

Environmental NEWS

Winter 2017

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Environment
Testing

Comprehensive National Environment Testing

Delivering timely industry news to your PC



Paul Wise, President, Eurofins Environment Testing US

The old adage, Time is Money, certainly rings true in the environmental testing industry. Whether responding to a disaster, new regulations, or the advancement of innovative technologies, timely information and action can be like gold.

While we strive to provide quality data delivery in fast turnaround times as our primary end product, we believe there is great value in establishing collaborative, proactive partnerships with clients along the way. One of the ways we do this is by serving as industry experts on a variety of environmental testing and analysis issues to help guide current and potential clients through the sometimes complex array of testing options, best practices and emerging trends to ensure a successful project outcome.

To that end, and with the backdrop of a continually changing environmental industry, we've targeted several diverse topics to engage with current and potential clients as well as other interested parties through a well-orchestrated 2017 webinar launch.

By having the opportunity to connect with audiences real-time on informative topics, our goals are to:

- Deliver the most up-to-date information on our testing capabilities performed in these areas to help clients make informed choices for the best course of action regarding their project work
- Enable us to be available to current and potential clients to answer questions on the spot on these topics
- Leave no doubt we are market leaders in the industry by sharing our knowledge and expertise and instilling confidence in clients' decision to use us as their lab of choice
- Present up-to-date market research in certain trending areas,

such as PFAS, EPA Method 325, etc.

We will begin webinar promotion well in advance to allow clients to plan for these. Within an email outlining the upcoming webinars, recipients will find a link to register. And the webinar schedule and registration details will be available on EurofinsUS.com.

Our hope is that clients find these topics of interest and beneficial and this will foster discussions on sharing expertise and advice, advance positive project results and ultimately surpass client satisfaction as the preferred provider of environmental testing services in the US.

Eurofins Environment Testing US 2017 Webinars

January	PFAS
February	Maintaining Sample Integrity
March	UCMR4
April	Canister Sampling Procedures
May	Aquatic Toxicology
June	Arsenic Speciation in Waters, Sediments/Soils, Tissues
Tentative Schedule:	
July	PFAs for PWS
August	Cooler Packing
September	Passive Soil Gas Measurements using WMS devices
October	Sample Analysis Procedures
November	EPA 1669 – Trace Metal Clean Sampling and Analysis to Meet EPA Trace Metals Water Quality Criteria
December	Working with Environmental Laboratories

EPA turns up the heat with new Guidance for Perfluorinated Alkylated Substances (PFAS)

Don Wyand, Director, Business Development and National Programs, Eurofins Lancaster Laboratories Environmental

I've always been amazed at the ingenuity of chemists to develop new products to make our lives easier; perhaps that's what piqued my interest to study chemistry in the first place. Some of the largest companies of the world have researched and developed compounds used in the manufacturing of many of the products we prize in our daily lives to weatherproof clothing, resist stains, and ensure our omelettes don't stick to the pan! Perfluorinated compounds (PFCs) used in the manufacturing of some of these products and polyfluorinated alkyl substances (PFAS) used in fire-fighting foam are now classified by the USEPA as emerging contaminants and are in the spotlight of both Governmental and State regulators in the US and abroad.

In May 2016 the EPA decreased the drinking water Health Advisory Limits (HAL) to 70 ng/L for PFOS, PFOA, or PFOS/PFOA combined which are extremely low limits for environmental contaminants. At the State level, Texas established regulatory limits for 16 PFAS compounds, and Alaska, Illinois, Maine, Michigan, Minnesota, New Jersey, New York, and North Carolina also have regulatory or advisory limits.

Emerging contaminants, by definition, are a synthetic or naturally occurring chemical that is not commonly monitored in the environment but has the potential to enter the environment and cause known or suspected adverse ecological or human health effects. Our mission as the global leader in environment testing is to offer the services needed to accurately identify and quantify these compounds at the local level, and to collaborate with our US, European, and Australian counterparts and thrust Eurofins into a market-leading position.

PFAS compounds are unique in their many C-F bonds (strongest bond in nature) and functional groups which



allow them to be both hydrophilic and hydrophobic. Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) are the most common compounds in this group. PFAS are soluble, non-volatile, and persistent compounds in the environment which make them difficult to treat. They are typically found in large dilute plumes, bioaccumulate, and are estimated to have a half life of 4 years in humans. PFAS have been studied for years, however, it wasn't until recently that the USEPA and State agencies started to aggressively regulate and investigate these compounds in the environment.

Eurofins Eaton Analytical has extensive analysis experience with PFOA/PFOS through their support of the USEPA Unregulated Contaminate Monitoring Rule (UCMR 3) initiative. They've analyzed samples throughout the US from water supplies and have presented, and published multiple papers related to potable water.

Here at Eurofins Lancaster Laboratories Environmental, we have developed the LC/MS/MS analysis for several PFAS over the last 4-5 years for one of our largest industrial accounts and have grown our capacity 400%, expanded both the

list of PFAS we analyze, and the matrices in which we support including groundwater, soil, sediment, and ecological tissue samples. We are also developing the Total Oxidizable Precursor analysis (TOP) in Lancaster and will be participating in the upcoming 2017 EPA and DOD PT programs. Our diverse experience enabled us to secure multiple large projects on both the public and private sides of our market. On the Federal/State side we've secured multiple contracts to investigate the use of aqueous film forming foams (AFFF) as fire suppressants throughout the US for the DOD. On the industrial side of the market we are supporting multiple project sites in New York and Vermont where PFAS are now known to have contaminated the groundwater.

Detecting widespread compounds like PFAS at the part per trillion level presents many challenges. Time and time again we have successfully deployed new services to our customers through strong collaboration among our diverse and experienced teams. Data quality, capacity, turnaround time, and technical expertise in addition to Eurofins financial resources have allowed us to capitalize on this market and will continue to help us grow and serve our clients' expanding needs into the future.

Understanding the Matrix



Dorothy Love, QA Director, Eurofins Environment Testing US

I recently caught some of *The Matrix* movie on TV. I must admit, I had no idea what it was about. It made no sense to me. In some ways, understanding the impact that a sample matrix has on analytical results can be just as convoluted. For example, how many types of soil, water, and tissue are there? Does it really matter to the data?

There are four elements identified in the Ancient World: Earth, Wind, Fire, and Water. For our industry, these would translate to Soil, Air, Energy, and Water. Primarily, we are testing three of these “elements” or “matrices.” While the ancients may have identified earth as one element, we know that not all earth content is the same. Sand differs from clay; clay differs from sludge; sludge differs from sediment, and so on and so on. Similar differences exist for water. A drinking water differs from a waste treatment influent; saline waters differ from groundwater; groundwater differs from surface water, and so on and so on. Air can also have differences such as industrial emissions as compared to indoor air. Needless to say, there is a great deal of variability in a tissue matrix ranging from flora to fauna. All of these differences, can impact the analyses that are performed on samples. Extracting organics or digesting metals from a sandy soil may have different effectiveness than performing the same process



on a sludge or clay. Saline waters can impact instrumentation in ways that a groundwater would not.

In our industry, our goal is to use the matrix quality control (QC) samples to evaluate the potential impact that the sample matrix may have on the data obtained. Therefore, virtually all methods and regulatory programs require matrix QC. These include matrix spikes (MS), matrix spike duplicates (MSD), and/or sample duplicates (DUP). To have the matrix QC data that is relevant to your samples/site the sample used for this QC needs to come from your location. This will allow you to determine if the matrix of your sample is impacting the analytical results. Low MS or MSD recoveries could indicate that your sample results may be biased low due to matrix effects. High RPD results for DUPs could indicate that there are homogeneity issues with the samples. When evaluating data, these are factors you will want to take into consideration.

In order for the laboratory to provide pertinent matrix QC data for your project, we need to have sufficient sample volume. This is where we need to rely on you, the clients, to help us out. For soils and tissues, this is generally not an issue. For waters, however, it often is a problem. Many tests require a full container to be used for analysis (i.e. organic extractions, volatiles) and therefore we need to have additional containers submitted to the laboratory in order to perform the matrix



QC. When requesting bottles for your sampling events, indicate that you want site QC. When extra containers are provided, fill them and return them to the lab. It is essential for the laboratory to have extra sample volume to perform the matrix QC analyses. The same volume of sample used for the background or unspiked sample needs to be used for the matrix QC. Triplicate containers may be needed. The laboratory cannot use reduced volumes for the matrix QC trials as this would dilute the matrix effect and make your assessment of the impact of the matrix useless.

To process the matrix QC samples, the laboratory may enter them into our LIMS as separate samples. They would then appear on your Analytical Report as individual samples with detections. These detections should not be alarming to the end user. They simply need to understand that the analytes were spiked into those samples in order to evaluate the matrix effects. Also keep in mind that the matrix spikes will be reported using the same dilution level as the unspiked sample. The addition of the spikes could cause results to be above the calibration range but it is important to keep all the QC pieces at the same dilution so that the evaluation of impact is comparing apples to apples. (But of course, apples would be a different matrix as well.)

The matrix may still be convoluted but creating QC from your site samples will help to ensure relevance between the samples and the QC.

Pollutants in the News: Lead in Drinking Water

*David N. Speis, Vice President,
Eurofins QC*

Lead contaminated drinking water has become a foreground environmental and human health issue as the result of the recent drinking water contamination in Flint, Michigan. The Flint issue has triggered a broad response to potential lead contamination that includes widespread testing, especially in schools and a flood of state regulations specifying regular testing of drinking water in schools.

Lead-contaminated source water is not the cause of the difficulties in Flint or in the numerous facilities where lead exceeding National Drinking Water Standards has been detected. However, the corrosive properties of the source water is the primary reason that the presence of lead is detected in delivered water.

Slightly corrosive water will leach metals from pipes. While plumbing in newer homes and neighborhoods no longer contains lead, this is not the case for older homes, towns and cities. Even though many older homes have been re-plumbed with copper piping, the service connection line delivering water from the street main to the dwelling frequently is lead or contains lead. There are also many other potential sources of lead in plumbing systems including soldering materials, fittings and pressure tanks.

Leaching occurs when water sits in the lead piping for long periods of time. This typically occurs during overnight periods. The initial flush of water contains the highest concentration of lead because the standing water in the pipes leached metals during the period it was standing. This situation can be remedied by allowing the water to run for several minutes, purging the lead contaminated water from the line prior to using it.

Sampling of drinking water for lead occurs at the delivery point in the facility, typically from a location where the water would be consumed such as a kitchen

sink or water fountain.

The sample is collected as the first draw of the day to determine if lead leached into the piping during the standing period.

Samples are collected in relatively small volumes to assure that dilution does not occur as large volumes of water with lower lead concentrations are drawn from the piping. The container used for sampling is a pre-cleaned high-density polyethylene 250 ml wide-mouth container.

Thermal preservation is unnecessary and no other preservatives are added until the samples arrive at the laboratory. Samples are required to be preserved with Nitric Acid within 48 hours of receipt at the laboratory.

Once at the laboratory, sample analysis is performed by Inductively Coupled Plasma/Mass Spectrometry (ICP/MS). Drinking water samples rarely require acid digestion to ionize metal complexes, and the sample is analyzed without any additional preparation. However, the sample may require digestion if the turbidity exceeds defined limits.

The Federal action level for lead in drinking water is 15 parts per billion (ppb). Detected concentrations of lead above 15 ppb are a concern for young children who are undergoing developmental growth. Chronic exposure of adults to lead can also cause neurological effects. There are many remedies that may be employed to reduce the lead concentration in drinking water. They range from the simple precautionary techniques such as flushing pipes



prior to drawing water for potable use and only using cold water for potable purposes to more costly approaches such as plumbing modifications to eliminate lead sources in the plumbing system.

Many states are crafting regulations that mandate the testing of drinking water lead in schools. For example, New Jersey has adopted regulation that mandate that drinking water be tested for lead in every public school by July 2017. Many other municipalities are initiating voluntary programs for testing drinking water lead in private homes.

Lead in drinking water concerns have created the need for laboratory capacity throughout the country. Eurofins Environment Testing US, through its network of seven state-of-the-art national laboratories, has ample capacity to accommodate the analysis of drinking water samples for lead at a moment's notice with rapid TAT for emergent situations. Data is provided promptly with detected lead concentrations reported in comparison to National Drinking Water Standards.

For questions or additional information on lead testing in drinking water contact a Eurofins Environmental representative at 717-656-2300.

Eurofins Frontier Global Sciences ready to support new EPA proposed Selenium Water Quality criteria



Robert Brunette, Business Development Director

In July 2016, EPA Region 9 proposed a revision of the Clean Water Act (CWA) for Selenium water quality criteria. The proposed new standard sets tissue and water column Selenium concentrations at trace level limits.

Eurofins Frontier Global Sciences is uniquely suited to support the proposed trace Total Selenium levels in tissues and waters by offering our trace clean sample containers, collection procedures as well as our trace level Selenium analysis methods (EPA 1638/EPA 200.8/EPA 1640). Seawater and Brackish waters are a particular challenge for measuring Se at trace levels and Eurofins Frontier Global Science's Method EPA 1640 or Trace Level EPA 200.8 can achieve the proposed limits that most labs will be challenged to meet. The proposed EPA Selenium criteria include the following limits in fish tissues, muscles, clam and water column samples which are considered by many to be trace level limits:

EPA Region 9 Proposed Se Criteria

Sample Type	Limit
Fish Tissues - whole Body	8.5 ug/g *
Muscle Tissues	11.3 ug/g *
Clam Tissues	15 ug/g *
Water Column - Dissolved	0.2 ug/L
Water Column - Particulate	1 ug/g

* Dry Weight

In the proposal, EPA Region 9 states that the new Selenium water quality standard is based on "...the latest science on selenium fate and bioaccumulation indicates that the existing criteria are not protective of aquatic life and aquatic-dependent wildlife in the salt and estuarine waters of the San Francisco Bay and Delta."

Additionally, the proposed Selenium water quality criteria standard states that due to a "...rapid acceleration of selenium accumulation in the food chain of fish and bird species in the San Francisco Bay and Delta ecosystem...EPA is proposing revised federal criteria to ensure protection of these vulnerable species."

For more information about Eurofins Frontier Global Science's trace level Selenium methods in tissues and waters, please contact us at 425-686-1996 or RobertBrunette@EurofinsUS.com.

Eurofins Frontier Global Sciences – Worldwide Center of Excellence for Trace Metals and Metals Speciation

Eurofins Frontier Global Sciences is proud to be the Worldwide Center of Excellence for the analysis of trace metals and metals speciation in soil, sediment, biological tissue, water, and air.

Nearly 20 years ago, Eurofins Frontier Global Sciences helped develop and validate many of the trace metals and metals speciation analysis methods that today are used around the world. We served as the EPA Trace Metals and Metals Speciation Reference Laboratory for the validation of what are now the U.S. EPA 1600 Series Trace Metal and Metals Speciation Analysis Methods.

In order to serve our clients both here in the United States and abroad, Eurofins Frontier Global Sciences has developed an extensive offering of trace metals and metals speciation analysis methods and holds the internationally recognized ISO-17015 certification that enables us to receive samples from almost every continent in the world. Our laboratory, located in Bothell, Washington, is entirely dedicated to the analysis of trace metals and metals speciation.

EPA 1600 Series Trace Metals and Metals Speciation Methods in Waters, Tissues, and Sediments

EPA 1630	Methyl Mercury
EPA 1630 mod	Ethyl Mercury
EPA 1630 mod	DiMethyl Mercury
EPA 1631	Low-Level Total Mercury
EPA 1631 mod	Elemental Mercury
EPA 1631 mod	Ionic Mercury
EPA 1632	Arsenic Speciation (As3/As5)
EPA 1638	Trace Metals + DRC/KED (Full Suite of Metals*)
EPA 200.8	CWA Trace Metals + DRC/KED (Full Suite of Metals*)
EPA 1640	Trace Metals in Saline Waters

Hexavalent Chromium in Waters by HPCL-ICP-MS

Selenium Speciation by HPCL-ICP-MS

Other speciation by LC-ICP-MS or LC-AFS including Selenium, Arsenic, Vanadium, Molybdenum, Cobalt, etc.

*Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc

We believe that our people provide our strength. Their dedication to quality, professional competence and hard work are the key elements in the company's success. In this regular feature, we introduce you to some of the people who have helped make our lab an industry leader.

Chuck Neslund is Technical Director of Eurofins Lancaster Laboratories Environmental. With the Lab since 1984, Chuck brings a wide range of environmental knowledge and expertise to his clients' unique testing challenges. From chemist in the early days to Group Leader of GC/MS Semivolatiles to Manager of GC/MS Semivolatiles and Volatiles in Air to his current role, Chuck continuously embraces a passion for science and dedication to delivering effective solutions to his clients.

What does your current job entail?

I'm fortunate in that my job allows me to be involved in a lot of different aspects of our work and interact with a lot of people. I work to grow our footprint for performing HRMS analyses, PFAS analyses and method development. I get to help other departments improve difficult analyses and bring new analytical technologies on board. I also get to perform a lot of presentations at conferences and in front of clients that allow me to "talk up" and brag about the work we do and our successes.

Why should clients trust us with their projects?

Clients should trust us with their projects because we are good chemists, good analysts and we take pride in that. We want your project to be successful because that means we have done our job. We also realize that everything doesn't always go as planned, but we are going to work to

People are the chemistry



make it as right as we can now and better for anything in the future.

Given all of your responsibilities, how would you describe a typical workday?

I don't think that I have a typical workday. Maybe if we looked at a workweek? That would be days filled with meetings to discuss projects we are working on, status and progress. Conference calls to discuss results, or a challenging matrix or better define what a certain analytical technique might deliver to a project. It would involve calls with business development folks on markets that we are trying to grow, PFAS being one of the

principle ones. It would involve travel to a client site to share our expertise and capabilities on PFAS, HRMS or other analyses or maybe to a conference to share that same information to a larger audience.

How would you characterize your leadership style?

I believe in the individual, the individual working within a system, within a team. So I place expectations on the individuals for performance and responsibility to their work and their colleagues. I expect people to want to be successful and to want to make their team successful.

You've been here for 30 years and seen countless changes. Is there anything that hasn't changed during your tenure?

People. Even though we have grown and added a lot of people, the employees at ELLE make this a different and better place to work. There are certainly significant generational differences; heck, I'm managing folks that are younger than some of my children. But in total, they are all good, hard working people, and they make the difference.

And when you're not working?

I like the outdoors, and I like projects. So when I am not working at the lab, I am either working on a project at home or at one of my kids' homes. Or I am running, biking, hunting or hiking. Recently, my two sons and I completely gutted and remodeled the bathroom of my younger son's house. It is a 70-year-old house and ended up presenting some challenges for us, but was satisfying to complete. I've built a two-tier deck on the back of our house and plan to build a large shed/utility barn on the lower part of our property in the next year (my wife doesn't know about that one yet!).

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