

An update of the lists with compounds that are relevant for the production of drinking water from the river Meuse – 2018

Authors

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Background

RIWA-Meuse is an international organisation that represents the interests of the drinking water companies in Belgium and the Netherlands that use the River Meuse as a source for their drinking water production. RIWA aims for clean water in the river Meuse to guarantee sustainable supply of impeccable drinking water. For this reason, RIWA-Meuse closely monitors the quality of the Meuse water and, where necessary, advocates improvement of the water quality. In order to control trends and developments with regard to compounds (of emerging concern) in the Meuse, RIWA makes a compilation of lists of compounds that are considered (potentially) relevant for the drinking water production, namely:

List 1 - Drinking water relevant compounds

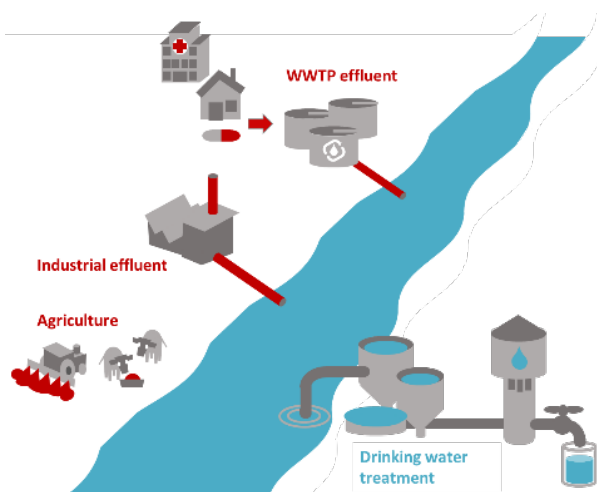
List 2 - Candidate drinking water relevant compounds

List 3 - No longer drinking water relevant compounds

All associated drinking water companies monitor the selected compounds on list 1 and 2 in order to have a detailed insight in the water quality of the river Meuse. This is the scientific basis upon which RIWA develops its lobby and advocacy.

Goal

The goal of this study is to evaluate and update the lists of (candidate) relevant compounds.



Methodology

In this study the compounds on the existing list 1 and 2 are re-evaluated, based on measurement data from the monitoring stations and intake points along the Meuse in the period 2013-2017. Based on literature studies and the screening of data new candidate drinking water relevant compounds are identified. Compounds, that are considered drinking water relevant, fulfil a fixed set of criteria concerning their detection frequency, occurrence in concentrations above the ERM target value, (potential) removal by water treatment, toxicological properties, odour/taste threshold and public perception. Additional background information is collected to further assess the fulfilment of the selection criteria for (candidate) drinking water relevant compounds and to identify emission sources in the Meuse catchment.

Results

Based on the evaluation the following compounds are identified to include in the new joint monitoring program of the drinking water companies along the river Meuse:

List 1: Drinking water relevant compounds		
Industrial compounds	Pharmaceutical residues	X-ray contrast agents
1,4-dioxane	Gabapentin +	Amidotrizoic acid
Benzo(a)pyrene	Gabapentin lactam	Iohexol
Bisphenol A	Hydrochlorothiazide	Iomeprol
Bis(2-ethylhexyl)phthalate (DEHP)	Lamotrigin	Iopamidol
Diethylenetriaminepentaacetic acid (DTPA)	Metformin +	Iopromide
Diisopropylether (DIPE)	Guanylurea	Ioxitalamic acid
Ethylenediaminetetraacetic acid (EDTA)	Metoprolol	Pesticides
Fluoride	Paroxetine	Desphenylchloridazon
Melamine +	Sotalol	Diethyltoluamide (DEET)
Melem	Tramadol	Glyphosate +
Nitriloacetic acid (NTA)	Valsartan +	Aminomethylphosphonic acid AMPA
Pyrazole	Valsartanic acid	N,N-dimethylsulfamid (DMS)
		Terbutylazine
List 2: Candidate drinking water relevant compounds		
Industrial compounds	Pharmaceutical residues	Pesticides
Ethylsulphate	Cetirizine	3,5,6-Trichloro-2-pyridinol
Hexa(methoxymethyl)melamine	Citalopram	Sebuthylazin
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy) propanoate (HFPO-DA; GenX compound)	Fluconazole	Hormone disrupting compounds
Methoxymethyltriphenylphosphonium	Oxipurinol	Anti-AR-Calux
	Telmisartan	
	Venlafaxine +	
	O-Desmethylvenlafaxine	
	Vigabatrin	



The recommended monitoring frequency for compounds of list 1 is 13 times a year for a period of 5 years and 13 times a year for the period of 1 year is recommended for compounds of list 2.

The sources of the compounds, included in list 1 and 2, are mostly the emissions via municipal and industrial WWTP effluent. These include pharmaceutical residues, X-ray contrast agents and pesticides, as well as industrial compounds, like DIPE, fluoride, melamine, pyrazole and HFPO-DA (GenX), that can be related to specific industrial point sources.

Since toxicity is an important criterion for the selection of drinking water relevant compounds, not all of the compounds that are present in relatively high concentrations ($>1 \mu\text{g/L}$) end up on the list of drinking water relevant compounds. This is the case for sucralose and methenamine, which are included in List 3. For these compounds, human health effects are expected to be negligible at the detected concentrations.

Recommendations

A recommendation for the future is for the drinking water companies to develop an aligned strategy for the evaluation of screening data for the Meuse. The screening process is qualitative rather than quantitative: substances can be detected, but the exact concentrations cannot be directly known. This makes the list of potential relevant compounds very long and it is difficult to prioritize and select compounds from the screening.

In addition it is recommended to initiate the development of suitable analytical techniques for the monitoring of more polar compounds in water. The existing analytical data gap makes it difficult to monitor and prioritize PMT (polar/mobile/toxic) compounds from the REACH database.

Although industries have to have a discharge permit to be allowed to emit compounds into surface waters, it is too often not clear which compounds are emitted. In order to get more grip on these compounds, members of RIWA have initiated several research projects. It is recommended to use the results of these studies in the next evaluation of drinking water relevant substances in the Meuse.

Report

This study is described in the report "An update of the lists with compounds that are relevant for the drinking water production from the river Meuse – 2018" (HWL201809)

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More information

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The pdf of this report can be found on the website www.riwa-maas.org

