

Establishing Terminology & Approach for and Hierarchy of NIST Traceability for Flow Rate Audit and Calibration Standards

Primary, Traceable, or Comparable: Is It a
Political Election or a Reliable, Accurate
Comparison?

Discussion, Lead by Mark Shanis, 11/4/09

EPA-OAQPS-AQAD-AAMG-RTP,

shanis.mark@epa.gov



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



GOALS for Flow Traceability

Our Goal for Ambient Air Flow standard certification traceability (as it is for Ozone) has started with audit flow standards, but must include all air monitoring flow standards, because flow is critical to determining not only concentration, but also PM cut points



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



What is our Specific Traceability Goal?

To show how comparable two different SLT agencies are to NIST. Why?: NIST has been set up to be our single national std. source. All groups making the same type of measurements can have trust in independent measurement comparison to each other, through their quantified NIST traceability (including mean & variability)



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Flow Traceability Issues – Terminology and Approaches for Accomplishing Flow Traceability

Recent vendor uses of EPA Traceability
Terms have been related to issues about
the best approach for accomplishing Flow
Traceability

EPA Definitions for traceability to NIST
come from 1979 Ozone Standard
Certification Guidance



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Terminology Updated and Approach Goals Revisited in 2008 - 2009

Following work by Ambient Air QA Workgroup, lead by Mike Papp, A Draft Update of the 1979 Ozone Traceability Guidance Was Posted on AMTIC in May 2009

The review of Terminology and Approach refocused goals and terminology from specifying equipment and SOPs onto quantifying amount of variability of SLT measurements from what NIST would have measured



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Refocus Approach from Equipment Basis to Performance Objective

Basis: O₃ → Flow

Since 1979, when the last guidance version was published, EPA has set up a traceability network for O₃ based on NIST SRPs

EPA is now looking at summarizing the data for the intercomparisons to estimate an acceptance limit(s) for *total* variability from SLTs to NIST



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Proposal: Discuss Extending the O3 Goal and Approach to Flow

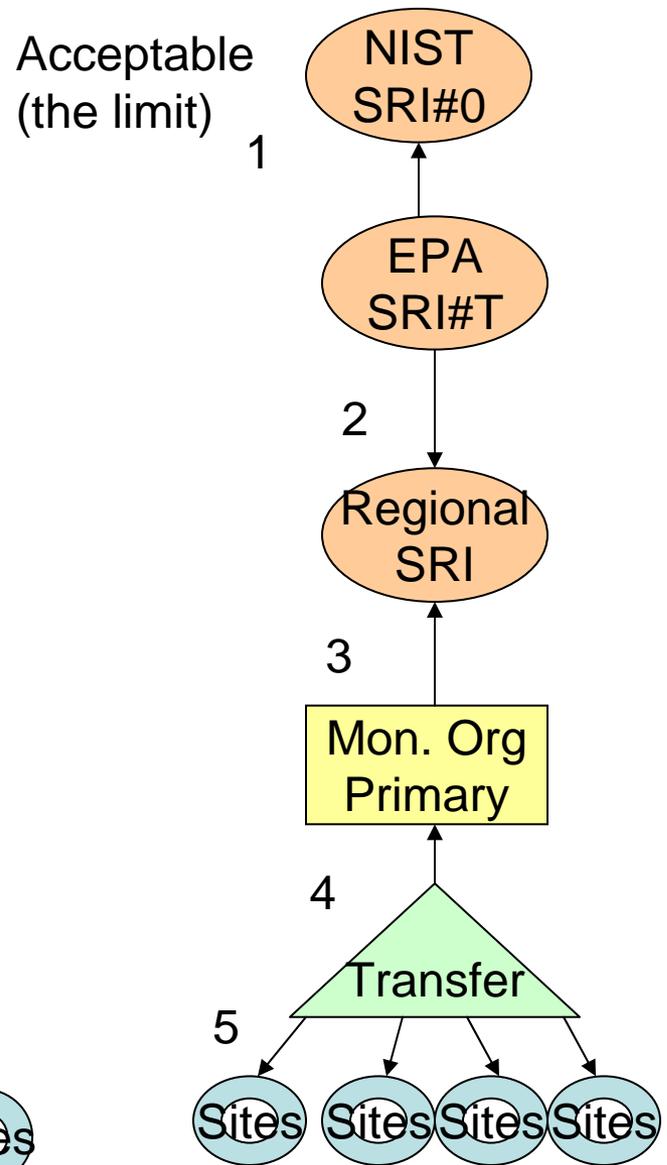
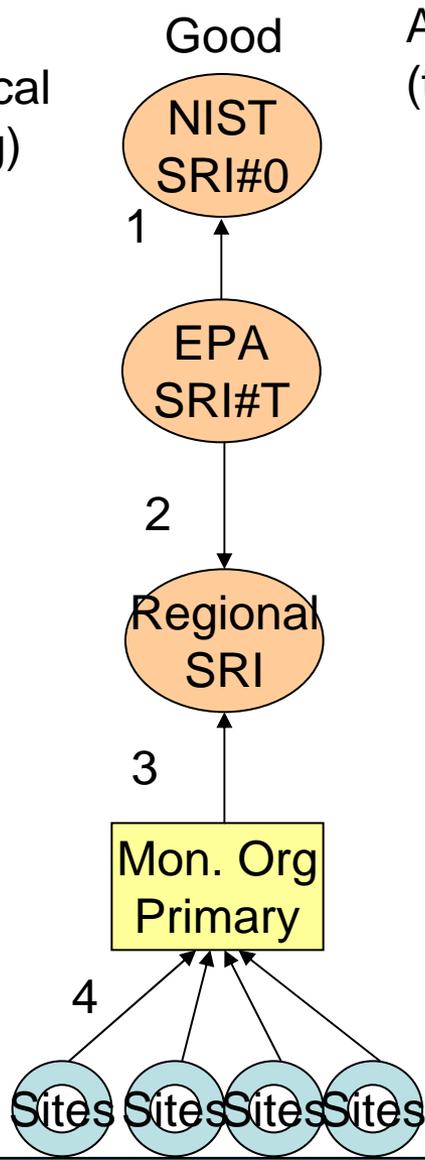
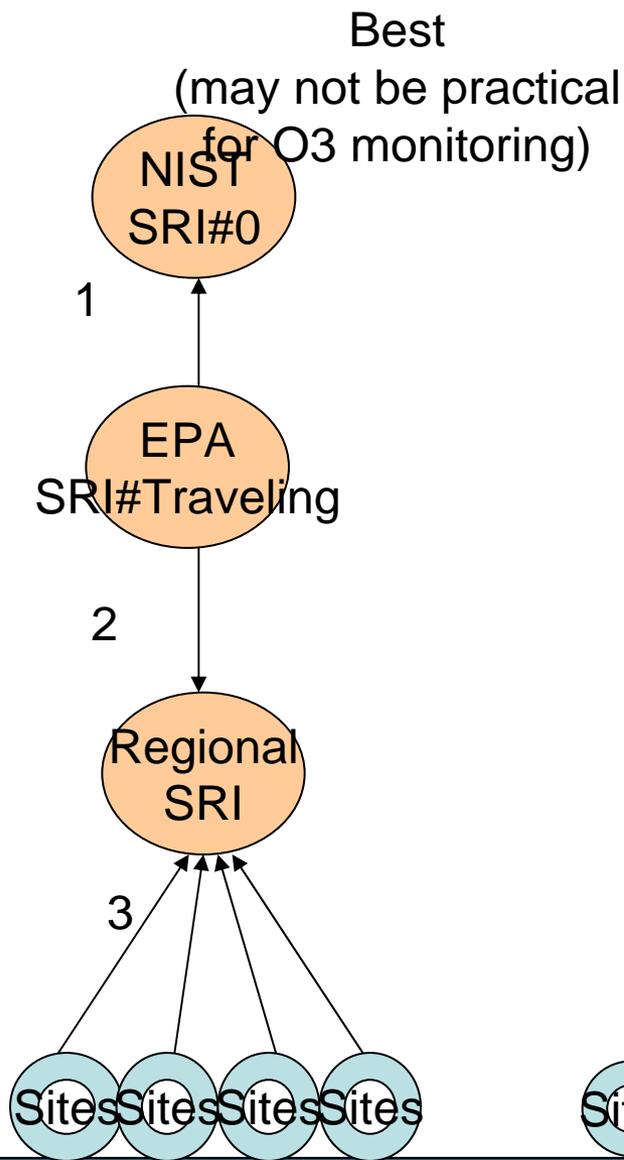
Consider Several Flow Traceability Scenarios, substituting SRIs (I = Instrument) for SRPs, at the NIST, EPA National, EPA Regional and SLT levels of comparison



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day





2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Proposed Additional Details of a *National* Flow Certification Traceability Approach

- *National*- meaning used by **any cert lab used by SLT that reports flow audit data to EPA**
- Procedures: NIST (as should all cert. labs) certifies flow stds. using a tandem comparison design that controls for effects due to test level order and power status(on\off). May also need an apparatus that adds *NO additional pressure during the certifying procedure*
- Per Test-Do more than once, varying flow levels (Lo, med, hi), and turning on and off and on, and preferably over more than one day.



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Proposal: Additional Details of a National Flow Certification Traceability Approach

All Certifying metrology laboratories should follow the same procedure if Monitoring QA data will be reported to EPA

Note: Flow is even more critical (vulnerable to) due to zero air sources at the Trace level; some PM samplers work at ~ 5LPM; or even at 1.5 LPM(Fairbanks AK study)



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Proposal: Discussion on Frequency

- 1. Primary "Bench" flow, temperature, pressure standard certified NIST traceable *annually*.
- 2. Compare any Field (i.e., Traveling) standards against primary "bench" standard *annually*. [We could propose this as one option among other frequencies, such as semiannual or quarterly, given the biweekly calibration of ozone span/zeros as a basis]
- 3. Submit Field standards to manufacturer every (?) three years for refurbishment and NIST certification.-Whatever accumulated appropriate data shows.



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day



Proposal: What Do You Think?

Lets Talk!!



2009 National Ambient Air Monitoring Conference, Nashville, TN

Appendix A in Half-a-Day

