Fine PM Test Method

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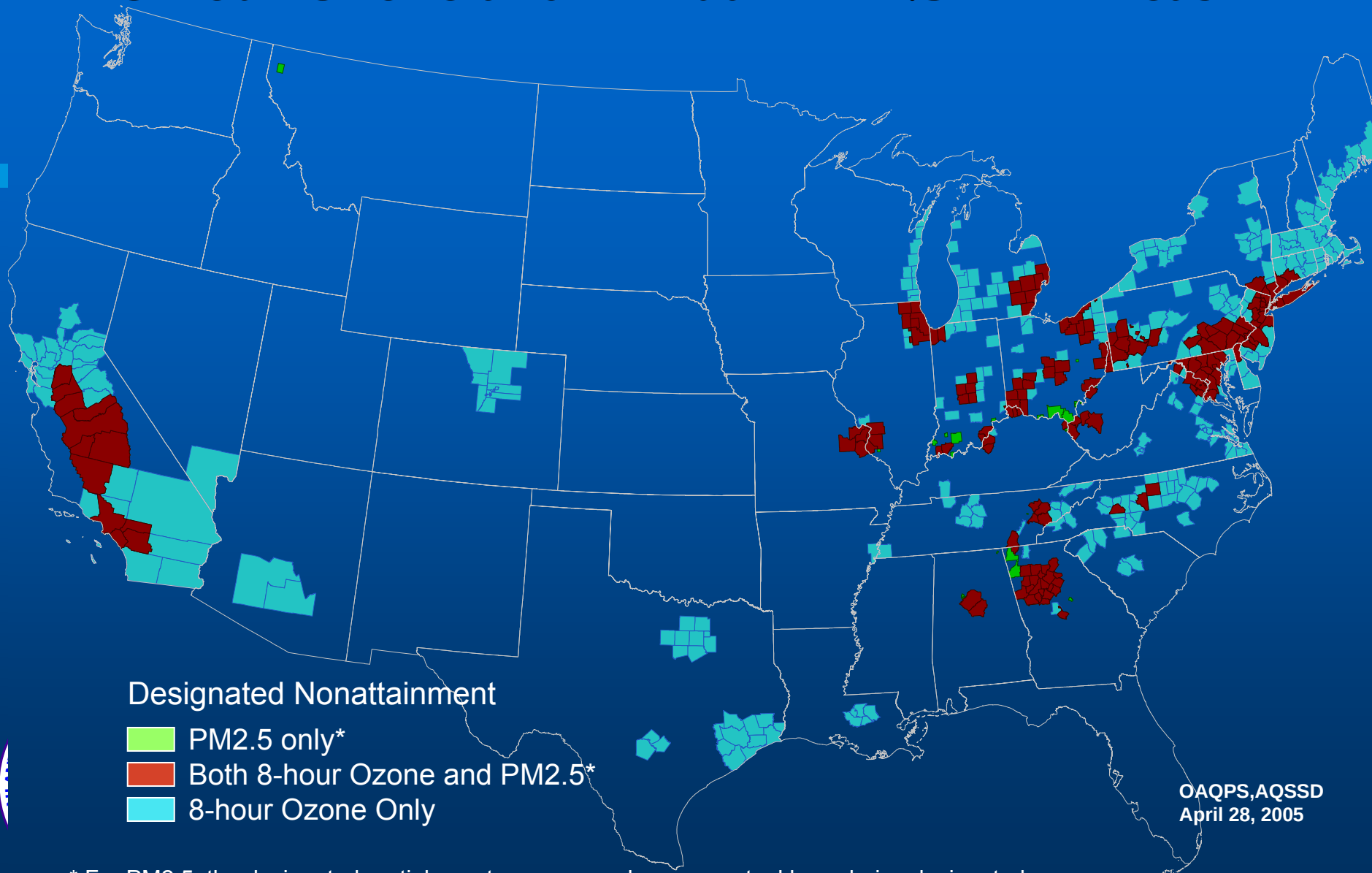
Presentation Topics

- Particulate Matter NAAQS (1997)
- PM Implementation Rule
- Particulate Matter NAAQS (2006)
- Condensable PM Test Method
- Particle Sizing Test Method
- Implications of new test methods

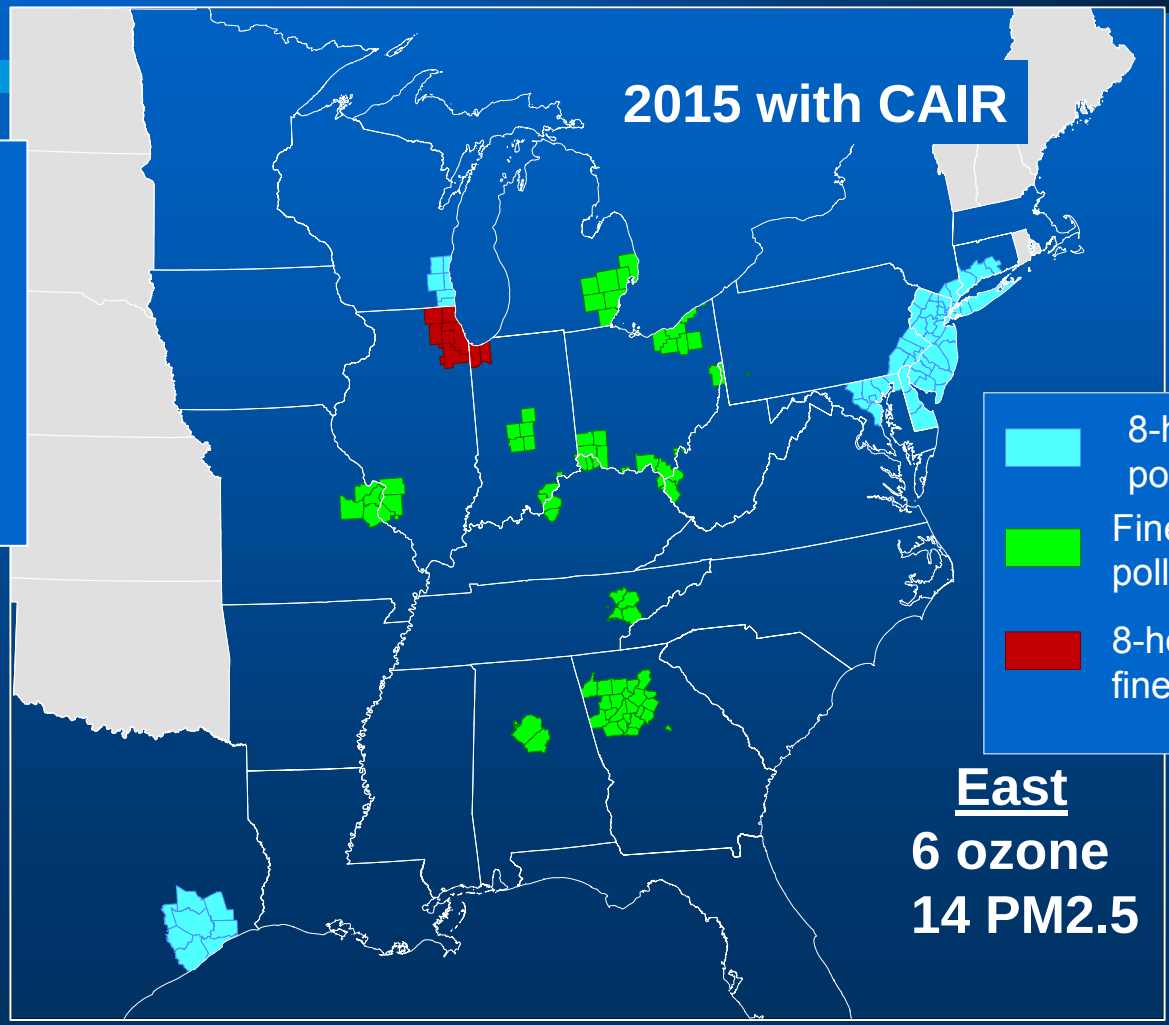
8-hour Ozone and Annual PM2.5 NA Areas



* For PM2.5, the designated partial county areas are shown as actual boundaries designated.

Non Attainment Areas w/ SOx/NOx reductions

Projected NAs in 2015 after Reductions of SOx & NOx from coal fired utility boilers



Promulgated Implementation Rule

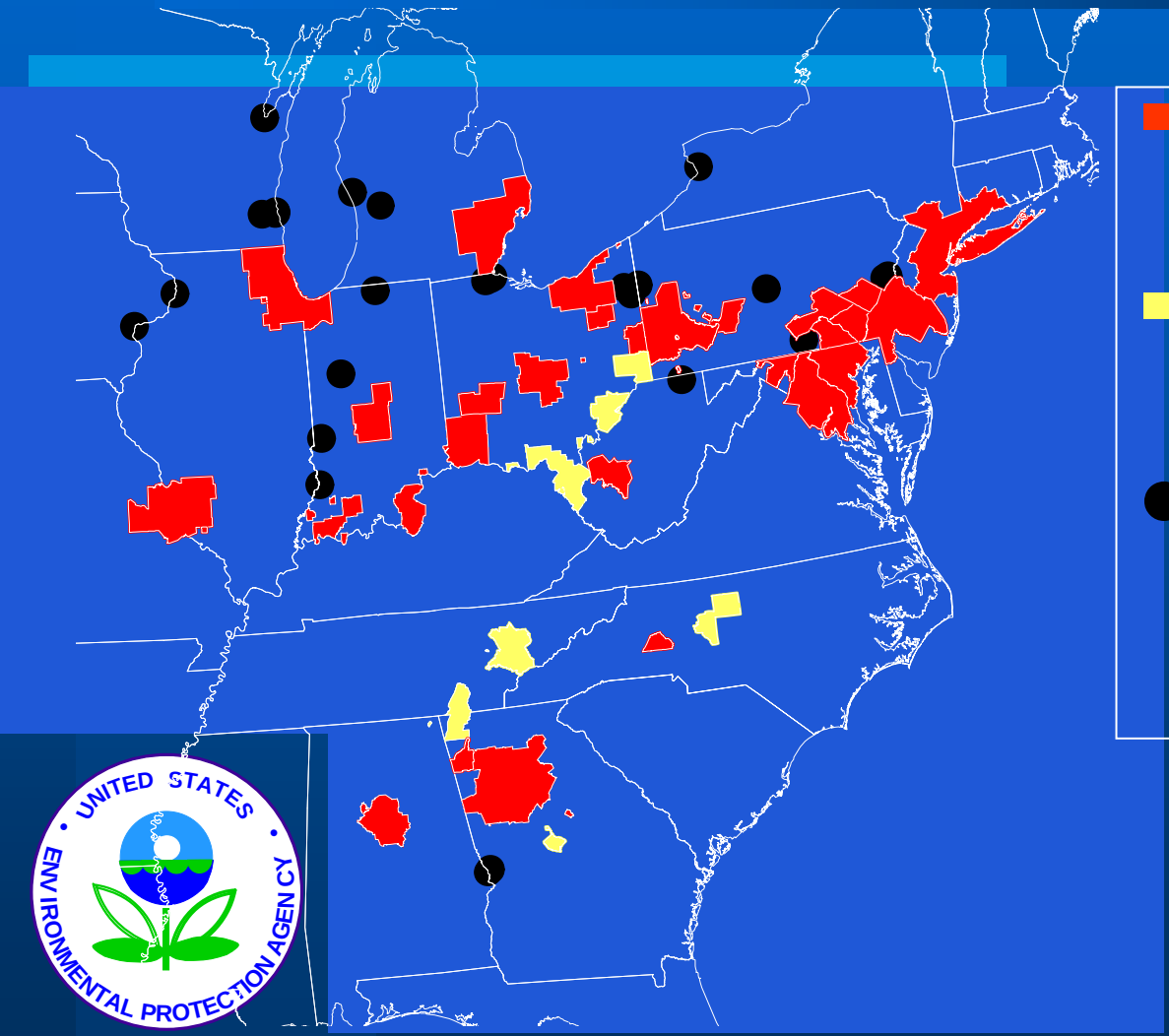
- **April 25, 2007 in Federal Register**
  - **Regulation of precursor pollutants**
    - **SO2, NOx**
    - **VOC, NH4**
  - **RACT/RACM selected to attain NAAQS as expeditiously as practicable**
  - **Regulation of Condensable PM**
    - **Transition period from 2007 to 2011**
      - **CPM regulation encouraged but not required**
    - **Regulations developed after 2011 are required to address CPM**

Legal actions by Advocacy Groups, Industry Groups, State Agencies

Promulgated NAAQS Revision (2006)

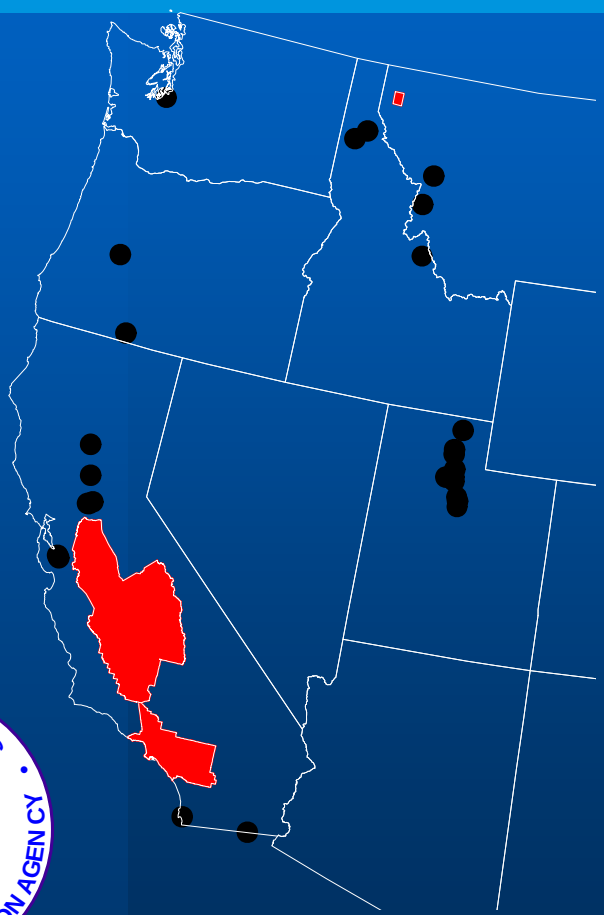
- Affirms 15 ug/M^3 $PM_{2.5}$ annual average
- Establishes 35 ug/M^3 $PM_{2.5}$ 24 hr average standard
  - Increases need for local controls
  - Short term emissions more important
    - Start up / shut down
    - Malfunction impacts
    - Performance degradation
  - Becomes air quality driver
- Establishes 150 ug/M PM_{10} 24 hr average standard
- DC circuit court remanded standard for better justification by EPA

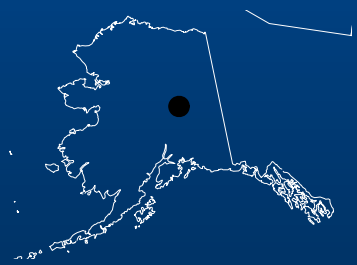
Potential 24-Hour $PM_{2.5}$ NAAQS NA's



- Current nonattainment area violates new 24-hr NAAQS [32 areas]
- Current nonattainment area meets new 24-hr NAAQS [7 areas]
- Sites not in a current nonattainment area violate the new 24-hr NAAQS (59 sites)

Potential 24-Hour $PM_{2.5}$ NAAQS NA's





- Current nonattainment area violates new 24-hr NAAQS [32 areas]
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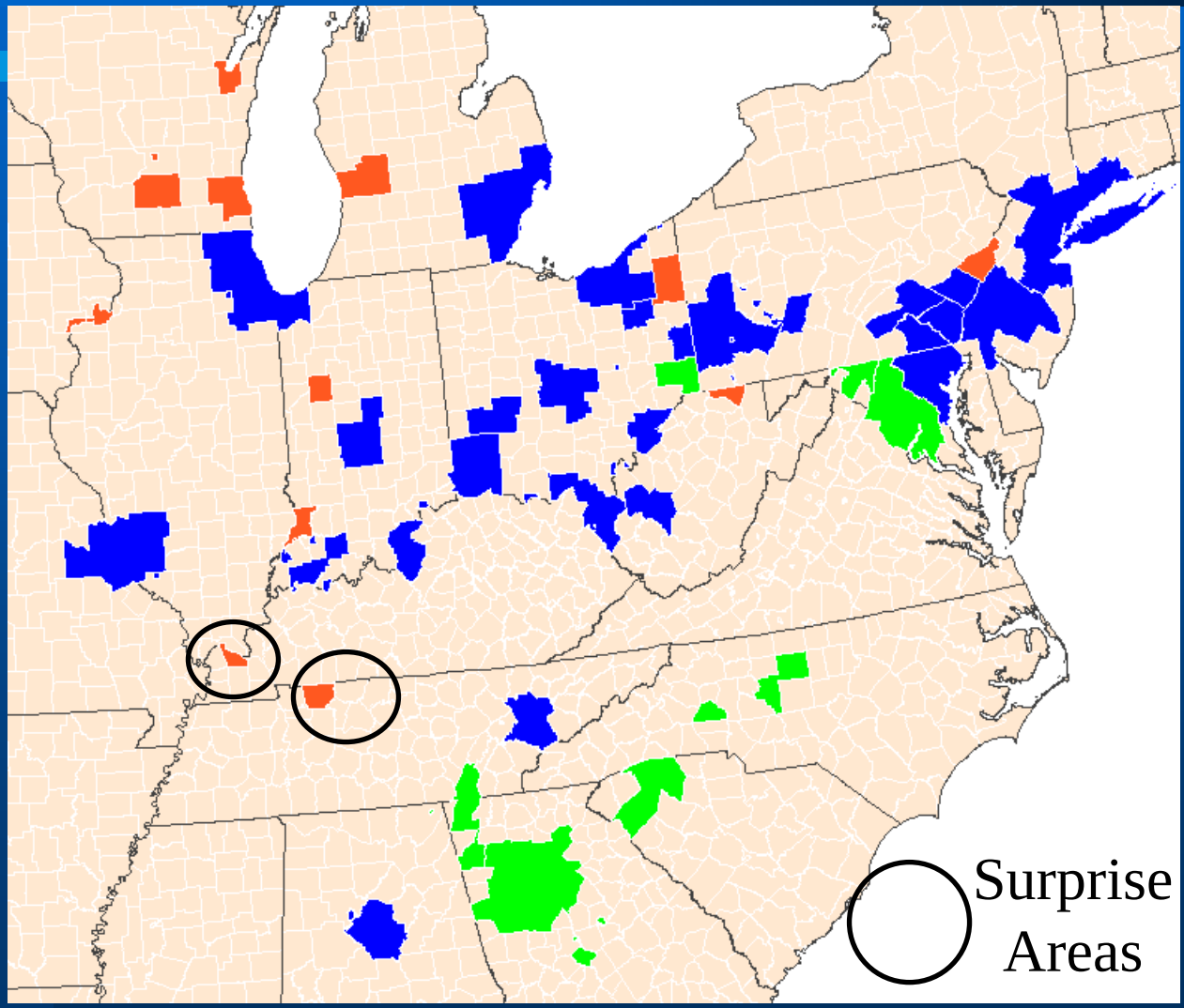
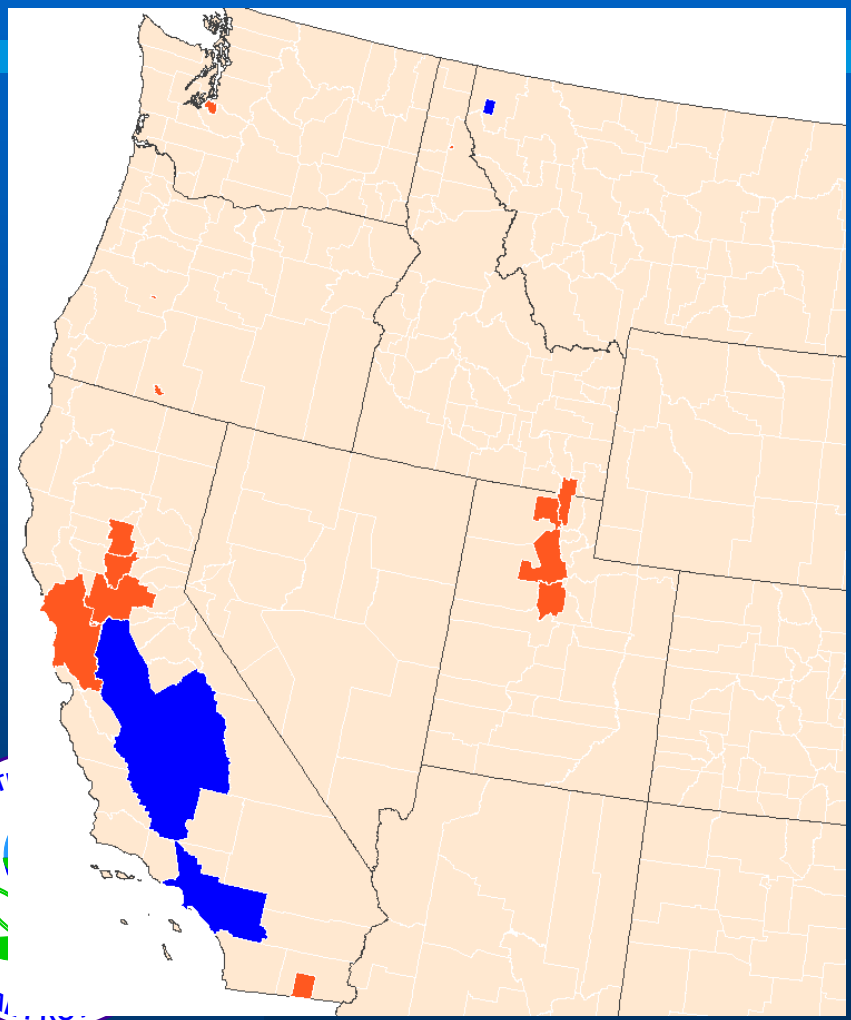
Eastern PM2.5 Non-attainment Areas



Western PM2.5 Non-attainment Areas



Method 202 (12//17/91)

- Intent - replicate ambient air emissions
- PM is defined by the conditions
- Each M202 option creates different mass
  - N_2 purge/Air purge/No purge
  - Water evaporation temperature
  - Multiple sulfate mass
  - Analysis of some components
- No Referee Method available in 1990

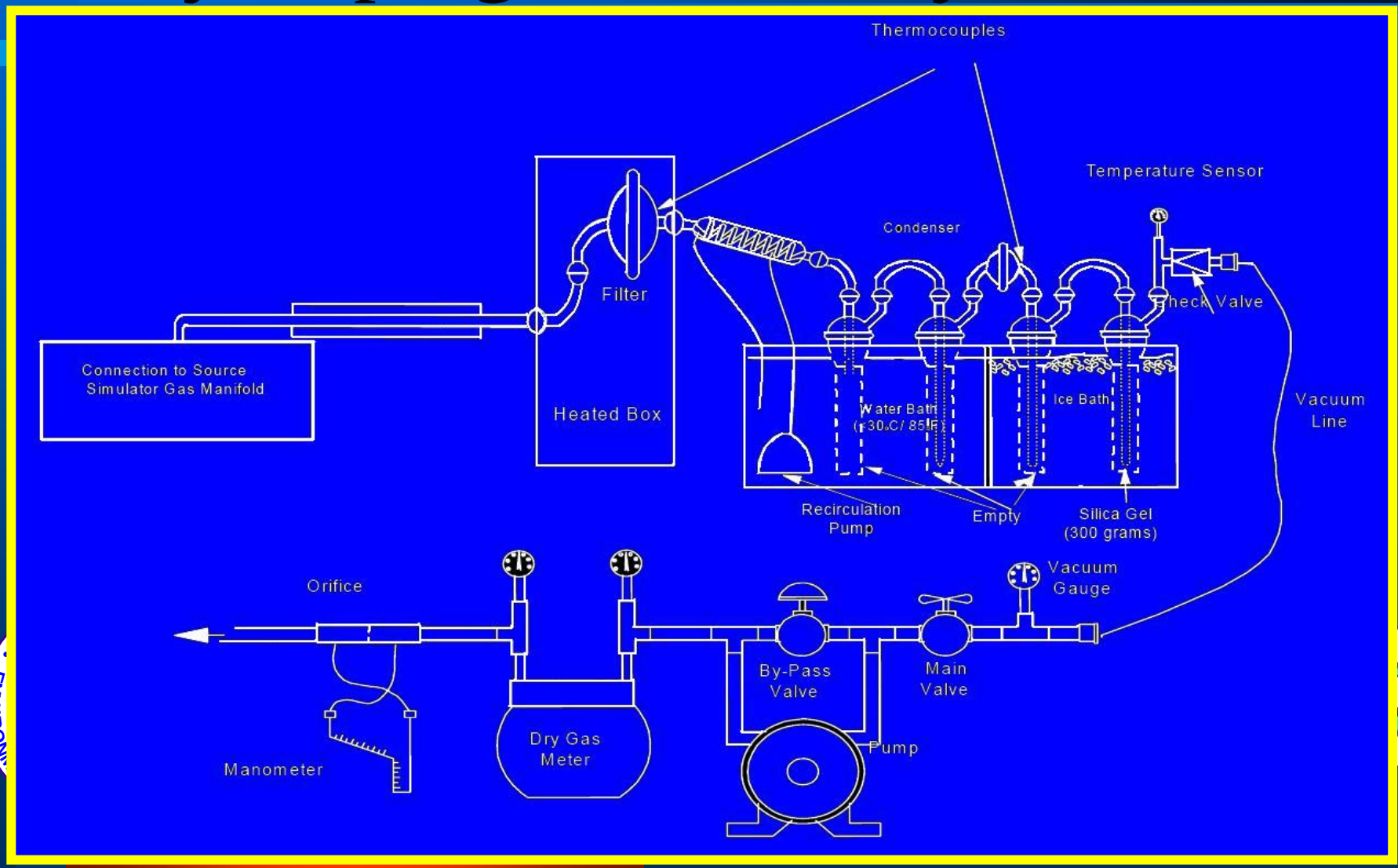
Method 202 Assessment (2004)

- **Conducted Laboratory Study**
- **36 samples**
- **SO_2 bubbled through impingers**
  - **300 ppm for 1 & 3 hours**
  - **50 ppm for 6 hours**
  - **Nitrogen purge and no purge**
  - **Hold times from 1 to 20 hrs for initial analysis**

Method 202 Artifacts

SO_2 ppm	Test duration	H_2O volume	Artifact Mass (mg)	
			No Purge	Purge
300	1 Hr	400 ml	180 ± 6	10 ± 0.5
300	3 Hr	800 ml	400 ± 25	20 ± 5
50	6 Hr	1400 ml	200 ± 10	20 ± ??

Dry Impinger Train Layout



Dry Impinger Method Performance

Run	Organic (mg)	Inorganic (mg)	Filter (mg)	Total
1	0.11	2.23	-0.34	2.34
2	0.15	2.88	-0.06	3.03
3	0.09	1.37	0.00	1.46
4	0.30	1.91	0.00	2.22
5	0.16	1.54	0.07	1.77
6	0.33	2.19	-0.17	2.52
7	0.08	1.18	0.30	1.56
8	0.02	1.87	0.17	2.06
Blank	-0.02	0.21	0.00	0.68
Average	0.16	1.90	0.00	2.12
Std Dev	0.1	0.51	0.17	0.45
MDL	0.31	1.54	0.49	1.36

Filterable PM Sizing

- **Method 201A** (1990)

- **Method 201A** (2009/10)

$PM_{2.5}$ Regulatory Requirements

- **Clean Air Fine Particle Implementation Rule**
  - **Promulgated April 25, 2007**
  - **January 1, 2011 is critical date for $PM_{2.5}$**
  - **New or revised SIP rules must consider $PM_{2.5}$ in setting limits**
  - **NSR/PSD permits must also consider $PM_{2.5}$ in limits**
  - **Transition period was for development of improved knowledge using improved test method**

Existing use of CPM Methods

- **Most States do not address CPM**
- **Some States address CPM**
  - **States test methods for CPM are inconsistent**
- **Only rules that are new or revised need consider CPM**
- **States do not have to use EPA's test method for acceptance of SIP or NSR/PSD rules**

Implications of considering $PM_{2.5}$

- **States w/o CPM testing now**
  - **$PM_{2.5}$ will need to be addressed in new or revised emissions limits**
  - **Will likely adopt new test methods**
    - **Higher numerical limits do not mean higher emissions**
    - **State will need good information to know where they are and what revised limits will achieve**

Implications of considering $PM_{2.5}$

- **States w/ CPM testing now**
  - **May convince EPA that their rules comply with intent of implementation rule**
  - **May wish to adopt new test method**
    - **Numerical limits will require adjustment**
    - **Adjustment requires careful consideration**
    - **Risk of errors may be greater than for States that are just now adopting CPM testing**

Comments or Questions