

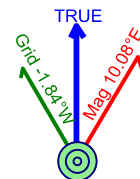


**Job Number:** 15xxxB  
**Company:** Black Hills Plateau Production  
**Lease/Well:** Winter Flats 10-31-99BH  
**Location:** Mesa County, CO  
**Rig Name:**  
**State/Country:** CO/ Mesa  
**Country:** USA

**Elev. GL:** 6094.00 ft **RKB:** 24.00 ft  
**System:** US State Plane 1983  
**Group:** Colorado Central Zone  
**Datum:** GRS80  
**Mag. Decl.:** 10.08° (C:\HawkEye\IGRF2015.MIF)  
**Grid Conv.:** -1.84417 W  
**Date:** Thursday, July 09, 2015

### NOVA Directional Inc. Survey Report

Calculated by HawkEye Software  
Minimum Curvature Method  
Vertical Section Plane 142.00°  
Northing (US ft): 1544539.91 Easting (US ft): 2172579.19  
Latitude: 39°17'30.9894" N Longitude: -108°25'26.6201" W  
Well Location: Section 10, T9S, R99W, Sixth Principal Meridian, Mesa County, CO  
Direction Reference: True North



Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS °/100 Ft	Latitude Dec. Deg	Longitude Dec. Deg
<b>Surface</b>									
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.2919415	-108.4240611
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	39.2919415	-108.4240611
<b>Casing 10 3/4 "</b>									
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	39.2919415	-108.4240611
<b>Tangent - Build @ 2.00°/ 100 Ft</b>									
1500.00	0.00	264.46	1500.00	0.00	0.00	0.00	0.00	39.2919415	-108.4240611
1560.00	1.20	264.46	1560.00	-0.06	-0.63	-0.34	2.00	39.2919413	-108.4240633
1620.00	2.40	264.46	1619.96	-0.24	-2.50	-1.35	2.00	39.2919408	-108.4240700
1680.00	3.60	264.46	1679.88	-0.55	-5.63	-3.03	2.00	39.2919400	-108.4240810
1740.00	4.80	264.46	1739.72	-0.97	-10.00	-5.39	2.00	39.2919388	-108.4240965
1800.00	6.00	264.46	1799.45	-1.51	-15.62	-8.42	2.00	39.2919374	-108.4241163
<b>Cameo</b>									
1857.93	7.16	264.46	1857.00	-2.15	-22.23	-11.99	2.00	39.2919356	-108.4241397
1860.00	7.20	264.46	1859.05	-2.18	-22.48	-12.13	2.00	39.2919355	-108.4241406
1920.00	8.40	264.46	1918.50	-2.96	-30.59	-16.50	2.00	39.2919334	-108.4241692
1980.00	9.60	264.46	1977.76	-3.87	-39.93	-21.53	2.00	39.2919309	-108.4242022
2040.00	10.80	264.46	2036.81	-4.89	-50.51	-27.24	2.00	39.2919281	-108.4242396
2100.00	12.00	264.46	2095.62	-6.04	-62.31	-33.60	2.00	39.2919249	-108.4242813
2160.00	13.20	264.46	2154.18	-7.30	-75.34	-40.63	2.00	39.2919215	-108.4243273
2220.00	14.40	264.46	2212.44	-8.68	-89.58	-48.31	2.00	39.2919177	-108.4243777
<b>Rollins</b>									
2273.36	15.47	264.46	2264.00	-10.01	-103.27	-55.69	2.00	39.2919140	-108.4244260
2280.00	15.60	264.46	2270.40	-10.18	-105.04	-56.65	2.00	39.2919136	-108.4244323
2340.00	16.80	264.46	2328.02	-11.79	-121.70	-65.63	2.00	39.2919091	-108.4244911
2400.00	18.00	264.46	2385.27	-13.53	-139.56	-75.26	2.00	39.2919044	-108.4245542
<b>Begin Hold @ 18.04°, 264.46° Azm</b>									
2402.06	18.04	264.46	2387.23	-13.59	-140.19	-75.61	2.00	39.2919042	-108.4245565
<b>Cozzette</b>									
2427.06	18.04	264.46	2411.00	-14.33	-147.90	-79.76	0.00	39.2919022	-108.4245837
<b>Corcoran</b>									
2651.07	18.04	264.46	2624.00	-21.03	-216.95	-117.00	0.00	39.2918838	-108.4248277
<b>Mancos</b>									
2890.86	18.04	264.46	2852.00	-28.19	-290.87	-156.86	0.00	39.2918641	-108.4250889
2902.06	18.04	264.46	2862.64	-28.52	-294.32	-158.73	0.00	39.2918632	-108.4251011
<b>Mancos A</b>									
3297.88	18.04	264.46	3239.00	-40.35	-416.34	-224.53	0.00	39.2918307	-108.4255322
3402.06	18.04	264.46	3338.06	-43.46	-448.45	-241.85	0.00	39.2918222	-108.4256457
3902.06	18.04	264.46	3813.48	-58.40	-602.58	-324.97	0.00	39.2917812	-108.4261902
<b>MOAB</b>									
4005.67	18.04	264.46	3912.00	-61.49	-634.52	-342.19	0.00	39.2917727	-108.4263031
4402.06	18.04	264.46	4288.90	-73.33	-756.71	-408.09	0.00	39.2917401	-108.4267348

Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS °/100 Ft	Latitude Dec. Deg	Longitude Dec. Deg
<b>Mancos B</b>									
4442.13	18.04	264.46	4327.00	-74.53	-769.06	-414.75	0.00	39.2917368	-108.4267785
4902.06	18.04	264.46	4764.31	-88.27	-910.83	-491.21	0.00	39.2916991	-108.4272794
5402.06	18.04	264.46	5239.73	-103.21	-1064.96	-574.33	0.00	39.2916581	-108.4278240
<b>Niobrara</b>									
5479.12	18.04	264.46	5313.00	-105.51	-1088.72	-587.14	0.00	39.2916518	-108.4279079
<b>Casing 7 5/8 "</b>									
5530.00	18.04	264.46	5361.38	-107.03	-1104.40	-595.60	0.00	39.2916476	-108.4279633
<b>KOP - Build and Turn @ 8.00°/100 Ft</b>									
5591.13	18.04	264.46	5419.50	-108.86	-1123.24	-605.76	0.00	39.2916426	-108.4280299
5651.13	16.11	249.44	5476.88	-112.68	-1140.29	-613.24	8.00	39.2916321	-108.4280902
5711.13	15.44	231.89	5534.66	-120.53	-1154.38	-615.72	8.00	39.2916105	-108.4281399
5771.13	16.19	214.42	5592.42	-132.37	-1165.39	-613.18	8.00	39.2915780	-108.4281788
5831.13	18.19	199.59	5649.76	-148.10	-1173.27	-605.63	8.00	39.2915348	-108.4282067
5891.13	21.09	188.16	5706.29	-167.62	-1177.94	-593.13	8.00	39.2914812	-108.4282232
5951.13	24.56	179.59	5761.60	-190.78	-1179.38	-575.76	8.00	39.2914176	-108.4282283
6011.13	28.40	173.12	5815.30	-217.44	-1177.59	-553.65	8.00	39.2913444	-108.4282219
6071.13	32.48	168.12	5867.03	-247.39	-1172.56	-526.95	8.00	39.2912622	-108.4282041
6131.13	36.72	164.15	5916.41	-280.43	-1164.34	-495.85	8.00	39.2911715	-108.4281751
6191.13	41.07	160.90	5963.10	-316.33	-1152.98	-460.57	8.00	39.2910729	-108.4281350
6251.13	45.49	158.17	6006.78	-354.84	-1138.57	-421.36	8.00	39.2909672	-108.4280840
6311.13	49.97	155.84	6047.13	-395.68	-1121.20	-378.48	8.00	39.2908551	-108.4280227
6371.13	54.49	153.79	6083.87	-438.57	-1101.00	-332.24	8.00	39.2907373	-108.4279513
6431.13	59.04	151.96	6116.75	-483.21	-1078.11	-282.97	8.00	39.2906147	-108.4278704
6491.13	63.61	150.30	6145.53	-529.29	-1052.68	-231.01	8.00	39.2904882	-108.4277805
6551.13	68.20	148.76	6170.02	-576.48	-1024.90	-176.72	8.00	39.2903587	-108.4276824
6611.13	72.81	147.32	6190.04	-624.45	-994.97	-120.49	8.00	39.2902270	-108.4275766
6671.13	77.42	145.96	6205.45	-672.86	-963.09	-62.71	8.00	39.2900941	-108.4274640
6731.13	82.04	144.64	6216.14	-721.38	-929.48	-3.79	8.00	39.2899608	-108.4273452
6791.13	86.67	143.35	6222.04	-769.66	-894.38	55.87	8.00	39.2898283	-108.4272212
6851.13	91.29	142.07	6223.11	-817.37	-858.05	115.83	8.00	39.2896973	-108.4270928
<b>Target - Hold @ 91.62°,141.98° Azm</b>									
6855.28	91.62	141.98	6223.00	-820.65	-855.49	119.98	8.00	39.2896883	-108.4270838
7355.28	91.62	141.98	6208.91	-1214.38	-547.64	619.79	0.00	39.2886073	-108.4259960
7855.28	91.62	141.98	6194.82	-1608.11	-239.78	1119.59	0.00	39.2875263	-108.4249083
8355.28	91.62	141.98	6180.72	-2001.85	68.08	1619.39	0.00	39.2864453	-108.4238206
8855.28	91.62	141.98	6166.63	-2395.58	375.93	2119.19	0.00	39.2853642	-108.4227330
9355.28	91.62	141.98	6152.54	-2789.31	683.79	2618.99	0.00	39.2842832	-108.4216453
9855.28	91.62	141.98	6138.45	-3183.04	991.65	3118.79	0.00	39.2832021	-108.4205577
10355.28	91.62	141.98	6124.35	-3576.78	1299.50	3618.59	0.00	39.2821210	-108.4194702
10855.28	91.62	141.98	6110.26	-3970.51	1607.36	4118.40	0.00	39.2810400	-108.4183827
11355.28	91.62	141.98	6096.17	-4364.24	1915.22	4618.20	0.00	39.2799589	-108.4172952
11855.28	91.62	141.98	6082.08	-4757.98	2223.07	5118.00	0.00	39.2788778	-108.4162077
12355.28	91.62	141.98	6067.98	-5151.71	2530.93	5617.80	0.00	39.2777967	-108.4151203
12855.28	91.62	141.98	6053.89	-5545.44	2838.79	6117.60	0.00	39.2767155	-108.4140329
13355.28	91.62	141.98	6039.80	-5939.18	3146.64	6617.40	0.00	39.2756344	-108.4129456
13855.28	91.62	141.98	6025.71	-6332.91	3454.50	7117.20	0.00	39.2745533	-108.4118582
14355.28	91.62	141.98	6011.61	-6726.64	3762.36	7617.00	0.00	39.2734721	-108.4107709
14855.28	91.62	141.98	5997.52	-7120.37	4070.21	8116.81	0.00	39.2723909	-108.4096837
15355.28	91.62	141.98	5983.43	-7514.11	4378.07	8616.61	0.00	39.2713098	-108.4085965
15855.28	91.62	141.98	5969.34	-7907.84	4685.93	9116.41	0.00	39.2702286	-108.4075093
16355.28	91.62	141.98	5955.24	-8301.57	4993.78	9616.21	0.00	39.2691474	-108.4064221
16855.28	91.62	141.98	5941.15	-8695.31	5301.64	10116.01	0.00	39.2680662	-108.4053350
<b>BH - Proposed End of Lateral</b>									
16967.19	91.62	141.98	5938.00	-8783.43	5370.55	10227.88	0.00	39.2678242	-108.4050917



Job ID : 15xxxB  
Company : Black Hills Plateau Production  
Lease/Well : Winter Flats 10-31-99BH  
Location : Mesa County, CO  
Rig Name :

Elevation (To MSL) : 6094 ft  
RKB : 24 ft  
North Reference : True North  
Latitude : 39°17'30.9894" N  
Longitude : -108°25'26.6201" W



CRITICAL POINTS - WINTER FLATS 10-31-99BH PLAN 7-09-15											
MD	Inc	Azm	TVD	EW	NS	VS	CI	Cldir	DLS		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1500.00	0.00	264.46	1500.00	0.00	0.00	0.00	0.00	0.00	0.00		
2402.06	18.04	264.46	2387.23	-140.19	-13.59	-75.61	140.85	264.46	2.00		
5591.13	18.04	264.46	5419.50	-1123.24	-108.86	-605.76	1128.51	264.46	0.00		
6855.28	91.62	141.98	6223.00	-855.49	-820.65	119.98	1185.46	226.19	8.00		
16967.19	91.62	141.98	5938.00	5370.55	-8783.43	10227.88	10295.21	148.56	0.00		

CURVES LEGEND :

Winter Flats 10-31-99AH plan 5-20-15

Winter Flats 10-31-99BH plan 7-09-15

Winter Flats 10-31-99CH plan 5-20-15

Winter Flats 10-31-99DH plan 5-20-15

WF 10-43-99 Survey