

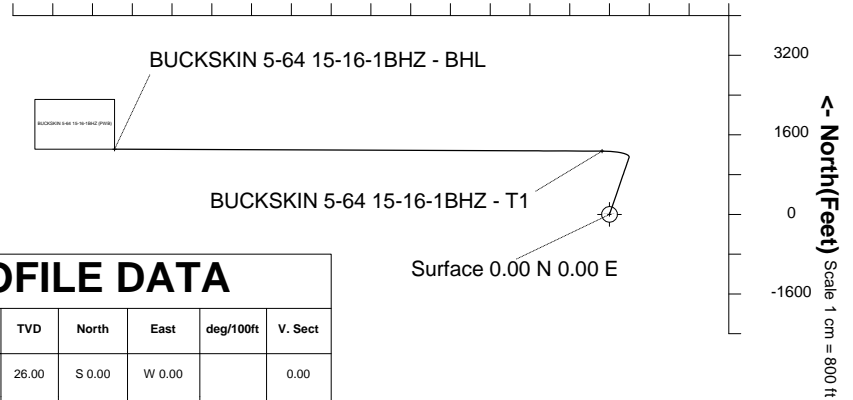
Highlands Natural Resources

Location	DJ Basin Southern Extension	Slot	Buckskin 5-64 15-16-1BHZ
Field	DJ Basin Southern Extension	Well	BUCKSKIN 5-64 15-16-1BHZ
Installation	HNR Arapahoe County Pad Updated 7-14-2017_AJS	Wellbore	BUCKSKIN 5-64 15-16-1BHZ (PWB)

Scale 1 cm = 800 ft

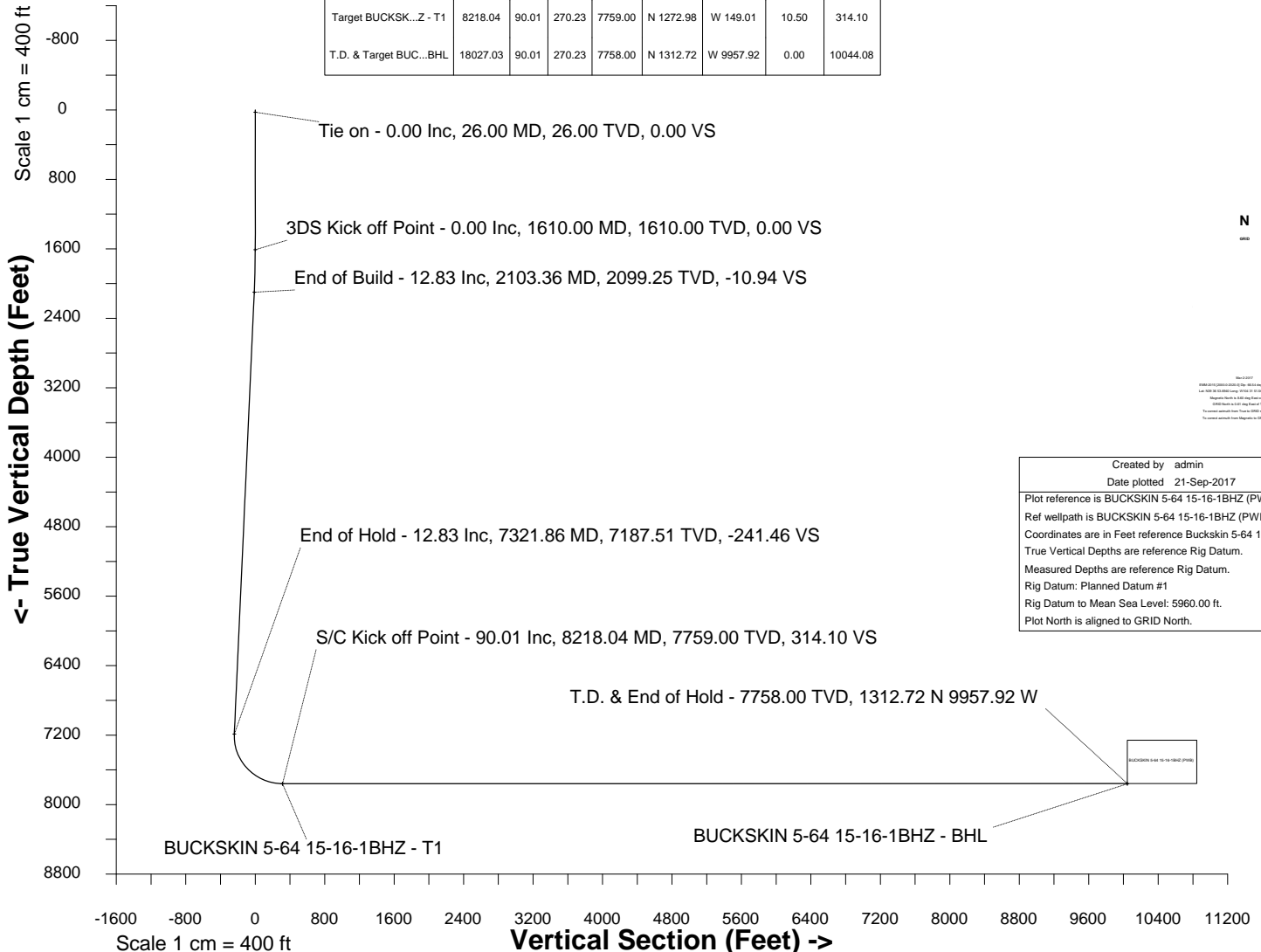
East (Feet) ->

-11200 -9600 -8000 -6400 -4800 -3200 -1600 0 1600



WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	26.00	0.00	0.00	26.00	S 0.00	W 0.00		0.00
KOP	1610.00	0.00	18.99	1610.00	S 0.00	W 0.00	0.00	0.00
End of Build	2103.36	12.83	18.99	2099.25	N 52.00	E 17.89	2.60	-10.94
End of Hold	7321.86	12.83	18.99	7187.51	N 1147.55	E 394.83	0.00	-241.46
Target BUCKSK...Z - T1	8218.04	90.01	270.23	7759.00	N 1272.98	W 149.01	10.50	314.10
T.D. & Target BUC...BHL	18027.03	90.01	270.23	7758.00	N 1312.72	W 9957.92	0.00	10044.08



Created by	admin
Date plotted	21-Sep-2017
Plot reference is BUCKSKIN 5-64 15-16-1BHZ (PWB).	
Ref wellpath is BUCKSKIN 5-64 15-16-1BHZ (PWP#1).	
Coordinates are in Feet reference Buckskin 5-64 15-16-1BHZ.	
True Vertical Depths are reference Rig Datum.	
Measured Depths are reference Rig Datum.	
Rig Datum: Planned Datum #1	
Rig Datum to Mean Sea Level: 5960.00 ft.	
Plot North is aligned to GRID North.	

Azimuth 277.51 with reference 0.00 N, 0.00 E from Buckskin 5-64 15-16-1BHZ



SYSDRILL
Well Design Combined Report
Wellbore: BUCKSKIN 5-64 15-16-1BHZ (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
Buckskin 5-64 15-16-1BHZ	N39 36 53.2986	W104 31 51.5759	1650277.0905	3272987.3849	40.02S	0.22W	0.00

Declination		
Date	Source	Time
Mar-2-2017	EMM-2015 [2000.0-2020.0]	14:57

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
HNR Arapahoe County Pad Updated 7-14-2017_AJS	N39 36 53.6940	W104 31 51.5676	1650317.1047	3272987.6089	CO83-CF 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
26.00	0.00	0.000	26.00	0.00N	0.00E		0.00	1650277.09	3272987.38
1610.00	0.00	18.990	1610.00	0.00N	0.00E	==>	0.00	1650277.09	3272987.38
2103.36	12.83	18.990	2099.25	52.00N	17.89E	2.60	-10.94	1650329.09	3273005.28
7321.86	12.83	18.990	7187.51	1147.55N	394.83E	==>	-241.46	1651424.61	3273382.20
8218.04	90.01	270.230	7759.00	1272.98N	149.01W	10.50	314.10	1651550.04	3272838.38
18027.03	90.01	270.230	7758.00	1312.72N	9957.92W	==>	10044.08	1651589.77	3263029.72

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
26.00	0.00	0.000	26.00	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	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	
1500.00	0.00	0.000	1500.00	0.00N	0.00E	==>	0.00	
1600.00	0.00	0.000	1600.00	0.00N	0.00E	==>	0.00	
1700.00	2.34	18.990	1699.97	1.74N	0.60E	2.60	-0.37	
1800.00	4.94	18.990	1799.76	7.74N	2.66E	2.60	-1.63	
1900.00	7.54	18.990	1899.16	18.02N	6.20E	2.60	-3.79	
2000.00	10.14	18.990	1997.97	32.55N	11.20E	2.60	-6.85	
2100.00	12.74	18.990	2095.97	51.30N	17.65E	2.60	-10.79	
2200.00	12.83	18.990	2193.48	72.29N	24.87E	==>	-15.21	
2300.00	12.83	18.990	2290.98	93.29N	32.10E	==>	-19.63	
2400.00	12.83	18.990	2388.49	114.28N	39.32E	==>	-24.05	
2500.00	12.83	18.990	2485.99	135.27N	46.54E	==>	-28.46	
2600.00	12.83	18.990	2583.49	156.27N	53.77E	==>	-32.88	
2700.00	12.83	18.990	2681.00	177.26N	60.99E	==>	-37.30	
2800.00	12.83	18.990	2778.50	198.25N	68.21E	==>	-41.72	
2900.00	12.83	18.990	2876.01	219.25N	75.43E	==>	-46.13	
3000.00	12.83	18.990	2973.51	240.24N	82.66E	==>	-50.55	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5960.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 277.510 degrees
Bottom hole distance is 10044.08 Feet on azimuth 277.51 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 21-Sep-2017



SYSDRILL
Well Design Combined Report
Wellbore: BUCKSKIN 5-64 15-16-1BHZ (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3100.00	12.83	18.990	3071.02	261.23N	89.88E	==>	-54.97	
3200.00	12.83	18.990	3168.52	282.23N	97.10E	==>	-59.38	
3300.00	12.83	18.990	3266.03	303.22N	104.33E	==>	-63.80	
3400.00	12.83	18.990	3363.53	324.21N	111.55E	==>	-68.22	
3500.00	12.83	18.990	3461.03	345.21N	118.77E	==>	-72.64	
3600.00	12.83	18.990	3558.54	366.20N	126.00E	==>	-77.05	
3700.00	12.83	18.990	3656.04	387.19N	133.22E	==>	-81.47	
3800.00	12.83	18.990	3753.55	408.19N	140.44E	==>	-85.89	
3900.00	12.83	18.990	3851.05	429.18N	147.67E	==>	-90.31	
4000.00	12.83	18.990	3948.56	450.17N	154.89E	==>	-94.72	
4100.00	12.83	18.990	4046.06	471.17N	162.11E	==>	-99.14	
4200.00	12.83	18.990	4143.56	492.16N	169.33E	==>	-103.56	
4300.00	12.83	18.990	4241.07	513.16N	176.56E	==>	-107.98	
4400.00	12.83	18.990	4338.57	534.15N	183.78E	==>	-112.39	
4500.00	12.83	18.990	4436.08	555.14N	191.00E	==>	-116.81	
4600.00	12.83	18.990	4533.58	576.14N	198.23E	==>	-121.23	
4700.00	12.83	18.990	4631.09	597.13N	205.45E	==>	-125.65	
4800.00	12.83	18.990	4728.59	618.12N	212.67E	==>	-130.06	
4900.00	12.83	18.990	4826.10	639.12N	219.90E	==>	-134.48	
5000.00	12.83	18.990	4923.60	660.11N	227.12E	==>	-138.90	
5100.00	12.83	18.990	5021.10	681.10N	234.34E	==>	-143.31	
5200.00	12.83	18.990	5118.61	702.10N	241.56E	==>	-147.73	
5300.00	12.83	18.990	5216.11	723.09N	248.79E	==>	-152.15	
5400.00	12.83	18.990	5313.62	744.08N	256.01E	==>	-156.57	
5500.00	12.83	18.990	5411.12	765.08N	263.23E	==>	-160.98	
5600.00	12.83	18.990	5508.63	786.07N	270.46E	==>	-165.40	
5700.00	12.83	18.990	5606.13	807.06N	277.68E	==>	-169.82	
5800.00	12.83	18.990	5703.63	828.06N	284.90E	==>	-174.24	
5900.00	12.83	18.990	5801.14	849.05N	292.13E	==>	-178.65	
6000.00	12.83	18.990	5898.64	870.04N	299.35E	==>	-183.07	
6100.00	12.83	18.990	5996.15	891.04N	306.57E	==>	-187.49	
6200.00	12.83	18.990	6093.65	912.03N	313.80E	==>	-191.91	
6300.00	12.83	18.990	6191.16	933.02N	321.02E	==>	-196.32	
6400.00	12.83	18.990	6288.66	954.02N	328.24E	==>	-200.74	
6500.00	12.83	18.990	6386.17	975.01N	335.46E	==>	-205.16	
6600.00	12.83	18.990	6483.67	996.00N	342.69E	==>	-209.57	
6700.00	12.83	18.990	6581.17	1017.00N	349.91E	==>	-213.99	
6800.00	12.83	18.990	6678.68	1037.99N	357.13E	==>	-218.41	
6900.00	12.83	18.990	6776.18	1058.98N	364.36E	==>	-222.83	
7000.00	12.83	18.990	6873.69	1079.98N	371.58E	==>	-227.24	
7100.00	12.83	18.990	6971.19	1100.97N	378.80E	==>	-231.66	
7200.00	12.83	18.990	7068.70	1121.97N	386.03E	==>	-236.08	
7300.00	12.83	18.990	7166.20	1142.96N	393.25E	==>	-240.50	
7400.00	12.83	341.400	7263.83	1164.00N	394.88E	10.50	-239.36	
7500.00	18.93	309.190	7360.15	1184.84N	378.72E	10.50	-220.62	
7600.00	27.73	294.450	7451.96	1204.77N	344.87E	10.50	-184.46	
7700.00	37.37	286.630	7536.19	1223.13N	294.47E	10.50	-132.09	
7800.00	47.34	281.690	7610.02	1239.32N	229.21E	10.50	-65.27	
7900.00	57.46	278.140	7670.97	1252.78N	151.26E	10.50	13.77	
8000.00	67.65	275.320	7717.00	1263.06N	63.24E	10.50	102.38	
8100.00	77.89	272.880	7746.58	1269.83N	31.90W	10.50	197.58	
8200.00	88.15	270.630	7758.71	1272.84N	130.97W	10.50	296.20	
8300.00	90.01	270.230	7758.99	1273.31N	230.97W	==>	395.40	
8400.00	90.01	270.230	7758.98	1273.72N	330.97W	==>	494.60	
8500.00	90.01	270.230	7758.97	1274.12N	430.97W	==>	593.79	
8600.00	90.01	270.230	7758.96	1274.53N	530.97W	==>	692.99	
8700.00	90.01	270.230	7758.95	1274.93N	630.96W	==>	792.18	
8800.00	90.01	270.230	7758.94	1275.34N	730.96W	==>	891.37	
8900.00	90.01	270.230	7758.93	1275.74N	830.96W	==>	990.57	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5960.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 277.510 degrees
Bottom hole distance is 10044.08 Feet on azimuth 277.51 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 21-Sep-2017



SYSDRILL
Well Design Combined Report
Wellbore: BUCKSKIN 5-64 15-16-1BHZ (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9000.00	90.01	270.230	7758.92	1276.15N	930.96W	==>	1089.76	
9100.00	90.01	270.230	7758.91	1276.55N	1030.96W	==>	1188.96	
9200.00	90.01	270.230	7758.90	1276.96N	1130.96W	==>	1288.15	
9300.00	90.01	270.230	7758.89	1277.36N	1230.96W	==>	1387.35	
9400.00	90.01	270.230	7758.88	1277.77N	1330.96W	==>	1486.54	
9500.00	90.01	270.230	7758.87	1278.17N	1430.96W	==>	1585.74	
9600.00	90.01	270.230	7758.86	1278.58N	1530.96W	==>	1684.93	
9700.00	90.01	270.230	7758.85	1278.98N	1630.96W	==>	1784.12	
9800.00	90.01	270.230	7758.84	1279.39N	1730.96W	==>	1883.32	
9900.00	90.01	270.230	7758.83	1279.79N	1830.95W	==>	1982.51	
10000.00	90.01	270.230	7758.82	1280.20N	1930.95W	==>	2081.71	
10100.00	90.01	270.230	7758.81	1280.60N	2030.95W	==>	2180.90	
10200.00	90.01	270.230	7758.80	1281.01N	2130.95W	==>	2280.10	
10300.00	90.01	270.230	7758.79	1281.41N	2230.95W	==>	2379.29	
10400.00	90.01	270.230	7758.78	1281.82N	2330.95W	==>	2478.49	
10500.00	90.01	270.230	7758.77	1282.22N	2430.95W	==>	2577.68	
10600.00	90.01	270.230	7758.76	1282.63N	2530.95W	==>	2676.87	
10700.00	90.01	270.230	7758.75	1283.04N	2630.95W	==>	2776.07	
10800.00	90.01	270.230	7758.74	1283.44N	2730.95W	==>	2875.26	
10900.00	90.01	270.230	7758.73	1283.85N	2830.95W	==>	2974.46	
11000.00	90.01	270.230	7758.72	1284.25N	2930.95W	==>	3073.65	
11100.00	90.01	270.230	7758.71	1284.66N	3030.94W	==>	3172.85	
11200.00	90.01	270.230	7758.70	1285.06N	3130.94W	==>	3272.04	
11300.00	90.01	270.230	7758.69	1285.47N	3230.94W	==>	3371.23	
11400.00	90.01	270.230	7758.68	1285.87N	3330.94W	==>	3470.43	
11500.00	90.01	270.230	7758.67	1286.28N	3430.94W	==>	3569.62	
11600.00	90.01	270.230	7758.66	1286.68N	3530.94W	==>	3668.82	
11700.00	90.01	270.230	7758.65	1287.09N	3630.94W	==>	3768.01	
11800.00	90.01	270.230	7758.63	1287.49N	3730.94W	==>	3867.21	
11900.00	90.01	270.230	7758.62	1287.90N	3830.94W	==>	3966.40	
12000.00	90.01	270.230	7758.61	1288.30N	3930.94W	==>	4065.60	
12100.00	90.01	270.230	7758.60	1288.71N	4030.94W	==>	4164.79	
12200.00	90.01	270.230	7758.59	1289.11N	4130.94W	==>	4263.98	
12300.00	90.01	270.230	7758.58	1289.52N	4230.93W	==>	4363.18	
12400.00	90.01	270.230	7758.57	1289.92N	4330.93W	==>	4462.37	
12500.00	90.01	270.230	7758.56	1290.33N	4430.93W	==>	4561.57	
12600.00	90.01	270.230	7758.55	1290.73N	4530.93W	==>	4660.76	
12700.00	90.01	270.230	7758.54	1291.14N	4630.93W	==>	4759.96	
12800.00	90.01	270.230	7758.53	1291.54N	4730.93W	==>	4859.15	
12900.00	90.01	270.230	7758.52	1291.95N	4830.93W	==>	4958.34	
13000.00	90.01	270.230	7758.51	1292.35N	4930.93W	==>	5057.54	
13100.00	90.01	270.230	7758.50	1292.76N	5030.93W	==>	5156.73	
13200.00	90.01	270.230	7758.49	1293.16N	5130.93W	==>	5255.93	
13300.00	90.01	270.230	7758.48	1293.57N	5230.93W	==>	5355.12	
13400.00	90.01	270.230	7758.47	1293.97N	5330.93W	==>	5454.32	
13500.00	90.01	270.230	7758.46	1294.38N	5430.93W	==>	5553.51	
13600.00	90.01	270.230	7758.45	1294.78N	5530.92W	==>	5652.71	
13700.00	90.01	270.230	7758.44	1295.19N	5630.92W	==>	5751.90	
13800.00	90.01	270.230	7758.43	1295.59N	5730.92W	==>	5851.09	
13900.00	90.01	270.230	7758.42	1296.00N	5830.92W	==>	5950.29	
14000.00	90.01	270.230	7758.41	1296.40N	5930.92W	==>	6049.48	
14100.00	90.01	270.230	7758.40	1296.81N	6030.92W	==>	6148.68	
14200.00	90.01	270.230	7758.39	1297.21N	6130.92W	==>	6247.87	
14300.00	90.01	270.230	7758.38	1297.62N	6230.92W	==>	6347.07	
14400.00	90.01	270.230	7758.37	1298.02N	6330.92W	==>	6446.26	
14500.00	90.01	270.230	7758.36	1298.43N	6430.92W	==>	6545.45	
14600.00	90.01	270.230	7758.35	1298.83N	6530.92W	==>	6644.65	
14700.00	90.01	270.230	7758.34	1299.24N	6630.92W	==>	6743.84	
14800.00	90.01	270.230	7758.33	1299.64N	6730.91W	==>	6843.04	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5960.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 277.510 degrees
Bottom hole distance is 10044.08 Feet on azimuth 277.51 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
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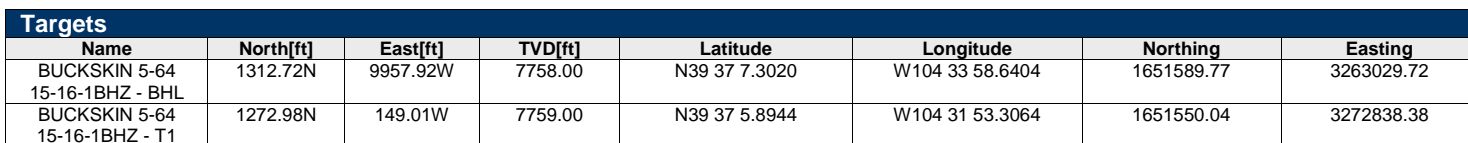
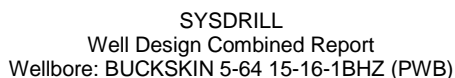


SYSDRILL
Well Design Combined Report
Wellbore: BUCKSKIN 5-64 15-16-1BHZ (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
14900.00	90.01	270.230	7758.32	1300.05N	6830.91W	==>	6942.23	
15000.00	90.01	270.230	7758.31	1300.45N	6930.91W	==>	7041.43	
15100.00	90.01	270.230	7758.30	1300.86N	7030.91W	==>	7140.62	
15200.00	90.01	270.230	7758.29	1301.26N	7130.91W	==>	7239.82	
15300.00	90.01	270.230	7758.28	1301.67N	7230.91W	==>	7339.01	
15400.00	90.01	270.230	7758.27	1302.07N	7330.91W	==>	7438.20	
15500.00	90.01	270.230	7758.26	1302.48N	7430.91W	==>	7537.40	
15600.00	90.01	270.230	7758.25	1302.88N	7530.91W	==>	7636.59	
15700.00	90.01	270.230	7758.24	1303.29N	7630.91W	==>	7735.79	
15800.00	90.01	270.230	7758.23	1303.70N	7730.91W	==>	7834.98	
15900.00	90.01	270.230	7758.22	1304.10N	7830.91W	==>	7934.18	
16000.00	90.01	270.230	7758.21	1304.51N	7930.90W	==>	8033.37	
16100.00	90.01	270.230	7758.20	1304.91N	8030.90W	==>	8132.57	
16200.00	90.01	270.230	7758.19	1305.32N	8130.90W	==>	8231.76	
16300.00	90.01	270.230	7758.18	1305.72N	8230.90W	==>	8330.95	
16400.00	90.01	270.230	7758.17	1306.13N	8330.90W	==>	8430.15	
16500.00	90.01	270.230	7758.16	1306.53N	8430.90W	==>	8529.34	
16600.00	90.01	270.230	7758.15	1306.94N	8530.90W	==>	8628.54	
16700.00	90.01	270.230	7758.14	1307.34N	8630.90W	==>	8727.73	
16800.00	90.01	270.230	7758.13	1307.75N	8730.90W	==>	8826.93	
16900.00	90.01	270.230	7758.11	1308.15N	8830.90W	==>	8926.12	
17000.00	90.01	270.230	7758.10	1308.56N	8930.90W	==>	9025.31	
17100.00	90.01	270.230	7758.09	1308.96N	9030.90W	==>	9124.51	
17200.00	90.01	270.230	7758.08	1309.37N	9130.89W	==>	9223.70	
17300.00	90.01	270.230	7758.07	1309.77N	9230.89W	==>	9322.90	
17400.00	90.01	270.230	7758.06	1310.18N	9330.89W	==>	9422.09	
17500.00	90.01	270.230	7758.05	1310.58N	9430.89W	==>	9521.29	
17600.00	90.01	270.230	7758.04	1310.99N	9530.89W	==>	9620.48	
17700.00	90.01	270.230	7758.03	1311.39N	9630.89W	==>	9719.68	
17800.00	90.01	270.230	7758.02	1311.80N	9730.89W	==>	9818.87	
17900.00	90.01	270.230	7758.01	1312.20N	9830.89W	==>	9918.06	
18000.00	90.01	270.230	7758.00	1312.61N	9930.89W	==>	10017.26	
18027.03	90.01	270.230	7758.00	1312.72N	9957.92W	==>	10044.08	

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 5960.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 277.510 degrees
Bottom hole distance is 10044.08 Feet on azimuth 277.51 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 21-Sep-2017



Survey Tool Program					
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
564184	Planned	1500.00	1500.00	WdW Rate Gyro	Standard
564183	Planned	18027.03	7758.00	ISCWSA MWD	Rev 4 + SAG + FLT

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 5960.0ft above Mean Sea Level)
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