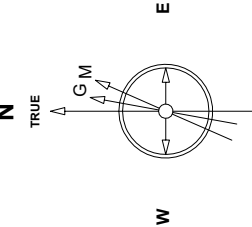


Great Western Operating Company, LLC

Created by admin	
Date plotted 25-Feb-2019	
Plot reference is Seltzer LD 21-031HC (AWB).	
Ref wellpath is Seltzer LD 21-031HC (AWP#1).	
Coordinates are in Feet reference Slot E15 - Seltzer LD 21-031HC	
True Vertical Depths are reference Rig Datum.	
Measured Depths are reference Rig Datum.	
Rig Datum: Actual Datum #1	
Rig Datum to Mean Sea Level: 5199.50 ft.	
Plot North is aligned to TRUE North.	

Location Field Installation	Colorado	Slot	Slot E15 - Seltzer LD 21-031HC
	Wattenburg	Well	Seltzer LD 21-031HC
	Seltzer	Wellbore	Seltzer LD 21-031HC (AWB)



Jan-17-2017
Dip: 66.42 deg Field: 52215.2 OT
Lat: N39 59 58.7292 Long: W104 53 32.3962 Elev: 5142.60 ft
Magnetic North is 8.23 deg East of TRUE North
To correct azimuth from Magnetic to TRUE add 8.26 deg

Scale 1 cm = 600 ft

East (Feet) ->

-8000
-6000
-4000
-2000
-0
2000
4000
6000
8000
10000
12000

- True Vertical Depth (Feet)

9.625" Csg: 1739 MD/TVD

460 Setback: 8244 / 7907 MD/TVD, 460 FNL, 2607 FEL Sec 04
Top Perf: 8345 / 7919 MD/TVD, 560 FNL, 2611 FEL Sec 04

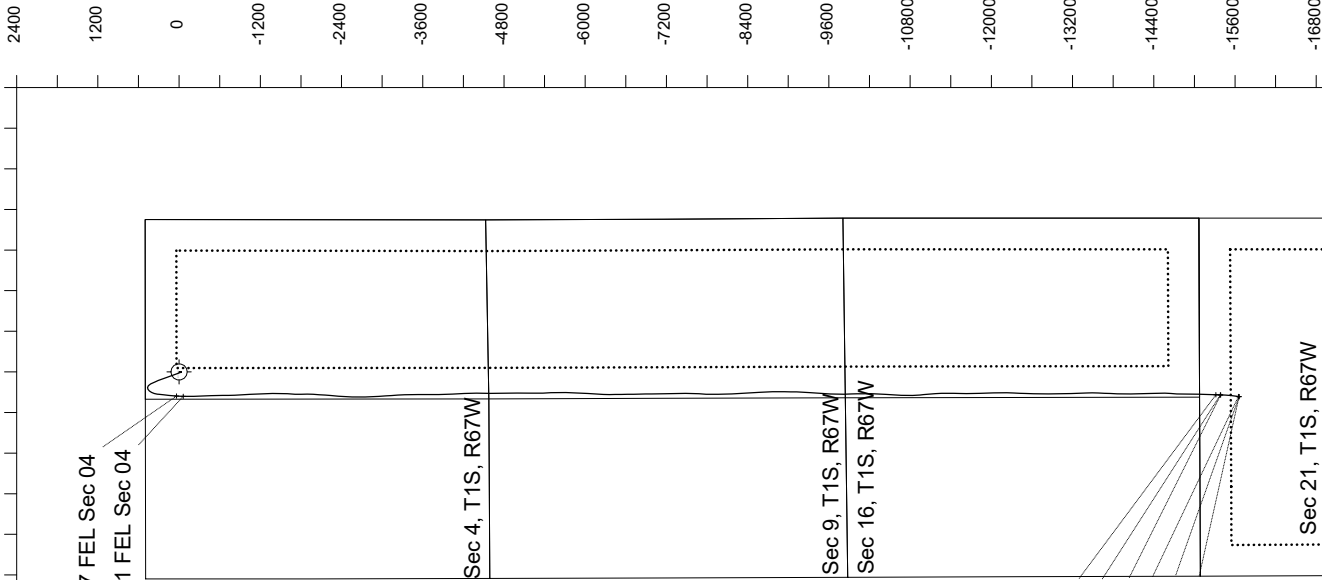
Btm Perf: 23,615 / 7979 MD/TVD, 240 FNL, 2610 FEL Sec 21
Btm Toe Sub: 23,681 / 7979 MD/TVD, 306 FNL, 2611 FEL Sec 21
310 Setback: 23,685 / 7979 MD/TVD, 310 FNL, 2612 FEL Sec 21
PBTD: 23,950 / 7979 MD/TVD, 574 FNL, 2636 FEL Sec 21
5.5" Csg: 23,960 / 7979 MD/TVD, 584 FNL, 2637 FEL Sec 21
BHL: 23,960 / 7979 MD/TVD, 584 FNL, 2637 FEL Sec 21

Scale 1 cm = 1000 ft

Vertical Section (Feet) ->

Azimuth 181.34 with reference 0.00 N, 0.00 E from Slot E15 - Seltzer LD 21-031HC

Btm Perf: 23,615 / 7979 MD/TVD, 240 FNL, 2610 FEL Sec 21
Btm Toe Sub: 23,681 / 7979 MD/TVD, 306 FNL, 2611 FEL Sec 21
310 Setback: 23,685 / 7979 MD/TVD, 310 FNL, 2612 FEL Sec 21
PBTD: 23,950 / 7979 MD/TVD, 574 FNL, 2636 FEL Sec 21
5.5" Csg: 23,960 / 7979 MD/TVD, 584 FNL, 2637 FEL Sec 21
BHL: 23,960 / 7979 MD/TVD, 584 FNL, 2637 FEL Sec 21



Great Western Operating Co, LLC
Directional Survey Report
Wellpath: Seltzer LD 21-031HC (AWP#1)
MDs and TVDs are from Rig Floor 5159.5ft above Mean Sea Level

Wellbore Information

Date Created	Date Revised	API #	RKB above GL	Well Name
Dec-10-2018	Feb-25-2019	05-123-10199	20.00	Seltzer LD 21-031HC (AWB)

Slot Coordinates

Latitude	Longitude
39.99898900	-104.89242600

Pad Information

Pad Name	Ground Elev.
Seltzer	5139.50

Field

Name
Wattenburg

Wellpath Report

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
0.00	0.00	0.000	0.00	0.00	0.00		0.00	39.99898900	-104.89242600
20.00	0.00	233.900	20.00	0.00	0.00	==>	0.00	39.99898900	-104.89242600
154.00	0.53	233.900	154.00	-0.37	-0.50	0.40	0.38	39.99898800	-104.89242779
241.00	0.48	216.410	240.99	-0.90	-1.04	0.19	0.92	39.99898654	-104.89242972
302.00	0.92	171.670	301.99	-1.59	-1.12	1.10	1.61	39.99898465	-104.89243001
392.00	2.15	167.630	391.96	-3.95	-0.66	1.37	3.96	39.99897816	-104.89242834
482.00	1.23	186.620	481.92	-6.56	-0.41	1.18	6.57	39.99897100	-104.89242745
572.00	1.01	201.820	571.90	-8.25	-0.81	0.41	8.27	39.99896634	-104.89242890
662.00	0.92	185.030	661.89	-9.71	-1.17	0.33	9.74	39.99896234	-104.89243018
752.00	1.01	175.450	751.87	-11.22	-1.17	0.20	11.25	39.99895820	-104.89243018
842.00	1.23	168.770	841.86	-12.96	-0.92	0.28	12.98	39.99895343	-104.89242928
932.00	1.27	169.210	931.84	-14.89	-0.55	0.05	14.89	39.99894814	-104.89242795
1022.00	1.10	156.290	1021.82	-16.66	-0.01	0.35	16.65	39.99894328	-104.89242604
1112.00	0.88	146.010	1111.80	-18.02	0.72	0.31	18.00	39.99893953	-104.89242342
1202.00	1.14	177.830	1201.79	-19.49	1.14	0.68	19.46	39.99893550	-104.89242192
1292.00	1.14	180.460	1291.77	-21.28	1.17	0.06	21.25	39.99893059	-104.89242183
1382.00	0.97	167.980	1381.76	-22.92	1.32	0.32	22.88	39.99892609	-104.89242128
1472.00	1.71	175.980	1471.73	-25.00	1.57	0.85	24.96	39.99892036	-104.89242038
1562.00	1.41	190.130	1561.70	-27.43	1.47	0.54	27.39	39.99891369	-104.89242074
1652.00	1.45	190.750	1651.67	-29.64	1.07	0.05	29.61	39.99890763	-104.89242219
1738.00	1.32	194.970	1737.65	-31.67	0.61	0.19	31.65	39.99890207	-104.89242383
1739.00	1.32	195.170	1738.65	-31.69	0.60	0.66	31.67	39.99890201	-104.89242385
1762.00	1.44	199.300	1761.64	-32.22	0.44	0.66	32.20	39.99890055	-104.89242444
1852.00	0.25	329.020	1851.63	-33.12	-0.04	1.79	33.11	39.99889809	-104.89242614
1941.00	0.34	327.240	1940.63	-32.73	-0.28	0.10	32.73	39.99889915	-104.89242700
2031.00	0.41	92.550	2030.63	-32.52	-0.10	0.74	32.51	39.99889973	-104.89242637
2121.00	0.07	238.640	2120.63	-32.56	0.17	0.52	32.55	39.99889961	-104.89242539
2210.00	0.13	54.320	2209.63	-32.53	0.21	0.22	32.52	39.99889970	-104.89242526
2300.00	0.00	8.310	2299.63	-32.47	0.29	0.14	32.46	39.99889986	-104.89242497
2390.00	0.03	345.110	2389.63	-32.45	0.28	0.03	32.43	39.99889992	-104.89242499
2479.00	0.11	166.500	2478.63	-32.51	0.30	0.16	32.49	39.99889976	-104.89242494
2569.00	0.13	254.510	2568.63	-32.62	0.22	0.19	32.61	39.99889945	-104.89242522
2659.00	0.25	227.830	2658.63	-32.78	-0.03	0.16	32.77	39.99889901	-104.89242609
2749.00	0.17	110.540	2748.63	-32.96	-0.05	0.40	32.95	39.99889852	-104.89242616
2838.00	0.04	165.000	2837.63	-33.04	0.09	0.17	33.02	39.99889831	-104.89242569
2928.00	0.28	315.630	2927.63	-32.91	-0.06	0.35	32.90	39.99889866	-104.89242621
3017.00	0.06	85.300	3016.63	-32.75	-0.17	0.36	32.74	39.99889910	-104.89242659
3107.00	0.24	333.700	3106.63	-32.58	-0.20	0.30	32.57	39.99889957	-104.89242672
3196.00	0.07	351.190	3195.62	-32.36	-0.29	0.20	32.35	39.99890018	-104.89242705
3286.00	0.31	273.880	3285.62	-32.29	-0.54	0.34	32.29	39.99890037	-104.89242794
3376.00	0.26	26.410	3375.62	-32.09	-0.70	0.53	32.09	39.99890092	-104.89242849
3465.00	0.41	67.150	3464.62	-31.78	-0.31	0.31	31.78	39.99890176	-104.89242712
3555.00	0.11	276.130	3554.62	-31.65	-0.10	0.57	31.64	39.99890213	-104.89242636
3645.00	0.10	219.880	3644.62	-31.70	-0.24	0.11	31.69	39.99890199	-104.89242685
3735.00	0.18	224.540	3734.62	-31.86	-0.39	0.09	31.86	39.99890154	-104.89242738
3824.00	0.11	283.910	3823.62	-31.94	-0.57	0.18	31.94	39.99890133	-104.89242803
3914.00	0.10	199.520	3913.62	-31.99	-0.68	0.16	32.00	39.99890118	-104.89242842
4004.00	0.09	236.860	4003.62	-32.10	-0.76	0.07	32.11	39.99890087	-104.89242873
4094.00	0.11	222.860	4093.62	-32.21	-0.88	0.03	32.22	39.99890059	-104.89242915
4183.00	0.12	216.140	4182.62	-32.34	-1.00	0.02	32.36	39.99890021	-104.89242955
4273.00	0.61	13.250	4272.62	-31.95	-0.94	0.80	31.97	39.99890128	-104.89242936
4363.00	0.03	122.700	4362.62	-31.50	-0.81	0.69	31.51	39.99890253	-104.89242890
4452.00	0.00	8.310	4451.62	-31.51	-0.79	0.03	31.52	39.99890249	-104.89242883
4542.00	0.10	230.330	4541.62	-31.56	-0.85	0.11	31.57	39.99890236	-104.89242904
4632.00	0.10	250.560	4631.62	-31.64	-0.99	0.04	31.65	39.99890215	-104.89242952
4721.00	0.07	276.790	4720.62	-31.66	-1.11	0.05	31.68	39.99890209	-104.89242998
4811.00	0.15	219.170	4810.62	-31.74	-1.24	0.14	31.76	39.99890186	-104.89243044
4901.00	0.03	227.520	4900.62	-31.85	-1.33	0.13	31.87	39.99890157	-104.89243076
4990.00	0.11	189.440	4989.62	-31.95	-1.37	0.10	31.97	39.99890129	-104.89243088
5080.00	0.10	272.050	5079.62	-32.03	-1.46	0.15	32.06	39.99890107	-104.89243121
5170.00	0.10	277.790	5169.62	-32.02	-1.62	==>	32.05	39.99890110	-104.89243176
5260.00	0.17	197.240	5259.62	-32.14	-1.73	0.20	32.17	39.99890078	-104.89243218
5349.00	0.12	223.750	5348.62	-32.33	-1.84	0.09	32.36	39.99890025	-104.89243255
5439.00	0.07	279.270	5438.62	-32.39	-1.96	0.11	32.43	39.99890009	-104.89243298

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
5528.00	0.10	210.090	5527.62	-32.45	-2.05	0.11	32.49	39.99889993	-104.89243331
5617.00	0.04	18.070	5616.62	-32.49	-2.08	0.16	32.52	39.99889983	-104.89243341
5707.00	0.00	8.310	5706.62	-32.46	-2.07	0.04	32.49	39.99889991	-104.89243338
5796.00	1.96	331.580	5795.60	-31.12	-2.79	2.20	31.17	39.99890358	-104.89243597
5886.00	4.12	334.940	5885.47	-26.83	-4.89	2.41	26.94	39.99891534	-104.89244347
5975.00	6.30	336.730	5974.09	-19.45	-8.18	2.46	19.64	39.99893561	-104.89245519
6065.00	8.73	339.420	6063.31	-8.52	-12.53	2.73	8.81	39.99896562	-104.89247072
6155.00	12.09	342.930	6151.82	6.89	-17.70	3.80	-6.48	39.99900791	-104.89248917
6244.00	15.02	341.260	6238.33	26.73	-24.14	3.32	-26.15	39.99906236	-104.89251217
6333.00	18.32	338.140	6323.58	50.64	-33.06	3.84	-49.85	39.99912800	-104.89254399
6423.00	20.25	337.190	6408.53	78.12	-44.36	2.17	-77.07	39.99920345	-104.89258435
6512.00	23.11	339.850	6491.23	108.72	-56.35	3.40	-107.38	39.99928746	-104.89262715
6601.00	25.72	341.430	6572.26	143.43	-68.52	3.02	-141.80	39.99938274	-104.89267058
6691.00	29.64	341.920	6651.95	183.12	-81.65	4.36	-181.16	39.99949167	-104.89271745
6780.00	30.15	340.270	6729.10	225.08	-96.03	1.09	-222.78	39.99960686	-104.89276876
6870.00	30.34	339.130	6806.85	267.59	-111.76	0.67	-264.91	39.99972357	-104.89282490
6959.00	30.12	337.650	6883.75	309.25	-128.26	0.87	-306.17	39.99983792	-104.89288379
7048.00	30.10	336.570	6960.74	350.38	-145.62	0.61	-346.89	39.99995083	-104.89294578
7138.00	30.16	334.610	7038.59	391.51	-164.29	1.10	-387.58	40.00006374	-104.89301241
7227.00	25.46	330.010	7117.29	428.31	-183.45	5.80	-423.91	40.00016474	-104.89308081
7317.00	15.35	312.570	7201.61	453.21	-201.96	12.99	-448.37	40.00023309	-104.89314686
7406.00	12.56	284.590	7288.07	463.63	-220.02	8.10	-458.37	40.00026169	-104.89321134
7496.00	12.39	257.350	7376.02	463.98	-238.93	6.48	-458.28	40.00026265	-104.89327883
7585.00	17.55	245.230	7461.99	456.26	-260.45	6.75	-450.06	40.00024146	-104.89335564
7675.00	23.20	223.640	7546.45	437.70	-285.06	10.35	-430.93	40.00019052	-104.89344348
7764.00	28.67	201.000	7626.65	404.98	-304.87	12.61	-397.76	40.00010070	-104.89351420
7853.00	37.62	194.010	7701.12	358.58	-319.13	10.92	-351.04	39.99997333	-104.89356510
7943.00	46.49	188.120	7767.90	299.48	-330.42	10.78	-291.69	39.99981109	-104.89360538
8032.00	55.98	185.680	7823.57	230.66	-338.65	10.87	-222.70	39.99962218	-104.89363475
8121.00	64.67	185.720	7867.59	153.79	-346.32	9.76	-145.67	39.99941116	-104.89366214
8211.00	74.49	184.450	7898.95	69.88	-353.76	10.99	-61.61	39.99918082	-104.89368868
8243.84	78.15	183.650	7906.72	38.06	-356.01	11.40	-29.74	39.99909346	-104.89369671
8300.00	84.42	182.330	7915.22	-17.35	-358.90	11.40	25.72	39.99894136	-104.89370702
8345.00	85.93	181.580	7919.01	-62.16	-360.43	3.75	70.55	39.99881835	-104.89371247
8390.00	87.45	180.830	7921.60	-107.08	-361.37	3.75	115.48	39.99869506	-104.89371584
8479.00	87.41	179.050	7925.59	-195.98	-361.28	2.00	204.36	39.99845100	-104.89371550
8568.00	88.49	178.780	7928.78	-284.91	-359.60	1.25	293.22	39.99820689	-104.89370949
8657.00	89.88	178.210	7930.04	-373.87	-357.26	1.69	382.10	39.99796269	-104.89370114
8747.00	89.94	176.390	7930.19	-463.76	-353.02	2.02	471.87	39.99771592	-104.89368601
8836.00	89.97	177.360	7930.25	-552.63	-348.17	1.09	560.60	39.99747197	-104.89366868
8926.00	89.78	180.350	7930.45	-642.60	-346.37	3.33	650.51	39.99722499	-104.89366226
9015.00	90.06	180.140	7930.58	-731.60	-346.75	0.39	739.49	39.99698068	-104.89366362
9105.00	89.94	178.800	7930.58	-821.60	-345.92	1.49	829.44	39.99673364	-104.89366064
9194.00	90.09	177.560	7930.55	-910.55	-343.09	1.40	918.30	39.99648946	-104.89365055
9283.00	89.88	175.620	7930.58	-999.39	-337.80	2.19	1006.99	39.99624559	-104.89363165
9372.00	89.94	174.960	7930.72	-1088.09	-330.49	0.74	1095.50	39.99600210	-104.89360556
9462.00	89.88	176.070	7930.86	-1177.81	-323.45	1.24	1185.03	39.99575580	-104.89358044
9551.00	89.75	177.730	7931.14	-1266.67	-318.64	1.87	1273.76	39.99551186	-104.89356326
9640.00	90.25	179.990	7931.14	-1355.65	-316.87	2.60	1362.67	39.99526761	-104.89355693
9730.00	90.37	182.840	7930.66	-1445.61	-319.09	3.17	1452.66	39.99502066	-104.89356486
9819.00	90.22	183.590	7930.20	-1534.47	-324.08	0.86	1541.61	39.99477673	-104.89358267
9909.00	90.18	182.000	7929.88	-1624.36	-328.47	1.77	1631.58	39.99452998	-104.89359833
9998.00	89.91	180.170	7929.81	-1713.34	-330.16	2.08	1720.58	39.99428572	-104.89360434
10088.00	89.97	179.170	7929.91	-1803.34	-329.64	1.11	1810.54	39.99403867	-104.89360249
10177.00	89.88	180.070	7930.03	-1892.33	-329.05	1.02	1899.50	39.99379436	-104.89360038
10266.00	89.94	182.960	7930.17	-1981.29	-331.40	3.25	1988.49	39.99355016	-104.89360877
10356.00	89.94	184.040	7930.26	-2071.13	-336.89	1.20	2078.42	39.99330357	-104.89362837
10445.00	89.72	183.500	7930.52	-2159.93	-342.75	0.66	2167.34	39.99305979	-104.89364925
10535.00	89.88	184.540	7930.84	-2249.71	-349.06	1.17	2257.24	39.99281334	-104.89367177
10624.00	90.22	184.710	7930.76	-2338.42	-356.23	0.43	2346.09	39.99256982	-104.89369737
10714.00	90.49	183.660	7930.20	-2428.18	-362.80	1.20	2435.98	39.99232343	-104.89372081
10803.00	90.71	182.820	7929.27	-2517.03	-367.83	0.98	2524.92	39.99207952	-104.89373876
10893.00	90.15	181.500	7928.60	-2606.96	-371.22	1.59	2614.91	39.99183265	-104.89375086
10982.00	90.28	180.940	7928.26	-2695.94	-373.12	0.65	2703.91	39.99158840	-104.89375761
11071.00	89.51	176.130	7928.42	-2784.88	-370.84	5.47	2792.77	39.99134424	-104.89374949
11161.00	89.75	176.140	7929.01	-2874.67	-364.77	0.27	2882.40	39.99109775	-104.89372784
11250.00	89.69	176.650	7929.44	-2963.50	-359.18	0.58	2971.07	39.99085392	-104.89370786
11340.00	89.78	177.180	7929.86	-3053.37	-354.34	0.60	3060.80	39.99060723	-104.89369057
11429.00	89.85	175.590	7930.14	-3142.19	-348.72	1.79	3149.46	39.99036341	-104.89367054
11518.00	92.06	176.560	7928.66	-3230.96	-342.63	2.71	3238.07	39.99011972	-104.89364880
11607.00	94.00	178.760	7923.96	-3319.75	-339.00	3.29	3326.75	39.98987598	-104.89363584
11697.00	92.34	178.110	7918.98	-3409.57	-336.55	1.98	3416.50	39.98962940	-104.89362707
11786.00	90.12	180.100	7917.07	-3498.53	-335.16	3.35	3505.40	39.98938520	-104.89362211
11876.00	87.97	179.510	7918.57	-3588.51	-334.85	2.48	3595.35	39.98913819	-104.89362102
11965.00	88.06	178.790	7921.65	-3677.45	-333.53	0.81	3684.23	39.98889406	-104.89361630
12055.00	87.85	181.530	7924.86	-3767.38	-333.78	3.05	3774.14	39.98864718	-104.89361719
12144.00	88.03	179.400	7928.06	-3856.32	-334.51	2.40	3863.07	39.98840305	-104.89361977
12233.00	88.12	178.580	7931.05	-3945.25	-332.94	0.93	3951.95	39.98815891	-104.89361417
12322.00	88.06	176.560	7934.02	-4034.12	-329.17	2.27	4040.70	39.98791497	-104.89360070
12412.00	88.65	176.210	7936.60	-4123.90	-323.50	0.76	4130.33	39.98766850	-104.89358046
12501.00	90.15	177.280	7937.54	-4212.75	-318.44	2.07	4219.03	39.98742461	-104.89356242
12591.00	89.82	179.620	7937.56	-4302.71	-316.01	2.63	4308.91	39.98717766	-104.89355373
12680.00	90.37	179.130	7937.41	-4391.71	-315.04	0.83	4397.86	39.98693336	-104.89355026
12769.00	90.15	181.220	7937.01	-4480.70	-315.31	2.36	4486.83	39.98668907	-104.89355123
12859.00	89.38	179.840	7937.38	-4570.69	-316.14	1.76	4576.82	39.98644203	-104.89355419
12948.00	89.91	179.610	7937.93	-4659.69	-315.71	0.65	4665.78	39.98619772	-104.89355267
13038.00	90.18	180.120	7937.86	-4749.69	-315.50	0.64	4755.75	39.98595067	-104.89355190

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
13127.00	89.97	179.870	7937.74	-4838.69	-315.49	0.37	4844.73	39.98570635	-104.89355187
13216.00	89.97	177.360	7937.79	-4927.65	-313.34	2.82	4933.62	39.98546213	-104.89354419
13306.00	90.25	179.810	7937.61	-5017.62	-311.12	2.74	5023.51	39.98521517	-104.89353626
13395.00	90.40	181.180	7937.11	-5106.61	-311.89	1.55	5112.50	39.98497087	-104.89353900
13485.00	89.78	181.410	7936.97	-5196.59	-313.92	0.73	5202.50	39.98472388	-104.89354625
13574.00	89.85	179.720	7937.26	-5285.58	-314.80	1.90	5291.49	39.98447959	-104.89354938
13663.00	89.85	178.670	7937.49	-5374.57	-313.55	1.18	5380.42	39.98423530	-104.89354491
13753.00	90.00	177.600	7937.61	-5464.52	-310.62	1.20	5470.28	39.98398838	-104.89353446
13842.00	90.03	177.750	7937.58	-5553.45	-307.01	0.17	5559.10	39.98374427	-104.89352157
13931.00	90.06	179.380	7937.51	-5642.42	-304.78	1.83	5647.99	39.98350004	-104.89351361
14021.00	90.03	181.590	7937.44	-5732.41	-305.54	2.46	5737.98	39.98325300	-104.89351633
14110.00	90.00	181.700	7937.42	-5821.37	-308.10	0.13	5826.97	39.98300879	-104.89352544
14200.00	90.28	182.130	7937.20	-5911.32	-311.11	0.57	5916.97	39.98276187	-104.89353617
14289.00	90.09	184.510	7936.91	-6000.17	-316.26	2.68	6005.91	39.98251799	-104.89355456
14378.00	89.82	184.700	7936.98	-6088.88	-323.41	0.37	6094.76	39.98227446	-104.89358005
14468.00	90.12	183.180	7937.03	-6178.66	-329.59	1.72	6184.67	39.98202800	-104.89360211
14557.00	90.12	181.870	7936.84	-6267.57	-333.51	1.47	6273.65	39.98178393	-104.89361610
14647.00	90.03	180.100	7936.72	-6357.56	-335.06	1.97	6363.64	39.98153691	-104.89362161
14736.00	90.00	178.290	7936.70	-6446.54	-333.81	2.03	6452.58	39.98129264	-104.89361715
14826.00	90.12	179.340	7936.61	-6536.52	-331.95	1.17	6542.49	39.98104563	-104.89361050
14915.00	89.97	179.770	7936.54	-6625.52	-331.26	0.51	6631.44	39.98080133	-104.89360803
15004.00	89.69	178.400	7936.80	-6714.51	-329.83	1.57	6720.37	39.98055705	-104.89360296
15094.00	89.57	178.800	7937.38	-6804.48	-327.64	0.46	6810.27	39.98031007	-104.89359511
15183.00	90.06	178.740	7937.67	-6893.46	-325.73	0.55	6899.18	39.98006582	-104.89358829
15272.00	90.18	181.040	7937.48	-6982.45	-325.55	2.59	6988.14	39.97982152	-104.89358767
15362.00	89.23	178.750	7937.95	-7072.44	-325.39	2.75	7078.11	39.97957449	-104.89358708
15451.00	90.00	178.040	7938.54	-7161.40	-322.90	1.18	7166.99	39.97933028	-104.89357818
15540.00	89.91	178.590	7938.61	-7250.36	-320.28	0.63	7255.86	39.97908607	-104.89356884
15630.00	89.63	178.700	7938.98	-7340.34	-318.15	0.33	7345.76	39.97883908	-104.89356124
15719.00	89.97	179.360	7939.29	-7429.32	-316.64	0.83	7434.69	39.97859481	-104.89355586
15808.00	90.09	181.530	7939.24	-7518.32	-317.34	2.44	7523.67	39.97835052	-104.89355832
15897.00	89.82	184.020	7939.31	-7607.21	-321.64	2.81	7612.64	39.97810651	-104.89357369
15987.00	90.12	182.670	7939.36	-7697.05	-326.90	1.54	7702.58	39.97785988	-104.89359242
16076.00	90.28	181.060	7939.05	-7786.00	-329.79	1.82	7791.57	39.97761570	-104.89360275
16165.00	90.00	180.580	7938.83	-7874.99	-331.07	0.62	7880.57	39.97737142	-104.89360730
16255.00	90.06	178.630	7938.78	-7964.98	-330.45	2.17	7970.52	39.97712438	-104.89360508
16344.00	90.09	177.070	7938.67	-8053.92	-327.11	1.75	8059.36	39.97688024	-104.89359316
16433.00	89.35	178.390	7939.10	-8142.84	-323.58	1.70	8148.18	39.97663613	-104.89358058
16523.00	90.71	180.140	7939.05	-8232.83	-322.43	2.46	8238.11	39.97638911	-104.89357645
16612.00	88.74	178.390	7939.48	-8321.81	-321.29	2.96	8327.04	39.97614484	-104.89357238
16701.00	89.48	173.830	7940.86	-8410.58	-315.25	5.19	8415.64	39.97590118	-104.89355084
16791.00	89.66	174.130	7941.54	-8500.08	-305.81	0.39	8504.90	39.97565550	-104.89351716
16880.00	89.14	176.830	7942.47	-8588.79	-298.80	3.09	8593.42	39.97541198	-104.89349213
16969.00	89.29	177.410	7943.69	-8677.66	-294.33	0.67	8682.17	39.97516800	-104.89347617
17059.00	89.17	180.360	7944.90	-8767.63	-292.58	3.28	8772.07	39.97492104	-104.89346992
17148.00	89.08	180.800	7946.26	-8856.61	-293.48	0.50	8861.05	39.97467676	-104.89347313
17237.00	89.29	179.760	7947.53	-8945.60	-293.91	1.19	8950.02	39.97443248	-104.89347468
17327.00	89.66	180.590	7948.35	-9035.60	-294.19	1.01	9040.00	39.97418544	-104.89347566
17416.00	89.45	180.730	7949.04	-9124.59	-295.21	0.28	9128.99	39.97394115	-104.89347931
17506.00	89.38	183.300	7949.96	-9214.52	-298.38	2.86	9218.97	39.97369427	-104.89349060
17595.00	89.38	184.400	7950.92	-9303.31	-304.35	1.24	9307.88	39.97345053	-104.89351191
17684.00	89.32	185.700	7951.93	-9391.96	-312.18	1.46	9396.69	39.97320719	-104.89353986
17774.00	89.35	184.180	7952.98	-9481.62	-319.93	1.69	9486.50	39.97296107	-104.89356750
17863.00	89.23	182.530	7954.08	-9570.46	-325.14	1.86	9575.44	39.97271720	-104.89358608
17953.00	89.38	181.160	7955.17	-9660.40	-328.04	1.53	9665.42	39.97247029	-104.89359641
18042.00	89.82	178.980	7955.79	-9749.39	-328.15	2.50	9754.39	39.97222600	-104.89359680
18131.00	89.97	178.740	7955.96	-9838.37	-326.38	0.32	9843.31	39.97198174	-104.89359047
18221.00	89.45	179.460	7956.41	-9928.36	-324.96	0.99	9933.24	39.97173471	-104.89358543
18310.00	88.92	178.410	7957.68	-10017.34	-323.31	1.32	10022.15	39.97149047	-104.89357952
18400.00	89.20	180.610	7959.15	-10107.31	-322.54	2.46	10112.09	39.97124347	-104.89357677
18489.00	88.49	181.390	7960.95	-10196.28	-324.09	1.18	10201.07	39.97099925	-104.89358231
18579.00	88.52	181.420	7963.30	-10286.22	-326.30	0.05	10291.04	39.97075235	-104.89359017
18668.00	88.55	182.030	7965.57	-10375.15	-328.98	0.69	10380.00	39.97050823	-104.89359973
18757.00	89.23	182.670	7967.30	-10464.06	-332.63	1.05	10468.97	39.97026417	-104.89361274
18847.00	89.05	182.950	7968.65	-10553.94	-337.04	0.37	10558.93	39.97001743	-104.89362847
18936.00	89.08	184.560	7970.10	-10642.74	-342.87	1.81	10647.84	39.96977368	-104.89364926
19025.00	89.38	183.290	7971.30	-10731.52	-348.96	1.47	10736.74	39.96952997	-104.89367099
19114.00	91.05	179.080	7970.96	-10820.48	-350.80	5.09	10825.71	39.96928577	-104.89367755
19203.00	89.54	173.450	7970.50	-10909.25	-345.00	6.55	10914.33	39.96904209	-104.89365687
19292.00	89.94	174.290	7970.91	-10997.74	-335.50	1.05	11002.57	39.96879918	-104.89362296
19382.00	90.12	176.080	7970.86	-11087.41	-327.94	2.00	11092.05	39.96855300	-104.89359600
19471.00	92.25	176.220	7969.02	-11176.19	-321.97	2.40	11180.66	39.96830930	-104.89357469
19561.00	91.97	177.610	7965.71	-11266.00	-317.13	1.57	11270.33	39.96806278	-104.89355741
19650.00	90.89	180.770	7963.48	-11354.95	-315.87	3.75	11359.23	39.96781860	-104.89355293
19739.00	91.23	181.560	7961.84	-11443.91	-317.68	0.97	11448.21	39.96757438	-104.89355938
19829.00	91.14	179.930	7959.98	-11533.88	-318.85	1.81	11538.18	39.96732740	-104.89356355
19919.00	91.32	179.580	7958.04	-11623.86	-318.47	0.44	11628.13	39.96708040	-104.89356217
19999.00	91.08	180.370	7956.37	-11703.84	-318.43	1.03	11708.09	39.96686085	-104.89356204
20088.00	91.26	179.330	7954.55	-11792.82	-318.20	1.19	11797.04	39.96661659	-104.89356121
20177.00	90.96	177.110	7952.83	-11881.76	-315.44	2.52	11885.88	39.96637245	-104.89355134
20267.00	90.00	178.170	7952.07	-11971.68	-311.73	1.59	11975.69	39.96612562	-104.89353812
20356.00	89.82	178.160	7952.21	-12060.63	-308.88	0.20	12064.55	39.96588143	-104.89352795
20446.00	89.45	180.090	7952.79	-12150.61	-307.51	2.18	12154.48	39.96563442	-104.89352304
20535.00	89.69	181.990	7953.45	-12239.59	-309.12	2.15	12243.47	39.96539016	-104.89352880
20624.00	89.32	182.470	7954.22	-12328.52	-312.58	0.68	12332.46	39.96514604	-104.89354115
20714.00	89.42	182.070	7955.21	-12418.44	-316.15	0.46	12422.44	39.96489919	-104.89355386
20803.00	89.48	182.070	7956.07	-12507.38	-319.36	0.07	12511.43	39.96465505	-104.89356532

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
20893.00	89.08	181.770	7957.20	-12597.32	-322.38	0.56	12601.42	39.96440815	-104.89357608
20982.00	89.17	180.230	7958.56	-12686.30	-323.93	1.73	12690.40	39.96416391	-104.89358161
21072.00	88.92	180.640	7960.06	-12776.28	-324.61	0.53	12780.38	39.96391689	-104.89358405
21161.00	88.98	180.580	7961.69	-12865.26	-325.56	0.10	12869.36	39.96367263	-104.89358742
21250.00	88.86	179.950	7963.37	-12954.24	-325.97	0.72	12958.32	39.96342837	-104.89358889
21339.00	88.86	177.890	7965.14	-13043.21	-324.30	2.31	13047.22	39.96318416	-104.89358290
21429.00	88.80	177.110	7966.97	-13133.10	-320.37	0.87	13137.00	39.96293739	-104.89356889
21518.00	89.78	177.930	7968.08	-13222.01	-316.52	1.44	13225.80	39.96269333	-104.89355515
21608.00	89.85	177.840	7968.37	-13311.95	-313.20	0.13	13315.63	39.96244644	-104.89354330
21698.00	89.85	179.000	7968.60	-13401.91	-310.72	1.29	13405.51	39.96219948	-104.89353444
21787.00	89.88	180.400	7968.81	-13490.91	-310.25	1.57	13494.47	39.96195517	-104.89353278
21876.00	89.82	182.420	7969.05	-13579.88	-312.44	2.27	13583.47	39.96171095	-104.89354058
21966.00	90.06	182.400	7969.14	-13669.80	-316.23	0.27	13673.45	39.96146411	-104.89355408
22055.00	90.18	181.930	7968.95	-13758.73	-319.59	0.55	13762.44	39.96121997	-104.89356607
22144.00	90.15	182.440	7968.70	-13847.67	-322.98	0.57	13851.43	39.96097584	-104.89357817
22234.00	90.06	180.720	7968.53	-13937.63	-325.46	1.91	13941.43	39.96072888	-104.89358702
22323.00	89.91	178.660	7968.56	-14026.62	-324.98	2.32	14030.39	39.96048458	-104.89358530
22413.00	89.94	179.860	7968.67	-14116.61	-323.82	1.33	14120.33	39.96023755	-104.89358115
22502.00	89.88	179.670	7968.81	-14205.61	-323.45	0.22	14209.29	39.95999324	-104.89357984
22591.00	89.97	179.010	7968.93	-14294.61	-322.43	0.75	14298.24	39.95974894	-104.89357618
22681.00	90.03	176.830	7968.93	-14384.54	-319.16	2.42	14388.07	39.95950206	-104.89356452
22770.00	90.15	178.010	7968.79	-14473.45	-315.16	1.33	14476.86	39.95925800	-104.89355023
22859.00	88.83	181.270	7969.58	-14562.43	-314.60	3.95	14565.81	39.95901374	-104.89354823
22949.00	88.89	183.850	7971.37	-14652.32	-318.62	2.87	14655.76	39.95876700	-104.89356256
23038.00	88.22	184.190	7973.62	-14741.07	-324.85	0.84	14744.63	39.95852336	-104.89358481
23128.00	88.58	180.710	7976.13	-14830.94	-328.70	3.89	14834.57	39.95827666	-104.89359852
23217.00	88.71	178.700	7978.24	-14919.91	-328.24	2.26	14923.50	39.95803243	-104.89359688
23307.00	90.31	181.120	7979.01	-15009.89	-328.10	3.22	15013.46	39.95778541	-104.89359637
23396.00	90.03	181.750	7978.74	-15098.86	-330.33	0.77	15102.46	39.95754118	-104.89360432
23486.00	90.00	182.210	7978.72	-15188.81	-333.44	0.51	15192.45	39.95729426	-104.89361540
23575.00	90.03	182.490	7978.70	-15277.73	-337.09	0.32	15281.44	39.95705016	-104.89362842
23615.00	89.98	181.830	7978.69	-15317.71	-338.59	1.66	15321.44	39.95694043	-104.89363379
23664.00	89.91	181.020	7978.74	-15366.69	-339.81	1.66	15370.44	39.95680596	-104.89363814
23681.16	89.93	181.300	7978.77	-15383.85	-340.16	1.64	15387.60	39.95675887	-104.89363937
23684.61	89.94	181.360	7978.77	-15387.30	-340.24	1.64	15391.05	39.95674940	-104.89363966
23754.00	90.03	182.490	7978.79	-15456.65	-342.57	1.64	15460.43	39.95655903	-104.89364796
23843.00	90.12	186.070	7978.67	-15545.38	-349.21	4.02	15549.30	39.95631543	-104.89367165
23933.00	90.03	189.140	7978.55	-15634.58	-361.12	3.41	15638.75	39.95607058	-104.89371413
23950.16	90.03	189.140	7978.55	-15651.52	-363.84	==>	15655.75	39.95602407	-104.89372385
23960.00	90.03	189.140	7978.54	-15661.24	-365.41	==>	15665.50	39.95599740	-104.89372942

Comments

MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment
1739.00	1738.65	-31.69	0.60	39.99890201	-104.89242385	9.625" Csg: 1739 MD/TVD
8243.84	7906.72	38.06	-356.01	39.99909346	-104.89369671	460 Setback: 8244 / 7907 MD/TVD, 460 FNL, 2607 FEL Sec 04
8345.00	7919.01	-62.16	-360.43	39.99881835	-104.89371247	Top Perf: 8345 / 7919 MD/TVD, 560 FNL, 2611 FEL Sec 04
23615.00	7978.69	-15317.71	-338.59	39.95694043	-104.89363379	Btm Perf: 23,615 / 7979 MD/TVD, 240 FNL, 2610 FEL Sec 21
23681.16	7978.77	-15383.85	-340.16	39.95675887	-104.89363937	Btm Toe Sub: 23,681 / 7979 MD/TVD, 306 FNL, 2611 FEL Sec 21
23684.61	7978.77	-15387.30	-340.24	39.95674940	-104.89363966	310 Setback: 23,685 / 7979 MD/TVD, 310 FNL, 2612 FEL Sec 21
23950.16	7978.55	-15651.52	-363.84	39.95602407	-104.89372385	PBTD: 23,950 / 7979 MD/TVD, 574 FNL, 2636 FEL Sec 21
23960.00	7978.54	-15661.24	-365.41	39.95599740	-104.89372942	5.5" Csg: 23,960 / 7979 MD/TVD, 584 FNL, 2637 FEL Sec 21
23960.00	7978.54	-15661.24	-365.41	39.95599740	-104.89372942	BHL: 23,960 / 7979 MD/TVD, 584 FNL, 2637 FEL Sec 21

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	1739.00	1738.65	-31.69	0.60
8.500	1739.00	1738.65	-31.69	0.60	23960.00	7978.54	-15661.24	-365.41

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	1739.00	1738.65	-31.69	0.60
5 1/2in Casing	0.00	0.00	0.00	0.00	23960.00	7978.54	-15661.24	-365.41

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool
500265	As Drilled - 20181130	23960.00	7978.54	MWD

Coordinates are from Slot
MDs and TVDs are from Rig Floor 5159.5ft above Mean Sea Level
Vertical Section is from 0.00 0.00 on azimuth 181.340 degrees
Bottom hole distance is 15665.50 Feet on azimuth 181.34 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Great Western Operating Co.
Date Printed: