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- MWRA Update



ITLA

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2005-2006 ITLA Officers

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Message from the President

By Jim Occhialini

Greetings fellow members of the Independent Testing Laboratories Association:

I trust everyone is doing well as we head into the fall season. I never thought I would say this after the disappointing spring we had but I am looking forward to some cooler temperatures. We've got a meeting coming up – September 7th at the Holiday Inn in Taunton MA.

Regarding meeting locations, the Executive Board is looking for suggestions from the membership regarding potential locations for future meetings. We would like to spread the locations around to best accommodate our membership's geographic spread. So, if anyone has any strategic locations they would like to suggest, please do.

Our upcoming meeting is an important one (of course they're all important,) but this one will be particularly informative. There is a lot going on in our industry, both locally and at the national level, and this meeting will provide you with

valuable information and insights that you can use. The state of Connecticut is moving rapidly to implement their data quality enhancement policies. The policy is now out for public comment and on schedule to be put in place by the end of the year. Mr. Glen Breland, of Alpha Woods Hole Labs and a member of the Connecticut work group, will give a summary of what transpired at the recent July 29th training session and give a status report on where the policy stands today.

As far as the Commonwealth of Massachusetts is concerned, things have been relatively quiet on the data quality enhancement front since the CAM was released. Mr. John Fitzgerald, along with Mr. Ken Marra of the Massachusetts Department of Environmental Protection, has asked for time at our meeting to address the lab community. They will present an update on the Massachusetts Data Quality Enhancement Policy. When the CAM was released, DEP clearly stated that they weren't finished yet, that there was more work to be done. Come to the

Quarterly Meeting - Wednesday, September 7, 2005, Holiday Inn, Taunton, MA

Feature Presentation: "Emerging DBPs & Other Contaminants in Drinking Water"

by Dr. Susan Richardson, US EPA Atlanta, GA, See page 5 for agenda

meeting & hear for yourself what the current status of the program is and in what direction they are headed.

There has been much publicity and discussion in the literature regarding “emerging contaminants of concern”. Our featured speaker will be Dr. Susan Richardson, of the US EPA in Atlanta, GA. We requested that Ms. Richardson come to speak to us about this important topic. The title of her talk will be “Emerging DBPs (disinfection by-products) and Other Contaminants in Drinking Water”. Take advantage of this tremendous opportunity to hear someone from EPA speak on what potential environmental contaminants have reached EPA’s “radar screen” and what they intend to do from both a regulatory and analytical perspective.

So, I hope to see you all in Taunton, September 7th. One last comment, please send in your dues if you have not already done so. We need your support if we are to continue to be able to put on meetings such as this. As always, if anyone has any issues they would like to have addressed or ways in which the ITLA can be more effective, please do not hesitate to contact me at jocchialini@alphalab.com, or (508) 898-9220 as well as any member of the Executive Board. We have a great meeting coming up and I look forward to seeing you all.

MWRA Items

By Mike Delaney, mike.delaney@mwra.state.ma.us

MWRA TRAC Training Session.

MWRA is preparing a training session for labs and consultants who work for industries with MWRA sewer use permits. The MWRA pretreatment program, called Toxic Reduction and Control (TRAC), issues permits to industries that discharge into the MWRA sewer system. Many of these permits require self-monitoring by the industries using certified labs and NPDES-approved methods. We tentatively plan to offer this training on Wednesday, 11/16/05. The training session will be held at the Deer Island Treatment Plant in Winthrop, MA and will include a tour of the treatment plant and the MWRA Central Lab. We plan to cover the following topics:

- Introduction to MWRA and TRAC
- Overview of the Industrial Pre-Treatment Program
- Role of the MWRA Laboratory
- Deer Island NPDES permit
- TRAC sewer use regulation
- Local Limits process
- Sampling and preservation requirements
- Lab Testing requirements
- Electronic reporting using “eSMART”
- Ethical responsibilities
- Tour of the Deer Island Treatment Plant and Central Lab

MWRA starts its Ozone Drinking Water Treatment Plant

On July 27th, MWRA placed into operation its new John J. Carroll Water Treatment Plant at Walnut Hill in Marlboro. This state-of-the-art plant treats drinking water for 2.3 million people in 41 communities in Eastern Massachusetts served by the MWRA. The plant treats 270 million gallons of water daily (up to 405 million gallons on a peak day). This treatment will improve drinking water quality & strengthen the region’s ability to comply with the Safe Drinking Water Act. These changes, along with other improvements, mean that the MWRA will be able to drastically reduce the chlorine used in the water treatment process.

MWRA Participates in Red Tide Study

In addition to its extensive required monitoring program in Massachusetts Bay, MWRA participated in a large monitoring effort to gauge the extent and duration of the Red Tide outbreak in the Bay this spring. Woods Hole Oceanographic Institute tested samples for the Paralytic Shellfish Poisoning dinoflagellate Alexandrium, and MWRA tested samples for chlorophyll and five dissolved inorganic nutrients. In all MWRA tested about 600 samples.

MWRA Delivers Annual Water Quality Report.

MWRA has mailed its Annual Water Quality Report to every household in the service area.

The report, required by the federal Safe Drinking Water Act, updates consumers on last year’s water quality results. MWRA takes up to 500 samples each week &, of the 120 possible contaminants tested for, MWRA met every standard. In addition,

the MWRA system as a whole was below the Lead Action Level. MWRA distributes the report through bulk mail to over 900,000 homes in 41 cities and towns. The report is also available on-line at www.mwra.com.

“A Healthy Environment Starts at Home.”

MWRA’s guide to reducing our use of hazardous household products is now available online at www.mwra.com as a 25-page, downloadable PDF file. Publication of this booklet was required by the MWRA’s wastewater discharge permit from EPA and MA DEP.

TRAC “eSMART”

We continue to receive lab data electronically using the web-based “e-SMART” program. Labs access e-SMART using a PIN provided by MWRA. The program accepts either data files in a specific format, or on-line data entry. Chains of custody are scanned & submitted as PDF files. So far, over 20 labs are using e-SMART. To find out more, call Alice Chang at 617-305-5621 or alice.chang@mwra.state.ma.us.

Labs using e-SMART are reminded of the following: If the chain of custody form is missing, or is missing vital information, including the permit number, the sample location number, or the effluent flow information, TRAC will return the report for correction and resubmission.

e-SMART File Format Specification: To better assist labs that choose to use a LIMS system to submit data, TRAC modified the e-SMART File Format Specification that labs can access using the e-SMART Help function. The specifications include: a data file overview, formatting instructions, a sample file, instructions for checking the file format, and a dictionary of MWRA test codes and components.

Visit our web page for more information.

Check us out at www.mwra.com. We have a wealth of information for both the public and experts on our water & wastewater activities. This includes monthly updates on drinking water quality testing, information on lead, our most recent Consumer Confidence Report, and many technical reports associated with the Deer Island Treatment Plant and our extensive Harbor and Outfall Monitoring program.

Calibration Strategies & Dilution Practices

By Bill Hahn, SPEX CertiPrep

- We manufacture inorganic and organic certified reference materials (CRM’s)
- We also manufacture sample prep equipment
- We have an ISO 9001-2000 quality system
- We are NVLAP approved to manufacture PT Samples. We are Audited and accepted as contractors to various state and federal agencies.

Why talk about Calibrations and Dilutions at all?

- We have observed over the years that chemists use a variety of techniques to dilute solutions and calibrate instruments.
- We have also observed that many techniques in common practice contain an unacceptable amount of error and uncertainty.
- We wish to promote good laboratory practices and reduce the errors at the bench.
- The goal is to show calculations, uncertainties and lab practices that will help chemists make better measurements, or understand why they do well.

Techniques

- This presentation pertains mostly to GC and GC/MS techniques
- The same calibration principles apply to AA, ICP, ICP-MS
- The dilution schemes are specific to GC practices

Calibration Strategies

- There are many ways to calibrate an instrument
- 1 point
- 2 point
- Multiple points
- External Standard
- Internal Standard

Do more points = more confidence?

- Generally yes, but there is a point of diminishing returns
- Calibrating below working range skews curves
- Calibrating above linear range also skews curves
- Too many points, over time, are meaningless and expensive

External vs. Internal Standard

- External standard techniques are highly dependent

on consistency in sample prep, dilutions and instrument conditions

- Internal standard techniques give a relative response to quantitate & is generally more accurate

Syringes and Pipettes

- Always use the same syringe for I/S additions
- Check your accuracy and precision
- Check the syringes, pipettes and volumetrics for accuracy and precision
- Make sure that all analysts are being consistent

Internal Standard Variations

Internal Standard Variations at 40 ug/ml

Cal Level	10 ul	20 ul	
Standard Error	2.72%	1.05%	
1	0.03	0.01	ug/ml
2	0.05	0.02	ug/ml
5	0.14	0.05	ug/ml
20	0.54	0.21	ug/ml
50	1.36	0.53	ug/ml
80	2.18	0.84	ug/ml
120	3.26	1.26	ug/ml
160	4.35	1.68	ug/ml
200	5.44	2.10	ug/ml
240	6.53	2.52	ug/ml

Typical linear calculations

- Average response factor
- Linear Regression

Average response factor

- Sum of all response factors / N
- Is a weighted way to evaluate a straight line
- Used in CLP, 8000, 500 and 600 series methods
- CLP Daily Cal range = 25% rsd for 50 STD
- This means that from 37.5 to 62.5 passes

Linear Regressions

- $y=mx+b$
- m =slope
- b =intercept
- r =Correlation Coefficient
- r^2 =The square of r is conventionally used as a measure of the strength of the association between X and Y . For example, if the coefficient is .90, then 81% of the variance of Y is said to be explained by the changes in X and the linear relation between X and Y within the range observed.

Dilution Schemes

- There are many ways to perform dilutions
- Using uncertainties, you can determine the best

methods

- Always use dilutions appropriate to the scale of your application
- There is always the good, the bad and the ugly

The Ugly...

- How many people create matter in sludge?
- Remember those 1,200,000mg/kg results?
- Huge dilutions = expanded error

The Bad

- Using a 10 ul syringe to diluting 2 ul to 1 L is bad
- The Expanded error at 2 ul = 23%
- A target of 2 ug/L from a 1000 ug/ml std using 2 ul = 1.77 to 2.23ug/L

The Good

- Use dilutions that are within the 100x level of your working volumes
- Use at least 50% of your syringe volumes
- Use calibrated pipettes and glassware

Cumbersome

- Without total isolation while performing these dilutions, errors are almost guaranteed
- Combining all of the uncertainties illustrates a 8.5% curve variability
- Add another 1% if the I/S was inclusive of the 1 ml volume
- This will cause a ~ 40% failures in PT's

Serial Dilutions

- Offer much more accuracy (as much as 35%)
- Combining all of the uncertainties illustrates a 4.2% curve variability
- Add another 1% if the I/S was inclusive of the 1 ml volume
- This will cause less failures in PT's

Whatever your methods

- Validate
- Validate

References

- ISO Guide 17025: Certification of Reference Materials, general and statistical principles
- ASTM Guide D6362-98
- ILAC-G21-2000
- ISO/REMCON280
- EURACHEM/CITAC Guide, Second Edition
- ISO Guidelines for Uncertainty Calculations for Chemical Analysis: NCSL, Robert Watters and Mark Levenson-NIST

Regulatory Update: The DEP says they are moving ahead with the implementation of more forms for electronic sub-mission. At this writing, nothing has gone live, which means that all of the “deadlines” have been moved. Therefore, having all drinking water forms on line by the Nov. 21, 2005 will not occur.

Perchlorate: Carol Rowan West from DEP’s Office of Research and Standards indicated that perchlorate had undergone a full internal review within DEP. No MCL has been established although it remains apparent that the limit will be 1.0 ppb in water. Upon questioning of the LCO, it was determined that the LC/MS/MS and the IC/MS methods for low level perchlorate would be considered before publication in the Federal Register. The word from the LCO was that if you are interested, begin to pull your data packages together. Note: the LCO is planning to formalize the submission.

Electronic Record-Keeping: Because labs are beginning to maintain records electronically, Oscar was asked if all certified labs had to keep paper copies of records for the prescribed 10 years. Oscar indicated that keeping electronic copies of data was acceptable as long as they remained retrievable by

software on hand at the lab.

Regulatory Revision: The LCO is considering dropping non-potable water certification. Nothing has been decided at this juncture, but ITLA has been asked to provide a response as to whether elimination of this whole category would affect labs’ ability to do business, especially in other states. Please respond directly to Bob Bentley at bob@h2otest.net .

September 7, 2005

ITLA Quarterly Meeting
Taunton, MA
8:30 a.m. - 12:00 p.m.

November 2, 2005

ITLA Executive Board Meeting,
Doubletree Guest Suites, Waltham, MA
1:00-4:00 p.m.

November 9, 2005

Deadline for Newsletter submissions

December 7, 2005

ITLA Quarterly Meeting,
TBD
8:30 a.m. - 12:00 p.m.

calendar

ITLA Quarterly Meeting

Wednesday September 7, 2005

**Holiday Inn
Taunton, MA**

8:30 a.m. Registration

9:00 a.m. Committee Reports

- Secretary
- Technical
- Newsletter
- Election
- Lab Advisory
- Membership
- Treasurer
- Regulatory
- By-laws
- Ethics

**9:30 a.m. Regulatory/Lab Advisory
Committee Report**

9:50 a.m. Connecticut Data Quality Enhancement Policy Status Report

Glen Breland, Alpha Woods Hole Labs, member of the CT Workgroup

10:00 a.m. Break

10:10 a.m. MCP Data Quality Enhancement Policy – Status, Current Issues and Future Direction

*Ken Marra & John Fitzgerald
MADEP*

11:00 a.m. Featured Speaker

“Emerging DBPs and Other Contaminants in Drinking Water”
Dr. Susan Richardson, USEPA,
Atlanta, GA

12:00 p.m. Meeting Adjourns