



THE INSTITUTE REVIEW

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2023 Environmental Measurement Symposium

By Lara Phelps, USEPA and Jerry Parr, TNI

For the seventeenth year, the Environmental Measurement Symposium (EMS), which represents the combined meetings of the National Environmental Monitoring Conference (NEMC), and the Forum on Environmental Accreditation (the Forum), will be meeting at the Hyatt Regency in Minneapolis, MN from July 30 – August 3, 2023. This year, the Symposium's theme is "Science and Innovation that Serves the Public Good."



REGISTER NOW

The 2023 Symposium will be held at the Hyatt Regency Minneapolis. Special advance registration rates of \$148 per night (single) can be obtained before July 7, 2023 using our secure [on-line registration system](#).

Some of the highlights for the week include:

- A special half-day general session focused on the conference theme;
- Over 130 oral and poster presentations on a variety of cutting-edge environmental monitoring issues;
- Meetings of TNI Committees to further TNI efforts on environmental laboratory accreditation, proficiency testing, and accreditation of field sampling and measurement organizations;
- A meeting of the Environmental Monitoring Coalition;
- An exhibit program showcasing the latest innovations in environmental monitoring;
- An Innovative New Technology Showcase;
- A special session providing an update from EPA program offices;
- 7 vendor lunch presentations; and
- One keynote presentation on the Department of Defense Environmental Laboratory Accreditation Program.

Visit the [Symposium website](#) for detailed information.

Forum on Environmental Accreditation

The NELAC Institute's (TNI's) semi-annual meeting is an integral part of the Environmental Measurement Symposium (Symposium). Highlights from this summer's Forum will include:

- An Assessment Forum and Mentor Session;
- Meetings of TNI's standard development committees;
- A special session on the value of accreditation;
- Meetings of the TNI executive committees that manage TNI's Proficiency Testing Program and National Environmental Field Activities Program.

As these sessions become further developed, additional details will be available on the TNI website.

2023 NEMC Technical Sessions

The National Environmental Monitoring Conference (NEMC) provides the principal forum for addressing policy and technical issues affecting monitoring in all environmental media (i.e., water, air, soil, and waste) and across all environmental programs. The technical program is organized by a committee of environmental experts from government and private industry, which brings together a balance of technical and policy topics for each year's symposium that are of interest to all.

Each NEMC technical session consists of 3 – 7 oral presentations. The titles of the presentations, abstracts, and authors can be found on the Symposium website. Technical Sessions for NEMC 2023 include:

- Advances in Sensor Technologies in Environmental Monitoring
- Air Monitoring, Methods, and Technology
- Analyzing Microplastics in the Environment
- Best Management Practices for Environmental Laboratories
- Collaborative Efforts to Improve Environmental Monitoring
- Crafting Consensus Methods for Environmental Sampling and Measurement
- Drinking Water
- Emerging Environmental Applications for High Resolution Mass Spectrometry
- Ensuring Reliable Data
- Environmental Forensics
- Laboratory Informatics
- New Organic Monitoring Techniques
- Operational Issues Impacting the Environmental Laboratory Industry
- Polyfluoroalkyl Substances (PFAS) in the Environment

We look forward to seeing you July 30-August 3 in Minneapolis, Minnesota!



Things to Do When Visiting Minneapolis

By Kristin Daigle, Pace Laboratories

Welcome to Minneapolis! Minnesota's most populous city and its twin city of Saint Paul, located just across the river, offer plenty to do for any visitor.

Downtown Minneapolis is the heart of the city. There are many restaurants, bars, sports venues and other attractions to keep you occupied during your time here.

The Twin Cities are home to many great venues for music and shows, and [First Avenue](#), the historic music venue and nightclub in downtown Minneapolis is maybe the most famous.

To learn about Minnesota's music history, catch a ride to [Paisley Park](#) in Chanhassen, the house and studio of late singer-songwriter Prince. While touring the property you can see artifacts from his life, listen to rare music and recordings and even play on his ping-pong table.

You can also catch some live theater at venues like the [Orpheum](#), [Guthrie](#) or [State Theater](#), or dress up and see the [Minnesota Orchestra](#) perform at Orchestra Hall, which frequently features guest performers from around the world. [The Ordway Theater for Performing Arts](#) is home to the Minnesota Opera and host to a variety of touring shows.



Looking to check out a sporting event? See the Minnesota Twins at [Target Field](#), the Minnesota Lynx or Timberwolves at [Target Center](#) or take in a Wild hockey game at the [Xcel Energy Center](#). The Twin's minor league affiliate, the [St. Paul Saints](#), also offers good fun for those willing to make the short trip to downtown St. Paul. You can also take a tour of [U.S. Bank Stadium](#), home to the Minnesota Vikings.

If you can't catch a game in person, no problem. There are many great sports bars in downtown Minneapolis. [Tom's Watch Bar](#) is a fairly new sports bar in Minneapolis. You can watch the biggest sporting events from collegiate, professional to international. [Brit's Pub](#) is known for its fireplace, lawn bowling on the rooftop and showing of soccer and rugby games. Minneapolis is also home to the well-known [Surly Brewing Company](#). You can take a tour of the brewery or sit in the beer hall to enjoy their signature pizza and 30 rotating taps.

For shoppers, the [Mall of America](#), the largest mall in the U.S. is a short Uber ride away to the suburb of Bloomington. Here you will find shopping and food galore along with a full indoor theme park, a mini-golf course and aquarium.

Looking to learn more about history or look at some great art? [Minneapolis Institute of Art](#) is one of the largest art museums in the United States with historical and modern collections from all over the world.

The [Walker Art Center](#) is located in the Lowry Hill neighborhood of Minneapolis. It is known for its collection of contemporary art. It also has a theatre as well as a rooftop terrace among many other things. It is right across from the Minneapolis Sculpture Garden which has many sculptures including the well-known Spoonbridge and Cherry which is open year-round and free to the public.

To get outdoors, try [Bde Maka Ska](#). Minneapolis's largest lake has a great bike and walking trail, or you can rent kayaks and canoes to take onto the lake. Enjoy outdoor activities like beach volleyball, or just relax and take in the sun on one of the lake's three beaches. You can also cross over the Mississippi River on the [Stone Arch Bridge](#) while taking in the views of the city, or visit [Minnehaha Falls](#), a regional park featuring cascading waterfalls and wading pools near the Mississippi River and [Sea Salt](#), a seasonal sea food restaurant.

If you'd like to get a feel of the different cultures Minneapolis has to offer, the [Midtown Global Market](#) offers exactly that. Midtown Global Market is an internationally themed market with foods from diverse restaurants. It also includes grocery items, apparel, and jewelry from different cultures.



The 2023 Forum on Environmental Accreditation

By Ilona Taunton, TNI

The 2023 Forum on Environmental Accreditation was held in San Antonio, Texas from January 9-12, 2023. This article summarizes all of the meetings held. Presentations given at the 2023 Forum will be posted on the [Previous Conferences](#) webpage.

The general session on Monday morning featured an introduction to TNI for first time attendees, followed by TNI's annual report on 2022 accomplishments and 2023 objectives as described in another article in this issue of The Institute Review.

The one and a half-day **Assessment Forum/Mentor Session** that began Monday afternoon focused on "Dark Side of Internal and External Auditing - Stuff We Rarely Talk About Publicly" and included the following topics:

- Purpose of Assessments – benefits to operations and quality.
- Dealing with Differences – handling disagreements between the lab and an assessor or different agencies.
- Etiquette – take the gloves off – no need for tears.
- Focused Reports and Responses – the need to be more concise.
- Evaluating Vendors, Suppliers, Consumables – by the assessors.
- Evaluating Vendors, Suppliers, Consumables – by the labs.
- Handling Issues with Vendors or Suppliers.

The **National Environmental Field Activities Program (NEFAP) Executive Committee** and the **Field Activities Committee** held a joint session Monday afternoon on efforts related to the accreditation of Field Sampling and Measurement Organizations (FSMOs) which included the following topics:

- Process and Timing for Finalization of Field Standard.
- Future Specific Sampling Modules Discussion.
- Ideas for TNI First Annual Conclave on Sampling Issues.
- Discuss Addition of Language to Module 2 of Laboratory Standard to Include Accredited FSMOs.
- Review of Changes to FSMO NEFAP Volume 1 and 2 Standards.

The **Proficiency Testing (PT) Expert Committee** also met Monday afternoon. The committee first reviewed proposed changes to Volume 1, Module 1, the PT requirements for laboratories with these suggested changes:

- Remove Technology/Method from 3.2, the definition of a Field of Proficiency Testing table.
- Revise the Note to 4.1.4 to state: "PT results for drinking and potable water are required by test method, rather than technology, per Federal Regulations, 40CFR Part 141."
- Remove "radiochemistry" from 4.2.3
- Revise 4.3.5 to state "The laboratory shall report chemistry PT study results to the PTRL as established by the TNI FoPT tables, or if the laboratory LOQ is below the PTRL."
- Revise 7.2 to clarify which Accreditation Body the laboratory is to submit questions to.
- Remove language from section 4.1.5(g) in Volume 2, Module 2 and add it to Module 1.



The **Chemistry Expert Committee** met Tuesday morning. The Committee first discussed 4 standard interpretations on detection limits, number of calibration points, relative error, and demonstration of capability. The committee then discussed the activities of four workgroups:

- 1.4 /1.5 Method Selection Method Validation LOD/LOQ (Validation/Verification)
- 1.6 Demonstration of Capability
- 1.7.1 Calibration
- 1.7.2 Quality Control, 1.7.3 Data Acceptance, and 1.7.4 Sample Handling

The **Training Committee** also met Tuesday morning where they discussed a training Course Catalogue and future training courses.

At lunch on Tuesday, the Forum featured an entertaining presentation on the “Reintroduction of Freshwater Mussels into the Mission Reach of the San Antonio River” from the San Antonio River Authority.

The **National Environmental Laboratory Accreditation Program (NELAP) Accreditation Council** provided updates on implementation of 2016 Standard and the 2021 EPA Method Update Rule and discussed the use of remote assessments. The Laboratory Accreditation System Executive Committee provided an update on standards interpretations.

The **Microbiology Expert Committee** reviewed revised language for the draft standard, reviewed current standards interpretations, and provided an update regarding dates for Understanding Microbiology webinar series.

The **Proficiency Testing (PT) Program Executive Committee** provided information on the following topics:

- White Paper on the PT Program,
- Comments on EPA’s DMR-QA program,
- WETT FoPT,
- Chemistry FoPT,
- Radiochemistry FoPT,
- SOP 4-107 (FoPT Management SOP) Review, and
- 2023 and Long-Term Goals.

On Wednesday morning,

- The Advocacy Committee, with TNI’s Small Laboratory Advocate, hosted an Open Forum to allow all attendees, especially those from small laboratories to bring forth any concerns.
- The Laboratory Accreditation Body Expert Committee discussed the status of revised Draft Standard, proposed changes in response to comments.
- The Quality Systems Committee presented a crosswalk between the 2005 and 2017 versions of ISO/IEC 17025, discussed standard interpretations, provided an update from the Definitions Workgroup, and presented several other proposed changes to Module 2.



- TNI has recognized four non-governmental organizations, A2LA, ANAB, IAS, and PJLA to accredit laboratories. Each of the organizations shared insights about their effort including most common finding and experiences in being an NGAB.

Wednesday afternoon was devoted to a new TNI effort to establish credentialling programs to certify individuals for key functions such as a Quality Manager, a Laboratory Assessor, or a Technical Expert. The totally voluntary program would contain these key elements:

- Awarding a Certificate with minimum requirements for education and experience and passing a comprehensive exam.
- Periodic Recertification based on continued employment in the field and some minimum number of professional development hours.
- Training courses made available to assist with the initial certification and/or recertification but would not be required.
- A “Digital Badge” pathway established as an alternate process.

A separate article in this issue of The Institute Review discusses this effort in more detail.

TNI would like to thank the organizations that exhibited at the 2023 Forum.

ANSI National Accreditation Board
Autoscribe Informatics
Clinisys
Environmental Express
ERA
EST Analytical
International Accreditation Services
LabWare
Mandel Scientific
MANTECH
Phenova, a Phenomenex Company
Quality Environmental Containers
Seal Analytical
Skalar, Inc.
Xylem Analytics

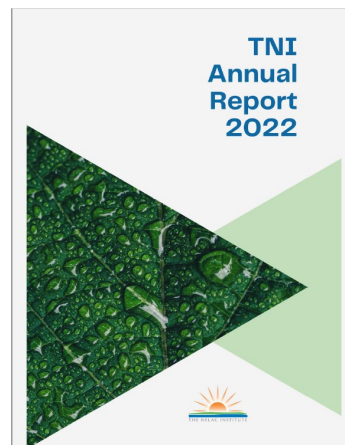
TNI 2022 Annual Report

By Jerry Parr

Each year, at TNI's annual meeting, every TNI committee presents their accomplishments from the previous year and plan for the upcoming year. For this year, these presentations occurred on January 9, 2023 in San Antonio, Texas.

Following the presentations, the slides were turned into a Word document that was presented to the TNI Board of Directors for their review and approval. Once that step was completed, the document was turned into an annual report which was published [here](#).

In addition to the 2022 accomplishments and 2023 plan, the report contains appendices that include a list of all TNI committee members in 2022 and lists of all new analyte and method codes added in 2022.



TNI's Credentialing Initiative

Phase 1: Certified Environmental Laboratory Quality Management Systems Professional

By Kenneth Brown, City of Escondido, CA, and
Chair of the TNI Competency Task Force

Background

In February 2020, the TNI Board of Directors created a Competency Task Force with the goal to explore and make recommendations regarding programs to document competencies for Quality Managers, Technical Managers, Assessors, Samplers, and others as appropriate.

The Task Force has met continuously since then and on April 12, 2023, presented a business plan to the TNI Board of Directors for Phase I of this effort, a plan to credential Environmental Laboratory Quality Management System professionals. This article summarizes the plan which was approved by the Board at their May meeting. Note: The Board also dissolved the Competency Task Force, transitioning it to a permanent Credentials Committee.

A preliminary version of this plan was presented to the TNI membership at the January 2023 meeting in San Antonio where it received substantial support. TNI is also planning a webinar sometime in May to solicit feedback from the broader TNI community.

Summary

The proposed credentialing initiative will be governed by a process in which a certificate awarding the certified professional credential may be obtained by one of two options, 1) having specified education and experience and passing a comprehensive test or by 2) accumulating digital badges. Both options would require ongoing professional development hours to maintain the credential after the initial award.

This program will be totally voluntary. It is up to the individual, or laboratory management, to make the decision to apply.

The full credential is initially obtained by an individual demonstrating that they have achieved defined knowledge, skills, and abilities (KSAs), also called "competencies," for a Quality Management System (QMS) professional in an environmental laboratory. A partial example of a KSA is provided below.

The Data Integrity Specialist knows or understands:

- a. Requirements for external ethics program training and any external resources available to employees;
- b. How to provide a procedure for confidential reporting of data integrity issues in their laboratory;
- c. The differences between improper, illegal, and unethical practices and laboratory errors;
- ...
- s. How to establish and maintain a documented data integrity system.

A complete listing of all the KSAs will soon be available on the new [Credentials webpage](#).



Digital Badge Option

Under this option an individual could become a Certified Environmental Laboratory QMS Professional by accumulating a series of “digital badges” that are acquired by taking specified TNI training courses and passing an exam specific to each badge.

1. Basic Quality Management Specialist
2. Proficiency Testing (PT) Specialist
3. Data Integrity Specialist
4. Document Control and Records Specialist
5. Customer Service Specialist
6. Measurement Traceability Specialist
7. Corrective Action Specialist
8. Internal Audit Specialist
9. Method Validation Specialist
10. Sample Handling Specialist
11. Quality Control Specialist
12. Data Review and Reporting Specialist

Some individuals may only want to earn a digital badge for their specialty (e.g., a Customer Service Manager or a Sample Log-In Technician) and not apply to be certified.

To become a Certified Environmental Laboratory QMS Professional by the digital badge route, an individual would need to take a minimum of 40 hours of training courses offered by TNI (total for all 12 badges). Some courses may be applicable to meet the requirements for more than one badge, so the 40 hours is a maximum. Some classes may not cover all the KSAs, but the references for each badge that are provided can be used to fill in the gaps.

To earn a badge, the individual must complete the required number of courses and pass an exam for each badge. The exams will be open-book, not be proctored, consist of 30 questions, and must be completed within 25 minutes. The badge is earned by paying a \$95 administrative fee (separate from and in addition to any training course fees) that allows TNI to issue the badge and record the information for each individual. For individuals that just want one or more digital badges, there would be no other costs.

Individuals that earn all 12 digital badges could then apply to become certified by paying a \$110 administrative fee that covers verification that all training was completed. The individual would then receive a certificate valid for three years and their name entered into the public database of certified professionals. The total fee to become certified, not counting training course fees, would be 12 badges at \$95 each plus \$110 for a total of \$1250.

Legacy Badges

Well over 1000 individuals have taken some of the required training courses, dating back to 2012. Individuals that took these classes could apply to receive the badge for the \$95 fee by successfully completing the exam for that badge without having to retake training courses.



Awarding of Badges and Certificates and the Database of Certified Professionals and Specialists

Once TNI has verified the individual has passed the exam for each badge and completed the required course work, TNI would issue the digital badge and publish the individual's name in a public database, showing name, contact information, the date of the award, and the applicable standard(s).

Badges have no expiration date. However, each badge is connected to a particular version(s) of a TNI Standard, and an individual would need to take a new training course based on the changes (no test required) to obtain a new badge. All individuals who earn digital badges would have their name published in a public database on the TNI website.

The exams for any new applicants will be updated to reflect the changes in any newly adopted standard.

Once TNI has verified the individual has acquired the 12 required digital badges, applied for the credential, and paid the fee for administrative costs, TNI would issue a certificate valid for three years, publish the individual's name in a public database, showing name, contact information, the date of the award, and the applicable standard(s).

The Exam Option

Under this option an individual could become a Certified Environmental Laboratory QMS Professional by demonstrating that they meet established minimum requirements for education and experience and passing a comprehensive exam. Training courses would be available to assist with the initial certification but are not required. Table 1 summarizes the minimum qualifications.

Table 1: Proposed Minimum Qualifications for Education and Experience

EDUCATION	EXPERIENCE
High School	Five years in working in a laboratory, including at least one year in a position in quality.*
Associate's, in related field	Four years in working in a laboratory, including at least one year in a position in quality.*
Bachelor's, in related field	Three years in working in a laboratory, including at least one year in a position in quality.*
Master's or higher degree, in related field**	Two years in working in a laboratory, including at least one year in a position in quality.*

* Working in some capacity in the area of quality control, quality assurance, or quality management.

** In chemistry, environmental sciences, biological sciences, physical sciences, chemical engineering, or equivalent scientific discipline.

The Exam would be open book and consist of 150 questions and would be proctored over a 2.5-hour time span. To become certified initially, the individual must get a grade of 70 or higher. The fee for testing and award of credential would be \$375 for the initial certification.



Periodic Recertification

Recertification is based on continued employment in the field and acquiring 24 professional development hours over a 3-year period, with documentation of those hours to be submitted to TNI for review with payment of the renewal fee.

Professional development hours would be awarded for such activities as participation in a professional society, preparing publications and/or presentations, attending training courses, or attending meetings. See Table 2 below.

Table 2: Examples of Professional Development Hours

ACTIVITY ¹	PDH EARNED	MAXIMUM HOURS ²
Training Course (Attendee)	1/hour of course	No limit
Training Course (Instructor)	2/per hour of course	No limit
Employment	0.1/month	3.6
Relevant College Course	1/per each credit hour	No limit
Meetings/Conferences ³	1/day	15
Committee Officer ³	2/year	6
Committee Member ³	0.1/per meeting attended	10
Presentation at Conference ³	1/presentation	6
Membership in Professional Society ³	0.5/year/society	6
Development of Questions for Quiz	1 hour for 20 questions	No limit
Proctor Exam	4 hours per exam	No limit

Notes:

1 Individuals could submit additional PDH for other similar activities.

2 Hours accumulate over a 3-year period.

3. Activities in organizations other than TNI, such as ASTM, ACS, ACIL, FSEA, etc., are accepted.

Implementation of the Initiative

For the last six months, the Task Force and TNI staff have been working diligently to make this new initiative a reality. With Board approving the final plan in May, these are the remaining items to work through:

- Develop and finalize any needed policies or SOPs.
- Compile and publish list of applicable training courses for each badge.
- Develop exams for each Badge and then the larger exam.
- Complete on-line system for applications and tracking.
- Finalize the creation of all 12 Badges.



TNI hopes to open up the Phase 1 initiative, the Digital Badge option, for members to apply in June of this year, with the Exam option following later this fall.

Anyone interested in helping with this effort should contact me at kbrown@escondido.org or Lynn Bradley at lynn.bradley@nelac-institute.org.

Figure 1: Examples of Digital Badges



FSMO Standard Update—April 2023

By Scott Haas, Environmental Testing, Inc.

The Field Activities Committee (FAC) is anticipating the release of new draft versions of both the Volume 1 and Volume 2 standards in the second quarter of 2023. Volume 1 has been updated to incorporate ISO/IEC 17025:20017 while Volume 2 has been updated to incorporate ISO/IEC 17011:2017. Both volumes of the Standard have also had additional language added to provide more value and clarity for both Field Sampling and Measurement Organizations (FSMOs) and their Accrediting Body (AB).

Volume 1 has been clarified by replacing the term laboratory with FSMO throughout the document. While this is not a huge change, it will improve the readability and make it easier to relate to sampling. Several definitions have also been added and/or clarified. One example is a replacement of the definition of laboratory with FSMO and expanding the definition. The original “laboratory” definition included only sampling associated with subsequent testing or calibration. This definition did not consider common field activities where the testing happens in situ or involves a direct observation (opacity, groundwater elevation measurements, etc.). New elements have also been added. Examples include:

- A specific requirement for confidential reporting of data integrity issues to senior management.
- Certifications or licenses needed must be evaluated as part of the personnel competence.
- Appropriate personnel safety and security must be evaluated when planning a sampling event.
- The equipment necessary to take a representative sample must be defined prior to a sampling event along with written procedures for cleaning and decontamination.
- The development of a sampling plan requiring consideration of factors like sample storage, environmental conditions, homogeneity, physical form, quantity, timing of sample collection, and specific client or regulatory requirements like required confidence interval, allowable risk factor, or other statistical criteria relative to collecting representative samples. The type of sample should also be considered when evaluating representativeness (incremental, single grab, multiple grabs, composite (flow weighted, time weighted), etc.)

In addition to updating Volume 2 to include ISO/IEC 17011:2017, changes being recommended to the EL Volume 2 Standard were considered and incorporated where possible to encourage consistency across TNI programs. Some examples of changes to the Standard include:

- Adding definitions specific to FSMOs including Field, Field Measurement, Field Sampling, Matrix, Preservation.
- Adding definitions related to Proficiency Testing.
- A requirement for an accreditation body to seek recognition from The NELAC Institute (TNI) using this standard as a basis for granting recognition along with several Notes to clarify this requirement.
- Specifying that an accreditation body shall not delegate authority for granting, maintaining, suspending, or revoking a CAB’s accreditation.



- Requirements for an assessor's education or commensurate experience and training (including technical training related to sampling).
- Requirements for an assessor to perform unsupervised assessments.
- The general applicability of the accreditation granted and the type (umbrella vs. individual).
- Details and processes to be followed during an assessment.

Updating the FSMO standards to include the 2017 versions of ISO/IEC 17025 and ISO/IEC 17011 required a significant reorganization of the material included in previous versions. The FAC is excited to bring this iteration of the standard update to a close. However, because sampling is a diverse topic that spans multiple matrices and disciplines, we are already looking to the future. We are beginning to evaluate how developing guidance modules or requirements specific to a matrix, sampling technique or even an industry could bring more value and reliability to our data sets. Sample quality is the new frontier for enhancing data reliability!

TNI Committee Openings

By Paul Junio, Pace Labs

TNI is a volunteer organization. Among the things that we do as volunteers is to serve on committees. Some of these committees are Standards Development Committees. Others are Administrative Committees. All are important to the overall success of the organization.

TNI's "Procedures for Expert Committee Operations (SOP 2-101)" requires that we annually post the number of openings available for Committee Members for each of our Expert Committees. Regardless of when committee membership changes, members who are interested in participating on committees are encouraged to submit an application. Membership on an Expert Committee can be time-consuming but also very rewarding. If you feel that you are able to provide input on the basis of your Stakeholder Group (Accreditation Body, Laboratory/FSMO, or Other), and have an interest in joining a committee, the table below shows the number of committee members present on each Expert Committee, along with the interest category that they represent.

Committees may have from 5 to 15 members and must maintain balance among the different stakeholder groups. Balance means that no one stakeholder group represents more than 50% of committee membership. Laboratory Stakeholders should keep this in mind as that group frequently is the highest represented group on a committee and may not be able to be added to without resulting in imbalance. Also, Committee membership is limited to no more than two members of the same organization sitting on a particular Expert Committee unless approved by the TNI Board of Directors. While TNI members are allowed to serve on more than one expert committee at a time, keep in mind the time commitment hoped for among our volunteers. In other words, if you don't believe that you can contribute as a full-time member of a committee, it might be best to let someone else serve.

Committee	Lab/FSMO	AB	Other
LASEC	4	4	5
PTP Executive Committee	5	4	4
Asbestos	4	3	2
Chemistry	6	4	3
Field Activities	6	3	3
Laboratory Accreditation Body	4	3	2
PT Expert	6	3	5
Quality Management Systems	5	4	4
Microbiology	7	3	4
Radiochemistry	3	4	4
Whole Effluent Toxicity (WET)	4	3	1

All TNI members are welcome to apply by filling out an application. We've recently removed the link to Join a Committee from the TNI tab on the homepage of the website. The application is now only found on the TNI Member Page (that little button in the upper right corner of the TNI website's homepage). From there, there is a link to 'Join a Committee' under the Member Benefits listing. In order to help us track our associate committee members (since Associate Members are frequently targeted to become voting Committee members), we have added the ability to choose to be an Associate Member at that link. Any TNI Member can request to become an Associate Member of any Expert Committee by submitting an application. There is no limit on the number of Associate members that an Expert Committee may have, nor is there a limit to the number of committees on which a TNI member may join as an Associate. Associate Members are frequently targeted to become full Committee members.

These numbers are subject to change. With all of that said, if you are interested, but still have questions, feel free to [contact me](#), and I will help where I can.

TNI Moves from “Quality System” to “Quality Management System”

By Jerry Parr, TNI

Background

At the first meeting of the National Environmental Laboratory Accreditation Conference (NELAC) in February 1995, a newly formed Quality System Committee, chaired by Silky Labie of the Florida Department of Environmental Protection, presented the first version of the Quality System Standard (Chapter 5). At that time, the language in the standard stated:

Quality Systems include all quality assurance (QA) policies and quality control (QC) procedures, which shall be delineated in a QA Plan to help ensure and document the quality of the analytical data. These shall include QA policies, which will establish essential QC procedures applicable to environmental laboratories regardless of size and complexity. The laboratory shall meet any additional or more stringent requirements as specified by the analytical methods, specific programs or Agencies.

Note the emphasis on QA/QC as compared to the overall management system in ISO/IEC 17025.

By 1997, NELAC had moved to ISO/IEC Guide 25, and in 2002, moved to ISO 17025: 1999. The language remained unchanged until the final 2003 NELAC Standard. The 2009 (and 2016) TNI Standard was revised to contain some, but not all, of the language contained in the 2005 version of 17025.

These documents use the terms management systems, quality systems, and quality management systems somewhat interchangeably. Also used is technical management system and “technical, managerial, and documentation requirements.”

The 2005 version of ISO 17025, contains a definition (in a Note):

The term 'management system' means the quality, administrative and technical systems that govern the operations of a laboratory.

This definition is very consistent with the opinion of the TNI Board of Directors, where the Board indicated items such as financial performance, personnel, and health and safety are outside the scope of TNI's Module 2.

The 2009 TNI Standard contains this definition:

Quality System: *A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA and QC activities.*



The 2017 version of 17025 takes a very different approach, organized as follows:

Section 4 General Requirements

- 1) Impartiality
- 2) Confidentiality

Section 5 Structural Requirements

Section 6 Resource Requirements

- 1) Personnel
- 2) Facilities
- 3) Equipment
- 4) Traceability
- 5) Externally provided services

Section 7 Process Requirements

- 1) Reviews of requests, tenders, and contracts
- 2) Selection, verification and validation of methods
- 3) Sampling
- 4) Handling test items
- 5) Technical records
- 6) Measurement uncertainty
- 7) Ensuring the validity of results
- 8) Reporting results
- 9) Complaints
- 10) Non-conforming work
- 11) Control of data

Section 8 Management Requirements

- 1) Management system documentation
- 2) Control of management system documents
- 3) Control of records
- 4) Actions to address risks and opportunities
- 5) Improvement
- 6) Corrective actions
- 7) Internal audits
- 8) Management reviews

In looking at all of this, it is important to note that Section 1 is informative only. It does not impose any requirements for laboratories, but helps set the stage for the importance of the requirements contained in Sections 4 through 8 of ISO 17025:2017.

Note: ISO has published close to 100 “management” standards. Some of these could be used by laboratories, or organizations that have laboratories. Examples include:



- 24518 – Crisis management of water utilities
- 30401 – Human resource management
- 41001 – Facility management
- 14001 – Environmental management systems
- 35001 – Biorisk management for laboratories

Because of the variety of “management” standards, the TNI Board of Directors voted unanimously on September 9, 2020 that TNI should use “quality management system” to ensure no confusion with the other management standards and has proposed the following definition for TNI’s Quality Systems committee to consider:

Quality Management System: *The quality, administrative and technical systems that govern the operations of a laboratory. It describes the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality management system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA/QC activities.*

Small Lab Advocacy Group (SLAG)

By Robin Cook, City of Daytona Beach

The Small Lab Advocacy Group (SLAG) was started as an initiative to help small labs with limited resources achieve and maintain compliance with the TNI Standard. Yet, it is a bit of a misnomer, in my opinion. It really is a group that is committed to educating all laboratories, at all levels of staffing and experience to be successful. The challenges that small labs face (staffing, costs, time) are universal to all labs. All of the elements of the Standard are implementable, but the approach may vary, as it should.

Currently, we are using LinkedIn as a means to communicate and connect. There are 160 members and counting. We have had some very interesting discussions on microbiology QC, training, DOCs, sampling, and CBODs, to name a few. We are adopting a peer-to-peer mentoring approach that we hope will help everyone. In support of this effort, The Advocacy Committee hosted a Small Lab Open Forum in San Antonio. We are hopeful that we can continue to provide that opportunity in our winter meetings.

We have found that so often labs are frustrated with the “how-to’s”. When we understand the “why’s”, the “how-to’s” are easier to reach. We tend to understand “what” the Standard tells us to do, but not “how”. So we want to provide some context for the requirement and give practical advice when we can so that labs can understand why one approach over another makes sense. The SLAG can help labs think outside the box and get a bit creative in that approach, as well as looking to address the concerns of the small labs as we work through revision and standard development.

I truly wish that this group had been around when Florida was adopting the NELAC Standard back in 2000. I spent entirely too much time trying to reinvent the wheel. I am certain that experience shaped my mindset these days. We all learned a lot the hard way during those early years. I would like to encourage those TNI members that are not currently engaged with the SLAG group to hop on board. We would love the opportunity to share more experiences and success stories.

Thinking about joining SLAG? [Click this link](#) to get started!

EPA Proposes Clean Water Act Methods Update Rule for the Analysis of Effluent

By Jerry Parr, TNI

On February 21, EPA proposed changes to its test procedures required to be used by industries and municipalities when analyzing the chemical, physical, and biological properties of wastewater and other environmental samples for reporting under the EPA's [National Pollutant Discharge Elimination System permit program](#). The proposed changes include:

- Revisions to four current EPA methods,
- 50 revised methods (97 techniques) published by Standard Methods,
- Five new and 8 revised methods (18 techniques) published by ASTM International,
- Two new methods approved by EPA under the alternate test procedures (ATP) program, and
- Other minor technical corrections.

Note: Copies of many of the methods can be found in the Docket: EPA-HQ-OW-2022-0901.

1. Revised EPA Methods in Table 1A and/or 1H

The revisions include standardizing language between the related methods, updating to reflect current lab practices and clarifying edits.

Method	Analyte	Technique	Approved in Table
1103.2	<i>E. coli</i>	membrane filter (MF) two-step	1H
1106.2	<i>Enterococci</i>	MF two step	1H
1600.1	<i>Enterococci</i>	MF single-step	1A and 1H
1603.1	<i>E. coli</i>	single	1A and 1H

2. Revised ASTM Methods in Table 1A

These changes to currently approved ASTM methods include minor clarifications and editorial changes. As an example, ASTM added text to the appropriate method scope sections to indicate that the method was developed in accordance with the “Decision on Principles for the Development of International Standards, Guides and Recommendations” issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee. None of these proposed changes will affect the performance of the method. A brief description of any minor procedural changes (if there are any) in this revision from the last approved version of the method are shown in Notes following the table. Method revisions that are only formatting in nature will have no description of the changes.



Method	Analyte	Technique	Change
D888-18 (A, B, C)	Dissolved Oxygen	Winkler, Electrode, Luminescent-based Sensor	
D1293-18 (A, B)	Hydrogen Ion (pH).	Electrometric.	
D1976-20	Metals	ICP-AES	change the initial instrument calibration from four standards to using only one and a calibration blank.
D2330-20	Surfactants	Colorimetric (Methylene Blue)	
D5907-18 (A and B)	Filterable Matter (TDS) and Nonfilterable Matter (TSS)	Gravimetric	
D7237-18	Free Cyanide	Flow Injection, followed by Gas Diffusion Amperometry	added new information about sulfide interferences and potential mitigation strategies.
D7284-20	Total Cyanide	Flow Injection, Gas Diffusion Amperometry	
D7573-18a ^{e1}	Total Organic Carbon	Combustion	adds data from a validation study

3. Revised Standard Methods in Table 1B

The newer versions provide clarifications and make editorial corrections. These edits include removal of referents to specific brand names and trademarks, incorporation of footnotes into the text, a reformatting of figures, tables and reference lists, removal of bibliographical references that are no longer available, small editorial changes based on current style guides and changes to scientific publishing standards, and minor clarifications to procedures based on input from users. For example, the revisions replace distilled water with reagent water in all methods. EPA generally proposes to approve and include only the most recent version of a method published by the Standard Methods Committee. EPA is proposing to list only one version of the method with the year of publication designated by the last four digits in the method number (e.g., 3111 C-2019). The date indicates the date of the specific revision to the method. This allows use of a specific method in any edition of the hard copy publication of “Standard Methods for the Examination of Water & Wastewater” that includes a method with the same method number and year of publication. The revisions to methods previously approved will not affect the performance of the method.

The preamble contained supplemental information that does not appear in the regulation, but is shown in Notes at the bottom of the table.



Method	Analyte	Technique
2120 B-2021	Color	Visual Comparison
2120 F-2021	Color	Weighted-Ordinate Spectrophotometric.
2130 B-2020	Turbidity	Nephelometric
2310 B-2020	Acidity	Titration
2320 B-202	Alkalinity	Titration
2340 B-2021	Hardness	Hardness by Calculation
2510 B-2021	Specific Conductance	Wheatstone bridge
2540 B-2020	Residue—Total	Gravimetric, 103-105°
2540 C-2020	Total Dissolved Solids (TDS)	Gravimetric, 180°
2540D-2020	Total Suspended Solids (TSS)	Gravimetric, 103-105° post washing of residue
2540 E-2020	Fixed and Volatile Solids	Gravimetric, 550°
2540 F-2020	Settleable Solids	Volumetric, (Imhoff cone), or gravimetric
3111 B-2019	Metals	AA direct aspiration
3111 C-2019 ¹	Metals	AA direct aspiration
3111 D-2019 ²	Metals	AA direct aspiration
3111 E-2019	Metals	AA direct aspiration
3112 B-2020	Mercury	Cold-Vapor AA
3113 B-2020 ³	Metals	AA Furnace
3114 B-2020	Arsenic and Selenium	AA Hydride, Manual
3114 C-2020	Arsenic and Selenium	AA Hydride, Continuous
3120 B-2020 ⁴	Metals	Inductively Coupled Plasma Emission Spectroscopy (ICP/AES)
3125 B-2020 ⁵	Metals	Inductively Coupled Plasma-Mass Spectrometry (ICP-MS),
3500-Al B-2020	Aluminum	Eriochrome Cyanine R
3500-As B-2020	Arsenic	Silver Diethyldithiocarbamate
3500-Ca B-2020	Calcium	EDTA Titrimetric
3500-Cr B-2020	Chromium	Colorimetric.
3500-Cr C-2020	Chromium	Ion Chromatographic
3500-Cu B-2020	Copper	Colorimetric, Neocuproine
3500-K B-2020	Potassium	Flame Photometric
3500-Mn B-2020	Manganese	Colorimetric (Persulfate)



Method	Analyte	Technique
3500-Na B-2020	Sodium	Flame Emission Photometric
3500-Pb B-2020	Lead	Dithizone
4110 B-2020	Inorganic Anions	Ion Chromatography
4110 C-2020	Inorganic Anions	Ion Chromatography
4110 D-2020	Inorganic Anions	Ion Chromatography
4140 B-2020	Inorganic Anions	CIE/UV (Capillary Ion Electrophoresis)
4500-Cl ⁻ B-2021 ⁶	Chloride	Titrimetric
4500-Cl ⁻ C-2021	Chloride	Mercuric Nitrate
4500-Cl ⁻ D-2021	Chloride	Potentiometric
4500-Cl ⁻ E-2021	Chloride	Automated Ferricyanide
4500-CN ⁻ B-2021	Cyanide, Total	Manual Distillation
4500-CN ⁻ C-2021	Cyanide, Total	Manual Distillation
4500-CN ⁻ D-2021	Cyanide, Total	Titrimetric
4500-CN ⁻ E-2021	Cyanide, Total	Spectrophotometric
4500-CN ⁻ F-2021	Cyanide, Total	Ion Selective Electrode
4500-CN ⁻ G-2021	Cyanide, Available	Manual distillation with MgCl ₂ followed by titrimetric or spectrophotometric
4500-CN ⁻ N-2021	Cyanide, Total	Flow Injection Analysis.
4500-F ⁻ B-2021	Fluoride	Preliminary Distillation Step
4500-F ⁻ C-2021	Fluoride	Ion-Selective Electrode.
4500-F ⁻ E-2021	Fluoride	Complexone.
4500-H ⁺ B-2021 ⁷	Hydrogen ion (pH)	Electrometric
4500-NorgB-2021	Kjeldahl Nitrogen (TKN)	Macro-Kjeldahl
4500-NorgC-2021	Kjeldahl Nitrogen (TKN)	Semi-Micro-Kjeldahl
4500-NorgD-2021	Kjeldahl Nitrogen (TKN)	Block Digestion and Flow Injection Analysis.
4500-NH ₃ B-2021 ⁸	Ammonia (as N)	Preliminary Manual Distillation Step.
4500-NH ₃ C-2021	Ammonia (as N)	Titration
4500-NH ₃ D-2021	Ammonia (as N)	Electrode
4500-NH ₃ E-2021	Ammonia (as N)	Electrode
4500-NH ₃ F-2021	Ammonia (as N)	Phenate
4500-NH ₃ G-2021	Ammonia (as N)	Semi-Automated Phenate
4500-NH ₃ H-2021	Ammonia (as N)	Semi-Automated Phenate



Method	Analyte	Technique
4500-NO ₂ ⁻ B-2021	Nitrite	Spectrophotometric, Manual
4500-NO ₃ -D-2019	Nitrate	Electrode
4500-NO ₃ -E-2019	Nitrate	Cadmium Reduction
4500-NO ₃ -F-2019	Nitrate	Automated Cadmium Reduction
4500-NO ₃ -H-2019	Nitrate	Automated Hydrazine Reduction
4500-NO ₃ -I-2019,	Nitrate	Cadmium Reduction Flow Injection
4500-O B-2021	Oxygen (Dissolved)	Iodometric
4500-O C-2021	Oxygen (Dissolved)	Winkler (Azide Modification)
4500-O D-2021	Oxygen (Dissolved)	Winkler (Azide Modification)
4500-O E-2021	Oxygen (Dissolved)	Winkler (Azide Modification)
4500-O F-2021	Oxygen (Dissolved)	Winkler (Azide Modification)
4500-O G-2021	Oxygen (Dissolved)	Electrode
4500-O H-2021	Oxygen (Dissolved)	Luminescence
4500-P B-2021	Phosphorus Total and Ortho Phosphorus	Digestion Sample Preparation.
4500-P E-2021	Phosphorus Total and Ortho Phosphorus	Manual
4500-P F-2021	Phosphorus Total and Ortho Phosphorus	Automated Ascorbic Acid Reduction Method.
4500-P G-2021	Phosphorus Total and Ortho Phosphorus	Automated.
4500-S ₂ ⁻ B-2021	Sulfide	Sample Pretreatment.
4500-S ₂ ⁻ C-2021	Sulfide	Sample Pretreatment.
4500-S ₂ ⁻ D-2021	Sulfide	Colorimetric
4500-S ₂ ⁻ F-2021	Sulfide	Titrimetric
4500-S ₂ ⁻ G-2021	Sulfide	Ion-Selective Electrode
4500-SiO ₂ C-2021	Silica	Colorimetric
4500-SiO ₂ E-2021	Silica	Automated Molybdate-Reactive Silica.
4500-SiO ₂ F-2021	Silica	Automated Molybdate-Reactive Silicate.
4500-SO ₄ 2-C-2021	Sulfate	Gravimetric with Ignition of Residue
4500-SO ₄ 2-D-2021	Sulfate	Gravimetric with Drying of Residue.
4500-SO ₄ 2-E-2021	Sulfate	Turbidimetric
4500-SO ₄ 2-F-2021	Sulfate	Automated Colorimetric
4500-SO ₄ 2-G-2021	Sulfate	Automated Colorimetric



Method	Analyte	Technique
4500-SO32-B-2021	Sulfite	Titrimetric Iodometric
5520 B-2021	Oil and Grease	Liquid-Liquid, Partition-Gravimetric
5520 F-2021	Oil and Grease	Silica gel treatment and gravimetry.
5530 B-2021	Phenols	Manual Distillation.
5530 D-2021 ⁹	Phenols	Colorimetric
5540 C-2021	Surfactants	Colorimetric (methylene blue)

Notes from the Preamble:

1. Manganese was inadvertently left off in an earlier rulemaking approving method 3111 C.
2. Calcium was inadvertently left off in an earlier rulemaking approving method 3111 D.
3. Although not specifically listed as target analytes in 3113 B, the method is also approved in Table IB for determination of gold, thallium, and vanadium, as these elements may also be determined using the method.
4. Although not specifically listed as a target analyte in method 3120 B, the method is also approved in Table IB for determination of phosphorus because this element may also be determined using the method.
5. Although not specifically listed as a target analyte in method 3125 B, the method is also approved in Table IB for determination of boron, calcium, gold, iridium, iron, magnesium, palladium, platinum, potassium, rhodium, ruthenium, silica, sodium, tin, and titanium as these elements may also be determined using the method.
6. A reference has been added to 4500-Cl-B for the Standard Methods Joint Task Group validation report titled: "Interlaboratory validation study for the use of H₂O₂ with boiling for determining Cl-."
7. This version of 4500-H+ B adds information to Section 2—Apparatus, regarding equipment that may be used for manual or automatic temperature compensation.
8. This version of 4500-NH3B replaces instructions for storage of ammonia-free water with instructions for preparation of ammonia-free water using an ion exchange resin and simply says that if high blank values are produced, the analyst should prepare fresh ammonia-free water.
9. Note that for regulatory compliance monitoring for 5530-D required under the Clean Water Act, the colorimetric reaction must be performed at a pH of 10.0 ± 0.2 as stated in footnote 27.

4. Revised Standard Methods in Tables 1C and 1D

The introductory text to Section 3 also applies to this section.

Method	Analyte Group	Technique
5540 C-2021	Volatile Organic Compounds	Purge and Trap Capillary-Column GC/MS ¹
6200 C-2020	Volatile Organic Compounds	Purge and Trap Capillary-Column GC
6410 B-2020	Extractable Base/Neutrals and Acids	Liquid-Liquid Extraction GC/MS ²
6420 B-2020	Phenols	Liquid-Liquid Extraction GC
6440 B-2021	Polynuclear Aromatic Hydrocarbons	Liquid-Liquid Extraction Chromatographic ³
6630 B and C-2021	Organochlorine Pesticides	Liquid-Liquid Extraction GC ⁴
6640 B-2021	Acidic Herbicide Compounds	Micro Liquid-Liquid Extraction GC



Notes:

1. This method is approved for dichlorodifluoromethane but 6200C is not.
2. This revision adds a note that although the method was validated extracting base neutrals first and then acids, performance may be improved by extracting acids first and then base neutrals. In addition, EPA proposes to approve method 6410-B for endrin aldehyde in Table ID. This parameter was inadvertently left off the 2000 MUR rulemaking.
3. This revision of the method replaces distilled, deionized water with reagent water, adds that the packed columns used for validation of the method are no longer available or recommended, and includes information on alternative capillary columns that may be used.
4. The analyte lists are comparable, but 6330B contains captan, carbophenothion, dichloran, malathion, parathion methyl, parathion ethyl, and trifluralin and 6630 C contains endosulfan sulfate and endrin aldehyde.

5. New Alternate Test Procedures in Table 1C

Method Number	Title
ATM Method 16130,	Determination of 2,3,7,8-Substituted Tetra- through Octa-Chlorinated Dibenzo- <i>p</i> -Dioxins and Dibenzofurans (CDDs/CDFs) Using Waters and Agilent Gas Chromatography-Tandem-Mass Spectrometry (GC/MS/MS), Revision 1.0
ATM Method PAM-16130-SSI	Determination of 2,3,7,8-Substituted Tetra- through Octa-Chlorinated Dibenzo- <i>p</i> -Dioxins and Dibenzofurans (CDDs/CDFs) Using Shimadzu Gas Chromatography Mass Spectrometry (GC-MS/MS), Revision 1.1

6. New ASTM Methods in Table 1B

Method	Analyte	Technique
4500-CN ⁻ P-2021	Cyanide, Total	Segmented Flow Injection, In-Line Ultraviolet Digestion followed by gas diffusion amperometry.
4500-CN-Q-2021	Weak and Dissociable Cyanide	Flow Injection, Gas Diffusion, followed by amperometry
4500-CN-R-2021	Free Cyanide	Flow Injection, followed by Gas Diffusion amperometry.
4500-F and G-2021	Fluoride	Ion-Selective Electrode Flow Injection Analysis
5520 G-2021	Oil and Grease	Solid-Phase, Partition-Gravimetric

7. Other Technical Corrections and Changes Note Discussed Above

1. Table IA. Removing the units of “number per 100 mL” under parameter 1. Coliform (fecal), because parameter 1 is specifically for biosolids that are reported as “number per gram dry weight”.
2. Table IA. Moving USGS Method “B-0050-85” from parameter 1. Coliform (fecal) number per gram dry weight to parameter 2. Coliform (fecal) number per 100 mL, to address an error from the previous rulemaking when Parameter 1 Coliform (fecal) was split into two parameters to eliminate confusion as to which methods were approved for biosolids.
3. Table IA. Moving the phrase “two-step” in parameter 3, in the “Method” column from the second to the third line which returns the phrase to the proper line after having been inadvertently moved.



4. Table IB. Revising footnote 85 to remove bullet formatting.
5. Table IB. Adding footnote 86 to Method 419D, listed as an approved method for determination nitrate using Colorimetric (Brucine sulfate) methodology. This addition corrects a long-standing typographical error regarding the appropriate footnote for this method in Table IB.
6. Table IB. Correcting an inadvertent error to footnote 57. The reference number was incorrectly changed to 335.4-1. The correct number is 335.4.
7. Tables IC and ID. Adding footnote 15 to the Standard Method Column header and adding footnote 15 to refer to Quality Control Section: Part 6000 Individual Organic Compounds, 6020 (2019).
8. Table IC. The parameter 39, dichlorodifluoromethane, should refer to Method 6200 B rather than 6200 C for the GC/MS method.
9. Table IC. Parameters 66-72, 95, 96 and 97. These parameters are missing the footnote 10 that was inadvertently dropped in an earlier rulemaking. Footnote 10 to table IC applies to all of the 17 dioxin and furan congeners.
10. Table IH. Parameter 2 has method B-0025-85 is moved down one row because it was inadvertently moved. This method is a one-step membrane filtration (MF) method rather than a most probable number (MPN) method.
11. Footnote 5 to Table II for the preservation and holding time requirements for cyanide to add the year (2015) of the ASTM method D7365-09a.

EPA Proposes to Regulate Six PFAS in Drinking Water

By Jerry Parr, TNI

On March 29, EPA proposed to regulate 6 polyfluoroalkyl substances (PFAS):

- perfluorooctanoic acid (PFOA),
- perfluorooctane sulfonic acid (PFOS)
- perfluorohexane sulfonic acid (PFHxS),
- hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt (also known as a GenX chemicals),
- perfluorononanoic acid (PFNA),
- perfluorobutane sulfonic acid (PFBS), and
- mixtures of these PFAS as contaminants in drinking water.

<https://www.govinfo.gov/content/pkg/FR-2023-03-29/pdf/2023-05471.pdf>

Maximum Contaminant Levels (MCL) for PFOA and PFOS are set at 4 ng/L (ppt) while a “Hazard Index” MCL is set for the other 4 at 1.0 (unitless), and calculated by dividing the measured concentration of each compound by a health-based value as shown in the equation below.

$$\text{Hazard Index} = (\text{GenX} / 10 \text{ ppt}) + (\text{PFBS} / 2000 \text{ ppt}) + (\text{PFNA} / 10 \text{ ppt}) + (\text{PFHxS} / 9.0 \text{ ppt})$$

Groundwater systems serving greater than 10,000 and all surface water systems would be required to monitor quarterly within a 12-month period for the 6 regulated PFAS using EPA methods 533 or 537. There are 13,083 such systems in the US. Groundwater systems serving fewer than 10,000 individuals (36,200 systems) would be required to collect and analyze 2 samples over a 12-month period. Existing data from the EPA Unregulated Contaminant Monitoring Rule (UCMR) 5 can be used. Systems that do not detect PFAS above the trigger level would be eligible for reduced monitoring. Systems that do detect PFAs would be required to collect and analyze samples quarterly.

Laboratories would be required to report down to a “trigger level” equal to 1/3 of the Practical Quantitation Limit, e.g., 1.3 ppt for PFOA. The proposed rule states “EPA has sufficient confidence that while measurements below the PQL may be slightly less precise and accurate, they are achievable by individual laboratories and appropriate for this intended purpose.” Although not discussed in the preamble, the proposed rule would require laboratories to analyze “Performance Evaluation” samples for all 6 compounds with limits of 70-130%. EPA estimates the annual sampling and analytical costs to be \$90 million.

This rule is expected to be finalized in late 2023.

Metrology Corner

What Does Degrees C Represent in the Measurement of Temperature, and Why Should We Use Celsius and Not Centigrade?

By Marlene Moore, Advanced Systems, Inc.

Temperature is traceable to the International System of Units (SI) through an unbroken chain of comparisons. Here is a brief summary of the history of the temperature unit we use in environmental testing. The SI base unit of thermodynamic temperature is represented by the symbol K or kelvin. Most environmental testing laboratories refer to the temperature measurement as degrees C. How does degrees C relate to the SI unit of kelvin?

Here is the history of 0 C.

In 1742 the temperature measurement was defined as centigrade from the Latin centrum and gradus which means steps. The Swedish astronomer Anders Celsius (1700-1744) developed the scale centigrade with the freezing point of water as 100 and the boiling point as 0. The divisions between both points indicated as degrees or units.

In 1743 a scale reversal was proposed by Jean- Pierre Christin and the centigrade scale was based on 00C for the freezing point of water and 100 0 C for the boiling point of water at 1 atm pressure.

In 1948 the scale was renamed through international agreement to Celsius to honor Anders Celsius and to remove the conflict in the French and Spanish languages relating to “centigrade” meaning 1/100th of an angular measurement.

Between 1954 and 2019 the unit degree Celsius and the Celsius scale were defined by absolute zero as the triple point of water (temperature and pressure at which vapor, liquid, solid water coexist in a stable equilibrium).

After 2007, it was clarified that this definition referred to Vienna Standard Mean Ocean Water (VSMOW), a precisely defined water standard for determining the triple point. This definition precisely related the Celsius scale to the SI base unit for the thermodynamic temperature referred to as Kelvin. The lowest temperature possible is absolute zero.

Until May 19, 2019, the triple point of water was defined as 273.16 K (0.01°C). With this change, water now freezes at -0.0001 0C and boils at 99.9830 0C.

On May 20, 2019, kelvin was redefined using the Boltzmann constant (exactly 1.380649×10^{-23} J/K). This is one of the seven defining constants of the SI base units. The measurement using the triple point of VSMOW no longer defines the thermodynamic temperature of absolute zero. Absolute zero is defined as 0 K or -273.15 0C. Said another way: “The temperature in degree Celsius is now defined as the temperature in kelvin subtracted by 273.15. This means that a temperature difference of one degree Celsius and that of one kelvin are exactly the same ...” (0 °C remains exactly 273.15 K).

So, when a laboratory expresses a temperature as degrees C (0 C), the C is for Celsius and not centigrade.

1 References: Wikipedia April 2023: URL: <https://en.wikipedia.org/w/index.php?title=Celsius&oldid=1149184302>

2 Instituto Nacional de Metrología de Colombia – INM, Physicist Ciro Alberto Sánchez works at the Temperature and Humidity Laboratory of the Physical Metrology Subdirectorate (Date: January 14th, 2020)

Member Spotlight

Stephanie Drier: Defensible Data Matters

Margarine or butter, skim or whole milk, broken or sprained ankle, should I drink the water or not? Stephanie loves science and the fact that people make many life choices and decisions based on scientific data. In early 2023, Stephanie Drier will celebrate 17 years in her role as a laboratory assessor and supervisor of the Minnesota Department of Health's Environmental Laboratory Accreditation Program (MNELAP).

Over the years, she has filled the roles of assessor, quality assurance officer, and is now the supervisor of a team of two talented assessors. Stephanie states that she has worked with amazing predecessors and continues to have great people on her team who have a passion for the health of citizens. They also work hard to ensure accredited laboratories comply with the rules, regulations, methods, and federal requirements. This oversight ensures accredited laboratories report defensible and accurate data. After all, it is this very data that people routinely use in their personal or professional lives in making small and easy decisions, to very complex and costly decisions.

Stephanie worked for Minnesota when they transitioned to a National Accreditation Body in 2010. She has seen the growth of both the accreditation bodies' and the laboratories' quality systems. Early on MNELAP did not have a procedure for complaints or reviewing proficiency testing data, and laboratories did not always uniquely label their standard operating procedure or individual samples. The use of the NELAC/TNI Standards has improved documentation, consistency, and legal defensibility of data for States and laboratories alike.

While employed for MNELAP, Stephanie has contributed to the TNI Quality System Committee, Accreditation Council, and the Advocacy Committee. Stephanie has also attended many TNI Forums on Laboratory Accreditation and looks forward to attending in-person forums in the future. The involvement with the TNI forums and committees has allowed immeasurable personal and professional growth. She values the relationships she has built with the TNI and scientific community as these colleagues care about the same citations in the Code of Federal Regulations, the TNI Standards, and are working to implement and enforce the requirements.

When Stephanie is not at work, she enjoys spending time with her husband of 20 years and their two children. Her children are very active in sports, and she enjoys cheering and supporting them at all stages of sports and school. She relaxes by playing on a "seasoned participant" softball team and reselling items online. This summer, she is looking forward to learning how to row a dragon boat across White Bear Lake, Minnesota. Please connect in-person with Stephanie at the next TNI Meeting in Minneapolis or reach out by email at stephanie.drier@state.mn.us.



ChairSpeaks

“Musings from the TNI Chair”

Spring Cleaning

When **they** told me my office would be refreshed this year, I felt the universe was tired of **their** pace and to compensate, made **me** pay for it. You see, for at least five years, there were plans to remodel my office. There would be a lot of moving furniture, boxing files, and ensuring that pictures and other personal artifacts could be safely packed, so **they** could paint over dull wallpaper and replace worn and outdated carpet. Fine, of course, but that never happened until...

A month ago, I was informed the remodeling would definitely occur this April and that my office was the third of three to be spruced...

Suddenly, last week, my position on the queue moved up to the princely slot, and I had to pack all my care and woes tout suite. Some things move slowly when you contemplate the landscape, or quickly, if you look at your assigned spot in the vegetable plot. I felt like early Zucchini. The pattern is a familiar one: years to initializing, months or weeks to implementing, and days to actually make it happen. A bit like developing standards...I had only very few days to move.

What I found and kept...

With little time to pack, I could not linger much, but found remnants of my past, some which I had taken with me with previous professional moves.

The “Methods Manual” from my first job as a bench chemist looked like a collection of old recipes handed down through generations; I started in the food section of an agricultural laboratory. There were hand-written notes, excerpts from journals, lots of tables with specifications for different products (vanilla ice cream must contain at least 10% butter fat) in all sorts of formats -- no standardization, barely OPs, not SOPs; and the **HORROR**, the **HORROR**; occasional corrections in “white-out”.

I compiled that manual out of a hodgepodge of instructions, transcriptions of oral advice, and my desire for order and flair. I found some of my own beautifully drawn calibration curves, yes by hand, and a first essay into programming a calculator to compute results for a chloride determination. We have come a long way, baby!

I found, as expected, many documents related to TNI and its predecessors: critical minutes of meetings concluding that after housing NELAC, EPA could not do both, recognize ABs and develop accreditation standards; incorporation papers of INELA as a standards development consensus organization; guidelines for EPA and INELA to stay in their own lanes; arrangements for the dissolution of NELAC; and the Chesapeake Bay Summit agenda, formalizing TNI’s operations to facilitate AB recognition, by hosting NELAP’s AC, and to develop standards. Wow! What a circular journey!



The manual and those documents I kept, as well as older editions of Standard Methods (they once fetched a few dollars on the Internet), some of my textbooks from college (unwisely), and all versions of the Drinking Water Laboratory Certification Manual. Also, I could not toss (for historical, read sentimental, reasons) all the programs, attendee lists, and conference materials from the NELAC and TNI meetings I have attended.

Purification and Rejuvenation...

I got rid of a lot. I filled a huge gray garbage bin, but kept more than what I discarded. That makes sense, given how long I have been in this business. When a junior staff member remarked that I had a lot of “stuff” and that she could not envision accumulating so much, I had to admit I did not need all that I kept for doing “what I do now”.

What I retained that was not essential to my day-to-day activities had personal resonance, made sense of the half-forgotten past, and had potential historical importance. What I discarded, apart from inconsequential clutter, was no longer relevant, available easily elsewhere (the Internet helps with purging), redundant, and supra-ephemera, not worth preserving in archives.

Reviewing, sorting, and selecting what to keep and what to chuck does something to one. The ultimate goal of purging is to purify. Freed space can be filled with new ideas, objects, and constructs, ready stimuli to form what we think and how we act. Lack of clutter brings clarity and feels healthier. And as part of selecting, we can remember where we came from, appreciate how far – for the better – we are from that spot, and where our next signposts should be erected.

The Institute will be undergoing some consequential renovations, like my office, in the near future. Those will involve embarking on significant initiatives, as for instance, the credentialing of laboratory personnel, and inevitable changes in leadership. For someone that harbors an innovative streak, I am excited about those possibilities. For someone that reacts more “evolutionarily” than “revolutionarily”, I am respectful of origins, and as you have read, not likely to toss out everything.

Spring is the renewal season. Spring cleaning is good. Spring is here, I hear.

Only connect.

Alfredo

Alfredo Sotomayor
TNI Chair

See notes regarding acronyms on the next page...



NOTES:

If you are new to this newsletter, or cannot retain in your mind all the letter combinations in our rich alphabet soup, here is the decoder:

AB	Accreditation Body
AC	Accreditation Council
EPA	You know what this means
INELA	Institute for National Environmental Laboratory Accreditation; now defunct
NELAC	(Obsolete) National Environmental Laboratory Accreditation Conference (see TNI)
NELAP	National Environmental Laboratory Accreditation Program
OP	Operating Procedure
SOP	Standard Operating Procedure
TNI	The NELAC Institute; NELAC is no longer an acronym

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