

Whole Effluent Toxicity Testing Expert Committee Meeting Summary

April 15, 2015 1 pm Eastern

1. Welcome, Roll Call, Approval of Minutes and Announcements

Chair Rami Naddy welcomed everyone to this first meeting of the new WET Expert Committee, and invited everyone to say a few words about themselves and why they wanted to be part of the group. Attendance is recorded in Attachment 1, below.

2. Background – Subcommittee Efforts

Subcommittee recommendation to PT Program Executive Committee (PTPEC)

Rami discussed the recommendations developed by the WET subcommittee of Quality Systems to drop the reporting of NOEC values and instead, report IC25 values as PT results. This was offered to PTPEC for use in the WET Field of Proficiency Testing (FoPT) table (see Attachment 2) but has not yet been accepted.

EPA has expressed concern that if the NOEC is included in the NPDES permit, it must be reported to meet permit requirements, but the DMRQA PT results have no bearing on what is reported under the permit itself. The values of NOEC and IC25 may differ greatly, and the subcommittee sought to standardize reporting to one value. The wider acceptability limits of NOECs can (since they are solely based on the test concentrations used) make it easier to pass these PT results.

Since the LAMS database presently includes both NOEC and IC25, the subcommittee hopes to use LAMS as part of its education process for switching ABs to the use of IC25 for PT results.

Water types used for WET testing

Teresa presented this part of the discussion, and explained the effort to drop the use of dilute mineral water and to combine all the WET PT results as just reconstituted water. This concept has not moved out of the DMRQA yet. Existing data from PT Providers (PTPs) need to be examined to determine if the concept shows utility, and additional data may yet be needed for thorough evaluation. Presently, WET PT results for freshwater tests are analyzed separately based on how they are prepared (i.e., moderately hard synthetic freshwater [MHSF] vs dilute mineral waters [DMW]).

One participant posed the question of whether the coefficient of variation, as described in the EPA freshwater manual, is applicable to DMRQA dilute mineral water tests, as it is to tests performed by the laboratory, and also whether that coefficient applies to inter-lab variability as well as intra-lab variability. There are three WET PTPs, with an unknown number of labs participating, so adequate statistical power may not be available to provide definitive answers about this issue.

Adequacy of Method Blanks for WET PTs

Chris Pasch addressed this topic, noting the need for blanks in PT studies, but that the DMRQA data seem “too predictable.” The subcommittee was developing recommendations to improve the DMRQA process in this regard and this item was tabled depending on the outcome of the recommendation for dropping the NOEC.

Recommendation to PTPEC about conducting WET PT tests

Pete De Lisle explained that the recommendations remain outstanding, with ongoing conflicting and outdated instructions from the available PTPs. Adequate sample amounts are not always provided by PTPs, leaving insufficient quantities to make the required dilutions of test sample, and errors in instructions include

- forty-fathom seawater is no longer available, replaced by “synthetic seawater,” but is still called for in some instructions,
- misspelling of sheepshead minnow, and
- referring to a 7-day chronic *Ceriodaphnia dubia* test when the actual test is a three-brood test

Rami noted that the subcommittee’s request to PTPEC for improved instructions had resulted in the instructions being placed in FoPT table, as desired by the PTPs and so inserted by the PTPEC. This was objectionable to the NELAP Accreditation Council, since labs have no reason to refer to FoPT tables because, those are oriented to the PTPs themselves. The instructions are already contained in the DMRQA studies and the goal is consistency across studies, so that the study results will be comparable.

3. Goals and Priorities for Expert Committee

With the allotted hour used up, Rami chose to postpone discussion of goals and priorities for the committee until the next meeting. All committee members should send their suggestions for short- and long-term goals and priorities to Lynn lynn.bradley@nelac-institute.org no later than May 8, so that a draft list can be circulated prior to the next meeting.

4. Next Meeting

The WET Expert Committee will meet again on Wednesday, May 20, 2015, at 1 pm Eastern. Documents, teleconference information and an agenda will be circulated in advance of the meeting. In addition to the goals and priorities, the FoPT table will be on that agenda.

Attachment 1

Committee Membership

| Member | Affiliation | Email | Phone | Category | Term Expiration | Present |
|--------------------------|-------------------------------------------|--------------------------------------------------------------------------------|--------------|----------------|--------------------|---------|
| Rami Naddy (Chair) | TRE Env. Strat. LLC | naddyrb.tre@gmail.com | 970-416-0916 | Lab | Feb. 2018 | Yes |
| Ginger Briggs | Bio-Analytical Laboratories | bioanalytical@wildblue.net | 318-745-2772 | Lab | Feb. 2018 | Yes |
| Pete De Lisle | Coastal Bioanalysts Inc | pfd@coastalbio.com | 804-694-8285 | Lab | Feb. 2018 | Yes |
| Steven Rewa | Environmental Resources Management | steven.rewa@erm.com | 616-738-7324 | Lab | Feb. 2018 | Yes |
| Chris Burbage | Hampton Roads Sanitation District | cburbage@hrsd.com | 757-355-5013 | Lab | Feb. 2018 | Yes |
| Chris Pasch | Alan Plummer Associates, Inc. | cpasch@apainv.com | 512-687-2162 | Other | Feb. 2018 | Yes |
| Teresa Norberg-King | USEPA | norberg-king.teresa@epa.gov | 218-529-5163 | Other | Feb. 2018 | Yes |
| Elizabeth West | LA DEQ LELAP | elizabeth.west@la.gov | 318-676-7457 | AB | Feb. 2018 | Yes |
| Amy Hackman | Penn. Dept. Environ. Protection | ahackman@pa.gov | 717-346-8209 | AB | Feb. 2018 | Yes |
| Michele Potter | New Jersey Dept of Environ Protect. | Michele.Potter@dep.nj.gov | 609 984-3870 | AB | Feb. 2018 | No |
| Michael Pfeil | Texas Comm. Environ. Quality | Michael.pfeil@tceq.texas.gov | 512-239-4592 | AB | Feb. 2018 | Yes |
| Affiliate Member | | | | | | |
| Kari Fleming | WI DNR | kari.fleming@wisconsin.gov | 608-267-7663 | AB | Dec. 2015 | No |
| Associate Members | | | | | | |
| Joe Pardue | Pro2Serve | Parduegjr@oro.doe.gov | 423-404-4117 | Other | --- | Yes |
| Brian Krausz | USEPA | krausz.brian@epa.gov | 202-564-2970 | Other (EPA) | -- | No |

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|-----------------------|------------------------------------------------|----------------------------------------------------------------------------------------|-------------------|--------------|-----|-----|
| Peter M Paulos | Atkins Environmental Toxicology Lab | Peter.Paulos@atkinsglobal.com | 713-292-9023 | Lab (Assoc.) | --- | Yes |
| Robert Kelley | ETT Environmental Inc | bobkelley@ettenvironmental.com | 864-877-6942 | Lab (Assoc.) | --- | No |
| Jamie Mitchell | Hampton Roads Sanitation District | jmitchell@hrsd.com | 757-460-4220 | Lab (Assoc.) | --- | No |
| Mark O'Neil | Environmental Enterprises USA, Inc. | moneil@eeusa.com | 800-966-2788 | Lab (Assoc.) | --- | Yes |
| Kevin Dischler | Element Materials Technology | Kevin.dischler@element.com | 337-443-4010 | Lab (Assoc.) | --- | Yes |
| Jennifer Loudon | Raritan Township Municipal Utilities Authority | JLoudon@rtmua.com | 908-787-7453 x 19 | Lab (Assoc.) | --- | No |
| Vel Rey Lozano | USEPA Region 8 | Lozano.VelRey@epa.gov | 303-312-6128 | Other (EPA) | -- | No |
| Barbara Escobar | Pima County RWRD, CRAO Laboratory | Barbara.escobar@pima.gov | 520-724-6052 | Lab (Assoc.) | --- | Yes |
| Robert Martino | QC Laboratories | rmartino@qclaboratories.com | 267-699-0103 | Lab (Assoc.) | --- | Yes |
| Program Administrator | | | | | | |
| Lynn Bradley | TNI | Lynn.Bradley@nelac-institute.org | 540-885-5736 | | | Yes |

Attachment 2

WET PT Summary

Summary: The WET FoPT Committee has discussed changing the reporting requirements for the Analyte (Endpoint) in the WET Table for the next review. After much discussion, the committee felt that using a point estimate such as the IC25 for reporting the effect of the short-term chronic tests is the preferable endpoint for reporting the performance test results. With this change, the No Observable Effect Concentration (NOEC) reporting requirement would be eliminated from the WET Table in the next review (see footnote from proficiency table below) and the IC25 would be the required reported endpoint for short-term chronic studies.

Background: The WET Methods allow multiple statistical endpoints to be derived for each short-term chronic test method. For example, the effect endpoints (a concentration of the effluent/chemical) for the fathead minnow larval survival and growth short-term chronic test can be reported as an IC25 for growth, a NOEC for growth, an LC50 (or EC50) for survival, and a No Observed Effect Concentration (NOEC) for survival. The IC25 is a point estimate of the toxicant concentration that would cause a given percent reduction in a biological measurement (e.g., survival, fecundity, reproduction, growth, length, or biomass). Hypothesis test methods are used to determine the NOEC, which is the highest tested concentration that is not statistically different from the control response. This detectable difference at the NOEC varies between individual tests based on the response variability. In addition, with the 2002 WET method revisions, EPA recommended the use of point estimation techniques over hypothesis testing approaches for calculating endpoints for effluent toxicity tests under the NPDES Permitting Program. Further, when hypothesis testing is used, EPA requires an evaluation of sensitivity. EPA's whole effluent rule (40 CFR 69951) states "However, to reduce the within-test variability and to increase statistical sensitivity when test endpoints are expressed using hypothesis testing rather than the preferred point estimation techniques, variability criteria must be applied as a test review step when NPDES permits require sublethal hypothesis testing endpoints (i.e., NOEC or lowest observed effect concentration (LOEC)) and the effluent has been determined to have no toxicity at the permitted receiving water concentration". As a result of that requirement, the variability criteria must be applied as a test review step, and the PMSD must be reported for the associated NOEC determination which is an additional reporting requirement that has not been incorporated into the reporting of the proficiency testing. Given those conditions, and after much discussion, the Committee felt that using point estimate endpoints for both the acute (i.e., LC50s) and short-term chronic (i.e., IC25s) test methods in the Proficiency Testing program is the most appropriate means for evaluating the results of the toxicity tests in PTs. All WET laboratories that report NOECs can easily report the results as an IC25. In addition this proposal accomplishes another important goal of reducing the number of test results for any one test expected from the laboratories and thereby reducing the burden for the laboratories, without any loss to the proficiency testing program.

Based on our recommendation the following test codes could be eliminated from the PT WET Organisms / Test Conditions / Endpoints Checklist for DMR-QAs: 756, 810, 759, 814, 766, 768, 769, 771, 799, 818, 824, 826, 805, & 822.

3) Analyte definitions:

LC50 = Concentration where 50% of the organisms do not survive.

NOEC = No Observable Effects Concentration

IC25 = Concentration where there is 25% reduction growth or reproduction¹.

ON = Calculation based on Original Number of organisms used to start the test.

¹ by definition this incorporates the survival endpoint as well

