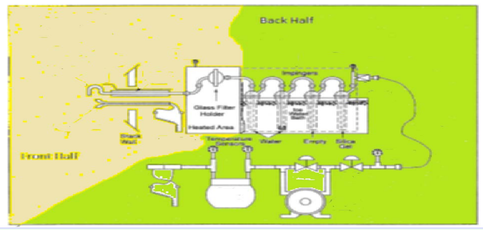
Estimating Point Source Condensable PM (CPM) Emissions in Inventories

Raymond Merrill, Barrett Parker, Mike Hays, Venkatesh Rao, U.S. EPA

CPM Defined in 40 CFR 51.50

- ❑ Vapor at stack temperature
- ❑ Condenses to liquid or solid after discharge from stack
- ❑ May result from reaction as gases cool and condense
- ❑ Obtained from “back half” (green part) of a PM sampling train



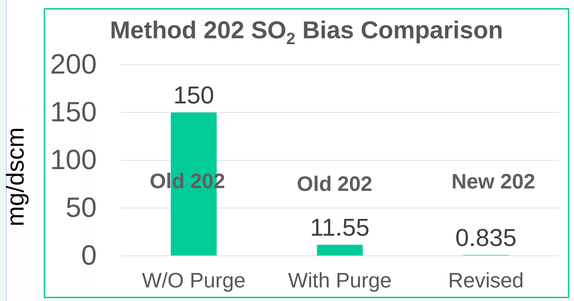
CPM Emissions Can Be Large

- ❑ Condensables are often higher than filterable mass
  - ✓ Can be 10 to 70 percent of total PM emissions
  - ✓ Combustion, metallurgical, and wood products are major emitters
  - ✓ Average CPM from prelim-inary EGU combustion data:

Preliminary EGU CPM Data	
Fuel	**Average % of Total PM**
Refuse Coal	25
#6 Fuel Oil	30
#2 Fuel Oil	50
Subbituminous or Bituminous Coal	60
Lignite or Petroleum Coke	67

CPM Inventory Issues

- ❑ Lack of availability
  - ✓ Historically only total filterable PM in databases
    - Some states include only filterable PM_{10} or $PM_{2.5}$
  - ✓ Current emissions data are very limited
- ❑ Poor estimation techniques
  - ✓ Calculations from emissions factors developed by using data from old, biased methods
  - ✓ Augmentations are known to introduce uncertainty in estimating CPM
- ❑ Little speciation of CPM exists
  - ✓ Sulfuric acid
  - ✓ Ammonium salts
  - ✓ Metal compounds
  - ✓ Organic compounds
- ❑ Old method data and estimation techniques generated biased inventories



Better Data Can be Obtained

- ❑ Revised Method 202 (from 2010)
  - ✓ Has a lower blank interference
  - ✓ Produces significantly less SO_2 artifact
- ❑ 2015 Best Practices further minimize
  - ✓ Blank and artifact effects
  - ✓ Available @ https://www.epa.gov/emc/method-202-condensable-particulate-matter

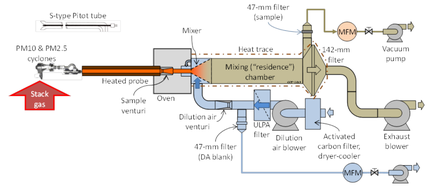
EPA Needs States to

- ❑ Require
  - ✓ Revised test methods
  - ✓ Best M-202 practices
  - ✓ Data to be uploaded into CEDRI[1] by sources
- ❑ Use
  - ✓ Electronic Reporting Tool (ERT) available @ https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert
- ❑ Report
  - ✓ Organic / inorganic split
- ❑ Develop
  - ✓ Facility specific emissions factors

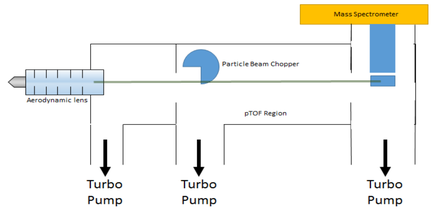
[1] Consolidated Emissions and Data Reporting Interface

Future Research and Development:

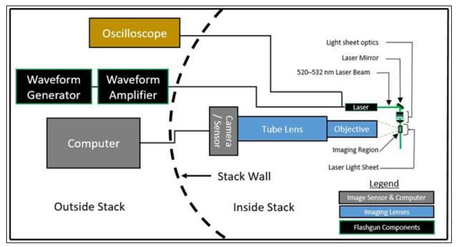
Dilution Sampling Evaluation



CPM Speciation Development



Wet Stack Method R&D



For further information:

Regulatory Measurements:
Merrill.Raymond@epa.gov
Shappley.Ned@epa.gov
Dewees.Jason@epa.gov

Inventories:
Rao.Vankatesh@epa.gov

Regulatory Policy:
Damberg.Rich@epa.gov
Parker.Barrett@epa.gov

PSD/NSR:
Deroeck.Dan@epa.gov
Buckler.Charles@epa.gov