

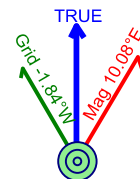


Job Number: 15xxxA
Company: Black Hills Plateau Production
Lease/Well: Winter Flats 10-31-99AH
Location: Mesa County, CO
Rig Name:
State/County: CO/ Mesa
Country: USA




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.: -1.84423 W
Date: Wednesday, May 20, 2015

NOVA Directional Inc. Survey Report

Calculated by HawkEye Software
Minimum Curvature Method
Vertical Section Plane 146.00°
Northing (US ft): 1544545.03 Easting (US ft): 2172554.73
Latitude: 39°17'31.0322" N Longitude: -108°25'26.9332" W
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
Surface									
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.2919534	-108.4241481
Casing 10 3/4 "									
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	39.2919534	-108.4241481
KOP-Begin Build @ 2.50°/ 100 Ft									
1100.00	0.00	266.12	1100.00	0.00	0.00	0.00	0.00	39.2919534	-108.4241481
1160.00	1.50	266.12	1159.99	-0.05	-0.78	-0.39	2.50	39.2919533	-108.4241509
1220.00	3.00	266.12	1219.95	-0.21	-3.13	-1.58	2.50	39.2919528	-108.4241592
1280.00	4.50	266.12	1279.82	-0.48	-7.05	-3.55	2.50	39.2919521	-108.4241730
1340.00	6.00	266.12	1339.56	-0.85	-12.53	-6.30	2.50	39.2919511	-108.4241924
1400.00	7.50	266.12	1399.14	-1.33	-19.56	-9.84	2.50	39.2919498	-108.4242172
1460.00	9.00	266.12	1458.52	-1.91	-28.15	-14.16	2.50	39.2919482	-108.4242476
1520.00	10.50	266.12	1517.65	-2.60	-38.29	-19.26	2.50	39.2919463	-108.4242834
1580.00	12.00	266.12	1576.50	-3.39	-49.97	-25.13	2.50	39.2919441	-108.4243247
1640.00	13.50	266.12	1635.02	-4.29	-63.18	-31.78	2.50	39.2919416	-108.4243713
1700.00	15.00	266.12	1693.17	-5.29	-77.91	-39.19	2.50	39.2919389	-108.4244234
1760.00	16.50	266.12	1750.92	-6.39	-94.16	-47.36	2.50	39.2919359	-108.4244808
Cameo									
1776.79	16.92	266.12	1767.00	-6.71	-98.98	-49.78	2.50	39.2919350	-108.4244978
1820.00	18.00	266.12	1808.21	-7.59	-111.91	-56.29	2.50	39.2919326	-108.4245435
1880.00	19.50	266.12	1865.03	-8.90	-131.15	-65.96	2.50	39.2919290	-108.4246115
1940.00	21.00	266.12	1921.32	-10.30	-151.87	-76.39	2.50	39.2919251	-108.4246847
2000.00	22.50	266.12	1977.05	-11.81	-174.06	-87.54	2.50	39.2919210	-108.4247631
2060.00	24.00	266.12	2032.17	-13.41	-197.68	-99.43	2.50	39.2919166	-108.4248466
2120.00	25.50	266.12	2086.66	-15.11	-222.75	-112.03	2.50	39.2919119	-108.4249351
2180.00	27.00	266.12	2140.47	-16.91	-249.22	-125.35	2.50	39.2919070	-108.4250287
Rollins									
2221.19	28.03	266.12	2177.00	-18.19	-268.21	-134.90	2.50	39.2919034	-108.4250958
Hold @ 28.35°,266.12° Azm									
2233.99	28.35	266.12	2188.28	-18.60	-274.24	-137.93	2.50	39.2919023	-108.4251171
Cozzette									
2392.75	28.35	266.12	2328.00	-23.71	-349.46	-175.76	0.00	39.2918883	-108.4253829
Corcoran									
2638.19	28.35	266.12	2544.00	-31.59	-465.74	-234.24	0.00	39.2918666	-108.4257937
Mancos									
2897.26	28.35	266.12	2772.00	-39.92	-588.47	-295.98	0.00	39.2918438	-108.4262274
3233.99	28.35	266.12	3068.35	-50.74	-748.01	-376.21	0.00	39.2918141	-108.4267911
Mancos A									
3341.54	28.35	266.12	3163.00	-54.20	-798.96	-401.84	0.00	39.2918046	-108.4269711
MOAB									
4109.67	28.35	266.12	3839.00	-78.88	-1162.87	-584.87	0.00	39.2917367	-108.4282569
4233.99	28.35	266.12	3948.41	-82.88	-1221.77	-614.49	0.00	39.2917258	-108.4284650

Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS °/100 Ft	Latitude Dec. Deg	Longitude Dec. Deg
 Mancos B									
4584.64	28.35	266.12	4257.00	-94.15	-1387.89	-698.05	0.00	39.2916948	-108.4290520
5233.99	28.35	266.12	4828.48	-115.02	-1695.54	-852.78	0.00	39.2916375	-108.4301390
 Niobrara									
5815.22	28.35	266.12	5340.00	-133.70	-1970.90	-991.27	0.00	39.2915861	-108.4311119
 Casing 7 5/8 "									
5865.00	28.35	266.12	5383.81	-135.30	-1994.48	-1003.13	0.00	39.2915817	-108.4311953
KOP - Build and Turn @ 8.50°/100 Ft									
5903.05	28.35	266.12	5417.30	-136.52	-2012.51	-1012.20	0.00	39.2915784	-108.4312590
5963.05	26.47	255.81	5470.59	-140.77	-2039.71	-1023.89	8.50	39.2915667	-108.4313550
6023.05	25.41	244.38	5524.58	-149.62	-2064.29	-1030.30	8.50	39.2915424	-108.4314419
6083.05	25.29	232.46	5578.84	-163.00	-2086.08	-1031.38	8.50	39.2915056	-108.4315189
6143.05	26.12	220.84	5632.93	-180.82	-2104.89	-1027.13	8.50	39.2914567	-108.4315853
6203.05	27.81	210.21	5686.44	-202.92	-2120.58	-1017.58	8.50	39.2913960	-108.4316408
6263.05	30.22	200.92	5738.93	-229.13	-2133.02	-1002.81	8.50	39.2913240	-108.4316847
6323.05	33.18	193.02	5790.00	-259.25	-2142.11	-982.92	8.50	39.2912413	-108.4317168
6383.05	36.58	186.35	5839.23	-293.04	-2147.79	-958.09	8.50	39.2911486	-108.4317369
6443.05	40.28	180.70	5886.24	-330.23	-2150.01	-928.50	8.50	39.2910465	-108.4317447
6503.05	44.22	175.88	5930.65	-370.52	-2148.74	-894.39	8.50	39.2909359	-108.4317402
6563.05	48.34	171.72	5972.12	-413.60	-2144.01	-856.03	8.50	39.2908176	-108.4317235
6623.05	52.59	168.06	6010.31	-459.12	-2135.84	-813.72	8.50	39.2906926	-108.4316946
6683.05	56.94	164.79	6044.93	-506.73	-2124.31	-767.80	8.50	39.2905619	-108.4316539
6743.05	61.37	161.84	6075.69	-556.04	-2109.50	-718.64	8.50	39.2904265	-108.4316015
6803.05	65.85	159.13	6102.36	-606.67	-2091.53	-666.61	8.50	39.2902875	-108.4315380
6863.05	70.38	156.60	6124.72	-658.22	-2070.54	-612.14	8.50	39.2901460	-108.4314638
6923.05	74.94	154.22	6142.60	-710.28	-2046.70	-555.66	8.50	39.2900031	-108.4313796
6983.05	79.53	151.93	6155.85	-762.43	-2020.20	-497.60	8.50	39.2898599	-108.4312860
7043.05	84.13	149.71	6164.37	-814.26	-1991.25	-438.44	8.50	39.2897176	-108.4311837
7103.05	88.74	147.53	6168.10	-865.37	-1960.08	-378.64	8.50	39.2895773	-108.4310735
Target - Hold @ 91.57°,146.20° Azm									
7139.79	91.57	146.20	6168.00	-896.12	-1940.00	-341.92	8.50	39.2894928	-108.4310025
8139.79	91.57	146.20	6140.62	-1726.77	-1383.87	657.70	0.00	39.2872123	-108.4290375
9139.79	91.57	146.20	6113.23	-2557.41	-827.74	1657.32	0.00	39.2849318	-108.4270725
10139.79	91.57	146.20	6085.85	-3388.06	-271.62	2656.94	0.00	39.2826512	-108.4251077
11139.79	91.57	146.20	6058.46	-4218.70	284.51	3656.56	0.00	39.2803706	-108.4231430
12139.79	91.57	146.20	6031.08	-5049.35	840.64	4656.18	0.00	39.2780899	-108.4211784
13139.79	91.57	146.20	6003.70	-5879.99	1396.77	5655.80	0.00	39.2758092	-108.4192140
14139.79	91.57	146.20	5976.31	-6710.64	1952.90	6655.42	0.00	39.2735285	-108.4172497
15139.79	91.57	146.20	5948.93	-7541.28	2509.03	7655.04	0.00	39.2712477	-108.4152855
16139.79	91.57	146.20	5921.54	-8371.93	3065.15	8654.65	0.00	39.2689669	-108.4133214
AH - Proposed End of Lateral									
16634.41	91.57	146.20	5908.00	-8782.78	3340.23	9149.09	0.00	39.2678388	-108.4123500



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

Elevation (To MSL) : 6094 ft
RKB : 24 ft
North Reference : True North
Latitude : 39°17'31.0323" N
Longitude : -108°25'26.9332" W



CRITICAL POINTS - WINTER FLATS 10-31-99AH PLAN 5-20-15											
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		
1100.00	0.00	266.12	1100.00	0.00	0.00	0.00	0.00	0.00	0.00		
2233.99	28.35	266.12	2188.28	-274.24	-18.60	-137.93	274.87	266.12	2.50		
5903.05	28.35	266.12	5417.30	-2012.51	-136.52	-1012.20	2017.14	266.12	0.00		
7139.79	91.57	146.20	6168.00	-1940.00	-896.12	-341.92	2136.97	245.21	8.50		
16634.41	91.57	146.20	5908.00	3340.23	-8782.78	9149.09	9396.51	159.18	0.00		

CURVES LEGEND:			
—	Winter Flats 10-31-99AH plan 5-20-15		
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