

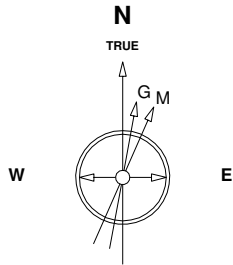
Great Western Operating Company, LLC

Location Colorado
Field Wattenburg
Installation Land

Slot Land JG 31-13D
Well Land JG 31-13D
Wellbore Land JG 31-13D (AWB)

Created by admin
Date plotted 14-Mar-2016

Plot reference is Land JG 31-13D (AWB).
Ref wellpath is Land JG 31-13D (AWP#1).
Coordinates are in Feet reference Land JG 31-13D.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Actual Datum #1
Rig Datum to Mean Sea Level: 4946.60 ft.
Plot North is aligned to TRUE North.

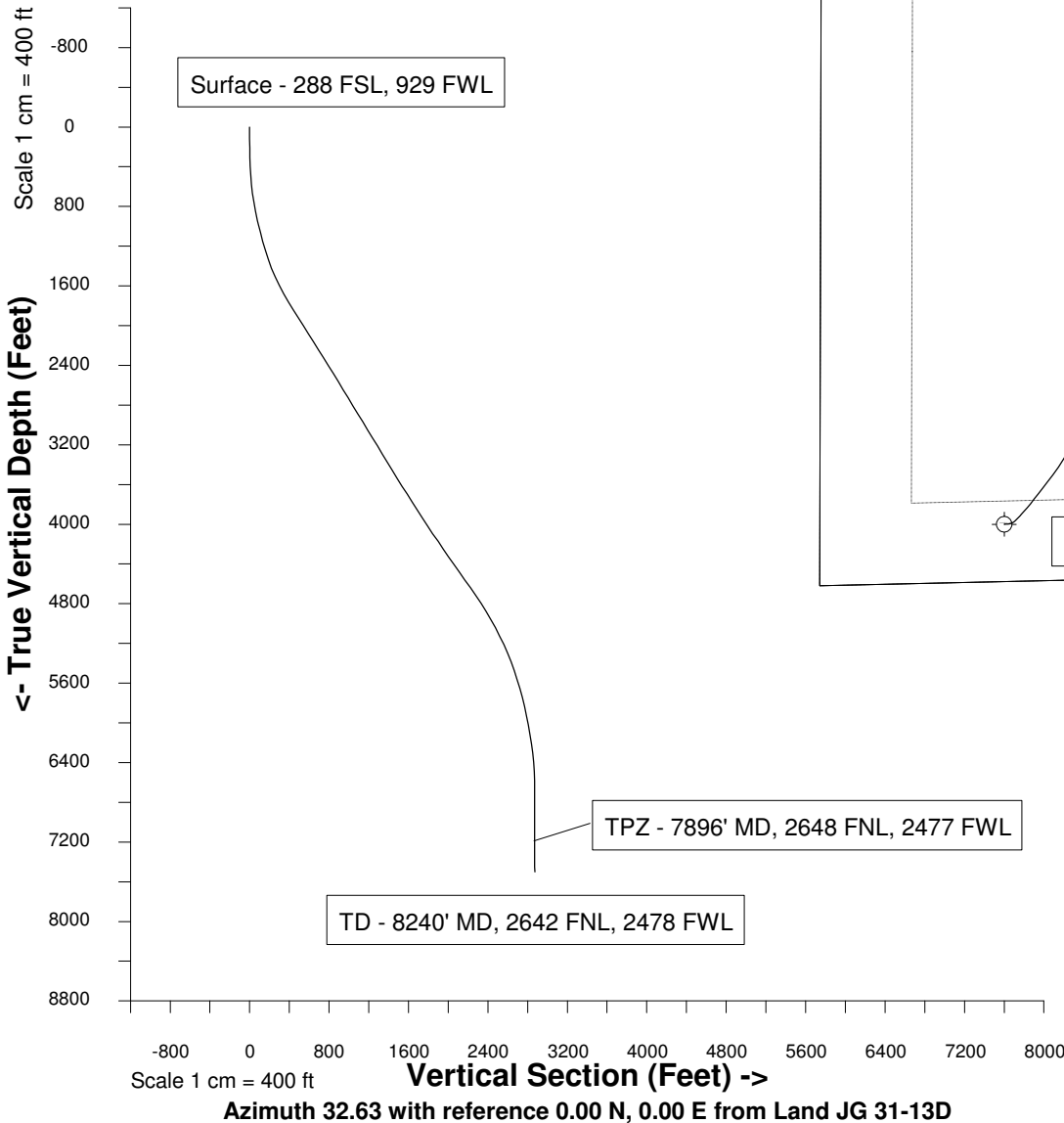


28-Aug-2015
IGRF Model [1900.0-2020.0] Dip: 66.68 deg Field: 52453.1 nT
Lat: N40 5 17.5596 Long: W104 35 57.6708 Elev: 4932.60 ft
Magnetic North is 8.29 deg East of TRUE North
To correct azimuth from Magnetic to TRUE add 8.29 deg

Scale 1 cm = 200 ft

East (Feet) ->

-1200 -800 -400 0 400 800 1200 1600 2000 2400 2800 3200 3600 4000 4400



W2 Sec 31, T2N, R64W

TD - 8240' MD, 2642 FNL, 2478 FWL

TPZ - 7896' MD, 2648 FNL, 2477 FWL

Surface - 288 FSL, 929 FWL

North(Feet)

Scale 1 cm = 200 ft



Company: GREAT WESTERN
Field: WATTENBERG
City/Blk/Par: WELD
Well Name: Land JG 31-13D
Rig: CADE 25

Job Number: PA-2516
Magnetic Decl.: 8.56
Grid Corr.: TRUE
Total Survey Corr.: 8.56
Target Info: 2673'FSL & 2478'FWL

Calculation Method
Proposed Azimuth 32.74
Depth Reference RKB
Tie Into Drill SURFACE
Minimum Curvature

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates N/S (ft)	E/W (ft)	DLS (°/100')	Bld Rate (°/100')	Wlk Rate (°/100')	Remarks
0	Tie In	0	0.00	0.00		0.00	0.00	0.00	0.00				SURFACE
1	MWD	119	0.30	68.30	119	119.00	0.25	0.12	N 0.29 E	0.25	0.3	57.4	
2	MWD	211	0.60	53.00	92	211.00	0.90	0.49	N 0.90 E	0.35	0.3	-16.6	
3	MWD	304	2.60	91.90	93	303.96	2.44	0.72	N 3.40 E	2.33	2.2	41.8	
4	MWD	396	4.70	89.80	92	395.77	5.56	0.66	N 9.25 E	2.29	2.3	-2.3	
5	MWD	486	6.30	86.40	90	485.35	10.49	0.98	N 17.87 E	1.81	1.8	-3.8	
6	MWD	576	7.80	76.90	90	574.67	17.80	2.68	N 28.74 E	2.11	1.7	-10.6	
7	MWD	667	8.90	63.10	91	664.71	28.30	7.26	N 41.04 E	2.50	1.2	-15.2	
8	MWD	758	9.70	50.90	91	754.52	41.66	15.28	N 53.27 E	2.33	0.9	-13.4	
9	MWD	852	11.50	41.60	94	846.92	58.45	27.29	N 65.64 E	2.64	1.9	-9.9	
10	MWD	947	13.30	41.80	95	939.70	78.60	42.52	N 79.21 E	1.90	1.9	0.2	
11	MWD	986	14.00	42.30	39	977.60	87.68	49.35	N 85.37 E	1.82	1.8	1.3	
12	MWD	1072	14.40	41.80	86	1060.97	108.50	65.02	N 99.50 E	0.49	0.5	-0.6	
13	MWD	1166	15.50	40.60	94	1151.79	132.49	83.27	N 115.47 E	1.22	1.2	-1.3	
14	MWD	1260	17.10	39.50	94	1242.01	158.65	103.47	N 132.43 E	1.73	1.7	-1.2	
15	MWD	1355	18.90	38.40	95	1332.36	187.84	126.31	N 150.87 E	1.93	1.9	-1.2	
16	MWD	1450	21.30	37.70	95	1421.56	220.34	152.02	N 170.99 E	2.54	2.5	-0.7	
17	MWD	1545	24.30	36.90	95	1509.13	257.04	181.31	N 193.28 E	3.17	3.2	-0.8	
18	MWD	1639	26.60	38.60	94	1594.00	297.27	213.23	N 218.02 E	2.57	2.4	1.8	
19	MWD	1734	29.10	37.20	95	1678.00	341.46	248.26	N 245.27 E	2.72	2.6	-1.5	
20	MWD	1830	31.40	33.70	96	1760.92	389.75	287.67	N 273.26 E	3.02	2.4	-3.6	
21	MWD	1924	32.20	30.90	94	1840.82	439.27	329.53	N 299.71 E	1.79	0.9	-3.0	
22	MWD	2019	32.50	30.40	95	1921.07	490.07	373.26	N 325.62 E	0.42	0.3	-0.5	
23	MWD	2114	32.40	30.40	95	2001.24	541.00	417.23	N 351.42 E	0.11	-0.1	0.0	
24	MWD	2209	32.30	30.40	95	2081.50	591.79	461.07	N 377.14 E	0.11	-0.1	0.0	
25	MWD	2304	32.20	29.80	95	2161.84	642.43	504.93	N 402.57 E	0.35	-0.1	-0.6	
26	MWD	2399	32.10	30.20	95	2242.27	692.93	548.71	N 427.84 E	0.25	-0.1	0.4	
27	MWD	2494	32.40	31.20	95	2322.62	743.59	592.30	N 453.72 E	0.64	0.3	1.1	
28	MWD	2588	31.60	30.50	94	2402.33	793.37	635.06	N 479.27 E	0.94	-0.9	-0.7	
29	MWD	2683	31.80	30.50	95	2483.16	843.25	678.07	N 504.61 E	0.21	0.2	0.0	
30	MWD	2778	31.90	31.20	95	2563.86	893.36	721.11	N 530.31 E	0.40	0.1	0.7	
31	MWD	2873	31.00	30.40	95	2644.90	942.89	763.68	N 555.70 E	1.04	-0.9	-0.8	
32	MWD	2968	30.80	30.50	95	2726.42	991.64	805.74	N 580.42 E	0.22	-0.2	0.1	
33	MWD	3063	31.10	30.50	95	2807.89	1040.46	847.83	N 605.22 E	0.32	0.3	0.0	
34	MWD	3158	31.20	31.20	95	2889.19	1089.57	890.02	N 630.42 E	0.40	0.1	0.7	
35	MWD	3252	32.30	31.40	94	2969.12	1139.02	932.29	N 656.11 E	1.18	1.2	0.2	
36	MWD	3346	31.60	30.90	94	3048.88	1188.74	974.85	N 681.85 E	0.80	-0.7	-0.5	
37	MWD	3442	31.70	31.10	96	3130.61	1239.10	1018.03	N 707.79 E	0.15	0.1	0.2	
38	MWD	3537	31.10	30.70	95	3211.69	1288.57	1060.50	N 733.21 E	0.67	-0.6	-0.4	
39	MWD	3631	31.10	30.50	94	3292.18	1337.09	1102.30	N 757.93 E	0.11	0.0	-0.2	
40	MWD	3726	31.20	29.50	95	3373.49	1386.17	1144.85	N 782.50 E	0.55	0.1	-1.1	
41	MWD	3821	31.00	30.00	95	3454.83	1435.17	1187.46	N 806.85 E	0.34	-0.2	0.5	
42	MWD	3916	31.60	30.00	95	3536.00	1484.47	1230.20	N 831.52 E	0.63	0.6	0.0	
43	MWD	4011	33.10	31.10	95	3616.26	1535.26	1273.97	N 857.37 E	1.70	1.6	1.2	
44	MWD	4106	32.20	30.70	95	3696.25	1586.49	1317.94	N 883.69 E	0.97	-0.9	-0.4	
45	MWD	4201	32.40	31.20	95	3776.55	1637.23	1361.48	N 909.80 E	0.35	0.2	0.5	
46	MWD	4296	32.60	30.90	95	3856.67	1688.25	1405.21	N 936.12 E	0.27	0.2	-0.3	
47	MWD	4391	32.70	32.30	95	3936.66	1739.49	1448.86	N 962.98 E	0.80	0.1	1.5	
48	MWD	4486	33.30	32.50	95	4016.33	1791.23	1492.54	N 990.70 E	0.64	0.6	0.2	
49	MWD	4581	34.90	32.60	95	4094.99	1844.49	1537.44	N 1019.36 E	1.69	1.7	0.1	
50	MWD	4675	34.80	32.50	94	4172.13	1898.20	1582.71	N 1048.26 E	0.12	-0.1	-0.1	
51	MWD	4769	34.30	31.90	94	4249.56	1951.51	1627.82	N 1076.67 E	0.64	-0.5	-0.6	
52	MWD	4865	33.80	31.40	96	4329.10	2005.25	1673.58	N 1104.87 E	0.60	-0.5	-0.5	
53	MWD	4960	35.70	31.10	95	4407.15	2059.38	1719.87	N 1132.96 E	2.01	2.0	-0.3	
54	MWD	5054	35.30	31.60	94	4483.68	2113.95	1766.49	N 1161.36 E	0.53	-0.4	0.5	
55	MWD	5149	35.10	31.10	95	4561.31	2168.69	1813.25	N 1189.85 E	0.37	-0.2	-0.5	
56	MWD	5244	34.60	30.90	95	4639.27	2222.95	1859.79	N 1217.81 E	0.54	-0.5	-0.2	
57	MWD	5339	34.60	30.50	95	4717.46	2276.86	1906.17	N 1245.35 E	0.24	0.0	-0.4	
58	MWD	5434	33.40	31.40	95	4796.22	2329.96	1951.73	N 1272.67 E	1.37	-1.3	0.9	
59	MWD	5529	31.70	30.50	95	4876.30	2381.04	1995.56	N 1298.96 E	1.86	-1.8	-0.9	
60	MWD	5624	29.40	30.90	95	4958.10	2429.30	2037.08	N 1323.60 E	2.43	-2.4	0.4	
61	MWD	5720	28.00	31.20	96	5042.31	2475.38	2076.58	N 1347.38 E	1.47	-1.5	0.3	
62	MWD	5815	26.70	31.20	95	5126.69	2519.01	2113.91	N 1369.99 E	1.37	-1.4	0.0	
63	MWD	5910	25.10	31.60	95	5212.14	2560.49	2149.33	N 1391.60 E	1.69	-1.7	0.4	
64	MWD	6005	22.70	29.30	95	5298.99	2598.94	2182.48	N 1411.14 E	2.71	-2.5	-2.4	
65	MWD	6099	20.90	30.90	94	5386.27	2633.80	2212.69	N 1428.63 E	2.02	-1.9	1.7	
66	MWD	6193	18.80	30.20	94	5474.68	2665.70	2240.17	N 1444.86 E	2.25	-2.2	-0.7	
67	MWD	6288	17.00	31.20	95	5565.08	2694.88	2265.28	N 1459.75 E	1.92	-1.9	1.1	
68	MWD	6381	15.90	30.40	93	5654.27	2721.20	2287.90	N 1473.24 E	1.21	-1.2	-0.9	
69	MWD	6475	14.80	31.60	94	5744.91	2746.07	2309.23	N 1486.05 E	1.22	-1.2	1.3	
70	MWD	6570	13.00	33.50	95	5837.13	2768.88	2328.47	N 1498.30 E	1.95	-1.9	2.0	
71	MWD	6665	11.70	31.90	95	5929.93	2789.20	2345.56	N 1509.29 E	1.41	-1.4	-1.7	
72	MWD	6760	10.40	32.50	95	6023.16	2807.41	2360.97	N 1518.99 E	1.37	-1.4	0.6	
73	MWD	6855	9.80	30.90	95	6116.69	2824.06	2375.14	N 1527.75 E	0.70	-0.6	-1.7	
74	MWD	6950	8.60	26.00	95	6210.47	2839.20	2388.47	N 1535.02 E	1.51	-1.3	-5.2	
75	MWD	7044	7.10	21.70	94	6303.59	2851.88	2400.18	N 1540.25 E	1.71	-1.6	-4.6	
76	MWD	7139	5.00	19.10	95	6398.05	2861.67	2409.55	N 1543.77 E	2.23	-2.2	-2.7	
77	MWD	7234	2.60	19.30	95	6492.84	2867.79	2415.49	N 1545.84 E	2.53	-2.5	0.2	
78	MWD	7328	0.60	43.50	94	6586.80	2870.34	2417.86	N 1546.88 E	2.20	-2.1	25.7	
79	MWD	7518	0.30	152.70	190	6776.79	2871.07	2418.14	N 1547.79 E	0.40	-0.2	57.5	
80	MWD	7708	0.30	196.50	190	6966.79	2870.35	2417.23	N 1547.88 E	0.12	0.0	23.1	
81	MWD	7896	0.30	23.30	188	7154.79	2870.36	2417.21	N 1547.94 E	0.32	0.0	-92.1	
82	MWD	8086	0.30	26.50	190	7344.79	2871.34	2418.11	N 1548.36 E	0.01	0.0	1.7	
83	MWD	8190	0.40	18.80	104	7448.78	2871.97	2418.69	N 1548.59 E	0.11	0.1	-7.4	TD SURVEY
84	PRJ	8240	0.40	18.80	50	7498.78	2872.31	2419.02	N 1548.71 E	0.00	0.0	0.0	PROJECTION TO BIT