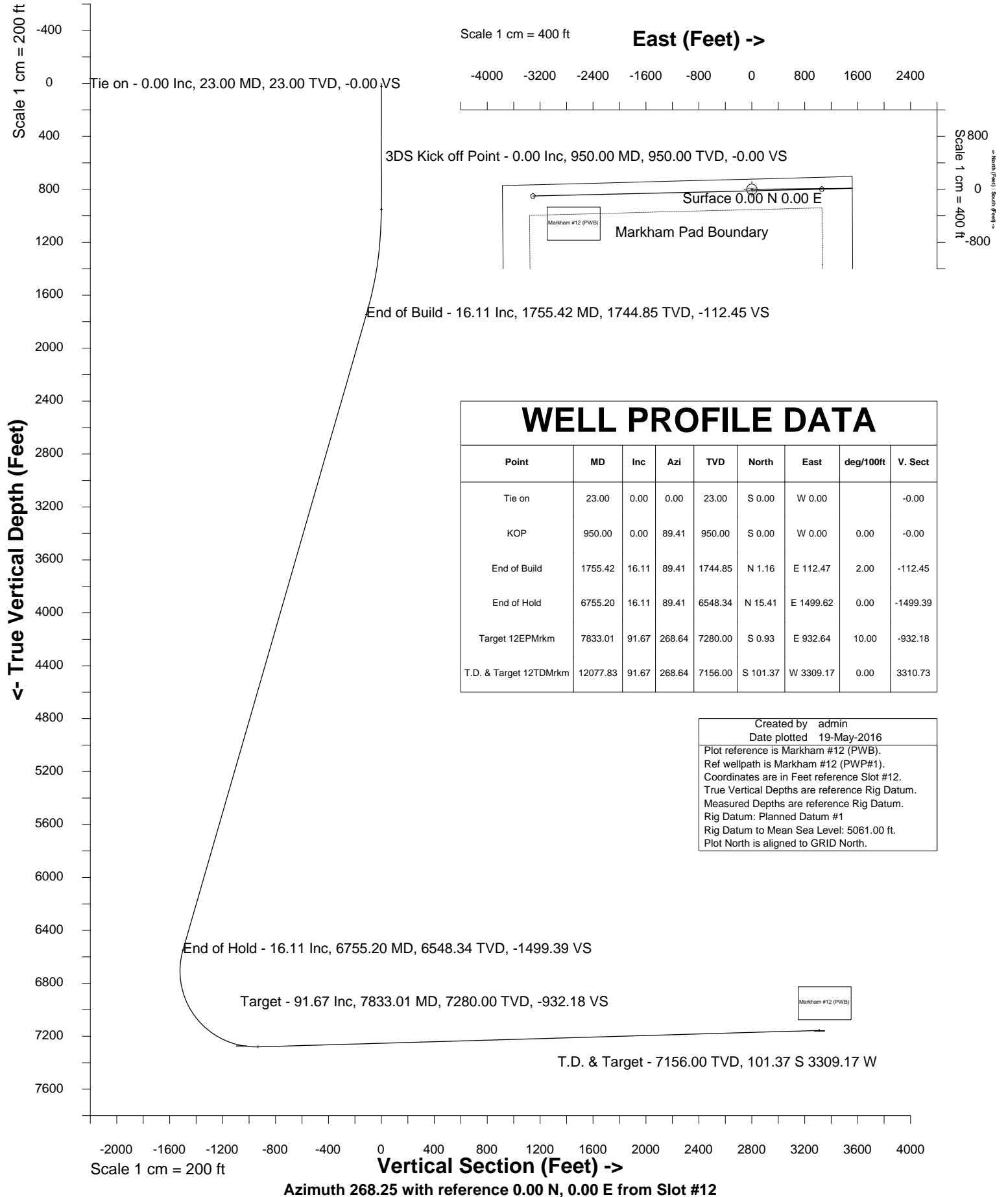


Cub Creek Energy, LLC

Location	Weld County, CO	Slot	Slot #12
Field	WATTENBERG	Well	Markham #12
Installation	Markham Pad	Wellbore	Markham #12 (PWB)





SYS DRILL
Well Design Combined Report
Wellbore: Markham #12 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Slot #12	40.26910000	-105.02314000	1341232.3603	3133066.2437	174.83N	6.52W	0.00

Declination		
Date	Source	Time
Feb-17-2016	EMM-2015 [2000.0-2020.0]	11:55

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Markham Pad	40.26862000	-105.02312000	1341057.5349	3133072.7650	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
23.00	0.00	0.000	23.00	0.00N	0.00E		0.00	1341232.36	3133066.24
950.00	0.00	89.410	950.00	0.00N	0.00E	==>	0.00	1341232.36	3133066.24
1755.42	16.11	89.410	1744.85	1.16N	112.47E	2.00	-112.45	1341233.52	3133178.71
6755.20	16.11	89.410	6548.34	15.41N	1499.62E	==>	-1499.39	1341247.77	3134565.80
7833.01	91.67	268.640	7280.00	0.93S	932.64E	10.00	-932.18	1341231.43	3133998.84
12077.83	91.67	268.640	7156.00	101.37S	3309.17W	==>	3310.73	1341131.00	3129757.22

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
23.00	0.00	0.000	23.00	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	1.00	89.410	1000.00	0.00N	0.44E	2.00	-0.44	
1100.00	3.00	89.410	1099.93	0.04N	3.93E	2.00	-3.93	
1200.00	5.00	89.410	1199.68	0.11N	10.90E	2.00	-10.90	
1300.00	7.00	89.410	1299.13	0.22N	21.35E	2.00	-21.35	
1400.00	9.00	89.410	1398.15	0.36N	35.27E	2.00	-35.26	
1500.00	11.00	89.410	1496.63	0.54N	52.63E	2.00	-52.62	
1600.00	13.00	89.410	1594.44	0.75N	73.42E	2.00	-73.41	
1700.00	15.00	89.410	1691.46	1.00N	97.61E	2.00	-97.60	
1800.00	16.11	89.410	1787.68	1.28N	124.84E	==>	-124.82	
1900.00	16.11	89.410	1883.76	1.57N	152.58E	==>	-152.56	
2000.00	16.11	89.410	1979.83	1.85N	180.33E	==>	-180.30	
2100.00	16.11	89.410	2075.90	2.14N	208.07E	==>	-208.04	
2200.00	16.11	89.410	2171.98	2.42N	235.82E	==>	-235.78	
2300.00	16.11	89.410	2268.05	2.71N	263.56E	==>	-263.52	
2400.00	16.11	89.410	2364.12	2.99N	291.30E	==>	-291.26	
2500.00	16.11	89.410	2460.20	3.28N	319.05E	==>	-319.00	
2600.00	16.11	89.410	2556.27	3.56N	346.79E	==>	-346.74	
2700.00	16.11	89.410	2652.35	3.85N	374.54E	==>	-374.48	
2800.00	16.11	89.410	2748.42	4.13N	402.28E	==>	-402.22	
2900.00	16.11	89.410	2844.49	4.42N	430.02E	==>	-429.96	
3000.00	16.11	89.410	2940.57	4.70N	457.77E	==>	-457.70	
3100.00	16.11	89.410	3036.64	4.99N	485.51E	==>	-485.44	

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Vertical Section is from 0.00N 0.00E on azimuth 268.250 degrees
Bottom hole distance is 3310.73 Feet on azimuth 268.25 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 19-May-2016



SYSDRILL
Well Design Combined Report
Wellbore: Markham #12 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3200.00	16.11	89.410	3132.71	5.27N	513.26E	==>	-513.18	
3300.00	16.11	89.410	3228.79	5.56N	541.00E	==>	-540.92	
3400.00	16.11	89.410	3324.86	5.84N	568.75E	==>	-568.66	
3500.00	16.11	89.410	3420.94	6.13N	596.49E	==>	-596.40	
3600.00	16.11	89.410	3517.01	6.42N	624.23E	==>	-624.14	
3700.00	16.11	89.410	3613.08	6.70N	651.98E	==>	-651.88	
3800.00	16.11	89.410	3709.16	6.99N	679.72E	==>	-679.62	
3900.00	16.11	89.410	3805.23	7.27N	707.47E	==>	-707.36	
4000.00	16.11	89.410	3901.31	7.56N	735.21E	==>	-735.10	
4100.00	16.11	89.410	3997.38	7.84N	762.95E	==>	-762.84	
4200.00	16.11	89.410	4093.45	8.13N	790.70E	==>	-790.58	
4300.00	16.11	89.410	4189.53	8.41N	818.44E	==>	-818.32	
4400.00	16.11	89.410	4285.60	8.70N	846.19E	==>	-846.06	
4500.00	16.11	89.410	4381.67	8.98N	873.93E	==>	-873.80	
4600.00	16.11	89.410	4477.75	9.27N	901.68E	==>	-901.54	
4700.00	16.11	89.410	4573.82	9.55N	929.42E	==>	-929.28	
4800.00	16.11	89.410	4669.90	9.84N	957.16E	==>	-957.02	
4900.00	16.11	89.410	4765.97	10.12N	984.91E	==>	-984.76	
5000.00	16.11	89.410	4862.04	10.41N	1012.65E	==>	-1012.50	
5100.00	16.11	89.410	4958.12	10.69N	1040.40E	==>	-1040.24	
5200.00	16.11	89.410	5054.19	10.98N	1068.14E	==>	-1067.98	
5300.00	16.11	89.410	5150.27	11.26N	1095.88E	==>	-1095.72	
5400.00	16.11	89.410	5246.34	11.55N	1123.63E	==>	-1123.46	
5500.00	16.11	89.410	5342.41	11.83N	1151.37E	==>	-1151.20	
5600.00	16.11	89.410	5438.49	12.12N	1179.12E	==>	-1178.94	
5700.00	16.11	89.410	5534.56	12.40N	1206.86E	==>	-1206.68	
5800.00	16.11	89.410	5630.63	12.69N	1234.61E	==>	-1234.41	
5900.00	16.11	89.410	5726.71	12.97N	1262.35E	==>	-1262.15	
6000.00	16.11	89.410	5822.78	13.26N	1290.09E	==>	-1289.89	
6100.00	16.11	89.410	5918.86	13.54N	1317.84E	==>	-1317.63	
6200.00	16.11	89.410	6014.93	13.83N	1345.58E	==>	-1345.37	
6300.00	16.11	89.410	6111.00	14.11N	1373.33E	==>	-1373.11	
6400.00	16.11	89.410	6207.08	14.40N	1401.07E	==>	-1400.85	
6500.00	16.11	89.410	6303.15	14.68N	1428.81E	==>	-1428.59	
6600.00	16.11	89.410	6399.22	14.97N	1456.56E	==>	-1456.33	
6700.00	16.11	89.410	6495.30	15.25N	1484.30E	==>	-1484.07	
6800.00	11.63	89.720	6591.81	15.50N	1510.35E	10.00	-1510.12	
6900.00	1.64	96.460	6691.02	15.38N	1521.89E	10.00	-1521.64	
7000.00	8.38	267.120	6790.72	14.86N	1516.02E	10.00	-1515.77	
7100.00	18.37	267.960	6887.88	13.93N	1492.94E	10.00	-1492.66	
7200.00	28.37	268.220	6979.56	12.63N	1453.34E	10.00	-1453.04	
7300.00	38.37	268.350	7062.96	11.00N	1398.42E	10.00	-1398.10	
7400.00	48.37	268.440	7135.56	9.08N	1329.86E	10.00	-1329.52	
7500.00	58.37	268.500	7195.15	6.94N	1249.74E	10.00	-1249.37	
7600.00	68.37	268.550	7239.91	4.64N	1160.49E	10.00	-1160.09	
7700.00	78.37	268.590	7268.49	2.26N	1064.82E	10.00	-1064.39	
7800.00	88.37	268.630	7280.01	0.15S	965.64E	10.00	-965.19	
7900.00	91.67	268.640	7278.04	2.52S	865.70E	==>	-865.22	
8000.00	91.67	268.640	7275.12	4.88S	765.78E	==>	-765.27	
8100.00	91.67	268.640	7272.20	7.25S	665.85E	==>	-665.31	
8200.00	91.67	268.640	7269.28	9.62S	565.92E	==>	-565.36	
8300.00	91.67	268.640	7266.36	11.98S	465.99E	==>	-465.40	
8400.00	91.67	268.640	7263.44	14.35S	366.06E	==>	-365.45	
8500.00	91.67	268.640	7260.52	16.71S	266.13E	==>	-265.49	
8600.00	91.67	268.640	7257.59	19.08S	166.20E	==>	-165.54	
8700.00	91.67	268.640	7254.67	21.45S	66.27E	==>	-65.58	
8800.00	91.67	268.640	7251.75	23.81S	33.66W	==>	34.37	
8900.00	91.67	268.640	7248.83	26.18S	133.59W	==>	134.33	
9000.00	91.67	268.640	7245.91	28.54S	233.52W	==>	234.28	

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Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 19-May-2016



SYS DRILL
Well Design Combined Report
Wellbore: Markham #12 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9100.00	91.67	268.640	7242.99	30.91S	333.45W	==>	334.24	
9200.00	91.67	268.640	7240.07	33.28S	433.38W	==>	434.19	
9300.00	91.67	268.640	7237.15	35.64S	533.31W	==>	534.15	
9400.00	91.67	268.640	7234.23	38.01S	633.24W	==>	634.10	
9500.00	91.67	268.640	7231.30	40.37S	733.16W	==>	734.06	
9600.00	91.67	268.640	7228.38	42.74S	833.09W	==>	834.01	
9700.00	91.67	268.640	7225.46	45.11S	933.02W	==>	933.97	
9800.00	91.67	268.640	7222.54	47.47S	1032.95W	==>	1033.92	
9900.00	91.67	268.640	7219.62	49.84S	1132.88W	==>	1133.88	
10000.00	91.67	268.640	7216.70	52.20S	1232.81W	==>	1233.83	
10100.00	91.67	268.640	7213.78	54.57S	1332.74W	==>	1333.79	
10200.00	91.67	268.640	7210.86	56.94S	1432.67W	==>	1433.74	
10300.00	91.67	268.640	7207.93	59.30S	1532.60W	==>	1533.70	
10400.00	91.67	268.640	7205.01	61.67S	1632.53W	==>	1633.65	
10500.00	91.67	268.640	7202.09	64.03S	1732.46W	==>	1733.61	
10600.00	91.67	268.640	7199.17	66.40S	1832.39W	==>	1833.56	
10700.00	91.67	268.640	7196.25	68.77S	1932.32W	==>	1933.52	
10800.00	91.67	268.640	7193.33	71.13S	2032.25W	==>	2033.47	
10900.00	91.67	268.640	7190.41	73.50S	2132.17W	==>	2133.43	
11000.00	91.67	268.640	7187.49	75.86S	2232.10W	==>	2233.38	
11100.00	91.67	268.640	7184.56	78.23S	2332.03W	==>	2333.34	
11200.00	91.67	268.640	7181.64	80.60S	2431.96W	==>	2433.29	
11300.00	91.67	268.640	7178.72	82.96S	2531.89W	==>	2533.25	
11400.00	91.67	268.640	7175.80	85.33S	2631.82W	==>	2633.20	
11500.00	91.67	268.640	7172.88	87.69S	2731.75W	==>	2733.16	
11600.00	91.67	268.640	7169.96	90.06S	2831.68W	==>	2833.11	
11700.00	91.67	268.640	7167.04	92.43S	2931.61W	==>	2933.06	
11800.00	91.67	268.640	7164.12	94.79S	3031.54W	==>	3033.02	
11900.00	91.67	268.640	7161.19	97.16S	3131.47W	==>	3132.97	
12000.00	91.67	268.640	7158.27	99.52S	3231.40W	==>	3232.93	
12077.83	91.67	268.640	7156.00	101.37S	3309.17W	==>	3310.73	

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Prepared by IPT
Date Printed: 19-May-2016



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SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Markham #12 (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
Markham #12 (PWB)	Feb-22-2016	May-19-2016

Well		
Name	Government ID	Last Revised
Markham #12		Feb-22-2016

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
Slot #12	40.26910000	-105.02314000	1341232.3603	3133066.2437	174.83N	6.52W

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Markham Pad	40.26862000	-105.02312000	3133072.7650	1341057.5349	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]
Markham #11	14.84	849.00	12077.83	-145.39	12077.83	0.55	12077.83
Markham #10	29.28	748.00	12077.83	-28.25	12077.83	0.92	12077.83
Markham #9	47.44	948.00	12077.83	37.49	1023.66	1.85	12077.83
Markham #8	61.99	847.00	12077.83	53.14	923.00	2.33	12077.83
Markham #7	76.55	747.00	12077.83	68.74	800.00	2.78	12077.83
Markham #6	94.76	947.00	12077.83	84.99	990.85	3.70	12077.83
Markham #5	109.33	847.00	12077.83	100.57	892.42	4.18	12077.83
Markham #4	127.54	746.00	12077.83	119.80	794.00	4.64	12077.83
Markham #3	142.09	1072.87	12077.83	130.17	1253.31	5.54	12077.83
Markham #2	156.68	1123.00	12077.83	144.51	1253.31	6.03	12077.83
Markham #1	174.95	169.00	12077.83	172.84	223.00	6.56	12077.83
Markham #33-32D	495.34	9264.69	9264.69	351.76	9264.69	3.45	9264.69
Markham #44-32D	1547.50	3265.02	7962.63	1509.66	3336.65	18.69	8585.99

