



Addressing micropollutants: a holistic approach

Summary

Micropollutants can directly or indirectly enter the water cycle through many means. Once in the water cycle, they can pose a risk to drinking water resources and aquatic ecosystems.

Current technologies used in waste water treatment plants are not entirely capable of removing micropollutants. The most **sustainable and preferred solution remains to prevent micropollutants – including microplastics - from entering the water cycle** in the first place.

We call on the EU institutions to legislate according to the source control approach, the precautionary principle and the polluter pays principle. EurEau believes that the correct use of the source control approach is instrumental to achieve a truly circular economy.

In recent years, however, some countries or regions in Europe (Switzerland¹, the Netherlands, Sweden, Germany², Denmark and Flanders) have started to explore extra end-of-pipe treatment at waste water treatment plants, with the purpose of **addressing only one specific category of micropollutants: pharmaceuticals for human use**.

What are micropollutants?

Micropollutants are organic or mineral contaminants of anthropogenic as well as natural origin that raise considerable toxicological concerns for the aquatic environment. They can be found in waters at very low concentrations, ranging from micrograms to nanograms per litre. They can originate from industrial processes, from pharmaceuticals for human use and veterinary drugs, personal hygiene products, industrial or household chemicals, detergents, cosmetics, textiles, pesticides, or from micro-substances in coatings or paints. Some of them have been on the EU's regulatory agenda for the past 50 years to ensure the protection of water resources.

Why micropollutants constitute a challenge

Micropollutants are a challenge for waste water operators, whose mission is to treat waste water to ensure the protection of the environment and ecosystems, and for drinking water operators, who have to rely on drinking water resources to produce drinking water.

¹ <https://www.micropoll.ch/aktuell/>.

² <https://www.masterplan-wasser.nrw.de/das-kompetenzzentrum/general-information-gb/>.



Micropollutants can enter the water cycle directly or indirectly via the waste water treatment infrastructure: urban and domestic waste water, industrial waste water, hospital effluents, storm water runoffs, and also through agricultural or rural runoffs and manure. Since micropollutants are not entirely biodegradable, once present in the water cycle, they can gradually accumulate and could pose a risk to drinking water resources and aquatic ecosystems.

Technologies currently used in waste water treatment plants are not entirely capable of removing micropollutants.

Advanced treatment processes exist but they are expensive, energy intensive and often substance-specific: they rarely come out well in cost effectiveness and environmental performances analysis. Innovative technologies and solutions that address these drawbacks are being developed. EurEau recognises that these may provide a useful treatment solution for tackling specific micropollutants or addressing specific local conditions in the long term.

The most sustainable and preferred solution however is to prevent micropollutants from entering the water cycle in the first place. Steps should be taken at various stages before they can enter the water cycle to prevent them from doing so. Their release should be addressed as a priority at the source, meaning along the different steps that precede their emission, discharge or loss into the aquatic environment.

Establishing the necessary conditions that support such a source control approach is an EU wide challenge.

EurEau's solution: control at source approach

EurEau has consistently advocated for a control at source approach to micropollutants as well as for the implementation of the Precautionary Principle in environmental policy. In fact, EU legislation is built on the Precautionary Principle, on the Control at Source Principle and on the Polluter Pays Principle, enshrined in Art. 191(2) of the Treaty on the Functioning of the European Union, stating that *"the Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on **the precautionary principle** and on the principles **that preventive action should be taken, that environmental damage should as a priority be rectified at source** and that the **polluter should pay.**"* These principles constitute the underlying philosophy behind the Water Framework Directive and cutting-edge and far-reaching European chemical legislation such as the REACH Regulation, the Plant Protection Products Regulation, the Biocides Regulation and cosmetics legislation.

Through the application of these principles, EU authorities can impose restrictions on a chemical substance even in the case of scientific uncertainty, while in the US system, for instance, scientific evidence of harmful effects is needed before a substance can be regulated.



Call on the European institutions to act

EurEau calls on the European institutions to:

- ~ adopt a strategic approach to micropollutants based on the Source Control Principle
- ~ consider the life-cycle approach to substances when legislating
- ~ use the ecolabel more extensively, and
- ~ contribute to awareness-raising amongst citizens.

Specifically, EurEau considers that action is needed on the following:

1. Strategy on pharmaceuticals in the environment

The Directive on Priority Substances requires the European Commission to come up with a strategic approach to pharmaceuticals in the environment (PiE). EurEau supports the adoption of such a strategic approach where actions should be taken along the whole life cycle of a pharmaceutical product (design, authorisation, marketing and post marketing). Measures should be taken all along the life cycle of pharmaceutical products to restrict the release of pharmaceutical substances in the environment so that potential environmental damage is rectified at the source. This means that measures will necessarily be taken, as a priority, by the pharmaceutical industry, by the regulators, by doctors and health practitioners, by patients and, as a means of last resort, at the end of the pipe by water operators.

In March 2019 the European Commission adopted the long-awaited Strategy³ that unfortunately fails to properly address the crucial role of the Environmental Risk Assessment for the improvement of the authorisation process, the necessary review of the functioning of the interface between the pharmaceuticals legislation and the chemical legislation such as REACH and CLP, and the financial and technical obstacles for advanced waste water treatment.

2. Microplastics

Marine litter, including microplastics, is a global challenge in the marine environment that needs holistic solutions involving many stakeholders, also taking into account the polluter pays principle.

Microplastics and marine litter are primarily a waste management problem, but waste water infrastructure can be considered one of the pathways of marine litter into the marine environment.

EurEau already cooperates with international and regional organisations such as UNEP and OSPAR to address the issue of microplastics in an effective way.

EurEau is in favour of source control actions to reduce marine litter and supports any product-oriented action at European level, especially related to micro plastics, such as:

- a. more research into the sources of microplastics

³ http://ec.europa.eu/environment/water/water-dangersub/pdf/strategic_approach_pharmaceuticals_env.PDF.



- b. legislation to ban and substitute microplastics in personal care and cosmetic products and detergents
- c. use of eco-labelling and information on microplastics in products
- d. legislation to avoid non-degradable wet wipes in waste water, and
- e. innovative research for improved technologies, e.g. for laundry washing and textile finishing.

3. Pesticides

Pesticides are substances that prevent, destroy or control a harmful organism (a 'pest') or disease, or protect plants or plant products during production, storage and transport such as herbicides, fungicides, insecticides, acaricides, rodenticides, growth regulators, repellents etc. The so-called 'Pesticides package' regulates the authorisation and the sustainable use of pesticides as well as obligations for the documentation of the applications by farmers.

Although the introduction of stringent cut-off criteria within the authorisation process of active substances may reflect the intention of the European co-legislators to tackle the impacts of pesticides on the environment, these new requirements are only effective in the future when pesticide producers apply for the authorisation of new active substances.

Agriculture is considered as the greatest contributor to pesticides in surface water and groundwater used for the abstraction of drinking water. Pesticides, their metabolites and transformation products are increasingly having a negative impact on the quality of water resources, and drinking water operators have to increasingly resort to extra and expensive treatment while consumers bear the costs.

At EU level, EurEau believes that adequate drinking water related criteria should be taken into account in the authorisation phase. In this context, we acknowledge the unprecedented attempt of the European Commission to set out scientific criteria for the determination of endocrine disrupting properties by amending Annex II to Regulation (EC) No 1107/2009⁴.

In the post-marketing phase, authorisation holders should run monitoring programmes to control the fate of authorised pesticides in the aquatic environment.

According to the new pesticides legislation, a Member State shall review an authorisation where it concludes that the objectives of the WFD, concerning the reduction of pollution in surface water and ground water and allowing for the reduction of the level of purification treatment required in the production of drinking water, cannot be met. Although crucial for the protection of water resources, this obligation to review the authorisation of certain pesticides has not resulted in an improvement of the quality of water bodies and more transparency is needed in its implementation.

⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0605&from=EN>.



4. Need for specific regulation on chemicals in textiles

The consumption of textiles in the EU has increased to about 19kg per person annually, leading to an increased use of chemicals and raw materials.

Approximately 80% of textiles are imported from non-EU countries. In many cases there is a lack of knowledge about the chemical substances used and the transfer of information in the supply chains needs to be improved.

More than 10% of the substances used in the textile industry are identified to be of potential concern for human health and 5% are expected to have a very harmful impact on the environment – and many of them are washed away from households to the urban water cycle.

Therefore EurEau supports the need for the enhanced chemicals regulation of textiles.

5. Phasing out mercury in dental amalgam in the EU

Mercury is one of the most hazardous environmental toxins and is a threat to human health and the environment as elementary mercury accumulates in water, sediments and living organisms. It is therefore of great importance that the use and release of mercury is phased out.

Swedish studies indicate that dental amalgam is the source of 85-90% of the mercury entering the waste water treatment plants, making dental amalgam the single largest source of mercury to the receiving waters and to sewage sludge, due to daily erosion of people's amalgam fillings and leakage from dental clinics and their sewers.

Using amalgam separators in dental practice will only partly solve the problem. In the long-term, new control mechanisms (such as an EU-wide phase-out of 'new' dental amalgam) are required to deal with this diffuse source. This is crucial if the mercury requirements of the Water Framework Directive and its daughter Directive on Priority Substances are to be achieved. Since alternatives exist, a phase-out of all new amalgam fillings, carried out with great success already e.g. in Finland and Sweden, is also a cost-efficient method to reduce the flow of mercury to the European waters. It can also be regarded as best practice or best available technology to reduce the flow of mercury in urban areas.

6. Better use of REACH

The REACH regulation is a key instrument to control hazardous substances entering the urban water cycle and to fulfil the requirements for good chemical status in the Water Framework Directive. It is essential that the authorisation process of REACH is used much more, identifying more substances of very high concern for the candidate list and using the authorisation process in a strict way. EurEau supports the initiative by the environmental ministers from Denmark, Belgium, France, The Netherlands, Germany, Austria, Norway and Sweden to step up the efforts to work with REACH.

Annex I of the REACH Regulation sets out the details of how to carry out a 'chemical safety assessment' to be documented in a 'chemical safety report'. The assessment has



to consider all stages of the life-cycle of the substance covering, where relevant, the waste stage.

Annex I does require a comprehensive safety assessment, however, in the practical implementation of safety assessments, the waste phase is not sufficiently considered and communication between all stakeholders is lacking. It is crucial that downstream users communicate all relevant information to manufacturers.

Households are a significant source of harmful substance emissions to waste waters and to sewage sludge, soil and water courses. The slow disintegration of chemical products in household cleaners is an important source of emissions to the waste waters apart from direct use of chemicals.

EurEau calls for the thorough implementation of REACH Annex I. Safety assessments should take into account emissions to waste water, the efficiency of waste water treatment, emissions to water bodies and the impact of sewage sludge utilisation. Guidance for REACH Annex I implementation should be updated to cover the end of the life cycle of substances adequately. Consideration should also be given to how products and substances are treated once they become waste, under the risk management option analysis (RMOA).

Moreover in the context of the Drinking Water Directive (DWD) revision and the choice of the European Commission not to follow the WHO recommendations for certain parameters such as PFAS, we advocate for controlling PFAS and all PMT substances at the source. PFAS have not been sufficiently regulated so far by the EU and Member States, especially in groundwater and surface water. Setting a parametric value at the level of the DWD will not favour the control at source approach, rather the end-of-pipe treatment in drinking water plants. EurEau thinks that REACH Annex XV and art. 57(f) should be used in order to designate PFAS as Substances of Very High Concern.

The source control approach is key to delivering the circular economy

Fewer harmful substances in the environment will result in cleaner groundwater, rivers, lakes, coasts and seas – and a better quality of the residual products obtained from the treatment of waste water.

Water suppliers will have access to adequate and reliable drinking water resources that are protected from contamination.

An effective source control approach facilitates the possible reuse of water and nutrients, like nitrogen and phosphorus, from waste water and sludge. In fact, sewage sludge and waste water are to be considered valuable sources that can be reused and recycled if they fulfil appropriate quality criteria. In that sense, source control can add to a true circular economy, creating jobs, and a sustainable society.

Fewer harmful substances in the society will also reduce the overall exposure of the population to chemicals and would be a strong driver for product innovation.



National and regional developments in member states on end-of-pipe treatment

In the last decade some countries or regions in Europe (Switzerland, the Netherlands, Sweden, Germany, Denmark, UK and Flanders) started to investigate or implement end-of-pipe treatment at specific waste water treatment plants, with the purpose of addressing **one specific category of micropollutants: pharmaceuticals for human use**.

In these experiences, the treatment at the end of the pipe is **part of a holistic policy towards reducing micropollutants in the environment and is a complementary tool to control-at-source measures**.

These experiences give valuable information on the elements that need to be taken into account by public authorities when considering the various approaches to micropollutants, including technological limits and costs of extra treatment.

The EurEau briefing paper on '[Treating micropollutants at waste water treatment plants](#)' summarises the current knowledge and experiences.

About EurEau

EurEau is the voice of Europe's water sector. We represent drinking and waste water service providers from 29 countries in Europe, from both the private and the public sectors.

Our members are the national associations of water services in Europe. At EurEau, we bring national water professionals together to agree European water industry positions regarding the management of water quality, resource efficiency and access to water for Europe's citizens and businesses. The EurEau secretariat is based in Brussels, from where we coordinate the work of around 150 experts from member organisations and utilities and advocate common positions with EU decision makers.



EurEau

Our members are fully committed to the continuous supply of clean water and its safe return into the water cycle. We have a role in raising awareness of threats to the water environment. With a direct employment of around 476,000 people, the European water sector makes a significant contribution to the European economy.