

PFAS Analysis

Integrated targeted analysis, precursor and organofluorine screening, high-resolution characterisation and specialist environmental applications



National Capability

Eurofins Environment Testing Australia provides PFAS analytical services through laboratories in Brisbane, Melbourne, Perth and Sydney. Available methods, matrices, analyte lists, reporting limits and accreditation status vary by laboratory and are confirmed during the quotation process.

PFAS in The Environment

Per- and polyfluoroalkyl substances (PFAS) are a diverse group of fluorinated substances used in industrial processes and consumer products. Their structures, properties, environmental behaviour and analytical measurability vary substantially. Legacy applications include aqueous film-forming foams, while other uses include textiles, food packaging, fluoropolymers and specialty industrial fluids.

Many PFAS are highly persistent; some are mobile, bioaccumulative or transform into persistent terminal products. PFAS have been detected in groundwater, surface water, soil, sediment, biosolids, air, biota and food. A well-designed investigation, therefore, requires methods selected for the matrix, expected compounds and project data-quality objectives.

Core Analytical Capability

- Targeted PFAS analysis using recognised methods, including US EPA Methods 533 and 537.1 for finished drinking water and US EPA Method 1633A for applicable aqueous matrices, soils, sediments, biosolids and fish or shellfish tissue.
- Laboratory-developed methods for extended analyte lists, specialist matrices and applications outside published method scopes, supported by fit-for-purpose validation or verification.
- Total Oxidisable Precursor (TOP) Assay to indicate oxidisable precursor compounds through changes in measured terminal products.
- Combustion ion chromatography for total fluorine and operationally defined organofluorine measurements, including TOF, EOF and AOF.
- Branched and linear isomer analysis for selected PFAS, and targeted analysis of neutral or volatile fluorinated compounds including fluorotelomer alcohols.
- LC-QToF-MS and GC-QToF-MS suspect and non-target screening to support identification of emerging fluorinated contaminants and environmental forensics.



Matrices

Routine environmental matrices	Specialist matrices and applications
Drinking water; groundwater and surface water; wastewater and landfill leachate; soil, sediment and biosolids; fish and shellfish tissue.	AFFF and firefighting products; air and source emissions; consumer products and textiles; food-contact, agricultural and industrial materials; cosmetics; fluoropolymer dispersions; battery-fire media; dielectric and immersion-cooling fluids.

Method selection, quality and data delivery

Eurofins operates dedicated PFAS work areas with controlled materials, consumables, workflows and contamination-monitoring practices. LC-MS/MS is used for trace-level targeted analysis, while GC-MS/MS and accurate-mass LC-QToF-MS or GC-QToF-MS support selected neutral, volatile, suspect and non-target applications.

Method framework

- US EPA Methods 533 and 537.1: finished drinking water within the applicable published scope.
- US EPA Method 1633A: specified aqueous matrices, soils, sediments, biosolids, landfill leachate and fish or shellfish tissue within the applicable scope.
- Laboratory-developed methods: extended PFAS panels, non-standard matrices and specialist applications supported by matrix-specific validation or verification.
- Project-specific QSM alignment: methods may be operated in alignment with applicable DoD QSM requirements where specified and within the performing laboratory's validated scope. Compliance should be agreed during quotation and data-quality planning.

Methods use method-specified isotopically labelled standards and isotope-dilution or internal-standard quantification as applicable to the analyte and method. Extraction, clean-up and quality-control criteria are applied in accordance with the selected method.

Complementary tools are not interchangeable

Tool	Primary information	Interpretive limitation
Targeted PFAS	Concentrations of specified individual analytes.	Does not describe unidentified PFAS or fluorinated substances outside the analyte list.
TOP Assay	Change in terminal PFAS after oxidation, indicating the presence of oxidisable precursors.	Operationally defined; may not represent all precursor classes or total PFAS.
TF/TOF/EOF/AOF	Operationally defined total or organofluorine fractions.	Does not identify individual PFAS and may include non-PFAS fluorinated substances viz., PPCPs.
HRMS screening	Suspect and non-target evidence for known and emerging compounds.	Identification confidence and quantification depend on standards, libraries and validation.

Reporting and project planning

- Standard analytical reports, agreed electronic data deliverables such as ESdat or EQUIS-compatible formats, and project-specific summary or validation packages may be available.
- Method suitability, analyte list, achievable reporting limits, quality-control requirements, hold times and accreditation status should be agreed before sample collection.
- Results from targeted PFAS, TOP Assay, organofluorine measurements and HRMS screening provide complementary information and should not be described as equivalent measures of total PFAS.

Reporting and project planning

Use laboratory-supplied containers and the instructions for the selected method. Minimise contact with fluoropolymer-containing equipment and PFAS-treated products where these could affect project objectives. Include field blanks, equipment blanks and other quality-control samples where required by the method, project plan or regulator.

Specialist applications

Lithium-ion battery and BESS fire investigations

Battery fires can require assessment of fluorinated compounds from firefighting agents, battery electrolytes, salts, and additives, as well as complex combustion products. Lithium hexafluorophosphate and other fluorinated battery constituents may generate degradation products during thermal runaway incidents.

- PFAS analysis of firewater, runoff, groundwater, soil and sediment.
- Targeted analysis of fluorinated compounds associated with electrolytes and degradation products.
- Total fluorine and organofluorine measurements by combustion ion chromatography.
- LC-QToF-MS and GC-QToF-MS screening for emerging fluorinated contaminants.
- Characterisation of contaminants in suppression waters and impacted environmental media to support remediation, waste classification and environmental risk-assessment programs.



FIT-FOR-PURPOSE DESIGN

Specialist work should begin with a defined decision question, expected compound classes, sample matrices, target reporting limits, a quality-control plan, and the required accreditation status. Targeted and screening methods can then be combined without overstating what any individual measurement represents.

Data centres and immersion-cooling fluids

Advanced thermal-management systems may use highly fluorinated dielectric or heat-transfer fluids. Environmental assessment may be required during manufacture, operation, maintenance or accidental releases. Conventional targeted PFAS methods may not fully characterise all constituents as fluid chemistries evolve.

- Environmental monitoring associated with data-centre operations and accidental releases.
- Characterisation of fluorinated dielectric and immersion-cooling fluids.
- Analysis of potentially impacted groundwater, surface water and soil.
- Targeted PFAS analysis, TOF/EOF/AOF, and high-resolution suspect or non-target screening for fluorinated replacement chemistries.
- Source characterisation and environmental forensic investigation.

Stationary-source emissions

Industrial processes, waste treatment, remediation systems, thermal destruction technologies, manufacturing and energy-generation facilities may release PFAS and other fluorinated compounds to air. Eurofins provides integrated source testing, sampling and analytical services for atmospheric emissions.

- Isokinetic stack sampling by experienced source-testing personnel.
- Sampling of combustion systems, thermal treatment units, incinerators, remediation systems and industrial process vents.
- PFAS stack-emissions testing in accordance with US EPA OTM-45 where applicable.
- Analysis of volatile and semi-volatile compounds, including fluorotelomer alcohols, fluorotelomer acrylates and related precursor compounds using approaches including US EPA OTM-50.
- Analysis of liquid impinger solutions and associated stack-sampling media, plus HRMS screening for emerging fluorinated contaminants.
- Support for compliance monitoring, process optimisation, and destruction or removal-efficiency studies.

PFAS NEMP 3.1, accreditation and assurance

Support for PFAS NEMP 3.1 investigations

The PFAS National Environmental Management Plan Version 3.1 provides nationally consistent guidance for assessment, management and remediation of PFAS-impacted sites. Eurofins supports consultants, industry and regulators with analytical services aligned to project data-quality objectives, including site assessment, conceptual site-model development, source identification, remediation verification and environmental forensics.

Targeted PFAS analysis may be combined with TOP Assay, organofluorine measurements and high-resolution screening where precursor compounds, unknown PFAS or unidentified sources are suspected. The analytical program should be matched to the investigation objectives and interpreted with the limitations of each method clearly recognised.

Accreditation and quality assurance

Eurofins Environment Testing Australia laboratories in Brisbane, Melbourne, Perth and Sydney hold NATA accreditation against ISO/IEC 17025:2017; the current accredited location, matrix, analyte, method and reporting limit must be confirmed against the applicable scope or quotation.

- Selected services may be aligned with DoD QSM 6.0 Table B-24 where required by the project and within the performing laboratory's validated scope.
- Eurofins has participated in the National Measurement Institute PFAS proficiency-testing program since 2015. Participation and performance information may be discussed where disclosure is permitted.
- Ongoing proficiency testing and interlaboratory comparison provide external evidence for evaluating results, monitoring continuing performance, identifying improvement opportunities and assessing comparability.

Client value

Requirement	Eurofins response
Routine compliance	Recognised targeted methods, agreed reporting limits, defined QC and accredited testing where available.
Complex source investigation	Targeted PFAS, precursor assessment, organofluorine measurements, isomer information and environmental forensic support.
Unknown or emerging chemistry	Accurate-mass LC-QToF-MS and GC-QToF-MS suspect and non-target screening.
Specialist incidents	Integrated support for battery fires, cooling-fluid releases, AFFF, industrial products and stationary-source emissions.
Large or multi-site programs	Multiple Australian laboratory locations, dedicated PFAS workflows and agreed electronic data deliverables.

Before submitting samples

Confirm the decision objective, matrix, analyte list and required method.

- Confirm containers, preservation, hold times, field QC and contamination-control requirements.
- Confirm reporting limits, turnaround time, electronic deliverables and validation package needs.
- Confirm whether NATA accreditation, QSM alignment or another project-specific requirement applies.
- Discuss unusual matrices or expected high concentrations before collection so dilution, clean-up and method suitability can be planned.

Available methods, analyte lists, reporting limits and accreditation status are confirmed during quotation.

