



# Precision

## Survey Report

<b>Client</b>	Bighorn Directional	<b>MWD Operator</b>	D. Rask/A. Skoog
<b>Well Name</b>	Pappenheim 6-62-23-0263BH	<b>Rig Name</b>	Nabors M-37
<b>Location</b>	Weld County, Colorado	<b>End Date</b>	8/7/2013
<b>Start Date</b>	8/1/2013	<b>Proposed Direction</b>	188.43

<b>SUR NUM</b>	<b>MD ft</b>	<b>INC °</b>	<b>AZM °</b>	<b>TVD ft</b>	<b>N-S ft</b>	<b>E-W ft</b>	<b>SECT ft</b>	<b>DLS °/100'</b>
<b>TIE IN</b>	740	0.14	175.88	739.99	0.21	2.12	-0.52	0.6
1	882	0.4	312.2	881.99	0.37	1.77	-0.62	0.4
2	975	2.8	304.0	974.95	1.86	-0.36	-1.79	2.6
3	1067	5.0	300.6	1066.73	5.16	-5.67	-4.27	2.4
4	1160	7.2	296.1	1159.20	9.78	-14.40	-7.57	2.4
5	1252	10.0	294.3	1250.15	15.61	-26.86	-11.50	3.1
6	1344	10.1	289.4	1340.74	21.58	-41.75	-15.22	0.9
7	1436	8.8	284.6	1431.49	26.03	-56.17	-17.51	1.7
8	1532	10.3	275.3	1526.17	28.67	-71.82	-17.83	2.2
9	1627	9.8	270.1	1619.71	29.47	-88.36	-16.20	1.1
10	1723	9.6	266.4	1714.34	28.98	-104.52	-13.35	0.7
11	1819	10.0	271.5	1808.94	28.70	-120.84	-10.67	1.0
12	1914	10.8	277.3	1902.38	30.05	-137.92	-9.50	1.4
13	2009	10.3	275.7	1995.77	32.02	-155.20	-8.92	0.6
14	2105	10.8	281.8	2090.15	34.71	-172.54	-9.04	1.3
15	2201	10.7	281.1	2184.47	38.27	-190.09	-9.99	0.2
16	2297	10.1	279.2	2278.89	41.33	-207.15	-10.51	0.7
17	2393	9.9	277.3	2373.43	43.72	-223.64	-10.46	0.4
18	2489	10.8	283.2	2467.87	46.83	-240.58	-11.05	1.4
19	2586	10.1	281.1	2563.26	50.54	-257.78	-12.20	0.8
20	2682	9.6	280.4	2657.85	53.60	-273.91	-12.87	0.5
21	2777	10.5	288.7	2751.40	57.81	-289.90	-14.68	1.8
22	2873	10.6	287.1	2845.77	63.21	-306.63	-17.58	0.3
23	2969	10.0	287.3	2940.23	68.29	-323.03	-20.19	0.6
24	3065	9.1	284.3	3034.89	72.64	-338.34	-22.25	1.1
25	3160	9.1	281.5	3128.70	75.99	-352.98	-23.42	0.5
26	3255	7.9	278.5	3222.65	78.46	-366.80	-23.83	1.3



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27	3349	9.1	276.0	3315.62	80.19	-380.58	-23.53	1.3
28	3445	11.3	282.0	3410.10	82.94	-397.34	-23.79	2.5
29	3540	11.6	283.1	3503.21	87.04	-415.74	-25.15	0.4
30	3637	11.7	282.9	3598.21	91.44	-434.83	-26.71	0.1
31	3733	12.1	281.5	3692.15	95.62	-454.18	-28.01	0.5
32	3828	11.4	278.8	3785.16	99.04	-473.21	-28.60	0.9
33	3924	11.1	276.6	3879.31	101.56	-491.77	-28.37	0.5
34	4020	11.0	278.7	3973.53	104.00	-510.00	-28.11	0.4
35	4117	10.6	284.1	4068.82	107.58	-527.80	-29.04	1.1
36	4212	9.6	281.8	4162.34	111.33	-544.03	-30.37	1.1
37	4307	9.1	280.8	4256.08	114.35	-559.17	-31.14	0.6
38	4401	8.4	289.7	4348.99	118.06	-572.93	-32.79	1.6
39	4497	7.8	286.4	4444.03	122.26	-585.78	-35.07	0.8
40	4592	7.6	286.2	4538.18	125.84	-598.00	-36.81	0.2
41	4688	7.3	283.4	4633.37	129.02	-610.03	-38.20	0.5
42	4784	8.5	289.2	4728.46	132.77	-622.66	-40.05	1.5
43	4879	8.3	287.1	4822.44	137.09	-635.85	-42.40	0.4
44	4974	7.4	284.8	4916.55	140.67	-648.32	-44.11	1.0
45	5070	5.9	285.5	5011.90	143.57	-659.05	-45.40	1.6
46	5167	5.0	282.2	5108.46	145.80	-667.98	-46.29	1.0
47	5264	4.0	274.8	5205.16	146.97	-675.49	-46.36	1.2
48	5360	3.5	274.6	5300.95	147.49	-681.75	-45.95	0.5
49	5455	1.4	285.2	5395.86	148.03	-685.76	-45.89	2.3
50	5551	1.1	278.3	5491.84	148.47	-687.80	-46.03	0.3
51	5648	1.0	275.0	5588.82	148.67	-689.56	-45.98	0.1
52	5744	1.0	278.8	5684.81	148.88	-691.23	-45.93	0.1
53	5775	1.2	229.1	5715.80	148.70	-691.74	-45.69	3.0



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54	5807	4.5	192.4	5747.76	147.26	-692.26	-44.18	11.3
55	5839	8.3	186.6	5779.56	143.74	-692.80	-40.62	12.0
56	5870	12.9	184.1	5810.02	138.06	-693.30	-34.93	14.9
57	5903	14.2	185.5	5842.10	130.36	-693.95	-27.21	4.1
58	5935	16.8	182.0	5872.93	121.83	-694.49	-18.70	8.6
59	5967	20.4	182.2	5903.26	111.63	-694.87	-8.55	11.3
60	5998	22.6	182.9	5932.10	100.28	-695.38	2.75	7.1
61	6030	25.1	182.7	5961.36	87.36	-696.01	15.62	7.8
62	6062	28.2	181.8	5989.96	73.02	-696.56	29.89	9.8
63	6094	29.8	179.2	6017.95	57.51	-696.69	45.25	6.4
64	6127	33.2	177.1	6046.08	40.28	-696.12	62.21	10.8
65	6159	36.8	176.4	6072.29	21.96	-695.07	80.18	11.3
66	6190	40.1	175.8	6096.57	2.73	-693.76	99.01	10.7
67	6222	42.3	177.2	6120.64	-18.31	-692.48	119.63	7.5
68	6254	45.2	178.3	6143.76	-40.42	-691.62	141.37	9.4
69	6287	45.8	177.8	6166.89	-63.94	-690.81	164.52	2.1
70	6319	47.9	178.3	6188.77	-87.27	-690.02	187.49	6.7
71	6351	53.0	179.2	6209.14	-111.93	-689.49	211.80	16.1
72	6383	57.2	180.2	6227.44	-138.17	-689.36	237.74	13.4
73	6415	60.5	179.2	6243.99	-165.55	-689.21	264.80	10.7
74	6447	63.5	179.2	6259.02	-193.80	-688.82	292.69	9.4
75	6479	64.0	179.2	6273.17	-222.50	-688.42	321.02	1.6
76	6511	66.1	179.2	6286.67	-251.51	-688.01	349.65	6.6
77	6543	70.8	180.1	6298.42	-281.26	-687.83	379.06	14.9
78	6574	75.2	180.6	6307.48	-310.90	-688.02	408.40	14.3
79	6606	79.3	181.1	6314.54	-342.10	-688.48	439.33	12.9
80	6638	84.5	180.6	6319.05	-373.76	-688.95	470.73	16.3
81	6670	86.2	179.7	6321.64	-405.66	-689.03	502.29	6.0
82	6703	86.6	179.0	6323.71	-438.59	-688.66	534.81	2.4
83	6756	87.1	178.7	6326.63	-491.50	-687.60	586.99	1.1
84	6783	87.8	178.8	6327.83	-518.47	-687.01	613.58	2.6
85	6814	88.1	178.8	6328.94	-549.44	-686.36	644.12	1.0
86	6906	87	179.2	6332.87	-641.34	-684.75	734.80	1.3



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87	6999	85.4	179	6339.03	-734.12	-683.30	826.36	1.7
88	7091	88	179.5	6344.33	-825.95	-682.10	917.02	2.9
89	7183	91.4	179.7	6344.81	-917.94	-681.45	1007.92	3.7
90	7278	91.5	179.2	6342.41	-1012.90	-680.54	1101.72	0.5
91	7373	92.0	179.5	6339.50	-1107.85	-679.46	1195.49	0.6
92	7468	91.5	179.4	6336.60	-1202.80	-678.55	1289.28	0.5
93	7563	91.0	176.4	6334.53	-1297.70	-675.07	1382.65	3.2
94	7658	91.4	179.5	6332.54	-1392.61	-671.68	1476.03	3.3
95	7754	90.3	180.1	6331.12	-1488.60	-671.34	1570.93	1.3
96	7849	91.3	179.9	6329.79	-1583.59	-671.34	1664.90	1.1
97	7945	91.7	178.3	6327.28	-1679.54	-669.83	1759.59	1.7
98	8040	91.2	179.4	6324.87	-1774.49	-667.93	1853.23	1.3
99	8136	89.3	179.7	6324.45	-1870.48	-667.17	1948.08	2.0
100	8232	90.3	179	6324.79	-1966.47	-666.08	2042.87	1.3
101	8329	91	178.1	6323.69	-2063.43	-663.63	2138.43	1.2
102	8425	92	177.6	6321.18	-2159.33	-660.03	2232.76	1.2
103	8521	91.4	177.1	6318.33	-2255.18	-655.59	2326.93	0.8
104	8616	90.0	178.1	6317.17	-2350.09	-651.62	2420.23	1.8
105	8712	90.7	178.3	6316.58	-2446.04	-648.60	2514.70	0.8
106	8808	90.3	179.0	6315.74	-2542.01	-646.34	2609.30	0.8
107	8902	90.2	180.2	6315.33	-2636.00	-645.68	2702.18	1.3
108	8998	90.0	179.2	6315.17	-2732.00	-645.18	2797.07	1.1
109	9095	90.2	177.9	6315.00	-2828.97	-642.73	2892.63	1.4
110	9190	91.6	177.4	6313.50	-2923.87	-638.83	2985.94	1.6
111	9287	91.3	176.7	6311.05	-3020.71	-633.84	3081.00	0.8
112	9383	90.6	177.6	6309.46	-3116.58	-629.07	3175.13	1.2
113	9480	88.9	178.8	6309.88	-3213.52	-626.02	3270.58	2.1
114	9575	90.2	179.0	6310.63	-3308.50	-624.20	3364.26	1.4
115	9671	90.9	178.1	6309.71	-3404.47	-621.77	3458.83	1.2
116	9766	90.5	179.4	6308.54	-3499.43	-619.70	3552.47	1.4
117	9861	90.3	179.9	6307.88	-3594.43	-619.12	3646.36	0.6
118	9957	92.4	179.7	6305.62	-3690.40	-618.78	3741.24	2.2
119	10052	90.7	180.6	6303.05	-3785.36	-619.03	3835.21	2.0



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120	10148	90.8	181.1	6301.79	-3881.34	-620.45	3930.36	0.5
121	10243	89.0	182.0	6301.96	-3976.30	-623.02	4024.67	2.1
122	10339	90.4	180.6	6302.46	-4072.27	-625.20	4119.92	2.1
123	10436	90.4	179.5	6301.78	-4169.26	-625.29	4215.88	1.1
124	10531	90.4	177.9	6301.12	-4264.23	-623.13	4309.51	1.7
125	10581	90.1	176.9	6300.90	-4314.18	-620.86	4358.59	2.1
PTB	10625	90.1	176.9	6300.83	-4358.12	-618.48	4401.70	0.0