

Bighorn Directional, Inc.

Nighthawk Production, LLC
Snowking 13-33
Lincoln County, CO
Rev #2



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Minimum of Curvature
Slot Location: 1605330.40', 3578317.60'
Plane of Vertical Section: 335.95°

Measured Depth Feet	BORE Inc Degrees	HOLE Direction Degrees	True Vertical Depth Feet	RECTANGULAR COORDINATES		LAMBERT COORDINATES		Vertical Section Feet	CLOSURES		Dogleg Severity Deg/100'
				North(-South) Feet	East(-West) Feet	Y Feet	X Feet		Distance Feet	Direction Deg	
1555.25	0.00	335.95	1555.25	0.00	0.00	1605330.4	3578317.6	0.00	0.00	0.00	0.00
KOP-Start Build											
1585.25	0.45	335.95	1585.25	0.11	-0.05	1605330.5	3578317.6	0.12	0.12	335.95	1.50
1615.25	0.90	335.95	1615.25	0.43	-0.19	1605330.8	3578317.4	0.47	0.47	335.95	1.50
1645.25	1.35	335.95	1645.24	0.97	-0.43	1605331.4	3578317.2	1.06	1.06	335.95	1.50
1675.25	1.80	335.95	1675.23	1.72	-0.77	1605332.1	3578316.8	1.88	1.88	335.95	1.50
1705.25	2.25	335.95	1705.21	2.69	-1.20	1605333.1	3578316.4	2.94	2.94	335.95	1.50
1735.25	2.70	335.95	1735.18	3.87	-1.73	1605334.3	3578315.9	4.24	4.24	335.95	1.50
1765.25	3.15	335.95	1765.14	5.27	-2.35	1605335.7	3578315.2	5.77	5.77	335.95	1.50
1795.25	3.60	335.95	1795.09	6.88	-3.07	1605337.3	3578314.5	7.54	7.54	335.95	1.50
1825.25	4.05	335.95	1825.02	8.71	-3.89	1605339.1	3578313.7	9.54	9.54	335.95	1.50
1855.25	4.50	335.95	1854.94	10.75	-4.80	1605341.2	3578312.8	11.77	11.77	335.95	1.50
1885.25	4.95	335.95	1884.84	13.01	-5.80	1605343.4	3578311.8	14.25	14.25	335.95	1.50
1915.25	5.40	335.95	1914.72	15.48	-6.91	1605345.9	3578310.7	16.95	16.95	335.95	1.50
1945.25	5.85	335.95	1944.57	18.17	-8.11	1605348.6	3578309.5	19.89	19.89	335.95	1.50
1955.22	6.00	335.95	1954.49	19.11	-8.53	1605349.5	3578309.1	20.92	20.92	335.95	1.50
End of Build											
2055.22	6.00	335.95	2053.95	28.65	-12.78	1605359.1	3578304.8	31.38	31.38	335.95	0.00
2155.22	6.00	335.95	2153.40	38.20	-17.04	1605368.6	3578300.6	41.83	41.83	335.95	0.00
2255.22	6.00	335.95	2252.85	47.74	-21.30	1605378.1	3578296.3	52.28	52.28	335.95	0.00
2355.22	6.00	335.95	2352.30	57.29	-25.56	1605387.7	3578292.0	62.73	62.73	335.95	0.00
2455.22	6.00	335.95	2451.75	66.84	-29.82	1605397.2	3578287.8	73.19	73.19	335.95	0.00
2555.22	6.00	335.95	2551.21	76.38	-34.08	1605406.8	3578283.5	83.64	83.64	335.95	0.00
2655.22	6.00	335.95	2650.66	85.93	-38.34	1605416.3	3578279.3	94.09	94.09	335.95	0.00
2755.22	6.00	335.95	2750.11	95.47	-42.60	1605425.9	3578275.0	104.55	104.55	335.95	0.00
2855.22	6.00	335.95	2849.56	105.02	-46.86	1605435.4	3578270.7	115.00	115.00	335.95	0.00
2955.22	6.00	335.95	2949.02	114.56	-51.12	1605445.0	3578266.5	125.45	125.45	335.95	0.00

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				North(-South) Feet	East(-West) Feet	Y Feet	X Feet		Distance Feet	Direction Deg	
3055.22	6.00	335.95	3048.47	124.11	-55.38	1605454.5	3578262.2	135.90	135.90	335.95	0.00
3155.22	6.00	335.95	3147.92	133.66	-59.64	1605464.1	3578258.0	146.36	146.36	335.95	0.00
3255.22	6.00	335.95	3247.37	143.20	-63.90	1605473.6	3578253.7	156.81	156.81	335.95	0.00
3355.22	6.00	335.95	3346.82	152.75	-68.15	1605483.1	3578249.4	167.26	167.26	335.95	0.00
3455.22	6.00	335.95	3446.28	162.29	-72.41	1605492.7	3578245.2	177.71	177.71	335.95	0.00
3555.22	6.00	335.95	3545.73	171.84	-76.67	1605502.2	3578240.9	188.17	188.17	335.95	0.00
3655.22	6.00	335.95	3645.18	181.38	-80.93	1605511.8	3578236.7	198.62	198.62	335.95	0.00
3700.29	6.00	335.95	3690.00	185.69	-82.85	1605516.1	3578234.7	203.33	203.33	335.95	0.00
Niobrara											
3800.29	6.00	335.95	3789.45	195.23	-87.11	1605525.6	3578230.5	213.78	213.78	335.95	0.00
3900.29	6.00	335.95	3888.91	204.78	-91.37	1605535.2	3578226.2	224.24	224.24	335.95	0.00
4000.29	6.00	335.95	3988.36	214.32	-95.63	1605544.7	3578222.0	234.69	234.69	335.95	0.00
4100.29	6.00	335.95	4087.81	223.87	-99.89	1605554.3	3578217.7	245.14	245.14	335.95	0.00
4200.29	6.00	335.95	4187.26	233.41	-104.15	1605563.8	3578213.5	255.60	255.60	335.95	0.00
4300.29	6.00	335.95	4286.71	242.96	-108.41	1605573.4	3578209.2	266.05	266.05	335.95	0.00
4400.29	6.00	335.95	4386.17	252.51	-112.67	1605582.9	3578204.9	276.50	276.50	335.95	0.00
4500.29	6.00	335.95	4485.62	262.05	-116.93	1605592.5	3578200.7	286.95	286.95	335.95	0.00
4600.29	6.00	335.95	4585.07	271.60	-121.18	1605602.0	3578196.4	297.41	297.41	335.95	0.00
4629.38	6.00	335.95	4614.00	274.37	-122.42	1605604.8	3578195.2	300.45	300.45	335.95	0.00
"D" Sand											
4729.38	6.00	335.95	4713.45	283.92	-126.68	1605614.3	3578190.9	310.90	310.90	335.95	0.00
4766.89	6.00	335.95	4750.75	287.50	-128.28	1605617.9	3578189.3	314.82	314.82	335.95	0.00
Start Drop											
4796.89	5.55	335.95	4780.60	290.26	-129.51	1605620.7	3578188.1	317.84	317.84	335.95	1.50
4826.89	5.10	335.95	4810.47	292.80	-130.64	1605623.2	3578187.0	320.62	320.62	335.95	1.50
4856.89	4.65	335.95	4840.36	295.13	-131.68	1605625.5	3578185.9	323.17	323.17	335.95	1.50
4886.89	4.20	335.95	4870.27	297.24	-132.63	1605627.6	3578185.0	325.49	325.49	335.95	1.50
4916.89	3.75	335.95	4900.20	299.14	-133.47	1605629.5	3578184.1	327.57	327.57	335.95	1.50

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				North(-South) Feet	East(-West) Feet	Y Feet	X Feet		Distance Feet	Direction Deg	
4946.89	3.30	335.95	4930.15	300.83	-134.23	1605631.2	3578183.4	329.41	329.41	335.95	1.50
4976.89	2.85	335.95	4960.10	302.29	-134.88	1605632.7	3578182.7	331.02	331.02	335.95	1.50
5006.89	2.40	335.95	4990.07	303.55	-135.44	1605633.9	3578182.2	332.40	332.40	335.95	1.50
5036.89	1.95	335.95	5020.05	304.59	-135.91	1605635.0	3578181.7	333.53	333.53	335.95	1.50
5066.89	1.50	335.95	5050.04	305.41	-136.27	1605635.8	3578181.3	334.44	334.44	335.95	1.50
5096.89	1.05	335.95	5080.03	306.02	-136.55	1605636.4	3578181.1	335.10	335.10	335.95	1.50
5126.89	0.60	335.95	5110.02	306.42	-136.72	1605636.8	3578180.9	335.54	335.54	335.95	1.50
5156.89	0.15	335.95	5140.02	306.60	-136.80	1605637.0	3578180.8	335.73	335.73	335.95	1.50
5166.86	0.00	335.95	5150.00	306.61	-136.81	1605637.0	3578180.8	335.75	335.75	335.95	1.50
Vertical 6238.87 Pennsylvanian	0.00	335.95	6222.00	306.61	-136.81	1605637.0	3578180.8	335.75	335.75	335.95	0.00
6999.87 LKC	0.00	335.95	6983.00	306.61	-136.81	1605637.0	3578180.8	335.75	335.75	335.95	0.00
7324.87 Marmaton	0.00	335.95	7308.00	306.61	-136.81	1605637.0	3578180.8	335.75	335.75	335.95	0.00
7524.87 Cherokee	0.00	335.95	7508.00	306.61	-136.81	1605637.0	3578180.8	335.75	335.75	335.95	0.00
8144.87 Spergen	0.00	335.95	8128.00	306.61	-136.81	1605637.0	3578180.8	335.75	335.75	335.95	0.00
9016.86 TD	0.00	335.95	9000.00	306.61	-136.81	1605637.0	3578180.8	335.75	335.75	335.95	0.00

Final Station Closure Distance: 335.75' Direction: 335.95°

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Horizontal Plan

1" = 100'



Vertical Target Objective

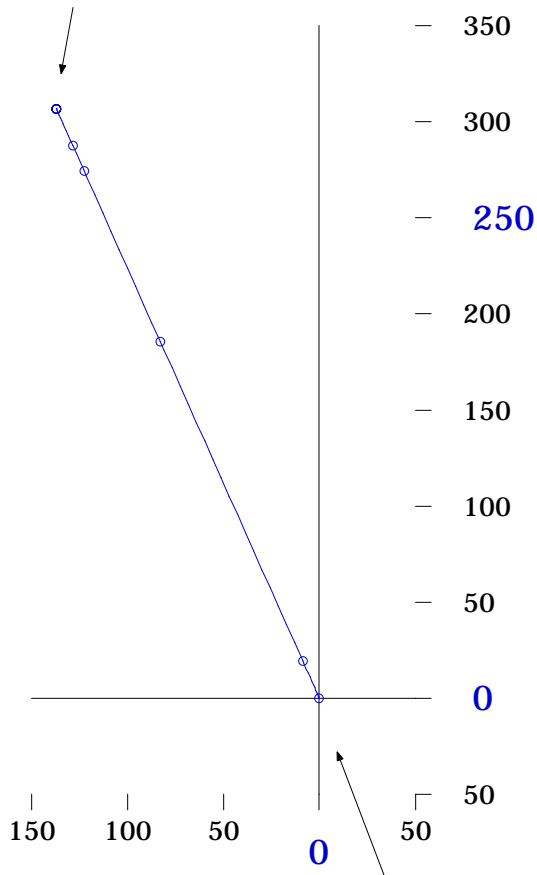
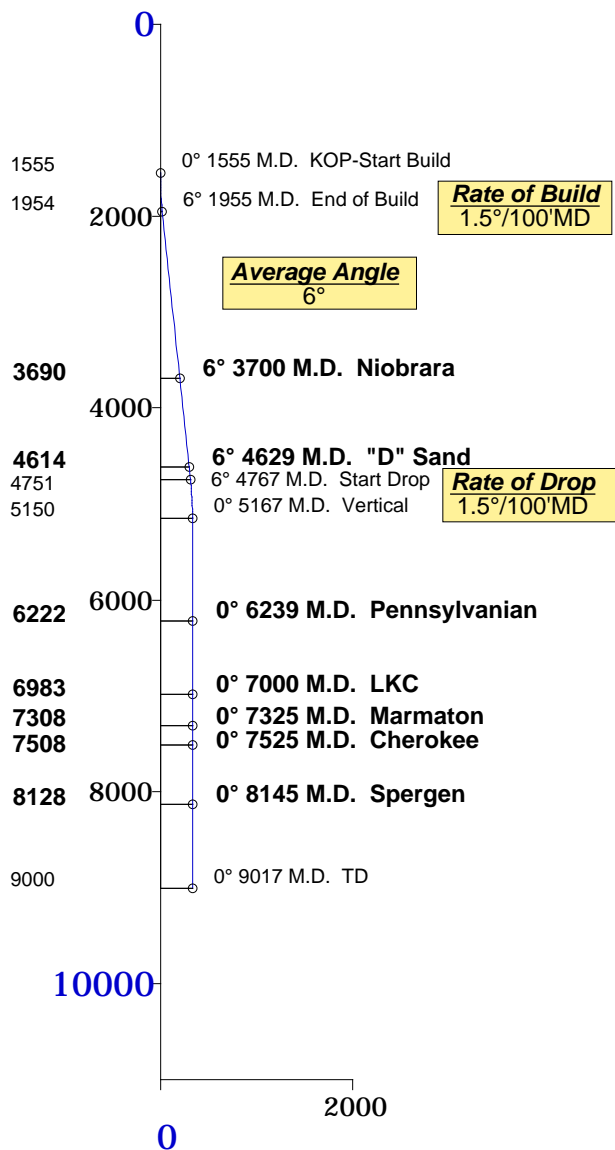
335.75' Displacement from S/L
@ 335.95° Azimuth from S/L
North-306.61' East-136.81' of S/L
TVD-5150' MD-5167'
Y=1605637', X=3578181'

Plane of Proposal

335.95° Azimuth

Vertical Section

1" = 2000'



Surface Location

Y=1605330.4'
X=3578317.6'
NAD 83
312' FSL, 737' FWL



Denver, Colorado
303-463-1919

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