

## **PFAS Analysis by Total Oxidizable Precursor Assay (TOP Assay)**

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**Background/Objectives.** Current analytical methods detect and quantify a very small portion of perfluoroalkyl substances (PFAS) that exist in the environment. In many fire-fighting foams and other products containing PFAS, the bulk of these chemicals may be tied up in more complex molecules and polymeric compounds.

**Approach/Activities.** To obtain a more accurate total PFAS that is present, a method known as total oxidizable precursor assay (TOP Assay) is being utilized. The TOP assay is a standardized pre-treatment of waters or sample extracts capable of revealing the presence of PFAS that may, given time, weather to perfluorinated alkyl substances of concern.

**Results/Lessons Learned.** Under the conditions of the assay, fluorotelomer sulfonates are broken down to shorter chain carboxylates by cleavage of the non-fluorinated portion of the molecule. Perfluorinated carboxylates and sulfonates remain intact under the conditions of the assay. This includes both alkaline and heat-activated persulfate, both of which are used in the TOP assay. TOP assay is a useful tool in exposing the potential for ongoing contamination by PFAS compounds through biotic and abiotic weathering processes. There may also be a case to expand analytical suites to cover other PFAS that may arise from weathering that might include some oxidation and hydrolysis, and, ideally, to have better models for predicting environmental endpoints of AFFF degradation.