

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	OLANDER 9
Field	WATTENBERG	Well	W OLANDER 9
Installation	Olander Pad	Wellbore	W OLANDER 9 (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	900.00	0.00	291.03	900.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1627.74	14.55	291.03	1619.94	N 32.99	W 85.81	2.00	-21.41
End of Hold	6452.49	14.55	291.03	6289.85	N 468.12	W 1217.53	0.00	-303.72
Target OLANDER 9 EP	7405.09	90.00	179.63	6897.82	S 103.36	W 1360.85	10.00	281.65
T.D. & Target OLA...2mi	17080.80	90.00	179.63	6897.82	S 9778.87	W 1299.00	0.00	9864.77

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

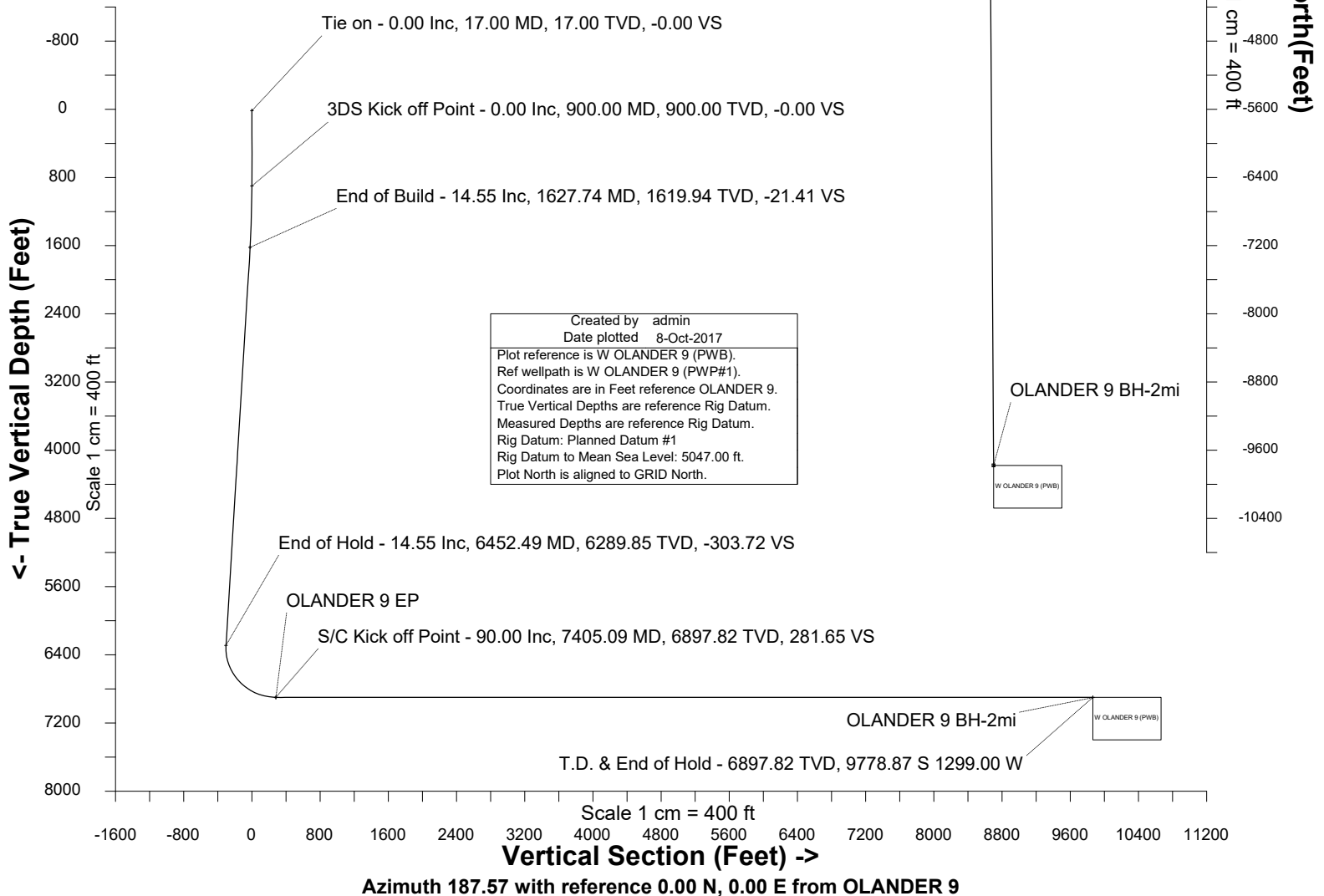
East (Feet) ->

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

Surface 0.00 N 0.00 E

OLANDER 9 EP

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





SYSDRILL
Well Design Combined Report
Wellbore: W OLANDER 9 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
OLANDER 9	40.20288000	-105.02503000	1317106.9016	3132668.0599	0.63N	117.32E	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	1317106.90	3132668.06
900.00	0.00	291.030	900.00	0.00N	0.00E	==>	0.00	1317106.90	3132668.06
1627.74	14.55	291.030	1619.94	32.99N	85.81W	2.00	-21.41	1317139.89	3132582.25
6452.49	14.55	291.030	6289.85	468.12N	1217.53W	==>	-303.72	1317575.00	3131450.58
7405.09	90.00	179.630	6897.82	103.36S	1360.85W	10.00	281.65	1317003.55	3131307.27
17080.80	90.00	179.630	6897.82	9778.87S	1299.00W	==>	9864.77	1307328.47	3131369.12

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	291.030	900.00	0.00N	0.00E	==>	0.00	
1000.00	2.00	291.030	999.98	0.63N	1.63W	2.00	-0.41	
1100.00	4.00	291.030	1099.84	2.50N	6.51W	2.00	-1.62	
1200.00	6.00	291.030	1199.45	5.63N	14.65W	2.00	-3.65	
1300.00	8.00	291.030	1298.70	10.01N	26.02W	2.00	-6.49	
1400.00	10.00	291.030	1397.47	15.62N	40.62W	2.00	-10.13	
1500.00	12.00	291.030	1495.62	22.47N	58.43W	2.00	-14.58	
1517.00	12.34	291.030	1512.24	23.75N	61.78W	2.00	-15.41	
1617.00	14.34	291.030	1609.54	32.03N	83.31W	2.00	-20.78	
1717.00	14.55	291.030	1706.33	41.04N	106.75W	==>	-26.63	
1817.00	14.55	291.030	1803.12	50.06N	130.21W	==>	-32.48	
1917.00	14.55	291.030	1899.92	59.08N	153.66W	==>	-38.33	
2017.00	14.55	291.030	1996.71	68.10N	177.12W	==>	-44.18	
2117.00	14.55	291.030	2093.50	77.12N	200.58W	==>	-50.03	
2217.00	14.55	291.030	2190.29	86.14N	224.03W	==>	-55.89	
2317.00	14.55	291.030	2287.08	95.16N	247.49W	==>	-61.74	
2417.00	14.55	291.030	2383.87	104.17N	270.95W	==>	-67.59	
2517.00	14.55	291.030	2480.66	113.19N	294.40W	==>	-73.44	
2617.00	14.55	291.030	2577.45	122.21N	317.86W	==>	-79.29	
2717.00	14.55	291.030	2674.24	131.23N	341.32W	==>	-85.14	
2817.00	14.55	291.030	2771.03	140.25N	364.77W	==>	-90.99	
2917.00	14.55	291.030	2867.82	149.27N	388.23W	==>	-96.84	
3017.00	14.55	291.030	2964.61	158.29N	411.69W	==>	-102.70	

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 187.570 degrees
Bottom hole distance is 9864.77 Feet on azimuth 187.57 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 9 (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	14.55	291.030	3061.40	167.30N	435.14W	==>	-108.55	
3217.00	14.55	291.030	3158.20	176.32N	458.60W	==>	-114.40	
3317.00	14.55	291.030	3254.99	185.34N	482.06W	==>	-120.25	
3417.00	14.55	291.030	3351.78	194.36N	505.51W	==>	-126.10	
3517.00	14.55	291.030	3448.57	203.38N	528.97W	==>	-131.95	
3617.00	14.55	291.030	3545.36	212.40N	552.43W	==>	-137.80	
3717.00	14.55	291.030	3642.15	221.42N	575.88W	==>	-143.65	
3817.00	14.55	291.030	3738.94	230.43N	599.34W	==>	-149.51	
3917.00	14.55	291.030	3835.73	239.45N	622.79W	==>	-155.36	
4017.00	14.55	291.030	3932.52	248.47N	646.25W	==>	-161.21	
4117.00	14.55	291.030	4029.31	257.49N	669.71W	==>	-167.06	
4217.00	14.55	291.030	4126.10	266.51N	693.16W	==>	-172.91	
4317.00	14.55	291.030	4222.89	275.53N	716.62W	==>	-178.76	
4417.00	14.55	291.030	4319.68	284.55N	740.08W	==>	-184.61	
4517.00	14.55	291.030	4416.48	293.56N	763.53W	==>	-190.46	
4617.00	14.55	291.030	4513.27	302.58N	786.99W	==>	-196.32	
4717.00	14.55	291.030	4610.06	311.60N	810.45W	==>	-202.17	
4817.00	14.55	291.030	4706.85	320.62N	833.90W	==>	-208.02	
4917.00	14.55	291.030	4803.64	329.64N	857.36W	==>	-213.87	
5017.00	14.55	291.030	4900.43	338.66N	880.82W	==>	-219.72	
5117.00	14.55	291.030	4997.22	347.68N	904.27W	==>	-225.57	
5217.00	14.55	291.030	5094.01	356.69N	927.73W	==>	-231.42	
5317.00	14.55	291.030	5190.80	365.71N	951.19W	==>	-237.28	
5417.00	14.55	291.030	5287.59	374.73N	974.64W	==>	-243.13	
5517.00	14.55	291.030	5384.38	383.75N	998.10W	==>	-248.98	
5617.00	14.55	291.030	5481.17	392.77N	1021.56W	==>	-254.83	
5717.00	14.55	291.030	5577.97	401.79N	1045.01W	==>	-260.68	
5817.00	14.55	291.030	5674.76	410.81N	1068.47W	==>	-266.53	
5917.00	14.55	291.030	5771.55	419.82N	1091.93W	==>	-272.38	
6017.00	14.55	291.030	5868.34	428.84N	1115.38W	==>	-278.23	
6117.00	14.55	291.030	5965.13	437.86N	1138.84W	==>	-284.09	
6217.00	14.55	291.030	6061.92	446.88N	1162.30W	==>	-289.94	
6317.00	14.55	291.030	6158.71	455.90N	1185.75W	==>	-295.79	
6417.00	14.55	291.030	6255.50	464.92N	1209.21W	==>	-301.64	
6517.00	13.64	264.580	6352.48	470.31N	1232.69W	10.00	-303.89	
6617.00	17.54	229.540	6448.99	459.39N	1255.95W	10.00	-290.01	
6717.00	25.00	210.850	6542.22	431.40N	1278.31W	10.00	-259.31	
6817.00	33.75	200.850	6629.33	387.18N	1299.08W	10.00	-212.75	
6917.00	42.99	194.660	6707.68	328.09N	1317.65W	10.00	-151.73	
7017.00	52.47	190.340	6774.88	255.92N	1333.43W	10.00	-78.10	
7117.00	62.07	187.000	6828.89	172.85N	1345.96W	10.00	5.89	
7217.00	71.74	184.210	6868.08	81.42N	1354.85W	10.00	97.70	
7317.00	81.44	181.720	6891.25	15.60S	1359.83W	10.00	194.53	
7417.00	90.00	179.630	6897.82	115.26S	1360.78W	==>	293.45	
7517.00	90.00	179.630	6897.82	215.26S	1360.14W	==>	392.49	
7617.00	90.00	179.630	6897.82	315.26S	1359.50W	==>	491.53	
7717.00	90.00	179.630	6897.82	415.26S	1358.86W	==>	590.58	
7817.00	90.00	179.630	6897.82	515.26S	1358.22W	==>	689.62	
7917.00	90.00	179.630	6897.82	615.25S	1357.58W	==>	788.66	
8017.00	90.00	179.630	6897.82	715.25S	1356.94W	==>	887.71	
8117.00	90.00	179.630	6897.82	815.25S	1356.30W	==>	986.75	
8217.00	90.00	179.630	6897.82	915.25S	1355.66W	==>	1085.79	
8317.00	90.00	179.630	6897.82	1015.25S	1355.03W	==>	1184.84	
8417.00	90.00	179.630	6897.82	1115.24S	1354.39W	==>	1283.88	
8517.00	90.00	179.630	6897.82	1215.24S	1353.75W	==>	1382.92	
8617.00	90.00	179.630	6897.82	1315.24S	1353.11W	==>	1481.96	
8717.00	90.00	179.630	6897.82	1415.24S	1352.47W	==>	1581.01	
8817.00	90.00	179.630	6897.82	1515.24S	1351.83W	==>	1680.05	
8917.00	90.00	179.630	6897.82	1615.23S	1351.19W	==>	1779.09	

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Vertical Section is from 0.00N 0.00E on azimuth 187.570 degrees
Bottom hole distance is 9864.77 Feet on azimuth 187.57 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 9 (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	6897.82	1715.23S	1350.55W	==>	1878.14	
9117.00	90.00	179.630	6897.82	1815.23S	1349.91W	==>	1977.18	
9217.00	90.00	179.630	6897.82	1915.23S	1349.27W	==>	2076.22	
9317.00	90.00	179.630	6897.82	2015.23S	1348.63W	==>	2175.27	
9417.00	90.00	179.630	6897.82	2115.22S	1347.99W	==>	2274.31	
9517.00	90.00	179.630	6897.82	2215.22S	1347.35W	==>	2373.35	
9617.00	90.00	179.630	6897.82	2315.22S	1346.71W	==>	2472.39	
9717.00	90.00	179.630	6897.82	2415.22S	1346.07W	==>	2571.44	
9817.00	90.00	179.630	6897.82	2515.22S	1345.44W	==>	2670.48	
9917.00	90.00	179.630	6897.82	2615.21S	1344.80W	==>	2769.52	
10017.00	90.00	179.630	6897.82	2715.21S	1344.16W	==>	2868.57	
10117.00	90.00	179.630	6897.82	2815.21S	1343.52W	==>	2967.61	
10217.00	90.00	179.630	6897.82	2915.21S	1342.88W	==>	3066.65	
10317.00	90.00	179.630	6897.82	3015.21S	1342.24W	==>	3165.70	
10417.00	90.00	179.630	6897.82	3115.20S	1341.60W	==>	3264.74	
10517.00	90.00	179.630	6897.82	3215.20S	1340.96W	==>	3363.78	
10617.00	90.00	179.630	6897.82	3315.20S	1340.32W	==>	3462.83	
10717.00	90.00	179.630	6897.82	3415.20S	1339.68W	==>	3561.87	
10817.00	90.00	179.630	6897.82	3515.19S	1339.04W	==>	3660.91	
10917.00	90.00	179.630	6897.82	3615.19S	1338.40W	==>	3759.95	
11017.00	90.00	179.630	6897.82	3715.19S	1337.76W	==>	3859.00	
11117.00	90.00	179.630	6897.82	3815.19S	1337.12W	==>	3958.04	
11217.00	90.00	179.630	6897.82	3915.19S	1336.49W	==>	4057.08	
11317.00	90.00	179.630	6897.82	4015.18S	1335.85W	==>	4156.13	
11417.00	90.00	179.630	6897.82	4115.18S	1335.21W	==>	4255.17	
11517.00	90.00	179.630	6897.82	4215.18S	1334.57W	==>	4354.21	
11617.00	90.00	179.630	6897.82	4315.18S	1333.93W	==>	4453.26	
11717.00	90.00	179.630	6897.82	4415.18S	1333.29W	==>	4552.30	
11817.00	90.00	179.630	6897.82	4515.17S	1332.65W	==>	4651.34	
11917.00	90.00	179.630	6897.82	4615.17S	1332.01W	==>	4750.38	
12017.00	90.00	179.630	6897.82	4715.17S	1331.37W	==>	4849.43	
12117.00	90.00	179.630	6897.82	4815.17S	1330.73W	==>	4948.47	
12217.00	90.00	179.630	6897.82	4915.17S	1330.09W	==>	5047.51	
12317.00	90.00	179.630	6897.82	5015.16S	1329.45W	==>	5146.56	
12417.00	90.00	179.630	6897.82	5115.16S	1328.81W	==>	5245.60	
12517.00	90.00	179.630	6897.82	5215.16S	1328.17W	==>	5344.64	
12617.00	90.00	179.630	6897.82	5315.16S	1327.54W	==>	5443.69	
12717.00	90.00	179.630	6897.82	5415.16S	1326.90W	==>	5542.73	
12817.00	90.00	179.630	6897.82	5515.15S	1326.26W	==>	5641.77	
12917.00	90.00	179.630	6897.82	5615.15S	1325.62W	==>	5740.81	
13017.00	90.00	179.630	6897.82	5715.15S	1324.98W	==>	5839.86	
13117.00	90.00	179.630	6897.82	5815.15S	1324.34W	==>	5938.90	
13217.00	90.00	179.630	6897.82	5915.15S	1323.70W	==>	6037.94	
13317.00	90.00	179.630	6897.82	6015.14S	1323.06W	==>	6136.99	
13417.00	90.00	179.630	6897.82	6115.14S	1322.42W	==>	6236.03	
13517.00	90.00	179.630	6897.82	6215.14S	1321.78W	==>	6335.07	
13617.00	90.00	179.630	6897.82	6315.14S	1321.14W	==>	6434.12	
13717.00	90.00	179.630	6897.82	6415.14S	1320.50W	==>	6533.16	
13817.00	90.00	179.630	6897.82	6515.13S	1319.86W	==>	6632.20	
13917.00	90.00	179.630	6897.82	6615.13S	1319.22W	==>	6731.24	
14017.00	90.00	179.630	6897.82	6715.13S	1318.58W	==>	6830.29	
14117.00	90.00	179.630	6897.82	6815.13S	1317.95W	==>	6929.33	
14217.00	90.00	179.630	6897.82	6915.13S	1317.31W	==>	7028.37	
14317.00	90.00	179.630	6897.82	7015.12S	1316.67W	==>	7127.42	
14417.00	90.00	179.630	6897.82	7115.12S	1316.03W	==>	7226.46	
14517.00	90.00	179.630	6897.82	7215.12S	1315.39W	==>	7325.50	
14617.00	90.00	179.630	6897.82	7315.12S	1314.75W	==>	7424.55	
14717.00	90.00	179.630	6897.82	7415.12S	1314.11W	==>	7523.59	
14817.00	90.00	179.630	6897.82	7515.11S	1313.47W	==>	7622.63	

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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	179.630	6897.82	7615.11S	1312.83W	==>	7721.67	
15017.00	90.00	179.630	6897.82	7715.11S	1312.19W	==>	7820.72	
15117.00	90.00	179.630	6897.82	7815.11S	1311.55W	==>	7919.76	
15217.00	90.00	179.630	6897.82	7915.10S	1310.91W	==>	8018.80	
15317.00	90.00	179.630	6897.82	8015.10S	1310.27W	==>	8117.85	
15417.00	90.00	179.630	6897.82	8115.10S	1309.63W	==>	8216.89	
15517.00	90.00	179.630	6897.82	8215.10S	1309.00W	==>	8315.93	
15617.00	90.00	179.630	6897.82	8315.10S	1308.36W	==>	8414.98	
15717.00	90.00	179.630	6897.82	8415.09S	1307.72W	==>	8514.02	
15817.00	90.00	179.630	6897.82	8515.09S	1307.08W	==>	8613.06	
15917.00	90.00	179.630	6897.82	8615.09S	1306.44W	==>	8712.10	
16017.00	90.00	179.630	6897.82	8715.09S	1305.80W	==>	8811.15	
16117.00	90.00	179.630	6897.82	8815.09S	1305.16W	==>	8910.19	
16217.00	90.00	179.630	6897.82	8915.08S	1304.52W	==>	9009.23	
16317.00	90.00	179.630	6897.82	9015.08S	1303.88W	==>	9108.28	
16417.00	90.00	179.630	6897.82	9115.08S	1303.24W	==>	9207.32	
16517.00	90.00	179.630	6897.82	9215.08S	1302.60W	==>	9306.36	
16617.00	90.00	179.630	6897.82	9315.08S	1301.96W	==>	9405.41	
16717.00	90.00	179.630	6897.82	9415.07S	1301.32W	==>	9504.45	
16817.00	90.00	179.630	6897.82	9515.07S	1300.68W	==>	9603.49	
16917.00	90.00	179.630	6897.82	9615.07S	1300.05W	==>	9702.53	
17017.00	90.00	179.630	6897.82	9715.07S	1299.41W	==>	9801.58	
17080.80	90.00	179.630	6897.82	9778.87S	1299.00W	==>	9864.77	

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 187.570 degrees
Bottom hole distance is 9864.77 Feet on azimuth 187.57 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 9 EP	103.36S	1360.85W	6897.82	40.20261620	-105.02990370	1317003.55	3131307.27
OLANDER 9 BH-2mi	9778.87S	1299.00W	6897.82	40.17605640	-105.02986590	1307328.47	3131369.12

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
562290	Planned	1517.00	1512.24	WdW Rate Gyro	Standard	
562289	Planned	17080.80	6897.82	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes