

Great Western Operating Co, LLC
 Directional Survey Report
 Wellpath: Tollway LC 24-379HC
 MDs and TVDs are from Rig Floor 5178.2ft above Mean Sea Level

Wellbore Information

Date Created	Date Revised	API #	RKB above GL	Well Name
Sep-17-2019	Dec-2-2019	05-001-10446	20.00	Tollway LC 24-379HC

Slot Coordinates

Latitude	Longitude
39.97744200	-104.93844000

Pad Information

Pad Name	Ground Elev.
Tollway	5158.20

Field

Name
Wattensburg

Wellpath Report

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
0.00	0.00	0.00	0.00	0.00	0.00		0.00	39.97744200	-104.93844000
14.00	0.00	27.20	14.00	0.00	0.00	0.00	0.00	39.97744200	-104.93844000
96.00	0.18	27.20	96.00	0.11	0.06	0.22	-0.13	39.97744231	-104.93843979
186.00	0.57	7.51	186.00	0.68	0.18	0.45	-0.70	39.97744388	-104.93843935
273.00	0.40	15.51	272.99	1.41	0.32	0.21	-1.42	39.97744586	-104.93843886
365.00	0.53	1.27	364.99	2.14	0.42	0.19	-2.13	39.97744788	-104.93843852
455.00	0.75	4.52	454.99	3.14	0.47	0.25	-3.07	39.97745063	-104.93843832
545.00	0.83	8.74	544.98	4.38	0.62	0.11	-4.26	39.97745401	-104.93843780
635.00	1.45	25.27	634.96	6.05	1.20	0.77	-6.03	39.97745861	-104.93843571
725.00	1.01	35.29	724.94	7.73	2.15	0.54	-7.95	39.97746321	-104.93843234
815.00	0.75	23.33	814.93	8.92	2.84	0.35	-9.31	39.97746647	-104.93842988
905.00	0.35	49.52	904.92	9.63	3.28	0.51	-10.15	39.97746845	-104.93842830
995.00	0.44	24.91	994.92	10.13	3.63	0.21	-10.74	39.97746980	-104.93842703
1085.00	0.31	58.23	1084.92	10.57	3.99	0.28	-11.28	39.97747101	-104.93842577
1175.00	0.48	31.51	1174.92	11.02	4.39	0.27	-11.86	39.97747224	-104.93842433
1265.00	1.19	5.84	1264.91	12.27	4.68	0.87	-13.12	39.97747568	-104.93842329
1355.00	0.22	349.76	1354.90	13.37	4.75	1.09	-14.16	39.97747870	-104.93842306
1445.00	1.36	250.88	1444.89	13.19	3.71	1.57	-13.58	39.97747820	-104.93842677
1535.00	3.43	251.76	1534.81	12.00	0.14	2.30	-11.07	39.97747493	-104.93843950
1625.00	6.06	249.21	1624.49	9.47	-6.86	2.93	-5.98	39.97746799	-104.93846447
1715.00	8.53	251.06	1713.76	5.61	-17.62	2.76	1.81	39.97745741	-104.93850285
1765.00	10.46	247.54	1763.07	2.68	-25.32	4.03	7.56	39.97744934	-104.93853034
1845.00	12.40	245.51	1841.48	-3.66	-39.85	2.48	19.13	39.97743195	-104.93858218
1934.00	12.45	247.69	1928.40	-11.26	-57.42	0.53	33.06	39.97741108	-104.93864488
2024.00	12.38	247.07	2016.29	-18.70	-75.28	0.17	46.96	39.97739065	-104.93870861
2113.00	14.51	247.34	2102.85	-26.72	-94.36	2.39	61.87	39.97736865	-104.93877668
2202.00	17.02	248.79	2188.49	-35.73	-116.79	2.85	79.02	39.97734392	-104.93885673
2292.00	19.60	248.81	2273.93	-45.95	-143.15	2.87	98.84	39.97731586	-104.93895079
2381.00	23.06	248.57	2356.82	-57.72	-173.30	3.89	121.58	39.97728355	-104.93905838
2470.00	26.10	251.49	2437.75	-70.31	-208.10	3.68	146.91	39.97724900	-104.93918255
2560.00	29.43	249.59	2517.38	-84.31	-247.61	3.83	175.39	39.97721057	-104.93932352
2650.00	31.74	249.07	2594.85	-100.48	-290.45	2.58	207.19	39.97716618	-104.93947637
2739.00	34.83	251.53	2669.24	-116.90	-336.44	3.79	240.47	39.97712110	-104.93964046
2829.00	37.70	249.40	2741.81	-134.72	-386.59	3.48	276.68	39.97707216	-104.93981940
2918.00	40.33	249.50	2810.95	-154.39	-439.04	2.96	315.50	39.97701818	-104.94000657
3008.00	42.83	251.03	2878.27	-174.54	-495.26	3.00	356.25	39.97696287	-104.94020717
3097.00	45.24	250.60	2942.25	-194.87	-553.69	2.73	398.03	39.97690705	-104.94041563
3187.00	45.77	249.30	3005.33	-216.88	-613.99	1.19	442.11	39.97684662	-104.94063080
3276.00	45.03	248.57	3067.82	-239.65	-673.12	1.02	486.42	39.97678410	-104.94084180
3366.00	44.57	248.74	3131.68	-262.74	-732.19	0.53	530.99	39.97672073	-104.94105255
3455.00	44.59	249.09	3195.07	-285.21	-790.48	0.28	574.69	39.97665903	-104.94126053
3545.00	45.15	250.30	3258.86	-307.24	-850.03	1.13	618.48	39.97659855	-104.94147300
3634.00	45.11	251.69	3321.65	-327.78	-909.66	1.11	660.94	39.97654216	-104.94168578
3724.00	44.88	249.69	3385.30	-348.82	-969.71	1.59	704.02	39.97648440	-104.94190004
3813.00	45.11	249.48	3448.23	-370.77	-1028.68	0.31	747.51	39.97642414	-104.94211046
3902.00	45.09	251.62	3511.06	-391.76	-1088.12	1.70	790.31	39.97636652	-104.94232254
3992.00	44.93	248.40	3574.70	-413.51	-1147.92	2.54	833.94	39.97630680	-104.94253591
4081.00	45.07	249.96	3637.63	-435.88	-1206.74	1.25	877.76	39.97624539	-104.94274578
4171.00	45.09	249.32	3701.18	-458.05	-1266.49	0.50	921.76	39.97618452	-104.94295896
4260.00	44.95	250.28	3764.09	-479.79	-1325.57	0.78	965.10	39.97612484	-104.94316976
4350.00	44.81	250.98	3827.87	-500.85	-1385.48	0.57	1008.15	39.97606701	-104.94338352
4439.00	45.01	251.34	3890.90	-521.14	-1444.95	0.36	1050.31	39.97601130	-104.94359571
4529.00	44.97	250.28	3954.55	-542.05	-1505.04	0.83	1093.29	39.97595388	-104.94381011
4618.00	45.11	251.07	4017.44	-562.89	-1564.46	0.65	1135.94	39.97589666	-104.94402215
4707.00	45.06	250.46	4080.28	-583.66	-1623.97	0.49	1178.56	39.97583966	-104.94423447
4797.00	44.67	248.84	4144.07	-605.73	-1683.50	1.34	1222.38	39.97577905	-104.94444685
4886.00	44.31	250.82	4207.56	-627.24	-1742.03	1.61	1265.29	39.97572000	-104.94465571
4976.00	44.61	250.83	4271.80	-647.94	-1801.57	0.33	1307.86	39.97566315	-104.94486815
5065.00	44.80	250.57	4335.05	-668.64	-1860.66	0.30	1350.25	39.97560634	-104.94507898
5155.00	45.06	249.02	4398.77	-690.59	-1920.31	1.25	1394.01	39.97554606	-104.94529179
5244.00	45.07	249.10	4461.63	-713.11	-1979.15	0.06	1437.97	39.97548424	-104.94550174
5334.00	45.04	249.01	4525.21	-735.88	-2038.64	0.08	1482.42	39.97542171	-104.94571401
5424.00	45.20	248.86	4588.72	-758.80	-2098.15	0.21	1527.02	39.97535878	-104.94592634
5513.00	45.24	249.00	4651.41	-781.51	-2157.10	0.12	1571.20	39.97529642	-104.94613667
5602.00	45.21	249.91	4714.10	-803.68	-2216.26	0.73	1614.97	39.97523554	-104.94634775
5692.00	45.09	252.33	4777.57	-824.33	-2276.63	1.91	1657.81	39.97517885	-104.94656312
5781.00	45.22	248.57	4840.35	-845.44	-2336.07	3.00	1700.72	39.97512089	-104.94677521
5871.00	44.93	249.76	4903.90	-868.10	-2395.62	0.99	1745.10	39.97505865	-104.94698769
5960.00	44.94	249.91	4966.91	-889.77	-2454.63	0.12	1788.34	39.97499915	-104.94719822
6049.00	45.04	250.36	5029.85	-911.15	-2513.81	0.37	1831.39	39.97494044	-104.94740936
6139.00	45.07	251.88	5093.43	-931.77	-2574.08	1.20	1874.17	39.97488385	-104.94762440
6229.00	44.75	247.36	5157.19	-953.87	-2633.61	3.56	1918.03	39.97482314	-104.94783681
6318.00	44.39	252.15	5220.61	-975.48	-2692.17	3.80	1961.04	39.97476380	-104.94804575
6408.00	44.73	250.11	5284.74	-995.91	-2751.92	1.63	2003.44	39.97470772	-104.94825893
6497.00	45.16	251.47	5347.73	-1016.59	-2811.29	1.18	2045.92	39.97465092	-104.94847075
6586.00	44.90	251.06	5410.63	-1036.81	-2870.92	0.44	2088.09	39.97459539	-104.94868350

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
6676.00	45.13	250.54	5474.26	-1057.75	-2931.03	0.48	2131.10	39.97453790	-104.94889798
6765.00	44.94	251.07	5537.15	-1078.45	-2990.50	0.47	2173.64	39.97448105	-104.94911016
6855.00	45.65	250.98	5600.46	-1099.25	-3050.99	0.79	2216.68	39.97442393	-104.94932598
6944.00	45.27	247.47	5662.90	-1121.74	-3110.29	2.84	2260.79	39.97436218	-104.94953754
7034.00	45.20	247.97	5726.27	-1145.97	-3169.42	0.40	2306.44	39.97429565	-104.94974850
7123.00	44.48	248.89	5789.38	-1169.04	-3227.78	1.09	2350.72	39.97423229	-104.94995671
7213.00	44.21	249.60	5853.74	-1191.33	-3286.60	0.63	2394.47	39.97417107	-104.95016659
7302.00	45.29	249.20	5916.95	-1213.38	-3345.25	1.25	2437.92	39.97411053	-104.95037584
7391.00	45.52	252.14	5979.44	-1234.35	-3405.04	2.37	2480.83	39.97405294	-104.95058916
7481.00	45.62	250.66	6042.45	-1254.85	-3465.95	1.18	2523.76	39.97399665	-104.95080647
7571.00	45.53	251.52	6105.45	-1275.68	-3526.75	0.69	2566.95	39.97393944	-104.95102341
7660.00	44.56	250.24	6168.33	-1296.30	-3586.26	1.49	2609.43	39.97388281	-104.95123572
7750.00	44.31	249.05	6232.60	-1318.22	-3645.33	0.97	2652.93	39.97382263	-104.95144648
7839.00	45.04	249.65	6295.88	-1340.28	-3703.89	0.95	2696.36	39.97376203	-104.95165539
7928.00	44.35	249.25	6359.15	-1362.25	-3762.50	0.84	2739.73	39.97370169	-104.95186451
8018.00	45.36	250.01	6422.95	-1384.35	-3822.01	1.27	2783.56	39.97364103	-104.95207682
8108.00	45.27	250.04	6486.24	-1406.20	-3882.15	0.10	2827.43	39.97358099	-104.95229138
8197.00	45.28	250.40	6548.87	-1427.60	-3941.65	0.29	2870.63	39.97352223	-104.95250367
8286.00	45.26	251.29	6611.51	-1448.35	-4001.38	0.71	2913.31	39.97346525	-104.95271676
8376.00	45.38	247.52	6674.80	-1470.85	-4061.26	2.98	2957.67	39.97340345	-104.95293040
8465.00	44.36	249.39	6737.88	-1493.92	-4119.65	1.87	3001.96	39.97334010	-104.95313874
8555.00	44.80	249.10	6801.98	-1516.31	-4178.72	0.54	3045.89	39.97327862	-104.95334949
8645.00	45.25	250.36	6865.59	-1538.36	-4238.45	1.11	3089.77	39.97321806	-104.95356256
8734.00	44.70	247.67	6928.56	-1560.88	-4297.17	2.22	3133.69	39.97315622	-104.95377207
8824.00	45.00	251.58	6992.38	-1582.96	-4356.65	3.08	3177.50	39.97309556	-104.95398428
8913.00	45.39	252.33	7055.10	-1602.52	-4416.69	0.74	3219.22	39.973034184	-104.95419849
9003.00	45.31	252.61	7118.35	-1621.81	-4477.74	0.24	3261.09	39.97298887	-104.95441631
9092.00	45.31	250.76	7180.94	-1641.69	-4537.81	1.48	3303.11	39.97293427	-104.95463059
9182.00	45.08	248.87	7244.37	-1663.72	-4597.74	1.51	3347.05	39.97287376	-104.95484440
9271.00	45.29	249.90	7307.10	-1685.94	-4656.83	0.85	3390.85	39.97281272	-104.95505522
9360.00	45.55	249.92	7369.56	-1707.72	-4716.36	0.29	3434.40	39.97275291	-104.95526762
9450.00	45.33	249.05	7432.71	-1730.19	-4776.42	0.73	3478.80	39.97269119	-104.95548189
9539.00	44.93	247.13	7495.51	-1753.72	-4834.94	1.59	3523.56	39.97262657	-104.95569065
9629.00	44.77	249.25	7559.32	-1777.30	-4893.86	1.67	3568.53	39.97256180	-104.95590087
9718.00	44.90	249.58	7622.43	-1799.36	-4952.60	0.30	3612.04	39.97250121	-104.95611045
9808.00	45.26	248.98	7685.98	-1821.91	-5012.21	0.62	3656.33	39.97243928	-104.95632310
9897.00	47.01	235.83	7747.79	-1851.60	-5068.78	10.82	3705.98	39.97235775	-104.95652491
9987.00	49.57	227.53	7807.73	-1893.27	-5121.34	7.44	3765.04	39.97224335	-104.95671241
10076.00	56.31	223.26	7861.35	-1943.17	-5171.77	8.48	3830.83	39.97210631	-104.95689232
10166.00	59.80	214.00	7909.04	-2002.80	-5219.27	9.55	3904.37	39.97194262	-104.95706174
10256.00	61.82	203.80	7953.02	-2071.48	-5257.10	10.14	3982.42	39.97175406	-104.95719668
10345.00	68.08	198.80	7990.70	-2146.56	-5286.28	8.68	4062.92	39.97154793	-104.95730072
10434.00	74.26	197.44	8019.41	-2226.59	-5312.45	7.09	4146.77	39.97132824	-104.95739402
10524.00	79.91	191.71	8039.54	-2311.42	-5334.46	8.83	4233.39	39.97109533	-104.95747248
10613.00	86.58	185.62	8050.01	-2398.71	-5347.73	10.11	4318.81	39.97085571	-104.95751976
10658.00	90.31	180.66	8051.23	-2443.61	-5350.19	13.79	4361.01	39.97073247	-104.95752850
10702.00	89.91	176.91	8051.15	-2487.59	-5349.26	8.57	4401.04	39.97061174	-104.95752514
10792.00	89.72	178.03	8051.44	-2577.50	-5345.28	1.26	4482.04	39.97036493	-104.95751090
10881.00	89.94	177.55	8051.70	-2666.43	-5341.85	0.59	4562.36	39.97012080	-104.95749858
10971.00	90.37	179.72	8051.46	-2756.40	-5339.71	2.46	4644.14	39.96987383	-104.95749087
11060.00	90.86	181.98	8050.50	-2845.38	-5341.03	2.60	4726.38	39.96962957	-104.95749551
11150.00	90.83	182.36	8049.17	-2935.30	-5344.43	0.42	4810.31	39.96938272	-104.95750760
11239.00	90.22	182.12	8048.36	-3024.23	-5347.91	0.74	4893.36	39.96913860	-104.95751994
11329.00	89.69	181.73	8048.43	-3114.18	-5350.94	0.73	4977.17	39.96889168	-104.95753065
11418.00	89.66	179.69	8048.93	-3203.17	-5352.04	2.29	5059.33	39.96864740	-104.95753452
11508.00	89.32	179.64	8049.74	-3293.16	-5351.51	0.38	5141.77	39.96840035	-104.95753257
11597.00	89.26	179.50	8050.84	-3382.15	-5350.84	0.17	5223.24	39.96815607	-104.95753012
11686.00	89.23	179.56	8052.01	-3471.14	-5350.11	0.08	5304.67	39.96791178	-104.95752745
11776.00	89.57	179.66	8052.95	-3561.14	-5349.50	0.39	5387.08	39.96766474	-104.95752520
11865.00	89.85	180.43	8053.40	-3650.13	-5349.57	0.92	5468.85	39.96742043	-104.95752538
11955.00	89.63	179.64	8053.81	-3740.13	-5349.63	0.91	5551.52	39.96717338	-104.95752550
12044.00	89.66	180.54	8054.36	-3829.13	-5349.77	1.01	5633.31	39.96692907	-104.95752593
12134.00	89.75	180.19	8054.83	-3919.13	-5350.34	0.40	5716.19	39.96668202	-104.95752791
12223.00	90.22	178.79	8054.85	-4008.12	-5349.55	1.66	5797.61	39.96643772	-104.95752502
12313.00	89.17	176.58	8055.33	-4098.04	-5345.91	2.72	5878.75	39.96619089	-104.95751198
12402.00	90.89	177.23	8055.28	-4186.90	-5341.11	2.07	5958.47	39.96594695	-104.95749477
12492.00	91.08	181.75	8053.74	-4276.86	-5340.31	5.03	6040.77	39.96570000	-104.95749184
12581.00	90.99	181.03	8052.13	-4365.82	-5342.47	0.82	6123.32	39.96545580	-104.95749947
12671.00	90.31	180.68	8051.11	-4455.81	-5343.81	0.85	6206.50	39.96520878	-104.95750420
12760.00	90.37	181.39	8050.58	-4544.79	-5345.42	0.80	6288.85	39.96496451	-104.95750986
12850.00	90.06	179.94	8050.24	-4634.78	-5346.46	1.65	6371.92	39.96471748	-104.95751352
12939.00	90.06	178.85	8050.15	-4723.77	-5345.52	1.22	6453.28	39.96447318	-104.95751010
13029.00	90.06	180.63	8050.05	-4813.77	-5345.11	1.98	6535.77	39.96422613	-104.95750857
13118.00	90.34	179.27	8049.74	-4902.77	-5345.03	1.56	6617.47	39.96398183	-104.95750823
13208.00	89.85	179.02	8049.59	-4992.76	-5343.69	0.61	6699.59	39.96373480	-104.95750337
13297.00	90.09	178.23	8049.64	-5081.73	-5341.56	0.93	6780.45	39.96349056	-104.95749568
13386.00	89.91	180.05	8049.64	-5170.72	-5340.22	2.05	6861.65	39.96324628	-104.95749085
13476.00	90.83	180.03	8049.06	-5260.71	-5340.28	1.02	6944.33	39.96299923	-104.95749100
13565.00	90.95	179.48	8047.68	-5349.70	-5339.90	0.63	7025.91	39.96275495	-104.95748958
13655.00	91.23	180.40	8045.96	-5439.68	-5339.81	1.07	7108.51	39.96250794	-104.95748917
13744.00	91.23	180.80	8044.05	-5528.66	-5340.74	0.45	7190.59	39.96226369	-104.95749243
13833.00	90.15	181.01	8042.98	-5617.64	-5342.15	1.24	7272.87	39.96201943	-104.95749737
13923.00	90.09	179.63	8042.79	-5707.64	-5342.65	1.53	7355.72	39.96177238	-104.95749910
14013.00	90.09	177.95	8042.65	-5797.61	-5340.75	1.87	7437.60	39.96152539	-104.95749225
14102.00	90.18	179.77	8042.44	-5886.59	-5338.98	2.05	7518.62	39.96128113	-104.95748586
14192.00	88.92	180.38	8043.15	-5976.59	-5339.10	1.56	7601.32	39.96103409	-104.95748622
14281.00	89.51	181.35	8044.37	-6065.57	-5340.44	1.28	7683.57	39.96078983	-104.95749094
14371.00	89.05	181.23	8045.50	-6155.54	-5342.46	0.53	7767.00	39.96054285	-104.95749810
14460.00	88.92	180.03	8047.08	-6244.51	-5343.44	1.36	7849.10	39.96029859	-104.95750152
14550.00	89.66	180.21	8048.19	-6334.51	-5343.63	0.85	7931.83	39.96005155	-104.95750212
14639.00	88.74	180.26	8049.43	-6423.50	-5344.00	1.04	8013.70	39.95980727	-104.95750336
14728.00	90.52	180.53	8050.01	-6512.49	-5344.61	2.02	8095.67	39.95956297	-104.95750548
14817.00	90.03	181.33	8049.58	-6601.48	-5346.05	1.05	8177.97	39.95931870	-104.95751056
14907.00	89.82	179.94	8049.70	-6691.47	-5347.05	1.56	8261.01	39.95907166	-104.95751405
14996.00	89.82	178.53	8049.98	-6780.46	-5345.86	1.58	8342.27	39.958827	

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
15443.00	90.18	179.68	8051.91	-7227.34	-5338.33	1.21	8749.71	39.95760064	-104.95748252
15533.00	89.35	178.89	8052.27	-7317.33	-5337.20	1.27	8831.91	39.95735360	-104.95747845
15622.00	90.37	178.77	8052.49	-7406.31	-5335.39	1.15	8912.91	39.95710935	-104.95747189
15711.00	90.28	178.53	8051.99	-7495.28	-5333.29	0.29	8993.80	39.95686511	-104.95746435
15801.00	90.18	180.87	8051.63	-7585.28	-5332.82	2.60	9076.26	39.95661807	-104.95746260
15891.00	90.12	180.42	8051.39	-7675.27	-5333.83	0.50	9159.31	39.95637103	-104.95746614
15980.00	90.28	182.06	8051.08	-7764.25	-5335.76	1.85	9241.79	39.95612678	-104.95747294
16069.00	90.34	181.74	8050.60	-7853.19	-5338.71	0.37	9324.65	39.95588260	-104.95748340
16159.00	89.75	181.49	8050.53	-7943.16	-5341.25	0.71	9408.27	39.95563564	-104.95749238
16248.00	90.06	179.92	8050.67	-8032.15	-5342.34	1.80	9490.43	39.95539135	-104.95749622
16338.00	87.57	179.99	8052.54	-8122.12	-5342.27	2.77	9573.04	39.95514436	-104.95749590
16427.00	88.62	181.28	8055.49	-8211.06	-5343.26	1.87	9655.11	39.95490021	-104.95749935
16517.00	89.11	179.92	8057.28	-8301.04	-5344.20	1.61	9738.12	39.95465321	-104.95750264
16606.00	89.14	178.90	8058.64	-8390.02	-5343.28	1.15	9819.48	39.95440895	-104.95749930
16696.00	89.17	179.05	8059.96	-8480.00	-5341.67	0.17	9901.48	39.95416195	-104.95749349
16785.00	88.92	178.53	8061.45	-8568.97	-5339.79	0.65	9982.44	39.95391773	-104.95748672
16875.00	88.77	177.06	8063.26	-8658.88	-5336.33	1.64	10063.65	39.95367091	-104.95747430
16965.00	89.02	178.61	8065.00	-8748.80	-5332.93	1.74	10144.88	39.95342408	-104.95746211
17054.00	89.08	179.13	8066.47	-8837.77	-5331.18	0.59	10225.90	39.95317985	-104.95745578
17144.00	88.98	178.41	8068.00	-8927.73	-5329.25	0.81	10307.76	39.95293289	-104.95744882
17233.00	88.92	181.67	8069.63	-9016.70	-5329.31	3.66	10389.49	39.95268865	-104.95744898
17322.00	89.23	180.08	8071.06	-9105.68	-5330.67	1.82	10471.75	39.95244440	-104.95745375
17412.00	88.89	178.39	8072.54	-9195.66	-5329.46	1.92	10553.91	39.95219741	-104.95744940
17501.00	88.80	179.47	8074.34	-9284.62	-5327.80	1.22	10634.95	39.95195319	-104.95744341
17591.00	88.77	179.92	8076.24	-9374.60	-5327.32	0.50	10717.40	39.95170619	-104.95744163
17681.00	87.45	179.97	8079.21	-9464.55	-5327.24	1.47	10799.98	39.95145927	-104.95744125
17770.00	88.40	180.61	8082.43	-9553.49	-5327.69	1.29	10881.84	39.95121512	-104.95744279
17860.00	89.11	180.28	8084.39	-9643.46	-5328.39	0.87	10964.75	39.95096813	-104.95744521
17949.00	89.38	182.21	8085.56	-9732.43	-5330.32	2.19	11047.22	39.95072391	-104.95745204
18039.00	89.11	181.83	8086.75	-9822.37	-5333.49	0.52	11131.07	39.95047702	-104.95746329
18128.00	89.48	181.26	8087.84	-9911.33	-5335.89	0.76	11213.72	39.95023281	-104.95747178
18218.00	89.85	179.81	8088.37	-10001.32	-5336.73	1.66	11296.70	39.94998578	-104.95747471
18308.00	90.58	180.37	8088.03	-10091.32	-5336.87	1.02	11379.41	39.94973872	-104.95747514
18398.00	90.77	179.04	8086.97	-10181.31	-5336.41	1.49	11461.88	39.94949169	-104.95747342
18487.00	91.23	179.07	8085.42	-10270.28	-5334.94	0.52	11543.01	39.94924744	-104.95746812
18576.00	89.97	180.22	8084.49	-10359.27	-5334.39	1.92	11624.52	39.94900316	-104.95746608
18666.00	88.22	180.53	8085.91	-10449.25	-5334.98	1.97	11707.39	39.94875614	-104.95746811
18755.00	90.52	180.58	8086.89	-10538.24	-5335.84	2.58	11789.46	39.94851187	-104.95747112
18846.00	87.11	181.01	8088.77	-10629.20	-5337.10	3.78	11873.49	39.94826218	-104.95747555
18936.00	87.97	179.15	8092.63	-10719.11	-5337.23	2.28	11956.12	39.94801536	-104.95747593
19026.00	87.97	176.89	8095.82	-10808.99	-5334.12	2.51	12037.44	39.94776862	-104.95746478
19115.00	87.85	177.86	8099.07	-10897.84	-5330.05	1.10	12117.42	39.94752473	-104.95745018
19204.00	87.94	180.08	8102.34	-10986.76	-5328.45	2.49	12198.46	39.94728064	-104.95744441
19294.00	89.66	180.58	8104.22	-11076.73	-5328.97	1.99	12281.29	39.94703365	-104.95744619
19383.00	89.85	180.34	8104.60	-11165.73	-5329.68	0.34	12363.31	39.94678934	-104.95744867
19473.00	90.22	179.58	8104.55	-11255.73	-5329.62	0.94	12445.94	39.94654228	-104.95744838
19562.00	90.06	181.85	8104.33	-11344.72	-5330.73	2.56	12528.11	39.94629801	-104.95745227
19652.00	89.82	180.11	8104.42	-11434.70	-5332.27	1.95	12611.36	39.94605099	-104.95745769
19742.00	89.57	178.43	8104.90	-11524.69	-5331.12	1.89	12693.55	39.94580396	-104.95745353
19831.00	89.66	178.69	8105.50	-11613.66	-5328.89	0.31	12774.37	39.94555973	-104.95744549
19920.00	89.69	179.57	8106.00	-11702.65	-5327.54	0.99	12855.56	39.94531545	-104.95744060
20010.00	90.52	180.29	8105.84	-11792.64	-5327.43	1.22	12938.18	39.94506840	-104.95744014
20099.00	90.71	179.31	8104.88	-11881.64	-5327.11	1.12	13019.78	39.94482410	-104.95743897
20189.00	90.58	178.25	8103.87	-11971.61	-5325.20	1.19	13101.66	39.94457712	-104.95743206
20278.00	90.52	178.12	8103.02	-12060.56	-5322.38	0.16	13182.24	39.94433294	-104.95742194
20367.00	89.51	178.54	8102.99	-12149.52	-5319.79	1.23	13262.91	39.94408874	-104.95741262
20457.00	91.51	179.50	8102.19	-12239.50	-5318.25	2.46	13344.94	39.94384174	-104.95740707
20544.00	90.43	178.53	8100.89	-12316.47	-5316.92	1.89	13415.11	39.94363043	-104.95740229
20558.00	90.43	178.53	8100.71	-12340.47	-5316.31	0.00	13436.90	39.94356457	-104.95740007

Comments

MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment
0.00	0.00	0.00	0.00	39.97744200	-104.93844000	Surface Location
1816.00	1813.12	-1.18	-34.32	39.97743876	-104.93856248	9.625" Csg: 1816 / 1813 MD/TVD,
10652.78	8051.24	-2438.39	-5350.10	39.97074680	-104.95752820	460 Setback: 10,653 / 8051 MD/TVD, 460 FNL, 529 FWL Sec 13
20342.21	8102.84	-12124.74	-5320.44	39.94415676	-104.95741499	Btm Toe Sub: 20,342 / 8103 MD/TVD, 471 FSL, 531 FWL Sec 24
20352.76	8102.89	-12135.29	-5320.16	39.94412781	-104.95741396	460 Setback: 20,353 / 8103 MD/TVD, 460 FSL, 531 FWL Sec 24
20547.19	8100.79	-12329.66	-5316.59	39.94359424	-104.95740107	PBTD: 20,547 / 8101 MD/TVD, 266 FSL, 534 FWL Sec 24
20558.00	8100.71	-12340.47	-5316.31	39.94356457	-104.95740007	5.5" Csg: 20,558 / 8101 MD/TVD, 255 FSL, 534 FWL Sec 24
20558.00	8100.71	-12340.47	-5316.31	39.94356457	-104.95740007	BHL: 20,558 / 8101 MD/TVD, 255 FSL, 534 FWL Sec 24

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	1816.00	1813.12	-1.18	-34.32
8.500	1816.00	1813.12	-1.18	-34.32	20558.00	8100.71	-12340.47	-5316.31

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	1816.00	1813.12	-1.18	-34.32
5 1/2in Casing	0.00	0.00	0.00	0.00	20558.00	8100.71	-12340.47	-5316.31

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool
659632	As Drilled - 20191202	20558.00	8100.71	MWD

Coordinates are from Slot
MD's and TVD's are from Rig Floor 5178.2ft above Mean Sea Level
Vertical Section is from Wellhead on azimuth 203.31 degrees
Bottom hole distance is 13436.90 Feet on azimuth 203.31 degrees from Wellhead
Survey calculation uses Minimum Curvature method