

**The PFAS eBook from SCIEX**

# The forever changing world of PFAS testing



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# The PFAS lifecycle: an overview

PFAS regulations continue to accelerate around the globe. Recent years have seen regulations evolve beyond drinking water and include other matrices in the PFAS lifecycle such as food and consumer products.



Craig M. Butt  
SCIEX



Jianru Stahl-Zeng  
SCIEX

These MCLs cover PFOA and PFOS (4 ng/L or parts-per-trillion), and PFHxS, PFNA and HFPO-DA (10 ng/L). PFBS is also covered by a hazard index approach in samples containing PFAS mixtures. The final rule also requires all public water systems to complete initial monitoring by 2027 and, if exceedances are found, to implement reduction solutions by 2029. In addition, several states have established their MCLs or guidance levels for PFAS in drinking water.

How do these drinking water regulations in the United States impact the PFAS lifecycle? In 2021, the US EPA established its PFAS Strategic Roadmap, which ran until 2024. A guiding principle of this roadmap was the PFAS lifecycle and understanding the source of PFAS contamination by driving to the root cause. As a result, EPA 1633A was finalized for the analysis of PFAS in wastewater, surface water, groundwater, soil biosolids, sediment, landfill leachate, and fish tissue. These matrices are more complex and inherently challenging, placing increasing demand on instrument performance.

In January 2021, the European Union began enforcing PFAS drinking water

levels as part of their Drinking Water Directive. The limits are 100 ng/L for the sum of 20 PFAS compounds and 500 ug/L for “total PFAS”. In October 2022, the European Commission proposed a standard for surface and groundwater for 24 PFAS compounds at 4.4 ng/L (as PFOA equivalents). The lower limits will require lower reporting limits and presumably novel analytical methods to meet these limits.

Consumer products have also been subject to recent or proposed regulations in the United States and European Union. A wide PFAS ban has been proposed in the European Union, although the details have not been finalized. In February 2025, France approved banning the manufacture, import and export of PFAS-containing consumer products, including cosmetics, textiles and footwear. Similar bans have been passed in several US states, including New York and California. Some regulations also cover food packaging. Personal care products, such as cosmetics, may accumulate in the body during dermal absorption, or enter the wastewater systems after wash-off. Similarly, textiles may contribute to wastewater

contamination and may be a source to landfills during disposal. In addition, the PFAS used in our consumer products may end up in our house dust, which can be ingested by humans and our pets.

The need to protect human health and the environment has necessitated a full understanding of the PFAS lifecycle. As such, regulations on so-called “upstream” matrices such wastewater, surface waters and consumer products are expanding. Researchers will need to adapt our current methods to study these novel matrices, presumably with lower and lower detection limits. Innovation in our mass spectrometry will be crucial to meet these demands.

# PFAS – A global headline maker

An insight into the various bodies around the world driving policy, guidelines and regulation.

Every day, it seems like there’s a new headline about Per- and polyfluoroalkyl substances (PFAS) restrictions being implemented somewhere. Stories like “Forever Chemical used on Jersey’s Potato crops” or “Are PFAS in everything? What you need to know about ‘forever chemicals’” grab attention and raise concerns globally. After all, most of us consume food and water or use products that might have been exposed to PFAS at some point.

PFAS isn’t a new issue; it dates back to the 1940s when it revolutionized non-stick, heat-resistant products. From household items like furniture, wall paint, and carpets to industrial uses like electrical wire coatings, firefighting foams, and cosmetics, PFAS has been widely adopted. However, unlike its initial promise, this chemical group leaves a lasting impact on the human body and the environment. Numerous studies have highlighted the toxicity of PFAS, classifying it as carcinogenic and an endocrine disruptor.

The dangers of PFAS are well-documented, prompting regulators across various industries to impose strict testing and reporting procedures. These measures ensure water quality is safe and PFAS levels are within acceptable limits. Guidelines are also issued for PFAS levels in the food chain, and policies are being developed for manufactured products and personal care items like clothing and makeup.

A significant regulatory move came in 2022 when the US Environmental Protection Agency (EPA) issued drinking water health advisory levels (HALs) for four PFAS compounds. In response, companies like SCIEX, Eurofins, and Phenomenex developed detailed methods to detect these compounds at extremely low levels. This advisory underscores the seriousness with which regulators are addressing PFAS contamination.

Regulatory efforts aren’t limited to the United States. Around the world, national standard agencies have been rigorously governing PFAS in drinking water, raw waters, and wastewaters for years. Their focus has now expanded to include food, produce, and manufacturing processes. The following map highlights some of the regulations being implemented globally to manage and control PFAS in various regions.

companies are exploring new materials and technologies that can provide the same benefits without the harmful environmental and health impacts. Public pressure and advocacy are also playing a crucial role in pushing for stricter regulations and more transparency from manufacturers.

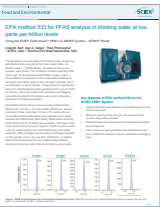
In the meantime, individuals can take steps to reduce their exposure to PFAS by being mindful of the products they use and the food they consume. Opting for PFAS-free products, filtering drinking water, and staying informed about local

regulations and advisories can help mitigate the risks associated with these persistent chemicals. The collective effort of regulators, industries, and consumers will be essential in moving towards a PFAS-free future.

## US EPA regulations



EPA 533 [4500]: Analysis of PFAS at low ppt levels in drinking water



EPA 533 [5500+]: PFAS analysis in drinking water at low parts-per-trillion levels



EPA 537 [Micro LC + 6500+]: Analysis for PFAS using microflow liquid chromatography

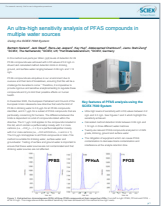


EPA 537.1 [4500]: Analysis of PFAS in drinking water



EPA 537 [5500]: Quantitation of PFAS in water samples using LCMS large-volume injection and solid phase extraction

## EU water framework directive



An ultra-high sensitivity analysis of PFAS compounds in multiple water sources



Quantitation of PFAS in food with parts per trillion levels of sensitivity



# PFAS regulations around the world

## Canada

Driving down from 30ng/L to 25ng/L

A goal of 30 ng/L for 25 PFAS in drinking water to reduce health risks. This replaces previous guidelines for PFOS, PFOA, and nine other PFAS. The target is precautionary and based on achievable treatment methods.

## United States

First ever nationwide drinking water standards

The EPA's new regulation limits six PFAS chemicals in drinking water, aiming to protect 100 million people and reduce health risks, with \$1 billion in funding to support compliance.

## Brazil

Brazil's Strides Towards Regulating PFAS: Uncovering New Regulatory Initiatives

Brazil's National PFAS Control Policy Bill No. 2726/2023 aims to regulate PFAS by enforcing environmental preservation, requiring annual reports from companies, and promoting public awareness and research. The bill has passed the first approval stage and will move to the senate if it clears all stages.

## France

PFAS ban passed

France has passed a new law banning PFAS (per- and polyfluoralkyl substances) in products like clothing and cosmetics. PFAS are known as

"forever chemicals" due to their persistence in the environment and links to health issues such as cancer and reduced fertility. Despite some opposition and the exclusion of cookware from the ban, this law is a significant step towards protecting public health and the environment.

## Argentina

Lowest PFAS levels in the world

This study is the first to track human PFAS exposure in Argentina, finding the lowest maternal PFAS levels globally.

## United Kingdom

A precautionary approach to regulation

In August 2024, the DWI updated guidelines for PFAS in drinking water. Water companies in England and Wales must monitor more PFAS and update risk assessments. The limit is 0.1 micrograms per litre for 48 specified.

## China

Chinese government is working to - reduce PFAS discharge from industrial sources.

China's Ministry of Ecology and Environment has drafted a plan to manage new pollutants. The plan includes strict regulations on new chemical registrations, bans on harmful chemicals, and moratorium standards for hazardous chemicals, consumer products.

## South Africa

Production and distribution prohibition

South Africa regulates per- and polyfluoroalkyl substances (PFAS) by prohibiting the production, distribution, and import of certain PFAS. These regulations took effect in December 2021.

## Australia

Lower limits proposed for drinking water

Australian Governments are managing PFAS contamination by investigating its extent, breaking exposure pathways, supporting communities, funding research, reviewing legislation, and improving coordination across government levels.

## Japan

Ban on 138 Chemicals

The Japanese government proposed banning 138 PFAS chemicals on January 10, 2025. The ban will prohibit the manufacture, import, and use of these chemicals.



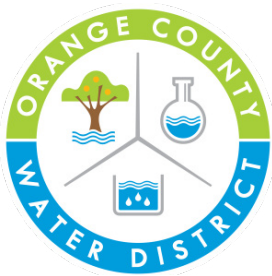
A close-up photograph showing a person's hands in blue nitrile gloves. The left hand holds a glass dropper with a black rubber bulb, dispensing a small amount of clear liquid into a glass test tube held by the right hand. The background is a body of water with ripples and reflections of green foliage. The overall scene suggests a scientific or environmental sampling activity.

03

Industry  
collaborations



# Industry collaborations: a customer success story



## What does good look like?

A sneak-peek into Orange County Water District. We had the privilege of interviewing Lily Sanchez, Supervising Chemist at OCWD, a collaborating lab, to gain an insight of how an industry leading water testing facility is run to the highest standards.



**Lily Sanchez**  
Supervising  
Chemist at  
Orange County  
Water District  
[OCWD]

### SCIEX [S], Lily Sanchez [LS]

**S: Can you tell us a little bit about OCWD?**

**LS:** Here at Orange County Water District, we have over 225 employees and our lab consists of 35 team members including five to six student interns. I’ve worked here over 30 years, so having spent more than half of my life here, I look at OCWD as my second home! Our main goal is to follow and adhere to EPA standard methods for monitoring drinking water quality, groundwater surface water, and recycled water. We conduct routine analysis on a daily basis for results reporting. We test approximately 1500 locations throughout the central and northern Orange County, including about 200 drinking wells, while serving over 2.5 million residents.

**S: What do your day-to-day responsibilities look like?**

**LS:** I stand as the working supervisor, and I love being hands-on with the method development process. When a new PFAS testing method surfaces, I am the one who sets up and develops the method. On completion, the

method is certified online, then my responsibility shifts to training our staff. I and another co-supervisor oversee the daily operation of our lab.

Our instrument portfolio includes GC, GCMS, LC, HPLC, LC-MS/MS, and each team member is responsible for certain methods. For methods like 524.2, we would have a team of three staff members on samples as it’s a heavy workload compared to other automated methods.

Every morning, we have a group meeting: So what needs to be done? Who’s doing what? Each analyst would decide who is processing and running which sets of samples, and be prepared for any reruns, retracts, or resampling. Once complete, then the process moves to data analysis and reporting. Sometimes, it can be 1-2 hours a day as my job also includes trouble shooting and problem solving! Even though it’s a workplace, it’s always like a big family with everyone. I try to make as a better place, and I always enjoy being here every day.

“Even though it’s a workplace, it’s always like a big family with everyone. I try to make it a better place and I always enjoy being here every day.”

**S: Many of our users want to know how you tackle the common problems other labs face: contamination, sample prep, the usuals!**

**LS:** We are very good as a lab to handle, and control, PFAS background. If we had a background problem, we would troubleshoot and determine if it’s coming from the extraction, or from the instrument, or from sample collection. Step 1 – if the sample blank passes, then that confirms the instrument is fine and we eliminate that potential and re-evaluate the extraction process. Is it the filtration plate? Are there other potential sources? Our protocol ensures this is a rare occurrence though.

“We analyze PFAS daily, with two 6500s, running up to 120 samples across both systems routinely.”

**S: How do you ensure data quality? Do you participate in any Proficiency Testing programs?**

**LS:** We perform PT every year between April and May, when we do PT for both 533 and 537 and all other methods within our lab. Our staff is great for this because we always get 100%!

**S: What has been your biggest challenge and how did you overcome that?**

**LS:** That has to be when I first started setting up methods back in 2011, when there were not too many people testing for PFAS at the time. I had to figure out myself. Background contamination was the biggest challenge, for PFOA, as well as LC separation. This is where the community, and SCIEX, helped by

suggesting tweaks like delay columns. Carryover was also a concern, but eventually solved by automation. So my advice for anyone out there is to connect with your community and vendor.

“SCIEX provides us with a lot of support. SCIEX is always my number 1 go-to, so it is the combination of community collaboration and vendor contacts.”

**S: We are always here to help and provide an educational platform for all interested users. How do you think is the best way for us to deliver this?**

**LS:**For me, it is technical support and application notes: if the person have never done the method or have no experience with LCMS, I think it would be good for a vendor to provide the application note, guide them through the process, and develop the method with them. So I think the best way is help the customer with PFAS testing, is start with the basic method, and they can improve from there.

For us internally, the most important thing the analyst needs to learn is: how to troubleshoot a problem. This is to minimize downtime. We go through data review regularly to make sure that they know what to look for, like PFAS peaks. I personally set out two or three solid days with each analyst, to make sure they understand everything, and go through initial demonstration capability. They have to demonstrate the capability of three-day MDL and calculate the PIR. We have very extensive training:

# Industry collaborations: a customer success story

checklists of what needs to be done at each stage, and once they pass all of that, only then can they can report the data. They are then considered qualified analysts for date reporting for the method they are assigned, as PFAS testing is a constant training course!

**S: What about the future? What do you see if the next trend in testing for PFAS in drinking water?**

**LS:**From what I’m seeing lately, it’ll be direct injection methods. I’m on the standard method committee, and we’re trying to develop that too. So for the future, I think that we’ll need more sensitive and faster methods, which means more advanced LCMS instruments. I want a 7500 for our lab!

So direct injections will be more common. Reduced time means money saving

and shorter turnaround times: results within 1 hour is ideal. Attention is also shifting to non-targeted analysis, and total organic fluorene. I expect to see more compounds required on the regulatory list, groundwater analysis, and additional responsibilities for government agencies like us to clean up those wells. So for PFAS testing, it will depend on how we adapt, develop methods to be faster and more reliable, so we can meet those growing PFAS demands.

**S: As we close this insightful interview, anything you’d like to add?**

**LS:** The SCIEX and Phenomenex staff that I’ve worked with, I feel like I can always go ask them whenever I have questions or problems. I come to them and they’re always a good resource for me. They’re always helping me, whenever I have a

problem, they provide suggestions, and t’s always worked out. And if not, they will send me to somebody else. So I really appreciate all of that. The support.

**S: Well that is great to hear, and our internal PFAS is always happy to help any way we can. Thank you Lily, for providing us your perspective into your world of PFAS testing!**

**To learn more about what Orange County Water County does, check out this video:**



# Automated solid-phase extraction system for the analysis of PFAS in drinking water

This technical note demonstrates the use of the PromoChrom automated solid-phase extraction (SPE) system for the analysis of PFAS in drinking water following EPA Method 533. Using the SCIEX QTRAP 6500+ system, negligible background contamination was observed as well as excellent method performance in spikes into reagent water and raw untreated groundwater samples. Milli-Q water blank spikes at 2, 40 and 70 ng/L showed mean recovery ranging from 96% to 115% with the mean precision <10% coefficient of variation [CV]. Sample matrix and duplicate spikes at 2 and 40 ng/L showed mean recovery between 95% and 122% with <13%CV. Analysis of raw untreated groundwater samples showed the detection of 5 out of the 6 EPA-regulated PFAS compounds.





# Industry insights



## A European case study of 15 months of robustness

A look to The Netherlands – HET Waterlaboratorium’s PFAS testing method  
A look to The Netherlands – HET Waterlaboratorium’s 15 months of robustness.

**In the dynamic field of water testing, laboratories are facing an ever-increasing sample load. More than ever, the robustness of testing systems has become a crucial factor in delivering reliable results.**

Hup and Abdessamad Chahbouni from HET Waterlaboratorium in The Netherlands, in collaboration with the SCIEX European support team and Jianru Stahl-Zeng, have developed a method that stands out for its robustness. This refined method is now running as a routine application with unmatched reliability, becoming a significant asset to their laboratory’s offerings.

At HET Waterlaboratorium, 26 PFAS compounds of interest can be measured in diverse water samples, ranging from drinking water to ground and surface water. This broad and

reliable offering sets the lab apart in the industry. In 2020 the European Dring Water Directive set the limit of PFAS in drinking water to 0.5 µg/L for all identified PFAS compounds. To ensure the safety of drinking water the analysis of ground water sources for contamination is vital to protect drinking water sources.

The robustness of the method developed by HET Waterlaboratorium is demonstrated over a 15-month period, during which preventive maintenance was required only once. Prior to this maintenance, calibration specifications were consistently met with only front-end cleaning needed. This level of robustness is unmatched in the industry, providing confidence and reliability in the testing process.

Having a reliable partner for method development is crucial. The collaboration between HET Waterlaboratorium and the SCIEX European support team exemplifies the importance of teamwork in achieving scientific excellence. Their combined expertise has resulted in a method that not only meets but exceeds industry standards, ensuring that HET Waterlaboratorium can continue to deliver high-quality results to their customers.

### Technical notes

An ultra-high sensitivity analysis of PFAS compounds in multiple water sources

PFAS analysis on the SCIEX 7500 system: 15 months of robustness data

## Eurofins Japan

We have spoken to Ms Megumi Monden-san, Mr. Hayao Ogata-san, Mr. Tomoya Nojima-san and Miss Rosamond-san, and Ms. Machida-san from the environment testing group at Eurofins Nihon Kankyo.

The labs work includes collaborations with Japanese research institutions and involvement in PFAS-related research beyond laboratory analysis, such as tracking PFAS trends and exploring PFAS remediation strategies.

The officially recognized methods currently adopted in Japan mainly target PFOA, PFOS, and PFHxS in drinking water and environmental water.

Looking ahead, we expect there will be increasing demand for regulations on longer-chain PFAS, leading to a greater focus on analytical methods that cover a wider range of PFAS compounds.’

Among environmental samples, water samples account for 60–70%, while soil makes up about 30%. In addition, exhaust gas from factories and waste are also analyzed.’

**Eurofins Nihon Kankyo K.K.**  
Environment testing Japan POPs (PFAS PCB) team



**Megumi Monden**  
Manager



**Hayao Ogata**  
Associate Manager





# 04

Addressing the  
challenges of  
PFAS testing

# Addressing the challenges of PFAS testing



The  
challenges



05



Solutions  
at every level

# The complete solution guide

## LC

Built from the same legacy of innovation as all SCIEX products, these systems deliver precision and robustness with the assurance of quality and support you would expect from the leader in the quantification of molecules.



### SCIEX 4500 system

Sensitive and robust performance meets all EPA method 533 performance criteria but is mainly used in other environmental matrices than drinking water where the focus is on robust performance.



### SCIEX 5500+ system

Excellent sensitivity and precision to easily meet minimum reporting limits of EPA method 533 with excellent linear dynamic range.



### SCIEX 6500+ system

The LOQS of the European Drinking Water Directive are easily achievable with the QTRAP 6500+ system for all required PFAS compounds and without SPE.



### SCIEX 7500+ system

For ultimate quantitation of trace level PFAS compounds, the SCIEX 7500+ system is the instrument of choice.



### X500R QTOF system

The greater selectivity from high-resolution fragments provided cleaner chromatograms with lower background noise for more sensitive quantitation and increased analyte specificity for more confident identification.



### ZenoTOF 7600 system

Traditional fragmentation methods using collision-induced dissociation (CID) can be too aggressive to form diagnostic MS/MS spectra. The ZenoTOF 7600 system, electron activated dissociation (EAD) has shown potential as a form of fragmentation to produce more robust spectra for PFAS analysis.

## Software

An easy to learn software system ensures fast result interpretation that is consistent and doesn't create a bottleneck for your sample turnover. SCIEX OS qualitative rules ("traffic lights") are used to quickly identify PFAS detections. Custom calculated columns tailored to EPA requirements are available to get you up and running fast.



## Service

Setting up PFAS testing from scratch requires a bit of tweaking in the beginning. When you are just starting out a reliable support team is as important as the system you purchase. SCIEX support specialists have years of PFAS experience under their belt and get your lab up to speed fast and for good.





# SCIE X 7500+ system

In the beginning of this eBook, we first asked the question: How low can we go? Regardless of where you are in the world, trace-level PFAS testing levels seem to be a pre-requisite for an application to be deemed suitable for challenging assays.

Enter the SCIEX 7500+ system, the mass spectrometer providing the highest sensitivity delivered by our instrument fleet to-date. Combined with reliable sample preparation steps and robust LC chromatography methods, the 7500+ not only delivers trace-level quantitation to meet the most demanding needs, but also tackles challenging matrices that were once thought to be impossible to test by LC-MS/MS.

**A few highlights before your download:**

- Mass Guard technology actively removed contaminating ions in complex matrices, which imparted exceptional robustness to the SCIEX 7500+ system
- The SCIEX 7500+ system maintained quantitative performance after >7000 injections of food extracts and solvent QC samples with most PFAS analytes retaining >70% of the initial peak area sensitivity

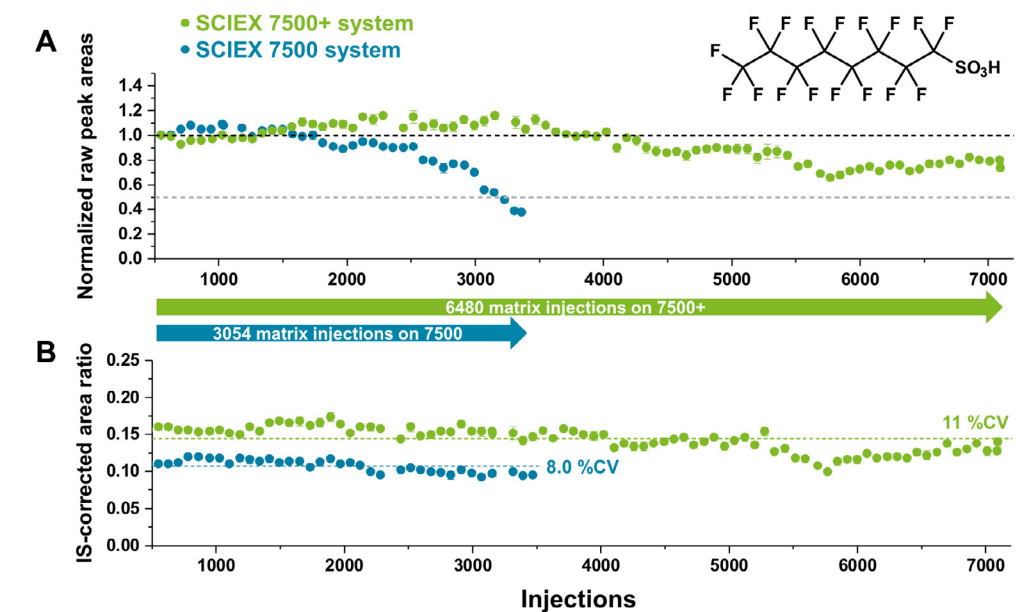
- The combination of SCIEX OS software enhancements for system performance tracking and the extractable DJet+ assembly offers increased flexibility for user-initiated management of system maintenance and uptime
- Equipped with the renowned sensitivity of the SCIEX 7500 system, the exceptional data stability and robustness demonstrated by the SCIEX 7500+ system deliver a powerful and efficient platform for PFAS analysis in food



**Achieving exceptional robustness for PFAS analysis in food with the next-generation SCIEX 7500+ system.**

This technical note demonstrates >2x robustness improvement for the analysis of PFAS food extracts on the SCIEX 7500+ system. At the end of the study, comprising over 6400 food matrix injections, the majority of PFAS compounds (10 out 13) maintained >70% of the initial sensitivity. Residue analysis in food matrices is challenged by the presence of interfering co-extractables which can result in

instrument contamination and system downtime. Here, the robustness of the SCIEX 7500+ system and SCIEX 7500 system was evaluated in an accelerated manner through an aggressive sample preparation procedure and by omitting the diverter valve. The SCIEX 7500+ system features new Mass Guard technology designed to improve instrument robustness while maintaining optimal sensitivity longer.



# SCIEX ZenoTOF 7600 system

So far, we have spent a large amount of time discussing the merits of quantitation, and trace-level testing of PFAS compounds driven by sensitivity and accuracy. These advantages are provided by a targeted approach where the mass spec user is fully aware of the specific list of compounds and analytes they are targeting for both identification and quantitation.

Reporting out on concentrations and amounts of analytes present in a given matrix is the basis of a targeted approach.

However, as we are all aware, there are roughly 8000 to 12,000 potential PFAS compounds in existence, depending on how a family of analytes are classified based on their fluorinated state. A targeted MRM method simply cannot accommodate such a large number of compounds, especially when a large number of them have not even been identified. This is where a non-targeted approach, by the accurate mass route, becomes a valuable method of both discovery, identification, and ultimately quantitation.

We present two applications that addresses different components of the PFAS lifecycle: PFAS characterization in cosmetic products, and then a demonstration of the power of EAD technology on the ZenoTOF 7600 system to decipher specific structures

of PFAS molecules. Although these are non-targeted approached for analysis of PFAS from a discovery and structural analysis point of view, there remains a common goal of possessing the ability to quantify concentrations per unit of matrix for understanding various levels of PFAS contamination.

Why do we need this when there is no current government regulations requirement for unknown PFAS discovery, you ask? The answer lies in the future of PFAS applications, we should prepare and be ready for anything coming our way, so allow SCIEX to help you achieve that goal.



## Characterizing PFAS in cosmetic products using non-targeted acquisition and Molecular Profiler Software

- Leverage Data-Dependent Acquisition (DDA) with the ZenoTOF 7600 system to characterize PFAS compounds
- Suspect screening and confirmation by library matching against the SCIEX Fluorochemical HR-MS/MS Spectral Library can produce good initial compound identification data
- Molecular Profiler, the software, identifies PAPs-like properties with diagnostic fragment ion screening results in significant time-savings

## Use of electron activated dissociation (EAD) to elucidate PFAS structures

- The EAD approach collecting MS/MS spectra generally can generate more fragments to help confirm compound identity during a non-targeted analysis
- Ramping energy ranges over a set time can product unique fragments exclusive to a particular class of compounds, providing additional spectral information for the identification of nontargeted PFAS structures



# SCIEX 6500+ system

One of our most popular ‘workhorse’ instruments ever built, the QTRAP 6500+ system continues to perform – handling large numbers of injections with ease and reliability.

**If certain regional regulations of PFAS-testing do not require the absolute trace-levels of low sensitivity quantitation, then this is an ideal and proven platform to bestow your trust upon.**

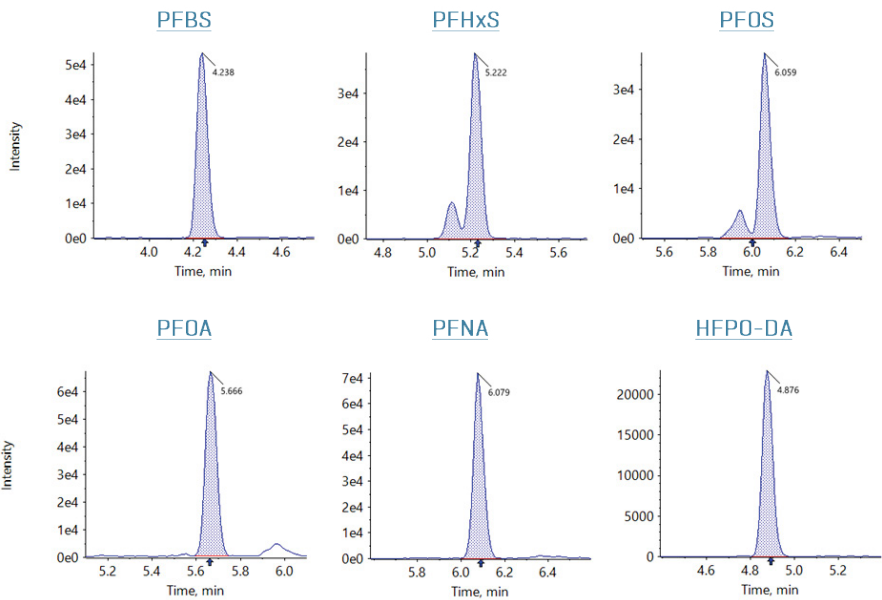
Here we highlight a PFAS application in drinking water, employing the technique of direct injection and detection by LC-MS/MS. Baseline PFAS contamination can be reduced to a minimum to ensure the capture of high quality MSMS spectra, while the power and flexibility of the SCIEX OS software will enable your lab to adhere to regional requirements such as the European Union [EU]’s Directive 2020/2184.



**Automated solid-phase extraction system for the analysis of PFAS in drinking water.**

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# SCIEX 5500+ system

The combination of sample preparation, and well-designed LC chromatography, opens up some possibilities around the type of hardware needed for some specific requirements set out by the EPA.

Our 5500+ suite of mass spectrometers are capable for meeting two of the guidelines set out by the institution. Here we present how both the EPA 533 and EPA 1633 method are delivered using the 5500+ system.

### Key Features:

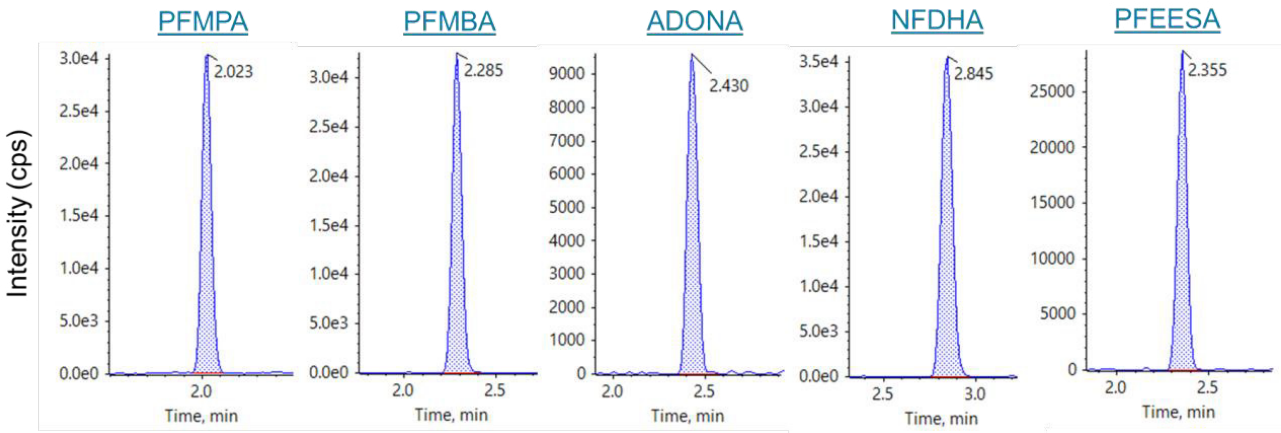
- Existing methods were adapted to meet challenges of novel PFAS compounds
- Minimum reporting limits of 2 ng/L with excellent linear dynamic range were achieved
- Method showed good peak and chromatographic resolution of all compounds



### EPA method 533 for PFAS analysis in drinking water at low parts-per-trillion levels

PFAS drinking water analysis by EPA Method 5331 using the SCIEX 5500+ System. Excellent sensitivity and precision were as shown; the “in-sample” minimum reporting limits were 2 ng/L for all analytes except PFHpA which was 4 ng/L. Novel perfluorinated ether carboxylic and sulfonic acids were detected in 0.50 ng/mL standard, which corresponds to

2 ng/L in sample, significantly below the US EPA drinking water guidelines of 70 ng/L for PFOS and PFOA. Custom built calculations and flagging rules in SCIEX OS Software streamlined data review and report generation.





# SCIEX 4500 system

The EPA method 537.1 was one of the first EPA regulation specifically identifying a certain number of PFAS compounds needing to be tested in a single mass spectrometry method.

In this case, the QTRAP 4500 system, was used and proved to be sufficient to quantify 14 PFAS compounds in drinking water, rounding out the entire SCIEX mass spectrometer suite to highlight that there is a different solution for any requirement you might need.

### Key Features:

- Robust and reproducible results with qualifying accuracy and precision for calculated concentrations, asymmetry factor, and linearity
- Total sample runtime takes only 8-10 min, depending on autosampler settings and system dead volume
- Sensitive MDLs of 0.08-0.2 ng/L for the entire suite of 14 PFAS compounds



### Analysis of PFAS in drinking water with EPA method 537.1

In order to protect the safety of drinking water and human health, the EPA releases methods for the detection of contaminants. The EPA method 537.1 describes the detection of selected per- and polyfluorinated alkyl substances in drinking water. Here a robust LC-MRM assay was developed using the QTRAP

4500 system for PFAS detection. Sensitive MDLs of 0.08-0.2 ng/L for all of 14 PFAS compounds in EPA method 537 were achieved, all of which meet or exceed the requirements of the US EPA’s UCMR3 list in a 10-minute run.

| Compound                                        | Abbreviation | Method detection limit [ng/mL] | UCRM3 reporting limit [ng/mL] |
|-------------------------------------------------|--------------|--------------------------------|-------------------------------|
| Perfluorohexane carboxylate                     | PFHxA        | 0.09                           | -                             |
| Perfluoroheptane carboxylate                    | PFHpA        | 0.1                            | 10                            |
| Perfluorooctane carboxylate                     | PFOA         | 0.1                            | 20                            |
| Perfluorononane carboxylate                     | PFNA 0.09    | 20                             |                               |
| Perfluorodecane carboxylate                     | PFDA         | 0.1                            | -                             |
| Perfluoroundecanecarboxylate                    | PFUnDA       | 0.1                            | -                             |
| Perfluorododecane carboxylate                   | PFDoA        | 0.1                            | -                             |
| Perfluorotridecane carboxylate                  | PFTrDA       | 0.2                            | -                             |
| Perfluorotetradecane carboxylate                | PFTeDA       | 0.2                            | -                             |
| Perfluorobutane sulfonate                       | PFBS         | 0.1                            | 90                            |
| Perfluorohexane sulfonate                       | PFHxS        | 0.08                           | 30                            |
| Perfluorooctane sulfonate                       | PFOS         | 0.1                            | 40                            |
| n-ethyl perfluorooctane sulfonamidoacetic acid  | n-EtFOSAA    | 0.1                            | -                             |
| n-methyl perfluorooctane sulfonamidoacetic acid | n-MeFOSAA    | 0.09                           | -                             |

# Controlling carryover with the ExionLC AE system

While the solutions presented here so far are hardware driven from the mass spectrometer perspective, there are some distinct advantages available through the liquid chromatography system that provide an extra level of analysis, especially when it comes to minimizing carryover from sample to sample, and reducing background contamination.

Background levels for PFAS were less and 1/3 of the lower concentration standard [1ppt or 1pg/mL], less than 1% variation for mean CVs, and much more. Check out how the ExionLC AE system can enable you to do just that:

### Key Features:

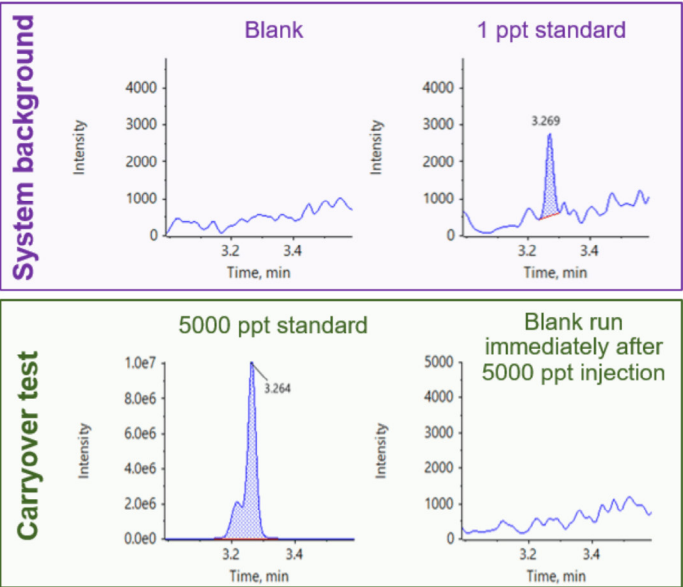
- Low system carryover:**  
Limit carryover using the ExionLC AE system to <1/3 of the calculated maximum residue limit (MRL) for PFAS testing
- Negligible system background:**  
Attain background blank samples consistently <1/3 of the lowest concentration standard [1 ppt]
- Repeatability across injections:**  
Obtain consistent results across 55 injections with an average %CV value of 3.1% across all compounds tested



### Controlling carryover and background contamination in PFAS analysis using the ExionLC AE system

In this technical note, the combined use of the ExionLC AE system and the ExionLC AE PFAS kit demonstrated negligible system background and low system carryover, which enabled sensitive and precise quantitation of per- and polyfluoroalkyl substances. Having an HPLC system that contains minimal PFAS contamination is crucial for ensuring the accuracy and reliability of analytical results. PFAS, known for

their persistence and environmental concerns, can contaminate HPLC equipment, leading to inaccurate data and potential misinterpretation of results. An HPLC system with limited PFAS contamination and low background levels helps prevent inaccurate results, aids detection and ensures compliance with increasingly stringent regulations related to PFAS use.





06

## SCIEX OS software



SCIEX OS  
software:  
when software  
compliments hardware

# SCIEX OS: when software compliments hardware

Mass spectrometry has become the gold standard solution for quantitative analytical assays in many applications, from PFAS testing to pharmaceutical drug research and development. Software plays a key role in all these applications, because without it, we can't drive the instrument or process the data it generates.



**April Quinn-Paquet**  
Global Marketing Product  
Manager, Software

Users want to load their samples and push a button—without the need to monitor the system until data are acquired, processed and ready for review—and during data review, they want to be able to easily identify outliers and failed samples. SCIEX OS software brings this vision to life with an easy-to-use interface and automated batch-building tools. It also provides automated customizable decision rules that immediately determine what to do with a sample that fails acceptance criteria and automated data processing and sample flagging rules.

While Analyst software was the flagship data acquisition and processing software for SCIEX triple quadrupole and QTRAP systems, SCIEX OS software is the platform of the future, bringing all SCIEX mass spectrometers under a single software for acquisition and processing. With advanced tools that streamline and automate workflows like never before, and data security with built-in 21 CFR Part 11 compliance tools, SCIEX OS software can transform the way you work.

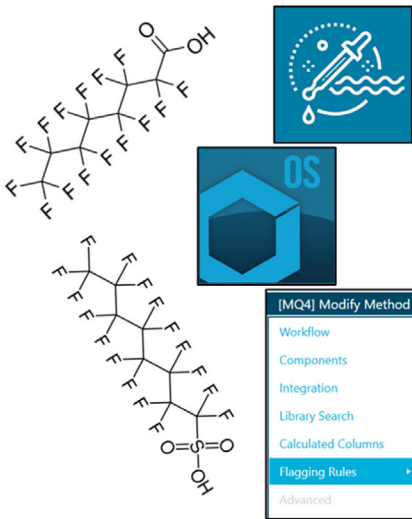
The technical debt incurred by not maintaining up-to-date software can be detrimental to the overall efficiency of the lab. With regular cadence updates to SCIEX OS software, driven by the feedback we gain from our users through various channels, we strive to continue to serve our customers in the best way possible.

## SCIEX OS calculated columns and custom flagging for PFAS applications: EPA methods 533 and 1633

Engineered to do more. Faster.

The integrated software platform solution for all SCIEX innovations, SCIEX OS software delivers data integrity, seamless usability and efficiency gains for your mass spectrometry workflows throughout your laboratory. Built on advanced and sophisticated algorithms, SCIEX OS software facilitates instrument control and automated data processing, simplifying your workflows and empowering swift, well informed decision-making.

This technical note demonstrates the formulation of several quality control (QC) calculations and flagging rules directly within the SCIEX OS software for EPA PFAS Methods 533 and 1633. Using the Calculated Columns feature in the processing method, SCIEX OS eliminates the need to export the data to a third-party software platform, minimizing data processing and review time. In addition, the development of Custom Flagging rules within SCIEX OS allows for the quick review of data outside of the EPA criteria. The flexibility of SCIEX OS is shown, highlighting the ability to adapt to changing QC requirements.



Workflow

Components

Integration

Library Search

Calculated Columns

Flagging Rules

Advanced

Use the calculator to create a new formula.

Formula name: EPA QC calculations

Description: Type a description for the formula

Library Search

Calculated Columns

Flagging Rules

Advanced

COUNT

MAX

STDEV

Clear

SUM

MIN

MEDIAN

(

MEAN

ABS

IF

)

LEFT

RIGHT

ISNUMBER

+

Select or type functions, operators, an...

I:0

Formula Details

Columns

Workflow

Components

Integration

Library Search

Calculated Columns

Flagging Rules

Advanced

Rule name: EPA QC flagging rule

Flag a results column: Select a results column

Flagging criteria: Range

Step 1: Define the values for the flagging criteria

Value for all components

Lower limit

Upper limit

Step 2: Apply the values to the following sample types

Unknowns

Standards





07

PFAS around  
the world:  
regional focus and trends



# PFAS around the world: regional focus and trends

## North America

The recent announcement of the EPA’s final testing limits for PFAS marks the introduction of the United States’ first-ever national, legally enforceable drinking water standard aimed at protecting communities from exposure to these harmful substances.



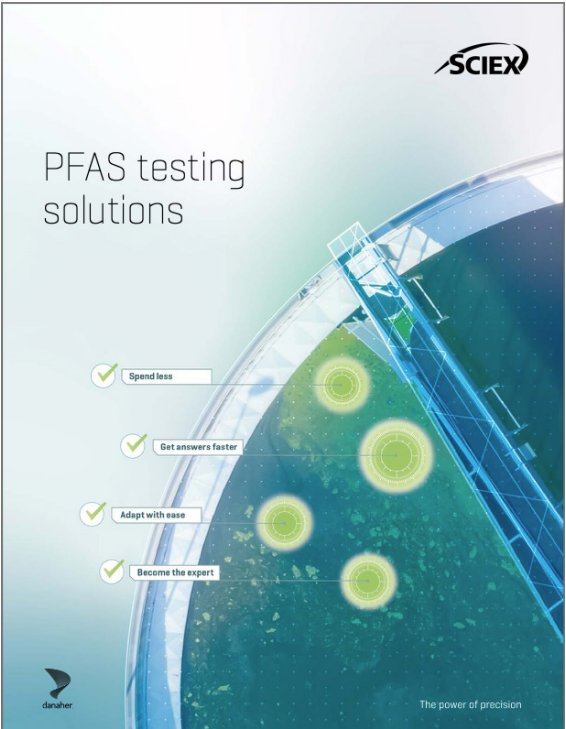
**Karl Oetjen**  
Market development  
Manager, Americas

This rule marks a significant milestone in the U.S. and has major implications for the Americas, as other countries continue to address PFAS and develop their own regulations.

In response, there is now a heightened urgency among U.S. public water systems to align with these new standards. It’s estimated that 6-10% of the 66,000 public drinking water systems nationwide may need to take action to reduce PFAS levels to comply with these regulations. They are preparing to undertake comprehensive monitoring over the next three years and developing strategies to mitigate any exceedances of PFAS compounds within five years.

Additionally, we have observed a notable increase in PFAS soil testing in our region. As awareness of PFAS contamination grows, stakeholders are not only focusing on drinking water

but also on the broader environmental impact of these chemicals. Soil testing has become a critical component in identifying and mitigating PFAS contamination at its source, helping to prevent further spread to water supplies and agricultural products. This comprehensive approach is essential for effectively managing PFAS pollution and protecting both public health and the environment.



# PFAS around the world

## Europe

PFAS compounds are now considered to be of major concern due to their inherent bio-accumulation potential. This concern has become apparent to regulators who are increasingly extending testing requirements for these compounds, which is impacting food manufacturers and producers.

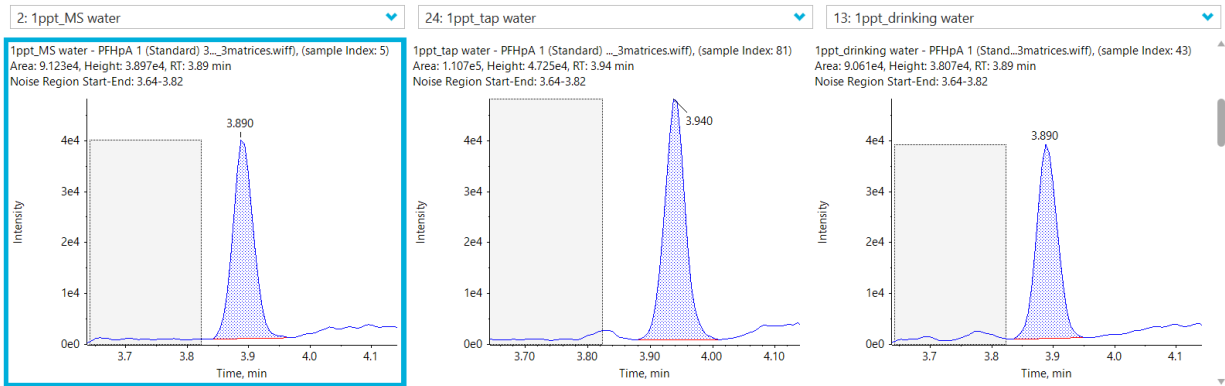


**Jianru Stahl-Zeng**  
Senior Technical  
Marketing Manager

The scope of analytes to be quantified includes compounds listed in the EU Commission Recommendation, EU 2022/1431. The Commission Regulation EU 2022/2388 was followed to ensure that enforced limits are met for the relevant PFAS compounds mentioned. These regulations have been driving the demand for testing with high sensitivity, selectivity and reliability. SCIEX experts, in collaboration with users and thought leaders, have been able to continuously improve our solutions and provide optimized support for our customers.

Besides tap water and environmental water, there are individual needs such as the development of PFAS purification systems and the measurement of PFAS in wastewater. Given the anticipated strengthening

of regulations worldwide and the extensive variety of PFAS, estimated to be around 5000 types, there could be a demand for both targeted and non-targeted PFAS measurements. **Confident quantification of per - and polyfluoroalkyl substances in water intended for human consumption.**





# PFAS around the world

## China

The Chinese government has released the “Action Plan for the Treatment of New Pollutants,” aiming to address PFAS pollution through investigation, monitoring, risk assessment, and whole-process control.

PFOA, PFOS, and PFHxS have been listed as the key controlled new pollutants, which prohibits their production, processing, use, import, and export. China’s new Standards for Drinking Water Quality [GB 5749-2022] set limits for PFOA and PFOS in tap water at <80 ng/L and 40 ng/L, respectively.

This regulation represents the first Chinese guideline of PFAS in drinking water employing LC-MS/MS. Meanwhile, the government will strengthen PFAS source prevention and control, with a particular focus on construction projects

in key industries such as petrochemicals, coatings, textile printing and dyeing, rubber, pesticides, pharmaceuticals, electroplating, and tanning. With the continuous improvement of technology and policies, China strives to effectively control PFAS pollution and promote the sustained improvement of ecological and environmental quality.



**Haiyan Cheng**  
Senior Market  
Development  
Manager, China

# PFAS around the world

## Japan

Currently in Japan, provisional target values for PFOA and PFOS have been established for tap water and environmental water, but the measurement is not mandatory.

However, in June 2024, the Food Safety Commission of Japan conducted a health impact assessment of perfluoroalkyl substances [PFAS] and determined that a TDI [tolerable daily intake] of 20 ng/kg body weight/day for both PFOS and PFOA is appropriate. As a result, this is now considered the standard for monitoring PFAS in food. Additionally, investigations involving the collection of concentration distribution data for PFAS in drinking water, food, and other potential exposure sources are expected to be conducted in the future.

Besides tap water and environmental water, there are individual needs such as the development of PFAS purification systems and the measurement of PFAS in wastewater. Given the anticipated strengthening of regulations worldwide and the extensive variety of PFAS, estimated to be around 5000 types, there could be a demand for both targeted and non-targeted PFAS measurements.



**Kai Uchiumi**  
Market Development  
Manager, Japan

# PFAS around the world

## Southeast Asia

PFAS Testing in food: Safeguarding consumer health in the wider Asia region.

The presence of PFAS chemicals in food is an emerging concern across ASEAN countries, with recent studies revealing varied contamination levels.



**See Chung Yip**  
Field Application and  
Market Development  
Manager

Despite lacking strict regulations in most nations, Singapore stands out for its proactive approach. The Singapore Food Agency (SFA) diligently monitors PFAS levels, setting stringent limits aligned with global standards. Employing cutting-edge technology like liquid chromatography-tandem mass spectrometry (LC-MS/MS), SFA ensures accurate and sensitive detection of PFAS compounds in diverse food samples. Their findings, particularly in seafood, underscore their commitment to consumer safety. While current levels

pose minimal risk, ongoing surveillance and alignment with international standards remain paramount.

For the broader ASEAN region, See-Chung Yip and his SEA application team from SCIEX offer invaluable support and consultation for PFAS testing in food, ensuring a concerted effort to address this critical health concern.

Asia Summit: PFAS testing in the East



# PFAS around the world

## Australia and New Zealand

In Australia and New Zealand, PFAS have been used for a long time in a wide range of consumer products and industrial applications, including certain firefighting foams. The Australian Industrial Chemicals Introduction Scheme (AICIS) provides information on PFASs.



**Charlie Liu**  
Field Applications and Market  
Development Specialist

There are now PFAS-contaminated sites around Australia resulting from these various uses. Over time, the chemicals have worked their way across and through the soil to contaminate surface and ground water, and have migrated into adjoining land areas. PFAS are also present in waste streams, including at landfills and wastewater treatment facilities, and more broadly in the environment. The PFAS National Environmental Management Plan (PFAS NEMP), developed by all state, territory and the Australian Governments, as well as the New Zealand Government, through HEPA's National Chemicals Working Group, provides nationally agreed guidance and standards on the investigation, assessment and management of PFAS wastes and contamination in the environment, including prevention of the spread of contamination. The final PFAS NEMP 2.0 was agreed by Heads of EPAs in October 2019 and published in May 2020. A NEMP 3.0 has been drafted and the Nation Chemical Working Group has received feedback from the public, which is expected to be finalised in 2024.

**The new guidance focuses on the following SIX areas:**

1. PFAS family - international approaches to grouping of PFASs
2. Environmental data and monitoring guidance on ambient monitoring data collection and land use classifications to enable comparability
3. Water-risk-based criteria and guidance for beneficial reuse of biosolids
4. Soil - guidance and standards around PFAS behaviour in soil, including leaching and associated ecological and human health guidance. It finalises and reviews two guideline values already in the NEMP and proposes two new guideline values for soil and one for wildlife diet
5. Resource recovery and waste guidance on management of risks associated with PFASin resource recovery products
6. Site specific guidance - guidance on principles and approaches to remediation and management; guidance on construction water; and guidance on estuarine, coastal and marine sediment





08

After sales,  
service, and  
support: for all  
your needs



# After sales, service, and support: for all your needs

# Why choose SCIEX service?

## SCIEX Now support network

**SCIEX Now**

- Manage your instruments.
- Submit and manage support cases, track status and view history.
- Access online training courses and articles.
- Manage software licenses linked to your registered instruments.
- View and report critical instrument statistics when connected to StatusScope remote monitoring service.
- Be a part of the SCIEX community by submitting questions and comments.
- Receive notifications from SCIEX with content based on your preferences.

**SCIEX Now learning hub**

- SCIEX Now learning hub success programs provide LC-MS and CE training customized to meet your exact needs.
- With a selection of training methods and certifications available, you can build a mass spectrometry program that is most suited to your lab and users.
- Starting with a clear understanding of your desired learning outcomes, we aim to help you improve lab productivity and consistency by designing and delivering a program that is focused on knowledge advancement and retention.

## Maintaining and servicing your PFAS testing system

**Ensure peak performance with SCIEX servicing and support**

The success of your laboratory depends on several critical factors: the expertise of your staff, robust methodologies, and the reliability of your PFAS testing LC-

MS/MS system. In a constantly changing regulatory environment, it's essential to keep your system running at its best. SCIEX servicing and support offer a comprehensive range of preventative maintenance services designed to minimize downtime, preventing costly sample backlogs and delays.

## Ensure peak performance with SCIEX servicing and support

- Maximize Uptime: Keep your lab productive with guaranteed onsite response, parts delivery, and remote monitoring services for a swift return to full operational status
- Full SCIEX Coverage: Benefit from unparalleled expertise, parts availability, and training across the entire SCIEX portfolio of instruments, workflows, and software
- Total Workflow Support: From instrument installations to relocations, software training, workflow validations, and more, SCIEX provides comprehensive support for your entire workflow

Ensure your lab's success with SCIEX's dedicated servicing and support, designed to keep your PFAS testing system at peak performance. Discover a service package that meets your needs and budget by visiting SCIEX Instrument Service and Support

Regular maintenance of both hardware and software is crucial for efficient laboratory operations. A well-serviced mass spectrometer system can achieve up to **18% higher productivity** compared to one without a service plan.

SCIEX offers a range of service plans and packages to support your SCIEX LC-MS/MS systems throughout their lifespan. These plans include genuine parts, software, and expert assistance to meet your workflow needs. Whether you have a legacy instrument or the latest model, SCIEX service plans ensure consistent service, support, and satisfaction.

**For more information, visit SCIEX service.**



# After sales, service, and support: for all your needs

## Upskilling, refreshing and advancing your Team’s Knowledge

SCIEX provides a comprehensive learning hub designed to enhance your team’s skills and knowledge. This hub offers a variety of free courses to help your team upskill immediately. Additionally, there are several paid options for onsite training with a SCIEX expert or hands-on experience in a SCIEX classroom at a regional location.

### Exclusive features of the SCIEX Learning hub:

- **Tailored technology:**  
Enhance training retention with a personalized mix of online, in-person courses, and hands-on experience
- **Flexible training options:**  
Learn at your own pace online, receive training at one of SCIEX’s global facilities or at your site
- **Unlimited course access:**  
Enroll to gain unlimited access to over 300 courses, with no time restrictions or additional commitments
- **Centralized training management:**  
Easily browse the course catalog, enroll in courses, track your progress, and print transcripts and certificates—all from a single login



## Additional benefits of upskilling for PFAS testing using LC-MS/ MS with SCIEX:

- **Unmatched analytical precision:**  
With SCIEX’s cutting-edge LC-MS/MS technology, your team will achieve unparalleled accuracy and reliability in PFAS quantitation, setting new standards in analytical performance.
- **Enhanced contamination control:**  
Our training programs include best practices to help minimize background PFAS contamination, ensuring your results are consistently precise.
- **Regulatory mastery:**  
Stay ahead of the curve with the latest techniques and regulatory updates. SCIEX training ensures your team meets and exceeds stringent environmental and health standards for PFAS testing.

- **Operational excellence:**  
Empower your team to optimize workflows and troubleshoot with ease. SCIEX-trained personnel work more efficiently, delivering faster and more effective PFAS analysis.
- **Professional growth:**  
SCIEX’s commitment to continuous learning fosters professional development, keeping your team motivated, engaged, and at the forefront of their field.







09

On-demand:  
customer  
collaborations



# On-demand: customer collaborations

## SCIEX PFAS summits:

Throughout the last few years, SCIEX have hosted our very own PFAS Summits – Scientific Series. One of our goals was to provide an educational channel for all mass spec users to come to an online forum and exchange scientific ideas and technical knowledge, while providing a platform for our industry-leading collaborators to present their work in the PFAS-testing world to a global audience.

### Phase I: PFAS testing: A scientific series

Our inaugural event kicked off the scientific series soon after the 4ppq announcement from the EPA. Not only was SCIEX first to market with an application and technical presentation with Eurofins California, we also gathered 3 additional industry experts, complemented by our internal applications team, to deliver a user-led roundtable. Click on the link to access all the on-demand materials!



**Amy Rand**  
Assistant Professor  
Carleton University



**Cora Young**  
Associate Professor  
and Guy Warwick Rogers  
Chair York University



**Andrew Patterson**  
Technical Director,  
Eurofins Specialty  
Services



**Christopher Higgins**  
PhD, University  
University Distinguished Professor,  
Colorado School of Mines

### Phase II: PFAS in food testing with SCIEX OS software

As the conversation of PFAS-testing gradually expands beyond drinking water, the next component with the PFAS lifecycle began to include PFAS in food, and food packaging materials. From farming, production, to consumption, food encompasses many aspects of our everyday lives, and information is needed at all levels to improve our understanding of its presence. By extension, human exposure is another area where we can start to evaluate the impact and effects of long-term PFAS exposure. All this, along with the advantages of SCIEX OS for your PFAS-testing needs, can be uncovered here in our second PFAS Summit.



**Kevin Stroski**  
PhD candidate,  
Baylor University



**Cheryl Murphy**  
Professor and Director,  
Center for PFAS Research,  
Michigan State University, USA



**Andrew Savage**  
Expert Chemist, NQAC,  
Dublin, OH, USA



**Pradeep Dewapriya**  
Postdoctoral Research Fellow,  
The University of Queensland, Australia



**Christian Lindh**  
Associate Professor and  
Senior University Lecturer,  
Lund University, Sweden



**Yelena Sapozhn**  
Expert Chemist, USDA,  
ARS, Wyndmoor, PA, USA



**Xanthippe Theurillat**  
R&D Specialist, Nestle,  
Switzerland



**Anthony Williams**  
Scientist, Center of Computational  
Toxicology and Exposure, US  
Environmental Protection Agency [EPA]



**Christel Nielsen**  
Occupational and  
Environmental Medicine,  
Lund University, Sweden



# On-demand: customer collaborations

## Phase III: A day in the life of the PFAS lifecycle

After Phase II of our PFAS Summit, our users were specifically requesting addition topics to be discussed around the PFAS lifecycle, as well as specific examples of ‘what good looks like’. For this event, we invited industry leaders from NIST, the FDA, post-doctoral researchers, to provide yet another unique perspective into other aspects of the detection and quantitation of forever chemicals.



**Amy Rand**  
Assistant Professor,  
Charleton University, Canada



**Annelise Blomberg**  
Postdoctoral Researcher,  
Lund University, Sweden



**Pradeep Dewapriya**  
Postdoctoral Research Fellow,  
Queensland Alliance of Environmental  
Health Sciences [QAEHS]



**Ben Place**  
Research Chemist, National Institute  
of Standards and Technology (NIST)



**Christian Lindh**  
Associate Professor and  
Senior University Lecturer,  
Lund University, Sweden



**Susie Genualdi**  
Research Chemist, Food and  
Drug Administration (FDA)



**Jeremy Gauthier**  
Postdoctoral Fellow,  
University of Toronto, Canada



**Larry Zintek**  
Organic Methods  
Group Leader,  
US EPA



**Yuki Liang**  
Laboratory Technician, University  
of British Columbia, Canada







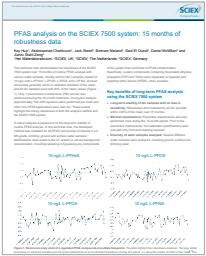
10

Technical  
materials



# Water

Drinking water has been identified as a significant source of PFAS exposure. Contamination can be through nearby industrial plants – from AFFF-impacted soils and water – or from runoff from agricultural fields.



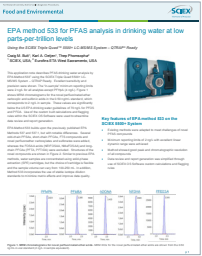
**PFAS analysis on the SCIEX 7500 system: 15 months of robustness data**

Demonstrates the robustness of the SCIEX 7500 system over 15 months of routine PFAS analysis with various water samples.



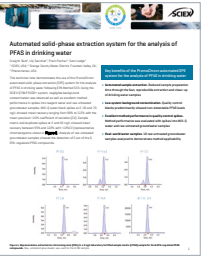
**A robust and sensitive routine analysis method of 40 PFAS compounds in surface water using the SCIEX 7500 system**

This technical note describes a sensitive and robust method for the analysis of per- and polyfluoroalkyl substances (PFAS) in surface water which is based on EU Directive 2020/2184 and WAC/IV/A/025 and is accredited under the ISO 17025.



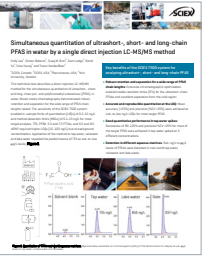
**EPA method 533 for PFAS analysis in drinking water at low parts-per-trillion levels**

Excellent sensitivity and precision were as shown; the “in-sample” minimum reporting limits were 2 ng/L for all analytes except PFHpA which was 4 ng/L.



**Automated solid-phase extraction system for the analysis of PFAS in drinking waters**

This technical note demonstrates the use of the PromoChrom automated solid-phase extraction (SPE) system for the analysis of PFAS in drinking water following EPA Method 533.



**Simultaneous quantitation of ultrashort-, short- and long-chain PFAS in water by a single direct injection LC-MS/MS method**

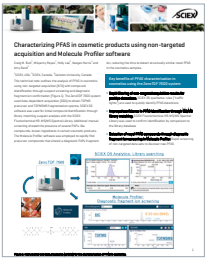
This technical note describes a direct injection LC-MS/MS method for the simultaneous quantitation of ultrashort-, short- and long-chain per- and polyfluoroalkyl substances (PFAS).





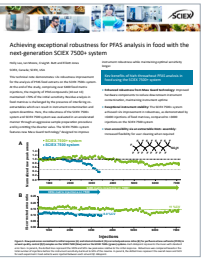
# Food and consumer goods

PFAS are used in many of our consumer goods, such as food packaging papers, cosmetics, personal care products, nonstick cookware, textiles, furniture, stain repellent sprays and cleaning products.



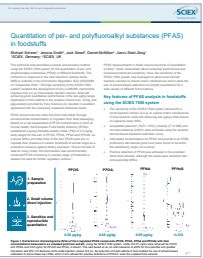
**Characterizing PFAS in cosmetic products using non-targeted acquisition and Molecule Profiler software.**

This technical note outlines the analysis of PFAS in cosmetics using non-targeted acquisition [NTA] with compound identification through suspect screening and diagnostic fragment ion confirmation.



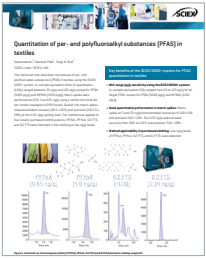
**Achieving exceptional robustness for PFAS analysis in food with the next-generation SCIEX 7500+ system**

This technical note demonstrates >2x robustness improvement for the analysis of PFAS food extracts on the SCIEX 7500+ system.



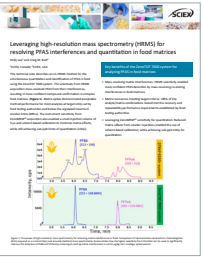
**Quantitation of per- and polyfluoroalkyl substances [PFAS] in foodstuffs**

This technical note describes a simple and sensitive method using the SCIEX 7500 system for the quantitation of per- and polyfluoroalkyl substances [PFAS] in different foodstuffs.



**Quantitation of per- and polyfluoroalkyl substances [PFAS] in textiles**

This technical note describes the analysis of per- and polyfluoroalkyl substances [PFAS] in textiles using the SCIEX 6500+ system.



**Leveraging high-resolution mass spectrometry [HRMS] for PFAS quantitation and resolving interferences in food matrices**

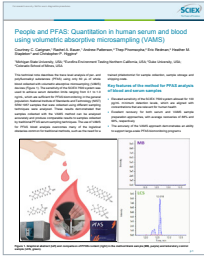
This technical note describes a LC-MS/MS method for the simultaneous quantitation and identification of PFAS in food on the ZenoTOF 7600 system.





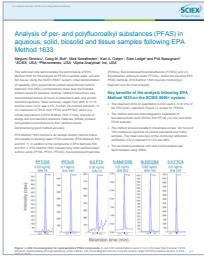
# Human exposure

Human exposure to PFAS occurs through multiple exposure pathways, including the ingestion of contaminated drinking water and food. Inhalation of indoor air and household dust, and dermal uptake from cosmetics and personal care products.



**People & PFAS: Quantitation of PFASs in human serum and blood using volumetric absorptive microsamplers (VAMS)**

This technical note describes the trace level analysis of per- and polyfluoroalkyl substances (PFAS) using only 60 µL of whole blood collected with VAMS devices.



**Analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid, biosolid and tissue samples following EPA Method 1633.**

This technical note demonstrates the performance of EPA Method 1633 for the analysis 40 PFAS in surface water, soil and fish tissue.







11

Phenomenex:  
your partner in PFAS  
testing consumables



# Phenomenex: your partner in PFAS testing consumables

## Bringing robustness, efficiency, and quality data to your PFAS analysis

Phenomenex is our sister company within Danaher that provides high-quality and cost-effective chromatography PFAS analytical tools, PFAS testing methods, and resources to help you and your lab achieve quality analysis in a wide range of PFAS matrices.

Our list of solutions include:

- Standardization and Calibration
- Sample preparation
- Analytical columns
- Testing Applications
- Complimentary full-time support from experts

## New! “Designed for PFAS” Complete product portfolio

Phenomenex now provides new QC tested SPE plus a vast selection of consumables verified for PFAS analysis, reduce potential risk of false positives due to background contamination.

The “Designed for PFAS” products offer reproducibility and accuracy in detecting and quantifying a broad range of PFAS compounds. From sample preparation to analysis, the “Designed for PFAS” portfolio has shown to meet the most stringent quality standards and maintain data quality without having to worry about background contamination. Click on the tab to find out more.

# Designed for PFAS

Complete product portfolio aiming to reduce or eliminate background interferences



- PFAS QC tested SPE media
- Sub-components verified for the absence of PFAS
- Low background contamination

To order PFAS products and learn more, visit [www.phenomenex.com/PFAS](http://www.phenomenex.com/PFAS)





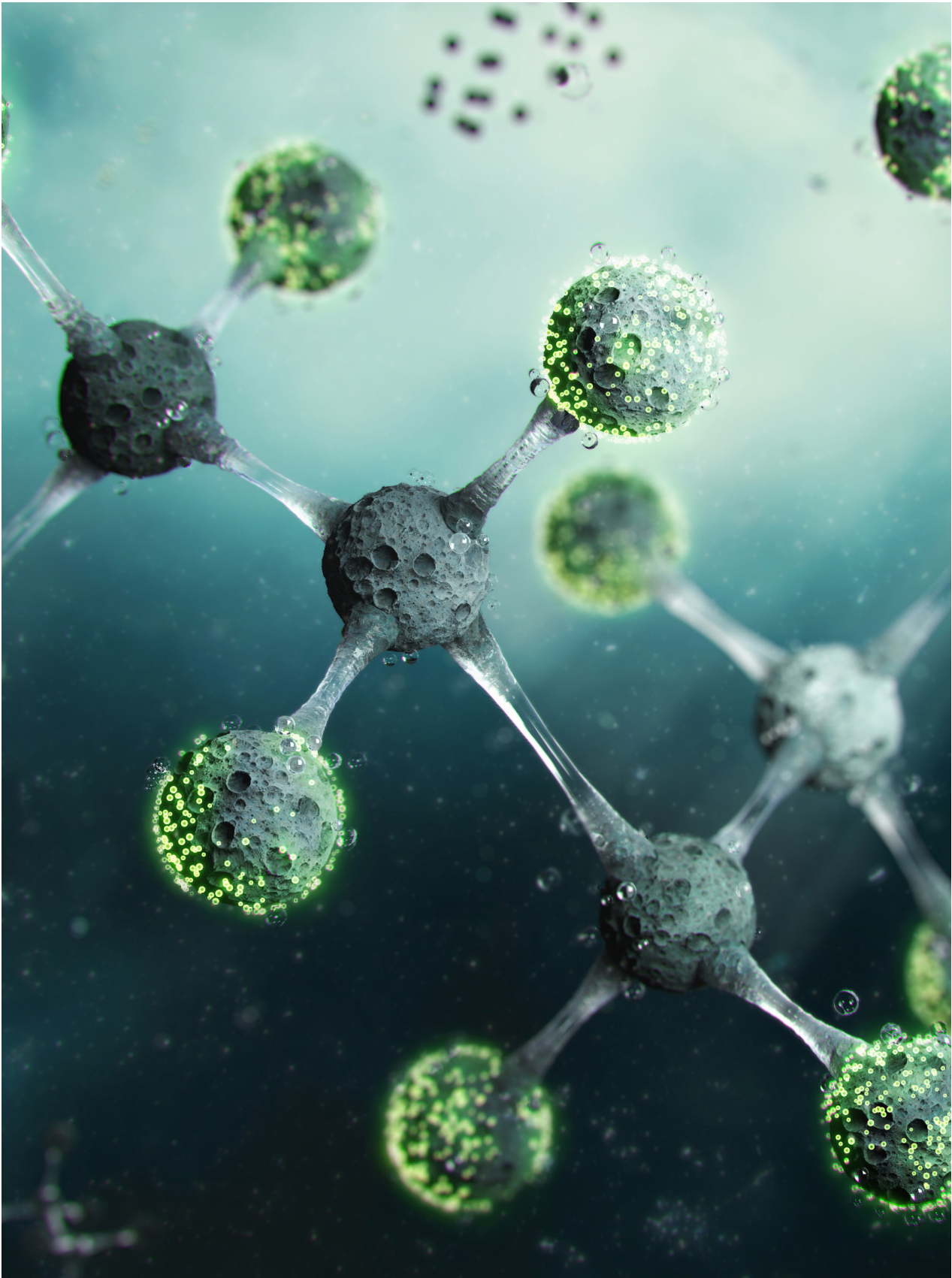
# Conclusion

Industry experts, research leaders, internal application scientists, we present PFAS- Industry experts from all our collaborators with different perspectives in the hope of enabling the wider scientific community to find the methodology and solution that fits their needs.

Here at SCIEX, we understand and empathize the challenges many laboratories face when it comes to detecting and quantifying this family of forever chemicals. Whether it is trace-level detection at the parts-per-quadrillion level, the difference in matrices and therefore sample preparation steps, or simply the number of analytes needed to be included in the MRM list, it can be daunting. We hope you enjoyed our presentation of this eBook, and follow us online at our various channels to get the updates on what the SCIEX team is researching.

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