

Transnational Action Program on Emerging Substances

**TAPES**

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Presentation NoPills  
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TAPES [www.tapes-interreg.eu](http://www.tapes-interreg.eu)

**TAPES Project**

- Project started second half 2012
- Will run until end of 2015, budget ca 4,2 Mio
- 10 partners (NL, Ge, Ch, Be, UK)
- Water boards, water companies, research organisations
- Lead partner: **Waternet, the Amsterdam Watercycle company**

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**Emerging substances in the water cycle**

- Pharmaceutical residues
- Iodinated X-ray contrast agents
- Perfluorinated compounds
- Personal Care products
- Fragrances
- Artificial sweeteners
- Anticorrosion agents
- Endocrine disrupting compounds (EDC)
- Nitrosamines
- Pesticides
- Pesticide metabolites
- Biocides
- Algal toxins/cyanobacteria
- Flame retardants
- Complexing agents
- Plasticizers/anti-oxidants
- Fuel additives
- ...

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**Major characteristics of emerging substances**

- Most of them are present in the environment for many years, but have only recently been detected
- Most of them are polar and persistent compounds
- Most of them are produced and used in high quantities
- Sources: Mainly application, less production (quasi-diffuse pollution instead of point sources)
- **Most of them are used due to their positive effects and enter the environment through Intended use** (no accidental spills)
- **Polluter: You and me (instead of chemical industries)**
- Knowledge on occurrence, health effects and behavior in the environment is incomplete
- Information about removal options during wastewater treatment or drinking water treatment is incomplete and fragmented

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**Relevance of pharmaceuticals / emerging substances**

- **Most of them stay and accumulate in the environment for many years, but have only recently been detected**
- There is no correlation between analytical detection of an emerging substance and its health effects
- At the concentration levels found in the environment, no adverse effects for wild-life are expected (with few exceptions, data sets still limited)
- **Concentration levels of pharmaceuticals found in drinking waters are far below therapeutic doses**
- **At the concentration levels found in drinking waters, no adverse effects for humans are expected**
- With few exceptions, there are no environmental quality standards or drinking water threshold values
- Possible threshold limits would only be exceeded in exceptional cases
- **Increasing resistance to antibiotics**

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### Problem: Consumer's perception

Take one three times a day. Or you can just drink the local water.

DOCTOR OF MEDICINE

EKG 1

Nature 424, 5 (2003)

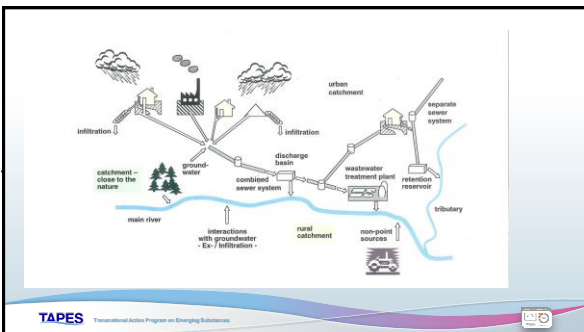
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### ES – a transnational problem

Metformin

Lobith	0,73±0,1 µg/L 3,3±1,4 µg/L	Düsseldorf	0,74±0,21 µg/L 4,8±2,1 µg/L
Köln	0,56±0,15 µg/L 2,9±1,6 µg/L	Mainz	0,53±0,15 µg/L 2,0±1,5 µg/L
Karlsruhe	0,39±0,08 µg/L 1,6±0,79 µg/L	Basel	0,27±0,04 µg/L 0,66±0,38 µg/L

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### TAPES aims

- to combat emerging substances by an international water cycle based approach
- to provide experience based knowledge on the effectiveness of various technologies and (policy) measures
- to find the best way to incorporate these in the water cycle
- to develop a new approach in sharing knowledge and expertise

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### Project Activities

Demonstration of Technologies in waste water treatment

1-Step filter

Dissolved Air flotation (DAF)

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### Project Activities

Technologies in Waste water treatment

Retention soil filters

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### Project Activities

Technologies for Drinking Water production

Input of fullscale and pilot plant data to DSS and WaterCloud

Research aims:

- GAC / PAC- Evaluation

New adsorbents

Focus on polar ES with low elimination rates by commercial GAC/ PAC

Selective ES removal - interaction adsorbent and adsorbate

Optimizing the process design for ES removal

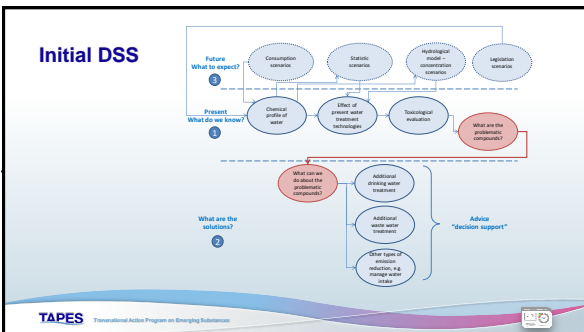
Impact of natural organic mater – Adsorber design

PAC- Ultrafiltration process

### Project Activities

Development of DSS

Objective: Development of a tool to define the best allocation of measures and investments in the water cycle to prevent/reduce ES contamination



### Project Activity

Development of the "Water share point"

Development of a web-based environment for the storage and exchange of various categories of information on emerging substances in the aquatic environment.

- What is the goal of the application?
- What is this application doing? What processes does it support?
- Who are the users?
- What data does it use or produce?
- How do you guard quality and security?
- Who owns the data and application?
- Who has access to what?

### Link to Pills – NoPills - TAPES

Danube, Meuse and Rhine Memorandum 2008

These companies feel responsible for the sustainable use of water resources, which is even more important in view of possible climate changes. The practice of drinking water must be given priority over all other uses for water bodies.

This goal is to achieve a water quality that allows them to produce drinking water using only natural treatment methods. The prerequisite for the production of drinking water according to this principle is the extensive restriction of the water supplies.

Target values

Subgroup of non-natural substances with known biological effects	Target value
Phenols and their metabolites per individual substance	µg/L, 0.1*
Endocrine active substances per individual substance	µg/L, 0.1*
Pharmaceuticals (incl. antibiotics) per individual substance	µg/L, 0.1*
Biotrans per individual substance	µg/L, 0.1*
Other organic halogen compounds per individual substance	µg/L, 0.1*

### Link to Pills – NoPills - TAPES

Recommendations for Actions

- PREVENT AND REDUCE EMISSIONS
  - Eco-classification: PPCP should be classified according to their environmental impacts
  - E.g. Green pharmacy: incentives for "environmental friendly" pharmaceuticals
  - Harmonised take-back scheme for unused pharmaceuticals
- IMPROVE KNOWLEDGE
  - Information of citizens on take-back schemes (including modern information media such as internet)
  - Proper disposal of pharmaceutical waste (e.g. incineration, recycling)
- TREATMENT OPTIONS
  - Separate treatment of special wastewater (e.g. urine separation in hospitals and medical practices)
  - WWTP
  - Drinking water treatment plant

**Link to Pills - NoPills**  
Project are complementary

- **Pills:** development and implementation of various technologies at hospitals (pharmaceuticals)
- **NoPills:** Focus on medicines; especially by a behavioural approach combined with technical measures at wwtp
- **Tapes:** focus on emerging substances: unlocking knowledge, development of technology for wwtp and drinking water facilities, decision support

Other initiatives:  
Pharmafilter at RdGG hospital (LIFE+, The Netherlands)  
Water bard Groot Salland: Grip op geneesmiddelen

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**Thank you for your attention**

Questions??  
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