

Great Western Operating Company, LLC

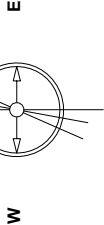
Created by	mmount
Date plotted	9-Sep-2019
Plot reference is Rio LC 12-366HNX (AWB).	
Ref wellpath is Rio LC 12-366HNX (AWPH1).	
Coordinates are in Feet reference E06 - Rio LC 12-366HNX.	
True Vertical Depths are reference Rig Datum.	
Measured Depths are reference Rig Datum.	
Rig Datum: Actual Datum #1	
Rig Datum to Mean Sea Level: 5088.40 ft.	
Plot North is aligned to TRUE North.	

Location	Colorado	Slot	E06 - Rio LC 12-366HNX
Field	Wattenburg	Well	Rio LC 12-366HNX
Installation	Rio	Wellbore	Rio LC 12-366HNX (AWB)

Scale 1 cm = 400 ft

East (Feet) ->

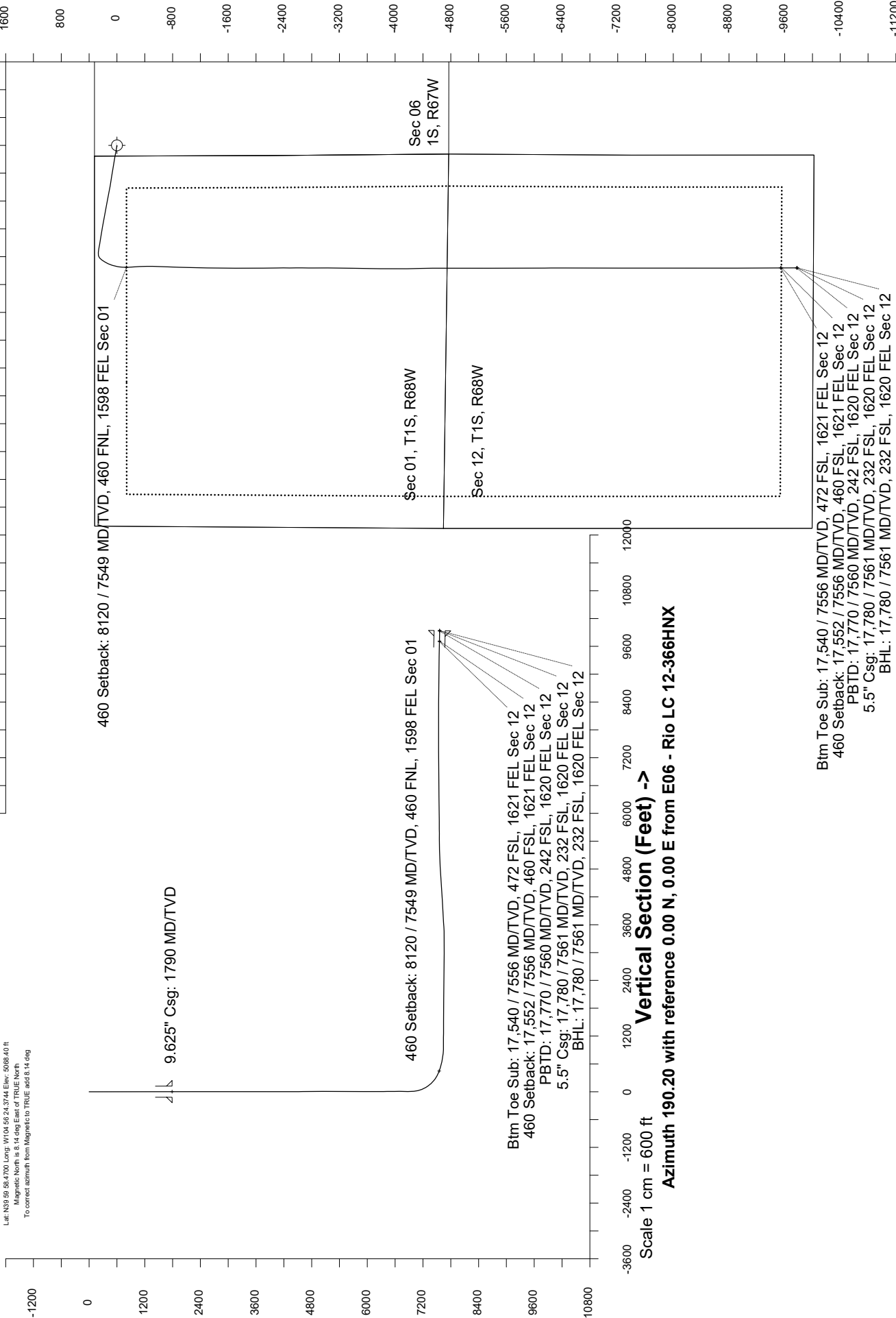
Sep-10-2018
IGRF-12 Dec 98.48 deg Field: 52023.8 nT
Lat: N19 59 98.4700 Long: W104 56 24.3744 Elev: 5088.40 ft
Magnetic North is 8.14 deg East of TRUE North.
To correct azimuth from Magnetic to TRUE add 8.14 deg



Scale 1 cm = 600 ft

<- True Vertical Depth (Feet)

<- North(Feet)



Scale 1 cm = 600 ft

Vertical Section (Feet) ->

Azimuth 190.20 with reference 0.00 N, 0.00 E from E06 - Rio LC 12-366HNX

Great Western Operating Co, LLC
Directional Survey Report
Wellpath: Rio LC 12-366HNX
MDs and TVDs are from Rig Floor 5088.4ft above Mean Sea Level

Wellbore Information

Date Created	Date Revised	API #	RKB above GL	Well Name
Sep-5-2019	Sep-9-2019	05-001-10467	20.00	Rio LC 12-366HNX

Slot Coordinates

Latitude	Longitude
39.99945500	-104.93978200

Pad Information

Pad Name	Ground Elev.
Rio	5068.40

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	39.99945500	-104.93978200
12.60	0.00	249.85	12.60	0.00	0.00	0.00	0.00	39.99945500	-104.93978200
92.60	0.35	249.85	92.60	-0.08	-0.23	0.00	0.12	39.99945477	-104.93978282
182.60	0.18	308.29	182.60	-0.09	-0.60	0.00	0.20	39.99945475	-104.93978414
272.60	0.66	236.22	272.60	-0.29	-1.14	0.00	0.49	39.99945420	-104.93978607
361.60	0.75	258.90	361.59	-0.69	-2.14	0.00	1.06	39.99945311	-104.93978963
451.60	0.48	285.62	451.58	-0.70	-3.08	0.00	1.24	39.99945308	-104.93979299
541.60	0.48	274.46	541.58	-0.57	-3.82	0.00	1.24	39.99945344	-104.93979563
631.60	0.66	320.86	631.58	-0.14	-4.52	0.00	0.94	39.99945462	-104.93979814
721.60	0.57	301.70	721.57	0.50	-5.23	0.00	0.44	39.99945637	-104.93980066
811.60	0.62	298.54	811.57	0.97	-6.04	0.00	0.12	39.99945765	-104.93980355
901.60	0.66	286.50	901.56	1.35	-6.96	0.00	-0.09	39.99945870	-104.93980685
991.60	0.92	280.78	991.55	1.63	-8.17	0.00	-0.16	39.99945947	-104.93981116
1081.60	0.48	230.86	1081.55	1.53	-9.17	0.00	0.12	39.99945919	-104.93981474
1171.60	0.22	201.42	1171.55	1.13	-9.53	0.00	0.58	39.99945809	-104.93981600
1261.60	0.44	285.14	1261.54	1.06	-9.92	0.00	0.72	39.99945790	-104.93981742
1351.60	0.83	246.51	1351.54	0.89	-10.85	0.00	1.05	39.99945743	-104.93982074
1441.60	0.83	276.13	1441.53	0.70	-12.10	0.00	1.46	39.99945691	-104.93982519
1531.60	0.66	274.54	1531.52	0.81	-13.27	0.00	1.55	39.99945722	-104.93982935
1621.60	0.53	263.12	1621.52	0.80	-14.20	0.00	1.73	39.99945719	-104.93983267
1711.60	0.79	274.81	1711.51	0.80	-15.23	0.00	1.91	39.99945720	-104.93983635
1790.00	0.44	257.27	1789.91	0.78	-16.06	0.50	2.08	39.99945714	-104.93983932
1800.00	0.40	252.92	1799.91	0.76	-16.13	0.00	2.11	39.99945709	-104.93983957
1890.00	0.76	3.51	1889.90	1.26	-16.39	0.00	1.66	39.99945847	-104.93984051
1979.00	0.62	274.26	1978.90	1.89	-16.84	0.00	1.12	39.99946019	-104.93984210
2069.00	0.17	175.60	2068.90	1.79	-17.31	0.00	1.30	39.99945992	-104.93984379
2158.00	0.46	34.27	2157.90	1.96	-17.10	0.00	1.10	39.99946037	-104.93984304
2248.00	0.57	203.91	2247.90	1.85	-17.08	0.00	1.21	39.99946007	-104.93984296
2337.00	0.09	140.42	2336.89	1.39	-17.21	0.00	1.68	39.99945881	-104.93984344
2426.00	0.03	295.33	2425.89	1.34	-17.19	0.00	1.72	39.99945869	-104.93984336
2516.00	0.07	106.62	2515.89	1.34	-17.16	0.00	1.72	39.99945867	-104.93984325
2606.00	0.09	112.52	2605.89	1.29	-17.04	0.00	1.74	39.99945855	-104.93984283
2695.00	0.03	11.16	2694.89	1.29	-16.97	0.00	1.74	39.99945854	-104.93984258
2784.00	0.00	98.24	2783.89	1.31	-16.97	0.00	1.71	39.99945861	-104.93984256
2874.00	0.80	345.67	2873.89	1.92	-17.12	0.00	1.14	39.99946028	-104.93984312
2964.00	0.65	284.98	2963.88	2.66	-17.77	0.00	0.53	39.99946231	-104.93984543
3053.00	0.61	256.48	3052.88	2.68	-18.72	0.00	0.68	39.99946236	-104.93984882
3142.00	0.14	21.04	3141.88	2.67	-19.14	0.00	0.76	39.99946234	-104.93985032
3232.00	0.07	66.42	3231.88	2.80	-19.05	0.00	0.62	39.99946268	-104.93985000
3321.00	0.04	112.61	3320.88	2.81	-18.97	0.00	0.60	39.99946271	-104.93984972
3411.00	0.11	98.20	3410.88	2.78	-18.86	0.00	0.60	39.99946264	-104.93984931
3500.00	0.14	210.83	3499.88	2.68	-18.83	0.00	0.70	39.99946235	-104.93984921
3590.00	2.00	283.89	3589.86	2.96	-20.41	0.00	0.70	39.99946313	-104.93985485
3679.00	4.35	271.31	3678.72	3.41	-25.29	0.00	1.12	39.99946436	-104.93987228
3769.00	7.38	279.05	3768.24	4.40	-34.42	0.00	1.77	39.99946707	-104.93990484
3858.00	12.93	286.57	3855.81	8.14	-49.62	0.00	0.78	39.99947734	-104.93995910
3948.00	14.32	284.54	3943.28	13.81	-70.04	0.00	-1.18	39.99949290	-104.94003201
4037.00	17.25	276.92	4028.92	18.16	-93.81	0.00	-1.26	39.99950485	-104.94011682
4126.00	18.92	272.99	4113.52	20.50	-121.32	0.00	1.31	39.99951128	-104.94021502
4216.00	21.26	282.66	4198.07	24.84	-151.82	0.00	2.44	39.99952319	-104.94032390
4306.00	24.29	281.98	4281.04	32.26	-185.86	0.00	1.16	39.99954356	-104.94044539
4395.00	26.35	279.21	4361.49	39.22	-223.27	0.00	0.94	39.99956267	-104.94057891
4484.00	27.30	278.47	4440.91	45.39	-262.95	0.00	1.89	39.99957960	-104.94072056
4574.00	27.37	280.49	4520.86	52.20	-303.71	0.00	2.41	39.99959829	-104.94086604
4663.00	27.08	278.22	4600.00	58.82	-343.88	0.00	3.01	39.99961646	-104.94100941
4753.00	26.98	280.60	4680.18	65.50	-384.22	0.00	3.58	39.99963481	-104.94115341
4842.00	27.10	280.56	4759.45	72.93	-423.99	0.00	3.31	39.99965520	-104.94129537
4932.00	27.43	276.66	4839.45	79.10	-464.74	0.00	4.46	39.99967211	-104.94144081
5021.00	27.42	282.46	4918.47	85.90	-505.12	0.00	4.92	39.99969078	-104.94158493
5111.00	26.98	275.48	4998.53	92.32	-545.69	0.00	5.78	39.99970840	-104.94172973
5200.00	26.79	279.19	5077.92	97.45	-585.58	0.00	7.80	39.99972249	-104.94187214
5290.00	27.19	281.55	5158.12	104.81	-625.75	0.00	7.67	39.99974268	-104.94201552
5379.00	27.11	281.46	5237.31	112.91	-665.55	0.00	6.75	39.99976491	-104.94215757
5469.00	27.52	280.74	5317.28	120.86	-706.08	0.00	6.10	39.99978673	-104.94230222
5558.00	27.09	279.37	5396.36	127.99	-746.27	0.00	6.20	39.99980630	-104.94244570
5648.00	27.23	280.90	5476.44	135.22	-786.71	0.00	6.25	39.99982615	-104.94259004

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
5737.00	27.17	279.68	5555.60	142.48	-826.74	0.00	6.18	39.99984609	-104.94273290
5827.00	26.42	282.71	5635.94	150.34	-866.53	0.00	5.49	39.99986767	-104.94287493
5916.00	26.41	281.55	5715.65	158.66	-905.24	0.00	4.16	39.99989050	-104.94301309
6006.00	26.84	280.62	5796.10	166.42	-944.82	0.00	3.54	39.99991178	-104.94315437
6095.00	27.39	279.42	5875.32	173.47	-984.76	0.00	3.67	39.99993114	-104.94329694
6185.00	27.14	280.58	5955.32	180.63	-1025.36	0.00	3.82	39.99995078	-104.94344186
6274.00	26.96	281.25	6034.59	188.29	-1065.10	0.00	3.32	39.99997181	-104.94358372
6363.00	27.11	280.48	6113.86	195.91	-1104.83	0.00	2.85	39.99999274	-104.94372552
6452.00	27.15	281.07	6193.07	203.50	-1144.70	0.00	2.44	40.00001356	-104.94386783
6542.00	27.02	276.87	6273.21	209.89	-1185.15	0.00	3.32	40.00003109	-104.94401222
6631.00	26.96	278.29	6352.52	215.22	-1225.19	0.00	5.17	40.00004571	-104.94415512
6720.00	26.84	279.76	6431.89	221.53	-1264.95	0.00	5.99	40.00006304	-104.94429706
6810.00	26.91	279.76	6512.17	228.43	-1305.05	0.00	6.31	40.00008197	-104.94444017
6899.00	26.80	280.20	6591.57	235.40	-1344.64	0.00	6.46	40.00010109	-104.94458151
6989.00	26.78	279.90	6671.91	242.48	-1384.59	0.00	6.57	40.00012051	-104.94472408
7078.00	26.90	280.02	6751.32	249.43	-1424.17	0.00	6.74	40.00013959	-104.94486535
7168.00	26.29	279.80	6831.80	256.36	-1463.85	0.00	6.94	40.00015862	-104.94500701
7257.00	26.08	278.86	6911.66	262.73	-1502.61	0.00	7.54	40.00017609	-104.94514533
7347.00	26.93	277.43	6992.20	268.41	-1542.36	0.00	8.99	40.00019168	-104.94528725
7436.00	27.27	255.71	7071.63	265.98	-1582.21	0.00	18.44	40.00018500	-104.9452945
7526.00	27.03	231.89	7151.95	248.22	-1618.39	0.00	42.33	40.00013623	-104.94555858
7615.00	29.97	215.61	7230.27	217.61	-1647.29	0.00	77.57	40.00005221	-104.94566175
7705.00	35.73	211.96	7305.86	177.00	-1674.32	0.00	122.32	39.99994072	-104.94575820
7794.00	43.94	204.64	7374.18	126.77	-1701.01	0.00	176.48	39.99980284	-104.94585345
7883.00	51.45	197.44	7434.08	65.37	-1724.36	0.00	241.05	39.99963428	-104.94593680
7973.00	57.78	191.06	7486.21	-5.69	-1742.24	0.00	314.15	39.99943922	-104.94600061
8062.00	66.83	182.70	7527.59	-83.77	-1751.42	0.00	392.63	39.99922487	-104.94603336
8120.19	70.08	179.82	7548.96	-137.87	-1752.59	7.24	446.08	39.99907636	-104.94603753
8152.00	71.88	178.29	7559.32	-167.94	-1752.10	0.00	475.58	39.99899383	-104.94603574
8241.00	75.00	175.44	7584.69	-253.10	-1747.41	0.00	558.57	39.99876006	-104.94601901
8331.00	78.03	177.40	7605.68	-340.43	-1741.96	0.00	643.55	39.99852032	-104.94599952
8420.00	80.42	178.46	7622.32	-427.80	-1738.80	0.00	728.98	39.99828049	-104.94598824
8509.00	83.55	181.45	7634.73	-515.91	-1738.74	0.00	815.68	39.99803862	-104.94598800
8599.00	88.12	182.17	7641.26	-605.60	-1741.58	0.00	904.46	39.99779241	-104.94599810
8688.00	89.94	182.09	7642.77	-694.52	-1744.89	0.00	992.56	39.99754831	-104.94600988
8777.00	89.85	182.05	7642.93	-783.46	-1748.10	0.00	1080.67	39.99730416	-104.94602133
8867.00	89.88	182.25	7643.14	-873.40	-1751.48	0.00	1169.78	39.99705727	-104.94603336
8956.00	89.57	180.69	7643.57	-962.37	-1753.76	0.00	1257.75	39.99681305	-104.94604149
9045.00	89.85	181.60	7644.02	-1051.35	-1755.54	0.00	1345.64	39.99656879	-104.94604781
9135.00	89.42	182.04	7644.60	-1141.30	-1758.40	0.00	1434.67	39.99632186	-104.94605799
9224.00	89.35	180.64	7645.55	-1230.27	-1760.48	0.00	1522.60	39.99607764	-104.94606540
9314.00	89.45	181.99	7646.49	-1320.24	-1762.55	0.00	1611.52	39.99583066	-104.94607274
9403.00	89.51	179.94	7647.30	-1409.22	-1764.04	0.00	1699.35	39.99558641	-104.94607807
9493.00	90.15	180.16	7647.57	-1499.21	-1764.12	0.00	1787.94	39.99533935	-104.94607833
9583.00	89.78	180.82	7647.62	-1589.21	-1764.89	0.00	1876.65	39.99509230	-104.94608105
9672.00	89.66	180.25	7648.06	-1678.20	-1765.72	0.00	1964.39	39.99484800	-104.94608400
9761.00	89.42	180.06	7648.77	-1767.20	-1765.96	0.00	2052.02	39.99460370	-104.94608483
9851.00	89.17	178.98	7649.88	-1857.19	-1765.21	0.00	2140.45	39.99435667	-104.94608212
9940.00	89.45	179.88	7650.95	-1946.18	-1764.32	0.00	2227.88	39.99411239	-104.94607894
10030.00	89.88	180.53	7651.48	-2036.18	-1764.65	0.00	2316.51	39.99386534	-104.94608006
10120.00	89.45	179.90	7652.00	-2126.17	-1764.98	0.00	2405.14	39.99361829	-104.94608125
10209.00	89.17	178.88	7653.08	-2215.16	-1764.04	0.00	2492.56	39.99337401	-104.94607784
10299.00	90.37	178.53	7653.44	-2305.13	-1762.00	0.00	2580.75	39.99312703	-104.94607056
10388.00	90.06	180.46	7653.10	-2394.13	-1761.22	0.00	2668.20	39.99288274	-104.94606774
10478.00	89.14	180.73	7653.73	-2484.12	-1762.15	0.00	2756.93	39.99263570	-104.94607105
10567.00	88.74	178.15	7653.38	-2573.09	-1761.28	0.00	2844.34	39.99239146	-104.94606793
10657.00	89.78	181.09	7656.54	-2663.07	-1760.69	0.00	2932.79	39.99214446	-104.94606577
10746.00	89.32	180.37	7657.24	-2752.06	-1761.82	0.00	3020.58	39.99190018	-104.94606980
10836.00	89.05	180.25	7658.52	-2842.05	-1762.31	0.00	3109.23	39.99165315	-104.94607151
10925.00	88.86	180.61	7660.14	-2931.03	-1762.98	0.00	3196.92	39.99140888	-104.94607387
11015.00	90.28	179.81	7660.82	-3021.03	-1763.31	0.00	3285.55	39.99116184	-104.94607503
11104.00	91.91	181.06	7659.12	-3110.00	-1763.98	0.00	3373.24	39.99091759	-104.94607742
11194.00	92.99	180.52	7655.27	-3199.91	-1765.22	0.00	3461.95	39.99067079	-104.94608182
11283.00	93.20	180.29	7650.47	-3288.78	-1765.85	0.00	3549.52	39.99042684	-104.94608404
11373.00	93.17	179.15	7645.46	-3378.64	-1765.41	0.00	3637.88	39.99018017	-104.94608245
11462.00	93.11	180.54	7640.59	-3467.50	-1765.17	0.00	3725.30	39.98993623	-104.94608157
11552.00	93.29	181.86	7635.57	-3557.34	-1767.05	0.00	3814.05	39.98968961	-104.94608826
11641.00	93.45	180.96	7630.33	-3646.16	-1769.24	0.00	3901.85	39.98944580	-104.94609604
11731.00	93.39	180.83	7624.96	-3735.98	-1770.64	0.00	3990.51	39.98919921	-104.94610102
11820.00	93.76	182.66	7619.41	-3824.77	-1773.35	0.00	4078.37	39.98895550	-104.94611065
11910.00	93.51	181.28	7613.71	-3914.53	-1776.43	0.00	4167.26	39.98870909	-104.94612165
11999.00	93.36	178.61	7608.37	-4003.36	-1776.35	0.00	4254.67	39.98846523	-104.94612132
12088.00	93.42	178.94	7603.11	-4092.19	-1774.45	0.00	4341.76	39.98822140	-104.94611452
12178.00	93.29	178.70	7597.84	-4182.01	-1772.60	0.00	4429.83	39.98797482	-104.94610789
12267.00	93.33	179.15	7592.71	-4270.85	-1770.93	0.00	4516.97	39.98773096	-104.94610192
12357.00	93.20	178.98	7587.58	-4360.69	-1769.46	0.00	4605.13	39.98748434	-104.94609667
12446.00	93.26	178.67	7582.57	-4449.53	-1767.64	0.00	4692.25	39.98724046	-104.94609014
12536.00	93.45	179.13	7577.30	-4539.36	-1765.92	0.00	4780.35	39.98699388	-104.94608396
12626.00	93.48	180.02	7571.86	-4629.19	-1765.25	0.00	4868.64	39.98674728	-104.94608156
12715.00	93.54	180.33	7566.41	-4718.02	-1765.52	0.00	4956.12	39.98650342	-104.94608251
12804.00	93.39	180.12	7561.03	-4806.86	-1765.87	0.00	5043.61	39.98625956	-104.94608373
12894.00	91.88	179.96	7556.89	-4896.76	-1765.93	0.00	5132.11	39.98601277	-104.94608393
12983.00	90.06	179.93	7555.39	-4985.74	-1765.85	0.00	5219.67	39.98576850	-104.94608360
13073.00	90.18	180.10	7555.20	-5075.74	-1765.87	0.00	5308.25	39.98552144	-104.94608367
13162.00	90.12	180.02	7554.97	-5164.74	-1765.97	0.00	5395.86	39.98527713	-104.94608398
13252.00	90.09	180.18	7554.80	-5254.74	-1766.12	0.00	5484.46	39.98503007	-104.94608451
13341.00	90.65	179.94	7554.23	-5343.74	-1766.22	0.00	5572.07	39.98478577	-104.94608482
13431.00	90.43	179.60	7553.38	-5433.74	-1765.85	0.00	5660.58	39.98453872	-104.94608351
13520.00	90.65	179.76	7552.54	-5522.73	-1765.36	0.00	5748.08	39.98429442	-104.94608172
13610.00	90.68	179.78	7551.49	-5612.72	-1765.00	0.00	5836.59	39.98404738	-104.94608040

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
13699.00	90.65	180.65	7550.46	-5701.72	-1765.33	0.00	5924.23	39.98380309	-104.94608157
13789.00	90.62	179.73	7549.46	-5791.71	-1765.63	0.00	6012.85	39.98355605	-104.94608261
13879.00	90.52	179.50	7548.57	-5881.70	-1765.02	0.00	6101.32	39.98330901	-104.94608043
13968.00	90.65	179.76	7547.66	-5970.70	-1764.45	0.00	6188.80	39.98306472	-104.94607836
14058.00	90.65	179.70	7546.64	-6060.69	-1764.02	0.00	6277.30	39.98281768	-104.94607682
14147.00	90.55	179.29	7545.71	-6149.68	-1763.24	0.00	6364.74	39.98257339	-104.94607400
14237.00	90.74	179.83	7544.69	-6239.67	-1762.55	0.00	6453.19	39.98232635	-104.94607151
14326.00	90.83	179.95	7543.47	-6328.66	-1762.38	0.00	6540.74	39.98208206	-104.94607088
14416.00	90.59	179.73	7542.36	-6418.66	-1762.13	0.00	6629.27	39.98183502	-104.94606996
14505.00	90.71	179.71	7541.35	-6507.65	-1761.69	0.00	6716.78	39.98159073	-104.94606839
14595.00	90.74	180.30	7540.21	-6597.64	-1761.70	0.00	6805.35	39.98134369	-104.94606839
14684.00	90.71	180.11	7539.08	-6686.63	-1762.02	0.00	6892.99	39.98109940	-104.94606951
14773.00	90.49	180.26	7538.15	-6775.63	-1762.31	0.00	6980.63	39.98085510	-104.94607051
14863.00	89.82	180.42	7537.91	-6865.63	-1762.84	0.00	7069.30	39.98060805	-104.94607239
14952.00	89.82	179.71	7538.19	-6954.63	-1762.94	0.00	7156.91	39.98036374	-104.94607273
15042.00	89.75	179.26	7538.53	-7044.62	-1762.13	0.00	7245.34	39.98011669	-104.94606982
15132.00	90.74	181.05	7538.14	-7134.62	-1762.38	0.00	7333.95	39.97986965	-104.94607067
15221.00	89.91	181.12	7537.64	-7223.60	-1764.06	0.00	7421.83	39.97962539	-104.94607666
15311.00	89.69	179.02	7537.95	-7313.59	-1764.17	0.00	7510.42	39.97937834	-104.94607703
15400.00	90.15	180.32	7538.07	-7402.59	-1763.66	0.00	7597.92	39.97913404	-104.94607518
15489.00	90.28	180.83	7537.74	-7491.58	-1764.55	0.00	7685.66	39.97888974	-104.94607834
15579.00	89.94	180.32	7537.57	-7581.58	-1765.45	0.00	7774.40	39.97864270	-104.94608154
15668.00	90.22	179.86	7537.44	-7670.58	-1765.59	0.00	7862.01	39.97839839	-104.94608202
15758.00	90.34	180.88	7537.00	-7760.57	-1766.18	0.00	7950.69	39.97815134	-104.94608407
15847.00	89.17	179.66	7537.38	-7849.57	-1766.59	0.00	8038.35	39.97790704	-104.94608554
15937.00	88.55	179.54	7539.18	-7939.55	-1765.97	0.00	8126.80	39.97766004	-104.94608328
16026.00	90.09	180.03	7540.23	-8028.54	-1765.63	0.00	8214.32	39.97741575	-104.94608206
16116.00	90.03	179.83	7540.14	-8118.54	-1765.52	0.00	8302.88	39.97716869	-104.94608165
16206.00	89.94	180.35	7540.16	-8208.54	-1765.66	0.00	8391.48	39.97692163	-104.94608213
16295.00	89.75	178.64	7540.40	-8297.53	-1764.88	0.00	8478.93	39.97667734	-104.94607931
16385.00	90.43	179.69	7540.26	-8387.52	-1763.57	0.00	8567.26	39.97643031	-104.94607461
16475.00	90.15	180.03	7539.80	-8477.52	-1763.35	0.00	8655.80	39.97618326	-104.94607380
16564.00	90.49	179.97	7539.31	-8566.51	-1763.35	0.00	8743.39	39.97593895	-104.94607378
16654.00	89.91	180.55	7538.99	-8656.51	-1763.76	0.00	8832.04	39.97569190	-104.94607521
16744.00	88.83	179.76	7539.98	-8746.50	-1764.00	0.00	8920.65	39.97544486	-104.94607606
16833.00	89.02	179.99	7541.65	-8835.49	-1763.81	0.00	9008.20	39.97520059	-104.94607534
16923.00	88.89	179.68	7543.29	-8925.47	-1763.55	0.00	9096.71	39.97495358	-104.94607439
17012.00	88.77	181.05	7545.11	-9014.45	-1764.11	0.00	9184.38	39.97470932	-104.94607639
17102.00	88.86	179.72	7546.97	-9104.43	-1764.72	0.00	9273.04	39.97446233	-104.94607853
17192.00	88.80	179.43	7548.81	-9194.41	-1764.05	0.00	9361.48	39.97421533	-104.94607612
17281.00	88.49	179.06	7550.92	-9283.37	-1762.88	0.00	9448.84	39.97397111	-104.94607192
17371.00	88.95	179.59	7552.93	-9373.34	-1761.82	0.00	9537.20	39.97372413	-104.94606811
17460.00	88.86	179.75	7554.63	-9462.33	-1761.31	0.00	9624.68	39.97347986	-104.94606626
17540.43	89.19	179.50	7555.99	-9542.74	-1760.78	0.52	9703.73	39.97325911	-104.94606436
17549.00	89.23	179.47	7556.11	-9551.31	-1760.70	0.52	9712.15	39.97323559	-104.94606408
17552.06	89.22	179.49	7556.15	-9554.37	-1760.67	0.80	9715.16	39.97322719	-104.94606398
17639.00	88.98	180.15	7557.52	-9641.30	-1760.40	0.80	9800.67	39.97298856	-104.94606299
17728.00	88.68	179.79	7559.33	-9730.28	-1760.36	0.53	9888.23	39.97274430	-104.94606280
17756.00	88.68	179.96	7559.98	-9758.27	-1760.29	0.61	9915.77	39.97266746	-104.94606258
17769.85	88.68	179.96	7560.30	-9772.12	-1760.28	0.00	9929.40	39.97262945	-104.94606254
17780.00	88.68	179.96	7560.53	-9782.27	-1760.28	0.00	9939.38	39.97260159	-104.94606251

Comments

MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment
1790.00	1789.91	0.78	-16.06	39.99945714	-104.93983932	9.625" Csg: 1790 MD/TVD
8120.19	7548.96	-137.87	-1752.59	39.99907636	-104.94603753	460 Setback: 8120 / 7549 MD/TVD, 460 FNL, 1598 FEL Sec 01
17540.43	7555.99	-9542.74	-1760.78	39.97325911	-104.94606436	Btm Toe Sub: 17,540 / 7556 MD/TVD, 472 FSL, 1621 FEL Sec 12
17552.06	7556.15	-9554.37	-1760.67	39.97322719	-104.94606398	460 Setback: 17,552 / 7556 MD/TVD, 460 FSL, 1621 FEL Sec 12
17769.85	7560.30	-9772.12	-1760.28	39.97262945	-104.94606254	PBTD: 17,770 / 7560 MD/TVD, 242 FSL, 1620 FEL Sec 12
17780.00	7560.53	-9782.27	-1760.28	39.97260159	-104.94606251	5.5" Csg: 17,780 / 7561 MD/TVD, 232 FSL, 1620 FEL Sec 12
17780.00	7560.53	-9782.27	-1760.28	39.97260159	-104.94606251	BHL: 17,780 / 7561 MD/TVD, 232 FSL, 1620 FEL Sec 12

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	1790.00	1789.91	0.78	-16.06
8.500	1790.00	1789.91	0.78	-16.06	17780.00	7560.53	-9782.27	-1760.28

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	1790.00	1789.91	0.78	-16.06
5 1/2in Casing	0.00	0.00	0.00	0.00	17780.00	7560.53	-9782.27	-1760.28

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool
608587	As Drilled - 20190905	17780.00	7560.53	MWD

Coordinates are from Slot

MD's and TVD's are from Rig Floor 5088.4ft above Mean Sea Level

Vertical Section is from Wellhead on azimuth 190.20 degrees

Bottom hole distance is 9939.38 Feet on azimuth 190.20 degrees from Wellhead

Survey calculation uses Minimum Curvature method