



PFAS information reported to the US Toxics Release Inventory

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Addition of certain PFAS to the TRI

National Defense Authorization Act :

- Section 7321(b) automatically added 172 PFAS to TRI reporting for reporting year 2020, and an additional 4 PFAS for reporting year 2021
- Section 7321(c) indicates that certain EPA activities involving PFAS trigger automatic additions to the TRI list
 - E.g. EPA finalizing a toxicity value for a PFAS will add it to the TRI list
 - Effective date will be January 1 of the following year with a 100 lb reporting threshold

Addition of certain PFAS to the TRI

Updates on Implementation:

- For Reporting Year 2022 (data collected by July 1, 2023), 180 PFAS are reportable.
- For Reporting Year 2023 (reporting forms due by July 1, 2024), the NDAA automatically added nine additional PFAS to the TRI list for a total of 189 PFAS. The addition of these nine PFAS was codified in a final rule in June 2023.
- Proposed Rule issued in December 2022 that would add PFAS subject to TRI reporting to the list of Chemicals of Special Concern, which would:
 - Eliminate the use of the *de minimis* exemption,
 - Eliminate the option for facilities to use the shorter reporting form (Form A),
 - Limit the use of range reporting for covered PFAS, and
 - Result in a more complete picture of releases and other waste management for TRI-listed PFAS

PFAS Data in the 2021 TRI National Analysis

PFAS

What are PFAS?

PFAS (per- and poly-fluoroalkyl substances) are synthetic chemicals that do not occur naturally. Strong carbon-fluorine bonds in PFAS make them resistant to degradation and thus highly persistent in the environment. Industry uses PFAS to make a wide variety of products such as apparel, paper, plastics, and food packaging.



Health effects of exposure

Most people in the United States have been exposed to PFAS. Current scientific research suggests that exposure to high levels of certain PFAS may lead to adverse health outcomes. However, research to assess the health effects of exposure to PFAS is still ongoing.

U.S. EPA, "Our Current Understanding of the Human Health and Environmental Risks of PFAS"

PFAS releases in TRI

The **hazardous waste management** sector reports the most releases. Most PFAS releases are **disposed of in regulated landfills**.



U.S. EPA TRI, Reporting Year 2021

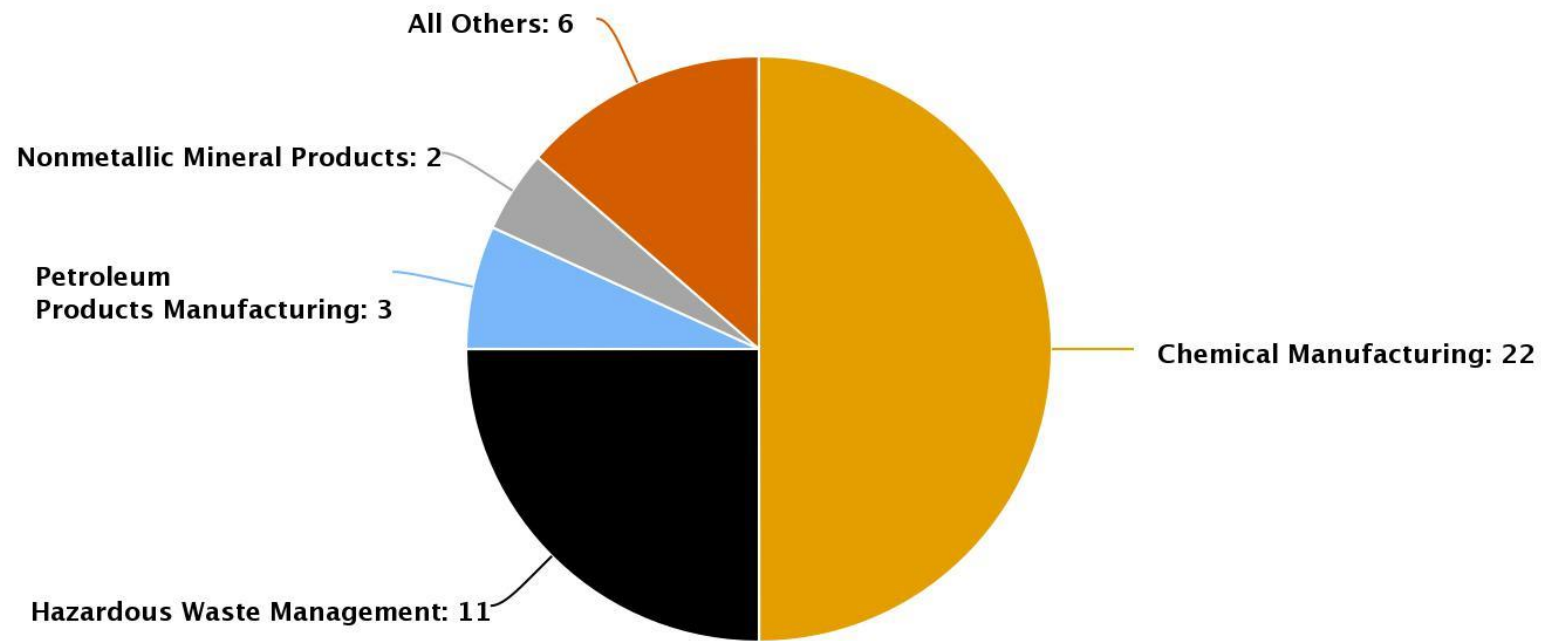
44 facilities submitted TRI forms for PFAS for 2021

 Facilities initiated 11 source reduction activities for PFAS in the past 2 years.

U.S. EPA TRI, Reporting Year 2021

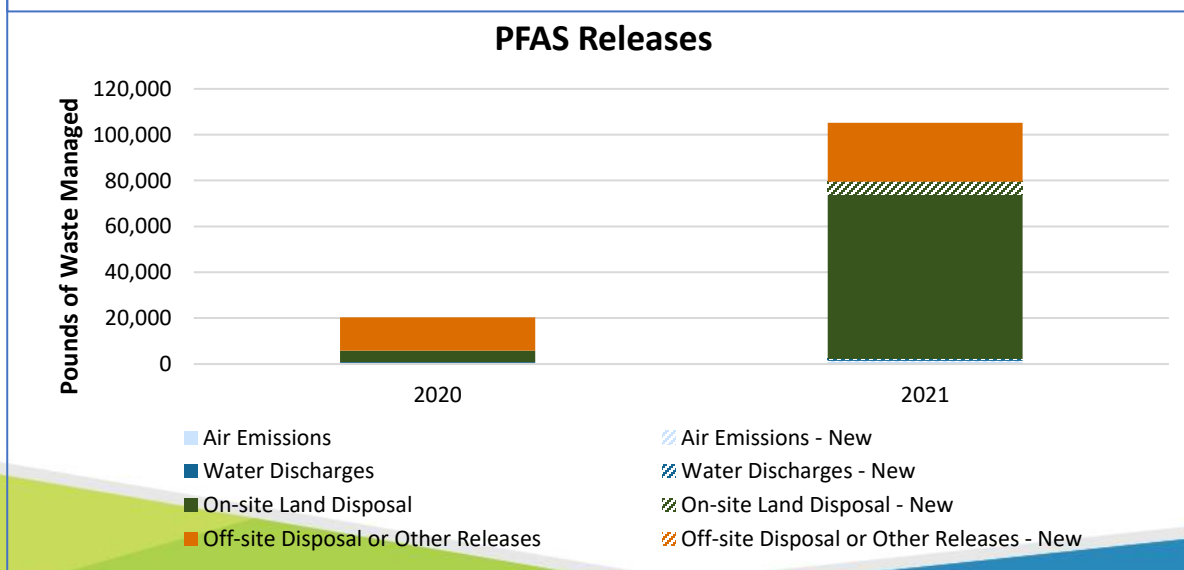
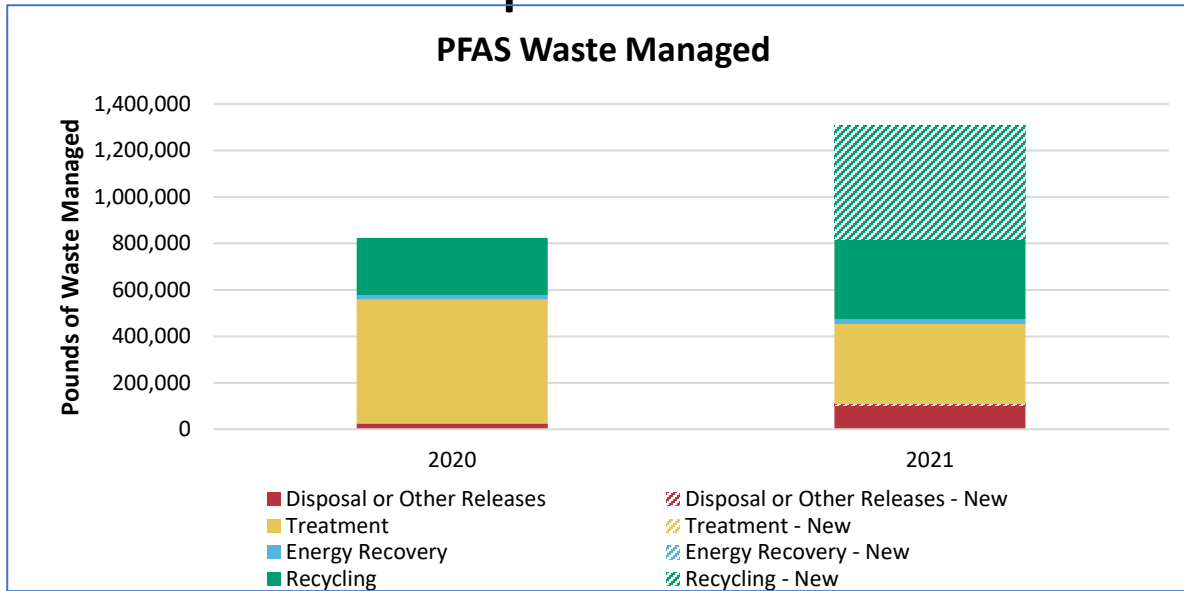
PFAS Data in the 2021 TRI National Analysis

Number of Facilities Reporting PFAS by Sector, 2021



- Most facilities reporting PFAS were in the chemical manufacturing sector or the hazardous waste management sector.
- Facilities reported 44 different PFAS for 2021. The most reported PFAS were perfluorooctanoic acid (PFOA), hexafluoropropylene oxide dimer acid (HFPO-DA), and perfluorooctanesulfonic acid (PFOS).

PFAS Comparison 2020 vs. 2021



Forms:

- 2021: 44 facilities submitted 89 forms
- 2020: 41 facilities submitted 95 forms

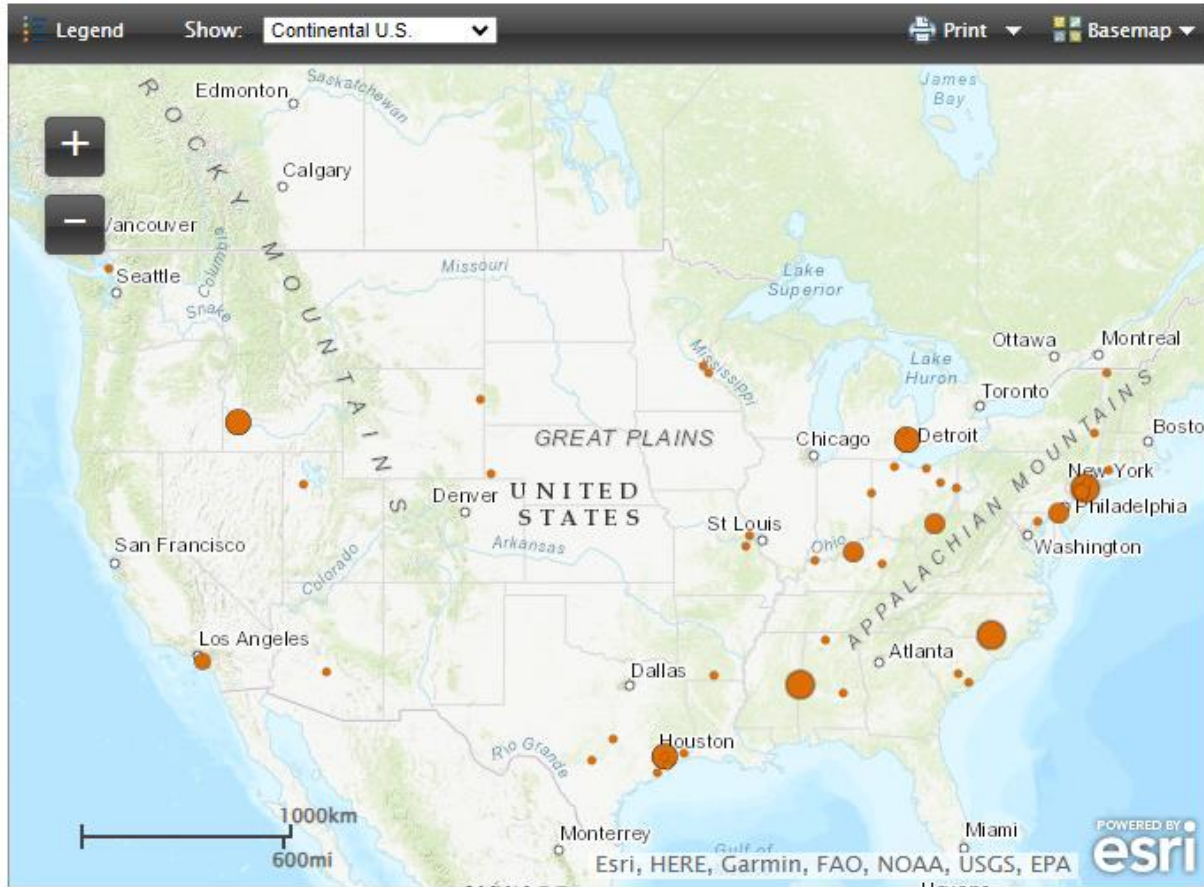
PFAS waste managed increased by 59%.

- The increase was driven by a newly added chemical (perfluorooctyl iodide).

PFAS releases were about 5 times higher in 2021 than 2020.

- Increase driven by the hazardous waste management sector.
- One hazardous waste facility reported an increase of 68,500 pounds of PFAS releases.

PFAS-reporting Facility Locations and Demographics



- 56 distinct facilities over 2 years of reporting (2020 – 2021)
- Demographic Index
 - 6 (of 56) are in census blocks with demographic index greater than 80th percentile
 - 30 are in areas with demographic indices greater than the national median (>50th percentile)
- Supplemental demographic index
 - 15 facilities in census blocks greater than the 80th percentile
 - 16 in census blocks between the 60th and 80th percentiles
- Three facilities with largest releases are in census blocks with demographic index percentiles of 90
 - These facilities accounted for 74% of PFAS releases for 2020 and 2021
 - Inconclusive of skew towards communities of concern: 50% disposed in RCRA Subtitle C landfill and 22% transferred off site.
 - Facilities are in AL, NC, and NJ

PFAS & Pollution Prevention

- **2020:** 2 facilities reported 4 source reduction activities to TRI
- **2021:** 4 facilities reported 7 source reduction activities to TRI
 - Material substitutions and modifications (4), product modifications (2), and process and equipment modifications (1)
- Optional text comments corresponding to Source Reduction Activities
 - Reformulated a product to remove an ingredient containing PFAS as an impurity (chemical manufacturing, Ohio)
 - Substituted non-PFAS chemistry for fume control (fabricated metals, Ohio)
 - Finding alternative for component currently used in aqueous film forming foam (AFFF) (chemical, Michigan)
 - Replacing fire-fighting foams containing PFAS with fluorine-free foams (petroleum, Texas) and replacing AR-AFFF material with synthetic foam in 2023 (general warehousing and storage, Vermont)

PFAS & Other Optional Information

Source Reduction

- Material is obsolete; none will be used after July 2022.(Soap and Other Detergent Manufacturing)

Pollution control (Chemical and Plastics and Rubber Facilities)

- Installed a Thermal Oxidizer in late 2019, reducing process emissions at an efficiency greater than 99%.
- Installed carbon beds on vent
- Several carbon adsorption treatment units for waters.
- Dilute stream concentration using ultrafiltration to allow shipping for off-site recycle.

Barriers and Other Environmental Practices (Hazardous Waste Facilities)

- Wastes that qualify are sent for energy recovery or recycling.
- Waste streams are treated through the wastewater treatment plant or the chemical fixation building.
- Primary service offered is treatment by incineration of hazardous chemicals from off-site generators.
- Waste streams vary in volumes and constituent concentrations. Applicable regulatory limits are met prior to land disposal.



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Resources:

- TRI homepage: <https://www.epa.gov/tri>
- TRI National Analysis: <https://www.epa.gov/trinationalanalysis>
- TRI Data & Tools: <https://www.epa.gov/toxics-release-inventory-tri-program/tri-data-and-tools>
- Agency PFAS information: <https://www.epa.gov/pfas>

Prevention of PFAS pollution & Monitoring of PFAS environmental releases

OECD Webinar - 12/10/2023 - Nicolas HUMEZ

www.sarpi.veolia.com

MAÎTRISER DURABLEMENT LE RISQUE DÉCHET
POUR PÉRENNISER L'ACTIVITÉ INDUSTRIELLE
ET LE DÉVELOPPEMENT DES TERRITOIRES



Disclaimer

The information contained in this statement is based on the Veolia group's understanding and know-how of the scientific and technical fields discussed herein as of the time of publication. Statements that may be interpreted as predictive of future outcomes or performance should not be considered guarantees of such, but rather reasoned assessments of the possible evolution of the technologies described. As this document is based on the state of the Veolia group's scientific, technical, and regulatory knowledge at the time of its publication, the completeness and accuracy of the information contained herein cannot be guaranteed.

Descriptions contained herein apply exclusively to those examples and/or to the general situations specifically referenced, and in no event should be considered to apply to specific scenarios without prior review and validation

What PFAS are?

>9200 substances - C_nF_{2n+1}

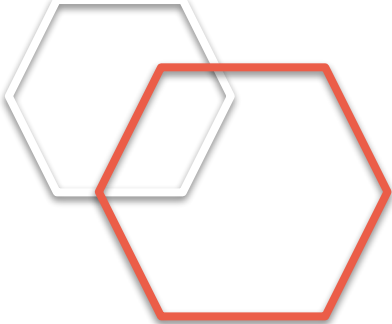
- Super-strong carbon-fluorine bonds
- Persist in the environment longer than any other man made substances
- Some substances are recognized to be: Bioaccumulative, long half life in humans, Toxic: PBT, vPvB , PMT, vPvM (Mobile), C/R
- Large range of applications in all areas of society: firefighting foams, coating additives, electronics, non-sticky frying pans, textiles, cleaning products, cosmetics and in industrial processes,...
- Some resist fire, other repel water , oil and stains



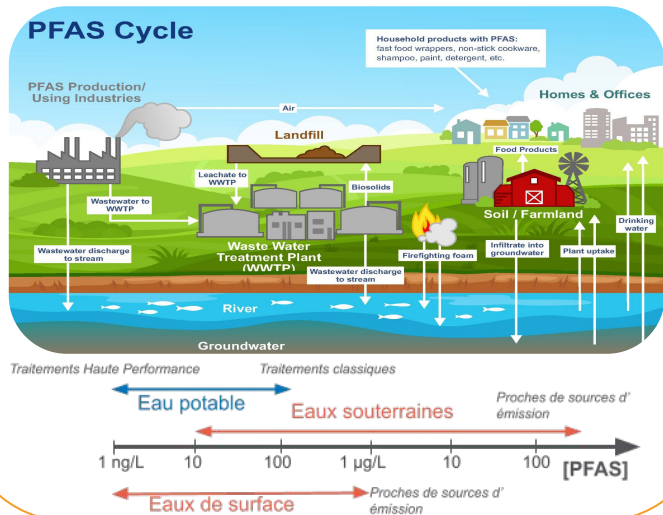
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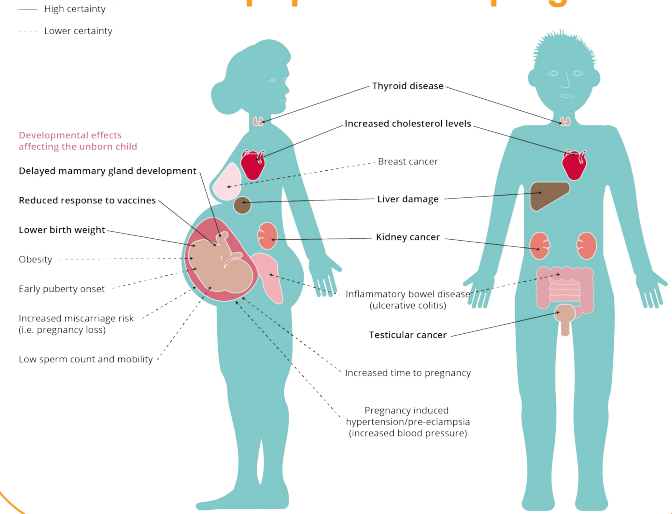
Where are PFAS?



In the Environment Very mobile in water



In human body 100% of the population impregnated



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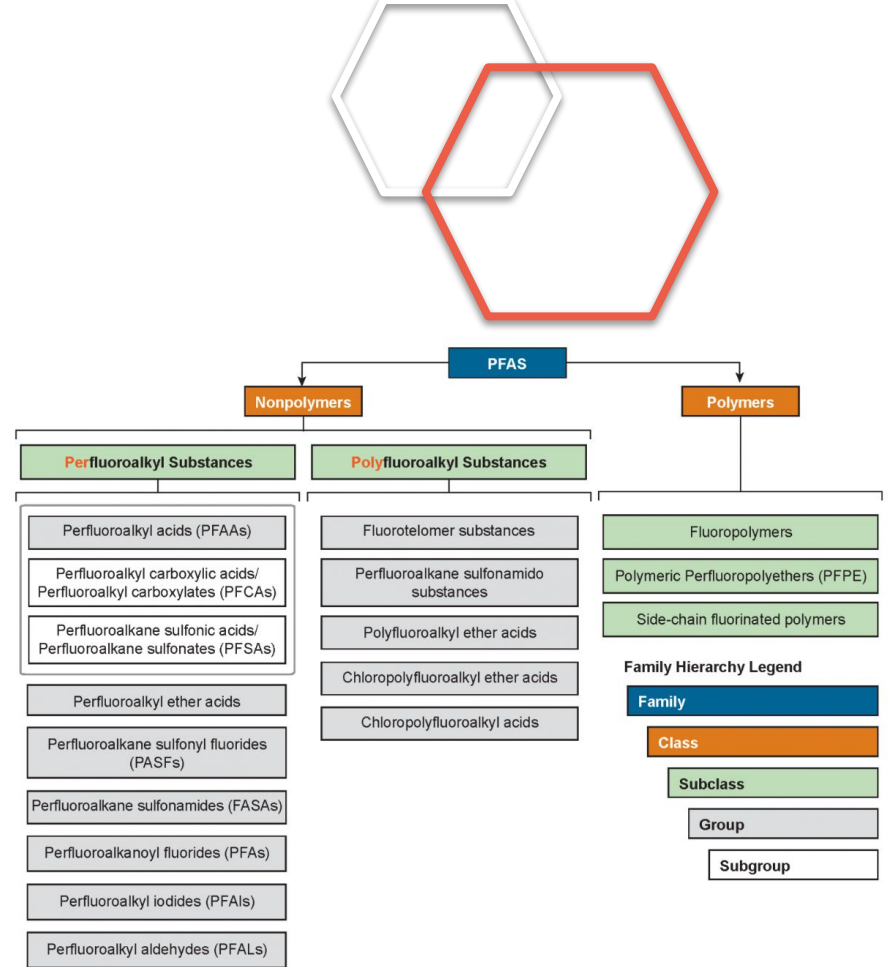
Do we have the big picture?

< 1%

The fraction of known PFAS monitored by targeted analysis

> 99%

Unknown PFAS



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An emerging regulation in Europe with different approaches among Member States

Quality & Emissions

Water

Drinking Water, by 2026:

$\sum 20\text{PFAS} < 0,1\mu\text{g/l}$ or
 $\text{PFAS}_{\text{Tot}} < 0,5\mu\text{g/l}$

Surface / underground Water:

At EU level: PFOS/PFOA = Haz Priority Subs.
=> Extension to 22 other PFAS (**Tox Eq.**)

FR, new monitoring of PFAS for good state of water bodies
(5 surface & 14 underground)

National monitoring campaign just starts

Releases from waste treatment facilities:

PFOS/PFOA monitoring every 6 months
FL: 46 PFAS, ELVs $< 0,01\mu\text{g/l}$

Air

Nothing for PFAS in general

For POP-PFAS

- PFOS, PFOA & PFHxS
- POP-PFAS waste means waste with POP-PFAS > Annex IV POP Reg. levels
- DE / DRE = 99.99% / 99.9999%

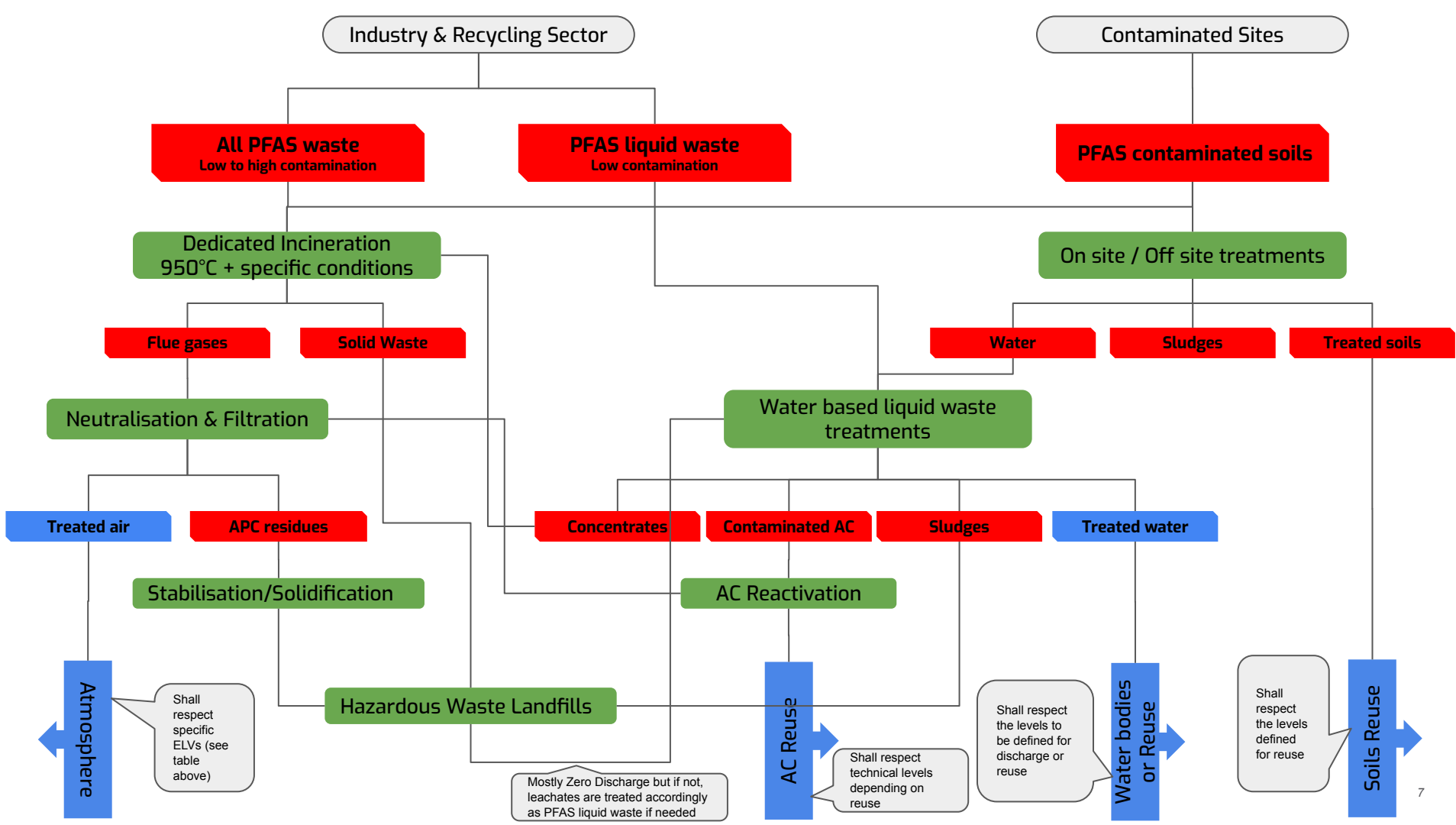
Quality Standards

Tolerable weekly Intake (EFAS)

$2\text{ pg/kg (PCDD/F \& PCB-DL)} < 4,4\text{ ng/kg}$
 $(\text{PFOS} + \text{PFOA} + \text{PFNA} + \text{PFHxS}) < 4\text{ }\mu\text{g/kg (Hg inorganic)}$

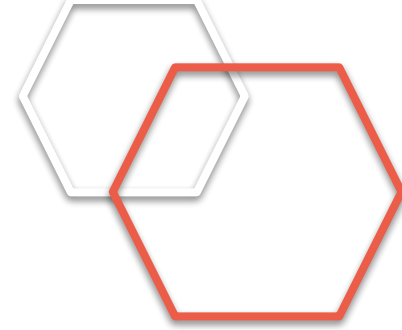
Environmental Quality Standard (EU Directive)

$0,65\text{ ng/l (PFOS)} < 1,6\text{ ng/l (HBCDD/BFR)} < 1200\text{ ng/l (Pb and comp.)}$





The wish list



- Common standard methods for emissions to water and emissions to air (index methods)
- Standards for PFAS analysis in ALL kind of waste (solid waste, Oily waste, complex and multiphasic waste (index methods)
- What is a PFAS waste?
- Definition of harmonised and practicable ELVs for emissions to water and emissions to air
- Transparency and traceability about the presence of PFAS in waste