PFAS Onsite Analysis in a Mobile Lab

Cascade Technical Services now provides onsite analyses for per and polyfluoroalkyl substances (PFAS) through our MobiLab program.

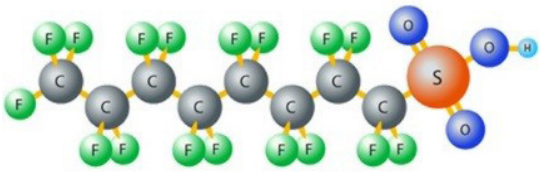

Figure 1 - perfluoroctane sulfonate

PFAS are a group of emerging contaminants associated with a variety of commercial products such as non-stick cookware, wires and cables, stain repellent treatments of fabrics, and food packaging, as well as in aqueous film forming foams used in aviation firefighting operations. These compounds are very persistent in the environment. The US EPA recently set a health advisory level for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) at 70 ng/L or parts per trillion.

Our PFAS MobiLab service complements our high resolution site characterization services such as Waterloo^{APS}, CORE^{DFN} and drilling and direct push services for efficient and effective site characterization of PFAS sites. PFAS analyses can be augmented with NELAP-accredited sample analyses for volatile organic compounds (VOCs) and semi volatile organic compounds (SVOCs) for complex contaminant mixtures such as those found at firefighting training areas at Department of Defense (DoD) sites.

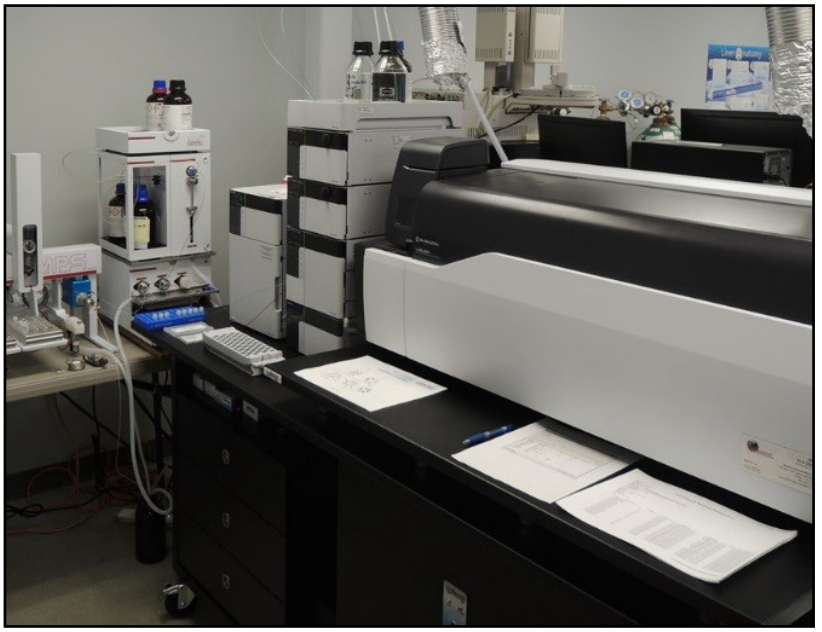

Figure 2 - Shimadzu Model 8050 LC/MS/MS

Onsite analyses provide rapid turnaround to allow for the use of dynamic work strategies as utilized in the Triad Approach to site characterization. These investigations reduce the uncertainty associated with conventional approaches and are cost effective.

Our standard analysis includes the 24 compounds as listed in the DoD's QSM, version 5.1. in water and soil matrices using state of the art LC/MS/MS. The method follows procedures set forth in modified EPA Method 537 and ASTM Method D7978/D7968. Sample preparation and injection may incorporate either direct sample injection or an in-line, solid phase extraction (SPE)/enrichment step.

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PFAS Analysis

The selection of the specific sample introduction/sample concentration technique is dependent on the detection limit requirements and/or the need for sample cleanup to remove matrix interferences. An internal standard calibration curve using labelled analogues of the target compounds is used for quantification. Detection limits are in the single digits to low tens of ppt levels. Cascade's analytical instrumentation includes Shimadzu Model 8050 LC/MS/MS and a Gerstel Multi-Purpose Sampling (MPS) unit for the direct injection and in-line SPE techniques. Sample cycle time is typically less than 25 minutes per sample with results available either the same day or the day after sampling The method needs only small water sample volumes to achieve low detection limits which makes vertical aquifer profiling more cost effective.

Figure 3- Gerstel Automated Multi-Purpose Sampling and SPE System

Cascade is currently seeking accreditation with the DoD's Environmental Laboratory Accreditation Program (ELAP) for this capability.

The mobile PFAS lab is housed in a self-contained trailer for mobilization and set up on sites for active site characterization.

Many PFAS sampling programs have encountered cross contamination issues which only become evident following demobilization. With MobiLab onsite, these issues can be recognized and rectified while still in the field.

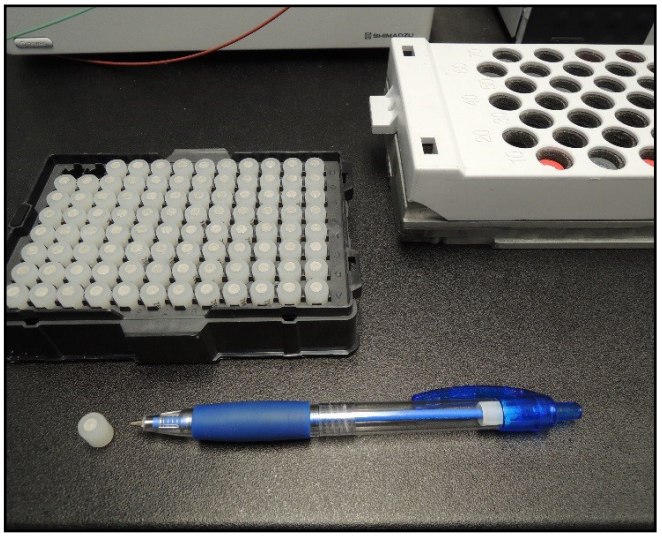

Figure 4 - Customized Solid Phase Extraction Cartridge

In addition:

- Field teams can spend the full day sampling without the need to spend the time to pack and ship sampling
- Because the lab is not charging on a per sample basis, extra QC samples can be collected to improve the quality of the data.