

The wastewater treatment plant as the waste manager of last resort

Louise Reeves & Georgina Davis

Queensland Water Directorate

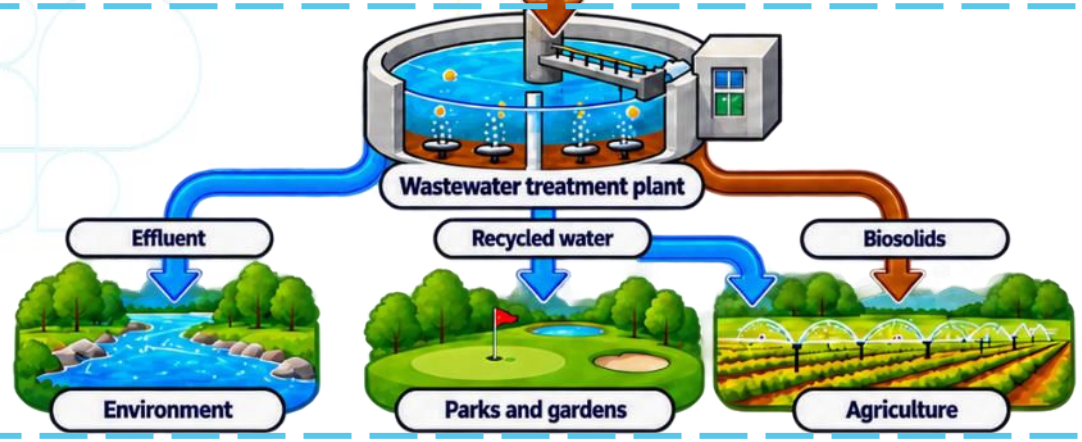
About *qldwater*

- Queensland's central **advisory and advocacy** body for urban water and sewerage services.
- We bring water service providers together to support **safe, secure and sustainable services**.
- Our members include all Queensland **local government** owned **water service providers**, plus state owned authorities and sector partners.
- Member utilities range from Urban Utilities' 680,000+ water connections to Croydon Shire Council's 142.

The urban water connection



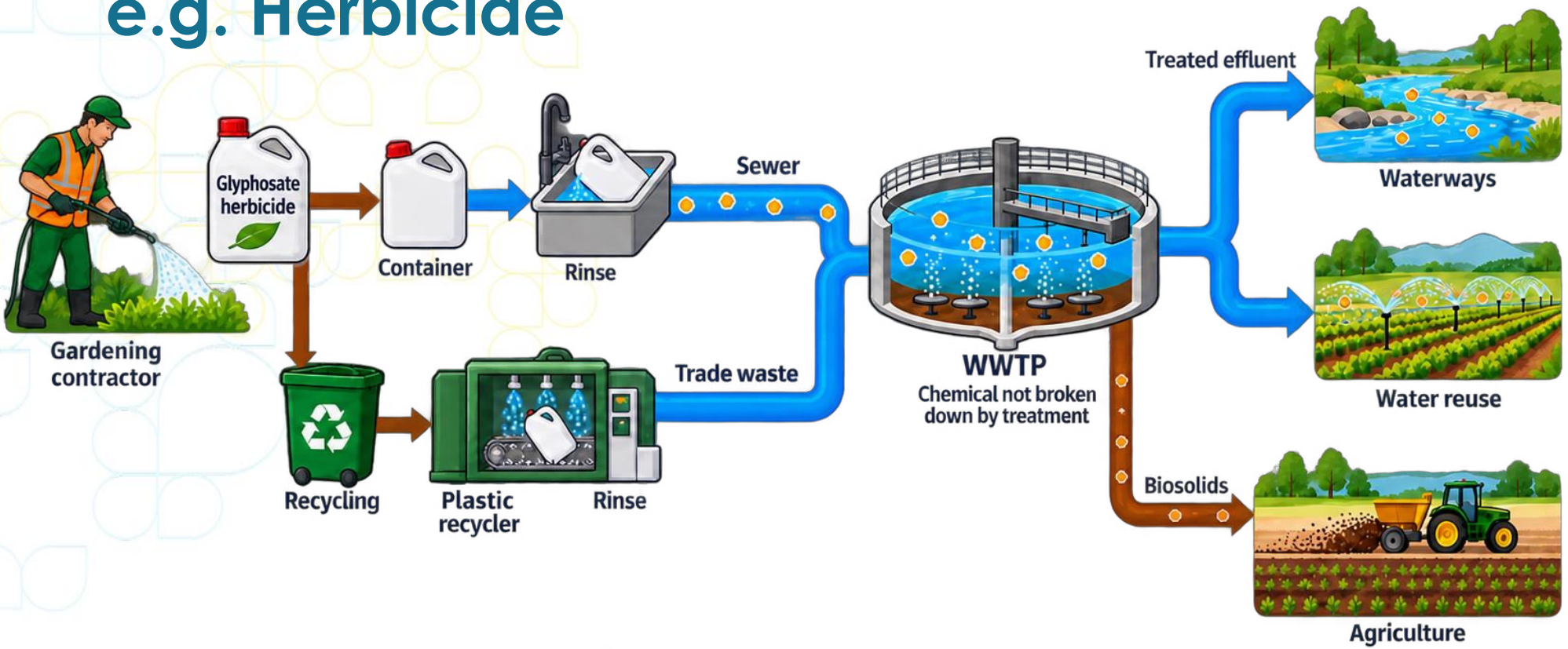
Waste sector



Urban water

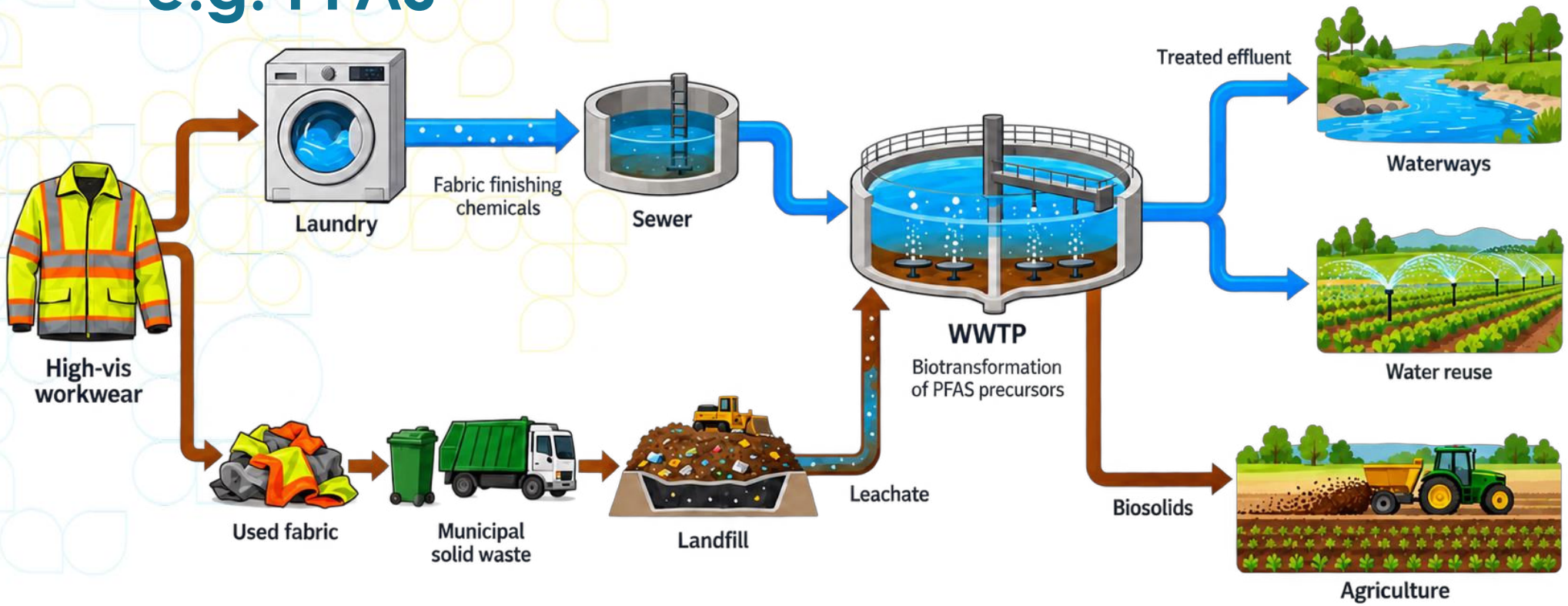
How contaminants reach wastewater

e.g. Herbicide

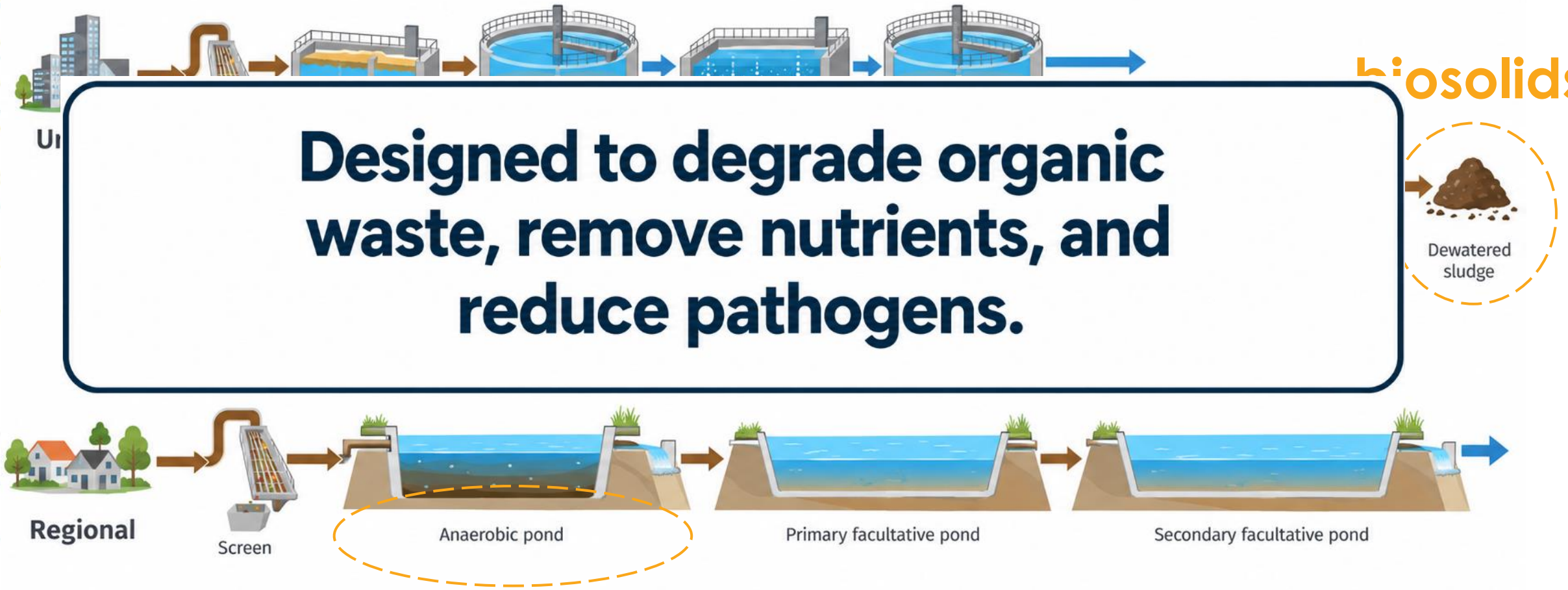


How contaminants reach wastewater

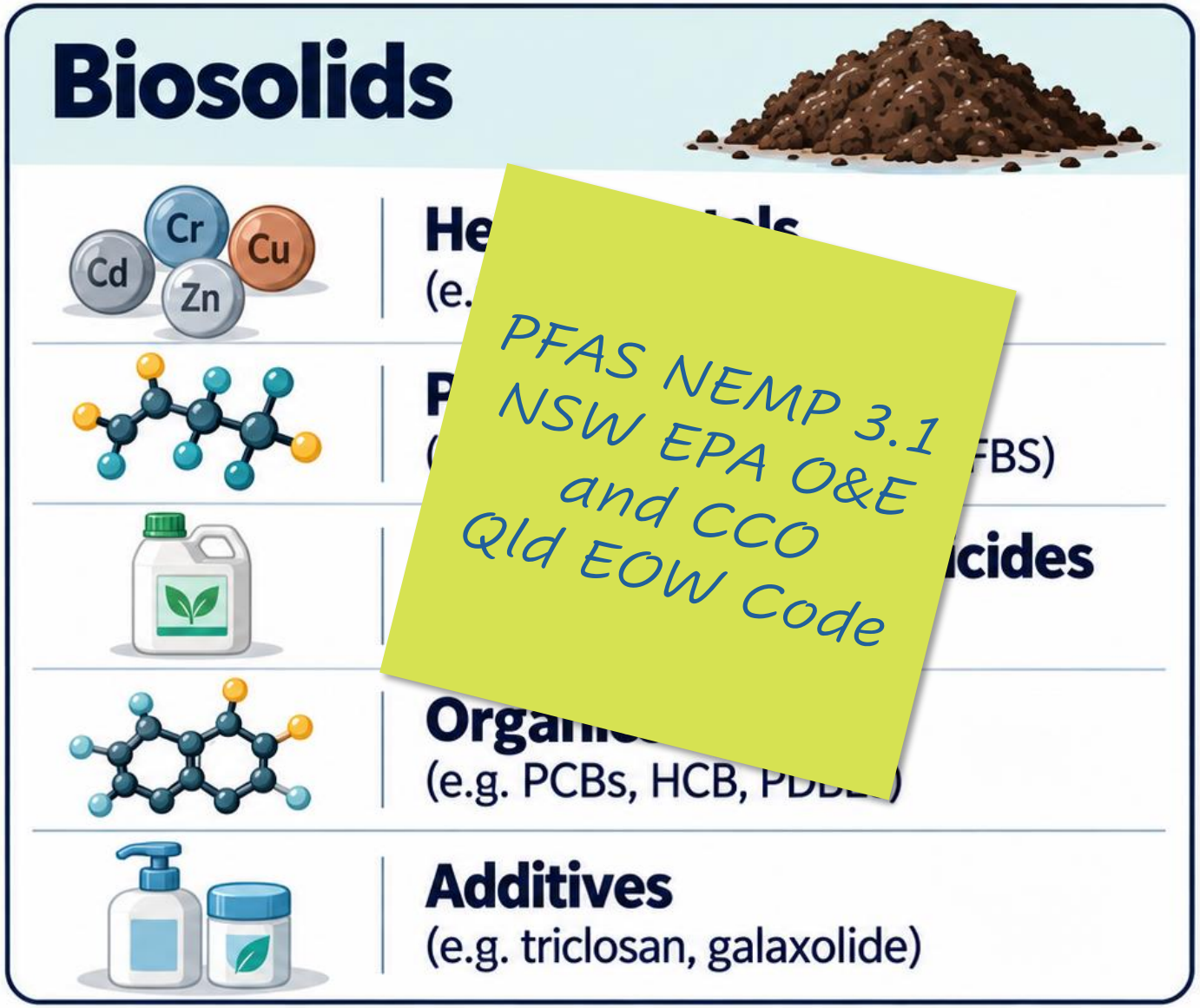
e.g. PFAS



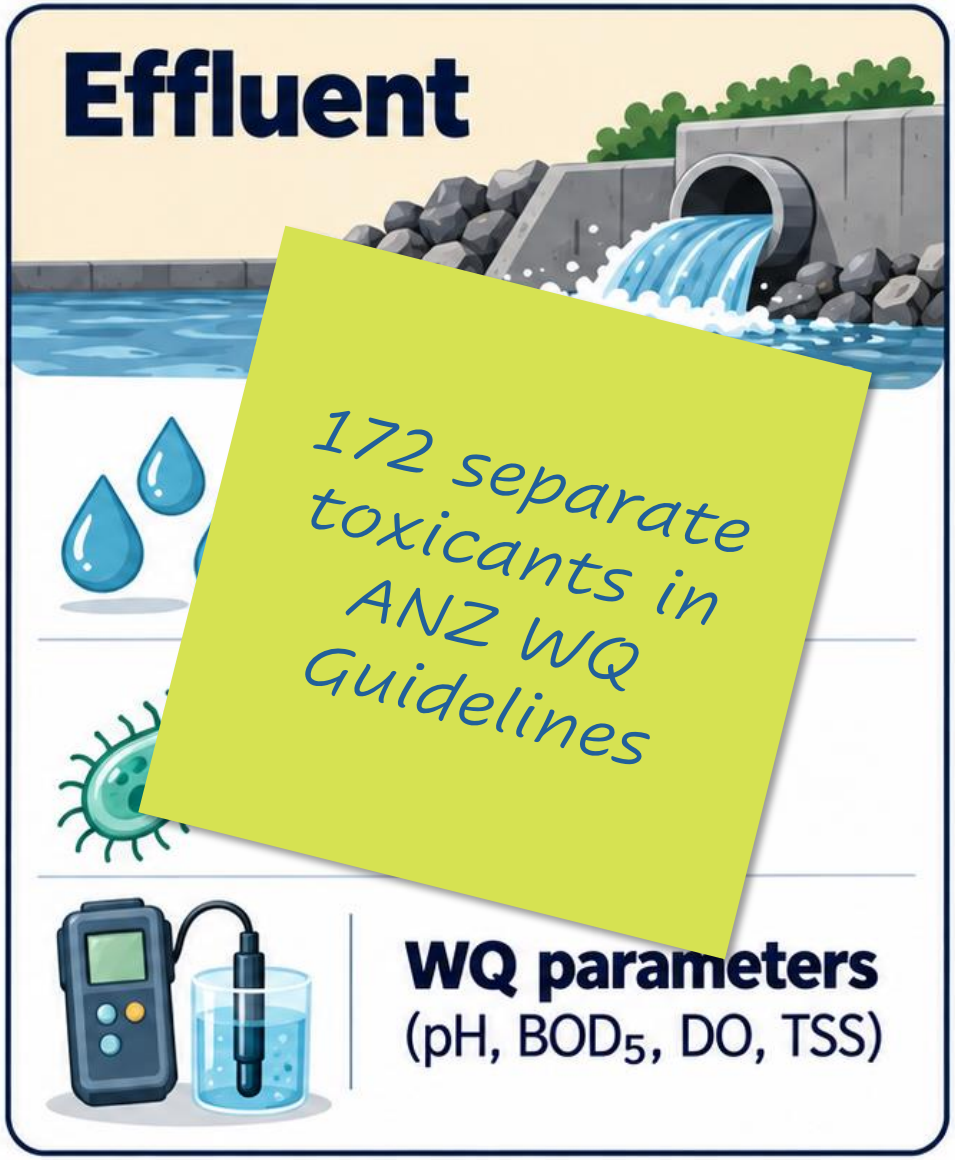
What treatment can and cannot do



Regulatory pressures



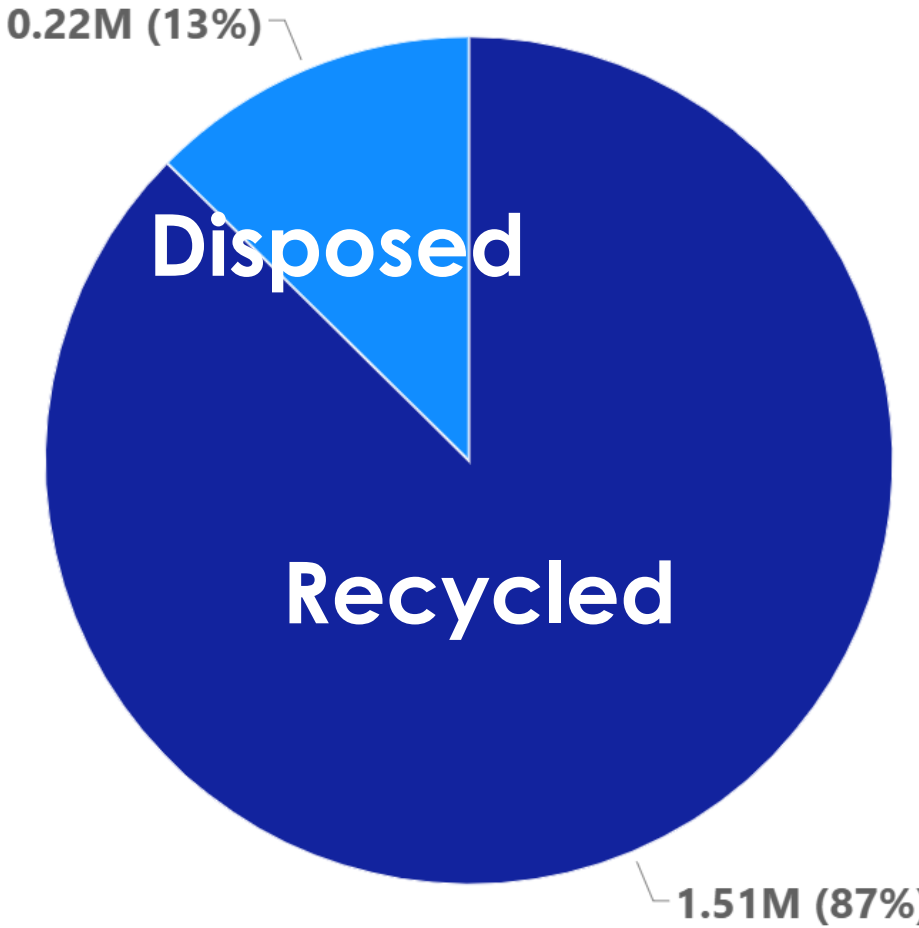
PFAS NEMP 3.1
NSW EPA O&E
and CCO
Qld EOW Code



172 separate toxicants in ANZ WQ Guidelines

Why biosolids matter

- Biosolids are a valuable agricultural resource
  - Organic carbon
  - Macronutrients: N, P, K, S
  - Micronutrients: Cu, Zn, Ca, Mg, Zn etc
- Valuable local source
  - Reduces reliance on imported fertilizers
  - Nutrient intensive crops e.g. cotton, pasture



DCCEEW National waste and resource recovery report 2026

Why “just landfill it” is difficult

Physical properties

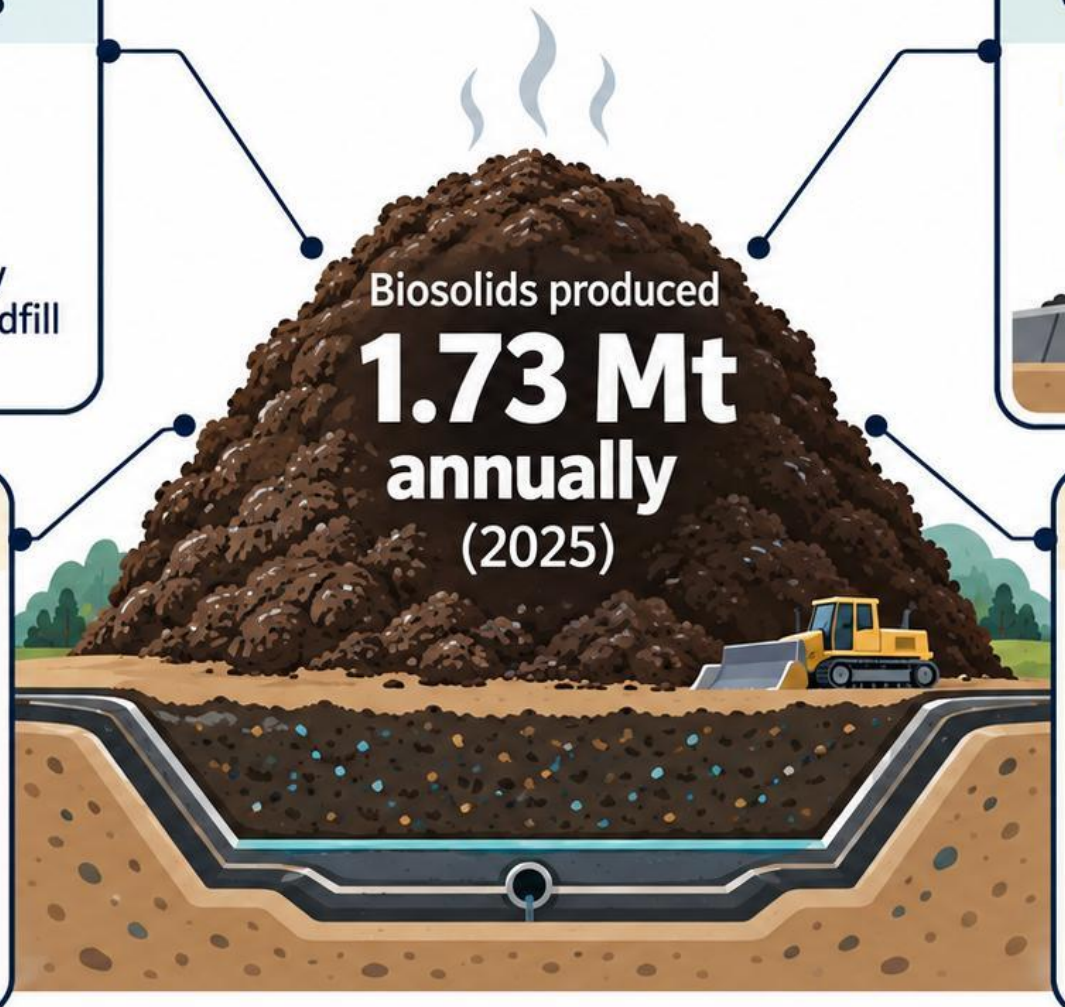
60–80% water

Geotechnically unstable in landfill

Capacity

Landfill capacity is inadequate





Costs



Transportation costs

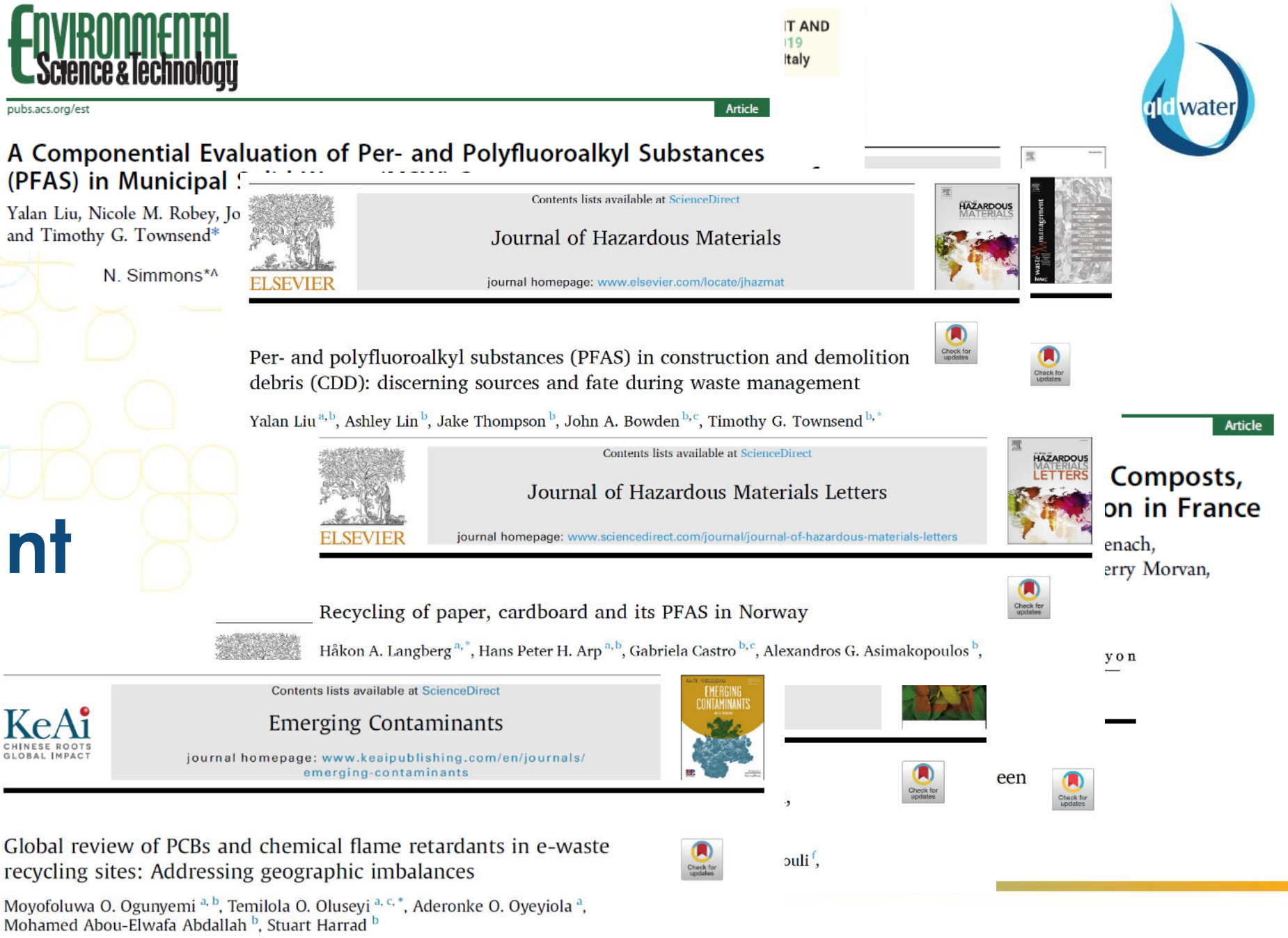
Gate fees and waste levy

Regulation & contaminants

Classification as regulated waste

Contains PFAS

Where are the contaminant risks?



Environmental Science & Technology

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Article

A Componential Evaluation of Per- and Polyfluoroalkyl Substances (PFAS) in Municipal

Yalan Liu, Nicole M. Robey, Jo
and Timothy G. Townsend*

N. Simmons*^

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ELSEVIER

Per- and polyfluoroalkyl substances (PFAS) in construction and demolition debris (CDD): discerning sources and fate during waste management

Yalan Liu [a,b], Ashley Lin [b], Jake Thompson [b], John A. Bowden [b,c], Timothy G. Townsend [b,*]

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erry Morvan,

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Håkon A. Langberg [a,*], Hans Peter H. Arp [a,b], Gabriela Castro [b,c], Alexandros G. Asimakopoulos [b],

yon

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Moyofoluwa O. Ogunyemi [a, b], Temilola O. Oluseyi [a, c, *], Aderonke O. Oyeyiola [a], Mohamed Abou-Elwafa Abdallah [b], Stuart Harrad [b]

ouli [f],

Chemical profiling of industrial wastewaters

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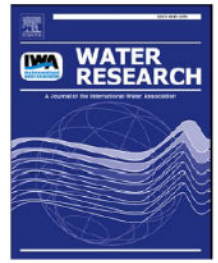
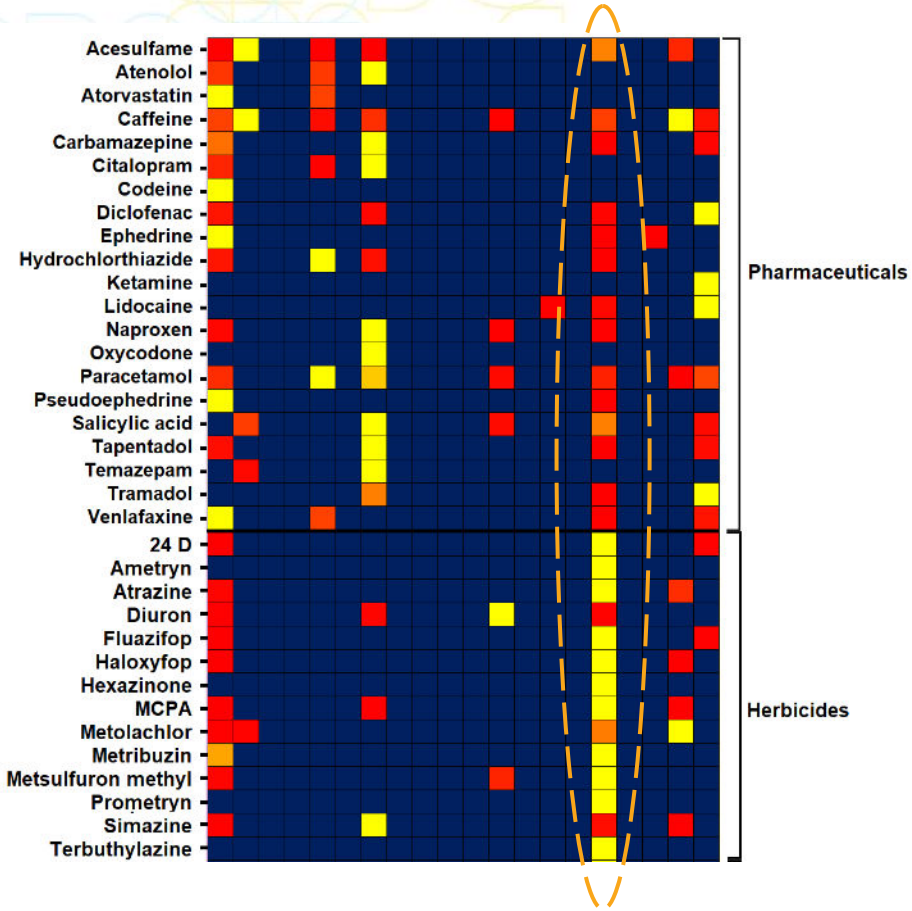


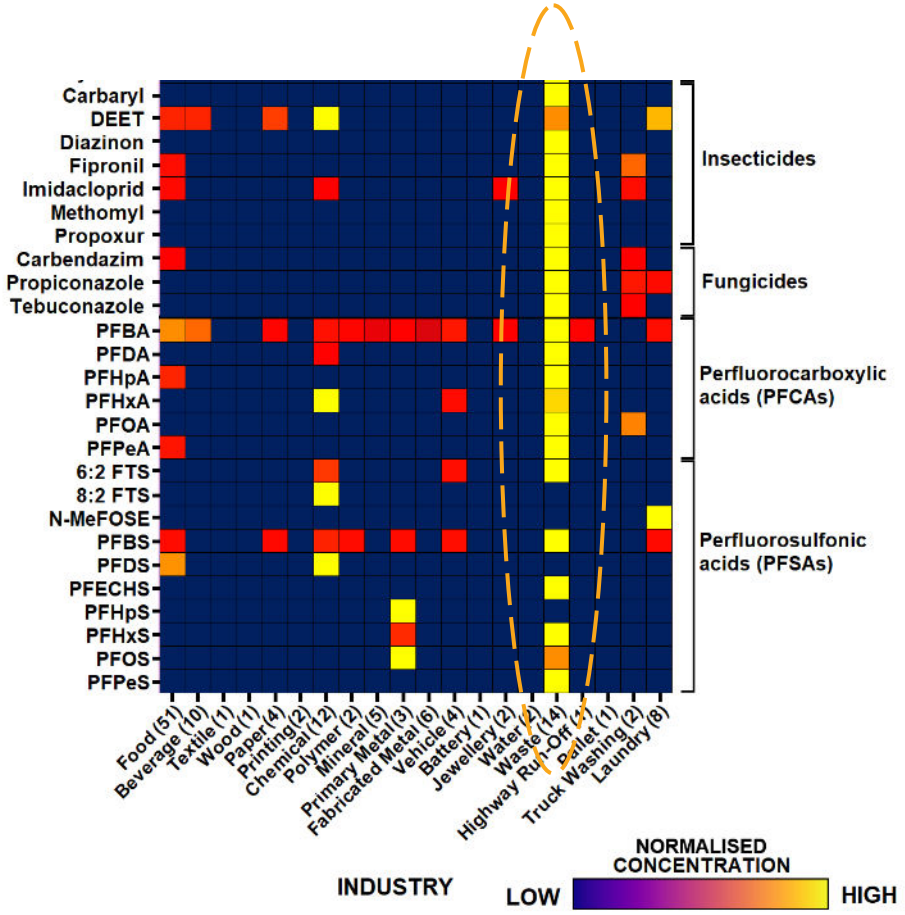
Chemical profiling of industry wastewaters to identify industry sources of contaminants

Chantal A. Keane [a,b,*], Rory Verhagen [a], Jochen F. Mueller [a], Jake W. O'Brien [a], Ryan Shiels [a], Jiaying Li [a,c,**]

https://doi.org/10.1016/j.watres.2026.125575

“Waste collection, treatment and disposal services”





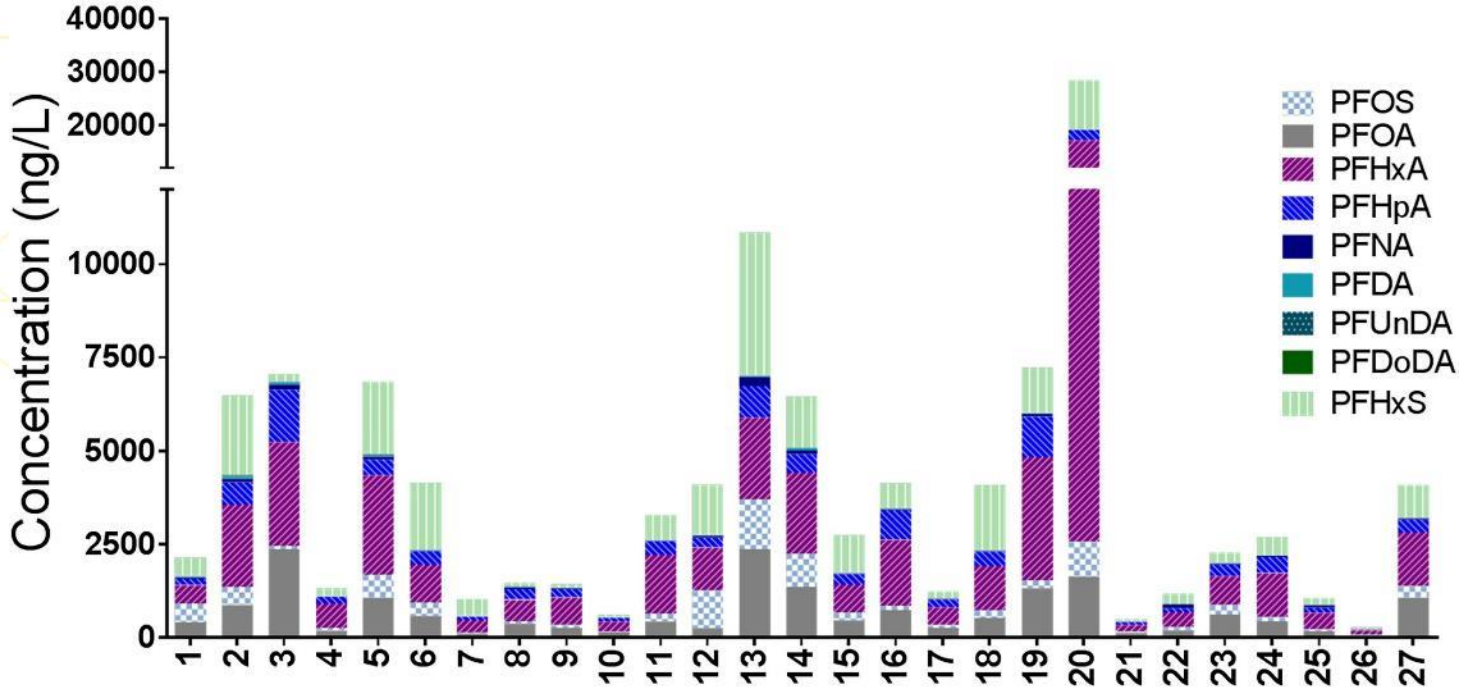
https://doi.org/10.1016/j.watres.2026.125575

Landfill leachate

- Very high PFAS concentrations…

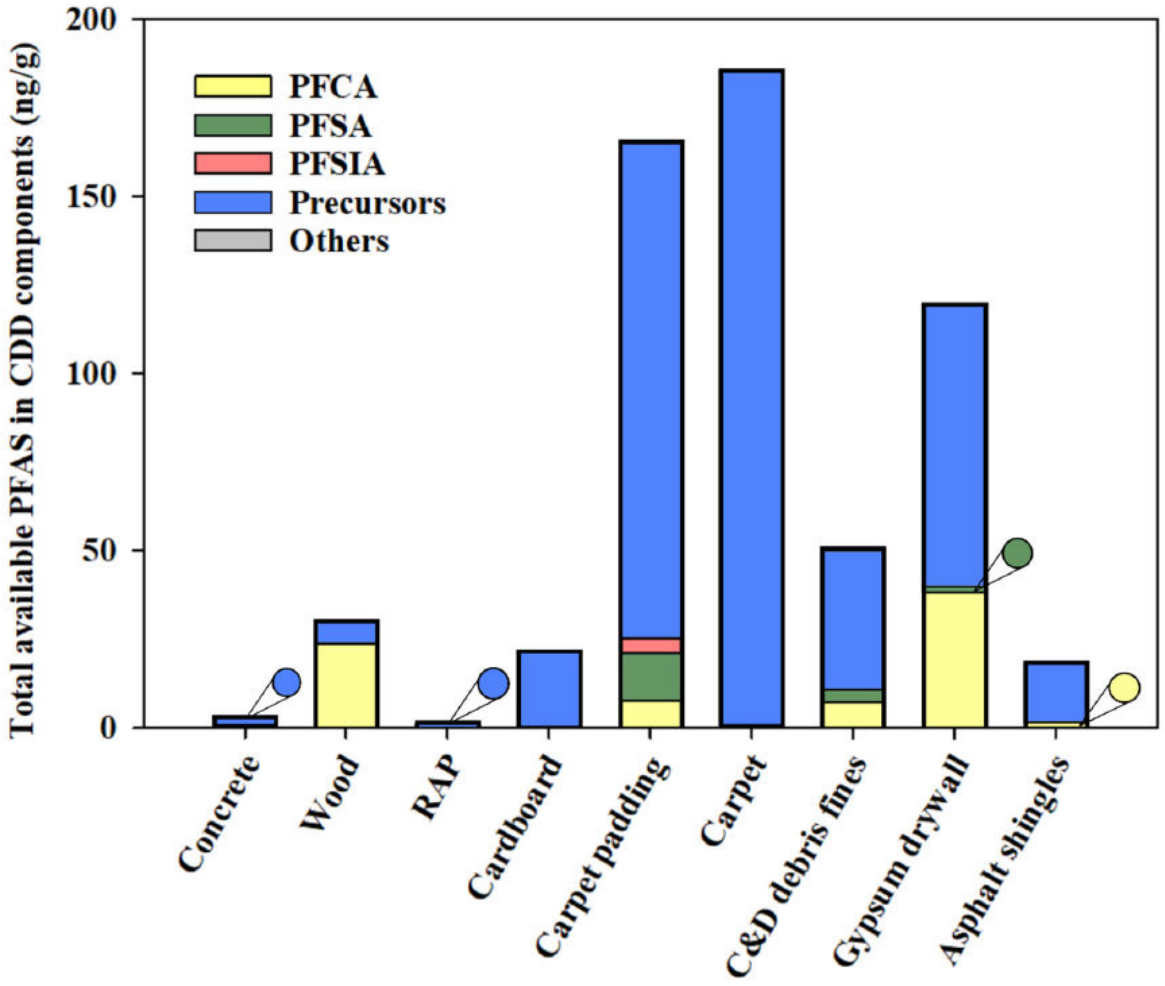
Note scale

Only 9 PFAS analytes… does not include precursors



http://dx.doi.org/10.1016/j.jhazmat.2017.02.006

Construction and demolition waste

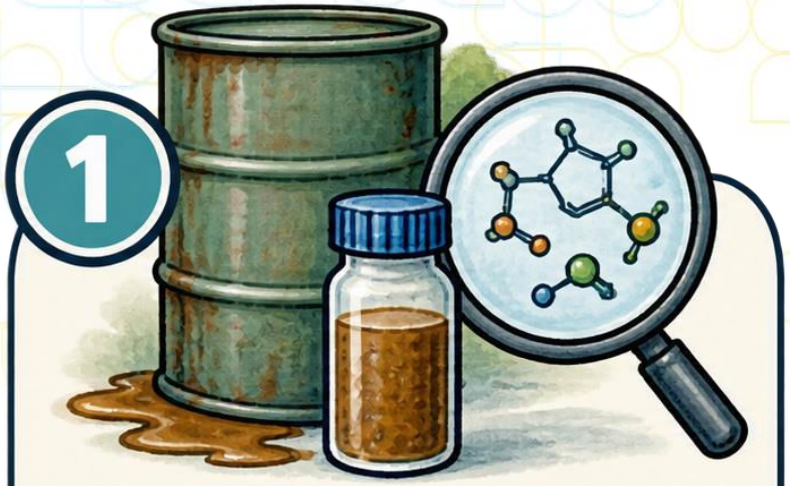




crushed concrete, mixed wood, asphalt shingles, gypsum drywall, carpet/foam padding, carpet, CDD fines, metals, cardboard, and reclaimed asphalt pavement (RAP)—

https://doi.org/10.1016/j.jhazmat.2024.134567

Three questions for waste managers…



1

What contaminants and precursors are in the incoming waste?



2

Where will they go after processing?



3

What is your liability for these risks?

SWEAP environmental leadership



lreeves@qldwater.com.au