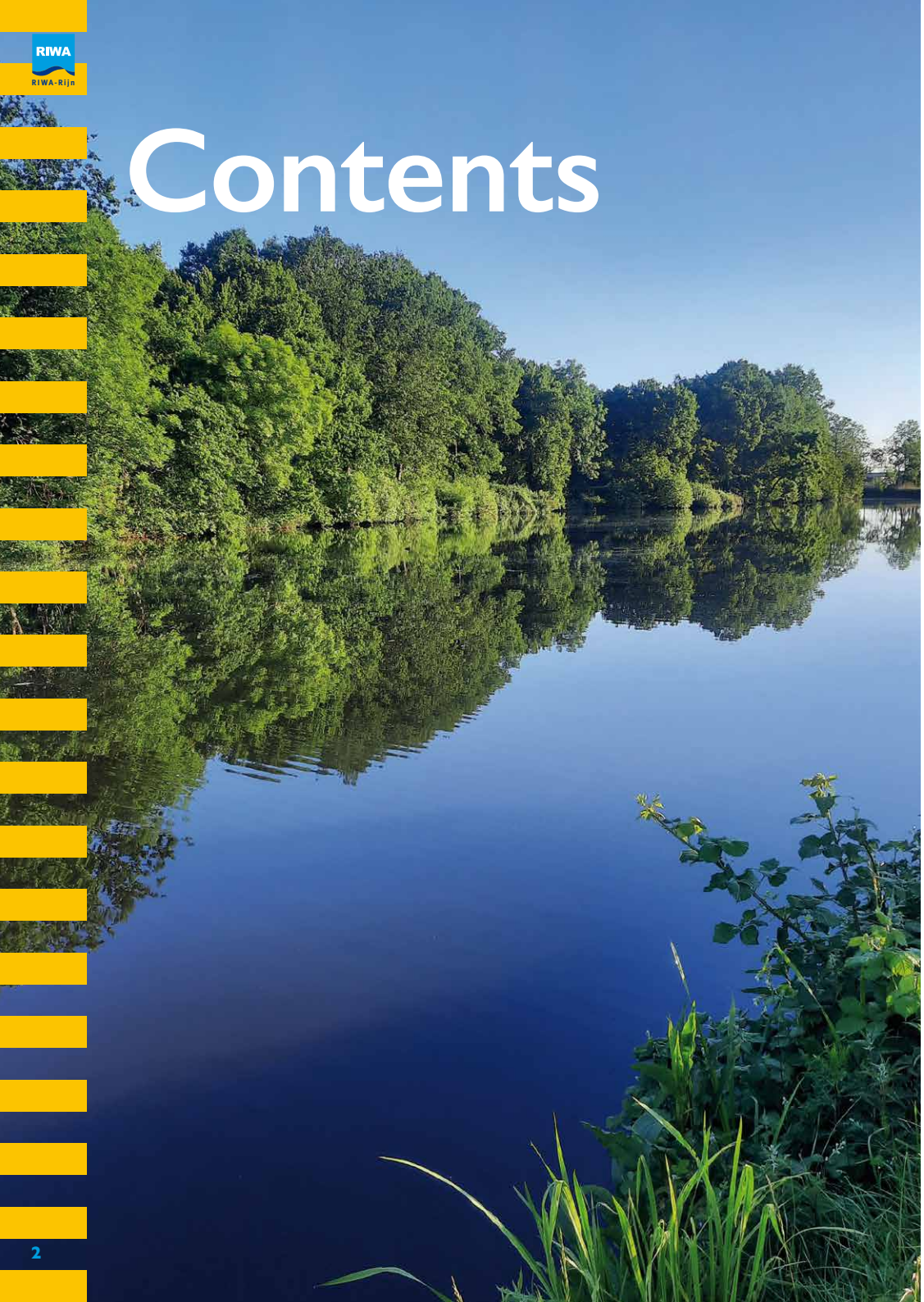
Annual Report 2020
The Rhine

Vereniging van Rivierwaterbedrijven

1951 2021 RIWA-Rijn



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Introduction

RIWA-Rijn 1951 2021

By
Dr. G.J. Stroomberg

On 15 June this year, RIWA attained the respectable age of 70 years. On this date in 1951, the directors of 'the four largest river water companies in the Netherlands' (Amsterdam, Rotterdam, The Hague and the province of Noord-Holland) met for the first time. The aim of this meeting was *'to jointly study the problem of the pollution of the Rhine, in order, as one, to provide the Government with advice in its further steps to combat this wrong as far as possible.'*

In the first instance, this 'Rhine Commission' (from 1952, the 'Rhine Commission of Water Supply Companies') was set up to advise the Dutch government about viewpoints to be taken on the International Rhine Commission (the IRC, the predecessor of the ICPR) that had been founded one year earlier. In the present day we are still studying the problem of the pollution of the Rhine and providing the government with advice. Many things have however changed in the intervening years. The network of four river water companies in the Netherlands expanded, along the Meuse and the Scheldt, and with the IAWR to the upstream part of the Rhine and to the river associations of the Ruhr, Elbe and Donau. And via the European River Memorandum (ERM), these associations call on the European governments to take measures, so that river water can be purified into clean, wholesome drinking water with simple, natural methods.

We no longer give our advice to the Dutch government alone, but also, together with the IAWR in the working groups of the ICPR, to the other national delegations and represented stakeholders. We were therefore delighted that the ICPR positively received our proposal in our last annual report, to make licence applications for large industrial discharges centrally available, and that they discussed it. The final conclusion was that no potential role could be seen for the ICPR in the process of licence issuance. But the Rhine river basin delegations did observe that there are hindrances to effective public participation and they intend to make efforts to remove these. To encourage the Rhine river basin countries in this, RIWA-Rijn has initiated a project to investigate how public access to the licence issuance process is organised in the different regions. In this project, specific attention will be paid to the Aarhus Convention and the conditions this imposes on effective stakeholder participation.

We publish and share the measurement data on which we base our advice, just as in the initial years, now not only with the substantively involved parties, but also with everyone who is interested in the development of the water quality of the Rhine. We share the data partly directly, and partly via this annual report, in which we also test against the ERM's target values, and describe the trends and developments.

This year also, we see substances that exceed the ERM target value, as we describe in this reporting about the water quality of the Rhine. A new element in this is that we have altered the way in which we indicate a trend in the water quality tables, with the help of a RIWA pictogram. A new RIWA pictogram has been added (a circle symbol) that indicates when no trend can be discerned, for example because too many observations lie below the reporting limit. With this new symbol, we have also been able to reduce the text needed to explain the results. We hope that this has improved the readability of the report.

In the description of the water quality this year, we have paid particular attention to PFAS compounds, because these are now a problem for all Dutch drinking water companies. These forever chemicals in no sense belong in the environment or the sources of drinking water. RIWA-Rijn calls for a total European ban on PFAS substances because they degrade poorly and therefore remain present in the environment for a long time.

New this year is measurement data for anthropogenic gadolinium. Gadolinium complexes are used in the same way as X-ray contrast agents for medical imaging and are excreted by the patient essentially unchanged. Due to their polar and persistent nature, we have detected these substances at elevated concentrations in the Rhine at Lobith. For these substances too, just as for X-ray contrast agents, the use of urine bags by patients is recommended to prevent emissions into the environment.

The plans to extract lithium, 'white gold', on a large scale from geothermal well water in the area between Basel and Karlsruhe raises the question of what the possible impact on the water quality of the Rhine could be. According to media reports, the expected quantity of lithium to be extracted could be enough to provide 400 million electric vehicles with a battery. We are therefore also paying attention to the present lithium concentrations and present an indicative health-based drinking water guideline value for lithium, which was derived by KWR Water Research Institute, commissioned by RIWA-Rijn. It is clear that care must be taken that the extraction, transport and processing of lithium has no effect on the present lithium concentrations in the Rhine.

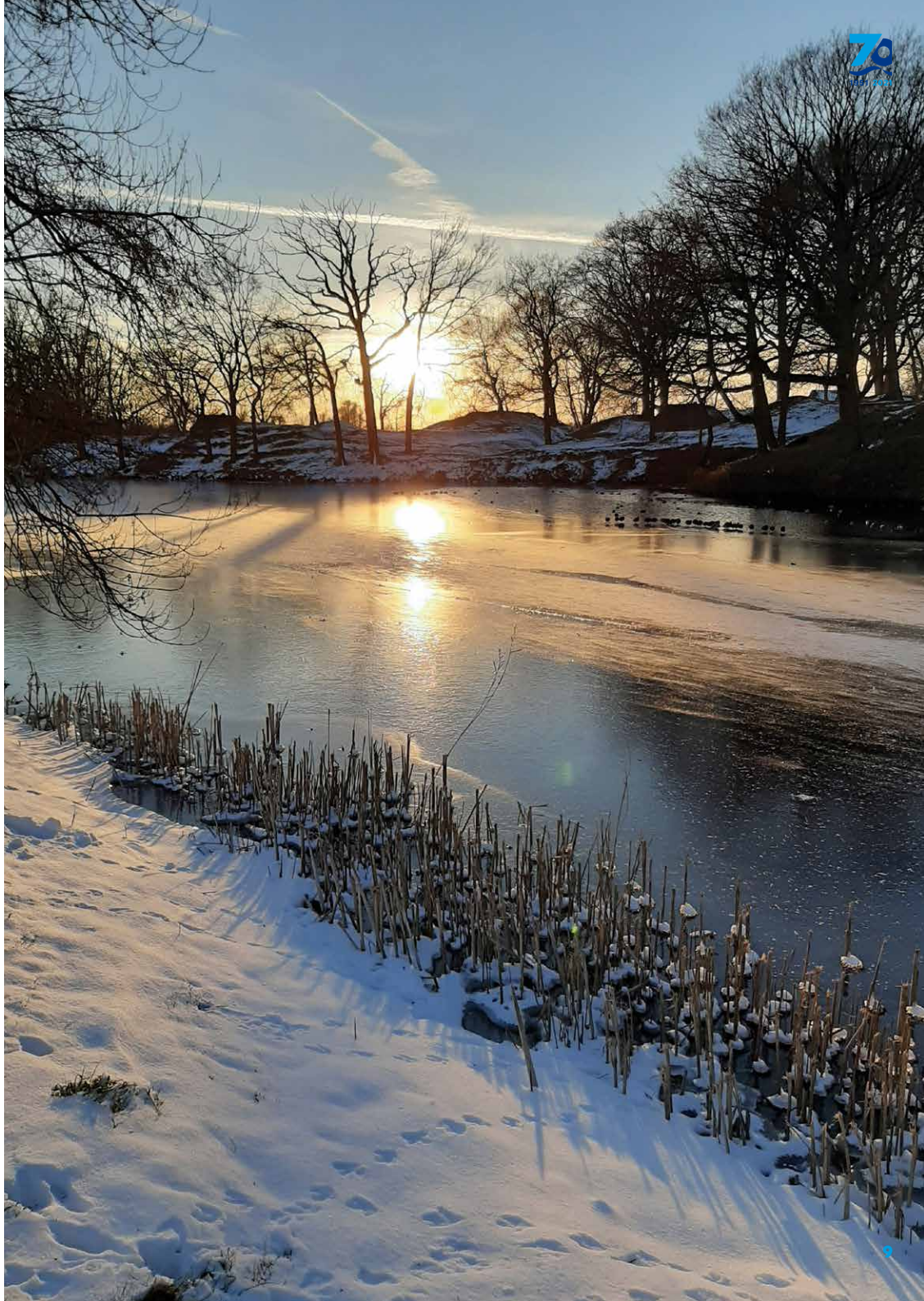
In follow-up to our theme report[1] last year, we also describe the water quality of the Rhine in terms of the removal requirement for the drinking water companies. The removal requirement includes the number and quantity of substances that drinking water companies must remove to meet the Dutch legal obligations for clean and wholesome drinking water. We calculate this removal requirement from the year 2000, the year in which the Water Framework Directive (WFD) came into force, and based on WFD Article 7.3, we may expect the required level of purification to decrease. The method applied has also been published as an Open Access article in 'Water Supply'[2].

"Calling for a clean river for 70 years is something to contemplate."

In this annual report, we also pay attention to substances that are persistent, mobile and possibly toxic, the PMT and vPvM substances. Due to their stated properties, these are difficult to remove during drinking water purification. In the context of a presentation for the UBA workshop[3] on 25 and 26 March this year in Berlin, Harrie Timmer (Vewin) and André Bannink (RIWA) wrote a background article that appeared in the Water Solutions magazine. The article provides many recommendations on how we can combine existing ideas and draft legislation for the protection of drinking water sources and achieve the WFD objectives for PMT and vPvM substances. We are glad to repeat this message in this report.

Besides our current look at the condition of the Rhine and the recommendations for the future, we also take advantage of the occasion of RIWA's 70th anniversary to look back at our past. Calling for a clean river for 70 years is maybe not something to celebrate, but it is something to contemplate. For this reason, the research group of Prof. Dr. Liesbeth van de Grift (Professor of International History and the Environment at Utrecht University) researched our archive for the history of RIWA's foundation, with particular attention to the early years. Much of what was advised for the first time and called for regarding the management of the river in the initial years, has become generally accepted in the meantime. Not only on the Rhine, but throughout Europe. However, there is still much to do, and the protection of the Rhine demands continuing attention. It is also clear though that international cooperation through the sharing of measurement data and insights has led and is still leading to better policy and a clean(er) Rhine.

1 Removal requirement and purification treatment effort for Dutch Rhine water from 2000-2018
2 doi: 10.2166/ws.2020.289
3 3rd PMT Workshop: PMT and vPvM substances under REACH



1 The quality of the Rhine water in 2020

In this chapter, we describe the quality of the surface water in the Rhine river basin in 2020. In the assessment of the surface water, we look at the water's suitability as a source for the production of drinking water.

1. The RIWA water quality measurement network and the RIWA-base

The RIWA water quality measurement network consists of different programmes that are carried out in four locations. The results from this are stored in our database, the RIWA-base.

1.1 Measurement locations

The water quality data from four locations is considered: the Rhine at Lobith, the Lek Canal at Nieuwegein, the Amsterdam-Rhine Canal at Nieuwersluis and the IJsselmeer at Andijk. The position of these locations may be found on the map on the following page (Illustration 1.1). At Nieuwegein, Nieuwersluis and Andijk, Rhine water is taken in by Waternet and PWN for the production of drinking water. There is a border measurement station at Lobith. Here, the quality of the Rhine water is monitored by Rijkswaterstaat (the executive agency of the Ministry of Infrastructure and Water Management), to determine the water quality at the entry point of the river into the Netherlands. Besides this, we, RIWA-Rijn, do additional measurements there (see section 1.2). Drinking water companies Vitens and Oasen also employ the water quality data to monitor their (riverbank) filtration locations along the IJssel and the Lek. Vitens abstracts riverbank groundwater along the IJssel at Zwolle. Oasen uses riverbank filtrate for the drinking water production along the Rhine tributaries the Noord and the Lek. The abstracted riverbank groundwater, which is partly Rhine water, is also analysed extensively. Only the analyses of the Rhine water itself are presented in this report.

1.2 The RIWA water quality measurement network

At the reporting locations, as well as the conventional parameters, an extensive package of organic micropollutants is investigated, including the residues of pharmaceuticals and endocrine-disrupting chemicals. This year, via screening investigation or national or international contacts, new '*contaminants of emerging concern (CECs)*' have been added to the measurement network. Under long-running agreements within the *Internationale Arbeitsgemeinschaft der Wasserwerke im Rheineinzugsgebiet* (IAWR), the umbrella organisation of drinking water companies within the entire Rhine river basin, the measurements

Illustration 1.1 Overview of reporting locations, other water intake locations and riverbank filtration locations in the Dutch part of the Rhine river basin. The areas supplied with drinking water by the Rhine are also shown.

to be done are divided into two programmes. The first is a basic programme, with fixed measurement frequencies and permanently-described parameters for all sampling points, and the second is an additional programme, with periodically-alterable parameters, only at the main sampling points. Lobith is one of these main sampling points.

At each of the three intake locations, the surface water is analysed by the relevant drinking water company and by Rijkswaterstaat. Rijkswaterstaat's analyses are mostly done in their laboratory in Lelystad. The analyses for the intake locations are conducted by Het Waterlaboratorium (HWL) in Haarlem.

Also in 2020, commissioned by RIWA-Rijn, additional analyses of pharmaceuticals, complexing agents, artificial sweeteners, perfluoro compounds, plant protection products and biocides, benzotriazoles and a number of metabolites were conducted at Lobith by the *Technologiezentrum Wasser* (TZW) in Karlsruhe. Besides this, also commissioned by RIWA-Rijn, a number of bacteriological parameters, hexamethoxymethyl melamine (HMMM) and 1,4-dioxane were measured by RheinEnergie in Cologne.

RIWA-Rijn has an agreement with Rijkswaterstaat to exchange data from the various measurement locations, to avoid double measurements as far as possible. This declaration of intent was renewed in 2016 and at that time RIWA-Maas entered into it too.

1.3 The RIWA-base

All measurement data is stored in our database, the RIWA-base. The RIWA-base now contains 3.72 million measurement data points (one data point is one parameter at one location on one date), from 1875 to the present. Various functions are built into the RIWA-base for analysing the data. All measurement series are checked for breaches of the target values in the European River Memorandum (see section 2.1 of this chapter) and for the presence of trends. The trends are calculated over a period of five years. These breaches and trends are presented in this annual report, the trends being reported with 95% confidence. More information about the functions that are implemented in the RIWA-base may be found in the report '30 Years of RIWA-base' (May 2012, available from our website www.riwa-rijn.org).

1.4 The RIWA-base for the benefit of third parties

Others besides ourselves process the data in the RIWA-base. Other organisations also employ the extensive and well-organised data series. Annual data deliveries are made to the Ctgb (Dutch Board for the Authorisation of Plant Protection Products and Biocides) and to the Pesticides Atlas. Further, RIWA-Rijn has in the past year delivered data to the research institute Deltares, the RIVM (Netherlands National Institute for Public Health and the Environment, particularly the working parties on 'Approach to emerging substances' and PMT), the ICPR (International Commission for Protection of the Rhine), KWR (KWR Water Research Institute), Rijkswaterstaat, Vewin (Association of Water Companies in the Netherlands) and I&W (Netherlands Ministry of Infrastructure and Water Management). Various universities, research bureaus and water boards have also found their way to the RIWA-base over the course of time.

2. Assessment of the water quality

We assess the water quality of the Rhine based on the target values in the European River Memorandum (ERM). Also, the trends in the data over the last five years are looked at.

2.1 European River Memorandum (ERM)

The IAWR (*Internationale Arbeitsgemeinschaft der Wasserwerke im Rheineinzugsgebiet*), in collaboration with the IAWD (*Internationale Arbeitsgemeinschaft der Wasserwerke im Donau-einzugsgebiet*), the AWE (*Arbeitsgemeinschaft der Wasserversorger im Einzugsgebiet der Elbe*), the AWWR (*Arbeitsgemeinschaft der Wasserwerke an der Ruhr*), RIWA-Maas (the Association of Meuse River Water Companies) and RIWA-Schelde (the Association of Scheldt River Water Companies) drafted the European River Memorandum (ERM). Together, these organisations represent 188 million consumers in 18 countries, with 170 water supply companies.

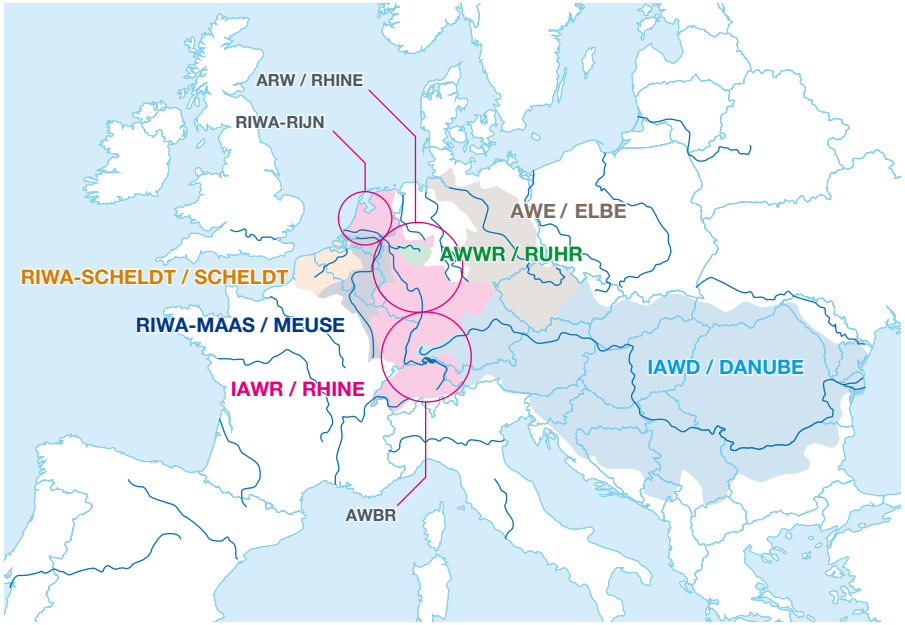


Illustration 1.2 Schematic overview of the river basins of the ERM coalition

Illustration 1.2 presents an overview of the organisations and their river basins.
The ERM is available in English, German, French and Dutch. The document describes principles for sustainable protection of the water quality and specific target values for groups of substances. The target values (ERM target values) in this memorandum are defined as maximum values[1]. A general principle of this ERM is that, for many substances, legal standards already exist, while for other substances, which from the philosophy of purification that is as natural as possible are problematic, no legal standards yet apply. The ERM targets these substances and groups of substances specifically.

It is recognised that the ERM has no legal status, and that it is based on the precautionary principle and the generally-shared presumption that sources for drinking water ought to be pure. For this reason, the values in the ERM are consistently indicated as 'target values' in this annual report. The ERM target values are presented in the text box below.

ERM target values

Surface water that meets the target values in the following tables makes sustainable production of drinking water possible using simple processes that are as natural as possible.

General parameters	Target value
Oxygen content	> 8 mg/L
Electrical conductivity	70 mS/m
pH value	7 - 9
Temperature	25 °C
Chloride	100 mg/L
Sulphate	100 mg/L
Nitrate	25 mg/L
Fluoride	1.0 mg/L
Ammonium	0.3 mg/L

Composite organic parameters	Target value
Total organic carbon (TOC)	4 mg/L
Dissolved organic carbon (DOC)	3 mg/L
Adsorbable organic halogen compounds (AOX)	25 µg/L
Adsorbable organic sulphur compounds (AOS)	80 µg/L

Anthropogenic (non natural) substances	Target value
Evaluated substances without known effects on biological systems microbially poorly degradable substances, per individual substance	1.0 µg/L
Evaluated substances with known effects on biological systems, per individual substance	0.1 µg/L*
Non-evaluated substances that cannot be removed sufficiently by natural procedures, per individual substance	0.1 µg/L
Non-evaluated substances that form non-evaluated degradation/transformation products, per individual substance	0.1 µg/L

**except if toxicological findings require an even lower value, e.g. for genotoxic substances*

1. Exceptions are oxygen content and acidity (pH)

2.2 Data, trends and pictograms

The measured parameters are categorised in the RIWA-base into groups based on their areas of application. If a parameter has multiple areas of application, it may arise in multiple groups. Metabolites are categorised into the parameter group of their parent substance. The data are reported in this annual report by parameter group and may be found in Appendix 1 *Water quality data 2020*. In this appendix, the measurement results for the four reporting locations are presented as monthly averages, together with a number of other parameters for the year 2020 and the five-year trends (period 2016-2020).

There is a difference between the content of Appendix 1 for the printed version of the annual report and its digital version. In the printed version of the report, only the parameters that are handled in the text are presented in Appendix 1. These are the parameters that exceeded the target value in the ERM at one or more locations, that had a value of 80-100% of the ERM target value, or that revealed a significant trend. Appendix 1 of the digital version of this annual report contains the complete overview of the available data for the measured parameters, so also for those parameters that were indeed analysed for, but were not detected (reported under the reporting limit). This version may be found on our website (www.riwa-rijn.org). Further, the CAS number is presented in both versions, to simplify searching for parameters.

Appendix 1 also contains RIWA pictograms, presenting information about the position of the maximum with respect to the ERM target value, the number of measurements in the reporting year and the trend. Previously, observations about the position of the maximum with respect to the ERM target value could only be made when a symbol for the trend was available. It does however happen that a data series is not suitable for a trend calculation, yet does contain values that lie above the target value. From this year, therefore, a new pictogram with a circle symbol has been added. This pictogram is shown when no trend analysis could be conducted, so that by means of the colour of the pictogram, information is indeed available about (breaches of) the ERM target value. A comprehensive description of the colours and symbols used in the pictograms may be found in Appendix 1 on page 153. Further, it happened in the past that, for a series with many values below the reporting limit, the application of the reporting limit to a parameter could lead to an 'erroneous' trend. Values under the reporting limit, the so-called censored values, were previously set to half of the value of the reporting limit for entry of the data into the trend analysis program. This meant that they were no longer recognised by the program as censored values. By no longer modifying the censored values for entry, but by actually entering them as censored values, it is possible to look at how many censored values a data series has during the trend analysis. When more than 80% of the data series consists of censored values, no trend is calculated for this data series. In this way, 'apparent' trends resulting from entry of a modified reporting limit no longer arise. All trends presented are genuine trends.

All the results are discussed in the following sections. Section 3 presents an overview of the number of parameters and measurements in the monitoring programmes and the number of parameters that exceeded the ERM target value in 2020. Then in section 4, the breaching parameters and trends are gone into more deeply for each parameter group.

3. General results

This section presents an overview of the number of parameters and measurements in the monitoring programmes and the number of parameters that exceeded the ERM target value in 2020.

3.1 Number of parameters and data points

The following results concern the extent of the monitoring programmes in 2020. Table 1.1 presents an overview of the number of parameters and the number of measurements that we report for the year 2020 for each reporting location. Table 1.2 shows how many parameters were added or removed with respect to 2019, and also what the nett result of this is on the monitoring programmes. As already announced in the annual report for 2019, at Nieuwegein, a large group of parameters was removed in 2020 (223), motivated by risk-based monitoring. Substances that had no longer been found for some time, or only incidentally, were removed from the monitoring programme, or measured at a much lower frequency. For part of the parameters that were no longer determined using a target substance analysis, we went over to screening and effect monitoring. We do not include any non-target or suspect screening results in the RIWA-base, so that we no longer report these parameters. At Nieuwegein, despite this reduction in parameters, the monitoring programme still contains the most parameters of the four locations (677); see Table 1.1 The number of parameters measured at Andijk (643) and at

Nieuwersluis (637) is indeed similar. The number of measurements from Nieuwersluis (6607) is however quite a bit fewer than from Nieuwegein (12210) or Andijk (8457), which means that the measurement frequency for some of the parameters is lower there. Lobith has the fewest parameters with a total of 473. At Nieuwersluis, 168 parameters were added compared to 2019 (see Table 1.2). This is the result both of newly-added parameters and of parameters that were not measured in 2019, but that were again measured in 2020. For this last group of parameters, no five-year trend can be determined, because the measurement series is interrupted. In total in 2020, 34787 results were reported for the Rhine reporting locations (see Table 1.1). This total is similar to the number of data points in 2019 (34513).

Table 1.1 Overview of the number of parameters and measurements in 2020 for each reporting location

Reporting location	Number of parameters determined in 2020	Number of measurements in 2020
Lobith	473	7513
Nieuwegein	677	12210
Nieuwersluis	637	6607
Andijk	643	8457
Total		**34787**

Table 1.2 Overview of the number of parameters added to the monitoring programme in 2020 (new parameters), the number of parameters no longer measured (removed parameters) and the nett result of this (total difference) for each reporting location

Reporting location	Number of new parameters	Number of parameters removed	Total difference
Lobith	4	10	-6
Nieuwegein	6	223	-217
Nieuwersluis	179	11	168
Andijk	11	11	0

3.2 Results from testing against ERM target value

The measurement values of the parameters were compared to the ERM target values. Table 1.3 presents an overview of the parameters that at least once in 2020 had a value above the ERM target value at one or more locations. For each parameter, the highest measured value (for oxygen the lowest measured value) at each location is presented, with breaches of the target value in bold. Further, Table 1.4 shows which parameters are reported with a reporting limit that is higher than the ERM target value, so that no proper test against this target value is possible.

Of the measured parameters in 2020, 60 parameters exceeded the ERM target value. There are ten parameters that exceeded the ERM target value in 2019, but no longer in 2020. These are diethylenetriaminepentaacetic acid (DTPA), pyrazole, monobromoacetic acid, theophylline, caffeine, furosemide, bisphenol A, 4-nonylphenol isomers, acesulfame and GR-Calux activity with respect to dexamethasone. Also, there are ten parameters that did not exceed the target value in 2019, but did in 2020. These are the parameters water temperature, ammonium, naphthalene, benzotriazole, dichloroacetic acid, trichloroacetic acid (TCA), hexamethoxymethyl melamine (HMMM), ibesartan, bis(2-ethylhexyl) phthalate (DEHP) and P53 Calux activity with respect to cyclofosfamide. Gadolinium (anthropogenic) is a newly-measured parameter in 2020 and is also a parameter in breach. Besides this, lithium and lithium after filtration have in 2020 received a target value of 0.1 µg/L (see section 4.5) and this target value was exceeded by both parameters.

The number of parameters with an excessive reporting limit with respect to the ERM target value is thirteen. There are two parameters whose reporting limit was too high in 2019, but no longer in 2020. These are diazinon and flonicamid. Also, in 2020, there are an additional six parameters whose reporting limit is too high to be tested properly. These are 1,1-dichloroethene, 1,3,5-trichlorobenzene, chloroethene, trichlorobenzenes (3 isomers), NRF2-Calux activity with respect to curcumin and P53 Calux activity with respect to cyclofosfamide. However, the measurements of this last parameter were mainly above the reporting limit, which means that most of these measurements could be tested and exceedances were found.

Table 1.3 Parameters that exceeded the ERM target value (ERM tv) at least once in 2020 at one or more locations. An explanation of the pictograms can be found on page 153.

	CAS-number	dimension	ERM tv	Lobith		Nieuwegein		Nieuwersluis		Andijk	
				max.	pict.	max.	pict.	max.	pict.	max.	pict.
General parameters											
water temperature		°C	25	25,7		25,5		25,5		25	
oxygen	7782-44-7	mg/L	8	8,18		6,7		7,9		2,6	
conductivity (at 20 °C)		mS/m	70	73,2		62,1		64,4		79,6	
Inorganic substances											
chloride	16887-00-6	mg/L	100	140		87		89		155	
Nutrients											
ammonium (NH4)		mg/L	0,3	0,21		0,14		0,31		0,11	
Group compounds											
TOC (total organic carbon)		mg/L	4	8,6		3,16		8,3		8,62	
DOC (dissolved organic carbon)		mg/L	3	7,2		2,92		7,77		6,95	
AOX (adsorbable organic halides)		µg/L	25	43		-		-		-	
Detergent components and complexing agents											
nitrilotriacetic acid (NTA)	139-13-9	µg/L	1	2,9		< 1		< 1		< 1	
ethylenediaminetetraacetic acid (EDTA)	60-00-4	µg/L	1	5,8		7		9,8		7,8	
methylglycinediacetic acid (alpha ADA)	164462-16-2	µg/L	1	2,4		-		-		-	
Polycyclistic aromatic hydrocarbons (PAHs)											
phenanthrene	85-01-8	µg/L	0,1	0,01		0,01		0,21		0,01	
fluoranthene	206-44-0	µg/L	0,1	0,02		0,01		0,20		0,01	
pyrene	129-00-0	µg/L	0,1	0,01		0,01		0,14		0,01	
naphthalene	91-20-3	µg/L	0,1	< 0,03		0,01		0,14		< 0,03	
Amide fungicides											
N,N-dimethylsulphamide (DMS)[a]	3984-14-3	µg/L	0,1	0,03		0,07		0,14		< 0,05	
Anilide herbicides											
metazachlor ESA	172960-62-2	µg/L	0,1	0,1		0,11		0,04		0,11	
Triazin herbicides											
metolachlor OA	152019-73-3	µg/L	0,1	0,02		0,03		0,03		0,14	
metolachlor ESA	171118-09-5	µg/L	0,1	0,06		0,07		0,06		0,24	
Other herbicides											
aminomethylphosphonic acid (AMPA)	1066-51-9	µg/L	0,1	0,30		0,78		0,81		0,32	
Industrial solvents											
tetrachloroethene	127-18-4	µg/L	0,1	< 0,1		0,22		0,04		< 0,01	
1,4-dioxane[b]	123-91-1	µg/L	0,1	1,42		0,75		0,85		0,4	
Industrial chemicals (benzotriazoles)											
benzotriazole	95-14-7	µg/L	1	0,73		1,1		0,83		0,58	
Industrial chemicals (with haloacids)											
trifluoroacetic acid (TFA)	76-05-1	µg/L	0,1	1,3		1,2		1,3		1,4	
dichloroacetic acid	79-43-6	µg/L	0,1	-		0,11		0,02		< 0,02	
trichloroacetic acid (TCA)	76-03-9	µg/L	0,1	-		0,18		0,09		0,11	
Industrial chemicals (precursors and intermediates)											
methenamine	100-97-0	µg/L	1	4		2,8		1,9		1,7	
Other industrial chemicals											
hexamethoxymethyl melamine (HMMM)	3089-11-0	µg/L	1	1,5		0,75		0,69		0,47	
1,3,5-triazine-2,4,6-triamine (melamine)	108-78-1	µg/L	1	2,5		2,4		2,2		1,4	

Continuation Table 1.3

	CAS-number	dimension	ERM tv	Lobith max.	Lobith pict.	Nieuwegein max.	Nieuwegein pict.	Nieuwersluis max.	Nieuwersluis pict.	Andijk max.	Andijk pict.
X-ray contrast agents											
diatrizoic acid (amidotrizoic acid)	117-96-4	µg/L	0,1	0,26		0,17		0,2		0,39	
iohexol	66108-95-0	µg/L	0,1	0,48		0,22		0,2		0,12	
iomeprol	78649-41-9	µg/L	0,1	0,71		0,52		0,83		0,43	
iopamidol	60166-93-0	µg/L	0,1	0,41		0,24		0,22		0,18	
iopromide	73334-07-3	µg/L	0,1	0,33		0,36		0,67		0,18	
Blood pressure-lowering drugs and diuretics											
metoprolol	37350-58-6	µg/L	0,1	0,15		0,10		0,12		0,06	
sotalol	3930-20-9	µg/L	0,1	0,02		0,08		0,13		0,02	
hydrochlorothiazide	58-93-5	µg/L	0,1	0,13		0,09		0,15		0,07	
valsartan	137862-53-4	µg/L	0,1	0,14		0,12		0,12		0,07	
irbesartan	138402-11-6	µg/L	0,1	-		0,07		0,11		0,02	
valsartan acid	164265-78-5	µg/L	0,1	0,31		0,3		0,3		0,25	
atenolol acid	56392-14-4	µg/L	0,1	0,12		-		-		-	
candesartan	139481-59-7	µg/L	0,1	0,31		0,13		0,16		0,1	
Analgesic and antipyretic drugs											
diclofenac	15307-86-5	µg/L	0,1	0,18		0,08		0,1		0,06	
N-acetyl-4-aminoantipyrine (AAA)	83-15-8	µg/L	0,1	0,28		0,46		0,5		0,34	
N-formyl-4-aminoantipyrine (FAA)	1672-58-8	µg/L	0,1	0,55		0,26		0,27		0,17	
Various pharmaceuticals											
metformin	657-24-9	µg/L	0,1	1,5		0,81		0,79		0,51	
gluanylurea	141-83-3	µg/L	0,1	2,4		3,5		3,3		0,77	
gabapentine	60142-96-3	µg/L	0,1	0,31		0,36		0,39		0,27	
10,11-dihydro-10,11-dihydroxycarbamazepine	58955-93-4	µg/L	0,1	0,17		0,15		0,2		0,11	
lamotrigine	84057-84-1	µg/L	0,1	0,11		0,12		0,12		0,08	
sitagliptin	486460-32-6	µg/L	0,1	0,28		0,1		0,1		0,05	
oxypurinol	2465-59-0	µg/L	0,1	1,3		1,2		1,2		0,82	
gadolinium (anthropogenic)	7440-54-2	µg/L	0,1	0,43		0,19		0,18		0,16	
lithium	7439-93-2	µg/L	0,1	24,9		13,4		12,9		12,5	
lithium, 0.45 µm filtrate		µg/L	0,1	23,7		12,9		12,4		12,4	
Endocrine-disrupting chemicals (EDCs)											
bis(2-ethylhexyl) phthalate (DEHP)[c]	117-81-7	µg/L	0,1	< 1 *)		1,44		< 1 *)		< 1 *)	
Artificial sweeteners											
sucralose	56038-13-2	µg/L	1	1,2		2,4		3,9		1,7	
Bioassays											
AR-anti-Calux act. with respect to flutamide		µg/L	0,1	-		47		3,11		27,79	
NRF2-Calux act. with respect to curcumin		µg/L	0,1	-		< 100 *)		< 100 *)		170	
P53 Calux act. with respect to cyclofosfamide		µg/L	0,1	-		< 150 *)		< 150 *)		439	

a This parameter also belongs to the group 'Wood preservatives'
b This parameter also belongs to the group 'Ethers'
c This parameter also belongs to the group 'Plasticisers'

**) means that the reporting limit is above the ERM target value*

Table 1.4 Non-testable parameters in 2020. The reporting limit used by laboratories for these parameters in 2020 was too high to allow the values to be tested against the ERM target value (ERM tv).

	CAS-number	dimension		ERM tv	Lobith	Nieuwegein	Nieuwersluis	Andijk
Industrial solvents								
dichloromethane	75-09-2	µg/L		0,1	no assessment	< 0,05	no assessment	no assessment
1,1,2,2-tetrachloroethane	79-34-5	µg/L		0,1	no assessment	< 0,03	no assessment	no assessment
Industrial chemicals (with arom. hydrocarbons)								
3-chloromethylbenzene	108-41-8	µg/L		0,1	no assessment	no assessment	no assessment	no assessment
Industrial chemicals (with vol. halog. hydrocarbons)								
1,1-dichloroethene	75-35-4	µg/L		0,1	no assessment	< 0,05	< 0,05	< 0,05
1,3,5-trichlorobenzene	108-70-3	µg/L		0,1	no assessment	< 0,01	< 0,05	< 0,05
chloroethene	75-01-4	µg/L		0,1	no assessment	< 0,03	< 0,03	< 0,03
Industrial chemicals (with haloacids)								
monochloroacetic acid	79-11-8	µg/L		0,1	n.d.	no assessment	no assessment	no assessment
Other Industrial chemicals								
3-chloropropene	107-05-1	µg/L		0,1	no assessment	< 0,1	< 0,1	< 0,1
trichlorobenzenes (3 isomers)	12002-48-1	µg/L		0,1	no assessment	< 0,015	< 0,075	< 0,075
Endocrine-disrupting chemicals (EDC's)								
bis(2-ethylhexyl) phthalate (DEHP)a	117-81-7	µg/L		0,1	no assessment	**1,44**	no assessment	no assessment
di-(2-methylpropyl)phtalate (DIBP)a	84-69-5	µg/L		0,1	n.d.	no assessment	no assessment	n.d.
Bioassays								
NRF2-Calux act. with respect to curcumine		µg/L		0,1	n.d.	no assessment	no assessment	**170**
P53 Calux act. with respect to cyclofosfamide		µg/L		0,1	n.d.	no assessment	no assessment	**439**

a This parameter also belongs to the group 'Plasticisers'

no assessment : no proper test possible
n.d. : no data
number : highest value measured
bold number : exceedance of ERM target value

4. Results for each parameter group

This section describes the parameters (from the parameter groups) that exceeded the target value in the European River Memorandum (ERM) at one or more locations, that had a value of 80-100% of the ERM target value, or that revealed a relevant significant trend. The names of the subsections largely correspond to the names of the parameter groups that are used in Appendix 1 *Water quality data 2020*. Firstly, the parameter groups with the most or highest breaches of the ERM target value are considered.

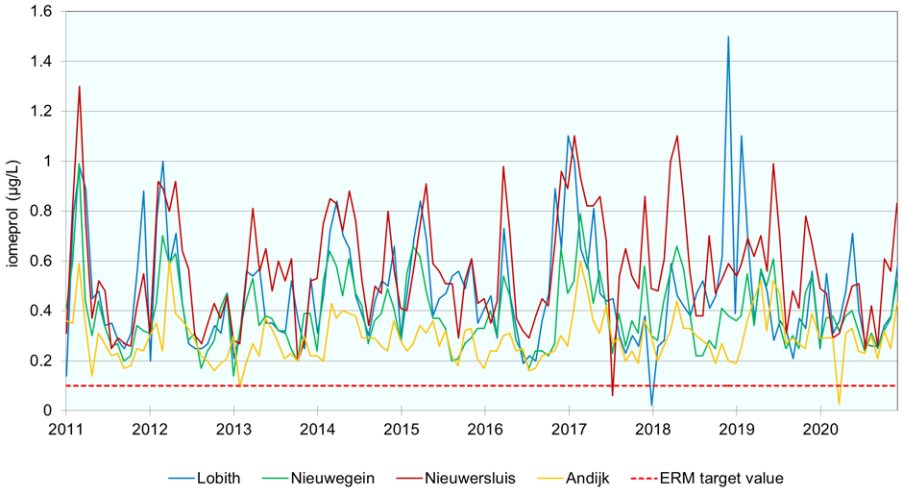
4.1 X-ray contrast agents

The largest source of X-ray contrast agents is excretion via the urine by people to whom these agents have been administered, for example when they underwent a CT scan. In the purification of the waste water in conventional sewage treatment plants, these agents are hardly removed at all, so they end up in the surface water. A source approach is therefore required and could have a major effect. An example here would be the use of urine bags. In May 2021, the report on the Wide Test of Urine Bags appeared, in which outpatients in six hospitals were given urine bags after their CT scans (Hoogenboom et al., 2021). The primary findings of this study were:

1. The willingness to use urine bags is very high among both personnel and patients.
2. Early, clear and repeated patient communication about the urine bags is important. The staff communication proved to be effective.
3. The costs of offering urine bags after a CT scan were entirely defined by the costs of the urine bags themselves.
4. National implementation of urine bags is possible.

In 2020, five X-ray contrast agents exceeded the ERM target value (0.1 µg/L) at all locations, just as in preceding years (see Table 1.3). These are diatrizoic acid (amidotrizoic acid), iohexol, iomeprol, iopamidol and iopromide. Of the 260 measurements, nearly 65% exceeded the target value. This means there was a reduction with respect to the number of breaches in 2019 (83%). Iomeprol again had the most breaches (all measurements but one at Andijk) and had the highest concentration of the X-ray contrast agents at each location. The highest value (0.83 µg/L) was observed at Nieuwersluis (see Table 1.3). At the other locations, the maximums were lower than in 2019. Graph 1.1 shows the concentrations of iomeprol at the Rhine locations in the last ten years. Through this entire period, almost all concentrations were above the ERM target value.

Both the concentrations and the loads of diatrizoic acid (amidotrizoic acid) and iopamidol demonstrated a falling trend at Nieuwegein. This also applies to the diatrizoic acid load at Lobith. Further, iopromide had a falling trend at Nieuwersluis, and ioxitalamic acid, just as in 2019, showed a falling trend at Nieuwegein, Nieuwersluis and Andijk. Appendix 1 *Water quality data 2020* presents all measurements and the associated loads of the X-ray contrast agents that exceeded the ERM target value and/or revealed a trend.



Graph 1.1 Concentrations of iomeprol at the Rhine locations during the period 2011-2020

4.2 Blood pressure-lowering drugs and diuretics

Blood pressure-lowering drugs, for example beta blockers, are widely applied. Diuretics are also known as water pills. Within this group, there are eight substances that exceeded the ERM target value of 0.1 µg/L in 2020 (see Table 1.3). Seven of these revealed breaches in 2018 and 2019. Irbesartan was added to the breaching substances in 2020. Most breaches took place at Lobith and Nieuwersluis.

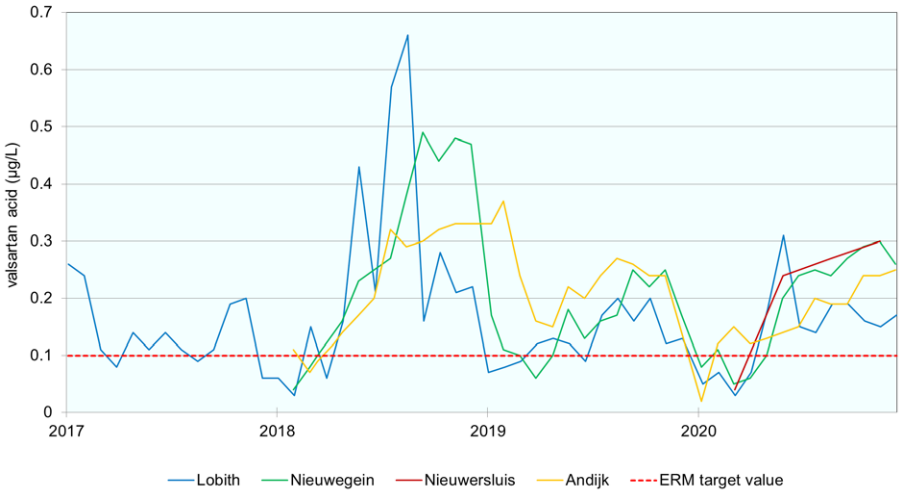
The beta blocker metoprolol had a rising trend at Nieuwersluis and also exceeded the target value here (four out of thirteen measurements), just as at Lobith (two out of thirteen

measurements). The maximums of 0.12 and 0.15 µg/L respectively were similar to those in 2019. This also applies to the maximum of the beta blocker sotalol at Nieuwersluis, with a value of 0.13 µg/L. This substance exceeded the target value here twice. At Nieuwegein, the maximum for sotalol (0.08 µg/L) approached the target value. Atenolol acid, a metabolite of the beta blocker atenolol, was only measured at Lobith and exceeded the target value three times, with a maximum of 0.12 µg/L. Atenolol had a rising trend at Nieuwersluis and bisoprolol had a rising trend at Nieuwegein.

The diuretic hydrochlorothiazide exceeded the ERM target value once at Lobith (max. 0.13 µg/L) and three times at Nieuwersluis (max. 0.15 µg/L). The maximums were lower than those of 2019 (0.17 and 0.20 µg/L respectively). At Nieuwegein, this substance had a breach in 2019, but no longer in 2020. The maximum (0.09 µg/L) was indeed in the vicinity of the ERM target value. At Lobith, this substance had a falling trend, just as in 2019 (both for the concentration and the load), and a falling trend may also be seen at Nieuwersluis.

Just as in 2019, the blood pressure-lowering drug valsartan exceeded the ERM target value at all locations, except at Andijk (see Table 1.3). The maximums for Lobith and Nieuwegein were lower in 2020 (0.14 and 0.12 µg/L) compared to 2019 (0.3 and 0.15 µg/L). Valsartan acid, a metabolite of valsartan, exceeded the ERM target value at all locations (see Table 1.3 and Graph 1.2). This substance had more breaches than its parent substance valsartan. Most of the breaches took place at Andijk, but the maximum of 0.25 µg/L was lower than the one in 2019 (0.37 µg/L). The highest concentrations at Lobith, Nieuwegein and Nieuwersluis were almost identical (0.31, 0.3 and 0.3 µg/L respectively). Candesartan, also a blood pressure-lowering drug, had more breaches in 2020 than in 2019: at Lobith, ten of the thirteen measurements, at Nieuwegein, six of the thirteen measurements, and at Nieuwersluis, seven of the eleven measurements. The maximum at Nieuwegein was equal to that of 2019 (0.13 µg/L). The maximum at Lobith, at 0.31 µg/L, was twice as high as that of 2019 (0.15 µg/L). The highest concentration at Nieuwersluis was 0.16 µg/L and that at Andijk was equal to the target value of 0.1 µg/L. The blood pressure-lowering drug irbesartan exceeded the target value once at Nieuwersluis, with a value of 0.11 µg/L. The maximum for telmisartan was close to the target value with a value of 0.09 µg/L.

The data for the parameters described in this section may be found in Appendix 1 *Water quality data 2020* in the printed version of this annual report.

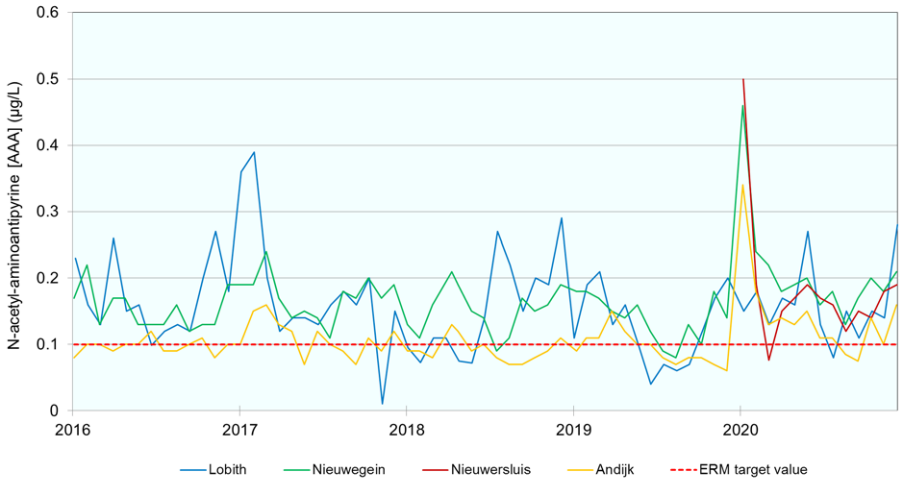


Graph 1.2 Concentrations of valsartan acid at the Rhine locations during the period 2017-2020

4.3 Analgesic and antipyretic drugs

In total, 542 analysis results were reported for the parameter group 'analgesic and antipyretic drugs', of which 87% were above the reporting limit. The parameters within this group that exceeded the ERM target value in 2020 also revealed breaches in previous years. The most striking substances are N-acetyl-aminoantipyrine (AAA) and N-formyl-4-aminoantipyrine (FAA), two metabolites of phenazone (antipyrine). Both substances, looking at all locations, had many breaches, 47 out of 52 measurements and 45 out of 49 measurements respectively. In 2019, the highest concentrations for both substances were measured at Lobith. In 2020, this still applied for FAA (max. 0.55 µg/L), but the maximum for AAA measured at Lobith (0.28 µg/L) was the lowest maximum for the four locations. The highest value for AAA was found at Nieuwersluis (0.5 µg/L), followed by Nieuwegein (0.46 µg/L) and then Andijk (0.34 µg/L).

The maximums for FAA were lower: Nieuwersluis, 0.27 µg/L, Nieuwegein, 0.26 µg/L and Andijk, 0.17 µg/L. Most maximums of 2020 were higher than those of 2019. Graph 1.3 shows the course of the concentrations of AAA during the past five years.



Graph 1.3 Concentrations of N-acetyl-aminoantipyrine (AAA) at the Rhine locations during the period 2016-2020

The third breaching substance in this group is diclofenac, a painkiller and anti-inflammatory drug. The ERM target value was exceeded twice at Lobith, with a maximum of 0.18 µg/L. The highest concentration measured at Nieuwersluis was equal to the target value (0.1 µg/L) and that at Nieuwegein came into its vicinity with a value of 0.08 µg/L. Further, lidocaine, phenazone and primidone revealed a rising trend at Nieuwegein, Nieuwersluis and Andijk.

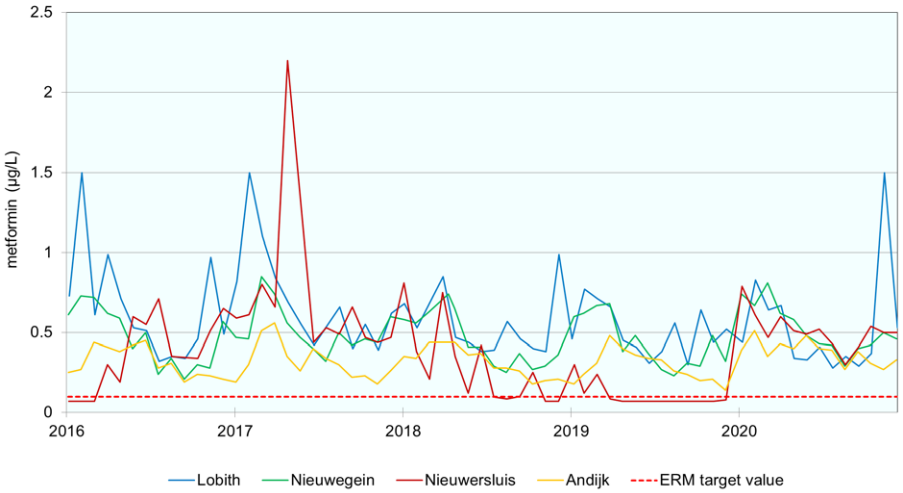
4.4 Antidepressants and tranquillisers

The maximum in 2020 for O-desmethylvenlafaxine, a metabolite of the antidepressant enlafaxine, with a value of 0.1 µg/L, was equal to the ERM target value. Further, a rising trend was observed for the oxazepam concentration at all locations, and for the oxazepam load at Lobith and Nieuwegein. Temazepam had a rising trend at Nieuwersluis and Andijk. In total, 312 analysis results were reported for this parameter group, of which over 67% were above the reporting limit. The data for all the parameters in this parameter group may be found in Appendix 1 of the printed version of this annual report.

4.5 Other pharmaceuticals

In total, 972 analysis results were reported in the parameter group 'other pharmaceuticals' in 2020, of which 83% were above the reporting limit and 44% above the ERM target value of 0.1 µg/L. The eight breaching substances within this group may be found in Table 1.3. Seven of these also exceeded the ERM target value in 2019. The eighth breaching parameter is a new parameter in this group, namely anthropogenic gadolinium. Furosemide had a breach in 2019, but no longer in 2020.

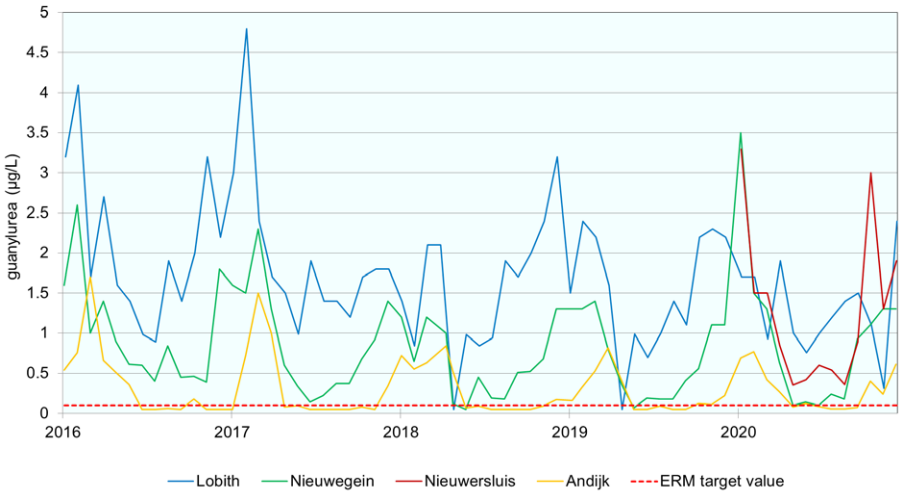
Metformin is a medication that is used in the treatment of diabetes type 2. At all locations all thirteen measurements exceeded the target value. This means an increase in the number of breaches for Nieuwersluis compared to 2019 (three out of twelve measurements). The maximums in 2020 in all locations were higher than in 2019, with the greatest increases at Lobith (1.5 µg/L with respect to 0.77 µg/L) and Nieuwersluis (0.79 µg/L with respect to 0.3 µg/L). Both the metformin concentration and the load demonstrated a falling trend at Lobith.



Graph 1.4 Concentrations of metformin at the Rhine locations during the period 2016-2020

A possible cause of the high concentrations of metformin is that the doses of metformin are high (2 grams/tablet) and the substance is almost completely excreted via the urine. Simple purification scarcely stems the substance, but even with application of ozone and UV/H2O2, removal is incomplete. Graph 1.4 shows the course of the concentrations of metformin during the period 2016-2020.

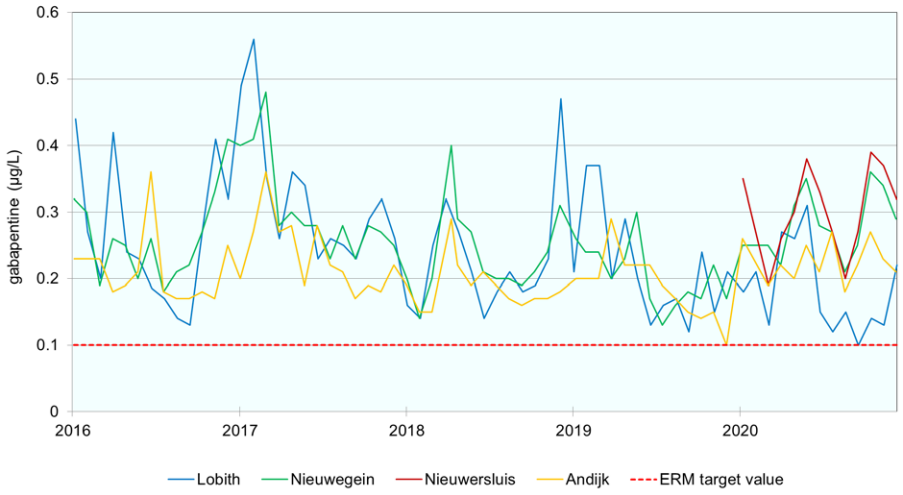
Guanylurea, a metabolite of metformin, also exceeded the ERM target value at all locations (see Table 1.3 and Graph 1.5). At Lobith and Nieuwegein, all thirteen measurements were above the target value. The highest values were measured at Nieuwegein (3.5 µg/L) and Nieuwersluis (3.3 µg/L). The maximums for Lobith (2.4 µg/L) and Andijk (0.77 µg/L) were similar to those in 2019 (2.4 and 0.82 µg/L respectively). At Lobith, both the concentrations and the loads of guanylurea, just as for the parent substance metformin, demonstrated a falling trend.



Graph 1.5 Concentrations of guanylurea at the Rhine locations during the period 2016-2020

Another breaching substance is gabapentine. Gabapentine is used for the treatment of epilepsy, and to combat nerve and postoperative pain. All measurements at the locations exceeded the target value, apart from one measurement at Lobith. In 2019, the highest value was measured at Lobith (0.37 µg/L), but in 2020, this was at Nieuwersluis (0.39 µg/L). The maximums for Nieuwegein, Lobith and Andijk were 0.36 µg/L, 0.31 µg/L and 0.27 µg/L respectively. Gabapentine had a falling trend in 2018 and 2019 at Lobith, Nieuwegein and Andijk, but in 2020, a falling trend could still be seen only at Lobith (both for the concentration and the load).

Graph 1.6 shows the concentrations of this substance at the Rhine locations for the last five years. The maximum at Nieuwersluis for the substance gabapentin-lactam, the primary transformation product of gabapentine, with a value of 0.09 µg/L, was close to the ERM target value.



Graph 1.6 Concentrations of gabapentine at the Rhine locations during the period 2016-2020

Gadolinium: MRI contrast agent

Gadolinium is a silver-white lanthanide. The lanthanides, preferably called lanthanoids, form a series of 15 elements from atomic number 57 to 71. Part of the series comprises the rare earth elements (REE). Gadolinium is used for diverse applications both in industry and in medical science: it is present in microwaves, cathode ray tubes, in many alloys to improve the properties of metals, and in compact discs. But gadolinium is mainly used as a contrast agent in MRI scans. Agents such as gadobutrol, gadoxetate or a solution of the gadolinium complex in DTPA are administered to make tissues better visible in an MRI scan. Further, gadolinium complexes are used to make blood vessels visible. After the investigation is completed, the complex is excreted via the kidneys.

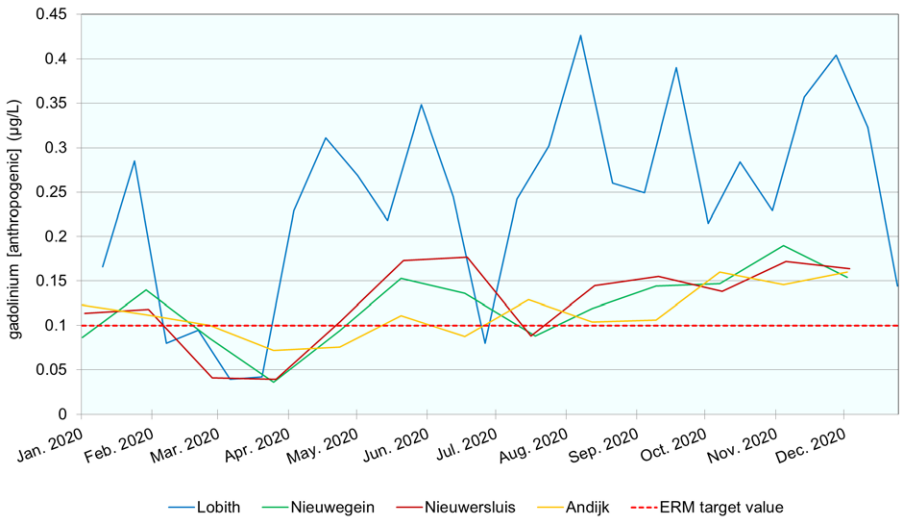
In 2013, RIWA published the report 'MRI Contrast Media. Magnetic Resonance Imaging (MRI) Contrast Media in the Aquatic Environment' (Kools et al., 2013). It was reported in this that the use of MRI contrast agents in medical diagnosis has increased significantly, from 75,000 MRI procedures in 1993 to around 766,000 in 2010. MRI contrast agents based on gadolinium (Gd) are by far the most applied. Total sales of Gd MRI contrast agents were estimated at around 833 kg of Gd annually (data from 2011). Gd agents mainly leave the body via the urine and therefore the primary route into the environment is via the sewer and waste water processing.

Because the use of Gd in MRI techniques was increasing steeply, the expectation was that this trend would continue for several years more, so that the environmental concentrations would increase correspondingly. In the water chain, Gd concentrations have been demonstrated in waste water, surface water, rivers, lakes, groundwater, coastal and ocean water and drinking water.

The amount of anthropogenic Gd on top of the supply via the Rhine (329-730 kg) and Meuse is 300 to 450 kg via the Dutch sewage treatment plants. Gadolinium has already been demonstrated in drinking water and soft drinks of fast-food restaurants in Germany (Schmidt et al., 2019).

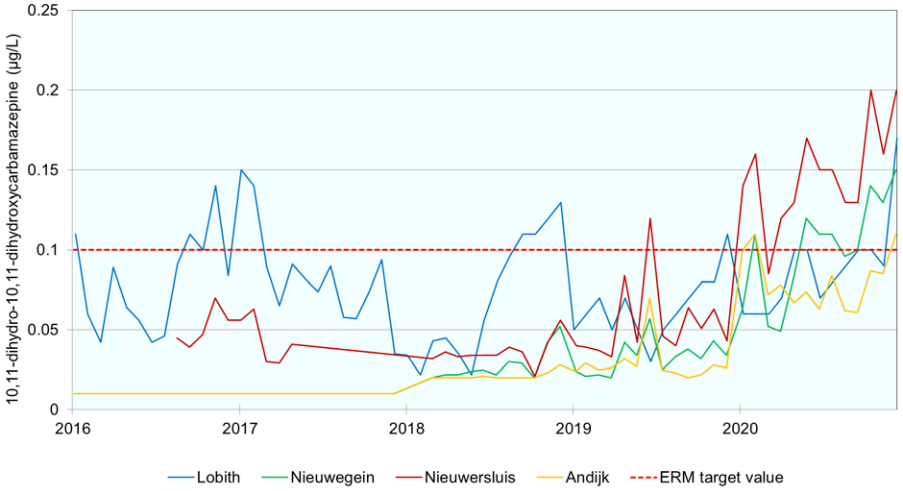
The Dutch Medicines Evaluation Board (CBG) decided in 2018, as a precaution, to limit the use of gadolinium contrast agents in MRI scans. It emerged from a study in a European connection that, when using these contrast agents, traces of gadolinium remain behind in the brain. There are two types of gadolinium agent, the linear and the macrocyclic. With the linear agents, more traces remain behind. These linear agents are little used in the Netherlands. The CBG suspended the linear contrast agent gadodiamide (Omniscan) in the meantime *[CBG News Bulletin, 10 January 2018]*.

Anthropogenic gadolinium, together with the parameter gadolinium anomaly is new this year in the RIWA-base. The principle of determining an anomaly depends on determining the natural concentration of the aberrant element based on the other rare earth elements. If, for example, the measured gadolinium concentration is higher than expected, there is a (positive) gadolinium anomaly (enrichment with anthropogenic gadolinium).
The concentration of anthropogenic gadolinium is corrected for the natural background concentration. Gadolinium (anthropogenic) exceeded the ERM target value at all locations: at Lobith, 21 out of 26 measurements, and at Nieuwegein, Nieuwersluis and Andijk, eight, ten and nine out of thirteen measurements respectively. The highest value was measured at Lobith (0.43 µg/L). This maximum was quite a bit higher than those at Nieuwersluis (0.19 µg/L), Nieuwegein (0.18 µg/L) and Andijk (0.16 µg/L). See Graph 1.7 for the course of gadolinium in 2020.



Graph 1.7 Concentrations of gadolinium (anthropogenic) at the Rhine locations in 2020

10,11-Dihydro-10,11-dihydroxycarbamazepine, a metabolite of carbamazepine, had more breaches in 2020 than in 2019 (see Graph 1.8). Most of the breaches took place at Nieuwersluis, followed by Nieuwegein, Andijk and Lobith (twelve breaches, seven, two and one respectively out of thirteen measurements). All maximums were higher than in 2019. The highest maximum in 2020 was measured at Nieuwersluis (0.2 µg/L), followed by Lobith (0.17 µg/L), Nieuwegein (0.15 µg/L) and Andijk (0.11 µg/L). A rising trend was still present at Andijk and Nieuwegein. The maximum for the parent substance carbamazepine at Lobith was close to the target value with a value of 0.09 µg/L. Further, carbamazepine revealed a rising trend at Nieuwegein, Nieuwersluis and Andijk.

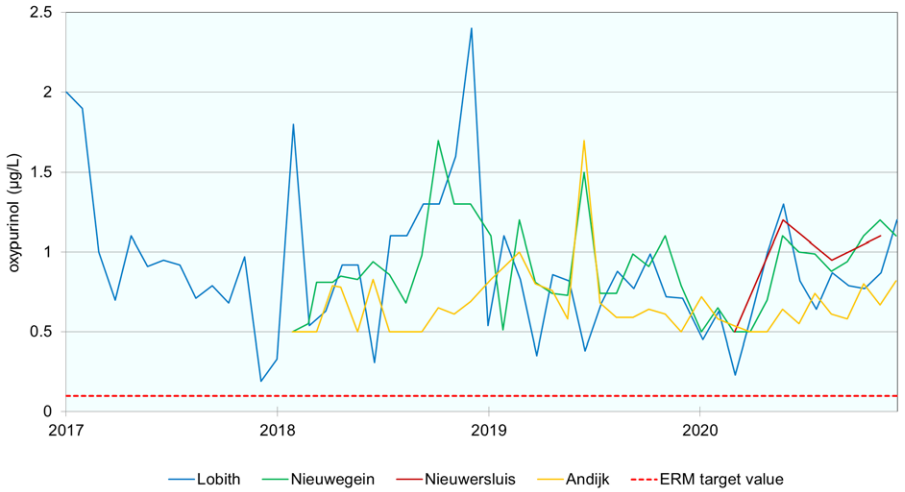


Graph 1.8 Concentrations of 10,11-dihydro-10,11-dihydroxycarbamazepine at the Rhine locations (2016-2020)

Lamotrigine, a medicine that is used as an anti-epileptic drug among other things, exceeded the target value at Nieuwegein in previous years. This was the case once in 2020, and breaches also took place at Lobith and Nieuwersluis (once and four times respectively out of thirteen measurements). The maximums were similar to those of 2019 and are close together at all locations (0.11 µg/L and 0.12 µg/L).

Just as in 2018 and 2019, sitagliptin, a product that reduces blood glucose, only exceeded the ERM target value at Lobith. The number of breaches (eleven out of thirteen measurements) has increased with respect to 2019 (eight out of thirteen measurements). The maximum also increased from 0.17 µg/L in 2019 to 0.28 µg/L in 2020. Just as in previous years, the maximum at Nieuwegein was equal to the target value of 0.1 µg/L.

Oxypurinol is a metabolite of allopurinol, a product that is used for gout and kidney stones. Oxypurinol exceeded the ERM target value at all locations (see Table 1.3 and Graph 1.9). The parameter had a reporting limit of 0.5 µg/L at Nieuwegein, Nieuwersluis and Andijk, a value higher than the target value. There were however only a few values reported under the reporting limit, which means that the other values are actual breaches. In 2019, the highest value was measured at Andijk (1.7 µg/L), but in 2020, the lowest maximum was measured here (0.82 µg/L). The maximums at Lobith, Nieuwegein and Nieuwersluis were almost identical (1.3, 1.2 and 1.2 µg/L).



Graph 1.9 Concentrations of oxypurinol at the Rhine locations during the period 2017-2020

Will lithium become a problem for the water quality in the Rhine?

Lithium is a silver-white alkali metal and has diverse applications, including the well-known lithium-ion battery. This is a rechargeable battery that is often used in consumer electronics and electric vehicles, mainly because of the high energy density and long service life. Lithium is also used in the glass and ceramics industry. Because lithium is also used for the treatment of psychiatric symptoms, RIWA for the time being considers the metal to be a medication with an associated ERM target value of 0.1 µg/L. Lithium may be prescribed for bipolar disorders, mood changes and depression. Detrimental health effects from chronic exposure mainly manifest themselves in the kidneys.

Why is RIWA looking at lithium?

The reason to become alert to the lithium dossier now arises from the plans for lithium extraction, as a by-product of geothermal energy extraction, in the southern Rhine Valley in Germany. This could help the European vehicle industry to become more independent of international suppliers such as China. The Australian company Vulcan Energy Resources, which is seeking to turn the Upper Rhine Valley into a European 'Lithium Valley', says that it could produce up to 400 tons of lithium hydroxide, which could be delivered directly to battery manufacturers, without causing any CO_2 emissions. This is possible by combining lithium extraction with the generation of geothermal heat. It is said that the conditions for this form of lithium extraction are ideal in this region, which could contain up to 14 million tons of the much-in-demand mineral – almost one third of the worldwide reserves. It is considered to be one of the world's first lithium sources with a nett zero carbon footprint. The total energy generation from these geothermal power stations is estimated at 74 MW. The pre-feasibility study for the project was published in January 2021. The final feasibility study, trial projects, licensing process and the preparation of purchase agreements are planned to be carried out in the rest of the year 2021.

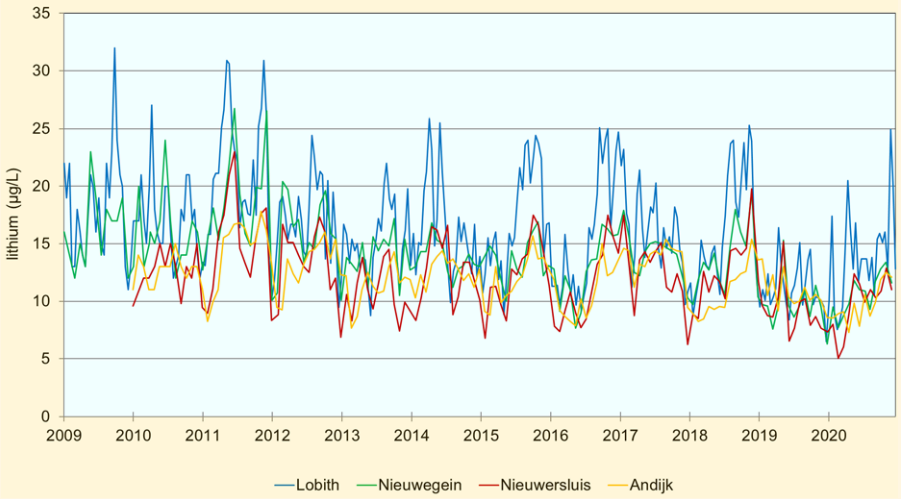
What could this mean for drinking water production?

In response to the plans to extract lithium from the Rhine river basin in the environs of Karlsruhe, RIWA-Rijn has requested information about the potential impact on the water quality of the Rhine, including the risks of lithium in the Rhine to drinking water supplies. KWR Water Research Institute (KWR) has conducted a brief toxicological assessment for lithium in drinking water. In a memorandum, KWR summarised knowledge about exposure to and the toxicity of lithium and possibilities for drinking water purification, and estimated a provisional drinking water target value. The risks of other pollutants that could end up in the Rhine through the extraction of lithium are not discussed in the memorandum.

Lithium mostly arises in surface water in the form of a positively-charged ion (Li^+), which is smaller than sodium. In conventional drinking water purification plants (i.e. coagulation/flocculation/sedimentation), it is not removed. Active carbon can adsorb lithium ions, but only after a chemical pre-treatment. This is however applied to extract lithium, not to remove it from (drinking) water. The standard active carbon that is applied in a drinking water purification plant is probably not suitable for the removal of lithium.

As a result of the planned lithium extraction, it is plausible to expect the concentrations in the Rhine to rise and end up (structurally) above the indicative drinking water target value of 7.5 µg/L derived by KWR. Based on the (limited) toxicological information and the assumption that lithium is poorly or not removed in the usual drinking water purification, there would seem to be reason for concern about undesirable human health effects as a result of exposure to lithium via drinking water.

Graph 1.10 presents an overview of the concentrations of lithium measured at Lobith, Nieuwegein, Nieuwersluis and Andijk between 2009 and 2020.



Graph 1.10 Concentrations of lithium measured at Lobith, Nieuwegein, Nieuwersluis and Andijk (2009-2020)

Lithium and lithium after filtration were both added to the group 'other pharmaceuticals' this year, because lithium is used for the treatment of psychiatric symptoms, among other things (see text box). The values of these two parameters are almost equal, which means that lithium is mainly present in dissolved form. All the values significantly exceeded the ERM target value (0.1 µg/L, see Graph 1.10).

The highest value for lithium was measured at Lobith (24.9 µg/L). The maximums for the other locations were around half of this value: Nieuwegein, 13.4 µg/L, Nieuwersluis, 12.9 µg/L and Andijk, 12.5 µg/L. For both parameters, a falling trend was seen at Nieuwegein.

4.6 Endocrine-disrupting chemicals (EDCs)

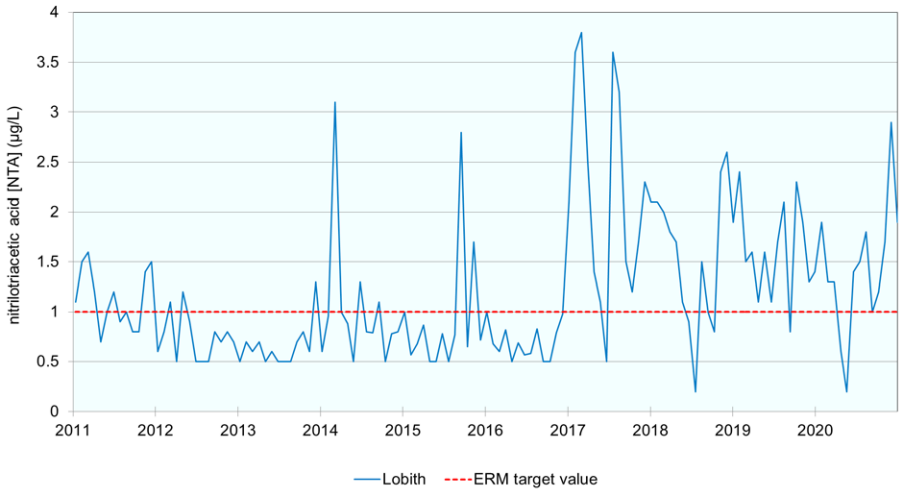
Hormone or endocrine disruption may be caused in both human and animal by organic micropollutants. This substance group is very heterogeneous; the substances have the shared property that they can disrupt hormonal functioning. They may cause damage to the reproductive organs of organisms, and also cause behavioural changes. A distinction may be made between the natural and the synthetic hormone disrupters. These may be all kinds of substances, such as fire retardants, agricultural chemicals, solvents and plasticisers (particularly the phthalates and nonylphenols).

Bisphenol A and the parameter 4-nonylphenol isomers exceeded the ERM target value in 2019, but no longer in 2020. Bis(2-ethylhexyl)phthalate (DEHP) was measured at all locations. Just as in previous years however, the reporting limit for this substance, with a value of 1.0 µg/L, is too high for it to be tested against the ERM target value of 0.1 µg/L. One actual breach did occur at Nieuwegein, with a value of 1.44 µg/L. Also diisobutyl phthalate (DIBP), a parameter that is only measured at Nieuwegein and Nieuwersluis, still had a reporting limit (0.5 µg/L) that is too high for proper testing (see Table 1.4). DEHP and DIBP also belong to the parameter group 'plasticisers' (see Appendix 1).
In total, 444 analyses were conducted in the group 'endocrine-disrupting chemicals (EDCs)', of which 22% were over the reporting limit. The data for the parameters described here may be found in Appendix 1 *Water quality data 2020* in the printed version of this annual report.

4.7 Detergent components and complexing agents

The parameter group includes the substances nitrilotriacetic acid (NTA), ethylenediaminetetraacetic acid (EDTA) and diethylenetriaminepentaacetic acid (DTPA). These substances are not toxic in themselves, but through their complexing capacity, they have the property of releasing heavy metals from silt and keeping them dissolved in water, so that they are harder to remove during drinking water production. Moreover, heavy metals such as cadmium and mercury become available again in this way to all kinds of aquatic organisms, which could have detrimental effects.

In the two previous years, NTA exceeded the target value of 1 µg/L at Lobith and at Andijk, but in 2020 this was only still the case at Lobith (see Table 1.3). There were ten breaches out of thirteen measurements and the highest measured value of 2.9 µg/L was higher than that of 2019 (see Graph 1.11). However, no increasing trend could be seen any more. The load of NTA demonstrated a falling trend at Nieuwegein.



Graph 1.11 Concentrations of NTA measured at Lobith during the past ten years (2011-2020)

In this reporting year also, all measurements of EDTA exceeded the ERM target value. The maximums at Nieuwegein, Nieuwersluis and Andijk were indeed lower than in 2019. The highest value was again measured at Nieuwersluis, namely 9.8 µg/L. Thereafter followed Andijk (7.8 µg/L), Nieuwegein (7 µg/L) and Lobith (5.8 µg/L). The load of EDTA had a falling trend at Lobith. There were no more breaches for the substance DTPA in 2020. The last substance in this group that demonstrated a breach is methylglycinediacetic acid (alpha ADA). This substance is only measured at Lobith and had a maximum value of 2.4 µg/L in 2020. The number of breaches (six out of thirteen measurements) was lower than in 2019 (nine out of thirteen measurements). The data for the parameters described above may be found in Appendix 1 *Water quality data 2020* in the printed version of this annual report.

4.8 Biocides

A well-known substance in the biocides group is diethyltoluamide (DEET), the active constituent in mosquito sprays and gels. The highest value measured for this substance at Nieuwersluis, at 0.095 µg/L, was very close to the ERM target value (0.1 µg/L). A falling trend could be seen however. In total, 519 analysis results were reported for this parameter group, of which almost 15% were above the reporting limit. The data for the other biocides may be found in Appendix 1 *Water quality data 2020* in the digital version of this annual report.

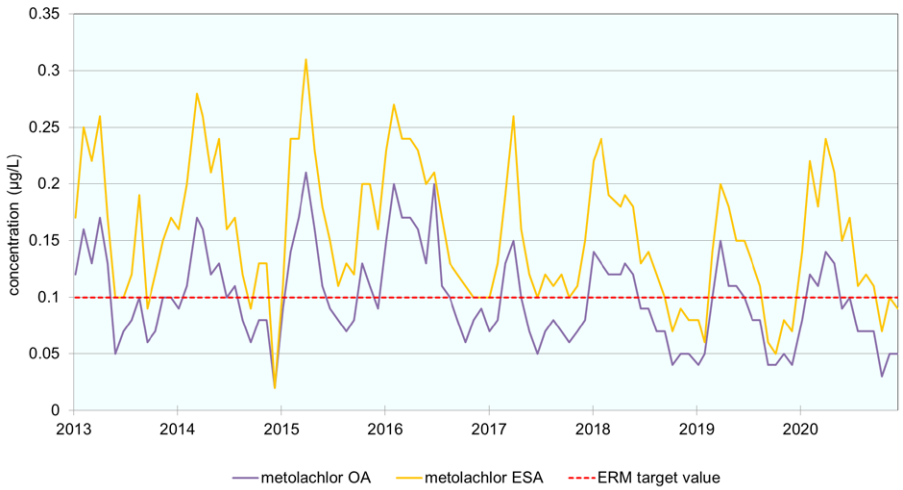
4.9 Fungicides and herbicides (all groups)

Further subdivisions have been made in the RIWA-base within the parameter groups fungicides and herbicides. The fungicides have been subdivided into eight subgroups and the herbicides into thirteen subgroups. In total, 1913 analysis results were reported for the fungicides in 2020, of which 3.1% were above the reporting limit. For the herbicides, there were 4318 results, of which 19% were above the reporting limit.

There was one substance in the fungicides group that exceeded the ERM target value (0.1 µg/L) in 2020, and that was N,N-dimethylsulphamide (DMS). DMS is a metabolite of a fungicide based on amides and it also belongs to the group wood preservatives (see Appendix 1). Just as in previous years, the breaches occurred at Nieuwersluis. The maximum of 0.14 µg/L was similar to the maximums in previous years, but the number of breaches (two out of thirteen measurements) was lower than that of 2019 (seven out of thirteen measurements).

Moreover, this substance had a falling trend at Nieuwersluis. At Lobith too, we observed a falling trend. In 2019, the maximums for DMS at Andijk and Nieuwegein came out in the vicinity of the target value, but in 2020, this was no longer the case.

In the herbicides groups, four substances exceeded the ERM target value (0.1 µg/L) in 2020 (see Table 1.3). These were metabolites of herbicides. In previous years, they also exceeded the target value. Metazachlor ESA is a metabolite of metazachlor, a herbicide based on anilides. This metabolite exceeded the target value once at Nieuwegein and once at Andijk, in both cases with a value of 0.11 µg/L. In Lobith, the highest measured value was equal to the target value. Metazachlor itself had a falling trend at Nieuwersluis.

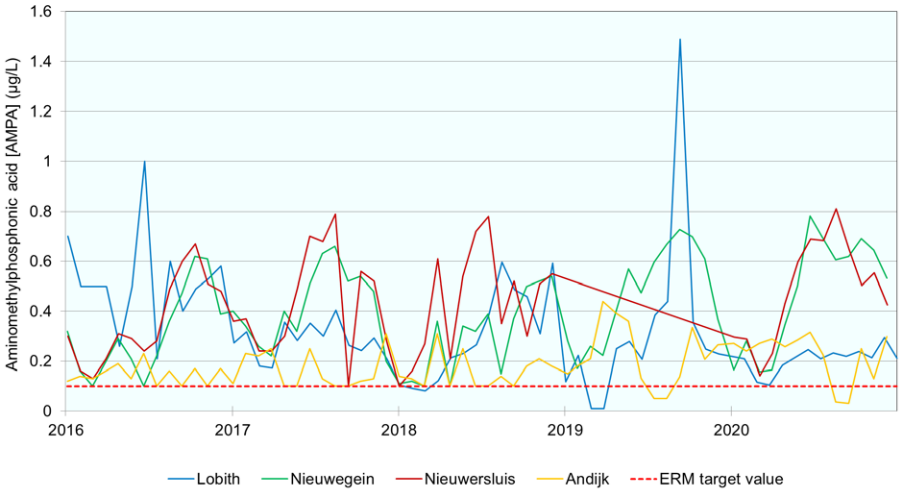


Graph 1.12 Concentrations of metolachlor OA and metolachlor ESA measured at Andijk (2013-2020)

Metolachlor OA and metolachlor ESA are metabolites of metolachlor, a herbicide based on a triazine group. Both metabolites exceeded the ERM target value only at Andijk and had maximums of 0.14 µg/L and 0.24 µg/L respectively (see Graph 1.12). The number of breaches was somewhat higher than in 2019 with four (metolachlor OA) and ten (metolachlor ESA) out of thirteen measurements. Both metabolites and also their parent substance metolachlor had falling trends at Andijk. This also applies to metolachlor OA and metolachlor at Lobith.

Aminomethylphosphonic acid (AMPA) is a breakdown product of the herbicide glyphosate and of phosphonates in for example cooling water additives. This substance comes within the group of other herbicides and, within the herbicide groups, demonstrates the most breaches.

The target value of 0.1 µg/L was exceeded at all four locations (see Table 1.3 and Graph 1.13), and overall, all measurements were in breach, except at Andijk (only eleven of the thirteen measurements). The highest measured value (0.81 µg/L) was at Nieuwersluis. The maximum at Nieuwegein was of the same order of magnitude as in 2019, that at Lobith was somewhat lower (0.78 µg/L w.r.t. 1.49 µg/L in 2019) and that at Andijk was also lower (0.32 µg/L w.r.t. 0.44 µg/L in 2019). Glyphosate, the parent substance of AMPA, just as in 2019, did not exceed the ERM target value.



Graph 1.13 Concentrations of aminomethylphosphonic acid (AMPA) measured at all Rhine locations in 2016-2020

Since 2011, the government of the Netherlands has applied a standard for metabolites toxicologically irrelevant to humans of 1 µg/L for the raw material for the production of drinking water [Dutch Drinking Water Regulation 2011]. Since April 2020, a list of metabolites of plant protection products toxicologically irrelevant to humans and their standards has been available [source: https://rvszoeksysteem.rivm.nl/Stoffen]. Metazachlor OA, metazachlor ESA, metolachlor OA, metolachlor ESA and AMPA are on this list.

The data for the parameters described here may be found in Appendix 1 *Water quality data 2020* in the printed version of this annual report. All available data on the measured fungicides and herbicides is presented in Appendix 1 of the digital version of this annual report.

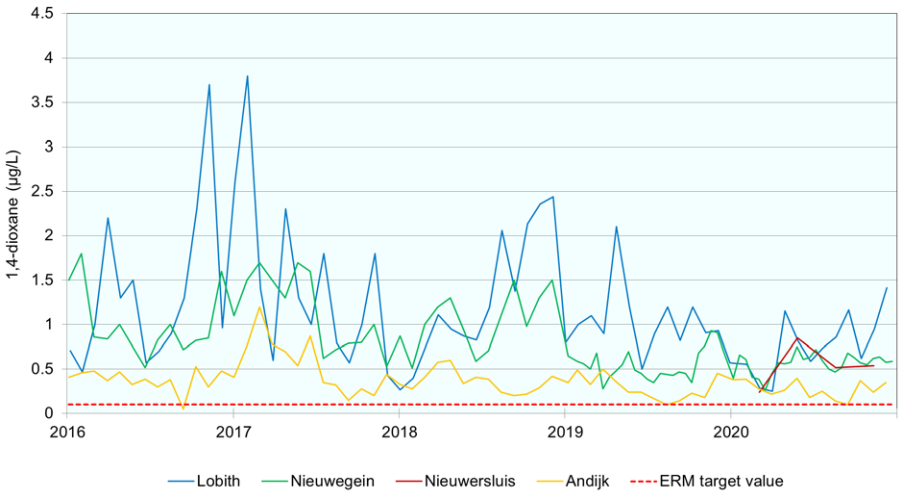
4.10 Industrial solvents

Two substances in this group exceeded the ERM target value in 2020. These were tetrachloroethylene and 1,4-dioxane. Only one breach by tetrachloroethylene occurred. This was at Nieuwersluis, with a value of 0.22 µg/L (see Table 1.3). The substance 1,4-dioxane is used as a solvent for inks and adhesives, among other things. It also arises as a contaminant in glyphosate. 1,4-Dioxane is highly soluble in water and is difficult to degrade biologically. This substance also comes within the group 'ethers' (see Appendix 1). Although an ERM target value of 1.0 µg/L is defined for the ethers and industrial solvents, the target value for 1,4-dioxane is stipulated at 0.1 µg/L, because the World Health Organization's International Agency for Research into Cancer (WHO IARC) states that this substance could possibly be carcinogenic to humans (IARC class 2B). In 2020, just as in 2019, all measurements exceeded the ERM target value, apart from one measurement at Andijk (see Graph 1.14).

The highest value was measured at Lobith and was 1.42 µg/L (see Table 1.3). This maximum is lower than that of 2019 (2.1 µg/L). In 2020, the maximums at Nieuwegein and Andijk were also lower than those in 2019. At Andijk and Nieuwegein, the 1,4-dioxane concentration demonstrated a falling trend. This also applies to the 1,4-dioxane load at Nieuwegein and at Lobith. In December 2020, we received a Rhine alarm notification due to elevated concentrations of 1,4-dioxane at Lobith. See Appendix 2 for a summary of all alarm notifications received in 2020.

Just as in previous years, dichloromethane and 1,1,2,2-tetrachloroethane were reported at Lobith with a reporting limit that is higher than the ERM target value of 0.1 µg/L, so that any breaches could not be properly observed (see Table 1.4). The reporting limit has even been raised from 0.5 µg/L to 5 µg/L. At Nieuwersluis and Andijk too, the reporting limit (0.5 µg/L) is too high with respect to the target value.

In total, 31 parameters were reported in the parameter group 'industrial solvents'. In total, 1528 analysis results were reported, of which 14.7% were above the reporting limit. See Appendix 1 *Water quality data 2020* for the data on the substances mentioned above. The data for the other parameters within this group may be found in the digital version of this annual report.



Graph 1.14 Concentrations of 1,4-dioxane at the Rhine locations during the period 2016-2020

PFAS: new standards in the EU Drinking Water Directive

Until now, little attention was paid to PFAS in reports on the water quality of the Rhine. This is because the ERM target value of 0.1 µg/L was never exceeded. We did in the past pay attention to incidents with HFPO-DA (See the section 'PFOA en GenX: Effecten op oevergrondwater en consequenties voor de regelegeving' (PFOA and GenX: Effects on riverbank groundwater and consequences for legislation) in the RIWA-Rijn Annual Report 2016) and in 2006, RIWA published the theme report, *'Perfluoroalkylcarboxylates and -sulfonates. Emerging Contaminants for Drinking Water Supplies?'* in collaboration with TZW Karlsruhe. Before this, the substances PFOS and PFOA had already been remarked on as new problem substances in the RIWA theme report, '*Trends in Priority Substances During the Period 1977-2002*'. It was concluded here that: 'The particular properties of these substances make it difficult to predict their behaviour in the aquatic environment and during water purification.'

That attention is again being paid to PFAS is due to new standards being provided for this substance group in drinking water, and because there are new health and hygiene insights. On 16 December 2020, the European Parliament formally adopted the revised Drinking Water Directive. The Directive entered into force on 12 January 2021, and the Member States have two years from that date to transpose it into national legislation. In the revised Drinking Water Directive, standards are included for PFAS for the first time: one standard for PFAS Total (0.5 µg/L) and one for the Sum of PFAS (0.1 µg/L).

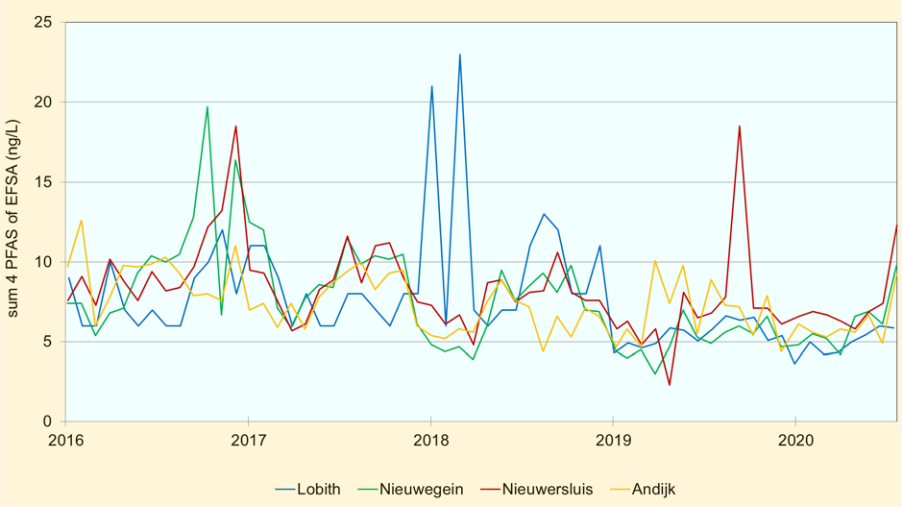
The Sum of PFAS includes the following 20 substances:

- Perfluorobutanoic acid (PFBA)
- Perfluorohexanoic acid (PFHxA)
- Perfluorooctanoic acid (PFOA)
- Perfluorodecanoic acid (PFDA)
- Perfluorododecanoic acid (PFDoDA)
- Perfluorobutane sulfonic acid (PFBS)
- Perfluorohexane sulfonic acid (PFHxS)
- Perfluorooctane sulfonic acid (PFOS)
- Perfluorodecane sulfonate (PFDS)
- Perfluorododecane sulfonic acid
- Perfluoropentanoic acid (PFPA)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorononanoic acid (PFNA)
- Perfluoroundecanoic acid (PFUnDA)
- Perfluorotridecanoic acid (PFTrDA)
- Perfluoropentane sulfonic acid (PFPS)
- Perfluoroheptane sulfonic acid (PFHpS)
- Perfluorononane sulfonic acid (PFNS)
- Perfluoroundecane sulfonic acid
- Perfluorotridecane sulfonic acid

In September 2020, the European Food Safety Authority (EFSA) issued a new scientific opinion about the health risks from the presence of PFAS in foodstuffs. EFSA has calculated the quantity of PFAS that humans can ingest safely during their entire lives (health and hygiene target value): the total ought not to exceed 4.4 ng/kg/week. If the levels of the four substances mentioned in the EFSA proposal are tested against the drinking water target value calculated based on the said proposal of 4.4 ng/L for four PFAS (PFOS, PFOA, PFHxS and PFNA), then, in 2020, almost no single measurement complied (see Graph 1.15). When 4.4 ng/L of PFOA equivalents are assumed, as is currently proposed, then the difference is even greater, given that PFOS would then count double, PFHxS six times and PFNA ten times. It is not yet clear what the relationship is between the new Drinking Water Directive and the EFSA opinion. Because it is expected that standard levels and target values will become lower, drinking water laboratories are working on the further lowering of the reporting limits.

In the EFSA report, the RIVM sees reason to reconsider the existing limit values for PFAS in foodstuffs, the soil, (drinking) water, air etc. On the request of the Dutch Ministry for Infrastructure and Water Management, the RIVM is calculating the risk limits for PFAS in the soil, surface water and drinking water. Probably the risk limits will be lower in some

cases. For the standardisation on drinking water, the RIVM will take the contribution of water to the total package of foodstuff ingestion into account. The RIVM's advisory report came out on 4 June 2021.



Graph 1.15 Sum of the four PFAS from EFSA (PFOS, PFOA, PFHxS and PFNA) at the Rhine locations during the period 2016-2020. Values that were reported below the reporting limit were set to 0 ng/L when calculating the sum.

The drinking water sector considers that substances such as PFAS in no sense belong in the environment or the sources of drinking water. The principle is and will remain the source approach. The drinking water sector is calling for a total national and European prohibition on PFAS, because they degrade poorly and therefore remain present in the environment for a long time. Things that do not end up in the sources of drinking water do not need to be purified out by the drinking water companies either. The source approach gives implementation to the precautionary principle and is always to be preferred to an end-of-pipe solution. The sector has therefore been arguing for some time for stricter licence issuance. But even if a prohibition comes along quickly, PFAS will remain in sources of drinking water for years to come as a result of continuing supply through its presence in the environment.

4.11 Industrial chemicals with PFAS

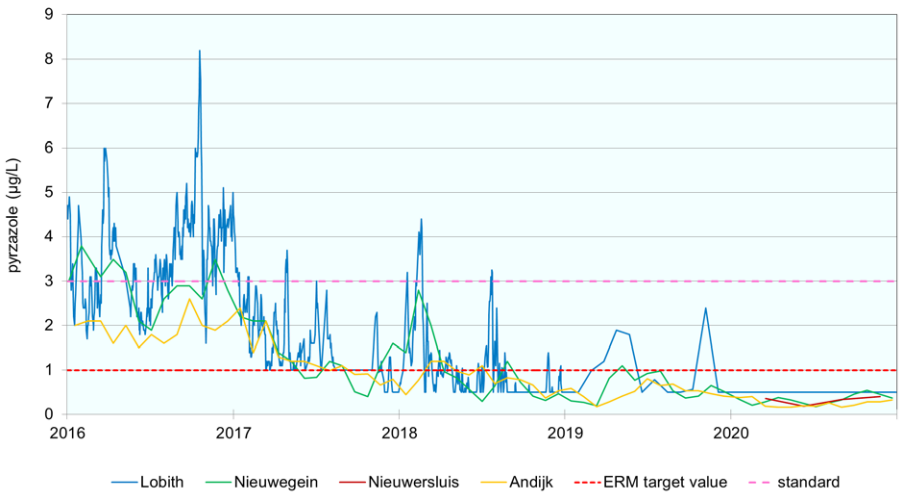
From 2016, there has been much attention to discharges of PFOA in the past by the company Chemours in Dordrecht and to GenX-related substances that are used as successors to PFOA. PFOA and GenX-related substances belong to the per- and polyfluoroalkyl substances (PFAS). The Netherlands is making efforts towards a European prohibition of PFAS. To prevent a prohibition on one substance in the PFAS group leading to a switch to a different substance in the group, the Netherlands wants to prohibit all products with PFAS, except for essential applications. The Netherlands is receiving widespread support for this.

In 2020, there were no breaches of the ERM target value (0.1 µg/L), just as in preceding years. Some substances revealed a falling or rising trend. Perfluorooctanoic acid (PFOA) had a rising trend at Nieuwersluis and Andijk. Perfluorooctane sulfonic acid (PFOS) revealed a falling trend at all locations, except at Nieuwersluis where no trend could be observed for this substance. Perfluorohexanoic acid (PFHxA) had a rising trend at Nieuwersluis and Andijk, just as in 2019. Finally, at Lobith, we observed rising trends for perfluoropentanoic acid (PFPA), perfluorobutanoic acid (PFBA) and perfluoroheptanoic acid (PFHpA). In total, there were 1157 measurements of these substances at the reporting locations, of which 36% were reported as above the reporting limit. The data for the parameters listed above may be found in Appendix 1 *Water quality data 2020* in the printed version of this annual report. The complete dataset is in the digital version of this annual report.

4.12 Industrial chemicals with aromatic nitrogen compounds and with benzotriazoles

In previous years, pyrazole was the only substance in the parameter group 'industrial chemicals with aromatic nitrogen compounds' that exceeded the ERM target value. Pyrazole is a waste product from the production of acrylonitrile. In the Rhine river basin, acrylonitrile is produced at Chempark Dormagen near Cologne. In July 2017, a Dutch standard of 3 µg/L was stipulated for surface water that is used to produce drinking water. The members of RIWA-Rijn pronounced that a maximum of 1 µg/L in the Rhine is sufficiently low to allow drinking water to be produced without additional measures. For this reason, the concentrations of pyrazole are tested against the target value of 1 µg/L. The pyrazole concentrations did not exceed this target value in 2020. The highest value was measured at Nieuwegein (0.55 µg/L). A falling trend could be seen at Lobith,

Nieuwegein and Andijk. This was also the case for the pyrazole load at Lobith and Nieuwegein. This is probably result of the expansion of the waste water treatment at Chempark Dormagen in Cologne. Graph 1.16 shows the course of the concentrations of pyrazole during the past five years.



Graph 1.16 Concentrations of pyrazole at the Rhine locations during the period 2016-2020, including the ERM target value (1 µg/L) and the legal standard (3 µg/L)

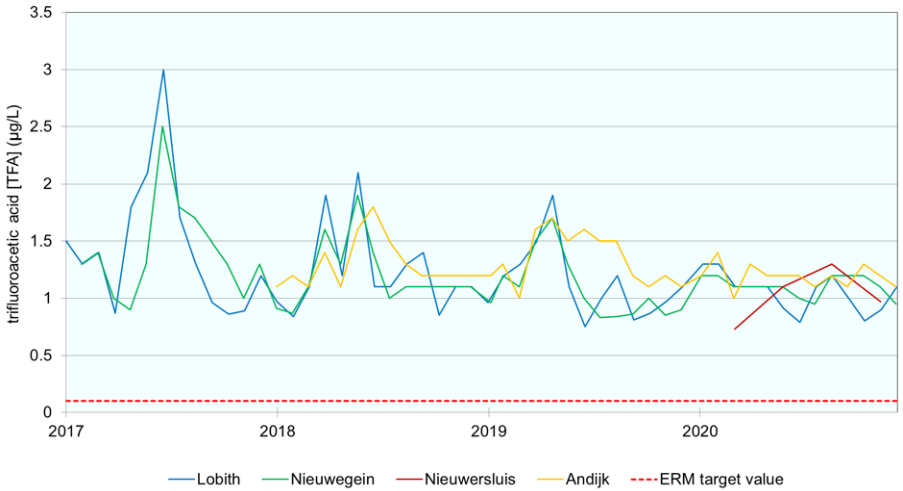
The maximum for benzotriazole, a parameter in the group 'industrial chemicals with benzotriazoles', was close to the ERM target value of 1 µg/L at Nieuwegein in 2019. In 2020, the maximum at this location exceeded the target value. This was the only breach (out of 52 measurements). The maximum at Nieuwersluis, with a value of 0.84 µg/L, was very close to the target value. 4-Methylbenzotriazole had a falling trend at Nieuwegein and at Lobith. This also applied to the load for this substance and for 5-methyl-1H-benzotriazole at Lobith. See Appendix 1 *Water quality data 2020* for the data on pyrazole and the other substances described above. The data for the other parameters in these groups may be found in the digital version of this annual report.

4.13 Industrial chemicals with aromatic hydrocarbons and with volatile halogenated hydrocarbons

In the parameter group 'industrial chemicals with aromatic hydrocarbons', 3-chloromethylbenzene, just as in previous years, had a reporting limit at all locations (0.5 or 5 µg/L) that was too high to be able to test properly against the ERM target value of 1.0 µg/L (see Table 1.4). In the group 'industrial chemicals with volatile halogenated hydrocarbons', three substances were measured at Lobith with a reporting limit above the ERM target value. These were 1,1-dichloroethene (0.5 µg/L), 1,3,5-trichlorobenzene (0.5 µg/L) and chloroethene (0.3 µg/L); see also Table 1.4. The data for the parameters described above may be found in Appendix 1 *Water quality data 2020* in the printed version of this report. The other available data may be found in the digital version of this annual report.

4.14 Industrial chemicals with haloacids

At Lobith in 2020, just as in previous years, only the substance trifluoroacetic acid (TFA) in this group was measured. TFA has been added to the monitoring programs since 2017, after it was discovered that this substance was present at high concentrations in the Rhine river basin. It mainly ends up in the Rhine from the Neckar, and the largest point source is a discharge from the company Solvay Fluor GmbH in Bad Wimpfen.
TFA is used for industrial purposes, and is also a breakdown product of for example long-chain perfluoro compounds, hydrofluorocarbons (such as are used in refrigerators and air conditioners), plant protection products and pharmaceuticals (personal communication from KWR, Jan. 2017). In 2020 also, TFA was found above the ERM target value of 0.1 µg/L at all locations and in every measurement (see Table 1.3 and Graph 1.17). The maximums vary from 1.2 µg/L to 1.4 µg/L, where the highest concentration was measured at Andijk. The maximums are a little higher than those measured in 2019 (1.7 µg/L and 1.9 µg/L). The measurement series are still too short to allow a five-year trend to be determined. Dichloroacetic acid once (out of 51 measurements) revealed a breach of the ERM target value at Nieuwegein with a value of 0.11 µg/L.

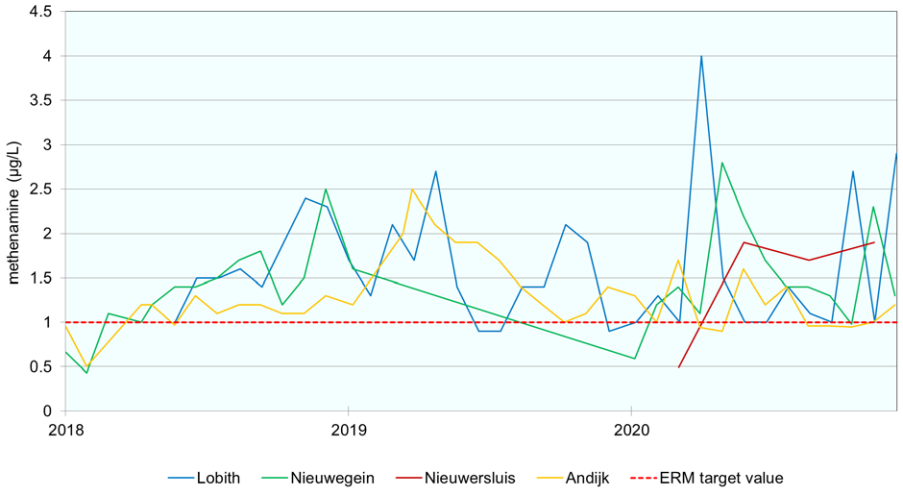


Graph 1.17 Concentrations of trifluoroacetic acid (TFA) at the Rhine locations during the period 2017-2020

Trichloroacetic acid (TCA) did not exceed the ERM target value any more in 2019, after breaches in the previous years. In 2020, another breach was observed at Nieuwegein (two out of 51 measurements) and at Andijk (one out of thirteen measurements). The maximums were 0.18 µg/L and 0.11 µg/L respectively. The maximum at Nieuwersluis, with a value of 0.09 µg/L, was in the vicinity of the target value. Monobromoacetic acid exceeded the target value at Andijk in 2019, but in 2020 this was no longer the case. The reporting limit for monochloroacetic acid (0.5 µg/L) at Nieuwegein, Nieuwersluis and Andijk, just as in previous years, is too high with respect to the ERM target value to allow it to be tested properly (see Table 1.4). In total, 613 analysis results were reported for this parameter group, of which 26% were above the reporting limit. The data for the substances described above may be seen in Appendix 1 *Water quality data 2020* in the printed version of this report.

4.15 Industrial chemicals (precursors and intermediates)

The group 'industrial chemicals (precursors and intermediates)' only contained one parameter in 2020, namely methenamine (also known as hexamine or urotropine). Methenamine has many applications. It is used in industrial applications, for example photography and dentistry, and is also a much-used substance in organic synthesis. It is also used as a preservative against moulds (E239). Further, methenamine is the main constituent of solid fuel tablets (known by the name Esbit, much used for example in camping cookers and miniature steam engines). The substance may also be used as a corrosion inhibitor and antibiotic. Methenamine was added to the monitoring programs in 2018. In 2020 also, the ERM target value of 1 µg/L was exceeded at all locations. The number of breaches was different for each location: at Lobith, Nieuwegein and Andijk, seven, eleven and six of the thirteen measurements respectively were in breach. At Nieuwersluis, this applied to three of the four measurements. The highest value was measured at Lobith, just as in 2018 and 2019 (see Table 1.3).



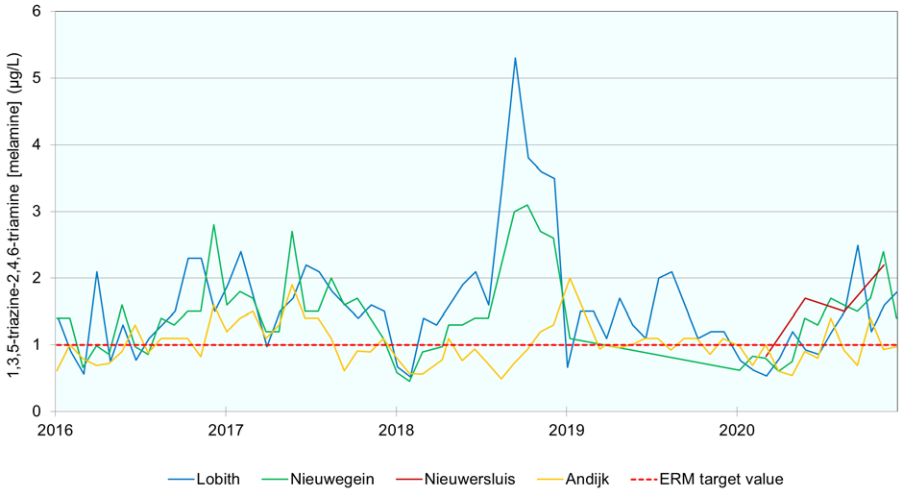
Graph 1.18 Concentrations of methenamine at the Rhine locations during the period 2018-2020

This maximum was however higher in 2020 (4 µg/L) with respect to the previous years (2.4 µg/L). Also at Nieuwegein, the maximum in 2020 (2.8 µg/L) was higher than in 2019 (1.6 µg/L). The maximum at Andijk (1.7 µg/L) in 2020 was conversely lower than that in 2019 (2.5 µg/L). Graph 1.18 shows the concentrations of methenamine from 2018 onwards. See Appendix 1 *Water quality data 2020* for the data on methenamine.

4.16 Other industrial chemicals

The last group of the industrial chemicals is the 'other industrial chemicals'. In 2020, this group contained 871 analysis results, of which 23% were reported above the reporting limit. Two substances in this group exceeded the ERM target value of 1 µg/L. These were hexamethoxymethyl melamine (HMMM) and 1,3,5-triazine-2,4,6-triamine (melamine). HMMM is used in the coatings industry; its other applications include as a cross-linker for water-based paints. This substance exceeded the target value once at Lobith, with a value of 1.5 µg/L (see Table 1.3). Melamine is used in the manufacture of plastic tableware. It is also used as a constituent of a number of medicines. The number of breaches in 2020 was reduced with respect to 2019. The maximums at Lobith (2.5 µg/L), Nieuwegein (2.4 µg/L) and Nieuwersluis (2.2 µg/L) were very close to each other. The maximum at Andijk (1.4 µg/L) was lower and was also reduced with respect to 2019 (2.0 µg/L). The load of melamine demonstrated a falling trend at Lobith. Graph 1.19 shows the concentrations of melamine at the Rhine locations during the last five years (2016-2020).

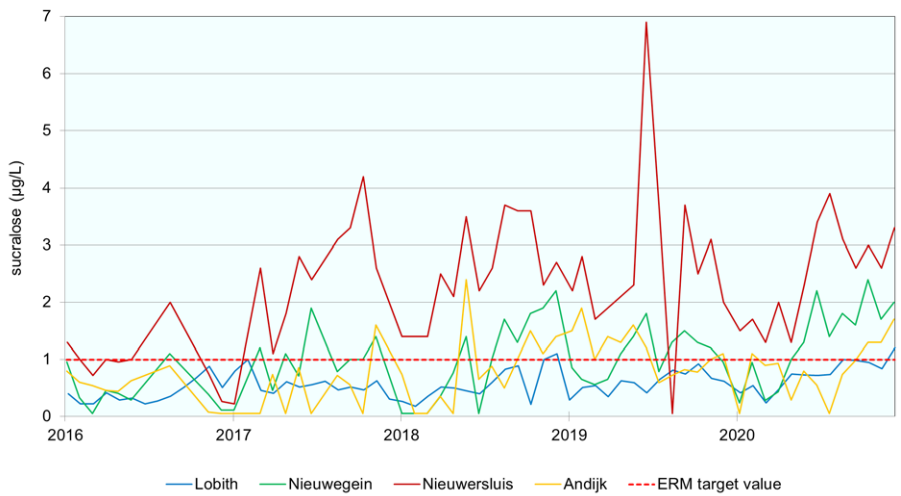
Further, two parameters within this parameter group had a reporting limit at Lobith that was too high to allow the data to be tested properly against the ERM target value (see Table 1.4). The first was 3-chloropropene with a reporting limit of 1 µg/L. In 2019, this was also the case at Nieuwegein and Andijk, but here, the reporting limits were modified to 0.1 µg/L. The second parameter was the trichlorobenzenes (3 isomers), with a reporting limit of 0.75 µg/L. The data for the parameters described above may be found in Appendix 1 *Water quality data 2020* in the printed version of this annual report.



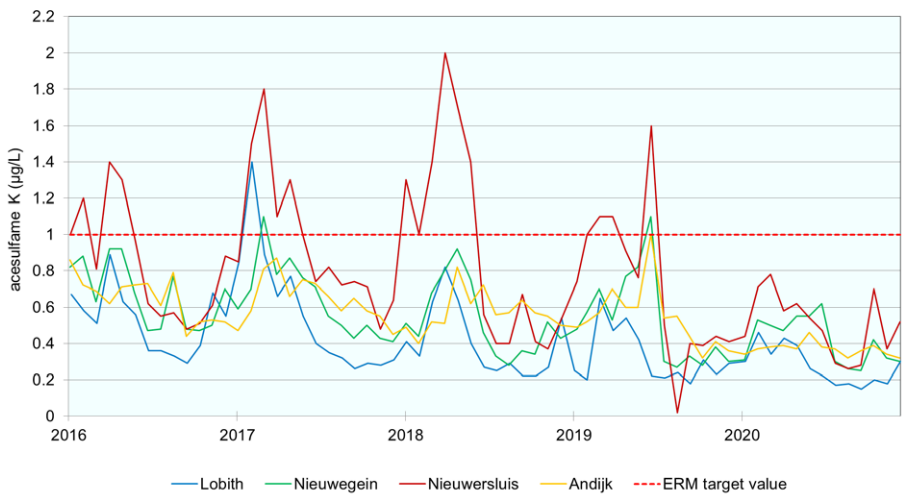
Graph 1.19 Concentrations of 1,3,5-triazine-2,4,6-triamine (melamine) measured at the Rhine locations during the period 2016-2020

4.17 Artificial sweeteners

In total, 260 measurements were reported for this parameter group in 2020, of which 98% were above the reporting limit. In 2019, sucralose exceeded the ERM target value everywhere except at Lobith. In 2020, breaches again happened at all locations (see Table 1.3 and Graph 1.20), in which there was one breach at Lobith with a value of 1.2 µg/L. Sucralose also revealed a rising trend here. Most breaches took place at Nieuwersluis (all thirteen measurements), just as in previous years, and the highest concentration was also measured here (3.9 µg/L). This maximum was a good bit lower than that in 2019 (6.9 µg/L), but similar to that in 2018 (3.7 µg/L). The highest value at Andijk (1.7 µg/L) was similar to that in 2019, and that at Nieuwegein (2.4 µg/L) was higher.



Graph 1.20 Concentrations of sucralose at the Rhine locations during the period 2016-2020



Graph 1.21 Concentrations of acesulfame-K at the Rhine locations during the period 2016-2020

Acesulfame-K previously revealed breaches of the ERM target value (1.0 µg/L) at Nieuwegein and Nieuwersluis. In 2020 this was no longer the case. The maximums for this substance were now well under the target value everywhere (see Graph 1.21). Acesulfame-K (both concentration and load) and cyclamate revealed a falling trend at all locations. This also applied to sacharine at Lobith and Nieuwersluis. The data for the sweeteners may be found in Appendix 1 *Water quality data 2020*.

4.18 Bioassays

The bioassays in this group come from the Calux series. Calux stands for 'Chemically Activated LUciferase eXpression' (source: BioDetection Systems). In 2020, these measurements were conducted at Nieuwegein, Nieuwersluis and Andijk. Most of them were tested against the ERM target value of 0.1 µg/L. There are three parameters for which the reporting limit is too high to allow them to be tested properly against the target value (see Table 1.4), namely AR-anti-Calux activity with respect to flutamide (anti-androgen response), NRF2-Calux activity with respect to curcumin (oxidative stress response) and P53 Calux activity with respect to cyclofosfamide (p53-dependent pathway activation +/-S9).

AR-anti-Calux activity with respect to flutamide was however reported below the reporting limit only five times (three times at Nieuwegein and twice at Andijk). The other measurements were above the reporting limit of 1.4 µg/L and so also above the target value. The highest value was measured at Nieuwegein (47 µg/L), and this was higher than that in 2019 (18.6 µg/L at Andijk). At Nieuwegein and Nieuwersluis, only reporting limits were reported for NRF2-Calux activity with respect to curcumin (100 µg/L), so that it is not clear whether or how often the target value was exceeded. At Andijk, three values for this bioassay were reported above the reporting limit, so these were actual breaches. The highest value was 170 µg/L, which was lower with respect to the maximum in 2019 (215 µg/L at Andijk and 387 µg/L at Nieuwegein). It applies for P53 Calux activity with respect to cyclofosfamide also that all measurements at Nieuwegein and Nieuwersluis were reported below the reporting limit (150 µg/L). At Andijk, a value above this limit was reported once, which, with a value of 439 µg/L, was genuinely a breach of the target value. GR-Calux activity with respect to dexamethasone (glucocorticoid response) revealed breaches in 2019, but no longer in 2020. See Appendix 1 *Water quality data 2020* for the data on parameters described within this group.

4.19 Polycyclic aromatic hydrocarbons (PAHs)

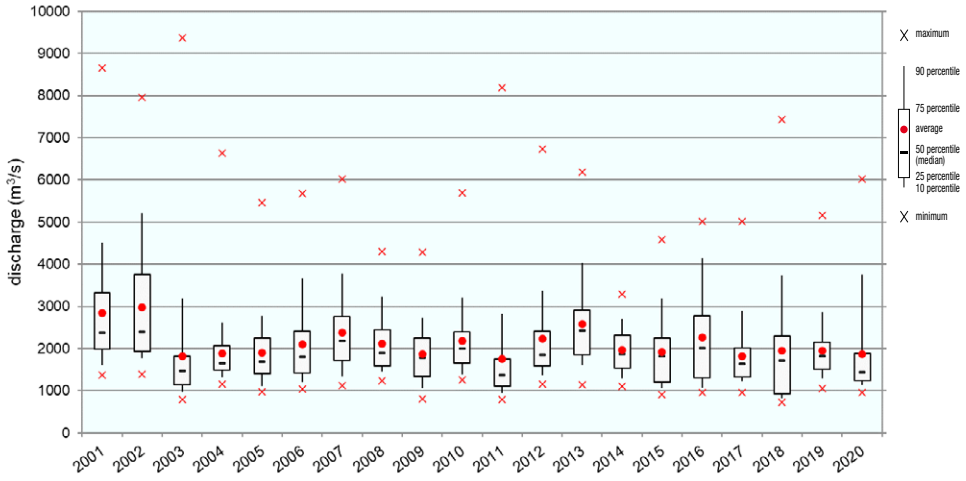
Polycyclic aromatic hydrocarbons (PAHs) are mainly released in combustion processes, for example during the combustion of fossil fuels and the incineration of waste. Atmospheric deposition is therefore a major source of water pollution by PAHs. Traffic also, particularly that with diesel engines, produces significant amounts. Besides this, these substances arise in tar products. These have applications including road surfacing, wood preservation, shipbuilding, hydraulic engineering, and the coating of pipes and barrels.

In total, 720 analysis results were reported for this parameter group, of which almost 48% were above the reporting limit. In the Drinking Water Decree, a standard of 0.1 µg/L is stipulated for the sum of PAHs. The ERM gives no target values for sums of parameters. For this reason, the individual PAHs are tested against 0.1 µg/L here. At Nieuwersluis, four PAHs exceeded the 0.1 µg/L limit once in 2020. These were phenanthrene, fluoranthene, pyrene and naphthalene (see Table 1.3). In 2019, this was also the case for these substances, apart from naphthalene. The highest concentration encountered in 2020 was for phenanthrene (0.21 µg/L), and pyrene had a falling trend. Further, the maximum for benzo(b)fluoranthene was equal to the target value with a value of 0.1 µg/L. Some other PAHs had a falling trend. The parameters described here may be found in Appendix 1 *Water quality data 2020*. The data for the other PAHs may be found in Appendix 1 of the digital version of this annual report.

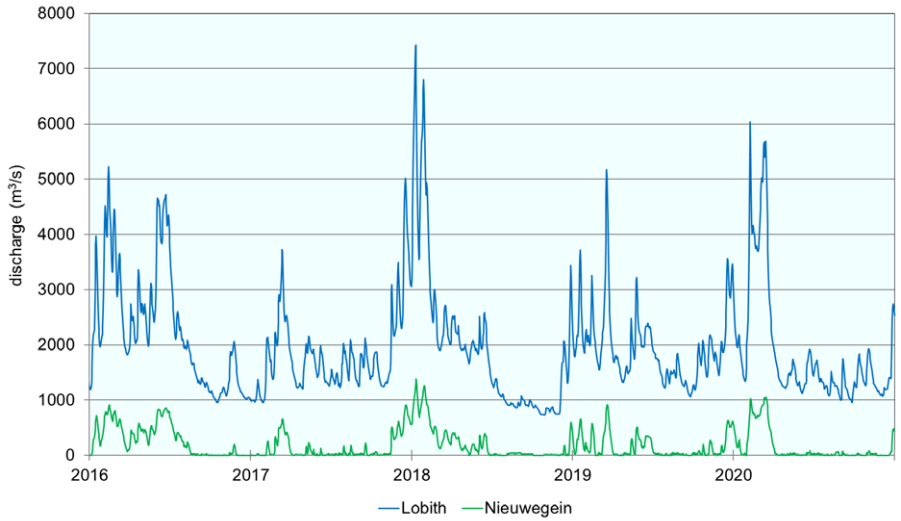
4.20 General parameters

The highest water discharges at Lobith and Nieuwegein in 2020 occurred in the first months of the year (see Graph 1.22). The maximum at Lobith, with a value of 6030 m^3/s, was higher than that of 2019 (5170 m^3/s). The lowest discharge measured was 964 m^3/s, and this was lower than in 2019 when the lowest discharge was 1064 m^3/s. This is indeed higher than the minimum discharge in 2018 (732 m^3/s). The average discharge in 2020 (1869 m^3/s) was also lower than that in 2019 (1950 m^3/s). The five-year moving average was 1972 m^3/s and the 20-year moving average was 2119 m^3/s. Both were a little lower than in 2019 (1984 and 2151 m^3/s respectively).

The discharge measured in the Lek at Hagestein is representative of the discharge at Nieuwegein and is therefore presented as Nieuwegein in Graph 1.23. The maximum discharge, with a value of 1050 m^3/s, was a little higher than that in 2019 (911 m^3/s),



Graph 1.22 Box plot of the water discharge of the Rhine at Lobith during the period 2001-2020



Graph 1.23 Water discharge at Lobith and at Nieuwegein during the period 2016-2020. For Nieuwegein, the discharge of the Lek at Hagestein is used as the representative discharge.

but was lower than that in 2018 (1380 m^3/s). The average discharge in 2020 was 150 m^3/s and was therefore almost equal to that in 2019. Both the five-year moving average (189 m^3/s) and the 20-year moving average (244 m^3/s) in 2020 were lower than those in 2019 (197 and 258 m^3/s respectively).

In 2019, the values for the water temperature and the acidity (pH) at all reporting locations were between 80% and 100% of the ERM target value (25°C for the water temperature and 9 for the pH). In 2020, this was again the case for the pH, and it applies also to the water temperature at Andijk. However, the water temperature at Lobith, Nieuwegein and also Nieuwersluis was measured once above the ERM target value, with a highest value of 25.7°C at Lobith (see Table 1.3). We did not observe any trends for these parameters.

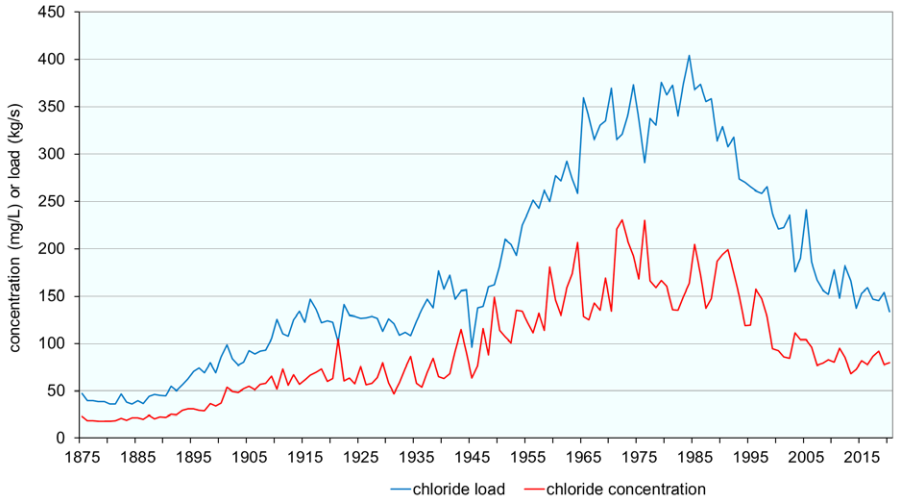
In 2020, just as in 2019, the oxygen content at all reporting locations, except for Lobith, went below the ERM target value. The minimum at Lobith, with a value of 8.18 mg/L, was in the vicinity of the target value. The lowest value measured was again observed at Andijk and was extremely low with a value of 2.6 mg/L. See Table 1.3 for the minimums at the other locations. Both the oxygen content and the oxygen saturation demonstrated a falling trend at Nieuwegein.

The electrical conductivity (EC) once exceeded the target value at Lobith (out of 26 measurements); the same happened seven times at Andijk (out of 51 measurements). The number of breaches at Andijk was markedly reduced with respect to 2019 (17 out of 52 measurements). Also, the maximum, with a value of 79.6 mS/m, was reduced with respect to the previous year, when a maximum of 93.5 mS/m was measured. At Nieuwersluis and Nieuwegein, the highest measured pH was between 80% and 100% of the ERM target value, and at Nieuwersluis we observed a falling trend. The breaches at Andijk, just as in previous years, were associated with the elevated chloride concentrations in the water.

See Appendix 1 *Water quality data 2020* for the data for the parameters discussed within this group.

4.21 Inorganic substances

Part of the inorganic substances, such as chloride and sulfate, is listed as 'conservative', because their levels are only affected by dilution and discharge of the ions and not by the physico-chemical or biological processes that happen in the water. The course of the levels of these substances in the water is thus mainly determined by the size of the discharges and the flow of the river.



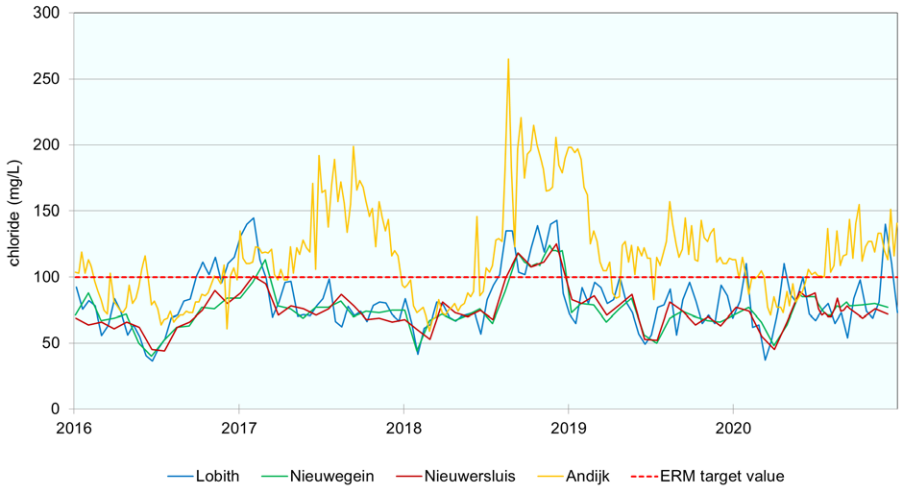
Graph 1.24 The average chloride concentration (red line) and the average chloride load (blue line) at Lobith for each year during the period 1875-2020

The average chloride concentration at Lobith in 2020 had a value of 79.8 mg/L. This was a little higher than the average in 2019 (77.4 mg/L). The average chloride load was however reduced with respect to the previous year, being 133 kg/s. Also, the highest measured load at Lobith, with a value of 248 kg/s, was lower than that in 2019 (306 kg/s). The year-averaged load also demonstrated a falling trend during the past years. The year-averaged concentration is however reducing less. This could be the result of the drier summers with long-term low discharges. These low discharges would seem to have more effect on the average chloride concentration than the falling chloride load.

See Graph 1.24 for the course of the year-averaged chloride concentration and load at Lobith during the period 1875-2020.

In 2017 and 2018, the ERM target value of 100 mg/L was exceeded at all locations; in 2019 this was only the case at Andijk. In 2020, there were again breaches at Andijk. Besides this, the average concentration at this location, with a value of 108 mg/L, was higher than the target value. The maximum was 155 mg/L and was lower than that of 2019 (198 mg/L). The number of breaches was also lower with respect to 2019 (with 33 and 48 respectively out of 52 measurements). In 2019, the maximum at Lobith was still exactly equal to the ERM target value, but in 2020, a breach of the ERM target value occurred four times (out of 26 measurements). The highest measured value was 140 mg/L. The maximums at Nieuwegein and Nieuwersluis in 2020 were somewhat higher than those of 2019, with values of 87 mg/L and 89 mg/L respectively. The chloride concentrations in the IJsselmeer are affected by various factors. The water in the lake has a long residence time, so that much time passes before higher chloride concentrations reduce again. Dilution takes place by factors including the supply of (fresh) water from the IJssel. Also, the salinity of the IJsselmeer is affected by the operation of the sluices of the IJsselmeer Dam (Afsluitdijk), and by the pumping out of saline seepage from deep polders around the IJsselmeer and the Markermeer. When the sluices are closed, salt water from the Wadden Sea can enter the IJsselmeer, and during drainage, this water is largely drained back out of the IJsselmeer. The frequency of drainage is related to the water level of the IJsselmeer. Drought in the Netherlands leads to a greater water demand in the IJsselmeer area. When there is simultaneously a low water supply rate via the IJssel (the Rhine), this affects the processes above and thus also the chloride concentrations in the IJsselmeer.

The high chloride concentrations at Andijk this year too led to problems with water intake for drinking water production. In 2020, there were 60 days in total with an intake stop (see also Appendix 3 'Intake stops and limited production' in this annual report). This is almost twice as many days as in 2019, when the intake was stopped for a total of 33 days. Graph 1.25 presents the chloride course at the different locations during the last five years.

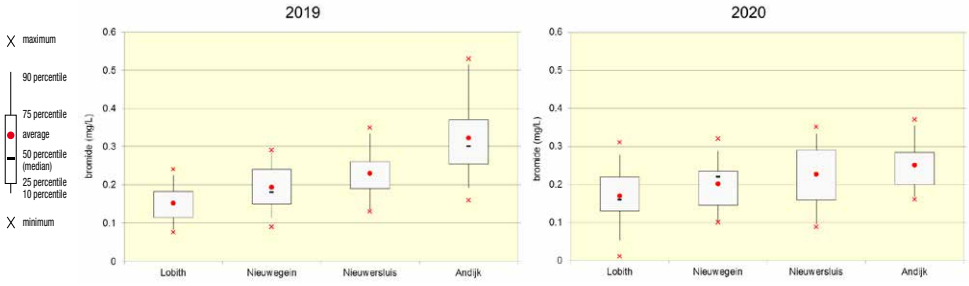


Graph 1.25 The concentration of chloride (measured weekly or fortnightly) at the Rhine locations during the period 2016-2020

Another substance of interest is bromide. Higher concentrations of bromide are undesirable for drinking water production, because this substance can be converted into the toxic byproduct bromate through the application of ozone in the drinking water production process. With the increase in the use of ozone techniques as an extra purification step at sewage treatment plants, the production of this by-product (and also of other by-products such as N-nitrosodimethylamine (NDMA)) and the possible consequences of this for the drinking water production is a major concern. Graph 1.26 shows the box plots of the bromide concentrations at the Rhine locations in 2019 and 2020. The concentrations in 2020 would still seem to increase somewhat from Lobith to Andijk, but the differences are smaller than in 2019. At Nieuwegein and Nieuwersluis, the concentrations in 2020 were at the same level as in 2019. At Lobith, they were a little higher and at Andijk somewhat lower.

A possible source of bromide is coal power stations. Bromine or bromide is used in the flue gas scrubbing of coal power stations to convert elementary mercury into oxidised mercury, so the mercury can be captured. It is known that waste incineration plants are also a source of bromide.

In 2020, the bromate concentrations were mainly reported as below the reporting limit (<1 µg/L at Lobith and <0.5 µg/L at the other locations). The highest value at Lobith was 1.4 µg/L, at Nieuwegein 0.7 µg/L and at Andijk 0.5 µg/L. In 2020, bromate had a falling trend at Nieuwegein, just as in 2019.



Graph 1.26 Box plots of the bromide concentrations at each reporting location in 2019 and 2020. The locations are presented from left to right from upstream to downstream.

4.22 Nutrients

This group of nutrients, also called eutrophication substances, comprises ammonium, nitrogen, nitrite, nitrate and phosphate. In 2020, ammonium exceeded the ERM target value of 0.3 mg/L at Nieuwersluis, with a value of 0.31 mg/L. In 2019, the maximum at Lobith approached the target value, but in 2020 it was well below it. Moreover, we observed a falling trend there. Some other parameters demonstrated a falling trend too. The data for all the nutrients may be found in Appendix 1 of the digital version of this annual report.

4.23 Group parameters

A group parameter is a parameter that characterises a certain group of related compounds and it is defined by an analysis method that is targeted at the shared properties of this group of related compounds. Examples of this are total organic carbon (TOC), dissolved organic carbon (DOC, the filtered variant of TOC), total inorganic carbon (TIC), chemical oxygen demand (COD) and biochemical oxygen demand (BOD). Adsorbable organic halides (AOX) also come into this category. Due to the scarce relevant information on this group of halides, it was however decided to reduce the measurements of them from 2016. AOX measurements for example give no information about the risk to public health, because it cannot be said, based on these measurements, what specific substances are involved.

TOC and DOC are indicators of the load of organic substances in the water. The values of these parameters have exceeded the ERM target value for several years at all locations, except at Nieuwegein. The maximum for DOC here was indeed close to the ERM target value with a value of 2.92 mg/L. At Andijk, just as in previous years, all the measurements of TOC and DOC exceeded the target value. At Lobith, this applied to almost all the measurements, and at Nieuwersluis, to half of them. The highest TOC value was measured at Andijk (8.62 mg/L) and the highest DOC value at Nieuwersluis. Both parameters had a rising trend at Lobith. The AOX was only still measured at Lobith, and, in 2020, demonstrated four breaches out of 26 measurements. This was similar to the number of breaches in the preceding years.

4.24 Other parameter groups

This subsection contains information about the parameter groups that were not covered in the previous sections, but that do feature in the RIWA-base. These other parameter groups are presented in Table 1.5, where it is indicated for each group in 2020 how many parameters belong to the group, how many measurements were conducted for the group, and how many of these were reported as above the reporting limit (number and percentage with respect to the total number of data points in the group).

Table 1.5 Other parameter groups with information about the number of parameters in each group, the number of data points per group, and how many of the data points were reported as above the reporting limit (number and percentage) in 2020

Parameter group	Number of parameters	Number of data points	Number of data points above reporting limit	Percentage of data points above reporting limit
Hydrobiological parameters	45	767	726	94.7
Biological parameters	16	507	479	94.5
Metals	34	2323	2151	92.6
Metals after filtration	29	1882	1599	85.0
Sum parameters	8	266	220	82.7
Ethers	9	330	221	67.0
Industrial chemicals (with PCBs)	7	355	189	53.2
Radioactivity	8	187	99	52.9
Antibiotics	10	420	110	26.2
Petrol additives	6	250	58	23.2
Antibiotics based on sulphonamides	4	156	36	23.1
Perfumes, colourants and flavourings	1	52	10	19.2
Soil decontaminants	1	52	10	19.2
Wood preservatives	3	168	31	18.5
Fire-retardant agents	14	714	81	11.3
Veterinary substances	7	373	42	11.3
Cholesterol-reducing agents	7	286	19	6.64
Insecticides (all 9 groups)	83	4539	256	5.64
Acaricides	19	1012	43	4.25
Industrial chemicals (with phenols)	20	332	13	3.92
Disinfection byproducts (with halogens)	5	292	7	2.40
Disinfectants based on nitroso compounds	8	312	4	1.28
Plasticisers	9	184	1	0.54
Nematicides	8	426	1	0.23
Physiological and other plant growth regulators	6	334	0	0
Cytostatic agents	3	110	0	0
Disinfectants	1	52	0	0
Germination inhibitors	1	52	0	0
Rodenticides	1	51	0	0

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2 The water quality of the Rhine in terms of removal requirement according to the Water Framework Directive

The European Water Framework Directive[1] (WFD) came into force in 2000 and aims to ensure that the water quality in Europe is in order in 2027. Article 7.3 of the WFD states: '*Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water.*' This raises the question of to what extent the deterioration of the water quality of these water bodies has been avoided, and to what extent the required purification level for drinking water was reduced since the WFD entered into force, or whether changes are still needed in order to achieve the goal set for 2027. In this chapter we will address part of these questions by looking at the removal requirement for the Rhine in the Netherlands.

Because no prescribed manner exists to assess the necessary level of purification, RIWA-Rijn had a method with indices developed for it by KWR Water Research Institute. This is described in our theme report 'Removal requirement and purification treatment effort for Dutch Rhine Water from 2000-2018'.[2] The method reveals the course of the removal requirement and the purification treatment effort through the years and provides insight into which water quality parameters are responsible for this.

The necessary level of purification, the purification treatment effort, is of course associated with the requirements that are imposed on wholesome and clean drinking water in the indicated body of drinking water. The difference between the water quality in the source and the requirements for drinking water may be considered as the removal requirement. The purification treatment effort is then defined, based on persistence and mobility, as the effort that must be made to reduce the concentration of a substance to the required level. In this chapter, we will only discuss the removal requirement (and not the purification treatment effort), based on the method in the theme report.

1 EU Water Framework Directive (2000/60/EC) (WFD), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060
2 Pronk, T. E., Vries, D., Kools, S. A. E., Hofman-Caris, R., Stroomberg, G. J. (2020), Removal requirement and purification treatment effort for Dutch Rhine water from 2000-2018, RIWA-Rijn

1. The removal requirement index

The removal requirement index assumes that water at an intake location has to be purified such that, after purification, all the substances present end up below their concentrations in the Dutch Drinking Water Decree (Drinkwaterbesluit (DWB)). It is determined for each substance what percentage of the concentration in the intake water needs to be removed in order to meet the DWB value. The sum of these percentages forms the removal requirement index (see Equation 1). Only concentrations above the reporting limit are included in determining the percentage to be removed.

$$\textit{Removal Requirement Index} = \sum_{n}^{1} \left(\left(1 - \left(\frac{std_n}{max_n} \right) \right) * 100 \right) \qquad \text{(Equation 1)}$$

Here, '*std*' is the DWB value for the parameter, '*max*' is the peak concentration in a year and '*n*' is a parameter. The DWB values used may be found in Annex A of the Drinking Water Decree and an explanation of this is presented in the theme report.

For the theme report, the group labels in the REWAB database are used for the groups of alerting parameters in the DWB, such as 'other anthropogenic substances'. For the current calculation of the index, these labels have been added to the substances for which they were still missing. Due to this, the number of parameters that contribute to the index for the locations and years under consideration has now been expanded by another 26 substances, compared to the theme report and the RIWA-Rijn annual report for 2018. For the index, the same DWB values have been used throughout the entire period 2000-2020.

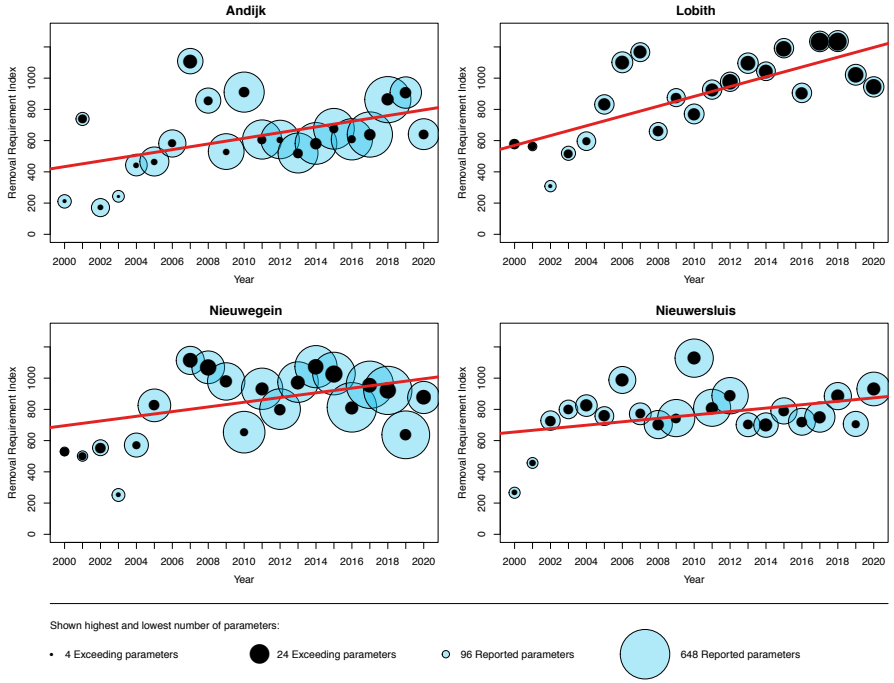
It has been found that a larger measurement package does not lead to an increase in the number of substances that contribute to the removal requirement. In the calculation of the removal requirement index, we assume that the measurement programme is always aimed at measuring at least all potentially contributing substances.

For more information about the method, we refer to the theme report cited already.

3 Drinkwaterbesluit (DWB) (2018), https://wetten.overheid.nl/BWBR0030111/2018-07-01

2. Development of the removal requirement since 2000

To investigate to what extent the removal requirement has diminished since the entry into force of the WFD in 2000, the removal requirement index was calculated for the three intake locations of the Rhine water companies and for the border measurement station at Lobith. This is presented in Graph 2.1. The blue circles indicate the number of substances measured (reported parameters) in the year concerned. The internal black circles indicate the number of substances with a concentration in the surface water that is above the DWB value (exceeding or breaching parameters) in the year concerned. The position of the circles indicates the level of the removal requirement index, which can be read off the vertical axis. The red line is a linear regression line for the relationship between this removal requirement index and time.



Graph 2.1 The Removal Requirement Index from 2000 to 2020 at Andijk, Lobith, Nieuwegein and Nieuwersluis. The red line is a linear regression line for the relationship between the removal requirement index and time.

Table 2.1 Significance (p-value) of trend in removal requirement index. The trend is considered to be significant if $p < 0.05$.

Location	Andijk	Lobith	Nieuwegein	Nieuwersluis
p-value of the trend in removal requirement index	**0.030**	**0.0001**	0.171	0.082

In Table 2.1, it may be seen that the index at Andijk and Lobith has increased significantly since 2000. At Nieuwegein and Nieuwersluis, the regression line suggests a rising trend, but this change in the index is not significant.

As already said, this time more substances were assessed in calculating the index, in comparison to the calculation in the annual report for 2018 and the RIWA-Rijn theme report about the indices. Due to this, a different picture can be seen, particularly at Lobith: here we see the index rising more steeply when viewed over the whole period. Despite this expansion, the conclusion remains the same, namely that the removal requirement has not reduced in a single location during the period 2000-2020. This would seem contrary to the WFD's intention that the purification level should be reduced. A reduction can indeed be seen at all locations in 2019 and/or 2020 compared to preceding years, but this is insufficient to allow us to say there is a falling trend.

In some years, higher values of the index were caused by some parameters that specifically contribute to the removal requirement in those years, and not, or much less, in surrounding years. In other cases, the index rises due to a gradual increase in the number of parameters that contribute and/or a gradual increase in the concentrations, or the index falls due to a gradual decrease in concentrations. The most striking peaks and increases in the removal requirement index are discussed per reporting location below. Detailed information about the parameters mentioned may be found in Chapter 1 of this annual report and in previous annual reports.

Andijk: The high value in 2007 at Andijk is specifically due to the parameters docosane, dotriacontane, icosane, hexacosane, n-octacosane, tetracosane and triacontane. These are alkanes and members of the paraffins. The high value in 2010 at Andijk is mainly due to bis(2-ethylhexyl)phthalate (DEHP), di-n-butylphthalate (DBPH) and nitrite. In 2019, the index was somewhat higher due to multiple substances that arose in higher concentrations than in other years. In 2020, the index was back at the level of before 2018, because the concentrations of all the contributing substances were somewhat reduced again in 2020, and the concentrations of nitrilotriacetic acid (NTA), diethylenetriaminepentaacetic acid (DTPA) and oxypurinol among other things were below their DWB levels.

Lobith: At Lobith, high values of the removal requirement index may be seen in 2006 and 2007, which are due to polycyclic aromatic hydrocarbons (PAHs) including benzo-(a)pyrene, and due to tetraglyme, triglyme, nitrite and DEHP. In 2008, many of these substances no longer contribute to the index so that it is lower, after which the index increases again as more and more substances with a removal requirement appear.
In 2017 and 2018, the high values of the index at Lobith were specifically caused by bentazon, benzotriazole, oxypurinol, trifluoroacetic acid (TFA), PAHs and total cyanide. In 2019, an improvement may be seen with respect to 2017 and 2018, because the concentration of almost all these substances fell so that some no longer had a removal requirement in that year. The improvement is also thanks to poly(melamine-co-formaldehyde) methylated (MPMF) and pyrazole no longer contributing. After this, in 2020, the concentrations of DTPA, iomeprol, PAHs and TFA also reduced. In the next section, the substances that contribute to the removal requirement at Lobith and the groups to which they belong are considered further.

Nieuwegein: The high value for 2007 at Nieuwegein was due to aluminium, isoproturon, diglyme, hexamethoxymethyl melamine (HMMM) and NTA. After this, the index appeared to decline gradually. In 2019, the removal requirement at Nieuwegein was lower than in most other years, due to a decrease in 1,4-dioxane, 1,3,5-triazine-2,4,6-triamine (melamine), bromate, pesticides and PAHs. In 2020, the index was higher than in 2019, but lower than in the preceding two years. Of the substances that had reduced in 2019, melamine and the PAHs, including benzo(a)pyrene, had increased again in 2020.
Also, between 2019 and 2020, the contribution to the removal requirement of DEHP, guanylurea, methenamine and trichloroacetic acid (TCA) increased. Besides this, in 2020, mainly aluminium, ethylenediaminetetraacetic acid (EDTA), iron, lithium and sucralose contributed to the removal requirement at Nieuwegein.

Nieuwersluis: In contrast to the annual report on 2018, at Nieuwersluis a peak in the removal requirement index may now indeed be seen, namely in 2010. This high removal requirement was caused by 1,3- and 1,4-dimethylbenzene, butocarboxim-sulfoxide, ethylbenzene, NTA and methylbenzene (toluene). Also, glyphosate had a higher concentration in that year compared to other years. In 2019, the removal requirement index at Nieuwersluis was reduced with respect to 2018. In 2020, conversely, the value of the index was higher than in most other years. This was due to a recent increase in melamine, beta-hexachlorocyclohexane (beta-HCH), methenamine and PAHs. Besides this, in 2020, mainly aluminium, EDTA, guanylurea, iron, lithium, manganese and sucralose contributed to the removal requirement at Nieuwersluis.

3. The removal requirement for Lobith in detail

The border measurement station at Lobith is of strategic importance to the drinking water supply, and for this reason, we will look at the removal requirement index for this location in more detail. To gain more insight into the makeup of the index through the years, the parameters have been subdivided into four groups, and a graph was prepared for each group, in which the contributions of the individual parameters may be seen (Graphs 2.2 to 2.5).

If we look at the contribution of the four substance groups to the removal requirement index at Lobith throughout the entire period (2000-2020), it may be seen that, from 2004, the group 'Industrial pollutants and consumer products' (Graph 2.2) makes the greatest contribution to the removal requirement index. As already said, the index has been expanded, so that now, through the whole period from 2000, more substances can contribute with respect to the results in the annual report for 2018. As more substances are now included in the calculation, and these substances are mainly included in the group 'Industrial pollutants and consumer products', the removal requirement for this group is greater than we saw in the annual report for 2018, and this group now makes the greatest contribution to the index in many years. This group is followed in size of contribution by the group 'General parameters and nutrients' (Graph 2.3), which makes a fairly constant contribution to the level of the index. Parameters with values above the DWB value in the group 'Pharmaceuticals and endocrine disrupting chemicals (EDCs)' contribute from roughly 2009 (Graph 2.4). The contribution of the group 'Plant protection products, biocides and their metabolites' (Graph 2.5) is the smallest, and from 2015 is very small or zero. The contribution of this group is smaller than we saw in the annual report for 2018, because a formal list of metabolites of plant protection products toxicologically irrelevant to humans is now available (see Chapter 1, section 4.9). Therefore, a drinking water standard of 1 µg/L now applies for the substances concerned instead of 0.1 µg/L, so that these substances now have a much lower removal requirement, or none.

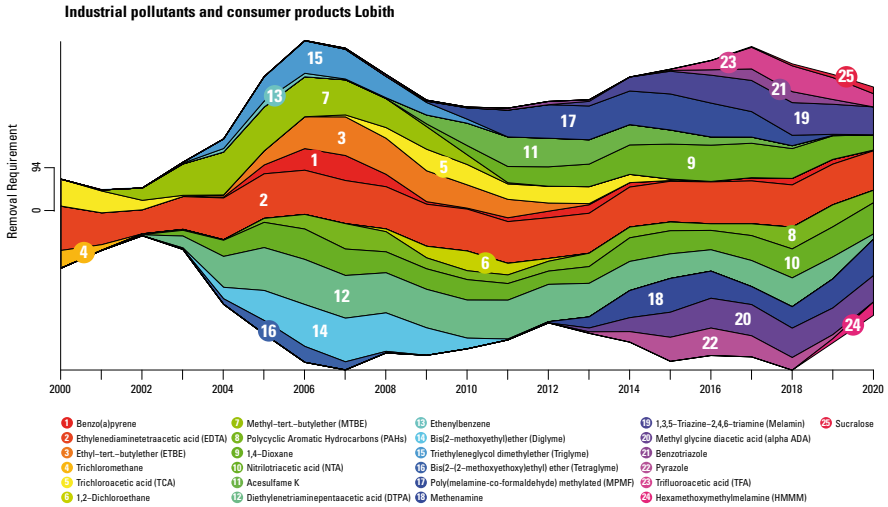
In the following subsections, the substances that contribute to the removal requirement are gone into more deeply using ribbon graphs. The contribution of the individual parameters to the index over time may be seen in these ribbon graphs (Graphs 2.2 to 2.5). As the contribution of a parameter is a 'percentage to be removed', this is always less than 100. The width of a 'ribbon' indicates the removal requirement of the relevant parameter. The scale is different for each graph.

3.1 Industrial pollutants and consumer products

As already said, the group 'Industrial pollutants and consumer products' makes up the major part of the removal requirement index at Lobith. Due to the expansion with more substances, there are - particularly in this group - more substances that contribute to the index than in the annual report for 2018. The general pattern that there are industrial substances that disappear while new substances are added continues to apply.

It may be seen in Graph 2.2 that substances arise in this group that were present at higher concentrations than their maximum value according to the Drinking Water Decree during almost the entire period presented. Examples of these are EDTA and NTA. It is also noticeable that some substances contributed for a number of years and then disappeared again from the index, such as bis(2-methoxyethyl)ether (diglyme) and ethyl tert-butyl ether (ETBE) around 2007, acesulfame K and MPMF between 2009 and 2018, and from 2015 to 2018 pyrazole, that in 2020 no longer contributed to the total removal requirement.

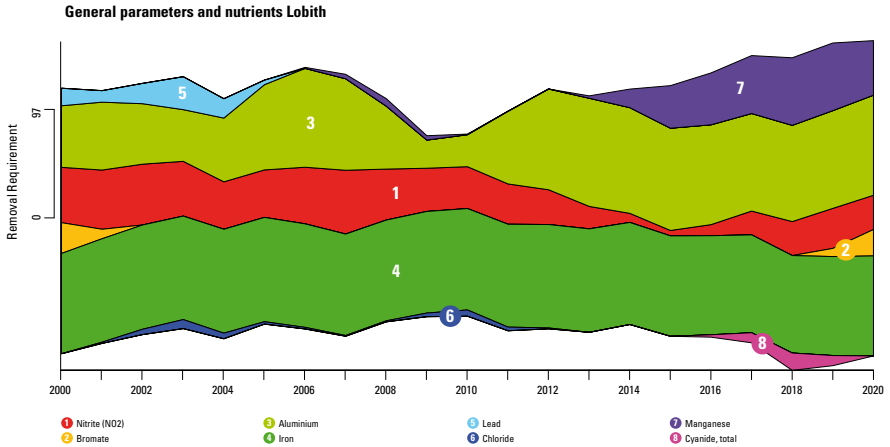
Other substances have arisen, and in 2020, still contribute to the removal requirement. These are, in order of occurrence: 1,4-dioxane, methenamine, melamin, methylglycinediacetic acid (alpha ADA), TFA, HMMM and sucralose. Of these, TFA, melamine amongst others are very difficult to remove from the water during drinking water production. PFAS substances do not currently contribute to the removal requirement index, because, for this group of substances, no specific drinking water standard has (yet) been stipulated in the Netherlands (see the text box next to Chapter 1, section 4.11).



Graph 2.2 The contribution to the removal requirement index of individual parameters (shown as coloured 'ribbons') in the parameter group 'Industrial pollutants and consumer products' at Lobith (2000-2020). Through the use of a smoothing factor when drafting these graphs, the peaks for each parameter are visually extended across the adjacent years.

3.2 General parameters and nutrients

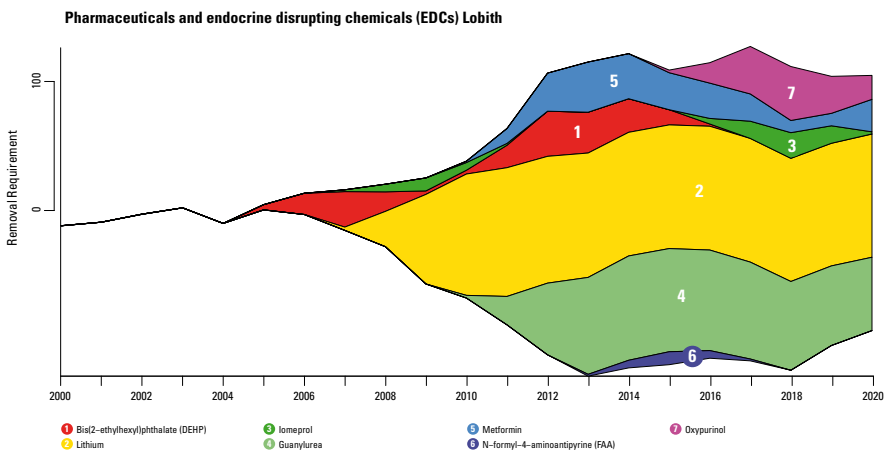
In this group, iron, aluminium and often nitrite as well cause a removal requirement (see Graph 2.3). In recent years, manganese has been added to these. Recently, bromate has also been added to the measurement programme at Lobith (see Chapter 1, section 4.21) and this substance contributes to the removal requirement.



Graph 2.3 The contribution to the removal requirement index of individual parameters (shown as coloured 'ribbons') in the parameter group 'General parameters and nutrients' at Lobith (2000-2020). Through the use of a smoothing factor when drafting these graphs, the peaks for each parameter are visually extended across the adjacent years.

3.3 Pharmaceuticals and endocrine disrupting chemicals (EDCs)

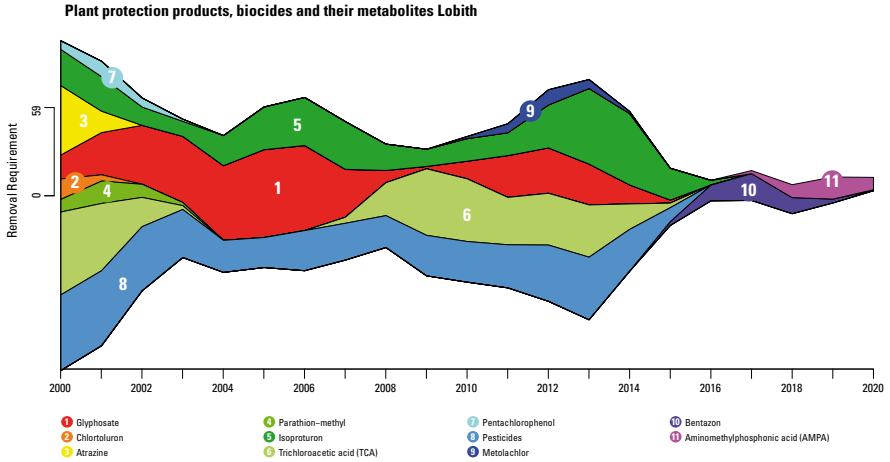
The substance group 'Pharmaceuticals and endocrine disrupting chemicals (EDCs)' has made a small contribution to the total removal requirement index since about 2010 (see Graph 2.4). The substances DEHP, N-formyl-4-aminoantipyrine (FAA) and iomeprol now no longer have a removal requirement. The substances lithium, guanylurea and to a lesser extent metformin still give rise to a removal requirement in 2020, and in the last years, oxypurinol has joined them. Lithium is categorised into this group because it is used for the treatment of psychiatric symptoms; see for more information the text box in Chapter 1, section 4.5.



Graph 2.4 The contribution to the removal requirement index of individual parameters (shown as coloured 'ribbons') in the parameter group 'Pharmaceuticals and endocrine disrupting chemicals (EDCs)' at Lobith (2000-2020). Through the use of a smoothing factor when drafting these graphs, the peaks for each parameter are visually extended across the adjacent years.

3.4 Plant protection products, biocides and their metabolites

Graph 2.5 presents the course of the removal requirement of the substances in the group 'Plant protection products, biocides and their metabolites'. As described above, the picture for this substance group has changed with respect to this graph in the annual report for 2018, because a list of metabolites toxicologically irrelevant to humans is now available. These substances are now compared to a value of 1 µg/L, rather than 0.1 µg/L in the calculation of the index, so that these substances now have a much lower removal requirement, or none. For more information about this list, see Chapter 1, section 4.9. In the present graph, we no longer see a removal requirement for aminomethylphosphonic acid (AMPA), except for the year 2019. The incorporation of the list has also affected the sum of the pesticides, because the metabolites toxicologically irrelevant to humans are no longer counted in this.



Graph 2.5 The contribution to the removal requirement index of individual parameters (shown as coloured 'ribbons') in the parameter group 'Plant protection products, biocides and their metabolites' at Lobith (2000-2020). Through the use of a smoothing factor when drafting these graphs, the peaks for each parameter are visually extended across the adjacent years.

It may be seen in the graph that the concentrations of part of the substances that contributed to the index in 2000 have reduced fairly rapidly. Since 2015, glyphosate, isoproturon, TCA and the sum of the pesticides no longer have a removal requirement for drinking water purification. In 2020, the removal requirement for the substance group plant protection products, biocides and their metabolites was in fact zero.

3.5 Summary for Lobith

The removal requirement index at Lobith has risen significantly during the period from 2000 to 2020. If we look at the last years, we see that the removal requirement index has reduced in 2019 and 2020 with respect to 2017 and 2018. This is primarily due to the reduction in the concentrations of a number of industrial substances. At Lobith, from 2000, in almost all years, the largest group of the substances to be removed was formed of the industrial chemicals, from which substances have disappeared, while new substances regularly crop up in the removal requirement index. A number of these are difficult to remove during drinking water purification. Besides this, a number of general parameters form a fixed part of the removal requirement. The contribution of the plant protection products to the removal requirement has reduced sharply since some years ago, while the influence of pharmaceuticals and endocrine-disrupting chemicals has increased.
The question is whether the fall in the total removal requirement at Lobith in 2019 and 2020 will continue in the coming years.

4. Conclusion

With the help of the removal requirement index, we have created a picture of what the water quality of the Rhine means to the removal requirement that confronts the Dutch Rhine drinking water companies. The development of the removal requirement since 2000 was also considered. This gives an impression of to what extent the Rhine is on its way towards the objective in WFD Article 7.3 that the level of purification treatment that is required in the production of drinking water should be reduced.
In summary, we can say that the total removal requirement is formed by a multiplicity of substances from different substance groups. The removal requirement index has not reduced at any single location during the period 2000-2020 and even reveals an increase at Lobith and Andijk, and though there would seem to be a slight improvement in some recent years, this period is too short to allow us to speak of a significantly falling trend. Much effort will therefore continue to be needed to improve the water quality, to reduce the removal requirement and to bring the WFD objective of lowering the required level of purification treatment, closer.

3 Combining science and legislation to protect the surface water sources of our drinking water: a call for concerted action

This chapter is an article that was written by Harrie Timmer (Vewin) and André Bannink (RIWA) for Water Solutions Magazine. A German version of this article was published in the April 2021 issue of the German trade journal gwf *Wasser | Abwasser*.

Introduction

During the last decade science has found new ways to identify and categorize substances that cause problems for drinking water production, especially from surface water, as they are persistent, mobile and toxic (PMT) or very persistent and very mobile (vPvM) (Neumann et al., 2019; Arp & Hale, 2019). As a result of their physical-chemical properties, these substances are difficult to remove in the current drinking water purification systems and therefore might end up in drinking water in higher concentrations than acceptable (Reemtsma et al., 2016; Albergamo et al., 2019; Schulze et al., 2019).

Minimization of the emission of these substances to the environment is therefore of paramount importance. The ambitions of the EU Water Framework Directive (WFD) and International Commission for Protection of the Rhine (ICPR) are high (Teodosiu, 2003), and for some macro-pollutants remarkable progress is made improving the quality of the water flowing in the river Rhine (Schulte-Wülwer-Leidig, 2018). However, the actual results on micro-pollutants are not always in line with these ambitions (Carvalho et al., 2019; Pronk et al., 2020; Wuijts et.al, 2017). Although efforts seem to be great, the goals are still not met. This chapter provides a realistic and practical framework with the aim of protecting the sources of drinking water and achieving the objectives of the WFD for PMT and vPvM micropollutants, by combining existing ideas and legislation. It presents a way forward, providing a focus point for science, legislation, and the drinking water agenda the coming years, without pretending to be perfect or complete.

Additionally, we underscore the importance of complete and coherent Pollutant Release and Transfer Registers (PRTR) and present a short-cut on improving transparency on industrial emissions in a very practical way using the existing institutional routes of the ICPR and the International Meuse Commission (IMC).

(European) ambitions on water quality

On a European scale there are several ambitions to improve both ground and surface water quality in river basins. This is important for drinking water suppliers that depend on these sources. For the Dutch drinking water suppliers, located downstream in the basins of the rivers Meuse and Rhine, the most important ambitions are set by the WFD, and the (members of) the ICPR. European regulation providing tools to meet these ambitions are the Urban Waste Water Treatment Directive (UWWTD) and the Industrial Emissions Directive (IED), both aiming to protect the water environment from the adverse effects of discharges of urban and industrial waste water respectively.

The goal of the WFD is to ensure that the quality of surface water and groundwater in Europe meets high standards (good ecological status), at latest in the year 2027[1]. For drinking water, it is important that the objectives of Article 7.3 of the WFD are met. The aim of Article 7.3 is to achieve improvements in water quality and reduce the level of water treatment for drinking water production. The non-deterioration principle in the same WFD also underscores the basic idea that Member States must take measures to prevent the status of their water bodies from deteriorating.

During the 16th Rhine Ministerial Conference in January 2020 the ICPR adopted the "Rhine 2040"[1] programme with ambitious targets for water quality. The programme's objectives are to further improve water quality and to preserve the Rhine as a resource for drinking water production. Therefore, the discharge of micropollutants, e.g. residues of pharmaceuticals, contrast agents, industrial compounds and pesticides into the Rhine and its tributaries should be reduced by at least 30% by 2040.

Another important ambition is laid down in the EU's chemicals strategy for sustainability towards a toxic-free environment as presented in October 2020. The Strategy is the first step towards a zero pollution ambition for a toxic-free environment announced in the European Green Deal. This strategy aims to better protect citizens and the environment by banning the most harmful chemicals in consumer products, which includes plans to introduce endocrine disruptors, persistent, mobile, and toxic and very persistent and very mobile substances as categories of substances of very high concern (SVHC).

1 The original goal was to achieve good ecological status by 2015, with the possibility of two extension periods of six years.

Combining the EU Chemicals strategy with the Water Framework Directive, the Industrial Emissions Directive (IED) and the Urban Waste Water Treatment Directive (UWWTD), provides in theory an adequate framework of relevant environmental legislation to improve the quality of the European waters.

Improvement on water quality plateaus

During the 70s, 80s and 90s of the last century the water quality in the Rhine river basin improved enormously (Schulte-Wülwer-Leidig, 2018). This was the result of early European water legislation for rivers and lakes used for drinking water abstraction in 1975 (Council Directive 75/440/EEC), which culminated in 1980 in setting binding quality targets for our drinking water (Council Directive 80/778/EEC, as revised by Council Directive 98/83/EC). Also, directives were introduced aimed at setting quality objectives for fishing waters, shellfish waters, bathing waters and groundwaters. Its main emission control element was the Dangerous Substances Directive.

A second phase of water regulation was the adoption of the Urban Waste Water Treatment Directive (Council Directive 91/271/EEC), providing for secondary (biological) wastewater treatment (and even more stringent treatment where necessary) and the Directive for Integrated Pollution and Prevention Control (IPPC, Council Directive 96/61/EC), adopted in 1996, addressing pollution from large industrial installations, later transformed into the IED.

In December 2000, the European Water Framework Directive (WFD, Directive 2000/60/EC) was adopted, with a visionary water management model for the whole river basin - the natural geographical and hydrological unit - instead of following administrative and/or political boundaries (European Parliament and Council, 22 December 2000). Unfortunately, this WFD did not provide the big steps forward as seen from the earlier legislation. Although the ambitions for 2027 are still unchanged, the last progress reports of the WFD do not look very promising. It is very unlikely that we will meet the high water quality standards that we set ourselves more than 20 years ago (Carvalho et al., 2019; Wuijts et.al, 2017).

A similar conclusion can be drawn on the water quality of the river Rhine when we look from the perspective of the drinking water suppliers. The Dutch association of river water suppliers RIWA-Rijn published a report in 2020 which illustrated that the effort to

purify drinking water from river water did not decrease in between 2000 and 2018 (Pronk et al., 2020). In this study the Removal Requirement Index (RRI) for source water at the five locations along the river Rhine was calculated in the period 2000 to 2018. The Removal Requirement Index is the difference between the measured river water quality and the requirements from the Dutch drinking water regulations. Figure 3.1 provides the results of the river water intake location at Nieuwegein, which is the main source for the drinking water of Amsterdam. The Removal Requirement Index at this intake location rose instead of dropped in 19 years. Which is at odds with the non-deterioration ambitions of the WFD, and the goal of the WFD article 7.3, to reduce the required level of drinking water treatment.

Recent insights and developments identifying relevant parameters

In 2017 the German Umweltbundesamt (UBA) has come up with a coherent vision based on the idea to prevent emissions into the environment of substances, registered under the EU's Registration, Evaluation, Authorization, and restriction of Chemicals (REACH), which have the intrinsic properties that indicate a hazard to the sources of our drinking water (Neumann, 2019). These properties are persistency, mobility, and toxicity (PMT) as well as being very persistent and very mobile (vPvM). UBA proposed criteria and an assessment procedure that can be used to identify these substances. The aim is to classify these substances as "substances of very high concern" (SVHC), and to minimize environmental emissions of PMT/vPvM substances by encouraging registrants to implement strict risk reduction measures. This will eventually avoid undue contamination of the sources of our drinking water and will protect these valuable resources for future generations. This idea is gradually getting accepted by regulatory agencies and can be recognized in the recently presented EU Chemical Strategy, as part of the EU's zero pollution ambition, which is a key commitment of the European Green Deal (European Commission, 2020).

Unlike the WFD, the positively distinguishing part of this concept is that it identifies problems beforehand at the source of the problem and prevents pollution. Within the WFD regulations there is a system of watch-lists and lists with priority substances that can identify problem causing substances after they have entered the environment. Which is putting the proverbial cart before the horse. The current problems with PFAS and similar substances proves again that the precautionary principle should prevail. Prevention is always better than the cure and should be the preferred option.

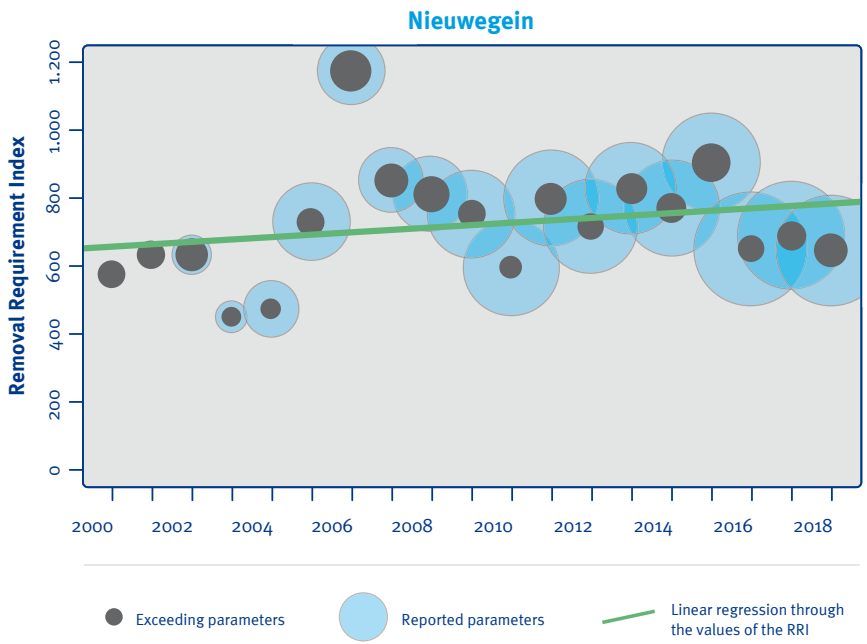


Figure 3.1 Removal Requirement Index for source water along the river Rhine at Nieuwegein in the period 2000 to 2018. The size of the blue spheres indicates the number of measured substances in that year that are in the Dutch drinking water Decree (DWB) (2018). The size of the black cores indicates the number of substances exceeding DWB values in that year. The height of the blue spheres with black core, along the y-axis, is the height of the removal requirement. This value is the sum of all removal requirements (RR) for individual substances that exceed the DWB value in that year. The solid (green) line is a linear regression through the values of the RR index.

The proposed approach in which PMT/vPvM substances are classified as SVHC also offers clues for other European environmental directives aiming to protect the water environment, like the IED and UWWTD.

Developments improving licensing of industrial discharges

The need for improved procedures for contaminants before they enter the aquatic environment became apparent in the Netherlands in 2015 and 2017. As a result of some seriously problematic issues with emerging substances like pyrazole, PFOA and GenX threatening our drinking water supply (RIWA-Maas, 2016; Gebbink et al., 2017; Gebbink & van Leeuwen, 2020), the system of licensing industrial discharges in the Netherlands was elegantly revised in 2019 by adding a drinking water test to the existing regulatory guidelines of the "discharge-test" guidelines, that are used by the authorities in their permitting procedures. Figure 3.2 illustrates the idea of the discharge-test.

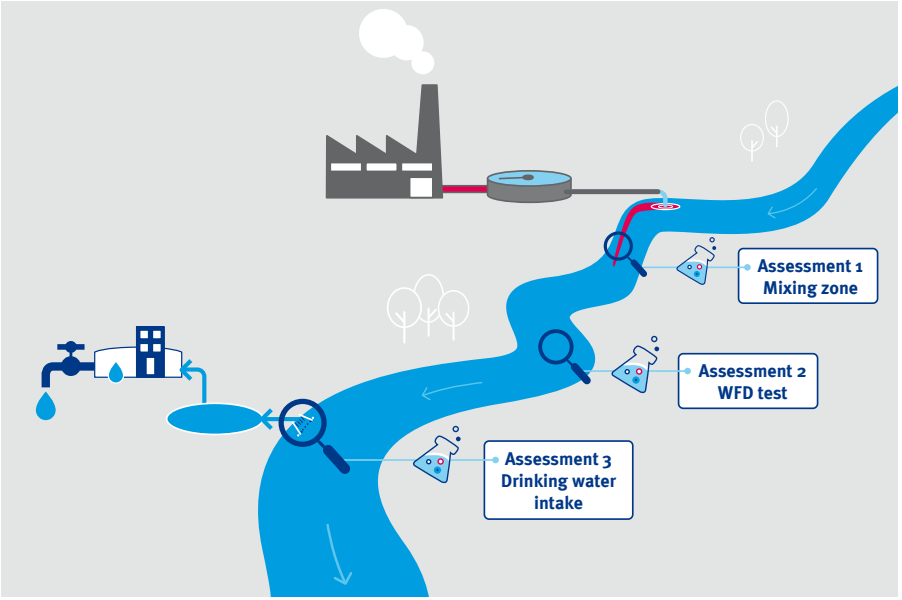


Figure 3.2 The principles of the discharge-test

The most important revision is that the potential impact of industrial discharges on the water quality of the river at the location of the direct intake of a drinking water supply company, or indirect, at the location of a riverbank infiltration site (where the production wells are directly along the river), is added as an important criterion for licensing and the amount of effort that an industry or Industrial wastewater treatment should make to prevent emissions.

To guarantee adequate safeguarding of water quality, the following two principal rules are applied when assessing a discharge permit application:

- The first specifies that at the very minimum the 'best available technique' (BAT) is applied. For a range of economic sectors water emission abatement techniques are outlined in European reference documents (the BAT reference document or BREF and BAT conclusions), as well as Dutch Information documents about BAT. Should these documents be unforthcoming, the competent authority must make its own independent assessment regarding the best available techniques for the requested discharge. The General Assessment Methodology (GAM) is used to assess the detrimental aquatic impact of substances. The detrimental aquatic impact of substances then determines which (combination of) techniques must be applied as BAT.
- Following BAT application, the second principal approach entails assessment of the remaining discharge on its effect on surface water quality. The 'discharge test' tool has been developed for this in the Netherlands, such as outlined in the Discharge Test Handbook. If the discharge test cannot be met, additional pollution abatement (BAT+) is required prior to endorsing the discharge.

The discharge test consists of 3 important steps:

1. Assessment of the effects of the discharge in close vicinity of the discharge (mixing zone test), in which the acute, not completely diluted, impact of the discharge is weighted.
2. Assessment of effects of the discharge at WFD water body level, in which the consequences of the discharge for the water body is calculated and matched with the of Environmental Quality Standards (EQS), based on yearly average flow conditions.
3. Assessment of effects of the discharge at the nearest drinking water intake location, based on 90-percentile low flow conditions. The concentrations at the drinking water intake location may not exceed the drinking water intake standards. If no (provisional) drinking water standards are available, the concentrations at the drinking water intake location may not exceed a value of 1 µg/L.

This elegant approach is in line with EU regulations and protects the drinking water intake against PMT/vPvM substances, by describing additional pollution abatement (BAT+). The identification of these substances within REACH as Substance of Very High Concern (SVHC) helps the watershed or river authorities in the licensing process as required based on the IED and UWWTD.

The approach also provides the opportunity to allow acceptable and a minimum of unavoidable discharges for industries and (for example) concentrate of drinking water production reverse osmosis installations.

The need for improved transparency on (industrial) emissions

Next to an adequate system of labelling problematic substances and the use of this information in the permitting process of industrial emissions, transparency is needed on the location, amount, and chemical composition of these emissions. Ideally this should be centralized per watershed, easily accessible and standardized. This will help drinking water utilities to ask upstream industries to adapt their process when their monitoring methods[2] detect a signal (feature/peak) of an emerging compound, known or unknown. In most cases these discharges are unintentional and the result of process disruptions or unknown by-products of their process. In the majority of cases a telephone-call or e-mail would prevent further harm, but unfortunately a quick identification of the source is not always possible. A transparent system with emission sources will help.

This need is recognized and regulated in article 8 and 9 of the Revised Drinking Water Directive (EU) 2020/2184 of 16 December 2020, in which member states shall ensure the identification of hazards and possible pollution sources affecting the bodies of water used for the abstraction of water intended for human consumption, using Risk Analysis, followed by Risk Management. Similar goals are described in the 1992 Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes (ECE Water Convention), which aims to prevent, control, and reduce transboundary pollution (Wouters & Vinogradov, 2003).

2 *Be it targeted analysis, non-target or suspect screening.*

Luckily, this transparent system of emissions is the intention of the Aarhus convention (1998) and the Kyiv Protocol (2003). The Aarhus Convention describes the rights citizens and civil society organisations have, to receive environmental information that is held by public authorities. The objective of the legally binding Kyiv Protocol is to enhance public access to information through the establishment of coherent, nationwide Pollutant Release and Transfer Registers (PRTRs). PRTRs are inventories of pollution from industrial sites and other sources. The Protocol places indirect obligations on private enterprises to report annually to their national governments on their releases and transfers of pollutants. “E-PRTR”, is the EU system for collecting and disseminating information about environmental releases and transfers of hazardous substances from industrial and other facilities.

One would expect that, with gradual integration of EU and national legislation, this system would be functional after almost 20 years. Unfortunately, it is not yet fully operational within the EU, although it is signed and ratified by all member states and the EU. Pistocchi et al (2019) states that the information currently available shows limited quality, completeness, and homogeneity.

Overall, we conclude that on EU level, the components of the high-quality regulatory and registration machinery are available, but the machine still has to be put together, and requires finetuning for optimal performance.

A tempting perspective to protect the quality of sources for drinking water

The list of instruments and operating mechanism that we need is:

- A fully operational and complete system within REACH, in which all relevant substances that can potentially harm drinking water sources are identified as SVHC;
- This SVHC label should be used by the licensing authorities in the EU to minimize the emissions of these specific substances to a level that is below the level that poses problems for the ecological or human use of these waters. This minimization should apply to both indirect discharges into wastewater systems (UWWTD) and direct discharges to surface waters (IED);
- An easily accessible, complete registration system for industrial (and other) emissions in the framework of the European Pollutant Release and Transfer Registers (E-PRTR), including emissions of SVHC substances.

This integrated concept is visualized in figure 3.3.

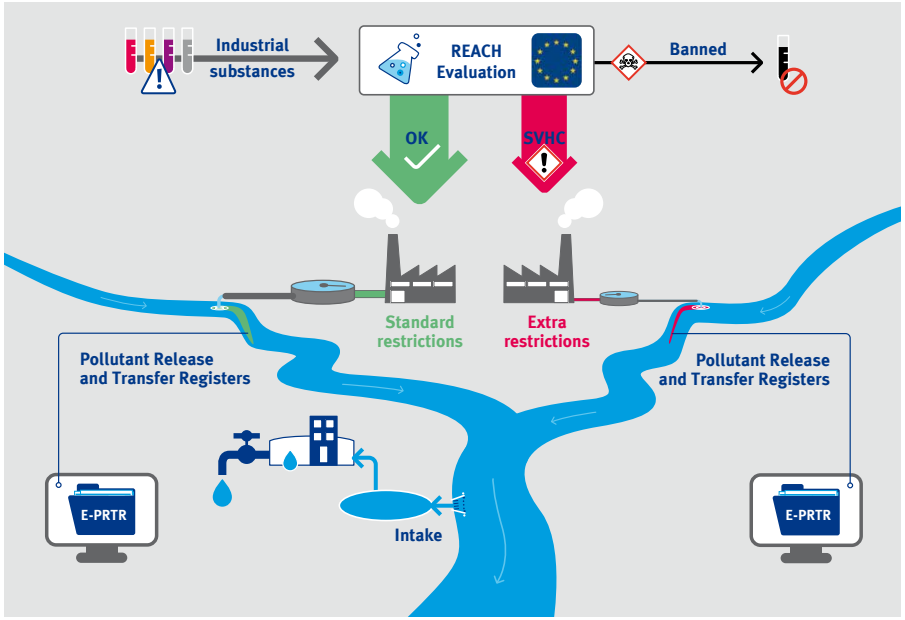


Figure 3.3 Visualisation of the total concept with 1) identification of PMT/vPvM substances within REACH, 2) Licensing process with restrictions on SVHC substances and 3) registration in PRTR system

Not the solution for everything

As stated, this concept is not perfect and not complete, as it lacks solutions for unknown emerging compounds, agricultural emissions like pesticides, non-industrial emissions from Urban Waste Water Treatment Plants (such as pharmaceuticals and personal care products) and emissions below thresholds of the REACH regulation etc. But it is a realistic step into the right direction, and provides a focus point for science, legislation and the drinking water agenda agenda the coming years.

The way forward: next steps

In order to prevent pollution at the source, protect drinking water sources, meet the ambitions of the European River Memorandum Coalition (ERM Coalition)[3] and fulfil the ambitions of the WFD, the described existing instruments and operating mechanism should be combined and made operational. In concrete terms, the next steps should be taken by the EU and its member states:

1. **EU:** Identify PMT and vPvM substances as SVHC in REACH, as is the ambition of the EU's Chemicals Strategy for Sustainability - Towards a Toxic-Free Environment[4];
2. **Member States:** Use the SVHC label in the regional/national licensing process to minimize the emission of these substances as much as possible with the most stringent emission thresholds, in order to meet the acceptable ecological and human quality standards. Strict licensing should apply to both indirect discharges into wastewater systems (UWWTD) and direct discharges to open water (IED).
3. This approach for minimizing industrial discharges of PMT and vPvM substances into wastewater systems should be considered within the current revision of the Urban Waste Water Treatment Directive.
4. Consider a catchment area that is a source of a drinking water intake as a "vulnerable area" and include an assessment at the intake location for drinking water (river water or riverbank filtrate), when assessing industrial emissions. The presented Dutch system of the General Assessment Methodology (GAM) can be used as an example.
5. The suggestions for improved methodology for licensing and assessment should be considered within the scope of the current evaluation and revision of the Industrial Emissions Directive (IED) that addresses pollution from large industrial installations in 2021.
6. **EU/Member States/Industry:** Optimize the current E-PRTR towards an easily accessible, complete registration system for industrial (and other) emissions with at least the discharge of the SVHC substances. The attention under the EU Green Deal for the improved implementation by the EU of the Aarhus Convention on the access to information, public participation in decision-making and access to justice in environ-

3 *Around 170 water suppliers representing the water protection and drinking water interests of 188 million people in the catchment areas of the rivers Rhine and Ruhr, Danube, Elbe, Meuse and Scheldt in 18 riparian states: Germany, Austria, Belgium, Bosnia-Herzegovina, France, Croatia, Liechtenstein, Luxembourg, the Netherlands, Montenegro, Romania, Serbia, Slovakia, Slovenia, Switzerland, Czech Republic, Bulgaria and Hungary.*

4 *https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf*

mental matters might provide an impetus for a more strict and complete implementation of the E-PRTR.

7. **EU/Member States of the Rhine River Basin:** As an option preventing discussions on confidentiality and the protection of legitimate economic interests, the optimization of E-PRTR could start with a pilot of an easily accessible, complete registration system for emissions more than 300 kg per year (>300 kg/a) per watershed under the (confidential) umbrella of the ICPR, as was proposed by RIWA-Rijn (De Jonge, 2020).
8. **EU/Member states:** use the review and revision of the Industrial Emissions Directive (IED) and the Urban Waste Water Treatment Directive (UWWTD) to align these directives with the ideas presented here.

These actions will give substance to article 191.2 of the Treaty on the Functioning of the European Union (TFEU) that states that *"Union policy on the environment (…) 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"*. We are convinced that these steps will reduce the vast majority of the current quality issues for drinking water sources, and that these steps help to achieve the targets of the WFD and ICPR. A dedicated and focussed effort of the EU organization, (inter)national institutes (UBA/RIVM), regulators and NGO's like the ERM Coalition and EUREAU, could do this within one term of the European Commission (five years).

Acknowledgments

We would like to express our appreciation to Wennemar Cramer (Vewin), Dr. Gerard Stroomberg (RIWA), Dju Bijstra (RWS-WVL) and Jos van den Akker (Vewin) for their valuable suggestions on previous versions of this paper.

Postscript

On 1 June 2021, the ICPR answered the letter from RIWA-Rijn of 9 October 2020, in which improved transparency and completeness of and accessibility to discharge licences was requested via the ICPR's documents system (step 7 in this chapter). Because discharge licences do not come under the ICPR's authority, but under that of the countries or member states, and a specific regional solution for a river basin does not seem sensible, the delegations of the countries in the Rhine river basin do not consider the proposal to be feasible within the ICPR.

The delegations did however understand RIWA-Rijn's concerns and confirmed that they would make efforts, at national or member state level, as far as is possible, to remove obstacles in order to enable better information provision or public participation concerning planned discharges. Further-reaching regulations ought to be introduced at EU level, according to the ICPR.

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Policy recommendations

- Embrace the ambition of the EU strategy for sustainable substances in the area of sustainability – towards an environment without toxic substances.

- Identify (very) persistent, (very) mobile and toxic substances (PMT and vPvM substances) as very high concern (VHC) substances in REACH.

- Use the VHC label in regional and national licensing processes to minimise the discharge of these substances as far as possible, to meet the ecological and health and hygiene quality standards.

- Impose strict licensing requirements on indirect discharges into waste water systems and direct discharges into open water.

- Deal with PMT and vPvM substances at the source, only authorise essential applications, and restrict unavoidable industrial discharges to an absolute minimum.

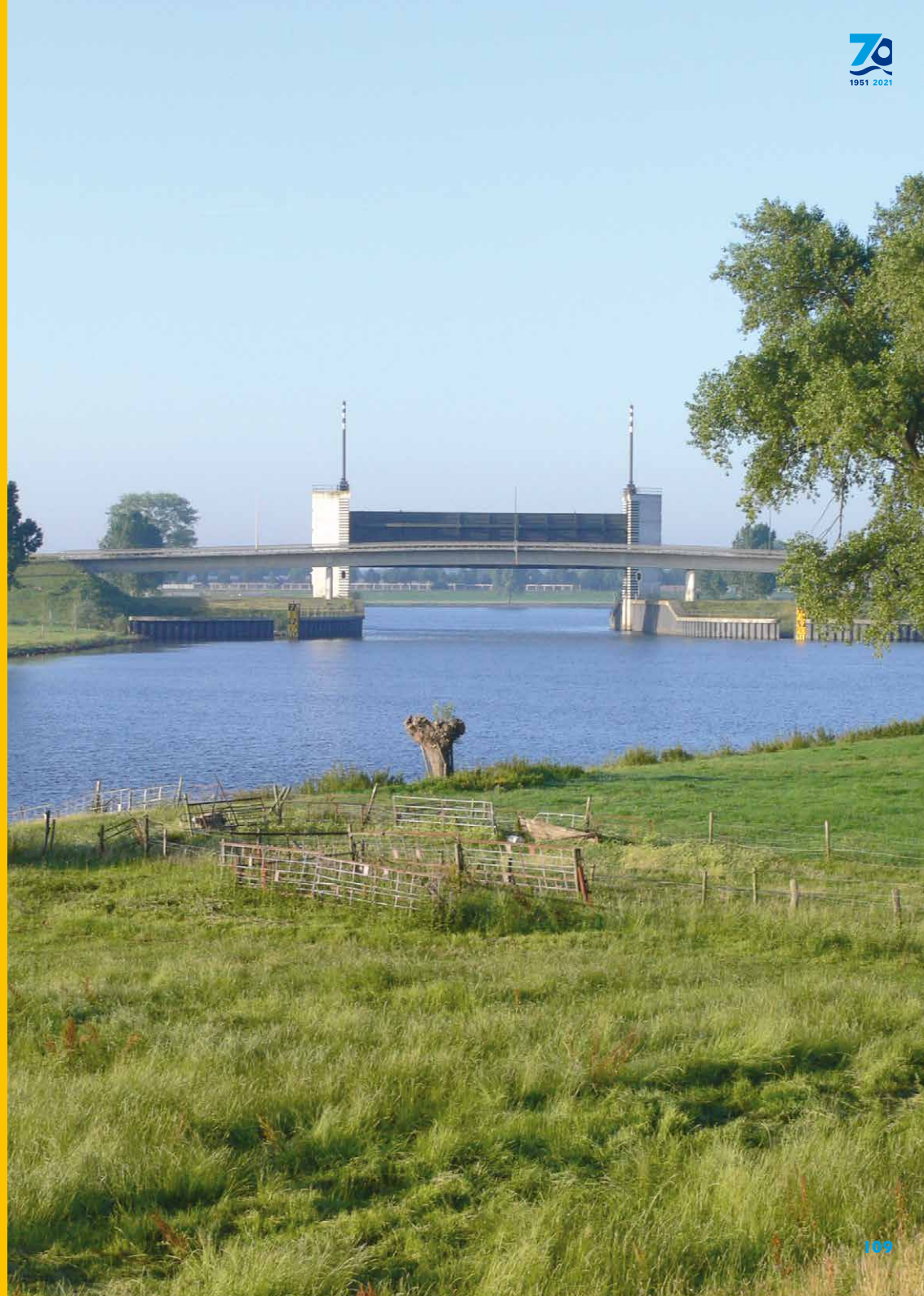
- Consider a river basin that is a source for drinking water abstraction as a 'vulnerable area', and, in the assessment of industrial emissions, include an assessment for the abstraction of drinking water (river water or riverbank filtrate).

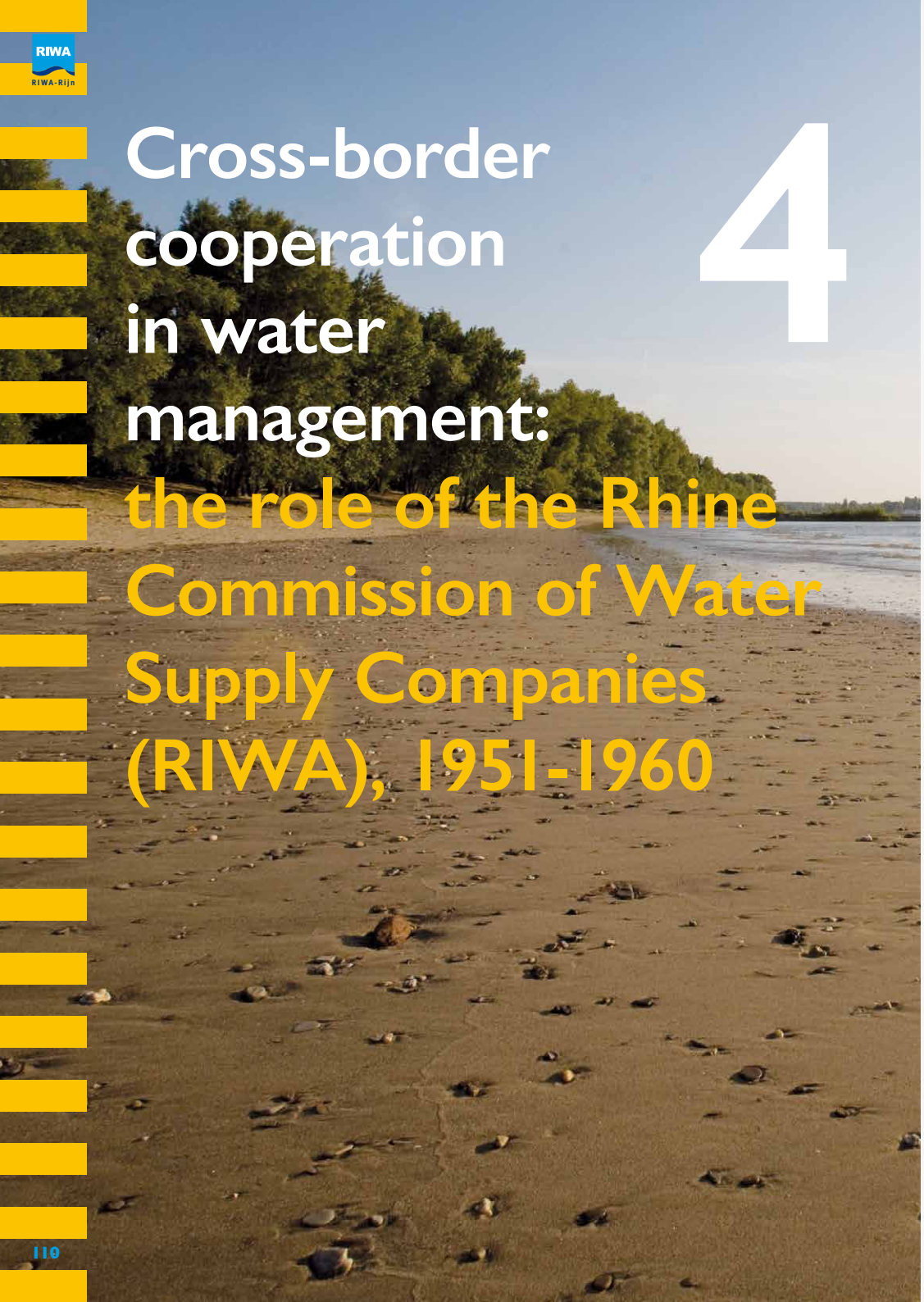
- Optimise the current E-PRTR to an easily accessible, complete registration system for industrial (and other) emissions with the minimum discharge of VHC substances.

- Improve the implementation of the Aarhus Convention concerning access to information, participation in decision-making and access to the courts as regards environmental matters.

- Start with a pilot of an easily-accessible, complete registration system for emissions of more than 300 kg per year per body of water.

- Use the revision and reassessment of the Industrial Emissions Directive (IED) and the Urban Waste Water Treatment Directive (UWWTD) to bring these Directives into line with the recommendations listed above.





4 Cross-border cooperation in water management: the role of the Rhine Commission of Water Supply Companies (RIWA), 1951-1960

Daan Sanders MA, Prof. Liesbeth van de Grift, Dr Joep Schenk, commissioned by RIWA-Rijn

Introduction

Historians often look for the start of the development of transnational environmental policy at the end of the sixties and in the seventies. Various subjects then attracted the attention and led, sometimes only after a long time, to European legislation and policy. One of the best-known examples is the pollution of the Rhine. As early as the fifties, Dutch newspapers were writing about the Rhine as the 'biggest sewer in Europe'. The Netherlands was dependent on water from the Rhine for its drinking water supply and also for agriculture and horticulture. In West Germany and France, that water had already become seriously polluted by pesticides and discharged waste products, such as oil from shipping and salt from the potash mines in Alsace, before it even reached the Netherlands. In 1969, these problems attracted attention in West Germany and much further afield when, inexplicably, thousands of dead fish floated up in the Rhine, colouring it silver. The falling oxygen content in the Rhine and the pesticide endosulfan were the causes: the agent had ended up in the water in much too large amounts and had damaged the biological life there severely.[1] In response to these events, the European Parliament conducted research into pollution of the Rhine and concluded that it was dealing with a transnational problem here that demanded a *European* solution. In this way, it made a step towards the Europeanisation of environmental policy.[2]

At least, that is the familiar story. Less well known is that the process of increasing cross-border cooperation was initiated much earlier, outside the context of the European Economic Community. The Rhine Commission of Water Supply Companies (RIWA) played an important role in the 'trans-nationalisation' of river water management. Even early in the fifties, it drew attention to the problems of river water pollution and did research itself into the quality of the Rhine water. As a commission of Dutch drinking water companies that made use of Rhine water, RIWA had an interest in the river water being as clean as possible.

1 *Carel Dieperink, Tussen zout en zalm: Lessen uit de ontwikkeling van het regime inzake de Rijnvervuiling [Between salt and salmon: Lessons from the development of the regime concerning the pollution of the Rhine] (Thesis, Utrecht University. Amsterdam 1997), particularly pp 145-146. In the West German context, the endosulfan 'Thiodan' was mentioned. The scandal of this serious pollution was never completely solved.*

2 *Jan-Henrik Meyer, 'Getting started: Agenda-setting in European Environmental Policy in the 1970s' in Johnny Laursen (ed.), The Institutions and Dynamics of the European Community, 1973–1983 (Baden-Baden 2014), 221-242, 235-236 q.v.*

Striking is that even in the fifties, RIWA had called for serious measures to protect the quality of river water, particularly too in an international context.

This article elucidates RIWA's role in the first decade of its existence. This period coincides with the first phase in the development of the Rhine Regime, as described by Carel Dieperink.[3] Water has various functions (including drinking water, a transport medium, raw material, energy generation), which can cause conflicts of interest to arise. To keep these water conflicts on the right lines, consultation structures were created, agreements were made about the underlying principles and about the rights and obligations of the states involved – together called a 'regime'. In 1949, on the initiative of the Netherlands and Switzerland, an informal advisory body was formed, the International Rhine Commission, which was formalised by the Bern Convention in 1963.[4] From its foundation in 1951, RIWA has been closely involved with the development of the regime.

This article charts out how RIWA developed and tried to affect the national and international regime development, as a representative of drinking water companies. What objectives did it set itself and in what way did RIWA attempt to achieve these? What other players did RIWA have to deal with and how did this cooperation proceed? How successful was RIWA in achieving its goals and what obstacles confronted it? These questions form the leitmotiv of this article. The first part concerns RIWA's general development. Thereafter, we shed light on two dossiers that RIWA concerned itself with in the fifties: water quality (mainly salinisation) and radioactivity. Based on these dossiers, we show how RIWA manoeuvred in a complex Dutch and international landscape where the post-war political tensions were palpable.

The article is based on research that Daan Sanders conducted in RIWA's archives. The Director of RIWA-Rijn, Gerard Stroomberg, opened the archives to us, with the aim of gaining insight into RIWA's historical development.[5]

3 *Dieperink, Tussen zout en zalm [Between salt and salmon]: a shorter article based on this thesis is Carel Dieperink, 'Van open riool tot zalmrivier? Lessen uit de ontwikkeling van het regime inzake de Rijnvervuiling [From open sewer to salmon river: Lessons from the development of the regime concerning the pollution of the Rhine]', Beleid en Maatschappij 25:4 (1998); particularly on this point, see page 193.*

4 *Dieperink, 'Van open riool tot zalm' [From open sewer to salmon], 191.*

5 *Without further citation, the documents that are referred to in the footnotes originated from the RIWA archive.*

RIWA and environmental history

For historians studying the history of environmental policy, RIWA is an interesting organisation. Indeed, because RIWA contributed to the development of environmental policy, but there are more reasons. To understand this, we briefly report here on the history of environmental politics and policy. After this, we show to what new insights investigation into RIWA can lead.

Historians often speak of two waves of environmental activism: the one arose around 1900, the second in the seventies of the last century. The first wave stood up for the protection of nature. With the rise of industrialisation and urbanisation, nature was coming under more and more pressure. Concerned citizens set up nature protection organisations that were intended to protect natural areas and threatened species. This led to the foundation of national parks and the first international agreements about the protection of animal species, such as the whale. In the Netherlands in this period, Vogelbescherming Nederland (Dutch Society for Bird Protection) (1899) and Natuurmonumenten (Dutch Society for Nature Conservation) (1905) were set up; the Naardermeer lake was the first area to receive protected status.

The second wave started at the end of the sixties, when, thanks to publications such as *Silent Spring* (1962) by Rachel Carson and obvious environmental problems such as the Rhine pollution, it was becoming ever clearer what a sorry state the environment was in. The report from the Club of Rome, *The Limits to Growth* (1972), demonstrated that the stock of natural resources and raw materials was finite and could not possibly serve as a basis for endless economic growth. Anxious citizens organised themselves into clubs that were to form the core of the environmental movement. This was also the time when the 'environment' as a concept made its appearance. It reflected the realisation that problems such as water and air pollution and the exhaustion of natural resources were related to each other and needed to be considered as one cohesive whole. In the years that followed, the environment would develop into a separate policy area with its own Ministry and National Environmental Policy Plan (1989).[6]

6 *For these subjects, see the theme issue of the Yearbook of Parliamentary History, 'Nature, Environment, Climate' (2019), particularly: Jonne Harmsma, 'Grenzen aan de groei? Een nieuw milieuministerie in zwaar weer (1971-1975)' [Limits to growth? A new environmental ministry in heavy weather (1971-1975)], Jaarboek voor Parlementaire Geschiedenis [Yearbook for Parliamentary History] (2019) 42-51; Johan van Merriënboer, 'Autopartij met calimerocomplex. Het Nationaal Milieubeleidsplan en de moord door de VVD-fractie op het tweede kabinet-Lubbers in mei 1989' [Car party with inferiority complex. The National Environmental Policy Plan and the bringing down by the VVD faction of the second Lubbers cabinet in May 1989], Jaarboek voor Parlementaire Geschiedenis (2019) 52-62.*

The story of the two waves raises questions. Because what exactly happened in between the two waves? Did concerns about nature, public health, the quality of water and air disappear completely from the agenda in the fifties and sixties against the background of post-war recovery? This does not seem very plausible, even though other themes came to be higher up on the agenda. RIWA's activities for a clean Rhine confirm this. It is interesting to investigate what did happen in this period, who were the driving forces behind it, and what terms were used to speak about environmental problems. Such an investigation can also help us to better understand the 'sudden' revolution in the seventies.

Secondly, an investigation of RIWA enables us to focus our attention on the role of (various types of) companies as 'environmental actors'. Until now, historians have paid a lot of attention to nature and environmental organisations and the way in which they influenced public opinion and politics by bringing environmental problems to light. The role of (different types of) companies as 'environmental actors' has however barely been investigated – and it does need to be. On the one hand, Corporate Social Responsibility can no longer be dismissed from our lives; on the other hand, companies are regularly accused of 'greenwashing' when they stand up for sustainability. What role companies actually played in the development, successful or not, of environmental regimes is often unclear.[7] The restricted access to business archives has not helped investigators here. In this sense too, this research project could serve as an example.

RIWA occupies a particular position as an association of utility companies – companies, set up by governments, that occupy a monopoly position and serve the 'public benefit'. The member companies are non-profit, but economic considerations do play a role: the cleaner the Rhine is when it enters the Netherlands, the lower the costs for water purification. Previous publications described RIWA as an environmental organisation avant la lettre.[8]

7 *For this theme, see for example Robert Falkner, Business power and conflict in international environmental politics (New York, 2008).*

8 *In the past, RIWA's history has already been described by (ex) employees of RIWA and the companies involved themselves, on the occasion of its fiftieth anniversary. These articles give a primarily factual overview. Little attention is paid in them to RIWA's first decade: M. Gast and P. Beemsterboer, '50 jaar RIWA: verleden, heden en toekomst' [50 years of RIWA: past, present and future], H_2O 35:3, February 2002; Editorial, '"We moesten keihard lobbyen voor iedere maatregel." Jan Jansen, ex-Rijkswaterstaat over 50 jaar RIWA' ['We had to fight extremely hard for every measure.' Jan Jansen, formerly of Rijkswaterstaat on 50 years of RIWA], Waterspiegel 5:1, April 2002. See particularly this latter publication for the perspective of RIWA as an environmental organisation. In the issue of H_2O mentioned, 35:3 2002, there were also separate articles about the history of the water quality of the Maas (Meuse) and Rhine in international perspective.*

We try to place RIWA in its time: what motivated the organisation, how did it justify its actions, and what exactly did it try to achieve?

The foundation of RIWA in times of reconstruction and pollution

Whereas in a large part of the Netherlands the emerging water supply companies abstracted their water largely from groundwater, their contemporaries in the west of the Netherlands – situated close to the sea – were thrown back on dune water. Due to the population growth and the increasing water consumption by agriculture and industry, these water companies had to abstract their water more and more from tributaries of the Rhine. The Rhine water had yet another important function for the fresh water management of the Netherlands: it was necessary to combat the salinisation that was heading inland from the North Sea. In the Netherlands, after the Second World War, major concerns arose when it became clear that the water quality of the Rhine was deteriorating as a result of already existing and new forms of pollution. This increasing pollution had to be seen in the light of the post-war reconstruction of Europe. As early as the thirties, the Dutch government had made contact with German industry and the potash mines in French Alsace about their problematic salt dumping into the Rhine and tributaries, but these increased rapidly after 1945. Along with this came other problems, including the reduction in river life, fungus formation, oil spills, pollution with phenols and new detergents, and possibly even radioactivity.

The pollution ensured that the taste of the drinking water in the west of the country deteriorated, and the water supply companies themselves feared for the quality they could supply and for damage to the water supply systems.[9]

9 *Dieperink, Tussen zout en zalm [Between salt and salmon], mainly 119-121; Gast and Beemsterboer, '50 jaar RIWA' [50 years of RIWA]," 15; Dossier 7 document 11, Prof. W.F.J.M. Krul (RVD), 'Voorgeschiedenis nationaal en internationaal overleg Rijn' [Prehistory of the national and international Rhine consultation], 17 April 1952. For a concise introduction to the prehistory of the drinking water supply in the Netherlands, see J.W. Schot, H.W. Lintsen, A. Rip and A.A. Albert de la Bruhèze (ed.), Techniek in Nederland in de twintigste eeuw. Deel 1. Techniek in ontwikkeling, waterstaat, kantoor en informatietechnologie [Engineering in the Netherlands in the twentieth century. Part 1. Engineering in development, public works, office and information technology] (Zutphen, 1998) particularly for the perspective on water management and water technology; and see J.W. Schot, H.W. Lintsen, A. Rip and A.A. Albert de la Bruhèze (ed.), Techniek in Nederland in de twintigste eeuw. Deel 6. Stad, bouw, industriële productie [Engineering in the Netherlands in the twentieth century. Part 6. City, construction, industrial production] (Zutphen, 2003) particularly for the perspective on urban architecture and water supplies.*

In this context, the directors and specialists from four large water supply companies met on 15 June 1951: from the Amsterdam Municipal Water Supply Company (GWA), the Duinwaterleiding from The Hague, the Noord-Holland Provincial Water Company (PWN) and the Rotterdam Drinking Water Company (DWL). All four were dependent on the Rhine for their drinking water supply. On the initiative of the director of the GWA, Cornelis Biemond, they decided to call into existence the 'Rhine Commission' (from 1952, the 'Rhine Commission of Water Supply Companies', RIWA). The aim of this would be 'to jointly study the problem of the pollution of the Rhine and together as one, to provide the Government with advice in its further steps to combat this wrong as far as possible.'[10] The Rhine Commission would therefore direct itself primarily at two activities: to perform joint research and to exchange knowledge and examination and the promotion of the interests of these companies to the State Government and other organisations.[11] In this way, they hoped to get the subject of river water quality on to the agenda.

Originally, RIWA was no more than a meeting platform for the directors and specialists of the four companies. RIWA had only a few researchers on staff who were paid by the four companies and who were on the payroll of the GWA.[12]

The agenda and activities of RIWA were determined by what the directors and investigators raised for joint consideration. The companies acted in rotation as host of the meeting location and the directors rotated as chair. After having worked in this way for a year, the initiator and driving force Biemond took on the chair permanently; there was also a permanent secretariat in Amsterdam.[13]

10 Minutes of 1st RIWA meeting, 15 June 1951.
11 Chair Biemond summarised RIWA's objectives in the same way from its foundation in 1958: RIWA was founded in 1951 with the 'aim of conducting research into the water of the Rhine in common consultation, and to argue for their interests on behalf of the four companies involved and if necessary also to act externally'. Minutes of 22nd RIWA meeting, 8 January 1958.
12 'Rijncommissie. 1e halfjaar 1955' (Rhine Commission's financial summary for first six months of 1955), September 1955. There is in general little documentation available about the finances of RIWA during the first ten years.
13 Minutes of 4th RIWA meeting, 11 March 1952; Minutes of 5th RIWA meeting, 18 April 1952. It is stated in this last document that the RIWA secretariat, with permanent chair Biemond, was moved to Amsterdam because this would simplify the coordination and communication. R. Sijderius (also spelled Syderius), of the Rotterdam water company, until that point the permanent official secretary of RIWA, would continue to act as minute-taker of the RIWA meetings. The meeting continued to be held alternately in different cities, but the organisational centre of gravity was in Amsterdam. Upon leaving the Rotterdam water company in 1954, Syderius would be replaced as minute-taker by GWA staff member L. Huisman. RIWA archive, 13th RIWA meeting, 3 December 1954.

Biemond chaired the RIWA meetings and also acted as RIWA's face to the outside world. But due to RIWA's nature as a platform for cooperation between separate companies, it was decided that 'if steps need to be taken to the government, this will happen via the company boards.'[14] As utility companies, accountable to the Municipal or Provincial Councils, the four participating companies made these bodies aware of the foundation, objectives and structure of the new Rhine Commission.[15] As will emerge later, the RIWA companies would also use the connections with the municipal and provincial councils in promoting their interests to the State Government.

RIWA's first objective, research, initially encompassed the comparison and streamlining of the existing research. Even before the foundation of the Commission, such research was conducted into various aspects of the Rhine water by the companies and by government bodies. RIWA became a platform where specialists from the companies could exchange and compare the measurement data and methods and make them uniform. The primary product of this was the annual report Samenstelling Rijnwater (Composition of Rhine Water), the first edition of which appeared in 1952.[16] In this annual report, the measurement results from the various laboratories were combined and compared. This not only provided a more complete and more accurate picture of the water quality and measurement methods than had existed until that point, it could moreover serve as evidence while lobbying for a cleaner Rhine. Besides this, the directors and specialists used the RIWA meetings in the area of water quality to discuss existing and new research opportunities.

The second and more important purpose of RIWA was the joint promotion of the interests of the drinking water companies in the west of the country, which were dependent on the Rhine water. Biemond wrote to the alderman in Amsterdam about the founding of RIWA: 'With my colleagues, I have come to the conclusion that it merits recommendation to accommodate our common and shared interests in a permanent body in order to represent our viewpoint with greater force and unanimity.'[17] RIWA targeted its lobbying mainly at the control of pollution as a result of the dumping of waste, which also contained chloride.

14 Minutes of 22nd RIWA meeting, 8 January 1958, words of chair Biemond.
15 Letter from Biemond (RIWA/GWA) to Alderman of Amsterdam for municipal companies, 26 July 1951; Minutes of 2nd RIWA meeting, 14 September 1951.
16 Ir J. Kooijmans, 'De samenstelling van het Rijnwater in 1952. Opgesteld voor de Rijncommissie' (The Composition of the Rhine Water in 1952. Drafted for the Rhine Commission), October 1953.
17 Letter from Biemond (RIWA/GWA) to Alderman of Amsterdam for Municipal Companies, 26 July 1951.

This happened particularly in Germany and France. Besides this, RIWA was alert to the possible negative effects of water construction and canalisations on water abstraction.

In the following sections, we show how RIWA proceeded. We do this based on two topics that came to be high on the agenda: water quality and radioactivity.

Lobbying for a clean Rhine

The foundation of RIWA meant that the four companies could combine their lobbying efforts in an attempt to increase their effectiveness. In its lobbying work, RIWA mainly targeted two organisations: Rijkswaterstaat, the government body with most responsibility in the area of water management, and the Netherlands State Institute for Drinking Water Supply (RVD). To strengthen its position and avoid double work, it was already agreed in the first two meetings that all existing contacts of the companies with Rijkswaterstaat should now proceed via the Rhine Commission and should thus be coordinated.[18]

The quality of the Rhine water was an international matter. To be able to make international agreements, on the initiative of the Netherlands and Switzerland, the International Rhine Commission (IRC, later ICPR) was founded, with the aim of forming the most important international platform for making cross-border policy concerning (the quality of) the Rhine water. Other participating countries were Germany, France and Luxembourg. Rijkswaterstaat represented the Netherlands in the IRC. The combination of the forces of the four water supply companies enabled them to exert influence, via Rijkswaterstaat, on the position of the Netherlands within the IRC. Conversely, RIWA provided Rijkswaterstaat with relevant information, suggestions and commentary in preparation for the meetings of the International Rhine Commission.

This was a win-win arrangement. This also emerges from the words of the Chief Engineer-Director of the Rijkswaterstaat board, G.B.R. De Graaff, who named 'the cooperation [between the four companies and with Rijkswaterstaat] beneficial and convenient for the Public Works Department'.[19]

18 *Minutes of 1st RIWA meeting, 15 June 1951; Minutes of 2nd RIWA meeting, 14 September 1951.*
19 *'Aantekeningen over besprekingen tesamen met Ir. Schreur, gehouden met: prof. Krul, directie Rijkswaterstaat Ir. G.B.R. de Graaff, Pharmaceutische Inspectie, Hoofdinspecteur Roosendaal' [Notes on discussions together with Mr Schreur, held with: Prof. Krul, Rijkswaterstaat board, G.B.R. de Graaff, Pharmaceutical Inspectorate, Chief Inspector at Roosendaal], November 1951; Minutes of 3rd RIWA meeting, 11 December 1951.*

De Graaff, who as head of the Rijkswaterstaat Water Management Department had been there at the birth of the IRC,[20] became the primary contact point at Rijkswaterstaat for RIWA. To prevent confusion with the IRC, in 1952, the directors decided to change the name 'Rhine Commission' to 'Rhine Commission of Water Supply Companies', which was gradually shortened to RIWA.

In this way, RIWA made the first steps in the field of international cooperation. Due to the sensitivity of political cooperation and the lack of clarity about RIWA's exact role, it would prove difficult to achieve a position on this international playing field. Right from the start, there was a certain friction with Rijkswaterstaat about international water policy. Around the foundation, RIWA's initiative takers were of the view that approaching researchers and organisations abroad, particularly in West Germany, was essential, to 'have technical and policy research run in parallel.'[21] Rijkswaterstaat however made it known that it considered contacts across the border to be a sensitive point. International contacts in the area of water management and quality had always been Rijkswaterstaat's territory.[22] De Graaff indicated being nervous of direct, autonomous foreign contacts from RIWA, because this could disrupt the delicate negotiation processes in the IRC. Rijkswaterstaat was afraid that its diplomatic efforts could be undermined if RIWA were to operate independently. In particular, De Graaff indicated he wanted to avoid the impression that the Netherlands together with West Germany was turning against France.[23]

20 *Prof. W.F.J.M. Krul (RVD), 'Voorgeschiedenis nationaal en internationaal overleg Rijn' [Prehistory of the national and international Rhine consultation], 17 April 1952.*
21 *Minutes of 2nd RIWA meeting, 17 September 1951.*
22 *Besides this, at the start, before these contacts were tied up, there seems to have been a degree of suspicion at RIWA of contacts with Germans, so soon after the Second World War. These suspicions however disappeared quickly when it emerged that the German colleagues were very well-disposed and friendly, and the contacts moreover were useful to RIWA. This picture was confirmed in a retrospective on these first transnational contacts with Germans by Biemond in a letter from Biemond to Mr Van der Veen (GWA director), 23 December 1975.*
23 *De Graaff gave this explanation of France's position in relation to RIWA's transnational contacts in the Minutes of the 11th RIWA meeting, 23 December 1953.*


Photo: Joop van Bilsen. National Archives Collection, Anefo.

G.B.R. de Graaff, Chief Engineer of the Directorate-General for Public Works and Water Management and acting Secretary-General of the Ministry of Transport, Public Works and Water Management (second from the left, front row). Here at the opening of a new bridge over the Twente Rhine Canal in Lochem, 1955.

Both Rijkswaterstaat and RIWA saw West Germany and especially France as major causes of pollution. On this matter, De Graaff stated that 'France only used the Rhine as a shipping route and a gutter for discharging wastewater.'[24] The Netherlands, situated downstream, found itself in a dependent position. For this reason, and also because of the economic interests that were crucial to all the countries involved during the reconstruction, it was even more important not to antagonise the other countries.[25]

Prof. W.F.J.M. Krul, director of the Netherlands State Institute for Drinking Water Supply (RVD) and a permanent guest at the RIWA meetings, could certainly agree with De Graaff's warnings.[26] Therefore, it was stated during the fourth meeting in May 1952: 'International contacts must continue to go via Rijkswaterstaat. When the international consultation does not proceed as desired, we can ultimately attempt to reach our goal via the Minister.'[27]

However, this meant that the matter was not resolved. Biemond and the other directors understood that they should not get involved with the international communication about specific policy and measures, and realised that this was not to their advantage at this point either. They were however of the opinion that transnational exchange of technical details about water pollution and research ought to be able to happen. This was less politically sensitive and moreover RIWA was a specialist in this field. As Biemond stated: 'In the Netherlands, the Rhine Commission was founded for exactly these problems.'[28]
From discussion reports and correspondence between 1951 and 1953, it emerges that RIWA more or less agreed with De Graaff and Krul that they could indeed form contacts with experts and fellow water companies abroad, but under conditions. A separation was made between the two fields of knowledge and policy, which, as will emerge, were not fully separable in practice. It was agreed that RIWA should not consult with foreign cooperation partners about policy. The organisation should dedicate its efforts to involving not only Germans, but other nationalities too, particularly the French, in transnational activities. In this way, suspicions or accusations of exclusion could be avoided. Moreover, RIWA promised to act transparently, for example by making the results of its cooperation available to the IRC.[29]

In the subsequent years, RIWA continued to seek the best approach to develop its transnational network. Biemond was a big champion of a cross-border exchange of ideas and experience; such an exchange directly served RIWA's two objectives, namely building up knowledge and representing interests.

24 *Quote from Minutes of 11th RIWA meeting, 23 December 1953. On this point, see Dieperink, Tussen zout en zalm [Between salt and salmon], particularly page 122.*
25 *De Graaff already made the point about the Netherlands' dependent position as opposed to the other countries along the Rhine, particularly France and Germany, in the pre-discussion between him and delegates of the Commission for RIWA's official foundation: 'Aantekeningen over besprekingen tesamen met Ir. Schreur, gehouden met: prof. Krul, directie Rijkswaterstaat Ir. G.B.R. de Graaff, Pharmaceutische Inspectie, Hoofdinspecteur Roosendaal' [Notes on discussions together with Mr Schreur, held with: Prof. Krul, Rijkswaterstaat board, G.B.R. de Graaff, Pharmaceutical Inspectorate, Chief Inspector at Roosendaal], November 1951. On this point, see also Dieperink, Tussen zout en zalm [Between salt and salmon], particularly page 122.*
26 *In the thirties, De Graaff and Krul had already built up semi-official contact with German and French industrial concerns (polluters such as the potash mines) and government organisations. Mainly Krul had already found out in this that solving the deteriorating quality of the Rhine water in the Netherlands as a result of French and German discharges was very sensitive and complex. W.F.J.M. Krul (RVD), 'Voorgeschiedenis nationaal en internationaal overleg Rijn' [Prehistory of the national and international Rhine consultation], 17 April 1952.*
27 *Minutes of 4th RIWA meeting, 11 March 1952, 30 May 1952.*
28 *Minutes of 6th RIWA meeting, 30 May 1952.*
29 *Particularly in the Minutes of the 6th RIWA meeting, 30 May 1952, but the discussion about the transnational contacts came back repeatedly, for example in the Minutes of the 3rd RIWA meeting, 11 December 1951, and the Minutes of the 11th RIWA meeting, 23 December 1953.*

But because RIWA was dependent on Rijkswaterstaat for creating the international regime for water quality, Biemond realised that 'it was very desirable to have a good relationship with Mr De Graaff' and that the transnational approach should not as a result be at the cost of the understanding with Rijkswaterstaat. RIWA's primary strategy, to exercise influence on water management, was therefore mainly via direct contacts with Dutch government organisations in the fifties.

The dependency of Rijkswaterstaat, and the importance of good relationships, were for example made clear again when, after the Flood Disaster of 1953, the Delta Plans were developed. The four directors were of the opinion that too little account was taken of the water quality and drinking water supply. They considered, moreover, that they received too little information and recognition. RIWA therefore made its way repeatedly to various departments within Rijkswaterstaat with requests for information about the plans, research into the effects the plans could have on the water quality and possibilities for participation.[30] This led to Rijkswaterstaat approaching Biemond to become a member of the Commission for Water Management and its subcommission that considered the canalisation of the Lower Rhine.[31]

Prof. W.F.J.M. Krul, director of the National Institute for Drinking Water Supply, ca.1958.

Photographer: A.M.A. Susan. Collection Haags Gemeentearchief.

30 Minutes of 12th RIWA meeting, 26 March 1954 among others.
31 Minutes of 13th RIWA meeting, 3 December 1954.

This was a token of recognition for the role for RIWA, but also posed new challenges. The Commission meetings were confidential and Biemond, who participated in them on behalf of RIWA, could not supply any information to the other directors, while their interests were just as important. That these other directors were satisfied with Biemond's promise that he, in consultation with Rijkswaterstaat, would supply as much information as possible, and promote their interests as well as possible, illustrates Biemond's leading role in RIWA and the trust that the other companies put in him.[32]

Research and influence on policy

Besides its lobbying of the State government, RIWA addressed itself to doing its own research. This research served to let RIWA gain a good picture of the water quality, and also formed an important instrument in the attempts to influence policy. With an eye on its first aim, RIWA developed innovative research directions. For example, in 1954, the companies decided that hydrobiological research in the Rhine was needed to see how much and what plankton was present in the river water at what times of year. Such research would help to gain insight into the quality of the water. Moreover, these very small organisms could cause damage to water pipework and filter systems. RIWA negotiated with various scientific institutes and government bodies about setting up a hydrobiological institute, but because the expectations, objectives and areas of interest were too diverse, this came to nothing. Therefore, the RIWA companies themselves paid researchers to conduct hydrobiological research from January 1955.[33] This yielded interesting results that particularly suggested that the Rhine was heavily polluted.[34] After a year or two however, the companies established that funding scientific research for a longer term was not part of their objectives. The research had indeed provided some insight, but because it remained impossible to make a contract with a state institute or higher educational establishment, the plankton research was scaled down again in 1957.[35] The results were indeed translated into German, English and French and distributed to water specialist colleagues.[36]

32 Ibid.
33 G. van Heusden, 'Hydrobiologisch Onderzoek van de Rivier - Eerste Rapport' [Hydrobiological Research on the River - First Report], 19 February 1955.
34 RIWA's archive contains five research reports in total on Hydrobiology, from 1955 and 1956. The cited discussion/interpretation of the results took place on occasions including the 15th RIWA meeting, 1 June 1955.
35 Minutes of 21st RIWA meeting, 1957. The individual companies (mainly GWA) did continue to conduct occasional minor studies into plankton.
36 Minutes of 22nd RIWA meeting, 8 January 1958.


Photograph: Jac. de Nijs. National Archives Collection, Anefo.

Cornelis Biemond (left) receiving royal honours on his retirement as director of the Amsterdam Water Works (1964).

The accumulation of knowledge, as mentioned, also served the lobbying for measures to improve the water quality of the Rhine. Within RIWA, the chemist-biologists of the four companies met regularly about their measurements; within RIWA, the 'Commission on Smell and Taste' was also founded for the experts led by the chief Rotterdam researcher Dr E. L. Molt.[37] In the area of salinisation, the result of the research was mainly a number of reports that specifically considered the 'Chloorafvoer van de Lek en Bovenrijn' [Chloride transport of the Lek and Upper Rhine].[38] Transnational contacts mainly with German colleagues helped to increase knowledge on both sides.[39] The primary partners in RIWA's network were Prof. J. Holluta of the Technical University in Karlsruhe, who mainly did research into the effect of oil residues, cleaning products and other waste on the taste of the water and possible solutions for this, and Prof. Sander of the Bundesanstalt für

37 *This commission occupied itself, among other things, with the influence of organic substances and detergents on smell and flavour, and what could be done to counter this, for example in E. L. Molt, 'Verslag bespreking subcommissie "reuk en smaak"' [Report on discussions of "Smell and Taste" Subcommission], 11 September 1956.*

38 *Reports by GWA chief engineer L. Huisman and from 1957 by GWA engineer K.D. Venhuizen about the 'Chloorafvoer van Lek en Bovenrijn' [Chlorine transport of the Lek and Upper Rhine] during the years 1952 to 1960.*

39 *In Minutes of 14th RIWA meeting, 1 March 1955, the first mention was made of contacts with Prof. Sander.*

Gewasserkunde in Koblenz, a specialist in the area of chloride and salinisation.[40] In this way, specialists from the companies affiliated with RIWA could for example, with Sander's measurement data, gain more insight into the (significant) effect of the French Moselle on the salinisation.[41]

RIWA shared the results and interpretations of these studies with Rijkswaterstaat and the Netherlands State Institute for Drinking Water Supply (RVD). They served as a contribution by the Netherlands delegation to the International Rhine Commission. RIWA attempted to influence the process in this way. Especially for Rijkswaterstaat and the Netherlands delegation, RIWA conducted a number of studies into the natural chloride transport in order to demonstrate what the influence of the industrial discharges was, and calculated the impact of French proposals with regard to salt discharges for the International Rhine Commission.[42] With this it also becomes clear how closely RIWA's knowledge production became linked to policy and international diplomacy. The French brought the Dutch measurements of the increased chloride transport, the assertions about the (French) source of this pollution and the proposed measures into doubt. In this way, they blocked the process of regime creation so desired by the Netherlands, and they created space to grant new discharge licences to the potash mines in Alsace.[43] In October 1955, it emerged again from RIWA studies that the man-made discharge of chloride was increasing, and, as a result of the French proposals, could possibly increase even further.

40 *There are a number of reports of these encounters present in the RIWA archive, of which the most important: (probably by E.L. Molt) 'Rapport van de subcommissie "Reuk en Smaak" van de met professor Holluta en Professor Sander gevoerde besprekingen' [Report from the "Smell and Taste" Subcommission on the discussions conducted with Professors Holluta and Sander], November-December 1955; E.L. Molt (Rotterdam) 'Verslag van het bezoek van Professor Holluta 28 en 29-5-1956' [Report on the visit of Professor Holluta, 28 and 29 May 1956], 12 June 1956.*

41 *J. Kooijmans (GWA), 'De invloed van de Moezel op de waterafvoer en chloorbelasting van de Rijn (periode November 1952-October 1953)' [The influence of the Moselle on the water discharge and chlorine load of the Rhine (period November 1952-October 1953)], 13 May 1955; J. Kooijmans (GWA), 'De invloed van de Moezel op de waterafvoer en chloorbelasting van de Rijn (periode November 1953-October 1954)' [The influence of the Moselle on the water discharge and chlorine load of the Rhine (period November 1953-October 1954)], July 1955. The contacts with Sander and the exchange of measurement data mainly took place through correspondence between Biemond and Molt with Sander, including Letter from Biemond (GWA/RIWA) to Professor Sander (Bundesanstalt f. Gewässer-kunde, Koblenz), 24 March 1955.*

42 *L. Huisman (GWA), 'Natuurlijk Cl-gehalte van het Lekwater' [Natural Cl content of water in the Lek], 5 June 1956; L. Huisman (GWA), 'Natuurlijk Cl-gehalte van het Lekwater II' [Natural Cl content of water in the Lek II], November 1957; L. Huisman (GWA), 'Chloorlozing Kalimijnen Elzas' [Chlorine discharge from Alsace potash mines], October 1955; L. Huisman (GWA), 'Chloorlozing Kalimijnen Elzas II' [Chlorine discharge from Alsace potash mines II], January 1956.*

43 *Dieperink, Tussen zout en zalm [Between salt and salmon], 133-134.*

The RIWA directors could not hide their disappointment. Biemond sent the reports to De Graaff with the warning that this meant a 'serious quality deterioration' of the 'river water as a raw material for drinking water production.' He was 'requested as chair to convey to [De Graaff, RIWA's] disappointment about this change in the licensing conditions.'[44]

In the second half of the fifties, it became steadily clearer that the International Rhine Commission could scarcely make any progress; they got no further than discussing and making plans for measurements of water quality. The actual measures in the area of salt and other waste products that were mainly suggested by the Netherlands were not really treated seriously.[45] This was not the fault of the cooperation among RIWA, Rijkswaterstaat and the Netherlands delegation; the last generally acted with goodwill,[46] although it did seem to RIWA that the Dutch government did not really make the additional diplomatic efforts to add weight to the call for measures. The nadir was reached in 1958; early that year, serious problems suddenly arose with the taste of the water in Amsterdam. Amsterdam's Municipal Council – after discussion with RIWA/GWA it may be assumed – pressed the Minister of Transport, Public Works and Water Management to raise this matter urgently at the IRC. The Netherlands delegation presented specific proposals to improve and safeguard the water quality, but RIWA had to observe with disappointment and irritation that Germany and France opposed these. It was considered to 'request the Minister now to proceed to taking further steps', but this did not finally happen, due to the fall of the Drees III Cabinet.[47] The state of affairs about the IRC led to increasing levels of discontent at RIWA. Gradually, they drew the conclusion that the strategy of promoting their interests via Rijkswaterstaat was possibly too one-sided.

44 *Letter from Biemond to De Graaff, 3 November 1955; the issue was discussed at the RIWA meeting of October 1955 – it was also decided there that Biemond should send a letter expressing disappointment to De Graaff, Minutes of 16th RIWA meeting, 21 October 1955.*
45 *An example is that those present at the RIWA meeting of March 1957 complained about the fact that the International Rhine Commission was still squabbling about the measurements and was still far from the point of negotiating about specific measures; Minutes of the 20th RIWA meeting, 12 March 1957.*
46 *In this way, a RIWA representative (usually Biemond) was able to consult the meeting agendas of the International Rhine Commission, and De Graaff often gave written or oral explanations afterwards on the course of the meetings.*
47 *Minutes of 23rd RIWA meeting, 29 October 1958; Minutes of 24th RIWA meeting, 4 February 1959.*

Searching for new routes

This nadir coincided with new opportunities that arose to further the promotion of interests, namely through transnational cooperation with comparable organisations in the Rhine river basin. In 1957, the 'Arbeitsgemeinschaft Rhein-Wasserwerke eV' (ARW), RIWA's West German equivalent, came into being. This happened partly on the initiative of colleagues with whom RIWA had previously entered into relationships. The connections between the two organisations were reinforced by mutual working visits: an ARW delegation visited the Netherlands in 1958[48] and a RIWA delegation paid a return visit in 1960. One of the aims that arose through this was 'to consult about problems of organisation and tactics, about a common standpoint for the drinking water supply companies along the Rhine about the pollution by industrial and domestic waste products, and about the supervisory measures that could be taken to combat this.'[49] From this objective it once again emerges how closely the two areas of research and policy were linked together. RIWA was optimistic about the possibilities cooperation between RIWA and ARW could offer to allow more influence to be exerted within the IRC. It expected that a shared definition of their standpoint could help to streamline the positions of the Dutch and German delegations within the IRC.

In this way, RIWA and ARW made the first tentative steps in developing a transnational lobbying platform. This lobbying would be targeted both at the IRC and particularly at their own national governments. RIWA even envisaged 'coming to set up a working group, which, either in cooperation with the International Rhine Commission, or entirely independently, would press the governments of the countries concerned for measures to improve the quality of the Rhine water. (…) It would also have to define standards for the permissible limits of various pollutants and prepare a detailed plan for the quality improvement, complete with a budget for the costs associated with this, and the way in which the costs could be apportioned to the water polluters and water consumers.'[50] To advance the international lobbying process, the success of a specific measure would be encouraging.

48 *Minutes of 23rd RIWA meeting, 29 October 1958. RIWA had originally intended to 'disseminate the report about the ARW visit widely, but at De Graaff's request, the distribution was restricted.'*
49 *Minutes of 28th RIWA meeting, 14 September 1960.*
50 *Minutes of 23rd RIWA meeting, 29 October 1958. On this point, see Dieperink, Tussen zout en zalm [Between salt and salmon], 127-128.*

GEMEENTEWATERLEIDINGEN
AMSTERDAM
-o-

ONDERZOEK VAN WATER UIT DE RIJN TE RHENEN, RESP. LEK TE VREESWIJK

Jaargemiddelden

Behoort bij rapport
"De samenstelling van het
Rijnwater". dd.1-12-1951

Jaar	Afvoer in m3/sec te Arnhem	Kleur in mg Pt/l	Verbruik aan $KMnO_4$ in mg/l	Chloride (Cl^-) in mg/l	Sulfaat (SO_4^{--}) in mg/l	Hydrocarbonaat (HCO_3^-) in mg/l	Calcium (Ca^{++}) in mg/l	Magnesium (Mg^{++}) in mg/l	Natrium (Na^+) in mg/l	Totale hardheid in D. graden	Bicarbonaathardheid in D. graden	Nitraat (NO_3^-) in mg/l	Ammonium (NH_4^+) in mg/l	Albuminoid ammonium (NH_4) in mg/l	Slibgehalte gedroogd bij 110° C in mg/l	Aantal bacteriën per ml water op pepton-gelatine na 3 dagen broeden bij 22° C	Aantal bacteriën per ml water op pepton-agar na 3 dagen broeden bij 37° C	Meest waarschijnlijk aantal colibacteriën per ml water M.P.N.
1928		19	19,3	64,2	47,6	162	63,3	9,8	33,3	11,2	7,5	3,0	0,22	0,21	31,4	400.000	30.000	100
29		26	25,6	79,4	48,6	160	68,3	9,5	38,8	11,9	7,3	3,2	0,53	0,16	29,2	410.000	20.000	110
30		24	21,0	58,6	42,0	161	62,8	9,9	25,8	11,0	7,4	3,1	0,30	0,09	36,8	160.000	15.000	60
31		17	15,3	47,2	42,4	170	63,4	10,4	20,4	11,3	7,8	3,5	0,22	0,14	36,2	130,000	6.600	65
') 32		16	18,7	58,5	45,9	174	65,3	9,9	29,5	11,4	8,0							
33		19	22,4	74,0	46,6	174	67,6	9,7	35,6	11,7	8,0							
34		20	24,7	86,6	50,6	164	68,0	9,4	41,8	11,7	7,5							
35		16	19,9	57,9	46,5	151	62,2	8,4	30,6	10,7	7,0							
36		16	19,6	53,8	47,3	161	65,1	9,2	27,2	11,2	7,4							
37		13	22,0	70,0	53,4	157	68,2	9,5	34,8	11,7	7,2							
38		17	24,3	84,5	56,0	152	69,5	10,2	41,1	12,0	6,9							
39		20	19,8	65	50,0	153	66,4	10,2	31,4	11,6	7,0		0,36	0,28				
40	610	18	18,9	63	52,9	161	66,0	11,4	33,6	11,8	7,3	3,6	0,66	0,16	34,6	430.000		
41	540	18	18,4	68	55,8	159	65,4	10,7	37,9	11,6	7,3	3,3	0,78	0,18	34,8	209.000	13.000	
42	380	19	20,2	92	66,2	163	70,6	10,8	49,1	12,4	7,5	3,4	1,17	0,22	31,2	170.000	16.400	26
43	270	22	21,7	115	67,4	155	71,0	10,8	64,3	12,4	7,1	3,7	1,10	0,33	22,5	247.000	11.500	30
") 44	360	19	20,0	90,5	60,9	146	64,1	10,4	45,5	11,4	6,7	3,4	1,01	0,24				
") 45	290	10	12,1	63,5	47,2	155	58,6	10,7	39,5	10,7	7,2	3,5	0,32	0,18	18,6			
46	360	13	12,6	77	51,7	162	63,9	10,9	40,9	11,4	7,5	3,7	0,47	0,27	25,3	74.000	5.700	10
47	295	16	17,1	116	59,5	156	68,7	10.7	66,4	12,3	7,1	3,3	0,74	0,28	43,1	737.000	23.000	19
48	440	17	16,6	88	59,1	150	67,4	10,0	50,3	11,7	6,9	3,8	0,54	0,27	27,0	89.000	9.300	25
49	207	21	21,5	149	74,1	150	76,5	11,2	76,6	13,3	6,9	3,3	0,52	0,32	32,1	42.000	3.700	10
50	330	21	21,0	114	61,5	140	69,2	10,3	56,8	12,1	6,4	2,5	0,61	0,31	36,0	49.000	6.400	28

') In Juni 1932 werd het monsterpunt verlegd van Rhenen naar Vreeswijk.

'') Van September 1944 t/m Juni 1945 had geen onderzoek plaats.

Table from the report "De samenstelling van het Rijnwater" ("The composition of the Rhine water"), 1951.

This led RIWA to consider lobbying together with ARW for a prohibition on the discharge of oil/oily substances by the shipping on the Rhine.[51] RIWA attached value to continually emphasising that this was about a shared interest: in Germany and in other countries too, drinking water companies, industry, agriculture and the population could profit from cleaner Rhine water. [52]

With its exploration of the possibilities to apply transnational pressure on governments and polluters at the end of the fifties, RIWA began to release itself from the promise to Rijkswaterstaat that the transnational cooperation would only be directed at knowledge interchange. Concerning the IRC, RIWA maintained an ambivalent attitude. Within it, new developments were underway. With support from France and Luxembourg, in 1960, Germany arranged the foundation of international working groups that served to accumulate more knowledge and to make recommendations in various areas. On the one hand, RIWA and the Netherlands delegation interpreted this as a 'diversionary tactic' intended to expend more time on measurements and advice rather than implementing measures. On the other hand, this development gave various RIWA specialists the opportunity to make themselves count. In this, Biemond and Molt became members of the working group 'Hygienische und Chemische Anforderungen' [Hygienic and Chemical Requirements].[53] The foundation of these working groups gave RIWA more direct involvement in the difficult process in the IRC and reduced the one-sided dependence with respect to Rijkswaterstaat.[54]

Principles that would later be guiding ones in the international management of the Rhine were disseminated very early on by RIWA, it emerges from our research. Regularly, particularly chair Biemond emphasised that, to keep the Rhine clean, it was necessary in Europe 'to consider the Rhine as a single river and to argue for management in the common interest'.[55] He expressed this message consistently to the Dutch government and also during his cooperation with partners abroad. In a RIWA meeting on 14 October 1953, he called explicitly to 'use propaganda' on the Germans and others to promote this idea.

51 Minutes of 28th RIWA meeting, 14 September 1960.
52 On this point, see also Dieperink, Tussen zout en zalm [Between salt and salmon], 127-128.
53 Minutes of 26th RIWA meeting, 1 March 1960; Minutes of 27th RIWA meeting, 8 June 1960.
54 More information about the working groups in the International Rhine Commission and the Netherlands' role in them from 1960 may be found in Dieperink, Tussen zout en zalm [Between salt and salmon], 134-135.
55 Minutes of 10th RIWA meeting, 14 October 1953.

One single time, RIWA too looked for publicity with it. Together with a German journalist in 1954, Biemond drafted a press release in which he argued for an international, European approach to Rhine pollution.[56]

The vision mentioned was founded on the principle of prevention that RIWA supported: keeping the Rhine clean could be done best when polluters, particularly industry, stopped discharging, or purified the wastewater before discharge. One of the instruments RIWA considered was to introduce subsidies financed by the countries along the Rhine, which would enable industries to finance water purification or storage on location. In this way, RIWA was not only an early promoter of an international approach, but went a step further by calling for a regime in which the countries would together bear responsibility for the Rhine and be subject to the same measures and enforcement mechanisms. The transnational lobbying of their own governments by the drinking water companies was also aimed at this.

When RIWA entered its second decade, new and old challenges and solutions were in prospect in the area of water quality. In conclusion, we may state that the accumulation of knowledge and the measurement regime were successful: the cooperation between the companies had led to substantive measurement reports, more in-depth research and a better insight into the quality of the Rhine water. Promoting interests remained a challenge, and it would continue to be one in the coming years. RIWA continued the fight against salt discharges into the Rhine, but the International Rhine Commission did not provide enough solace in this regard. Finally, in the eighties, RIWA would decide to take legal actions, together with environmental organisations. The transnational cooperation with partners in the Rhine river basin would indeed become closer. This led to developments including a common warning system for disasters (1968) and the foundation of the International Association of Waterworks in the Rhine Basin (IAWR) in 1970. Participating organisations, besides RIWA, were the ARW and the Association of Waterworks – Lake Constance/ Rhine (AWBR), set up in 1968, representing water companies in Switzerland, Lichtenstein, Austria, France and Southern Germany.[57]

56 The drafting of the press release and communication with the press are present in the RIWA archive: Draft letter presumably from Biemond to 'Herr Kopp DPA' 13 January 1954; article in the Schleswig-Holsteinische Volks-Zeitung, 19 February 1954 'Holländer fordert Europäisches Tennessee-Projekt' [Dutchman promotes European Tennessee Project] with accompanying letter from J. Kopp (Deutsche Presse Agentur) to Biemond, 23 March 1954. Biemond presented his interpretation of (his intentions with) this message in Minutes of 12th RIWA meeting, 26 March 1954.
57 See Gast and Beemsterboer, '50 jaar RIWA' [50 years of RIWA].

Radioactivity as a new challenge

Nuclear science and technology were very promising developments at the beginning of the fifties when RIWA was founded. They also formed a new and unknown source of contamination, which RIWA tried to get a grip on. In the fifties, many European countries made plans to investigate the possibilities of nuclear technology for science, energy supply, industry, waging war and the medical world. This happened at the national and the international level. The approach was technocratic in the sense that a relatively small circle of experts from the sectors mentioned made the new nuclear plans. The wider public and other interests hardly came into the picture, and there was little public transparency.[58]
For RIWA, radioactivity formed a different kind of challenge from the problem of pollution by chloride, which had been known about for decades. In the following paragraphs, we will consider whether this led to a different approach by RIWA.

In RIWA's earliest meetings, it was decided that one of the companies should first make a summary about the radioactivity dossier, based on which a discussion could be held about the steps that might be necessary and possible.[59] GWA researcher Van Haaren, as author of the report, concluded that there was mainly a risk of discharging or leaking radioactive material from existing or future nuclear reactors and 'uranium piles' situated in the Rhine river basin. The risk of radioactive contamination of the surface water as a result of atomic bomb tests or a nuclear weapon attack also existed. The report further considered whether protective or purification measures against radioactive contamination were technically possible and affordable, but there was not yet any clarity about this. Van Haaren strongly recommended the companies to test the Rhine water for radioactivity.[60]
In a second report, Van Haaren crystallised this recommendation and advised measuring radioactivity with Geiger-Müller equipment. The GWA laboratory then started testing the river water and suspended matter regularly for radioactivity from 1953.

58 *The theme issue of the Journal for the History of Environment and Society on 'Siting Nuclear Installations at the Border' (2018) is informative about this point, particularly: Arne Kaijser and Jan-Henrik Meyer, 'Nuclear Installations at the Border. Transnational connection and international implications. An introduction', Journal for the History of Environment and Society, 3 (2018), particularly 4-5, 18.*
59 *Minutes of 1st RIWA meeting, 15 June 1951; Minutes of 2nd RIWA meeting, 14 September 1951.*
60 *F.W.J. van Haaren, (GWA) 'Radio-activiteit. Rapport opgesteld voor de rijncommissie' [Radioactivity. Report drafted for the Rhine Commission], 1 December 1951.*

The labs in Rotterdam and The Hague would then start testing too, in 1953 and early in 1956 respectively, on a monthly and later even a weekly basis.[61] In this way, RIWA gained insight into the 'normal' radioactivity of the water, and it would be possible to measure and recognise any elevated radioactivity levels.

With the early accumulation of knowledge in the area of radioactivity, RIWA wanted to anticipate situations that could arise in the future, particularly the 'possibility that radioactive material could be discharged into the Rhine in the future.'[62] Rivers such as the Rhine lent themselves very well to the siting of nuclear facilities, thanks to the presence of cooling water, among other things. RIWA based this possible future scenario on American and British literature and on correspondence with colleagues in these countries. Because these countries had a lead in the area of nuclear technology, there was also experience there with the risks and detrimental effects of nuclear facilities in the basins of rivers. Chair Biemond and Van Haaren maintained correspondence with colleagues in the United States and United Kingdom to gather knowledge about the risks and effects, and also in the area of test methods, measurement equipment, maximum permissible amounts of radioactivity and disasters.[63]

That the accumulation of expertise in the field of radioactivity was not an unnecessary luxury became clear in 1953. That year, RIWA received messages that there were plans in both West Germany and the Netherlands to build nuclear (research) facilities on the Rhine. Biemond put Van Haaren to work immediately to find out what the possible risks and policy options were;[64]

61 *Van Haaren gave this advice in F.W.J. van Haaren (GWA), 'Radio-activiteit. Rapport opgesteld voor de rijncommissie (tweede rapport)' [Radioactivity. Report drafted for the Rhine Commission (second report)], March 1952. It was then decided to purchase Geiger-Müller counters in the Minutes of the 7th RIWA meeting, 1 October 1952. The first mention of the measurement results was made in J. Kooijmans, 'De samenstelling van het Rijnwater in 1953. Opgesteld voor de Rijncommissie [The composition of the Rhine water in 1953. Drafted for the Rhine Commission], September 1954. The start of the Rotterdam measurements was reported in the Minutes of the 9th RIWA meeting, 1 July 1953, and that of the measurements by The Hague lab in 'De samenstelling van het Rijnwater in 1956' [The composition of the Rhine water in 1956], 10 June 1957.*
62 *Minutes of 3rd RIWA meeting, 18 April 1952.*
63 *For example Letter from E.F.W. Mackenzie (Metropolitan Water Board London) to Biemond (RIWA/GWA), 11 March 1952.*
64 *Minutes of 9th RIWA meeting, 1 July 1953. Chair Biemond had heard on the radio in April that West German industry was planning to develop a facility for research into and production of radioactive isotopes. The press releases that Biemond had requested are still present in the RIWA archive: ANP, 'West Germany intends to produce isotopes', 26 April 1953, and Reuters 'atom1' and 'atom2', 26 April 1953.*

Van Haaren then wrote a critical report for internal use, which he presented to the RIWA meeting in July. Van Haaren was critical with regard to the objectives the West German government had stated and expressed his suspicion that the motivation had to be to gain knowledge for a nuclear reactor for energy generation and/or for nuclear weapons. He recommended taking precautions against the accidental or deliberate contamination of surface water.[65]

The messages from Germany were also the basis for initiatives of RIWA companies to make contact with West German colleagues. In this way, they hoped to gain more information about the nuclear plans and their impact on drinking water; moreover, they saw joint promotion of interests also in the area of radioactivity as an important instrument.[66] RIWA delegates indicated, during the first meetings with West German scientists and drinking water managers in July and October 1953, that RIWA had the nuclear plans and potential problems with radioactivity high on the agenda. Unfortunately, the German colleagues did not possess any more information than RIWA itself; there could not therefore be any joint promotion of interests on this theme.[67]

But Biemond still had another iron in the fire. He had contacted Rijkswaterstaat to communicate his worries and questions about the German nuclear plans. In September, in response to this, Biemond and the rest of RIWA received a 'secret' letter from De Graaff with information, which illustrated the sensitivity of the matter. (Dutch) Foreign Affairs, De Graaff stated, had learned that the Germans were developing two research reactors (in the Rhine river basin), but no large electricity reactors.

65 *F.W.J. van Haaren (GWA), 'Rapport betreffende: vooruitzichten van de ontwikkeling van het gebruik en de productie van radioactieve stoffen in West-Duitsland' [Report on: outlook for the development and production of radioactive substances in West Germany], 8 May 1953; Minutes of 9th RIWA meeting, 1 July 1953. History shows with hindsight that such risks of radioactive contamination of surface water, also through faults in another country, were small, but not entirely imaginary. A European example is the Manzares incident (1970), in which technical and human faults in an experimental reactor in Madrid led to radioactively-contaminated waste water ending up in the upper waters of the Tagus, causing damage as far away as Portugal. M.D. Mar Rubio-Varas, Antonio Carvalho and Joseba de la Torre, 'Siting (and mining) at the border. Spain-Portugal nuclear transboundary issues" Journal for the History of Environment and Society, 3 (2018), 40-42.*

66 *Minutes of 9th RIWA meeting, 1 July 1953.*

67 *R. Syderius, 'Verslag van de bijeenkomst der Rijncommissie te Rotterdam ter ontvangst van de "Interessengemeinschaft der am Niederrhein gelegenen Wasserwerke" op 15 juli 1953' [Report on the meeting of the Rhine Commission to welcome the 'Interests Association of Water Works Sited on the Lower Rhine' on 15 July 1953], October 1953; L. Huisman, 'Verslag studiereis Duitsland, 20-24 oktober 1953' [Report on study trip to Germany, 20-24 October 1953], 6 November 1953.*

He reassured RIWA that Foreign Affairs would 'be made aware in good time' if there were other developments.[68]

This reassured RIWA temporarily, but not for long. In October, Biemond wrote another concerned letter to De Graaff on behalf of RIWA, this time because RIWA had learned of the existence of plans 'at KEMA N.V. (an energy consultancy company in Arnhem) to construct a uranium pile in Nijmegen.' Biemond warned De Graaff of the 'hazards of radioactive contamination of the cooling water, that might be discharged through a very large part of our country from this point upstream.' He stated he would be 'glad to learn what conditions have been or will be imposed from Rijkswaterstaat's side on the granting of a licence for this discharge.'[69]

Biemond used multiple lobbying channels to express his unease. For example, he sent letters to the Amsterdam Alderman for Municipal Companies and to the director of the Amsterdam Municipality Energy Company, stating his concerns about KEMA's plans and those in West Germany and the risks to the safety of the drinking water. Biemond also stated that if the Netherlands should site a nuclear facility on the Rhine, this would 'seriously weaken the objections that the Netherlands might make to the siting of nuclear reactors in West Germany'. He asked the addressees to encourage consultation and careful decision-making by Rijkswaterstaat and the entire national government.[70] Biemond forwarded the letters to his fellow directors with the suggestion that they could make similar approaches to their municipal or provincial councils.

RIWA's approaches to municipal and provincial councils proved effective: in May 1954, the Municipal Executives of Amsterdam, Rotterdam and The Hague and the Provincial Council of Noord-Holland wrote a joint letter to the Minister of Social Affairs and Public Health.

68 *Letter from G.B.R. de Graaff (Rijkswaterstaat) to C. Biemond (RIWA/GWA) 'betreffende productie radio-actieve stoffen in Nederland en in West-Duitsland' [concerning production of radioactive substances in the Netherlands and West Germany], SECRET, 24 September 1953.*

69 *Letter from Biemond (RIWA) to De Graaff (Rijkwaterstaat), 17 October 1953.*

70 *Transcript of letter from Biemond to L. Vos (director of Amsterdam Municipality Energy Company), 31 December 1953; letter from Biemond to the Amsterdam Alderman for the Municipal Companies, 31 December 1953 – quote from this document; copy of letter from Biemond 'to the water supply companies of Rotterdam, The Hague, PWN' and the Netherlands National Institute for Drinking Water Supply (RVD), 31 December 1953; letter from Biemond to L. Vos, 11 January 1954.*

The letter referred to the Dutch and German nuclear plans and asked the Minister and his official colleagues in other relevant areas 'with an eye on the interests of the drinking water supply to institute a thorough study into the hazards and precautions that might be taken against these' – almost literally RIWA's arguments.[71] In response to this, at the end of 1954, an interdepartmental 'nuclear reactor working group' was set up within the State government, to conduct research into the risks and consequences of (the KEMA) plans for a reactor in the Netherlands. Experts from various ministries would take seats on this, as would Biemond and Van Haaren on behalf of GWA and RIWA.[72] In this way, the protection of the Rhine against radioactive contamination came to be on the agenda in the highest regions of the ministries.[73]

Strategy in the radioactivity dossier

In the mid-fifties, RIWA saw itself confronted with two dilemmas contained in the radioactivity dossier. The first concerned the tension between ideals and their feasibility; the second, the estimation of the actual risks associated with these nuclear reactors. Concerning the first, RIWA had difficulty formulating specific objectives. Some within RIWA, such as GWA chief researcher Van Haaren, would rather have called for a total prohibition of nuclear activities on the Rhine (or at any event in Germany). Such total prohibitions seemed however unfeasible in the post-war context of reconstruction and the Cold War.[74] The assessment was that the Netherlands, and RIWA entirely, lacked the political weight to prevent the German plans. In the Dutch context too, RIWA did not seem able to obstruct all the nuclear ambitions. It was clear that weighty national and geopolitical interests and considerations were involved with the European nuclear programmes.[75] The feasible alternative was to call for strict requirements and controls before the nuclear facilities were built, in order to make the risk of radioactive contamination of the Rhine water as low as possible. It emerges from Biemond's letters that this second objective and strategy gained the upper hand, even though Biemond was clearly not reassured that such measures could deliver a firm guarantee.

The second challenge RIWA was faced with was making a realistic estimate of the risks associated with nuclear installations in the river basin of the Rhine. We see that different views on this existed within RIWA. This is clear for example from the discussions about the RIWA contribution to the 'Nuclear Reactor Working group'. S. Kramer, director of the Noord-Holland water supply company PWN, considered 'the conclusion, that under the current circumstances, the siting of a nuclear reactor should be counter-recommended, too strong'. Others however remarked that 'we must express our standpoint positively to prevent the water supply being faced with a fait accompli, as in Britain and America.'[76]

This discussion about strategy in the nuclear dossier within RIWA was entirely to do with advancing insights into the highly uncertain area of nuclear technology in the second half of the fifties. In fact, it was not only becoming ever clearer that the siting of some nuclear installations in the Rhine area was probably unavoidable. Simultaneously, RIWA was learning more about the new and improved technical possibilities to prevent risks of radioactive contamination, and RIWA moreover observed that the risks to public health and environmental safety were rising on the agenda of nuclear experts and governments. Another important observation was that wholesale building of nuclear power stations and other nuclear installations would not necessarily happen. At the start of the fifties, this fear did still exist, but due to the costs and technical difficulties, this development was being hampered.[77]

71 *Letter from the Municipal Executives of Amsterdam, Rotterdam and The Hague and the Provincial Council of Noord-Holland to the Minister of Social Affairs and Public Health, May 1954; letter from Amsterdam Municipal Executive to the Ministers of Transport, Public Works and Water Management, Economic Affairs, Education, Arts and Sciences and Internal Affairs, with copy of the aforementioned letter to the Minister of Transport, Public Works and Water Management, 21 June 1954.*

72 *Minutes of 13th RIWA meeting, 3 December 1954; Minutes of 14th RIWA meeting, 1 March 1955. Also copy of letter from Ministry of Public Health to The Hague Municipal Executive concerning building a nuclear reactor, July 1954.*

73 *Another example comes from Elmar Hellendoorn's research into the development of the Netherlands' nuclear policy and research in the fifties and sixties, also in consultation and competition with other European countries. Hellendoorn wrote, referring to the Dutch position in Europe in the area of nuclear plans around 1955: 'Cees Fock, the Secretary-General of the Dutch Prime Minister's office, considered European cooperation in the atomic field mostly relevant to the Netherlands in view of the dangers of radioactive contamination of the Rhine (as future German and Swiss nuclear power plants might leak contaminated cooling water in the river).' Elmar Hellendoorn, Between the devil and the deep sea. The Netherlands and the struggle for European nuclear order, 1954-1966 (thesis, Utrecht University, 2016), 85.*

74 *Minutes of 9th RIWA meeting, 1 July 1953.*

75 *See Hellendoorn, Between the Devil and the Deep Sea.*

76 *Minutes of 14th RIWA meeting, 1 March 1955.*

77 *These conclusions were for example drawn in F.M.J. van Haaren, 'Rapport [van bezoek aan] Tweede Internationale Conferentie over het vreedzaam gebruik van atoomenergie. Geneve, 1-13 september 1958' [Report on [visit to] Second International Conference on the peaceful use of atomic energy. Geneva, 1-13 September 1958], 23 October 1958. The same conclusion as regards the speed of the development in the nuclear field was drawn in the Ministerial 'De Pous Memorandum' of 1961 about nuclear energy: 'With regard to the application of nuclear energy, the present period is one of reflection and reorientation. The original expectation, that nuclear energy would provide a solution to energy problems at a high rate and on a large scale, proved to be unfounded.' Memorandum concerning nuclear energy, Ministers De Pous, Cals, Veldkamp and Beerman (State Budget for 1958, 5300, section VI, no. 16), September 1961.*

The position of some within RIWA, including Kramer, that the siting of some nuclear installations with strict safety and discharge conditions would not by definition be a disaster, was based on these insights. However, a majority within RIWA retained the tendency to argue for few or no nuclear installations on the Rhine, in the hope that as few as possible of such plans would be realised, or only under very strict conditions.

These insights confirmed for RIWA the importance for drinking water companies of having in-depth expertise in house, and of producing measurement results themselves. In this way, RIWA could monitor any effects and get risks on to the agenda in good time. In this, RIWA attached great importance to the exchange with colleagues abroad, a cooperative effort that was intensified in the middle of the fifties.[78] Particularly the mutual visits and frequent exchanges of correspondence with the German Professor Holluta helped to exchange and compare measurement methods and results. These helped for example to compare the radioactivity values at Karslruhe and in the Netherlands, so that it could be determined whether, downstream from Karlsruhe, more radioactive substances were reaching the Rhine.[79] Around 1956, such exchanges obtained a more structural character, certainly after the ARW was founded in 1957.

Based on this knowledge, RIWA therefore succeeded in exerting influence on the nuclear plans and the nuclear agenda. It did not do this by expressing criticism in public and giving negative advice, as would become usual decades later among opponents of nuclear energy; RIWA ensured that it would itself form part of the small circle of involved experts. In this way, the early efforts on knowledge acquisition had directly served the goal of promotion of interests. RIWA succeeded, long before the anti-nuclear protest movement arose, in creating access to the State government to draw attention to risks and objections. In the years that followed the companies would continue to monitor the radioactivity levels and exchange these readings with West German colleagues. As a dossier, radioactivity faded somewhat into the background, while the salinification of the Rhine particularly came to dominate the agenda.

78 Minutes of 17th RIWA meeting, 8 February 1956.
79 Particularly in two letters from Prof. J. Holluta to Dr E.L. Molt (Rotterdam), 12 February 1957 and 20 February 1957, and letter from Molt to Holluta, 5 February 1957.

Conclusion

The creation of the international Rhine regime, with the founding of the IAWR and the Rhine Conventions, is often seen as a successful example of transnational cooperation in the field of water management. This article has made it clear that RIWA played a major role in the first phase of this development that was characterised by difficult consultation between the countries along the Rhine. They called early, in the fifties, for the reduction of discharges with polluting substances, and emphasised in this the importance of international agreements and measures. These ideas would find their way into the later Rhine regime and also reappear in the new wave of environmental activism that arose in the seventies.

From its foundation in 1951, RIWA set itself the goal of promoting the water quality of the Rhine for the benefit of the drinking water supply in the west of the country. Research enabled RIWA to obtain an up-to-date picture of the quality of the Rhine water, the source on which the four companies depended. RIWA itself performed a hydrobiological study into the plankton population and measured radioactivity levels.

Research cooperation and exchange rapidly played a crucial role in the expansion of expertise; in this way, German and Dutch data together could provide insight into where exactly the Rhine was being polluted and researchers learned from each other's methods. Besides this, knowledge served as the basis for the promotion of interests. In this way, the specialist knowledge about nuclear risks helped RIWA to crack open the door into the circle of experts who made the nuclear plans on behalf of the government, science and businesses.

RIWA used the studies into the water quality and the chloride transport in particular to makes its point in the meetings with Rijkswaterstaat and, via this route, to call for international measures in the International Rhine Commission. Rijkswaterstaat was the primary contact point and generally received the well-founded requests from RIWA favourably.

RIWA also used its relationships with provincial and municipal executives to put pressure on the State government with the argument that this served the public health and drinking water supply of the Dutch people.

The international campaign against the discharge of salt compounds and other waste products gave little reason for satisfaction. The disagreement among the countries on the Rhine in the IRC proved persistent and the salt problem would continue to lead to conflicts and legal cases for decades. The calls by RIWA and Rijkswaterstaat for international measures were stopped by resistance from the other countries on the Rhine that were not prepared to impose restrictions on industry. In response to the limited results that RIWA had been able to achieve via Rijkswaterstaat and the IRC, it set its sights over the border and made greater efforts towards cooperation with partners in the rest of the river basin. This meant that RIWA, besides its own research and the lobbying of the State government, developed a third strategy: the transnational cooperation with researchers and drinking water companies in other countries, particularly West Germany.

The developments in the radioactivity dossier were more positive. Long before any anti-nuclear groups arose, RIWA had drawn attention to the risks of nuclear plants on the major rivers and had itself succeeded in exerting some influence. Initially, RIWA tended towards a total prohibition of nuclear facilities in the Rhine river basin. Advancing insight in the field of safety possibilities and the number of nuclear reactors that would be built (fewer than originally feared), and the awareness that RIWA only had limited influence, caused RIWA to start putting more effort towards the demand that the government should impose strict safety and discharge requirements on the nuclear industry and should also encourage this across the border.

The picture that emerges from this investigation is that of an organisation that relatively early disseminated viewpoints that would later become generally accepted in the creation of the international Rhine regime, and that would remain the core of RIWA's work.
The first is that preventing pollution must be the solution for a cleaner Rhine. The second standpoint holds that all the countries on the Rhine have responsibility for the entire river, and that for effective improvement and maintenance of the water quality, an international regime is absolutely necessary.

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About the authors

Daan Sanders MA is a researcher at Utrecht University. He specialises in the history of nuclear armaments.

Prof. Liesbeth van de Grift is Professor of International History in Relation to the Environment in the Department of History and Art History at Utrecht University.

Dr Joep Schenk is a lecturer in the Department of History and Art History at Utrecht University, with expertise in the field of international water management.
He wrote the book, 'The Rhine and European Security in the Long Nineteenth Century' about the Central Commission for Navigation on the Rhine.

Research and projects 5

RIWA-Rijn participates in a number of research projects that were initiated by universities and research institutes. These are projects targeted at obtaining insight into the development of the water quality and how this can be improved, at obtaining insight into the origin, fate and effects of substances and substance groups, and at developing methods for processing and presentation of water quality data. In these projects, RIWA-Rijn contributes by making water quality data available from our database, participating in steering groups and stakeholder consultations, supervising students and researchers, secondments to our organisation and, in some cases, by co-financing.

Research topics of the member companies of RIWA-Rijn are accommodated in the Joint Research Programme (BTO) of KWR Water Research Institute. The published reports may be found at https://library.kwrwater.nl/. Specific topics that fall outside the scope of the Joint Research Programme, for example because they support policy development, are commissioned by RIWA-Rijn. The reports on these projects may be downloaded via our website at https://www.riwa-rijn.org/en/riwa-rijnpublications/.

In the last reporting year, we published the thematic report, 'Removal requirement and purification treatment effort for Dutch Rhine water from 2000-2018.' This report describes the development of the water quality of the Rhine based on the purification treatment effort index. This index has been implemented in the meantime in the RIWA-base and the new results for the years 2019-2020 are described in Chapter 2 of this annual report. The index and the method of calculation (R-script) have also been published as an Open Access article: Pronk, T.E., R.C.H.M. Hofman-Caris, D. Vries, S.A.E. Kools, T.L. ter Laak, and G.J. Stroomberg. 2021. 'A Water Quality Index for the Removal Requirement and Purification Treatment Effort of Micropollutants.' Water Science and Technology: Water Supply 21 (1): 128–45. https://doi.org/10.2166/ws.2020.289.

Below, the various research projects in which RIWA-Rijn participates and contributes are described briefly. Although some projects have ended in the meantime, results will continue to be published in the near future.

Outfitting the Factory of the Future with ON-line analysis (OFF/ON)

Coordinator(s) : Dr Jeroen Jansen (Radboud Universiteit Nijmegen)
Prof. Lutgarde Buydens (Radboud Universiteit Nijmegen)
Subsidy provider : NWO Framework New Chemical Innovations

Industrial chemical processes are becoming ever more complicated, for example due to variable natural raw materials. It is therefore important to translate all process measurements into interpretable information to safeguard the quality of the end product. For this purpose, OFF/ON intends to make use of data processing methods from '-omics'. In this way, the health of a process can be observed and improved, just like that of a person.

Duration: 2015-2020

Technologies for the Risk Assessment of MicroPlastics (TRAMP)

Coordinator(s) : Prof. Bart Koelmans (Wageningen University & Research)
Subsidy provider : STW Open Technology Programme

TRAMP provides answers to questions about how microplastics and extremely small plastic nanoparticles can be measured, to what extent they are polluting the Dutch freshwater environment and how their harmfulness can be determined. The project also includes the development of mathematical models to predict what the influence of various sources of plastic is on the extent of plastic pollution. Via joint research for the drinking water companies, we translate the developed knowledge into information that fits the knowledge demand of the drinking water sector.

Duration: 2016-2019

Measurement for Management (M4M)

Coordinator(s) : Dr Jeroen Jansen (Radboud Universiteit Nijmegen)
Prof. Mark Huijbregts (Radboud Universiteit Nijmegen)
Dr Renate Wesselink (Wageningen University & Research)
Subsidy provider : TKI Energy and Industry

The aim of Measurement for Management (M4M) is to develop operationally predictive technologies that (1) are transparent and include all available process information, (2) provide predictions of Key Performance Indicators in the area of safety, sustainability for the environment and economic performance, and (3) involve all relevant stakeholders in the company in order to understand how the M4M methodology can be applied in practice optimally.

Duration: 2020-2025

Best chemical risk assessment professionals for maximum Ecosystem Services benefit (PRORISK)

Coordinator(s) : Prof. Luděk Bláha, (Masaryk University, RECETOX, Brno)
Dr Veronika Jálová, (Masaryk University, RECETOX, Brno)
Subsidy provider : EU Marie Skłodowska-Curie Innovative Training Networks

PRIORISK is intended to develop and apply new integral frameworks for the risk assessment of chemical substances in the environment by using advanced scientific concepts. These frameworks will support a European harmonisation of the environmental risk assessment of chemical substances. PRIORISK intends to develop and integrate mechanistic understanding, in-depth analyses of chemical-biological interactions and exposure, and functioning of ecosystems. In doing this, young researchers will obtain knowledge on how to deal with ever more complex data, to evaluate the robustness of risk predications critically, and to assess the socio-economic costs of environmental damage.

Duration: 2020-2025

Psychopharmaceutical Prevention & Pilots to Reduce Effects in the water cycle (Psychopharmac'eau)

Coordinator(s) : Prof. Annemarie van Wezel (University of Amsterdam)
Prof. Paul van den Brink (Wageningen University & Research)
Dr Lisette de Senerpont Domis (Netherlands Institute for Ecology-KNAW)
Subsidy provider : TKI Water and Maritime

PsychoPharmac'eau investigates possibilities to reduce the emissions and effects of psychopharmaceutical products, which form a highly significant part of the total consumption of medication. The research concentrates on possibilities to improve regulation and policies, possibilities to develop benign by design alternatives, to gain insight into the scale of real ecosystem effects, and the possibilities for mitigation through improved water treatment technologies and nature-based solutions.

Duration: 2020-2025

An integral approach to tracking down undesirable perfluoro substances in the water chain

Coordinator(s) : Dr Frederic Béen (KWR Water Research)
Dr Bjorn Berendsen (Wageningen Food Safety Research)
Subsidy provider : TKI Water and Maritime

Of the over 4700 PFAS that are recorded in the CAS register, and that are potentially produced and applied, only a fraction is monitored by the current approach. The presence and fate of the complex mixture of PFAS in surface and drinking water therefore remains unknown. It is of crucial importance to implement effective and cost-efficient monitoring of PFAS in order to protect water quality.

Duration: 2021-2024

Exposure, hazard and risk of PFAS in aquatic and terrestrial ecosystems

Coordinator(s) : Prof. C.A.M. van Gestel (VU University Amsterdam)
Dr M.H.S. Kraak (University of Amsterdam)
Subsidy provider : NWO Applied and Technical Sciences

This research is targeted at the risks of PFAS in ecosystems. To elucidate the drivers of environmental PFAS exposure, screening will be done for (bioavailable) PFAS (profiles, levels) in water, soils and sediments (background, hotspots), employing a suite of advanced passive sampling tools. Also, PFAS bioavailability and bioaccumulation in selected aquatic, sediment and soil organisms will be measured. PFAS hazards will be characterized by determining their ecotoxicity to these selected organisms. To improve PFAS environmental risk assessment, a connection will be made between bioaccumulation and ecotoxicity to the chemical properties of PFAS.

Duration: 2021-2025

Zero Pollution of Persistent, Mobile Substances (ZeroPM)

Coordinator(s) : Dr Sarah Hale and (Norwegian Geotechnical Institute, Oslo)
Prof. Hans Peter Arp (Norwegian Geotechnical Institute, Oslo)
Subsidy provider : EU Horizon 2020

ZeroPM intends to interlink and synergize prevention, prioritization and removal strategies to protect the environment and human health from persistent, mobile (PM) substances. In order to do this, ZeroPM will establish an evidence-based multilevel framework to guide policy, technological and market incentives to minimise use, emissions and pollution of entire groups of PM substances. ZeroPM will prioritize PM substances and substance groups through the development and application of robust screening and prioritization tools aimed at the worldwide identification of all PM substances.

Duration: 2021-2026

Appendices

Appendix 1

Water quality data 2020

This appendix contains the water quality data for the surface water at the reporting locations Lobith, Nieuwegein, Nieuwersluis and Andijk for 2020. The monthly averages are presented, together with additional metrics and five-year trends. To simplify searching for parameters, CAS numbers are included in the table.

There is a difference in content between Appendix 1 in the printed version of this report and its digital version. In Appendix 1 of the printed version of this annual report, only those parameters are reported that exceeded the target value in the European River Memorandum (ERM) at one or more locations, that had a value of 80-100% of the ERM target value, or that revealed a significant trend. Appendix 1 of the digital version of this annual report contains the complete overview of the available data for all analysed parameters. This pdf version may be found on our website: www.riwa-rijn.org.

Information about the position of the maximum with respect to the ERM target value, about the number of measurements and about the trend is presented using a RIWA pictogram. This year, we are introducing a new symbol to the RIWA pictograms. Previously, the position of the maximum with respect to the ERM target value could only be shown when a symbol for the trend was available. It does however happen that a data series is not suitable for a trend calculation yet does contain values that lie above the target value. A measurement series is unsuitable for trend analysis when it contains too few measurements or has too many censored values (values below the reporting limit). Starting this year, a new pictogram with a circle symbol has been added. This pictogram is shown when no trend analysis can be conducted, so that by means of the colour of the pictogram, information is still presented regarding (exceedances of) the ERM target value.

On the following pages, a more detailed explanation is given of the RIWA pictograms, and also of the other columns in the table in Appendix 1.

Explanation of the table

Abbreviations and symbols used

r.l.	reporting limit
n	number of measurements
min.	minimum
P10, P50, P90	percentile values
avg.	average
max.	maximum
*	insufficient number of measurements to calculate value

Values

All values shown are based on the measurements in the reporting year. To determine the trend, the measurements of the reporting year and those of the four previous years are used. The values in the monthly columns can be both individual and average values, depending on the measurement frequency. The individual measurement values are used to calculate the statistical metrics. These complete measurement series can be requested from us.

RIWA pictograms

The pictograms that are used in this annual report give information about the number of measurements, the position of the highest value measured with respect to the ERM target value*, and the five-year trend of a parameter. In this way, information about the parameter concerned may be seen at a glance.

The colour indicates the height of the maximum value measured in the reporting year with respect to the ERM target value:

- no ERM target value for this parameter
- 0-79% of the target value
- 80-100% of the target value
- >100% of the target value

It may be seen from the symbol whether the measurement series contains enough information to determine a five-year trend. If a trend analysis could be conducted, the symbol indicates whether there is a significant trend, and whether this is rising or falling.

Trends are tested two-sided with 95% confidence.

- A circle indicates that there is insufficient measurement data or too many censored values for determining a trend
- A horizontal dash indicates that, despite a measurement series with sufficient data, no significant trend could be demonstrated
- An arrow is used to indicate that a significant trend has been demonstrated, with the direction of the arrow indicating whether the trend is rising or falling

The colouring indicates how many measurements the parameter has in the reporting year:

- <20 measurements, the symbol is coloured and the background is white
- ≥20 measurements, the symbol is white and the background is coloured

* *Target values in the European River Memorandum*

General parameters	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith																							
water discharge		m^3/s		1900	3960	4040	1450	1440	1480	1420	1220	1200	1470	1400	1530	366	964	1140	1440	1870	3760	6030	
water temperature		°C		6.79	7.21	8.75	13.5	16.4	20.7	21.6	23.6	19.8	14.2	12.5	7.64	26	6.15	6.93	13.9	14.4	21.7	25.7	
oxygen	7782-44-7	mg/L		13.7	13.5	11.6	12.3	11	9.33	8.75	8.52	8.83	10.1	10.8	12	26	8.18	8.41	10.8	10.8	13.6	13.8	
oxygen saturation		%		111	111	98.3	111	102	86.2	80.3	76.1	82.1	92.1	97.2	99.6	26	70.7	77.5	96.6	95.1	111	113	
suspended matter		mg/L		12	38	32	26	11	15.1	13.3	13	17.5	11.2	12.5	17.9	26	7.3	8.59	13.5	18.1	38.8	51	
Secchi depth		m		0.8	0.35	0.45	0.95	0.9	1	1	0.8	0.8	0.8	0.85	0.633	26	0.2	0.3	0.85	0.781	1.03	1.2	
acidity (pH)		pH		8	7.93	7.96	8.14	8.12	8.05	7.98	7.95	7.82	7.85	7.89	7.8	26	7.78	7.8	7.93	7.95	8.17	8.24	
conductivity (at 20 °C)		mS/m		61.3	46.7	43.5	64.7	61.3	61.1	58	54.6	54.4	58.6	56.2	64.7	26	38.6	46.8	56.8	57.4	67.9	73.2	
residue on ignition, 600 °C		mg/L		8.95	30.5	29	14	10.5	10.9	11.7	10.8	14.5	9.55	10.6	15.2	25	6.5	6.74	12	14.6	35.2	46	
percentage residue on ignition, 600 °C		% DS		75	77.5	92.5	76	95	76	89.7	78.5	81	90.5	85	84.3	25	57	63.2	87	84	96.4	100	
total hardness		mmol/L		2.43	2.07	1.98	2.63	2.46	2.34	2.19	2.06	2.07	2.01	2.17	2.4	26	1.81	1.92	2.17	2.24	2.61	2.79	
Nieuwegein																							
water discharge		m^3/s		172	701	723	20.4	15.2	21.1	15.6	17.5	9.75	9.19	20.9	91.9	363	0	1.27	14.9	150	706	1050	
water temperature		°C		5.7	7.7	8.3	15.2	17.7	21.2	21.1	25.5	19.2	14.3	11.8	7.7	13	5.7	6.42	14.3	14.1	23.8	25.5	
oxygen	7782-44-7	mg/L		11.6	9.8	9.85	8.4	7.4	7.5	8.2	6.7	7.5	8.3	10.2	9	13	6.7	6.98	8.4	8.79	11	11.6	
oxygen saturation		%		92	81.2	82.6	77.6	69.1	69.1	75.6	58.1	69.9	76.2	90.9	74.6	13	58.1	62.5	76.2	76.9	91.6	92	
turbidity		FTE		11.5	17	13	13.5	14.9	15.1	14.5	7.8	9.5	10	12.5	16.5	26	6.6	7.77	11	12.8	22	24	
suspended matter		mg/L		13.8	15.5	12.4	230	192	48.2	20.6	8.87	21.1	12.2	16	19	26	7.7	9.55	13.8	47.7	169	404	
Secchi depth		m		0.4	0.6	0.6	0.7	1	1	0.9	1	1.1	0.9	0.9	0.5	13	0.4	0.44	0.9	0.785	1.06	1.1	
acidity (pH)		pH		8.08	8.2	8.16	8.21	8.14	8.07	8.03	7.95	7.95	8.03	8.14	8.13	13	7.95	7.95	8.1	8.1	8.21	8.21	
conductivity (at 20 °C)		mS/m		52	58	48.9	55.2	62.1	59.4	55.8	53.9	56	55.6	57.5	57.8	24	47.4	51.2	55.8	55.8	60.1	62.1	
residue on ignition, 600 °C		mg/L	5	13	20	12.5	21	7.3	5.8	13.9	<	9.7	13	8.4	14	14	<	<	12.5	12	21	21	
percentage residue on ignition, 600 °C		% DS		78	84	75	88	97	98	76.5		99	76	83	78	13	66	68.8	83	83.4	98.6	99	
total hardness		mmol/L		2	2.25	1.97	2.24	2.26	2	2.09	1.88	1.98	1.89	2	2.07	13	1.88	1.88	2	2.05	2.26	2.26	
Nieuwersluis																							
water temperature		°C		5.9	7.7	7.15	14.3	18.7	21.7	21	25.5	20	13.8	11.8	6.9	13	5.9	6.14	13.8	14	24	25.5	
oxygen	7782-44-7	mg/L		11.3	10.5	10.6	9.1	9.3	8.6	8.6	7.9	9	9.1	10.3	10.7	13	7.9	8.18	9.3	9.65	11.1	11.3	
oxygen saturation		%		90	87	86.5	83.5	86.7	78.8	79.3	68.5	83.6	83.1	91.8	87.2	13	68.5	72.6	83.6	84	91.3	91.8	
turbidity		FTE				21		8.4			3.8			13		4	3.8	*	*	11.6	*	21	
suspended matter		mg/L		10.2	10.9	19.9	8.5	8.1	9.2	8.6	5.9	13.6	10.6	8.7	8.2	13	5.9	6.78	9.2	10.9	20.6	23.7	
Secchi depth		m		0.8	0.9	0.7	0.6	0.9	1	1	1.2	0.9	1	0.9	1	13	0.5	0.54	0.9	0.892	1.12	1.2	
acidity (pH)		pH		7.91	8.02	7.92	7.44	8.09	7.95	8.04	8.01	7.94	7.81	7.96	7.89	13	7.44	7.58	7.95	7.92	8.08	8.09	
conductivity (at 20 °C)		mS/m		58.1	59.3	47.6	57.3	64.4	60.5	55.8	55.3	54.6	53.2	58.2	57.9	24	47.3	50.5	56.5	56.4	61.3	64.4	
total hardness		mmol/L		2.23	2.27	1.93	2.25	2.31	2.12	2.09	1.97	1.86	1.93	2	2.12	13	1.86	1.88	2.09	2.08	2.3	2.31	
Andijk																							
water temperature		°C		5.4	6.68	6.44	10.8	14	18.9	18.7	21.6	16.5	12.6	10	5.8	52	4.7	5.6	12.3	12.4	20.2	25	
oxygen	7782-44-7	mg/L		11.2	10.8	11.3	10.1	9.03	7.34	8.4	5.48	7.43	9.17	10.7	11.8	51	2.6	6.52	9.5	9.34	11.6	12.1	
oxygen saturation		%		88	87.8	90.8	87.9	82.5	68.2	78.3	50.2	69.1	83	92.6	93.8	51	22.8	60.7	85.3	80.5	94.6	99.6	
turbidity		FTE		5.1	8.5	36.5	9.5	19	2.9	3.7	3.7	4.1	12	4.5	6.4	13	2.9	3.22	6.4	11.7	38.8	48	
suspended matter		mg/L		9.5	42.1	35.1	27.4	19.9	6.32	7.3	10.3	8.85	19.2	20.2	13.5	52	2.5	4.85	11.4	18.3	53.8	98.7	
Secchi depth		m		1.9	0.9	0.4	0.6	0.5	1.7	0.9	0.7	0.6	0.7	1	1.2	13	0.3	0.38	0.7	0.885	1.82	1.9	
acidity (pH)		pH		8.25	8.23	8.36	8.36	8.29	8.39	8.48	7.92	8.2	8.14	8.32	8.27	50	7.73	8.03	8.3	8.28	8.5	8.64	
saturation index		SI		0.458	0.56	0.646	0.7	0.73	0.806	0.758	0.165	0.353	0.343	0.492	0.473	50	0.03	0.208	0.535	0.551	0.87	1	
conductivity (at 20 °C)		mS/m		65.8	63.7	59.1	56.7	60	62.6	62.6	61.2	66.4	69.5	68.6	73.7	51	54.7	56.6	62.6	63.9	70.4	79.6	
total hardness		mmol/L		2.12	2.31	2.16	2.11	2.18	2.03	1.95	1.76	1.8	1.97	2.01	2.19	52	1.65	1.79	2.07	2.05	2.24	2.59	
Radioactivity																							
Lobith																							
total beta radioactivity		Bq/L		0.161	0.141	0.116	0.155	0.147	0.142	0.165	0.155	0.135	0.164	0.142	0.187	13	0.116	0.124	0.155	0.154	0.188	0.19	
total alpha radioactivity		Bq/L		0.045	0.054	0.043	0.04	0.035	0.042	0.061	0.06	0.05	0.063	0.045	0.065	13	0.035	0.037	0.05	0.0514	0.0666	0.069	
residual beta radioactivity (total - K40)		Bq/L	0.001	0.003	0.045	0.017	0.008	0.017	0.023	0.046	0.036	0.025	0.031	0.018	0.0317	13	<	0.0015	0.023	0.0256	0.0562	0.063	
tritium activity	10028-17-8	Bq/L		2.32	0.793	2.4	8.13	3	3.12	4.41	4.01	2.03	1.72	2.85	3.12	13	0.793	1.16	2.85	3.15	6.64	8.13	

An explanation of this table can be found on page 151-153.

Radioactivity	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
strontium-90	10098-97-2	Bq/L	0.001		<		<		0.0021		<		0.0069		<	6	<	*	*	0.00183	*	0.0069	
polonium-210	7440-08-6	Bq/L	0.0001		0.0834		<		<		<		<		0.0358	6	<	*	*	0.0199	*	0.0834	
radium-226	13982-63-3	Bq/L			0.00143		0.00502		0.00203		0.00325		0.00215		0.0037	6	0.00143	*	*	0.00293	*	0.00502	
radium-228	7440-14-4	Bq/L			0.00125		0.00187		0.0008		0.00057		0.00028		0.00162	6	0.00028	*	*	0.00107	*	0.00187	
Nieuwegein																							
total beta radioactivity		Bq/L	0.2	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
total alpha radioactivity		Bq/L	0.05			<		<			<			<		4	<	*	*	<	*	<	
residual beta radioactivity (total - K40)		Bq/L	0.2	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tritium activity	10028-17-8	Bq/L	2	2	2.5	3.1	5	4.9	4.2	3.4	2.6	2.2	<	<	2.9	13	<	<	2.8	2.92	4.96	5	
Nieuwersluis																							
total beta radioactivity		Bq/L	0.2			<		<			<			<		4	<	*	*	<	*	<	
total alpha radioactivity		Bq/L	0.05			<		<			<			<		4	<	*	*	<	*	<	
residual beta radioactivity (total - K40)		Bq/L	0.2			<		<			<			<		4	<	*	*	<	*	<	
tritium activity	10028-17-8	Bq/L				3.6		4.1			2.7			2.1		4	2.1	*	*	3.13	*	4.1	
Andijk																							
total beta radioactivity		Bq/L	0.2	0.2	<	0.2	<	<	<	<	0.2	<	<	<	0.2	13	<	<	<	<	0.2	0.2	
total alpha radioactivity		Bq/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.05	
residual beta radioactivity (total - K40)		Bq/L	0.2	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tritium activity	10028-17-8	Bq/L	2	2.3	<	2.8	2.6	2.5	3.3	2.3	3.2	2.1	<	2.5	2	13	<	<	2.5	2.34	3.26	3.3	
Inorganic substances																							
Lobith																							
bicarbonate	71-52-3	mg/L		190	140	180	190	180	170	140	140	140	170	170	165	13	140	140	170	165	190	190	
chloride	16887-00-6	mg/L		96	63	44.5	92	84	86	74	69	69	86	75	108	26	37	53.4	74.5	79.8	110	140	
chloride (load)		kg/s		160	242	167	129	128	118	99.4	87.7	79.8	115	115	163	26	74.2	85.5	127	133	211	248	
sulfate	14808-79-8	mg/L		61	41	43.5	67	64.5	65.5	55.3	52.5	53	59	54	61.7	26	38	41.8	57	56.7	69.2	75	
silicate (Si)	7631-86-9	mg/L		3.65	3.45	3.3	1.28	1.2	1.7	1.7	1.55	1.75	2.05	2.6	3.03	26	0.35	1.21	2.1	2.28	3.53	3.7	
bromide	24959-67-9	mg/L	0.02	0.22	0.14	<	0.19	0.22	0.23	0.16	0.15	0.12	0.19	0.12	0.225	13	<	0.054	0.16	0.169	0.278	0.31	
bromide (load)		kg/s		0.307	0.517	0.0256	0.238	0.348	0.39	0.213	0.208	0.165	0.246	0.226	0.361	13	0.0256	0.0813	0.246	0.277	0.466	0.517	
fluoride	16984-48-8	mg/L		0.14	0.12	0.13	0.14	0.12	0.13	0.13	0.14	0.12		0.13	0.11	12	0.1	0.106	0.13	0.127	0.14	0.14	
fluoride (load)		kg/s		0.195	0.443	0.333	0.176	0.19	0.22	0.173	0.194	0.165		0.244	0.217	12	0.111	0.127	0.194	0.231	0.41	0.443	
total cyanide (CN)	57-12-5	µg/L	1	2	<	<	1.5	1.7	<	<	<	1.2	2.6	1.2	2.6	13	<	<	1.2	1.38	3.26	3.7	
bromate	15541-45-4	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	1.4	13	<	<	<	<	1.04	1.4	
Nieuwegein																							
carbon dioxide	124-38-9	mg/L		2.7	2.3	2.3	2	2.2	2.2	2.5	2.6	2.9	2.6	2.2	2.6	13	2	2.04	2.5	2.42	2.82	2.9	
bicarbonate	71-52-3	mg/L		153	176	165	189	186	160	166	153	158	155	162	174	13	153	153	162	166	188	189	
carbonate	16518-46-0	mg/L	5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chloride	16887-00-6	mg/L		72	77	57	64	87	85	75	76	79.5	79	80	77	25	48	65.2	78	76.6	85	87	
chloride (load)		kg/s		18	25.1	30.8	0.64	0.87	2.71	0.996	1.6	1.54	0.79	2.06	0.77	25	0.64	0.71	0.85	5.53	20.8	51.8	
sulfate	14808-79-8	mg/L		42.8	51	48.7	57	66	62	58	55	58	59	58	59	13	42.8	44.6	58	55.6	64.4	66	
silicate (Si)	7631-86-9	mg/L		3.2	3.4	3.2	1.5	0.6	0.6	1.4	0.6	1.1	1.1	2	2.5	13	0.6	0.6	1.5	1.88	3.36	3.4	
bromide	24959-67-9	mg/L		0.11	0.18	0.105	0.19	0.23	0.22	0.23	0.24	0.22	0.24	0.32	0.22	13	0.1	0.104	0.22	0.201	0.288	0.32	
bromide (load)		kg/s		0.0275	0.0587	0.0504	0.0019	0.0023	0.0185	0.0023	0.0024	0.0022	0.0024	0.00824	0.0022	13	0.0019	0.00202	0.0024	0.0176	0.0705	0.0784	
fluoride	16984-48-8	mg/L		0.11	0.11	0.12	0.13	0.13	0.16	0.13	0.16	0.15	0.14	0.08	0.09	13	0.08	0.084	0.13	0.125	0.16	0.16	
fluoride (load)		kg/s		0.0275	0.0359	0.0592	0.0013	0.0013	0.0135	0.0013	0.0016	0.0015	0.0014	0.00206	0.0009	13	0.0009	0.00106	0.0016	0.0159	0.0708	0.0941	
total cyanide (CN)	57-12-5	µg/L	2	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bromate	15541-45-4	µg/L	0.5	<	<	<	<	<	0.5	<	<	<	<	<	<	26	<	<	<	<	0.53	0.7	
Nieuwersluis																							
carbon dioxide	124-38-9	mg/L				6.1		2.6			2.3			3.6		4	2.3	*	*	3.65	*	6.1	
bicarbonate	71-52-3	mg/L		170	180	170	190	200	170	180	150	160	170	180	190	13	150	154	170	175	196	200	
carbonate	16518-46-0	mg/L	5			<		<			<			<		4	<	*	*	<	*	<	
chloride	16887-00-6	mg/L		77	74	50	66	89	86.5	72.5	76	76.3	69	76	72	24	45	60.5	75.5	74.7	87.5	89	

An explanation of this table can be found on page 151-153.

Inorganic substances	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
sulfate	14808-79-8	mg/L		52	53	48	72	68	58	57	56	58	53	57	58	13	44	47.2	57	56.8	70.4	72	
silicate (Si)	7631-86-9	mg/L		3.9	3.8	3.4	1.9	0.9	1.3	2.2	1.2	1.4	2.1	2.6	3.3	13	0.9	1.02	2.2	2.42	3.86	3.9	
bromide	24959-67-9	mg/L		0.13	0.19	0.0985	0.2	0.26	0.28	0.23	0.22	0.3	0.28	0.35	0.31	13	0.087	0.0962	0.23	0.227	0.334	0.35	
fluoride	16984-48-8	mg/L		0.11	0.11	0.12	0.12	0.14	0.13	0.12	0.14	0.12	0.14	0.09	0.08	13	0.08	0.084	0.12	0.118	0.14	0.14	
total cyanide (CN)	57-12-5	µg/L	1	<	<	<	<	<	<	<	<	2.2	<	<	<	13	<	<	<	<	1.52	2.2	
bromate	15541-45-4	µg/L	0.5			<		0.5			<			<		4	<	*	*	<	*	0.5	
Andijk																							
carbon dioxide	124-38-9	mg/L		1.95	2.2	1.56	1.48	1.63	1.18	0.775	2.38	1.48	1.8	1.3	1.83	50	0.6	0.71	1.7	1.61	2.2	3.3	
bicarbonate	71-52-3	mg/L		161	177	169	167	180	162	135	122	126	138	139	162	51	115	121	158	153	180	196	
carbonate	16518-46-0	mg/L	5	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	8	
chloride	16887-00-6	mg/L		108	96.5	87.6	79	84.8	99.4	110	115	129	129	126	130	52	71	77.3	105	108	140	155	
sulfate	14808-79-8	mg/L		59.8	58.8	58.6	57.5	59.3	61.6	61.5	59.4	62.3	64.5	66.2	67.5	52	54	57	61	61.4	66.7	71	
silicate (Si)	7631-86-9	mg/L	0.3	1.7	3.5	1.07	<	0.8	0.7	<	1	<	0.6	0.4	1.8	13	<	<	0.7	1.01	2.9	3.5	
bromide	24959-67-9	mg/L		0.27	0.21	0.215	0.19	0.16	0.23	0.22	0.33	0.37	0.27	0.29	0.28	13	0.16	0.168	0.25	0.25	0.354	0.37	
fluoride	16984-48-8	mg/L		0.12	0.11	0.125	0.14	0.12	0.09	0.14	0.13	0.13	0.15	0.1	0.09	13	0.09	0.09	0.12	0.121	0.146	0.15	
total cyanide (CN)	57-12-5	µg/L	2	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bromate	15541-45-4	µg/L	0.5			<		<			<			<		4	<	*	*	<	*	<	
chlorate	7790-93-4	µg/L	5			6.9		<			<			<		4	<	*	*	<	*	6.9	
Nutrients																							
Lobith																							
ammonium (NH4)		mg/L	0.0129	0.123	0.0766	0.0818	0.0348	<	0.0328	0.0661	0.0406	0.027	0.0232	0.027	0.141	26	<	0.0137	0.0522	0.0607	0.129	0.206	
Kjeldahl nitrogen		mg/L	0.2	0.65	0.95	1.35	1	2.2	0.55	0.867	0.55	0.3	1.1	0.35	0.867	26	<	<	0.75	0.892	1.59	3.9	
organic nitrogen (N)	7727-37-9	mg/L													2.9	1	*	*	*	*	*	*	
nitrite (NO2)	14797-65-0	mg/L	0.0328	0.0821	0.115	0.0985	0.0493	0.0411	0.0493	0.0328	<	<	<	<	0.0876	26	<	<	0.0493	0.0543	0.108	0.131	
nitrate (NO3)	14797-55-8	mg/L		14.2	13.7	12	10.6	9.3	7.75	6.64	5.98	6.2	7.53	7.97	12	26	5.75	6.06	8.85	9.47	14.2	14.6	
orthophosphate (PO4)		mg/L		0.172	0.162	0.134	0.0564	0.0662	0.0916	0.124	0.105	0.14	0.152	0.147	0.18	26	0.0194	0.0367	0.143	0.129	0.181	0.19	
total phosphate (PO4)		mg/L		0.253	0.244	0.277	0.0813	0.13	0.167	0.208	0.195	0.212	0.235	0.215	0.297	26	0.0583	0.109	0.221	0.213	0.316	0.368	
Nieuwegein																							
ammonium (NH4)		mg/L		0.06	0.12	0.055	0.07	0.12	0.11	0.08	0.11	0.08	0.14	0.1	0.13	13	0.04	0.048	0.1	0.0946	0.136	0.14	
Kjeldahl nitrogen		mg/L	1	<	1.4	1.55	<	<	<	<	<	<	<	<	<	13	<	<	<	<	2.12	2.6	
organic nitrogen (N)	7727-37-9	mg/L	1	<	1.3	1.5	<	<	<	<	<	<	<	<	<	13	<	<	<	<	2.02	2.5	
nitrite (NO2)	14797-65-0	mg/L		0.069	0.088	0.0825	0.051	0.092	0.083	0.076	0.04	0.086	0.13	0.062	0.067	13	0.04	0.0444	0.076	0.0776	0.122	0.13	
N-total		mg/L		3.3	4.4	4.15	2	1.6	1	1.5	0.7	1.2	1.3	1.5	1.9	13	0.7	0.82	1.6	2.21	5.24	5.8	
nitrate (NO3)	14797-55-8	mg/L		14.3	13	12.4	8.82	6.95	4.27	6.66	3.02	5.32	5.4	6.63	8.26	13	3.02	3.52	6.95	8.26	14.1	14.3	
orthophosphate (PO4)		mg/L		0.18	0.24	0.165	0.11	0.15	0.13	0.18	0.18	0.23	0.27	0.29	0.25	13	0.11	0.118	0.18	0.195	0.282	0.29	
total phosphate (PO4)		mg/L		0.28	1.4	0.25	0.28	0.22	0.23	0.35	0.25	0.31	0.43	0.42	0.38	13	0.22	0.224	0.28	0.388	1.01	1.4	
Nieuwersluis																							
ammonium (NH4)		mg/L		0.15	0.16	0.215	0.11	0.09	0.08	0.05	0.13	0.05	0.17	0.12	0.19	13	0.05	0.05	0.12	0.133	0.262	0.31	
Kjeldahl nitrogen		mg/L	0.2	1.1	1	1	2.4	1.2	0.5	1.4	0.8	1.3	<	1.1	0.9	13	<	0.26	1.1	1.06	2	2.4	
organic nitrogen (N)	7727-37-9	mg/L	1			<		1.4			<			<		4	<	*	*	<	*	1.4	
nitrite (NO2)	14797-65-0	mg/L		0.115	0.096	0.094	0.036	0.053	0.064	0.041	0.033	0.049	0.13	0.071	0.085	13	0.033	0.0342	0.071	0.0739	0.124	0.13	
N-total		mg/L				3.2		3.2			0.9			1.6		4	0.9	*	*	2.23	*	3.2	
nitrate (NO3)	14797-55-8	mg/L		12	11.5	9.14	9.44	7.54	6	6.18	3.72	4.65	5.26	6.92	8.09	13	3.72	4.09	7.54	7.66	11.8	12	
orthophosphate (PO4)		mg/L		0.17	0.19	0.185	0.19	0.18	0.24	0.24	0.22	0.25	0.2	0.28	0.24	13	0.15	0.158	0.22	0.213	0.268	0.28	
total phosphate (PO4)		mg/L		0.33	0.32	0.41	0.25	0.26	0.35	0.36	0.29	0.34	0.36	0.41	0.37	13	0.25	0.254	0.34	0.343	0.464	0.5	
Andijk																							
ammonium (NH4)		mg/L	0.02	0.06	0.05	<	0.05	0.03	0.05	0.03	0.07	0.05	0.03	0.02	0.11	13	<	<	0.05	0.0446	0.094	0.11	
Kjeldahl nitrogen		mg/L	1	<	1.4	4.86	<	<	<	1.07	<	2.33	1.07	<	1.32	40	<	<	<	1.48	2.62	20	
organic nitrogen (N)	7727-37-9	mg/L	1	<	1.2	1.25	<	<	<	1.3	<	1.2	<	<	<	13	<	<	<	<	1.3	1.3	
nitrite (NO2)	14797-65-0	mg/L	0.007	0.0503	0.044	0.0296	0.0215	0.0318	0.0366	0.0125	0.0128	0.0085	0.0131	0.0118	0.037	52	<	<	0.022	0.0255	0.049	0.082	
nitrate (NO3)	14797-55-8	mg/L	0.89	8.49	11.3	11.5	9.55	8.7	5.93	2.67	<	<	1.44	1.35	3.65	52	<	<	4.74	5.42	10.9	14	

An explanation of this table can be found on page 151-153.

Nutrients	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
orthophosphate (PO4)		mg/L	0.06	0.09	0.0775	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	0.101	0.16	
total phosphate (PO4)		mg/L	0.06	0.143	0.26	0.226	0.137	0.158	0.092	0.0875	0.214	0.16	0.18	0.15	0.185	52	<	0.073	0.145	0.166	0.297	0.43	
Group parameters																							
Lobith																							
TOC (total organic carbon)		mg/L		5.05	7.1	8.45	5.35	4.05	6.1	4	5.7	5.9	4.65	5.35	5.97	26	3.2	3.97	5.4	5.59	7.81	8.6	
DOC (dissolved organic carbon)		mg/L		4.9	5.65	6.85	3.5	3.55	5.5	3.8	5.15	5.65	4.15	4.95	4.83	26	3	3.07	5.05	4.83	6.36	7.2	
COD (chemical oxygen demand)		mg/L	5	9	10	10	8	6	9	6	8	13	<	10	10	13	<	<	9	8.58	13	13	
BOD (biochemical oxygen demand)		mg/L	0.5	1.5	2.1	1.1	2	<	0.95	1.3	0.76	1	0.8	1	0.925	13	<	<	1	1.12	2.06	2.1	
absorbance 410 nm		1/m			3.17	2.51	1.68	1.48	1.66	1.49	1.67	1.66	1.5	1.41		20	1.25	1.26	1.61	1.82	3.31	3.77	
AOX (adsorbable organic halides)		µg/L		13	18.5	12.5	7.85	20.5	19	12.1	19.9	11.6	12.5	16.5	20.6	26	7.5	7.98	13	15.4	29.2	43	
EOX (extractable organic halides)		µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
TOC (total organic carbon)		mg/L		3.16	2.91	3.01	3.02	3.03	2.81	2.66	2.74	2.25	2.61	2.44	2.94	13	2.25	2.33	2.91	2.81	3.13	3.16	
DOC (dissolved organic carbon)		mg/L		2.92	2.83	2.74	2.77	2.79	2.76	2.52	2.75	2.19	2.48	2.41	2.82	13	2.19	2.28	2.76	2.67	2.88	2.92	
COD (chemical oxygen demand)		mg/L	5	7.8	<	16.5	31	<	7.7	<	8.7	6.7	9.3	10	11	13	<	<	8.7	10.2	26.2	31	
UV absorbance, 254 nm		1/m		8.8	7.9	8.35	7.8	7.2	6.7	6.6	7.1	6	9.6	5.9	8.1	13	5.9	5.94	7.8	7.57	9.32	9.6	
colour, Pt/Co scale (Pt)		mg/L		14	11	13	9	9	8	8	21	14	8	8	15	13	8	8	11	11.6	18.6	21	
mineral oil, GC method		mg/L	0.05	<		<	<	<	<	<	<	0.09	<	<	<	12	<	<	<	<	0.0705	0.09	
TAC (total anorganic carbon)		mmol/L		2.6	2.9	2.75	3.1	3.1	2.7	2.8	2.6	2.7	2.6	2.7	2.9	13	2.6	2.6	2.7	2.78	3.1	3.1	
Nieuwersluis																							
TOC (total organic carbon)		mg/L		3.89	4.16	6.27	5.1	2.89	2.91	2.71	2.53	2.52	4.73	2.87	4.26	13	2.52	2.52	3.89	3.93	7.02	8.3	
DOC (dissolved organic carbon)		mg/L		3.83	3.96	5.86	4.25	2.82	2.8	2.55	2.47	2.43	4.36	2.89	4.09	13	2.43	2.45	3.83	3.71	6.41	7.77	
COD (chemical oxygen demand)		mg/L				35		5.3			8.5			11		4	5.3	*	*	15	*	35	
UV absorbance, 254 nm		1/m				29.9		6.9			6.2			8		4	6.2	*	*	12.8	*	29.9	
colour, Pt/Co scale (Pt)		mg/L				44		8			9			11		4	8	*	*	18	*	44	
mineral oil, GC method		mg/L	0.05			<		<			<			<		4	<	*	*	<	*	<	
TAC (total anorganic carbon)		mmol/L				3		3.3			2.7			3		4	2.7	*	*	3	*	3.3	
Andijk																							
anions		meq/L				7.21		6.81			7.04			7.2		4	6.81	*	*	7.07	*	7.21	
cations		meq/L				7.13		6.61			6.94			6.97		4	6.61	*	*	6.91	*	7.13	
ions balance		%				1.1		2.9			1.4			3.2		4	1.1	*	*	2.15	*	3.2	
TOC (total organic carbon)		mg/L		5.23	5.8	8.01	7.55	5.88	6.28	4.95	6.1	6.72	5.03	5.28	4.76	13	4.76	4.84	5.88	6.12	8.19	8.62	
DOC (dissolved organic carbon)		mg/L		4.99	5.25	6.64	6.6	5.86	5.97	5.3	5.27	5.29	4.78	4.83	4.56	52	4.1	4.67	5.24	5.46	6.71	6.95	
COD (chemical oxygen demand)		mg/L		19	43	32	26.5	33	20.3	14.5	23	27	27.5	30	16.7	27	10	14	24	24.8	37.6	43	
UV absorbance, 254 nm		1/m		11.6	16.4	20.6	19.4	14.9	14.6	11.1	11.1	11.1	11	8.7	10.2	13	8.7	9.3	11.6	13.9	20.9	21.9	
colour, Pt/Co scale (Pt)		mg/L		11	18	22.5	19	15	13	8	11	17	6	7	20	13	6	6.4	15	14.6	23	25	
mineral oil, GC method		mg/L	0.05			<		<			<			<		4	<	*	*	<	*	<	
Sum parameters																							
Lobith																							
wolman salts (As, Cr, Cu sum)		µg/L		3.82	8.26	6.98	3.96	4.49	4.93	4.9	5.16	5.25	4.33	4.23	5.33	26	3.74	3.82	4.7	5.13	7.88	9.13	
wolman salts (As, Cr, Cu sum) (load)		g/s		6.59	31.9	30.6	5.67	6.83	6.87	6.58	6.58	6.33	5.77	6.66	10	26	4.96	5.03	6.65	10.7	30	48.3	
PAHs (6 of Borneff)		µg/L		0.022	0.0493	0.0307	0.0347	0.0202	0.0115	0.0223	0.0161	0.0299	0.0347	0.0117	0.0508	13	0.0115	0.0116	0.0241	0.0296	0.0661	0.0774	
PAHs (10 "waterleidingbesluit" compounds NL)		µg/L		0.037	0.0709	0.0462	0.0548	0.0326	0.0227	0.0418	0.0317	0.0524	0.0653	0.0226	0.0775	13	0.0226	0.0227	0.0448	0.0487	0.0945	0.11	
Nieuwegein																							
wolman salts (As, Cr, Cu sum)		µg/L		5.64	7.67	5.59	7.24	6.27	6.7		6.08	6.17	6.98	7.21	8.03	12	5.41	5.48	6.49	6.6	7.92	8.03	
wolman salts (As, Cr, Cu sum) (load)		g/s		1.41	2.5	2.71	0.0724	0.0627	0.564		0.0608	0.0617	0.0698	0.186	0.0803	12	0.0608	0.0611	0.133	0.873	3.72	4.24	
trihalomethanes (sum THM)		µg/L	0.03	<	<	<	<	<	<	<	0.03	<	<	<	<	13	<	<	<	<	<	0.03	
PAHs (6 of Borneff)		µg/L	0.012	0.0177		0.0171	0.018	0.015	<		0.019	0.014	0.0196	0.0634	0.0182	11	<	<	0.018	0.0205	0.0546	0.0634	
PAHs (total of 16 EPA compounds)		µg/L		0.0543		0.0385	0.0442	0.042	0.0274		0.0385	0.0388	0.0471	0.146		10	0.0274	0.0284	0.0411	0.0516	0.137	0.146	
PAHs (10 "waterleidingbesluit" compounds NL)		µg/L	0.02	<	0.02	<	<	<	<	<	<	<	<	0.03	<	13	<	<	<	<	0.026	0.03	
aromates (sum)		µg/L	0.05	0.13	0.12	0.07	0.06	<	<	0.1	0.11	<	<	0.08	0.06	13	<	<	0.06	0.0692	0.126	0.13	

An explanation of this table can be found on page 151-153.

Sum parameters	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis																							
wolman salts (As, Cr, Cu sum)		µg/L		4.58	4.8	6.46	6	5.23	5.18	5.04	4.76	5.73	6.03	5.22	4.81	13	4.58	4.66	5.18	5.41	7.06	7.75	
trihalomethanes (sum THM)		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
PAHs (6 of Borneff)		µg/L		0.0184	0.0219	0.242	0.0348	0.018	0.0138	0.0216	0.0128	0.0207	0.0297	0.0117	0.0199	13	0.0117	0.0121	0.0207	0.0544	0.279	0.43	
PAHs (total of 16 EPA compounds)		µg/L				0.119		0.0639			0.0523			0.0468		4	0.0468	*	*	0.0705	*	0.119	
PAHs (10 "waterleidingbesluit" compounds NL)		µg/L		0.0354	0.0389	0.471	0.0642	0.0349	0.0251	0.0383	0.0268	0.0373	0.0481	0.0233	0.0397	13	0.0233	0.024	0.0383	0.104	0.547	0.853	
aromates (sum)		µg/L	0.05			0.08		0.07			<			0.08		4	<	*	*	0.0638	*	0.08	
Andijk																							
wolman salts (As, Cr, Cu sum)		µg/L		2.86	3.68	6.69	3.71	5.39	3.1	3.16	2.92	2.44	3.26	2.5	2.78	13	2.44	2.46	3.16	3.78	7.21	8.42	
trihalomethanes (sum THM)		µg/L	0.03			0.04		0.04			<			<		4	<	*	*	<	*	0.04	
PAHs (6 of Borneff)		µg/L	0.006	<		0.016	<	0.00826	<	<	<	<	<	<	<	12	<	<	<	<	0.0177	0.0204	
PAHs (total of 16 EPA compounds)		µg/L	0.24			<		<			<			<		4	<	*	*	<	*	<	
PAHs (10 "waterleidingbesluit" compounds NL)		µg/L	0.02	<		0.029	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.0319	0.0363	
pesticides (sum of 35)		µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
aromates (sum)		µg/L	0.05			<		<			<			<		4	<	*	*	<	*	<	
Biological parameters																							
Lobith																							
coliform bacteria, (37 °C, not confirmed)		n/100 mL		16000	22000	48	120	240	840	120	280	600	1000	780	23500	13	48	76.8	780	6850	28600	33000	
coliform bacteria, (37 °C, confirmed)		n/100 mL		1730		10500	608	770	1990	2360	17300	2050	1410	921	1210	12	488	560	1570	3450	15300	17300	
thermotol. bact. coli group (44 °C, not confirmed)		n/100 mL		3400	6400	25	45	43	40	180	270	260	650	540	7300	13	25	31	270	2030	9760	12000	
Escherichia coli (confirmed)		n/100 mL		365	5170	2090	91.5	41	89	45	332	60	135	157	494	13	41	42.6	137	705	3940	5170	
Enterococci spp		n/100 mL		790	1500	32	2	3	25	2	37	77	33	48	870	13	2	2	37	330	1340	1500	
intestinal enterococci		n/100 mL		74	1600	770	13.5	0	11	6	32	10	23	18	190	13	0	2.4	20	212	1270	1600	
somatic coliphages		n/L		5530	15900	6800	2450	570	540	350	2930	850	2380	5100	5910	13	350	426	2780	3980	12300	15900	
clostridium perfringens-b		n/100 mL		65	350	260	59	94	62	56	30	21	30	8	68	13	8	13.2	62	89.4	314	350	
colony count 20°C, R2A 7 days		n/mL		2750	30000	54000	2660	1150	1720	1190	2750	2300	1670		1300	12	920	989	2010	8680	46800	54000	
Nieuwegein																							
colony count 22 °C (3 day GGA method)		n/mL		1300	500	505	930	430	660	330	530	620	240	780		12	240	243	575	611	1190	1300	
coliform bacteria, (37 °C, not confirmed)		n/100 mL		360	790	1370	280	68	52	245	150	39	250	84	540	14	39	45.5	265	417	1600	2400	
coliform bacteria, (37 °C, confirmed)		n/100 mL		780	620	950	510	100	210	340	160	42	170	310	800	13	42	65.2	340	457	1100	1300	
Escherichia coli (confirmed)		n/100 mL		260	370	585	100	35	100	86	40	8	70	62	0	13	0	3.2	86	177	622	770	
Enterococci spp		n/100 mL		18	46	58.5	3	12	11	15	59	4	18	12	15	13	3	3.4	15	25.4	83.6	100	
Enterococci spp (not confirmed)		n/100 mL		18	46	58.5	3	12	11	15	59	4	18	12	15	13	3	3.4	15	25.4	83.6	100	
spores sulphite-reducing clostridia		n/100 mL		460	290	235	280	130	120	150	720	160	200	160	8	13	8	52.8	160	242	616	720	
clostridium perfringens (incl. spores)		n/100 mL	10	61	96	210	88	52	25	68	<	40	110	22	22	13	<	11.8	61	77.6	216	240	
campylobacter spp.		n/100 mL		10		37	6.7	11	1.7	11	3.4	1.7	2.3	3.7		11	1.7	1.7	6.7	11.4	43.6	48	
f-specific RNA-bacteriophages		n/mL	0.008	<	0.008	0.11	<	0.008	<	<	<	<	<	<	0.008	13	<	<	<	0.0131	0.0692	0.11	
colony count 20°C, R2A 7 days		n/mL		3400	1100	1200	2100	190	1160	350	970	300	630	7800	330	13	190	234	970	1590	6040	7800	
campylobacter-b		n/100 mL	0.7	2		2.72	2.7	2.1	0.7	<	<	<	<	<		11	<	<	<	1.34	4.62	5.1	
Nieuwersluis																							
colony count 22 °C (3 day GGA method)		n/mL		1600	1100	2070	300	340	240	130	920	610	1100	6000	2100	13	130	174	920	1430	5120	6000	
coliform bacteria, (37 °C, not confirmed)		n/100 mL		1000	1500	1460	150	140	280	180	1600	1600	1700	1400	1500	13	110	122	1400	1070	2360	2800	
coliform bacteria, (37 °C, confirmed)		n/100 mL		1000	900	1160	120	110	160	72	1600	1600	1400	1400	900	13	72	87.2	900	890	1960	2200	
Escherichia coli (confirmed)		n/100 mL	1	440	440	100	24	48	<	28	260	170	720	500	340	13	<	<	200	244	632	720	
Enterococci spp		n/100 mL		44	50	28.5			2	2	57	7	42	29	45	11	2	2	42	30.5	56.4	57	
Enterococci spp (not confirmed)		n/100 mL		44	50	28.5	0	0	2	2	57	7	42	29	45	13	0	0	29	25.8	55.8	57	
spores sulphite-reducing clostridia		n/100 mL				530		120			190			210		4	120	*	*	263	*	530	
clostridium perfringens (incl. spores)		n/100 mL				350		66			40			88		4	40	*	*	136	*	350	
campylobacter spp.		n/100 mL				27		2.9			6			28		4	2.9	*	*	16	*	28	
f-specific RNA-bacteriophages		n/mL	0.008			0.11		<			<			0.016		4	<	*	*	0.0335	*	0.11	
campylobacter-b		n/100 mL	1			11		<			<			5.6		4	<	*	*	4.43	*	11	

An explanation of this table can be found on page 151-153.

Biological parameters	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk																							
colony count 22 °C (3 day GGA method)		n/mL		120	240	6350	380	150	170	470	1600	320	650	180		12	120	129	350	1420	6890	7700	▭
coliform bacteria, (37 °C, not confirmed)		n/100 mL		1	7	34.5	0	8	2	13	2	5	4	45	5	13	0	0.4	5	12.4	55.8	63	▭
coliform bacteria, (37 °C, confirmed)		n/100 mL		1	3	32.5		8	1	13	2	5	4	45	4	12	1	1	4	12.6	57.6	63	▭
Escherichia coli (confirmed)		n/100 mL		1	1	6.5		3	0	13	2	4	2	18	3	12	0	0	2.5	5	16.5	18	▭
Enterococci spp		n/100 mL				1		1	1	2	33	2				6	1	*	*	6.67	*	33	◯
Enterococci spp (not confirmed)		n/100 mL		0	0	0.5	0	1	1	2	82	2	0	0	0	13	0	0	0	6.85	50	82	▭
spores sulphite-reducing clostridia		n/100 mL		88	60	465	96	92	34	96	710	160	320	81	55	13	34	42.4	96	209	758	790	▭
clostridium perfringens (incl. spores)		n/100 mL		27	7	58.5	4	3	1	6	0	0	0	0	7	13	0	0	4	13.2	61.4	73	◯
campylobacter spp.		n/100 mL	0.3	0.9	14	1.1	1.35	<	<	0.7	1.5	0.6	0.3	0.3		13	<	<	0.7	1.79	9.2	14	▭
somatic coliphages		n/L		400	2000	160	149	4	20	140	60	12	44	100	700	14	4	8	120	292	1350	2000	▭
colony count 20°C, R2A 7 days		n/mL		2530	2900	4610	13300	43000	7100	6700	1950	7300	2030		297	12	297	424	4800	8030	34100	43000	▨
campylobacter-b		n/100 mL	0.7	0.9	14	1.1	1.52			<	<	<	<	<		11	<	<	<	1.97	11.7	14	▭
Hydrobiological parameters																							
Lobith																							
chlorophyll-a		µg/L	2	<	2.15	2.85	18	16	6	12.2	8.8	4.85	3.05	<	<	26	<	<	4.05	6.52	21.3	25	▭
Nieuwegein																							
chlorophyll-a		µg/L	2	<	<	<	2.5	<	5.9	6.1	4.5	2.2	<	2.2	2.4	13	<	<	2.2	2.58	6.02	6.1	◯
Nieuwersluis																							
chlorophyll-a		µg/L	2	<	<	2.4	3.3	3.3	2.7	2.7	5	3.7	<	4.2	<	13	<	<	2.7	2.59	4.68	5	◯
Andijk																							
xanthophyceae		n/mL		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯
chlorophyll-a		µg/L	5	16	11	54	19	<	21	47	26	76	38	17	35	13	<	5.9	21	30.8	68.8	76	◯
chlorophyll-a and phaeophytine (sum)		µg/L		20	18	90	34	6	28	60	34	100	49.5	20	47	13	6	10.8	34	42.8	96	100	◯
phaeophytine during chlorophyll-a determination		µg/L	5	<	7	36	15	<	7	13	7.8	26	11.5	<	12	13	<	<	7.8	12.1	32	36	◯
phytoplankton total		n/mL		5000	3000	4100	5900	2000	4200	10000	13000	11000	12000	5400	12000	13	2000	2400	5900	7660	15400	17000	◯
phytoplankton divers		n/mL		62	94	0	0	0	190	0	0	400	0	160	0	13	0	0	0	69.7	316	400	◯
cyanobacteria (cyanophyceae)		n/mL		890	610	240	1200	46	760	2400	9300	3900	4800	670	2900	13	46	124	1200	2500	8340	9300	◯
cryptomanada (cryptophyceae)		n/mL		620	450	790	450	470	88	290	400	400	280	930	730	13	88	145	450	475	874	930	◯
chrysophyceae		n/mL		0	0	0	0	0	0	0	700	25	11.5	0	0	13	0	0	0	57.5	430	700	◯
chlorophyceae		n/mL		2800	1300	1300	3400	1500	3100	6800	2300	4300	5550	3100	6400	13	1300	1300	3100	3650	7220	7500	◯
euglenophyceae		n/mL		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯
dinophyceae		n/mL		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯
zooplancton, total		n/L		20	63	100	170	94	130	65	490	1600	1150	40	50	13	20	28	100	394	1440	1600	◯
rhizopoda		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯
testacea		n/L		0	2	0	10	8	0	2	0	10	35	0	15	13	0	0	2	9	36	40	◯
tardigrada		n/L		0	0	0	0	0.5	0	0	0	0	5	0	0	13	0	0	0	0.808	6.2	10	◯
rotatoria		n/L		6	32	5	75	66	60	18	380	1400	575	10	10	13	5	5.4	60	247	1180	1400	◯
ciliata		n/L		5	12	80	55	7	12	30	70	70	480	0	18	13	0	2	30	101	528	720	◯
heliozoa		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯
ostracoda		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯
cladocera		n/L		5	0	0	5	1	60	5	18	28	40	25	0	13	0	0	5	17.5	52	60	◯
nauplius larvae		n/L		3	14	20	12	1	0	0	1	6	5	0	0	13	0	0	1	5.15	17.6	20	◯
cyclopoidea		n/L		0	0	0	0	1	0	0	0	6	0	0	2	13	0	0	0	0.692	4.4	6	◯
calanoidea		n/L		0	2	0	0	0.5	0	0	0	0	0	0	0	13	0	0	0	0.192	1.4	2	◯
harpacticoidea		n/L		0	0	0	0	0	0	5	0	0	0	0	0	13	0	0	0	0.385	3	5	◯
gastrotricha		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯
oligochaeta		n/L		0	0	0	0	0	0	0	0	2	0	0	0	13	0	0	0	0.154	1.2	2	◯
nematoda		n/L		1	0	0	2	1	0.5	0	1	0	35	0	5	13	0	0	1	6.19	40	60	◯
turbellaria		n/L		0	0	0	0	0	0.5	0	1	0	0	0	0	13	0	0	0	0.115	0.8	1	◯
chironomidae		n/L		0	0	0	0	0	0	0	0	0	0	5	0	13	0	0	0	0.385	3	5	◯
hydrachnellae		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	◯

An explanation of this table can be found on page 151-153.

Hydrobiological parameters	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
hydrachnellae, larve		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	○
bivalvia, larve		n/L		0	0	0	3	12.8	0	0	130	3	2.6	0	0	26	0	0	0	8.54	25.5	130	○
biology, miscellaneous		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	○
bacillariophyceae-pigment		µg/L	0.1	2.4	2.1	11	6.25	0.367	1.35	3.5	1.22	6.74	2.98	3.2	2.35	26	<	0.363	2.15	3.47	10.3	17	○
chlorophyceae-pigment		µg/L		6.6	3.2	3.65	7.75	5.4	5.2	9	3.45	9.4	41.3	6.65	15.5	26	2	2.61	5.65	10.8	20.3	87	○
cryptophyceae-pigment		µg/L	0.1	0.17	0.26	<	<	<	<	<	<	<	<	0.385	<	26	<	<	<	0.104	0.344	0.72	○
cyanophyceae-pigment		µg/L	0.1	3.15	2.05	4.45	4.6	2.28	4.65	7.95	11.5	19	11.3	5.4	9.1	26	<	1.24	4.95	7.1	17	24	○
total chlorophyll		µg/L		12	7.55	19	19	8.13	11	20.5	16	35.5	55.3	15.5	27	26	4.8	5.74	16	21.4	45.1	87	○
protozoa < 30 µm		n/L		0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	○
dreissena-larvae, resting		n/L		0	0	0	2.5	11.8	0	0	130	3	2.6	0	0	26	0	0	0	8.27	22	130	○
dreissena-larvae, dead		n/L		0	0	0	0	0.4	0	0	0	0	0	0	0	26	0	0	0	0.0769	0	2	○
dreissena-larvae, alive		n/L		0	0	0	0.5	0	0	0	1	0	0	0	0	26	0	0	0	0.115	0.3	2	○
dreissena-larvae, empty shells		n/L		0	0	0	0	0.6	1	0	11	0	1.8	0.5	0	26	0	0	0	1	3.6	11	○
khakista		n/mL		660	540	1700	800	57	130	920	230	1700	1420	610	1900	13	57	86.2	660	929	2200	2400	○
Metals																							
Lobith																							
sodium	7440-23-5	mg/L		51	31.5	26.5	52	47	50.5	48.3	48	45	49.5	48.5	63.3	26	22	31	47	47.5	62.9	84	▭
potassium	7440-09-7	mg/L		4.85	3.5	3.3	4.8	4.65	4.7	4.27	4.4	4.5	4.3	4.6	5.47	26	3.1	3.47	4.4	4.48	5.46	6.5	▭
calcium	7440-70-2	mg/L		77.5	67	62.5	82.5	77	73	69	63.5	65	63.5	69	74.7	26	57	60.7	68.5	70.5	82.6	87	▭
magnesium	7439-95-4	mg/L		12	9.6	10.2	14	13	12.5	11.3	11.5	11	10.5	11	13	26	9.4	9.64	11.5	11.7	14	15	▭
iron	7439-89-6	mg/L		0.338	1.36	1.19	0.322	0.286	0.273	0.321	0.307	0.37	0.252	0.234	0.628	26	0.158	0.21	0.319	0.489	1.33	1.81	▨
manganese	7439-96-5	µg/L		29.1	70.3	53.2	36.3	35.5	34	36.6	37.9	39.3	25.6	22.5	47.1	26	19.1	20.5	34.4	39.1	70.2	86.8	▨
aluminium	7429-90-5	µg/L		265	1320	1240	279	238	211	258	226	286	179	195	513	26	120	160	252	430	1270	1930	▨
antimony	7440-36-0	µg/L		0.23	0.255	0.204	0.21	0.229	0.236	0.249	0.247	0.237	0.249	0.215	0.227	26	0.2	0.204	0.231	0.233	0.257	0.269	▭
arsenic	7440-38-2	µg/L		0.914	1.4	1.36	0.983	1.09	1.29	1.34	1.4	1.39	1.29	1.15	1.26	26	0.906	0.96	1.2	1.24	1.51	1.59	▭
barium	7440-39-3	µg/L		79.2	66.8	66.1	84.7	78.9	79.4	77.5	80.2	78.4	76.3	75.2	88.8	26	60	65.5	78.5	78	91.4	114	▭
beryllium	7440-41-7	µg/L		0.0221	0.0894	0.0869	0.0236	0.0178	0.0166	0.0184	0.0162	0.022	0.0143	0.0154	0.0365	26	0.0103	0.0124	0.0183	0.0313	0.0867	0.133	▨
boron	7440-42-8	µg/L	50	<	<	<	<	<	<	<	50.4	<	<	51.2	<	26	<	<	<	<	69.2	77.4	▨
cadmium	7440-43-9	µg/L		0.0271	0.0626	0.0351	0.0274	0.024	0.0306	0.0301	0.0317	0.0371	0.0266	0.0223	0.0355	26	0.0191	0.0206	0.0289	0.0325	0.0466	0.0733	▭
chromium	7440-47-3	µg/L		0.873	2.57	2.54	0.845	0.858	0.872	1.01	0.941	1.09	0.737	0.689	1.32	26	0.564	0.613	0.907	1.19	2.54	3.44	▨
cobalt	7440-48-4	µg/L		0.257	0.673	0.547	0.284	0.306	0.309	0.3	0.282	0.327	0.23	0.199	0.394	26	0.182	0.2	0.292	0.343	0.703	0.748	▨
copper	7440-50-8	µg/L		2.04	4.3	3.08	2.14	2.55	2.77	2.55	2.82	2.77	2.3	2.4	2.75	26	1.95	2.04	2.55	2.7	3.98	4.45	▭
mercury	7439-97-6	µg/L		0.00489	0.0114	0.00903	0.0059	0.00622	0.0115	0.0164	0.0098	0.0121	0.0074	0.00544	0.0101	26	0.00429	0.00453	0.00902	0.0095	0.0156	0.0285	▭
lead	7439-92-1	µg/L		0.825	3.02	1.88	0.918	0.877	1.12	1.16	1.22	1.43	0.905	0.777	1.42	26	0.6	0.71	1.05	1.3	2.63	3.19	▭
lithium	7439-93-2	µg/L		13.8	8.19	8.89	17.3	14.7	14.3	13.7	12.8	13	15.5	14.4	19.3	26	7.53	8.68	13.7	14	20.2	24.9	▬
molybdenum	7439-98-7	µg/L		1.46	0.909	0.845	1.84	1.54	1.73	1.76	1.82	1.93	1.99	1.68	1.8	26	0.728	0.911	1.7	1.62	2.02	2.13	▭
nickel	7440-02-0	µg/L		1.49	2.94	2.57	1.37	1.31	1.22	1.23	1.22	1.37	1.3	1.11	1.87	24	0.999	1.09	1.38	1.61	3.02	3.29	▨
selenium	7782-49-2	µg/L		0.27	0.303	0.256	0.299	0.23	0.239	0.223	0.228	0.236	0.245	0.221	0.29	26	0.202	0.21	0.246	0.253	0.31	0.381	▭
strontium	7440-24-6	µg/L		452	318	351	525	530	523	491	485	479	519	503	537	26	299	319	492	479	556	647	▭
thallium	7440-28-0	µg/L		0.0137	0.0295	0.0253	0.0169	0.0164	0.0186	0.0181	0.0176	0.0175	0.0131	0.012	0.0178	26	0.0112	0.012	0.0166	0.018	0.0279	0.0334	▨
tellurium	13494-80-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	▨
tin	7440-31-5	µg/L	0.03	0.0778	0.229	0.129	0.0598	0.0931	0.0816	0.115	0.0924	0.108	0.0522	0.0371	0.11	26	<	0.0382	0.0885	0.0998	0.181	0.239	▭
titanium	7440-32-6	µg/L		6.92	18.7	19.2	6.45	5.35	5.72	6.29	5.23	6.33	5.1	4.5	9.24	26	3.72	4.04	6.23	8.21	19.3	27.6	▨
vanadium	7440-62-2	µg/L		1.23	3.03	2.89	1.35	1.15	1.24	1.37	1.41	1.44	1.28	1.36	1.87	26	1.08	1.12	1.39	1.63	3.08	4.19	▨
silver	7440-22-4	µg/L	0.004	0.0069	0.0169	0.0107	0.00545	0.0067	0.0066	0.0081	0.0094	0.0092	0.0165	0.00595	0.0104	25	<	0.00492	0.0083	0.00949	0.0168	0.0253	▭
zinc	7440-66-6	µg/L		10.7	21.3	14.7	8.57	8.15	10.7	8.45	8.27	8.85	7.39	7.07	12.9	26	5.9	6.85	9.07	10.6	18.6	24	▨
wolman salts (As, Cr, Cu sum)		µg/L		3.82	8.26	6.98	3.96	4.49	4.93	4.9	5.16	5.25	4.33	4.23	5.33	26	3.74	3.82	4.7	5.13	7.88	9.13	▭
rubidium	7440-17-7	µg/L		4.62	5.02	4.97	4.66	4.7	4.58	4.33	4.38	4.6	4.97	4.59	5.91	26	3.86	3.95	4.62	4.8	5.94	6.89	▭
uranium	7440-61-1	µg/L		0.656	0.618	0.674	0.866	0.833	0.759	0.756	0.707	0.767	0.733	0.736	0.7	26	0.588	0.6	0.736	0.733	0.847	0.889	▭
cesium	7440-46-2	µg/L		0.361	0.544	0.476	0.337	0.287	0.307	0.285	0.292	0.445	0.542	0.318	0.516	26	0.242	0.28	0.337	0.393	0.692	0.757	▭

An explanation of this table can be found on page 151-153.

Metals	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein																							
sodium	7440-23-5	mg/L		32.4	39.8	29.6	37.7	50	43.4	42.2	44.5	43.6	45	43.9	42.3	13	28.4	29.3	42.3	40.3	48	50	
potassium	7440-09-7	mg/L		3.36	4.14	3.39	4.22	4.99	4.65	4.53	4.47	4.72	5.02	5.09	4.87	13	3.36	3.37	4.53	4.37	5.06	5.09	
calcium	7440-70-2	mg/L		64.9	72.7	63.5	70.9	69.9	60.6	63.8	56.9	60.5	58.3	62.4	65.3	13	56.9	57.5	63.8	64.1	71.9	72.7	
magnesium	7439-95-4	mg/L		9.22	10.6	9.5	11.4	12.5	11.8	12	11.2	11.5	10.5	10.7	10.7	13	9.22	9.22	10.7	10.9	12.3	12.5	
iron	7439-89-6	mg/L		0.655	1.32	0.622	1.12	0.343	0.418	0.449	0.345	0.432	0.375	0.514	0.874	13	0.343	0.344	0.514	0.622	1.24	1.32	
manganese	7439-96-5	µg/L		35	74	44	77	53	45	59	47	42	36	36	58	13	35	35.4	47	50	75.8	77	
aluminium	7429-90-5	µg/L		488	461	585	577	267	231	219	194	309	421	545	461	13	194	204	461	411	601	617	
antimony	7440-36-0	µg/L		0.181	0.217	0.214	0.246	0.279	0.283	0.281	0.342	0.272	0.309	0.314	0.253	13	0.181	0.193	0.272	0.262	0.331	0.342	
arsenic	7440-38-2	µg/L		1.11	1.39	1.16	1.4	1.53	1.98	1.85	2.07	2.16	2.31	2.23	1.85	13	1.11	1.11	1.85	1.71	2.28	2.31	
barium	7440-39-3	µg/L		57	74.7	61.3	71.7	77.1	67.1	70.3	68.5	71.6	67.5	60.6	67.8	13	57	58.4	67.8	67.4	76.1	77.1	
beryllium	7440-41-7	µg/L		0.0328	0.0336	0.0405	0.0389	0.017	0.0157	0.0153	0.0131	0.0186	0.0265	0.0372	0.0296	13	0.0131	0.014	0.0296	0.0276	0.041	0.0424	
boron	7440-42-8	µg/L	50	<	68	<	<	81.8	79.9	60.9	73.3	<	57.2	61.6	<	13	<	<	57.2	<	81	81.8	
cadmium	7440-43-9	µg/L	0.05	<	0.08	<	<	<	<	<	<	<	<	0.08	0.06	13	<	<	<	<	0.08	0.08	
chromium	7440-47-3	µg/L	1	2.1	3.2	1.65	2.2	1.6	1.4	<	<	1	1	1.6	2.3	13	<	<	1.6	1.59	2.84	3.2	
cobalt	7440-48-4	µg/L		0.288	0.356	0.333	0.486	0.346	0.3	0.265	0.255	0.281	0.331	0.412	0.338	13	0.255	0.259	0.331	0.333	0.456	0.486	
copper	7440-50-8	µg/L		2.43	3.08	2.78	3.64	3.14	3.32	3.01	3.51	3.01	3.67	3.38	3.88	13	2.43	2.54	3.14	3.2	3.8	3.88	
mercury	7439-97-6	µg/L	0.02	<	<	<		<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
lead	7439-92-1	µg/L		1.3	2.8	1.35	1.9	0.8	1.1	1	0.6	1	1.1	1	2.2	13	0.6	0.68	1.1	1.35	2.56	2.8	
lithium	7439-93-2	µg/L		6.27	9.52	8.23	9.75	11.8	11	10.9	9.3	11.7	12.8	13.4	11.6	13	6.27	6.84	10.9	10.3	13.2	13.4	
molybdenum	7439-98-7	µg/L		0.741	1.06	0.928	1.19	1.64	1.54	1.68	1.72	1.76	1.81	1.82	1.48	13	0.741	0.811	1.54	1.41	1.82	1.82	
nickel	7440-02-0	µg/L	2	2	3	<	2.7	<	2	<	<	<	<	<	2.3	13	<	<	<	<	2.88	3	
selenium	7782-49-2	µg/L		0.205	0.24	0.26	0.247	0.23	0.196	0.191	0.191	0.199	0.211	0.228	0.192	13	0.191	0.191	0.211	0.219	0.263	0.273	
strontium	7440-24-6	µg/L		325	399	347	427	479	453	444	454	448	447	464	448	13	325	329	447	422	473	479	
thallium	7440-28-0	µg/L		0.0151	0.0198	0.017	0.0228	0.0205	0.0202	0.0216	0.0233	0.0216	0.0257	0.0251	0.0218	13	0.0151	0.0158	0.0216	0.0209	0.0255	0.0257	
tellurium	13494-80-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tin	7440-31-5	µg/L		0.127	0.118	0.0945	0.104	0.0581	0.0587	0.0584	0.0569	0.0498	0.0986	0.12	0.109	13	0.0498	0.0526	0.0986	0.0883	0.124	0.127	
titanium	7440-32-6	µg/L		8.53	8.87	9.19	9.97	4.87	4.99	4.58	3.79	5.75	8.29	9.48	8.83	13	3.79	4.11	8.53	7.41	9.77	9.97	
vanadium	7440-62-2	µg/L		1.51	1.6	1.73	1.8	1.55	1.66	1.77	1.63	1.7	2.05	1.95	1.95	13	1.51	1.53	1.72	1.74	2.01	2.05	
silver	7440-22-4	µg/L		0.009	0.0089	0.0084	0.0093	0.0048	0.0052	0.0051	0.0043	0.0058	0.0092	0.015	0.0121	13	0.0043	0.0045	0.0089	0.00812	0.0138	0.015	
zinc	7440-66-6	µg/L		9.17	10.7	9.33	9.77	5.65	6.08	5.25	5.74	6.72	9.05	12.4	10.2	13	5.25	5.41	9.05	8.41	11.7	12.4	
wolman salts (As, Cr, Cu sum)		µg/L		5.64	7.67	5.59	7.24	6.27	6.7		6.08	6.17	6.98	7.21	8.03	12	5.41	5.48	6.49	6.6	7.92	8.03	
rubidium	7440-17-7	µg/L		3.4	4.22	3.52	4.25	4.51	4.45	4.11	4.33	4.46	4.9	5.11	4.55	13	3.4	3.44	4.33	4.26	5.03	5.11	
uranium	7440-61-1	µg/L		0.579	0.702	0.644	0.836	0.87	0.824	0.729	0.724	0.701	0.758	0.793	0.804	13	0.579	0.594	0.729	0.739	0.856	0.87	
cesium	7440-46-2	µg/L		0.284	0.284	0.245	0.264	0.161	0.162	0.151	0.15	0.181	0.218	0.25	0.217	13	0.15	0.15	0.218	0.216	0.284	0.284	
Nieuwersluis																							
sodium	7440-23-5	mg/L		38.5	38.4	29.2	38.8	50.7	46	43	47.9	42.3	41.5	43	39.6	13	26.5	28.6	41.5	40.6	49.6	50.7	
potassium	7440-09-7	mg/L		4.56	4.54	4.52	4.67	5.31	4.98	4.87	4.9	4.65	5.67	5.14	5.3	13	3.98	4.2	4.9	4.89	5.53	5.67	
calcium	7440-70-2	mg/L		72	74.4	62.7	72	72.5	66.1	64.5	60.4	56.8	60.6	63.1	68.3	13	56.8	58.2	64.5	65.8	73.6	74.4	
magnesium	7439-95-4	mg/L		10.5	10.1	8.87	11.1	12.3	11.5	11.6	11.3	10.8	10.1	10.3	10.1	13	8.75	8.85	10.5	10.6	12	12.3	
iron	7439-89-6	mg/L		0.63	0.638	0.96	0.45	0.481	0.342	0.345	0.279	0.531	0.562	0.475	0.489	13	0.279	0.304	0.489	0.549	1.05	1.33	
manganese	7439-96-5	µg/L		115	109	122	70.9	75	61	60.8	49.9	91.1	82.2	69.7	90	13	49.9	54.3	82.2	86	142	160	
aluminium	7429-90-5	µg/L		308	339	709	272	298	209	199	181	328	304	279	241	13	181	188	298	337	755	937	
antimony	7440-36-0	µg/L		0.215	0.212	0.237	0.239	0.272	0.292	0.286	0.305	0.286	0.322	0.289	0.242	13	0.208	0.21	0.272	0.264	0.315	0.322	
arsenic	7440-38-2	µg/L		1.03	1.14	1.27	1.09	1.32	1.57	1.61	1.57	1.78	1.68	1.79	1.4	13	1.03	1.03	1.51	1.42	1.79	1.79	
barium	7440-39-3	µg/L		65.1	68.8	56.1	70.2	80.5	71.9	71.3	71.2	72.6	71.1	73	68.1	13	55	55.9	71.1	68.9	77.5	80.5	
beryllium	7440-41-7	µg/L		0.0203	0.0213	0.0419	0.0156	0.0169	0.0138	0.0125	0.0126	0.0189	0.0217	0.0207	0.0167	13	0.0125	0.0125	0.0189	0.0211	0.0443	0.0541	
boron	7440-42-8	µg/L	50	<	<	<	<	53.2	<	<	<	<	<	<	<	13	<	<	<	<	<	53.2	
cadmium	7440-43-9	µg/L		0.0436	0.0288	0.0405	0.102	0.0307	0.0238	0.028	0.0266	0.0306	0.087	0.0391	0.0274	13	0.0238	0.0249	0.0306	0.0422	0.096	0.102	
chromium	7440-47-3	µg/L		0.924	1.02	1.55	1.46	0.943	0.786	0.764	0.603	1.12	1.1	0.936	0.678	13	0.603	0.633	0.943	1.03	1.83	2.07	
cobalt	7440-48-4	µg/L		0.289	0.324	0.383	0.288	0.322	0.26	0.233	0.209	0.285	0.302	0.265	0.285	13	0.209	0.219	0.285	0.294	0.437	0.512	
copper	7440-50-8	µg/L		2.63	2.64	3.64	3.45	2.97	2.82	2.67	2.59	2.83	3.25	2.49	2.73	13	2.49	2.53	2.82	2.95	3.88	4.17	
mercury	7439-97-6	µg/L		0.00926	0.00617	0.0104	0.00886	0.00936	0.00566	0.00561	0.00462	0.00724	0.00908	0.00798	0.00644	13	0.00462	0.00502	0.00724	0.00777	0.0121	0.0139	

An explanation of this table can be found on page 151-153.

Metals	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
lead	7439-92-1	µg/L		1.06	1.12	1.51	0.939	0.998	0.74	0.759	0.597	1.03	1.27	0.958	0.937	13	0.597	0.654	0.998	1.03	1.7	1.99	
lithium	7439-93-2	µg/L		7.33	7.99	5.54	8.83	12.4	11.5	9.91	11	10.3	10.9	12.9	11	13	5.03	5.44	10.3	9.63	12.7	12.9	
molybdenum	7439-98-7	µg/L		0.995	0.937	0.793	1.26	1.74	1.51	1.6	1.69	1.71	1.63	1.65	1.38	13	0.783	0.791	1.51	1.36	1.73	1.74	
nickel	7440-02-0	µg/L		1.54	1.85	2.46	1.85	1.5	1.41	1.33	1.3	1.59	1.96	1.55	1.65	13	1.3	1.31	1.59	1.73	2.68	3.16	
selenium	7782-49-2	µg/L		0.17	0.209	0.19	0.225	0.217	0.19	0.18	0.185	0.174	0.185	0.2	0.168	13	0.168	0.169	0.188	0.191	0.222	0.225	
strontium	7440-24-6	µg/L		386	398	298	415	489	465	446	447	437	391	451	436	13	286	295	436	412	479	489	
thallium	7440-28-0	µg/L		0.0126	0.0133	0.0164	0.0146	0.0199	0.018	0.0185	0.0214	0.019	0.0165	0.0162	0.0124	13	0.0124	0.0125	0.0165	0.0165	0.0208	0.0214	
tellurium	13494-80-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tin	7440-31-5	µg/L		0.0902	0.0971	0.116	0.29	0.0839	0.0603	0.0628	0.0541	0.0634	0.0995	0.0713	0.0724	13	0.0541	0.0566	0.0839	0.0982	0.225	0.29	
titanium	7440-32-6	µg/L		5.46	6.02	8.98	4.55	5.39	3.92	3.69	2.93	6.35	5.66	4.82	4.53	13	2.93	3.23	5.39	5.48	9.74	12	
vanadium	7440-62-2	µg/L		1.14	1.23	1.74	1.12	1.3	1.37	1.49	1.28	1.56	1.54	1.34	1.4	13	1.12	1.13	1.34	1.4	1.97	2.24	
silver	7440-22-4	µg/L		0.0091	0.01	0.0118	0.0152	0.0088	0.0068	0.0072	0.0062	0.0083	0.0129	0.0082	0.008	13	0.0062	0.00644	0.0085	0.00955	0.0151	0.0152	
zinc	7440-66-6	µg/L		9.5	9.23	11.8	11	7.27	6.2	5.96	5.06	7.86	11.4	7.83	8.79	13	5.06	5.42	7.86	8.75	14.2	16	
wolman salts (As, Cr, Cu sum)		µg/L		4.58	4.8	6.46	6	5.23	5.18	5.04	4.76	5.73	6.03	5.22	4.81	13	4.58	4.66	5.18	5.41	7.06	7.75	
rubidium	7440-17-7	µg/L		3.89	4.1	3.73	3.93	5.13	4.92	4.2	4.43	4.55	4.62	4.7	4.62	13	3.2	3.48	4.43	4.35	5.05	5.13	
uranium	7440-61-1	µg/L		0.596	0.677	0.626	0.724	0.819	0.757	0.68	0.688	0.642	0.629	0.706	0.688	13	0.576	0.584	0.68	0.681	0.794	0.819	
cesium	7440-46-2	µg/L		0.201	0.205	0.234	0.141	0.19	0.163	0.156	0.153	0.2	0.175	0.169	0.142	13	0.141	0.141	0.169	0.182	0.264	0.304	
Andijk																							
sodium	7440-23-5	mg/L		59.2	53.2	45.8	42.4	47.3	48	59.5	62.1	66.9	70	70.9	71.7	52	37.2	41.8	57	58	74.5	85.8	
potassium	7440-09-7	mg/L		6.17	5.69	6.2	9.74	5.64	6.06	5.77	6.74	6.8	5.96	6.54	6.14	13	5.64	5.66	6.15	6.43	8.56	9.74	
calcium	7440-70-2	mg/L		65.3	74	69.2	65.7	68.7	62.5	55.4	47.5	48.4	55.9	57.7	65.1	52	43.9	47.4	62.7	61.1	70.4	83.8	
magnesium	7439-95-4	mg/L		11.9	11.3	10.7	11.5	11.2	11.6	13.9	14	14.4	14.1	13.8	13.7	52	8.29	10.3	12.7	12.6	15.2	16.7	
iron	7439-89-6	mg/L		0.164	0.373	1.3	0.249	0.776	0.0295	0.0663	0.0774	0.0773	0.203	0.0904	0.123	13	0.0295	0.0442	0.164	0.371	1.41	1.84	
manganese	7439-96-5	µg/L		21	26	75	26	30	13	59	101	47	53	18	21	13	13	15	30	43.5	99	101	
aluminium	7429-90-5	µg/L		101	253	893	162	528	13.9	18.6	17.4	21.8	107	48.6	67.1	13	13.9	15.3	101	240	1020	1350	
antimony	7440-36-0	µg/L		0.223	0.215	0.273	0.252	0.265	0.229	0.221	0.258	0.201	0.218	0.222	0.221	13	0.201	0.207	0.223	0.236	0.287	0.302	
arsenic	7440-38-2	µg/L		0.951	1.07	1.54	0.884	1.32	1.11	1.34	1.85	1.25	1.44	1.11	1.08	13	0.884	0.911	1.25	1.27	1.82	1.85	
barium	7440-39-3	µg/L		56.5	60	62.8	57.3	68.6	52.7	54.8	55.9	53	66.1	63.4	63.6	13	52.7	52.8	59.5	59.8	67.6	68.6	
beryllium	7440-41-7	µg/L		0.0065	0.0202	0.0562	0.0124	0.0347	0.0022	0.0025	0.0019	0.0028	0.009	0.0044	0.0056	13	0.0019	0.00202	0.0065	0.0165	0.0613	0.0791	
boron	7440-42-8	µg/L	50	<	<	<	<	<	51.4	<	50.2	62.7	104	61.7	57.3	13	<	<	50.2	<	92	104	
cadmium	7440-43-9	µg/L		0.0079	0.0146	0.0363	0.0113	0.0289	0.005	0.0042	0.0037	0.003	0.0092	0.0061	0.0084	13	0.003	0.00328	0.0084	0.0134	0.0388	0.0454	
chromium	7440-47-3	µg/L		0.451	0.721	2.01	0.545	1.29	0.189	0.219	0.108	0.146	0.389	0.204	0.244	13	0.108	0.123	0.389	0.656	2.24	2.88	
cobalt	7440-48-4	µg/L		0.139	0.213	0.524	0.196	0.421	0.158	0.175	0.145	0.149	0.205	0.138	0.135	13	0.135	0.136	0.175	0.24	0.592	0.706	
copper	7440-50-8	µg/L		1.46	1.89	3.14	2.28	2.78	1.8	1.6	0.961	1.04	1.43	1.19	1.46	13	0.961	0.993	1.6	1.86	3.37	3.77	
mercury	7439-97-6	µg/L		0.00172	0.00256	0.0112	0.0027	0.00747	0.0008	0.00082	0.0014	0.00109	0.00208	0.00106	0.00159	13	0.0008	0.000808	0.00172	0.00352	0.0124	0.0157	
lead	7439-92-1	µg/L		0.308	0.442	2.08	0.443	1.25	0.0656	0.105	0.108	0.233	0.479	0.244	0.276	13	0.0656	0.0814	0.308	0.624	2.23	2.84	
lithium	7439-93-2	µg/L		8.6	8.54	8.99	7.28	9.83	7.85	10.6	8.72	9.89	11.9	12.5	12.1	13	7.28	7.51	9.07	9.68	12.3	12.5	
molybdenum	7439-98-7	µg/L		1.25	0.964	1.05	0.991	1.18	1.09	1.35	1.19	1.19	1.65	1.46	1.34	13	0.964	0.975	1.19	1.21	1.57	1.65	
nickel	7440-02-0	µg/L	2	<	<	2.95	<	<	<	<	<	2.2	<	<	<	13	<	<	<	<	3.08	3.6	
selenium	7782-49-2	µg/L		0.154	0.207	0.234	0.2	0.236	0.178	0.162	0.154	0.138	0.17	0.158	0.156	13	0.138	0.144	0.17	0.183	0.259	0.274	
strontium	7440-24-6	µg/L		410	391	383	364	420	384	419	403	399	457	441	448	13	364	368	403	408	453	457	
thallium	7440-28-0	µg/L		0.0099	0.0112	0.0223	0.0149	0.0217	0.0102	0.0091	0.0044	0.006	0.0095	0.0084	0.0092	13	0.0044	0.00504	0.0099	0.0122	0.0243	0.026	
tellurium	13494-80-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tin	7440-31-5	µg/L	0.03	0.0317	0.0305	0.104	<	0.0737	<	<	<	<	<	<	<	13	<	<	<	0.0356	0.112	0.138	
titanium	7440-32-6	µg/L		1.86	4.66	13.9	2.77	8.83	0.371	0.392	0.348	0.438	2.27	0.94	1.46	13	0.348	0.357	1.86	4.01	15.5	19.9	
vanadium	7440-62-2	µg/L		0.761	1.28	2.73	0.83	1.93	0.807	0.721	0.767	0.691	1.23	0.638	0.877	13	0.638	0.659	0.83	1.23	2.95	3.63	
silver	7440-22-4	µg/L	0.004	<	<	0.0104	<	0.0064	<	<	<	<	<	<	<	13	<	<	<	<	0.0109	0.0132	
zinc	7440-66-6	µg/L		2.19	3.53	11	3.03	7.13	0.716	0.71	0.917	0.603	2.1	1.55	1.97	13	0.603	0.646	2.1	3.58	11.8	14.8	
wolman salts (As, Cr, Cu sum)		µg/L		2.86	3.68	6.69	3.71	5.39	3.1	3.16	2.92	2.44	3.26	2.5	2.78	13	2.44	2.46	3.16	3.78	7.21	8.42	
rubidium	7440-17-7	µg/L		4.08	4.22	5.34	3.95	4.92	3.86	4.11	4.3	4.24	4.53	4.46	4.35	13	3.86	3.9	4.3	4.44	5.59	6.04	
uranium	7440-61-1	µg/L		0.61	0.597	0.622	0.621	0.724	0.665	0.675	0.528	0.564	0.668	0.673	0.656	13	0.528	0.542	0.626	0.633	0.704	0.724	
cesium	7440-46-2	µg/L		0.0686	0.133	0.329	0.0857	0.222	0.0399	0.0524	0.0511	0.0471	0.07	0.05	0.065	13	0.0399	0.0428	0.0686	0.119	0.368	0.466	

An explanation of this table can be found on page 151-153.

Metals, after filtration	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith																							
iron, 0.45 µm filtrate		mg/L		0.0078	0.0093	0.0063	0.0039	0.00305	0.00265	0.00237	0.00215	0.0029	0.00395	0.0067	0.0115	26	0.0019	0.00221	0.00395	0.00534	0.00979	0.017	
manganese, 0.45 µm filtrate		µg/L		8.98	4.78	8.36	5.41	0.546	0.879	0.856	0.191	1.18	2.02	3.1	5.17	26	0.176	0.221	1.76	3.42	10.7	14.5	
boron, 0.45 µm filtrate		µg/L	50	<	<	<	<	<	<	<	51.4	<	<	52.4	<	26	<	<	<	<	60.9	79.9	
aluminium, 0.45 µm filtrate		µg/L		8.12	9.05	8.61	7.11	1.68	1.54	2.6	2.54	4.04	4.94	5.38	7.77	26	1.12	1.68	5.15	5.27	9.01	9.51	
antimony, 0.45 µm filtrate		µg/L		0.22	0.203	0.174	0.197	0.219	0.21	0.218	0.219	0.208	0.258	0.236	0.232	26	0.167	0.187	0.214	0.217	0.244	0.274	
arsenic, 0.45 µm filtrate		µg/L		0.75	0.778	0.794	0.735	0.901	1.01	1.09	1.16	1.12	1.09	1	0.92	26	0.716	0.725	0.983	0.949	1.15	1.18	
barium, 0.45 µm filtrate		µg/L		73.7	52.6	53	78.5	73.9	73.5	71.4	73.3	71.2	73.2	72.8	80.7	26	45.6	52.7	71.6	71.1	84.7	107	
beryllium, 0.45 µm filtrate		µg/L		0.00345	0.00495	0.0057	0.0017	0.0012	0.00105	0.0014	0.0017	0.0014	0.00205	0.0025	0.00253	26	0.0008	0.00111	0.00175	0.00243	0.00562	0.006	
cadmium, 0.45 µm filtrate		µg/L		0.00905	0.00815	0.00695	0.0077	0.00815	0.00775	0.00717	0.00645	0.0083	0.009	0.00905	0.00873	26	0.0062	0.00641	0.0081	0.00803	0.00973	0.0102	
chromium, 0.45 µm filtrate		µg/L		0.212	0.228	0.185	0.203	0.185	0.162	0.17	0.161	0.165	0.18	0.177	0.191	26	0.125	0.16	0.185	0.184	0.228	0.234	
cobalt, 0.45 µm filtrate		µg/L		0.0985	0.0889	0.0797	0.12	0.123	0.137	0.0993	0.0838	0.0921	0.0869	0.0781	0.0948	26	0.0662	0.0794	0.0943	0.0983	0.131	0.147	
copper, 0.45 µm filtrate		µg/L		1.28	1.68	1.36	1.33	1.42	1.87	1.54	1.49	1.62	1.52	1.68	1.66	26	1.21	1.28	1.53	1.54	1.84	2.22	
mercury, 0.45 µm filtrate		µg/L		0.00055	0.000755	0.00071	0.00039	0.000435	0.000435	0.00041	0.0004	0.00041	0.000415	0.00047	0.000607	26	0.00035	0.00037	0.00045	0.0005	0.000812	0.00088	
lead, 0.45 µm filtrate		µg/L	0.02	0.0238	0.0295	<	<	<	0.0238	<	<	<	<	0.0249	0.0385	26	<	<	0.0224	0.0206	0.0335	0.0583	
lithium, 0.45 µm filtrate		µg/L		12.3	6.46	7.09	15.3	12.5	13.9	12.9	12.8	12.4	14.1	12.9	17.7	26	5.39	6.55	12.7	12.7	18.1	23.7	
molybdenum, 0.45 µm filtrate		µg/L		1.39	0.857	0.827	1.75	1.5	1.65	1.69	1.77	1.87	1.94	1.7	1.78	26	0.703	0.861	1.64	1.57	2	2.06	
nickel, 0.45 µm filtrate		µg/L		1.02	1.1	0.922	0.873	0.865	0.829	0.76	0.745	0.777	0.842	0.837	0.975	24	0.712	0.753	0.857	0.88	1.09	1.18	
tin, 0.45 µm filtrate		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	0.0313	
titanium, 0.45 µm filtrate		µg/L		0.19	0.188	0.144	0.107	0.0733	0.132	0.092	0.0732	0.0783	0.142	0.146	0.216	26	0.0604	0.0675	0.127	0.133	0.191	0.299	
vanadium, 0.45 µm filtrate		µg/L		0.731	0.727	0.698	0.723	0.628	0.796	0.878	0.899	0.841	0.838	0.874	0.911	26	0.624	0.653	0.811	0.803	0.925	0.978	
silver, 0.45 µm filtrate		µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
zinc, 0.45 µm filtrate		µg/L		5.1	3.58	2.87	2.48	2.08	4.3	2.05	1.83	2.03	2.71	3.4	4.38	26	1.69	1.72	2.6	3.08	5.32	6.87	
rubidium, 0.45 µm filtrate		µg/L		3.94	2.37	2.3	4.03	4.05	3.99	3.78	3.82	3.78	4.54	4.06	4.84	26	1.97	2.38	3.89	3.83	4.74	6.28	
uranium, 0.45 µm filtrate		µg/L		0.655	0.558	0.634	0.836	0.833	0.729	0.736	0.7	0.738	0.752	0.747	0.679	26	0.539	0.562	0.718	0.716	0.828	0.854	
selemium, 0.45 µm filtrate		µg/L		0.243	0.252	0.212	0.257	0.196	0.203	0.194	0.2	0.205	0.221	0.218	0.225	26	0.173	0.179	0.215	0.218	0.268	0.279	
strontium, 0.45 µm filtrate		µg/L		440	314	335	516	513	512	481	470	459	520	494	529	26	282	317	490	468	544	638	
thallium, 0.45 µm filtrate		µg/L		0.0093	0.00825	0.00815	0.0117	0.0117	0.0139	0.0122	0.0129	0.0114	0.0077	0.00925	0.0099	26	0.0049	0.00771	0.0107	0.0106	0.0132	0.0154	
tellurium, 0.45 µm filtrate		µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
cesium, 0.45 µm filtrate		µg/L		0.227	0.0414	0.0409	0.181	0.158	0.172	0.14	0.153	0.267	0.413	0.209	0.26	26	0.0253	0.042	0.161	0.189	0.348	0.52	
Nieuwegein																							
iron, 0.45 µm filtrate		mg/L		0.0096	0.0048	0.0049	0.0025	0.0024	0.0028	0.0011	0.0027	0.0019	0.002	0.002	0.0038	13	0.0011	0.00142	0.0027	0.00349	0.00824	0.0096	
manganese, 0.45 µm filtrate		µg/L		9.22	17.4	19	7.83	14.7	1.35	2.55	0.498	2.48	3.72	9.44	7.88	13	0.498	0.839	7.88	8.84	22.2	25.4	
boron, 0.45 µm filtrate		µg/L	50	<	76	<	<	81.6	88.1	<	87.9	<	57.7	<	<	13	<	<	<	<	88	88.1	
aluminium, 0.45 µm filtrate		µg/L		5.2	3.4	5.3	3.4	4	4.9	2.1	2.7	1.8	7.9	2.7	1.5	13	1.5	1.62	3.4	3.86	7.34	7.9	
antimony, 0.45 µm filtrate		µg/L		0.176	0.213	0.197	0.224	0.268	0.272	0.271	0.286	0.262	0.286	0.289	0.259	13	0.176	0.183	0.262	0.246	0.288	0.289	
arsenic, 0.45 µm filtrate		µg/L		0.875	1.05	0.843	0.98	1.36	1.8	1.66	1.86	1.64	1.86	1.72	1.52	13	0.79	0.824	1.52	1.39	1.86	1.86	
barium, 0.45 µm filtrate		µg/L		48.8	61.7	56.4	65.9	71.9	64.3	65.9	67	66	63.8	66.3	64	13	48.8	51.4	64.3	62.9	69.9	71.9	
beryllium, 0.45 µm filtrate		µg/L		0.0043	0.0025	0.00285	0.0022	0.0017	0.0017	0.0013	0.0011	0.0014	0.0013	0.0018	0.0018	13	0.0011	0.00118	0.0018	0.00206	0.00382	0.0043	
cadmium, 0.45 µm filtrate		µg/L		0.0096	0.0152	0.0086	0.0126	0.0129	0.0094	0.012	0.0074	0.0096	0.0126	0.0251	0.0174	13	0.0074	0.00784	0.012	0.0124	0.022	0.0251	
chromium, 0.45 µm filtrate		µg/L		0.152	0.15	0.111	0.128	0.168	0.161	0.141	0.168	0.117	0.123	0.133	0.13	13	0.0973	0.105	0.133	0.138	0.168	0.168	
cobalt, 0.45 µm filtrate		µg/L		0.0787	0.108	0.103	0.173	0.199	0.136	0.107	0.111	0.0815	0.0845	0.106	0.0945	13	0.0787	0.0798	0.107	0.114	0.189	0.199	
copper, 0.45 µm filtrate		µg/L	0.3	1.52	1.94	0.945	2.19	2.53	2.52	2.1	2.59	2.08	2.44	2.01	2.54	13	<	0.698	2.1	2.03	2.57	2.59	
mercury, 0.45 µm filtrate		µg/L		0.00076	0.00046	0.00059	0.00028	0.00031	0.00031	0.00024	0.00024	0.0002	0.0003	0.00032	0.00037	13	0.0002	0.000216	0.00031	0.000382	0.000712	0.00076	
lead, 0.45 µm filtrate		µg/L	0.02	0.0266	0.0277	0.0209	<	0.0281	0.0226	<	0.021	<	0.0247	0.0315	0.0328	13	<	<	0.0226	0.0221	0.0323	0.0328	
lithium, 0.45 µm filtrate		µg/L		6.1	8.92	6.53	9.26	11.8	11.6	10.5	9.79	11.4	11.5	12.9	9.93	13	6.1	6.14	9.93	9.75	12.5	12.9	
molybdenum, 0.45 µm filtrate		µg/L		0.758	0.977	0.836	1.23	1.65	1.47	1.65	1.68	1.78	1.82	1.77	1.48	13	0.758	0.772	1.48	1.38	1.8	1.82	
nickel, 0.45 µm filtrate		µg/L		0.872	1.1	0.986	1.12	1.13	1.12	1.03	1.06	1.01	1.12	1.08	1.11	13	0.872	0.908	1.08	1.06	1.13	1.13	
tin, 0.45 µm filtrate		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
titanium, 0.45 µm filtrate		µg/L		0.16	0.13	0.112	0.0706	0.0768	0.14	0.0861	0.104	0.0983	0.14	0.103	0.0987	13	0.0706	0.0731	0.103	0.11	0.152	0.16	
vanadium, 0.45 µm filtrate		µg/L		0.608	0.789	0.725	0.796	1.02	1.15	1.21	1.21	1.13	1.3	1.11	0.99	13	0.608	0.65	1.02	0.982	1.26	1.3	
silver, 0.45 µm filtrate		µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
zinc, 0.45 µm filtrate		µg/L		3.02	3.59	2.72	1.68	2.25	2.09	1.63	1.95	2.39	2.52	3.23	3.44	13	1.63	1.65	2.39	2.56	3.53	3.59	

An explanation of this table can be found on page 151-153.

Metals, after filtration	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
rubidium, 0.45 µm filtrate		µg/L		2.54	3.22	2.33	3.03	3.99	4.05	3.47	3.85	3.79	3.95	3.93	3.65	13	2.28	2.32	3.65	3.39	4.03	4.05	
uranium, 0.45 µm filtrate		µg/L		0.594	0.669	0.644	0.814	0.877	0.784	0.733	0.717	0.724	0.705	0.776	0.81	13	0.594	0.601	0.724	0.73	0.852	0.877	
selemium, 0.45 µm filtrate		µg/L		0.19	0.211	0.235	0.229	0.209	0.182	0.173	0.173	0.187	0.187	0.202	0.168	13	0.168	0.17	0.19	0.198	0.242	0.25	
strontium, 0.45 µm filtrate		µg/L		328	390	336	415	478	455	432	449	440	436	447	437	13	323	325	436	414	469	478	
thallium, 0.45 µm filtrate		µg/L		0.0075	0.0104	0.00805	0.0124	0.0165	0.0163	0.017	0.0195	0.0162	0.0176	0.0155	0.0141	13	0.0075	0.00762	0.0155	0.0138	0.0187	0.0195	
tellurium, 0.45 µm filtrate		µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cesium, 0.45 µm filtrate		µg/L		0.0646	0.07	0.0321	0.0372	0.0534	0.0518	0.0455	0.0621	0.0441	0.0415	0.0411	0.0295	13	0.0275	0.0283	0.0441	0.0465	0.0678	0.07	
Nieuwersluis																							
iron, 0.45 µm filtrate		mg/L		0.016	0.0103	0.03	0.0055	0.0027	0.0035	0.0023	0.0026	0.0021	0.026	0.0062	0.012	13	0.0021	0.00218	0.0062	0.0115	0.0407	0.0505	
manganese, 0.45 µm filtrate		µg/L		69.6	69	81.1	15.8	8.19	2.04	1.65	0.287	0.654	8.17	10.4	54.1	13	0.287	0.434	10.4	30.9	96.8	115	
boron, 0.45 µm filtrate		µg/L	50	<	<	<	<	<	<	<	<	<	56.2	<	<	13	<	<	<	<	<	56.2	
aluminium, 0.45 µm filtrate		µg/L		2.43	3.38	7.15	3.95	2.15	1.51	2.31	1.93	1.66	3.67	1.83	2.58	13	1.51	1.57	2.43	3.21	7.72	10	
antimony, 0.45 µm filtrate		µg/L		0.203	0.204	0.219	0.218	0.245	0.263	0.264	0.26	0.246	0.293	0.263	0.248	13	0.193	0.197	0.246	0.242	0.281	0.293	
arsenic, 0.45 µm filtrate		µg/L		0.682	0.751	0.77	0.855	1.05	1.36	1.39	1.41	1.44	1.25	1.38	1.04	13	0.682	0.689	1.05	1.09	1.43	1.44	
barium, 0.45 µm filtrate		µg/L		60.1	61.9	48.8	65.1	73.1	66.6	65.2	67.4	65.1	63.1	67.3	62.1	13	47.5	48.5	65.1	62.7	70.8	73.1	
beryllium, 0.45 µm filtrate		µg/L		0.0024	0.0027	0.0043	0.002	0.0008	0.0009	0.0007	0.0007	0.0006	0.0029	0.0015	0.0022	13	0.0006	0.00064	0.002	0.002	0.00482	0.0061	
cadmium, 0.45 µm filtrate		µg/L		0.0233	0.0114	0.0151	0.0743	0.0159	0.0104	0.0143	0.0132	0.0097	0.0473	0.0185	0.0134	13	0.0097	0.00998	0.0143	0.0217	0.0635	0.0743	
chromium, 0.45 µm filtrate		µg/L	0.09	0.0955	0.182	0.22	0.19	0.109	0.13	0.0989	0.143	<	0.148	0.114	0.0975	13	<	<	0.13	0.138	0.221	0.228	
cobalt, 0.45 µm filtrate		µg/L		0.121	0.157	0.177	0.146	0.156	0.112	0.0905	0.0922	0.0775	0.0919	0.0956	0.151	13	0.0775	0.0827	0.112	0.126	0.21	0.245	
copper, 0.45 µm filtrate		µg/L		1.99	1.76	2.34	2.66	2.17	2.04	1.99	1.84	1.91	2.21	1.99	1.89	13	1.76	1.79	1.99	2.09	2.62	2.66	
mercury, 0.45 µm filtrate		µg/L		0.00054	0.00052	0.00101	0.00183	0.00033	0.00034	0.00036	0.00028	0.00029	0.00061	0.00041	0.00048	13	0.00028	0.000284	0.00048	0.000616	0.00161	0.00183	
lead, 0.45 µm filtrate		µg/L	0.02	0.0256	0.0228	0.0487	0.0274	<	<	<	<	<	0.0595	0.0217	0.0307	13	<	<	0.0228	0.0258	0.068	0.0736	
lithium, 0.45 µm filtrate		µg/L		7.22	7.78	4.44	8.8	12.4	11.5	10.8	11.4	10.8	9.99	12.3	9.14	13	3.98	4.34	9.99	9.31	12.4	12.4	
molybdenum, 0.45 µm filtrate		µg/L		0.935	0.937	0.742	1.19	1.66	1.54	1.6	1.72	1.7	1.57	1.67	1.33	13	0.739	0.741	1.54	1.33	1.71	1.72	
nickel, 0.45 µm filtrate		µg/L		1.14	1.34	1.65	1.22	1.04	1.06	0.925	0.944	0.976	1.33	1.11	1.26	13	0.925	0.933	1.14	1.2	1.77	2.06	
tin, 0.45 µm filtrate		µg/L	0.03	<	<	<	0.0328	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.0328	
titanium, 0.45 µm filtrate		µg/L		0.107	0.0819	0.216	0.0654	0.0464	0.077	0.0577	0.0361	0.0642	0.167	0.08	0.125	13	0.0361	0.0402	0.08	0.103	0.249	0.303	
vanadium, 0.45 µm filtrate		µg/L		0.476	0.544	0.515	0.592	0.634	0.88	1.02	0.908	0.89	0.843	0.823	0.765	13	0.476	0.489	0.765	0.723	0.975	1.02	
silver, 0.45 µm filtrate		µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
zinc, 0.45 µm filtrate		µg/L		4.24	3.59	4.12	5.48	2.15	2.16	1.95	1.59	1.79	4.96	3.12	4.22	13	1.59	1.67	3.12	3.34	5.5	5.51	
rubidium, 0.45 µm filtrate		µg/L		3.2	3.28	2.39	3.49	4.36	4.36	3.87	4.07	3.84	4.1	4.09	3.95	13	2.35	2.38	3.87	3.64	4.36	4.36	
uranium, 0.45 µm filtrate		µg/L		0.6	0.657	0.611	0.722	0.798	0.739	0.688	0.697	0.643	0.628	0.694	0.673	13	0.563	0.578	0.673	0.674	0.774	0.798	
selemium, 0.45 µm filtrate		µg/L		0.156	0.179	0.16	0.202	0.203	0.176	0.167	0.165	0.16	0.16	0.171	0.144	13	0.144	0.146	0.167	0.169	0.203	0.203	
strontium, 0.45 µm filtrate		µg/L		383	392	289	413	486	456	436	439	429	384	446	417	13	273	286	417	405	474	486	
thallium, 0.45 µm filtrate		µg/L		0.0075	0.0073	0.0069	0.01	0.0143	0.0155	0.014	0.0179	0.0124	0.0107	0.0113	0.0083	13	0.0066	0.00684	0.0107	0.011	0.0169	0.0179	
tellurium, 0.45 µm filtrate		µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cesium, 0.45 µm filtrate		µg/L		0.0583	0.0612	0.0237	0.0368	0.0527	0.0637	0.0556	0.0731	0.0536	0.0467	0.0497	0.048	13	0.0223	0.0234	0.0527	0.0498	0.0693	0.0731	
Andijk																							
iron, 0.45 µm filtrate		mg/L		0.0036	0.0061	0.00915	0.004	0.0042	0.0053	0.0044	0.0026	0.0015	0.0029	0.0011	0.0032	13	0.0011	0.00126	0.004	0.0044	0.00976	0.0122	
manganese, 0.45 µm filtrate		µg/L		0.26	0.554	0.259	0.248	0.296	0.733	0.467	0.53	0.35	0.217	0.178	0.374	13	0.178	0.194	0.3	0.363	0.661	0.733	
boron, 0.45 µm filtrate		µg/L	50	151	<	<	<	<	55.6	<	55.2	64.8	100	<	53.2	13	<	<	53.2	54.1	131	151	
aluminium, 0.45 µm filtrate		µg/L	1	1.4	2.1	3.05	1.6	1.5	2.3	3.4	<	10.3	<	2.8	1.4	13	<	<	2.1	2.61	7.74	10.3	
antimony, 0.45 µm filtrate		µg/L		0.203	0.214	0.248	0.24	0.242	0.214	0.206	0.196	0.184	0.198	0.208	0.214	13	0.184	0.189	0.214	0.217	0.255	0.264	
arsenic, 0.45 µm filtrate		µg/L		0.839	0.917	0.771	0.709	0.842	1.09	1.21	1.71	1.11	1.17	0.979	0.962	13	0.709	0.721	0.962	1.01	1.51	1.71	
barium, 0.45 µm filtrate		µg/L		50.7	55.9	52.1	53.5	59.9	50.9	51.8	52.2	51.5	61.5	61.9	61.5	13	50.7	50.8	52.5	55	61.7	61.9	
beryllium, 0.45 µm filtrate		µg/L		0.0016	0.0025	0.003	0.0022	0.0017	0.0019	0.0007	0.0008	0.0011	0.0011	0.0006	0.001	13	0.0006	0.00064	0.0016	0.00163	0.00302	0.0031	
cadmium, 0.45 µm filtrate		µg/L	0.002	0.0039	0.0079	0.0051	0.005	0.0075	0.0033	0.0025	<	<	0.002	0.002	0.0044	13	<	<	0.0039	0.0039	0.00774	0.0079	
chromium, 0.45 µm filtrate		µg/L	0.09	<	0.174	<	0.131	0.167	0.15	0.141	0.107	<	0.094	<	<	13	<	<	0.107	0.0998	0.171	0.174	
cobalt, 0.45 µm filtrate		µg/L		0.0827	0.102	0.112	0.107	0.14	0.149	0.152	0.099	0.0953	0.116	0.0971	0.091	13	0.0827	0.086	0.102	0.112	0.151	0.152	
copper, 0.45 µm filtrate		µg/L		1.2	1.53	1.61	1.9	1.68	1.59	1.26	0.69	0.823	1.12	1.03	1.24	13	0.69	0.743	1.26	1.33	1.81	1.9	
mercury, 0.45 µm filtrate		µg/L		0.00034	0.0005	0.000455	0.00052	0.00051	0.00047	0.00029	0.00034	0.00025	0.00025	0.00017	0.00027	13	0.00017	0.000202	0.00034	0.000371	0.00052	0.00052	

An explanation of this table can be found on page 151-153.

Metals, after filtration	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
lead, 0.45 µm filtrate		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	0.0266	<	13	<	<	<	<	<	0.0266	
lithium, 0.45 µm filtrate		µg/L		8.33	7.92	7.27	7.17	8.64	8.23	10.6	8.48	10.1	11.7	12.4	10.9	13	6.02	6.48	8.52	9.15	12.1	12.4	
molybdenum, 0.45 µm filtrate		µg/L		1.21	0.915	0.996	1.01	1.17	1.06	1.34	1.19	1.19	1.58	1.45	1.4	13	0.915	0.946	1.19	1.19	1.53	1.58	
nickel, 0.45 µm filtrate		µg/L		1.07	1.32	1.64	1.43	1.21	1.18	1.1	1.08	1.12	1.04	1.06	1.04	13	1.04	1.04	1.12	1.22	1.71	1.89	
tin, 0.45 µm filtrate		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
titanium, 0.45 µm filtrate		µg/L		0.0733	0.124	0.474	0.0707	0.085	0.0942	0.0579	0.0472	0.0306	0.0647	0.0407	0.0498	13	0.0306	0.0346	0.0707	0.13	0.553	0.839	
vanadium, 0.45 µm filtrate		µg/L		0.405	0.692	0.589	0.376	0.537	0.717	0.568	0.605	0.449	0.731	0.448	0.558	13	0.376	0.388	0.568	0.559	0.725	0.731	
silver, 0.45 µm filtrate		µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
zinc, 0.45 µm filtrate		µg/L	0.5	1.05	1.4	1.16	0.852	0.903	0.51	<	<	<	0.676	0.55	1.11	13	<	<	0.852	0.779	1.38	1.4	
rubidium, 0.45 µm filtrate		µg/L		3.8	3.45	3.39	3.39	3.56	3.8	3.93	4.13	4.16	4.18	4.21	3.88	13	3.1	3.22	3.8	3.79	4.2	4.21	
uranium, 0.45 µm filtrate		µg/L		0.579	0.577	0.625	0.603	0.697	0.633	0.657	0.515	0.598	0.643	0.679	0.67	13	0.515	0.54	0.633	0.623	0.69	0.697	
selemium, 0.45 µm filtrate		µg/L		0.132	0.182	0.167	0.169	0.183	0.168	0.148	0.133	0.129	0.143	0.135	0.138	13	0.129	0.13	0.148	0.153	0.183	0.183	
strontium, 0.45 µm filtrate		µg/L		395	381	366	355	402	376	411	387	396	436	438	428	13	351	353	395	395	437	438	
thallium, 0.45 µm filtrate		µg/L		0.0079	0.0071	0.008	0.0117	0.0126	0.0101	0.0084	0.0039	0.0058	0.0071	0.0079	0.0076	13	0.0039	0.00458	0.0079	0.00816	0.0122	0.0126	
tellurium, 0.45 µm filtrate		µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cesium, 0.45 µm filtrate		µg/L		0.0298	0.039	0.0272	0.0264	0.0318	0.0351	0.0453	0.0457	0.0394	0.0311	0.0304	0.0388	13	0.026	0.0262	0.0318	0.0344	0.0455	0.0457	
Detergent components and complexing agents																							
Lobith																							
nitrilotriacetic acid (NTA)	139-13-9	µg/L	0.2	1.9	1.3	1.3	0.6	<	1.4	1.5	1.8	1	1.2	1.7	2.4	13	<	0.3	1.4	1.43	2.5	2.9	
nitrilotriacetic acid (NTA) (load)		g/s		2.65	4.8	3.33	0.753	0.158	2.37	2	2.49	1.37	1.55	3.2	4.17	13	0.158	0.396	2.49	2.54	4.98	5.1	
ethylenediaminetetraacetic acid (EDTA)	60-00-4	µg/L		5.3	2.8	2.6	3.4	3.3	3.4	3.6	2.8	2.5	4.7	4	5.5	13	2.5	2.54	3.4	3.8	5.6	5.8	
ethylenediaminetetraacetic acid (EDTA) (load)		g/s		7.39	10.3	6.65	4.27	5.22	5.76	4.8	3.87	3.44	6.08	7.52	10.2	13	3.44	3.61	6.08	6.6	12.5	14	
diethylenetriaminepentaacetic acid (DTPA)	67-43-6	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diethylenetriaminepentaacetic acid (DTPA) (load)		g/s		0.697	1.85	1.28	0.628	0.79	0.847	0.667	0.692	0.687	0.647	0.94	0.95	13	0.557	0.585	0.697	0.894	1.64	1.85	
methylglycinediacetic acid (alpha ADA)	164462-16-2	µg/L	1	1.2	2.4	1.9	<	<	<	<	1.5	<	1.2	<	2.4	13	<	<	<	1.08	2.4	2.4	
methylglycinediacetic acid (alpha ADA) (load)		g/s		2.4	8.83	9.36	0.794	0.642	0.939	0.662	1.89	0.564	2.05	0.729	2.91	13	0.564	0.585	0.973	2.51	9.15	9.36	
Nieuwegein																							
nitrilotriacetic acid (NTA)	139-13-9	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
nitrilotriacetic acid (NTA) (load)		g/s		0.125	0.163	0.247	0.005	0.005	0.0421	0.005	0.005	0.005	0.005	0.0129	0.005	13	0.005	0.005	0.005	0.067	0.301	0.392	
ethylenediaminetetraacetic acid (EDTA)	60-00-4	µg/L		4.8	7	3.9	4.2	4.5	4.2	4	3.9	3.5	4.9	5.8	6.5	13	2.4	2.84	4.5	4.7	6.8	7	
ethylenediaminetetraacetic acid (EDTA) (load)		g/s		1.2	2.28	2.36	0.042	0.045	0.354	0.04	0.039	0.035	0.049	0.149	0.065	13	0.035	0.0366	0.065	0.694	3.45	4.24	
diethylenetriaminepentaacetic acid (DTPA)	67-43-6	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diethylenetriaminepentaacetic acid (DTPA) (load)		g/s		0.125	0.163	0.247	0.005	0.005	0.0421	0.005	0.005	0.005	0.005	0.0129	0.005	13	0.005	0.005	0.005	0.067	0.301	0.392	
Nieuwersluis																							
nitrilotriacetic acid (NTA)	139-13-9	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethylenediaminetetraacetic acid (EDTA)	60-00-4	µg/L		9.8	9.5	6.4	5.7	5.9	5.5	4.8	4.6	4.8	9.5	6.7	8.8	13	4.2	4.36	5.9	6.8	9.68	9.8	
diethylenetriaminepentaacetic acid (DTPA)	67-43-6	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
nitrilotriacetic acid (NTA)	139-13-9	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethylenediaminetetraacetic acid (EDTA)	60-00-4	µg/L		5.2	7.8	4.95	5.4	5.1	4.5	3.6	3.1	4.8	3.5	3.1	4.2	13	3.1	3.1	4.5	4.63	6.92	7.8	
diethylenetriaminepentaacetic acid (DTPA)	67-43-6	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Polycyclic aromatic hydrocarbons (PAHs)																							
Lobith																							
anthracene	120-12-7	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
benzo(a)anthracene	56-55-3	µg/L	0.001	0.00215	0.00425	0.00283	0.00386	0.00194	<	0.00176	0.00141	0.00274	0.00453	0.00107	0.00512	13	<	<	0.00274	0.00287	0.0063	0.00748	
benzo(b)fluoranthene	205-99-2	µg/L		0.00576	0.0134	0.00833	0.0102	0.00549	0.003	0.00586	0.00355	0.00729	0.00731	0.00282	0.0113	13	0.00282	0.00289	0.00586	0.00735	0.0165	0.0185	
benzo(k)fluoranthene	207-08-9	µg/L		0.00185	0.00442	0.0028	0.0032	0.00169	0.00091	0.00177	0.00108	0.00227	0.00252	0.00093	0.00377	13	0.00091	0.000918	0.00185	0.00238	0.00544	0.00612	
benzo(ghi)perylene	191-24-2	µg/L		0.00238	0.00551	0.00344	0.00374	0.00221	0.00123	0.00238	0.00149	0.00301	0.00372	0.00145	0.00605	13	0.00123	0.00132	0.00238	0.00328	0.00812	0.00986	
benzo(a)pyrene	50-32-8	µg/L	0.002	0.00236	0.0056	0.00332	0.00436	0.00233	<	0.00228	<	0.00271	0.00361	<	0.00572	13	<	<	0.00236	0.00315	0.00777	0.00922	
chrysene	218-01-9	µg/L	0.004	<	0.00475	<	0.00424	<	<	<	<	<	0.00684	<	0.00524	13	<	<	<	<	0.00783	0.00849	
dibenzo(a,h)anthracene	53-70-3	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Polycyclic aromatic hydrocarbons (PAHs)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
phenanthrene	85-01-8	µg/L		0.00549	0.00586	0.00454	0.00383	0.00426	0.00375	0.00697	0.00559	0.00937	0.0102	0.00353	0.00825	13	0.00353	0.00362	0.00559	0.00615	0.00987	0.0102	
fluoranthene	206-44-0	µg/L		0.00731	0.0148	0.00992	0.00975	0.00619	0.00425	0.00808	0.0079	0.0123	0.0143	0.00426	0.0173	13	0.00425	0.00425	0.00975	0.0103	0.0192	0.0222	
indeno(1,2,3-cd)pyrene	193-39-5	µg/L		0.00232	0.00554	0.00284	0.00345	0.00228	0.00108	0.00188	0.0011	0.00235	0.00326	0.00123	0.00664	13	0.00108	0.00109	0.00232	0.00312	0.00912	0.0115	
pyrene	129-00-0	µg/L		0.00575	0.0104	0.00752	0.0105	0.00457	0.00397	0.00907	0.00559	0.00905	0.0106	0.00335	0.0118	13	0.00335	0.0036	0.00837	0.008	0.0134	0.0153	
naphthalene	91-20-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
acenaphthene	83-32-9	µg/L	0.002	0.009	<	<	0.004	0.004	<	<	0.003	<	0.003	<	<	13	<	<	<	0.00246	0.007	0.009	
acenaphthylene	208-96-8	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
anthracene	120-12-7	µg/L	0.004	<		<	<	<	<	0.00519	<	<	<	<	<	12	<	<	<	<	0.00423	0.00519	
benzo(a)anthracene	56-55-3	µg/L	0.001	0.00216		0.0024	0.00366	0.00204	0.00144	0.00118	<	0.00129	0.00256	0.0259	0.00347	12	<	<	0.0021	0.00408	0.0192	0.0259	
benzo(b)fluoranthene	205-99-2	µg/L	0.004	<	0.009	0.005	<	<	<	<	<	<	<	0.01	<	13	<	<	<	<	0.0096	0.01	
benzo(k)fluoranthene	207-08-9	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
benzo(ghi)perylene	191-24-2	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
benzo(a)pyrene	50-32-8	µg/L	0.002	0.00268		0.00212	0.00304	<	<	<	<	<	0.00255	0.0374	0.00317	12	<	<	<	0.00484	0.0272	0.0374	
chrysene	218-01-9	µg/L	0.004	<		<	<	<	<	<	<	<	<	0.0363	0.00404	12	<	<	<	0.00503	0.0266	0.0363	
dibenzo(a,h)anthracene	53-70-3	µg/L	0.003	<		<	<	<	<	<	<	<	<	0.00638	<	12	<	<	<	<	0.00492	0.00638	
phenanthrene	85-01-8	µg/L	0.002	0.003	0.005	0.0035	0.004	0.005	<	<	0.003	0.006	<	0.004	0.005	13	<	<	0.004	0.00346	0.0056	0.006	
fluoranthene	206-44-0	µg/L	0.004	0.007	0.004	<	0.007	0.006	<	0.007	0.01	0.005	0.009	0.01	0.007	13	<	<	0.007	0.00631	0.01	0.01	
fluorene	86-73-7	µg/L	0.003	0.004	<	<	<	0.003	<	0.005	<	0.005	0.005	<		12	<	<	<	<	0.005	0.005	
indeno(1,2,3-cd)pyrene	193-39-5	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pyrene	129-00-0	µg/L	0.003	<	<	<	0.003	0.003	<	<	<	<	0.006	<	<	13	<	<	<	<	0.0048	0.006	
naphthalene	91-20-3	µg/L	0.004	0.009	0.007	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0082	0.009	
Nieuwersluis																							
acenaphthene	83-32-9	µg/L	0.002			<		0.006			0.004			0.002		4	<	*	*	0.00325	*	0.006	
acenaphthylene	208-96-8	µg/L	0.005			<		<			<			<		4	<	*	*	<	*	<	
anthracene	120-12-7	µg/L	0.004	<	<	0.00474	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.00529	0.00748	
benzo(a)anthracene	56-55-3	µg/L	0.001	0.00128	0.00168	0.0221	0.0018	0.00159	<	0.00158	<	0.00139	0.00244	0.00112	0.00174	13	<	<	0.00159	0.00459	0.026	0.0416	
benzo(b)fluoranthene	205-99-2	µg/L		0.00472	0.00524	0.0566	0.00736	0.00448	0.00347	0.0042	0.0026	0.006	0.00675	0.00278	0.00388	13	0.0026	0.00267	0.00472	0.0127	0.0653	0.1	
benzo(k)fluoranthene	207-08-9	µg/L		0.00148	0.00167	0.0187	0.00235	0.00135	0.00116	0.00128	0.00069	0.00176	0.00216	0.00089	0.00134	13	0.00069	0.00077	0.00148	0.00412	0.0217	0.0334	
benzo(ghi)perylene	191-24-2	µg/L		0.00164	0.00186	0.0167	0.00262	0.00153	0.00138	0.00129	0.00097	0.00233	0.00321	0.00099	0.00171	13	0.00097	0.000978	0.00171	0.00408	0.0191	0.0286	
benzo(a)pyrene	50-32-8	µg/L	0.002	<	<	0.0228	0.00245	<	<	<	<	<	0.00291	<	<	13	<	<	<	0.00461	0.0265	0.0416	
chrysene	218-01-9	µg/L	0.004	<	<	0.0315	<	<	<	<	<	<	<	<	<	13	<	<	<	0.00655	0.037	0.059	
dibenzo(a,h)anthracene	53-70-3	µg/L	0.003	<	<	0.00312	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.00344	0.00474	
phenanthrene	85-01-8	µg/L		0.00705	0.00624	0.116	0.0139	0.0062	0.00409	0.00274	0.00572	0.00554	0.00664	0.004	0.00809	13	0.00274	0.00324	0.00624	0.0232	0.135	0.213	
fluoranthene	206-44-0	µg/L		0.00794	0.0105	0.109	0.0174	0.00832	0.00537	0.0127	0.00681	0.00779	0.0115	0.00512	0.0106	13	0.00512	0.00522	0.0105	0.0248	0.126	0.195	
fluorene	86-73-7	µg/L	0.003			0.005		0.003			<			<		4	<	*	*	<	*	0.005	
indeno(1,2,3-cd)pyrene	193-39-5	µg/L		0.00166	0.00161	0.018	0.00261	0.00131	0.00142	0.00111	0.00071	0.00184	0.00318	0.00093	0.00134	13	0.00071	0.000798	0.00161	0.00414	0.0207	0.0315	
pyrene	129-00-0	µg/L		0.00561	0.00607	0.078	0.0122	0.00614	0.00374	0.00935	0.00484	0.00663	0.00824	0.00349	0.00697	13	0.00349	0.00359	0.00663	0.0176	0.091	0.143	
naphthalene	91-20-3	µg/L	0.03	<	<	0.079	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0918	0.143	
Andijk																							
acenaphthene	83-32-9	µg/L	0.002			<		<			<			<		4	<	*	*	<	*	<	
acenaphthylene	208-96-8	µg/L	0.005			<		<			<			<		4	<	*	*	<	*	<	
anthracene	120-12-7	µg/L	0.004	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
benzo(a)anthracene	56-55-3	µg/L	0.001	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.00104	0.00127	
benzo(b)fluoranthene	205-99-2	µg/L	0.00009	0.00071		0.00434	0.00084	0.00218	0.00012	0.00019	<	0.00025	0.00083	0.00034	0.00077	12	<	<	0.00074	0.00125	0.00478	0.00545	
benzo(k)fluoranthene	207-08-9	µg/L	0.00007	0.00021		0.00136	0.00026	0.00077	<	0.00008	<	0.00008	0.00025	0.0001	0.00028	12	<	<	0.00023	0.000401	0.00149	0.0017	
benzo(ghi)perylene	191-24-2	µg/L	0.0002	0.00031		0.00174	0.00051	0.00097	<	<	<	<	0.00047	<	0.0004	12	<	<	0.000355	0.000553	0.00198	0.00233	
benzo(a)pyrene	50-32-8	µg/L	0.002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
chrysene	218-01-9	µg/L	0.004	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
dibenzo(a,h)anthracene	53-70-3	µg/L	0.003	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
phenanthrene	85-01-8	µg/L	0.002	0.00659		0.00534	<	0.00246	<	<	<	<	<	0.00202	0.00545	12	<	<	<	0.00277	0.00657	0.00659	

An explanation of this table can be found on page 151-153.

Polycyclic aromatic hydrocarbons (PAHs)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
fluoranthene	206-44-0	µg/L	0.002	<		0.00594	<	0.00236	<	<	<	<	<	<	0.00259	12	<	<	<	0.00207	0.00671	0.00787	
fluorene	86-73-7	µg/L	0.003			<		<			<			<		4	<	*	*	<	*	<	
indeno(1,2,3-cd)pyrene	193-39-5	µg/L	0.0002	0.0003		0.00159	0.00048	0.00098	<	<	<	<	0.00045	<	0.00036	12	<	<	0.00033	0.000521	0.00176	0.00201	
pyrene	129-00-0	µg/L	0.002	<		0.00384	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.00436	0.00515	
naphthalene	91-20-3	µg/L	0.03	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
Biocides																							
Lobith																							
tributyltin-cation	36643-28-4	µg/L		0.00006	0.00014	0.00006	0.00017	0.00009	0.00009	0.00014	0.00006	0.0001	0.00008	0.00006	0.00007	13	0.00006	0.00006	0.00008	0.0000915	0.000158	0.00017	
carbendazim	10605-21-7	µg/L	0.01	<	<	<	0.0145	0.012	<	<	<	0.024	<	<	0.024	13	<	<	<	<	0.024	0.024	
dichlorvos	62-73-7	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propiconazole	60207-90-1	µg/L	0.003	<	<	<	<	0.00312	<	<	<	<	0.00544	0.00355	0.00413	13	<	<	<	<	0.00514	0.00544	
Nieuwegein																							
tributyltin-cation	36643-28-4	µg/L		0.00016	0.00019	0.000145	0.00023	0.00016	0.00016	0.00019	0.00016	0.00016	0.00019	0.00023	0.00025	13	0.00014	0.000144	0.00016	0.000182	0.000242	0.00025	
carbendazim	10605-21-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
diethyltoluamide (DEET)	134-62-3	µg/L	0.02	<	<	<	<	<	<	<	<	0.027	0.026	<	<	52	<	<	<	<	0.0254	0.037	
dichlorvos	62-73-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propiconazole	60207-90-1	µg/L	0.003	<	<	<	<	0.00691	<	<	<	<	<	<	<	13	<	<	<	<	0.00475	0.00691	
propoxur	114-26-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
N,N-dimethyl-N'-phenylsulphamide	4710-17-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
Nieuwersluis																							
tributyltin-cation	36643-28-4	µg/L		0.00015	0.00011	0.000205	0.00013	0.00015	0.00015	0.00016	0.00007	0.00012	0.00014	0.00015	0.00016	13	0.00007	0.000086	0.00015	0.000146	0.000212	0.00024	
carbendazim	10605-21-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diethyltoluamide (DEET)	134-62-3	µg/L	0.02	<	<	<	0.095	<	0.024	<	0.042	0.026	0.027	<	<	13	<	<	<	0.0226	0.0738	0.095	
dichlorvos	62-73-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propiconazole	60207-90-1	µg/L	0.003	0.00331	<	<	<	<	<	<	<	<	0.00325	<	<	13	<	<	<	<	0.00329	0.00331	
propoxur	114-26-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethyl-N'-phenylsulphamide	4710-17-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
tributyltin-cation	36643-28-4	µg/L	0.00004	<	<	0.00013	0.00005	0.00022	0.00006	0.00005	0.00006	<	<	<	<	13	<	<	0.00005	0.0000631	0.000188	0.00022	
carbendazim	10605-21-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diethyltoluamide (DEET)	134-62-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dichlorvos	62-73-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
propiconazole	60207-90-1	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propoxur	114-26-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethyl-N'-phenylsulphamide	4710-17-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Carbamate fungicides																							
Nieuwegein																							
propamocarb	24579-73-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
propamocarb	24579-73-5	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
Benzimidazole fungicides																							
Lobith																							
carbendazim	10605-21-7	µg/L	0.01	<	<	<	0.0145	0.012	<	<	<	0.024	<	<	0.024	13	<	<	<	<	0.024	0.024	
Nieuwegein																							
carbendazim	10605-21-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
thiabendazole	148-79-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Benzimidazole fungicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis																							
carbendazim	10605-21-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
thiabendazole	148-79-8	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
carbendazim	10605-21-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Conazole fungicides																							
Lobith																							
propiconazole	60207-90-1	µg/L	0.003	<	<	<	<	0.00312	<	<	<	<	0.00544	0.00355	0.00413	13	<	<	<	<	0.00514	0.00544	
Nieuwegein																							
bitertanol	55179-31-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
etridiazole	2593-15-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
propiconazole	60207-90-1	µg/L	0.003	<	<	<	<	0.00691	<	<	<	<	<	<	<	13	<	<	<	<	0.00475	0.00691	
triadimenol	55219-65-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	46	<	<	<	<	<	<	
triadimenol-a	89482-17-7	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	46	<	<	<	<	<	<	
triadimenol-b	82200-72-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	47	<	<	<	<	<	<	
Nieuwersluis																							
bitertanol	55179-31-2	µg/L	0.03					<			<			<		3	*	*	*	*	*	*	
etridiazole	2593-15-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propiconazole	60207-90-1	µg/L	0.003	0.00331	<	<	<	<	<	<	<	<	0.00325	<	<	13	<	<	<	<	0.00329	0.00331	
triadimenol	55219-65-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	
triadimenol-a	89482-17-7	µg/L	0.05	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	
triadimenol-b	82200-72-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	
Andijk																							
bitertanol	55179-31-2	µg/L	0.03					<			<			<		3	*	*	*	*	*	*	
etridiazole	2593-15-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propiconazole	60207-90-1	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triadimenol	55219-65-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triadimenol-a	89482-17-7	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triadimenol-b	82200-72-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Amide fungicides																							
Lobith																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L		0.02	0.02	0.01	0.02	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.02	13	0.01	0.01	0.02	0.0192	0.026	0.03	
Nieuwegein																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L	0.05	<	<	<	0.062	0.0595	<	<	<	<	<	<	<	26	<	<	<	<	0.062	0.065	
2,6-dichlorobenzamide (BAM)	2008-58-4	µg/L	0.01	<	<	<	0.01	<	<	<	<	<	<	<	<	13	<	<	<	<	0.01	0.01	
metalaxyl	57837-19-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
boscalid	188425-85-6	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	23	<	<	<	<	<	<	
fluopicolide	239110-15-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
amisulbrom	348635-87-0	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<		12	<	<	<	<	<	<	
fluopyram	658066-35-4	µg/L	0.01	<	<	<	<	<	<	0.015	<	<	<	<	<	13	<	<	<	<	0.011	0.015	
Nieuwersluis																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L	0.05	0.14	0.092	0.11	0.087	0.1	0.074	0.077	<	0.064	0.068	0.077	0.058	13	<	<	0.077	0.0832	0.132	0.14	
2,6-dichlorobenzamide (BAM)	2008-58-4	µg/L	0.01			0.02		<			<			<		4	<	*	*	<	*	0.02	
metalaxyl	57837-19-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
boscalid	188425-85-6	µg/L	0.04		<	<	<	<	<	<	<	<		<	<	11	<	<	<	<	<	<	
fluopicolide	239110-15-7	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
amisulbrom	348635-87-0	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
fluopyram	658066-35-4	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	

An explanation of this table can be found on page 151-153.

Amide fungicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
2,6-dichlorobenzamide (BAM)	2008-58-4	µg/L	0.01	0.03	0.01	0.03	0.03	0.01	0.02	<	0.01	<	0.02	0.03	0.02	13	<	<	0.02	0.0192	0.03	0.03	▬
metalaxyl	57837-19-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
boscalid	188425-85-6	µg/L	0.04		<	<	<	<	<	<	<	<		<	<	11	<	<	<	<	<	<	●
amisulbrom	348635-87-0	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	●
Pyrimidine fungicides																							
Nieuwegein																							
bupirimate	41483-43-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
pyrimethanil	53112-28-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cyprodinil	121552-61-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Nieuwersluis																							
bupirimate	41483-43-6	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
pyrimethanil	53112-28-0	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
cyprodinil	121552-61-2	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
Andijk																							
bupirimate	41483-43-6	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
pyrimethanil	53112-28-0	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
cyprodinil	121552-61-2	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
Strobilurine fungicides																							
Nieuwegein																							
kresoxim-methyl	143390-89-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
azoxystrobin	131860-33-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Nieuwersluis																							
kresoxim-methyl	143390-89-0	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
azoxystrobin	131860-33-8	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	●
Andijk																							
kresoxim-methyl	143390-89-0	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
Other fungicides																							
Lobith																							
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dodine	2439-10-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
pyrazophos	13457-18-6	µg/L	0.005	<	<	<	<	<	<		<	<	<	<	<	12	<	<	<	<	<	<	●
tolclofos-methyl	57018-04-9	µg/L	0.003	<	<	<	<	<	<		<	<	<	<	<	12	<	<	<	<	<	<	●
quinoxyfen	124495-18-7	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cybutryne	28159-98-0	µg/L	0.0008	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Nieuwegein																							
diethofencarb	87130-20-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dodemorph	1593-77-7	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
dodine	2439-10-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	14	<	<	<	<	<	<	●
fenpropimorph	67564-91-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
2-phenylphenol	90-43-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
furalaxyl	57646-30-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
hexachlorobenzene (HCB)	118-74-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
procymidone	32809-16-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
pyrazophos	13457-18-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
tolclofos-methyl	57018-04-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
triadimefon	43121-43-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○

An explanation of this table can be found on page 151-153.

Other fungicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
vinclozolin	50471-44-8	µg/L	0.02	<	<	<	<	<	<	<	<		<	<	<	12	<	<	<	<	<	<	●
dimethomorph	110488-70-5	µg/L	0.07	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	○
edifenphos	17109-49-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
bixafen	581809-46-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	○
fluxapyroxad	907204-31-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
isoparazam	881685-58-1	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
quinoxyfen	124495-18-7	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cybutryne	28159-98-0	µg/L	0.0008	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cis-dimethomorph	113210-97-2	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
trans-dimethomorph	113210-98-3	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	○
cis-dodemorph		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
trans-dodemorph		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
Nieuwersluis																							
diethofencarb	87130-20-9	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	●
dodemorph	1593-77-7	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dodine	2439-10-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
fenpropimorph	67564-91-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
2-phenylphenol	90-43-7	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	●
furalaxyl	57646-30-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	●
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
procymidone	32809-16-8	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
pyrazophos	13457-18-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
tolclofos-methyl	57018-04-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
triadimefon	43121-43-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
vinclozolin	50471-44-8	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
dimethomorph	110488-70-5	µg/L	0.07	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
edifenphos	17109-49-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
bixafen	581809-46-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
fluxapyroxad	907204-31-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	●
isoparazam	881685-58-1	µg/L	0.04			<		<			<			<		4	<	*	*	<	*	<	●
quinoxyfen	124495-18-7	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cybutryne	28159-98-0	µg/L	0.0008	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
cis-dimethomorph	113210-97-2	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
trans-dimethomorph	113210-98-3	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cis-dodemorph		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
trans-dodemorph		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Andijk																							
diethofencarb	87130-20-9	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dodemorph	1593-77-7	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dodine	2439-10-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
fenpropimorph	67564-91-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
furalaxyl	57646-30-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	●
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
procymidone	32809-16-8	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
pyrazophos	13457-18-6	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
tolclofos-methyl	57018-04-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
triadimefon	43121-43-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
vinclozolin	50471-44-8	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	●
dimethomorph	110488-70-5	µg/L	0.07	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●

An explanation of this table can be found on page 151-153.

Other fungicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
edifenphos	17109-49-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bixafen	581809-46-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fluxapyroxad	907204-31-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
isoparazam	881685-58-1	µg/L	0.04			<		<			<			<		4	<	*	*	<	*	<	
quinoxyfen	124495-18-7	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cybutryne	28159-98-0	µg/L	0.0008	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-dimethomorph	113210-97-2	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-dimethomorph	113210-98-3	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-dodemorph		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-dodemorph		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Phenoxy herbicides																							
Lobith																							
2,4-dichlorophenoxyacetic acid (2,4-D)	94-75-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-(2,4-dichlorophenoxy)butanoic acid (2,4-DB)	94-82-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4-dichlorprop (2,4-DP)	120-36-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-chloro-2-methylphenoxyacetic acid (MCPA)	94-74-6	µg/L	0.01	<	<	0.01	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.01	
4-(4-chloro-2-methylphenoxy)butanoic acid (MCPB)	94-81-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
mecoprop (MCPP)	93-65-2	µg/L	0.01	<	<	<	<	0.01	0.01	<	0.02	0.01	0.02	<	0.0125	13	<	<	<	<	0.02	0.02	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-(2,4,5-trichlorophenoxy)propionic acid (2,4,5-TP)	93-72-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
2,4-dichlorophenoxyacetic acid (2,4-D)	94-75-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	0.01	
2,4-dichlorprop (2,4-DP)	120-36-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	0.02	
4-chloro-2-methylphenoxyacetic acid (MCPA)	94-74-6	µg/L	0.01	<	<	<	<	0.0175	0.02	<	<	<	<	<	<	51	<	<	<	<	0.02	0.02	
4-(4-chloro-2-methylphenoxy)butanoic acid (MCPB)	94-81-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	50	<	<	<	<	<	<	
mecoprop (MCPP)	93-65-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	0.01	0.01	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
Nieuwersluis																							
2,4-dichlorophenoxyacetic acid (2,4-D)	94-75-7	µg/L	0.01	<		<	<		<		<		0.01		<	7	<	*	*	<	*	0.01	
4-(2,4-dichlorophenoxy)butanoic acid (2,4-DB)	94-82-6	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,4-dichlorprop (2,4-DP)	120-36-5	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
4-chloro-2-methylphenoxyacetic acid (MCPA)	94-74-6	µg/L	0.01	<		<	<		0.01		<		0.02		<	7	<	*	*	<	*	0.02	
4-(4-chloro-2-methylphenoxy)butanoic acid (MCPB)	94-81-5	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
mecoprop (MCPP)	93-65-2	µg/L	0.01	0.01		0.01	0.01		0.02		<		0.02		0.01	7	<	*	*	0.0121	*	0.02	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2-(2,4,5-trichlorophenoxy)propionic acid (2,4,5-TP)	93-72-1	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
Andijk																							
2,4-dichlorophenoxyacetic acid (2,4-D)	94-75-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4-dichlorprop (2,4-DP)	120-36-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-chloro-2-methylphenoxyacetic acid (MCPA)	94-74-6	µg/L	0.01	0.01	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.01	
4-(4-chloro-2-methylphenoxy)butanoic acid (MCPB)	94-81-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
mecoprop (MCPP)	93-65-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Amide herbicides																							
Lobith																							
dimethenamid-p	163515-14-8	µg/L	0.001	<	<	<	<	0.00566	0.0065	0.00264	<	0.00136	0.00173	<	<	13	<	<	<	0.00168	0.00616	0.0065	
Nieuwegein																							
propyzamide	23950-58-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethenamid	87674-68-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
dimethenamid-p	163515-14-8	µg/L	0.001	0.00129	<	<	<	0.00142	0.00519	0.00828	0.00303	<	0.00124	0.00168	0.00161	13	<	<	0.00129	0.00202	0.00704	0.00828	

An explanation of this table can be found on page 151-153.

Amide herbicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis																							
propyzamide	23950-58-5	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
dimethenamid	87674-68-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethenamid-p	163515-14-8	µg/L	0.001	0.00145	<	0.00106	<	0.00162	0.00962	0.00617	0.00112	<	0.00153	0.00224	0.00118	13	<	<	0.00145	0.0022	0.00824	0.00962	
Andijk																							
propyzamide	23950-58-5	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
dimethenamid	87674-68-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethenamid-p	163515-14-8	µg/L	0.001	0.00174	0.00286	0.00453	0.00322	0.00188	0.00209	0.00382	0.00179	<	0.00128	0.0013	0.0014	13	<	<	0.00188	0.00238	0.00453	0.00455	
Anilide herbicides																							
Lobith																							
metazachlor	67129-08-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	0.00745	13	<	<	<	<	0.00852	0.0128	
metazachlor OA	1231244-60-2	µg/L	0.01	0.03	0.05	0.06	0.0125	<	<	<	<	<	<	<	<	13	<	<	<	0.0158	0.056	0.06	
metazachlor ESA	172960-62-2	µg/L	0.01	0.07	0.1	0.08	0.04	<	<	0.01	<	<	<	0.01	0.01	13	<	<	0.01	0.0296	0.092	0.1	
metazachlor ESA (load)		g/s		0.14	0.368	0.394	0.0671	0.00642	0.00939	0.0132	0.00631	0.00564	0.00854	0.0146	0.0121	13	0.00564	0.00591	0.0132	0.0856	0.384	0.394	
Nieuwegein																							
metazachlor	67129-08-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
metazachlor OA	1231244-60-2	µg/L	0.03	0.05	0.04	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.046	0.05	
metazachlor ESA	172960-62-2	µg/L	0.03	0.11	0.09	0.085	0.06	0.04	<	<	<	<	<	<	<	13	<	<	<	0.0442	0.102	0.11	
metazachlor ESA (load)		g/s		0.0275	0.0293	0.0434	0.0006	0.0004	0.00126	0.00015	0.00015	0.00015	0.00015	0.000386	0.00015	13	0.00015	0.00015	0.0004	0.0113	0.0541	0.0706	
Nieuwersluis																							
metazachlor	67129-08-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
metazachlor OA	1231244-60-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
metazachlor ESA	172960-62-2	µg/L	0.03			0.04		0.04			<			<		4	<	*	*	<	*	0.04	
Andijk																							
metazachlor	67129-08-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
metazachlor OA	1231244-60-2	µg/L	0.03	0.03	0.05	0.05	0.05	0.03	0.04	<	0.03	<	<	<	<	13	<	<	0.03	0.0312	0.056	0.06	
metazachlor ESA	172960-62-2	µg/L	0.03	0.05	0.08	0.09	0.09	0.07	0.07	0.05	0.06	0.05	<	0.04	0.03	13	<	<	0.06	0.0604	0.102	0.11	
Chloroacetanilide herbicides																							
Lobith																							
alachlor	15972-60-8	µg/L	0.001	<	<	<	<	<	<	<	0.00163	<	<	<	<	13	<	<	<	<	0.00118	0.00163	
Nieuwegein																							
alachlor	15972-60-8	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propachlor	1918-16-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
Nieuwersluis																							
alachlor	15972-60-8	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propachlor	1918-16-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
alachlor	15972-60-8	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propachlor	1918-16-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
(Bis-)carbamate herbicides																							
Nieuwegein																							
chlorpropham	101-21-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
methyl-N-(3-hydroxyphenyl) carbamate (MHPC)	13683-89-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
Nieuwersluis																							
chlorpropham	101-21-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methyl-N-(3-hydroxyphenyl) carbamate (MHPC)	13683-89-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
chlorpropham	101-21-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methyl-N-(3-hydroxyphenyl) carbamate (MHPC)	13683-89-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Sulfonylurea herbicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith																							
metsulphuron-methyl	74223-64-6	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
nicosulfuron	111991-09-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
triflusulfuron-methyl	126535-15-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
metsulphuron-methyl	74223-64-6	µg/L	0.002	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
nicosulfuron	111991-09-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triflusulfuron-methyl	126535-15-7	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
nicosulfuron	111991-09-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Urea herbicides																							
Lobith																							
chlortoluron	15545-48-9	µg/L	0.0003	0.00221	0.00404	0.0022	0.00126	0.00141	0.00096	0.00077	<	0.00043	0.00102	0.0128	0.0159	13	<	<	0.00141	0.00455	0.019	0.0232	
diuron	330-54-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
isoproturon	34123-59-6	µg/L		0.0012	0.00115	0.00299	0.00183	0.0029	0.0025	0.00231	0.0023	0.00261	0.00387	0.00382	0.00541	13	0.00115	0.00117	0.00261	0.00295	0.00555	0.00613	
linuron	330-55-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methabenzthiazuron	18691-97-9	µg/L	0.0001	<	0.00013	<	0.00012	0.00019	0.00017	<	<	0.00011	0.00011	<	<	13	<	<	<	<	0.000182	0.00019	
monolinuron	1746-81-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	0.00129	<	<	13	<	<	<	<	<	0.00129	
Nieuwegein																							
4-isopropylaniline	99-88-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloro-4-methoxyaniline	5345-54-0	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorbromuron	13360-45-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
chlortoluron	15545-48-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
diuron	330-54-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
isoproturon	34123-59-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
linuron	330-55-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
methabenzthiazuron	18691-97-9	µg/L	0.0001	<	0.00011	0.000105	0.00017	0.00022	0.00028	<	<	0.00015	0.00016	0.00023	<	13	<	<	0.00015	0.000133	0.00026	0.00028	
metoxuron	19937-59-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
monolinuron	1746-81-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
monuron	150-68-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
1-(3,4-dichlorophenyl)urea (DCPU)	2327-02-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
1-(3,4-dichlorophenyl)-3-methylurea (DCPMU)	3567-62-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
Nieuwersluis																							
4-isopropylaniline	99-88-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-chloro-4-methoxyaniline	5345-54-0	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
chlorbromuron	13360-45-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlortoluron	15545-48-9	µg/L		0.0115	0.00557	0.00276	0.00203	0.00251	0.00108	0.00079	0.00069	0.00065	0.0006	0.00141	0.00502	13	0.0006	0.00062	0.00203	0.00287	0.00913	0.0115	
diuron	330-54-1	µg/L	0.0006	0.00312	<	0.00267	0.00232	0.00353	0.00488	0.0064	0.00331	0.00363	0.0058	0.00441	0.00509	13	<	0.00111	0.00353	0.0037	0.00616	0.0064	
isoproturon	34123-59-6	µg/L		0.00228	0.00131	0.0014	0.00181	0.00266	0.00227	0.00218	0.00181	0.00243	0.00246	0.00302	0.00254	13	0.00131	0.00132	0.00227	0.00212	0.00288	0.00302	
linuron	330-55-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methabenzthiazuron	18691-97-9	µg/L	0.0001	0.00024	0.00015	0.00016	0.00019	0.0003	0.00021	<	0.00017	0.00021		0.00035	<	12	<	<	0.00019	0.000187	0.000335	0.00035	
metoxuron	19937-59-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
monolinuron	1746-81-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
monuron	150-68-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1-(3,4-dichlorophenyl)urea (DCPU)	2327-02-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1-(3,4-dichlorophenyl)-3-methylurea (DCPMU)	3567-62-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
4-isopropylaniline	99-88-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-chloro-4-methoxyaniline	5345-54-0	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	

An explanation of this table can be found on page 151-153.

Urea herbicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
chlorbromuron	13360-45-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlortoluron	15545-48-9	µg/L		0.00384	0.00544	0.004	0.00307	0.00186	0.00168	0.00111	0.0008	0.00077	0.00064	0.00065	0.00279	13	0.00064	0.000644	0.00186	0.00236	0.00502	0.00544	
diuron	330-54-1	µg/L		0.00206	0.00218	0.00203	0.00149	0.00181	0.00125	0.002	0.00137	0.00115	0.00189	0.00227	0.00261	13	0.00115	0.00119	0.00199	0.00186	0.00247	0.00261	
isoproturon	34123-59-6	µg/L	0.0003	0.00139	0.00111	0.000955	0.00062	0.00069	<	0.00068	<	0.00038	0.00136	0.00109	0.00143	13	<	<	0.0009	0.000843	0.00141	0.00143	
linuron	330-55-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methabenzthiazuron	18691-97-9	µg/L	0.0001	<	<	0.00016	0.00014	<	0.00021	<	<	0.00017	<	0.00035	<	13	<	<	<	0.000118	0.000294	0.00035	
metoxuron	19937-59-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
monolinuron	1746-81-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
monuron	150-68-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1-(3,4-dichlorophenyl)urea (DCPU)	2327-02-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1-(3,4-dichlorophenyl)-3-methylurea (DCPMU)	3567-62-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Triazine herbicides																							
Lobith																							
atrazine	1912-24-9	µg/L	0.002	<	<	<	0.0192	0.00328	0.00252	0.00249	0.00425	<	0.00207	0.00203	<	13	<	<	0.00203	0.00322	0.0132	0.0192	
desethylatrazine	6190-65-4	µg/L		0.00414	0.00239	0.00314	0.00466	0.0037	0.00366	0.00392	0.00345	0.00287	0.00391	0.00424	0.00355	13	0.00239	0.00258	0.00366	0.00363	0.00449	0.00466	
metolachlor	51218-45-2	µg/L		0.00109	0.00221	0.00298	0.00352	0.0187	0.00884	0.00515	0.00185	0.00184	0.00455	0.00521	0.00434	13	0.00109	0.00139	0.00352	0.00497	0.0148	0.0187	
propazine	139-40-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
simazine	122-34-9	µg/L	0.001	<	<	<	<	<	<	<	0.00149	0.00115	0.00155	<	<	13	<	<	<	<	0.00153	0.00155	
terbutryn	886-50-0	µg/L		0.00388	0.00256	0.00204	0.00341	0.00444	0.00405	0.00385	0.00431	0.00405	0.00617	0.00543	0.00508	13	0.00204	0.00225	0.00405	0.00418	0.00592	0.00617	
terbuthylazine	5915-41-3	µg/L	0.002	<	0.00205	<	<	0.00445	0.00807	0.0136	0.005	0.00345	0.00311	<	0.00215	13	<	<	0.00311	0.0037	0.0114	0.0136	
metolachlor OA	152019-73-3	µg/L	0.01	0.02	0.02	0.02	0.015	<	<	0.01	<	<	<	<	<	13	<	<	<	0.0104	0.02	0.02	
metolachlor OA (load)		g/s		0.04	0.0736	0.0986	0.0256	0.00642	0.00939	0.0132	0.00631	0.00564	0.00854	0.00729	0.00605	13	0.00564	0.00581	0.00939	0.0251	0.0886	0.0986	
metolachlor ESA	171118-09-5	µg/L		0.06	0.05	0.06	0.04	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.02	13	0.01	0.01	0.02	0.03	0.06	0.06	
Nieuwegein																							
atrazine	1912-24-9	µg/L	0.002	<	<	<	<	0.0299	0.00811	0.00331	0.0033	0.00307	0.00248	0.00225	0.00218	13	<	<	0.00225	0.00458	0.0212	0.0299	
cyanazine	21725-46-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	0.02	
desethylatrazine	6190-65-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	0.01	
desisopropylatrazine	1007-28-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
desmetryn	1014-69-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
hexazinone	51235-04-2	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
metamitron	41394-05-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
metolachlor	51218-45-2	µg/L	0.01	<	<	<	<	0.0125	<	0.0175	0.0117	<	<	<	<	26	<	<	<	<	0.02	0.03	
metribuzin	21087-64-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
prometryn	7287-19-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
propazine	139-40-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
simazine	122-34-9	µg/L	0.001	<	<	<	<	0.00104	<	0.00117	0.00106	0.00251	0.00164	<	<	13	<	<	<	<	0.00216	0.00251	
terbutryn	886-50-0	µg/L	0.002	0.00224	0.00205	<	<	0.00257	0.00342	0.00402	0.00337	0.00454	0.00368	0.0046	0.00454	13	<	<	0.00337	0.00305	0.00458	0.0046	
terbuthylazine	5915-41-3	µg/L	0.002	<	<	<	<	<	0.00796	0.0166	0.0111	0.00545	0.00456	0.00202	0.00252	13	<	<	0.00202	0.00432	0.0144	0.0166	
desethyl-terbutylazine	30125-63-4	µg/L	0.01	<	<	<	<	<	<	0.02	0.0117	<	<	<	0.0125	26	<	<	<	<	0.02	0.02	
metolachlor OA	152019-73-3	µg/L	0.03	0.03	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.03	
metolachlor OA (load)		g/s		0.0075	0.00489	0.0074	0.00015	0.00015	0.00126	0.00015	0.00015	0.00015	0.00015	0.000386	0.00015	13	0.00015	0.00015	0.00015	0.0023	0.0101	0.0118	
metolachlor ESA	171118-09-5	µg/L	0.03	0.07	0.06	0.06	0.05	0.03	<	<	<	<	<	<	<	13	<	<	<	0.0335	0.07	0.07	
Nieuwersluis																							
atrazine	1912-24-9	µg/L	0.002	<	<	<	<	0.0167	0.00502	0.00309	0.00253	0.00373	<	0.00237	<	13	<	<	<	0.00311	0.012	0.0167	
cyanazine	21725-46-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
desethylatrazine	6190-65-4	µg/L		0.00235	0.00203	0.00131	0.00235	0.00424	0.00363	0.00369	0.00301	0.00319	0.00241	0.00301	0.00269	13	0.00106	0.00126	0.00269	0.00271	0.00402	0.00424	
desisopropylatrazine	1007-28-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
desmetryn	1014-69-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexazinone	51235-04-2	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
metamitron	41394-05-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Triazine herbicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
metolachlor	51218-45-2	µg/L		0.00251	0.00123	0.00216	0.00349	0.00413	0.00995	0.00805	0.00218	0.00203	0.00164	0.00242	0.00364	13	0.00123	0.00139	0.00242	0.00351	0.00919	0.00995	
metribuzin	21087-64-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
prometryn	7287-19-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propazine	139-40-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
simazine	122-34-9	µg/L	0.001	<	<	<	<	0.00101	0.00132	0.00149	0.00101	0.00222	<	0.00116	<	13	<	<	<	<	0.00193	0.00222	
terbutryn	886-50-0	µg/L	0.002	0.00323		<	0.00212	0.00265	0.00386	0.00426	0.00363	0.00405	0.00315	0.00382	0.004	12	<	<	0.00343	0.00306	0.0042	0.00426	
terbuthylazine	5915-41-3	µg/L	0.002	0.00224	<	<	<	<	0.00938	0.0152	0.00729	0.00448	0.00283	0.00236	0.00235	13	<	<	0.00236	0.00405	0.0129	0.0152	
desethyl-terbutylazine	30125-63-4	µg/L	0.01	0.01	<	<	<	<	0.01	<	<	<	<	<	<	13	<	<	<	<	0.01	0.01	
metolachlor OA	152019-73-3	µg/L	0.03			0.03		<			<			<		4	<	*	*	<	*	0.03	
metolachlor ESA	171118-09-5	µg/L	0.03			0.06		0.03			<			<		4	<	*	*	<	*	0.06	
Andijk																							
atrazine	1912-24-9	µg/L	0.002	<	<	<	<	0.0237	0.0111	0.00984	0.00824	0.00859	0.00437	0.00453	0.00344	13	<	<	0.00437	0.00606	0.0187	0.0237	
cyanazine	21725-46-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
desethylatrazine	6190-65-4	µg/L		0.00264	0.00205	0.002	0.00149	0.00312	0.00251	0.00369	0.00301	0.00302	0.00321	0.00302	0.00279	13	0.00149	0.00165	0.00279	0.00266	0.0035	0.00369	
desisopropylatrazine	1007-28-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
desmetryn	1014-69-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexazinone	51235-04-2	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
metamitron	41394-05-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
metolachlor	51218-45-2	µg/L		0.00186	0.00328	0.0049	0.00352	0.00362	0.00341	0.00414	0.00257	0.0021	0.00174	0.00221	0.00318	13	0.00174	0.00179	0.00328	0.00319	0.00501	0.00547	
metribuzin	21087-64-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
prometryn	7287-19-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propazine	139-40-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
simazine	122-34-9	µg/L	0.001	<	<	<	<	<	<	0.00101	<	<	0.00135	0.00107	<	13	<	<	<	<	0.00124	0.00135	
terbutryn	886-50-0	µg/L	0.002	0.00262	<	0.00234	<	<	<	0.0024	<	<	0.00268	0.00235	0.00314	13	<	<	0.0023	<	0.00296	0.00314	
terbuthylazine	5915-41-3	µg/L	0.002	0.00419	0.00234	0.00303	0.00233	<	0.00436	0.00714	0.00676	0.00688	0.00542	0.00538	0.00399	13	<	<	0.00419	0.0043	0.00704	0.00714	
desethyl-terbutylazine	30125-63-4	µg/L	0.01	0.01	<	<	<	<	<	<	<	<	0.01	<	<	13	<	<	<	<	0.01	0.01	
metolachlor OA	152019-73-3	µg/L		0.08	0.12	0.125	0.13	0.09	0.1	0.07	0.07	0.07	0.03	0.05	0.05	13	0.03	0.038	0.08	0.0854	0.136	0.14	
metolachlor ESA	171118-09-5	µg/L		0.14	0.22	0.21	0.21	0.15	0.17	0.11	0.12	0.11	0.07	0.1	0.09	13	0.07	0.078	0.14	0.147	0.232	0.24	
Thiocarbamate herbicides																							
Nieuwegein																							
prosulfocarb	52888-80-9	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
prosulfocarb	52888-80-9	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
prosulfocarb	52888-80-9	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Uracil herbicides																							
Nieuwegein																							
bromacil	314-40-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
Nieuwersluis																							
bromacil	314-40-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
bromacil	314-40-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Other herbicides																							
Lobith																							
aclonifen	74070-46-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bentazon	25057-89-0	µg/L	0.01	<	<	<	<	<	<	<	0.03	<	<	0.04	<	13	<	<	<	<	0.036	0.04	
bifenox	42576-02-3	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chloridazon	1698-60-8	µg/L	0.001	<	<	<	<	0.0011	<	0.00106	<	<	<	<	<	13	<	<	<	<	0.00108	0.0011	
2,4-dinitrophenol	51-28-5	µg/L	0.01	<	<	<	<	0.01	0.02	<	<	0.01	0.01	0.01	<	13	<	<	<	<	0.016	0.02	
dinoseb (2-sec-butyl-4,6-dinitrophenol)	88-85-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	0.0125	13	<	<	<	<	0.014	0.02	

An explanation of this table can be found on page 151-153.

Other herbicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
dinoterb (2-tert-butyl-4,6-dinitrophenol)	1420-07-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
glyphosate	1071-83-6	µg/L	0.03	<	<	<	0.0706		<	<	<	<	<	<	<	12	<	<	<	<	0.0539	0.0706	
glyphosate (load)		g/s		0.00697	0.0185	0.0128	0.0886		0.0254	0.02	0.0208	0.0206	0.0194	0.0282	0.0285	12	0.00697	0.00872	0.0203	0.0265	0.0741	0.0886	
trifluralin	1582-09-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aminomethylphosphonic acid (AMPA)	1066-51-9	µg/L		0.209	0.117	0.104	0.184		0.246	0.21	0.232	0.219	0.238	0.213	0.254	12	0.104	0.108	0.213	0.207	0.28	0.295	
aminomethylphosphonic acid (AMPA) (load)		g/s		0.291	0.432	0.266	0.231		0.417	0.28	0.321	0.301	0.308	0.401	0.449	12	0.231	0.242	0.315	0.345	0.528	0.569	
chloridazon-methyl-desphenyl	17254-80-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.022	0.03	
chloridazon-desphenyl	6339-19-1	µg/L		0.04	0.05	0.05	0.065	0.051	0.04	0.04	0.04	0.03	0.03	0.04	0.04	13	0.03	0.03	0.04	0.0447	0.066	0.07	
glufosinate	51276-47-2	µg/L	0.01	<	<	<	<		<	<	<	<	0.0168	0.0153	0.0138	12	<	<	<	<	0.0209	0.0227	
Nieuwegein																							
aclonifen	74070-46-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bentazon	25057-89-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	0.0275	51	<	<	<	<	0.03	0.04	
bifenox	42576-02-3	µg/L	0.001	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
chlorthal	2136-79-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
chloridazon	1698-60-8	µg/L	0.001	<	0.00109	<	0.0026	0.00201	0.00163	0.00206	0.0019	0.00232	0.00165	<	0.00173	13	<	<	0.00165	0.00146	0.00249	0.0026	
dalapon (2,2-dichloropropionic acid)	75-99-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
dicamba	1918-00-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	49	<	<	<	<	<	0.01	
dichlobenil	1194-65-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,6-dichlorobenzamide (BAM)	2008-58-4	µg/L	0.01	<	<	<	0.01	<	<	<	<	<	<	<	<	13	<	<	<	<	0.01	0.01	
2,4-dinitrophenol	51-28-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dinoseb (2-sec-butyl-4,6-dinitrophenol)	88-85-7	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dinoterb (2-tert-butyl-4,6-dinitrophenol)	1420-07-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethofumesat	26225-79-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
glyphosate	1071-83-6	µg/L	0.03	<	<	<	<	0.031	<	0.032	<	<	<	<	<	13	<	<	<	<	0.0316	0.032	
glyphosate (load)		g/s		0.00375	0.00489	0.0074	0.00015	0.00031	0.00126	0.00032	0.00015	0.00015	0.00015	0.000386	0.00015	13	0.00015	0.00015	0.00032	0.00204	0.00902	0.0118	
trifluralin	1582-09-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aminomethylphosphonic acid (AMPA)	1066-51-9	µg/L		0.164	0.28	0.161	0.347	0.502	0.781	0.691	0.605	0.619	0.691	0.644	0.532	13	0.158	0.16	0.532	0.475	0.745	0.781	
aminomethylphosphonic acid (AMPA) (load)		g/s		0.041	0.0913	0.0786	0.00347	0.00502	0.0657	0.00691	0.00605	0.00619	0.00691	0.0166	0.00532	13	0.00347	0.00409	0.00691	0.0317	0.111	0.124	
sebuthylazine	7286-69-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
flumioxazin	103361-09-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<		24	<	<	<	<	<	<	
glufosinate	51276-47-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
aclonifen	74070-46-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	
bentazon	25057-89-0	µg/L	0.01	0.02		0.01	0.01		<		0.03		0.02		0.02	7	<	*	*	0.0164	*	0.03	
bifenox	42576-02-3	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorthal	2136-79-0	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
chloridazon	1698-60-8	µg/L		0.00298	0.00215	0.00211	0.00333	0.00289	0.00281	0.0029	0.00226	0.00237	0.00303	0.00271	0.00246	13	0.00172	0.00189	0.00271	0.00262	0.00321	0.00333	
dalapon (2,2-dichloropropionic acid)	75-99-0	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
dicamba	1918-00-9	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
dichlobenil	1194-65-6	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
2,6-dichlorobenzamide (BAM)	2008-58-4	µg/L	0.01			0.02		<			<			<		4	<	*	*	<	*	0.02	
2,4-dinitrophenol	51-28-5	µg/L		0.01		0.02	0.02		0.01		0.01		0.02		0.02	7	0.01	*	*	0.0157	*	0.02	
dinoseb (2-sec-butyl-4,6-dinitrophenol)	88-85-7	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
dinoterb (2-tert-butyl-4,6-dinitrophenol)	1420-07-1	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
ethofumesat	26225-79-6	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
glyphosate	1071-83-6	µg/L	0.03	0.03	<	<	0.03	0.033	<	<	0.039	<	<	<	<	13	<	<	<	<	0.0366	0.039	
trifluralin	1582-09-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aminomethylphosphonic acid (AMPA)	1066-51-9	µg/L		0.296	0.289	0.186	0.431	0.599	0.689	0.683	0.811	0.647	0.504	0.553	0.425	13	0.141	0.177	0.504	0.485	0.762	0.811	

An explanation of this table can be found on page 151-153.

Other herbicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
sebuthylazine	7286-69-3	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
flumioxazin	103361-09-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<		12	<	<	<	<	<	<	
glufosinate	51276-47-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
aclonifen	74070-46-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bentazon	25057-89-0	µg/L	0.02	<	0.02	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.02	
bifenox	42576-02-3	µg/L	0.001	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
chlorthal	2136-79-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chloridazon	1698-60-8	µg/L		0.00256	0.00104	0.00363	0.00269	0.00169	0.00212	0.00162	0.00193	0.00162	0.0016	0.00189	0.00156	13	0.00104	0.00125	0.00189	0.00212	0.00428	0.00534	
dalapon (2,2-dichloropropionic acid)	75-99-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dicamba	1918-00-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dichlobenil	1194-65-6	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
2,6-dichlorobenzamide (BAM)	2008-58-4	µg/L	0.01	0.03	0.01	0.03	0.03	0.01	0.02	<	0.01	<	0.02	0.03	0.02	13	<	<	0.02	0.0192	0.03	0.03	
2,4-dinitrophenol	51-28-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dinoseb (2-sec-butyl-4,6-dinitrophenol)	88-85-7	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dinoterb (2-tert-butyl-4,6-dinitrophenol)	1420-07-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethofumesat	26225-79-6	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
glyphosate	1071-83-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trifluralin	1582-09-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aminomethylphosphonic acid (AMPA)	1066-51-9	µg/L		0.272	0.241	0.28	0.258	0.284	0.316	0.225	0.038	0.031	0.249	0.13	0.298	13	0.031	0.0338	0.258	0.223	0.309	0.316	
sebuthylazine	7286-69-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
flumioxazin	103361-09-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<		12	<	<	<	<	<	<	
glufosinate	51276-47-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Physiological plant growth regulators																							
Nieuwegein																							
diphenylamine	122-39-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
diphenylamine	122-39-4	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
diphenylamine	122-39-4	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
Other plant growth regulators																							
Lobith																							
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-(2,4,5-trichlorophenoxy)propionic acid (2,4,5-TP)	93-72-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
carbaryl	63-25-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
metoxuron	19937-59-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	14	<	<	<	<	<	<	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
Nieuwersluis																							
carbaryl	63-25-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
metoxuron	19937-59-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2-(2,4,5-trichlorophenoxy)propionic acid (2,4,5-TP)	93-72-1	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
Andijk																							
carbaryl	63-25-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
metoxuron	19937-59-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Other plant growth regulators	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Germination inhibitors																							
Nieuwegein																							
chlorpropham	101-21-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
Nieuwersluis																							
chlorpropham	101-21-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
chlorpropham	101-21-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Soil decontaminants																							
Lobith																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Wood preservatives																							
Lobith																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L		0.02	0.02	0.01	0.02	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.02	13	0.01	0.01	0.02	0.0192	0.026	0.03	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L	0.05	<	<	<	0.062	0.0595	<	<	<	<	<	<	<	26	<	<	<	<	0.062	0.065	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
Nieuwersluis																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L	0.05	0.14	0.092	0.11	0.087	0.1	0.074	0.077	<	0.064	0.068	0.077	0.058	13	<	<	0.077	0.0832	0.132	0.14	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
N,N-dimethylsulphamide (DMS)	3984-14-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachlorobenzene (HCB)	118-74-1	µg/L	0.0002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
N,N-dimethyl-N'-p-tolylsulphamide (DMST)	66840-71-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Insecticides, neonicotinoids																							
Lobith																							
imidacloprid	138261-41-3	µg/L	0.0005	0.00222	0.00138	0.00146	0.00244	<	0.00152	0.00175	0.00128	0.0014	0.00281	0.00287	<	13	<	<	0.00146	0.00153	0.00285	0.00287	
thiacloprid	111988-49-9	µg/L	0.0005	<	<	<	0.00067	0.00082	0.001	<	0.00052	<	<	<	<	13	<	<	<	<	0.000928	0.001	
Nieuwegein																							
imidacloprid	138261-41-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
thiacloprid	111988-49-9	µg/L	0.0005	<	<	<	0.00119	0.00244	0.00155	0.00076	0.00079	<	0.0006	0.00081	<	13	<	<	0.0006	0.000742	0.00208	0.00244	
clothianidin	210880-92-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
thiametoxam	153719-23-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
imidacloprid	138261-41-3	µg/L		0.00317	0.00321	0.00255	0.00335	0.00282	0.0029	0.00269	0.00229	0.00321	0.00479	0.00537	0.00457	13	0.00203	0.00213	0.00317	0.00334	0.00514	0.00537	
thiacloprid	111988-49-9	µg/L	0.0005	0.00054	<	<	0.0012	0.0021	0.00227	0.00072	0.00064	<	0.00071	0.00153	<	13	<	<	0.00064	0.000843	0.0022	0.00227	
clothianidin	210880-92-5	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
thiametoxam	153719-23-4	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	

An explanation of this table can be found on page 151-153.

Insecticides, neonicotinoids	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk																							
imidacloprid	138261-41-3	µg/L	0.0005	0.00149	0.00163	0.00233	0.00133	<	0.00104	0.00066	0.00276	<	0.00191	0.0013	0.00169	13	<	<	0.00149	0.00146	0.0026	0.00276	
thiacloprid	111988-49-9	µg/L	0.0005	<	<	<	<	<	<	<	0.00056	<	<	0.00092	<	13	<	<	<	<	0.000776	0.00092	
Pyrethroid insecticides																							
Lobith																							
cyhalothrin	68085-85-8	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cypermethrin	52315-07-8	µg/L	0.0007	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
deltamethrin	52918-63-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
esfenvalerate	66230-04-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
cyhalothrin	68085-85-8	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cypermethrin	52315-07-8	µg/L	0.0007	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
deltamethrin	52918-63-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
esfenvalerate	66230-04-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
Nieuwersluis																							
cyhalothrin	68085-85-8	µg/L	0.005	<	<	<	<	<	<	<	<	<	0.00658	<	<	13	<	<	<	<	<	0.00658	
cypermethrin	52315-07-8	µg/L	0.0007	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
deltamethrin	52918-63-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
esfenvalerate	66230-04-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
cyhalothrin	68085-85-8	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cypermethrin	52315-07-8	µg/L	0.0007	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
deltamethrin	52918-63-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
esfenvalerate	66230-04-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Carbamate insecticides																							
Lobith																							
fenoxycarb	72490-01-8	µg/L	0.00009	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pirimicarb	23103-98-2	µg/L	0.0003	<	<	<	<	0.00035	<	<		<	<	<	<	12	<	<	<	<	<	0.00035	
Nieuwegein																							
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
aldicarb-sulfone	1646-88-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
aldicarb-sulfoxide	1646-87-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
butocarboxim	34681-10-2	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
butoxycarboxim	34681-23-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
carbaryl	63-25-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
carbofuran	1563-66-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
ethiofencarb	29973-13-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
fenoxycarb	72490-01-8	µg/L	0.00009	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methiocarb	2032-65-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
pirimicarb	23103-98-2	µg/L	0.0003	<		<	0.00032	<	<	<	<	<	<	<	<	12	<	<	<	<	<	0.00032	
butocarboxim-sulfoxide	34681-24-8	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
methiocarb-sulfone	2179-25-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	50	<	<	<	<	<	<	
methiocarb-sulphoxide	2635-10-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
Nieuwersluis																							
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfone	1646-88-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfoxide	1646-87-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
butocarboxim	34681-10-2	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Carbamate insecticides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
butoxycarboxim	34681-23-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
carbaryl	63-25-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
carbofuran	1563-66-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethiofencarb	29973-13-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenoxycarb	72490-01-8	µg/L	0.00009	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methiocarb	2032-65-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pirimicarb	23103-98-2	µg/L	0.0003	<	0.00032	<	0.00043	<	0.00038	<	<	<	<	0.00049	0.00091	13	<	<	<	0.000305	0.000742	0.00091	
butocarboxim-sulfoxide	34681-24-8	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methiocarb-sulfone	2179-25-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<		12	<	<	<	<	<	<	
methiocarb-sulphoxide	2635-10-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfone	1646-88-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfoxide	1646-87-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
butocarboxim	34681-10-2	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
butoxycarboxim	34681-23-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
carbaryl	63-25-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
carbofuran	1563-66-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethiofencarb	29973-13-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenoxycarb	72490-01-8	µg/L	0.00009	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methiocarb	2032-65-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pirimicarb	23103-98-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
butocarboxim-sulfoxide	34681-24-8	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methiocarb-sulfone	2179-25-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<		12	<	<	<	<	<	<	
methiocarb-sulphoxide	2635-10-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Organophosphorus insecticides																							
Lobith																							
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
coumaphos	56-72-4	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diazinon	333-41-5	µg/L	0.0002	<	<	<	<	0.00024	0.00022		<	<	<	0.00022	<	12	<	<	<	<	0.000234	0.00024	
dichlorvos	62-73-7	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethoate	60-51-5	µg/L	0.0003	<	<	<	<	<	0.00035	<	0.00031	<	<	<	<	13	<	<	<	<	0.000334	0.00035	
fenitrothion	122-14-5	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
malathion	121-75-5	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
parathion-ethyl	56-38-2	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
parathion-methyl	298-00-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pirimiphos-methyl	29232-93-7	µg/L	0.0001	0.00052	0.00016	0.00013	<	<	<		<	<	<	<	0.000105	12	<	<	<	0.000114	0.000412	0.00052	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorpyriphos-ethyl	2921-88-2	µg/L	0.001	<	<	<	<	<	<		<	<	<	<	<	12	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.002	<	<	<	<	<	<	<		<	<	<	<	11	<	<	<	<	<	<	
Nieuwegein																							
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
azinphos-methyl	86-50-0	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
coumaphos	56-72-4	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diazinon	333-41-5	µg/L	0.0002	<	0.00028	<	<	0.0003	0.00047	0.0005	0.00046	0.00025	0.00036	0.00054	0.00038	13	<	<	0.0003	0.000303	0.000524	0.00054	
dichlorvos	62-73-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
dimethoate	60-51-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Organophosphorus insecticides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
ethoprophos	13194-48-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
fenitrothion	122-14-5	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
phosphamidon	13171-21-6	µg/L	0.03	<	<	<	<		<	<	<	<	<		<	15	<	<	<	<	<	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
malathion	121-75-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
paraoxon-ethyl	311-45-5	µg/L	0.04	<		<	<	<		<	<	<	<	<	<	20	<	<	<	<	<	<	
parathion-ethyl	56-38-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
parathion-methyl	298-00-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
pirimiphos-methyl	29232-93-7	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfotep	3689-24-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<		12	<	<	<	<	<	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
cis-phosphamidon	23783-98-4	µg/L	0.02	<	<	<	<		<	<	<	<	<		<	15	<	<	<	<	<	<	
trans-phosphamidon	297-99-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
chlorpyriphos-ethyl	2921-88-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
Nieuwersluis																							
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	
azinphos-methyl	86-50-0	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
coumaphos	56-72-4	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	
diazinon	333-41-5	µg/L	0.0002		0.00029	<	0.00041	0.00029	0.00043	0.0004	0.00034	0.00058	0.00046	0.00032	0.00089	12	<	<	0.00037	0.000396	0.000797	0.00089	
dichlorvos	62-73-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethoate	60-51-5	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethoprophos	13194-48-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenitrothion	122-14-5	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
phosphamidon	13171-21-6	µg/L	0.03	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
malathion	121-75-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
paraoxon-ethyl	311-45-5	µg/L	0.04	<		<	<			<	<	<	<	<	<	10	<	<	<	<	<	<	
parathion-ethyl	56-38-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
parathion-methyl	298-00-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pirimiphos-methyl	29232-93-7	µg/L	0.0001		<	<	<	<	<		<	<	<		<	9	<	*	*	<	*	<	
sulfotep	3689-24-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-phosphamidon	23783-98-4	µg/L	0.02	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
trans-phosphamidon	297-99-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorpyriphos-ethyl	2921-88-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<		<	<	<	<	<	<	<	12	<	<	<	<	<	<	
azinphos-methyl	86-50-0	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
coumaphos	56-72-4	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diazinon	333-41-5	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	0.00024	13	<	<	<	<	<	0.00024	
dichlorvos	62-73-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethoate	60-51-5	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethoprophos	13194-48-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Organophosphorus insecticides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
fenitrothion	122-14-5	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
phosphamidon	13171-21-6	µg/L	0.03	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
malathion	121-75-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
paraoxon-ethyl	311-45-5	µg/L	0.04	<		<	<			<	<	<	<	<	<	10	<	<	<	<	<	<	
parathion-ethyl	56-38-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
parathion-methyl	298-00-0	µg/L	0.01	<	<	<	0.014	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0104	0.014	
pirimiphos-methyl	29232-93-7	µg/L	0.0001		<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
sulfotep	3689-24-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
cis-phosphamidon	23783-98-4	µg/L	0.02	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
trans-phosphamidon	297-99-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorpyriphos-ethyl	2921-88-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Organochlorine insecticides																							
Lobith																							
p,p'-DDD	72-54-8	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
p,p'-DDE	72-55-9	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
o,p'-DDT	789-02-6	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
p,p'-DDT	50-29-3	µg/L	0.00009	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
alpha-endosulfan	959-98-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
beta-endosulfan	33213-65-9	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
endrin	72-20-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
heptachlor	76-44-8	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
alpha-hexachlorocyclohexane (alpha-HCH)	319-84-6	µg/L	0.00006	<	<	0.00006	0.00009	0.00008	0.00008	0.00007	0.00007	0.00008	0.00008	<	0.000065	13	<	<	0.00007	0.0000638	0.000086	0.00009	
beta-hexachlorocyclohexane (beta-HCH)	319-85-7	µg/L		0.00029	0.00008	0.0001	0.0003	0.00017	0.00016	0.00024	0.00031	0.00022	0.0003	0.00012	0.000215	13	0.00008	0.000088	0.00022	0.000209	0.00031	0.00031	
lindane (gamma-HCH)	58-89-9	µg/L		0.00017	0.00012	0.0001	0.00018	0.00017	0.00014	0.00012	0.00014	0.00018	0.00016	0.00016	0.00119	13	0.0001	0.000108	0.00016	0.000309	0.00139	0.0022	
delta-hexachlorocyclohexane (delta-HCH)	319-86-8	µg/L	0.00008	<	<	<	<	<	<	<	<	0.0001	<	<	<	13	<	<	<	<	<	0.0001	
cis-heptachlor epoxide	1024-57-3	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-heptachlor epoxide	28044-83-9	µg/L	0.0007	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
p,p'-DDD	72-54-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
p,p'-DDE	72-55-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
o,p'-DDT	789-02-6	µg/L	0.0002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
p,p'-DDT	50-29-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
alpha-endosulfan	959-98-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
beta-endosulfan	33213-65-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
endrin	72-20-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
heptachlor	76-44-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
heptachlor epoxide (cis + trans)		µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
alpha-hexachlorocyclohexane (alpha-HCH)	319-84-6	µg/L	0.00006	0.00007		0.00007	<	<	0.00007	0.00007	0.00006	<	<	0.00007	<	12	<	<	0.00006	<	0.000077	0.00008	
beta-hexachlorocyclohexane (beta-HCH)	319-85-7	µg/L	0.00005	0.00013		0.000052	0.00016	0.00023	0.00027	0.00027	0.00037	0.00029	0.00039	0.00031	0.00017	12	<	<	0.00025	0.000225	0.000384	0.00039	
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00014		0.000145	0.00013	0.00013	0.00015	0.00011	<	<	0.00012	0.00016	0.00013	12	<	<	0.00013	0.00012	0.000174	0.00018	
delta-hexachlorocyclohexane (delta-HCH)	319-86-8	µg/L	0.00008	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
cis-heptachlor epoxide	1024-57-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
trans-heptachlor epoxide	28044-83-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
cis-chlorfenvinphos	18708-87-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
trans-chlorfenvinphos	18708-86-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Organochlorine insecticides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis																							
p,p'-DDD	72-54-8	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
p,p'-DDE	72-55-9	µg/L	0.0002	<	<	0.000205	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.000226	0.00031	●
o,p'-DDT	789-02-6	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
p,p'-DDT	50-29-3	µg/L	0.00009	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
alpha-endosulfan	959-98-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
beta-endosulfan	33213-65-9	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
endrin	72-20-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
heptachlor	76-44-8	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
heptachlor epoxide (cis + trans)		µg/L	0.04	<	<	<	<	<	<		<	<	<	<	<	12	<	<	<	<	<	<	●
alpha-hexachlorocyclohexane (alpha-HCH)	319-84-6	µg/L	0.00006	0.00008	<	0.00014	0.00008	0.00009	<	<	<	<	<	<	<	13	<	<	<	<	0.000148	0.00018	↘
beta-hexachlorocyclohexane (beta-HCH)	319-85-7	µg/L		0.00011	0.00011	0.000065	0.00014	0.00026	0.00016	0.00045	0.00038	0.00035	0.00023	0.00015	0.00015	13	0.00005	0.000062	0.00015	0.000202	0.000422	0.00045	▬
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00019	0.00021	0.0002	0.00024	0.00017	0.00009	<	0.0001	0.00009	0.00011	<	0.00017	13	<	<	0.00017	0.000142	0.000236	0.00024	↘
delta-hexachlorocyclohexane (delta-HCH)	319-86-8	µg/L	0.00008	0.0001	0.00012	0.00012	<	0.00011	<	<	<	<	<	<	<	13	<	<	<	<	0.000168	0.0002	●
cis-heptachlor epoxide	1024-57-3	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
trans-heptachlor epoxide	28044-83-9	µg/L	0.0007	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cis-chlorfenvinphos	18708-87-7	µg/L	0.02	<	<	<	<	<		<	<	<	<	<	<	12	<	<	<	<	<	<	●
trans-chlorfenvinphos	18708-86-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Andijk																							
p,p'-DDD	72-54-8	µg/L	0.0003	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
p,p'-DDE	72-55-9	µg/L	0.0002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
o,p'-DDT	789-02-6	µg/L	0.0002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
p,p'-DDT	50-29-3	µg/L	0.00009	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
alpha-endosulfan	959-98-8	µg/L	0.0005	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
beta-endosulfan	33213-65-9	µg/L	0.0003	0.00092		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.000689	0.00092	●
endrin	72-20-8	µg/L	0.0005	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
heptachlor	76-44-8	µg/L	0.00005	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
heptachlor epoxide (cis + trans)		µg/L	0.04	<	<	<	<	<	<		<	<	<	<	<	12	<	<	<	<	<	<	●
alpha-hexachlorocyclohexane (alpha-HCH)	319-84-6	µg/L	0.00006	0.00006		0.00008	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.000084	0.00009	↘
beta-hexachlorocyclohexane (beta-HCH)	319-85-7	µg/L		0.00015		0.000105	0.00009	0.00014	0.00011	0.00018	0.00015	0.00013	0.00016	0.00008	0.00013	12	0.00008	0.000083	0.00013	0.000128	0.000174	0.00018	↘
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00013		0.000095	0.00012	0.00012	0.00009	<	<	<	0.00009	<	0.00011	12	<	<	0.00009	0.0000842	0.000127	0.00013	↘
delta-hexachlorocyclohexane (delta-HCH)	319-86-8	µg/L	0.00008	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
cis-heptachlor epoxide	1024-57-3	µg/L	0.00005	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
trans-heptachlor epoxide	28044-83-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cis-chlorfenvinphos	18708-87-7	µg/L	0.02	<	<	<	<	<		<	<	<	<	<	<	12	<	<	<	<	<	<	●
trans-chlorfenvinphos	18708-86-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Benzoylurea insecticides																							
Lobith																							
teflubenzuron	83121-18-0	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Nieuwersluis																							
teflubenzuron	83121-18-0	µg/L	0.004	<		<	<		<		<		<		<	7	<	*	*	<	*	<	●
Insecticides produced by fermentation																							
Lobith																							
abamectine	71751-41-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
Nieuwegein																							
abamectine	71751-41-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	14	<	<	<	<	<	<	●
Nieuwersluis																							
abamectine	71751-41-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Andijk																							
abamectine	71751-41-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●

An explanation of this table can be found on page 151-153.

Other insecticides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith																							
1,2-dichlorobenzene	95-50-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
aldrin	309-00-2	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dicofol	115-32-2	µg/L	0.0001	0.0001	<	<	0.00023	0.00061	<	0.00013	0.00037	0.00013	0.00016	<	<	13	<	<	0.00011	0.000161	0.000514	0.00061	●
dieldrin	60-57-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
isodrin	465-73-6	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
pyridaben	96489-71-3	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
pyriproxyphen	95737-68-1	µg/L	0.00001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Nieuwegein																							
1,2-dichlorobenzene	95-50-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
aldrin	309-00-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dicofol	115-32-2	µg/L	0.0001	<		0.00015	0.00039	0.00026	0.0002	0.00062	0.00072	<	0.00019	0.00013	0.00011	12	<	<	0.00019	0.000252	0.00069	0.00072	●
dieldrin	60-57-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
isodrin	465-73-6	µg/L	0.0003	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
methomyl	16752-77-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	○
oxamyl	23135-22-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	○
pyridaben	96489-71-3	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
pyriproxyphen	95737-68-1	µg/L	0.00001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
flonicamid	158062-67-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
methoxyfenozide	161050-58-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cyflumetofen	400882-07-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	○
cis-deltamethrin		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
cis-fenvalerate		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
trans-fenvalerate		µg/L	0.06	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
trans-deltamethrin	64363-96-8	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	○
Nieuwersluis																							
1,2-dichlorobenzene	95-50-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
aldrin	309-00-2	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
dicofol	115-32-2	µg/L	0.0001	<	<	0.000185	0.00034	0.00034	<	0.00023	0.00084	0.00026	0.00014	<	<	13	<	<	0.00014	0.000213	0.00064	0.00084	●
dieldrin	60-57-1	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	●
isodrin	465-73-6	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
methomyl	16752-77-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
oxamyl	23135-22-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
pyridaben	96489-71-3	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	0.000205	0.00025	●
pyriproxyphen	95737-68-1	µg/L	0.00001	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	●
flonicamid	158062-67-0	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	●
methoxyfenozide	161050-58-4	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	●
cyflumetofen	400882-07-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cis-deltamethrin		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
cis-fenvalerate		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
trans-fenvalerate		µg/L	0.06	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
trans-deltamethrin	64363-96-8	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
Andijk																							
1,2-dichlorobenzene	95-50-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
aldrin	309-00-2	µg/L	0.0003	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
dicofol	115-32-2	µg/L	0.0001	<		<	0.00014	0.00027	<	<	0.00014	0.00031	<	<	<	12	<	<	<	0.00011	0.000298	0.00031	●
dieldrin	60-57-1	µg/L	0.0002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	●
isodrin	465-73-6	µg/L	0.0003	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	●

An explanation of this table can be found on page 151-153.

Other insecticides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
methomyl	16752-77-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
oxamyl	23135-22-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pyridaben	96489-71-3	µg/L	0.0002	<	<	0.00029	<	<	<	<	<	0.00026	<	<	<	13	<	<	<	<	0.000302	0.00033	
pyriproxyphen	95737-68-1	µg/L	0.00001	<	<	<	<	<	<	<	0.00003	<	<	<	<	13	<	<	<	<	0.00002	0.00003	
cyflumetofen	400882-07-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-deltamethrin		µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-fenvalerate		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-fenvalerate		µg/L	0.06	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-deltamethrin	64363-96-8	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Acaricides																							
Lobith																							
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
alpha-endosulfan	959-98-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
beta-endosulfan	33213-65-9	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
lindane (gamma-HCH)	58-89-9	µg/L		0.00017	0.00012	0.0001	0.00018	0.00017	0.00014	0.00012	0.00014	0.00018	0.00016	0.00016	0.00119	13	0.0001	0.000108	0.00016	0.000309	0.00139	0.0022	
parathion-ethyl	56-38-2	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.002	<	<	<	<	<	<	<		<	<	<	<	11	<	<	<	<	<	<	
Nieuwegein																							
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
butoxycarboxim	34681-23-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
alpha-endosulfan	959-98-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
beta-endosulfan	33213-65-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
phosphamidon	13171-21-6	µg/L	0.03	<	<	<	<		<	<	<	<	<		<	15	<	<	<	<	<	<	
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00014		0.000145	0.00013	0.00013	0.00015	0.00011	<	<	0.00012	0.00016	0.00013	12	<	<	0.00013	0.00012	0.000174	0.00018	
parathion-ethyl	56-38-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
sulfotep	3689-24-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<		12	<	<	<	<	<	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
butocarboxim-sulfoxide	34681-24-8	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
cis-phosphamidon	23783-98-4	µg/L	0.02	<	<	<	<		<	<	<	<	<		<	15	<	<	<	<	<	<	
trans-phosphamidon	297-99-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
cyflumetofen	400882-07-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
Nieuwersluis																							
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<	<	<	<	<	<		<		12	<	<	<	<	<	<	
butoxycarboxim	34681-23-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.01	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
alpha-endosulfan	959-98-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
beta-endosulfan	33213-65-9	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
phosphamidon	13171-21-6	µg/L	0.03	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00019	0.00021	0.0002	0.00024	0.00017	0.00009	<	0.0001	0.00009	0.00011	<	0.00017	13	<	<	0.00017	0.000142	0.000236	0.00024	

An explanation of this table can be found on page 151-153.

Acaricides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
parathion-ethyl	56-38-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfotep	3689-24-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
butocarboxim-sulfoxide	34681-24-8	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-phosphamidon	23783-98-4	µg/L	0.02	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
trans-phosphamidon	297-99-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cyflumetofen	400882-07-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
azinphos-ethyl	2642-71-9	µg/L	0.0006	<	<	<	<		<	<	<	<	<	<	<	12	<	<	<	<	<	<	
butoxycarboxim	34681-23-7	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
2-methyl-4,6-dinitrophenol (DNOC)	534-52-1	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
alpha-endosulfan	959-98-8	µg/L	0.0005	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
beta-endosulfan	33213-65-9	µg/L	0.0003	0.00092		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.000689	0.00092	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
phosphamidon	13171-21-6	µg/L	0.03	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00013		0.000095	0.00012	0.00012	0.00009	<	<	<	0.00009	<	0.00011	12	<	<	0.00009	0.0000842	0.000127	0.00013	
parathion-ethyl	56-38-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfotep	3689-24-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
butocarboxim-sulfoxide	34681-24-8	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-phosphamidon	23783-98-4	µg/L	0.02	<	<	<			<	<	<		<			8	<	*	*	<	*	<	
trans-phosphamidon	297-99-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
mevinphos	7786-34-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cyflumetofen	400882-07-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Rodenticides																							
Lobith																							
endrin	72-20-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
endrin	72-20-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
endrin	72-20-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
endrin	72-20-8	µg/L	0.0005	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
Nematicides																							
Lobith																							
cis-1,3-dichloropropene	10061-01-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-1,3-dichloropropene	10061-02-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
cis-1,3-dichloropropene	10061-01-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-1,3-dichloropropene	10061-02-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
aldicarb-sulfone	1646-88-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
aldicarb-sulfoxide	1646-87-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	52	<	<	<	<	<	<	
1,2-dibromo-3-chloropropane (DBCP)	96-12-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Nematicides	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
fluopyram	658066-35-4	µg/L	0.01	<	<	<	<	<	<	0.015	<	<	<	<	<	13	<	<	<	<	0.011	0.015	
Nieuwersluis																							
cis-1,3-dichloropropene	10061-01-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-1,3-dichloropropene	10061-02-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfone	1646-88-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfoxide	1646-87-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dibromo-3-chloropropane (DBCP)	96-12-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fluopyram	658066-35-4	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
cis-1,3-dichloropropene	10061-01-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-1,3-dichloropropene	10061-02-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb	116-06-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfone	1646-88-4	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
aldicarb-sulfoxide	1646-87-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dibromo-3-chloropropane (DBCP)	96-12-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
triazophos	24017-47-8	µg/L	0.00004	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
Ethers																							
Lobith																							
diisopropyl ether (DIPE)	108-20-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,4-dioxane	123-91-1	µg/L		0.569	0.555	0.286	0.702	0.816	0.588	0.743	0.858	1.16	0.622	0.946	1.42	13	0.249	0.264	0.743	0.767	1.32	1.42	
1,4-dioxane (load)		g/s		1.14	2.04	1.41	0.953	1.05	1.1	0.984	1.08	1.31	1.06	1.38	1.72	13	0.484	0.684	1.14	1.25	1.91	2.04	
Nieuwegein																							
diisopropyl ether (DIPE)	108-20-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetraethylene glycol dimethyl ether (tetraglyme)	143-24-8	µg/L	0.01	0.03	0.08	0.0125	<	0.02	0.05	0.14	0.06	0.03	0.04	0.05	0.03	13	<	<	0.03	0.0431	0.116	0.14	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	0.02	<	0.02	0.02	0.07	0.19	0.13	0.24	0.59	0.12	0.07	0.03	0.06	13	<	<	0.07	0.121	0.45	0.59	
bis(2-methoxyethyl)ether (diglyme)	111-96-6	µg/L	0.02	<	0.13	0.06	0.02	0.12	0.12	0.13	0.06	0.05	0.08	0.06	0.06	13	<	<	0.06	0.0738	0.13	0.13	
ethyl tert-butyl ether (ETBE)	637-92-3	µg/L	0.03	<	<	<	<	0.14	0.05	0.04	0.13	<	<	<	<	13	<	<	<	0.0381	0.136	0.14	
triethyleneglycol dimethylether (triglyme)	112-49-2	µg/L	0.01	<	0.05	0.0225	<	0.04	0.09	0.11	0.07	0.03	0.04	0.06	0.03	13	<	<	0.04	0.0442	0.102	0.11	
tert-amyl-methyl ether (TAME)	994-05-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,4-dioxane	123-91-1	µg/L		0.53	0.51	0.363	0.565	0.665	0.62	0.66	0.497	0.655	0.56	0.63	0.585	26	0.26	0.397	0.58	0.559	0.692	0.75	
1,4-dioxane (load)		g/s		0.0999	0.252	0.219	0.00565	0.00665	0.0296	0.0066	0.00497	0.00655	0.0056	0.0112	0.01	25	0.0047	0.00512	0.0064	0.0576	0.28	0.306	
Nieuwersluis																							
diisopropyl ether (DIPE)	108-20-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetraethylene glycol dimethyl ether (tetraglyme)	143-24-8	µg/L				0.02		0.02			0.03			0.04		4	0.02	*	*	0.0275	*	0.04	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L		0.03	0.02	0.025	0.1	0.07	0.07	0.11	0.27	0.11	0.14	0.04	0.18	13	0.02	0.02	0.07	0.0915	0.234	0.27	
bis(2-methoxyethyl)ether (diglyme)	111-96-6	µg/L				0.04		0.12			0.03			0.05		4	0.03	*	*	0.06	*	0.12	
ethyl tert-butyl ether (ETBE)	637-92-3	µg/L	0.03			<		0.06			0.06			<		4	<	*	*	0.0375	*	0.06	
triethyleneglycol dimethylether (triglyme)	112-49-2	µg/L				0.02		0.04			0.04			0.03		4	0.02	*	*	0.0325	*	0.04	
tert-amyl-methyl ether (TAME)	994-05-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
1,4-dioxane	123-91-1	µg/L				0.24		0.85			0.52			0.54		4	0.24	*	*	0.538	*	0.85	
Andijk																							
diisopropyl ether (DIPE)	108-20-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetraethylene glycol dimethyl ether (tetraglyme)	143-24-8	µg/L		0.03	0.02	0.02	0.01	0.01	0.01	0.03	0.03	0.02	0.04	0.04	0.03	13	0.01	0.01	0.03	0.0238	0.04	0.04	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	0.02	<	<	<	<	<	<	<	0.03	<	<	<	<	13	<	<	<	<	0.022	0.03	
bis(2-methoxyethyl)ether (diglyme)	111-96-6	µg/L		0.07	0.07	0.065	0.06	0.08	0.05	0.08	0.06	0.06	0.08	0.05	0.06	13	0.05	0.05	0.06	0.0654	0.08	0.08	
ethyl tert-butyl ether (ETBE)	637-92-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
triethyleneglycol dimethylether (triglyme)	112-49-2	µg/L		0.04	0.02	0.03	0.02	0.02	0.02	0.04	0.03	0.03	0.05	0.04	0.04	13	0.02	0.02	0.03	0.0315	0.046	0.05	

An explanation of this table can be found on page 151-153.

Ethers	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
tert-amyl-methyl ether (TAME)	994-05-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
1,4-dioxane	123-91-1	µg/L		0.38	0.39	0.25	0.26	0.4	0.18	0.25	0.14	0.098	0.37	0.24	0.35	13	0.098	0.115	0.26	0.274	0.396	0.4	
Petrol additives																							
Lobith																							
1,3,5-trimethylbenzene	108-67-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,4-trimethylbenzene	95-63-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3-trimethylbenzene	526-73-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
1,3,5-trimethylbenzene	108-67-8	µg/L	0.01	<	<	<	<	0.01	<	<	0.01	<	<	<	0.01	13	<	<	<	<	0.01	0.01	
1,2,4-trimethylbenzene	95-63-6	µg/L	0.01	<	0.01	<	<	<	<	<	<	<	<	<	0.02	13	<	<	<	<	0.016	0.02	
1,2,3-trimethylbenzene	526-73-8	µg/L	0.01	<	<	<	<	0.02	<	0.01	0.01	<	<	<	<	13	<	<	<	<	0.016	0.02	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	0.02	<	0.02	0.02	0.07	0.19	0.13	0.24	0.59	0.12	0.07	0.03	0.06	13	<	<	0.07	0.121	0.45	0.59	
ethyl tert-butyl ether (ETBE)	637-92-3	µg/L	0.03	<	<	<	<	0.14	0.05	0.04	0.13	<	<	<	<	13	<	<	<	0.0381	0.136	0.14	
tert-amyl-methyl ether (TAME)	994-05-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
1,3,5-trimethylbenzene	108-67-8	µg/L	0.01	<	<	<	0.01	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.01	
1,2,4-trimethylbenzene	95-63-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	0.01	<	0.01	13	<	<	<	<	0.01	0.01	
1,2,3-trimethylbenzene	526-73-8	µg/L	0.01	<	<	<	0.01	0.01	<	<	<	<	<	<	<	13	<	<	<	<	0.01	0.01	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L		0.03	0.02	0.025	0.1	0.07	0.07	0.11	0.27	0.11	0.14	0.04	0.18	13	0.02	0.02	0.07	0.0915	0.234	0.27	
ethyl tert-butyl ether (ETBE)	637-92-3	µg/L	0.03			<		0.06			0.06			<		4	<	*	*	0.0375	*	0.06	
tert-amyl-methyl ether (TAME)	994-05-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
1,3,5-trimethylbenzene	108-67-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,4-trimethylbenzene	95-63-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3-trimethylbenzene	526-73-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	0.02	<	<	<	<	<	<	<	0.03	<	<	<	<	13	<	<	<	<	0.022	0.03	
ethyl tert-butyl ether (ETBE)	637-92-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
tert-amyl-methyl ether (TAME)	994-05-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Industrial solvents																							
Lobith																							
1,2-dichloroethane	107-06-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dichloromethane	75-09-2	µg/L	5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachlorobutadiene	87-68-3	µg/L	0.001	0.00125	<	0.00162	0.00148	0.00104	0.0012	0.00114	<	<	<	<	<	13	<	<	0.00104	<	0.00156	0.00162	
tetrachloroethene	127-18-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrachloromethane	56-23-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloroethene	79-01-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloromethane	67-66-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3-trichloropropane	96-18-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
benzene	71-43-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cyclohexane	110-82-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methylbenzene (toluene)	108-88-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chlorobenzene	108-90-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dichlorobenzene	95-50-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichlorobenzene	541-73-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,4-dichlorobenzene	106-46-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethoxymethane	109-87-5	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tributyl phosphate (TBP)	126-73-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
n-propylbenzene	103-65-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-1,2-dichloroethene	156-59-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Industrial solvents	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
trans-1,2-dichloroethene	156-60-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trimethylbenzene	108-67-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,2,2-tetrachloroethane	79-34-5	µg/L	5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3- and 1,4-dimethylbenzene		µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,6- and 2,3,5,6-tetrachlorophenol		µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
1,4-dioxane	123-91-1	µg/L		0.569	0.555	0.286	0.702	0.816	0.588	0.743	0.858	1.16	0.622	0.946	1.42	13	0.249	0.264	0.743	0.767	1.32	1.42	
1,4-dioxane (load)		g/s		1.14	2.04	1.41	0.953	1.05	1.1	0.984	1.08	1.31	1.06	1.38	1.72	13	0.484	0.684	1.14	1.25	1.91	2.04	
1,2-dichloropropane	78-87-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
bromochloromethane	74-97-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dichloroethane	107-06-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dichloromethane	75-09-2	µg/L	0.05	<	<	<	<	<	<	<	<	<	<		<	12	<	<	<	<	<	<	
hexachlorobutadiene	87-68-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrachloroethene	127-18-4	µg/L	0.03	<	<	<	<	<	0.22	<	<	<	<	<	<	13	<	<	<	0.0308	0.138	0.22	
tetrachloromethane	56-23-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloroethene	79-01-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloromethane	67-66-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3-trichloropropane	96-18-4	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
benzene	71-43-2	µg/L	0.01	<	<	<	<	<	<	0.01	0.01	<	<	<	<	13	<	<	<	<	0.01	0.01	
cyclohexane	110-82-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methylbenzene (toluene)	108-88-3	µg/L	0.01	<	0.03	<	0.02	<	<	<	0.01	0.01	<	0.02	<	13	<	<	<	<	0.026	0.03	
chlorobenzene	108-90-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dichlorobenzene	95-50-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichlorobenzene	541-73-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,4-dichlorobenzene	106-46-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethoxymethane	109-87-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tributyl phosphate (TBP)	126-73-8	µg/L	0.1	<			<	<	<	<	<	<	<	<	<	20	<	<	<	<	<	<	
triethyl phosphate (TEP)	78-40-0	µg/L	0.02	0.07	0.045	0.04	0.065	0.065	0.03	0.045	0.08	0.085	0.105	0.095	0.04	24	<	0.02	0.06	0.0646	0.115	0.12	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triisobutyl phosphate (TIBP)	126-71-6	µg/L	0.2	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
n-propylbenzene	103-65-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-1,2-dichloroethene	156-59-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-1,2-dichloroethene	156-60-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trimethylbenzene	108-67-8	µg/L	0.01	<	<	<	<	0.01	<	<	0.01	<	<	<	0.01	13	<	<	<	<	0.01	0.01	
1,1,2,2-tetrachloroethane	79-34-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3- and 1,4-dimethylbenzene		µg/L	0.01	0.03	0.05	0.0175	0.02	<	<	0.01	0.03	0.01	0.01	0.02	0.03	13	<	<	0.02	0.0196	0.042	0.05	
1,4-dioxane	123-91-1	µg/L		0.53	0.51	0.363	0.565	0.665	0.62	0.66	0.497	0.655	0.56	0.63	0.585	26	0.26	0.397	0.58	0.559	0.692	0.75	
1,4-dioxane (load)		g/s		0.0999	0.252	0.219	0.00565	0.00665	0.0296	0.0066	0.00497	0.00655	0.0056	0.0112	0.01	25	0.0047	0.00512	0.0064	0.0576	0.28	0.306	
1,2-dichloropropane	78-87-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
bromochloromethane	74-97-5	µg/L	0.05			<		<			<			<		4	<	*	*	<	*	<	
1,2-dichloroethane	107-06-2	µg/L	0.01	0.01	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.01	
dichloromethane	75-09-2	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachlorobutadiene	87-68-3	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrachloroethene	127-18-4	µg/L	0.01	0.01	0.01	0.0225	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.028	0.04	
tetrachloromethane	56-23-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloroethene	79-01-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloromethane	67-66-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3-trichloropropane	96-18-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
benzene	71-43-2	µg/L	0.01	<	<	<	<	<	<	<	0.01	0.01	<	<	<	13	<	<	<	<	0.01	0.01	
cyclohexane	110-82-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Industrial solvents	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
methylbenzene (toluene)	108-88-3	µg/L	0.01	0.02	0.03	0.015	0.02	0.01	<	0.01	0.01	0.02	<	0.02	0.01	13	<	<	0.01	0.0146	0.026	0.03	
chlorobenzene	108-90-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dichlorobenzene	95-50-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichlorobenzene	541-73-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,4-dichlorobenzene	106-46-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethoxymethane	109-87-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tributyl phosphate (TBP)	126-73-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	0.14	<	13	<	<	<	<	0.104	0.14	
triethyl phosphate (TEP)	78-40-0	µg/L	0.02		0.08	0.035	0.06	<		0.1	0.07	0.05	0.13	0.1	0.04	11	<	<	0.06	0.0645	0.124	0.13	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triisobutyl phosphate (TIBP)	126-71-6	µg/L	0.2	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
n-propylbenzene	103-65-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-1,2-dichloroethene	156-59-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.01	
trans-1,2-dichloroethene	156-60-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trimethylbenzene	108-67-8	µg/L	0.01	<	<	<	0.01	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.01	
1,1,2,2-tetrachloroethane	79-34-5	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3- and 1,4-dimethylbenzene		µg/L	0.01	0.01	0.02	0.0125	0.02	<	0.01	0.02	0.02	0.02	0.02	0.02	0.02	13	<	<	0.02	0.0162	0.02	0.02	
2,3,4,6- and 2,3,5,6-tetrachlorophenol		µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
1,4-dioxane	123-91-1	µg/L				0.24		0.85			0.52			0.54		4	0.24	*	*	0.538	*	0.85	
1,2-dichloropropane	78-87-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
bromochloromethane	74-97-5	µg/L	0.05			<		<			<			<		4	<	*	*	<	*	<	
1,2-dichloroethane	107-06-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dichloromethane	75-09-2	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachlorobutadiene	87-68-3	µg/L	0.001	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
tetrachloroethene	127-18-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrachloromethane	56-23-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloroethene	79-01-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloromethane	67-66-3	µg/L	0.01	<	<	<	<	<	<	<	0.01	<	<	<	<	13	<	<	<	<	<	0.01	
1,2,3-trichloropropane	96-18-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
benzene	71-43-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cyclohexane	110-82-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methylbenzene (toluene)	108-88-3	µg/L	0.01	<	<	<	0.02	<	<	0.01	<	<	<	0.01	<	13	<	<	<	<	0.016	0.02	
chlorobenzene	108-90-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dichlorobenzene	95-50-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichlorobenzene	541-73-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,4-dichlorobenzene	106-46-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethoxymethane	109-87-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tributyl phosphate (TBP)	126-73-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triethyl phosphate (TEP)	78-40-0	µg/L			0.05	0.06	0.04	0.06		0.08	0.04	0.05	0.13	0.08	0.06	11	0.04	0.04	0.06	0.0645	0.12	0.13	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triisobutyl phosphate (TIBP)	126-71-6	µg/L	0.2	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
n-propylbenzene	103-65-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-1,2-dichloroethene	156-59-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trans-1,2-dichloroethene	156-60-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trimethylbenzene	108-67-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,2,2-tetrachloroethane	79-34-5	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3- and 1,4-dimethylbenzene		µg/L	0.01	<	<	<	0.01	<	<	<	0.01	<	<	<	<	13	<	<	<	<	0.01	0.01	
1,4-dioxane	123-91-1	µg/L		0.38	0.39	0.25	0.26	0.4	0.18	0.25	0.14	0.098	0.37	0.24	0.35	13	0.098	0.115	0.26	0.274	0.396	0.4	
1,2-dichloropropane	78-87-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with PFAS)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith																							
perfluorooctanoic acid (PFOA)	335-67-1	µg/L		0.0017	0.00191	0.00188	0.00212	0.00224	0.00253	0.00246	0.00239	0.00192	0.00261	0.00184	0.00168	13	0.00156	0.00162	0.00192	0.00207	0.00258	0.00261	
perfluorooctane sulfonic acid (PFOS)	1763-23-1	µg/L		0.00191	0.00139	0.00127	0.00138	0.00181	0.002	0.00195	0.00194	0.00177	0.0021	0.0018	0.00175	13	0.00127	0.00131	0.00181	0.00176	0.00212	0.00213	
perfluorobutane sulfonic acid (PFBS)	375-73-5	µg/L		0.00987	0.00298	0.00515	0.0148	0.00819	0.00653	0.0139	0.00792	0.00917	0.0147	0.00868	0.007	13	0.00298	0.00385	0.00858	0.00891	0.0148	0.0148	
perfluoroundecanoic acid (PFUnDA)	2058-94-8	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoropentanoic acid (PFPA)	2706-90-3	µg/L		0.00238	0.0016	0.00198	0.00296	0.00256	0.0032	0.0035	0.00356	0.00291	0.00364	0.00292	0.00288	13	0.0016	0.00175	0.00292	0.00284	0.00361	0.00364	
perfluorohexanoic acid (PFHxA)	307-24-4	µg/L		0.0024	0.00184	0.00193	0.00264	0.00275	0.0029	0.0031	0.00296	0.00278	0.00358	0.00275	0.00249	13	0.00184	0.00188	0.00275	0.00266	0.00339	0.00358	
perfluorododecanoic acid (PFDoDA)	307-55-1	µg/L	0.00005	<	<	<	<	<	0.00006	<	<	<	<	0.00006	<	13	<	<	<	<	0.00006	0.00006	
perfluorodecanoic acid (PFDA)	335-76-2	µg/L		0.00017	0.00015	0.00011	0.00009	0.00018	0.00023	0.0002	0.00023	0.00024	0.00027	0.00028	0.000225	13	0.00009	0.000098	0.00022	0.0002	0.000276	0.00028	
perfluorobutanoic acid (PFBA)	375-22-4	µg/L		0.00472	0.00205	0.00245	0.00323	0.00503	0.00487	0.00383	0.00412	0.00279	0.00403	0.00471	0.0318	13	0.00205	0.00221	0.00403	0.0081	0.0378	0.0597	
perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L		0.00102	0.00088	0.00087	0.00114	0.00115	0.00159	0.00163	0.00153	0.00123	0.00168	0.00128	0.00113	13	0.00087	0.000874	0.00123	0.00125	0.00166	0.00168	
perfluorononanoic acid (PFNA)	375-95-1	µg/L		0.00021	0.0002	0.00019	0.00021	0.0003	0.00036	0.00037	0.00039	0.00036	0.00041	0.00035	0.000265	13	0.00019	0.000194	0.0003	0.000298	0.000402	0.00041	
perfluorotetradecanoic acid (PFTDA)	376-06-7	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorohexane sulfonic acid (PFHxS)	355-46-4	µg/L		0.00117	0.0007	0.00099	0.00127	0.00107	0.0011	0.00109	0.00103	0.00096	0.00127	0.00089	0.000975	13	0.0007	0.000712	0.00107	0.00104	0.00127	0.00127	
perfluorotridecanoic acid (PFTrDA)	72629-94-8	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
6:2 fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	µg/L	0.001	0.00155	0.00143	0.00106	<	<	<	<	<	<	<	<	0.00114	13	<	<	<	<	0.0015	0.00155	
perfluorooctane sulfonamide (PFOSA)	754-91-6	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoroheptane sulfonic acid (PFHpS)	375-92-8	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorodecane sulfonic acid (PFDS)	335-77-3	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
7H-dodecafluoroheptanoic acid	1546-95-8	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2H,2H-perfluorodecanoic acid	27854-31-5	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoropentane sulfonic acid (PFPS)	2706-91-4	µg/L		0.00025	0.00015	0.00019	0.00027	0.00022	0.00024	0.00024	0.00024	0.0002	0.00028	0.00017	0.00022	13	0.00015	0.000158	0.00024	0.000222	0.000276	0.00028	
2H,2H,3H,3H-perfluoroundecanoic acid (OTS)	34598-33-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrafluoro-2-(heptafluoropropoxy)propanoate (HFPO-DA) (GenX)	62037-80-3	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-(6-chlorododecafluorohexyloxy)-tetrafluoroethanesulfonic acid potassium salt	73606-19-6	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-(8-chloro-hexadecafluorooctoxy)-tetrafluoroethanesulfonate, potassium salt	83329-89-9	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-hexadecafluorodec-2-enoate (8:2 FTUCA)	70887-84-2	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,2,3-trifluoro-3-(1,1,2,2,3,3-hexafluoro-3-(trifluoromethoxy) propoxy)propanoic acid	919005-14-4	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-ethylperfluorooctane sulfonamidoacetic acid	2991-50-6	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1H,1H,2H,2H-perfluorodecanesulphonic acid (8:2 FTS)	39108-34-4	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	2355-31-9	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorononane sulfonic acid (PFNS)	68259-12-1	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sum of branched PFHxS isomers		µg/L		0.00028	0.00017	0.00024	0.00031	0.00024	0.00023	0.00025	0.00025	0.00027	0.00035	0.00021	0.00025	13	0.00017	0.000174	0.00025	0.000254	0.000338	0.00035	
sum of branched PFOS isomers		µg/L		0.00152	0.00124	0.00122	0.00144	0.00152	0.00216	0.00185	0.00187	0.00174	0.00228	0.00152	0.00136	13	0.00108	0.00114	0.00152	0.00162	0.00223	0.00228	
Nieuwegein																							
perfluorooctanoic acid (PFOA)	335-67-1	µg/L		0.0027	0.0032	0.00225	0.0027	0.0027	0.0026	0.0033	0.0035	0.0026	0.0055	0.0039	0.0035	13	0.002	0.0022	0.0027	0.00313	0.00486	0.0055	
perfluorooctane sulfonic acid (PFOS)	1763-23-1	µg/L		0.0021	0.0023	0.00245	0.0028	0.003	0.0023	0.0052	0.01	0.0053	0.0071	0.0038	0.0055	13	0.0021	0.00214	0.003	0.00418	0.00884	0.01	
perfluorobutane sulfonic acid (PFBS)	375-73-5	µg/L		0.0037	0.0036	0.00385	0.0062	0.01	0.0091	0.0085	0.01	0.01	0.012	0.0085	0.0084	13	0.0036	0.0036	0.0085	0.00752	0.0112	0.012	
perfluoroundecanoic acid (PFUnDA)	2058-94-8	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoropentanoic acid (PFPA)	2706-90-3	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorohexanoic acid (PFHxA)	307-24-4	µg/L	0.0025	<	0.0028	<	0.0027	0.0031	0.0039	0.0041	0.0046	0.0039	0.0043	0.0041	0.003	13	<	<	0.0031	0.0031	0.00448	0.0046	
perfluorododecanoic acid (PFDoDA)	307-55-1	µg/L	0.00005	<	<	<	<	<	<	<	0.00006	<	<	<	<	13	<	<	<	<	<	0.00006	
perfluorodecanoic acid (PFDA)	335-76-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorobutanoic acid (PFBA)	375-22-4	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L	0.0025	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorononanoic acid (PFNA)	375-95-1	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorotetradecanoic acid (PFTDA)	376-06-7	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorohexane sulfonic acid (PFHxS)	355-46-4	µg/L	0.001	<	<	<	0.0011	0.0012	0.0012	0.0013	0.0017	0.0011	0.0015	0.0011	0.0012	13	<	<	0.0011	0.00103	0.00162	0.0017	
perfluorotridecanoic acid (PFTrDA)	72629-94-8	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
6:2 fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	µg/L	0.001	<	0.00182	0.00113	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.00155	0.00182	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with PFAS)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
perfluorooctane sulfonamide (PFOSA)	754-91-6	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoroheptane sulfonic acid (PFHpS)	375-92-8	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorodecane sulfonic acid (PFDS)	335-77-3	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoropentane sulfonic acid (PFPS)	2706-91-4	µg/L	0.0001	<	0.00019	0.000205	0.00023	0.00031	0.00027	0.00022	0.00028	0.00023	0.00023	0.00028	0.00025	13	<	0.000106	0.00023	0.000227	0.000298	0.00031	
tetrafluoro-2-(heptafluoropropoxy)propanoate (HFPO-DA) (GenX)	62037-80-3	µg/L	0.0001	<	<	<	0.00011	<	<	0.00018	<	<	<	<	0.00024	13	<	<	<	<	0.000216	0.00024	
2-(6-chlorododecafluorohexyloxy)-tetrafluoroethanesulfonic acid potassium salt	73606-19-6	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-(8-chloro-hexadecafluorooctoxy)-tetrafluoroethanesulfonate, potassium salt	83329-89-9	µg/L	0.0002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
cis-hexadecafluorodec-2-enoate (8:2 FTUCA)	70887-84-2	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,2,3-trifluoro-3-(1,1,2,2,3,3-hexafluoro-3-(trifluoromethoxy)propoxy)propanoic acid	919005-14-4	µg/L	0.0001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-ethylperfluorooctane sulfonamidoacetic acid	2991-50-6	µg/L	0.0001	<	<	<	<	0.00014	0.00017	0.00015	0.0002	0.0002	0.00016	0.00015	0.00016	13	<	<	0.00015	0.000122	0.0002	0.0002	
1H,1H,2H,2H-perfluorodecanesulphonic acid (8:2 FTS)	39108-34-4	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	2355-31-9	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorononane sulfonic acid (PFNS)	68259-12-1	µg/L	0.00005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sum of branched PFHxS isomers		µg/L		0.00013	0.00016	0.00019	0.00025	0.00028	0.00027	0.00024	0.0003	0.00029	0.0003	0.00029	0.00023	13	0.00013	0.000142	0.00025	0.00024	0.0003	0.0003	
sum of branched PFOS isomers		µg/L		0.00153	0.00123	0.00137	0.00151	0.00174	0.00177	0.00182	0.002	0.00165	0.00182	0.00155	0.00151	13	0.00123	0.00126	0.00155	0.00161	0.00193	0.002	
Nieuwersluis																							
perfluorooctanoic acid (PFOA)	335-67-1	µg/L		0.0041	0.0037	0.0041	0.003	0.0028	0.0033	0.0036	0.0033	0.0029	0.0084	0.0042	0.0041	13	0.0028	0.00284	0.0037	0.00397	0.00672	0.0084	
perfluorooctane sulfonic acid (PFOS)	1763-23-1	µg/L		0.0025	0.0032	0.0024	0.0028	0.003	0.0029	0.0074	0.011	0.0082	0.012	0.0045	0.0076	13	0.0023	0.00238	0.0032	0.00538	0.0116	0.012	
perfluorobutane sulfonic acid (PFBS)	375-73-5	µg/L		0.0046	0.0044	0.0047	0.0067	0.012	0.012	0.0092	0.011	0.01	0.012	0.0085	0.0097	13	0.0031	0.00362	0.0092	0.00842	0.012	0.012	
perfluoroundecanoic acid (PFUnDA)	2058-94-8	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoropentanoic acid (PFPA)	2706-90-3	µg/L	0.005	<	<	<	<	<	<	<	0.0051	<	0.0052	<	<	13	<	<	<	<	0.00516	0.0052	
perfluorohexanoic acid (PFHxA)	307-24-4	µg/L	0.0025	<	0.0026	<	0.0029	0.0033	0.0042	0.0042	0.0047	0.0031	0.0044	0.0047	0.0032	13	<	<	0.0032	0.00316	0.0047	0.0047	
perfluorodecanoic acid (PFDA)	335-76-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorobutanoic acid (PFBA)	375-22-4	µg/L	0.005	<	<	<	<	<	<	<	0.0054	<	<	<	<	13	<	<	<	<	0.00528	0.0054	
perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L	0.0025	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorononanoic acid (PFNA)	375-95-1	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorohexane sulfonic acid (PFHxS)	355-46-4	µg/L	0.001	<	<	<	<	0.0011	0.0012	0.0013	0.0016	0.0011	0.0013	<	0.001	13	<	<	0.001	<	0.00148	0.0016	
6:2 fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	µg/L	0.0025	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrafluoro-2-(heptafluoropropoxy)propanoate (HFPO-DA) (GenX)	62037-80-3	µg/L	0.0001	0.00015	0.00013	0.000155	<	<	<	0.00021	<	<	0.00011	<	0.00018	13	<	<	0.00011	0.000107	0.000198	0.00021	
Andijk																							
perfluorooctanoic acid (PFOA)	335-67-1	µg/L		0.004	0.0031	0.0032	0.0031	0.0031	0.0033	0.004	0.0039	0.0029	0.0057	0.004	0.0035	13	0.0029	0.00298	0.0033	0.00362	0.00502	0.0057	
perfluorooctane sulfonic acid (PFOS)	1763-23-1	µg/L		0.0021	0.0025	0.00235	0.0025	0.0026	0.0016	0.0052	0.0077	0.0043	0.0052	0.0031	0.0042	13	0.0016	0.0018	0.0026	0.00352	0.0067	0.0077	
perfluorobutane sulfonic acid (PFBS)	375-73-5	µg/L		0.008	0.0044	0.00375	0.0043	0.0067	0.0062	0.0077	0.008	0.0081	0.012	0.0074	0.0084	13	0.0033	0.00366	0.0074	0.00682	0.0106	0.012	
perfluoroundecanoic acid (PFUnDA)	2058-94-8	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluoropentanoic acid (PFPA)	2706-90-3	µg/L	0.005	<	<	<	<	<	<	<	<	<	0.0053	<	<	13	<	<	<	<	<	0.0053	
perfluorohexanoic acid (PFHxA)	307-24-4	µg/L		0.0055	0.0032	0.00425	0.0041	0.0036	0.0035	0.005	0.0055	0.0041	0.0049	0.0048	0.0045	13	0.0032	0.00332	0.0044	0.0044	0.0055	0.0055	
perfluorodecanoic acid (PFDA)	335-76-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorobutanoic acid (PFBA)	375-22-4	µg/L	0.005	0.0063	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.0063	
perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L	0.0025	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorononanoic acid (PFNA)	375-95-1	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
perfluorohexane sulfonic acid (PFHxS)	355-46-4	µg/L	0.001	<	<	<	<	0.001	<	<	0.0015	<	0.0014	0.0011	0.0012	13	<	<	<	<	0.00146	0.0015	
6:2 fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	µg/L	0.0025	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrafluoro-2-(heptafluoropropoxy)propanoate (HFPO-DA) (GenX)	62037-80-3	µg/L	0.0001	0.00019	<	0.000325	0.0002	<	0.00013	0.00019	<	<	<	<	0.00016	13	<	<	0.00013	0.00014	0.000362	0.00047	
Industrial chemicals (with arom. nitrogen comp.)																							
Lobith																							
pyrazole	288-13-1	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pyrazole (load)		g/s		0.349	0.923	0.64	0.314	0.395	0.423	0.333	0.346	0.344	0.323	0.47	0.475	13	0.278	0.293	0.349	0.447	0.822	0.923	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with arom. nitrogen comp.)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein																							
aniline	62-53-3	µg/L	0.03	0.12	0.061	0.102	<	0.035	0.033	0.037	<	0.036	<	0.03	0.031	13	<	<	0.035	0.0486	0.12	0.12	
N-methylaniline	100-61-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloroaniline	108-42-9	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3-dichloroaniline	608-27-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4-trichloroaniline	634-67-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trichloroaniline	636-30-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,6-trichloroaniline	634-93-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3,4,5-trichloroaniline	634-91-3	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-methylaniline	108-44-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-diethylaniline	91-66-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-ethylaniline	103-69-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,6-trimethylaniline	88-05-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4-dimethylaniline	95-68-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3,4-dimethylaniline	95-64-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3-dimethylaniline	87-59-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloro-4-methylaniline	95-74-9	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-methoxy-2-nitroaniline	96-96-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-nitroaniline	88-74-4	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-nitroaniline	99-09-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-(phenylsulfon)aniline	4273-98-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4- and 5-chloro-2-methylaniline		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N,N-dimethylaniline (DMA)	121-69-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4- and 2,5-dichloroaniline		µg/L	0.03	<	0.038	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.038	
2-methoxyaniline	90-04-0	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2- and 4-methylaniline		µg/L	0.03	0.031	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.031	0.031	
2-(trifluoromethyl)aniline	88-17-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,5- and 3,5-dimethylaniline		µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trimethylaniline	137-17-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pyrazole	288-13-1	µg/L		0.34	0.21	0.29	0.38	0.33	0.25	0.18	0.295	0.46	0.55	0.46	0.37	13	0.18	0.192	0.33	0.339	0.514	0.55	
pyrazole (load)		g/s			0.156	0.293	0.0038	0.0033	0.0025	0.0018	0.00295	0.0046	0.0055	0.0046	0.00896	12	0.0018	0.00201	0.0042	0.0409	0.252	0.293	
4-bromoaniline	106-40-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-chloroaniline	95-51-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-chloroaniline	106-47-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,6-dichloroaniline	608-31-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3,4-dichloroaniline	95-76-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3,5-dichloroaniline	626-43-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,6-diethylaniline	579-66-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,6-dimethylaniline	87-62-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
aniline	62-53-3	µg/L	0.03			0.048		0.037			<			<		4	<	*	*	<	*	0.048	
N-methylaniline	100-61-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-chloroaniline	108-42-9	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,3-dichloroaniline	608-27-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,3,4-trichloroaniline	634-67-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4,5-trichloroaniline	636-30-6	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4,6-trichloroaniline	634-93-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3,4,5-trichloroaniline	634-91-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-methylaniline	108-44-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
N,N-diethylaniline	91-66-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
N-ethylaniline	103-69-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4,6-trimethylaniline	88-05-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4-dimethylaniline	95-68-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with arom. nitrogen comp.)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
3,4-dimethylaniline	95-64-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,3-dimethylaniline	87-59-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-chloro-4-methylaniline	95-74-9	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4-methoxy-2-nitroaniline	96-96-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-nitroaniline	88-74-4	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-nitroaniline	99-09-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-(phenylsulfon)aniline	4273-98-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4- and 5-chloro-2-methylaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
N,N-dimethylaniline (DMA)	121-69-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4- and 2,5-dichloroaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-methoxyaniline	90-04-0	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2- and 4-methylaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-(trifluoromethyl)aniline	88-17-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,5- and 3,5-dimethylaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4,5-trimethylaniline	137-17-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
pyrazole	288-13-1	µg/L				0.36			0.19			0.34		0.4		4	0.19	*	*	0.323	*	0.4	
4-bromoaniline	106-40-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-chloroaniline	95-51-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4-chloroaniline	106-47-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,6-dichloroaniline	608-31-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3,4-dichloroaniline	95-76-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3,5-dichloroaniline	626-43-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,6-diethylaniline	579-66-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,6-dimethylaniline	87-62-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
aniline	62-53-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
N-methylaniline	100-61-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-chloroaniline	108-42-9	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,3-dichloroaniline	608-27-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,3,4-trichloroaniline	634-67-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4,5-trichloroaniline	636-30-6	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4,6-trichloroaniline	634-93-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3,4,5-trichloroaniline	634-91-3	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-methylaniline	108-44-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
N,N-diethylaniline	91-66-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
N-ethylaniline	103-69-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4,6-trimethylaniline	88-05-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4-dimethylaniline	95-68-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3,4-dimethylaniline	95-64-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,3-dimethylaniline	87-59-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-chloro-4-methylaniline	95-74-9	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4-methoxy-2-nitroaniline	96-96-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-nitroaniline	88-74-4	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3-nitroaniline	99-09-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-(phenylsulfon)aniline	4273-98-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4- and 5-chloro-2-methylaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
N,N-dimethylaniline (DMA)	121-69-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,4- and 2,5-dichloroaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-methoxyaniline	90-04-0	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2- and 4-methylaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-(trifluoromethyl)aniline	88-17-5	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,5- and 3,5-dimethylaniline		µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with arom. nitrogen comp.)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
2,4,5-trimethylaniline	137-17-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
pyrazole	288-13-1	µg/L		0.38	0.41	0.19	0.16	0.16	0.2	0.19	0.215	0.21	0.29	0.28	0.33	13	0.16	0.16	0.21	0.248	0.398	0.41	
4-bromoaniline	106-40-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2-chloroaniline	95-51-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4-chloroaniline	106-47-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,6-dichloroaniline	608-31-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3,4-dichloroaniline	95-76-1	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
3,5-dichloroaniline	626-43-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,6-diethylaniline	579-66-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2,6-dimethylaniline	87-62-7	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Industrial chemicals (benzotriazoles)																							
Lobith																							
benzotriazole	95-14-7	µg/L		0.43	0.64	0.38	0.615	0.65	0.48	0.57	0.64	0.59	0.51	0.5	0.68	13	0.38	0.4	0.57	0.562	0.71	0.73	
benzotriazole (load)		g/s		0.86	2.36	1.87	0.935	0.835	0.902	0.755	0.807	0.666	0.871	0.729	0.823	13	0.666	0.691	0.86	1.03	2.16	2.36	
5-methyl-1H-benzotriazole	136-85-6	µg/L		0.07	0.11	0.06	0.105	0.12	0.12	0.1	0.11	0.11	0.1	0.08	0.13	13	0.06	0.064	0.11	0.102	0.126	0.13	
5-methyl-1H-benzotriazole (load)		g/s		0.14	0.405	0.296	0.161	0.154	0.225	0.132	0.139	0.124	0.171	0.117	0.157	13	0.117	0.12	0.154	0.183	0.361	0.405	
4-methyl-1H-benzotriazole	29878-31-7	µg/L		0.13	0.19	0.13	0.21	0.22	0.22	0.23	0.25	0.28	0.27	0.2	0.29	13	0.13	0.13	0.22	0.218	0.286	0.29	
4-methyl-1H-benzotriazole (load)		g/s		0.26	0.699	0.641	0.326	0.283	0.413	0.305	0.315	0.316	0.461	0.292	0.351	13	0.26	0.269	0.316	0.384	0.676	0.699	
Nieuwegein																							
benzotriazole	95-14-7	µg/L		0.55	0.48	0.372	0.495	0.575	0.604	0.623	0.54	0.783	0.838	0.656	0.67	52	0.3	0.393	0.58	0.594	0.77	1.1	
benzotriazole (load)		g/s		0.0854	0.323	0.259	0.00801	0.00745	0.0214	0.00842	0.0113	0.0114	0.00838	0.0137	0.0897	51	0.003	0.00522	0.008	0.0708	0.329	0.482	
5-methyl-1H-benzotriazole	136-85-6	µg/L	0.05	0.058	0.0605	0.0526	0.0738	0.0838	0.103	0.092	0.077	0.113	0.123	0.092	0.108	52	<	0.0566	0.0845	0.0859	0.12	0.15	
5-methyl-1H-benzotriazole (load)		g/s		0.00735	0.0412	0.0342	0.00115	0.00109	0.00349	0.00124	0.0016	0.00158	0.00123	0.00193	0.0153	51	0.00074	0.00078	0.0012	0.00939	0.0413	0.0777	
4-methyl-1H-benzotriazole	29878-31-7	µg/L		0.17	0.165	0.13	0.183	0.193	0.23	0.223	0.198	0.288	0.308	0.272	0.263	52	0.11	0.133	0.21	0.218	0.3	0.34	
4-methyl-1H-benzotriazole (load)		g/s		0.0245	0.113	0.0905	0.00298	0.0025	0.00755	0.003	0.00402	0.00416	0.00308	0.00569	0.0381	51	0.0018	0.00192	0.003	0.0251	0.118	0.177	
4- and 5-methylbenzotriazole	29385-43-1	µg/L													0.43	1	*	*	*	*	*	*	
Nieuwersluis																							
benzotriazole	95-14-7	µg/L		0.61	0.52	0.285	0.56	0.72	0.83	0.58	0.64	0.77	0.7	0.64	0.68	13	0.25	0.278	0.64	0.602	0.806	0.83	
5-methyl-1H-benzotriazole	136-85-6	µg/L	0.05	0.08	0.079	<	0.091	0.11	0.14	0.096	0.099	0.13	0.11	0.13	0.12	13	<	<	0.099	0.0972	0.136	0.14	
4-methyl-1H-benzotriazole	29878-31-7	µg/L		0.19	0.16	0.09	0.18	0.24	0.21	0.22	0.25	0.28	0.24	0.31	0.26	13	0.081	0.0882	0.22	0.209	0.298	0.31	
4- and 5-methylbenzotriazole	29385-43-1	µg/L													0.42	1	*	*	*	*	*	*	
Andijk																							
benzotriazole	95-14-7	µg/L		0.52	0.43	0.4	0.34	0.45	0.37	0.41	0.34	0.4	0.58	0.4	0.5	13	0.34	0.34	0.41	0.426	0.556	0.58	
5-methyl-1H-benzotriazole	136-85-6	µg/L	0.05	0.059	0.054	<	0.051	0.062	0.052	0.061	<	0.063	0.071	0.05	0.079	13	<	<	0.054	0.0521	0.0758	0.079	
4-methyl-1H-benzotriazole	29878-31-7	µg/L		0.18	0.14	0.115	0.12	0.15	0.13	0.14	0.11	0.14	0.22	0.15	0.2	13	0.1	0.104	0.14	0.147	0.212	0.22	
4- and 5-methylbenzotriazole	29385-43-1	µg/L													0.3	1	*	*	*	*	*	*	
Industrial chemicals (with arom. hydrocarbons)																							
Lobith																							
chlorobenzene	108-90-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-chloromethylbenzene	95-49-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloromethylbenzene	108-41-8	µg/L	5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pentachlorobenzene	608-93-5	µg/L		0.00006	0.00005	0.00006	0.00007	0.00005	0.00006	0.00009	0.00006	0.00006	0.00006	0.00004	0.000055	13	0.00004	0.00004	0.00006	0.0000592	0.000082	0.00009	
Nieuwegein																							
chlorobenzene	108-90-7	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-chloromethylbenzene	95-49-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloromethylbenzene	108-41-8	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pentachlorobenzene	608-93-5	µg/L		0.00005		0.00006	0.00004	0.00004	0.00005	0.00006	0.00004	0.00004	0.00004	0.00005	0.00005	12	0.00004	0.00004	0.000045	0.0000483	0.000074	0.00008	
1-methyl-4-isopropylbenzene	99-87-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
chlorobenzene	108-90-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with arom. hydrocarbons)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis (continued)																							
2-chloromethylbenzene	95-49-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloromethylbenzene	108-41-8	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pentachlorobenzene	608-93-5	µg/L	0.00002	0.00004	0.00003	0.00003	0.00003	0.00003	0.00002	<	0.00003	0.00004	0.00002	<	0.00002	13	<	<	0.00003	0.0000262	0.00004	0.00004	
1-methyl-4-isopropylbenzene	99-87-6	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
chlorobenzene	108-90-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-chloromethylbenzene	95-49-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloromethylbenzene	108-41-8	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pentachlorobenzene	608-93-5	µg/L	0.00002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.000024	0.00003	
1-methyl-4-isopropylbenzene	99-87-6	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
Industrial chemicals (with vol. halog. hydrocarbons)																							
Lobith																							
dibromomethane	74-95-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethane	75-34-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethene	75-35-4	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachloroethane	67-72-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,1-trichloroethane	71-55-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,2-trichloroethane	79-00-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3-trichlorobenzene	87-61-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,4-trichlorobenzene	120-82-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trichlorobenzene	108-70-3	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chloroethene	75-01-4	µg/L	0.3	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichloropropane	142-28-9	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
dibromomethane	74-95-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethane	75-34-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethene	75-35-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachloroethane	67-72-1	µg/L	0.01	<	<	<	<	<	<	<	<		<	<	<	12	<	<	<	<	<	<	
1,1,1-trichloroethane	71-55-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,2-trichloroethane	79-00-5	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3,4-tetrachlorobenzene	634-66-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,4,5-tetrachlorobenzene	95-94-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3-trichlorobenzene	87-61-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,4-trichlorobenzene	120-82-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trichlorobenzene	108-70-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chloroethene	75-01-4	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichloropropane	142-28-9	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
dibromomethane	74-95-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethane	75-34-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethene	75-35-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachloroethane	67-72-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,1-trichloroethane	71-55-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,2-trichloroethane	79-00-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3,4-tetrachlorobenzene	634-66-2	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
1,2,4,5-tetrachlorobenzene	95-94-3	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
1,2,3-trichlorobenzene	87-61-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,4-trichlorobenzene	120-82-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trichlorobenzene	108-70-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chloroethene	75-01-4	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichloropropane	142-28-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with vol. halog. hydrocarbons)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk																							
dibromomethane	74-95-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethane	75-34-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1-dichloroethene	75-35-4	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexachloroethane	67-72-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,1-trichloroethane	71-55-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,1,2-trichloroethane	79-00-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,3,4-tetrachlorobenzene	634-66-2	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
1,2,4,5-tetrachlorobenzene	95-94-3	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
1,2,3-trichlorobenzene	87-61-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2,4-trichlorobenzene	120-82-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3,5-trichlorobenzene	108-70-3	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
chloroethene	75-01-4	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,3-dichloropropane	142-28-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Industrial chemicals (with haloacids)																							
Lobith																							
trifluoroacetic acid (TFA)	76-05-1	µg/L		1.3	1.3	1.1	1.1	0.91	0.79	1.1	1.2	1	0.8	0.9	1.1	13	0.79	0.794	1.1	1.05	1.3	1.3	
trifluoroacetic acid (TFA) (load)		g/s		2.6	4.78	5.42	1.75	1.17	1.48	1.46	1.51	1.13	1.37	1.31	1.33	13	1.13	1.14	1.46	2.08	5.17	5.42	
Nieuwegein																							
tetrachloro-orthophthalic acid	632-58-6	µg/L	0.02	<	<	<	<	<	<	<	<	0.025	0.03	<	<	51	<	<	<	<	0.028	0.05	
trifluoroacetic acid (TFA)	76-05-1	µg/L		1.2	1.2	1.1	1.1	1.1	1	0.95	1.2	1.2	1.2	1.1	0.95	13	0.95	0.95	1.1	1.11	1.2	1.2	
trifluoroacetic acid (TFA) (load)		g/s		0.3	0.391	0.543	0.011	0.011	0.0842	0.0095	0.012	0.012	0.012	0.0283	0.0095	13	0.0095	0.0095	0.012	0.151	0.674	0.863	
monochloroacetic acid	79-11-8	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
dichloroacetic acid	79-43-6	µg/L	0.02	<	<	0.04	<	<	<	<	<	<	<	<	0.0225	51	<	<	<	<	0.03	0.11	
monobromoacetic acid	79-08-3	µg/L	0.06	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
dibromoacetic acid	631-64-1	µg/L	0.06	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
bromochloroacetic acid	5589-96-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
trichloroacetic acid (TCA)	76-03-9	µg/L		0.0625	0.0775	0.085	0.0625	0.0725	0.052	0.0375	0.038	0.0575	0.06	0.066	0.075	51	0.03	0.04	0.06	0.0616	0.08	0.18	
2,6-dichlorobenzoic acid	50-30-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	0.01	
Nieuwersluis																							
tetrachloro-orthophthalic acid	632-58-6	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
trifluoroacetic acid (TFA)	76-05-1	µg/L				0.73		1.1			1.3			0.97		4	0.73	*	*	1.03	*	1.3	
monochloroacetic acid	79-11-8	µg/L	0.5			<		<			<			<		4	<	*	*	<	*	<	
dichloroacetic acid	79-43-6	µg/L	0.02			<		0.02			<			<		4	<	*	*	<	*	0.02	
monobromoacetic acid	79-08-3	µg/L	0.06			<		<			<			<		4	<	*	*	<	*	<	
dibromoacetic acid	631-64-1	µg/L	0.06			<		<			<			<		4	<	*	*	<	*	<	
bromochloroacetic acid	5589-96-8	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
trichloroacetic acid (TCA)	76-03-9	µg/L				0.05		0.08			0.06			0.09		4	0.05	*	*	0.07	*	0.09	
2,6-dichlorobenzoic acid	50-30-6	µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
tetrachloro-orthophthalic acid	632-58-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	0.04	<	<	13	<	<	<	<	0.028	0.04	
trifluoroacetic acid (TFA)	76-05-1	µg/L		1.2	1.4	1.15	1.2	1.2	1.2	1.1	1.2	1.1	1.3	1.2	1.1	13	1	1.04	1.2	1.19	1.36	1.4	
monochloroacetic acid	79-11-8	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dichloroacetic acid	79-43-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
monobromoacetic acid	79-08-3	µg/L	0.06	<	<	<	<	<	0.06	<	<	0.06	<	0.06	<	13	<	<	<	<	0.06	0.06	
dibromoacetic acid	631-64-1	µg/L	0.06	<	<	<	<	<	<	<	<	<	0.07	<	<	13	<	<	<	<	<	0.07	
bromochloroacetic acid	5589-96-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
trichloroacetic acid (TCA)	76-03-9	µg/L	0.03	0.04	0.11	0.05	0.05	0.05	0.04	<	<	<	0.03	0.03	0.04	13	<	<	0.04	0.0412	0.094	0.11	
2,6-dichlorobenzoic acid	50-30-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.01	
Industrial chemicals (with phenols)																							
Lobith																							
3-chlorophenol	108-43-0	µg/L	0.05		<		<		<		<		<		<	6	<	*	*	<	*	<	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with phenols)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
4-chlorophenol	106-48-9	µg/L	0.05		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,3-dichlorophenol	576-24-9	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,6-dichlorophenol	87-65-0	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
3,4-dichlorophenol	95-77-2	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
3,5-dichlorophenol	591-35-5	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,3,4,5-tetrachlorophenol	4901-51-3	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,3,4,6-tetrachlorophenol	58-90-2	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,3,5,6-tetrachlorophenol	935-95-5	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,3,4-trichlorophenol	15950-66-0	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,3,5-trichlorophenol	933-78-8	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,3,6-trichlorophenol	933-75-5	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
3,4,5-trichlorophenol	609-19-8	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,4- and 2,5-dichlorophenol		µg/L	0.04		<		<		<		<		<		<	6	<	*	*	<	*	<	
2-chlorophenol	95-57-8	µg/L	0.05		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,4-dinitrophenol	51-28-5	µg/L	0.01	<	<	<	<	0.01	0.02	<	<	0.01	0.01	0.01	<	13	<	<	<	<	0.016	0.02	
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trichlorophenol	95-95-4	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
2,4,6-trichlorophenol	88-06-2	µg/L	0.02		<		<		<		<		<		<	6	<	*	*	<	*	<	
Nieuwegein																							
4,4'-sulfonyldiphenol (BPS)	80-09-1	µg/L	0.008			<		<			<			<		4	<	*	*	<	*	<	
2,4-dinitrophenol	51-28-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	14	<	<	<	<	<	<	
Nieuwersluis																							
3-chlorophenol	108-43-0	µg/L	0.05	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
4-chlorophenol	106-48-9	µg/L	0.05	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,3-dichlorophenol	576-24-9	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,6-dichlorophenol	87-65-0	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
3,4-dichlorophenol	95-77-2	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
3,5-dichlorophenol	591-35-5	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,3,4,5-tetrachlorophenol	4901-51-3	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,3,4,6-tetrachlorophenol	58-90-2	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,3,5,6-tetrachlorophenol	935-95-5	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,3,4-trichlorophenol	15950-66-0	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,3,5-trichlorophenol	933-78-8	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,3,6-trichlorophenol	933-75-5	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
3,4,5-trichlorophenol	609-19-8	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
4,4'-sulfonyldiphenol (BPS)	80-09-1	µg/L	0.008			<		<			<			<		4	<	*	*	<	*	<	
2,4- and 2,5-dichlorophenol		µg/L	0.04	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2-chlorophenol	95-57-8	µg/L	0.05	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,4-dinitrophenol	51-28-5	µg/L		0.01		0.02	0.02		0.01		0.01		0.02		0.02	7	0.01	*	*	0.0157	*	0.02	
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5-trichlorophenol	95-95-4	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
2,4,6-trichlorophenol	88-06-2	µg/L	0.02	<		<	<		<		<		<		<	7	<	*	*	<	*	<	
Andijk																							
4,4'-sulfonyldiphenol (BPS)	80-09-1	µg/L	0.008			<		<			<			<		4	<	*	*	<	*	<	
2,4-dinitrophenol	51-28-5	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pentachlorophenol	87-86-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Industrial chemicals (with PCBs)																							
Lobith																							
2,4,4'-trichlorobiphenyl (PCB 28)	7012-37-5	µg/L		0.00007	0.00009	0.00008	0.00006	0.00008	0.00008	0.00015	0.00013	0.00017	0.00021	0.00008	0.00012	13	0.00006	0.000064	0.00009	0.000111	0.000194	0.00021	
2,5,2',5'-tetrachlorobiphenyl (PCB 52)	35693-99-3	µg/L		0.00009	0.00007	0.00005	0.00009	0.00007	0.00008	0.00012	0.00012	0.00014	0.00014	0.00007	0.00008	13	0.00005	0.000058	0.00009	0.0000923	0.00014	0.00014	

An explanation of this table can be found on page 151-153.

Industrial chemicals (with PCBs)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
2,4,5,2',5'-pentachlorobiphenyl (PCB 101)	37680-73-2	µg/L		0.00009	0.00006	0.00006	0.00008	0.00007	0.00006	0.00011	0.00011	0.00013	0.00017	0.00006	0.00011	13	0.00006	0.00006	0.00009	0.0000938	0.000154	0.00017	
2,4,5,3',4'-pentachlorobiphenyl (PCB 118)	31508-00-6	µg/L		0.00007	0.00003	0.00005	0.00006	0.00004	0.00004	0.0001	0.00004	0.00006	0.00008	0.00003	0.000055	13	0.00003	0.00003	0.00005	0.0000546	0.000092	0.0001	
2,3,4,2',4',5'-hexachlorobiphenyl (PCB 138)	35065-28-2	µg/L	0.00005	<	0.00012	<	<	0.00009	0.00006	0.00009	0.00007	0.00014	0.00011	0.00005	0.000115	13	<	<	0.00007	0.0000796	0.000152	0.00016	
2,4,5,2',4',5'-hexachlorobiphenyl (PCB 153)	35065-27-1	µg/L		0.00013	0.00015	0.00008	0.00014	0.00009	0.00008	0.00018	0.00011	0.00019	0.00018	0.00007	0.000155	13	0.00007	0.000074	0.00013	0.000132	0.000196	0.0002	
2,3,4,5,2',4',5'-heptachlorobiphenyl (PCB 180)	35065-29-3	µg/L	0.00004	0.00006	0.00006	<	<	<	<	<	<	0.0001	0.00008	<	0.000085	13	<	<	<	0.0000469	0.000112	0.00012	
Nieuwegein																							
2,4,4'-trichlorobiphenyl (PCB 28)	7012-37-5	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,5,2',5'-tetrachlorobiphenyl (PCB 52)	35693-99-3	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2',5'-pentachlorobiphenyl (PCB 101)	37680-73-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,3',4'-pentachlorobiphenyl (PCB 118)	31508-00-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2',4',5'-hexachlorobiphenyl (PCB 138)	35065-28-2	µg/L	0.00005	0.0002		0.00008	0.00009	0.00008	0.00009	0.00006	<	<	0.00009	0.00013	0.00013	12	<	<	0.00009	0.00009	0.000179	0.0002	
2,4,5,2',4',5'-hexachlorobiphenyl (PCB 153)	35065-27-1	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,5,2',4',5'-heptachlorobiphenyl (PCB 180)	35065-29-3	µg/L	0.00004	<		0.0000495	<	0.00005	<	<	0.00008	0.00005	0.00008	0.00009	0.00008	12	<	<	0.00005	0.0000508	0.000087	0.00009	
Nieuwersluis																							
2,4,4'-trichlorobiphenyl (PCB 28)	7012-37-5	µg/L		0.00014	0.0002	0.000225	0.00014	0.00017	0.00009	0.00016	0.00016	0.0002	0.0002	0.00012	0.00019	13	0.00009	0.000102	0.00017	0.000171	0.000236	0.00026	
2,5,2',5'-tetrachlorobiphenyl (PCB 52)	35693-99-3	µg/L		0.00011	0.00014	0.00014	0.00011	0.00013	0.00007	0.00025	0.00014	0.00017	0.00014	0.00008	0.00013	13	0.00007	0.000074	0.00013	0.000135	0.000218	0.00025	
2,4,5,2',5'-pentachlorobiphenyl (PCB 101)	37680-73-2	µg/L		0.00008	0.00013	0.000115	0.00009	0.0001	0.00005	0.00019	0.00011	0.00012	0.00013	0.00006	0.00011	13	0.00005	0.000054	0.00011	0.000108	0.000174	0.00019	
2,4,5,3',4'-pentachlorobiphenyl (PCB 118)	31508-00-6	µg/L	0.00002	0.00005	0.00005	0.0000445	0.00003	0.00006	0.00003	<	0.00006	0.00007	0.00007	0.00004	0.00005	13	<	<	0.00005	0.0000469	0.000076	0.00008	
2,3,4,2',4',5'-hexachlorobiphenyl (PCB 138)	35065-28-2	µg/L	0.00005	0.00007	0.00007	0.00012	0.00006	0.00007	<	<	0.00007	<	0.0001	0.00005	0.00008	13	<	<	0.00007	0.0000681	0.000124	0.00014	
2,4,5,2',4',5'-hexachlorobiphenyl (PCB 153)	35065-27-1	µg/L		0.00013	0.00013	0.00014	0.00008	0.00012	0.00006	0.00016	0.00011	0.00015	0.00014	0.00006	0.00011	13	0.00006	0.00006	0.00012	0.000118	0.00016	0.00016	
2,3,4,5,2',4',5'-heptachlorobiphenyl (PCB 180)	35065-29-3	µg/L	0.00004	<	0.00005	0.0000445	<	0.00004	<	<	0.00006	0.00005	0.00006	<	<	13	<	<	<	<	0.000066	0.00007	
Andijk																							
2,4,4'-trichlorobiphenyl (PCB 28)	7012-37-5	µg/L	0.00004	<		0.0000645	<	0.00004	<	<	<	<	<	<	<	12	<	<	<	<	0.000089	0.00011	
2,5,2',5'-tetrachlorobiphenyl (PCB 52)	35693-99-3	µg/L	0.00003	<		0.000032	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.0000395	0.00005	
2,4,5,2',5'-pentachlorobiphenyl (PCB 101)	37680-73-2	µg/L	0.00003	<		0.000032	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.0000395	0.00005	
2,4,5,3',4'-pentachlorobiphenyl (PCB 118)	31508-00-6	µg/L	0.00002	<		0.000035	<	0.00003	<	<	<	<	<	<	<	12	<	<	<	<	0.000037	0.00004	
2,3,4,2',4',5'-hexachlorobiphenyl (PCB 138)	35065-28-2	µg/L	0.00005	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
2,4,5,2',4',5'-hexachlorobiphenyl (PCB 153)	35065-27-1	µg/L	0.00002	<		0.00007	0.00003	0.00009	<	<	<	<	0.00002	<	<	12	<	<	<	0.0000292	0.000087	0.00009	
2,3,4,5,2',4',5'-heptachlorobiphenyl (PCB 180)	35065-29-3	µg/L	0.00004	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
Industrial chemicals (precursors and intermediates)																							
Lobith																							
methenamine	100-97-0	µg/L	1	<	1.3	<	2.75	<	<	1.4	1.1	<	2.7	<	2.9	13	<	<	1.1	1.38	3.56	4	
methenamine (load)		g/s		1	4.78	2.46	4.81	0.642	0.939	1.85	1.39	0.564	4.61	0.729	3.51	13	0.564	0.595	1.85	2.47	6.58	7.78	
Nieuwegein																							
methenamine	100-97-0	µg/L		0.59	1.2	1.25	2.8	2.2	1.7	1.4	1.4	1.3	0.98	2.3	1.3	13	0.59	0.746	1.4	1.51	2.6	2.8	
methenamine (load)		g/s		0.147	0.391	0.661	0.028	0.022	0.143	0.014	0.014	0.013	0.0098	0.0592	0.013	13	0.0098	0.0111	0.028	0.167	0.815	1.1	
Nieuwersluis																							
methenamine	100-97-0	µg/L				0.49		1.9			1.7			1.9		4	0.49	*	*	1.5	*	1.9	
Andijk																							
methenamine	100-97-0	µg/L		1.3	1	1.32	0.9	1.6	1.2	1.4	0.96	0.96	0.95	1	1.2	13	0.9	0.916	1	1.16	1.66	1.7	
Other industrial chemicals																							
Lobith																							
dicyclopentadiene	77-73-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dimethylbenzene (o-xylene)	95-47-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethenylbenzene (styrene)	100-42-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethylbenzene	100-41-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iso-propylbenzene (cumene)	98-82-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-ethyltoluene	620-14-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-ethyltoluene	622-96-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-ethyltoluene	611-14-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Other industrial chemicals	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
t-butylbenzene	98-06-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methylmethacrylate (MMA)	80-62-6	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloropropene (allyl chloride)	107-05-1	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexamethoxymethyl melamine (HMMM)	3089-11-0	µg/L	0.1	0.23	0.25	0.17	0.19	<	0.18	0.63	0.36	0.49	1.5	0.86	1	13	<	<	0.26	0.469	1.3	1.5	
hexamethoxymethyl melamine (HMMM) (load)		g/s		0.46	0.92	0.838	0.327	0.0642	0.338	0.834	0.454	0.553	2.56	1.25	1.21	13	0.0642	0.0976	0.553	0.78	2.04	2.56	
1,3,5-triazine-2,4,6-triamine (melamine)	108-78-1	µg/L		0.76	0.62	0.53	1	0.92	0.86	1.2	1.5	2.5	1.2	1.6	1.8	13	0.53	0.566	1.2	1.19	2.22	2.5	
1,3,5-triazine-2,4,6-triamine (melamine) (load)		g/s		1.52	2.28	2.61	1.52	1.18	1.62	1.59	1.89	2.82	2.05	2.33	2.18	13	1.18	1.3	1.89	1.93	2.74	2.82	
trichlorobenzenes (3 isomers)	12002-48-1	µg/L	0.75	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-methylpyridine (3-picoline)	108-99-6	µg/L	0.01	0.0204	<	<	0.0125		0.0162	0.0164	0.0147	0.0106	0.0153	<	0.0217	12	<	<	0.0143	0.0137	0.0268	0.0295	
ethyl dimethylcarbamate	687-48-9	µg/L	0.01	0.03	0.04	0.02	0.025	0.02	<	0.02	0.01	0.01	0.03	0.02	0.02	13	<	<	0.02	0.0212	0.036	0.04	
Nieuwegein																							
dicyclopentadiene	77-73-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dimethylbenzene (o-xylene)	95-47-6	µg/L	0.01	0.01	0.02	0.0125	0.01	<	<	0.01	0.02	<	<	0.01	0.03	13	<	<	0.01	0.0119	0.026	0.03	
ethenylbenzene (styrene)	100-42-5	µg/L	0.02	<	<	<	<	<	0.05	<	0.07	<	<	<	<	13	<	<	<	<	0.062	0.07	
ethylbenzene	100-41-4	µg/L	0.01	<	0.02	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.014	0.02	
iso-propylbenzene (cumene)	98-82-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-ethyltoluene	620-14-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-ethyltoluene	622-96-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-ethyltoluene	611-14-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
t-butylbenzene	98-06-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iso-butylbenzene	538-93-2	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-methyl-3-nitroaniline	119-32-4	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2'-aminoacetophenone	551-93-9	µg/L	0.03	<	<	<	0.039	0.039	0.038	0.034	0.033	0.034	<	<	<	13	<	<	<	<	0.039	0.039	
n-butylbenzene	104-51-8	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methylmethacrylate (MMA)	80-62-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloropropene (allyl chloride)	107-05-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexamethoxymethyl melamine (HMMM)	3089-11-0	µg/L		0.34	0.36	0.19	0.23	0.23	0.28	0.25	0.32	0.4	0.37	0.75	0.72	13	0.17	0.186	0.32	0.356	0.738	0.75	
hexamethoxymethyl melamine (HMMM) (load)		g/s		0.085	0.117	0.0996	0.0023	0.0023	0.0236	0.0025	0.0032	0.004	0.0037	0.0193	0.0072	13	0.0023	0.0023	0.0072	0.0361	0.146	0.165	
1,3,5-triazine-2,4,6-triamine (melamine)	108-78-1	µg/L		0.62	0.83	0.7	0.75	1.4	1.3	1.7	1.6	1.5	1.7	2.4	1.4	13	0.6	0.608	1.4	1.28	2.12	2.4	
1,3,5-triazine-2,4,6-triamine (melamine) (load)		g/s		0.155	0.271	0.375	0.0075	0.014	0.109	0.017	0.016	0.015	0.017	0.0618	0.014	13	0.0075	0.0101	0.017	0.111	0.485	0.628	
trichlorobenzenes (3 isomers)	12002-48-1	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
dicyclopentadiene	77-73-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dimethylbenzene (o-xylene)	95-47-6	µg/L	0.01	<	<	<	<	<	<	0.01	0.01	<	<	<	0.01	13	<	<	<	<	0.01	0.01	
ethenylbenzene (styrene)	100-42-5	µg/L	0.01	<	<	<	<	0.02	<	<	<	0.01	<	0.02	0.01	13	<	<	<	<	0.02	0.02	
ethylbenzene	100-41-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iso-propylbenzene (cumene)	98-82-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-ethyltoluene	620-14-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-ethyltoluene	622-96-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-ethyltoluene	611-14-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
t-butylbenzene	98-06-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iso-butylbenzene	538-93-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4-methyl-3-nitroaniline	119-32-4	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2'-aminoacetophenone	551-93-9	µg/L	0.03			0.042		0.038			0.031			<		4	<	*	*	0.0315	*	0.042	
n-butylbenzene	104-51-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
methylmethacrylate (MMA)	80-62-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloropropene (allyl chloride)	107-05-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexamethoxymethyl melamine (HMMM)	3089-11-0	µg/L				0.14		0.23			0.45			0.69		4	0.14	*	*	0.378	*	0.69	
1,3,5-triazine-2,4,6-triamine (melamine)	108-78-1	µg/L				0.83		1.7			1.5			2.2		4	0.83	*	*	1.56	*	2.2	
trichlorobenzenes (3 isomers)	12002-48-1	µg/L	0.075	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Other industrial chemicals	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk																							
dicyclopentadiene	77-73-6	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
1,2-dimethylbenzene (o-xylene)	95-47-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethenylbenzene (styrene)	100-42-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ethylbenzene	100-41-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iso-propylbenzene (cumene)	98-82-8	µg/L	0.01	<	<	<	<	<	<	<	0.02	<	<	<	<	13	<	<	<	<	0.014	0.02	
3-ethyltoluene	620-14-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-ethyltoluene	622-96-8	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2-ethyltoluene	611-14-3	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
t-butylbenzene	98-06-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iso-butylbenzene	538-93-2	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
4-methyl-3-nitroaniline	119-32-4	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
2'-aminoacetophenone	551-93-9	µg/L	0.03			<		0.033			<			<		4	<	*	*	<	*	0.033	
n-butylbenzene	104-51-8	µg/L	0.03			<		<			<			<		4	<	*	*	<	*	<	
methylmethacrylate (MMA)	80-62-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
3-chloropropene (allyl chloride)	107-05-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hexamethoxymethyl melamine (HMMM)	3089-11-0	µg/L		0.4	0.32	0.245	0.23	0.23	0.19	0.24	0.16	0.17	0.3	0.32	0.47	13	0.16	0.164	0.24	0.271	0.442	0.47	
1,3,5-triazine-2,4,6-triamine (melamine)	108-78-1	µg/L		0.98	0.69	0.8	0.54	0.9	0.8	1.4	0.92	0.69	1.4	0.93	0.97	13	0.54	0.564	0.92	0.909	1.4	1.4	
trichlorobenzenes (3 isomers)	12002-48-1	µg/L	0.075	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Disinfectants																							
Lobith																							
1,4-dichlorobenzene	106-46-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
1,4-dichlorobenzene	106-46-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
1,4-dichlorobenzene	106-46-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
1,4-dichlorobenzene	106-46-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Disinfection byproducts (with halogens)																							
Lobith																							
bromodichloromethane	75-27-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dibromochloromethane	124-48-1	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tribromomethane	75-25-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
bromodichloromethane	75-27-4	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dibromochloromethane	124-48-1	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tribromomethane	75-25-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dibromoacetic acid	631-64-1	µg/L	0.06	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
bromochloroacetic acid	5589-96-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	51	<	<	<	<	<	<	
Nieuwersluis																							
bromodichloromethane	75-27-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dibromochloromethane	124-48-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tribromomethane	75-25-2	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dibromoacetic acid	631-64-1	µg/L	0.06			<		<			<			<		4	<	*	*	<	*	<	
bromochloroacetic acid	5589-96-8	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
bromodichloromethane	75-27-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dibromochloromethane	124-48-1	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tribromomethane	75-25-2	µg/L	0.01	<	<	<	<	<	<	<	<	0.04	0.02	0.02	<	13	<	<	<	<	0.032	0.04	
dibromoacetic acid	631-64-1	µg/L	0.06	<	<	<	<	<	<	<	<	<	0.07	<	<	13	<	<	<	<	<	0.07	
bromochloroacetic acid	5589-96-8	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Disinfection byproducts based on nitroso compounds	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein																							
N-nitrosodimethylamine (NDMA)	62-75-9	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosomorpholine (NMOR)	59-89-2	µg/L	0.003	0.0047	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.00402	0.0047	
N-nitrosopiperidine (NPIP)	100-75-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosopyrrolidine (NPYR)	930-55-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosomethylethylamine (NMEA)	10595-95-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosodiethylamine (NDEA)	55-18-5	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosodi-n-propylamine (NDPA)	621-64-7	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitroso-n-dibutylamine (NDBA)	924-16-3	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
N-nitrosodimethylamine (NDMA)	62-75-9	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosomorpholine (NMOR)	59-89-2	µg/L	0.003	0.008	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0054	0.008	
N-nitrosopiperidine (NPIP)	100-75-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosopyrrolidine (NPYR)	930-55-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosomethylethylamine (NMEA)	10595-95-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosodiethylamine (NDEA)	55-18-5	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosodi-n-propylamine (NDPA)	621-64-7	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitroso-n-dibutylamine (NDBA)	924-16-3	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
N-nitrosodimethylamine (NDMA)	62-75-9	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosomorpholine (NMOR)	59-89-2	µg/L	0.003	0.0032	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.0032	
N-nitrosopiperidine (NPIP)	100-75-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosopyrrolidine (NPYR)	930-55-2	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosomethylethylamine (NMEA)	10595-95-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosodiethylamine (NDEA)	55-18-5	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitrosodi-n-propylamine (NDPA)	621-64-7	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
N-nitroso-n-dibutylamine (NDBA)	924-16-3	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Fire-retardant agents																							
Lobith																							
pentachlorobenzene	608-93-5	µg/L		0.00006	0.00005	0.00006	0.00007	0.00005	0.00006	0.00009	0.00006	0.00006	0.00006	0.00004	0.000055	13	0.00004	0.00004	0.00006	0.0000592	0.000082	0.00009	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,2′,4′-tetrabromodiphenylether (PBDE-47)	5436-43-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,2′,5′-tetrabromodiphenylether (PBDE-49)	243982-82-3	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2′,4′-pentabromodiphenylether (PBDE-85)	182346-21-0	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2′,4′-pentabromodiphenylether (PBDE-99)	60348-60-9	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,6,2′,4′-pentabromodiphenylether (PBDE-100)	189084-64-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2′,4′,5′-hexabromodiphenylether (PBDE-153)	68631-49-2	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2′,4′,6′-hexabromodiphenylether (PBDE-154)	207122-15-4	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,4′-tribromodiphenylether (PBDE-28)	41318-75-6	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2′,4′,5′-hexabromodiphenylether (PBDE-138)	182677-30-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,2′,3,3′,4,4′,5,5′,6,6′-decabromodiphenylether (PBDE-209)	1163-19-5	µg/L	0.04	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
pentachlorobenzene	608-93-5	µg/L		0.00005		0.00006	0.00004	0.00004	0.00005	0.00006	0.00004	0.00004	0.00004	0.00005	0.00005	12	0.00004	0.00004	0.000045	0.0000483	0.000074	0.00008	
triethyl phosphate (TEP)	78-40-0	µg/L	0.02	0.07	0.045	0.04	0.065	0.065	0.03	0.045	0.08	0.085	0.105	0.095	0.04	24	<	0.02	0.06	0.0646	0.115	0.12	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triisobutyl phosphate (TIBP)	126-71-6	µg/L	0.2	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
2,4,2′,4′-tetrabromodiphenylether (PBDE-47)	5436-43-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,2′,5′-tetrabromodiphenylether (PBDE-49)	243982-82-3	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2′,4′-pentabromodiphenylether (PBDE-85)	182346-21-0	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2′,4′-pentabromodiphenylether (PBDE-99)	60348-60-9	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,6,2′,4′-pentabromodiphenylether (PBDE-100)	189084-64-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2′,4′,5′-hexabromodiphenylether (PBDE-153)	68631-49-2	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Fire-retardant agents	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
2,4,5,2',4',6'-hexabromodiphenylether (PBDE-154)	207122-15-4	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,4'-tribromodiphenylether (PBDE-28)	41318-75-6	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2',4',5'-hexabromodiphenylether (PBDE-138)	182677-30-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,2',3,3',4,4',5,5',6,6'-decabromodiphenylether (PBDE-209)	1163-19-5	µg/L	0.01	<	<	<	<	<	<		<	<		<		10	<	<	<	<	<	<	
Nieuwersluis																							
pentachlorobenzene	608-93-5	µg/L	0.00002	0.00004	0.00003	0.00003	0.00003	0.00003	0.00002	<	0.00003	0.00004	0.00002	<	0.00002	13	<	<	0.00003	0.0000262	0.00004	0.00004	
triethyl phosphate (TEP)	78-40-0	µg/L	0.02		0.08	0.035	0.06	<		0.1	0.07	0.05	0.13	0.1	0.04	11	<	<	0.06	0.0645	0.124	0.13	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triisobutyl phosphate (TIBP)	126-71-6	µg/L	0.2	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
2,4,2',4'-tetrabromodiphenylether (PBDE-47)	5436-43-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,2',5'-tetrabromodiphenylether (PBDE-49)	243982-82-3	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2',4'-pentabromodiphenylether (PBDE-85)	182346-21-0	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2',4'-pentabromodiphenylether (PBDE-99)	60348-60-9	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,6,2',4'-pentabromodiphenylether (PBDE-100)	189084-64-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2',4',5'-hexabromodiphenylether (PBDE-153)	68631-49-2	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2',4',6'-hexabromodiphenylether (PBDE-154)	207122-15-4	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,4'-tribromodiphenylether (PBDE-28)	41318-75-6	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2',4',5'-hexabromodiphenylether (PBDE-138)	182677-30-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,2',3,3',4,4',5,5',6,6'-decabromodiphenylether (PBDE-209)	1163-19-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
pentachlorobenzene	608-93-5	µg/L	0.00002	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	0.000024	0.00003	
triethyl phosphate (TEP)	78-40-0	µg/L			0.05	0.06	0.04	0.06		0.08	0.04	0.05	0.13	0.08	0.06	11	0.04	0.04	0.06	0.0645	0.12	0.13	
triphenyl phosphate (TPP)	115-86-6	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
triisobutyl phosphate (TIBP)	126-71-6	µg/L	0.2	<		<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
2,4,2',4'-tetrabromodiphenylether (PBDE-47)	5436-43-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,2',5'-tetrabromodiphenylether (PBDE-49)	243982-82-3	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2',4'-pentabromodiphenylether (PBDE-85)	182346-21-0	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2',4'-pentabromodiphenylether (PBDE-99)	60348-60-9	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,6,2',4'-pentabromodiphenylether (PBDE-100)	189084-64-8	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2',4',5'-hexabromodiphenylether (PBDE-153)	68631-49-2	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,5,2',4',6'-hexabromodiphenylether (PBDE-154)	207122-15-4	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,4,4'-tribromodiphenylether (PBDE-28)	41318-75-6	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,3,4,2',4',5'-hexabromodiphenylether (PBDE-138)	182677-30-1	µg/L	0.0005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
2,2',3,3',4,4',5,5',6,6'-decabromodiphenylether (PBDE-209)	1163-19-5	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
X-ray contrast agents																							
Lobith																							
amidotrizoic acid	117-96-4	µg/L		0.08	0.23	0.08	0.145	0.26	0.15	0.14	0.16	0.18	0.16	0.18	0.25	13	0.08	0.08	0.16	0.166	0.256	0.26	
amidotrizoic acid (load)		g/s		0.16	0.847	0.394	0.228	0.334	0.282	0.185	0.202	0.203	0.273	0.262	0.303	13	0.16	0.17	0.272	0.3	0.666	0.847	
iohexol	66108-95-0	µg/L		0.14	0.48	0.17	0.245	0.41	0.14	0.09	0.14	0.11	0.17	0.17	0.37	13	0.09	0.098	0.17	0.222	0.452	0.48	
iohexol (load)		g/s		0.28	1.77	0.838	0.384	0.527	0.263	0.119	0.177	0.124	0.29	0.248	0.448	13	0.119	0.121	0.29	0.45	1.4	1.77	
iomeprol	78649-41-9	µg/L		0.25	0.55	0.31	0.42	0.71	0.4	0.27	0.26	0.26	0.34	0.38	0.58	13	0.25	0.254	0.36	0.396	0.658	0.71	
iomeprol (load)		g/s		0.5	2.02	1.53	0.645	0.912	0.752	0.357	0.328	0.293	0.581	0.554	0.702	13	0.293	0.307	0.591	0.756	1.83	2.02	
iopamidol	60166-93-0	µg/L		0.08	0.15	0.1	0.2	0.41	0.27	0.23	0.2	0.26	0.25	0.25	0.33	13	0.08	0.088	0.24	0.225	0.378	0.41	
iopamidol (load)		g/s		0.16	0.552	0.493	0.303	0.527	0.507	0.305	0.252	0.293	0.427	0.365	0.4	13	0.16	0.197	0.365	0.376	0.542	0.552	
iopromide	73334-07-3	µg/L		0.16	0.27	0.12	0.195	0.32	0.18	0.13	0.18	0.16	0.16	0.15	0.33	13	0.12	0.124	0.18	0.196	0.326	0.33	
iopromide (load)		g/s		0.32	0.994	0.591	0.304	0.411	0.338	0.172	0.227	0.181	0.273	0.219	0.4	13	0.172	0.175	0.32	0.364	0.833	0.994	
Nieuwegein																							
amidotrizoic acid	117-96-4	µg/L		0.075	0.099	0.098	0.089	0.08	0.076	0.098	0.081	0.13	0.11	0.17	0.16	13	0.075	0.0754	0.098	0.105	0.166	0.17	
amidotrizoic acid (load)		g/s		0.0187	0.0323	0.049	0.00089	0.0008	0.0064	0.00098	0.00081	0.0013	0.0011	0.00438	0.0016	13	0.0008	0.000804	0.0016	0.0129	0.06	0.0784	
iodipamide	606-17-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iohexol	66108-95-0	µg/L		0.097	0.19	0.2	0.15	0.16	0.12	0.11	0.075	0.092	0.084	0.14	0.16	13	0.075	0.0786	0.14	0.137	0.208	0.22	

An explanation of this table can be found on page 151-153.

X-ray contrast agents	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
iohexol (load)		g/s		0.0242	0.0619	0.105	0.0015	0.0016	0.0101	0.0011	0.00075	0.00092	0.00084	0.0036	0.0016	13	0.00075	0.000786	0.0016	0.0244	0.128	0.173	
iomeprol	78649-41-9	µg/L		0.26	0.37	0.35	0.38	0.4	0.32	0.24	0.31	0.25	0.32	0.37	0.52	13	0.24	0.244	0.32	0.342	0.472	0.52	
iomeprol (load)		g/s		0.065	0.121	0.181	0.0038	0.004	0.0269	0.0024	0.0031	0.0025	0.0032	0.00952	0.0052	13	0.0024	0.00244	0.0052	0.0469	0.227	0.298	
iopamidol	60166-93-0	µg/L		0.11	0.1	0.117	0.12	0.14	0.13	0.15	0.16	0.18	0.2	0.24	0.22	13	0.094	0.0964	0.14	0.153	0.232	0.24	
iopamidol (load)		g/s		0.0275	0.0326	0.0511	0.0012	0.0014	0.0109	0.0015	0.0016	0.0018	0.002	0.00618	0.0022	13	0.0012	0.00128	0.0022	0.0147	0.0573	0.0737	
iopromide	73334-07-3	µg/L		0.12	0.27	0.185	0.18	0.22	0.2	0.17	0.14	0.18	0.14	0.28	0.36	13	0.12	0.128	0.18	0.202	0.328	0.36	
iopromide (load)		g/s		0.03	0.088	0.101	0.0018	0.0022	0.0168	0.0017	0.0014	0.0018	0.0014	0.00721	0.0036	13	0.0014	0.0014	0.0036	0.0276	0.139	0.173	
iothalamic acid	2276-90-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ioxaglic acid	59017-64-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ioxitalamic acid	28179-44-4	µg/L		0.017	0.028	0.017	0.019	0.02	0.016	0.017	0.015	0.02	0.017	0.035	0.029	13	0.015	0.0154	0.017	0.0205	0.0326	0.035	
Nieuwersluis																							
amidotrizoic acid	117-96-4	µg/L		0.12	0.11	0.053	0.088	0.096	0.12	0.11	0.13	0.11	0.12	0.16	0.2	13	0.041	0.0506	0.11	0.113	0.184	0.2	
iodipamide	606-17-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iohexol	66108-95-0	µg/L		0.2	0.18	0.107	0.13	0.17	0.16	0.1	0.083	0.077	0.076	0.14	0.13	13	0.073	0.0742	0.13	0.128	0.192	0.2	
iomeprol	78649-41-9	µg/L		0.49	0.47	0.3	0.41	0.5	0.51	0.25	0.42	0.26	0.61	0.56	0.83	13	0.25	0.254	0.47	0.455	0.742	0.83	
iopamidol	60166-93-0	µg/L		0.16	0.093	0.055	0.12	0.15	0.15	0.15	0.18	0.16	0.17	0.22	0.18	13	0.041	0.0522	0.15	0.142	0.204	0.22	
iopromide	73334-07-3	µg/L		0.26	0.36	0.29	0.27	0.24	0.36	0.18	0.18	0.16	0.35	0.097	0.67	13	0.097	0.122	0.26	0.285	0.55	0.67	
iothalamic acid	2276-90-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ioxaglic acid	59017-64-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ioxitalamic acid	28179-44-4	µg/L		0.024	0.026	0.0115	0.019	0.018	0.016	0.016	0.016	0.011	0.024	0.028	0.021	13	0.011	0.011	0.018	0.0186	0.0272	0.028	
Andijk																							
amidotrizoic acid	117-96-4	µg/L		0.12	0.087	0.084	0.074	0.068	0.052	0.063	0.39	0.039	0.085	0.084	0.13	13	0.039	0.0442	0.084	0.105	0.286	0.39	
iodipamide	606-17-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
iohexol	66108-95-0	µg/L		0.1	0.12	0.062	0.12	0.12	0.092	0.09	0.066	0.065	0.075	0.069	0.11	13	0.014	0.0344	0.092	0.0885	0.12	0.12	
iomeprol	78649-41-9	µg/L		0.29	0.29	0.158	0.31	0.33	0.24	0.23	0.3	0.21	0.32	0.25	0.43	13	0.025	0.099	0.29	0.27	0.39	0.43	
iopamidol	60166-93-0	µg/L	0.01	0.18	0.11	0.0575	0.093	0.1	0.08	0.094	0.076	0.075	0.16	0.13	0.15	13	<	0.033	0.1	0.105	0.172	0.18	
iopromide	73334-07-3	µg/L		0.11	0.13	0.0705	0.11	0.11	0.087	0.082	0.058	0.061	0.068	0.083	0.18	13	0.011	0.0298	0.087	0.0938	0.16	0.18	
iothalamic acid	2276-90-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ioxaglic acid	59017-64-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ioxitalamic acid	28179-44-4	µg/L	0.01	0.016	0.018	0.016	0.013	0.013	<	0.01	<	<	0.011	<	0.017	13	<	<	0.013	0.0115	0.0176	0.018	
Cytostatic agents																							
Nieuwegein																							
cyclophosphamide	50-18-0	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ifosfamid	3778-73-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methotrexate (MTX)	59-05-2	µg/L	0.02	<		<	<	<	<	<	<	<	<	<	<	11	<	<	<	<	<	<	
Nieuwersluis																							
cyclophosphamide	50-18-0	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ifosfamid	3778-73-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methotrexate (MTX)	59-05-2	µg/L	0.02	<			<	<	<	<	<	<	<	<	<	10	<	<	<	<	<	<	
Andijk																							
cyclophosphamide	50-18-0	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ifosfamid	3778-73-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
methotrexate (MTX)	59-05-2	µg/L	0.02	<		<	<	<	<	<	<	<	<	<	<	11	<	<	<	<	<	<	
Antibiotics																							
Lobith																							
clarithromycin	81103-11-9	µg/L	0.01	<	0.01	<	<	<	<	<	<	<	<	<	0.02	13	<	<	<	<	0.016	0.02	
sulfamethoxazole	723-46-6	µg/L		0.02	0.03	0.01	0.025	0.06	0.03	0.04	0.04	0.04	0.03	0.04	0.05	13	0.01	0.014	0.03	0.0338	0.056	0.06	
acetylsulfamethoxazole	21312-10-7	µg/L	0.01	0.01	0.02	<	<	0.01	<	<	<	<	0.01	<	0.02	13	<	<	<	<	0.02	0.02	
Nieuwegein																							
chloramphenicol	56-75-7	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Antibiotics	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
clarithromycin	81103-11-9	µg/L	0.005	0.014	0.016	0.0095	0.005	0.005	<	<	<	<	<	<	0.006	13	<	<	0.005	0.00615	0.0152	0.016	
sulfamethoxazole	723-46-6	µg/L		0.026	0.039	0.0165	0.026	0.033	0.029	0.027	0.028	0.034	0.046	0.039	0.044	13	0.016	0.0164	0.029	0.0311	0.0452	0.046	
trimethoprim	738-70-5	µg/L	0.002	0.005	0.006	0.004	0.003	0.002	<	<	<	<	<	0.002	0.003	13	<	<	0.002	0.00262	0.0056	0.006	
azithromycin	83905-01-5	µg/L	0.04			<	<	<	<		<	<	<	<	<	10	<	<	<	<	<	<	
lincomycin	154-21-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tiamulin	55297-95-5	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfaquinoxaline	59-40-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
theophylline	58-55-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	0.023	<	13	<	<	<	<	<	0.023	
acetylsulfamethoxazole	21312-10-7	µg/L	0.01	0.011	0.011	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.011	0.011	
Nieuwersluis																							
chloramphenicol	56-75-7	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
clarithromycin	81103-11-9	µg/L	0.005	0.018	0.021	0.012	0.009	0.007	0.008	<	0.005	<	0.01	<	0.011	13	<	<	0.009	0.00927	0.0198	0.021	
sulfamethoxazole	723-46-6	µg/L		0.036	0.034	0.018	0.032	0.039	0.035	0.034	0.033	0.033	0.05	0.045	0.041	13	0.013	0.017	0.034	0.0345	0.048	0.05	
trimethoprim	738-70-5	µg/L	0.002	0.008	0.01	0.006	0.004	0.003	0.002	0.002	0.002	<	0.005	0.004	0.01	13	<	<	0.004	0.00485	0.01	0.01	
azithromycin	83905-01-5	µg/L	0.04			<	<	<	<		<	<	<	<	<	10	<	<	<	<	<	<	
lincomycin	154-21-2	µg/L	0.002	0.004	<	0.006	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.007	0.009	
tiamulin	55297-95-5	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfaquinoxaline	59-40-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
theophylline	58-55-9	µg/L	0.02	<	<	<	0.03	<	<	0.021	<	<	<	0.022	<	13	<	<	<	<	0.0268	0.03	
acetylsulfamethoxazole	21312-10-7	µg/L	0.01	0.012	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.012	
Andijk																							
chloramphenicol	56-75-7	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
clarithromycin	81103-11-9	µg/L	0.005	<	0.005	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.005	
sulfamethoxazole	723-46-6	µg/L		0.028	0.03	0.0215	0.018	0.02	0.014	0.016	0.011	0.009	0.021	0.017	0.028	13	0.009	0.0098	0.019	0.0196	0.0292	0.03	
trimethoprim	738-70-5	µg/L	0.002	<	0.003	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0022	0.003	
azithromycin	83905-01-5	µg/L	0.04			<	<	<	<		<	<	<	<	<	10	<	<	<	<	<	<	
lincomycin	154-21-2	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tiamulin	55297-95-5	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfaquinoxaline	59-40-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
theophylline	58-55-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.02	
acetylsulfamethoxazole	21312-10-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Antibiotics based on sulphonamides																							
Nieuwegein																							
sulfadiazine	68-35-9	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	0.004	0.005	13	<	<	<	<	0.0046	0.005	
sulfadimidine	57-68-1	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfapyridine	144-83-2	µg/L	0.004	0.013	0.019	0.008	0.005	0.004	0.004	0.004	<	0.005	0.009	0.012	0.023	13	<	<	0.006	0.00892	0.0214	0.023	
sulfamethizole	144-82-1	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
sulfadiazine	68-35-9	µg/L	0.003	<	<	<	0.003	<	<	<	<	<	0.003	0.003	0.003	13	<	<	<	<	0.003	0.003	
sulfadimidine	57-68-1	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfapyridine	144-83-2	µg/L		0.025	0.024	0.0155	0.011	0.012	0.012	0.01	0.01	0.009	0.026	0.021	0.034	13	0.009	0.0094	0.015	0.0173	0.0308	0.034	
sulfamethizole	144-82-1	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
sulfadiazine	68-35-9	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfadimidine	57-68-1	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sulfapyridine	144-83-2	µg/L	0.004	0.006	0.012	0.0055	<	<	<	<	<	<	<	<	0.007	13	<	<	<	<	0.01	0.012	
sulfamethizole	144-82-1	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Blood pressure-lowering drugs and diuretics																							
Lobith																							
atenolol	29122-68-7	µg/L	0.01	<	<	<	<	0.01	<	<	<	<	<	<	0.01	13	<	<	<	<	0.01	0.01	
betaxolol	63659-18-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Blood pressure-lowering drugs and diuretics	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Lobith (continued)																							
bisoprolol	66722-44-9	µg/L	0.01	0.02	0.02	<	0.015	0.02	<	<	0.01	<	0.01	0.02	0.03	13	<	<	0.01	0.0138	0.026	0.03	
metoprolol	37350-58-6	µg/L		0.07	0.08	0.04	0.095	0.14	0.06	0.05	0.07	0.06	0.08	0.09	0.15	13	0.04	0.044	0.08	0.0831	0.146	0.15	
metoprolol (load)		g/s		0.14	0.294	0.197	0.153	0.18	0.113	0.0662	0.0883	0.0677	0.137	0.131	0.182	13	0.0662	0.0668	0.137	0.146	0.256	0.294	
pindolol	13523-86-9	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
propranolol	525-66-6	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
sotalol	3930-20-9	µg/L	0.01	<	0.01	<	<	0.01	<	<	<	<	0.01	0.01	0.02	13	<	<	<	<	0.016	0.02	
hydrochlorothiazide	58-93-5	µg/L		0.09	0.09	0.04	0.04	0.05	0.02	0.02	0.03	0.03	0.05	0.07	0.13	13	0.02	0.02	0.04	0.0538	0.114	0.13	
hydrochlorothiazide (load)		g/s		0.18	0.331	0.197	0.0635	0.0642	0.0376	0.0265	0.0378	0.0339	0.0854	0.102	0.157	13	0.0265	0.0294	0.0778	0.106	0.278	0.331	
valsartan	137862-53-4	µg/L		0.1	0.12	0.08	0.105	0.14	0.05	0.03	0.04	0.03	0.04	0.05	0.11	13	0.03	0.03	0.08	0.0769	0.132	0.14	
valsartan (load)		g/s		0.2	0.442	0.394	0.172	0.18	0.0939	0.0397	0.0505	0.0339	0.0683	0.0729	0.133	13	0.0339	0.0362	0.111	0.158	0.423	0.442	
telmisartan	144701-48-4	µg/L		0.03	0.05	0.03	0.045	0.09	0.05	0.05	0.06	0.06	0.06	0.05	0.07	13	0.03	0.03	0.05	0.0531	0.082	0.09	
valsartan acid	164265-78-5	µg/L		0.05	0.07	0.03	0.125	0.31	0.15	0.14	0.19	0.19	0.16	0.15	0.17	13	0.03	0.038	0.15	0.143	0.262	0.31	
valsartan acid (load)		g/s		0.1	0.258	0.148	0.179	0.398	0.282	0.185	0.24	0.214	0.273	0.219	0.206	13	0.1	0.114	0.219	0.222	0.352	0.398	
atenolol acid	56392-14-4	µg/L		0.08	0.12	0.07	0.1	0.11	0.06	0.04	0.07	0.05	0.06	0.06	0.1	13	0.04	0.044	0.07	0.0785	0.116	0.12	
candesartan	139481-59-7	µg/L		0.09	0.1	0.05	0.14	0.31	0.12	0.11	0.15	0.13	0.14	0.13	0.19	13	0.05	0.066	0.13	0.138	0.262	0.31	
candesartan (load)		g/s		0.18	0.368	0.246	0.215	0.398	0.225	0.146	0.189	0.147	0.239	0.19	0.23	13	0.146	0.146	0.225	0.23	0.386	0.398	
Nieuwegein																							
atenolol	29122-68-7	µg/L	0.002	0.006	0.012	0.0055	0.007	0.004	0.002	0.003	<	0.003	0.008	0.007	0.011	13	<	<	0.006	0.00577	0.0116	0.012	
bisoprolol	66722-44-9	µg/L	0.002	0.012	0.015	0.011	0.005	0.004	0.002	0.003	<	0.003	0.003	0.007	0.009	13	<	<	0.005	0.00662	0.0142	0.015	
metoprolol	37350-58-6	µg/L		0.06	0.086	0.0445	0.046	0.046	0.035	0.039	0.025	0.04	0.078	0.072	0.095	13	0.025	0.029	0.046	0.0547	0.0914	0.095	
metoprolol (load)		g/s		0.015	0.028	0.0227	0.00046	0.00046	0.00295	0.00039	0.00025	0.0004	0.00078	0.00185	0.00095	13	0.00025	0.000306	0.00095	0.00745	0.0333	0.0369	
propranolol	525-66-6	µg/L	0.01	<	<	<	<	<		<	<	<	<	<	<	12	<	<	<	<	<	<	
sotalol	3930-20-9	µg/L		0.015	0.061	0.0095	0.025	0.025	0.02	0.019	0.015	0.024	0.071	0.052	0.081	13	0.009	0.0094	0.024	0.0328	0.077	0.081	
losartan	114798-26-4	µg/L		0.007	0.019	0.007	0.012	0.015	0.014	0.008	0.007	0.008	0.013	0.015	0.019	13	0.006	0.0064	0.012	0.0116	0.019	0.019	
enalapril	75847-73-3	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hydrochlorothiazide	58-93-5	µg/L	0.02	0.083	0.088	0.0425	<	<	<	<	<	<	0.023	0.029	0.08	13	<	<	0.021	0.0345	0.086	0.088	
hydrochlorothiazide (load)		g/s		0.0207	0.0287	0.0272	0.0001	0.0001	0.000842	0.0001	0.0001	0.0001	0.00023	0.000746	0.0008	13	0.0001	0.0001	0.000746	0.00823	0.0416	0.0502	
valsartan	137862-53-4	µg/L	0.015	0.094	0.12	0.088	0.09	0.069	0.03	0.021	0.021	0.019	<	0.026	0.05	13	<	<	0.05	0.0557	0.11	0.12	
valsartan (load)		g/s		0.0235	0.0391	0.0452	0.0009	0.00069	0.00253	0.00021	0.00021	0.00019	0.000075	0.000669	0.0005	13	0.000075	0.000121	0.00069	0.0122	0.0599	0.0737	
irbesartan	138402-11-6	µg/L	0.005			0.029	0.029	0.022	<	0.019	0.009	<	0.034	0.035	0.067	11	<	<	0.023	0.0253	0.0606	0.067	
telmisartan	144701-48-4	µg/L		0.03	0.04	0.03	0.03	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.05	13	0.03	0.03	0.04	0.0408	0.05	0.05	
valsartan acid	164265-78-5	µg/L		0.08	0.11	0.055	0.1	0.2	0.24	0.25	0.24	0.27	0.29	0.3	0.26	13	0.05	0.054	0.24	0.188	0.296	0.3	
valsartan acid (load)		g/s		0.02	0.0359	0.0257	0.001	0.002	0.0202	0.0025	0.0024	0.0027	0.0029	0.00772	0.0026	13	0.001	0.0014	0.0029	0.0116	0.0379	0.0392	
candesartan	139481-59-7	µg/L		0.07	0.09	0.06	0.08	0.11	0.11	0.1	0.1	0.12	0.11	0.13	0.12	13	0.06	0.06	0.1	0.0969	0.126	0.13	
candesartan (load)		g/s		0.0175	0.0293	0.0296	0.0008	0.0011	0.00926	0.001	0.001	0.0012	0.0011	0.00335	0.0012	13	0.0008	0.00088	0.0012	0.0097	0.04	0.0471	
lisinopril	83915-83-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
atenolol	29122-68-7	µg/L		0.018	0.02	0.0155	0.013	0.012	0.012	0.008	0.006	0.008	0.021	0.015	0.023	13	0.006	0.0068	0.015	0.0144	0.0222	0.023	
bisoprolol	66722-44-9	µg/L		0.014	0.013	0.0055	0.006	0.004	0.004	0.004	0.002	0.002	0.003	0.007	0.01	13	0.002	0.002	0.004	0.00615	0.0136	0.014	
metoprolol	37350-58-6	µg/L		0.12	0.11	0.0705	0.082	0.075	0.078	0.061	0.044	0.049	0.11	0.096	0.11	13	0.044	0.046	0.082	0.0828	0.116	0.12	
propranolol	525-66-6	µg/L	0.01	<	<	<	<	<		<	<	<	<	<	<	12	<	<	<	<	<	<	
sotalol	3930-20-9	µg/L		0.094	0.086	0.0725	0.073	0.07	0.063	0.054	0.047	0.048	0.13	0.095	0.11	13	0.047	0.0474	0.073	0.0781	0.122	0.13	
losartan	114798-26-4	µg/L		0.02	0.027	0.021	0.017	0.022	0.022	0.012	0.01	0.012	0.031	0.021	0.031	13	0.01	0.0108	0.021	0.0205	0.031	0.031	
enalapril	75847-73-3	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hydrochlorothiazide	58-93-5	µg/L		0.15	0.14	0.069	0.026	0.024	0.022	0.02	0.026	0.024	0.073	0.064	0.14	13	0.02	0.0208	0.064	0.0652	0.146	0.15	
valsartan	137862-53-4	µg/L		0.12	0.12	0.081	0.097	0.086	0.059	0.036	0.028	0.017	0.026	0.031	0.068	13	0.017	0.0206	0.062	0.0654	0.12	0.12	
irbesartan	138402-11-6	µg/L				0.0525	0.057	0.05	0.049	0.029	0.031	0.023	0.081	0.06	0.11	11	0.023	0.0242	0.05	0.0541	0.104	0.11	
telmisartan	144701-48-4	µg/L				0.02		0.06			0.05			0.06		4	0.02	*	*	0.0475	*	0.06	
valsartan acid	164265-78-5	µg/L				0.04		0.24			0.27			0.3		4	0.04	*	*	0.213	*	0.3	
candesartan	139481-59-7	µg/L				0.0405	0.081	0.14	0.14	0.11	0.1	0.12	0.13	0.15	0.16	11	0.037	0.0384	0.12	0.11	0.158	0.16	
lisinopril	83915-83-7	µg/L	0.01	<	<	0.0115	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0128	0.018	

An explanation of this table can be found on page 151-153.

Blood pressure-lowering drugs and diuretics	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk																							
atenolol	29122-68-7	µg/L	0.002	<	0.006	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0048	0.006	
bisoprolol	66722-44-9	µg/L	0.002	0.002	0.01	<	<	0.002	<	<	<	<	<	<	0.004	13	<	<	<	0.00208	0.0076	0.01	
metoprolol	37350-58-6	µg/L	0.004	0.03	0.059	0.013	<	0.013	<	<	<	<	0.012	0.009	0.035	13	<	<	0.009	0.0149	0.0494	0.059	
propranolol	525-66-6	µg/L	0.01	<	<	<	<	<		<	<	<	<	<	<	12	<	<	<	<	<	<	
sotalol	3930-20-9	µg/L	0.004	0.014	0.023	0.0125	<	<	<	<	<	<	<	0.004	0.014	13	<	<	<	0.00723	0.0194	0.023	
losartan	114798-26-4	µg/L	0.002	0.006	0.012	0.007	0.005	0.004	0.002	0.002	<	<	0.003	0.003	0.005	13	<	<	0.004	0.00446	0.0104	0.012	
enalapril	75847-73-3	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
hydrochlorothiazide	58-93-5	µg/L	0.04	<	0.065	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0494	0.065	
valsartan	137862-53-4	µg/L	0.015	0.019	0.072	0.018	<	0.041	0.015	<	<	<	<	<	0.025	13	<	<	0.015	0.0195	0.0596	0.072	
irbesartan	138402-11-6	µg/L	0.005			0.018	<	<	<	<	<	<	<	<	0.018	11	<	<	<	0.00673	0.018	0.018	
telmisartan	144701-48-4	µg/L		0.03	0.03	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.03	13	0.02	0.02	0.03	0.0254	0.03	0.03	
valsartan acid	164265-78-5	µg/L		0.02	0.12	0.135	0.13	0.14	0.15	0.2	0.19	0.19	0.24	0.24	0.25	13	0.02	0.06	0.15	0.165	0.246	0.25	
candesartan	139481-59-7	µg/L	0.05	0.08	0.07	0.055	<	0.07	0.06	0.08	0.06	0.06	0.09	0.08	0.1	13	<	<	0.07	0.0681	0.096	0.1	
lisinopril	83915-83-7	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Analgesic and antipyretic drugs																							
Lobith																							
lidocaine	137-58-6	µg/L	0.01	0.01	0.01	<	<	0.01	0.01	<	0.01	0.01	0.01	0.01	0.03	13	<	<	0.01	0.0104	0.022	0.03	
diclofenac	15307-86-5	µg/L		0.09	0.11	0.05	0.055	0.06	0.02	0.02	0.03	0.03	0.07	0.1	0.18	13	0.02	0.02	0.06	0.0669	0.152	0.18	
diclofenac (load)		g/s		0.18	0.405	0.246	0.0891	0.077	0.0376	0.0265	0.0378	0.0339	0.12	0.146	0.218	13	0.0265	0.0294	0.117	0.131	0.342	0.405	
ibuprofen	15687-27-1	µg/L	0.01	<	0.05	0.03	<	<	<	<	<	<	<	<	0.02	13	<	<	<	0.0115	0.042	0.05	
naproxen	22204-53-1	µg/L	0.01	0.02	0.03	0.02	0.02	0.02	<	<	0.01	<	0.01	0.01	0.03	13	<	<	0.02	0.0158	0.03	0.03	
phenazone	60-80-0	µg/L	0.01	<	<	<	0.0175	0.03	0.01	<	0.01	<	0.01	0.01	0.02	13	<	<	0.01	0.0115	0.03	0.03	
primidone	125-33-7	µg/L	0.01	0.01	0.01	<	0.015	0.05	0.01	0.01	0.02	0.02	0.02	0.02	0.03	13	<	<	0.02	0.0181	0.042	0.05	
tramadol	27203-92-5	µg/L		0.02	0.03	0.01	0.025	0.05	0.03	0.03	0.03	0.03	0.04	0.03	0.04	13	0.01	0.014	0.03	0.03	0.046	0.05	
N-acetyl-4-aminoantipyrine (AAA)	83-15-8	µg/L		0.15	0.18	0.13	0.165	0.27	0.13	0.08	0.15	0.11	0.15	0.14	0.28	13	0.08	0.092	0.15	0.162	0.276	0.28	
N-acetyl-4-aminoantipyrine (AAA) (load)		g/s		0.3	0.663	0.641	0.264	0.347	0.244	0.106	0.189	0.124	0.256	0.204	0.339	13	0.106	0.113	0.256	0.303	0.654	0.663	
N-formyl-4-aminoantipyrine (FAA)	1672-58-8	µg/L		0.2	0.21	0.13	0.265	0.55	0.22	0.17	0.26	0.23	0.24	0.27	0.47	13	0.13	0.146	0.23	0.268	0.518	0.55	
N-formyl-4-aminoantipyrine (FAA) (load)		g/s		0.4	0.773	0.641	0.408	0.706	0.413	0.225	0.328	0.26	0.41	0.394	0.569	13	0.225	0.239	0.41	0.457	0.746	0.773	
Nieuwegein																							
lidocaine	137-58-6	µg/L		0.008	0.011	0.006	0.007	0.009	0.008	0.01	0.008	0.009	0.011	0.015	0.017	13	0.006	0.006	0.009	0.00962	0.0162	0.017	
diclofenac	15307-86-5	µg/L	0.015	0.081	0.083	0.0495	<	<	<	<	<	<	<	0.026	0.054	13	<	<	<	0.0304	0.0822	0.083	
diclofenac (load)		g/s		0.0202	0.0271	0.0307	0.000075	0.000075	0.000631	0.000075	0.000075	0.000075	0.000075	0.000669	0.00054	13	0.000075	0.000075	0.00054	0.00854	0.0442	0.0557	
ketoprofen	22071-15-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
naproxen	22204-53-1	µg/L	0.01	0.02	0.022	0.017	<	<	<	<	<	<	<	0.01	0.012	13	<	<	<	0.0102	0.0226	0.023	
phenazone	60-80-0	µg/L		0.007	0.012	0.0065	0.011	0.017	0.015	0.013	0.011	0.013	0.014	0.013	0.014	13	0.006	0.0064	0.013	0.0118	0.0162	0.017	
primidone	125-33-7	µg/L		0.01	0.013	0.0075	0.01	0.014	0.015	0.013	0.012	0.014	0.016	0.016	0.017	13	0.007	0.0074	0.013	0.0127	0.0166	0.017	
tramadol	27203-92-5	µg/L		0.027	0.042	0.019	0.025	0.034	0.033	0.034	0.03	0.03	0.042	0.047	0.054	13	0.019	0.019	0.033	0.0335	0.0512	0.054	
N-acetyl-4-aminoantipyrine (AAA)	83-15-8	µg/L		0.46	0.24	0.2	0.19	0.2	0.16	0.18	0.13	0.17	0.2	0.18	0.21	13	0.13	0.142	0.19	0.209	0.372	0.46	
N-acetyl-4-aminoantipyrine (AAA) (load)		g/s		0.115	0.0782	0.105	0.0019	0.002	0.0135	0.0018	0.0013	0.0017	0.002	0.00463	0.0021	13	0.0013	0.00146	0.0021	0.0333	0.15	0.173	
N-formyl-4-aminoantipyrine (FAA)	1672-58-8	µg/L		0.19		0.155	0.14	0.26	0.2	0.18	0.15	0.19	0.21	0.2	0.24	12	0.13	0.133	0.19	0.189	0.254	0.26	
N-formyl-4-aminoantipyrine (FAA) (load)		g/s		0.0475		0.0838	0.0014	0.0026	0.0168	0.0018	0.0015	0.0019	0.0021	0.00515	0.0024	12	0.0014	0.00143	0.0025	0.0209	0.113	0.141	
Nieuwersluis																							
lidocaine	137-58-6	µg/L		0.015	0.013	0.008	0.015	0.013	0.014	0.015	0.011	0.01	0.016	0.017	0.022	13	0.007	0.0078	0.014	0.0136	0.02	0.022	
diclofenac	15307-86-5	µg/L	0.015	0.1	0.088	0.033	<	<	<	<	<	<	0.021	0.034	0.079	13	<	<	0.021	0.0333	0.0952	0.1	
ketoprofen	22071-15-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
naproxen	22204-53-1	µg/L	0.01	0.021	0.029	0.0145	<	<	<	<	<	<	0.012	0.012	0.021	13	<	<	0.012	0.0118	0.0258	0.029	
phenazone	60-80-0	µg/L		0.016	0.014	0.0085	0.014	0.021	0.016	0.015	0.012	0.015	0.014	0.014	0.016	13	0.007	0.0082	0.014	0.0142	0.019	0.021	
primidone	125-33-7	µg/L		0.012	0.013	0.006	0.011	0.017	0.018	0.013	0.012	0.014	0.014	0.016	0.018	13	0.005	0.0058	0.013	0.0131	0.018	0.018	
tramadol	27203-92-5	µg/L		0.051	0.049	0.0275	0.039	0.046	0.047	0.045	0.039	0.036	0.048	0.056	0.067	13	0.023	0.0266	0.046	0.0445	0.0626	0.067	
N-acetyl-4-aminoantipyrine (AAA)	83-15-8	µg/L		0.5	0.19	0.113	0.17	0.19	0.17	0.16	0.12	0.15	0.14	0.18	0.19	13	0.076	0.0936	0.17	0.184	0.376	0.5	
N-formyl-4-aminoantipyrine (FAA)	1672-58-8	µg/L		0.2		0.072	0.13	0.27	0.2	0.16	0.14	0.16	0.16	0.2	0.19	12	0.06	0.0672	0.16	0.163	0.249	0.27	

An explanation of this table can be found on page 151-153.

Analgesic and antipyretic drugs	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk																							
lidocaine	137-58-6	µg/L	0.003	0.008	0.008	0.005	0.003	0.004	<	0.003	<	<	0.005	0.005	0.009	13	<	<	0.004	0.00458	0.0086	0.009	
diclofenac	15307-86-5	µg/L	0.015	0.024	0.055	<	<	<	<	<	<	<	<	<	0.022	13	<	<	<	<	0.0426	0.055	
ketoprofen	22071-15-4	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
naproxen	22204-53-1	µg/L	0.01	<	0.017	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0122	0.017	
phenazone	60-80-0	µg/L		0.014	0.009	0.006	0.005	0.009	0.007	0.009	0.007	0.007	0.008	0.006	0.009	13	0.005	0.005	0.007	0.00785	0.012	0.014	
primidone	125-33-7	µg/L		0.013	0.011	0.008	0.007	0.01	0.008	0.011	0.007	0.008	0.013	0.011	0.015	13	0.007	0.007	0.01	0.01	0.0142	0.015	
tramadol	27203-92-5	µg/L	0.01	0.027	0.029	0.0145	<	0.017	<	0.013	0.01	<	0.019	0.018	0.028	13	<	<	0.017	0.0158	0.0286	0.029	
N-acetyl-4-aminoantipyrine (AAA)	83-15-8	µg/L		0.34	0.18	0.135	0.13	0.15	0.11	0.11	0.085	0.075	0.14	0.1	0.16	13	0.075	0.079	0.13	0.142	0.276	0.34	
N-formyl-4-aminoantipyrine (FAA)	1672-58-8	µg/L		0.17		0.12	0.091	0.16	0.089	0.11	0.084	0.07	0.16	0.12	0.17	12	0.07	0.0742	0.115	0.122	0.17	0.17	
Antidepressants and tranquillisers																							
Lobith																							
oxazepam	604-75-1	µg/L	0.01	<	0.02	<	<	0.02	0.02	<	0.01	0.02	0.02	0.02	0.03	13	<	<	0.02	0.0146	0.026	0.03	
oxazepam (load)		g/s		0.01	0.0736	0.0246	0.011	0.0257	0.0376	0.00662	0.0126	0.0226	0.0342	0.0292	0.0363	13	0.00662	0.00786	0.0246	0.0258	0.0592	0.0736	
venlafaxine	93413-69-5	µg/L	0.01	0.02	0.02	<	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.03	13	<	0.011	0.02	0.0212	0.036	0.04	
O-desmethylvenlafaxine	93413-62-8	µg/L		0.05	0.05	0.02	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.06	0.1	13	0.02	0.024	0.04	0.0438	0.084	0.1	
N,O-didesmethylvenlafaxine	135308-74-6	µg/L	0.01	0.01	0.01	<	0.015	0.02	0.01	0.01	<	0.01	0.01	0.02	0.03	13	<	<	0.01	0.0131	0.026	0.03	
Nieuwegein																							
diazapam	439-14-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
oxazepam	604-75-1	µg/L		0.009	0.024	0.006	0.017	0.021	0.02	0.016	0.013	0.015	0.029	0.027	0.033	13	0.006	0.006	0.017	0.0182	0.0314	0.033	
oxazepam (load)		g/s		0.00225	0.00782	0.00296	0.00017	0.00021	0.00168	0.00016	0.00013	0.00015	0.00029	0.000695	0.00033	13	0.00013	0.000138	0.00033	0.00152	0.00658	0.00782	
temazepam	846-50-4	µg/L	0.003	<	0.01	<	0.007	0.009	0.009	0.007	0.007	0.007	0.015	0.011	0.017	13	<	<	0.007	0.00796	0.0162	0.017	
paroxetine	61869-08-7	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
venlafaxine	93413-69-5	µg/L		0.022	0.028	0.0135	0.015	0.02	0.018	0.019	0.014	0.018	0.024	0.027	0.031	13	0.013	0.0134	0.019	0.0202	0.0298	0.031	
citalopram	59729-33-8	µg/L		0.004	0.005	0.003	0.004	0.004	0.003	0.003	0.003	0.002	0.003	0.003	0.003	13	0.002	0.002	0.003	0.00331	0.0046	0.005	
Nieuwersluis																							
diazapam	439-14-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
oxazepam	604-75-1	µg/L		0.037	0.035	0.025	0.03	0.034	0.036	0.027	0.026	0.023	0.053	0.038	0.047	13	0.023	0.023	0.034	0.0335	0.0506	0.053	
temazepam	846-50-4	µg/L		0.02	0.02	0.015	0.017	0.018	0.02	0.015	0.014	0.014	0.03	0.019	0.03	13	0.013	0.0134	0.018	0.019	0.03	0.03	
paroxetine	61869-08-7	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
venlafaxine	93413-69-5	µg/L		0.045	0.036	0.022	0.026	0.031	0.032	0.028	0.024	0.023	0.037	0.037	0.045	13	0.017	0.0194	0.031	0.0314	0.045	0.045	
citalopram	59729-33-8	µg/L		0.011	0.011	0.007	0.01	0.009	0.01	0.006	0.007	0.006	0.01	0.008	0.011	13	0.006	0.006	0.009	0.00869	0.011	0.011	
Andijk																							
diazapam	439-14-5	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
oxazepam	604-75-1	µg/L	0.004	0.013	0.015	0.01	0.009	0.009	0.006	0.007	0.004	<	0.008	0.007	0.014	13	<	<	0.009	0.00877	0.0146	0.015	
temazepam	846-50-4	µg/L		0.006	0.007	0.005	0.004	0.004	0.003	0.003	0.003	0.003	0.004	0.004	0.006	13	0.003	0.003	0.004	0.00438	0.0066	0.007	
paroxetine	61869-08-7	µg/L	0.004	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
venlafaxine	93413-69-5	µg/L		0.015	0.02	0.0075	0.004	0.009	0.005	0.005	0.004	0.003	0.01	0.008	0.016	13	0.003	0.0034	0.008	0.00877	0.0184	0.02	
citalopram	59729-33-8	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Cholesterol-reducing agents																							
Lobith																							
bezafibrate	41859-67-0	µg/L	0.01	0.01	0.01	<	<	0.01	<	<	<	<	<	0.02	0.01	13	<	<	<	<	0.016	0.02	
Nieuwegein																							
bezafibrate	41859-67-0	µg/L	0.005	0.009	0.014	0.01	0.006	0.005	<	<	<	<	<	<	<	13	<	<	<	0.0055	0.0136	0.014	
clofibric acid	882-09-7	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenofibrate	49562-28-9	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenofibric acid	42017-89-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
gemfibrozil	25812-30-0	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
clofibrate	637-07-0	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pravastatin	81093-37-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Cholesterol-reducing agents	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwersluis																							
bezafibrate	41859-67-0	µg/L	0.005	0.01	0.01	<	0.005	0.006	<	<	<	<	<	<	0.005	13	<	<	<	<	0.01	0.01	
clofibric acid	882-09-7	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenofibrate	49562-28-9	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenofibric acid	42017-89-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
gemfibrozil	25812-30-0	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
clofibrate	637-07-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pravastatin	81093-37-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
bezafibrate	41859-67-0	µg/L	0.005	<	0.007	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0052	0.007	
clofibric acid	882-09-7	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenofibrate	49562-28-9	µg/L	0.003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenofibric acid	42017-89-0	µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
gemfibrozil	25812-30-0	µg/L	0.015	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
clofibrate	637-07-0	µg/L	0.05	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
pravastatin	81093-37-0	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Other pharmaceuticals																							
Lobith																							
carbamazepine	298-46-4	µg/L		0.03	0.04	0.02	0.04	0.09	0.04	0.04	0.05	0.05	0.05	0.04	0.07	13	0.02	0.024	0.04	0.0462	0.082	0.09	
carbamazepine (load)		g/s		0.06	0.147	0.0986	0.0599	0.116	0.0752	0.053	0.0631	0.0564	0.0854	0.0583	0.0848	13	0.053	0.0543	0.0631	0.0783	0.135	0.147	
metformin	657-24-9	µg/L		0.44	0.83	0.64	0.505	0.33	0.41	0.28	0.35	0.29	0.37	1.5	0.53	13	0.28	0.284	0.41	0.537	1.23	1.5	
metformin (load)		g/s		0.88	3.05	3.15	0.861	0.424	0.77	0.371	0.442	0.327	0.632	2.19	0.642	13	0.327	0.345	0.642	1.12	3.11	3.15	
furosemide	54-31-9	µg/L	0.01	0.02	0.02	0.01	<	<	<	<	<	<	<	<	0.03	13	<	<	<	<	0.026	0.03	
guanylurea	141-83-3	µg/L		1.7	1.7	0.93	1.45	0.76	1	1.2	1.4	1.5	1.1	0.31	2.4	13	0.31	0.49	1.2	1.3	2.2	2.4	
guanylurea (load)		g/s		3.4	6.26	4.58	2.46	0.976	1.88	1.59	1.77	1.69	1.88	0.452	2.91	13	0.452	0.662	1.88	2.49	5.59	6.26	
gabapentin	60142-96-3	µg/L		0.18	0.21	0.13	0.265	0.31	0.15	0.12	0.15	0.1	0.14	0.13	0.22	13	0.1	0.108	0.15	0.182	0.294	0.31	
gabapentin (load)		g/s		0.36	0.773	0.641	0.423	0.398	0.282	0.159	0.189	0.113	0.239	0.19	0.266	13	0.113	0.131	0.282	0.343	0.72	0.773	
levetiracetam	102767-28-2	µg/L	0.01	<	0.04	0.03	0.0125	<	<	<	0.01	<	0.01	<	0.03	13	<	<	<	0.0135	0.036	0.04	
10,11-dihydro-10,11-dihydroxycarbamazepine	58955-93-4	µg/L		0.06	0.06	0.06	0.085	0.1	0.07	0.08	0.09	0.1	0.1	0.09	0.17	13	0.06	0.06	0.09	0.0885	0.142	0.17	
10,11-dihydro-10,11-dihydroxycarbamazepine (load)		g/s		0.12	0.221	0.296	0.13	0.128	0.132	0.106	0.114	0.113	0.171	0.131	0.206	13	0.106	0.109	0.131	0.154	0.266	0.296	
lamotrigine	84057-84-1	µg/L		0.06	0.06	0.03	0.075	0.09	0.09	0.07	0.07	0.1	0.08	0.07	0.11	13	0.03	0.042	0.07	0.0754	0.106	0.11	
cetirizine	83881-51-0	µg/L	0.01	<	<	<	0.02	0.02	0.02	0.01	0.01	0.01	0.01	<	0.01	13	<	<	0.01	0.0115	0.026	0.03	
sitagliptin	486460-32-6	µg/L		0.11	0.13	0.06	0.16	0.28	0.13	0.1	0.13	0.13	0.13	0.15	0.24	13	0.06	0.076	0.13	0.147	0.264	0.28	
sitagliptin (load)		g/s		0.22	0.478	0.296	0.247	0.36	0.244	0.132	0.164	0.147	0.222	0.219	0.291	13	0.132	0.138	0.222	0.251	0.431	0.478	
oxypurinol	2465-59-0	µg/L		0.45	0.63	0.23	0.8	1.3	0.82	0.64	0.87	0.79	0.77	0.87	1.2	13	0.23	0.318	0.79	0.782	1.26	1.3	
oxypurinol (load)		g/s		0.9	2.32	1.13	1.2	1.67	1.54	0.847	1.1	0.891	1.32	1.27	1.45	13	0.847	0.865	1.23	1.29	2.06	2.32	
gadolinium anomaly		-		133	22.7	14.2	121	138	189	171	338	231	206	188	191	26	9	19	156	163	318	351	
gadolinium (anthropogenic)	7440-54-2	µg/L		0.226	0.0876	0.0407	0.27	0.244	0.297	0.208	0.343	0.32	0.25	0.293	0.29	26	0.0395	0.0686	0.247	0.24	0.394	0.426	
lithium	7439-93-2	µg/L		13.8	8.19	8.89	17.3	14.7	14.3	13.7	12.8	13	15.5	14.4	19.3	26	7.53	8.68	13.7	14	20.2	24.9	
lithium, 0.45 µm filtrate		µg/L		12.3	6.46	7.09	15.3	12.5	13.9	12.9	12.8	12.4	14.1	12.9	17.7	26	5.39	6.55	12.7	12.7	18.1	23.7	
Nieuwegein																							
carbamazepine	298-46-4	µg/L		0.031	0.044	0.0235	0.037	0.05	0.044	0.042	0.039	0.043	0.054	0.055	0.053	13	0.021	0.023	0.043	0.0415	0.0546	0.055	
carbamazepine (load)		g/s		0.00775	0.0143	0.0123	0.00037	0.0005	0.0037	0.00042	0.00039	0.00043	0.00054	0.00142	0.00053	13	0.00037	0.000378	0.00054	0.00423	0.018	0.0204	
metformin	657-24-9	µg/L		0.74	0.67	0.715	0.58	0.48	0.43	0.42	0.29	0.4	0.42	0.5	0.46	13	0.29	0.334	0.48	0.525	0.782	0.81	
metformin (load)		g/s		0.185	0.218	0.381	0.0058	0.0048	0.0362	0.0042	0.0029	0.004	0.0042	0.0129	0.0046	13	0.0029	0.00334	0.0058	0.0957	0.469	0.635	
furosemide	54-31-9	µg/L	0.01	0.021	0.025	<	<	<	<	<	<	<	<	<	0.036	13	<	<	<	0.0107	0.0316	0.036	
guanylurea	141-83-3	µg/L		3.5	1.5	0.97	0.1	0.14	0.099	0.24	0.18	0.93	1.1	1.3	1.3	13	0.099	0.0994	0.93	0.948	2.7	3.5	
guanylurea (load)		g/s		0.875	0.489	0.575	0.001	0.0014	0.00833	0.0024	0.0018	0.0093	0.011	0.0335	0.013	13	0.001	0.00116	0.011	0.2	0.962	1.02	
gabapentin	60142-96-3	µg/L		0.25		0.235	0.31	0.35	0.28	0.27	0.21	0.25	0.36	0.34	0.29	12	0.21	0.213	0.275	0.282	0.357	0.36	
gabapentin (load)		g/s		0.0625		0.12	0.0031	0.0035	0.0236	0.0027	0.0021	0.0025	0.0036	0.00875	0.0029	12	0.0021	0.00222	0.00355	0.0297	0.156	0.196	
amisulpride	53583-79-2	µg/L				0.015	0.008	0.006	0.003	0.004	0.003	0.005	0.005	0.012	0.019	11	0.003	0.003	0.006	0.00864	0.0188	0.019	
2,3-bis(sulfanyl)butanedioic acid (DMSA)	304-55-2	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Other pharmaceuticals	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
10,11-dihydro-10,11-dihydroxycarbamazepine	58955-93-4	µg/L		0.063	0.11	0.0505	0.084	0.12	0.11	0.11	0.096	0.1	0.14	0.13	0.15	13	0.049	0.0502	0.11	0.101	0.146	0.15	
10,11-dihydro-10,11-dihydroxycarbamazepine (load)		g/s		0.0157	0.0359	0.0254	0.00084	0.0012	0.00926	0.0011	0.00096	0.001	0.0014	0.00335	0.0015	13	0.00084	0.000888	0.0015	0.00946	0.0388	0.0408	
lamotrigine	84057-84-1	µg/L		0.049	0.072	0.033	0.059	0.091	0.08	0.091	0.069	0.086	0.12	0.09	0.096	13	0.031	0.0326	0.08	0.0745	0.11	0.12	
cetirizine	83881-51-0	µg/L	0.01	<	0.01	<	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	13	<	<	0.02	0.0165	0.026	0.03	
sitagliptin	486460-32-6	µg/L		0.08	0.1	0.07	0.08	0.09	0.08	0.07	0.06	0.07	0.06	0.09	0.08	13	0.06	0.06	0.08	0.0769	0.096	0.1	
sitagliptin (load)		g/s		0.02	0.0326	0.0346	0.0008	0.0009	0.00673	0.0007	0.0006	0.0007	0.0006	0.00232	0.0008	13	0.0006	0.0006	0.0009	0.0104	0.046	0.0549	
oxypurinol	2465-59-0	µg/L	0.5	<	0.65	<	0.7	1.1	1	0.99	0.88	0.94	1.1	1.2	1.1	13	<	<	0.94	0.801	1.16	1.2	
oxypurinol (load)		g/s		0.0625	0.212	0.123	0.007	0.011	0.0842	0.0099	0.0088	0.0094	0.011	0.0309	0.011	13	0.007	0.00772	0.011	0.0542	0.206	0.212	
gabapentin-lactam	64744-50-9	µg/L		0.02	0.04	0.02	0.05	0.07	0.07	0.05	0.05	0.05	0.05	0.05	0.04	13	0.02	0.02	0.05	0.0446	0.07	0.07	
omeprazole	73590-58-6	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ranitidine	66357-35-5	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
gadolinium anomaly		-		27.6	64.2	21.4	51	79.8	75.1	66.1	104	83.5	97.7	142	78.6	13	17.6	20.6	75.1	70.2	127	142	
gadolinium (anthropogenic)	7440-54-2	µg/L		0.0867	0.14	0.0605	0.0943	0.153	0.136	0.0881	0.119	0.144	0.147	0.19	0.154	13	0.0357	0.0555	0.136	0.121	0.176	0.19	
lithium	7439-93-2	µg/L		6.27	9.52	8.23	9.75	11.8	11	10.9	9.3	11.7	12.8	13.4	11.6	13	6.27	6.84	10.9	10.3	13.2	13.4	
lithium, 0.45 µm filtrate		µg/L		6.1	8.92	6.53	9.26	11.8	11.6	10.5	9.79	11.4	11.5	12.9	9.93	13	6.1	6.14	9.93	9.75	12.5	12.9	
Nieuwersluis																							
carbamazepine	298-46-4	µg/L		0.059	0.052	0.032	0.052	0.064	0.062	0.053	0.05	0.054	0.065	0.064	0.076	13	0.027	0.031	0.054	0.055	0.0716	0.076	
metformin	657-24-9	µg/L		0.79	0.61	0.535	0.51	0.49	0.52	0.43	0.3	0.41	0.54	0.5	0.5	13	0.3	0.344	0.5	0.513	0.718	0.79	
furosemide	54-31-9	µg/L	0.01	0.063	0.047	0.027	<	<	<	<	<	<	0.037	0.025	0.065	13	<	<	0.015	0.0247	0.0642	0.065	
guanylurea	141-83-3	µg/L		3.3	1.5	1.17	0.35	0.42	0.6	0.54	0.36	0.89	3	1.3	1.9	13	0.35	0.354	0.89	1.27	3.18	3.3	
gabapentin	60142-96-3	µg/L		0.35		0.225	0.3	0.38	0.33	0.27	0.2	0.27	0.39	0.37	0.32	12	0.19	0.193	0.31	0.303	0.387	0.39	
amisulpride	53583-79-2	µg/L				0.0125	0.012	0.011	0.009	0.007	0.007	0.007	0.015	0.016	0.028	11	0.007	0.007	0.011	0.0125	0.0256	0.028	
2,3-bis(sulfanyl)butanedioic acid (DMSA)	304-55-2	µg/L	0.02			<		<			<			<		4	<	*	*	<	*	<	
10,11-dihydro-10,11-dihydroxycarbamazepine	58955-93-4	µg/L		0.14	0.16	0.103	0.13	0.17	0.15	0.15	0.13	0.13	0.2	0.16	0.2	13	0.085	0.099	0.15	0.148	0.2	0.2	
lamotrigine	84057-84-1	µg/L		0.078	0.074	0.0425	0.086	0.12	0.097	0.096	0.077	0.094	0.12	0.11	0.11	13	0.032	0.0404	0.094	0.0882	0.12	0.12	
cetirizine	83881-51-0	µg/L				0.01		0.05			0.02			0.02		4	0.01	*	*	0.025	*	0.05	
sitagliptin	486460-32-6	µg/L				0.04		0.1			0.07			0.08		4	0.04	*	*	0.0725	*	0.1	
oxypurinol	2465-59-0	µg/L	0.5			<		1.2			0.95			1.1		4	<	*	*	0.875	*	1.2	
gabapentin-lactam	64744-50-9	µg/L				0.02		0.09			0.06			0.06		4	0.02	*	*	0.0575	*	0.09	
omeprazole	73590-58-6	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ranitidine	66357-35-5	µg/L	0.002	0.003	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	0.0022	0.003	
gadolinium anomaly		-		43.6	56	12.8	52.2	108	143	79	214	143	52.6	97.9	62.3	13	7.1	11.7	62.3	82.9	186	214	
gadolinium (anthropogenic)	7440-54-2	µg/L		0.114	0.118	0.0402	0.104	0.173	0.177	0.0884	0.145	0.155	0.138	0.172	0.164	13	0.0394	0.04	0.138	0.125	0.175	0.177	
lithium	7439-93-2	µg/L		7.33	7.99	5.54	8.83	12.4	11.5	9.91	11	10.3	10.9	12.9	11	13	5.03	5.44	10.3	9.63	12.7	12.9	
lithium, 0.45 µm filtrate		µg/L		7.22	7.78	4.44	8.8	12.4	11.5	10.8	11.4	10.8	9.99	12.3	9.14	13	3.98	4.34	9.99	9.31	12.4	12.4	
Andijk																							
carbamazepine	298-46-4	µg/L		0.046	0.039	0.0285	0.028	0.03	0.023	0.03	0.022	0.023	0.037	0.035	0.044	13	0.022	0.0224	0.03	0.0318	0.0452	0.046	
metformin	657-24-9	µg/L		0.39	0.51	0.39	0.4	0.48	0.4	0.39	0.27	0.38	0.31	0.27	0.33	13	0.27	0.27	0.39	0.378	0.498	0.51	
furosemide	54-31-9	µg/L	0.01	<	0.012	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	0.012	
guanylurea	141-83-3	µg/L	0.055	0.69	0.77	0.345	0.08	0.12	0.086	<	<	0.073	0.4	0.24	0.61	13	<	<	0.24	0.293	0.738	0.77	
gabapentin	60142-96-3	µg/L		0.26		0.205	0.2	0.25	0.21	0.27	0.18	0.22	0.27	0.23	0.21	12	0.18	0.183	0.22	0.226	0.27	0.27	
amisulpride	53583-79-2	µg/L	0.001			0.0065	0.004	0.004	0.001	0.001	<	<	0.003	0.004	0.011	11	<	<	0.004	0.00382	0.0102	0.011	
10,11-dihydro-10,11-dihydroxycarbamazepine	58955-93-4	µg/L		0.1	0.11	0.075	0.067	0.074	0.063	0.084	0.062	0.061	0.087	0.085	0.11	13	0.061	0.0614	0.078	0.081	0.11	0.11	
lamotrigine	84057-84-1	µg/L		0.07	0.053	0.0445	0.042	0.052	0.044	0.063	0.04	0.047	0.082	0.057	0.075	13	0.04	0.0404	0.052	0.0549	0.0792	0.082	
cetirizine	83881-51-0	µg/L	0.01	<	<	<	<	0.01	<	0.01	<	<	<	<	<	13	<	<	<	<	0.01	0.01	
sitagliptin	486460-32-6	µg/L		0.03	0.05	0.03	0.02	0.04	0.02	0.03	0.02	0.01	0.03	0.02	0.04	13	0.01	0.014	0.03	0.0285	0.046	0.05	
oxypurinol	2465-59-0	µg/L	0.5	0.72	0.58	<	<	0.64	0.55	0.74	0.61	0.58	0.8	0.67	0.82	13	<	<	0.61	0.596	0.812	0.82	
gabapentin-lactam	64744-50-9	µg/L		0.04	0.03	0.03	0.02	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.03	13	0.02	0.024	0.03	0.0315	0.04	0.04	
omeprazole	73590-58-6	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
ranitidine	66357-35-5	µg/L	0.002	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
gadolinium anomaly		-		75.6	40.4	30.4	30.8	68	56.8	160	124	114	129	161	107	13	26.7	28.3	75.6	86.7	161	161	

An explanation of this table can be found on page 151-153.

Other pharmaceuticals	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Andijk (continued)																							
gadolinium (anthropogenic)	7440-54-2	µg/L		0.123	0.112	0.086	0.0759	0.111	0.0877	0.129	0.104	0.106	0.16	0.146	0.16	13	0.0719	0.0735	0.111	0.114	0.16	0.16	
lithium	7439-93-2	µg/L		8.6	8.54	8.99	7.28	9.83	7.85	10.6	8.72	9.89	11.9	12.5	12.1	13	7.28	7.51	9.07	9.68	12.3	12.5	
lithium, 0.45 µm filtrate		µg/L		8.33	7.92	7.27	7.17	8.64	8.23	10.6	8.48	10.1	11.7	12.4	10.9	13	6.02	6.48	8.52	9.15	12.1	12.4	
Veterinary substances																							
Lobith																							
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
lindane (gamma-HCH)	58-89-9	µg/L		0.00017	0.00012	0.0001	0.00018	0.00017	0.00014	0.00012	0.00014	0.00018	0.00016	0.00016	0.00119	13	0.0001	0.000108	0.00016	0.000309	0.00139	0.0022	
Nieuwegein																							
chlorfenvinphos	470-90-6	µg/L	0.03	<	<	<	<	<	<	<	<	<	<	<	<	25	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00014		0.000145	0.00013	0.00013	0.00015	0.00011	<	<	0.00012	0.00016	0.00013	12	<	<	0.00013	0.00012	0.000174	0.00018	
piperonyl butoxide	51-03-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	26	<	<	<	<	<	<	
Nieuwersluis																							
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00019	0.00021	0.0002	0.00024	0.00017	0.00009	<	0.0001	0.00009	0.00011	<	0.00017	13	<	<	0.00017	0.000142	0.000236	0.00024	
piperonyl butoxide	51-03-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
chlorfenvinphos	470-90-6	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
fenthion	55-38-9	µg/L	0.001	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
fenvalerate	51630-58-1	µg/L	0.09	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
heptenophos	23560-59-0	µg/L	0.0003	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
lindane (gamma-HCH)	58-89-9	µg/L	0.00008	0.00013		0.000095	0.00012	0.00012	0.00009	<	<	<	0.00009	<	0.00011	12	<	<	0.00009	0.0000842	0.000127	0.00013	
piperonyl butoxide	51-03-6	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tetrachlorvinphos	22248-79-9	µg/L	0.02	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Perfumes, colourants and flavourings																							
Lobith																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
dimethyldisulfide (DMDS)	624-92-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Endocrine-disrupting chemicals (EDCs)																							
Lobith																							
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-tert-octylphenol	140-66-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tributyltin-cation	36643-28-4	µg/L		0.00006	0.00014	0.00006	0.00017	0.00009	0.00009	0.00014	0.00006	0.0001	0.00008	0.00006	0.00007	13	0.00006	0.00006	0.00008	0.0000915	0.000158	0.00017	
dibutyltin	1002-53-5	µg/L		0.0003	0.00024	0.00012	0.00024	0.00016	0.00032	0.00024	0.00019	0.0003	0.0002	0.00019	0.00027	13	0.00012	0.000136	0.00024	0.000234	0.000312	0.00032	
4-nonylphenol isomers		µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Endocrine-disrupting chemicals (EDCs)	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein																							
benzylbutyl phthalate (BBP)	85-68-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
di-n-butyl phthalate (DBPH)	84-74-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
diethyl phthalate (DEPH)	84-66-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	1.44	<	<	<	<	13	<	<	<	<	1.06	1.44	
dimethyl phthalate (DMP)	131-11-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
di-n-octyl phthalate (DOP)	117-84-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-octylphenol	1806-26-4	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bisphenol A	80-05-7	µg/L	0.008			0.014		<			0.009			<		4	<	*	*	<	*	0.014	
4-tert-octylphenol	140-66-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	14	<	<	<	<	<	<	
tributyltin-cation	36643-28-4	µg/L		0.00016	0.00019	0.000145	0.00023	0.00016	0.00016	0.00019	0.00016	0.00016	0.00019	0.00023	0.00025	13	0.00014	0.000144	0.00016	0.000182	0.000242	0.00025	
4-isononylphenol	26543-97-5	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
di-(2-methylpropyl)phthalate (DIBP)	84-69-5	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
dibutyltin	1002-53-5	µg/L		0.00032	0.00036	0.000305	0.00023	0.00018	0.00027	0.00019	0.00025	0.00016	0.00019		0.00049	12	0.00016	0.000163	0.00024	0.000271	0.000475	0.00049	
dipropyl phthalate	131-16-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diheptyl phtalate	3648-21-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
4-nonylphenol isomers		µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	14	<	<	<	<	<	<	
Nieuwersluis																							
benzylbutyl phthalate (BBP)	85-68-7	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
di-n-butyl phthalate (DBPH)	84-74-2	µg/L	0.1					<			<			<		3	*	*	*	*	*	*	
diethyl phthalate (DEPH)	84-66-2	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethyl phthalate (DMP)	131-11-3	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
di-n-octyl phthalate (DOP)	117-84-0	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
4-octylphenol	1806-26-4	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
bisphenol A	80-05-7	µg/L	0.008			0.023		<			<			<		4	<	*	*	0.00875	*	0.023	
4-tert-octylphenol	140-66-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tributyltin-cation	36643-28-4	µg/L		0.00015	0.00011	0.000205	0.00013	0.00015	0.00015	0.00016	0.00007	0.00012	0.00014	0.00015	0.00016	13	0.00007	0.000086	0.00015	0.000146	0.000212	0.00024	
4-isononylphenol	26543-97-5	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
di-(2-methylpropyl)phthalate (DIBP)	84-69-5	µg/L	0.5					<			<			<		3	*	*	*	*	*	*	
tetrabutyltin	1461-25-2	µg/L	0.0003	<												1	*	*	*	*	*	*	
dibutyltin	1002-53-5	µg/L		0.00018	0.00056	0.00026	0.00073	0.00046	0.00019	0.00018	0.00014	0.00014	0.00023	0.00047	0.00017	13	0.00014	0.00014	0.00021	0.000305	0.000662	0.00073	
diphenyltin	1011-95-6	µg/L	0.00009	<												1	*	*	*	*	*	*	
dipropyl phthalate	131-16-8	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
diheptyl phtalate	3648-21-3	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
4-nonylphenol isomers		µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Andijk																							
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bisphenol A	80-05-7	µg/L	0.008			0.01		<			<			<		4	<	*	*	<	*	0.01	
4-tert-octylphenol	140-66-9	µg/L	0.005	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
tributyltin-cation	36643-28-4	µg/L	0.00004	<	<	0.00013	0.00005	0.00022	0.00006	0.00005	0.00006	<	<	<	<	13	<	<	0.00005	0.0000631	0.000188	0.00022	
tetrabutyltin	1461-25-2	µg/L	0.0003	<												1	*	*	*	*	*	*	
triphenyltin ion	892-20-6	µg/L	0.0001	<												1	*	*	*	*	*	*	
dibutyltin	1002-53-5	µg/L	0.00005	<	<	0.00017	0.00005	0.00008	0.00008	<	0.00009	<	<	<	0.00006	13	<	<	0.00005	0.0000654	0.00018	0.00022	
diphenyltin	1011-95-6	µg/L	0.00009	<												1	*	*	*	*	*	*	
4-nonylphenol isomers		µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Plasticisers																							
Lobith																							
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwegein																							
benzylbutyl phthalate (BBP)	85-68-7	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
di-n-butyl phthalate (DBPH)	84-74-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	

An explanation of this table can be found on page 151-153.

Plasticisers	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
diethyl phthalate (DEPH)	84-66-2	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	1.44	<	<	<	<	13	<	<	<	<	1.06	1.44	
dimethyl phthalate (DMP)	131-11-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
di-n-octyl phthalate (DOP)	117-84-0	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
di-(2-methylpropyl)phthalate (DIBP)	84-69-5	µg/L	0.5	<	<	<	<	<	<	<	<	<	<	<	<	12	<	<	<	<	<	<	
dipropyl phthalate	131-16-8	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
diheptyl phtalate	3648-21-3	µg/L	0.1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
benzylbutyl phthalate (BBP)	85-68-7	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
di-n-butyl phthalate (DBPH)	84-74-2	µg/L	0.1					<			<			<		3	*	*	*	*	*	*	
diethyl phthalate (DEPH)	84-66-2	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
dimethyl phthalate (DMP)	131-11-3	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
di-n-octyl phthalate (DOP)	117-84-0	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
di-(2-methylpropyl)phthalate (DIBP)	84-69-5	µg/L	0.5					<			<			<		3	*	*	*	*	*	*	
dipropyl phthalate	131-16-8	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
diheptyl phtalate	3648-21-3	µg/L	0.1			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	µg/L	1	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Artificial sweeteners																							
Lobith																							
sucralose	56038-13-2	µg/L		0.42	0.54	0.24	0.615	0.73	0.72	0.74	1	0.98	0.95	0.84	1.2	13	0.24	0.312	0.74	0.738	1.12	1.2	
sucralose (load)		g/s		0.84	1.99	1.18	0.928	0.937	1.35	0.98	1.26	1.11	1.62	1.22	1.45	13	0.84	0.873	1.18	1.22	1.84	1.99	
saccharin	81-07-2	µg/L		0.08	0.19	0.13	0.075	0.04	0.04	0.02	0.04	0.02	0.05	0.04	0.1	13	0.02	0.02	0.05	0.0692	0.166	0.19	
cyclamate	100-88-9	µg/L		0.06	0.24	0.17	0.045	0.05	0.07	0.05	0.11	0.04	0.08	0.06	0.08	13	0.03	0.034	0.06	0.0846	0.212	0.24	
acesulfame K	55589-62-3	µg/L		0.3	0.46	0.34	0.41	0.26	0.22	0.17	0.18	0.15	0.2	0.18	0.3	13	0.15	0.158	0.26	0.275	0.448	0.46	
acesulfame K (load)		g/s		0.6	1.69	1.68	0.658	0.334	0.413	0.225	0.227	0.169	0.342	0.262	0.363	13	0.169	0.192	0.363	0.586	1.69	1.69	
Nieuwegein																							
sucralose	56038-13-2	µg/L		0.24	0.95	0.355	1	1.3	2.2	1.4	1.8	1.6	2.4	1.7	2	13	0.24	0.256	1.4	1.33	2.32	2.4	
sucralose (load)		g/s		0.06	0.31	0.153	0.01	0.013	0.185	0.014	0.018	0.016	0.024	0.0438	0.02	13	0.01	0.0112	0.024	0.0785	0.274	0.31	
saccharin	81-07-2	µg/L	0.01	0.062	0.098	0.0885	0.063	0.047	0.067	0.034	<	0.04	0.039	0.054	0.054	13	<	0.0166	0.054	0.0569	0.105	0.11	
cyclamate	100-88-9	µg/L		0.085	0.081	0.113	0.023	0.036	0.098	0.073	0.054	0.081	0.09	0.065	0.07	13	0.023	0.0282	0.073	0.0755	0.135	0.16	
acesulfame K	55589-62-3	µg/L		0.31	0.53	0.485	0.55	0.55	0.62	0.3	0.26	0.25	0.42	0.32	0.3	13	0.25	0.254	0.42	0.414	0.592	0.62	
acesulfame K (load)		g/s		0.0775	0.173	0.244	0.0055	0.0055	0.0522	0.003	0.0026	0.0025	0.0042	0.00824	0.003	13	0.0025	0.00254	0.0055	0.0634	0.304	0.392	
Nieuwersluis																							
sucralose	56038-13-2	µg/L		1.5	1.7	1.65	1.3	2.3	3.4	3.9	3.1	2.6	3	2.6	3.3	13	1.3	1.3	2.6	2.46	3.7	3.9	
saccharin	81-07-2	µg/L		0.094	0.1	0.0785	0.13	0.048	0.053	0.035	0.03	0.034	0.065	0.063	0.12	13	0.03	0.0316	0.065	0.0715	0.126	0.13	
cyclamate	100-88-9	µg/L		0.1	0.086	0.0805	0.032	0.048	0.1	0.067	0.05	0.073	0.1	0.073	0.16	13	0.032	0.0384	0.076	0.0808	0.136	0.16	
acesulfame K	55589-62-3	µg/L		0.44	0.71	0.68	0.62	0.54	0.47	0.29	0.26	0.28	0.7	0.37	0.52	13	0.26	0.268	0.52	0.505	0.752	0.78	
Andijk																							
sucralose	56038-13-2	µg/L	0.05	<	1.1	0.915	0.29	0.8	0.55	<	0.74	0.98	1.3	1.3	1.7	13	<	<	0.9	0.818	1.54	1.7	
saccharin	81-07-2	µg/L	0.01	0.036	0.069	0.0495	0.058	0.048	0.05	<	0.027	0.027	0.024	0.025	0.031	13	<	0.0126	0.036	0.0384	0.0646	0.069	
cyclamate	100-88-9	µg/L		0.048	0.076	0.0765	0.076	0.061	0.061	0.055	0.052	0.057	0.057	0.054	0.065	13	0.048	0.0496	0.061	0.0627	0.0856	0.092	
acesulfame K	55589-62-3	µg/L		0.34	0.37	0.385	0.37	0.46	0.38	0.37	0.32	0.36	0.39	0.34	0.32	13	0.32	0.32	0.37	0.368	0.432	0.46	
Bioassays																							
Nieuwegein																							
ER-Calux act. with respect to 17-beta-estradiol		ng/L	0.034	0.045	0.095	0.101	0.058	0.079	<	<	<	0.066	<	0.04	0.053	13	<	<	0.053	0.0542	0.101	0.104	
GR-Calux act. with respect to dexamethasone		µg/L	0.0043	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
AR-anti-Calux act. with respect to flutamide		µg/L	1.4	3.49	<	6.02	11.9	2.5	<	22.2	47	7.66	6.47	5.55	7.49	13	<	<	6.47	9.83	37.1	47	
CYTO-Calux cytotoxicity		%		102	134	105	140	106	129	125	123	98	183	97	87	13	87	90.2	115	118	166	183	

An explanation of this table can be found on page 151-153.

Bioassays	CAS no.	dimension	r.l.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	n	min.	P10	P50	avg.	P90	max.	pict.
Nieuwegein (continued)																							
NRF2-Calux act. with respect to curcumin		µg/L	100	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
P53 Calux act. with respect to actinomycin D		µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
P53 Calux act. with respect to cyclofosfamide		µg/L	150	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
Nieuwersluis																							
ER-Calux act. with respect to 17-beta-estradiol		ng/L				0.378		0.12			0.09			0.047		4	0.047	*	*	0.159	*	0.378	
GR-Calux act. with respect to dexamethasone		µg/L	0.0043			0.0067		<			<			<		4	<	*	*	<	*	0.0067	
AR-anti-Calux act. with respect to flutamide		µg/L				2.09		3.11			2.59			1.76		4	1.76	*	*	2.39	*	3.11	
CYTO-Calux cytotoxicity		%				102		105			114			137		4	102	*	*	115	*	137	
NRF2-Calux act. with respect to curcumin		µg/L	100			<		<			<			<		4	<	*	*	<	*	<	
P53 Calux act. with respect to actinomycin D		µg/L	0.01			<		<			<			<		4	<	*	*	<	*	<	
P53 Calux act. with respect to cyclofosfamide		µg/L	150			<		<			<			<		4	<	*	*	<	*	<	
Andijk																							
ER-Calux act. with respect to 17-beta-estradiol		ng/L	0.034	<	0.096	<	<	0.049	<	0.377	<	0.046	<	<	<	13	<	<	<	0.0555	0.265	0.377	
GR-Calux act. with respect to dexamethasone		µg/L	0.0043	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
AR-anti-Calux act. with respect to flutamide		µg/L	1.4	7.44	<	3.56	5.39	2.78	<	27.8	5.25	8.93	3.67	3.25	7.67	13	<	<	4.15	6.21	20.2	27.8	
CYTO-Calux cytotoxicity		%		106	122	109	123	108	107	146	123	93	118	51	91	13	51	67	108	108	137	146	
NRF2-Calux act. with respect to curcumin		µg/L	100	<	<	<	<	102	<	103	<	<	<	<	170	13	<	<	<	<	143	170	
P53 Calux act. with respect to actinomycin D		µg/L	0.01	<	<	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	<	<	
P53 Calux act. with respect to cyclofosfamide		µg/L	150	<	439	<	<	<	<	<	<	<	<	<	<	13	<	<	<	<	293	439	

An explanation of this table can be found on page 151-153.

Appendix 2

Received alarm messages

Received alarm messages by RIWA-Rijn in 2020 as part of the International Warning and Alarm Plan (IWAP)

No.	Date	Location	Rkm**	Type of contamination	Highest concentration	Explanation
1	06 feb.	Lobith	863	turbidity	105 FTU	Increased concentration.
2	09 apr.	Bad Honnef	640	atrazine	1.3 µg/L	Increased concentration. Increased concentrations were also measured at Bad Godesberg and Düsseldorf-Flehe.
3	09 apr.	Bimmen	865	unknown organic compound	8 µg/L	Increased concentration
4	11 apr.	Bimmen	865	unknown substance	5.1 µg/L	Increased concentration
5	11 apr.	Bimmen / Lobith	865	atrazine	0.78 µg/L	Increased concentration. This is a follow-up message to that of 09-04 on atrazine at Bad Honnef.
6	13 aug.	Lobith	863	sum PAHs	3.4 µg/L	Increased concentration
7	14 aug.	Bimmen	865	two unknown compounds	3.4 µg/L	Increased concentration
8	20 aug.	Lobith	865	tetrahydrofuran	3.1 µg/L	Increased concentration
9	04 sep.	Lobith	863	benzene	4.6 µg/L	Increased concentration
10*	09 okt.	Ludwigshafen	433	imidazole (300 kg)	unknown	Operational malfunction at BASF. At Lobith a maximum of 0.7 µg/L was measured on 13-10.
11*	04 nov.	Ludwigshafen	433	triisopropanolamine (264 kg) and melamine (196 kg)	unknown	Operational malfunction. The loads have been calculated. Follow-up message on 05-11: increased concentrations of triisopropanolamine could not be confirmed in a re-analysis of the water samples. The message of 04-11 was therefore an erroneous finding.
12	12 nov.	Bad Honnef	640	nitrobenzene	9.4 µg/L	Increased concentration
13	14 nov.	Bimmen / Lobith	865	nitrobenzene	4.6 / 4.0 µg/L	This is a follow-up message to that of 12-11 on nitrobenzene at Bad Honnef. This message is sent for information purposes, the alarm value of 10 µg/L has not been exceeded.
14	03 dec.	Lobith	863	1,4-dioxane	4.6 µg/L	Increased concentration
15	07 dec.	Bimmen	865	cyclohexanone	3 µg/L	Increased concentration
16	15 dec.	Bimmen / Lobith	865	hexanedinitrile (adiponitrile)	3.6 / 3.7 µg/L	Increased concentration
17	21 dec.	Bimmen / Lobith	865	acetone	11 / 26 µg/L	Increased concentration
18	24 dec.	Bimmen	865	hydrocarbons (alkane/alkene mixture)	6 µg/L	Increased concentration
19	27 dec.	Lobith	863	turbidity	71.6 FTU	Increased concentration

** This message was sent as an information message through IWAP and not a as warning, despite a load > 150 kg*
*** Rhine kilometre, the downstream distance from Konstanz, the point where the Rhine becomes navigable*

Every year the secretariat of the International Commission for the Protection of the Rhine (ICPR) compiles an overview of all received IWAP messages in the Rhine, in which the information of the messages is summarised, evaluated statistically and/or presented in figures. This overview is published as an ICPR report in the working languages Dutch, German and French on the ICPR website (https://www.iksr.org/en/)

Appendix 3

Intake stops and limited production

ir. Cornelis Biemond water abstraction station (WCB) in Nieuwegein 1969–2020

Year	Contaminant	Number of days
2020		None
2019	Phenol (guanylurea, EDTA, melamine, methenamine (urotropine), sucralose, acesulfame, aniline, suspended matter, oxypurinol, TFA)	June: 3 days intake stop The following parameters exceeded the legal standard at intake location Nieuwegein (sampling frequency: 13x/year): guanylurea (3x), EDTA (13x), melamine (10x), methenamine (urotropine) (9x), sucralose (7x), acesulfame (1x), aniline (1x), suspended matter (4x), oxypurinol (5x) and TFA (7x). If the Minister of Infrastructure and Water Management had not granted an exemption for these substances, (preventive) intake stops would have been necessary. *This ruling was modified in June 2019. This summary still assumes the original situation.
2018	(pyrazole, glyphosate, guanylurea, 1,4-dioxane, EDTA, melamine, methenamine (urotropine), TFA, suspended matter)	None The following parameters did however exceed the legal standard (number of breaches in 13 measurements): pyrazole (3x), glyphosate (2x), guanylurea (3x), 1,4-dioxane (6x), EDTA (13x), melamine (6x), methenamine (urotropine) (10x), TFA (10x) and suspended matter (4x). If the Minister of Infrastructure and Water Management had not granted an exemption for these substances, (preventive) intake stops would have been necessary.
2017	(melamine, 1,4-dioxane, trifluoroacetate (TFA), pyrazole)	None. Without making use of exemptions from the Minister of Infrastructure and Water Management, intake stops would have been necessary as a result of breaches by the following substances (number of breaches in 13 measurements): melamine (12x), 1,4-dioxane (6x), TFA (11x) and pyrazole (5x). By using groundwater, without these exemptions, unlimited water could have been abstracted for three months.
2016	Acetochlor	February: Groundwater mixed in 50/50 for 6 days
2015	Phenol Metolachlor Pyrazole	January: 4 days intake stop (with use of groundwater) May: 7 days limited intake (with use of groundwater) August: 2 days intake stop
2014	Phenol Isoproturon	7 days 32 days limited intake
2013	Tetrapropylammonium Isoproturon	April: 4 days limited intake November: 11 days limited intake
2012	Metolachlor (max. 0.30 µg/L)	4 days limited intake and mixing in of groundwater
2011	Glyphosate Isoproturon Chlortoluron Xylene	1 day limited intake 1 day and 8 days limited intake 1 day limited intake 3 days limited intake
2010		None
2009		None
2008	1,2-dichlorobenzene	2
2007	Xylene/benzene	1 day limited intake by Waternet; PWN did not take any water from Nieuwegein
2006	Low water level/low discharge	In this period, intensive discussion was conducted with Rijkswaterstaat on progress of the normal production
2005		None
2004	MTBE	5 days limited intake (max. 50000 m3/day)
2003		None
2002	Isoproturon/chlortoluron	19 (of which 8 days limited intake and the remaining days, limited intake and mixing in of groundwater)

Continuation

Year	Contaminant	Number of days
2001	Isoproturon/chlortoluron	34 (of which 9 days limited intake and the remaining days, limited intake and mixing in of groundwater)
2000		None
1999	Isoproturon	7 days limited intake and mixing in of groundwater
1998	Isoproturon	7 days limited intake and mixing in of groundwater
1995-1997		None
1994	Isoproturon	36
1991-1993		None
1990	Metamitron	6
1989	Nitrobenzene Chloride	4 4th quarter limited intake
1988	Isophorone Dichloropropene Mecoprop	5 12 4
1987	Neopentylglycol	3
1986	'Sandoz' Fatty acids/turpentine 2,4-D herbicide Chloride	9 3 5 1st quarter limited intake
1985	Chloride	17 days 3rd quarter limited intake
1984	Phenetidine/o-isoanisidine	5
1983	Dichloroisobutyl ether Chloride	7 35 days limited intake
1982	Chloronitrobenzene	10
1981		None
1980	Styrene	6
1970-1979		None
1969	Endosulfan	14

Appendix 3

Intake stops and limited production

Andijk pump station (PSA) (2018 - 2020)

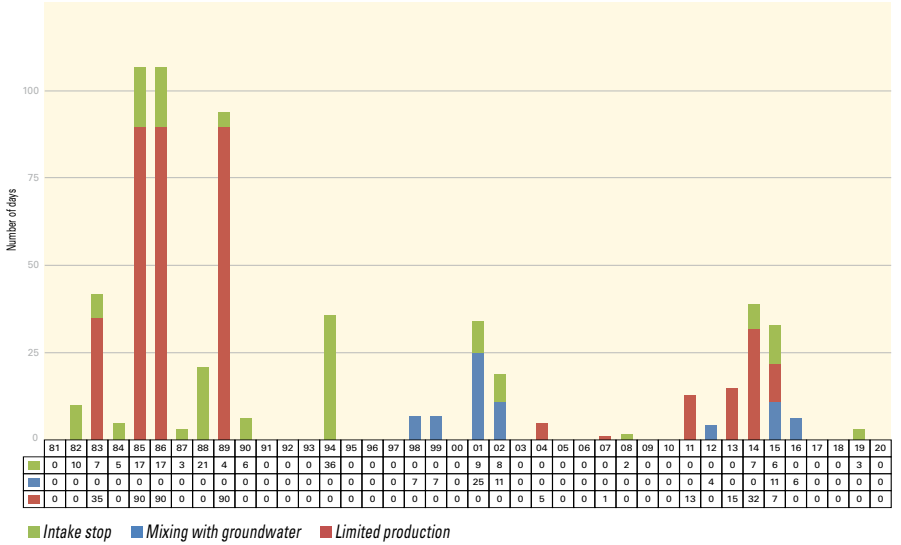
Year	Contaminant	Number of days
2020	Chloride/conductivity	February: 9 days intake stop March: 12 days intake stop May: 1 day intake stop July: 3 days intake stop August: 1 day intake stop September: 7 days intake stop October: 9 days intake stop November: 5 days intake stop December: 13 days intake stop*
2019	Chloride/conductivity	January: 3 days intake stop February: 1 day intake stop March: 2 days intake stop April: 3 days intake stop August: 8 days intake stop September: 3 days intake stop October: 2 days intake stop November: 10 days intake stop December: 1 day intake stop
2018	Chloride/conductivity	August: 12 days intake stop September: 22 days intake stop October: 22 days intake stop November: 14 days intake stop December: 10 days intake stop

** 10 days elevated salinity due to fault at Leemans pumping station, due to which Lely pumping station was used*

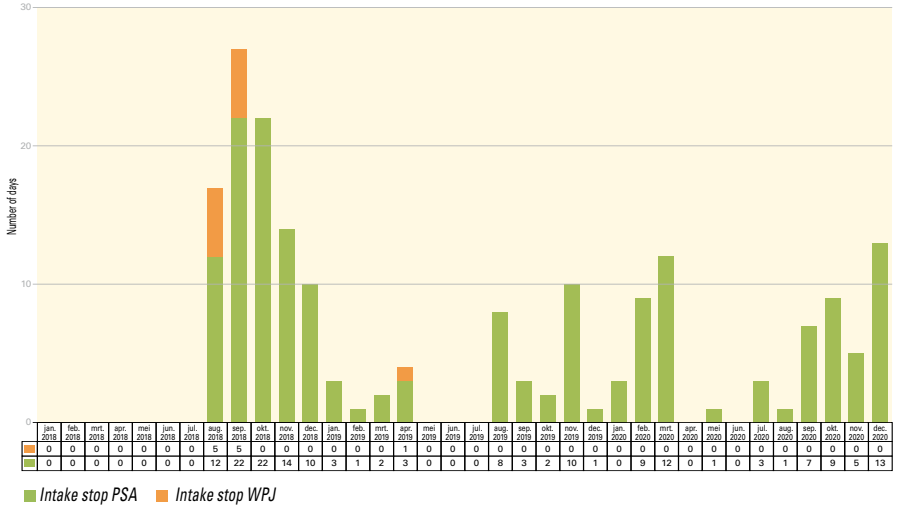
Princess Juliana water production station (WPJ) in Andijk (2018 - 2020)

Year	Contaminant	Number of days
2020		None
2019	Turbidity*	April: 1 day intake stop
2018	Chloride/conductivity	August: 5 days intake stop September: 5 days intake stop

** due to works on the Houtrib dyke in combination with east wind*



Intake stops and limited production at ir. Cornelis Biemond water abstraction station (WCB) in Nieuwegein in the past 40 years (1981-2020)



Intake stops and limited production at Andijk pump station (PSA) and at Princess Juliana water production station (WPJ) in Andijk 2018-2020

Appendix 4

Executive board RIWA-Rijn

Chair	H. Doedel, PWN (till 15 april 2021)
	S. de Haas, Waternet (from 15 april 2021)
Official Secretary	G.J. Stroomberg, RIWA-Rijn
Members	H. Doedel, PWN (15 april till 1 juli 2021)
	R.T. van Houten, Waternet (till 15 april 2021)
	R.A. Kloosterman, Vitens
	P.M. Pistor, PWN (from 1 juli 2021)
	L.P. Wessels, Oasen

RIWA-Rijn

Director	G.J. Stroomberg
Staff	A.D. Bannink
	J.A. de Jonge
	R.E.M. Neefjes
Visiting address	Ampèrebaan 4, 3439 MH Nieuwegein
Postal address	Groenendael 6, 3439 LV Nieuwegein
Phone	+31 (0)30 600 9030
E-mail	riwa@riwa.org
Website	www.riwa-rijn.org

RIWA-Rijn member companies

Oasen

Postal address	Postbus 122, 2800 AC Gouda
Visiting address	Nieuwe Gouwe O.Z. 3, 2801 SB Gouda
Phone	+31 (0)182 59 35 30
Website	www.oasen.nl

PWN Waterleidingbedrijf Noord-Holland

Postal address	Postbus 2113, 1990 AC Velserbroek
Visiting address	Rijksweg 501, 1991 AS Velserbroek
Phone	+31 (0)23 541 39 05
Website	www.pwn.nl

Vitens

Postal address	Postbus 1205, 8801 BE Zwolle
Visiting address	Oude Veerweg 1, 8019 BE Zwolle
Phone	+31 (0)900 0650
Website	www.vitens.nl

Waternet

Postal address	Postbus 94370, 1090 GJ Amsterdam
Visiting address	Korte Ouderkerkerdijk 7, 1096 AC Amsterdam
Phone	+31 (0)889 39 4000
Website	www.waternet.nl

Appendix 4

Internal consultation groups

Rhine Water Quality Expert Group (EWR)

The EWR exchanges information mutually and advises the RIWA-Rijn board about current issues on water quality and prepares viewpoint documents.

Chair	G.J. Stroomberg
Official Secretary	A.D. Bannink
Participants	Oasen, PWN, Vitens, Waternet, Het Waterlaboratorium, Evides, Dunea, KWR Water Research Institute, Rijkswaterstaat WVL, RIVM

Meuse and Rhine Water Quality Expert Groups (EWMR)

In the joint meeting of the EWM (Meuse Water Quality Expert Group from RIWA-Maas) and the EWR, information is exchanged mutually and viewpoint documents are prepared

Chair	G.J. Stroomberg, RIWA-Rijn
Vice chair	M.P. van der Ploeg, RIWA-Maas
Official Secretary	A.D. Bannink, RIWA
Participants	Dunea, Evides/WBB, Oasen, PWN, Vitens, Vivaqua, De Watergroep, water-link, Waternet, WML, Aqualab Zuid, Het Waterlaboratorium, KWR Water Research Institute, Rijkswaterstaat WVL, ILT

Appendix 5

RIWA Umbrella

RIWA-Rijn, RIWA-Maas and RIWA-Schelde together form the RIWA Umbrella. The chair rotates every three years. From January 2019, it is with RIWA-Rijn.

RIWA Umbrella secretariat

Visiting address	Ampèrebaan 4, 3439 MH Nieuwegein
Postal address	Groenendael 6, 3439 LV Nieuwegein
Phone	+31 (0)30 600 9030
E-mail	riwa@riwa.org

IAWR

Internationale Arbeitsgemeinschaft der Wasserwerke im Rheineinzugsgebiet

Members

ARW Arbeitsgemeinschaft Rhein-Wasserwerke e.V.

Postal address	GEW - RheinEnergie AG Parkgürtel 24 , D - 50823 Köln - Ehrenfeld, Germany

AWBR Arbeitsgemeinschaft Wasserwerke Bodensee-Rhein

Postal address	c/o DVGW-Technologiezentrum Wasser Karlsruher Straße 84, D - 76139 Karlsruhe, Germany

RIWA-Rijn Vereniging van Rivierwaterbedrijven

Postal address	Groenendael 6, 3439 LV Nieuwegein

IAWR secretariat

Postal address	c/o Stadtwerke Karlsruhe GmbH Daxlander Straße 72, D - 76185 Karlsruhe, Germany
Phone	+49 (0)721 599 3202
E-mail	iawr@iawr.org
Website	www.iawr.org

Colophon

Text and editing	**RIWA-Rijn** R.E.M. Neefjes J.A. de Jonge A.D. Bannink G.J. Stroomberg
External contributions	**Chapter 3** H. Timmer, Vewin **Chapter 4** D. Sanders, Universiteit Utrecht L. van de Grift, Universiteit Utrecht J. Schenk, Universiteit Utrecht
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