The development of a national monitoring system for diffuse contaminated soil and sediment in the Netherlands

Symke Haverkamp, Michiel Gadella, Ministry of Infrastructure and Water Management and Arjen Wintersen, RIVM

Ministerie van Infrastructuur
en Waterstaat

Development of a national monitoring system for diffuse contaminated soil and sediment in the Netherlands

Symke Haverkamp (Dep. Infrastructure & Water)
Arjen Wintersen (RIVM)

14th of March 2024

De obscuris naturalium rerum, quae omnipotente Deo artifice facta sentimus, **non affirmando, sed quaerendo tractandum est**.

Augustinus, *Gn. litt. Imp.* 1.1, AD 393/4

Principles of Dutch Soil Policy

1) Sustainable soil quality

→ Prevention of contamination

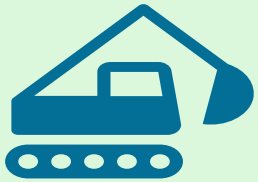
→ Remediation heavily contaminated sites

Principles of Dutch Soil Policy

1) Sustainable soil quality

→ Prevention of contamination

→ Remediation heavily contaminated sites



2) Reuse of lightly contaminated soil in accordance with

→ quality of receiving soil

→ intended function

Principles of Dutch Soil Policy

1) Sustainable soil quality

→ Prevention of contamination

→ Remediation heavily contaminated sites

3. Regulated & non-regulated substances

2) Reuse of lightly contaminated soil in accordance with

→ quality of receiving soil

→ intended function

Principles of Dutch Soil Policy

1) Sustainable soil quality

→ Prevention of contamination

→ Remebiation heavily contaminated sites

3. Regulated & non-regulated substances

2) Reuse of lightly contaminated soil in accordance with

→ quality of receiving soil

→ intended function

4. Decentralised decisions municipalities

analysis of dutch PFAS crisis

2019 dutch PFAS crisis!
Stagnation of application of soil & sediment
Societal & political dynamics

Competent authorities risc averse
Why?
- no background levels to compare
- no risk standards to assess and manage risks

Aims monitoring system

No surprises!

Proactively search for diffuse contamination of the national level of non-regulated substances (persistent, toxic, mobile, bioaccumulating)

→ (water)Soil monitoring

Serves as input for policy to minimize sources

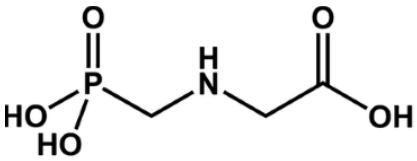
The show must go on!

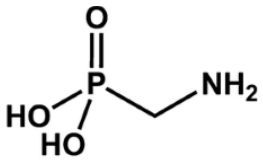
Continuation of application of soil & sediment contingent on human and ecological risc management

→ Framework reuse soil & sediment with non-regulated (diffuse) substances

Substance screening: process

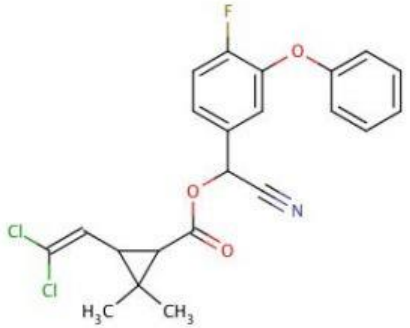
- Going from longlist (~50 substance(groups) to shortlist (4 groups+PreFAS)
- Based on expert judgement (expert group)
- Longlist established based on wide array of sources
- Criteria for ranking:
  - **P**ersistance
  - **M**obility
  - **B**ioaccumulation
  - **T**oxicity
  - **E**missions
  - **O**bservations and corroboration
- Additional consideration: diversity in types of substances/type of application, Dutch screening standards not derived yet



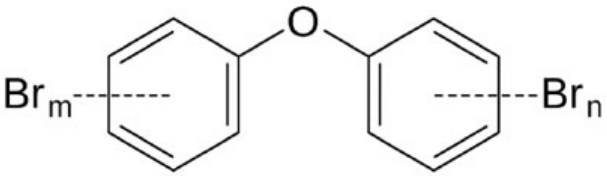


Selected substance groups

Medium chain length polychlorinated alkenes (C14-C17)	Full	Full
Polybromated diphenyl ethers (PBDE)	Screening	Full
Pyrethroids	Screening	Screening
Glyphosate & AMPA	Full	Screening
Prefas: N-EtFOSE, N-MeFOSE	-	Screening



- Option for screening a subset of samples
- Pending lab consultations
- Selected substances represent different emission and use types

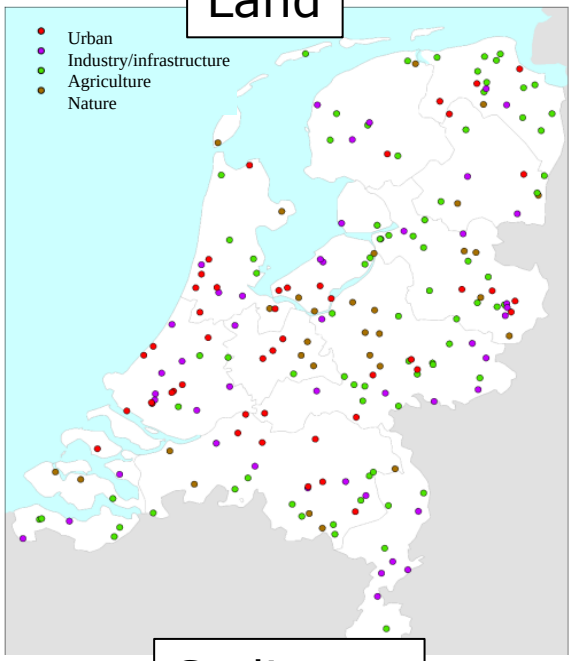


Measurement campaign setup

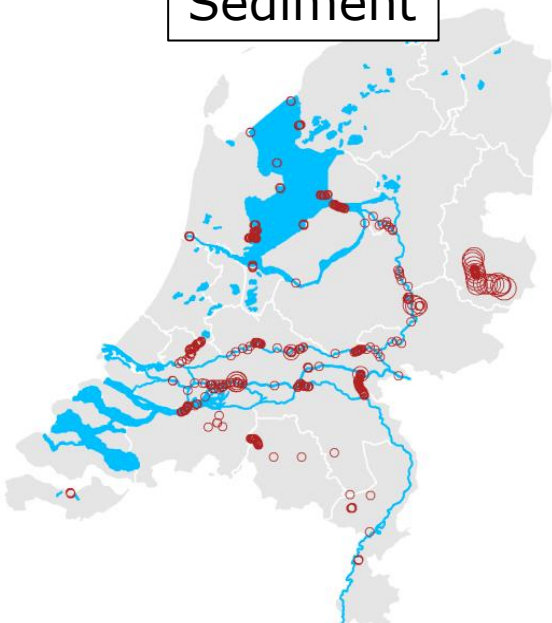
- Nation wide, representative for diffuse load (avoiding point sources)
- **Soil** samples:
  - 200 agricultural and natural locations
  - 200 locations in built up areas
  - Stratification based on land use, soil type
  - 0-20 cm & 50-100 cm
- **Sediment** samples:
  - 200 regional waterbodies
  - 80 'national' waterbodies (incl. 20 floodplains)
  - Stratification based on surface area, wb type, management, land use
  - Aimed at freshly deposited material
- Sampling strategy aimed at potentially wide array of substances, including microplastics
- Samples will be stored frozen for later analysis

Potential sampling sites

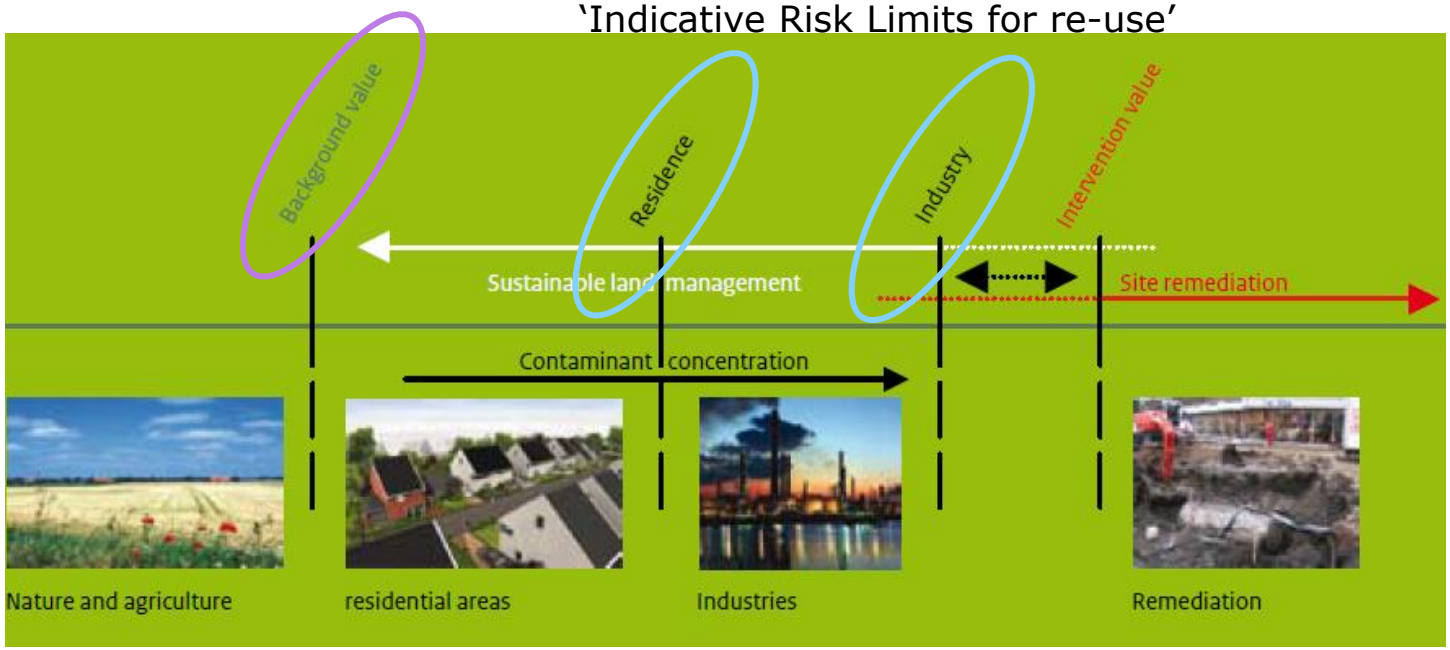
Land



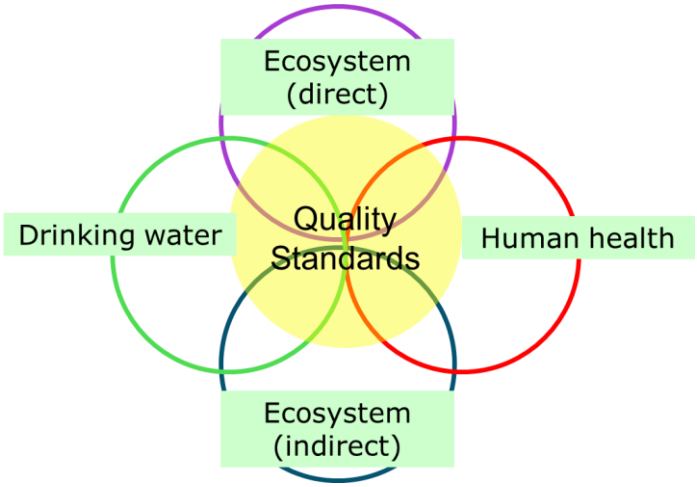
Sediment



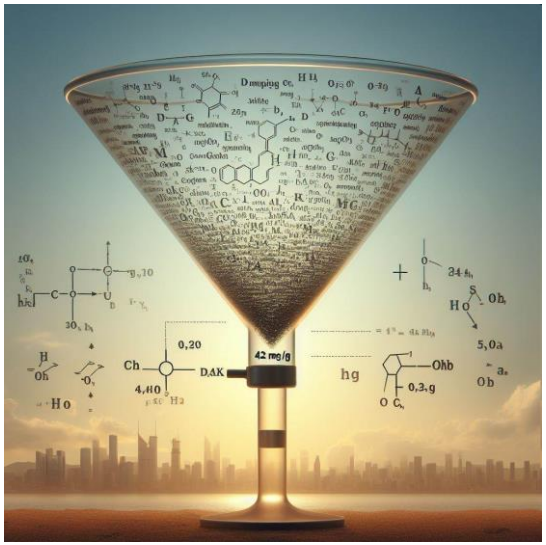
Building blocks for Soil & Sediment standards



Indicative Risk Limits (IRLs)



- Align with protection goals and levels of regular soil standards
- Aimed at quick development
- Dilemmas (pilot):
  - Dealing with very little, or large amounts of data/information
  - How to deal with rel. high/low IRLs



Follow up after pilot

- Formalization of screening and monitoring
- Possibility of re-analysis of stored samples

Timeframe

- q4 2025

Framework reuse soil & sediments with diffuse non-regulated substances

1) Background levels known
2) IRL (human/ecology) values
   - Determined reasonably quickly
   - Step towards possible regulation

+ location specific arguments = Actionable information for competent authorities

- Scenario's to consider (→ local or national political debate)
  - BGL < concentration < IRV function
  - IRL function < concentration < BGL
  - IRL funct. & BGL < concentration
  - IRL < detection limit

WE MAKE TOMORROW BEAUTIFUL
OVAM

EmConSoil
a Multi-stakeholder Network for Emerging Soil Contaminants

The development of a national monitoring system for diffuse contaminated soil and sediment in the Netherlands

Symke Haverkamp, Michiel Gadella, Ministry of Infrastructure and Water Management and Arjen Wintersen, RIVM

beEU
belgium24.eu