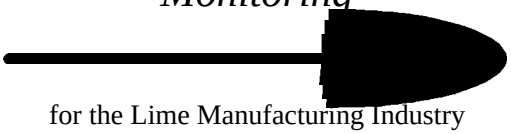
Compliance Assurance Monitoring and Periodic Monitoring



for the Lime Manufacturing Industry

Jim Peeler
Emission Monitoring Inc.
March 24, 1999

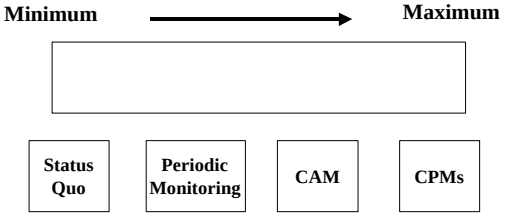
New Regulatory Monitoring Programs

- Periodic Monitoring
  - Part 70 Requirements and Agency Guidance
  - PM to be included in Title V Permits
- Compliance Assurance Monitoring (CAM)
  - Part 64 Regulations (Oct. 22, 1997)
  - Applies to Major Emission Units with Active Controls (Kiln Particulate Emissions)

New Regulatory Monitoring Programs (cont'd.)

- Continuous Particulate Monitoring
  - Regulations Under Development
  - Expected for:
    - Hazardous Waste Incinerators
    - Portland Cement MACT Standards
    - Others MACT Standards?

Relative Rigor



Timing

- Periodic Monitoring - Permit (Now)
- CAM - Permit Renewal (5 Years) or Major Permit Modification
- MACT/CPMs
  - Ongoing Demonstration Projects: 1 year
  - Trial Implementation: 1-2 years
  - Continuous Compliance Monitoring: 3 Years+
  - MACT (where applicable) will replace CAM

NLA Opacity Evaluation Effort

- Began Evaluation of Potential MACT Limits
- Evolved to Example CAM Plans
- Expanded to Include Periodic Monitoring

NLA Goals

- Reasonable Periodic Monitoring Programs
  - Avoid Bad Precedents
- Appropriate CAM Approaches
  - Least Risk & Lowest Cost
- No MACT for Hazardous Metals
  - No Continuous Particulate Monitoring Requirement

Common Elements of PM & CAM

- "Reasonable Assurance of Compliance"
  "Representative of Compliance"
- Monitoring and Documentation
- Action Triggers

Periodic Monitoring [1] CAM

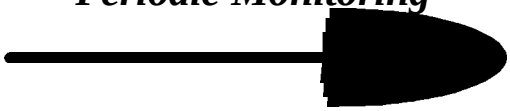
Affected Sources in Lime Industry

• CAM	• Periodic Monitoring
– **Kiln w/ Baghouse and COMS**	– **Kiln w/ Baghouse and COMS**
– **Kiln w/ Baghouse w/out COMS**	– **Kiln w/ Baghouse w/out COMS**
– **Kiln w/ Wet Scrubbers**	– **Kiln w/ Wet Scrubbers**
	– **Other Smaller Sources**

Kilns With Good Controls and Good O&M Programs

- CAM and PM Require Considerable **<u>Documentation</u>** But No Additional Control Measures

Part II
Periodic Monitoring



for the Lime Manufacturing Industry

Periodic Monitoring Regulations

- State Operating Permit Programs
  40 CFR 70.6 (a) (3)
- Federal Operating Permit Programs
  40 CFR 71.6 (a) (3)

  Regulation versus Guidance

- Periodic Monitoring Guidance (Sept. 15, 1998)

Periodic Monitoring Evaluation Factors

- Margin of Compliance: Likelihood of Violation
- Necessity of Add-On Controls
- Variability of Emissions Over Time
- Available Monitoring, Process, Control Equipment, and Maintenance Data

Periodic Monitoring Evaluation Factors (cont'd.)

- Technical and Economic Factors for Possible Monitoring Methods
- Monitoring Found on Similar Emission Units

Periodic Monitoring: Kiln With Fabric Filter

- Monitoring
  - COM (if installed) or VEOs Weekly, or Bag-Break Detectors
  - Routine Baghouse Inspections including Pressure Drop (Weekly - Monthly)
- Corrective Action Trigger
  - Exceedance of Opacity Limit
  - Baghouse Problems

Parameters for Periodic Monitoring Kilns With Wet Scrubbers

- NSPS (Continuous)
  - Pressure Drop
  - Liquid Supply Pressure
- Non -NSPS
  - Pressure Drop
  - Liquid Supply Pressure/ Liquid Flow Rate
  - Scrubber Outlet Temp. or Temperature Drop Across Scrubber
  - Equipment Inspections

Periodic Monitoring Kilns With Wet Scrubbers

- Frequency of Monitoring
  - NSPS: Continuous
  - Existing Sources: Daily or Weekly
- Indicator Ranges
  - Source-Specific Determinations
  - Recommend Long-Term Data Review
  - Limiting Values During Particulate Tests

Periodic Monitoring Numerous Other Sources

- Fugitives from Roads, Lots, Piles, etc.
  - Work Practice Requirements
  - Visible Emissions
- Conveyor, Elevator, Load-Out, etc. Control Systems
  - Regular Equipment Inspections
  - Parametric Values (Pressure Drop for Fabric Filters)
  - Visible Emissions

Periodic Monitoring Three Recent Draft Permits

- State 1
  - Kiln Fuel Sulfur Limitations
  - Daily Visible Emissions at Property Line
  - Kiln Particulate Test (If Requested by State)
- State 2
  - Annual Kiln Particulate Tests
  - Weekly Fugitive Visible Observations
  - Kiln Baghouse Pressure Drop
  - Weekly Kiln Visible Observations

Periodic Monitoring Recommendations

- Beware Overreaching Regulators
- Carefully Negotiate Permit Monitoring Procedures, Action Triggers, Recordkeeping
- Collect Supporting Information & Test Results
- Keep It Simple
- Establish Favorable Precedents - Share Results

Part III Compliance Assurance Monitorin

for the Lime Manufacturing Industry

Elements of CAM Plan

- Ranges or the process to set indicator ranges
- Performance criteria for monitoring:
  - Specifications for obtaining representative data
  - Verification procedures for monitoring operational status
  - Quality assurance and control procedures
  - Monitoring frequency
  - Data averaging

Elements of CAM Plan (cont'd.)

- Emission test data
- Justification for parameters, ranges, and monitoring approach
- If necessary, **implementation plan** for installing, testing, and operating the monitoring

All Permits Require:

- Approved monitoring approach, including indicators to be monitored
- Definition of exceedances or excursions
- Duty to conduct monitoring
- Minimum data availability and averaging period requirements
- Milestones for testing, installation, or final verification

Selected CAM Requirements

- CAM for Particulate Standards, Opacity Monitoring Still Applies
- Must use COM where already required
- Data Collection Frequency
  - Actual Emissions > 100 tons/year: continuous
  - Actual Emissions < 100 tons/year: daily
- Indicators and Ranges
  - Excursions
  - Exceedances

Critically Important Strategies

- Representative Conditions / Standard Applicability
  - NSPS (federal standards)
    - Particulate only at "Representative Conditions"
    - Opacity except Start-up, Shutdown, Malfunction
    - COM, Proper O&M At All Times
  - State Standards Vary!

Critically Important Strategies

- Exemptions and Excluded Periods
  - Start-up and Shutdown
  - Process Transients or Upsets
  - Control Equipment Factors
  - Monitoring Malfunctions and QA

Critically Important Strategies

- Time Issues
  - QIP Triggers based on "Percent of Observations" outside indicator range
  - Applicable Averaging Period (3-hours or longer)
  - Allow Time for Operator Corrective Action
  - Monitor and Respond Quickly

Critically Important Strategies

- Establishing Parameter Ranges and Testing
  - Representative Conditions
  - Maximum Production Rate
  - Proximity to Standard
  - Test QA
- (Beware: EPA Examples Oversimplify)

Critically Important Strategies

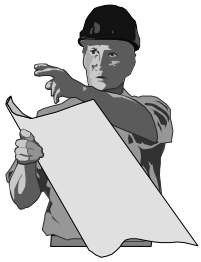
- Extrapolation to Equivalent Standard
  - Provide Operational Flexibility
  - Avoid Overly Restrictive Limits
  - Minimize Re-testing

Critically Important Strategies

- Units of Measure
  - Exceedance of .6 lbs./ton, along with "Any Credible Evidence" arguably a **VIOLATION**
  - Excursion of Parameter Value difficult to relate to Emission Standard

Critically Important Strategies

- Incorporating Work Practice Procedures & Control Equipment Inspections

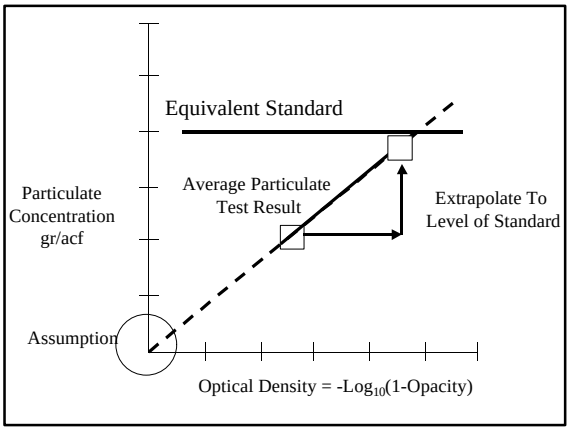


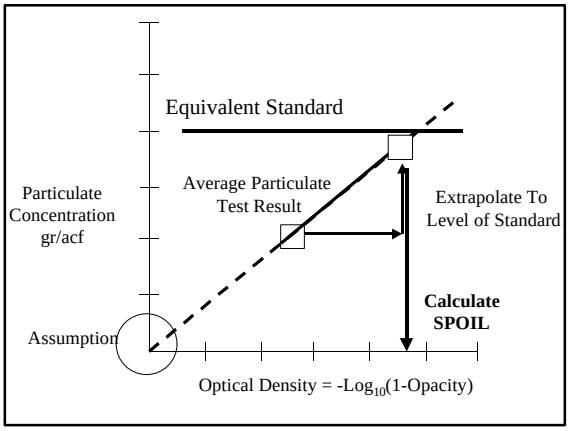
Critically Important Strategies

- Corrective Action
  - Reasonable Scope, Reasonable Cost
  - Consider Compliance Margin
  - Consider Severity of Problem
  - Document Actions

CAM Plan Example #1: NSPS Kiln With Fabric Filter

- Opacity as Indicator
  - Required by CAM Regulation
  - No New Liabilities
- Rationale for Establishing "SPOIL" (Surrogate Particulate Opacity Indicator Level)
  - Optical Density Linearly Related to Mass Concentration
  - Relationship through "Zero/Zero"
  - Slope Based on Particulate Test





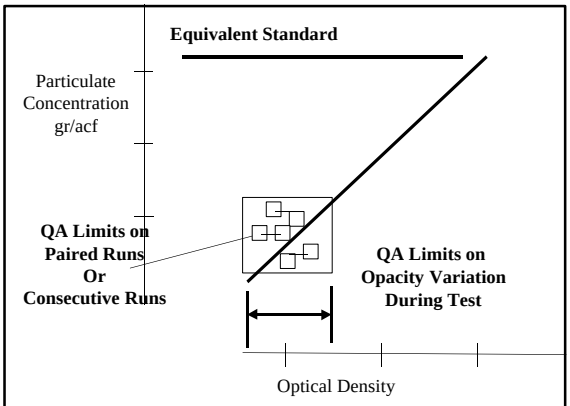
CAM Plan Example #1: NSPS Kiln With Fabric Filter Determination of "SPOIL"

- QA Opacity COM (span at 40% opacity)
- Test at Steady-State Conditions
  - Maximum Production Rate
  - ≤ 10% Feed Rate Variation
  - Standard Deviation COM data ≤2% Opacity (achievable)

CAM Plan Example #1: NSPS Kiln With Fabric Filter Determination of "SPOIL" (cont'd.)

- QA Tester
  - Three paired-run particulate tests ±10% or ±.0011 gr./dscf of average,

    OR
  - Four consecutive runs ±15% or ±.0017 gr./dscf of average



CAM Plan Example #1: NSPS Kiln With Fabric Filter

- Rationale for Averaging Time (3-Hour Block Average)
- Rationale for Representative Test Conditions
- Rationale for Frequency
  - Daily (Actual Emissions <100 tons/year)
  - Continuous (Actual Emissions >100 tons/year)
- Rationale for Corrective Action Trigger
- Rationale for Quality Improvement Plan Trigger

CAM Plan Example #1: NSPS Kiln With Fabric Filter

- Recommended Approach
  - Simplified If Emissions are Near Standard
    - (Observed Opacity becomes the SPOIL)
  - Not Applicable IF:
    - Emissions <10% of Standard
    - Opacity <3%
    - Opacity Monitor Unreliable

CAM Plan Example #2: Kiln With Fabric Filter without COMS

- Monitoring
  - Visible Emissions Observations (Daily)
  - Pressure Drop Across Baghouse (Daily)
  - Annual Particulate Tests
- Corrective Action Limit:
  - VEO Opacity > Opacity During Test, or Applicable Opacity Limit
  - Pressure Drop < Value During Last Test
- Conduct Retest if Limits Too Restrictive

CAM Plan Example #3 Kilns With Wet Scrubbers

- NSPS (continuous)
  - Pressure Drop
  - Liquid Supply Pressure
- Non -NSPS
  - Pressure Drop,
  - Liquid Supply Pressure/ Liquid Flow Rate
  - Scrubber Outlet Temp. or Temperature Drop Across Scrubber
  - Equipment Inspections

CAM Plan Example #3 Kilns With Wet Scrubbers

- Frequency of Monitoring
  - Daily or Continuous
- Indicator Ranges
  - Source-Specific Determinations
    - Correlate Particulate Test Results with Parametric Values
    - Establish Method For Extrapolating to Standard
  - Long-Term Historical Data Review

Affected Sources in Lime Industry

CAM	Periodic Monitoring
– Kiln w/ Baghouse and COMS	**– Kiln w/ Baghouse and COMS**
– Kiln w/ Baghouse w/out COMS	**– Kiln w/ Baghouse w/out COMS**
– Kiln w/ Wet Scrubbers	**– Kiln w/ Wet Scrubbers**
	– Numerous Other Smaller Sources