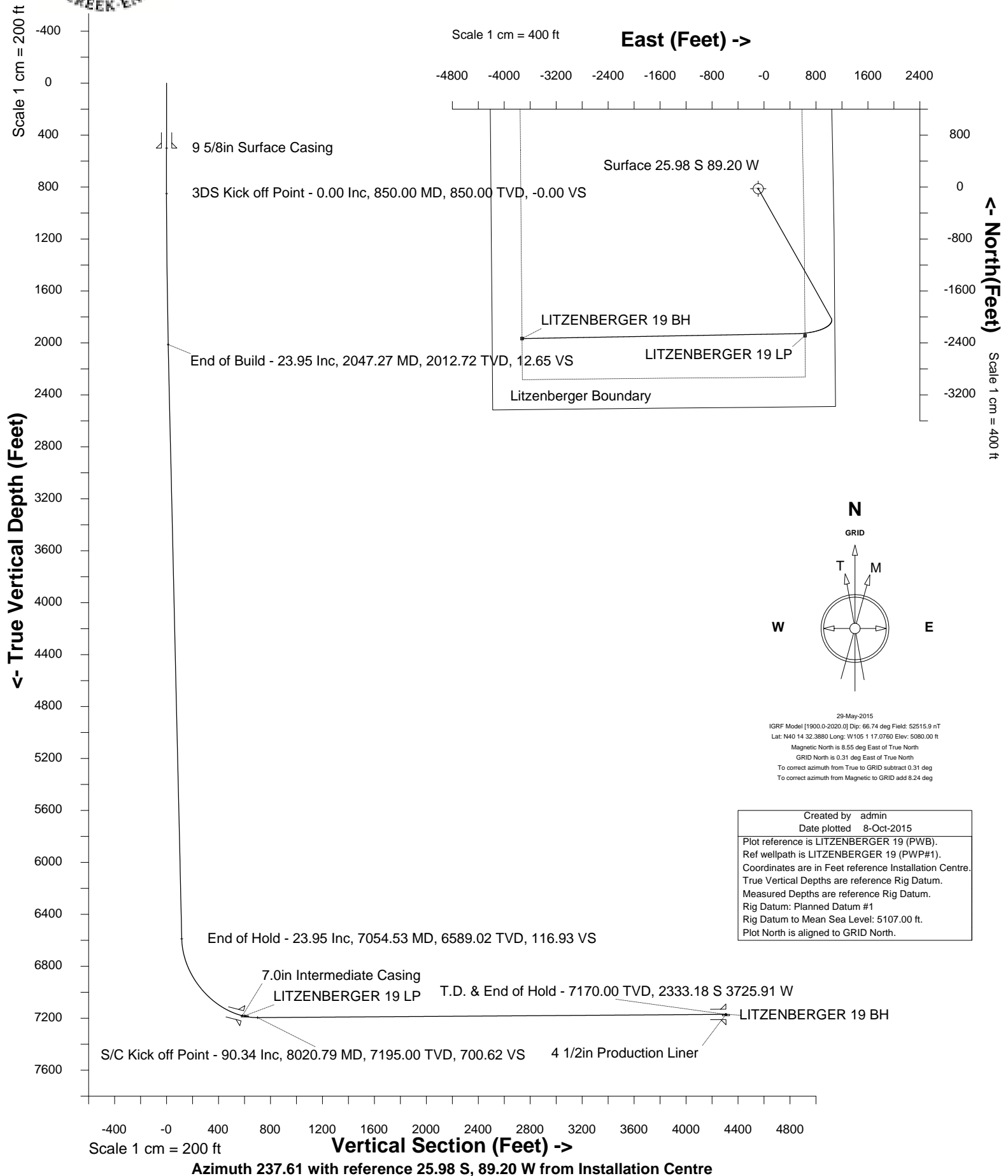




# Cub Creek Energy, LLC

Location	Weld County, CO	Slot	LITZENBERGER 19
Field	WATTENBERG	Well	LITZENBERGER 19
Installation	Litzenberger Pad - Finalized	Wellbore	LITZENBERGER 19 (PWB)





SYSDRILL  
Well Design Combined Report  
Wellbore: LITZENBERGER 19 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
LITZENBERGER 19	40.24226000	-105.02173000	1331457.1708	3133512.4305	25.98S	89.20W	0.00

Declination		
Date	Source	Time
29-May-2015	IGRF Model [1900.0-2020.0]	11:25

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Litzenberger Pad - Finalized	40.24233000	-105.02141000	1331483.1524	3133601.6223	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
25.00	0.00	0.000	25.00	0.00N	0.00E		0.00	1331457.17	3133512.43
12244.61	90.34	268.980	7170.00	2307.20S	3636.71W	==>	4306.83	1329150.08	3129875.88

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 Slot Datum
25.00	0.00	0.000	25.00	0.00N	0.00E	==>	0.00	
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	9 5/8in Surface Casing
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	150.550	900.00	0.38S	0.21E	2.00	0.02	
1000.00	3.00	150.550	999.93	3.42S	1.93E	2.00	0.20	
1100.00	5.00	150.550	1099.68	9.49S	5.36E	2.00	0.56	
1200.00	7.00	150.550	1199.13	18.59S	10.50E	2.00	1.10	
1300.00	9.00	150.550	1298.15	30.71S	17.34E	2.00	1.81	
1400.00	11.00	150.550	1396.63	45.83S	25.88E	2.00	2.70	
1500.00	13.00	150.550	1494.44	63.94S	36.10E	2.00	3.77	
1600.00	15.00	150.550	1591.46	85.00S	47.99E	2.00	5.01	
1700.00	17.00	150.550	1687.58	109.00S	61.55E	2.00	6.42	
1800.00	19.00	150.550	1782.68	135.91S	76.74E	2.00	8.01	
1900.00	21.00	150.550	1876.65	165.69S	93.55E	2.00	9.76	
2000.00	23.00	150.550	1969.36	198.31S	111.97E	2.00	11.69	
2100.00	23.95	150.550	2060.91	233.34S	131.75E	==>	13.75	
2200.00	23.95	150.550	2152.31	268.68S	151.71E	==>	15.83	
2300.00	23.95	150.550	2243.70	304.02S	171.66E	==>	17.91	
2400.00	23.95	150.550	2335.09	339.36S	191.62E	==>	20.00	
2500.00	23.95	150.550	2426.49	374.71S	211.57E	==>	22.08	
2600.00	23.95	150.550	2517.88	410.05S	231.53E	==>	24.16	
2700.00	23.95	150.550	2609.27	445.39S	251.48E	==>	26.24	
2800.00	23.95	150.550	2700.67	480.73S	271.44E	==>	28.33	
2900.00	23.95	150.550	2792.06	516.07S	291.39E	==>	30.41	
3000.00	23.95	150.550	2883.45	551.42S	311.35E	==>	32.49	
3100.00	23.95	150.550	2974.84	586.76S	331.31E	==>	34.57	
3200.00	23.95	150.550	3066.24	622.10S	351.26E	==>	36.66	
3300.00	23.95	150.550	3157.63	657.44S	371.22E	==>	38.74	
3400.00	23.95	150.550	3249.02	692.78S	391.17E	==>	40.82	
3500.00	23.95	150.550	3340.42	728.13S	411.13E	==>	42.90	
3600.00	23.95	150.550	3431.81	763.47S	431.08E	==>	44.99	

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Vertical Section is from 0.00N 0.00E on azimuth 237.610 degrees  
Bottom hole distance is 4306.83 Feet on azimuth 237.61 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 8-Oct-2015



SYSDRILL  
Well Design Combined Report  
Wellbore: LITZENBERGER 19 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3700.00	23.95	150.550	3523.20	798.81S	451.04E	==>	47.07	
3800.00	23.95	150.550	3614.60	834.15S	470.99E	==>	49.15	
3900.00	23.95	150.550	3705.99	869.49S	490.95E	==>	51.23	
4000.00	23.95	150.550	3797.38	904.83S	510.90E	==>	53.32	
4100.00	23.95	150.550	3888.78	940.18S	530.86E	==>	55.40	
4200.00	23.95	150.550	3980.17	975.52S	550.81E	==>	57.48	
4300.00	23.95	150.550	4071.56	1010.86S	570.77E	==>	59.56	
4400.00	23.95	150.550	4162.96	1046.20S	590.72E	==>	61.65	
4500.00	23.95	150.550	4254.35	1081.54S	610.68E	==>	63.73	
4600.00	23.95	150.550	4345.74	1116.89S	630.64E	==>	65.81	
4700.00	23.95	150.550	4437.14	1152.23S	650.59E	==>	67.89	
4800.00	23.95	150.550	4528.53	1187.57S	670.55E	==>	69.98	
4900.00	23.95	150.550	4619.92	1222.91S	690.50E	==>	72.06	
5000.00	23.95	150.550	4711.32	1258.25S	710.46E	==>	74.14	
5100.00	23.95	150.550	4802.71	1293.60S	730.41E	==>	76.22	
5200.00	23.95	150.550	4894.10	1328.94S	750.37E	==>	78.31	
5300.00	23.95	150.550	4985.50	1364.28S	770.32E	==>	80.39	
5400.00	23.95	150.550	5076.89	1399.62S	790.28E	==>	82.47	
5500.00	23.95	150.550	5168.28	1434.96S	810.23E	==>	84.55	
5600.00	23.95	150.550	5259.68	1470.30S	830.19E	==>	86.64	
5700.00	23.95	150.550	5351.07	1505.65S	850.14E	==>	88.72	
5800.00	23.95	150.550	5442.46	1540.99S	870.10E	==>	90.80	
5900.00	23.95	150.550	5533.86	1576.33S	890.05E	==>	92.88	
6000.00	23.95	150.550	5625.25	1611.67S	910.01E	==>	94.97	
6100.00	23.95	150.550	5716.64	1647.01S	929.96E	==>	97.05	
6200.00	23.95	150.550	5808.04	1682.36S	949.92E	==>	99.13	
6300.00	23.95	150.550	5899.43	1717.70S	969.88E	==>	101.21	
6400.00	23.95	150.550	5990.82	1753.04S	989.83E	==>	103.30	
6500.00	23.95	150.550	6082.22	1788.38S	1009.79E	==>	105.38	
6600.00	23.95	150.550	6173.61	1823.72S	1029.74E	==>	107.46	
6700.00	23.95	150.550	6265.00	1859.07S	1049.70E	==>	109.54	
6800.00	23.95	150.550	6356.40	1894.41S	1069.65E	==>	111.63	
6900.00	23.95	150.550	6447.79	1929.75S	1089.61E	==>	113.71	
7000.00	23.95	150.550	6539.18	1965.09S	1109.56E	==>	115.79	
7100.00	22.23	161.930	6630.87	2000.58S	1127.65E	10.50	119.53	
7200.00	21.74	190.200	6723.86	2036.90S	1130.25E	10.50	136.79	
7300.00	25.72	214.580	6815.60	2073.09S	1114.61E	10.50	169.39	
7400.00	32.56	231.090	6903.03	2107.96S	1081.26E	10.50	216.22	
7500.00	40.84	241.960	6983.23	2140.32S	1031.32E	10.50	275.73	
7600.00	49.85	249.590	7053.49	2169.11S	966.46E	10.50	345.92	
7700.00	59.23	255.390	7111.47	2193.34S	888.86E	10.50	424.43	
7800.00	68.83	260.140	7155.23	2212.22S	801.11E	10.50	508.64	
7886.00	77.17	263.740	7180.36	2223.68S	719.76E	10.50	583.48	7.0in Intermediate Casing
7900.00	78.54	264.300	7183.31	2225.11S	706.14E	10.50	595.73	
8000.00	88.31	268.190	7194.75	2231.58S	607.15E	10.50	682.79	
8100.00	90.34	268.980	7194.53	2233.50S	507.18E	==>	768.24	
8200.00	90.34	268.980	7193.94	2235.28S	407.19E	==>	853.61	
8300.00	90.34	268.980	7193.35	2237.05S	307.21E	==>	938.99	
8400.00	90.34	268.980	7192.76	2238.83S	207.23E	==>	1024.37	
8500.00	90.34	268.980	7192.16	2240.61S	107.25E	==>	1109.75	
8600.00	90.34	268.980	7191.57	2242.39S	7.26E	==>	1195.13	
8700.00	90.34	268.980	7190.98	2244.17S	92.72W	==>	1280.51	
8800.00	90.34	268.980	7190.39	2245.95S	192.70W	==>	1365.88	
8900.00	90.34	268.980	7189.80	2247.72S	292.68W	==>	1451.26	
9000.00	90.34	268.980	7189.20	2249.50S	392.67W	==>	1536.64	
9100.00	90.34	268.980	7188.61	2251.28S	492.65W	==>	1622.02	
9200.00	90.34	268.980	7188.02	2253.06S	592.63W	==>	1707.40	
9300.00	90.34	268.980	7187.43	2254.84S	692.61W	==>	1792.77	
9400.00	90.34	268.980	7186.84	2256.61S	792.60W	==>	1878.15	
9500.00	90.34	268.980	7186.24	2258.39S	892.58W	==>	1963.53	

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Bottom hole distance is 4306.83 Feet on azimuth 237.61 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 8-Oct-2015



SYSDRILL  
Well Design Combined Report  
Wellbore: LITZENBERGER 19 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9600.00	90.34	268.980	7185.65	2260.17S	992.56W	==>	2048.91	
9700.00	90.34	268.980	7185.06	2261.95S	1092.54W	==>	2134.29	
9800.00	90.34	268.980	7184.47	2263.73S	1192.53W	==>	2219.67	
9900.00	90.34	268.980	7183.88	2265.50S	1292.51W	==>	2305.04	
10000.00	90.34	268.980	7183.29	2267.28S	1392.49W	==>	2390.42	
10100.00	90.34	268.980	7182.69	2269.06S	1492.47W	==>	2475.80	
10200.00	90.34	268.980	7182.10	2270.84S	1592.46W	==>	2561.18	
10300.00	90.34	268.980	7181.51	2272.62S	1692.44W	==>	2646.56	
10400.00	90.34	268.980	7180.92	2274.40S	1792.42W	==>	2731.94	
10500.00	90.34	268.980	7180.33	2276.17S	1892.40W	==>	2817.31	
10600.00	90.34	268.980	7179.73	2277.95S	1992.39W	==>	2902.69	
10700.00	90.34	268.980	7179.14	2279.73S	2092.37W	==>	2988.07	
10800.00	90.34	268.980	7178.55	2281.51S	2192.35W	==>	3073.45	
10900.00	90.34	268.980	7177.96	2283.29S	2292.33W	==>	3158.83	
11000.00	90.34	268.980	7177.37	2285.06S	2392.32W	==>	3244.20	
11100.00	90.34	268.980	7176.77	2286.84S	2492.30W	==>	3329.58	
11200.00	90.34	268.980	7176.18	2288.62S	2592.28W	==>	3414.96	
11300.00	90.34	268.980	7175.59	2290.40S	2692.26W	==>	3500.34	
11400.00	90.34	268.980	7175.00	2292.18S	2792.24W	==>	3585.72	
11500.00	90.34	268.980	7174.41	2293.96S	2892.23W	==>	3671.10	
11600.00	90.34	268.980	7173.82	2295.73S	2992.21W	==>	3756.47	
11700.00	90.34	268.980	7173.22	2297.51S	3092.19W	==>	3841.85	
11800.00	90.34	268.980	7172.63	2299.29S	3192.17W	==>	3927.23	
11900.00	90.34	268.980	7172.04	2301.07S	3292.16W	==>	4012.61	
12000.00	90.34	268.980	7171.45	2302.85S	3392.14W	==>	4097.99	
12100.00	90.34	268.980	7170.86	2304.62S	3492.12W	==>	4183.36	
12200.00	90.34	268.980	7170.26	2306.40S	3592.10W	==>	4268.74	
12244.61	90.34	268.980	7170.00	2307.20S	3636.71W	==>	4306.83	4 1/2in Production Liner

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Vertical Section is from 0.00N 0.00E on azimuth 237.610 degrees  
Bottom hole distance is 4306.83 Feet on azimuth 237.61 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Integrated Petroleum Technologies, Inc.  
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SYSDRILL  
Well Design Combined Report  
Wellbore: LITZENBERGER 19 (PWB)



Hole Sections								
Diameter [in]	Start MD[ft]	Start TVD[ft]	Start North[ft]	Start East[ft]	End MD[ft]	End TVD[ft]	End North[ft]	End East[ft]
12 1/4	25.00	25.00	0.00N	0.00E	500.00	500.00	0.00N	0.00E
8 3/4	500.00	500.00	0.00N	0.00E	7886.00	7180.36	2223.68S	719.76E
6 1/8	7890.00	7181.24	2224.10S	715.88E	12244.61	7170.00	2307.20S	3636.71W

Casings								
Name	Top MD[ft]	Top TVD[ft]	Top North[ft]	Top East[ft]	Shoe MD[ft]	Shoe TVD[ft]	Shoe North[ft]	Shoe East[ft]
9 5/8in Surface Casing	25.00	25.00	0.00N	0.00E	500.00	500.00	0.00N	0.00E
7.0in Intermediate Casing	25.00	25.00	0.00N	0.00E	7886.00	7180.36	2223.68S	719.76E
4 1/2in Production Liner	7166.00	6692.22	2024.50S	1131.42E	12244.61	7170.00	2307.20S	3636.71W

Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
LITZENBERGER 19 LP	2262.09S	721.37E	7180.00	40.23604000	-105.01919000	1329195.18	3134233.77
LITZENBERGER 19 BH	2307.20S	3636.71W	7170.00	40.23598000	-105.03480000	1329150.08	3129875.88

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
391534	Planned	12244.61	7170.00	ISCWSA MWD	Rev 3 + Fixed Rig + Rotating	

Notes

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Vertical Section is from 0.00N 0.00E on azimuth 237.610 degrees  
Bottom hole distance is 4306.83 Feet on azimuth 237.61 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
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SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: LITZENBERGER 19 (PWB)



Ellipse separations are reported ONLY if BOTH wells have uncertainty data
Only Depth and Magnetic Reference Field error terms are correlated across tie points
Scan limit is calculated on CENTRE to CENTRE distance
Summary data uses Closest Approach clearance calculation for all minima
Hole size/Casings ARE included
Hole size/Casings are NOT subtracted from Centre-Centre distance
Confidence limit of 95.00% / 2.80 SD.

Wellbore		
Name	Created	Last Revised
LITZENBERGER 19 (PWB)	19-Jun-2015	7-Oct-2015

Well		
Name	Government ID	Last Revised
LITZENBERGER 19		16-Jun-2015

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
LITZENBERGER 19	40.24226000	-105.02173000	1331457.1708	3133512.4305	25.98S	89.20W

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Litzenberger Pad - Finalized	40.24233000	-105.02141000	3133601.6223	1331483.1524	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

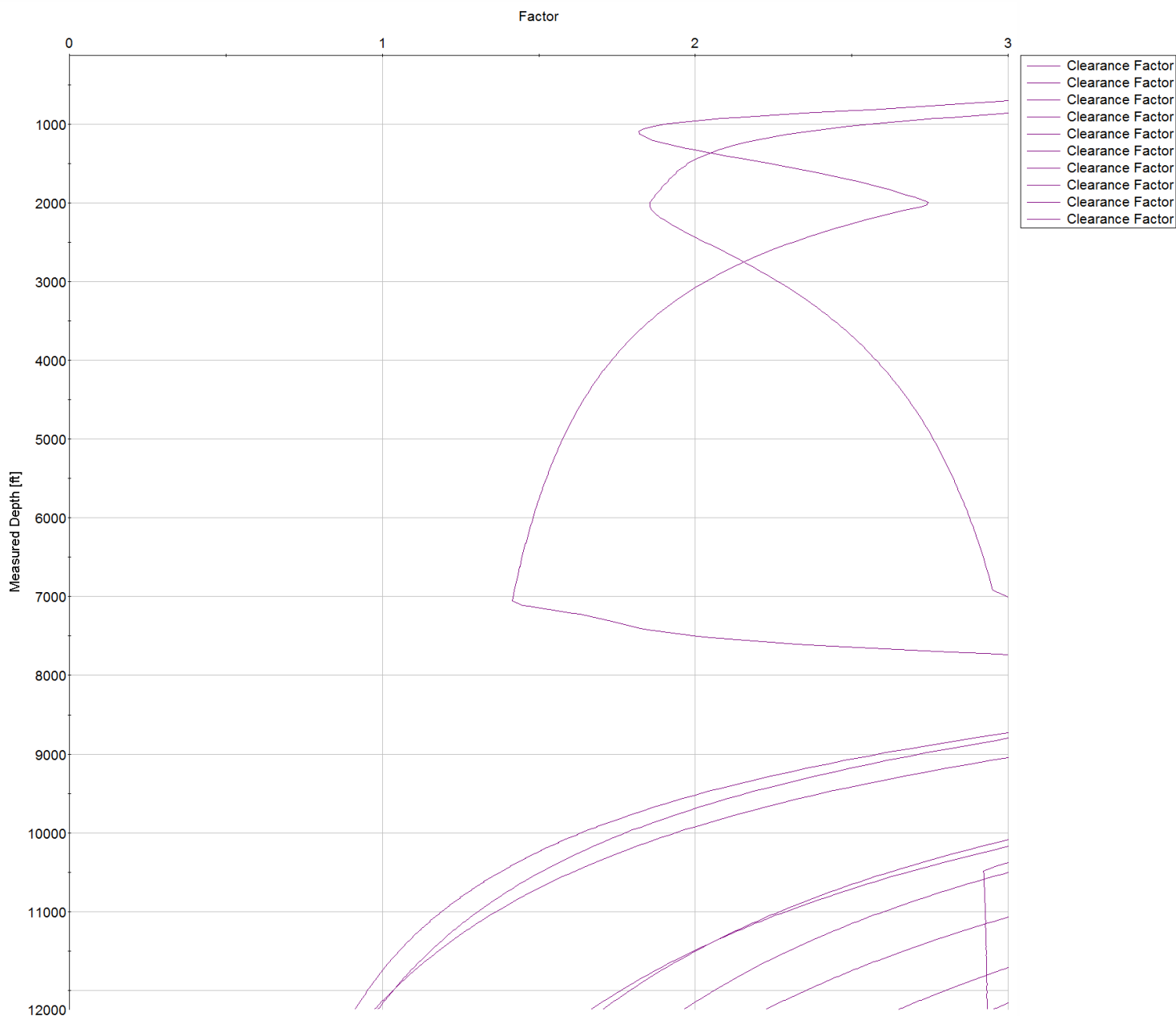
Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
LITZENBERGER 20	12.24	992.85	12244.61	-17.88	12244.61	0.91	12244.61
LITZENBERGER 18	16.34	1026.47	1126.67	-5.09	12244.61	0.99	12244.61
LITZENBERGER 21	25.15	992.85	12244.61	-9.16	12244.61	0.97	12244.61
LITZENBERGER 6	25.50	800.00	800.00	20.18	825.00	4.61	878.02
LITZENBERGER 5	29.07	750.00	12214.31	23.88	828.81	5.22	894.42
LITZENBERGER 7	30.51	850.00	850.00	24.88	894.42	5.13	960.04
LITZENBERGER 17	30.71	851.03	926.40	24.70	992.85	1.70	12244.61
LITZENBERGER 4	37.68	832.70	832.70	32.13	861.61	6.54	927.23
LITZENBERGER 8	39.92	850.00	850.00	34.19	910.83	6.59	992.85
LITZENBERGER 16	40.80	1194.26	9544.50	33.14	1238.91	1.96	12244.61
LITZENBERGER 22	40.83	992.85	12244.61	34.30	1042.06	1.67	12244.61
LITZENBERGER 3	50.71	861.61	861.61	45.09	878.02	8.59	960.04
LITZENBERGER 9	51.43	651.00	651.00	47.07	681.17	6.91	12244.61
LITZENBERGER 23	52.50	912.08	12244.61	46.43	943.64	2.22	12244.61
LITZENBERGER 15	56.03	1226.33	1226.33	48.22	1255.31	2.95	12244.61
LITZENBERGER 2	61.06	861.61	861.61	55.38	878.02	10.18	960.04
LITZENBERGER 12	66.50	601.00	601.00	62.37	625.00	4.93	12244.61
LITZENBERGER 24	69.38	910.83	12244.61	63.33	943.64	2.65	12244.61
LITZENBERGER 14	69.75	1229.23	1229.23	61.94	1255.31	3.53	12244.61
LITZENBERGER 1	76.39	850.00	850.00	70.74	861.61	11.87	12244.61
LITZENBERGER 11	79.57	551.00	551.00	75.77	582.74	5.40	12244.61



SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: LITZENBERGER 19 (PWB)



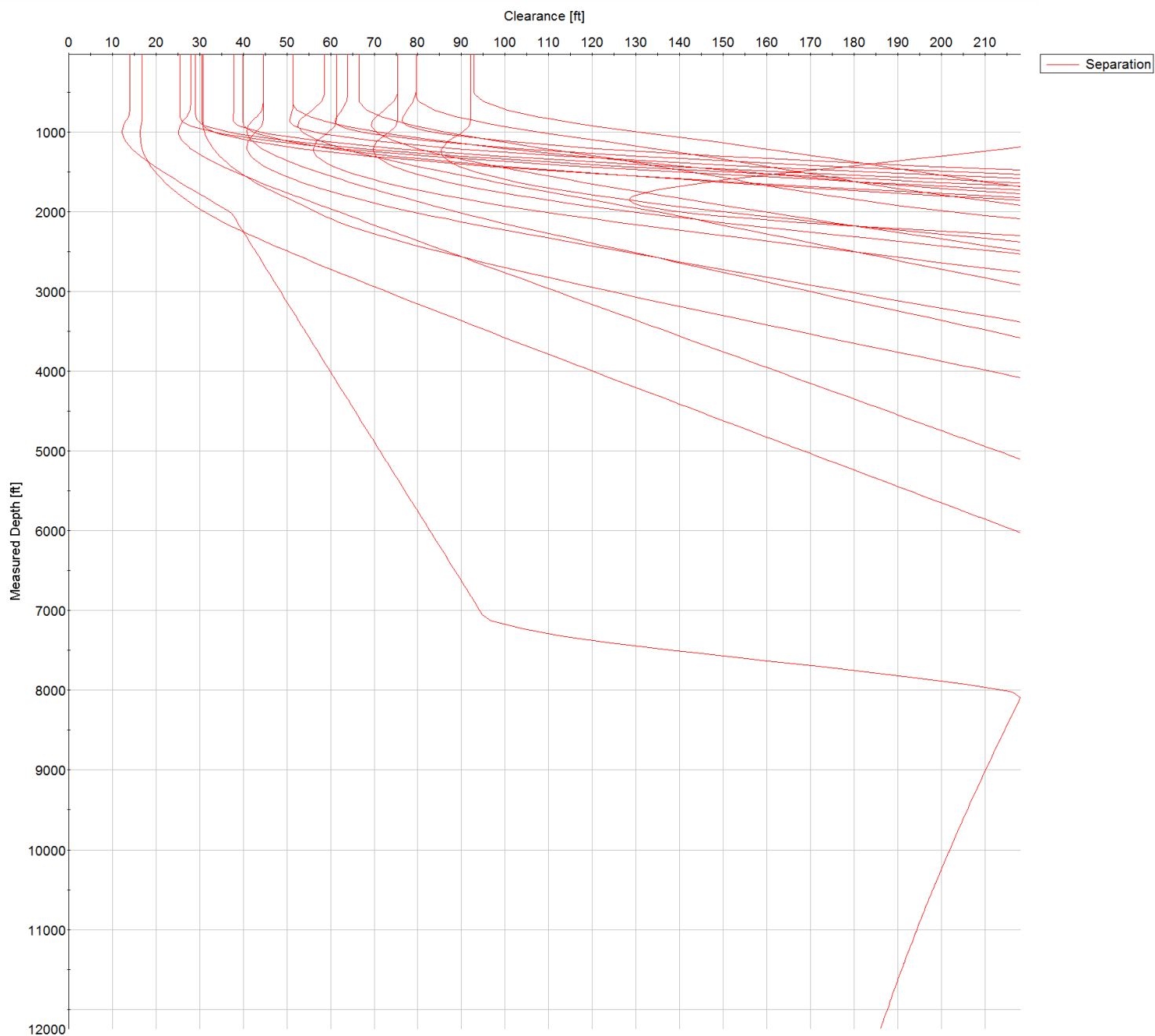
Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
LITZENBERGER 13	85.36	1231.15	1231.15	77.41	1271.72	3.93	12244.61
LITZENBERGER 10	92.90	502.00	502.00	89.26	484.32	5.92	12244.61
Kintz #2	128.52	1850.95	9443.93	115.55	1862.27	7.41	9408.20
Kintz #1	274.19	861.61	8331.14	261.91	1107.68	17.29	1763.85
Billings #2A-18H	1153.20	12244.61	12244.61	759.86	10489.24	2.92	10489.24
Billings #2B-18H	1486.20	12244.61	12244.61	1093.97	12244.61	3.79	12244.61



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 5107.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 237.610 degrees  
Prepared by Integrated Petroleum Technologies, Inc.  
Date Printed: 8-Oct-2015



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