

## MEMORANDUM

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**To:** Process for Developing Improved Cordwood Test Methods for Wood Heaters Docket  
<https://www.regulations.gov/docket/EPA-HQ-OAR-2016-0130>

**Date:** June 24, 2024

**Re:** Description of Contents in the **IDC-Woodstove-Test-Results-East-Coast Zip File**

**Background:** The Northeast States for Coordinated Air Use Management (NESCAUM) managed a contract provided by the New York State Energy Research and Development Authority (NYSERDA) to obtain data to analyze the precision and variability of the Cordwood Stove Integrated Duty Cycle (IDC) test method. This work followed the US Environmental Protection Agency's Office of Air Quality Planning and Standards (OAQPS) research plan provided by Steffan Johnson, Leader of the Measurement Technology Group. Hearth Lab Solutions in Bethel, Vermont conducted the testing for this effort. EPA refers to the NYSERDA work as the East Coast Lab. OAQPS funded testing at PFS TECO for West Coast testing.

**Instructions:** Woodstove testing results measured by Hearth Lab Solutions using the IDC-TEOM draft method are available for download by contacting the EPA Docket Center, Public Reading Room to request the zip file **IDC-Woodstove-Test-Results-East-Coast.zip** from the **EPA-HQ-OAR-2016-0130 Docket** at Email: [docket-customerservice@epa.gov](mailto:docket-customerservice@epa.gov). Address: 1301 Constitution Ave. NW, Room 3334, Washington, DC 20004. Phone: (202) 566-1744; Fax: (202) 566-9744.

**Description:** Hearthlab Solutions (HLS) tested three pairs of wood stove models for a total of six stoves, under contract by NESCAUM. Each identical pair of stoves was assigned a number identifier (named EPA Stove 1, Stove 7, and Stove 17). The EPA Stove 1 pair were small, non-catalytic woodstoves. The pair of Stove 7s were medium-sized hybrid cordwood stoves. The pair of Stove 17s were large, catalytic cordwood stoves. Each stove was then assigned to one of two identical test stands, (A or B). The stoves with an A tested on stand A. Stoves identified with a B tested on Stand B. HLS testing used maple (red) and birch (yellow) fuel. HLS obtained ASTM E2515 PM filter measurements following their procedures listed in their Quality Assurance Program Plan (QAPP). HLS also obtained real-time PM data following NYSERDA's TEOM Standard Operating Procedures (SOP). NYSERDA owns the copyright to the Cordwood Stove IDC test method and TEOM SOP, which means that these materials cannot be used, modified, or copied without NYSERDA permission. NESCAUM received NYSERDA's permission for this effort.

NESCAUM organized HLS cordwood stove testing data as follows:

1. **IDC Test Report:** Contains stove specific .pdf. This is the summary test report, which documents lab conditions, fuel load information, PM filter-based measurements, TEOM-based PM measurements, CO & CO2 emissions data, and IDC efficiency on a per-run and per-phase basis.
2. **Supplementary Emissions Data:** Contains a stove-specific .pdf file containing TEOM-based and filter-based PM emission summaries reported in g/kg.
3. **Attachment A - IDC Protocol:** Contains a copy of the Integrated Duty Cycle Test Method for Cordwood Stoves. (Revision Date: 05/28/2021) used to direct appliance operation under this project.

## MEMORANDUM

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4. Attachment B - TEOM Protocol: Contains a copy of NYSERDA's TEOM SOP (Revision Date: 06/01/2021) used to direct collection of real-time PM data during testing under this project.
5. Attachment C - Tunnel & Sampling Photos: Contains a .pdf copy of a hand-drawn schematic of the two identical dilution tunnels (A and B) at HLS, as well as .jpg files containing photographs of tunnel A and tunnel B, and the sampling equipment used during this project.
6. Attachment D - QAPP Attachment: Contains a .pdf copy of the Quality Assurance Project Plan (QAPP) that encompassed all testing under this project.
7. Attachment E - Calibration Data: Contains calibration logs for equipment, supplies, and consumables outlined under QAPP sections 17.0 and 18.0, including stove-specific TEOM QC checks and IDC PM Measurement Datasheets that detailed leak checks, tunnel traverse, and more for each test.
8. Attachment F - Fuel Calculator Data: Contains stove-specific, protected .xlsm versions of NYSERDA's IDC Fuel Calculator, used to determine and document proper fuel load during all testing under this project.
9. Attachment G - Fuel Analysis: Contains .pdf copies of the results of each fuel analysis. NESCAUM sent five cordwood samples, three maple and two birch, for analysis. NESCAUM used an average of these results for each species to direct emissions and efficiency calculations.
10. Attachment H - Raw Data: Contains stove-specific raw data files. This includes raw RH data, raw TEOM data, an RH spreadsheet with QC plot, a protected .xlsm file containing filter results for all testing done under this project and protected .xlsm files containing raw real time data collected at 1-minute intervals.

Precision analyses of the PM results are also provided in the docket. See US EPA's docket: Process for Developing Improved Cordwood Test Methods for Wood Heaters (<https://www.regulations.gov/docket/EPA-HQ-OAR-2016-0130>).