

US ROCKIES WATTENBERG PLANNING



Project: WELD-NAD83-UTMFT13N
Site: 1N-65W-09 Bat Pad
Well: BAT 29N1-9HZ
Wellbore: Plan B
Design: PDD Actual Surveys

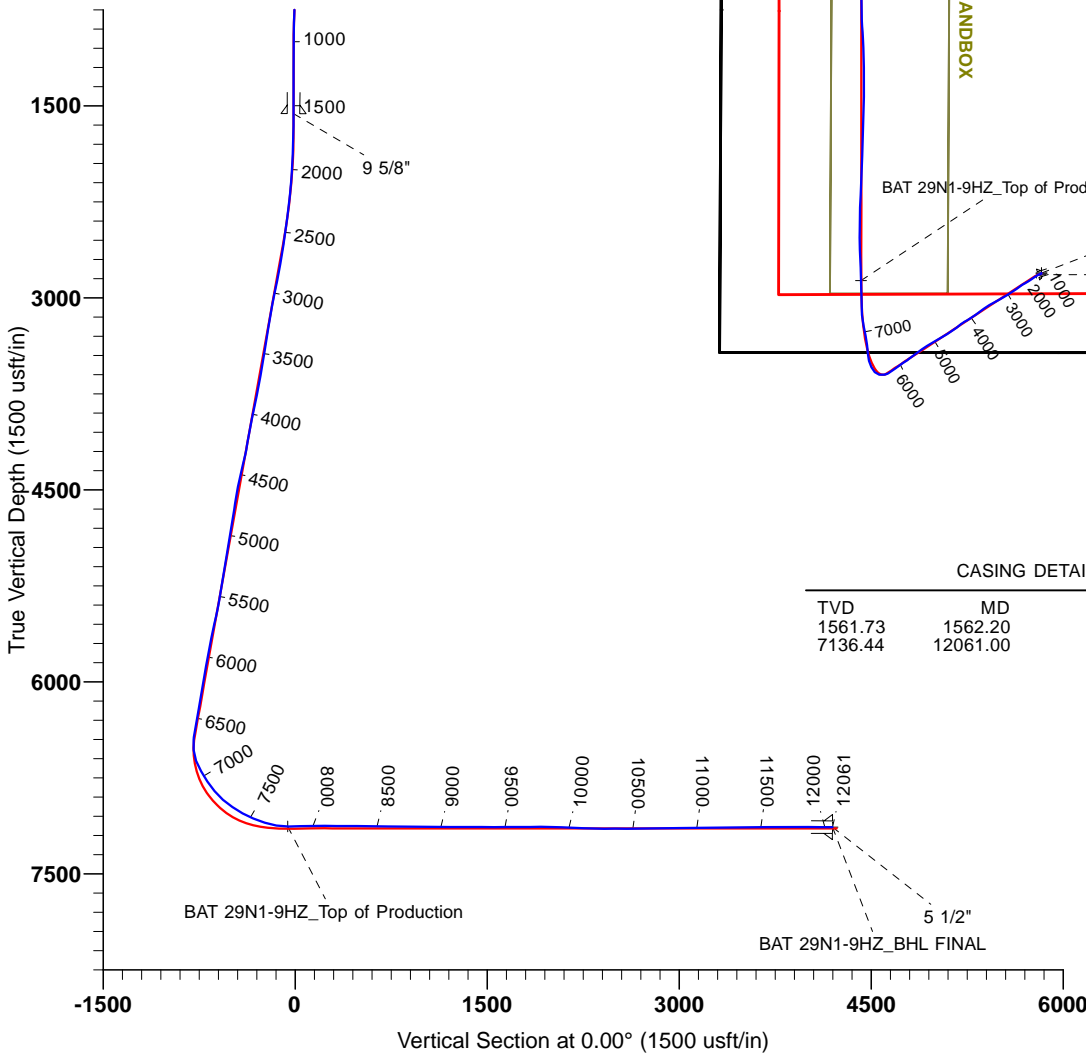
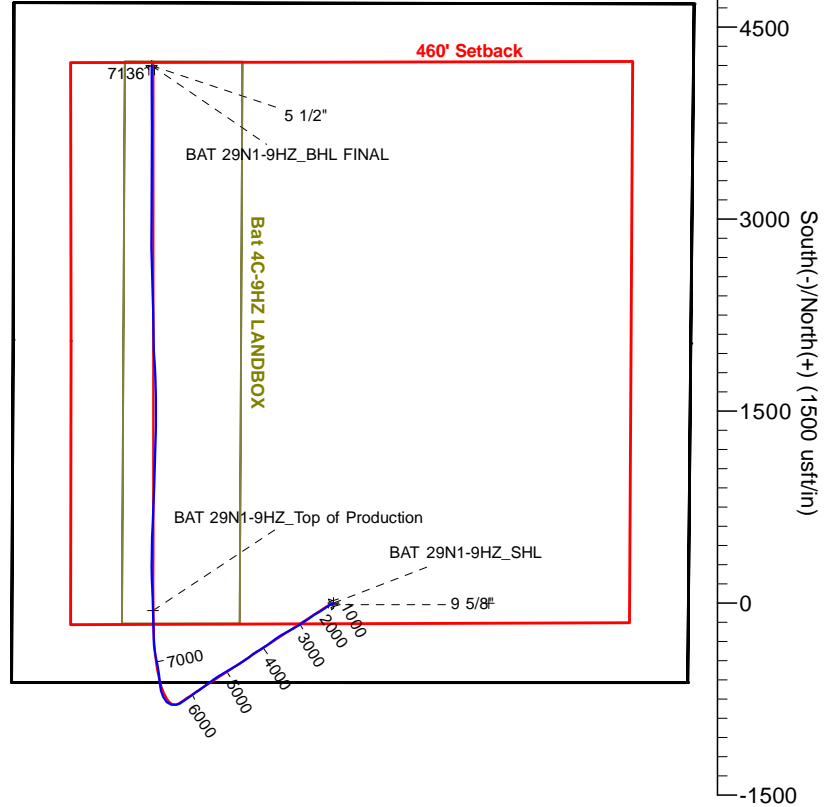
West(-)/East(+) (1500 usft/in)

Top Of Production: 561FSL & 1103FWL Sec 9
 BHL: 491FNL & 1077FWL Sec 9

Section Lines

FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION	DIPANGLE	DIPDIR
6910.22	7224.00	SSPG	0.00	359.47
6939.42	7269.00	NBRR	0.00	359.47
7057.82	7496.00	N470_B_CK	0.00	359.47
7127.53	7747.00	N700_C_CK	0.00	359.47



CASING DETAILS

TVD	MD	Name	Size
1561.73	1562.20	9 5/8"	9-5/8
7136.44	12061.00	5 1/2"	5-1/2

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
1N-R65W-Sec. 9_Section lines	0.00	-0.33	1213.80	14548919.51	17341104.05	40.060443	-104.665168	Polygon
BAT 29N1-9HZ_Landing Diagram	0.00	0.00	0.00	14548915.34	1732890.25	40.060444	-104.669506	Polygon
BAT 29N1-9HZ_SHL	0.00	0.00	0.00	14548915.34	1732890.25	40.060444	-104.669506	Point
BAT 29N1-9HZ_Top of Production	7130.91	-57.20	-1408.82	14548852.91	1731481.66	40.060287	-104.674541	Point
BAT 29N1-9HZ_BHL FINAL	7136.44	4199.58	-1419.96	14553109.62	1731454.71	40.071977	-104.674582	Point



Survey Report

Company: US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference: Well BAT 29N1-9HZ
Project: WELD-NAD83-UTMFT13N	TVD Reference: 4931+25 @ 4956.00usft (hp311)
Site: 1N-65W-09 Bat Pad	MD Reference: 4931+25 @ 4956.00usft (hp311)
Well: BAT 29N1-9HZ	North Reference: True
Wellbore: Plan B	Survey Calculation Method: Minimum Curvature
Design: PDD Actual Surveys	Database: EDM 5000 MultiUser DB

Project WELD-NAD83-UTMFT13N	
Map System: Universal Transverse Mercator (US Survey Feet)	System Datum: Mean Sea Level
Geo Datum: North American Datum 1983	
Map Zone: Zone 13N (108 W to 102 W)	

Site 1N-65W-09 Bat Pad, centered on the 3N1		
Site Position:	Northing: 14,548,915.67 usft	Latitude: 40.060444
From: Lat/Long	Easting: 1,732,980.35 usft	Longitude: -104.669184
Position Uncertainty: 2.68 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.21 °

Well BAT 29N1-9HZ			
Well Position	+N/-S 0.00 usft	Northing: 14,548,915.34 usft	Latitude: 40.060444
	+E/-W 0.00 usft	Easting: 1,732,890.25 usft	Longitude: -104.669506
Position Uncertainty	3.28 usft	Wellhead Elevation: usft	Ground Level: 4,931.00 usft

Wellbore Plan B					
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	5/27/2015	(°) 8.25	(°) 66.66	(nT) 52,546

Design PDD Actual Surveys				
Audit Notes:				
Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.00		
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	0.00

Survey Program		Date 7/7/2015		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
20.00	1,525.00	Cathedral MWD Surface (Plan B)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination
1,572.00	12,003.00	PDD MWD+IFR1 Vert/Curve/Lat (Plan B)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination
12,061.00	12,061.00	PDD Projection to Bit (Plan B)	APC_BLIND	OWSG BLIND

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103.00	1.00	147.66	103.00	-0.61	0.39	-0.61	1.20	1.20	0.00	
166.00	1.30	150.96	165.98	-1.70	1.03	-1.70	0.49	0.48	5.24	
225.00	0.90	197.56	224.97	-2.73	1.21	-2.73	1.60	-0.68	78.98	
287.00	0.60	222.86	286.97	-3.43	0.85	-3.43	0.71	-0.48	40.81	
346.00	0.50	207.46	345.97	-3.89	0.52	-3.89	0.30	-0.17	-26.10	
406.00	0.60	242.66	405.96	-4.26	0.12	-4.26	0.58	0.17	58.67	
469.00	0.60	299.76	468.96	-4.25	-0.46	-4.25	0.91	0.00	90.63	

Survey Report

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Site:	1N-65W-09 Bat Pad	MD Reference:	4931+25 @ 4956.00usft (hp311)
Well:	BAT 29N1-9HZ	North Reference:	True
Wellbore:	Plan B	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000 MultiUser DB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
532.00	1.10	284.46	531.95	-3.93	-1.33	-3.93	0.86	0.79	-24.29	
596.00	1.60	264.96	595.94	-3.86	-2.82	-3.86	1.05	0.78	-30.47	
660.00	2.20	255.96	659.90	-4.24	-4.90	-4.24	1.04	0.94	-14.06	
723.00	2.90	242.66	722.84	-5.26	-7.49	-5.26	1.45	1.11	-21.11	
787.00	2.90	236.76	786.76	-6.89	-10.28	-6.89	0.47	0.00	-9.22	
851.00	2.90	235.16	850.67	-8.71	-12.96	-8.71	0.13	0.00	-2.50	
914.00	2.30	235.36	913.61	-10.33	-15.31	-10.33	0.95	-0.95	0.32	
978.00	0.80	226.66	977.58	-11.37	-16.69	-11.37	2.37	-2.34	-13.59	
1,042.00	0.50	296.66	1,041.58	-11.55	-17.27	-11.55	1.23	-0.47	109.38	
1,106.00	0.70	296.46	1,105.58	-11.25	-17.87	-11.25	0.31	0.31	-0.31	
1,168.00	0.80	271.66	1,167.57	-11.07	-18.64	-11.07	0.54	0.16	-40.00	
1,232.00	0.50	308.36	1,231.57	-10.89	-19.31	-10.89	0.78	-0.47	57.34	
1,296.00	0.80	248.46	1,295.56	-10.88	-19.94	-10.88	1.09	0.47	-93.59	
1,360.00	0.90	259.40	1,359.56	-11.13	-20.85	-11.13	0.30	0.16	17.09	
1,424.00	0.70	262.60	1,423.55	-11.28	-21.73	-11.28	0.32	-0.31	5.00	
1,488.00	0.90	242.00	1,487.54	-11.56	-22.56	-11.56	0.54	0.31	-32.19	
1,525.00	1.40	260.90	1,524.54	-11.77	-23.27	-11.77	1.68	1.35	51.08	
1,572.00	1.50	250.70	1,571.52	-12.06	-24.41	-12.06	0.59	0.21	-21.70	
1,762.00	1.90	238.20	1,761.44	-14.55	-29.44	-14.55	0.29	0.21	-6.58	
1,950.00	5.20	233.80	1,949.05	-21.22	-38.96	-21.22	1.76	1.76	-2.34	
2,139.00	9.30	237.10	2,136.50	-34.58	-58.71	-34.58	2.18	2.17	1.75	
2,328.00	12.50	236.00	2,322.07	-54.32	-88.49	-54.32	1.70	1.69	-0.58	
2,517.00	15.90	241.20	2,505.27	-78.24	-128.15	-78.24	1.92	1.80	2.75	
2,706.00	16.60	233.20	2,686.75	-106.88	-172.46	-106.88	1.24	0.37	-4.23	
2,895.00	19.20	236.50	2,866.59	-140.22	-220.00	-140.22	1.48	1.38	1.75	
3,084.00	20.90	238.30	3,044.13	-175.09	-274.61	-175.09	0.96	0.90	0.95	
3,273.00	19.10	241.70	3,221.73	-207.46	-330.52	-207.46	1.13	-0.95	1.80	
3,462.00	17.60	241.80	3,401.11	-235.63	-382.93	-235.63	0.79	-0.79	0.05	
3,651.00	16.90	234.70	3,581.63	-265.01	-430.54	-265.01	1.17	-0.37	-3.76	
3,840.00	19.80	233.50	3,761.00	-299.93	-478.70	-299.93	1.55	1.53	-0.63	
4,029.00	19.40	235.60	3,939.05	-336.71	-530.34	-336.71	0.43	-0.21	1.11	
4,218.00	18.50	240.10	4,117.82	-369.39	-582.23	-369.39	0.91	-0.48	2.38	
4,407.00	22.20	233.80	4,295.01	-405.44	-637.07	-405.44	2.27	1.96	-3.33	
4,596.00	18.20	232.50	4,472.35	-444.52	-689.32	-444.52	2.13	-2.12	-0.69	
4,784.00	16.60	241.60	4,651.78	-475.17	-736.25	-475.17	1.68	-0.85	4.84	
4,973.00	18.80	237.10	4,831.83	-504.56	-785.57	-504.56	1.37	1.16	-2.38	
5,162.00	17.50	242.50	5,011.43	-534.22	-836.35	-534.22	1.12	-0.69	2.86	
5,350.00	16.90	237.10	5,191.03	-562.12	-884.37	-562.12	0.91	-0.32	-2.87	
5,539.00	17.90	234.40	5,371.39	-593.95	-931.06	-593.95	0.68	0.53	-1.43	
5,728.00	20.30	233.50	5,549.97	-630.37	-981.04	-630.37	1.28	1.27	-0.48	
5,917.00	18.90	233.80	5,728.01	-667.95	-1,032.09	-667.95	0.74	-0.74	0.16	
6,106.00	16.30	237.40	5,908.16	-700.32	-1,079.15	-700.32	1.49	-1.38	1.90	
6,295.00	15.90	232.70	6,089.75	-730.30	-1,122.09	-730.30	0.72	-0.21	-2.49	

Survey Report

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Wellbore:	Plan B	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000 MultiUser DB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
6,390.00	17.10	235.30	6,180.84	-746.14	-1,143.93	-746.14	1.48	1.26	2.74	
6,485.00	17.60	234.70	6,271.52	-762.39	-1,167.13	-762.39	0.56	0.53	-0.63	
6,579.00	20.30	236.10	6,360.41	-779.70	-1,192.27	-779.70	2.91	2.87	1.49	
6,674.00	26.10	260.40	6,447.89	-792.42	-1,226.66	-792.42	11.66	6.11	25.58	
6,768.00	25.10	279.70	6,532.81	-792.51	-1,266.77	-792.51	8.90	-1.06	20.53	
6,862.00	27.40	315.90	6,617.65	-773.49	-1,301.70	-773.49	16.97	2.45	38.51	
6,957.00	33.20	334.00	6,699.81	-734.30	-1,328.39	-734.30	11.33	6.11	19.05	
7,052.00	33.60	345.70	6,779.20	-685.40	-1,346.30	-685.40	6.78	0.42	12.32	
7,146.00	40.50	355.80	6,854.25	-629.64	-1,354.98	-629.64	9.77	7.34	10.74	
7,241.00	49.30	353.50	6,921.48	-562.95	-1,361.33	-562.95	9.42	9.26	-2.42	
7,335.00	55.20	348.60	6,979.03	-489.63	-1,373.01	-489.63	7.51	6.28	-5.21	
7,430.00	61.90	347.60	7,028.56	-410.38	-1,389.74	-410.38	7.11	7.05	-1.05	
7,524.00	67.10	355.90	7,069.08	-326.52	-1,401.76	-326.52	9.70	5.53	8.83	
7,618.00	74.10	359.30	7,100.29	-238.00	-1,405.41	-238.00	8.19	7.45	3.62	
7,713.00	79.10	359.10	7,122.30	-145.63	-1,406.70	-145.63	5.27	5.26	-0.21	
7,808.00	90.50	358.10	7,130.89	-51.21	-1,409.02	-51.21	12.05	12.00	-1.05	
7,902.00	92.60	357.40	7,128.35	42.68	-1,412.71	42.68	2.35	2.23	-0.74	
7,996.00	90.50	357.70	7,125.81	136.56	-1,416.72	136.56	2.26	-2.23	0.32	
8,091.00	89.00	358.80	7,126.22	231.51	-1,419.63	231.51	1.96	-1.58	1.16	
8,186.00	89.10	0.90	7,127.80	326.49	-1,419.87	326.49	2.21	0.11	2.21	
8,280.00	90.90	0.60	7,127.80	420.48	-1,418.64	420.48	1.94	1.91	-0.32	
8,375.00	88.70	2.40	7,128.13	515.43	-1,416.16	515.43	2.99	-2.32	1.89	
8,469.00	89.10	2.40	7,129.93	609.33	-1,412.22	609.33	0.43	0.43	0.00	
8,563.00	89.50	2.40	7,131.08	703.24	-1,408.29	703.24	0.43	0.43	0.00	
8,658.00	90.20	2.50	7,131.33	798.16	-1,404.22	798.16	0.74	0.74	0.11	
8,753.00	90.80	2.30	7,130.50	893.07	-1,400.25	893.07	0.67	0.63	-0.21	
8,847.00	88.00	1.70	7,131.49	987.00	-1,396.97	987.00	3.05	-2.98	-0.64	
8,942.00	88.40	1.60	7,134.47	1,081.91	-1,394.23	1,081.91	0.43	0.42	-0.11	
9,036.00	89.30	1.40	7,136.36	1,175.86	-1,391.77	1,175.86	0.98	0.96	-0.21	
9,131.00	90.20	1.60	7,136.77	1,270.82	-1,389.29	1,270.82	0.97	0.95	0.21	
9,225.00	91.30	1.50	7,135.54	1,364.78	-1,386.74	1,364.78	1.18	1.17	-0.11	
9,319.00	89.10	359.80	7,135.21	1,458.76	-1,385.68	1,458.76	2.96	-2.34	-1.81	
9,414.00	89.80	359.40	7,136.13	1,553.76	-1,386.34	1,553.76	0.85	0.74	-0.42	
9,509.00	91.10	359.00	7,135.38	1,648.74	-1,387.67	1,648.74	1.43	1.37	-0.42	
9,603.00	89.70	357.80	7,134.72	1,742.70	-1,390.29	1,742.70	1.96	-1.49	-1.28	
9,697.00	91.10	357.10	7,134.07	1,836.60	-1,394.47	1,836.60	1.67	1.49	-0.74	
9,791.00	89.80	356.10	7,133.33	1,930.43	-1,400.05	1,930.43	1.74	-1.38	-1.06	
9,886.00	88.30	359.00	7,134.90	2,025.32	-1,404.11	2,025.32	3.44	-1.58	3.05	
9,980.00	87.20	358.80	7,138.59	2,119.22	-1,405.91	2,119.22	1.19	-1.17	-0.21	
10,075.00	87.30	0.20	7,143.15	2,214.11	-1,406.74	2,214.11	1.48	0.11	1.47	
10,170.00	89.50	358.70	7,145.81	2,309.06	-1,407.65	2,309.06	2.80	2.32	-1.58	
10,264.00	90.20	357.00	7,146.05	2,402.99	-1,411.18	2,402.99	1.96	0.74	-1.81	
10,359.00	89.50	358.70	7,146.30	2,497.92	-1,414.74	2,497.92	1.94	-0.74	1.79	

Survey Report

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Site:	1N-65W-09 Bat Pad	MD Reference:	4931+25 @ 4956.00usft (hp311)
Well:	BAT 29N1-9HZ	North Reference:	True
Wellbore:	Plan B	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000 MultiUser DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,453.00	88.70	358.00	7,147.78	2,591.87	-1,417.45	2,591.87	1.13	-0.85	-0.74
10,548.00	91.80	358.50	7,147.36	2,686.81	-1,420.35	2,686.81	3.31	3.26	0.53
10,642.00	90.10	1.10	7,145.80	2,780.78	-1,420.68	2,780.78	3.30	-1.81	2.77
10,737.00	90.20	0.20	7,145.55	2,875.78	-1,419.60	2,875.78	0.95	0.11	-0.95
10,831.00	91.20	359.30	7,144.41	2,969.77	-1,420.01	2,969.77	1.43	1.06	-0.96
10,926.00	92.40	358.70	7,141.42	3,064.70	-1,421.67	3,064.70	1.41	1.26	-0.63
11,021.00	89.90	0.90	7,139.52	3,159.67	-1,422.00	3,159.67	3.51	-2.63	2.32
11,115.00	89.80	1.20	7,139.76	3,253.65	-1,420.27	3,253.65	0.34	-0.11	0.32
11,210.00	90.40	0.50	7,139.60	3,348.64	-1,418.86	3,348.64	0.97	0.63	-0.74
11,304.00	90.90	0.40	7,138.53	3,442.63	-1,418.13	3,442.63	0.54	0.53	-0.11
11,398.00	90.90	0.20	7,137.05	3,536.62	-1,417.63	3,536.62	0.21	0.00	-0.21
11,493.00	90.80	359.90	7,135.64	3,631.61	-1,417.55	3,631.61	0.33	-0.11	-0.32
11,587.00	90.60	359.80	7,134.50	3,725.60	-1,417.80	3,725.60	0.24	-0.21	-0.11
11,682.00	90.10	359.90	7,133.91	3,820.60	-1,418.05	3,820.60	0.54	-0.53	0.11
11,777.00	89.30	359.40	7,134.41	3,915.59	-1,418.63	3,915.59	0.99	-0.84	-0.53
11,871.00	89.80	0.00	7,135.15	4,009.59	-1,419.12	4,009.59	0.83	0.53	0.64
11,966.00	89.60	359.50	7,135.65	4,104.59	-1,419.53	4,104.59	0.57	-0.21	-0.53
12,003.00	89.50	359.80	7,135.94	4,141.59	-1,419.76	4,141.59	0.85	-0.27	0.81
12,061.00	89.50	359.80	7,136.44	4,199.58	-1,419.96	4,199.58	0.00	0.00	0.00