

**SUMMARY OF THE
ENVIRONMENTAL LABORATORY ADVISORY BOARD MEETING
Teleconference: 866-299-3188/9195415544#
December 16, 2009; 1:00 – 3:00 PM EDT**

The Environmental Laboratory Advisory Board (ELAB or Board) teleconference was held on December 16, 2009 from 1:00 to 3:00 PM EST. The agenda for this meeting is provided as Attachment A, a list of meeting participants is provided as Attachment B, and action items are included as Attachment C. The official signature of the Chair or Vice-Chair is included as Attachment D.

AGENDA ITEMS:

1. OPENING REMARKS/ROLL CALL

Mr. Dave Speis called an official role of the ELAB Board members and guests. The Agenda for this meeting has been changed to accommodate the Office of Water (OW) discussion with the Board related to the proficiency test (PT) frequency issue. Mr. Speis asked Mr. Jeff Lowry to lead the discussion on PT frequency and introduce guests from EPA's OW QA program.

2. PROFICIENCY TEST FREQUENCY UPDATE/DISCUSSION

Mr. Jeff Lowry started an open discussion about PT frequency guided by questions ELAB drafted for discussion with OW.

PT Questions and Discussion

1. What are the Agency's objectives for the Drinking Water (DW) PT program?

Mr. Greg Carroll from the Office of Water (OW) stated that he has discussed this question with OW's laboratory and certification team and his peers in EPA headquarters. Mr. Carroll is also interested in discussing this topic with his regional peers as well as senior management.

The proficiency test (PT) program represents one of many tools used to evaluate water laboratory capability and ensure quality results. OW also looks at initial and ongoing laboratory audits as well as other parameters to assess drinking water analysis quality. Low level PT results are also used as an indicator of a laboratory's ability to measure regulated contaminants below the regulatory level. To do this, EPA regulatory staff should look at the laboratory pass rate for PT concentrations below the regulatory level. This information is also used for the review of drinking water regulations that occurs every six years.

Dr. Michael Wichman stated that often PT concentration levels prepared by providers below the maximum contaminant level (MCL) are still not low enough to give an accurate assessment of a laboratory's capability to analyze samples below regulatory limits. Mr. Carroll replied that he cannot speak to this specifically and it may be necessary to follow up with Ms. Michella Karapondo. He speculated that at some point, PT's were designed to be lower than the regulatory limit. Mr. Jeff Lowry added that PT concentration ranges developed by EPA and TNI cover the MCL and typically go below the MCL by only 10-15 percent. This may be another issue for discussion between Mr. Carroll's peers in EPA headquarters and TNI. Mr. Lowry suggested Mr. Carroll contact the PT Board within TNI for more information.

2. Are the Agency's objectives being achieved through the present DW PT program?

Regarding the first objective, using PTs as a tool to ensure laboratory capability, PT data are used effectively to support initial and ongoing certification and accreditation.

There are two issues surrounding the Agency's second objective to support the six-year review of regulations:

- a. How low the contaminant levels are and the amount of data that exist to reflect laboratory ability below the MCL; and,
- b. EPA access to PT information. In past years, the data have been provided to the Agency by the PT providers, but not all providers share this information. OW needs to work with TNI and the PT providers to establish a more consistent approach.

Mr. Lowry noted that Ms. Karapondo sends the request for data to the PT providers and most PT providers submit this information to OW. Mr. Carroll agreed, adding that the information that has been provided is very helpful. The issue for EPA is acquiring a more complete dataset to determine where lower PT levels are practical. Mr. Lowry asked what tools are used to determine the effectiveness of the six-year review. To determine if laboratories can consistently detect lower contaminant levels, Mr. Carroll replied, a statistical review is used but he is unsure of the particular routine. Ms. Wynne Miller, the Associate Branch Chief of the Targeting and Analysis Branch, can provide more detailed information about this process.

Mr. Jack Farrell asked how the PT data are used to determine ongoing laboratory capability. Mr. Carroll replied that he is unsure beyond a pass/fail basis. Ms. Miller may be able to provide a better answer. Mr. Farrell also asked if there are rules about the number of PT failures and correlating failures with corrective action. Mr. Carroll replied that while there could be exceptions, generally a laboratory is allowed to participate in another PT study to achieve passing results and satisfy OW's requirements for the certification program. He is not aware of particular state that mandates a particular consequence for one PT failure.

3. *What metrics are used to determine the DW PT programs effectiveness?*

Mr. Carroll stated that the OW Certification Manual (CM) does not have details about the number of allowed PT failures. This is another question that should be discussed with regional staff at the monthly teleconference. It is difficult to generalize individual state or regional policies, although it is probably an exception to have a hard cutoff for PT failures. It is likely that PT failures are handled on a case-by-case basis.

4. *How are the DW PT data used?*

This question was covered in the previous conversation. The Board could ask Ms. Miller for more information on this topic.

5. *Are the DW PT data evaluated on a summary or laboratory level (or both)?*

Mr. Lowry commented that it seems the PT data are reviewed only at a summary level by OW. Mr. Carroll indicated that a summary of PT data is reviewed by OW during the six-year regulatory review, but not on a laboratory level for accreditation or certification purposes. Mr. Farrell asked how these data are handled for states where EPA retains primacy, such as Wyoming and the Tribal systems. Mr. Carroll replied that this question can be raised at the regional teleconference in early January or February. Mr. Lowry added that the Board should reach out to OW before its teleconference with the regions to gain input on information that could be asked.

6. *What is the role of PT samples and results under DW PT program?*

This topic was covered in the discussion of question 3.

7. *What are your DW PT program requirements for acceptable PT performance?*

This topic was covered in the previous discussion.

8. *Is the DW PT frequency sufficient for identifying operational and analytical difficulties?*

Mr. Carroll stated that OW has a long-standing history of using annual PTs to support the drinking water, wastewater, and the Discharge Monitoring Report – Quality Assurance (DMRQA) program. In general, this frequency seems to be reasonable. Additionally, no quantitative report has been generated that shows a measurable benefit of more frequent PTs. If EPA were to consider a different frequency, the burden would lie on the Agency to justify the cost benefit of additional PTs. Dr. Jeff Flowers summarized that it appears the current frequency is adequate to meet the needs of the Agency.

While OW requires one PT per year, the TNI program requires two PTs per year. Mr. Farrell asked if this difference in PT frequency is a stumbling block to move the two programs closer together. Mr. Carroll replied that while nothing should be ruled out,

altering the Agency's PT frequency policy would require rulemaking. Dr. Judy Brisbin recalled a recent study released that compared the annual PT frequency to two PTs per year. Dr. Flowers replied that this study is available on the TNI Web site. The study demonstrated that drinking water laboratories that performed two PTs annually had a higher failure rate than those performing one PT annually.

Mr. Dechant stated that the state agencies have different requirements about pass or fail results, as well as PT frequency. He asked if this inconsistent approach causes problems for how the Agency evaluates PT data. Mr. Carroll replied that different PT frequency requirements are not a problem in terms of data quality and laboratory capability as long as the minimum requirement is satisfied. He also believes that state agencies requiring different numbers of PTs probably does not interfere with how these data are used for the six-year regulatory review.

9. In your experience, what is an acceptable PT failure rate?

Mr. Carroll stated that PT criteria are defined individually for some contaminants; others are based on a fixed percent or hard number difference for an entire PT sample. The key requirement for a laboratory is meeting the minimum passing requirement of one PT per year.

Mr. Dechant asked what the expected failure rate was when the acceptance limits were determined. Mr. Carroll replied that he would need to reference this information with the Office of Research and Development (ORD). ORD ran the PT program when this information was developed. Mr. Lowry added that to his knowledge, EPA acceptance limits are based on the 95 percent confidence limits. The key question is what failure rate is acceptable, not the acceptance limits that determine failure. Mr. Dechant stated that he is looking for an EPA objective or expectation to compare to TNI's expectation that no more than 10 percent of the PT samples will be failures. Mr. Lowry offered to share with Mr. Dechant the information from TNI's work with Dr. Britain, who developed these limits. Dr. Flowers agreed that confidence intervals are the best parameter to use because they adjust to the error population.

10. How do EPA region/state regulating offices handle the enforcement of corrective action for failed requirements of DW PTs?

Ms. Jennifer Best stated that both the OW Certification Manual and the regulations state that laboratories have to analyze a successful PT annually. There is no guidance when a PT is failed. The state agencies have adopted their own criteria. Dr. Brisbin added that the Certification Manual states in Chapter 3, Sections 13 and 14 that continued failure to generate acceptable results will result in a downgrade to provisional status. Mr. Lowry suggested this is another question to pass along to the regional representatives.

Ms. Best commented that OW relies on state and regional agencies to oversee laboratories and ensure corrective action is implemented. Mr. Farrell suggested the Board obtain more information on how the regions handle a laboratory that is not meeting the

annual PT requirement. The TNI program has specific guidance for these occurrences. Dr. Reza Karimi added that it seems as though the same issue exists here as the Board encountered with the Office of Resource Conservation and Recovery (ORCR) SW-846 method identification issues. That is to say, the OW Certification Manual is a guidance document that state agencies have implemented as regulation.

11. *Does the EPA Office of Water give the national, state and/or local regulators any guidance or requirements on how to use the information from a DW PT program?*

Ms. Best stated that Chapter 3, Section 13 and 14 in the OW Certification Manual provides information about PT program management, but not data evaluation. PT data evaluation would be the responsibility of the state agencies. Mr. Farrell added that it would be beneficial to determine how states use and evaluate PT data.

12. *Is the Agency able to obtain complementary value from the DW PT program in the following areas?*

- a. Data comparability between laboratories.
- b. Identification of inter-laboratory differences.
- c. Educating laboratories for performance improvement.

Ms. Best stated that this is likely something that generally happens. For example, if a laboratory starts failing PTs, the contract officer will contact the laboratory to determine the circumstances of the failure. It is her understanding that PT data is reviewed by the American Association for Laboratory Accreditation (A2LA) to identify inter-laboratory differences as a means to oversee PT providers. State and regional agencies do communicate with laboratories to determine any issues with obtaining successful PT results.

Mr. Dechant asked if EPA uses PT performance data to target methods that may need improvements. Dr. Brisbin replied that this may be part of the six-year regulatory review. Somewhat related to Mr. Dechant's question, Ms. Best cited an example where enumerative PTs were required for an LT2 microbiological method. At that time a PT did not yet exist for this method so the EPA and NELAC PT Board worked together to develop enumerative drinking water PTs.

Mr. Lowry asked if the six-year statistical review is passed on to the methods branch. Ms. Best replied that she cannot answer this question, but she can find out and discuss this further with the Board.

What would the Agency change in the present DW PT program to achieve the objectives of the program?

Ms. Best stated that at this point, the EPA Technical Support Center (TSC) has not identified any needed changes to the PT program, but offered to follow up on this topic with the regions for additional feedback. Dr. Flowers understands the Agency's primary

concern is to gain access to PT data from the providers. Historically, the Agency only receives 85 percent of the existing PT data.

General Discussion

Mr. Farrell stated that the Board's goal on this topic was to make recommendations to EPA if there are things that would advance the usefulness of the PT program. Mr. Lowry has heard suggestions about using whole-volume samples instead of concentrates, setting tighter acceptance limits, and providing lower concentration PT samples. Mr. Farrell added that laboratories frequently ask for PTs with concentrations that more accurately reflect the work being performed rather than the regulatory limits.

Ms. Best recommended the Board create a list questions that should be asked of the regions before OW's next teleconference with the regional representatives. The questions can be shared with the regions in advance to promote a more meaningful discussion. Mr. Lowry agreed to accumulate the information gathered from this teleconference and send his feedback to the Board for review. Ms. Best added that the next OW meeting with regional representatives is scheduled for January 5, 2010, which may be too soon to get questions to the regional representatives. It may be more reasonable to have this discussion during the February meeting, which will occur the first Tuesday of the month (February 2, 2010).

Mr. Speis implied that the value of the PT program is largely programmatic for EPA, rather than laboratory specific. Ms. Best replied that the Agency does use PT data to evaluate laboratory competency, but perhaps the data is not used as widely as the Board might have thought. This may also be a stumbling block for the six-year review. Ms. Best asked ELAB to start the list of questions for the region and submit it to OW for further reflection. Because the OW meeting with the regions is an internal meeting, outside participation is not allowed, but Ms. Best affirmed that she will share the minutes from the meeting with the regional representatives as they pertain to this topic.

2. FOLLOW-UP ON KEY TOPICS

A. TNI Standard Comparison with Drinking Water Program

The Board's action item for this topic was to review the comparison document and identify significant differences between the TNI accreditation standard and the OW's Certification Manual. Mr. Dechant stated that he has not received feedback on this topic, but this is not surprising due to the length of the comparison document. It will take ELAB a while to get through the document, but he asked the members to send feedback on which items were significant as they identified these issues rather than waiting to compile a complete list for the entire document.

Ms. Morgan recommended dividing the document up amongst the Board members in the interest of time. Mr. Wichman commented that depending on a member's representation,

significant issues may be missed unless each member of the Board reviews the entire document. Mr. Dechant agreed. Mr. Speis recommended the Board review the document in sections over two months of meetings and hold additional discussions between those meetings to complete the review in a timely manner. Mr. Dechant will take the lead on scheduling document sections to be reviewed at each of the four meetings. As a Board member identifies a significant issue, that information can be shared with ELAB electronically and discussed at the following meeting.

Ms. Autry reminded the Board that additional ELAB meetings in which decisions are made cannot be held without announcing the meeting in a Federal Register notice. Only administrative calls can be held until Ms. Autry is able to do this. Anything the Board discusses during at these administrative calls is for the purposes of making decisions during the Board's official meetings. Members from OW are welcome to participate in these workgroup meetings, as well. Eastern Research Group (ERG) was asked to send a line-numbered copy of the comparison document to the Board for easier review by the group. The Board would like to complete its review of the standard comparison in two month's time.

B. Update from the Office of Resource Conservation and Recovery (ORCR)

Mr. Speis held an update teleconference the week of December 7 with Mr. Jim Michael and Ms. Kim Kirkland from ORCR. The morning of the call, Mr. Speis received an edited copy of the Board's recommendations and it appears that every recommendation that was in the final document submitted to ORCR will be incorporated into ORCR's method identification policy, with the exception of some minor editing. ORCR added an additional piece, as well: the definition of "preliminary version." A cursory review by the Office of General Council of the edited recommendations found no significant issues. The new method identification policy will be incorporated with future editions of the SW-846 compendium of methods and could be posted in the Code of Federal Regulations (CFR).

Mr. Lowry asked for clarification on the difference between a "draft" method and a "preliminary" version. Mr. Speis replied that a "preliminary" version of a method has not advanced as far in ORCR's review process as a "draft" version. These are methods that have not undergone a technical review, but are widely used by other state agencies. These are also methods ORCR feels confident will pass the technical review process.

Mr. Dechant clarified that the text "a new method number is assigned when a new technology is introduced or the quality control requirements are changed..." indicates a new numbering method for ORCR. ORCR is still deciding on what constitutes a major change to a method. Mr. Speis has been considering recommendations to bring to ORCR, including the situation of a quality control change to a method that changes the way data are evaluated. This is still a gray area for ORCR, but some guidelines for deciding which changes are significant need to be implemented. Mr. Farrell added that Ms. Kim Kirkland has accepted a place on the panel for the Assessment Forum with TNI in Chicago. This is likely to be an issue that will arise in this panel. Mr. Speis concluded that the fourth

edition of the SW-846 method compendium will reset the method designations and the new method identification policy will be implemented.

3. AGENDA DISCUSSION FOR JANUARY FACE-TO-FACE ELAB MEETING

The Board's immediate objective in regards to the January face-to-face meeting is to draft an agenda for discussion that can be published with the TNI conference agenda. There are two key topics that will need to be discussed: the TNI and OW Certification Manual standard comparison and the PT frequency issue.

Dr. Flowers suggested another topic for discussion: the omission of a policy for reciprocity in the new TNI standard. TNI assumed that the accrediting bodies (ABs) would develop memorandums of understanding (MOUs) between each of the bodies agreeing to reciprocity. However, the ABs do not believe this will occur. The NELAP Board has discussed implementing a gentlemen's agreement, or rather, an un-signed agreement to address reciprocity. This issue is fundamental to the Board's founding principals and it appears that no organization is working to find a solution. Mr. Farrell replied that it is his understanding that the NELAP Board is developing a policy, though it may not sufficiently address the issue. Dr. Flowers stated that in an AB committee meeting, all four ABs stated that they could not sign the policy.

Mr. Speis questioned ELAB's ability to address this issue within its scope of work. Ms. Autry replied that the Board will need to provide its thoughts on the issue to the Agency on how to deal with the omission of reciprocity from the TNI standard, even if that information would be more helpful to a different entity. There is nothing in ELAB's scope that prevents the Board from listening to outside concerns. It is possible that a topic will arise out of such a conversation that the Board can address with EPA. Dr. Flowers stated that the January face-to-face meeting would be a good time to hold a public forum on the issue.

Mr. Lowry stated his opinion that this is a significant accreditation issue for laboratories. Even if only one of the AB is unable to sign the policy, it will be an issue for laboratories. Mr. Farrell stated it will be difficult getting the appropriate people at ABs to sign the MOU. However, because the ABs are state agencies or departments, this is not necessarily an EPA issue. Dr. Flowers replied that if no solution were determined for this problem, it would prevent the formation of a national accreditation program. It is necessary to discuss this issue so that a solution can be developed.

In regards to the January meeting agenda, Ms. Autry recommended that the Board focus on the key topics the ELAB has currently decided to address or any the Board plans to begin working on. It is possible to schedule a longer session for the open discussion period to enable the Board to solicit and get feedback about this topic. Mr. Lowry added that this issue will likely arise during the Board's standard comparison discussion. Mr. Speis agreed that this is an issue that has not been given priority, but he is unsure if there is anything ELAB can do about it. This is an issue that is best discussed within TNI.

Mr. Lowry will develop a presentation for the PT frequency issue, which Dr. Karimi will present at the meeting. Mr. Dechant will be responsible for a presentation on the standard comparison effort and Mr. Speis will present information on the ORCR method identification update. The meeting will begin with opening remarks and a roll call, followed by approval of the December meeting minutes. Ms. Autry recommended the Board defer important topics until after the break to retain its meeting attendance. The Board is also being given some time in the opening general session to provide highlights about its current activities.

The schedule decided for the face-to-face meeting is as follows:

1:30 – 1:45	Opening Remarks, Roll Call, and Approval of December Minutes
1:45 – 1:55	Workgroup Updates (Judy Morgan)
1:55 – 2:20	ORCR SW-846 Update (Dave Speis)
2:20 – 3:00	TNI/OW Standard Comparison Review (Gary Dechant)
3:00 – 3:30	Break
3:30 – 4:00	PT Frequency Issue (Reza Karimi)
4:00 – 5:00	Open Forum Discussion

Ms. Autry will distribute the Agenda to the Board following this meeting. Any feedback received before the next morning will be incorporated when she submits the agenda for publishing.

4. WORKGROUP UPDATES/ASSIGNMENTS (OLD AND NEW)

There are no workgroup updates or assignments to report at this time.

5. REVIEW AND APPROVAL OF OCTOBER/NOVEMBER MEETING MINUTES.

Mr. Farrell began a motion to approve the October minutes and Dr. Karimi seconded. The meeting minutes for October were approved unanimously with no discussion.

Ms. Morgan began the motion to accept the November meeting minutes as written. Dr. Flowers seconded the motion and the minutes were approved unanimously.

6. REVIEW ACTION ITEMS/ASSIGNMENTS

Mr. Dechant will develop a schedule for reviewing the comparison document of two regularly-scheduled meeting and two administrative meetings. The Board members will identify the important issues in the comparison document that should be addressed.

Dr. Ray Merrill stated that there were two additional action items for ERG:

- Distribute the line-numbered spreadsheet version of the comparison document to the Board and members of OW.
- Send a draft section of the minutes to Mr. Lowry that details the discussion of the PT program with OW for him to use as the start of a series of questions for Regional OW representatives.

A detailed list of ELAB action items can be found in Appendix C.

7. CLOSING REMARKS/ADJOURN

Citing no additional comments or issues, Mr. Speis adjourned the meeting.

Attachment A

AGENDA
ENVIRONMENTAL LABORATORY ADVISORY BOARD
Monthly Teleconference: 866-299-3188/9195415544#
December 16, 2009; 1:00 - 3:00 pm (ET)

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|--|---------------------|
| 1. Opening Remarks/ Roll Call of ELAB Members and Identification of Guests | Acting
DFO/Chair |
| 2. Proficiency Test Discussion with Office of Water | Lowery et al |
| A. TNI Standard Comparison with Drinking Water Program | Dechant |
| B. Update on Report to ORCR (see Speis Message 12/14/09) | Speis |
| 3. Agenda for January Face-to-Face Meeting | Speis, All |
| 4. Workgroup Updates/Assignments (Old and New) | All |
| 5. Review/Approval of November Minutes | Chair |
| 6. Review Action Items/Assignments | Chair |
| 7. Closing Remarks/Adjourn | Acting
DFO/Chair |

MEMBERSHIP LISTING AND GUESTS

ELAB MEETING

December 16, 2009; 1:00 PM – 3:00 PM EST

Attendance (Y/N)	Name	Affiliation
Y	Mr. David (Dave) N. Speis (Chair)	Accutest Laboratories Representing: American Council of Independent Laboratories (ACIL)
Y	Ms. Judith (Judy) R. Morgan (Vice-Chair)	Environmental Science Corp. Representing: Commercial Env. Lab.
Y	Ms. Lara P. Autry, DFO	US Environmental Protection Agency Representing: EPA
N	Dr. Richard Burrows	Test America Inc. Representing: Commercial Lab Industry
Y	Mr. Gerald (Gary) Dechant	Analytical Quality Associates, Inc. Representing: Data Users
Y	Mr. John (Jack) E. Farrell, III	Analytical Excellence, Inc. Representing: The NELAC Institute (TNI) City of Maitland Florida
Y	Dr. Jeff Flowers	Representing: Elected Officials of Local Government
Y	Dr. Reza Karimi	Battelle Memorial Institute Representing: Non-profit Research and Development Organizations
N	Dr. H. M. (Skip) Kingston	Duquesne University Representing: Government Consortiums, Native Americans, and Academia
Y	Mr. Jeffrey (Jeff) C. Lowry	Environmental Resource Associates Representing: Proficiency Testing Providers
N	Mr. Orval Osborne	Creek Environmental Laboratories, Inc. Representing: Small Laboratories/Native Americans
Y	Mr. Glenn (Joe) J. Pardue, Jr.	Pro2Serve Representing: Clients of QS Services
Y	Dr. Jim Pletl	Hampton Roads Sanitation District Representing: Municipal Env. Lab.
N	Ms. Nan Thomey	Environmental Chemistry, Inc. Representing: Owners Full Service Labs
N	Mr. Rock Vitale	Environmental Standards, Inc. Representing: Third Party Assessors
Y	Dr. Michael D. Wichman	University of Iowa Hygienic Laboratory Representing: Association of Public Health Laboratories (APHL)

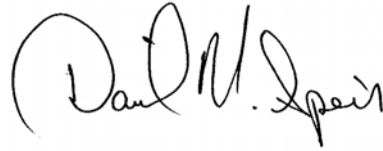
Attendance (Y/N)	Name	Affiliation
Y	Ms. Jennifer Colby (Contractor)	Eastern Research Group, Inc (ERG)
Y	Dr. Raymond Merrill (Contractor)	Eastern Research Group, Inc. (ERG)
Y	Ms. Jennifer Best (Guest)	EPA/OW
Y	Ms. Lynn Bradley (Guest)	EPA/OEI
Y	Dr. Judy Brisbin (Guest)	EPA/OW
Y	Mr. Greg Carroll (Guest)	EPA/OW
Y	Ms. Paula Hogg (Guest)	HRSD
Y	Ms. Patsy Root (Guest)	IDEXX Laboratories
Y	Mr. Cheng-Wen Tsai (Guest)	USEPA Region 5
Y	Dr. Joanne Wyman (Guest)	Dynamac Corp.

ACTION ITEMS

1. ERG will provide Mr. Jeff Lowry with the text of the Board's discussion with OW about the PT program so Mr. Lowry can develop questions for OW to raise to the regions for more information.
2. Mr. Gary Dechant will create a schedule for which the Board can review the OW/TNI Standard comparison document in a timely manner for discussion during ELAB's monthly meetings.
 - a. ERG will submit an Excel file of the comparison with numbered lines to aid the Board's discussion of the document.
3. Presentation material to be finalized for the face-to-face meeting in January:
 - a. Mr. Lowry will create a presentation on the PT frequency issue for presentation by Dr. Reza Karimi.
 - b. Mr. Dave Speis will prepare an update on the ORCR SW-846 method identification issues.
 - c. Mr. Dechant will prepare material to present an update of the OW/TNI standard comparison effort.

Attachment D

I hereby certify that these are the final version of minutes for the Environmental Laboratory Advisory Board Meeting held on December 16, 2009.

A handwritten signature in black ink, appearing to read "David N. Speis". The signature is written in a cursive style with a large initial "D".

Signature Chair

Mr. David N. Speis

Print Name Chair