Pacific Energy
Fireplace Products Ltd.

Project # 19-494
Model: NEO 2.5 LE
AKA: Neo 2.5 Insert LE, NEOSTONE 2.5 LE
Type: Residential Non-catalytic Wood Fired Heater
September 27, 2019

ASTM E3053 Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel (EPA ALT-125)

Contact: Mr. Jeff Bain
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Prepared by: Sebastian Button,
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Affidavit

PFS-TECO was contracted by Pacific Energy Fireplace Products Ltd. (Pacific Energy) to provide testing services for the NEO 2.5 LE Wood-Fired Room Heater per ASTM E3053, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel*, which was approved for use under EPA ALT-125. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory beginning on 9/11/2019 and ending on 7/16/2019. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed ASTM E3053, with variances as described in EPA ALT-125. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel,* with the exception of caveats described in EPA ALT-125. A copy of EPA ALT-125 is included in Appendix A for reference, as required by the approval letter.

PFS-TECO is accredited by the U.S. Environmental Protection Agency for the certification and auditing of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards for Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces, Methods 28R, 28WHH, 28 WHH-PTS, and all methods listed in Sections 60.534 and 60.5476. PFS-TECO holds EPA Accreditation Certificate Numbers 4 and 4M (mobile). PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2005 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

The following people were associated with the testing, analysis and report writing associated with this project.

Sebastian Button, Laboratory Supervisor

Introduction

Pacific Energy of Duncan, BC, contracted with PFS-TECO to perform EPA certification testing on NEO 2.5 LE Wood-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. All testing was performed by Sebastian Button.

Notes

- Prior to start of testing, 50 hours of conditioning was performed per ASTM E3053.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- Front filters were changed on sample train A at one hour for all 5 test runs.
- A total of 5 test runs were completed. Test runs were performed in accordance with ASTM E3053. For the four test runs used in the weighted average, no anomalies occurred. See the Run Narrative section for further detail on each run.

Wood Heater Identification and Testing

- Appliance Tested: ***NEO 2.5 LE***
- Serial Number: ***502 0032920– PFS Tracking Number 0030***
- Manufacturer***: Pacific Energy Fireplace Products Ltd.***
- Catalyst: ***No***
- Heat exchange blower: ***Optional***
- Type: ***Wood Stove***
- Style: ***Free Standing***
- Date Received: ***Thursday, August 01, 2019***
- Testing Period – Start: ***Wednesday, September 11, 2019***
  Finish: ***Tuesday, September 17, 2019***
- Test Location: ***PFS-TECO Portland Laboratory***
  11785 SE HWY 212 - Suite 305, Clackamas, OR 97015
- Elevation: ***~131 Feet above sea level***
- Test Technician(s): ***Sebastian Button***
- Observers: [redacted] ***of Pacific Energy (Test Runs 1 through 3 only).***

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Sebastian Button. All procedures used are directly from ASTM E3053 and ASTM E2515. See the list below for equipment used. See Appendix C submitted with this report for calibration data.

Equipment List:

Equipment ID#	Equipment Description
041	Rice Lake 3'x3' floor scale w/digital weight indicator
050	Digiweigh DWP12i Platform Scale
053	APEX XC-60 Digital Emissions Sampling Box A
054	APEX XC-60 Digital Emissions Sampling Box B
055	APEX Ambient sampling box
057	California Analytical ZRE CO2/CO/O2 IR ANALYZER
064	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
051	10 lb audit weight
090	Dewalt Tape Measure
092	Digital Calipers
095	Anemometer
111	Microtector
115	Delmhorst Wood Moisture Meter
SA17187	Gas Analyzer Calibration Span Gas
CC170624	Gas Analyzer Calibration Mid Gas

Results

The weighted average emissions rate for the 5 run test series was measured to be **2.04 g/hr** with a Higher Heating Value efficiency of **71.9%.** The average CO emission rate for the 5 tests was **2.1 g/min.** The Pacific Energy NEO 2.5 LE Wood-Fired Room Heater meets the 2020 cordwood PM emission standard of ≤ 2.5 g/hr per CFR 40 part 60, §60.532 (c).

Detailed individual run data can be found in Appendix A submitted with this report.

Summary Table

	High Fire Test	Low Fire Test	Medium Fire Test #1*	Medium Fire Test #2	Medium Fire Test #3
Date	9/11/2019	9/11/2019	9/12/2019	9/16/2019	9/17/2019
Run Number	1	2	3	4	5
PM Emission Rate (g/hr)	4.33	1.48	5.03	1.51	1.41
Burn Rate (kg/hr)	4.43	1.15	1.60	1.49	1.35
Heat Output (BTU/hr)	59,861	15,845	21,563	20,425	18,445
HHV Efficiency (%)	69.1%	72.8%	71.1%	72.4%	72.4%
LHV Efficiency (%)	73.9%	77.9%	76.1%	77.5%	77.5%
CO Emissions (g/MJ output)	2.02	6.78	8.10	6.16	6.58
CO Emissions (g/kg dry fuel)	27.83	98.53	115.10	89.03	95.17
CO Emissions (g/min)	2.12	1.89	3.07	2.21	2.13
1st Hour Emission Rate (g/hr)	5.21	8.94	16.65	3.91	3.21
Weighting Factor (%)	20%	40%	N/A	20%	20%
Weighted particulate emission average of 4 test runs: 2.04 grams per hour.					
Weighted average HHV efficiency of 4 test runs: 71.9%.					
Average CO emission rate for 4 test runs: 2.1 grams per minute					

***Run 3 is excluded from the weighted average on a 2-for-1 basis, results from runs 4 & 5 results were averaged together and used for weighed average calculations**

Test Run Narrative

Run 1

Run 1 was performed on 9/11/2019 as a high fire test run per ASTM E3053. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 33 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. Total test time was 127 minutes, main test fuel load burn time was 94 min. The particulate emissions rate from kindling ignition to test completion was 4.33 g/hr. The burn rate of the test fuel load was 4.43 kg/hr. The main test load portion of the run had an overall HHV efficiency of 69.1%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 2

Run 2 was performed on 9/11/2019 as a low fire test run per ASTM E3053. The overall test duration was 493 minutes. The burn rate for the test run was 1.15 kg/hr. The particulate emissions rate for the test run was 1.48 g/hr. The run had an overall HHV efficiency of 72.8%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 3

Run 3 was performed on 9/12/2019 as a medium fire test run per ASTM E3053. The overall test duration was 336 minutes. The burn rate for the test run was 1.60 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (2.79 kg/hr). The particulate emissions rate for the test run was 5.03 g/hr. The run had an overall HHV efficiency of 71.1%. The train A front filter was changed at 1 hr. There were no anomalies and all criteria were met. This test run was excluded from the weighted average calculation on a 2-for-1 basis, being replaced by test runs 4 and 5.

Run 4

Run 4 was performed on 9/16/2019 as a medium fire test run per ASTM E3053. The overall test duration was 367 minutes. The burn rate for the test run was 1.49 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (2.79 kg/hr). The particulate emissions rate for the test run was 1.51 g/hr. The run had an overall HHV efficiency of 72.4%. The train A front filter was changed at 1 hr. There were no anomalies and all criteria were met.

Run 5

Run 5 was performed on 9/17/2019 as a medium fire test run per ASTM E3053. The overall test duration was 403 minutes. The burn rate for the test run was 1.35 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (2.79 kg/hr). The particulate emissions rate for the test run was 1.41 g/hr. The run had an overall HHV efficiency of 72.4%. The train A front filter was changed at 1 hr. There were no anomalies and all criteria were met.

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E3053 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	67	74	57.7	47.2	30.04	7.42[1]	21.29	21.5%	127[1]
2	75	80	47.2	31.9	30.03	21.29	25.16	21.1%	493
3	76	82	45.1	31	29.97	20.23	24.19	22.5%	336
4	76	76	46.4	41.8	29.74	21.65	24.37	21.1%	367
5	75	75	47.2	47.1	29.67	21.42	24.42	22.1%	403

[1]This is the weight of the kindling and startup fuel

[2]Total test time was 127 min, high fire test load burn duration was 94 min.

Appliance Operation and Test Settings

The appliance was operated according to procedures as described in the Operations Manual, found in Appendix B submitted with this report. Detailed run information can be found in Appendix A submitted with this report.

Settings & Run Notes

	Pre-Burn Air Setting	Test Run Air and Fan Settings
Run 1	N/A – Cold Start Ignition	Air control set to high fire test setting (fully open), blower off for first 4 min, then set to high.
Run 2	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to low fire test setting (15/64" PAC Opening*), blower off for first 6 min, then set to high.
Run 3	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to medium fire test setting (11/32" PAC Opening), blower off for first 8 min, then set to high.
Run 4	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to medium fire test setting (9/32" PAC Opening), blower off for first 10 min, then set to high.
Run 5	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to medium fire test setting (9/32" PAC Opening), blower off for first 10 min, then set to high.

*PAC openings described above are for use on prototype test stove, the production model design has been revised so that when the PAC is fully closed it will have an equivalent air opening as the test setting described above, see Appendix C drawings for further detail.

Appliance Description

Model(s): NEO 2.5 LE

Additional Models Discussion: In addition to the tested model, this design is offered as the NEO 2.5 Insert LE and the NEOSTONE 2.5 LE. The difference between the models is that the NEO 2.5 LE is a free-standing design, while the NEO 2.5 Insert LE is designed to be a fireplace insert. The NEOSTONE 2.5 LE is another free-standing model that uses soapstone cladding. All models use an identical design in aspects that may affect emissions or air control and are presumed to have the same emissions performance as the test specimen provided for certification.

Appliance Type: Wood-Fired Room Heater

Firebox Volume: 2.10 ft^3

Air Introduction System: Primary Air enters the firebox from the front bottom of the appliance and is channeled up the sides on the appliance and down through the air wash, as well as through a pilot air opening in the front of the firebox. Primary air is controlled via a damper arm located below the ashlip which moves left (open) to right (closed). Secondary air is pulled through a fixed opening in to rear bottom of the appliance and channeled up through secondary air baffle. Dimensions on all these features can be found in Appendix D.

Baffles: A stainless steel secondary air baffle directs all flames towards the front of the firebox. The baffle is partially insulated with Superwool Blanket.

Refractory Insulation: The firebox is lined with 1" thick firebrick.

Flue Outlet: 6-inch exhaust outlet located on the top of the appliance.

Fan: The NEO 2.5 LE is equipped from the factory with a convection fan that attaches to the rear of the appliance.

Appliance Dimensions

NEO 2.5 LE Unit Dimensions

Height	Width	Depth	Firebox Volume
41"	29"	24"	2.10 ft^3

Appliance design drawings can be found in Appendix D submitted with the CBI copy of this report.

Appliance Front

Appliance Left

Appliance Right

Appliance Rear

Test Fuel Properties

Test fuel used was Maple cordwood, split and air-dried to the specified moisture content range. Typical fuel loads are pictured below:

Typical Kindling Load

Typical Startup Load

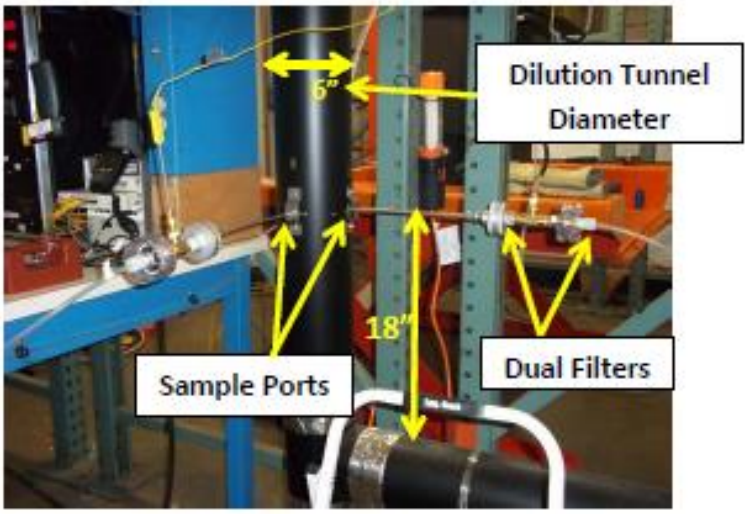
Typical High Fire Load

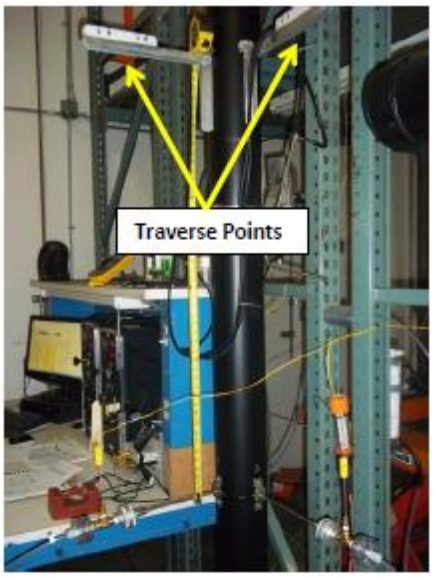
Typical Low Fire Load

Sampling Locations and Descriptions

Sample ports are located 16.5 feet downstream from any disturbances and 1 foot upstream from any disturbances. Flow rate traverse data was collected 12 feet downstream from any disturbances and 5.5 feet upstream from any disturbances. (See below).

Sample Points





Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 6 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used with the exception of caveats described in ALT-125: Pall TX40 Emfab filters were used, filter temperatures were maintained between 80 and 90°F for all tests, filters were weighed in pairs where applicable, and no sampling intervals fell outside of proportional rates of +/- 10%.

Analytical Methods Description

All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings, dessicated for a minimum of 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 Section 10.

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E3053. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 2975 Allenby Road Duncan, BC V9L 6V8, Canada, for archival.

Sealing Label

ATTENTION:

THIS SEAL IS NOT TO BE BROKEN WITHOUT PRIOR AUTHORIZATION FROM THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.

THIS APPLIANCE HAS BEEN SEALED INACCORDANCE WITH REQUIREMNTS OF 40CFR PART 60 SUBPART AAA §60.535 (a)(2)(vii)

REPORT #_____ DATE SEALED_____

MANUFACTURER_____ MODEL #_____

Sealed Unit

List of Appendices

The following appendices have been submitted electronically in conjunction with this report:

Appendix A – Test Run Data, Technician Notes, Sample Analysis, and Alternate Test Method Approval

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 2 8 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Justin White
Hearthstone QHPP, Inc.
#17 Stafford Ave.
Morrisville, VT 05661

Dear Mr. White,

I am writing in response to your letter dated January 12, 2018, regarding wood heaters manufactured by Hearthstone QHPP, Inc. (Hearthstone). This response, dated February 28, 2018, supercedes our previous response (dated February 26, 2018) to correct an inaccuracy regarding required changes to ASTM E3053-17.

You are requesting to use an alternative test method, using cord wood, as referenced in section 60.532(c) of 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020, must not discharge into the atmosphere any gases that contain particulate matter in excess of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator along with the procedures in 40 CFR 60.534. You have requested approval to use the procedures and specifications found in ASTM Method E3053-17, a cord wood test method titled, "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel," in conjunction with ASTM E2515-11 and Canadian Standards Administration (CSA) Method CSA-B415.1-10, which are specified in 40 CFR 60.534.

We understand that Hearthstone is also requesting that the alternative method proposed above be approved to apply broadly to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA, from the approval date of this request until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, providing all requirements of section 60.533 of Subpart AAA are met.

With the caveats set forth below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 in conjunction with section 60.534 of Subpart AAA to meet the 2020 cord wood compliance option until such time that Subpart AAA is revised or replaced to require a different cord wood certification method. We also approve application of this alternative method to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA.

As required in Subpart AAA, section 60.354(d), you or your approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run. Also, as required by Subpart AAA, section 60.534(e), you must have your approved laboratory measure the efficiency, heat output, and carbon monoxide emissions of the tested wood heater using CSA-B415.1-10. For measurement of particulate matter emission concentrations, ASTM 2515-11 must be used.

The following change to ASTM E3053-17 must be followed:

1. Coal bed conditions prior to loading test fuel. The coal bed shall be a level plane without valleys or ridges for all test runs in the high, low, and medium burn rate categories.

The following changes to ASTM E2515-11 must be followed:

1. The filter temperature must be maintained between 80 and 90 degrees F during testing.

2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.

3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.

4. Only one point is allowed outside the +/- 10 percent proportionality range per test run.

A copy of this letter must be included in each certification test report where this alternative test method is utilized.

It is reasonable that this alternative test method approval be broadly applicable to all wood heaters subject to the requirements of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-125 on our website at *http://www3.epa.gov/ttn/emc/approalt.html* for use by other interested parties. As noted earlier in this letter, this alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Amanda Aldridge, EPA/OAQPS/OID
Adam Baumgart-Getz, EPA/OAQPS/OID
Rafael Sanchez, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD

WOOD HEATER TESTING SUMMARY

SECTION 1 – Model Identification	
Model Name(s)/Number(s)	NEO 2.5 LE, NEO 2.5 Insert LE, NEOSTONE 2.5 LE
Manufacturer	Pacific Energy Fireplace Products
Address 1	2975 Allenby Road
Address 2	Duncan, BC V9L 6V8, Canada
Appliance Category(s) (Free-standing, Insert, etc.)	Free-standing
Usable Firebox Volume - ft^3	2.1
Catalytic/Non-Cat	Non-Cat
Convection Air Fan (No, Standard, Optional)	Optional
SECTION 1B – Laboratory Information	
Testing Laboratory	PFS-TECO
Address 1	11785 SE Hwy 212 Ste 305
Address 2	Clackamas, OR 97015
ISO/Accreditation Info	ISO 17025
Dates Tested	9/11/19 - 9/17/19
Test Methods/Standards	ASTM E3053 (ALT-125), ASTM E2515
Dilution Tunnel Inside Diameter - in.	6.00
Filter Diameter - mm	47
Filter Material	Pall Type TX40

SECTION 2 – Test Conditions Summary

Test Run #	1	2	3	4	5
Date Tested	9/11/2019	9/11/2019	9/12/2019	9/16/2019	9/17/2019
Test Run Category (L, M, H)	High Fire	Low Fire	Medium Fire	Medium Fire	Medium Fire
Average Barometric Pressure - in Hg	30.04	30.03	29.97	29.74	29.67
Max. Observed Ambient Temp - °F	75	80	82	79	76
Min. Observed Ambient Temp - °F	67	74	76	76	74
Max. Observed Filter Temp - °F	85	87	90	87	86
Test Fuel Load					
Cordwood Fuel Species	Maple, Hard	Maple, Hard	Maple, Hard	Maple, Hard	Maple, Hard
Specific Gravity (from Table 1)	0.6	0.6	0.6	0.6	0.6
Higher Heating Value - Btu/lb (from Annex A1)	8587	8587	8587	8587	8587
Nom. Test Fuel Load Piece Length - in.	16	16	16	16	16
Number of Test Fuel Pieces	5	5	5	5	5
Test Fuel Weight					
Kindling - As Fired lb	3.03	N/A	N/A	N/A	N/A
Kindling Wt. - As % of Test Fuel Load	14%	N/A	N/A	N/A	N/A
Kindling Moisture - % DB	10%	N/A	N/A	N/A	N/A
Kindling - kg DB	1.25	N/A	N/A	N/A	N/A
SU Fuel - As Fired lb	4.39	N/A	N/A	N/A	N/A
SU Fuel Wt. - As % of Test Fuel Load	21%	N/A	N/A	N/A	N/A
SU Fuel Moisture - % DB	22%	N/A	N/A	N/A	N/A
SU Fuel - kg DB	1.64	N/A	N/A	N/A	N/A
Test Fuel Load - As Fired lb	21.29	25.16	24.19	24.37	24.42
Ave. Test Fuel Load MC % DB	21.5%	21.1%	22.5%	21.1%	22.1%
Test Fuel Load - kg DB	7.95	9.43	8.96	9.13	9.07
Test Fuel Loading Density - lb/ft3	10.14	11.98	11.52	11.60	11.63
Residual SU Fuel Wt. - As Fired lb	2.14	N/A	N/A	N/A	N/A
Residual SU Fuel Wt. - As % of Test Fuel Load	10%	N/A	N/A	N/A	N/A
Test Run Duration - minutes	127	493	336	367	403
Test Run Duration - h	2.12	8.22	5.60	6.12	6.72
Run Duration of High Fire Load Only - minutes	94	N/A	N/A	N/A	N/A
Run Duration of High Fire Load Only - h	1.57	N/A	N/A	N/A	N/A
Test Fuel Load Wt. at End of Test - As Fired lb	2.2	0.0	0	0	0
Total Fuel Burned - kg DB	8.87	9.43	8.96	9.13	9.07
% Test Fuel Load Wt. at End of Test	10.3%	0.0%	0.0%	0.0%	0.0%

SECTION 3 – Test Run Results Summary

Test Run #	1	2	3	4	5
Date Tested	9/11/19	9/11/19	9/12/19	9/16/19	9/17/19
Test Run Category	High Fire	Low Fire	Medium Fire	Medium Fire	Medium Fire
Burn Rate - kg/h DB	4.43	1.15	1.60	1.49	1.35
Heat Output - Btu/h	59,861	15,845	21,563	20,425	18,445
Average Dilution Tunnel Flow Rate - dscfm	200.85	198.73	193.77	190.71	191.56
Average Sample Flow Rates - dscfm					
Train 1	0.146	0.149	0.149	0.148	0.148
Train 2	0.146	0.148	0.147	0.146	0.146
Total PM Emissions - g					
Train 1	9.43	12.92	26.34	9.41	8.77
Train 2	8.90	11.47	30.03	9.05	10.16
Average	9.164	12.194	28.185	9.227	9.466
PM Emission Train Precision - %	2.9%	6.0%	6.5%	2.0%	7.3%
PM Emission Train Precision - g/kg	0.03	0.08	0.21	0.02	0.08
PM Emission Rate - g/h	4.33	1.48	5.03	1.51	1.41
Total CO Emissions - g	200	931	1032	810.9	859.7
CO Emissions Rate - g/h	127	113	184	133	128
Overall Efficiency - CSA B415.1-10					
% HHV Basis	69%	73%	71%	72%	72%
% LHV Basis	74%	78%	76%	77%	77%

SECTION 4 - Weighted Average Summary

Test Run Category	High Fire	Low Fire	Medium Fire*
Burn Rate - kg/h DB	4.43	1.15	1.42
PM Emission Rate - g/h	4.33	1.48	1.46
CO Emissions Rate - g/h	127.3	113.2	130.3
Overall Efficiency - CSA B415.1-10			
% HHV Basis	69%	73%	72%
% LHV Basis	74%	78%	77%
Heat Output - Btu/h	59900	15800	19435
Category Weighting	20%	40%	40%

*Average of Runs 4 and 5, Run 3 not included in weighted average

ASTM E 3053 Weighted Averages	
PM Emission Rate - g/h	2.0
CO Emissions Rate - g/h (Arithmetic Average)	123.6
CO Emissions Rate - g/min (Arithmetic Average)	2.1
Overall Efficiency - CSA B415.1-10	
% HHV Basis	72%
% LHV Basis	77%
Heat Output Range - Btu/h	15800 to 59900

Conditioning Data

Client:	Pacific Energy	Job #:	19-494
Model:	NEO 2.5	Tracking #:	0030
Date(s):	8/6/19 - 9/9/2019	Technician:	SJB

		Average:	315.6	75.8	N/A
Elapsed Time (hrs)	**Scale Reading (lbs)**	**Weight Change (lbs)**	**Flue (°F)**	**Ambient (°F)**	**Catalyst Exit (°F)**
0	4.5	-	74	71	N/A
1	10.1	5.6	799	75	N/A
2	15.7	5.6	514	78	N/A
3	8.7	-7.0	356	79	N/A
4	6.2	-2.5	200	79	N/A
5	4.1	-2.1	183	79	N/A
6	3.3	-0.8	160	79	N/A
7	2.5	-0.8	171	78	N/A
8	1.7	-0.8	157	77	N/A
9	1.1	-0.6	148	76	N/A
10	0.6	-0.5	142	75	N/A
11	4.2	3.6	169	70	N/A
12	11.1	6.9	609	72	N/A
13	24.3	13.2	433	75	N/A
14	11.5	-12.8	530	75	N/A
15	5.6	-5.9	334	75	N/A
16	3.2	-2.4	231	75	N/A
17	2.3	-0.9	190	74	N/A
18	1.5	-0.8	173	76	N/A
19	0.9	-0.6	158	76	N/A
20	0.3	-0.6	148	76	N/A
21	20.9	20.6	455	72	N/A
22	7.4	-13.5	608	75	N/A
23	17.4	10.0	494	75	N/A
24	7.1	-10.3	471	75	N/A
25	3.8	-3.3	232	76	N/A
26	2.7	-1.1	208	76	N/A
27	1.6	-1.1	200	77	N/A
28	0.8	-0.8	180	77	N/A
29	0.1	-0.7	163	77	N/A
30	17.8	17.7	674	73	N/A
31	4.6	-13.2	507	76	N/A
32	15.1	10.5	469	77	N/A
33	6.4	-8.7	383	78	N/A
34	4.6	-1.8	200	77	N/A
35	3.5	-1.1	197	78	N/A
36	2.5	-1.0	194	78	N/A
37	1.7	-0.8	177	80	N/A
38	0.9	-0.8	166	80	N/A
39	0.3	-0.6	153	80	N/A
40	19.6	19.3	1078	73	N/A
41	5.3	-14.3	597	73	N/A
42	15.1	9.8	572	72	N/A
43	7.0	-8.1	506	73	N/A
44	5.0	-2.0	254	76	N/A
45	4.1	-0.9	206	76	N/A
46	3.3	-0.8	186	76	N/A
47	2.2	-1.1	190	76	N/A
48	1.6	-0.6	184	75	N/A
49	0.7	-0.9	166	75	N/A
50	0.0	-0.7	149	76	N/A

Signature/Date: 

Sample Calculations – ASTM E3053 & E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run: 1

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)

M_{Kdb} - Weight of kindling, dry basis, lb (kg)

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)

V_s – Average gas velocity in the dilution tunnel, ft/sec

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr

$V_{m(std)}$ – Volume of gas sampled, corrected to dry standard conditions, dscf

m_n – Total particulate matter collected, mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf

E_T – Total particulate emissions, g

PR - Proportional rate variation

PM_{RH} - Particulate emission rate for high fire test run, g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned

PM_R – Particulate emission rate for low or medium fire test run, g/hr

PM_F – Particulate emission factor for low or medium fire test run, g/dry kg of fuel burned

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)
ASTM E3053 equation (1)

$$M_{Fldb} = \Sigma((M_{FLnwb})(100/(100 + MC_{FLn})))$$

Where,

M_{FLnwb} = Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)
MC_{FLn} = Average fuel moisture of test fuel piece, n, in test fuel load, % dry basis
n = individual test fuel pieces that comprise the test fuel load, as applicable.

Sample Calculation:

n	M_{FLnwb}	MC_{FLn}	$(M_{FLnwb})(100/(100 + MC_{FLn}))$		
1	4.99	21.1	4.99 (100) / (100+ 21.1)) =	4.12	
2	4.07	21.5	4.07 (100) / (100+ 21.5)) =	3.35	
3	4.32	20.6	4.32 (100) / (100+ 20.6)) =	3.58	
4	5.31	22.1	5.31 (100) / (100+ 22.1)) =	4.35	
5	2.60	22.8	2.6 (100) / (100+ 22.8)) =	2.12	
6	0.00	NA	N/A	-	
7	N/A	N/A	N/A	-	
			SUM	17.52	lbs

M_{Fldb} = **17.52** lbs
M_{Fldb} = **7.95** kg

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)
ASTM E3053 equation (2)

$$M_{SUdb} = (M_{SUwb})(100/(100 + MC_{SU}))$$

Where,

M_{SUwb} = Total weight of start-up fuel pieces, wet basis, lb (kg)

MC_{SU} = Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample Calculation:

M_{SUwb} = 4.39

MC_{SU} = 21.5

M_{SUdb} = 4.4 (100/(100+ 21.5)

M_{SUdb} = **3.61** lbs

= **1.64** kg

M_{Kdb} - Weight of kindling, dry basis, lb (kg)
ASTM E3053 equation (3)

$$M_{Kdb} = (M_{Kwb})(100/(100 + MC_K))$$

Where,

M_{Kwb} = Weight of kindling per 8.5.6, wet basis, lb (kg);

MC_K = Average moisture of kindling (may be assumed 10%), % dry basis.

Sample calculation:

M_{Kwb} = 3.03

MC_K = 10.0

M_{Kdb} = 3.03 (100/(100+ 10.0)

M_{Kdb} = **2.75** lbs

= **1.25** kgs

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)
ASTM E3053 equation (4)

$$M_{FREHdb} = M_{RSUBdb} + M_{FLEHdb}$$

Where,

M_{RSUBdb} = Weight of residual start-up fuel bed when high fire test load added, lb (kg)

M_{FLEHdb} = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

M_{RSUBdb} = 2.14

M_{FLEHdb} = 2.2

M_{FREHdb} = 2.14 + 2.2

M_{FREHdb} = **4.34** lbs

= **1.97** kg

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

ASTM E3053 equation (5)

$$M_{TFBHdb} = M_{Kdb} + M_{SUdb} + M_{FLdb} - M_{FREHdb}$$

Sample Calculation:

M_{Kdb} = 2.75

M_{SUdb} = 3.61

M_{FLdb} = 17.52

M_{FREHdb} = 4.34

M_{TFBHdb} = 2.75 + 3.61 + 17.52 - 4.34

= **19.54** lbs

= **8.87** kg

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

ASTM E3053 equation (6)

$$BR_H = 60 (M_{FLdb} - M_{FLEHdb})/\theta_{H1}$$

Where,

θ_{H1} = Total duration of high fire test run, from time when test fuel load is added to end of test run, min.

Sample calculation:

M_{FLdb} = 17.52

M_{FLEHdb} = 2.20

θ_{H1} = 94

$$BR_H = \frac{60 (17.52 - 2.20)}{94}$$

BR_H = **9.78** lb/hr

= **4.43** kg/hr

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis
ASTM E3053 equation (7)

$$M_{TFBdb} = M_{FLdb} - M_{FREdb}$$

Where,

M_{FLdb} = Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

M_{FREdb} = Weight of remaining fuel at end of low or medium fire test run, lb (kg)

Sample Calculation:

M_{FLdb} = N/A - Applicable to Low/Medium Fire Tests Only

M_{FREdb} = N/A - Applicable to Low/Medium Fire Tests Only

M_{TFBdb} = N/A - N/A

= **N/A** lbs

= **N/A** kg

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)
ASTM E3053 equation (8)

$$BR = \frac{60\ M_{TFBdb}}{\theta}$$

Where,

θ = Total test run duration for low or medium fire test run, min.

Sample Calculation:

M_{TFBdb} = N/A - Applicable to Low/Medium Fire Tests Only

θ = N/A - Applicable to Low/Medium Fire Tests Only

$$BR = \frac{60 \times \text{N/A}}{\text{N/A}}$$

BR = **N/A** lb/hr

= **N/A** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equation (9)

$$v_s = F_P \times k_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where:

F_p = Adjustment factor for pitot tube center point reading = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)

v_{scent} = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec

v_{strav} = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec

k_p = Pitot tube constant, 85.49

C_p = Pitot tube coefficient: 0.99, unitless

ΔP* = Velocity pressure in the dilution tunnel, in H_2O

T_s = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)

P_s = Absolute average gas static pressure in dilution tunnel, = $P_{bar} + P_g$, in Hg

P_{bar} = Barometric pressure at test site, in. Hg

P_g = Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)

M_s = **The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{18.82}{20.42} = 0.922$$

$$V_s = 0.922 \times 85.49 \times 0.99 \times 0.302 \times \left(\frac{137.3 + 460}{\left(30.04 + \frac{-0.20}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **19.61** ft/s

*The ASTM test standard mistakenly has the square root of the average delta p instead of the average of the square root of delta p. The current EPA Method 2 is also incorrect. This was verified by Mike Toney at EPA.

**The ASTM test standard mistakenly identifies Ms as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr
ASTM E2515 equation (3)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_{s(avg)}} \times \frac{P_s}{P_{std}}$$

Where:

3600	=	Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws}	=	Water vapor in gas stream, proportion by volume; assume 2%
A	=	Cross sectional area of dilution tunnel, ft^2
T_{std}	=	Standard absolute temperature, 528 °R
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
$T_{s(avg)}$	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 19.61 \times 0.1963 \times \frac{528}{137.3 + 460} \times \frac{30.04 + \frac{-0.20}{13.6}}{29.92}$$

Q_{sd} = **12051.2** dscf/hr

$V_{m(std)}$ – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf
ASTM E2515 equation (6)

$$V_{m(std)} = K_1 V_m Y \frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}$$

Where:

K_1	=	17.64 °R/in. Hg
V_m	=	Volume of gas sample measured at the dry gas meter, dcf
Y	=	Dry gas meter calibration factor, dimensionless
P_{bar}	=	Barometric pressure at the testing site, in. Hg
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 18.573 \times 0.999 \times \frac{\left(30.04 + \frac{2.20}{13.6}\right)}{(85.5 + 460)}$$

$V_{m(std)}$ = **18.122** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 18.552 \times 0.996 \times \frac{\left(30.04 + \frac{2.23}{13.6}\right)}{(85.0 + 460)}$$

$V_{m(std)}$ = **18.063** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 24.88 \times 0.992 \times \frac{\left(\underline{30.04} + \frac{0.00}{13.6}\right)}{(71.4 + 460)}$$

$V_{m(std)}$ = **24.611** dscf

m_n – Total Particulate Matter Collected, mg
ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg
m_f = mass of particulate matter from filters, mg
m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A (first hour):

m_n = 0.0 + 3.7 + 0.0

m_n = 3.7 mg

Using equation for Train A (post-first hour):

m_n = 0.0 + 1.3 + 1.7

m_n = 3.0 mg

Train A aggregate:

m_n = 3.7 + 3.0
m_n = **6.7** mg

Using equation for Train B:

m_n = 0.1 + 2.5 + 3.7

m_n = **6.3** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf
ASTM E2515 equation (13)

$$C_s = K_2 \times \frac{m_n}{V_{m(std)}}$$

Where:

K_2	=	Constant, 0.001 g/mg
m_n	=	Total mass of particulate matter collected in the sampling train, mg
$V_{m(std)}$	=	Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{6.7}{18.12}$$

C_s = **0.00037** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{6.3}{18.06}$$

C_s = **0.00035** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{24.61}$$

C_r = **0.000000** g/dscf

E_T – Total Particulate Emissions, g
ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculation:

For Train 1

E_T = (0.000370 - 0.000000) x 12051.2 x 127 /60

E_T = **9.43** g

For Train 2

E_T = (0.000349 - 0.000000) x 12051.2 x 127 /60

E_T = **8.90** g

Average

E = **9.16** g

Total emission values shall not differ by more than 7.5% from the total average emissions

7.5% of the average =	0.69
Train 1 difference =	0.27
Train 2 difference =	0.27

PR - Proportional Rate Variation

ASTM E2515 equation (16)

$$PR = \left[\frac{\theta \times V_{mi} \times V_s \times T_m \times T_{si}}{\theta_i \times V_m \times V_{si} \times T_{mi} \times T_s} \right] \times 100$$

Where:

θ	=	Total sampling time, min
θ_i	=	Length of recording interval, min
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf
V_m	=	Volume of gas sample as measured by dry gas meter, dcf
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
V_s	=	Average gas velocity in the dilution tunnel, ft/sec
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR
T_m	=	Absolute average dry gas meter temperature, ^oR
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR

Sample calculation (for the first 1 minute interval of Train 1):

$$PR = \left(\frac{127 \times 0.122 \times 19.61 \times (75.0 + 460) \times (85.5 + 460)}{1 \times 18.573 \times 18.21 \times (137.3 + 460) \times (75.0 + 460)} \right) \times 100$$

PR = **82** %

PM_{RH} - Particulate emission rate for high fire test run, g/hr;
ASTM E3053 equation (9)

$$PM_{RH} = 60(E_{TH}/\theta_{H2})$$

Where,

E_{TH} = Total particulate emissions for high fire test run including kindling and start-up, g

θ_{H2} = Total duration of high fire test run, from ignition of kindling to end of test run, min.

Sample Calculation:

E_{TH} = 9.16

θ_{H2} = 127

PM_{RH} = 60(9.16 / 127)

PM_{RH} = **4.33** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.

ASTM E3053 equation (10)

$$PM_{FH} = E_{TH}/M_{TFBHdb}$$

Sample Calculation:

E_{TH} = 9.16

M_{TFBHdb} = 8.87

PM_{FH} = 9.16 / 8.87

= **1.03** g/kg

PM_R - Particulate emission rate for low or medium fire test runs, g/hr
ASTM E3053 equation (12)

$$PM_R = 60(E_T/\theta)$$

Where,

E_T = Total particulate emissions for low or medium fire test runs from Test Method E2515, g

Sample Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only
θ = N/A - Applicable to Low/Medium Fire Tests Only

PM_R = 60(N/A / N/A)

PM_{RH} = **N/A** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.
ASTM E3053 equation (13)

$$PM_F = E_T/M_{TFBdb}$$

Sample Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only
M_{TFBdb} = N/A - Applicable to Low/Medium Fire Tests Only

PM_{FH} = N/A / N/A
= **N/A** g/kg

Sample Calculations – ASTM E3053 & E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run: 2

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)

M_{Kdb} - Weight of kindling, dry basis, lb (kg)

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)

V_s – Average gas velocity in the dilution tunnel, ft/sec

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr

$V_{m(std)}$ – Volume of gas sampled, corrected to dry standard conditions, dscf

m_n – Total particulate matter collected, mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf

E_T – Total particulate emissions, g

PR - Proportional rate variation

PM_{RH} - Particulate emission rate for high fire test run, g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned

PM_R – Particulate emission rate for low or medium fire test run, g/hr

PM_F – Particulate emission factor for low or medium fire test run, g/dry kg of fuel burned

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)
ASTM E3053 equation (1)

$$M_{Fldb} = \Sigma((M_{FLnwb})(100/(100 + MC_{FLn})))$$

Where,

M_{FLnwb} = Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)
MC_{FLn} = Average fuel moisture of test fuel piece, n, in test fuel load, % dry basis
n = individual test fuel pieces that comprise the test fuel load, as applicable.

Sample Calculation:

n	M_{FLnwb}	MC_{FLn}	$(M_{FLnwb})(100/(100 + MC_{FLn}))$		
1	4.73	20.9	4.73 (100) / (100+ 20.9)) =	3.91	
2	4.76	22.4	4.76 (100) / (100+ 22.4)) =	3.89	
3	5.32	20.7	5.32 (100) / (100+ 20.7)) =	4.41	
4	7.33	20.6	7.33 (100) / (100+ 20.6)) =	6.08	
5	3.02	21.1	3.02 (100) / (100+ 21.1)) =	2.49	
6	0.00	NA	N/A	-	
7	0.00		N/A	-	
			SUM	20.78	lbs

M_{Fldb} = **20.78** lbs
M_{Fldb} = **9.43** kg

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)
ASTM E3053 equation (2)

$$M_{SUdb} = (M_{SUwb})(100/(100 + MC_{SU}))$$

Where,

M_{SUwb} = Total weight of start-up fuel pieces, wet basis, lb (kg)

MC_{SU} = Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample Calculation:

M_{SUwb} = N/A - Applicable to High Fire Tests Only

MC_{SU} = N/A - Applicable to High Fire Tests Only

M_{SUdb} = N/A (100/(100+ N/A)

M_{SUdb} = **N/A** lbs

= **N/A** kg

M_{Kdb} - Weight of kindling, dry basis, lb (kg)
ASTM E3053 equation (3)

$$M_{Kdb} = (M_{Kwb})(100/(100 + MC_K))$$

Where,

M_{Kwb} = Weight of kindling per 8.5.6, wet basis, lb (kg);

MC_K = Average moisture of kindling (may be assumed 10%), % dry basis.

Sample calculation:

M_{Kwb} = N/A - Applicable to High Fire Tests Only

MC_K = N/A - Applicable to High Fire Tests Only

M_{Kdb} = N/A (100/(100+ N/A)

M_{Kdb} = **N/A** lbs

= **N/A** kgs

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)
ASTM E3053 equation (4)

$$M_{FREHdb} = M_{RSUBdb} + M_{FLEHdb}$$

Where,

M_{RSUBdb} = Weight of residual start-up fuel bed when high fire test load added, lb (kg)

M_{FLEHdb} = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

M_{RSUBdb} = N/A - Applicable to High Fire Tests Only

M_{FLEHdb} = N/A - Applicable to High Fire Tests Only

M_{FREHdb} = N/A + N/A

M_{FREHdb} = **N/A** lbs

= **N/A** kg

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

ASTM E3053 equation (5)

$$M_{TFBHdb} = M_{Kdb} + M_{SUdb} + M_{FLdb} - M_{FREHdb}$$

Sample Calculation:

M_{Kdb} = N/A

M_{SUdb} = N/A

M_{FLdb} = N/A

M_{FREHdb} = N/A

M_{TFBHdb} = N/A + N/A + N/A - N/A

= **N/A** lbs

= **N/A** kg

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

ASTM E3053 equation (6)

$$BR_H = 60 (M_{FLdb} - M_{FLEHdb})/\theta_{H1}$$

Where,

θ_{H1} = Total duration of high fire test run, from time when test fuel load is added to end of test run, min.

Sample calculation:

M_{FLdb} = N/A - Applicable to High Fire Tests Only

M_{FLEHdb} = N/A - Applicable to High Fire Tests Only

θ_{H1} = N/A - Applicable to High Fire Tests Only

$$BR_H = \frac{60 (\text{N/A} - \text{N/A})}{\text{N/A}}$$

BR_H = **N/A** lb/hr

= **N/A** kg/hr

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis
ASTM E3053 equation (7)

$$M_{TFBdb} = M_{FLdb} - M_{FREdb}$$

Where,

M_{FLdb} = Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

M_{FREdb} = Weight of remaining fuel at end of low or medium fire test run, lb (kg)

Sample Calculation:

M_{FLdb} = 20.78

M_{FREdb} = 0.00

M_{TFBdb} = 20.78 - 0.00

= **20.78** lbs

= **9.43** kg

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)
ASTM E3053 equation (8)

$$BR = \frac{60\ M_{TFBdb}}{\theta}$$

Where,

θ = Total test run duration for low or medium fire test run, min.

Sample Calculation:

M_{TFBdb} = 20.78

θ = 493

$$BR = \frac{60 \times 20.78}{493}$$

BR = **2.53** lb/hr

= **1.15** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equation (9)

$$v_s = F_P \times k_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where:

F_p = Adjustment factor for pitot tube center point reading = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)

v_{scent} = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec

v_{strav} = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec

k_p = Pitot tube constant, 85.49

C_p = Pitot tube coefficient: 0.99, unitless

ΔP* = Velocity pressure in the dilution tunnel, in H_2O

T_s = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)

P_s = Absolute average gas static pressure in dilution tunnel, = $P_{bar} + P_g$, in Hg

P_{bar} = Barometric pressure at test site, in. Hg

P_g = Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)

M_s = **The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{18.81}{20.41} = 0.922$$

$$V_s = 0.922 \times 85.49 \times 0.99 \times 0.289 \times \left(\frac{97.0 + 460}{\left(30.03 + \frac{-0.20}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **18.10** ft/s

*The ASTM test standard mistakenly has the square root of the average delta p instead of the average of the square root of delta p. The current EPA Method 2 is also incorrect. This was verified by Mike Toney at EPA.

**The ASTM test standard mistakenly identifies Ms as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr
ASTM E2515 equation (3)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_{s(avg)}} \times \frac{P_s}{P_{std}}$$

Where:

3600	=	Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws}	=	Water vapor in gas stream, proportion by volume; assume 2%
A	=	Cross sectional area of dilution tunnel, ft^2
T_{std}	=	Standard absolute temperature, 528 °R
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
$T_{s(avg)}$	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 18.10 \times 0.1963 \times \frac{528}{97.0 + 460} \times \frac{30.03 + \frac{-0.20}{13.6}}{29.92}$$

Q_{sd} = **11923.9** dscf/hr

$V_{m(std)}$ – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf
ASTM E2515 equation (6)

$$V_{m(std)} = K_1 V_m Y \frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}$$

Where:

K_1	=	17.64 °R/in. Hg
V_m	=	Volume of gas sample measured at the dry gas meter, dcf
Y	=	Dry gas meter calibration factor, dimensionless
P_{bar}	=	Barometric pressure at the testing site, in. Hg
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 73.295 \times 0.999 \times \frac{\left(30.03 + \frac{2.19}{13.6}\right)}{(101.9 + 460)}$$

$V_{m(std)}$ = **69.404** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 72.768 \times 0.996 \times \frac{\left(30.03 + \frac{2.18}{13.6}\right)}{(\#\#\#\#\# + 460)}$$

$V_{m(std)}$ = **68.823** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 96.83 \times 0.992 \times \frac{\left(\underline{30.03} + \frac{0.00}{13.6}\right)}{(77.6 + 460)}$$

$V_{m(std)}$ = **94.645** dscf

m_n – Total Particulate Matter Collected, mg
ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg

m_f = mass of particulate matter from filters, mg

m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A (first hour):

m_n = 0.0 + 6.4 + 0.0

m_n = 6.4 mg

Using equation for Train A (post-first hour):

m_n = 0.3 + 0.1 + 2.5

m_n = 2.9 mg

Train A aggregate:

m_n = 6.4 + 2.9

m_n = **9.3** mg

Using equation for Train B:

m_n = 0.2 + 4.9 + 3.1

m_n = **8.2** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf
ASTM E2515 equation (13)

$$C_s = K_2 \times \frac{m_n}{V_{m(std)}}$$

Where:

K_2	=	Constant, 0.001 g/mg
m_n	=	Total mass of particulate matter collected in the sampling train, mg
$V_{m(std)}$	=	Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{9.3}{69.40}$$

C_s = **0.00013** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{8.2}{68.82}$$

C_s = **0.00012** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.2}{94.64}$$

C_r = **0.000002** g/dscf

E_T – Total Particulate Emissions, g
ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculation:

For Train 1

E_T = (0.000134 - 0.000002) x 11923.9 x 493 /60

E_T = **12.92** g

For Train 2

E_T = (0.000119 - 0.000002) x 11923.9 x 493 /60

E_T = **11.47** g

Average

E = **12.19** g

Total emission values shall not differ by more than 7.5% from the total average emissions

7.5% of the average =	0.91
Train 1 difference =	0.73
Train 2 difference =	0.73

PR - Proportional Rate Variation

ASTM E2515 equation (16)

$$PR = \left[\frac{\theta \times V_{mi} \times V_s \times T_m \times T_{si}}{\theta_i \times V_m \times V_{si} \times T_{mi} \times T_s} \right] \times 100$$

Where:

θ	=	Total sampling time, min
θ_i	=	Length of recording interval, min
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf
V_m	=	Volume of gas sample as measured by dry gas meter, dcf
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
V_s	=	Average gas velocity in the dilution tunnel, ft/sec
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR
T_m	=	Absolute average dry gas meter temperature, ^oR
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR

Sample calculation (for the first 1 minute interval of Train 1):

$$PR = \left(\frac{493 \times 0.145 \times 18.10 \times (154.0 + 460) \times (\#\#\#\# + 460)}{1 \times 73.295 \times 19.51 \times (97.0 + 460) \times (94.0 + 460)} \right) \times 100$$

PR = **101** %

PM_{RH} - Particulate emission rate for high fire test run, g/hr;
ASTM E3053 equation (9)

$$PM_{RH} = 60(E_{TH}/\theta_{H2})$$

Where,

E_{TH} = Total particulate emissions for high fire test run including kindling and start-up, g

θ_{H2} = Total duration of high fire test run, from ignition of kindling to end of test run, min.

Sample Calculation:

E_{TH} = N/A - Applicable to High Fire Tests Only

θ_{H2} = N/A - Applicable to High Fire Tests Only

PM_{RH} = 60(N/A / N/A)

PM_{RH} = **N/A** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.

ASTM E3053 equation (10)

$$PM_{FH} = E_{TH}/M_{TFBHdb}$$

Sample Calculation:

E_{TH} = N/A - Applicable to High Fire Tests Only

M_{TFBHdb} = N/A - Applicable to High Fire Tests Only

PM_{FH} = N/A / N/A

= **N/A** g/kg

PM_R - Particulate emission rate for low or medium fire test runs, g/hr
ASTM E3053 equation (12)

$$PM_R = 60(E_T/\theta)$$

Where,

E_T = Total particulate emissions for low or medium fire test runs from Test Method E2515, g

Sample Calculation:

E_T = 12.19
θ = 493

PM_R = 60(12.19 / 493)

PM_{RH} = **1.48** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.

ASTM E3053 equation (13)

$$PM_F = E_T/M_{TFBdb}$$

Sample Calculation:

E_T = 12.19
M_{TFBdb} = 9.43

PM_{FH} = 12.19 / 9.43
= **1.29** g/kg

PACIFIC ENERGY
FIREPLACE PRODUCTS LTD.

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Fax: (250) 748-0844

September 6, 2018

Mr. John Steinert
PFS TECO Laboratories.
11785 SE Highway 212 - Suite 305
Clackamas, OR 97015
RE: OPERATING INSTRUCTIONS FOR THE NEO 2.5 LE WOODSTOVE

John: The operating instructions for the NEO 2.5 LE are as follows:

PRIMARY AIR CONTROL (PAC):
To open the primary air inlet orifice and increase the amount of air entering the stove, push the end of the handle underneath the ash lip to the left. To close the primary air inlet orifice and decrease the amount of air entering the stove, pull the end of the handle underneath the ash lip to the right.

BURN CATEGORY	Primary Air Control (PAC)
Low:	Set control at the stop. At the stop the primary air inlet orifice should be closed with a set height of 0.2344" (15/64"). Be certain to check this.
Medium:	Set PAC at (stop) to 0.6250" (5/8") open.
High:	Wide Open. Push the handle all the way to the left.

START-UP:
Load kindling and ignite, crack the door open about 1" to 4" until kindling is fully ignited. When kindling is burnt down, load remaining kindling and 2 to 3 small pieces of start-up fuel, crack the door open about 1" to 2" until kindling and start-up fuel is ignited. When kindling and start-up fuel is burnt down, load remaining start-up fuel, crack the door open about 1" to 2" until start-up fuel is ignited.

FUEL LOAD:
As soon as the fuel is loaded, close the door. If the fuel load is slow to ignite, crack the door open about 1" to 2". Monitor and adjust the door so that the impact of the air flow into the stove is maximized, i.e., watch the hot coals in the coal bed and adjust the door so that they become as bright as possible. Close the door as soon as the fuel load ignites. If the flames falter or go out, crack the door open again until the fuel reignites, then close the door.

FAN:
Operate the fan as follows:

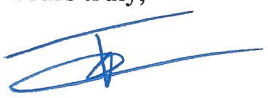
Low: Turn fan on High within 10 minutes.
Medium: Turn fan on High within 10 minutes.
High: Turn fan on High within 5 minutes.

LOWER PRIMARY AIR ORIFICE (LPAO):
Clear the coals away from in front of the LPAO on all runs.

Direct line: (250) 715-2398
Email: jbain@pacificenergy.net
Web: www.pacificenergy.net

If you require any additional information, please feel free to contact me at your convenience.

Yours truly,



Jeff Bain
New Product Development Manager – Solid Fuels

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 1 Data Summary

Client: Pacific Energy
Model: NEO 2.5 LE
Job #: 19-494
Tracking #: 030
Test Date: 9/11/2019

Techician Signature

9/16/2019
Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

Burn Rate (kg/hr):	4.43

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	24.880	18.573	18.552	8.688
Average Gas Velocity in Dilution Tunnel (ft/sec)	19.61			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	12051.2			
Average Gas Meter Temperature (°F)	71.4	85.5	85.0	79.8
Total Sample Volume (dscf)	24.611	18.122	18.063	8.565
Average Tunnel Temperature (°F)	137.3			
Total Time of Test (min)	127			
Total Particulate Catch (mg)	0.0	6.7	6.3	3.7
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0003697	0.0003488	0.0004320
Total PM Emissions (g)	0.00	9.43	8.90	5.21
Particulate Emission Rate (g/hr)	0.00	4.46	4.20	5.21
Emissions Factor (g/kg)	-	1.06	1.00	-
Difference from Average Total Particulate Emissions (g)	-	0.27	0.27	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

Final Average Results	
Total Particulate Emissions (g)	9.16
Particulate Emission Rate (g/hr)	4.33
Emissions Factor (g/kg)	1.03
HHV Efficiency (%)	69.1%
LHV Efficiency (%)	73.9%
CO Emissions (g/min)	2.12

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80 / Max: 85	OK
Face Velocity	< 30 ft/min	8.9	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 67 / Max: 75	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

B415.1 Efficiency Results

Manufacturer:	Pacific Energy
Model:	NEO 2.5 LE
Date:	09/11/19
Run:	1
Control #:	19-494
Test Duration:	94
Output Category:	High

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	69.1%	73.9%
Combustion Efficiency	98.1%	98.1%
Heat Transfer Efficiency	70.4%	75.3%

Output Rate (kJ/h)	63,104	59,861	**(Btu/h)**
Burn Rate (kg/h)	4.58	10.08	**(lb/h)**
Input (kJ/h)	91,319	86,626	**(Btu/h)**

Test Load Weight (dry kg)	7.17	15.80	**dry lb**
MC wet (%)	17.72		
MC dry (%)	21.54		
Particulate (g)	9.16		
CO (g)	200		
Test Duration (h)	1.57		

Emissions	**Particulate**	**CO**
g/MJ Output	0.09	2.02
g/kg Dry Fuel	1.28	27.83
g/h	5.85	127.35
g/min	0.10	2.12
lb/MM Btu Output	0.22	4.69

Air/Fuel Ratio (A/F)	8.63

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 1
Technician: SJB
Date: 9/11/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	21.00		
Total Load Weight Range (lbs):	20.00	to	22.10
Core Load Weight Range (lbs):	9.50	to	13.70
Remainder Load Weight Range (lbs):	7.40	to	11.60
Core Load Piece Range (lbs):	3.20	to	5.30
Remainder Load Piece Range (lbs):	2.10	to	11.60
Max Allowable Kindling Weight (lbs):	4.26		
Max Allowable Start-up Fuel Weight (lbs):	6.39		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.99	In Range	23.2	20.6	19.5	21.1	In Range	4.12	1.87
2	16.00	4.07	In Range	18.5	22.4	23.7	21.5	In Range	3.35	1.52
3	16.00	4.32	In Range	21.1	21.4	19.3	20.6	In Range	3.58	1.62
Core Load Wt. (lbs)		13.38	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	5.31	In Range	22.9	19.2	24.3	22.1	In Range	4.35	1.97
2	16.00	2.60	In Range	23.4	24.4	20.5	22.8	In Range	2.12	0.96
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		7.91	In Range							

Total Load Weight (lbs):	21.29	In Range	
Core Load % of Total Weight:	63%	In Range	45-65%
Remainder % of Total Weight:	37%	In Range	35-55%
Total Load % of Target Weight:	101%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	10.1		
Total Load Average Moisture Content (%DB):	21.5	In Range	19-25%
Total Load Average Moisture Content (%WB):	17.7		
Total Test Load Weight (dry basis):	17.52 lbs	7.95 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.03	In Range	10	10	10	10.0	In Range	2.75	1.25

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.39	In Range	21.6	23.4	19.5	21.5	In Range	3.61	1.64

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.1	to	4.3	
Actual Residual Start-up Fuel Weight (lb):		2.1		In Range

TEST END POINT

High Fire Test Run End Point Range:	1.9	to	2.3	lb
Actual Fuel Load Ending Weight (lb):		2.2		In Range

Total Weight All Fuel Added: 28.71 lbs, wet basis
23.88 lbs, dry basis
10.83 kg, dry basis

Total Weight All Fuel Burned (dry basis): 19.54 lbs
8.87 kg

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Pacific Energy	Job #:	19-494
Model:	NEO 2.5 LE	Tracking #:	030
Run #:	1	Technician:	SJB
Test Start Time:	8:48	Date:	9/11/2019
Test Type:	High Fire		

Recording Interval (min):	1
Total Sampling Time (min):	127
High Fire Test Load Time (min):	33

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.03	30.05	30.04
Relative Humidity (%)	57.7	47.2	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Meter Box γ Factor:	0.999	(A)
Meter Box γ Factor:	0.996	(B)
Meter Box γ Factor:	0.992	(Ambient)

Ambient Sample Volume: 24.880 ft^3

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	9/10/2019

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-12	in. Hg
(B)	0.000	cfm @	-16	in. Hg
(Ambient)	0.000	cfm @	-14	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.070	75
2	0.084	75
3	0.080	75
4	0.074	75
5	0.076	75
6	0.086	75
7	0.084	75
8	0.072	75
Center	0.094	75

Static Pressure: -0.200 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	18.82	ft/sec
V_{scent}:	20.42	ft/sec
F_p:	0.922	[ratio]
Initial Tunnel Flow:	212.9	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

High Fire Test Begins from Cold Start, No Preburn is Performed

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.090	0.01	75	-0.02		2.2		74	72	84	67
1	0.122	0.122	0.088	2.30	75	-0.03	82	2.2	0	75	85	83	67
2	0.268	0.146	0.092	2.30	75	-2.65	97	2.1	-0.1	81	133	82	67
3	0.416	0.148	0.090	2.27	75	-0.19	100	1.9	-0.2	92	212	83	67
4	0.560	0.144	0.087	2.26	75	-2.57	100	1.8	-0.1	102	263	84	67
5	0.706	0.146	0.088	2.20	75	-0.91	102	1.7	-0.1	113	311	84	67
6	0.849	0.143	0.087	2.21	75	0	99	1.5	-0.2	96	340	84	67
7	0.992	0.143	0.087	2.17	75	-2.61	98	1.4	-0.1	92	329	83	67
8	1.137	0.145	0.093	2.17	75	-0.21	96	1.4	0	93	354	82	67
9	1.279	0.142	0.091	2.16	75	-1.29	96	1.2	-0.2	95	381	83	67
10	1.424	0.145	0.092	2.16	75	-2.53	97	1.2	0	93	356	84	67
11	1.572	0.148	0.086	2.14	75	-2.23	102	1.1	-0.1	92	334	85	67
12	1.717	0.145	0.089	2.15	76	-2.58	98	1.0	-0.1	91	321	84	67
13	1.857	0.140	0.088	2.18	76	-0.53	95	1.0	0	90	300	83	67
14	2.004	0.147	0.086	2.20	76	-0.96	103	3.3	2.3	110	295	82	67
15	2.144	0.140	0.088	2.15	76	-0.23	97	3.1	-0.2	104	384	82	67
16	2.290	0.146	0.093	2.08	76	-0.01	98	2.9	-0.2	106	467	83	67
17	2.430	0.140	0.089	2.18	77	-0.82	96	2.6	-0.3	111	549	84	67
18	2.574	0.144	0.088	2.02	77	-0.29	100	2.4	-0.2	116	605	84	67
19	2.717	0.143	0.098	2.18	77	-0.7	94	2.2	-0.2	117	607	83	67
20	2.859	0.142	0.086	1.99	77	-1.58	100	2.0	-0.2	120	623	82	68
21	3.009	0.150	0.086	2.46	77	-1.96	106	1.7	-0.3	120	616	80	68
22	3.159	0.150	0.090	2.24	77	-0.8	104	1.5	-0.2	121	599	82	68
23	3.303	0.144	0.096	2.23	78	-0.29	96	1.4	-0.1	120	579	84	68
24	3.450	0.147	0.090	2.23	78	-2.01	101	1.2	-0.2	120	561	85	68
25	3.594	0.144	0.093	2.20	78	-2.55	98	4.0	2.8	131	583	84	68
26	3.738	0.144	0.091	2.19	78	0	99	3.7	-0.3	128	618	83	68
27	3.882	0.144	0.088	2.17	79	-0.86	101	3.5	-0.2	132	666	82	69
28	4.026	0.144	0.090	2.18	79	-0.26	100	3.2	-0.3	135	695	82	69
29	4.170	0.144	0.094	2.14	79	-0.04	98	3.0	-0.2	136	709	83	69
30	4.313	0.143	0.096	2.18	79	-0.76	97	2.7	-0.3	139	717	84	69
31	4.459	0.146	0.090	2.15	80	-2.08	102	2.4	-0.3	140	723	84	69
32	4.599	0.140	0.093	2.13	80	-2.64	96	2.1	-0.3	139	715	83	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.744	0.145	0.091	2.11	80	-0.16	104	23.3	21.2	183	620	81	70
34	4.882	0.138	0.091	2.12	81	-1.88	96	23.0	-0.3	151	601	82	70
35	5.028	0.146	0.094	2.09	81	-0.69	100	22.7	-0.3	146	661	83	70
36	5.172	0.144	0.093	2.27	81	-2.87	99	22.4	-0.3	147	719	84	70
37	5.339	0.167	0.090	2.25	81	-2.79	117	22.1	-0.3	150	761	84	70
38	5.483	0.144	0.093	2.25	82	-1.9	99	21.8	-0.3	152	788	83	70
39	5.633	0.150	0.091	2.25	82	-2.79	105	21.6	-0.2	153	783	82	70
40	5.776	0.143	0.091	2.24	82	-0.16	100	21.3	-0.3	154	782	82	70
41	5.925	0.149	0.089	2.24	82	-0.09	105	21.0	-0.3	152	755	83	70
42	6.068	0.143	0.091	2.23	83	-0.08	100	20.8	-0.2	152	753	84	70
43	6.217	0.149	0.089	2.21	83	-2.82	105	20.5	-0.3	154	767	84	70
44	6.360	0.143	0.097	2.22	83	-1.39	97	20.0	-0.5	154	772	83	70
45	6.509	0.149	0.091	2.22	83	-0.8	104	19.9	-0.1	156	777	82	70
46	6.653	0.144	0.088	2.24	84	-2.89	102	19.7	-0.2	156	778	82	70
47	6.801	0.148	0.092	2.23	84	-0.8	103	19.3	-0.4	156	774	83	70
48	6.945	0.144	0.095	2.21	84	-1.33	98	19.0	-0.3	154	767	84	71
49	7.093	0.148	0.090	2.21	84	-0.38	104	18.9	-0.1	155	760	84	71
50	7.236	0.143	0.088	2.23	84	-0.89	102	18.7	-0.2	156	759	83	71
51	7.384	0.148	0.090	2.18	85	-2.83	104	18.4	-0.3	156	757	82	71
52	7.527	0.143	0.086	2.21	85	-0.32	102	18.0	-0.4	154	754	82	71
53	7.674	0.147	0.089	2.19	85	-0.18	103	17.9	-0.1	153	744	83	71
54	7.818	0.144	0.088	2.18	85	-0.19	102	17.7	-0.2	153	739	84	71
55	7.965	0.147	0.087	2.18	85	-2.4	105	17.4	-0.3	154	734	84	71
56	8.108	0.143	0.095	2.18	86	-0.05	97	17.1	-0.3	154	734	83	71
57	8.254	0.146	0.093	2.17	86	-1.54	100	17.0	-0.1	153	736	82	71
58	8.399	0.145	0.088	2.17	86	-2.9	102	16.7	-0.3	152	736	82	71
59	8.544	0.145	0.091	2.17	86	-2.65	101	16.4	-0.3	155	745	83	71
60	8.688	0.144	0.090	2.17	86	-0.49	100	16.1	-0.3	153	747	84	71
61	8.845	0.157	0.092	2.53	86	-2.38	108	16.0	-0.1	154	748	82	71
62	8.994	0.149	0.092	2.31	87	0	103	15.7	-0.3	153	747	82	72
63	9.145	0.151	0.095	2.31	87	-2.71	102	15.6	-0.1	154	751	83	72
64	9.291	0.146	0.095	2.32	87	-2.04	99	15.2	-0.4	155	752	84	72
65	9.443	0.152	0.093	2.30	87	-0.19	104	15.0	-0.2	154	754	83	72

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Client: Pacific Energy
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Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.589	0.146	0.091	2.30	87	-2.8	101	14.7	-0.3	153	758	82	72
67	9.740	0.151	0.088	2.29	87	-0.05	106	14.5	-0.2	154	758	81	72
68	9.886	0.146	0.094	2.27	88	0	99	14.1	-0.4	155	758	82	72
69	10.038	0.152	0.094	2.29	88	-0.23	103	14.0	-0.1	154	760	84	72
70	10.183	0.145	0.093	2.24	88	-2.88	99	13.7	-0.3	154	757	85	73
71	10.334	0.151	0.091	2.25	88	-0.33	104	13.4	-0.3	154	758	84	73
72	10.480	0.146	0.091	2.26	88	-0.29	101	13.1	-0.3	154	758	82	73
73	10.629	0.149	0.089	2.26	88	-0.54	104	12.9	-0.2	154	762	81	73
74	10.774	0.145	0.089	2.25	88	-1.14	101	12.7	-0.2	154	761	82	73
75	10.925	0.151	0.095	2.24	89	-2.67	102	12.4	-0.3	154	763	84	73
76	11.070	0.145	0.095	2.24	89	-0.15	98	12.1	-0.3	157	764	84	73
77	11.219	0.149	0.090	2.22	89	-2.86	104	11.9	-0.2	155	763	83	73
78	11.364	0.145	0.094	2.23	89	-0.41	99	11.7	-0.2	154	763	82	73
79	11.513	0.149	0.093	2.22	89	-2.73	102	11.5	-0.2	155	760	81	73
80	11.658	0.145	0.091	2.23	89	-0.1	100	11.2	-0.3	155	760	82	74
81	11.807	0.149	0.093	2.23	89	-0.01	102	11.0	-0.2	153	756	84	74
82	11.952	0.145	0.091	2.24	90	-0.86	100	10.7	-0.3	153	753	84	73
83	12.101	0.149	0.091	2.23	90	-0.09	103	10.5	-0.2	153	753	83	74
84	12.246	0.145	0.095	2.20	90	-1.75	98	10.2	-0.3	153	751	82	74
85	12.395	0.149	0.097	2.22	90	-2.83	99	10.1	-0.1	154	747	81	74
86	12.539	0.144	0.091	2.23	90	-2.75	99	9.8	-0.3	152	742	82	74
87	12.688	0.149	0.096	2.23	90	-0.6	100	9.6	-0.2	152	736	84	74
88	12.833	0.145	0.098	2.23	90	-2.73	96	9.4	-0.2	151	730	85	74
89	12.982	0.149	0.095	2.22	90	-2.82	100	9.2	-0.2	152	726	84	74
90	13.127	0.145	0.093	2.22	91	-0.07	98	8.9	-0.3	149	721	83	74
91	13.276	0.149	0.092	2.22	91	-2.89	102	8.7	-0.2	150	717	82	74
92	13.421	0.145	0.095	2.22	91	-0.65	97	8.6	-0.1	149	712	82	74
93	13.569	0.148	0.090	2.21	91	-2.9	102	8.3	-0.3	149	712	84	74
94	13.714	0.145	0.096	2.21	91	-2.93	97	8.2	-0.1	149	712	84	74
95	13.863	0.149	0.094	2.20	91	-2.45	100	8.0	-0.2	148	708	83	74
96	14.008	0.145	0.091	2.19	91	-0.23	99	7.8	-0.2	147	709	82	74
97	14.156	0.148	0.094	2.18	91	-0.89	99	7.6	-0.2	145	711	82	74
98	14.301	0.145	0.097	2.19	91	-2.01	96	7.4	-0.2	145	707	83	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.449	0.148	0.092	2.20	91	-0.4	101	7.3	-0.1	145	697	84	74
100	14.594	0.145	0.093	2.19	92	-2.95	98	7.0	-0.3	143	688	84	74
101	14.742	0.148	0.092	2.19	92	-2.78	100	6.9	-0.1	144	680	83	75
102	14.888	0.146	0.091	2.18	92	-1.11	99	6.8	-0.1	142	673	82	75
103	15.036	0.148	0.090	2.18	92	-1.25	101	6.5	-0.3	140	671	82	75
104	15.182	0.146	0.090	2.21	92	-1.69	100	6.4	-0.1	141	663	83	74
105	15.330	0.148	0.098	2.21	92	-0.77	97	6.4	0	141	658	85	74
106	15.476	0.146	0.092	2.22	92	-0.28	99	6.2	-0.2	140	655	84	75
107	15.624	0.148	0.098	2.22	92	-2.84	97	6.1	-0.1	138	649	83	74
108	15.770	0.146	0.092	2.21	92	-0.47	98	6.0	-0.1	138	628	82	75
109	15.918	0.148	0.089	2.20	92	-0.65	101	5.9	-0.1	135	610	82	75
110	16.064	0.146	0.086	2.21	92	-2.97	101	5.8	-0.1	134	598	84	74
111	16.212	0.148	0.089	2.21	92	-0.11	101	5.7	-0.1	133	590	85	75
112	16.358	0.146	0.090	2.23	93	-0.19	99	5.6	-0.1	132	583	84	75
113	16.506	0.148	0.089	2.21	93	-1.34	101	5.5	-0.1	131	580	83	74
114	16.653	0.147	0.089	2.21	93	-0.52	100	5.4	-0.1	129	577	82	74
115	16.801	0.148	0.093	2.20	93	-2.51	98	5.3	-0.1	129	574	82	74
116	16.948	0.147	0.090	2.20	93	-1.48	99	5.1	-0.2	128	576	83	74
117	17.096	0.148	0.093	2.22	93	-1.78	98	5.1	0	128	579	85	74
118	17.244	0.148	0.091	2.21	93	-2.37	99	5.0	-0.1	127	581	84	74
119	17.391	0.147	0.100	2.22	93	-2.02	94	5.0	0	127	572	83	75
120	17.540	0.149	0.090	2.20	93	-0.41	100	4.7	-0.3	126	564	82	74
121	17.687	0.147	0.093	2.20	93	-0.76	97	4.8	0.1	125	555	82	74
122	17.836	0.149	0.092	2.21	93	0	99	4.7	-0.1	125	548	83	75
123	17.982	0.146	0.090	2.21	93	-2.77	98	4.6	-0.1	124	545	84	75
124	18.131	0.149	0.096	2.23	93	-0.12	97	4.5	-0.1	124	537	85	74
125	18.277	0.146	0.090	2.20	93	-0.67	98	4.4	-0.1	122	533	84	74
126	18.427	0.150	0.091	2.22	93	-0.14	100	4.4	0	123	534	82	74
127	18.573	0.146	0.092	2.23	93	-2.75	97	4.1	-0.3	123	547	82	74
Avg/Tot	18.573	0.146	0.091	2.20	85	-1.31	100			137	638	83	71.4

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	75	-1		82	0.000	0.05	0.02
1	0.119	0.119	2.34	75	-0.7	80	82	-0.010	0.12	0.03
2	0.265	0.146	2.33	75	-2.69	97	81	-0.020	1.52	0.06
3	0.413	0.148	2.31	75	-2.47	100	81	-0.040	2.12	0.08
4	0.559	0.146	2.31	75	-1.22	101	81	-0.050	2.78	0.04
5	0.706	0.147	2.26	75	-0.94	102	82	-0.060	2.96	0.06
6	0.851	0.145	2.28	75	-0.38	100	82	-0.060	6.01	0.11
7	0.998	0.147	2.25	75	-0.56	101	83	-0.060	5.90	0.16
8	1.142	0.144	2.26	75	-0.47	96	84	-0.070	6.66	0.20
9	1.287	0.145	2.25	75	-0.48	98	85	-0.060	8.89	0.29
10	1.433	0.146	2.26	75	-3	98	85	-0.060	7.06	0.26
11	1.576	0.143	2.23	75	-2.71	99	84	-0.070	5.56	0.35
12	1.723	0.147	2.22	75	-0.97	100	83	-0.050	5.23	0.39
13	1.867	0.144	2.23	75	-0.43	98	83	-0.050	4.42	0.40
14	2.014	0.147	2.24	76	-0.73	103	82	-0.080	1.88	0.22
15	2.156	0.142	2.24	76	-3.04	98	83	-0.070	8.16	0.45
16	2.304	0.148	2.22	76	-1.2	99	83	-0.090	10.66	0.48
17	2.446	0.142	2.23	76	-2.74	98	83	-0.080	13.46	0.30
18	2.591	0.145	2.20	76	-2.46	101	84	-0.080	15.59	0.55
19	2.731	0.140	2.18	77	-0.68	92	83	-0.090	14.90	0.54
20	2.876	0.145	2.14	77	-0.79	102	83	-0.100	14.80	0.61
21	3.015	0.139	2.12	77	-0.64	98	83	-0.090	14.74	0.42
22	3.158	0.143	2.12	77	-1.26	99	82	-0.070	14.32	0.30
23	3.298	0.140	2.19	78	-0.82	93	82	-0.070	12.63	0.27
24	3.441	0.143	2.18	78	-0.75	99	82	-0.090	12.49	0.29
25	3.583	0.142	2.29	78	-2.26	97	82	-0.080	8.27	0.21
26	3.728	0.145	2.27	78	-3.14	100	82	-0.100	12.78	0.30
27	3.875	0.147	2.20	79	-3.35	103	82	-0.100	15.58	0.44
28	4.016	0.141	2.15	79	-2.46	98	82	-0.100	16.42	0.60
29	4.162	0.146	2.16	79	-1.9	100	83	-0.090	16.75	0.57
30	4.301	0.139	2.14	79	-1.72	94	83	-0.100	17.15	0.51
31	4.445	0.144	2.12	80	-1.74	101	83	-0.120	16.90	0.50

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.584	0.139	2.14	80	-1.61	95	82	-0.100	16.80	0.53
33	4.727	0.143	2.06	80	-4.19	103	82	-0.090	15.50	0.38
34	4.865	0.138	2.02	80	-4.25	97	82	-0.110	6.66	0.92
35	5.004	0.139	2.33	81	-4.48	95	82	-0.100	11.69	0.90
36	5.152	0.148	2.30	81	-2.31	102	82	-0.100	14.02	0.39
37	5.299	0.147	2.29	81	-2.67	103	82	-0.100	15.79	0.28
38	5.446	0.147	2.28	81	-4.52	102	83	-0.110	16.89	0.40
39	5.593	0.147	2.28	82	-4.22	103	84	-0.090	16.56	0.37
40	5.740	0.147	2.28	82	-3.54	103	84	-0.110	16.19	0.32
41	5.887	0.147	2.30	82	-2.41	104	84	-0.110	15.65	0.30
42	6.035	0.148	2.30	82	-2.26	103	84	-0.110	14.97	0.23
43	6.182	0.147	2.31	83	-2.33	104	84	-0.110	15.86	0.31
44	6.330	0.148	2.30	83	-2.25	100	84	-0.100	15.81	0.33
45	6.477	0.147	2.29	83	-2.33	103	83	-0.110	15.81	0.38
46	6.624	0.147	2.30	83	-2.28	105	83	-0.100	16.21	0.39
47	6.772	0.148	2.30	84	-2.78	103	83	-0.100	15.82	0.39
48	6.919	0.147	2.29	84	-3.62	100	84	-0.100	15.61	0.38
49	7.068	0.149	2.30	84	-2.23	105	85	-0.110	15.45	0.41
50	7.215	0.147	2.30	84	-4.45	104	84	-0.100	15.23	0.36
51	7.363	0.148	2.30	84	-4.25	104	84	-0.110	15.27	0.35
52	7.509	0.146	2.32	84	-3.06	105	84	-0.100	15.01	0.33
53	7.659	0.150	2.31	85	-2.37	105	84	-0.100	15.03	0.27
54	7.805	0.146	2.31	85	-4.41	103	83	-0.110	14.72	0.23
55	7.955	0.150	2.31	85	-3.61	107	83	-0.100	14.50	0.24
56	8.101	0.146	2.30	85	-4.45	99	84	-0.100	14.44	0.22
57	8.250	0.149	2.29	85	-2.42	102	84	-0.100	14.42	0.23
58	8.396	0.146	2.30	86	-4.22	103	85	-0.100	14.61	0.20
59	8.546	0.150	2.29	86	-2.31	104	84	-0.110	14.86	0.24
60	8.692	0.146	2.29	86	-3.76	102	84	-0.110	15.21	0.23
61	8.843	0.151	2.31	86	-2.25	104	84	-0.100	15.28	0.23
62	8.988	0.145	2.26	86	-2.41	100	84	-0.100	15.05	0.23
63	9.137	0.149	2.25	86	-3.84	101	84	-0.110	15.42	0.23

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.281	0.144	2.25	86	-3.7	98	83	-0.100	15.43	0.27
65	9.430	0.149	2.26	87	-4.67	102	83	-0.100	15.63	0.25
66	9.574	0.144	2.25	87	-4.42	100	83	-0.110	15.84	0.27
67	9.724	0.150	2.25	87	-2.46	106	83	-0.100	15.87	0.24
68	9.868	0.144	2.25	87	-4.29	98	83	-0.090	15.75	0.28
69	10.017	0.149	2.26	87	-4.54	102	83	-0.110	15.76	0.26
70	10.162	0.145	2.24	87	-3.09	99	82	-0.100	15.85	0.26
71	10.311	0.149	2.24	88	-2.49	103	82	-0.100	15.84	0.25
72	10.455	0.144	2.25	88	-2.6	100	82	-0.100	15.84	0.26
73	10.604	0.149	2.23	88	-2.47	104	82	-0.090	15.96	0.28
74	10.748	0.144	2.24	88	-2.38	101	82	-0.100	15.90	0.29
75	10.897	0.149	2.24	88	-3.14	101	82	-0.100	15.87	0.34
76	11.041	0.144	2.23	88	-4.32	98	82	-0.110	15.84	0.36
77	11.190	0.149	2.23	88	-2.61	104	82	-0.110	15.95	0.37
78	11.334	0.144	2.24	88	-4.57	98	82	-0.090	15.97	0.39
79	11.482	0.148	2.24	89	-2.5	101	81	-0.110	15.78	0.42
80	11.626	0.144	2.23	89	-2.87	100	81	-0.110	15.85	0.35
81	11.775	0.149	2.23	89	-2.95	102	81	-0.110	15.78	0.30
82	11.919	0.144	2.22	89	-2.38	99	81	-0.090	15.90	0.24
83	12.067	0.148	2.22	89	-2.48	102	81	-0.110	15.53	0.28
84	12.211	0.144	2.21	89	-3.54	97	81	-0.100	15.58	0.24
85	12.360	0.149	2.23	89	-3.83	100	81	-0.090	15.63	0.16
86	12.504	0.144	2.23	90	-3.29	99	81	-0.110	15.48	0.15
87	12.653	0.149	2.22	90	-4.23	100	82	-0.100	15.21	0.20
88	12.797	0.144	2.22	90	-2.37	95	82	-0.110	15.02	0.17
89	12.946	0.149	2.21	90	-2.41	100	83	-0.100	14.88	0.17
90	13.090	0.144	2.21	90	-4.54	98	83	-0.090	14.85	0.17
91	13.239	0.149	2.21	90	-3.43	102	83	-0.090	14.75	0.14
92	13.383	0.144	2.22	90	-3.05	97	83	-0.100	14.58	0.17
93	13.532	0.149	2.22	90	-4.24	103	83	-0.100	14.71	0.18
94	13.676	0.144	2.21	90	-2.9	96	83	-0.100	14.85	0.25
95	13.825	0.149	2.22	90	-2.46	101	83	-0.110	14.81	0.20

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	13.970	0.145	2.20	91	-3.04	99	83	-0.090	14.41	0.18
97	14.119	0.149	2.22	91	-3.64	100	83	-0.100	14.68	0.16
98	14.263	0.144	2.22	91	-4.53	95	83	-0.100	14.35	0.23
99	14.413	0.150	2.22	91	-4.58	102	83	-0.090	13.84	0.14
100	14.557	0.144	2.25	91	-2.38	97	83	-0.110	13.45	0.19
101	14.707	0.150	2.24	91	-2.61	102	83	-0.100	12.82	0.23
102	14.852	0.145	2.24	91	-2.45	99	83	-0.100	12.85	0.27
103	15.001	0.149	2.25	91	-3.36	102	83	-0.100	12.60	0.24
104	15.146	0.145	2.25	91	-2.85	99	83	-0.090	12.56	0.29
105	15.296	0.150	2.22	91	-2.52	98	83	-0.090	12.37	0.36
106	15.441	0.145	2.23	91	-4.28	98	82	-0.100	12.23	0.38
107	15.591	0.150	2.25	91	-3.06	98	82	-0.090	12.06	0.41
108	15.736	0.145	2.25	91	-2.69	98	82	-0.100	11.74	0.41
109	15.886	0.150	2.24	92	-4.49	103	82	-0.080	10.47	0.21
110	16.031	0.145	2.24	92	-2.41	101	81	-0.090	9.98	0.22
111	16.181	0.150	2.25	92	-4.14	102	81	-0.090	10.05	0.16
112	16.327	0.146	2.24	92	-2.76	99	81	-0.090	9.92	0.20
113	16.477	0.150	2.27	92	-2.51	102	81	-0.090	9.79	0.23
114	16.623	0.146	2.26	92	-2.88	99	81	-0.080	9.92	0.28
115	16.772	0.149	2.26	92	-2.28	99	81	-0.090	10.02	0.28
116	16.918	0.146	2.27	92	-4.45	99	81	-0.090	10.09	0.41
117	17.068	0.150	2.25	92	-3.96	100	81	-0.100	10.49	0.42
118	17.215	0.147	2.26	92	-2.58	99	81	-0.080	10.90	0.38
119	17.364	0.149	2.27	92	-2.99	95	81	-0.080	10.77	0.29
120	17.511	0.147	2.26	92	-3.07	99	81	-0.080	9.69	0.23
121	17.660	0.149	2.25	92	-4.51	99	80	-0.100	9.53	0.28
122	17.808	0.148	2.26	92	-2.45	99	80	-0.080	9.42	0.28
123	17.958	0.150	2.26	92	-4.22	101	80	-0.090	9.32	0.41
124	18.106	0.148	2.27	92	-4.08	97	80	-0.080	9.26	0.47
125	18.255	0.149	2.27	92	-4.05	100	80	-0.080	9.10	0.63
126	18.404	0.149	2.27	92	-3.4	100	80	-0.080	9.31	0.68
127	18.552	0.148	2.27	93	-4.29	98	80	-0.090	9.76	0.55

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
Avg/Tot	18.552	0.146	2.23	85	-2.85	100	82	-0.091	12.74	0.31

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	72	72	72	72	71	71.8	N/A
1	72	72	72	72	71	71.8	N/A
2	72	72	73	73	71	72.2	N/A
3	73	73	74	75	71	73.2	N/A
4	75	75	77	79	71	75.4	N/A
5	78	78	82	85	71	78.8	N/A
6	81	80	88	94	71	82.8	N/A
7	85	83	93	107	72	88.0	N/A
8	88	85	99	120	73	93.0	N/A
9	93	90	106	134	74	99.4	N/A
10	97	94	111	149	76	105.4	N/A
11	102	98	115	163	79	111.4	N/A
12	105	101	120	175	84	117.0	N/A
13	108	105	125	185	89	122.4	N/A
14	111	107	129	193	95	127.0	N/A
15	116	112	136	200	102	133.2	N/A
16	122	118	144	210	108	140.4	N/A
17	128	124	152	225	115	148.8	N/A
18	133	130	161	250	122	159.2	N/A
19	138	135	171	282	128	170.8	N/A
20	143	140	183	316	136	183.6	N/A
21	148	146	197	351	144	197.2	N/A
22	153	151	213	384	153	210.8	N/A
23	159	156	230	413	163	224.2	N/A
24	166	161	249	436	172	236.8	N/A
25	175	168	268	455	183	249.8	N/A
26	184	176	283	474	195	262.4	N/A
27	194	188	297	495	205	275.8	N/A
28	204	200	311	521	217	290.6	N/A
29	214	211	323	549	228	305.0	N/A
30	223	222	336	578	238	319.4	N/A
31	233	233	348	607	250	334.2	N/A
32	243	244	361	634	260	348.4	N/A
33	254	255	375	655	273	362.4	N/A
34	264	267	386	664	284	373.0	N/A
35	274	279	395	668	294	382.0	N/A
36	283	289	403	674	302	390.2	N/A
37	293	301	358	666	308	385.2	N/A
38	303	311	333	666	316	385.8	N/A
39	311	321	314	672	320	387.6	N/A
40	320	330	299	678	326	390.6	N/A
41	328	338	288	684	330	393.6	N/A
42	335	346	279	687	332	395.8	N/A
43	341	353	272	690	335	398.2	N/A
44	348	360	267	693	339	401.4	N/A
45	353	366	262	697	341	403.8	N/A
46	359	372	258	701	344	406.8	N/A
47	364	378	254	705	346	409.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	369	383	252	707	349	412.0	N/A
49	374	388	250	710	349	414.2	N/A
50	378	393	249	712	354	417.2	N/A
51	382	397	247	713	356	419.0	N/A
52	386	401	246	714	360	421.4	N/A
53	390	405	245	714	363	423.4	N/A
54	393	409	244	713	365	424.8	N/A
55	397	413	244	712	369	427.0	N/A
56	400	416	244	709	372	428.2	N/A
57	403	419	244	708	375	429.8	N/A
58	406	423	244	705	379	431.4	N/A
59	408	426	244	704	381	432.6	N/A
60	411	429	244	704	383	434.2	N/A
61	413	432	244	705	386	436.0	N/A
62	415	435	244	705	390	437.8	N/A
63	417	438	245	706	393	439.8	N/A
64	420	441	246	708	396	442.2	N/A
65	422	444	248	711	398	444.6	N/A
66	423	447	249	714	401	446.8	N/A
67	425	449	252	716	404	449.2	N/A
68	427	452	254	717	406	451.2	N/A
69	428	455	256	720	409	453.6	N/A
70	430	458	259	723	412	456.4	N/A
71	431	461	262	725	415	458.8	N/A
72	433	464	265	727	417	461.2	N/A
73	434	467	268	730	420	463.8	N/A
74	436	470	272	733	423	466.8	N/A
75	438	472	275	735	425	469.0	N/A
76	439	475	279	737	426	471.2	N/A
77	441	478	283	739	430	474.2	N/A
78	443	481	286	741	432	476.6	N/A
79	445	483	290	742	435	479.0	N/A
80	447	486	293	743	437	481.2	N/A
81	449	489	296	744	439	483.4	N/A
82	451	491	299	745	441	485.4	N/A
83	453	494	302	746	444	487.8	N/A
84	455	496	305	746	446	489.6	N/A
85	457	499	308	746	448	491.6	N/A
86	460	501	311	746	450	493.6	N/A
87	462	503	313	745	453	495.2	N/A
88	465	505	316	744	455	497.0	N/A
89	467	508	319	742	458	498.8	N/A
90	470	510	321	740	460	500.2	N/A
91	473	512	323	738	463	501.8	N/A
92	476	514	325	736	466	503.4	N/A
93	479	516	328	733	467	504.6	N/A
94	482	518	331	731	469	506.2	N/A
95	485	520	334	730	471	508.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	488	522	335	727	474	509.2	N/A
97	491	524	338	724	476	510.6	N/A
98	494	526	341	723	479	512.6	N/A
99	497	527	344	721	481	514.0	N/A
100	500	529	347	718	484	515.6	N/A
101	502	531	349	714	486	516.4	N/A
102	505	533	350	710	489	517.4	N/A
103	508	534	351	705	491	517.8	N/A
104	510	536	353	699	495	518.6	N/A
105	513	538	353	693	498	519.0	N/A
106	515	539	355	688	500	519.4	N/A
107	517	541	356	682	503	519.8	N/A
108	519	542	357	676	507	520.2	N/A
109	520	544	357	668	511	520.0	N/A
110	522	545	358	659	514	519.6	N/A
111	523	547	358	649	518	519.0	N/A
112	525	548	357	639	521	518.0	N/A
113	525	549	356	629	525	516.8	N/A
114	526	550	355	620	528	515.8	N/A
115	527	550	354	612	531	514.8	N/A
116	527	551	354	604	534	514.0	N/A
117	527	551	354	597	537	513.2	N/A
118	527	551	353	591	540	512.4	N/A
119	527	550	353	587	542	511.8	N/A
120	527	550	352	582	545	511.2	N/A
121	527	549	351	576	547	510.0	N/A
122	526	549	350	571	549	509.0	N/A
123	526	548	348	564	552	507.6	N/A
124	526	547	347	558	553	506.2	N/A
125	525	546	346	552	556	505.0	N/A
126	524	545	344	546	557	503.2	N/A
127	524	544	343	541	558	502.0	N/A
Average	362	379	273	584	355	391	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 1

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T301	86.7	173.9	177.6	3.7
	T302	87.2			
Train A Filters - Remainder	T303	88.4	175.5	176.8	1.3
	T307	87.1			
Train A Probe	10A	116821.3	116821.3	116821.1	0.0*
Train A O-Rings	10A	3431.0	3431.0	3432.7	1.7
Train B Filters	T304	87.4	177.7	180.2	2.5
	T305	90.3			
Train B Probe	10B	117904.9	117904.9	117905.0	0.1
Train B O-Rings	10B	3570.2	3570.2	3573.9	3.7
Background Filter	T306	87.4	87.4	87.4	0.0

**Negative value corrected to zero*

Placed in Dessicator on:	9/11 - 11:10

Train A Filters - First Hour	177.6	9/12 12:51	177.6	9/16 8:09				
Train A Filters - Remainder	176.8	9/12 12:51	176.8	9/16 8:09				
Train A Probe	116821.2	9/12 12:51	116821.1	9/16 8:09				
Train A O-Rings	3432.6	9/12 12:51	3432.7	9/16 8:09				
Train B Filters	180.2	9/12 12:51	180.2	9/16 8:09				
Train B Probe	117905.0	9/12 12:51	117905.0	9/16 8:09				
Train B O-Rings	3573.8	9/12 12:49	3573.9	9/16 8:09				
Background Filter	87.4	9/11 11:18	87.4	9/16 8:09				

1st hour Sub-Total, mg:	3.7
Remainder Sub-Total, mg:	3.0
Train 1 Aggregate, mg:	**6.7**
Train 2 Aggregate, mg:	**6.3**
Ambient Aggregate, mg:	0.0

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy | Job Number: 19-494 | Tracking #: 0030
Model: NEO 2.5 | Run Number: 1 | Test Date: 9/11/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: N/A
Air Control Setting: N/A

Time	Notes
N/A	High Fire test begins from cold start per ASTM E3053

Test Notes
Test Burn Start Time: 8:48
Air Control Setting: Fully Open

Time	Notes
0 min	Started with 2.2 lbs of kindling, lit with torch for 60 seconds, door left cracked open ~3”
5 min	Closed Door
13 min	@1.0 lbs, added 2.3 lbs of kindling and start-up pieces, left door cracked open ~3”
14 min	Closed door
24 min	@1.2 lbs, added 3.0 lbs of start-up fuel, door closed immediately.
32 min	@2.1 lbs, leveled coal bed and loaded high fire test fuel load, door open 60 sec
36 min	Turned fan on high
60 min	Changed 1-hr filter
127 min	End of Test

Test Burn End Time: 10:55

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.00 CO (%): 4.310
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:21	8:25	8:23	19:45	19:47	19:50
CO_2	0.00	10.09	17.00	-0.08	10.00	16.97
CO	0.00	2.493	4.310	-0.007	2.502	4.339

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature:  Date: 9/12/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy | Job Number: 19-494 | Tracking #: 0030
Model: NEO 2.5 | Run Number: 1 | Test Date: 9/11/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

Residual Start-up Fuel Coal Bed

Technician Signature: _____ Date: 9/12/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 1 Test Date: 9/11/2019

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

N/A

Low Fire Fuel Load

N/A

Low Fire Fuel Loaded

Technician Signature: _____ Date: 9/12/2019

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 2 Data Summary

Client:	Pacific Energy
Model:	NEO 2.5 LE
Job #:	19-494
Tracking #:	030
Test Date:	9/11/2019

9/16/2019

Techician Signature — Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

Burn Rate (kg/hr):	1.15

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	96.827	73.295	72.768	8.866
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.10			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11923.9			
Average Gas Meter Temperature (°F)	77.6	101.9	100.8	94.0
Total Sample Volume (dscf)	94.645	69.404	68.823	8.515
Average Tunnel Temperature (°F)	97.0			
Total Time of Test (min)	493			
Total Particulate Catch (mg)	0.2	9.3	8.2	6.4
Particulate Concentration, dry-standard (g/dscf)	0.0000021	0.0001340	0.0001191	0.0007516
Total PM Emissions (g)	0.21	12.92	11.47	8.94
Particulate Emission Rate (g/hr)	0.03	1.57	1.40	8.94
Emissions Factor (g/kg)	-	1.37	1.21	-
Difference from Average Total Particulate Emissions (g)	-	0.73	0.73	-
Difference from Average Emissions Factor (g/kg)	-	0.08	0.08	-

Final Average Results	
Total Particulate Emissions (g)	12.19
Particulate Emission Rate (g/hr)	1.48
Emissions Factor (g/kg)	1.29
HHV Efficiency (%)	72.8%
LHV Efficiency (%)	77.9%
CO Emissions (g/min)	1.89

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80 / Max: 87	OK
Face Velocity	< 30 ft/min	10.6	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 74 / Max: 80	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer:	Pacific Energy
Model:	NEO 2.5 LE
Date:	09/11/19
Run:	2
Control #:	19-494
Test Duration:	493
Output Category:	Low

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	72.8%	77.9%
Combustion Efficiency	93.0%	93.0%
Heat Transfer Efficiency	78.3%	83.7%

Output Rate (kJ/h)	16,703	15,845	**(Btu/h)**
Burn Rate (kg/h)	1.15	2.53	**(lb/h)**
Input (kJ/h)	22,941	21,762	**(Btu/h)**

Test Load Weight (dry kg)	9.44	20.81	**dry lb**
MC wet (%)	17.41		
MC dry (%)	21.07		
Particulate (g)	12.19		
CO (g)	931		
Test Duration (h)	8.22		

Emissions	**Particulate**	**CO**
g/MJ Output	0.09	6.78
g/kg Dry Fuel	1.29	98.53
g/h	1.48	113.25
g/min	0.02	1.89
lb/MM Btu Output	0.21	15.76

Air/Fuel Ratio (A/F)	11.16

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 2
Technician: SJB
Date: 9/11/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	21.00		
Total Load Weight Range (lbs):	20.00	to	22.10
Core Load Weight Range (lbs):	9.50	to	13.70
Remainder Load Weight Range (lbs):	7.40	to	11.60
Core Load Piece Range (lbs):	3.20	to	5.30
Remainder Load Piece Range (lbs):	2.10	to	11.60
Max Allowable Kindling Weight (lbs):	4.26		
Max Allowable Start-up Fuel Weight (lbs):	6.39		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.99	In Range	23.2	20.6	19.5	21.1	In Range	4.12	1.87
2	16.00	4.07	In Range	18.5	22.4	23.7	21.5	In Range	3.35	1.52
3	16.00	4.32	In Range	21.1	21.4	19.3	20.6	In Range	3.58	1.62
Core Load Wt. (lbs)		13.38	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	5.31	In Range	22.9	19.2	24.3	22.1	In Range	4.35	1.97
2	16.00	2.60	In Range	23.4	24.4	20.5	22.8	In Range	2.12	0.96
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		7.91	In Range							

Total Load Weight (lbs):	21.29	In Range	
Core Load % of Total Weight:	63%	In Range	45-65%
Remainder % of Total Weight:	37%	In Range	35-55%
Total Load % of Target Weight:	101%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	10.1		
Total Load Average Moisture Content (%DB):	21.5	In Range	19-25%
Total Load Average Moisture Content (%WB):	17.7		
Total Test Load Weight (dry basis):	17.52 lbs	7.95 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.03	In Range	10	10	10	10.0	In Range	2.75	1.25

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.39	In Range	21.6	23.4	19.5	21.5	In Range	3.61	1.64

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.1	to	4.3	
Actual Residual Start-up Fuel Weight (lb):		2.1		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 2
Technician: SJB
Date: 9/11/2019

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	25.20		
Total Load Weight Range (lbs):	23.94	to	26.46
Core Load Weight Range (lbs):	11.34	to	16.38
Remainder Load Weight Range (lbs):	8.82	to	13.86
Core Load Piece Range (lbs):	3.78	to	6.30
Remainder Load Piece Range (lbs):	2.52	to	7.56

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.73	In Range	20.5	18.7	23.5	20.9	In Range	3.91	1.77
2	16.00	4.76	In Range	19.7	24.8	22.7	22.4	In Range	3.89	1.76
3	16.00	5.32	In Range	19.7	23.7	18.6	20.7	In Range	4.41	2.00
Core Load Wt. (lbs)		14.81	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	7.33	In Range	21.6	20.6	19.7	20.6	In Range	6.08	2.76
2	16.00	3.02	In Range	22.4	21.9	18.9	21.1	In Range	2.49	1.13
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		10.35	In Range							

Remainder Load Small/Large Piece Weight Ratio:	41%	In Range	≤ 67%
Total Load Weight (lbs):	25.16	In Range	
Core Load % of Total Weight:	59%	In Range	45-65%
Remainder % of Total Weight:	41%	In Range	35-55%
Total Load % of Target Weight:	100%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	12.0		
Total Load Average Moisture Content (%DB):	21.1	In Range	19-25%
Total Load Average Moisture Content (%WB):	17.4		
Total Test Load Weight (dry basis):	20.78 lbs	9.43 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	2.6	to	5.0	
Actual Charcoal Bed Wt. (lb):		3.8		In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb):	0.0	Valid Test (≥90%)

Total Fuel Burned During Test Run:	25.2	lbs, wet basis
	20.8	lbs, dry basis
	9.43	kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Pacific Energy	Job #:	19-494
Model:	NEO 2.5 LE	Tracking #:	030
Run #:	2	Technician:	SJB
Test Start Time:	11:00	Date:	9/11/2019
Test Type:	Low Fire		

Recording Interval (min):	1
Total Sampling Time (min):	493

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.05	30.01	30.03
Relative Humidity (%)	47.2	31.9	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Meter Box γ Factor:	0.999 (A)	Ambient Sample Volume:	96.827 ft^3
Meter Box γ Factor:	0.996 (B)		
Meter Box γ Factor:	0.992 (Ambient)		

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	9/10/2019

Sample Train Post-Test Leak Checks

(A)	0.001	cfm @	-11	in. Hg
(B)	0.000	cfm @	-13	in. Hg
(Ambient)	0.002	cfm @	-14	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.070	75
2	0.084	75
3	0.080	75
4	0.074	75
5	0.076	75
6	0.086	75
7	0.084	75
8	0.072	75
Center	0.094	75

Static Pressure: -0.200 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	18.81	ft/sec
V_{scent}:	20.41	ft/sec
F_p:	0.922	[ratio]
Initial Tunnel Flow:	212.8	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client:	Pacific Energy	Job #:	19-494
Model:	NEO 2.5 LE	Tracking #:	030
Run #:	2	Technician:	SJB
		Date:	9/11/2019

Low Fire performed as a continuation of High Fire Test, see Run 1 test data for details

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.092	0.01	94	-0.06		25.2		134	557	82	75
1	0.145	0.145	0.088	2.38	93	-1.87	101	25.1	-0.1	154	455	84	75
2	0.295	0.150	0.092	2.38	93	-2.58	102	24.8	-0.3	145	650	84	74
3	0.448	0.153	0.092	2.38	93	-2.05	104	24.5	-0.3	150	818	83	74
4	0.599	0.151	0.096	2.38	93	-1.17	101	24.2	-0.3	155	912	81	74
5	0.751	0.152	0.087	2.34	93	-2.6	108	23.8	-0.4	163	933	81	74
6	0.902	0.151	0.094	2.28	93	-0.49	101	23.4	-0.4	145	719	82	75
7	1.055	0.153	0.091	2.25	93	-2.19	104	23.2	-0.2	135	655	84	75
8	1.205	0.150	0.088	2.23	93	-2.05	103	23.0	-0.2	132	627	84	74
9	1.351	0.146	0.091	2.22	93	-1.28	98	22.8	-0.2	129	613	83	74
10	1.501	0.150	0.089	2.21	93	-0.09	102	22.5	-0.3	127	606	82	74
11	1.646	0.145	0.090	2.22	93	-2.77	98	22.3	-0.2	125	599	81	74
12	1.795	0.149	0.094	2.20	93	-2.36	98	22.2	-0.1	124	594	82	74
13	1.940	0.145	0.087	2.17	93	-0.66	99	21.9	-0.3	123	588	83	74
14	2.088	0.148	0.087	2.15	93	-0.32	101	21.8	-0.1	123	580	84	74
15	2.231	0.143	0.087	2.13	93	-0.65	98	21.6	-0.2	121	573	84	74
16	2.378	0.147	0.093	2.08	93	-2.96	97	21.4	-0.2	120	570	82	74
17	2.522	0.144	0.088	2.29	93	-0.39	98	21.2	-0.2	120	563	81	74
18	2.673	0.151	0.088	2.23	93	-2.5	103	21.0	-0.2	119	564	81	74
19	2.818	0.145	0.089	2.15	93	-2	98	20.8	-0.2	119	568	83	74
20	2.965	0.147	0.087	2.08	93	-1.86	100	20.7	-0.1	118	567	84	74
21	3.106	0.141	0.094	1.97	93	-3.5	93	20.5	-0.2	118	568	84	74
22	3.254	0.148	0.090	2.17	94	-3.38	99	20.1	-0.4	118	564	83	74
23	3.397	0.143	0.085	2.17	94	-4.74	98	20.0	-0.1	117	566	82	74
24	3.550	0.153	0.082	2.33	94	-0.34	107	19.8	-0.2	117	565	80	74
25	3.698	0.148	0.082	2.25	94	-0.43	104	19.6	-0.2	117	565	81	74
26	3.849	0.151	0.087	2.26	94	0	103	19.4	-0.2	117	564	81	74
27	3.995	0.146	0.086	2.25	94	0	100	19.1	-0.3	116	562	83	74
28	4.146	0.151	0.081	2.25	94	-2.04	106	19.0	-0.1	116	561	84	74
29	4.292	0.146	0.084	2.25	94	0	101	18.8	-0.2	116	561	85	74
30	4.443	0.151	0.083	2.24	94	0	105	18.6	-0.2	116	558	84	74
31	4.589	0.146	0.084	2.21	94	-1.81	101	18.3	-0.3	116	560	83	74
32	4.741	0.152	0.086	2.23	94	-2.43	104	18.3	0	115	558	82	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.887	0.146	0.086	2.24	94	-0.4	100	18.0	-0.3	115	555	82	74
34	5.039	0.152	0.089	2.25	94	0	102	17.9	-0.1	115	556	81	75
35	5.184	0.145	0.087	2.22	94	-2.51	98	17.6	-0.3	115	553	82	75
36	5.335	0.151	0.083	2.22	94	-0.64	105	17.5	-0.1	115	554	83	75
37	5.481	0.146	0.085	2.21	94	0	100	17.3	-0.2	115	552	84	75
38	5.631	0.150	0.083	2.22	94	-0.72	104	17.1	-0.2	115	551	84	75
39	5.777	0.146	0.085	2.23	94	-2.49	100	16.8	-0.3	114	550	83	75
40	5.926	0.149	0.082	2.23	94	-2.66	104	16.7	-0.1	114	552	82	74
41	6.072	0.146	0.085	2.24	94	-2.71	100	16.5	-0.2	114	551	81	75
42	6.221	0.149	0.079	2.21	95	-2.52	106	16.3	-0.2	114	550	81	75
43	6.368	0.147	0.081	2.22	95	-2.75	103	16.1	-0.2	114	551	82	75
44	6.517	0.149	0.085	2.23	95	-2.45	102	15.9	-0.2	114	557	83	75
45	6.663	0.146	0.084	2.20	95	-0.1	101	15.7	-0.2	115	561	84	75
46	6.811	0.148	0.084	2.18	95	0	102	15.4	-0.3	115	562	84	75
47	6.957	0.146	0.082	2.21	95	-2.72	102	15.4	0	116	567	83	75
48	7.105	0.148	0.082	2.18	95	-0.83	103	15.2	-0.2	115	564	83	75
49	7.251	0.146	0.083	2.19	95	-0.01	101	15.0	-0.2	115	564	82	75
50	7.398	0.147	0.087	2.19	95	-2.21	100	14.8	-0.2	115	563	82	75
51	7.545	0.147	0.084	2.19	95	-0.62	101	14.7	-0.1	115	561	82	75
52	7.692	0.147	0.086	2.18	95	-2.35	100	14.5	-0.2	115	555	83	75
53	7.839	0.147	0.086	2.19	95	-1.43	100	14.3	-0.2	114	553	84	75
54	7.986	0.147	0.083	2.18	95	-0.01	102	14.1	-0.2	113	549	84	75
55	8.132	0.146	0.083	2.17	95	-2.1	101	14.0	-0.1	114	551	83	75
56	8.279	0.147	0.081	2.19	95	-0.58	103	13.9	-0.1	114	550	82	75
57	8.425	0.146	0.087	2.18	95	-2.52	99	13.7	-0.2	115	547	82	75
58	8.573	0.148	0.084	2.18	95	0	102	13.5	-0.2	114	541	82	76
59	8.719	0.146	0.086	2.17	95	-2.13	99	13.4	-0.1	114	542	83	76
60	8.866	0.147	0.083	2.18	95	-2.67	102	13.3	-0.1	114	535	84	76
61	9.022	0.156	0.086	2.24	96	-0.22	106	13.1	-0.2	114	532	83	76
62	9.169	0.147	0.084	2.24	96	0	101	13.0	-0.1	114	529	83	76
63	9.320	0.151	0.085	2.22	96	-2.32	103	12.8	-0.2	113	526	82	76
64	9.466	0.146	0.084	2.25	96	-2.01	100	12.6	-0.2	114	527	82	76
65	9.616	0.150	0.083	2.21	96	-0.97	104	12.5	-0.1	113	518	83	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.762	0.146	0.088	2.23	96	-0.11	98	12.4	-0.1	114	518	84	76
67	9.913	0.151	0.081	2.24	96	0	106	12.2	-0.2	113	514	84	76
68	10.059	0.146	0.082	2.24	96	-2.42	102	12.1	-0.1	113	511	84	76
69	10.210	0.151	0.083	2.22	96	-1.12	104	12.0	-0.1	113	511	83	76
70	10.355	0.145	0.082	2.21	96	0	101	11.9	-0.1	112	509	82	76
71	10.507	0.152	0.080	2.23	96	-2.58	107	11.8	-0.1	112	509	82	76
72	10.653	0.146	0.084	2.22	96	-0.99	100	11.6	-0.2	111	507	83	76
73	10.804	0.151	0.084	2.22	96	-0.96	104	11.5	-0.1	111	504	84	76
74	10.950	0.146	0.084	2.23	96	-1.19	100	11.4	-0.1	112	507	84	76
75	11.101	0.151	0.081	2.21	96	-2.19	106	11.2	-0.2	111	504	84	76
76	11.247	0.146	0.085	2.23	96	0	100	11.0	-0.2	111	504	83	76
77	11.397	0.150	0.080	2.23	96	0	105	10.9	-0.1	111	504	82	76
78	11.543	0.146	0.085	2.22	96	-2.43	100	10.8	-0.1	111	502	82	76
79	11.693	0.150	0.086	2.22	96	-2.48	102	10.6	-0.2	111	498	82	76
80	11.840	0.147	0.082	2.22	97	-0.29	102	10.5	-0.1	111	498	84	76
81	11.990	0.150	0.080	2.24	97	-0.37	105	10.4	-0.1	111	498	84	76
82	12.137	0.147	0.083	2.22	97	0	101	10.2	-0.2	110	497	84	76
83	12.286	0.149	0.086	2.23	97	-0.3	101	10.2	0	109	498	83	76
84	12.435	0.149	0.083	2.21	97	-1.81	103	10.0	-0.2	110	496	82	76
85	12.583	0.148	0.082	2.23	97	-2.14	103	9.9	-0.1	110	498	82	76
86	12.733	0.150	0.082	2.21	97	-0.17	104	9.7	-0.2	111	497	82	76
87	12.880	0.147	0.083	2.21	97	-1.12	101	9.7	0	111	495	83	76
88	13.029	0.149	0.083	2.22	97	-2.32	103	9.6	-0.1	110	494	84	76
89	13.176	0.147	0.083	2.23	97	-0.12	101	9.5	-0.1	110	493	84	76
90	13.326	0.150	0.080	2.20	97	-1.14	105	9.4	-0.1	110	491	84	76
91	13.472	0.146	0.082	2.22	97	-2.59	101	9.2	-0.2	110	489	83	76
92	13.622	0.150	0.083	2.22	97	-0.01	103	9.0	-0.2	111	487	82	76
93	13.767	0.145	0.078	2.22	97	-2.54	103	9.0	0	111	482	82	76
94	13.917	0.150	0.083	2.21	97	-0.5	103	8.8	-0.2	110	477	83	76
95	14.062	0.145	0.082	2.19	97	-2.67	100	8.8	0	110	471	84	76
96	14.213	0.151	0.078	2.23	97	-2.55	107	8.7	-0.1	109	464	84	77
97	14.359	0.146	0.085	2.20	97	-2.11	99	8.4	-0.3	109	456	84	77
98	14.509	0.150	0.077	2.20	98	-2.59	107	8.6	0.2	109	451	83	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.654	0.145	0.081	2.21	98	-2.31	101	8.5	-0.1	108	444	82	77
100	14.806	0.152	0.078	2.21	98	-0.01	108	8.4	-0.1	108	440	82	77
101	14.951	0.145	0.083	2.20	98	-1.95	99	8.3	-0.1	108	439	82	77
102	15.102	0.151	0.081	2.20	98	-1.62	105	8.2	-0.1	108	435	83	77
103	15.248	0.146	0.085	2.22	98	0	99	8.1	-0.1	108	438	84	77
104	15.399	0.151	0.084	2.21	98	0	103	8.0	-0.1	108	438	84	77
105	15.545	0.146	0.085	2.20	98	-2.2	99	8.0	0	108	438	83	77
106	15.695	0.150	0.082	2.21	98	-0.18	104	7.9	-0.1	108	436	83	77
107	15.841	0.146	0.084	2.23	98	-0.96	99	7.8	-0.1	107	435	82	77
108	15.991	0.150	0.081	2.22	98	-0.06	104	7.7	-0.1	107	432	82	77
109	16.137	0.146	0.082	2.22	98	-2.36	101	7.7	0	107	431	83	76
110	16.287	0.150	0.079	2.22	98	-1.77	105	7.6	-0.1	107	427	84	76
111	16.433	0.146	0.081	2.18	98	-0.22	101	7.5	-0.1	107	430	84	77
112	16.583	0.150	0.080	2.20	98	-1.56	105	7.4	-0.1	107	430	84	77
113	16.730	0.147	0.084	2.19	98	-0.47	100	7.3	-0.1	107	429	83	77
114	16.879	0.149	0.082	2.23	98	-0.16	103	7.3	0	107	430	82	77
115	17.027	0.148	0.078	2.21	98	-1.07	105	7.1	-0.2	107	428	82	77
116	17.176	0.149	0.084	2.22	98	-2.54	102	7.1	0	107	428	83	77
117	17.325	0.149	0.084	2.21	98	-0.85	101	7.0	-0.1	106	426	84	77
118	17.473	0.148	0.082	2.20	98	-2.04	102	6.9	-0.1	107	428	84	77
119	17.622	0.149	0.082	2.19	99	-2.14	102	6.8	-0.1	106	430	84	77
120	17.770	0.148	0.084	2.22	99	-0.72	101	6.8	0	106	429	83	77
121	17.920	0.150	0.086	2.22	99	-2.58	101	6.6	-0.2	106	430	82	77
122	18.066	0.146	0.082	2.23	99	-1.24	100	6.5	-0.1	106	431	82	77
123	18.216	0.150	0.079	2.21	99	-2.48	105	6.4	-0.1	106	432	82	77
124	18.362	0.146	0.085	2.24	99	-2.31	99	6.4	0	106	433	83	77
125	18.513	0.151	0.087	2.20	99	-2.47	101	6.4	0	106	435	84	77
126	18.658	0.145	0.081	2.23	99	-0.95	100	6.3	-0.1	106	435	84	77
127	18.809	0.151	0.088	2.21	99	-2.59	100	6.1	-0.2	107	437	83	77
128	18.954	0.145	0.083	2.21	99	-2.26	99	6.1	0	107	440	83	77
129	19.106	0.152	0.082	2.22	99	0	105	5.9	-0.2	107	443	82	78
130	19.252	0.146	0.082	2.21	99	-2.53	101	5.9	0	107	444	82	77
131	19.403	0.151	0.081	2.19	99	-0.13	105	5.8	-0.1	107	443	83	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.549	0.146	0.084	2.20	99	0	99	5.7	-0.1	107	440	84	78
133	19.699	0.150	0.084	2.21	99	-1.91	102	5.7	0	107	438	84	77
134	19.845	0.146	0.079	2.19	99	-2.7	102	5.5	-0.2	107	437	84	77
135	19.995	0.150	0.087	2.16	99	-1.7	100	5.5	0	108	442	83	77
136	20.141	0.146	0.080	2.19	100	0	102	5.4	-0.1	108	445	82	77
137	20.291	0.150	0.084	2.19	100	0	102	5.3	-0.1	108	445	82	77
138	20.436	0.145	0.086	2.19	100	-2.27	97	5.2	-0.1	108	451	83	78
139	20.586	0.150	0.082	2.21	100	0	103	5.0	-0.2	108	451	84	78
140	20.731	0.145	0.080	2.17	100	0	101	5.0	0	108	452	84	78
141	20.880	0.149	0.081	2.19	100	-0.5	103	4.9	-0.1	108	451	84	78
142	21.026	0.146	0.082	2.17	100	-2.19	100	4.8	-0.1	108	449	83	78
143	21.175	0.149	0.081	2.18	100	-2.02	103	4.6	-0.2	108	448	82	78
144	21.321	0.146	0.080	2.17	100	-2.69	102	4.6	0	108	445	82	78
145	21.469	0.148	0.083	2.17	100	0	101	4.6	0	107	427	82	78
146	21.615	0.146	0.080	2.18	100	0	101	4.6	0	106	402	84	78
147	21.764	0.149	0.084	2.16	100	0	101	4.5	-0.1	105	380	84	78
148	21.910	0.146	0.080	2.16	100	-2.5	101	4.5	0	105	363	84	78
149	22.058	0.148	0.079	2.16	100	-2.22	103	4.4	-0.1	103	346	83	78
150	22.204	0.146	0.084	2.16	100	-0.09	99	4.4	0	103	333	83	78
151	22.352	0.148	0.082	2.15	100	0	101	4.4	0	102	320	82	78
152	22.500	0.148	0.087	2.18	100	-0.99	98	4.4	0	102	309	82	78
153	22.647	0.147	0.084	2.15	100	-1.76	99	4.3	-0.1	100	300	83	78
154	22.795	0.148	0.085	2.16	100	-2.28	99	4.3	0	100	292	84	78
155	22.942	0.147	0.083	2.17	100	-2.61	100	4.3	0	100	286	84	78
156	23.090	0.148	0.084	2.15	100	-2.18	100	4.2	-0.1	99	281	84	78
157	23.237	0.147	0.085	2.14	100	-0.77	99	4.3	0.1	99	274	83	78
158	23.385	0.148	0.083	2.15	101	-2.68	100	4.1	-0.2	98	270	82	78
159	23.532	0.147	0.082	2.14	101	-2.86	100	4.2	0.1	98	266	82	78
160	23.680	0.148	0.086	2.17	101	-1.55	98	4.1	-0.1	98	263	83	78
161	23.826	0.146	0.078	2.16	101	-1.2	102	4.2	0.1	97	260	84	78
162	23.975	0.149	0.084	2.18	101	-2	100	4.2	0	97	259	85	78
163	24.120	0.145	0.086	2.16	101	-1.49	96	4.2	0	97	256	84	78
164	24.269	0.149	0.081	2.16	101	-0.02	102	4.1	-0.1	96	255	83	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.415	0.146	0.084	2.16	101	-2.13	98	4.1	0	96	251	82	78
166	24.564	0.149	0.083	2.16	101	-2.68	101	4.1	0	96	249	82	78
167	24.710	0.146	0.080	2.16	101	-0.71	100	4.1	0	95	247	82	78
168	24.859	0.149	0.084	2.16	101	-2.73	100	4.0	-0.1	95	245	84	78
169	25.004	0.145	0.084	2.16	101	-2.66	97	4.1	0.1	95	242	84	78
170	25.153	0.149	0.087	2.17	101	-2.28	98	4.1	0	95	239	85	78
171	25.302	0.149	0.083	2.16	101	-1.48	101	4.0	-0.1	95	236	84	78
172	25.451	0.149	0.081	2.17	101	-0.62	102	4.0	0	94	235	83	78
173	25.596	0.145	0.085	2.17	101	-2.73	97	4.0	0	94	234	82	78
174	25.745	0.149	0.082	2.17	101	-2.6	101	3.9	-0.1	94	232	82	78
175	25.890	0.145	0.082	2.16	101	-2.31	98	4.0	0.1	94	230	83	78
176	26.040	0.150	0.080	2.16	101	-0.58	103	3.9	-0.1	94	228	84	78
177	26.185	0.145	0.083	2.16	101	0	98	3.9	0	93	226	85	78
178	26.335	0.150	0.083	2.19	101	-2.54	101	3.8	-0.1	93	225	85	78
179	26.479	0.144	0.080	2.17	101	-2.61	99	3.9	0.1	93	223	84	78
180	26.629	0.150	0.083	2.18	101	-1.38	101	3.9	0	93	222	83	77
181	26.774	0.145	0.085	2.16	101	-2.23	96	3.9	0	93	221	82	77
182	26.924	0.150	0.084	2.17	102	-0.7	100	3.8	-0.1	93	220	82	77
183	27.068	0.144	0.083	2.16	102	-0.65	97	3.8	0	93	219	83	78
184	27.219	0.151	0.086	2.15	102	-2.62	100	3.7	-0.1	93	217	84	78
185	27.363	0.144	0.086	2.16	102	-1.36	95	3.8	0.1	93	216	85	77
186	27.514	0.151	0.086	2.16	102	-2.7	100	3.8	0	92	216	84	77
187	27.658	0.144	0.085	2.16	102	-2.71	96	3.8	0	92	215	83	78
188	27.809	0.151	0.083	2.15	102	-0.01	101	3.8	0	92	214	82	77
189	27.954	0.145	0.084	2.16	102	-1.08	97	3.7	-0.1	92	214	82	77
190	28.104	0.150	0.085	2.15	102	-0.13	100	3.7	0	92	214	82	78
191	28.249	0.145	0.085	2.17	102	-0.51	96	3.7	0	92	213	83	78
192	28.399	0.150	0.084	2.16	102	-1.89	100	3.7	0	91	213	85	77
193	28.544	0.145	0.084	2.16	102	-1.72	97	3.7	0	91	211	85	77
194	28.694	0.150	0.080	2.16	102	-2.76	103	3.7	0	91	210	84	77
195	28.839	0.145	0.082	2.19	102	-0.2	98	3.6	-0.1	91	210	83	77
196	28.989	0.150	0.085	2.17	102	0	99	3.6	0	91	209	82	77
197	29.134	0.145	0.082	2.17	102	-2.18	98	3.6	0	91	206	82	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	29.284	0.150	0.084	2.15	102	-1.85	100	3.6	0	91	205	83	77
199	29.429	0.145	0.083	2.17	102	0	97	3.6	0	91	205	84	77
200	29.579	0.150	0.083	2.16	102	-2.21	101	3.6	0	91	204	85	77
201	29.723	0.144	0.080	2.17	102	-0.51	98	3.5	-0.1	91	202	84	77
202	29.873	0.150	0.084	2.16	102	-0.33	100	3.5	0	91	201	83	77
203	30.018	0.145	0.083	2.18	102	-2.68	97	3.6	0.1	91	200	83	77
204	30.167	0.149	0.080	2.15	102	-0.35	102	3.5	-0.1	91	200	82	77
205	30.313	0.146	0.081	2.17	102	-0.77	99	3.5	0	90	201	83	77
206	30.462	0.149	0.082	2.15	102	-1.67	100	3.5	0	90	200	84	77
207	30.609	0.147	0.083	2.18	102	-2.62	99	3.5	0	90	199	85	77
208	30.757	0.148	0.087	2.17	102	0	97	3.4	-0.1	90	198	85	77
209	30.904	0.147	0.087	2.17	102	-0.07	96	3.4	0	90	198	84	77
210	31.052	0.148	0.080	2.16	102	-0.67	101	3.5	0.1	90	197	83	77
211	31.199	0.147	0.079	2.16	102	-0.56	101	3.4	-0.1	90	196	82	77
212	31.347	0.148	0.085	2.15	102	-1.3	98	3.4	0	90	195	82	77
213	31.495	0.148	0.080	2.16	102	0	101	3.4	0	90	195	83	77
214	31.643	0.148	0.086	2.16	102	-0.41	97	3.4	0	90	195	84	77
215	31.791	0.148	0.084	2.19	102	0	99	3.3	-0.1	90	195	85	77
216	31.938	0.147	0.082	2.14	102	0	99	3.3	0	90	195	84	77
217	32.087	0.149	0.080	2.14	102	-0.42	102	3.3	0	89	194	83	77
218	32.233	0.146	0.082	2.14	102	-2.71	98	3.3	0	90	193	82	77
219	32.382	0.149	0.082	2.16	102	0	100	3.3	0	89	194	82	77
220	32.529	0.147	0.084	2.16	102	-1.96	98	3.3	0	89	194	83	77
221	32.678	0.149	0.080	2.17	102	-2.27	102	3.3	0	89	192	84	77
222	32.824	0.146	0.085	2.14	102	-1.64	97	3.2	-0.1	89	191	85	77
223	32.974	0.150	0.083	2.18	102	-2.02	100	3.2	0	89	191	85	77
224	33.119	0.145	0.086	2.17	102	-2.5	95	3.2	0	89	191	84	77
225	33.269	0.150	0.085	2.17	102	-1.7	99	3.2	0	89	190	83	77
226	33.414	0.145	0.081	2.17	102	-2.69	98	3.2	0	89	190	82	77
227	33.563	0.149	0.086	2.18	102	-0.09	98	3.1	-0.1	89	189	82	77
228	33.709	0.146	0.084	2.16	102	-0.69	97	3.2	0.1	89	189	83	77
229	33.859	0.150	0.083	2.14	102	-0.7	100	3.1	-0.1	89	189	84	77
230	34.004	0.145	0.084	2.15	102	-2.69	97	3.1	0	89	189	84	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	34.154	0.150	0.082	2.17	102	-0.56	101	3.1	0	89	189	84	77
232	34.299	0.145	0.085	2.17	102	-2.04	96	3.1	0	89	188	83	77
233	34.449	0.150	0.083	2.17	102	-2.71	100	3.1	0	89	188	82	77
234	34.594	0.145	0.087	2.17	102	-2.59	95	3.1	0	89	189	82	77
235	34.744	0.150	0.084	2.19	102	0	100	3.0	-0.1	89	188	83	77
236	34.889	0.145	0.082	2.15	102	-2.74	98	2.9	-0.1	89	188	84	77
237	35.041	0.152	0.082	2.17	102	-0.8	102	3.0	0.1	89	188	85	77
238	35.185	0.144	0.087	2.16	102	0	94	3.0	0	89	187	84	77
239	35.336	0.151	0.083	2.18	102	-1.82	101	3.0	0	89	187	83	77
240	35.481	0.145	0.086	2.15	102	-1.89	95	3.0	0	89	187	82	77
241	35.631	0.150	0.082	2.16	102	0	101	3.0	0	89	187	82	77
242	35.776	0.145	0.084	2.15	102	-0.01	97	3.0	0	89	187	83	77
243	35.926	0.150	0.083	2.14	102	-1.25	100	3.0	0	89	186	84	77
244	36.071	0.145	0.085	2.15	102	-2.43	96	2.9	-0.1	89	186	85	77
245	36.222	0.151	0.080	2.16	102	0	103	2.9	0	89	186	84	77
246	36.367	0.145	0.082	2.15	102	-2.73	98	2.9	0	89	186	84	77
247	36.517	0.150	0.080	2.16	102	-2.66	102	2.9	0	89	186	83	77
248	36.662	0.145	0.087	2.16	103	-2.38	95	2.8	-0.1	89	186	82	77
249	36.811	0.149	0.086	2.16	102	-0.76	98	2.9	0.1	89	186	82	77
250	36.957	0.146	0.083	2.14	102	-2.24	98	2.9	0	89	185	84	77
251	37.106	0.149	0.084	2.16	103	-0.93	99	2.8	-0.1	89	185	84	77
252	37.252	0.146	0.081	2.15	103	-2.7	99	2.8	0	89	185	84	77
253	37.402	0.150	0.085	2.19	103	-2.06	99	2.8	0	89	184	84	77
254	37.548	0.146	0.085	2.17	103	-0.95	96	2.8	0	89	184	83	77
255	37.696	0.148	0.084	2.16	103	-0.05	98	2.9	0.1	89	185	82	77
256	37.843	0.147	0.079	2.16	103	-0.73	101	2.8	-0.1	89	185	83	77
257	37.991	0.148	0.083	2.18	103	-2.53	99	2.7	-0.1	89	184	84	77
258	38.138	0.147	0.078	2.15	103	-0.15	101	2.7	0	89	184	85	77
259	38.286	0.148	0.083	2.16	103	-0.01	99	2.7	0	89	184	85	77
260	38.434	0.148	0.083	2.16	103	-0.08	99	2.7	0	89	184	84	77
261	38.582	0.148	0.084	2.16	103	0	98	2.7	0	89	184	83	77
262	38.730	0.148	0.087	2.15	103	-1.45	97	2.7	0	89	184	82	77
263	38.877	0.147	0.081	2.15	103	-2.7	99	2.7	0	88	183	82	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	39.026	0.149	0.086	2.16	103	-2.18	98	2.6	-0.1	88	182	83	77
265	39.172	0.146	0.082	2.16	103	-1.38	98	2.6	0	88	182	84	77
266	39.321	0.149	0.080	2.16	103	-0.04	101	2.6	0	88	181	85	77
267	39.467	0.146	0.084	2.16	103	-0.01	97	2.6	0	88	181	84	77
268	39.617	0.150	0.087	2.16	103	-2.67	98	2.6	0	88	181	84	77
269	39.763	0.146	0.087	2.14	103	-2.17	95	2.6	0	88	181	83	77
270	39.912	0.149	0.083	2.18	103	0	100	2.6	0	88	181	82	77
271	40.058	0.146	0.087	2.15	103	-2.51	95	2.5	-0.1	88	180	82	77
272	40.207	0.149	0.081	2.16	103	-0.63	101	2.5	0	88	180	83	77
273	40.352	0.145	0.084	2.16	103	-1.58	96	2.5	0	88	179	84	77
274	40.502	0.150	0.083	2.16	103	-1.73	100	2.5	0	88	180	84	77
275	40.647	0.145	0.084	2.18	103	0	96	2.6	0.1	88	180	84	77
276	40.797	0.150	0.081	2.16	103	-0.03	101	2.5	-0.1	88	180	83	77
277	40.943	0.146	0.082	2.18	103	-2.55	98	2.5	0	89	180	82	77
278	41.093	0.150	0.081	2.17	103	-1	101	2.5	0	88	179	82	77
279	41.237	0.144	0.083	2.17	103	-0.19	96	2.5	0	88	179	83	77
280	41.388	0.151	0.085	2.17	103	-0.01	100	2.4	-0.1	88	179	84	77
281	41.533	0.145	0.079	2.15	103	0	99	2.4	0	88	179	84	77
282	41.684	0.151	0.084	2.16	103	-0.28	100	2.4	0	88	179	84	77
283	41.830	0.146	0.088	2.21	103	-0.99	95	2.4	0	88	180	83	77
284	41.983	0.153	0.081	2.20	103	-0.36	103	2.4	0	88	179	83	77
285	42.130	0.147	0.081	2.22	103	0	99	2.4	0	89	180	82	78
286	42.283	0.153	0.086	2.23	103	-0.66	100	2.3	-0.1	88	180	83	77
287	42.429	0.146	0.080	2.22	103	-0.11	99	2.4	0.1	88	179	84	77
288	42.580	0.151	0.087	2.21	103	0	99	2.3	-0.1	88	179	85	77
289	42.729	0.149	0.083	2.24	103	-0.64	100	2.3	0	88	179	84	77
290	42.879	0.150	0.086	2.20	103	-2.67	98	2.3	0	88	179	84	78
291	43.029	0.150	0.081	2.21	103	-2.71	101	2.3	0	88	179	83	77
292	43.179	0.150	0.083	2.24	103	-1.24	100	2.2	-0.1	88	179	82	78
293	43.330	0.151	0.083	2.24	103	-0.41	101	2.2	0	88	180	82	77
294	43.478	0.148	0.080	2.22	103	-0.64	101	2.2	0	88	179	83	78
295	43.629	0.151	0.084	2.23	103	-1.02	100	2.2	0	88	178	84	77
296	43.776	0.147	0.084	2.22	103	-0.19	98	2.2	0	88	178	84	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	43.928	0.152	0.087	2.22	103	-2.78	99	2.1	-0.1	88	178	84	77
298	44.074	0.146	0.081	2.21	103	-2.45	99	2.2	0.1	88	178	84	77
299	44.228	0.154	0.083	2.22	103	-0.04	103	2.2	0	88	178	83	77
300	44.375	0.147	0.084	2.19	103	0	98	2.2	0	88	178	82	77
301	44.527	0.152	0.082	2.20	103	-0.31	102	2.2	0	88	178	82	77
302	44.675	0.148	0.082	2.21	103	-1.43	99	2.1	-0.1	88	177	83	77
303	44.826	0.151	0.081	2.23	103	-0.5	102	2.1	0	88	177	84	77
304	44.973	0.147	0.082	2.20	103	-1.26	99	2.2	0.1	88	176	85	77
305	45.124	0.151	0.085	2.22	103	-2.27	100	2.1	-0.1	88	175	84	78
306	45.273	0.149	0.086	2.21	103	-1.7	98	2.1	0	88	175	83	78
307	45.423	0.150	0.085	2.22	103	-0.18	99	2.1	0	88	175	83	78
308	45.574	0.151	0.087	2.22	103	-0.65	99	2.1	0	88	174	82	78
309	45.723	0.149	0.076	2.23	103	0	104	2.0	-0.1	88	174	82	78
310	45.874	0.151	0.084	2.23	103	-1.17	100	2.0	0	88	174	82	78
311	46.021	0.147	0.085	2.22	103	-2.14	97	2.0	0	88	173	84	78
312	46.173	0.152	0.084	2.22	103	-2.47	101	2.0	0	88	174	84	78
313	46.319	0.146	0.084	2.23	103	-0.15	97	2.0	0	88	174	84	78
314	46.472	0.153	0.084	2.21	103	-2.42	102	2.0	0	88	173	84	78
315	46.619	0.147	0.085	2.20	103	-1.44	97	2.0	0	88	171	83	78
316	46.772	0.153	0.085	2.22	103	-2.22	101	2.0	0	88	172	82	78
317	46.919	0.147	0.084	2.22	103	-0.07	98	1.9	-0.1	88	172	82	78
318	47.072	0.153	0.086	2.22	103	-1.73	100	1.9	0	88	171	83	78
319	47.218	0.146	0.082	2.23	104	-1.79	98	2.0	0.1	88	170	84	78
320	47.370	0.152	0.080	2.22	104	0	103	1.8	-0.2	88	171	84	78
321	47.518	0.148	0.086	2.22	104	0	97	1.9	0.1	88	171	84	78
322	47.668	0.150	0.085	2.22	104	-0.87	99	1.8	-0.1	89	170	83	78
323	47.819	0.151	0.082	2.22	104	-2.31	101	1.9	0.1	89	169	82	77
324	47.968	0.149	0.084	2.20	104	-0.55	99	1.8	-0.1	89	168	82	78
325	48.118	0.150	0.083	2.21	104	-2.51	100	1.8	0	89	168	83	78
326	48.267	0.149	0.081	2.22	104	-2.62	101	1.8	0	89	168	84	78
327	48.418	0.151	0.082	2.22	104	-2	101	1.8	0	89	168	85	77
328	48.564	0.146	0.085	2.21	104	-2.48	96	1.8	0	89	168	84	78
329	48.717	0.153	0.085	2.22	104	-2.71	101	1.8	0	89	167	83	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	48.863	0.146	0.081	2.21	104	-1.82	99	1.8	0	89	167	83	78
331	49.016	0.153	0.083	2.23	104	-0.59	102	1.8	0	89	167	82	78
332	49.163	0.147	0.086	2.21	104	0	96	1.8	0	89	166	83	78
333	49.316	0.153	0.085	2.23	104	-2.41	101	1.8	0	89	167	84	78
334	49.463	0.147	0.083	2.23	104	-0.02	98	1.7	-0.1	89	165	84	78
335	49.614	0.151	0.083	2.20	104	-0.12	101	1.7	0	89	165	84	78
336	49.761	0.147	0.085	2.20	104	0	97	1.7	0	89	165	83	78
337	49.912	0.151	0.081	2.22	104	-2.44	102	1.7	0	89	165	83	78
338	50.061	0.149	0.081	2.21	104	-2.67	101	1.7	0	89	165	82	78
339	50.211	0.150	0.083	2.22	104	-2.61	100	1.7	0	89	165	81	78
340	50.362	0.151	0.081	2.20	104	-0.33	102	1.8	0.1	89	165	82	78
341	50.510	0.148	0.081	2.22	104	-1.81	100	1.7	-0.1	89	164	84	78
342	50.662	0.152	0.081	2.21	104	-1.37	103	1.7	0	89	163	84	78
343	50.809	0.147	0.083	2.23	104	-0.42	98	1.6	-0.1	89	163	84	78
344	50.960	0.151	0.080	2.22	104	-0.8	103	1.7	0.1	89	163	84	78
345	51.107	0.147	0.084	2.20	104	-1.72	98	1.6	-0.1	89	163	83	78
346	51.259	0.152	0.080	2.21	104	-1.43	103	1.6	0	89	163	82	78
347	51.406	0.147	0.084	2.23	105	-0.2	97	1.6	0	89	163	82	78
348	51.559	0.153	0.085	2.20	105	-0.06	101	1.6	0	89	163	83	78
349	51.706	0.147	0.083	2.23	105	-0.69	98	1.6	0	89	163	84	78
350	51.859	0.153	0.083	2.19	105	-1.98	102	1.6	0	89	162	84	78
351	52.006	0.147	0.083	2.20	105	-2.72	98	1.5	-0.1	89	162	84	78
352	52.156	0.150	0.085	2.21	105	-1.33	99	1.6	0.1	89	162	84	78
353	52.305	0.149	0.086	2.22	105	-0.29	98	1.5	-0.1	89	162	83	79
354	52.455	0.150	0.081	2.20	105	-0.31	101	1.5	0	89	162	82	79
355	52.606	0.151	0.083	2.19	105	-0.5	101	1.5	0	89	162	82	79
356	52.755	0.149	0.082	2.21	105	-2.51	100	1.5	0	89	161	82	79
357	52.906	0.151	0.084	2.22	105	-2.51	100	1.5	0	89	161	83	79
358	53.055	0.149	0.081	2.21	105	-1.34	100	1.5	0	89	161	84	79
359	53.206	0.151	0.085	2.22	105	-2.16	99	1.5	0	89	161	84	79
360	53.353	0.147	0.084	2.20	105	-2.71	97	1.5	0	89	161	84	79
361	53.505	0.152	0.080	2.20	105	0	103	1.5	0	89	161	83	79
362	53.652	0.147	0.084	2.19	105	-0.97	97	1.4	-0.1	89	160	82	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	53.806	0.154	0.082	2.22	105	-0.47	103	1.4	0	89	160	82	79
364	53.953	0.147	0.087	2.20	105	-2.96	96	1.4	0	89	160	82	79
365	54.105	0.152	0.084	2.22	105	-0.46	101	1.3	-0.1	89	160	84	79
366	54.253	0.148	0.083	2.24	105	-2.42	99	1.4	0.1	89	160	84	79
367	54.404	0.151	0.081	2.20	105	0	102	1.3	-0.1	89	160	84	79
368	54.552	0.148	0.081	2.23	105	0	100	1.4	0.1	89	159	84	79
369	54.702	0.150	0.083	2.23	105	-0.9	100	1.4	0	89	160	83	79
370	54.852	0.150	0.081	2.20	105	-2.54	101	1.3	-0.1	89	160	82	79
371	55.002	0.150	0.083	2.20	106	-2.7	100	1.3	0	89	159	82	79
372	55.153	0.151	0.085	2.21	106	-2.44	99	1.3	0	89	159	82	79
373	55.302	0.149	0.087	2.20	106	-2.68	97	1.3	0	89	159	83	79
374	55.453	0.151	0.080	2.21	106	-2.6	102	1.3	0	89	159	84	79
375	55.600	0.147	0.084	2.20	106	-0.55	97	1.3	0	89	159	84	79
376	55.752	0.152	0.081	2.21	106	-2.61	102	1.3	0	89	159	84	79
377	55.898	0.146	0.085	2.21	106	-2.54	96	1.3	0	89	159	83	79
378	56.052	0.154	0.082	2.21	106	-2.6	103	1.3	0	89	158	82	79
379	56.199	0.147	0.083	2.20	106	-0.35	98	1.3	0	89	159	82	79
380	56.351	0.152	0.084	2.20	106	0	100	1.3	0	89	158	82	79
381	56.499	0.148	0.083	2.23	106	0	98	1.2	-0.1	89	158	83	79
382	56.650	0.151	0.079	2.21	106	-2.47	103	1.2	0	89	158	84	79
383	56.798	0.148	0.083	2.19	106	-2.59	98	1.2	0	89	158	84	79
384	56.949	0.151	0.083	2.20	106	-0.53	100	1.2	0	89	158	84	79
385	57.098	0.149	0.085	2.22	106	-2.22	98	1.2	0	89	157	83	79
386	57.248	0.150	0.087	2.21	106	-0.49	97	1.3	0.1	89	157	83	79
387	57.399	0.151	0.085	2.22	106	0	99	1.2	-0.1	89	157	82	79
388	57.548	0.149	0.085	2.22	106	-2.19	98	1.2	0	89	157	82	80
389	57.700	0.152	0.083	2.21	106	-1.62	101	1.2	0	89	157	82	80
390	57.846	0.146	0.085	2.21	106	0	96	1.1	-0.1	89	157	84	80
391	57.998	0.152	0.082	2.23	106	-0.71	102	1.1	0	89	156	84	80
392	58.145	0.147	0.085	2.21	106	-0.1	97	1.1	0	89	157	84	80
393	58.298	0.153	0.085	2.20	106	-0.18	101	1.1	0	89	157	84	80
394	58.446	0.148	0.086	2.21	106	-0.39	97	1.1	0	89	157	83	80
395	58.598	0.152	0.082	2.21	106	-2.67	102	1.1	0	89	157	82	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	58.746	0.148	0.087	2.20	106	0	96	1.1	0	89	157	82	80
397	58.898	0.152	0.084	2.22	106	-1.01	100	1.2	0.1	89	156	82	80
398	59.045	0.147	0.084	2.20	106	-1.95	97	1.1	-0.1	89	156	83	80
399	59.196	0.151	0.085	2.20	106	-0.47	99	1.1	0	89	156	84	80
400	59.345	0.149	0.079	2.21	106	-2.68	102	1.0	-0.1	89	157	84	80
401	59.496	0.151	0.086	2.22	106	-1.54	99	1.0	0	89	156	84	80
402	59.647	0.151	0.083	2.22	107	-0.96	100	1.0	0	89	157	83	80
403	59.796	0.149	0.087	2.20	107	-0.01	97	1.0	0	89	156	83	80
404	59.947	0.151	0.085	2.22	107	-2.69	99	1.0	0	89	156	82	80
405	60.094	0.147	0.086	2.23	107	0	96	1.0	0	89	157	82	80
406	60.246	0.152	0.085	2.22	107	-1.3	100	1.0	0	89	156	82	80
407	60.393	0.147	0.086	2.21	107	-2.09	96	1.1	0.1	89	155	84	80
408	60.547	0.154	0.079	2.23	107	-2.73	105	0.9	-0.2	89	155	84	80
409	60.694	0.147	0.083	2.20	107	-2.42	98	0.9	0	89	156	84	80
410	60.847	0.153	0.085	2.20	107	-0.18	100	0.9	0	89	156	84	80
411	60.995	0.148	0.082	2.22	107	-0.47	99	0.9	0	89	156	83	80
412	61.146	0.151	0.088	2.22	107	-2.07	97	0.9	0	89	156	83	80
413	61.294	0.148	0.084	2.21	107	-2.61	98	0.9	0	89	156	82	80
414	61.445	0.151	0.082	2.20	107	-0.84	101	0.9	0	89	157	82	80
415	61.594	0.149	0.083	2.20	107	-0.81	99	0.9	0	89	157	83	80
416	61.745	0.151	0.085	2.19	107	-1.09	99	0.9	0	89	156	84	80
417	61.896	0.151	0.084	2.17	107	0	100	1.0	0.1	89	157	85	80
418	62.045	0.149	0.082	2.20	107	-1.64	100	0.9	-0.1	89	156	84	80
419	62.196	0.151	0.081	2.22	107	-2	101	0.8	-0.1	89	157	84	80
420	62.343	0.147	0.083	2.20	107	-2.74	98	0.8	0	89	157	83	80
421	62.496	0.153	0.083	2.21	107	-1.26	102	0.8	0	89	157	83	80
422	62.642	0.146	0.085	2.19	107	0	96	0.8	0	89	156	82	80
423	62.796	0.154	0.083	2.19	107	-0.78	102	0.8	0	89	157	82	80
424	62.944	0.148	0.087	2.21	107	-2.72	96	0.8	0	89	157	83	80
425	63.097	0.153	0.083	2.21	107	-2.75	102	0.8	0	89	157	84	80
426	63.244	0.147	0.083	2.23	107	-1.8	98	0.6	-0.2	89	157	85	80
427	63.395	0.151	0.081	2.23	107	-1.33	101	0.7	0.1	89	157	84	80
428	63.544	0.149	0.084	2.22	107	-2.75	98	0.7	0	89	157	84	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429	63.694	0.150	0.085	2.21	107	-2.76	98	0.6	-0.1	89	157	83	80
430	63.845	0.151	0.082	2.21	107	0	101	0.7	0.1	89	157	83	80
431	63.995	0.150	0.083	2.22	107	-2.1	100	0.7	0	89	157	82	80
432	64.146	0.151	0.086	2.20	107	0	98	0.7	0	89	157	82	80
433	64.295	0.149	0.087	2.22	107	-1.72	97	0.7	0	89	157	83	80
434	64.446	0.151	0.085	2.24	107	-2.6	99	0.7	0	89	157	84	80
435	64.593	0.147	0.079	2.21	107	-0.49	100	0.7	0	89	157	84	80
436	64.746	0.153	0.085	2.22	107	-2.15	100	0.6	-0.1	89	156	84	80
437	64.894	0.148	0.086	2.21	107	-1.65	97	0.5	-0.1	89	157	83	80
438	65.047	0.153	0.084	2.22	107	-2.43	101	0.6	0.1	89	157	83	80
439	65.194	0.147	0.086	2.21	107	0	96	0.6	0	89	157	82	80
440	65.347	0.153	0.085	2.22	107	-0.15	100	0.6	0	89	156	82	80
441	65.494	0.147	0.085	2.24	107	-0.25	96	0.6	0	89	156	83	80
442	65.646	0.152	0.081	2.23	107	-2.25	102	0.6	0	89	157	84	80
443	65.794	0.148	0.083	2.23	108	-0.23	98	0.6	0	89	157	85	80
444	65.945	0.151	0.079	2.21	108	0	103	0.6	0	89	156	84	80
445	66.096	0.151	0.081	2.22	108	-2.2	101	0.6	0	89	156	84	80
446	66.245	0.149	0.085	2.21	108	-1.97	98	0.5	-0.1	89	156	83	80
447	66.397	0.152	0.084	2.22	108	-0.03	100	0.5	0	89	157	82	80
448	66.544	0.147	0.084	2.22	108	-1.99	97	0.5	0	89	156	82	80
449	66.697	0.153	0.087	2.22	108	-0.03	99	0.5	0	89	156	82	80
450	66.843	0.146	0.084	2.23	108	0	96	0.5	0	89	156	83	80
451	66.997	0.154	0.080	2.20	108	-0.08	104	0.4	-0.1	89	155	84	80
452	67.145	0.148	0.084	2.22	108	-1.73	97	0.5	0.1	89	156	84	80
453	67.297	0.152	0.084	2.23	108	-2.81	100	0.5	0	89	156	84	80
454	67.445	0.148	0.082	2.21	108	-0.28	99	0.5	0	89	156	83	80
455	67.596	0.151	0.086	2.22	108	-1.28	98	0.4	-0.1	89	156	83	80
456	67.745	0.149	0.084	2.22	108	-0.11	98	0.4	0	89	155	82	80
457	67.895	0.150	0.081	2.21	108	-1.8	101	0.4	0	89	156	82	80
458	68.046	0.151	0.084	2.21	108	-0.38	99	0.4	0	89	156	83	80
459	68.196	0.150	0.083	2.21	108	-2.8	99	0.4	0	89	156	84	80
460	68.347	0.151	0.083	2.19	108	0	100	0.4	0	89	157	84	80
461	68.496	0.149	0.086	2.20	108	-2.38	97	0.4	0	89	157	84	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462	68.647	0.151	0.080	2.19	108	0	102	0.4	0	89	156	84	80
463	68.795	0.148	0.083	2.23	108	-1.65	98	0.4	0	89	155	83	80
464	68.947	0.152	0.084	2.24	108	-1.04	100	0.3	-0.1	89	156	82	80
465	69.094	0.147	0.080	2.20	108	-0.89	99	0.3	0	89	155	82	80
466	69.248	0.154	0.085	2.20	108	0	101	0.3	0	89	156	82	80
467	69.395	0.147	0.082	2.21	108	-2.66	98	0.3	0	89	155	84	80
468	69.551	0.156	0.079	2.22	108	-2.72	106	0.2	-0.1	89	156	84	80
469	69.698	0.147	0.085	2.22	108	-1.99	96	0.3	0.1	89	155	84	80
470	69.849	0.151	0.085	2.19	108	-2.1	99	0.3	0	89	155	84	80
471	69.998	0.149	0.082	2.21	108	-2.6	99	0.3	0	89	154	83	80
472	70.148	0.150	0.082	2.22	108	-2.84	100	0.2	-0.1	89	154	83	80
473	70.299	0.151	0.085	2.21	108	-0.24	99	0.2	0	89	154	82	80
474	70.449	0.150	0.081	2.21	108	0	101	0.2	0	89	154	82	80
475	70.600	0.151	0.081	2.17	108	-0.64	101	0.2	0	89	154	83	80
476	70.748	0.148	0.082	2.22	108	-2.75	99	0.2	0	89	153	84	80
477	70.900	0.152	0.087	2.20	108	-2.63	98	0.2	0	89	154	85	80
478	71.047	0.147	0.083	2.20	108	-0.63	97	0.3	0.1	89	153	84	80
479	71.199	0.152	0.083	2.20	108	-1.36	101	0.2	-0.1	88	153	84	80
480	71.347	0.148	0.084	2.21	108	-1.79	97	0.1	-0.1	88	153	83	80
481	71.500	0.153	0.083	2.22	108	-2.48	101	0.2	0.1	89	153	83	80
482	71.648	0.148	0.082	2.21	108	-2.63	99	0.1	-0.1	88	153	82	80
483	71.800	0.152	0.082	2.21	108	-2.72	101	0.1	0	88	153	83	80
484	71.947	0.147	0.084	2.22	108	-2.22	97	0.1	0	89	153	84	80
485	72.099	0.152	0.082	2.23	108	-2.52	101	0.1	0	88	152	85	80
486	72.247	0.148	0.081	2.21	108	-0.93	99	0.2	0.1	88	153	85	80
487	72.398	0.151	0.082	2.18	108	0	101	0.1	-0.1	88	152	84	80
488	72.549	0.151	0.083	2.21	108	-2.65	100	0.1	0	88	152	83	80
489	72.697	0.148	0.084	2.21	108	-0.29	97	0.1	0	88	152	83	80
490	72.849	0.152	0.080	2.22	108	-2.04	103	0.1	0	88	152	82	80
491	72.997	0.148	0.080	2.22	108	-2.66	100	0.1	0	88	152	82	80
492	73.148	0.151	0.082	2.21	108	-1.27	101	0.1	0	88	152	83	80
493	73.295	0.147	0.086	2.21	108	-0.46	96	0.0	-0.1	88	151	84	80
Avg/Tot	73.295	0.149	0.084	2.19	102	-1.34	100			97	280	83	77.6

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	92	-1		81	0.000	8.02	0.44
1	0.135	0.135	1.96	92	-1.4	95	81	-0.090	5.72	0.20
2	0.276	0.141	2.22	92	-1.44	96	81	-0.100	5.43	0.60
3	0.424	0.148	2.20	92	-2.31	102	83	-0.120	15.25	0.66
4	0.568	0.144	2.21	92	-3.01	97	85	-0.100	18.58	0.14
5	0.715	0.147	2.18	92	-2.35	105	87	-0.110	20.00	0.55
6	0.859	0.144	2.15	92	-2.67	97	85	-0.110	18.38	4.40
7	1.003	0.144	2.11	92	-2.77	98	84	-0.110	17.61	3.63
8	1.146	0.143	2.10	92	-3.18	99	85	-0.090	17.51	2.64
9	1.289	0.143	2.16	92	-2.78	97	85	-0.100	17.30	2.26
10	1.434	0.145	2.14	92	-3.04	99	86	-0.090	17.30	1.86
11	1.577	0.143	2.14	92	-0.95	97	86	-0.080	17.01	1.71
12	1.723	0.146	2.14	92	-1.28	97	86	-0.110	17.00	1.52
13	1.865	0.142	2.12	92	-2.67	98	86	-0.100	16.67	1.66
14	2.011	0.146	2.11	92	-2.86	101	86	-0.070	16.77	1.68
15	2.152	0.141	2.08	92	-1.89	97	86	-0.100	16.87	1.73
16	2.297	0.145	2.09	92	-1.01	97	86	-0.090	16.43	1.84
17	2.437	0.140	2.22	92	-1.88	96	85	-0.100	16.72	1.92
18	2.586	0.149	2.19	92	-3.54	102	85	-0.090	16.52	1.97
19	2.729	0.143	2.16	92	-2.92	97	85	-0.090	16.70	1.96
20	2.874	0.145	2.08	92	-3.04	100	85	-0.090	16.82	1.91
21	3.014	0.140	1.98	93	-3.47	92	85	-0.090	16.63	2.06
22	3.159	0.145	2.08	93	-3.39	98	84	-0.080	17.01	2.08
23	3.303	0.144	2.07	93	-2.41	100	84	-0.090	16.84	2.15
24	3.444	0.141	2.14	93	-5.23	100	83	-0.090	16.80	2.25
25	3.586	0.142	2.21	93	-2.28	100	83	-0.090	17.08	2.33
26	3.730	0.144	2.16	93	-3	99	83	-0.070	17.13	2.28
27	3.876	0.146	2.17	93	-0.7	101	84	-0.080	17.12	2.21
28	4.021	0.145	2.17	93	-1.51	103	84	-0.090	17.05	2.31
29	4.168	0.147	2.18	93	-2.99	102	84	-0.090	16.95	2.34
30	4.312	0.144	2.16	93	-2.41	101	84	-0.080	17.17	2.35
31	4.459	0.147	2.16	93	-2.82	102	84	-0.090	17.20	2.31

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.602	0.143	2.15	93	-2.95	98	84	-0.080	16.91	2.31
33	4.749	0.147	2.16	93	-2.12	101	84	-0.090	16.94	2.31
34	4.892	0.143	2.16	93	-0.85	97	84	-0.080	16.99	2.37
35	5.040	0.148	2.16	93	-2.86	101	84	-0.080	16.86	2.44
36	5.183	0.143	2.16	93	-2.82	100	84	-0.080	16.65	2.30
37	5.330	0.147	2.15	93	-1.44	102	84	-0.080	16.67	2.16
38	5.473	0.143	2.15	93	-1.15	100	84	-0.090	16.88	2.28
39	5.620	0.147	2.15	93	-1.33	102	84	-0.090	16.87	2.38
40	5.762	0.142	2.15	93	-0.79	100	84	-0.090	16.60	2.45
41	5.909	0.147	2.16	93	-3.08	102	84	-0.090	16.69	2.41
42	6.051	0.142	2.14	94	-1.24	102	84	-0.090	16.77	2.48
43	6.198	0.147	2.14	94	-0.56	104	84	-0.090	16.88	2.56
44	6.340	0.142	2.13	94	-3.07	98	84	-0.080	16.77	2.52
45	6.487	0.147	2.14	94	-1.52	102	84	-0.090	16.93	2.31
46	6.630	0.143	2.14	94	-1.95	99	84	-0.080	16.91	2.34
47	6.776	0.146	2.13	94	-2.87	103	84	-0.100	17.03	2.38
48	6.919	0.143	2.13	94	-2.55	101	84	-0.080	16.98	2.43
49	7.064	0.145	2.13	94	-1.17	101	84	-0.080	16.73	2.09
50	7.207	0.143	2.11	94	-0.85	98	84	-0.090	16.43	1.81
51	7.351	0.144	2.12	94	-1.56	100	84	-0.080	16.24	1.78
52	7.495	0.144	2.13	94	-1.36	99	84	-0.090	15.95	1.68
53	7.638	0.143	2.11	94	-3.06	98	84	-0.090	15.99	1.78
54	7.783	0.145	2.12	94	-2.58	101	84	-0.090	16.06	1.58
55	7.925	0.142	2.10	94	-0.93	99	84	-0.090	16.14	1.43
56	8.072	0.147	2.12	94	-2.99	104	84	-0.070	16.00	1.28
57	8.214	0.142	2.11	94	-3.03	97	84	-0.100	16.27	1.21
58	8.362	0.148	2.26	94	-2.29	103	84	-0.090	16.16	0.99
59	8.508	0.146	2.24	94	-1.16	100	84	-0.100	15.99	0.97
60	8.658	0.150	2.25	94	-1.38	105	84	-0.080	16.09	0.91
61	8.804	0.146	2.27	94	-0.82	100	84	-0.090	15.90	0.88
62	8.954	0.150	2.25	94	-0.97	104	84	-0.080	16.00	0.76
63	9.101	0.147	2.26	95	-2.3	101	84	-0.080	16.02	0.79

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.250	0.149	2.23	95	-2.21	103	84	-0.080	15.96	0.85
65	9.397	0.147	2.26	95	-2.38	102	84	-0.070	16.15	0.99
66	9.547	0.150	2.26	95	-2.85	102	84	-0.080	16.20	1.11
67	9.695	0.148	2.26	95	-2.87	104	84	-0.080	16.13	1.09
68	9.844	0.149	2.25	95	-1.36	104	84	-0.080	15.79	0.94
69	9.993	0.149	2.26	95	-0.71	104	84	-0.080	15.65	0.99
70	10.141	0.148	2.26	95	-2.96	104	84	-0.080	15.60	1.06
71	10.290	0.149	2.25	95	-1.25	106	84	-0.090	15.69	1.07
72	10.438	0.148	2.26	95	-0.69	102	84	-0.080	15.49	1.10
73	10.587	0.149	2.26	95	-2.86	103	84	-0.080	15.54	1.08
74	10.734	0.147	2.26	95	-3.16	102	84	-0.080	15.62	1.09
75	10.883	0.149	2.25	95	-3.16	105	84	-0.090	15.54	1.15
76	11.030	0.147	2.26	95	-1.26	101	84	-0.100	15.54	1.09
77	11.180	0.150	2.26	95	-2.21	106	84	-0.080	15.25	1.14
78	11.326	0.146	2.25	95	-1.58	100	84	-0.080	15.55	1.03
79	11.477	0.151	2.25	95	-1.35	103	84	-0.080	15.50	1.01
80	11.623	0.146	2.25	96	-2.52	102	84	-0.070	15.48	1.04
81	11.775	0.152	2.24	96	-1.7	107	84	-0.090	15.57	0.97
82	11.921	0.146	2.26	96	-1.63	101	84	-0.070	15.53	0.91
83	12.072	0.151	2.25	96	-3.07	103	84	-0.070	15.20	0.93
84	12.217	0.145	2.25	96	-0.89	101	84	-0.070	15.54	0.98
85	12.368	0.151	2.24	96	-3.06	105	84	-0.080	15.68	0.94
86	12.515	0.147	2.25	96	-0.94	103	84	-0.080	15.32	0.74
87	12.665	0.150	2.24	96	-3.05	104	84	-0.080	15.34	0.65
88	12.810	0.145	2.25	96	-1.83	101	84	-0.080	15.25	0.59
89	12.960	0.150	2.24	96	-1.49	104	84	-0.080	15.16	0.55
90	13.107	0.147	2.23	96	-3.2	104	84	-0.060	14.93	0.58
91	13.257	0.150	2.24	96	-2.85	105	84	-0.080	15.02	0.59
92	13.403	0.146	2.25	96	-2.35	101	84	-0.080	14.92	0.53
93	13.552	0.149	2.24	96	-1.33	107	84	-0.080	14.85	0.52
94	13.699	0.147	2.23	96	-2.4	102	84	-0.090	14.49	0.45
95	13.849	0.150	2.25	96	-1.14	105	84	-0.080	14.45	0.38

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	13.997	0.148	2.26	96	-2.48	106	84	-0.080	14.14	0.42
97	14.146	0.149	2.24	96	-1.17	102	84	-0.090	14.06	0.27
98	14.294	0.148	2.24	97	-3.09	106	84	-0.080	13.52	0.22
99	14.442	0.148	2.24	96	-3.17	104	84	-0.070	13.55	0.19
100	14.591	0.149	2.22	97	-3.08	106	84	-0.070	13.66	0.16
101	14.739	0.148	2.25	97	-1.15	102	84	-0.070	13.55	0.18
102	14.888	0.149	2.25	97	-2.84	104	84	-0.070	13.43	0.26
103	15.035	0.147	2.24	97	-1.21	100	84	-0.080	13.68	0.29
104	15.185	0.150	2.24	97	-0.75	103	84	-0.070	13.56	0.30
105	15.332	0.147	2.25	97	-3.1	100	84	-0.050	13.72	0.25
106	15.482	0.150	2.24	97	-1.76	104	84	-0.070	13.75	0.29
107	15.628	0.146	2.25	97	-1.41	100	84	-0.070	1.94	0.03
108	15.780	0.152	2.24	97	-0.7	106	84	-0.070	13.85	0.31
109	15.926	0.146	2.25	97	-3.04	101	84	-0.070	13.83	0.25
110	16.078	0.152	2.25	97	-1.64	108	84	-0.060	13.74	0.27
111	16.224	0.146	2.24	97	-2.8	102	84	-0.070	13.84	0.28
112	16.375	0.151	2.24	97	-2.21	106	84	-0.070	13.77	0.26
113	16.522	0.147	2.25	97	-0.7	101	84	-0.080	13.79	0.27
114	16.672	0.150	2.25	97	-3.18	104	84	-0.070	13.87	0.23
115	16.818	0.146	2.26	97	-1.27	104	84	-0.070	13.84	0.29
116	16.969	0.151	2.25	97	-3.06	104	84	-0.080	13.87	0.26
117	17.116	0.147	2.26	97	-0.81	101	84	-0.080	13.90	0.32
118	17.266	0.150	2.26	97	-1.29	104	84	-0.060	14.13	0.29
119	17.415	0.149	2.25	97	-3	103	84	-0.070	14.08	0.33
120	17.565	0.150	2.25	98	-1	103	84	-0.070	14.34	0.27
121	17.714	0.149	2.25	98	-1.18	101	84	-0.080	14.34	0.32
122	17.863	0.149	2.25	98	-0.61	103	84	-0.070	14.25	0.35
123	18.014	0.151	2.24	98	-1.16	107	84	-0.070	14.30	0.39
124	18.162	0.148	2.26	98	-1.83	101	84	-0.070	14.46	0.37
125	18.311	0.149	2.26	98	-3.08	100	84	-0.070	14.54	0.34
126	18.459	0.148	2.27	98	-1.17	103	84	-0.060	14.76	0.37
127	18.610	0.151	2.26	98	-1.96	101	84	-0.070	14.79	0.45

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.756	0.146	2.25	98	-2.69	101	84	-0.080	14.83	0.50
129	18.909	0.153	2.25	98	-3.01	106	84	-0.080	14.86	0.48
130	19.056	0.147	2.24	98	-2.78	102	84	-0.080	14.70	0.66
131	19.207	0.151	2.25	98	-2.33	105	84	-0.070	15.19	0.66
132	19.354	0.147	2.24	98	-0.84	101	84	-0.080	15.06	0.68
133	19.505	0.151	2.25	98	-2.03	103	84	-0.070	14.96	0.67
134	19.651	0.146	2.24	98	-1.96	103	84	-0.060	15.00	0.67
135	19.801	0.150	2.22	98	-3.15	101	84	-0.070	15.09	0.68
136	19.947	0.146	2.22	98	-2.41	103	84	-0.070	15.32	0.82
137	20.096	0.149	2.19	98	-2.52	102	84	-0.070	15.57	0.87
138	20.241	0.145	2.16	99	-1.07	98	84	-0.070	15.60	1.18
139	20.389	0.148	2.13	99	-3.01	103	84	-0.070	15.48	1.43
140	20.533	0.144	2.12	99	-1.09	101	85	-0.090	15.62	1.22
141	20.680	0.147	2.09	99	-2.9	102	84	-0.090	15.35	1.23
142	20.821	0.141	2.06	99	-1.93	98	85	-0.080	15.34	1.05
143	20.966	0.145	2.03	99	-1.27	101	84	-0.070	15.06	0.96
144	21.104	0.138	2.02	99	-1.12	97	85	-0.070	14.96	0.96
145	21.247	0.143	2.00	99	-2.8	98	85	-0.060	13.86	0.75
146	21.387	0.140	2.01	99	-1.38	98	84	-0.070	11.78	0.52
147	21.529	0.142	2.01	99	-1.52	97	84	-0.080	10.83	0.66
148	21.672	0.143	2.19	99	-1.6	100	84	-0.060	10.32	0.63
149	21.819	0.147	2.20	99	-2.65	103	84	-0.060	9.53	0.62
150	21.967	0.148	2.20	99	-1.22	101	84	-0.050	9.02	0.66
151	22.115	0.148	2.20	99	-3.33	102	84	-0.070	8.48	0.90
152	22.263	0.148	2.21	99	-2.34	99	84	-0.060	8.37	0.85
153	22.411	0.148	2.19	99	-1.23	101	84	-0.050	8.35	0.84
154	22.559	0.148	2.21	99	-3.64	100	84	-0.050	8.37	0.81
155	22.708	0.149	2.21	99	-3.56	102	84	-0.050	8.25	0.78
156	22.854	0.146	2.21	99	-2.19	99	84	-0.050	8.43	0.75
157	23.003	0.149	2.22	99	-3.44	101	84	-0.060	8.43	0.75
158	23.149	0.146	2.20	99	-3.15	100	84	-0.050	8.33	0.81
159	23.299	0.150	2.22	99	-3.35	103	84	-0.050	8.13	0.81

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.446	0.147	2.22	99	-1.38	99	83	-0.050	8.15	0.83
161	23.595	0.149	2.22	100	-1.21	105	83	-0.070	8.10	0.79
162	23.741	0.146	2.22	100	-2.66	99	83	-0.050	8.17	0.81
163	23.891	0.150	2.19	100	-3.64	100	83	-0.050	8.32	0.74
164	24.037	0.146	2.21	100	-3.61	101	83	-0.050	8.08	0.76
165	24.188	0.151	2.21	100	-1.75	102	83	-0.050	8.28	0.77
166	24.334	0.146	2.20	100	-3.04	99	83	-0.050	8.33	0.80
167	24.485	0.151	2.20	100	-3.35	104	83	-0.050	8.36	0.82
168	24.630	0.145	2.21	100	-3.35	98	83	-0.030	8.20	0.88
169	24.781	0.151	2.21	100	-2	102	83	-0.050	8.19	0.92
170	24.927	0.146	2.21	100	-2.38	97	83	-0.040	8.21	0.99
171	25.124	0.197	2.21	100	-3.25	134	83	-0.040	8.29	0.94
172	25.269	0.145	2.21	100	-3.3	100	83	-0.050	8.19	0.98
173	25.419	0.150	2.22	100	-1.24	101	83	-0.040	8.02	0.94
174	25.596	0.177	2.23	100	-3.28	121	83	-0.040	8.09	0.93
175	25.746	0.150	2.21	100	-1.47	102	83	-0.040	8.09	0.99
176	25.893	0.147	2.21	100	-3.53	102	83	-0.040	8.06	1.06
177	26.042	0.149	2.21	100	-1.43	101	83	-0.030	7.99	1.02
178	26.189	0.147	2.21	100	-1.4	100	83	-0.040	8.13	1.01
179	26.339	0.150	2.20	100	-3.07	104	83	-0.040	8.10	1.07
180	26.487	0.148	2.22	100	-1.2	100	83	-0.040	8.11	1.09
181	26.635	0.148	2.21	100	-3.37	99	82	-0.040	8.15	1.08
182	26.784	0.149	2.21	100	-1.19	100	82	-0.030	8.08	1.05
183	26.932	0.148	2.21	100	-1.76	100	82	-0.040	8.41	1.04
184	27.080	0.148	2.22	101	-3.49	98	82	-0.050	8.25	1.03
185	27.228	0.148	2.20	101	-3.19	98	82	-0.040	8.45	1.05
186	27.377	0.149	2.21	101	-2.82	99	82	-0.030	8.28	1.08
187	27.524	0.147	2.21	101	-2.31	98	82	-0.040	8.31	1.05
188	27.673	0.149	2.21	101	-3.54	101	82	-0.030	8.30	1.09
189	27.819	0.146	2.20	101	-1.26	98	82	-0.040	8.31	1.14
190	27.969	0.150	2.21	101	-1.56	100	82	-0.040	8.44	1.15
191	28.116	0.147	2.22	101	-3.49	98	82	-0.030	8.41	1.12

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	28.266	0.150	2.21	101	-1.71	101	82	-0.040	8.57	1.16
193	28.411	0.145	2.21	101	-1.27	97	82	-0.040	8.59	1.17
194	28.561	0.150	2.19	101	-3.49	103	82	-0.020	8.62	1.14
195	28.708	0.147	2.19	101	-3.03	100	82	-0.030	8.54	1.18
196	28.859	0.151	2.21	101	-1.67	101	82	-0.030	7.98	1.08
197	29.005	0.146	2.21	101	-3.74	99	82	-0.040	7.91	1.12
198	29.155	0.150	2.20	101	-1.97	101	82	-0.030	7.93	1.12
199	29.301	0.146	2.20	101	-2.43	99	82	-0.040	7.86	1.06
200	29.452	0.151	2.22	101	-2.96	102	82	-0.030	8.10	1.00
201	29.598	0.146	2.21	101	-1.21	100	82	-0.030	8.10	1.04
202	29.749	0.151	2.22	101	-2.41	101	82	-0.040	7.95	0.98
203	29.894	0.145	2.21	101	-1.89	98	82	-0.040	7.90	1.01
204	30.044	0.150	2.21	101	-1.75	103	82	-0.040	7.95	0.99
205	30.190	0.146	2.22	101	-3.67	100	82	-0.040	8.06	0.98
206	30.340	0.150	2.21	101	-1.95	102	82	-0.030	8.02	0.97
207	30.487	0.147	2.21	101	-2.37	99	82	-0.040	8.01	0.98
208	30.637	0.150	2.21	101	-1.61	99	82	-0.020	8.13	0.96
209	30.783	0.146	2.21	101	-1.25	96	82	-0.040	7.99	0.97
210	30.933	0.150	2.20	101	-2.86	103	82	-0.030	8.11	0.98
211	31.081	0.148	2.22	101	-3.34	102	82	-0.020	8.09	0.97
212	31.231	0.150	2.20	101	-2.56	100	82	-0.040	8.28	0.98
213	31.379	0.148	2.22	101	-1.95	102	82	-0.040	8.01	1.04
214	31.527	0.148	2.21	101	-2.76	98	81	-0.030	7.92	1.02
215	31.676	0.149	2.22	101	-2.8	100	82	-0.020	8.03	1.05
216	31.824	0.148	2.22	101	-1.21	101	82	-0.030	7.93	1.03
217	31.973	0.149	2.21	101	-1.77	102	81	-0.040	7.96	1.02
218	32.120	0.147	2.21	101	-3.24	100	81	-0.030	7.92	1.12
219	32.269	0.149	2.23	101	-3.48	101	81	-0.030	7.81	1.19
220	32.417	0.148	2.22	101	-1.89	99	81	-0.030	7.80	1.15
221	32.566	0.149	2.21	101	-1.17	102	81	-0.020	7.84	1.17
222	32.712	0.146	2.22	101	-3.18	97	81	-0.030	7.84	1.11
223	32.863	0.151	2.20	101	-1.66	102	81	-0.020	8.21	1.06

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	33.010	0.147	2.20	101	-1.22	97	81	-0.030	8.08	1.07
225	33.161	0.151	2.21	101	-2.5	101	81	-0.030	8.26	1.03
226	33.307	0.146	2.22	101	-2.55	100	81	-0.020	8.21	1.02
227	33.458	0.151	2.22	101	-2.23	100	81	-0.040	8.13	1.03
228	33.604	0.146	2.21	101	-1.42	98	81	-0.030	8.16	1.01
229	33.755	0.151	2.20	101	-3.22	102	81	-0.030	8.10	1.04
230	33.901	0.146	2.20	101	-2.74	98	81	-0.030	8.29	0.98
231	34.051	0.150	2.22	101	-3.16	102	81	-0.040	8.18	1.00
232	34.197	0.146	2.21	101	-1.95	97	81	-0.030	8.27	1.04
233	34.348	0.151	2.21	101	-2.49	102	81	-0.030	8.23	1.11
234	34.494	0.146	2.22	101	-3.54	96	81	-0.030	8.39	1.11
235	34.644	0.150	2.21	101	-1.22	101	81	-0.040	8.21	1.14
236	34.791	0.147	2.22	101	-1.29	100	81	-0.030	8.33	1.09
237	34.941	0.150	2.21	101	-1.44	102	81	-0.030	8.19	1.11
238	35.089	0.148	2.20	101	-1.27	98	81	-0.030	8.18	1.04
239	35.238	0.149	2.20	101	-1.45	101	81	-0.030	8.01	1.06
240	35.386	0.148	2.19	101	-1.46	98	81	-0.030	8.21	1.02
241	35.535	0.149	2.21	101	-2.1	101	81	-0.020	8.20	1.01
242	35.684	0.149	2.20	101	-1.27	100	81	-0.020	8.29	1.01
243	35.832	0.148	2.21	101	-1.8	100	81	-0.040	8.21	1.03
244	35.981	0.149	2.21	101	-1.8	99	81	-0.030	8.12	1.00
245	36.128	0.147	2.21	101	-1.35	101	81	-0.030	8.07	1.00
246	36.277	0.149	2.20	101	-1.22	101	81	-0.030	8.22	1.01
247	36.424	0.147	2.21	101	-2.66	101	81	-0.030	8.05	0.99
248	36.574	0.150	2.20	101	-1.82	99	81	-0.020	8.14	1.06
249	36.720	0.146	2.22	101	-3.15	97	81	-0.040	8.33	1.10
250	36.871	0.151	2.20	101	-1.97	102	81	-0.020	8.07	1.11
251	37.017	0.146	2.21	102	-1.34	98	81	-0.010	8.31	1.10
252	37.168	0.151	2.21	101	-1.33	103	81	-0.020	8.15	1.11
253	37.314	0.146	2.20	102	-1.29	97	81	-0.020	8.41	1.10
254	37.465	0.151	2.20	102	-1.8	100	81	-0.030	8.19	1.04
255	37.611	0.146	2.20	102	-3.68	98	81	-0.030	8.15	1.10

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	37.762	0.151	2.20	102	-3.64	104	81	-0.010	8.14	1.07
257	37.908	0.146	2.23	102	-3.62	98	81	-0.020	8.12	1.09
258	38.058	0.150	2.20	102	-2.23	104	81	-0.010	8.06	1.05
259	38.204	0.146	2.21	102	-2.06	98	81	-0.030	8.10	1.08
260	38.354	0.150	2.21	102	-1.15	101	81	-0.030	8.18	1.12
261	38.500	0.146	2.20	102	-3.59	98	81	-0.030	8.15	1.07
262	38.650	0.150	2.21	102	-1.33	99	81	-0.030	8.27	1.07
263	38.797	0.147	2.20	102	-2.55	100	81	-0.030	8.08	1.03
264	38.946	0.149	2.20	102	-1.25	98	81	-0.020	8.28	1.06
265	39.093	0.147	2.19	102	-2.83	99	81	-0.020	8.04	1.03
266	39.243	0.150	2.21	102	-3.14	103	81	-0.050	7.95	1.06
267	39.391	0.148	2.21	102	-1.32	99	81	-0.020	8.01	1.04
268	39.540	0.149	2.20	102	-1.85	98	81	-0.030	7.98	1.00
269	39.688	0.148	2.21	102	-3.54	97	81	-0.040	7.93	0.97
270	39.836	0.148	2.21	102	-1.59	100	81	-0.010	7.99	0.97
271	39.985	0.149	2.19	102	-2.74	98	81	-0.020	8.08	0.97
272	40.132	0.147	2.21	102	-2.95	100	81	-0.040	7.82	1.00
273	40.281	0.149	2.20	102	-2.71	100	81	-0.020	8.01	0.97
274	40.428	0.147	2.21	102	-3.3	99	81	-0.030	7.95	1.01
275	40.577	0.149	2.21	102	-3.59	100	81	-0.030	7.94	0.97
276	40.724	0.147	2.20	102	-1.51	100	81	-0.020	7.99	0.96
277	40.874	0.150	2.22	102	-1.26	102	81	-0.030	7.85	0.98
278	41.020	0.146	2.20	102	-1.31	99	81	-0.030	7.88	0.97
279	41.170	0.150	2.21	102	-3.58	101	81	-0.030	8.03	1.00
280	41.316	0.146	2.20	102	-1.53	97	81	-0.030	8.12	0.99
281	41.467	0.151	2.20	102	-2.45	104	81	-0.030	8.01	0.97
282	41.613	0.146	2.20	102	-3.38	98	81	-0.040	8.01	0.98
283	41.764	0.151	2.21	102	-3.28	99	81	-0.040	7.90	1.00
284	41.910	0.146	2.18	102	-2.75	99	81	-0.030	7.88	1.01
285	42.061	0.151	2.20	102	-1.59	103	81	-0.020	7.77	1.30
286	42.206	0.145	2.21	102	-1.2	96	81	-0.040	7.71	1.25
287	42.357	0.151	2.19	102	-2	103	81	-0.030	7.80	1.25

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	42.503	0.146	2.19	102	-1.24	96	81	-0.030	7.76	1.25
289	42.653	0.150	2.19	102	-2.46	101	81	-0.030	7.86	1.24
290	42.798	0.145	2.20	102	-3.66	96	81	-0.030	7.69	1.36
291	42.948	0.150	2.20	102	-1.61	102	81	-0.030	7.54	1.38
292	43.094	0.146	2.18	102	-1.33	98	81	-0.030	7.77	1.33
293	43.244	0.150	2.20	102	-3.37	101	81	-0.030	7.42	1.35
294	43.390	0.146	2.19	102	-3.68	100	81	-0.030	7.48	1.37
295	43.539	0.149	2.18	102	-1.25	100	81	-0.030	7.48	1.37
296	43.685	0.146	2.19	102	-1.8	98	81	-0.020	7.35	1.28
297	43.834	0.149	2.18	102	-2.31	98	81	-0.030	7.33	1.30
298	43.981	0.147	2.17	102	-1.21	100	81	-0.040	7.24	1.36
299	44.130	0.149	2.18	102	-2.61	100	81	-0.030	7.39	1.35
300	44.277	0.147	2.19	102	-3.55	98	81	-0.020	7.33	1.33
301	44.426	0.149	2.19	102	-2.27	101	81	-0.020	7.40	1.30
302	44.573	0.147	2.19	102	-1.7	99	81	-0.030	7.31	1.31
303	44.721	0.148	2.18	102	-1.57	101	81	-0.030	7.41	1.29
304	44.869	0.148	2.18	102	-2.44	100	81	0.000	7.21	1.28
305	45.017	0.148	2.18	102	-3.68	98	81	-0.020	7.36	1.26
306	45.165	0.148	2.18	102	-1.22	98	81	-0.030	7.35	1.28
307	45.313	0.148	2.18	102	-1.35	98	81	-0.030	7.28	1.26
308	45.461	0.148	2.19	102	-2.78	97	81	-0.030	7.53	1.20
309	45.608	0.147	2.18	102	-3.67	103	81	-0.040	7.41	1.15
310	45.756	0.148	2.19	102	-1.66	99	81	-0.030	7.27	1.14
311	45.903	0.147	2.19	102	-1.31	98	81	-0.030	7.34	1.15
312	46.052	0.149	2.16	102	-2.38	100	81	-0.020	7.39	1.17
313	46.198	0.146	2.19	102	-1.64	98	81	-0.020	7.22	1.15
314	46.348	0.150	2.20	102	-2.5	100	81	-0.010	7.27	1.14
315	46.493	0.145	2.17	102	-1.37	96	81	-0.020	7.35	1.13
316	46.643	0.150	2.19	102	-2.56	100	81	-0.020	7.30	1.15
317	46.788	0.145	2.19	102	-2.84	97	81	-0.030	7.26	1.17
318	46.938	0.150	2.17	102	-1.25	99	81	-0.030	7.20	1.11
319	47.084	0.146	2.17	102	-2.29	99	81	-0.030	7.34	1.10

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	47.234	0.150	2.16	102	-1.68	103	81	-0.040	7.32	1.07
321	47.380	0.146	2.20	102	-3.55	96	81	-0.040	7.35	1.08
322	47.530	0.150	2.18	102	-1.29	100	81	-0.020	7.30	1.08
323	47.675	0.145	2.17	102	-2.73	98	81	-0.030	7.32	1.05
324	47.826	0.151	2.18	103	-3.52	101	81	-0.030	7.14	1.05
325	47.971	0.145	2.18	103	-1.57	97	81	-0.030	7.16	0.96
326	48.121	0.150	2.19	103	-3.5	102	81	-0.020	7.15	0.95
327	48.266	0.145	2.18	103	-3.01	98	81	-0.030	7.07	0.93
328	48.417	0.151	2.17	103	-2.27	100	81	-0.030	7.03	0.95
329	48.562	0.145	2.19	103	-3.68	96	81	-0.020	7.19	0.91
330	48.712	0.150	2.18	103	-3.35	102	81	-0.030	7.19	0.91
331	48.857	0.145	2.19	103	-3.69	97	81	-0.030	7.12	0.93
332	49.007	0.150	2.19	103	-1.22	99	81	-0.030	7.07	0.93
333	49.152	0.145	2.20	103	-1.73	96	81	-0.020	7.21	0.89
334	49.302	0.150	2.18	103	-3.7	101	81	-0.020	7.16	0.91
335	49.448	0.146	2.17	103	-1.26	98	81	-0.030	7.15	1.00
336	49.598	0.150	2.19	103	-1.24	100	81	0.000	7.21	0.99
337	49.744	0.146	2.17	103	-1.38	99	81	-0.020	7.18	0.98
338	49.893	0.149	2.18	103	-1.38	101	81	-0.030	7.31	1.01
339	50.039	0.146	2.18	103	-1.69	98	81	-0.020	7.24	0.99
340	50.188	0.149	2.16	103	-3.66	101	81	-0.030	7.35	0.96
341	50.335	0.147	2.18	103	-3.04	100	81	-0.030	7.28	1.03
342	50.484	0.149	2.17	103	-3.75	101	81	-0.020	7.50	1.01
343	50.631	0.147	2.19	103	-2.15	99	81	-0.010	7.24	0.98
344	50.779	0.148	2.17	103	-1.69	101	81	-0.030	7.23	0.95
345	50.927	0.148	2.18	103	-1.64	99	82	-0.020	7.18	0.99
346	51.075	0.148	2.18	103	-2.71	101	82	-0.020	7.17	0.94
347	51.223	0.148	2.17	103	-3.47	99	82	-0.020	7.36	0.95
348	51.370	0.147	2.18	104	-3.62	97	82	-0.020	7.26	0.93
349	51.518	0.148	2.17	104	-1.33	99	82	-0.010	7.25	0.91
350	51.666	0.148	2.17	104	-3.6	99	82	-0.020	7.46	0.93
351	51.814	0.148	2.18	104	-3.48	99	82	-0.020	7.29	0.96

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	51.961	0.147	2.19	104	-3.57	97	82	-0.030	7.22	0.95
353	52.109	0.148	2.17	104	-3.63	98	82	-0.020	7.38	0.93
354	52.255	0.146	2.18	104	-3.28	99	82	-0.030	7.43	0.93
355	52.404	0.149	2.18	104	-1.63	100	82	-0.030	7.26	0.94
356	52.550	0.146	2.17	104	-1.61	99	82	-0.020	7.30	0.95
357	52.700	0.150	2.16	104	-1.97	100	82	-0.010	7.23	0.94
358	52.846	0.146	2.17	104	-1.93	99	82	-0.030	7.21	1.05
359	52.995	0.149	2.17	104	-2.5	99	82	-0.030	7.05	1.10
360	53.141	0.146	2.17	104	-3.63	97	82	-0.020	7.07	1.04
361	53.290	0.149	2.17	104	-1.24	102	82	-0.030	6.96	1.06
362	53.436	0.146	2.16	104	-3.54	97	82	-0.020	7.16	0.96
363	53.586	0.150	2.17	104	-1.27	101	82	-0.010	7.11	0.97
364	53.731	0.145	2.17	104	-2.48	95	82	-0.010	6.99	0.99
365	53.882	0.151	2.18	104	-3.66	101	82	-0.020	6.95	0.95
366	54.027	0.145	2.17	104	-1.78	97	82	-0.020	7.05	0.94
367	54.177	0.150	2.16	104	-2.46	102	82	-0.020	7.01	0.91
368	54.323	0.146	2.17	104	-3.43	99	82	-0.020	6.91	0.92
369	54.473	0.150	2.16	104	-2.09	101	82	-0.020	7.01	0.88
370	54.618	0.145	2.17	104	-1.58	98	82	-0.010	6.92	0.89
371	54.768	0.150	2.17	104	-1.28	101	83	-0.040	6.90	0.95
372	54.913	0.145	2.17	104	-1.83	96	82	-0.020	7.00	0.93
373	55.064	0.151	2.15	104	-1.54	99	82	-0.030	6.92	0.93
374	55.209	0.145	2.18	105	-2.31	99	83	-0.020	7.03	0.95
375	55.359	0.150	2.18	105	-1.33	100	83	-0.020	6.93	0.91
376	55.504	0.145	2.17	105	-2.48	98	83	-0.020	6.96	0.93
377	55.654	0.150	2.19	105	-1.73	99	83	-0.020	6.90	0.93
378	55.799	0.145	2.18	105	-2.22	98	83	-0.030	6.69	0.95
379	55.948	0.149	2.16	105	-1.26	100	83	-0.010	6.90	0.96
380	56.094	0.146	2.16	105	-1.47	97	83	-0.010	6.81	0.97
381	56.244	0.150	2.17	105	-2.21	100	83	-0.030	6.90	1.00
382	56.390	0.146	2.17	105	-3.54	100	83	-0.020	6.90	1.01
383	56.539	0.149	2.18	105	-2.48	100	83	-0.020	6.78	0.99

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	56.684	0.145	2.17	105	-1.13	97	83	-0.020	7.03	1.04
385	56.833	0.149	2.17	105	-3.4	99	83	-0.040	6.76	1.04
386	56.980	0.147	2.17	105	-1.37	96	83	-0.020	7.16	1.03
387	57.129	0.149	2.16	105	-2.5	99	83	-0.030	6.88	1.02
388	57.275	0.146	2.16	105	-3.66	97	83	-0.020	6.88	1.00
389	57.424	0.149	2.17	105	-3.62	100	83	-0.020	7.09	1.03
390	57.571	0.147	2.16	105	-1.16	97	83	-0.020	7.08	1.04
391	57.720	0.149	2.16	105	-1.86	100	83	-0.020	7.11	1.04
392	57.867	0.147	2.17	105	-1.84	97	83	-0.010	7.07	1.06
393	58.015	0.148	2.15	105	-1.38	98	83	-0.030	6.96	1.05
394	58.163	0.148	2.17	105	-2.2	97	83	-0.040	6.97	1.07
395	58.310	0.147	2.16	105	-2.86	99	83	-0.030	7.16	1.06
396	58.458	0.148	2.17	105	-1.79	97	83	0.000	7.29	1.07
397	58.605	0.147	2.14	105	-1.17	98	83	-0.020	7.06	1.06
398	58.754	0.149	2.17	105	-1.33	99	83	-0.020	7.15	1.08
399	58.901	0.147	2.17	105	-1.26	97	83	-0.020	7.10	1.07
400	59.049	0.148	2.16	105	-3.41	102	83	-0.020	7.21	1.06
401	59.195	0.146	2.18	105	-1.37	96	83	-0.020	7.25	1.05
402	59.344	0.149	2.17	106	-1.25	100	83	-0.020	7.20	1.10
403	59.490	0.146	2.17	106	-2.46	95	83	-0.010	7.27	1.10
404	59.639	0.149	2.16	106	-2.4	98	83	-0.020	7.33	1.09
405	59.785	0.146	2.16	106	-1.55	96	83	-0.030	7.21	1.09
406	59.934	0.149	2.17	106	-3.48	98	83	-0.030	7.23	1.12
407	60.080	0.146	2.16	106	-3.36	96	83	-0.030	7.29	1.18
408	60.229	0.149	2.16	106	-3.72	102	83	-0.040	7.21	1.13
409	60.375	0.146	2.16	106	-3.18	98	84	-0.020	7.32	1.13
410	60.524	0.149	2.16	106	-1.89	98	83	-0.030	7.21	1.13
411	60.670	0.146	2.15	106	-2.65	98	84	-0.020	7.24	1.15
412	60.819	0.149	2.15	106	-1.71	97	84	-0.010	7.29	1.11
413	60.965	0.146	2.16	106	-2	97	83	-0.020	6.86	1.14
414	61.115	0.150	2.17	106	-1.3	101	84	-0.010	7.05	1.16
415	61.260	0.145	2.16	106	-2.36	97	84	-0.030	6.88	1.18

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
416	61.411	0.151	2.16	106	-1.43	100	84	-0.020	7.06	1.18
417	61.556	0.145	2.16	106	-1.57	96	84	-0.020	7.03	1.13
418	61.706	0.150	2.15	106	-2.61	101	84	-0.010	6.89	1.16
419	61.851	0.145	2.17	106	-3.81	98	84	-0.020	6.96	1.13
420	62.001	0.150	2.15	106	-1.82	100	84	-0.010	7.05	1.12
421	62.146	0.145	2.17	106	-2.27	97	84	-0.020	6.84	1.12
422	62.296	0.150	2.15	106	-2.6	99	84	-0.020	6.86	1.08
423	62.441	0.145	2.15	106	-1.92	97	84	-0.030	6.71	1.12
424	62.592	0.151	2.17	106	-2.38	99	84	-0.030	6.77	1.09
425	62.737	0.145	2.16	106	-1.37	97	84	-0.020	6.95	1.09
426	62.886	0.149	2.16	106	-2.89	100	84	-0.010	6.73	1.06
427	63.031	0.145	2.17	106	-1.64	98	84	-0.020	6.87	1.10
428	63.181	0.150	2.17	106	-2.54	100	84	-0.030	6.83	1.16
429	63.326	0.145	2.16	106	-1.46	96	84	-0.030	6.74	1.14
430	63.475	0.149	2.15	106	-2.23	100	84	-0.030	6.69	1.18
431	63.622	0.147	2.17	106	-3.59	98	84	-0.020	6.73	1.14
432	63.771	0.149	2.15	106	-3.36	98	84	-0.020	6.74	1.15
433	63.917	0.146	2.17	106	-1.35	95	84	-0.020	6.78	1.14
434	64.065	0.148	2.18	106	-3.67	98	84	-0.030	6.78	1.15
435	64.211	0.146	2.15	106	-2.96	100	84	-0.040	6.79	1.16
436	64.360	0.149	2.15	106	-1.92	98	84	-0.020	6.77	1.12
437	64.507	0.147	2.15	106	-1.39	97	84	-0.030	6.89	1.14
438	64.655	0.148	2.15	107	-1.39	98	84	-0.010	6.84	1.13
439	64.803	0.148	2.16	107	-1.67	97	84	-0.030	6.85	1.14
440	64.951	0.148	2.17	107	-1.42	98	84	-0.020	7.02	1.13
441	65.098	0.147	2.15	107	-2.08	97	84	-0.020	6.96	1.14
442	65.246	0.148	2.13	107	-3.26	100	84	-0.030	6.82	1.12
443	65.394	0.148	2.16	107	-3.55	99	84	-0.030	6.80	1.12
444	65.541	0.147	2.15	107	-1.6	101	84	-0.020	6.91	1.11
445	65.689	0.148	2.15	107	-3.48	100	84	-0.020	6.81	1.11
446	65.836	0.147	2.16	107	-1.33	97	84	-0.040	7.03	1.12
447	65.984	0.148	2.15	107	-2.31	98	84	-0.020	6.82	1.08

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
448	66.131	0.147	2.15	107	-2.96	98	84	-0.030	6.90	1.09
449	66.280	0.149	2.15	107	-1.33	97	84	-0.030	6.83	1.14
450	66.427	0.147	2.16	107	-3.42	98	84	-0.030	6.71	1.12
451	66.575	0.148	2.16	107	-2.17	101	84	-0.030	6.80	1.06
452	66.721	0.146	2.16	107	-1.75	97	84	-0.020	6.75	1.11
453	66.870	0.149	2.16	107	-3.62	99	84	-0.020	6.84	1.13
454	67.015	0.145	2.16	107	-2.8	97	84	-0.030	6.80	1.10
455	67.164	0.149	2.17	107	-3.63	98	84	-0.020	6.76	1.08
456	67.310	0.146	2.14	107	-3.31	97	84	-0.040	6.78	1.06
457	67.459	0.149	2.16	107	-3.58	101	84	-0.030	6.80	1.12
458	67.605	0.146	2.16	107	-1.44	97	84	-0.010	6.79	1.11
459	67.755	0.150	2.14	107	-1.34	100	84	-0.020	6.79	1.11
460	67.900	0.145	2.16	107	-1.3	97	84	-0.020	6.85	1.06
461	68.049	0.149	2.16	107	-1.34	98	84	-0.030	6.69	1.11
462	68.195	0.146	2.15	107	-2.1	99	84	-0.020	6.84	1.08
463	68.344	0.149	2.16	107	-1.38	99	84	-0.020	6.70	1.08
464	68.490	0.146	2.16	107	-3.41	97	84	-0.010	6.71	1.07
465	68.639	0.149	2.15	107	-1.71	101	84	-0.020	6.64	1.08
466	68.785	0.146	2.17	107	-3.63	96	84	-0.020	6.70	1.07
467	68.935	0.150	2.15	107	-3.76	101	84	-0.030	6.76	1.09
468	69.080	0.145	2.16	107	-1.52	99	84	-0.010	6.44	1.08
469	69.230	0.150	2.15	107	-2.2	99	84	-0.010	6.47	1.11
470	69.375	0.145	2.14	107	-3.18	96	84	-0.010	6.56	1.09
471	69.525	0.150	2.15	107	-1.3	101	84	-0.030	6.66	1.11
472	69.670	0.145	2.16	107	-2.96	97	84	-0.020	6.68	1.08
473	69.820	0.150	2.15	107	-1.28	99	84	-0.020	6.50	1.08
474	69.965	0.145	2.15	107	-3.55	98	84	-0.020	6.72	1.09
475	70.115	0.150	2.15	107	-3.52	101	84	-0.030	6.43	1.11
476	70.260	0.145	2.15	107	-3.63	97	84	-0.030	6.66	1.11
477	70.410	0.150	2.14	107	-1.35	98	84	-0.020	6.61	1.07
478	70.556	0.146	2.16	107	-3.73	97	84	-0.020	6.50	1.11
479	70.705	0.149	2.15	107	-2.44	99	84	-0.020	6.57	1.10

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
480	70.850	0.145	2.16	107	-1.35	96	84	-0.010	6.56	1.09
481	71.000	0.150	2.17	107	-1.47	100	84	-0.030	6.69	1.11
482	71.145	0.145	2.15	107	-3.64	97	84	0.000	6.48	1.09
483	71.294	0.149	2.16	107	-1.45	100	84	-0.030	6.53	1.09
484	71.439	0.145	2.17	107	-3.44	96	84	-0.010	6.74	1.07
485	71.589	0.150	2.14	107	-3.64	101	84	-0.020	6.45	1.05
486	71.735	0.146	2.16	107	-2.14	99	84	-0.020	6.53	1.10
487	71.884	0.149	2.16	107	-1.47	100	84	-0.020	6.55	1.06
488	72.030	0.146	2.15	107	-1.55	97	84	-0.020	6.59	1.05
489	72.178	0.148	2.15	107	-1.75	98	84	-0.030	6.58	1.08
490	72.324	0.146	2.16	107	-2.2	99	84	-0.020	6.61	1.05
491	72.473	0.149	2.15	107	-1.68	101	84	-0.020	6.46	1.08
492	72.619	0.146	2.14	107	-1.3	98	84	-0.020	6.67	1.06
493	72.768	0.149	2.14	107	-3.04	98	84	-0.020	6.63	1.06
Avg/Tot	72.768	0.148	2.18	101	-2.25	100	83	-0.044	9.83	1.09

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	514	533	473	598	569	537.4	N/A
1	514	532	489	603	573	542.2	N/A
2	513	532	497	605	576	544.6	N/A
3	513	531	500	616	577	547.4	N/A
4	513	531	501	638	578	552.2	N/A
5	512	529	501	669	578	557.8	N/A
6	511	528	500	702	578	563.8	N/A
7	511	527	449	716	578	556.2	N/A
8	510	525	409	725	576	549.0	N/A
9	508	523	379	731	574	543.0	N/A
10	506	520	355	734	572	537.4	N/A
11	504	518	335	735	570	532.4	N/A
12	501	514	319	734	568	527.2	N/A
13	498	511	305	731	565	522.0	N/A
14	495	507	293	727	562	516.8	N/A
15	491	503	283	722	560	511.8	N/A
16	487	499	273	718	557	506.8	N/A
17	484	495	265	714	554	502.4	N/A
18	480	491	258	710	551	498.0	N/A
19	476	488	251	707	548	494.0	N/A
20	472	484	245	705	545	490.2	N/A
21	469	480	240	703	542	486.8	N/A
22	465	477	236	701	539	483.6	N/A
23	461	473	231	699	537	480.2	N/A
24	458	470	227	697	534	477.2	N/A
25	455	467	223	695	531	474.2	N/A
26	452	464	220	694	529	471.8	N/A
27	449	461	218	693	526	469.4	N/A
28	446	458	215	692	523	466.8	N/A
29	443	455	213	690	521	464.4	N/A
30	441	453	211	689	518	462.4	N/A
31	438	450	209	687	517	460.2	N/A
32	436	448	207	686	514	458.2	N/A
33	433	446	206	684	512	456.2	N/A
34	431	444	204	682	511	454.4	N/A
35	429	443	203	681	509	453.0	N/A
36	427	441	202	680	507	451.4	N/A
37	426	439	201	679	506	450.2	N/A
38	424	438	200	679	504	449.0	N/A
39	423	436	201	678	499	447.4	N/A
40	422	435	199	677	499	446.4	N/A
41	420	434	199	677	497	445.4	N/A
42	419	433	198	676	496	444.4	N/A
43	418	432	198	675	494	443.4	N/A
44	417	431	197	674	493	442.4	N/A
45	416	430	197	674	492	441.8	N/A
46	415	429	196	673	490	440.6	N/A
47	414	428	196	674	489	440.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	414	428	196	673	487	439.6	N/A
49	413	427	196	673	486	439.0	N/A
50	412	426	196	672	485	438.2	N/A
51	412	425	196	671	484	437.6	N/A
52	411	424	196	671	482	436.8	N/A
53	410	424	196	670	481	436.2	N/A
54	410	423	196	669	478	435.2	N/A
55	409	423	196	668	477	434.6	N/A
56	408	422	196	667	476	433.8	N/A
57	408	422	196	665	475	433.2	N/A
58	408	422	197	664	474	433.0	N/A
59	407	422	197	662	473	432.2	N/A
60	407	422	197	660	471	431.4	N/A
61	407	421	197	659	470	430.8	N/A
62	407	421	197	658	469	430.4	N/A
63	407	421	198	656	467	429.8	N/A
64	407	421	198	653	466	429.0	N/A
65	407	421	198	651	465	428.4	N/A
66	407	422	199	649	464	428.2	N/A
67	407	422	199	646	463	427.4	N/A
68	407	422	200	644	462	427.0	N/A
69	407	423	200	641	461	426.4	N/A
70	408	423	201	639	461	426.4	N/A
71	408	424	202	638	460	426.4	N/A
72	408	425	203	636	459	426.2	N/A
73	409	425	204	635	458	426.2	N/A
74	410	426	205	634	457	426.4	N/A
75	410	427	206	633	455	426.2	N/A
76	411	428	207	632	453	426.2	N/A
77	412	429	208	633	454	427.2	N/A
78	412	429	208	633	453	427.0	N/A
79	413	430	209	632	453	427.4	N/A
80	413	431	210	632	452	427.6	N/A
81	414	432	211	632	451	428.0	N/A
82	415	433	212	632	451	428.6	N/A
83	415	434	213	631	450	428.6	N/A
84	416	434	213	630	450	428.6	N/A
85	416	435	214	630	449	428.8	N/A
86	417	436	215	631	449	429.6	N/A
87	417	437	215	630	448	429.4	N/A
88	418	437	216	630	448	429.8	N/A
89	418	438	216	629	447	429.6	N/A
90	419	439	217	628	447	430.0	N/A
91	419	440	218	627	446	430.0	N/A
92	420	441	218	626	446	430.2	N/A
93	420	441	218	626	446	430.2	N/A
94	420	442	219	624	445	430.0	N/A
95	421	443	220	620	445	429.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	421	443	220	617	445	429.2	N/A
97	422	444	221	612	444	428.6	N/A
98	422	444	221	607	445	427.8	N/A
99	422	445	221	602	445	427.0	N/A
100	423	446	221	597	445	426.4	N/A
101	423	446	221	592	445	425.4	N/A
102	423	447	221	587	445	424.6	N/A
103	423	447	221	582	445	423.6	N/A
104	423	447	222	579	446	423.4	N/A
105	423	448	222	576	445	422.8	N/A
106	424	448	223	574	445	422.8	N/A
107	424	449	223	573	445	422.8	N/A
108	424	449	223	571	446	422.6	N/A
109	424	449	224	569	446	422.4	N/A
110	424	449	224	567	446	422.0	N/A
111	424	450	224	565	447	422.0	N/A
112	424	450	224	564	447	421.8	N/A
113	424	450	225	564	448	422.2	N/A
114	424	450	225	563	449	422.2	N/A
115	424	450	225	563	450	422.4	N/A
116	424	451	225	562	451	422.6	N/A
117	424	451	226	561	451	422.6	N/A
118	424	451	227	560	452	422.8	N/A
119	424	451	228	560	453	423.2	N/A
120	424	452	228	559	453	423.2	N/A
121	425	452	229	559	454	423.8	N/A
122	425	452	230	559	455	424.2	N/A
123	425	453	230	559	456	424.6	N/A
124	425	453	232	559	457	425.2	N/A
125	425	453	232	559	458	425.4	N/A
126	426	454	233	560	458	426.2	N/A
127	426	454	234	560	459	426.6	N/A
128	427	455	235	561	459	427.4	N/A
129	427	455	236	562	459	427.8	N/A
130	427	456	237	564	460	428.8	N/A
131	428	457	238	566	460	429.8	N/A
132	428	457	239	567	460	430.2	N/A
133	429	457	239	568	461	430.8	N/A
134	429	458	240	569	461	431.4	N/A
135	430	458	241	570	462	432.2	N/A
136	431	459	241	572	463	433.2	N/A
137	431	460	242	574	463	434.0	N/A
138	432	460	242	576	464	434.8	N/A
139	433	461	243	579	464	436.0	N/A
140	433	461	244	582	466	437.2	N/A
141	434	462	244	585	466	438.2	N/A
142	435	463	245	587	467	439.4	N/A
143	436	463	246	589	467	440.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	436	464	247	591	468	441.2	N/A
145	437	464	249	591	469	442.0	N/A
146	438	465	250	588	469	442.0	N/A
147	439	465	251	582	469	441.2	N/A
148	439	466	252	572	470	439.8	N/A
149	440	466	253	561	470	438.0	N/A
150	441	466	253	549	470	435.8	N/A
151	441	466	253	536	471	433.4	N/A
152	441	466	252	523	472	430.8	N/A
153	441	465	250	510	472	427.6	N/A
154	441	465	249	497	472	424.8	N/A
155	440	464	247	485	472	421.6	N/A
156	440	463	245	473	472	418.6	N/A
157	439	462	243	462	472	415.6	N/A
158	438	460	242	452	471	412.6	N/A
159	437	458	240	442	471	409.6	N/A
160	435	457	238	433	470	406.6	N/A
161	434	455	236	425	470	404.0	N/A
162	432	453	234	417	469	401.0	N/A
163	430	450	232	411	469	398.4	N/A
164	429	448	230	405	467	395.8	N/A
165	427	446	228	399	466	393.2	N/A
166	425	443	226	393	465	390.4	N/A
167	423	440	225	388	464	388.0	N/A
168	421	438	223	383	462	385.4	N/A
169	419	435	221	378	461	382.8	N/A
170	416	432	219	373	460	380.0	N/A
171	414	430	218	369	459	378.0	N/A
172	412	427	216	364	457	375.2	N/A
173	410	425	215	360	456	373.2	N/A
174	408	422	213	356	455	370.8	N/A
175	406	419	211	352	453	368.2	N/A
176	403	417	210	349	452	366.2	N/A
177	401	414	209	345	451	364.0	N/A
178	399	412	208	341	450	362.0	N/A
179	397	409	207	338	448	359.8	N/A
180	395	407	205	335	447	357.8	N/A
181	393	405	204	331	446	355.8	N/A
182	391	402	203	329	445	354.0	N/A
183	389	400	202	326	444	352.2	N/A
184	387	398	201	323	443	350.4	N/A
185	386	396	200	320	442	348.8	N/A
186	384	393	200	318	441	347.2	N/A
187	382	391	199	316	440	345.6	N/A
188	380	389	198	313	439	343.8	N/A
189	378	387	197	311	438	342.2	N/A
190	377	386	196	309	437	341.0	N/A
191	375	384	196	307	437	339.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	374	382	195	306	436	338.6	N/A
193	372	380	195	304	435	337.2	N/A
194	370	378	194	303	434	335.8	N/A
195	369	377	194	301	433	334.8	N/A
196	368	375	193	300	432	333.6	N/A
197	366	373	193	299	432	332.6	N/A
198	365	372	192	297	431	331.4	N/A
199	363	370	192	296	431	330.4	N/A
200	362	369	191	295	430	329.4	N/A
201	361	368	191	293	430	328.6	N/A
202	360	366	190	292	429	327.4	N/A
203	358	365	190	291	428	326.4	N/A
204	357	364	189	290	427	325.4	N/A
205	356	362	189	288	426	324.2	N/A
206	355	361	188	287	424	323.0	N/A
207	354	360	188	286	423	322.2	N/A
208	353	359	188	285	422	321.4	N/A
209	352	357	187	284	421	320.2	N/A
210	351	356	187	283	420	319.4	N/A
211	350	355	186	282	418	318.2	N/A
212	349	354	186	281	417	317.4	N/A
213	348	353	186	280	416	316.6	N/A
214	347	352	186	280	414	315.8	N/A
215	346	351	185	279	413	314.8	N/A
216	345	350	184	278	412	313.8	N/A
217	344	349	184	277	411	313.0	N/A
218	343	348	184	276	410	312.2	N/A
219	342	347	184	275	409	311.4	N/A
220	341	346	184	275	408	310.8	N/A
221	340	345	183	274	406	309.6	N/A
222	339	344	183	273	404	308.6	N/A
223	339	343	182	272	403	307.8	N/A
224	338	342	182	272	402	307.2	N/A
225	337	342	182	271	401	306.6	N/A
226	336	341	181	270	400	305.6	N/A
227	336	340	181	270	398	305.0	N/A
228	335	339	181	269	397	304.2	N/A
229	334	339	180	268	397	303.6	N/A
230	333	338	180	268	396	303.0	N/A
231	333	337	180	267	395	302.4	N/A
232	332	337	180	267	394	302.0	N/A
233	331	336	180	266	393	301.2	N/A
234	331	335	179	266	392	300.6	N/A
235	330	335	179	265	391	300.0	N/A
236	329	334	179	265	390	299.4	N/A
237	329	334	179	264	390	299.2	N/A
238	328	333	178	264	389	298.4	N/A
239	328	332	179	263	388	298.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	327	332	178	263	388	297.6	N/A
241	326	331	178	262	388	297.0	N/A
242	326	331	178	262	387	296.8	N/A
243	325	330	178	261	386	296.0	N/A
244	325	330	178	261	386	296.0	N/A
245	324	329	178	260	386	295.4	N/A
246	324	329	178	260	385	295.2	N/A
247	323	328	178	260	384	294.6	N/A
248	323	328	178	259	384	294.4	N/A
249	322	328	178	259	384	294.2	N/A
250	322	327	177	258	384	293.6	N/A
251	322	327	178	258	383	293.6	N/A
252	321	326	178	258	382	293.0	N/A
253	321	326	178	257	382	292.8	N/A
254	320	325	178	257	381	292.2	N/A
255	320	325	178	257	381	292.2	N/A
256	319	325	178	257	380	291.8	N/A
257	319	324	178	256	380	291.4	N/A
258	319	324	178	256	380	291.4	N/A
259	318	324	178	256	379	291.0	N/A
260	318	323	179	256	379	291.0	N/A
261	317	323	179	255	378	290.4	N/A
262	317	323	179	255	378	290.4	N/A
263	317	322	179	255	377	290.0	N/A
264	316	322	179	255	377	289.8	N/A
265	316	321	179	254	376	289.2	N/A
266	316	321	178	254	376	289.0	N/A
267	316	321	179	254	376	289.2	N/A
268	315	321	179	253	375	288.6	N/A
269	315	320	179	253	375	288.4	N/A
270	315	320	179	252	374	288.0	N/A
271	314	320	179	252	374	287.8	N/A
272	314	319	178	252	373	287.2	N/A
273	314	319	178	251	372	286.8	N/A
274	313	319	178	251	372	286.6	N/A
275	313	318	178	250	372	286.2	N/A
276	313	318	178	250	371	286.0	N/A
277	312	318	178	250	371	285.8	N/A
278	312	318	178	249	371	285.6	N/A
279	312	317	178	249	370	285.2	N/A
280	311	317	178	248	370	284.8	N/A
281	311	317	178	248	369	284.6	N/A
282	311	316	178	248	369	284.4	N/A
283	310	316	179	247	369	284.2	N/A
284	310	316	179	247	368	284.0	N/A
285	310	316	179	247	367	283.8	N/A
286	310	315	178	246	367	283.2	N/A
287	309	315	178	246	366	282.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	309	315	178	246	366	282.8	N/A
289	309	315	178	246	365	282.6	N/A
290	309	315	179	246	365	282.8	N/A
291	309	314	179	247	364	282.6	N/A
292	309	314	179	246	363	282.2	N/A
293	308	314	179	247	363	282.2	N/A
294	308	314	179	246	362	281.8	N/A
295	308	314	179	246	362	281.8	N/A
296	308	313	179	246	362	281.6	N/A
297	308	313	179	246	361	281.4	N/A
298	307	313	179	246	361	281.2	N/A
299	307	313	179	245	361	281.0	N/A
300	307	312	179	245	361	280.8	N/A
301	307	312	179	245	360	280.6	N/A
302	306	312	178	245	360	280.2	N/A
303	306	311	178	244	360	279.8	N/A
304	306	311	178	244	360	279.8	N/A
305	306	311	178	244	359	279.6	N/A
306	305	311	177	243	359	279.0	N/A
307	305	310	177	243	359	278.8	N/A
308	305	310	176	243	359	278.6	N/A
309	304	310	176	242	359	278.2	N/A
310	304	309	176	242	358	277.8	N/A
311	304	309	175	241	358	277.4	N/A
312	303	308	175	241	358	277.0	N/A
313	303	308	175	240	357	276.6	N/A
314	303	308	175	240	357	276.6	N/A
315	302	307	175	239	356	275.8	N/A
316	302	307	174	239	356	275.6	N/A
317	301	306	174	239	355	275.0	N/A
318	301	306	174	238	355	274.8	N/A
319	301	306	174	238	354	274.6	N/A
320	300	305	173	237	354	273.8	N/A
321	300	305	173	237	353	273.6	N/A
322	300	304	173	237	353	273.4	N/A
323	299	304	173	236	353	273.0	N/A
324	299	304	173	236	352	272.8	N/A
325	298	303	173	235	352	272.2	N/A
326	298	303	172	235	352	272.0	N/A
327	298	302	172	235	352	271.8	N/A
328	297	302	172	234	351	271.2	N/A
329	297	301	172	233	351	270.8	N/A
330	296	301	172	233	350	270.4	N/A
331	296	300	172	232	350	270.0	N/A
332	295	300	171	232	350	269.6	N/A
333	295	300	171	231	349	269.2	N/A
334	295	299	171	231	349	269.0	N/A
335	294	299	171	230	348	268.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	294	298	170	230	348	268.0	N/A
337	293	298	170	229	348	267.6	N/A
338	293	297	170	229	347	267.2	N/A
339	292	297	170	228	347	266.8	N/A
340	292	296	170	228	346	266.4	N/A
341	291	296	170	228	346	266.2	N/A
342	291	296	170	227	346	266.0	N/A
343	291	295	170	227	346	265.8	N/A
344	290	295	170	227	346	265.6	N/A
345	290	294	170	226	345	265.0	N/A
346	290	294	170	226	345	265.0	N/A
347	289	293	170	226	345	264.6	N/A
348	289	293	170	225	345	264.4	N/A
349	289	293	170	225	344	264.2	N/A
350	288	292	170	225	344	263.8	N/A
351	288	292	170	224	344	263.6	N/A
352	288	291	170	224	343	263.2	N/A
353	287	291	170	224	343	263.0	N/A
354	287	290	170	223	343	262.6	N/A
355	287	290	170	223	342	262.4	N/A
356	287	290	170	223	342	262.4	N/A
357	286	289	170	223	341	261.8	N/A
358	286	289	170	223	341	261.8	N/A
359	286	288	170	222	340	261.2	N/A
360	286	288	170	222	340	261.2	N/A
361	286	288	170	222	339	261.0	N/A
362	286	287	170	222	338	260.6	N/A
363	285	287	170	222	338	260.4	N/A
364	285	287	170	222	337	260.2	N/A
365	285	286	170	221	336	259.6	N/A
366	285	286	170	221	336	259.6	N/A
367	285	286	170	221	335	259.4	N/A
368	284	285	170	221	334	258.8	N/A
369	284	285	170	220	333	258.4	N/A
370	284	284	170	220	333	258.2	N/A
371	284	284	170	220	332	258.0	N/A
372	283	284	170	220	331	257.6	N/A
373	283	283	170	219	330	257.0	N/A
374	283	283	170	219	330	257.0	N/A
375	283	283	170	219	329	256.8	N/A
376	282	282	170	219	328	256.2	N/A
377	282	282	170	218	327	255.8	N/A
378	282	282	170	218	326	255.6	N/A
379	282	281	171	218	326	255.6	N/A
380	281	281	173	218	325	255.6	N/A
381	281	280	173	217	324	255.0	N/A
382	281	280	173	217	323	254.8	N/A
383	280	280	173	217	323	254.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	280	279	174	216	322	254.2	N/A
385	280	279	174	216	321	254.0	N/A
386	280	279	175	216	320	254.0	N/A
387	279	278	175	216	320	253.6	N/A
388	279	278	176	215	319	253.4	N/A
389	279	277	176	215	319	253.2	N/A
390	278	277	177	215	318	253.0	N/A
391	278	276	177	215	317	252.6	N/A
392	278	276	178	214	317	252.6	N/A
393	278	276	178	214	316	252.4	N/A
394	277	275	179	214	315	252.0	N/A
395	277	275	179	214	315	252.0	N/A
396	277	275	180	213	314	251.8	N/A
397	277	274	181	213	313	251.6	N/A
398	276	274	182	213	313	251.6	N/A
399	276	273	182	213	312	251.2	N/A
400	276	273	183	213	312	251.4	N/A
401	276	272	183	213	311	251.0	N/A
402	276	272	184	212	311	251.0	N/A
403	275	272	184	212	310	250.6	N/A
404	275	271	185	212	310	250.6	N/A
405	275	271	185	212	309	250.4	N/A
406	275	271	185	212	309	250.4	N/A
407	275	270	186	212	308	250.2	N/A
408	275	270	186	212	308	250.2	N/A
409	275	270	186	212	307	250.0	N/A
410	275	269	186	212	307	249.8	N/A
411	274	269	187	212	306	249.6	N/A
412	274	269	187	212	306	249.6	N/A
413	274	269	187	212	306	249.6	N/A
414	274	269	187	212	305	249.4	N/A
415	274	268	186	212	305	249.0	N/A
416	274	268	185	212	304	248.6	N/A
417	274	268	185	211	304	248.4	N/A
418	274	268	185	211	304	248.4	N/A
419	274	268	184	212	303	248.2	N/A
420	274	268	184	212	303	248.2	N/A
421	274	268	183	212	303	248.0	N/A
422	274	268	182	212	302	247.6	N/A
423	274	267	182	212	302	247.4	N/A
424	274	267	181	212	302	247.2	N/A
425	274	267	181	212	301	247.0	N/A
426	274	267	180	212	301	246.8	N/A
427	274	267	180	212	301	246.8	N/A
428	274	267	180	211	300	246.4	N/A
429	274	267	180	211	300	246.4	N/A
430	274	267	180	211	300	246.4	N/A
431	274	267	180	211	300	246.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	274	267	180	211	299	246.2	N/A
433	274	267	179	211	299	246.0	N/A
434	274	267	179	211	299	246.0	N/A
435	274	267	179	211	299	246.0	N/A
436	274	267	179	211	298	245.8	N/A
437	273	267	178	211	298	245.4	N/A
438	273	267	179	211	298	245.6	N/A
439	273	267	178	210	298	245.2	N/A
440	273	267	179	210	298	245.4	N/A
441	273	267	179	210	297	245.2	N/A
442	273	267	179	210	297	245.2	N/A
443	273	267	180	210	297	245.4	N/A
444	273	267	180	210	297	245.4	N/A
445	273	267	180	210	296	245.2	N/A
446	272	267	180	210	296	245.0	N/A
447	272	266	180	210	296	244.8	N/A
448	272	266	180	210	296	244.8	N/A
449	272	266	180	210	295	244.6	N/A
450	272	266	180	209	295	244.4	N/A
451	272	266	180	209	295	244.4	N/A
452	272	266	180	209	295	244.4	N/A
453	271	266	180	209	295	244.2	N/A
454	271	266	180	209	294	244.0	N/A
455	271	266	180	209	294	244.0	N/A
456	271	265	180	209	294	243.8	N/A
457	271	265	180	209	294	243.8	N/A
458	271	265	180	208	293	243.4	N/A
459	271	265	180	208	293	243.4	N/A
460	270	265	180	208	293	243.2	N/A
461	270	265	181	208	293	243.4	N/A
462	270	265	180	208	293	243.2	N/A
463	270	265	180	208	293	243.2	N/A
464	270	264	180	208	293	243.0	N/A
465	270	264	181	208	292	243.0	N/A
466	269	264	180	208	292	242.6	N/A
467	269	264	181	207	292	242.6	N/A
468	269	264	180	207	292	242.4	N/A
469	269	264	180	207	291	242.2	N/A
470	269	264	180	207	291	242.2	N/A
471	269	264	180	207	291	242.2	N/A
472	269	263	179	206	291	241.6	N/A
473	268	263	179	206	291	241.4	N/A
474	268	263	179	206	291	241.4	N/A
475	268	263	178	206	291	241.2	N/A
476	268	263	178	205	290	240.8	N/A
477	268	263	178	205	290	240.8	N/A
478	268	262	178	205	290	240.6	N/A
479	268	262	179	205	290	240.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	268	262	179	204	290	240.6	N/A
481	268	262	179	204	290	240.6	N/A
482	267	262	178	204	289	240.0	N/A
483	267	262	178	204	289	240.0	N/A
484	267	262	178	204	289	240.0	N/A
485	267	261	177	203	289	239.4	N/A
486	267	261	177	203	288	239.2	N/A
487	267	261	177	203	288	239.2	N/A
488	266	261	177	203	288	239.0	N/A
489	266	261	177	203	287	238.8	N/A
490	266	260	176	203	287	238.4	N/A
491	266	260	176	202	287	238.2	N/A
492	266	260	176	202	286	238.0	N/A
493	266	260	176	202	286	238.0	N/A
Average	349	357	201	369	397	335	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 2

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/11/2019

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T308	87.2	174.1	180.5	6.4
	T309	86.9			
Train A Filters - Remainder	T310	87.3	174.5	174.6	0.1
	T315	87.2			
Train A Probe	11A	117036.7	117036.7	117037.0	0.3
Train A O-Rings	11A	3424.4	3424.4	3426.9	2.5
Train B Filters	T311	87.1	262.1	267.0	4.9
	T312	87.3			
	T314	87.7			
Train B Probe	11B	117490.7	117490.7	117490.9	0.2
Train B O-Rings	11B	4234.2	4234.2	4237.3	3.1
Background Filter	T313	86.7	86.7	86.9	0.2

Placed in Dessicator on:	9/11 - 19:30

Train A Filters - First Hour	180.7	9/16 8:10	180.5	9/16 16:07				
Train A Filters - Remainder	174.7	9/16 8:10	174.6	9/16 16:07				
Train A Probe	117037.0	9/16 8:10	117037.0	9/16 16:07				
Train A O-Rings	3427.1	9/16 8:11	3426.9	9/16 16:08				
Train B Filters	267.1	9/16 8:11	267.0	9/16 16:08				
Train B Probe	117491.0	9/16 8:11	117490.9	9/16 16:08				
Train B O-Rings	4237.3	9/16 8:11	4237.3	9/16 16:08				
Background Filter	87.0	9/16 8:11	86.9	9/16 16:08				

1st hour Sub-Total, mg:	6.4
Remainder Sub-Total, mg:	2.9
Train 1 Aggregate, mg:	**9.3**
Train 2 Aggregate, mg:	**8.2**
Ambient Aggregate, mg:	0.2

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 2 Test Date: 9/11/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: N/A
Air Control Setting: N/A

Time	Notes
N/A	Low fire test performed as a continuation of Run 1 High Fire Test, see Run 1 Notes for detail

Test Notes
Test Burn Start Time: 11:00
Air Control Setting: Fully Closed (15/64" PAC opening)

Time	Notes
0 min	Leveled remaining 3.8 lbs of charcoal from high fire test, zeroed scale, turned off fan and loaded low fire test fuel load, door open 1 minute
5 min	Air turned down to test setting
6 min	Fan turned on to high
25 min	Changed front filter on both trains
60 min	Changed 1-hr filter
493 min	End of Test

Test Burn End Time: 19:13

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.00 CO (%): 4.310
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:21	8:25	8:23	19:45	19:47	19:50
CO_2	0.00	10.09	17.00	-0.08	10.00	16.97
CO	0.00	2.493	4.310	-0.007	2.502	4.339

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature:  Date: 9/17/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy | Job Number: 19-494 | Tracking #: 0030
Model: NEO 2.5 | Run Number: 2 | Test Date: 9/11/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

Residual Start-up Fuel Coal Bed

Technician Signature: _____ Date: 9/17/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 2 Test Date: 9/11/2019

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Low Fire Fuel Load

Low Fire Fuel Loaded

Technician Signature: Date: 9/17/2019

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 3 Data Summary

Client:	Pacific Energy
Model:	NEO 2.5 LE
Job #:	19-494
Tracking #:	030
Test Date:	9/12/2019

9/16/2019

Techician Signature | Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

Burn Rate (kg/hr):	1.60

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	65.984	49.966	49.393	8.794
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.91			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11626.2			
Average Gas Meter Temperature (°F)	79.8	100.4	99.5	84.9
Total Sample Volume (dscf)	64.103	47.342	46.730	8.570
Average Tunnel Temperature (°F)	104.1			
Total Time of Test (min)	336			
Total Particulate Catch (mg)	0.2	19.3	21.7	12.3
Particulate Concentration, dry-standard (g/dscf)	0.0000031	0.0004077	0.0004644	0.0014353
Total PM Emissions (g)	0.20	26.34	30.03	16.65
Particulate Emission Rate (g/hr)	0.04	4.70	5.36	16.65
Emissions Factor (g/kg)	-	2.93	3.35	-
Difference from Average Total Particulate Emissions (g)	-	1.85	1.85	-
Difference from Average Emissions Factor (g/kg)	-	0.21	0.21	-

Final Average Results	
Total Particulate Emissions (g)	28.18
Particulate Emission Rate (g/hr)	5.03
Emissions Factor (g/kg)	3.14
HHV Efficiency (%)	71.1%
LHV Efficiency (%)	76.1%
CO Emissions (g/min)	3.07

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81 / Max: 90	OK
Face Velocity	< 30 ft/min	9.1	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 76 / Max: 82	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

B415.1 Efficiency Results

Manufacturer:	Pacific Energy
Model:	NEO 2.5 LE
Date:	09/12/19
Run:	3
Control #:	19-494
Test Duration:	336
Output Category:	Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	71.1%	76.1%
Combustion Efficiency	91.8%	91.8%
Heat Transfer Efficiency	77.5%	82.9%

Output Rate (kJ/h)	22,731	21,563	**(Btu/h)**
Burn Rate (kg/h)	1.60	3.53	**(lb/h)**
Input (kJ/h)	31,949	30,307	**(Btu/h)**

Test Load Weight (dry kg)	8.96	19.76	**dry lb**
MC wet (%)	18.36		
MC dry (%)	22.49		
Particulate (g)	28.18		
CO (g)	1,032		
Test Duration (h)	5.60		

Emissions	**Particulate**	**CO**
g/MJ Output	0.22	8.10
g/kg Dry Fuel	3.14	115.10
g/h	5.03	184.24
g/min	0.08	3.07
lb/MM Btu Output	0.51	18.84

Air/Fuel Ratio (A/F)	10.33

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 3
Technician: SJB
Date: 9/12/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	21.00		
Total Load Weight Range (lbs):	20.00	to	22.10
Core Load Weight Range (lbs):	9.50	to	13.70
Remainder Load Weight Range (lbs):	7.40	to	11.60
Core Load Piece Range (lbs):	3.20	to	5.30
Remainder Load Piece Range (lbs):	2.10	to	11.60
Max Allowable Kindling Weight (lbs):	4.05		
Max Allowable Start-up Fuel Weight (lbs):	6.07		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	5.13	In Range	24.9	26.0	22.6	24.5	In Range	4.12	1.87
2	16.00	4.44	In Range	24.2	25.4	23.9	24.5	In Range	3.57	1.62
3	16.00	3.20	In Range	19.1	21.8	26.8	22.6	In Range	2.61	1.18
Core Load Wt. (lbs)		12.77	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	3.48	In Range	23.5	26.7	22.3	24.2	In Range	2.80	1.27
2	16.00	3.98	In Range	24.8	23.9	22.6	23.8	In Range	3.22	1.46
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		7.46	In Range							

Total Load Weight (lbs):	20.23	In Range	
Core Load % of Total Weight:	63%	In Range	45-65%
Remainder % of Total Weight:	37%	In Range	35-55%
Total Load % of Target Weight:	96%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	9.6		
Total Load Average Moisture Content (%DB):	24.0	In Range	19-25%
Total Load Average Moisture Content (%WB):	19.3		
Total Test Load Weight (dry basis):	16.32 lbs	7.40 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.07	In Range	10	10	10	10.0	In Range	2.79	1.27

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.83	In Range	21.9	24.6	19.7	22.1	In Range	3.96	1.79

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.0	to	4.0	
Actual Residual Start-up Fuel Weight (lb):		2.0		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 3
Technician: SJB
Date: 9/12/2019

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	25.20		
Total Load Weight Range (lbs):	23.94	to	26.46
Core Load Weight Range (lbs):	11.34	to	16.38
Remainder Load Weight Range (lbs):	8.82	to	13.86
Core Load Piece Range (lbs):	3.78	to	6.30
Remainder Load Piece Range (lbs):	2.52	to	7.56

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.72	In Range	22.3	20.4	23.6	22.1	In Range	3.87	1.75
2	16.00	4.78	In Range	24.2	22.0	23.1	23.1	In Range	3.88	1.76
3	16.00	5.07	In Range	23.7	23.6	25.8	24.4	In Range	4.08	1.85
Core Load Wt. (lbs)		14.57	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	6.16	In Range	22.3	21.5	24.1	22.6	In Range	5.02	2.28
2	16.00	3.46	In Range	19.0	20.4	18.6	19.3	In Range	2.90	1.32
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		9.62	In Range							

Remainder Load Small/Large Piece Weight Ratio:	56%	In Range	≤ 67%
Total Load Weight (lbs):	24.19	In Range	
Core Load % of Total Weight:	60%	In Range	45-65%
Remainder % of Total Weight:	40%	In Range	35-55%
Total Load % of Target Weight:	96%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.5		
Total Load Average Moisture Content (%DB):	22.5	In Range	19-25%
Total Load Average Moisture Content (%WB):	18.4		
Total Test Load Weight (dry basis):	19.75 lbs	8.96 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	2.5	to	4.8	
Actual Charcoal Bed Wt. (lb):		4.0		In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb):	0.0	Valid Test (≥90%)

Total Fuel Burned During Test Run:	24.2	lbs, wet basis
	19.7	lbs, dry basis
	8.96	kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Pacific Energy	Job #:	19-494
Model:	NEO 2.5 LE	Tracking #:	030
Run #:	3	Technician:	SJB
Test Start Time:	11:19	Date:	9/12/2019
Test Type:	Medium Fire		

Recording Interval (min):	1
Total Sampling Time (min):	336

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.02	29.92	29.97
Relative Humidity (%)	45.1	31.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Meter Box γ Factor:	0.999	(A)	
Meter Box γ Factor:	0.996	(B)	
Meter Box γ Factor:	0.992	(Ambient)	
Ambient Sample Volume:	65.984	ft^3	

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	9/10/2019

Sample Train Post-Test Leak Checks

(A)	0.002	cfm @	-11	in. Hg
(B)	0.000	cfm @	-13	in. Hg
(Ambient)	0.001	cfm @	-14	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.060	115
2	0.080	115
3	0.078	115
4	0.062	115
5	0.058	115
6	0.080	115
7	0.082	115
8	0.056	115
Center	0.085	115

Static Pressure: -0.190 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	18.37	ft/sec
V_{scent}:	20.13	ft/sec
F_p:	0.912	[ratio]
Initial Tunnel Flow:	192.8	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

Recording Interval (min): 1
Run Time (min): 150

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
0	2.0	0.001	76	76	76	76	75	75.8	72	68
1	1.9	-0.019	76	76	77	76	75	76.0	88	68
2	2.9	-0.050	76	77	78	77	75	76.6	176	68
3	1.6	-0.069	79	79	81	80	75	78.8	311	68
4	1.4	-0.058	84	84	88	87	75	83.6	349	68
5	1.3	-0.068	89	87	96	99	75	89.2	362	68
6	1.1	-0.062	95	92	104	113	76	96.0	400	68
7	0.9	-0.072	100	96	111	131	78	103.2	412	68
8	0.9	-0.064	104	101	116	149	81	110.2	390	68
9	0.7	-0.054	107	106	122	166	85	117.2	370	68
10	0.8	-0.061	110	110	128	181	91	124.0	353	68
11	2.8	-0.081	113	113	133	194	98	130.2	366	68
12	2.5	-0.076	117	118	140	207	104	137.2	506	68
13	2.3	-0.090	123	123	148	228	112	146.8	550	68
14	2.0	-0.080	129	129	157	255	121	158.2	602	68
15	1.8	-0.096	134	135	167	288	130	170.8	626	68
16	1.6	-0.092	139	140	178	321	140	183.6	602	69
17	1.4	-0.084	144	144	190	352	151	196.2	578	69
18	1.3	-0.076	149	149	204	380	162	208.8	567	69
19	1.1	-0.079	154	155	220	405	174	221.6	595	69
20	4.7	-0.087	160	165	239	429	186	235.8	588	69
21	4.5	-0.082	168	174	254	451	198	249.0	600	69
22	4.2	-0.092	177	185	269	473	209	262.6	639	69
23	4.0	-0.108	186	195	283	496	219	275.8	642	69
24	3.6	-0.091	196	206	297	519	229	289.4	648	70
25	3.5	-0.103	206	217	311	542	238	302.8	643	70
26	3.3	-0.103	216	228	325	563	247	315.8	648	70
27	3.0	-0.097	226	240	338	584	256	328.8	662	70
28	2.8	-0.102	236	251	352	605	265	341.8	665	70
29	2.6	-0.101	246	263	367	625	274	355.0	669	70
30	2.4	-0.095	256	275	381	645	282	367.8	677	70
31	2.2	-0.096	266	287	396	663	291	380.6	676	70
32	2.0	-0.094	277	298	411	680	300	393.2	678	71
33	22.0	-0.099	287	309	424	692	311	404.6	600	72
34	21.7	-0.101	297	321	433	697	320	413.6	648	71
35	21.5	-0.107	307	331	439	702	328	421.4	709	71
36	21.2	-0.101	317	343	390	692	335	415.4	753	71
37	20.9	-0.099	326	353	361	691	341	414.4	784	71
38	20.6	-0.109	335	363	340	695	346	415.8	780	71
39	20.3	-0.099	343	372	324	700	351	418.0	794	71
40	20.0	-0.103	350	380	310	707	355	420.4	812	72
41	19.7	-0.110	356	388	300	715	358	423.4	818	72
42	19.3	-0.113	362	395	292	722	361	426.4	809	72
43	19.0	-0.095	367	403	286	729	363	429.6	806	72

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

Recording Interval (min): 1
Run Time (min): 150

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
44	18.8	-0.122	371	410	280	735	366	432.4	801	72
45	18.5	-0.102	375	417	277	740	368	435.4	798	73
46	18.3	-0.120	379	424	274	744	370	438.2	797	73
47	18.0	-0.106	382	430	271	747	372	440.4	782	73
48	17.7	-0.096	386	437	269	749	374	443.0	765	73
49	17.4	-0.083	389	443	268	750	375	445.0	758	73
50	17.2	-0.092	392	449	268	750	377	447.2	755	73
51	17.0	-0.113	394	454	267	749	378	448.4	750	73
52	16.7	-0.100	397	460	268	747	379	450.2	747	73
53	16.5	-0.099	400	465	268	747	381	452.2	747	73
54	16.2	-0.090	402	470	268	746	383	453.8	749	73
55	16.0	-0.088	405	475	269	745	384	455.6	751	73
56	15.7	-0.096	407	480	270	745	386	457.6	757	73
57	15.5	-0.101	409	484	271	745	388	459.4	759	74
58	15.2	-0.111	412	488	272	747	390	461.8	760	74
59	14.9	-0.100	414	493	273	748	391	463.8	754	74
60	14.7	-0.090	416	497	274	748	393	465.6	755	74
61	14.5	-0.093	418	500	275	749	395	467.4	757	74
62	14.1	-0.107	421	504	276	751	397	469.8	763	74
63	13.9	-0.106	423	508	277	752	399	471.8	750	74
64	13.7	-0.108	425	512	278	749	401	473.0	719	74
65	13.5	-0.095	428	515	279	743	403	473.6	690	74
66	13.3	-0.079	430	518	279	733	405	473.0	665	74
67	13.1	-0.088	433	521	280	722	407	472.6	642	74
68	13.0	-0.105	436	523	280	710	410	471.8	622	74
69	12.8	-0.079	439	524	279	696	412	470.0	609	74
70	12.7	-0.089	442	525	278	681	413	467.8	594	74
71	12.6	-0.081	445	525	276	666	415	465.4	583	74
72	12.5	-0.081	447	525	274	652	417	463.0	576	74
73	12.2	-0.092	450	524	273	638	417	460.4	572	74
74	12.2	-0.089	452	522	271	624	418	457.4	570	74
75	12.0	-0.088	454	521	269	612	418	454.8	570	74
76	11.9	-0.102	455	519	267	602	419	452.4	571	74
77	11.7	-0.092	457	516	266	592	419	450.0	572	74
78	11.6	-0.093	458	514	264	584	418	447.6	578	74
79	11.5	-0.087	458	511	262	578	418	445.4	584	74
80	11.2	-0.086	459	509	261	573	417	443.8	591	74
81	11.1	-0.090	459	507	260	570	416	442.4	591	75
82	11.0	-0.088	459	504	259	568	416	441.2	593	74
83	10.8	-0.081	459	502	258	566	415	440.0	600	74
84	10.7	-0.081	459	500	258	565	415	439.4	609	75
85	10.6	-0.091	459	499	258	566	416	439.6	618	75
86	10.4	-0.102	458	497	258	568	415	439.2	623	75
87	10.2	-0.075	458	496	259	572	416	440.2	630	75

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

Recording Interval (min): 1
Run Time (min): 150

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
88	10.1	-0.089	458	496	259	578	417	441.6	660	75
89	9.8	-0.096	458	495	260	587	418	443.6	675	75
90	9.7	-0.087	458	495	260	597	420	446.0	685	75
91	9.4	-0.091	459	495	260	608	421	448.6	683	75
92	9.4	-0.096	459	496	261	618	422	451.2	683	75
93	9.2	-0.109	460	496	262	626	425	453.8	683	75
94	9.0	-0.084	462	497	264	634	427	456.8	682	75
95	8.8	-0.089	463	497	266	641	429	459.2	681	76
96	8.7	-0.087	465	498	269	647	432	462.2	670	76
97	8.5	-0.090	467	499	271	650	435	464.4	667	76
98	8.3	-0.097	470	500	273	652	439	466.8	662	76
99	8.3	-0.088	472	501	275	654	442	468.8	656	76
100	8.1	-0.099	473	502	276	653	444	469.6	653	76
101	8.0	-0.095	475	503	278	652	447	471.0	647	76
102	7.9	-0.093	477	505	280	650	451	472.6	639	76
103	7.8	-0.084	479	506	281	647	454	473.4	634	76
104	7.7	-0.096	480	508	282	644	457	474.2	633	76
105	7.5	-0.095	482	509	284	642	461	475.6	633	76
106	7.4	-0.086	483	511	285	641	464	476.8	637	76
107	7.3	-0.107	484	512	287	641	468	478.4	639	76
108	7.2	-0.102	485	514	289	641	472	480.2	638	76
109	7.1	-0.088	486	515	291	640	476	481.6	634	76
110	6.9	-0.095	488	517	294	639	479	483.4	631	76
111	6.8	-0.085	489	518	298	638	483	485.2	625	76
112	6.7	-0.092	490	520	302	636	487	487.0	619	76
113	6.6	-0.093	491	521	307	633	490	488.4	611	76
114	6.5	-0.080	493	522	311	630	494	490.0	605	76
115	6.3	-0.077	494	524	315	626	498	491.4	605	76
116	6.3	-0.089	495	525	318	623	502	492.6	602	76
117	6.1	-0.083	497	527	322	619	506	494.2	596	76
118	6.0	-0.087	498	528	324	616	510	495.2	601	76
119	6.0	-0.094	500	529	325	614	514	496.4	592	76
120	5.9	-0.078	501	530	326	609	516	496.4	570	76
121	5.7	-0.083	502	532	327	602	519	496.4	556	76
122	5.7	-0.082	503	533	328	594	522	496.0	544	76
123	5.7	-0.069	504	533	328	584	524	494.6	535	76
124	5.6	-0.087	505	533	327	575	527	493.4	525	76
125	5.5	-0.076	506	533	325	565	529	491.6	524	76
126	5.5	-0.084	506	533	323	556	530	489.6	522	76
127	5.4	-0.083	506	533	321	548	531	487.8	519	76
128	5.3	-0.083	506	532	318	539	530	485.0	514	76
129	5.2	-0.082	506	531	316	532	530	483.0	510	76
130	5.2	-0.092	506	529	313	525	530	480.6	508	76
131	5.1	-0.080	506	528	310	518	529	478.2	504	76

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

Recording Interval (min): 1
Run Time (min): 150

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
132	4.8	-0.066	505	526	307	512	528	475.6	502	76
133	5.0	-0.081	505	524	305	506	527	473.4	499	76
134	4.8	-0.077	504	522	302	500	525	470.6	490	76
135	4.8	-0.073	503	520	300	494	524	468.2	479	76
136	4.8	-0.066	502	518	297	488	522	465.4	475	76
137	4.6	-0.066	501	516	294	482	521	462.8	466	76
138	4.7	-0.079	500	514	291	476	519	460.0	463	76
139	4.6	-0.057	499	511	288	470	518	457.2	462	76
140	4.6	-0.077	497	509	286	464	516	454.4	453	76
141	4.5	-0.075	496	506	283	458	514	451.4	446	76
142	4.4	-0.067	494	503	280	452	512	448.2	435	76
143	4.4	-0.054	493	501	278	446	510	445.6	432	76
144	4.4	-0.071	491	498	275	440	508	442.4	428	76
145	4.3	-0.066	489	495	272	434	507	439.4	430	76
146	4.2	-0.070	487	492	269	428	506	436.4	429	76
147	4.2	-0.073	485	489	267	423	504	433.6	426	76
148	4.2	-0.053	483	486	265	418	502	430.8	424	76
149	4.1	-0.082	481	483	263	414	501	428.4	425	76
150	4.0	-0.072	479	480	261	409	499	425.6	423	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.079	0.01	77	-0.07		24.2		125	406	84	76
1	0.124	0.124	0.081	2.20	77	-2.28	90	24.2	0	135	329	83	76
2	0.266	0.142	0.083	2.18	77	-1.65	101	24.0	-0.2	121	363	82	76
3	0.412	0.146	0.082	2.13	77	-1.19	104	23.6	-0.4	119	385	82	76
4	0.549	0.137	0.083	2.05	77	-1.15	97	23.4	-0.2	122	476	83	76
5	0.699	0.150	0.087	2.21	77	-2.05	105	23.2	-0.2	133	655	84	76
6	0.837	0.138	0.083	2.20	77	-1.64	99	22.9	-0.3	140	753	85	76
7	0.987	0.150	0.082	2.31	77	-1.45	109	22.5	-0.4	148	805	83	76
8	1.129	0.142	0.085	2.05	78	-0.62	100	22.3	-0.2	135	665	82	76
9	1.284	0.155	0.083	2.35	78	0	110	22.1	-0.2	130	610	83	76
10	1.430	0.146	0.080	2.34	78	0	106	21.7	-0.4	128	589	84	76
11	1.582	0.152	0.085	2.32	78	-2.64	107	21.6	-0.1	128	580	84	76
12	1.727	0.145	0.084	2.31	79	-2.55	102	21.4	-0.2	126	574	84	76
13	1.880	0.153	0.081	2.31	79	0	110	21.2	-0.2	126	574	83	76
14	2.025	0.145	0.085	2.31	79	-1.32	102	21.0	-0.2	126	572	82	76
15	2.177	0.152	0.080	2.31	80	-1.86	110	20.7	-0.3	126	578	83	76
16	2.323	0.146	0.079	2.31	80	0	106	20.5	-0.2	126	577	84	76
17	2.474	0.151	0.077	2.29	80	-0.57	111	20.3	-0.2	126	577	85	76
18	2.619	0.145	0.078	2.28	81	-0.81	106	20.1	-0.2	125	570	84	76
19	2.770	0.151	0.079	2.29	81	-2.1	109	19.9	-0.2	124	565	84	77
20	2.916	0.146	0.081	2.30	81	-2.68	104	19.7	-0.2	124	563	83	76
21	3.065	0.149	0.083	2.29	82	-0.34	105	19.5	-0.2	123	561	82	77
22	3.211	0.146	0.082	2.29	82	-2.19	103	19.3	-0.2	125	563	83	77
23	3.361	0.150	0.080	2.26	82	-0.45	108	19.1	-0.2	124	566	84	77
24	3.508	0.147	0.082	2.28	83	0	104	18.9	-0.2	124	568	85	77
25	3.657	0.149	0.080	2.27	83	-2.31	107	18.6	-0.3	124	570	84	77
26	3.804	0.147	0.084	2.27	84	0	102	18.5	-0.1	124	568	83	77
27	3.952	0.148	0.081	2.26	84	0	105	18.2	-0.3	124	568	82	77
28	4.101	0.149	0.085	2.25	84	-1.9	103	18.1	-0.1	124	570	82	77
29	4.249	0.148	0.079	2.28	85	-2.68	106	17.9	-0.2	124	572	83	77
30	4.397	0.148	0.084	2.24	85	-1.41	103	17.7	-0.2	124	569	84	77
31	4.545	0.148	0.081	2.25	85	-2.27	105	17.5	-0.2	124	571	85	77
32	4.694	0.149	0.084	2.27	86	-0.58	104	17.3	-0.2	124	581	84	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.840	0.146	0.083	2.26	86	0	102	17.1	-0.2	126	581	83	77
34	4.990	0.150	0.078	2.24	86	-2.5	108	16.9	-0.2	125	585	82	77
35	5.136	0.146	0.080	2.24	87	-2.01	104	16.8	-0.1	124	579	82	77
36	5.286	0.150	0.082	2.24	87	-0.31	105	16.5	-0.3	125	578	83	77
37	5.431	0.145	0.082	2.24	87	-0.02	102	16.3	-0.2	126	573	85	77
38	5.581	0.150	0.085	2.23	88	0	103	16.0	-0.3	125	572	85	77
39	5.725	0.144	0.080	2.22	88	-0.12	102	15.9	-0.1	125	568	84	77
40	5.874	0.149	0.085	2.23	88	-0.24	103	15.6	-0.3	125	568	83	77
41	6.019	0.145	0.086	2.22	89	-2.73	99	15.4	-0.2	125	565	82	77
42	6.168	0.149	0.082	2.20	89	0	104	15.2	-0.2	125	566	82	77
43	6.312	0.144	0.081	2.19	89	-2.04	101	15.0	-0.2	124	567	83	77
44	6.461	0.149	0.082	2.17	90	-2.27	104	14.7	-0.3	125	566	84	77
45	6.604	0.143	0.078	2.18	90	-1.46	102	14.6	-0.1	124	566	85	77
46	6.753	0.149	0.080	2.17	90	-2.27	105	14.4	-0.2	124	566	84	77
47	6.896	0.143	0.086	2.14	90	-0.77	97	14.2	-0.2	124	566	83	78
48	7.043	0.147	0.087	2.14	91	-0.02	99	13.8	-0.4	124	562	82	78
49	7.186	0.143	0.083	2.14	91	-0.06	99	13.8	0	124	563	82	77
50	7.333	0.147	0.080	2.13	91	-0.58	104	13.6	-0.2	124	563	83	78
51	7.476	0.143	0.080	2.12	92	-2.88	101	13.4	-0.2	123	563	84	78
52	7.621	0.145	0.078	2.09	92	-0.01	103	13.1	-0.3	124	562	85	78
53	7.763	0.142	0.081	2.06	92	-1.42	99	13.0	-0.1	124	557	85	78
54	7.909	0.146	0.084	2.25	92	-2.91	100	12.8	-0.2	125	551	84	78
55	8.058	0.149	0.083	2.22	93	-0.52	103	12.6	-0.2	124	548	83	78
56	8.206	0.148	0.080	2.20	93	-2.82	104	12.5	-0.1	123	545	82	78
57	8.353	0.147	0.083	2.19	93	-2.43	101	12.2	-0.3	123	544	82	78
58	8.499	0.146	0.084	2.15	93	-1.13	100	12.1	-0.1	122	544	84	78
59	8.643	0.144	0.082	2.08	94	-1.54	100	11.9	-0.2	123	543	85	78
60	8.794	0.151	0.081	2.21	94	0	105	11.7	-0.2	123	542	85	78
61	8.940	0.146	0.079	1.95	94	0	103	11.5	-0.2	123	543	83	78
62	9.087	0.147	0.083	2.20	94	-2	101	11.2	-0.3	122	540	83	78
63	9.234	0.147	0.082	2.20	94	-1.09	102	11.1	-0.1	122	541	82	78
64	9.382	0.148	0.079	2.19	95	-0.45	104	11.0	-0.1	122	538	82	78
65	9.529	0.147	0.080	2.18	95	-2.05	103	10.8	-0.2	123	539	83	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.677	0.148	0.081	2.20	95	-2.1	103	10.6	-0.2	122	540	84	78
67	9.823	0.146	0.084	2.20	95	-2.49	100	10.5	-0.1	122	539	85	79
68	9.972	0.149	0.080	2.21	95	-0.6	104	10.3	-0.2	122	540	85	78
69	10.118	0.146	0.083	2.17	96	-2.55	100	10.2	-0.1	123	548	84	78
70	10.267	0.149	0.083	2.21	96	0	102	9.9	-0.3	122	552	83	78
71	10.412	0.145	0.081	2.20	96	-1.45	101	9.8	-0.1	123	552	82	78
72	10.561	0.149	0.084	2.20	96	0	101	9.5	-0.3	122	550	82	79
73	10.707	0.146	0.082	2.16	96	-0.84	101	9.5	0	121	545	83	79
74	10.856	0.149	0.084	2.17	97	-0.97	101	9.3	-0.2	121	545	84	79
75	11.001	0.145	0.083	2.20	97	-2.39	99	9.1	-0.2	121	547	85	79
76	11.150	0.149	0.082	2.17	97	-2.55	102	9.0	-0.1	121	546	84	79
77	11.295	0.145	0.082	2.18	97	-2.4	100	8.8	-0.2	121	541	83	79
78	11.445	0.150	0.083	2.18	97	-1.01	102	8.7	-0.1	121	537	82	79
79	11.589	0.144	0.083	2.17	97	-1.92	98	8.4	-0.3	121	534	82	79
80	11.739	0.150	0.081	2.19	97	-2.66	104	8.3	-0.1	119	527	83	79
81	11.883	0.144	0.080	2.19	98	-0.07	100	8.3	0	119	526	84	79
82	12.033	0.150	0.082	2.18	98	-1.35	103	8.1	-0.2	118	519	85	79
83	12.177	0.144	0.080	2.20	98	-2.34	100	8.0	-0.1	118	510	84	79
84	12.327	0.150	0.087	2.19	98	0	100	7.9	-0.1	118	500	84	79
85	12.471	0.144	0.081	2.16	98	-1.21	99	7.8	-0.1	118	490	83	79
86	12.621	0.150	0.081	2.16	98	-2.55	103	7.6	-0.2	116	481	82	79
87	12.766	0.145	0.078	2.19	98	0	102	7.5	-0.1	116	477	83	79
88	12.916	0.150	0.080	2.18	99	0	104	7.5	0	116	477	84	79
89	13.060	0.144	0.079	2.16	99	0	100	7.4	-0.1	116	477	85	79
90	13.210	0.150	0.081	2.17	99	-0.25	103	7.2	-0.2	115	477	85	79
91	13.355	0.145	0.079	2.18	99	-1.19	101	7.1	-0.1	115	472	84	79
92	13.505	0.150	0.081	2.18	99	0	103	7.1	0	114	471	83	79
93	13.649	0.144	0.082	2.18	99	-2.5	98	7.0	-0.1	115	471	82	79
94	13.799	0.150	0.081	2.16	99	-1.25	103	6.9	-0.1	115	476	82	79
95	13.943	0.144	0.080	2.16	99	-0.1	99	6.7	-0.2	114	481	82	79
96	14.093	0.150	0.080	2.15	100	-1.2	103	6.6	-0.1	115	489	83	79
97	14.238	0.145	0.084	2.16	100	0	98	6.5	-0.1	116	493	84	79
98	14.387	0.149	0.080	2.14	100	-0.79	103	6.4	-0.1	116	496	85	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.531	0.144	0.083	2.14	100	0	97	6.3	-0.1	116	495	84	79
100	14.680	0.149	0.083	2.10	100	-0.56	101	6.2	-0.1	116	496	83	80
101	14.823	0.143	0.081	2.09	100	-2.55	98	6.0	-0.2	116	499	82	79
102	14.971	0.148	0.083	2.07	100	-0.28	100	5.9	-0.1	115	497	82	80
103	15.113	0.142	0.081	2.05	100	-0.07	97	5.8	-0.1	116	493	84	80
104	15.259	0.146	0.083	2.04	100	-1.65	99	5.7	-0.1	116	495	84	80
105	15.401	0.142	0.081	2.02	100	-2.65	97	5.6	-0.1	115	495	85	80
106	15.545	0.144	0.082	1.98	101	-2.92	98	5.5	-0.1	115	483	84	80
107	15.686	0.141	0.080	1.97	101	-1.03	97	5.4	-0.1	114	469	83	80
108	15.830	0.144	0.082	2.31	101	-1.47	98	5.3	-0.1	114	462	82	80
109	15.981	0.151	0.083	2.30	101	-2.88	102	5.2	-0.1	114	459	82	80
110	16.134	0.153	0.077	2.26	101	-2.89	107	5.1	-0.1	113	457	83	80
111	16.281	0.147	0.079	2.24	101	-3.17	102	5.0	-0.1	113	454	84	80
112	16.432	0.151	0.078	2.20	101	-1.41	105	5.0	0	112	451	84	80
113	16.578	0.146	0.080	2.16	101	-3.13	100	4.9	-0.1	112	452	84	80
114	16.728	0.150	0.079	2.11	101	-0.99	103	4.9	0	112	452	83	80
115	16.869	0.141	0.082	2.01	101	-3.23	95	4.7	-0.2	112	451	82	80
116	17.014	0.145	0.078	1.92	101	-3.6	101	4.6	-0.1	112	446	82	80
117	17.151	0.137	0.084	1.84	101	-1.27	92	4.6	0	112	442	82	80
118	17.285	0.134	0.078	1.77	102	-1.48	93	4.5	-0.1	110	439	84	80
119	17.421	0.136	0.082	1.70	102	-2.23	92	4.4	-0.1	110	429	84	80
120	17.550	0.129	0.080	1.66	102	-1.77	88	4.4	0	110	417	84	80
121	17.678	0.128	0.082	1.61	102	-3.15	86	4.3	-0.1	109	407	83	80
122	17.806	0.128	0.083	1.54	102	-4.12	86	4.2	-0.1	108	397	83	80
123	17.929	0.123	0.084	1.49	102	-2.04	82	4.2	0	108	386	82	80
124	18.050	0.121	0.082	1.44	102	-2.36	81	4.2	0	107	374	82	80
125	18.173	0.123	0.082	1.99	102	-3.66	83	4.1	-0.1	106	363	83	80
126	18.314	0.141	0.080	1.86	102	-3.79	96	4.1	0	106	352	84	80
127	18.484	0.170	0.084	3.31	102	0	113	4.0	-0.1	105	346	85	80
128	18.638	0.154	0.079	2.24	102	-0.37	105	4.0	0	104	343	84	80
129	18.792	0.154	0.083	2.25	102	-0.93	103	4.0	0	104	337	84	80
130	18.940	0.148	0.081	2.24	102	0	100	3.9	-0.1	104	333	83	80
131	19.092	0.152	0.079	2.26	102	-0.19	104	3.7	-0.2	103	326	82	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.239	0.147	0.083	2.22	102	-1.99	98	3.7	0	103	322	82	80
133	19.391	0.152	0.085	2.25	103	-2.26	100	3.8	0.1	102	318	83	80
134	19.541	0.150	0.084	2.24	103	-2.04	99	3.8	0	102	313	85	80
135	19.692	0.151	0.083	2.25	103	0	100	3.7	-0.1	101	312	85	80
136	19.843	0.151	0.081	2.25	103	-2.05	101	3.6	-0.1	100	309	84	80
137	19.993	0.150	0.079	2.26	103	0	102	3.7	0.1	101	306	84	80
138	20.144	0.151	0.085	2.25	103	-2.58	99	3.5	-0.2	100	306	83	80
139	20.292	0.148	0.087	2.27	103	-2.36	96	3.6	0.1	100	301	82	80
140	20.444	0.152	0.083	2.24	103	0	101	3.6	0	100	295	82	80
141	20.592	0.148	0.079	2.24	103	-0.73	101	3.5	-0.1	99	292	83	80
142	20.746	0.154	0.082	2.25	103	-0.6	103	3.5	0	99	288	84	80
143	20.894	0.148	0.078	2.24	103	-2.19	101	3.5	0	99	285	84	80
144	21.046	0.152	0.082	2.24	103	0	101	3.5	0	98	283	84	80
145	21.194	0.148	0.080	2.23	103	0	100	3.4	-0.1	98	280	83	80
146	21.346	0.152	0.082	2.25	103	-2.24	101	3.4	0	98	279	82	80
147	21.496	0.150	0.083	2.26	103	0	99	3.4	0	98	277	82	80
148	21.647	0.151	0.083	2.24	103	-0.15	100	3.4	0	98	275	83	80
149	21.798	0.151	0.084	2.25	103	0	99	3.4	0	98	273	84	80
150	21.947	0.149	0.077	2.26	103	-2.19	102	3.4	0	97	270	85	80
151	22.099	0.152	0.081	2.26	103	-1.54	102	3.3	-0.1	96	267	84	80
152	22.247	0.148	0.084	2.25	103	-0.12	97	3.3	0	97	266	83	80
153	22.400	0.153	0.079	2.24	103	-2.39	104	3.3	0	96	265	83	80
154	22.548	0.148	0.089	2.25	103	0	95	3.3	0	96	263	82	80
155	22.702	0.154	0.079	2.24	104	-1.32	104	3.2	-0.1	96	263	82	80
156	22.850	0.148	0.081	2.25	104	-0.64	99	3.2	0	96	262	83	80
157	23.002	0.152	0.083	2.29	104	0	100	3.2	0	95	262	84	80
158	23.151	0.149	0.085	2.27	104	0	97	3.2	0	96	260	85	80
159	23.302	0.151	0.082	2.26	104	-0.3	100	3.2	0	96	259	84	80
160	23.453	0.151	0.085	2.24	104	-0.09	98	3.1	-0.1	95	257	83	80
161	23.603	0.150	0.079	2.26	104	-0.76	101	3.1	0	95	257	82	80
162	23.756	0.153	0.083	2.23	104	0	101	3.1	0	95	255	82	80
163	23.904	0.148	0.085	2.26	104	-2.01	96	3.1	0	95	254	82	80
164	24.056	0.152	0.080	2.25	104	-0.81	102	3.0	-0.1	95	254	83	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.204	0.148	0.082	2.23	104	-2.11	98	3.1	0.1	95	252	85	80
166	24.358	0.154	0.083	2.26	104	-2.37	102	3.1	0	95	251	85	80
167	24.506	0.148	0.084	2.24	104	-0.31	97	3.0	-0.1	94	249	84	80
168	24.659	0.153	0.083	2.22	104	-0.92	101	3.0	0	95	249	83	80
169	24.807	0.148	0.084	2.24	104	-0.73	97	2.9	-0.1	95	250	82	80
170	24.959	0.152	0.082	2.24	104	-2.36	101	2.9	0	94	248	82	80
171	25.108	0.149	0.079	2.26	104	0	101	3.0	0.1	94	247	82	80
172	25.260	0.152	0.080	2.24	104	-2.3	102	2.9	-0.1	94	247	83	80
173	25.412	0.152	0.086	2.24	104	-1.16	98	2.9	0	94	246	84	80
174	25.561	0.149	0.079	2.22	104	-1.76	101	2.8	-0.1	94	246	84	80
175	25.713	0.152	0.080	2.25	104	-1.24	102	2.9	0.1	94	246	84	80
176	25.861	0.148	0.082	2.24	104	-2.34	98	2.8	-0.1	94	245	83	80
177	26.014	0.153	0.085	2.25	104	-2.59	100	2.9	0.1	94	244	82	80
178	26.162	0.148	0.082	2.24	104	-1.59	98	2.7	-0.2	94	244	82	80
179	26.316	0.154	0.087	2.22	104	0	99	2.7	0	94	243	82	80
180	26.464	0.148	0.083	2.25	104	-0.79	98	2.7	0	94	243	83	80
181	26.617	0.153	0.084	2.24	104	-2.52	100	2.7	0	93	242	84	80
182	26.765	0.148	0.081	2.23	104	-0.06	99	2.7	0	94	242	85	80
183	26.916	0.151	0.081	2.24	104	-2.41	101	2.6	-0.1	93	241	84	80
184	27.067	0.151	0.082	2.24	104	-0.49	100	2.6	0	94	241	83	80
185	27.218	0.151	0.080	2.25	104	0	101	2.7	0.1	94	240	82	80
186	27.369	0.151	0.082	2.25	104	0	100	2.6	-0.1	94	240	82	80
187	27.518	0.149	0.087	2.25	104	-1.73	96	2.6	0	94	241	82	80
188	27.670	0.152	0.086	2.24	104	-0.6	98	2.5	-0.1	93	239	83	80
189	27.818	0.148	0.079	2.25	105	-2.3	100	2.5	0	94	239	84	80
190	27.972	0.154	0.083	2.24	105	-2.5	101	2.5	0	94	239	84	80
191	28.120	0.148	0.082	2.24	105	0	98	2.5	0	93	238	84	80
192	28.274	0.154	0.086	2.24	105	-0.44	100	2.6	0.1	94	238	83	80
193	28.422	0.148	0.081	2.24	105	0	99	2.4	-0.2	94	237	82	80
194	28.574	0.152	0.083	2.23	105	0	100	2.4	0	93	237	82	81
195	28.723	0.149	0.080	2.23	105	-2.48	100	2.4	0	93	237	82	80
196	28.874	0.151	0.080	2.23	105	-0.32	101	2.4	0	94	238	83	80
197	29.027	0.153	0.085	2.24	105	-0.35	99	2.4	0	93	236	84	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	29.176	0.149	0.081	2.23	105	-1.48	99	2.2	-0.2	94	236	84	80
199	29.329	0.153	0.085	2.22	105	-1.36	99	2.3	0.1	94	235	84	81
200	29.476	0.147	0.085	2.23	105	-2.19	95	2.3	0	93	236	83	81
201	29.629	0.153	0.077	2.25	105	-1.65	104	2.3	0	93	235	82	80
202	29.778	0.149	0.084	2.24	105	-0.16	97	2.3	0	94	236	82	81
203	29.932	0.154	0.086	2.24	105	0	99	2.2	-0.1	93	235	82	81
204	30.080	0.148	0.083	2.23	105	-2.48	97	2.2	0	93	236	84	81
205	30.233	0.153	0.086	2.24	105	0	99	2.2	0	93	235	85	81
206	30.381	0.148	0.083	2.22	105	-0.81	97	2.2	0	93	234	85	81
207	30.533	0.152	0.086	2.24	105	-0.61	98	2.2	0	93	234	84	81
208	30.684	0.151	0.085	2.25	105	0	98	2.2	0	93	233	83	81
209	30.835	0.151	0.083	2.24	105	-0.2	99	2.0	-0.2	93	232	82	81
210	30.987	0.152	0.086	2.24	105	-2.66	98	2.1	0.1	93	232	82	81
211	31.135	0.148	0.088	2.25	105	-2.29	94	2.0	-0.1	93	231	82	81
212	31.288	0.153	0.085	2.25	105	0	99	2.1	0.1	93	230	84	81
213	31.435	0.147	0.081	2.24	105	0	98	2.1	0	93	229	85	81
214	31.590	0.155	0.085	2.24	105	0	101	1.9	-0.2	93	229	85	81
215	31.738	0.148	0.081	2.22	105	0	98	2.0	0.1	93	227	84	81
216	31.891	0.153	0.084	2.23	105	-2.13	100	1.9	-0.1	93	227	83	81
217	32.039	0.148	0.086	2.23	105	-1.29	96	2.0	0.1	93	227	83	81
218	32.192	0.153	0.083	2.25	105	-0.06	101	2.0	0	93	227	82	81
219	32.341	0.149	0.080	2.24	105	0	100	2.0	0	93	225	82	81
220	32.493	0.152	0.078	2.24	105	-2.08	103	1.9	-0.1	93	225	83	81
221	32.644	0.151	0.085	2.23	105	-2.23	98	1.9	0	93	226	84	81
222	32.794	0.150	0.083	2.22	105	0	99	1.9	0	93	226	84	81
223	32.946	0.152	0.085	2.25	105	0	99	1.9	0	93	225	84	81
224	33.094	0.148	0.084	2.25	106	0	97	1.8	-0.1	93	225	83	81
225	33.247	0.153	0.084	2.27	106	-1.64	100	1.8	0	93	225	82	81
226	33.395	0.148	0.081	2.24	106	-0.51	98	1.8	0	93	225	82	81
227	33.549	0.154	0.086	2.24	106	-2.58	99	1.8	0	93	226	82	81
228	33.698	0.149	0.082	2.24	106	0	98	1.8	0	93	226	83	81
229	33.850	0.152	0.081	2.24	106	-0.11	101	1.8	0	93	225	84	81
230	33.999	0.149	0.081	2.25	106	-2.29	99	1.8	0	93	225	84	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	34.150	0.151	0.081	2.24	106	-1.46	100	1.7	-0.1	93	226	84	81
232	34.301	0.151	0.088	2.24	106	0	96	1.7	0	93	226	83	81
233	34.452	0.151	0.087	2.23	106	-0.79	97	1.7	0	93	227	83	81
234	34.604	0.152	0.083	2.24	106	-2.22	100	1.7	0	93	227	82	81
235	34.752	0.148	0.079	2.24	106	-2.26	100	1.7	0	93	226	82	81
236	34.905	0.153	0.082	2.25	106	-0.2	101	1.7	0	93	226	83	81
237	35.052	0.147	0.082	2.23	106	-2.49	97	1.6	-0.1	93	225	84	81
238	35.206	0.154	0.081	2.24	106	-2.58	102	1.6	0	93	224	85	81
239	35.354	0.148	0.083	2.24	106	-2.17	97	1.5	-0.1	93	224	84	81
240	35.508	0.154	0.081	2.22	106	0	102	1.6	0.1	93	223	84	81
241	35.655	0.147	0.085	2.25	106	-2.16	95	1.6	0	93	222	83	81
242	35.807	0.152	0.083	2.25	106	-2.47	100	1.6	0	93	221	82	81
243	35.957	0.150	0.080	2.23	106	-2.22	100	1.5	-0.1	93	221	82	81
244	36.109	0.152	0.083	2.22	106	-1.03	100	1.5	0	93	220	83	81
245	36.261	0.152	0.079	2.24	106	0	102	1.5	0	93	219	84	81
246	36.410	0.149	0.082	2.24	106	-1.13	98	1.5	0	92	218	85	81
247	36.562	0.152	0.080	2.23	106	-0.62	102	1.5	0	93	218	84	81
248	36.710	0.148	0.085	2.21	106	0	96	1.4	-0.1	93	217	84	81
249	36.863	0.153	0.084	2.22	106	-2.06	100	1.4	0	93	216	83	81
250	37.011	0.148	0.079	2.24	106	-0.66	99	1.3	-0.1	92	216	83	81
251	37.165	0.154	0.081	2.25	106	-0.77	102	1.4	0.1	93	215	82	81
252	37.313	0.148	0.082	2.22	106	-0.99	98	1.3	-0.1	92	215	82	81
253	37.466	0.153	0.079	2.23	106	-0.55	103	1.2	-0.1	93	215	83	81
254	37.613	0.147	0.081	2.22	106	-2.56	98	1.5	0.3	93	213	84	81
255	37.765	0.152	0.083	2.24	106	0	100	1.4	-0.1	92	213	84	81
256	37.916	0.151	0.086	2.25	106	-1.74	97	1.3	-0.1	93	213	84	81
257	38.067	0.151	0.078	2.24	106	0	102	1.3	0	93	212	83	81
258	38.219	0.152	0.078	2.22	106	-1.31	103	1.3	0	93	212	83	81
259	38.368	0.149	0.085	2.25	106	-0.19	97	1.3	0	93	212	82	81
260	38.519	0.151	0.082	2.24	106	0	100	1.2	-0.1	93	213	82	81
261	38.667	0.148	0.083	2.24	106	0	97	1.2	0	93	212	84	81
262	38.821	0.154	0.087	2.22	106	0	99	1.2	0	93	211	85	81
263	38.970	0.149	0.085	2.23	106	-0.22	97	1.2	0	93	211	85	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	39.123	0.153	0.084	2.23	106	-1.08	100	1.2	0	92	211	84	81
265	39.271	0.148	0.083	2.23	106	-1.9	97	1.2	0	93	212	83	81
266	39.423	0.152	0.084	2.24	106	-1.9	99	1.2	0	93	212	83	81
267	39.572	0.149	0.081	2.24	106	-2.61	99	1.2	0	92	211	82	81
268	39.723	0.151	0.085	2.22	106	-2.42	98	1.1	-0.1	92	210	82	81
269	39.875	0.152	0.084	2.22	107	-0.25	99	1.1	0	92	210	83	82
270	40.024	0.149	0.082	2.22	107	-2.29	98	1.1	0	92	209	84	82
271	40.177	0.153	0.086	2.24	107	-0.94	98	1.1	0	92	210	85	81
272	40.324	0.147	0.084	2.25	106	-0.18	96	1.1	0	93	210	84	81
273	40.478	0.154	0.085	2.22	107	-2.14	100	1.0	-0.1	93	209	84	81
274	40.625	0.147	0.081	2.22	107	-0.88	97	1.0	0	93	210	83	81
275	40.779	0.154	0.080	2.23	107	0	103	1.0	0	92	209	82	81
276	40.928	0.149	0.083	2.22	107	-0.31	97	1.0	0	92	209	82	82
277	41.081	0.153	0.084	2.22	107	-0.91	100	0.9	-0.1	93	209	83	81
278	41.228	0.147	0.080	2.25	107	-2.64	98	0.9	0	92	208	84	81
279	41.380	0.152	0.082	2.24	107	-1.36	100	0.9	0	93	208	85	81
280	41.530	0.150	0.083	2.22	107	-2.02	98	0.9	0	93	208	85	82
281	41.682	0.152	0.085	2.22	107	-2.35	98	0.9	0	93	208	84	81
282	41.834	0.152	0.086	2.23	107	-0.28	98	0.9	0	93	208	83	81
283	41.983	0.149	0.082	2.24	107	-0.63	98	0.9	0	93	207	83	81
284	42.135	0.152	0.087	2.25	107	-2.47	97	0.9	0	92	207	82	81
285	42.283	0.148	0.084	2.24	107	-2.48	96	0.9	0	93	207	82	81
286	42.436	0.153	0.084	2.22	107	-2.48	100	0.8	-0.1	92	207	83	81
287	42.584	0.148	0.085	2.22	107	0	96	0.8	0	93	207	84	81
288	42.738	0.154	0.083	2.24	107	-0.5	101	0.8	0	93	207	85	81
289	42.887	0.149	0.081	2.26	107	0	99	0.8	0	92	207	84	81
290	43.038	0.151	0.081	2.24	107	-2.06	100	0.8	0	92	207	83	81
291	43.187	0.149	0.082	2.23	107	0	98	0.8	0	92	206	83	82
292	43.338	0.151	0.082	2.22	107	0	99	0.7	-0.1	92	206	82	82
293	43.490	0.152	0.085	2.22	107	0	98	0.7	0	92	207	82	82
294	43.640	0.150	0.081	2.24	107	-2.56	99	0.7	0	93	208	83	82
295	43.793	0.153	0.079	2.23	107	-0.98	103	0.7	0	93	208	84	81
296	43.940	0.147	0.086	2.24	107	-0.73	94	0.7	0	92	208	85	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	44.093	0.153	0.087	2.24	107	0	98	0.7	0	93	209	84	81
298	44.241	0.148	0.082	2.22	107	-2.62	97	0.6	-0.1	92	208	84	81
299	44.395	0.154	0.081	2.22	107	0	102	0.6	0	92	208	83	82
300	44.543	0.148	0.082	2.22	107	0	97	0.5	-0.1	92	209	82	82
301	44.697	0.154	0.081	2.22	107	0	102	0.6	0.1	93	208	82	82
302	44.844	0.147	0.083	2.23	107	-2.63	96	0.5	-0.1	93	208	82	82
303	44.996	0.152	0.083	2.23	107	0	99	0.6	0.1	92	209	84	82
304	45.146	0.150	0.084	2.24	107	-2.6	98	0.5	-0.1	93	209	84	82
305	45.298	0.152	0.085	2.22	107	-2.58	98	0.5	0	93	209	84	82
306	45.450	0.152	0.081	2.22	107	-1.79	101	0.5	0	93	209	84	82
307	45.599	0.149	0.085	2.22	107	0	96	0.5	0	93	209	83	82
308	45.751	0.152	0.089	2.22	107	-2.38	96	0.5	0	93	208	83	82
309	45.899	0.148	0.081	2.22	107	-2.32	98	0.5	0	92	209	82	81
310	46.052	0.153	0.086	2.23	107	0	98	0.4	-0.1	93	207	82	82
311	46.201	0.149	0.084	2.22	107	0	97	0.4	0	92	208	83	82
312	46.354	0.153	0.080	2.22	107	-0.93	102	0.4	0	93	208	85	81
313	46.503	0.149	0.084	2.22	107	-2.36	97	0.4	0	93	208	85	82
314	46.654	0.151	0.080	2.25	107	-2.44	101	0.4	0	93	208	84	82
315	46.803	0.149	0.079	2.22	107	-0.84	100	0.4	0	93	208	83	82
316	46.954	0.151	0.084	2.24	107	-1.52	98	0.3	-0.1	93	206	83	82
317	47.106	0.152	0.084	2.21	107	-2.52	99	0.4	0.1	93	208	82	82
318	47.256	0.150	0.077	2.24	107	-2.59	102	0.3	-0.1	93	207	82	82
319	47.409	0.153	0.082	2.23	107	-1.15	101	0.3	0	93	207	83	82
320	47.556	0.147	0.082	2.24	107	-2.34	97	0.3	0	93	207	85	82
321	47.709	0.153	0.080	2.24	107	-0.01	102	0.3	0	93	208	85	82
322	47.856	0.147	0.080	2.22	107	0	98	0.3	0	93	206	84	82
323	48.010	0.154	0.080	2.21	107	-2.61	103	0.2	-0.1	93	206	84	82
324	48.158	0.148	0.079	2.23	107	-0.06	99	0.2	0	94	207	83	82
325	48.312	0.154	0.083	2.23	107	-0.94	101	0.2	0	94	206	83	82
326	48.459	0.147	0.081	2.24	107	-0.45	98	0.2	0	94	205	82	82
327	48.611	0.152	0.084	2.23	107	-0.69	99	0.2	0	94	205	82	82
328	48.760	0.149	0.079	2.23	107	-0.06	100	0.2	0	94	205	84	82
329	48.912	0.152	0.084	2.22	107	-1.34	99	0.1	-0.1	94	204	85	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	49.063	0.151	0.079	2.22	108	-2.62	101	0.1	0	94	203	85	82
331	49.212	0.149	0.081	2.22	108	-0.79	99	0.1	0	94	203	84	82
332	49.365	0.153	0.080	2.24	108	0	102	0.1	0	94	203	84	82
333	49.512	0.147	0.081	2.20	108	-1	97	0.2	0.1	94	201	83	82
334	49.664	0.152	0.079	2.26	108	-1.02	102	0.1	-0.1	94	201	83	82
335	49.812	0.148	0.082	2.18	108	0	97	0.1	0	94	201	82	82
336	49.966	0.154	0.084	2.21	108	0	100	0.0	-0.1	94	200	82	82
Avg/Tot	49.966	0.149	0.082	2.20	100	-1.19	100			104	342	83	79.8

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	76	-1		81	0.000	6.31	0.79
1	0.111	0.111	2.23	76	-2.62	82	81	-0.070	3.69	0.39
2	0.255	0.144	2.20	76	-2.43	103	81	-0.070	4.32	1.09
3	0.398	0.143	2.15	76	-2.6	103	82	-0.060	6.83	1.69
4	0.540	0.142	2.03	76	-1.47	102	82	-0.090	7.92	1.80
5	0.681	0.141	2.10	76	-3.17	100	83	-0.090	12.33	1.12
6	0.821	0.140	2.26	77	-4.6	102	84	-0.100	15.62	0.69
7	0.964	0.143	2.47	77	-2.72	105	81	-0.110	17.14	0.83
8	1.119	0.155	2.47	77	-0.3	111	82	-0.100	17.11	2.06
9	1.264	0.145	2.23	77	-3.06	105	84	-0.090	16.53	1.94
10	1.411	0.147	2.22	77	-2.41	108	84	-0.070	16.70	1.79
11	1.553	0.142	2.22	78	-0.54	101	85	-0.080	16.63	1.77
12	1.698	0.145	2.20	78	-1.51	103	85	-0.110	16.35	1.42
13	1.841	0.143	2.20	78	-1.1	104	86	-0.080	16.53	1.41
14	1.988	0.147	2.20	79	-1.79	104	86	-0.080	16.71	1.36
15	2.130	0.142	2.20	79	-1.6	104	87	-0.070	16.75	1.56
16	2.276	0.146	2.20	79	-1.51	107	87	-0.070	16.83	1.73
17	2.419	0.143	2.17	80	-2.58	106	87	-0.090	16.85	1.91
18	2.563	0.144	2.19	80	-3.03	106	87	-0.080	16.50	1.63
19	2.707	0.144	2.18	80	-3.05	105	87	-0.090	15.78	1.46
20	2.850	0.143	2.18	81	-1.09	103	87	-0.090	15.91	1.33
21	2.994	0.144	2.18	81	-0.9	102	87	-0.080	15.94	1.25
22	3.137	0.143	2.16	81	-0.71	103	87	-0.080	15.69	1.40
23	3.282	0.145	2.15	82	-1.74	105	88	-0.090	15.76	1.42
24	3.424	0.142	2.17	82	-1.3	102	87	-0.090	15.71	1.42
25	3.571	0.147	2.18	83	-1.54	106	88	-0.080	15.63	1.44
26	3.711	0.140	2.17	83	-0.99	99	87	-0.080	15.85	1.52
27	3.857	0.146	2.17	83	-0.61	105	88	-0.070	15.68	1.57
28	3.998	0.141	2.17	84	-2.94	99	88	-0.080	15.79	1.63
29	4.143	0.145	2.15	84	-3	105	88	-0.080	15.96	1.62
30	4.285	0.142	2.15	84	-0.78	100	88	-0.080	15.77	1.57
31	4.431	0.146	2.13	85	-2.89	105	88	-0.100	15.80	1.52

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.573	0.142	2.16	85	-1.14	100	88	-0.080	15.88	1.49
33	4.719	0.146	2.16	85	-1.9	103	88	-0.080	16.04	1.60
34	4.861	0.142	2.15	86	-2.97	103	88	-0.080	16.38	1.75
35	5.005	0.144	2.14	86	-3.07	104	88	-0.090	16.15	1.75
36	5.148	0.143	2.23	86	-1.65	102	88	-0.080	16.30	1.83
37	5.293	0.145	2.20	87	-0.68	103	88	-0.090	16.30	1.90
38	5.440	0.147	2.20	87	-1.39	102	88	-0.080	16.29	1.93
39	5.584	0.144	2.21	87	-2.37	103	88	-0.090	16.34	1.89
40	5.731	0.147	2.20	88	-1.95	102	88	-0.070	16.38	1.91
41	5.875	0.144	2.20	88	-2.65	100	88	-0.080	16.58	1.87
42	6.023	0.148	2.18	88	-2.4	105	88	-0.090	16.45	1.87
43	6.167	0.144	2.20	89	-1.42	102	88	-0.100	16.43	1.74
44	6.314	0.147	2.18	89	-0.68	104	88	-0.090	16.36	1.77
45	6.456	0.142	2.17	89	-3.03	103	88	-0.080	16.44	1.78
46	6.604	0.148	2.17	89	-3.15	106	88	-0.090	16.61	1.82
47	6.747	0.143	2.16	90	-0.74	98	88	-0.070	16.49	1.85
48	6.894	0.147	2.16	90	-0.78	101	88	-0.080	16.33	1.75
49	7.036	0.142	2.15	90	-0.7	99	88	-0.080	16.40	1.82
50	7.182	0.146	2.14	91	-2.23	104	88	-0.080	16.33	1.77
51	7.324	0.142	2.13	91	-2.89	101	88	-0.090	16.32	1.87
52	7.469	0.145	2.11	91	-1.55	105	88	-0.080	16.38	1.77
53	7.610	0.141	2.10	91	-1.04	100	88	-0.090	16.25	1.82
54	7.756	0.146	2.09	92	-1.12	101	88	-0.090	16.03	1.84
55	7.897	0.141	2.09	92	-1.02	98	88	-0.090	16.00	1.88
56	8.041	0.144	2.05	92	-3.29	102	88	-0.090	15.92	1.79
57	8.185	0.144	2.19	92	-1.11	100	88	-0.070	15.88	1.80
58	8.332	0.147	2.16	93	-3.33	102	88	-0.080	16.00	1.75
59	8.476	0.144	2.14	93	-3.07	101	89	-0.090	16.01	1.75
60	8.620	0.144	2.09	93	-1.59	101	89	-0.080	16.06	1.79
61	8.762	0.142	2.02	93	-2.28	101	88	-0.090	16.01	1.86
62	8.905	0.143	2.09	93	-3.72	99	88	-0.080	15.78	1.83
63	9.049	0.144	2.02	94	-2.25	101	88	-0.080	15.86	1.82

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.187	0.138	1.94	94	-1.77	98	88	-0.080	15.63	1.85
65	9.326	0.139	1.86	94	-4.27	98	88	-0.080	15.82	1.86
66	9.484	0.158	2.31	94	-2.39	111	87	-0.100	15.62	1.87
67	9.634	0.150	2.25	95	-1.35	103	88	-0.080	15.92	1.76
68	9.781	0.147	2.23	95	-0.66	104	89	-0.090	15.82	1.85
69	9.931	0.150	2.24	95	-1.59	104	89	-0.090	16.21	1.85
70	10.077	0.146	2.25	95	-0.78	101	89	-0.080	16.82	1.88
71	10.227	0.150	2.24	95	-0.61	105	89	-0.080	16.50	1.66
72	10.374	0.147	2.24	95	-2.16	101	89	-0.080	16.33	1.72
73	10.524	0.150	2.25	95	-2.93	105	89	-0.080	15.93	1.61
74	10.671	0.147	2.24	96	-0.48	101	89	-0.090	15.82	1.49
75	10.821	0.150	2.24	96	-2.89	104	89	-0.080	16.14	1.55
76	10.969	0.148	2.24	96	-0.57	103	89	-0.080	16.09	1.54
77	11.116	0.147	2.22	96	-2.65	102	89	-0.080	15.84	1.54
78	11.265	0.149	2.23	96	-2.15	103	89	-0.080	16.01	1.41
79	11.413	0.148	2.24	96	-1.02	102	90	-0.080	15.43	1.41
80	11.562	0.149	2.23	96	-1.64	104	89	-0.080	15.01	1.23
81	11.709	0.147	2.22	97	-1.14	103	89	-0.080	15.21	1.00
82	11.858	0.149	2.23	97	-2.87	103	89	-0.070	14.56	0.94
83	12.004	0.146	2.22	97	-0.67	102	89	-0.080	13.92	0.84
84	12.155	0.151	2.23	97	-0.71	102	89	-0.080	13.80	0.71
85	12.301	0.146	2.23	97	-2.98	102	89	-0.080	13.52	0.64
86	12.451	0.150	2.22	97	-0.76	104	89	-0.080	13.29	0.48
87	12.597	0.146	2.22	97	-2.72	103	89	-0.090	12.91	0.52
88	12.748	0.151	2.21	98	-0.6	105	89	-0.080	13.07	0.47
89	12.894	0.146	2.23	98	-0.57	103	89	-0.070	13.28	0.44
90	13.045	0.151	2.22	98	-2.99	105	89	-0.080	13.33	0.50
91	13.191	0.146	2.23	98	-2.29	103	89	-0.070	13.34	0.60
92	13.342	0.151	2.21	98	-3.09	105	89	-0.070	13.37	0.62
93	13.487	0.145	2.22	98	-1.04	100	89	-0.060	13.13	0.88
94	13.639	0.152	2.23	98	-0.88	105	89	-0.080	13.54	0.75
95	13.784	0.145	2.22	98	-0.82	101	89	-0.090	13.73	0.71

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	13.934	0.150	2.22	99	-0.76	105	89	-0.070	13.96	0.91
97	14.080	0.146	2.22	99	-1.13	99	89	-0.080	14.18	1.06
98	14.229	0.149	2.20	99	-3.07	104	89	-0.080	14.08	1.17
99	14.375	0.146	2.18	99	-2.44	100	89	-0.070	14.42	1.21
100	14.524	0.149	2.17	99	-2.17	102	89	-0.080	14.43	1.24
101	14.669	0.145	2.15	99	-1.28	100	89	-0.080	14.86	1.26
102	14.817	0.148	2.13	99	-3.1	101	89	-0.100	14.59	1.19
103	14.960	0.143	2.12	99	-2.06	99	89	-0.070	14.28	1.10
104	15.108	0.148	2.11	99	-0.77	101	89	-0.080	14.35	1.17
105	15.251	0.143	2.10	99	-1.42	99	89	-0.100	14.34	1.19
106	15.398	0.147	2.06	100	-0.79	101	89	-0.070	13.58	1.08
107	15.538	0.140	2.07	100	-2.24	97	88	-0.070	13.29	0.96
108	15.685	0.147	2.36	100	-2.08	101	88	-0.070	12.96	0.98
109	15.834	0.149	2.30	100	-1.03	102	88	-0.070	12.37	0.98
110	15.986	0.152	2.28	100	-1.08	108	89	-0.070	12.44	0.99
111	16.134	0.148	2.23	100	-1.15	103	89	-0.070	12.35	0.93
112	16.285	0.151	2.23	100	-1.18	106	88	-0.070	12.60	0.86
113	16.431	0.146	2.19	100	-3.28	101	88	-0.060	12.53	0.92
114	16.580	0.149	2.16	100	-1.63	104	88	-0.080	12.42	0.98
115	16.725	0.145	2.10	100	-1.48	99	88	-0.060	12.92	1.07
116	16.870	0.145	2.05	100	-3.12	102	88	-0.080	12.35	1.04
117	17.011	0.141	1.98	100	-2.54	95	88	-0.070	12.29	0.94
118	17.153	0.142	1.94	101	-1.75	99	88	-0.070	12.22	0.92
119	17.288	0.135	1.88	101	-2.44	92	88	-0.070	11.70	0.97
120	17.426	0.138	1.84	101	-2.19	95	87	-0.070	11.41	0.89
121	17.559	0.133	1.78	101	-2.19	91	87	-0.070	11.10	0.93
122	17.691	0.132	1.73	101	-3.23	89	87	-0.060	10.75	0.96
123	17.823	0.132	1.69	101	-3.2	89	87	-0.060	10.32	0.88
124	17.951	0.128	1.66	101	-4.58	87	87	-0.060	9.92	1.00
125	18.078	0.127	1.79	101	-4.92	86	87	-0.060	9.67	1.10
126	18.224	0.146	2.08	101	-5.38	101	87	-0.050	9.62	1.12
127	18.365	0.141	2.03	101	-3.58	95	87	-0.060	9.57	1.17

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.508	0.143	1.96	101	-4.44	99	87	-0.060	9.39	1.16
129	18.678	0.170	1.90	101	-1.47	115	86	-0.060	9.50	1.16
130	18.824	0.146	2.07	101	-1.16	100	87	-0.050	9.37	1.23
131	18.966	0.142	2.08	101	-1.2	98	87	-0.060	9.25	1.28
132	19.115	0.149	2.20	102	-1.94	100	87	-0.050	9.14	1.33
133	19.261	0.146	2.19	102	-0.95	97	88	-0.050	9.29	1.32
134	19.412	0.151	2.22	102	-0.77	101	87	-0.050	9.45	1.25
135	19.558	0.146	2.20	102	-2.66	98	87	-0.050	9.38	1.24
136	19.707	0.149	2.21	102	-1.15	101	87	-0.050	9.31	1.22
137	19.854	0.147	2.20	102	-2.98	101	87	-0.030	9.50	1.22
138	20.004	0.150	2.17	102	-0.92	100	87	-0.050	9.39	1.19
139	20.152	0.148	2.21	102	-0.54	97	87	-0.040	9.09	1.09
140	20.300	0.148	2.19	102	-2.71	99	87	-0.050	8.60	1.09
141	20.448	0.148	2.20	102	-1.12	102	87	-0.060	8.57	1.07
142	20.597	0.149	2.19	102	-1.59	101	87	-0.050	8.75	1.08
143	20.745	0.148	2.20	102	-0.53	102	87	-0.030	8.70	1.08
144	20.893	0.148	2.20	102	-2.98	100	86	-0.050	8.61	1.03
145	21.042	0.149	2.22	102	-2.49	102	86	-0.060	8.62	1.04
146	21.189	0.147	2.19	102	-0.47	99	86	-0.050	8.68	1.05
147	21.338	0.149	2.19	102	-3.1	100	86	-0.030	8.58	1.04
148	21.485	0.147	2.20	102	-2.89	99	86	-0.050	8.54	1.03
149	21.634	0.149	2.19	102	-2.37	99	86	-0.050	8.65	1.06
150	21.781	0.147	2.20	102	-0.72	102	86	-0.050	8.48	1.21
151	21.931	0.150	2.19	102	-0.7	102	86	-0.050	8.42	1.19
152	22.077	0.146	2.20	102	-1.13	97	86	-0.060	8.43	1.23
153	22.228	0.151	2.20	102	-2	104	86	-0.040	8.55	1.22
154	22.374	0.146	2.20	103	-1.13	94	86	-0.050	8.58	1.25
155	22.525	0.151	2.19	103	-3.01	103	86	-0.040	8.66	1.24
156	22.671	0.146	2.20	103	-2.32	99	86	-0.040	8.63	1.23
157	22.822	0.151	2.20	103	-0.5	101	86	-0.050	8.54	1.22
158	22.968	0.146	2.19	103	-0.56	96	86	-0.030	8.72	1.23
159	23.119	0.151	2.19	103	-2.6	101	86	-0.040	8.72	1.23

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.265	0.146	2.20	103	-3.1	96	85	-0.050	8.58	1.20
161	23.415	0.150	2.20	103	-1.38	103	85	-0.050	8.60	1.17
162	23.561	0.146	2.22	103	-1.51	97	85	-0.040	8.47	1.22
163	23.711	0.150	2.19	103	-3.02	99	85	-0.040	8.50	1.26
164	23.858	0.147	2.21	103	-1.67	100	85	-0.040	8.51	1.25
165	24.008	0.150	2.20	103	-0.72	101	85	-0.040	8.46	1.29
166	24.154	0.146	2.20	103	-0.48	97	85	-0.050	8.61	1.26
167	24.304	0.150	2.19	103	-2.67	99	85	-0.030	8.54	1.23
168	24.452	0.148	2.21	103	-2.84	99	85	-0.030	8.47	1.21
169	24.601	0.149	2.18	103	-2.97	99	85	-0.030	8.62	1.21
170	24.750	0.149	2.20	103	-2.74	100	85	-0.040	8.70	1.22
171	24.898	0.148	2.20	103	-0.52	101	85	-0.050	8.62	1.25
172	25.047	0.149	2.20	103	-2.94	101	85	-0.040	8.81	1.26
173	25.195	0.148	2.19	103	-2.91	97	85	-0.040	8.59	1.30
174	25.344	0.149	2.18	103	-2.09	102	85	-0.050	8.50	1.31
175	25.491	0.147	2.18	103	-1.33	100	85	-0.050	8.49	1.32
176	25.640	0.149	2.21	103	-0.51	100	85	-0.040	8.70	1.25
177	25.787	0.147	2.20	103	-1.86	97	85	-0.040	8.36	1.29
178	25.937	0.150	2.20	103	-0.53	101	85	-0.050	8.42	1.28
179	26.083	0.146	2.20	103	-1	95	85	-0.050	8.45	1.30
180	26.234	0.151	2.20	103	-0.94	101	85	-0.050	8.79	1.28
181	26.380	0.146	2.19	103	-2.35	97	85	-0.040	8.59	1.30
182	26.531	0.151	2.18	103	-0.85	102	85	-0.050	8.68	1.27
183	26.677	0.146	2.19	103	-0.5	98	85	-0.040	8.61	1.29
184	26.828	0.151	2.21	103	-1.31	101	85	-0.040	8.58	1.31
185	26.974	0.146	2.20	104	-1.2	99	85	-0.040	8.54	1.32
186	27.125	0.151	2.19	104	-0.58	101	85	-0.040	8.56	1.30
187	27.272	0.147	2.21	104	-2.15	96	85	-0.040	8.57	1.26
188	27.422	0.150	2.20	104	-0.55	98	85	-0.040	8.57	1.22
189	27.568	0.146	2.20	104	-0.58	100	85	-0.030	8.49	1.25
190	27.718	0.150	2.20	104	-0.72	100	85	-0.060	8.54	1.25
191	27.865	0.147	2.21	104	-2.88	98	85	-0.050	8.35	1.24

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	28.015	0.150	2.19	104	-0.9	98	85	-0.030	8.45	1.25
193	28.162	0.147	2.19	104	-1.74	99	85	-0.030	8.56	1.24
194	28.311	0.149	2.19	104	-0.82	99	85	-0.030	8.41	1.27
195	28.460	0.149	2.20	104	-2.9	101	85	-0.040	8.65	1.25
196	28.609	0.149	2.19	104	-0.48	101	85	-0.050	8.73	1.21
197	28.757	0.148	2.19	104	-0.75	97	85	-0.040	8.68	1.19
198	28.906	0.149	2.19	104	-0.58	100	85	-0.050	8.62	1.21
199	29.055	0.149	2.21	104	-1.26	98	85	-0.030	8.77	1.28
200	29.203	0.148	2.20	104	-1.7	97	85	-0.030	8.62	1.32
201	29.352	0.149	2.20	104	-0.52	103	85	-0.050	8.53	1.28
202	29.499	0.147	2.20	104	-1.47	97	85	-0.050	8.49	1.28
203	29.648	0.149	2.21	104	-1.19	97	85	-0.040	8.54	1.21
204	29.795	0.147	2.20	104	-2.02	98	85	-0.040	8.41	1.29
205	29.945	0.150	2.19	104	-2.7	98	85	-0.060	7.95	1.17
206	30.092	0.147	2.18	104	-1.16	98	85	-0.040	8.06	1.01
207	30.242	0.150	2.19	104	-0.48	98	85	-0.040	7.98	1.06
208	30.389	0.147	2.20	104	-0.53	97	85	-0.040	7.91	1.03
209	30.540	0.151	2.19	104	-3.04	100	85	-0.030	8.15	0.99
210	30.686	0.146	2.19	104	-0.88	95	85	-0.040	7.91	1.03
211	30.837	0.151	2.19	104	-0.5	98	85	-0.050	7.91	1.09
212	30.983	0.146	2.19	104	-1.09	96	85	-0.030	8.13	1.07
213	31.134	0.151	2.16	104	-0.41	102	85	-0.040	7.99	1.14
214	31.280	0.146	2.20	104	-0.66	96	85	-0.060	8.11	1.18
215	31.430	0.150	2.20	104	-2.48	101	85	-0.040	8.04	1.22
216	31.576	0.146	2.19	104	-0.73	96	85	-0.040	8.16	1.19
217	31.726	0.150	2.17	104	-2.98	98	85	-0.030	8.27	1.21
218	31.873	0.147	2.19	104	-0.49	98	85	-0.020	8.10	1.21
219	32.023	0.150	2.19	104	-0.63	102	85	-0.030	8.27	1.21
220	32.169	0.146	2.18	104	-2.89	100	85	-0.040	8.17	1.19
221	32.319	0.150	2.19	104	-2.88	99	85	-0.030	8.07	1.22
222	32.468	0.149	2.19	104	-2.97	99	85	-0.040	8.42	1.21
223	32.617	0.149	2.19	104	-2.4	98	85	-0.030	8.35	1.19

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	32.765	0.148	2.19	104	-0.89	98	85	-0.040	8.49	1.17
225	32.913	0.148	2.19	105	-2.36	98	85	-0.040	8.25	1.20
226	33.062	0.149	2.20	105	-0.48	100	85	-0.030	8.43	1.20
227	33.211	0.149	2.19	105	-0.92	97	85	-0.040	8.33	1.19
228	33.360	0.149	2.19	105	-2.95	99	85	-0.040	8.40	1.19
229	33.506	0.146	2.20	105	-1.11	98	85	-0.050	8.24	1.18
230	33.656	0.150	2.21	105	-1.28	101	85	-0.040	8.39	1.32
231	33.803	0.147	2.20	105	-2.73	99	85	-0.020	8.44	1.27
232	33.953	0.150	2.19	105	-0.83	97	85	-0.040	8.41	1.11
233	34.099	0.146	2.19	105	-2.55	95	85	-0.050	8.34	1.12
234	34.250	0.151	2.19	105	-0.58	100	85	-0.040	8.19	1.14
235	34.396	0.146	2.19	105	-0.65	99	85	-0.030	8.24	1.17
236	34.547	0.151	2.19	105	-2.96	101	85	-0.030	8.26	1.23
237	34.693	0.146	2.18	105	-1.69	97	85	-0.030	8.17	1.21
238	34.844	0.151	2.17	105	-2.89	101	85	-0.040	7.90	1.24
239	34.990	0.146	2.20	105	-1.57	97	85	-0.030	7.78	1.29
240	35.141	0.151	2.17	105	-2.86	101	85	-0.020	7.76	1.26
241	35.288	0.147	2.20	105	-0.78	96	85	-0.030	7.53	1.29
242	35.438	0.150	2.20	105	-1.44	100	85	-0.030	7.76	1.24
243	35.583	0.145	2.18	105	-0.57	98	85	-0.020	7.63	1.26
244	35.734	0.151	2.17	105	-0.6	100	85	-0.030	7.72	1.28
245	35.881	0.147	2.19	105	-0.59	100	85	-0.030	7.60	1.23
246	36.030	0.149	2.18	105	-2.9	99	85	-0.040	7.68	1.24
247	36.177	0.147	2.19	105	-2.07	99	85	-0.040	7.64	1.25
248	36.327	0.150	2.19	105	-2.72	98	85	-0.030	7.59	1.21
249	36.475	0.148	2.19	105	-2.8	98	85	-0.030	7.71	1.20
250	36.624	0.149	2.18	105	-0.59	101	85	-0.020	7.69	1.20
251	36.773	0.149	2.19	105	-1.32	100	85	-0.030	7.59	1.22
252	36.921	0.148	2.19	105	-0.49	99	85	-0.040	7.48	1.17
253	37.070	0.149	2.18	105	-1.95	101	85	-0.040	7.59	1.17
254	37.218	0.148	2.20	105	-2.18	99	85	-0.040	7.45	1.15
255	37.367	0.149	2.19	105	-0.61	99	85	-0.020	7.56	1.14

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	37.514	0.147	2.19	105	-3.05	96	85	-0.040	7.67	1.10
257	37.664	0.150	2.19	105	-2.07	103	85	-0.040	7.71	1.08
258	37.811	0.147	2.19	105	-1.41	101	85	-0.020	7.60	1.09
259	37.961	0.150	2.19	105	-2.92	98	85	-0.030	7.67	1.13
260	38.107	0.146	2.20	105	-1.93	97	85	-0.040	7.58	1.11
261	38.258	0.151	2.18	105	-0.76	100	85	-0.040	7.68	1.11
262	38.405	0.147	2.19	105	-1.69	95	85	-0.030	7.75	1.06
263	38.556	0.151	2.18	105	-2.77	99	85	-0.030	7.72	1.13
264	38.702	0.146	2.19	105	-1.69	96	85	-0.020	7.68	1.12
265	38.853	0.151	2.18	105	-2.87	100	85	-0.030	7.57	1.17
266	38.999	0.146	2.19	105	-2.32	96	85	-0.040	7.82	1.16
267	39.150	0.151	2.19	106	-0.7	101	85	-0.030	7.59	1.18
268	39.296	0.146	2.19	106	-2.21	96	85	-0.040	7.67	1.20
269	39.446	0.150	2.20	106	-0.9	99	85	-0.040	7.71	1.21
270	39.592	0.146	2.20	106	-0.44	97	85	-0.030	7.60	1.20
271	39.743	0.151	2.21	106	-2.92	98	85	-0.040	7.56	1.23
272	39.889	0.146	2.19	106	-0.63	96	85	-0.030	7.68	1.17
273	40.039	0.150	2.19	106	-0.52	98	85	-0.030	7.64	1.18
274	40.186	0.147	2.19	106	-0.54	99	85	-0.030	7.69	1.19
275	40.336	0.150	2.18	106	-2.3	101	85	-0.040	7.53	1.23
276	40.484	0.148	2.18	106	-3.01	98	85	-0.030	7.66	1.22
277	40.633	0.149	2.19	106	-1.23	98	85	-0.020	7.57	1.21
278	40.782	0.149	2.18	106	-0.52	100	85	-0.060	7.55	1.22
279	40.930	0.148	2.17	106	-2.92	99	85	-0.030	7.64	1.18
280	41.080	0.150	2.17	106	-2.86	99	85	-0.040	7.57	1.20
281	41.227	0.147	2.20	106	-0.53	96	85	-0.040	7.58	1.24
282	41.376	0.149	2.18	106	-0.53	97	85	-0.040	7.71	1.25
283	41.523	0.147	2.20	106	-2.94	98	85	-0.030	7.61	1.28
284	41.673	0.150	2.19	106	-0.6	97	85	-0.030	7.64	1.24
285	41.820	0.147	2.19	106	-2.76	97	85	-0.050	7.64	1.29
286	41.970	0.150	2.19	106	-1.06	99	85	-0.020	7.80	1.25
287	42.116	0.146	2.17	106	-1.11	96	85	-0.040	7.47	1.33

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	42.268	0.152	2.19	106	-2.25	101	85	-0.030	7.74	1.30
289	42.414	0.146	2.18	106	-0.94	98	85	-0.040	7.76	1.30
290	42.565	0.151	2.19	106	-0.61	101	85	-0.030	7.62	1.29
291	42.711	0.146	2.18	106	-0.76	97	85	-0.040	7.77	1.28
292	42.862	0.151	2.19	106	-1.93	101	85	-0.040	7.76	1.26
293	43.009	0.147	2.18	106	-0.99	96	85	-0.040	7.80	1.25
294	43.159	0.150	2.20	106	-1.72	101	85	-0.040	7.70	1.29
295	43.305	0.146	2.20	106	-2.78	99	85	-0.040	7.78	1.31
296	43.455	0.150	2.20	106	-0.84	98	85	-0.050	7.77	1.31
297	43.602	0.147	2.20	106	-1.33	95	85	-0.030	7.65	1.28
298	43.752	0.150	2.18	106	-1.55	100	85	-0.020	7.79	1.26
299	43.899	0.147	2.18	106	-0.86	99	85	-0.030	7.87	1.26
300	44.049	0.150	2.18	106	-2.76	100	85	-0.040	7.87	1.28
301	44.197	0.148	2.20	106	-0.45	99	85	-0.030	7.71	1.29
302	44.346	0.149	2.19	106	-0.52	99	85	-0.030	7.89	1.27
303	44.495	0.149	2.17	106	-0.45	99	85	-0.040	7.73	1.26
304	44.643	0.148	2.19	106	-1.9	97	85	-0.030	7.75	1.27
305	44.792	0.149	2.18	106	-0.7	98	85	-0.040	7.57	1.26
306	44.941	0.149	2.19	106	-2.49	100	85	-0.050	7.37	1.22
307	45.090	0.149	2.18	106	-2.63	98	85	-0.030	7.36	1.24
308	45.236	0.146	2.19	106	-1.98	93	85	-0.030	7.40	1.27
309	45.386	0.150	2.18	106	-0.54	101	85	-0.040	7.36	1.30
310	45.533	0.147	2.19	106	-1.76	96	85	-0.040	7.21	1.29
311	45.683	0.150	2.18	106	-1.31	99	85	-0.020	7.47	1.28
312	45.829	0.146	2.19	106	-0.71	99	85	-0.030	7.27	1.31
313	45.980	0.151	2.18	106	-2.85	99	85	-0.050	7.34	1.33
314	46.127	0.147	2.20	106	-0.63	99	85	-0.040	7.46	1.31
315	46.277	0.150	2.17	106	-2.22	102	85	-0.030	7.50	1.30
316	46.424	0.147	2.19	106	-0.5	97	85	-0.040	7.56	1.30
317	46.575	0.151	2.18	106	-1.2	99	85	-0.040	7.61	1.31
318	46.721	0.146	2.19	106	-2.48	100	85	-0.030	7.58	1.27
319	46.872	0.151	2.18	106	-1.76	101	86	-0.030	7.51	1.30

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	47.018	0.146	2.18	106	-2.7	97	86	-0.020	7.59	1.29
321	47.168	0.150	2.19	106	-2.26	101	86	-0.030	7.40	1.26
322	47.314	0.146	2.19	106	-0.48	99	86	-0.030	7.55	1.23
323	47.465	0.151	2.18	106	-0.71	102	86	-0.040	7.43	1.18
324	47.611	0.146	2.18	106	-2.93	99	86	-0.030	7.44	1.21
325	47.761	0.150	2.18	107	-2.97	99	86	-0.030	7.15	1.23
326	47.908	0.147	2.17	107	-0.69	99	86	-0.020	7.18	1.21
327	48.058	0.150	2.17	107	-1.54	99	86	-0.050	6.97	1.18
328	48.206	0.148	2.19	107	-0.59	100	86	-0.030	6.99	1.12
329	48.355	0.149	2.18	107	-0.99	98	86	-0.020	6.87	1.12
330	48.503	0.148	2.19	107	-0.94	100	86	-0.050	6.85	1.10
331	48.651	0.148	2.18	107	-2.96	99	86	-0.040	7.02	1.05
332	48.800	0.149	2.17	107	-1.34	100	86	-0.030	6.88	1.03
333	48.948	0.148	2.19	107	-0.56	99	86	-0.040	6.79	1.02
334	49.097	0.149	2.19	107	-2.96	101	86	-0.030	6.86	1.03
335	49.244	0.147	2.17	107	-2.16	98	86	-0.040	6.89	1.01
336	49.393	0.149	2.16	107	-2.75	98	86	-0.030	6.78	1.04
Avg/Tot	49.393	0.147	2.17	100	-1.74	100	86	-0.054	10.52	1.27

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	475	476	285	415	498	429.8	N/A
1	472	472	303	419	499	433.0	N/A
2	470	468	317	420	498	434.6	N/A
3	467	465	328	421	499	436.0	N/A
4	464	462	337	421	498	436.4	N/A
5	461	459	343	428	496	437.4	N/A
6	457	457	348	446	496	440.8	N/A
7	453	455	352	476	494	446.0	N/A
8	449	454	356	512	493	452.8	N/A
9	446	454	318	532	492	448.4	N/A
10	443	454	296	548	490	446.2	N/A
11	439	454	278	562	488	444.2	N/A
12	436	454	265	573	486	442.8	N/A
13	433	454	254	583	485	441.8	N/A
14	429	454	244	591	484	440.4	N/A
15	425	454	237	599	482	439.4	N/A
16	422	454	231	604	481	438.4	N/A
17	419	453	226	610	479	437.4	N/A
18	415	453	221	614	478	436.2	N/A
19	412	452	217	617	476	434.8	N/A
20	409	452	214	618	475	433.6	N/A
21	406	451	211	618	473	431.8	N/A
22	403	450	208	618	472	430.2	N/A
23	400	449	206	619	470	428.8	N/A
24	398	448	204	619	469	427.6	N/A
25	395	447	201	620	467	426.0	N/A
26	393	446	200	620	466	425.0	N/A
27	391	445	199	621	464	424.0	N/A
28	389	444	197	621	463	422.8	N/A
29	387	442	196	621	462	421.6	N/A
30	385	441	195	621	460	420.4	N/A
31	383	440	194	621	459	419.4	N/A
32	382	438	193	622	458	418.6	N/A
33	380	437	193	623	457	418.0	N/A
34	379	436	192	625	457	417.8	N/A
35	378	435	191	627	456	417.4	N/A
36	377	433	191	628	454	416.6	N/A
37	376	432	191	630	453	416.4	N/A
38	375	431	191	632	452	416.2	N/A
39	375	430	190	633	452	416.0	N/A
40	374	428	190	633	450	415.0	N/A
41	374	427	190	634	449	414.8	N/A
42	374	426	190	634	448	414.4	N/A
43	374	425	190	634	447	414.0	N/A
44	374	424	190	635	446	413.8	N/A
45	374	424	190	636	446	414.0	N/A
46	374	423	190	637	444	413.6	N/A
47	374	422	191	638	444	413.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	374	422	191	639	443	413.8	N/A
49	375	421	191	639	442	413.6	N/A
50	375	420	191	640	442	413.6	N/A
51	375	420	192	641	441	413.8	N/A
52	376	420	192	640	440	413.6	N/A
53	376	420	193	640	439	413.6	N/A
54	377	420	193	639	438	413.4	N/A
55	377	419	193	637	438	412.8	N/A
56	378	419	193	636	437	412.6	N/A
57	378	420	194	634	437	412.6	N/A
58	379	420	194	633	437	412.6	N/A
59	380	420	194	632	436	412.4	N/A
60	380	420	195	631	435	412.2	N/A
61	381	420	195	631	435	412.4	N/A
62	381	420	195	631	434	412.2	N/A
63	382	420	195	631	435	412.6	N/A
64	383	421	196	631	434	413.0	N/A
65	383	421	196	631	433	412.8	N/A
66	384	421	197	631	434	413.4	N/A
67	385	422	197	633	433	414.0	N/A
68	385	422	198	634	432	414.2	N/A
69	386	423	199	637	432	415.4	N/A
70	387	423	199	640	432	416.2	N/A
71	387	424	200	645	432	417.6	N/A
72	388	424	201	648	430	418.2	N/A
73	389	424	202	652	431	419.6	N/A
74	390	425	203	655	431	420.8	N/A
75	391	425	204	656	431	421.4	N/A
76	392	426	205	657	432	422.4	N/A
77	393	427	206	657	432	423.0	N/A
78	394	427	207	657	433	423.6	N/A
79	395	428	209	656	433	424.2	N/A
80	396	429	210	656	433	424.8	N/A
81	397	430	211	654	434	425.2	N/A
82	398	431	212	651	434	425.2	N/A
83	399	431	213	648	433	424.8	N/A
84	400	432	214	643	434	424.6	N/A
85	400	433	215	637	434	423.8	N/A
86	401	434	216	630	434	423.0	N/A
87	402	435	216	623	435	422.2	N/A
88	403	436	216	616	435	421.2	N/A
89	404	436	217	610	435	420.4	N/A
90	405	436	217	606	435	419.8	N/A
91	405	437	217	602	435	419.2	N/A
92	406	437	217	598	434	418.4	N/A
93	406	437	217	594	435	417.8	N/A
94	406	437	217	591	435	417.2	N/A
95	407	437	218	589	436	417.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	407	437	220	589	436	417.8	N/A
97	408	437	222	589	436	418.4	N/A
98	408	437	224	590	436	419.0	N/A
99	408	437	224	591	437	419.4	N/A
100	409	437	225	594	437	420.4	N/A
101	409	436	227	597	438	421.4	N/A
102	410	436	228	600	438	422.4	N/A
103	410	436	228	602	438	422.8	N/A
104	411	436	230	602	438	423.4	N/A
105	411	436	231	603	438	423.8	N/A
106	412	436	235	603	438	424.8	N/A
107	413	436	240	601	438	425.6	N/A
108	413	437	243	598	438	425.8	N/A
109	414	437	245	595	438	425.8	N/A
110	415	437	247	594	438	426.2	N/A
111	415	437	249	592	438	426.2	N/A
112	416	437	251	590	438	426.4	N/A
113	416	437	252	587	439	426.2	N/A
114	417	437	253	585	440	426.4	N/A
115	418	437	250	582	440	425.4	N/A
116	418	437	249	580	440	424.8	N/A
117	419	437	249	578	441	424.8	N/A
118	419	437	249	576	442	424.6	N/A
119	420	436	249	572	443	424.0	N/A
120	420	436	250	568	443	423.4	N/A
121	421	436	250	561	443	422.2	N/A
122	421	436	251	554	445	421.4	N/A
123	422	436	251	546	446	420.2	N/A
124	422	435	251	537	446	418.2	N/A
125	423	435	252	528	447	417.0	N/A
126	423	434	253	519	448	415.4	N/A
127	423	434	254	509	448	413.6	N/A
128	424	433	254	499	449	411.8	N/A
129	424	433	255	490	450	410.4	N/A
130	425	433	255	481	451	409.0	N/A
131	425	432	255	473	451	407.2	N/A
132	426	432	255	466	452	406.2	N/A
133	426	431	255	459	453	404.8	N/A
134	427	431	255	452	454	403.8	N/A
135	427	430	255	446	455	402.6	N/A
136	427	430	255	440	453	401.0	N/A
137	427	429	255	435	455	400.2	N/A
138	427	429	254	430	456	399.2	N/A
139	427	428	254	425	457	398.2	N/A
140	427	427	254	420	457	397.0	N/A
141	426	426	253	415	457	395.4	N/A
142	426	426	252	410	458	394.4	N/A
143	425	425	251	405	457	392.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	424	424	251	401	458	391.6	N/A
145	423	423	250	396	459	390.2	N/A
146	423	422	250	392	459	389.2	N/A
147	422	420	249	388	458	387.4	N/A
148	421	419	248	384	459	386.2	N/A
149	420	418	248	380	459	385.0	N/A
150	419	416	248	377	458	383.6	N/A
151	418	415	249	373	455	382.0	N/A
152	417	413	249	369	457	381.0	N/A
153	416	412	249	366	458	380.2	N/A
154	415	411	249	363	457	379.0	N/A
155	414	409	249	360	458	378.0	N/A
156	413	407	249	357	457	376.6	N/A
157	412	406	249	354	456	375.4	N/A
158	411	404	249	351	457	374.4	N/A
159	410	403	249	349	457	373.6	N/A
160	409	401	249	346	457	372.4	N/A
161	408	400	248	344	457	371.4	N/A
162	407	398	248	342	457	370.4	N/A
163	406	397	248	339	457	369.4	N/A
164	405	395	248	337	457	368.4	N/A
165	405	394	248	336	456	367.8	N/A
166	404	393	247	334	456	366.8	N/A
167	403	392	247	333	455	366.0	N/A
168	402	390	247	331	455	365.0	N/A
169	401	389	247	330	455	364.4	N/A
170	401	388	247	328	453	363.4	N/A
171	400	387	246	327	454	362.8	N/A
172	399	386	246	325	453	361.8	N/A
173	398	385	246	325	453	361.4	N/A
174	398	384	246	323	453	360.8	N/A
175	397	383	245	322	453	360.0	N/A
176	396	382	245	321	452	359.2	N/A
177	395	381	245	320	453	358.8	N/A
178	395	380	245	319	453	358.4	N/A
179	394	379	245	318	453	357.8	N/A
180	393	378	245	317	452	357.0	N/A
181	393	377	245	316	451	356.4	N/A
182	392	376	245	315	452	356.0	N/A
183	391	376	245	315	451	355.6	N/A
184	391	375	245	314	451	355.2	N/A
185	390	374	245	313	451	354.6	N/A
186	390	373	245	313	451	354.4	N/A
187	389	373	245	312	450	353.8	N/A
188	388	372	245	311	450	353.2	N/A
189	388	371	245	311	450	353.0	N/A
190	387	370	245	310	449	352.2	N/A
191	387	370	245	309	449	352.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	386	369	245	308	448	351.2	N/A
193	386	368	245	308	447	350.8	N/A
194	385	368	245	307	447	350.4	N/A
195	385	367	244	306	446	349.6	N/A
196	384	367	244	306	446	349.4	N/A
197	384	366	244	305	445	348.8	N/A
198	383	366	243	305	444	348.2	N/A
199	383	365	242	304	443	347.4	N/A
200	383	365	240	304	443	347.0	N/A
201	382	364	239	304	442	346.2	N/A
202	382	364	238	304	441	345.8	N/A
203	381	364	236	304	441	345.2	N/A
204	381	363	235	304	441	344.8	N/A
205	380	363	234	303	440	344.0	N/A
206	380	363	233	303	440	343.8	N/A
207	379	362	231	303	440	343.0	N/A
208	379	362	230	303	440	342.8	N/A
209	378	362	229	303	441	342.6	N/A
210	377	362	227	302	441	341.8	N/A
211	376	362	227	302	441	341.6	N/A
212	375	361	226	301	442	341.0	N/A
213	374	361	224	301	442	340.4	N/A
214	373	361	223	300	442	339.8	N/A
215	373	361	223	299	442	339.6	N/A
216	372	361	222	299	442	339.2	N/A
217	371	360	221	298	443	338.6	N/A
218	370	360	220	297	444	338.2	N/A
219	369	360	219	297	444	337.8	N/A
220	368	360	218	296	445	337.4	N/A
221	367	359	218	295	445	336.8	N/A
222	366	359	217	295	445	336.4	N/A
223	365	359	217	294	445	336.0	N/A
224	364	359	217	294	445	335.8	N/A
225	363	358	216	294	444	335.0	N/A
226	362	358	216	294	445	335.0	N/A
227	361	358	215	293	445	334.4	N/A
228	360	358	215	293	445	334.2	N/A
229	360	357	215	293	445	334.0	N/A
230	359	357	214	293	445	333.6	N/A
231	358	357	214	293	445	333.4	N/A
232	357	356	214	293	445	333.0	N/A
233	357	356	214	293	445	333.0	N/A
234	356	356	213	293	444	332.4	N/A
235	355	356	213	293	444	332.2	N/A
236	355	355	213	293	443	331.8	N/A
237	354	355	213	293	443	331.6	N/A
238	354	355	213	293	442	331.4	N/A
239	353	355	213	293	442	331.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	352	354	213	292	441	330.4	N/A
241	352	354	212	292	441	330.2	N/A
242	352	354	212	291	437	329.2	N/A
243	351	354	212	291	435	328.6	N/A
244	351	353	211	290	436	328.2	N/A
245	350	353	211	290	435	327.8	N/A
246	350	353	210	289	434	327.2	N/A
247	349	352	209	289	433	326.4	N/A
248	349	352	208	288	433	326.0	N/A
249	348	352	208	287	432	325.4	N/A
250	348	351	207	286	431	324.6	N/A
251	347	351	206	286	430	324.0	N/A
252	347	350	206	285	429	323.4	N/A
253	346	350	206	284	427	322.6	N/A
254	346	350	205	284	427	322.4	N/A
255	345	349	205	283	425	321.4	N/A
256	345	349	205	282	424	321.0	N/A
257	344	348	205	282	424	320.6	N/A
258	344	348	204	281	423	320.0	N/A
259	343	347	204	280	422	319.2	N/A
260	342	347	204	280	421	318.8	N/A
261	342	346	203	279	420	318.0	N/A
262	341	346	203	278	419	317.4	N/A
263	341	345	203	278	417	316.8	N/A
264	341	345	203	278	416	316.6	N/A
265	340	344	203	277	416	316.0	N/A
266	340	343	202	277	415	315.4	N/A
267	339	343	202	276	413	314.6	N/A
268	339	343	202	276	413	314.6	N/A
269	339	342	202	275	411	313.8	N/A
270	338	342	202	275	411	313.6	N/A
271	338	341	202	274	410	313.0	N/A
272	337	341	202	274	409	312.6	N/A
273	337	341	202	274	408	312.4	N/A
274	337	340	202	273	408	312.0	N/A
275	336	340	202	273	407	311.6	N/A
276	336	339	202	272	406	311.0	N/A
277	336	339	202	272	406	311.0	N/A
278	335	339	202	272	405	310.6	N/A
279	335	338	202	271	404	310.0	N/A
280	335	338	201	271	404	309.8	N/A
281	335	338	202	271	403	309.8	N/A
282	334	337	202	270	403	309.2	N/A
283	334	337	202	270	402	309.0	N/A
284	334	337	202	269	400	308.4	N/A
285	334	336	202	269	400	308.2	N/A
286	333	336	203	268	399	307.8	N/A
287	333	335	203	268	398	307.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	333	335	203	268	398	307.4	N/A
289	333	335	203	267	396	306.8	N/A
290	333	334	204	267	395	306.6	N/A
291	332	334	205	267	395	306.6	N/A
292	332	334	205	266	393	306.0	N/A
293	332	333	206	266	393	306.0	N/A
294	332	333	207	266	393	306.2	N/A
295	332	333	207	266	393	306.2	N/A
296	332	332	208	266	392	306.0	N/A
297	332	332	208	265	392	305.8	N/A
298	332	332	208	265	390	305.4	N/A
299	332	331	209	265	390	305.4	N/A
300	332	331	208	265	389	305.0	N/A
301	332	331	208	265	390	305.2	N/A
302	332	331	209	265	389	305.2	N/A
303	333	330	209	265	389	305.2	N/A
304	333	330	208	265	389	305.0	N/A
305	333	330	207	265	388	304.6	N/A
306	333	330	207	265	388	304.6	N/A
307	333	329	206	265	387	304.0	N/A
308	333	329	205	264	387	303.6	N/A
309	333	329	205	264	385	303.2	N/A
310	333	329	205	264	386	303.4	N/A
311	333	329	204	264	385	303.0	N/A
312	333	328	204	264	385	302.8	N/A
313	333	328	203	264	385	302.6	N/A
314	333	328	203	264	385	302.6	N/A
315	333	328	204	264	385	302.8	N/A
316	333	328	203	264	385	302.6	N/A
317	333	327	203	264	385	302.4	N/A
318	333	327	203	263	385	302.2	N/A
319	333	327	203	263	384	302.0	N/A
320	333	327	203	263	384	302.0	N/A
321	333	327	203	263	384	302.0	N/A
322	333	326	203	263	384	301.8	N/A
323	333	326	202	263	383	301.4	N/A
324	333	326	203	263	383	301.6	N/A
325	333	326	203	263	383	301.6	N/A
326	333	325	202	262	382	300.8	N/A
327	333	325	202	262	382	300.8	N/A
328	333	325	202	262	381	300.6	N/A
329	333	325	202	262	380	300.4	N/A
330	333	324	201	261	380	299.8	N/A
331	332	324	201	261	379	299.4	N/A
332	332	324	201	261	378	299.2	N/A
333	332	323	200	260	377	298.4	N/A
334	332	323	200	260	377	298.4	N/A
335	332	323	200	259	376	298.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	331	322	199	259	375	297.2	N/A
Average	381	390	223	418	436	370	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 3

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/12/2019

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T316	86.1	172.5	184.8	12.3
	T317	86.4			
Train A Filters - Remainder	T323	86.1	258.1	261.7	3.6
	T318	85.9			
	T325	86.1			
Train A Probe	12A	116889.4	116889.4	116891.2	1.8
Train A O-Rings	12A	3396.2	3396.2	3397.8	1.6
Train B Filters	T319	86.1	430.6	450.7	20.1
	T320	87.4			
	T322	86.6			
	T324	84.4			
	T326	86.1			
Train B Probe	12B	117957.5	117957.5	117958.5	1.0
Train B O-Rings	12B	3406.6	3406.6	3407.2	0.6
Background Filter	T321	86.3	86.3	86.5	0.2

Placed in Dessicator on:	9/12/2019 19:00

Train A Filters - First Hour	185.0	9/16 8:17	184.8	9/16 16:09				
Train A Filters - Remainder	261.7	9/16 8:17	261.7	9/16 16:09				
Train A Probe	116891.1	9/16 8:17	116891.2	9/16 16:10				
Train A O-Rings	3397.9	9/16 8:17	3397.8	9/16 16:10				
Train B Filters	450.9	9/16 8:18	450.7	9/16 16:10				
Train B Probe	117958.6	9/16 8:18	117958.5	9/16 16:10				
Train B O-Rings	3407.2	9/16 8:18	3407.2	9/16 16:10				
Background Filter	86.5	9/16 8:18	86.5	9/16 16:10				

1st hour Sub-Total, mg:	12.3
Remainder Sub-Total, mg:	7.0
Train 1 Aggregate, mg:	**19.3**
Train 2 Aggregate, mg:	**21.7**
Ambient Aggregate, mg:	0.2

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 3 Test Date: 9/12/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 8:48
Air Control Setting: Fully Open

Time	Notes
0 min	Started with 2.0 lbs of kindling, lit with torch for 60 seconds, door left cracked open ~3"
3 min	Closed Door
10 min	@0.8 lbs, added 2.2 lbs of kindling and start-up pieces, left door cracked open ~3"
11 min	Closed door
19 min	@1.1 lbs, added 3.7 lbs of start-up fuel, door closed immediately.
32 min	@2.0 lbs, leveled coal bed and loaded high fire test fuel load, door open 60 sec
35 min	Turned fan on high
150 min	Leveled remaining 4.0 lbs of charcoal from high fire test, zeroed scale, turned off fan in preparation of loading medium fire test load.

Test Notes
Test Burn Start Time: 11:19
Air Control Setting: Medium Fire Test Setting (PAC open 11/32")

Time	Notes
0 min	Loaded medium fire test fuel load, door open 1 minute
7 min	Air turned down to test setting, changed front filter on both trains
8 min	Fan turned on to high
60 min	Changed 1-hr filter
65 min	Changed Train B Front filter
336 min	End of Test

Test Burn End Time: 16:54

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.00 CO (%): 4.310
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	7:55	8:00	7:57	10:06	10:08	10:09
CO_2	0.00	10.08	17.00	-0.03	10.10	17.09
CO	0.00	2.497	4.310	-.004	2.486	4.297

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature: Date: 9/17/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy | Job Number: 19-494 | Tracking #: 0030
Model: NEO 2.5 | Run Number: 3 | Test Date: 9/12/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

Residual Start-up Fuel Coal Bed

Technician Signature: _____ Date: 9/17/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 3 Test Date: 9/12/2019

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Medium Fire Fuel Load

Medium Fire Fuel Loaded

Technician Signature: Date: 9/17/2019

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 4 Data Summary

Client: Pacific Energy
Model: NEO 2.5 LE
Job #: 19-494
Tracking #: 030
Test Date: 9/16/2019

9/20/2019

Techician Signature | Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

Burn Rate (kg/hr):	1.49

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	71.978	54.524	53.566	8.699
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.58			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11442.4			
Average Gas Meter Temperature (°F)	77.2	97.5	97.0	82.1
Total Sample Volume (dscf)	69.714	51.521	50.504	8.453
Average Tunnel Temperature (°F)	98.4			
Total Time of Test (min)	367			
Total Particulate Catch (mg)	0.1	7.0	6.6	2.9
Particulate Concentration, dry-standard (g/dscf)	0.0000014	0.0001359	0.0001307	0.0003431
Total PM Emissions (g)	0.10	9.41	9.05	3.91
Particulate Emission Rate (g/hr)	0.02	1.54	1.48	3.91
Emissions Factor (g/kg)	-	1.03	0.99	-
Difference from Average Total Particulate Emissions (g)	-	0.18	0.18	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	9.23
Particulate Emission Rate (g/hr)	1.51
Emissions Factor (g/kg)	1.01
HHV Efficiency (%)	72.4%
LHV Efficiency (%)	77.5%
CO Emissions (g/min)	2.21

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80 / Max: 87	OK
Face Velocity	< 30 ft/min	8.2	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 76 / Max: 79	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

B415.1 Efficiency Results

Manufacturer:	Pacific Energy
Model:	NEO 2.5 LE
Date:	09/16/19
Run:	4
Control #:	19-494
Test Duration:	367
Output Category:	Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	72.4%	77.5%
Combustion Efficiency	93.7%	93.7%
Heat Transfer Efficiency	77.3%	82.7%

Output Rate (kJ/h)	21,532	20,425	**(Btu/h)**
Burn Rate (kg/h)	1.49	3.28	**(lb/h)**
Input (kJ/h)	29,722	28,194	**(Btu/h)**

Test Load Weight (dry kg)	9.11	20.07	**dry lb**
MC wet (%)	17.39		
MC dry (%)	21.05		
Particulate (g)	9.23		
CO (g)	811		
Test Duration (h)	6.12		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	6.16
g/kg Dry Fuel	1.01	89.03
g/h	1.51	132.57
g/min	0.03	2.21
lb/MM Btu Output	0.16	14.31

Air/Fuel Ratio (A/F)	10.69

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 4
Technician: SJB
Date: 9/16/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	21.00		
Total Load Weight Range (lbs):	20.00	to	22.10
Core Load Weight Range (lbs):	9.50	to	13.70
Remainder Load Weight Range (lbs):	7.40	to	11.60
Core Load Piece Range (lbs):	3.20	to	5.30
Remainder Load Piece Range (lbs):	2.10	to	11.60
Max Allowable Kindling Weight (lbs):	4.33		
Max Allowable Start-up Fuel Weight (lbs):	6.50		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	3.20	In Range	19.7	20.4	22.3	20.8	In Range	2.65	1.20
2	16.00	5.10	In Range	25.1	24.3	23.9	24.4	In Range	4.10	1.86
3	16.00	3.61	In Range	24.2	22.0	23.4	23.2	In Range	2.93	1.33
Core Load Wt. (lbs)		11.91	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.28	In Range	21.0	18.4	19.6	19.7	In Range	3.58	1.62
2	16.00	3.17	In Range	22.9	26.4	20.7	23.3	In Range	2.57	1.17
3	16.00	2.29	In Range	19.6	18.7	21.3	19.9	In Range	1.91	0.87
Remainder Load (lbs)		9.74	In Range							

Total Load Weight (lbs):	21.65	In Range	
Core Load % of Total Weight:	55%	In Range	45-65%
Remainder % of Total Weight:	45%	In Range	35-55%
Total Load % of Target Weight:	103%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	10.3		
Total Load Average Moisture Content (%DB):	22.1	In Range	19-25%
Total Load Average Moisture Content (%WB):	18.1		
Total Test Load Weight (dry basis):	17.74 lbs	8.04 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.03	In Range	10	10	10	10.0	In Range	2.75	1.25

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.80	In Range	21.9	19.7	20.3	20.6	In Range	3.98	1.80

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.2	to	4.3	
Actual Residual Start-up Fuel Weight (lb):		2.2		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 4
Technician: SJB
Date: 9/16/2019

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	25.20		
Total Load Weight Range (lbs):	23.94	to	26.46
Core Load Weight Range (lbs):	11.34	to	16.38
Remainder Load Weight Range (lbs):	8.82	to	13.86
Core Load Piece Range (lbs):	3.78	to	6.30
Remainder Load Piece Range (lbs):	2.52	to	7.56

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.52	In Range	24.2	20.2	21.0	21.8	In Range	3.71	1.68
2	16.00	4.73	In Range	23.4	18.5	24.9	22.3	In Range	3.87	1.75
3	16.00	5.15	In Range	19.2	23.1	18.6	20.3	In Range	4.28	1.94
Core Load Wt. (lbs)		14.40	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	6.12	In Range	19.2	20.6	21.3	20.4	In Range	5.08	2.31
2	16.00	3.85	In Range	19.7	20.4	22.3	20.8	In Range	3.19	1.45
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		9.97	In Range							

Remainder Load Small/Large Piece Weight Ratio:	63%	In Range	≤ 67%
Total Load Weight (lbs):	24.37	In Range	
Core Load % of Total Weight:	59%	In Range	45-65%
Remainder % of Total Weight:	41%	In Range	35-55%
Total Load % of Target Weight:	97%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.6		
Total Load Average Moisture Content (%DB):	21.1	In Range	19-25%
Total Load Average Moisture Content (%WB):	17.4		
Total Test Load Weight (dry basis):	20.13 lbs	9.13 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	2.5	to	4.8
Actual Charcoal Bed Wt. (lb):	4.8	In Range	

TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.0 Valid Test (≥90%)

Total Fuel Burned During Test Run: 24.4 lbs, wet basis
20.1 lbs, dry basis
9.13 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Pacific Energy	Job #:	19-494
Model:	NEO 2.5 LE	Tracking #:	030
Run #:	4	Technician:	SJB
Test Start Time:	13:08	Date:	9/16/2019
Test Type:	Medium Fire		

Recording Interval (min):	1
Total Sampling Time (min):	367

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.70	29.77	29.74
Relative Humidity (%)	46.4	41.8	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Meter Box γ Factor:	0.999	(A)	
Meter Box γ Factor:	0.996	(B)	
Meter Box γ Factor:	0.992	(Ambient)	
Ambient Sample Volume:	71.978	ft^3	

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	9/10/2019

Sample Train Post-Test Leak Checks

(A)	0.001	cfm @	-12	in. Hg
(B)	0.000	cfm @	-13	in. Hg
(Ambient)	0.002	cfm @	-14	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.050	71
2	0.070	71
3	0.064	71
4	0.057	71
5	0.056	71
6	0.066	71
7	0.062	71
8	0.050	71
Center	0.075	71

Static Pressure: -0.150 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	16.46	ft/sec
V_{scent}:	18.27	ft/sec
F_p:	0.901	[ratio]
Initial Tunnel Flow:	185.0	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

Recording Interval (min): 1
Run Time (min): 134

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
0	2.0	-0.011	69	69	69	69	69	69.0	70	68
1	2.0	-0.025	69	69	70	69	69	69.2	91	68
2	1.8	-0.054	70	70	71	70	69	70.0	160	68
3	1.6	-0.046	74	72	75	73	69	72.6	259	68
4	1.5	-0.054	79	77	82	79	70	77.4	302	68
5	1.4	-0.047	85	81	89	89	71	83.0	308	68
6	1.3	-0.050	90	84	97	101	72	88.8	308	68
7	1.2	-0.046	94	88	104	113	74	94.6	323	68
8	1.1	-0.050	98	93	110	125	76	100.4	335	68
9	1.0	-0.050	101	98	116	137	79	106.2	331	68
10	0.8	-0.057	104	103	122	150	82	112.2	342	68
11	2.9	-0.058	108	108	128	162	87	118.6	353	68
12	2.8	-0.057	112	112	135	173	92	124.8	342	68
13	2.6	-0.068	116	118	142	184	98	131.6	360	68
14	2.4	-0.080	121	123	149	195	105	138.6	403	68
15	2.3	-0.072	125	129	156	208	112	146.0	447	68
16	2.1	-0.090	129	134	164	226	119	154.4	489	68
17	1.9	-0.085	132	140	174	250	127	164.6	536	69
18	1.8	-0.082	137	145	184	279	135	176.0	540	69
19	1.6	-0.080	142	150	195	307	143	187.4	522	69
20	1.5	-0.067	146	156	207	330	152	198.2	502	69
21	1.3	-0.084	151	162	221	351	161	209.2	518	69
22	1.1	-0.087	156	168	236	371	170	220.2	549	69
23	4.6	-0.097	162	175	258	390	180	233.0	554	69
24	4.3	-0.093	169	182	270	408	190	243.8	569	69
25	4.1	-0.083	176	189	281	425	200	254.2	591	69
26	3.9	-0.095	184	199	292	444	211	266.0	601	70
27	3.6	-0.097	194	209	302	464	222	278.2	621	70
28	3.4	-0.103	203	219	312	485	232	290.2	627	70
29	3.1	-0.086	213	229	322	507	243	302.8	635	70
30	2.9	-0.087	223	240	332	529	254	315.6	648	70
31	2.6	-0.103	233	250	342	553	265	328.6	658	70
32	2.4	-0.101	244	260	352	576	276	341.6	663	70
33	2.2	-0.100	254	271	362	599	286	354.4	667	71
34	23.6	-0.094	265	281	375	619	300	368.0	551	71
35	23.2	-0.093	276	290	383	628	310	377.4	542	71
36	23.0	-0.086	287	300	388	632	320	385.4	597	71
37	22.7	-0.107	298	310	345	621	328	380.4	678	71
38	22.4	-0.098	309	319	320	619	335	380.4	739	71
39	22.1	-0.112	318	328	301	626	343	383.2	771	71
40	21.7	-0.112	327	336	287	636	350	387.2	775	71
41	21.5	-0.122	335	343	276	648	355	391.4	776	71
42	21.1	-0.111	343	350	267	661	360	396.2	799	72
43	20.8	-0.112	350	356	261	674	364	401.0	806	72

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

Recording Interval (min): 1
Run Time (min): 134

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
44	20.5	-0.100	356	362	256	686	369	405.8	807	72
45	20.2	-0.124	362	368	252	696	374	410.4	793	72
46	20.0	-0.108	367	374	249	704	378	414.4	766	72
47	19.6	-0.103	372	379	246	711	382	418.0	777	72
48	19.4	-0.108	377	384	245	717	386	421.8	791	72
49	19.1	-0.107	381	389	243	723	389	425.0	802	73
50	18.9	-0.100	385	393	242	730	392	428.4	809	73
51	18.5	-0.104	389	398	241	737	396	432.2	810	73
52	18.2	-0.103	392	402	241	743	397	435.0	810	73
53	18.0	-0.121	396	407	242	748	401	438.8	809	73
54	17.8	-0.099	400	411	242	753	405	442.2	805	73
55	17.5	-0.110	403	415	244	757	408	445.4	805	73
56	17.3	-0.113	407	419	245	760	411	448.4	811	73
57	16.9	-0.113	411	423	246	764	413	451.4	821	73
58	16.6	-0.099	415	427	247	768	415	454.4	795	74
59	16.3	-0.107	418	430	248	769	418	456.6	772	74
60	16.2	-0.091	422	434	250	768	423	459.4	764	74
61	15.9	-0.095	426	437	252	765	425	461.0	740	74
62	15.7	-0.095	429	441	255	760	429	462.8	716	74
63	15.4	-0.099	433	444	256	752	432	463.4	701	74
64	15.3	-0.106	437	448	258	744	435	464.4	688	74
65	15.1	-0.091	440	451	259	735	437	464.4	680	74
66	15.0	-0.091	443	453	260	725	439	464.0	672	74
67	14.5	-0.091	447	456	260	716	440	463.8	670	74
68	14.5	-0.097	449	459	261	707	442	463.6	673	74
69	14.2	-0.097	452	461	261	701	443	463.6	673	74
70	14.0	-0.086	455	463	262	696	444	464.0	675	74
71	13.9	-0.101	457	465	262	693	446	464.6	671	74
72	13.6	-0.082	460	467	262	689	446	464.8	668	74
73	13.5	-0.111	462	468	262	686	446	464.8	668	74
74	13.3	-0.100	465	469	263	683	448	465.6	669	74
75	13.1	-0.084	467	470	263	682	448	466.0	672	74
76	12.9	-0.103	470	471	263	680	448	466.4	675	74
77	12.7	-0.089	472	472	263	680	448	467.0	680	74
78	12.3	-0.088	475	473	263	681	449	468.2	689	75
79	12.2	-0.089	477	473	263	683	449	469.0	692	75
80	12.1	-0.089	480	474	264	686	450	470.8	681	75
81	11.9	-0.090	482	475	264	688	450	471.8	677	75
82	11.7	-0.099	484	476	265	688	451	472.8	681	75
83	11.4	-0.083	487	476	266	689	452	474.0	687	75
84	11.3	-0.093	489	477	267	691	453	475.4	687	75
85	11.1	-0.092	491	479	267	693	454	476.8	685	75
86	11.0	-0.086	493	480	268	694	456	478.2	685	75
87	10.7	-0.099	495	481	269	695	457	479.4	691	75

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

Recording Interval (min): 1
Run Time (min): 134

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
88	10.6	-0.094	497	482	270	698	459	481.2	686	75
89	10.4	-0.092	499	484	271	699	461	482.8	677	75
90	10.2	-0.101	501	485	273	698	463	484.0	671	75
91	10.0	-0.097	503	487	275	696	464	485.0	668	75
92	9.9	-0.096	505	489	276	693	466	485.8	664	76
93	9.7	-0.087	506	490	278	691	467	486.4	667	76
94	9.5	-0.076	508	492	279	689	470	487.6	661	76
95	9.3	-0.081	509	494	281	687	473	488.8	663	76
96	9.2	-0.091	510	495	283	684	474	489.2	653	76
97	9.1	-0.087	510	497	286	680	476	489.8	645	76
98	8.9	-0.085	511	498	288	675	477	489.8	643	76
99	8.7	-0.079	511	500	291	670	479	490.2	636	76
100	8.5	-0.093	512	501	293	665	480	490.2	634	76
101	8.4	-0.089	512	503	295	661	481	490.4	632	76
102	8.3	-0.086	513	504	296	657	481	490.2	629	76
103	8.1	-0.087	513	506	299	653	483	490.8	624	76
104	7.9	-0.080	513	507	300	649	484	490.6	626	76
105	7.8	-0.093	514	508	302	645	484	490.6	625	76
106	7.7	-0.081	514	510	303	642	485	490.8	623	76
107	7.5	-0.072	514	511	304	639	485	490.6	618	76
108	7.4	-0.079	514	512	305	637	486	490.8	619	76
109	7.3	-0.091	515	513	307	635	486	491.2	621	76
110	7.1	-0.079	515	514	308	633	487	491.4	619	76
111	7.0	-0.097	516	515	310	632	489	492.4	622	76
112	6.8	-0.088	516	516	311	632	489	492.8	619	76
113	6.7	-0.089	516	517	312	630	490	493.0	610	76
114	6.5	-0.092	517	517	313	628	491	493.2	605	76
115	6.5	-0.076	517	518	314	625	492	493.2	598	76
116	6.3	-0.095	518	518	315	621	493	493.0	592	76
117	6.2	-0.085	518	519	316	616	493	492.4	583	76
118	6.1	-0.081	519	519	317	610	494	491.8	576	76
119	5.9	-0.070	519	519	317	605	495	491.0	573	76
120	5.9	-0.091	520	519	317	599	496	490.2	569	76
121	5.8	-0.090	520	519	317	594	497	489.4	563	76
122	5.6	-0.080	520	519	317	588	498	488.4	558	76
123	5.6	-0.085	521	519	318	582	498	487.6	552	76
124	5.5	-0.084	521	518	318	576	500	486.6	544	76
125	5.5	-0.077	521	518	318	570	501	485.6	536	76
126	5.4	-0.082	521	517	318	564	502	484.4	528	76
127	5.3	-0.075	522	517	318	556	502	483.0	522	76
128	5.2	-0.077	522	516	317	550	503	481.6	514	76
129	5.2	-0.073	521	515	317	542	504	479.8	512	76
130	5.1	-0.062	521	514	316	536	505	478.4	509	76
131	5.0	-0.077	521	512	315	529	505	476.4	501	76

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

Recording Interval (min): 1
Run Time (min): 134

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
132	4.9	-0.086	520	511	314	522	505	474.4	493	76
133	4.9	-0.068	519	510	313	515	506	472.6	490	76
134	4.8	-0.077	518	508	312	509	506	470.6	488	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.368		0.088	0.00	74	-0.08		24.3		127	497	82	76
1	0.491	0.123	0.081	2.33	74	0	90	23.6	-0.7	143	384	83	76
2	0.643	0.152	0.082	2.27	74	-2.22	109	23.9	0.3	127	435	84	76
3	0.788	0.145	0.080	2.27	74	-0.07	106	23.6	-0.3	128	548	84	76
4	0.938	0.150	0.084	2.27	74	-0.81	107	23.4	-0.2	135	680	83	76
5	1.079	0.141	0.084	2.22	74	0	101	23.0	-0.4	140	764	82	76
6	1.227	0.148	0.080	2.20	74	0	109	22.8	-0.2	145	805	81	76
7	1.369	0.142	0.084	2.19	75	-0.47	102	22.5	-0.3	149	845	82	76
8	1.515	0.146	0.082	2.17	75	-2.27	106	22.2	-0.3	141	736	84	76
9	1.657	0.142	0.081	2.16	75	0	103	22.0	-0.2	133	668	84	76
10	1.802	0.145	0.082	2.12	75	-1.01	104	21.7	-0.3	130	637	83	76
11	1.955	0.153	0.082	2.11	75	-2.37	110	21.6	-0.1	127	609	82	76
12	2.098	0.143	0.082	2.14	76	-1.68	102	21.4	-0.2	125	589	81	77
13	2.243	0.145	0.085	2.10	76	-0.34	102	21.2	-0.2	123	574	82	76
14	2.385	0.142	0.078	2.13	76	-0.05	104	21.0	-0.2	123	568	83	77
15	2.531	0.146	0.080	2.10	77	-0.1	105	20.8	-0.2	122	568	84	77
16	2.671	0.140	0.083	2.10	77	0	99	20.6	-0.2	121	565	84	77
17	2.816	0.145	0.086	2.09	77	0	101	20.4	-0.2	121	564	83	77
18	2.955	0.139	0.082	2.07	78	-2.53	99	20.2	-0.2	120	562	82	77
19	3.101	0.146	0.079	2.10	78	0	105	20.0	-0.2	120	559	81	77
20	3.241	0.140	0.083	2.11	78	-0.28	99	19.9	-0.1	120	556	82	76
21	3.388	0.147	0.080	2.11	79	-0.14	105	19.6	-0.3	120	553	84	77
22	3.528	0.140	0.082	2.08	79	-2.62	99	19.5	-0.1	119	549	84	77
23	3.672	0.144	0.078	2.09	80	0	104	19.3	-0.2	118	546	83	77
24	3.814	0.142	0.082	2.18	80	-2.5	100	19.1	-0.2	118	543	82	77
25	3.960	0.146	0.087	2.19	80	-1.34	100	19.0	-0.1	117	541	81	77
26	4.106	0.146	0.081	2.18	81	0	103	18.8	-0.2	117	541	81	77
27	4.251	0.145	0.078	2.20	81	-0.97	105	18.6	-0.2	117	541	82	77
28	4.397	0.146	0.084	2.16	81	-2.61	101	18.4	-0.2	117	539	84	77
29	4.543	0.146	0.081	2.18	82	0	103	18.2	-0.2	117	537	84	77
30	4.690	0.147	0.081	2.18	82	-2.54	104	18.1	-0.1	117	536	84	77
31	4.835	0.145	0.082	2.18	83	0	101	17.9	-0.2	116	533	83	77
32	4.982	0.147	0.083	2.17	83	-0.64	102	17.7	-0.2	116	535	82	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	5.127	0.145	0.079	2.18	83	-2.66	103	17.5	-0.2	116	542	82	77
34	5.275	0.148	0.082	2.17	84	-1.81	103	17.4	-0.1	116	533	83	77
35	5.420	0.145	0.088	2.16	84	-0.69	98	17.2	-0.2	116	544	84	77
36	5.567	0.147	0.082	2.15	84	-1.25	103	17.1	-0.1	116	533	84	77
37	5.712	0.145	0.078	2.19	85	-2.18	104	16.9	-0.2	116	541	83	77
38	5.859	0.147	0.083	2.16	85	0	102	16.7	-0.2	116	528	82	77
39	6.003	0.144	0.083	2.15	85	0	100	16.5	-0.2	116	542	81	77
40	6.151	0.148	0.082	2.17	86	-2.68	103	16.4	-0.1	115	530	82	77
41	6.296	0.145	0.082	2.17	86	-2.59	101	16.2	-0.2	115	538	83	77
42	6.443	0.147	0.084	2.16	86	-0.65	101	15.8	-0.4	115	538	84	77
43	6.588	0.145	0.080	2.17	87	0	102	15.9	0.1	115	532	84	77
44	6.736	0.148	0.081	2.16	87	-2.69	103	15.6	-0.3	115	541	83	77
45	6.880	0.144	0.083	2.16	87	0	99	15.5	-0.1	115	532	82	77
46	7.028	0.148	0.082	2.17	88	-0.3	103	15.4	-0.1	115	547	82	77
47	7.172	0.144	0.078	2.16	88	0	102	15.3	-0.1	115	554	82	77
48	7.321	0.149	0.079	2.17	88	-2.65	105	15.0	-0.3	116	556	84	77
49	7.464	0.143	0.083	2.15	88	0	99	14.8	-0.2	116	553	84	77
50	7.612	0.148	0.080	2.14	89	-1.06	104	14.6	-0.2	116	551	84	77
51	7.756	0.144	0.078	2.13	89	-2.79	102	14.5	-0.1	116	558	83	77
52	7.904	0.148	0.082	2.14	89	-2.4	102	14.3	-0.2	116	570	82	77
53	8.047	0.143	0.082	2.14	89	0	99	14.1	-0.2	117	571	82	77
54	8.195	0.148	0.084	2.11	90	-0.85	101	13.9	-0.2	117	578	83	77
55	8.338	0.143	0.084	2.11	90	-0.31	98	13.7	-0.2	118	577	84	77
56	8.486	0.148	0.089	2.11	90	-1.19	98	13.6	-0.1	117	572	84	77
57	8.628	0.142	0.083	2.10	90	-0.2	98	13.3	-0.3	118	569	84	77
58	8.776	0.148	0.082	2.09	91	-0.3	102	13.2	-0.1	117	569	83	77
59	8.917	0.141	0.078	2.08	91	-2.78	100	13.1	-0.1	118	573	82	77
60	9.067	0.150	0.081	2.32	91	-1.45	104	12.8	-0.3	117	574	81	77
61	9.216	0.149	0.084	2.07	91	0	102	12.7	-0.1	118	573	82	78
62	9.369	0.153	0.082	2.27	91	-0.16	106	12.5	-0.2	118	573	84	77
63	9.517	0.148	0.082	2.28	92	0	102	12.3	-0.2	118	577	85	77
64	9.668	0.151	0.084	2.26	92	0	103	12.1	-0.2	118	580	85	78
65	9.817	0.149	0.079	2.27	92	0	105	11.9	-0.2	119	581	84	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.967	0.150	0.082	2.28	92	0	104	11.6	-0.3	119	577	83	78
67	10.118	0.151	0.083	2.28	92	-0.39	104	11.6	0	119	576	82	78
68	10.268	0.150	0.078	2.26	93	-1.66	106	11.4	-0.2	118	572	82	78
69	10.419	0.151	0.085	2.25	93	-2.46	102	11.1	-0.3	118	567	83	78
70	10.568	0.149	0.080	2.27	93	0	104	11.1	0	118	570	84	77
71	10.719	0.151	0.082	2.26	93	-2.18	104	10.9	-0.2	118	571	85	78
72	10.866	0.147	0.079	2.26	93	-2.21	103	10.6	-0.3	118	570	84	78
73	11.018	0.152	0.080	2.24	93	-2.06	106	10.5	-0.1	118	567	83	78
74	11.166	0.148	0.081	2.26	94	-1.36	102	10.4	-0.1	118	562	82	78
75	11.319	0.153	0.078	2.25	94	0	108	10.1	-0.3	118	558	81	78
76	11.466	0.147	0.084	2.24	94	-2.3	100	10.0	-0.1	118	557	82	78
77	11.619	0.153	0.081	2.21	94	-1.28	106	9.9	-0.1	117	554	84	78
78	11.766	0.147	0.083	2.24	94	0	100	9.6	-0.3	117	556	84	78
79	11.917	0.151	0.083	2.23	94	0	103	9.4	-0.2	117	559	84	78
80	12.066	0.149	0.083	2.24	95	-2.67	101	9.3	-0.1	117	555	83	78
81	12.215	0.149	0.081	2.25	95	-2.45	103	9.2	-0.1	116	553	82	78
82	12.366	0.151	0.081	2.23	95	-2.36	104	9.0	-0.2	117	555	82	78
83	12.516	0.150	0.080	2.23	95	-2.51	104	8.9	-0.1	117	550	82	78
84	12.666	0.150	0.078	2.24	95	-1.67	105	8.7	-0.2	116	552	84	78
85	12.815	0.149	0.077	2.24	95	-0.25	105	8.6	-0.1	116	549	84	78
86	12.966	0.151	0.078	2.23	95	-2.51	106	8.5	-0.1	116	547	84	79
87	13.112	0.146	0.084	2.21	96	-1.58	99	8.3	-0.2	115	543	83	78
88	13.263	0.151	0.081	2.24	96	-0.92	104	8.2	-0.1	115	540	82	78
89	13.409	0.146	0.085	2.22	96	-2.44	98	8.0	-0.2	115	529	82	78
90	13.561	0.152	0.079	2.21	96	-2.49	106	7.9	-0.1	114	523	83	78
91	13.708	0.147	0.085	2.23	96	0	98	7.8	-0.1	113	517	84	78
92	13.860	0.152	0.081	2.20	96	-2.44	104	7.6	-0.2	113	514	84	78
93	14.006	0.146	0.078	2.20	96	-2.44	102	7.5	-0.1	114	513	84	78
94	14.158	0.152	0.084	2.19	96	-2.48	102	7.5	0	113	514	83	78
95	14.305	0.147	0.084	2.19	96	0	99	7.3	-0.2	112	512	82	78
96	14.455	0.150	0.076	2.19	97	-1.68	106	7.2	-0.1	113	513	82	78
97	14.602	0.147	0.080	2.22	97	-1.9	101	7.1	-0.1	113	515	82	78
98	14.752	0.150	0.082	2.18	97	-1.77	102	6.9	-0.2	113	520	84	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.899	0.147	0.086	2.20	97	-2.4	98	6.8	-0.1	113	522	84	78
100	15.048	0.149	0.079	2.18	97	0	103	6.6	-0.2	113	522	84	78
101	15.196	0.148	0.079	2.18	97	-2.4	103	6.7	0.1	113	522	83	78
102	15.344	0.148	0.082	2.16	97	0	101	6.5	-0.2	113	523	82	78
103	15.492	0.148	0.081	2.15	97	0	101	6.4	-0.1	113	524	82	78
104	15.640	0.148	0.082	2.16	97	-0.09	101	6.1	-0.3	112	522	83	78
105	15.786	0.146	0.084	2.10	97	-0.07	98	6.1	0	113	524	84	78
106	15.932	0.146	0.081	2.08	97	-1.25	100	6.0	-0.1	113	524	85	78
107	16.076	0.144	0.080	2.05	98	-0.11	99	5.8	-0.2	113	525	84	78
108	16.221	0.145	0.081	2.03	98	-0.23	99	5.8	0	113	522	83	78
109	16.365	0.144	0.083	2.16	98	-3.04	97	5.6	-0.2	112	522	82	78
110	16.513	0.148	0.084	2.14	98	-1.96	99	5.5	-0.1	112	521	82	78
111	16.659	0.146	0.079	2.13	98	-1.89	101	5.4	-0.1	112	519	82	78
112	16.806	0.147	0.079	2.07	98	-3.14	102	5.3	-0.1	112	515	84	78
113	16.951	0.145	0.084	2.10	98	-1.69	97	5.2	-0.1	111	509	84	78
114	17.097	0.146	0.078	2.07	98	-1.26	102	5.2	0	111	504	84	78
115	17.240	0.143	0.079	2.06	98	-2.92	99	5.1	-0.1	111	496	83	78
116	17.388	0.148	0.085	2.13	98	-0.43	98	5.0	-0.1	110	491	82	78
117	17.533	0.145	0.079	2.13	98	-1.41	100	4.9	-0.1	110	486	82	78
118	17.681	0.148	0.086	2.12	98	-0.89	98	4.7	-0.2	110	484	83	78
119	17.825	0.144	0.074	2.10	98	-0.66	103	4.7	0	109	477	84	78
120	17.973	0.148	0.082	2.08	98	-3.04	100	4.6	-0.1	109	473	85	78
121	18.117	0.144	0.081	2.07	99	-3.18	98	4.6	0	109	472	84	78
122	18.265	0.148	0.082	2.06	99	-3.15	100	4.5	-0.1	108	472	83	78
123	18.407	0.142	0.080	2.07	99	-0.68	97	4.4	-0.1	108	468	82	78
124	18.555	0.148	0.081	2.06	99	-0.67	101	4.3	-0.1	109	462	82	78
125	18.697	0.142	0.083	2.06	99	-3.15	95	4.3	0	108	462	83	78
126	18.845	0.148	0.080	2.04	99	-0.74	101	4.1	-0.2	108	458	84	78
127	18.986	0.141	0.082	2.06	99	-1.46	95	4.1	0	108	455	85	78
128	19.133	0.147	0.083	2.05	99	-3.1	99	4.0	-0.1	107	452	84	78
129	19.274	0.141	0.083	2.06	99	-2.75	95	3.9	-0.1	107	444	83	78
130	19.422	0.148	0.080	2.04	99	-0.72	101	3.9	0	106	431	82	78
131	19.564	0.142	0.081	2.05	99	-2.33	96	3.9	0	105	420	82	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.711	0.147	0.082	2.05	99	-2.53	99	3.9	0	105	404	83	78
133	19.853	0.142	0.080	2.04	99	-2.46	97	3.8	-0.1	104	389	84	78
134	20.000	0.147	0.085	2.04	99	-0.66	97	3.7	-0.1	103	377	85	78
135	20.142	0.142	0.077	2.03	99	-1.04	98	3.7	0	102	365	84	78
136	20.287	0.145	0.080	2.03	99	-1.17	99	3.7	0	102	361	83	78
137	20.434	0.147	0.082	2.14	99	-0.81	99	3.6	-0.1	101	356	82	78
138	20.583	0.149	0.083	2.15	99	-0.71	99	3.5	-0.1	101	350	82	78
139	20.730	0.147	0.079	2.15	99	-0.73	100	3.4	-0.1	100	345	83	78
140	20.879	0.149	0.078	2.18	100	-1.02	102	3.6	0.2	100	339	84	78
141	21.025	0.146	0.078	2.17	100	-2.81	100	3.5	-0.1	99	334	84	78
142	21.175	0.150	0.085	2.17	100	-2.56	98	3.4	-0.1	99	330	84	78
143	21.320	0.145	0.083	2.17	100	-0.75	96	3.4	0	98	324	83	78
144	21.470	0.150	0.081	2.14	100	-3.04	101	3.3	-0.1	98	319	82	78
145	21.615	0.145	0.083	2.15	100	-0.75	96	3.4	0.1	98	312	82	78
146	21.766	0.151	0.082	2.15	100	-3.32	101	3.4	0	97	308	83	78
147	21.911	0.145	0.078	2.17	100	-2.52	99	3.4	0	97	303	84	78
148	22.061	0.150	0.080	2.16	100	-1.02	101	3.4	0	97	299	84	78
149	22.206	0.145	0.081	2.15	100	-3.11	97	3.3	-0.1	96	295	84	78
150	22.356	0.150	0.080	2.16	100	-1.69	101	3.3	0	96	292	83	78
151	22.501	0.145	0.078	2.16	100	-0.94	99	3.3	0	96	290	82	78
152	22.653	0.152	0.084	2.16	100	-2.75	100	3.3	0	95	288	82	78
153	22.798	0.145	0.079	2.16	100	-1.32	98	3.2	-0.1	95	285	83	78
154	22.949	0.151	0.083	2.14	100	-1.13	100	3.2	0	95	282	84	78
155	23.094	0.145	0.080	2.15	100	-3.33	98	3.2	0	94	280	84	78
156	23.244	0.150	0.085	2.15	100	-2.81	98	3.2	0	94	277	83	78
157	23.389	0.145	0.083	2.16	100	-2.25	96	3.2	0	94	272	82	78
158	23.540	0.151	0.084	2.14	100	-3.38	99	3.1	-0.1	93	269	82	78
159	23.685	0.145	0.081	2.15	100	-0.79	97	3.1	0	93	266	82	78
160	23.836	0.151	0.085	2.17	100	-0.75	99	3.1	0	93	262	84	78
161	23.981	0.145	0.083	2.16	100	-3.19	96	3.1	0	93	260	85	77
162	24.130	0.149	0.085	2.16	100	-0.79	97	3.1	0	92	258	84	78
163	24.276	0.146	0.082	2.16	100	-0.93	97	3.0	-0.1	92	255	83	78
164	24.425	0.149	0.082	2.18	100	-1.37	99	3.0	0	92	254	82	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.571	0.146	0.083	2.16	100	-1.1	96	3.0	0	92	252	82	77
166	24.720	0.149	0.079	2.15	100	-0.77	101	3.0	0	92	250	82	78
167	24.867	0.147	0.081	2.15	100	-3.25	98	3.0	0	92	249	84	77
168	25.016	0.149	0.082	2.16	100	-0.81	99	2.8	-0.2	92	249	85	77
169	25.162	0.146	0.077	2.16	100	-1.11	100	2.9	0.1	91	247	84	77
170	25.311	0.149	0.081	2.16	100	-0.78	99	3.0	0.1	91	248	83	77
171	25.459	0.148	0.081	2.16	100	-1.76	99	2.9	-0.1	91	249	82	77
172	25.607	0.148	0.080	2.18	101	-0.85	99	2.9	0	91	248	82	77
173	25.755	0.148	0.084	2.15	101	-3.43	97	2.8	-0.1	91	248	83	77
174	25.903	0.148	0.082	2.13	101	-2.37	98	2.8	0	91	248	84	77
175	26.052	0.149	0.079	2.14	101	-3.36	101	2.8	0	91	248	85	77
176	26.199	0.147	0.083	2.15	101	-0.79	97	2.8	0	91	248	84	77
177	26.348	0.149	0.081	2.16	101	-2.09	99	2.8	0	90	246	83	77
178	26.495	0.147	0.082	2.17	101	-3.11	97	2.7	-0.1	90	245	82	77
179	26.645	0.150	0.085	2.15	101	-1.89	98	2.6	-0.1	90	244	82	77
180	26.791	0.146	0.081	2.17	101	-3.16	97	2.7	0.1	90	242	83	77
181	26.940	0.149	0.084	2.17	101	-1.61	97	2.7	0	90	241	85	77
182	27.086	0.146	0.082	2.16	101	-1.86	97	2.7	0	90	239	85	77
183	27.236	0.150	0.079	2.17	101	-0.73	101	2.7	0	90	238	84	77
184	27.381	0.145	0.083	2.14	101	-0.86	95	2.6	-0.1	90	237	83	77
185	27.532	0.151	0.081	2.17	101	-2.97	101	2.6	0	90	235	82	77
186	27.677	0.145	0.079	2.16	101	-2.85	98	2.6	0	90	235	82	77
187	27.827	0.150	0.078	2.16	101	-0.97	102	2.6	0	89	234	83	77
188	27.972	0.145	0.084	2.18	101	-3.53	95	2.6	0	89	234	85	77
189	28.124	0.152	0.080	2.16	101	-1.42	102	2.4	-0.2	89	231	85	77
190	28.270	0.146	0.082	2.16	101	-0.87	97	2.5	0.1	89	231	84	77
191	28.420	0.150	0.081	2.15	101	-1.28	100	2.5	0	89	229	83	77
192	28.566	0.146	0.082	2.15	101	-3.25	97	2.5	0	89	228	82	77
193	28.717	0.151	0.079	2.14	101	-3.19	102	2.5	0	89	227	82	77
194	28.862	0.145	0.083	2.13	101	-0.85	95	2.3	-0.2	89	226	84	77
195	29.013	0.151	0.087	2.15	101	-3.17	97	2.4	0.1	89	225	85	77
196	29.158	0.145	0.084	2.13	101	-2.2	95	2.4	0	89	224	84	77
197	29.309	0.151	0.084	2.15	101	-3.15	99	2.4	0	89	225	83	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	29.454	0.145	0.080	2.18	101	-3.17	97	2.4	0	89	223	82	77
199	29.604	0.150	0.080	2.17	101	-3.41	100	2.4	0	89	222	82	77
200	29.750	0.146	0.083	2.17	101	-2.89	96	2.5	0.1	89	222	82	77
201	29.899	0.149	0.081	2.16	101	-1.88	99	2.3	-0.2	89	221	83	77
202	30.046	0.147	0.083	2.18	101	-0.9	97	2.3	0	89	221	84	77
203	30.195	0.149	0.083	2.16	101	-2.87	98	2.3	0	89	220	84	77
204	30.342	0.147	0.081	2.14	101	-3.07	98	2.3	0	89	220	83	77
205	30.490	0.148	0.076	2.16	101	-2.43	102	2.2	-0.1	89	218	82	77
206	30.638	0.148	0.086	2.16	101	-0.86	96	2.2	0	89	218	81	77
207	30.786	0.148	0.081	2.16	101	-3.27	98	2.1	-0.1	89	217	82	77
208	30.935	0.149	0.081	2.17	101	-2.46	99	2.2	0.1	89	217	84	77
209	31.082	0.147	0.081	2.17	101	-2.75	98	2.2	0	89	216	84	77
210	31.232	0.150	0.083	2.16	101	-2.77	99	2.2	0	89	216	84	77
211	31.379	0.147	0.083	2.16	101	-0.73	97	2.2	0	89	215	83	77
212	31.528	0.149	0.078	2.16	101	-3.15	101	2.1	-0.1	89	215	82	77
213	31.675	0.147	0.085	2.15	101	-2.63	95	2.1	0	89	214	81	77
214	31.825	0.150	0.079	2.16	101	-1.45	101	2.2	0.1	88	214	82	77
215	31.970	0.145	0.080	2.14	101	-3.32	97	2.1	-0.1	88	213	83	77
216	32.120	0.150	0.084	2.16	101	-1.93	98	2.1	0	88	213	84	77
217	32.266	0.146	0.079	2.18	101	-3.34	98	2.1	0	88	212	84	77
218	32.416	0.150	0.078	2.17	101	-1.73	102	2.1	0	88	212	83	77
219	32.562	0.146	0.083	2.18	101	-0.73	96	2.1	0	88	213	82	77
220	32.712	0.150	0.080	2.16	102	-3.27	100	2.0	-0.1	88	214	81	77
221	32.857	0.145	0.082	2.16	102	-0.77	96	2.0	0	88	213	82	77
222	33.008	0.151	0.082	2.15	102	-3.4	100	2.0	0	88	213	83	77
223	33.153	0.145	0.081	2.15	102	-0.69	96	2.0	0	88	212	84	77
224	33.305	0.152	0.080	2.17	102	-1.37	101	2.0	0	88	212	84	77
225	33.450	0.145	0.081	2.15	102	-2.21	96	2.0	0	88	212	83	77
226	33.602	0.152	0.081	2.16	102	-3.15	101	1.9	-0.1	88	212	82	78
227	33.747	0.145	0.081	2.16	102	-0.84	96	1.9	0	88	212	81	78
228	33.898	0.151	0.083	2.15	102	-2.14	99	1.9	0	88	212	82	78
229	34.044	0.146	0.084	2.15	102	-1.34	95	1.9	0	88	212	84	78
230	34.195	0.151	0.078	2.16	102	-1.65	102	1.9	0	88	211	84	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	34.341	0.146	0.082	2.18	102	-0.77	96	1.8	-0.1	88	210	84	77
232	34.490	0.149	0.079	2.16	102	-1	100	1.9	0.1	88	210	83	77
233	34.636	0.146	0.081	2.17	102	-1.02	97	1.8	-0.1	88	209	82	77
234	34.786	0.150	0.080	2.17	102	-1.83	100	1.6	-0.2	88	209	81	77
235	34.933	0.147	0.080	2.16	102	-1.14	98	1.8	0.2	88	209	82	77
236	35.082	0.149	0.082	2.18	102	-1.21	98	1.7	-0.1	88	208	83	77
237	35.230	0.148	0.083	2.15	102	-3.35	97	1.7	0	87	208	84	77
238	35.379	0.149	0.079	2.16	102	-0.82	100	1.7	0	87	208	84	77
239	35.528	0.149	0.078	2.16	102	-3.17	101	1.7	0	87	207	83	77
240	35.676	0.148	0.081	2.15	102	-0.75	98	1.7	0	87	207	82	77
241	35.825	0.149	0.080	2.15	102	-3.34	99	1.7	0	87	206	81	77
242	35.972	0.147	0.082	2.15	102	-2.88	97	1.7	0	87	205	82	77
243	36.122	0.150	0.085	2.12	102	-3.31	97	1.7	0	87	205	84	77
244	36.269	0.147	0.081	2.15	102	-3.21	97	1.6	-0.1	87	205	84	77
245	36.419	0.150	0.082	2.15	102	-0.8	99	1.6	0	87	204	84	77
246	36.565	0.146	0.081	2.16	102	-3.36	97	1.6	0	87	205	83	77
247	36.715	0.150	0.083	2.17	102	-0.83	98	1.6	0	87	205	82	77
248	36.860	0.145	0.084	2.15	102	-0.77	94	1.6	0	87	204	81	77
249	37.012	0.152	0.084	2.17	102	-1.31	99	1.6	0	87	203	82	77
250	37.157	0.145	0.080	2.15	102	-3.32	97	1.6	0	87	203	84	77
251	37.308	0.151	0.083	2.17	102	-1.07	99	1.3	-0.3	87	203	84	77
252	37.453	0.145	0.083	2.17	102	-0.58	95	1.5	0.2	87	204	84	77
253	37.605	0.152	0.081	2.16	103	-1.74	101	1.5	0	87	203	83	77
254	37.750	0.145	0.081	2.14	103	-3.37	96	1.5	0	87	202	82	77
255	37.902	0.152	0.084	2.17	103	-2.47	99	1.5	0	87	202	81	77
256	38.048	0.146	0.082	2.15	103	-0.87	96	1.5	0	87	202	82	77
257	38.198	0.150	0.086	2.15	103	-0.87	96	1.4	-0.1	87	201	84	77
258	38.345	0.147	0.079	2.14	103	-3.26	99	1.5	0.1	87	201	84	77
259	38.495	0.150	0.079	2.15	103	-2.51	101	1.4	-0.1	87	200	84	77
260	38.641	0.146	0.084	2.18	103	-0.94	95	1.3	-0.1	87	199	83	77
261	38.791	0.150	0.080	2.17	103	-0.81	100	1.4	0.1	87	200	82	77
262	38.937	0.146	0.084	2.17	103	-3.38	95	1.4	0	87	199	81	77
263	39.087	0.150	0.083	2.19	103	-0.76	98	1.4	0	87	199	82	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	39.234	0.147	0.081	2.16	103	-3.36	97	1.4	0	87	199	84	77
265	39.383	0.149	0.078	2.16	103	-0.78	100	1.3	-0.1	86	199	84	77
266	39.531	0.148	0.086	2.14	103	-1.84	95	1.3	0	86	198	83	77
267	39.681	0.150	0.081	2.15	103	-1.12	99	1.3	0	86	197	82	77
268	39.829	0.148	0.082	2.16	103	-2.62	97	1.3	0	86	197	82	77
269	39.977	0.148	0.080	2.15	103	-3.07	98	1.3	0	86	197	81	77
270	40.127	0.150	0.081	2.18	103	-0.84	99	1.3	0	86	196	83	77
271	40.274	0.147	0.085	2.17	103	-1.74	95	1.2	-0.1	86	196	84	77
272	40.424	0.150	0.082	2.15	103	-1.85	99	1.2	0	86	197	84	77
273	40.570	0.146	0.078	2.16	103	-3.48	98	1.2	0	86	197	83	77
274	40.720	0.150	0.080	2.16	103	-0.99	100	1.3	0.1	86	196	82	77
275	40.866	0.146	0.080	2.17	103	-1.89	97	1.2	-0.1	86	197	81	77
276	41.017	0.151	0.082	2.14	103	-1.19	99	1.2	0	86	195	82	77
277	41.163	0.146	0.082	2.15	103	-2.66	96	1.2	0	86	196	83	77
278	41.313	0.150	0.081	2.16	103	-2.96	99	1.1	-0.1	86	196	84	77
279	41.459	0.146	0.084	2.17	103	-1.54	95	1.1	0	86	196	84	77
280	41.610	0.151	0.080	2.16	103	-3.17	100	1.1	0	86	196	83	77
281	41.756	0.146	0.085	2.15	103	-1.51	94	1.1	0	86	196	82	77
282	41.908	0.152	0.077	2.16	103	-3.05	103	1.1	0	86	195	81	77
283	42.054	0.146	0.081	2.15	103	-0.82	97	1.1	0	86	196	82	77
284	42.205	0.151	0.084	2.17	103	-0.96	98	1.1	0	86	196	83	77
285	42.351	0.146	0.079	2.15	103	-1.95	98	1.0	-0.1	86	195	84	77
286	42.502	0.151	0.078	2.17	103	-2.76	102	1.0	0	86	195	84	77
287	42.648	0.146	0.082	2.18	103	-1.48	96	1.0	0	86	195	83	77
288	42.797	0.149	0.080	2.15	103	-1.2	99	1.0	0	86	194	82	77
289	42.944	0.147	0.082	2.17	103	-3.2	97	1.0	0	86	194	81	77
290	43.094	0.150	0.079	2.17	103	-0.79	100	1.0	0	86	193	82	77
291	43.241	0.147	0.084	2.18	103	-1.61	95	1.0	0	86	194	84	77
292	43.390	0.149	0.078	2.14	103	-0.92	100	0.9	-0.1	86	194	84	77
293	43.538	0.148	0.078	2.14	103	-1.18	100	0.9	0	86	194	84	77
294	43.688	0.150	0.086	2.16	103	-3.39	96	0.8	-0.1	86	194	83	77
295	43.836	0.148	0.078	2.15	103	-0.77	100	0.9	0.1	85	193	82	77
296	43.984	0.148	0.083	2.15	103	-1.23	97	0.9	0	86	192	81	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	44.134	0.150	0.081	2.15	103	-0.87	99	0.9	0	85	191	82	77
298	44.281	0.147	0.084	2.15	103	-2.83	95	0.9	0	85	190	84	77
299	44.431	0.150	0.080	2.16	103	-0.99	100	0.9	0	85	188	84	77
300	44.577	0.146	0.081	2.16	103	-3.37	96	0.8	-0.1	85	188	84	77
301	44.728	0.151	0.084	2.19	103	-0.76	98	0.8	0	85	187	83	77
302	44.873	0.145	0.087	2.16	103	-1.2	92	0.8	0	85	187	82	77
303	45.024	0.151	0.078	2.14	103	-0.97	102	0.9	0.1	85	186	81	77
304	45.170	0.146	0.079	2.15	103	-3.24	98	0.8	-0.1	85	185	82	77
305	45.320	0.150	0.082	2.15	103	-0.97	98	0.8	0	85	184	84	77
306	45.466	0.146	0.080	2.15	103	-1.15	97	0.8	0	85	184	84	77
307	45.617	0.151	0.083	2.15	103	-0.86	99	0.7	-0.1	85	183	83	77
308	45.763	0.146	0.083	2.16	103	-3.52	95	0.7	0	85	184	82	77
309	45.914	0.151	0.080	2.13	103	-1.41	100	0.7	0	85	183	81	77
310	46.060	0.146	0.083	2.15	103	-1.84	95	0.6	-0.1	85	183	82	77
311	46.211	0.151	0.077	2.16	103	-2.33	102	0.8	0.2	85	182	83	77
312	46.357	0.146	0.081	2.14	103	-3.43	96	0.7	-0.1	85	182	84	77
313	46.508	0.151	0.081	2.17	103	-2.8	100	0.7	0	85	181	84	77
314	46.654	0.146	0.083	2.15	103	-3.52	95	0.7	0	85	180	83	77
315	46.804	0.150	0.082	2.15	103	-2.55	98	0.7	0	85	179	82	77
316	46.950	0.146	0.083	2.17	103	-3.14	95	0.6	-0.1	84	179	81	77
317	47.100	0.150	0.083	2.14	103	-3.31	98	0.6	0	85	179	82	77
318	47.247	0.147	0.080	2.16	103	-2.12	98	0.6	0	84	178	83	77
319	47.396	0.149	0.080	2.16	103	-3.35	99	0.6	0	84	179	84	77
320	47.544	0.148	0.076	2.16	103	-0.88	101	0.6	0	84	179	84	77
321	47.693	0.149	0.082	2.14	103	-3.27	98	0.6	0	84	178	83	77
322	47.842	0.149	0.080	2.16	103	-2.4	99	0.6	0	84	178	82	77
323	47.990	0.148	0.083	2.14	103	-1.18	96	0.6	0	84	178	81	77
324	48.139	0.149	0.083	2.14	103	-3.22	97	0.5	-0.1	84	177	82	77
325	48.287	0.148	0.080	2.14	103	-2.05	98	0.5	0	84	177	84	77
326	48.436	0.149	0.078	2.14	103	-1.86	100	0.5	0	84	177	84	77
327	48.583	0.147	0.083	2.17	103	-3.02	96	0.4	-0.1	84	177	84	77
328	48.734	0.151	0.079	2.17	103	-3.43	101	0.5	0.1	84	177	83	77
329	48.879	0.145	0.079	2.16	103	-1.89	97	0.5	0	84	176	82	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	49.030	0.151	0.080	2.16	103	-1.82	100	0.6	0.1	84	177	81	77
331	49.176	0.146	0.083	2.17	103	-0.82	95	0.5	-0.1	84	176	83	77
332	49.326	0.150	0.080	2.15	103	-0.95	100	0.4	-0.1	84	176	84	77
333	49.472	0.146	0.083	2.16	103	-1.04	95	0.4	0	84	176	84	77
334	49.623	0.151	0.080	2.15	103	-2.17	100	0.5	0.1	84	176	83	77
335	49.770	0.147	0.084	2.16	103	-0.81	95	0.3	-0.2	84	176	82	77
336	49.921	0.151	0.084	2.16	103	-2.57	98	0.4	0.1	84	176	81	77
337	50.067	0.146	0.080	2.15	103	-0.93	97	0.4	0	84	176	82	77
338	50.218	0.151	0.080	2.15	103	-2.38	100	0.4	0	84	176	83	77
339	50.364	0.146	0.081	2.16	103	-0.85	96	0.4	0	84	176	84	77
340	50.515	0.151	0.082	2.15	103	-2.95	99	0.4	0	84	176	84	77
341	50.661	0.146	0.084	2.15	103	-0.73	95	0.3	-0.1	84	175	83	77
342	50.811	0.150	0.087	2.16	103	-0.95	96	0.3	0	84	176	82	76
343	50.957	0.146	0.083	2.17	103	-2.83	95	0.3	0	84	175	81	77
344	51.108	0.151	0.077	2.19	103	-1.93	102	0.3	0	84	176	82	77
345	51.255	0.147	0.083	2.15	103	-1.31	96	0.3	0	84	175	84	76
346	51.404	0.149	0.085	2.16	103	-2.29	96	0.3	0	84	176	84	77
347	51.552	0.148	0.080	2.15	103	-2.15	98	0.3	0	84	176	84	77
348	51.701	0.149	0.084	2.17	103	-2.86	96	0.3	0	83	176	83	77
349	51.850	0.149	0.081	2.15	103	-1.86	98	0.2	-0.1	83	175	82	77
350	51.998	0.148	0.081	2.15	103	-3.3	98	0.2	0	83	175	81	77
351	52.148	0.150	0.081	2.17	103	-0.84	99	0.2	0	83	174	82	77
352	52.295	0.147	0.080	2.15	103	-0.92	98	0.1	-0.1	83	174	84	77
353	52.446	0.151	0.081	2.16	103	-2.93	100	0.1	0	83	174	84	77
354	52.592	0.146	0.081	2.15	103	-2.77	96	0.2	0.1	83	174	83	77
355	52.742	0.150	0.083	2.17	103	-2.9	98	0.1	-0.1	83	174	82	77
356	52.888	0.146	0.084	2.15	103	-1.82	95	0.2	0.1	83	174	81	77
357	53.039	0.151	0.083	2.17	103	-3.15	98	0.2	0	83	174	82	77
358	53.184	0.145	0.083	2.17	103	-1.09	94	0.1	-0.1	83	174	83	77
359	53.335	0.151	0.085	2.16	103	-1.01	97	0.1	0	83	173	84	77
360	53.481	0.146	0.079	2.14	103	-3.26	97	0.1	0	83	173	84	77
361	53.633	0.152	0.084	2.16	103	-1.39	98	0.1	0	83	172	83	76
362	53.779	0.146	0.087	2.15	103	-1.98	93	0.1	0	83	172	82	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	53.931	0.152	0.083	2.15	103	-1.91	99	0.1	0	83	172	81	76
364	54.076	0.145	0.078	2.19	103	-2.48	97	0.1	0	83	171	82	76
365	54.228	0.152	0.080	2.17	103	-3	101	0.1	0	83	171	84	76
366	54.374	0.146	0.086	2.18	103	-0.95	93	0.1	0	83	171	84	76
367	54.524	0.150	0.082	2.17	103	-0.87	98	0.0	-0.1	83	171	84	76
Avg/Tot	54.524	0.148	0.082	2.15	97	-1.70	99			98	334	83	77.2

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	74	-1		81	0.000	5.17	0.24
1	0.128	0.128	2.25	74	-1.76	95	82	-0.070	3.03	0.37
2	0.277	0.149	2.34	74	-1.76	109	81	-0.070	5.86	1.38
3	0.425	0.148	2.33	74	-2.66	110	81	-0.100	8.64	1.28
4	0.575	0.150	2.32	74	-1.96	109	80	-0.110	12.68	0.44
5	0.719	0.144	2.22	74	-2.28	105	81	-0.100	14.95	0.51
6	0.863	0.144	2.21	74	-2.38	108	82	-0.100	15.90	0.30
7	1.007	0.144	2.19	74	-1.09	106	84	-0.110	17.32	0.12
8	1.150	0.143	2.19	74	-1.47	106	83	-0.100	18.83	0.43
9	1.296	0.146	2.17	75	-0.51	108	84	-0.100	17.17	2.61
10	1.438	0.142	2.17	75	-0.51	104	85	-0.080	16.88	1.46
11	1.584	0.146	2.16	75	-2.93	106	85	-0.080	15.71	0.88
12	1.724	0.140	2.15	75	-0.94	102	85	-0.090	15.11	0.85
13	1.870	0.146	2.14	76	-2.7	104	85	-0.090	15.35	0.85
14	2.010	0.140	2.14	76	-1.06	104	85	-0.080	15.32	0.95
15	2.156	0.146	2.15	76	-0.73	107	85	-0.080	15.67	1.04
16	2.297	0.141	2.16	77	-2.86	101	85	-0.080	15.75	1.14
17	2.443	0.146	2.15	77	-3.03	103	85	-0.080	15.67	1.12
18	2.585	0.142	2.15	77	-2.22	103	85	-0.080	15.62	1.08
19	2.728	0.143	2.13	78	-3.1	105	85	-0.080	15.62	1.10
20	2.871	0.143	2.13	78	-2.27	102	85	-0.090	15.32	1.01
21	3.012	0.141	2.13	79	-1.16	103	85	-0.080	15.39	0.99
22	3.157	0.145	2.12	79	-3.07	104	85	-0.080	15.07	0.98
23	3.298	0.141	2.13	79	-0.73	104	85	-0.090	15.19	0.91
24	3.442	0.144	2.12	80	-1.78	103	85	-0.100	14.71	0.92
25	3.582	0.140	2.11	80	-2.91	97	85	-0.080	14.95	0.77
26	3.727	0.145	2.11	80	-2.08	105	85	-0.080	14.73	0.85
27	3.868	0.141	2.13	81	-1.28	103	85	-0.080	15.19	0.82
28	4.012	0.144	2.12	81	-1.07	102	85	-0.080	14.90	0.85
29	4.154	0.142	2.12	82	-0.77	102	85	-0.080	15.29	0.83
30	4.297	0.143	2.11	82	-1.33	103	85	-0.090	14.75	0.89
31	4.439	0.142	2.11	82	-1.1	101	85	-0.080	14.45	0.69

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.579	0.140	2.09	83	-1.74	99	85	-0.080	14.90	0.71
33	4.724	0.145	2.10	83	-3.05	105	85	-0.080	15.32	0.72
34	4.865	0.141	2.10	83	-0.62	100	86	-0.080	14.68	0.73
35	5.010	0.145	2.08	84	-2.8	99	86	-0.080	15.35	0.74
36	5.150	0.140	2.10	84	-2.65	99	86	-0.080	14.67	0.65
37	5.295	0.145	2.08	84	-2.34	106	86	-0.080	15.73	0.70
38	5.434	0.139	2.09	85	-1.81	98	86	-0.080	14.55	0.67
39	5.579	0.145	2.07	85	-2.06	102	86	-0.080	15.47	0.65
40	5.721	0.142	2.09	85	-1.29	101	86	-0.080	14.75	0.61
41	5.865	0.144	2.09	86	-1.01	102	86	-0.080	15.64	0.65
42	6.006	0.141	2.10	86	-3.02	99	86	-0.080	15.74	0.67
43	6.147	0.141	2.08	86	-1.59	101	86	-0.080	15.14	0.70
44	6.291	0.144	2.07	87	-3.11	102	86	-0.080	15.83	0.61
45	6.432	0.141	2.09	87	-2.5	99	86	-0.090	15.25	0.62
46	6.577	0.145	2.09	87	-2.85	102	86	-0.090	15.86	0.75
47	6.717	0.140	2.08	87	-0.64	101	86	-0.080	16.14	0.90
48	6.861	0.144	2.06	88	-1.73	103	86	-0.080	15.93	0.99
49	7.000	0.139	2.06	88	-1.99	97	86	-0.090	15.66	0.94
50	7.145	0.145	2.07	88	-1.07	104	86	-0.080	15.71	0.75
51	7.286	0.141	2.07	89	-0.67	102	86	-0.090	16.00	0.81
52	7.429	0.143	2.05	89	-3.18	101	86	-0.080	16.60	1.20
53	7.571	0.142	2.06	89	-3.02	100	86	-0.100	16.59	1.24
54	7.711	0.140	2.04	89	-1.33	97	86	-0.080	16.84	1.29
55	7.854	0.143	2.04	90	-2.22	99	86	-0.080	16.59	1.23
56	7.994	0.140	2.03	90	-1.46	95	87	-0.080	16.64	1.11
57	8.141	0.147	2.13	90	-3.25	103	87	-0.080	16.47	1.00
58	8.282	0.141	2.11	90	-3.16	99	87	-0.090	16.67	1.15
59	8.429	0.147	2.10	90	-3.26	106	87	-0.090	16.59	1.23
60	8.570	0.141	2.10	91	-0.91	100	87	-0.080	16.70	1.26
61	8.714	0.144	2.05	91	-2.41	100	87	-0.090	16.83	1.44
62	8.859	0.145	2.22	91	-3.35	102	87	-0.080	16.61	1.45
63	9.008	0.149	2.18	91	-1.96	105	87	-0.080	16.94	1.72

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.152	0.144	2.13	91	-1.47	100	87	-0.090	16.75	1.84
65	9.298	0.146	2.09	92	-1.2	104	87	-0.080	16.88	1.91
66	9.440	0.142	2.17	92	-3.71	100	87	-0.090	16.85	1.82
67	9.586	0.146	2.02	92	-4.17	102	87	-0.090	16.86	1.82
68	9.721	0.135	1.75	92	-2.66	97	86	-0.080	16.94	1.85
69	9.868	0.147	2.26	92	-2.19	101	86	-0.080	16.77	1.42
70	10.009	0.141	2.23	93	-2.37	100	86	-0.090	16.62	1.51
71	10.156	0.147	2.19	93	-1.8	103	85	-0.090	16.63	1.66
72	10.297	0.141	2.19	93	-2.32	101	85	-0.080	17.14	1.75
73	10.441	0.144	2.15	93	-1.1	102	85	-0.080	16.94	1.98
74	10.586	0.145	2.12	93	-2.07	102	85	-0.090	16.93	1.92
75	10.735	0.149	2.12	93	-2.92	107	85	-0.080	16.84	2.00
76	10.879	0.144	2.11	93	-2.21	100	84	-0.090	16.78	1.96
77	11.025	0.146	2.13	93	-3.71	103	84	-0.070	16.75	2.11
78	11.167	0.142	2.12	94	-2.02	99	84	-0.090	16.48	2.13
79	11.313	0.146	2.10	94	-2.04	101	84	-0.080	16.79	1.99
80	11.459	0.146	2.10	94	-2.37	101	84	-0.080	16.64	2.15
81	11.602	0.143	2.11	94	-1.66	100	84	-0.080	16.49	2.36
82	11.749	0.147	2.08	94	-1.66	103	83	-0.070	16.38	1.49
83	11.899	0.150	2.06	94	-2.85	106	84	-0.080	16.22	1.22
84	12.041	0.142	2.08	94	-2.89	102	85	-0.080	16.14	1.17
85	12.187	0.146	2.09	95	-2.35	105	86	-0.080	16.37	1.16
86	12.328	0.141	2.07	95	-2.77	101	86	-0.080	16.70	1.25
87	12.474	0.146	2.07	95	-2.42	100	86	-0.080	16.60	1.36
88	12.615	0.141	2.06	95	-1.57	99	86	-0.080	15.97	0.79
89	12.760	0.145	2.07	95	-2.53	99	86	-0.080	15.41	0.61
90	12.901	0.141	2.08	95	-2.33	100	86	-0.070	15.10	0.63
91	13.047	0.146	2.07	95	-2.82	100	86	-0.100	14.92	0.60
92	13.189	0.142	2.08	95	-1.9	99	86	-0.080	14.95	0.64
93	13.334	0.145	2.07	96	-0.46	103	86	-0.080	14.93	0.69
94	13.477	0.143	2.08	96	-0.42	98	86	-0.070	15.11	0.78
95	13.621	0.144	2.07	96	-2.97	99	86	-0.070	15.33	0.71

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	13.765	0.144	2.08	96	-1.95	104	86	-0.080	15.44	0.67
97	13.906	0.141	2.08	96	-1.97	99	86	-0.090	15.11	0.91
98	14.052	0.146	2.07	96	-2.01	101	86	-0.080	15.46	0.91
99	14.194	0.142	2.06	96	-1.87	96	86	-0.070	15.98	1.16
100	14.340	0.146	2.07	96	-2.71	103	86	-0.080	15.90	1.06
101	14.482	0.142	2.08	96	-0.46	100	86	-0.100	15.74	0.90
102	14.627	0.145	2.06	96	-1.2	101	86	-0.090	15.84	1.27
103	14.768	0.141	2.07	97	-1.03	98	86	-0.080	15.91	1.30
104	14.914	0.146	2.07	97	-0.46	101	86	-0.080	15.63	1.34
105	15.055	0.141	2.20	97	-1.51	96	86	-0.090	15.47	1.36
106	15.205	0.150	2.19	97	-1.57	104	86	-0.080	15.56	1.17
107	15.351	0.146	2.19	97	-1.17	102	87	-0.080	15.48	1.33
108	15.501	0.150	2.19	97	-0.99	104	86	-0.080	15.61	1.27
109	15.646	0.145	2.19	97	-0.54	100	86	-0.090	15.47	1.03
110	15.796	0.150	2.17	97	-0.62	102	87	-0.070	15.41	0.91
111	15.941	0.145	2.18	97	-2.5	102	86	-0.070	15.25	0.99
112	16.091	0.150	2.17	97	-1.04	106	86	-0.080	15.27	0.91
113	16.236	0.145	2.17	97	-0.79	99	86	-0.080	15.03	0.71
114	16.385	0.149	2.17	97	-1.14	106	86	-0.070	14.82	0.53
115	16.530	0.145	2.17	98	-0.58	102	86	-0.090	14.58	0.50
116	16.679	0.149	2.15	98	-2.42	101	86	-0.090	14.67	0.49
117	16.824	0.145	2.17	98	-1.32	102	86	-0.080	14.49	0.48
118	16.974	0.150	2.16	98	-2.95	101	86	-0.080	14.47	0.41
119	17.118	0.144	2.16	98	-1.79	104	86	-0.080	14.46	0.49
120	17.268	0.150	2.16	98	-2.66	103	86	-0.070	14.17	0.46
121	17.412	0.144	2.16	98	-0.58	100	86	-0.080	14.13	0.49
122	17.561	0.149	2.15	98	-2.29	102	86	-0.070	14.24	0.46
123	17.706	0.145	2.14	98	-2.2	101	86	-0.060	14.36	0.41
124	17.855	0.149	2.13	98	-1.74	103	86	-0.080	14.31	0.38
125	18.000	0.145	2.14	98	-3	99	86	-0.090	14.32	0.36
126	18.149	0.149	2.15	98	-3.15	104	86	-0.070	14.05	0.43
127	18.293	0.144	2.15	98	-2.8	99	86	-0.080	14.05	0.44

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.442	0.149	2.15	98	-1.05	102	86	-0.070	13.70	0.50
129	18.586	0.144	2.13	98	-0.59	98	86	-0.070	13.55	0.49
130	18.736	0.150	2.16	98	-1.17	104	86	-0.070	12.39	0.57
131	18.880	0.144	2.16	98	-1.97	99	86	-0.060	11.98	0.56
132	19.029	0.149	2.15	98	-1.51	102	86	-0.070	11.55	0.57
133	19.173	0.144	2.16	99	-2.29	100	85	-0.060	10.85	0.60
134	19.322	0.149	2.16	99	-0.61	100	85	-0.050	10.30	0.68
135	19.467	0.145	2.16	99	-3.1	102	85	-0.060	10.47	0.66
136	19.616	0.149	2.16	99	-2.09	103	85	-0.060	10.26	0.66
137	19.760	0.144	2.15	99	-2.48	98	85	-0.050	10.56	0.53
138	19.909	0.149	2.16	99	-2.29	101	85	-0.070	10.21	0.67
139	20.053	0.144	2.15	99	-0.51	100	85	-0.060	10.03	0.78
140	20.202	0.149	2.15	99	-1.15	104	85	-0.070	10.07	0.87
141	20.346	0.144	2.16	99	-2.52	101	85	-0.060	10.12	0.91
142	20.495	0.149	2.16	99	-1.66	100	85	-0.070	9.97	0.92
143	20.640	0.145	2.15	99	-1.43	98	85	-0.060	10.00	0.92
144	20.789	0.149	2.15	99	-0.75	102	84	-0.050	10.05	0.97
145	20.933	0.144	2.16	99	-0.75	97	84	-0.060	9.73	0.99
146	21.082	0.149	2.14	99	-2.63	101	84	-0.060	9.41	1.09
147	21.226	0.144	2.16	99	-1.38	100	84	-0.060	9.57	0.99
148	21.375	0.149	2.15	99	-1.85	103	84	-0.040	9.48	0.96
149	21.520	0.145	2.16	99	-2.98	99	84	-0.050	9.76	0.91
150	21.669	0.149	2.16	99	-1.94	102	84	-0.050	9.63	0.91
151	21.813	0.144	2.15	99	-2.63	100	84	-0.050	9.72	0.93
152	21.962	0.149	2.16	99	-2.41	100	84	-0.050	9.79	0.89
153	22.107	0.145	2.15	99	-0.82	100	84	-0.030	9.96	0.78
154	22.255	0.148	2.14	99	-3.03	100	84	-0.040	9.78	0.83
155	22.400	0.145	2.14	100	-1.86	99	84	-0.050	8.47	1.09
156	22.549	0.149	2.14	100	-2.95	99	83	-0.050	8.37	1.14
157	22.693	0.144	2.15	100	-3.09	97	83	-0.050	8.25	1.30
158	22.842	0.149	2.14	100	-1.06	100	83	-0.040	8.23	1.29
159	22.987	0.145	2.15	100	-2.9	99	83	-0.050	8.10	1.29

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.136	0.149	2.14	100	-0.8	99	83	-0.060	8.11	1.25
161	23.280	0.144	2.15	100	-2.82	97	83	-0.050	8.09	1.26
162	23.429	0.149	2.14	100	-3.15	99	83	-0.050	8.33	1.23
163	23.574	0.145	2.15	100	-2.8	98	83	-0.050	8.28	1.24
164	23.722	0.148	2.15	100	-1.19	100	83	-0.030	8.30	1.33
165	23.867	0.145	2.15	100	-0.66	97	83	-0.040	8.23	1.26
166	24.016	0.149	2.15	100	-3.06	103	83	-0.040	8.37	1.27
167	24.160	0.144	2.15	100	-2.01	98	83	-0.040	8.46	1.24
168	24.309	0.149	2.14	100	-0.92	101	83	-0.040	8.58	1.26
169	24.454	0.145	2.15	100	-0.62	101	83	-0.040	8.52	1.27
170	24.603	0.149	2.15	100	-2.25	101	83	-0.040	8.76	1.28
171	24.747	0.144	2.16	100	-1.15	98	82	-0.040	8.83	1.29
172	24.896	0.149	2.16	100	-3.01	102	82	-0.040	8.72	1.30
173	25.041	0.145	2.16	100	-2.56	97	82	-0.040	8.94	1.30
174	25.190	0.149	2.15	100	-1.76	101	82	-0.040	8.97	1.27
175	25.334	0.144	2.15	100	-1.03	99	82	-0.050	9.15	1.27
176	25.483	0.149	2.15	100	-1.86	100	82	-0.030	9.08	1.25
177	25.628	0.145	2.15	100	-2.69	98	82	-0.050	8.61	1.28
178	25.777	0.149	2.15	100	-1.4	100	82	-0.030	8.13	1.30
179	25.922	0.145	2.16	100	-0.7	96	82	-0.050	8.14	1.28
180	26.071	0.149	2.16	100	-0.58	101	82	-0.040	8.29	1.22
181	26.215	0.144	2.15	100	-1.81	96	82	-0.030	8.41	1.21
182	26.364	0.149	2.16	100	-0.57	100	82	-0.020	8.36	1.17
183	26.509	0.145	2.14	100	-2.59	100	82	-0.030	8.37	1.15
184	26.658	0.149	2.14	100	-0.78	100	82	-0.040	8.30	1.23
185	26.803	0.145	2.12	100	-2.74	98	82	-0.030	8.36	1.25
186	26.952	0.149	2.14	100	-0.68	102	82	-0.030	8.24	1.39
187	27.097	0.145	2.15	100	-0.52	100	82	-0.040	8.07	1.33
188	27.245	0.148	2.15	100	-1.11	99	82	-0.030	8.08	1.32
189	27.391	0.146	2.16	100	-0.77	100	82	-0.040	7.95	1.37
190	27.539	0.148	2.16	100	-0.68	100	81	-0.040	7.92	1.49
191	27.684	0.145	2.16	100	-1.58	98	82	-0.040	8.09	1.43

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	27.833	0.149	2.15	100	-2.54	100	81	-0.020	8.07	1.38
193	27.978	0.145	2.14	100	-2.88	100	81	-0.040	8.15	1.37
194	28.127	0.149	2.15	100	-3.08	100	81	-0.020	8.03	1.39
195	28.272	0.145	2.15	100	-2.4	95	81	-0.030	7.93	1.31
196	28.421	0.149	2.15	100	-0.66	99	81	-0.040	8.12	1.32
197	28.566	0.145	2.15	100	-2.55	97	81	-0.030	7.95	1.31
198	28.714	0.148	2.15	100	-1.52	101	81	-0.040	7.94	1.28
199	28.860	0.146	2.15	100	-0.54	100	81	-0.040	8.08	1.33
200	29.008	0.148	2.14	100	-3	99	81	-0.040	8.11	1.27
201	29.153	0.145	2.15	100	-0.68	98	81	-0.020	8.07	1.22
202	29.301	0.148	2.14	100	-1.39	99	81	-0.040	7.81	1.10
203	29.447	0.146	2.15	100	-2.44	98	81	-0.040	7.92	1.07
204	29.595	0.148	2.15	100	-0.64	100	81	-0.050	8.01	1.05
205	29.740	0.145	2.15	100	-2.88	101	81	-0.020	8.09	1.08
206	29.889	0.149	2.13	100	-2.93	98	81	-0.030	7.98	1.05
207	30.034	0.145	2.15	100	-2.98	98	81	-0.040	7.89	1.09
208	30.182	0.148	2.14	100	-1.55	100	81	-0.040	7.85	1.08
209	30.328	0.146	2.14	100	-2.75	99	81	-0.030	7.84	1.10
210	30.476	0.148	2.14	100	-1.5	99	81	-0.050	7.81	1.10
211	30.622	0.146	2.14	101	-0.7	98	81	-0.030	7.55	1.11
212	30.770	0.148	2.13	101	-1.96	102	81	-0.030	7.65	1.06
213	30.916	0.146	2.14	101	-2.99	96	81	-0.040	7.53	1.08
214	31.064	0.148	2.14	101	-0.66	101	81	-0.030	7.67	1.08
215	31.210	0.146	2.13	101	-1.5	99	81	-0.030	7.39	1.15
216	31.358	0.148	2.15	101	-0.77	98	81	-0.030	7.49	1.13
217	31.504	0.146	2.15	101	-0.58	100	81	-0.030	7.74	1.15
218	31.652	0.148	2.14	101	-0.66	102	81	-0.040	7.51	1.18
219	31.798	0.146	2.15	101	-1.18	98	81	-0.030	7.62	1.32
220	31.945	0.147	2.16	101	-0.62	100	81	-0.030	7.80	1.32
221	32.092	0.147	2.14	101	-0.68	99	81	-0.040	7.58	1.35
222	32.239	0.147	2.14	101	-0.68	99	81	-0.040	7.50	1.27
223	32.386	0.147	2.14	101	-0.96	99	81	-0.030	7.49	1.27

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	32.533	0.147	2.16	101	-2.4	100	81	-0.040	7.55	1.31
225	32.680	0.147	2.14	101	-2.5	99	81	-0.040	7.75	1.25
226	32.827	0.147	2.15	101	-0.67	99	81	-0.030	7.68	1.26
227	32.973	0.146	2.14	101	-0.59	99	81	-0.040	7.45	1.34
228	33.121	0.148	2.15	101	-2.75	99	81	-0.040	7.66	1.31
229	33.268	0.147	2.14	101	-1.71	98	81	-0.040	7.69	1.34
230	33.415	0.147	2.14	101	-1.03	101	81	-0.030	7.38	1.38
231	33.562	0.147	2.15	101	-1.2	99	81	-0.030	7.36	1.35
232	33.709	0.147	2.15	101	-1.34	101	81	-0.040	7.54	1.30
233	33.856	0.147	2.14	101	-3.12	99	81	-0.030	7.67	1.27
234	34.002	0.146	2.14	101	-3.05	99	81	-0.030	7.57	1.19
235	34.149	0.147	2.14	101	-0.85	100	81	-0.030	7.66	1.05
236	34.296	0.147	2.15	101	-0.6	99	81	-0.030	7.46	1.07
237	34.443	0.147	2.15	101	-0.76	98	81	-0.040	7.47	1.03
238	34.590	0.147	2.14	101	-3.09	101	81	-0.030	7.45	1.00
239	34.737	0.147	2.14	102	-2.31	101	81	-0.020	7.51	1.08
240	34.883	0.146	2.14	102	-1.17	98	81	-0.030	7.56	1.06
241	35.031	0.148	2.15	102	-0.66	100	81	-0.030	7.50	1.08
242	35.177	0.146	2.14	102	-1.07	98	81	-0.040	7.68	1.05
243	35.325	0.148	2.14	102	-2.95	97	81	-0.040	7.59	1.06
244	35.471	0.146	2.15	102	-2.77	98	81	-0.050	7.56	1.05
245	35.619	0.148	2.14	102	-3.08	99	81	-0.030	7.47	1.07
246	35.765	0.146	2.13	102	-1.76	98	81	-0.040	7.29	1.03
247	35.913	0.148	2.13	102	-0.56	99	81	-0.030	7.18	0.98
248	36.059	0.146	2.13	102	-0.65	97	81	-0.030	7.23	1.03
249	36.207	0.148	2.14	102	-0.67	98	81	-0.020	7.09	0.98
250	36.353	0.146	2.15	102	-0.62	99	81	-0.030	7.31	1.04
251	36.501	0.148	2.15	102	-0.71	99	81	-0.030	7.46	1.04
252	36.647	0.146	2.15	102	-1.75	97	81	-0.030	7.23	1.10
253	36.795	0.148	2.16	102	-1.36	100	81	-0.030	7.38	1.07
254	36.941	0.146	2.13	102	-2.15	98	81	-0.030	7.26	1.09
255	37.089	0.148	2.14	102	-2.12	98	81	-0.030	7.28	1.05

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	37.234	0.145	2.15	102	-2.98	97	81	-0.030	7.19	1.09
257	37.383	0.149	2.15	102	-1.27	97	81	-0.040	7.21	1.12
258	37.528	0.145	2.14	102	-2.92	99	81	-0.030	7.27	1.16
259	37.676	0.148	2.15	102	-1.57	101	81	-0.030	7.26	1.16
260	37.822	0.146	2.16	102	-2.51	97	81	-0.020	7.41	1.15
261	37.970	0.148	2.15	102	-1.93	100	81	-0.030	7.32	1.12
262	38.116	0.146	2.15	102	-0.66	97	81	-0.020	7.39	1.11
263	38.264	0.148	2.15	102	-1.91	99	81	-0.030	7.28	1.11
264	38.409	0.145	2.16	102	-2.99	98	81	-0.040	7.29	1.13
265	38.558	0.149	2.14	102	-1.57	102	81	-0.030	7.48	1.13
266	38.703	0.145	2.14	102	-3.03	95	81	-0.040	7.58	1.11
267	38.852	0.149	2.13	102	-2.61	100	81	-0.030	7.40	1.08
268	38.998	0.146	2.13	102	-0.63	98	81	-0.030	7.64	1.09
269	39.147	0.149	2.15	102	-1.85	101	81	-0.030	7.50	1.04
270	39.292	0.145	2.15	102	-1.39	98	81	-0.040	7.32	1.04
271	39.441	0.149	2.15	102	-0.68	98	81	-0.010	7.47	1.00
272	39.586	0.145	2.13	102	-2.73	97	81	-0.030	7.40	0.98
273	39.735	0.149	2.15	102	-0.78	102	81	-0.030	7.56	0.99
274	39.880	0.145	2.15	102	-1.18	98	81	-0.030	7.54	0.94
275	40.029	0.149	2.15	102	-0.75	101	81	-0.030	7.50	0.98
276	40.174	0.145	2.15	102	-0.65	97	81	-0.030	7.53	0.93
277	40.323	0.149	2.14	102	-1.85	100	81	-0.030	7.41	0.94
278	40.468	0.145	2.14	102	-3.05	98	81	-0.040	7.53	0.93
279	40.617	0.149	2.14	102	-0.63	99	81	-0.020	7.46	0.93
280	40.762	0.145	2.14	102	-2.89	98	81	-0.040	7.43	0.93
281	40.911	0.149	2.15	102	-0.6	98	81	-0.040	7.60	0.96
282	41.056	0.145	2.14	102	-0.5	100	81	-0.030	7.55	0.96
283	41.206	0.150	2.14	102	-2.77	101	81	-0.030	7.45	1.01
284	41.350	0.144	2.12	102	-3.04	95	81	-0.030	7.51	1.02
285	41.500	0.150	2.14	102	-1.77	102	81	-0.030	7.65	1.02
286	41.645	0.145	2.15	102	-1	100	81	-0.030	7.69	1.04
287	41.795	0.150	2.15	102	-0.83	100	81	-0.030	7.39	1.01

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	41.939	0.144	2.15	103	-3	97	81	-0.040	7.45	0.98
289	42.089	0.150	2.14	103	-1.38	100	81	-0.030	7.18	0.99
290	42.234	0.145	2.15	103	-2.98	99	81	-0.020	7.03	1.03
291	42.383	0.149	2.13	103	-2.64	98	81	-0.040	7.10	1.03
292	42.528	0.145	2.13	103	-3.12	99	81	-0.030	7.07	1.00
293	42.678	0.150	2.15	103	-1.08	103	81	-0.030	7.12	1.05
294	42.822	0.144	2.16	103	-0.94	94	81	-0.030	7.22	1.01
295	42.972	0.150	2.14	103	-2.74	103	81	-0.030	6.74	1.13
296	43.117	0.145	2.15	103	-1.37	96	81	-0.040	6.48	1.20
297	43.266	0.149	2.14	103	-2.33	100	81	-0.040	6.38	1.19
298	43.411	0.145	2.15	103	-0.61	96	81	-0.040	6.39	1.16
299	43.561	0.150	2.15	103	-2.78	101	81	-0.030	6.39	1.18
300	43.705	0.144	2.14	103	-2.06	97	81	-0.020	6.41	1.14
301	43.855	0.150	2.14	103	-1.12	99	81	-0.030	6.38	1.15
302	44.000	0.145	2.13	103	-2.93	94	81	-0.020	6.56	1.06
303	44.150	0.150	2.15	103	-1.58	103	81	-0.030	6.43	1.10
304	44.295	0.145	2.16	103	-2.25	99	81	-0.030	6.38	1.07
305	44.444	0.149	2.14	103	-2.93	99	81	-0.030	6.41	1.08
306	44.589	0.145	2.14	103	-2.13	98	81	-0.030	6.56	1.07
307	44.738	0.149	2.15	103	-1.18	99	80	-0.040	6.40	1.08
308	44.883	0.145	2.15	103	-2.62	96	81	-0.030	6.39	0.99
309	45.032	0.149	2.15	103	-1.29	101	80	-0.040	6.42	0.99
310	45.177	0.145	2.14	103	-1.42	96	80	-0.030	6.54	1.00
311	45.326	0.149	2.15	103	-2.71	103	80	-0.030	6.41	1.03
312	45.471	0.145	2.15	103	-2.95	97	80	-0.020	6.56	1.02
313	45.620	0.149	2.17	103	-1.39	100	80	-0.030	6.46	1.05
314	45.765	0.145	2.14	103	-2.98	96	80	-0.020	6.50	1.11
315	45.914	0.149	2.13	103	-0.77	99	80	-0.040	6.39	1.07
316	46.060	0.146	2.14	103	-0.94	97	80	-0.010	6.42	1.09
317	46.209	0.149	2.16	103	-1.06	99	80	-0.030	6.51	1.06
318	46.354	0.145	2.14	103	-1.31	98	80	-0.030	6.55	1.08
319	46.503	0.149	2.15	103	-1.4	101	80	-0.030	6.70	1.12

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	46.649	0.146	2.14	103	-0.94	101	80	-0.060	6.69	1.09
321	46.797	0.148	2.15	103	-3.04	99	80	-0.030	6.47	1.03
322	46.943	0.146	2.14	103	-3.15	99	80	-0.030	6.58	1.08
323	47.091	0.148	2.15	103	-2.38	98	80	-0.030	6.59	1.08
324	47.237	0.146	2.15	103	-2.28	97	80	-0.030	6.38	1.02
325	47.386	0.149	2.15	103	-1.6	101	80	-0.030	6.45	1.02
326	47.532	0.146	2.15	103	-2.17	100	80	-0.020	6.61	0.97
327	47.680	0.148	2.14	103	-2.96	98	80	-0.020	6.62	0.91
328	47.826	0.146	2.15	103	-2.51	99	80	-0.020	6.70	0.88
329	47.975	0.149	2.14	103	-0.73	101	80	-0.030	6.64	0.88
330	48.122	0.147	2.15	103	-0.74	99	80	-0.020	6.73	0.85
331	48.269	0.147	2.15	103	-2.77	97	80	-0.030	6.65	0.84
332	48.416	0.147	2.15	103	-0.6	99	80	-0.030	6.61	0.86
333	48.564	0.148	2.13	103	-2.94	98	80	-0.030	6.63	0.84
334	48.711	0.147	2.14	103	-0.67	99	80	-0.030	6.55	0.84
335	48.858	0.147	2.13	103	-2.11	97	80	-0.020	6.62	0.87
336	49.005	0.147	2.15	103	-1.45	97	80	-0.030	6.59	0.89
337	49.153	0.148	2.16	103	-3.07	100	80	-0.030	6.63	0.85
338	49.300	0.147	2.14	103	-1.94	99	80	-0.030	6.75	0.80
339	49.447	0.147	2.15	103	-1.89	99	80	-0.020	6.72	0.83
340	49.594	0.147	2.14	103	-1.35	98	80	-0.020	6.68	0.86
341	49.741	0.147	2.15	103	-2.92	97	80	-0.030	6.75	0.84
342	49.889	0.148	2.15	103	-2.44	96	80	-0.030	6.58	0.84
343	50.036	0.147	2.15	103	-2.97	97	80	-0.030	6.66	0.79
344	50.184	0.148	2.14	103	-2.41	102	80	-0.030	6.52	0.83
345	50.330	0.146	2.12	103	-2.47	97	80	-0.030	6.62	0.80
346	50.478	0.148	2.16	103	-2.55	97	80	-0.030	6.62	0.81
347	50.624	0.146	2.15	103	-0.92	99	80	-0.030	6.48	0.82
348	50.773	0.149	2.15	103	-1.06	98	80	-0.010	6.59	0.78
349	50.919	0.146	2.15	103	-1.11	98	80	-0.030	6.49	0.79
350	51.067	0.148	2.14	103	-0.59	99	80	-0.030	6.66	0.80
351	51.213	0.146	2.15	103	-1.98	98	80	-0.020	6.68	0.81

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	51.361	0.148	2.16	103	-2.58	100	80	-0.030	6.54	0.79
353	51.507	0.146	2.15	103	-1.28	98	80	-0.030	6.59	0.79
354	51.655	0.148	2.16	103	-0.99	99	80	-0.020	6.22	0.93
355	51.801	0.146	2.16	103	-2.81	97	80	-0.030	6.25	0.95
356	51.950	0.149	2.14	103	-1.33	98	80	-0.030	6.15	0.96
357	52.095	0.145	2.14	103	-0.66	96	80	-0.010	6.28	0.93
358	52.244	0.149	2.15	103	-0.65	99	80	-0.030	6.15	0.90
359	52.390	0.146	2.15	103	-2.36	96	80	-0.010	6.17	0.88
360	52.539	0.149	2.13	103	-2.36	101	80	-0.030	6.08	0.89
361	52.684	0.145	2.15	103	-0.74	95	80	-0.010	6.03	0.90
362	52.833	0.149	2.15	103	-0.82	96	80	-0.030	6.05	0.89
363	52.978	0.145	2.16	103	-1.5	96	80	-0.030	6.02	0.92
364	53.127	0.149	2.15	102	-0.72	102	80	-0.030	6.12	0.94
365	53.272	0.145	2.16	102	-2.11	98	80	-0.030	6.07	0.90
366	53.421	0.149	2.14	102	-2.99	97	80	-0.030	6.17	0.93
367	53.566	0.145	2.15	102	-0.97	97	80	-0.030	6.09	0.94
Avg/Tot	53.566	0.146	2.13	97	-1.82	100	83	-0.052	10.35	1.04

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	514	502	366	519	508	481.8	N/A
1	513	500	386	522	512	486.6	N/A
2	512	498	401	521	513	489.0	N/A
3	511	497	410	522	512	490.4	N/A
4	509	495	415	531	511	492.2	N/A
5	506	493	418	553	510	496.0	N/A
6	503	490	419	584	508	500.8	N/A
7	500	488	420	620	506	506.8	N/A
8	496	486	420	657	504	512.6	N/A
9	492	483	420	687	502	516.8	N/A
10	488	481	419	711	501	520.0	N/A
11	484	481	373	713	498	509.8	N/A
12	481	480	342	710	496	501.8	N/A
13	477	478	318	705	494	494.4	N/A
14	474	476	299	699	492	488.0	N/A
15	470	475	283	692	490	482.0	N/A
16	466	473	269	686	488	476.4	N/A
17	462	471	258	680	486	471.4	N/A
18	458	468	249	675	483	466.6	N/A
19	455	466	241	670	482	462.8	N/A
20	451	464	234	666	480	459.0	N/A
21	447	461	228	662	479	455.4	N/A
22	443	459	222	659	477	452.0	N/A
23	439	456	218	656	474	448.6	N/A
24	436	454	214	652	472	445.6	N/A
25	432	451	210	650	470	442.6	N/A
26	429	449	206	646	468	439.6	N/A
27	425	446	203	644	466	436.8	N/A
28	422	444	201	642	463	434.4	N/A
29	419	441	198	639	461	431.6	N/A
30	416	438	196	637	459	429.2	N/A
31	413	436	194	635	457	427.0	N/A
32	410	433	192	633	454	424.4	N/A
33	408	431	190	633	452	422.8	N/A
34	405	429	189	632	450	421.0	N/A
35	403	426	187	631	448	419.0	N/A
36	401	424	186	631	445	417.4	N/A
37	399	422	185	631	443	416.0	N/A
38	397	420	184	631	441	414.6	N/A
39	395	418	183	631	439	413.2	N/A
40	393	417	182	632	437	412.2	N/A
41	391	415	181	631	435	410.6	N/A
42	389	413	180	632	433	409.4	N/A
43	388	412	179	630	430	407.8	N/A
44	386	410	179	630	429	406.8	N/A
45	385	409	179	631	427	406.2	N/A
46	384	408	178	631	425	405.2	N/A
47	382	407	178	633	423	404.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	381	406	177	635	421	404.0	N/A
49	380	405	177	637	420	403.8	N/A
50	379	404	177	638	418	403.2	N/A
51	378	403	176	639	416	402.4	N/A
52	377	402	177	641	414	402.2	N/A
53	376	401	176	644	413	402.0	N/A
54	375	401	176	648	411	402.2	N/A
55	375	400	176	650	410	402.2	N/A
56	374	400	176	652	408	402.0	N/A
57	373	399	176	653	407	401.6	N/A
58	373	399	176	654	406	401.6	N/A
59	372	399	176	654	405	401.2	N/A
60	372	399	176	654	404	401.0	N/A
61	372	398	177	656	403	401.2	N/A
62	371	399	177	657	402	401.2	N/A
63	371	399	177	658	401	401.2	N/A
64	371	399	177	660	399	401.2	N/A
65	371	399	177	661	399	401.4	N/A
66	371	400	178	662	398	401.8	N/A
67	371	401	178	664	398	402.4	N/A
68	371	401	178	666	397	402.6	N/A
69	371	402	179	668	396	403.2	N/A
70	371	402	179	669	396	403.4	N/A
71	371	403	180	670	395	403.8	N/A
72	371	404	180	670	395	404.0	N/A
73	372	405	181	671	394	404.6	N/A
74	372	406	181	671	393	404.6	N/A
75	373	407	182	672	393	405.4	N/A
76	373	408	182	673	392	405.6	N/A
77	374	409	183	674	392	406.4	N/A
78	374	410	184	675	392	407.0	N/A
79	375	411	184	676	391	407.4	N/A
80	376	412	185	677	391	408.2	N/A
81	377	414	186	679	391	409.4	N/A
82	378	415	186	680	391	410.0	N/A
83	378	417	187	680	390	410.4	N/A
84	379	418	188	680	391	411.2	N/A
85	381	420	189	679	390	411.8	N/A
86	382	422	190	678	390	412.4	N/A
87	383	423	191	677	389	412.6	N/A
88	384	425	192	676	389	413.2	N/A
89	385	426	193	674	389	413.4	N/A
90	386	428	194	672	389	413.8	N/A
91	387	430	195	668	389	413.8	N/A
92	389	431	196	665	389	414.0	N/A
93	390	433	196	661	388	413.6	N/A
94	391	434	198	658	388	413.8	N/A
95	392	436	198	656	388	414.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	393	437	199	653	388	414.0	N/A
97	395	438	201	652	388	414.8	N/A
98	396	439	202	651	388	415.2	N/A
99	397	441	203	650	388	415.8	N/A
100	398	442	204	651	389	416.8	N/A
101	399	443	205	650	389	417.2	N/A
102	400	445	207	651	389	418.4	N/A
103	401	446	208	652	389	419.2	N/A
104	402	447	209	653	389	420.0	N/A
105	403	449	211	654	390	421.4	N/A
106	404	450	212	654	391	422.2	N/A
107	406	452	213	654	392	423.4	N/A
108	407	453	215	654	392	424.2	N/A
109	408	455	216	655	393	425.4	N/A
110	409	456	218	655	394	426.4	N/A
111	410	458	219	654	395	427.2	N/A
112	411	459	220	654	395	427.8	N/A
113	412	461	222	653	396	428.8	N/A
114	413	462	223	651	397	429.2	N/A
115	414	464	224	649	398	429.8	N/A
116	415	465	226	646	399	430.2	N/A
117	416	467	227	643	400	430.6	N/A
118	417	468	228	640	402	431.0	N/A
119	418	470	229	636	402	431.0	N/A
120	419	471	231	631	404	431.2	N/A
121	420	472	232	627	405	431.2	N/A
122	421	474	233	623	406	431.4	N/A
123	422	475	234	620	407	431.6	N/A
124	423	476	235	617	409	432.0	N/A
125	424	477	237	614	410	432.4	N/A
126	425	478	238	613	412	433.2	N/A
127	426	480	240	611	413	434.0	N/A
128	427	481	242	609	415	434.8	N/A
129	428	482	243	607	416	435.2	N/A
130	429	483	244	604	418	435.6	N/A
131	430	484	246	598	419	435.4	N/A
132	431	484	247	592	421	435.0	N/A
133	431	485	248	583	422	433.8	N/A
134	432	486	249	574	424	433.0	N/A
135	433	486	250	563	425	431.4	N/A
136	433	486	250	552	427	429.6	N/A
137	434	487	250	542	429	428.4	N/A
138	434	487	250	532	430	426.6	N/A
139	435	487	250	522	431	425.0	N/A
140	436	486	250	513	433	423.6	N/A
141	436	486	249	504	433	421.6	N/A
142	436	485	248	496	434	419.8	N/A
143	436	485	248	488	435	418.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	436	484	247	480	435	416.4	N/A
145	436	483	246	472	436	414.6	N/A
146	436	482	245	465	437	413.0	N/A
147	435	480	244	458	437	410.8	N/A
148	435	479	243	451	438	409.2	N/A
149	434	477	242	444	439	407.2	N/A
150	433	476	241	438	439	405.4	N/A
151	433	474	240	432	439	403.6	N/A
152	432	473	239	427	440	402.2	N/A
153	431	471	238	422	440	400.4	N/A
154	430	469	237	417	440	398.6	N/A
155	429	467	236	412	440	396.8	N/A
156	428	465	235	407	441	395.2	N/A
157	427	463	234	403	441	393.6	N/A
158	426	461	233	398	441	391.8	N/A
159	425	460	232	394	441	390.4	N/A
160	423	458	230	389	440	388.0	N/A
161	422	456	229	384	440	386.2	N/A
162	421	453	228	380	439	384.2	N/A
163	419	451	226	375	438	381.8	N/A
164	418	449	225	371	438	380.2	N/A
165	416	447	224	367	437	378.2	N/A
166	414	445	223	363	436	376.2	N/A
167	413	443	221	360	434	374.2	N/A
168	411	441	220	356	433	372.2	N/A
169	409	438	219	353	433	370.4	N/A
170	407	436	218	351	432	368.8	N/A
171	406	434	217	349	430	367.2	N/A
172	404	432	216	347	429	365.6	N/A
173	402	430	215	345	428	364.0	N/A
174	400	428	214	344	427	362.6	N/A
175	399	426	213	342	426	361.2	N/A
176	397	424	212	341	425	359.8	N/A
177	395	422	211	340	424	358.4	N/A
178	394	420	210	338	422	356.8	N/A
179	392	419	210	337	421	355.8	N/A
180	390	417	209	335	420	354.2	N/A
181	389	415	208	333	419	352.8	N/A
182	388	413	207	332	418	351.6	N/A
183	386	412	207	330	417	350.4	N/A
184	385	410	206	329	416	349.2	N/A
185	384	408	206	327	415	348.0	N/A
186	382	407	205	326	414	346.8	N/A
187	381	405	205	324	413	345.6	N/A
188	380	403	204	323	412	344.4	N/A
189	379	402	203	321	411	343.2	N/A
190	377	400	203	319	410	341.8	N/A
191	376	399	202	317	409	340.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	375	397	202	316	408	339.6	N/A
193	374	396	201	314	407	338.4	N/A
194	373	395	201	313	406	337.6	N/A
195	372	393	201	311	405	336.4	N/A
196	371	392	200	310	404	335.4	N/A
197	369	390	200	308	403	334.0	N/A
198	369	389	200	307	402	333.4	N/A
199	367	388	200	306	401	332.4	N/A
200	366	386	200	304	401	331.4	N/A
201	365	385	199	303	400	330.4	N/A
202	364	384	199	302	399	329.6	N/A
203	363	383	199	301	398	328.8	N/A
204	362	381	199	300	398	328.0	N/A
205	361	380	199	299	397	327.2	N/A
206	360	379	199	298	396	326.4	N/A
207	359	378	199	297	396	325.8	N/A
208	358	377	199	296	395	325.0	N/A
209	357	376	198	295	394	324.0	N/A
210	356	375	198	294	393	323.2	N/A
211	355	374	198	293	393	322.6	N/A
212	355	373	197	292	392	321.8	N/A
213	354	372	197	291	391	321.0	N/A
214	353	371	196	290	390	320.0	N/A
215	352	370	196	289	390	319.4	N/A
216	351	369	196	288	389	318.6	N/A
217	350	368	195	287	388	317.6	N/A
218	349	367	195	286	388	317.0	N/A
219	348	366	194	285	387	316.0	N/A
220	347	365	193	285	386	315.2	N/A
221	347	364	193	284	386	314.8	N/A
222	346	363	192	283	386	314.0	N/A
223	345	362	192	283	385	313.4	N/A
224	344	361	191	282	385	312.6	N/A
225	343	360	191	281	385	312.0	N/A
226	343	359	190	281	385	311.6	N/A
227	342	359	190	280	384	311.0	N/A
228	341	358	189	280	384	310.4	N/A
229	341	357	189	279	384	310.0	N/A
230	340	356	189	279	384	309.6	N/A
231	339	355	188	278	384	308.8	N/A
232	339	354	188	278	384	308.6	N/A
233	338	353	188	277	384	308.0	N/A
234	338	352	187	277	384	307.6	N/A
235	337	352	187	277	384	307.4	N/A
236	337	351	187	276	383	306.8	N/A
237	336	350	186	275	383	306.0	N/A
238	336	349	186	275	382	305.6	N/A
239	335	348	186	274	382	305.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	335	348	185	274	381	304.6	N/A
241	335	347	185	273	380	304.0	N/A
242	334	346	185	273	380	303.6	N/A
243	334	345	185	272	379	303.0	N/A
244	333	344	184	271	378	302.0	N/A
245	333	344	184	271	377	301.8	N/A
246	333	343	184	271	376	301.4	N/A
247	332	342	184	270	375	300.6	N/A
248	332	341	184	270	373	300.0	N/A
249	332	341	183	269	372	299.4	N/A
250	332	340	183	269	371	299.0	N/A
251	331	339	183	268	370	298.2	N/A
252	331	338	183	267	368	297.4	N/A
253	331	338	182	267	367	297.0	N/A
254	330	337	182	266	366	296.2	N/A
255	330	336	182	266	365	295.8	N/A
256	330	335	182	265	364	295.2	N/A
257	329	334	181	265	363	294.4	N/A
258	329	334	181	264	362	294.0	N/A
259	329	333	181	264	361	293.6	N/A
260	328	332	181	263	360	292.8	N/A
261	328	331	180	262	359	292.0	N/A
262	328	331	180	262	359	292.0	N/A
263	328	330	180	261	358	291.4	N/A
264	327	329	180	261	357	290.8	N/A
265	327	329	180	261	357	290.8	N/A
266	327	328	179	260	357	290.2	N/A
267	327	327	179	260	356	289.8	N/A
268	326	327	179	259	356	289.4	N/A
269	326	326	179	259	356	289.2	N/A
270	326	326	179	258	356	289.0	N/A
271	326	325	179	258	355	288.6	N/A
272	325	324	179	258	355	288.2	N/A
273	325	324	179	257	355	288.0	N/A
274	325	323	179	257	355	287.8	N/A
275	325	323	179	256	355	287.6	N/A
276	324	322	179	256	354	287.0	N/A
277	324	322	179	256	354	287.0	N/A
278	324	321	178	255	354	286.4	N/A
279	324	321	178	255	353	286.2	N/A
280	324	320	178	255	353	286.0	N/A
281	324	320	178	255	353	286.0	N/A
282	324	319	178	254	352	285.4	N/A
283	324	319	178	254	352	285.4	N/A
284	323	318	178	254	352	285.0	N/A
285	323	318	178	254	351	284.8	N/A
286	323	317	178	253	351	284.4	N/A
287	323	317	177	253	351	284.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	323	317	177	253	350	284.0	N/A
289	323	316	177	253	350	283.8	N/A
290	323	316	177	253	350	283.8	N/A
291	323	316	177	252	350	283.6	N/A
292	322	315	177	252	349	283.0	N/A
293	322	315	176	252	349	282.8	N/A
294	322	315	176	251	348	282.4	N/A
295	322	314	176	251	348	282.2	N/A
296	322	314	177	251	347	282.2	N/A
297	321	314	177	250	346	281.6	N/A
298	321	313	177	250	346	281.4	N/A
299	321	313	177	249	345	281.0	N/A
300	320	313	177	248	344	280.4	N/A
301	320	312	177	248	344	280.2	N/A
302	319	312	177	247	343	279.6	N/A
303	319	312	177	246	343	279.4	N/A
304	318	311	177	246	342	278.8	N/A
305	318	311	176	245	341	278.2	N/A
306	317	310	176	244	341	277.6	N/A
307	317	310	176	243	340	277.2	N/A
308	316	309	176	242	339	276.4	N/A
309	315	309	176	242	339	276.2	N/A
310	315	308	176	241	338	275.6	N/A
311	314	308	175	240	337	274.8	N/A
312	313	307	175	240	337	274.4	N/A
313	313	307	175	239	336	274.0	N/A
314	312	306	175	238	335	273.2	N/A
315	311	305	175	238	335	272.8	N/A
316	310	305	175	237	334	272.2	N/A
317	310	304	175	236	333	271.6	N/A
318	309	304	175	236	333	271.4	N/A
319	308	303	175	235	332	270.6	N/A
320	307	303	174	235	332	270.2	N/A
321	307	303	174	234	331	269.8	N/A
322	306	302	174	234	330	269.2	N/A
323	305	302	174	233	330	268.8	N/A
324	305	301	174	233	329	268.4	N/A
325	304	301	174	233	329	268.2	N/A
326	303	301	174	232	328	267.6	N/A
327	302	300	173	232	327	266.8	N/A
328	302	300	173	232	327	266.8	N/A
329	301	300	173	231	326	266.2	N/A
330	300	299	173	231	325	265.6	N/A
331	300	299	173	230	325	265.4	N/A
332	299	298	173	230	324	264.8	N/A
333	299	298	172	230	324	264.6	N/A
334	298	298	172	229	323	264.0	N/A
335	297	297	173	229	322	263.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	297	297	173	229	322	263.6	N/A
337	296	296	173	228	321	262.8	N/A
338	296	296	172	228	320	262.4	N/A
339	295	296	172	228	320	262.2	N/A
340	295	295	172	228	319	261.8	N/A
341	294	295	172	227	318	261.2	N/A
342	294	295	172	227	318	261.2	N/A
343	293	294	172	227	317	260.6	N/A
344	293	294	172	227	317	260.6	N/A
345	292	294	172	227	316	260.2	N/A
346	292	293	172	227	316	260.0	N/A
347	292	293	172	226	315	259.6	N/A
348	291	293	172	226	315	259.4	N/A
349	291	292	172	226	314	259.0	N/A
350	291	292	172	226	314	259.0	N/A
351	290	292	172	226	313	258.6	N/A
352	290	292	172	225	313	258.4	N/A
353	289	291	172	225	312	257.8	N/A
354	289	291	172	225	312	257.8	N/A
355	289	291	173	225	312	258.0	N/A
356	288	291	173	225	311	257.6	N/A
357	288	290	173	225	311	257.4	N/A
358	288	290	172	224	311	257.0	N/A
359	288	290	172	224	310	256.8	N/A
360	287	290	172	224	310	256.6	N/A
361	287	289	172	223	309	256.0	N/A
362	287	289	171	223	309	255.8	N/A
363	287	289	171	223	309	255.8	N/A
364	286	288	171	222	309	255.2	N/A
365	286	288	170	222	308	254.8	N/A
366	286	288	170	221	308	254.6	N/A
367	286	287	170	221	308	254.4	N/A
Average	370	388	204	421	392	355	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 4

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/16/2019

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T327	86.2	86.2	89.1	2.9
Train A Filters - Remainder	T328	86.1	172.3	174.0	1.7
	T329	86.2			
Train A Probe	13A	117456.3	117456.3	117457.1	0.8
Train A O-Rings	13A	3361.3	3361.3	3362.9	1.6
Train B Filters	T330	86.9	260.3	264.6	4.3
	T331	86.8			
	T333	86.6			
Train B Probe	13B	117055.2	117055.2	117055.8	0.6
Train B O-Rings	13B	3446.1	3446.1	3447.8	1.7
Background Filter	T332	86.7	86.7	86.8	0.1

Placed in Dessicator on:	9/17 - 7:45

Train A Filters - First Hour	89.1	9/19 14:28	89.1	9/20 8:26				
Train A Filters - Remainder	174.2	9/19 14:28	174.0	9/20 8:26				
Train A Probe	117457.0	9/19 14:29	117457.1	9/20 8:26				
Train A O-Rings	3362.8	9/19 14:29	3362.9	9/20 8:26				
Train B Filters	264.6	9/19 14:29	264.6	9/20 8:26				
Train B Probe	117056.0	9/19 14:29	117055.8	9/20 8:26				
Train B O-Rings	3447.8	9/19 14:29	3447.8	9/20 8:26				
Background Filter	86.9	9/19 14:29	86.8	9/20 8:26				

1st hour Sub-Total, mg:	2.9
Remainder Sub-Total, mg:	4.1
Train 1 Aggregate, mg:	**7.0**
Train 2 Aggregate, mg:	**6.6**
Ambient Aggregate, mg:	0.1

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 4 Test Date: 9/16/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 10:52
Air Control Setting: Fully Open

Time	Notes
0 min	Started with 2.0 lbs of kindling, lit with torch for 60 seconds, door left cracked open ~3”
3 min	Closed Door
10 min	@0.8 lbs, added 2.1 lbs of kindling and start-up pieces, left door cracked open ~3”
11 min	Closed door
22 min	@1.1 lbs, added 3.7 lbs of start-up fuel, door closed immediately.
33 min	@2.2 lbs, leveled coal bed and loaded high fire test fuel load, door open 60 sec
36 min	Turned fan on high
134 min	Leveled remaining 4.8 lbs of charcoal from high fire test, zeroed scale, turned off fan in preparation of loading medium fire test load.

Test Notes
Test Burn Start Time: 13:08
Air Control Setting: Medium Fire Test Setting (PAC open 9/32”)

Time	Notes
0 min	Loaded medium fire test fuel load, door open 1 minute
7 min	Air turned down to test setting.
10 min	Fan turned on to high
60 min	Changed 1-hr filter
68 min	Changed train B front filter
367 min	End of Test

Test Burn End Time: 19:15

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.00 CO (%): 4.310
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	11:17	11:21	11:19	9/17 – 7:14	9/17 – 7:15	9/17 – 7:18
CO_2	0.00	10.08	17.00	0.03	10.03	16.90
CO	0.00	2.497	4.310	-0.007	2.467	4.283

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature:  Date: 9/17/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy | Job Number: 19-494 | Tracking #: 0030
Model: NEO 2.5 | Run Number: 4 | Test Date: 9/16/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

Residual Start-up Fuel Coal Bed

Technician Signature: _____ Date: 9/17/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 4 Test Date: 9/16/2019

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Medium Fire Fuel Load

Medium Fire Fuel Loaded

Technician Signature: Date: 9/17/2019

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 5 Data Summary

Client:	Pacific Energy
Model:	NEO 2.5 LE
Job #:	19-494
Tracking #:	030
Test Date:	9/17/2019

Techician Signature

9/20/2019
Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

Burn Rate (kg/hr):	1.35

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	79.040	59.811	59.005	8.808
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.60			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11493.8			
Average Gas Meter Temperature (°F)	75.3	95.9	95.4	81.0
Total Sample Volume (dscf)	76.655	56.560	55.677	8.557
Average Tunnel Temperature (°F)	95.0			
Total Time of Test (min)	403			
Total Particulate Catch (mg)	0.1	6.5	7.4	2.4
Particulate Concentration, dry-standard (g/dscf)	0.0000013	0.0001149	0.0001329	0.0002805
Total PM Emissions (g)	0.10	8.77	10.16	3.21
Particulate Emission Rate (g/hr)	0.01	1.31	1.51	3.21
Emissions Factor (g/kg)	-	0.96	1.12	-
Difference from Average Total Particulate Emissions (g)	-	0.69	0.69	-
Difference from Average Emissions Factor (g/kg)	-	0.08	0.08	-

Final Average Results	
Total Particulate Emissions (g)	9.47
Particulate Emission Rate (g/hr)	1.41
Emissions Factor (g/kg)	1.04
HHV Efficiency (%)	72.4%
LHV Efficiency (%)	77.5%
CO Emissions (g/min)	2.13

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80 / Max: 86	OK
Face Velocity	< 30 ft/min	13.6	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 74 / Max: 76	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer:	Pacific Energy
Model:	NEO 2.5 LE
Date:	09/17/19
Run:	5
Control #:	19-494
Test Duration:	403
Output Category:	Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	72.4%	77.5%
Combustion Efficiency	93.2%	93.2%
Heat Transfer Efficiency	77.7%	83.1%

Output Rate (kJ/h)	19,444	18,445	**(Btu/h)**
Burn Rate (kg/h)	1.34	2.96	**(lb/h)**
Input (kJ/h)	26,842	25,463	**(Btu/h)**

Test Load Weight (dry kg)	9.03	19.91	**dry lb**
MC wet (%)	18.07		
MC dry (%)	22.06		
Particulate (g)	9.47		
CO (g)	860		
Test Duration (h)	6.72		

Emissions	Particulate	CO
g/MJ Output	0.07	6.58
g/kg Dry Fuel	1.05	95.17
g/h	1.41	127.99
g/min	0.02	2.13
lb/MM Btu Output	0.17	15.30

Air/Fuel Ratio (A/F)	11.09

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 5
Technician: SJB
Date: 9/17/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	21.00		
Total Load Weight Range (lbs):	20.00	to	22.10
Core Load Weight Range (lbs):	9.50	to	13.70
Remainder Load Weight Range (lbs):	7.40	to	11.60
Core Load Piece Range (lbs):	3.20	to	5.30
Remainder Load Piece Range (lbs):	2.10	to	11.60
Max Allowable Kindling Weight (lbs):	4.28		
Max Allowable Start-up Fuel Weight (lbs):	6.43		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	3.75	In Range	23.8	24.6	24.7	24.4	In Range	3.02	1.37
2	16.00	3.39	In Range	21.4	21.6	25.8	22.9	In Range	2.76	1.25
3	16.00	4.78	In Range	21.0	19.0	25.0	21.7	In Range	3.93	1.78
Core Load Wt. (lbs)		11.92	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	7.00	In Range	19.5	24.6	19.3	21.1	In Range	5.78	2.62
2	16.00	2.50	In Range	24.3	26.7	23.6	24.9	In Range	2.00	0.91
3	16.00		NA				NA	NA	NA	NA
Remainder Load (lbs)		9.50	In Range							

Total Load Weight (lbs):	21.42	In Range	
Core Load % of Total Weight:	56%	In Range	45-65%
Remainder % of Total Weight:	44%	In Range	35-55%
Total Load % of Target Weight:	102%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	10.2		
Total Load Average Moisture Content (%DB):	22.5	In Range	19-25%
Total Load Average Moisture Content (%WB):	18.4		
Total Test Load Weight (dry basis):	17.48 lbs	7.93 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.03	In Range	10	10	10	10.0	In Range	2.75	1.25

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.45	In Range	23.6	19.8	18.7	20.7	In Range	3.69	1.67

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.1	to	4.3	
Actual Residual Start-up Fuel Weight (lb):		2.1		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Pacific Energy
Job #: 19-494
Model: NEO 2.5 LE
Tracking #: 030
Run #: 5
Technician: SJB
Date: 9/17/2019

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.10		
Target Load Weight (lbs):	25.20		
Total Load Weight Range (lbs):	23.94	to	26.46
Core Load Weight Range (lbs):	11.34	to	16.38
Remainder Load Weight Range (lbs):	8.82	to	13.86
Core Load Piece Range (lbs):	3.78	to	6.30
Remainder Load Piece Range (lbs):	2.52	to	7.56

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.81	In Range	19.6	22.4	18.6	20.2	In Range	4.00	1.82
2	16.00	4.83	In Range	20.0	23.8	19.3	21.0	In Range	3.99	1.81
3	16.00	5.12	In Range	23.0	21.7	24.7	23.1	In Range	4.16	1.89
Core Load Wt. (lbs)		14.76	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	6.20	In Range	21.8	24.3	25.7	23.9	In Range	5.00	2.27
2	16.00	3.46	In Range	19.8	25.4	18.6	21.3	In Range	2.85	1.29
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		9.66	In Range							

Remainder Load Small/Large Piece Weight Ratio:	56%	In Range	≤ 67%
Total Load Weight (lbs):	24.42	In Range	
Core Load % of Total Weight:	60%	In Range	45-65%
Remainder % of Total Weight:	40%	In Range	35-55%
Total Load % of Target Weight:	97%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.6		
Total Load Average Moisture Content (%DB):	22.1	In Range	19-25%
Total Load Average Moisture Content (%WB):	18.1		
Total Test Load Weight (dry basis):	20.01 lbs	9.07 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	2.5	to	4.8	
Actual Charcoal Bed Wt. (lb):		4.7		In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb):	0.0	Valid Test (≥90%)

Total Fuel Burned During Test Run:	24.4	lbs, wet basis
	20.0	lbs, dry basis
	9.07	kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Pacific Energy	Job #:	19-494
Model:	NEO 2.5 LE	Tracking #:	030
Run #:	5	Technician:	SJB
Test Start Time:	11:24	Date:	9/17/2019
Test Type:	Medium Fire		

Recording Interval (min):	1
Total Sampling Time (min):	403

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.68	29.66	29.67
Relative Humidity (%)	47.2	47.1	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Meter Box γ Factor:	0.999	(A)	
Meter Box γ Factor:	0.996	(B)	
Meter Box γ Factor:	0.992	(Ambient)	
Ambient Sample Volume:	79.040	ft^3	

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	9/10/2019

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-11	in. Hg
(B)	0.000	cfm @	-11	in. Hg
(Ambient)	0.001	cfm @	-14	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.052	69
2	0.072	69
3	0.064	69
4	0.056	69
5	0.054	69
6	0.068	69
7	0.064	69
8	0.054	69
Center	0.076	69

Static Pressure: -0.160 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	16.58	ft/sec
V_{scent}:	18.37	ft/sec
F_p:	0.903	[ratio]
Initial Tunnel Flow:	186.9	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

Recording Interval (min): 1
Run Time (min): 120

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
0	2.0	0.005	74	75	75	73	76	74.6	71	69
1	2.0	-0.041	74	75	75	74	75	74.6	112	68
2	1.7	-0.077	76	78	77	76	76	76.6	320	69
3	1.5	-0.087	78	86	82	83	77	81.2	390	69
4	1.3	-0.059	82	94	90	95	79	88.0	387	69
5	1.3	-0.058	86	99	96	110	82	94.6	350	69
6	1.2	-0.046	89	104	101	125	85	100.8	338	69
7	1.1	-0.068	92	108	106	139	88	106.6	323	69
8	1.1	-0.048	95	113	112	151	93	112.8	312	69
9	2.9	-0.061	97	115	115	161	98	117.2	267	69
10	2.6	-0.066	101	119	121	170	103	122.8	297	69
11	2.6	-0.061	105	123	127	177	109	128.2	322	69
12	2.4	-0.068	111	127	135	186	115	134.8	367	69
13	2.2	-0.073	116	132	143	195	121	141.4	441	69
14	2.1	-0.087	122	139	150	210	127	149.6	499	69
15	1.9	-0.094	127	144	158	230	133	158.4	546	69
16	1.6	-0.097	133	149	167	257	140	169.2	590	69
17	1.4	-0.099	138	154	178	290	148	181.6	609	69
18	1.2	-0.089	142	162	191	327	156	195.6	601	70
19	1.0	-0.084	146	171	204	361	166	209.6	569	70
20	4.4	-0.099	151	181	218	390	177	223.4	538	70
21	4.2	-0.089	157	191	231	411	188	235.6	544	70
22	3.9	-0.077	164	201	245	431	199	248.0	589	70
23	3.7	-0.095	171	212	257	454	210	260.8	627	70
24	3.4	-0.098	178	223	270	480	220	274.2	666	70
25	3.1	-0.103	187	233	282	509	231	288.4	698	70
26	2.9	-0.104	196	244	295	542	242	303.8	719	70
27	2.6	-0.099	204	254	308	576	252	318.8	728	70
28	2.4	-0.097	213	265	322	610	262	334.4	719	70
29	2.1	-0.091	222	275	337	641	271	349.2	716	71
30	23.6	-0.103	232	286	353	664	284	363.8	646	72
31	22.9	-0.100	241	298	367	677	294	375.4	671	71
32	22.6	-0.105	251	309	378	687	302	385.4	706	71
33	22.3	-0.108	261	321	340	680	310	382.4	723	71
34	22.1	-0.096	271	331	320	677	317	383.2	730	71
35	21.8	-0.105	281	341	304	676	324	385.2	747	71
36	21.4	-0.110	290	350	293	679	329	388.2	766	71
37	21.1	-0.109	299	358	284	685	334	392.0	782	71
38	20.8	-0.098	307	366	277	691	339	396.0	771	72
39	20.6	-0.095	315	373	272	697	343	400.0	754	72
40	20.3	-0.109	322	380	269	702	347	404.0	746	72
41	20.0	-0.100	329	387	266	705	350	407.4	737	72
42	19.8	-0.101	335	394	264	706	354	410.6	734	72
43	19.4	-0.105	341	400	263	707	357	413.6	731	72

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

Recording Interval (min): 1
Run Time (min): 120

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
44	19.3	-0.095	347	406	263	707	361	416.8	726	72
45	18.8	-0.106	352	412	263	708	364	419.8	727	72
46	18.8	-0.105	357	418	263	709	368	423.0	732	72
47	18.5	-0.102	362	424	263	711	371	426.2	741	72
48	18.3	-0.096	367	429	264	714	375	429.8	747	72
49	18.0	-0.108	372	434	265	717	378	433.2	749	72
50	17.7	-0.090	376	439	266	720	381	436.4	746	72
51	17.5	-0.098	381	444	267	723	385	440.0	749	72
52	17.2	-0.093	386	448	269	725	389	443.4	753	72
53	17.0	-0.097	390	453	271	728	392	446.8	752	73
54	16.7	-0.106	394	457	273	730	396	450.0	750	73
55	16.4	-0.108	399	461	275	732	400	453.4	751	73
56	16.1	-0.087	403	465	276	734	403	456.2	758	73
57	15.9	-0.086	408	469	278	737	407	459.8	758	73
58	15.6	-0.102	412	472	280	739	411	462.8	755	73
59	15.4	-0.090	416	476	281	741	413	465.4	755	73
60	15.0	-0.103	421	479	283	742	417	468.4	755	73
61	14.9	-0.103	425	482	284	743	421	471.0	753	73
62	14.6	-0.104	429	485	286	743	423	473.2	747	73
63	14.4	-0.101	433	489	288	743	426	475.8	742	73
64	14.1	-0.095	437	492	290	742	430	478.2	741	73
65	13.9	-0.107	441	494	292	740	432	479.8	746	73
66	13.6	-0.094	445	497	294	739	436	482.2	735	73
67	13.4	-0.100	449	500	295	737	439	484.0	724	73
68	13.2	-0.086	452	502	297	734	442	485.4	721	73
69	12.9	-0.102	456	504	299	732	445	487.2	718	73
70	12.7	-0.102	459	507	301	730	448	489.0	721	73
71	12.5	-0.099	463	509	302	729	451	490.8	721	73
72	12.2	-0.101	466	511	304	727	454	492.4	721	73
73	12.1	-0.100	470	513	306	726	457	494.4	719	73
74	11.7	-0.093	473	515	308	725	460	496.2	717	74
75	11.6	-0.098	476	517	310	724	463	498.0	699	73
76	11.4	-0.081	478	519	311	721	465	498.8	685	73
77	11.1	-0.113	481	521	313	717	468	500.0	675	74
78	11.0	-0.099	484	523	314	712	470	500.6	668	73
79	10.6	-0.099	486	525	315	706	472	500.8	662	74
80	10.6	-0.089	489	527	316	700	475	501.4	660	73
81	10.3	-0.079	490	528	317	695	478	501.6	658	73
82	10.1	-0.097	492	530	318	689	480	501.8	653	73
83	10.1	-0.095	494	532	318	683	482	501.8	652	73
84	9.9	-0.094	496	533	319	678	485	502.2	648	73
85	9.6	-0.093	497	534	320	673	487	502.2	647	73
86	9.4	-0.088	498	536	321	668	489	502.4	645	74
87	9.3	-0.087	499	537	321	664	491	502.4	643	73

WOODSTOVE PREBURN DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

Recording Interval (min): 1
Run Time (min): 120

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
88	9.2	-0.089	500	538	322	660	494	502.8	640	74
89	9.0	-0.093	501	539	323	656	496	503.0	642	74
90	8.8	-0.097	501	540	324	654	499	503.6	646	74
91	8.7	-0.101	502	541	325	652	501	504.2	648	73
92	8.4	-0.089	503	542	325	651	503	504.8	649	74
93	8.2	-0.090	503	542	327	650	504	505.2	651	74
94	8.1	-0.102	504	544	328	650	506	506.4	648	74
95	8.1	-0.091	504	544	329	649	508	506.8	648	74
96	7.8	-0.094	505	545	330	649	510	507.8	644	73
97	7.7	-0.095	505	546	332	648	512	508.6	642	74
98	7.5	-0.083	506	547	333	647	514	509.4	635	73
99	7.4	-0.081	506	548	334	646	516	510.0	631	73
100	7.2	-0.091	507	549	336	644	518	510.8	630	74
101	7.0	-0.093	507	550	337	642	521	511.4	630	74
102	6.9	-0.097	508	551	338	640	524	512.2	630	74
103	6.7	-0.093	509	552	339	639	526	513.0	633	74
104	6.6	-0.095	509	553	340	638	529	513.8	631	74
105	6.4	-0.090	510	554	341	637	532	514.8	629	74
106	6.3	-0.085	511	555	341	636	535	515.6	627	74
107	6.2	-0.087	512	556	342	634	538	516.4	624	74
108	5.9	-0.085	513	557	344	633	541	517.6	616	74
109	5.8	-0.081	514	559	345	630	544	518.4	613	74
110	5.8	-0.084	515	560	346	628	547	519.2	611	74
111	5.7	-0.084	516	561	347	626	550	520.0	609	74
112	5.5	-0.091	517	563	349	623	553	521.0	604	74
113	5.4	-0.081	518	564	350	621	556	521.8	599	74
114	5.3	-0.078	519	565	351	618	559	522.4	600	74
115	5.2	-0.089	520	566	352	616	562	523.2	597	74
116	5.1	-0.083	521	567	353	614	564	523.8	599	74
117	5.0	-0.073	522	569	353	613	567	524.8	601	74
118	4.8	-0.098	524	569	354	611	569	525.4	594	74
119	4.9	-0.072	525	570	354	609	571	525.8	586	74
120	4.7	-0.083	526	571	355	605	572	525.8	577	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.082	0.01	74	-0.14		24.3		140	565	83	75
1	0.132	0.132	0.081	2.12	74	-2.47	98	24.2	-0.1	156	448	82	74
2	0.278	0.146	0.084	2.10	74	-0.31	105	24.0	-0.2	146	611	82	74
3	0.419	0.141	0.081	2.20	74	0	104	23.6	-0.4	147	768	83	74
4	0.566	0.147	0.080	2.18	74	-2.24	109	23.2	-0.4	154	847	84	74
5	0.707	0.141	0.077	2.10	74	0	106	22.9	-0.3	147	722	84	74
6	0.850	0.143	0.085	2.20	74	-1.94	102	22.6	-0.3	136	651	83	74
7	0.994	0.144	0.084	2.16	74	0	103	22.4	-0.2	131	628	82	74
8	1.136	0.142	0.083	2.09	74	-0.56	102	22.2	-0.2	130	616	82	74
9	1.279	0.143	0.077	2.08	75	-0.8	106	21.9	-0.3	126	611	83	74
10	1.420	0.141	0.086	2.13	75	-0.85	99	21.7	-0.2	126	612	84	74
11	1.674	0.254	0.077	2.12	75	-2.44	188	21.5	-0.2	125	612	85	74
12	1.814	0.140	0.078	2.09	75	-0.41	103	21.3	-0.2	124	609	84	74
13	1.958	0.144	0.083	2.06	76	-2.76	102	21.1	-0.2	124	606	83	74
14	2.095	0.137	0.081	2.03	76	-2.61	99	20.7	-0.4	124	606	82	74
15	2.242	0.147	0.084	2.16	76	-3.03	104	20.6	-0.1	124	606	82	74
16	2.383	0.141	0.083	2.18	76	-1.27	100	20.4	-0.2	123	600	84	74
17	2.531	0.148	0.077	2.16	77	-2.88	109	20.2	-0.2	122	594	85	74
18	2.672	0.141	0.084	2.09	77	-3.28	99	20.0	-0.2	122	587	84	74
19	2.817	0.145	0.084	2.13	77	-1.73	102	19.8	-0.2	121	583	83	74
20	2.958	0.141	0.088	2.10	78	-0.75	97	19.6	-0.2	121	580	82	74
21	3.100	0.142	0.083	2.26	78	-0.91	100	19.3	-0.3	120	573	82	74
22	3.249	0.149	0.082	2.24	78	-0.9	106	19.2	-0.1	119	569	82	74
23	3.397	0.148	0.082	2.24	79	-2.49	105	19.0	-0.2	119	567	84	74
24	3.544	0.147	0.080	2.24	79	-2.77	105	18.9	-0.1	118	563	85	74
25	3.691	0.147	0.082	2.22	79	-0.83	104	18.7	-0.2	118	559	84	74
26	3.837	0.146	0.087	2.19	80	-1.88	100	18.5	-0.2	118	555	83	74
27	3.983	0.146	0.086	2.16	80	-2.44	101	18.3	-0.2	117	551	82	74
28	4.128	0.145	0.080	2.16	80	-1.45	104	18.1	-0.2	117	547	82	74
29	4.273	0.145	0.084	2.15	81	-3.46	101	18.0	-0.1	116	546	83	74
30	4.418	0.145	0.079	2.14	81	-1.05	104	17.8	-0.2	116	543	85	74
31	4.562	0.144	0.078	2.13	81	-3.53	104	17.5	-0.3	116	544	84	74
32	4.707	0.145	0.076	2.09	82	-3.84	106	17.5	0	116	543	83	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.849	0.142	0.085	2.08	82	-1.41	98	17.3	-0.2	116	544	82	74
34	4.995	0.146	0.084	2.25	82	-3.9	101	17.1	-0.2	116	544	82	74
35	5.142	0.147	0.083	2.26	83	-3.86	102	16.9	-0.2	115	544	83	74
36	5.291	0.149	0.082	2.22	83	-1.44	104	16.8	-0.1	115	544	84	74
37	5.436	0.145	0.084	2.19	83	-1.52	100	16.6	-0.2	115	541	85	74
38	5.584	0.148	0.076	2.16	84	-2.41	107	16.4	-0.2	115	538	84	74
39	5.728	0.144	0.086	2.13	84	-4.04	98	16.3	-0.1	114	539	82	74
40	5.875	0.147	0.082	2.08	84	-4.11	103	16.1	-0.2	114	539	82	74
41	6.018	0.143	0.091	2.20	85	-1.86	95	15.9	-0.2	114	539	82	74
42	6.167	0.149	0.086	2.16	85	-2.42	101	15.8	-0.1	114	541	84	74
43	6.309	0.142	0.083	2.10	85	-3.27	98	15.6	-0.2	115	546	85	74
44	6.455	0.146	0.085	2.16	85	-4.9	100	15.4	-0.2	115	547	84	74
45	6.597	0.142	0.083	2.08	86	-3.4	98	15.0	-0.4	115	552	83	74
46	6.742	0.145	0.081	2.04	86	-3.32	102	15.1	0.1	115	554	82	74
47	6.888	0.146	0.089	2.25	86	0	97	14.9	-0.2	114	554	81	74
48	7.040	0.152	0.081	2.24	86	0	106	14.7	-0.2	114	555	80	75
49	7.183	0.143	0.079	2.21	87	-1.23	101	14.5	-0.2	115	558	83	75
50	7.334	0.151	0.078	2.19	87	-0.5	108	14.3	-0.2	115	559	85	75
51	7.479	0.145	0.083	2.18	87	-2.48	100	14.2	-0.1	115	559	85	75
52	7.629	0.150	0.079	2.19	87	-2.12	106	13.9	-0.3	115	558	84	75
53	7.774	0.145	0.079	2.20	88	-1.79	102	13.8	-0.1	115	560	83	75
54	7.924	0.150	0.080	2.19	88	-1.96	105	13.6	-0.2	115	558	82	75
55	8.068	0.144	0.086	2.20	88	-0.36	98	13.5	-0.1	115	559	82	75
56	8.218	0.150	0.083	2.19	88	-1.36	103	13.3	-0.2	115	560	83	75
57	8.364	0.146	0.076	2.19	89	0	105	13.1	-0.2	115	559	84	75
58	8.513	0.149	0.077	2.19	89	0	106	12.9	-0.2	115	556	85	75
59	8.659	0.146	0.079	2.18	89	-2.53	103	12.8	-0.1	115	554	84	75
60	8.808	0.149	0.086	2.21	89	-2.66	101	12.5	-0.3	115	552	82	75
61	8.953	0.145	0.084	2.18	89	0	99	12.3	-0.2	115	553	82	76
62	9.103	0.150	0.078	2.19	90	-1.67	106	12.2	-0.1	115	555	82	76
63	9.248	0.145	0.083	2.20	90	-0.61	100	12.0	-0.2	115	557	83	76
64	9.397	0.149	0.080	2.18	90	-0.82	104	11.9	-0.1	115	557	85	76
65	9.543	0.146	0.081	2.19	90	-1.8	102	11.7	-0.2	115	558	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.691	0.148	0.085	2.19	90	-0.75	100	11.5	-0.2	115	559	83	76
67	9.838	0.147	0.084	2.18	91	-0.46	100	11.2	-0.3	115	556	82	76
68	9.987	0.149	0.079	2.21	91	0	105	11.1	-0.1	115	555	82	76
69	10.133	0.146	0.083	2.17	91	-0.51	100	11.0	-0.1	115	554	83	76
70	10.281	0.148	0.081	2.18	91	-1.11	103	10.8	-0.2	115	555	84	76
71	10.428	0.147	0.076	2.18	91	-2.17	105	10.5	-0.3	115	555	85	76
72	10.576	0.148	0.076	2.19	91	-2.41	106	10.4	-0.1	115	554	84	76
73	10.723	0.147	0.083	2.16	92	-0.19	101	10.2	-0.2	115	552	83	76
74	10.871	0.148	0.077	2.16	92	0	105	10.1	-0.1	115	547	82	76
75	11.018	0.147	0.083	2.17	92	-2.52	101	9.9	-0.2	114	544	82	76
76	11.166	0.148	0.079	2.16	92	-2.03	104	9.8	-0.1	114	544	83	76
77	11.314	0.148	0.084	2.19	92	-0.47	101	9.6	-0.2	114	536	85	76
78	11.461	0.147	0.084	2.17	92	-0.16	100	9.4	-0.2	113	533	84	76
79	11.608	0.147	0.079	2.17	92	-2.27	103	9.4	0	113	523	83	76
80	11.755	0.147	0.079	2.16	93	-0.47	103	9.2	-0.2	113	517	82	76
81	11.904	0.149	0.080	2.17	93	0	103	9.1	-0.1	112	514	82	76
82	12.050	0.146	0.083	2.16	93	0	99	8.9	-0.2	111	512	82	76
83	12.199	0.149	0.082	2.14	93	-2.57	102	8.8	-0.1	111	507	84	76
84	12.344	0.145	0.082	2.17	93	-1.91	99	8.8	0	111	505	85	76
85	12.493	0.149	0.083	2.17	93	-0.32	101	8.6	-0.2	110	501	84	76
86	12.639	0.146	0.079	2.16	93	-2.49	102	8.5	-0.1	110	500	83	76
87	12.787	0.148	0.077	2.15	93	-1.1	105	8.3	-0.2	110	502	82	76
88	12.933	0.146	0.086	2.16	94	-2.54	97	8.2	-0.1	110	497	82	76
89	13.082	0.149	0.077	2.15	94	-2.42	105	8.2	0	110	495	83	76
90	13.227	0.145	0.086	2.13	94	0	97	8.1	-0.1	109	496	84	76
91	13.377	0.150	0.085	2.16	94	-0.61	101	8.0	-0.1	109	494	85	75
92	13.522	0.145	0.079	2.16	94	-2.66	101	7.9	-0.1	109	493	84	76
93	13.671	0.149	0.079	2.16	94	-2.55	104	7.7	-0.2	109	490	83	76
94	13.816	0.145	0.079	2.16	94	-1.72	101	7.7	0	108	491	82	76
95	13.965	0.149	0.078	2.15	94	-1.76	104	7.6	-0.1	108	495	82	76
96	14.110	0.145	0.085	2.17	94	-1.45	97	7.5	-0.1	108	496	83	76
97	14.259	0.149	0.078	2.15	95	0	104	7.3	-0.2	109	499	84	76
98	14.403	0.144	0.079	2.16	95	-1.98	100	7.2	-0.1	108	498	84	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.553	0.150	0.077	2.16	95	-2.03	105	7.1	-0.1	109	497	83	76
100	14.697	0.144	0.079	2.15	95	-2.44	100	7.0	-0.1	108	494	82	76
101	14.846	0.149	0.082	2.16	95	-0.09	101	7.0	0	108	490	82	76
102	14.991	0.145	0.080	2.19	95	0	100	6.9	-0.1	107	486	82	76
103	15.140	0.149	0.083	2.15	95	-0.91	101	6.7	-0.2	107	484	84	76
104	15.285	0.145	0.083	2.14	95	-0.51	98	6.7	0	107	478	85	76
105	15.434	0.149	0.080	2.13	95	-0.74	103	6.6	-0.1	107	476	84	76
106	15.579	0.145	0.079	2.14	95	0	100	6.5	-0.1	107	476	83	76
107	15.729	0.150	0.083	2.17	95	-2.54	101	6.4	-0.1	107	474	82	76
108	15.873	0.144	0.082	2.15	95	-2.33	98	6.5	0.1	107	472	82	76
109	16.022	0.149	0.083	2.14	96	-2.62	100	6.3	-0.2	106	465	82	76
110	16.167	0.145	0.079	2.14	96	-1.79	100	6.2	-0.1	106	459	84	76
111	16.316	0.149	0.081	2.13	96	-1.83	102	6.0	-0.2	106	453	85	76
112	16.460	0.144	0.084	2.15	96	-1.61	96	5.9	-0.1	105	442	84	76
113	16.609	0.149	0.079	2.14	96	-2.46	103	6.0	0.1	105	435	83	76
114	16.753	0.144	0.085	2.15	96	-2.21	96	5.8	-0.2	104	431	82	76
115	16.903	0.150	0.081	2.12	96	-0.1	102	5.8	0	104	425	82	76
116	17.047	0.144	0.082	2.13	96	-0.08	97	5.8	0	103	422	83	76
117	17.196	0.149	0.080	2.14	96	-2.44	102	5.7	-0.1	103	417	84	76
118	17.340	0.144	0.084	2.11	96	-0.04	96	5.7	0	103	411	85	76
119	17.490	0.150	0.083	2.13	96	-1.17	101	5.6	-0.1	102	407	84	76
120	17.634	0.144	0.085	2.14	96	-2.19	96	5.5	-0.1	102	402	83	76
121	17.783	0.149	0.085	2.14	96	-2.65	99	5.4	-0.1	102	398	82	76
122	17.927	0.144	0.083	2.11	96	0	97	5.4	0	101	394	82	76
123	18.076	0.149	0.080	2.13	96	0	102	5.4	0	101	390	83	76
124	18.220	0.144	0.084	2.12	97	-1.06	96	5.3	-0.1	101	387	84	76
125	18.369	0.149	0.079	2.13	97	-1.17	102	5.1	-0.2	101	384	84	76
126	18.513	0.144	0.085	2.12	97	-0.78	95	5.1	0	100	381	84	76
127	18.663	0.150	0.083	2.12	97	-2.56	100	5.0	-0.1	100	379	83	76
128	18.807	0.144	0.078	2.12	97	-0.88	99	5.1	0.1	100	379	82	76
129	18.956	0.149	0.078	2.12	97	-0.69	103	5.0	-0.1	100	379	82	76
130	19.099	0.143	0.082	2.13	97	-0.59	96	5.0	0	99	377	84	76
131	19.249	0.150	0.081	2.12	97	0	102	4.9	-0.1	99	374	85	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.392	0.143	0.081	2.12	97	-1.89	97	4.7	-0.2	99	373	84	76
133	19.542	0.150	0.084	2.11	97	-1.67	100	4.8	0.1	99	373	83	76
134	19.685	0.143	0.080	2.12	97	-2.52	97	4.7	-0.1	99	373	82	76
135	19.834	0.149	0.078	2.09	97	-2.16	103	4.7	0	98	368	82	76
136	19.978	0.144	0.084	2.11	97	-2.45	96	4.6	-0.1	98	361	83	76
137	20.127	0.149	0.078	2.12	97	-0.11	103	4.6	0	98	355	84	76
138	20.270	0.143	0.081	2.13	97	-0.81	97	4.5	-0.1	97	352	85	76
139	20.418	0.148	0.082	2.09	97	-2.7	99	4.5	0	97	351	84	76
140	20.562	0.144	0.083	2.09	97	-2.37	96	4.4	-0.1	97	346	83	76
141	20.711	0.149	0.079	2.10	97	-0.8	102	4.4	0	97	345	82	76
142	20.854	0.143	0.081	2.10	97	-0.41	97	4.2	-0.2	97	356	82	76
143	21.003	0.149	0.081	2.23	97	-2.41	101	4.2	0	97	369	83	76
144	21.150	0.147	0.079	2.23	97	-2.16	101	4.2	0	98	385	84	76
145	21.302	0.152	0.078	2.23	97	0	105	4.1	-0.1	98	395	84	76
146	21.449	0.147	0.081	2.23	97	-2.51	99	4.0	-0.1	98	386	83	76
147	21.602	0.153	0.078	2.21	97	0	105	4.0	0	96	352	82	76
148	21.749	0.147	0.082	2.20	98	-2.7	98	3.9	-0.1	96	332	82	76
149	21.901	0.152	0.083	2.22	98	-1.05	101	3.9	0	95	319	82	76
150	22.049	0.148	0.080	2.22	98	-0.2	100	4.0	0.1	94	308	84	76
151	22.199	0.150	0.075	2.21	98	-2.2	105	3.8	-0.2	94	300	85	76
152	22.347	0.148	0.080	2.20	98	0	100	3.9	0.1	94	293	84	76
153	22.497	0.150	0.084	2.22	98	-0.57	99	3.8	-0.1	93	288	83	76
154	22.646	0.149	0.085	2.20	98	0	98	3.8	0	93	284	82	76
155	22.796	0.150	0.085	2.21	98	-2.47	98	3.7	-0.1	92	280	82	76
156	22.947	0.151	0.081	2.20	98	-1.73	101	3.7	0	92	277	83	76
157	23.095	0.148	0.082	2.22	98	-0.1	99	3.7	0	92	275	84	76
158	23.247	0.152	0.083	2.19	98	-1.1	101	3.7	0	92	272	85	76
159	23.393	0.146	0.079	2.21	98	-0.95	99	3.7	0	91	270	84	76
160	23.544	0.151	0.085	2.22	98	-0.13	99	3.7	0	91	269	83	76
161	23.692	0.148	0.079	2.23	98	-1.87	101	3.6	-0.1	91	266	82	76
162	23.843	0.151	0.082	2.21	98	-2.57	101	3.5	-0.1	91	263	82	76
163	23.990	0.147	0.081	2.21	98	-0.02	99	3.6	0.1	90	260	84	76
164	24.143	0.153	0.079	2.19	98	-0.91	104	3.6	0	90	256	85	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.290	0.147	0.080	2.17	98	-1.24	99	3.5	-0.1	90	254	84	76
166	24.442	0.152	0.082	2.21	98	0	101	3.4	-0.1	90	253	83	75
167	24.590	0.148	0.085	2.20	98	-1.28	97	3.5	0.1	90	250	82	76
168	24.740	0.150	0.080	2.22	98	-1.02	101	3.5	0	89	250	82	76
169	24.888	0.148	0.081	2.19	98	-2.64	99	3.4	-0.1	89	248	83	76
170	25.038	0.150	0.083	2.21	98	-0.04	99	3.4	0	89	246	84	76
171	25.187	0.149	0.083	2.21	98	-1.36	99	3.4	0	89	244	84	75
172	25.337	0.150	0.081	2.20	98	0	100	3.4	0	89	243	84	75
173	25.488	0.151	0.079	2.20	98	-0.16	102	3.3	-0.1	89	243	83	75
174	25.636	0.148	0.083	2.19	98	-2.25	98	3.3	0	88	242	82	75
175	25.788	0.152	0.081	2.21	98	-2.81	102	3.3	0	88	241	82	75
176	25.934	0.146	0.079	2.20	98	-0.13	99	3.3	0	88	239	84	75
177	26.086	0.152	0.080	2.21	98	-0.23	102	3.3	0	88	237	85	75
178	26.232	0.146	0.087	2.21	98	-2.69	94	3.2	-0.1	88	237	84	76
179	26.384	0.152	0.081	2.21	98	-0.35	102	3.2	0	88	236	83	75
180	26.531	0.147	0.081	2.21	98	-1.23	98	3.2	0	88	236	82	75
181	26.684	0.153	0.080	2.20	98	-1.86	103	3.2	0	88	237	82	75
182	26.831	0.147	0.082	2.21	99	-2.36	98	3.2	0	88	238	83	75
183	26.983	0.152	0.078	2.22	99	-2.67	103	3.2	0	87	237	84	75
184	27.130	0.147	0.083	2.20	99	-1.65	97	3.1	-0.1	87	238	84	75
185	27.281	0.151	0.081	2.22	99	-0.58	101	3.1	0	87	236	84	75
186	27.428	0.147	0.077	2.19	99	-1.41	101	3.1	0	87	234	82	75
187	27.579	0.151	0.080	2.21	99	-0.57	101	3.1	0	87	233	82	76
188	27.727	0.148	0.084	2.21	99	-0.03	97	3.1	0	87	231	82	75
189	27.878	0.151	0.082	2.22	99	-2.05	100	3.1	0	87	229	84	75
190	28.028	0.150	0.080	2.19	99	-0.17	101	3.0	-0.1	87	228	85	75
191	28.176	0.148	0.084	2.21	99	-2.42	97	3.1	0.1	87	225	84	75
192	28.327	0.151	0.078	2.19	99	-2.06	103	3.0	-0.1	87	224	83	76
193	28.475	0.148	0.081	2.21	99	-0.12	99	2.9	-0.1	87	223	82	75
194	28.626	0.151	0.082	2.22	99	-0.38	100	3.0	0.1	87	221	82	76
195	28.773	0.147	0.079	2.23	99	-0.22	99	3.0	0	87	220	83	75
196	28.924	0.151	0.083	2.22	99	-0.53	100	3.0	0	87	220	84	75
197	29.071	0.147	0.081	2.20	99	-1.87	98	2.9	-0.1	87	219	85	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	29.224	0.153	0.082	2.20	99	-1.94	101	2.9	0	87	217	84	75
199	29.371	0.147	0.084	2.20	99	-2.72	96	2.9	0	86	217	83	75
200	29.523	0.152	0.085	2.21	99	-0.35	99	2.9	0	86	217	82	75
201	29.671	0.148	0.084	2.21	99	-0.29	97	2.9	0	86	216	82	75
202	29.821	0.150	0.081	2.21	99	-2.67	100	2.9	0	86	215	84	75
203	29.968	0.147	0.082	2.21	99	-2.72	97	3.0	0.1	86	215	84	75
204	30.119	0.151	0.083	2.22	99	-0.02	99	2.9	-0.1	86	215	84	75
205	30.267	0.148	0.079	2.21	99	-0.12	100	2.8	-0.1	86	215	83	75
206	30.417	0.150	0.078	2.20	99	-2.26	102	2.8	0	86	215	82	75
207	30.568	0.151	0.079	2.19	99	-1.47	102	2.8	0	86	214	82	75
208	30.717	0.149	0.086	2.20	99	-2.4	96	2.7	-0.1	86	212	82	75
209	30.867	0.150	0.078	2.17	99	-0.09	102	2.8	0.1	86	213	84	75
210	31.015	0.148	0.080	2.21	99	-0.54	99	2.8	0	86	212	85	75
211	31.166	0.151	0.084	2.21	99	-1.84	99	2.8	0	85	211	84	75
212	31.312	0.146	0.082	2.19	99	-0.98	97	2.7	-0.1	85	210	83	75
213	31.464	0.152	0.081	2.21	99	-2.37	101	2.7	0	85	211	82	75
214	31.610	0.146	0.080	2.20	99	0	98	2.7	0	85	211	82	75
215	31.763	0.153	0.084	2.21	99	-1.62	100	2.7	0	85	212	83	75
216	31.910	0.147	0.086	2.19	99	-0.8	95	2.7	0	85	211	84	75
217	32.062	0.152	0.083	2.21	99	0	100	2.6	-0.1	85	211	85	75
218	32.209	0.147	0.085	2.22	99	-0.09	96	2.6	0	85	211	84	75
219	32.361	0.152	0.082	2.19	99	0	101	2.6	0	85	211	83	75
220	32.508	0.147	0.079	2.22	99	-2.59	99	2.6	0	85	211	82	75
221	32.659	0.151	0.080	2.19	99	-1.26	101	2.6	0	85	211	82	75
222	32.807	0.148	0.079	2.21	99	-0.01	100	2.6	0	85	211	83	75
223	32.956	0.149	0.081	2.21	99	-2.76	99	2.4	-0.2	85	211	84	75
224	33.107	0.151	0.080	2.21	99	-1.74	101	2.5	0.1	85	210	84	75
225	33.256	0.149	0.081	2.20	99	-1.88	99	2.5	0	85	210	83	75
226	33.407	0.151	0.082	2.22	99	-0.36	100	2.5	0	85	211	82	75
227	33.555	0.148	0.084	2.21	100	-0.11	97	2.5	0	85	211	82	75
228	33.706	0.151	0.082	2.20	100	-2.75	100	2.5	0	85	211	83	75
229	33.852	0.146	0.080	2.21	100	-1.23	98	2.5	0	85	211	84	75
230	34.004	0.152	0.079	2.21	100	-0.72	102	2.4	-0.1	85	211	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	34.151	0.147	0.078	2.21	100	-2.74	100	2.4	0	85	212	84	75
232	34.303	0.152	0.083	2.20	100	-2.81	100	2.4	0	85	212	82	75
233	34.450	0.147	0.079	2.19	100	-0.09	99	2.4	0	85	211	82	75
234	34.603	0.153	0.078	2.20	100	-2.74	104	2.4	0	85	211	83	75
235	34.750	0.147	0.081	2.20	100	-0.34	98	2.3	-0.1	85	212	84	75
236	34.902	0.152	0.078	2.20	100	-1.43	103	2.3	0	85	212	85	75
237	35.048	0.146	0.085	2.21	100	0	95	2.3	0	85	211	84	75
238	35.199	0.151	0.078	2.17	100	0	102	2.3	0	85	211	83	75
239	35.347	0.148	0.080	2.19	100	0	99	2.3	0	85	210	82	75
240	35.497	0.150	0.079	2.19	100	-0.36	101	2.3	0	85	212	82	75
241	35.647	0.150	0.085	2.20	100	-0.04	97	2.1	-0.2	85	211	83	75
242	35.796	0.149	0.078	2.23	100	-2.32	101	2.2	0.1	85	210	84	75
243	35.947	0.151	0.079	2.19	100	-0.37	102	2.3	0.1	85	210	84	75
244	36.095	0.148	0.083	2.18	100	-2.8	97	2.2	-0.1	85	210	83	75
245	36.246	0.151	0.081	2.21	100	-2.46	100	2.2	0	85	210	82	75
246	36.393	0.147	0.073	2.21	100	-0.98	103	2.2	0	85	210	82	75
247	36.544	0.151	0.078	2.20	100	-1.06	102	2.2	0	85	209	83	75
248	36.690	0.146	0.082	2.21	100	-0.16	96	2.1	-0.1	85	208	84	75
249	36.842	0.152	0.082	2.18	100	-2.58	100	2.1	0	85	207	85	75
250	36.990	0.148	0.083	2.19	100	-0.8	97	2.1	0	85	208	84	75
251	37.142	0.152	0.081	2.19	100	-0.65	101	2.1	0	85	207	83	75
252	37.288	0.146	0.082	2.21	100	-1.35	96	2.0	-0.1	85	205	82	75
253	37.440	0.152	0.080	2.19	100	-1.91	102	2.0	0	85	206	82	75
254	37.587	0.147	0.079	2.20	100	-2.81	99	2.0	0	85	205	83	75
255	37.738	0.151	0.080	2.20	100	-1.6	101	2.0	0	85	205	84	75
256	37.885	0.147	0.085	2.16	100	-1.7	95	2.0	0	85	205	84	75
257	38.035	0.150	0.087	2.21	100	-0.05	96	2.0	0	85	203	83	75
258	38.183	0.148	0.082	2.20	100	-0.08	98	2.0	0	85	203	82	75
259	38.333	0.150	0.077	2.19	100	-0.9	102	1.9	-0.1	85	203	82	75
260	38.483	0.150	0.085	2.19	100	-2.7	97	1.9	0	85	202	82	75
261	38.632	0.149	0.083	2.19	100	-0.37	98	1.9	0	85	202	84	75
262	38.783	0.151	0.080	2.20	100	-1.71	101	1.9	0	85	202	85	75
263	38.930	0.147	0.077	2.19	100	-1.73	100	1.9	0	85	202	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	39.081	0.151	0.082	2.20	100	-2.62	100	1.9	0	85	201	83	75
265	39.227	0.146	0.080	2.20	100	-1.36	98	1.9	0	85	200	82	75
266	39.379	0.152	0.079	2.19	100	-1.52	102	1.9	0	85	201	82	75
267	39.525	0.146	0.079	2.18	100	-1.09	98	1.8	-0.1	85	200	83	75
268	39.676	0.151	0.079	2.20	100	-2.71	102	1.8	0	85	200	84	75
269	39.823	0.147	0.083	2.18	100	-0.46	97	1.8	0	85	199	84	75
270	39.976	0.153	0.082	2.18	100	-0.12	101	1.8	0	85	198	83	75
271	40.124	0.148	0.081	2.18	100	-2.4	98	1.7	-0.1	85	198	82	75
272	40.276	0.152	0.082	2.20	100	0	100	1.8	0.1	85	197	82	75
273	40.423	0.147	0.082	2.20	100	-0.87	97	1.8	0	84	197	82	75
274	40.573	0.150	0.084	2.18	100	-0.13	98	1.7	-0.1	84	197	84	75
275	40.720	0.147	0.078	2.20	100	-0.11	100	1.7	0	85	197	85	75
276	40.870	0.150	0.080	2.20	100	-0.4	100	1.7	0	84	196	84	75
277	41.018	0.148	0.083	2.18	100	-1.96	97	1.7	0	85	196	83	75
278	41.167	0.149	0.085	2.21	100	-1.56	97	1.7	0	84	195	82	75
279	41.317	0.150	0.080	2.19	100	-2.84	100	1.6	-0.1	84	194	82	75
280	41.466	0.149	0.086	2.19	100	-2.1	96	1.7	0.1	84	194	84	75
281	41.616	0.150	0.081	2.19	100	-0.1	100	1.6	-0.1	84	193	85	75
282	41.764	0.148	0.080	2.19	100	-0.34	99	1.6	0	84	193	84	75
283	41.915	0.151	0.087	2.18	100	0	97	1.6	0	84	192	83	75
284	42.062	0.147	0.082	2.17	100	-1.4	97	1.6	0	84	192	82	75
285	42.212	0.150	0.088	2.22	100	-0.24	96	1.6	0	84	192	82	75
286	42.359	0.147	0.084	2.20	100	0	96	1.5	-0.1	84	192	83	75
287	42.510	0.151	0.081	2.18	100	-0.02	100	1.6	0.1	84	192	84	75
288	42.656	0.146	0.088	2.19	100	-0.13	93	1.5	-0.1	84	191	85	75
289	42.808	0.152	0.077	2.18	100	-2.72	104	1.5	0	84	191	84	75
290	42.955	0.147	0.084	2.18	100	-0.24	96	1.5	0	84	190	83	75
291	43.107	0.152	0.082	2.17	100	-0.69	100	1.6	0.1	84	190	82	75
292	43.253	0.146	0.079	2.19	100	-1.28	98	1.5	-0.1	84	190	82	75
293	43.405	0.152	0.076	2.19	100	-0.7	104	1.5	0	84	190	83	75
294	43.551	0.146	0.079	2.19	100	-2.7	98	1.4	-0.1	84	190	84	75
295	43.701	0.150	0.082	2.19	100	-2.82	99	1.4	0	84	189	84	75
296	43.849	0.148	0.084	2.17	100	-2.82	97	1.4	0	84	189	83	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	43.999	0.150	0.087	2.21	100	-2.07	96	1.4	0	84	189	82	75
298	44.147	0.148	0.076	2.19	100	-2.51	102	1.4	0	84	189	81	75
299	44.297	0.150	0.087	2.19	100	-2.66	96	1.4	0	84	190	82	75
300	44.447	0.150	0.082	2.20	100	-2.5	99	1.4	0	84	190	84	75
301	44.595	0.148	0.085	2.19	100	-0.39	96	1.3	-0.1	84	190	85	75
302	44.746	0.151	0.083	2.21	100	-0.02	99	1.2	-0.1	84	190	84	75
303	44.893	0.147	0.080	2.19	100	-0.9	98	1.3	0.1	84	190	83	75
304	45.044	0.151	0.084	2.19	100	-0.13	99	1.3	0	84	190	82	75
305	45.190	0.146	0.079	2.20	100	-1.08	98	1.2	-0.1	84	189	81	75
306	45.341	0.151	0.082	2.17	100	-0.61	100	1.3	0.1	84	189	83	75
307	45.488	0.147	0.082	2.20	100	-1.42	97	1.4	0.1	84	190	84	75
308	45.639	0.151	0.082	2.21	100	-1.96	100	1.3	-0.1	84	189	85	75
309	45.786	0.147	0.083	2.19	100	-1.71	96	1.3	0	84	189	84	75
310	45.939	0.153	0.083	2.20	100	-2.64	100	1.2	-0.1	84	189	83	75
311	46.085	0.146	0.079	2.19	100	-2.67	98	1.2	0	84	189	81	75
312	46.237	0.152	0.079	2.19	100	-2.67	102	1.1	-0.1	84	188	81	76
313	46.384	0.147	0.081	2.19	100	-2.74	98	1.2	0.1	84	189	83	76
314	46.535	0.151	0.079	2.21	100	-2.45	102	1.2	0	84	187	84	76
315	46.681	0.146	0.084	2.20	100	-1.52	95	1.2	0	83	188	84	76
316	46.832	0.151	0.080	2.20	100	-2.16	101	1.2	0	83	188	84	76
317	46.980	0.148	0.080	2.18	100	-0.33	99	1.1	-0.1	83	186	82	76
318	47.130	0.150	0.077	2.17	100	-2.65	102	1.1	0	83	186	81	76
319	47.280	0.150	0.086	2.20	100	-0.62	97	1.1	0	83	187	82	75
320	47.429	0.149	0.083	2.18	100	-2.56	98	1.1	0	83	187	83	76
321	47.579	0.150	0.081	2.19	101	-0.21	99	1.1	0	83	186	84	76
322	47.727	0.148	0.086	2.18	101	-1.96	95	1.1	0	83	185	84	76
323	47.878	0.151	0.079	2.18	101	-2.8	101	1.0	-0.1	83	185	83	76
324	48.024	0.146	0.084	2.20	101	-1.42	95	1.0	0	83	186	82	76
325	48.176	0.152	0.083	2.19	101	-2.79	99	0.9	-0.1	83	185	81	76
326	48.322	0.146	0.080	2.19	101	-0.16	97	1.0	0.1	83	186	82	76
327	48.474	0.152	0.084	2.18	101	-0.08	99	0.9	-0.1	83	185	83	76
328	48.621	0.147	0.080	2.17	101	-1.08	98	1.0	0.1	83	185	84	76
329	48.773	0.152	0.085	2.19	101	-0.56	98	1.0	0	83	185	84	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	48.920	0.147	0.083	2.19	101	-0.08	96	1.0	0	83	184	83	76
331	49.071	0.151	0.079	2.18	101	-0.1	101	0.9	-0.1	83	183	82	76
332	49.218	0.147	0.081	2.19	101	-0.01	97	0.9	0	83	183	81	76
333	49.369	0.151	0.082	2.18	101	-2.44	99	0.8	-0.1	83	184	82	76
334	49.515	0.146	0.080	2.19	101	-0.86	97	0.9	0.1	83	183	84	76
335	49.666	0.151	0.086	2.18	101	-2.84	97	0.9	0	83	183	84	76
336	49.814	0.148	0.083	2.18	101	-1.05	97	0.9	0	83	182	83	76
337	49.963	0.149	0.083	2.17	101	-0.13	98	0.9	0	83	182	82	76
338	50.113	0.150	0.082	2.20	101	-0.03	99	0.9	0	83	183	81	76
339	50.262	0.149	0.080	2.17	101	-0.2	99	0.8	-0.1	83	182	81	76
340	50.412	0.150	0.080	2.18	101	-0.96	100	0.8	0	83	182	83	76
341	50.560	0.148	0.084	2.18	101	-2.75	96	0.8	0	83	182	84	76
342	50.712	0.152	0.081	2.19	101	-0.59	101	0.8	0	83	182	84	76
343	50.858	0.146	0.077	2.19	101	-0.97	99	0.8	0	83	181	83	76
344	51.008	0.150	0.078	2.19	101	-2.06	101	0.8	0	83	181	82	76
345	51.155	0.147	0.086	2.20	101	-2.83	95	0.8	0	83	179	81	76
346	51.307	0.152	0.088	2.18	101	-0.49	97	0.8	0	83	180	82	76
347	51.453	0.146	0.085	2.17	101	-1.63	94	0.8	0	83	180	83	76
348	51.606	0.153	0.087	2.18	101	-0.84	98	0.7	-0.1	83	180	84	76
349	51.753	0.147	0.078	2.17	101	-2.8	99	0.7	0	83	179	84	76
350	51.904	0.151	0.083	2.18	101	-1.26	99	0.7	0	83	179	83	76
351	52.052	0.148	0.086	2.19	101	-2.77	95	0.7	0	83	178	82	76
352	52.202	0.150	0.078	2.19	101	-0.09	101	0.6	-0.1	83	179	81	76
353	52.349	0.147	0.080	2.21	101	-2.03	98	0.6	0	83	179	82	76
354	52.500	0.151	0.082	2.21	101	-1.5	99	0.7	0.1	83	180	84	76
355	52.648	0.148	0.079	2.19	101	-0.71	99	0.6	-0.1	83	179	84	76
356	52.797	0.149	0.084	2.18	101	-0.47	97	0.6	0	83	180	84	76
357	52.948	0.151	0.081	2.19	101	-1.49	100	0.6	0	83	180	83	76
358	53.096	0.148	0.082	2.19	101	-1.21	97	0.6	0	83	179	81	76
359	53.247	0.151	0.080	2.20	101	-0.54	101	0.7	0.1	83	179	81	76
360	53.394	0.147	0.081	2.18	101	-2.68	97	0.6	-0.1	83	179	83	76
361	53.546	0.152	0.082	2.19	101	-2.08	100	0.6	0	83	179	84	76
362	53.692	0.146	0.079	2.19	101	-0.42	98	0.5	-0.1	83	179	85	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	53.843	0.151	0.078	2.18	101	-2.61	102	0.5	0	82	179	84	76
364	53.990	0.147	0.079	2.18	101	-0.43	99	0.5	0	82	178	82	76
365	54.141	0.151	0.084	2.20	101	-2.67	98	0.5	0	82	178	81	76
366	54.288	0.147	0.084	2.21	101	-2.81	96	0.5	0	82	178	81	76
367	54.440	0.152	0.084	2.18	101	-2.24	99	0.5	0	82	178	83	76
368	54.587	0.147	0.086	2.19	101	-0.07	94	0.5	0	82	177	84	76
369	54.739	0.152	0.083	2.18	101	-2.44	99	0.5	0	82	178	84	76
370	54.886	0.147	0.088	2.18	101	-2.79	93	0.4	-0.1	82	177	83	76
371	55.037	0.151	0.084	2.19	101	-2.79	98	0.4	0	82	177	82	76
372	55.183	0.146	0.083	2.20	101	-2.72	95	0.3	-0.1	82	177	81	76
373	55.334	0.151	0.081	2.20	101	-1.11	100	0.4	0.1	82	177	82	76
374	55.482	0.148	0.081	2.20	101	-0.9	98	0.4	0	82	176	83	76
375	55.632	0.150	0.082	2.18	101	-1.31	99	0.4	0	82	176	84	76
376	55.782	0.150	0.085	2.20	101	-2.79	97	0.4	0	82	175	84	76
377	55.930	0.148	0.084	2.18	101	-1.47	96	0.4	0	82	175	83	76
378	56.081	0.151	0.082	2.19	101	-0.72	99	0.2	-0.2	82	175	82	76
379	56.228	0.147	0.082	2.16	101	-2.43	97	0.3	0.1	82	174	81	76
380	56.380	0.152	0.079	2.21	101	-2.28	102	0.3	0	82	175	82	76
381	56.526	0.146	0.080	2.20	101	-0.14	97	0.3	0	82	175	84	76
382	56.677	0.151	0.083	2.16	101	-2.21	99	0.3	0	82	175	84	76
383	56.824	0.147	0.085	2.18	101	-0.27	95	0.3	0	82	175	84	76
384	56.976	0.152	0.083	2.20	101	-1.33	99	0.3	0	82	175	83	76
385	57.122	0.146	0.078	2.19	101	-1.46	98	0.3	0	82	174	82	76
386	57.275	0.153	0.078	2.16	101	-0.73	103	0.2	-0.1	82	174	81	76
387	57.422	0.147	0.075	2.19	101	-2.53	101	0.2	0	82	174	82	76
388	57.574	0.152	0.081	2.20	101	-0.07	101	0.2	0	82	174	84	76
389	57.721	0.147	0.078	2.21	101	-2.76	99	0.2	0	82	174	84	75
390	57.871	0.150	0.087	2.19	101	-1.88	96	0.2	0	82	174	83	75
391	58.018	0.147	0.080	2.19	101	-0.33	98	0.2	0	82	174	82	75
392	58.169	0.151	0.085	2.20	101	-2.82	98	0.2	0	82	173	81	75
393	58.317	0.148	0.080	2.18	101	-2.28	99	0.2	0	82	173	82	76
394	58.467	0.150	0.081	2.19	101	-0.33	99	0.2	0	82	173	83	75
395	58.617	0.150	0.080	2.19	101	-2.78	100	0.2	0	82	172	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	58.766	0.149	0.080	2.16	101	-1.45	99	0.1	-0.1	82	172	84	75
397	58.916	0.150	0.086	2.20	101	-0.04	96	0.1	0	82	172	83	75
398	59.064	0.148	0.083	2.17	101	-1.23	97	0.1	0	82	172	82	75
399	59.215	0.151	0.080	2.18	101	0	101	0.1	0	82	171	81	75
400	59.361	0.146	0.081	2.18	101	-2.81	97	0.1	0	82	171	82	75
401	59.513	0.152	0.083	2.20	101	-2.3	99	0.1	0	82	171	83	75
402	59.659	0.146	0.084	2.17	101	-2.48	95	0.1	0	82	171	84	75
403	59.811	0.152	0.085	2.19	101	-0.32	98	0.0	-0.1	82	170	84	75
Avg/Tot	59.811	0.148	0.082	2.18	96	-1.40	100			95	315	83	75.3

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	74	-1		80	0.000	7.34	0.28
1	0.141	0.141	2.24	74	-2.92	106	80	-0.070	3.99	0.34
2	0.284	0.143	2.24	74	-0.35	105	83	-0.090	7.40	0.97
3	0.431	0.147	2.21	74	-0.63	110	84	-0.100	14.39	1.21
4	0.573	0.142	2.21	74	-1.11	107	85	-0.110	17.31	0.97
5	0.719	0.146	2.13	74	-2.81	112	85	-0.090	18.59	3.09
6	0.860	0.141	2.18	74	-2.17	102	84	-0.080	16.97	3.20
7	1.004	0.144	2.16	74	-0.69	104	84	-0.100	16.90	1.59
8	1.145	0.141	2.11	74	-1.63	102	85	-0.090	17.03	1.58
9	1.285	0.140	2.08	74	-3.06	105	85	-0.090	17.15	1.33
10	1.428	0.143	2.15	75	-3.33	101	85	-0.090	16.94	1.63
11	1.568	0.140	2.10	75	-3.43	105	85	-0.080	17.07	1.61
12	1.710	0.142	2.09	75	-3.4	106	85	-0.100	17.20	1.63
13	1.847	0.137	2.03	75	-3.61	99	85	-0.090	17.22	1.65
14	1.989	0.142	2.01	76	-3.48	103	85	-0.100	16.93	1.84
15	2.130	0.141	2.20	76	-3.6	101	86	-0.090	17.14	1.74
16	2.273	0.143	2.16	76	-2.25	103	86	-0.090	17.04	1.46
17	2.416	0.143	2.13	77	-2.59	106	86	-0.080	16.70	1.36
18	2.557	0.141	2.11	77	-3.85	100	86	-0.090	16.51	1.35
19	2.700	0.143	2.09	77	-1.9	102	86	-0.090	16.61	1.24
20	2.838	0.138	2.05	78	-1.91	96	86	-0.090	16.28	1.23
21	2.980	0.142	2.21	78	-2.13	101	86	-0.080	16.34	1.14
22	3.122	0.142	2.18	78	-2.65	102	86	-0.080	16.36	1.00
23	3.269	0.147	2.16	79	-3.41	105	85	-0.090	16.10	1.06
24	3.410	0.141	2.12	79	-2.02	102	85	-0.080	15.93	1.01
25	3.555	0.145	2.11	79	-4.16	104	85	-0.070	15.99	1.04
26	3.695	0.140	2.09	80	-2.71	97	85	-0.080	15.76	0.95
27	3.835	0.140	2.06	80	-2.12	98	85	-0.090	15.43	0.79
28	3.976	0.141	2.03	80	-2.42	102	85	-0.080	15.28	0.81
29	4.116	0.140	2.15	81	-4.23	99	84	-0.080	15.25	0.77
30	4.261	0.145	2.12	81	-2.95	105	84	-0.080	15.04	0.71
31	4.400	0.139	2.10	81	-2.48	102	84	-0.090	15.49	0.68

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.543	0.143	2.05	82	-4.24	106	84	-0.080	15.30	0.77
33	4.681	0.138	2.01	82	-4.75	96	84	-0.090	15.41	0.78
34	4.823	0.142	2.16	82	-3.39	100	84	-0.090	15.63	0.79
35	4.967	0.144	2.14	83	-3.35	101	84	-0.090	15.43	0.76
36	5.109	0.142	2.07	83	-4.62	101	84	-0.080	15.57	0.76
37	5.250	0.141	2.02	83	-3.68	99	83	-0.080	15.42	0.74
38	5.392	0.142	2.20	84	-0.32	104	83	-0.080	15.48	0.80
39	5.538	0.146	2.19	84	-0.55	101	82	-0.090	15.47	0.79
40	5.682	0.144	2.19	84	-1.56	102	84	-0.090	15.52	0.70
41	5.830	0.148	2.19	84	-2.56	99	84	-0.090	15.42	0.88
42	5.973	0.143	2.19	85	-0.91	99	85	-0.080	15.59	0.84
43	6.121	0.148	2.21	85	-0.63	104	85	-0.090	15.88	0.95
44	6.264	0.143	2.17	85	-0.94	99	85	-0.080	16.00	1.02
45	6.412	0.148	2.19	86	-2.25	104	85	-0.080	16.26	1.10
46	6.555	0.143	2.19	86	-0.45	101	85	-0.080	16.31	1.10
47	6.703	0.148	2.19	86	-2.97	100	85	-0.080	16.28	1.16
48	6.846	0.143	2.18	86	-0.85	101	85	-0.070	16.33	1.15
49	6.994	0.148	2.18	87	-0.52	106	85	-0.080	16.52	1.28
50	7.137	0.143	2.18	87	-0.89	103	85	-0.080	16.52	1.33
51	7.285	0.148	2.19	87	-1.11	104	85	-0.070	16.70	1.35
52	7.428	0.143	2.20	87	-2.06	103	85	-0.090	16.57	1.43
53	7.576	0.148	2.17	87	-2.76	106	85	-0.080	16.80	1.39
54	7.719	0.143	2.17	88	-2.68	102	85	-0.070	16.63	1.42
55	7.867	0.148	2.18	88	-2.82	102	85	-0.080	16.77	1.62
56	8.010	0.143	2.18	88	-2.92	100	85	-0.090	16.69	1.59
57	8.158	0.148	2.16	88	-0.78	108	85	-0.090	16.60	1.56
58	8.302	0.144	2.17	89	-2.69	104	85	-0.100	16.77	1.47
59	8.450	0.148	2.17	89	-0.86	106	85	-0.090	16.82	1.52
60	8.594	0.144	2.19	89	-0.42	99	85	-0.080	16.74	1.58
61	8.742	0.148	2.16	89	-0.74	103	85	-0.090	16.79	1.59
62	8.885	0.143	2.17	89	-0.52	103	85	-0.100	16.70	1.68
63	9.033	0.148	2.18	90	-2.88	103	85	-0.080	16.75	1.81

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.177	0.144	2.18	90	-0.51	102	86	-0.090	16.84	1.86
65	9.325	0.148	2.16	90	-2.81	104	86	-0.090	16.73	1.95
66	9.469	0.144	2.17	90	-1.03	99	86	-0.080	16.80	1.92
67	9.616	0.147	2.17	90	-0.77	102	86	-0.070	16.83	1.89
68	9.761	0.145	2.19	90	-0.42	103	86	-0.080	16.88	1.95
69	9.908	0.147	2.16	91	-1.95	102	86	-0.090	16.69	1.97
70	10.053	0.145	2.15	91	-3	102	86	-0.090	16.75	1.94
71	10.199	0.146	2.16	91	-0.46	106	86	-0.090	16.59	2.13
72	10.344	0.145	2.15	91	-0.51	105	86	-0.080	16.80	2.22
73	10.490	0.146	2.16	91	-2.62	101	86	-0.090	16.82	2.39
74	10.635	0.145	2.15	91	-0.6	105	86	-0.090	16.70	1.82
75	10.781	0.146	2.16	92	-1.11	101	86	-0.080	16.22	1.45
76	10.927	0.146	2.15	92	-2.17	104	86	-0.080	16.26	1.50
77	11.072	0.145	2.17	92	-0.59	100	86	-0.080	16.05	1.40
78	11.218	0.146	2.15	92	-1.36	100	86	-0.080	15.94	1.25
79	11.362	0.144	2.14	92	-1.04	102	86	-0.090	15.22	1.05
80	11.508	0.146	2.14	92	-2.63	104	86	-0.080	15.02	1.02
81	11.652	0.144	2.15	92	-2.77	101	86	-0.070	14.58	1.03
82	11.799	0.147	2.15	93	-0.58	101	85	-0.090	14.50	1.13
83	11.944	0.145	2.14	93	-3.02	101	85	-0.080	14.31	0.94
84	12.091	0.147	2.13	93	-1.1	102	85	-0.080	14.27	0.81
85	12.234	0.143	2.14	93	-1.05	99	85	-0.080	13.98	0.80
86	12.381	0.147	2.12	93	-0.57	104	85	-0.090	13.96	0.86
87	12.525	0.144	2.14	93	-1.23	103	85	-0.080	14.06	0.81
88	12.673	0.148	2.14	93	-3.05	100	85	-0.070	13.80	0.85
89	12.816	0.143	2.14	93	-0.54	102	85	-0.060	13.86	0.75
90	12.964	0.148	2.14	93	-2.85	100	85	-0.070	13.51	0.70
91	13.107	0.143	2.12	94	-3.03	97	85	-0.070	13.62	0.71
92	13.254	0.147	2.13	94	-0.61	104	85	-0.060	13.52	0.71
93	13.397	0.143	2.13	94	-0.92	101	85	-0.080	13.53	0.68
94	13.545	0.148	2.13	94	-0.65	104	85	-0.060	13.68	0.66
95	13.688	0.143	2.14	94	-2.95	101	85	-0.080	13.70	0.64

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	13.836	0.148	2.13	94	-0.45	100	85	-0.070	13.88	0.65
97	13.978	0.142	2.12	94	-1.9	101	85	-0.080	14.05	0.60
98	14.126	0.148	2.13	94	-3.02	104	85	-0.070	14.14	0.62
99	14.268	0.142	2.13	94	-1.62	101	85	-0.080	14.19	0.61
100	14.416	0.148	2.12	94	-3.01	104	85	-0.090	14.26	0.53
101	14.559	0.143	2.13	94	-0.64	99	85	-0.080	13.99	0.54
102	14.706	0.147	2.12	94	-2.71	103	85	-0.070	13.78	0.55
103	14.850	0.144	2.13	95	-0.87	99	85	-0.070	13.75	0.50
104	14.997	0.147	2.11	95	-1.38	101	85	-0.080	13.78	0.52
105	15.140	0.143	2.12	95	-2.85	100	85	-0.080	13.72	0.52
106	15.287	0.147	2.13	95	-0.74	103	85	-0.070	13.79	0.55
107	15.431	0.144	2.12	95	-3.05	99	85	-0.070	13.77	0.48
108	15.578	0.147	2.14	95	-2.76	101	85	-0.080	13.51	0.51
109	15.722	0.144	2.11	95	-2.21	99	84	-0.090	13.44	0.46
110	15.867	0.145	2.11	95	-2.22	102	84	-0.060	12.77	0.62
111	16.012	0.145	2.12	95	-0.5	100	84	-0.070	12.98	0.54
112	16.157	0.145	2.11	95	-1.91	99	84	-0.070	12.45	0.47
113	16.302	0.145	2.11	95	-2.78	102	84	-0.070	12.10	0.44
114	16.447	0.145	2.13	95	-2.04	98	84	-0.060	12.01	0.44
115	16.592	0.145	2.11	95	-0.51	100	84	-0.080	12.09	0.37
116	16.735	0.143	2.11	96	-2.38	98	84	-0.080	11.85	0.36
117	16.882	0.147	2.11	96	-2.17	102	84	-0.060	11.67	0.37
118	17.025	0.143	2.11	96	-0.58	97	84	-0.070	11.58	0.34
119	17.172	0.147	2.09	96	-2.97	100	84	-0.060	11.50	0.35
120	17.315	0.143	2.11	96	-0.67	96	84	-0.060	11.41	0.33
121	17.462	0.147	2.11	96	-3.02	99	84	-0.070	11.16	0.41
122	17.605	0.143	2.10	96	-2.3	97	84	-0.060	11.13	0.44
123	17.753	0.148	2.11	96	-1.51	102	84	-0.080	11.04	0.49
124	17.895	0.142	2.10	96	-2.02	96	84	-0.080	11.14	0.50
125	18.042	0.147	2.11	96	-2.13	102	83	-0.070	10.90	0.54
126	18.184	0.142	2.10	96	-2.98	95	83	-0.070	11.01	0.54
127	18.331	0.147	2.10	96	-1.25	100	83	-0.050	11.15	0.55

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.473	0.142	2.10	96	-3.04	99	83	-0.070	11.11	0.57
129	18.620	0.147	2.09	96	-2.9	103	83	-0.060	11.29	0.55
130	18.762	0.142	2.10	96	-2.89	97	83	-0.060	11.31	0.56
131	18.909	0.147	2.10	96	-2.03	101	83	-0.060	11.05	0.63
132	19.052	0.143	2.08	96	-1.32	98	83	-0.050	11.10	0.61
133	19.198	0.146	2.10	96	-1.08	98	83	-0.070	11.29	0.56
134	19.342	0.144	2.09	96	-2.52	100	83	-0.060	11.40	0.61
135	19.487	0.145	2.09	96	-0.75	101	83	-0.060	11.24	0.67
136	19.630	0.143	2.10	96	-1.26	96	83	-0.070	10.73	0.79
137	19.775	0.145	2.08	97	-0.71	101	83	-0.050	10.45	0.83
138	19.919	0.144	2.08	97	-1.18	99	83	-0.060	10.49	0.89
139	20.063	0.144	2.10	97	-2.61	98	83	-0.070	10.48	0.88
140	20.207	0.144	2.08	97	-0.78	97	83	-0.060	10.45	0.92
141	20.350	0.143	2.07	97	-2.27	99	82	-0.060	10.27	1.00
142	20.496	0.146	2.08	97	-2.75	100	82	-0.050	10.63	1.09
143	20.638	0.142	2.13	97	-2.96	97	82	-0.050	11.25	0.83
144	20.786	0.148	2.14	97	-0.87	103	82	-0.070	12.30	0.62
145	20.930	0.144	2.14	97	-1.14	101	82	-0.060	13.11	0.46
146	21.078	0.148	2.13	97	-2.39	101	82	-0.060	12.83	0.52
147	21.222	0.144	2.11	97	-2.18	100	82	-0.060	9.97	1.07
148	21.370	0.148	2.13	97	-2.09	101	82	-0.050	9.31	1.23
149	21.513	0.143	2.11	97	-2.99	97	82	-0.050	9.09	1.11
150	21.661	0.148	2.11	97	-0.76	102	82	-0.050	8.98	1.12
151	21.804	0.143	2.13	97	-2.26	101	82	-0.050	9.02	1.13
152	21.952	0.148	2.13	97	-0.96	102	82	-0.050	8.94	1.17
153	22.095	0.143	2.12	97	-1.57	96	82	-0.040	8.85	1.18
154	22.244	0.149	2.12	97	-0.82	99	82	-0.050	8.78	1.17
155	22.386	0.142	2.12	97	-1.11	94	82	-0.050	8.92	1.21
156	22.534	0.148	2.11	97	-2.78	101	82	-0.040	8.80	1.24
157	22.677	0.143	2.12	97	-2.43	97	82	-0.030	8.87	1.24
158	22.825	0.148	2.11	97	-1.33	100	81	-0.030	8.84	1.34
159	22.968	0.143	2.11	97	-1.59	99	81	-0.050	8.81	1.34

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.116	0.148	2.13	97	-1.05	98	81	-0.050	8.75	1.31
161	23.259	0.143	2.12	97	-0.77	99	81	-0.040	8.81	1.37
162	23.407	0.148	2.12	97	-1.07	100	81	-0.040	8.62	1.47
163	23.550	0.143	2.12	97	-0.95	97	81	-0.040	8.61	1.49
164	23.698	0.148	2.12	97	-0.84	102	81	-0.050	8.48	1.53
165	23.842	0.144	2.11	97	-1.78	99	81	-0.050	8.68	1.47
166	23.992	0.150	2.20	97	-1.2	101	81	-0.040	8.75	1.49
167	24.138	0.146	2.20	97	-0.71	97	81	-0.040	8.62	1.51
168	24.288	0.150	2.21	98	-3.14	102	81	-0.050	8.68	1.46
169	24.434	0.146	2.18	98	-0.78	99	81	-0.050	8.67	1.51
170	24.585	0.151	2.20	98	-1.66	101	81	-0.030	8.60	1.43
171	24.731	0.146	2.18	98	-3.13	98	81	-0.040	8.69	1.37
172	24.881	0.150	2.19	98	-0.67	102	81	-0.040	8.86	1.30
173	25.027	0.146	2.20	98	-1.63	100	81	-0.040	8.23	1.46
174	25.178	0.151	2.19	98	-0.89	101	81	-0.030	8.01	1.33
175	25.323	0.145	2.19	98	-0.95	98	81	-0.030	8.11	1.10
176	25.474	0.151	2.19	98	-1.43	104	81	-0.050	8.26	0.93
177	25.620	0.146	2.19	98	-1.27	100	81	-0.050	8.39	0.89
178	25.770	0.150	2.19	98	-2.97	98	81	-0.040	8.13	1.08
179	25.916	0.146	2.20	98	-0.81	99	81	-0.040	8.26	1.04
180	26.065	0.149	2.19	98	-1.97	101	81	-0.040	8.11	1.11
181	26.212	0.147	2.19	98	-2.59	100	81	-0.050	7.99	1.04
182	26.362	0.150	2.20	98	-0.74	101	81	-0.040	7.45	1.09
183	26.508	0.146	2.19	98	-2.89	101	81	-0.040	7.67	1.01
184	26.657	0.149	2.20	98	-3.21	100	81	-0.040	7.61	0.95
185	26.804	0.147	2.20	98	-1.9	100	81	-0.040	7.52	0.98
186	26.953	0.149	2.18	98	-2.93	103	81	-0.040	7.50	0.94
187	27.101	0.148	2.19	98	-2.97	101	81	-0.040	7.66	0.90
188	27.250	0.149	2.19	98	-2.88	99	81	-0.040	7.55	0.90
189	27.398	0.148	2.20	98	-3.14	100	81	-0.040	7.51	0.92
190	27.546	0.148	2.19	98	-1.25	101	81	-0.040	7.60	0.89
191	27.695	0.149	2.18	98	-3.21	99	81	-0.040	7.42	0.91

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	27.842	0.147	2.18	98	-0.72	101	81	-0.030	7.43	0.89
193	27.992	0.150	2.21	98	-3.12	102	81	-0.040	7.28	0.93
194	28.138	0.146	2.19	98	-2.99	98	81	-0.030	7.11	0.90
195	28.287	0.149	2.20	98	-1.13	102	81	-0.030	7.29	0.87
196	28.434	0.147	2.20	98	-3.12	98	81	-0.040	7.08	0.95
197	28.583	0.149	2.17	98	-2.51	101	81	-0.040	7.10	0.97
198	28.730	0.147	2.20	98	-0.68	99	81	-0.030	7.13	1.00
199	28.880	0.150	2.19	98	-2.71	100	81	-0.030	7.35	0.97
200	29.025	0.145	2.19	98	-0.95	96	81	-0.050	7.47	0.90
201	29.175	0.150	2.19	98	-1.46	100	81	-0.030	7.44	0.88
202	29.321	0.146	2.17	98	-3.06	99	81	-0.030	7.44	0.92
203	29.473	0.152	2.20	98	-2.19	102	81	-0.030	7.62	0.90
204	29.618	0.145	2.18	98	-2.79	97	81	-0.040	7.52	1.03
205	29.769	0.151	2.18	98	-1.17	103	81	-0.030	7.41	0.99
206	29.915	0.146	2.18	98	-2.56	101	81	-0.040	7.44	1.01
207	30.065	0.150	2.18	98	-1.46	103	81	-0.030	7.50	0.98
208	30.211	0.146	2.19	98	-1.98	96	81	-0.040	7.66	0.98
209	30.362	0.151	2.19	98	-0.98	104	81	-0.050	7.63	0.97
210	30.507	0.145	2.18	98	-2.13	99	81	-0.040	7.66	0.99
211	30.657	0.150	2.19	98	-0.79	100	81	-0.040	7.72	0.94
212	30.803	0.146	2.19	98	-0.84	98	81	-0.030	8.01	0.95
213	30.953	0.150	2.19	99	-1.76	101	81	-0.030	7.95	1.00
214	31.099	0.146	2.19	99	-2.49	99	81	-0.040	8.15	1.06
215	31.249	0.150	2.18	99	-3.25	99	81	-0.040	8.13	1.09
216	31.395	0.146	2.19	99	-2.67	96	81	-0.040	8.12	1.12
217	31.545	0.150	2.19	99	-1.47	100	81	-0.030	8.26	1.17
218	31.692	0.147	2.17	99	-1.25	97	81	-0.030	8.17	1.16
219	31.841	0.149	2.18	99	-3.2	100	81	-0.030	8.07	1.17
220	31.989	0.148	2.18	99	-3.22	101	81	-0.040	8.22	1.14
221	32.137	0.148	2.17	99	-2.71	100	81	-0.030	8.31	1.06
222	32.285	0.148	2.19	99	-0.77	101	81	-0.020	8.30	1.03
223	32.433	0.148	2.18	99	-1.46	100	81	-0.030	8.21	1.08

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	32.582	0.149	2.18	99	-3.21	101	81	-0.040	8.24	1.06
225	32.729	0.147	2.19	99	-3.04	99	81	-0.030	8.17	1.09
226	32.878	0.149	2.18	99	-1.47	100	81	-0.030	8.33	1.08
227	33.025	0.147	2.19	99	-3.19	97	81	-0.040	8.23	1.13
228	33.174	0.149	2.19	99	-1.75	100	81	-0.040	8.27	1.09
229	33.320	0.146	2.18	99	-0.94	99	81	-0.040	8.38	1.10
230	33.469	0.149	2.19	99	-2.42	102	81	-0.030	8.31	1.14
231	33.616	0.147	2.17	99	-1.19	101	81	-0.040	8.31	1.12
232	33.766	0.150	2.21	99	-0.97	100	81	-0.030	8.40	1.10
233	33.911	0.145	2.18	99	-1.52	99	81	-0.060	8.33	1.10
234	34.061	0.150	2.17	99	-1.81	103	81	-0.040	8.24	1.08
235	34.207	0.146	2.19	99	-2.71	98	81	-0.030	8.22	1.11
236	34.357	0.150	2.18	99	-3.23	103	81	-0.050	8.20	1.12
237	34.503	0.146	2.18	99	-2.99	96	81	-0.030	8.33	1.05
238	34.654	0.151	2.19	99	-3.12	104	81	-0.020	8.17	1.08
239	34.799	0.145	2.18	99	-2.6	98	81	-0.050	8.22	1.02
240	34.950	0.151	2.18	99	-3.19	103	81	-0.020	8.28	1.02
241	35.095	0.145	2.18	99	-2.34	95	81	-0.040	8.11	1.05
242	35.245	0.150	2.19	99	-0.82	103	81	-0.040	8.13	1.02
243	35.391	0.146	2.18	99	-3.02	100	81	-0.040	8.09	1.00
244	35.541	0.150	2.17	99	-1.37	100	81	-0.040	8.16	1.03
245	35.687	0.146	2.20	99	-1.54	98	81	-0.030	8.16	0.98
246	35.837	0.150	2.18	99	-2.7	107	81	-0.030	8.10	0.99
247	35.982	0.145	2.19	99	-2.29	100	81	-0.020	7.97	0.97
248	36.132	0.150	2.19	99	-2.62	101	81	-0.030	7.84	0.97
249	36.277	0.145	2.19	99	-1.52	97	81	-0.040	7.47	1.10
250	36.427	0.150	2.17	99	-2.95	100	81	-0.010	7.42	1.17
251	36.574	0.147	2.19	99	-1.44	99	81	-0.040	7.14	1.26
252	36.723	0.149	2.19	99	-2.8	100	81	-0.040	7.41	1.32
253	36.869	0.146	2.17	99	-0.87	99	81	-0.020	7.14	1.36
254	37.018	0.149	2.18	99	-3.15	102	81	-0.030	7.04	1.34
255	37.164	0.146	2.17	99	-2.28	99	81	-0.040	7.43	1.34

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	37.314	0.150	2.17	99	-1.12	99	81	-0.040	7.15	1.31
257	37.460	0.146	2.17	99	-3.19	95	81	-0.030	7.10	1.24
258	37.610	0.150	2.18	99	-2.52	101	81	-0.030	7.21	1.19
259	37.757	0.147	2.18	99	-2.54	102	81	-0.040	7.27	1.15
260	37.905	0.148	2.17	99	-3.21	97	81	-0.030	7.32	1.10
261	38.053	0.148	2.17	99	-1.78	99	81	-0.040	7.13	1.14
262	38.200	0.147	2.17	99	-1.13	100	81	-0.030	7.28	1.22
263	38.348	0.148	2.18	99	-3.12	102	81	-0.040	7.36	1.19
264	38.496	0.148	2.17	99	-3.17	99	81	-0.030	7.29	1.21
265	38.644	0.148	2.15	99	-1.14	100	81	-0.030	7.36	1.17
266	38.791	0.147	2.18	99	-1.32	100	81	-0.020	7.33	1.18
267	38.940	0.149	2.18	99	-2.74	102	81	-0.030	7.32	1.17
268	39.086	0.146	2.17	99	-2.12	100	81	-0.030	7.41	1.18
269	39.235	0.149	2.17	99	-2.93	99	81	-0.040	7.49	1.16
270	39.381	0.146	2.17	99	-3.18	98	81	-0.030	7.43	1.12
271	39.530	0.149	2.18	99	-3.05	101	81	-0.040	7.48	1.09
272	39.676	0.146	2.16	99	-3.21	98	81	-0.020	7.54	1.12
273	39.826	0.150	2.18	99	-2.78	100	81	-0.040	7.52	1.10
274	39.972	0.146	2.17	99	-3.04	97	81	-0.040	7.44	1.09
275	40.121	0.149	2.17	99	-2.51	102	81	-0.030	7.62	1.08
276	40.267	0.146	2.17	99	-3.02	99	81	-0.020	7.58	1.09
277	40.416	0.149	2.17	99	-2.88	99	81	-0.030	7.43	1.15
278	40.562	0.146	2.17	99	-2.51	96	81	-0.030	7.30	1.17
279	40.712	0.150	2.16	99	-2.55	102	81	-0.030	7.43	1.11
280	40.857	0.145	2.17	99	-2.89	95	81	-0.030	7.33	1.13
281	41.008	0.151	2.17	99	-0.84	102	81	-0.040	7.52	1.05
282	41.153	0.145	2.18	99	-2.5	98	81	-0.040	7.52	1.06
283	41.303	0.150	2.17	99	-3.03	98	81	-0.040	7.41	1.09
284	41.448	0.145	2.16	99	-1.61	97	81	-0.030	7.46	1.09
285	41.598	0.150	2.18	99	-1.26	97	81	-0.010	7.42	1.09
286	41.743	0.145	2.17	99	-2.43	96	81	-0.030	7.58	1.06
287	41.893	0.150	2.17	99	-1.54	101	81	-0.030	7.47	1.10

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	42.038	0.145	2.16	99	-0.86	94	81	-0.040	7.41	1.00
289	42.188	0.150	2.17	99	-2.79	104	81	-0.040	7.38	0.90
290	42.333	0.145	2.15	99	-1.44	96	81	-0.030	7.29	0.89
291	42.484	0.151	2.15	99	-2.68	101	81	-0.040	7.29	0.89
292	42.629	0.145	2.20	99	-0.66	99	81	-0.030	7.46	0.89
293	42.778	0.149	2.17	99	-2.47	104	81	-0.030	7.41	0.83
294	42.923	0.145	2.17	99	-0.79	99	81	-0.030	7.32	0.86
295	43.073	0.150	2.17	99	-1.32	100	81	-0.030	7.38	0.86
296	43.218	0.145	2.17	99	-3.06	96	81	-0.020	7.31	0.81
297	43.367	0.149	2.18	99	-2.11	97	81	-0.030	7.24	0.97
298	43.513	0.146	2.17	99	-1.56	102	81	-0.030	7.00	0.99
299	43.662	0.149	2.14	99	-1.12	97	81	-0.030	7.15	0.94
300	43.808	0.146	2.17	99	-3.15	98	81	-0.030	7.15	1.00
301	43.957	0.149	2.17	99	-3.22	98	81	-0.030	7.06	0.97
302	44.103	0.146	2.16	99	-3.29	97	81	-0.030	7.19	0.93
303	44.252	0.149	2.16	99	-0.89	101	81	-0.020	7.08	0.94
304	44.398	0.146	2.16	99	-2.92	97	81	-0.030	7.02	0.96
305	44.546	0.148	2.16	99	-0.85	101	81	-0.040	6.96	0.97
306	44.692	0.146	2.16	99	-2.33	98	81	-0.030	7.13	0.92
307	44.841	0.149	2.15	99	-2.88	100	81	-0.030	7.03	0.94
308	44.988	0.147	2.15	99	-3.18	98	81	-0.020	7.07	0.89
309	45.136	0.148	2.17	99	-1.17	99	81	-0.030	7.10	0.90
310	45.283	0.147	2.17	99	-2.16	98	81	-0.030	6.97	0.94
311	45.431	0.148	2.17	100	-3.23	101	81	-0.030	7.04	0.92
312	45.578	0.147	2.16	100	-2.91	100	81	-0.020	6.93	0.94
313	45.726	0.148	2.15	100	-1.08	100	81	-0.040	6.99	0.94
314	45.874	0.148	2.16	100	-0.79	101	81	-0.050	7.08	0.91
315	46.021	0.147	2.17	100	-2.01	97	81	-0.020	7.16	0.91
316	46.169	0.148	2.16	100	-2.41	100	81	-0.050	7.08	0.89
317	46.316	0.147	2.16	100	-3.21	99	81	-0.030	7.03	0.88
318	46.464	0.148	2.16	100	-2.57	102	81	-0.010	6.98	0.87
319	46.611	0.147	2.16	100	-2.46	96	81	-0.020	7.04	0.90

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	46.759	0.148	2.14	100	-3.19	98	81	-0.020	7.05	0.89
321	46.906	0.147	2.17	100	-1.28	99	81	-0.030	6.93	0.85
322	47.054	0.148	2.16	100	-3.19	97	81	-0.030	6.91	0.90
323	47.200	0.146	2.17	100	-3.12	99	81	-0.030	7.00	0.86
324	47.349	0.149	2.17	100	-0.99	98	81	-0.030	6.79	0.87
325	47.495	0.146	2.16	100	-1.12	97	81	-0.020	6.94	0.86
326	47.643	0.148	2.17	100	-3.27	100	81	-0.030	6.91	0.85
327	47.789	0.146	2.16	100	-2.35	96	81	-0.040	6.97	0.89
328	47.938	0.149	2.15	100	-2.5	101	81	-0.040	6.91	0.90
329	48.084	0.146	2.16	100	-0.91	96	81	-0.030	6.86	0.87
330	48.234	0.150	2.16	100	-0.96	100	81	-0.030	6.92	0.86
331	48.379	0.145	2.17	100	-3.12	99	81	-0.030	7.03	0.89
332	48.528	0.149	2.16	100	-1.16	100	81	-0.040	7.02	0.87
333	48.674	0.146	2.16	100	-2.5	98	81	-0.040	6.94	0.90
334	48.823	0.149	2.15	100	-2.82	101	81	-0.030	6.94	0.87
335	48.969	0.146	2.16	100	-1.81	95	81	-0.030	7.01	0.88
336	49.119	0.150	2.14	100	-1.81	100	81	-0.030	6.90	0.91
337	49.264	0.145	2.15	100	-1.46	96	81	-0.030	6.93	0.91
338	49.414	0.150	2.17	100	-3.08	100	81	-0.040	6.94	0.90
339	49.559	0.145	2.16	100	-0.91	98	81	-0.040	6.80	0.93
340	49.709	0.150	2.15	100	-0.88	101	81	-0.040	6.99	0.88
341	49.855	0.146	2.14	100	-3.13	96	81	-0.030	6.92	0.90
342	50.005	0.150	2.16	100	-1.86	101	81	-0.020	7.06	0.90
343	50.150	0.145	2.15	100	-3.14	100	81	-0.030	6.92	0.88
344	50.300	0.150	2.15	100	-0.98	103	81	-0.030	7.06	0.83
345	50.445	0.145	2.15	100	-1.15	95	81	-0.020	6.91	0.81
346	50.595	0.150	2.16	100	-0.81	97	81	-0.040	6.97	0.82
347	50.740	0.145	2.15	100	-3.2	95	81	-0.030	6.96	0.79
348	50.890	0.150	2.16	100	-3.15	97	81	-0.030	6.91	0.79
349	51.035	0.145	2.16	101	-2.63	99	81	-0.020	6.96	0.79
350	51.185	0.150	2.16	101	-1.54	99	81	-0.040	7.00	0.81
351	51.330	0.145	2.16	101	-1.88	94	81	-0.030	6.87	0.80

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	51.479	0.149	2.17	101	-0.76	102	81	-0.030	7.00	0.82
353	51.624	0.145	2.17	101	-3.09	98	81	-0.030	6.94	0.89
354	51.774	0.150	2.17	101	-3.17	100	81	-0.020	7.02	0.89
355	51.919	0.145	2.15	101	-2.07	99	81	-0.030	6.98	0.91
356	52.069	0.150	2.16	101	-3.2	99	81	-0.030	6.77	0.91
357	52.215	0.146	2.17	101	-0.85	98	81	-0.030	6.78	0.89
358	52.364	0.149	2.16	101	-3	99	81	-0.030	6.93	0.87
359	52.510	0.146	2.15	101	-1.37	99	81	-0.020	6.85	0.90
360	52.659	0.149	2.16	101	-3.26	100	81	-0.030	6.74	0.88
361	52.805	0.146	2.16	101	-3.2	97	81	-0.030	6.79	0.88
362	52.954	0.149	2.16	101	-0.79	101	81	-0.050	6.74	0.91
363	53.100	0.146	2.16	101	-3.21	100	81	-0.040	6.78	0.86
364	53.249	0.149	2.15	101	-1.15	101	81	-0.040	6.88	0.85
365	53.396	0.147	2.14	101	-2.99	97	81	-0.020	6.79	0.85
366	53.544	0.148	2.16	101	-3.01	97	81	-0.030	6.74	0.85
367	53.691	0.147	2.15	101	-2.25	97	81	-0.030	6.87	0.86
368	53.839	0.148	2.16	101	-0.99	96	81	-0.020	6.64	0.88
369	53.987	0.148	2.15	101	-3.16	98	81	-0.030	6.74	0.85
370	54.134	0.147	2.15	101	-2.21	95	81	-0.030	6.61	0.85
371	54.282	0.148	2.15	101	-1.01	97	81	-0.030	6.58	0.86
372	54.429	0.147	2.16	101	-1.58	97	81	-0.030	6.52	0.87
373	54.578	0.149	2.16	101	-3.06	100	81	-0.020	6.76	0.81
374	54.724	0.146	2.14	101	-1.38	98	81	-0.020	6.62	0.85
375	54.873	0.149	2.17	101	-0.96	99	81	-0.020	6.65	0.83
376	55.020	0.147	2.16	101	-1.92	96	81	-0.040	6.67	0.84
377	55.168	0.148	2.15	101	-2.93	97	81	-0.040	6.60	0.84
378	55.314	0.146	2.18	101	-2.31	97	81	-0.030	6.65	0.86
379	55.463	0.149	2.15	101	-0.98	99	81	-0.040	6.52	0.84
380	55.609	0.146	2.16	101	-0.99	99	81	-0.020	6.61	0.81
381	55.758	0.149	2.15	101	-2.29	101	81	-0.030	6.63	0.83
382	55.904	0.146	2.15	101	-2.43	97	81	-0.030	6.67	0.84
383	56.053	0.149	2.16	101	-2.8	98	81	-0.030	6.63	0.79

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	56.199	0.146	2.16	101	-0.82	97	81	-0.010	6.59	0.87
385	56.348	0.149	2.16	101	-2.28	102	81	-0.030	6.68	0.84
386	56.493	0.145	2.15	101	-0.82	99	81	-0.020	6.67	0.82
387	56.643	0.150	2.16	101	-3.04	105	81	-0.030	6.62	0.85
388	56.788	0.145	2.16	101	-2.96	97	81	-0.020	6.63	0.81
389	56.938	0.150	2.16	101	-2.53	102	81	-0.040	6.51	0.85
390	57.083	0.145	2.15	101	-0.8	94	81	-0.020	6.43	0.82
391	57.234	0.151	2.17	101	-2.35	102	81	-0.040	6.37	0.81
392	57.379	0.145	2.16	101	-1.14	95	81	-0.030	6.46	0.78
393	57.529	0.150	2.16	101	-2.87	101	80	-0.030	6.47	0.79
394	57.674	0.145	2.15	101	-3.27	97	80	-0.030	6.27	0.80
395	57.825	0.151	2.16	101	-2.92	102	80	-0.040	6.42	0.84
396	57.970	0.145	2.16	101	-3.23	98	80	-0.030	6.35	0.80
397	58.119	0.149	2.16	101	-1.88	97	80	-0.030	6.47	0.77
398	58.264	0.145	2.15	101	-3.23	96	80	-0.030	6.37	0.76
399	58.415	0.151	2.16	101	-0.96	102	80	-0.030	6.47	0.80
400	58.560	0.145	2.14	101	-2.2	97	80	-0.020	6.49	0.80
401	58.710	0.150	2.17	101	-3.08	99	80	-0.040	6.30	0.83
402	58.855	0.145	2.16	101	-1.41	95	80	-0.030	6.36	0.79
403	59.005	0.150	2.15	101	-0.97	98	80	-0.030	6.19	0.83
Avg/Tot	59.005	0.146	2.15	95	-2.04	100	82	-0.050	9.98	1.01

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	526	568	396	613	577	536.0	N/A
1	527	567	422	616	582	542.8	N/A
2	528	565	441	617	584	547.0	N/A
3	528	563	453	628	585	551.4	N/A
4	528	562	460	648	585	556.6	N/A
5	528	559	464	676	585	562.4	N/A
6	526	557	466	701	584	566.8	N/A
7	525	554	466	723	582	570.0	N/A
8	522	550	465	741	580	571.6	N/A
9	519	546	464	756	577	572.4	N/A
10	515	542	462	768	574	572.2	N/A
11	512	540	403	759	570	556.8	N/A
12	508	536	367	754	566	546.2	N/A
13	505	532	340	748	563	537.6	N/A
14	501	529	319	742	560	530.2	N/A
15	496	524	302	737	556	523.0	N/A
16	492	520	287	732	551	516.4	N/A
17	488	516	275	727	547	510.6	N/A
18	483	512	265	722	544	505.2	N/A
19	478	507	256	717	540	499.6	N/A
20	474	503	248	712	536	494.6	N/A
21	469	499	241	706	532	489.4	N/A
22	465	494	235	701	528	484.6	N/A
23	461	490	230	696	525	480.4	N/A
24	457	486	226	691	521	476.2	N/A
25	452	482	222	685	517	471.6	N/A
26	449	479	218	680	513	467.8	N/A
27	445	475	215	675	510	464.0	N/A
28	441	472	212	671	507	460.6	N/A
29	437	468	209	666	504	456.8	N/A
30	434	465	207	662	500	453.6	N/A
31	430	462	204	658	498	450.4	N/A
32	427	459	202	654	494	447.2	N/A
33	424	456	200	651	491	444.4	N/A
34	421	453	198	648	488	441.6	N/A
35	418	451	197	646	485	439.4	N/A
36	416	448	195	644	483	437.2	N/A
37	413	446	194	641	480	434.8	N/A
38	411	443	193	639	478	432.8	N/A
39	408	441	191	636	475	430.2	N/A
40	406	439	190	635	472	428.4	N/A
41	404	437	190	632	470	426.6	N/A
42	402	435	189	631	468	425.0	N/A
43	400	433	188	630	465	423.2	N/A
44	398	431	187	630	463	421.8	N/A
45	397	430	187	631	461	421.2	N/A
46	395	428	186	631	459	419.8	N/A
47	394	426	186	632	457	419.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	393	425	186	634	456	418.8	N/A
49	391	424	186	635	454	418.0	N/A
50	390	422	186	637	453	417.6	N/A
51	389	421	186	639	451	417.2	N/A
52	388	420	185	640	450	416.6	N/A
53	388	420	185	642	448	416.6	N/A
54	387	419	185	643	448	416.4	N/A
55	387	418	185	645	447	416.4	N/A
56	386	418	186	647	446	416.6	N/A
57	385	417	186	648	445	416.2	N/A
58	385	417	186	649	444	416.2	N/A
59	385	417	186	650	444	416.4	N/A
60	385	417	186	650	442	416.0	N/A
61	385	417	187	650	442	416.2	N/A
62	385	417	187	650	441	416.0	N/A
63	385	417	187	650	441	416.0	N/A
64	385	417	188	651	440	416.2	N/A
65	385	417	188	652	440	416.4	N/A
66	385	417	189	653	440	416.8	N/A
67	386	417	190	653	440	417.2	N/A
68	386	418	190	654	439	417.4	N/A
69	386	418	191	654	439	417.6	N/A
70	387	418	191	655	438	417.8	N/A
71	387	419	192	656	438	418.4	N/A
72	388	419	192	657	437	418.6	N/A
73	388	420	193	659	438	419.6	N/A
74	389	420	194	660	438	420.2	N/A
75	389	421	194	661	437	420.4	N/A
76	390	421	195	661	438	421.0	N/A
77	391	422	196	660	437	421.2	N/A
78	391	422	196	660	437	421.2	N/A
79	392	423	196	659	437	421.4	N/A
80	393	423	197	658	437	421.6	N/A
81	393	424	197	656	436	421.2	N/A
82	394	425	198	654	435	421.2	N/A
83	395	426	198	651	435	421.0	N/A
84	396	426	198	648	436	420.8	N/A
85	396	427	199	645	436	420.6	N/A
86	397	428	199	642	435	420.2	N/A
87	398	428	199	639	434	419.6	N/A
88	398	429	200	636	434	419.4	N/A
89	399	430	200	633	434	419.2	N/A
90	399	430	201	630	433	418.6	N/A
91	400	431	201	627	433	418.4	N/A
92	400	432	201	624	433	418.0	N/A
93	400	433	202	620	432	417.4	N/A
94	400	433	202	617	432	416.8	N/A
95	400	434	203	616	433	417.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	401	435	203	615	432	417.2	N/A
97	400	435	203	613	432	416.6	N/A
98	400	436	204	612	433	417.0	N/A
99	400	437	204	613	433	417.4	N/A
100	400	437	205	613	433	417.6	N/A
101	400	438	206	613	433	418.0	N/A
102	400	439	206	613	433	418.2	N/A
103	400	439	207	611	433	418.0	N/A
104	400	440	208	610	433	418.2	N/A
105	400	441	209	610	433	418.6	N/A
106	400	441	210	609	434	418.8	N/A
107	400	442	210	608	434	418.8	N/A
108	400	443	211	606	434	418.8	N/A
109	400	444	212	605	435	419.2	N/A
110	399	444	213	603	435	418.8	N/A
111	399	445	213	601	436	418.8	N/A
112	399	446	214	598	436	418.6	N/A
113	399	446	215	593	436	417.8	N/A
114	399	447	215	588	437	417.2	N/A
115	399	447	216	583	437	416.4	N/A
116	399	448	217	578	438	416.0	N/A
117	399	448	218	572	438	415.0	N/A
118	399	448	219	567	438	414.2	N/A
119	399	449	219	561	439	413.4	N/A
120	398	449	219	555	439	412.0	N/A
121	398	449	220	549	440	411.2	N/A
122	398	449	220	543	440	410.0	N/A
123	398	449	221	536	440	408.8	N/A
124	398	449	221	530	440	407.6	N/A
125	398	448	221	525	441	406.6	N/A
126	398	448	221	519	441	405.4	N/A
127	398	448	222	514	441	404.6	N/A
128	398	448	222	510	441	403.8	N/A
129	398	448	222	506	441	403.0	N/A
130	398	447	223	502	442	402.4	N/A
131	398	447	223	498	443	401.8	N/A
132	398	447	223	495	443	401.2	N/A
133	398	447	224	492	443	400.8	N/A
134	398	447	224	490	443	400.4	N/A
135	398	447	224	487	444	400.0	N/A
136	397	447	224	484	444	399.2	N/A
137	398	447	225	480	444	398.8	N/A
138	398	447	225	476	444	398.0	N/A
139	397	447	225	471	444	396.8	N/A
140	397	447	226	467	444	396.2	N/A
141	397	447	227	464	444	395.8	N/A
142	397	447	227	462	444	395.4	N/A
143	397	446	227	462	444	395.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	397	446	228	463	444	395.6	N/A
145	397	446	228	466	444	396.2	N/A
146	397	445	228	471	443	396.8	N/A
147	397	445	228	472	443	397.0	N/A
148	397	444	228	469	442	396.0	N/A
149	397	444	228	463	441	394.6	N/A
150	398	443	227	455	441	392.8	N/A
151	398	442	227	447	441	391.0	N/A
152	397	441	226	438	441	388.6	N/A
153	397	440	226	430	441	386.8	N/A
154	397	439	226	422	440	384.8	N/A
155	397	438	225	415	439	382.8	N/A
156	397	437	225	408	440	381.4	N/A
157	397	435	225	401	440	379.6	N/A
158	396	434	225	395	440	378.0	N/A
159	396	432	225	390	440	376.6	N/A
160	395	431	225	384	440	375.0	N/A
161	395	429	225	380	440	373.8	N/A
162	394	428	225	375	439	372.2	N/A
163	393	426	225	371	440	371.0	N/A
164	393	424	225	367	440	369.8	N/A
165	392	423	225	363	440	368.6	N/A
166	391	421	226	359	441	367.6	N/A
167	390	419	226	355	441	366.2	N/A
168	390	418	227	351	441	365.4	N/A
169	389	416	228	348	442	364.6	N/A
170	388	414	229	344	442	363.4	N/A
171	387	412	230	341	441	362.2	N/A
172	386	411	231	338	442	361.6	N/A
173	385	409	232	336	442	360.8	N/A
174	384	408	232	333	442	359.8	N/A
175	383	406	232	331	442	358.8	N/A
176	382	404	232	329	442	357.8	N/A
177	382	403	232	327	442	357.2	N/A
178	381	401	232	325	442	356.2	N/A
179	380	400	232	324	442	355.6	N/A
180	379	398	232	322	441	354.4	N/A
181	378	397	231	320	440	353.2	N/A
182	377	395	230	319	440	352.2	N/A
183	377	394	228	318	439	351.2	N/A
184	376	393	227	318	438	350.4	N/A
185	375	391	225	317	438	349.2	N/A
186	374	390	223	316	437	348.0	N/A
187	373	389	222	315	436	347.0	N/A
188	373	388	222	314	435	346.4	N/A
189	372	386	221	312	434	345.0	N/A
190	371	385	220	311	434	344.2	N/A
191	370	384	220	309	432	343.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	369	383	219	308	431	342.0	N/A
193	368	382	217	306	431	340.8	N/A
194	367	381	216	304	430	339.6	N/A
195	366	379	215	302	429	338.2	N/A
196	364	378	214	301	428	337.0	N/A
197	363	377	212	299	427	335.6	N/A
198	362	376	211	298	426	334.6	N/A
199	361	374	210	296	425	333.2	N/A
200	360	373	209	295	424	332.2	N/A
201	358	372	208	293	423	330.8	N/A
202	357	371	206	292	422	329.6	N/A
203	356	369	206	291	421	328.6	N/A
204	355	368	205	290	420	327.6	N/A
205	354	367	203	289	419	326.4	N/A
206	353	365	202	288	417	325.0	N/A
207	352	364	201	286	416	323.8	N/A
208	351	363	201	285	416	323.2	N/A
209	350	362	200	284	414	322.0	N/A
210	349	361	199	283	414	321.2	N/A
211	348	359	199	282	412	320.0	N/A
212	347	358	198	281	411	319.0	N/A
213	346	357	198	281	410	318.4	N/A
214	345	356	197	280	409	317.4	N/A
215	344	354	196	279	409	316.4	N/A
216	343	353	196	279	408	315.8	N/A
217	342	352	195	278	407	314.8	N/A
218	341	351	195	278	406	314.2	N/A
219	340	350	194	277	406	313.4	N/A
220	339	349	194	277	405	312.8	N/A
221	339	348	194	276	405	312.4	N/A
222	338	347	194	276	405	312.0	N/A
223	337	346	194	276	405	311.6	N/A
224	337	345	194	275	404	311.0	N/A
225	336	344	195	275	404	310.8	N/A
226	335	343	195	275	404	310.4	N/A
227	335	342	195	275	404	310.2	N/A
228	334	341	195	275	404	309.8	N/A
229	334	341	195	274	403	309.4	N/A
230	334	340	196	274	404	309.6	N/A
231	333	339	196	274	403	309.0	N/A
232	333	338	197	274	403	309.0	N/A
233	333	338	197	274	403	309.0	N/A
234	332	337	197	274	403	308.6	N/A
235	332	336	198	274	403	308.6	N/A
236	332	336	198	273	403	308.4	N/A
237	332	335	198	273	403	308.2	N/A
238	331	335	198	273	403	308.0	N/A
239	331	334	199	273	402	307.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	331	333	199	272	402	307.4	N/A
241	331	333	199	272	403	307.6	N/A
242	331	332	199	272	402	307.2	N/A
243	331	332	199	271	402	307.0	N/A
244	331	331	199	271	402	306.8	N/A
245	331	331	199	271	401	306.6	N/A
246	331	330	199	271	401	306.4	N/A
247	330	330	199	270	401	306.0	N/A
248	331	329	199	270	401	306.0	N/A
249	331	329	198	269	401	305.6	N/A
250	331	328	197	269	400	305.0	N/A
251	331	328	197	268	399	304.6	N/A
252	330	328	195	268	399	304.0	N/A
253	331	327	195	267	398	303.6	N/A
254	330	327	194	267	397	303.0	N/A
255	330	326	193	266	396	302.2	N/A
256	330	326	192	266	395	301.8	N/A
257	330	326	191	265	394	301.2	N/A
258	330	325	190	265	394	300.8	N/A
259	330	325	190	264	393	300.4	N/A
260	329	324	189	264	392	299.6	N/A
261	329	324	189	263	392	299.4	N/A
262	329	324	188	262	391	298.8	N/A
263	328	323	188	262	391	298.4	N/A
264	328	323	187	261	390	297.8	N/A
265	328	322	187	260	390	297.4	N/A
266	327	322	186	260	389	296.8	N/A
267	327	322	186	259	388	296.4	N/A
268	327	321	186	259	388	296.2	N/A
269	326	321	185	259	388	295.8	N/A
270	326	320	185	258	388	295.4	N/A
271	325	320	185	258	388	295.2	N/A
272	325	319	184	257	388	294.6	N/A
273	324	319	184	257	387	294.2	N/A
274	324	319	184	256	388	294.2	N/A
275	323	318	184	256	387	293.6	N/A
276	323	318	184	256	387	293.6	N/A
277	323	317	184	255	387	293.2	N/A
278	322	317	183	255	387	292.8	N/A
279	322	317	183	254	387	292.6	N/A
280	321	316	183	254	387	292.2	N/A
281	321	316	183	253	386	291.8	N/A
282	321	316	183	253	386	291.8	N/A
283	320	315	183	252	386	291.2	N/A
284	320	315	183	252	386	291.2	N/A
285	319	315	183	251	386	290.8	N/A
286	319	314	183	251	385	290.4	N/A
287	319	314	184	250	385	290.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	318	314	184	250	384	290.0	N/A
289	318	314	184	250	384	290.0	N/A
290	317	313	184	249	384	289.4	N/A
291	317	313	184	249	383	289.2	N/A
292	317	313	184	249	382	289.0	N/A
293	316	313	184	248	382	288.6	N/A
294	316	312	185	248	380	288.2	N/A
295	316	312	185	248	379	288.0	N/A
296	315	312	185	248	378	287.6	N/A
297	315	311	185	247	377	287.0	N/A
298	315	311	185	247	376	286.8	N/A
299	314	311	185	247	374	286.2	N/A
300	314	311	185	247	373	286.0	N/A
301	314	310	184	246	372	285.2	N/A
302	314	310	184	246	371	285.0	N/A
303	313	310	184	246	370	284.6	N/A
304	313	310	184	246	369	284.4	N/A
305	313	310	183	246	368	284.0	N/A
306	313	310	183	245	367	283.6	N/A
307	313	310	183	245	366	283.4	N/A
308	312	310	182	245	365	282.8	N/A
309	312	310	182	245	364	282.6	N/A
310	312	310	182	244	363	282.2	N/A
311	312	310	182	244	362	282.0	N/A
312	312	310	181	244	361	281.6	N/A
313	311	310	181	244	361	281.4	N/A
314	311	310	181	243	360	281.0	N/A
315	311	310	181	243	359	280.8	N/A
316	311	309	180	243	358	280.2	N/A
317	311	309	180	242	358	280.0	N/A
318	310	309	180	242	357	279.6	N/A
319	310	309	180	242	357	279.6	N/A
320	310	309	180	242	356	279.4	N/A
321	310	309	179	241	356	279.0	N/A
322	309	309	179	241	355	278.6	N/A
323	309	309	179	241	355	278.6	N/A
324	309	309	179	240	354	278.2	N/A
325	309	308	179	240	354	278.0	N/A
326	309	308	179	240	353	277.8	N/A
327	308	308	178	239	353	277.2	N/A
328	308	308	178	239	352	277.0	N/A
329	308	308	178	239	352	277.0	N/A
330	308	307	178	238	352	276.6	N/A
331	307	307	177	238	351	276.0	N/A
332	307	307	177	238	351	276.0	N/A
333	307	306	177	237	351	275.6	N/A
334	307	306	177	237	351	275.6	N/A
335	306	306	177	237	350	275.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	306	306	177	236	350	275.0	N/A
337	306	305	177	236	350	274.8	N/A
338	306	305	177	236	350	274.8	N/A
339	305	305	176	236	349	274.2	N/A
340	305	304	176	235	349	273.8	N/A
341	305	304	176	235	349	273.8	N/A
342	305	304	176	235	349	273.8	N/A
343	304	303	176	235	349	273.4	N/A
344	304	303	176	234	348	273.0	N/A
345	304	303	176	234	348	273.0	N/A
346	304	302	176	234	347	272.6	N/A
347	304	302	176	234	347	272.6	N/A
348	303	302	176	233	346	272.0	N/A
349	303	301	176	233	345	271.6	N/A
350	303	301	176	233	345	271.6	N/A
351	303	301	176	232	344	271.2	N/A
352	303	300	176	232	343	270.8	N/A
353	303	300	176	232	342	270.6	N/A
354	302	300	176	232	342	270.4	N/A
355	302	300	176	231	341	270.0	N/A
356	302	299	176	231	340	269.6	N/A
357	302	299	175	231	339	269.2	N/A
358	302	299	175	231	338	269.0	N/A
359	302	299	175	231	338	269.0	N/A
360	302	298	175	230	337	268.4	N/A
361	302	298	175	230	336	268.2	N/A
362	301	298	175	230	335	267.8	N/A
363	301	297	175	230	334	267.4	N/A
364	301	297	175	230	333	267.2	N/A
365	301	297	175	229	333	267.0	N/A
366	301	297	175	229	332	266.8	N/A
367	301	296	174	229	331	266.2	N/A
368	301	296	174	229	330	266.0	N/A
369	300	296	174	228	329	265.4	N/A
370	300	296	174	228	329	265.4	N/A
371	300	295	174	228	328	265.0	N/A
372	300	295	174	228	327	264.8	N/A
373	300	295	174	227	326	264.4	N/A
374	300	295	174	227	326	264.4	N/A
375	300	294	174	227	325	264.0	N/A
376	299	294	174	226	324	263.4	N/A
377	299	294	173	226	324	263.2	N/A
378	299	294	173	226	323	263.0	N/A
379	299	293	173	226	323	262.8	N/A
380	299	293	173	225	322	262.4	N/A
381	299	293	173	225	321	262.2	N/A
382	299	292	173	225	321	262.0	N/A
383	299	292	173	224	320	261.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	299	292	173	224	320	261.6	N/A
385	298	291	173	224	319	261.0	N/A
386	298	291	172	224	319	260.8	N/A
387	298	291	172	223	318	260.4	N/A
388	298	290	172	223	318	260.2	N/A
389	298	290	172	223	317	260.0	N/A
390	298	290	172	223	317	260.0	N/A
391	298	289	172	222	317	259.6	N/A
392	298	289	172	222	316	259.4	N/A
393	297	289	172	222	316	259.2	N/A
394	297	288	172	222	316	259.0	N/A
395	297	288	172	222	315	258.8	N/A
396	297	288	172	221	315	258.6	N/A
397	297	287	172	221	315	258.4	N/A
398	297	287	172	221	314	258.2	N/A
399	297	287	171	221	314	258.0	N/A
400	297	286	171	220	314	257.6	N/A
401	296	286	171	220	313	257.2	N/A
402	296	286	171	220	313	257.2	N/A
403	296	285	171	220	313	257.0	N/A
Average	362	378	206	399	413	352	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Pacific Energy
Model: NEO 2.5 LE
Run #: 5

Job #: 19-494
Tracking #: 030
Technician: SJB
Date: 9/17/2019

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T334	87.1	87.1	89.5	2.4
Train A Filters - Remainder	T335	87.3	176.2	178.5	2.3
	T336	88.9			
Train A Probe	14A	116818.2	116818.2	116818.9	0.7
Train A O-Rings	14A	3367.4	3367.4	3368.5	1.1
Train B Filters	T337	86.2	259.3	261.5	2.2
	T338	86.3			
	T340	86.8			
Train B Probe	14B	116772.0	116772.0	116773.1	1.1
Train B O-Rings	14B	3341.6	3341.6	3345.7	4.1
Background Filter	T339	86.3	86.3	86.4	0.1

Placed in Dessicator on:	9/18 - 8:00

Train A Filters - First Hour	89.4	9/19 14:29	89.5	9/20 8:28				
Train A Filters - Remainder	178.5	9/19 14:29	178.5	9/20 8:28				
Train A Probe	116819.0	9/19 14:29	116818.9	9/20 8:28				
Train A O-Rings	3368.5	9/19 14:29	3368.5	9/20 8:28				
Train B Filters	261.4	9/19 14:30	261.5	9/20 8:28				
Train B Probe	116773.0	9/19 14:30	116773.1	9/20 8:28				
Train B O-Rings	3345.8	9/19 14:30	3345.7	9/20 8:28				
Background Filter	86.4	9/19 14:30	86.4	9/20 8:28				

1st hour Sub-Total, mg:	2.4
Remainder Sub-Total, mg:	4.1
Train 1 Aggregate, mg:	**6.5**
Train 2 Aggregate, mg:	**7.4**
Ambient Aggregate, mg:	0.1

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 5 Test Date: 9/17/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 9:23
Air Control Setting: Fully Open

Time	Notes
0 min	Started with 2.0 lbs of kindling, lit with torch for 60 seconds, door left cracked open ~3”
3 min	Closed Door
8 min	@1.1 lbs, added 1.9 lbs of kindling and start-up pieces, left door cracked open ~3”
9 min	Closed door
19 min	@1.0 lbs, added 3.6 lbs of start-up fuel, door closed immediately.
29 min	@2.1 lbs, leveled coal bed and loaded high fire test fuel load, door open 60 sec
32 min	Turned fan on high
120 min	Leveled remaining 4.7 lbs of charcoal from high fire test, zeroed scale, turned off fan in preparation of loading medium fire test load.

Test Notes
Test Burn Start Time: 11:24
Air Control Setting: Medium Fire Test Setting (9/32”)

Time	Notes
0 min	Loaded medium fire test fuel load, door open 1 minute
4 min	Air turned down to test setting.
10 min	Fan turned on to high
38 min	Changed Train B front filter
60 min	Changed 1-hr filter
403 min	End of Test

Test Burn End Time: 18:05

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.00 CO (%): 4.310
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	9:30	9:35	9:33	9/18 - 7:54	9/18 -7:56	9/18 -7:58
CO_2	0.00	10.07	17.00	0.00	10.04	17.01
CO	0.00	2.492	4.310	-0.011	2.473	4.290

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature:  Date: 9/18/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy Job Number: 19-494 Tracking #: 0030
Model: NEO 2.5 Run Number: 5 Test Date: 9/17/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

Residual Start-up Fuel Coal Bed

Technician Signature: _____ Date: 9/18/2019

ASTM E3053 Wood Heater Run Sheets

Client: Pacific Energy | Job Number: 19-494 | Tracking #: 0030
Model: NEO 2.5 | Run Number: 5 | Test Date: 9/17/2019

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Medium Fire Fuel Load

Medium Fire Fuel Loaded

Technician Signature: _____ Date: 9/18/2019

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A2LA ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI01A05026181218

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Rice Lake	IQ+355E-2A x 100(	A05026	#041	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.1	QC033	12/18/18	6/13/18	12/2019

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 250 Tol: 1	Test Wt: HB44 Tol: HB44	Test Wt: 100 Tol: 1	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 16.9°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	999.3	1000.2	0.12
700	699.7	700.1	0.12
500	499.7	500.1	0.08
300	299.8	300.1	0.08
100	99.9	100.0	0.05
50	50.0	50.0	0.05

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/24/17	11/2019	20172265

Permanent Information Concerning this Equipment:
12 month calibration cycle. 2000lb platform.

Comments/Information Concerning this Calibration
12/18 - RH = 67%. Adjusted span.

Report prepared/reviewed by: ServiceTechDC **Date:** 12/28/18 **Technician:** R.Kauble **Signature:**

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.

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CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0182484A0912013i181218

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 400x.01	82484A0912013i	#050	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.01	QC033	12/18/18	6/13/18	12/2019

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 50 Tol: 0.05	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.01	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 16.4°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.99	399.99	0.058
300	300.00	300.00	0.058
200	200.03	200.03	0.058
100	100.01	100.01	0.012
50	50.00	50.00	0.012
20	20.00	20.00	0.012

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/24/17	11/2019	20172265

Permanent Information Concerning this Equipment:
12 month calibration cycle.

Comments/Information Concerning this Calibration
12/18 - RH = 64%. Adjusted span.

Report prepared/reviewed by: ServiceTechJC **Date:** 12/28/18 **Technician:** R.Kauble
Signature:

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	53
Serial #:	1902130
Calibration Date:	6/14/2019
Calibration Expiration:	12/14/2019
Barometric Pressure:	29.97 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	12/17/2018
γ Factor:	1.004
Allowable Deviation (±5%):	0.0502
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	147.373	142.005	143.359
Standard DGM Temperature (°F)	71.0	72.0	72.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.227	5.114	5.224
DGM Temperature (°F)	78.0	85.0	91.0
DGM Pressure (in H_2O)	2.67	2.00	1.5
Time (min)	33.0	36.0	42.0
Net Volume for Standard DGM (ft^3)	5.204	5.015	5.063
Net Volume for DGM (ft^3)	5.227	5.114	5.224

Dry Gas Meter γ Factor	1.000	0.998	0.998
γ Factor Deviation From Average	1.000	0.998	0.998

Average Gas Meter γ Factor: 0.999

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	54
Serial #:	1902133
Calibration Date:	6/14/2019
Calibration Expiration:	12/14/2019
Barometric Pressure:	29.97 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	12/17/2018
γ Factor:	1.000
Allowable Deviation (±5%):	0.05
Actual Deviation:	0.00
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	139.967	143.359	139.656
Standard DGM Temperature (°F)	72.0	73.0	75.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.098	5.242	5.114
DGM Temperature (°F)	92.0	93.0	95.0
DGM Pressure (in H_2O)	2.99	2.02	1.3
Time (min)	30.0	37.0	45.0
Net Volume for Standard DGM (ft^3)	4.943	5.063	4.932
Net Volume for DGM (ft^3)	5.098	5.242	5.114

Dry Gas Meter γ Factor	0.997	0.995	0.995
γ Factor Deviation From Average	0.997	0.995	0.995

Average Gas Meter γ Factor: 0.996

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	Apex-AK-600
Lab ID #:	55
Serial #:	810016
Calibration Date:	6/14/2019
Calibration Expiration:	6/14/2020
Barometric Pressure:	29.95 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/15/2018
γ Factor:	0.999
Allowable Deviation (±5%):	0.04995
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	146.758	221.981	165.496
Standard DGM Temperature (°F)	75.0	76.0	77.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.283	8.006	5.965
DGM Temperature (°F)	82.0	84.0	85.0
DGM Pressure (in H_2O)	0.00	0.00	0.0
Time (min)	27.0	41.0	30.0
Net Volume for Standard DGM (ft^3)	5.183	7.839	5.844
Net Volume for DGM (ft^3)	5.283	8.006	5.965

Dry Gas Meter γ Factor	0.992	0.992	0.992
γ Factor Deviation From Average	0.992	0.992	0.992

Average Gas Meter γ Factor: 0.992

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

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Calibration Services

Certificate Number: 1550.01

Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Material	Assumed Density	Range	Tolerance Class
Stainless Steel	7.95 g/cm^3	200mg & 100mg	ASTM Class 1

Method and Traceability
The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:
100g to 1mg Working Standards Were Calibrated: 03/03/17 Due: 03/31/18 Standards ID: 723318
Mass Comparators Used: MET-05 **Tested by:** D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" **(Previously known as "Apparent Mass vs. 8.0g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

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Calibration Services

Certificate Number: 1550.01

Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.967	753.44	49.44

Conventional Mass Value

Nominal Value	As Found grams	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200mg SN 1000101395	0.2000061	0.0061	0.0026	0.01
100mg SN 1000126267	0.1000046	0.0046	0.0028	0.01

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were new from the manufacturer and were within ASTM Class 1 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

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ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16

Signature David S. Thompson

Established 1974

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A2LA ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0134307497181218

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
g	0.0001	QC012	12/18/18	6/13/18	12/2019

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 100 Tol: 0.0003
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 50 x 4 Tol: 0.0002
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0001

1. 100.0001	5. 100.0002	9. 100.0001
2. 100.0001	6. 100.0001	10. 100.0001
3. 100.0001	7. 100.0001	**Result**
4. 100.0001	8. 100.0002	0.00004

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 21.3°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	200.0002	200.0001	0.00014
100	100.0001	100.0001	0.00014
50	50.0003	50.0001	0.00014
20	20.0001	20.0001	0.00014
1	1.0001	1.0000	0.00014
0.1	0.1000	0.1000	0.00014

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	R.L./Troemner	10kg to 1mg	G782	1/3/18	1/2019	20172421

Permanent Information Concerning this Equipment:
12 month calibration cycle.

Comments/Info Concerning this Calibration:
12/18 - RH = 56%. Adjusted span.

Report prepared/reviewed by: ServiceTech JC **Date:** 12/28/18 **Technician:** R.Kauble

Signature:

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

DICK MUNNS COMPANY
LIQUID & GAS FLOW CALIBRATION

ISO 17025 IAS ACCREDITED
CL-122

CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	03/14/2019
PO NUMBER:	N/A	**CALIBRATION DUE:**	03/14/2020
INST. MANUFACTURER:	DWYER	**PROCEDURE:**	T.O.33K6-4-1769-1
INST. DESCRIPTION:	VELOMETER	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70°F
MODEL NUMBER:	471	**RECEIVED CONDITION:**	WITHIN MFG. SPECS.
SERIAL NUMBER:	CP288559 (ID# 095)	**LEFT CONDITION:**	WITHIN MFG. SPECS.
RATED UNCERTAINTY:	SEE NOTES BELOW.	**AMBIENT CONDITIONS:**	762 mm HGA 43% RH 69°F
UNCERTAINTY GIVEN:	± .20% RD ; k=2	**CERTIFICATE FILE #:**	490265.2019

NOTES: ± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) ***± 5% F.S. (0-15000) *** ± 2 °F

NOTES CONT. : Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
64	65	0 TO 200°F	0 TO 200°F
110	112	43.4	43.5
206	210	69.0	68.9
498	509	99.4	99.2
503	505		
1049	1058		
1497	1514		
509	513		
3419	3460		
4992	5068		
5136	5235		
13928	14232		

STANDARDS USED:		
A220: 12" WIND TUNNEL 0 - 8000 FPM | CMC ± .203% RD | TRACE# 1520423238	DUE	05/23/2019
A24: HART SCIENTIFIC TEMP. STANDARD | ±.024 F | TRACE# 1520423238	DUE	03/07/2020

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NCSL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

Dick Munns Company • 11133 Winners Circle • Los Alamitos, CA 90720
Phone (714) 827-1215 • Fax (714) 827-0823

Date: 3/14/2019

Approved By:

Calibration Technician:

Model 1430 Microtector® Electronic Point Gage

Installation and Operating Instructions

Model 1430 Microtector® Portable Electronic Point Gage combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

SPECIFICATIONS AND FEATURES

- Accurate and repeatable to ± .00025 inches water column
- Pressure range: 0 - 2″ w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology
- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic plastic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2″ thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8″ pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

Maximum pressure: 100 psig with optional pipe thread connections.

Tygon® is a registered trademark of Saint-Gobain Corporation

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PGVP ID: F22018

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062

Certificate Modification Date: 09/05/2018
Praxair Order Number: 70716136
Part Number: NI CD10CO33E-AS

Fill Date: 08/31/2018
Lot Number: 70086824308
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	09/05/2026	NIST Traceable
Cylinder Number:	CC170624	Expanded Uncertainty
10.00 %	Carbon dioxide	± 0.3 %
2.51 %	Carbon monoxide	± 0.7 %
10.50 %	Oxygen	± 0.6 %
Balance	Nitrogen	

Certification Information:

Certification Date: 09/05/2018 *Term:* 96 Months *Expiration Date:* 09/05/2026

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.

Do Not Use this Standard if Pressure is less than 100 PSIG.

CO responses have been corrected for CO2 interference. CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. *Component:* **Carbon dioxide**

Requested Concentration: 10 %
Certified Concentration: 10.00 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 08/20/2018

First Analysis Data:							Date	09/05/2018
Z:	0	R:	14.02	C:	10	Conc:	10	
R:	14.02	Z:	0	C:	10	Conc:	10	
Z:	0	C:	10	R:	14.02	Conc:	10	
UOM:	%			Mean Test Assay:			10	%

Reference Standard: Type / Cylinder #: GMIS / CC141375
Concentration / Uncertainty: 14.02 % ±0.3%
Expiration Date: 06/11/2026
Traceable to: SRM # / Sample # / Cylinder #: SRM 1675b / 6-F-51 / CAL014538
SRM Concentration / Uncertainty: 13.963% / ±0.034%
SRM Expiration Date: 05/16/2022

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:				%

2. *Component:* **Carbon monoxide**

Requested Concentration: 2.5 %
Certified Concentration: 2.51 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 08/20/2018

First Analysis Data:							Date	09/05/2018
Z:	0	R:	2.48	C:	2.51	Conc:	2.51	
R:	2.48	Z:	0	C:	2.51	Conc:	2.51	
Z:	0	C:	2.51	R:	2.48	Conc:	2.51	
UOM:	%			Mean Test Assay:			2.51	%

Reference Standard: Type / Cylinder #: GMIS / CC102045
Concentration / Uncertainty: 2.48 % ±0.448%
Expiration Date: 04/03/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2641a / 52-D-30 / CAL017193
SRM Concentration / Uncertainty: 4.009% / ±0.017%
SRM Expiration Date: 07/15/2019

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:				%

3. *Component:* **Oxygen**

Requested Concentration: 10.5 %
Certified Concentration: 10.50 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/04/2018

First Analysis Data:							Date	09/05/2018
Z:	0	R:	9.88	C:	10.49	Conc:	10.49	
R:	9.88	Z:	0	C:	10.5	Conc:	10.5	
Z:	0	C:	10.5	R:	9.88	Conc:	10.5	
UOM:	%			Mean Test Assay:			10.5	%

Reference Standard: Type / Cylinder #: NTRM / DT0010402
Concentration / Uncertainty: 9.88 % ±0.4%
Expiration Date: 11/18/2022
Traceable to: SRM # / Sample # / Cylinder #: NTRM #170701 / N/A / NTRM #DT0010402
SRM Concentration / Uncertainty: 9.875% / ±0.040%
SRM Expiration Date: 11/18/2022

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:				%

Analyzed By: Danielle Burns

Certified By: Jose Vasquez

PRAXAIR
Making our planet more productive

DocNumber: 225861

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22018

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062

Certificate Modification Date: 10/01/2018
Praxair Order Number: 70743165
Part Number: NI CD17CO8E-AS

Fill Date: 09/26/2018
Lot Number: 70086826911
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 1290 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	10/01/2026	NIST Traceable
Cylinder Number:	SA17187	Expanded Uncertainty
17.00 %	Carbon dioxide	± 0.3 %
4.31 %	Carbon monoxide	± 0.6 %
16.99 %	Oxygen	± 0.2 %
Balance	Nitrogen	

Certification Information:

Certification Date: 10/01/2018 *Term:* 96 Months *Expiration Date:* 10/01/2026

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.
CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. ***Component:*** **Carbon dioxide**

Requested Concentration: 17 %
Certified Concentration: 17.00 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 09/21/2018

First Analysis Data: **Date** 10/01/2018

Z:	0	R:	20.1	C:	17	Conc:	17
R:	20.1	Z:	0	C:	17	Conc:	17
Z:	0	C:	17.01	R:	20.11	Conc:	17.01

UOM: % **Mean Test Assay:** 17 %

Reference Standard: Type / Cylinder #: GMIS / CC187238
Concentration / Uncertainty: 20.10 % ±0.24%
Expiration Date: 06/07/2026
Traceable to: SRM # / Sample # / Cylinder #: RGM#CC193512 / N/A / RGM#CC193512
SRM Concentration / Uncertainty: 26.99% / ±0.05%
SRM Expiration Date: 05/15/2023

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

2. ***Component:*** **Carbon monoxide**

Requested Concentration: 4.25 %
Certified Concentration: 4.31 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 09/21/2018

First Analysis Data: **Date** 10/01/2018

Z:	0	R:	5	C:	4.31	Conc:	4.31
R:	5	Z:	0	C:	4.3	Conc:	4.3
Z:	0	C:	4.32	R:	5.01	Conc:	4.32

UOM: % **Mean Test Assay:** 4.31 %

Reference Standard: Type / Cylinder #: GMIS / CC242633
Concentration / Uncertainty: 5.00 % ±0.543%
Expiration Date: 04/03/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2642a / 51-D-23 / FF23106
SRM Concentration / Uncertainty: 7.859% / ±0.039%
SRM Expiration Date: 07/15/2019

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

3. ***Component:*** **Oxygen**

Requested Concentration: 17 %
Certified Concentration: 16.99 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/04/2018

First Analysis Data: **Date** 10/01/2018

Z:	0	R:	20.86	C:	16.99	Conc:	16.99
R:	20.86	Z:	0	C:	16.99	Conc:	16.99
Z:	0	C:	16.99	R:	20.86	Conc:	16.99

UOM: % **Mean Test Assay:** 16.99 %

Reference Standard: Type / Cylinder #: GMIS / CC75874
Concentration / Uncertainty: 20.86 % ±0.111%
Expiration Date: 11/07/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331
SRM Concentration / Uncertainty: 20.863% / ±0.021%
SRM Expiration Date: 08/23/2021

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

Analyzed By **Jose Vasquez**

Certified By **Danielle Burns**

Verification of Standardization

of

Tape Measure

by

Advanced Calibration Technologies
28111 S.E. Wally Road
Boring, OR 97009
1-800-259-5058

ACCREDITED
Calibration
Cert# 1342.01

Customer:	PFS Teco, Inc	Street:	11785 Southeast Highway 212 Suite 305
City:	Clackamas State: OR	Zip:	97015 Location: In House
Machine Manufacturer:	Dewalt	Model:	16' Tape Measure
Capacity:	0.000 - 192.000 inches 0.125 Divisions	Serial #:	090
Calibration Cycle:	12 Months	Lab ID#:	#090
Previous Calibration Date:	January 2019	Calibration Procedure:	Ad-Tek SR
Equipment Used:	Gauge Blocks S/N: ADGB002	Action Recommended:	
If Other, Explain:			

Verification Data

Purpose:

This method provides instructions for checking the critical dimensions of the equipment.

Tolerance:

Equipment shall meet the dimensional tolerances specified in the applicable test method.

Procedure:

Verified using manufacturer's procedures.

Actual Dimensions (inches)	Unit Under Test As Found (inches)	Unit Under Test As Left (inches)	Difference (inches)
0.0000	0.000	0.000	0.000
0.1250	0.050	0.050	-0.075
0.2500	0.250	0.250	0.000
0.5000	0.500	0.500	0.000
0.7500	0.750	0.750	0.000
1.0000	1.000	1.000	0.000
3.0000	3.000	3.000	0.000
5.0000	5.000	5.000	0.000
7.0000	7.000	7.000	0.000
9.0000	9.000	9.000	0.000
12.0000	12.000	12.000	0.000

The overall condition of the device as found:	Within Specification
The overall condition of the device as left:	Within Specification
The measurement of uncertainty (MU) was calculated to be:	0.00060

File No: PFS-101666-0119D0120-AH-SR-090

Temperature: 72.1°F Humidity: 41.1%

The equipment used in the verification of this instrument has been calibrated and is NIST traceable.
The uncertainty of calibration was estimated at the 95% confidence level, coverage factor (k=2).

Remarks:

This certificate of verification is issued as a statement of fact that on the date of verification the above instrument had an accuracy as indicated and was calibrated to meet the requirements of the manufacturer's specifications. This certificate should not be construed or regarded as a guarantee or warranty of any kind that the instrument will retain the same percentage of accuracy as determined on the date when the verification was performed and reported. Ad-Tek, Inc. hereby expressly disclaims any and all liability for damage or loss by all parties arising or resulting from deterioration, obsolescence, malfunction, subsequent calibration performed by another agency or substandard performance of said instrument.

Service Technician: Alisa Houser Date of Service: January 16, 2019

Technical Manager: Nicole Ostrowski Date Next Due: January 2020

We sincerely appreciate your business and thank you for selecting Advanced Calibration Technologies, Inc. for servicing your equipment.
To reschedule, please call (800) 259-5058. Thank You.

Verification of Standardization

of

Calipers

by

Advanced Calibration Technologies
28111 S.E. Wally Road
Boring, OR 97009
1-800-259-5058

ACCREDITED
Calibration
Cert# 1342.01

Customer:	PFS Teco, Inc	Street:	11785 Southeast Highway 212 Suite 305
City:	Clackamas State: OR	Zip:	97015 Location: In House
Machine Manufacturer:	General	Model:	6" Digital Caliper
Capacity:	0.0000 - 6.0000 inches 0.0005 Divisions	Serial #:	092
Calibration Cycle:	12 Months	Lab ID#:	092
Previous Calibration Date:	January 2018	Calibration Procedure:	Ad-Tek DC
Equipment Used:	Gauge Blocks S/N: ADGB002	Action Recommended:	
If Other, Explain:			

Verification Data

Purpose:

This method provides instructions for checking the critical dimensions of the inside diameter of the equipment.

Tolerance:

Equipment shall meet the dimensional tolerances specified by the manufacturer for the inside diameter.

Procedure:

Verified using the procedure to meet manufacturer's tolerance for inside diameter.

Actual Dimensions (inches)	Unit Under Test As Found (inches)	Unit Under Test As Left (inches)	Difference (inches)
0.0000	0.0000	0.0000	0.0000
0.0500	0.0500	0.0500	0.0000
0.1000	0.1000	0.1000	0.0000
0.1010	0.1010	0.1010	0.0000
0.1050	0.1050	0.1050	0.0000
0.1100	0.1100	0.1100	0.0000
0.1500	0.1500	0.1500	0.0000
0.5000	0.5000	0.5000	0.0000
1.0000	1.0000	1.0000	0.0000
3.0000	2.9995	2.9995	-0.0005
5.0000	4.9990	4.9990	-0.0010

The overall condition of the device as found:	Within Specification
The overall condition of the device as left:	Within Specification
The measurement of uncertainty (MU) was calculated to be:	0.00062

This certificate does not reflect meausrements for inside jaws, step height, or depth.

File No: PFS-101666-0119D0120-AH-DC-092

Temperature: 68.2°F Humidity: 41.6%

The equipment used in the verification of this instrument has been calibrated and is NIST traceable.
The uncertainty of calibration was estimated at the 95% confidence level, coverage factor (k=2).

Remarks:

This certificate of verification is issued as a statement of fact that on the date of verification the above instrument had an accuracy as indicated and was calibrated to meet the requirements of the manufacturer's specifications. This certificate should not be construed or regarded as a guarantee or warranty of any kind that the instrument will retain the same percentage of accuracy as determined on the date when the verification was performed and reported. Ad-Tek, Inc. hereby expressly disclaims any and all liability for damage or loss by all parties arising or resulting from deterioration, obsolescence, malfunction, subsequent calibration performed by another agency or substandard performance of said instrument.

Service Technician: Alisa Houser Date of Service: January 15, 2019

Technical Manager: Nicole Ostrowski Date Next Due: January 2020

We sincerely appreciate your business and thank you for selecting Advanced Calibration Technologies, Inc. for servicing your equipment.
To reschedule, please call (800) 259-5058. Thank You.

J-2000

owner's manual

DELMHORST®
INSTRUMENT CO.

WHEN ACCURACY IS THE POINT.™