NCore – One Year Later

Chris Harrison
Southwest Ohio Air Quality Agency
Cincinnati, Ohio
Original location
Reasons for Original Site

- Historical data
  - Site had 30 years of data
  - Trace analyzers installed July 2006
- NOy comparison
  - Converter atop mast vs. converter back of unit
- Met Tower requirements
- Site met original criteria
- Regional Approval Received
- Realized site may not be permanent
Move required

- Original site not representative of urban population exposure
- Not downwind of city center
- OAQPS clarified met requirements
Late 2009, EPA request to move site

- Prepared new site plan
- Removed precursor analyzers & related equipment
  - Maintenance, annual servicing and training
- Contract required for HVAC system at new location – began June 2010
- Target date for equipment install at new site: October 1, 2010
- All equipment (HVAC system included) installed December 11, 2010
Site Parameters

- Collecting following parameters:
  - Trace Sulfur Dioxide
  - Trace Carbon Monoxide
  - Trace Total Reactive Nitrogen
  - Ozone
  - Nitrogen Dioxide
  - PM2.5, PM10, PMcoarse FRM
  - Chemical Speciation
  - Meteorological Data
  - BAM FEM
  - Lead
Challenges with Trace Level Equipment

- Staffing
- Equipment
- QA/QC
- Data Collection
- Data Review & Reporting
Challenges - Staffing

- Turnover
- Training
  - Operations of Equipment
  - Calibrations
  - Annual Servicing of Equipment
  - Data Management
- **Full time** dedicated staff member required
  - Learn complexities of equipment
  - Learn data validity of real time data
Challenges - Equipment

- Calibrations
  - Mass Flow Controller Checks
- Method Detection Limits
- Vendor Assistance
- Sensitivity to Temperature & Humidity
  - Small amount of drift leads to frequent adjustments
  - Independent HVAC System
- Learning nuances of equipment
  - Periodic maintenance vs. Annual Servicing
Challenges - QA/QC

- Calibrations
  - Mass Flow Controller Checks
  - What level do we calibrate?
- Zero/Span Check
- Precision Checks
  - New procedure = new form
- Method Detection Limits
- Audits
  - What levels do we audit?
  - Low level
    - Know how to perform, challenge was low level
    - Acquiring equipment and gas cylinder for dilution key
Challenges – Data Collection

- Different data acquisition software
  - Benefits of New Software
  - Drawbacks of New Software
- Communication between trace equipment and original data acquisition software
  - Benefits of Original Software
  - Drawbacks of Original Software
Challenges - Data Review & Reporting

- Level 1 data review & processing significant increase
  - More Shortfalls & editing due to increased QC
- Data processing & formatting
- NCore has doubled continuous parameters for review
  - Leads to larger data file and increased data validation
Challenges Overcome

- Careful review of Technical Assistance Document critical to developing program
- Back-up Staff
- Working closely with Ohio EPA to develop audit procedures
- Individual equipment diagnostics
Individual Equipment Diagnostics

- CO/CO₂ converter efficiency
- SO₂ UV lamp intensity
- NOy converter efficiency
Ongoing Challenges

- Span Check vs. Precision Check
  - How many cylinders do we purchase
    - Regulators, plumbing, etc
- Clarification of CFR language
  - Zero/Span, Calibration, Audit Ranges
Audit Performance

Has audit performance improved?
• No
## CO Audits

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Precision data

Has Precision Data Improved?

- Yes and No
NOy Precision Data

NOy Precision

Percent Difference

Series 1

Linear (Series 1)

SO2 Precision Data

Percent Difference

Date


Series 1

Linear (Series 1)
Future Challenges

- Data analysis to determine patterns
  - Staff time needed
- Keeping experienced staff
  - Develop SOPs for training
- Determining Method Detection Limits
  - Time and understanding
  - Budget
  - Equipment
  - Space in monitoring area
Lessons Learned

- Challenges and solutions are evolving with new program
- Install and operate equipment at least 6 months in advance to avoid data loss
- Develop equipment and/or Ncore work groups to work out equipment issues
- Wait for funding, guidance, site approval before moving forward
- Start with new equipment – as much as you can
Monitoring & Analysis Group
Thank you!

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