

2005 Field Audit Summary for the IMPROVE Network



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Before the
IMPROVE Steering Committee Meeting
September 26-28, 2006

Overview

- What did we accomplish in 2005?
 - What could we conclude from our audits?
 - Did we learn any valuable lessons?
 - Where do we go from here?
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How did we earn our pay?

- Audited 34 IMPROVE sites and 35 samplers;
 - ◆ One site was improperly positioned with respect to an adjacent shelter which caused water to drip onto one module box and then it infiltrated the sample train and sharp cut cyclone. (This was corrected in February)
 - ◆ Two leaks where the Vacuum reading $< 33\text{mm Hg}$.
 - ◆ Four flow rates calculated from the vacuum reading were $> \pm 10$ percent of flow measured by standard.

How did we earn our pay? Cont.

- ◆ Five flowrates with difference $> \pm 10$ percent of theoretical or the flow rate was questionable due to differences between calibration values and the expected design flow.
- ◆ One had flies that were observed in one exposed filter cassette (fly eggs on the filter).
Cudos to the Auditor!!
- ◆ Two clocks were $> \pm 60$ minutes from reference standard

How did we earn our pay? Cont.

- ◆ Three sites reported operator errors with respect to handling filter cassettes or reading the instrument temperature sensor.
- ◆ Two sites where calibration plug was missing, (for 12 weeks).
- ◆ Three sites with temperature reading $> \pm 10$ degrees Celsius from reference standard.

Conclusions, Recommendations & Results

- ◆ We audited 21% of IMPROVE network; 25% is target
- ◆ Network samplers are generally performing well but some sites are experiencing some issues
- ◆ We need a better procedure for providing auditors with site coefficients; we are working with UC Davis to create one
- ◆ Mechanism has been developed to provide UC Davis critical findings immediately
- ◆ UC Davis has advised operators to duct tape calibration adapter plugs

IMPROVE should devise a permanent device to secure calibration adapter plugs

Conclusions, Recommendations & Results

- ◆ UC Davis is currently resolving issue with temperature sensors
- ◆ Site operators are being trained to reset clocks and temperature
- ◆ A procedure to track follow-up actions is needed and is under Development (for both networks)!!
- ◆ A comparison of actual flow rate measured by a reference std and the design values is needed and has been implemented

What did we learn?

- On-site, regional training pays off
- Contractor support for training will be essential
- We need to compile and publish “tricks of the trade”
- A few critical audit do’s and don’ts
 - ◆ Know the idiosyncrasies of the TriCal
 - ◆ Use an auditor’s check-out sheet

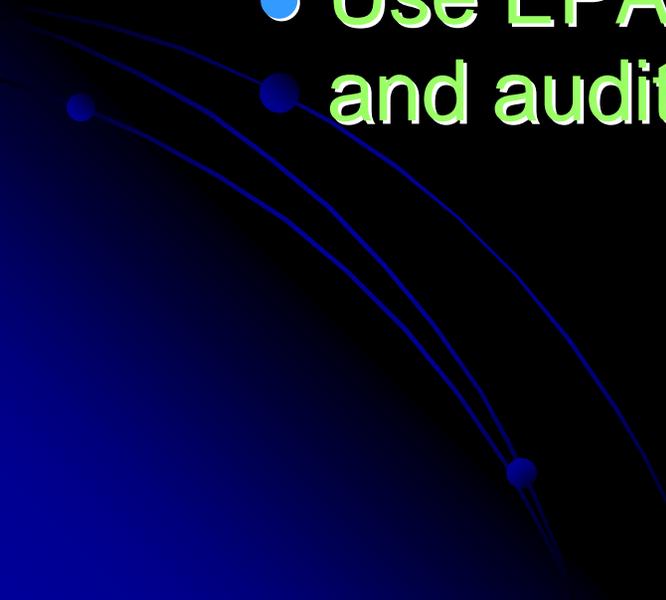
What did we learn?

- **New Auditors are going to make mistakes**
 - ◆ One reference standard failed during audit of sampler flow rates
 - ◆ One adverse flow rate finding was unsubstantiated (Trical/operator error)
- **We cannot short-cut tools necessary to do the audits**
- **Electronic reporting is the way of the future!**

Where do We Go from Here?

- Retain and empower expert auditors
 - ◆ EPA Regional; State; Local; Tribal personnel
 - ◆ Complete revision of audit SOPs and Field manuals
 - ◆ Conduct local/regional courses rather than national
 - ◆ Develop electronic recertification
- Recommend revisions to the IMPROVE QAPP

Where do We Go from Here? Cont.

- Facilitate better coordination between State and EPA Regional auditors.
 - Use EPA Regional Staff to recertify and audit auditors
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Expected Evolution and Changes in the IMPROVE Field Audit Program

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Before the
IMPROVE Steering Committee Meeting
September 26-28, 2006



Overview

- What has happened so far in 2006?
 - What Changes took place from 2005 to 2006 in procedures and tools?
 - What Challenges do we face for 2007?
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2006 Training Courses

- RTP, NC
- Frostburg, MD
- Kansas City/Sac and Fox Indian Reservation
- Denver
- Sacramento
- Seattle
- Las Vegas – November
- Florida -- December

The Evolution—New Changes

- Revised and conducted a comprehensive and training course in 2006
 - ◆ In 2006 introduced a Training and Field Manual with all SOPs and electronic forms on a CD
 - We've trained and certified over 30 auditors in 2006!
- Philosophy is to forge a partnership with UC Davis with a goal to continually improve the QA program
 - ◆ New Manual for 2007 and every year hereafter

Changes Implemented in '06

- Use of routine sampling event cartridge for audits
 - Uses an unexposed filter for the audit
 - Worksheets revised to record audit position
- Worksheets use site coefficients and site data in transfer from UC Davis Excel spreadsheets
 - Eliminates transcription errors

Changes Implemented in '06 cont.

- Revised the current worksheet to reflect the temperature MQO acceptance value of $\pm 10^{\circ}\text{C}$
 - 10°C change results in calculated flow rate difference of slightly greater than 2%
 - UC Davis will be replacing the components that have caused large recorded temperature variations
- Sampler's reported sampling event date

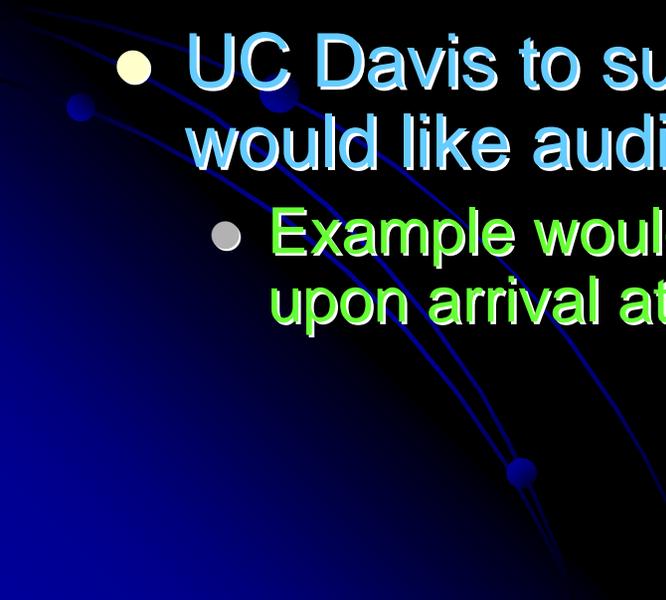
Changes Implemented in '06 cont.

- Evaluating site conditions against siting criteria derived from QAPP
 - Maps and measurements
 - Exceptions are anticipated but documentation is required
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Changes Implemented in '06 cont.

- Comparing Reference Flow Rate to Theoretical flow rate
 - Historically challenged the Mag and Vac readings which were an assessment of the calibration
 - Disparate readings among the Reference Standard, Mag and Vac confounds the conclusion
 - Direct comparison of reference to design flow provides more accurate assessment of the true flow rate

Challenges for '07

- Central location for storing and retrieving site coefficient data from yearly calibrations
 - IMPROVE/VIEWS website to host
 - UC Davis to supply Critical findings list
 - Immediate notification that data is in jeopardy
 - UC Davis to supply list of MQOs that they would like auditors to evaluate
 - Example would be sampling position on cartridge upon arrival at site.
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Challenges for '07

- OAQPS/ORIA will revise '07 audit training and manual to reflect new MQOs and critical issues.

