

PFAS Contaminated Sites Risk Assessment

Outcome of a recent Swedish policy/expert workshop

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Background

Targeted analysis of PFAS includes everything from a few percent to, say, 80% of the content of PFAS in contaminated soil and groundwater

We can't say which specific substances are present within the site



Physico-chemical properties and toxicological data is limited or even non-existent for the majority of PFASs

Is risk assessment of PFAS as a group a way forward?

National workshop on Risk assessment of PFAS

- Purpose of WS – Discuss how to characterize and assess the risk of PFAS contaminated sites
- Authorities, researchers, consultants, laboratories

Shortcomings of the methodology we use today

How to account for a spectrum of PFASs even though we have a significant lack of knowledge?

Possible improvements



Use of different methods for chemical analysis

Risk assessment

Methodology based on individual compounds

- Need to be based on assumptions about the properties of the compounds (both physico-chemical and toxicological)
- Need to be based on policy decisions, e.g. what compounds are to be taken into account
- Threshold of Toxicological Concern (TTC)

Methodology taking PFAS as a group into account

- Different methods for risk assessing a mixture were discussed
 - Hazard index (HI)/Toxic units (TU)
 - Relative potency factors (RPF)
 - Effect based methodology (e.g. in vitro test, in vivo test, biomarkers)

$$HI = \sum_i HQ_i = \frac{Dose_1}{Ref_1} + \frac{Dose_2}{Ref_2} + \dots$$

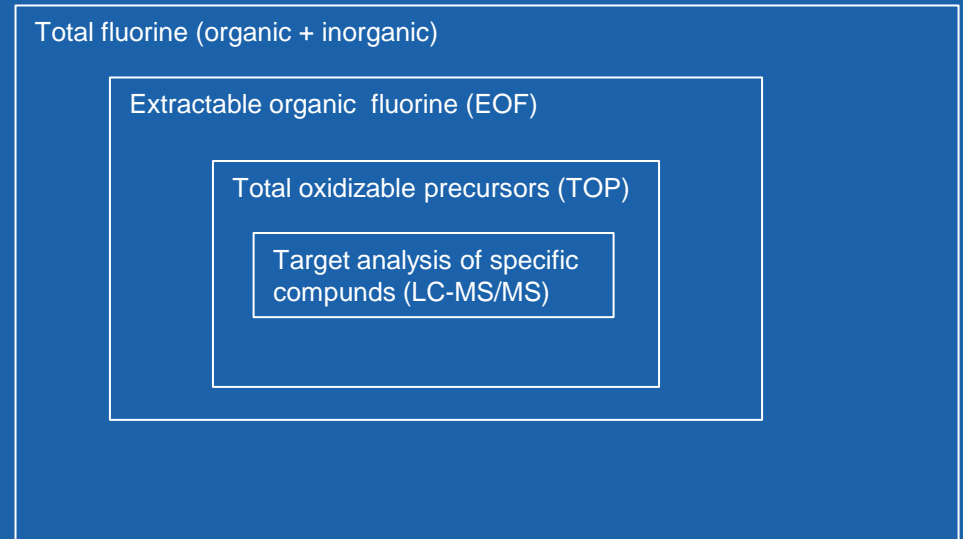
Broader chemical analysis methods

Limitations

- No information on content of specific substances a problem
- Lack of guidance values for total concentration of PFAS
- Background values of total PFAS unknown
- Methods are not standardized

Possibilities

- A tool for determining whether PFASs have been used at the site
- A tool to delineate a pollution distribution, and thereby be a support in the design of the mapping of the pollution picture
- Together with target analysis of, say, ΣPFAS_{20} , a measure of the uncertainty in the risk assessment
- A tool for following up a cleanup action.



Conclusions

- At present, a risk assessment should be based on individual compounds quantified by LC-MS/MS
- It will be difficult to design a risk assessment methodology based solely on a scientific basis. A greater or lesser element of policy-based decisions will be required.
- Broader analysis methods such as TOP and EOF could be of some use for assessing the risks posed by a contaminated site, a need for standardization
- An urgent need for guidance on how to assess the risks of PFAS contaminated sites

Thank you!