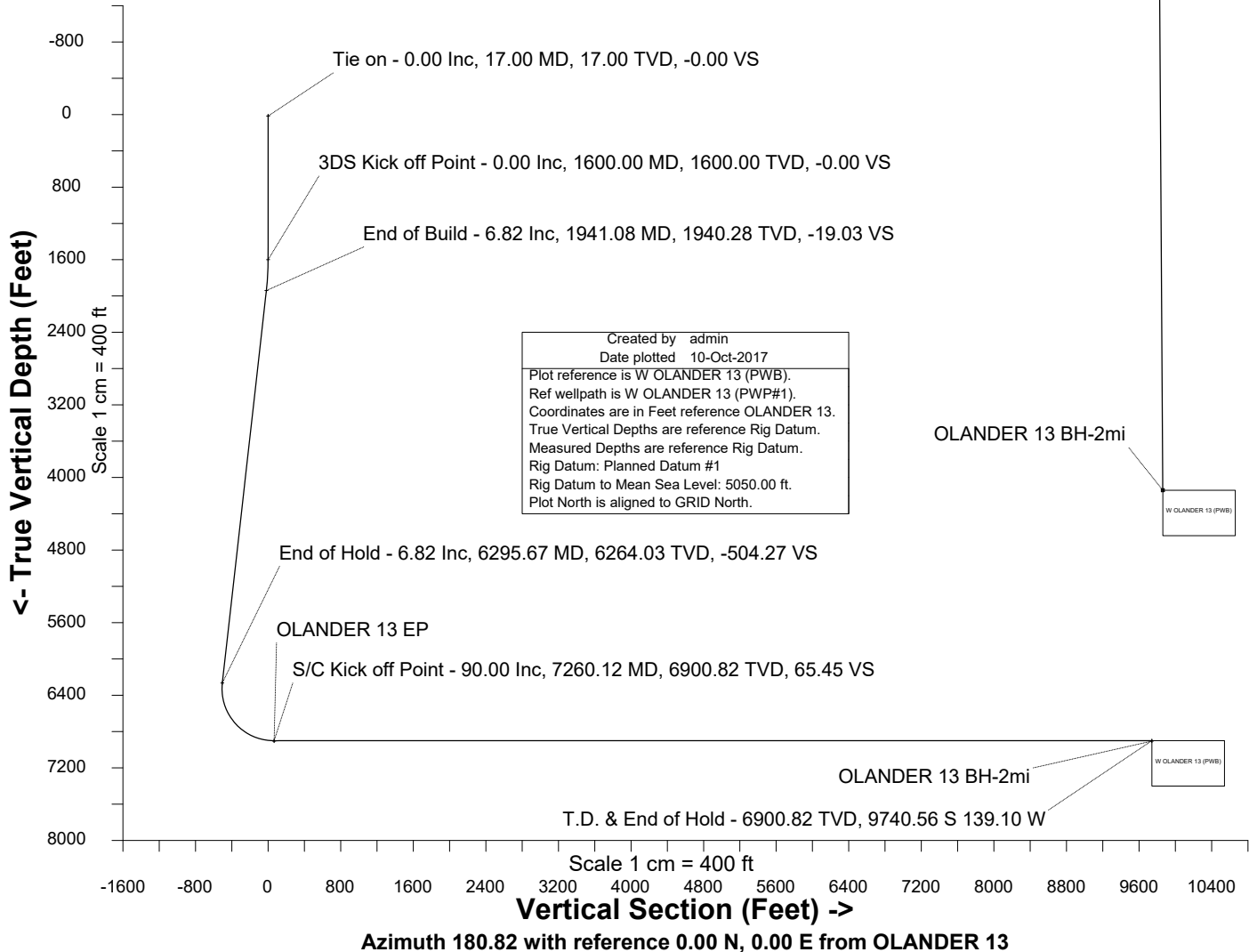
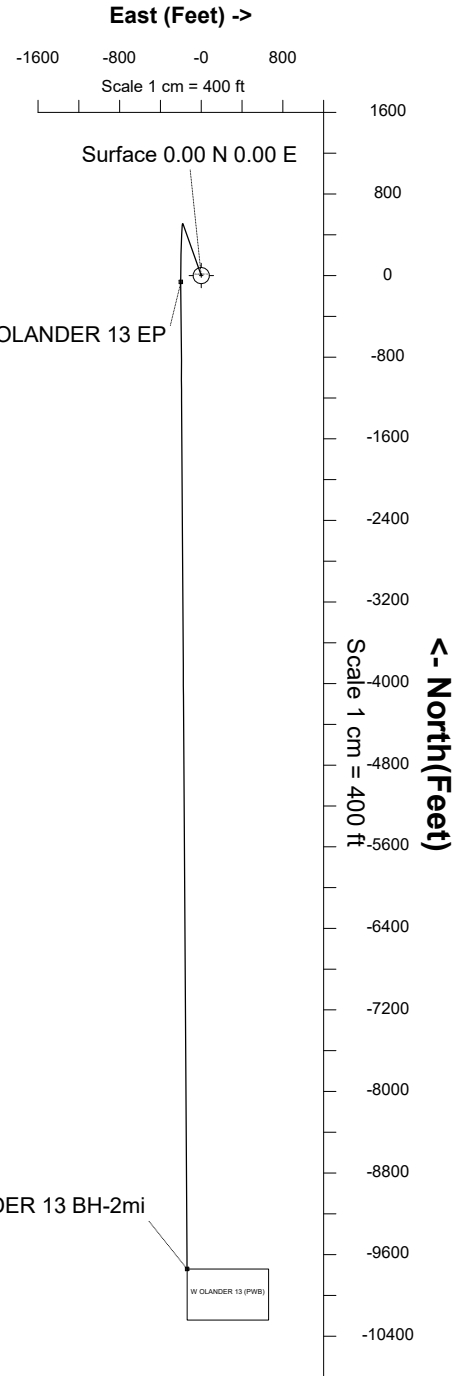
Location	Weld County, CO	Slot	OLANDER 13
Field	WATTENBERG	Well	W OLANDER 13
Installation	Olander Pad	Wellbore	W OLANDER 13 (PWB)

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	1600.00	0.00	340.56	1600.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1941.08	6.82	340.56	1940.28	N 19.12	W 6.75	2.00	-19.03
End of Hold	6295.67	6.82	340.56	6264.03	N 506.88	W 178.87	0.00	-504.27
Target OLANDER 13 EP	7260.12	90.00	179.64	6900.82	S 62.60	W 200.17	10.00	65.45
T.D. & Target OLA...2mi	16938.27	90.00	179.64	6900.82	S 9740.56	W 139.10	0.00	9741.55

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





SYS DRILL
Well Design Combined Report
Wellbore: W OLANDER 13 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 13	40.20281000	-105.02545000	1317080.7741	3132550.8836	25.50S	0.14E	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	1317080.77	3132550.88
1600.00	0.00	340.560	1600.00	0.00N	0.00E	==>	0.00	1317080.77	3132550.88
1941.08	6.82	340.560	1940.28	19.12N	6.75W	2.00	-19.03	1317099.90	3132544.13
6295.67	6.82	340.560	6264.03	506.88N	178.87W	==>	-504.27	1317587.63	3132372.02
7260.12	90.00	179.640	6900.82	62.60S	200.17W	10.00	65.45	1317018.18	3132350.72
16938.27	90.00	179.640	6900.82	9740.56S	139.10W	==>	9741.55	1307340.65	3132411.79

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	0.34	340.560	1617.00	0.05N	0.02W	2.00	-0.05	
1717.00	2.34	340.560	1716.97	2.25N	0.79W	2.00	-2.24	
1817.00	4.34	340.560	1816.79	7.75N	2.73W	2.00	-7.71	
1917.00	6.34	340.560	1916.35	16.52N	5.83W	2.00	-16.44	
2017.00	6.82	340.560	2015.66	27.63N	9.75W	==>	-27.49	
2117.00	6.82	340.560	2114.95	38.83N	13.70W	==>	-38.63	
2217.00	6.82	340.560	2214.24	50.03N	17.65W	==>	-49.77	
2317.00	6.82	340.560	2313.53	61.23N	21.61W	==>	-60.92	
2417.00	6.82	340.560	2412.83	72.43N	25.56W	==>	-72.06	
2517.00	6.82	340.560	2512.12	83.63N	29.51W	==>	-83.20	
2617.00	6.82	340.560	2611.41	94.83N	33.47W	==>	-94.35	
2717.00	6.82	340.560	2710.70	106.04N	37.42W	==>	-105.49	
2817.00	6.82	340.560	2809.99	117.24N	41.37W	==>	-116.63	
2917.00	6.82	340.560	2909.29	128.44N	45.32W	==>	-127.78	
3017.00	6.82	340.560	3008.58	139.64N	49.28W	==>	-138.92	

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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 180.820 degrees
Bottom hole distance is 9741.55 Feet on azimuth 180.82 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 13 (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	6.82	340.560	3107.87	150.84N	53.23W	==>	-150.06	
3217.00	6.82	340.560	3207.16	162.04N	57.18W	==>	-161.21	
3317.00	6.82	340.560	3306.45	173.24N	61.13W	==>	-172.35	
3417.00	6.82	340.560	3405.75	184.44N	65.09W	==>	-183.49	
3517.00	6.82	340.560	3505.04	195.64N	69.04W	==>	-194.64	
3617.00	6.82	340.560	3604.33	206.84N	72.99W	==>	-205.78	
3717.00	6.82	340.560	3703.62	218.04N	76.95W	==>	-216.92	
3817.00	6.82	340.560	3802.91	229.25N	80.90W	==>	-228.07	
3917.00	6.82	340.560	3902.21	240.45N	84.85W	==>	-239.21	
4017.00	6.82	340.560	4001.50	251.65N	88.80W	==>	-250.35	
4117.00	6.82	340.560	4100.79	262.85N	92.76W	==>	-261.50	
4217.00	6.82	340.560	4200.08	274.05N	96.71W	==>	-272.64	
4317.00	6.82	340.560	4299.37	285.25N	100.66W	==>	-283.78	
4417.00	6.82	340.560	4398.67	296.45N	104.61W	==>	-294.93	
4517.00	6.82	340.560	4497.96	307.65N	108.57W	==>	-306.07	
4617.00	6.82	340.560	4597.25	318.85N	112.52W	==>	-317.21	
4717.00	6.82	340.560	4696.54	330.05N	116.47W	==>	-328.36	
4817.00	6.82	340.560	4795.84	341.26N	120.42W	==>	-339.50	
4917.00	6.82	340.560	4895.13	352.46N	124.38W	==>	-350.64	
5017.00	6.82	340.560	4994.42	363.66N	128.33W	==>	-361.79	
5117.00	6.82	340.560	5093.71	374.86N	132.28W	==>	-372.93	
5217.00	6.82	340.560	5193.00	386.06N	136.24W	==>	-384.07	
5317.00	6.82	340.560	5292.30	397.26N	140.19W	==>	-395.22	
5417.00	6.82	340.560	5391.59	408.46N	144.14W	==>	-406.36	
5517.00	6.82	340.560	5490.88	419.66N	148.09W	==>	-417.50	
5617.00	6.82	340.560	5590.17	430.86N	152.05W	==>	-428.65	
5717.00	6.82	340.560	5689.46	442.06N	156.00W	==>	-439.79	
5817.00	6.82	340.560	5788.76	453.27N	159.95W	==>	-450.94	
5917.00	6.82	340.560	5888.05	464.47N	163.90W	==>	-462.08	
6017.00	6.82	340.560	5987.34	475.67N	167.86W	==>	-473.22	
6117.00	6.82	340.560	6086.63	486.87N	171.81W	==>	-484.37	
6217.00	6.82	340.560	6185.92	498.07N	175.76W	==>	-495.51	
6317.00	4.86	332.250	6285.26	508.87N	179.71W	10.00	-506.26	
6417.00	6.11	201.060	6385.05	507.65N	183.61W	10.00	-504.98	
6517.00	15.84	187.560	6483.11	489.11N	187.32W	10.00	-486.38	
6617.00	25.78	184.280	6576.47	453.80N	190.75W	10.00	-451.03	
6717.00	35.75	182.750	6662.29	402.81N	193.78W	10.00	-400.00	
6817.00	45.73	181.820	6737.97	337.68N	196.33W	10.00	-334.84	
6917.00	55.72	181.170	6801.19	260.39N	198.32W	10.00	-257.54	
7017.00	65.71	180.650	6850.05	173.30N	199.68W	10.00	-170.43	
7117.00	75.70	180.210	6883.05	79.04N	200.37W	10.00	-76.17	
7217.00	85.69	179.810	6899.20	19.52S	200.38W	10.00	22.38	
7317.00	90.00	179.640	6900.82	119.48S	199.81W	==>	122.32	
7417.00	90.00	179.640	6900.82	219.48S	199.18W	==>	222.30	
7517.00	90.00	179.640	6900.82	319.48S	198.55W	==>	322.28	
7617.00	90.00	179.640	6900.82	419.47S	197.92W	==>	422.26	
7717.00	90.00	179.640	6900.82	519.47S	197.29W	==>	522.24	
7817.00	90.00	179.640	6900.82	619.47S	196.66W	==>	622.21	
7917.00	90.00	179.640	6900.82	719.47S	196.03W	==>	722.19	
8017.00	90.00	179.640	6900.82	819.47S	195.40W	==>	822.17	
8117.00	90.00	179.640	6900.82	919.46S	194.77W	==>	922.15	
8217.00	90.00	179.640	6900.82	1019.46S	194.13W	==>	1022.13	
8317.00	90.00	179.640	6900.82	1119.46S	193.50W	==>	1122.11	
8417.00	90.00	179.640	6900.82	1219.46S	192.87W	==>	1222.09	
8517.00	90.00	179.640	6900.82	1319.46S	192.24W	==>	1322.07	
8617.00	90.00	179.640	6900.82	1419.45S	191.61W	==>	1422.04	
8717.00	90.00	179.640	6900.82	1519.45S	190.98W	==>	1522.02	
8817.00	90.00	179.640	6900.82	1619.45S	190.35W	==>	1622.00	
8917.00	90.00	179.640	6900.82	1719.45S	189.72W	==>	1721.98	

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Vertical Section is from 0.00N 0.00E on azimuth 180.820 degrees
Bottom hole distance is 9741.55 Feet on azimuth 180.82 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 13 (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	6900.82	1819.45S	189.09W	==>	1821.96	
9117.00	90.00	179.640	6900.82	1919.44S	188.46W	==>	1921.94	
9217.00	90.00	179.640	6900.82	2019.44S	187.82W	==>	2021.92	
9317.00	90.00	179.640	6900.82	2119.44S	187.19W	==>	2121.90	
9417.00	90.00	179.640	6900.82	2219.44S	186.56W	==>	2221.87	
9517.00	90.00	179.640	6900.82	2319.44S	185.93W	==>	2321.85	
9617.00	90.00	179.640	6900.82	2419.43S	185.30W	==>	2421.83	
9717.00	90.00	179.640	6900.82	2519.43S	184.67W	==>	2521.81	
9817.00	90.00	179.640	6900.82	2619.43S	184.04W	==>	2621.79	
9917.00	90.00	179.640	6900.82	2719.43S	183.41W	==>	2721.77	
10017.00	90.00	179.640	6900.82	2819.43S	182.78W	==>	2821.75	
10117.00	90.00	179.640	6900.82	2919.42S	182.14W	==>	2921.73	
10217.00	90.00	179.640	6900.82	3019.42S	181.51W	==>	3021.71	
10317.00	90.00	179.640	6900.82	3119.42S	180.88W	==>	3121.68	
10417.00	90.00	179.640	6900.82	3219.42S	180.25W	==>	3221.66	
10517.00	90.00	179.640	6900.82	3319.42S	179.62W	==>	3321.64	
10617.00	90.00	179.640	6900.82	3419.41S	178.99W	==>	3421.62	
10717.00	90.00	179.640	6900.82	3519.41S	178.36W	==>	3521.60	
10817.00	90.00	179.640	6900.82	3619.41S	177.73W	==>	3621.58	
10917.00	90.00	179.640	6900.82	3719.41S	177.10W	==>	3721.56	
11017.00	90.00	179.640	6900.82	3819.41S	176.47W	==>	3821.54	
11117.00	90.00	179.640	6900.82	3919.40S	175.83W	==>	3921.51	
11217.00	90.00	179.640	6900.82	4019.40S	175.20W	==>	4021.49	
11317.00	90.00	179.640	6900.82	4119.40S	174.57W	==>	4121.47	
11417.00	90.00	179.640	6900.82	4219.40S	173.94W	==>	4221.45	
11517.00	90.00	179.640	6900.82	4319.40S	173.31W	==>	4321.43	
11617.00	90.00	179.640	6900.82	4419.39S	172.68W	==>	4421.41	
11717.00	90.00	179.640	6900.82	4519.39S	172.05W	==>	4521.39	
11817.00	90.00	179.640	6900.82	4619.39S	171.42W	==>	4621.37	
11917.00	90.00	179.640	6900.82	4719.39S	170.79W	==>	4721.34	
12017.00	90.00	179.640	6900.82	4819.39S	170.15W	==>	4821.32	
12117.00	90.00	179.640	6900.82	4919.38S	169.52W	==>	4921.30	
12217.00	90.00	179.640	6900.82	5019.38S	168.89W	==>	5021.28	
12317.00	90.00	179.640	6900.82	5119.38S	168.26W	==>	5121.26	
12417.00	90.00	179.640	6900.82	5219.38S	167.63W	==>	5221.24	
12517.00	90.00	179.640	6900.82	5319.38S	167.00W	==>	5321.22	
12617.00	90.00	179.640	6900.82	5419.37S	166.37W	==>	5421.20	
12717.00	90.00	179.640	6900.82	5519.37S	165.74W	==>	5521.18	
12817.00	90.00	179.640	6900.82	5619.37S	165.11W	==>	5621.15	
12917.00	90.00	179.640	6900.82	5719.37S	164.47W	==>	5721.13	
13017.00	90.00	179.640	6900.82	5819.37S	163.84W	==>	5821.11	
13117.00	90.00	179.640	6900.82	5919.36S	163.21W	==>	5921.09	
13217.00	90.00	179.640	6900.82	6019.36S	162.58W	==>	6021.07	
13317.00	90.00	179.640	6900.82	6119.36S	161.95W	==>	6121.05	
13417.00	90.00	179.640	6900.82	6219.36S	161.32W	==>	6221.03	
13517.00	90.00	179.640	6900.82	6319.36S	160.69W	==>	6321.01	
13617.00	90.00	179.640	6900.82	6419.35S	160.06W	==>	6420.98	
13717.00	90.00	179.640	6900.82	6519.35S	159.43W	==>	6520.96	
13817.00	90.00	179.640	6900.82	6619.35S	158.80W	==>	6620.94	
13917.00	90.00	179.640	6900.82	6719.35S	158.16W	==>	6720.92	
14017.00	90.00	179.640	6900.82	6819.35S	157.53W	==>	6820.90	
14117.00	90.00	179.640	6900.82	6919.34S	156.90W	==>	6920.88	
14217.00	90.00	179.640	6900.82	7019.34S	156.27W	==>	7020.86	
14317.00	90.00	179.640	6900.82	7119.34S	155.64W	==>	7120.84	
14417.00	90.00	179.640	6900.82	7219.34S	155.01W	==>	7220.82	
14517.00	90.00	179.640	6900.82	7319.34S	154.38W	==>	7320.79	
14617.00	90.00	179.640	6900.82	7419.33S	153.75W	==>	7420.77	
14717.00	90.00	179.640	6900.82	7519.33S	153.12W	==>	7520.75	
14817.00	90.00	179.640	6900.82	7619.33S	152.48W	==>	7620.73	

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Well Design Combined Report
Wellbore: W OLANDER 13 (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	179.640	6900.82	7719.33S	151.85W	==>	7720.71	
15017.00	90.00	179.640	6900.82	7819.33S	151.22W	==>	7820.69	
15117.00	90.00	179.640	6900.82	7919.32S	150.59W	==>	7920.67	
15217.00	90.00	179.640	6900.82	8019.32S	149.96W	==>	8020.65	
15317.00	90.00	179.640	6900.82	8119.32S	149.33W	==>	8120.62	
15417.00	90.00	179.640	6900.82	8219.32S	148.70W	==>	8220.60	
15517.00	90.00	179.640	6900.82	8319.32S	148.07W	==>	8320.58	
15617.00	90.00	179.640	6900.82	8419.31S	147.44W	==>	8420.56	
15717.00	90.00	179.640	6900.82	8519.31S	146.80W	==>	8520.54	
15817.00	90.00	179.640	6900.82	8619.31S	146.17W	==>	8620.52	
15917.00	90.00	179.640	6900.82	8719.31S	145.54W	==>	8720.50	
16017.00	90.00	179.640	6900.82	8819.31S	144.91W	==>	8820.48	
16117.00	90.00	179.640	6900.82	8919.30S	144.28W	==>	8920.45	
16217.00	90.00	179.640	6900.82	9019.30S	143.65W	==>	9020.43	
16317.00	90.00	179.640	6900.82	9119.30S	143.02W	==>	9120.41	
16417.00	90.00	179.640	6900.82	9219.30S	142.39W	==>	9220.39	
16517.00	90.00	179.640	6900.82	9319.30S	141.76W	==>	9320.37	
16617.00	90.00	179.640	6900.82	9419.29S	141.13W	==>	9420.35	
16717.00	90.00	179.640	6900.82	9519.29S	140.49W	==>	9520.33	
16817.00	90.00	179.640	6900.82	9619.29S	139.86W	==>	9620.31	
16917.00	90.00	179.640	6900.82	9719.29S	139.23W	==>	9720.29	
16938.27	90.00	179.640	6900.82	9740.56S	139.10W	==>	9741.55	

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 180.820 degrees
Bottom hole distance is 9741.55 Feet on azimuth 180.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 10-Oct-2017



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
OLANDER 13 EP	62.60S	200.17W	6900.82	40.20264110	-105.02616780	1317018.18	3132350.72
OLANDER 13 BH-2mi	9740.56S	139.10W	6900.82	40.17607460	-105.02613430	1307340.65	3132411.79

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562390	Planned	1517.00	1517.00	WdW Rate Gyro	Standard	
562389	Planned	16938.27	6900.82	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes