Stove Emissions Testing

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Stove Emissions Testing

- We are planning limited, stove emissions testing in in the laboratory to support the Partnership for Clean Indoor Air

- We ask for your comments and advice!

Literature survey findings

- Many stoves have been tested for emissions
- Most stoves tested were from China, India, and other Asian countries
- Many types of coal and biomass fuels have been tested
- Pollutants measured included CO_2 and PICs (products of incomplete combustion): PM, CO, CH_4, NMHCs, NO_2, SO_2, HCHO, OC, BC, PAHs, and others
- PICs cause adverse health effects and global climate change
- Emissions of PICs were high for traditional and so-called "improved" stoves
- Kirk Smith and others have raised issue that biomass stoves may not be "greenhouse neutral" as previously assumed

Why test stoves for emissions?

- Hopefully show that a stove can achieve low emissions of PICs - demonstrate that better stoves can improve health and reduce global climate change
  - Publish peer-reviewed test results for a practical stove with low emissions of PICs!
- Provide stove emissions information that will be valuable to PCIA partners
- Compare and validate emission test results from PCIA partners
  - EPA lab may be considered a more independent source of data
  - EPA lab has well established quality assurance
- Lab tests are not a substitute for field tests – but lab tests have value

What stoves to test?

- Baseline
  - Open, three-stone fire
  - Typical “improved” stove – VITA? other?
- Newer “clean-burning” stoves
  - Stoves that are practical – used in the field
  - High-temperature combustion
  - Likely low emissions of PICs

What fuels to test?

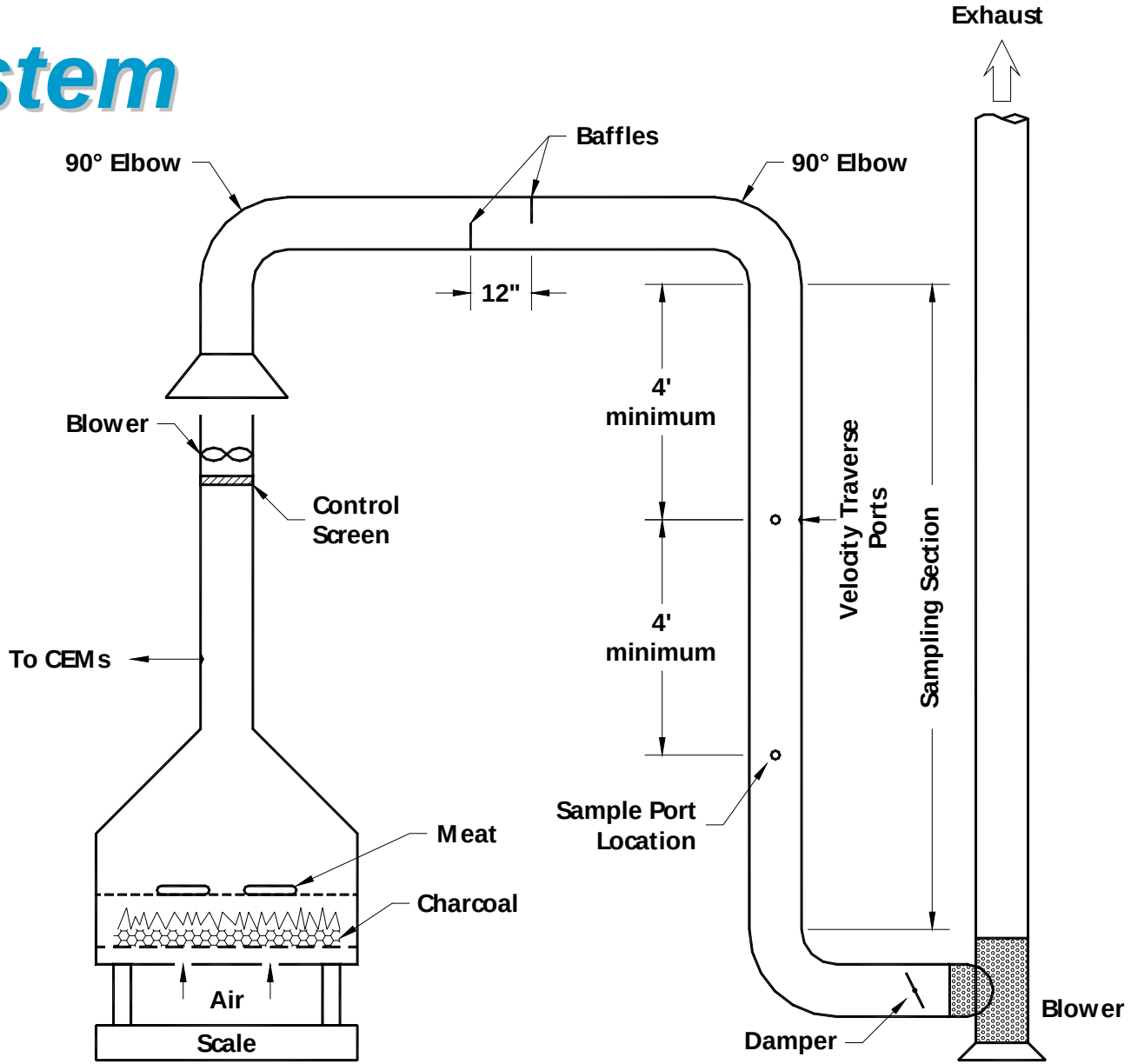
- Firewood – consistent species, size, and moisture content
- Charcoal?
- Dung?
- Other biomass?

What pollutants to measure?

- PM (size-fractionated), CO, CO_2, CH_4, NMHCs
- Others?

Test system

- Used in previous study
- Has hood and dilution tunnel



Test plan

- Use Water Boiling Test (WBT), Version 1.5, 20-August-2004, for operating stoves and for measuring stove performance
- Compare two methods for measuring emissions
  - Direct, hood-capture method
  - Carbon-balance method
- Use dilution tunnel for emissions sampling?
- How to minimize stove operator variability?

Stove emissions testing

- Please let us know if you have questions, comments, or advice!

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