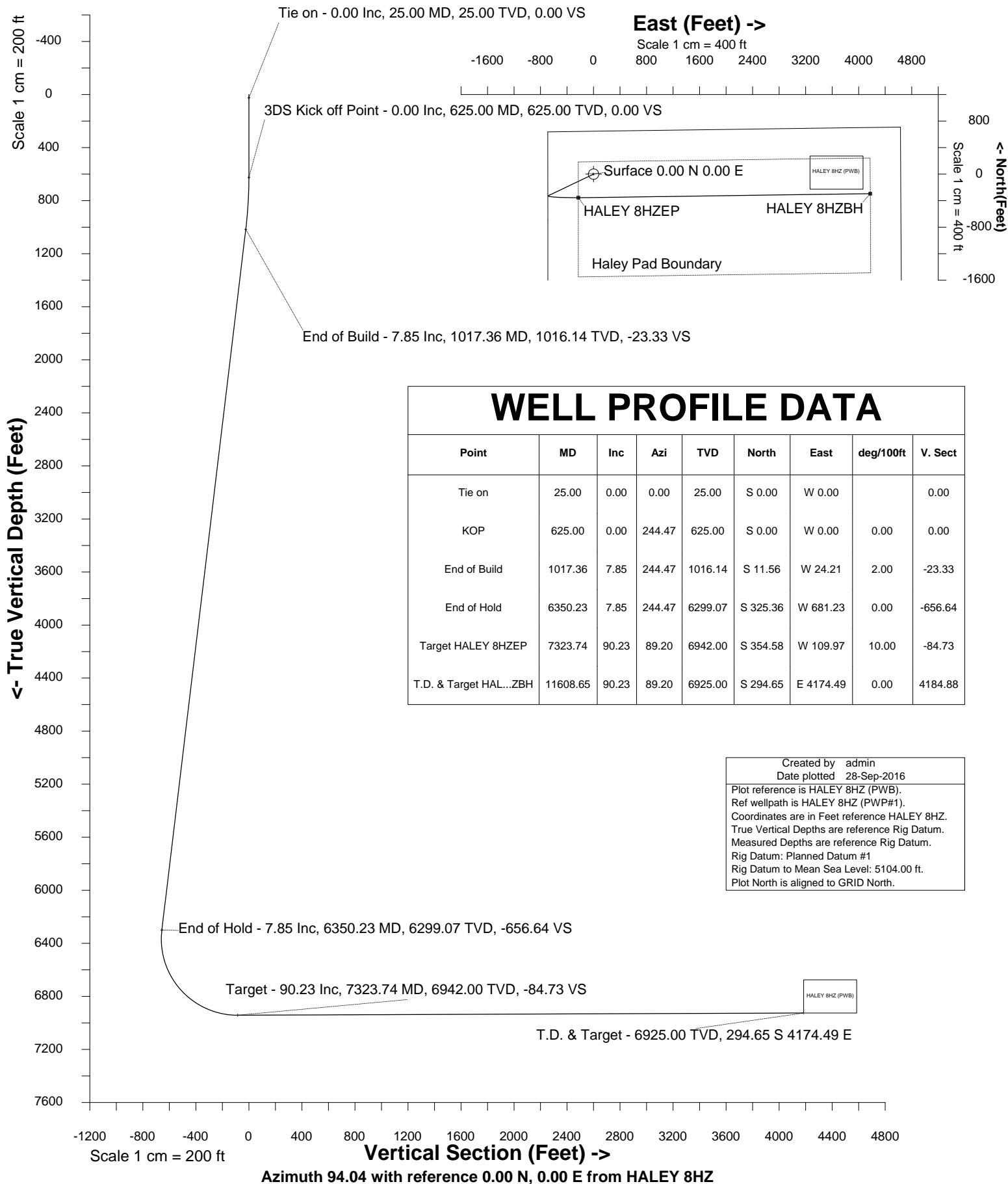




Cub Creek Energy, LLC



Location	Weld County, CO	Slot	HALEY 8HZ
Field	WATTENBERG	Well	HALEY 8HZ
Installation	Haley	Wellbore	HALEY 8HZ (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: HALEY 8HZ (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
HALEY 8HZ	40.20936000	-105.03389000	1319454.2942	3130180.9102	10.99N	11.11E	0.00

Declination		
Date	Source	Time
Oct-19-2015	IGRF Model [1900.0-2020.0]	09:07

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Haley	40.20933000	-105.03393000	1319443.3072	3130169.7961	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	1319454.29	3130180.91
625.00	0.00	244.470	625.00	0.00N	0.00E	==>	0.00	1319454.29	3130180.91
1017.36	7.85	244.470	1016.14	11.56S	24.21W	2.00	-23.33	1319442.73	3130156.70
6350.23	7.85	244.470	6299.07	325.36S	681.23W	==>	-656.64	1319128.95	3129499.71
7323.74	90.23	89.200	6942.00	354.58S	109.97W	10.00	-84.73	1319099.73	3130070.95
11608.65	90.23	89.200	6925.00	294.65S	4174.49E	==>	4184.88	1319159.66	3134355.22

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
25.00	0.00	0.000	25.00	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	1.50	244.470	699.99	0.42S	0.89W	2.00	-0.85	
800.00	3.50	244.470	799.89	2.30S	4.82W	2.00	-4.65	
900.00	5.50	244.470	899.58	5.68S	11.90W	2.00	-11.47	
1000.00	7.50	244.470	998.93	10.56S	22.12W	2.00	-21.32	
1100.00	7.85	244.470	1098.00	16.42S	34.39W	==>	-33.15	
1200.00	7.85	244.470	1197.06	22.31S	46.71W	==>	-45.02	
1300.00	7.85	244.470	1296.13	28.19S	59.03W	==>	-56.90	
1400.00	7.85	244.470	1395.19	34.08S	71.35W	==>	-68.77	
1500.00	7.85	244.470	1494.25	39.96S	83.67W	==>	-80.65	
1600.00	7.85	244.470	1593.32	45.84S	95.99W	==>	-92.52	
1700.00	7.85	244.470	1692.38	51.73S	108.31W	==>	-104.40	
1800.00	7.85	244.470	1791.45	57.61S	120.63W	==>	-116.28	
1900.00	7.85	244.470	1890.51	63.50S	132.95W	==>	-128.15	
2000.00	7.85	244.470	1989.57	69.38S	145.27W	==>	-140.03	
2100.00	7.85	244.470	2088.64	75.27S	157.59W	==>	-151.90	
2200.00	7.85	244.470	2187.70	81.15S	169.91W	==>	-163.78	
2300.00	7.85	244.470	2286.76	87.03S	182.23W	==>	-175.65	
2400.00	7.85	244.470	2385.83	92.92S	194.55W	==>	-187.53	
2500.00	7.85	244.470	2484.89	98.80S	206.87W	==>	-199.40	
2600.00	7.85	244.470	2583.95	104.69S	219.19W	==>	-211.28	
2700.00	7.85	244.470	2683.02	110.57S	231.51W	==>	-223.15	
2800.00	7.85	244.470	2782.08	116.45S	243.83W	==>	-235.03	
2900.00	7.85	244.470	2881.14	122.34S	256.15W	==>	-246.91	

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig (Planned Datum #1 5104.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 94.040 degrees
Bottom hole distance is 4184.88 Feet on azimuth 94.04 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 28-Sep-2016



SYSDRILL
Well Design Combined Report
Wellbore: HALEY 8HZ (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	7.85	244.470	2980.21	128.22S	268.48W	==>	-258.78	
3100.00	7.85	244.470	3079.27	134.11S	280.80W	==>	-270.66	
3200.00	7.85	244.470	3178.34	139.99S	293.12W	==>	-282.53	
3300.00	7.85	244.470	3277.40	145.88S	305.44W	==>	-294.41	
3400.00	7.85	244.470	3376.46	151.76S	317.76W	==>	-306.28	
3500.00	7.85	244.470	3475.53	157.64S	330.08W	==>	-318.16	
3600.00	7.85	244.470	3574.59	163.53S	342.40W	==>	-330.03	
3700.00	7.85	244.470	3673.65	169.41S	354.72W	==>	-341.91	
3800.00	7.85	244.470	3772.72	175.30S	367.04W	==>	-353.78	
3900.00	7.85	244.470	3871.78	181.18S	379.36W	==>	-365.66	
4000.00	7.85	244.470	3970.84	187.06S	391.68W	==>	-377.54	
4100.00	7.85	244.470	4069.91	192.95S	404.00W	==>	-389.41	
4200.00	7.85	244.470	4168.97	198.83S	416.32W	==>	-401.29	
4300.00	7.85	244.470	4268.03	204.72S	428.64W	==>	-413.16	
4400.00	7.85	244.470	4367.10	210.60S	440.96W	==>	-425.04	
4500.00	7.85	244.470	4466.16	216.49S	453.28W	==>	-436.91	
4600.00	7.85	244.470	4565.22	222.37S	465.60W	==>	-448.79	
4700.00	7.85	244.470	4664.29	228.25S	477.92W	==>	-460.66	
4800.00	7.85	244.470	4763.35	234.14S	490.24W	==>	-472.54	
4900.00	7.85	244.470	4862.42	240.02S	502.56W	==>	-484.41	
5000.00	7.85	244.470	4961.48	245.91S	514.88W	==>	-496.29	
5100.00	7.85	244.470	5060.54	251.79S	527.20W	==>	-508.17	
5200.00	7.85	244.470	5159.61	257.67S	539.52W	==>	-520.04	
5300.00	7.85	244.470	5258.67	263.56S	551.84W	==>	-531.92	
5400.00	7.85	244.470	5357.73	269.44S	564.16W	==>	-543.79	
5500.00	7.85	244.470	5456.80	275.33S	576.48W	==>	-555.67	
5600.00	7.85	244.470	5555.86	281.21S	588.80W	==>	-567.54	
5700.00	7.85	244.470	5654.92	287.09S	601.12W	==>	-579.42	
5800.00	7.85	244.470	5753.99	292.98S	613.44W	==>	-591.29	
5900.00	7.85	244.470	5853.05	298.86S	625.76W	==>	-603.17	
6000.00	7.85	244.470	5952.11	304.75S	638.08W	==>	-615.04	
6100.00	7.85	244.470	6051.18	310.63S	650.40W	==>	-626.92	
6200.00	7.85	244.470	6150.24	316.52S	662.73W	==>	-638.80	
6300.00	7.85	244.470	6249.31	322.40S	675.05W	==>	-650.67	
6400.00	3.94	212.270	6348.57	328.27S	685.21W	10.00	-660.40	
6500.00	8.52	111.870	6448.16	333.94S	680.16W	10.00	-654.96	
6600.00	18.15	99.350	6545.37	339.24S	657.87W	10.00	-632.35	
6700.00	28.03	95.430	6637.25	344.01S	619.01W	10.00	-593.26	
6800.00	37.98	93.450	6721.01	348.09S	564.77W	10.00	-538.86	
6900.00	47.94	92.200	6794.10	351.37S	496.79W	10.00	-470.82	
7000.00	57.91	91.280	6854.31	353.75S	417.14W	10.00	-391.20	
7100.00	67.89	90.550	6899.80	355.15S	328.25W	10.00	-302.43	
7200.00	77.87	89.920	6929.20	355.54S	232.80W	10.00	-207.19	
7300.00	87.86	89.340	6941.60	354.89S	133.70W	10.00	-108.38	
7400.00	90.23	89.200	6941.70	353.52S	33.71W	==>	-8.74	
7500.00	90.23	89.200	6941.30	352.12S	66.27E	==>	90.90	
7600.00	90.23	89.200	6940.90	350.72S	166.26E	==>	190.55	
7700.00	90.23	89.200	6940.51	349.32S	266.25E	==>	290.19	
7800.00	90.23	89.200	6940.11	347.92S	366.24E	==>	389.83	
7900.00	90.23	89.200	6939.71	346.52S	466.23E	==>	489.47	
8000.00	90.23	89.200	6939.32	345.12S	566.22E	==>	589.12	
8100.00	90.23	89.200	6938.92	343.73S	666.21E	==>	688.76	
8200.00	90.23	89.200	6938.52	342.33S	766.20E	==>	788.40	
8300.00	90.23	89.200	6938.13	340.93S	866.19E	==>	888.04	
8400.00	90.23	89.200	6937.73	339.53S	966.18E	==>	987.69	
8500.00	90.23	89.200	6937.33	338.13S	1066.17E	==>	1087.33	
8600.00	90.23	89.200	6936.94	336.73S	1166.16E	==>	1186.97	

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 5104.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 94.040 degrees
Bottom hole distance is 4184.88 Feet on azimuth 94.04 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 28-Sep-2016



SYSDRILL
Well Design Combined Report
Wellbore: HALEY 8HZ (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	90.23	89.200	6936.54	335.33S	1266.15E	==>	1286.62	
8800.00	90.23	89.200	6936.14	333.94S	1366.14E	==>	1386.26	
8900.00	90.23	89.200	6935.75	332.54S	1466.13E	==>	1485.90	
9000.00	90.23	89.200	6935.35	331.14S	1566.12E	==>	1585.54	
9100.00	90.23	89.200	6934.95	329.74S	1666.11E	==>	1685.19	
9200.00	90.23	89.200	6934.56	328.34S	1766.10E	==>	1784.83	
9300.00	90.23	89.200	6934.16	326.94S	1866.08E	==>	1884.47	
9400.00	90.23	89.200	6933.76	325.54S	1966.07E	==>	1984.12	
9500.00	90.23	89.200	6933.37	324.14S	2066.06E	==>	2083.76	
9600.00	90.23	89.200	6932.97	322.75S	2166.05E	==>	2183.40	
9700.00	90.23	89.200	6932.57	321.35S	2266.04E	==>	2283.04	
9800.00	90.23	89.200	6932.18	319.95S	2366.03E	==>	2382.69	
9900.00	90.23	89.200	6931.78	318.55S	2466.02E	==>	2482.33	
10000.00	90.23	89.200	6931.38	317.15S	2566.01E	==>	2581.97	
10100.00	90.23	89.200	6930.99	315.75S	2666.00E	==>	2681.62	
10200.00	90.23	89.200	6930.59	314.35S	2765.99E	==>	2781.26	
10300.00	90.23	89.200	6930.19	312.95S	2865.98E	==>	2880.90	
10400.00	90.23	89.200	6929.80	311.56S	2965.97E	==>	2980.54	
10500.00	90.23	89.200	6929.40	310.16S	3065.96E	==>	3080.19	
10600.00	90.23	89.200	6929.00	308.76S	3165.95E	==>	3179.83	
10700.00	90.23	89.200	6928.60	307.36S	3265.94E	==>	3279.47	
10800.00	90.23	89.200	6928.21	305.96S	3365.93E	==>	3379.11	
10900.00	90.23	89.200	6927.81	304.56S	3465.92E	==>	3478.76	
11000.00	90.23	89.200	6927.41	303.16S	3565.90E	==>	3578.40	
11100.00	90.23	89.200	6927.02	301.77S	3665.89E	==>	3678.04	
11200.00	90.23	89.200	6926.62	300.37S	3765.88E	==>	3777.69	
11300.00	90.23	89.200	6926.22	298.97S	3865.87E	==>	3877.33	
11400.00	90.23	89.200	6925.83	297.57S	3965.86E	==>	3976.97	
11500.00	90.23	89.200	6925.43	296.17S	4065.85E	==>	4076.61	
11600.00	90.23	89.200	6925.03	294.77S	4165.84E	==>	4176.26	
11608.65	90.23	89.200	6925.00	294.65S	4174.49E	==>	4184.88	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5104.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 94.040 degrees
Bottom hole distance is 4184.88 Feet on azimuth 94.04 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 28-Sep-2016



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: HALEY 8HZ (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
HALEY 8HZ (PWB)	Oct-19-2015	Sep-27-2016

Well		
Name	Government ID	Last Revised
HALEY 8HZ		Oct-19-2015

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
HALEY 8HZ	40.20936000	-105.03389000	1319454.2942	3130180.9102	10.99N	11.11E

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Haley	40.20933000	-105.03393000	3130169.7961	1319443.3072	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]
HALEY 2HZ	10.93	551.00	11600.18	7.80	582.74	2.73	11608.65
HALEY 7HZ	11.17	425.00	7323.74	-5.91	6504.66	0.89	6504.66
HALEY 9HZ	11.17	625.00	625.00	-29.06	11608.65	0.92	11608.65
HALEY 3HZ	13.77	625.00	7323.74	10.15	648.36	3.31	11608.65
HALEY 1HZ	15.63	500.72	11595.95	12.76	525.00	4.10	11608.65
HALEY 10HZ	19.55	625.00	625.00	15.94	648.36	1.60	11608.65
HALEY 4HZ	22.40	625.00	11603.01	18.75	664.76	1.83	11608.65
HALEY 11HZ	30.72	625.00	11608.65	27.11	648.36	1.38	11608.65
HALEY 5HZ	32.61	625.00	11602.57	28.98	648.36	1.90	11608.65
HALEY #1	32.80	1156.89	7383.44	19.94	1173.29	2.53	1189.70
Haley #10	34.31	24.00	6425.00	34.15	41.40	19.89	845.21
HALEY 12HZ	39.10	625.00	625.00	35.49	648.36	2.29	11608.65
HALEY 6HZ	40.60	625.00	625.00	-32.85	11608.65	0.91	11608.65
Haley #3	45.44	806.74	8041.24	40.57	878.02	4.44	8100.00
HALEY #2	61.16	29.00	8660.61	60.43	107.02	8.22	8965.29
HALEY #6-4-20	1076.61	10741.33	10741.33	891.99	10741.33	5.83	10753.35

