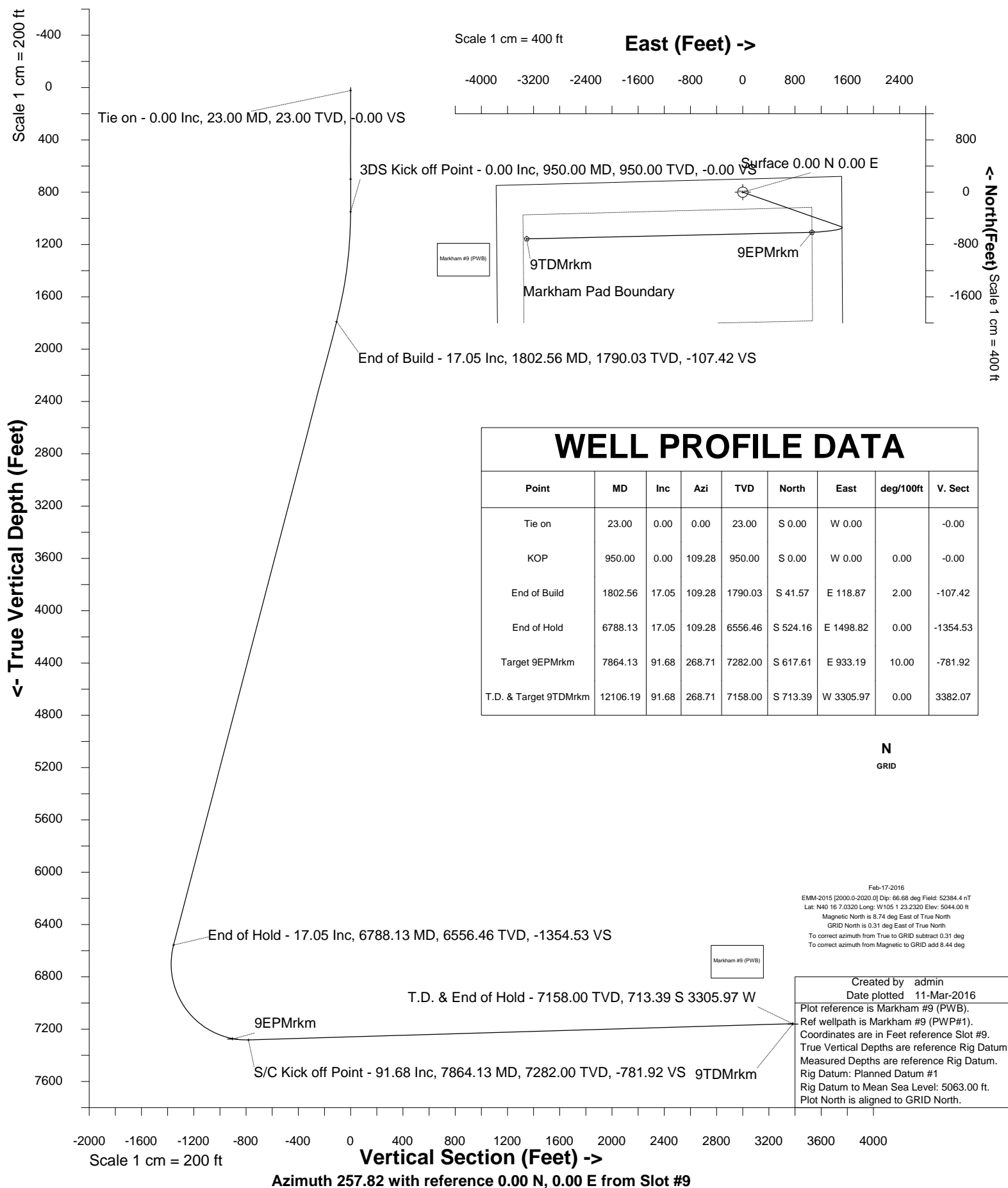


Cub Creek Energy, LLC			
Location	Weld County, CO	Slot	Slot #9
Field	WATTENBERG	Well	Markham #9
Installation	Markham Pad	Wellbore	Markham #9 (PWB)

Slot	Slot #9
------	---------

Well Markham #9

Wellbore Markham #9 (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: Markham #9 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Slot #9	N40 16 8.2920	W105 1 23.2680	1341185.0187	3133069.2888	127.49N	3.48W	0.00

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

Installation Details						
Name	Installatio n Position (Latitude)	Installatio n Position (Longitud e)	Northing	Easting	Coord System Name	North Alignment
Markham Pad	N40 16 7.0320	W105 1 23.2320	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	1341185.02	3133069.29
950.00	0.00	109.280	950.00	0.00N	0.00E	==>	0.00	1341185.02	3133069.29
1802.56	17.05	109.280	1790.03	41.57S	118.87E	2.00	-107.42	1341143.45	3133188.15
6788.13	17.05	109.280	6556.46	524.16S	1498.82E	==>	-1354.53	1340660.88	3134568.04
7864.13	91.68	268.710	7282.00	617.61S	933.19E	10.00	-781.92	1340567.43	3134002.44
12106.19	91.68	268.710	7158.00	713.39S	3305.97W	==>	3382.07	1340471.66	3129763.47

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	109.280	1000.00	0.14S	0.41E	2.00	-0.37	
1100.00	3.00	109.280	1099.93	1.30S	3.71E	2.00	-3.35	
1200.00	5.00	109.280	1199.68	3.60S	10.29E	2.00	-9.30	
1300.00	7.00	109.280	1299.13	7.05S	20.16E	2.00	-18.22	
1400.00	9.00	109.280	1398.15	11.64S	33.29E	2.00	-30.09	
1500.00	11.00	109.280	1496.63	17.38S	49.68E	2.00	-44.90	
1600.00	13.00	109.280	1594.44	24.24S	69.31E	2.00	-62.64	
1700.00	15.00	109.280	1691.46	32.22S	92.14E	2.00	-83.27	
1800.00	17.00	109.280	1787.58	41.32S	118.16E	2.00	-106.79	
1900.00	17.05	109.280	1883.19	51.00S	145.84E	==>	-131.80	
2000.00	17.05	109.280	1978.79	60.68S	173.52E	==>	-156.81	
2100.00	17.05	109.280	2074.40	70.36S	201.20E	==>	-181.83	
2200.00	17.05	109.280	2170.00	80.04S	228.87E	==>	-206.84	
2300.00	17.05	109.280	2265.61	89.72S	256.55E	==>	-231.86	
2400.00	17.05	109.280	2361.21	99.40S	284.23E	==>	-256.87	
2500.00	17.05	109.280	2456.81	109.08S	311.91E	==>	-281.88	
2600.00	17.05	109.280	2552.42	118.76S	339.59E	==>	-306.90	
2700.00	17.05	109.280	2648.02	128.44S	367.27E	==>	-331.91	
2800.00	17.05	109.280	2743.63	138.12S	394.95E	==>	-356.93	
2900.00	17.05	109.280	2839.23	147.80S	422.63E	==>	-381.94	

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Coordinates are from Slot MD's are from Rig (Planned Datum #1 5063.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 257.820 degrees
Bottom hole distance is 3382.07 Feet on azimuth 257.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 14-Apr-2016



SYSDRILL
Well Design Combined Report
Wellbore: Markham #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
3000.00	17.05	109.280	2934.84	157.48S	450.31E	==>	-406.96	
3100.00	17.05	109.280	3030.44	167.16S	477.98E	==>	-431.97	
3200.00	17.05	109.280	3126.04	176.84S	505.66E	==>	-456.98	
3300.00	17.05	109.280	3221.65	186.52S	533.34E	==>	-482.00	
3400.00	17.05	109.280	3317.25	196.20S	561.02E	==>	-507.01	
3500.00	17.05	109.280	3412.86	205.88S	588.70E	==>	-532.03	
3600.00	17.05	109.280	3508.46	215.56S	616.38E	==>	-557.04	
3700.00	17.05	109.280	3604.07	225.24S	644.06E	==>	-582.06	
3800.00	17.05	109.280	3699.67	234.92S	671.74E	==>	-607.07	
3900.00	17.05	109.280	3795.27	244.60S	699.41E	==>	-632.08	
4000.00	17.05	109.280	3890.88	254.28S	727.09E	==>	-657.10	
4100.00	17.05	109.280	3986.48	263.96S	754.77E	==>	-682.11	
4200.00	17.05	109.280	4082.09	273.64S	782.45E	==>	-707.13	
4300.00	17.05	109.280	4177.69	283.32S	810.13E	==>	-732.14	
4400.00	17.05	109.280	4273.30	293.00S	837.81E	==>	-757.16	
4500.00	17.05	109.280	4368.90	302.68S	865.49E	==>	-782.17	
4600.00	17.05	109.280	4464.50	312.36S	893.17E	==>	-807.18	
4700.00	17.05	109.280	4560.11	322.03S	920.85E	==>	-832.20	
4800.00	17.05	109.280	4655.71	331.71S	948.52E	==>	-857.21	
4900.00	17.05	109.280	4751.32	341.39S	976.20E	==>	-882.23	
5000.00	17.05	109.280	4846.92	351.07S	1003.88E	==>	-907.24	
5100.00	17.05	109.280	4942.53	360.75S	1031.56E	==>	-932.26	
5200.00	17.05	109.280	5038.13	370.43S	1059.24E	==>	-957.27	
5300.00	17.05	109.280	5133.73	380.11S	1086.92E	==>	-982.28	
5400.00	17.05	109.280	5229.34	389.79S	1114.60E	==>	-1007.30	
5500.00	17.05	109.280	5324.94	399.47S	1142.28E	==>	-1032.31	
5600.00	17.05	109.280	5420.55	409.15S	1169.95E	==>	-1057.33	
5700.00	17.05	109.280	5516.15	418.83S	1197.63E	==>	-1082.34	
5800.00	17.05	109.280	5611.76	428.51S	1225.31E	==>	-1107.36	
5900.00	17.05	109.280	5707.36	438.19S	1252.99E	==>	-1132.37	
6000.00	17.05	109.280	5802.96	447.87S	1280.67E	==>	-1157.38	
6100.00	17.05	109.280	5898.57	457.55S	1308.35E	==>	-1182.40	
6200.00	17.05	109.280	5994.17	467.23S	1336.03E	==>	-1207.41	
6300.00	17.05	109.280	6089.78	476.91S	1363.71E	==>	-1232.43	
6400.00	17.05	109.280	6185.38	486.59S	1391.39E	==>	-1257.44	
6500.00	17.05	109.280	6280.99	496.27S	1419.06E	==>	-1282.46	
6600.00	17.05	109.280	6376.59	505.95S	1446.74E	==>	-1307.47	
6700.00	17.05	109.280	6472.20	515.63S	1474.42E	==>	-1332.48	
6800.00	15.95	110.870	6567.83	525.32S	1501.98E	10.00	-1357.38	
6900.00	7.79	141.090	6665.69	535.51S	1519.13E	10.00	-1371.99	
7000.00	8.13	219.020	6764.98	546.31S	1518.93E	10.00	-1369.52	
7100.00	16.46	246.940	6862.68	557.38S	1501.40E	10.00	-1350.05	
7200.00	25.97	255.630	6955.82	568.39S	1467.07E	10.00	-1314.17	
7300.00	35.74	259.840	7041.57	579.01S	1416.98E	10.00	-1262.97	
7400.00	45.60	262.420	7117.32	588.90S	1352.65E	10.00	-1198.00	
7500.00	55.50	264.240	7180.78	597.77S	1276.04E	10.00	-1121.24	
7600.00	65.43	265.680	7230.02	605.36S	1189.48E	10.00	-1035.03	
7700.00	75.36	266.900	7263.53	611.42S	1095.60E	10.00	-941.98	
7800.00	85.30	268.010	7280.31	615.78S	997.24E	10.00	-844.91	
7900.00	91.68	268.710	7280.95	618.42S	897.34E	==>	-746.71	
8000.00	91.68	268.710	7278.03	620.68S	797.41E	==>	-648.55	
8100.00	91.68	268.710	7275.11	622.94S	697.48E	==>	-550.39	
8200.00	91.68	268.710	7272.18	625.20S	597.55E	==>	-452.23	
8300.00	91.68	268.710	7269.26	627.45S	497.62E	==>	-354.07	
8400.00	91.68	268.710	7266.34	629.71S	397.69E	==>	-255.91	
8500.00	91.68	268.710	7263.41	631.97S	297.75E	==>	-157.75	
8600.00	91.68	268.710	7260.49	634.23S	197.82E	==>	-59.59	

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Bottom hole distance is 3382.07 Feet on azimuth 257.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 14-Apr-2016



SYSDRILL
Well Design Combined Report
Wellbore: Markham #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
8700.00	91.68	268.710	7257.57	636.48S	97.89E	==>	38.57	
8800.00	91.68	268.710	7254.64	638.74S	2.04W	==>	136.73	
8900.00	91.68	268.710	7251.72	641.00S	101.97W	==>	234.89	
9000.00	91.68	268.710	7248.80	643.26S	201.90W	==>	333.05	
9100.00	91.68	268.710	7245.87	645.52S	301.84W	==>	431.21	
9200.00	91.68	268.710	7242.95	647.77S	401.77W	==>	529.37	
9300.00	91.68	268.710	7240.03	650.03S	501.70W	==>	627.52	
9400.00	91.68	268.710	7237.10	652.29S	601.63W	==>	725.68	
9500.00	91.68	268.710	7234.18	654.55S	701.56W	==>	823.84	
9600.00	91.68	268.710	7231.26	656.80S	801.50W	==>	922.00	
9700.00	91.68	268.710	7228.34	659.06S	901.43W	==>	1020.16	
9800.00	91.68	268.710	7225.41	661.32S	1001.36W	==>	1118.32	
9900.00	91.68	268.710	7222.49	663.58S	1101.29W	==>	1216.48	
10000.00	91.68	268.710	7219.57	665.84S	1201.22W	==>	1314.64	
10100.00	91.68	268.710	7216.64	668.09S	1301.15W	==>	1412.80	
10200.00	91.68	268.710	7213.72	670.35S	1401.09W	==>	1510.96	
10300.00	91.68	268.710	7210.80	672.61S	1501.02W	==>	1609.12	
10400.00	91.68	268.710	7207.87	674.87S	1600.95W	==>	1707.28	
10500.00	91.68	268.710	7204.95	677.12S	1700.88W	==>	1805.44	
10600.00	91.68	268.710	7202.03	679.38S	1800.81W	==>	1903.60	
10700.00	91.68	268.710	7199.10	681.64S	1900.74W	==>	2001.76	
10800.00	91.68	268.710	7196.18	683.90S	2000.68W	==>	2099.92	
10900.00	91.68	268.710	7193.26	686.15S	2100.61W	==>	2198.08	
11000.00	91.68	268.710	7190.34	688.41S	2200.54W	==>	2296.24	
11100.00	91.68	268.710	7187.41	690.67S	2300.47W	==>	2394.40	
11200.00	91.68	268.710	7184.49	692.93S	2400.40W	==>	2492.56	
11300.00	91.68	268.710	7181.57	695.19S	2500.34W	==>	2590.72	
11400.00	91.68	268.710	7178.64	697.44S	2600.27W	==>	2688.88	
11500.00	91.68	268.710	7175.72	699.70S	2700.20W	==>	2787.04	
11600.00	91.68	268.710	7172.80	701.96S	2800.13W	==>	2885.20	
11700.00	91.68	268.710	7169.87	704.22S	2900.06W	==>	2983.36	
11800.00	91.68	268.710	7166.95	706.47S	2999.99W	==>	3081.51	
11900.00	91.68	268.710	7164.03	708.73S	3099.93W	==>	3179.67	
12000.00	91.68	268.710	7161.10	710.99S	3199.86W	==>	3277.83	
12100.00	91.68	268.710	7158.18	713.25S	3299.79W	==>	3375.99	
12106.19	91.68	268.710	7158.00	713.39S	3305.97W	==>	3382.07	

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Bottom hole distance is 3382.07 Feet on azimuth 257.82 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 14-Apr-2016

Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
445550	Planned	12106.19	7158.00	ISCWSA MWD	Rev 4 + SAG + FLT



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Markham #9 (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 #9 (PWB)	Feb-22-2016	Mar-11-2016

Well		
Name	Government ID	Last Revised
Markham #9		Feb-22-2016

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
Slot #9	N40 16 8.2920	W105 1 23.2680	1341185.0187	3133069.2888	127.49N	3.48W

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Markham Pad	N40 16 7.0320	W105 1 23.2320	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 #8	14.57	849.00	12106.19	-145.03	12106.19	0.55	12106.19
Markham #10	17.95	882.77	12100.44	-24.96	12106.19	0.93	12106.19
Markham #7	29.14	749.00	749.00	-25.10	12106.19	0.93	12106.19
Markham #11	32.68	958.04	12100.00	22.32	1040.06	1.42	12106.19
Markham #6	47.36	949.00	12106.19	36.89	1056.46	1.85	12106.19
Markham #12	47.44	958.04	12097.54	37.12	1040.06	1.85	12106.19
Markham #5	61.93	849.00	12106.19	52.79	892.42	2.33	12106.19
Markham #4	80.15	748.00	748.00	72.03	794.00	2.78	12106.19
Markham #3	89.30	1368.14	12106.19	75.11	1384.55	3.69	12106.19
Markham #2	103.72	1337.28	1330.93	89.80	1368.14	4.18	12106.19
Markham #1	127.54	171.00	12106.19	124.89	223.00	4.68	12106.19
Markham #33-32D	167.05	9283.88	9283.88	22.64	9300.00	1.16	9300.00
Markham #44-32D	1157.06	7979.57	7979.57	1064.18	7995.44	12.38	8143.08