



PM_{2.5} Chemical Speciation Network (CSN)

CSN Newsletter

This is the fifth issue of the CSN newsletter. You can find previous issues of the newsletter [here](#). We use the newsletter to communicate information on CSN that is useful to the State, Local, and Tribal (SLT) monitoring agencies and data validators, as well as users of CSN data. The EPA AMTIC page for CSN is [here](#).

Questions Regarding CSN

If you have any questions regarding CSN, contact us using the CSNsupport@sonomatech.com email address. This email address puts you in touch with EPA, the sample analysis laboratory (University of California at Davis or UC Davis), and the CSN Data Analysis and Reporting Tool (DART) support team (Sonoma Technology).

The shipping and sample handling laboratory, Research Triangle Institute (RTI) in North Carolina has a separate email address for site operators to contact them regarding shipping and handling requests. Please use shal@rti.org for any questions specifically related to late shipments, stopping and starting sample collection, and any other issues related to the logistics of shipping and handling.

Return Shipments—We Need Your Help

The Sample Handling Lab (SHAL) continues to receive some late post-sampling shipments. When shipments arrive late, it may compromise sample integrity and make it more difficult to turn around new modules for your next sampling date. Please help by sending your post-sampling shipments back on the 2024 shipping schedule.



Met One Super SASS

URG 3000N

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Special points of interest

- 2024 National Ambient Air Monitoring Conference, August 12-15 in New Orleans, LA
- The 2024 Shipping and Sampling Calendars for CSN are available
- Firmware update for recently purchased SuperSASS

2024 Shipping and Sampling Schedules Available

The 2024 CSN shipping and sampling schedules for 1-in-3 and 1-in-6 sampling are now available. The schedules have been posted on EPA's CSN AMTIC web site [here](#). Copies of the schedules were sent to site operators in a December 2023 shipment and also emailed to site operators and EPA CSN Region representatives.



CSN Sampler Maintenance and Repair

Monitoring agencies are responsible for the maintenance, repair, and if needed, replacement, of CSN samplers.

Please see the sampler Operation Manuals for recommended maintenance tasks and schedules.

To request support from the manufacturers, see the following links:

Met One: <https://metone.com/request-support/>

URG: <https://urgcorp.com/resources/maintenance>



CSN Data Analysis and Reporting Tool (DART) Training

[Manage](#) | [Explore](#) | [Validate](#) | [Export](#) | [Help](#) | [Log In](#)



[https://
dart.sonomatech.com](https://dart.sonomatech.com).

Please note that UC Davis is working to catch up on data delivery after slight delays during the 2023 contract transition. Therefore, the DART data delivery schedule is affected. Please see current and

planned batch review timelines below:

We held a CSN DART webinar training on February 15, 2024. The webinar covered the overall data batch validation process, the use of the DART web application for CSN data review, and new DART features.

Slides from the webinar are posted to AMTIC [here](#).

Agency users can request access to DART by setting up an account using the [Log In](#) tab at the top of the DART home page or requesting DART access through: CSNsupport@sonomatech.com.

The DART home page web address is:

Sampled Month	DART Review
August 2023	Expires 2/28/24
September 2023	Expires 3/6/2024
October 2023	Begins early March
November 2023	Begins end of March
December 2023	Begins end of April

CSN National Contract QAPPs —Posted on AMTIC

The CSN Filter Shipping, Handling, and Laboratory Analysis Contract was awarded March 2023 to the Air Quality Research Center at the University of California at Davis. The contract award includes a sub-contract to RTI International for the filter preparation, shipping, handling, and gravimetric analysis work. UC Davis continues to conduct the lab analysis, data review, validation and submission, but the filter preparation, shipping, handling, and gravimetric analysis work transitioned to RTI June 2023.

For reference, the Shipping and Handling and Laboratory Analysis Quality Assurance



Project Plans (QAPPs) and Standard Operating Procedures (SOPs) for the new contract are posted on AMTIC [here](#).

MDLs for Elements—ICP-MS Update

The CSN has been operating since 2000 with elements being analyzed by X-Ray Fluorescence (XRF). With continued improvements in air quality and decreasing PM_{2.5} concentrations over time, the percentage of non-detects for the 33 CSN target elements continues to increase.

Some of the PM_{2.5} elements of most interest are not always detected above the XRF method detection limits (MDLs). Soil/crustal elements (Fe, Si, Ti, Ca, Al) are regularly detectable by XRF. However, trace element concentrations are often not detected. The crustal elements are a larger fraction of the mass than trace elements.

EPA has been working with UC Davis and RTI on a special study to explore the use of Inductively Coupled Plasma Mass Spectrometry (ICPMS) instead of XRF to analyze Teflon® filters for CSN. Hundreds of samples from across the U.S. have been analyzed so far. ICP-MS offers much improved MDLs for many elements when compared to XRF MDLs. ICP-MS does have some challenges. It cannot measure 4 of the 33 elements (Si, S, Cl, and Br) and although the cost has decreased considerably over the last decade, the current cost of XRF is 5 times less than the cost of ICP-MS.

For the elements that ICP-MS can measure, the ICP-MS sensitivity is about 5 times better than XRF for Sodium to 4500 times better than XRF for Cerium. Other elements only show slight improvements (less than 2 times better than XRF) for Aluminum, Phosphorus, Potassium, Iron, Calcium, Zinc, Arsenic.

We continue to explore improvements in the extraction efficiency of ICP-MS by adding stronger acids to the extraction solution and cost efficiencies by using extracts from the Nylon filters used for Ion Chromatography.

Given the higher cost for ICP-MS and the continued decrease in PM_{2.5} concentrations trace elements, EPA is continuing to explore ICP-MS as a viable method for CSN. We also continue to explore the use of 25-mm Teflon filter inserts in SuperSASS samplers that would increase XRF sensitivity by a factor of 3.

UC Davis and RTI have published a paper on their work so far on this effort. See a snapshot of the paper title in the Journal of The Air and Waste Management Association below and the link for access is <https://doi.org/10.1080/10962247.2023.2247376>



2022 Site Summaries Available Soon

Starting in 2017, CSN's analysis laboratory contractor has compiled individual CSN site summaries.

These summaries include information on the site AQS ID, site latitude/longitude, completeness, daily reconstructed fine mass (RCFM), long-term trends in RCFM, chemical composition, and a map of RCFM as compared to both nearby CSN and Interagency Monitoring of PROtected Visual Environments (IMPROVE) monitoring sites.

To view all CSN site summaries for 2017–2022, please visit: <https://aqrc.ucdavis.edu/csn-field-sites-maps>.

CSN/IMPROVE Archive (CIA) Tool

The CSN/IMPROVE Archive (CIA) is a suite of interactive, data visualization tools for CSN and IMPROVE data that has been developed by the UC Davis Air Quality Research Center (AQRC).

To access the CIA:

- 1) Go to <https://particles.ucdavis.edu> and sign up.
- 2) Email signup-aqrc@ucdavis.edu to request authorization
- 3) You should receive a notification that your account is active; go to <https://particles.ucdavis.edu> and explore.

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OPEN ACCESS [Check for updates](#)

NOTEBOOK PAPER

Evaluating PM_{2.5} element concentration measurements for a nationwide monitoring network

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Filter Archive and Long Term Storage

CSN began sample collection in 2000. Teflon, Nylon, and Quartz filters are collected for every sampling event at every site. Teflon filters have been stored under refrigeration since 2003; Nylon filter extracts are stored under refrigeration for 6 months; and Quartz filters remnants (previously frozen) are stored under refrigeration since 2018. UC Davis maintains the current archive of close to 450,000 filters. As rental rates for cold storage have gone up significantly, we are considering options to reduce the space needed for long-term storage. Two options are being considered:

- Keep at least 5 years of both Teflon and Quartz filters in cold storage and rotate out older filters into room temperature controlled storage.
- Keep 1 year of Teflon filters in cold storage (per CFR requirements for FRM filters) and at least 5 years of Quartz filters in cold storage. Keep remaining filters in room temperature controlled storage.



Black Dust URG3000N Samplers

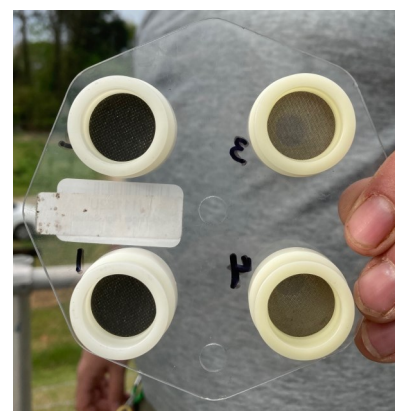
The network has identified that some of the quartz filters have been impacted by a contamination from the URG3000N sampler, potentially related to the rotation of the URG sampler head.

The potential contamination was identified based on data validation steps including a comparison between elemental carbon measurements from the Quartz filter and filter light absorption measurements from the Teflon filter. The cross-sampler comparison combined with reports that some quartz filters have visible black dust present and the observation of a rotating sampler head at one site led to the maintenance recommendations. UC Davis is working on a procedure for invalidation of impacted data .

If the quartz filters from your site are dark in color and/or the sampler cap rotates during sampling, we recommend cleaning the inlet cap, downtube, inlet tee, and cyclone assembly.

Thanks to many of you for reporting various pieces of this puzzle to us and to UC Davis for putting the pieces together.

For more information, please reach out to Melinda Beaver, beaver.melinda@epa.gov, URG, and CSNsupport@sonomatech.com.



Recently Purchased Super SASS 2 Samplers and Control Box Firmware Update

We've received reports that some CSN site operators have found that the controller for new Met One Super SASS 2 samplers is reporting incorrect summary/average values for some operational parameters (e.g., Temperature and Pressure). Samplers received since approximately January 2023 may be affected. Met One is currently working on a firmware update. If you are having issues with a recently purchased Super SASS 2 sampler, please reach out to Met One service at service.moi@acoem.com.



2024 National Air Monitoring Conference (NAAMC)

The National Ambient Air Monitoring Conference, will be held **August 12-15 in New Orleans, Louisiana** at the Sheraton New Orleans. The 2024 National Ambient Air Monitoring Conference, sponsored by EPA in conjunction with the Association of Air Pollution Control Agencies (AAPCA) and the National Association of Clean Air Agencies (NACAA) is a must for federal, state, local and tribal air pollution organizations involved with operating, planning, or managing air monitoring networks and reporting data to AQS, and/or AIRNOW. Essential training on air monitoring topics will help prepare you for future challenges of air monitoring.

The conference is intended to provide a national and international forum for EPA, State, local, tribal, international, and other agencies who are involved in implementing air monitoring programs.

For information and instructions on submitting abstracts, the conference website is located [here](#).

If you have questions about the conference, you can send them to: Colin Barrette barrette.colin@epa.gov. For exhibitor inquiries contact Erin Pittorino erin.pittorino@erg.com.



More details to follow!

CSN Contacts

Wondering who the right people are to contact regarding CSN? The current contacts are:

EPA Contacts

Program Lead: Melinda Beaver; beaver.melinda@epa.gov; 919-541-1062

Technical Point of Contact: Joann Rice; rice.joann@epa.gov; 919-541-3372

Quality Assurance: Doug Jager; jager.doug@epa.gov; 919-541-4804

Mega Performance Evaluation (PE) Program: Colin Barrette; barrette.colin@epa.gov; 919-541-5535

Regional Contacts

Region 1: Anne McWilliams; mckilliams.anne@epa.gov; 617-918-1697

Region 2: Gavin Lau; lau.gavin@epa.gov; 212-637-3708

Region 3: Lori Hyden; hyden.loretta@epa.gov; 215-814-2113

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Region 8: Josh Rickard; rickard.joshua@epa.gov; 303-312-6460

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Region 10: Will Wallace; wallace.will@epa.gov; 206-553-2495

General Contacts

CSNsupport@sonomatech.com and/or shal@rti.org

AQS User Support [AQS User Support | US EPA](#)

Ambient Air Monitoring Group (AAMG)

We plan, implement, and assess the nation's ambient air quality networks.

We collaborate with states, locals, tribes, instrument companies, researchers and colleagues at EPA and other Federal agencies to optimize the ambient air monitoring networks.

We provide oversight, guidance, and tools to ensure quality data for clean air decisions across the country.

