

# Revisions to the Ambient Monitoring Regulations

## Focus on Coarse Particles



## ***PM Components: Inhalable Coarse Particles***

- Processes including crushing, grinding, dust
  - Resuspended dusts (soil, street dust)
  - Coal/oil fly ash
  - Aluminum, silica, iron-oxides
  - Inhalable Biological Materials (e.g., from soils, plant fragments)
- Sources
  - Resuspension of dust tracked onto roads
  - Tire and brake wear
  - Suspension from disturbed soil (farms, mines, construction, unpaved roads)
  - Demolition operations
  - Industrial stacks and fugitives
  - Biological sources
- Residence time
  - From hours to days
- Transport distance
  - Typically short when emitted near ground but can travel long distances when mixed high in atmosphere (for example, during dust storm events)

## *Expectations for PM<sub>10</sub> Monitoring Networks*

- Continued use of existing high volume FRM (appendix J) and FEM's
  - Data reported to AQS still corrected to standard temperature and pressure (STP)
- Meet sampling frequency requirements in §58.12(e).
- Comply with existing minimum monitoring requirements.
  - Between 200 and 500 required by rule.
  - Seems reasonable to reduce overall PM<sub>10</sub> network size from 1,200 monitors to approximately 750.
  - Review monitor discontinuation criteria and consider elimination of low reading monitors not needed for other objectives (like PSD or public reporting).
  - Give priority to maintaining monitors sited in urban and industrial areas, those in nonattainment areas, and other monitors that show violations of the PM<sub>10</sub> NAAQS.

## *Retain Existing PM<sub>10</sub> Minimum Monitoring Requirements\**

<b>MSA population</b>	<b>High Concentration<sup>2</sup></b>	<b>Medium Concentration<sup>3</sup></b>	<b>Low Concentration<sup>4</sup></b>
>1,000,000	6-10	4-8	2-4
500k – 1,000,000	4-8	2-4	1-2
250k – 500k	3-4	1-2	0-1
100k – 250k	1-2	0-1	0

\1\ Selection of urban areas and actual number of stations per area will be jointly determined by EPA and the State agency.

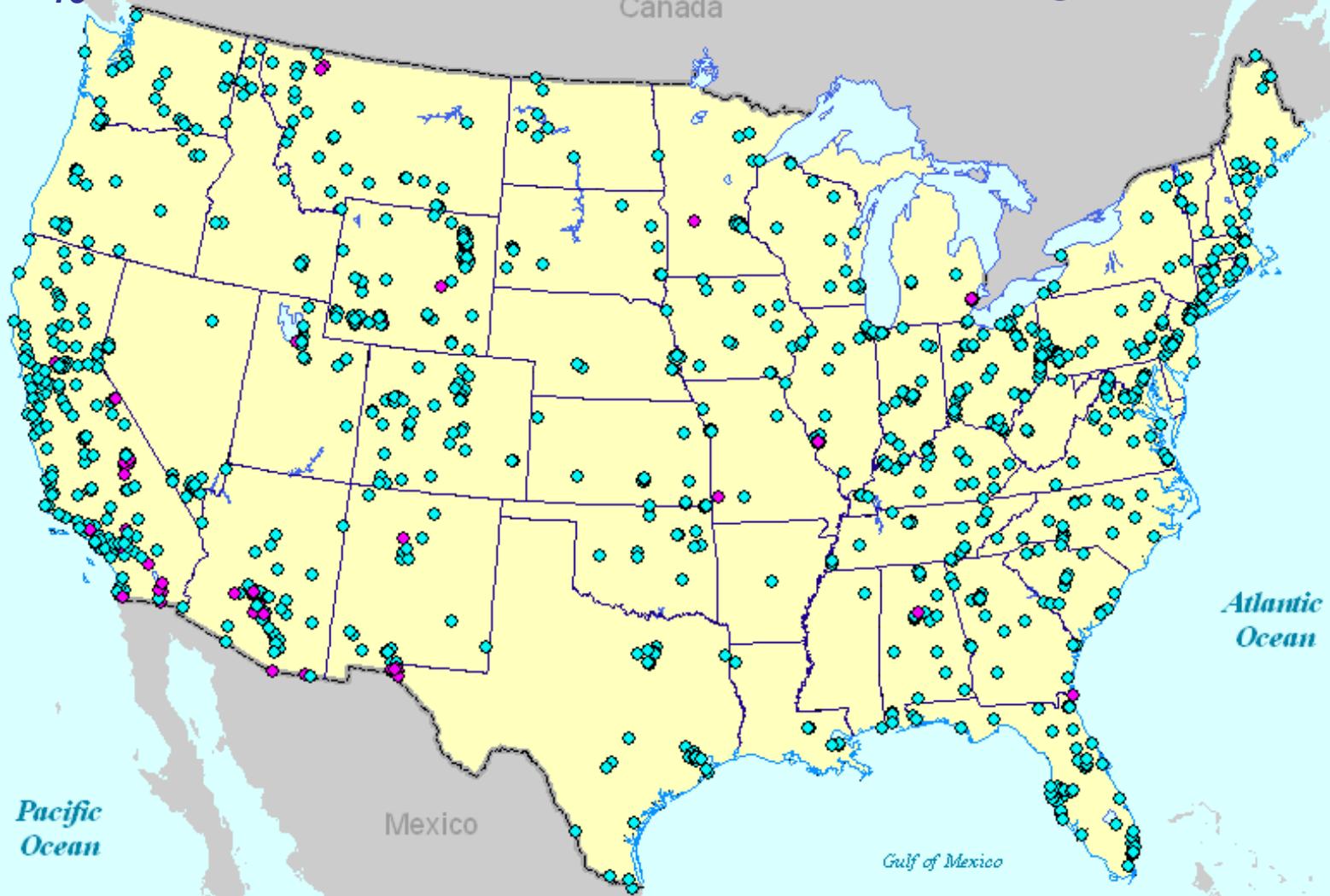
\2\ High concentration areas are those for which ambient PM<sub>10</sub> data show ambient concentrations exceeding either PM<sub>10</sub> NAAQS by 20 percent or more.

\3\ Medium concentration areas are those for which ambient PM<sub>10</sub> data show ambient concentrations exceeding 80 percent of the PM<sub>10</sub> NAAQS.

\4\ Low concentration areas are those for which ambient PM<sub>10</sub> data show ambient concentrations less than 80 percent of the PM<sub>10</sub> NAAQS.

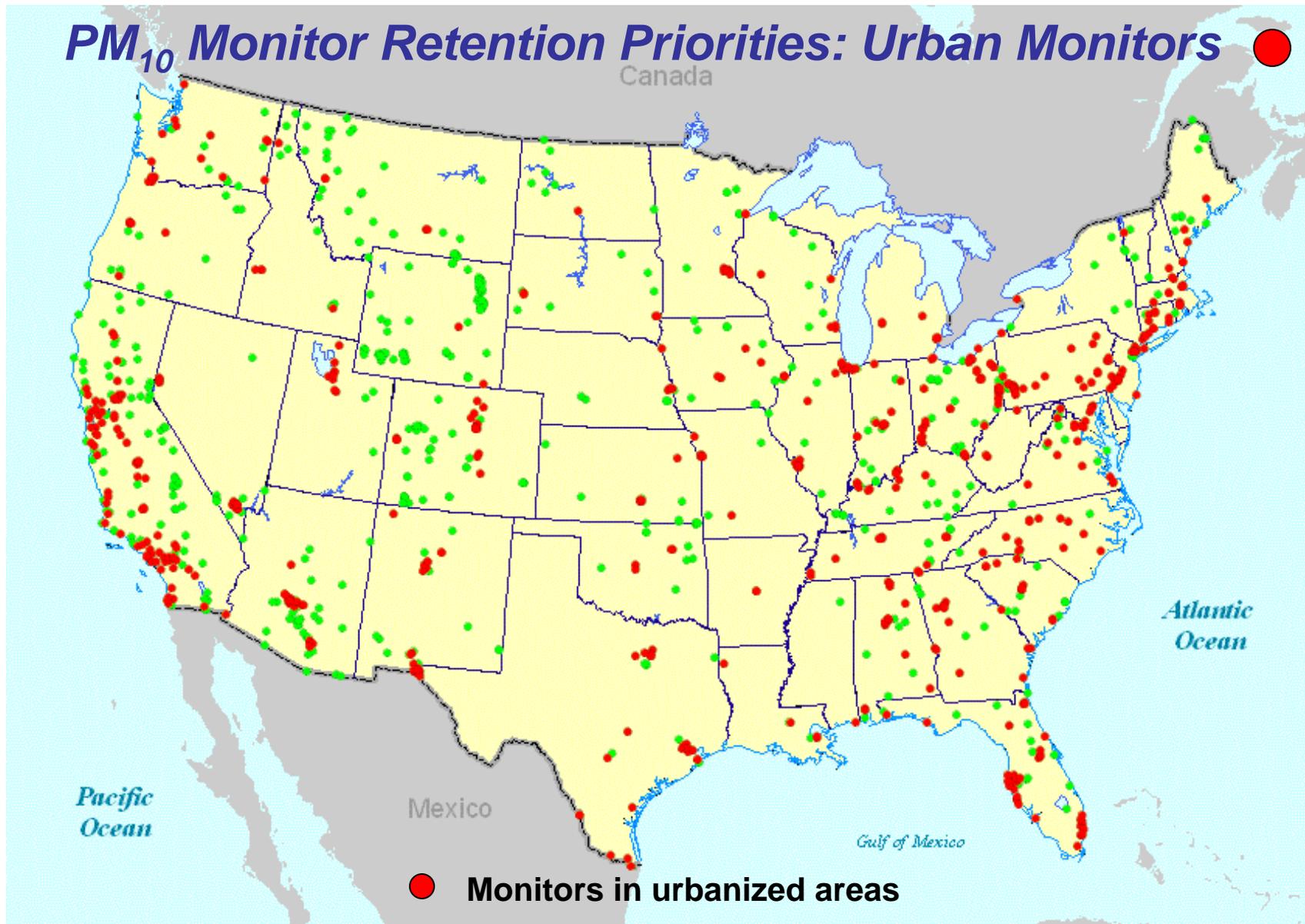
\* PM<sub>10</sub> concentrations corrected to standard temperature and pressure (STP)

# *PM<sub>10</sub> Monitor Retention Priorities: Violating Monitors*

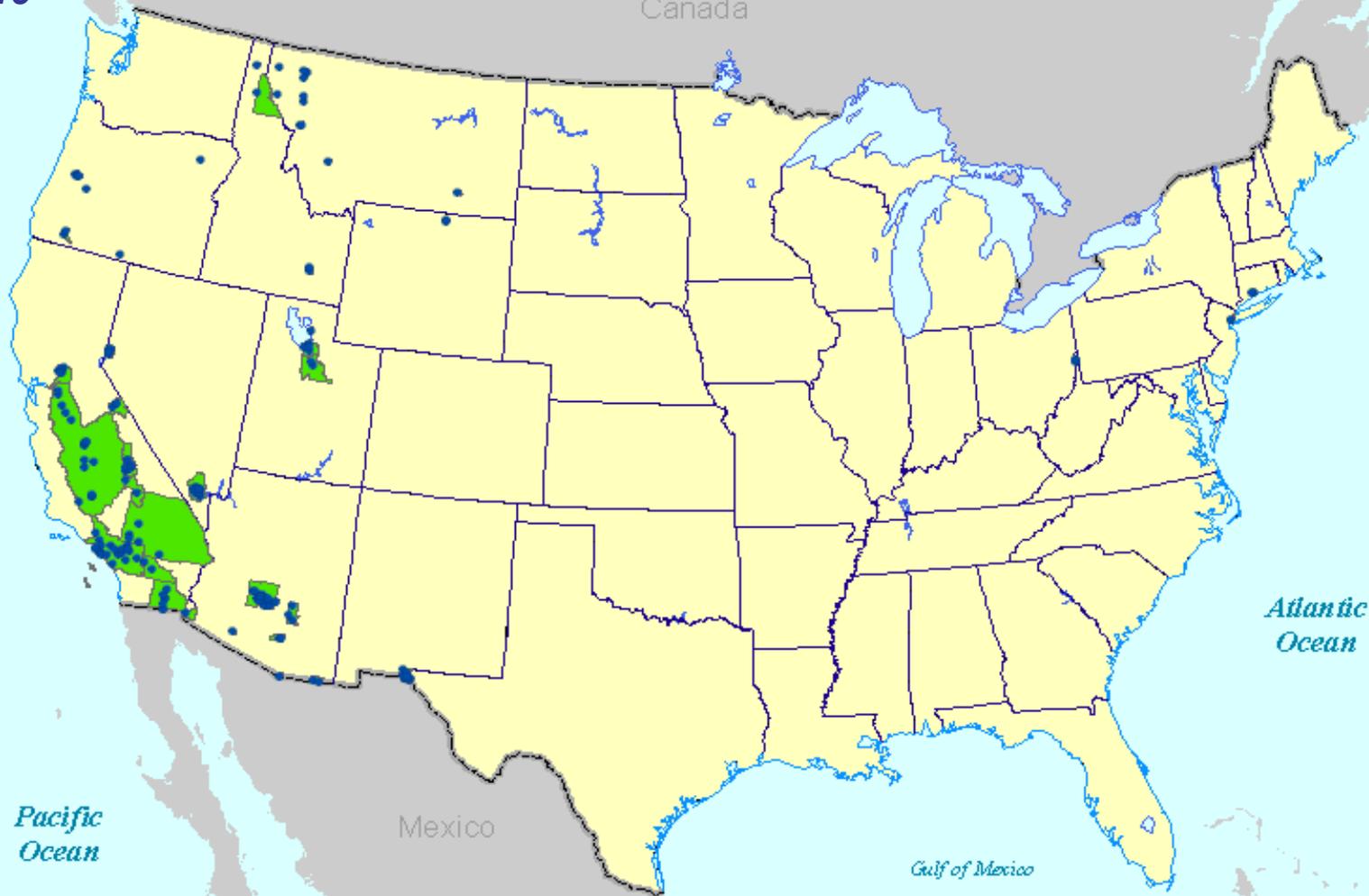


● Violating Monitors (expected exceedances > 1.0)

# PM<sub>10</sub> Monitor Retention Priorities: Urban Monitors



# *PM<sub>10</sub> Monitor Retention Priorities: Nonattainment Areas*



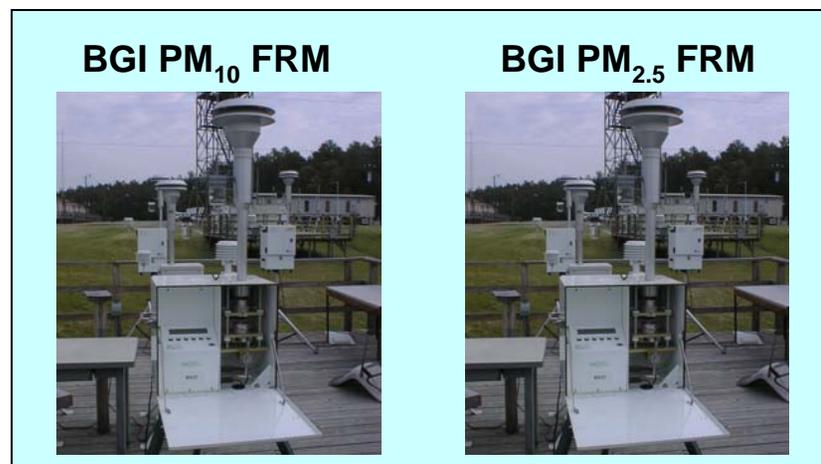
 **Monitors in designated nonattainment areas (smallest areas not visible)**

## ***Objectives of $PM_{10-2.5}$ Monitoring Program***

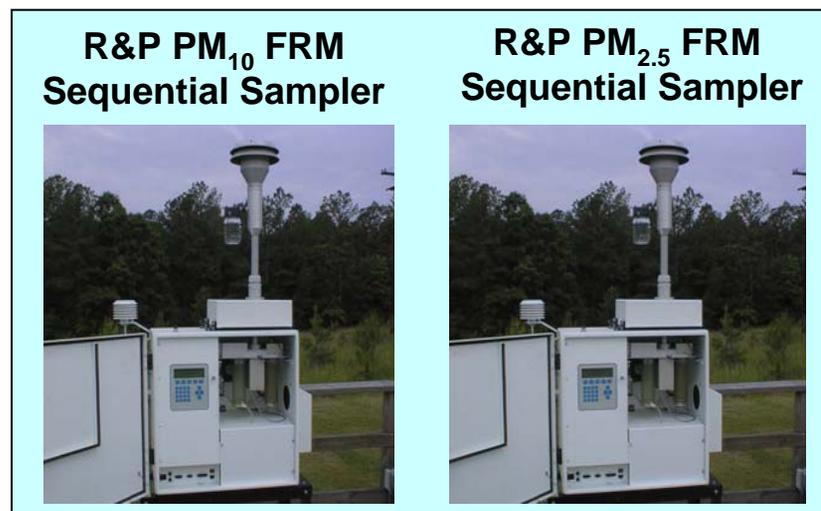
- Deploy robust methods for the measurement of thoracic coarse particles in support of:
  - National assessments of coarse particle mass concentrations and components
    - Promote better understanding of urban-rural differences
    - Investigate improved source particle tracers
  - Current and planned epidemiological and toxicological studies supporting future reviews of PM NAAQS
  - Evaluations of coarse particle control measures in  $PM_{10}$  problem areas

## *PM<sub>10-2.5</sub> Monitoring Rule Developments*

- Finalized FRM and FEM provisions
- PM<sub>10-2.5</sub> monitoring required as part of NCore multi-pollutant monitoring network
  - Plan due by July 1, 2009
  - Full network deployment by January 1, 2011
- Required measurements include filter-based mass and speciation
  - 1-in-3 day sampling frequency



$$PM_{10} - PM_{2.5} = PM_{10-2.5}$$



## *PM<sub>10-2.5</sub> Monitoring Challenges*

- PM<sub>10-2.5</sub> FRM
  - Peer Reviewed by Clean Air Scientific Advisory Committee (CASAC).
  - Currently deployable but more useful as basis of comparison for FEM tests and for QA of other methods.
  - Does not collect a discrete coarse sample, limiting utility for speciation.
- Continue development of single-sampler FEM's (and alternative FRM) that are more cost-effective to deploy and operate.
  - Data from recent ORD-lead field campaigns contributed to setting of PM<sub>10-2.5</sub> FEM test criteria in monitoring rule.
- Monitoring options include:
  - Dichotomous samplers that provide individual coarse and fine samples (with some [~10%] fine-contamination of coarse sample).
  - Continuous samplers for near real-time measurements to meet multiple objectives.
  - Saturation samplers for investigation of small-scale spatial trends near sources.
  - Other methods (particle sizing) to support science-based initiatives.

## ***Expectations for $PM_{10-2.5}$ Monitoring Networks EPA Action Items***

- EPA must develop guidance on coarse speciation
  - Method (dichot more direct approach than FRM)
    - Development of dedicated multi-filter sampler?
  - Components?
    - Similarities to STN sampling (carbon, metals, ions, crustal elements)
    - Other analyses: pesticides, aeroallergens, endotoxins, other constituents?
  - Additional important sites for health research
- Develop needed AQS modifications to handle reporting of paired samples.

## ***Expectations for PM<sub>10-2.5</sub> Monitoring Networks Monitoring Agency Action Items***

- Address NCore requirements with FRM's or FEM's.
- Strategically deploy additional SLAMS PM<sub>10-2.5</sub> monitors in urban and rural areas where data would be useful for NAAQS development and/or understanding air quality in areas where PM<sub>10-2.5</sub> concentrations are relatively high.
- Periodically review availability of excess PM<sub>2.5</sub> FRM's (due to introduction of continuous FEMs or ARMs) in support of additional PM<sub>10-2.5</sub> monitoring.
  - Convert excess PM<sub>2.5</sub> FRM's to PM<sub>10c</sub> as part of PM<sub>10-2.5</sub> FRM or FEM.
- Consider introduction of continuous PM<sub>10-2.5</sub> FEM's at NCore and SLAMS to meet other objectives as monitors become available.