

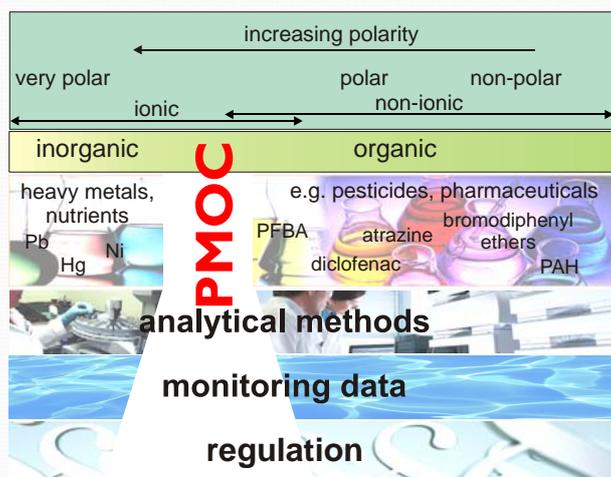
PROtecting water resources from MOBILE TracE chemicals (PROMOTE)



Coordination: Hemholtz Centre for Environmental Research – UFZ, Thorsten Reemtsma, Urs Berger

Pilot Call Kick-off meeting 11th of March 2015, Brussels

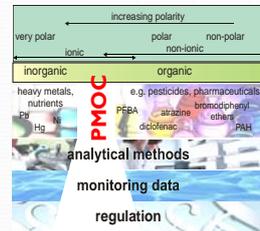
Present Situation



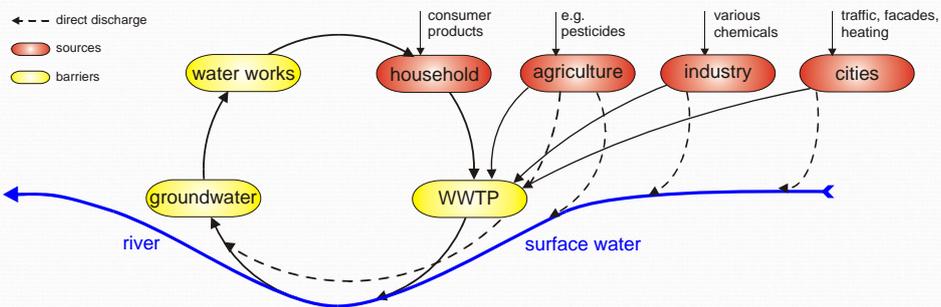
- PMOC: Persistent Mobile Organic Chemicals

PMOC

- Persistent Mobile Organic Chemicals
 - Insufficient analytical methods
 - Insufficient monitoring data
 - Insufficient knowledge on behaviour
 - Insufficient knowledge on removal methods
- None of the priority substances of the WFD, including the most recent proposals is a PMOC compound
- Is more activity needed?
 - Yes: PROMOTE
- Is more regulation needed?
 - We should know at the end



Partially Closed Water Cycle



- approx. 250 pesticides
- approx. 200 (1000?) pharmaceuticals
- approx. 10.000 registered chemicals in REACH, > 100.000 preregistered chemicals



What Do We Want To PROMOTE?

- Analytical methods to detect and to quantify highly polar compounds (PMOC)
- Tools to determine PMOC from data submitted in the REACH process
- Knowledge on occurrence, and sources of PMOC
- Knowledge on transformation and removal options for PMOC
- Knowledge on potential health effects of PMOC
- Drinking Water Quality
 - by improving quality of raw waters used for drinking water production
- Link between chemicals policy and water policy

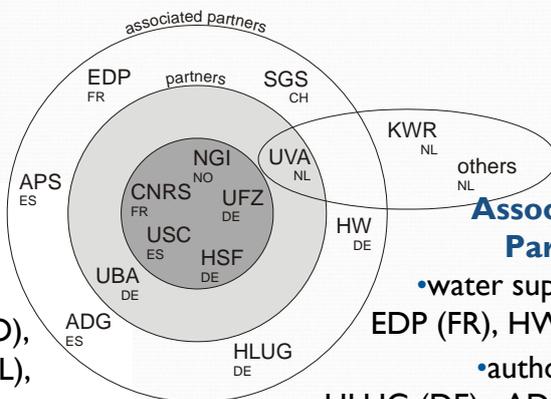


PROMOTE – Linking Chemicals Policy and Water Policy

- Water Policy
 - developing specific measures against pollution of water ... aimed at the progressive reduction of discharges' (Article 16 (1) of WFD)
 - the most hazardous substances may be recommended for inclusion into the 'watch list' proposed for inclusion into the WFD
- Chemicals Policy
 - tools to consider drinking water quality under REACH



PROMOTE Consortium



Partners

academia:
 CNRS (FR),
 HSF (DE), NGI (NO),
 UFZ (DE), UVA (NL),
 USC (ES)

authorities:
 UBA (DE)

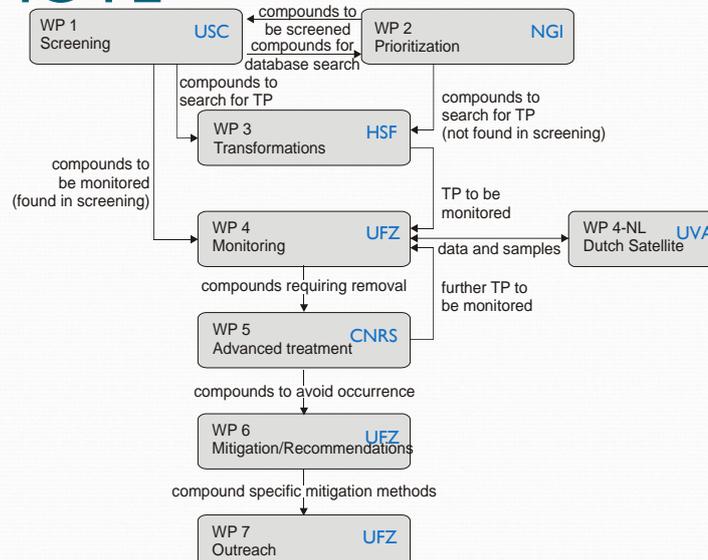
Associated Partners

- water suppliers:
 EDP (FR), HW (DE)
- authorities:
 HLUG (DE), ADG (ES)
- analytical companies:
 APS (ES), SGS (DE/CH)

PROMOTE - Partners

Person	Affiliation	Location	Expertise	Funding Agency
Hervé Gallard	CNRS: University of Poitiers	Poitiers, FR	Water Treatment	ONEMA
Thomas Knepper	HSF: Fresenius University of Applied Sciences	Idstein, DE	Analytical Methods, environmental chemistry	BMBF
Hans Peter Arp	NGI: Norwegian Geotechnical Institute	Oslo, NOR	Theoretical environmental chemistry	RCN
Thorsten Reemtsma, Urs Berger	UFZ: Helmholtz Centre for Environmental Research	Leipzig, DE	Analytical Methods, environmental chemistry	BMBF
Christoph Schulte	UBA: Federal Environment Agency (DE)	Dessau, DE	REACH Regulation	
Pim de Voogt	UVA: University of Amsterdam	Amsterdam, NL	Analytical Methods, environmental chemistry	
Jose Benito Quintana	USC: University of Santiago de Compostela	Santiago, ES	Analytical Chemistry	MINECO

PROMOTE



WP I – „Screening“

- Provide screening methods capable of multi-analyte detection of polar and very polar chemicals (PMOC)
- Provide data on which PMOC seem to be relevant for further investigation on subsequent WPs
- Obtaining data of pollutants from different (associated) partner locations and water type
- Partners involved: USC (coordination), HSF, UFZ (and UVA/KWR via WP-4NL)

WP 1 -Outcome

- Novel analytical methods to screen for PMOC in water
- List of previously unknown PMOC in the water cycle
 - for monitoring in WP 4
 - for comparison with outcome of WP 2)



WP 2 – „Prioritization“

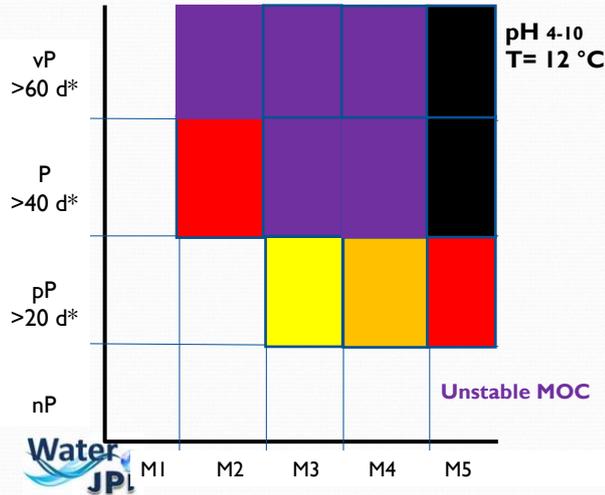
- Prioritize persistent and polar chemicals or transformation products (PMOC) from the compounds registered under REACH
 - 10'000 registered, 110'000 preregistered
- Develop criteria to identify uses under REACH that may cause a contamination of source waters, based on volume emitted and emission release category (industry/municipal)

- Partners involved: NGI (coordination), UBA, UFZ



First Selection Exercise based on OECD Data

Immobile POC



P

Persistency:

According to definition used in REACH

M:

Mobility:

Not explicitly defined in REACH; based on organic carbon distribution coefficients (K_{oc}/D_{oc}); alternatively subcooled liquid solubility (S_L)

PMOC:

Black – very probable
Purple – probable PMOC
Red/yellow/orange – possible

WP 2 - Outcome

- Automated ranking according to the expected relevance of the industrial chemical for raw water used in drinking water production
- List of compounds to search for in analytical screening (WP 1) and for testing environmental stability (WP 3)

WP 3 – „Transformations“

- Understanding the occurrence and fate of selected classes of chemicals,
 - including stability,
 - removal efficacy in wastewater treatment,
 - transformation products (TP)
- Identification of TP of selected REACH chemicals

- Partners involved: HSF (ccordination), USC, UFZ, CNRS



WP 3 - Outcome

- Identity of TP products and knowledge of transformation pathway of selected REACH chemicals (for WP 4)
- List of TP to search for in screening (WP 1) and monitoring of site studies (WP 4)
- List of precursor compounds of highly polar transformation products (for WP 6)



WP 4 – „Monitoring“

- Development of targeted quantitative (and semi-quantitative) methods for previously detected PMOC (WP 1) and TPs (from WP3)
- Providing concentration data of novel PMOC in different river basins and in different compartments of the water cycle
- Verification of information on occurrence of PMOC (WP 1) and TP (WP 3)
- Detection of source of PMOC determined in the screening for industrial chemicals
- Partners involved: UFZ (coordinator), HSF, USC, UFZ; ADG, EDP, SGS, HW, HLUG



River Basins

Country	Rivers	Characteristics	Partner, Assoc. partner
Spain, Galicia	Many different	Urban and rural settings, 2 mio inhabitants	USC, ADG
France, Paris	Seine, Marne	densely populated, intensive use; source of DW resource	CNRS, EDP
Germany, Hestia	Main catchment	densely populated,	HSF, HLUG
Netherlands	Rhine catchment	High dilution	UVA, KIWA
Norway, Oslo	Small, urban	WW discharge	NGI



WP 4 - Outcome

- Concentration data for PMOC in different discharges, five river basins, and related drinking water production stages.
- Knowledge on occurrence and behaviour of PMOC in aquatic systems with different characteristics and climate.
- List of PMOC safely removed before drinking water production or in drinking water production (for WP 6)
- List of PMOC for which advanced treatment may be required (WP 5)
- Emission sources of PMOC (for WP 6)



WP 5 – „Advanced treatment and mitigation methods”

- Investigation the removal of selected PMOC during oxidation treatments (ozonation, chlorine disinfection)
- Evaluate the efficiency of advanced oxidation and combination of ozone/GAC for the mineralisation of PMOC
- Assessing the role of the selected contaminants as a source of potentially toxic compounds
- Partners involved: CNRS (coordination), USC, UFZ, HSF,



WP 5 - Outcome

- Kinetic database used to predict the behaviour of selected polar contaminants in full-scale treatment plants
- Knowledge on the ability of advanced oxidation and ozone/GAC to transform and mineralize the selected PMOC (for WP 6)
- List of compounds not removed by advanced treatment or with unfavourable TP, so that their occurrence in source water needs to be avoided (for WP 6)



WP 6 – „Mitigation Strategies and Recommendations”

- Assignment of PMOC to different mitigation groups
- Recommendation of mitigation strategies for the different groups
- Risk assessment of selected compounds

- Partners involved: UFZ (coordination), HSF, NGI, UVA, UBA, USC, CNRS



WP 6 - Outcome

- Definition of criteria for the mitigation groups and assignment of the newly detected polar contaminants to these groups.
- List of recommended mitigation strategies for the different groups of compounds (for WP 7).
- PMOC identified that may pose a threat at certain emission levels (if increased) (for WP 7).
- Criteria for compounds to be regulated under REACH with respect to drinking water safety (for WP 7).



WP 7 – „Communication and Interaction”

- Support of communication and data exchange between the partners
- Dissemination of results to the public and to science
- Communication with relevant stakeholders groups to elaborate project recommendations and place them at the right recipient

- Partners involved: all, incl. associated partners



Mobility Actions

- to stimulate mobility of researchers within the Consortium
- to enhance collaborative research and innovation during the project life and beyond to support training of (young) scientists
- Eight MAs proposed
 - Duration 0.5 – 1 month
 - Development of analytical methods
 - Exchange of samples, joint experiments and analyses
 - REACH database and database screening



Water JPI Project - PROMOTE

- Coordination
 - Thorsten Reemtsma, Urs Berger
 - Helmholtz Centre for Environmental Research
 - Department of Analytical Chemistry
 - www.ufz.de/analytik

