

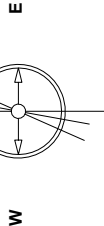
Great Western Operating Company, LLC

Created by	admin
Date plotted	14-May-2018
Plot reference is	T&M DE 22-039HC (AWB).
Ref wellpath is	T&M DE 22-039HC (AWP#1).
Coordinates are in Feet reference T&M DE 22-039HC.	
True Vertical Depths are reference Rig Datum.	
Measured Depths are reference Rig Datum.	
Rig Datum: Actual Datum #1	
Rig Datum to Mean Sea Level: 5109.60 ft.	
Plot North is aligned to TRUE North.	

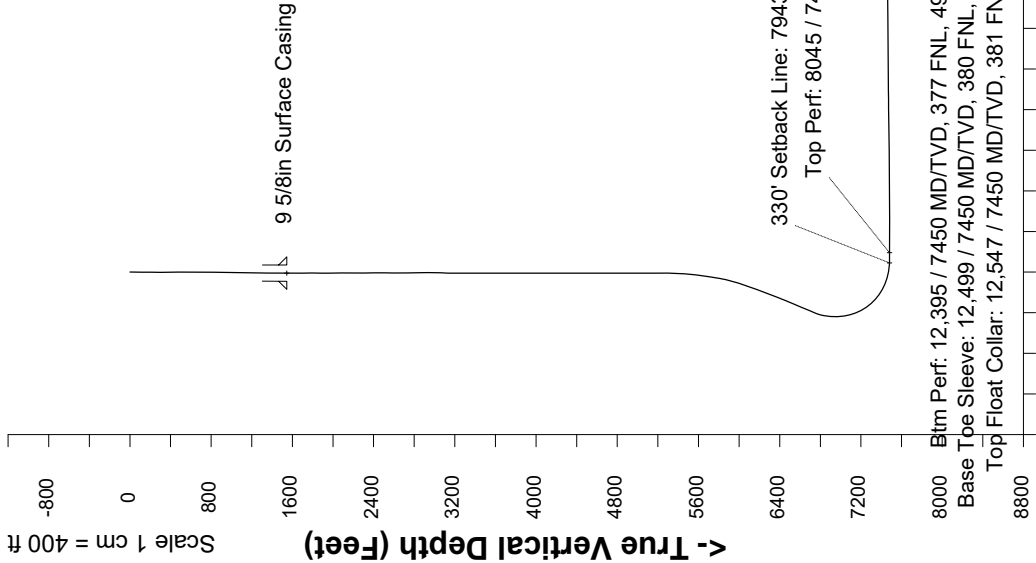
Location	Colorado	Slot	T&M DE 22-039HC
Field	Wattenburg	Well	T&M DE 22-039HC
Installation	T&M	Wellbore	T&M DE 22-039HC (AWB)

Scale 1 cm = 250 ft

East (Feet) ->



Jan-26-2016
Dip: 67.09 deg Field: 52681.3 nT
Lat: N40 39 19 1088 Long: W104 46 18.2794 Elev: 5088.60 ft
Magnetic North is 6.35 deg East of TRUE North
To correct azimuth from Magnetic to TRUE add 6.38 deg



Scale 1 cm = 400 ft

Vertical Section (Feet) ->

Azimuth 99.61 with reference 0.00 N, 0.00 E from T&M DE 22-039HC

<- North(Feet)

Scale 1 cm = 250 ft

Great Western Operating Co, LLC
Wellbore Survey Report
Wellpath: T&M DE 22-039HC (AWP#1)
MDs and TVDs are from Rig (Actual Datum #1 5109.6ft above Mean Sea Level)

Wellbore Information

Date Created	Date Revised	API #	Name
Jul-5-2017	May-14-2018	05-123-43241	T&M DE 22-039HC (AWB)

Slot Coordinates

Latitude	Longitude
40.65530800	-104.77174400

Pad Information

Name	Ground Elev
T&M	5089.60

Field

Name
Wattenburg

Wellpath Report

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
0.00	0.00	0.000	0.00	0.00	0.00		0.00
9.90	0.00	304.900	9.90	0.00	0.00	==>	0.00
113.90	0.57	304.900	113.90	0.30	-0.42	0.55	-0.47
208.90	0.92	289.920	208.89	0.83	-1.53	0.42	-1.65
303.90	0.57	323.360	303.88	1.47	-2.53	0.57	-2.74
396.90	0.40	23.390	396.88	2.13	-2.68	0.55	-2.99
492.90	0.44	48.440	492.88	2.69	-2.27	0.19	-2.68
587.90	0.48	103.630	587.87	2.83	-1.61	0.45	-2.06
682.90	1.19	153.290	682.86	1.86	-0.78	1.00	-1.08
778.90	1.18	159.090	778.84	0.05	0.02	0.13	0.02
873.90	0.92	209.180	873.83	-1.53	0.00	0.97	0.26
968.90	1.58	255.240	968.81	-2.53	-1.64	1.21	-1.19
1062.90	1.85	275.020	1062.77	-2.73	-4.40	0.69	-3.88
1158.90	1.58	297.780	1158.73	-1.98	-7.12	0.76	-6.69
1253.90	1.23	311.230	1253.70	-0.70	-9.04	0.50	-8.80
1347.90	0.44	353.330	1347.69	0.33	-9.84	1.01	-9.76
1442.90	0.35	341.500	1442.68	0.96	-9.98	0.13	-10.00
1488.90	0.48	6.070	1488.68	1.29	-10.00	0.47	-10.08
1611.00	0.19	245.430	1610.78	1.71	-10.13	0.49	-10.28
1700.00	0.57	67.780	1699.78	1.82	-9.86	0.85	-10.02
1789.00	0.67	21.730	1788.78	2.47	-9.25	0.55	-9.54
1879.00	0.57	314.570	1878.77	3.27	-9.38	0.77	-9.79
1968.00	0.66	161.030	1967.77	3.10	-9.53	1.35	-9.91
2058.00	0.53	164.670	2057.77	2.21	-9.25	0.15	-9.49
2147.00	0.45	151.160	2146.76	1.51	-8.97	0.16	-9.10
2236.00	0.40	152.120	2235.76	0.92	-8.66	0.06	-8.69
2326.00	0.44	145.760	2325.76	0.36	-8.31	0.07	-8.26
2415.00	0.43	172.720	2414.76	-0.25	-8.08	0.23	-7.92
2505.00	0.75	209.240	2504.75	-1.10	-8.32	0.53	-8.02
2594.00	1.02	198.010	2593.74	-2.36	-8.85	0.36	-8.34
2684.00	0.74	156.080	2683.73	-3.66	-8.87	0.76	-8.13
2773.00	0.96	118.610	2772.72	-4.54	-7.98	0.66	-7.11
2863.00	1.48	100.250	2862.70	-5.11	-6.17	0.72	-5.23
2953.00	1.10	321.100	2952.69	-4.64	-5.57	2.69	-4.72
3042.00	4.30	324.460	3041.58	-1.26	-8.05	3.60	-7.72
3131.00	0.42	253.830	3130.49	1.36	-10.30	4.70	-10.39
3221.00	0.00	98.260	3220.49	1.27	-10.62	0.47	-10.68
3310.00	0.07	275.610	3309.49	1.28	-10.67	0.08	-10.74
3400.00	0.07	247.640	3399.49	1.26	-10.78	0.04	-10.84
3490.00	0.13	197.840	3489.49	1.14	-10.86	0.11	-10.90
3579.00	0.00	98.260	3578.49	1.05	-10.89	0.15	-10.91
3669.00	0.04	30.920	3668.49	1.08	-10.88	0.04	-10.90
3758.00	0.07	249.820	3757.49	1.08	-10.91	0.12	-10.94
3847.00	0.03	185.110	3846.49	1.04	-10.96	0.07	-10.98
3937.00	0.25	26.820	3936.49	1.19	-10.88	0.31	-10.92
4026.00	0.07	113.620	4025.49	1.34	-10.74	0.29	-10.81
4116.00	0.11	16.890	4115.49	1.41	-10.66	0.15	-10.75
4205.00	0.06	300.360	4204.49	1.51	-10.68	0.13	-10.78
4295.00	0.03	97.460	4294.49	1.53	-10.70	0.10	-10.80
4384.00	0.04	313.700	4383.49	1.55	-10.70	0.07	-10.81
4473.00	0.06	329.770	4472.49	1.61	-10.74	0.03	-10.86
4563.00	0.04	328.430	4562.49	1.68	-10.78	0.02	-10.91
4652.00	0.04	109.090	4651.49	1.70	-10.77	0.08	-10.90
4742.00	0.11	243.960	4741.49	1.65	-10.82	0.16	-10.94
4831.00	0.03	178.520	4830.49	1.59	-10.89	0.11	-11.01
4921.00	0.09	158.950	4920.49	1.50	-10.87	0.07	-10.96
5011.00	0.09	140.650	5010.49	1.38	-10.80	0.03	-10.88
5100.00	0.04	80.880	5099.49	1.33	-10.72	0.09	-10.79
5190.00	0.11	61.190	5189.49	1.37	-10.62	0.08	-10.70
5279.00	0.22	248.400	5278.49	1.35	-10.70	0.37	-10.78
5369.00	2.86	235.250	5368.45	0.01	-12.71	2.94	-12.53
5458.00	5.26	239.270	5457.22	-3.34	-18.04	2.71	-17.23
5547.00	7.54	240.370	5545.66	-8.31	-26.62	2.57	-24.86
5636.00	10.57	234.360	5633.54	-15.96	-38.33	3.56	-35.13
5726.00	14.18	227.220	5721.44	-28.26	-53.14	4.35	-47.67
5815.00	16.57	227.360	5807.25	-44.26	-70.48	2.69	-62.10
5904.00	19.26	234.600	5891.94	-61.37	-91.79	3.92	-80.25
5993.00	21.73	239.160	5975.30	-78.32	-117.90	3.30	-103.17
6083.00	24.80	237.990	6057.98	-96.87	-148.22	3.45	-129.96

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
6172.00	26.73	236.940	6138.12	-117.69	-180.82	2.23	-158.63
6262.00	26.79	237.170	6218.49	-139.73	-214.83	0.13	-188.48
6351.00	26.69	236.420	6297.97	-161.65	-248.34	0.40	-217.85
6440.00	28.47	236.150	6376.85	-184.53	-282.61	2.00	-247.82
6530.00	30.73	235.870	6455.10	-209.38	-319.46	2.52	-280.01
6619.00	30.31	234.110	6531.77	-235.31	-356.48	1.11	-312.18
6708.00	30.63	234.810	6608.48	-261.54	-393.21	0.54	-344.01
6798.00	30.49	235.980	6685.98	-287.53	-430.87	0.68	-376.80
6887.00	29.93	233.230	6762.90	-313.45	-467.37	1.68	-408.46
6976.00	23.99	207.760	6842.45	-342.87	-493.69	14.45	-429.50
7066.00	19.80	197.650	6925.97	-373.62	-506.85	6.25	-437.33
7155.00	19.78	173.810	7009.85	-403.00	-509.80	9.01	-435.34
7245.00	23.09	149.510	7093.78	-433.41	-499.18	10.44	-419.79
7334.00	28.95	134.850	7173.81	-463.70	-475.01	9.73	-390.90
7424.00	36.50	124.360	7249.53	-494.24	-437.38	10.47	-348.70
7514.00	45.88	114.210	7317.26	-522.69	-385.65	12.77	-292.94
7603.00	54.27	108.500	7374.35	-547.31	-322.11	10.63	-226.19
7692.00	63.53	104.110	7420.29	-568.54	-249.04	11.23	-150.59
7782.00	72.53	98.550	7453.95	-584.78	-167.30	11.52	-67.29
7871.00	80.76	92.980	7474.50	-593.40	-81.25	11.07	18.99
7943.22	88.48	91.070	7481.27	-595.93	-9.45	11.02	90.21
7960.00	90.28	90.630	7481.45	-596.18	7.33	11.02	106.79
8045.00	90.48	92.370	7480.89	-598.40	92.30	2.06	190.93
8050.00	90.49	92.470	7480.84	-598.61	97.29	2.06	195.89
8139.00	90.46	93.280	7480.11	-603.07	186.17	0.91	284.27
8229.00	88.95	92.690	7480.57	-607.76	276.05	1.80	373.67
8318.00	89.01	91.890	7482.15	-611.32	364.96	0.90	461.93
8407.00	90.09	91.650	7482.85	-614.07	453.92	1.24	550.09
8497.00	90.03	91.160	7482.76	-616.27	543.89	0.55	639.17
8586.00	90.06	90.760	7482.69	-617.76	632.88	0.45	727.16
8676.00	90.55	90.550	7482.21	-618.79	722.87	0.59	816.06
8765.00	90.55	90.940	7481.36	-619.95	811.86	0.44	903.99
8854.00	90.59	91.550	7480.47	-621.88	900.83	0.69	992.04
8944.00	91.02	91.280	7479.21	-624.11	990.79	0.56	1081.11
9033.00	90.95	91.860	7477.68	-626.54	1079.75	0.66	1169.22
9122.00	90.99	92.740	7476.17	-630.11	1168.66	0.99	1257.48
9211.00	90.46	92.310	7475.04	-634.04	1257.57	0.77	1345.79
9301.00	90.52	92.240	7474.27	-637.61	1347.49	0.10	1435.05
9390.00	90.46	91.340	7473.51	-640.39	1436.45	1.01	1523.22
9480.00	90.52	91.730	7472.74	-642.80	1526.41	0.44	1612.32
9569.00	90.46	93.020	7471.98	-646.49	1615.33	1.45	1700.61
9659.00	90.52	94.160	7471.21	-652.12	1705.15	1.27	1790.11
9748.00	90.43	94.720	7470.47	-659.01	1793.88	0.64	1878.74
9838.00	90.52	94.590	7469.73	-666.31	1883.58	0.18	1968.40
9927.00	90.43	94.090	7468.99	-673.05	1972.32	0.57	2057.02
10016.00	90.46	93.280	7468.30	-678.77	2061.13	0.91	2145.54
10106.00	90.43	94.080	7467.60	-684.55	2150.94	0.89	2235.06
10195.00	90.40	93.840	7466.95	-690.69	2239.73	0.27	2323.62
10285.00	90.40	94.080	7466.33	-696.91	2329.51	0.27	2413.18
10374.00	90.71	94.950	7465.46	-703.91	2418.23	1.04	2501.82
10464.00	90.77	95.680	7464.30	-712.25	2507.83	0.81	2591.56
10553.00	90.77	94.390	7463.11	-720.06	2596.48	1.45	2680.27
10643.00	90.71	92.460	7461.94	-725.44	2686.31	2.15	2769.73
10732.00	90.65	91.050	7460.89	-728.16	2775.26	1.59	2857.89
10821.00	90.65	90.800	7459.88	-729.60	2864.24	0.28	2945.86
10911.00	90.52	89.170	7458.96	-729.57	2954.23	1.82	3034.58
11001.00	90.49	90.180	7458.16	-729.06	3044.23	1.12	3123.23
11090.00	90.55	90.320	7457.36	-729.45	3133.22	0.17	3211.04
11179.00	90.62	88.720	7456.45	-728.71	3222.21	1.80	3298.66
11269.00	90.34	88.710	7455.69	-726.69	3312.19	0.31	3387.03
11358.00	90.40	87.410	7455.12	-723.68	3401.13	1.46	3474.22
11448.00	90.31	90.260	7454.56	-721.85	3491.10	3.17	3562.62
11537.00	90.40	92.230	7454.01	-723.78	3580.07	2.22	3650.67
11626.00	90.46	92.540	7453.34	-727.48	3668.99	0.35	3738.96
11716.00	90.43	93.450	7452.64	-732.18	3758.87	1.01	3828.36
11805.00	90.55	94.680	7451.88	-738.49	3847.64	1.39	3916.93
11894.00	90.55	94.760	7451.03	-745.82	3936.33	0.09	4005.61
11984.00	90.46	93.110	7450.23	-751.99	4026.11	1.84	4095.16
12073.00	90.49	91.020	7449.50	-755.20	4115.05	2.35	4183.38
12163.00	89.42	90.620	7449.57	-756.49	4205.04	1.27	4272.32
12252.00	90.28	92.130	7449.80	-758.62	4294.01	1.95	4360.40
12342.00	89.88	94.610	7449.67	-763.91	4383.85	2.79	4449.86
12395.00	89.92	94.570	7449.77	-768.16	4436.67	0.10	4502.65
12431.00	89.94	94.550	7449.81	-771.02	4472.56	0.10	4538.51

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
12499.00	89.94	93.580	7449.89	-775.84	4540.39	1.43	4606.19
12521.00	89.94	93.260	7449.91	-777.15	4562.35	1.43	4628.06
12537.00	89.85	93.450	7449.94	-778.09	4578.32	1.31	4643.97
12560.90	89.85	93.450	7450.00	-779.52	4602.18	==>	4667.73
12561.00	89.85	93.450	7450.00	-779.53	4602.28	==>	4667.83

Comments

MD[ft]	TVD[ft]	North[ft]	East[ft]	Comment			
7943.22	7481.27	-595.93	-9.45	330' Setback Line: 7943 / 7481 MD/TVD, 392 FNL, 330 FWL Sec 22			
8045.00	7480.89	-598.40	92.30	Top Perf: 8045 / 7481 MD/TVD, 390 FNL, 432 FWL Sec 22			
12395.00	7449.77	-768.16	4436.67	Btm Perf: 12,395 / 7450 MD/TVD, 377 FNL, 498 FEL Sec 22			
12499.00	7449.89	-775.84	4540.39	Base Toe Sleeve: 12,499 / 7450 MD/TVD, 380 FNL, 394 FEL Sec 22			
12547.00	7449.96	-778.69	4588.30	Top Float Collar: 12,547 / 7450 MD/TVD, 381 FNL, 346 FEL Sec 22			
12561.00	7450.00	-779.53	4602.28	5-1/2" Casing Shoe: 12,561 / 7450 MD/TVD, 381 FNL, 332 FEL Sec 22			
12561.00	7450.00	-779.53	4602.28	Total Depth: 12,561 / 7450 MD/TVD, 381 FNL, 332 FEL Sec 22			

Hole Sections

Diameter [in]	Start MD[ft]	Start TVD[ft]	Start North[ft]	Start East[ft]	End MD[ft]	End TVD[ft]	End North[ft]	End East[ft]
13.500	0.00	0.00	0.00	0.00	1545.00	1544.78	1.63	-10.00
8.500	1545.00	1544.78	1.63	-10.00	12561.00	7450.00	-779.53	4602.28

Casings

Name	Top MD[ft]	Top TVD[ft]	Top North[ft]	Top East[ft]	Shoe MD[ft]	Shoe TVD[ft]	Shoe North[ft]	Shoe East[ft]
9 5/8in Casing	0.00	0.00	0.00	0.00	1545.00	1544.78	1.63	-10.00
5 1/2in Casing	0.00	0.00	0.00	0.00	12561.00	7450.00	-779.53	4602.28

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
279409	As Drilled - 20170705	12561.00	7450.00	MWD	

Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Actual Datum #1 5109.6ft above Mean Sea Level)
Vertical Section is from 0.00 0.00 on azimuth 99.610 degrees
Bottom hole distance is 4667.83 Feet on azimuth 99.61 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Great Western Operating Co.
Date Printed: