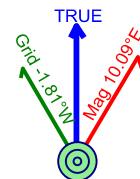




**Job Number:** 15091  
**Company:** Black Hills Plateau Production LLC  
**Lease/Well:** Homer Deep Unit 7-23BH  
**Location:** Garfield County, CO  
**Rig Name:** Ensign 161  
**State/Country:** CO/ Garfield  
**Country:** USA  
**Elev. GL:** 5674.00 ft  
**RKB:** 25.00 ft  
**System:** US State Plane 1983  
**Group:** Colorado Central Zone  
**Datum:** GRS80  
**Mag. Decl.:** 10.09° (C:\HawkEye\IGRF2015.MIF)  
**Grid Conv.:** -1.80985 W  
**Date:** Wednesday, April 08, 2015

### NOVA Directional Inc. Survey Report

Calculated by HawkEye Software  
 Minimum Curvature Method  
 Vertical Section Plane 147.70°  
 Northing (US ft): 1573219.00 Easting (US ft): 2188895.28  
 Latitude: 39°22'19.4520" N Longitude: -108°22'10.7040" W  
 Well Location: 1868.0 FSL, 2451.0 FWL, Section 7, T8S, R98W, Sixth Principal Meridian, Garfield 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 Casing tie-in</b>									
1006.00	2.70	215.30	1005.74	-13.34	-7.30	7.38	0.00	39.3720334	-108.3696658
<b>Tangent - Build @ 2.00°/100 Ft</b>									
1106.00	2.70	215.30	1105.63	-17.18	-10.02	9.17	0.00	39.3720228	-108.3696755
1136.00	3.29	217.14	1135.59	-18.45	-10.95	9.74	2.00	39.3720194	-108.3696787
1166.00	3.89	218.42	1165.53	-19.93	-12.10	10.38	2.00	39.3720153	-108.3696828
1196.00	4.48	219.36	1195.45	-21.63	-13.48	11.09	2.00	39.3720106	-108.3696877
1226.00	5.08	220.08	1225.34	-23.56	-15.08	11.86	2.00	39.3720053	-108.3696933
1256.00	5.68	220.64	1255.21	-25.70	-16.90	12.69	2.00	39.3719994	-108.3696998
1286.00	6.28	221.10	1285.05	-28.06	-18.94	13.60	2.00	39.3719930	-108.3697070
1316.00	6.87	221.48	1314.85	-30.64	-21.21	14.57	2.00	39.3719859	-108.3697150
1346.00	7.47	221.80	1344.62	-33.44	-23.70	15.60	2.00	39.3719782	-108.3697238
1376.00	8.07	222.08	1374.34	-36.46	-26.41	16.70	2.00	39.3719699	-108.3697334
1406.00	8.67	222.31	1404.02	-39.69	-29.35	17.87	2.00	39.3719610	-108.3697438
1436.00	9.27	222.52	1433.65	-43.15	-32.50	19.11	2.00	39.3719515	-108.3697550
<b>Begin Hold @ 9.35°/222.54° Azm</b>									
1439.81	9.35	222.54	1437.41	-43.60	-32.92	19.27	2.00	39.3719503	-108.3697564
2439.81	9.35	222.54	2424.14	-163.26	-142.71	61.74	0.00	39.3716218	-108.3701448
3439.81	9.35	222.54	3410.86	-282.91	-252.51	104.21	0.00	39.3712932	-108.3705332
4439.81	9.35	222.54	4397.59	-402.57	-362.30	146.68	0.00	39.3709647	-108.3709216
5439.81	9.35	222.54	5384.31	-522.23	-472.10	189.15	0.00	39.3706362	-108.3713099
<b>KOP - Build and Turn @ 8.00°/100 Ft</b>									
6263.29	9.35	222.54	6196.87	-620.76	-562.51	224.13	0.00	39.3703657	-108.3716298
6293.29	10.23	209.38	6226.43	-624.88	-565.47	226.03	8.00	39.3703544	-108.3716402
6323.29	11.55	198.74	6255.89	-630.05	-567.74	229.18	8.00	39.3703402	-108.3716483
6353.29	13.18	190.47	6285.20	-636.26	-569.33	233.58	8.00	39.3703231	-108.3716539
6383.29	15.01	184.08	6314.30	-643.49	-570.23	239.22	8.00	39.3703032	-108.3716570
6413.29	16.98	179.10	6343.14	-651.75	-570.43	246.09	8.00	39.3702806	-108.3716578
6443.29	19.05	175.15	6371.67	-661.01	-569.95	254.17	8.00	39.3702552	-108.3716561
6473.29	21.18	171.95	6399.84	-671.25	-568.78	263.46	8.00	39.3702270	-108.3716519
6503.29	23.37	169.33	6427.60	-682.47	-566.92	273.93	8.00	39.3701962	-108.3716453
6533.29	25.59	167.13	6454.90	-694.63	-564.37	285.57	8.00	39.3701628	-108.3716363
6563.29	27.84	165.26	6481.70	-707.72	-561.14	298.36	8.00	39.3701269	-108.3716249
6593.29	30.11	163.65	6507.94	-721.72	-557.24	312.27	8.00	39.3700885	-108.3716111
6623.29	32.39	162.25	6533.59	-736.59	-552.68	327.29	8.00	39.3700476	-108.3715950
6653.29	34.69	161.02	6558.59	-752.32	-547.45	343.38	8.00	39.3700045	-108.3715765
6683.29	37.01	159.92	6582.90	-768.88	-541.57	360.51	8.00	39.3699590	-108.3715557
6713.29	39.33	158.93	6606.49	-786.23	-535.06	378.66	8.00	39.3699114	-108.3715326
6743.29	41.66	158.04	6629.30	-804.35	-527.91	397.80	8.00	39.3698616	-108.3715073
6773.29	43.99	157.23	6651.30	-823.21	-520.15	417.88	8.00	39.3698098	-108.3714799
6803.29	46.33	156.48	6672.46	-842.76	-511.78	438.89	8.00	39.3697561	-108.3714503
6833.29	48.68	155.78	6692.72	-862.99	-502.83	460.76	8.00	39.3697006	-108.3714186
6863.29	51.03	155.14	6712.06	-883.85	-493.30	483.48	8.00	39.3696433	-108.3713849

Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS °/100 Ft	Latitude Dec. Deg	Longitude Dec. Deg
6893.29	53.38	154.54	6730.45	-905.30	-483.22	507.00	8.00	39.3695844	-108.3713493
6923.29	55.73	153.97	6747.84	-927.31	-472.61	531.28	8.00	39.3695240	-108.3713117
6953.29	58.09	153.43	6764.22	-949.84	-461.47	556.28	8.00	39.3694622	-108.3712723
6983.29	60.45	152.92	6779.55	-972.86	-449.83	581.95	8.00	39.3693990	-108.3712312
7013.29	62.81	152.44	6793.80	-996.31	-437.72	608.24	8.00	39.3693346	-108.3711883
7043.29	65.18	151.97	6806.95	-1020.16	-425.14	635.12	8.00	39.3692691	-108.3711438
7073.29	67.54	151.52	6818.98	-1044.36	-412.13	662.53	8.00	39.3692027	-108.3710978
7103.29	69.91	151.09	6829.87	-1068.88	-398.71	690.43	8.00	39.3691353	-108.3710503
7133.29	72.27	150.67	6839.59	-1093.67	-384.90	718.77	8.00	39.3690673	-108.3710015
7163.29	74.64	150.26	6848.13	-1118.69	-370.72	747.49	8.00	39.3689986	-108.3709513
7193.29	77.01	149.86	6855.48	-1143.89	-356.21	776.55	8.00	39.3689294	-108.3709000
7223.29	79.38	149.46	6861.62	-1169.23	-341.37	805.89	8.00	39.3688598	-108.3708475
7253.29	81.75	149.08	6866.54	-1194.67	-326.25	835.47	8.00	39.3687900	-108.3707940
7283.29	84.12	148.70	6870.23	-1220.16	-310.87	865.24	8.00	39.3687200	-108.3707396
7313.29	86.49	148.32	6872.68	-1245.65	-295.25	895.13	8.00	39.3686500	-108.3706844
7343.29	88.86	147.94	6873.90	-1271.10	-279.42	925.10	8.00	39.3685801	-108.3706284
<b>Target - Hold @ 90.65°,147.65° Azm</b>									
7366.03	90.65	147.65	6874.00	-1290.35	-267.31	947.85	8.00	39.3685273	-108.3705855
8366.03	90.65	147.65	6862.58	-2135.12	267.69	1947.78	0.00	39.3662079	-108.3686932
9366.03	90.65	147.65	6851.16	-2979.90	802.69	2947.71	0.00	39.3638885	-108.3668009
10366.03	90.65	147.65	6839.73	-3824.68	1337.69	3947.65	0.00	39.3615691	-108.3649088
11366.03	90.65	147.65	6828.31	-4669.45	1872.69	4947.58	0.00	39.3592496	-108.3630169
12366.03	90.65	147.65	6816.89	-5514.23	2407.69	5947.52	0.00	39.3569301	-108.3611250
13366.03	90.65	147.65	6805.47	-6359.00	2942.68	6947.45	0.00	39.3546106	-108.3592333
14366.03	90.65	147.65	6794.05	-7203.78	3477.68	7947.39	0.00	39.3522911	-108.3573417
15366.03	90.65	147.65	6782.63	-8048.56	4012.68	8947.32	0.00	39.3499715	-108.3554502
16366.03	90.65	147.65	6771.21	-8893.33	4547.68	9947.26	0.00	39.3476518	-108.3535588
17366.03	90.65	147.65	6759.78	-9738.11	5082.68	10947.19	0.00	39.3453322	-108.3516676
<b>BH - Proposed End of Lateral</b>									
17434.88	90.65	147.65	6759.00	-9796.27	5119.51	11016.04	0.00	39.3451725	-108.3515374