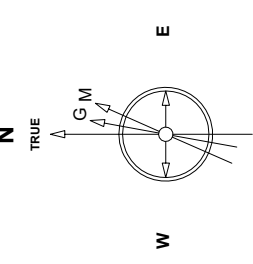


# Great Western Operating Company, LLC

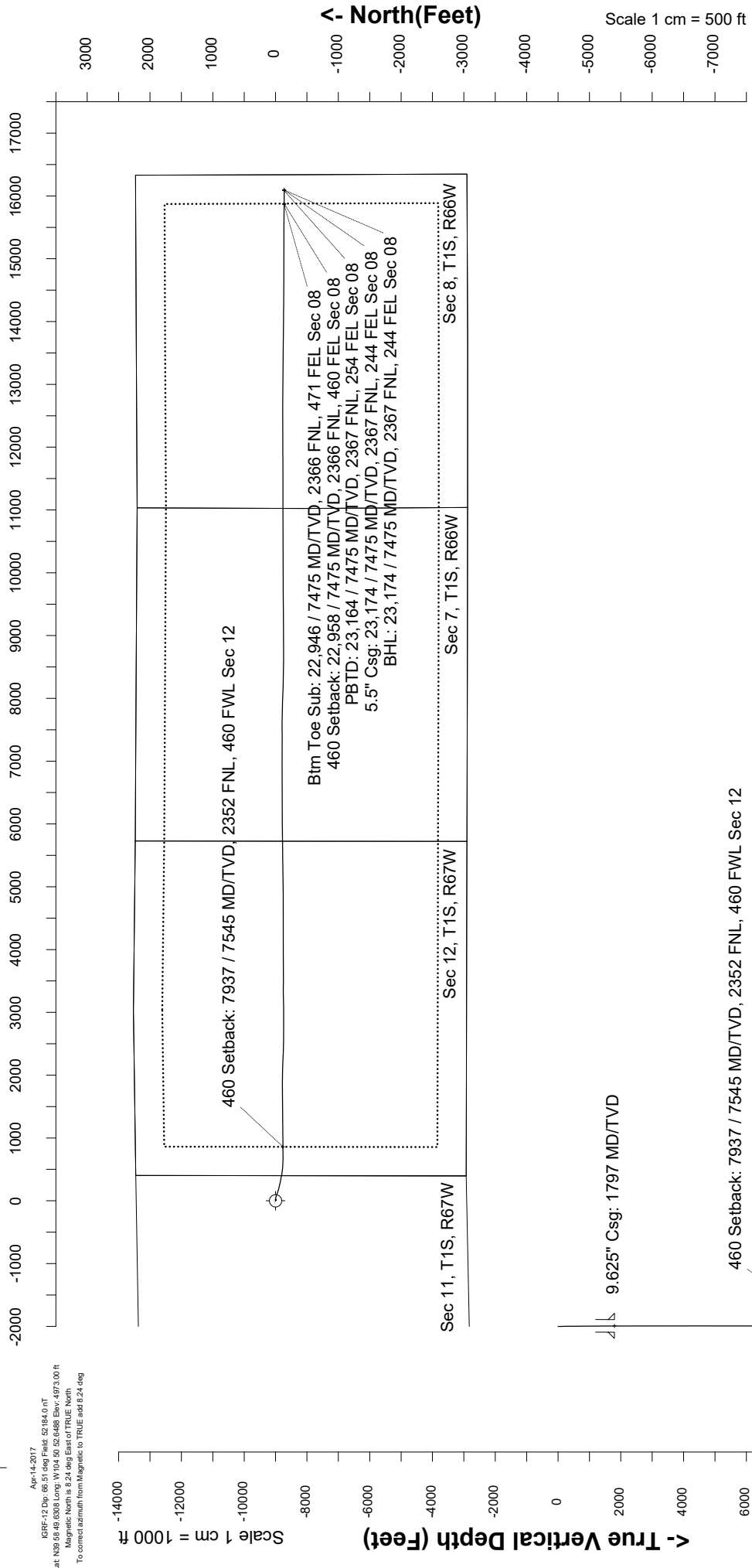
Location	Colorado	Slot	N02 - Brant LE 08-162HNX
Field	Wattenburg	Well	Brant LE 08-162HNX
Installation	Brant	Wellbore	Brant LE 08-162HNX (AWB)

Created by: mmount  
 Date plotted: 13-Feb-2020  
 Plot reference is Brant LE 08-162HNX (AWB).  
 Ref wellpath is Brant LE 08-162HNX (AWP#1).  
 Coordinates are in Feet reference N02 - Brant LE 08-162HNX.  
 True Vertical Depths are reference Rig Datum.  
 Measured Depths are reference Rig Datum.  
 Rig Datum: Actual Datum #1  
 Rig Datum to Mean Sea Level: 4993.00 ft.  
 Plot North is aligned to TRUE North.



Scale 1 cm = 500 ft

East (Feet) ->



460 Setback: 7937 / 7545 MD/TVD, 2352 FNL, 460 FWL Sec 12

Scale 1 cm = 500 ft

Btm Toe Sub: 22,946 / 7475 MD/TV, 2366 FNL, 471 FEL Sec 08  
 460 Setback: 22,958 / 7475 MD/TV, 2366 FNL, 460 FEL Sec 08  
 PBTD: 23,164 / 7475 MD/TV, 2367 FNL, 254 FEL Sec 08  
 5.5\" Csg: 23,174 / 7475 MD/TV, 2367 FNL, 244 FEL Sec 08  
 BHL: 23,174 / 7475 MD/TV, 2367 FNL, 244 FEL Sec 08

Scale 1 cm = 1000 ft

Vertical Section (Feet) ->

Azimuth 90.49 with reference 0.00 N, 0.00 E from N02 - Brant LE 08-162HNX

Apr-14-2017  
 KRF-12.Dwg, 66.51 deg Field, 52784.0 FT  
 Lat: N39 59.49 (308) Long: W104 50 52.6488 Elev: 4973.00 ft  
 Magnetic North is 9.24 deg East of TRUE North  
 To correct azimuth from Magnetic to TRUE add 8.24 deg

Great Western Operating Co, LLC  
 Directional Survey Report  
 Wellpath: Brant LE 08-162HNX  
 MDs and TVDs are from Rig 4993.0ft above Mean Sea Level

**Wellbore Information**

Date Created	Date Revised	API #	RKB above GL	Well Name
Feb-12-2020	Feb-13-2020	05-001-10336	20.00	Brant LE 08-162HNX

**Slot Coordinates**

Latitude	Longitude
39.98071100	-104.84817000

**Pad Information**

Pad Name	Ground Elev.
Brant	4973.00

**Field**

Name
Wattenburg

**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	39.98071100	-104.84817000
14.00	0.00	162.30	14.00	0.00	0.00	0.00	0.00	39.98071100	-104.84817000
92.00	0.83	162.30	92.00	-0.54	0.17	0.00	0.18	39.98070952	-104.84816939
179.00	0.48	91.46	178.99	-1.15	0.73	0.00	0.74	39.98070785	-104.84816740
264.00	0.48	341.07	263.99	-0.82	0.97	0.00	0.98	39.98070875	-104.84816655
357.00	0.26	2.16	356.99	-0.24	0.85	0.00	0.85	39.98071034	-104.84816697
446.00	0.09	97.96	445.99	-0.05	0.93	0.00	0.93	39.98071087	-104.84816669
536.00	0.18	205.89	535.99	-0.19	0.93	0.00	0.94	39.98071049	-104.84816666
626.00	0.35	286.40	625.99	-0.24	0.61	0.00	0.61	39.98071035	-104.84816783
716.00	0.09	182.07	715.99	-0.23	0.34	0.00	0.35	39.98071037	-104.84816878
806.00	0.35	128.99	805.99	-0.47	0.55	0.00	0.56	39.98070970	-104.84816802
896.00	0.83	123.10	895.98	-1.00	1.31	0.00	1.32	39.98070825	-104.84816531
986.00	1.41	81.96	985.97	-1.20	2.96	0.00	2.97	39.98070770	-104.84815945
1076.00	1.01	81.35	1075.95	-0.93	4.84	0.00	4.84	39.98070845	-104.84815274
1166.00	0.92	89.17	1165.93	-0.80	6.34	0.00	6.35	39.98070881	-104.84814736
1256.00	0.88	62.80	1255.92	-0.47	7.68	0.00	7.68	39.98070971	-104.84814259
1346.00	1.41	71.42	1345.90	0.20	9.35	0.00	9.34	39.98071154	-104.84813665
1436.00	1.45	75.81	1435.88	0.83	11.50	0.00	11.49	39.98071328	-104.84812897
1526.00	1.67	103.76	1525.84	0.80	13.88	0.00	13.87	39.98071319	-104.84812048
1616.00	0.62	151.75	1615.83	0.06	15.38	0.00	15.38	39.98071115	-104.84811512
1706.00	0.40	230.06	1705.82	-0.58	15.37	0.00	15.37	39.98070942	-104.84811515
1746.00	0.44	286.49	1745.82	-0.62	15.12	0.00	15.12	39.98070929	-104.84811606
1886.00	0.03	144.47	1885.82	-0.50	14.62	0.00	14.63	39.98070963	-104.84811782
1975.00	0.19	244.38	1974.82	-0.58	14.50	0.00	14.51	39.98070940	-104.84811825
2065.00	0.04	235.25	2064.82	-0.66	14.34	0.00	14.35	39.98070918	-104.84811882
2154.00	0.39	213.15	2153.82	-0.93	14.15	0.00	14.16	39.98070843	-104.84811950
2244.00	0.13	298.99	2243.82	-1.14	13.89	0.00	13.90	39.98070787	-104.84812042
2333.00	0.06	231.46	2332.82	-1.12	13.77	0.00	13.78	39.98070792	-104.84812087
2423.00	0.04	271.55	2422.82	-1.15	13.70	0.00	13.71	39.98070784	-104.84812111
2512.00	0.28	278.60	2511.82	-1.12	13.46	0.00	13.46	39.98070793	-104.84812199
2602.00	0.15	272.62	2601.82	-1.08	13.12	0.00	13.13	39.98070804	-104.84812318
2691.00	0.29	296.54	2690.82	-0.97	12.80	0.00	12.81	39.98070833	-104.84812432
2781.00	0.39	257.83	2780.82	-0.94	12.30	0.00	12.31	39.98070843	-104.84812611
2870.00	0.13	133.85	2869.81	-1.07	12.08	0.00	12.08	39.98070806	-104.84812691
2959.00	0.43	239.34	2958.81	-1.31	11.86	0.00	11.87	39.98070740	-104.84812768
3049.00	1.77	79.66	3048.80	-1.23	12.94	0.00	12.95	39.98070762	-104.84812383
3138.00	0.29	308.89	3137.79	-0.84	14.12	0.00	14.12	39.98070868	-104.84811963
3228.00	0.20	295.40	3227.79	-0.63	13.80	0.00	13.80	39.98070926	-104.84812077
3317.00	0.16	144.58	3316.79	-0.67	13.73	0.00	13.73	39.98070916	-104.84812102
3407.00	0.28	243.63	3406.79	-0.87	13.60	0.00	13.61	39.98070862	-104.84812146
3496.00	0.21	348.76	3495.79	-0.81	13.38	0.00	13.38	39.98070879	-104.84812227
3585.00	0.09	340.21	3584.79	-0.58	13.32	0.00	13.33	39.98070941	-104.84812247
3675.00	0.21	152.13	3674.79	-0.66	13.37	0.00	13.38	39.98070919	-104.84812228
3764.00	0.60	279.48	3763.79	-0.73	12.99	0.00	13.00	39.98070901	-104.84812364
3854.00	0.42	142.21	3853.78	-0.91	12.73	0.00	12.74	39.98070850	-104.84812458
3944.00	0.62	230.04	3943.78	-1.48	12.56	0.00	12.57	39.98070693	-104.84812519
4033.00	1.61	80.57	4032.77	-1.59	13.42	0.00	13.43	39.98070664	-104.84812211
4123.00	0.42	256.11	4122.76	-1.46	14.35	0.00	14.36	39.98070699	-104.84811880
4212.00	0.39	53.89	4211.76	-1.36	14.28	0.00	14.29	39.98070727	-104.84811906
4302.00	0.22	210.55	4301.76	-1.33	14.44	0.00	14.45	39.98070736	-104.84811849
4392.00	0.43	240.16	4391.76	-1.64	14.06	0.00	14.07	39.98070649	-104.84811984
4481.00	0.28	269.98	4480.76	-1.81	13.55	0.00	13.56	39.98070603	-104.84812165
4571.00	0.06	227.15	4570.76	-1.84	13.29	0.00	13.31	39.98070594	-104.84812256
4660.00	0.24	349.53	4659.76	-1.69	13.23	0.00	13.24	39.98070636	-104.84812280
4750.00	0.15	111.88	4749.76	-1.55	13.30	0.00	13.31	39.98070675	-104.84812254
4839.00	0.11	93.64	4838.76	-1.60	13.49	0.00	13.51	39.98070661	-104.84812185
4929.00	0.06	269.33	4928.76	-1.60	13.53	0.00	13.55	39.98070660	-104.84812171
5019.00	0.07	248.68	5018.76	-1.62	13.44	0.00	13.45	39.98070654	-104.84812206
5108.00	0.13	232.54	5107.76	-1.71	13.30	0.00	13.32	39.98070632	-104.84812253
5198.00	0.18	215.42	5197.76	-1.88	13.14	0.00	13.16	39.98070583	-104.84812311
5287.00	0.07	216.90	5286.76	-2.04	13.03	0.00	13.04	39.98070540	-104.84812351
5377.00	0.12	248.31	5376.76	-2.12	12.91	0.00	12.92	39.98070518	-104.84812394
5466.00	0.03	233.23	5465.76	-2.17	12.80	0.00	12.82	39.98070505	-104.84812432
5556.00	0.19	301.25	5555.75	-2.10	12.66	0.00	12.67	39.98070522	-104.84812484

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
5646.00	0.03	272.86	5645.75	-2.03	12.50	0.00	12.52	39.98070544	-104.84812538
5735.00	0.32	292.72	5734.75	-1.93	12.25	0.00	12.27	39.98070570	-104.84812628
5824.00	1.60	43.76	5823.74	-0.94	12.88	0.00	12.89	39.98070843	-104.84812403
5914.00	0.13	235.30	5913.73	-0.09	13.67	0.00	13.67	39.98071076	-104.84812123
6004.00	0.09	152.49	6003.73	-0.21	13.62	0.00	13.62	39.98071043	-104.84812141
6093.00	0.25	186.77	6092.73	-0.46	13.63	0.00	13.63	39.98070973	-104.84812138
6183.00	1.73	84.30	6182.72	-0.52	14.95	0.00	14.96	39.98070957	-104.84811664
6273.00	3.96	90.30	6272.60	-0.40	19.41	0.00	19.42	39.98070989	-104.84810072
6362.00	6.41	100.73	6361.23	-1.34	27.37	0.00	27.38	39.98070731	-104.84807234
6452.00	9.68	99.20	6450.33	-3.49	39.78	0.00	39.81	39.98070142	-104.84802806
6541.00	12.44	98.82	6537.67	-6.16	56.64	0.00	56.69	39.98069410	-104.84796789
6631.00	15.73	103.14	6624.96	-10.42	78.11	0.00	78.19	39.98068240	-104.84789129
6720.00	18.22	110.67	6710.08	-18.07	102.88	0.00	103.03	39.98066139	-104.84780289
6810.00	20.35	113.36	6795.03	-29.25	130.41	0.00	130.66	39.98063071	-104.84770464
6899.00	22.98	113.92	6877.74	-42.43	160.51	0.00	160.87	39.98059453	-104.84759726
6989.00	25.68	105.32	6959.76	-54.71	195.39	0.00	195.85	39.98056081	-104.84747278
7079.00	28.23	97.72	7040.00	-62.73	235.31	0.00	235.84	39.98053881	-104.84733033
7168.00	30.32	100.92	7117.64	-69.81	278.23	0.00	278.82	39.98051936	-104.84717717
7258.00	30.24	100.59	7195.36	-78.28	322.82	0.00	323.48	39.98049611	-104.84701808
7347.00	32.66	104.30	7271.28	-88.33	368.13	0.00	368.87	39.98046851	-104.84685640
7437.00	40.14	99.22	7343.69	-99.00	420.38	0.00	421.21	39.98043924	-104.84666994
7526.00	48.46	95.68	7407.34	-106.90	481.96	0.00	482.86	39.98041753	-104.84645021
7616.00	58.40	95.94	7460.90	-114.22	553.78	0.00	554.74	39.98039743	-104.84619394
7705.00	67.89	91.30	7501.07	-119.09	632.91	0.00	633.91	39.98038406	-104.84591157
7795.00	76.46	89.43	7528.60	-119.60	718.50	0.00	719.50	39.98038264	-104.84560615
7884.00	85.07	89.10	7542.87	-118.48	806.26	0.00	807.25	39.98038574	-104.84529301
7935.00	90.15	89.37	7544.99	-117.80	857.19	0.00	858.17	39.98038760	-104.84511125
7974.00	90.15	89.64	7544.89	-117.46	896.19	0.00	897.17	39.98038852	-104.84497210
8063.00	89.82	89.39	7544.92	-116.71	985.19	0.00	986.15	39.98039058	-104.84465453
8153.00	90.52	89.41	7544.65	-115.76	1075.18	0.00	1076.14	39.98039315	-104.84433340
8242.00	90.18	90.03	7544.10	-115.33	1164.18	0.00	1165.13	39.98039434	-104.84401583
8332.00	89.97	88.47	7543.99	-114.15	1254.17	0.00	1255.10	39.98039756	-104.84369472
8421.00	89.60	90.53	7544.32	-113.37	1343.16	0.00	1344.08	39.98039968	-104.84337717
8511.00	90.46	89.32	7544.27	-113.26	1433.16	0.00	1434.08	39.98039999	-104.84305603
8601.00	89.66	88.02	7544.18	-111.17	1523.13	0.00	1524.03	39.98040571	-104.84273498
8690.00	90.06	90.16	7544.40	-109.75	1612.11	0.00	1613.00	39.98040957	-104.84241746
8780.00	91.08	90.22	7543.50	-110.05	1702.11	0.00	1702.99	39.98040874	-104.84209633
8870.00	90.37	90.27	7542.36	-110.44	1792.10	0.00	1792.98	39.98040766	-104.84177521
8959.00	90.55	88.68	7541.65	-109.62	1881.09	0.00	1881.96	39.98040988	-104.84145766
9048.00	91.17	91.07	7540.31	-109.43	1970.07	0.00	1970.94	39.98041040	-104.84114014
9138.00	90.22	91.47	7539.22	-111.42	2060.04	0.00	2060.92	39.98040490	-104.84081910
9227.00	90.62	92.57	7538.57	-114.56	2148.98	0.00	2149.89	39.98039627	-104.84050173
9317.00	89.57	92.01	7538.42	-118.15	2238.91	0.00	2239.84	39.98038638	-104.84018085
9406.00	89.42	92.26	7539.20	-121.47	2327.84	0.00	2328.80	39.98037725	-104.83986350
9496.00	90.06	92.15	7539.61	-124.93	2417.78	0.00	2418.76	39.98036772	-104.83954260
9585.00	90.68	91.54	7539.04	-127.80	2506.73	0.00	2507.73	39.98035983	-104.83922519
9675.00	89.85	89.25	7538.62	-128.42	2596.72	0.00	2597.72	39.98035811	-104.83890408
9764.00	89.72	89.96	7538.95	-127.81	2685.71	0.00	2686.71	39.98035976	-104.83858651
9854.00	89.66	90.83	7539.44	-128.43	2775.71	0.00	2776.71	39.98035803	-104.83826538
9943.00	89.05	90.77	7540.44	-129.67	2864.70	0.00	2865.70	39.98035460	-104.83794785
10032.00	90.89	89.59	7540.49	-129.95	2953.69	0.00	2954.70	39.98035380	-104.83763029
10122.00	90.22	88.95	7539.62	-128.80	3043.68	0.00	3044.67	39.98035692	-104.83730918
10211.00	90.52	88.68	7539.04	-126.96	3132.66	0.00	3133.63	39.98036194	-104.83699168
10301.00	90.18	88.91	7538.49	-125.07	3222.63	0.00	3223.59	39.98036710	-104.83667061
10390.00	90.68	88.72	7537.83	-123.23	3311.61	0.00	3312.55	39.98037212	-104.83635310
10479.00	90.99	91.28	7536.53	-123.23	3400.60	0.00	3401.53	39.98037209	-104.83603558
10569.00	90.92	90.27	7535.03	-124.44	3490.57	0.00	3491.51	39.98036871	-104.83571451
10656.00	91.45	89.13	7533.23	-123.99	3577.55	0.00	3578.48	39.98036993	-104.83540414
10745.00	91.11	91.46	7531.24	-124.45	3666.52	0.00	3667.45	39.98036864	-104.83508667
10835.00	90.09	88.98	7530.30	-124.79	3756.51	0.00	3757.44	39.98036765	-104.83476557
10925.00	89.60	89.72	7530.54	-123.77	3846.50	0.00	3847.42	39.98037042	-104.83444445
11015.00	89.72	90.12	7531.08	-123.65	3936.50	0.00	3937.42	39.98037072	-104.83412330
11104.00	91.11	89.69	7530.43	-123.50	4025.49	0.00	4026.41	39.98037109	-104.83380574
11193.00	90.83	90.11	7528.92	-123.34	4114.48	0.00	4115.39	39.98037148	-104.83348821
11283.00	90.55	89.84	7527.84	-123.30	4204.47	0.00	4205.38	39.98037154	-104.83316708
11373.00	91.38	89.75	7526.32	-122.98	4294.46	0.00	4295.36	39.98037238	-104.83284598
11462.00	91.02	89.91	7524.46	-122.72	4384.44	0.00	4384.33	39.98037307	-104.83252847
11551.00	91.42	90.04	7522.57	-122.68	4472.42	0.00	4473.31	39.98037313	-104.83221097
11641.00	91.41	89.52	7520.34	-122.33	4562.39	0.00	4563.27	39.98037403	-104.83188992
11730.00	89.91	90.14	7519.32	-122.07	4651.38	0.00	4652.26	39.98037471	-104.83157237
11820.00	90.52	90.29	7518.98	-122.41	4741.38	0.00	4742.26	39.98037374	-104.83125123
11909.00	90.92	90.00	7517.86	-122.63	4830.37	0.00	4831.25	39.98037307	-104.83093367
11999.00	91.05	89.87	7516.32	-122.53	4920.36	0.00	4921.23	39.98037330	-104.83061257
12088.00	90.00	88.15	7515.50	-120.99	5009.34	0.00	5010.19	39.98037748	-104.83029507
12177.00	91.26	89.32	7514.52	-119.03	5098.31	0.00	5099.14	39.98038282	-104.82997759
12267.00	90.89	89.24	7512.83	-117.90	5188.28	0.00	5189.10	39.98038587	-104.82965653
12356.00	91.63	89.45	7510.88	-116.88	5277.26	0.00	5278.06	39.98038861	-104.82933905
12446.00	92.15	89.01	7507.91	-115.67	5367.20	0.00	5367.99	39.98039188	-104.82901810
12535.00	91.72	89.30	7504.90	-114.36	5456.14	0.00	5456.92	39.98039543	-104.82870074
12625.00	92.06	89.28	7501.93	-113.25	5546.08	0.00	5546.85	39.98039843	-104.82837979
12714.00	90.74	89.49	7499.76	-112.29	5635.05	0.00	5635.80	39.98040100	-104.82806232
12803.00	90.95	89.38	7498.45	-111.41	5724.03	0.00	5724.78	39.98040335	-104.82774479
12893.00	91.05	89.29	7496.88	-110.37	5814.01	0.00	5814.75	39.98040616	-104.82742371
12982.00	90.52	89.91	7495.66	-109.75	5903.00	0.00	5903.73	39.98040781	-104.82710617
13072.00	90.68	89.32	7494.71	-109.14	5993.00	0.00	5993.71	39.98040941	-104.82678505
13161.00	90.52	89.47	7493.78	-108.20	6081.99	0.00	6082.69	39.98041193	-104.82646750
13251.00	90.52	89.48	7492.97	-107.38	6171.98	0.00	6172.67	39.98041413	-104.82614638

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
13340.00	90.62	89.42	7492.08	-106.52	6260.97	0.00	6261.65	39.98041642	-104.82582883
13430.00	91.05	89.35	7490.77	-105.56	6350.96	0.00	6351.63	39.98041901	-104.82550773
13519.00	90.74	89.15	7489.38	-104.39	6439.94	0.00	6440.59	39.98042214	-104.82519022
13609.00	91.05	89.57	7487.97	-103.39	6529.92	0.00	6530.57	39.98042484	-104.82486913
13698.00	90.80	90.29	7486.54	-103.28	6618.91	0.00	6619.55	39.98042507	-104.82455159
13788.00	90.92	90.37	7485.18	-103.80	6708.90	0.00	6709.54	39.98042358	-104.82423048
13877.00	90.09	90.39	7484.40	-104.39	6797.89	0.00	6798.53	39.98042189	-104.82391292
13967.00	90.68	90.87	7483.80	-105.38	6887.88	0.00	6888.53	39.98041911	-104.82359181
14057.00	90.46	88.93	7482.90	-105.22	6977.87	0.00	6978.52	39.98041947	-104.82327069
14146.00	90.46	90.51	7482.19	-104.79	7066.87	0.00	7067.50	39.98042060	-104.82295313
14236.00	90.09	90.34	7481.75	-105.45	7156.86	0.00	7157.50	39.98041869	-104.82263200
14325.00	90.68	90.64	7481.16	-106.21	7245.86	0.00	7246.50	39.98041653	-104.82231444
14414.00	90.43	89.87	7480.29	-106.61	7334.85	0.00	7335.49	39.98041537	-104.82199688
14504.00	89.72	87.86	7480.18	-104.83	7424.83	0.00	7425.45	39.98042019	-104.82167581
14593.00	90.65	90.48	7479.89	-103.54	7513.81	0.00	7514.42	39.98042366	-104.82135829
14683.00	90.00	90.99	7479.38	-104.69	7603.80	0.00	7604.42	39.98042042	-104.82103718
14772.00	90.06	91.17	7479.33	-106.37	7692.78	0.00	7693.41	39.98041574	-104.82071966
14862.00	89.69	91.22	7479.53	-108.25	7782.76	0.00	7783.41	39.98041051	-104.82039858
14952.00	89.97	91.76	7479.79	-110.59	7872.73	0.00	7873.39	39.98040400	-104.82007754
15041.00	89.38	90.69	7480.30	-112.49	7961.71	0.00	7962.38	39.98039870	-104.81976005
15131.00	89.72	92.28	7481.01	-114.82	8051.67	0.00	8052.36	39.98039222	-104.81943903
15220.00	88.86	92.05	7482.11	-118.18	8140.60	0.00	8141.32	39.98038291	-104.81912171
15310.00	89.20	91.43	7483.63	-120.92	8230.55	0.00	8231.28	39.98037533	-104.81880076
15400.00	89.45	92.03	7484.69	-123.63	8320.50	0.00	8321.25	39.98036779	-104.81847978
15489.00	88.89	92.85	7485.98	-127.42	8409.41	0.00	8410.19	39.98035731	-104.81816253
15578.00	89.75	88.92	7487.04	-128.80	8498.37	0.00	8499.16	39.98035345	-104.81784508
15668.00	90.37	89.63	7486.94	-127.66	8588.36	0.00	8589.14	39.98035650	-104.81752396
15758.00	89.91	90.69	7486.72	-127.91	8678.36	0.00	8679.14	39.98035572	-104.81720282
15847.00	90.37	90.26	7486.51	-128.65	8767.36	0.00	8768.14	39.98035361	-104.81688525
15937.00	90.34	89.31	7485.95	-128.31	8857.35	0.00	8858.13	39.98035445	-104.81656411
16026.00	89.91	89.28	7485.76	-127.21	8946.35	0.00	8947.11	39.98035737	-104.81624656
16115.00	90.37	89.29	7485.54	-126.10	9035.34	0.00	9036.09	39.98036033	-104.81592900
16205.00	90.49	90.46	7484.86	-125.91	9125.34	0.00	9126.08	39.98036078	-104.81560787
16295.00	89.88	89.84	7484.57	-126.14	9215.33	0.00	9216.08	39.98036004	-104.81528673
16384.00	90.06	90.03	7484.62	-126.04	9304.33	0.00	9305.07	39.98036022	-104.81496915
16474.00	90.09	89.54	7484.50	-125.70	9394.33	0.00	9395.07	39.98036106	-104.81464800
16563.00	90.15	89.35	7484.31	-124.84	9483.33	0.00	9484.05	39.98036333	-104.81433043
16652.00	90.25	89.48	7484.00	-123.93	9572.32	0.00	9573.03	39.98036573	-104.81401287
16742.00	90.09	89.53	7483.74	-123.15	9662.32	0.00	9663.02	39.98036777	-104.81369173
16831.00	89.82	89.51	7483.81	-122.41	9751.32	0.00	9752.01	39.98036972	-104.81337416
16920.00	89.91	89.71	7484.02	-121.80	9840.31	0.00	9841.00	39.98037129	-104.81305659
17010.00	89.72	90.64	7484.31	-122.08	9930.31	0.00	9930.99	39.98037044	-104.81273545
17099.00	89.94	89.29	7484.57	-122.02	10019.31	0.00	10019.99	39.98037049	-104.81241788
17189.00	89.85	89.40	7484.74	-121.00	10109.30	0.00	10109.97	39.98037321	-104.81209675
17278.00	89.63	89.69	7485.14	-120.29	10198.30	0.00	10198.96	39.98037505	-104.81177918
17368.00	89.94	90.41	7485.48	-120.37	10288.30	0.00	10288.95	39.98037473	-104.81145804
17457.00	90.74	89.93	7484.95	-120.63	10377.30	0.00	10377.95	39.98037391	-104.81114047
17547.00	90.37	90.29	7484.08	-120.80	10467.29	0.00	10467.94	39.98037333	-104.81081934
17636.00	90.22	89.31	7483.62	-120.49	10556.29	0.00	10556.93	39.98037408	-104.81050176
17726.00	90.46	89.36	7483.09	-119.45	10646.28	0.00	10646.91	39.98037684	-104.81018064
17815.00	90.83	89.22	7482.08	-118.35	10735.27	0.00	10735.89	39.98037976	-104.80986310
17905.00	90.59	89.25	7480.97	-117.14	10825.25	0.00	10825.86	39.98038295	-104.80954201
17994.00	90.55	89.91	7480.08	-116.49	10914.25	0.00	10914.84	39.98038464	-104.80922445
18084.00	91.01	90.50	7478.86	-116.81	11004.24	0.00	11004.83	39.98038365	-104.80890334
18174.00	91.05	90.17	7477.24	-117.34	11094.22	0.00	11094.82	39.98038209	-104.80858225
18263.00	90.86	90.49	7475.76	-117.85	11183.21	0.00	11183.80	39.98038058	-104.80826472
18352.00	89.91	90.64	7475.16	-118.73	11272.20	0.00	11272.80	39.98037806	-104.80794716
18441.00	90.12	90.37	7475.14	-119.51	11361.19	0.00	11361.80	39.98037579	-104.80762960
18531.00	89.72	90.27	7475.26	-120.02	11451.19	0.00	11451.80	39.98037430	-104.80730846
18620.00	89.94	89.63	7475.52	-119.94	11540.19	0.00	11540.80	39.98037440	-104.80699088
18710.00	89.82	89.45	7475.71	-119.22	11630.19	0.00	11630.78	39.98037627	-104.80666974
18799.00	90.12	90.46	7475.76	-119.15	11719.19	0.00	11719.78	39.98037634	-104.80635216
18889.00	89.78	88.07	7475.84	-117.99	11809.17	0.00	11809.75	39.98037940	-104.80603106
18978.00	89.97	89.90	7476.03	-116.42	11898.16	0.00	11898.72	39.98038361	-104.80571354
19068.00	89.42	89.86	7476.51	-116.23	11988.15	0.00	11988.71	39.98038401	-104.80539240
19157.00	89.60	89.26	7477.27	-115.54	12077.15	0.00	12077.69	39.98038576	-104.80507484
19247.00	90.28	89.89	7477.37	-114.88	12167.14	0.00	12167.68	39.98038748	-104.80475370
19336.00	89.51	90.00	7477.53	-114.79	12256.14	0.00	12256.68	39.98038759	-104.80443613
19425.00	89.69	90.28	7478.15	-115.01	12345.14	0.00	12345.67	39.98038687	-104.80411855
19515.00	90.09	89.99	7478.32	-115.22	12435.14	0.00	12435.67	39.98038617	-104.80379741
19604.00	89.82	89.86	7478.39	-115.10	12524.14	0.00	12524.67	39.98038636	-104.80347983
19694.00	89.97	89.56	7478.56	-114.65	12614.14	0.00	12614.66	39.98038749	-104.80315868
19783.00	90.31	89.83	7478.34	-114.18	12703.14	0.00	12703.65	39.98038867	-104.80284111
19873.00	90.37	90.74	7477.81	-114.62	12793.13	0.00	12793.65	39.98038731	-104.80251997
19962.00	90.15	90.20	7477.40	-115.35	12882.13	0.00	12882.64	39.98038518	-104.80220241
20052.00	90.06	90.26	7477.24	-115.71	12972.13	0.00	12972.64	39.98038406	-104.80188126
20141.00	90.09	90.16	7477.12	-116.04	13061.13	0.00	13061.64	39.98038304	-104.80156369
20230.00	90.15	90.40	7476.94	-116.48	13150.13	0.00	13150.64	39.98038171	-104.80124611
20320.00	89.78	91.19	7476.99	-117.72	13240.12	0.00	13240.64	39.98037815	-104.80092500
20409.00	89.78	91.03	7477.33	-119.45	13329.10	0.00	13329.63	39.98037329	-104.80060748
20499.00	89.78	90.86	7477.68	-120.93	13419.09	0.00	13419.63	39.98036908	-104.80028638
20588.00	89.88	90.61	7477.94	-122.07	13508.08	0.00	13508.63	39.98036582	-104.79996883
20678.00	88.92	90.63	7478.88	-123.05	13598.07	0.00	13598.62	39.98036301	-104.79964773
20767.00	89.69	90.79	7479.96	-124.15	13687.05	0.00	13687.61	39.98035985	-104.79933020
20856.00	89.48	90.66	7480.61	-125.28	13776.04	0.00	13776.61	39.98035662	-104.79901265
20946.00	89.20	91.06	7481.65	-126.63	13866.03	0.00	13866.60	39.98035278	-104.79869157
21035.00	90.18	90.08	7482.13	-127.51	13955.02	0.00	13955.60	39.98035021	-104.79837402

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
21125.00	90.31	90.21	7481.74	-127.74	14045.02	0.00	14045.60	39.98034944	-104.79805287
21214.00	89.85	90.32	7481.62	-128.15	14134.02	0.00	14134.60	39.98034818	-104.79773530
21304.00	90.43	90.20	7481.40	-128.56	14224.01	0.00	14224.59	39.98034691	-104.79741415
21393.00	90.40	90.39	7480.75	-129.02	14313.01	0.00	14313.59	39.98034552	-104.79709659
21483.00	89.78	90.75	7480.61	-129.91	14403.01	0.00	14403.59	39.98034292	-104.79677546
21573.00	90.65	90.28	7480.27	-130.72	14493.00	0.00	14493.59	39.98034055	-104.79645433
21662.00	89.51	90.43	7480.15	-131.27	14582.00	0.00	14582.59	39.98033889	-104.79613676
21752.00	89.57	90.46	7480.87	-131.97	14671.99	0.00	14672.58	39.98033683	-104.79581564
21841.00	89.45	90.34	7481.63	-132.59	14760.99	0.00	14761.58	39.98033498	-104.79549808
21930.00	90.12	90.30	7481.97	-133.09	14849.98	0.00	14850.58	39.98033347	-104.79518051
22020.00	90.68	91.41	7481.34	-134.43	14939.97	0.00	14940.57	39.98032964	-104.79485941
22110.00	90.31	87.69	7480.56	-133.73	15029.95	0.00	15030.54	39.98033143	-104.79453834
22199.00	90.71	89.92	7479.77	-131.87	15118.92	0.00	15119.49	39.98033637	-104.79422086
22288.00	90.37	90.11	7478.93	-131.90	15207.91	0.00	15208.49	39.98033616	-104.79390329
22378.00	90.92	90.36	7477.92	-132.26	15297.91	0.00	15298.48	39.98033500	-104.79358217
22467.00	90.55	90.25	7476.78	-132.74	15386.90	0.00	15387.47	39.98033354	-104.79326462
22557.00	90.25	90.60	7476.15	-133.41	15476.89	0.00	15477.47	39.98033156	-104.79294349
22646.00	90.09	90.55	7475.88	-134.30	15565.89	0.00	15566.47	39.98032895	-104.79262593
22736.00	90.12	90.52	7475.72	-135.14	15655.89	0.00	15656.47	39.98032649	-104.79230480
22826.00	90.22	90.67	7475.45	-136.07	15745.88	0.00	15746.47	39.98032377	-104.79198367
22915.00	89.91	90.45	7475.35	-136.94	15834.88	0.00	15835.47	39.98032123	-104.79166611
23005.00	89.94	90.10	7475.47	-137.38	15924.87	0.00	15925.47	39.98031988	-104.79134496
23094.00	90.12	89.42	7475.42	-137.00	16013.87	0.00	16014.46	39.98032075	-104.79102739
23149.00	90.61	91.41	7475.07	-137.40	16068.87	0.00	16069.45	39.98031956	-104.79083115
23174.00	90.61	91.41	7474.81	-138.02	16093.86	0.00	16094.45	39.98031783	-104.79074198

#### Comments

MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment
1797.00	1796.82	-0.53	14.81	39.98070953	-104.84811715	9.625" Csg: 1797 MD/TVD
7937.40	7544.99	-117.77	859.59	39.98038767	-104.84510269	460 Setback: 7937 / 7545 MD/TVD, 2352 FNL, 460 FWL Sec 12
22946.49	7475.40	-137.16	15866.36	39.98032059	-104.79155374	Btm Toe Sub: 22,946 / 7475 MD/TVD, 2366 FNL, 471 FEL Sec 08
22957.91	7475.41	-137.22	15877.78	39.98032040	-104.79151299	460 Setback: 22,958 / 7475 MD/TVD, 2366 FNL, 460 FEL Sec 08
23163.51	7474.92	-137.76	16083.37	39.98031855	-104.79077939	PBTD: 23,164 / 7475 MD/TVD, 2367 FNL, 254 FEL Sec 08
23174.00	7474.81	-138.02	16093.86	39.98031783	-104.79074198	5.5" Csg: 23,174 / 7475 MD/TVD, 2367 FNL, 244 FEL Sec 08
23174.00	7474.81	-138.02	16093.86	39.98031783	-104.79074198	BHL: 23,174 / 7475 MD/TVD, 2367 FNL, 244 FEL Sec 08

#### 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	1797.00	1796.82	-0.53	14.81
8.500	1797.00	1796.82	-0.53	14.81	23174.00	7474.81	-138.02	16093.86

#### 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	1797.00	1796.82	-0.53	14.81
5 1/2in Casing	0.00	0.00	0.00	0.00	23174.00	7474.81	-138.02	16093.86

#### Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool
778427	As Drilled - 20200212	23174.00	7474.81	MWD

Coordinates are from Slot  
MD's and TVD's are from Rig 4993.0ft above Mean Sea Level  
Vertical Section is from Wellhead on azimuth 90.49 degrees  
Bottom hole distance is 16094.45 Feet on azimuth 90.49 degrees from Wellhead  
Survey calculation uses Minimum Curvature method