

3002542514



July 23, 2015

HOBBS OCD

MAR 28 2016

RECEIVED

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: Ivar the Boneless Federal No 011H

Please find enclosed a copy of the survey from 0' to 5050' ran on the above referenced well.

Sincerely, 
Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 23 day of July, A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas

VES Survey International
P.O. Box 261021 Corpus Christi, TX 78426
T (361) 767-0602 F (361) 767-0612
www.vessurvey.com



MAR 29 2016



Company: Concho
Lease/Well: Ivar The Boneless Federal No/011H
Location: S22, T17S, R32E
Rig Name: United 43
State/County: New Mexico/Lea
VS-Azi: 0.00 Degrees
Latitude: 32.82703, Longitude: -103.76127
Grid North = True North -0.31 degs (NAD 27)
Grid Convergence Applied = -0.31 degs

Depth Reference : RKB = 12.5 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...neless fed 11h_gyro survey.ut

Minimum Curvature Method

Report Date/Time: 7/23/2015 / 10:08

VES Survey International

West Texas

(432) 583-5444

Surveyor: Gene Heiss

Ivar the Boneless Federal No 011H / API 30-025-42514

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.36	320.57	100.00	0.24	-0.20	0.24	0.31	320.57	0.36
200.00	0.40	1.97	200.00	0.83	-0.39	0.83	0.91	335.10	0.27
300.00	0.33	3.76	300.00	1.46	-0.35	1.46	1.50	346.36	0.07
400.00	0.31	312.94	399.99	1.93	-0.53	1.93	2.00	344.54	0.27
500.00	0.42	221.68	499.99	1.84	-0.97	1.84	2.09	332.17	0.52
600.00	0.21	191.30	599.99	1.39	-1.25	1.39	1.87	318.08	0.26
700.00	0.35	244.04	699.99	1.08	-1.56	1.08	1.90	304.72	0.28
800.00	0.26	155.28	799.99	0.74	-1.74	0.74	1.89	293.10	0.43
900.00	0.13	150.82	899.99	0.44	-1.59	0.44	1.65	285.34	0.13
1000.00	0.29	162.81	999.99	0.10	-1.46	0.10	1.46	273.75	0.16
1100.00	0.37	176.18	1099.99	-0.46	-1.36	-0.46	1.44	251.15	0.11
1200.00	0.62	193.20	1199.98	-1.31	-1.48	-1.31	1.97	228.13	0.29
1300.00	0.49	164.62	1299.98	-2.26	-1.47	-2.26	2.70	213.14	0.30
1400.00	0.71	157.65	1399.97	-3.25	-1.12	-3.25	3.44	199.05	0.23
1500.00	0.45	105.72	1499.97	-3.93	-0.51	-3.93	3.97	187.33	0.56
1600.00	0.59	81.46	1599.96	-3.96	0.39	-3.96	3.98	174.45	0.26

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1700.00	1.24	83.64	1899.95	-3.77	1.97	-3.77	4.25	152.37	0.64
1800.00	1.66	77.70	1799.92	-3.34	4.46	-3.34	5.57	126.83	0.45
1900.00	1.74	74.88	1899.87	-2.83	7.34	-2.63	7.80	109.74	0.12
2000.00	1.63	76.07	1999.83	-1.89	10.19	-1.89	10.36	100.53	0.12
2100.00	1.63	79.61	2099.79	-1.30	12.97	-1.30	13.03	95.70	0.10
2200.00	1.09	92.98	2199.76	-1.09	15.32	-1.09	15.36	94.08	0.62
2300.00	1.11	120.15	2299.74	-1.62	17.10	-1.62	17.18	95.42	0.52
2400.00	1.07	134.82	2399.73	-2.76	18.60	-2.76	18.80	98.45	0.28
2500.00	1.08	157.48	2499.71	-4.29	19.62	-4.29	20.08	102.33	0.42
2600.00	0.86	178.01	2599.70	-5.91	20.00	-5.91	20.86	106.46	0.40
2700.00	0.90	192.57	2699.68	-7.43	19.86	-7.43	21.20	110.52	0.23
2800.00	0.96	202.82	2799.67	-8.98	19.36	-8.98	21.34	114.87	0.18
2900.00	1.02	201.58	2899.66	-10.58	18.71	-10.58	21.49	119.48	0.06
3000.00	1.02	202.56	2999.64	-12.23	18.04	-12.23	21.79	124.14	0.02
3100.00	0.84	202.71	3099.63	-13.73	17.41	-13.73	22.17	128.26	0.18
3200.00	1.29	203.32	3199.61	-15.44	16.68	-15.44	22.73	132.79	0.45
3300.00	1.26	191.41	3299.58	-17.55	16.02	-17.55	23.76	137.82	0.27
3400.00	1.32	208.82	3399.56	-19.66	15.28	-19.66	24.90	142.14	0.35
3500.00	1.41	197.27	3499.53	-21.86	14.39	-21.86	26.18	146.64	0.24
3600.00	1.46	217.43	3599.50	-24.05	13.25	-24.05	27.46	151.14	0.50
3700.00	1.42	199.57	3699.47	-26.23	12.07	-26.23	28.87	155.30	0.45
3800.00	1.53	203.83	3799.44	-28.62	11.11	-28.62	30.70	158.78	0.16
3900.00	1.53	208.12	3899.40	-31.02	9.94	-31.02	32.57	162.23	0.11
4000.00	1.50	207.40	3999.37	-33.36	8.71	-33.36	34.48	165.37	0.04
4100.00	1.16	204.33	4099.34	-35.45	7.69	-35.45	36.27	167.76	0.35
4200.00	1.16	208.54	4199.32	-37.26	6.79	-37.26	37.87	169.67	0.09
4300.00	1.44	208.57	4299.29	-39.23	5.69	-39.23	39.64	171.75	0.28
4400.00	0.96	225.28	4399.27	-40.91	4.47	-40.91	41.16	173.76	0.57
4500.00	0.79	229.49	4499.26	-41.95	3.35	-41.95	42.08	175.43	0.18
4600.00	0.95	212.73	4599.25	-43.10	2.38	-43.10	43.16	176.84	0.30
4700.00	0.86	215.59	4699.23	-44.41	1.50	-44.41	44.43	178.07	0.10
4800.00	0.73	218.48	4799.22	-45.52	0.66	-45.52	45.52	179.17	0.14
4900.00	0.63	212.47	4899.22	-46.48	-0.03	-46.48	46.48	180.04	0.12
5050.00	0.69	188.38	5049.21	-48.08	-0.61	-48.08	48.08	180.73	0.19



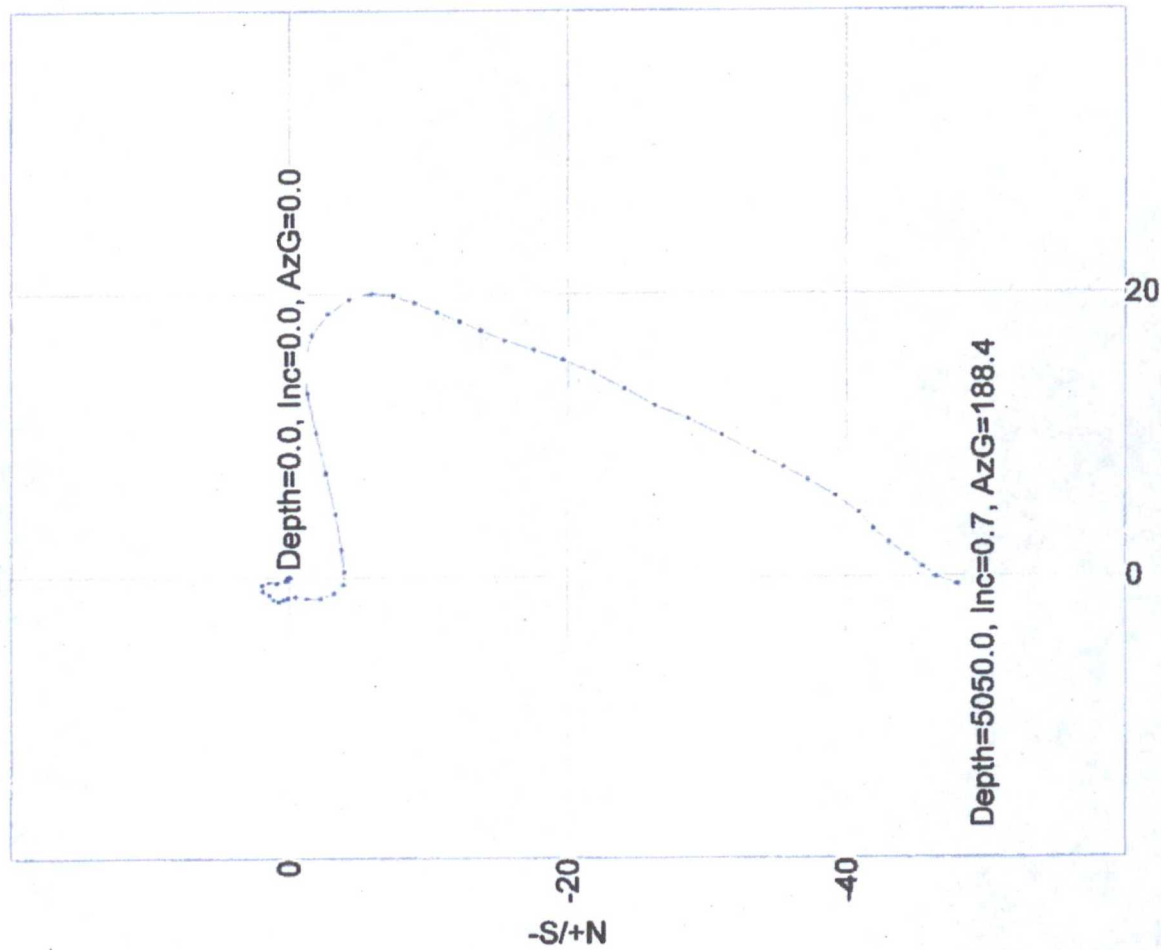
VES Survey International

West Texas

(432) 563-5444

Surveyor: Gene Heiss

Ivar the Boneless Federal No 011H / API 30-025-42514



VES Survey Date: 7/16/2015

WELL NAME AND NUMBER Ivar the Boneless Fed No. 11H
 LOCATION Section 22, T17S, R32E, Unit D, 75 FNL, 330 FWL, Lea Cty
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth
.2° @ 570'
.6° @ 917'
.7° @ 1257'
1.2° @ 1607'
1.1° @ 1924'
1.6° @ 2142'
.9° @ 2433'
.7° @ 2848'
.9° @ 3238'
1.3° @ 3655'
.9° @ 3942'
1.0° @ 4362'
.3° @ 4748'
.8° @ 5084'
.8° @ 5130'
.7° @ 5163'
.5° @ 5195'
1.8° @ 5227'

Degrees @ Depth
5.3° @ 5260'
9.6° @ 5292'
14.4° @ 5324'
19.9° @ 5388'
26.5° @ 5452'
35.6° @ 5516'
39.4° @ 5548'
42.7° @ 5580'
45.8° @ 5612'
49.1° @ 5644'
52.2° @ 5617'
55.0° @ 5708'
58.2° @ 5771'
60.5° @ 5803'
62.8° @ 5835'
64.9° @ 5867'
70.1° @ 5899'
75.4° @ 5923'

Degrees @ Depth
82.2° @ 5956'
85.5° @ 5988'
87.6° @ 6019'
90.6° @ 6051'
90.7° @ 6244'
89.8° @ 6437'
92.0° @ 6629'
90.8° @ 6724'
91.1° @ 6820'
90.1° @ 7013'
89.8° @ 7107'
89.4° @ 7203'
90.5° @ 7298'
89.9° @ 7394'
91.2° @ 7491'
91.0° @ 7597'
91.0° @ 7682'
91.0° @ 7776'

Drilling Contractor- UNITED DRILLING, INC.

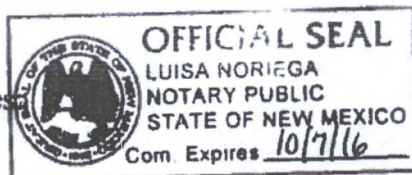
By: Angel Salazar
 (Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 28th day of July 2015.

Luisa Noriega
 Notary Public

My Commission Expires



Chaves
 County

NM
 State

WELL NAME AND NUMBER Ivar the Boneless Fed No. 11H
 LOCATION Section 22, T17S, R32E, Unit D, 75 FNL, 330 FWL, Lea Cty
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
90.9° @ 7872'	92.9° @ 9896'	
90.9° @ 7967'	92.3° @ 9993'	
90.9° @ 8063'	91.2° @ 10185'	
90.5° @ 8159'	90.9° @ 10282'	
90.1° @ 8350'	93.5° @ 10482'	
90.2° @ 8447'		
90.7° @ 8641'		
90.9° @ 8737'		
91.0° @ 8834'		
90.9° @ 8931'		
92.0° @ 9027'		
91.8° @ 9123'		
91.3° @ 9220'		
90.9° @ 9316'		
92.4° @ 9413'		
92.0° @ 9510'		
91.8° @ 9607'		
92.4° @ 9799'		

Drilling Contractor- UNITED DRILLING, INC.

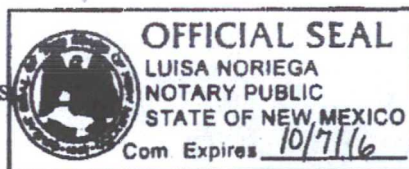
By: *Angel Salazar*
 (Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 28th day of July 2015.

Luisa Noriega
 Notary Public

My Commission Expires



Chaves NM
 County State



9/8/15

State of New Mexico
County of Lea

I, Donald D. Mason, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 07/17/2015 through 07/22/2015 conduct or supervise the taking of a MWD survey from a depth of 5130 feet to a depth of 10536 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC; that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating, LLC for the Ivar the Boneless Federal #11H Well API 30-025-42514 in Lea County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

Donald D. Mason
President

State of Texas
County of Burnet

Before me, a notary public, on this day personally appeared Donald D. Mason, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.



Notary Public's Signature

8610 N New Braunfels, Suite 405

San Antonio, Texas 78217

(210) 826-2022



Customer Name: COG

Well Name: Ivar The Boneless Federal #11H

API Number: 30-025-42514

County / Parish: Lea Co, NM

M.W.D. Operator: Justin Campos

Directional Driller: John Overton

Total Magnetic Correction: 6.99

Job #: NM-552

Vertical Section: 359.88

Tie In Survey(s) Provided By:

VES

	Meas. Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N/-S	+E/-W	Dist.	Angle	DLS
Tie - In										
0	5050.00	0.69	188.38	5049.21	-48.08	-48.08	-0.61	48.08	180.73	0.19
1	5130.00	0.80	199.40	5129.20	-49.08	-49.08	-0.87	49.09	181.01	0.23
2	5163.00	0.70	202.30	5162.20	-49.48	-49.49	-1.02	49.50	181.18	0.32
3	5195.00	0.50	205.50	5194.20	-49.79	-49.79	-1.15	49.81	181.33	0.63
4	5227.00	1.80	2.90	5226.19	-49.42	-49.42	-1.19	49.43	181.38	7.09
5	5260.00	5.30	6.20	5259.13	-47.38	-47.38	-1.00	47.40	181.21	10.62
6	5292.00	9.60	5.80	5290.85	-43.26	-43.26	-0.57	43.26	180.75	13.44
7	5324.00	14.40	4.90	5322.14	-36.64	-36.64	0.04	36.64	179.93	15.01
8	5356.00	18.00	6.70	5352.86	-27.76	-27.76	0.96	27.77	178.02	11.36
9	5388.00	19.90	9.80	5383.13	-17.48	-17.48	2.46	17.65	171.98	6.72
10	5420.00	22.70	8.70	5412.94	-6.02	-6.01	4.32	7.40	144.25	8.84
11	5452.00	26.50	6.60	5442.03	7.18	7.19	6.08	9.42	40.21	12.18
12	5484.00	30.90	4.20	5470.09	22.47	22.49	7.50	23.71	18.45	14.21
13	5516.00	35.60	3.30	5496.85	39.97	39.99	8.64	40.91	12.19	14.77
14	5548.00	39.40	2.90	5522.23	59.42	59.44	9.69	60.22	9.26	11.90
15	5580.00	42.70	2.40	5546.36	80.41	80.43	10.66	81.13	7.55	10.36
16	5612.00	45.80	2.50	5569.28	102.71	102.73	11.62	103.39	6.45	9.69
17	5644.00	49.10	2.40	5590.92	126.26	126.28	12.62	126.91	5.71	10.32
18	5677.00	52.20	1.40	5611.84	151.76	151.79	13.46	152.38	5.07	9.68
19	5708.00	55.00	0.30	5630.23	176.70	176.73	13.83	177.27	4.47	9.47
20	5740.00	56.80	0.30	5648.17	203.20	203.23	13.97	203.71	3.93	5.63
21	5771.00	58.20	358.70	5664.83	229.34	229.37	13.74	229.78	3.43	6.27
22	5803.00	60.50	359.80	5681.14	256.87	256.89	13.38	257.24	2.98	7.77
23	5835.00	62.80	0.80	5696.34	285.02	285.05	13.53	285.37	2.72	7.70
24	5867.00	64.90	358.60	5710.44	313.74	313.77	13.37	314.06	2.44	9.01
25	5899.00	70.10	356.80	5722.68	343.28	343.30	12.18	343.52	2.03	17.06
26	5923.00	75.40	356.10	5729.80	366.15	366.17	10.76	366.33	1.68	22.26
27	5956.00	82.20	356.10	5736.20	398.43	398.45	8.56	398.54	1.23	20.61
28	5988.00	85.50	357.50	5739.63	430.19	430.21	6.78	430.26	0.90	11.19
29	6019.00	87.60	359.20	5741.50	461.12	461.14	5.89	461.17	0.73	8.71
30	6051.00	90.60	2.00	5742.00	493.11	493.12	6.23	493.16	0.72	12.82
31	6148.00	90.90	2.40	5740.73	590.02	590.04	9.95	590.13	0.97	0.52
32	6244.00	90.70	2.70	5739.39	685.91	685.94	14.22	686.09	1.19	0.38
33	6341.00	90.30	359.60	5738.54	782.87	782.90	16.17	783.07	1.18	3.22
34	6437.00	89.80	359.10	5738.46	878.86	878.90	15.08	879.03	0.98	0.74
35	6533.00	92.10	358.80	5736.87	974.83	974.86	13.32	974.95	0.78	2.42
36	6629.00	92.00	359.10	5733.43	1070.76	1070.78	11.56	1070.85	0.62	0.33
37	6724.00	90.80	1.20	5731.11	1165.72	1165.75	11.81	1165.81	0.58	2.55
38	6820.00	91.10	0.70	5729.52	1261.69	1261.72	13.40	1261.79	0.61	0.61
39	6917.00	90.30	1.20	5728.33	1358.67	1358.70	15.01	1358.78	0.63	0.97
40	7013.00	90.10	0.60	5728.00	1454.65	1454.69	16.52	1454.78	0.65	0.66
41	7107.00	89.80	0.30	5728.08	1548.64	1548.68	17.26	1548.78	0.64	0.45
42	7203.00	89.40	359.90	5728.75	1644.64	1644.68	17.43	1644.77	0.61	0.59
43	7298.00	90.50	359.40	5728.83	1739.64	1739.68	16.85	1739.76	0.55	1.27
44	7394.00	89.90	359.30	5728.50	1835.63	1835.67	15.76	1835.74	0.49	0.63
45	7491.00	91.20	359.10	5727.57	1932.62	1932.65	14.40	1932.71	0.43	1.36

46	7587.00	91.00	358.90	5725.72	2028.59	2028.62	12.73	2028.66	0.36	0.29
47	7682.00	91.00	358.70	5724.07	2123.56	2123.59	10.74	2123.61	0.29	0.21
48	7776.00	91.00	358.60	5722.43	2217.52	2217.55	8.52	2217.56	0.22	0.11
49	7872.00	90.90	358.60	5720.83	2313.49	2313.50	6.18	2313.51	0.15	0.10
50	7967.00	90.90	359.30	5719.34	2408.46	2408.48	4.44	2408.48	0.11	0.74
51	8063.00	90.90	359.10	5717.83	2504.44	2504.45	3.10	2504.46	0.07	0.21
52	8159.00	90.50	359.30	5716.66	2600.43	2600.44	1.76	2600.44	0.04	0.47
53	8254.00	90.50	359.40	5715.83	2695.42	2695.43	0.68	2695.43	0.01	0.11
54	8350.00	90.10	359.30	5715.33	2791.41	2791.42	-0.41	2791.42	359.99	0.43
55	8447.00	90.20	359.90	5715.08	2888.41	2888.42	-1.09	2888.42	359.98	0.63
56	8544.00	91.40	0.30	5713.72	2985.40	2985.41	-0.92	2985.41	359.98	1.30
57	8641.00	90.70	359.70	5711.94	3082.38	3082.39	-0.92	3082.39	359.98	0.95
58	8737.00	90.90	359.60	5710.60	3178.37	3178.38	-1.50	3178.38	359.97	0.23
59	8834.00	91.00	359.30	5709.00	3275.36	3275.36	-2.43	3275.36	359.96	0.33
60	8931.00	90.90	359.20	5707.39	3372.34	3372.34	-3.70	3372.34	359.94	0.15
61	9027.00	92.00	359.90	5704.96	3468.30	3468.30	-4.46	3468.30	359.93	1.36
62	9123.00	91.80	359.70	5701.78	3564.25	3564.25	-4.79	3564.25	359.92	0.29
63	9220.00	91.30	359.30	5699.15	3661.21	3661.21	-5.64	3661.21	359.91	0.66
64	9316.00	90.90	358.70	5697.31	3757.18	3757.18	-7.31	3757.18	359.89	0.75
65	9413.00	92.40	359.30	5694.52	3854.13	3854.12	-9.01	3854.13	359.87	1.67
66	9510.00	92.00	358.90	5690.79	3951.05	3951.03	-10.53	3951.05	359.85	0.58
67	9607.00	91.80	359.70	5687.58	4047.99	4047.97	-11.71	4047.99	359.83	0.85
68	9703.00	91.20	359.70	5685.06	4143.95	4143.94	-12.22	4143.96	359.83	0.63
69	9799.00	92.40	0.90	5682.05	4239.90	4239.89	-11.71	4239.90	359.84	1.77
70	9896.00	92.90	0.60	5677.56	4336.79	4336.77	-10.45	4336.79	359.86	0.60
71	9993.00	92.30	0.70	5673.16	4433.68	4433.67	-9.35	4433.68	359.88	0.63
72	10089.00	90.60	1.10	5670.73	4529.63	4529.62	-7.84	4529.63	359.90	1.82
73	10185.00	91.20	0.90	5669.23	4625.60	4625.59	-6.16	4625.60	359.92	0.66
74	10282.00	90.90	1.20	5667.45	4722.56	4722.56	-4.39	4722.56	359.95	0.44
75	10379.00	92.00	0.60	5664.99	4819.51	4819.52	-2.86	4819.52	359.97	1.29
76	10482.00	93.50	0.50	5660.05	4922.38	4922.39	-1.88	4922.39	359.98	1.46
PTB	10536.00	93.50	0.50	5656.75	4976.28	4976.29	-1.40	4976.29	359.98	0.00