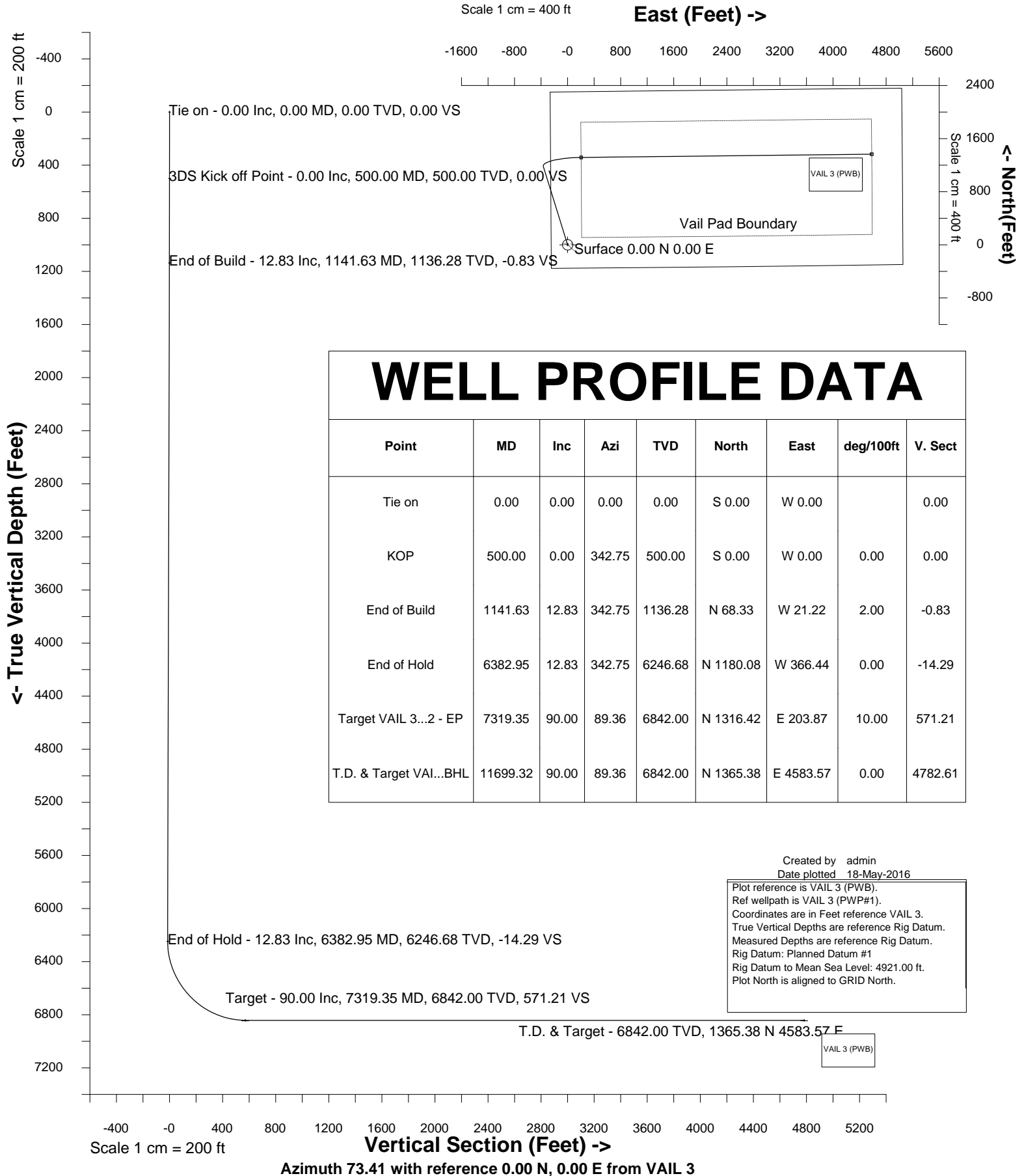


# Cub Creek Energy, LLC

Location	Weld County, CO	Slot	VAIL 3
Field	WATTENBERG	Well	VAIL 3
Installation	Vail Pad - Rev 03 - 05-13-2016	Wellbore	VAIL 3 (PWB)





#### Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
VAIL 3	40.32931000	-104.95988000	1363267.0452	3150584.9382	32.79S	0.20E	0.00

#### Declination

Date	Source	Time
May-16-2016	EMM-2015 [2000.0-2020.0]	11:20

#### Installation Details

Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Vail Pad - Rev 03 - 05-13-2016	40.32940000	-104.95988000	1363299.8308	3150584.7385	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
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	1363267.05	3150584.94
500.00	0.00	342.750	500.00	0.00N	0.00E	==>	0.00	1363267.05	3150584.94
1141.63	12.83	342.750	1136.28	68.33N	21.22W	2.00	-0.83	1363335.38	3150563.72
6382.95	12.83	342.750	6246.68	1180.08N	366.44W	==>	-14.29	1364447.08	3150218.51
7319.35	90.00	89.360	6842.00	1316.42N	203.87E	10.00	571.21	1364583.41	3150788.80
11699.32	90.00	89.360	6842.00	1365.38N	4583.57E	==>	4782.61	1364632.36	3155168.31

#### 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	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	342.750	500.00	0.00N	0.00E	==>	0.00	
600.00	2.00	342.750	599.98	1.67N	0.52W	2.00	-0.02	
700.00	4.00	342.750	699.84	6.66N	2.07W	2.00	-0.08	
800.00	6.00	342.750	799.45	14.99N	4.65W	2.00	-0.18	
900.00	8.00	342.750	898.70	26.63N	8.27W	2.00	-0.32	
1000.00	10.00	342.750	997.47	41.56N	12.91W	2.00	-0.50	
1100.00	12.00	342.750	1095.62	59.79N	18.56W	2.00	-0.72	
1200.00	12.83	342.750	1193.19	80.72N	25.06W	==>	-0.98	
1300.00	12.83	342.750	1290.69	101.93N	31.65W	==>	-1.23	
1400.00	12.83	342.750	1388.20	123.14N	38.24W	==>	-1.49	
1500.00	12.83	342.750	1485.70	144.35N	44.82W	==>	-1.75	
1600.00	12.83	342.750	1583.20	165.56N	51.41W	==>	-2.00	
1700.00	12.83	342.750	1680.70	186.77N	58.00W	==>	-2.26	
1800.00	12.83	342.750	1778.21	207.98N	64.58W	==>	-2.52	
1900.00	12.83	342.750	1875.71	229.19N	71.17W	==>	-2.78	
2000.00	12.83	342.750	1973.21	250.41N	77.76W	==>	-3.03	
2100.00	12.83	342.750	2070.71	271.62N	84.34W	==>	-3.29	
2200.00	12.83	342.750	2168.21	292.83N	90.93W	==>	-3.55	
2300.00	12.83	342.750	2265.72	314.04N	97.52W	==>	-3.80	
2400.00	12.83	342.750	2363.22	335.25N	104.10W	==>	-4.06	
2500.00	12.83	342.750	2460.72	356.46N	110.69W	==>	-4.32	
2600.00	12.83	342.750	2558.22	377.67N	117.28W	==>	-4.57	
2700.00	12.83	342.750	2655.73	398.88N	123.86W	==>	-4.83	
2800.00	12.83	342.750	2753.23	420.10N	130.45W	==>	-5.09	
2900.00	12.83	342.750	2850.73	441.31N	137.04W	==>	-5.34	
3000.00	12.83	342.750	2948.23	462.52N	143.62W	==>	-5.60	
3100.00	12.83	342.750	3045.74	483.73N	150.21W	==>	-5.86	
3200.00	12.83	342.750	3143.24	504.94N	156.79W	==>	-6.11	

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 4921.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 73.410 degrees  
Bottom hole distance is 4782.61 Feet on azimuth 73.41 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 17-May-2016

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3300.00	12.83	342.750	3240.74	526.15N	163.38W	==>	-6.37	
3400.00	12.83	342.750	3338.24	547.36N	169.97W	==>	-6.63	
3500.00	12.83	342.750	3435.74	568.57N	176.55W	==>	-6.89	
3600.00	12.83	342.750	3533.25	589.79N	183.14W	==>	-7.14	
3700.00	12.83	342.750	3630.75	611.00N	189.73W	==>	-7.40	
3800.00	12.83	342.750	3728.25	632.21N	196.31W	==>	-7.66	
3900.00	12.83	342.750	3825.75	653.42N	202.90W	==>	-7.91	
4000.00	12.83	342.750	3923.26	674.63N	209.49W	==>	-8.17	
4100.00	12.83	342.750	4020.76	695.84N	216.07W	==>	-8.43	
4200.00	12.83	342.750	4118.26	717.05N	222.66W	==>	-8.68	
4300.00	12.83	342.750	4215.76	738.26N	229.25W	==>	-8.94	
4400.00	12.83	342.750	4313.26	759.48N	235.83W	==>	-9.20	
4500.00	12.83	342.750	4410.77	780.69N	242.42W	==>	-9.45	
4600.00	12.83	342.750	4508.27	801.90N	249.01W	==>	-9.71	
4700.00	12.83	342.750	4605.77	823.11N	255.59W	==>	-9.97	
4800.00	12.83	342.750	4703.27	844.32N	262.18W	==>	-10.22	
4900.00	12.83	342.750	4800.78	865.53N	268.77W	==>	-10.48	
5000.00	12.83	342.750	4898.28	886.74N	275.35W	==>	-10.74	
5100.00	12.83	342.750	4995.78	907.95N	281.94W	==>	-11.00	
5200.00	12.83	342.750	5093.28	929.17N	288.53W	==>	-11.25	
5300.00	12.83	342.750	5190.79	950.38N	295.11W	==>	-11.51	
5400.00	12.83	342.750	5288.29	971.59N	301.70W	==>	-11.77	
5500.00	12.83	342.750	5385.79	992.80N	308.29W	==>	-12.02	
5600.00	12.83	342.750	5483.29	1014.01N	314.87W	==>	-12.28	
5700.00	12.83	342.750	5580.79	1035.22N	321.46W	==>	-12.54	
5800.00	12.83	342.750	5678.30	1056.43N	328.05W	==>	-12.79	
5900.00	12.83	342.750	5775.80	1077.65N	334.63W	==>	-13.05	
6000.00	12.83	342.750	5873.30	1098.86N	341.22W	==>	-13.31	
6100.00	12.83	342.750	5970.80	1120.07N	347.80W	==>	-13.56	
6200.00	12.83	342.750	6068.31	1141.28N	354.39W	==>	-13.82	
6300.00	12.83	342.750	6165.81	1162.49N	360.98W	==>	-14.08	
6400.00	12.46	350.360	6263.32	1183.71N	367.31W	10.00	-14.09	
6500.00	14.69	32.960	6360.76	1205.03N	362.21W	10.00	-3.11	
6600.00	21.75	56.180	6455.81	1226.03N	339.86W	10.00	24.30	
6700.00	30.45	67.560	6545.59	1246.07N	300.96W	10.00	67.30	
6800.00	39.72	74.130	6627.36	1264.52N	246.67W	10.00	124.60	
6900.00	49.24	78.510	6698.64	1280.85N	178.65W	10.00	194.45	
7000.00	58.88	81.790	6757.28	1294.54N	98.97W	10.00	274.72	
7100.00	68.60	84.450	6801.48	1305.18N	10.04W	10.00	362.99	
7200.00	78.34	86.780	6829.90	1312.45N	85.42E	10.00	456.56	
7300.00	88.11	88.950	6841.68	1316.13N	184.53E	10.00	552.59	
7400.00	90.00	89.360	6842.00	1317.32N	284.52E	==>	648.76	
7500.00	90.00	89.360	6842.00	1318.44N	384.51E	==>	744.91	
7600.00	90.00	89.360	6842.00	1319.56N	484.51E	==>	841.06	
7700.00	90.00	89.360	6842.00	1320.67N	584.50E	==>	937.21	
7800.00	90.00	89.360	6842.00	1321.79N	684.49E	==>	1033.36	
7900.00	90.00	89.360	6842.00	1322.91N	784.49E	==>	1129.51	
8000.00	90.00	89.360	6842.00	1324.03N	884.48E	==>	1225.67	
8100.00	90.00	89.360	6842.00	1325.14N	984.48E	==>	1321.82	
8200.00	90.00	89.360	6842.00	1326.26N	1084.47E	==>	1417.97	
8300.00	90.00	89.360	6842.00	1327.38N	1184.46E	==>	1514.12	
8400.00	90.00	89.360	6842.00	1328.50N	1284.46E	==>	1610.27	
8500.00	90.00	89.360	6842.00	1329.62N	1384.45E	==>	1706.42	
8600.00	90.00	89.360	6842.00	1330.73N	1484.44E	==>	1802.57	
8700.00	90.00	89.360	6842.00	1331.85N	1584.44E	==>	1898.73	
8800.00	90.00	89.360	6842.00	1332.97N	1684.43E	==>	1994.88	
8900.00	90.00	89.360	6842.00	1334.09N	1784.43E	==>	2091.03	
9000.00	90.00	89.360	6842.00	1335.21N	1884.42E	==>	2187.18	
9100.00	90.00	89.360	6842.00	1336.32N	1984.41E	==>	2283.33	

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Bottom hole distance is 4782.61 Feet on azimuth 73.41 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 17-May-2016



SYSDRILL  
Well Design Combined Report  
Wellbore: VAIL 3 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9200.00	90.00	89.360	6842.00	1337.44N	2084.41E	==>	2379.48	
9300.00	90.00	89.360	6842.00	1338.56N	2184.40E	==>	2475.63	
9400.00	90.00	89.360	6842.00	1339.68N	2284.39E	==>	2571.78	
9500.00	90.00	89.360	6842.00	1340.79N	2384.39E	==>	2667.94	
9600.00	90.00	89.360	6842.00	1341.91N	2484.38E	==>	2764.09	
9700.00	90.00	89.360	6842.00	1343.03N	2584.38E	==>	2860.24	
9800.00	90.00	89.360	6842.00	1344.15N	2684.37E	==>	2956.39	
9900.00	90.00	89.360	6842.00	1345.27N	2784.36E	==>	3052.54	
10000.00	90.00	89.360	6842.00	1346.38N	2884.36E	==>	3148.69	
10100.00	90.00	89.360	6842.00	1347.50N	2984.35E	==>	3244.84	
10200.00	90.00	89.360	6842.00	1348.62N	3084.34E	==>	3341.00	
10300.00	90.00	89.360	6842.00	1349.74N	3184.34E	==>	3437.15	
10400.00	90.00	89.360	6842.00	1350.86N	3284.33E	==>	3533.30	
10500.00	90.00	89.360	6842.00	1351.97N	3384.33E	==>	3629.45	
10600.00	90.00	89.360	6842.00	1353.09N	3484.32E	==>	3725.60	
10700.00	90.00	89.360	6842.00	1354.21N	3584.31E	==>	3821.75	
10800.00	90.00	89.360	6842.00	1355.33N	3684.31E	==>	3917.90	
10900.00	90.00	89.360	6842.00	1356.44N	3784.30E	==>	4014.06	
11000.00	90.00	89.360	6842.00	1357.56N	3884.29E	==>	4110.21	
11100.00	90.00	89.360	6842.00	1358.68N	3984.29E	==>	4206.36	
11200.00	90.00	89.360	6842.00	1359.80N	4084.28E	==>	4302.51	
11300.00	90.00	89.360	6842.00	1360.92N	4184.28E	==>	4398.66	
11400.00	90.00	89.360	6842.00	1362.03N	4284.27E	==>	4494.81	
11500.00	90.00	89.360	6842.00	1363.15N	4384.26E	==>	4590.96	
11600.00	90.00	89.360	6842.00	1364.27N	4484.26E	==>	4687.11	
11699.32	90.00	89.360	6842.00	1365.38N	4583.57E	==>	4782.61	

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Bottom hole distance is 4782.61 Feet on azimuth 73.41 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 17-May-2016



SYSDRILL  
Well Design Combined Report  
Wellbore: VAIL 3 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
VAIL 3 - V2 - BHL	1365.38N	4583.57E	6842.00	40.33298000	-104.94341000	1364632.36	3155168.31
VAIL 3 - V2 - EP	1316.42N	203.87E	6842.00	40.33292000	-104.95912000	1364583.41	3150788.80

Notes



SYSDRILL  
Closest Approach + Clearance Factor Summary Report  
Wellbore: VAIL 3 (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
VAIL 3 (PWB)	May-16-2016	May-18-2016

Well		
Name	Government ID	Last Revised
VAIL 3		May-16-2016

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
VAIL 3	40.32931000	-104.95988000	1363267.0452	3150584.9382	32.79S	0.20E

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Vail Pad - Rev 03 - 05-13-2016	40.32940000	-104.95988000	3150584.7385	1363299.8308	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]
VAIL 4	14.54	590.55	1017.06	3.76	1082.68	1.07	11699.32
VAIL 2	18.21	567.07	11699.32	-90.71	11699.32	0.73	11699.32
VAIL 5	32.76	524.93	902.23	1.85	11699.32	1.01	11699.32
VAIL 1	32.78	533.70	11699.32	21.57	1181.10	1.43	11699.32
VAIL 6	47.33	508.53	803.81	38.37	967.85	1.63	11699.32
VAIL 7	61.91	508.53	11696.19	55.50	738.19	1.84	11696.19
VAIL 8	80.13	508.53	508.53	80.10	1.00	1599.59	1.00
VAIL 9	94.71	508.53	508.53	89.28	574.15	3.10	11699.32
NLB #2-1-12	400.53	10287.90	10287.90	232.64	10301.84	2.38	10318.24
VAIL #1	586.01	7932.54	7932.54	511.01	7939.63	7.78	7988.85
NLB #1-3-12	835.83	10194.83	10194.83	673.77	10236.22	5.08	10318.24
UPRC #11-8I8	999.60	5314.96	5312.34	943.81	5500.00	16.00	6430.45
ABRAMS #1	2120.66	7392.57	7392.57	2057.54	7431.10	25.39	8776.25
HSR-MAPLEWOOD ACRES #12-7	2634.41	11699.32	11699.32	2439.86	11699.32	13.54	11699.32

