



Wellbore Anderson 19-1-8HC





WARD PETROLEUM

INTEGRATED PETROLEUM TECHNOLOGIES, INC
SYSDRILL
Well Design Combined Report
Wellbore: Anderson 19-1-8HC



Wellhead Details							
Name	Northing	Easting	Latitude	Longitude	North	East	Elevation Above Inst.
Slot #2	1229159.0230	3189564.7296	39.96044000	-104.82374000	0.13S	16.82W	-0.00

Declination			
Date	Source	Time	
28-Aug-2014	IGRF Model [1900.0-2015.0]	10:16	

Site Details				
Name	Northing	Easting	Coord System Name	North Alignment
Anderson	1229159.1513	3189581.5481	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
22.00	0.00	0.000	22.00	0.00N	0.00E		0.00	1229159.02	3189564.73
1350.00	0.00	0.000	1350.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1971.25	12.43	126.490	1966.40	39.90S	53.95E	2.00	49.25	1229119.12	3189618.67
7199.90	12.43	126.490	7072.57	708.88S	958.44E	==>	875.06	1228450.16	3190523.14
8230.03	89.82	179.670	7687.00	1416.21S	1070.52E	8.00	1590.88	1227742.86	3190635.22
12590.54	89.82	179.670	7701.00	5776.62S	1095.55E	==>	5879.59	1223382.59	3190660.24

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	1229159.02	3189564.73
22.00	0.00	0.000	22.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1328.00	0.00	0.000	1328.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1350.00	0.00	0.000	1350.00	0.00N	0.00E	==>	0.00	1229159.02	3189564.73
1428.00	1.56	126.490	1427.99	0.63S	0.85E	2.00	0.78	1229158.39	3189565.58
1528.00	3.56	126.490	1527.89	3.29S	4.44E	2.00	4.06	1229155.74	3189569.17
1628.00	5.56	126.490	1627.56	8.01S	10.84E	2.00	9.89	1229151.01	3189575.57
1728.00	7.56	126.490	1726.90	14.81S	20.02E	2.00	18.28	1229144.22	3189584.75
1828.00	9.56	126.490	1825.79	23.66S	31.99E	2.00	29.20	1229135.37	3189596.72
1928.00	11.56	126.490	1924.09	34.56S	46.72E	2.00	42.66	1229124.47	3189611.45
1971.25	12.43	126.490	1966.40	39.90S	53.95E	2.00	49.25	1229119.12	3189618.67
2000.00	12.43	126.490	1994.47	43.58S	58.92E	==>	53.79	1229115.45	3189623.65
2100.00	12.43	126.490	2092.13	56.37S	76.22E	==>	69.59	1229102.65	3189640.95
2200.00	12.43	126.490	2189.78	69.17S	93.52E	==>	85.38	1229089.86	3189658.24
2300.00	12.43	126.490	2287.44	81.96S	110.82E	==>	101.17	1229077.06	3189675.54
2400.00	12.43	126.490	2385.10	94.76S	128.11E	==>	116.97	1229064.27	3189692.84
2500.00	12.43	126.490	2482.76	107.55S	145.41E	==>	132.76	1229051.48	3189710.14
2600.00	12.43	126.490	2580.42	120.35S	162.71E	==>	148.56	1229038.68	3189727.44
2700.00	12.43	126.490	2678.07	133.14S	180.01E	==>	164.35	1229025.89	3189744.73
2800.00	12.43	126.490	2775.73	145.93S	197.31E	==>	180.14	1229013.09	3189762.03
2900.00	12.43	126.490	2873.39	158.73S	214.61E	==>	195.94	1229000.30	3189779.33
3000.00	12.43	126.490	2971.05	171.52S	231.91E	==>	211.73	1228987.50	3189796.63
3100.00	12.43	126.490	3068.70	184.32S	249.21E	==>	227.53	1228974.71	3189813.93

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 5027.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 169.260 degrees
Bottom hole distance is 5879.59 Feet on azimuth 169.26 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 3-Sep-2014



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Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
3200.00	12.43	126.490	3166.36	197.11S	266.51E	==>	243.32	1228961.92	3189831.23
3300.00	12.43	126.490	3264.02	209.91S	283.80E	==>	259.11	1228949.12	3189848.52
3400.00	12.43	126.490	3361.68	222.70S	301.10E	==>	274.91	1228936.33	3189865.82
3500.00	12.43	126.490	3459.34	235.50S	318.40E	==>	290.70	1228923.53	3189883.12
3600.00	12.43	126.490	3556.99	248.29S	335.70E	==>	306.49	1228910.74	3189900.42
3700.00	12.43	126.490	3654.65	261.09S	353.00E	==>	322.29	1228897.95	3189917.72
3800.00	12.43	126.490	3752.31	273.88S	370.30E	==>	338.08	1228885.15	3189935.02
3900.00	12.43	126.490	3849.97	286.68S	387.60E	==>	353.88	1228872.36	3189952.31
4000.00	12.43	126.490	3947.63	299.47S	404.90E	==>	369.67	1228859.56	3189969.61
4100.00	12.43	126.490	4045.28	312.26S	422.19E	==>	385.46	1228846.77	3189986.91
4200.00	12.43	126.490	4142.94	325.06S	439.49E	==>	401.26	1228833.97	3190004.21
4300.00	12.43	126.490	4240.60	337.85S	456.79E	==>	417.05	1228821.18	3190021.51
4400.00	12.43	126.490	4338.26	350.65S	474.09E	==>	432.85	1228808.39	3190038.81
4500.00	12.43	126.490	4435.91	363.44S	491.39E	==>	448.64	1228795.59	3190056.10
4600.00	12.43	126.490	4533.57	376.24S	508.69E	==>	464.43	1228782.80	3190073.40
4700.00	12.43	126.490	4631.23	389.03S	525.99E	==>	480.23	1228770.00	3190090.70
4800.00	12.43	126.490	4728.89	401.83S	543.29E	==>	496.02	1228757.21	3190108.00
4900.00	12.43	126.490	4826.55	414.62S	560.59E	==>	511.81	1228744.42	3190125.30
5000.00	12.43	126.490	4924.20	427.42S	577.88E	==>	527.61	1228731.62	3190142.60
5100.00	12.43	126.490	5021.86	440.21S	595.18E	==>	543.40	1228718.83	3190159.89
5200.00	12.43	126.490	5119.52	453.00S	612.48E	==>	559.20	1228706.03	3190177.19
5300.00	12.43	126.490	5217.18	465.80S	629.78E	==>	574.99	1228693.24	3190194.49
5400.00	12.43	126.490	5314.83	478.59S	647.08E	==>	590.78	1228680.44	3190211.79
5500.00	12.43	126.490	5412.49	491.39S	664.38E	==>	606.58	1228667.65	3190229.09
5600.00	12.43	126.490	5510.15	504.18S	681.68E	==>	622.37	1228654.86	3190246.38
5700.00	12.43	126.490	5607.81	516.98S	698.98E	==>	638.16	1228642.06	3190263.68
5800.00	12.43	126.490	5705.47	529.77S	716.27E	==>	653.96	1228629.27	3190280.98
5900.00	12.43	126.490	5803.12	542.57S	733.57E	==>	669.75	1228616.47	3190298.28
6000.00	12.43	126.490	5900.78	555.36S	750.87E	==>	685.55	1228603.68	3190315.58
6100.00	12.43	126.490	5998.44	568.16S	768.17E	==>	701.34	1228590.89	3190332.88
6200.00	12.43	126.490	6096.10	580.95S	785.47E	==>	717.13	1228578.09	3190350.17
6300.00	12.43	126.490	6193.75	593.75S	802.77E	==>	732.93	1228565.30	3190367.47
6400.00	12.43	126.490	6291.41	606.54S	820.07E	==>	748.72	1228552.50	3190384.77
6500.00	12.43	126.490	6389.07	619.33S	837.37E	==>	764.52	1228539.71	3190402.07
6600.00	12.43	126.490	6486.73	632.13S	854.67E	==>	780.31	1228526.91	3190419.37
6700.00	12.43	126.490	6584.39	644.92S	871.96E	==>	796.10	1228514.12	3190436.67
6800.00	12.43	126.490	6682.04	657.72S	889.26E	==>	811.90	1228501.33	3190453.96
6900.00	12.43	126.490	6779.70	670.51S	906.56E	==>	827.69	1228488.53	3190471.26
7000.00	12.43	126.490	6877.36	683.31S	923.86E	==>	843.48	1228475.74	3190488.56
7100.00	12.43	126.490	6975.02	696.10S	941.16E	==>	859.28	1228462.94	3190505.86
7199.90	12.43	126.490	7072.57	708.88S	958.44E	==>	875.06	1228450.16	3190523.14
7200.00	12.43	126.520	7072.68	708.90S	958.46E	8.00	875.07	1228450.15	3190523.16
7300.00	18.31	147.480	7169.13	728.58S	975.58E	8.00	897.60	1228430.47	3190540.28
7400.00	25.35	157.840	7261.93	761.70S	992.13E	8.00	933.22	1228397.35	3190556.83
7500.00	32.81	163.820	7349.29	807.62S	1007.78E	8.00	981.25	1228351.43	3190572.48
7600.00	40.46	167.760	7429.48	865.44S	1022.23E	8.00	1040.76	1228293.61	3190586.93
7700.00	48.21	170.630	7500.96	934.04S	1035.20E	8.00	1110.57	1228225.01	3190599.90
7800.00	56.01	172.870	7562.34	1012.08S	1046.43E	8.00	1189.34	1228146.97	3190611.13
7900.00	63.85	174.730	7612.41	1098.05S	1055.71E	8.00	1275.53	1228061.01	3190620.41
8000.00	71.70	176.360	7650.21	1190.27S	1062.86E	8.00	1367.47	1227968.79	3190627.56
8100.00	79.57	177.840	7674.99	1286.94S	1067.73E	8.00	1463.36	1227872.12	3190632.43
8200.00	87.45	179.250	7686.28	1386.19S	1070.24E	8.00	1561.33	1227772.88	3190634.93
8230.03	89.82	179.670	7687.00	1416.21S	1070.52E	8.00	1590.88	1227742.86	3190635.22
8300.00	89.82	179.670	7687.22	1486.18S	1070.92E	==>	1659.69	1227672.90	3190635.62
8400.00	89.82	179.670	7687.55	1586.17S	1071.50E	==>	1758.05	1227572.90	3190636.19
8500.00	89.82	179.670	7687.87	1686.17S	1072.07E	==>	1856.40	1227472.91	3190636.77
8600.00	89.82	179.670	7688.19	1786.17S	1072.64E	==>	1954.75	1227372.91	3190637.34
8700.00	89.82	179.670	7688.51	1886.17S	1073.22E	==>	2053.11	1227272.92	3190637.91
8800.00	89.82	179.670	7688.83	1986.16S	1073.79E	==>	2151.46	1227172.92	3190638.49
8900.00	89.82	179.670	7689.15	2086.16S	1074.37E	==>	2249.82	1227072.93	3190639.06

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 5027.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 169.260 degrees
Bottom hole distance is 5879.59 Feet on azimuth 169.26 degrees from Wellhead
Calculation method uses Minimum Curvature method
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MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
9000.00	89.82	179.670	7689.47	2186.16S	1074.94E	==>	2348.17	1226972.93	3190639.64
9100.00	89.82	179.670	7689.79	2286.16S	1075.51E	==>	2446.52	1226872.94	3190640.21
9200.00	89.82	179.670	7690.11	2386.16S	1076.09E	==>	2544.88	1226772.94	3190640.78
9300.00	89.82	179.670	7690.44	2486.15S	1076.66E	==>	2643.23	1226672.95	3190641.36
9400.00	89.82	179.670	7690.76	2586.15S	1077.24E	==>	2741.58	1226572.96	3190641.93
9500.00	89.82	179.670	7691.08	2686.15S	1077.81E	==>	2839.94	1226472.96	3190642.51
9600.00	89.82	179.670	7691.40	2786.15S	1078.38E	==>	2938.29	1226372.97	3190643.08
9700.00	89.82	179.670	7691.72	2886.15S	1078.96E	==>	3036.64	1226272.97	3190643.65
9800.00	89.82	179.670	7692.04	2986.14S	1079.53E	==>	3135.00	1226172.98	3190644.23
9900.00	89.82	179.670	7692.36	3086.14S	1080.11E	==>	3233.35	1226072.98	3190644.80
10000.00	89.82	179.670	7692.68	3186.14S	1080.68E	==>	3331.70	1225972.99	3190645.38
10100.00	89.82	179.670	7693.00	3286.14S	1081.25E	==>	3430.06	1225872.99	3190645.95
10200.00	89.82	179.670	7693.32	3386.13S	1081.83E	==>	3528.41	1225773.00	3190646.52
10300.00	89.82	179.670	7693.65	3486.13S	1082.40E	==>	3626.76	1225673.00	3190647.10
10400.00	89.82	179.670	7693.97	3586.13S	1082.98E	==>	3725.12	1225573.01	3190647.67
10500.00	89.82	179.670	7694.29	3686.13S	1083.55E	==>	3823.47	1225473.01	3190648.25
10600.00	89.82	179.670	7694.61	3786.13S	1084.12E	==>	3921.83	1225373.02	3190648.82
10700.00	89.82	179.670	7694.93	3886.12S	1084.70E	==>	4020.18	1225273.03	3190649.39
10800.00	89.82	179.670	7695.25	3986.12S	1085.27E	==>	4118.53	1225173.03	3190649.97
10900.00	89.82	179.670	7695.57	4086.12S	1085.85E	==>	4216.89	1225073.04	3190650.54
11000.00	89.82	179.670	7695.89	4186.12S	1086.42E	==>	4315.24	1224973.04	3190651.11
11100.00	89.82	179.670	7696.21	4286.11S	1086.99E	==>	4413.59	1224873.05	3190651.69
11200.00	89.82	179.670	7696.54	4386.11S	1087.57E	==>	4511.95	1224773.05	3190652.26
11300.00	89.82	179.670	7696.86	4486.11S	1088.14E	==>	4610.30	1224673.06	3190652.84
11400.00	89.82	179.670	7697.18	4586.11S	1088.72E	==>	4708.65	1224573.06	3190653.41
11500.00	89.82	179.670	7697.50	4686.11S	1089.29E	==>	4807.01	1224473.07	3190653.98
11600.00	89.82	179.670	7697.82	4786.10S	1089.86E	==>	4905.36	1224373.07	3190654.56
11700.00	89.82	179.670	7698.14	4886.10S	1090.44E	==>	5003.71	1224273.08	3190655.13
11800.00	89.82	179.670	7698.46	4986.10S	1091.01E	==>	5102.07	1224173.08	3190655.71
11900.00	89.82	179.670	7698.78	5086.10S	1091.59E	==>	5200.42	1224073.09	3190656.28
12000.00	89.82	179.670	7699.10	5186.10S	1092.16E	==>	5298.77	1223973.10	3190656.85
12100.00	89.82	179.670	7699.43	5286.09S	1092.73E	==>	5397.13	1223873.10	3190657.43
12200.00	89.82	179.670	7699.75	5386.09S	1093.31E	==>	5495.48	1223773.11	3190658.00
12300.00	89.82	179.670	7700.07	5486.09S	1093.88E	==>	5593.84	1223673.11	3190658.58
12400.00	89.82	179.670	7700.39	5586.09S	1094.46E	==>	5692.19	1223573.12	3190659.15
12500.00	89.82	179.670	7700.71	5686.08S	1095.03E	==>	5790.54	1223473.12	3190659.72
12590.54	89.82	179.670	7701.00	5776.62S	1095.55E	==>	5879.59	1223382.59	3190660.24

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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]
13 1/2	22.00	22.00	0.00N	0.00E	1200.00	1200.00	0.00N	0.00E
8 3/4	1200.00	1200.00	0.00N	0.00E	8230.00	7687.00	1416.18S	1070.52E
6 1/8	8230.00	7687.00	1416.18S	1070.52E	12590.54	7701.00	5776.62S	1095.55E

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	22.00	22.00	0.00N	0.00E	1200.00	1200.00	0.00N	0.00E
7.0in Intermediate Casing	22.00	22.00	0.00N	0.00E	8230.00	7687.00	1416.18S	1070.52E
4 1/2in Production Liner	8030.00	7659.04	1218.89S	1064.57E	12590.54	7701.00	5776.62S	1095.55E

Targets								
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting	Last Revised
Anderson 19-1-8HC BH	5776.62S	1095.55E	7701.00	39.94456000	-104.81999000	1223382.59	3190660.24	28-Aug-2014
Anderson 19-1-8HC LP	1416.21S	1070.52E	7687.00	39.95653000	-104.81996000	1227742.86	3190635.22	28-Aug-2014

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
299473	Planned	12590.54	7701.00	WdW Rate Gyro	Standard	

Notes

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 5027.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 169.260 degrees
Bottom hole distance is 5879.59 Feet on azimuth 169.26 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 3-Sep-2014



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: Anderson 19-1-8HC



Ellipse separations are reported ONLY if BOTH wells have uncertainty data
Only Depth and Magnetic Reference Field error terms are correlated across tie points
Proximities beyond 2000.00ft with expansion rate of 0.00ft/1000ft are not reported
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
Anderson 19-1-8HC	28-Aug-2014	29-Aug-2014

Well		
Name	Government ID	Last Revised
Anderson 19-1-8HC		29-Aug-2014

Slot						
Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
Slot #2	1229159.0230	3189564.7296	39.96044000	-104.82374000	0.13S	16.82W

Installation				
Name	Easting	Northing	Coord System Name	North Alignment
Anderson	3189581.5481	1229159.1513	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Field				
Name	Easting	Northing	Coord System Name	North Alignment
West Brighton	3178196.4983	1231661.3262	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Clearance Summary								
Offset Wellbore	Offset Structure	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
Anderson 18-3-8HN	Anderson	12.28	1285.12	7561.61	9.44	1186.70	1.73	7567.93
Anderson 18-3-7HC	Anderson	13.79	1250.00	7794.28	10.95	1186.70	4.85	1186.70
Anderson 19-1-9HN	Anderson	14.02	1350.74	8225.48	11.18	1186.70	4.93	1186.70
Anderson 19-1-7HN	Anderson	16.82	1285.12	8232.16	13.98	1186.70	5.06	12590.54
Anderson 18-3-9HC	Anderson	24.95	1350.74	7672.89	22.11	1186.70	8.72	1432.76
Anderson 19-1-10HC	Anderson	28.03	1350.74	12588.64	25.19	1186.70	8.39	12587.62
Anderson 18-3-10HN	Anderson	38.05	1301.53	7430.69	35.21	1186.70	13.38	1432.76
Anderson 19-1-11HN	Anderson	44.85	1301.53	12590.54	42.01	1186.70	12.95	12590.54
Anderson 18-3-11HC	Anderson	51.63	1250.00	7546.41	48.79	1186.70	18.18	1186.70
Anderson 19-1-12HC	Anderson	58.87	1250.00	1250.00	56.03	1186.70	16.50	12590.54
Anderson 18-3-12HN	Anderson	68.16	1200.00	1200.00	65.30	1200.00	23.83	1200.00
W RITCHEY #1-19 (AWB)	Offsets	328.80	12055.67	12055.67	255.92	12046.28	4.51	12046.28



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Closest Approach + Clearance Factor Summary Report
Wellbore: Anderson 19-1-8HC



Offset Wellbore	Offset Structure	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
W RITCHEY #1-19 (AWB)	Offsets	328.80	12055.67	12055.67	256.02	12046.28	4.51	12046.28
W WAGNER #1 (AWB)	Offsets	1529.46	5408.93	5408.93	1506.08	5408.93	65.41	5451.79
W Wagner #1 (AWB)	Offsets	1529.46	5408.93	5408.93	1506.26	5408.93	65.66	5533.81