TEST REPORT

SCOPE: EMISSIONS, EFFICIENCY AND OUTPUT

FUEL: EPA TEST FUEL (CRIBS)

TEST STANDARD: EPA

MODEL: LEGEND II WOOD STOVE

Notice to reader: Our Legend II wood stove was tested as part of our 3.1 Series (NG1800) firebox. Therefore, the 3.1 Series (NG1800) is referenced throughout the attached test report.

TEST REPORT

REPORT NUMBER: 101440749MTL-001
REPORT DATE: February 27, 2014

EVALUATION CENTER

Intertek Testing Services NA Inc.
1829, 32nd Avenue
Lachine, Québec
H8T 3J1

RENDERED TO

Stove Builder International Inc
250 Rue de Copenhague
St-Augustin-de-Desmaures, QC
G3A 2H3

PRODUCT EVALUATED:

MODEL NG1800 SOLID FUEL ROOM HEATER

Report of Testing Model NG1800 Wood Fuel Room Heater Insert for compliance as an "Affected Facility" with the applicable requirements of the following criteria: EPA Method 28 "Certification and Auditing of Wood Heaters" and EPA Method 5G "Determination of Particulate Matter Emissions from Wood Heaters".

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I. INTRODUCTION

Intertek Testing Services NA (Intertek) has conducted testing for (Stove Builder International Inc, on model NG1800 Solid Fuel Room Heater, to evaluate all applicable performance requirements included in EPA Method 28 “Certification and auditing of wood heaters” and Method 5G “Determination of particulate matter emissions from wood heaters.”

I.A PURPOSE OF TEST

The test was conducted to determine if the unit is in accordance with U.S EPA requirements under 40 CGR 60 SUBPART AAA, NSPS for Residential Wood Heaters. This evaluation was conducted from December 2, 2013 to February 06, 2014.

I.B LABORATORY

The test on the NG-1800 Solid Fuel Room Heater was conducted at the SBI Laboratory located at 250 Rue de Copenhague, St-Augustin-de-Desmaures QC. G3A 2H3. The laboratory elevation is 213 feet above sea level. The test was conducted by Claude Pelland, P.Eng.

I.C DESCRIPTION OF UNIT

The model NG-1800 Solid Fuel Room Heater is constructed of carbon HR and CR steel . The outer dimensions are 29 3/4-inches deep, 31 1/2-inches high, and 23 3/4-inches wide. The unit has a front loading door with a viewing glass. (See product drawings.). See also components description in Appendix H.

Proprietary drawings and manufacturing methods are on file at Intertek in Lachine, Quebec

I.D REPORT ORGANIZATION

This report includes summaries of all data necessary to determine compliance with the regulations. Raw data, calibration records, intermediate calculations, drawings, specifications and other supporting information are contained in appendices to this report.

II. SUMMARY

II.A PRETEST INFORMATION

A sample was submitted to Intertek directly from the client. The sample was not independently selected for testing. The test unit was handed to the Intertek representative at SBI laboratory located in St-Augustin-de-Desmaures, Quebec on December 2nd, 2013. The unit was inspected upon presentation on testing site and found to be in good condition. The unit was set up following the manufacturer's instructions without difficulty.

Following assembly, the unit was placed on the test stand and instrumented with thermocouples in the specified locations. Prior to beginning the emissions tests program, the unit was operated for a minimum of 10 hours at high-to-medium burn rates to break-in the stove. The unit was found to be operating satisfactory during this break-in. The 10 plus hours of pre-burning were conducted during several consecutive R & D runs performed by the manufacturer immediately preceding the dates of the testing reflected in this report. The fuel used for the break-in process was dimensional Douglas Fir lumber. Proofs of burning are reproduced in appendix C of this report.

Following the pre-burn break-in process the unit was allowed to cool. The unit's chimney system and laboratory dilution tunnels were cleaned using standard wire brush chimney cleaning equipment. On December 2nd, 2013 the unit was set-up for testing.

II.B INFORMATION LOG

TEST STANDARD

From December 2nd, 2013 through to February 6th, the unit was tested for EPA emissions.

Deviation from Standard Method

No deviations from the standards were performed, however, only the applicable sections from each standard were used during all testing.

II.C SUMMARY OF TEST RESULTS

RUN #1(R&D) (November 25, 2013) Air control was fully opened and was set at full closed position at 5 minutes. Burn time was 470 minutes for a burn-rate of 1,08 kg/h. The fuel was loaded by 120 seconds and the door was left partially opened and closed by 150 seconds. The blower was off for the first 30 minutes of the test and set at minimum speed for the remainder of the test. This reached a Category II. This burn rate was not retained for emissions calculation purposes. See modifications made to the unit between Nov 26 and Dec 02 as described in appendix G.

RUN #2 (R&D) (November 26, 2013) Air control was fully opened and closed with a rod of 5/32"ø at 5 minutes. Burn time was 570 minutes for a burn-rate of 0,90 kg/h. The fuel was loaded by 120 seconds and the door was left partially opened and closed by 150 seconds. The blower was off for the first 30 minutes of the test and at minimum speed for the remainder of the test. This reached a Category II. This burn rate was not retained for emissions calculation purposes. See modifications made to the unit between Nov 26 and Dec 02 as described in appendix G.

RUN #1 (December 2, 2013) Air control was set at full closed position (fixed 0.525 in² opening). Burn time was 470 minutes for a burn-rate of 1,07 kg/h. The fuel was loaded by 135 seconds and the door was left partially opened and closed by 145 seconds. The air control was opened for 5 minutes, and then fully closed. The blower was off for the first 30 minutes of the test and set at minimum speed for the remainder of the test. This reached a Category II.

RUN #2 (December 3, 2013) Air control was set at full closed position (fixed 0.525 in² opening). Burn time was 530 minutes for a burn-rate of 0,97 kg/h. The fuel was loaded by 120 seconds and the door was left partially opened and closed by 150 seconds. The air control was opened for 5 minutes, and then fully closed. The blower was off for the first 30 minutes of the test and set at minimum speed for the remainder of the test. This reached a Category II.

RUN #3 (December 4, 2013) Air control was set with a 1/16" drill bit from full closed position. Burn time was 420 minutes for a burn-rate of 1,19 kg/h. The fuel was loaded by 110 seconds and the door was left partially opened and closed by 150 seconds. The air control was opened for 5 minutes, and then set with a drill bit of 1/16" from full closed position. The blower was off for the first 30 minutes of the test and set at minimum speed for the remainder of the test. This reached a Category II. It is to be noted that only the last 30 minutes of the preborn were recorded on the logger. The first 30 minutes, though performed are not available.

RUN #4 (December 5, 2013) Air control was set with a 1/64" drill bit from full closed position. Burn time was 470 minutes for a burn-rate of 1,06 kg/h. The fuel was loaded by 115 seconds and the door was left partially opened and closed by 150 seconds. The air control was opened for 5 minutes, and then set with a drill bit of 1/64" from full closed position. The blower was off for the first 30 minutes of the test and set at minimum speed for the remainder of the test. This reached a Category II.

RUN #5 (December 6, 2013) Air control was set with a 3/16" drill bit from full closed position. Burn time was 350 minutes for a burn-rate of 1,45 kg/h. The fuel was loaded by 120 seconds and the door was left partially opened and closed by 180 seconds. The air control was opened for 5 minutes, and then set with a drill bit of 3/16" from full closed position. The blower was off for the first 30 minutes of the test and set at minimum speed for the remainder of the test. This reached a Category III.

RUN #6 (December 9, 2013) Air control was set to fully opened position. Burn time was 170 minutes for a burn-rate of 3,01 kg/h. The fuel was loaded by 95 seconds and the door was left partially opened and closed by 300 seconds. The air control was fully opened for the duration of the test. The blower was on for the full duration of the test and set to maximum speed. This reached a Category IV.

RUN #7 (December 10, 2013) Air control was set to fully opened position. Burn time was 180 minutes for a burn-rate of 2,85 kg/h. The fuel was loaded by 85 seconds and the door was left partially opened and closed by 280 seconds. The air control was fully opened for the duration of the test. The blower was off for the first 30 minutes of the test and set at maximum speed for the remainder of the test. This reached a Category IV.

RUN #8 (December 11, 2013) Air control was set to fully opened position. Burn time was 160 minutes for a burn-rate of 3,03 kg/h. The fuel was loaded by 95 seconds and the door was left partially opened and closed by 300 seconds. The air control was fully opened for the duration of the test. The blower was on for the full duration of the test and set to maximum speed. This reached a Category IV.

RUN #9 (February 4, 2014) Air control was set with a 1" flat bar from full closed position for the full duration of the test. Burn time was 220 minutes for a burn-rate of 2,19 kg/h. The fuel was loaded by 105 seconds and the door was left partially opened and closed by 120 seconds. The air control was fully opened for the duration of the test. The blower was off for the first 15 minutes of the test and set at maximum speed for the remainder of the test. This reached a Category IV.

RUN #10 (February 5, 2014) Air control was set with a 7/32" drill bit from full closed position. Burn time was 510 minutes for a burn-rate of 0,95 kg/h. The fuel was loaded by 90 seconds and the door was left partially opened and closed by 105 seconds. The air control was opened for 5 minutes, and then set with a drill bit of 7/32" from fully closed position. The blower was off for the full duration of the test because it was a fan confirmation test. This reached a Category II.

RUN #11 (February 6, 2014) Air control was set with a 1/2" drill bit from full closed position. Burn time was 250 minutes for a burn-rate of 2,01 kg/h. The fuel was loaded by 125 seconds and the door was left partially opened and closed by 140 seconds. The air control was opened for 5 minutes, and then set with a drill bit of 1/2" from full closed position. The blower was off for the first 30 minutes of the test and set at minimum speed for the remainder of the test. This reached a Category IV.

II.D SUMMARY OF OTHER DATA

Operation of the unit to achieve the various burn rates was performed as per the following Testing protocol which was communicated by client prior to starting the test program. It was as follows:

Category 1 (<0,80 kg/h)
With primary air control completely closed, the stove cannot achieve this burn-rate category but can achieve category 2 with burn-rate <1,00 kg/h.

Category 2 – Lowest achievable burn-rate :
Put 3.5 lbs of kindling on top of 2-3 sheets of newspaper. Light that up and let that burn until only small flames remain in the stove. Level the coal bed and add a preburn fuel load (See picture below for general positions of pieces). Let that burn until yellow flaming has ceased. Remove all embers from the stove, zero the scale and put back 1,50 lbs of embers in the stove. Add a second preburn fuel. Wait for the scale to indicate approximately 9,00 lbs, close the primary air control completely and turn on the blower at minimum speed.
45 minutes after closing the air control, stir the coal bed and rake everything to the middle-front of the stove. Wait to be in the coal bed range allowed and for the average firebox temperature to reach approximately 415 °F. Just prior to loading, level the coal bed by following the general shape of the baffle which means having about 1" more coals at the front than at the back and leaving about ½" to 1" of coals at the back. This operation must not take more than 1 minute. When this is done, close the door, turn off the blower, start all required equipments and put the fuel load in. Position it by following the general shape of the firebox baffle. Once the fuel load is in, remove embers in front of the pilot and a little bit under the 2 x 4 in the middle. Turn on the blower 30 minutes after the beginning of the test.

Category 2 – Alternative test (0,80 kg/h -1,25 kg/h):
Put 3.5 lbs of kindling on top of 2-3 sheets of newspaper. Light that up and let that burn until only small flames remain in the stove. Level the coal bed and add a pre burn fuel load (See picture below for general positions of pieces). Let that burn until yellow flaming has ceased. Remove all embers from the stove, zero the scale and put back 1,50 lbs of embers in the stove. Add a second pre burn fuel. Wait for the scale to indicate approximately 9,00 lbs, close the primary air control with a drill bit of 1/16”Ø and turn on the blower at minimum speed.
45 minutes after closing the air control, stir the coal bed and rake everything to the middle-front of the stove. Wait to be in the coal bed range allowed and for the average firebox temperature to reach approximately 415°F. Prior to loading, level the coal bed by following the general shape of the baffle which means having about 1" more coals at the front than at the back and leaving about ½ to 1" of coals at the back. This operation must not take more than 1 minute. When this is done, close the door, turn off the blower, start all required equipment and put the fuel load in. Once the fuel load is in, remove embers in front of the pilot and a little bit under the 2 x 4 in the middle. Turn on the blower 30 minutes after the beginning of the test.

Category 3 (1,25 kg/h – 1,90 kg/h)
Put 3.5 lbs of kindling on top of 2-3 sheets of newspaper. Light that up and let that burn until only small flames remain in the stove. Level the coal bed and add a pre burn fuel load (See picture below for general positions of pieces). Let that burn until yellow flaming has ceased. Remove all embers from the stove, zero the scale and put back 1,50 lbs of embers in the stove. Add a second pre burn fuel. Wait for the scale to indicate approximately 9,50 lbs, close the primary air control with a drill bit of 3/16"Ø and turn on the blower at minimum speed.
45 minutes after closing the air control, stir the coal bed and rake everything to the middle-front of the stove. Wait to be in the coal bed range allowed and for the average firebox temperature to reach approximately 450 °F. Prior to loading, level the coal bed by following the general shape of the baffle which means having about 1" more coals at the front than at the back and leaving about ½ to 1" of coals at the back. This operation must not take more than 1 minute. When this is done, close the door, turn off the blower, start all required equipment and put the fuel load in. Once the fuel load is in, remove embers in front of the pilot and a little bit under the 2 x 4 in the middle. Turn on the blower 30 minutes after the beginning of the test.

Category 4 (Primary air control fully opened):
Put 3.5 lbs of kindling on top of 2-3 sheets of newspaper. Light that up and let that burn until only small flames remain in the stove. Level the coal bed and add a pre burn fuel load (See picture below for general positions of pieces). Wait for approximately a pound to be burnt and then close the door and start the blower at maximum speed.
Wait for the average firebox temperature to start dropping and for the coal bed to be close to the minimum. When there is approximately ¼ pound left before reaching minimum coal bed weight, open the door, level the coal bed by following the general shape of the baffle which means having about 1" more coals at the front than at the back and leaving about ½ to 1" of coals at the back. This operation must not take more than 1 minute. When this is done, close the door, start all required equipment and put the fuel load in.

Thirteen runs were performed on this program. Program was planned to start on November, 18, 2013 and beginning of it was delayed to Nov 25, 2013.

On November 27, it was halted due to poor results obtained with a date of test resume being December 2nd.

Program ran from December 2nd to 11th where it halted again due to extreme conditions of low temperature and negative pressure in and around the laboratory.

On February 4th the program resumed and concluded.

The below mentioned runs were discarded based on the accompanying reasons:

Runs #1a and #2a	were not considered based on their poor results. See appendix G for unit modification description.
Run #1	too high emissions. Eliminated based on the 2/3 rule by runs2, 3, 4
Runs #6, #7, #8	based on the fact that the full opened air intake position was resettled at a lower position. The conditions of #6, #7 and #8 are therefore no longer possible.

EMISSIONS:

Run Number	Test Date (mm/dd/yyyy)	Burn Rate (kg/hr)	Emission Rate (g/hr)	Adjusted Emission Rate (g/hr)	Heating Efficiency (% HHV)	Heating Efficiency (% LHV)
1*[1]	**12/02/2013**	**1.07**	**6.39**	**8.48**	**64.6**	**69.8**
1a*[1]	**11/25/2013**	**1.08**	**4.66**	**6.53**	**Not reported**	**Not reported**
2	**12/03/2013**	**0.97**	**4.09**	**5.86**	**Not available**	**Not Available**
2a*[1]	**11/26/2013**	**0.90**	**5.86**	**7.89**	**Not reported**	**Not reported**
3	**12/03/2013**	**1.19**	**2.78**	**4.26**	**68.8**	**74.0**
4	**12/05/2013**	**1.06**	**3.25**	**4.84**	**67.1**	**72.5**
5	**12/06/2013**	**1.45**	**2.64**	**4.07**	**68.9**	**74.5**
6*[1]	**12/09/2013**	**3.01**	**4.35**	**6.17**	**Not available**	**Not Available**
7*[1]	**12/10/2013**	**2.85**	**6.26**	**8.34**	**55.4**	**59.9**
8*[1]	**12/11/2013**	**3.03**	**7.97**	**10.19**	**65.1**	**70.3**
9	**02/04/2014**	**2.19**	**1.80**	**2.96**	**65.3**	**70.5**
10*[2]	**02/05/2014**	**0.95**	**3.85**	**5.57**	**66.2**	**71.6**
11	**02/06/2014**	**2.01**	**1.85**	**3.01**	**66.8**	**72.2**

*1: Runs 1a, 2a, 1, 6, 7, 8 not retained for Emission calculation purposes based on the reasons presented above.
*2: Run 10 was conducted as a fan confirmation test and is therefore not included in the weighted average.

WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate	(E) Average Emission Rate g/hr	Heat Output (Btu/hr)	Probability	(K) Weighting Factor	(KxE)
2	0.97	5.860	11696.45	0.3488	0.4176	2.4471
4	1.06	4.840	12781.69	0.4176	0.1892	0.9157
3	1.19	4.260	14349.26	0.5380	0.3044	1.2967
5	1.45	4.070	17484.39	0.7220	0.3756	1.5287
11	2.01	3.010	24236.98	0.9136	0.2132	0.6417
9	2.19	2.960	26407.46	0.9352	0.0864	0.2557
				Totals:	1.5864	7.0858
					Weighted average emission rate:	**4.4666**

TEST FACILITY CONDITIONS

Run	Room Temp. °F before	Room Temp °F after	Baro. Pres. In. Hg before	Baro. Pres. In. Hg after	R.H. % before	R.H. % after	Air Vel. Ft/min before	Air Vel. Ft/min after
1	**81.42**	**73.59**	**30.09**	**30.03**	**81**	**77**	**<50**	**<50**
1a	**71.35**	**72.02**	**30.27**	**30.18**	**50**	**75**	**<50**	**<50**
2	**85.31**	**83.00**	**29.97**	**30.00**	**85**	**80**	**<50**	**<50**
2a	**75.22**	**83.60**	**30.18**	**30.21**	**74**	**81**	**<50**	**<50**
3	**79.99**	**85.28**	**30.15**	**30.18**	**71**	**76**	**<50**	**<50**
4	**82.10**	**86.21**	**30.06**	**29.85**	**78**	**99**	**<50**	**<50**
5	**71.43**	**87.18**	**29.91**	**29.97**	**78**	**78**	**<50**	**<50**
6	**74.31**	**69.11**	**30.21**	**30.03**	**81**	**81**	**<50**	**<50**
7	**77.42**	**69.35**	**29.83**	**29.77**	**43**	**45**	**<50**	**<50**
8	**71.89**	**73.29**	**29.97**	**30.00**	**62**	**64**	**<50**	**<50**
9	**71.07**	**70.41**	**30.42**	**30.42**	**59**	**56**	**<50**	**<50**
10	**80.82**	**84.88**	**30.06**	**30.00**	**69**	**66**	**<50**	**<50**
11	**76.44**	**68.82**	**30.24**	**45.00**	**46**	**45**	**<50**	**<50**

DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA (5G-3)

Run No.	Burn Time (min)	Velocity (ft/sec)	Volumetric Flow Rate (dscf/min)	Total Temp. (^oR)	Volume Sample (ft^3)		Particulate Catch (mg)	
					1	2	1	2
1	**470**	**7.87**	**150.844**	**543.4**	**74.776**	**61.685**	**51.2**	**44.8**
1a	**470**	**7.63**	**147.591**	**557.2**	**74.824**	**60.160**	**38.5**	**32.4**
2	**530**	**7.67**	**147.746**	**568.3**	**84.370**	**75.788**	**36.3**	**37.3**
2a	**570**	**7.68**	**147.519**	**574.3**	**89.613**	**82.412**	**57.5**	**56.2**
3	**420**	**7.58**	**145.020**	**530.1**	**65.452**	**59.918**	**20.7**	**19.4**
4	**470**	**7.42**	**141.760**	**552.8**	**75.116**	**69.843**	**28.2**	**27.2**
5	**350**	**7.69**	**143.793**	**536.3**	**55.537**	**54.019**	**17.2**	**16.3**
6	**170**	**8.61**	**147.209**	**494.6**	**27.294**	**25.464**	**13.4**	**12.6**
7	**180**	**8.21**	**137.894**	**508.1**	**28.385**	**27.387**	**21.7**	**20.5**
8	**160**	**8.55**	**146.962**	**515.9**	**26.091**	**24.501**	**21.4**	**24.2**
9	**220**	**8.08**	**150.600**	**566.3**	**36.342**	**34.045**	**06.8**	**07.2**
10	**510**	**7.55**	**146.558**	**560.9**	**84.825**	**80.740**	**36.9**	**35.6**
11	**250**	**7.66**	**144.039**	**530.6**	**42.134**	**40.456**	**08.8**	**08.7**

Filters and probe weight history can be found in appendix I

DILUTION TUNNEL DUAL TRAIN PRECISION

Run No.	Sample Ratios		Total Emissions (g)		% Deviation	% Deviation or 7.5% of 7.5 grams*
	Train 1	Train 2	Train 1	Train 2		
1	**948.119**	**1149.332**	**48.544**	**51.490**	**2.44**	**5.60**
1a	**927.083**	**1153.045**	**35.693**	**37.359**	**1.89**	**3.33**
2	**928.116**	**1033.213**	**33.691**	**38.539**	**5.57**	**8.66**
2a	**938.216**	**1020.314**	**53.953**	**57.342**	**2.53**	**5.33**
3	**930.588**	**1016.524**	**19.263**	**19.721**	**0.97**	**1.06**
4	**886.993**	**953.954**	**25.013**	**25.948**	**1.52**	**2.00**
5	**906.205**	**931.659**	**15.587**	**15.186**	**1.08**	**1.06**
6	**916.898**	**982.782**	**12.286**	**12.383**	**0.33**	**0.53**
7	**874.445**	**906.288**	**18.985**	**18.579**	**0.88**	**1.87**
8	**901.222**	**959.724**	**19.286**	**23.225**	**7.70**	**20.93**
9	**911.669**	**973.188**	**6.199**	**7.007**	**5.08**	**4.13**
10	**881.164**	**925.744**	**32.515**	**32.956**	**0.56**	**0.80**
11	**854.651**	**890.091**	**7.521**	**7.744**	**1.21**	**0.93**

*= As described in Method 5G-3 section 16.2.5

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (^oF)	Initial Draft (in/H_2O)	Run Time (min)	Average Draft (in/H_2O)
1	**1.07**	**83.7**	**0.058**	**470**	**0.091**
1a	**1.08**	**97.6**	**0.055**	**470**	**0.056**
2	**0.97**	**108.7**	**0.050**	**530**	**0.072**
2a	**0.90**	**114.6**	**0.060**	**570**	**0.053**
3	**1.19**	**70.4**	**0.055**	**420**	**0.063**
4	**1.06**	**93.1**	**0.055**	**470**	**0.067**
5	**1.45**	**76.7**	**0.058**	**350**	**0.070**
6	**3.07**	**34.9**	**0.100**	**170**	**0.185**
7	**2.85**	**48.4**	**0.073**	**180**	**0.088**
8	**3.03**	**56.2**	**0.080**	**160**	**0.059**
9	**2.19**	**106.7**	**0.073**	**220**	**0.107**
10	**0.95**	**101.2**	**0.055**	**510**	**0.052**
11	**2.01**	**70.9**	**0.065**	**250**	**0.074**

III. PROCESS DESCRIPTION

III.A TEST SET-UP DESCRIPTON

A standard 6” diameter single wall pipe and insulated chimney system was installed to 15’ above floor level. The unit controls were set to the lowest setting during the test.

III.B AIR SUPPLY SYSTEM

Combustion air enters at front of the firebox through an opening at the bottom of the firebox. This air is controlled by a sliding damper, which covers the inlet hole. The lever is located just below the door. All gases exit through the 6” dia. flue

IV. SAMPLING SYSTEMS

IV.A. SAMPLING LOCATIONS

Particulate samples are collected from the dilution tunnel at a point 23 feet from the tunnel entrance. The tunnel has two elbows and two mixing baffles in the system ahead of the sampling section. The first 10 feet of the sampling section is a 10 inches diameter pipe and the remaining is made of an 8 inches diameter pipe. Tunnel velocity pressure is determined by a standard Pitot tube located 48 inches from the beginning of the sampling section. The dry bulb thermocouple is located six inches downstream from the Pitot tube. Tunnel samplers are located 48 inches downstream of the Pitot tube and 36 inches upstream from the end of this section.

Stack gas samples are collected from the steel chimney section 8 feet ± 6 inches above the scale platform. (See Figure 1)

IV.A.(1) DILUTION TUNNEL

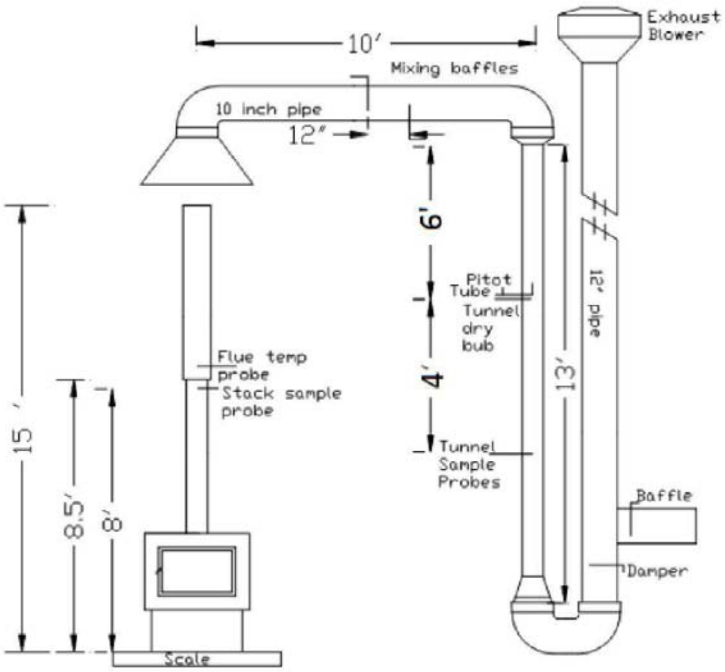

FIGURE 1

IV.B.(2). DILUTION TUNNEL SAMPLE SYSTEMS

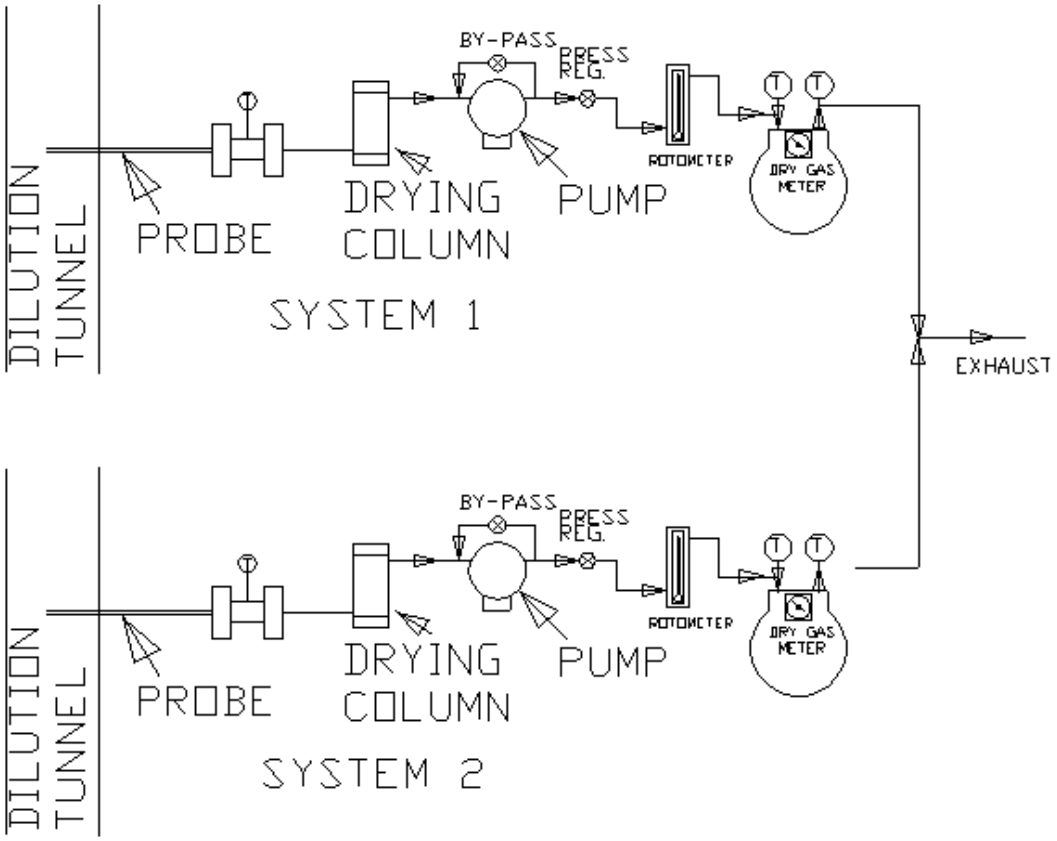

Figure 2

V. SAMPLING METHODS

V.A. PARTICULATE SAMPLING

Particulates were sampled in strict accordance with EPA Method 5G-3. This method uses two identical sampling systems with Gelman A/E 61631 binder free, 47-mm diameter filters. The dryers used in the sample systems are filled with “Drierite” before each test run.

VI. QUALITY ASSURANCE

VI.A. INSTRUMENT CALIBRATION

VI.A. (1). DRY GAS METERS

At the beginning and conclusion of the test program, the dry gas meters were checked against a calibrated and traceable standard reference dry gas meter. Three runs were made on each dry gas meter used during the test program. The average calibration factors obtained are then compared with the six-month calibration factor and, if within 5%, the six-month factor is used to calculate standard volumes. Results of this calibration are contained in Appendix D.

An integral part of the post test calibration procedure is a leak check of the pressure side by plugging the system exhaust and pressurizing the system to 10” W.C. The system is judged to be leak free if it retains the pressure for at least 10 minutes.

The standard dry gas meter is calibrated annually by an external recognized calibration agency

VI.A.(2). STACK SAMPLE ROTAMETER

The stack sample rotometer is checked by running three tests at each flow rate used during the test program. The flow rate is checked by running the rotometer in series with one of the dry gas meters for 10 minutes with the rotometer at a constant setting. The dry gas meter volume measured is then corrected to standard temperature and pressure conditions. The flow rate determined is then used to calculate actual sampled volumes.

VI.A.(3). GAS ANALYZERS

The continuous analyzers are zeroed and spanned before each test with appropriate gases. A mid-scale multi-component calibration gas is then analyzed (values are recorded). At the conclusion of a test, the instruments are checked again with zero, span and calibration gases (values are recorded only). The drift in each meter is then calculated and must not exceed 5% of the scale used for the test.

At the conclusion of each unit test program, a five-point calibration check is made. This calibration check must meet accuracy requirements of the applicable standards. Consistent deviations between analyzer readings and calibration gas concentrations are used to correct data before computer processing. Data is also corrected for interferences as prescribed by the instrument manufacturer's instructions.

VI.B. TEST METHOD PROCEDURES

VI.B.(1). LEAK CHECK PROCEDURES

Before and after each test, each sample train is tested for leaks. Leakage rates are measured and must not exceed 0.02 CFM or 4% of the sampling rate. Leak checks are performed checking the entire sampling train, not just the dry gas meters. Pre-test and post-test leak checks are conducted with a vacuum of 5 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post test vacuum value. If leakage limits are not met, the test run is rejected. During these tests, there was typically no vacuum

VI.B.(2). TUNNEL VELOCITY/FLOW MEASUREMENT

The tunnel velocity is calculated from a center point Pitot tube signal multiplied by an adjustment factor. This factor is determined by a traverse of the tunnel as prescribed in EPA Method 1. Final tunnel velocities and flow rates are calculated from EPA Method 2, Equation 6.9 and 6.10. (Tunnel cross sectional area is the average from both lines of traverse.)

Pitot tubes are cleaned before each test and leak checks are conducted after each test.

VI.B.(3). PM SAMPLING PROPORTIONALITY (5G-3)

Proportionality was calculated in accordance with EPA Method 5G-3. The data and results are included in Appendix C.

VII. CONCLUSION

These tests demonstrate that this unit is an affected facility under the definition given in the regulation. The weighted average emission rate of 4.47 g/hr has been achieved.

VII.A RESULTS AND OBSERVATIONS

The Model NG-1800 Solid Fuel space heater has been found to be in compliance with the applicable performance and construction requirements of the following criteria: EPA Method 28 “Certification and auditing of wood heaters” and Method 5G Determination of particulate matter emissions from wood heaters.”

INTERTEK TESTING SERVICES NA

Reported by: _____

Claude Pelland, P.Eng.
Project Engineer

Reviewed by:

Bruce Davis

_____

Date: November 11th, 2013
Primary air control setting: Fully closed

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
15:30	285,6	465,6	415,6	72,39	98,89	320,4	408,7	440,9	0,041	54,05
15:40	253,9	418,2	393,1	80,34	95,22	324,7	391,5	433,8	0,046	21,45
15:50	261,4	375	361,1	83,27	89,94	312,5	359,1	421	0,049	20,71
16:00	300,6	350	339,7	84,66	93,05	352	336,3	404,6	0,054	19,66
16:10	303	336	326,3	87,21	94,69	379,3	329,7	387,4	0,054	18,68
16:20	288,4	329,1	321,9	88,59	94,23	393,1	327,1	371	0,052	17,81
16:30	270,5	323,5	317	89,2	93,28	378,1	325,9	355,8	0,05	17,09
16:40	277,7	318,8	319,8	89,31	93,22	365,8	323,8	341,8	0,046	16,28
16:50	295,3	322,1	332,4	89,84	94,53	383,1	323,5	327,9	0,053	15,41
17:00	297,7	335,1	344,1	91,01	95,29	408,7	333,8	314,4	0,054	14,58
17:10	290,2	346,6	352,7	91,93	95,32	412,1	344	303,1	0,053	13,83
17:20	287,2	352,6	358,1	92,44	95,02	407,9	350,4	293,6	0,052	13,1
17:30	289,2	354,4	360,6	89,27	94,83	407,2	354,2	288	0,052	12,45
17:40	282,7	354	358,3	75,7	87,95	402,8	353,7	277,4	0,05	11,7
17:50	273,8	351,6	357,5	74,26	86,38	393,6	354,5	268,6	0,05	10,99
18:00	270,1	350,7	359,8	76,77	87,68	386,5	356	262,6	0,048	10,34
18:10	266,8	351,1	361,1	76,31	85,97	380,3	353,7	256,8	0,048	9,7
18:20	263,7	353,2	364,9	74,97	85,66	376	353,9	252,5	0,048	9,1
18:30	254,1	355	367,8	78,8	85,97	368,5	353,5	248,5	0,046	8,47
18:40	243,9	356,5	367,3	74,29	83,55	355,6	352,2	245,6	0,045	7,94
18:50	234,9	359,4	367,7	77,64	84,66	342,3	351,2	243	0,043	7,45
19:00	227,6	362,9	365,6	76,84	82,67	330	347,4	240,5	0,041	7,03
19:10	227,8	365,7	366,2	74,31	82,1	323,1	344,8	238,6	0,042	6,58
19:20	213,6	373,2	363,8	79,06	83,01	314,8	343,3	237,3	0,039	6,27
19:30	204,8	371,1	356,8	76,87	80,91	298,8	338,6	235,5	0,039	6
19:40	200,3	363,1	351,5	73,75	79,65	286,1	334,1	234,5	0,036	5,72
19:50	196,7	359,6	349,8	77,48	81,19	276,5	332,1	234,9	0,037	5,48
20:00	192,6	357,2	346,6	77,22	79,85	269,9	330,4	235,1	0,035	5,22
20:10	191,1	356,1	344,4	72,63	78,57	264,5	330,8	236,5	0,035	4,99
20:20	191,6	357,4	345,9	79,08	80,97	263,7	334	238,8	0,035	4,75
20:30	189,8	358,7	345	76,7	79,11	263,2	337,5	241,3	0,035	4,53
20:40	190	359,8	344,2	73,67	78,17	262,5	341,7	245	0,034	4,32
20:50	189	361,8	345,4	76,91	79,98	262,7	344,5	249,7	0,035	4,18
21:00	188	362,3	345,7	78,02	79,72	263	343,2	252,9	0,033	3,98
21:10	188	362,2	345,2	75,75	78,4	261,5	344	255,9	0,033	3,77
21:20	187,3	362,1	346,1	74,53	78,81	260,5	345,5	258,7	0,033	3,62
21:30	185,5	363,3	346,2	78,44	79,91	259	345,7	261	0,033	3,45
21:40	184,6	362,3	345,7	76,38	78,54	257,2	343,2	262,6	0,033	3,27
21:50	184,8	361	345,8	74,14	78,47	255,6	340,1	264,2	0,033	3,11
22:00	184	360,8	346,5	78,4	79,59	255,4	337,3	265,9	0,033	2,96
22:10	183,6	361,5	344,9	75,61	78,14	254,7	333	267	0,033	2,78
22:20	182,7	363,2	344,5	73,75	77,99	252,9	328,4	268,9	0,033	2,61
22:30	181,1	365,8	345,1	78,89	79,73	251,9	325,5	271,3	0,031	2,47

22:40	179,8	366,2	343,3	76,75	78,36	249,5	322,7	272,7	0,032	2,31
22:50	178,7	367,9	340	73,5	77,54	247,5	319,4	273,7	0,032	2,15
23:00	176,7	370,8	338,2	78,17	79,29	245,7	317	274,4	0,031	2,04
23:10	175,7	371,5	334,4	75,34	77,41	242,6	313	273,9	0,031	1,92
23:20	174,1	369,8	331,6	77,15	79,08	241	310,7	274,5	0,031	1,74
23:30	170,9	362,7	327	77,27	78,3	237,4	305,4	273,6	0,03	1,65
23:40	170,2	361	321,1	73,77	77,02	234,2	300,1	272,5	0,031	1,53
23:50	169	364,1	318,2	78,47	78,78	232,4	297,2	272,1	0,029	1,37
0:00	168,6	370,5	315,1	75,89	77,28	231	293,7	270,1	0,029	1,21
0:10	169,3	375,9	314,7	77,49	78,8	229,9	293,1	269,3	0,031	1,03
0:20	168,7	381,4	313,7	77	77,85	229	291,3	266,6	0,03	0,89
0:30	169,8	384,6	313,4	75,88	78,08	228,2	291,1	266	0,03	0,73
0:44	167,5	383,7	312,7	76,8	77,83	227,1	289,7	263,8	0,029	0,6
0:50	167	379,2	312	75,98	78,24	225,6	287,9	263,3	0,029	0,43
1:00	164,9	375	310,7	77,52	78,01	222,8	284,5	261,8	0,028	0,32
1:10	164,4	370,2	307,8	73,93	76,39	219,9	281	260,6	0,029	0,17
1:20	163	366,4	306	77,51	78,02	218,4	279,1	259,5	0,029	0,04
1:30	163,3	363,3	301,8	71,81	76,08	216,5	278	257,4	0,029	-0,08

Date: November 12th, 2013
Primary air control setting: Fully closed

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
15:34	273,5	466,6	412,4	75,76	99,47	324,4	410,7	447,8	-	55,71
15:44	230,8	415,6	383,9	74,83	89,5	304,9	387,3	438,7	-	21,85
15:54	221,5	369,1	352,3	79,02	83,86	294	355,1	421	-	21,21
16:04	212,6	336,5	324,2	78,78	83,47	285	324,6	403,8	-	20,58
16:14	233,2	311,4	303,6	76,43	84,42	286,8	301,3	384,4	-	19,86
16:24	252,8	291,5	293,1	74,91	84,77	299,4	285,8	364,8	-	19,14
16:34	233,1	280,8	288,9	76,69	83,28	314,7	279,8	348,6	-	18,44
16:44	240,4	271,9	289,8	78,34	83,95	318,4	272,4	333,6	-	17,84
16:54	232,3	269,3	296,6	76,22	83,72	314,5	272,3	318	-	17,15
17:04	220,2	270,6	301,6	75,13	82,68	300,3	273,7	304,4	-	16,55
17:14	234,3	276,8	296,5	74,96	82,31	307,7	281,2	291,8	-	15,9
17:24	231,3	286,2	293,8	76,48	83,04	328,4	292,4	280,8	-	15,23
17:34	233,6	291,3	293,3	80,49	85,4	324,8	300,8	271,1	-	14,64
17:44	248,5	296,5	291,9	77,17	84,16	332,8	308,2	261,1	-	13,97
17:54	249	302,7	297,2	79,68	86,37	346,1	312,6	253,3	-	13,29
18:04	221,8	301,5	300,2	79,72	84,66	335,4	308,4	247,6	-	12,69
18:14	204,1	289,5	295,3	75,73	81,79	301	296,1	242,5	-	12,13
18:24	191,8	278,8	291	80,42	82,81	275,1	284,5	238,7	-	11,62
18:34	184,1	270,8	286,3	77,52	80,49	255,7	275,3	234,6	-	11,11
18:44	180,7	265,3	285,3	80,27	81,67	244,9	270,3	231,8	-	10,63
18:54	176,9	261,2	283,9	77,32	79,52	236,6	267,3	229,3	-	10,13
19:04	175	258,6	284,9	79,89	80,9	232,4	266,5	227,4	-	9,68
19:14	174,4	258	285,3	75,93	78,58	228,5	266,4	226,3	-	9,25
19:24	174,3	258,4	287,8	79,48	80,31	228	268,5	225,4	-	8,75
19:34	175,6	261	291	78,91	80,53	229,2	272,4	225,4	-	8,26
19:44	174,6	264	293,5	78,71	79,71	229,5	275	224,2	-	7,78
19:54	174,2	266,9	297,1	80,27	80,68	230,1	278,8	224,6	-	7,34
20:04	172,3	269,9	298,4	78,09	79,21	229,6	280,2	223,8	-	6,92
20:14	172,4	272,7	300,9	80,3	80,37	229,5	282,5	223,9	-	6,58
20:24	173,8	276,3	304,1	77,35	78,48	230,5	284	224,2	-	6,22
20:34	174,5	281,5	311,6	80,19	80,25	234,1	287,7	226,1	-	5,96
20:44	175,4	286,7	317,1	77,04	78,6	236,6	290,3	228,6	-	5,73
20:54	175,2	292	322,7	80,28	80,2	240	291,8	230,9	-	5,5
21:04	174,9	297,6	325,8	77,82	78,75	239,8	291	232,5	-	5,3
21:14	175	304,6	329,9	80,66	80,41	240,1	292	234,4	-	5,08
21:24	174,9	314,5	333,2	78,05	78,79	240,2	292,5	234,7	-	4,82
21:34	176,2	325,7	338,1	80,71	80,49	240,3	294,6	236	-	4,63
21:44	176,9	338,4	341,6	78,14	78,89	239,7	297,2	235,8	-	4,39
21:54	179	351,7	346,9	80,67	80,58	241,4	300,1	236,4	-	4,17
22:04	180,3	361,2	351,1	78,55	79,11	242,4	303	236,5	-	3,92
22:14	182,2	367,8	356	79,09	80,43	245,4	308,6	237,8	-	3,71
22:24	182,1	372,5	358	79,11	79,71	246,8	311,8	238,4	-	3,53
22:34	183,2	372,3	356,1	76,87	79,48	249,8	315	239,9	-	3,27

22:44	181,1	371,8	352,5	79,89	80,31	250,9	317	242,3	-	3,1
22:54	180,1	372,8	347,6	76,93	78,57	249,8	318,5	245,9	-	2,92
23:04	178,6	372,1	344,8	80,85	80,54	248,5	319,8	249,7	-	2,75
23:14	177,2	371	340,7	78,73	79,16	246,2	319	252,3	-	2,6
23:24	177,1	373,4	338,5	77,89	79,22	244,3	319,4	255,1	-	2,44
23:34	175,4	376,4	336,4	79,6	79,57	243,3	318,6	256,5	-	2,29
23:44	175	375,9	333,9	76,1	78,49	241	316,4	258,3	-	2,13
23:54	173,2	378,2	332,5	80,08	79,59	239,2	313,2	258,9	-	2
0:04	173,7	380,9	329,9	76,53	77,81	237,4	311,3	259,9	-	1,87
0:14	172,8	383,5	328,9	80,31	79,64	237	310,3	261	-	1,71
0:24	172,6	386,2	326,1	76,97	77,77	235,9	309	261,6	-	1,54
0:34	172,7	386,7	326,2	80,2	79,73	235,2	308,9	262,6	-	1,42
0:44	172	382,7	323,7	77,33	77,99	234,3	307,3	263,2	-	1,28
0:54	170,5	376,8	321	80,22	79,58	233,9	305	264,7	-	1,16
1:04	168,9	372,2	315,6	76,54	77,45	231,3	300,3	265,1	-	1,02
1:14	167,1	371,8	312,4	79,76	79,22	228,7	297,6	265,3	-	0,9
1:24	166,7	372	308,6	76,31	77,59	225,3	294,3	265,3	-	0,8
1:34	165,1	371,2	306,2	79,45	78,94	223,1	290,9	264,2	-	0,63
1:44	164,9	369,5	305	76,7	77,97	222,2	289,7	263,8	-	0,49
1:54	163,3	369	304,1	78,61	78,22	221,2	287,6	264,9	-	0,35
2:04	163,2	367,9	303,5	80,32	79,15	221,2	285,3	267,7	-	0,21
2:14	161,5	362	300,7	76,81	77,03	219,2	282	269	-	0,08
2:24	160,4	358,4	299,2	79,32	78,46	217,5	279,4	269,3	-	-0,03
2:24	160,2	358,3	299,2	79,44	78,47	217,6	279,3	269,5	-	-0,04

Date: November 13th, 2013
Primary air control setting: category 2

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
15:50	275,3	460,8	422,3	82,79	102,4	321,8	403,7	449,7	0,043	55,88
16:00	252	414,7	393,9	83,6	96,54	318,1	382	439	0,048	21,4
16:10	219,8	369,1	358,8	83,36	87,86	292,3	344,5	422,9	0,045	20,89
16:20	260,7	338,1	329,7	85,57	90,44	292,9	320,9	404,3	0,052	20,13
16:30	283,6	319,7	318,9	85,27	93,03	341,1	306,3	385,4	0,055	19,16
16:40	287,4	306,2	312,6	76,79	88,99	360,5	291,7	365,3	0,056	18,19
16:50	265	299,1	314	81,58	89,74	355,5	290,7	348,4	0,051	17,39
17:00	286,8	299,1	320,1	79,3	89,43	353,3	284	333,1	0,056	16,44
17:10	279,5	306,7	330,3	76,48	88,35	370,4	295,5	320,2	0,054	15,53
17:20	269	314,3	332,7	77,01	88,03	371,4	312,4	308,4	0,052	14,75
17:30	275,1	323	336,4	80,19	89,26	369,3	322,8	296,6	0,053	13,95
17:40	279,2	331,9	344,1	79,37	88,24	374,9	326,1	285,6	0,052	13,2
17:50	273,5	335,4	350,4	76,88	87,35	373,9	327,1	276,3	0,052	12,52
18:00	264,3	335,1	353,7	79,75	88,35	367,6	328,4	268,9	0,052	11,89
18:10	265	334,9	353,6	79,66	87,33	360,7	328,8	260,9	0,052	11,25
18:20	243	335,4	353,8	76,41	85,24	353,7	328,9	255,2	0,047	10,68
18:30	221,4	322,3	344,8	79,3	85,65	322,9	322	251,2	0,043	10,08
18:40	207,4	309,4	332,1	79,03	83,51	295,1	310,8	246,3	0,041	9,5
18:50	198,7	300,4	322,2	76,12	81,48	274,2	303,6	242,1	0,039	8,97
19:00	192,6	294,4	316,5	80,74	82,86	260,8	299,5	239	0,038	8,46
19:10	188,9	290,9	311	77,87	80,59	251,5	296,5	235,6	0,037	7,93
19:20	187,1	290	309,8	80,62	82,25	247,3	297,3	233,9	0,036	7,39
19:30	184,4	290,6	308,4	78,65	80,58	243,2	297,4	231,5	0,035	6,88
19:40	182,6	292,5	308,9	79,43	81,35	241,4	298,9	230,4	0,035	6,49
19:50	180,5	294,6	308,6	78,63	80	238,6	299,4	228,6	0,034	6,14
20:00	180,1	297,2	310,3	79,2	80,73	237,1	301,9	228,4	0,035	5,84
20:10	179,2	299,6	311,2	78,76	79,75	235,6	303,4	227,1	0,035	5,56
20:20	180,7	304,1	315	80,79	81,02	237,8	308,8	227,8	0,033	5,28
20:30	183,4	312,3	319,7	78,59	79,54	241,5	317,4	228,1	0,035	5,02
20:40	186,7	324,9	324,9	78,62	80,59	247,3	330	228,9	0,035	4,77
20:50	188,1	341,5	328,6	79,32	80,2	252,4	339,5	229,5	0,035	4,51
21:00	191,4	358	332,8	76,21	79,45	257	350	230,8	0,037	4,3
21:10	191,7	370,6	337,1	80,04	80,94	260,8	357,1	232	0,035	4,1
21:20	194,9	379,6	338,9	76,58	79,3	260,9	361,2	233,2	0,036	3,84
21:30	194,4	381,2	342,2	80,73	81,72	263,4	363,7	236	0,036	3,62
21:40	193,4	381,6	343,2	79,08	80,45	263,7	362,3	240,1	0,036	3,42
21:50	193,6	382,5	343,9	75,56	79,28	262,9	361,5	245,8	0,036	3,17
22:00	191,5	383,1	345,9	80,66	81,25	262,6	359,8	252	0,035	3,01
22:10	190,5	384,8	345,2	78,63	79,93	260	358,5	258,5	0,035	2,81
22:20	191,7	388,8	345,6	76,34	79,82	259,2	359	264,2	0,035	2,6
22:30	190,8	390,2	346,3	80,44	80,99	259,7	357,8	268,8	0,036	2,42
22:40	189,5	389	345,6	78,32	79,8	258,5	353,7	273,9	0,035	2,23

22:50	189	391,8	346	76,89	79,86	257,1	348,2	278,2	0,035	2,07
23:00	186,6	395	346,6	80,42	80,8	255,5	341,9	281	0,035	1,93
23:10	184,8	395,2	344,5	78,02	79,4	252,9	336,5	283,1	0,035	1,76
23:20	184	395,1	342,1	79,37	80,83	250,8	335	285,2	0,034	1,61
23:30	182,3	396,3	338,1	79,14	79,77	248,6	331,6	285,6	0,034	1,47
23:40	181,9	389,9	334,9	77,04	79,61	245,3	330	287,2	0,034	1,33
23:50	179,7	384,7	331,7	79,27	79,79	243,1	325,8	288,1	0,033	1,21
0:00	178,9	383,5	328,1	76,61	78,55	240,5	323	288,8	0,033	1,08
0:10	178,3	387,6	326,8	80,47	80,4	240	320,2	288,1	0,033	0,9
0:20	177,2	391	324,2	77,24	78,23	237,2	317	286,4	0,033	0,76
0:30	176,5	389,6	323,7	80,31	80,21	235,9	315	285,3	0,033	0,64
0:40	174,2	384,3	321	77,2	78,26	233,3	310,2	283,4	0,033	0,45
0:50	173,1	379,4	318,5	80,43	79,97	231,4	307,7	283,1	0,031	0,35
1:00	171,4	377,6	314,6	77,66	78,31	228,7	302,8	281,4	0,032	0,23
1:10	170,5	374,2	312,4	80,04	79,78	227	300,2	280,7	0,031	0,09
1:20	169,1	371,5	309,4	77,11	77,9	224,8	295,5	278,1	0,031	-0,03

Date: November 14th, 2013
Primary air control setting: Category 2

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
16:08	235,8	481,9	417	79,78	93,86	314,6	399,6	456,3	0,043	49,81
16:18	245,1	431,4	396,1	84,49	95,74	305,1	390,4	440,7	0,047	21,72
16:28	243,8	384,9	363,8	88,2	91,82	295	358,3	428,3	0,05	20,93
16:38	265,4	355,6	341,2	89,24	93,22	310,6	330,4	404	0,052	19,99
16:48	267,3	336,6	327,9	78,6	90,28	331,9	308,6	389,3	0,054	19,06
16:58	268,5	324,3	322,2	81,97	90,63	353,6	300,7	372	0,052	18,09
17:08	276,9	315,4	315	79,98	90,29	357	295,4	353	0,054	17,35
17:18	303,6	317,7	317,1	80,36	92,39	372	298,5	336	0,058	16,41
17:28	324,6	331	325,2	76,13	93,59	405,9	314,4	320,9	0,061	15,35
17:38	331,3	345,2	336,5	75,1	94,97	424,3	330	304,4	0,061	14,3
17:48	333,3	356,8	347,7	74,24	95,69	437,8	342	289,9	0,061	13,28
17:58	326,7	361,8	356,8	74,79	95,15	436,8	349,8	279,7	0,06	12,32
18:08	326,7	366,5	363,9	74,51	95,11	438,3	354,1	269,9	0,058	11,4
18:18	321,2	372,7	372,6	74,33	94,68	435,9	359,6	262,7	0,058	10,54
18:28	316,5	380,9	384,5	82,61	95,75	435,8	369,4	260,8	0,058	9,72
18:38	316,7	390	391	77,93	93,51	434	373	257,6	0,059	8,91
18:48	316,4	399,1	398,1	79,72	93,82	434,6	378,7	256,5	0,058	8,07
18:58	311,8	410,3	404,5	77,02	92,45	434,9	384,3	253,4	0,057	7,34
19:08	301,2	420,8	411,8	79,42	92,45	425,8	392,4	252,6	0,054	6,69
19:18	277	429,4	416,8	76,25	89,71	404,4	395,3	251,8	0,052	6,01
19:28	258,7	433,5	416,2	78,72	88,7	380,7	401,3	252,5	0,048	5,58
19:38	243,7	432,2	409,1	81,74	87,52	356,6	404,4	253,8	0,046	5,27
19:48	234,6	426,9	403,4	77,33	85,26	336	398,8	254,4	0,044	5,01
19:58	227,7	423,6	400,2	79,36	85,43	322,6	394,6	258,1	0,043	4,77
20:08	221,6	421,1	396,4	79,91	84,15	312,2	388,1	260,7	0,042	4,53
20:18	218,7	420,3	393,9	77,36	83,42	304,2	384,4	265,2	0,041	4,3
20:28	215,8	420,6	392,7	79,04	83,84	298,2	382,6	269,9	0,041	4,09
20:38	213,6	420,8	392	81,09	83,51	294,6	379,9	273,2	0,04	3,88
20:48	212,7	420,4	389,8	77,86	82,48	290,9	377,6	275,9	0,04	3,68
20:58	211,6	420	388	77,62	82,73	288,9	376,3	278,9	0,039	3,48
21:08	209,9	419	386,8	81,48	83,26	288,3	375,1	280,8	0,04	3,25
21:18	209,6	415,9	381,5	78,35	82,03	285,4	373,1	282,7	0,04	3,06
21:28	208,4	411,2	378,5	77,24	82,38	282,8	371,9	285,7	0,039	2,87
21:38	204,2	406,6	374,6	81,16	82,95	280,1	370,4	287,5	0,039	2,71
21:48	199,3	401,5	366,2	78,06	81,28	273,9	363,6	289,5	0,037	2,56
21:58	197,7	398,8	359,7	77,66	81,71	268,7	356,3	289,5	0,038	2,42
22:08	194,1	395,4	355,4	81,23	82,07	264	349,7	290,2	0,037	2,25
22:18	191,6	393,6	349,8	78,06	80,63	258,9	342,9	289,6	0,036	2,11
22:28	190	391,6	346,2	77,04	80,85	255,3	338,4	289	0,036	1,96
22:38	187	388,6	342,3	80,85	81,2	251,6	334	288	0,036	1,81
22:48	185,2	385,1	337,2	77,61	79,86	247,6	328,2	286,1	0,034	1,66
22:58	183,7	381,7	333,5	78,1	80,64	244,3	325,2	285,1	0,035	1,51

23:08	181,3	378,2	328,6	80,72	80,85	241	321	283	0,035	1,39
23:18	178	372,7	322	78,23	79,47	237	314,6	280,5	0,033	1,22
23:28	177,4	368,4	320,5	77,4	80,16	234,9	309,5	278,5	0,033	1,08
23:38	175,8	370,4	319,1	79,96	80,06	233,2	303,7	277,3	0,032	0,95
23:48	176,8	382,5	319	77,96	79,2	232,6	300,1	271,9	0,033	0,81
23:58	177,4	394,2	321,5	79,82	80,4	233,2	300	270	0,034	0,66
0:08	177,5	403,5	321,8	79,24	79,62	233,6	298,6	272,3	0,033	0,48
0:18	178,4	400,7	324,1	76,85	79,44	233,4	298	269	0,033	0,3
0:28	177,6	399,8	327,1	80,41	80,09	233,6	297	266,9	0,033	0,15
0:38	177,1	397,8	326,7	77,02	78,89	232,8	295,2	262,7	0,033	0,01
0:48	176,6	392,9	327,4	80,88	80,23	232,5	294,5	262,1	0,033	-0,11

Date: November 15th, 2013
Primary air control setting: Fully opened

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
11:11	584,9	639,9	490,4	76,71	174,4	564,5	511,5	337,5	0,074	39,51
11:21	598,8	553,4	498,4	76,32	161,9	537,9	513,1	393,3	0,084	20,21
11:31	671,2	504,3	478,7	77,5	168,3	591,7	496,3	397,4	0,091	17,47
11:41	790,8	509,3	481,3	77,6	195,6	720,6	508,7	382,2	0,098	14,01
11:51	753,4	558,9	513,4	81,02	192,9	763,7	541,7	368,4	0,096	10,87
12:01	676,5	641,1	548,8	82,25	176	720,9	568,5	354,2	0,091	8,51
12:11	636,8	701,7	576,5	81,61	164,9	666,4	586,8	347,6	0,088	6,62
12:21	593,8	716,1	586,9	81,1	154,2	622,1	596,3	342,2	0,085	5,16
12:31	561,1	719,3	584	79,89	146,1	581	586,4	341,7	0,081	4,18
12:41	517	708,2	574,9	79,29	137,1	532,8	567	347,9	0,075	3,47
12:51	472,8	679,3	558,1	77,61	129	485,4	547	353,2	0,073	2,93
13:01	447,2	663,7	536,4	76	123,4	445,5	525,3	358,1	0,069	2,39
13:11	429,8	659,4	518,1	74,69	120	420,9	506,6	362	0,068	1,89
13:21	413,9	664,5	502	73,96	116,7	400,3	491,3	366,1	0,067	1,4
13:31	406	669,8	487,2	76,03	115,6	389,5	481,2	366,3	0,064	1,1
13:41	396	651,5	475,5	76,44	113,9	380,1	469,9	367,2	0,064	0,72
13:51	387,1	634,1	465,7	75,46	112,3	368,4	459	367,6	0,063	0,4
14:01	377,8	618,8	455,7	75,22	110,8	358,9	449,2	366,9	0,062	0,08
14:11	368,6	601,2	445,5	74,89	109,2	348,5	439	366,8	0,061	-0,23

Date: November 18th, 2013
Primary air control setting: 10% opened

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
15:53	280,2	482,3	427,5	70,56	101,2	332,4	413,3	443,8	0,044	55,88
16:03	264,9	428,5	397,6	70,85	97,47	319,2	389	429	0,051	21,21
16:13	271	378	362,7	72,8	92,56	318,5	353,1	409,2	0,052	20,35
16:23	284,1	346,1	334,4	72,52	93,01	323,7	328,2	394,1	0,053	19,4
16:33	283,4	325,4	315,5	72,7	92,11	320,8	313,4	375,5	0,053	18,41
16:43	291	317,4	309,5	72,83	92,68	346,1	307,3	356,5	0,054	17,44
16:53	273,7	312,8	310,7	73,4	91,72	351,3	301,2	339,6	0,051	16,63
17:03	307,6	315,3	312,8	73,26	93,9	355,9	304,4	323,2	0,057	15,65
17:13	300,4	329,3	325,8	72,93	94,03	379,2	316,9	308,7	0,054	14,73
17:23	308,3	339,4	336,9	76,17	94,13	393,3	325,5	297	0,057	13,83
17:33	301,7	347,3	346,5	80,88	94,62	398,4	331,7	287,8	0,055	13,09
17:43	309,5	352	350	78,2	93,46	398,9	332,7	277,2	0,054	12,26
17:53	316,4	359,5	359,2	78,63	94,73	412,2	338,9	270,7	0,057	11,38
18:03	304,9	364,4	369,5	79,99	93,79	415	344,3	265	0,055	10,57
18:13	299,3	368	372,4	77,63	92,85	402,5	352,4	259,4	0,055	9,86
18:23	298,1	373,4	374,5	78,48	92,95	398,8	360,2	255	0,053	9,09
18:33	298,3	380,1	379,6	80,63	92,99	398,7	366,9	250,5	0,053	8,36
18:43	299,8	388,6	384,9	77,72	92,46	401,5	373	247,2	0,054	7,63
18:53	294,9	398,5	391,1	80,84	93,14	400,4	381,2	244,6	0,054	6,94
19:03	291,9	408,9	395,6	76,25	91,06	396,5	385,6	242,4	0,053	6,29
19:13	284,6	415,9	397,6	79,36	91,71	393,5	390,4	241,3	0,052	5,79
19:23	265,2	417,9	396,7	78,73	89,29	376,1	389,3	241,1	0,049	5,4
19:33	252,7	414,7	392,9	77,43	88,45	354,2	385,6	242,6	0,046	5,11
19:43	238,5	411,3	388,8	80,84	88,27	334,2	382	245	0,043	4,83
19:53	227,8	409,4	384,7	79,31	86,13	315,7	375,7	247,5	0,041	4,63
20:03	220,7	407,5	381,6	76,84	84,61	300,5	369,9	250,8	0,04	4,43
20:13	214,4	405,4	380,6	78,33	85,17	289,3	362,7	254,3	0,039	4,24
20:23	209,8	403,1	380,6	80,83	85,06	281,4	354,9	256,1	0,038	4,05
20:33	205,9	398,2	377,9	77,38	83,06	275,3	347,3	258,2	0,038	3,88
20:43	204,6	390	374,5	76,83	83,51	269,9	340,3	261,3	0,038	3,71
20:53	202,8	387,5	374,1	80,77	84,36	266,6	334,4	262,6	0,037	3,51
21:03	202	385,5	372,1	79,09	83,28	265	330	264	0,037	3,33
21:13	200	384,1	369,7	77,1	82,75	262,3	327,4	266,6	0,037	3,19
21:23	196,3	382	366	80,96	84,13	259,2	324,2	267,9	0,037	3,03
21:33	193,1	378,5	359,5	78,95	82,53	254,7	319,8	269,1	0,036	2,87
21:43	192	375,2	352,7	76,86	81,97	250,3	316,3	271,2	0,035	2,73
21:53	189,2	372,4	346,7	80,64	83,07	246,9	313,5	271,6	0,034	2,61
22:03	188,3	372,2	338,7	76,51	80,91	243,4	310,6	271,5	0,034	2,42
22:13	187,2	375,2	335	80,96	83,17	242,8	310,6	271,8	0,033	2,28
22:23	186,3	376,8	330,5	78,66	81,66	242	309,6	271	0,034	2,13
22:33	186	372,3	328,6	78,44	82,52	241,1	308	272,5	0,035	1,99
22:43	184	369,3	326,1	79,7	82,08	239,7	304,5	273,1	0,033	1,84

22:53	183,7	368,7	322,4	75,21	80,44	237,5	302,3	275,2	0,033	1,68
23:03	181,4	369,3	320,3	80,2	82,32	235,3	301,6	276,2	0,033	1,55
23:13	180,7	368,5	316,4	76,65	80,4	233,2	300,8	276,2	0,032	1,38
23:23	179,2	366,4	315,8	80,33	82,17	232	300	277,2	0,033	1,28
23:33	177,4	365,4	310,9	77,27	80,23	229,1	297,9	276,7	0,031	1,11
23:43	176,4	366,8	308,5	80,42	81,93	227	296,4	276,3	0,031	1
23:53	175,6	370,3	305,6	78,04	80,43	224,4	293,9	273,2	0,032	0,83
0:03	175,2	371,6	305,4	80,65	81,99	222,8	292,4	271,4	0,031	0,71
0:13	173,8	371,8	302,6	77,93	80,19	220,3	289,1	267,4	0,031	0,54
0:23	173,2	367,1	301,3	80,63	81,68	219,4	289,6	266	0,031	0,41
0:33	172,5	361,6	297,8	78,52	80,41	217,4	290,4	264,6	0,031	0,25
0:43	171,7	354,3	296,2	80,73	81,71	217,1	292,8	266,2	0,031	0,14
0:53	170,7	347,7	292	78,23	80,11	215,8	294,3	266,7	0,031	-0,02

Date: November 19th, 2013
Primary air control setting: 25% opened

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
15:42	328,5	528,9	449,1	69,79	113	373,4	454,4	471,6	0,053	55,88
15:52	400,9	474,6	433,4	76,37	115,4	408	434,6	464,3	0,068	20,6
16:02	402,8	432,6	408,7	79,71	110,8	426,3	404,5	450,1	0,069	19,1
16:12	443,9	422,2	396,7	86,44	115,9	451,2	388,6	433,6	0,076	17,52
16:22	481,6	437	400,1	76,67	118,9	518,4	390	406,8	0,077	15,75
16:32	470,6	458,5	419,6	74,4	116,9	537,6	404,3	387,5	0,075	13,95
16:42	462	478,1	439,8	74,06	115,8	541,3	419,7	368,8	0,075	12,29
16:52	446,1	493,4	455,4	73,38	113,3	531,1	432,5	354,3	0,072	10,89
17:02	430,7	504,2	464,6	73,33	110,7	515,7	440,7	341,8	0,071	9,56
17:12	418,2	513,8	471,6	72,02	108,5	502,5	446,4	330,7	0,071	8,39
17:22	400,4	519,5	475,5	79,96	107,6	487,7	450	324,5	0,066	7,36
17:32	389,6	522,1	478,3	80,91	107,9	472,3	449,7	320	0,066	6,55
17:42	363,5	525,6	483,1	78,33	103,6	449,9	444,2	314,7	0,062	5,79
17:52	339,9	528,9	484,7	76,77	99,58	417,2	439,1	310,3	0,059	5,2
18:02	323,8	516,4	480,3	79,98	98,53	394	436,2	311,4	0,057	4,79
18:12	305,9	498,9	463,6	76,48	95,26	369,8	429,9	311,9	0,054	4,46
18:22	291,8	476,8	449,6	78,15	94,38	348,9	419,3	314,4	0,052	4,17
18:32	279,1	460,8	438	80,86	93,26	330,7	404,8	315,4	0,05	3,93
18:42	271,3	449,8	426,9	77,52	91,15	316,8	392,7	317,4	0,049	3,73
18:52	265	439,9	418,8	79,95	91,73	307,2	382,6	318,4	0,048	3,52
19:02	257,8	434,2	408,2	79,05	89,45	298,4	374	317,3	0,047	3,3
19:12	254,6	429	400	76,69	88,91	291,3	367,5	318,4	0,047	3,1
19:22	251	429,7	395,1	79,68	89,54	286,6	362,7	317,7	0,047	2,89
19:32	248,7	433,9	389,9	80,14	88,72	281,8	358,8	314,7	0,046	2,64
19:42	252,8	449,6	384,9	75,66	87,53	279,7	358	313,2	0,047	2,4
19:52	256,6	476,6	386,4	79,31	89,55	282,6	362,7	315	0,047	2,1
20:02	259	502,8	389,8	80,87	89,6	286,1	366,8	313,4	0,046	1,84
20:12	260,4	522,9	391,8	77,08	88,09	288,3	371,3	312,4	0,047	1,56
20:22	259,4	523,8	395,5	77,36	88,99	289,9	376,7	315	0,047	1,3
20:32	256,1	513,2	396,7	81,54	90,02	289	378,2	314,9	0,047	1,08
20:42	256,3	507,9	394,2	79,04	88,62	286,9	376,7	315,4	0,047	0,84
20:52	255,9	504,5	392,5	76,1	88,15	285,6	376,2	316,8	0,047	0,61
21:02	253,2	499,6	390,9	78,76	89,06	284,3	374,3	317,8	0,047	0,42
21:12	250,3	493,4	388,3	80,8	88,99	281,7	370,6	317,1	0,046	0,24
21:22	249,2	490,2	382,5	77,34	87,33	279	366,7	316,4	0,045	0,03
21:32	247	485,4	379,3	78,01	88,43	276,7	364,9	317,3	0,045	-0,18

Date: November 21th, 2013
Primary air control setting: 10% opened

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
15:44	301,8	464,3	412,4	77,82	106,7	337,6	405,2	449,8	0,048	55,88
15:54	288,6	422	394,5	84,12	104	329,3	392,9	440,2	0,055	20,63
16:04	290,3	380,1	365,8	86,45	97,82	327,1	365,1	425,2	0,056	19,82
16:14	288,3	352,7	342,9	80,55	95,8	333,4	336,1	407,6	0,055	18,94
16:24	298,9	334,4	326,8	83,3	96,3	339,8	319,5	388,6	0,058	17,99
16:34	316,8	331,7	322,4	79,69	96,08	363,6	318	369,4	0,06	17
16:44	325,2	334,6	330,2	78,6	97,27	377,6	323	351,9	0,061	16,06
16:54	335,3	344,9	341,2	81,97	99,26	394,3	332,3	336,2	0,061	15,07
17:04	337,8	355,9	353,2	81,03	98,59	405,2	337,6	322	0,063	14,07
17:14	339,6	366,5	363,4	78,55	99,05	418,9	345	308,8	0,062	13,1
17:24	331,6	370	374	82,77	99,2	417,6	349,7	295,7	0,061	12,25
17:34	328	367	379,2	79,43	97,34	409,1	348	283,8	0,06	11,4
17:44	330,4	369,7	383,6	79,8	97,93	408,6	353,4	277,1	0,06	10,56
17:54	332,1	376,5	388	82,68	98,32	409,4	364	270,4	0,061	9,7
18:04	341,9	386,6	393,8	78,37	98,05	415,7	375,4	264,5	0,064	8,78
18:14	345,4	398,1	402,1	79,95	99,2	426,5	385,4	260,5	0,063	7,9
18:24	335,7	410,7	410,7	81,36	98	427,6	394,9	257,3	0,061	7,09
18:34	325,1	424	417,8	79,61	96,47	418,5	402,5	255,8	0,06	6,43
18:44	313,1	432,2	423,1	80,98	95,94	401,4	407,6	254,3	0,057	5,86
18:54	294,7	437,3	424,3	80,15	93,19	382,8	409,7	252	0,054	5,42
19:04	277,7	441	420,2	79,39	91,89	362,1	407,7	252,1	0,051	5,08
19:14	263,3	436,6	414,5	80,98	91,27	342,3	403,2	253,2	0,05	4,79
19:24	254,4	429,5	408,8	81,61	89,45	325,2	396,9	253,1	0,047	4,52
19:34	248,6	425,1	403,4	76,96	87,64	313,2	393,4	255,4	0,047	4,25
19:44	244,5	423,7	401,7	80,56	88,72	306,2	389,3	259,6	0,046	4,01
19:54	240	423,9	399,6	82,03	88	300,5	384,2	262,7	0,045	3,77
20:04	236,9	425,8	396,4	77,92	86,13	295,6	380,2	268	0,045	3,58
20:14	234,7	426,3	396,2	79,83	87,3	293	377,7	272,3	0,044	3,3
20:24	232,7	428,5	394,1	82,78	87,51	290,3	375,9	275,1	0,044	3,12
20:34	230,3	430,4	391,1	80,51	86,03	287,3	374,1	277,2	0,044	2,9
20:44	229,1	429,7	387,6	78,04	85,37	283,9	371,8	282,1	0,043	2,73
20:54	228,9	427,8	385,9	82,66	87,19	281	368,9	284,4	0,044	2,48
21:04	228,2	422,7	381,9	80,17	85,56	279,2	366,4	286,8	0,043	2,26
21:14	228,2	419,7	378,3	77,73	85,46	278,4	367	291,2	0,044	2,06
21:24	226,6	417,8	374,7	82,57	86,55	278,1	366,4	291,7	0,042	1,87
21:34	224	414,1	368,9	79,37	85,01	275,1	362,2	291,9	0,042	1,67
21:44	222,3	411,4	364	79,07	85,66	272,2	360,4	296,3	0,042	1,53
21:54	217,3	406,8	358,9	82,13	85,85	268,6	356,2	293,8	0,041	1,35
22:04	213,6	404,8	352	78,3	83,92	263,2	351,2	294,9	0,04	1,16
22:14	212,8	403,9	349,6	80,59	85,42	259,7	348,1	292,9	0,041	0,98
22:24	211,1	408,6	348,4	80,91	84,8	257,8	344,7	290,5	0,04	0,81
22:34	210,4	408	346,7	76,98	83,57	255,9	342,7	292,9	0,041	0,67

22:44	207,6	400,8	344,8	81,6	84,84	254,1	340	289,4	0,039	0,5
22:54	204,8	393,8	338,5	78,94	83,35	250,4	336,3	288,3	0,039	0,33
23:04	201,5	389,2	335,1	82,06	84,73	246,7	331,8	286,4	0,038	0,19
23:14	200,4	389,1	331,3	79,71	83,23	244,1	325,1	284,7	0,038	-0,01
23:24	200,6	392,8	331,6	82,28	84,51	242,4	322,2	289,3	0,038	-0,13

Date: November 22th, 2013
Primary air control setting: 10% opened

Time	FLUE :	BACK :	RIGHT SIDE :	AMBIANT :	TUNNEL :	TOP :	LEFT SIDE :	BOTTOM :	DRAFT :	Weight(Lbs)
15:37	293,3	471,7	418,8	76,57	110,1	335,7	405,9	428,2	0,042	33,94
15:47	288,8	425,8	399,4	83,28	107,1	343,2	391,7	417,1	0,056	21,19
15:57	289	384,7	373,3	86,73	103	346,2	361	406,2	0,055	20,28
16:07	308,4	357,9	351,4	88,7	104,5	352,1	336	391,4	0,058	19,32
16:17	316,9	342	336,2	80,2	102,3	364,9	319,6	372,6	0,06	18,4
16:27	327	339,4	331,2	78,62	101,7	395,7	316,2	355,3	0,061	17,33
16:37	344,4	348,2	339,2	78,6	104	419,1	323,7	340	0,063	16,22
16:47	350,2	358,6	346,9	81,78	105,3	438,5	337	327,9	0,064	15,1
16:57	347,5	369,8	353,8	78,73	104,2	446,5	348,4	314,4	0,063	14,08
17:07	348,7	377,2	357,8	82,09	105,1	448,6	359,6	302,3	0,062	13,08
17:17	340	379,7	361	78,37	103,3	445,1	367,5	291,6	0,063	12,19
17:27	342,4	383	366,1	82,09	104,6	441,5	372,4	283,3	0,06	11,24
17:37	340,8	390,6	372,4	78,54	103	440,8	380,8	276,7	0,061	10,3
17:47	339,5	398,4	379	80,85	103,5	441,2	388,8	271,1	0,061	9,37
17:57	330,8	406,1	387,2	79,03	101,8	439,5	394,7	266,3	0,06	8,59
18:07	312	411,1	391,2	79,77	99,54	424,6	395,4	262,3	0,057	7,89
18:17	303,1	414,1	391,8	77,9	98,61	409,5	396,5	258,8	0,054	7,34
18:27	290,2	417,7	391,1	80,89	97,49	396	396,8	256,3	0,053	6,77
18:37	278,5	419,9	388,3	78,15	95,44	376,5	398,3	254,1	0,052	6,3
18:47	262,7	424,4	388,1	81,81	95,1	360	400,4	252,6	0,049	5,88
18:57	250,1	419,1	385,4	76,7	91,87	337,8	394,2	251,2	0,047	5,55
19:07	239,4	412,8	382,4	78,6	91,78	322,1	389	251,6	0,045	5,32
19:17	231,1	409,3	379,4	81,08	91,28	308,6	383,4	251,3	0,043	5,07
19:27	226	408,5	376,1	76,97	88,91	297,9	379,8	252,3	0,042	4,86
19:37	222,6	410,1	375,5	77,16	88,81	291,9	378,3	254,1	0,042	4,66
19:47	221,1	415	376,3	79,28	89,57	288,5	378,3	256,5	0,042	4,37
19:57	220,6	418,6	377,6	81,07	89,81	287,1	378,9	257,7	0,042	4,16
20:07	219,4	420,3	376,9	78,21	88,17	283,3	379,7	259,6	0,041	3,93
20:17	220,4	423	376,9	77,49	88,19	281,6	381,7	263,3	0,041	3,72
20:27	219,9	423,8	377,1	81,47	89,5	282	382,7	265,1	0,041	3,5
20:37	221,2	422,6	374,8	77,86	87,9	282,9	384,4	268,2	0,042	3,26
20:47	221,5	421,8	374,7	77,05	88,03	282,4	384,7	272,2	0,042	3,04
20:57	219,5	420,5	373,8	79,8	89,05	282,2	381,4	276,8	0,041	2,88
21:07	215,3	417,2	371,4	79,66	88,32	280,6	375,4	280,1	0,04	2,69
21:17	211,5	410,7	369	76,31	86,58	275,3	367,3	283,2	0,039	2,54
21:27	208,3	405,6	368,4	79,07	88	270,3	357,8	286,6	0,039	2,34
21:37	205,3	401,9	365,7	79,86	87,41	266,1	349,2	286,7	0,039	2,19
21:47	203,5	398	362,6	77,14	86,2	262,1	343	286,9	0,038	2,03
21:57	201,3	392,7	359,1	78,7	86,86	259,3	339,3	292,9	0,037	1,89
22:07	198,7	388,2	353,2	80,25	87,1	256,8	335,4	292,5	0,037	1,74
22:17	197,8	385,5	346,9	76,95	85,55	253,5	333,3	293,1	0,037	1,62
22:27	196,7	383,1	344,3	80,16	87,29	251,9	332,3	296,6	0,037	1,46

22:37	193,5	381	340,2	79,23	86,11	248,1	328,1	295,6	0,037	1,3
22:47	193,8	377,7	337,1	75,64	85,04	246,1	324,3	295,1	0,036	1,12
22:57	191,9	375,2	336,7	80,7	86,92	244,6	320,9	295,8	0,036	0,97
23:07	191	372,7	333,6	78,23	85,22	242,2	317,3	294,1	0,036	0,79
23:17	190	370,9	332,2	79,31	86,11	240,9	318,3	294	0,036	0,66
23:27	187,2	369,5	328,2	79,63	85,63	238,6	314,7	292,5	0,035	0,5
23:37	186,7	372,5	324,9	76,47	84,34	235,8	312,3	292,2	0,036	0,37
23:47	184,9	376,6	324,1	80,01	85,69	234,5	310,2	290	0,035	0,21
23:57	183,1	375,6	322,1	77,01	83,98	231,5	307,7	283,6	0,035	0,06
0:07	180,9	366,7	321,4	80,56	85,69	228,4	304,2	282,1	0,033	-0,06

Date: 2013-10-31

Equipment: SBI-153 Temperature: 70 F
Accuracy: 0,001 R.H.: 34%
Reference: SBI-188

S.D.	0,00	%	
R.M.U.	0,09	%	
O.M.U	**0,41**	**%**	
	Ave A.D.	0,18	%
Standard	Reading	A.D.	
MΩ	MΩ		
1,100	1,098	0,18	

Engineer: Vincent Pelletier

Date: 2013-10-31

Equipment: SBI-153 Temperature: 70 F
Accuracy: 0,1 R.H.: 34%
Reference: SBI-188

S.D.	0,00	%	
R.M.U.	0,08	%	
O.M.U	**0,17**	**%**	
	Ave A.D.	0,00	%
Standard	Reading	A.D.	
MΩ	MΩ		
120,0	120,0	0,00	

Kestrel®
Weather & Environmental Meters
by NK

Certificate of Conformity

This instrument was produced under rigorous factory production control and documented standard procedures. It was individually visually inspected, leak tested and function tested for display, backlight, button and software performance. The accuracy of each of its primary measurements was individually calibrated and/or tested against standards traceable to the National Institute of Standards and Technology ("NIST") or calibrated intermediary standards. This instrument is certified to have performed at the time of manufacture in compliance with the following specifications as they apply to this meter's specific model, measurements and features.

Methods Used in Calibration and Testing

Wind Speed:

The Kestrel Pocket Weather Meter impeller installed in this unit was individually tested in a subsonic wind tunnel operating at approximately 300 fpm (1.5 m/s) and 1200 fpm (6.1 m/s) monitored by a Gill Instruments Model 1350 ultrasonic time-of-flight anemometer. The Standard's maximum combined uncertainty is +/–1.04% within the airspeed range 706.6 to 3923.9 fpm (3.59 to 19.93 m/s), and +/–1.66% within the airspeed range 166.6 to 706.6 fpm (0.85 to 3.59 m/s).

Temperature:

Temperature response is verified in comparison with a Eutechnics 4600 Precision Thermometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Eutechnics 4600. The Eutechnics 4600 is calibrated annually and is traceable to NIST with a system accuracy of +/– 0.05 °C.

Direction / Heading

The sensitivity of the magnetic directional sensor is verfied at the component level by applying a magnetic field to the sensor and measuring the signal output at 4 points, as well as after assembly by orienting the unit to the cardinal directions and measuring the magnetic field output. In both cases the compass output must be accurate to within +/– 5 degrees.

Relative Humidity:

Relative humidity receives a two-point calibration in humidity and temperature controlled chambers at 75.3% RH and 32.8% RH at 25° C. The calibration tanks are monitored with an Edgetech Model 2002 DewPrime II Standard Chilled Mirror Hygrometer. Following calibration, performance is further verified at an RH of approximately 43.2% against the Edgetech Hygrometer. The Edgetech Hygrometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/– 0.2% RH.

Barometric Pressure:

Pressure response is verified against a Mensor Series 6000 Digital Barometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Mensor Barometer. The Mensor Barometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/– 0.02% F.S.

Approved By:

Michael Naughton, Engineering Manager

The enclosed Kestrel Weather and Environmental Meter was manufactured by Nielsen-Kellerman Co. at its facilities located at 21 Creek Circle, Boothwyn, PA 19061 USA.

Temps (s)	Heure	FLUE :	FIREBOX BACK :	FIREBOX RIGHT SIDE :	AMBIANT :	DILUTION TUNNEL :	FIREBOX TOP :	FIREBOX LEFT SIDE :	FIREBOX BOTTOM :	DMG INLET 1 :	DMG OUTLET 1 :	PROBE TEMPERATURE 1 :	DGM OUTLET 2 :	PROBE TEMPERATURE 2 :	DGM INLET 2 :
0	11,01	73,25	70,78	70,79	68,47	76,81	70,5	70,21	70,71	77,74	77,66	4175,1	77,58	4175,1	77,48
10	11,01	73,25	70,78	70,79	68,47	76,79	70,48	70,22	70,7	77,74	77,66	4175,1	77,57	4175,1	77,5
20	11,01	31,53	70,78	70,8	68,49	76,75	70,48	70,21	70,71	77,74	77,65	4175,1	77,59	4175,1	77,49
30	11,01	31,53	70,78	70,8	68,49	76,75	70,48	70,21	70,71	77,74	77,65	4175,1	77,59	4175,1	77,49
40	11,01	31,35	70,76	70,79	68,58	76,66	70,48	70,22	70,69	77,76	77,67	4175,1	77,58	4175,1	77,48
50	11,02	31,35	70,76	70,79	68,58	76,66	70,48	70,22	70,69	77,76	77,67	4175,1	77,58	4175,1	77,48
60	11,02	31,35	70,74	70,77	68,65	76,6	70,48	70,19	70,69	77,74	77,66	4175,1	77,56	4175,1	77,5
70	11,02	31,35	70,74	70,77	68,65	76,6	70,48	70,19	70,69	77,74	77,66	4175,1	77,56	4175,1	77,5
80	11,02	31,35	70,74	70,77	68,65	76,6	70,48	70,19	70,69	77,74	77,66	4175,1	77,56	4175,1	77,5
90	11,02	31,35	70,77	70,78	68,8	76,57	70,49	70,22	70,7	77,78	77,7	4175,2	77,6	4175,2	77,51
100	11,02	31,35	70,77	70,78	68,8	76,57	70,49	70,22	70,7	77,78	77,7	4175,2	77,6	4175,2	77,51
110	11,03	31,35	70,77	70,78	68,8	76,57	70,49	70,22	70,7	77,78	77,7	4175,2	77,6	4175,2	77,51
120	11,03	31,35	70,75	70,76	68,94	76,54	70,48	70,21	70,67	77,77	77,68	4175,2	77,59	4175,2	77,51
130	11,03	31,35	70,75	70,76	68,94	76,54	70,48	70,21	70,67	77,77	77,68	4175,2	77,59	4175,2	77,51
140	11,03	31,35	70,75	70,76	68,94	76,54	70,48	70,21	70,67	77,77	77,68	4175,2	77,59	4175,2	77,51
150	11,03	69,4	70,75	70,75	69	76,51	70,46	70,22	70,69	77,78	77,69	4175,2	77,61	4175,2	77,5
160	11,03	69,4	70,75	70,75	69	76,51	70,46	70,22	70,69	77,78	77,69	4175,2	77,61	4175,2	77,5
170	11,04	69,4	70,75	70,75	69	76,51	70,46	70,22	70,69	77,78	77,69	4175,2	77,61	4175,2	77,5
180	11,04	69,36	70,75	70,76	69,27	76,48	70,48	70,21	70,68	77,8	77,69	4175,3	77,62	4175,3	77,52
190	11,04	69,36	70,75	70,76	69,27	76,48	70,48	70,21	70,68	77,8	77,69	4175,3	77,62	4175,3	77,52
200	11,04	149,4	70,75	70,76	69,35	76,47	70,47	70,21	70,65	77,8	77,7	4175,3	77,62	4175,3	77,53
210	11,04	149,4	70,75	70,76	69,35	76,47	70,47	70,21	70,65	77,8	77,7	4175,3	77,62	4175,3	77,53
220	11,04	149,4	70,75	70,76	69,35	76,47	70,47	70,21	70,65	77,8	77,7	4175,3	77,62	4175,3	77,53
230	11,05	149,4	70,73	70,72	69,4	76,43	70,47	70,22	70,66	77,81	77,72	4175,3	77,62	4175,3	77,55
240	11,05	149,4	70,73	70,72	69,4	76,43	70,47	70,22	70,66	77,81	77,72	4175,3	77,62	4175,3	77,55
250	11,05	149,4	70,73	70,72	69,4	76,43	70,47	70,22	70,66	77,81	77,72	4175,3	77,62	4175,3	77,55
260	11,05	299,3	70,73	70,74	69,62	76,4	70,47	70,24	70,66	77,83	77,74	4175,4	77,64	4175,4	77,53
270	11,05	299,3	70,73	70,74	69,62	76,4	70,47	70,24	70,66	77,83	77,74	4175,4	77,64	4175,4	77,53
280	11,05	299,3	70,73	70,74	69,62	76,4	70,47	70,24	70,66	77,83	77,74	4175,4	77,64	4175,4	77,53
290	11,06	299,4	70,74	70,74	69,99	76,4	70,48	70,24	70,67	77,82	77,74	4175,4	77,66	4175,4	77,56
300	11,06	499,4	70,73	70,77	70,08	76,4	70,5	70,25	70,68	77,82	77,74	4175,5	77,67	4175,5	77,58
310	11,06	499,4	70,75	70,75	70,04	76,41	70,51	70,27	70,69	77,86	77,78	4175,5	77,68	4175,5	77,6
320	11,06	749,4	70,71	70,71	70,08	76,38	70,49	70,25	70,65	77,83	77,75	4175,5	77,66	4175,5	77,55

330	11,06	749,4	70,75	70,74	70,1	76,42	70,51	70,27	70,67	77,86	77,79	4175,6	77,68	4175,6	77,59
340	11,06	999,5	70,73	70,74	70,08	76,41	70,49	70,26	70,69	77,83	77,74	4175,6	77,68	4175,6	77,57
350	11,07	999,5	70,7	70,74	70,05	76,41	70,5	70,25	70,67	77,83	77,75	4175,6	77,66	4175,6	77,57
360	11,07	999,5	70,72	70,76	70,09	76,41	70,52	70,25	70,69	77,82	77,76	4175,6	77,69	4175,6	77,59
370	11,07	1249,4	70,72	70,73	70,08	76,38	70,52	70,26	70,65	77,85	77,76	4175,6	77,68	4175,6	77,6
380	11,07	1249,5	70,75	70,74	70,06	76,4	70,51	70,28	70,7	77,85	77,79	4175,7	77,7	4175,7	77,61
390	11,07	1499,4	70,73	70,75	70,03	76,37	70,53	70,29	70,7	77,87	77,8	4175,7	77,71	4175,7	77,61
400	11,07	1499,4	70,74	70,75	70	76,36	70,52	70,29	70,67	77,84	77,76	4175,7	77,7	4175,7	77,61
410	11,08	1749,5	70,75	70,74	70	76,37	70,52	70,28	70,69	77,85	77,78	4175,7	77,71	4175,7	77,62
420	11,08	1749,5	70,75	70,74	69,99	76,33	70,52	70,28	70,67	77,87	77,79	4175,7	77,71	4175,7	77,63
430	11,08	73,66	70,73	70,73	69,94	76,34	70,55	70,28	70,69	77,84	77,76	4175,7	77,7	4175,7	77,61
440	11,08	70,76	70,74	70,75	69,94	76,33	70,52	70,28	70,67	77,86	77,78	4175,8	77,71	4175,8	77,59
450	11,08	70,68	70,74	70,74	69,94	76,33	70,53	70,29	70,69	77,87	77,82	4175,8	77,72	4175,8	77,64
460	11,08	70,69	70,75	70,76	56,64	76,32	70,54	70,31	70,7	77,87	77,8	4175,8	77,74	4175,8	77,63
470	11,09	70,6	70,72	70,75	71,25	76,28	70,54	70,28	70,69	77,85	77,79	4175,8	77,72	4175,8	77,65
480	11,09	70,57	70,74	70,75	74,15	76,27	70,52	70,3	70,68	77,85	77,78	4175,8	77,72	4175,8	77,6
490	11,09	70,54	70,76	70,78	31,63	76,27	70,55	70,31	70,7	77,9	77,84	4175,9	77,75	4175,9	77,66
500	11,09	70,46	70,75	70,76	31,75	76,24	70,53	70,31	70,71	77,88	77,8	4175,9	77,74	4175,9	77,65
510	11,09	70,39	70,76	70,77	74,72	76,22	70,52	70,3	70,66	77,89	77,81	4175,9	77,76	4175,9	77,66
520	11,09	70,34	70,76	70,78	74,79	76,19	70,53	70,31	70,7	77,88	77,81	4176	77,76	4176	77,65
530	11,1	70,28	70,76	70,77	149,6	76,19	70,55	70,3	70,69	77,89	77,84	4176	77,75	4176	77,66
540	11,1	70,19	70,75	70,78	149,7	76,19	70,54	70,3	70,69	77,89	77,82	4176	77,75	4176	77,65
550	11,1	70,1	70,75	70,76	299,7	76,15	70,55	70,31	70,69	77,92	77,86	4176,1	77,77	4176,1	77,69
560	11,1	70,06	70,77	70,78	299,6	76,16	70,55	70,29	70,7	77,89	77,83	4176,1	77,78	4176,1	77,67
570	11,1	70	70,77	70,79	499,9	76,16	70,57	70,29	70,71	77,94	77,86	4176,1	77,78	4176,1	77,69
580	11,1	69,93	70,76	70,78	499,9	76,12	70,54	70,3	70,69	77,93	77,85	4176,2	77,78	4176,2	77,67
590	11,1	69,89	70,76	70,78	749,5	76,11	70,53	70,29	70,69	77,94	77,88	4176,2	77,79	4176,2	77,68
600	11,11	69,84	70,77	70,79	749,5	76,11	70,55	70,3	70,68	77,92	77,87	4176,2	77,8	4176,2	77,71
610	11,11	69,78	70,76	70,79	999,5	76,08	70,54	70,3	70,7	77,91	77,85	4176,3	77,79	4176,3	77,71
620	11,11	69,71	70,74	70,81	999,5	76,1	70,54	70,3	70,71	77,92	77,85	4176,3	77,8	4176,3	77,73
630	11,11	69,63	70,77	70,81	1249,4	76,1	70,55	70,29	70,7	77,92	77,87	4176,3	77,82	4176,3	77,7
640	11,11	69,58	70,77	70,79	1249,7	76,11	70,54	70,29	70,7	77,95	77,88	4176,4	77,81	4176,4	77,7
650	11,11	69,53	70,76	70,79	1499,4	76,07	70,54	70,28	70,68	77,92	77,85	4176,4	77,8	4176,4	77,69
660	11,12	69,47	70,74	70,8	1499,3	76,08	70,54	70,3	70,69	77,94	77,87	4176,4	77,83	4176,4	77,7
670	11,12	69,41	70,73	70,78	1749,4	76,06	70,51	70,27	70,68	77,95	77,91	4176,4	77,81	4176,4	77,74

680	11,12	69,39	70,76	70,79	1749,6	76,05	70,52	70,29	70,67	77,95	77,89	4176,5	77,82	4176,5	77,73
690	11,12	69,39	70,74	70,79	4176,5	76,04	70,53	70,26	70,7	77,95	77,89	4176,5	77,83	4176,5	77,74
700	11,12	69,41	70,73	70,8	4176,6	4176,6	70,52	70,28	70,68	77,95	77,9	4176,6	77,84	4176,6	77,75
710	11,12	69,4	70,75	70,79	4176,6	31,83	70,52	70,26	70,68	77,96	77,9	4176,6	77,81	4176,6	77,75
720	11,13	69,44	70,77	70,83	4176,7	31,64	70,56	70,28	70,69	77,99	77,92	4176,7	77,85	4176,7	77,78
730	11,13	69,42	70,74	70,79	4176,6	31,65	70,52	70,24	70,68	77,97	77,9	4176,6	77,86	4176,6	77,74
740	11,13	69,44	70,73	70,78	4176,7	74,74	70,53	70,25	70,69	77,96	77,91	4176,7	77,84	4176,7	77,76
750	11,13	69,44	70,75	70,82	4176,7	74,76	70,51	70,26	70,68	77,98	77,91	4176,7	77,87	4176,7	77,76
760	11,13	69,46	70,74	70,79	4176,7	149,6	70,51	70,26	70,67	77,99	77,94	4176,7	77,86	4176,7	77,78
770	11,13	69,49	70,74	70,78	4176,8	149,7	70,49	70,26	70,69	78	77,94	4176,8	77,88	4176,8	77,8
780	11,14	69,53	70,74	70,81	4176,8	299,7	70,51	70,26	70,66	78,01	77,93	4176,8	77,88	4176,8	77,79
790	11,14	69,57	70,74	70,77	4176,8	299,7	70,5	70,27	70,68	77,99	77,95	4176,8	77,87	4176,8	77,8
800	11,14	69,62	70,74	70,8	4176,9	499,8	70,51	70,28	70,7	78,01	77,95	4176,9	77,9	4176,9	77,79
810	11,14	69,62	70,71	70,78	4176,9	499,8	70,49	70,25	70,67	77,99	77,92	4176,9	77,87	4176,9	77,76
820	11,14	69,67	70,76	70,81	4177	749,7	70,49	70,26	70,67	78,02	77,97	4177	77,9	4177	77,8
830	11,14	69,7	70,74	70,82	4177	749,7	70,49	70,27	70,69	78,02	77,97	4177	77,91	4177	77,81
840	11,15	69,74	70,74	70,8	4177	999,9	70,51	70,28	70,68	78,03	77,98	4177	77,91	4177	77,84
850	11,15	69,76	70,72	70,79	4177,1	999,9	70,5	70,26	70,69	78,01	77,98	4177,1	77,9	4177,1	77,82
860	11,15	69,81	70,75	70,81	4177,1	1249,9	70,51	70,27	70,7	78,06	77,95	4177,1	77,94	4177,1	77,82
870	11,15	69,84	70,72	70,79	4177,1	1249,9	70,5	70,28	70,69	78,02	77,96	4177,1	77,94	4177,1	77,84
880	11,15	69,86	70,74	70,78	4177,2	1499,8	70,5	70,28	70,71	78,03	77,98	4177,2	77,92	4177,2	77,84
890	11,15	69,91	70,75	70,8	4177,2	1499,8	70,48	70,27	70,7	78,06	78	4177,2	77,93	4177,2	77,83
900	11,16	69,96	70,72	70,77	4177,2	1750	70,48	70,3	70,68	78,05	78,02	4177,2	77,94	4177,2	77,85
910	11,16	69,99	70,74	70,79	4177,3	1749,9	70,49	70,3	70,72	78,06	77,98	4177,3	77,95	4177,3	77,84
920	11,16	70,03	70,76	70,81	4177,4	4177,4	70,48	70,3	70,7	78,07	78,03	4177,4	77,96	4177,4	77,78
930	11,16	70,03	70,72	70,76	4177,3	75,94	70,46	70,28	70,68	78,05	78	4177,3	77,94	4177,3	77,84
940	11,16	70,09	70,74	70,8	4177,4	76,03	70,49	70,3	70,7	78,06	78,03	4177,4	77,96	4177,4	77,87
950	11,16	70,08	70,72	70,79	69,6	75,97	70,47	70,28	70,67	78,05	78,01	4177,4	77,94	4177,4	77,85
960	11,17	70,14	70,72	70,78	70,08	76	70,48	70,31	70,69	78,12	78,05	4177,5	77,98	4177,5	77,88
970	11,17	70	70,73	70,78	70,13	76,04	70,39	70,31	70,69	78,11	78,05	4177,5	77,97	4177,5	77,88
980	11,17	70,09	70,72	70,77	70,19	76,04	2246,3	70,28	70,68	78,08	78,03	4177,5	77,96	4177,5	77,86
990	11,17	70,24	70,72	70,78	70	76,06	31,53	70,3	70,69	78,08	78,02	4177,6	77,99	4177,6	77,87
1000	11,17	70,26	70,74	70,75	70,02	76,06	31,49	70,3	70,69	78,12	78,06	4177,6	77,98	4177,6	77,89
1010	11,17	70,27	70,71	70,78	70,04	76,04	74,5	70,3	70,66	78,07	78,02	4177,6	77,96	4177,6	77,85
1020	11,17	70,3	70,7	70,77	70,15	76,04	74,51	70,28	70,69	78,08	78,02	4177,7	77,97	4177,7	77,88

1030	11,18	70,35	70,73	70,76	70,37	76,07	149,5	70,31	70,71	78,08	78,03	4177,7	78	4177,7	77,89
1040	11,18	70,37	70,73	70,79	70,4	76,06	149,5	70,31	70,69	78,1	78,05	4177,8	78,01	4177,8	77,9
1050	11,18	70,43	70,73	70,76	70,41	76,1	294,6	70,33	70,69	78,13	78,08	4177,8	78,01	4177,8	77,92
1060	11,18	70,44	70,75	70,78	70,5	76,11	299,5	70,33	70,69	78,13	78,07	4177,9	78,01	4177,9	77,91
1070	11,18	70,48	70,75	70,79	70,66	76,1	299,5	70,32	70,7	78,12	78,07	4177,9	78,02	4177,9	77,92
1080	11,18	70,53	70,77	70,79	70,8	76,15	499,6	70,35	70,72	78,13	78,1	4178	78,05	4178	77,95
1090	11,19	70,54	70,73	70,78	70,71	76,12	749,5	70,31	70,69	78,13	78,07	4178	78,02	4178	77,92
1100	11,19	70,6	70,76	70,79	70,58	76,15	749,5	70,37	70,7	78,14	78,09	4178	78,04	4178	77,93
1110	11,19	70,6	70,73	70,8	70,53	76,14	999,6	70,34	70,7	78,12	78,06	4178	78,03	4178	77,91
1120	11,19	70,6	70,77	70,8	70,53	76,17	999,6	70,35	70,72	78,15	78,12	4178,1	78,06	4178,1	77,96
1130	11,19	70,61	70,75	70,8	70,38	76,14	1249,5	70,35	70,73	78,14	78,08	4178,1	78,03	4178,1	77,93
1140	11,19	70,59	70,74	70,8	70,26	76,15	1249,6	70,37	70,72	78,14	78,09	4178,2	78,04	4178,2	77,93
1150	11,2	70,59	70,76	70,8	70,14	76,16	1499,5	70,36	70,7	78,16	78,1	4178,2	78,05	4178,2	77,95
1160	11,2	70,57	70,75	70,79	70,03	76,16	1499,6	70,36	70,72	78,14	78,09	4178,3	78,06	4178,3	77,95
1170	11,2	70,52	70,76	70,8	69,93	76,11	1499,5	70,36	70,7	78,15	78,12	4178,3	78,04	4178,3	77,96
1180	11,2	70,55	70,77	70,8	69,85	76,14	1749,6	70,39	70,73	78,17	78,13	4178,3	78,07	4178,3	77,99
1190	11,2	70,51	70,77	70,78	69,73	76,1	1749,6	70,37	70,73	78,16	78,12	4178,4	78,05	4178,4	77,98
1200	11,2	70,46	70,78	70,78	69,46	76,09	31,6	70,37	70,72	78,17	78,13	4178,4	78,07	4178,4	77,98
1210	11,21	70,25	4178,4	70,86	69,28	76,07	70,19	70,38	70,69	78,16	78,1	4178,4	78,08	4178,4	77,97
1220	11,21	70,28	50,01	70,8	69,25	76,07	70,49	70,37	70,71	78,18	78,14	4178,5	78,08	4178,5	77,99
1230	11,21	70,32	71,59	70,8	69,2	76,07	70,52	70,39	70,73	78,19	78,16	4178,5	78,08	4178,5	77,99
1240	11,21	70,24	31,42	70,79	69,14	76,03	70,52	70,35	70,71	78,16	78,11	4178,5	78,07	4178,5	77,98
1250	11,21	70,21	73,81	70,79	69,04	76,07	70,55	70,36	70,71	78,18	78,13	4178,6	78,1	4178,6	78
1260	11,21	70,19	73,74	70,83	68,94	76,05	70,55	70,41	70,75	78,19	78,15	4178,7	78,11	4178,7	77,99
1270	11,22	70,1	75,41	70,8	68,95	76,02	70,52	70,37	70,73	78,18	78,14	4178,7	78,08	4178,7	78
1280	11,22	70,07	81,89	70,81	68,87	76,02	70,54	70,38	70,73	78,19	78,15	4178,7	78,1	4178,7	77,99
1290	11,22	70,04	79,05	70,83	68,73	76,01	70,55	70,38	70,75	78,21	78,13	4178,8	78,11	4178,8	78,03
1300	11,22	70	74,61	70,82	68,62	76	70,53	70,39	70,72	78,21	78,16	4178,8	78,13	4178,8	78,02
1310	11,22	69,85	74,66	70,82	68,57	75,98	70,53	70,37	70,71	78,21	78,17	4178,8	78,1	4178,8	78,02
1320	11,22	69,86	74,18	70,8	67,91	76	70,52	70,37	70,73	78,22	78,16	4178,9	78,12	4178,9	78,04
1330	11,23	69,85	73,97	70,78	67,69	75,98	70,47	70,36	70,72	78,21	78,18	4178,9	78,11	4178,9	78,02
1340	11,23	69,66	73,77	70,81	67,78	75,99	70,52	70,36	70,72	78,24	78,2	4179	78,13	4179	78,04
1350	11,23	69,66	73,56	70,84	67,99	75,94	70,52	70,39	70,74	78,23	78,17	4179	78,13	4179	78,02
1360	11,23	69,63	73,43	70,82	67,73	75,91	70,51	70,36	70,71	78,2	78,17	4179	78,12	4179	78,02
1370	11,23	69,69	73,55	70,83	67,05	75,9	70,54	70,38	70,74	78,23	78,2	4179,1	78,14	4179,1	78,04

1380	11,23	69,94	73,41	70,84	67,21	75,92	70,54	70,36	70,74	78,24	78,19	4179,1	78,16	4179,1	78,05
1390	11,24	69,87	73,31	70,84	67,48	75,99	70,54	70,36	70,73	78,24	78,19	4179,2	78,15	4179,2	78,05
1400	11,24	69,83	73,32	70,84	67,74	76,1	70,51	70,36	70,72	78,26	78,2	4179,2	78,16	4179,2	78,04
1410	11,24	69,76	73,28	70,81	68,02	76,08	70,5	70,33	70,71	78,22	78,19	4179,2	78,14	4179,2	78,05
1420	11,24	69,74	73,32	70,82	68,24	76,08	70,5	70,35	70,71	78,25	78,19	4179,3	78,16	4179,3	78,05
1430	11,24	69,72	73,33	70,85	68,45	76,06	70,53	70,35	70,73	78,25	78,22	4179,3	78,16	4179,3	78,05
1440	11,24	69,71	75,11	70,81	68,47	76,02	70,51	70,33	70,72	78,24	78,18	4179,4	78,16	4179,4	78,04
1450	11,24	69,73	73,71	70,87	68,59	76,01	70,49	70,37	70,73	78,25	78,21	4179,4	78,19	4179,4	78,06
1460	11,25	69,72	73,63	70,84	68,77	76	70,52	70,34	70,73	78,27	78,21	4179,5	78,19	4179,5	78,05
1470	11,25	69,77	4179,5	70,82	68,84	75,98	70,46	70,35	70,73	78,28	78,25	4179,5	78,17	4179,5	78,09
1480	11,25	70,05	70,75	70,8	68,96	75,99	70,56	70,34	70,72	78,27	78,22	4179,5	78,16	4179,5	78,08
1490	11,25	70,15	70,79	70,82	69,03	75,95	70,5	70,33	70,7	78,26	78,22	4179,6	78,17	4179,6	78,06
1500	11,25	69,97	4179,7	70,85	69,15	75,98	70,51	70,36	70,78	78,27	78,23	4179,7	78,21	4179,7	78,08
1510	11,25	69,9	73,59	70,81	69,18	75,97	70,48	70,35	70,71	78,27	78,23	4179,7	78,17	4179,7	78,08
1520	11,26	69,81	4179,7	70,8	69,25	75,97	70,58	70,35	70,74	78,31	78,26	4179,7	78,19	4179,7	78,11
1530	11,26	69,87	4179,8	70,82	69,32	75,95	70,47	70,33	70,71	78,28	78,24	4179,8	78,21	4179,8	78,1
1540	11,26	69,94	4179,8	70,83	69,35	75,96	70,47	70,35	70,72	78,29	78,25	4179,8	78,21	4179,8	78,1
1550	11,26	69,93	4179,8	70,81	69,48	75,96	70,46	70,34	70,71	78,26	78,23	4179,8	78,2	4179,8	78,08
1560	11,26	69,99	4179,9	70,83	69,68	76	70,47	70,34	70,72	78,29	78,23	4179,9	78,22	4179,9	78,1
1570	11,26	69,82	4179,9	70,81	69,82	76,03	70,47	70,35	70,72	78,29	78,25	4179,9	78,22	4179,9	78,11
1580	11,27	70,01	4180	70,81	69,85	76,06	70,45	70,36	70,71	78,32	78,27	4180	78,21	4180	78,14
1590	11,27	70,09	4180	70,83	70,03	76,05	70,47	70,36	70,71	78,31	78,28	4180	78,23	4180	78,13
1600	11,27	70,1	4180	70,8	70,14	76,06	70,46	70,35	70,7	78,31	78,27	4180	78,2	4180	78,12
1610	11,27	70,16	4180,1	70,81	70,09	76,07	70,46	70,35	70,7	78,3	78,27	4180,1	78,23	4180,1	78,1
1620	11,27	70,21	4180,1	70,8	70,09	76,1	70,46	70,36	70,71	78,31	78,29	4180,1	78,24	4180,1	78,14
1630	11,27	70,24	4180,2	70,82	70,32	76,09	70,46	70,36	70,73	78,3	78,28	4180,2	78,23	4180,2	78,15
1640	11,28	70,28	4180,2	70,81	70,3	76,09	70,46	70,38	70,72	78,29	78,27	4180,2	78,24	4180,2	78,11
1650	11,28	70,27	4180,2	70,79	70,45	76,11	70,45	70,37	70,71	78,31	78,26	4180,2	78,24	4180,2	78,12
1660	11,28	70,31	4180,3	70,81	70,44	76,13	70,48	70,38	70,71	78,31	78,26	4180,3	78,25	4180,3	78,13
1670	11,28	70,35	4180,3	70,79	70,39	76,13	70,46	70,37	70,72	78,31	78,28	4180,3	78,24	4180,3	78,14
1680	11,28	70,37	4180,4	70,82	70,55	76,17	70,48	70,4	70,72	78,34	78,3	4180,4	78,25	4180,4	78,14
1690	11,28	70,42	4180,4	70,81	70,62	76,19	70,47	70,38	70,73	78,32	78,28	4180,4	78,26	4180,4	78,16
1700	11,29	70,41	4180,4	70,78	70,63	76,16	70,46	70,37	70,69	78,31	78,28	4180,4	78,24	4180,4	78,15
1710	11,29	70,49	4180,5	70,81	70,85	76,21	70,46	70,4	70,73	78,31	78,29	4180,5	78,27	4180,5	78,17
1720	11,29	70,53	4180,5	70,8	70,67	76,2	70,48	70,4	70,71	78,35	78,29	4180,5	78,25	4180,5	78,18

1730	11,29	70,52	4180,5	70,79	70,55	76,2	70,45	70,39	70,7	78,33	78,3	4180,5	78,25	4180,5	78,16
1740	11,29	70,57	4180,6	70,83	70,66	76,25	70,48	70,41	70,75	78,33	78,3	4180,6	78,3	4180,6	78,2
1750	11,29	70,56	4180,6	70,81	70,48	76,23	70,47	70,41	70,72	78,33	78,3	4180,6	78,27	4180,6	78,16
1760	11,3	70,57	4180,6	70,81	70,5	76,22	70,47	70,42	70,73	78,36	78,33	4180,6	78,28	4180,6	78,19
1770	11,3	70,57	4180,7	70,8	70,44	76,22	70,48	70,41	70,72	78,36	78,32	4180,7	78,26	4180,7	78,2
1780	11,3	70,55	4180,7	70,81	70,37	76,25	70,48	70,41	70,72	78,34	78,32	4180,7	78,28	4180,7	78,19
1790	11,3	70,55	4180,8	70,81	70,24	76,25	70,49	70,41	70,73	78,37	78,35	4180,8	78,27	4180,8	78,2
1800	11,3	70,53	32,08	70,74	70,07	76,24	70,6	70,38	70,68	78,34	78,31	4180,8	78,31	4180,8	78,18
1810	11,3	70,51	32,02	70,82	69,93	76,24	70,52	70,4	70,71	78,37	78,36	4180,8	78,29	4180,8	78,2
1820	11,31	70,47	74,97	70,82	69,82	76,26	70,5	70,4	70,71	78,35	78,33	4180,9	78,32	4180,9	78,19
1830	11,31	70,44	74,97	70,81	69,77	76,25	70,5	70,4	70,71	78,36	78,34	4180,9	78,28	4180,9	78,21
1840	11,31	70,42	149,8	70,81	69,47	76,25	70,5	70,42	70,73	78,36	78,29	4180,9	78,29	4180,9	78,18
1850	11,31	70,39	149,8	70,81	69,43	76,24	70,51	70,41	70,72	78,37	78,33	4181	78,31	4181	78,2
1860	11,31	70,37	299,8	70,83	69,44	76,23	70,54	70,44	70,75	78,36	78,36	4181,1	78,34	4181,1	78,21
1870	11,31	70,3	299,8	70,83	69,25	76,21	70,51	70,41	70,71	78,39	78,35	4181	78,29	4181	78,21
1880	11,31	70,24	499,8	70,8	69,06	76,2	70,5	70,41	70,73	78,37	78,36	4181,1	78,3	4181,1	78,21
1890	11,32	70,23	499,8	70,8	69,14	76,2	70,52	70,41	70,74	78,39	78,37	4181,1	78,31	4181,1	78,22
1900	11,32	70,17	749,6	70,82	69,01	76,23	70,52	70,42	70,75	78,36	78,34	4181,2	78,31	4181,2	78,22
1910	11,32	70,12	749,7	70,85	68,98	76,25	70,54	70,44	70,73	78,4	78,39	4181,2	78,34	4181,2	78,24
1920	11,32	70,08	999,7	70,85	68,92	76,23	70,51	70,41	70,7	78,35	78,33	4181,2	78,31	4181,2	78,21
1930	11,32	70,06	999,8	70,84	68,65	76,25	70,54	70,42	70,74	78,4	78,38	4181,3	78,34	4181,3	78,25
1940	11,32	69,98	999,8	70,83	68,33	76,24	70,51	70,4	70,71	78,36	78,33	4181,3	78,32	4181,3	78,23
1950	11,33	69,93	1249,7	70,84	68,46	76,23	70,53	70,41	70,74	78,4	78,39	4181,4	78,33	4181,4	78,24
1960	11,33	69,87	1249,6	70,84	68,56	76,25	70,51	70,4	70,71	78,38	78,33	4181,4	78,34	4181,4	78,22
1970	11,33	69,84	1499,6	70,86	68,24	76,26	70,54	70,42	70,75	78,43	78,4	4181,5	78,35	4181,5	78,27
1980	11,33	69,77	1499,7	70,85	67,61	76,26	70,54	70,42	70,74	78,42	78,38	4181,5	78,35	4181,5	78,26
1990	11,33	69,7	1749,7	70,85	67,77	76,23	70,53	70,39	70,72	78,43	78,37	4181,5	78,32	4181,5	78,24
2000	11,33	69,67	1749,7	70,87	68,06	76,24	70,52	70,39	70,71	78,42	78,41	4181,6	78,36	4181,6	78,26
2010	11,34	69,64	4181,6	71,06	67,4	76,27	70,72	70,51	70,86	78,42	78,38	4181,6	78,34	4181,6	78,28
2020	11,34	69,33	70,74	4181,6	67,44	76,24	70,59	70,39	70,91	78,42	78,39	4181,6	78,34	4181,6	78,25
2030	11,34	69,69	70,79	1749,5	66,96	76,22	70,54	70,38	70,72	78,43	78,42	4181,7	78,37	4181,7	78,26
2040	11,34	69,43	70,78	31,38	66,49	76,22	70,52	70,36	70,71	78,43	78,41	4181,7	78,37	4181,7	78,28
2050	11,34	69,42	70,78	31,37	66,39	76,22	70,53	70,36	70,71	78,43	78,42	4181,7	78,36	4181,7	78,27
2060	11,34	69,29	70,76	74,44	66,68	76,24	70,52	70,35	70,72	78,39	78,36	4181,7	78,36	4181,7	78,24
2070	11,35	69,31	70,78	74,43	67,21	76,22	70,53	70,36	70,7	78,43	78,42	4181,8	78,37	4181,8	78,28

2080	11,35	69,34	70,76	149,4	67,75	76,23	70,54	70,37	70,71	78,43	78,4	4181,8	78,37	4181,8	78,28
2090	11,35	69,31	70,77	149,4	68,03	76,23	70,53	70,36	70,7	78,41	78,39	4181,9	78,39	4181,9	78,26
2100	11,35	69,4	70,79	299,4	68,14	76,25	70,55	70,39	70,73	78,43	78,41	4182	78,41	4182	78,29
2110	11,35	69,39	70,73	299,4	68,2	76,19	70,52	70,34	70,69	78,43	78,42	4181,9	78,35	4181,9	78,27
2120	11,35	69,43	70,76	499,5	68,38	76,21	70,51	70,35	70,71	78,46	78,42	4182	78,39	4182	78,28
2130	11,36	69,48	70,77	499,5	68,53	76,21	70,54	70,35	70,73	78,47	78,44	4182	78,41	4182	78,31
2140	11,36	69,47	70,76	749,4	68,65	76,19	70,51	70,36	70,72	78,46	78,44	4182	78,38	4182	78,3
2150	11,36	69,53	70,75	749,4	68,72	76,2	70,51	70,35	70,71	78,43	78,43	4182,1	78,39	4182,1	78,28
2160	11,36	69,61	70,78	999,5	68,8	76,2	70,52	70,37	70,73	78,46	78,42	4182,2	78,41	4182,2	78,31
2170	11,36	69,59	70,74	999,5	68,89	76,18	70,5	70,35	70,72	78,45	78,42	4182,2	78,41	4182,2	78,31
2180	11,36	69,67	70,77	1249,5	69,03	76,18	70,49	70,36	70,7	78,45	78,44	4182,2	78,41	4182,2	78,28
2190	11,37	69,69	70,76	1249,5	69,15	76,22	70,5	70,37	70,7	78,44	78,42	4182,2	78,43	4182,2	78,3
2200	11,37	69,74	70,74	1499,4	69,16	76,17	70,49	70,35	70,7	78,47	78,45	4182,2	78,38	4182,2	78,31
2210	11,37	69,73	70,75	1499,4	69,4	76,18	70,5	70,36	70,71	78,47	78,44	4182,3	78,42	4182,3	78,32
2220	11,37	69,81	70,75	1749,5	69,38	76,2	70,47	70,38	70,71	78,49	78,44	4182,4	78,44	4182,4	78,32
2230	11,37	69,83	70,76	1749,6	69,47	76,19	70,48	70,37	70,71	78,49	78,47	4182,4	78,44	4182,4	78,32
2240	11,37	69,8	70,75	4182,4	69,61	76,2	70,46	70,39	70,69	78,45	78,42	4182,4	78,42	4182,4	78,3
2250	11,38	69,88	70,72	4182,4	69,64	76,21	70,43	70,7	70,68	78,48	78,46	4182,4	78,42	4182,4	78,34
2260	11,38	69,91	70,58	70,83	69,71	76,2	70,66	4182,5	70,91	78,5	78,47	4182,5	78,43	4182,5	78,34
2270	11,38	69,92	70,76	70,83	69,83	76,24	70,46	31,41	70,69	78,48	78,47	4182,5	78,41	4182,5	78,32
2280	11,38	70,04	70,74	70,84	69,79	76,25	70,47	31,42	70,72	78,48	78,44	4182,5	78,43	4182,5	78,34
2290	11,38	70,05	70,74	70,85	69,92	76,25	70,47	74,46	70,71	78,49	78,44	4182,6	78,45	4182,6	78,32
2300	11,38	70,08	70,73	70,84	69,91	76,25	70,46	74,46	70,71	78,49	78,47	4182,6	78,46	4182,6	78,34
2310	11,38	70,13	70,73	70,86	70,09	76,28	70,46	149,4	70,72	78,5	78,46	4182,6	78,47	4182,6	78,35
2320	11,39	70,13	70,71	70,82	69,88	76,26	70,42	149,4	70,68	78,46	78,44	4182,6	78,46	4182,6	78,32
2330	11,39	70,17	70,75	70,84	69,94	76,31	70,46	299,5	70,7	78,48	78,47	4182,7	78,46	4182,7	78,35
2340	11,39	70,2	70,74	70,82	70,04	76,29	70,43	299,4	70,7	78,49	78,49	4182,7	78,45	4182,7	78,36
2350	11,39	70,26	70,74	70,84	70,33	76,3	70,46	499,5	70,72	78,52	78,5	4182,8	78,45	4182,8	78,36
2360	11,39	70,25	70,73	70,82	70,61	76,3	70,44	499,5	70,7	78,5	78,49	4182,8	78,43	4182,8	78,37
2370	11,39	70,3	70,75	70,84	70,59	76,33	70,46	749,4	70,7	78,51	78,5	4182,8	78,45	4182,8	78,34
2380	11,4	70,35	70,74	70,81	70,74	76,32	70,44	749,4	70,7	78,49	78,46	4182,8	78,48	4182,8	78,37
2390	11,4	70,35	70,73	70,81	70,67	76,33	70,42	999,5	70,69	78,47	78,44	4182,8	78,43	4182,8	78,33
2400	11,4	70,39	70,74	70,81	70,67	76,33	70,44	999,5	70,69	78,49	78,49	4182,9	78,45	4182,9	78,35
2410	11,4	70,42	70,72	70,84	70,67	76,36	70,44	1249,5	70,69	78,49	78,45	4182,9	78,47	4182,9	78,36
2420	11,4	70,46	70,75	70,82	70,67	76,36	70,45	1249,5	70,71	78,51	78,5	4183	78,48	4183	78,38

2430	11,4	70,46	70,75	70,82	70,51	76,35	70,45	1499,4	70,71	78,51	78,51	4183	78,46	4183	78,39
2440	11,41	70,46	70,76	70,83	70,44	76,34	70,46	1499,5	70,73	78,53	78,51	4183	78,48	4183	78,38
2450	11,41	70,44	70,74	70,85	70,34	76,37	70,46	1734,3	70,71	78,53	78,52	4183,1	78,48	4183,1	78,42
2460	11,41	70,45	70,73	70,82	70,18	76,39	70,45	1749,6	70,73	78,51	78,49	4183,1	78,47	4183,1	78,39
2470	11,41	70,28	70,74	70,68	70,03	76,37	70,43	4183,1	70,6	78,51	78,46	4183,1	78,48	4183,1	78,35
2480	11,41	70,42	70,74	70,81	69,87	76,38	70,45	4183,1	70,58	78,52	78,54	4183,1	78,48	4183,1	78,39
2490	11,41	70,54	70,75	71,1	69,74	76,39	70,47	69,93	4183,2	78,51	78,48	4183,2	78,5	4183,2	78,38
2500	11,42	70,32	70,76	70,85	69,67	76,39	70,5	70,4	31,43	78,53	78,52	4183,2	78,53	4183,2	78,39
2510	11,42	70,34	70,75	70,85	69,42	76,36	70,48	70,38	31,43	78,54	78,53	4183,2	78,5	4183,2	78,42
2520	11,42	70,28	70,77	70,87	69,34	76,37	70,47	70,38	31,49	78,52	78,48	4183,3	78,52	4183,3	78,37
2530	11,42	70,25	70,74	70,85	69,36	76,36	70,48	70,39	74,45	78,53	78,53	4183,3	78,5	4183,3	78,4
2540	11,42	70,24	70,76	70,85	69,25	76,32	70,49	70,4	74,44	78,53	78,53	4183,3	78,53	4183,3	78,39
2550	11,42	70,19	70,76	70,83	69,19	76,28	70,48	70,39	149,4	78,54	78,52	4183,3	78,5	4183,3	78,39
2560	11,43	70,15	70,78	70,86	68,89	76,26	70,48	70,4	149,4	78,57	78,55	4183,4	78,5	4183,4	78,42
2570	11,43	70,1	70,75	70,84	68,92	76,24	70,49	70,4	299,4	78,54	78,55	4183,4	78,5	4183,4	78,42
2580	11,43	70,02	70,74	70,87	68,64	76,23	70,49	70,4	299,5	78,55	78,54	4183,4	78,52	4183,4	78,41
2590	11,43	69,97	70,77	70,84	68,4	76,24	70,49	70,4	499,5	78,54	78,52	4183,5	78,49	4183,5	78,41
2600	11,43	69,95	70,75	70,84	68,4	76,26	70,49	70,4	499,5	78,55	78,53	4183,5	78,5	4183,5	78,43
2610	11,43	69,92	70,77	70,88	68,55	76,28	70,51	70,44	749,4	78,54	78,51	4183,5	78,51	4183,5	78,41
2620	11,44	69,82	70,77	70,85	68,45	76,28	70,51	70,41	749,4	78,53	78,51	4183,6	78,49	4183,6	78,42
2630	11,44	69,78	70,76	70,86	68,34	76,27	70,49	70,4	999,5	78,52	78,49	4183,6	78,51	4183,6	78,39
2640	11,44	69,75	70,77	70,86	67,61	76,29	70,53	70,44	999,6	78,58	78,56	4183,6	78,51	4183,6	78,42
2650	11,44	69,7	70,78	70,88	67,54	76,3	70,53	70,41	1249,5	78,56	78,55	4183,7	78,53	4183,7	78,43
2660	11,44	69,66	70,78	70,87	67,65	76,33	70,53	70,41	1249,6	78,57	78,54	4183,7	78,51	4183,7	78,45
2670	11,44	69,59	70,76	70,88	67,76	76,3	70,5	70,39	1499,5	78,55	78,52	4183,7	78,51	4183,7	78,38
2680	11,45	69,52	70,77	70,87	67,89	76,3	70,52	70,38	1499,5	78,53	78,51	4183,8	78,5	4183,8	78,39
2690	11,45	69,46	70,76	70,86	67,71	76,31	70,53	70,38	1749,6	78,56	78,54	4183,8	78,49	4183,8	78,42
2700	11,45	69,43	70,74	70,84	67,79	76,18	70,52	70,4	1749,5	78,54	78,5	4183,8	78,49	4183,8	78,39
2710	11,45	69,47	70,75	70,87	67,51	76,2	70,53	70,27	4183,9	78,54	78,53	4183,9	78,51	4183,9	78,38
2720	11,45	69,38	70,76	71,14	67,38	76,04	70,54	70,4	70,63	78,54	78,51	4183,9	78,52	4183,9	78,39
2730	11,45	69,31	70,75	70,87	67,53	75,75	70,49	70,36	70,71	78,55	78,52	4183,9	78,49	4183,9	78,39
2740	11,46	69,3	70,75	70,85	67,83	75,57	70,51	70,39	70,7	78,55	78,52	4184	78,5	4184	78,41
2750	11,46	87,78	70,73	70,85	67,99	76,53	70,51	70,36	70,68	78,55	78,5	4184	78,51	4184	78,39
2760	11,46	104,2	70,73	70,86	68,15	80,39	70,48	70,35	70,69	78,53	78,52	4184	78,49	4184	78,41
2770	11,46	119,5	70,74	70,88	68,29	82,67	70,48	70,35	70,68	78,55	78,51	4184	78,47	4184	78,37

2780	11,46	125,4	70,73	70,83	68,33	83,69	70,49	70,36	70,68	78,57	78,54	4184,1	78,48	4184,1	78,4
2790	11,46	133,9	70,78	70,87	68,45	84,48	70,51	70,39	70,69	78,59	78,56	4184,2	78,49	4184,2	78,43
2800	11,46	145,7	70,78	70,9	68,49	86,51	70,54	70,42	70,7	78,56	78,53	4184,2	78,52	4184,2	78,41
2810	11,47	160,3	70,84	70,92	68,64	89,1	70,59	70,48	70,69	78,58	78,53	4184,2	78,49	4184,2	78,42
2820	11,47	176	70,87	70,94	68,69	92,2	70,61	70,5	70,69	78,56	78,54	4184,3	78,49	4184,3	78,4
2830	11,47	193,3	70,96	70,97	69,06	95,88	70,68	70,58	70,68	78,56	78,53	4184,3	78,49	4184,3	78,4
2840	11,47	217,6	71,09	71,02	69,18	101	70,78	70,66	70,67	78,56	78,51	4184,3	78,49	4184,3	78,41
2850	11,47	232,6	71,25	71,1	69,35	105	70,91	70,77	70,69	78,59	78,55	4184,4	78,48	4184,4	78,42
2860	11,47	251,3	71,4	71,25	69,63	109,3	71,11	70,92	70,7	78,6	78,56	4184,4	78,5	4184,4	78,43
2870	11,48	264,8	71,62	71,39	69,84	113,4	71,3	71,12	70,68	78,57	78,52	4184,4	78,51	4184,4	78,41
2880	11,48	282,8	71,87	71,56	70,22	117,6	71,61	71,41	70,67	78,55	78,51	4184,5	78,49	4184,5	78,4
2890	11,48	306,3	72,16	71,76	70,56	123,1	71,9	71,72	70,67	78,57	78,48	4184,5	78,51	4184,5	78,36
2900	11,48	333,3	72,5	72,02	70,79	129,5	72,32	72,1	70,67	78,57	78,53	4184,5	78,47	4184,5	78,41
2910	11,48	367,1	72,88	72,37	71,02	137,8	72,82	72,55	70,69	78,45	78,58	4184,6	78,5	4184,6	78,44
2920	11,48	398,7	73,29	72,75	71,36	146,6	73,43	73,02	70,7	78,58	78,52	4184,6	78,5	4184,6	78,22
2930	11,49	424,1	73,68	73,15	71,67	153,8	74,13	73,52	70,71	78,57	78,49	4184,6	78,51	4184,6	78,4
2940	11,49	450,5	74,15	73,6	71,92	161,3	74,94	74,08	70,74	78,65	78,52	4184,7	78,47	4184,7	78,41
2950	11,49	471,5	74,62	74,07	72,14	169	75,8	74,65	70,76	78,62	78,52	4184,7	78,49	4184,7	78,42
2960	11,49	491,8	75,14	74,56	72,22	176,4	76,7	75,23	70,78	78,53	78,52	4184,7	78,5	4184,7	78,4
2970	11,49	517,1	75,69	75,07	72,14	183,9	77,64	75,84	70,82	78,61	78,6	4184,8	78,53	4184,8	4184,8
2980	11,49	531,2	76,23	75,64	72,74	192,9	78,65	76,45	70,84	78,58	78,55	4184,8	78,47	4184,8	31,68
2990	11,5	538,9	76,88	76,3	73,25	197,3	79,85	77,15	70,92	78,62	78,55	4184,8	78,5	4184,8	31,67
3000	11,5	546,3	77,53	76,94	73,22	203,1	81,17	77,85	70,97	78,56	78,51	4184,9	78,45	4184,9	31,65
3010	11,5	554	78,2	77,55	74,04	209,3	82,55	78,6	71,05	78,61	78,58	4184,9	78,51	4184,9	74,74
3020	11,5	566,5	78,94	78,22	74,37	214,9	84,06	79,42	71,14	78,64	78,54	4185	78,51	4185	74,74
3030	11,5	574,2	79,66	78,81	75,09	220,4	85,55	80,23	71,2	78,64	78,55	4185	78,5	4185	149,7
3040	11,5	577,6	80,44	79,49	75,39	225,6	87,1	81,12	71,32	78,65	78,59	4185	78,5	4185	149,7
3050	11,51	586,5	81,23	80,2	76,02	230,1	88,7	82,04	71,42	78,63	78,57	4185	78,48	4185	299,7
3060	11,51	594,8	82,06	80,92	75,99	235,7	90,4	83,01	71,55	78,62	78,55	4185,1	78,51	4185,1	299,7
3070	11,51	597,1	82,89	81,71	76,57	240,5	92,26	84,01	71,7	78,64	78,6	4185,1	78,51	4185,1	499,8
3080	11,51	602	83,76	82,56	76,55	244,5	94,1	85,07	71,87	78,65	78,58	4185,1	78,5	4185,1	499,8
3090	11,51	596,7	84,64	83,45	76,71	248,9	95,95	86,17	72,03	78,64	78,56	4185,2	78,5	4185,2	749,7
3100	11,51	594,1	85,53	84,39	77,13	250,8	97,74	87,32	72,24	78,64	78,57	4185,2	78,51	4185,2	749,7
3110	11,52	590,6	86,44	85,35	77	252,9	99,59	88,5	72,44	78,68	78,57	4185,2	78,51	4185,2	999,8
3120	11,52	593,7	87,37	86,3	77,13	256,5	101,5	89,68	72,66	78,65	78,57	4185,2	78,49	4185,2	999,8

3130	11,52	602,3	88,34	87,33	77,17	259,7	103,6	90,97	72,92	78,65	78,56	4185,3	78,52	4185,3	1249,8
3140	11,52	609	89,34	88,34	77,63	262,6	105,6	92,27	73,19	78,66	78,61	4185,3	78,51	4185,3	1249,8
3150	11,52	612,6	90,38	89,4	77,77	266,9	107,8	93,63	73,48	78,66	78,6	4185,4	78,51	4185,4	1499,7
3160	11,52	614,6	91,42	90,48	77,91	269,3	110	95,01	73,78	78,64	78,6	4185,4	78,5	4185,4	1499,7
3170	11,53	615,7	92,52	91,61	78,08	271,9	112,5	96,43	74,11	78,65	78,61	4185,5	78,51	4185,5	1749,9
3180	11,53	619,7	93,68	92,75	77,95	274,7	115	97,89	74,47	78,66	78,58	4185,5	78,51	4185,5	1749,8
3190	11,53	613	94,84	93,9	78,19	276,9	117,7	99,38	74,83	78,65	78,73	4185,5	78,24	4185,5	4185,5
3200	11,53	604,8	96,06	95,06	78,38	276,9	120,3	100,9	75,22	78,7	78,58	4185,5	78,42	4185,5	78,21
3210	11,53	598,6	97,3	96,25	78,46	278,8	123,1	102,4	75,64	78,69	78,64	4185,6	78,53	4185,6	78,52
3220	11,53	588,7	98,59	97,5	77,86	279,8	125,9	104	76,08	78,63	78,59	4185,6	78,5	4185,6	78,44
3230	11,53	584,9	99,99	98,77	77,51	280,8	128,8	105,7	76,6	4185,6	79,92	4185,6	78,22	4185,6	78,37
3240	11,54	552,6	101,4	100,1	76,85	278,8	131,8	107,3	77,1	31,85	78,61	4185,7	78,53	4185,7	78,45
3250	11,54	495,4	103,3	101,8	76,39	269,9	135,8	109,4	77,85	31,78	78,59	4185,7	78,53	4185,7	78,46
3260	11,54	460,9	104,7	103,1	75,89	263,3	138,7	111	78,41	74,76	78,59	4185,7	78,51	4185,7	78,44
3270	11,54	434,2	106,2	104,5	75,83	258,4	141,7	112,5	79,05	74,79	78,61	4185,8	78,54	4185,8	78,47
3280	11,54	417,4	107,7	105,9	75,89	254	144,6	114,1	79,69	149,7	78,62	4185,8	78,54	4185,8	78,49
3290	11,54	415,3	109,2	107,2	75,76	252,2	147,7	115,7	80,37	149,7	78,6	4185,8	78,53	4185,8	78,48
3300	11,55	437,8	110,7	108,6	75,11	245,7	150,6	117,4	81,07	299,8	78,62	4185,9	78,54	4185,9	78,48
3310	11,55	454,7	112,3	109,9	74,57	232,1	153,5	119,2	81,78	299,8	78,63	4185,9	78,55	4185,9	78,47
3320	11,55	465,6	113,8	111,2	74,45	223	156,4	121,1	82,57	499,8	78,65	4185,9	78,54	4185,9	78,47
3330	11,55	476,4	115,4	112,5	74,38	216,5	159,2	122,9	83,35	499,8	78,63	4185,9	78,53	4185,9	78,46
3340	11,55	487,5	117	113,8	73,04	212	162	124,8	84,21	749,2	78,63	4186	78,55	4186	78,49
3350	11,55	499,1	118,5	115,2	73,55	207,8	164,7	126,6	85,06	749,7	78,65	4186	78,57	4186	78,48
3360	11,56	511,8	120,1	116,4	73,79	204,6	167,4	128,4	85,94	749,7	78,66	4186	78,55	4186	78,5
3370	11,56	522,5	121,7	117,7	74,03	202,1	170	130,1	86,86	999,8	78,66	4186,1	78,57	4186,1	78,5
3380	11,56	533,2	123,3	118,9	73,89	199,7	172,6	131,8	87,81	999,8	78,67	4186,1	78,55	4186,1	78,5
3390	11,56	543,7	124,9	120,1	73,87	197,4	175,2	133,4	88,81	1249,8	78,69	4186,2	78,58	4186,2	78,51
3400	11,56	553,8	126,5	121,3	73,55	195,7	177,8	135	89,8	1249,8	78,64	4186,2	78,54	4186,2	78,49
3410	11,56	564,5	128	122,4	73,58	194,2	180,5	136,5	90,86	1499,7	78,68	4186,2	78,59	4186,2	78,51
3420	11,57	574,6	129,6	123,6	73,42	192,9	183,1	137,9	91,87	1499,7	78,69	4186,2	78,58	4186,2	78,49
3430	11,57	586,8	131,2	124,7	73,12	191,3	185,8	139,3	92,96	1749,8	78,68	4186,3	78,57	4186,3	78,52
3440	11,57	594,2	132,8	125,8	72,92	190,3	188,6	140,7	94,05	1749,8	78,67	4186,3	78,58	4186,3	78,52
3450	11,57	599,3	134,4	126,9	70,87	189,8	191,4	142	95,19	1749,8	78,7	4186,3	78,56	4186,3	78,52
3460	11,57	605,3	136	128	72,1	188,5	194,2	143,2	96,32	4186,4	78,7	4186,4	78,61	4186,4	78,49
3470	11,57	609,7	137,7	129	72,65	187,7	197,1	144,4	97,5	4186,4	78,73	4186,4	78,63	4186,4	78,55

3480	11,58	615,6	139,4	130	72,71	186,8	200,1	145,5	98,67	4186,4	78,71	4186,4	78,59	4186,4	78,51
3490	11,58	619,5	141,1	131,1	72,79	185,8	203,2	146,6	99,86	4186,4	78,72	4186,4	78,61	4186,4	78,53
3500	11,58	625	142,7	132,1	72,66	185,2	206,3	147,6	101,1	4186,5	78,74	4186,5	78,62	4186,5	78,54
3510	11,58	628,7	144,3	133,1	72,5	184,6	209,5	148,6	102,3	4186,5	78,72	4186,5	78,6	4186,5	78,53
3520	11,58	633,1	145,7	134,1	72,26	183,7	212,7	149,6	103,5	4186,5	78,71	4186,5	78,59	4186,5	78,53
3530	11,58	635,3	147,2	135,1	72,29	183,1	216,1	150,5	104,7	4186,5	78,71	4186,5	78,6	4186,5	78,54
3540	11,59	636,4	148,6	136,1	72,05	182,4	219,5	151,4	106	4186,6	78,73	4186,6	78,63	4186,6	78,54
3550	11,59	636	150,1	137,1	72,35	182	222,9	152,2	107,2	4186,6	78,75	4186,6	78,65	4186,6	78,56
3560	11,59	635,2	151,5	138,1	72,34	181,7	226,4	153	108,5	4186,6	78,74	4186,6	78,62	4186,6	78,56
3570	11,59	635,5	152,9	139,1	71,96	180,8	229,9	153,8	109,7	4186,7	78,76	4186,7	78,64	4186,7	78,57
3580	11,59	634,4	154,4	140,1	71,91	179,3	233,5	154,6	111	4186,7	78,71	31,97	78,63	4186,7	78,56
3590	11,59	635,6	155,8	141,1	71,97	179	237	155,4	112,2	4186,7	78,73	31,69	78,63	4186,7	78,55
3600	12	638,4	157,2	142,1	72	178,7	240,6	156,2	113,5	4186,8	78,74	74,89	78,65	4186,8	78,56
3610	12	640,7	158,7	143,2	72,07	179	244,2	157	114,8	4186,8	78,76	74,77	78,64	4186,8	78,54
3620	12	643,2	160,1	144,2	71,8	179,2	247,8	157,9	116	4186,8	78,76	149,9	78,66	4186,8	78,57
3630	12	645,4	161,6	145,2	71,79	179	251,4	158,7	117,3	4186,8	78,73	149,8	78,62	4186,8	78,54
3640	12	647,6	163	146,3	71,61	178,7	254,9	159,5	118,6	4186,9	78,77	299,9	78,65	4186,9	78,57
3650	12	652,5	164,4	147,4	71,86	178,8	258,5	160,3	119,9	4186,9	78,73	299,8	78,64	4186,9	78,54
3660	12	661,1	165,9	148,5	71,84	179,5	262	161,2	121,2	4186,9	78,77	499,9	78,64	4186,9	78,56
3670	12,01	667,5	167,4	149,6	71,88	180,2	265,6	162	122,4	4186,9	78,74	499,9	78,65	4186,9	78,56
3680	12,01	671,5	168,8	150,7	71,89	180,7	269,1	162,9	123,7	4187	78,75	749,8	78,65	4187	78,55
3690	12,01	677,6	170,3	151,8	72,08	181,2	272,7	163,8	125	4187	78,74	749,7	78,64	4187	78,56
3700	12,01	679,2	171,9	152,9	72,18	181,3	276,3	164,7	126,3	4187	78,76	999,8	78,67	4187	78,58
3710	12,01	680,2	173,4	154,1	71,9	181	279,7	165,5	127,6	4187	78,74	999,8	78,64	4187	78,56
3720	12,01	681,4	174,9	155,2	71,86	181	283,2	166,4	128,9	4187,1	78,76	1250	78,65	4187,1	78,57
3730	12,02	682,5	176,4	156,4	71,8	181,4	286,6	167,3	130,2	4187,1	78,78	1249,8	78,66	4187,1	78,57
3740	12,02	684,9	177,9	157,5	72	181,4	290	168,2	131,5	4187,1	78,79	1499,8	78,67	4187,1	78,59
3750	12,02	687,7	179,4	158,7	72,11	181,8	293,5	169	132,7	4187,1	78,76	1499,7	78,64	4187,1	78,57
3760	12,02	690,2	180,9	159,9	71,9	181,5	296,8	170	134	4187,2	78,79	1749,8	78,66	4187,2	78,59
3770	12,02	691,5	182,4	161,1	71,57	181,8	300,2	170,9	135,3	4187,2	78,79	1749,9	78,66	4187,2	78,58
3780	12,02	691,1	183,9	162,3	71,16	181,4	303,6	171,8	136,6	4187,2	78,8	4187,2	78,66	4187,2	78,59
3790	12,03	688,2	185,3	163,6	71,79	180,8	307	172,7	137,9	4187,2	78,77	4187,2	78,66	4187,2	78,59
3800	12,03	686,1	186,7	164,8	71,38	180,5	310,4	173,7	139,3	4187,3	78,79	4187,3	78,67	31,75	78,6
3810	12,03	684,5	188,1	166,1	71,72	180,4	313,7	174,7	140,6	4187,3	78,79	4187,3	78,67	31,84	78,59
3820	12,03	683,4	189,5	167,3	71,84	180,5	317	175,7	141,8	4187,3	78,77	4187,3	78,65	74,75	78,58

3830	12,03	685	191	168,7	71,91	180,4	320,3	176,8	143,1	4187,3	78,77	4187,3	78,67	74,75	78,59
3840	12,03	683,4	192,4	170	71,93	180,4	323,5	177,8	144,4	4187,3	78,78	4187,3	78,67	74,74	78,6
3850	12,04	682,7	193,7	171,3	71,76	180,6	326,8	178,9	145,7	4187,4	78,78	4187,4	78,66	149,8	78,61
3860	12,04	683,8	195,1	172,7	71,73	180,6	330	179,9	147	4187,4	78,77	4187,4	78,68	149,7	78,6
3870	12,04	686,4	196,4	174,1	71,66	180,6	333,1	181	148,4	4187,4	78,79	4187,4	78,69	299,8	78,6
3880	12,04	686,7	197,7	175,5	71,45	180,4	336,3	182,1	149,7	4187,5	78,79	4187,5	78,68	299,8	78,61
3890	12,04	688,8	199	176,9	71,55	181,2	339,4	183,2	151	4187,5	78,81	4187,5	78,69	499,8	78,62
3900	12,04	690	200,4	178,4	71,41	181,1	342,6	184,3	152,3	4187,5	78,8	4187,5	78,68	499,8	78,63
3910	12,05	691,2	201,7	179,9	71,56	181,1	345,6	185,3	153,6	4187,5	78,79	4187,5	78,7	749,7	78,61
3920	12,05	691,7	203,1	181,4	71,26	181,6	348,6	186,5	154,8	4187,6	78,81	4187,6	78,69	749,7	78,62
3930	12,05	693,1	204,5	182,9	71,74	182,1	351,6	187,6	156	4187,6	78,79	4187,6	78,68	999,8	78,6
3940	12,05	697,5	206,2	184,5	71,89	182,3	354,5	188,7	157,3	4187,6	78,79	4187,6	78,69	999,8	78,61
3950	12,05	699,5	208	186	71,89	182,3	357,4	189,8	158,6	4187,6	78,77	4187,6	78,69	1249,7	78,6
3960	12,05	700,3	209,9	187,6	71,94	182,6	360,4	191	159,9	4187,6	78,79	4187,6	78,7	1249,7	78,62
3970	12,06	701,3	211,9	189,2	72,12	182,2	363,2	192,2	161,2	4187,7	78,78	4187,7	78,68	1499,6	78,61
3980	12,06	701,8	213,8	190,7	71,91	182,5	366,1	193,3	162,4	4187,6	78,77	4187,6	78,66	1499,7	78,59
3990	12,06	704,7	215,8	192,3	72,31	182,9	368,9	194,5	163,7	4187,7	78,83	4187,7	78,71	1749,7	78,62
4000	12,06	705,7	217,8	194	72,45	183,2	371,7	195,6	165	4187,7	78,79	4187,7	78,69	1749,7	78,63
4010	12,06	706,4	219,8	195,6	72,48	183,8	374,5	196,8	166,2	4187,8	78,8	4187,8	78,7	4187,8	78,63
4020	12,06	706,7	221,7	197,3	72,25	184	377,1	198	167,5	4187,8	78,81	4187,8	78,75	4187,8	78,63
4030	12,07	705,3	223,6	198,9	72,23	184,1	379,8	199,1	168,7	78,85	78,83	4187,8	78,58	4187,8	78,47
4040	12,07	703,2	225,6	200,6	72,28	183,9	382,4	200,3	170	78,93	78,77	4187,8	78,7	4187,8	78,61
4050	12,07	700	227,5	202,3	72,42	183,7	385	201,5	171,3	78,87	78,81	4187,8	78,71	4187,8	78,62
4060	12,07	700,1	229,4	204	72,5	182,8	387,6	202,7	172,5	78,91	78,77	4187,8	78,67	4187,8	78,62
4070	12,07	698,5	231,3	205,7	72,47	182,4	390,1	203,8	173,7	78,9	78,87	4187,9	78,72	4187,9	78,63
4080	12,07	697	233,2	207,5	72,29	182,6	392,7	205	175	78,87	78,8	4187,9	78,73	4187,9	78,65
4090	12,07	694,7	235,1	209,2	72,43	182,9	395,2	206,2	176,2	78,85	31,73	4187,9	78,71	4187,9	78,62
4100	12,08	693,2	237	210,9	72,62	182,8	397,6	207,4	177,5	78,86	31,7	4187,9	78,73	4187,9	78,64
4110	12,08	693,4	238,9	212,6	72,51	182,3	400,1	208,6	178,8	78,94	74,73	4187,9	78,72	4187,9	78,62
4120	12,08	692,3	240,8	214,3	72,71	182,1	402,5	209,8	180,1	78,89	74,73	4188	78,72	4188	78,62
4130	12,08	692,6	242,7	216,1	72,36	182,6	404,8	211	181,4	78,89	149,7	4188	78,73	4188	78,63
4140	12,08	692,1	244,6	217,8	72,59	182,5	407,2	212,2	182,7	78,93	149,7	4188	78,72	4188	78,62
4150	12,08	691,8	246,5	219,5	72,75	182,3	409,5	213,3	184	78,94	299,7	4188	78,72	4188	78,65
4160	12,09	692	248,4	221,3	72,88	182,4	411,8	214,6	185,3	78,95	299,6	4188	78,72	4188	78,65
4170	12,09	692	250,2	223	72,5	182,1	414,1	215,8	186,6	78,95	499,6	4188,1	78,72	4188,1	78,64

4180	12,09	691,5	252,2	224,7	72,49	182	416,3	216,9	187,9	78,97	499,7	4188,1	78,73	4188,1	78,67
4190	12,09	690,9	254	226,4	72,73	181,7	418,4	218,1	189,2	78,89	749,5	4188,1	78,73	4188,1	78,65
4200	12,09	690,3	255,8	228,2	72,7	181,9	420,4	219,3	190,4	78,88	749,6	4188,1	78,73	4188,1	78,63
4210	12,09	690,9	257,7	229,9	72,96	181,4	422,4	220,5	191,8	78,87	756,4	4188,2	78,73	4188,2	78,65
4220	12,1	690,5	259,5	231,6	72,92	181,3	424,4	221,7	193,1	78,95	999,7	4188,1	78,74	4188,1	78,64
4230	12,1	691,4	261,4	233,3	72,62	181,5	426,5	222,9	194,4	78,91	999,7	4188,2	78,73	4188,2	78,66
4240	12,1	692,2	263,2	235,1	72,73	181,6	428,5	224,1	195,7	78,93	1249,6	4188,2	78,74	4188,2	78,66
4250	12,1	691,7	265	236,8	72,75	181,4	430,4	225,3	197,1	78,92	1249,6	4188,2	78,74	4188,2	78,65
4260	12,1	692,6	266,8	238,5	72,91	181	432,4	226,5	198,4	78,99	1499,6	4188,3	78,75	4188,3	78,69
4270	12,1	692,3	268,7	240,2	73,08	181,4	434,3	227,7	199,7	78,98	1499,4	4188,3	78,73	4188,3	78,68
4280	12,11	692,6	270,4	241,8	72,83	181,7	436,1	228,9	201	78,91	1749,6	4188,3	78,75	4188,3	78,67
4290	12,11	694,2	272,2	243,5	72,89	181,8	437,8	230,1	202,4	78,97	1749,7	4188,3	78,76	4188,3	78,68
4300	12,11	692,6	274	245,1	72,9	182,4	439,6	231,3	203,7	78,88	78,83	4188,3	77,55	4188,3	78,61
4310	12,11	692,1	275,8	246,8	72,65	181,8	441,2	232,5	205	78,98	78,87	4188,3	31,6	4188,3	78,68
4320	12,11	691,8	277,5	248,5	72,62	182,4	442,8	233,7	206,3	78,95	78,85	4188,3	31,59	4188,3	78,68
4330	12,11	692	279,3	250,2	72,93	182,3	444,3	234,9	207,7	78,93	78,85	4188,4	31,47	4188,4	78,69
4340	12,12	691,8	281,1	251,8	72,73	182	446	236,1	209	78,93	78,83	4188,4	74,6	4188,4	78,66
4350	12,12	692	282,8	253,4	73,01	182,2	447,6	237,3	210,4	78,97	78,87	4188,4	74,57	4188,4	78,69
4360	12,12	692,5	284,5	255,1	73,11	182,3	449,2	238,4	211,7	78,95	78,85	4188,4	149,5	4188,4	78,68
4370	12,12	692,8	286,2	256,7	73,08	182	450,7	239,6	213,1	78,94	78,83	4188,4	149,5	4188,4	78,7
4380	12,12	694,6	287,9	258,3	73	182,1	452,1	240,8	214,4	78,93	78,85	4188,4	299,5	4188,4	78,67
4390	12,12	694,5	289,6	259,9	73,18	182,5	453,7	241,9	215,8	78,97	78,85	4188,4	299,6	4188,4	78,68
4400	12,13	695,1	291,3	261,6	73,35	182,6	455,1	243,1	217,2	78,94	78,9	4188,5	499,6	4188,5	78,7
4410	12,13	694,7	293	263,2	73,15	182,2	456,6	244,2	218,5	78,98	78,89	4188,5	499,6	4188,5	78,72
4420	12,13	695,5	294,7	264,8	73,18	181,8	457,9	245,4	219,9	78,98	78,85	4188,5	749,4	4188,5	78,68
4430	12,13	696,9	296,3	266,4	73,56	182,4	459,2	246,5	221,2	78,94	78,87	4188,5	749,4	4188,5	78,69
4440	12,13	696,5	298	268	73,7	181,7	460,6	247,7	222,6	78,97	78,86	4188,5	999,6	4188,5	78,71
4450	12,13	696,2	299,7	269,7	73,55	182,1	462,1	248,8	224	78,93	78,83	4188,5	999,6	4188,5	78,69
4460	12,14	696,9	301,3	271,2	73,58	182,1	463,4	249,9	225,5	78,95	78,85	4188,5	1249,5	4188,5	78,69
4470	12,14	697,3	303	272,8	73,51	181,8	464,7	251,1	226,9	78,93	78,87	4188,6	1249,5	4188,6	78,71
4480	12,14	697,5	304,6	274,4	73,5	181,7	465,9	252,2	228,2	78,96	78,85	4188,6	1249,5	4188,6	78,69
4490	12,14	696,5	306,3	276	73,79	182,1	467,1	253,4	229,6	78,94	78,88	4188,6	1499,4	4188,6	78,7
4500	12,14	696,9	307,8	277,6	73,83	181,7	468,4	254,5	231	78,94	78,85	4188,6	1499,4	4188,6	78,69
4510	12,14	697,9	309,5	279,2	73,92	181,8	469,7	255,7	232,5	79,03	78,85	4188,7	1749,4	4188,7	78,72
4520	12,14	697,8	311,1	280,7	74,03	181,7	470,9	256,9	233,9	78,92	78,84	4188,7	1749,4	4188,7	78,69

4530	12,15	699,5	312,7	282,3	73,48	181,7	472,2	258	235,2	78,95	78,86	4188,7	78,69	4188,7	78,67

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T1 (Flue) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,01	%	
R.M.U.	0,14	%	
O.M.U	**1,74**	**%**	
	Ave A.D.	0,86	%
Standard	Reading	A.D.	
70,0	69,40	0,86	
70,0	69,40	0,86	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,81**	**%**	
	Ave A.D.	0,40	%
Standard	Reading	A.D.	
150,0	149,40	0,40	
150,0	149,40	0,40	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,47**	**%**	
	Ave A.D.	0,23	%
Standard	Reading	A.D.	
300,0	299,30	0,23	
300,0	299,30	0,23	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,24**	**%**	
	Ave A.D.	0,12	%
Standard	Reading	A.D.	
500,0	499,40	0,12	
500,0	499,40	0,12	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,16**	**%**	
	Ave A.D.	0,08	%
Standard	Reading	A.D.	
750,0	749,40	0,08	
750,0	749,40	0,08	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,09**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
1250,0	1249,40	0,05	
1250,0	1249,50	0,04	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T2 (ambiant) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,71**	**%**	
	Ave A.D.	0,33	%
Standard	Reading	A.D.	
75,0	74,72	0,37	
75,0	74,79	0,28	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,49**	**%**	
	Ave A.D.	0,23	%
Standard	Reading	A.D.	
150,0	149,60	0,27	
150,0	149,70	0,20	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,24**	**%**	
	Ave A.D.	0,12	%
Standard	Reading	A.D.	
300,0	299,70	0,10	
300,0	299,60	0,13	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,06**	**%**	
	Ave A.D.	0,02	%
Standard	Reading	A.D.	
500,0	499,90	0,02	
500,0	499,90	0,02	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,14**	**%**	
	Ave A.D.	0,07	%
Standard	Reading	A.D.	
750,0	749,50	0,07	
750,0	749,50	0,07	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,07**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
1250,0	1249,40	0,05	
1250,0	1249,70	0,02	

Vincent Pelletier

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T3 (Dilution tunnel) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,72**	**%**	
	Ave A.D.	0,33	%
Standard	Reading	A.D.	
75,0	74,74	0,35	
75,0	74,76	0,32	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,49**	**%**	
	Ave A.D.	0,23	%
Standard	Reading	A.D.	
150,0	149,60	0,27	
150,0	149,70	0,20	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,21**	**%**	
	Ave A.D.	0,10	%
Standard	Reading	A.D.	
300,0	299,70	0,10	
300,0	299,70	0,10	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,09**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
500,0	499,80	0,04	
500,0	499,80	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,08**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
750,0	749,70	0,04	
750,0	749,70	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,02**	**%**	
	Ave A.D.	0,01	%
Standard	Reading	A.D.	
1250,0	1249,90	0,01	
1250,0	1249,90	0,01	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T4 (Firebox top) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,01	%	
R.M.U.	0,13	%	
O.M.U	**1,35**	**%**	
	Ave A.D.	0,66	%
Standard	Reading	A.D.	
75,0	74,50	0,67	
75,0	74,51	0,65	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,68**	**%**	
	Ave A.D.	0,33	%
Standard	Reading	A.D.	
150,0	149,50	0,33	
150,0	149,50	0,33	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,34**	**%**	
	Ave A.D.	0,17	%
Standard	Reading	A.D.	
300,0	299,50	0,17	
300,0	299,50	0,17	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,16**	**%**	
	Ave A.D.	0,08	%
Standard	Reading	A.D.	
500,0	499,60	0,08	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,14**	**%**	
	Ave A.D.	0,07	%
Standard	Reading	A.D.	
750,0	749,50	0,07	
750,0	749,50	0,07	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,07**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
1250,0	1249,50	0,04	
1250,0	1249,60	0,03	

Vincent Pelletier

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T5 (Firebox back) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,28**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
75,0	74,97	0,04	
75,0	74,97	0,04	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,30**	**%**	
	Ave A.D.	0,13	%
Standard	Reading	A.D.	
150,0	149,80	0,13	
150,0	149,80	0,13	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,15**	**%**	
	Ave A.D.	0,07	%
Standard	Reading	A.D.	
300,0	299,80	0,07	
300,0	299,80	0,07	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,09**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
500,0	499,80	0,04	
500,0	499,80	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,10**	**%**	
	Ave A.D.	0,05	%
Standard	Reading	A.D.	
750,0	749,60	0,05	
750,0	749,70	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,06**	**%**	
	Ave A.D.	0,03	%
Standard	Reading	A.D.	
1250,0	1249,70	0,02	
1250,0	1249,60	0,03	

Vincent Pelletier

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T6 (Firebox right) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,01	%	
R.M.U.	0,13	%	
O.M.U	**1,53**	**%**	
	Ave A.D.	0,75	%
Standard	Reading	A.D.	
75,0	74,44	0,75	
75,0	74,43	0,76	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,81**	**%**	
	Ave A.D.	0,40	%
Standard	Reading	A.D.	
150,0	149,40	0,40	
150,0	149,40	0,40	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,41**	**%**	
	Ave A.D.	0,20	%
Standard	Reading	A.D.	
300,0	299,40	0,20	
300,0	299,40	0,20	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,20**	**%**	
	Ave A.D.	0,10	%
Standard	Reading	A.D.	
500,0	499,50	0,10	
500,0	499,50	0,10	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,16**	**%**	
	Ave A.D.	0,08	%
Standard	Reading	A.D.	
750,0	749,40	0,08	
750,0	749,40	0,08	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,08**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
1250,0	1249,50	0,04	
1250,0	1249,50	0,04	

Vincent Pelletier

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T7 (Firebox left) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,01	%	
R.M.U.	0,13	%	
O.M.U	**1,46**	**%**	
	Ave A.D.	0,72	%
Standard	Reading	A.D.	
75,0	74,46	0,72	
75,0	74,46	0,72	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,81**	**%**	
	Ave A.D.	0,40	%
Standard	Reading	A.D.	
150,0	149,40	0,40	
150,0	149,40	0,40	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,37**	**%**	
	Ave A.D.	0,18	%
Standard	Reading	A.D.	
300,0	299,50	0,17	
300,0	299,40	0,20	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,20**	**%**	
	Ave A.D.	0,10	%
Standard	Reading	A.D.	
500,0	499,50	0,10	
500,0	499,50	0,10	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,16**	**%**	
	Ave A.D.	0,08	%
Standard	Reading	A.D.	
750,0	749,40	0,08	
750,0	749,40	0,08	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,08**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
1250,0	1249,50	0,04	
1250,0	1249,50	0,04	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T3 (Dilution tunnel) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,01	%	
R.M.U.	0,13	%	
O.M.U	**1,50**	**%**	
	Ave A.D.	0,74	%
Standard	Reading	A.D.	
75,0	74,45	0,73	
75,0	74,44	0,75	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,81**	**%**	
	Ave A.D.	0,40	%
Standard	Reading	A.D.	
150,0	149,40	0,40	
150,0	149,40	0,40	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,37**	**%**	
	Ave A.D.	0,18	%
Standard	Reading	A.D.	
300,0	299,40	0,20	
300,0	299,50	0,17	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,20**	**%**	
	Ave A.D.	0,10	%
Standard	Reading	A.D.	
500,0	499,50	0,10	
500,0	499,50	0,10	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,16**	**%**	
	Ave A.D.	0,08	%
Standard	Reading	A.D.	
750,0	749,40	0,08	
750,0	749,40	0,08	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,07**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
1250,0	1249,50	0,04	
1250,0	1249,60	0,03	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T9 (DGM inlet 1) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,66**	**%**	
	Ave A.D.	0,30	%
Standard	Reading	A.D.	
75,0	74,76	0,32	
75,0	74,79	0,28	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,42**	**%**	
	Ave A.D.	0,20	%
Standard	Reading	A.D.	
150,0	149,70	0,20	
150,0	149,70	0,20	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,15**	**%**	
	Ave A.D.	0,07	%
Standard	Reading	A.D.	
300,0	299,80	0,07	
300,0	299,80	0,07	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,09**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
500,0	499,80	0,04	
500,0	499,80	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,08**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
750,0	749,70	0,04	
750,0	749,70	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,04**	**%**	
	Ave A.D.	0,02	%
Standard	Reading	A.D.	
1250,0	1249,80	0,02	
1250,0	1249,80	0,02	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T10 (DGM outlet 1) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,77**	**%**	
	Ave A.D.	0,36	%
Standard	Reading	A.D.	
75,0	74,73	0,36	
75,0	74,73	0,36	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,42**	**%**	
	Ave A.D.	0,20	%
Standard	Reading	A.D.	
150,0	149,70	0,20	
150,0	149,70	0,20	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,24**	**%**	
	Ave A.D.	0,12	%
Standard	Reading	A.D.	
300,0	299,70	0,10	
300,0	299,60	0,13	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,15**	**%**	
	Ave A.D.	0,07	%
Standard	Reading	A.D.	
500,0	499,60	0,08	
500,0	499,70	0,06	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,12**	**%**	
	Ave A.D.	0,06	%
Standard	Reading	A.D.	
750,0	749,50	0,07	
750,0	749,60	0,05	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,07**	**%**	
	Ave A.D.	0,03	%
Standard	Reading	A.D.	
1250,0	1249,60	0,03	
1250,0	1249,60	0,03	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T11 (Probe temperature 1) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,53**	**%**	
	Ave A.D.	0,23	%
Standard	Reading	A.D.	
75,0	74,89	0,15	
75,0	74,77	0,31	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,24**	**%**	
	Ave A.D.	0,10	%
Standard	Reading	A.D.	
150,0	149,90	0,07	
150,0	149,80	0,13	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,12**	**%**	
	Ave A.D.	0,05	%
Standard	Reading	A.D.	
300,0	299,90	0,03	
300,0	299,80	0,07	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,06**	**%**	
	Ave A.D.	0,02	%
Standard	Reading	A.D.	
500,0	499,90	0,02	
500,0	499,90	0,02	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,07**	**%**	
	Ave A.D.	0,03	%
Standard	Reading	A.D.	
750,0	749,80	0,03	
750,0	749,70	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,02**	**%**	
	Ave A.D.	0,01	%
Standard	Reading	A.D.	
1250,0	1250,00	0,00	
1250,0	1249,80	0,02	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T12 (DGM inlet 2) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,74**	**%**	
	Ave A.D.	0,35	%
Standard	Reading	A.D.	
75,0	74,74	0,35	
75,0	74,74	0,35	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,42**	**%**	
	Ave A.D.	0,20	%
Standard	Reading	A.D.	
150,0	149,70	0,20	
150,0	149,70	0,20	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,21**	**%**	
	Ave A.D.	0,10	%
Standard	Reading	A.D.	
300,0	299,70	0,10	
300,0	299,70	0,10	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,09**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
500,0	499,80	0,04	
500,0	499,80	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,08**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
750,0	749,70	0,04	
750,0	749,70	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,04**	**%**	
	Ave A.D.	0,02	%
Standard	Reading	A.D.	
1250,0	1249,80	0,02	
1250,0	1249,80	0,02	

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T13 (DGM outlet 2) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,01	%	
R.M.U.	0,13	%	
O.M.U	**1,14**	**%**	
	Ave A.D.	0,55	%
Standard	Reading	A.D.	
75,0	74,60	0,53	
75,0	74,57	0,57	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,68**	**%**	
	Ave A.D.	0,33	%
Standard	Reading	A.D.	
150,0	149,50	0,33	
150,0	149,50	0,33	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,31**	**%**	
	Ave A.D.	0,15	%
Standard	Reading	A.D.	
300,0	299,50	0,17	
300,0	299,60	0,13	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,16**	**%**	
	Ave A.D.	0,08	%
Standard	Reading	A.D.	
500,0	499,60	0,08	
500,0	499,60	0,08	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,16**	**%**	
	Ave A.D.	0,08	%
Standard	Reading	A.D.	
750,0	749,40	0,08	
750,0	749,40	0,08	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,08**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
1250,0	1249,50	0,04	
1250,0	1249,50	0,04	

Vincent Pelletier

Vincent Pelletier

Date: 2013-06-20

Equipment: SBI-199 & SBI-200
T14 (Probe temperature 2) Temperature: 72 F
Accuracy: 0,1 R.H.: 54%
Reference: SBI-096

S.D.	0,00	%	
R.M.U.	0,13	%	
O.M.U	**0,72**	**%**	
	Ave A.D.	0,33	%
Standard	Reading	A.D.	
75,0	74,75	0,33	
75,0	74,75	0,33	

S.D.	0,00	%	
R.M.U.	0,07	%	
O.M.U	**0,36**	**%**	
	Ave A.D.	0,17	%
Standard	Reading	A.D.	
150,0	149,80	0,13	
150,0	149,70	0,20	

S.D.	0,00	%	
R.M.U.	0,03	%	
O.M.U	**0,15**	**%**	
	Ave A.D.	0,07	%
Standard	Reading	A.D.	
300,0	299,80	0,07	
300,0	299,80	0,07	

S.D.	0,00	%	
R.M.U.	0,02	%	
O.M.U	**0,09**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
500,0	499,80	0,04	
500,0	499,80	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,08**	**%**	
	Ave A.D.	0,04	%
Standard	Reading	A.D.	
750,0	749,70	0,04	
750,0	749,70	0,04	

S.D.	0,00	%	
R.M.U.	0,01	%	
O.M.U	**0,05**	**%**	
	Ave A.D.	0,02	%
Standard	Reading	A.D.	
1250,0	1249,70	0,02	
1250,0	1249,70	0,02	

Vincent Pelletier

Date: 2013-06-20

Nitrogen

	Calibration gas	Results
CO	0,00%	0,00%
CO2	0,00%	0,00%
O2	0,00%	0,00%

Ambiant air

	Results
CO	0,00%
CO2	0,00%
O2	21,10%

Carbon Dioxide

	Calibration gas	Results
CO	0,00%	0,28%
CO2	19,80%	19,98%
O2	0,00%	0,00%

Carbon monoxide

	Calibration gas	Results
CO	0,996%	0,98%
CO2	0,00%	0,00%
O2	0,00%	0,00%

Vincent Pelletier

AIR LIQUIDE

CERTIFICAT D'ANALYSE

MONTREAL SPECIALTY GAS PLANT
11201 RAY LAWSON
MONTREAL QC
H1J 1M6

Client: QUEBEC
2230 BOUL. CHAREST O. STE-FOY
QUEBEC QUEBEC
G1N 2G3 CANADA

Date d'analyse: 25/11/2010
Code de produit: SPG-2MX0000729
Qualité: CERTIFIE
Taille: 7
Raccord de sortie du robinet: CGA 350

No de série: C0010195A
No d'ordre de fabrication: 10-SGM-3862
Pression: 10125 kPa (15°C)
1500 psi (21°C)
Volume: 0,739 m3
Date d'expiration: 25/11/2013

COMPOSANTS	CONCENTRATION NOMINALE	RÉSULTAT D'ANALYSE
MONOXYDE DE CARBONE	1 % molaire	0,996 % molaire
AZOTE	BALANCE	BALANCE

Analyse réalisée par: S. Amrani

SAMIA AMRANI B.Sc.

MÉTHODE D'ANALYSE:

La méthode d'analyse est basée sur le principe de la chromatographie en phase gazeuse comme décrit dans les Instructions d'Opérations de Air Liquide Canada. Selon les bescins,on choisi préferentiellement un détecteur FID ou TCD avec une colonne capillaire ou une colonne remplie.

PRÉCISION ANALYTIQUE:

Les spécifications pour les concentrations rapportées sont: +/- 2% pour les constituants en concentration supérieure à 0.5% et +/- 5% pour les constituants en concentration inférieure 0.5%. Sauf indication contraire, la précision d'analyse est indiquée en pourcentage du constituant. Dans certains cas, les valeurs peuvent changer en fonction de la nature, du nombre et de la concentration des constituants du mélange.

www.airliquide.ca

AIR LIQUIDE

CERTIFICAT D'ANALYSE

MONTREAL SPECIALTY GAS PLANT
11201 RAY LAWSON
MONTREAL QC
H1J 1M6

Client: QUEBEC
2230 BOUL. CHAREST O. STE-FOY
QUEBEC QUEBEC
G1N 2G3 CANADA

Date d'analyse: 19/09/2013
Code de produit: SPG-2MX0008101
Qualité: CERTIFIE
Taille: 7AL
Raccord de sortie du robinet: CGA 580

No de série: FF-33551
No d'ordre de fabrication: 13-SGM-3199
Pression: 13500 kPa (15°C)
2000 psi (21°C)
Volume: 1,0 m3
Date d'expiration: 19/09/2016

COMPOSANTS	CONCENTRATION NOMINALE	RÉSULTAT D'ANALYSE
DIOXYDE DE CARBONE	20 % molaire	19,9 % molaire
AZOTE	BALANCE	BALANCE

Analyse réalisée par:

FREDERIC GAGNON B.Sc.

MÉTHODE D'ANALYSE:

La méthode d'analyse est basée sur le principe de la chromatographie en phase gazeuse comme décrit dans les Instructions d'Opérations de Air Liquide Canada. Selon les besoins,on choisi préférentiellement un détecteur FID ou TCD avec une colonne capillaire ou une colonne remplie.

PRÉCISION ANALYTIQUE:

Les spécifications pour les concentrations rapportées sont: +/- 2% pour les constituants en concentration supérieure à 0.5% et +/- 5% pour les constituants en concentration inférieure 0.5%. Sauf indication contraire, la précision d'analyse est indiquée en pourcentage du constituant. Dans certains cas, les valeurs peuvent changer en fonction de la nature, du nombre et de la concentration des constituants du mélange.

C13-SGM-3199-1
24/09/2013

Claude Paré

De: Douglas, Rob [Robert.Douglas@nrc-cnrc.gc.ca]
Envoyé: 26 avril 2011 17:45
À: 'john.voorhees@intertek.com'
Cc: Claude Paré
Objet: NMI standards and ISO 17025 MRA recognition

Dear John Voorhees,

M. Claude Paré, a Lab Technician with Stove Builder International Inc. (250, rue de Copenhague Saint-Augustin-de-Desmaures Québec, Canada, G3A 2H3) has asked me to contact you with documentation for their use, by telephone, of our National Research Council (NRC) talking clock as a reference standard in the calibration of stopwatches for the measurement of (SI) time intervals.

Our NRC talking clock announces the official time for Canada, either as NRC Eastern Daylight Time ≡ UTC(NRC) - 4h, or as NRC Eastern Standard Time ≡ UTC(NRC) - 5h, depending on the season. These are defined identities, and this style of a verbal announcement from a National Institute of Metrology (NMI) has, in my long experience, never before required further documentation in the context of stopwatch calibration for time intervals. The start of the "beep" following each announcement is triggered by the UTC(NRC) signal. The UTC(NRC) signal is internationally compared in the highest level comparison amongst NMIs, primarily by continuous GPS measurements, sampled and verified every 5 days and published each month in the CIPM Key comparison CCTF-K001.UTC: http://kcdb.bipm.org/AppendixB/KCDB_ApB_result.asp?cmp_idy=617&cmp_cod=CCTF-K001.UTC&search=1&cmp_cod_search=&page=1&met_idy=8&bra_idy=0&epo_idy=0&cmt_idy=0&ett_idy_org=0&cou_cod=0 .

UTC(NRC), and time intervals derived from this time scale, are recognized http://kcdb.bipm.org/AppendixC/TF/CA/TF_CA.pdf internationally by the signatories of the CIPM MRA: http://www.bipm.org/en/cipm-mra/participation/signatories.html - in my opinion, this is the very highest and widest level of ISO 17025 recognition, and I must confess to being surprised by M. Paré's request.

I recommend this national standard widely for stopwatch calibration in Canada, for use within the uncertainties revealed by variations in repeated measurements that can quantify the overall variation from all the important sources of uncertainty (delay variations on the telephone network, reaction time variation, and the variation of the chronometer's rate). Thus I would be grateful if you would clarify for me what documentation about this standard you or your assessor believe is appropriate to meet the requirements of an ISO 17025 assessment.

Dr. Rob Douglas

Principal Research Officer : Agent de recherches principal
Frequency and Time : *Fréquence et temps*
Institute for National Measurement Standards : *Institut des etalons nationaux de mesure*
National Research Council Canada : *Conseil national de recherches Canada*
M-36, 1108 : *M-36, 1108*
1200 Montreal Road : *1200 chemin Montréal*
Ottawa, Canada K1A 0R6 : *Ottawa, Canada K1A 0R6*
==========
Tel: (613) 993-5186 : *Tél: (613) 993-5186*
Fax: (613) 952-1394 : *Télécopieur: (613) 952-1394*
rob.douglas@nrc-cnrc.gc.ca : *rob.douglas@nrc-cnrc.gc.ca*
Government of Canada : *Gouvernment du Canada*

Report of Calibration

As Found / As Left

ACCREDITED
CALIBRATION
CERT #2260.01

Procedure (RUN): Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.1.A

UUT

Made by:	Dwyer
Model:	2000-00
Serial No.:	W80111CF89
ID No.:	SBI-024
Description:	Pressure Gauge

Calibration

Report No.:	AC13011280-W80111CF89
Adjusted:	No
Condition:	In Tolerance
Calibration Date:	30-Jan-2013
Calibration Due:	30-Jan-2014

Customer

STOVE BUILDER INTERNATIONAL INC.
250 RUE DE COPENHAGUE
ST-AUSTIN-DE-DESMAURES, QC
G3A 2H3

Environment

Temperature:	23.3°C
Humidity:	38%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2005 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS

Instrument	Model	ID No./Serial No.	Traceability No.	Recall Date
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	1500138932/1500138934	20-Aug-2013

REMARKS:

Calibrated in vertical position.

Performed by: Anthony Morra
Anthony Morra

Reviewed by: Slava Peciurov

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Report of Calibration

As Found / As Left

ACCREDITED
CALIBRATION
CERT #2260.01

Procedure (RUN): Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.1.A

UUT

Made by:	Dwyer
Model:	2000-00
Serial No.:	W80111CF89
ID No.:	SBI-024
Description:	Pressure Gauge

Calibration

Report No.:	AC13011280-W80111CF89
Adjusted:	No
Condition:	In Tolerance
Calibration Date:	30-Jan-2013
Calibration Due:	30-Jan-2014

Test Description	STD	UUT	Error	Tolerance	Units	P/F	Uncertainty
LOW PRESSURE TEST							
0.0000 inH2O	0.0000	0.000	0.00000	±0.0100	inH2O	Pass	5.97e-004
0.0490 inH2O	0.0490	0.050	0.00100	±0.0100	inH2O	Pass	5.97e-004
0.0990 inH2O	0.0990	0.100	0.00100	±0.0100	inH2O	Pass	5.97e-004
0.1490 inH2O	0.1490	0.150	0.00100	±0.0100	inH2O	Pass	5.97e-004
0.1990 inH2O	0.1990	0.200	0.00100	±0.0100	inH2O	Pass	5.97e-004
0.2510 inH2O	0.2510	0.250	-0.00100	±0.0100	inH2O	Pass	5.97e-004
0.1990 inH2O	0.1990	0.200	0.00100	±0.0100	inH2O	Pass	5.97e-004
0.1490 inH2O	0.1490	0.150	0.00100	±0.0100	inH2O	Pass	5.97e-004
0.0970 inH2O	0.0970	0.100	0.00300	±0.0100	inH2O	Pass	5.97e-004
0.0470 inH2O	0.0470	0.050	0.00300	±0.0100	inH2O	Pass	5.97e-004
0.0000 inH2O	0.0000	0.000	0.00000	±0.0100	inH2O	Pass	5.97e-004

END OF REPORT

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Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	90R054300

Previous Calibration Comparision

Date	2013-07-02	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.977	0.04885	0.025
Acceptance	Acceptable		

Average Gas Meter y Factor

1.002

Calibration Date:	10-04-13
Calibrated by:	Claude Paré
Calibration Frequency:	6-month
Next Calibration Due:	04-04-14
Instrument Range:	1.000 cfm
Standard Temp.:	76 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.15 "Hg
Signature/Date:	2013-10-04

Current Calibration

Acceptable y Deviation	0.049
Maximum y Deviation	0.002
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	26-août-13	
	Calib. Value	0.9920	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	994.900	0.900	7.200
Final Reference Meter	1000.100	6.400	12.300
Initial DGM	862.720	868.728	874.906
Final DGM	867.884	874.190	879.954
Temp. Ref. Meter (°F), Tr	74.0	75.0	75.0
Temperature DGM (°F), Td	75.0	76.0	76.0
Time (Minutes)	31.5	22.3	58.8
Net Volume Ref. Meter, Vr	5.200	5.500	5.100
Net Volume DGM, Vd	5.164	5.462	5.048
Gas Meter y Factor =	**1.001**	**1.001**	**1.004**
Gas Meter y Factor Deviation (from avg.)	0.001	0.001	0.002
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.163936508

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	98Z332226

Previous Calibration Comparision

Date	2013-07-02	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.986	0.0493	0.008
Acceptance	Acceptable		

Average Gas Meter y Factor	**0.994**
Calibration Date:	10-04-13
Calibrated by:	Claude Paré
Calibration Frequency:	6-month
Next Calibration Due:	04-04-14
Instrument Range:	1.000 cfm
Standard Temp.:	77 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.09 "Hg
Signature/Date:	2013-10-04

Current Calibration

Acceptable y Deviation	0.049
Maximum y Deviation	0.005
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	26-août-13	
	Calib. Value	0.9920	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	13.300	19.800	30.400
Final Reference Meter	18.800	28.700	36.800
Initial DGM	689.801	696.342	706.856
Final DGM	695.283	705.268	713.244
Temp. Ref. Meter (°F), Tr	76.0	77.0	77.0
Temperature DGM (°F), Td	77.0	77.0	78.0
Time (Minutes)	44.8	28.3	60.5
Net Volume Ref. Meter, Vr	5.500	8.900	6.400
Net Volume DGM, Vd	5.482	8.926	6.388
Gas Meter y Factor =	**0.997**	**0.989**	**0.996**
Gas Meter y Factor Deviation (from avg.)	0.003	0.005	0.002
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.122502793

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

Ulrich Métrologie inc.
Ulrich Metrology Inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

ACCREDITATION ISO 17025 ™
SCC Scope Number 220

CALIBRATION CERTIFICATE

Certificate no.:	349496	**Calibration date:**	January 21, 2013
Identification:	SBI-096	**Certificate issued:**	January 31, 2013
Description:	CALIBRATOR, OMEGA CL23A	**Interval:**	12 months
Size:	TC K/J/T	**Due date:**	January 21, 2014
Manufacturer:	OMEGA	**Procedure no.:**	MET/CAL
Model no.:	CL23A	**Environment:**	CLAS Type 2 Laboratory
Serial no.:	T-256137	**Temperature:**	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	BEN

Property of: SBI
250 RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-08. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.

CALIBRATION STANDARDS

See notes below.

MEASUREMENT UNCERTAINTY

The above listed instrument meets or exceeds all specifications as stated in the reference procedure, unless noted otherwise. For measurement results associated with the conformance to a tolerance, the uncertainty in the measurement system did not exceed 25% (4:1 test uncertainty ratio) of the acceptable tolerance for each characteristic calibrated, unless otherwise noted in the report.

CALIBRATION DATA

See next page for measurement results.

Notes:

This certificate replaces certificate 347729. The DATA from 347729 is still valid and unchanged.

EQUIPMENT RECEIVED OUT OF SPECIFICATIONS.

Failed multiple calibrator outputs.

ADJUSTED.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

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166727 P

ULRICH
Ulrich Métrologie inc.
Ulrich Metrology inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CALIBRATION DATA

Certificate no.: 347729
Identification: SBI-096
Description: CALIBRATOR THERMOMETER
Serial no.: T-256137
Procedure: Omega CL23A: 5520A-M

Result: FAIL
Condition: AS-FOUND

CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
7870009	CALIBRATOR	FLUKE	5520A	2012/03/02	2013/03/02

MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
Temperature measurements are performed by electrical simulation.						
DISPLAY CALIBRATION						
Did all segments of the display illuminate?						
Result of Operator Evaluation					PASS	
THERMOMETER CALIBRATION						
K Type Thermocouple						
-200.0degF		-200.7	-201.0	-199.0	PASS	1.7
-60.0degF		-60.4	-61.0	-59.0	PASS	3.1
-40.0degF		-40.4	-40.5	-39.5	PASS	1.5
32.0degF		31.5	31.5	32.5	PASS	1.7
1240.0degF		1239.5	1239.5	1240.5	PASS	1.1
1260.0degF		1259.5	1259.5	1260.5	PASS	1.1
2500.0degF		2499.3	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-200.5	-201.0	-199.0	PASS	2.1
-60.0degF		-60.2	-61.0	-59.0	PASS	3.5
-40.0degF		-40.3	-40.5	-39.5	PASS	1.7
32.0degF		31.6	31.5	32.5	PASS	2.0
1240.0degF		1239.5	1239.5	1240.5	PASS	1.6
1260.0degF		1259.5	1259.5	1260.5	PASS	1.6
1400.0degF		1399.5	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-199.9	-201.0	-199.0	PASS	2.3
-60.0degF		-59.8	-61.0	-59.0	PASS	2.3
-40.0degF		-40.0	-40.5	-39.5	PASS	1.2
32.0degF		32.0	31.5	32.5	PASS	1.7
750.0degF		749.9	749.5	750.5	PASS	2.0
CALIBRATOR CALIBRATION						
K Type Thermocouple						
-200.0degF		-199.2	-201.0	-199.0	PASS	1.7

Ulrich Métrologie inc.
Ulrich Metrology inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
-60.0degF		-59.6	-61.0	-59.0	PASS	3.1
-40.0degF		-39.5	-40.5	-39.5	PASS	1.5
32.0degF		32.3	31.5	32.5	PASS	1.7
1240.0degF		1239.6	1239.5	1240.5	PASS	1.1
1260.0degF		1259.6	1259.5	1260.5	PASS	1.1
2500.0degF		2498.7	2499.0	2501.0	FAIL	1.4
J Type Thermocouple						
-200.0degF		-199.6	-201.0	-199.0	PASS	2.1
-60.0degF		-59.9	-61.0	-59.0	PASS	3.5
-40.0degF		-39.8	-40.5	-39.5	PASS	1.7
32.0degF		32.0	31.5	32.5	PASS	2.0
1240.0degF		1239.6	1239.5	1240.5	PASS	1.6
1260.0degF		1259.6	1259.5	1260.5	PASS	1.6
1400.0degF		1399.3	1399.4	1400.6	FAIL	1.8
T Type Thermocouple						
-200.0degF		-197.5	-201.0	-199.0	FAIL	2.3
-60.0degF		-59.9	-61.0	-59.0	PASS	2.3
-40.0degF		-39.8	-40.5	-39.5	PASS	1.2
32.0degF		31.9	31.5	32.5	PASS	1.7
750.0degF		749.6	749.5	750.5	PASS	2.0

End of Test Data

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Ulrich Métrologie inc.
Ulrich Metrology inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CALIBRATION DATA

Certificate no.: 347729
Identification: SBI-096
Description: CALIBRATOR THERMOMETER
Serial no.: T-256137
Procedure: Omega CL23A: 5520A-M

Result: PASS
Condition: AS-LEFT

CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
7870009	CALIBRATOR	FLUKE	5520A	2012/03/02	2013/03/02

MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
Temperature measurements are performed by electrical simulation.						
DISPLAY CALIBRATION						
Did all segments of the display illuminate?						
Result of Operator Evaluation					PASS	
THERMOMETER CALIBRATION						
K Type Thermocouple						
-200.0degF		-200.3	-201.0	-199.0	PASS	1.7
-60.0degF		-60.1	-61.0	-59.0	PASS	3.1
-40.0degF		-40.1	-40.5	-39.5	PASS	1.5
32.0degF		31.8	31.5	32.5	PASS	1.7
1240.0degF		1239.9	1239.5	1240.5	PASS	1.1
1260.0degF		1259.9	1259.5	1260.5	PASS	1.1
2500.0degF		2500.0	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-200.3	-201.0	-199.0	PASS	2.1
-60.0degF		-60.1	-61.0	-59.0	PASS	3.5
-40.0degF		-40.1	-40.5	-39.5	PASS	1.7
32.0degF		31.9	31.5	32.5	PASS	2.0
1240.0degF		1239.8	1239.5	1240.5	PASS	1.6
1260.0degF		1259.8	1259.5	1260.5	PASS	1.6
1400.0degF		1399.8	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-199.7	-201.0	-199.0	PASS	2.3
-60.0degF		-59.6	-61.0	-59.0	PASS	2.3
-40.0degF		-39.7	-40.5	-39.5	PASS	1.2
32.0degF		32.2	31.5	32.5	PASS	1.7
750.0degF		750.0	749.5	750.5	PASS	2.0
CALIBRATOR CALIBRATION						
K Type Thermocouple						
-200.0degF		-199.6	-201.0	-199.0	PASS	1.7

Ulrich Métrologie inc.
Ulrich Metrology inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
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PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
-60.0degF		-59.8	-61.0	-59.0	PASS	3.1
-40.0degF		-39.8	-40.5	-39.5	PASS	1.5
32.0degF		32.0	31.5	32.5	PASS	1.7
1240.0degF		1240.2	1239.5	1240.5	PASS	1.1
1260.0degF		1260.3	1259.5	1260.5	PASS	1.1
2500.0degF		2500.6	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-200.0	-201.0	-199.0	PASS	2.1
-60.0degF		-60.1	-61.0	-59.0	PASS	3.5
-40.0degF		-40.0	-40.5	-39.5	PASS	1.7
32.0degF		31.9	31.5	32.5	PASS	2.0
1240.0degF		1240.3	1239.5	1240.5	PASS	1.6
1260.0degF		1260.2	1259.5	1260.5	PASS	1.6
1400.0degF		1400.1	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-200.5	-201.0	-199.0	PASS	2.3
-60.0degF		-60.3	-61.0	-59.0	PASS	2.3
-40.0degF		-40.0	-40.5	-39.5	PASS	1.2
32.0degF		31.9	31.5	32.5	PASS	1.7
750.0degF		750.0	749.5	750.5	PASS	2.0

End of Test Data

CERTIFICATE OF NIST TRACEABLE CALIBRATION

Calibration Certificate No: 37492

LABORATORY ACCREDITATION BUREAU ACCREDITED
Certificate # L2115-1 Calibration

ISO 17025-2005 ACCREDITED

Customer Information

Customer: SBI St-Augustin

Address : 250, De Copenhague
Doors 11-12
St-Augustin-de-Desmaures

Customer PO #: 36368

Calibration Procedure Information

Procedure ID: GTP FLOW_INDI Revision #: 7 Revision Date: 1/6/2013

Calibration Standards Information

Graftel ID	Manufacturer	Model #	Description	CAL Due
10074	Meriam	50MJ10-14	Laminar Flowmeter	3/1/2014
10075	Meriam	50MJ10-9	Laminar Flowmeter	6/25/2014
51202	Paroscientific	760-100A	Pressure, 100 Psia	2/22/2014
10062	Graftel	9202	5-Channel Temperature Sensor	8/24/2015
10128	Furness	FCO352	Diff Pressure	8/5/2014
60030	Paroscientific	760-100A	Pressure, 100 psia	2/22/2014
10159	HOBO	U12-011	Environment Monitor System	12/3/2013

Sensor Information

Manufacturer: American Meter
Description: Gas Meter
Method Used: Laminar
Model #: DTM-200A
Rated Accuracy: ± 1 % of Reading
Accuracy Specified By: AmericanMeter
Instrument ID#: SBI-103
Range: 0 to 250 cfh
Condition: Functional
Serial #: 07J264834
Comments: Calibration Date: 08-26-2013

The instruments(s) listed on this certificate have been calibrated against standards traceable to the National Institue of Standards and Technology (NIST) or compared to nationally or internationally recognized consensus standards. The reported calibration uncertainty has a confidence level of 95% (K=2). A calibration uncertainty ratio of 4:1 was maintained unless required uncertainty is supported by analysis. Graftel, LLC. Quality Assurance System complies with applicable requirements of ISO/IEC-17025-2005 and ISO 9001: 2008. All results contained within this certification relate only to item(s) calibrated. This certificate shall not be reproduced except in full and with the written consent of Graftel, LLC. Acceptance Criteria per Simple Acceptance Rule: Measurement Uncertainty is not applied to the measured value when in/out of tolerance statement is made.

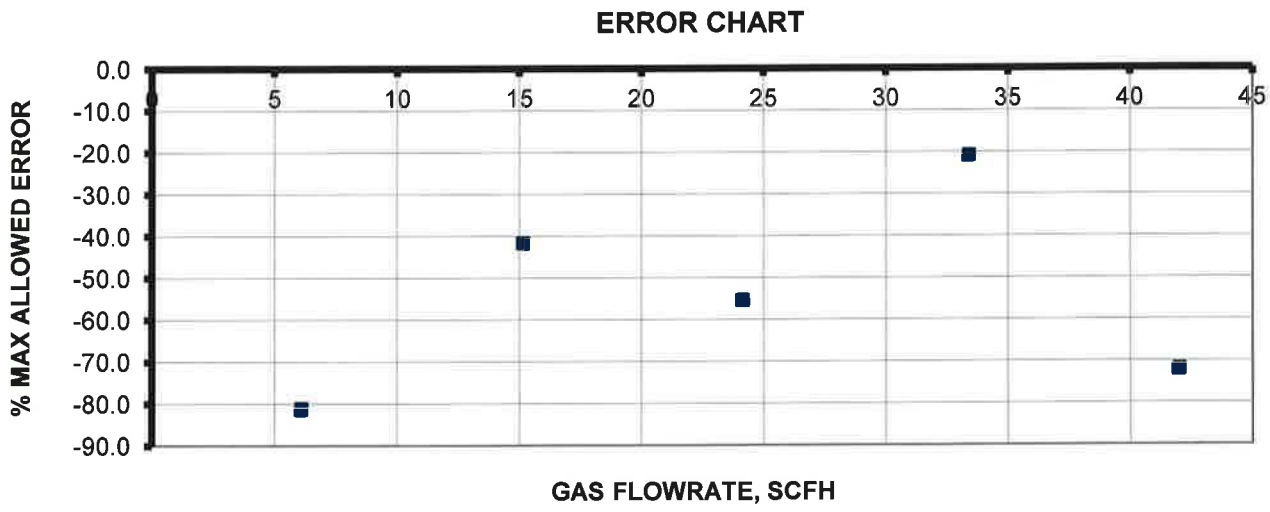
Performed By: L. Chan Date: 08/26/2013

L. Chan
Calibration Technician

GRAFTEL, LLC. 870 Cambridge Drive, Elk Grove Village, IL 60007 847.364.2600
www.graftel.com

ATTACHMENT TO CALIBRATION CERTIFICATE 37492
AS FOUND DATA

Air Flow Rate From Standard, scfh	Air Vol From Standard, scf	Air Vol From Meter, cf	Air vol From Meter, scf	Diff Air Vol STD - METER scf	% Proof	Measurement Uncertainty, scf	STATUS
6.079	0.2866	0.30	0.289	0.00	99.195	0.002	Pass
15.146	0.9610	1.00	0.965	0.00	99.585	0.005	Pass
24.166	0.9620	1.00	0.967	-0.01	99.450	0.005	Pass
33.409	1.9363	2.00	1.940	0.00	99.791	0.010	Pass
42.018	1.9333	2.00	1.947	-0.01	99.285	0.010	Pass



INSTRUMENT SPECIFICATIONS		
Test Gas	Air	
Standard Pressure,Meter	14.73	psia
Standard Temperature,Meter	60	F
Rated Accuracy	1	% Rding
Full Scale Flow Rate	250	scfh Natural Gas @ 1/2 inch WC
LABORATORY AMBIENT CONDITIONS		
Pressure	14.42	psia
Humidity	49.63	% RH
Temperature	69.88	F

Flow - Humidity - Temperature - Pressure - Design - Consulting - Engineering
NIST Traceable Calibration Data Sheet
Graftel, LLC. 870 Cambridge Drive, Elk Grove Village, IL 60007
P. 847-364-2600 F. 847-364-2899
www.graftel.com

Report of Calibration

As Found / As Left

ACCREDITED
CALIBRATION
CERT #2260.01

Procedure (RUN): Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.1.A

UUT

Made by:	Dwyer
Model:	2000-0DC
Serial No.:	W46QJM
ID No.:	SBI-117
Description:	Pressure Gauge

Calibration

Report No.:	AC13011280-W46QJM
Adjusted:	No
Condition:	In Tolerance
Calibration Date:	30-Jan-2013
Calibration Due:	30-Jan-2014

Customer

STOVE BUILDER INTERNATIONAL INC.
250 RUE DE COPENHAGUE
ST-AUSTIN-DE-DESMAURES, QC
G3A 2H3

Environment

Temperature:	23.4°C
Humidity:	38%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2005 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS

Instrument	Model	ID No./Serial No.	Traceability No.	Recall Date
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	1500138932/1500138934	20-Aug-2013

REMARKS:

Calibrated in vertical position.

Performed by: Anthony Morra
Anthony Morra

Reviewed by:
Slava Peciurov

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Report of Calibration

As Found / As Left

ACCREDITED
CALIBRATION
CERT #2260.01

Procedure (RUN): Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.1.A

UUT

Made by: Dwyer
Model: 2000-0DC
Serial No.: W46QJM
ID No.: SBI-117
Description: Pressure Gauge

Calibration

Report No.: AC13011280-W46QJM
Adjusted: No
Condition: In Tolerance
Calibration Date: 30-Jan-2013
Calibration Due: 30-Jan-2014

Test Description	STD	UUT	Error	Tolerance	Units	P/F	Uncertainty
LOW PRESSURE TEST							
0.0000 inH2O	0.0000	0.000	0.00000	±0.0150	inH2O	Pass	5.97e-004
0.1020 inH2O	0.1020	0.100	-0.00200	±0.0150	inH2O	Pass	5.97e-004
0.2040 inH2O	0.2040	0.200	-0.00400	±0.0150	inH2O	Pass	5.97e-004
0.3050 inH2O	0.3050	0.300	-0.00500	±0.0150	inH2O	Pass	5.97e-004
0.3980 inH2O	0.3980	0.400	0.00200	±0.0150	inH2O	Pass	5.97e-004
0.5000 inH2O	0.5000	0.500	0.00000	±0.0150	inH2O	Pass	5.97e-004
0.3960 inH2O	0.3960	0.400	0.00400	±0.0150	inH2O	Pass	5.97e-004
0.2950 inH2O	0.2950	0.300	0.00500	±0.0150	inH2O	Pass	5.97e-004
0.1950 inH2O	0.1950	0.200	0.00500	±0.0150	inH2O	Pass	5.97e-004
0.0950 inH2O	0.0950	0.100	0.00500	±0.0150	inH2O	Pass	5.97e-004
0.0000 inH2O	0.0000	0.000	0.00000	±0.0150	inH2O	Pass	5.97e-004

END OF REPORT

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DIGITAL MEASUREMENT METROLOGY LABORATORY

A division of
DIGITAL MEASUREMENT METROLOGY INC.
26 Automatic Road, Unit 4
Brampton, ON, Canada L6S 5N7
TEL. (905) 790-9400 FAX. (905) 790-9266
Internet: *www.dmm.ca* E-mail: *service@dmm.ca*
L-A-B Accredited Cert# L1048-1 Calibration, Testing & Dim Insp

CALIBRATION CERTIFICATE

Description:	WEIGHT SET	**Calibration Date:**	10/17/2013	**Certificate:**	62610
Asset Number:	SBI-190/191	**Property of:**	SBI ST-AUGUSTIN		
Serial/Model Number:	N / A	**Address:**	250, rue de Copenhague, Doors 10-12		
Manufacturer:	TROEMNER	**City/Prov/PC:**	St-Augustin-de-Desmaures QC G3A 2H3		
Instrument Capacity:	5 kg to 10 kg	**Country:**	Canada		
Procedure:	CP34G	**Method Used:**	COMPARISON		
Room Humidity:	43 % **Room Temp:** 20.2 °C	**Conformance Stds:**	ISO/IEC 17025: 2005		

CALIBRATION DATA

Units: kg

Asset #	Std/Nominal	As Found	As Left	Min	Max	Tolerance In	Tolerance Out	Uncertainty
SBI-190	5	5.0004	5.0004	4.9995	5.0005	✔		± 0.2 g
SBI-191	10	10.0006	10.0006	9.999	10.001	✔		± 0.22 g

Remarks:

Inspected, cleaned and tested using the mfgr's specs and procedures, customer's, national or international standards, or new procedure design. Measurement uncertainty is not considered when deciding compliance to the tolerance or specs. It is up to the user to make a judgment of conformity to the limits shown.

Received Condition:
In tolerance.

CALIBRATION STANDARD(S) USED

Traceable No.	Asset Number	Calibration Date	Date Due
62370	DMML-2356075	01-Oct-13	01-Oct-14
W-023485-14924	DMML-21669	06-Dec-11	06-Dec-13
W-023485-14924	DMML-21701	06-Dec-11	06-Dec-13

Weights are accurate to class F tolerance.

Estimated measurement uncertainty is, at minimum, an accuracy ratio of 4:1, unless otherwise stated.

Reported uncertainties represent a 95 % confidence level assuming a normal distribution, with a coverage factor of k=2.

This calibration was performed in the lab and is traceable to the International System of Units (SI Units) through NIST or NRC. This report is covered by our accreditation.

Calibration of the instrument expires on October 17, 2014

The results shown above relate to the above calibrated instrument/equipment only. Copyright of this Certificate is owned by the issuing laboratory and may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TECHNICIAN Chris Riddle — Christopher Riddle

QUALITY APPROVAL Andrés Galeano — Andres Galeano

END OF REPORT

L-A-B ACCREDITED CERT# L1048-1 CALIBRATION
SEAL OF INSPECTION
INSTRUMENTS INSPECTED IN ACCORDANCE WITH ISO/IEC 17025: 2005

Ulrich Métrologie inc.
Ulrich Metrology Inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

ACCREDITATION ISO 17025 ™

CALIBRATION CERTIFICATE

Certificate no.:	377318	**Calibration date:**	August 21, 2013
Identification:	SBI-213	**Certificate issued:**	August 21, 2013
Description:	THERMO-HYGROMETER, AMPROBE TH-3	**Interval:**	12 months
Manufacturer:	AMPROBE	**Due date:**	August 21, 2014
Model no.:	TH-3	**Procedure no.:**	MET/CAL
Serial no.:	101004044	**Environment:**	CLAS Type 2 Laboratory
		Temperature:	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	NFS

Property of: SBI
250 RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.

CALIBRATION STANDARDS

See notes below.

MEASUREMENT UNCERTAINTY

The above listed instrument meets or exceeds all specifications as stated in the reference procedure, unless noted otherwise. For measurement results associated with the conformance to a tolerance, the uncertainty in the measurement system did not exceed 25% (4:1 test uncertainty ratio) of the acceptable tolerance for each characteristic calibrated, unless otherwise noted in the report.

CALIBRATION DATA

See next page for measurement results.

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226673 P

Ulrich Métrologie inc.
Ulrich Metrology inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CALIBRATION DATA

Certificate no.: 377318
Identification: SBI-213
Description: THERMO-HYGROMETER
Serial no.: 101004044
Procedure: Amprobe TH-3: 2500ST-LT-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
1304953	HUMIDITY GENERATOR	THUNDER SCIENTIFIC	2500ST-LT	2013/04/19	2014/04/30

MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
TEMPERATURE CALIBRATION						
23°C						
23.00degC		23.30	22.20	23.80	PASS	
RELATIVE HUMIDITY CALIBRATION AT 23°C						
20% RH						
20.00%		19.50	17.00	23.00	PASS	
50% RH						
50.00%		48.50	47.00	53.00	PASS	
80% RH						
80.00%		77.50	77.00	83.00	PASS	

End of Test Data

Date: 2/8/2013

Equipment: SBI-232 Temperature: 72 F
Accuracy: 0.01 R.H.: 19%
Reference: Horloge parlante

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.00**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
84360.0	84360.0	0.00	

Technician: Claude Paré

Date: 2/8/2013

Equipment: SBI-234 Temperature: 72 F
Accuracy: 0.01 R.H.: 19%
Reference: Horloge parlante

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.00**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
84360.0	84360.0	0.00	

Technician: Claude Paré

Certificate No: MT0031229

METTLER-TOLEDO, LLC
1900 Polaris Pkwy
Columbus, OH 43240
1-800-METTLER

METTLER TOLEDO

ACCREDITED
Cert # 1788.01

Mass Calibration Certificate

Customer Information

Customer Name:	Sbi	*City:*	Saint-Augustin-De-Dema
Address:	250 Rue Copenhague	*State / Province:*	QC
Purchase Order:	34985	*Zip / Postal Code:*	G3A 2H3

Measurement and Test Equipment Identification

Serial Number:	B316239338	*Date Received:*	4/17/2013
Manufacturer:	Mettler-Toledo	*Condition:*	*Excellent*
Asset number:		*Tolerance Class:*	OIML E2

Environmental Conditions

Temperature:	20.430 °C	*Relative Humidity:*	47.680 *%RH*
Barometric Pressure:	988.9080 *hPa*	*Air Density:*	1.1688 *kg/m³*

The standards used to perform this calibration are traceable to NIST through METTLER TOLEDO traceability number: MT5061

This certificate is issued in accordance with the conditions granted by A2LA under Certificate number 1788.01, which is based on ISO/IEC17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards. All uncertainties in this certificate are reported at a 95% (k=2) confidence factor.

This certificate may not be partially reproduced, except with prior written permission of the issuing laboratory and A2LA.

Calibration Date:	04/17/2013	*Next Calibration Due:*	04/16/2014
Calibration Technician:	Kathy Weatherbie	*Signature:* Ann J Anderson	04/18/2013
		Metrology Specialist	Date

16280500A

Certificate No: MT0031229

As Found Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
100 mg	(B316239338)	0.1000032436	0.1000031492	0.0017	0.016	7.95

16280500A

Certificate No: MT0031229

As Left Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
100 mg	(B316239338)	0.1000032436	0.1000031492	0.0017	0.016	7.95

16280500A

Certificate No: MT0031229

Comparators Used

#	Equipment Used	Serial Number	Equipment Type	Calibration Due
#6 :	a5XL	B010016731	Automated Mass Comparator	08/31/2013

Comments

No Remarks

16280500A

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights. The number within the parentheses after the nominal value is the serial number of the set to which the weight belongs.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

Uncertainty - All Uncertainty values are reported at 95% confidence level (k=2) . The uncertainty value does not include a component for the affects due to magnetism.

Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - The METTLER TOLEDO procedure used to obtain the measurement results. All procedures are based on SOPs as defined in NIST Handbook 145. The same process is used to obtain the As Found and As Left results.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

16280500A

Certificate No: MT0031137

METTLER-TOLEDO, LLC
1900 Polaris Pkwy
Columbus, OH 43240
1-800-METTLER

METTLER TOLEDO

ACCREDITED
Cert # 1788.01

Mass Calibration Certificate

Customer Information

Customer Name:	Sbi	*City:*	Saint-Augustin-De-Dema
Address:	250 Rue Copenhague	*State / Province:*	QC
Purchase Order:	34985	*Zip / Postal Code:*	G3A 2H3

Measurement and Test Equipment Identification

Serial Number:	B316238717	*Date Received:*	4/16/2013
Manufacturer:	Mettler-Toledo	*Condition:*	*Excellent*
Asset number:		*Tolerance Class:*	OIML F1, F2

Environmental Conditions

Temperature:	20.365 °C	*Relative Humidity:*	47.865 *%RH*
Barometric Pressure:	981.2060 *hPa*	*Air Density:*	1.1599 *kg/m³*

The standards used to perform this calibration are traceable to NIST through METTLER TOLEDO traceability number: MT5061

This certificate is issued in accordance with the conditions granted by A2LA under Certificate number 1788.01, which is based on ISO/IEC17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards. All uncertainties in this certificate are reported at a 95% (k=2) confidence factor.

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Calibration Date:	04/09/2013	*Next Calibration Due:*	04/15/2014
Calibration Technician:	Kathy Weatherbie	*Signature:* Ann J Anderson	04/16/2013
		Metrology Specialist	Date

16280500A

Certificate No: MT0031137

As Found Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
200 g	(B316238717)	200.001163	200.000974	0.035	3.0	7.95
10 g	(B316238717)	10.0000725	10.0000630	0.0078	0.20	7.95

16280500A

As Left Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
200 g	(B316238717)	200.001163	200.000974	0.035	3.0	7.95
10 g	(B316238717)	10.0000725	10.0000630	0.0078	0.20	7.95

Certificate No: **MT0031137**

Comparators Used

#	Equipment Used	Serial Number	Equipment Type	Calibration Due
#11 :	a200XL	B010016733	Automated Mass Comparator	08/31/2013

Comments

No Remarks

16280500A

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights. The number within the parentheses after the nominal value is the serial number of the set to which the weight belongs.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

Uncertainty - All Uncertainty values are reported at 95% confidence level (k=2) . The uncertainty value does not include a component for the affects due to magnetism.

Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - The METTLER TOLEDO procedure used to obtain the measurement results. All procedures are based on SOPs as defined in NIST Handbook 145. The same process is used to obtain the As Found and As Left results.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

16280500A

Certificate No: MT00346

METTLER TOLEDO

METTLER TOLEDO
1900 Polaris Pkwy
Columbus, OH 43240
1-800-METTLER

ACCREDITED
Cert # 1788.01

Mass Calibration Certificate

Customer Information

Customer Name:	Mettler-Toledo QC	*City:*	Anjou
Address:	9280 Du Parcours	*State / Province:*	QC
		Zip / Postal Code:	H1J2Z1

Measurement and Test Equipment Identification

Serial Number:	MTP4	*Date Received:*	03/13/11
Manufacturer:	Troemner	*Condition:*	Good
Asset number:		*Tolerance Class*:	*ASTM , OIML* 6, F1

Environmental Conditions

Temperature:	20.436 ℃	*Relative Humidity:*	49.887 *%RH*
Barometric Pressure:	988.8998 *hPa*	*Air Density:*	1.1685 *kg/m*^{3}

The standards used to perform this calibration are traceable to NIST through METTLER TOLEDO traceability number: MT5061

This certificate is issued in accordance with the conditions granted by A2LA under Certificate number 1788.01, which is based on ISO/IEC17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards. All uncertainties in this certificate are reported at a 95% (k=2) confidence factor.

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Calibration Date:	03/30/2011	*Next Calibration Due:*	03/30/2013
Calibration Technician:	Kathy Weatherbie	*Signature:* Ann J Anderson	04/07/2011
		Metrology Specialist	Date

Certificate No: MT00346

As Found Data

Nominal Value&Suffix		Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Density (g/cm³)
5 kg	*	(MTP4)	5000.0060	4999.9916	2.0	7.85
5 kg		(MTP4)	5000.0232	5000.0089	2.0	7.85
2 kg		(MTP4)	2000.00054	1999.99481	0.34	7.85
1 kg		(MTP4)	999.998639	999.995772	0.065	7.85
500 g		(MTP4)	499.999773	499.998340	0.044	7.85
200 g	*	(MTP4)	199.999566	199.998992	0.020	7.85
200 g		(MTP4)	200.000444	199.999871	0.020	7.85
100 g	*	(MTP4)	100.000202	99.999915	0.018	7.85
100 g		(MTP4)	100.000381	100.000094	0.018	7.85
50 g		(MTP4)	49.9999113	49.9997680	0.0086	7.85
20 g	*	(MTP4)	20.0000049	19.9999475	0.0054	7.85
20 g		(MTP4)	20.0000019	19.9999446	0.0054	7.85
10 g		(MTP4)	10.0000847	10.0000561	0.0045	7.85
5 g		(MTP4)	5.0000688	5.0000545	0.0020	7.85
2 g	*	(MTP4)	2.0000782	2.0000725	0.0015	7.85
2 g		(MTP4)	2.0000555	2.0000498	0.0015	7.85
1 g		(MTP4)	1.0000425	1.0000397	0.0015	7.85
500 mg		(MTP4)	0.4999626	0.4999621	0.0011	7.95
200 mg	*	(MTP4)	0.19997458	0.19997439	0.00085	7.95
200 mg		(MTP4)	0.19998519	0.19998500	0.00085	7.95
100 mg		(MTP4)	0.09999607	0.09999598	0.00084	7.95
50 mg		(MTP4)	0.04999361	0.04999357	0.00069	7.95
20 mg		(MTP4)	0.01998330	0.01997741	0.00061	2.70
10 mg		(MTP4)	0.00994911	0.00994618	0.00062	2.70

Certificate No: MT00346

As Left Data

Nominal Value&Suffix		Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Density (g/cm³)
5 kg	*	(MTP4)	5000.0060	4999.9916	2.0	7.85
5 kg		(MTP4)	5000.0232	5000.0089	2.0	7.85
2 kg		(MTP4)	2000.00054	1999.99481	0.34	7.85
1 kg		(MTP4)	999.998639	999.995772	0.065	7.85
500 g		(MTP4)	499.999773	499.998340	0.044	7.85
200 g	*	(MTP4)	199.999566	199.998992	0.020	7.85
200 g		(MTP4)	200.000444	199.999871	0.020	7.85
100 g	*	(MTP4)	100.000202	99.999915	0.018	7.85
100 g		(MTP4)	100.000381	100.000094	0.018	7.85
50 g		(MTP4)	49.9999113	49.9997680	0.0086	7.85
20 g	*	(MTP4)	20.0000049	19.9999475	0.0054	7.85
20 g		(MTP4)	20.0000019	19.9999446	0.0054	7.85
10 g		(MTP4)	10.0000847	10.0000561	0.0045	7.85
5 g		(MTP4)	5.0000688	5.0000545	0.0020	7.85
2 g	*	(MTP4)	2.0000782	2.0000725	0.0015	7.85
2 g		(MTP4)	2.0000555	2.0000498	0.0015	7.85
1 g		(MTP4)	1.0000425	1.0000397	0.0015	7.85
500 mg		(MTP4)	0.4999626	0.4999621	0.0011	7.95
200 mg	*	(MTP4)	0.19997458	0.19997439	0.00085	7.95
200 mg		(MTP4)	0.19998519	0.19998500	0.00085	7.95
100 mg		(MTP4)	0.09999607	0.09999598	0.00084	7.95
50 mg		(MTP4)	0.04999361	0.04999357	0.00069	7.95
20 mg		(MTP4)	0.01998330	0.01997741	0.00061	2.70
10 mg		(MTP4)	0.00994911	0.00994618	0.00062	2.70

Certificate No: MT00346

Comparators Used

#	Equipment Used	Serial Number	Equipment Type	Calibration Due
#6 :	a5XL	B010016731	Automated Mass Comparator	06/30/2011
11# :	a200XL	B010016733	Automated Mass Comparator	06/30/2011
15# :	a1000	B010016732	Automated Mass Comparator	06/01/2011
16# :	XP2004S	1129043681	Comparator	08/02/2011
1# :	PR10003	1115413821	Comparator	08/16/2011

Comments

No Remarks

Certificate No: MT00346

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights. The number within the parentheses after the nominal value is the serial number of the set to which the weight belongs.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

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Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - The METTLER TOLEDO procedure used to obtain the measurement results. All procedures are based on SOPs as defined in NIST Handbook 145. The same process is used to obtain the As Found and As Left results.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

Measurement Canada | Mesures Canada

An Agency of Industry Canada | Un organisme d'Industrie Canada

District de Québec
1550, avenue d'Estimauville
Québec, Québec, G1J 0C4

№ du jeu de poids	Émis le	Date d'expiration
	2012-04-23	2013-04-23
Propriétaire: Mettler-Toledo L.L.C.		
Adresse: 2435 Watt, porte 15 Québec, Qc G1P 3X2		
Personne ressource: Sylvain Doyon		No de téléphone: 418-654-0001

CERTIFICAT DE DÉSIGNATION

Étalons gravimétriques

Je soussigné(e), étant autorisé(e) par le ministre d'Industrie à exercer les pouvoirs du ministre d'Industrie conformément à l'article 13 (1) de la *Loi sur les poids et mesures*,

1) certifie par la présente que l'étalon ou jeu d'étalons a été étalonné conformément à la partie III du Règlement sur les poids et mesures et par rapport à un étalon de référence traçable aux étalons nationaux de mesure du Canada par une chaîne ininterrompue de comparaisons (les étalons nationaux de mesures du Canada sont maintenus par l'Institut des étalons nationaux de mesures (IÉNM) du Conseil national de recherches du Canada), et

2) désigne ledit étalon ou jeu d'étalons décris ci-dessous à titre d'étalon(s) local(aux):

Numéro d'identification	Valeur Nominale	Numéro d'identification	Valeur Nominale	Numéro d'identification	Valeur Nominale	Numéro d'identification	Valeur Nominale
Q118	20 kg	Q128	20 kg	Q138	20 kg	Q148	20 kg
Q119	20 kg	Q129	20 kg	Q139	20 kg	Q149	20 kg
Q120	20 kg	Q130	20 kg	Q140	20 kg	Q150	20 kg
Q121	20 kg	Q131	20 kg	Q141	20 kg	Q151	20 kg
Q122	20 kg	Q132	20 kg	Q142	20 kg		
Q123	20 kg	Q133	20 kg	Q143	20 kg		
Q124	20 kg	Q134	20 kg	Q144	20 kg		
Q125	20 kg	Q135	20 kg	Q145	20 kg		
Q126	20 kg	Q136	20 kg	Q146	20 kg		
Q127	20 kg	Q137	20 kg	Q147	20 kg		

District	Certifié par	Désigné par : (Lettres moulées)	Titre du poste
28	Pascal Turgeon № du certificat d'étalonnage: 1367024	Guy Tessier (Signature)	Gestionnaire de district

Le droit d'auteur de ce certificat appartient à Mesures Canada et ne doit pas être reproduit autrement qu'en totalité sans avoir préalablement obtenu l'autorisation écrite de Mesures Canada.

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Measurement Canada | Mesures Canada

An Agency of Industry Canada | Un organisme d'Industrie Canada

District de Québec
1550, avenue d'Estimauville
Québec, Québec, G1J 0C4

№ du jeu de poids	Émis le	Date d'expiration
	2012-04-23	2013-04-23
Propriétaire: Mettler-Toledo L.L.C.		
Adresse: 2435 Watt, porte 15 Québec, Qc G1P 3X2		
Personne ressource: Sylvain Doyon		No de téléphone: 418-654-0001

CERTIFICAT DE DÉSIGNATION

Étalons gravimétriques

Je soussigné(e), étant autorisé(e) par le ministre d'Industrie à exercer les pouvoirs du ministre d'Industrie conformément à l'article 13 (1) de la *Loi sur les poids et mesures*,

1) certifie par la présente que l'étalon ou jeu d'étalons a été étalonné conformément à la partie III du Règlement sur les poids et mesures et par rapport à un étalon de référence traçable aux étalons nationaux de mesure du Canada par une chaîne ininterrompue de comparaisons (les étalons nationaux de mesures du Canada sont maintenus par l'Institut des étalons nationaux de mesures (IÉNM) du Conseil national de recherches du Canada), et

2) désigne ledit étalon ou jeu d'étalons décris ci-dessous à titre d'étalon(s) local(aux):

Numéro d'identification	Valeur Nominale	Numéro d'identification	Valeur Nominale	Numéro d'identification	Valeur Nominale	Numéro d'identification	Valeur Nominale
Q101	20 kg	Q111	20 kg				
Q102	20 kg	Q112	20 kg				
Q103	20 kg	Q113	20 kg				
Q104	20 kg	Q114	20 kg				
Q105	20 kg	Q115	20 kg				
Q106	20 kg	Q116	20 kg				
Q107	20 kg						
Q108	20 kg						
Q109	20 kg						
Q110	20 kg						

District	Certifié par	Désigné par : (Lettres moulées)	Titre du poste
28	Pascal Turgeon № du certificat d'étalonnage: 1367024	Guy Tessier (Signature)	Gestionnaire de district

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Document	Calibrated (YMD) - Étalonné (AMJ)
M11-0616	2012/03/27
Project/Applicant - Projet/Requérant	**Recalibration - Date - de réétalonnage**
CP-ML-11-0194 Mettler-Toledo Inc.	2013/03/27
Owner - Propriétaire	
Mettler-Toledo Inc. 110-780 rue King Ouest, suite 220 Sherbrooke QC J1H 1R7	

Approval and Calibration Services Laboratory
Standards Building
151 Tunney's Pasture Driveway
Ottawa, Ontario
K1A 0C9

Laboratoire des services d'approbation et d'étalonnage
Immeuble des normes
151, allée Tunney's Pasture
Ottawa, Ontario
K1A 0C9

Certificate of Calibration and Designation

I, the undersigned, being authorized by the Minister of Industry to exercise the power of the Minister of Industry pursuant to Section 13, sub-section 1 of the Weights and Measures Act,

1) hereby certify that the standard or set of standards has been calibrated in accordance with Part III of the Weights and Measures Regulations in relation to a reference standard traceable to the National Measurement Standards of Canada through an unbroken chain of comparisons (the National Measurement Standards are maintained by the Institute of National Measurement Standards (INMS) of the National Research Council of Canada), and

2) designate the said standard or set of standards described below as local standard(s):

Certificat d'Étalonnage et de Désignation

Je, soussigné(e), étant autorisé(e) par le ministre d'Industrie à exercer les pouvoirs du ministre d'Industrie conformément à l'article 13, paragraphe 1 de la Loi sur les poids et mesures,

1) certifie par la présente que l'étalon ou jeu d'étalons a été étalonné conformément à la partie III du Règlement sur les poids et mesures et par rapport à un étalon de référence traçable aux étalons nationaux de mesure du Canada par une chaîne ininterrompue de comparaisons (les étalons nationaux de mesures du Canada sont maintenus par l'Institut des étalons nationaux de mesures (IÉNM) du Conseil national de recherches du Canada), et

2) désigne ledit étalon ou jeu d'étalons décris ci-dessous à titre d'étalon(s) local(aux):

Project #:	CP-ML-11-0194
Serial No.:	55588
Standard Group:	Accredited Weight Kits
Manufacturer:	Mettler-Toledo Inc.
Characteristics:	Mettler Toledo Inc. 5kg to 100mg (2 X 5g) (Version:2008/12/10)

No. Projet:	CP-ML-11-0194
No. de série:	55588
Groupe d'étalons:	Jeux de poids accrédités
Fabricant:	Mettler-Toledo Inc.
Caractéristiques:	Mettler Toledo Inc. 5kg a 100mg (2 X 5g) (Version:2008/12/10)

PROCEDURE(S) USED	SOFTWARE USED
MC-MA-CP-001ver.7.0	DTCS ver. 2.3.4

PROCÉDURE(S) UTILISÉ(S)	LOGICIEL(S) UTILISÉ(S)
MC-MA-CP-001ver.7.0	SECI ver. 2.3.4

STANDARD(S) USED

Device	Certificate	Standard Group
874017	M10-0001	BM Metric Mass Standards
ML88025	M11-0082	BM Metric Mass Standards
MS58	M11-0108	BM Metric Mass Standards

ÉTALON(S) UTILISÉ(S)

Instrument	Certificat	Groupe d'étalons
874017	M10-0001	BM Étalons de masse - syst. mé
ML88025	M11-0082	BM Étalons de masse - syst. mé
MS58	M11-0108	BM Étalons de masse - syst. mé

Calibrated by: **Denis D'Aoust**
Étalonné par:
Legal Metrologist
Métrologiste légal

Designated by: **Ronald Peasley**
Désigné par:
Senior Engineer - Gravimetry
Ingénieur principal intérimaire - Gravimétrie

Date MAR 28 2012

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The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council. Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

Le Service d'évaluation des laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et certifié la capacité d'étalonnage du laboratoire et la traçabilité au Système international d'unités (SI) ou à des étalons acceptables selon le CLAS. Le présent certificat d'étalonnage est délivré conformément aux conditions de certification du CLAS et aux conditions d'accréditation du Conseil canadien des normes (CCN). Le CLAS et le CCN ne garantissent pas l'exactitude des étalonnages individuels effectués par les laboratoires accrédités.

CLAS NRC·CNRC
CLAS 2009-03
SCC 659

Canada

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Mesures Canada
Un organisme d'Industrie Canada

Document	Calibrated (YMD) - Étalonné (AMJ)
M11-0616	2012/03/27
Project/Applicant - Projet/Requérant	Recalibration - Date - de réétalonnage
CP-ML-11-0194	2013/03/27
Mettler-Toledo Inc.	

VERIFICATION VALUES - VALEURS D'ESSAI

Identification Number Numéro d'identification	Nominal Value Valeur nominale
TM1	5 kg
TM2	5 kg
TM1	2 kg
TM2	2 kg
TM	1 kg
TM1	500 g
TM2	500 g
TM3	500 g
TM4	500 g
TM1	200 g
TM2	200 g
TM	100 g
A6	50 g
A5	20 g
A4	10 g
A3•	10 g
A1	5 g
A2•	5 g
TM•	2 g
TM••	2 g
489A	1 g
	500 mg
•	500 mg
	200 mg
•	200 mg
	100 mg

NOTES:

All weights listed above were verified.
All values are expressed in conventional mass, as defined by the Organisation internationale de métrologie légale (OIML): "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density (8000 kg/m^3), at a conventionally chosen temperature (20°C), which balances this body at this reference in air of conventionally chosen density (1.2 kg/m^3)."

The applied standard tolerances are those established in Section 54 and set out in Schedule IV, Part III and IV of the Weights and Measures Regulations.

NOTES:

Tous les poids ci-haut mentionnés ont été étalonnés.
Toutes les valeurs sont exprimées en masse conventionnelle qui est définie par l'Organisation internationale de métrologie légale (OIML) comme suit: "La valeur conventionnelle du résultat de l'action de peser un corps dans l'air est égale à la masse d'un étalon, de densité conventionnellement choisie (8000 kg/m^3), à une température choisie conventionnellement (20°C), qui permet d'équilibrer ce corps à cette température de référence dans l'air de densité choisie conventionnellement (1.2 kg/m^3)."

Les marges de tolérance appliquées sont établies à l'article 54 et décrites à l'annex IV, partie III et IV du Règlement sur les poids et mesures.

Fabricant de poêles international inc.
Stove Builder International Inc.

RAPPORT DE CALIBRATION
REPORT OF CALIBRATION

DONNÉES DE CALIBRATION / CALIBRATION DATA

Date de calibration Calibration date: 2013-11-26

Équipement /Equipment: SBI-014 Température / Temperature : 71 F

Précision / Accuracy : 0.05 lbs R.H. : 20 %

Référence / Reference : SBI-190

Std/Nominal	True Mass (kg)	Scale reading (lbs)	Allowed (lbs) Min	Allowed (lbs) Max	Tolerance
5 kg	5.0004	11.00	10.82	11.23	In

Fait par :
Performed by: Vincent Pelletier

Vincent Pelletier

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SBI, Fabricant de poêles international inc | Stove Builder International Inc.
250 rue de Copenhague St-Augustin-de-Desmaures (Québec) G3A 2H3, Canada
Tel.: 1 418 878-3040 Fax.: 1 418 878-3001
www.sbi-international.com

Fabricant de poêles international inc.
Stove Builder International Inc.

RAPPORT DE CALIBRATION
REPORT OF CALIBRATION

DONNÉES DE CALIBRATION / CALIBRATION DATA

Date de calibration Calibration date: 2013-12-02

Équipement /Equipment: SBI-014 Température / Temperature : 69 F

Précision / Accuracy : 0.05 lbs R.H. : 21 %

Référence / Reference : SBI-190

Std/Nominal	True Mass (kg)	Scale reading (lbs)	Allowed (lbs) Min	Allowed (lbs) Max	Tolerance
5 kg	5.0004	11.00	10.82	11.23	In

Fait par :
Performed by: Vincent Pelletier

Vincent Pelletier

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Fabricant de poêles international inc.
Stove Builder International Inc.

RAPPORT DE CALIBRATION
REPORT OF CALIBRATION

DONNÉES DE CALIBRATION / CALIBRATION DATA

Date de calibration Calibration date: 2014-02-04

Équipement /Equipment: SBI-014 Température / Temperature : 68 F

Précision / Accuracy : 0.05 lbs R.H. : 13 %

Référence / Reference : SBI-190

Std/Nominal	True Mass (kg)	Scale reading (lbs)	Allowed (lbs) Min	Allowed (lbs) Max	Tolerance
5 kg	5.0004	11.00	10.82	11.23	In

Fait par :
Performed by: Vincent Pelletier

Vincent Pelletier

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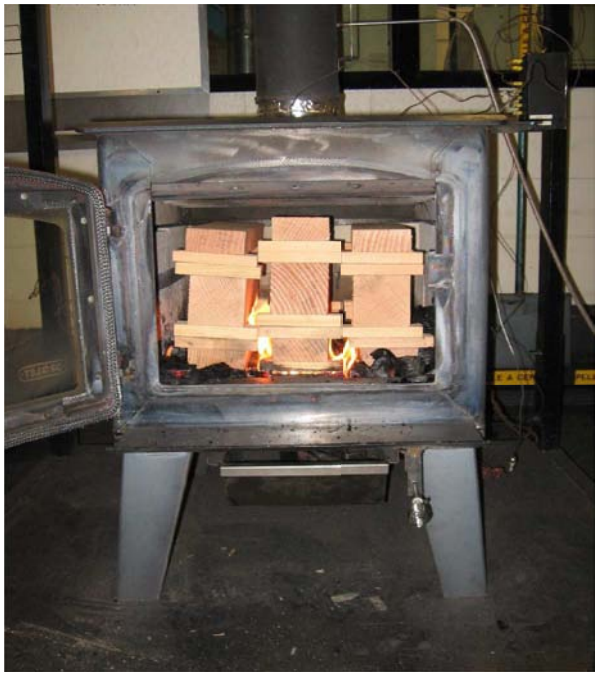
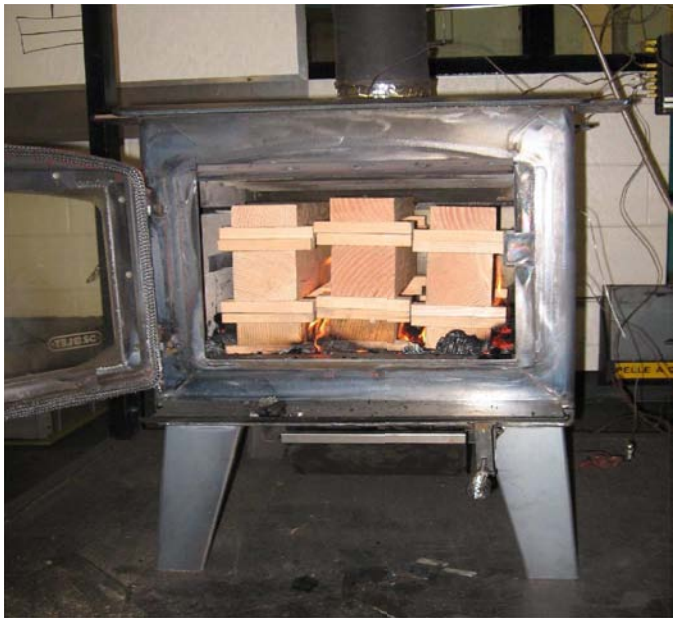
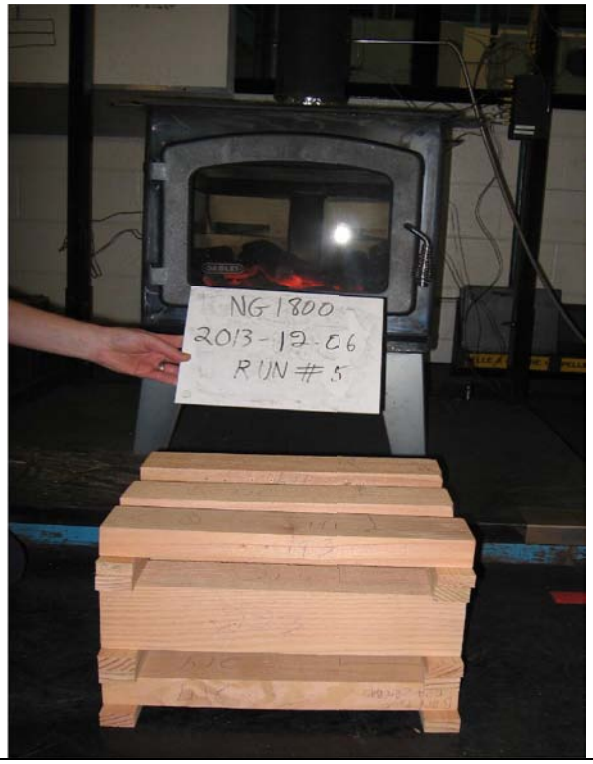
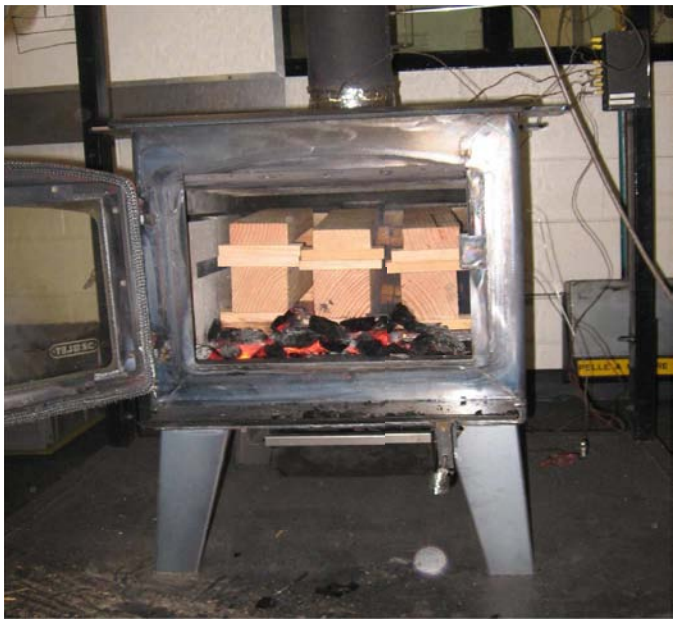
250 rue de Copenhague St-Augustin-de-Desmaures (Québec) G3A 2H3, Canada
Tel.: 1 418 878-3040 Fax.: 1 418 878-3001
www.sbi-international.com

Run 1a Fuel Load 	Run 1 Fuel Loaded N/A
Run 2a Fuel Load 	Run 2a Fuel Loaded

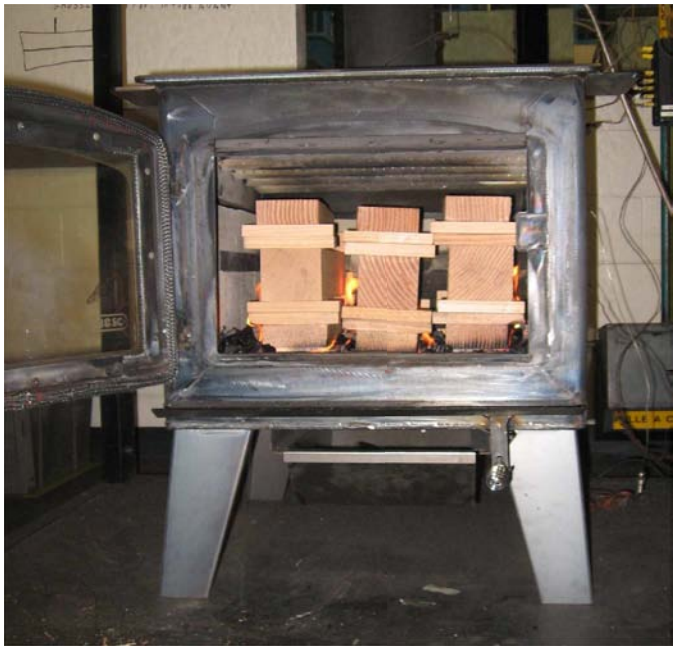
Run 1 Fuel Load 	Run 1 Fuel Loaded 
Run 2 Fuel Load 	Run 2 Fuel Loaded

Run 3 Fuel Load 	Run 3 Fuel Loaded
Run 4 Fuel Load 	Run 4 Fuel Loaded 

Run 5 Fuel Load  	Run 5 Fuel Loaded
Run 6 Fuel Load 	Run 6 Fuel Loaded 

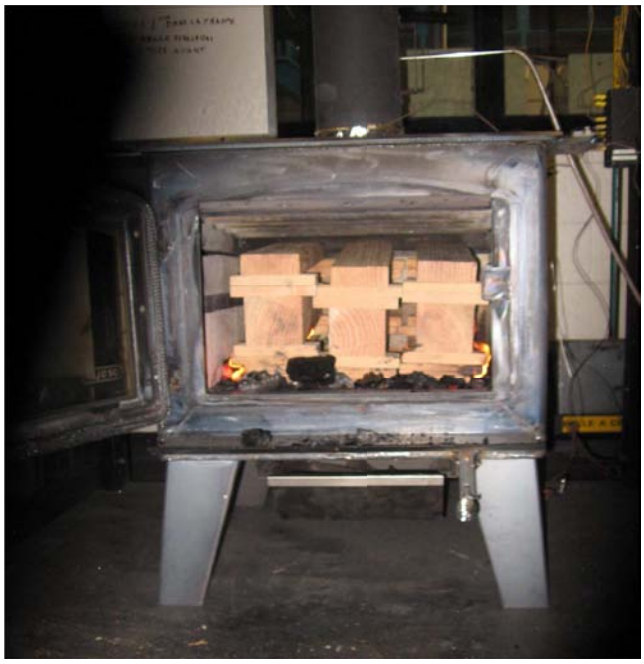
Run 7 Fuel Load

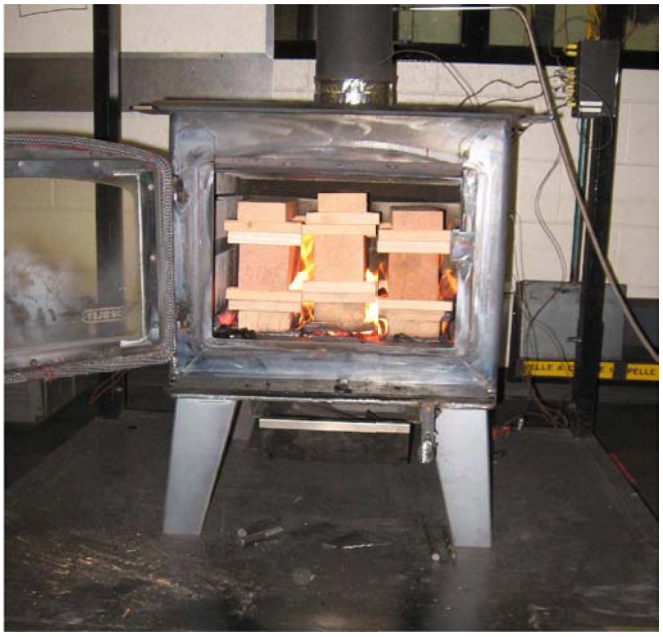
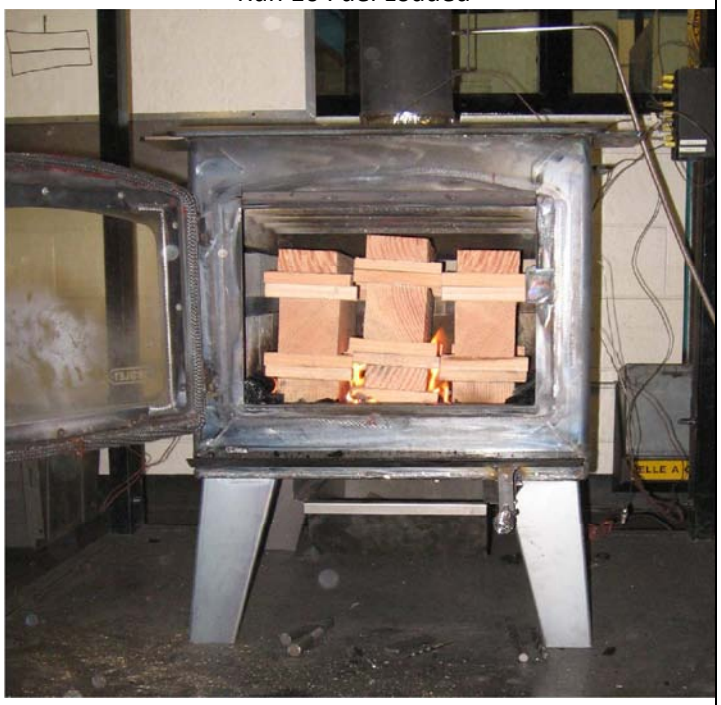
Run 7 Fuel Loaded

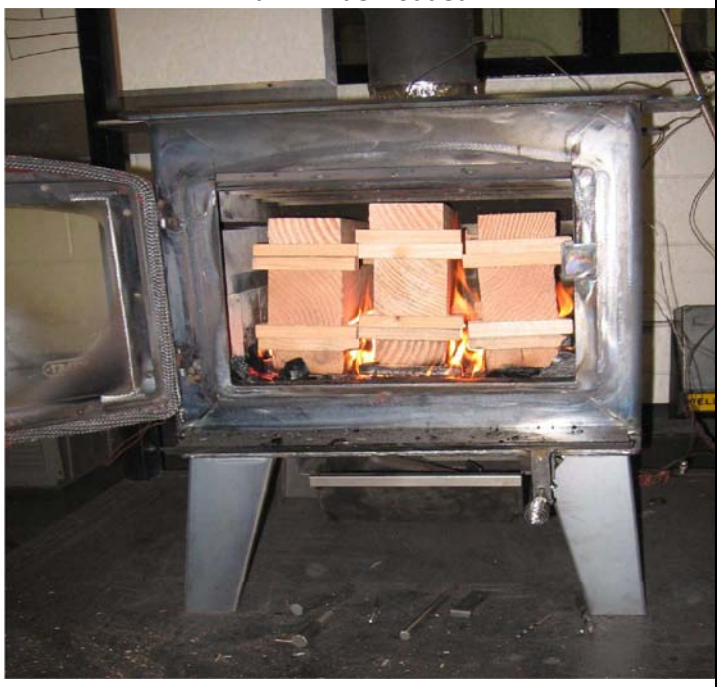


Run 8 Fuel Load

Run 8 Fuel Loaded



Run 9 Fuel Load	Run 9 Fuel Loaded
	
Run 10 Fuel Load	Run 10 Fuel Loaded
	

Run 11 Fuel Load	Run 11 Fuel Loaded
	

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 2, 2013
Test Run Number:	1

Dry Burn-Rate, kg/hr:	**1.07**	
Emission-Rate, g/hr:	**6.39**	
Adjusted Emission-Rate, g/hr :	**8.48**	
Duration of Test, Minutes	470	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	852.802	854.373
Dry Gas Meter Ending Reading, ft^3	926.755	915.822
Barometric Pressure Correction Factor	1.005	1.005
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.004	1.005
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**74.776**	**61.685**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**150.844**	
Total Tunnel Volume, scf	**70896.791**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	948.119	1149.332
Sample Particulate Mass, mg	51.2	44.8
Total Emissions, grams	48.544	51.490
Emission-Rate, g/hr	6.20	6.57
Adjusted Emission Rates, g/hr	**8.27**	**8.69**
Deviation, %	2.44%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	74.79	70.89
Post-Test Leak Check, cfm @ in. Hg vac.	0.004@5	0.0025@5
Average Firebox Surface Temperture delta-T, ℉	83.7	
Maximum Ambient Temperture, ℉	88	
Mimimum Ambient Temperature, ℉	69	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.21	
Dry-Basis Fuel Load Moisture Content, %	20.27	
Wet-Basis Fuel Load Moisture Content, %	16.85	
Coal Bed Range, lb.	4.50	5.50
Actual Coal Bed, Lb.	5.35	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 2, 2013
Test Run No:	1

Temperature Data

Firebox Temp Start	410.98
Firebox Temp End	327.28
Firebox Delta-T	**83.7**

Max Filter Temps	
Train A	Train B
74.79	**70.89**

Interval	10	Duration of Test, Min	**470**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	81.42	105.5	250.7	311.5	449	470.3	400.2	423.9		66.11	64.6	65	64.745
1	10	84.57	106.2	250.7	298.4	451.5	422	384.1	400.5		72.11	68.93	65.145	64.845
2	20	84.36	101.8	258.4	297.6	436	376.5	354.8	367.6		73.15	69.44	65.25	64.895
3	30	84.97	103.5	277.3	309.4	418.2	346.7	332.1	338.9		73.39	70.12	65.39	65.105
4	40	85.16	104.1	288.9	331.2	398	325.4	314.3	323.6		73.36	70.31	65.415	65.125
5	50	85.75	102.9	274	334.8	380.1	307.4	299.6	313		73.3	69.85	65.495	65.11
6	60	86.27	104.6	296.4	354.1	363.5	300.8	295.9	306		73.39	69.72	65.515	65.125
7	70	86.05	103.5	286.3	349.2	348.5	298.7	296.4	307.6		73.29	70.24	65.65	65.36
8	80	85.03	107.6	332.4	360.1	333.1	306	293.6	316.6		73.61	70.18	65.685	65.295
9	90	85.95	107.7	327	391.8	320.7	324.3	311.5	331.9		73.83	70.24	65.795	65.41
10	100	86.26	110.4	350.9	414.9	308.5	341.3	328	341.5		74.08	70.59	65.705	65.305
11	110	87.61	110.6	344.3	436.4	297.9	361	342.6	351		74.77	70.89	65.83	65.37
12	120	83.45	107.4	336.6	429.9	288.5	369.9	345.6	360.5		74.79	70.68	65.78	65.325
13	130	85.41	107.4	340.6	427.9	280.8	370.7	346.8	366.5		74.46	70.49	65.71	65.135
14	140	83.27	107.9	353	436.8	273.7	373.1	350.1	373.4		74.33	70.26	65.66	65.21
15	150	81.98	107.7	349.6	446	269.1	380.5	359.7	382.7		74.45	70.48	65.7	65.26
16	160	79.2	104.4	333.5	436.4	263.5	388.4	367.5	390.3		74.06	70.23	65.69	65.225
17	170	79.78	103.8	318.4	419	260.5	397	372.9	395.6		73.71	69.88	65.605	65.035
18	180	82.96	102.2	305.4	404.4	257.7	409.8	381.4	402.6		73.31	69.68	65.68	65.27

19	190	78.26	99.51	293	391.7	256.1	422.1	387.1	408.3		73.09	69.38	65.75	65.355
20	200	79.63	98.1	275.1	373.1	255.5	425.9	387.6	413.9		72.58	69.41	65.665	65.31
21	210	82.79	97.22	260.8	350.8	255	424.1	383.7	416.6		72.28	68.83	65.66	65.24
22	220	80.61	94.91	251.8	331.4	254.7	422.4	378.9	416.9		71.94	68.52	65.64	65.21
23	230	77.63	93.83	246	318.9	257.1	421.9	378.9	416.6		71.77	68.35	65.655	65.23
24	240	81.32	94.42	239.9	311.3	259.5	422.1	378.8	417.6		71.56	68.23	65.69	65.2
25	250	81.12	93.4	234.1	303.7	261.4	422	376.1	416.5		71.53	68.28	65.76	65.35
26	260	77.23	91.9	232	296.9	265	421.4	373.1	415		71.49	68.44	65.835	65.455
27	270	80.88	92.88	229.2	293.4	266.9	419	372.5	414.4		71.4	68.5	65.82	65.385
28	280	78.74	91.26	226.3	288.4	268.9	416.9	370.1	411.3		71.18	68.31	65.765	65.295
29	290	76.77	90.95	224.9	283.4	272.4	414.3	369.3	408.1		71.1	68.24	65.75	65.245
30	300	77.72	90.44	221.6	280.5	273.3	412.7	366.9	403.4		70.79	68.1	65.745	65.345
31	310	73.69	88.83	219.4	275.4	276.2	411.9	362	400		70.61	68	65.74	65.295
32	320	73.07	88.59	216.7	272.2	278.6	412.7	355	399.9		70.52	67.84	65.76	65.25
33	330	76.3	89.19	214.4	270.4	280.4	414.6	348.5	399.9		70.37	67.62	65.73	65.325
34	340	73.77	88.01	214.1	267.3	281.7	416.9	343.8	397.2		70.25	67.75	65.79	65.4
35	350	72.39	87.72	213.6	266	284	418.3	341.5	394.5		70.12	67.81	65.745	65.365
36	360	73.46	87.94	211.4	265.4	285.7	416.5	340.1	391.6		70.13	67.8	65.75	65.33
37	370	75.8	88.59	210.2	262.7	286.6	415.3	339.9	386		70.09	67.92	65.79	65.36
38	380	74.91	87.93	209.2	261.2	287.4	421.7	342.6	379.3		70.13	67.77	65.795	65.42
39	390	71.44	86.63	210.1	260	289.5	427	346.2	374.3		70.18	67.71	65.79	65.34
40	400	73.15	86.95	208.3	259.3	290.2	430	347.4	370.1		69.94	67.54	65.735	65.325
41	410	70.21	86.04	207.9	258.3	291.7	431.8	348.3	365.9		69.76	67.6	65.735	65.315
42	420	74.14	87.45	206.1	258.5	291.5	427.4	348.3	362.9		69.6	67.65	65.72	65.31
43	430	69.26	85.26	205.1	254.7	292.1	423.4	346.4	356.4		69.65	67.64	65.78	65.405
44	440	71.37	86.46	204.5	252.1	292.8	422.2	346.1	352.8		69.74	67.66	65.815	65.44
45	450	72.4	86.14	202.4	250	292.6	421.3	344.7	348.8		69.67	67.65	65.85	65.425
46	460	70.03	85.32	201.4	248	293.3	418.3	342.6	345.9		69.63	67.63	65.83	65.385
47	470	73.59	86.58	199.1	246.2	293.3	414.3	338.6	344		69.63	67.54	65.825	65.435

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 2, 2013
Test Run Number:	1

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.09	81	Meter Box (A)	1.002
End	30.03	77	Meter Box (B)	0.994
Duration of Test, Min		470		

Leak Check, cfm @ in Hg	
Train A	Train B
0.004@5	0.0025@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	**0.00**	**14.229**	**5.117**	**1.329**

	Particulate Sampling Data												Combustion Gasses, %		
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.058	22.21	**22.21**	852.802	854.373	**99.97**	**99.98**	0.00	0.00	16.39	2.13	1.49
10	0.015	0.00	0.00	0.058	21.20	**1.01**	854.388	855.598	**101.79**	**94.60**	0.00	0.00	18.05	1.6	0.81
20	0.015	0.00	0.00	0.060	20.47	**0.73**	855.952	856.944	**99.97**	**103.53**	0.00	0.00	16.75	2.68	0.88
30	0.015	0.00	0.00	0.065	19.55	**0.92**	857.499	858.318	**99.01**	**105.80**	0.00	0.00	15.85	3.97	1.04
40	0.015	0.00	0.00	0.065	18.63	**0.92**	859.038	859.708	**98.54**	**107.09**	0.00	0.00	15.17	4.43	0.9
50	0.015	0.00	0.00	0.065	17.88	**0.75**	860.573	860.944	**98.17**	**95.13**	0.00	0.00	16.05	4.66	1.12
60	0.015	0.00	0.00	0.065	16.96	**0.92**	862.104	862.304	**98.06**	**104.82**	0.00	0.00	14.8	4.86	0.95
70	0.015	0.00	0.00	0.065	16.23	**0.73**	863.656	863.633	**99.28**	**102.29**	0.00	0.00	14.55	5.48	1.15
80	0.015	0.00	0.00	0.073	15.17	**1.06**	865.247	864.869	**102.14**	**95.49**	0.00	0.00	11.71	8.88	0.71
90	0.015	0.00	0.00	0.070	14.26	**0.91**	866.762	866.137	**97.25**	**97.95**	0.00	0.00	13.17	7.5	0.79
100	0.015	0.00	0.00	0.075	13.28	**0.98**	868.282	867.433	**97.82**	**100.37**	0.00	0.00	11.65	9.07	0.69
110	0.015	0.00	0.00	0.073	12.36	**0.92**	869.788	868.781	**96.91**	**104.40**	0.00	0.00	13.1	7.53	0.71
120	0.015	0.00	0.00	0.070	11.54	**0.82**	871.394	870.064	**103.06**	**99.10**	0.00	0.00	13.14	7.35	0.73
130	0.015	0.00	0.00	0.073	10.72	**0.82**	872.992	871.382	**102.56**	**101.84**	0.00	0.00	12.64	8.15	0.67

140	0.015	0.00	0.00	0.073	9.81	0.91	874.598	872.675	103.13	99.93	0.00	0.00	12.07	8.76	0.64
150	0.015	0.00	0.00	0.073	8.93	0.88	876.180	873.991	101.56	101.68	0.00	0.00	12.43	8.22	0.68
160	0.015	0.00	0.00	0.070	8.14	0.79	877.757	875.306	100.95	101.32	0.00	0.00	12.73	7.7	0.79
170	0.015	0.00	0.00	0.068	7.33	0.81	879.332	876.519	100.79	93.44	0.00	0.00	12.45	7.22	1.28
180	0.015	0.00	0.00	0.065	6.63	0.70	880.911	877.804	100.88	98.81	0.00	0.00	12.69	6.87	1.29
190	0.015	0.00	0.00	0.063	6.01	0.62	882.488	879.065	100.50	96.71	0.00	0.00	13.09	6.07	1.26
200	0.015	0.00	0.00	0.060	5.64	0.37	884.061	880.494	100.14	109.47	0.00	0.00	13.63	5.23	1.45
210	0.015	0.00	0.00	0.060	5.35	0.29	885.636	881.844	100.19	103.35	0.00	0.00	13.63	5.1	1.54
220	0.015	0.00	0.00	0.055	5.04	0.31	887.212	883.143	100.04	99.24	0.00	0.00	13.5	5.22	1.56
230	0.015	0.00	0.00	0.055	4.75	0.29	888.792	884.422	100.20	97.62	0.00	0.00	13.63	5.09	1.61
240	0.015	0.00	0.00	0.055	4.53	0.22	890.375	885.735	100.44	100.27	0.00	0.00	13.82	4.76	1.7
250	0.015	0.00	0.00	0.053	4.30	0.23	891.957	887.073	100.27	102.06	0.00	0.00	13.84	4.67	1.78
260	0.015	0.00	0.00	0.053	4.06	0.24	893.538	888.415	100.05	102.20	0.00	0.00	13.93	4.82	1.77
270	0.015	0.00	0.00	0.053	3.85	0.21	895.117	889.732	100.02	100.40	0.00	0.00	13.93	4.61	1.87
280	0.015	0.00	0.00	0.050	3.61	0.24	896.697	891.033	99.94	99.05	0.00	0.00	14.2	4.74	1.65
290	0.015	0.00	0.00	0.050	3.41	0.20	898.283	892.322	100.30	98.12	0.00	0.00	14.1	4.67	1.67
300	0.015	0.00	0.00	0.050	3.19	0.22	899.861	893.597	99.75	96.99	0.00	0.00	14.27	4.41	1.67
310	0.015	0.00	0.00	0.050	2.97	0.22	901.440	894.873	99.67	96.93	0.00	0.00	14.39	4.49	1.51
320	0.015	0.00	0.00	0.050	2.75	0.22	903.026	896.152	100.08	97.15	0.00	0.00	14.41	4.37	1.56
330	0.015	0.00	0.00	0.050	2.55	0.20	904.610	897.420	100.02	96.35	0.00	0.00	14.44	4.29	1.68
340	0.015	0.00	0.00	0.048	2.36	0.19	906.192	898.727	99.77	99.20	0.00	0.00	14.43	4.41	1.58
350	0.015	0.00	0.00	0.050	2.14	0.22	907.772	900.015	99.63	97.73	0.00	0.00	14.59	4.33	1.58
360	0.015	0.00	0.00	0.050	1.97	0.17	909.358	901.313	100.02	98.52	0.00	0.00	14.84	3.97	1.65
370	0.015	0.00	0.00	0.050	1.78	0.19	910.950	902.685	100.45	104.19	0.00	0.00	14.47	4.54	1.54
380	0.015	0.00	0.00	0.048	1.55	0.23	912.529	903.999	99.57	99.72	0.00	0.00	14.55	4.29	1.58
390	0.015	0.00	0.00	0.048	1.36	0.19	914.104	905.288	99.20	97.72	0.00	0.00	14.68	4.19	1.58
400	0.015	0.00	0.00	0.048	1.15	0.21	915.688	906.603	99.81	99.72	0.00	0.00	14.79	4.02	1.65
410	0.015	0.00	0.00	0.048	0.94	0.21	917.275	907.939	99.92	101.23	0.00	0.00	14.93	4.11	1.6
420	0.015	0.00	0.00	0.048	0.76	0.18	918.852	909.271	99.42	101.06	0.00	0.00	15.22	3.62	1.64
430	0.015	0.00	0.00	0.450	0.58	0.18	920.432	910.578	99.40	98.95	0.00	0.00	15.08	4.01	1.52

440	**0.015**	**0.00**	**0.00**	**0.450**	**0.43**	**0.15**	**922.010**	**911.933**	**99.37**	**102.69**	**0.00**	**0.00**	15.08	3.81	1.56
450	**0.015**	**0.00**	**0.00**	**0.475**	**0.25**	**0.18**	**923.592**	**913.220**	**99.59**	**97.51**	**0.00**	**0.00**	15.2	3.71	1.56
460	**0.015**	**0.00**	**0.00**	**0.450**	**0.07**	**0.18**	**925.175**	**914.523**	**99.58**	**98.65**	**0.00**	**0.00**	15.43	3.54	1.59
470	**0.015**	**0.00**	**0.00**	**0.045**	**0.00**	**0.07**	**926.755**	**915.822**	**99.51**	**98.45**	**0.00**	**0.00**	15.52	3.46	1.55

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 2, 2013
Test Run Number:	1

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	106	0.1000
A2	0.0150	106	0.1225
A3	0.0150	106	0.1225
A4	0.0150	106	0.1225
A Center	0.0150	106	0.1225
B1	0.0100	103	0.1000
B2	0.0150	103	0.1225
B3	0.0150	102	0.1225
B4	0.0125	102	0.1118
B Center	0.0150	104	0.1225
Averages	0.01375	104.43	0.1155

Tunnel Diameter	**8.000**	inches
Tunnel Static	**-0.058**	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9432	factor
Baro. Pressure	30.09	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.924	Ft/ Sec
Initial Flow	**149.83**	Ft3/min

VS (1)	0.011357553		
VS (2)	0.013767812	STD Tunnel Flow:	150.84

470				556.284375	74.744	61.659	7.87	99.97	99.98
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	411.0		0.015	565.5			7.936		
10	391.3		0.015	566.2	1.605	1.230	7.941	101.79	94.60
20	366.5		0.015	561.8	1.582	1.352	7.910	99.97	103.53
30	349.1		0.015	563.5	1.564	1.379	7.922	99.01	105.80
40	338.5		0.015	564.1	1.556	1.395	7.926	98.54	107.09
50	327.0		0.015	562.9	1.552	1.241	7.917	98.17	95.13
60	324.1		0.015	564.6	1.548	1.365	7.929	98.06	104.82
70	320.1		0.015	563.5	1.569	1.333	7.922	99.28	102.29
80	321.9		0.015	567.6	1.608	1.240	7.950	102.14	95.49
90	336.0		0.015	567.7	1.531	1.272	7.951	97.25	97.95
100	346.8		0.015	570.4	1.536	1.300	7.970	97.82	100.37
110	357.8		0.015	570.6	1.522	1.352	7.971	96.91	104.40
120	358.9		0.015	567.4	1.623	1.287	7.949	103.06	99.10
130	358.5		0.015	567.4	1.615	1.323	7.949	102.56	101.84
140	361.4		0.015	567.9	1.623	1.298	7.953	103.13	99.93
150	367.6		0.015	567.7	1.599	1.321	7.951	101.56	101.68
160	369.2		0.015	564.4	1.594	1.320	7.928	100.95	101.32
170	369.0		0.015	563.8	1.592	1.218	7.924	100.79	93.44
180	371.2		0.015	562.2	1.596	1.289	7.913	100.88	98.81
190	373.1		0.015	559.51	1.594	1.265	7.894	100.50	96.71
200	371.2		0.015	558.1	1.590	1.434	7.884	100.14	109.47
210	366.0		0.015	557.22	1.592	1.355	7.877	100.19	103.35
220	360.9		0.015	554.91	1.593	1.304	7.861	100.04	99.24
230	358.7		0.015	553.83	1.597	1.283	7.853	100.20	97.62
240	357.9		0.015	554.42	1.600	1.318	7.858	100.44	100.27
250	355.9		0.015	553.4	1.599	1.342	7.850	100.27	102.06
260	354.3		0.015	551.9	1.597	1.346	7.840	100.05	102.20

270	353.2		0.015	552.88	1.596	1.321	7.847	100.02	100.40
280	351.1		0.015	551.26	1.597	1.305	7.835	99.94	99.05
290	349.5		0.015	550.95	1.603	1.293	7.833	100.30	98.12
300	347.4		0.015	550.44	1.595	1.279	7.829	99.75	96.99
310	345.1		0.015	548.83	1.596	1.280	7.818	99.67	96.93
320	343.7		0.015	548.59	1.603	1.283	7.816	100.08	97.15
330	342.8		0.015	549.19	1.601	1.272	7.820	100.02	96.35
340	341.4		0.015	548.01	1.599	1.311	7.812	99.77	99.20
350	340.9		0.015	547.72	1.597	1.292	7.810	99.63	97.73
360	339.9		0.015	547.94	1.603	1.302	7.812	100.02	98.52
370	338.1		0.015	548.59	1.609	1.376	7.816	100.45	104.19
380	338.4		0.015	547.93	1.596	1.318	7.812	99.57	99.72
390	339.4		0.015	546.63	1.592	1.293	7.802	99.20	97.72
400	339.4		0.015	546.95	1.601	1.319	7.805	99.81	99.72
410	339.2		0.015	546.04	1.604	1.340	7.798	99.92	101.23
420	337.7		0.015	547.45	1.594	1.336	7.808	99.42	101.06
430	334.6		0.015	545.26	1.597	1.311	7.792	99.40	98.95
440	333.2		0.015	546.46	1.595	1.359	7.801	99.37	102.69
450	331.5		0.015	546.14	1.598	1.291	7.799	99.59	97.51
460	329.6		0.015	545.32	1.600	1.307	7.793	99.58	98.65
470	327.3	327.28	0.015	546.58	1.597	1.303	7.802	99.51	98.45

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
Sample ID Number:	**101440749MTL-003**
Test Date:	**December 2, 2013**
Test Run Number:	**1**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.5	to	5.5

Average Firebox Temp, ℉	419.58

Final Coal Bed Wt, lb	5.35

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	83.84	183.5	616.6	699.9	539.8	701.6	572.2	582.4			8.48	**2.96**
1	10	82.96	128.1	463.3	641.3	545.8	677.6	567.7	583.3			7.33	1.15
2	20	80.03	113.4	383.4	558.4	529.8	640.8	538	559.7			6.69	0.64
3	30	79.91	104.3	332.3	479	503.8	605.2	504.1	535			6.35	0.34
4	40	79.19	104.5	297	417.2	488	561.9	471.9	506.1			6.10	0.25
5	50	84.47	106.6	281.4	376.2	469.7	533.2	450.7	483.4			5.86	0.24
6	60	83.34	99.46	256	344.4	463.6	503.9	425.7	457.8			5.67	0.19
7	70	79.53	98.06	245.1	320.9	453	479.7	408.3	436			5.35	0.32

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 2, 2013
Test Run Number: 1

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	9		120	
B - Rear Filter Catch	Filter	10		119.3	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			288.8	239.3	49.5
Probe & Filter Holder	Probe	21	136039.4	136037.7	1.7
			Total Particulate, mg		**51.2**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	11		118.6	
B - Rear Filter Catch	Filter	12		118.9	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			279.5	237.5	42
Probe & Filter Holder	Probe	22	139572.8	139570.0	2.8
			Total Particulate, mg		**44.8**

Manufacturer:	SBI
Model:	NG1800
Date:	12/02/13
Run:	1
Control #:	G101440749
Test Duration:	**470 min**

	HHV	LHV
Eff	**64.58%**	**69.80%**
Comb Eff	**85.95%**	**85.95%**
HT Eff	**75.13%**	**81.21%**
Output	**13,684**	**kJ/h**
Burn Rate	**1.07**	**kg/h**
Grams CO	**1,663**	**g**
Input	**21,190**	**kJ/h**
MC wet	**16.85**	

Overall Heating Efficiency:	64.58%
Combustion Efficiency:	85.95%
Heat Transfer Efficiency:	75.13%

Heat Output:	12,981	Btu/h	
Heat Input:	20,101	Btu/h	
Burn Duration:	7.83	h	
Burn Rate:	2.36	lb/h	
Stack Temp:	257.7	Deg. F	

Ultimate CO_2

$CO_{2\text{-ult}}$ 19.64

F_0

1.060

Averages	**1.33**	**5.12**	**2.26**	**20.51**	**14.73**	**125.31**	**26.10**	**82.4%**	**75.8%**	**62.5%**
INPUT DATA			**Oxygen Calculation**			**Input Data**		**Combust**	**Heat**	**Net**
Elapsed Time	**Weight Remainin**	**% CO [e]**	**% CO_2 [d]**	**Excess Air EA**	**Total O_2**	**Calc. % O_2 [g]**	**Flue Gas (ºC)**	**Room Temp (ºC)**	**Eff %**	**Transfer %**	**Eff %**
0	10.08	1.49	2.13	442.6%	20.70	17.83	121.5	27.5	68.1%	63.5%	43.3%
10	9.62	0.81	1.60	715.1%	20.78	18.78	121.5	29.2	74.6%	56.5%	42.2%
20	9.29	0.88	2.68	451.8%	20.70	17.58	125.8	29.1	81.0%	67.4%	54.6%
30	8.87	1.04	3.97	292.1%	20.61	16.12	136.3	29.4	83.7%	72.3%	60.5%
40	8.45	0.90	4.43	268.5%	20.59	15.71	142.7	29.5	86.8%	73.1%	63.4%
50	8.11	1.12	4.66	239.8%	20.56	15.34	134.4	29.9	84.7%	74.8%	63.4%
60	7.70	0.95	4.86	238.1%	20.56	15.22	146.9	30.2	87.1%	73.9%	64.4%
70	7.36	1.15	5.48	196.3%	20.50	14.45	141.3	30.0	86.2%	76.0%	65.5%
80	6.88	0.71	8.88	104.8%	20.31	11.07	166.9	29.5	94.1%	78.8%	74.2%
90	6.47	0.79	7.50	136.9%	20.39	12.50	163.9	30.0	92.4%	77.4%	71.6%
100	6.03	0.69	9.07	101.3%	20.30	10.88	177.2	30.1	94.4%	78.3%	73.9%
110	5.61	0.71	7.53	138.4%	20.40	12.51	173.5	30.9	93.2%	76.7%	71.5%
120	5.24	0.73	7.35	143.1%	20.41	12.69	169.2	28.6	92.9%	76.6%	71.1%
130	4.86	0.67	8.15	122.7%	20.36	11.87	171.4	29.7	94.0%	77.7%	73.0%
140	4.45	0.64	8.76	109.0%	20.32	11.24	178.3	28.5	94.6%	77.8%	73.6%
150	4.05	0.68	8.22	120.7%	20.35	11.79	176.4	27.8	93.9%	77.2%	72.5%
160	3.69	0.79	7.70	131.4%	20.38	12.28	167.5	26.2	92.6%	77.1%	71.4%
170	3.33	1.28	7.22	131.1%	20.38	12.52	159.1	26.5	87.9%	76.9%	67.6%
180	3.01	1.29	6.87	140.7%	20.40	12.89	151.9	28.3	87.3%	77.2%	67.4%
190	2.73	1.26	6.07	168.0%	20.46	13.76	145.0	25.7	86.2%	76.3%	65.8%
200	2.56	1.45	5.23	194.1%	20.50	14.54	135.1	26.5	82.7%	75.6%	62.5%
210	2.43	1.54	5.10	195.8%	20.50	14.63	127.1	28.2	81.5%	76.4%	62.3%
220	2.29	1.56	5.22	189.7%	20.49	14.49	122.1	27.0	81.6%	77.1%	63.0%
230	2.16	1.61	5.09	193.2%	20.50	14.60	118.9	25.4	80.8%	77.0%	62.3%
240	2.06	1.70	4.76	204.1%	20.51	14.90	115.5	27.4	79.0%	76.9%	60.8%
250	1.95	1.78	4.67	204.5%	20.51	14.95	112.3	27.3	78.0%	77.1%	60.1%
260	1.84	1.77	4.82	198.1%	20.50	14.80	111.1	25.1	78.6%	77.3%	60.7%
270	1.75	1.87	4.61	203.1%	20.51	14.97	109.6	27.2	77.0%	77.2%	59.5%
280	1.64	1.65	4.74	207.4%	20.52	14.95	107.9	26.0	79.4%	77.7%	61.7%
290	1.55	1.67	4.67	209.8%	20.52	15.02	107.2	24.9	79.0%	77.5%	61.2%
300	1.45	1.67	4.41	223.1%	20.54	15.29	105.3	25.4	78.2%	77.2%	60.3%
310	1.35	1.51	4.49	227.4%	20.54	15.30	104.1	23.2	80.0%	77.3%	61.9%
320	1.25	1.56	4.37	231.2%	20.55	15.40	102.6	22.8	79.1%	77.2%	61.1%
330	1.16	1.68	4.29	229.0%	20.55	15.42	101.3	24.6	77.7%	77.3%	60.0%
340	1.07	1.58	4.41	227.9%	20.54	15.34	101.2	23.2	79.0%	77.5%	61.3%
350	0.97	1.58	4.33	232.4%	20.55	15.43	100.9	22.4	78.8%	77.3%	60.9%
360	0.89	1.65	3.97	249.5%	20.57	15.77	99.7	23.0	76.8%	76.5%	58.7%
370	0.81	1.54	4.54	223.1%	20.54	15.23	99.0	24.3	79.9%	78.3%	62.5%
380	0.70	1.58	4.29	234.6%	20.55	15.47	98.4	23.8	78.6%	77.7%	61.1%
390	0.62	1.58	4.19	240.4%	20.56	15.58	98.9	21.9	78.3%	77.1%	60.4%
400	0.52	1.65	4.02	246.4%	20.57	15.72	97.9	22.9	76.9%	76.9%	59.2%
410	0.43	1.60	4.11	244.0%	20.56	15.65	97.7	21.2	77.8%	77.0%	59.9%
420	0.34	1.64	3.62	273.4%	20.59	16.15	96.7	23.4	75.4%	76.0%	57.3%
430	0.26	1.52	4.01	255.2%	20.57	15.80	96.2	20.7	78.2%	76.9%	60.2%
440	0.20	1.56	3.81	265.8%	20.59	16.00	95.8	21.9	77.0%	76.5%	59.0%
450	0.11	1.56	3.71	272.7%	20.59	16.10	94.7	22.4	76.6%	76.5%	58.6%
460	0.03	1.59	3.54	282.9%	20.60	16.27	94.1	21.1	75.6%	75.8%	57.3%
470	0.00	1.55	3.46	292.1%	20.61	16.37	92.8	23.1	75.6%	76.1%	57.6%

Air Fuel Ratio (A/F)		
Dry Molecular Weight (M_d)	29.41	
Dry Moles Exhaust Gas (N_r):	547.28	%HC
Air Fuel Ratio (A/F)	15.58	1.32

Combustion Efficiency:	85.95%	
Total Input (kJ):	165,991	157,434
Total Output (kJ):	107,191	101,665
Efficiency:	64.58%	
Total CO (g):	1662.81	

13,684 kJ/h

21,190 kJ/h

1.070 kg/h

125.4 Deg. C

18.89	3.30	67.30	2.74	67.29	166291	4.06	6.87	2.74	19810.00	16.85	78.82
Air Fuel Ratio	Wet Wt Now Wt	% Wet Consume x	Dry Wt. Now Wt_{dn}	% Dry Comsume y	Total Input	Fuel Properties Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value	Mw Moisture Fuel	[h]
30.7	10.08	0.00	8.38	0.00	0	4.06	6.87	2.74	19810.00	16.85	78.55
47.0	9.62	4.55	8.00	4.55	10276	4.06	6.87	2.74	19810.00	16.85	78.81
32.1	9.29	7.83	7.72	7.83	6166	4.06	6.87	2.74	19810.00	16.85	78.86
22.9	8.87	11.98	7.38	11.98	6876	4.06	6.87	2.74	19810.00	16.85	78.87
21.6	8.45	16.12	7.03	16.12	6241	4.06	6.87	2.74	19810.00	16.85	78.96
19.8	8.11	19.50	6.75	19.50	6241	4.06	6.87	2.74	19810.00	16.85	78.88
19.9	7.70	23.64	6.40	23.64	6166	4.06	6.87	2.74	19810.00	16.85	78.97
17.3	7.36	26.92	6.12	26.92	6689	4.06	6.87	2.74	19810.00	16.85	78.92
12.2	6.88	31.70	5.72	31.70	7362	4.06	6.87	2.74	19810.00	16.85	79.34
14.1	6.47	35.79	5.38	35.79	7063	4.06	6.87	2.74	19810.00	16.85	79.21
12.0	6.03	40.21	5.01	40.21	7100	4.06	6.87	2.74	19810.00	16.85	79.36
14.2	5.61	44.35	4.66	44.35	6502	4.06	6.87	2.74	19810.00	16.85	79.25
14.4	5.24	48.04	4.35	48.04	6128	4.06	6.87	2.74	19810.00	16.85	79.23
13.3	4.86	51.73	4.04	51.73	6465	4.06	6.87	2.74	19810.00	16.85	79.31
12.5	4.45	55.83	3.70	55.83	6689	4.06	6.87	2.74	19810.00	16.85	79.36
13.2	4.05	59.79	3.37	59.79	6241	4.06	6.87	2.74	19810.00	16.85	79.31
13.7	3.69	63.35	3.07	63.35	5979	4.06	6.87	2.74	19810.00	16.85	79.23
13.6	3.33	67.00	2.77	67.00	5643	4.06	6.87	2.74	19810.00	16.85	78.98
14.1	3.01	70.15	2.50	70.15	4933	4.06	6.87	2.74	19810.00	16.85	78.95
15.7	2.73	72.94	2.27	72.94	3699	4.06	6.87	2.74	19810.00	16.85	78.91
17.1	2.56	74.61	2.13	74.61	2466	4.06	6.87	2.74	19810.00	16.85	78.78
17.1	2.43	75.91	2.02	75.91	2242	4.06	6.87	2.74	19810.00	16.85	78.73
16.8	2.29	77.31	1.90	77.31	2242	4.06	6.87	2.74	19810.00	16.85	78.73
17.0	2.16	78.61	1.79	78.61	1906	4.06	6.87	2.74	19810.00	16.85	78.70
17.5	2.06	79.60	1.71	79.60	1682	4.06	6.87	2.74	19810.00	16.85	78.64
17.5	1.95	80.64	1.62	80.64	1756	4.06	6.87	2.74	19810.00	16.85	78.60
17.2	1.84	81.72	1.53	81.72	1682	4.06	6.87	2.74	19810.00	16.85	78.61
17.4	1.75	82.67	1.45	82.67	1682	4.06	6.87	2.74	19810.00	16.85	78.55
17.7	1.64	83.75	1.36	83.75	1644	4.06	6.87	2.74	19810.00	16.85	78.66
17.9	1.55	84.65	1.29	84.65	1569	4.06	6.87	2.74	19810.00	16.85	78.64
18.6	1.45	85.64	1.20	85.64	1644	4.06	6.87	2.74	19810.00	16.85	78.63
18.9	1.35	86.63	1.12	86.63	1644	4.06	6.87	2.74	19810.00	16.85	78.70
19.1	1.25	87.62	1.04	87.62	1569	4.06	6.87	2.74	19810.00	16.85	78.67
18.9	1.16	88.52	0.96	88.52	1457	4.06	6.87	2.74	19810.00	16.85	78.61
18.9	1.07	89.37	0.89	89.37	1532	4.06	6.87	2.74	19810.00	16.85	78.67
19.2	0.97	90.36	0.81	90.36	1457	4.06	6.87	2.74	19810.00	16.85	78.66
20.1	0.89	91.13	0.74	91.13	1345	4.06	6.87	2.74	19810.00	16.85	78.61
18.7	0.81	91.99	0.67	91.99	1569	4.06	6.87	2.74	19810.00	16.85	78.69
19.3	0.70	93.02	0.58	93.02	1569	4.06	6.87	2.74	19810.00	16.85	78.66
19.6	0.62	93.88	0.51	93.88	1495	4.06	6.87	2.74	19810.00	16.85	78.65
19.9	0.52	94.82	0.43	94.82	1569	4.06	6.87	2.74	19810.00	16.85	78.61
19.8	0.43	95.77	0.35	95.77	1457	4.06	6.87	2.74	19810.00	16.85	78.64
21.4	0.34	96.58	0.29	96.58	1345	4.06	6.87	2.74	19810.00	16.85	78.59
20.5	0.26	97.39	0.22	97.39	999	4.06	6.87	2.74	19810.00	16.85	78.67
21.0	0.20	98.06	0.19	97.78	1097	4.06	6.87	2.74	19810.00	16.85	78.63
21.4	0.11	98.87	0.11	98.71	1541	4.06	6.87	2.74	19810.00	16.85	78.63
21.9	0.03	99.68	0.03	99.64	1371	4.06	6.87	2.74	19810.00	16.85	78.60
22.5	0.00	100.00	0.00	100.00	300	4.06	6.87	2.74	19810.00	16.85	78.62

Moisture Content M_{Cwb}: 16.85

	Moisture of Wood (wet basis):	16.85	Dry kg :	8.38
(Btu)	Initial Dry Weight Wt_{do} (kg):	8.38	CA:	48.73
(Btu)	Moisture Content Dry	20.26	HY:	6.87
			OX:	43.9

Load Weight (kg):	**10.08**				
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**
Value in kJ/kg - CV:	**19,810**	**18,329**	Btu/lb	**8522.5**	**7885.2**

20.91	**1.63**	**5.26**	**0.17**	**0.16**	**30.87**	**99.72**	**8.82**	**1.12**	**517.81**	**32.27**	**11.26**
Mass Balance (moles/100 mole dry flue gas)				**kg Wood per 100 mole**	**Moles per kg of Dry Wood**						**Moisture Present**
[u]	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**	**HC**	**N_2**	**H_2O**	
20.84	0.94	2.84	0.19	0.09	22.83	191.02	15.97	2.02	841.79	30.48	11.26
20.91	0.62	1.94	0.09	0.06	26.14	306.78	13.23	1.44	1287.74	31.65	11.26
20.92	0.90	2.90	0.10	0.09	29.88	196.09	9.81	1.11	879.31	32.29	11.26
20.92	1.26	4.09	0.13	0.13	31.55	128.10	8.26	1.00	626.77	32.53	11.26
20.94	1.34	4.39	0.11	0.13	33.26	117.93	6.76	0.80	592.84	32.93	11.26
20.92	1.46	4.73	0.14	0.15	32.13	105.77	7.72	0.96	543.94	32.61	11.26
20.95	1.46	4.78	0.11	0.15	33.48	104.87	6.54	0.79	544.04	32.95	11.26
20.93	1.67	5.44	0.14	0.17	33.01	87.04	6.93	0.87	475.47	32.78	11.26
21.04	2.38	8.01	0.09	0.24	37.46	46.70	2.99	0.36	334.65	33.80	11.26
21.01	2.06	6.90	0.10	0.21	36.50	60.83	3.85	0.46	385.55	33.60	11.26
21.05	2.42	8.16	0.08	0.24	37.61	45.11	2.86	0.34	329.05	33.83	11.26
21.02	2.05	6.87	0.08	0.20	36.92	61.35	3.48	0.41	388.59	33.71	11.26
21.02	2.01	6.74	0.09	0.20	36.73	63.43	3.65	0.43	395.97	33.66	11.26
21.04	2.19	7.37	0.08	0.22	37.38	54.45	3.07	0.36	363.74	33.80	11.26
21.05	2.33	7.86	0.08	0.23	37.73	48.41	2.76	0.32	341.83	33.87	11.26
21.04	2.21	7.44	0.08	0.22	37.36	53.59	3.09	0.36	360.43	33.79	11.26
21.01	2.11	7.07	0.10	0.21	36.60	58.40	3.76	0.45	376.61	33.62	11.26
20.95	2.13	7.00	0.17	0.21	34.00	58.95	6.03	0.78	371.94	32.95	11.26
20.94	2.05	6.71	0.17	0.20	33.67	63.16	6.32	0.82	386.95	32.88	11.26
20.93	1.84	6.01	0.16	0.18	33.07	74.94	6.86	0.88	429.91	32.76	11.26
20.90	1.69	5.43	0.19	0.17	31.08	86.43	8.62	1.12	468.12	32.29	11.26
20.88	1.68	5.38	0.20	0.17	30.43	87.29	9.19	1.20	469.69	32.12	11.26
20.88	1.72	5.50	0.20	0.17	30.50	84.69	9.12	1.19	460.06	32.14	11.26
20.87	1.70	5.42	0.21	0.17	30.06	86.23	9.51	1.25	464.73	32.03	11.26
20.86	1.65	5.21	0.22	0.16	29.07	91.00	10.38	1.37	480.17	31.79	11.26
20.85	1.65	5.18	0.24	0.16	28.51	91.29	10.87	1.44	479.80	31.65	11.26
20.85	1.68	5.30	0.23	0.17	28.83	88.51	10.59	1.40	470.13	31.72	11.26
20.84	1.66	5.19	0.25	0.16	27.96	90.78	11.34	1.51	476.47	31.51	11.26
20.86	1.63	5.16	0.22	0.16	29.28	92.37	10.19	1.34	485.91	31.85	11.26
20.86	1.62	5.11	0.22	0.16	29.06	93.43	10.39	1.36	489.33	31.79	11.26
20.86	1.55	4.89	0.22	0.15	28.57	99.09	10.82	1.42	509.45	31.69	11.26
20.88	1.53	4.85	0.20	0.15	29.58	100.78	9.95	1.29	518.44	31.95	11.26
20.87	1.51	4.78	0.20	0.15	29.08	102.48	10.38	1.35	523.56	31.83	11.26
20.85	1.52	4.80	0.22	0.15	28.28	101.64	11.08	1.45	518.32	31.62	11.26
20.87	1.53	4.83	0.21	0.15	29.05	101.08	10.41	1.35	518.19	31.81	11.26
20.86	1.51	4.76	0.21	0.15	28.90	102.97	10.54	1.37	524.95	31.78	11.26
20.85	1.44	4.51	0.22	0.14	27.77	110.33	11.54	1.50	549.79	31.51	11.26
20.87	1.55	4.91	0.20	0.15	29.50	98.97	10.01	1.30	511.40	31.92	11.26
20.86	1.50	4.73	0.21	0.15	28.82	103.94	10.61	1.38	528.39	31.76	11.26
20.86	1.47	4.64	0.21	0.15	28.62	106.41	10.79	1.40	537.21	31.72	11.26
20.85	1.45	4.55	0.22	0.14	27.88	109.02	11.44	1.49	545.13	31.54	11.26
20.86	1.46	4.59	0.21	0.15	28.34	107.95	11.03	1.43	542.30	31.65	11.26
20.85	1.35	4.20	0.21	0.13	26.99	120.45	12.23	1.59	586.02	31.34	11.26
20.87	1.41	4.45	0.20	0.14	28.58	112.65	10.83	1.40	560.68	31.73	11.26
20.86	1.37	4.31	0.20	0.14	27.91	117.17	11.43	1.48	576.00	31.57	11.26
20.86	1.35	4.23	0.20	0.13	27.67	120.11	11.64	1.50	586.49	31.52	11.26
20.85	1.31	4.10	0.21	0.13	27.08	124.42	12.16	1.57	601.25	31.38	11.26
20.85	1.28	4.01	0.20	0.13	27.11	128.28	12.14	1.56	615.88	31.40	11.26

											SUMS
398.46	**3945.58**	**2972.04**	**2890.76**	**2858.58**	**3792.29**	**3459.46**	**299.25**	**6020.28**	**13438.33**	**120871.17**	**68519.73**
Stack Temp K	**Heat Content Change - Ambient to Stack Temperature**						**Room Temp K**	**Energy Losses (kJ/kg**			
	Flue Gas Constituent							**Flue Gas Constit**			
	CO_2	**O_2**	**CO**	**N_2**	**CH_4**	**H_2O**		**CO_2**	**O_2**	**CO**	**N_2**
394.65	3726.15	2812.93	2737.51	2706.72	3567.87	3276.55	300.61	85.05	537.34	4561.76	2278.50
394.65	3659.16	2761.31	2687.02	2656.85	3506.00	3216.04	302.36	95.66	847.11	3780.84	3421.33
398.93	3839.22	2894.60	2816.09	2784.60	3684.20	3370.32	302.24	114.73	567.60	2804.60	2448.53
409.43	4259.48	3204.01	3115.28	3080.83	4103.80	3727.81	302.58	134.38	410.42	2364.61	1930.99
415.87	4522.92	3397.42	3302.17	3265.90	4368.02	3951.07	302.68	150.43	400.67	1934.53	1936.15
407.59	4167.00	3135.38	3048.78	3015.02	4012.65	3648.31	303.01	133.90	331.62	2209.13	1639.99
420.04	4672.87	3506.49	3407.30	3370.06	4520.65	4076.58	303.30	156.46	367.71	1874.45	1833.45
414.43	4443.91	3338.75	3245.31	3209.63	4290.24	3883.09	303.18	146.71	290.60	1983.11	1526.08
440.04	5539.50	4139.86	4018.58	3975.54	5396.13	4806.61	302.61	207.49	193.34	859.54	1330.42
437.04	5393.14	4032.60	3914.98	3872.94	5248.93	4682.86	303.12	196.87	245.30	1103.20	1493.21
450.32	5949.60	4436.14	4303.65	4258.09	5817.98	5146.78	303.29	223.75	200.13	821.94	1401.12
446.65	5764.84	4301.00	4173.20	4128.88	5631.56	4990.98	304.04	212.85	263.85	999.73	1604.43
442.37	5671.90	4237.52	4113.05	4069.07	5527.95	4919.51	301.73	208.35	268.79	1047.49	1611.24
444.59	5724.41	4273.78	4147.51	4103.31	5585.64	4960.49	302.82	213.97	232.72	882.35	1492.52
451.48	6062.96	4521.13	4386.22	4339.76	5927.81	5245.56	301.63	228.77	218.87	792.21	1483.45
449.59	6009.91	4484.02	4350.82	4304.61	5870.59	5203.42	300.92	224.52	240.31	888.01	1551.52
440.65	5689.30	4254.17	4130.12	4085.76	5536.91	4940.21	299.37	208.25	248.43	1078.27	1538.76
432.26	5323.00	3987.05	3872.47	3830.52	5165.56	4632.55	299.69	180.99	235.05	1729.18	1424.73
425.04	4952.29	3713.67	3608.00	3568.70	4796.42	4316.51	301.46	166.74	234.54	1811.99	1380.93
418.15	4764.42	3580.01	3479.93	3441.65	4598.66	4163.86	298.85	157.55	268.29	1966.42	1479.59
408.21	4322.42	3254.27	3164.86	3129.72	4158.07	3787.37	299.61	134.34	281.25	2465.69	1465.09
400.26	3927.45	2960.83	2880.45	2848.26	3769.52	3447.33	301.37	119.50	258.45	2626.46	1337.79
395.26	3768.42	2844.74	2768.44	2737.31	3608.56	3313.57	300.16	114.95	240.91	2605.02	1259.31
392.04	3699.73	2795.82	2721.56	2690.80	3536.34	3257.68	298.50	111.21	241.09	2716.42	1250.49
388.65	3482.89	2632.73	2562.98	2533.98	3327.41	3067.93	300.55	101.23	239.59	2964.20	1216.73
385.43	3355.79	2538.48	2471.68	2443.62	3201.98	2958.78	300.44	95.67	231.74	3101.96	1172.46
384.26	3390.91	2566.90	2499.80	2471.32	3231.43	2992.58	298.28	97.75	227.20	3022.10	1161.84
382.71	3250.16	2460.10	2395.73	2368.45	3097.85	2867.98	300.31	90.88	223.34	3237.07	1128.50
381.09	3230.18	2446.46	2382.81	2355.60	3075.55	2852.63	299.12	94.59	225.99	2908.87	1144.62
380.32	3240.42	2455.22	2391.59	2364.22	3083.12	2863.21	298.02	94.16	229.40	2965.40	1156.88
378.48	3145.93	2384.30	2322.68	2296.07	2991.74	2780.76	298.55	89.89	236.27	3087.27	1169.73
377.26	3181.89	2413.37	2351.44	2324.40	3021.95	2815.33	296.31	94.11	243.22	2838.33	1205.06
375.76	3134.33	2378.26	2317.46	2290.77	2974.69	2774.73	295.97	91.15	243.71	2962.02	1199.35
374.48	3014.23	2286.87	2228.34	2202.69	2861.27	2668.01	297.76	85.26	232.44	3159.27	1141.69
374.32	3061.12	2323.24	2263.98	2237.88	2904.04	2710.74	296.36	88.93	234.83	2968.93	1159.65
374.04	3079.13	2337.44	2277.95	2251.66	2919.95	2727.51	295.59	88.98	240.69	3007.98	1182.00
372.82	3007.13	2283.10	2225.06	2199.37	2850.99	2664.21	296.18	83.50	251.89	3291.56	1209.19
372.15	2930.64	2224.72	2168.09	2143.07	2779.15	2595.97	297.48	86.47	220.17	2853.94	1095.97
371.59	2927.11	2222.55	2166.10	2141.08	2774.68	2593.62	296.99	84.36	231.01	3026.63	1131.33
372.09	3020.77	2294.38	2236.28	2210.41	2861.89	2677.71	295.06	86.45	244.14	3078.13	1187.44
371.09	2944.25	2236.28	2179.66	2154.44	2789.34	2609.92	296.01	82.08	243.79	3263.03	1174.46
370.87	2997.52	2277.67	2220.23	2194.49	2837.79	2658.56	294.38	84.96	245.87	3147.05	1190.08
369.87	2874.04	2183.27	2128.08	2103.44	2722.12	2548.17	296.56	77.58	262.97	3486.86	1232.66
369.32	2954.97	2246.36	2189.96	2164.52	2795.26	2622.39	293.85	84.46	253.05	3089.56	1213.60
368.98	2896.91	2201.82	2146.44	2121.53	2741.23	2570.25	295.02	80.85	257.98	3258.28	1222.00
367.82	2828.18	2149.86	2095.86	2071.52	2675.58	2509.70	295.59	78.27	258.21	3317.35	1214.93
367.26	2856.01	2171.91	2117.56	2092.93	2699.95	2535.76	294.28	77.33	270.23	3467.52	1258.36
365.98	2729.32	2075.24	2023.24	1999.72	2580.88	2422.79	296.26	73.98	266.21	3460.90	1231.59

			AVERAGE	SUMS						
48239.23	73506.97	25630.02	7421.37	58799.94	23325.98	35474.0	107490.7	23326.0	1662.8	117.2
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel	Rate	Loss	Loss 1	Latent	Output	Loss 2	CO	HC
1805.46	1440.15	531.90	11240.16	0.00	0	0.00	0	0	0.00	0.00
1282.95	1493.47	531.22	11452.58	5940.96	2606	3335.21	4335	2606	192.23	11.92
996.56	1528.72	532.96	8993.71	2799.26	1173	1626.04	3367	1173	85.52	5.55
893.05	1551.35	536.98	7821.78	2714.84	1120	1594.51	4161	1120	80.32	5.55
711.36	1578.11	539.49	7250.75	2284.13	825	1458.74	3956	825	59.60	4.01
854.49	1552.87	536.08	7258.08	2286.44	956	1329.96	3954	956	68.12	4.82
702.61	1583.20	540.91	7058.79	2197.02	794	1402.97	3969	794	57.04	3.91
778.06	1568.73	538.73	6832.02	2306.87	923	1383.40	4382	923	65.50	4.70
323.66	1648.61	549.13	5112.18	1899.74	434	1465.24	5462	434	31.16	2.15
414.25	1634.57	547.73	5635.14	2009.03	535	1474.27	5054	535	38.38	2.64
308.62	1661.77	552.95	5170.28	1853.06	400	1452.99	5247	400	28.71	1.98
366.18	1650.20	551.20	5648.44	1853.95	443	1411.15	4648	443	31.99	2.15
384.94	1645.74	550.40	5716.94	1768.59	438	1330.83	4360	438	31.60	2.13
322.76	1653.91	550.86	5349.09	1745.61	388	1357.15	4719	388	28.08	1.88
290.28	1667.13	554.07	5234.78	1767.55	361	1406.77	4921	361	26.06	1.75
326.39	1661.74	553.59	5446.08	1715.62	378	1337.97	4525	378	27.26	1.84
406.17	1644.12	550.63	5674.62	1712.68	443	1270.10	4266	443	31.74	2.19
701.77	1601.66	547.17	6420.55	1828.81	685	1144.19	3814	685	48.07	3.57
733.85	1587.76	543.61	6459.41	1608.37	627	981.13	3324	627	44.08	3.27
787.40	1576.96	541.89	6778.09	1265.79	509	756.74	2434	509	35.89	2.63
998.92	1541.99	537.65	7424.92	924.39	427	497.03	1542	427	30.04	2.22
1071.65	1523.25	533.82	7470.92	845.56	415	430.52	1397	415	29.12	2.17
1065.89	1519.54	532.32	7337.94	830.51	412	418.38	1412	412	28.89	2.16
1114.57	1512.59	531.69	7478.06	719.42	366	353.77	1186	366	25.61	1.92
1221.15	1495.26	529.55	7767.71	659.37	353	306.74	1022	353	24.67	1.86
1283.84	1485.19	528.32	7899.18	700.33	386	314.28	1056	386	26.97	2.04
1251.31	1489.68	528.70	7778.59	660.29	360	300.17	1021	360	25.16	1.90
1346.44	1475.74	527.30	8029.26	681.57	386	295.20	1000	386	26.96	2.05
1194.45	1491.18	527.13	7586.83	629.70	338	291.49	1015	338	23.69	1.78
1218.69	1488.98	527.25	7680.75	608.52	329	279.33	961	329	23.05	1.73
1266.37	1481.35	526.32	7857.20	652.14	359	293.23	992	359	25.15	1.88
1150.25	1494.62	526.71	7552.30	626.83	329	298.05	1017	329	23.12	1.71
1204.35	1487.65	526.25	7714.49	611.19	328	283.33	958	328	23.03	1.71
1295.85	1474.68	525.05	7914.23	582.23	326	256.60	875	326	22.82	1.71
1209.67	1485.05	525.53	7672.59	593.40	321	272.35	939	321	22.54	1.68
1224.73	1484.01	525.72	7754.11	570.45	309	261.12	887	309	21.72	1.61
1343.75	1469.56	525.01	8174.45	555.11	313	242.37	790	313	21.94	1.63
1160.50	1486.51	524.24	7427.80	588.48	316	272.43	981	316	22.20	1.65
1232.19	1478.96	524.21	7708.68	610.73	335	275.44	959	335	23.55	1.75
1251.93	1479.58	525.16	7852.83	592.53	325	267.93	902	325	22.80	1.69
1332.75	1468.98	524.39	8089.49	640.90	362	279.10	929	362	25.38	1.89
1281.21	1475.91	524.94	7950.02	584.86	324	261.19	873	324	22.73	1.69
1418.67	1458.07	523.70	8460.52	574.54	331	243.47	771	331	23.25	1.73
1248.32	1478.19	524.53	7891.70	398.15	217	180.69	601	217	15.30	1.13
1318.98	1469.16	523.95	8131.20	450.16	251.82	198.34	647	252	17.71	1.31
1341.89	1464.86	523.27	8198.77	637.62	360.14	277.48	903	360	25.34	1.87
1404.16	1459.19	523.56	8460.36	585.34	334.98	250.36	785	335	23.56	1.74
1395.94	1456.48	522.29	8407.39	127.29	73.10	54.19	173	73	5.15	0.38

Intertek Testing Services NA Ltd

Manufacturer:	SBI	**Technicians:**	_____
Model:	NG1800		_____
Date:	12/02/13		_____
Run:	1		_____
Control #:	G101440749		
Test Duration:	470		
Output Category:	2		

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	64.6%	69.8%
Combustion Efficiency	85.9%	85.9%
Heat Transfer Efficiency	75%	81.2%

Output Rate (kJ/h)	13,684	12,981	**(Btu/h)**
Burn Rate (kg/h)	1.07	2.36	**(lb/h)**
Input (kJ/h)	21,190	20,101	**(Btu/h)**

Test Load Weight (dry kg)	8.38	18.47	**dry lb**
MC wet (%)	16.85		
MC dry (%)	20.26		
Particulate (g)	50.017		
CO (g)	1,663		
Test Duration (h)	7.83		

Emissions	**Particulate**	**CO**
g/MJ Output	0.47	15.51
g/kg Dry Fuel	5.97	198.45
g/h	6.39	212.27
lb/MM Btu Output	1.08	36.05

Air/Fuel Ratio (A/F)	15.58

VERSION: 2.4 **15/04/2010**

Intertek

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 2, 2013
Test Run Number:	1

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:00	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	17	1.976	21.6	19.7	20.5
2	17	1.820	21.5	19.3	21.2
3	17	2.168	20.3	19.5	20.8
4	17	2.029	21.1	20.0	21.1
5	17	1.964	18.7	20.0	20.3
6	16	1.864	20.3	19.5	20.2
7	16	1.922	20.1	20.2	20.0
8	16	1.958	21.0	20.5	20.3
9	16	2.217	20.9	22.2	22.7
10	16	2.02	19.3	18.7	20.8
11	16	1.77	19.0	19.3	18.9
12	16	1.81	18.9	19.7	20.0
Total Weight		23.520	Average, %db		20.2

Allowable Fuel Load Range:	4.44	to	5.55

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.681		20.5	20.6	21.7
2	15	1.663		19.3	19.2	19.3
3	15	1.710		21.2	20.2	21.4
4	15		3.84	21.0	20.6	20.6
5	15		3.436	21.9	21.7	19.3
6	15		3.660	21.5	20.6	21.9
7	15	2.182		18.9	19.9	19.2
8	15	1.860		19.4	20.0	18.9
9	15	2.178		19.5	19.8	19.2
Totals		11.274	10.940			
% of Weight		50.8	49.2			
Total weight, wet, lb.		22.21		Average Moisture, dry		20.27
Total weight, dry, kg		8.38		Average Moisture, wet		16.85

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 25, 2013
Test Run Number:	1a

Dry Burn-Rate, kg/hr:	**1.08**	
Emission-Rate, g/hr:	**4.66**	
Adjusted Emission-Rate, g/hr :	**6.53**	
Duration of Test, Minutes	470	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	769.535	713.31
Dry Gas Meter Ending Reading, ft^3	842.783	772.635
Barometric Pressure Correction Factor	1.010	1.010
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.009	1.010
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**74.824**	**60.160**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**147.591**	
Total Tunnel Volume, scf	**69367.667**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	927.083	1153.045
Sample Particulate Mass, mg	38.5	32.4
Total Emissions, grams	35.693	37.359
Emission-Rate, g/hr	4.56	4.77
Adjusted Emission Rates, g/hr	**6.41**	**6.66**
Deviation, %	1.89%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	72.01	68.93
Post-Test Leak Check, cfm @ in. Hg vac.	0.004@5	0.000@5
Average Firebox Surface Temperture delta-T, ℉	97.56	
Maximum Ambient Temperture, ℉	84	
Mimimum Ambient Temperature, ℉	70	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.61	
Dry-Basis Fuel Load Moisture Content, %	20.97	
Wet-Basis Fuel Load Moisture Content, %	17.33	
Coal Bed Range, lb.	4.60	5.60
Actual Coal Bed, Lb.	5.12	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	November 25, 2013
Test Run No:	1a

Temperature Data

Firebox Temp Start	409.32
Firebox Temp End	311.76
Firebox Delta-T	**97.6**

Max Filter Temps	
Train A	Train B
72.01	**68.93**

Interval	10	Duration of Test, Min	**470**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	71.35	108	279.3	316.5	439	469.4	406.8	414.9		65.94	65.08	62.17	61.875
1	10	80.68	101.1	251.8	299.7	422.4	419	389.2	393.7		70.4	68.01	62.425	62.16
2	20	84.22	100.3	283.5	304.2	411	374.1	358.4	361.2		70.81	67.65	62.55	62.225
3	30	79.27	98.13	275	330.3	392.8	347.4	333	334.6		70.3	67.47	62.58	62.24
4	40	82.57	99.55	285.3	326.2	376.1	326.7	320.8	317.5		70.18	67.46	62.665	62.27
5	50	77.93	101.4	324.2	352.6	360	319.9	315.1	309.1		70.54	67.35	62.885	62.55
6	60	80.7	102.1	320.5	386.6	342.8	324.8	321.1	314.4		70.48	67.12	62.885	62.61
7	70	78.56	101.7	321.1	394.6	328.4	330	328.9	318.6		70.64	67.94	62.995	62.775
8	80	81.8	106	352.9	415	313.9	339.6	339.5	330.3		71.05	68.65	63.13	62.86
9	90	78.52	104.7	348.7	438.7	302.2	357.8	344.2	349.2		71.46	68.37	63.285	63.055
10	100	77.9	104.6	352.1	444.3	290.9	368.9	346.3	365		71.77	68.38	63.365	63.075
11	110	79.69	106.5	359	453.9	280.2	378.1	356	375.6		71.85	68.46	63.42	63.085
12	120	78.76	106.3	361.2	460	272.2	391.2	372.4	382.9		71.89	68.77	63.385	62.855
13	130	78.66	106.9	365.8	466.5	266.6	405.4	389.8	394		71.93	68.64	63.335	62.85
14	140	80.78	108.4	374.4	478.9	262.4	419.3	405	405.9		71.92	68.93	63.29	62.86
15	150	78.09	105.6	358	477.9	259.7	436	417.3	417.3		72.01	68.6	63.395	62.975
16	160	81.34	103.6	334.3	459.9	257.8	453.5	423.7	427.7		72	68.28	63.51	63.11
17	170	77.4	98.92	303	423.9	255.9	456.1	419.2	429		71.36	68.02	63.47	63.045
18	180	78.34	97.47	288.3	392.5	256.1	452.3	413.3	423.5		70.54	67.71	63.54	63.225
19	190	81.08	96.21	270.8	370.9	256	450.1	407.4	418.1		70.27	67.41	63.565	63.15

20	200	76.38	93.08	254.9	347.8	256.3	440.4	397.4	409.6		69.95	66.66	63.625	63.235
21	210	78.74	92.63	244.1	328.5	257.3	435	389.2	403.5		69.63	66.16	63.445	63.1
22	220	80.68	92.26	236.4	313.4	257.6	431.9	382.4	398.2		69.33	65.8	63.54	63.205
23	230	78.01	90.41	230.6	302.6	258.7	431.4	379	392.4		69.25	65.75	63.6	63.225
24	240	77.67	90.31	227.5	293.8	260.4	428.7	376.3	387.6		69.19	66	63.63	63.29
25	250	80.48	90.72	226.2	288.4	261.8	426.6	372.6	386.2		68.94	66.02	63.63	63.21
26	260	77.46	89.24	225.6	285.4	264.6	427.3	371.7	385.8		68.79	65.93	63.625	63.255
27	270	78.83	90.28	224.9	284.6	269	427	371.4	387.7		68.67	66.11	63.565	63.13
28	280	79.9	90.05	222.5	283.1	271.9	425.3	368.9	386.4		68.6	66	63.515	63.05
29	290	76.65	88.28	220.8	280.2	275	424.2	367.7	381.9		68.64	65.89	63.41	62.995
30	300	81.18	90.05	218.6	279.6	276.8	421.6	367.2	378.9		68.64	65.81	63.345	62.96
31	310	79.46	89.33	217.9	277.5	278.3	419.6	365.6	373.8		68.49	65.73	63.5	63.28
32	320	76.03	88.06	217.6	276.5	280.4	418.6	365	368.8		68.53	65.67	63.365	62.945
33	330	81.09	89.8	216	276.3	281.3	417.7	365.6	367		68.36	65.62	63.21	62.77
34	340	78.08	88.31	213.4	273	281.8	416.6	363.2	362.4		68.31	65.48	63.23	62.81
35	350	76.81	87.43	209.4	269.8	282.5	412	359.1	358.8		68.16	65.34	63.13	62.695
36	360	74.42	86.62	207.6	265.1	285.6	405.4	352.3	353.3		68.04	65.2	63.135	62.67
37	370	78.8	88.19	204.3	261.9	286.1	403.5	347.5	348.3		67.97	65.04	63.125	62.675
38	380	75.77	86.3	202.9	258.3	288.3	405.1	344.8	341.7		67.86	64.99	63.095	62.655
39	390	74.66	86.02	202.4	255.1	290.1	406.9	343.6	336.9		67.7	64.93	63.085	62.66
40	400	75.47	86.38	201.6	252.7	293.9	408.3	343.1	335.1		67.7	65.02	63.045	62.665
41	410	75.13	85.99	200.7	251	294.7	409.9	341.9	333.1		67.47	64.99	63.03	62.62
42	420	75.63	85.64	198.1	249.4	294.8	400.7	340.9	331.3		67.3	64.95	63.02	62.66
43	430	70.13	83.14	195.8	245.5	298.5	393.2	337.7	326		67.18	64.77	62.98	62.595
44	440	76.22	85.59	193.5	244.8	300.5	388.7	334.5	325		67.03	64.84	62.95	62.575
45	450	75.2	84.77	192.4	242.6	303.2	386.9	330.6	322.6		67.05	64.69	62.96	62.58
46	460	72.72	83.85	191.3	240	303.4	383.7	326.9	320.3		67.06	64.93	62.86	62.485
47	470	72.02	83.44	188.6	237.1	304.6	377.3	322.1	317.7		66.93	64.53	62.88	62.51

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 25, 2013
Test Run Number:	1a

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.27	50	Meter Box (A)	1.002
End	30.18	75	Meter Box (B)	0.994
Duration of Test, Min		470		

Leak Check, cfm @ in Hg	
Train A	Train B
0.004@5	0.000@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.015	0.00	0.00	0.055	22.61	22.61	769.535	713.310	99.96	99.96	0.00	0.00
10	0.015	0.00	0.00	0.058	21.55	1.06	771.096	714.545	100.93	98.57	0.00	0.00
20	0.015	0.00	0.00	0.063	20.68	0.87	772.646	715.841	100.12	103.35	0.00	0.00
30	0.015	0.00	0.00	0.060	19.65	1.03	774.184	717.063	99.15	97.26	0.00	0.00
40	0.015	0.00	0.00	0.063	18.76	0.89	775.726	718.314	99.52	99.69	0.00	0.00
50	0.015	0.00	0.00	0.070	17.70	1.06	777.253	719.515	98.67	95.81	0.00	0.00
60	0.015	0.00	0.00	0.068	16.71	0.99	778.803	720.748	100.22	98.41	0.00	0.00
70	0.015	0.00	0.00	0.070	15.77	0.94	780.359	721.961	100.55	96.75	0.00	0.00
80	0.015	0.00	0.00	0.073	14.69	1.08	781.917	723.298	101.04	107.03	0.00	0.00
90	0.015	0.00	0.00	0.073	13.61	1.08	783.466	724.609	100.31	104.79	0.00	0.00
100	0.015	0.00	0.00	0.073	12.65	0.96	785.010	725.835	99.96	97.99	0.00	0.00
110	0.015	0.00	0.00	0.075	11.62	1.03	786.564	727.061	100.77	98.15	0.00	0.00
120	0.015	0.00	0.00	0.075	10.49	1.13	788.145	728.371	102.51	104.90	0.00	0.00
130	0.015	0.00	0.00	0.075	9.41	1.08	789.651	729.584	97.71	97.19	0.00	0.00
140	0.015	0.00	0.00	0.078	8.27	1.14	791.194	730.872	100.25	103.33	0.00	0.00
150	0.015	0.00	0.00	0.073	7.30	0.97	792.739	732.118	100.11	99.69	0.00	0.00
160	0.015	0.00	0.00	0.070	6.58	0.72	794.285	733.342	99.98	97.73	0.00	0.00
170	0.015	0.00	0.00	0.065	6.06	0.52	795.834	734.582	99.76	98.61	0.00	0.00
180	0.015	0.00	0.00	0.063	5.68	0.38	797.384	735.828	99.68	98.93	0.00	0.00
190	0.015	0.00	0.00	0.058	5.32	0.36	798.934	737.075	99.56	98.91	0.00	0.00
200	0.015	0.00	0.00	0.055	5.01	0.31	800.494	738.317	99.91	98.22	0.00	0.00
210	0.015	0.00	0.00	0.055	4.81	0.20	802.055	739.553	99.97	97.73	0.00	0.00
220	0.015	0.00	0.00	0.053	4.60	0.21	803.617	740.782	99.98	97.12	0.00	0.00
230	0.015	0.00	0.00	0.050	4.41	0.19	805.180	741.989	99.87	95.22	0.00	0.00
240	0.015	0.00	0.00	0.050	4.16	0.25	806.743	743.263	99.85	100.48	0.00	0.00
250	0.015	0.00	0.00	0.050	3.92	0.24	808.304	744.546	99.76	101.25	0.00	0.00
260	0.015	0.00	0.00	0.050	3.68	0.24	809.867	745.819	99.76	100.31	0.00	0.00

270	0.015	0.00	0.00	0.050	3.45	0.23	811.421	747.094	99.29	100.59	0.00	0.00
280	0.015	0.00	0.00	0.050	3.27	0.18	812.990	748.369	100.23	100.59	0.00	0.00
290	0.015	0.00	0.00	0.050	3.08	0.19	814.551	749.651	99.58	100.99	0.00	0.00
300	0.015	0.00	0.00	0.048	2.89	0.19	816.119	750.919	100.20	100.05	0.00	0.00
310	0.015	0.00	0.00	0.048	2.69	0.20	817.681	752.226	99.72	103.00	0.00	0.00
320	0.015	0.00	0.00	0.048	2.51	0.18	819.243	753.487	99.64	99.32	0.00	0.00
330	0.015	0.00	0.00	0.048	2.29	0.22	820.816	754.767	100.53	101.01	0.00	0.00
340	0.015	0.00	0.00	0.048	2.09	0.20	822.388	756.044	100.32	100.63	0.00	0.00
350	0.015	0.00	0.00	0.048	1.95	0.14	823.960	757.320	100.26	100.49	0.00	0.00
360	0.015	0.00	0.00	0.045	1.76	0.19	825.525	758.595	99.74	100.34	0.00	0.00
370	0.015	0.00	0.00	0.045	1.61	0.15	827.095	759.867	100.20	100.25	0.00	0.00
380	0.015	0.00	0.00	0.045	1.42	0.19	828.661	761.138	99.78	100.00	0.00	0.00
390	0.015	0.00	0.00	0.045	1.26	0.16	830.233	762.383	100.14	97.93	0.00	0.00
400	0.015	0.00	0.00	0.045	1.06	0.20	831.801	763.675	99.93	101.66	0.00	0.00
410	0.015	0.00	0.00	0.045	0.86	0.20	833.361	764.939	99.38	99.43	0.00	0.00
420	0.015	0.00	0.00	0.045	0.71	0.15	834.938	766.213	100.44	100.18	0.00	0.00
430	0.015	0.00	0.00	0.043	0.54	0.17	836.511	767.485	99.96	99.80	0.00	0.00
440	0.015	0.00	0.00	0.043	0.41	0.13	838.079	768.757	99.87	100.03	0.00	0.00
450	0.015	0.00	0.00	0.043	0.24	0.17	839.649	770.045	99.92	101.21	0.00	0.00
460	0.015	0.00	0.00	0.043	0.11	0.13	841.214	771.434	99.54	109.08	0.00	0.00
470	0.015	0.00	0.00	0.040	0.00	0.11	842.783	772.635	99.75	94.27	0.00	0.00

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 25, 2013
Test Run Number:	1a

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0100	104	0.1000
A2	0.0150	104	0.1225
A3	0.0150	104	0.1225
A4	0.0125	104	0.1118
A Center	0.0150	104	0.1225
B1	0.0075	103	0.0866
B2	0.0150	103	0.1225
B3	0.0150	103	0.1225
B4	0.0125	102	0.1118
B Center	0.0150	106	0.1225
Averages	0.01325	103.66	0.1125

Tunnel Diameter	8.000	inches
Tunnel Static	-0.063	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9187	factor
Baro. Pressure	Start	
Pitot Factor	0.99	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.690	Ft/ Sec
Initial Flow	**146.47**	Ft3/min

VS (1)	0.011045089		
VS (2)	0.013737098	STD Tunnel Flow:	147.5907812

		Ending		554.2427083	74.79051325	60.13409117	7.630701809	99.96453015	99.96376709
470	Average	Average		Tunnel Temp,	STD Sample	STD Sample	Tunnel	Proportional	Proportional
Time	Firebox Temp	Firebox	Tunnel Delta-P	R	Ft3 (1)	Ft3 (2)	Velocity	Rate (1)	Rate (2)
0	409.32		0.015	568			7.725022136		
10	384.8		0.015	561.1	1.596289157	1.253471987	7.677957416	100.9303948	98.57137233
20	361.78		0.015	560.3	1.584661322	1.315220646	7.67248196	100.1237353	103.3534468
30	347.62		0.015	558.13	1.572302709	1.240087551	7.657610072	99.15032002	97.26040356
40	333.46		0.015	559.55	1.576135558	1.269443875	7.667345168	99.51837843	99.6894019
50	331.34		0.015	561.4	1.560146803	1.218053685	7.680009705	98.67154847	95.81172739
60	337.94		0.015	562.1	1.583646067	1.250364503	7.68479625	100.2201834	98.41458474
70	340.1		0.015	561.7	1.589441937	1.229694597	7.682061447	100.5511759	96.753239
80	347.66		0.015	566	1.59107422	1.355180873	7.711409752	101.0389742	107.0339406
90	358.42		0.015	564.7	1.581414599	1.328331919	7.702548801	100.3101574	104.7928226
100	363.08		0.015	564.6	1.576069019	1.24216069	7.701866768	99.96223161	97.98605072
110	368.76		0.015	566.5	1.586110036	1.242136943	7.714815099	100.7682101	98.1489079
120	375.74		0.015	566.3	1.613775843	1.327826418	7.713453141	102.5077651	104.9012399
130	384.46		0.015	566.9	1.537367879	1.229518204	7.717538296	97.70601609	97.18611635
140	394.3		0.015	568.4	1.575273991	1.305514558	7.727741736	100.2474677	103.3296099
150	401.64		0.015	565.6	1.576999393	1.262665715	7.70868439	100.1097785	99.69172821
160	404.52		0.015	563.6	1.577673459	1.240051352	7.695043105	99.97533909	97.73299289
170	396.82		0.015	558.92	1.58085571	1.256417292	7.663027603	99.76020468	98.61086449
180	387.54		0.015	557.47	1.58166477	1.262062406	7.653081093	99.68170688	98.92535486
190	380.5		0.015	556.21	1.581589247	1.263256375	7.64442741	99.56423792	98.90697759
200	370.3		0.015	553.08	1.591610651	1.257986799	7.622888051	99.91279034	98.21687155
210	362.7		0.015	552.63	1.593178582	1.252232657	7.619786332	99.97052248	97.72783775
220	356.7		0.015	552.26	1.593909917	1.244890842	7.617235083	99.98292574	97.12233211
230	352.82		0.015	550.41	1.594747581	1.22255965	7.604466001	99.86777725	95.22023565
240	349.36		0.015	550.31	1.594656214	1.290263071	7.60377517	99.85298357	100.4842523
250	347.12		0.015	550.72	1.592615707	1.299576637	7.60660718	99.76235509	101.2472778
260	346.96		0.015	549.24	1.594671441	1.289336542	7.59637934	99.75681388	100.3144293
270	347.94		0.015	550.28	1.585670767	1.291670774	7.603567908	99.2876332	100.5911408

280	347.12		0.015	550.05	1.601129376	1.291868334	7.601978714	100.2346283	100.5854987
290	345.8		0.015	548.28	1.593285116	1.299097548	7.589737696	99.5829472	100.9854956
300	344.82		0.015	550.05	1.600628667	1.28499683	7.601978714	100.2032827	100.05048
310	342.96		0.015	549.33	1.594031706	1.323709623	7.597001697	99.72496398	102.9972005
320	341.86		0.015	548.06	1.59444288	1.277939654	7.588214833	99.63531377	99.32085179
330	341.58		0.015	549.8	1.606147028	1.297629133	7.600250952	100.5258931	101.0110745
340	339.4		0.015	548.31	1.605064601	1.294488767	7.589945335	100.321929	100.6299844
350	336.44		0.015	547.43	1.605371421	1.293759654	7.583852218	100.2605536	100.4925661
360	332.34		0.015	546.62	1.598207545	1.292807569	7.578239451	99.73927558	100.3442938
370	329.46		0.015	548.19	1.603344288	1.289753331	7.589114744	100.2034368	100.2508927
380	327.64		0.015	546.3	1.599351053	1.288788689	7.576020915	99.78141884	100.0030745
390	326.52		0.015	546.02	1.605509528	1.262412721	7.574079164	100.1399653	97.93133465
400	326.62		0.015	546.38	1.601546731	1.310057536	7.57657561	99.92572003	101.6608654
410	326.12		0.015	545.99	1.593421271	1.281776553	7.57387109	99.38325775	99.43074725
420	323.42		0.015	545.64	1.610816275	1.291818318	7.571443133	100.4359942	100.1775889
430	320.18		0.015	543.14	1.606853391	1.289950769	7.554077893	99.95911947	99.80333774
440	318.7		0.015	545.59	1.601837671	1.290000138	7.571096219	99.87159314	100.0320096
450	317.18		0.015	544.77	1.603850162	1.306214057	7.565404552	99.92189415	101.2131592
460	314.86		0.015	543.85	1.599048128	1.408898457	7.559013677	99.53856506	109.0775302
470	311.76	311.76	0.015	543.44	1.603073832	1.218146932	7.556163829	99.75153784	94.27390838

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
Sample ID Number:	**101440749MTL-003**
Test Date:	**November 25, 2013**
Test Run Number:	**1a**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.6	to	5.6

Average Firebox Temp, °F: 417.32

Final Coal Bed Wt, lb	5.12

Interval	10

Time		Temperature Data												
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right		Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	84.89	235.6	817.4	762.5	498.1	710.3	571.1	515.2	611.44			8.96	3.84
1	0	84.43	131.1	487.3	675.8	532.4	707.3	581.2	537.4	606.82			7.62	1.34
2	0	81.52	115	413.8	579.6	549.4	664	560.2	524.2	575.48			6.79	0.83
3	0	78.84	103.7	363.2	519.5	515.5	620.1	532.8	502.5	538.08			6.29	0.50
4	0	76.12	102.3	315.8	457.7	487.5	575.8	498.7	479.8	499.9			5.86	0.43
5	0	72.61	102.8	288.8	394.8	472.2	550.7	464.4	467.2	469.86			5.49	0.37
6	0	70.54	92.79	256.3	351.5	455.1	509.5	436.9	445.8	439.76			5.27	0.22
7	0	76.97	93	241.6	324.3	443.2	478.5	416	424.6	417.32			5.12	0.15

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 25, 2013
Test Run Number:	1a

Intertek Equipment No.'s	SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	1		118.6	
B - Rear Filter Catch	Filter	2		119	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			273.7	237.6	36.1
Probe & Filter Holder	Probe	17	139747.8	139745.4	2.4
			Total Particulate, mg		**38.5**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	3		119	
B - Rear Filter Catch	Filter	4		118.3	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			267	237.3	29.7
Probe & Filter Holder	Probe	18	147883.6	147880.9	2.7
			Total Particulate, mg		**32.4**

Intertek

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 25, 2013
Test Run Number:	1a

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.732	20.2	19.1	19.8
2	16	1.835	20.4	18.5	20.4
3	16	1.716	20.5	18.4	20.1
4	16	1.752	21.0	18.7	20.8
5	16	1.932	19.9	18.3	20.2
6	16	1.836	19.5	18.4	20.1
7	16	1.904	19.5	18.0	20.2
8	16	1.874	20.2	18.4	20.0
9	17	2.007	20.2	18.6	20.2
10	17	1.98	20.1	18.7	20.8
11	17	1.97	18.8	18.5	19.8
12	17	1.94	20.4	19.0	20.5
Total Weight		22.474	Average, %db		19.6

Allowable Fuel Load Range:	4.52	to	5.65

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	10:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.		Moisture, %, Dry Basis	
		2x4	4x4		
1	15	2.004		21.7	20.9	22.1
2	15	2.028		22.1	21.5	22.1
3	15	1.693		21.1	20.6	21.4
4	15	1.638		21.4	20.0	20.5
5	15	1.875		20.0	19.7	21.0
6	15	1.699		20.6	19.4	20.3
7	15		4.162	21.7	22.0	21.4
8	15		4.147	21.7	22.3	22.4
9	15		3.368	19.3	19.4	19.5
Totals		10.937	11.677			
% of Weight		48.4	51.6			
Total weight, wet, lb.		22.61		Average Moisture, dry		20.97
Total weight, dry, kg		8.48		Average Moisture, wet		17.33

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 3, 2013
Test Run Number:	2

Dry Burn-Rate, kg/hr:	**0.97**	
Emission-Rate, g/hr:	**4.09**	
Adjusted Emission-Rate, g/hr :	**5.86**	
Duration of Test, Minutes	530	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	926.783	915.849
Dry Gas Meter Ending Reading, ft^3	1010.772	991.83
Barometric Pressure Correction Factor	1.002	1.002
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.000	1.001
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**84.370**	**75.788**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**147.746**	
Total Tunnel Volume, scf	**78305.211**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	928.116	1033.213
Sample Particulate Mass, mg	36.3	37.3
Total Emissions, grams	33.691	38.539
Emission-Rate, g/hr	3.81	4.36
Adjusted Emission Rates, g/hr	**5.53**	**6.18**
Deviation, %	5.57%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	76.04	73.03
Post-Test Leak Check, cfm @ in. Hg vac.	0.003@5	0.0025@5
Average Firebox Surface Temperture delta-T, ℉	108.66	
Maximum Ambient Temperture, ℉	88	
Mimimum Ambient Temperature, ℉	66	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.63	
Dry-Basis Fuel Load Moisture Content, %	20.36	
Wet-Basis Fuel Load Moisture Content, %	16.92	
Coal Bed Range, lb.	4.60	5.60
Actual Coal Bed, Lb.	5.16	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 3, 2013
Test Run No:	2

Temperature Data

Firebox Temp Start	410.98
Firebox Temp End	302.32
Firebox Delta-T	**108.7**

Max Filter Temps	
Train A	Train B
76.04	**73.03**

Interval	10	Duration of Test, Min	530

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	85.31	100.6	251.2	314.5	443.7	469.1	409.6	418		67.92	66.08	66.985	66.665
1	10	85.94	104	267.4	316.5	432	420.8	392.1	394.7		73.96	72	67.13	66.695
2	20	86.87	99.24	262.3	305.9	419	376.1	360	363.9		75.17	72.16	67.235	66.835
3	30	87.84	103.6	310.9	329.1	400.9	347.1	332.4	341.2		75.41	72.55	67.345	66.93
4	40	85.02	104.4	312	363.5	382.2	328.8	316	321.7		75.63	72.71	67.38	66.93
5	50	84.32	103.1	301.3	377.8	366.7	320.1	306.7	314.7		75.82	72.81	67.59	67.11
6	60	86.97	104	313.7	379.7	350.9	315.5	300.9	316.8		75.92	72.68	67.745	67.315
7	70	80.27	103.1	342.1	381.6	334.3	320.2	307	322.3		76.04	73.03	67.775	67.3
8	80	78.38	103.8	358.4	414.5	319.9	336.4	320.9	338		75.86	72.89	67.88	67.315
9	90	78.75	101	325.1	421.3	307.9	348.6	330.6	351.5		75.7	72.76	67.87	67.28
10	100	78.19	100.3	324.3	407.9	294.9	347.1	329.4	352.3		75.4	72.49	67.7	67.07
11	110	78.38	100.7	328	408.5	284.8	345.4	329.8	354.5		75.04	72.56	67.72	67.155
12	120	81.93	101.9	331.3	410.4	277	345.1	333.7	357.6		74.99	72.5	67.735	67.215
13	130	77.56	101.8	340	416.9	268.7	349.9	342.5	360.4		75.24	72.68	67.795	67.32
14	140	81.68	103.8	347.9	428.9	263.1	358	355.8	366.7		75.39	72.58	67.775	67.17
15	150	77.32	104.1	359.9	436.7	257.3	368.8	367.2	374.4		75.45	72.61	67.76	67.12
16	160	80.31	105.7	366.5	449.8	254.1	382.5	379.7	384.1		75.63	72.82	67.715	67.145
17	170	77.56	102.1	347.9	447.8	250.8	401.5	388.2	392.3		75.67	72.6	67.755	67.125

18	180	80.58	99.6	314.5	427.4	249.7	415.3	396.9	395.5		75.32	72.41	67.81	67.195
19	190	77.28	96.14	294.1	390.5	249.9	419.4	399.2	394.3		74.93	72.12	67.855	67.345
20	200	81.41	95.37	276.1	366.5	251.5	422.7	402.4	393.9		74.71	71.8	67.785	67.25
21	210	76.54	91.65	262.9	343.8	252.1	419.3	397.6	391		74.34	71.58	67.95	67.525
22	220	79.43	92.08	255.9	327.4	254.6	416.4	397	387.7		73.98	71.4	67.995	67.51
23	230	75.26	88.95	247.3	313.2	256.4	413.2	392.6	379.8		73.58	70.69	67.925	67.425
24	240	79.45	89.93	238.8	304.1	261.1	411.8	388	375.7		73.02	70.35	67.845	67.315
25	250	74.58	86.7	232.5	293.9	266.7	408.6	383.9	369.8		72.75	70.14	67.915	67.3
26	260	77.5	87.76	227.6	288.1	272.1	404.4	379.3	367.4		72.56	70.22	67.9	67.315
27	270	75.61	86.17	223.2	281.1	275.7	401	372.2	361.6		72.48	69.84	67.87	67.405
28	280	76.18	86.49	221.8	276.3	280.7	399.6	367.5	358.9		72.58	70.08	67.955	67.495
29	290	77.75	87.04	219	272.3	283.1	400.9	364.1	356.2		72.41	70	67.97	67.535
30	300	74.81	85.75	217.6	270.1	287.4	399.5	362.4	353.9		72.54	69.93	67.955	67.46
31	310	77.83	86.78	215.1	268.1	290	394.2	359.9	352.9		72.55	70.17	68.045	67.6
32	320	76.92	85.9	211.6	263.8	292	390.8	356.1	348.5		72.33	70.24	67.92	67.45
33	330	74.91	85.13	210.8	259.8	294.8	392.3	354.3	344.7		72.42	70.1	68	67.505
34	340	79.29	86.82	208.9	258.4	295.3	398.4	354.1	342.8		72.42	69.96	68.06	67.555
35	350	75.44	84.94	207.9	256.4	295.8	403.9	353.3	340.1		72.39	70.16	68.08	67.575
36	360	74.54	84.8	208.5	255.5	297	407.1	353.2	339.2		72.24	70.33	67.965	67.42
37	370	75.31	84.92	207.3	254.9	296.6	408.1	352.5	338.1		71.99	70.17	67.905	67.425
38	380	70.39	82.48	206.8	254.1	294.8	407.8	351.5	334.4		71.85	69.98	67.865	67.415
39	390	66.96	80.74	205.6	252.2	293.8	408.5	349.7	332.7		71.56	69.64	67.87	67.325
40	400	65.93	79.83	203.8	250.3	293	409	346.7	332.9		71.2	69.39	67.855	67.4
41	410	68.12	80.67	201.8	249.3	293.5	406.8	344.2	333.8		70.88	69.15	67.82	67.33
42	420	75.75	82.87	200.9	251.7	298.4	400.3	348.4	339.9		71.02	69.35	67.85	67.365
43	430	78.49	84.22	201.9	252.8	301.8	398.1	345.9	341.2		71.42	69.69	67.88	67.445
44	440	79.87	85.26	202.1	252.8	304.6	395.2	342.4	341.4		71.62	70.02	67.81	67.355
45	450	80.82	85.6	201.6	251.9	306.7	392.5	338.5	340.9		71.96	70.18	67.82	67.32
46	460	81.54	85.95	201.4	250.7	308.5	391.1	334.8	340		72.21	70.2	67.92	67.44
47	470	81.47	86.49	200.7	249.8	310.1	390.1	331.9	339.4		72.31	70.13	67.88	67.405
48	480	82.12	86.72	199.2	248.4	311	383.5	328.7	338.6		72.42	70.18	67.865	67.4
49	490	82.11	86.49	196.7	246.2	311.7	375.5	324.1	336.8		72.45	70.27	67.915	67.4
50	500	77.7	84.78	194.5	239.1	308.4	367.7	314.3	329.8		72.52	70.15	67.925	67.45
51	510	82.56	85.09	191	236.7	309.4	362.1	311.8	328.3		72.28	70.04	67.97	67.5
52	520	83.07	85.21	188.6	234.2	311.3	355.5	307.8	324		72.2	69.91	67.99	67.48
53	530	83	85.41	186.1	230.9	311.8	348.2	302.7	318		72.24	69.99	67.95	67.46

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 3, 2013
Test Run Number:	2

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	29.97	85	Meter Box (A)	1.002
End	30.00	80	Meter Box (B)	0.994
Duration of Test, Min		530		

Leak Check, cfm @ in Hg	
Train A	Train B
0.003@5	0.0025@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	14.009	5.491	1.187

	Particulate Sampling Data												Combustion Gasses, %		
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.050	22.63	22.63	926.783	915.849	99.98	99.98	0.00	0.00	15.980	2.360	1.490
10	0.015	0.00	0.00	0.060	21.42	1.21	928.370	917.275	101.36	100.66	0.00	0.00	18.020	1.520	0.800
20	0.015	0.00	0.00	0.063	20.79	0.63	929.979	918.733	102.31	102.46	0.00	0.00	16.620	2.960	0.890
30	0.015	0.00	0.00	0.070	19.82	0.97	931.575	920.173	101.86	101.57	0.00	0.00	14.190	5.760	0.880
40	0.015	0.00	0.00	0.070	18.92	0.90	933.165	921.616	101.54	101.85	0.00	0.00	14.310	5.600	0.950
50	0.015	0.00	0.00	0.068	18.05	0.87	934.742	923.039	100.55	100.29	0.00	0.00	14.840	4.960	1.030
60	0.015	0.00	0.00	0.070	17.20	0.85	936.324	924.379	100.92	94.48	0.00	0.00	13.720	6.380	0.980
70	0.015	0.00	0.00	0.075	16.10	1.10	937.896	925.838	100.20	102.79	0.00	0.00	12.030	8.610	0.770
80	0.015	0.00	0.00	0.075	14.93	1.17	939.470	927.263	100.37	100.46	0.00	0.00	11.980	8.520	0.660
90	0.015	0.00	0.00	0.070	14.13	0.80	941.045	928.706	100.18	101.48	0.00	0.00	14.420	5.690	0.860
100	0.015	0.00	0.00	0.070	13.37	0.76	942.623	930.181	100.34	103.71	0.00	0.00	13.800	6.590	0.770
110	0.015	0.00	0.00	0.070	12.60	0.77	944.198	931.650	100.19	103.30	0.00	0.00	13.570	6.730	0.730
120	0.015	0.00	0.00	0.070	11.79	0.81	945.769	933.059	100.04	99.18	0.00	0.00	12.920	7.560	0.720
130	0.015	0.00	0.00	0.073	10.94	0.85	947.345	934.463	100.33	98.80	0.00	0.00	12.460	8.230	0.690

140	0.015	0.00	0.00	0.073	10.03	0.91	948.915	935.868	100.13	99.07	0.00	0.00	12.130	8.630	0.670
150	0.015	0.00	0.00	0.075	9.04	0.99	950.489	937.273	100.42	99.11	0.00	0.00	11.520	9.480	0.670
160	0.015	0.00	0.00	0.075	8.12	0.92	952.064	938.705	100.63	101.15	0.00	0.00	11.140	9.570	0.710
170	0.015	0.00	0.00	0.070	7.31	0.81	953.638	940.142	100.24	101.18	0.00	0.00	12.060	8.510	0.650
180	0.015	0.00	0.00	0.068	6.73	0.58	955.219	941.573	100.45	100.52	0.00	0.00	13.300	6.270	1.190
190	0.015	0.00	0.00	0.063	6.18	0.55	956.790	943.006	99.50	100.33	0.00	0.00	13.130	6.220	1.310
200	0.015	0.00	0.00	0.060	5.79	0.39	958.370	944.450	100.01	101.04	0.00	0.00	13.450	5.600	1.360
210	0.015	0.00	0.00	0.058	5.43	0.36	959.948	945.982	99.52	106.79	0.00	0.00	13.640	5.200	1.520
220	0.015	0.00	0.00	0.055	5.16	0.27	961.520	947.518	99.17	107.11	0.00	0.00	13.700	5.140	1.410
230	0.015	0.00	0.00	0.055	4.85	0.31	963.097	948.923	99.22	97.71	0.00	0.00	13.830	4.880	1.410
240	0.015	0.00	0.00	0.055	4.61	0.24	964.676	950.322	99.45	97.40	0.00	0.00	14.130	4.720	1.370
250	0.015	0.00	0.00	0.525	4.37	0.24	966.262	951.745	99.58	98.78	0.00	0.00	14.250	4.590	1.420
260	0.015	0.00	0.00	0.050	4.18	0.19	967.843	953.258	99.37	105.13	0.00	0.00	14.490	4.280	1.520
270	0.015	0.00	0.00	0.050	4.01	0.17	969.423	954.674	99.16	98.23	0.00	0.00	14.450	4.370	1.480
280	0.015	0.00	0.00	0.050	3.82	0.19	971.001	956.070	99.05	96.86	0.00	0.00	14.280	4.740	1.440
290	0.015	0.00	0.00	0.050	3.62	0.20	972.589	957.424	99.73	93.98	0.00	0.00	14.280	4.700	1.470
300	0.015	0.00	0.00	0.050	3.40	0.22	974.176	958.810	99.55	96.10	0.00	0.00	14.510	4.280	1.580
310	0.015	0.00	0.00	0.050	3.23	0.17	975.757	960.240	99.25	99.22	0.00	0.00	14.790	3.990	1.610
320	0.015	0.00	0.00	0.050	3.08	0.15	977.342	961.737	99.44	103.82	0.00	0.00	14.810	4.140	1.520
330	0.015	0.00	0.00	0.050	2.88	0.20	978.929	963.184	99.48	100.27	0.00	0.00	14.750	4.150	1.600
340	0.015	0.00	0.00	0.048	2.73	0.15	980.514	964.517	99.50	92.50	0.00	0.00	14.630	4.230	1.620
350	0.015	0.00	0.00	0.048	2.54	0.19	982.097	965.934	99.20	98.16	0.00	0.00	14.800	3.980	1.660
360	0.015	0.00	0.00	0.048	2.36	0.18	983.682	967.437	99.34	104.13	0.00	0.00	14.770	4.030	1.680
370	0.015	0.00	0.00	0.048	2.15	0.21	985.272	968.955	99.67	105.18	0.00	0.00	14.940	4.050	1.480
380	0.015	0.00	0.00	0.048	2.00	0.15	986.858	970.420	99.21	101.28	0.00	0.00	14.920	4.170	1.390
390	0.015	0.00	0.00	0.045	1.78	0.22	988.441	971.804	98.86	95.55	0.00	0.00	14.780	4.230	1.510
400	0.015	0.00	0.00	0.045	1.63	0.15	990.045	973.200	100.09	96.28	0.00	0.00			
410	0.015	0.00	0.00	0.450	1.41	0.22	991.640	974.599	99.61	96.58	0.00	0.00			
420	0.015	0.00	0.00	0.048	1.31	0.10	993.235	976.021	99.81	98.36	0.00	0.00			
430	0.015	0.00	0.00	0.045	1.17	0.14	994.835	977.435	100.24	97.91	0.00	0.00			

440	0.015	0.00	0.00	0.045	1.03	0.14	996.429	978.840	99.97	97.40	0.00	0.00			
450	0.015	0.00	0.00	0.045	0.89	0.14	998.022	980.378	99.94	106.66	0.00	0.00			
460	0.015	0.00	0.00	0.045	0.77	0.12	999.621	981.798	100.33	98.48	0.00	0.00			
470	0.015	0.00	0.00	0.045	0.63	0.14	1001.212	983.205	99.88	97.64	0.00	0.00			
480	0.015	0.00	0.00	0.045	0.52	0.11	1002.804	984.622	99.97	98.35	0.00	0.00			
490	0.015	0.00	0.00	0.045	0.42	0.10	1004.404	986.065	100.44	100.13	0.00	0.00			
500	0.015	0.00	0.00	0.045	0.36	0.06	1005.992	987.593	99.53	105.86	0.00	0.00			
510	0.015	0.00	0.00	0.045	0.19	0.17	1007.587	989.049	99.99	100.89	0.00	0.00			
520	0.015	0.00	0.00	0.045	0.08	0.11	1009.180	990.454	99.87	97.37	0.00	0.00			
530	0.015	0.00	0.00	0.043	0.00	0.08	1010.772	991.830	99.83	95.38	0.00	0.00			

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 3, 2013
Test Run Number:	2

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	112	0.1000
A2	0.0125	112	0.1118
A3	0.0150	112	0.1225
A4	0.0125	112	0.1118
A Center	0.0150	113	0.1225
B1	0.0100	100	0.1000
B2	0.0150	101	0.1225
B3	0.0150	101	0.1225
B4	0.0125	102	0.1118
B Center	0.0150	101	0.1225
Averages	0.01325	106.65	0.1129

Tunnel Diameter	**8.000**	inches
Tunnel Static	**-0.050**	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9215	factor
Baro. Pressure	29.97	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.772	Ft/ Sec
Initial Flow	**145.79**	Ft3/min

VS (1)	0.009883976		
VS (2)	0.011003126	STD Tunnel Flow:	147.75

530				551.9994444	84.334	75.756	7.67	99.98	99.98
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	411.0		0.015	560.6			7.728		
10	391.2		0.015	564	1.596	1.423	7.752	101.36	100.66
20	365.0		0.015	559.24	1.617	1.455	7.719	102.31	102.46
30	350.1		0.015	563.6	1.604	1.437	7.749	101.86	101.57
40	342.4		0.015	564.4	1.598	1.440	7.755	101.54	101.85
50	337.2		0.015	563.1	1.584	1.419	7.746	100.55	100.29
60	332.8		0.015	564	1.589	1.336	7.752	100.92	94.48
70	333.1		0.015	563.1	1.579	1.455	7.746	100.20	102.79
80	345.9		0.015	563.8	1.580	1.421	7.750	100.37	100.46
90	352.0		0.015	561	1.581	1.439	7.731	100.18	101.48
100	346.3		0.015	560.3	1.585	1.471	7.726	100.34	103.71
110	344.6		0.015	560.7	1.582	1.465	7.729	100.19	103.30
120	344.8		0.015	561.9	1.578	1.405	7.737	100.04	99.18
130	347.7		0.015	561.8	1.583	1.400	7.737	100.33	98.80
140	354.5		0.015	563.8	1.577	1.401	7.750	100.13	99.07
150	360.9		0.015	564.1	1.581	1.401	7.753	100.42	99.11
160	370.0		0.015	565.7	1.582	1.428	7.763	100.63	101.15
170	376.1		0.015	562.1	1.581	1.433	7.739	100.24	101.18
180	377.0		0.015	559.6	1.588	1.427	7.722	100.45	100.52
190	370.7		0.015	556.14	1.577	1.429	7.698	99.50	100.33
200	367.4		0.015	555.37	1.587	1.440	7.692	100.01	101.04
210	360.8		0.015	551.65	1.584	1.527	7.666	99.52	106.79
220	356.6		0.015	552.08	1.578	1.531	7.669	99.17	107.11
230	351.0		0.015	548.95	1.583	1.401	7.648	99.22	97.71
240	348.1		0.015	549.93	1.585	1.395	7.655	99.45	97.40
250	344.6		0.015	546.7	1.592	1.419	7.632	99.58	98.78
260	342.3		0.015	547.76	1.587	1.509	7.639	99.37	105.13

270	338.3		0.015	546.17	1.586	1.412	7.628	99.16	98.23
280	336.6		0.015	546.49	1.584	1.391	7.631	99.05	96.86
290	335.3		0.015	547.04	1.594	1.349	7.634	99.73	93.98
300	334.7		0.015	545.75	1.593	1.382	7.625	99.55	96.10
310	333.0		0.015	546.78	1.587	1.425	7.633	99.25	99.22
320	330.2		0.015	545.9	1.591	1.492	7.626	99.44	103.82
330	329.2		0.015	545.13	1.593	1.442	7.621	99.48	100.27
340	329.8		0.015	546.82	1.591	1.328	7.633	99.50	92.50
350	329.9		0.015	544.94	1.589	1.412	7.620	99.20	98.16
360	330.4		0.015	544.8	1.591	1.498	7.619	99.34	104.13
370	330.0		0.015	544.92	1.596	1.513	7.620	99.67	105.18
380	328.5		0.015	542.48	1.592	1.460	7.602	99.21	101.28
390	327.4		0.015	540.74	1.589	1.380	7.590	98.86	95.55
400	326.4		0.015	539.83	1.610	1.392	7.584	100.09	96.28
410	325.5		0.015	540.67	1.602	1.395	7.590	99.61	96.58
420	327.7		0.015	542.87	1.601	1.418	7.605	99.81	98.36
430	328.0		0.015	544.22	1.606	1.409	7.615	100.24	97.91
440	327.3		0.015	545.26	1.601	1.401	7.622	99.97	97.40
450	326.1		0.015	545.6	1.600	1.533	7.624	99.94	106.66
460	325.0		0.015	545.95	1.605	1.415	7.627	100.33	98.48
470	324.3		0.015	546.49	1.597	1.403	7.631	99.88	97.64
480	322.0		0.015	546.72	1.598	1.413	7.632	99.97	98.35
490	318.9		0.015	546.49	1.606	1.439	7.631	100.44	100.13
500	311.9		0.015	544.78	1.594	1.523	7.619	99.53	105.86
510	309.7		0.015	545.09	1.601	1.451	7.621	99.99	100.89
520	306.6		0.015	545.21	1.599	1.400	7.622	99.87	97.37
530	302.3	302.32	0.015	545.41	1.598	1.372	7.623	99.83	95.38

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**December 3, 2013**
est Run Number:	**2**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.6	to	5.6

Average Firebox Temp, ℉	412.08

Final Coal Bed Wt, lb	5.16

Interval	10

Time		Temperature Data												
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right		Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	82.83	231.2	762.3	756.3	538.7	701.8	560.2	560.1				8.90	3.74
1	10	82.18	137.2	457.8	638.4	566.5	687.3	565.5	576.7				7.88	1.02
2	20	79.37	122.3	399.4	543.9	534.3	640.1	536.1	553.8				7.13	0.75
3	30	76.87	113.3	351.6	489.3	499.9	603.6	502	531.7				6.52	0.61
4	40	75.33	101.6	316.9	435.5	471.5	585.8	475	513.9				6.04	0.48
5	50	78.19	107.5	313.7	401.7	452.8	570.7	465.1	490.1				5.59	0.45
6	60	84.86	98.55	271.9	372.4	447.9	528.2	452.7	466				5.50	0.09
7	70	83.02	94.46	251.8	338.8	433.2	494.1	426.6	436.4				5.35	0.15
8	80	85.92	103.7	259.3	316.5	443.8	470.3	410.6	419.2	412.08			5.16	0.19

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 3, 2013
Test Run Number: 2

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	13		119.4	
B - Rear Filter Catch	Filter	14		119.3	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			272.3	238.7	33.6
Probe & Filter Holder	Probe	25	136813.0	136810.3	2.7
			Total Particulate, mg		**36.3**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	15		118.7	
B - Rear Filter Catch	Filter	16		118.9	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			272.4	237.6	34.8
Probe & Filter Holder	Probe	26	139804.3	139801.8	2.5
			Total Particulate, mg		**37.3**

Intertek

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 3, 2013
Test Run Number:	2

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.660	20.1	20.2	20.2
2	16	1.681	20.1	20.0	20.3
3	16	1.694	20.4	19.7	20.0
4	16	1.870	20.5	21.9	19.6
5	16	1.653	19.8	19.6	19.6
6	16	1.981	20.0	19.8	20.5
7	16	2.020	20.3	19.8	20.0
8	16	1.986	19.7	19.3	20.0
9	17	1.802	20.5	20.2	20.4
10	17	1.71	19.9	20.8	20.8
11	17	1.75	20.6	19.9	20.3
12	17	1.70	20.8	20.5	20.0
Total Weight		**21.510**	Average, %db		**20.2**

Allowable Fuel Load Range:	**4.53**	to	**5.66**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	10:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.630		19.3	19.3	20.0
2	15	1.609		19.2	18.8	19.2
3	15	1.538		19.2	19.1	20.0
4	15		4.072	22.8	22.8	22.2
5	15		3.431	20.0	19.5	19.2
6	15		4.210	22.0	21.0	22.5
7	15	2.122		19.9	20.9	19.5
8	15	1.843		19.8	19.0	19.3
9	15	2.170		22.8	22.3	20.2
Totals		10.912	11.713			
% of Weight		48.2	51.8			
Total weight, wet, lb.		**22.625**		Average Moisture, dry		**20.36**
Total weight, dry, kg		8.53		Average Moisture, wet		16.92

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 26, 2013
Test Run Number:	2a

Dry Burn-Rate, kg/hr:	**0.90**	
Emission-Rate, g/hr:	**5.86**	
Adjusted Emission-Rate, g/hr :	**7.89**	
Duration of Test, Minutes	570	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	842.837	772.666
Dry Gas Meter Ending Reading, ft^3	931.007	854.345
Barometric Pressure Correction Factor	1.009	1.009
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.005	1.006
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**89.613**	**82.412**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**147.519**	
Total Tunnel Volume, scf	**84085.766**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	938.316	1020.314
Sample Particulate Mass, mg	57.5	56.2
Total Emissions, grams	53.953	57.342
Emission-Rate, g/hr	5.68	6.04
Adjusted Emission Rates, g/hr	**7.69**	**8.09**
Deviation, %	2.53%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	76.77	72.48
Post-Test Leak Check, cfm @ in. Hg vac.	0.002@5	0.002@5
Average Firebox Surface Temperture delta-T, ℉	114.62	
Maximum Ambient Temperture, ℉	87	
Mimimum Ambient Temperature, ℉	74	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.80	
Dry-Basis Fuel Load Moisture Content, %	20.76	
Wet-Basis Fuel Load Moisture Content, %	17.19	
Coal Bed Range, lb.	4.60	5.70
Actual Coal Bed, Lb.	5.1	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	November 26, 2013
Test Run No:	2a

Temperature Data

Firebox Temp Start	411.7
Firebox Temp End	297.08
Firebox Delta-T	114.6

Max Filter Temps	
Train A	Train B
76.77	72.48

Interval	10	Duration of Test, Min	570

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	75.22	114.8	267.6	325.7	420.5	478	413.3	421		67.28	64.09	64.255	63.96
1	10	77.06	109.9	262.9	308.8	407	425.9	392.4	398.2		74.88	69.68	64.47	64.08
2	20	79.39	101.7	247.1	303.3	395.7	377.9	358.9	365.8		74.13	69.48	64.515	64.145
3	30	81.21	101.9	269.5	301.2	380.8	345.6	331.3	337.9		73.98	69.86	64.59	64.24
4	40	80	103.9	298.8	311.8	364.5	323.7	314	316.3		74.18	69.96	64.68	64.355
5	50	81.04	101	267	335.6	350.4	315.2	306.9	312.6		74.26	69.15	64.88	64.545
6	60	79.91	100.1	262.3	329.2	336.6	303.4	295.3	308.8		73.92	69.44	64.99	64.66
7	70	74.16	102.6	282.3	338.4	322.2	300.6	293	298.8		74.44	70.3	65.145	64.855
8	80	74.84	105.7	307.7	350.6	308.7	308.9	300.8	303.4		75.03	71.09	65.185	64.87
9	90	74.77	109.3	334.5	385	297.8	324.3	313.3	322		75.85	71.4	65.285	65.005
10	100	74.95	108.4	318.3	404.3	287.2	337.9	329.2	333.3		76.35	71.39	65.375	65.045
11	110	75.74	108	311	397.4	277.2	340.3	333.7	338.1		76.47	71.29	65.475	65.15
12	120	74.51	108.2	314.4	393.4	268.1	339.4	335.3	341.4		76.55	71.58	65.575	65.245
13	130	75.05	107.6	313.4	391.7	260.6	339.3	341.7	344.9		76.77	71.68	65.54	65.195
14	140	74.92	108	311	392.1	254.2	341.7	347.4	350.1		76.61	72.06	65.585	65.2
15	150	79.38	106.3	308.4	395.4	252.3	347	354.9	359.3		76.18	72.48	65.765	65.445
16	160	81.9	106.5	309.1	397.4	250.9	353.6	360.7	366.1		76.03	71.59	65.78	65.4
17	170	83.33	106.7	307.8	398	248.9	361.2	368.1	370.7		76.09	71.41	65.86	65.57
18	180	84.42	107	310	397.1	247	370.3	374.5	375.9		76.38	71.24	65.96	65.675
19	190	85.66	107	306.2	397	245.7	381.2	380.4	383.1		76.52	71.42	66.04	65.705
20	200	86	106.8	299.8	392.4	245.4	392.8	384.8	389.4		76.67	71.38	66.15	65.715
21	210	84.51	108.2	291.5	384.9	245.2	402	387.3	389.8		76.71	71.43	66.12	65.645
22	220	84.03	106.7	276.1	373.1	244.4	408.6	388.1	389.5		76.5	71.4	66.145	65.74

23	230	83.93	105.5	266.8	353.4	244.7	409	384.9	387.9		76.27	70.99	66.105	65.63
24	240	83.57	104	255.9	338.3	245.5	406.9	382.2	387		75.99	70.73	65.93	65.385
25	250	81.38	97.17	246.6	320.2	247.5	403.7	376.3	386.2		74.96	70.3	65.835	65.325
26	260	77.8	93.22	233.9	305.3	247.2	399.7	369.7	383.4		73.43	69.52	65.695	65.21
27	270	78.14	92.95	226.9	294.5	249.5	394.3	366.6	381.8		73.1	69.32	65.665	65.27
28	280	80.13	92.73	219.3	283.9	250.6	388.9	362.1	377.8		72.61	68.49	65.74	65.355
29	290	77.09	90.59	215.2	276.1	252.9	384.7	355.1	374		72.37	68.49	65.84	65.445
30	300	78.56	91.13	212.4	270.9	255.6	382.5	350.6	372.8		72.41	68.21	65.81	65.425
31	310	79.47	90.82	209.5	266.3	256.8	381.6	345.2	370.4		72.02	68.18	65.775	65.485
32	320	76.73	89.57	211.8	265.9	259.6	379.8	341.5	369.1		71.84	68.37	65.735	65.32
33	330	80.99	91.3	209.5	266.6	261.1	377.8	337.4	371.3		71.93	68.08	65.66	65.21
34	340	79.52	90.17	206	262.2	260.5	373.9	332.2	367.5		71.58	67.99	65.555	65.13
35	350	82.91	91.54	203.5	259.5	262.3	370.3	328.9	364.7		71.7	68.14	65.465	64.985
36	360	84.75	92.05	200.8	256.2	264.6	367.6	325.6	359.9		71.74	68.44	65.465	65.07
37	370	82.11	90.4	197	251.3	264.1	364.8	320.2	352.7		71.64	68.4	65.425	65.01
38	380	84.1	91.29	194	245.9	264.1	362	315.9	347.1		71.67	68.35	65.315	64.935
39	390	85.12	91.34	191.3	241.2	264.2	360	311.5	341.4		71.63	68.3	65.2	64.83
40	400	85.5	91.47	189	237.6	263.8	358.5	307.2	337.2		71.69	68.16	65.18	64.76
41	410	86.01	91.37	188.6	236.3	263.5	361.3	304.3	336.9		71.75	68.21	65.175	64.79
42	420	86.08	91.23	189.3	235.8	263.1	367.4	303.4	339.6		71.74	68.25	65.17	64.81
43	430	86.25	91.29	190.5	236.4	262.2	376.4	303.8	342.3		71.61	68.26	65.085	64.69
44	440	82.98	89.87	192.5	236.9	261.2	389.6	304.8	343		71.37	68.08	65.05	64.7
45	450	84.63	91.08	194.8	238.5	260.6	403.8	308.1	345.6		71.33	68	65.05	64.74
46	460	85.86	91.64	195.9	241.7	260.5	412.2	311.2	348.9		71.52	67.98	65.05	64.675
47	470	86.59	91.76	196.5	244.1	260.6	414.2	313.3	351.2		71.65	67.98	65.015	64.64
48	480	82.65	90	196.5	244.2	261.8	416	312.8	349.7		71.37	67.89	64.925	64.57
49	490	84.75	91.16	195.6	244.6	262.8	412.7	313.3	349.3		71.41	67.91	64.895	64.535
50	500	85.74	91.52	195.2	244.9	263.1	411.9	314.4	347.2		71.4	67.85	64.8	64.47
51	510	86.39	91.63	194.7	243.7	263.6	411.7	315.6	342.7		71.55	67.85	64.835	64.445
52	520	83.48	90.25	192.3	241.6	263.9	407.8	316.1	336.8		71.31	67.75	64.835	64.47
53	530	84.84	90.78	189.8	238.7	265.1	396	315.5	333.4		71.31	67.78	64.795	64.415
54	540	85.05	88.75	186.1	235.5	265.1	386.2	313.2	330.2		71	67.74	64.79	64.495
55	550	84.63	87.95	184.7	234.5	265.1	379.6	310.9	327.2		70.66	67.45	64.74	64.41
56	560	83.89	88.26	184.2	233	265.6	373.2	307.7	323.1		70.54	67.41	64.735	64.415
57	570	83.6	88.07	182.6	231.1	266.3	365.3	304	318.7		70.49	67.41	64.77	64.445

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 26, 2013
Test Run Number:	2a

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.18	74	Meter Box (A)	1.002
End	30.21	81	Meter Box (B)	0.994
Duration of Test, Min		570		

Leak Check, cfm @ in Hg	
Train A	Train B
0.002@5	0.002@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

Time	Particulate Sampling Data											
	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.015	0.00	0.00	0.060	22.80	22.80	842.837	772.666	99.96	99.96	0.00	0.00
10	0.015	0.00	0.00	0.060	21.86	0.94	844.357	774.087	99.51	100.42	0.00	0.00
20	0.015	0.00	0.00	0.063	21.12	0.74	845.883	775.503	99.17	99.33	0.00	0.00
30	0.015	0.00	0.00	0.063	20.27	0.85	847.434	777.052	100.80	108.66	0.00	0.00
40	0.015	0.00	0.00	0.068	19.48	0.79	848.972	778.496	100.11	101.45	0.00	0.00
50	0.015	0.00	0.00	0.063	18.71	0.77	850.508	779.868	99.69	96.11	0.00	0.00
60	0.015	0.00	0.00	0.060	18.09	0.62	852.034	781.318	98.94	101.47	0.00	0.00
70	0.015	0.00	0.00	0.065	17.25	0.84	853.584	782.821	100.69	105.38	0.00	0.00
80	0.015	0.00	0.00	0.068	16.31	0.94	855.134	784.375	100.96	109.25	0.00	0.00
90	0.015	0.00	0.00	0.070	15.26	1.05	856.676	785.749	100.74	96.88	0.00	0.00
100	0.015	0.00	0.00	0.068	14.41	0.85	858.218	787.192	100.64	101.65	0.00	0.00
110	0.015	0.00	0.00	0.068	13.65	0.76	859.765	788.516	100.91	93.22	0.00	0.00
120	0.015	0.00	0.00	0.065	12.87	0.78	861.307	789.952	100.58	101.10	0.00	0.00
130	0.015	0.00	0.00	0.068	12.10	0.77	862.847	791.357	100.41	98.88	0.00	0.00
140	0.015	0.00	0.00	0.065	11.31	0.79	864.384	792.813	100.24	102.50	0.00	0.00
150	0.015	0.00	0.00	0.068	10.56	0.75	865.916	794.382	99.73	110.24	0.00	0.00
160	0.015	0.00	0.00	0.068	9.79	0.77	867.450	795.787	99.87	98.74	0.00	0.00
170	0.015	0.00	0.00	0.065	9.09	0.70	868.983	797.242	99.81	102.24	0.00	0.00
180	0.015	0.00	0.00	0.065	8.44	0.65	870.518	798.598	99.95	95.29	0.00	0.00
190	0.015	0.00	0.00	0.065	7.82	0.62	872.048	800.010	99.61	99.22	0.00	0.00
200	0.015	0.00	0.00	0.063	7.27	0.55	873.582	801.402	99.83	97.80	0.00	0.00
210	0.015	0.00	0.00	0.060	6.79	0.48	875.106	802.795	99.31	98.00	0.00	0.00
220	0.015	0.00	0.00	0.058	6.43	0.36	876.643	804.184	100.02	97.57	0.00	0.00
230	0.015	0.00	0.00	0.058	6.09	0.34	878.175	805.528	99.59	94.33	0.00	0.00
240	0.015	0.00	0.00	0.055	5.78	0.31	879.705	806.930	99.36	98.32	0.00	0.00
250	0.015	0.00	0.00	0.053	5.53	0.25	881.239	808.351	99.04	99.06	0.00	0.00
260	0.015	0.00	0.00	0.053	5.28	0.25	882.789	809.787	99.74	99.77	0.00	0.00

270	0.015	0.00	0.00	0.050	5.13	0.15	884.347	811.445	100.24	115.15	0.00	0.00
280	0.015	0.00	0.00	0.050	4.92	0.21	885.908	812.834	100.39	96.43	0.00	0.00
290	0.015	0.00	0.00	0.050	4.68	0.24	887.465	814.148	99.92	91.03	0.00	0.00
300	0.015	0.00	0.00	0.050	4.50	0.18	889.024	815.466	100.11	91.36	0.00	0.00
310	0.015	0.00	0.00	0.050	4.29	0.21	890.582	816.845	100.02	95.55	0.00	0.00
320	0.015	0.00	0.00	0.048	4.05	0.24	892.142	818.346	100.04	103.92	0.00	0.00
330	0.015	0.00	0.00	0.048	3.86	0.19	893.704	819.775	100.34	99.11	0.00	0.00
340	0.015	0.00	0.00	0.048	3.65	0.21	895.265	821.140	100.20	94.59	0.00	0.00
350	0.015	0.00	0.00	0.045	3.50	0.15	896.830	822.579	100.60	99.87	0.00	0.00
360	0.015	0.00	0.00	0.045	3.36	0.14	898.388	824.023	100.19	100.24	0.00	0.00
370	0.015	0.00	0.00	0.045	3.17	0.19	899.961	825.475	101.01	100.66	0.00	0.00
380	0.015	0.00	0.00	0.045	3.03	0.14	901.505	826.920	99.25	100.27	0.00	0.00
390	0.015	0.00	0.00	0.045	2.89	0.14	903.064	828.359	100.24	99.88	0.00	0.00
400	0.015	0.00	0.00	0.043	2.73	0.16	904.622	829.783	100.19	98.86	0.00	0.00
410	0.015	0.00	0.00	0.043	2.54	0.19	906.180	831.240	100.19	101.14	0.00	0.00
420	0.015	0.00	0.00	0.043	2.39	0.15	907.738	832.707	100.17	101.82	0.00	0.00
430	0.015	0.00	0.00	0.043	2.22	0.17	909.295	834.154	100.13	100.46	0.00	0.00
440	0.015	0.00	0.00	0.043	2.02	0.20	910.851	835.604	99.95	100.53	0.00	0.00
450	0.015	0.00	0.00	0.043	1.84	0.18	912.406	837.041	99.99	99.73	0.00	0.00
460	0.015	0.00	0.00	0.045	1.65	0.19	913.962	838.463	100.11	98.76	0.00	0.00
470	0.015	0.00	0.00	0.045	1.49	0.16	915.518	839.862	100.12	97.17	0.00	0.00
480	0.015	0.00	0.00	0.045	1.33	0.16	917.070	841.335	99.72	102.17	0.00	0.00
490	0.015	0.00	0.00	0.043	1.13	0.20	918.625	842.789	100.03	100.96	0.00	0.00
500	0.015	0.00	0.00	0.045	0.98	0.15	920.172	844.220	99.56	99.41	0.00	0.00
510	0.015	0.00	0.00	0.045	0.83	0.15	921.723	845.659	99.82	99.98	0.00	0.00
520	0.015	0.00	0.00	0.043	0.63	0.20	923.270	847.112	99.44	100.82	0.00	0.00
530	0.015	0.00	0.00	0.043	0.52	0.11	924.817	848.560	99.50	100.53	0.00	0.00
540	0.015	0.00	0.00	0.043	0.39	0.13	926.364	849.965	99.32	97.35	0.00	0.00
550	0.015	0.00	0.00	0.043	0.23	0.16	927.913	851.413	99.38	100.27	0.00	0.00
560	0.015	0.00	0.00	0.040	0.07	0.16	929.459	852.845	99.22	99.19	0.00	0.00
570	0.015	0.00	0.00	0.040	0.00	0.07	931.007	854.345	99.32	103.88	0.00	0.00

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	November 26, 2013
Test Run Number:	2a

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	106	0.1000
A2	0.0125	106	0.1118
A3	0.0150	106	0.1225
A4	0.0125	106	0.1118
A Center	0.0150	107	0.1225
B1	0.0100	121	0.1000
B2	0.0125	121	0.1118
B3	0.0150	122	0.1225
B4	0.0150	121	0.1225
B Center	0.0150	123	0.1225
Averages	0.01325	113.89	0.1129

Tunnel Diameter	8.000	inches
Tunnel Static	0.058	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9215	factor
Baro. Pressure	30.18	
Pitot Factor	0.99	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.794	Ft/ Sec
Initial Flow	**145.38**	Ft3/min

VS (1)	0.009226791		
VS (2)	0.010032994	STD Tunnel Flow:	147.52

				557.5887931	89.575	82.377	7.68	99.96	99.96
570		Ending Average Firebox Temp							
Time	Firebox Temp		Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	411.7		0.015	574.8			7.798		
10	386.5		0.015	569.9	1.547	1.436	7.765	99.51	100.42
20	360.3		0.015	561.7	1.553	1.430	7.709	99.17	99.33
30	339.4		0.015	561.9	1.578	1.564	7.710	100.80	108.66
40	326.1		0.015	563.9	1.564	1.458	7.724	100.11	101.45
50	324.1		0.015	561	1.562	1.385	7.704	99.69	96.11
60	314.7		0.015	560.1	1.551	1.463	7.698	98.94	101.47
70	310.6		0.015	562.6	1.575	1.516	7.715	100.69	105.38
80	314.5		0.015	565.7	1.575	1.568	7.737	100.96	109.25
90	328.5		0.015	569.3	1.567	1.386	7.761	100.74	96.88
100	338.4		0.015	568.4	1.566	1.455	7.755	100.64	101.65
110	337.3		0.015	568	1.571	1.335	7.752	100.91	93.22
120	335.5		0.015	568.2	1.566	1.447	7.754	100.58	101.10
130	335.6		0.015	567.6	1.564	1.416	7.749	100.41	98.88
140	337.1		0.015	568	1.561	1.468	7.752	100.24	102.50
150	341.8		0.015	566.3	1.555	1.581	7.741	99.73	110.24
160	345.7		0.015	566.5	1.557	1.416	7.742	99.87	98.74
170	349.4		0.015	566.7	1.556	1.466	7.743	99.81	102.24
180	353.0		0.015	567	1.558	1.366	7.745	99.95	95.29
190	357.5		0.015	567	1.552	1.422	7.745	99.61	99.22
200	361.0		0.015	566.8	1.556	1.402	7.744	99.83	97.80
210	361.8		0.015	568.2	1.546	1.403	7.754	99.31	98.00
220	360.7		0.015	566.7	1.559	1.399	7.743	100.02	97.57
230	356.0		0.015	565.5	1.554	1.354	7.735	99.59	94.33
240	352.0		0.015	564	1.553	1.413	7.725	99.36	98.32
250	346.8		0.015	557.17	1.557	1.432	7.678	99.04	99.06
260	341.1		0.015	553.22	1.574	1.448	7.651	99.74	99.77

270	337.3		0.015	552.95	1.582	1.671	7.649	100.24	115.15
280	332.7		0.015	552.73	1.585	1.400	7.647	100.39	96.43
290	328.6		0.015	550.59	1.580	1.324	7.632	99.92	91.03
300	326.5		0.015	551.13	1.582	1.328	7.636	100.11	91.36
310	324.1		0.015	550.82	1.581	1.389	7.634	100.02	95.55
320	323.2		0.015	549.57	1.584	1.513	7.625	100.04	103.92
330	322.8		0.015	551.3	1.586	1.441	7.637	100.34	99.11
340	319.3		0.015	550.17	1.585	1.376	7.630	100.20	94.59
350	317.1		0.015	551.54	1.590	1.451	7.639	100.60	99.87
360	314.8		0.015	552.05	1.582	1.456	7.643	100.19	100.24
370	310.6		0.015	550.4	1.598	1.464	7.631	101.01	100.66
380	307.0		0.015	551.29	1.569	1.457	7.637	99.25	100.27
390	303.7		0.015	551.34	1.584	1.452	7.638	100.24	99.88
400	300.9		0.015	551.47	1.583	1.437	7.639	100.19	98.86
410	300.5		0.015	551.37	1.583	1.470	7.638	100.19	101.14
420	301.9		0.015	551.23	1.583	1.480	7.637	100.17	101.82
430	304.2		0.015	551.29	1.583	1.460	7.637	100.13	100.46
440	307.1		0.015	549.87	1.582	1.463	7.627	99.95	100.53
450	311.3		0.015	551.08	1.581	1.450	7.636	99.99	99.73
460	314.9		0.015	551.64	1.582	1.435	7.640	100.11	98.76
470	316.7		0.015	551.76	1.582	1.412	7.641	100.12	97.17
480	316.9		0.015	550	1.578	1.487	7.628	99.72	102.17
490	316.5		0.015	551.16	1.581	1.468	7.636	100.03	100.96
500	316.3		0.015	551.52	1.573	1.445	7.639	99.56	99.41
510	315.5		0.015	551.63	1.577	1.453	7.640	99.82	99.98
520	313.2		0.015	550.25	1.573	1.467	7.630	99.44	100.82
530	309.7		0.015	550.78	1.573	1.462	7.634	99.50	100.53
540	306.0		0.015	548.75	1.573	1.418	7.620	99.32	97.35
550	303.5		0.015	547.95	1.575	1.462	7.614	99.38	100.27
560	300.5		0.015	548.26	1.572	1.446	7.616	99.22	99.19
570	297.1	297.08	0.015	548.07	1.574	1.514	7.615	99.32	103.88

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
Sample ID Number:	**101440749MTL-003**
Test Date:	**November 26, 2013**
Test Run Number:	**2a**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.6	to	5.7

Average Firebox Temp, ℉	414.84

Final Coal Bed Wt, lb	5.1

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	81.22	177.2	596.5	709.2	514.8	702.6	571.7	549.4			8.55	**3.45**
1	10	80.38	128.2	453.7	633.5	523.1	680.1	565.6	556.8			7.44	1.11
2	20	78.29	115.3	396.9	565.4	496.7	635.3	533.1	540.5			6.66	0.78
3	30	75.36	105.9	343	500.5	470.8	594.1	500.7	514.2			6.17	0.49
4	40	71.47	115.3	308.1	438.8	444.8	561.2	474.8	488.7			5.83	0.34
5	50	69.41	108.9	282.4	393.7	439.9	534.5	455.9	466			5.51	0.32
6	60	68.27	102.8	257.5	355.3	431.5	503.3	432.6	440.5			5.26	0.25
7	70	78.21	147.8	297.1	329	423.9	481	416.3	424			5.10	0.16

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: November 26, 2013
Test Run Number: 2a

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	5		118.1	
B - Rear Filter Catch	Filter	6		118.9	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			290	237	53
Probe & Filter Holder	Probe	19	140113.0	140108.5	4.5
			Total Particulate, mg		**57.5**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	7		119	
B - Rear Filter Catch	Filter	8		118.3	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			288.4	237.3	51.1
Probe & Filter Holder	Probe	20	139064.1	139059.0	5.1
			Total Particulate, mg		**56.2**

TEST FUEL DATA
EPA Method 5G-3

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
Sample ID Number:	**101440749MTL-003**
Test Date:	**November 26, 2013**
Test Run Number:	**2a**

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:	SBI-214	Time:	9:00	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.562	22.7	22.4	23.1
2	16	1.987	22.0	21.5	22.3
3	16	1.892	21.9	21.2	22.6
4	16	2.025	22.0	21.6	22.5
5	16	1.883	21.3	20.8	21.4
6	16	1.956	23.8	21.9	23.8
7	16	1.928	22.3	21.5	22.5
8	16	1.988	23.8	22.0	23.8
9	17	1.862	22.3	20.6	22.7
10	17	1.87	22.4	20.1	22.3
11	17	1.91	22.3	20.4	22.3
12	17	1.69	22.7	21.9	23.0
Total Weight		**22.549**	Average, %db		**22.2**
Allowable Fuel Load Range:				to	

TEST FUEL LOAD PROPERTIES						
Eq. ID No.:	SBI-214		Time:	10:00	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb.		Moisture, %, Dry Basis		
		2x4	4x4			
1	15		4.39	22.2	20.0	22.4
2	15		3.54	22.4	22.0	21.7
3	15		4.37	21.3	21.6	19.4
4	15	1.858		20.1	18.7	19.3
5	15	1.941		21.3	21.0	20.2
6	15	1.630		19.5	19.1	19.8
7	15	1.561		20.5	19.7	20.4
8	15	1.915		21.9	20.3	21.3
9	15	1.593		21.7	21.1	21.7
Totals		10.498	12.306			
% of Weight		46.0	54.0			
Total weight, wet, lb.		**22.80**		Average Moisture, dry		**20.76**
Total weight, dry, kg		8.57		Average Moisture, wet		17.19

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 4, 2013
Test Run Number:	3

Dry Burn-Rate, kg/hr:	**1.19**	
Emission-Rate, g/hr:	**2.78**	
Adjusted Emission-Rate, g/hr :	**4.26**	
Duration of Test, Minutes	420	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1010.795	991.855
Dry Gas Meter Ending Reading, ft^3	1075.674	1051.681
Barometric Pressure Correction Factor	1.008	1.008
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	0.999	0.999
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**65.452**	**59.918**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**145.020**	
Total Tunnel Volume, scf	**60908.508**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	930.588	1016.524
Sample Particulate Mass, mg	20.7	19.4
Total Emissions, grams	19.263	19.721
Emission-Rate, g/hr	2.75	2.82
Adjusted Emission Rates, g/hr	**4.22**	**4.30**
Deviation, %	0.97%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	81.73	78.19
Post-Test Leak Check, cfm @ in. Hg vac.	0.001@5	0.0025@5
Average Firebox Surface Temperture delta-T, ℉	70.42	
Maximum Ambient Temperture, ℉	88	
Mimimum Ambient Temperature, ℉	75	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.00	
Dry-Basis Fuel Load Moisture Content, %	20.23	
Wet-Basis Fuel Load Moisture Content, %	16.83	
Coal Bed Range, lb.	4.40	5.40
Actual Coal Bed, Lb.	4.85	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 4, 2013
Test Run No:	3

Temperature Data

Firebox Temp Start	414.3
Firebox Temp End	343.88
Firebox Delta-T	**70.4**

Max Filter Temps	
Train A	Train B
81.73	**78.19**

Interval	10	Duration of Test, Min	**420**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	79.99	102.5	271.3	325.7	434.3	476.6	413.1	421.8		69.46	68.03	68.645	68.295
1	10	85.09	106.4	274.6	307.7	439.2	427	392.2	401.3		77.61	75.67	68.69	68.32
2	20	87.83	107.4	321.1	326.7	418.9	382.6	361.1	370.2		78.68	76.46	68.76	68.465
3	30	82.08	112.7	359.7	361.2	390.2	357.9	335.1	349.6		79.47	77.34	68.795	68.5
4	40	80.78	117.2	417.9	416.8	373	356.6	331.3	342.6		80.71	77.95	68.9	68.6
5	50	77.94	119.8	435.1	482.7	357.1	373.8	345.2	357.7		81.57	77.64	68.965	68.64
6	60	77.25	118.7	429.8	498.6	340.7	394.1	363.3	380.1		81.73	77.53	68.925	68.61
7	70	81.5	118.7	421.9	492.9	333.4	409.8	378.2	397		81.58	77.82	68.99	68.625
8	80	79.55	117.3	414.7	490.5	324.2	423.5	386.5	410.5		81.33	77.82	69.01	68.575
9	90	78.03	115.7	407.2	484.7	313.4	434.2	394.9	421.5		81.01	77.59	69.005	68.57
10	100	77.35	114.3	406	479.1	305	445.9	404.1	430		80.87	77.57	69	68.49
11	110	82.52	115.3	406.3	480.2	297.8	459.6	415.1	439.1		80.83	78.03	68.985	68.5
12	120	79.56	113.6	399.1	479.1	293.1	475.2	423.5	447		80.78	78.19	69.01	68.53
13	130	78.6	109.5	377.3	465.2	289.8	484.7	428.7	450		80.14	76.84	68.945	68.545
14	140	77.93	106.1	353.1	437.9	286.8	485.6	426.6	444.2		79.22	75.97	68.88	68.305
15	150	79.38	104.2	334.2	412.2	286.2	484.1	423.7	438.9		78.57	75.52	68.745	68.28
16	160	77.67	100.1	311.2	385.3	285.5	479.3	420.3	433.3		77.77	74.76	68.765	68.255
17	170	80.01	98.67	293.7	359.8	285.1	463.4	414.6	426.3		77.01	74.4	68.685	68.24
18	180	77.62	96.11	282.7	340.1	285.3	449.2	405.9	415.2		76.39	74.03	68.73	68.34

19	190	79.08	95.44	275.7	326.9	288.5	436.4	397.6	408.4		76.3	73.71	68.765	68.27
20	200	80.32	94.56	267	316	289.4	427.5	389.6	402.3		75.94	73.51	68.725	68.335
21	210	77.58	92.69	260.3	305.7	290.1	423	383.5	396.1		75.75	73.29	68.815	68.42
22	220	81.38	93.73	252.9	297	291.8	419.9	379.2	392.4		75.49	73.22	68.69	68.22
23	230	76.06	90.86	251.6	288	290.8	417.5	374.1	385.6		74.91	72.56	68.51	67.97
24	240	78.47	91.96	252.8	288.7	293.5	413.7	372.2	383.4		74.91	72.34	68.515	68.095
25	250	79.64	91.76	249.3	286.2	294.4	411.4	369.6	380.1		74.75	72.34	68.5	68.08
26	260	76.8	89.91	243.7	282.8	298.9	405.4	365.8	374.9		74.75	72.26	68.545	68.135
27	270	79.18	90.76	238.3	277.2	302.3	399.2	360.6	369		74.69	72.25	68.54	68.185
28	280	80.13	90.51	235	271.3	300.7	397.3	354.9	362.1		74.52	71.91	68.515	68.1
29	290	76.79	88.91	234.2	267.4	301.3	399.9	353.3	356.7		74.43	71.96	68.525	68.17
30	300	80.71	90.76	233.6	265.4	301.9	405.4	352.9	355.9		74.59	72.5	68.615	68.24
31	310	80.15	90.09	232.5	264.2	300.4	410.3	351	354		74.54	72.51	68.675	68.305
32	320	77.56	88.95	231.5	262.4	300.5	411.6	349.2	352.9		74.41	72.37	68.645	68.22
33	330	78.03	89.27	231.8	261.7	300.9	412.9	348.2	353.2		74.38	72.33	68.59	68.255
34	340	80.49	90.14	230.3	261.2	299.4	414.9	347.1	353.4		74.41	72.39	68.605	68.185
35	350	75.46	88.2	232.1	260.8	299	421.3	346.7	353.8		74.36	72.13	68.59	68.215
36	360	79.43	90.27	234.7	262.7	300.7	429	348.4	358.2		74.42	72.24	68.575	68.18
37	370	80.07	90.24	235.4	264.3	303.1	439.1	349.2	359.2		74.53	72.1	68.655	68.26
38	380	77.84	89.5	235.9	265.2	303.4	447.6	351.5	358.8		74.44	72.23	68.605	68.185
39	390	82.55	89.35	234.1	268.5	307.2	452.8	360.6	364.3		74.33	72.13	68.62	68.205
40	400	84.01	90.26	234.1	269.1	310.1	447.1	363.9	364.2		74.4	72.2	68.6	68.2
41	410	84.84	90.6	231.1	269	311.3	438.7	364.9	362.3		74.51	72.6	68.64	68.27
42	420	85.28	90.67	226.9	265.1	312.8	424.8	358.7	358		74.4	72.45	68.54	68.1

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 4, 2013
Test Run Number:	3

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.15	71	Meter Box (A)	1.002
End	30.18	76	Meter Box (B)	0.994
Duration of Test, Min		420		

Leak Check, cfm @ in Hg	
Train A	Train B
0.001@5	0.0025@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	14.185	5.101	0.966

	Particulate Sampling Data												Combustion Gasses, %		
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.055	22.00	22.00	1010.795	991.855	99.98	99.98	0.00	0.00	16.700	0.730	0.690
10	0.015	0.00	0.00	0.068	20.95	1.05	1012.384	993.238	103.51	97.69	0.00	0.00	17.210	3.790	0.500
20	0.015	0.00	0.00	0.070	20.01	0.94	1013.945	994.705	101.76	103.69	0.00	0.00	15.050	4.560	0.570
30	0.015	0.00	0.00	0.078	18.96	1.05	1015.484	996.141	100.79	101.96	0.00	0.00	13.250	6.780	0.590
40	0.015	0.00	0.00	0.083	17.45	1.51	1017.010	997.486	100.31	95.86	0.00	0.00	10.170	10.140	0.390
50	0.015	0.00	0.00	0.085	15.86	1.59	1018.536	998.793	100.52	93.35	0.00	0.00	10.640	9.940	0.360
60	0.015	0.00	0.00	0.090	14.41	1.45	1020.059	1000.144	100.24	96.41	0.00	0.00	11.850	8.640	0.360
70	0.015	0.00	0.00	0.083	13.22	1.19	1021.575	1001.572	99.76	101.90	0.00	0.00	11.240	9.400	0.350
80	0.015	0.00	0.00	0.080	12.02	1.20	1023.099	1002.966	100.17	99.36	0.00	0.00	11.220	9.430	0.330
90	0.015	0.00	0.00	0.080	10.87	1.15	1024.635	1004.365	100.82	99.58	0.00	0.00	11.440	9.210	0.330
100	0.015	0.00	0.00	0.080	9.72	1.15	1026.152	1005.765	99.45	99.55	0.00	0.00	11.190	9.440	0.340
110	0.015	0.00	0.00	0.080	8.65	1.07	1027.672	1007.209	99.73	102.76	0.00	0.00	10.890	9.880	0.340
120	0.015	0.00	0.00	0.080	7.56	1.09	1029.202	1008.704	100.24	106.23	0.00	0.00	11.410	8.970	0.320
130	0.015	0.00	0.00	0.075	6.82	0.74	1030.730	1010.210	99.76	106.63	0.00	0.00	12.770	7.250	0.380

140	0.015	0.00	0.00	0.070	6.22	0.60	1032.256	1011.620	99.34	99.58	0.00	0.00	13.290	6.370	0.630
150	0.015	0.00	0.00	0.070	5.69	0.53	1033.786	1013.038	99.46	99.98	0.00	0.00	13.690	5.670	0.810
160	0.015	0.00	0.00	0.065	5.24	0.45	1035.318	1014.444	99.23	98.78	0.00	0.00	14.050	4.710	1.130
170	0.015	0.00	0.00	0.065	4.98	0.26	1036.852	1015.890	99.24	101.46	0.00	0.00	14.270	4.500	1.090
180	0.015	0.00	0.00	0.060	4.71	0.27	1038.389	1017.360	99.20	102.89	0.00	0.00	14.380	4.320	1.210
190	0.015	0.00	0.00	0.060	4.46	0.25	1039.922	1018.762	98.88	98.08	0.00	0.00	14.470	4.190	1.240
200	0.015	0.00	0.00	0.060	4.24	0.22	1041.475	1020.226	100.09	102.32	0.00	0.00	14.650	3.910	1.350
210	0.015	0.00	0.00	0.060	4.04	0.20	1043.030	1021.588	100.04	95.02	0.00	0.00	14.830	3.760	1.390
220	0.015	0.00	0.00	0.058	3.81	0.23	1044.582	1023.013	99.96	99.55	0.00	0.00	15.000	3.590	1.400
230	0.015	0.00	0.00	0.055	3.59	0.22	1046.138	1024.428	99.99	98.64	0.00	0.00	14.680	4.250	1.070
240	0.015	0.00	0.00	0.055	3.40	0.19	1047.696	1025.854	100.22	99.48	0.00	0.00	14.570	4.330	1.060
250	0.015	0.00	0.00	0.055	3.16	0.24	1049.254	1027.309	100.21	101.49	0.00	0.00	15.040	3.670	1.230
260	0.015	0.00	0.00	0.055	2.96	0.20	1050.813	1028.759	100.09	100.96	0.00	0.00	15.700	2.970	1.310
270	0.015	0.00	0.00	0.055	2.80	0.16	1052.365	1030.187	99.72	99.49	0.00	0.00	15.680	3.040	1.330
280	0.015	0.00	0.00	0.053	2.60	0.20	1053.920	1031.614	99.90	99.42	0.00	0.00	15.310	3.470	1.310
290	0.015	0.00	0.00	0.053	2.40	0.20	1055.472	1033.039	99.56	99.12	0.00	0.00	15.380	3.350	1.350
300	0.015	0.00	0.00	0.053	2.22	0.18	1057.026	1034.486	99.84	100.81	0.00	0.00	15.270	3.410	1.390
310	0.015	0.00	0.00	0.053	2.04	0.18	1058.576	1035.932	99.51	100.66	0.00	0.00	15.400	3.260	1.390
320	0.015	0.00	0.00	0.053	1.86	0.18	1060.132	1037.369	99.79	99.95	0.00	0.00	15.530	3.180	1.440
330	0.015	0.00	0.00	0.053	1.64	0.22	1061.681	1038.802	99.39	99.69	0.00	0.00	15.400	3.280	1.420
340	0.015	0.00	0.00	0.050	1.43	0.21	1063.237	1040.252	99.91	100.97	0.00	0.00	15.110	3.840	1.230
350	0.015	0.00	0.00	0.053	1.22	0.21	1064.789	1041.667	99.48	98.35	0.00	0.00	14.980	3.990	1.180
360	0.015	0.00	0.00	0.053	0.99	0.23	1066.345	1043.052	99.93	96.46	0.00	0.00	14.890	4.170	1.080
370	0.015	0.00	0.00	0.053	0.79	0.20	1067.903	1044.476	100.04	99.15	0.00	0.00	15.010	3.910	1.250
380	0.015	0.00	0.00	0.053	0.58	0.21	1069.462	1045.896	100.04	98.82	0.00	0.00	15.040	3.850	1.280
390	0.015	0.00	0.00	0.055	0.37	0.21	1071.020	1047.337	99.96	100.27	0.00	0.00	15.390	3.520	1.270
400	0.015	0.00	0.00	0.055	0.17	0.20	1072.572	1048.750	99.67	98.40	0.00	0.00	15.300	3.580	1.300
410	0.015	0.00	0.00	0.055	0.02	0.15	1074.129	1050.269	100.01	105.80	0.00	0.00	16.350	2.540	1.230
420	0.015	0.00	0.00	0.055	0.00	0.02	1075.674	1051.681	99.26	98.39	0.00	0.00	16.270	2.560	1.320

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 4, 2013
Test Run Number:	3

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	108	0.1000
A2	0.0125	108	0.1118
A3	0.0150	108	0.1225
A4	0.0125	108	0.1118
A Center	0.0150	109	0.1225
B1	0.0075	110	0.0866
B2	0.0150	111	0.1225
B3	0.0150	111	0.1225
B4	0.0125	111	0.1118
B Center	0.0150	113	0.1225
Averages	0.013	109.73	0.1112

Tunnel Diameter	8.000	inches
Tunnel Static	-0.055	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9078	factor
Baro. Pressure	30.15	
Pitot Factor	0.99	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.654	Ft/ Sec
Initial Flow	**143.67**	Ft3/min

VS (1)	0.01243088		
VS (2)	0.013578789	STD Tunnel Flow:	145.02

420				559.3876744	65.425	59.895	7.58	99.98	99.98
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	414.3		0.015	562.5			7.604		
10	393.5		0.015	566.4	1.602	1.385	7.630	103.51	97.69
20	371.9		0.015	567.4	1.574	1.468	7.637	101.76	103.69
30	358.8		0.015	572.7	1.552	1.437	7.673	100.79	101.96
40	364.1		0.015	577.2	1.538	1.346	7.703	100.31	95.86
50	383.3		0.015	579.8	1.538	1.308	7.720	100.52	93.35
60	395.4		0.015	578.7	1.535	1.352	7.713	100.24	96.41
70	402.3		0.015	578.7	1.528	1.429	7.713	99.76	101.90
80	407.0		0.015	577.3	1.536	1.395	7.703	100.17	99.36
90	409.7		0.015	575.7	1.548	1.400	7.693	100.82	99.58
100	412.8		0.015	574.3	1.529	1.401	7.683	99.45	99.55
110	418.4		0.015	575.3	1.532	1.445	7.690	99.73	102.76
120	423.6		0.015	573.6	1.542	1.496	7.679	100.24	106.23
130	423.7		0.015	569.5	1.540	1.507	7.651	99.76	106.63
140	416.2		0.015	566.1	1.538	1.412	7.628	99.34	99.58
150	409.0		0.015	564.2	1.543	1.420	7.615	99.46	99.98
160	400.7		0.015	560.1	1.545	1.408	7.588	99.23	98.78
170	389.8		0.015	558.67	1.547	1.448	7.578	99.24	101.46
180	379.1		0.015	556.11	1.550	1.472	7.561	99.20	102.89
190	371.6		0.015	555.44	1.546	1.404	7.556	98.88	98.08
200	365.0		0.015	554.56	1.566	1.466	7.550	100.09	102.32
210	359.7		0.015	552.69	1.568	1.363	7.537	100.04	95.02
220	356.1		0.015	553.73	1.565	1.427	7.544	99.96	99.55
230	351.2		0.015	550.86	1.570	1.418	7.525	99.99	98.64
240	350.3		0.015	551.96	1.572	1.428	7.532	100.22	99.48
250	348.3		0.015	551.76	1.572	1.457	7.531	100.21	101.49
260	345.6		0.015	549.91	1.573	1.452	7.518	100.09	100.96

270	341.7		0.015	550.76	1.566	1.430	7.524	99.72	99.49
280	337.3		0.015	550.51	1.569	1.429	7.522	99.90	99.42
290	335.7		0.015	548.91	1.566	1.427	7.511	99.56	99.12
300	336.3		0.015	550.76	1.567	1.449	7.524	99.84	100.81
310	336.0		0.015	550.09	1.563	1.448	7.520	99.51	100.66
320	335.3		0.015	548.95	1.569	1.439	7.512	99.79	99.95
330	335.4		0.015	549.27	1.562	1.435	7.514	99.39	99.69
340	335.2		0.015	550.14	1.569	1.452	7.520	99.91	100.97
350	336.3		0.015	548.2	1.565	1.417	7.507	99.48	98.35
360	339.8		0.015	550.27	1.570	1.387	7.521	99.93	96.46
370	343.0		0.015	550.24	1.571	1.426	7.521	100.04	99.15
380	345.3		0.015	549.5	1.572	1.422	7.515	100.04	98.82
390	350.7		0.015	549.35	1.571	1.443	7.514	99.96	100.27
400	350.9		0.015	550.26	1.565	1.415	7.521	99.67	98.40
410	349.2		0.015	550.6	1.570	1.521	7.523	100.01	105.80
420	343.9	343.88	0.015	550.67	1.559	1.414	7.523	99.26	98.39

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**December 4, 2013**
Test Run Number:	**3**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.4	to	5.4

Average Firebox Temp, ℉	419.14

Final Coal Bed Wt, lb	4.85

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	71.82	104.2	333.1	425.9	444	539.4	468.5	472.5			5.58	**0.73**
1	10	70.94	100.6	314.2	394.8	450.9	525.1	456.3	455.1			5.28	0.30
2	20	69.06	95.66	287.9	359.8	441.6	500.9	435.3	436.8			5.07	0.21
3	30	81.18	135.9	300	335.9	432.7	482.2	418.9	426			4.85	0.22

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 4, 2013
Test Run Number: 3

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	17		119	
B - Rear Filter Catch	Filter	18		119.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			257.9	238.1	19.8
Probe & Filter Holder	Probe	27	136890.0	136889.1	0.9
			Total Particulate, mg		**20.7**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	19		119.4	
B - Rear Filter Catch	Filter	20		119.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			256.5	238.5	18
Probe & Filter Holder	Probe	28	136216.9	136215.5	1.4
			Total Particulate, mg		**19.4**

Manufacturer: SBI
Model: NG1800
Date: 12/02/13
Run: 3
Control #: G101440749
Test Duration: 420 min

	HHV	LHV
Eff	68.48%	74.02%
Comb Eff	91.86%	91.86%
HT Eff	74.55%	80.58%
Output	16,089	kJ/h
Burn Rate	1.19	kg/h
Grams CO	973	g
Input	23,493	kJ/h
MC wet	16.83	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.059

Overall Heating Efficiency:	68.48%
Combustion Efficiency:	91.86%
Heat Transfer Efficiency:	74.55%
Heat Output:	15,262 Btu/h
Heat Input:	22,286 Btu/h
Burn Duration:	7.00 h
Burn Rate:	2.61 lb/h
Stack Temp:	296.0 Deg. F

Averages	0.97	5.10	2.72	20.54	14.96	146.33	26.57	84.7%	72.4%	61.7%
INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net
Elapsed Time	Weight emaining (k	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %
0	9.98	0.69	0.73	1283.3%	20.85	19.77	132.9	26.7	64.5%	17.9%	11.5%
10	9.51	0.50	3.79	357.9%	20.66	16.62	134.8	29.5	91.3%	72.0%	65.8%
20	9.08	0.57	4.56	282.9%	20.60	15.76	160.6	31.0	91.6%	71.3%	65.3%
30	8.60	0.59	6.78	166.5%	20.45	13.38	182.1	27.8	93.8%	74.4%	69.8%
40	7.92	0.39	10.14	86.5%	20.24	9.91	214.4	27.1	97.1%	76.6%	74.4%
50	7.20	0.36	9.94	90.7%	20.26	10.14	223.9	25.5	97.3%	75.6%	73.6%
60	6.54	0.36	8.64	118.3%	20.35	11.53	221.0	25.1	97.0%	74.0%	71.8%
70	6.00	0.35	9.40	101.5%	20.30	10.72	216.6	27.5	97.3%	75.6%	73.6%
80	5.45	0.33	9.43	101.3%	20.30	10.70	212.6	26.4	97.5%	75.9%	74.0%
90	4.93	0.33	9.21	105.9%	20.31	10.94	208.4	25.6	97.4%	75.9%	73.9%
100	4.41	0.34	9.44	100.8%	20.29	10.68	207.8	25.2	97.4%	76.2%	74.2%
110	3.92	0.34	9.88	92.2%	20.27	10.22	207.9	28.1	97.5%	76.9%	75.0%
120	3.43	0.32	8.97	111.4%	20.33	11.20	203.9	26.4	97.4%	76.0%	74.0%
130	3.09	0.38	7.25	157.4%	20.44	13.00	191.8	25.9	96.3%	74.2%	71.5%
140	2.82	0.63	6.37	180.6%	20.48	13.79	178.4	25.5	93.0%	73.7%	68.5%
150	2.58	0.81	5.67	203.1%	20.51	14.44	167.9	26.3	90.2%	73.1%	66.0%
160	2.38	1.13	4.71	236.4%	20.55	15.28	155.1	25.4	84.7%	71.7%	60.7%
170	2.26	1.09	4.50	251.4%	20.57	15.53	145.4	26.7	84.6%	72.5%	61.3%
180	2.14	1.21	4.32	255.2%	20.57	15.65	139.3	25.3	82.7%	72.5%	59.9%
190	2.02	1.24	4.19	261.7%	20.58	15.77	135.4	26.2	82.0%	72.7%	59.6%
200	1.92	1.35	3.91	273.4%	20.59	16.01	130.6	26.8	79.7%	72.4%	57.8%
210	1.83	1.39	3.76	281.4%	20.60	16.14	126.8	25.3	78.7%	72.2%	56.8%
220	1.73	1.40	3.59	293.6%	20.61	16.32	122.7	27.4	77.9%	72.5%	56.5%
230	1.63	1.07	4.25	269.2%	20.59	15.80	122.0	24.5	84.2%	74.6%	62.8%
240	1.54	1.06	4.33	264.4%	20.58	15.72	122.7	25.8	84.5%	75.0%	63.4%
250	1.43	1.23	3.67	300.9%	20.62	16.33	120.7	26.5	80.3%	73.0%	58.6%
260	1.34	1.31	2.97	358.9%	20.66	17.03	117.6	24.9	76.1%	70.0%	53.3%
270	1.27	1.33	3.04	349.5%	20.65	16.95	114.6	26.2	76.2%	71.2%	54.2%
280	1.18	1.31	3.47	310.9%	20.62	16.50	112.8	26.7	78.5%	73.6%	57.7%
290	1.09	1.35	3.35	317.9%	20.63	16.60	112.3	24.9	77.4%	72.8%	56.4%
300	1.01	1.39	3.41	309.2%	20.62	16.52	112.0	27.1	77.2%	73.5%	56.7%
310	0.93	1.39	3.26	322.4%	20.63	16.68	111.4	26.8	76.5%	72.9%	55.8%
320	0.84	1.44	3.18	325.2%	20.63	16.73	110.8	25.3	75.5%	72.4%	54.7%
330	0.74	1.42	3.28	317.9%	20.63	16.64	111.0	25.6	76.3%	72.8%	55.5%
340	0.65	1.23	3.84	287.4%	20.61	16.15	110.2	26.9	80.9%	75.4%	61.0%
350	0.55	1.18	3.99	279.9%	20.60	16.02	111.2	24.1	82.0%	75.3%	61.8%
360	0.45	1.08	4.17	274.2%	20.59	15.88	112.6	26.4	83.8%	76.0%	63.7%
370	0.36	1.25	3.91	280.7%	20.60	16.06	113.0	26.7	80.9%	75.1%	60.8%
380	0.26	1.28	3.85	282.9%	20.60	16.11	113.3	25.5	80.3%	74.7%	60.0%
390	0.17	1.27	3.52	310.1%	20.62	16.47	112.3	28.1	79.2%	74.1%	58.6%
400	0.08	1.30	3.58	302.5%	20.62	16.39	112.3	28.9	79.0%	74.4%	58.8%
410	0.01	1.23	2.54	421.0%	20.69	17.54	110.6	29.4	74.6%	69.8%	52.1%
420	0.00	1.32	2.56	406.3%	20.68	17.46	108.3	29.6	73.5%	70.4%	51.8%
430	0.26	1.52	4.01	255.2%	20.57	15.80	96.2	20.7	78.2%	76.9%	60.2%
440	0.20	1.56	3.81	265.8%	20.59	16.00	95.8	21.9	77.0%	76.5%	59.0%
450	0.11	1.56	3.71	272.7%	20.59	16.10	94.7	22.4	76.6%	76.5%	58.6%
460	0.03	1.59	3.54	282.9%	20.60	16.27	94.1	21.1	75.6%	75.8%	57.3%
470	0.00	1.55	3.46	292.1%	20.61	16.37	92.8	23.1	75.6%	76.1%	57.6%

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.41
Dry Moles Exhaust Gas (N_r):	575.32
Air Fuel Ratio (A/F)	16.41

%HC 1.32

Combustion Efficiency:	91.86%	
Total Input (kJ):	164,453	155,976
Total Output (kJ):	112,621	106,815
Efficiency:	68.48%	
Total CO (g):	973.37	

16,089 kJ/h

23,493 kJ/h

1.186 kg/h

146.6 Deg. C

21.63	2.91	70.81	2.42	70.81	164528	4.06	6.87	2.74	19810.00	16.83	78.98
Air	Wet Wt	% Wet	Dry Wt.	% Dry		Fuel Properties				Mw	
Fuel Ratio	Now Wt	Consumed x	Now Wt_{dn}	Comsumed y	Total Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value	Moisture Fuel Burnt	[h]
78.8	9.98	0.00	8.30	0.00	0	4.06	6.87	2.74	19810.00	16.83	78.81
27.2	9.51	4.77	7.91	4.77	11355	4.06	6.87	2.74	19810.00	16.83	79.09
22.7	9.08	9.04	7.55	9.04	7438	4.06	6.87	2.74	19810.00	16.83	79.11
15.9	8.60	13.81	7.15	13.81	9569	4.06	6.87	2.74	19810.00	16.83	79.25
11.2	7.92	20.68	6.58	20.68	11587	4.06	6.87	2.74	19810.00	16.83	79.56
11.5	7.20	27.91	5.98	27.91	11363	4.06	6.87	2.74	19810.00	16.83	79.56
13.1	6.54	34.50	5.44	34.50	9868	4.06	6.87	2.74	19810.00	16.83	79.47
12.1	6.00	39.91	4.99	39.91	8933	4.06	6.87	2.74	19810.00	16.83	79.53
12.1	5.45	45.36	4.54	45.36	8784	4.06	6.87	2.74	19810.00	16.83	79.54
12.4	4.93	50.59	4.10	50.59	8597	4.06	6.87	2.74	19810.00	16.83	79.52
12.1	4.41	55.82	3.67	55.82	8298	4.06	6.87	2.74	19810.00	16.83	79.54
11.6	3.92	60.68	3.26	60.68	8074	4.06	6.87	2.74	19810.00	16.83	79.56
12.7	3.43	65.63	2.85	65.63	6840	4.06	6.87	2.74	19810.00	16.83	79.51
15.4	3.09	69.00	2.57	69.00	5009	4.06	6.87	2.74	19810.00	16.83	79.37
16.7	2.82	71.73	2.35	71.73	4224	4.06	6.87	2.74	19810.00	16.83	79.21
17.9	2.58	74.14	2.15	74.14	3663	4.06	6.87	2.74	19810.00	16.83	79.08
19.6	2.38	76.18	1.98	76.18	2654	4.06	6.87	2.74	19810.00	16.83	78.88
20.5	2.26	77.36	1.88	77.36	1981	4.06	6.87	2.74	19810.00	16.83	78.88
20.7	2.14	78.59	1.78	78.59	1944	4.06	6.87	2.74	19810.00	16.83	78.82
21.0	2.02	79.73	1.68	79.73	1757	4.06	6.87	2.74	19810.00	16.83	78.80
21.6	1.92	80.73	1.60	80.73	1570	4.06	6.87	2.74	19810.00	16.83	78.73
22.0	1.83	81.64	1.52	81.64	1607	4.06	6.87	2.74	19810.00	16.83	78.71
22.7	1.73	82.68	1.44	82.68	1682	4.06	6.87	2.74	19810.00	16.83	78.69
21.6	1.63	83.68	1.35	83.68	1532	4.06	6.87	2.74	19810.00	16.83	78.88
21.3	1.54	84.54	1.28	84.54	1607	4.06	6.87	2.74	19810.00	16.83	78.89
23.2	1.43	85.64	1.19	85.64	1645	4.06	6.87	2.74	19810.00	16.83	78.77
26.4	1.34	86.54	1.12	86.54	1346	4.06	6.87	2.74	19810.00	16.83	78.69
25.8	1.27	87.27	1.06	87.27	1346	4.06	6.87	2.74	19810.00	16.83	78.68
23.7	1.18	88.18	0.98	88.18	1495	4.06	6.87	2.74	19810.00	16.83	78.72
24.1	1.09	89.09	0.91	89.09	1420	4.06	6.87	2.74	19810.00	16.83	78.70
23.5	1.01	89.91	0.84	89.91	1346	4.06	6.87	2.74	19810.00	16.83	78.68
24.3	0.93	90.73	0.77	90.73	1346	4.06	6.87	2.74	19810.00	16.83	78.67
24.4	0.84	91.55	0.70	91.55	1495	4.06	6.87	2.74	19810.00	16.83	78.65
24.0	0.74	92.55	0.62	92.55	1607	4.06	6.87	2.74	19810.00	16.83	78.66
22.5	0.65	93.50	0.54	93.50	1570	4.06	6.87	2.74	19810.00	16.83	78.78
22.1	0.55	94.45	0.46	94.45	1645	4.06	6.87	2.74	19810.00	16.83	78.81
21.8	0.45	95.50	0.37	95.50	1607	4.06	6.87	2.74	19810.00	16.83	78.87
22.1	0.36	96.41	0.30	96.41	1532	4.06	6.87	2.74	19810.00	16.83	78.78
22.2	0.26	97.36	0.22	97.36	1570	4.06	6.87	2.74	19810.00	16.83	78.76
23.7	0.17	98.32	0.14	98.32	1532	4.06	6.87	2.74	19810.00	16.83	78.74
23.2	0.08	99.23	0.06	99.23	1308	4.06	6.87	2.74	19810.00	16.83	78.73
29.9	0.01	99.91	0.01	99.91	710	4.06	6.87	2.74	19810.00	16.83	78.69
29.0	0.00	100.00	0.00	100.00	75	4.06	6.87	2.74	19810.00	16.83	78.66
20.5	0.26	97.39	0.22	97.39	999	4.06	6.87	2.74	19810.00	16.85	78.67
21.0	0.20	98.06	0.19	97.78	1097	4.06	6.87	2.74	19810.00	16.85	78.63
21.4	0.11	98.87	0.11	98.71	1541	4.06	6.87	2.74	19810.00	16.85	78.63
21.9	0.03	99.68	0.03	99.64	1371	4.06	6.87	2.74	19810.00	16.85	78.60
22.5	0.00	100.00	0.00	100.00	300	4.06	6.87	2.74	19810.00	16.85	78.62

Moisture Content M_{Cwb}: 16.83

	Moisture of Wood (wet basis):	16.83	Dry kg :	8.30
(Btu)	Initial Dry Weight Wt_{do} (kg):	8.30	CA:	48.73
(Btu)	Moisture Content Dry	20.24	HY:	6.87
			OX:	43.9

Load Weight (kg):	**9.98**				
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**
Value in kJ/kg - CV:	**19,810**	**18,329**	Btu/lb	**8522.5**	**7885.2**

20.95	**1.52**	**5.00**	**0.12**	**0.15**	**32.14**	**118.68**	**7.74**	**0.94**	**592.74**	**32.65**	**11.24**
Mass Balance				**kg Wood pe**							
(moles/100 mole dry flue gas)				**00 mole df**	**Moles per kg of Dry Wood**						**Moisture**
[u]	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**	**HC**	**N_2**	**H_2O**	**Present**
20.90	0.37	1.12	0.07	0.04	20.01	542.00	18.92	1.89	2160.42	30.75	11.24
20.98	1.07	3.58	0.05	0.11	35.67	156.40	4.71	0.43	744.44	33.65	11.24
20.99	1.28	4.27	0.06	0.13	35.87	123.96	4.48	0.45	622.39	33.61	11.24
21.02	1.83	6.16	0.06	0.18	37.22	73.44	3.24	0.35	435.06	33.81	11.24
21.10	2.60	8.86	0.04	0.26	39.15	38.26	1.51	0.16	307.17	34.21	11.24
21.10	2.55	8.67	0.04	0.25	39.25	40.04	1.42	0.14	314.14	34.24	11.24
21.08	2.22	7.57	0.03	0.22	39.03	52.07	1.63	0.15	359.04	34.22	11.24
21.10	2.41	8.21	0.03	0.24	39.21	44.72	1.46	0.14	331.75	34.24	11.24
21.10	2.41	8.22	0.03	0.24	39.31	44.60	1.38	0.13	331.55	34.27	11.24
21.09	2.36	8.03	0.03	0.23	39.28	46.63	1.41	0.13	339.13	34.26	11.24
21.10	2.42	8.24	0.03	0.24	39.26	44.44	1.41	0.13	330.81	34.25	11.24
21.10	2.52	8.61	0.03	0.25	39.33	40.66	1.35	0.13	316.71	34.26	11.24
21.09	2.29	7.83	0.03	0.23	39.29	49.04	1.40	0.13	348.24	34.27	11.24
21.05	1.89	6.41	0.03	0.19	38.61	69.20	2.02	0.18	422.66	34.16	11.24
21.01	1.74	5.84	0.07	0.17	36.77	79.62	3.64	0.40	457.26	33.72	11.24
20.98	1.62	5.37	0.09	0.16	35.20	89.62	5.03	0.59	490.90	33.35	11.24
20.92	1.47	4.78	0.14	0.15	32.14	104.28	7.71	0.96	538.33	32.61	11.24
20.92	1.41	4.57	0.13	0.14	32.09	110.70	7.77	0.95	562.46	32.61	11.24
20.91	1.40	4.50	0.15	0.14	31.03	112.42	8.69	1.09	566.23	32.35	11.24
20.90	1.38	4.41	0.16	0.14	30.62	115.24	9.06	1.14	575.78	32.25	11.24
20.88	1.34	4.25	0.17	0.13	29.38	120.29	10.14	1.29	591.65	31.95	11.24
20.88	1.31	4.15	0.18	0.13	28.81	123.70	10.65	1.35	603.03	31.82	11.24
20.87	1.27	4.02	0.18	0.13	28.35	128.89	11.06	1.40	621.44	31.71	11.24
20.92	1.34	4.35	0.13	0.13	31.82	118.33	8.01	0.98	590.61	32.57	11.24
20.92	1.36	4.41	0.13	0.14	32.02	116.27	7.84	0.96	583.33	32.61	11.24
20.89	1.24	3.97	0.15	0.12	29.64	131.91	9.93	1.24	636.20	32.05	11.24
20.87	1.09	3.43	0.16	0.11	27.28	156.44	12.03	1.50	722.72	31.52	11.24
20.87	1.12	3.50	0.17	0.11	27.35	152.45	11.96	1.50	707.86	31.52	11.24
20.88	1.22	3.85	0.16	0.12	28.64	136.19	10.81	1.36	649.78	31.81	11.24
20.87	1.20	3.78	0.17	0.12	28.07	139.15	11.31	1.43	659.49	31.67	11.24
20.87	1.23	3.86	0.18	0.12	27.97	135.48	11.40	1.44	645.33	31.63	11.24
20.87	1.19	3.73	0.18	0.12	27.57	141.05	11.76	1.49	665.34	31.55	11.24
20.86	1.18	3.70	0.18	0.12	27.02	142.20	12.24	1.55	668.27	31.41	11.24
20.86	1.20	3.77	0.18	0.12	27.43	139.15	11.88	1.51	657.82	31.51	11.24
20.90	1.29	4.11	0.15	0.13	30.00	126.19	9.61	1.20	615.55	32.13	11.24
20.90	1.31	4.20	0.15	0.13	30.63	122.97	9.06	1.12	605.03	32.28	11.24
20.92	1.33	4.29	0.13	0.13	31.62	120.45	8.19	1.00	598.07	32.52	11.24
20.90	1.31	4.18	0.16	0.13	30.02	123.32	9.60	1.20	604.74	32.12	11.24
20.89	1.30	4.15	0.16	0.13	29.70	124.28	9.87	1.24	607.55	32.04	11.24
20.89	1.22	3.87	0.16	0.12	29.03	135.82	10.47	1.31	649.40	31.91	11.24
20.88	1.24	3.94	0.16	0.12	28.97	132.62	10.52	1.32	637.15	31.88	11.24
20.87	0.97	3.01	0.15	0.10	26.44	182.52	12.80	1.57	819.08	31.38	11.24
20.86	1.00	3.09	0.16	0.10	25.83	176.23	13.32	1.66	793.74	31.21	11.24
20.87	1.41	4.45	0.20	0.14	28.58	112.65	10.83	1.40	560.68	31.73	11.26
20.86	1.37	4.31	0.20	0.14	27.91	117.17	11.43	1.48	576.00	31.57	11.26
20.86	1.35	4.23	0.20	0.13	27.67	120.11	11.64	1.50	586.49	31.52	11.26
20.85	1.31	4.10	0.21	0.13	27.08	124.42	12.16	1.57	601.25	31.38	11.26
20.85	1.28	4.01	0.20	0.13	27.11	128.28	12.14	1.56	615.88	31.40	11.26

											SUMS
419.48	4809.67	3602.10	3498.47	3460.60	4668.41	4185.11	299.72	6965.89	16223.14	95118.77	80989.66
Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	Energy Losses (kJ/kg Flue Gas Constit			
	CO_2	O_2	CO	N_2	CH_4	H_2O		CO_2	O_2	CO	N_2
406.09	4227.49	3184.10	3096.94	3062.48	4063.89	3706.19	299.81	84.60	1725.78	5410.83	6616.25
407.93	4194.84	3156.35	3069.18	3035.19	4039.41	3672.72	302.64	149.64	493.65	1346.23	2259.50
433.76	5214.87	3901.14	3787.81	3747.04	5071.42	4530.89	304.17	187.08	483.57	1285.99	2332.14
455.21	6247.16	4655.50	4515.84	4468.16	6114.42	5400.34	300.97	232.52	341.91	931.20	1943.92
487.54	7671.90	5679.92	5500.26	5444.14	7590.65	6574.63	300.25	300.35	217.31	434.39	1672.27
497.09	8150.91	6024.68	5831.66	5772.67	8086.19	6969.96	298.67	319.91	241.21	410.55	1813.45
494.15	8036.25	5943.99	5754.56	5696.14	7963.57	6878.14	298.29	313.68	309.50	469.61	2045.14
489.76	7753.74	5737.41	5555.17	5498.65	7678.39	6640.01	300.65	304.04	256.59	421.28	1824.17
485.76	7620.43	5644.67	5466.84	5410.91	7533.46	6534.90	299.57	299.54	251.78	396.80	1794.00
481.59	7471.17	5539.83	5366.73	5311.52	7373.38	6415.69	298.72	293.43	258.33	405.79	1801.27
480.93	7456.60	5530.22	5357.72	5302.54	7356.40	6405.01	298.34	292.77	245.76	407.77	1754.14
481.09	7354.04	5450.73	5279.86	5225.66	7262.69	6311.66	301.22	289.21	221.63	390.14	1655.00
477.09	7243.20	5374.84	5207.91	5154.12	7139.53	6226.15	299.57	284.55	263.57	403.91	1794.88
464.98	6740.38	5014.86	4862.38	4811.47	6615.15	5814.11	299.04	260.21	347.04	582.46	2033.59
451.54	6178.79	4610.31	4473.43	4425.90	6034.90	5350.08	298.67	227.22	367.09	1045.50	2023.77
441.04	5701.94	4263.18	4138.76	4094.33	5550.17	4950.51	299.47	200.68	382.05	1443.69	2009.89
428.26	5199.72	3898.98	3787.99	3746.73	5036.58	4531.82	298.52	167.14	406.57	2211.62	2016.99
418.54	4743.47	3563.24	3463.37	3425.32	4580.70	4143.96	299.82	152.20	394.46	2226.30	1926.59
412.43	4540.06	3415.85	3321.45	3284.68	4372.40	3974.58	298.49	140.90	384.03	2488.75	1859.87
408.54	4347.90	3273.43	3183.49	3148.14	4182.61	3809.66	299.31	133.12	377.24	2592.96	1812.64
403.71	4121.86	3106.01	3021.35	2987.65	3959.13	3615.84	299.99	121.11	373.63	2901.56	1767.64
399.98	4026.70	3037.73	2955.77	2922.63	3860.24	3537.62	298.47	116.00	375.77	3045.38	1762.44
395.87	3777.12	2850.67	2774.06	2742.89	3618.29	3320.24	300.58	107.09	367.42	3159.55	1704.55
395.15	3860.44	2915.87	2838.07	2806.07	3693.05	3397.03	297.63	122.85	345.05	2290.05	1657.28
395.82	3836.65	2896.64	2819.05	2787.33	3673.03	3374.17	298.97	122.84	336.80	2240.27	1625.93
393.87	3732.10	2818.50	2743.19	2712.28	3571.22	3283.43	299.62	110.63	371.78	2838.65	1725.55
390.76	3665.09	2770.69	2697.35	2666.81	3500.95	3228.78	298.04	99.98	433.44	3437.39	1927.35
387.76	3492.09	2640.87	2571.20	2542.04	3333.60	3077.85	299.36	95.50	402.61	3416.77	1799.40
385.93	3397.19	2569.82	2502.21	2473.79	3241.42	2995.32	299.89	97.30	349.98	3087.08	1607.42
385.48	3449.99	2611.07	2542.68	2513.74	3288.95	3043.87	298.03	96.85	363.33	3230.36	1657.78
385.15	3353.20	2536.80	2470.11	2442.05	3198.89	2956.92	300.21	93.78	343.68	3254.41	1575.93
384.54	3340.22	2527.48	2461.17	2433.18	3185.41	2946.25	299.90	92.09	356.50	3355.64	1618.89
383.98	3372.61	2553.09	2486.37	2458.04	3213.88	2976.51	298.46	91.13	363.05	3493.16	1642.64
384.15	3369.41	2550.44	2483.73	2455.44	3211.35	2973.33	298.72	92.42	354.91	3390.09	1615.24
383.32	3283.28	2484.96	2419.89	2392.35	3129.89	2896.88	300.09	98.51	313.58	2742.99	1472.60
384.32	3430.71	2597.55	2529.78	2500.93	3268.22	3028.51	297.29	105.09	319.43	2586.49	1513.14
385.76	3405.27	2576.25	2508.54	2480.03	3248.45	3002.92	299.50	107.68	310.30	2338.25	1483.23
386.15	3407.52	2577.53	2509.69	2481.19	3251.50	3004.26	299.86	102.28	317.87	2739.67	1500.48
386.43	3466.18	2622.45	2553.56	2524.54	3306.29	3056.83	298.62	102.94	325.93	2819.48	1533.78
385.43	3325.39	2515.05	2448.77	2420.98	3173.92	2931.31	301.23	96.54	341.60	2989.70	1572.18
385.43	3294.34	2491.13	2425.36	2397.87	3145.24	2903.27	302.04	95.44	330.38	3002.73	1527.81
383.76	3208.85	2427.12	2363.20	2336.38	3062.23	2828.90	302.51	84.83	443.01	3653.24	1913.68
381.43	3104.67	2349.38	2287.77	2261.75	2960.49	2738.69	302.75	80.21	414.04	3800.08	1795.24
369.32	2954.97	2246.36	2189.96	2164.52	2795.26	2622.39	293.85	84.46	253.05	3089.56	1213.60
368.98	2896.91	2201.82	2146.44	2121.53	2741.23	2570.25	295.02	80.85	257.98	3258.28	1222.00
367.82	2828.18	2149.86	2095.86	2071.52	2675.58	2509.70	295.59	78.27	258.21	3317.35	1214.93
367.26	2856.01	2171.91	2117.56	2092.93	2699.95	2535.76	294.28	77.33	270.23	3467.52	1258.36
365.98	2729.32	2075.24	2023.24	1999.72	2580.88	2422.79	296.26	73.98	266.21	3460.90	1231.59

			AVERAGE	SUMS						
36013.57	67664.52	23278.24	7587.30	51832.38	13388.30	38444.1	112695.6	13388.3	973.4	63.8
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
1685.83	1466.11	535.97	17525.37	0.00	0	0.00	0	0	0.00	0.00
388.41	1603.33	535.59	6776.35	3884.27	985	2899.24	7471	985	75.53	3.98
406.64	1630.28	545.24	6870.94	2579.85	628	1951.56	4858	628	47.14	2.73
317.25	1669.41	555.02	5991.23	2893.88	595	2298.96	6675	595	43.80	2.74
141.78	1728.93	568.22	5063.25	2961.53	331	2630.07	8625	331	24.66	1.48
128.26	1744.00	572.66	5230.04	2999.88	304	2696.24	8363	304	22.83	1.31
137.68	1739.79	571.63	5587.02	2782.98	297	2485.75	7085	297	22.68	1.22
126.48	1732.90	568.95	5234.41	2360.43	243	2117.56	6573	243	18.43	1.02
115.58	1730.52	567.77	5155.99	2286.15	223	2062.73	6498	223	17.08	0.91
116.78	1726.30	566.43	5168.33	2242.87	223	2019.78	6354	223	17.10	0.90
120.84	1725.48	566.31	5113.07	2141.71	218	1923.88	6156	218	16.59	0.90
118.33	1722.56	565.26	4962.14	2022.31	204	1818.39	6051	204	15.44	0.86
112.52	1720.28	564.30	5144.01	1776.14	175	1600.66	5064	175	13.55	0.69
164.66	1700.36	559.67	5648.01	1427.99	186	1241.89	3581	186	14.32	0.74
360.31	1662.97	554.45	6241.30	1330.70	296	1034.95	2893	296	21.71	1.37
527.34	1631.23	549.96	6744.83	1247.16	360	887.16	2416	360	26.03	1.74
856.14	1581.60	545.25	7785.32	1042.94	406	636.54	1611	406	28.93	2.05
854.29	1569.11	540.89	7663.84	766.39	305	461.46	1215	305	21.76	1.53
971.63	1550.99	538.99	7935.14	778.54	336	442.33	1165	336	23.88	1.71
1015.39	1540.95	537.13	8009.43	710.27	317	393.26	1046	317	22.50	1.61
1149.17	1520.44	534.95	8368.49	663.17	318	345.00	907	318	22.51	1.63
1209.99	1511.46	534.08	8555.12	694.10	342	351.83	913	342	24.19	1.76
1255.13	1499.73	531.63	8625.11	732.32	372	360.53	950	372	26.29	1.91
873.74	1542.60	532.49	7364.06	569.67	243	326.97	963	243	17.35	1.21
854.06	1543.94	532.24	7256.08	588.70	249	339.73	1019	249	17.81	1.24
1104.57	1514.48	531.22	8196.87	680.50	325	355.76	964	325	23.09	1.64
1342.44	1487.59	530.60	9258.78	628.90	322	306.79	717	322	22.88	1.63
1339.20	1483.15	528.91	9065.54	615.77	321	295.16	730	321	22.76	1.63
1212.42	1493.86	527.98	8376.05	632.16	322	310.04	863	322	22.85	1.64
1273.38	1489.00	528.52	8639.23	619.42	321	298.91	801	321	22.71	1.64
1289.88	1484.50	527.55	8569.73	582.10	306	275.65	763	306	21.68	1.57
1328.08	1480.14	527.43	8758.77	594.94	316	279.08	751	316	22.36	1.62
1389.06	1474.69	527.77	8981.51	677.85	366	312.05	817	366	25.86	1.88
1346.44	1479.07	527.73	8805.91	714.44	381	332.94	893	381	26.98	1.96
1070.07	1505.65	526.87	7730.28	612.59	300	312.56	957	300	21.32	1.52
1002.99	1516.95	528.35	7572.44	628.66	296	332.87	1016	296	21.06	1.49
893.45	1527.64	528.06	7188.63	583.23	260	322.97	1024	260	18.61	1.30
1072.43	1508.87	528.08	7769.66	601.05	293	308.32	931	293	20.79	1.49
1107.32	1506.89	528.67	7925.01	628.02	309	319.16	942	309	21.91	1.57
1168.70	1496.41	527.26	8192.38	633.75	319	314.37	899	319	22.69	1.62
1179.32	1494.39	526.94	8157.02	538.67	274	264.46	770	274	19.45	1.39
1404.61	1468.40	526.11	9493.89	340.35	180	160.29	370	180	12.85	0.90
1480.95	1457.57	525.09	9553.18	36.05	20	16.25	39	20	1.41	0.10
1248.32	1478.19	524.53	7891.70	398.15	217	180.69	601	217	15.30	1.13
1318.98	1469.16	523.95	8131.20	450.16	251.82	198.34	647	252	17.71	1.31
1341.89	1464.86	523.27	8198.77	637.62	360.14	277.48	903	360	25.34	1.87
1404.16	1459.19	523.56	8460.36	585.34	334.98	250.36	785	335	23.56	1.74
1395.94	1456.48	522.29	8407.39	127.29	73.10	54.19	173	73	5.15	0.38

Intertek Testing Services NA Ltd

Manufacturer:	SBI		**Technicians:**
Model:	NG1800		_____
Date:	12/02/13		_____
Run:	3		_____
Control #:	G101440749		_____
Test Duration:	420		
Output Category:	2		

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	68.5%	74.0%
Combustion Efficiency	91.9%	91.9%
Heat Transfer Efficiency	75%	80.6%

Output Rate (kJ/h)	16,089	15,262	**(Btu/h)**
Burn Rate (kg/h)	1.19	2.61	**(lb/h)**
Input (kJ/h)	23,493	22,286	**(Btu/h)**

Test Load Weight (dry kg)	8.30	18.30	**dry lb**
MC wet (%)	16.83		
MC dry (%)	20.24		
Particulate (g)	19.492		
CO (g)	973		
Test Duration (h)	7.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.17	8.64
g/kg Dry Fuel	2.35	117.25
g/h	2.78	139.05
lb/MM Btu Output	0.40	20.09

Air/Fuel Ratio (A/F)	16.41

Version: 2.4 **15/04/2010**

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 4, 2013
Test Run Number:	3

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:	SBI-214	Time:	9:30	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.629	22.4	20.9	22.2
2	16	1.699	23.8	21.4	23.8
3	16	1.790	19.5	20.0	20.6
4	16	1.794	19.0	19.8	20.0
5	16	1.892	19.7	20.6	19.8
6	16	1.893	19.5	19.5	19.7
7	16	1.925	19.3	19.5	19.2
8	16	1.816	20.2	19.2	19.3
9	17	1.729	21.9	21.1	20.9
10	17	1.91	23.8	21.6	22.1
11	17	1.87	21.9	20.9	22.0
12	17	1.82	21.9	20.3	21.7
Total Weight		**21.761**	Average, %db		**20.8**

Allowable Fuel Load Range:	**4.40**	to	**5.50**

TEST FUEL LOAD PROPERTIES						
Eq. ID No.:	SBI-214		Time:	10:00	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb.		Moisture, %, Dry Basis		
		2x4	4x4			
1	15	1.711		18.9	19.2	19.7
2	15	1.539		19.3	19.8	18.7
3	15	1.723		18.8	19.3	19.2
4	15		3.755	21.9	21.5	22.2
5	15		3.410	19.2	19.7	19.0
6	15		3.817	21.9	22.2	22.6
7	15	2.150		20.6	21.9	21.5
8	15	1.775		19.9	18.7	19.2
9	15	2.119		20.3	21.0	20.0
Totals		11.017	10.982			
% of Weight		50.1	49.9			
Total weight, wet, lb.		**21.999**		Average Moisture, dry		**20.23**
Total weight, dry, kg		8.30		Average Moisture, wet		16.83

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 5, 2013
Test Run Number:	4

Dry Burn-Rate, kg/hr:	**1.06**	
Emission-Rate, g/hr:	**3.25**	
Adjusted Emission-Rate, g/hr :	**4.84**	
Duration of Test, Minutes	470	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1075.709	1051.721
Dry Gas Meter Ending Reading, ft^3	1150.603	1121.869
Barometric Pressure Correction Factor	1.001	1.001
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.000	1.000
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**75.116**	**69.843**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**141.760**	
Total Tunnel Volume, scf	**66627.237**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	886.993	953.954
Sample Particulate Mass, mg	28.2	27.2
Total Emissions, grams	25.013	25.948
Emission-Rate, g/hr	3.19	3.31
Adjusted Emission Rates, g/hr	**4.77**	**4.92**
Deviation, %	1.52%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	80.23	77.66
Post-Test Leak Check, cfm @ in. Hg vac.	0.0015@5	0.002@5
Average Firebox Surface Temperture delta-T, ℉	93.14	
Maximum Ambient Temperture, ℉	88	
Mimimum Ambient Temperature, ℉	76	
Fuel Properties		
Wet Fuel Load Weight, lb.	21.90	
Dry-Basis Fuel Load Moisture Content, %	20.17	
Wet-Basis Fuel Load Moisture Content, %	16.78	
Coal Bed Range, lb.	4.40	5.40
Actual Coal Bed, Lb.	5.23	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 5, 2013
Test Run No:	4

Temperature Data

Firebox Temp Start	412.18
Firebox Temp End	319.04
Firebox Delta-T	**93.1**

Max Filter Temps	
Train A	Train B
80.23	**77.66**

Interval	10	Duration of Test, Min	**470**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	**0**	82.1	106.9	267.7	316.1	459.3	462.2	410.4	412.9		68.52	67.27	67.355	67.18
1	**10**	85.38	104.2	244.4	292.6	456.2	417.3	387.8	392.2		77.59	75.22	67.385	67.08
2	**20**	87.19	106.1	311.3	311	441.2	375.1	356.6	362.3		78.24	76.29	67.535	67.145
3	**30**	87.2	106.5	312	344.5	422.2	353	338.5	340.7		78.33	76.19	67.595	67.195
4	**40**	86.16	109.9	342.1	369.4	402.7	338.7	325.9	328.3		78.74	76.4	67.615	67.185
5	**50**	88.14	114.1	381.6	421	384.2	339.2	326.9	330.3		79.46	77.05	67.675	67.27
6	**60**	79.76	115.4	415.8	466.5	363.6	355.2	338.3	342.5		80.23	77.35	67.75	67.32
7	**70**	78.29	111.9	389.8	485.5	348.1	375.6	353.7	363.2		79.75	76.41	67.915	67.59
8	**80**	81.48	112	385.4	473.8	333.9	386.2	360.8	377.5		79.56	77.32	67.975	67.57
9	**90**	79.52	111.8	387.9	477.1	319.4	396	369.4	386.5		79.66	77.38	67.945	67.48
10	**100**	77.63	111.7	392.3	485.3	307.3	406.5	376.5	398.4		79.64	77.5	68.07	67.72
11	**110**	77.01	110.6	389.9	489.2	298.2	421.3	387.9	408.8		79.69	77.66	68.265	67.915
12	**120**	82.57	110.6	383	493.8	292.1	437.6	401.8	419.1		79.38	76.58	68.125	67.67
13	**130**	79.05	107.7	364.4	484.4	286	451.1	408.8	427.5		79.03	76.24	68.18	67.8
14	**140**	77.68	103.6	341.6	456.1	282.1	458.8	409.2	432.7		78.41	75.77	68.205	67.745
15	**150**	81.69	101	310.5	421.1	279.7	462.4	407.1	434.3		77.7	75.2	68.25	67.95
16	**160**	78.07	97.47	292.1	386.3	277.2	456.6	400.8	429.6		77.02	74.34	68.245	67.81
17	**170**	81.63	96.13	274.5	360.9	276.7	453.5	397.2	423.8		76.21	74	68.21	67.78
18	**180**	76.55	92.78	260.9	338.7	276.5	440.7	389	414.4		75.72	73.77	68.23	67.825

19	190	80.87	93.02	250.9	321.8	276.9	432.6	380.9	410.1		75.15	73.24	68.175	67.735
20	200	75.89	89.81	244.1	308	276.4	428.5	373.5	403.8		74.69	72.84	68.15	67.735
21	210	78.85	90.44	238.1	299.4	277.3	427.6	368.9	402.4		74.55	72.85	68.245	67.825
22	220	79.06	89.68	232.9	292	276.4	430.5	364.8	398.5		74.34	72.41	68.255	67.885
23	230	77.51	88.55	230.8	287.1	277.1	437.2	362.8	395.2		74.25	72.46	68.325	68.015
24	240	80.26	89.81	229.3	282.8	279.2	444.4	362.4	392.5		74.2	72.65	68.355	68.015
25	250	78.87	88.69	227.3	278.5	280	441.5	361.9	388.6		74.17	72.59	68.455	68.08
26	260	76.84	87.62	225.5	276.1	283.9	435.9	361.7	386		74.08	72.4	68.32	67.945
27	270	79.7	88.73	223.9	274.6	286.4	433.6	359	386.2		74.07	72.6	68.34	67.955
28	280	79.12	88.02	221.9	272.8	286.8	431.6	355.6	384.7		73.64	72.04	68.205	67.835
29	290	77.06	87.15	221.7	271.8	292.1	429.5	353.4	383.3		73.58	71.68	68.145	67.75
30	300	81.02	88.62	217.8	271.1	291.3	423.5	349.3	381.9		73.54	71.61	68.085	67.65
31	310	80.94	88.49	215.5	268.6	293.3	414.1	344.3	376.2		73.37	71.54	68.07	67.81
32	320	77.82	87.04	215.3	265.1	296.5	406.9	338.7	370		73.55	71.52	68.095	67.76
33	330	82.57	89.07	213.4	263.2	297.7	403.1	334.4	367.1		73.66	71.56	68.155	67.865
34	340	80.47	87.91	212.4	260.2	297.6	400.6	330.2	362.8		73.71	71.67	68.21	67.895
35	350	77.4	86.57	212.8	258.4	299.8	401.9	327.7	359.6		73.79	71.49	68.205	67.84
36	360	82.23	88.61	210.8	258.1	299	405.2	326.3	359.3		73.7	71.8	68.245	67.795
37	370	85.1	89.78	210.7	257.6	301.2	409.7	326.2	359.7		73.86	72.17	68.155	67.79
38	380	82.51	88.18	210.1	256.4	300.6	411.3	324.9	358.3		73.57	71.86	68.115	67.745
39	390	85.23	89.82	209.9	255.6	301.3	411	325.6	358.4		73.88	72.25	68.175	67.72
40	400	84.13	88.89	208.4	254.4	301.6	409.4	324.7	356		73.76	72.12	68.12	67.73
41	410	85.03	86.91	206.1	254.7	303.9	409.4	326.9	356.4		73.52	71.71	68.17	67.78
42	420	85.4	87.69	206.1	254.3	303.3	412.6	326.2	355.4		73.64	71.46	68.13	67.78
43	430	85.72	87.67	205.2	252.9	302	410	324.7	353.1		73.74	71.12	68.275	67.98
44	440	85.89	88.07	204.6	251.8	301.9	408.1	323.4	350.2		73.65	71.14	68.285	67.97
45	450	85.95	87.98	203.5	250.4	301.1	404.8	322.2	347.7		73.79	71.28	68.42	68.15
46	460	86.42	87.96	201.5	248.4	300.2	398.5	320.1	343.8		73.87	71.46	68.45	68.115
47	470	86.21	88.15	199.8	245.7	299.2	393.7	317.7	338.9		73.74	71.58	68.445	68.09

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 5, 2013
Test Run Number:	4

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.06	78	Meter Box (A)	1.002
End	29.85	100	Meter Box (B)	0.994
Duration of Test, Min		470		

Leak Check, cfm @ in Hg	
Train A	Train B
0.0015@5	0.002@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	14.172	4.930	1.129

	Particulate Sampling Data												Combustion Gasses, %		
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.055	21.90	21.90	1075.709	1051.721	99.97	99.97	0.00	0.00	16.580	2.520	1.130
10	0.015	0.00	0.00	0.058	21.15	0.75	1077.330	1053.152	102.63	96.72	0.00	0.00	18.130	1.450	0.560
20	0.015	0.00	0.00	0.070	20.19	0.96	1078.939	1054.699	102.01	104.72	0.00	0.00	14.350	5.410	0.650
30	0.015	0.00	0.00	0.070	19.10	1.09	1080.525	1056.249	100.58	104.95	0.00	0.00	14.830	4.850	0.810
40	0.015	0.00	0.00	0.075	18.02	1.08	1082.104	1057.748	100.43	101.80	0.00	0.00	12.970	7.100	0.640
50	0.015	0.00	0.00	0.078	16.77	1.25	1083.684	1059.230	100.85	101.00	0.00	0.00	11.190	9.450	0.440
60	0.015	0.00	0.00	0.083	15.22	1.55	1085.258	1060.699	100.57	100.22	0.00	0.00	9.380	10.490	0.750
70	0.015	0.00	0.00	0.078	13.89	1.33	1086.842	1062.099	100.87	95.17	0.00	0.00	12.170	8.130	0.420
80	0.015	0.00	0.00	0.078	12.76	1.13	1088.408	1063.664	99.72	106.40	0.00	0.00	11.530	8.920	0.510
90	0.015	0.00	0.00	0.078	11.62	1.14	1089.981	1065.225	100.15	106.13	0.00	0.00	11.180	9.130	0.370
100	0.015	0.00	0.00	0.080	10.45	1.17	1091.552	1066.728	99.99	102.13	0.00	0.00	10.630	9.690	0.420
110	0.015	0.00	0.00	0.080	9.27	1.18	1093.130	1068.249	100.31	103.22	0.00	0.00	10.450	9.770	0.440
120	0.015	0.00	0.00	0.078	8.26	1.01	1094.710	1069.623	100.46	93.29	0.00	0.00	10.620	9.540	0.410
130	0.015	0.00	0.00	0.075	7.38	0.88	1096.288	1071.042	100.07	96.07	0.00	0.00	11.780	8.360	0.440

140	0.015	0.00	0.00	0.070	6.62	0.76	1097.866	1072.471	99.70	96.41	0.00	0.00	12.430	7.070	0.790
150	0.015	0.00	0.00	0.065	6.13	0.49	1099.450	1073.939	99.84	98.77	0.00	0.00	13.600	5.380	1.070
160	0.015	0.00	0.00	0.065	5.61	0.52	1101.027	1075.379	99.09	96.61	0.00	0.00	13.700	5.250	1.150
170	0.015	0.00	0.00	0.060	5.31	0.30	1102.614	1076.881	99.60	100.65	0.00	0.00	14.130	4.460	1.200
180	0.015	0.00	0.00	0.060	5.04	0.27	1104.191	1078.399	98.67	101.41	0.00	0.00	14.310	4.240	1.250
190	0.015	0.00	0.00	0.058	4.84	0.20	1105.775	1079.929	99.14	102.25	0.00	0.00	14.280	4.290	1.250
200	0.015	0.00	0.00	0.055	4.59	0.25	1107.362	1081.460	99.04	102.02	0.00	0.00	14.400	4.200	1.330
210	0.015	0.00	0.00	0.055	4.41	0.18	1108.953	1082.996	99.33	102.40	0.00	0.00	14.490	4.170	1.250
220	0.015	0.00	0.00	0.053	4.20	0.21	1110.540	1084.529	99.01	102.11	0.00	0.00	14.530	4.160	1.260
230	0.015	0.00	0.00	0.053	4.02	0.18	1112.124	1086.060	98.71	101.85	0.00	0.00	14.340	4.270	1.390
240	0.015	0.00	0.00	0.050	3.77	0.25	1113.715	1087.595	99.26	102.23	0.00	0.00	14.280	4.980	1.030
250	0.015	0.00	0.00	0.053	3.56	0.21	1115.319	1089.114	99.95	101.05	0.00	0.00	14.450	4.400	1.070
260	0.015	0.00	0.00	0.050	3.39	0.17	1116.922	1090.623	99.81	100.32	0.00	0.00	14.590	4.150	1.230
270	0.015	0.00	0.00	0.050	3.18	0.21	1118.525	1092.157	99.91	102.08	0.00	0.00	14.480	4.260	1.220
280	0.015	0.00	0.00	0.050	3.00	0.18	1120.129	1093.702	99.93	102.77	0.00	0.00	14.700	4.090	1.200
290	0.015	0.00	0.00	0.050	2.83	0.17	1121.742	1095.159	100.42	96.85	0.00	0.00	14.870	3.960	1.200
300	0.015	0.00	0.00	0.050	2.67	0.16	1123.340	1096.676	99.64	101.00	0.00	0.00	15.200	3.690	1.220
310	0.015	0.00	0.00	0.050	2.51	0.16	1124.950	1098.156	100.37	98.49	0.00	0.00	15.180	3.530	1.340
320	0.015	0.00	0.00	0.050	2.33	0.18	1126.547	1099.632	99.43	98.10	0.00	0.00	15.050	3.720	1.320
330	0.015	0.00	0.00	0.050	2.19	0.14	1128.155	1101.080	100.29	96.38	0.00	0.00	15.130	3.590	1.350
340	0.015	0.00	0.00	0.050	2.03	0.16	1129.760	1102.597	99.98	100.91	0.00	0.00	15.060	3.710	1.320
350	0.015	0.00	0.00	0.050	1.83	0.20	1131.362	1104.019	99.68	94.46	0.00	0.00	15.130	3.730	1.290
360	0.015	0.00	0.00	0.050	1.71	0.12	1132.970	1105.514	100.23	99.50	0.00	0.00	15.190	3.600	1.370
370	0.015	0.00	0.00	0.048	1.53	0.18	1134.572	1107.050	99.98	102.34	0.00	0.00	15.120	3.570	1.400
380	0.015	0.00	0.00	0.048	1.40	0.13	1136.195	1108.495	101.15	96.15	0.00	0.00	15.240	3.280	1.610
390	0.015	0.00	0.00	0.050	1.22	0.18	1137.780	1109.965	98.92	97.96	0.00	0.00	15.390	3.340	1.440
400	0.015	0.00	0.00	0.048	1.06	0.16	1139.390	1111.492	100.40	101.67	0.00	0.00	15.480	3.160	1.560
410	0.015	0.00	0.00	0.048	0.90	0.16	1140.989	1112.956	99.53	97.29	0.00	0.00	15.350	3.330	1.500
420	0.015	0.00	0.00	0.048	0.73	0.17	1142.590	1114.432	99.73	98.16	0.00	0.00	15.520	3.010	1.620
430	0.015	0.00	0.00	0.048	0.54	0.19	1144.193	1115.929	99.82	99.52	0.00	0.00	15.480	3.010	1.750

440	0.015	0.00	0.00	0.048	0.38	0.16	1145.794	1117.376	99.73	96.23	0.00	0.00	15.490	2.850	1.870
450	0.015	0.00	0.00	0.048	0.25	0.13	1147.400	1118.809	100.01	95.26	0.00	0.00	15.860	2.430	1.900
460	0.015	0.00	0.00	0.048	0.12	0.13	1148.995	1120.332	99.32	101.25	0.00	0.00	16.050	2.460	1.660
470	0.015	0.00	0.00	0.475	0.00	0.12	1150.603	1121.869	100.15	102.20	0.00	0.00	15.970	2.490	1.780

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 5, 2013
Test Run Number:	4

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	109	0.1000
A2	0.0100	109	0.1000
A3	0.0125	109	0.1118
A4	0.0125	109	0.1118
A Center	0.0150	110	0.1225
B1	0.0100	107	0.1000
B2	0.0125	107	0.1118
B3	0.0150	108	0.1225
B4	0.0125	107	0.1118
B Center	0.0150	108	0.1225
Averages	0.0125	108.17	0.1087

Tunnel Diameter	**8.000**	inches
Tunnel Static	**-0.055**	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.8876	factor
Baro. Pressure	30.06	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.485	Ft/ Sec
Initial Flow	**140.46**	Ft3/min

VS (1)	0.010662593		
VS (2)	0.01146745	STD Tunnel Flow:	141.76

470				555.8189583	75.084	69.814	7.42	99.97	99.97
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	412.2		0.015	566.9			7.490		
10	389.2		0.015	564.2	1.627	1.426	7.472	102.63	96.72
20	369.2		0.015	566.1	1.615	1.541	7.485	102.01	104.72
30	359.8		0.015	566.5	1.592	1.544	7.488	100.58	104.95
40	353.0		0.015	569.9	1.585	1.493	7.510	100.43	101.80
50	360.3		0.015	574.1	1.585	1.476	7.538	100.85	101.00
60	373.2		0.015	575.4	1.579	1.463	7.546	100.57	100.22
70	385.2		0.015	571.9	1.589	1.394	7.523	100.87	95.17
80	386.4		0.015	572	1.570	1.558	7.524	99.72	106.40
90	389.7		0.015	571.8	1.578	1.554	7.522	100.15	106.13
100	394.8		0.015	571.7	1.575	1.496	7.522	99.99	102.13
110	401.1		0.015	570.6	1.582	1.513	7.515	100.31	103.22
120	408.9		0.015	570.6	1.584	1.368	7.515	100.46	93.29
130	411.6		0.015	567.7	1.582	1.412	7.495	100.07	96.07
140	407.8		0.015	563.6	1.582	1.422	7.468	99.70	96.41
150	400.9		0.015	561	1.588	1.460	7.451	99.84	98.77
160	390.1		0.015	557.47	1.581	1.433	7.428	99.09	96.61
170	382.4		0.015	556.13	1.591	1.495	7.419	99.60	100.65
180	371.9		0.015	552.78	1.581	1.511	7.396	98.67	101.41
190	364.5		0.015	553.02	1.588	1.523	7.398	99.14	102.25
200	358.0		0.015	549.81	1.591	1.524	7.376	99.04	102.02
210	355.1		0.015	550.44	1.595	1.528	7.381	99.33	102.40
220	352.4		0.015	549.68	1.591	1.525	7.376	99.01	102.11
230	351.9		0.015	548.55	1.587	1.523	7.368	98.71	101.85
240	352.3		0.015	549.81	1.594	1.527	7.376	99.26	102.23
250	350.1		0.015	548.69	1.607	1.511	7.369	99.95	101.05
260	348.7		0.015	547.62	1.606	1.501	7.362	99.81	100.32

270	348.0		0.015	548.73	1.606	1.526	7.369	99.91	102.08
280	346.3		0.015	548.02	1.608	1.537	7.364	99.93	102.77
290	346.0		0.015	547.15	1.617	1.450	7.359	100.42	96.85
300	343.4		0.015	548.62	1.602	1.510	7.368	99.64	101.00
310	339.3		0.015	548.49	1.614	1.473	7.368	100.37	98.49
320	335.4		0.015	547.04	1.601	1.469	7.358	99.43	98.10
330	333.1		0.015	549.07	1.612	1.440	7.371	100.29	96.38
340	330.3		0.015	547.91	1.609	1.510	7.364	99.98	100.91
350	329.5		0.015	546.57	1.606	1.415	7.355	99.68	94.46
360	329.6		0.015	548.61	1.612	1.488	7.368	100.23	99.50
370	330.9		0.015	549.78	1.606	1.529	7.376	99.98	102.34
380	330.3		0.015	548.18	1.627	1.438	7.365	101.15	96.15
390	330.4		0.015	549.82	1.589	1.463	7.376	98.92	97.96
400	329.2		0.015	548.89	1.614	1.520	7.370	100.40	101.67
410	330.3		0.015	546.91	1.603	1.457	7.357	99.53	97.29
420	330.4		0.015	547.69	1.605	1.469	7.362	99.73	98.16
430	328.5		0.015	547.67	1.607	1.489	7.362	99.82	99.52
440	327.1		0.015	548.07	1.605	1.440	7.365	99.73	96.23
450	325.2		0.015	547.98	1.609	1.425	7.364	100.01	95.26
460	322.2		0.015	547.96	1.598	1.515	7.364	99.32	101.25
470	319.0	319.04	0.015	548.15	1.611	1.529	7.365	100.15	102.20

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**December 5, 2013**
Test Run Number:	**4**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.4	to	5.4

Average Firebox Temp, ℉	418.4

Final Coal Bed Wt, lb	5.23

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	79.44	231.1	765.6	734.7	548.8	661.3	552.8	525.8			8.83	3.60
1	10	81.67	137.3	483.2	653.6	572.7	664.6	566.7	550.5			7.51	1.32
2	20	79.86	121.1	417.3	566.4	543.9	624.1	542.3	532.4			6.76	0.75
3	30	76.82	110.5	363.8	497.1	511.4	587.5	510.3	510.2			6.18	0.58
4	40	75.46	104.1	334	450.9	493.8	556.8	488	485.3			5.76	0.42
5	50	79.52	103.3	294.8	405	481.5	529.7	469.3	466.9			5.43	0.33
6	60	83.98	98.02	266.6	359.3	460	498.3	446.1	445.2			5.38	0.05
7	70	82.49	94.31	249.3	326.4	450.1	472.2	420.3	423			5.23	0.15

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 5, 2013
Test Run Number: 4

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	21		119	
B - Rear Filter Catch	Filter	22		118.9	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			264.5	237.9	26.6
Probe & Filter Holder	Probe	31	137096.7	137095.1	1.6
			Total Particulate, mg		**28.2**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	23		118.7	
B - Rear Filter Catch	Filter	24		118.2	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			262.2	236.9	25.3
Probe & Filter Holder	Probe	32	136009.0	136007.1	1.9
			Total Particulate, mg		**27.2**

nufacturer: SBI
Model: NG1800
Date: 12/05/13
Run: 4
Control #: 3101440749
t Duration: 470 min

	HHV	LHV
Eff	67.10%	72.52%
Comb Eff	89.61%	89.61%
HT Eff	74.88%	80.93%
Output	14,033	kJ/h
Burn Rate	1.06	kg/h
Grams CO	1,230	g
Input	20,914	kJ/h
MC wet	16.78	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.059

Overall Heating Efficiency:	67.10%	
Combustion Efficiency:	89.61%	
Heat Transfer Efficiency:	74.88%	
Heat Output:	13,312	Btu/h
Heat Input:	19,839	Btu/h
Burn Duration:	7.83	h
Burn Rate:	2.33	lb/h
Stack Temp:	265.7	Deg. F

Averages	1.13	4.93	2.59	20.54	15.05	129.88	27.49	82.9%	75.0%	62.3%
INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net
Elapsed Time	Weight emaining (k	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %
0	9.94	1.13	2.52	438.2%	20.70	17.61	130.9	27.8	76.0%	64.8%	49.3%
10	9.60	0.56	1.45	877.3%	20.81	19.08	118.0	29.7	79.6%	54.6%	43.5%
20	9.16	0.65	5.41	224.1%	20.54	14.80	155.2	30.7	91.7%	74.5%	68.3%
30	8.67	0.81	4.85	247.0%	20.57	15.31	155.6	30.7	88.8%	72.9%	64.7%
40	8.18	0.64	7.10	153.8%	20.43	13.01	172.3	30.1	93.5%	76.1%	71.2%
50	7.61	0.44	9.45	98.6%	20.29	10.62	194.2	31.2	96.6%	77.6%	74.9%
60	6.91	0.75	10.49	74.8%	20.20	9.33	213.2	26.5	94.6%	76.9%	72.8%
70	6.30	0.42	8.13	129.7%	20.38	12.04	198.8	25.7	96.3%	75.1%	72.3%
80	5.79	0.51	8.92	108.3%	20.32	11.14	196.3	27.5	95.8%	76.5%	73.3%
90	5.27	0.37	9.13	106.8%	20.31	11.00	197.7	26.4	97.0%	76.7%	74.4%
100	4.74	0.42	9.69	94.3%	20.27	10.37	200.2	25.4	96.8%	77.0%	74.6%
110	4.21	0.44	9.77	92.4%	20.27	10.28	198.8	25.0	96.6%	77.2%	74.6%
120	3.75	0.41	9.54	97.4%	20.28	10.54	195.0	28.1	96.8%	77.5%	75.0%
130	3.35	0.44	8.36	123.2%	20.36	11.78	184.7	26.1	96.2%	76.7%	73.7%
140	3.00	0.79	7.07	149.9%	20.42	12.96	172.0	25.4	92.0%	75.6%	69.6%
150	2.78	1.07	5.38	204.5%	20.51	14.60	154.7	27.6	86.8%	74.0%	64.2%
160	2.55	1.15	5.25	206.9%	20.52	14.69	144.5	25.6	85.7%	74.6%	63.9%
170	2.41	1.20	4.46	247.0%	20.57	15.51	134.7	27.6	83.2%	73.9%	61.5%
180	2.29	1.25	4.24	257.8%	20.58	15.71	127.2	24.8	82.0%	73.8%	60.5%
190	2.20	1.25	4.29	254.6%	20.57	15.66	121.6	27.2	82.2%	75.1%	61.7%
200	2.08	1.33	4.20	255.2%	20.57	15.71	117.8	24.4	81.0%	75.0%	60.7%
210	2.00	1.25	4.17	262.4%	20.58	15.79	114.5	26.0	81.8%	75.6%	61.8%
220	1.91	1.26	4.16	262.4%	20.58	15.79	111.6	26.1	81.6%	76.0%	62.1%
230	1.82	1.39	4.27	247.0%	20.57	15.60	110.4	25.3	80.5%	76.3%	61.4%
240	1.71	1.03	4.98	226.8%	20.54	15.05	109.6	26.8	86.4%	78.5%	67.8%
250	1.62	1.07	4.40	259.1%	20.58	15.64	108.5	26.0	84.6%	77.2%	65.3%
260	1.54	1.23	4.15	265.1%	20.58	15.82	107.5	24.9	81.9%	76.4%	62.6%
270	1.44	1.22	4.26	258.4%	20.58	15.71	106.6	26.5	82.4%	77.1%	63.5%
280	1.36	1.20	4.09	271.3%	20.59	15.90	105.5	26.2	82.1%	76.7%	63.0%
290	1.28	1.20	3.96	280.7%	20.60	16.04	105.4	25.0	81.7%	76.2%	62.3%
300	1.21	1.22	3.69	300.1%	20.62	16.32	103.2	27.2	80.5%	76.1%	61.2%
310	1.14	1.34	3.53	303.3%	20.62	16.42	101.9	27.2	78.3%	75.7%	59.3%
320	1.06	1.32	3.72	289.7%	20.61	16.23	101.8	25.5	79.4%	76.0%	60.3%
330	0.99	1.35	3.59	297.6%	20.61	16.35	100.8	28.1	78.5%	76.2%	59.8%
340	0.92	1.32	3.71	290.5%	20.61	16.24	100.2	26.9	79.3%	76.5%	60.7%
350	0.83	1.29	3.73	291.3%	20.61	16.23	100.4	25.2	79.8%	76.3%	60.8%
360	0.78	1.37	3.60	295.2%	20.61	16.33	99.3	27.9	78.3%	76.4%	59.8%
370	0.69	1.40	3.57	295.2%	20.61	16.34	99.3	29.5	77.8%	76.6%	59.6%
380	0.64	1.61	3.28	301.7%	20.62	16.53	98.9	28.1	74.1%	75.3%	55.8%
390	0.55	1.44	3.34	310.9%	20.62	16.56	98.8	29.6	76.3%	75.8%	57.9%
400	0.48	1.56	3.16	316.2%	20.63	16.69	98.0	29.0	74.0%	75.2%	55.6%
410	0.41	1.50	3.33	306.7%	20.62	16.54	96.7	29.5	75.6%	76.1%	57.5%
420	0.33	1.62	3.01	324.3%	20.63	16.81	96.7	29.7	72.6%	74.9%	54.3%
430	0.25	1.75	3.01	312.7%	20.63	16.74	96.2	29.8	71.2%	74.9%	53.3%
440	0.17	1.87	2.85	316.2%	20.63	16.84	95.9	29.9	69.0%	74.3%	51.2%
450	0.11	1.90	2.43	353.6%	20.65	17.27	95.3	30.0	65.8%	72.3%	47.6%
460	0.05	1.66	2.46	376.8%	20.67	17.38	94.2	30.2	68.6%	72.9%	50.0%
470	0.00	1.78	2.49	360.0%	20.66	17.28	93.2	30.1	67.5%	73.2%	49.4%

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.39
Dry Moles Exhaust Gas (N_r):	575.98
Air Fuel Ratio (A/F)	16.42

%HC
1.32

Combustion Efficiency:	89.61%	
Total Input (kJ):	163,827	155,382
Total Output (kJ):	109,923	104,256
Efficiency:	67.10%	
Total CO (g):	1230.00	

14,033 kJ/h
20,914 kJ/h

1.056 kg/h

129.9 Deg. C

20.81	2.83	71.48	2.36	71.46	164341	4.06	6.87	2.74	19810.00	16.78	78.90
Air	Wet Wt	% Wet	Dry Wt.	% Dry		Fuel Properties				Mw	
Fuel Ratio	Now Wt	Consumed x	Now Wt_{dp}	Comsumed y	Total Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value	Moisture Fuel Burnt	[h]
31.0	9.94	0.00	8.27	0.00	0	4.06	6.87	2.74	19810.00	16.78	78.74
57.0	9.60	3.43	7.99	3.43	9215	4.06	6.87	2.74	19810.00	16.78	78.91
19.2	9.16	7.82	7.62	7.82	7667	4.06	6.87	2.74	19810.00	16.78	79.14
20.5	8.67	12.79	7.21	12.79	8116	4.06	6.87	2.74	19810.00	16.78	79.03
15.1	8.18	17.72	6.80	17.72	8714	4.06	6.87	2.74	19810.00	16.78	79.25
11.9	7.61	23.43	6.33	23.43	10472	4.06	6.87	2.74	19810.00	16.78	79.49
10.4	6.91	30.51	5.75	30.51	10771	4.06	6.87	2.74	19810.00	16.78	79.43
13.8	6.30	36.58	5.24	36.58	9200	4.06	6.87	2.74	19810.00	16.78	79.41
12.5	5.79	41.74	4.82	41.74	8490	4.06	6.87	2.74	19810.00	16.78	79.43
12.4	5.27	46.95	4.39	46.95	8639	4.06	6.87	2.74	19810.00	16.78	79.50
11.7	4.74	52.29	3.95	52.29	8789	4.06	6.87	2.74	19810.00	16.78	79.52
11.5	4.21	57.68	3.50	57.68	8191	4.06	6.87	2.74	19810.00	16.78	79.51
11.8	3.75	62.29	3.12	62.29	7069	4.06	6.87	2.74	19810.00	16.78	79.51
13.4	3.35	66.30	2.79	66.30	6134	4.06	6.87	2.74	19810.00	16.78	79.42
14.8	3.00	69.77	2.50	69.77	4675	4.06	6.87	2.74	19810.00	16.78	79.18
17.9	2.78	72.01	2.31	72.01	3777	4.06	6.87	2.74	19810.00	16.78	78.95
18.0	2.55	74.39	2.12	74.39	3067	4.06	6.87	2.74	19810.00	16.78	78.91
20.2	2.41	75.76	2.00	75.76	2132	4.06	6.87	2.74	19810.00	16.78	78.83
20.8	2.29	76.99	1.90	76.99	1758	4.06	6.87	2.74	19810.00	16.78	78.80
20.6	2.20	77.90	1.83	77.90	1683	4.06	6.87	2.74	19810.00	16.78	78.80
20.6	2.08	79.04	1.73	79.04	1608	4.06	6.87	2.74	19810.00	16.78	78.76
21.0	2.00	79.86	1.67	79.86	1459	4.06	6.87	2.74	19810.00	16.78	78.79
21.0	1.91	80.82	1.59	80.82	1459	4.06	6.87	2.74	19810.00	16.78	78.79
20.1	1.82	81.65	1.52	81.65	1608	4.06	6.87	2.74	19810.00	16.78	78.74
19.2	1.71	82.79	1.42	82.79	1720	4.06	6.87	2.74	19810.00	16.78	78.94
21.0	1.62	83.75	1.34	83.75	1421	4.06	6.87	2.74	19810.00	16.78	78.89
21.2	1.54	84.52	1.28	84.52	1421	4.06	6.87	2.74	19810.00	16.78	78.80
20.8	1.44	85.48	1.20	85.48	1459	4.06	6.87	2.74	19810.00	16.78	78.81
21.6	1.36	86.30	1.13	86.30	1309	4.06	6.87	2.74	19810.00	16.78	78.81
22.1	1.28	87.08	1.07	87.08	1234	4.06	6.87	2.74	19810.00	16.78	78.80
23.2	1.21	87.81	1.01	87.81	1197	4.06	6.87	2.74	19810.00	16.78	78.77
23.3	1.14	88.54	0.95	88.54	1272	4.06	6.87	2.74	19810.00	16.78	78.71
22.5	1.06	89.36	0.88	89.36	1197	4.06	6.87	2.74	19810.00	16.78	78.73
22.9	0.99	90.00	0.83	90.00	1122	4.06	6.87	2.74	19810.00	16.78	78.71
22.6	0.92	90.73	0.77	90.73	1346	4.06	6.87	2.74	19810.00	16.78	78.73
22.6	0.83	91.64	0.69	91.64	1197	4.06	6.87	2.74	19810.00	16.78	78.75
22.8	0.78	92.19	0.65	92.19	1122	4.06	6.87	2.74	19810.00	16.78	78.70
22.8	0.69	93.01	0.58	93.01	1159	4.06	6.87	2.74	19810.00	16.78	78.69
23.0	0.64	93.61	0.53	93.61	1159	4.06	6.87	2.74	19810.00	16.78	78.58
23.6	0.55	94.43	0.46	94.43	1272	4.06	6.87	2.74	19810.00	16.78	78.66
23.8	0.48	95.16	0.40	95.16	1197	4.06	6.87	2.74	19810.00	16.78	78.59
23.3	0.41	95.89	0.34	95.89	1234	4.06	6.87	2.74	19810.00	16.78	78.63
24.2	0.33	96.67	0.28	96.67	1346	4.06	6.87	2.74	19810.00	16.78	78.56
23.4	0.25	97.53	0.20	97.53	1103	4.06	6.87	2.74	19810.00	16.78	78.50
23.5	0.17	98.26	0.16	98.01	949	4.06	6.87	2.74	19810.00	16.78	78.44
25.5	0.11	98.86	0.11	98.69	1113	4.06	6.87	2.74	19810.00	16.78	78.40
27.0	0.05	99.45	0.05	99.37	1585	4.06	6.87	2.74	19810.00	16.78	78.50
26.0	0.00	100.00	0.00	100.00	514	4.06	6.87	2.74	19810.00	16.78	78.45

Moisture Content M_{Cwb}: 16.78

	Moisture of Wood (wet basis):	16.78	Dry kg :	8.27
(Btu)	Initial Dry Weight Wt_{do} (kg):	8.27	CA:	48.73
(Btu)	Moisture Content Dry	20.16	HY:	6.87
			OX:	43.9

Load Weight (kg):	**9.94**				
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**
Value in kJ/kg - CV:	**19,810**	**18,329**	Btu/lb	**8522.5**	**7885.2**

20.93	**1.53**	**4.96**	**0.14**	**0.15**	**31.14**	**113.44**	**8.60**	**1.07**	**570.31**	**32.38**	**11.20**
Mass Balance				**kg Wood pe**							
(moles/100 mole dry flue gas)				**00 mole df**	**Moles per kg of Dry Wood**						**Moisture**
[u]	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**	**HC**	**N_2**	**H_2O**	**Present**
20.88	0.93	2.93	0.14	0.09	27.16	189.86	12.18	1.47	848.67	31.58	11.20
20.93	0.51	1.64	0.05	0.05	28.71	377.78	11.09	1.01	1562.70	32.51	11.20
20.99	1.51	5.04	0.07	0.15	36.01	98.55	4.33	0.47	526.79	33.58	11.20
20.96	1.42	4.68	0.09	0.14	34.40	108.61	5.75	0.66	560.60	33.20	11.20
21.02	1.92	6.46	0.07	0.19	37.09	67.96	3.34	0.38	414.01	33.77	11.20
21.09	2.45	8.31	0.05	0.24	38.81	43.60	1.81	0.19	326.49	34.14	11.20
21.07	2.79	9.40	0.09	0.28	37.77	33.61	2.70	0.34	286.00	33.84	11.20
21.06	2.12	7.18	0.04	0.21	38.62	57.17	2.00	0.20	377.23	34.12	11.20
21.07	2.34	7.91	0.06	0.23	38.38	47.94	2.19	0.24	341.71	34.04	11.20
21.09	2.35	7.99	0.04	0.23	39.07	47.07	1.58	0.16	340.25	34.21	11.20
21.09	2.50	8.50	0.04	0.25	38.95	41.69	1.69	0.18	319.59	34.16	11.20
21.09	2.53	8.58	0.05	0.25	38.87	40.88	1.75	0.19	316.37	34.14	11.20
21.09	2.46	8.37	0.04	0.24	38.96	43.04	1.67	0.17	324.74	34.17	11.20
21.07	2.18	7.39	0.05	0.22	38.57	54.35	2.03	0.21	366.46	34.11	11.20
21.00	1.96	6.54	0.09	0.19	36.28	66.48	4.05	0.48	406.28	33.55	11.20
20.94	1.62	5.30	0.13	0.16	33.36	90.52	6.63	0.82	489.51	32.88	11.20
20.93	1.61	5.25	0.14	0.16	32.74	91.63	7.17	0.90	492.12	32.73	11.20
20.91	1.43	4.61	0.15	0.14	31.33	108.92	8.43	1.05	553.77	32.42	11.20
20.90	1.39	4.46	0.16	0.14	30.64	113.56	9.03	1.13	569.50	32.25	11.20
20.90	1.40	4.50	0.16	0.14	30.73	112.18	8.95	1.12	564.51	32.27	11.20
20.89	1.40	4.48	0.17	0.14	30.08	112.51	9.53	1.21	564.07	32.11	11.20
20.90	1.37	4.40	0.16	0.14	30.52	115.53	9.15	1.15	576.62	32.23	11.20
20.90	1.37	4.40	0.16	0.14	30.44	115.54	9.22	1.16	576.44	32.21	11.20
20.89	1.44	4.58	0.18	0.14	29.85	109.07	9.72	1.24	550.49	32.04	11.20
20.94	1.51	4.94	0.13	0.15	33.12	100.09	6.85	0.84	525.07	32.85	11.20
20.92	1.38	4.48	0.13	0.14	32.06	113.99	7.80	0.95	574.83	32.62	11.20
20.90	1.36	4.37	0.15	0.14	30.61	116.67	9.07	1.13	581.16	32.25	11.20
20.90	1.39	4.46	0.15	0.14	30.87	113.82	8.84	1.11	571.05	32.31	11.20
20.90	1.34	4.30	0.15	0.13	30.69	119.31	9.00	1.12	591.32	32.28	11.20
20.90	1.31	4.19	0.15	0.13	30.44	123.30	9.22	1.15	605.76	32.23	11.20
20.90	1.25	3.98	0.15	0.12	29.75	131.56	9.84	1.22	635.17	32.08	11.20
20.88	1.24	3.92	0.17	0.12	28.59	132.98	10.85	1.37	637.52	31.79	11.20
20.88	1.28	4.07	0.17	0.13	29.16	127.21	10.35	1.30	617.19	31.92	11.20
20.88	1.26	3.98	0.17	0.13	28.67	130.56	10.78	1.36	628.59	31.80	11.20
20.88	1.28	4.06	0.17	0.13	29.14	127.53	10.37	1.31	618.37	31.91	11.20
20.89	1.28	4.06	0.16	0.13	29.38	127.85	10.16	1.28	620.20	31.97	11.20
20.88	1.27	4.00	0.17	0.13	28.57	129.55	10.87	1.38	624.50	31.77	11.20
20.87	1.27	4.00	0.18	0.13	28.30	129.56	11.10	1.41	623.85	31.70	11.20
20.84	1.26	3.90	0.21	0.12	26.26	132.35	12.89	1.67	629.05	31.19	11.20
20.86	1.22	3.83	0.18	0.12	27.46	136.21	11.84	1.51	646.78	31.51	11.20
20.85	1.21	3.76	0.20	0.12	26.21	138.42	12.94	1.66	651.86	31.20	11.20
20.86	1.24	3.86	0.19	0.12	27.06	134.42	12.19	1.56	638.99	31.40	11.20
20.84	1.19	3.68	0.21	0.12	25.39	141.81	13.66	1.76	662.53	31.00	11.20
20.82	1.23	3.76	0.23	0.12	24.63	136.97	14.32	1.87	642.27	30.79	11.20
20.81	1.22	3.71	0.25	0.12	23.42	138.44	15.37	2.02	644.69	30.49	11.20
20.79	1.13	3.38	0.25	0.11	21.66	153.96	16.93	2.22	698.71	30.08	11.20
20.82	1.07	3.24	0.21	0.11	23.17	163.64	15.63	2.02	739.23	30.49	11.20
20.81	1.11	3.34	0.23	0.11	22.57	156.64	16.14	2.10	711.25	30.32	11.20

											SUMS
403.03	4090.29	3072.91	2986.87	2954.04	3949.21	3573.85	300.64	6455.46	14723.32	117898.91	74235.49
Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	Energy Losses (kJ/kg Flue Gas Consti			
	CO_2	O_2	CO	N_2	CH_4	H_2O		CO_2	O_2	CO	N_2
404.09	4100.07	3088.68	3004.27	2970.81	3940.20	3595.33	300.98	111.37	586.41	3483.03	2521.25
391.15	3498.65	2641.92	2571.27	2542.31	3348.41	3077.64	302.81	100.46	998.08	3166.79	3972.86
428.32	4999.63	3744.70	3637.05	3597.66	4852.05	4350.92	303.81	180.05	369.05	1240.23	1895.20
428.71	5015.73	3756.45	3648.39	3608.89	4868.37	4364.45	303.82	172.56	407.99	1646.98	2023.13
445.43	5743.81	4287.14	4160.20	4115.92	5607.03	4975.57	303.24	213.04	291.35	960.07	1704.05
467.37	6640.32	4932.52	4780.59	4730.95	6534.20	5715.68	304.34	257.72	215.08	520.04	1544.58
486.37	7642.63	5660.27	5481.74	5425.70	7557.27	6552.64	299.68	288.68	190.22	779.05	1551.75
471.93	7046.45	5235.20	5074.19	5021.45	6931.66	6066.79	298.87	272.12	299.30	574.71	1894.24
469.48	6873.11	5107.13	4950.24	4898.75	6759.59	5918.65	300.64	263.76	244.82	631.78	1673.97
470.87	6974.72	5182.31	5023.03	4970.80	6860.23	6005.65	299.55	272.53	243.92	456.07	1691.30
473.32	7120.52	5289.11	5126.16	5072.94	7006.98	6128.84	298.50	277.31	220.49	486.36	1621.27
471.98	7076.01	5257.88	5096.35	5043.34	6959.18	6093.34	298.16	275.06	214.97	504.34	1595.54
468.15	6792.43	5047.94	4893.05	4842.12	6678.57	5850.34	301.24	264.65	217.26	482.07	1572.43
457.82	6423.23	4785.79	4641.99	4593.03	6288.79	5551.13	299.29	247.77	260.10	583.96	1683.14
445.15	5912.30	4417.51	4287.86	4241.99	5761.37	5128.62	298.53	214.47	293.66	1164.46	1723.44
427.87	5098.03	3821.23	3712.08	3671.73	4941.35	4440.90	300.76	170.05	345.89	1902.05	1797.34
417.65	4747.63	3567.85	3468.23	3430.05	4581.44	4149.89	298.74	155.45	326.93	2054.53	1687.98
407.87	4266.14	3211.36	3123.00	3088.35	4105.09	3737.23	300.72	133.66	349.80	2411.80	1710.24
400.32	4062.27	3064.71	2982.07	2948.62	3893.99	3569.11	297.90	124.48	348.03	2583.56	1679.23
394.76	3742.40	2825.31	2749.59	2718.66	3583.17	3291.02	300.30	115.01	316.94	2558.76	1534.72
390.98	3693.47	2792.32	2718.45	2687.66	3527.69	3254.05	297.53	111.10	314.17	2721.47	1516.02
387.65	3494.56	2642.91	2573.23	2544.03	3335.60	3080.29	299.18	106.64	305.35	2612.30	1466.95
384.76	3372.41	2552.06	2485.14	2456.87	3215.65	2974.97	299.29	102.64	294.87	2631.70	1416.24
383.59	3357.85	2542.15	2475.78	2447.55	3199.31	2963.84	298.43	100.24	277.28	2774.20	1347.36
382.76	3265.59	2471.93	2407.30	2379.87	3112.22	2881.83	299.96	108.17	247.42	1955.25	1249.61
381.65	3249.97	2461.12	2397.01	2369.65	3095.14	2869.60	299.19	104.20	280.55	2225.18	1362.16
380.65	3252.46	2464.14	2400.23	2372.78	3095.01	2873.54	298.06	99.55	287.50	2588.89	1378.95
379.76	3155.69	2390.46	2328.38	2301.77	3003.73	2787.49	299.65	97.41	272.08	2522.20	1314.43
378.65	3122.97	2366.41	2305.13	2278.75	2970.96	2759.72	299.33	95.84	282.33	2568.77	1347.47
378.54	3162.19	2396.79	2334.88	2308.12	3006.84	2795.38	298.18	96.26	295.52	2632.06	1398.16
376.37	2990.39	2266.55	2208.00	2182.70	2843.52	2643.48	300.38	88.97	298.18	2805.54	1386.38
375.09	2940.42	2229.32	2171.89	2146.97	2794.60	2600.30	300.34	84.07	296.46	3094.97	1368.73
374.98	3002.18	2277.06	2218.63	2193.12	2851.30	2656.32	298.61	87.55	289.66	2951.23	1353.57
373.93	2858.64	2167.44	2111.63	2087.40	2716.60	2528.16	301.24	81.96	282.98	3073.75	1312.11
373.37	2880.84	2185.09	2129.03	2104.55	2735.91	2549.06	300.08	83.94	278.67	2955.99	1301.40
373.59	2954.99	2242.06	2184.72	2159.56	2804.74	2615.79	298.37	86.81	286.66	2897.39	1339.36
372.48	2807.56	2129.47	2074.83	2050.98	2666.41	2484.16	301.06	80.20	275.88	3098.90	1280.83
372.43	2744.26	2080.76	2027.20	2003.93	2607.82	2427.08	302.65	77.67	269.58	3163.56	1250.15
372.09	2785.92	2113.17	2058.97	2035.29	2645.62	2465.17	301.21	73.15	279.67	3673.96	1280.30
371.98	2723.57	2065.24	2012.12	1989.01	2587.79	2409.03	302.72	74.80	281.30	3374.74	1286.45
371.15	2713.39	2058.16	2005.38	1982.32	2576.69	2401.02	302.11	71.12	284.89	3687.61	1292.20
369.87	2642.76	2004.93	1953.60	1931.11	2508.88	2339.04	302.61	71.52	269.51	3473.49	1233.96
369.87	2634.88	1998.87	1947.66	1925.25	2501.59	2331.93	302.82	66.89	283.46	3893.12	1275.54
369.37	2607.94	1978.57	1927.92	1905.73	2475.71	2308.30	302.99	64.23	271.00	4079.57	1223.99
369.04	2590.90	1965.74	1915.45	1893.40	2459.31	2293.38	303.09	60.69	272.14	4379.02	1220.65
368.43	2565.04	1946.37	1896.63	1874.78	2434.23	2270.86	303.12	55.55	299.66	4824.32	1309.93
367.32	2510.35	1905.22	1856.62	1835.22	2381.56	2222.99	303.38	58.15	311.78	4452.72	1356.66
366.37	2476.88	1880.25	1832.40	1811.25	2348.84	2194.02	303.27	55.91	294.53	4596.39	1288.25

			AVERAGE	SUMS						
45956.85	73958.17	25563.58	7474.83	53903.98	17024.02	36880.0	110436.8	17024.0	1230.0	82.5
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
1314.32	1502.21	532.82	10051.40	0.00	0	0.00	0	0	0.00	0.00
901.29	1529.26	527.02	11195.75	5208.11	1878	3330.53	4007	1878	144.44	7.51
422.60	1622.50	541.28	6270.91	2427.00	637	1790.43	5240	637	46.89	2.92
593.23	1604.52	541.43	6989.85	2863.61	908	1955.75	5252	908	65.91	4.34
338.62	1652.69	548.28	5708.10	2510.93	564	1946.70	6203	564	41.18	2.66
173.30	1696.04	556.57	4963.34	2623.72	361	2262.44	7848	361	26.75	1.63
304.86	1709.83	565.94	5390.32	2930.85	580	2350.95	7840	580	41.11	2.95
178.37	1707.47	560.50	5486.71	2548.20	344	2203.78	6652	344	25.94	1.48
217.69	1698.04	558.84	5288.89	2266.61	359	1907.92	6223	359	26.33	1.66
139.13	1709.75	559.82	5072.51	2212.18	256	1956.54	6427	256	19.34	1.08
160.58	1711.57	561.20	5038.78	2235.53	283	1952.90	6553	283	20.97	1.27
169.92	1709.32	560.80	5029.96	2079.67	275	1805.12	6111	275	20.27	1.25
156.81	1702.47	558.08	4953.77	1767.60	225	1542.98	5301	225	16.73	1.00
186.91	1688.91	554.72	5205.51	1611.73	235	1376.38	4522	235	17.60	1.03
433.54	1647.46	549.99	6027.01	1422.32	372	1049.97	3253	372	26.78	1.83
735.25	1591.71	542.29	7084.57	1350.89	497	853.48	2426	497	35.42	2.51
803.52	1574.76	539.03	7142.19	1105.69	438	667.72	1961	438	31.09	2.22
942.11	1546.43	534.40	7628.42	820.91	358	463.29	1311	358	25.40	1.81
1014.03	1533.30	532.52	7815.16	693.46	316	377.02	1064	316	22.45	1.61
1005.32	1525.22	529.41	7585.38	644.43	300	344.07	1039	300	21.30	1.53
1079.09	1516.22	528.99	7787.06	632.16	306	326.08	976	306	21.65	1.57
1025.35	1516.28	527.05	7559.92	556.63	266	290.81	902	266	18.86	1.35
1034.43	1511.92	525.87	7517.65	553.52	268	285.55	905	268	19.01	1.36
1108.74	1503.75	525.74	7637.32	620.01	313	307.06	988	313	22.09	1.61
748.22	1538.93	524.82	6372.41	553.41	233	320.29	1167	233	16.66	1.16
851.40	1527.70	524.69	6875.88	493.29	219	274.12	928	219	15.66	1.09
1013.49	1510.83	524.73	7403.94	531.17	257	274.54	890	257	18.22	1.30
987.35	1510.78	523.77	7228.02	532.19	257	275.55	926	257	18.22	1.30
1000.77	1508.48	523.45	7327.11	484.16	234	249.88	825	234	16.66	1.18
1023.83	1507.22	523.85	7476.90	465.82	226	239.61	768	226	16.09	1.14
1091.49	1495.24	522.15	7687.96	464.46	234	230.55	732	234	16.64	1.18
1221.66	1480.27	521.67	8067.82	517.87	275	242.55	754	275	19.51	1.41
1164.20	1488.06	522.30	7856.56	474.64	247	227.63	722	247	17.50	1.26
1215.64	1478.59	520.86	7965.89	451.17	241	209.73	671	241	17.10	1.23
1166.17	1484.41	521.09	7791.70	529.57	278	251.14	817	278	19.73	1.42
1138.79	1489.41	521.84	7760.26	468.83	242	226.54	728	242	17.19	1.23
1228.69	1475.83	520.37	7960.69	450.88	244	207.26	671	244	17.24	1.25
1258.35	1470.92	519.73	8009.97	468.79	257	211.53	691	257	18.19	1.32
1487.27	1448.32	520.16	8762.83	512.85	300	212.60	647	300	21.12	1.56
1345.28	1461.32	519.53	8343.41	535.56	301	234.36	736	301	21.28	1.55
1484.98	1446.55	519.44	8786.79	530.84	311	220.17	666	311	21.89	1.61
1393.13	1454.13	518.74	8414.50	524.24	301	222.77	710	301	21.26	1.56
1574.17	1435.13	518.66	9046.97	614.88	369	245.40	732	369	26.00	1.92
1666.35	1424.83	518.40	9248.37	514.99	318	196.83	588	318	22.32	1.66
1801.05	1410.41	518.23	9662.19	462.74	294.33	168.41	486	294	20.61	1.55
1982.22	1390.95	517.98	10380.60	583.16	380.27	202.89	530	380	26.64	2.00
1798.77	1408.48	517.44	9904.00	792.45	497.50	294.96	793	497	35.02	2.58
1874.56	1399.75	517.12	10026.52	260.26	167.07	93.19	254	167	11.73	0.87

Intertek Testing Services NA Ltd

Manufacturer:	SBI
Model:	NG1800
Date:	12/05/13
Run:	4
Control #:	G101440749
Test Duration:	470
Output Category:	2

Technicians:

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Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	67.1%	72.5%
Combustion Efficiency	89.6%	89.6%
Heat Transfer Efficiency	75%	80.9%

Output Rate (kJ/h)	14,033	13,312	**(Btu/h)**
Burn Rate (kg/h)	1.06	2.33	**(lb/h)**
Input (kJ/h)	20,914	19,839	**(Btu/h)**

Test Load Weight (dry kg)	8.27	18.23	**dry lb**
MC wet (%)	16.78		
MC dry (%)	20.16		
Particulate (g)	25.4805		
CO (g)	1,230		
Test Duration (h)	7.83		

Emissions	**Particulate**	**CO**
g/MJ Output	0.23	11.19
g/kg Dry Fuel	3.08	148.73
g/h	3.25	157.02
lb/MM Btu Output	0.54	26.01

Air/Fuel Ratio (A/F)	16.42

Version: 2.4 **15/04/2010**

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 5, 2013
Test Run Number:	4

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:00	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.804	21.9	21.7	21.4
2	16	1.588	21.0	20.5	21.0
3	16	1.586	21.7	21.1	21.7
4	16	1.634	22.2	21.6	22.2
5	16	1.841	21.2	20.9	21.6
6	16	1.815	21.9	20.8	21.2
7	16	1.623	20.6	22.2	21.2
8	16	1.683	22.3	21.2	21.9
9	17	2.006	21.5	20.2	22.3
10	17	1.70	22.1	20.4	21.7
11	17	1.66	21.2	19.8	20.2
12	17	1.64	21.9	22.0	21.5
Total Weight		**20.578**	Average, %db		**21.4**

Allowable Fuel Load Range:	**4.38**	to	**5.48**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.560		19.2	19.4	19.3
2	15	1.511		18.7	20.2	18.6
3	15	1.834		19.8	19.3	19.7
4	15		3.623	22.2	20.4	20.4
5	15		3.435	21.1	19.7	19.2
6	15		3.747	21.9	21.7	23.8
7	15	2.095		20.1	21.2	19.9
8	15	2.001		19.5	19.8	19.2
9	15	2.097		19.5	20.4	20.5
Totals		11.098	10.805			
% of Weight		50.7	49.3			
Total weight, wet, lb.		**21.903**		Average Moisture, dry		**20.17**
Total weight, dry, kg		8.27		Average Moisture, wet		16.79

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 6, 2013
Test Run Number:	5

Dry Burn-Rate, kg/hr:	**1.45**	
Emission-Rate, g/hr:	**2.64**	
Adjusted Emission-Rate, g/hr :	**4.07**	
Duration of Test, Minutes	350	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1150.623	1121.906
Dry Gas Meter Ending Reading, ft^3	1206.095	1176.258
Barometric Pressure Correction Factor	1.001	1.001
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	0.998	0.999
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**55.537**	**54.019**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**143.793**	
Total Tunnel Volume, scf	**50327.531**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	906.205	931.659
Sample Particulate Mass, mg	17.2	16.3
Total Emissions, grams	15.587	15.186
Emission-Rate, g/hr	2.67	2.60
Adjusted Emission Rates, g/hr	**4.11**	**4.03**
Deviation, %	1.08%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	85.34	83.53
Post-Test Leak Check, cfm @ in. Hg vac.	0.0015@5	0.002@5
Average Firebox Surface Temperture delta-T, ℉	76.66	
Maximum Ambient Temperture, ℉	87	
Mimimum Ambient Temperature, ℉	71	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.46	
Dry-Basis Fuel Load Moisture Content, %	20.54	
Wet-Basis Fuel Load Moisture Content, %	17.04	
Coal Bed Range, lb.	4.50	5.60
Actual Coal Bed, Lb.	4.82	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 6, 2013
Test Run No:	5

Temperature Data

Firebox Temp Start	449.86
Firebox Temp End	373.2
Firebox Delta-T	**76.7**

Max Filter Temps	
Train A	Train B
85.34	**83.53**

Interval	10	Duration of Test, Min	**350**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	71.43	109.4	315.1	367.6	463	517.2	450.4	451.1		69.21	67.64	67.93	67.7
1	10	81.08	115.9	336.4	335.3	462.5	457.4	423.5	424.3		79.31	77.61	68.17	67.89
2	20	86.58	121.5	398.3	381.7	451.1	411.4	389.7	394.9		81.44	79.08	68.29	67.955
3	30	83.06	131.2	467.2	446.7	432.5	401.4	373.1	383.2		83.28	81.3	68.375	68.1
4	40	79.9	139.2	519.3	539	410	417.6	383	391		85.34	83.53	68.57	68.23
5	50	76.23	133.9	491.6	549.1	393.2	438.9	400.5	412.9		84.51	81.57	68.635	68.255
6	60	75.86	133.6	495.4	554.1	374.3	459.7	414.9	433.4		84.87	81.94	68.715	68.325
7	70	75.07	129.3	471.4	536.8	359	472.1	425.5	450.8		84.64	80.32	68.875	68.665
8	80	74.74	127.1	460.7	522.4	345.3	482.8	435	462.7		84.19	79.45	68.955	68.58
9	90	74.94	125.5	457.6	515.3	335.3	498.8	445.7	472.8		83.52	79.1	68.92	68.64
10	100	76.17	123.4	448.2	511.1	326.2	514.5	454.6	479.3		83.23	78.89	69.025	68.685
11	110	82.18	119.4	416.5	497.8	322.2	526	461	486		82.57	78.61	69.045	68.66
12	120	78.83	115	394.4	466	316.6	527.4	456.3	481.6		81.54	77.98	69.06	68.685
13	130	78.83	111.4	376.6	439.6	313.1	528	452.1	473.6		80.71	77.4	69.01	68.605
14	140	77.52	108	356.3	415.5	311	523.7	449.2	466.2		79.92	76.25	69.13	68.865
15	150	81.51	105.7	334.7	392.2	310	514	445.8	458.9		79.12	76.11	69.165	68.68
16	160	78.73	103.1	321.5	367.7	309.9	501.1	438.6	450.8		78.46	75.61	69.04	68.595
17	170	79.55	101.7	310.4	351.2	310.1	490.4	431	444.1		77.81	75.1	69	68.51
18	180	78.75	100.1	301.6	337.4	312.7	482.7	426	437.4		77.39	74.89	68.965	68.505
19	190	79.89	99.68	301.2	329.4	313.3	482.9	420.7	429.6		77.1	74.71	68.905	68.435
20	200	78.64	98.56	296.8	325.8	318.4	480.3	418.2	426.3		77.05	74.57	68.885	68.4

21	210	80.61	98.44	290.5	320.8	322	469.6	411.9	420.3		76.66	74.41	68.86	68.515
22	220	77.56	96.49	283.9	313.2	326.2	459.7	405.1	412.4		76.6	74.23	68.94	68.52
23	230	81.91	97.25	278.6	307.3	328.3	453.1	399.1	406		76.41	74.29	68.98	68.6
24	240	76.96	95.07	275	300.7	329.7	448.5	392.8	397.3		76.11	74.09	68.93	68.575
25	250	79.27	95.47	271.3	296	332	450.5	388.1	392.9		76.08	74.07	68.945	68.62
26	260	79.04	95.14	270.4	291.6	331.5	458.4	384.9	388.9		75.95	73.87	68.865	68.42
27	270	77.13	94.29	271.6	290.3	332.6	472.5	384.5	388.9		75.84	73.59	68.765	68.305
28	280	83.64	94.68	269	292.1	335.7	474.5	390.6	395.7		75.52	73.61	68.785	68.4
29	290	85.61	95.52	270.3	292.9	340.5	478.3	391.5	397.4		75.58	73.67	68.735	68.29
30	300	86.76	96.42	272.2	293.7	343.7	484.5	391.9	397.3		75.7	73.94	68.685	68.315
31	310	83.58	97.27	274.8	292.7	341.1	492.2	387.5	393.6		75.94	74.12	68.645	68.26
32	320	85.07	98	272.9	293	342.2	492.9	387.9	394.4		76.09	74	68.66	68.305
33	330	83.47	95.29	267.7	289.9	341	486.7	386.5	392.1		76.08	73.61	68.695	68.365
34	340	86.58	95.91	265.5	289.8	342.5	479.1	386.4	391.9		76.04	73.52	68.685	68.285
35	350	87.18	96.33	262.3	287.1	342.1	468.2	381.2	387.4		76.05	73.71	68.74	68.3

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 6, 2013
Test Run Number:	5

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	29.91	78	Meter Box (A)	1.002
End	29.97	78	Meter Box (B)	0.994
Duration of Test, Min		350		

Leak Check, cfm @ in Hg	
Train A	Train B
0.0015@5	0.002@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	13.579	5.878	0.826

	Particulate Sampling Data												Combustion Gasses, %		
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.058	22.46	22.46	1150.623	1121.906	99.98	99.97	0.00	0.00	16.480	0.700	0.720
10	0.015	0.00	0.00	0.075	21.23	1.23	1152.248	1123.369	103.34	94.94	0.00	0.00	13.980	5.530	0.590
20	0.015	0.00	0.00	0.083	19.85	1.38	1153.845	1124.825	102.03	94.93	0.00	0.00	13.190	7.700	0.500
30	0.015	0.00	0.00	0.088	18.23	1.62	1155.418	1126.292	101.32	96.42	0.00	0.00	9.680	10.740	0.490
40	0.015	0.00	0.00	0.093	16.18	2.05	1156.982	1127.796	101.38	99.49	0.00	0.00	8.570	11.620	0.570
50	0.015	0.00	0.00	0.090	14.40	1.78	1158.548	1129.295	101.05	98.72	0.00	0.00	9.370	11.510	0.410
60	0.015	0.00	0.00	0.090	12.60	1.80	1160.113	1130.880	100.94	104.34	0.00	0.00	9.940	10.280	0.400
70	0.015	0.00	0.00	0.088	11.16	1.44	1161.685	1132.499	100.99	106.12	0.00	0.00	10.390	9.970	0.360
80	0.015	0.00	0.00	0.085	9.79	1.37	1163.259	1134.055	100.92	101.82	0.00	0.00	10.510	10.000	0.350
90	0.015	0.00	0.00	0.085	8.45	1.34	1164.836	1135.602	100.98	101.08	0.00	0.00	10.550	9.890	0.310
100	0.015	0.00	0.00	0.085	7.28	1.17	1166.405	1137.152	100.27	101.09	0.00	0.00	10.840	9.360	0.300
110	0.015	0.00	0.00	0.080	6.51	0.77	1167.978	1138.699	100.17	100.55	0.00	0.00	12.640	7.780	0.330
120	0.015	0.00	0.00	0.078	5.83	0.68	1169.551	1140.258	99.79	100.94	0.00	0.00	13.050	6.920	0.490
130	0.015	0.00	0.00	0.075	5.23	0.60	1171.132	1141.825	99.99	101.15	0.00	0.00	13.210	6.530	0.600

140	0.015	0.00	0.00	0.073	4.77	0.46	1172.712	1143.359	99.61	98.68	0.00	0.00	13.800	5.450	0.820
150	0.015	0.00	0.00	0.070	4.43	0.34	1174.296	1144.920	99.65	100.25	0.00	0.00	14.090	4.820	0.980
160	0.015	0.00	0.00	0.068	4.16	0.27	1175.879	1146.481	99.38	100.03	0.00	0.00	14.190	4.730	1.030
170	0.015	0.00	0.00	0.065	3.88	0.28	1177.466	1148.044	99.52	100.05	0.00	0.00	14.440	4.400	1.180
180	0.015	0.00	0.00	0.065	3.66	0.22	1179.052	1149.607	99.32	99.91	0.00	0.00	14.570	5.200	0.970
190	0.015	0.00	0.00	0.065	3.32	0.34	1180.642	1151.172	99.54	100.02	0.00	0.00	14.000	5.050	0.860
200	0.015	0.00	0.00	0.065	3.06	0.26	1182.224	1152.742	98.95	100.24	0.00	0.00	14.580	4.480	0.940
210	0.015	0.00	0.00	0.063	2.88	0.18	1183.818	1154.318	99.69	100.59	0.00	0.00	14.850	4.010	1.100
220	0.015	0.00	0.00	0.063	2.68	0.20	1185.415	1155.827	99.69	96.15	0.00	0.00	15.000	4.100	1.030
230	0.015	0.00	0.00	0.060	2.45	0.23	1186.993	1157.425	98.56	101.87	0.00	0.00	15.050	3.980	1.070
240	0.015	0.00	0.00	0.060	2.22	0.23	1188.586	1159.024	99.32	101.74	0.00	0.00	15.090	3.930	1.080
250	0.015	0.00	0.00	0.060	2.01	0.21	1190.181	1160.616	99.47	101.32	0.00	0.00	15.110	3.920	1.190
260	0.015	0.00	0.00	0.060	1.76	0.25	1191.766	1162.220	98.84	102.09	0.00	0.00	14.810	4.280	1.100
270	0.015	0.00	0.00	0.060	1.52	0.24	1193.356	1163.781	99.09	99.30	0.00	0.00	15.030	4.080	1.010
280	0.015	0.00	0.00	0.060	1.33	0.19	1194.955	1165.369	99.68	101.04	0.00	0.00	14.910	4.190	1.040
290	0.015	0.00	0.00	0.060	1.11	0.22	1196.545	1166.925	99.21	99.10	0.00	0.00	14.820	4.350	1.040
300	0.015	0.00	0.00	0.060	0.88	0.23	1198.135	1168.505	99.30	100.70	0.00	0.00	14.640	4.560	1.040
310	0.015	0.00	0.00	0.060	0.69	0.19	1199.729	1170.118	99.63	102.90	0.00	0.00	14.980	4.200	1.060
320	0.015	0.00	0.00	0.060	0.53	0.16	1201.319	1171.622	99.44	96.00	0.00	0.00	15.340	3.730	1.080
330	0.015	0.00	0.00	0.060	0.34	0.19	1202.909	1173.148	99.19	97.15	0.00	0.00	15.400	3.490	1.240
340	0.015	0.00	0.00	0.060	0.14	0.20	1204.507	1174.694	99.75	98.50	0.00	0.00	15.870	3.110	1.180
350	0.015	0.00	0.00	0.058	0.00	0.14	1206.095	1176.258	99.15	99.68	0.00	0.00	15.880	3.030	1.270

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 6, 2013
Test Run Number:	5

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	117	0.1000
A2	0.0125	117	0.1118
A3	0.0150	118	0.1225
A4	0.0125	118	0.1118
A Center	0.0150	117	0.1225
B1	0.0100	123	0.1000
B2	0.0125	123	0.1118
B3	0.0150	123	0.1225
B4	0.0125	122	0.1118
B Center	0.0150	124	0.1225
Averages	0.013	120.06	0.1115

Tunnel Diameter	**8.000**	inches
Tunnel Static	**-0.058**	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9106	factor
Baro. Pressure	29.91	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.778	Ft/ Sec
Initial Flow	**142.25**	Ft3/min

VS (1)	0.014636013		
VS (2)	0.015047106	STD Tunnel Flow:	143.79

350				568.1725	55.512	53.995	7.69	99.98	99.97
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	449.9		0.015	569.4			7.703		
10	420.6		0.015	575.9	1.628	1.455	7.746	103.34	94.94
20	405.8		0.015	581.5	1.600	1.448	7.784	102.03	94.93
30	407.4		0.015	591.2	1.575	1.458	7.849	101.32	96.42
40	428.1		0.015	599.2	1.566	1.495	7.902	101.38	99.49
50	438.9		0.015	593.9	1.568	1.490	7.867	101.05	98.72
60	447.3		0.015	593.6	1.566	1.575	7.865	100.94	104.34
70	448.8		0.015	589.3	1.573	1.608	7.836	100.99	106.12
80	449.6		0.015	587.1	1.575	1.545	7.821	100.92	101.82
90	453.6		0.015	585.5	1.578	1.536	7.811	100.98	101.08
100	457.1		0.015	583.4	1.570	1.539	7.797	100.27	101.09
110	458.6		0.015	579.4	1.573	1.536	7.770	100.17	100.55
120	449.6		0.015	575	1.573	1.548	7.740	99.79	100.94
130	441.3		0.015	571.4	1.582	1.556	7.716	99.99	101.15
140	433.1		0.015	568	1.580	1.523	7.693	99.61	98.68
150	424.2		0.015	565.7	1.584	1.550	7.678	99.65	100.25
160	413.6		0.015	563.1	1.583	1.550	7.660	99.38	100.03
170	405.4		0.015	561.7	1.588	1.553	7.650	99.52	100.05
180	399.2		0.015	560.1	1.587	1.553	7.639	99.32	99.91
190	395.2		0.015	559.68	1.591	1.555	7.637	99.54	100.02
200	393.8		0.015	558.56	1.583	1.560	7.629	98.95	100.24
210	388.9		0.015	558.44	1.595	1.565	7.628	99.69	100.59
220	383.3		0.015	556.49	1.598	1.499	7.615	99.69	96.15
230	378.8		0.015	557.25	1.579	1.587	7.620	98.56	101.87
240	373.8		0.015	555.07	1.594	1.588	7.605	99.32	101.74
250	371.9		0.015	555.47	1.596	1.581	7.608	99.47	101.32
260	371.1		0.015	555.14	1.586	1.594	7.606	98.84	102.09

270	373.8		0.015	554.29	1.591	1.551	7.600	99.09	99.30
280	377.7		0.015	554.68	1.600	1.578	7.602	99.68	101.04
290	380.1		0.015	555.52	1.591	1.546	7.608	99.21	99.10
300	382.2		0.015	556.42	1.592	1.570	7.614	99.30	100.70
310	381.4		0.015	557.27	1.596	1.603	7.620	99.63	102.90
320	382.1		0.015	558	1.592	1.495	7.625	99.44	96.00
330	379.2		0.015	555.29	1.592	1.516	7.607	99.19	97.15
340	377.9		0.015	555.91	1.600	1.536	7.611	99.75	98.50
350	373.2	373.2	0.015	556.33	1.589	1.554	7.614	99.15	99.68

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**December 6, 2013**
Test Run Number:	**5**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.5	to	5.6

Average Firebox Temp, ℉	451.74

Final Coal Bed Wt, lb	4.82

Interval	10

Time		Temperature Data									Flue Draft	Fuel Weight	Weight Loss
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet			
0	0	82.76	236.2	704.7	715.4	552	656.9	546.1	545.7			9.42	**4.60**
1	10	83.51	149.7	514.4	618.7	552.3	652.5	555.6	559.5			8.37	1.05
2	20	80.42	135.2	462.8	552.7	529.5	626.1	536.9	550.8			7.41	0.96
3	30	78.43	126.8	432.5	511.8	495	599.2	515.3	533.1			6.62	0.79
4	40	76.33	116.9	394.4	472.4	478	572.4	500.8	510.4			6.05	0.57
5	50	75.42	122.8	406.4	445.4	464.6	573	495.5	488.6			5.30	0.75
6	60	74.1	106.9	340.4	409.8	460.4	546	480.8	473.1			5.02	0.28
7	70	71.14	112.1	319.8	370.4	464.7	518.5	452.6	452.5			4.82	0.20

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 6, 2013
Test Run Number: 5

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	25		118.1	
B - Rear Filter Catch	Filter	26		117.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			251.7	235.2	16.5
Probe & Filter Holder	Probe	33	135990.6	135989.9	0.7
			Total Particulate, mg		**17.2**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	27		118.2	
B - Rear Filter Catch	Filter	28		115.2	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			248.2	233.4	14.8
Probe & Filter Holder	Probe	34	108413.5	108412.0	1.5
			Total Particulate, mg		**16.3**

Manufacturer: SBI
Model: NG1800
Date: 12/06/13
Run: 5
Control #: G101440749
Test Duration: 350 min

	HHV	LHV
Eff	68.91%	74.47%
Comb Eff	93.60%	93.60%
HT Eff	73.62%	79.57%
Output	19,782	kJ/h
Burn Rate	1.45	kg/h
Grams CO	780	g
Input	28,709	kJ/h
MC wet	17.04	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.060

Overall Heating Efficiency:	68.91%	
Combustion Efficiency:	93.60%	
Heat Transfer Efficiency:	73.62%	
Heat Output:	18,765	Btu/h
Heat Input:	27,233	Btu/h
Burn Duration:	5.83	h
Burn Rate:	3.19	lb/h
Stack Temp:	344.3	Deg. F

Averages	0.83	5.88	2.45	20.50	14.21	173.07	26.73	87.8%	70.6%	62.6%
INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net
Elapsed Time	Weight emaining (k	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %
0	10.19	0.72	0.70	1283.3%	20.85	19.79	157.3	21.9	62.9%	-3.1%	-2.0%
10	9.63	0.59	5.53	221.0%	20.54	14.71	169.1	27.3	92.6%	72.8%	67.4%
20	9.01	0.50	7.70	139.5%	20.40	12.45	203.5	30.3	95.3%	74.3%	70.8%
30	8.27	0.49	10.74	74.9%	20.20	9.21	241.8	28.4	96.5%	75.4%	72.8%
40	7.34	0.57	11.62	61.1%	20.14	8.23	270.7	26.6	96.2%	74.3%	71.5%
50	6.53	0.41	11.51	64.8%	20.15	8.44	255.3	24.6	97.3%	75.1%	73.1%
60	5.72	0.40	10.28	83.9%	20.23	9.75	257.4	24.4	97.1%	73.5%	71.4%
70	5.06	0.36	9.97	90.2%	20.26	10.11	244.1	23.9	97.3%	74.0%	72.1%
80	4.44	0.35	10.00	89.8%	20.26	10.08	238.2	23.7	97.4%	74.5%	72.6%
90	3.83	0.31	9.89	92.6%	20.27	10.22	236.4	23.9	97.7%	74.5%	72.8%
100	3.30	0.30	9.36	103.3%	20.30	10.79	231.2	24.5	97.7%	74.2%	72.5%
110	2.95	0.33	7.78	142.2%	20.40	12.46	213.6	27.9	97.0%	73.4%	71.2%
120	2.65	0.49	6.92	165.1%	20.45	13.29	201.3	26.0	94.9%	72.6%	68.9%
130	2.37	0.60	6.53	175.5%	20.47	13.64	191.4	26.0	93.5%	72.7%	67.9%
140	2.16	0.82	5.45	213.3%	20.53	14.67	180.2	25.3	89.7%	70.9%	63.6%
150	2.01	0.98	4.82	238.7%	20.56	15.25	168.2	27.5	86.7%	70.6%	61.2%
160	1.89	1.03	4.73	241.0%	20.56	15.31	160.8	26.0	85.9%	71.0%	61.0%
170	1.76	1.18	4.40	252.0%	20.57	15.58	154.7	26.4	83.3%	70.7%	58.9%
180	1.66	0.97	5.20	218.4%	20.53	14.85	149.8	26.0	87.6%	73.9%	64.7%
190	1.51	0.86	5.05	232.4%	20.55	15.07	149.6	26.6	88.6%	73.6%	65.2%
200	1.39	0.94	4.48	262.4%	20.58	15.63	147.1	25.9	86.4%	72.1%	62.3%
210	1.31	1.10	4.01	284.4%	20.60	16.04	143.6	27.0	83.1%	70.9%	58.9%
220	1.22	1.03	4.10	282.9%	20.60	15.99	139.9	25.3	84.2%	71.6%	60.3%
230	1.11	1.07	3.98	289.0%	20.61	16.09	137.0	27.7	83.4%	71.9%	59.9%
240	1.01	1.08	3.93	292.1%	20.61	16.14	135.0	25.0	83.1%	71.6%	59.5%
250	0.91	1.19	3.92	284.4%	20.60	16.09	132.9	26.3	81.7%	72.0%	58.8%
260	0.80	1.10	4.28	265.1%	20.58	15.75	132.4	26.1	83.9%	73.4%	61.6%
270	0.69	1.01	4.08	285.9%	20.60	16.02	133.1	25.1	84.4%	72.5%	61.2%
280	0.60	1.04	4.19	275.6%	20.59	15.88	131.7	28.7	84.4%	73.6%	62.1%
290	0.50	1.04	4.35	264.4%	20.58	15.71	132.4	29.8	84.8%	74.2%	62.9%
300	0.40	1.04	4.56	250.8%	20.57	15.49	133.4	30.4	85.4%	74.8%	63.8%
310	0.31	1.06	4.20	273.4%	20.59	15.86	134.9	28.7	84.1%	73.2%	61.6%
320	0.24	1.08	3.73	308.4%	20.62	16.35	133.8	29.5	82.4%	71.7%	59.0%
330	0.15	1.24	3.49	315.3%	20.63	16.52	130.9	28.6	79.4%	70.9%	56.3%
340	0.06	1.18	3.11	357.9%	20.66	16.96	129.7	30.3	78.5%	69.5%	54.6%
350	0.00	1.27	3.03	356.8%	20.66	16.99	127.9	30.7	76.9%	69.4%	53.4%

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.51
Dry Moles Exhaust Gas (N_r):	529.65
Air Fuel Ratio (A/F)	15.12

%HC
1.32

Combustion Efficiency:	93.60%	
Total Input (kJ):	167,468	158,835
Total Output (kJ):	115,395	109,446
Efficiency:	68.91%	
Total CO (g):	779.61	

19,782 kJ/h
28,709 kJ/h

1.449 kg/h

173.5 Deg. C

20.20	2.86	71.92	2.37	71.92	167990	4.06	6.87	2.74	19810.00	17.04	79.09
Air Fuel Ratio	Wet Wt Now Wt	% Wet Consumed x	Dry Wt. Now Wt_{dn}	% Dry Comsumed y	Total Input	Fuel Properties Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value	Mw Moisture Fuel Burnt	[h]
78.6	10.19	0.00	8.45	0.00	0	4.06	6.87	2.74	19810.00	17.04	78.79
19.1	9.63	5.47	7.99	5.47	14309	4.06	6.87	2.74	19810.00	17.04	79.17
14.3	9.01	11.62	7.47	11.62	11185	4.06	6.87	2.74	19810.00	17.04	79.35
10.5	8.27	18.83	6.86	18.83	13683	4.06	6.87	2.74	19810.00	17.04	79.56
9.7	7.34	27.96	6.09	27.96	14279	4.06	6.87	2.74	19810.00	17.04	79.58
9.9	6.53	35.88	5.42	35.88	13347	4.06	6.87	2.74	19810.00	17.04	79.64
11.1	5.72	43.90	4.74	43.90	12080	4.06	6.87	2.74	19810.00	17.04	79.57
11.4	5.06	50.31	4.20	50.31	10477	4.06	6.87	2.74	19810.00	17.04	79.56
11.4	4.44	56.41	3.69	56.41	10104	4.06	6.87	2.74	19810.00	17.04	79.57
11.6	3.83	62.38	3.18	62.38	9358	4.06	6.87	2.74	19810.00	17.04	79.58
12.2	3.30	67.59	2.74	67.59	7233	4.06	6.87	2.74	19810.00	17.04	79.55
14.5	2.95	71.01	2.45	71.01	5406	4.06	6.87	2.74	19810.00	17.04	79.43
15.8	2.65	74.04	2.19	74.04	4772	4.06	6.87	2.74	19810.00	17.04	79.30
16.4	2.37	76.71	1.97	76.71	3952	4.06	6.87	2.74	19810.00	17.04	79.23
18.5	2.16	78.76	1.80	78.76	2983	4.06	6.87	2.74	19810.00	17.04	79.06
19.9	2.01	80.28	1.67	80.28	2274	4.06	6.87	2.74	19810.00	17.04	78.95
20.0	1.89	81.48	1.57	81.48	2051	4.06	6.87	2.74	19810.00	17.04	78.93
20.5	1.76	82.72	1.46	82.72	1864	4.06	6.87	2.74	19810.00	17.04	78.84
18.7	1.66	83.70	1.38	83.70	2088	4.06	6.87	2.74	19810.00	17.04	78.98
19.6	1.51	85.22	1.25	85.22	2237	4.06	6.87	2.74	19810.00	17.04	79.02
21.3	1.39	86.38	1.15	86.38	1640	4.06	6.87	2.74	19810.00	17.04	78.95
22.4	1.31	87.18	1.08	87.18	1417	4.06	6.87	2.74	19810.00	17.04	78.85
22.4	1.22	88.07	1.01	88.07	1603	4.06	6.87	2.74	19810.00	17.04	78.88
22.7	1.11	89.09	0.92	89.09	1715	4.06	6.87	2.74	19810.00	17.04	78.86
22.8	1.01	90.12	0.84	90.12	1640	4.06	6.87	2.74	19810.00	17.04	78.85
22.3	0.91	91.05	0.76	91.05	1715	4.06	6.87	2.74	19810.00	17.04	78.80
21.3	0.80	92.16	0.66	92.16	1827	4.06	6.87	2.74	19810.00	17.04	78.87
22.5	0.69	93.23	0.57	93.23	1603	4.06	6.87	2.74	19810.00	17.04	78.89
21.9	0.60	94.08	0.50	94.08	1529	4.06	6.87	2.74	19810.00	17.04	78.89
21.3	0.50	95.06	0.42	95.06	1678	4.06	6.87	2.74	19810.00	17.04	78.90
20.5	0.40	96.08	0.33	96.08	1566	4.06	6.87	2.74	19810.00	17.04	78.91
21.8	0.31	96.93	0.26	96.93	1305	4.06	6.87	2.74	19810.00	17.04	78.88
23.8	0.24	97.64	0.20	97.64	1305	4.06	6.87	2.74	19810.00	17.04	78.84
24.0	0.15	98.49	0.13	98.49	1454	4.06	6.87	2.74	19810.00	17.04	78.75
26.4	0.06	99.38	0.05	99.38	1790	4.06	6.87	2.74	19810.00	17.04	78.75
26.3	0.00	100.00	0.00	100.00	522	4.06	6.87	2.74	19810.00	17.04	78.71

Moisture Content M_{Cwb}: 17.04

Moisture of Wood (wet basis): 17.04

(Btu) Initial Dry Weight Wt_{do} (kg): 8.45

(Btu) Moisture Content Dry 20.54

Dry kg : 8.45

CA: 48.73

HY: 6.87

OX: 43.9

Load Weight (kg): **10.19**

Fuel Heating Value in kJ/kg - CV:	**HHV**	**LHV**		**HHV**	**LHV**
	19,810	**18,329**	Btu/lb	**8522.5**	**7885.2**

20.98	**1.67**	**5.56**	**0.10**	**0.17**	**33.86**	**107.17**	**6.22**	**0.73**	**553.72**	**33.05**	**11.41**
Mass Balance (moles/100 mole dry flue gas)				**kg Wood per 100 mole dry**	**Moles per kg of Dry Wood**						**Moisture Present**
[u]	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**	**HC**	**N_2**	**H_2O**	
20.90	0.37	1.12	0.07	0.04	19.13	540.83	19.68	2.00	2153.72	30.53	11.41
21.00	1.52	5.10	0.06	0.15	36.51	97.11	3.89	0.41	522.63	33.70	11.41
21.05	2.03	6.88	0.05	0.20	38.08	61.56	2.47	0.26	392.41	34.00	11.41
21.10	2.78	9.43	0.06	0.28	38.84	33.32	1.77	0.20	287.68	34.11	11.41
21.11	3.02	10.23	0.07	0.30	38.68	27.40	1.90	0.23	264.92	34.06	11.41
21.13	2.95	10.03	0.05	0.29	39.26	28.78	1.40	0.16	271.63	34.21	11.41
21.10	2.64	8.98	0.04	0.26	39.13	37.13	1.52	0.16	302.84	34.20	11.41
21.10	2.55	8.70	0.04	0.25	39.25	39.80	1.42	0.14	313.24	34.24	11.41
21.11	2.56	8.71	0.03	0.25	39.30	39.62	1.38	0.14	312.70	34.25	11.41
21.11	2.52	8.59	0.03	0.25	39.46	40.78	1.24	0.11	317.52	34.29	11.41
21.10	2.39	8.14	0.03	0.24	39.44	45.47	1.26	0.11	335.17	34.30	11.41
21.07	2.00	6.83	0.03	0.20	39.02	62.48	1.65	0.14	398.34	34.24	11.41
21.04	1.84	6.21	0.05	0.18	37.86	72.68	2.68	0.27	433.86	33.97	11.41
21.02	1.77	5.96	0.07	0.18	37.04	77.36	3.40	0.37	449.39	33.78	11.41
20.97	1.57	5.19	0.10	0.16	34.94	94.02	5.26	0.62	506.88	33.29	11.41
20.94	1.46	4.77	0.12	0.15	33.24	105.14	6.76	0.82	544.45	32.89	11.41
20.94	1.45	4.73	0.13	0.14	32.80	106.20	7.14	0.87	547.30	32.78	11.41
20.91	1.41	4.55	0.15	0.14	31.36	111.04	8.41	1.05	561.83	32.43	11.41
20.95	1.55	5.08	0.12	0.15	33.75	96.38	6.30	0.76	512.68	33.00	11.41
20.96	1.48	4.88	0.10	0.15	34.29	102.32	5.84	0.69	536.51	33.15	11.41
20.94	1.36	4.46	0.11	0.14	33.05	115.33	6.94	0.83	582.45	32.87	11.41
20.91	1.29	4.17	0.13	0.13	31.21	124.84	8.56	1.05	613.58	32.43	11.41
20.92	1.29	4.20	0.12	0.13	31.85	124.17	8.00	0.97	612.71	32.59	11.41
20.92	1.28	4.12	0.13	0.13	31.36	126.78	8.43	1.02	621.30	32.47	11.41
20.92	1.27	4.09	0.13	0.13	31.20	128.11	8.57	1.04	625.91	32.44	11.41
20.90	1.29	4.15	0.15	0.13	30.43	124.88	9.24	1.15	611.71	32.23	11.41
20.92	1.36	4.40	0.13	0.14	31.67	116.59	8.14	1.00	583.62	32.52	11.41
20.93	1.28	4.17	0.12	0.13	31.95	125.45	7.91	0.95	617.82	32.62	11.41
20.92	1.32	4.28	0.13	0.13	31.93	121.04	7.92	0.96	601.10	32.60	11.41
20.93	1.36	4.41	0.13	0.14	32.18	116.26	7.69	0.93	583.71	32.65	11.41
20.93	1.41	4.59	0.13	0.14	32.50	110.39	7.41	0.90	562.37	32.72	11.41
20.92	1.33	4.30	0.13	0.13	31.81	120.13	8.03	0.98	597.36	32.57	11.41
20.91	1.22	3.92	0.13	0.12	30.81	135.07	8.92	1.08	651.18	32.36	11.41
20.89	1.20	3.82	0.15	0.12	29.16	138.02	10.36	1.29	658.06	31.95	11.41
20.89	1.09	3.46	0.14	0.11	28.62	156.05	10.86	1.33	724.76	31.86	11.41
20.88	1.10	3.46	0.16	0.11	27.74	155.56	11.63	1.44	720.60	31.63	11.41

											SUMS
446.22	**5936.24**	**4420.11**	**4286.60**	**4241.53**	**5818.20**	**5125.91**	**299.88**	**7480.84**	**15019.34**	**64194.19**	**77670.55**
Stack Temp K	**Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent**						**Room Temp K**	**Energy Losses (kJ/kg Flue Gas Consti**			
	CO_2	**O_2**	**CO**	**N_2**	**CH_4**	**H_2O**		**CO_2**	**O_2**	**CO**	**N_2**
430.43	5422.94	4067.49	3951.97	3908.87	5250.35	4728.10	295.06	103.76	2199.82	5646.29	8418.62
442.26	5717.58	4272.93	4147.74	4103.32	5569.66	4961.10	300.42	208.73	414.96	1118.37	2144.52
476.65	7074.62	5246.00	5082.13	5029.84	6981.56	6075.48	303.47	269.39	322.95	712.30	1973.77
514.93	8830.62	6499.65	6284.54	6222.42	8820.59	7509.05	301.52	342.94	216.54	512.55	1790.05
543.87	10197.18	7464.51	7207.18	7138.12	10275.30	8608.18	299.76	394.45	204.51	550.65	1891.01
528.48	9581.20	7038.20	6801.77	6735.28	9600.76	8125.95	297.72	376.12	202.55	405.24	1829.51
530.59	9683.82	7110.85	6871.30	6804.27	9709.58	8208.79	297.52	378.91	264.02	441.31	2060.61
517.26	9104.12	6703.82	6482.67	6418.44	9087.51	7746.02	297.08	357.36	266.78	410.29	2010.52
511.32	8846.86	6522.50	6309.37	6246.43	8812.95	7539.60	296.89	347.68	258.43	397.94	1953.29
509.59	8766.25	6465.19	6254.47	6191.96	8728.01	7474.16	297.01	345.92	263.67	357.77	1966.05
504.37	8509.13	6281.37	6078.10	6017.05	8459.28	7263.86	297.69	335.58	285.62	365.39	2016.71
486.76	7608.18	5632.74	5454.58	5398.92	7527.60	6520.02	301.03	296.85	351.96	477.37	2150.63
474.48	7145.54	5305.68	5141.73	5088.45	7036.02	6147.29	299.17	270.52	385.64	772.40	2207.66
464.59	6718.77	4999.05	4847.12	4796.36	6593.34	5795.88	299.17	248.85	386.73	979.56	2155.44
453.32	6263.33	4671.87	4532.79	4484.71	6120.79	5420.96	298.44	218.84	439.27	1511.54	2273.23
441.32	5668.45	4236.84	4112.86	4068.78	5520.42	4919.43	300.66	188.41	445.47	1940.27	2215.27
433.98	5417.80	4057.08	3940.25	3897.62	5259.70	4713.56	299.11	177.70	430.85	2049.40	2133.16
427.82	5141.17	3854.58	3744.73	3703.97	4980.94	4480.03	299.57	161.21	428.01	2411.22	2081.02
422.93	4953.43	3718.03	3613.11	3573.57	4789.84	4322.90	299.12	167.19	358.33	1804.56	1832.09
422.71	4919.93	3692.57	3588.28	3549.03	4758.15	4293.17	299.76	168.69	377.81	1673.34	1904.08
420.26	4844.38	3638.30	3536.14	3497.33	4679.78	4230.98	299.06	160.12	419.60	1987.09	2037.03
416.76	4656.68	3499.11	3401.31	3363.89	4494.52	4069.79	300.16	145.31	436.84	2451.56	2064.02
413.09	4569.00	3437.17	3342.06	3305.09	4401.30	3999.21	298.46	145.50	426.79	2290.76	2025.06
410.15	4354.49	3276.16	3185.60	3150.34	4193.84	3812.01	300.88	136.54	415.35	2412.55	1957.32
408.15	4376.80	3296.29	3206.00	3170.34	4208.00	3836.68	298.13	136.54	422.29	2453.56	1984.35
406.09	4242.78	3195.89	3108.48	3073.87	4077.99	3720.01	299.41	129.10	399.11	2642.85	1880.32
405.59	4227.01	3184.44	3097.44	3062.94	4061.89	3706.85	299.28	133.88	371.27	2328.86	1787.60
406.26	4295.09	3236.00	3147.66	3112.59	4126.71	3766.97	298.22	137.24	405.95	2263.26	1923.02
404.82	4097.13	3085.42	3000.84	2967.47	3939.66	3591.14	301.84	130.81	373.46	2266.41	1783.74
405.54	4085.02	3075.10	2990.51	2957.32	3930.64	3578.69	302.93	131.47	357.51	2200.48	1726.22
406.59	4104.14	3088.37	3003.15	2969.87	3951.49	3593.72	303.57	133.38	340.94	2119.74	1670.16
408.04	4231.57	3184.48	3096.66	3062.34	4073.69	3705.64	301.81	134.60	382.56	2296.64	1829.32
406.98	4156.20	3127.92	3041.69	3007.97	4000.81	3639.87	302.63	128.05	422.48	2551.58	1958.73
404.09	4070.94	3066.23	2982.31	2949.12	3913.30	3569.01	301.74	118.72	423.21	2963.13	1940.69
402.87	3954.33	2978.08	2896.49	2864.28	3801.92	3466.28	303.47	113.18	464.73	3104.60	2075.91
401.09	3868.31	2914.20	2834.58	2803.01	3717.23	3392.27	303.81	107.31	453.33	3323.38	2019.86

			AVERAGE	SUMS						
23664.01	58464.58	20168.37	7407.27	52073.49	10717.38	41356.1	115916.6	10717.4	779.6	51.0
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
1789.59	1486.50	555.69	20200.26	0.00	0	0.00	0	0	0.00	0.00
368.60	1648.92	558.35	6462.45	4667.98	1061	3607.24	9641	1061	78.77	4.76
234.50	1701.50	571.07	5785.49	3266.54	526	2740.09	7918	526	39.09	2.36
184.00	1756.08	587.43	5389.60	3722.63	472	3250.45	9960	472	34.27	2.26
209.37	1790.65	599.97	5640.61	4065.86	536	3529.60	10214	536	38.30	2.68
141.74	1782.04	594.47	5331.67	3592.31	361	3231.20	9755	361	26.38	1.70
145.95	1784.39	595.41	5670.60	3457.81	351	3107.05	8622	351	25.99	1.58
128.21	1770.59	590.13	5533.88	2926.60	279	2647.36	7550	279	20.99	1.21
122.94	1764.12	587.78	5432.18	2770.58	261	2509.95	7333	261	19.64	1.12
103.09	1764.15	587.03	5387.68	2545.09	214	2331.51	6813	214	16.36	0.87
99.83	1757.31	584.63	5445.07	1988.07	167	1821.36	5245	167	12.92	0.65
126.31	1728.80	576.14	5708.06	1557.70	162	1395.71	3848	162	12.65	0.61
245.67	1702.70	571.89	6156.47	1483.09	241	1241.63	3289	241	18.08	1.06
333.24	1681.03	567.88	6352.72	1267.34	258	1009.22	2685	258	19.01	1.19
551.25	1644.32	563.60	7202.05	1084.36	306	777.93	1898	306	22.16	1.48
730.82	1607.98	557.88	7686.09	882.39	303	579.45	1392	303	21.72	1.50
779.27	1595.91	555.53	7721.83	799.30	289	509.89	1251	289	20.70	1.44
937.33	1571.12	552.86	8142.77	766.25	312	454.60	1098	312	22.16	1.58
682.62	1593.49	551.07	6989.35	736.63	259	477.28	1351	259	18.58	1.29
614.38	1599.87	550.73	6888.89	777.91	256	522.31	1459	256	18.46	1.24
738.56	1584.42	550.02	7476.84	619.15	223	395.79	1021	223	16.08	1.09
936.64	1557.84	548.18	8140.39	582.18	240	342.28	835	240	17.14	1.20
864.51	1563.27	547.38	7863.27	636.35	253	383.51	967	253	18.13	1.25
916.61	1551.58	545.24	7935.20	686.98	286	401.46	1028	286	20.44	1.42
933.31	1550.60	545.52	8026.17	664.64	278	386.82	976	278	19.88	1.38
1024.45	1537.08	544.19	8157.10	706.19	315	391.59	1009	315	22.39	1.59
893.34	1550.64	544.04	7609.63	701.76	294	407.31	1125	294	21.02	1.47
850.59	1557.16	544.73	7681.94	621.68	250	372.02	981	250	17.92	1.23
858.72	1550.54	542.72	7506.39	579.22	239	340.20	949	239	17.12	1.19
835.58	1552.60	542.58	7346.43	622.18	255	367.31	1056	255	18.25	1.27
807.20	1556.11	542.75	7170.27	566.78	229	337.46	999	229	16.40	1.14
873.58	1552.71	544.03	7613.42	501.50	207	294.58	803	207	14.81	1.03
968.40	1540.46	543.28	8112.96	534.41	230	304.62	770	230	16.45	1.14
1151.85	1518.65	542.47	8658.71	635.54	299	336.15	818	299	21.29	1.51
1190.66	1511.23	541.29	9001.61	813.18	385	428.46	976	385	27.47	1.93
1291.30	1498.20	540.45	9233.82	243.30	121	122.72	279	121	8.58	0.61

Intertek Testing Services NA Ltd

Manufacturer:	SBI
Model:	NG1800
Date:	12/06/13
Run:	5
Control #:	G101440749
Test Duration:	350
Output Category:	3

Technicians:

_____

_____

_____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	68.9%	74.5%
Combustion Efficiency	93.6%	93.6%
Heat Transfer Efficiency	74%	79.6%

Output Rate (kJ/h)	19,782	18,765	**(Btu/h)**
Burn Rate (kg/h)	1.45	3.19	**(lb/h)**
Input (kJ/h)	28,709	27,233	**(Btu/h)**

Test Load Weight (dry kg)	8.45	18.63	**dry lb**
MC wet (%)	17.04		
MC dry (%)	20.54		
Particulate (g)	15.3865		
CO (g)	780		
Test Duration (h)	5.83		

Emissions	Particulate	CO
g/MJ Output	0.13	6.76
g/kg Dry Fuel	1.82	92.22
g/h	2.64	133.65
lb/MM Btu Output	0.31	15.70

Air/Fuel Ratio (A/F)	15.12

Version: 2.4 **15/04/2010**

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 6, 2013.
Test Run Number:	5

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	8:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.845	20.2	20.4	21.2
2	16	1.965	21.7	20.5	21.5
3	16	1.859	20.3	20.0	20.6
4	16	1.886	22.3	20.0	23.8
5	16	1.527	19.3	20.0	19.8
6	16	1.560	20.3	20.2	20.4
7	16	1.543	20.3	20.9	19.4
8	16	1.551	21.5	20.3	22.0
9	17	2.031	21.9	20.3	21.9
10	17	2.03	20.6	20.1	21.9
11	17	1.98	20.2	20.2	20.3
12	17	1.93	20.2	19.9	20.5
Total Weight		**21.710**	Average, %db		**20.7**

Allowable Fuel Load Range:	**4.49**	to	**5.62**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:00	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.496		19.3	19.1	19.1
2	15	1.384		19.2	19.2	18.9
3	15	1.446		18.9	19.4	19.5
4	15		3.970	22.3	21.9	21.4
5	15		3.514	20.2	20.0	19.4
6	15		4.515	22.6	22.4	23.1
7	15	2.200		21.7	21.4	20.5
8	15	1.854		20.3	21.0	20.9
9	15	2.085		20.3	21.5	21.2
Totals		10.465	11.999			
% of Weight		46.6	53.4			
Total weight, wet, lb.		**22.464**		Average Moisture, dry		**20.54**
Total weight, dry, kg		8.45		Average Moisture, wet		17.04

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 9, 2013
Test Run Number:	6

Dry Burn-Rate, kg/hr:	**3.01**	
Emission-Rate, g/hr:	**4.35**	
Adjusted Emission-Rate, g/hr :	**6.17**	
Duration of Test, Minutes	170	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1206.121	1176.279
Dry Gas Meter Ending Reading, ft^3	1232.949	1201.49
Barometric Pressure Correction Factor	1.007	1.007
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.009	1.009
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**27.294**	**25.464**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**147.209**	
Total Tunnel Volume, scf	**25025.447**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	916.898	982.782
Sample Particulate Mass, mg	13.4	12.6
Total Emissions, grams	12.286	12.383
Emission-Rate, g/hr	4.34	4.37
Adjusted Emission Rates, g/hr	**6.15**	**6.19**
Deviation, %	0.33%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	85.7	79.05
Post-Test Leak Check, cfm @ in. Hg vac.	0.0015@5	0.006@5
Average Firebox Surface Temperture delta-T, ℉	34.94	
Maximum Ambient Temperture, ℉	77	
Mimimum Ambient Temperature, ℉	69	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.66	
Dry-Basis Fuel Load Moisture Content, %	20.70	
Wet-Basis Fuel Load Moisture Content, %	17.15	
Coal Bed Range, lb.	4.60	5.60
Actual Coal Bed, Lb.	5.34	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 9, 2013
Test Run No:	6

Temperature Data

Firebox Temp Start	481.12
Firebox Temp End	446.18
Firebox Delta-T	**34.9**

Max Filter Temps	
Train A	Train B
85.7	**79.05**

Interval	10	Duration of Test, Min	**170**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	74.31	187.5	570.4	509.5	316.5	607.7	491.6	480.3		65.17	66.12	62.495	62.285
1	10	72.03	177.8	543.2	474.6	358.1	525.4	489.1	478.4		80.43	72.17	62.815	62.54
2	20	71.59	185.2	637.5	533.4	358.6	459.9	462.6	452.4		80.21	72.09	63.01	62.735
3	30	73.55	215.9	765.3	664.7	347.9	453.2	465.9	457		84.48	77.28	63.03	62.67
4	40	76.64	219.6	785.6	734.8	335.9	481.6	495.5	491.2		82.7	76.41	63.125	62.8
5	50	76.86	204.3	716.1	708.4	323.5	523.8	523.7	525.5		80.86	79.05	63.27	62.94
6	60	77.25	190.1	664.9	655.3	312.3	564.3	543.4	550.8		78.48	77.26	63.525	63.19
7	70	76.43	182.6	644.9	618.3	305.6	608.2	554.6	565		85.7	77.71	63.625	63.25
8	80	76.04	175.7	617.7	595	302.9	658.9	565.9	570.4		77.43	76.03	63.71	63.28
9	90	76.18	165.5	576.5	560	308	685.7	566.2	571		73.96	73.21	63.725	63.285
10	100	74.74	152.3	535.1	523.5	313	689.4	556.2	570.9		77.63	70.92	63.73	63.215
11	110	74.07	144.2	504.1	482	320.5	711.7	543.8	559		78.37	70.23	63.815	63.28
12	120	72.72	136.9	472.4	448.1	329.2	700.5	530.1	541		78.03	69.02	63.815	63.26
13	130	71.53	132.6	451.8	422.3	335.6	684.5	514.3	522.4		77.29	69.08	63.825	63.355
14	140	71.23	128	431.1	401.9	338.9	674.6	499.9	506.4		77.9	69.7	63.87	63.31
15	150	70.34	124.3	413	382.4	343.3	654.1	481.7	489.9		79.37	70.71	63.865	63.44
16	160	69.55	122	402.7	367	345.2	640.3	464.1	474.4		79.99	71.68	63.885	63.34
17	170	69.11	121.4	401.9	357.4	347.5	613.4	450	462.6		79.87	72.14	63.995	63.5

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 9, 2013
Test Run Number:	6

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.21	81	Meter Box (A)	1.002
End	30.03	81	Meter Box (B)	0.994
Duration of Test, Min		170		

Leak Check, cfm @ in Hg	
Train A	Train B
0.0015@5	0.006@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

Time	Particulate Sampling Data											
	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.015	0.00	0.00	0.100	22.66	22.66	1206.121	1176.279	99.76	99.78	0.00	0.00
10	0.015	0.00	0.00	0.093	20.41	2.25	1207.713	1177.674	102.04	95.12	0.00	0.00
20	0.015	0.00	0.00	0.100	18.10	2.31	1209.287	1179.111	101.43	98.54	0.00	0.00
30	0.015	0.00	0.00	0.110	15.13	2.97	1210.825	1180.578	101.44	102.92	0.00	0.00
40	0.015	0.00	0.00	0.108	12.16	2.97	1212.309	1182.017	98.13	101.23	0.00	0.00
50	0.015	0.00	0.00	0.103	9.76	2.40	1213.743	1183.526	93.72	104.93	0.00	0.00
60	0.015	0.00	0.00	0.100	7.84	1.92	1215.269	1185.045	98.61	104.44	0.00	0.00
70	0.015	0.00	0.00	0.100	6.12	1.72	1216.885	1186.500	103.81	99.45	0.00	0.00
80	0.015	0.00	0.00	0.950	4.65	1.47	1218.518	1187.947	104.32	98.36	0.00	0.00
90	0.015	0.00	0.00	0.925	3.60	1.05	1220.091	1189.396	99.67	97.71	0.00	0.00
100	0.015	0.00	0.00	0.090	2.85	0.75	1221.658	1190.853	98.24	97.22	0.00	0.00
110	0.015	0.00	0.00	0.085	2.26	0.59	1223.235	1192.335	98.19	98.22	0.00	0.00
120	0.015	0.00	0.00	0.083	1.82	0.44	1224.852	1193.859	100.07	100.39	0.00	0.00
130	0.015	0.00	0.00	0.080	1.37	0.45	1226.468	1195.338	99.65	97.06	0.00	0.00
140	0.015	0.00	0.00	0.080	0.96	0.41	1228.087	1196.849	99.44	98.78	0.00	0.00
150	0.015	0.00	0.00	0.078	0.53	0.43	1229.707	1198.372	99.19	99.23	0.00	0.00
160	0.015	0.00	0.00	0.075	0.15	0.38	1231.325	1199.893	98.86	98.92	0.00	0.00
170	0.015	0.00	0.00	0.075	0.00	0.15	1232.949	1201.490	99.16	103.78	0.00	0.00

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 9, 2013
Test Run Number:	6

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	175	0.1000
A2	0.0125	175	0.1118
A3	0.0150	172	0.1225
A4	0.0150	177	0.1225
A Center	0.0125	177	0.1118
B1	0.0100	185	0.1000
B2	0.0150	183	0.1225
B3	0.0150	187	0.1225
B4	0.0125	185	0.1118
B Center	0.0150	186	0.1225
Averages	0.01325	180.1	0.1142

Tunnel Diameter	**8.000**	inches
Tunnel Static	**-0.083**	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9748	factor
Baro. Pressure	30.21	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	8.334	Ft/ Sec
Initial Flow	**139.50**	Ft3/min

VS (1)	0.030308801		
VS (2)	0.03248582	STD Tunnel Flow:	147.21

170				624.7722222	27.279	25.451	8.61	99.76	99.78
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	481.1		0.015	647.5			8.767		
10	465.1		0.015	637.8	1.621	1.410	8.702	102.04	95.12
20	453.4		0.015	645.2	1.602	1.452	8.752	101.43	98.54
30	477.7		0.015	675.9	1.565	1.482	8.958	101.44	102.92
40	507.8		0.015	679.6	1.510	1.454	8.982	98.13	101.23
50	521.0		0.015	664.3	1.459	1.524	8.880	93.72	104.93
60	525.2		0.015	650.1	1.552	1.533	8.785	98.61	104.44
70	530.3		0.015	642.6	1.643	1.469	8.734	103.81	99.45
80	538.6		0.015	635.7	1.660	1.460	8.687	104.32	98.36
90	538.2		0.015	625.5	1.599	1.462	8.617	99.67	97.71
100	530.6		0.015	612.3	1.593	1.471	8.526	98.24	97.22
110	523.4		0.015	604.2	1.603	1.496	8.469	98.19	98.22
120	509.8		0.015	596.9	1.643	1.538	8.418	100.07	100.39
130	495.8		0.015	592.6	1.642	1.492	8.388	99.65	97.06
140	484.3		0.015	588	1.645	1.525	8.355	99.44	98.78
150	470.3		0.015	584.3	1.646	1.537	8.329	99.19	99.23
160	458.2		0.015	582	1.644	1.535	8.312	98.86	98.92
170	446.2	446.18	0.015	581.4	1.650	1.611	8.308	99.16	103.78

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**December 9, 2013**
est Run Number:	**6**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.6	to	5.6

Average Firebox Temp, ℉	465.38

Final Coal Bed Wt, lb	5.34

Interval	10

Time		Temperature Data												
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right		Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	65.07	223	370.8	187.7	68.67	117.3	107.9	96.55				21.77	16.43
1	10	67.97	128.9	365.6	230.2	110.3	190.6	160.5	158.2				19.23	2.54
2	20	66.19	149.6	457	378	157.8	206.2	187.3	190.1				16.84	2.39
3	30	68.27	175.6	555.9	472.5	196.2	232.1	232.3	225.8				14.63	2.21
4	40	67.54	191.7	670.6	564.2	215	289.9	291	278.8				12.14	2.49
5	50	70.48	196.8	684.3	637.3	227.1	383.4	367.4	349.8				9.57	2.57
6	60	72.07	179	622.4	621.8	244.9	467.2	432.4	407.9				7.76	1.81
7	70	71.79	164.3	559.2	559.2	271.6	511.7	468.1	440.6				6.59	1.17
8	80	72.74	161.4	553.2	516.9	300.3	565.6	482.4	461.7	465.38			5.34	1.25

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 9, 2013
Test Run Number: 6

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	29		118.6	
B - Rear Filter Catch	Filter	30		117.9	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			247.7	236.5	11.2
Probe & Filter Holder	Probe	35	107842.1	107839.9	2.2
			Total Particulate, mg		**13.4**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	31		118.3	
B - Rear Filter Catch	Filter	32		118.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			246.2	236.4	9.8
Probe & Filter Holder	Probe	36	108502.3	108499.5	2.8
			Total Particulate, mg		**12.6**

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 9, 2013
Test Run Number:	6

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	8	0.937	22.5	23.1	23.8
2	8	0.866	20.9	19.0	20.6
3	8	0.945	23.1	19.8	22.6
4	8	0.892	24.2	22.4	24.4
5	8	0.916	21.7	21.9	21.9
6	8	0.922	23.3	21.7	22.3
7	8	0.908	21.1	22.1	20.5
8	8	1.034	19.2	18.3	19.3
9	8	0.912	22.3	21.9	22.0
10	8	0.959	21.9	21.0	22.3
11	8	0.844	23.8	22.8	23.2
12	8	0.882	22.0	20.9	21.9
17	17	1.909	21.9	20.8	21.9
18	17	1.954	22.0	21.0	21.9
19	17	1.838	21.6	21.2	22.4
20	17	1.865	22.3	21.3	21.7
21	17	1.869	22.1	21.9	21.9
Total Weight		20.452	Average, %db		21.8

Allowable Fuel Load Range: **4.53** to **5.66**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214		Time:	10:30	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb.		Moisture, %, Dry Basis		
		2x4	4x4			
1	15	1.589		19.1	19.3	19.5
2	15		3.446	19.0	18.7	19.9
3	15	2.374		20.2	20.5	22.0
4	15	1.743		18.9	19.2	19.9
5	15		3.646	21.1	19.5	20.6
6	15	1.999		19.7	19.5	20.0
7	15	1.731		19.7	20.0	19.7
8	15		3.829	20.0	20.0	20.0
9	15	2.301		20.9	21.9	23.0
Totals		11.737	10.921			
% of Weight		51.8	48.2			
Total weight, wet, lb.		22.658		Average Moisture, dry		20.07
Total weight, dry, kg		8.56		Average Moisture, wet		16.71

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 10, 2013
Test Run Number:	7

Dry Burn-Rate, kg/hr:	**2.85**	
Emission-Rate, g/hr:	**6.26**	
Adjusted Emission-Rate, g/hr :	**8.34**	
Duration of Test, Minutes	180	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1232.97	1201.456
Dry Gas Meter Ending Reading, ft^3	1261.381	1229.069
Barometric Pressure Correction Factor	0.996	0.996
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.001	1.002
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**28.385**	**27.387**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**137.894**	
Total Tunnel Volume, scf	**24820.902**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	874.445	906.288
Sample Particulate Mass, mg	21.7	20.5
Total Emissions, grams	18.975	18.579
Emission-Rate, g/hr	6.33	6.19
Adjusted Emission Rates, g/hr	**8.41**	**8.27**
Deviation, %	0.88%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	88.36	83.12
Post-Test Leak Check, cfm @ in. Hg vac.	0.0025@5	0.0045@5
Average Firebox Surface Temperture delta-T, ℉	48.38	
Maximum Ambient Temperture, ℉	85	
Mimimum Ambient Temperature, ℉	69	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.67	
Dry-Basis Fuel Load Moisture Content, %	20.08	
Wet-Basis Fuel Load Moisture Content, %	16.72	
Coal Bed Range, lb.	4.60	5.60
Actual Coal Bed, Lb.	4.64	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 10, 2013
Test Run No:	7

Temperature Data

Firebox Temp Start	485.38
Firebox Temp End	437
Firebox Delta-T	**48.4**

Max Filter Temps	
Train A	Train B
88.36	**83.12**

Interval	10	Duration of Test, Min	180

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	77.42	161.7	487	476	377.9	568.8	495.7	508.5		67.87	66.97	66.7	66.615
1	10	79.3	188.3	565.4	455	406.4	495.3	474.6	492.2		82.93	78.94	66.9	66.665
2	20	84.77	222.5	756	609.4	404.6	465.3	456.9	479.7		87.07	81.88	66.95	66.645
3	30	84.3	241.5	820.8	725.8	395.6	487.8	469.9	493.3		88.36	83.12	67.065	66.785
4	40	84.4	231.3	773.9	759.4	383.4	531	504.2	524.6		85.42	79.76	67.215	66.96
5	50	84.29	205.2	674.9	693.4	379.4	585.6	533.3	552.2		82.99	78.89	67.405	67.12
6	60	82.73	191.7	632.3	629	374.8	628.1	549.8	563.3		80.58	76.58	67.55	67.205
7	70	81	181.8	597	587	372.3	655	556	567.7		78.22	75.58	67.615	67.275
8	80	79.72	173.2	565.6	560.3	372.4	643.1	552.8	563.5		75.25	74.43	67.63	67.345
9	90	78.4	163	526.2	523.5	374.2	631.3	536.7	556.6		74.22	69.93	67.74	67.365
10	100	76.45	157.5	503.7	484.9	376.5	621.8	517.7	548.2		72.94	68.67	67.675	67.085
11	110	75.24	149.9	466	456.2	378.7	603.3	502.8	537.9		72.15	68.76	67.665	67.205
12	120	73.66	143	441.6	422.3	380.2	584.1	487.2	521.6		71.89	68.68	67.61	67.125
13	130	72.8	141.8	433.1	400.8	379.9	588.1	474.4	508		71.96	69.65	67.625	67.095
14	140	71.72	138.3	416.8	386.4	379.7	586.4	464.1	501.7		71.65	70.1	67.63	67.165
15	150	70.19	134.7	400	371.6	381.2	579	452.4	493		71.53	70.27	67.6	67.13
16	160	69.74	131.5	387.9	357.6	386.8	570.7	440.7	483.2		71.33	70.03	67.51	66.98
17	170	68.78	130.1	383.4	346.9	387.4	563.2	429.6	473.1		71.65	70.06	67.49	66.965
18	180	69.35	131.2	393.6	344.2	388	566.6	422.3	463.9		71.61	69.98	67.435	66.885

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 10, 2013
Test Run Number:	7

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	29.83	43	Meter Box (A)	1.002
End	29.77	45	Meter Box (B)	0.994
Duration of Test, Min		180		

Leak Check, cfm @ in Hg	
Train A	Train B
0.0025@5	0.0045@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	13.166	7.441	1.027

Time	Particulate Sampling Data												Combustion Gasses, %		
	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.073	22.66	22.66	1232.970	1201.456	99.88	99.81	0.00	0.00	20.630	3.770	1.100
10	0.015	0.00	0.00	0.095	20.33	2.33	1234.561	1202.889	102.37	94.84	0.00	0.00	19.060	3.020	0.800
20	0.015	0.00	0.00	0.108	17.24	3.09	1236.112	1204.363	102.39	100.10	0.00	0.00	17.510	8.560	1.080
30	0.015	0.00	0.00	0.110	14.05	3.19	1237.626	1205.810	101.31	99.60	0.00	0.00	14.730	13.200	1.140
40	0.015	0.00	0.00	0.105	11.18	2.87	1238.910	1207.037	85.27	83.81	0.00	0.00	10.810	15.040	1.390
50	0.015	0.00	0.00	0.100	9.14	2.04	1240.564	1208.533	107.70	100.21	0.00	0.00	7.910	12.920	0.860
60	0.015	0.00	0.00	0.098	7.46	1.68	1242.108	1209.999	99.49	97.18	0.00	0.00	7.490	10.590	0.780
70	0.015	0.00	0.00	0.095	6.02	1.44	1243.769	1211.336	106.20	87.94	0.00	0.00	8.540	9.750	0.780
80	0.015	0.00	0.00	0.090	4.86	1.16	1245.316	1213.020	98.24	110.01	0.00	0.00	9.610	9.250	0.780
90	0.015	0.00	0.00	0.088	4.02	0.84	1246.883	1214.659	98.69	106.20	0.00	0.00	10.490	8.470	0.780
100	0.015	0.00	0.00	0.085	3.28	0.74	1248.483	1216.271	100.33	104.04	0.00	0.00	11.280	7.310	0.850
110	0.015	0.00	0.00	0.083	2.78	0.50	1250.094	1217.900	100.40	104.47	0.00	0.00	12.160	6.590	0.890
120	0.015	0.00	0.00	0.080	2.31	0.47	1251.705	1219.427	99.84	97.38	0.00	0.00	12.890	5.810	1.020
130	0.015	0.00	0.00	0.080	1.81	0.50	1253.319	1221.069	99.92	104.62	0.00	0.00	13.520	5.040	1.210
140	0.015	0.00	0.00	0.078	1.30	0.51	1254.933	1222.719	99.63	104.81	0.00	0.00	14.120	5.060	1.140
150	0.015	0.00	0.00	0.075	0.93	0.37	1256.543	1224.351	99.09	103.36	0.00	0.00	14.440	4.690	1.180
160	0.015	0.00	0.00	0.075	0.53	0.40	1258.156	1225.949	99.02	100.96	0.00	0.00	14.700	4.340	1.230
170	0.015	0.00	0.00	0.075	0.20	0.33	1259.766	1227.567	98.73	102.11	0.00	0.00	15.000	4.050	1.260
180	0.015	0.00	0.00	0.075	0.00	0.20	1261.381	1229.069	99.14	94.89	0.00	0.00	15.260	3.920	1.240

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 10, 2013
Test Run Number:	7

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	178	0.1000
A2	0.0125	175	0.1118
A3	0.0150	181	0.1225
A4	0.0150	181	0.1225
A Center	0.0150	180	0.1225
B1	0.0100	168	0.1000
B2	0.0125	169	0.1118
B3	0.0150	171	0.1225
B4	0.0125	169	0.1118
B Center	0.0150	170	0.1225
Averages	0.01325	174.28	0.1129

Tunnel Diameter	**8.000**	inches
Tunnel Static	**-0.070**	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9215	factor
Baro. Pressure	29.83	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	8.242	Ft/ Sec
Initial Flow	**137.48**	Ft3/min

VS (1)	0.027591624		
VS (2)	0.028595533	STD Tunnel Flow:	137.89

180				629.3789474	28.371	27.375	8.21	99.88	99.81
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	485.4		0.015	621.7			8.164		
10	464.7		0.015	648.3	1.590	1.422	8.337	102.37	94.84
20	483.2		0.015	682.5	1.550	1.462	8.554	102.39	100.10
30	514.5		0.015	701.5	1.513	1.435	8.672	101.31	99.60
40	540.5		0.015	691.3	1.283	1.217	8.609	85.27	83.81
50	548.8		0.015	665.2	1.652	1.483	8.445	107.70	100.21
60	549.0		0.015	651.7	1.542	1.453	8.359	99.49	97.18
70	547.6		0.015	641.8	1.658	1.325	8.295	106.20	87.94
80	538.4		0.015	633.2	1.544	1.669	8.239	98.24	110.01
90	524.5		0.015	623	1.564	1.624	8.173	98.69	106.20
100	509.8		0.015	617.5	1.597	1.598	8.136	100.33	104.04
110	495.8		0.015	609.9	1.608	1.615	8.086	100.40	104.47
120	479.1		0.015	603	1.608	1.514	8.040	99.84	97.38
130	470.2		0.015	601.8	1.611	1.628	8.032	99.92	104.62
140	463.7		0.015	598.3	1.611	1.635	8.009	99.63	104.81
150	455.4		0.015	594.7	1.607	1.618	7.985	99.09	103.36
160	447.8		0.015	591.5	1.611	1.584	7.963	99.02	100.96
170	440.0		0.015	590.1	1.608	1.604	7.954	98.73	102.11
180	437.0	437	0.015	591.2	1.613	1.490	7.961	99.14	94.89

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**December 10, 2013**
est Run Number:	**7**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.6	to	5.6

Average Firebox Temp, ℉	484.92

Final Coal Bed Wt, lb	4.64

Interval	10

Time		Temperature Data												
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right		Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	67.3	222.6	450	165.5	73.05	113.2	110.6	95.13				23.22	**18.58**
1	10	70.7	117.5	340.1	246.3	113.4	170.1	160.4	160.3				19.32	3.90
2	20	71.07	134.2	450.2	309.8	160.2	180.2	181.6	191.8				17.51	1.81
3	30	73.53	147.4	502.8	414.1	192.5	210.8	215.3	229.6				15.53	1.98
4	40	73.21	170.7	615.1	503.4	211.3	259.7	266.3	272.7				13.40	2.13
5	50	76.94	193	656.2	587.4	222	330.7	332.6	335.7				11.13	2.27
6	60	77.89	187.7	631.4	603.2	236	403.9	394.1	400.7				9.31	1.82
7	70	76.26	178.9	603.2	570.8	258.7	475.7	438.7	455				7.84	1.47
8	80	76.97	172.3	574.8	546.5	295.9	524.4	470.4	492.7	465.98			6.49	1.35
9	90	77.08	161.1	519.6	513.6	341.3	560.5	490.5	502.8	481.74			5.42	1.07
10	100	78.1	166	491.9	479	374.4	567.5	495.7	508	484.92			4.64	0.78

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 10, 2013
Test Run Number: 7

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	33		117	
B - Rear Filter Catch	Filter	34		117.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			251.9	234.1	17.8
Probe & Filter Holder	Probe	17	139749.7	139745.8	3.9
			Total Particulate, mg		**21.7**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	35		115.2	
B - Rear Filter Catch	Filter	36		117.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			247.6	232.3	15.3
Probe & Filter Holder	Probe	18	147887.3	147882.1	5.2
			Total Particulate, mg		**20.5**

Manufacturer: SBI
Model: NG1800
Date: 12/10/13
Run: 7
Control #: G101440749
Test Duration: 180 min

	HHV	LHV
Eff	55.41%	59.89%
Comb Eff	90.45%	90.45%
HT Eff	61.26%	66.22%
Output	31,334	kJ/h
Burn Rate	2.85	kg/h
Grams CO	1,153	g
Input	56,545	kJ/h
MC wet	16.72	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.061

Overall Heating Efficiency:	55.41%
Combustion Efficiency:	90.45%
Heat Transfer Efficiency:	61.26%

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.69
Dry Moles Exhaust Gas (N_r):	434.21
Air Fuel Ratio (A/F)	12.38

Heat Output:	29,724	Btu/h	31,334	kJ/h
Heat Input:	53,639	Btu/h	56,545	kJ/h
Burn Duration:	3.00	h		
Burn Rate:	6.29	lb/h	2.854	kg/h
Stack Temp:	541.0	Deg. F	282.8	Deg. C

Averages	1.03	7.44	1.71	20.38	12.43	281.20	25.04	88.6%	63.7%	56.7%	15.91	3.11	69.78	2.59
INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt	% Wet	Dry Wt.
Elapsed Time	Weight emaining (k	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %	Fuel Ratio	Now Wt	Consumed x	Now Wt_{dn}
0	10.28	1.10	3.77	303.3%	20.62	16.30	252.8	25.2	82.3%	52.1%	42.8%	23.5	10.28	0.00	8.56
10	9.22	0.80	3.02	414.2%	20.69	17.27	296.3	26.3	83.9%	35.0%	29.4%	30.1	9.22	10.29	7.68
20	7.82	1.08	8.56	103.8%	20.30	11.20	402.2	29.3	90.9%	59.0%	53.7%	12.1	7.82	23.93	6.51
30	6.37	1.14	13.20	37.0%	19.99	6.22	438.2	29.1	93.4%	66.0%	61.7%	8.2	6.37	38.00	5.31
40	5.07	1.39	15.04	19.6%	19.86	4.12	412.2	29.1	93.0%	69.7%	64.8%	7.1	5.07	50.67	4.22
50	4.15	0.86	12.92	42.5%	20.03	6.68	357.2	29.1	94.9%	70.6%	67.0%	8.5	4.15	59.67	3.45
60	3.38	0.78	10.59	72.8%	20.19	9.21	333.5	28.2	94.5%	68.8%	65.0%	10.3	3.38	67.08	2.82
70	2.73	0.78	9.75	86.5%	20.24	10.10	313.9	27.2	94.0%	68.7%	64.6%	11.1	2.73	73.44	2.27
80	2.21	0.78	9.25	95.8%	20.28	10.64	296.4	26.5	93.8%	69.1%	64.8%	11.7	2.21	78.55	1.84
90	1.82	0.78	8.47	112.4%	20.33	11.47	274.6	25.8	93.3%	69.3%	64.6%	12.6	1.82	82.26	1.52
100	1.49	0.85	7.31	140.7%	20.40	12.67	262.1	24.7	91.7%	67.6%	62.0%	14.3	1.49	85.53	1.24
110	1.26	0.89	6.59	162.6%	20.45	13.41	241.1	24.0	90.5%	67.6%	61.2%	15.5	1.26	87.73	1.05
120	1.05	1.02	5.81	187.6%	20.49	14.17	227.6	23.1	88.1%	66.4%	58.5%	16.9	1.05	89.81	0.87
130	0.82	1.21	5.04	214.3%	20.53	14.88	222.8	22.7	84.6%	63.9%	54.1%	18.3	0.82	92.01	0.68
140	0.59	1.14	5.06	216.8%	20.53	14.90	213.8	22.1	85.4%	65.1%	55.6%	18.5	0.59	94.26	0.49
150	0.42	1.18	4.69	234.6%	20.55	15.27	204.4	21.2	84.1%	64.5%	54.3%	19.5	0.42	95.90	0.35
160	0.24	1.23	4.34	252.7%	20.57	15.62	197.7	21.0	82.5%	63.7%	52.6%	20.5	0.24	97.66	0.20
170	0.09	1.26	4.05	269.9%	20.59	15.91	195.2	20.4	81.3%	62.4%	50.7%	21.5	0.09	99.12	0.08
180	0.00	1.24	3.92	280.7%	20.60	16.06	200.9	20.8	81.1%	60.8%	49.3%	22.1	0.00	100.00	0.00

%HC					
1.32	Combustion Efficiency:	90.45%		Moisture of Wood (wet basis):	16.72
	Total Input (kJ):	169,634	160,889 (Btu)	Initial Dry Weight Wt_{do} (kg):	8.56
	Total Output (kJ):	94,002	89,156 (Btu)	Moisture Content Dry	20.08
	Efficiency:	55.41%			
	Total CO (g):	1153.35			

Load Weight (kg):	**10.28**					
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**	
Value in kJ/kg - CV:	**19,810**	**18,329**	Btu/lb	**8522.5**	**7885.2**	

69.78	**170382**	**4.06**	**6.87**	**2.74**	**19810.00**	**16.72**	**79.11**	**20.98**	**2.12**	**7.01**	**0.13**	**0.21**	**34.36**	**75.65**	**5.74**
% Dry		**Fuel Properties**				**Mw**	**Mass Balance**					**kg Wood pe**			
Comsumed	**Total**	**Carbon**	**Hydrogen**	**Oxygen**	**Calorific**	**Moisture**	**(moles/100 mole dry flue gas)**					**00 mole df**	**Moles per kg**		
y	**Input**	**/12= [a]**	**/1= [b]**	**/16= [c]**	**Value**	**Fuel Burnt**	**[h]**	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**
0.00	0	4.06	6.87	2.74	19810.00	16.72	78.83	20.91	1.23	3.96	0.13	0.12	30.75	132.93	8.97
10.29	29021	4.06	6.87	2.74	19810.00	16.72	78.91	20.93	0.96	3.13	0.09	0.10	31.53	180.29	8.35
23.93	23504	4.06	6.87	2.74	19810.00	16.72	79.16	21.00	2.41	7.99	0.14	0.24	35.72	46.76	4.51
38.00	22681	4.06	6.87	2.74	19810.00	16.72	79.44	21.07	3.57	11.95	0.16	0.36	37.16	17.52	3.21
50.67	18377	4.06	6.87	2.74	19810.00	16.72	79.45	21.07	4.09	13.67	0.20	0.41	36.92	10.11	3.41
59.67	13923	4.06	6.87	2.74	19810.00	16.72	79.54	21.10	3.42	11.52	0.11	0.34	37.95	19.62	2.53
67.08	11677	4.06	6.87	2.74	19810.00	16.72	79.42	21.07	2.82	9.50	0.10	0.28	37.68	32.77	2.78
73.44	9731	4.06	6.87	2.74	19810.00	16.72	79.37	21.05	2.62	8.79	0.10	0.26	37.44	38.80	3.00
78.55	7485	4.06	6.87	2.74	19810.00	16.72	79.33	21.04	2.49	8.37	0.10	0.25	37.28	42.87	3.14
82.26	5913	4.06	6.87	2.74	19810.00	16.72	79.28	21.03	2.30	7.71	0.10	0.23	36.99	50.09	3.41
85.53	4641	4.06	6.87	2.74	19810.00	16.72	79.17	21.00	2.03	6.78	0.10	0.20	36.10	62.56	4.20
87.73	3630	4.06	6.87	2.74	19810.00	16.72	79.11	20.98	1.87	6.20	0.11	0.19	35.44	72.13	4.79
89.81	3630	4.06	6.87	2.74	19810.00	16.72	79.00	20.96	1.71	5.63	0.13	0.17	34.09	83.13	5.98
92.01	3780	4.06	6.87	2.74	19810.00	16.72	78.87	20.92	1.58	5.11	0.15	0.16	32.13	94.87	7.71
94.26	3294	4.06	6.87	2.74	19810.00	16.72	78.90	20.93	1.56	5.08	0.14	0.16	32.56	95.89	7.34
95.90	2882	4.06	6.87	2.74	19810.00	16.72	78.86	20.92	1.48	4.80	0.15	0.15	31.81	103.58	8.00
97.66	2732	4.06	6.87	2.74	19810.00	16.72	78.81	20.91	1.41	4.53	0.15	0.14	30.94	111.35	8.77
99.12	2732	4.06	6.87	2.74	19810.00	16.72	78.78	20.90	1.35	4.31	0.16	0.13	30.23	118.74	9.40
100.00	749	4.06	6.87	2.74	19810.00	16.72	78.78	20.90	1.31	4.19	0.15	0.13	30.10	123.32	9.52

Moisture Content M_{Cwb}: 16.72

Dry kg : 8.56

CA: 48.73

HY: 6.87

OX: 43.9

															SUMS
0.71	435.95	33.09	11.15	554.35	10815.31	7868.72	7585.25	7515.15	11003.90	9055.84	298.19	7190.60	9940.07	31601.22	57585.90
of Dry Wood			Moisture	Stack Temp	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp	Energy Losses (kJ/kg Flue Gas Consti			
HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2	CO	N_2
1.09	642.93	32.33	11.15	525.93	9441.39	6938.15	6705.75	6640.06	9454.86	8011.45	298.38	290.30	922.26	2598.39	4269.10
0.93	823.93	32.67	11.15	569.48	11379.93	8288.57	7992.28	7917.93	11558.52	9542.52	299.43	358.83	1494.38	2430.56	6523.80
0.58	330.34	33.36	11.15	675.37	16302.93	11628.04	11149.86	11059.37	17097.90	13292.53	302.47	582.40	543.68	1325.75	3653.40
0.44	223.65	33.64	11.15	711.37	18100.26	12824.55	12275.01	12180.11	19169.94	14626.77	302.21	672.66	224.69	947.68	2724.03
0.48	195.03	33.56	11.15	685.32	16800.77	11961.33	11463.79	11371.96	17667.74	13664.97	302.26	620.27	120.98	1004.71	2217.85
0.34	233.63	33.85	11.15	630.32	14129.19	10164.50	9769.03	9684.95	14627.92	11653.61	302.20	536.20	199.44	739.54	2262.71
0.35	282.62	33.82	11.15	606.65	13038.78	9424.49	9069.23	8988.75	13401.73	10822.48	301.33	491.36	308.85	810.66	2540.41
0.37	304.79	33.77	11.15	587.04	12156.81	8822.27	8498.74	8421.40	12417.97	10144.59	300.37	455.18	342.35	873.14	2566.72
0.39	319.73	33.74	11.15	569.59	11376.13	8285.24	7988.92	7914.63	11555.89	9538.47	299.66	424.10	355.21	914.72	2530.52
0.42	346.23	33.69	11.15	547.71	10402.94	7610.57	7347.05	7276.89	10492.63	8774.87	298.93	384.80	381.20	989.01	2519.50
0.51	391.03	33.50	11.15	535.21	9878.79	7246.81	7000.86	6932.95	9920.84	8362.99	297.84	356.65	453.34	1217.40	2710.98
0.58	425.48	33.36	11.15	514.26	8967.03	6606.76	6389.80	6326.28	8942.14	7635.36	297.17	317.83	476.55	1385.22	2691.72
0.74	463.52	33.05	11.15	500.71	8400.58	6207.66	6008.38	5947.69	8337.32	7181.05	296.29	286.37	516.07	1729.58	2756.89
0.97	502.74	32.58	11.15	495.98	8211.06	6074.08	5880.70	5820.96	8135.05	7028.98	295.82	263.80	576.23	2228.13	2926.45
0.92	507.72	32.69	11.15	486.93	7837.36	5809.16	5627.11	5569.33	7739.58	6726.78	295.22	255.20	557.02	2117.30	2827.67
1.00	534.84	32.52	11.15	477.59	7463.50	5543.71	5372.88	5317.10	7344.85	6423.80	294.37	237.41	574.23	2307.84	2843.80
1.10	561.92	32.32	11.15	470.87	7181.99	5342.34	5179.64	5125.46	7050.90	6193.38	294.12	222.24	594.86	2527.19	2880.11
1.18	588.00	32.16	11.15	468.37	7094.39	5280.51	5120.52	5066.79	6957.60	6122.95	293.58	214.45	627.03	2709.52	2979.27
1.19	604.94	32.14	11.15	474.04	7327.17	5446.99	5280.27	5225.22	7200.74	6313.44	293.90	220.56	671.71	2744.87	3160.97

			AVERAGE	SUMS						
12221.69	33362.03	11237.24	8586.25	75632.02	16198.22	59433.8	94750.1	16198.2	1153.4	81.6
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
984.06	1680.78	579.78	11324.68	0.00	0	0.00	0	0	0.00	0.00
836.35	1748.09	596.86	13988.88	20493.11	4672	15820.73	8528	4672	342.62	21.74
527.82	1910.19	638.69	9181.92	10894.12	2128	8766.34	12610	2128	149.73	11.04
399.80	1971.35	653.57	7593.79	8694.21	1488	7206.23	13986	1488	102.89	8.05
436.76	1934.22	642.84	6977.63	6472.75	1293	5179.75	11904	1293	88.63	7.14
304.60	1882.79	620.41	6545.67	4600.41	713	3887.38	9322	713	49.71	3.79
317.94	1852.99	611.14	6933.36	4086.93	648	3439.29	7590	648	45.81	3.32
337.75	1827.64	603.58	7006.36	3441.64	580	2861.62	6289	580	41.20	2.94
351.00	1805.56	596.82	6977.92	2636.67	467	2169.59	4849	467	33.26	2.35
374.63	1776.98	588.30	7014.44	2093.87	398	1695.58	3820	398	28.47	1.99
460.21	1753.12	583.71	7535.41	1765.34	385	1380.39	2876	385	27.54	1.92
523.02	1721.48	575.59	7691.40	1409.54	343	1066.39	2221	343	24.56	1.71
663.65	1690.27	570.52	8213.35	1505.19	431	1074.32	2125	431	30.71	2.17
872.88	1661.47	568.83	9097.78	1736.03	582	1154.46	2044	582	41.21	2.97
821.65	1657.37	565.46	8801.66	1463.34	481	982.76	1830	481	34.15	2.43
897.47	1638.91	562.08	9061.74	1318.26	459	859.29	1564	459	32.60	2.33
986.21	1621.46	559.51	9391.57	1295.27	477	818.04	1437	477	33.87	2.43
1058.43	1611.11	558.72	9758.52	1345.88	512	833.98	1386	512	36.32	2.60
1067.47	1616.25	560.85	10042.67	379.47	142	237.64	369	142	10.07	0.72

Intertek Testing Services NA Ltd

Manufacturer:	SBI
Model:	NG1800
Date:	12/10/13
Run:	7
Control #:	G101440749
Test Duration:	180
Output Category:	4

Technicians:

_____

_____

_____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	55.4%	59.9%
Combustion Efficiency	90.5%	90.5%
Heat Transfer Efficiency	61%	66.2%

Output Rate (kJ/h)	31,334	29,724	**(Btu/h)**
Burn Rate (kg/h)	2.85	6.29	**(lb/h)**
Input (kJ/h)	56,545	53,639	**(Btu/h)**

Test Load Weight (dry kg)	8.56	18.87	**dry lb**
MC wet (%)	16.72		
MC dry (%)	20.08		
Particulate (g)	18.777		
CO (g)	1,153		
Test Duration (h)	3.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.20	12.27
g/kg Dry Fuel	2.19	134.69
g/h	6.26	384.45
lb/MM Btu Output	0.46	28.52

Air/Fuel Ratio (A/F)	12.38

Version: 2.4 **15/04/2010**

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 10, 2013
Test Run Number:	7

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	8	0.753	24.9	22.5	24.3
2	8	0.795	24.3	23.0	23.1
3	8	0.837	20.4	20.8	20.6
4	8	0.807	22.0	21.9	22.1
5	8	0.873	22.1	21.6	22.7
6	8	0.901	22.0	21.2	21.7
7	8	0.781	21.0	21.0	21.7
8	8	0.786	22.5	21.0	23.0
9	8	0.846	21.9	25.0	23.8
10	8	0.860	20.2	20.0	20.2
11	8	0.939	23.8	23.0	24.2
12	8	0.831	23.2	22.4	22.7
13	8	0.828	24.5	21.9	23.8
14	17	1.816	21.7	20.9	21.7
15	17	1.724	22.3	20.5	22.0
16	17	1.833	21.7	21.1	21.9
17	17	1.996	19.9	19.1	20.6
18	17	2.206	21.4	23.2	23.8
Total Weight		**20.412**	Average, %db		**22.1**

Allowable Fuel Load Range:	**4.53**	to	**5.67**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	10:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.607		19.3	19.4	19.5
2	15		3.916	22.0	19.1	20.2
3	15	2.073		19.3	19.2	19.0
4	15	1.551		19.3	19.4	19.0
5	15		3.453	20.0	20.1	20.1
6	15	1.964		19.0	19.9	19.2
7	15	1.612		19.5	19.2	19.5
8	15		4.302	22.0	22.0	22.3
9	15	2.195		21.4	21.2	22.1
Totals		11.002	11.671			
% of Weight		48.5	51.5			
Total weight, wet, lb.		**22.673**		Average Moisture, dry		**20.08**
Total weight, dry, kg		8.56		Average Moisture, wet		16.72

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 11, 2013
Test Run Number:	8

Dry Burn-Rate, kg/hr:	**3.03**	
Emission-Rate, g/hr:	**7.97**	
Adjusted Emission-Rate, g/hr :	**10.19**	
Duration of Test, Minutes	160	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1261.404	1229.146
Dry Gas Meter Ending Reading, ft^3	1287.285	1253.622
Barometric Pressure Correction Factor	1.002	1.002
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.004	1.005
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**26.091**	**24.501**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**146.962**	
Total Tunnel Volume, scf	**23513.953**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	901.222	959.724
Sample Particulate Mass, mg	21.4	24.2
Total Emissions, grams	19.286	23.225
Emission-Rate, g/hr	7.23	8.71
Adjusted Emission Rates, g/hr	**9.40**	**10.97**
Deviation, %	7.70%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	82.05	86.73
Post-Test Leak Check, cfm @ in. Hg vac.	0.0025@5	0.004@5
Average Firebox Surface Temperture delta-T, ℉	56.18	
Maximum Ambient Temperture, ℉	84	
Mimimum Ambient Temperature, ℉	72	
Fuel Properties		
Wet Fuel Load Weight, lb.	21.37	
Dry-Basis Fuel Load Moisture Content, %	19.85	
Wet-Basis Fuel Load Moisture Content, %	16.56	
Coal Bed Range, lb.	4.30	5.30
Actual Coal Bed, Lb.	4.58	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	December 11, 2013
Test Run No:	8

Temperature Data

Firebox Temp Start	523
Firebox Temp End	466.82
Firebox Delta-T	**56.2**

Max Filter Temps	
Train A	Train B
82.05	**86.73**

Interval	10	Duration of Test, Min	**160**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	**0**	71.89	124	400.7	449.5	486.6	629.1	522.6	527.2		66.83	65.25	65.535	65.17
1	**10**	73.52	190.1	581.6	487.1	500.1	552.2	490.5	505.9		80.64	82.44	65.765	65.34
2	**20**	76.31	210.6	704.1	675.7	484.4	525.5	492.2	499.3		81.85	85.64	65.71	65.215
3	**30**	81.22	215.7	704.2	759.9	464.8	542.5	517.6	515.1		82.05	86.73	65.74	65.355
4	**40**	83.46	207.9	696.6	773.3	445.3	582.1	554.9	544		78.77	84.19	65.725	65.235
5	**50**	83.98	192.1	639.9	733.4	431.8	643.6	580.8	577		77.62	78.14	65.895	65.445
6	**60**	83.43	174.3	569.5	661	424	668.1	580.8	587.7		74.31	73.71	65.975	65.495
7	**70**	81.41	158.8	518	583.2	427.4	664.3	566	587		71.78	70.8	66.05	65.645
8	**80**	79.83	154	494.7	532.6	434	661.9	547.1	582.7		70.61	70.76	66.025	65.48
9	**90**	77.48	144.4	448.1	491.9	446.8	661.5	530.7	566		69.59	70.37	66.07	65.535
10	**100**	76.39	137.5	417	446.6	457.2	638.3	510.1	540.1		68.43	69.06	66.08	65.495
11	**110**	74.56	132.8	393.9	412.5	464.6	613.6	489.5	518.3		68.58	69.01	66.01	65.425
12	**120**	74.78	132.4	383.2	390.1	467.4	597.2	472.1	503.3		71.21	70.93	65.97	65.41
13	**130**	74.36	130.8	374.2	373.7	468.2	586.5	458.2	491.8		73.51	71.9	65.98	65.455
14	**140**	74.16	131	376	367.8	468.9	584.5	450	484.4		76.7	72.65	66.15	65.585
15	**150**	73.58	130.3	374.5	363.4	468.5	586.3	445.8	478.3		79.01	74.02	66.105	65.575
16	**160**	73.29	130	370.3	361	465.7	589.3	443.1	475		79.13	74.86	66.095	65.635

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 11, 2013
Test Run Number:	8

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	29.97	62	Meter Box (A)	1.002
End	30.00	64	Meter Box (B)	0.994
Duration of Test, Min		160		

Leak Check, cfm @ in Hg	
Train A	Train B
0.0025@5	0.004@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	11.695	7.814	0.968

Time	Particulate Sampling Data												Combustion Gasses, %		
	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.018	0.00	0.00	0.080	21.37	21.37	1261.404	1229.146	100.04	100.06	0.00	0.00	20.170	0.110	0.260
10	0.018	0.00	0.00	0.010	18.51	2.86	1262.996	1230.622	99.98	98.00	0.00	0.00	8.990	11.580	0.670
20	0.018	0.00	0.00	0.011	15.16	3.35	1264.574	1232.143	100.66	102.59	0.00	0.00	4.310	15.360	1.530
30	0.015	0.00	0.00	0.011	11.41	3.75	1266.089	1233.568	104.78	104.19	0.00	0.00	3.380	15.660	2.300
40	0.015	0.00	0.00	0.011	8.39	3.02	1267.454	1234.912	93.86	97.72	0.00	0.00	4.110	14.050	1.180
50	0.018	0.00	0.00	0.010	6.23	2.16	1269.100	1236.480	103.50	104.25	0.00	0.00	7.830	11.790	0.640
60	0.018	0.00	0.00	0.095	4.86	1.37	1270.750	1238.075	102.31	104.58	0.00	0.00	10.430	9.190	0.640
70	0.018	0.00	0.00	0.090	3.94	0.92	1272.391	1239.671	100.49	103.33	0.00	0.00	11.740	8.210	0.620
80	0.018	0.00	0.00	0.088	3.22	0.72	1274.038	1241.048	100.47	88.83	0.00	0.00	11.940	7.970	0.600
90	0.018	0.00	0.00	0.080	2.72	0.50	1275.690	1242.586	99.98	98.43	0.00	0.00	13.940	5.500	0.940
100	0.018	0.00	0.00	0.078	2.27	0.45	1277.355	1244.133	100.18	98.44	0.00	0.00	14.160	5.130	1.010
110	0.018	0.00	0.00	0.075	1.81	0.46	1279.024	1245.624	100.04	94.52	0.00	0.00	14.530	4.720	1.070
120	0.018	0.00	0.00	0.075	1.40	0.41	1280.688	1247.275	99.72	104.63	0.00	0.00	14.770	4.530	1.040
130	0.018	0.00	0.00	0.075	1.04	0.36	1282.356	1248.823	99.82	97.96	0.00	0.00	14.610	4.750	0.970
140	0.018	0.00	0.00	0.073	0.63	0.41	1283.927	1250.412	94.00	100.55	0.00	0.00	14.540	4.670	1.040
150	0.018	0.00	0.00	0.073	0.26	0.37	1285.719	1252.011	107.17	101.12	0.00	0.00	14.610	4.870	0.970
160	0.018	0.00	0.00	0.073	0.00	0.26	1287.285	1253.622	93.63	101.84	0.00	0.00	14.760	4.740	0.970

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 11, 2013
Test Run Number:	8

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	197	0.1000
A2	0.0125	197	0.1118
A3	0.0150	199	0.1225
A4	0.0150	198	0.1225
A Center	0.0150	200	0.1225
B1	0.0100	185	0.1000
B2	0.0150	186	0.1225
B3	0.0150	187	0.1225
B4	0.0150	186	0.1225
B Center	0.0175	189	0.1323
Averages	0.014	192.46	0.1155

Tunnel Diameter	**8.000**	inches
Tunnel Static		in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9069	factor
Baro. Pressure	29.97	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	8.543	Ft/ Sec
Initial Flow	**139.17**	Ft3/min

VS (1)	0.031792805		
VS (2)	0.033856037	STD Tunnel Flow:	146.96

160				618.6294118	26.079	24.490	8.55	100.04	100.06
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	523.0		0.018	584			8.385		
10	507.2		0.018	650.1	1.605	1.477	8.847	99.98	98.00
20	535.4		0.018	670.6	1.591	1.523	8.985	100.66	102.59
30	560.0		0.015	675.7	1.527	1.426	8.350	104.78	104.19
40	579.9		0.015	667.9	1.376	1.345	8.302	93.86	97.72
50	593.3		0.018	652.1	1.659	1.569	8.860	103.50	104.25
60	584.3		0.018	634.3	1.663	1.596	8.739	102.31	104.58
70	565.6		0.018	618.8	1.653	1.596	8.631	100.49	103.33
80	551.7		0.018	614	1.659	1.378	8.598	100.47	88.83
90	539.4		0.018	604.4	1.664	1.539	8.530	99.98	98.43
100	518.5		0.018	597.5	1.677	1.548	8.481	100.18	98.44
110	499.7		0.018	592.8	1.682	1.492	8.448	100.04	94.52
120	486.0		0.018	592.4	1.677	1.652	8.445	99.72	104.63
130	475.7		0.018	590.8	1.681	1.549	8.434	99.82	97.96
140	471.1		0.018	591	1.582	1.590	8.435	94.00	100.55
150	468.5		0.018	590.3	1.805	1.600	8.430	107.17	101.12
160	466.8	466.82	0.018	590	1.578	1.611	8.428	93.63	101.84

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**December 11, 2013**
est Run Number:	**8**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.3	to	5.3

Average Firebox Temp, ℉	526.5

Final Coal Bed Wt, lb	4.58

Interval	10

Time		Temperature Data												
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right		Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	72.91	225.3	381.1	461.3	546.1	650.3	502.6	509.7				21.61	**17.03**
1	10	73.04	164.9	503.6	427.3	539.5	548.1	457.2	469.4				19.15	2.46
2	20	74.43	180.6	567.7	536.3	518.4	503.2	451.1	451.3				16.23	2.92
3	30	76.39	197.1	647.8	627.7	494.6	512	461.2	457.9				13.40	2.83
4	40	79.66	188.4	678.8	709.4	474.5	550.5	489.6	485.6				10.54	2.86
5	50	83.54	181	646.8	720	460.3	602.2	517.6	518.9				8.30	2.24
6	60	82.7	167.4	598.2	674.5	452.8	644.5	542.8	547.1				6.66	1.64
7	70	75.88	151.4	529.7	611.2	446.1	669.4	548	553.7				5.58	1.08
8	80	72.43	138.9	477.2	542.5	449.1	666	545.8	544.4	549.56			5.00	0.58
9	90	70.72	130.7	421.4	479	473.8	653.5	532.8	534.8	534.78			4.66	0.34
10	100	71.74	125.9	407.1	458.4	481.9	636.8	525.9	529.5	526.5			4.58	0.08

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: December 11, 2013
Test Run Number: 8

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	37		117.9	
B - Rear Filter Catch	Filter	38		116.2	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			252.1	234.1	18
Probe & Filter Holder	Probe	19	140111.1	140107.7	3.4
			Total Particulate, mg		**21.4**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	39		117.2	
B - Rear Filter Catch	Filter	40		118.5	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			253.8	235.7	18.1
Probe & Filter Holder	Probe	20	139066.0	139059.9	6.1
			Total Particulate, mg		**24.2**

Manufacturer: SBI
Model: NG1800
Date: 12/11/13
Run: 8
Control #: G101440749
Test Duration: 160 min

	HHV	LHV
Eff	65.05%	70.31%
Comb Eff	92.40%	92.40%
HT Eff	70.40%	76.09%
Output	39,104	kJ/h
Burn Rate	3.03	kg/h
Grams CO	852	g
Input	60,110	kJ/h
MC wet	16.56	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.061

Overall Heating Efficiency:	65.05%		
Combustion Efficiency:	92.40%		
Heat Transfer Efficiency:	70.40%		
Heat Output:	37,094 Btu/h	39,104	kJ/h
Heat Input:	57,020 Btu/h	60,110	kJ/h
Burn Duration:	2.67 h		
Burn Rate:	6.69 lb/h	3.034	kg/h
Stack Temp:	502.9 Deg. F	261.6	Deg. C

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.73
Dry Moles Exhaust Gas (N_r):	420.74
Air Fuel Ratio (A/F)	12.00

Averages	0.97	7.81	4.48	20.36	12.06	258.25	25.15	88.2%	38.9%	43.6%	32.37	2.75	71.59	2.30
INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt	% Wet	Dry Wt.
Elapsed Time	Weight emaining (k	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %	Fuel Ratio	Now Wt	Consumed x	Now Wt_{dn}
0	9.70	0.26	0.11	5208.9%	20.92	20.68	204.8	22.2	57.3%	-433.6%	-248.3%	313.8	9.70	0.00	8.09
10	8.40	0.67	11.58	60.4%	20.13	8.22	305.3	23.1	95.6%	71.9%	68.7%	9.6	8.40	13.40	7.01
20	6.88	1.53	15.36	16.3%	19.82	3.70	373.4	24.6	92.5%	71.9%	66.4%	6.9	6.88	29.07	5.74
30	5.18	2.30	15.66	9.4%	19.75	2.94	373.4	27.3	89.4%	72.1%	64.4%	6.4	5.18	46.61	4.32
40	3.81	1.18	14.05	29.0%	19.93	5.29	369.2	28.6	93.6%	71.1%	66.5%	7.7	3.81	60.74	3.18
50	2.83	0.64	11.79	58.0%	20.12	8.01	337.7	28.9	95.8%	70.4%	67.5%	9.5	2.83	70.85	2.36
60	2.21	0.64	9.19	99.8%	20.29	10.78	298.6	28.6	94.8%	69.0%	65.5%	11.9	2.21	77.26	1.84
70	1.79	0.62	8.21	122.5%	20.36	11.84	270.0	27.5	94.5%	69.3%	65.5%	13.3	1.79	81.57	1.49
80	1.46	0.60	7.97	129.2%	20.37	12.10	257.1	26.6	94.5%	69.8%	66.0%	13.7	1.46	84.93	1.22
90	1.23	0.94	5.50	205.0%	20.51	14.54	231.2	25.3	88.5%	65.1%	57.6%	18.0	1.23	87.27	1.03
100	1.03	1.01	5.13	219.9%	20.53	14.90	213.9	24.7	87.0%	65.7%	57.1%	18.8	1.03	89.38	0.86
110	0.82	1.07	4.72	239.3%	20.56	15.30	201.1	23.6	85.4%	65.5%	55.9%	19.8	0.82	91.53	0.69
120	0.64	1.04	4.53	252.7%	20.57	15.52	195.1	23.8	85.3%	65.4%	55.8%	20.6	0.64	93.45	0.53
130	0.47	0.97	4.75	243.4%	20.56	15.33	190.1	23.5	86.6%	67.1%	58.1%	20.1	0.47	95.13	0.39
140	0.29	1.04	4.67	244.0%	20.56	15.37	191.1	23.4	85.6%	66.6%	57.0%	20.1	0.29	97.05	0.24
150	0.12	0.97	4.87	236.4%	20.55	15.20	190.3	23.1	86.9%	67.5%	58.6%	19.7	0.12	98.78	0.10
160	0.00	0.97	4.74	244.0%	20.56	15.34	187.9	22.9	86.6%	67.2%	58.2%	20.2	0.00	100.00	0.00

%HC					
1.32	Combustion Efficiency:	92.40%		Moisture of Wood (wet basis):	16.56
	Total Input (kJ):	160,292	152,029 (Btu)	Initial Dry Weight Wt_{do} (kg):	8.09
	Total Output (kJ):	104,276	98,901 (Btu)	Moisture Content Dry	19.85
	Efficiency:	65.05%			
	Total CO (g):	852.24			

Load Weight (kg):	**9.70**				
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**
Value in kJ/kg - CV:	**19,810**	**18,329**	Btu/lb	**8522.5**	**7885.2**

71.59	**161267**	**4.06**	**6.87**	**2.74**	**19810.00**	**16.56**	**79.16**	**21.00**	**2.19**	**7.29**	**0.12**	**0.22**	**33.87**	**195.39**	**6.33**
% Dry		**Fuel Properties**				**Mw**	**Mass Balance**					**kg Wood pe**			
Comsumed	**Total**	**Carbon**	**Hydrogen**	**Oxygen**	**Calorific**	**Moisture**	**(moles/100 mole dry flue gas)**					**00 mole df**	**Moles per kg**		
y	**Input**	**/12= [a]**	**/1= [b]**	**/16= [c]**	**Value**	**Fuel Burnt**	**[h]**	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**
0.00	0	4.06	6.87	2.74	19810.00	16.56	78.95	20.94	0.09	0.31	0.00	0.01	11.98	2252.37	28.32
13.40	34034	4.06	6.87	2.74	19810.00	16.56	79.53	21.10	3.04	10.26	0.08	0.30	38.32	27.19	2.22
29.07	26624	4.06	6.87	2.74	19810.00	16.56	79.41	21.06	4.21	14.04	0.22	0.42	36.64	8.83	3.65
46.61	25387	4.06	6.87	2.74	19810.00	16.56	79.10	20.98	4.50	14.81	0.33	0.45	34.94	6.57	5.13
60.74	19424	4.06	6.87	2.74	19810.00	16.56	79.48	21.08	3.79	12.69	0.16	0.38	37.25	14.04	3.13
70.85	13237	4.06	6.87	2.74	19810.00	16.56	79.56	21.10	3.08	10.42	0.08	0.31	38.46	26.13	2.09
77.26	8587	4.06	6.87	2.74	19810.00	16.56	79.39	21.06	2.44	8.23	0.08	0.24	37.86	44.42	2.64
81.57	6150	4.06	6.87	2.74	19810.00	16.56	79.33	21.04	2.19	7.39	0.07	0.22	37.64	54.27	2.84
84.93	4575	4.06	6.87	2.74	19810.00	16.56	79.33	21.04	2.13	7.17	0.07	0.21	37.66	57.19	2.83
87.27	3562	4.06	6.87	2.74	19810.00	16.56	79.02	20.96	1.61	5.32	0.11	0.16	34.25	90.58	5.85
89.38	3412	4.06	6.87	2.74	19810.00	16.56	78.96	20.94	1.54	5.05	0.12	0.15	33.43	97.09	6.58
91.53	3262	4.06	6.87	2.74	19810.00	16.56	78.91	20.93	1.46	4.75	0.13	0.15	32.53	105.47	7.37
93.45	2887	4.06	6.87	2.74	19810.00	16.56	78.91	20.93	1.40	4.57	0.13	0.14	32.45	111.21	7.45
95.13	2887	4.06	6.87	2.74	19810.00	16.56	78.95	20.94	1.44	4.70	0.12	0.14	33.21	107.17	6.78
97.05	2925	4.06	6.87	2.74	19810.00	16.56	78.92	20.93	1.44	4.68	0.13	0.14	32.65	107.49	7.27
98.78	3337	4.06	6.87	2.74	19810.00	16.56	78.96	20.94	1.47	4.81	0.12	0.15	33.37	104.13	6.65
100.00	975	4.06	6.87	2.74	19810.00	16.56	78.95	20.94	1.43	4.70	0.12	0.14	33.20	107.43	6.79

Moisture Content M_{Cwb}: 16.56

Dry kg : 8.09

CA: 48.73

HY: 6.87

OX: 43.9

															SUMS
0.61	887.05	33.31	11.03	531.40	9758.85	7134.52	6886.26	6820.76	9853.62	8224.13	298.30	5757.14	18834.07	31105.83	85714.02
				Stack	Heat Content Change - Ambient to Stack Temperature						Room	Energy Losses (kJ/kg			
of Dry Wood			Moisture	Temp	Flue Gas Constituent						Temp	Flue Gas Consti			
HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2	CO	N_2
0.50	8601.21	33.51	11.03	477.98	7444.40	5527.99	5357.27	5301.73	7329.40	6405.02	295.31	89.21	12451.11	8165.69	45601.33
0.28	263.16	33.96	11.03	578.48	11918.19	8670.71	8358.24	8281.02	12126.91	9978.66	296.22	456.66	235.72	645.90	2179.26
0.52	189.45	33.49	11.03	646.54	15078.27	10822.88	10395.52	10307.39	15663.90	12398.95	297.77	552.53	95.53	1070.90	1952.73
0.74	176.49	33.05	11.03	646.59	14976.71	10744.29	10318.57	10231.40	15570.86	12306.69	300.49	523.33	70.58	1505.30	1805.74
0.43	210.71	33.66	11.03	642.37	14725.45	10570.02	10152.75	10066.65	15296.52	12109.42	301.74	548.53	148.37	917.11	2121.16
0.26	259.55	34.00	11.03	610.87	13211.45	9540.22	9178.28	9097.32	13599.10	10951.86	302.03	508.14	249.27	610.01	2361.20
0.31	327.08	33.90	11.03	571.76	11397.13	8293.62	7995.24	7921.27	11592.37	9545.45	301.72	431.53	368.38	767.28	2590.90
0.33	363.74	33.87	11.03	543.15	10132.37	7416.91	7161.17	7092.56	10210.38	8553.21	300.60	381.41	402.53	824.82	2579.85
0.32	374.80	33.88	11.03	530.21	9582.10	7033.58	6795.98	6729.83	9613.22	8118.61	299.72	360.83	402.24	821.51	2522.31
0.71	492.06	33.11	11.03	504.32	8478.89	6258.19	6055.45	5994.67	8431.10	7236.72	298.42	290.41	566.85	1692.03	2949.76
0.80	514.52	32.92	11.03	487.04	7743.26	5736.22	5555.65	5498.78	7653.66	6641.10	297.81	258.84	556.92	1899.03	2829.23
0.91	543.86	32.71	11.03	474.21	7224.09	5366.95	5201.84	5147.78	7106.91	6219.39	296.79	235.02	566.07	2125.40	2799.68
0.91	565.32	32.71	11.03	468.26	6962.59	5178.94	5021.16	4968.65	6835.95	6003.87	296.92	225.97	575.93	2145.96	2808.88
0.82	552.06	32.89	11.03	463.26	6756.26	5030.94	4879.04	4827.73	6621.37	5834.36	296.68	224.40	539.18	1952.51	2665.21
0.89	551.80	32.75	11.03	464.26	6803.49	5065.17	4912.00	4860.39	6669.71	5873.70	296.57	222.16	544.46	2093.61	2681.97
0.80	540.98	32.92	11.03	463.43	6779.95	5048.86	4896.49	4844.98	6643.98	5855.25	296.25	226.22	525.76	1913.23	2621.02
0.82	553.01	32.89	11.03	461.09	6685.89	4981.41	4831.71	4780.75	6546.12	5778.00	296.09	221.98	535.17	1955.55	2643.79

			AVERAGE	SUMS						
9299.73	29563.97	9783.16	11179.88	56016.28	12178.48	43837.8	105251.0	12178.5	852.2	64.1
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
453.23	1688.17	555.42	69004.16	0.00	0	0.00	0	0	0.00	0.00
252.11	1832.27	594.83	6196.74	10646.09	1505	9140.95	23388	1505	106.64	7.68
469.10	1887.59	621.51	6649.89	8937.28	2008	6929.46	17687	2008	137.36	11.14
668.00	1859.77	620.49	7053.21	9038.75	2703	6336.24	16348	2703	184.15	15.12
392.47	1887.36	618.32	6633.32	6504.19	1246	5257.75	12920	1246	85.89	6.80
237.06	1867.20	605.56	6438.44	4302.18	551	3751.35	8935	551	39.06	2.80
282.16	1813.97	590.05	6844.26	2966.84	444	2522.65	5620	444	32.00	2.17
294.47	1778.85	579.11	6841.03	2123.72	340	1783.61	4026	340	24.71	1.62
289.03	1764.74	574.32	6734.97	1555.35	251	1304.05	3020	251	18.33	1.19
635.82	1695.29	564.59	8394.76	1509.61	411	1098.44	2053	411	29.47	2.04
721.07	1665.90	558.03	8489.02	1462.28	444	1018.31	1950	444	31.74	2.21
812.32	1641.76	553.38	8733.62	1438.29	476	961.87	1824	476	34.01	2.39
813.74	1634.52	551.00	8756.00	1276.23	425	851.20	1611	425	30.41	2.12
732.00	1638.04	549.13	8300.47	1209.84	386	824.17	1678	386	27.68	1.90
795.55	1632.27	549.56	8519.58	1257.90	420	837.47	1667	420	30.06	2.10
718.51	1640.23	549.36	8194.33	1380.50	437	943.51	1957	437	31.35	2.16
733.09	1636.06	548.51	8274.13	407.22	130	276.77	568	130	9.36	0.64

Intertek Testing Services NA Ltd

Manufacturer:	SBI
Model:	NG1800
Date:	12/11/13
Run:	8
Control #:	G101440749
Test Duration:	160
Output Category:	4

Technicians:

_____

_____

_____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.1%	70.3%
Combustion Efficiency	92.4%	92.4%
Heat Transfer Efficiency	70%	76.1%

Output Rate (kJ/h)	39,104	37,094	**(Btu/h)**
Burn Rate (kg/h)	3.03	6.69	**(lb/h)**
Input (kJ/h)	60,110	57,020	**(Btu/h)**

Test Load Weight (dry kg)	8.09	17.83	**dry lb**
MC wet (%)	16.56		
MC dry (%)	19.85		
Particulate (g)	21.2555		
CO (g)	852		
Test Duration (h)	2.67		

Emissions	**Particulate**	**CO**
g/MJ Output	0.20	8.17
g/kg Dry Fuel	2.63	105.33
g/h	7.97	319.59
lb/MM Btu Output	0.47	18.99

Air/Fuel Ratio (A/F)	12.00

Version: 2.4 **15/04/2010**

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	December 11, 2013
Test Run Number:	8

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	8	0.795	21.7	21.0	21.7
2	8	0.789	19.9	20.3	19.8
3	8	0.831	19.9	19.5	20.0
4	8	0.796	20.5	21.5	20.2
5	8	0.900	23.8	21.3	22.6
6	8	0.781	23.0	21.9	22.1
7	8	0.785	22.0	21.5	22.0
8	8	0.795	24.5	21.7	23.0
9	8	0.908	19.5	20.9	20.0
10	8	0.776	20.1	20.5	20.3
11	8	0.883	21.7	21.1	21.9
12	8	1.037	22.8	22.4	19.5
13	8	0.822	22.5	23.0	23.0
14	17	1.831	21.3	19.3	23.3
15	17	2.018	22.8	21.0	22.5
16	17	1.889	22.7	21.9	23.0
17	17	1.947	20.6	22.4	18.9
18	17	1.819	22.1	20.1	22.1
Total Weight		20.402	Average, %db		21.5

Allowable Fuel Load Range:	4.27	to	5.34

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	10:30	Temp.,℉:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.544		19.0	19.2	19.0
2	15		3.660	22.3	18.9	20.9
3	15	2.050		19.2	20.4	20.4
4	15	1.571		19.2	18.7	19.2
5	15		3.515	20.9	20.2	19.9
6	15	1.760		19.0	19.2	18.7
7	15	1.575		19.0	19.8	19.9
8	15		3.601	22.1	18.6	20.8
9	15	2.097		19.7	21.6	20.2
Totals		10.597	10.776			
% of Weight		49.6	50.4			
Total weight, wet, lb.		21.373		Average Moisture, dry		19.85
Total weight, dry, kg		8.09		Average Moisture, wet		16.56

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 4, 2014
Test Run Number:	9

Dry Burn-Rate, kg/hr:	**2.19**	
Emission-Rate, g/hr:	**1.80**	
Adjusted Emission-Rate, g/hr :	**2.96**	
Duration of Test, Minutes	220	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1287.304	1253.65
Dry Gas Meter Ending Reading, ft^3	1322.658	1287.007
Barometric Pressure Correction Factor	1.017	1.017
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.009	1.010
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**36.342**	**34.045**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**150.600**	
Total Tunnel Volume, scf	**33131.911**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	911.669	973.188
Sample Particulate Mass, mg	6.8	7.2
Total Emissions, grams	6.199	7.007
Emission-Rate, g/hr	1.69	1.91
Adjusted Emission Rates, g/hr	**2.81**	**3.12**
Deviation, %	5.08%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	87.77	82.34
Post-Test Leak Check, cfm @ in. Hg vac.	0.002@5	0.004@5
Average Firebox Surface Temperture delta-T, ℉	106.66	
Maximum Ambient Temperture, ℉	76	
Mimimum Ambient Temperature, ℉	66	
Fuel Properties		
Wet Fuel Load Weight, lb.	21.42	
Dry-Basis Fuel Load Moisture Content, %	21.15	
Wet-Basis Fuel Load Moisture Content, %	17.46	
Coal Bed Range, lb.	4.30	5.30
Actual Coal Bed, Lb.	4.64	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	February 4, 2014
Test Run No:	9

Temperature Data

Firebox Temp Start	471.3
Firebox Temp End	364.64
Firebox Delta-T	**106.7**

Max Filter Temps	
Train A	Train B
87.77	**82.34**

Interval	10	Duration of Test, Min	220

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	71.07	112.3	401.9	407.6	416.5	556.6	482.3	493.5		65.93	65.63	62.39	62.25
1	10	75.61	134.9	505.1	367.4	412	476.6	450.1	453.3		78.59	71.68	62.63	62.43
2	20	68.93	163.1	673.5	505.7	395.9	461.7	424.4	437		87.77	80.1	62.71	62.55
3	30	70.89	172.8	715	606.6	378.4	493.9	443.8	463.5		81.53	82.34	62.82	62.84
4	40	75.49	164.3	687.6	625.7	363.4	538.9	476.2	502.5		86.36	80.6	62.98	62.95
5	50	76.19	151.8	614.5	578	351.8	585.3	508.2	530.6		84.25	77.24	63.1	62.87
6	60	75.11	142.9	579	537.5	341.4	610.7	524.8	552.1		82.61	74.8	63.25	62.99
7	70	74.14	136.4	549.9	503.3	331.5	623.4	527.8	565.3		82.19	73.07	63.35	62.93
8	80	72.69	129.9	514.4	474.3	323.3	635.9	526.3	568.1		81.9	72.94	63.4	62.95
9	90	70.66	122.1	473.8	440.8	316	647	524	555.4		81.27	72.94	63.53	63.13
10	100	69.91	115.9	443.6	405.8	310.8	631.7	517.4	539.6		80	72.01	63.53	62.7
11	110	68.91	110.8	415.7	378.8	307.1	618.6	502.4	523.5		78.55	71.69	63.56	62.72
12	120	68.52	107.2	393	353.9	303.9	602.5	486.3	504.7		77.16	70.87	63.49	62.69
13	130	69.1	105.1	379.1	335.5	301.4	599	472.9	490.9		76.14	70.15	63.47	62.89
14	140	66.13	102.2	366.2	322.2	297.9	594.1	461.3	478.1		75.44	69.88	63.44	62.82
15	150	67.74	100.3	351.7	309.9	295.4	584	451.4	466.2		74.73	69.71	63.43	62.88
16	160	66.59	98.05	341.4	297.6	291.1	573.4	440	453.2		73.86	69.45	63.47	62.91
17	170	66.26	96.46	332.5	288.9	288.2	563.1	428.7	442.1		73.21	69.07	63.43	62.93
18	180	71.7	97.65	331.1	283.3	286	556.1	418.8	432.6		73.06	68.87	63.46	63.09
19	190	67.12	95.8	329.6	279.7	283.4	553.6	411.7	428.2		72.97	68.98	63.49	63.01
20	200	72.35	96.06	322.1	277	281.4	544.7	406.3	424.2		72.91	68.74	63.47	62.87
21	210	66.18	92.26	304.5	268.9	278.7	521.1	400.7	415.8		72.51	68.26	63.47	62.77

22	220	70.41	91.4	290.9	259.3	276.6	492.6	393.6	401.1		71.73	68.07	63.42	62.77

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 4, 2014
Test Run Number:	9

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.42	59	Meter Box (A)	1.002
End	30.42	56	Meter Box (B)	0.994
Duration of Test, Min		220		

Leak Check, cfm @ in Hg	
Train A	Train B
0.002@5	0.004@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	12.872	6.779	1.027

Time	Particulate Sampling Data												Combustion Gasses, %		
	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.073	21.42	21.42	1287.304	1253.650	99.94	99.94	0.00	0.00	17.540	0.730	0.830
10	0.015	0.00	0.00	0.088	19.94	1.48	1288.900	1255.083	100.77	95.85	0.00	0.00	10.050	10.480	0.710
20	0.015	0.00	0.00	0.100	16.93	3.01	1290.457	1256.555	100.59	100.74	0.00	0.00	4.880	16.050	0.840
30	0.015	0.00	0.00	0.103	13.61	3.32	1292.068	1258.008	104.87	100.15	0.00	0.00	3.870	16.080	1.260
40	0.015	0.00	0.00	0.100	10.87	2.74	1293.558	1259.400	96.31	95.28	0.00	0.00	6.290	14.300	0.530
50	0.015	0.00	0.00	0.095	8.93	1.94	1295.124	1260.910	100.18	102.33	0.00	0.00	8.820	11.810	0.520
60	0.015	0.00	0.00	0.093	7.34	1.59	1296.697	1262.480	99.86	105.60	0.00	0.00	10.230	10.240	0.540
70	0.015	0.00	0.00	0.090	6.02	1.32	1298.270	1264.031	99.31	103.77	0.00	0.00	10.890	9.410	0.550
80	0.015	0.00	0.00	0.085	5.02	1.00	1299.871	1265.563	100.51	101.93	0.00	0.00	11.950	8.460	0.590
90	0.015	0.00	0.00	0.080	4.27	0.75	1301.510	1267.079	102.19	100.17	0.00	0.00	12.790	7.170	0.690
100	0.015	0.00	0.00	0.775	3.70	0.57	1303.120	1268.518	99.84	94.65	0.00	0.00	13.150	6.710	0.820
110	0.015	0.00	0.00	0.075	3.23	0.47	1304.746	1270.090	100.38	102.93	0.00	0.00	14.100	5.290	1.110
120	0.015	0.00	0.00	0.073	2.86	0.37	1306.367	1271.588	99.77	97.78	0.00	0.00	14.300	5.010	1.240
130	0.015	0.00	0.00	0.070	2.47	0.39	1307.992	1273.070	99.84	96.52	0.00	0.00	14.440	4.740	1.310
140	0.015	0.00	0.00	0.070	2.13	0.34	1309.625	1274.625	100.08	101.03	0.00	0.00	14.940	4.100	1.410
150	0.015	0.00	0.00	0.068	1.80	0.33	1311.253	1276.212	99.60	102.92	0.00	0.00	15.380	3.610	1.420
160	0.015	0.00	0.00	0.065	1.48	0.32	1312.876	1277.777	99.09	101.29	0.00	0.00	15.630	3.420	1.410
170	0.015	0.00	0.00	0.065	1.20	0.28	1314.510	1279.310	99.63	99.07	0.00	0.00	15.770	3.240	1.470
180	0.015	0.00	0.00	0.065	0.87	0.33	1316.140	1280.850	99.48	99.60	0.00	0.00	15.430	3.740	1.320
190	0.015	0.00	0.00	0.055	0.58	0.29	1317.763	1282.394	98.89	99.71	0.00	0.00	15.690	3.510	1.320

200	**0.015**	**0.00**	**0.00**	**0.055**	**0.31**	**0.27**	1319.399	1283.929	**99.72**	**99.18**	**0.00**	**0.00**	**16.010**	**3.200**	**1.300**
210	**0.015**	**0.00**	**0.00**	**0.060**	**0.07**	**0.24**	1321.031	1285.431	**99.10**	**96.73**	**0.00**	**0.00**	**16.920**	**2.280**	**1.260**
220	**0.015**	**0.00**	**0.00**	**0.060**	**0.00**	**0.07**	1322.658	1287.007	**98.75**	**101.42**	**0.00**	**0.00**	**16.980**	**2.330**	**1.180**

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 4, 2014
Test Run Number:	9

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0125	146	0.1118
A2	0.0125	142	0.1118
A3	0.0150	145	0.1225
A4	0.0150	145	0.1225
A Center	0.0150	145	0.1225
B1	0.0150	142	0.1225
B2	0.0100	141	0.1000
B3	0.0150	142	0.1225
B4	0.0150	142	0.1225
B Center	0.0150	143	0.1225
Averages	0.014	143.22	0.1170

Tunnel Diameter	**8.000**	inches
Tunnel Static	**-0.095**	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9553	factor
Baro. Pressure	30.42	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	8.252	Ft/ Sec
Initial Flow	**147.59**	Ft3/min

VS (1)	0.023056231		
VS (2)	0.024611302	STD Tunnel Flow:	150.60

220				579.1165217	36.324	34.029	8.08	99.94	99.94
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	471.3		0.015	572.3			8.038		
10	431.9		0.015	594.9	1.642	1.463	8.195	100.77	95.85
20	444.9		0.015	623.1	1.602	1.503	8.387	100.59	100.74
30	477.2		0.015	632.8	1.657	1.482	8.452	104.87	100.15
40	501.3		0.015	624.3	1.532	1.420	8.395	96.31	95.28
50	510.8		0.015	611.8	1.610	1.540	8.310	100.18	102.33
60	513.3		0.015	602.9	1.616	1.601	8.250	99.86	105.60
70	510.3		0.015	596.4	1.616	1.582	8.205	99.31	103.77
80	505.6		0.015	589.9	1.645	1.563	8.160	100.51	101.93
90	496.6		0.015	582.1	1.683	1.546	8.106	102.19	100.17
100	481.1		0.015	575.9	1.654	1.468	8.063	99.84	94.65
110	466.1		0.015	570.8	1.670	1.604	8.027	100.38	102.93
120	450.3		0.015	567.2	1.665	1.529	8.002	99.77	97.78
130	439.9		0.015	565.1	1.669	1.512	7.987	99.84	96.52
140	430.7		0.015	562.2	1.677	1.586	7.966	100.08	101.03
150	421.4		0.015	560.3	1.672	1.619	7.953	99.60	102.92
160	411.1		0.015	558.05	1.667	1.596	7.937	99.09	101.29
170	402.2		0.015	556.46	1.678	1.564	7.926	99.63	99.07
180	395.4		0.015	557.65	1.674	1.570	7.934	99.48	99.60
190	391.3		0.015	555.8	1.667	1.575	7.921	98.89	99.71
200	386.7		0.015	556.06	1.681	1.566	7.923	99.72	99.18
210	377.0		0.015	552.26	1.676	1.533	7.896	99.10	96.73
220	364.6	364.64	0.015	551.4	1.671	1.608	7.890	98.75	101.42

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**February 4, 2014**
Test Run Number:	**9**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.3	to	5.3

Average Firebox Temp, ℉	475.58

Final Coal Bed Wt, lb	4.64

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	66.47	174.1	394.9	282.2	436.3	427.5	352.4	370.3			20.90	**16.26**
1	10	66.67	126.2	496.8	322	449.9	456.1	342.1	364.1			18.71	2.19
2	20	66.2	137.3	557.5	418.3	457.9	464.3	350.4	376.2			16.00	2.71
3	30	66.86	141	582.2	459.2	454.5	449.2	363.6	388.4			13.67	2.33
4	40	68.29	147.5	599.5	488.2	444.7	466.2	388.5	404.2			11.41	2.26
5	50	67.67	149.8	619	505.6	430.2	496.9	433.6	432.8			9.07	2.34
6	60	67.99	143.2	588.2	509.7	420	532.9	470	461.2			7.33	1.74
7	70	68	136.8	555.7	486.7	414.8	560.6	490.1	486.3			5.92	1.41
8	80	67.41	125.3	496.2	455.3	411.8	570.7	493.6	499.4			5.03	0.89
9	90	70.26	113.9	411.1	416.1	416.1	564.2	484.9	496.6			4.64	0.39

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: February 4, 2014
Test Run Number: 9

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	49		119.7	
B - Rear Filter Catch	Filter	50		119.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			244.4	238.8	5.6
Probe & Filter Holder	Probe	17	139746.7	139745.5	1.2
			Total Particulate, mg		**6.8**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	51		117.2	
B - Rear Filter Catch	Filter	52		119.6	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			242.8	236.8	6
Probe & Filter Holder	Probe	18	147884.8	147883.6	1.2
			Total Particulate, mg		**7.2**

Manufacturer: SBI
Model: NG1800
Date: 02/04/14
Run: 9
Control #: G101440749
Test Duration: 220 min

	HHV	LHV
Eff	65.27%	70.55%
Comb Eff	92.78%	92.78%
HT Eff	70.35%	76.04%
Output	28,286	kJ/h
Burn Rate	2.19	kg/h
Grams CO	811	g
Input	43,334	kJ/h
MC wet	17.46	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.061

Overall Heating Efficiency:	65.27%	
Combustion Efficiency:	92.78%	
Heat Transfer Efficiency:	70.35%	

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.61
Dry Moles Exhaust Gas (N_r):	465.70
Air Fuel Ratio (A/F)	13.28

Heat Output:	26,832	Btu/h	28,286	kJ/h
Heat Input:	41,107	Btu/h	43,334	kJ/h
Burn Duration:	3.67	h		
Burn Rate:	4.82	lb/h	2.187	kg/h
Stack Temp:	450.6	Deg. F	232.6	Deg. C

	INPUT DATA			Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt	% Wet	Dry Wt.
Elapsed Time	Weight emaining (k	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %	Fuel Ratio	Now Wt	Consumed x	Now Wt_{dn}
Averages	1.03	6.78	2.45	20.42	13.13	231.40	21.39	85.0%	62.2%	54.2%	19.97	2.66	72.58	2.20	
0	9.72	0.83	0.73	1159.2%	20.84	19.69	205.5	21.7	60.7%	-28.6%	-17.4%	71.1	9.72	0.00	8.02
10	9.05	0.71	10.48	75.5%	20.20	9.37	262.8	24.2	94.9%	73.2%	69.5%	10.5	9.05	6.90	7.47
20	7.68	0.84	16.05	16.3%	19.82	3.35	356.4	20.5	95.9%	73.1%	70.0%	7.0	7.68	20.95	6.34
30	6.18	1.26	16.08	13.3%	19.80	3.09	379.4	21.6	93.9%	71.9%	67.5%	6.8	6.18	36.45	5.10
40	4.93	0.53	14.30	32.5%	19.96	5.40	364.2	24.2	97.1%	71.3%	69.2%	8.0	4.93	49.25	4.07
50	4.05	0.52	11.81	59.3%	20.13	8.06	323.6	24.6	96.6%	70.9%	68.5%	9.6	4.05	58.30	3.34
60	3.33	0.54	10.24	82.2%	20.23	9.72	303.9	24.0	96.0%	70.0%	67.2%	10.9	3.33	65.73	2.75
70	2.73	0.55	9.41	97.2%	20.28	10.60	287.7	23.4	95.6%	69.7%	66.7%	11.8	2.73	71.89	2.25
80	2.28	0.59	8.46	117.0%	20.34	11.59	268.0	22.6	94.9%	69.4%	65.9%	13.0	2.28	76.56	1.88
90	1.94	0.69	7.17	149.9%	20.42	12.91	245.4	21.5	93.1%	68.4%	63.6%	14.9	1.94	80.06	1.60
100	1.68	0.82	6.71	160.9%	20.44	13.32	228.7	21.1	91.4%	68.7%	62.8%	15.5	1.68	82.72	1.39
110	1.47	1.11	5.29	206.9%	20.52	14.67	213.2	20.5	86.2%	65.7%	56.7%	18.0	1.47	84.92	1.21
120	1.30	1.24	5.01	214.3%	20.53	14.90	200.6	20.3	84.2%	66.1%	55.7%	18.3	1.30	86.65	1.07
130	1.12	1.31	4.74	224.7%	20.54	15.15	192.8	20.6	82.8%	66.0%	54.7%	18.9	1.12	88.47	0.93
140	0.97	1.41	4.10	256.5%	20.58	15.77	185.7	19.0	79.7%	63.8%	50.8%	20.6	0.97	90.05	0.80
150	0.82	1.42	3.61	290.5%	20.61	16.29	177.6	19.9	77.7%	62.3%	48.4%	22.5	0.82	91.60	0.67
160	0.67	1.41	3.42	306.7%	20.62	16.50	171.9	19.2	77.0%	61.9%	47.7%	23.4	0.67	93.09	0.55
170	0.54	1.47	3.24	317.0%	20.63	16.65	166.9	19.0	75.5%	61.5%	46.4%	23.9	0.54	94.40	0.45
180	0.39	1.32	3.74	288.2%	20.61	16.21	166.2	22.1	79.4%	65.2%	51.8%	22.4	0.39	95.94	0.33
190	0.26	1.32	3.51	306.7%	20.62	16.45	165.3	19.5	78.5%	63.6%	49.9%	23.5	0.26	97.29	0.22
200	0.14	1.30	3.20	336.5%	20.64	16.79	161.2	22.4	77.4%	62.8%	48.6%	25.1	0.14	98.55	0.12
210	0.03	1.26	2.28	454.9%	20.71	17.80	151.4	19.0	72.4%	55.6%	40.2%	31.7	0.03	99.67	0.03
220	0.00	1.18	2.33	459.6%	20.71	17.79	143.8	21.3	74.0%	58.4%	43.2%	32.1	0.00	100.00	0.00

%HC					
1.32	Combustion Efficiency:	92.78%		Moisture of Wood (wet basis):	17.46
	Total Input (kJ):	158,890	150,699 (Btu)	Initial Dry Weight Wt_{do} (kg):	8.02
	Total Output (kJ):	103,714	98,367 (Btu)	Moisture Content Dry	21.15
	Efficiency:	65.27%			
	Total CO (g):	810.59			

Load Weight (kg):	**9.72**					
Fuel Heating	**HHV**	**LHV**			**HHV**	**LHV**
Value in kJ/kg - CV:	**19,810**	**18,329**		Btu/lb	**8522.5**	**7885.2**

72.58	**159149**	**4.06**	**6.87**	**2.74**	**19810.00**	**17.46**	**79.06**	**20.97**	**1.95**	**6.45**	**0.13**	**0.19**	**32.31**	**106.52**	**7.57**
% Dry		**Fuel Properties**				**Mw**	**Mass Balance**					**kg Wood pe**			
Comsumed	**Total**	**Carbon**	**Hydrogen**	**Oxygen**	**Calorific**	**Moisture**	**(moles/100 mole dry flue gas)**					**00 mole df**	**Moles per kg**		
y	**Input**	**/12= [a]**	**/1= [b]**	**/16= [c]**	**Value**	**Fuel Burnt**	**[h]**	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**
0.00	0	4.06	6.87	2.74	19810.00	17.46	78.75	20.89	0.41	1.22	0.09	0.04	18.06	487.28	20.54
6.90	22123	4.06	6.87	2.74	19810.00	17.46	79.44	21.07	2.78	9.36	0.09	0.28	37.92	33.89	2.57
20.95	23481	4.06	6.87	2.74	19810.00	17.46	79.76	21.16	4.19	14.15	0.12	0.42	38.52	8.05	2.02
36.45	22479	4.06	6.87	2.74	19810.00	17.46	79.57	21.11	4.31	14.46	0.18	0.43	37.46	7.19	2.94
49.25	17360	4.06	6.87	2.74	19810.00	17.46	79.77	21.16	3.67	12.47	0.07	0.37	39.17	14.78	1.45
58.30	13094	4.06	6.87	2.74	19810.00	17.46	79.61	21.12	3.05	10.36	0.06	0.30	38.89	26.53	1.71
65.73	10794	4.06	6.87	2.74	19810.00	17.46	79.50	21.09	2.67	9.05	0.06	0.27	38.54	36.58	2.03
71.89	8606	4.06	6.87	2.74	19810.00	17.46	79.44	21.07	2.47	8.35	0.06	0.25	38.32	43.15	2.24
76.56	6492	4.06	6.87	2.74	19810.00	17.46	79.36	21.05	2.25	7.58	0.07	0.22	37.87	51.87	2.64
80.06	4896	4.06	6.87	2.74	19810.00	17.46	79.23	21.02	1.96	6.56	0.08	0.19	36.86	66.34	3.55
82.72	3858	4.06	6.87	2.74	19810.00	17.46	79.15	20.99	1.88	6.26	0.10	0.19	35.90	71.28	4.39
84.92	3116	4.06	6.87	2.74	19810.00	17.46	78.93	20.94	1.61	5.25	0.14	0.16	33.02	91.59	6.93
86.65	2819	4.06	6.87	2.74	19810.00	17.46	78.85	20.92	1.58	5.11	0.16	0.16	31.91	94.90	7.90
88.47	2708	4.06	6.87	2.74	19810.00	17.46	78.80	20.90	1.53	4.93	0.17	0.15	31.12	99.43	8.60
90.05	2485	4.06	6.87	2.74	19810.00	17.46	78.72	20.88	1.40	4.45	0.18	0.14	29.41	113.12	10.11
91.60	2411	4.06	6.87	2.74	19810.00	17.46	78.68	20.87	1.28	4.05	0.18	0.13	28.27	127.57	11.12
93.09	2226	4.06	6.87	2.74	19810.00	17.46	78.67	20.87	1.23	3.88	0.18	0.12	27.87	134.41	11.49
94.40	2263	4.06	6.87	2.74	19810.00	17.46	78.64	20.86	1.21	3.77	0.19	0.12	27.00	138.78	12.25
95.94	2300	4.06	6.87	2.74	19810.00	17.46	78.73	20.88	1.29	4.09	0.17	0.13	29.21	126.55	10.31
97.29	2077	4.06	6.87	2.74	19810.00	17.46	78.72	20.88	1.23	3.89	0.17	0.12	28.67	134.39	10.78
98.55	1892	4.06	6.87	2.74	19810.00	17.46	78.71	20.88	1.15	3.62	0.16	0.11	28.01	146.99	11.38
99.67	1410	4.06	6.87	2.74	19810.00	17.46	78.66	20.87	0.91	2.82	0.16	0.09	25.18	196.56	13.92
100.00	260	4.06	6.87	2.74	19810.00	17.46	78.70	20.88	0.90	2.80	0.14	0.09	26.03	198.71	13.18

Moisture Content M_{Cwb}: 17.46

Dry kg : 8.02

CA: 48.73

HY: 6.87

OX: 43.9

															SUMS
0.93	547.25	32.66	11.75	504.55	8711.64	6402.81	6188.58	6127.90	8722.03	7393.65	294.54	6805.00	12716.48	50130.41	67068.12
				Stack	Heat Content Change - Ambient to Stack Temperature						Room	Energy Losses (kJ/kg			
of Dry Wood			Moisture	Temp	Flue Gas Constituent						Temp	Flue Gas Consti			
HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2	CO	N_2
2.21	1948.63	30.10	11.75	478.65	7490.70	5562.13	5390.29	5334.43	7375.52	6444.47	294.86	135.31	2710.33	5921.82	10394.85
0.32	287.48	33.88	11.75	535.98	9931.65	7285.13	7037.77	6969.53	9974.93	8407.05	297.38	376.64	246.91	745.15	2003.58
0.28	191.39	33.96	11.75	629.54	14417.81	10390.69	9991.18	9904.18	14886.11	11920.15	293.67	555.31	83.65	590.59	1895.57
0.42	185.38	33.69	11.75	652.59	15486.04	11109.14	10668.82	10578.71	16101.60	12724.37	294.76	580.12	79.84	862.00	1961.10
0.19	218.53	34.15	11.75	637.37	14654.22	10537.84	10126.72	10039.80	15181.05	12079.94	297.31	574.05	155.76	425.57	2193.99
0.21	262.19	34.11	11.75	596.76	12712.99	9213.20	8872.09	8792.05	13013.92	10589.22	297.70	494.45	244.42	499.81	2305.16
0.24	299.24	34.05	11.75	577.04	11817.62	8598.50	8288.88	8212.24	12022.50	9895.92	297.10	455.48	314.52	592.03	2457.41
0.26	323.48	34.01	11.75	560.87	11093.87	8098.61	7813.78	7740.10	11227.71	9330.89	296.56	425.07	349.46	651.26	2503.74
0.30	355.25	33.92	11.75	541.15	10226.85	7496.33	7240.45	7170.53	10283.10	8648.73	295.76	387.29	388.83	766.52	2547.36
0.41	407.28	33.70	11.75	518.59	9256.93	6817.88	6593.36	6527.95	9236.66	7878.40	294.63	341.17	452.30	1027.09	2658.71
0.52	423.46	33.47	11.75	501.82	8528.94	6303.76	6101.71	6040.01	8461.96	7292.70	294.21	306.19	449.34	1268.32	2557.70
0.86	492.68	32.80	11.75	486.32	7870.13	5836.07	5653.82	5595.63	7766.21	6758.92	293.66	259.88	534.51	1999.97	2756.84
1.00	502.31	32.53	11.75	473.71	7330.29	5450.21	5283.62	5228.48	7201.84	6317.51	293.44	233.94	517.22	2277.10	2626.30
1.09	517.36	32.34	11.75	465.98	6984.70	5201.26	5044.27	4991.21	6844.77	6031.96	293.76	217.35	517.17	2477.19	2582.24
1.29	564.61	31.94	11.75	458.82	6739.65	5028.04	4878.57	4826.77	6584.37	5834.55	292.11	198.19	568.76	2911.29	2725.23
1.42	616.26	31.69	11.75	450.76	6361.43	4753.01	4613.49	4564.13	6199.24	5518.09	293.01	179.87	606.35	3198.72	2812.70
1.46	641.02	31.61	11.75	445.04	6142.37	4595.48	4462.11	4414.05	5972.29	5337.51	292.37	171.16	617.67	3302.41	2829.50
1.56	655.30	31.40	11.75	440.09	5939.82	4448.76	4320.84	4274.05	5764.80	5168.90	292.18	160.38	617.41	3519.60	2800.78
1.30	614.83	31.92	11.75	439.32	5791.91	4335.92	4210.73	4165.25	5625.76	5037.03	295.21	169.16	548.72	2960.45	2560.93
1.36	643.06	31.81	11.75	438.48	5853.54	4385.19	4259.35	4213.18	5678.76	5095.43	292.66	167.84	589.33	3097.50	2709.34
1.42	688.95	31.68	11.75	434.32	5567.11	4171.72	4052.29	4008.30	5398.45	4847.81	295.57	155.94	613.22	3266.40	2761.53
1.71	868.86	31.10	11.75	424.54	5286.97	3972.93	3861.94	3819.44	5102.43	4620.96	292.14	133.14	780.93	3992.14	3318.54
1.60	879.19	31.32	11.75	416.98	4882.18	3672.83	3571.22	3531.71	4702.83	4273.43	294.49	127.08	729.84	3777.46	3105.03

			AVERAGE	SUMS						
19222.65	38639.62	13883.09	9063.71	55176.07	11471.19	43704.9	103973.4	11471.2	810.6	58.9
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
1983.45	1517.59	592.46	23255.80	0.00	0	0.00	0	0	0.00	0.00
288.03	1774.64	615.52	6050.48	6756.94	1130	5626.88	15366	1130	80.34	5.72
254.21	1898.04	656.81	5934.19	7033.77	973	6061.26	16447	973	66.90	5.33
377.29	1910.00	666.26	6436.61	7303.86	1363	5940.74	15175	1363	93.26	7.56
170.07	1913.90	658.69	6092.02	5338.63	507	4832.04	12022	507	35.62	2.63
186.90	1860.91	641.17	6232.83	4119.86	442	3677.77	8974	442	31.69	2.19
214.20	1833.98	633.02	6500.65	3542.19	429	3113.61	7252	429	31.01	2.07
231.68	1812.65	626.38	6600.24	2867.28	375	2492.57	5739	375	27.24	1.79
271.51	1784.77	618.36	6764.63	2216.69	333	1883.82	4275	333	24.23	1.58
369.00	1747.36	609.31	7204.93	1780.85	338	1442.49	3116	338	24.55	1.62
471.63	1715.88	602.43	7371.48	1435.53	333	1102.77	2422	333	23.92	1.64
774.59	1663.74	596.15	8585.69	1350.45	429	921.25	1765	429	30.52	2.17
896.24	1635.57	590.97	8777.34	1249.11	445	804.47	1570	445	31.48	2.27
981.03	1616.79	587.61	8979.39	1227.42	466	761.66	1480	466	32.92	2.39
1158.76	1590.64	585.29	9738.16	1221.73	503	718.37	1264	503	35.53	2.59
1269.21	1568.28	581.57	10216.69	1243.50	536	707.01	1168	536	37.90	2.76
1306.92	1558.37	579.45	10365.48	1164.56	511	653.44	1061	511	36.14	2.62
1399.77	1542.82	577.47	10618.23	1212.84	555	658.02	1050	555	39.18	2.86
1163.58	1564.50	575.92	9543.26	1107.93	473	635.03	1192	473	33.51	2.41
1214.43	1560.81	576.60	9915.85	1039.78	447	593.25	1038	447	31.66	2.27
1273.71	1546.42	573.69	10190.91	973.21	428	544.78	919	428	30.43	2.17
1533.05	1511.04	571.03	11839.88	842.47	389	453.77	567	389	27.73	1.95
1433.39	1510.90	566.94	11250.65	147.47	68	79.88	112	68	4.84	0.34

Intertek Testing Services NA Ltd

Manufacturer:	SBI
Model:	NG1800
Date:	02/04/14
Run:	9
Control #:	G101440749
Test Duration:	220
Output Category:	4

Technicians:

_____

_____

_____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.3%	70.5%
Combustion Efficiency	92.8%	92.8%
Heat Transfer Efficiency	70%	76.0%

Output Rate (kJ/h)	28,286	26,832	**(Btu/h)**
Burn Rate (kg/h)	2.19	4.82	**(lb/h)**
Input (kJ/h)	43,334	41,107	**(Btu/h)**

Test Load Weight (dry kg)	8.02	17.68	**dry lb**
MC wet (%)	17.46		
MC dry (%)	21.15		
Particulate (g)	6.603		
CO (g)	811		
Test Duration (h)	3.67		

Emissions	**Particulate**	**CO**
g/MJ Output	0.06	7.82
g/kg Dry Fuel	0.82	101.06
g/h	1.80	221.07
lb/MM Btu Output	0.15	18.16

Air/Fuel Ratio (A/F)	13.28

Version: 2.4 **15/04/2010**

Intertek

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 4, 2014
Test Run Number:	9

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.745	19.0	19.8	18.9
2	16	1.675	19.9	19.9	19.7
3	16	1.628	20.3	19.9	19.7
4	16	1.603	19.4	19.7	19.3
5	16	1.819	22.0	20.3	22.1
6	16	1.897	22.1	21.3	22.2
7	16	1.829	21.7	20.2	21.7
8	16	1.921	21.7	20.6	21.7
9	17	1.665	20.4	20.5	20.6
10	17	1.68	19.9	19.9	20.3
11	17	1.67	20.0	20.0	20.6
12	17	1.76	20.3	20.3	21.0
Total Weight		20.880	Average, %db		20.5

Allowable Fuel Load Range:	4.28	to	5.35

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	10:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.560		21.1	19.9	20.2
2	15	1.561		19.0	19.9	21.0
3	15	1.584		21.5	20.5	21.5
4	15	2.034		21.9	21.1	22.0
5	15	1.776		21.6	20.0	20.9
6	15	2.054		21.9	21.4	22.1
7	15		3.902	21.4	21.7	21.9
8	15		3.179	21.0	20.9	21.0
9	15		3.767	21.7	21.9	21.9
Totals		10.569	10.848			
% of Weight		49.3	50.7			
Total weight, wet, lb.		21.417		Average Moisture, dry		21.15
Total weight, dry, kg		8.02		Average Moisture, wet		17.45

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 5, 2014
Test Run Number:	10

Dry Burn-Rate, kg/hr:	**0.95**	
Emission-Rate, g/hr:	**3.85**	
Adjusted Emission-Rate, g/hr :	**5.57**	
Duration of Test, Minutes	510	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1322.678	1287.035
Dry Gas Meter Ending Reading, ft^3	1406.257	1367.17
Barometric Pressure Correction Factor	1.004	1.004
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.009	1.010
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**84.825**	**80.740**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**146.558**	
Total Tunnel Volume, scf	**74744.395**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	881.164	925.744
Sample Particulate Mass, mg	36.9	35.6
Total Emissions, grams	32.515	32.956
Emission-Rate, g/hr	3.83	3.88
Adjusted Emission Rates, g/hr	**5.54**	**5.60**
Deviation, %	0.56%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	72.77	68.93
Post-Test Leak Check, cfm @ in. Hg vac.	0,002@5	0,003@5
Average Firebox Surface Temperture delta-T, ℉	101.18	
Maximum Ambient Temperture, ℉	86	
Mimimum Ambient Temperature, ℉	75	
Fuel Properties		
Wet Fuel Load Weight, lb.	21.61	
Dry-Basis Fuel Load Moisture Content, %	21.02	
Wet-Basis Fuel Load Moisture Content, %	17.37	
Coal Bed Range, lb.	4.40	5.40
Actual Coal Bed, Lb.	5.3	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	February 5, 2014
Test Run No:	10

Temperature Data

Firebox Temp Start	415.56
Firebox Temp End	314.38
Firebox Delta-T	**101.2**

Max Filter Temps	
Train A	Train B
72.77	**68.93**

Interval	10	Duration of Test, Min	**510**

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	80.82	101.2	287.3	345.4	421.9	475.4	412.6	422.5		67.64	66.21	61.99	61.79
1	10	74.81	91.2	266.2	317.4	413.4	420.2	385.6	398.6		70.52	66.73	62.42	61.98
2	20	82.19	89.11	235.7	293	402.8	369.6	348.5	363.4		70.55	67	62.58	62.15
3	30	84.77	91.21	263.7	306.2	386.6	338.1	320.3	335.8		70.93	67.28	62.68	62.26
4	40	86.11	92.85	282.3	322.5	370.8	319.6	304.8	318.7		71.35	67.82	62.84	62.4
5	50	78.7	92.84	297.4	338.5	353.7	310.2	291.7	313.4		71.71	68.1	62.9	62.46
6	60	82.77	92.9	291.4	350.6	338.1	310.7	287	312.9		71.74	68.02	62.86	62.49
7	70	85.15	94.04	302.8	350.2	326	311.9	295.7	318.5		71.9	68.05	62.91	62.55
8	80	83.31	95.7	325.3	364.6	312.8	325.3	307.3	330.2		72.1	68.26	63	62.58
9	90	80.92	96.75	342.7	400.2	301.2	346.1	324.8	343.8		72.6	68.69	63.1	62.7
10	100	85.73	96.75	325.1	411.3	290.4	364.7	341.1	354.5		72.77	68.93	63.24	62.82
11	110	84.41	96.06	321.4	404.4	280.8	366.3	346.8	359.8		72.62	68.8	63.19	62.76
12	120	81.63	94.33	314.5	398.2	273	366.2	349.1	363.4		72.48	68.73	63.13	62.73
13	130	82.15	93.82	306.7	387.9	266.9	366.5	353.4	365.9		72.31	68.66	63.16	62.74
14	140	85.14	94.47	303.2	380	261.4	368.1	356.4	367.2		72.12	68.51	63.14	62.76
15	150	84.24	94.25	311.3	379.2	256.7	374.2	361.4	370.5		72.22	68.41	63.09	62.67
16	160	80.55	93.97	317.2	389.3	252.6	383.9	366.8	377.8		72.26	68.3	63.22	62.75
17	170	81.78	94.18	317.2	393.2	249.5	394.3	373.8	387.2		72.41	68.17	63.13	62.68
18	180	85.96	94.73	309.1	391.2	247.7	406.3	381.6	396.5		72.52	68.22	63.38	62.84
19	190	84.65	93.26	304.3	385.5	246	418.6	386.4	406		72.27	68.25	63.31	62.83
20	200	81.97	91.81	293.6	380.8	244.7	429	389.1	413.4		72.02	68.21	63.49	62.97
21	210	79.86	89.35	266.4	359.7	244.5	428	386.6	409.2		71.63	68.06	63.34	62.93

22	220	85.39	89.54	251.2	335.4	245	420.6	380.2	402.1		70.99	67.84	63.26	62.9
23	230	83.59	87.54	241.3	318	245.9	413.5	373.5	396.3		70.68	67.57	63.12	62.75
24	240	78.7	85.69	236	304.7	247.1	409.3	369.2	392.1		70.34	67.4	63.2	62.81
25	250	84.77	86.77	229.7	295.7	249.7	410	368.7	388.2		70.18	67.27	63.24	62.85
26	260	80.34	84.75	227.3	289.5	252.3	410.3	366.9	384.5		70.16	67.13	63.31	62.97
27	270	80.74	84.54	222.6	283.7	254.3	411.2	364.1	380.9		69.9	66.81	63.32	62.95
28	280	77.72	83.86	222.7	281.1	257.1	404	358.6	377.3		69.85	66.81	63.44	63.08
29	290	78.66	84.11	221	279.5	261.9	401.6	353.7	376		69.89	67.01	63.5	63.12
30	300	83.19	85	219.9	278	267.1	403.5	350.8	376.6		69.83	67.1	63.47	63.12
31	310	85.21	85.52	218	277	272.4	405.4	349.5	378.2		69.88	67.19	63.45	63.07
32	320	82.56	84.76	216.2	274.8	276.5	405.9	347.7	375.5		70.05	67.29	63.46	63.09
33	330	83.79	85.04	213.2	271.4	278.2	406.7	344	370.5		69.97	67.29	63.54	63.15
34	340	85.39	85.3	212	268.7	280.6	409	343.7	367.3		70.19	67.37	63.55	63.23
35	350	85.9	85.21	211.3	267.8	283.3	413.3	344.2	365.4		70.16	67.33	63.56	63.2
36	360	83.18	84.23	210.7	266.3	284.4	419.7	343.2	362.1		69.75	67.14	63.46	63.12
37	370	85.12	85.02	210	265.4	286.6	426.4	345.3	362.3		69.96	67.14	63.43	63.07
38	380	85.93	85.24	210.6	265.9	289.1	435	346.5	363.4		69.91	67.25	63.39	63.05
39	390	83.19	84.33	210.9	265.7	289.3	444.2	345.1	363.2		69.84	67.02	63.4	63.05
40	400	85	84.87	211.1	266.1	290.1	449.9	347.1	365.8		69.91	66.86	63.38	63.01
41	410	85.45	85.11	212	267.4	291.6	452.9	348.6	368		69.89	66.8	63.3	62.91
42	420	83.54	84.41	211.3	266.5	291.9	447.1	347.6	367.6		69.79	66.73	63.31	62.94
43	430	85.06	85.06	208.5	263.8	293.6	429	346.6	366.5		69.88	66.83	63.31	62.92
44	440	83.35	84.39	205.7	261.4	296.7	416.9	342.6	362.9		69.89	66.89	63.26	62.88
45	450	83.13	83.79	202.5	257.3	298.8	405.4	336.1	356.6		69.54	66.74	63.29	62.92
46	460	84.39	84.16	200	254.5	300.9	396.8	331.6	351.7		69.5	66.72	63.2	62.89
47	470	84.66	84	198.6	252	302.8	390.5	327.3	347.4		69.49	66.84	63.25	62.9
48	480	84.93	83.97	197.6	249.6	303.8	384.9	322.6	344.5		69.54	66.85	63.25	62.88
49	490	85.04	83.85	196.6	247.2	304.8	380.7	318.8	343.3		69.61	66.84	63.25	62.88
50	500	84.78	83.56	195.5	245.7	305.3	377.4	315.6	341.1		69.64	66.76	63.27	62.9
51	510	84.88	83.73	194	243.2	304.4	374.2	311.9	338.2		69.5	66.83	63.3	62.96

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 5, 2014
Test Run Number:	10

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.06	69	Meter Box (A)	1.002
End	30.00	66	Meter Box (B)	0.994
Duration of Test, Min		510		

Leak Check, cfm @ in Hg	
Train A	Train B
0.002@5	0.003@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	14.380	5.036	1.306

Time	Particulate Sampling Data												Combustion Gasses, %		
	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.055	21.61	21.61	1322.678	1287.035	99.97	99.97	0.00	0.00	19,21	0.680	0.560
10	0.015	0.00	0.00	0.058	20.77	0.84	1324.312	1288.566	100.09	97.82	0.00	0.00	16,79	2.430	0.730
20	0.015	0.00	0.00	0.058	20.25	0.52	1325.938	1290.115	99.38	98.75	0.00	0.00	14,54	5.220	0.840
30	0.015	0.00	0.00	0.058	19.41	0.84	1327.541	1291.639	98.14	97.32	0.00	0.00	15,93	4.670	0.930
40	0.015	0.00	0.00	0.060	18.51	0.90	1329.165	1293.178	99.54	98.40	0.00	0.00	15,02	5.190	0.960
50	0.015	0.00	0.00	0.063	17.64	0.87	1330.780	1294.730	98.98	99.22	0.00	0.00	14,07	5.800	1.100
60	0.015	0.00	0.00	0.063	16.68	0.96	1332.398	1296.307	99.18	100.81	0.00	0.00	14,32	5.520	1.210
70	0.015	0.00	0.00	0.060	15.77	0.91	1334.010	1297.905	98.90	102.25	0.00	0.00	12,96	7.000	1.130
80	0.015	0.00	0.00	0.065	14.76	1.01	1335.620	1299.499	98.91	102.14	0.00	0.00	12,02	8.760	0.720
90	0.015	0.00	0.00	0.068	13.72	1.04	1337.225	1301.081	98.68	101.44	0.00	0.00	12,35	8.240	0.740
100	0.015	0.00	0.00	0.065	12.88	0.84	1338.834	1302.682	98.90	102.64	0.00	0.00	13,38	7.130	0.760
110	0.015	0.00	0.00	0.065	12.12	0.76	1340.431	1304.261	98.11	101.18	0.00	0.00	13,21	7.220	0.730
120	0.015	0.00	0.00	0.063	11.40	0.72	1342.061	1305.849	99.99	101.60	0.00	0.00	13,46	6.620	0.910
130	0.015	0.00	0.00	0.060	10.72	0.68	1343.685	1307.446	99.57	102.13	0.00	0.00	13,63	6.510	0.940
140	0.015	0.00	0.00	0.060	9.97	0.75	1345.309	1309.032	99.63	101.48	0.00	0.00	13,23	7.100	0.900
150	0.015	0.00	0.00	0.063	9.21	0.76	1346.939	1310.614	99.99	101.22	0.00	0.00	12,50	8.160	0.750
160	0.015	0.00	0.00	0.065	8.47	0.74	1348.561	1312.070	99.45	93.12	0.00	0.00	12,55	8.020	0.790
170	0.015	0.00	0.00	0.065	7.69	0.78	1350.188	1313.522	99.79	92.90	0.00	0.00	12,52	7.870	0.930
180	0.015	0.00	0.00	0.060	6.92	0.77	1351.811	1315.053	99.55	97.97	0.00	0.00	12,53	7.570	1.000

190	0.015	0.00	0.00	0.060	6.31	0.61	1353.435	1316.633	99.49	100.97	0.00	0.00	12,55	7.580	0.920
200	0.015	0.00	0.00	0.060	5.86	0.45	1355.061	1318.227	99.45	101.71	0.00	0.00	14,03	4.960	1.420
210	0.015	0.00	0.00	0.055	5.54	0.32	1356.683	1319.813	99.01	100.98	0.00	0.00	14,33	4.510	1.590
220	0.015	0.00	0.00	0.053	5.23	0.31	1358.312	1321.412	99.47	101.83	0.00	0.00	14,23	4.450	1.690
230	0.015	0.00	0.00	0.050	5.01	0.22	1359.946	1323.013	99.62	101.80	0.00	0.00	14,18	4.500	1.710
240	0.015	0.00	0.00	0.050	4.77	0.24	1361.570	1324.604	98.83	100.98	0.00	0.00	14,06	4.620	1.680
250	0.015	0.00	0.00	0.050	4.53	0.24	1363.195	1326.210	98.98	102.03	0.00	0.00	14,17	4.490	1.700
260	0.015	0.00	0.00	0.050	4.33	0.20	1364.830	1327.703	99.39	94.65	0.00	0.00	14,25	4.430	1.740
270	0.015	0.00	0.00	0.050	4.07	0.26	1366.395	1329.223	95.12	96.35	0.00	0.00	14,24	4.730	1.460
280	0.015	0.00	0.00	0.050	3.87	0.20	1368.123	1330.956	104.93	109.75	0.00	0.00	14,19	4.690	1.450
290	0.015	0.00	0.00	0.050	3.65	0.22	1369.785	1332.548	100.94	100.84	0.00	0.00	13,99	5.010	1.420
300	0.015	0.00	0.00	0.045	3.44	0.21	1371.442	1334.128	100.72	100.16	0.00	0.00	14,07	4.830	1.430
310	0.015	0.00	0.00	0.045	3.25	0.19	1373.096	1335.706	100.59	100.09	0.00	0.00	14,53	4.420	1.610
320	0.015	0.00	0.00	0.045	3.10	0.15	1374.755	1337.286	100.82	100.14	0.00	0.00	14,58	4.250	1.620
330	0.015	0.00	0.00	0.045	2.92	0.18	1376.411	1338.865	100.65	100.10	0.00	0.00	14,63	4.340	1.570
340	0.015	0.00	0.00	0.045	2.72	0.20	1378.075	1340.465	101.16	101.44	0.00	0.00	14,50	4.540	1.510
350	0.015	0.00	0.00	0.045	2.56	0.16	1379.727	1342.031	100.42	99.28	0.00	0.00	14,44	4.540	1.550
360	0.015	0.00	0.00	0.045	2.35	0.21	1381.385	1343.605	100.71	99.71	0.00	0.00	14,47	4.490	1.590
370	0.015	0.00	0.00	0.045	2.17	0.18	1383.042	1345.196	100.73	100.87	0.00	0.00	14,50	4.510	1.580
380	0.015	0.00	0.00	0.045	1.99	0.18	1384.696	1346.826	100.58	103.37	0.00	0.00	14,35	4.690	1.580
390	0.015	0.00	0.00	0.045	1.77	0.22	1386.352	1348.452	100.61	103.03	0.00	0.00	14,30	4.760	1.550
400	0.015	0.00	0.00	0.045	1.58	0.19	1388.010	1349.987	100.79	97.32	0.00	0.00	14,38	4.720	1.550
410	0.015	0.00	0.00	0.045	1.41	0.17	1389.666	1351.496	100.70	95.71	0.00	0.00	14,35	4.710	1.530
420	0.015	0.00	0.00	0.045	1.19	0.22	1391.323	1353.053	100.70	98.68	0.00	0.00	15,22	3.740	1.540
430	0.015	0.00	0.00	0.045	1.05	0.14	1392.982	1354.620	100.88	99.38	0.00	0.00	15,33	3.580	1.610
440	0.015	0.00	0.00	0.045	0.94	0.11	1394.643	1356.189	100.95	99.45	0.00	0.00	15,48	3.390	1.660
450	0.015	0.00	0.00	0.043	0.77	0.17	1396.305	1357.759	100.95	99.45	0.00	0.00	15,62	3.400	1.510
460	0.015	0.00	0.00	0.043	0.63	0.14	1397.961	1359.327	100.64	99.37	0.00	0.00	15,62	3.360	1.540
470	0.015	0.00	0.00	0.043	0.47	0.16	1399.620	1360.893	100.79	99.22	0.00	0.00	15,63	3.330	1.560
480	0.015	0.00	0.00	0.043	0.35	0.12	1401.281	1362.459	100.91	99.23	0.00	0.00	15,67	3.290	1.590
490	0.015	0.00	0.00	0.040	0.23	0.12	1402.940	1364.025	100.78	99.21	0.00	0.00	15,72	3.270	1.560
500	0.015	0.00	0.00	0.040	0.10	0.13	1404.593	1365.574	100.38	98.11	0.00	0.00	15,85	3.080	1.640
510	0.015	0.00	0.00	0.040	0.00	0.10	1406.257	1367.170	101.06	101.09	0.00	0.00	15,94	2.960	1.630

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 5, 2014
Test Run Number:	10

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	90	0.1000
A2	0.0125	90	0.1118
A3	0.0150	90	0.1225
A4	0.0125	90	0.1118
A Center	0.0150	90	0.1225
B1	0.0100	90	0.1000
B2	0.0125	90	0.1118
B3	0.0150	90	0.1225
B4	0.0125	90	0.1118
B Center	0.0150	90	0.1225
Averages	0.013	90	0.1115

Tunnel Diameter	8.000	inches
Tunnel Static	-0.088	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9106	factor
Baro. Pressure	30.06	
Pitot Factor	0.99	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.555	Ft/ Sec
Initial Flow	**146.46**	Ft3/min

VS (1)	0.009737527		
VS (2)	0.010230109	STD Tunnel Flow:	146.56

510				548.6948077	84.787	80.704	7.55	99.97	99.97
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	415.6		0.015	561.2			7.636		
10	387.0		0.015	551.2	1.660	1.544	7.567	100.09	97.82
20	355.5		0.015	549.11	1.652	1.562	7.553	99.38	98.75
30	337.4		0.015	551.21	1.628	1.537	7.568	98.14	97.32
40	327.3		0.015	552.85	1.649	1.551	7.579	99.54	98.40
50	321.5		0.015	552.84	1.639	1.564	7.579	98.98	99.22
60	319.9		0.015	552.9	1.643	1.589	7.579	99.18	100.81
70	320.5		0.015	554.04	1.636	1.610	7.587	98.90	102.25
80	328.0		0.015	555.7	1.634	1.606	7.598	98.91	102.14
90	343.2		0.015	556.75	1.629	1.594	7.605	98.68	101.44
100	352.4		0.015	556.75	1.632	1.612	7.605	98.90	102.64
110	351.6		0.015	556.06	1.620	1.590	7.601	98.11	101.18
120	350.0		0.015	554.33	1.654	1.600	7.589	99.99	101.60
130	348.1		0.015	553.82	1.648	1.609	7.585	99.57	102.13
140	346.6		0.015	554.47	1.648	1.598	7.590	99.63	101.48
150	348.4		0.015	554.25	1.654	1.594	7.588	99.99	101.22
160	354.1		0.015	553.97	1.645	1.467	7.586	99.45	93.12
170	359.6		0.015	554.18	1.651	1.463	7.588	99.79	92.90
180	364.7		0.015	554.73	1.646	1.542	7.592	99.55	97.97
190	368.5		0.015	553.26	1.647	1.591	7.582	99.49	100.97
200	371.4		0.015	551.81	1.649	1.605	7.572	99.45	101.71
210	365.6		0.015	549.35	1.645	1.597	7.555	99.01	100.98
220	356.7		0.015	549.54	1.652	1.610	7.556	99.47	101.83
230	349.4		0.015	547.54	1.658	1.613	7.542	99.62	101.80
240	344.5		0.015	545.69	1.648	1.602	7.530	98.83	100.98
250	342.5		0.015	546.77	1.648	1.617	7.537	98.98	102.03
260	340.7		0.015	544.75	1.658	1.503	7.523	99.39	94.65

270	338.8		0.015	544.54	1.587	1.530	7.522	95.12	96.35
280	335.6		0.015	543.86	1.752	1.744	7.517	104.93	109.75
290	334.5		0.015	544.11	1.685	1.602	7.519	100.94	100.84
300	335.2		0.015	545	1.680	1.590	7.525	100.72	100.16
310	336.5		0.015	545.52	1.677	1.589	7.528	100.59	100.09
320	336.1		0.015	544.76	1.682	1.590	7.523	100.82	100.14
330	334.2		0.015	545.04	1.679	1.589	7.525	100.65	100.10
340	333.9		0.015	545.3	1.687	1.610	7.527	101.16	101.44
350	334.8		0.015	545.21	1.675	1.576	7.526	100.42	99.28
360	335.1		0.015	544.23	1.681	1.584	7.519	100.71	99.71
370	337.2		0.015	545.02	1.680	1.602	7.525	100.73	100.87
380	340.0		0.015	545.24	1.677	1.641	7.526	100.58	103.37
390	341.5		0.015	544.33	1.679	1.637	7.520	100.61	103.03
400	343.8		0.015	544.87	1.681	1.545	7.524	100.79	97.32
410	345.7		0.015	545.11	1.680	1.520	7.526	100.70	95.71
420	344.1		0.015	544.41	1.681	1.568	7.521	100.70	98.68
430	339.9		0.015	545.06	1.683	1.578	7.525	100.88	99.38
440	336.1		0.015	544.39	1.685	1.580	7.521	100.95	99.45
450	330.8		0.015	543.79	1.686	1.581	7.516	100.95	99.45
460	327.1		0.015	544.16	1.680	1.579	7.519	100.64	99.37
470	324.0		0.015	544	1.683	1.577	7.518	100.79	99.22
480	321.1		0.015	543.97	1.685	1.577	7.518	100.91	99.23
490	319.0		0.015	543.85	1.683	1.577	7.517	100.78	99.21
500	317.0		0.015	543.56	1.677	1.560	7.515	100.38	98.11
510	314.4	314.38	0.015	543.73	1.688	1.607	7.516	101.06	101.09

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
ample ID Number:	**101440749MTL-003**
Test Date:	**February 5, 2014**
est Run Number:	**10**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.4	to	5.4

Average Firebox Temp, ℉	415.14

Final Coal Bed Wt, lb	5.3

Interval	10

Time		Temperature Data									Flue Draft	Fuel Weight	Weight Loss
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet			
0	0	72.41	145.3	609.8	532.6	515.1	587.9	476.1	496.9			9.25	3.95
1	10	73.33	104.3	413.4	515	518.2	594.3	485.8	520.4			8.16	1.09
2	20	72.92	96.07	347.6	448.7	495.6	578.4	480.2	505.5			7.62	0.54
3	30	73.9	93.45	320.8	399.6	471.3	565.9	469.9	482.4			7.03	0.59
4	40	79.41	92.25	300	375.1	451.3	552.5	462.1	468.3			6.61	0.42
5	50	82.23	98.19	327.6	363.2	440.2	529.5	447.8	457.9			6.01	0.60
6	60	82.13	90.59	287.6	364.3	431.5	505.6	436.6	447.7			5.72	0.29
7	70	83.55	89.48	269.1	343	424.1	484.4	423	433.5			5.45	0.27
8	80	80.48	90.46	264.3	334	420.8	477.7	416.1	427.1			5.30	0.15

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: February 5, 2014
Test Run Number: 10

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	53		118.4	
B - Rear Filter Catch	Filter	54		117.4	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			269.1	235.8	33.3
Probe & Filter Holder	Probe	19	140111.3	140107.7	3.6
			Total Particulate, mg		**36.9**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	55		120	
B - Rear Filter Catch	Filter	56		118.5	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			271.3	238.5	32.8
Probe & Filter Holder	Probe	20	139063.1	139060.3	2.8
			Total Particulate, mg		**35.6**

Manufacturer: SBI
Model: NG1800
Date: 02/05/14
Run: 10
Control #: G101440749
Test Duration: 510 min

	HHV	LHV
Eff	66.24%	71.59%
Comb Eff	86.65%	86.65%
HT Eff	76.44%	82.62%
Output	12,507	kJ/h
Burn Rate	0.95	kg/h
Grams CO	1,521	g
Input	18,881	kJ/h
MC wet	17.37	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.060

Overall Heating Efficiency:	66.24%	
Combustion Efficiency:	86.65%	
Heat Transfer Efficiency:	76.44%	

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.40
Dry Moles Exhaust Gas (N_r):	554.66
Air Fuel Ratio (A/F)	15.80

Heat Output:	11,864	Btu/h	12,507	kJ/h
Heat Input:	17,911	Btu/h	18,881	kJ/h
Burn Duration:	8.50	h		
Burn Rate:	2.10	lb/h	0.953	kg/h
Stack Temp:	249.3	Deg. F	120.7	Deg. C

Averages	1.31	5.04	2.43	20.52	14.83	121.14	28.43	82.3%	75.6%	62.4%	19.89	3.11	68.26	2.58
INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt	% Wet	Dry Wt.
Elapsed Time	Weight emaining (k	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %	Fuel Ratio	Now Wt	Consumed x	Now Wt_{dn}
0	9.80	0.56	0.68	1484.1%	20.86	19.90	141.8	27.1	67.6%	5.5%	3.7%	91.1	9.80	0.00	8.10
10	9.42	0.73	2.43	521.6%	20.73	17.94	130.1	23.8	82.5%	63.0%	52.0%	36.3	9.42	3.88	7.79
20	9.19	0.84	5.22	224.1%	20.54	14.90	113.2	27.9	89.1%	78.6%	70.1%	19.1	9.19	6.29	7.59
30	8.81	0.93	4.67	250.8%	20.57	15.44	128.7	29.3	86.9%	75.5%	65.7%	20.6	8.81	10.18	7.28
40	8.40	0.96	5.19	219.4%	20.53	14.86	139.1	30.1	87.7%	75.6%	66.3%	18.8	8.40	14.34	6.94
50	8.00	1.10	5.80	184.7%	20.48	14.13	147.4	25.9	87.3%	75.5%	65.9%	16.7	8.00	18.37	6.61
60	7.57	1.21	5.52	191.9%	20.50	14.37	144.1	28.2	85.7%	75.4%	64.6%	17.1	7.57	22.81	6.25
70	7.16	1.13	7.00	141.6%	20.40	12.84	150.4	29.5	88.8%	77.6%	69.0%	14.2	7.16	27.02	5.91
80	6.70	0.72	8.76	107.2%	20.31	11.19	162.9	28.5	93.9%	78.8%	74.1%	12.3	6.70	31.70	5.53
90	6.23	0.74	8.24	118.7%	20.35	11.74	172.6	27.2	93.4%	77.3%	72.3%	13.0	6.23	36.51	5.14
100	5.84	0.76	7.13	149.0%	20.42	12.91	162.8	29.9	92.4%	76.9%	71.0%	14.8	5.84	40.40	4.83
110	5.50	0.73	7.22	147.1%	20.42	12.83	160.8	29.1	92.7%	77.1%	71.5%	14.7	5.50	43.91	4.54
120	5.17	0.91	6.62	160.9%	20.44	13.37	156.9	27.6	90.4%	76.3%	69.0%	15.4	5.17	47.24	4.27
130	4.86	0.94	6.51	163.7%	20.45	13.47	152.6	27.9	90.0%	76.6%	68.9%	15.6	4.86	50.39	4.02
140	4.52	0.90	7.10	145.5%	20.41	12.86	150.7	29.5	91.0%	77.9%	70.9%	14.5	4.52	53.86	3.74
150	4.18	0.75	8.16	120.5%	20.35	11.82	155.2	29.0	93.3%	78.8%	73.6%	13.1	4.18	57.38	3.45
160	3.84	0.79	8.02	123.0%	20.36	11.94	158.4	27.0	92.9%	78.2%	72.6%	13.3	3.84	60.80	3.18
170	3.49	0.93	7.87	123.2%	20.36	12.02	158.4	27.7	91.5%	78.0%	71.4%	13.2	3.49	64.41	2.88
180	3.14	1.00	7.57	129.2%	20.37	12.30	153.9	30.0	90.6%	78.2%	70.9%	13.6	3.14	67.98	2.59
190	2.86	0.92	7.58	131.1%	20.38	12.34	151.3	29.3	91.3%	78.4%	71.6%	13.7	2.86	70.80	2.37
200	2.66	1.42	4.96	207.9%	20.52	14.85	145.3	27.8	82.3%	73.7%	60.7%	17.9	2.66	72.88	2.20
210	2.51	1.59	4.51	222.0%	20.54	15.23	130.2	26.6	79.3%	74.2%	58.8%	18.6	2.51	74.36	2.08
220	2.37	1.69	4.45	219.9%	20.53	15.24	121.8	29.7	78.1%	75.5%	59.0%	18.4	2.37	75.80	1.96

230	2.27	1.71	4.50	216.3%	20.53	15.17	116.3	28.7	78.1%	76.2%	59.5%	18.2	2.27	76.82	1.88
240	2.16	1.68	4.62	211.8%	20.52	15.06	113.3	25.9	78.8%	76.6%	60.3%	18.0	2.16	77.93	1.79
250	2.06	1.70	4.49	217.3%	20.53	15.19	109.8	29.3	78.2%	77.1%	60.3%	18.3	2.06	79.04	1.70
260	1.96	1.74	4.43	218.4%	20.53	15.23	108.5	26.9	77.6%	76.8%	59.6%	18.3	1.96	79.96	1.62
270	1.85	1.46	4.73	217.3%	20.53	15.07	105.9	27.1	81.2%	78.1%	63.4%	18.4	1.85	81.17	1.53
280	1.76	1.45	4.69	219.9%	20.53	15.12	105.9	25.4	81.2%	77.8%	63.2%	18.5	1.76	82.09	1.45
290	1.66	1.42	5.01	205.5%	20.52	14.80	105.0	25.9	82.4%	78.6%	64.8%	17.7	1.66	83.11	1.37
300	1.56	1.43	4.83	213.8%	20.53	14.98	104.4	28.4	81.8%	78.6%	64.3%	18.2	1.56	84.08	1.29
310	1.47	1.61	4.42	225.8%	20.54	15.32	103.3	29.6	78.8%	77.9%	61.4%	18.8	1.47	84.96	1.22
320	1.41	1.62	4.25	234.6%	20.55	15.49	102.3	28.1	78.1%	77.5%	60.5%	19.3	1.41	85.65	1.16
330	1.32	1.57	4.34	232.4%	20.55	15.42	100.7	28.8	78.9%	78.0%	61.6%	19.2	1.32	86.49	1.09
340	1.23	1.51	4.54	224.7%	20.54	15.25	100.0	29.7	80.2%	78.7%	63.1%	18.8	1.23	87.41	1.02
350	1.16	1.55	4.54	222.5%	20.54	15.22	99.6	29.9	79.8%	78.8%	62.8%	18.6	1.16	88.15	0.96
360	1.07	1.59	4.49	223.1%	20.54	15.25	99.3	28.4	79.2%	78.5%	62.2%	18.6	1.07	89.12	0.88
370	0.98	1.58	4.51	222.5%	20.54	15.24	98.9	29.5	79.4%	78.7%	62.5%	18.6	0.98	89.96	0.81
380	0.90	1.58	4.69	213.3%	20.53	15.05	99.2	30.0	79.9%	79.1%	63.2%	18.1	0.90	90.79	0.75
390	0.80	1.55	4.76	211.3%	20.52	14.99	99.4	28.4	80.4%	79.1%	63.6%	18.0	0.80	91.81	0.66
400	0.72	1.55	4.72	213.3%	20.53	15.03	99.5	29.4	80.3%	79.1%	63.5%	18.1	0.72	92.69	0.59
410	0.64	1.53	4.71	214.8%	20.53	15.05	100.0	29.7	80.5%	79.0%	63.6%	18.2	0.64	93.47	0.53
420	0.54	1.54	3.74	272.0%	20.59	16.08	99.6	28.6	77.0%	76.6%	59.0%	21.4	0.54	94.49	0.45
430	0.48	1.61	3.58	278.5%	20.60	16.21	98.1	29.5	75.5%	76.5%	57.8%	21.7	0.48	95.14	0.39
440	0.43	1.66	3.39	289.0%	20.61	16.39	96.5	28.5	74.1%	75.9%	56.3%	22.2	0.43	95.65	0.40
450	0.35	1.51	3.40	300.1%	20.62	16.46	94.7	28.4	75.8%	76.4%	57.9%	22.9	0.35	96.44	0.33
460	0.29	1.54	3.36	300.9%	20.62	16.49	93.3	29.1	75.3%	76.6%	57.6%	23.0	0.29	97.08	0.27
470	0.21	1.56	3.33	301.7%	20.62	16.51	92.6	29.3	74.9%	76.6%	57.4%	23.0	0.21	97.82	0.20
480	0.16	1.59	3.29	302.5%	20.62	16.53	92.0	29.4	74.4%	76.6%	56.9%	23.0	0.16	98.38	0.15
490	0.10	1.56	3.27	306.7%	20.62	16.57	91.4	29.5	74.6%	76.6%	57.2%	23.3	0.10	98.94	0.10
500	0.05	1.64	3.08	316.2%	20.63	16.73	90.8	29.3	72.7%	76.0%	55.3%	23.7	0.05	99.54	0.04
510	0.00	1.63	2.96	328.0%	20.64	16.86	90.0	29.4	72.2%	75.7%	54.6%	24.4	0.00	100.00	0.00

%HC					
1.32	Combustion Efficiency:	86.65%		Moisture of Wood (wet basis):	17.37
	Total Input (kJ):	160,489	152,216 (Btu)	Initial Dry Weight Wt_{do} (kg):	8.10
	Total Output (kJ):	106,309	100,829 (Btu)	Moisture Content Dry	21.02
	Efficiency:	66.24%			
	Total CO (g):	1520.51			

Load Weight (kg):	**9.80**					
Fuel Heating	**HHV**	**LHV**			**HHV**	**LHV**
Value in kJ/kg - CV:	**19,810**	**18,329**		Btu/lb	**8522.5**	**7885.2**

68.21	**160917**	**4.06**	**6.87**	**2.74**	**19810.00**	**17.37**	**78.83**	**20.91**	**1.60**	**5.17**	**0.17**	**0.16**	**30.83**	**106.96**	**8.86**
% Dry		**Fuel Properties**				**Mw**	**Mass Balance**					**kg Wood pe**			
Comsumed	**Total**	**Carbon**	**Hydrogen**	**Oxygen**	**Calorific**	**Moisture**	**(moles/100 mole dry flue gas)**					**00 mole df**	**Moles per kg**		
y	**Input**	**/12= [a]**	**/1= [b]**	**/16= [c]**	**Value**	**Fuel Burnt**	**[h]**	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**
0.00	0	4.06	6.87	2.74	19810.00	17.37	78.86	20.92	0.32	0.99	0.05	0.03	21.52	629.71	17.72
3.88	8162	4.06	6.87	2.74	19810.00	17.37	78.90	20.93	0.80	2.58	0.08	0.08	30.63	226.10	9.20
6.29	5050	4.06	6.87	2.74	19810.00	17.37	79.04	20.97	1.52	5.01	0.10	0.15	34.59	98.74	5.57
10.18	6461	4.06	6.87	2.74	19810.00	17.37	78.96	20.95	1.41	4.61	0.11	0.14	33.37	110.31	6.65
14.34	6573	4.06	6.87	2.74	19810.00	17.37	78.99	20.95	1.54	5.07	0.12	0.15	33.80	96.81	6.25
18.37	6796	4.06	6.87	2.74	19810.00	17.37	78.97	20.95	1.73	5.68	0.14	0.17	33.64	81.97	6.38
22.81	6944	4.06	6.87	2.74	19810.00	17.37	78.90	20.93	1.70	5.52	0.15	0.17	32.73	85.21	7.17
27.02	7130	4.06	6.87	2.74	19810.00	17.37	79.03	20.96	2.04	6.71	0.14	0.20	34.53	63.33	5.57
31.70	7613	4.06	6.87	2.74	19810.00	17.37	79.33	21.04	2.36	7.92	0.09	0.23	37.37	47.75	3.07
36.51	6981	4.06	6.87	2.74	19810.00	17.37	79.28	21.03	2.23	7.49	0.09	0.22	37.08	52.82	3.33
40.40	5942	4.06	6.87	2.74	19810.00	17.37	79.20	21.01	1.97	6.57	0.09	0.20	36.47	66.02	3.89
43.91	5496	4.06	6.87	2.74	19810.00	17.37	79.22	21.01	1.98	6.63	0.09	0.20	36.67	65.16	3.71
47.24	5199	4.06	6.87	2.74	19810.00	17.37	79.10	20.98	1.88	6.24	0.11	0.19	35.36	71.40	4.86
50.39	5310	4.06	6.87	2.74	19810.00	17.37	79.08	20.98	1.86	6.17	0.12	0.19	35.12	72.66	5.07
53.86	5607	4.06	6.87	2.74	19810.00	17.37	79.14	20.99	2.00	6.64	0.11	0.20	35.73	64.72	4.53
57.38	5570	4.06	6.87	2.74	19810.00	17.37	79.27	21.03	2.22	7.43	0.09	0.22	37.00	53.58	3.40
60.80	5644	4.06	6.87	2.74	19810.00	17.37	79.25	21.02	2.19	7.34	0.10	0.22	36.75	54.73	3.62
64.41	5756	4.06	6.87	2.74	19810.00	17.37	79.18	21.00	2.20	7.31	0.12	0.22	36.02	55.04	4.26
67.98	5125	4.06	6.87	2.74	19810.00	17.37	79.13	20.99	2.14	7.10	0.13	0.21	35.53	57.75	4.69
70.80	3936	4.06	6.87	2.74	19810.00	17.37	79.16	21.00	2.12	7.06	0.11	0.21	35.91	58.46	4.36
72.88	2859	4.06	6.87	2.74	19810.00	17.37	78.77	20.89	1.62	5.19	0.18	0.16	30.84	92.34	8.83
74.36	2339	4.06	6.87	2.74	19810.00	17.37	78.67	20.87	1.55	4.92	0.21	0.15	29.18	98.56	10.29
75.80	1968	4.06	6.87	2.74	19810.00	17.37	78.62	20.85	1.57	4.94	0.22	0.16	28.55	97.76	10.84

76.82	1708	4.06	6.87	2.74	19810.00	17.37	78.62	20.85	1.58	4.99	0.22	0.16	28.54	96.25	10.85
77.93	1782	4.06	6.87	2.74	19810.00	17.37	78.64	20.86	1.61	5.07	0.22	0.16	28.92	94.28	10.52
79.04	1634	4.06	6.87	2.74	19810.00	17.37	78.62	20.85	1.58	4.98	0.22	0.16	28.57	96.67	10.82
79.96	1708	4.06	6.87	2.74	19810.00	17.37	78.60	20.85	1.58	4.95	0.23	0.16	28.25	97.15	11.10
81.17	1708	4.06	6.87	2.74	19810.00	17.37	78.74	20.89	1.57	5.02	0.19	0.16	30.26	96.43	9.34
82.09	1560	4.06	6.87	2.74	19810.00	17.37	78.74	20.89	1.56	4.98	0.19	0.16	30.25	97.53	9.35
83.11	1597	4.06	6.87	2.74	19810.00	17.37	78.77	20.90	1.63	5.23	0.18	0.16	30.92	91.31	8.76
84.08	1485	4.06	6.87	2.74	19810.00	17.37	78.76	20.89	1.59	5.08	0.18	0.16	30.59	94.88	9.06
84.96	1263	4.06	6.87	2.74	19810.00	17.37	78.65	20.86	1.54	4.86	0.21	0.15	28.91	100.18	10.53
85.65	1225	4.06	6.87	2.74	19810.00	17.37	78.64	20.86	1.50	4.72	0.21	0.15	28.52	103.97	10.87
86.49	1411	4.06	6.87	2.74	19810.00	17.37	78.67	20.87	1.51	4.76	0.20	0.15	28.97	102.96	10.48
87.41	1337	4.06	6.87	2.74	19810.00	17.37	78.70	20.88	1.54	4.89	0.20	0.15	29.67	99.62	9.87
88.15	1374	4.06	6.87	2.74	19810.00	17.37	78.69	20.87	1.55	4.92	0.20	0.15	29.45	98.75	10.05
89.12	1448	4.06	6.87	2.74	19810.00	17.37	78.67	20.87	1.55	4.90	0.21	0.15	29.15	99.02	10.32
89.96	1337	4.06	6.87	2.74	19810.00	17.37	78.67	20.87	1.55	4.91	0.21	0.15	29.24	98.78	10.24
90.79	1485	4.06	6.87	2.74	19810.00	17.37	78.68	20.87	1.59	5.07	0.21	0.16	29.56	94.82	9.96
91.81	1523	4.06	6.87	2.74	19810.00	17.37	78.70	20.88	1.60	5.10	0.20	0.16	29.83	93.94	9.71
92.69	1337	4.06	6.87	2.74	19810.00	17.37	78.70	20.88	1.59	5.07	0.20	0.16	29.77	94.79	9.77
93.47	1448	4.06	6.87	2.74	19810.00	17.37	78.71	20.88	1.59	5.05	0.20	0.16	29.85	95.41	9.70
94.49	1337	4.06	6.87	2.74	19810.00	17.37	78.64	20.86	1.35	4.24	0.20	0.13	27.86	119.80	11.47
95.14	408	4.06	6.87	2.74	19810.00	17.37	78.60	20.85	1.33	4.15	0.21	0.13	27.06	122.56	12.17
95.00	612	4.06	6.87	2.74	19810.00	17.37	78.56	20.84	1.30	4.02	0.22	0.13	26.28	127.01	12.87
95.90	1320	4.06	6.87	2.74	19810.00	17.37	78.63	20.86	1.26	3.93	0.19	0.13	27.19	131.63	12.08
96.65	1279	4.06	6.87	2.74	19810.00	17.37	78.61	20.85	1.26	3.92	0.20	0.12	26.90	131.98	12.33
97.50	1195	4.06	6.87	2.74	19810.00	17.37	78.60	20.85	1.25	3.90	0.20	0.12	26.70	132.33	12.51
98.14	1025	4.06	6.87	2.74	19810.00	17.37	78.59	20.85	1.25	3.89	0.21	0.12	26.40	132.69	12.76
98.77	1068	4.06	6.87	2.74	19810.00	17.37	78.60	20.85	1.24	3.85	0.20	0.12	26.53	134.43	12.66
99.47	1411	4.06	6.87	2.74	19810.00	17.37	78.55	20.84	1.21	3.75	0.21	0.12	25.49	138.42	13.57
100.00	428	4.06	6.87	2.74	19810.00	17.37	78.55	20.84	1.18	3.64	0.21	0.12	25.17	143.36	13.86

Moisture Content M_{Cwb}: 17.37

Dry kg : 8.10

CA: 48.73

HY: 6.87

OX: 43.9

															SUMS
1.12	545.05	32.28	11.68	394.29	3683.60	2776.21	2700.65	2670.51	3537.19	3232.07	301.58	6075.34	14991.15	131549.52	74376.11
				Stack	Heat Content Change - Ambient to Stack Temperature						Room	Energy Losses (kJ/kg			
of Dry Wood			Moisture	Temp	Flue Gas Constituent						Temp	Flue Gas Consti			
HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2	CO	N_2
1.57	2495.73	31.38	11.68	414.98	4578.26	3441.41	3345.52	3308.65	4416.17	4003.13	300.27	98.52	2167.10	5073.92	8257.50
0.98	994.65	32.57	11.68	403.26	4220.45	3182.70	3096.54	3061.88	4048.58	3706.01	296.93	129.28	719.62	2632.69	3045.51
0.65	523.80	33.22	11.68	386.32	3369.25	2547.85	2480.60	2452.47	3216.61	2969.39	301.03	116.55	251.58	1589.15	1284.61
0.79	564.33	32.94	11.68	401.87	3951.66	2977.35	2896.10	2863.82	3796.55	3465.91	302.47	131.89	328.43	1900.12	1616.14
0.76	514.46	33.01	11.68	412.21	4350.35	3269.98	3178.84	3143.81	4196.58	3803.68	303.21	147.06	316.58	1789.36	1617.36
0.80	457.94	32.93	11.68	420.59	4857.02	3647.50	3545.02	3506.13	4692.61	4241.58	299.09	163.37	298.98	1827.86	1605.58
0.91	467.81	32.71	11.68	417.26	4631.58	3479.00	3381.44	3344.31	4473.06	4045.92	301.36	151.59	296.43	2054.55	1564.51
0.71	389.83	33.10	11.68	423.59	4845.25	3633.57	3530.23	3491.76	4692.37	4223.48	302.68	167.30	230.10	1597.02	1361.19
0.37	338.40	33.78	11.68	436.09	5409.47	4046.86	3929.34	3887.03	5260.32	4700.20	301.66	202.15	193.25	881.28	1315.38
0.40	356.79	33.72	11.68	445.76	5869.44	4383.27	4254.08	4208.68	5724.47	5088.04	300.33	217.65	231.52	956.58	1501.62
0.46	405.06	33.60	11.68	435.98	5353.28	4003.79	3887.26	3845.46	5207.96	4649.78	303.00	195.21	264.33	1115.07	1557.64
0.44	402.35	33.65	11.68	433.93	5294.73	3962.32	3847.58	3806.09	5145.90	4602.50	302.27	194.15	258.19	1063.48	1531.36
0.59	422.50	33.34	11.68	430.09	5192.59	3890.31	3778.74	3737.76	5036.96	4520.50	300.72	183.60	277.77	1393.84	1579.19
0.62	426.62	33.28	11.68	425.76	4999.76	3749.05	3642.32	3602.65	4842.87	4357.56	301.01	175.59	272.39	1453.52	1536.96
0.56	398.23	33.41	11.68	423.82	4854.75	3640.54	3536.95	3498.42	4701.94	4231.51	302.67	173.45	235.62	1297.65	1393.17
0.41	359.47	33.70	11.68	428.32	5062.44	3793.06	3684.35	3644.38	4910.13	4407.60	302.17	187.32	203.25	974.96	1310.04
0.44	363.16	33.64	11.68	431.59	5278.60	3953.99	3840.41	3798.80	5122.04	4594.22	300.12	194.00	216.41	1038.41	1379.56
0.53	362.41	33.46	11.68	431.59	5252.46	3933.84	3820.70	3779.33	5097.92	4570.59	300.81	189.21	216.51	1220.94	1369.68
0.59	371.36	33.34	11.68	427.09	4974.56	3727.43	3620.65	3581.36	4824.44	4331.41	303.13	176.74	215.25	1345.15	1329.96
0.54	375.05	33.44	11.68	424.43	4890.75	3667.27	3562.86	3524.06	4737.38	4262.49	302.40	175.64	214.38	1249.03	1321.69
1.14	489.84	32.25	11.68	418.48	4699.51	3529.43	3430.32	3392.68	4539.94	4104.36	300.91	144.95	325.89	2529.18	1661.86
1.34	509.04	31.84	11.68	403.37	4117.88	3103.40	3018.91	2985.22	3954.45	3612.96	299.74	120.17	305.88	2942.61	1519.58
1.42	504.37	31.68	11.68	394.93	3653.09	2756.30	2682.04	2651.95	3501.14	3210.04	302.81	104.29	269.47	3097.20	1337.55

1.43	498.61	31.67	11.68	389.43	3466.38	2619.09	2549.42	2520.63	3314.16	3051.60	301.81	98.93	252.08	3096.85	1256.81
1.38	492.18	31.76	11.68	386.48	3450.19	2610.05	2541.41	2512.54	3291.69	3042.26	299.09	99.77	246.09	3002.40	1236.62
1.42	500.30	31.68	11.68	382.98	3178.72	2404.75	2341.53	2314.93	3032.55	2802.99	302.47	90.82	232.47	3086.81	1158.16
1.46	501.28	31.60	11.68	381.65	3218.75	2437.04	2373.46	2346.39	3066.35	2841.37	300.01	90.94	236.76	3166.82	1176.20
1.21	503.80	32.11	11.68	379.04	3104.32	2351.62	2290.56	2264.38	2954.67	2742.23	300.23	93.95	226.77	2665.01	1140.79
1.21	507.91	32.11	11.68	379.09	3170.70	2402.75	2340.57	2313.78	3015.99	2802.16	298.55	95.92	234.34	2668.78	1175.20
1.13	486.15	32.26	11.68	378.15	3112.48	2358.85	2297.86	2271.54	2960.14	2751.04	299.07	96.23	215.38	2500.10	1104.30
1.17	498.78	32.19	11.68	377.54	2991.47	2266.20	2207.38	2182.14	2847.11	2642.64	301.59	91.51	215.02	2582.85	1088.41
1.37	514.42	31.78	11.68	376.48	2905.76	2201.24	2144.10	2119.59	2765.61	2566.88	302.71	84.00	220.52	3002.51	1090.36
1.42	527.75	31.69	11.68	375.48	2921.70	2214.51	2157.31	2132.59	2778.17	2582.79	301.24	83.33	230.25	3100.20	1125.48
1.36	525.11	31.80	11.68	373.82	2828.20	2144.10	2088.83	2064.87	2688.25	2500.84	301.92	81.93	220.76	2987.67	1084.27
1.28	514.30	31.97	11.68	373.15	2767.23	2097.77	2043.67	2020.24	2630.53	2446.77	302.81	82.10	208.99	2812.53	1039.01
1.31	510.44	31.91	11.68	372.76	2740.68	2077.69	2024.12	2000.91	2605.18	2423.37	303.09	80.72	205.17	2865.79	1021.34
1.35	510.65	31.83	11.68	372.43	2785.12	2112.23	2057.98	2034.33	2645.57	2463.96	301.58	81.18	209.14	2942.07	1038.83
1.33	509.99	31.85	11.68	372.04	2728.15	2068.72	2015.50	1992.36	2592.13	2413.09	302.66	79.76	204.35	2919.15	1016.09
1.30	495.87	31.92	11.68	372.37	2724.35	2065.48	2012.27	1989.18	2589.29	2409.19	303.11	80.52	195.85	2837.84	986.37
1.26	493.26	31.99	11.68	372.54	2789.39	2115.42	2061.07	2037.39	2649.74	2467.66	301.59	83.22	198.72	2769.16	1004.95
1.27	496.29	31.98	11.68	372.65	2755.36	2089.10	2035.30	2011.94	2618.53	2436.77	302.59	82.01	198.02	2786.05	998.52
1.26	498.88	32.00	11.68	373.15	2765.96	2096.79	2042.71	2019.29	2629.35	2445.62	302.84	82.58	200.06	2764.25	1007.39
1.48	585.81	31.56	11.68	372.76	2790.91	2116.38	2061.96	2038.28	2651.61	2468.71	301.78	77.76	253.53	3270.17	1194.04
1.58	594.18	31.37	11.68	371.21	2695.83	2044.60	1992.10	1969.20	2560.58	2385.10	302.63	72.96	250.59	3468.64	1170.07
1.67	608.92	31.18	11.68	369.65	2669.56	2025.77	1974.03	1951.29	2533.20	2363.55	301.68	70.14	257.29	3666.45	1188.19
1.55	628.78	31.43	11.68	367.87	2602.71	1975.87	1925.60	1903.37	2467.97	2305.62	301.56	70.76	260.09	3440.42	1196.80
1.58	629.35	31.35	11.68	366.48	2520.09	1913.43	1864.82	1843.28	2389.00	2232.87	302.26	67.79	252.54	3511.92	1160.07
1.61	630.15	31.30	11.68	365.71	2483.11	1885.61	1837.77	1816.53	2353.37	2200.51	302.41	66.29	249.53	3562.17	1144.68
1.65	630.72	31.23	11.68	365.15	2455.06	1864.48	1817.22	1796.20	2326.43	2175.91	302.56	64.83	247.39	3634.45	1132.91
1.63	637.64	31.27	11.68	364.59	2430.43	1845.97	1799.23	1778.41	2302.65	2154.38	302.62	64.48	248.16	3604.23	1133.99
1.76	650.00	31.01	11.68	363.98	2411.46	1831.87	1785.55	1764.88	2284.02	2138.03	302.47	61.46	253.57	3864.62	1147.17
1.79	667.80	30.94	11.68	363.15	2375.93	1805.18	1759.61	1739.23	2249.69	2107.00	302.53	59.79	258.78	3946.06	1161.45

			AVERAGE	SUMS						
52015.95	79272.97	28664.76	7441.27	54153.31	21393.82	32759.5	106763.5	21420.2	1520.5	108.3
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
1404.68	1505.47	560.25	19067.44	0.00	0	0.00	0	0	0.00	0.00
874.21	1552.65	556.78	9510.74	3918.67	1432	2487.11	4244	1432	106.16	6.44
583.00	1559.17	548.18	5932.24	1512.36	550	962.65	3538	550	39.74	2.66
707.43	1562.50	553.98	6800.49	2218.12	843	1374.87	4243	843	60.70	4.13
675.86	1577.03	557.92	6681.17	2216.78	810	1406.48	4356	810	58.09	4.01
714.09	1587.41	563.03	6760.32	2319.07	863	1456.12	4477	863	61.27	4.38
812.96	1570.34	560.75	7011.13	2457.68	995	1462.43	4487	995	70.42	5.10
635.88	1595.24	562.82	6149.56	2213.30	795	1417.94	4917	795	56.17	4.09
332.11	1644.09	568.39	5136.66	1973.93	461	1513.03	5639	461	33.05	2.28
358.76	1654.29	572.92	5493.33	1935.93	458	1478.19	5045	458	32.86	2.26
412.20	1633.68	567.80	5745.93	1723.36	453	1270.54	4218	453	32.64	2.21
390.00	1634.50	567.25	5638.93	1564.43	399	1165.76	3932	399	28.80	1.93
531.41	1616.41	566.29	6148.51	1613.59	500	1113.94	3585	500	35.72	2.49
556.95	1608.21	564.39	6168.01	1653.40	533	1120.23	3657	533	38.06	2.67
497.57	1610.41	562.92	5770.78	1633.46	503	1130.58	3974	503	35.89	2.52
366.56	1630.46	564.97	5237.57	1472.71	373	1099.59	4098	373	26.78	1.84
393.62	1633.83	567.15	5422.98	1545.17	403	1141.75	4099	403	28.88	2.00
476.25	1624.07	566.88	5663.54	1645.57	488	1157.96	4110	488	34.63	2.47
529.13	1610.34	564.08	5770.66	1492.80	480	1013.08	3632	480	33.99	2.45
484.42	1612.86	563.28	5621.30	1116.96	341	776.12	2819	341	24.25	1.72
1018.71	1550.14	561.43	7792.17	1124.72	507	617.74	1735	507	35.69	2.63
1199.14	1515.02	555.69	8158.10	963.44	485	478.61	1376	485	34.02	2.53
1271.75	1494.46	550.99	8125.71	807.30	431	376.62	1161	431	30.16	2.26

1274.17	1489.16	549.14	8017.13	691.31	374	317.19	1017	374	26.19	1.97
1233.91	1493.10	549.03	7860.91	707.31	378	328.95	1075	378	26.49	1.99
1269.60	1481.73	546.23	7865.82	648.77	357	291.90	985	357	24.98	1.88
1305.31	1479.20	546.68	8001.91	690.00	383	307.03	1018	383	26.79	2.02
1077.60	1499.87	545.52	7249.51	625.12	321	304.55	1083	321	22.55	1.66
1077.60	1501.80	546.22	7299.87	574.73	293	281.78	985	293	20.62	1.52
1009.68	1507.26	545.63	6978.59	562.51	281	281.50	1034	281	19.78	1.46
1042.56	1500.32	544.36	7065.02	529.75	270	259.66	956	270	19.01	1.40
1226.67	1478.68	543.48	7646.22	487.33	268	219.47	775	268	18.79	1.40
1265.77	1475.11	543.66	7823.81	483.98	268	215.60	741	268	18.83	1.40
1216.06	1477.68	542.71	7611.08	542.16	298	244.54	869	298	20.90	1.55
1141.03	1483.75	542.07	7309.48	493.27	265	228.06	844	265	18.64	1.38
1166.66	1480.33	541.80	7361.81	510.60	278	232.57	863	278	19.53	1.45
1201.00	1478.06	542.27	7492.55	547.76	301	246.69	900	301	21.13	1.57
1191.00	1477.48	541.68	7429.50	501.37	276	225.63	835	276	19.35	1.44
1159.58	1480.62	541.64	7282.40	546.05	298	248.07	939	298	20.90	1.56
1129.34	1485.64	542.32	7213.35	554.39	298	256.56	968	298	20.91	1.56
1135.91	1483.96	541.96	7226.43	487.67	263	224.57	849	263	18.47	1.37
1125.04	1485.38	542.06	7206.75	526.87	283	244.22	921	283	19.85	1.47
1320.94	1465.74	542.33	8124.52	548.27	308	240.31	789	308	21.68	1.60
1407.82	1454.06	541.35	8365.49	172.39	100	72.48	236	100	7.02	0.52
1491.82	1444.66	541.10	8659.66	267.50	158.42	109.07	344	158	11.13	0.83
1382.13	1454.22	540.43	8344.84	556.08	319.56	236.52	764	320	22.53	1.65
1414.49	1448.57	539.58	8394.96	541.95	316.30	225.64	737	316	22.28	1.64
1437.04	1445.22	539.20	8444.12	509.20	299.85	209.35	685	300	21.12	1.55
1469.62	1441.07	538.91	8529.18	441.24	262.65	178.59	584	263	18.48	1.36
1453.38	1442.07	538.66	8484.98	457.59	271.32	186.27	611	260	19.11	1.41
1566.65	1429.86	538.47	8861.79	631.34	384.93	246.41	780	303	27.07	2.00
1596.87	1425.77	538.11	8986.82	194.07	119.08	74.98	234	238	8.38	0.62

Intertek Testing Services NA Ltd

Manufacturer:	SBI
Model:	NG1800
Date:	02/05/14
Run:	10
Control #:	G101440749
Test Duration:	510
Output Category:	2

Technicians:

_____

_____

_____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	66.2%	71.6%
Combustion Efficiency	86.7%	86.7%
Heat Transfer Efficiency	76%	82.6%

Output Rate (kJ/h)	12,507	11,864	**(Btu/h)**
Burn Rate (kg/h)	0.95	2.10	**(lb/h)**
Input (kJ/h)	18,881	17,911	**(Btu/h)**

Test Load Weight (dry kg)	8.10	17.86	**dry lb**
MC wet (%)	17.37		
MC dry (%)	21.02		
Particulate (g)	32.7355		
CO (g)	1,521		
Test Duration (h)	8.50		

Emissions	**Particulate**	**CO**
g/MJ Output	0.31	14.30
g/kg Dry Fuel	4.04	187.68
g/h	3.85	178.88
lb/MM Btu Output	0.72	33.24

Air/Fuel Ratio (A/F)	15.80

Version: 2.4 **15/04/2010**

Intertek

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 5, 2014
Test Run Number:	10

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.663	19.5	20.5	19.9
2	16	1.598	21.9	22.3	22.2
3	16	1.712	21.4	21.1	21.4
4	16	1.282	21.4	20.6	21.9
5	16	1.710	21.2	20.3	21.7
6	16	1.652	20.0	19.0	19.2
7	16	1.754	20.6	21.6	20.5
8	16	1.647	20.2	19.0	19.5
9	17	1.920	20.6	20.5	21.0
10	17	1.98	20.5	19.9	20.6
11	17	2.09	21.0	20.4	21.0
12	17	2.06	22.0	21.9	22.5
Total Weight		21.073	Average, %db		20.8

Allowable Fuel Load Range:	4.32	to	5.40

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214	Time:	10:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15	1.401		19.3	20.5	20.5
2	15	1.554		19.9	21.1	19.9
3	15	1.368		20.0	20.2	20.9
4	15		3.989	21.9	22.0	22.2
5	15		3.594	20.1	22.1	19.1
6	15		3.956	21.5	22.0	22.3
7	15	2.088		22.3	21.2	22.2
8	15	1.589		21.0	19.7	19.9
9	15	2.070		22.1	21.5	22.2
,		10.070	11.539			
% of Weight		46.6	53.4			
Total weight, wet, lb.		21.609		Average Moisture, dry		21.02
Total weight, dry, kg		8.10		Average Moisture, wet		17.37

Date: _____ Engineer Signature: _____

Results

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 6, 2014
Test Run Number:	11

Dry Burn-Rate, kg/hr:	**2.01**	
Emission-Rate, g/hr:	**1.83**	
Adjusted Emission-Rate, g/hr :	**3.01**	
Duration of Test, Minutes	250	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	1406.28	1367.198
Dry Gas Meter Ending Reading, ft^3	1447.543	1407.105
Barometric Pressure Correction Factor	1.010	1.010
Dry Gas Meter Calibration Factors (γ factors)	1.002	0.994
Dry Gas Meter Temperature Factors	1.009	1.010
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**42.134**	**40.456**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**144.039**	
Total Tunnel Volume, scf	**36009.709**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	854.651	890.091
Sample Particulate Mass, mg	8.8	8.7
Total Emissions, grams	7.521	7.744
Emission-Rate, g/hr	1.81	1.86
Adjusted Emission Rates, g/hr	**2.97**	**3.04**
Deviation, %	1.21%	
Operating Parameters	Train A	Train B
Max Filter Temperature, ℉	85.59	79.83
Post-Test Leak Check, cfm @ in. Hg vac.	0.002@5	0.003@5
Average Firebox Surface Temperture delta-T, ℉	70.9	
Maximum Ambient Temperture, ℉	84	
Mimimum Ambient Temperature, ℉	66	
Fuel Properties		
Wet Fuel Load Weight, lb.	22.28	
Dry-Basis Fuel Load Moisture Content, %	20.72	
Wet-Basis Fuel Load Moisture Content, %	17.16	
Coal Bed Range, lb.	4.50	5.50
Actual Coal Bed, Lb.	5.04	

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID No:	101440749MTL-003
Test Date:	February 6, 2014
Test Run No:	11

Temperature Data

Firebox Temp Start	450.9
Firebox Temp End	380
Firebox Delta-T	**70.9**

Max Filter Temps	
Train A	Train B
85.59	**79.83**

Interval	10	Duration of Test, Min	250

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	76.44	111.3	372.7	412.5	378.4	531.5	457.8	474.3		66.89	67.8	62.53	62.25
1	10	83.82	120.7	435.3	384.8	384.4	461.8	434.8	447.2		77.11	70.74	62.93	62.47
2	20	73.58	143.9	618.9	519.8	378.1	442	412.1	429.6		85.3	77.49	63.04	62.5
3	30	72.47	153.2	665.5	619.4	365.8	459.4	421.9	449.1		79.46	79.83	63.11	62.62
4	40	73.96	149.2	648.6	639.1	354.4	492.1	444.7	478.3		85.59	79.09	63.03	62.6
5	50	74.49	139.5	584.4	610.2	344.8	527.6	468.9	505.7		83.64	75.8	63.14	62.63
6	60	73.26	131.6	545.4	564.8	335.8	551.7	483.5	523		83.95	73.31	63.09	62.61
7	70	71.9	125.6	508.8	529.2	327.6	560.9	490.5	534.2		83.74	72.86	63.22	62.73
8	80	71.15	120	479.9	498.8	320.5	565.8	490.5	546.3		82.57	73.01	63.2	62.76
9	90	69.24	115.7	464.1	470.4	314.7	569.9	487.4	552.6		81.15	72.74	63.26	62.85
10	100	69.09	110.9	434.5	448.3	310.5	566.2	487.1	538.7		79.87	72.01	63.28	62.83
11	110	69.18	107.6	411.6	425.5	309.5	556	487.6	514.1		78.8	71.32	63.31	62.86
12	120	68.65	103.4	383	399.1	308.9	537.8	478.7	491.5		77.5	70.76	63.36	62.88
13	130	67.32	99.52	356.7	370.8	307	520	463.4	469.7		76.21	70.09	63.44	62.98
14	140	67.37	97.11	343.6	348.9	304.9	512.1	448.2	452.1		75.14	69.68	63.38	62.95
15	150	69.14	95.98	333.4	336.5	301.9	513.7	439.1	441.1		74.46	69.36	63.35	62.91
16	160	66.81	94.16	324.7	324	297.6	512.9	431.6	432.8		73.84	68.74	63.26	62.84
17	170	71.04	94.44	319.5	317.4	295.4	527.3	425.7	427.5		73.55	68.59	63.22	62.82
18	180	67.58	93.25	319.1	314.2	292.2	546.9	423	425.8		73.19	68.5	63.24	62.81
19	190	71.24	93.61	315.6	312.9	290.5	553.7	425.1	428.1		73.25	68.53	63.14	62.82
20	200	67.41	93.49	313	308.7	288	549	424.9	427.2		73.21	68.44	63.07	62.72
21	210	70.38	93.95	312	307.7	287.5	548.1	424.9	429.4		73.36	68.46	63.09	62.74
22	220	67.19	92.85	310.6	306	285.6	548.5	424.2	429.3		73.21	68.35	63.02	62.69
23	230	69.4	93.03	305.9	304.1	285.3	543.3	419.7	428		73.02	68.3	62.99	62.62
24	240	66.43	91.49	298.2	298.3	283.6	530.5	409	420.6		72.75	68.25	63.03	62.69
25	250	68.82	91.04	288.6	291.9	283.5	514.2	398.9	411.5		72.51	68.14	63	62.67

Gas Particulate Sampling Data

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 6, 2014
Test Run Number:	11

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.24	46	Meter Box (A)	1.002
End	30.18	45	Meter Box (B)	0.994
Duration of Test, Min		250		

Leak Check, cfm @ in Hg	
Train A	Train B
0.002@5	0.003@5

Maximum Vacuum		Average Gases, %		
Train A	Train B	O2	CO2	CO
0.00	0.00	12.72	6.975	6.975

Time	Particulate Sampling Data												Combustion Gasses, %		
	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg	O2	CO2	CO
0	0.015	0.00	0.00	0.065	22.28	22.28	1406.280	1367.198	99.94	99.94	0.00	0.00	17.820	0.720	0.540
10	0.015	0.00	0.00	0.085	20.74	1.54	1407.921	1368.694	100.40	94.64	0.00	0.00	10.600	10.980	0.810
20	0.015	0.00	0.00	0.098	18.06	2.68	1409.535	1370.224	100.68	98.70	0.00	0.00	5.330	15.180	0.930
30	0.015	0.00	0.00	0.100	15.06	3.00	1411.164	1371.801	102.38	102.49	0.00	0.00	3.990	15.830	1.720
40	0.015	0.00	0.00	0.098	12.34	2.72	1412.755	1373.372	99.68	101.77	0.00	0.00	5.840	14.140	1.000
50	0.015	0.00	0.00	0.093	10.33	2.01	1414.345	1374.915	98.80	99.15	0.00	0.00	9.040	11.470	0.640
60	0.015	0.00	0.00	0.090	8.76	1.57	1415.975	1376.479	100.62	99.84	0.00	0.00	9.950	10.560	0.610
70	0.015	0.00	0.00	0.085	7.45	1.31	1417.607	1378.095	100.21	102.61	0.00	0.00	10.710	9.710	0.610
80	0.015	0.00	0.00	0.083	6.35	1.10	1419.210	1379.710	97.96	102.05	0.00	0.00	11.510	9.030	0.620
90	0.015	0.00	0.00	0.080	5.41	0.94	1420.861	1381.330	100.51	101.97	0.00	0.00	11.440	8.870	0.640
100	0.015	0.00	0.00	0.078	4.66	0.75	1422.494	1382.941	98.99	100.98	0.00	0.00	12.250	7.880	0.790
110	0.015	0.00	0.00	0.075	4.07	0.59	1424.152	1384.545	100.21	100.25	0.00	0.00	13.290	6.520	0.950
120	0.015	0.00	0.00	0.070	3.60	0.47	1425.812	1386.137	99.95	99.12	0.00	0.00	14.210	5.180	1.200
130	0.015	0.00	0.00	0.070	3.27	0.33	1427.479	1387.735	100.01	99.14	0.00	0.00	14.610	4.620	1.320
140	0.015	0.00	0.00	0.065	2.94	0.33	1429.150	1389.367	100.05	101.03	0.00	0.00	14.520	4.760	1.230
150	0.015	0.00	0.00	0.065	2.64	0.30	1430.825	1390.999	100.19	100.94	0.00	0.00	14.830	4.360	1.390
160	0.015	0.00	0.00	0.065	2.32	0.32	1432.488	1392.531	99.33	94.61	0.00	0.00	14.780	4.390	1.370
170	0.015	0.00	0.00	0.065	2.00	0.32	1434.159	1394.099	99.84	96.86	0.00	0.00	14.570	4.670	1.350
180	0.015	0.00	0.00	0.065	1.69	0.31	1435.833	1395.723	99.91	100.22	0.00	0.00	14.410	4.780	1.340
190	0.015	0.00	0.00	0.063	1.40	0.29	1437.502	1397.356	99.66	100.80	0.00	0.00	14.610	4.560	1.440
200	0.015	0.00	0.00	0.063	1.07	0.33	1439.175	1398.979	99.90	100.19	0.00	0.00	14.770	4.450	1.330
210	0.015	0.00	0.00	0.063	0.81	0.26	1440.849	1400.599	100.00	100.05	0.00	0.00	14.640	4.700	1.200

220	0.015	0.00	0.00	0.063	0.53	0.28	1442.522	1402.221	99.85	100.08	0.00	0.00	15.260	4.070	1.240
230	0.015	0.00	0.00	0.060	0.29	0.24	1444.195	1403.825	99.87	99.00	0.00	0.00	15.480	3.700	1.250
240	0.015	0.00	0.00	0.060	0.05	0.24	1445.869	1405.457	99.79	100.57	0.00	0.00	15.860	3.440	1.210
250	0.015	0.00	0.00	0.060	0.00	0.05	1447.543	1407.105	99.75	101.52	0.00	0.00	16.390	2.770	1.370

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 6, 2014
Test Run Number:	11

	Dilution Tunnel		
	Delta P In. H2O	Temp,℉	Square Root
A1	0.0100	125	0.1000
A2	0.0125	126	0.1118
A3	0.0125	126	0.1118
A4	0.0150	125	0.1225
A Center	0.0150	126	0.1225
B1	0.0150	127	0.1225
B2	0.0150	127	0.1225
B3	0.0100	127	0.1000
B4	0.0100	126	0.1000
B Center	0.0150	131	0.1225
Averages	0.013	126.66	0.1114

Tunnel Diameter	8.000	inches
Tunnel Static	-0.095	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9094	factor
Baro. Pressure	30.24	
Pitot Factor	0.99	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.770	Ft/ Sec
Initial Flow	**142.05**	Ft3/min

VS (1)	0.019152053		
VS (2)	0.019946069	STD Tunnel Flow:	144.04

250				569.8661538	42.115	40.438	7.66	99.94	99.94
Time	Average Firebox Temp	Ending Average Firebox Temp	Tunnel Delta-P	Tunnel Temp, R	STD Sample Ft^3 (1)	STD Sample Ft^3 (2)	Tunnel Velocity	Proportional Rate (1)	Proportional Rate (2)
0	450.9		0.015	571.3			7.672		
10	422.6		0.015	580.7	1.676	1.517	7.734	100.40	94.64
20	436.3		0.015	603.9	1.648	1.551	7.887	100.68	98.70
30	463.1		0.015	613.2	1.663	1.598	7.948	102.38	102.49
40	481.7		0.015	609.2	1.624	1.592	7.922	99.68	101.77
50	491.4		0.015	599.5	1.623	1.564	7.859	98.80	99.15
60	491.8		0.015	591.6	1.664	1.585	7.807	100.62	99.84
70	488.5		0.015	585.6	1.666	1.638	7.767	100.21	102.61
80	484.4		0.015	580	1.636	1.636	7.730	97.96	102.05
90	479.0		0.015	575.7	1.685	1.641	7.701	100.51	101.97
100	470.2		0.015	570.9	1.666	1.632	7.669	98.99	100.98
110	458.5		0.015	567.6	1.692	1.625	7.647	100.21	100.25
120	443.2		0.015	563.4	1.694	1.613	7.618	99.95	99.12
130	426.2		0.015	559.52	1.701	1.619	7.592	100.01	99.14
140	413.2		0.015	557.11	1.705	1.653	7.576	100.05	101.03
150	406.5		0.015	555.98	1.709	1.653	7.568	100.19	100.94
160	399.8		0.015	554.16	1.697	1.552	7.556	99.33	94.61
170	398.7		0.015	554.44	1.705	1.589	7.557	99.84	96.86
180	400.4		0.015	553.25	1.708	1.645	7.549	99.91	100.22
190	402.1		0.015	553.61	1.704	1.655	7.552	99.66	100.80
200	399.6		0.015	553.49	1.708	1.645	7.551	99.90	100.19
210	399.5		0.015	553.95	1.709	1.642	7.554	100.00	100.05
220	398.7		0.015	552.85	1.708	1.644	7.547	99.85	100.08
230	396.1		0.015	553.03	1.708	1.626	7.548	99.87	99.00
240	388.4		0.015	551.49	1.709	1.654	7.537	99.79	100.57
250	380.0	380	0.015	551.04	1.709	1.670	7.534	99.75	101.52

Project Number:	**G101440749**
Manufacturer:	**Stove Builder International, inc**
Model:	**NG1800**
Sample ID Number:	**101440749MTL-003**
Test Date:	**February 6, 2014**
Test Run Number:	**11**

EPA Method 28
Pre Burn Data

Coal Bed Range	4.5	to	5.5

Average Firebox Temp, ℉	455.88

Final Coal Bed Wt, lb	5.04

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	65.97	148.1	590.4	478.8	430.6	535.5	360.3	344.2			14.97	9.93
1	10	69.65	130.5	516.7	518.8	435.6	507.4	406.4	374.8			12.98	1.99
2	20	66.25	133.7	557.1	524.7	423.8	496.5	417.7	399			10.96	2.02
3	30	67.55	133.2	556.7	553.9	406	514.3	434.4	434.4			9.01	1.95
4	40	68.21	126	528.9	545.9	388.7	528.7	449	465.3			7.54	1.47
5	50	70.48	137.9	555.2	545	378.5	550.9	465.1	488.7			5.99	1.55
6	60	80.55	116.1	447.3	506.7	375.2	554	470.6	502.1			5.40	0.59
7	70	77.29	108.5	393.1	434.3	375	537.5	460.7	487.1			5.12	0.28
8	80	76.85	121.8	395.2	426.2	376.9	535.8	459	481.5			5.04	0.08

Project Number: G101440749
Manufacturer: Stove Builder International, inc
Model: NG1800
Sample ID Number: 101440749MTL-003
Test Date: February 6, 2014
Test Run Number: 11

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	57		117.6	
B - Rear Filter Catch	Filter	58		119.7	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			244.7	237.3	7.4
Probe & Filter Holder	Probe	21	136036.2	136034.8	1.4
			Total Particulate, mg		**8.8**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	59		118.3	
B - Rear Filter Catch	Filter	60		117.7	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			243.5	236	7.5
Probe & Filter Holder	Probe	26	139796.8	139795.6	1.2
			Total Particulate, mg		**8.7**

Manufacturer:	SBI
Model:	NG1800
Date:	02/06/14
Run:	11
Control #:	G101440749
Test Duration:	250 min

	HHV	LHV
Eff	66.77%	72.16%
Comb Eff	92.17%	92.17%
HT Eff	72.44%	78.30%
Output	26,581	kJ/h
Burn Rate	2.01	kg/h
Grams CO	914	g
Input	39,811	kJ/h
MC wet	17.16	

Overall Heating Efficiency:	66.77%
Combustion Efficiency:	92.17%
Heat Transfer Efficiency:	72.44%

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.63
Dry Moles Exhaust Gas (N_r):	453.31
Air Fuel Ratio (A/F)	12.92

Heat Output:	25,215 Btu/h	26,581 kJ/h	
Heat Input:	37,765 Btu/h	39,811 kJ/h	
Burn Duration:	4.17 h		
Burn Rate:	4.43 lb/h	2.010 kg/h	
Stack Temp:	412.8 Deg. F	211.6 Deg. C	

Ultimate CO_2

$CO_{2\text{-ult}}$ 19.64

F_0

1.061

Averages	**1.08**	**6.97**	**2.26**	**20.41**	**12.89**	**210.72**	**21.48**	**86.3%**	**66.5%**	**58.1%**	**19.01**	**2.76**	**72.70**	**2.29**
INPUT DATA				**Oxygen Calculation**			**Input Data**		**Combust**	**Heat**	**Net**	**Air**	**Wet Wt**	**% Wet**	**Dry Wt.**
Elapsed Time	**Weight emaining (k**	**% CO [e]**	**% CO_2 [d]**	**Excess Air EA**	**Total O_2**	**Calc. % O_2 [g]**	**Flue Gas (ºC)**	**Room Temp (ºC)**	**Eff %**	**Transfer %**	**Eff %**	**Fuel Ratio**	**Now Wt**	**Consumed x**	**Now Wt_{dn}**
0	10.11	0.54	0.72	1459.0%	20.86	19.87	189.3	24.7	69.3%	-25.3%	-17.6%	89.9	10.11	0.00	8.37
10	9.41	0.81	10.98	66.6%	20.16	8.78	224.1	28.8	94.4%	76.7%	72.5%	9.9	9.41	6.90	7.80
20	8.19	0.93	15.18	21.9%	19.88	4.23	326.1	23.1	95.2%	74.1%	70.6%	7.3	8.19	18.93	6.79
30	6.83	1.72	15.83	11.9%	19.78	3.09	351.9	22.5	91.8%	73.1%	67.1%	6.6	6.83	32.40	5.66
40	5.60	1.00	14.14	29.7%	19.94	5.30	342.6	23.3	94.5%	72.3%	68.3%	7.8	5.60	44.61	4.64
50	4.69	0.64	11.47	62.2%	20.14	8.35	306.9	23.6	95.7%	71.6%	68.5%	9.7	4.69	53.63	3.88
60	3.97	0.61	10.56	75.9%	20.20	9.34	285.2	22.9	95.6%	71.8%	68.6%	10.5	3.97	60.68	3.29
70	3.38	0.61	9.71	90.3%	20.26	10.24	264.9	22.2	95.3%	71.9%	68.5%	11.4	3.38	66.56	2.80
80	2.88	0.62	9.03	103.6%	20.30	10.96	248.8	21.8	94.9%	72.0%	68.4%	12.2	2.88	71.50	2.39
90	2.45	0.64	8.87	106.6%	20.31	11.12	240.1	20.7	94.7%	72.4%	68.5%	12.3	2.45	75.72	2.03
100	2.11	0.79	7.88	126.6%	20.37	12.09	223.6	20.6	92.7%	71.9%	66.7%	13.5	2.11	79.08	1.75
110	1.85	0.95	6.52	163.0%	20.45	13.45	210.9	20.7	89.9%	70.0%	62.9%	15.5	1.85	81.73	1.53
120	1.63	1.20	5.18	207.9%	20.52	14.74	195.0	20.4	85.0%	67.6%	57.4%	18.0	1.63	83.84	1.35
130	1.48	1.32	4.62	230.7%	20.55	15.27	180.4	19.6	82.4%	67.1%	55.3%	19.2	1.48	85.32	1.23
140	1.33	1.23	4.76	227.9%	20.54	15.17	173.1	19.7	83.7%	68.7%	57.5%	19.1	1.33	86.80	1.11
150	1.20	1.39	4.36	241.6%	20.56	15.51	167.4	20.6	80.8%	67.9%	54.9%	19.8	1.20	88.15	0.99
160	1.05	1.37	4.39	241.0%	20.56	15.48	162.6	19.3	81.1%	68.5%	55.6%	19.8	1.05	89.59	0.87
170	0.91	1.35	4.67	226.3%	20.54	15.20	159.7	21.7	82.2%	70.3%	57.8%	18.9	0.91	91.02	0.75
180	0.77	1.34	4.78	221.0%	20.54	15.09	159.5	19.8	82.6%	70.5%	58.2%	18.7	0.77	92.41	0.64
190	0.64	1.44	4.56	227.4%	20.54	15.26	157.6	21.8	80.9%	70.2%	56.8%	19.0	0.64	93.72	0.53
200	0.49	1.33	4.45	239.8%	20.56	15.44	156.1	19.7	81.8%	69.7%	57.0%	19.7	0.49	95.20	0.40
210	0.37	1.20	4.70	232.9%	20.55	15.25	155.6	21.3	83.9%	71.0%	59.5%	19.4	0.37	96.36	0.30
220	0.24	1.24	4.07	269.9%	20.59	15.90	154.8	19.6	81.6%	68.4%	55.8%	21.5	0.24	97.62	0.20
230	0.13	1.25	3.70	296.8%	20.61	16.29	152.2	20.8	80.1%	67.1%	53.8%	23.0	0.13	98.70	0.11
240	0.02	1.21	3.44	322.4%	20.63	16.59	147.9	19.1	79.6%	66.2%	52.7%	24.4	0.02	99.78	0.02
250	0.00	1.37	2.77	374.5%	20.67	17.21	142.6	20.5	74.2%	62.8%	46.6%	27.2	0.00	100.00	0.00

%HC	Combustion Efficiency:	92.17%		Moisture of Wood (wet basis):	17.16
1.32	Total Input (kJ):	165,878	157,327 (Btu)	Initial Dry Weight Wt_{do} (kg):	8.37
	Total Output (kJ):	110,754	105,045 (Btu)	Moisture Content Dry	20.71
	Efficiency:	66.77%			
	Total CO (g):	914.07			

Load Weight (kg):	**10.11**				
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**
Value in kJ/kg - CV:	**19,810**	**18,329**	Btu/lb	**8522.5**	**7885.2**

72.70	**166064**	**4.06**	**6.87**	**2.74**	**19810.00**	**17.16**	**79.05**	**20.97**	**2.02**	**6.66**	**0.14**	**0.20**	**33.05**	**99.04**	**6.91**
% Dry		**Fuel Properties**				**Mw**	**Mass Balance**					**kg Wood pe**			
Comsumed	**Total**	**Carbon**	**Hydrogen**	**Oxygen**	**Calorific**	**Moisture**	**(moles/100 mole dry flue gas)**					**00 mole df**	**Moles per kg**		
y	**Input**	**/12= [a]**	**/1= [b]**	**/16= [c]**	**Value**	**Fuel Burnt**	**[h]**	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**
0.00	0	4.06	6.87	2.74	19810.00	17.16	78.87	20.92	0.32	1.01	0.05	0.03	22.49	620.48	16.87
6.90	21429	4.06	6.87	2.74	19810.00	17.16	79.43	21.07	2.93	9.85	0.10	0.29	37.68	30.12	2.78
18.93	21146	4.06	6.87	2.74	19810.00	17.16	79.66	21.13	4.00	13.48	0.13	0.40	38.15	10.63	2.34
32.40	21295	4.06	6.87	2.74	19810.00	17.16	79.36	21.05	4.38	14.56	0.25	0.44	36.30	7.09	3.94
44.61	17609	4.06	6.87	2.74	19810.00	17.16	79.56	21.10	3.76	12.65	0.14	0.37	37.77	14.16	2.67
53.63	13328	4.06	6.87	2.74	19810.00	17.16	79.54	21.10	3.00	10.15	0.08	0.30	38.40	27.96	2.14
60.68	10722	4.06	6.87	2.74	19810.00	17.16	79.49	21.09	2.77	9.36	0.07	0.28	38.33	33.89	2.21
66.56	8972	4.06	6.87	2.74	19810.00	17.16	79.44	21.07	2.56	8.65	0.07	0.25	38.13	40.23	2.40
71.50	7595	4.06	6.87	2.74	19810.00	17.16	79.39	21.06	2.39	8.08	0.07	0.24	37.90	46.02	2.60
75.72	6292	4.06	6.87	2.74	19810.00	17.16	79.37	21.05	2.36	7.96	0.08	0.23	37.77	47.36	2.72
79.08	4989	4.06	6.87	2.74	19810.00	17.16	79.24	21.02	2.16	7.22	0.10	0.21	36.69	56.30	3.68
81.73	3946	4.06	6.87	2.74	19810.00	17.16	79.08	20.98	1.87	6.18	0.12	0.19	35.07	72.36	5.11
83.84	2978	4.06	6.87	2.74	19810.00	17.16	78.88	20.92	1.61	5.22	0.15	0.16	32.37	92.10	7.50
85.32	2457	4.06	6.87	2.74	19810.00	17.16	78.79	20.90	1.50	4.83	0.17	0.15	30.87	102.02	8.82
86.80	2345	4.06	6.87	2.74	19810.00	17.16	78.84	20.91	1.51	4.89	0.15	0.15	31.61	100.75	8.17
88.15	2308	4.06	6.87	2.74	19810.00	17.16	78.74	20.89	1.46	4.66	0.18	0.15	30.02	106.76	9.57
89.59	2383	4.06	6.87	2.74	19810.00	17.16	78.76	20.89	1.46	4.67	0.17	0.15	30.19	106.49	9.42
91.02	2345	4.06	6.87	2.74	19810.00	17.16	78.78	20.90	1.52	4.89	0.17	0.15	30.78	100.16	8.90
92.41	2234	4.06	6.87	2.74	19810.00	17.16	78.79	20.90	1.55	4.98	0.17	0.15	31.01	97.87	8.69
93.72	2308	4.06	6.87	2.74	19810.00	17.16	78.74	20.88	1.52	4.86	0.19	0.15	30.09	100.71	9.50
95.20	2197	4.06	6.87	2.74	19810.00	17.16	78.78	20.90	1.46	4.69	0.17	0.15	30.53	105.95	9.12
96.36	2010	4.06	6.87	2.74	19810.00	17.16	78.85	20.92	1.49	4.82	0.15	0.15	31.70	102.87	8.09
97.62	1936	4.06	6.87	2.74	19810.00	17.16	78.79	20.90	1.35	4.31	0.16	0.13	30.39	118.73	9.26
98.70	1787	4.06	6.87	2.74	19810.00	17.16	78.76	20.89	1.26	4.01	0.16	0.13	29.57	130.19	9.99
99.78	1266	4.06	6.87	2.74	19810.00	17.16	78.76	20.89	1.18	3.76	0.15	0.12	29.25	141.05	10.29
100.00	186	4.06	6.87	2.74	19810.00	17.16	78.65	20.86	1.06	3.30	0.17	0.11	26.22	162.91	12.97

Moisture Content M_{Cwb}: 17.16

Dry kg : 8.37

CA: 48.73

HY: 6.87

OX: 43.9

															SUMS
0.85	520.92	32.83	11.51	483.87	7786.05	5749.64	5564.08	5508.09	7735.96	6649.73	294.63	6932.55	12384.34	51724.64	66341.86
				Stack	Heat Content Change - Ambient to Stack Temperature						Room	Energy Losses (kJ/kg			
of Dry Wood			Moisture	Temp	Flue Gas Constituent						Temp	Flue Gas Consti			
HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2	CO	N_2
1.46	2463.36	31.60	11.51	462.43	6676.36	4971.11	4820.93	4770.25	6543.80	5764.85	297.84	150.13	3084.47	4853.20	11750.86
0.36	272.56	33.81	11.51	497.21	8030.85	5931.84	5740.76	5682.91	7976.07	6861.00	301.94	302.57	178.64	802.51	1548.96
0.32	200.20	33.88	11.51	599.21	12882.91	9334.53	8988.47	8907.47	13191.82	10727.97	296.25	491.50	99.27	682.46	1783.31
0.56	182.00	33.40	11.51	625.09	14130.77	10188.68	9798.19	9712.60	14579.11	11690.29	295.63	513.01	72.23	1154.95	1767.69
0.37	212.54	33.79	11.51	615.71	13652.94	9860.42	9486.69	9402.94	14050.48	11319.99	296.46	515.73	139.62	781.35	1998.50
0.27	266.30	33.99	11.51	580.04	11969.72	8704.61	8390.01	8312.68	12187.20	10016.29	296.76	459.66	243.36	624.36	2213.70
0.27	288.54	33.99	11.51	558.37	10998.09	8033.46	7752.13	7678.77	11120.33	9257.66	296.07	421.56	272.27	643.75	2215.61
0.28	311.96	33.95	11.51	538.04	10102.99	7410.82	7159.19	7089.77	10146.99	8552.09	295.32	385.25	298.12	695.07	2211.70
0.31	333.24	33.91	11.51	521.98	9397.80	6916.50	6687.44	6621.37	9388.47	7990.41	294.90	356.22	318.28	753.90	2206.49
0.32	337.93	33.88	11.51	513.21	9047.15	6671.75	6454.15	6389.68	9009.00	7712.73	293.84	341.68	315.94	788.74	2159.26
0.45	368.92	33.63	11.51	496.76	8323.73	6159.05	5963.38	5902.71	8243.14	7127.93	293.76	305.39	346.77	1062.83	2177.65
0.63	425.39	33.27	11.51	484.04	7765.09	5760.70	5581.44	5523.87	7657.01	6672.60	293.81	272.35	416.86	1474.73	2349.80
0.94	492.92	32.63	11.51	468.15	7087.56	5275.75	5115.99	5062.28	6950.19	6117.55	293.51	229.42	485.90	2160.41	2495.28
1.12	526.49	32.28	11.51	453.54	6488.79	4845.57	4702.69	4652.52	6329.02	5624.58	292.77	200.31	494.34	2537.53	2449.49
1.03	523.63	32.47	11.51	446.26	6177.79	4620.37	4485.88	4437.65	6010.26	5365.82	292.80	195.31	465.51	2348.49	2323.70
1.22	542.16	32.08	11.51	440.59	5900.12	4417.06	4289.56	4243.22	5730.56	5131.34	293.78	177.11	471.54	2749.36	2300.51
1.20	541.59	32.12	11.51	435.76	5745.16	4306.64	4183.71	4138.21	5567.85	5005.15	292.49	173.44	458.59	2705.56	2241.19
1.14	519.24	32.25	11.51	432.87	5534.01	4148.83	4030.52	3986.67	5362.17	4821.92	294.84	170.33	415.56	2553.81	2070.03
1.11	511.17	32.30	11.51	432.65	5597.82	4198.57	4079.32	4034.84	5419.82	4880.45	292.92	173.59	410.91	2495.54	2062.47
1.22	519.52	32.08	11.51	430.71	5438.64	4079.11	3963.23	3920.01	5265.87	4741.55	294.95	163.64	410.82	2726.50	2036.53
1.16	540.44	32.20	11.51	429.26	5458.95	4097.45	3981.81	3938.23	5278.73	4764.03	292.82	166.65	434.11	2618.43	2128.36
1.01	531.87	32.49	11.51	428.71	5372.83	4031.87	3917.85	3875.03	5197.51	4687.44	294.47	170.34	414.76	2322.40	2061.02
1.16	588.39	32.21	11.51	427.93	5407.64	4060.19	3945.91	3902.67	5226.36	4721.18	292.70	164.36	482.08	2657.05	2296.28
1.25	629.54	32.03	11.51	425.32	5251.49	3944.11	3833.39	3791.31	5072.90	4586.63	293.93	155.31	513.49	2865.76	2386.80
1.27	669.72	31.98	11.51	421.04	5135.39	3861.79	3754.58	3713.12	4950.07	4492.73	292.28	150.21	544.70	2950.28	2486.76
1.63	744.39	31.27	11.51	415.71	4862.63	3659.81	3558.98	3519.52	4680.30	4258.91	293.61	127.49	596.20	3715.66	2619.90

			AVERAGE	SUMS						
19780.80	43243.44	15145.82	8290.52	55124.01	12994.30	42129.7	110940.3	12994.3	914.1	67.5
of Dry Fuel)			Total							
tuent			Loss	Total	Chemical	Sensible an	Total	Chem	Grams Produced	
CH_4	H_2O Comb	H_2O Fuel M	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
1309.32	1571.70	572.35	23292.03	0.00	0	0.00	0	0	0.00	0.00
320.36	1718.52	584.96	5456.53	5902.49	1194	4708.19	15527	1194	84.18	6.17
292.32	1852.88	629.46	5831.21	6224.52	1014	5210.97	14922	1014	69.86	5.53
509.90	1858.77	640.54	6517.08	7005.64	1739	5266.37	14289	1739	118.73	9.69
331.51	1868.18	636.28	6271.16	5574.52	962	4612.40	12035	962	66.49	5.21
241.26	1834.85	621.27	6238.46	4197.19	568	3629.10	9131	568	40.37	2.88
241.74	1808.97	612.54	6216.45	3364.60	468	2896.24	7357	468	33.55	2.32
256.11	1783.28	604.42	6233.97	2823.45	422	2401.72	6149	422	30.38	2.06
274.66	1762.04	597.96	6269.56	2403.62	387	2017.06	5191	387	27.94	1.87
288.66	1751.01	594.76	6240.05	1981.86	336	1646.18	4310	336	24.23	1.63
400.31	1718.46	588.03	6599.44	1661.92	362	1299.91	3327	362	25.94	1.80
564.29	1684.62	582.79	7345.44	1463.26	400	1063.72	2483	400	28.50	2.00
847.66	1634.47	576.41	8429.54	1267.34	445	821.84	1711	445	31.57	2.27
1005.47	1600.85	570.73	8858.73	1098.79	433	665.36	1358	433	30.63	2.23
921.91	1601.66	567.76	8424.34	997.41	382	615.28	1348	382	27.08	1.95
1095.92	1574.94	565.06	8934.46	1041.02	442	598.58	1267	442	31.22	2.28
1076.66	1572.98	563.61	8792.03	1057.47	449	608.11	1325	449	31.73	2.31
1017.16	1573.55	561.50	8361.95	990.03	418	572.20	1355	418	29.50	2.15
993.84	1577.99	562.17	8276.50	933.25	389	544.47	1301	389	27.45	2.00
1095.08	1562.47	560.57	8555.62	996.88	440	556.73	1311	440	31.00	2.28
1038.33	1569.37	560.83	8516.09	944.26	401	543.51	1252	401	28.33	2.06
908.26	1581.03	559.95	8017.77	813.67	324	489.56	1197	324	23.00	1.65
1037.56	1568.07	560.34	8765.72	856.62	357	499.73	1079	357	25.34	1.81
1116.31	1555.17	558.79	9151.63	825.54	355	470.36	961	355	25.24	1.80
1139.34	1549.66	557.71	9378.67	599.26	258	340.82	667	258	18.41	1.30
1456.85	1507.92	555.02	10579.03	99.41	48	51.31	87	48	3.41	0.24

Intertek Testing Services NA Ltd

Manufacturer:	SBI
Model:	NG1800
Date:	02/06/14
Run:	11
Control #:	G101440749
Test Duration:	250
Output Category:	4

Technicians:

_____

_____

_____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	66.8%	72.2%
Combustion Efficiency	92.2%	92.2%
Heat Transfer Efficiency	72%	78.3%

Output Rate (kJ/h)	26,581	25,215	**(Btu/h)**
Burn Rate (kg/h)	2.01	4.43	**(lb/h)**
Input (kJ/h)	39,811	37,765	**(Btu/h)**

Test Load Weight (dry kg)	8.37	18.46	**dry lb**
MC wet (%)	17.16		
MC dry (%)	20.71		
Particulate (g)	7.6325		
CO (g)	914		
Test Duration (h)	4.17		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	8.25
g/kg Dry Fuel	0.91	109.16
g/h	1.83	219.38
lb/MM Btu Output	0.16	19.18

Air/Fuel Ratio (A/F)	12.92

Version: 2.4 **15/04/2010**

Intertek

TEST FUEL DATA
EPA Method 5G-3

Project Number:	G101440749
Manufacturer:	Stove Builder International, inc
Model:	NG1800
Sample ID Number:	101440749MTL-003
Test Date:	February 6, 2014
Test Run Number:	11

Calibration Reference ID	SBI-153	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	9:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16	1.827	20.6	19.2	21.0
2	16	1.858	20.9	19.0	21.1
3	16	1.939	21.4	19.7	21.7
4	16	1.513	19.7	20.4	19.8
5	16	1.564	19.5	19.8	20.2
6	16	1.544	22.5	22.0	21.9
7	16	1.472	21.0	21.5	21.2
8	16	1.912	22.3	22.3	22.3
9	17	1.983	21.1	20.2	22.2
10	17	1.907	21.7	19.4	21.1
11	17	1.939	21.7	20.1	21.7
12	17	1.947	20.5	19.3	21.2
Total Weight		21.405	Average, %db		20.9

Allowable Fuel Load Range:	4.46	to	5.57

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214		Time:	10:30	Temp.,°F:	70
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15	1.550		19.8	19.1	20.2
2	15	1.554		19.5	19.1	20.0
3	15	1.463		19.5	18.9	19.3
4	15		3.950	22.3	22.7	21.9
5	15		3.720	20.0	22.1	20.0
6	15		4.005	21.0	21.9	22.2
7	15	2.174		21.9	21.7	22.1
8	15	1.641		19.7	18.9	19.5
9	15	2.221		22.0	21.9	22.2
,		10.603	11.675			
% of Weight		47.6	52.4			
Total weight, wet, lb.		22.278		Average Moisture, dry		20.72
Total weight, dry, kg		8.37		Average Moisture, wet		17.16

Date: _____ Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 25/11/2013 Engineer: Claude Pelland Run #: 1A Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	1	Tare:	0,1186	Preliminary Wt:	0,1534	
Rear Filter #	2	Tare:	0,1190	Preliminary Wt:	0,1210	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		25/11/2013 21:00		Preliminary Wt:	0,2744	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
26/11/2013	22:00	1,9	71,4	0,1529 0,1208	0,1 = 0,1000	
Probe #:	17	Tare:	139,7454	Preliminary Wt:	139,7487	
Date/Time in dessicator:		25/11/2013 21:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
26/11/2013	22:00	1,9	71,4	139,7478	200 = 200,0000	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 25/11/2013 Engineer: Claude Pelland Run #: 1A Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	3	Tare:	0,1190	Preliminary Wt:	0,1478	
Rear Filter #	4	Tare:	0,1183	Preliminary Wt:	0,1199	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		25/11/2013 21:00		Preliminary Wt:	0,2677	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
26/11/2013	22:00	1,9	71,4	0,1473 0,1197	0,1= 0,1000	
Probe #:	18	Tare:	147,8809	Preliminary Wt:	147,8841	
Date/Time in dessicator:		25/11/2013 21:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
26/11/2013	22:00	1,9	71,4	147,8836	200= 200,0000	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 26/11/2013 Engineer: Claude Pelland Run #: 2A Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	5	Tare:	0,1181	Preliminary Wt:	0,1675	
Rear Filter #	6	Tare:	0,1189	Preliminary Wt:	0,1225	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		26/11/2013 22:00		Preliminary Wt:	0,2900	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
Probe #:	19	Tare:	140,1085	Preliminary Wt:	140,1130	
Date/Time in dessicator:		26/11/2013 22:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 26/11/2013 Engineer: Claude Pelland Run #: 2A Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	7	Tare:	0,1190	Preliminary Wt:	0,1670	
Rear Filter #	8	Tare:	0,1183	Preliminary Wt:	0,1214	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		26/11/2013 22:00		Preliminary Wt:	0,2884	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
Probe #:	20	Tare:	139,0590	Preliminary Wt:	139,0641	
Date/Time in dessicator:		26/11/2013 22:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 02/12/2013 Engineer: Claude Pelland Run #: 1 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	9	Tare:	0,1200	Preliminary Wt:	0,1681	
Rear Filter #	10	Tare:	0,1193	Preliminary Wt:	0,1227	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		02/12/2013 21:00		Preliminary Wt:	0,2908	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
05/12/2013	8:00	2,5	68,8	0,1668 0,1223	0,1 = 0,1000	
06/12/2013	11:00	2,7	69,1	0,1674 0,1223	0,1 = 0,1000	
09/12/2013	9:00	2,1	69,0	0,1665 0,1224	0,1 = 0,1000	
08/01/2014	8:00	1,1	70,2	0,1664 0,1224	0,1 = 0,1000	
Probe #:	21	Tare:	136,0377	Preliminary Wt:	136,0406	
Date/Time in dessicator:		02/12/2013 21:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/12/2013	10:30	2,7	69,1	136,0397	200 = 199,9998	
09/12/2013	9:00	2,1	69,0	136,0394	200 = 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 02/12/2013 Engineer: Claude Pelland Run #: 1 Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	11	Tare:	0,1186	Preliminary Wt:	0,1601	
Rear Filter #	12	Tare:	0,1189	Preliminary Wt:	0,1216	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		02/12/2013 21:00		Preliminary Wt:	0,2817	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
05/12/2013	8:00	2,5	68,8	0,1590 0,1213	0,1= 0,1000	
06/12/2013	11:00	2,7	69,1	0,1592 0,1214	0,1= 0,1000	
09/12/2013	9:00	2,1	69,0	0,1584 0,1213	0,1= 0,1000	
08/01/2014	8:00	1,1	70,2	0,1582 0,1213	0,1= 0,1000	
Probe #:	22	Tare:	139,5700	Preliminary Wt:	139,5740	
Date/Time in dessicator:		02/12/2012 21:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/12/2013	10:30	2,7	69,1	139,5729	200= 199,9998	
09/12/2013	9:00	2,1	69,0	139,5728	200= 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 03/12/2013 Engineer: Claude Pelland Run #: 2 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	13	Tare:	0,1194	Preliminary Wt:	0,1480
Rear Filter #	14	Tare:	0,1193	Preliminary Wt:	0,1257
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		03/12/2013 22:00		Preliminary Wt:	0,2737

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
05/12/2013	8:00	2,5	68,8	0,1472 0,1256	0,1 = 0,1000	
06/12/2013	11:00	2,7	69,1	0,1476 0,1255	0,1 = 0,1000	
09/12/2013	9:00	2,1	69,0	0,1469 0,1253	0,1 = 0,1000	
08/01/2014	8:00	1,1	70,2	0,1470 0,1253	0,1 = 0,1000	

Probe #:	25	Tare:	136,8103	Preliminary Wt:	136,8134
Date/Time in dessicator:		03/12/2013 21:30			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/12/2013	10:30	2,7	69,1	136,8134	200 = 199,9998	
09/12/2013	9:00	2,1	69,0	136,8130	200 = 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800
Project #: G100968870 Sample ID #: _____
Date: 03/12/2013 Engineer: Claude Pelland Run #: 2 Sample Train #: B
Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	15	Tare:	0,1187	Preliminary Wt:	0,1530
Rear Filter #	16	Tare:	0,1189	Preliminary Wt:	0,1217
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		03/12/2013 22:00		Preliminary Wt:	0,2747

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
05/12/2013	8:00	2,5	68,8	0,1524 0,1215	0,1= 0,1000	
06/12/2013	11:00	2,7	69,1	0,1520 0,1214	0,1= 0,1000	
09/12/2013	9:00	2,1	69,0	0,1514 0,1211	0,1= 0,1000	
08/01/2014	8:00	1,1	70,2	0,1512 0,1212	0,1= 0,1000	

Probe #:	26	Tare:	139,8018	Preliminary Wt:	139,8052
Date/Time in dessicator:		03/12/2013 21:30			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/12/2013	10:30	2,7	69,1	139,8047	200= 199,9998	
09/12/2013	9:00	2,1	69,0	139,8043	200= 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 04/12/2013 Engineer: Claude Pelland Run #: 3 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	17	Tare:	0,1190	Preliminary Wt:	0,1377
Rear Filter #	18	Tare:	0,1191	Preliminary Wt:	0,1208
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		04/12/2013 19:00		Preliminary Wt:	0,2585

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/12/2013	11:00	2,7	69,1	0,1375 0,1207	0,1 = 0,1000	
09/12/2013	8:00	2,1	69,0	0,1372 0,1207	0,1 = 0,1000	
08/01/2014	8:00	1,1	70,2	0,1372 0,1207	0,1 = 0,1000	

Probe #:	27	Tare:	136,8891	Preliminary Wt:	136,8901
Date/Time in dessicator:		04/12/2013 19:00			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	9:00	2,1	69,0	136,8902	200 = 199,9998	
08/01/2014	8:30	1,1	70,2	136,8900	200 = 199,9996	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 04/12/2013 Engineer: Claude Pelland Run #: 3 Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	19	Tare:	0,1194	Preliminary Wt:	0,1368	
Rear Filter #	20	Tare:	0,1191	Preliminary Wt:	0,1207	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		04/12/2013	19:00	Preliminary Wt:	0,2575	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/12/2013	11:00	2,7	69,1	0,1365 0,1205	0,1 = 0,1000	
09/12/2013	8:00	2,1	69,0	0,1359 0,1205	0,1 = 0,1000	
08/01/2014	8:00	1,1	70,2	0,1359 0,1206	0,1 = 0,1000	
Probe #:	28	Tare:	136,2155	Preliminary Wt:	136,2166	
Date/Time in dessicator:		04/12/2013	19:00			
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	9:00	2,1	69,0	136,2168	200 = 199,9998	
08/01/2014	8:30	1,1	70,2	136,2169	200 = 199,9996	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 05/12/2013 Engineer: Claude Pelland Run #: 4 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	21	Tare:	0,1190	Preliminary Wt:	0,1439
Rear Filter #	22	Tare:	0,1189	Preliminary Wt:	0,1212
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		05/12/2013 20:00		Preliminary Wt:	0,2651

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	8:00	2,1	69,0	0,1434 0,1211	0,1= 0,1000	
08/01/2014	8:00	1,1	70,2	0,1433 0,1212	0,1 = 0,1000	

Probe #:	31	Tare:	137,0951	Preliminary Wt:	137,0969
Date/Time in dessicator:		05/12/2013 19:30			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	9:00	2,1	69,0	137,0966	200= 199,9998	
08/01/2014	8:30	1,1	70,2	137,0967	200= 199,9996	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 05/12/2013 Engineer: Claude Pelland Run #: 4 Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	23	Tare:	0,1187	Preliminary Wt:	0,1427	
Rear Filter #	24	Tare:	0,1182	Preliminary Wt:	0,1202	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		05/12/2013 20:00		Preliminary Wt:	0,2629	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	8:00	2,1	69,0	0,1421 0,1201	0,1= 0,1000	
08/01/2014	8:00	1,1	70,2	0,1421 0,1201	0,1= 0,1000	
Probe #:	32	Tare:	136,0071	Preliminary Wt:	136,0093	
Date/Time in dessicator:		05/12/2013 19:30				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	9:00	2,1	69,0	136,0089	200= 199,9998	
08/01/2014	8:30	1,1	70,2	136,0090	200= 199,9996	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 06/12/2013 Engineer: Claude Pelland Run #: 5 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	25	Tare:	0,1181	Preliminary Wt:	0,1333	
Rear Filter #	26	Tare:	0,1171	Preliminary Wt:	0,1189	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		06/12/2013	17:30	Preliminary Wt:	0,2522	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	8:00	2,1	69,0	0,1329 0,1188	0,1= 0,1000	
08/01/2014	8:00	1,1	70,2	0,1328 0,1189	0,1= 0,1000	
Probe #:	33	Tare:	135,9899	Preliminary Wt:	135,9905	
Date/Time in dessicator:		06/12/2013	17:30			
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	9:00	2,1	69,0	135,9909	200= 199,9998	
08/01/2014	8:30	1,1	70,2	135,9906	200= 199,9996	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 06/12/2013 Engineer: Claude Pelland Run #: 5 Sample Train #: 13

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	27	Tare:	0,1182	Preliminary Wt:	0,1321	
Rear Filter #	28	Tare:	0,1152	Preliminary Wt:	0,1165	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		06/12/2013 17:30		Preliminary Wt:	0,2486	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	8:00	2,1	69,0	0,1317 0,1164	0,1= 0,1000	
08/01/2014	8:00	1,1	70,2	0,1317 0,1165	0,1= 0,1000	
Probe #:	34	Tare:	108,4120	Preliminary Wt:	108,4138	
Date/Time in dessicator:		06/12/2013 17:30				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
09/12/2013	9:00	2,1	69,0	108,4136	200= 199,9998	
08/01/2014	8:30	1,1	70,2	108,4135	200= 199,9996	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 09/12/2013 Engineer: Claude Pelland Run #: 6 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	29	Tare:	0,1186	Preliminary Wt:	0,1291
Rear Filter #	30	Tare:	0,1179	Preliminary Wt:	0,1192
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		09/12/2013 15:30		Preliminary Wt:	0,2483

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:00	1,1	70,2	0,1287 0,1190	0,1= 0,1000	
09/01/2014	8:00	1,4	70,4	0,1287 0,1190	0,1= 0,1000	

Probe #:	35	Tare:	107,8399	Preliminary Wt:	107,8426
Date/Time in dessicator:		09/12/2013 15:30			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:30	1,1	70,2	107,8419	200= 199,9996	
09/01/2014	8:30	1,4	70,4	107,8421	200= 199,9997	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 09/12/2013 Engineer: Claude Pelland Run #: 6 Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	31	Tare:	0,1183	Preliminary Wt:	0,1272
Rear Filter #	32	Tare:	0,1181	Preliminary Wt:	0,1198
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		09/12/2013	15:30	Preliminary Wt:	0,2470

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:00	1,1	70,2	0,1268 0,1195	0,1 = 0,1000	
09/01/2014	8:00	1,4	70,4	0,1267 0,1195	0,1 = 0,1000	

Probe #:	36	Tare:	108,4995	Preliminary Wt:	108,5032
Date/Time in dessicator:		09/12/2013	15:30		

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:30	1,1	70,2	108,5025	200 = 199,9996	
09/01/2014	8:30	1,4	70,4	108,5023	200 = 199,9997	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 10/12/2013 Engineer: Claude Pelland Run #: 7 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	33	Tare:	0,1170	Preliminary Wt:	0,1340	
Rear Filter #	34	Tare:	0,1171	Preliminary Wt:	0,1187	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		10/12/2013 15:00		Preliminary Wt:	0,2527	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:00	1,1	70,2	0,1334 0,1186	0,1= 0,1000	
09/01/2014	8:00	1,4	70,4	0,1333 0,1186	0,1= 0,1000	
Probe #:	17	Tare:	139,7458	Preliminary Wt:	139,7505	
Date/Time in dessicator:		10/12/2013 15:30				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:30	1,1	70,2	139,7498	200= 199,9996	
09/01/2014	8:30	1,4	70,4	139,7497	200= 199,9997	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800
Project #: G100968870 Sample ID #: _____
Date: 10/12/2013 Engineer: Claude Pelland Run #: 7 Sample Train #: 13
Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	35	Tare:	0,1152	Preliminary Wt:	0,1299
Rear Filter #	36	Tare:	0,1171	Preliminary Wt:	0,1183
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		10/12/2013 15:00		Preliminary Wt:	0,2482

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:00	1,1	70,2	0,1295 0,1181	0,1 = 0,1000	
09/01/2014	8:00	1,4	70,4	0,1295 0,1181	0,1 = 0,1000	

Probe #:	18	Tare:	147,8821	Preliminary Wt:	147,8878
Date/Time in dessicator:		10/12/2013 15:30			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:30	1,1	70,2	147,8872	200 = 199,9996	
09/01/2014	8:30	1,4	70,4	147,8873	200 = 199,9997	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 11/12/2013 Engineer: Claude Pelland Run #: 8 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	37	Tare:	0,1179	Preliminary Wt:	0,1352	
Rear Filter #	38	Tare:	0,1162	Preliminary Wt:	0,1171	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		11/12/2013	14:30	Preliminary Wt:	0,2523	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:00	1,1	70,2	0,1344 0,1178	0,1 = 0,1000	
09/01/2014	8:00	1,4	70,4	0,1344 0,1177	0,1 = 0,1000	
Probe #:	19	Tare:	140,1077	Preliminary Wt:	140,1126	
Date/Time in dessicator:		11/12/2013	15:00			
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:30	1,1	70,2	140,1113	200 = 199,9996	
09/01/2014	8:30	1,4	70,4	140,1111	200 = 199,9997	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800
Project #: G100968870 Sample ID #: _____
Date: 11/12/2013 Engineer: Claude Pelland Run #: 8 Sample Train #: B
Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	39	Tare:	0,1172	Preliminary Wt:	0,1339
Rear Filter #	40	Tare:	0,1185	Preliminary Wt:	0,1205
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		11/12/2013 14:30		Preliminary Wt:	0,2544

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:00	1,1	70,2	0,1334 0,1203	0,1 = 0,1000	
09/01/2014	8:00	1,4	70,4	0,1335 0,1203	0,1 = 0,1000	

Probe #:	20	Tare:	139,0599	Preliminary Wt:	139,0672
Date/Time in dessicator:		11/12/2013 15:00			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
08/01/2014	8:30	1,1	70,2	139,0663	200 = 199,9996	
09/01/2014	8:30	1,4	70,4	139,0660	200 = 199,9997	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800
Project #: G100968870 Sample ID #: _____
Date: 04/02/2014 Engineer: Claude Pelland Run #: 9 Sample Train #: A
Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	49	Tare:	0,1197	Preliminary Wt:	0,1256	
Rear Filter #	50	Tare:	0,1191	Preliminary Wt:	0,1194	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		04/02/2014 16:30		Preliminary Wt:	0,2450	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/02/2014	8:00	2,6	68,7	0,1254 0,1192	0,1 = 0,1000	
12/02/2014	13:30	1,5	69,2	0,1253 0,1192	0,1 = 0,1000	
13/02/2014	9:30	2,7	68,5	0,1252 0,1192	0,1 = 0,1000	
Probe #:	17	Tare:	139,7455	Preliminary Wt:	139,7472	
Date/Time in dessicator:		04/02/2014 17:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
05/02/2014	21:00	3,2	69,3	139,7475	200 = 199,9997	
12/02/2014	13:00	1,5	69,2	139,7464	200g = 199,9997	
13/02/2014	9:00	2,7	68,5	139,7467	200 = 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800
Project #: G100968870 Sample ID #: _____
Date: 04/02/2014 Engineer: Claude Pelland Run #: 9 Sample Train #: B
Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	51	Tare:	0,1172	Preliminary Wt:	0,1230
Rear Filter #	52	Tare:	0,1196	Preliminary Wt:	0,1201
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		04/02/2014 16:30		Preliminary Wt:	0,2431

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
06/02/2014	8:00	2,6	68,7	0,1228 0,1199	0,1 = 0,1000	
12/02/2014	13:30	1,5	69,2	0,1228 0,1199	0,1 = 0,1000	
13/02/2014	9:30	2,7	68,5	0,1229 0,1199	0,1 = 0,1000	

Probe #:	18	Tare:	147,8836	Preliminary Wt:	147,8851
Date/Time in dessicator:		04/02/2014 17:00			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
05/02/2014	21:00	3,2	69,3	147,8856	200 = 199,9997	
12/02/2014	13:00	1,5	69,2	147,8846	200 = 199,9997	
13/02/2014	9:00	2,7	68,5	147,8848	200 = 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 05/02/2014 Engineer: Claude Pelland Run #: 10 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	53	Tare:	0,1184	Preliminary Wt:	0,1507
Rear Filter #	54	Tare:	0,1174	Preliminary Wt:	0,1195
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		05/02/2014 21:00		Preliminary Wt:	0,2702

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:30	1,5	69,2	0,1498 0,1194	0,1= 0,1000	
13/02/2014	9:30	2,7	68,5	0,1497 0,1194	0,1= 0,1000	

Probe #:	19	Tare:	140,1077	Preliminary Wt:	140,1118
Date/Time in dessicator:		05/02/2014 21:00			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:00	1,5	69,2	140,1108	200= 199,9997	
13/02/2014	9:00	2,7	68,5	140,1113	200= 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 05/02/2014 Engineer: Claude Pelland Run #: 10 Sample Train #: 13

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	55	Tare:	0,1200	Preliminary Wt:	0,1513
Rear Filter #	56	Tare:	0,1185	Preliminary Wt:	0,1211
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:		05/02/2014 21:00		Preliminary Wt:	0,2724

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:30	1,5	69,2	0,1504 0,1210	0,1= 0,1000	
13/02/2014	9:30	2,7	68,5	0,1503 0,1210	0,1= 0,1000	

Probe #:	20	Tare:	139,0603	Preliminary Wt:	139,0639
Date/Time in dessicator:		05/02/2014 21:00			

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:00	1,5	69,2	139,0626	200= 199,9997	
13/02/2014	9:00	2,7	68,5	139,0631	200= 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800

Project #: G100968870 Sample ID #: _____

Date: 06/02/2014 Engineer: Claude Pelland Run #: 11 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	57	Tare:	0,1176	Preliminary Wt:	0,1250	
Rear Filter #	58	Tare:	0,1197	Preliminary Wt:	0,1198	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		06/02/2014 16:00		Preliminary Wt:	0,2448	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:30	1,5	69,2	0,1250 0,1198	0,1= 0,1000	
13/02/2014	9:30	2,7	68,5	0,1250 0,1197	0,1= 0,1000	
Probe #:	21	Tare:	136,0348	Preliminary Wt:	136,0367	
Date/Time in dessicator:		06/02/2014 16:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:00	1,5	69,2	136,0359	200= 199,9997	
13/02/2014	9:00	2,7	68,5	136,0362	200= 199,9998	

Date: _____

Engineer Signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: NG1800
Project #: G100968870 Sample ID #: _____
Date: 06/02/2014 Engineer: Claude Pelland Run #: 11 Sample Train #: B
Balance Equipment #: SBI-206 Thermo/Hygrometer Equipment #: SBI-213

Front Filter #	59	Tare:	0,1183	Preliminary Wt:	0,1255	
Rear Filter #	60	Tare:	0,1177	Preliminary Wt:	0,1182	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		06/02/2014 16:00		Preliminary Wt:	0,2437	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:30	1,5	69,2	0,1254 0,1181	0,1= 0,1000	
13/02/2014	9:30	2,7	68,5	0,1255 0,1180	0,1= 0,1000	
Probe #:	22	Tare:	139,5683	Preliminary Wt:	139,7977	
Date/Time in dessicator:		06/02/2014 16:00				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/02/2014	13:00	1,5	69,2	139,7967	200= 199,9997	
13/02/2014	9:00	2,7	68,5	139,7968	200= 199,9998	

Date: _____

Engineer Signature: _____