

Environmental Air Quality

Monitoring Methods in Agricultural Settings



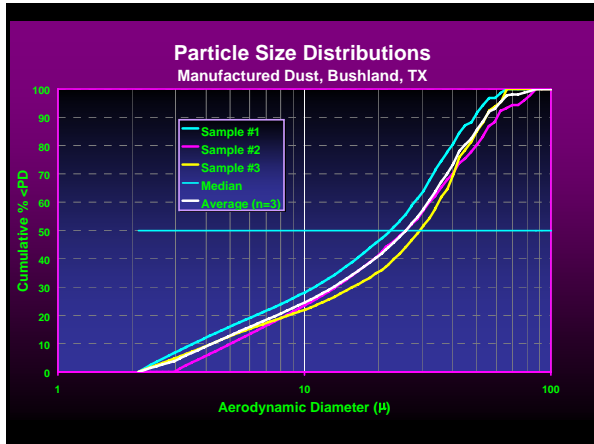
	Nuisance-Neighbor	Nuisance-Community	Current Regs	Anticipated Regs
PM	☑	☑	☑	⊗
Odor	☑	☑	⊗	☑
NH ₃	⊗	⊗	⊗	☑
H ₂ S	⊗	⊗	⊗	☑
VOCs	⊗	⊗	⊗	☑
GHGs	⊗	⊗	⊗	☑

	First Impressions	Environmental Justice	Nutrient Efficiency
PM	☑	☑	☑
Odor	☑	☑	☑
NH ₃	⊗	☑	☑
H ₂ S	⊗	☑	⊗
VOCs	⊗	☑	⊗
GHGs	⊗	⊗	☑

This PM factor is intended to include viable bioaerosols, endotoxin etc.

	Health-Human	Health-Occupational	Health-Animal	Visibility/Liability
PM	☑	☑	☑	☑
Odor	☑	⊗	⊗	⊗
NH ₃	☑	☑	☑	⊗
H ₂ S	☑	☑	☑	⊗
VOCs	☑	☑	⊗	⊗
GHGs	⊗	⊗	⊗	⊗





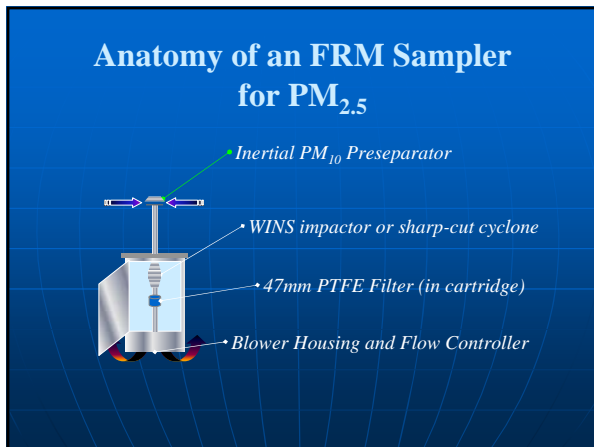
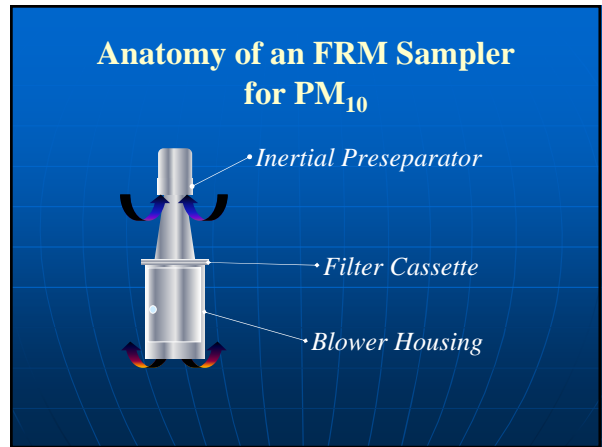
PM₁₀ and PM_{2.5}

- Refer to “aerodynamic equivalent diameter,” not physical dimension
- PM₁₀ – generally, “inhalable” PM
- PM_{2.5} – “respirable” PM

Anatomy of an FRM Sampler for PM₁₀

Principles of Operation

1. Move air at a specified rate
2. Remove the “boulders”
3. Capture what’s left and weigh it



Federal PM_{2.5} Air Monitoring

Amarillo, Texas

PM_{2.5} FRM Air Sampler

- Rupprecht & Patashnick Partisol-Plus Model 2025 Sequential Air Sampler
- U.S. EPA Reference Method Designation RFP5-0498-118



A Closer Look



- A filter-based, gravimetric sampling method
- 24-hr samples every three days
- System is automated with some moderate maintenance and programming

PM_{2.5} Continuous Air Monitor

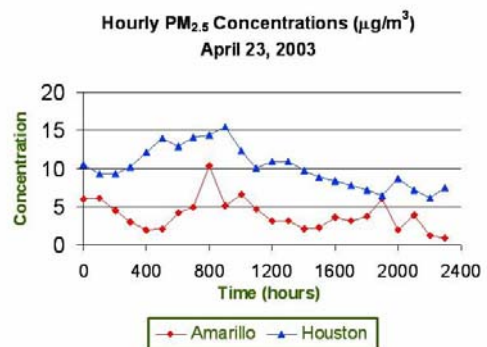


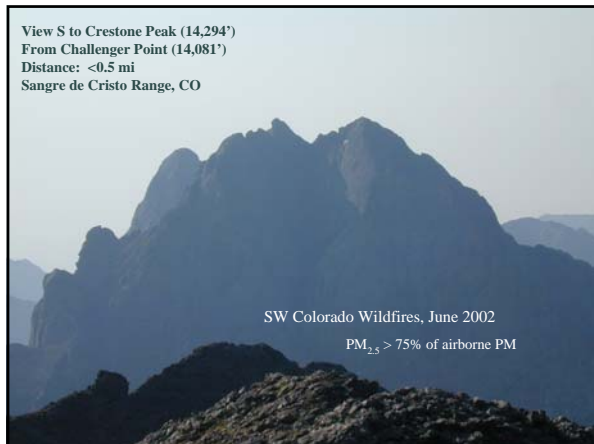
- TEOM Series 1400 Ambient Particulate Monitor
- Converts the change in oscillation frequency of a tapered element into a measure of increased PM mass on the end of the element

A Closer Look



- Inline filter method of sampling
- Fully automated with little maintenance
- Uploads hourly averages via the internet





Nuisance Condition

Any condition that interferes with the reasonable use or enjoyment of property

The FIDO(H) Factors in Odor Assessment

- Frequency
- Intensity (DT)
- Duration
- Offensiveness
- Hedonic tone (what does it smell *like*?)

