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Subject:	COMMISSION STAFF WORKING DOCUMENT REFIT EVALUATION of the Drinking Water Directive 98/83/EC

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Delegations will find attached document SWD(2016) 428 final - Part 1/2.

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PART 1/2

**COMMISSION STAFF WORKING DOCUMENT**

**REFIT EVALUATION of the Drinking Water Directive 98/83/EC**

## Table of Contents

1. Introduction.....	3
2. Background to the initiative .....	4
3. Evaluation Questions.....	7
4. Method .....	8
4.1. Evaluation Method .....	8
4.2. Limitations .....	10
5. Implementation state of play (Results) .....	13
6. Answers to the evaluation questions .....	15
6.1. Effectiveness.....	15
6.2. Efficiency .....	22
6.3. Coherence .....	28
6.4. Relevance .....	32
6.5. The EU-added value .....	36
7. Conclusions .....	38
Annexes .....	43
1. Procedural information .....	43
2. Synopsis Stakeholder Consultation .....	44

## 1. Introduction

In 1998 the European Union (EU) adopted the Drinking Water Directive 98/83/EC<sup>1</sup> (DWD). The DWD regulates the quality of water intended for human consumption.

The evaluation of this Directive was included in the Commission Work Programme 2015<sup>2</sup> as part of the Commission's Regulatory Fitness and Performance programme (REFIT)<sup>3</sup> to assess whether this instrument remains fit for purpose. It is the first full evaluation of the DWD and is also one of the follow up actions to the first successful European Citizens' Initiative (ECI) Right2Water<sup>4</sup>.

Safe, high quality, drinking water is essential for public health and well-being and an important asset for the economy. Every EU citizen uses up to 156 litres<sup>5</sup> of water per day. Whilst not a commercial product like any other, water is economically important. A good supply is essential to provide for high quality water services to citizens and an essential precondition for the development of economic activities. Defects in quality and quantity cause high social and economic costs.

### Box 1: The water sector

The total abstraction of freshwater across Europe is around 182 m<sup>3</sup>/year<sup>6</sup>, drawn in roughly equal amounts from groundwater and surface water sources. Drinking water in the EU stems from around 11,000 large supplies and 85,000 small supplies serving around 80 % and 20 % of the population<sup>7</sup> respectively. In more than 60 per cent of the EU water infrastructure, water services are provided by publicly owned undertakings<sup>8</sup>, the rest by regulated entities with different levels of private ownership. Regulatory options range from the largely decentralised management of private undertakings (subject to antitrust and price regulation) to public asset ownership, ministerial guidance and budget control. The European water sector is a major economic player (1% of GDP) with an annual turnover in the EU of about 80 billion Euro,

<sup>1</sup> Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption, OJ L 330, 5.12.1998, p. 32

<sup>2</sup> Commission Work Programme 2015 "A New Start", COM(2014) 910 final of 16 Dec. 2014, Annex 3 Refit

<sup>3</sup> For more information on REFIT, see [http://ec.europa.eu/info/law-making-process/evaluating-and-improving-existing-laws/refit-making-eu-law-simpler-and-less\\_en](http://ec.europa.eu/info/law-making-process/evaluating-and-improving-existing-laws/refit-making-eu-law-simpler-and-less_en)

<sup>4</sup> Communication from the Commission on the European Citizens' Initiative "Water and sanitation are a human right! Water is a public good, not a commodity!" COM/2014/0177 final

<sup>5</sup> VEWA Study 2015 – Comparison of European Water and Wastewater Prices, 2012 data of 6 countries

<sup>6</sup> EUROSTAT statistics-explained - water\_abstraction, 2012 data

<sup>7</sup> A water supply is an area of uniform water defined for monitoring purposes, often corresponding to one supplier. 96,000 water supplies in the EU cover approximately 474 million people. Small water supplies are those supplying less than 1,000 cubic meters per day or serving less than 5,000 people. Very small supplies with less than 10 cubic meters per day or serving less than 50 people are exempted from the Directive.

<sup>8</sup> Article Ralf Botschek 2013, <https://www.ceps.eu/system/files/article/2013/05/Forum.pdf>

providing around 500,000 full time-equivalent jobs<sup>9</sup> and a yearly investment of 7 billion Euro. It has an average growth rate of 5% per year, compared to 2.5% per year average growth rate for the EU economy<sup>10</sup>.

## 2. Background to the initiative

The 1998 DWD which replaced Directive 80/778/EEC<sup>11</sup> relates to the quality of drinking water. Its overall objective is to protect human health by ensuring that drinking water at the consumer tap is wholesome and clean.

The DWD was thus not a new intervention. Its general objective is to prevent adverse effects on human health of any contamination across the EU and to ensure that drinking water at the consumer tap is wholesome and clean. It requires Member States to establish safety precautions to maintain safe water quality. The DWD actions provide for a rather general EU framework setting quality standards and demanding that Member States ensure monitoring, compliance with the standards and provide the appropriate information to consumers. Concrete actions are left to the Member States.

In more detail, the DWD intervention logic<sup>12</sup> is to address all possible contamination causes, including from treatment and distribution, by setting strict EU wide minimum parametric values to be complied with at the consumer tap.

### Figure 1: Drinking Water supply principle

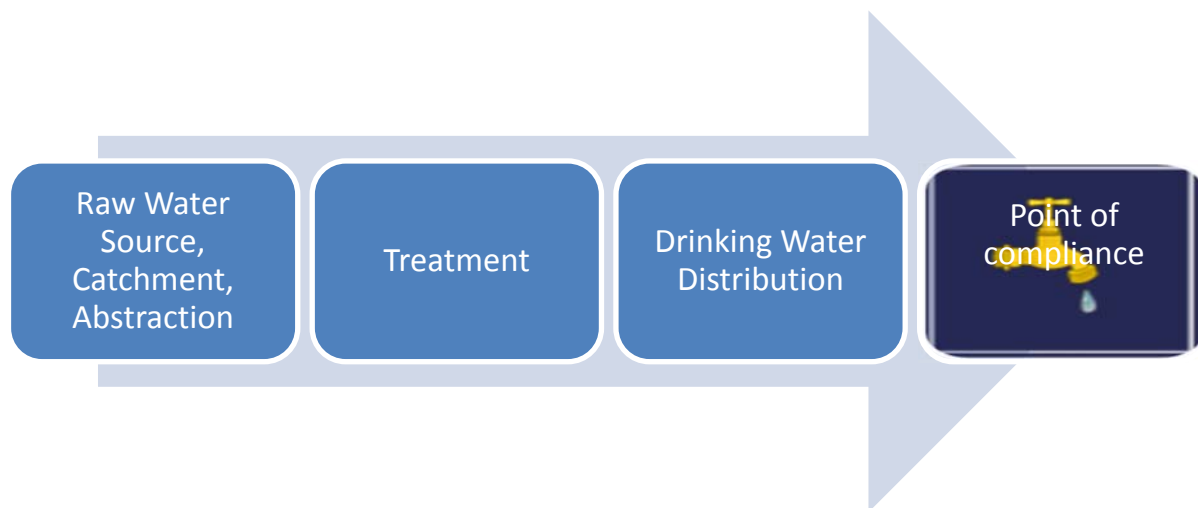
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<sup>9</sup> EUROSTAT 2010 - Workshop Greening the economic and social governance of the EU (the European Semester) Brussels, 28.11.2013

<sup>10</sup> The European Technology Platform for Water, <http://wsstp.eu/about-us/water-vision/>

<sup>11</sup> Council Directive 80/778/EEC of 15 July 1980 relating to the quality of water intended for human consumption, OJ L 229, 30.8.1980, p. 11–29. The first EU legislation in this area was the 1975 COUNCIL DIRECTIVE 75/440/EEC concerning the quality required of surface water intended for the abstraction of drinking water in the Member States repealed by the Water Framework Directive.

<sup>12</sup> The Intervention logic is a description summarising how a policy intervention was expected to work, see chapter 3.3 of Better Regulation Toolbox 41, [http://ec.europa.eu/smart-regulation/guidelines/tool\\_41\\_en.htm](http://ec.europa.eu/smart-regulation/guidelines/tool_41_en.htm)



The parameters and values are set by the EU legislator based on a Commission proposal. They are generally underpinned by the voluntary standards in the WHO's Guidelines for drinking water quality<sup>13</sup>. They build on over 50 years of guidance involving the participation by hundreds of experts and coordinated by the WHO Drinking Water Quality Committee. The DWD aims at protecting human health from the adverse effects of any contamination, and to ensure that drinking water at the consumer tap is wholesome and clean.

Within the DWD this is expected to happen by the establishment of appropriate monitoring programmes by the competent authorities. The DWD sets therefore the minimum frequencies of sampling and analyses depending on the volume of water distributed. The monitoring programmes serve to check that the water available to consumers meets the requirements of the Directive.

For any failure identified by the monitoring, remedial action has to be taken. The DWD provides a stepwise risk-dependent approach on remedial actions to be taken, up to prohibition and restriction in use, but without prescribing details.

In exceptional circumstances Member States may grant temporary derogations provided that potential dangers to human health are excluded. The DWD limits these derogations to be granted for a maximum of three times three years (i.e. a maximum period of nine years) and afterwards to comply with the Directive.

The DWD requires that Member States take all measures necessary to ensure that treatment and contact materials are secure. The Explanatory Memorandum<sup>14</sup> of the DWD identified as the single most important specific objective the reduction of lead in drinking water in order to protect infants, young children, and pregnant women from the neuro-toxic effects that are known to contribute to IQ deficits, learning and behavioural problems. For this specific objective, it includes an action plan reducing parametric value over 15 years from 25 µg/l to 10µg/l over 15 years by 24 December 2013.

<sup>13</sup> [http://www.who.int/water\\_sanitation\\_health/dwg/guidelines/en/](http://www.who.int/water_sanitation_health/dwg/guidelines/en/) (98' DWD based on 2<sup>nd</sup> edition 1996)

<sup>14</sup> COM(94) -612 final

Furthermore, the DWD requires up-to-date information on the water quality to be available to consumers and tri-annual ex-post reporting of water quality data to the Commission.

The abstraction of drinking water and the protection of water bodies for this aim is regulated in Article 7 of the EU Water Framework Directive (WFD)<sup>15</sup>, which was adopted shortly after the DWD. Article 7 of the WFD requires Member States to identify bodies of water for the abstraction of drinking water and to protect them, so that the resulting water will meet the DWD requirements.

These objectives and actions of the intervention logic, complemented by external factors and expected results, are presented in Figure 2 below.

**Figure 2:** Intervention logic

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<sup>15</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy - OJ L 327, 22.12.2000, p. 1–73

### Objectives DWD

- to prevent adverse effects on human health of any contamination equally for the whole EU population
- to ensure that drinking water at the consumer tap is wholesome and clean
- drinking water quality is monitored and – in case of non-compliance - restored

### Actions for Member States/Water operators:

- Monitoring programmes focusing on quality standards
  - Action plan on lead until 24/12/2013
- Remedial action to restore Drinking Water quality in case of non-compliance with microbial and chemical parameters
- Derogations in exceptional circumstances
  - Limitation until nine years after transposition
- Quality assurance measures for contact materials (Art. 10)
- Up-to-date information is provided to consumers

### Consequences:

- Maintain no adverse health effects through drinking water, lead contamination reduced
- Relevant quality information available to suppliers and authorities
- Exceedances not constituting a potential danger to human health temporarily granted
- Safer materials for water distribution used, lead pipes replaced
- Consumers and Commission better informed

### External Factors:

- Water Framework Directive (Article 7 abstraction, Ground Water Directive)
- Other EU legislation (agriculture (CAP), nitrates, pesticides, food, construction products)
- Evolution of treatment techniques
- Scientific development of analytical methods
- Pressures related to human and economic activities
- Climate change effects (floods, droughts, scarcity)

### Expected Results/Impacts:

- Higher water quality and contribution to better health
- Reduced concentration of contaminants like lead as an important indicator
- Consumers and Industry can rely on wholesome and clean tap water
- Further and indirect impacts on pollution prevention of source water, water supply, land-use, agriculture



## **Box 2: What is Drinking Water Quality and what is 'Compliance' in this report?**

The Directive sets standards for the most essential chemical and microbiological parameters that can be found in drinking water with relevance for human health. The Directive lists a total of 48 parameters that must be monitored and tested regularly. In general, WHO guidelines for drinking water are used as a basis for the standards in the Directive. Mostly the parametric values are based on lifelong exposure and an average drinking water intake of two litres per person per day.

To check drinking water quality, the actual concentration found is compared with the parametric value (standard, limit) set in the Directive. A concentration above the limit is an exceedance or non-compliance that requires follow-up and remedial measures. A concentration below the limit is a 'compliance' for this parameter.

As millions of analyses are carried out<sup>16</sup>, the available compliance information for each parameter is summarised as compliance rates. This percentage of compliance reflects the ratio of number of analyses done and number of analyses with exceedances. Compliance in this regard means more than 99 % of all analyses done meet the given standard. The compliance rates, or in this report often just referred to as 'compliance', are the most meaningful and manageable information to approximate water quality. It is also the only available information assessed and document since 1993. It allows a comparison between different water supplies and between Member States, and comparing the rates over time also permits to assess the implementation performance of the Directive. Therefore this report refers in the following to compliance rates to describe drinking water quality. It has to be noted that this 'compliance' with the parametric values should not be put on the same level with 'legal compliance with the Directive', as the DWD concedes corrective measures (remedial action) to mitigate temporary exceedances of parametric values.

### **3. Evaluation Questions**

In order to structure the evaluation exercise, the current analysis sets out to answer a series of questions initially drawn up in the 'Evaluation and Fitness Check Roadmap'<sup>17</sup> that will provide insight into the effects produced by the DWD. The evaluation questions are based on five different criteria: effectiveness, efficiency, coherence, relevance, and EU-added value.

The **effectiveness** analysis considers to what extent the Directive has achieved its objectives to protect human health from the adverse effects of any contamination. Which provisions have been most appropriate for protecting human health? To what extent have parameter requirements and also general ones for Member States been effective and why? What main factors, in particular related to water bodies or agriculture, have influenced, or stood in the

<sup>16</sup> microbiological parameters (4.1 million analyses), chemical parameters (7.1 million analyses), and indicator parameters (17.5 million analyses), reporting period 2011-2013 in all EU Member States

<sup>17</sup> [http://ec.europa.eu/smart-regulation/roadmaps/docs/2015\\_env\\_041\\_drinking\\_water\\_en.pdf](http://ec.europa.eu/smart-regulation/roadmaps/docs/2015_env_041_drinking_water_en.pdf)

way of achieving these objectives? What results, if any, did the DWD achieve beyond its main aim to protect human health, for example towards environmental protection? Did the Directive cause any other unexpected or unintended changes?

The **efficiency** analysis aims to consider, to the extent possible, the relationship between the resources used by DWD and the changes generated by its intervention. What are the costs and benefits associated with the implementation of the DWD? To what extent are the costs involved with implementing the DWD justified given the benefits that have been achieved? What provisions in the Directive have caused excessive administrative/regulatory costs compared to the benefits? Have there been technical or other developments since the establishment of the Directive that could contribute to achieving the objective more efficiently, for example the risk based water safety planning of the World Health Organisation (WHO)? To what extent does the Directive allow for efficient policy monitoring (e.g. reporting mechanism)? How far do the reporting processes allow for efficient collection of all relevant information?

The evaluation of **coherence** looks at how well different actions of the DWD work together and how the DWD relates to activities regulated by other legislation, including other EU policies. To what extent are the Drinking Water provisions internally coherent? Do provisions overlap or contradict, do they co-act as intended? To what extent are there overlaps, discrepancies, contradictions and what impacts do these overlaps have on effectiveness or efficiency? To what extent can effects be linked to provisions in other EU legislation? Which effects had the DWD on areas targeted by other EU legislation? To what extent are there any gaps between the DWD and other relevant EU legislation or initiatives that could prevent the objectives of the DWD being met?

**Relevance** looks at the relationship between the needs and problems in society and the objectives of the DWD. To what extent is the DWD approach to protect human health from the adverse effects of any contamination of drinking water still appropriate? Which other approaches or parameters than those set currently in the DWD became more important for human health? Can any obsolete provision in the Directive be identified and if yes, why are such provisions obsolete? What are citizens' expectations for the role of the EU to ensure drinking water quality?

Finally, the evaluation assesses what has been the **EU added value** of the Directive, and do the issues addressed continue to require action at EU level? Is there any possibility to compare EU legislation and its effectiveness with what is in place elsewhere in similar regions, e.g. in Asia, Latin-America or North America? What would be the most likely consequences of withdrawing the Directive?

## 4. Method

### 4.1. Evaluation Method

The evaluation has been coordinated by the EC's Directorate-General Environment with support of an Inter-Service Group, involving representatives of Commission Directorate-Generals for Internal Market, Industry, Entrepreneurship and SMEs; Climate Action; International Cooperation and Development; Migration and Home Affairs; Joint Research Centre; Justice and Consumers; Regional and Urban Policy; Research and Innovation; Health and Food Safety and the Secretariat-General. The Group steered and monitored progress of the exercise, ensuring the necessary quality, impartiality and usefulness of the evaluation.

To support this evaluation, the Commission awarded a study contract in 2014 to a consortium led by ECORYS<sup>18</sup>. The study was kicked-off in early 2015 and further information about it is available on the project website [www.safe2drink.eu](http://www.safe2drink.eu). A short overview of the method applied is provided here – more detailed information on the evaluation methodology, the evaluation matrix etc. can be found in the Evaluation Study, in particular chapter 1.4 and Study Annex A, available on the project website<sup>19</sup>. The study was published on this website and on CIRCABC<sup>20</sup> in July 2016. Unless specifically mentioned, the source of all data in this staff working document is the supporting study.

The evaluation has considered a previous EU-wide public open consultation on drinking water, which took place in 2014. This public consultation was triggered by the European Citizens' Initiative. Although this consultation predated the evaluation, many questions were already designed in anticipation of a future evaluation. The aim of this consultation was to get a better understanding of citizens' views on the need and the possible range of actions that could be undertaken in order to improve the supply with high quality drinking water. The questionnaire included a general part on citizens' perceptions on access to and the quality of drinking water, and a specific part on the DWD itself. This consultation received 5908 answers as well as 136 positions submitted by email<sup>21</sup>.

With regard to stakeholder consultations, new activities have focussed around a stakeholder conference and interviews with key stakeholders (water suppliers, water authorities, health authorities, consumer organisations, material/product/equipment providers). A specific DWD evaluation stakeholder conference took place on 26th May 2015. The aim of this expert consultation was to get detailed feedback inter alia from the water sector and authorities on stakeholder expectations and experiences on which DWD actions contributed to achieving the objectives. The target group included also consumer organisations and environmental NGOs. The conference was attended by approximately 70 stakeholders from across the EU. In addition, some 30 specific evaluation interviews were conducted with the most relevant

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<sup>18</sup> Study consortium under the lead of ECORYS with Ecorys, Alterra, KWR, ACTeon, and REC, under the framework-contract to the European Commission ENV.F.1/FRA/2010/0044

<sup>19</sup> <http://www.safe2drink.eu/dwd-evaluation/>

<sup>20</sup> Public consultation report: <https://circabc.europa.eu/w/browse/0070b535-5a6c-4ee4-84ba-6f6eb1682556>

<sup>21</sup> A detailed analysis, the questionnaire and further information is available on: [http://ec.europa.eu/environment/consultations/water\\_drink\\_en.htm](http://ec.europa.eu/environment/consultations/water_drink_en.htm)

groups of stakeholders ensuring also a geographical balance. All stakeholders were invited and had the opportunity over several months to provide written comments. 17 position papers were received within one year after the conference. This approach was intended to offer several opportunities for different types of stakeholders to engage in the evaluation and provide relevant opinions and data. Whilst subject to certain limits, e.g. a comparatively low representation of consumer and environmental organisations, the responses received and coverage provided was rated appropriate to inform the analysis under each of the five criteria. Opinions provided relating to possible future changes are not reported here as this is a retrospective exercise. Further details on the main findings of the consultation activities can be found in the Annex 2.

The wider methodology used for the ECORYS study was to visualise the links between policy objectives, actions and intended outcomes of the DWD. For the analysis of effectiveness, a key source was the detailed information collected through triannual implementation synthesis reports and the data reported (electronically) by Member States since 2005 to the European Environmental Agency (EEA). To assess efficiency, coherence, relevance, and EU-added value, the evaluation also used desk research, stakeholder views and the results of the public consultation to obtain evidence.

#### **4.2.Limitations**

One of the main challenges in this evaluation was to assess the benefits of the DWD on human health. Human health, however, is influenced by many factors including the quality of the drinking water. Given that the adverse effects are established only on theoretical grounds, it was not possible to highlight the real preventative effect of the DWD. No direct causal, statistical or epidemiological relations between drinking water quality and human health impacts could be established, although some desk research tried to do so. This finding hampers the initial evaluation method, which had in mind to assess effects on human health. As no clear cause-effect health evidence could be established, the method has been adapted during the evaluation process towards an assessment of indications, potential impacts, or risk reduction. In the absence of causal relations between drinking water and health impact data, it has been alternatively assumed that compliance with the parametric values, for which data is available, corresponds to the DWD objective to prevent adverse effects, as the parameters and their values are health-effect based. EU compliance data gained by regular monitoring is available since 1993. The longstanding experience with this water quality data and the observed absence of adverse effects has provided confidence that these data are an appropriate indicator. Thus the compliance rates with the parametric values have been used to assess the achievement of the DWD objective, whereby compliance means that negative effects on human health are unlikely.

Below some further limitations are listed, which explain in more detail the methodological difficulties, or point out some gaps related for example to monitoring data which prevented a wider evaluation.

- A limitation of the method was that prior to the adoption of the DWD, no impact assessment had been performed, as this was not yet customary at that time. Therefore

no detailed information about expected impacts at that time was available. This hampered a comparison between expected and achieved results today.

- Apart from drinking water quality, the DWD does not include additional reporting obligations that could allow a further/wider assessment of its effects. This relates for instance to data on raw water, information on supplies, suppliers and consumers, or economic and performance indicators i.e. on failures or response times. In addition, reporting obligations are limited to large supplies<sup>22</sup> (approx. 11,000 supplies). No systematically gathered data for small supplies (approx. 85,000 supplies providing around 20% of supply) is available.
- Drinking water contains many elements in very low concentrations. As most of the elements occur in harmless concentrations, drinking water quality is assessed meaningfully by comparing measured concentrations for essential parameters with preventative health-related parametric values, expressed as either being in compliance or non-compliance. It remains to be seen whether these few essential parameters and their values are the right or representative ones to describe whether drinking water is good, wholesome, or clean. The missing selection criteria for parameters limit their relevance.
- The compliance assessment has further limitations. First of all, the Directive concedes that not all parameters must be monitored in all supplies. The DWD allows this by providing a general monitoring derogation for a period of time to be determined by the competent authority for a parameter that is not likely to be present in a given supply in concentrations that could lead to the risk of a breach of the relevant parametric value. This monitoring derogation seems to be applied diversely, leading to different levels of completeness of monitoring data.
- The compliance rates reflect the ratio of number of analyses done and number of analyses with exceedances. This compliance calculation, however, gives no information on the population that has been supplied with compliant or non-compliant water.
- It was not possible to relate disease outbreaks of enteric infections to drinking water quality. Those micro-organisms that can cause outbreaks (for example *Campylobacter*, *Cryptosporidium*, *Giardia*, *Salmonella*, *Norovirus*) are not included in the parameters of the DWD. A detailed analysis of outbreaks and incidents in drinking water in the EU outbreaks is provided in Annex C of the evaluation study. The study collected data on for example confirmed annually reported cases in 2012 in the EU of campylobacteriosis 215,217 cases, cryptosporidiosis 9,591 cases, or giardiasis 16,223 cases, plus several case studies. The study found that epidemiological data are, however, presumably only the tip of the iceberg as water related disease surveillance systems are not necessarily capable to detect waterborne outbreaks due to

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<sup>22</sup> A water supply is an area of uniform water defined for monitoring purposes, often corresponding to one supplier.. Small water supplies are those supplying less than 1,000 cubic meters per day or serving less than 5,000. Very small supplies with less than 10 cubic meters per day or serving less than 50 people are exempted from the Directive.

methodological problems<sup>23</sup>. The DWD includes only two measurable 'indicator' parameters: E. Coli and Enterococci. They are easily analysable and analytical methods exist. They provide only a broad indication if the water is contaminated by pathogens. Therefore no direct link between the microbiological water quality and human health impacts could be established.

- A comprehensive assessment of pollution sources was not possible, as no obligation exists in the DWD to monitor raw water sources with regard to drinking water quality aspects. Water abstraction is regulated under the WFD but there is no obligation for the Member States to report on the quality of the abstracted waters.
- Drinking water is influenced by the domestic distribution system<sup>24</sup>, but only local limited data is available and no systematic evaluation of this influence is undertaken. Although the compliance point is the consumers tap, the DWD fails to intervene at the point the water enters the domestic system, and does not apply to the domestic system and its maintenance. For example, if lead pipes within the domestic distribution system leading from the water meter to the domestic residence cause drinking water contamination, this may fall under the responsibility of the landlord or owner of the residence.
- Assessing the costs linked with the implementation of the DWD was not an easy task: only a part of the drinking water costs – what a consumer pays or a water supplier has paid/invested - can be attributed to the DWD intervention. Many hydrogeological, historical, governance or anthropogenic factors play their role on drinking water quality. In addition, there were already provisions and parametric values in EU legislation implemented prior to the '98 DWD.<sup>25</sup> Despite these difficulties, average figures have been generated and verified by key stakeholders and in the light of the remaining uncertainties, these figures should be interpreted with caution.
- Benefits have been assessed at a qualitative level because not all effects can be monetized (lack of available data on avoided sickness for instance). The limitation is that "prevented" or "avoided" health effects cannot be specified per se. This applies for any other safety legislation.
- A final limitation refers to information challenges. It is recognised by the EC Smart Regulation Guidelines that when evaluating EU legislation, it is particularly difficult to identify what the situation would have been if a piece of EU legislation had not been adopted (the counterfactual), making absolute quantitative analysis problematic . Therefore, this evaluation mostly relies on qualitative, reasoned arguments about the likely contribution of the DWD to the changes observed. Furthermore, where “hard

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<sup>23</sup> <http://www.safe2drink.eu/wp-content/uploads/2016/07/DWD-evaluation-report-Annexes.pdf> (Annex C)

<sup>24</sup> Recital 22 . " ... it is recognised that neither the domestic distribution system nor its maintenance may be the responsibility of the Member States"

<sup>25</sup> COUNCIL DIRECTIVE of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (75/440/EEC) repealed by the WFD, and Council Directive 80/778/EEC of 15 July 1980 relating to the quality of water intended for human consumption, OJ L 229, 30.8.1980, p. 11–29

data” was available (e.g. on the non-compliance rates at MS level), the data gathering process was hampered by the uneven quality, quantity, or reliability of data.

Despite these limitations, the evaluation could come to solid conclusions based on bringing together facts (results of Member States monitoring programmes), expert judgements and plausibility analysis.

## 5. Implementation state of play (Results)

The DWD regulates the quality of drinking water from around 96,000 water supplies<sup>26</sup>.

In 2001, three years after its adoption, the Commission took action against France, Belgium, Luxembourg, Denmark, Greece, Spain, Portugal, Austria and Sweden for not achieving the 25 December 2000 deadline for national legislation to give effect to the revised DWD. The Commission took further action against breaches of the standards established by the DWD. The legal follow up culminated in a judgment by the Court of Justice of the European Union<sup>27</sup> against Portugal for not complying with a series of drinking water parameters.

Today the DWD is well implemented, including in those Member States that joined the EU after 2000. Over the evaluation period 1999-2016 there were close to 50 infringements with at least a letter of formal notice, the majority of which relate to issues of incorrect transposition. 14 concerned cases of non-communication, with four resulting in court rulings forcing the Member States to communicate their transposing legislation to the Commission (Belgium, Luxembourg, Spain, UK) and 19 non-conformity cases, with one ruling (UK). There were 15 bad application cases, some of which related, at least in part, to issues arising under the predecessor directive (80/778/EEC). Four of these have led to a ruling (France (2), Portugal, Spain), mainly due to non-compliance with microbiological parameters (e-coli and enterococci) or indicative parameters for clostridium, iron, manganese and nitrate. Two cases are still on-going (Hungary, Italy). These cases appear to be triggered by factors related to lack of management measures for nitrates pollution, poor monitoring, management, or administration practices in the early years of the DWD. However as current results show (see section 6.1 on effectiveness) the situation has improved over time, Apart from two abovementioned cases of non-compliance with the parametric values in Italy and Hungary, and on pilot case in Ireland, no major infringement procedures are ongoing. The overall compliance rates for chemical and microbiological parameters in large supplies for which reporting to the Commission is mandatory has increased from an average of around 95% in 1998 (based on 15 Member States), to around 97% in 2005 and more recently to a compliance

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<sup>26</sup> The reporting exercise 2008-2010 included voluntary data on small supplies and identified in total 96,000 water supplies in the EU cover approximately 474 million people.

<sup>27</sup> C-251/2003 of 29 September 2005



level above 99% in all Member States.<sup>28</sup> The synthesis report for the year 2008-2010<sup>29</sup> covered a voluntary one-off reporting exercise for small supplies. This report indicated some concerns about reduced monitoring and slightly lower compliance rates in small supplies. These have been addressed by the Commission by non-legal actions, for example a Framework for Action for the management of small drinking water supplies<sup>30</sup>. Data provided on a voluntary basis by most Member States for the year 2013 show that the situation is improving<sup>31</sup>. But as also explained in chapter 4.2 on limitations, attention must be drawn to the fact that the situation in small supplies could not be equally considered in this evaluation as no systematic data are available. More detailed information on the current implementation status can be found in the latest Synthesis Report<sup>32</sup>.

With regard to derogations, all first derogations had to start from the timescale for compliance (25th of December 2003). There was a maximum period of 9 years for derogations and this implies that for EU15 Member States no further derogations can be granted anymore. There are some exceptions for Member States that entered the EU at a later date. Under some circumstances late derogations are allowed but must be duly justified (i.e. if a new water supply zone has been defined, or a new value for existing parameters is established), and can only be granted if they do not constitute a potential danger to human health. Although the derogation provision is expiring, still some ongoing derogations were reported within the reporting exercise 2011-2013<sup>33</sup>. They concern mostly small supplies and hence relatively few inhabitants and the numbers are decreasing.

Remedial action is predominantly parameter-related and case-related. Therefore no comprehensive EU wide assessment has been performed. The latest country reports for 2011-2013 available on the website of DG Environment indicate per Member State for each year the number of restrictions and prohibitions in place. For the triannual reporting Member States indicate for all failures the types of remedial action they have taken. The latest implementation report shows for example for coliform bacteria contaminations detected, that the majority of the remedial actions taken (67 %) were related to the public distribution network or treatment infrastructure and operation (i.e. through better disinfection). Remedial actions to minimise high concentrations of arsenic in drinking water were mostly related to treatment (46 %) or catchment (29 %). In cases where the concentration of lead exceeds the parametric value, 67 % of all reported remedial actions consisted of the replacement or

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<sup>28</sup> Data for 1998 refers to the 1996-1998 Synthesis report [https://circabc.europa.eu/sd/a/f3dc4815-c271-41b5-a958-beef9d939ea3/report96\\_98.pdf](https://circabc.europa.eu/sd/a/f3dc4815-c271-41b5-a958-beef9d939ea3/report96_98.pdf); not fully comparable; since 2005 data systematically collected and electronically available; 2013 data stem from the preliminary result of the 2011-2013 Article 13 reporting exercise. Reporting is mandatory for large water supplies.

<sup>29</sup> COM(2014) 363 final on [http://ec.europa.eu/environment/water/water-drink/reporting\\_en.html](http://ec.europa.eu/environment/water/water-drink/reporting_en.html)  
<sup>30</sup> <http://ec.europa.eu/environment/water/water-drink/pdf/Small%20drinking%20water%20supplies.pdf>

<sup>31</sup> Data presented at the Expert Group Meeting on 22/09/2016 show an average compliance rate for microbiological parameter of 98 %, <https://circabc.europa.eu/sd/a/e3d61028-b813-4045-82c6-8e1893b3d26e/06%20-%20small%20Water%20Supplies.pdf>

<sup>32</sup> COM (2016) 666 final on [http://ec.europa.eu/environment/water/water-drink/reporting\\_en.html](http://ec.europa.eu/environment/water/water-drink/reporting_en.html)

<sup>33</sup> The 2013 reporting exercise: counted 108 derogations (of a total of 96,000 supplies) in 6 MS



disconnection of lead pipes in the domestic distribution network. It can be noted remedial action is in general taken promptly and that problems in relation to specific drinking water quality parameters or groups of parameters, which find their cause at different points of the drinking water supply chain: water source, treatment, distribution and end of pipe - the consumer, are in general promptly and satisfactorily resolved.

The DWD has different consumer information and notification requirements. Article 8(4) of the EU Drinking Water Directive stipulates that whether or not any failure to meet the parametric values has occurred, Member States shall ensure that any supply of water intended for human consumption that constitutes a potential danger to human health is prohibited or its use restricted or such other action is taken as is necessary to protect human health. In such cases consumers shall be informed promptly thereof and given the necessary advice. Furthermore, according to Article 8(7), Member States shall ensure that, where remedial action is taken, consumers are notified except where the competent authorities consider the non-compliance with the parametric value to be trivial. Article 13(1) of the Directive stipulates that Member States shall take the measures necessary for ensuring that adequate and up-to-date information on the quality of water intended for human consumption is available to consumers. As all these information and notification requirements are case-related, no EU wide implementation assessment of consumer information has been established. It is up to the Member States to decide how consumers are informed or notified or how this information is made available and by which means, and how the information is accessible, including through the internet or other media. The latest Commission synthesis report provides links to the national websites where information in the national languages can be found.

A peculiarity of the DWD relates to Article 10. This article supplements the strict standards to be complied with at the consumer tap. It requires Member States to take all measures necessary to ensure that no substances from new products in contact with drinking water remain in drinking water. The wording permits legal flexibility whether and how to transpose it. It recognises that several Member States and in particular the four Member States Germany, France, the Netherlands and the United Kingdom Great Britain at that time had already approval systems in place. These systems have been further developed and strengthened<sup>34</sup>, and the four Member States have agreed on collaboration in the harmonization of tests for the hygienic suitability of products in contact with drinking-water. Despite this initiative, a significant disparity is noted. Some Member States have specific requirements in place regulating materials and products in contact with drinking water, whereas other Member States have nothing. Mutual recognition is only rarely admitted. A specific study on this topic has been launched and results are expected by the end of 2016<sup>35</sup>.

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<sup>34</sup> Inter alia considering the Court judgement in Case C-171/11 - Fra.bo

<sup>35</sup> Product/Materials study: <https://circabc.europa.eu/w/browse/26398165-15d9-4eaf-8671-a6e8e6b6a32c>

## 6. Answers to the evaluation questions

The purpose of the evaluation is to gain a better understanding of whether the current instrument has achieved its objectives and is still fit for purpose. The evaluation looks at past and current performance. It assesses whether the DWD is a relevant piece of legislation and whether it provides efficient mechanisms to implement measures at EU and Member State level, which could not have been provided as efficiently and effectively by Member States and/or regional authorities.

### 6.1. Effectiveness

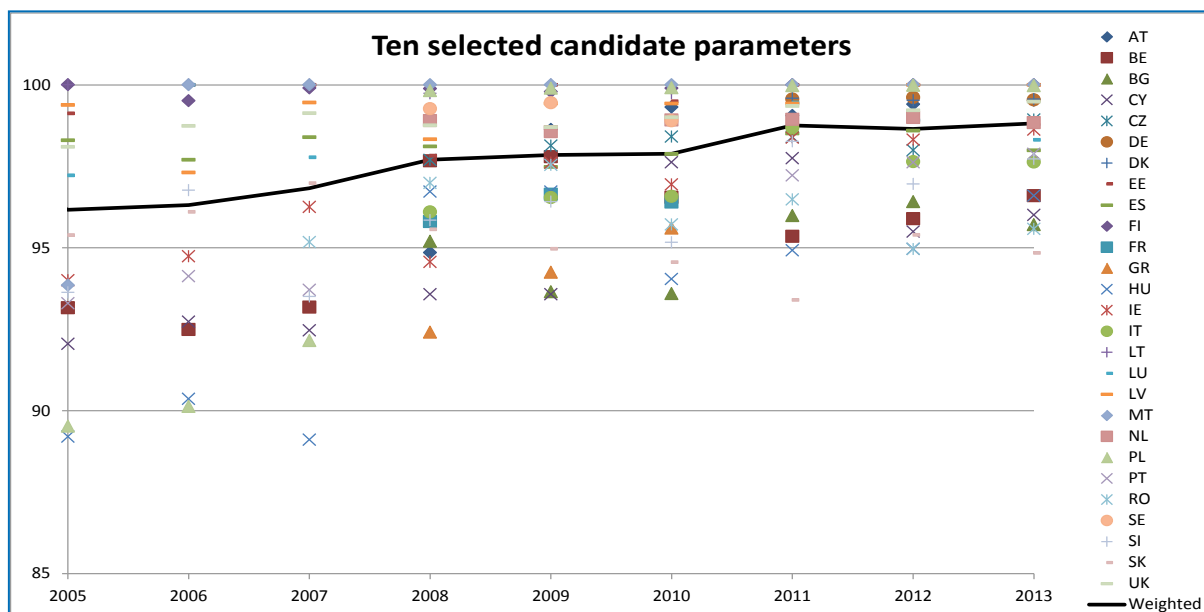
#### **To what extent has the Directive achieved its objectives to protect human health from the adverse effects of any contamination?**

The Directive is achieving its objectives and contributing to the protection of human health from the adverse effects of contamination by ensuring a high level compliance with the parametric values for the chemical and microbiological parameters or parameter groups defined in the Directive. However it should be noted that these objectives are not "one-off" events – just because quality was good in one period does not guarantee that no action will ever be needed thereafter. Furthermore, outbreaks cannot be prevented by the DWD – they should just be caught quicker. The DWD safety precautions contributed to maintaining good drinking water quality. The assessment of reported drinking water quality data provided by the Member States demonstrates clear trends and evidence (see below) that clean and wholesome drinking water in the EU is provided and its quality has improved.

Before the intervention of the 1998 DWD, drinking water compliance with the parametric values in Europe was over 90 % for most parameters. In 1998, compliance rates were in average around 95%<sup>36</sup> but varied between Member States. More recent data (see Figure 3 below) show that the preceding high compliance continued to increase significantly, from 2005 to 2013 - from 97% to over 99% for most parameters. Overall, Member States with lower compliance caught up, and in 2013 the average compliance rates in all Member States were between 99 and 100%.

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<sup>36</sup> Triannual reports prepared since 1993-1995, data electronically available since 2005 until 2013



**Figure 3: Compliance rates (%) 2005-2013:** Average compliance rates in Member States for 10 selected parameters representative of the different types of chemical, microbiological and pesticide contamination: Escherichia coli (E.coli), Clostridium perfringens, Chromium, Arsenic, Nitrate, Atrazin, Desethylatrazine, Terbutylatrazine, Lead, Copper (2 microbiological, 5 chemical parameters and 3 individual pesticides selected as representative examples).

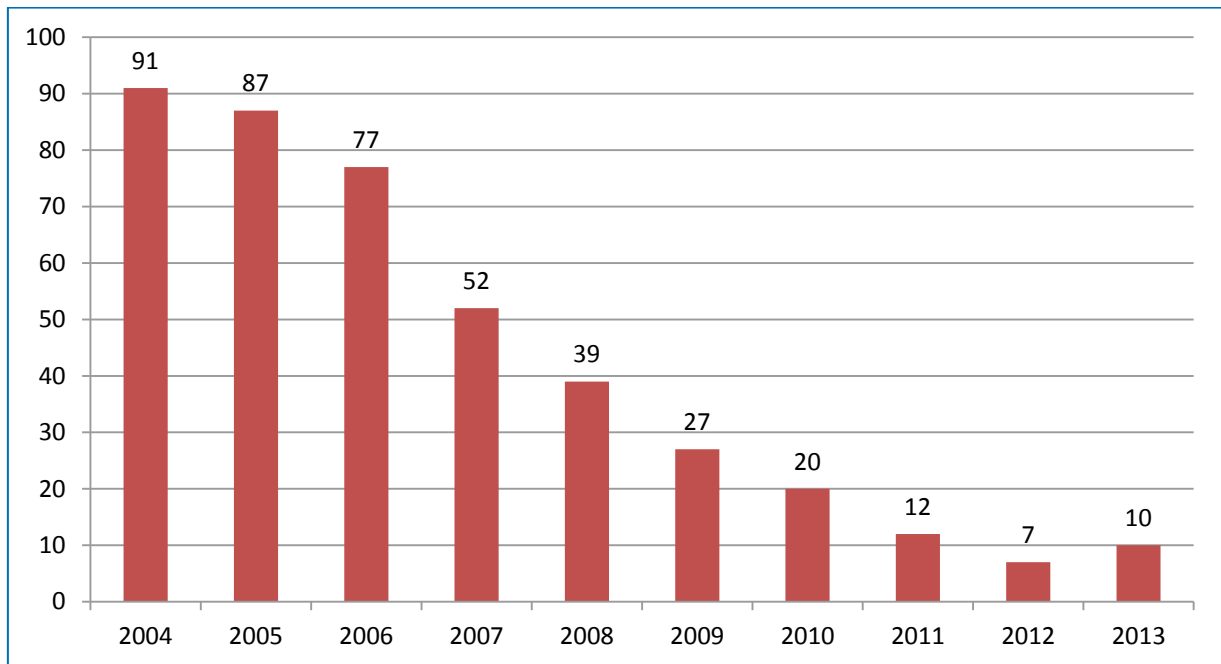
This compliance data, supported by further expert experiences observing less prohibitions and restrictions in water use, prove that drinking water quality improved and levels of contamination decreased since 1998. Further compliance data can be found in the triannual synthesis reports and are analysed in the annexes of the evaluation study (details in its Annexes B and C).

On the basis of an analysis of the reasons for non-compliance for example for lead and copper, it can be established that the issue of elevated concentrations of these metals in drinking water, where detected by DWD monitoring, was subsequently resolved by taking remedial actions linked to the application of the DWD. Thus the improvements in drinking water quality through actions related to the distribution network can be attributed to the DWD, although in several EU Member states there is still a lead problem to be tackled, mainly due to lead pipes in old buildings.

Other examples underpin this conclusion. In rural areas, local water supplies were upgraded or amalgamated with nearby supplies, leading for example in Ireland<sup>37</sup> to a considerable

<sup>37</sup> Example from one Member State chosen to show that the DWD is one important driver, but that also other drivers like controls on septic tanks and agricultural controls on nutrients probably had impacts on reducing bacterial pathogens in drinking water supplies. Please note that this DWD evaluation does not assess national implementation or implementation speed.

increase in compliance of the E. coli standard from 78% of samples analysed in 2004 to 97.6% in 2013. See Figure 4 below:



**Figure 4: Example: Number of public water supplies with detected E. coli in Ireland** (source Annex C Evaluation Study)

The evidence and examples given here and provided in the Annexes referred to above show that the DWD contributed to achieve its objectives to protect human health from the adverse effects of any contamination.

**Which provisions have been most appropriate for protecting human health? To what extent have parameter requirements and also general ones for Member States been effective and why?**

Better drinking water quality can be accredited mostly to the overall DWD intervention and not to specific provisions. This finding not to single out individual provisions was strongly supported during the stakeholder consultation and corresponds to the reality on the ground. Water suppliers and regulators clearly accredited the DWD intervention and its approach around setting essential parameters to be monitored EU-wide as the most appropriate response. Member States representatives stated that they feel confident when they all apply uniformly the **same values**. This approach reassures Member States that the standards they are applying are the right ones.

The required **systematic monitoring of supplies** led, in general, to the detection of problems and triggered their solutions. In cases of exceedances, which are predominantly for non-health related indicator-parameters, the causes were generally identified and mitigation measures

taken. This has been documented and figures have been reported to the Commission<sup>38</sup>. The DWD has created knowledge building as thousands of experts now apply and understand the importance of systematic monitoring. However, the relatively widely used general monitoring derogation for a period of time to be determined by the competent authority for a parameter that is not likely to be present in a given supply leads to differences across the countries and bears a risk that some contamination may be overlooked. As furthermore **water supplies are not exactly defined** in the Directive and not consistently applied in Member States, this may lead to gaps in coverage and to uncertainty about the population actually supplied.

The graduated provisions for remedial actions in case of failures (i.e. consumer advice, restriction, prohibition, enforcement action) were found to be effective<sup>39</sup>. The EU reporting requires also the identification of causes for failures<sup>40</sup>. These reasonable reports of categories of failures indicate that a wide set of appropriate action is taken. An analysis of different cause-sources show that failures occur equally related to raw water, treatment and distribution. Knowledge of the reasons and root causes is necessary to launch remedial action. To cover all causes along the abstraction treatment and distribution supply chain, **monitoring at the tap** was found to be a convenient method to guarantee the objective of wholesome and clean drinking water. This control at the end of the whole supply chain can cover effectively all cause sources.

Another important driver for high water quality identified by stakeholders and regulators is **reporting**. This obligation builds up the necessary pressure to monitor and remediate problems as soon as they appear and by doing so, to avoid possible impacts on the population health and to avoid EU prosecution.

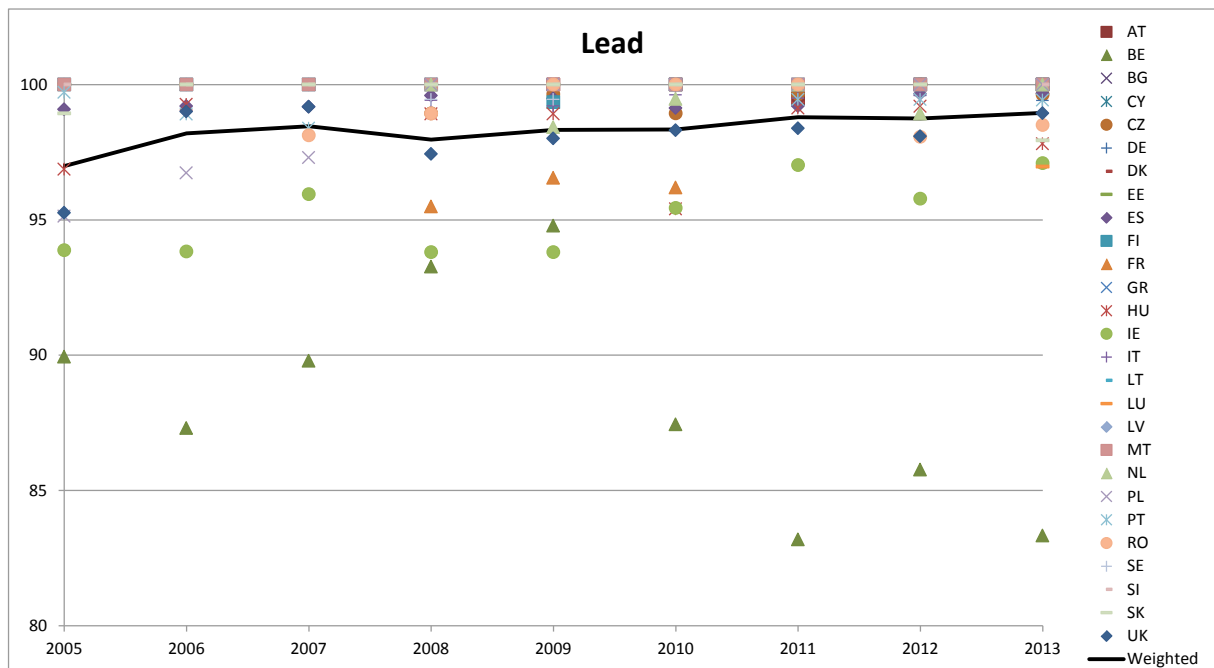
An important provision is the EU limit value for lead in drinking water at the tap. It had been set at 50µg/l in running water in the previous Directive. The current Directive granted a derogation of 25 µg/l over 15 years until 24 December 2013, when the value was reduced to 10µg/l. This requirement effectively reduced lead in drinking water (see Figure 5 below), by triggering the replacement of lead pipes and fittings, one of the main sources of lead in drinking water. The figure shows also that some Member States like Belgium and Ireland still lag behind probably because of old building stock or of poor product/material quality assurance. Overall, these measures contribute to societal health benefits for the population, and in particular the scientifically recognised negative impacts of lead on cognitive function and IQ are prevented.

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<sup>38</sup> 2011-13 report:25,000 causes for exceedances due to coliform bacteria and 15,000 causes due to iron identified

<sup>39</sup> The 2011-13 report gives three examples on the remedial actions taken in % for three important parameters coliform bacteria, arsenic, and lead.

<sup>40</sup> The EU reporting system requires to identify causes in detail and to classify them to categories, i.e. actions to replace source, disconnection or repair of defective components, disinfecting contaminated components, instructions to consumers, temporary limitations on consumption, etc.



**Figure 5: Compliance rates (%) 2005-2013 for lead**

**What main factors, in particular related to water bodies or agriculture, have influenced, or stood in the way of, achieving these objectives? What results, if any, did the DWD achieve beyond its main aim to protect human health, for example towards environmental protection? Did the Directive cause any other unexpected or unintended changes?**

Drinking water quality depends inter alia on water catchment, treatment and distribution. Factors influencing catchment, treatment and distribution influence the subsequent drinking water quality.

### **Influences on the environment**

An important effect that can be linked to the DWD is that it created the basis for a number of provisions in Directives that have been designed and implemented since 1998 (such as the Water Framework Directive (WFD)<sup>41</sup> and the Groundwater Directive (GWD)<sup>42</sup>) as they influence water catchment.

The DWD interacts with agriculture. Agricultural practices like fertilisation and plant protection influence drinking water quality significantly. An important factor influencing the DWD is the Nitrates Directive<sup>43</sup>. This Directive is one of the main drivers for the reduction of fertilizer pollution and has forced Member States to implement reinforced measures in

<sup>41</sup> WFD - Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ L 327, 22.12.2000, p. 1–73

<sup>42</sup> GWD - Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration

<sup>43</sup> ND - Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources, OJ L 375, 31.12.1991, p. 1–8

nitrate action programmes. EU Legislation on Plant Protection Products (PPPs)<sup>44</sup> also influences drinking water quality significantly for the same reason.

To protect drinking water against such contaminants, agriculture related parameters like nitrate and pesticides have been included in the DWD. These standards have contributed to reduce the release of fertilisers and crop protection products in the environment<sup>45</sup>. Clearly one of the main reasons justifying measures aiming at reducing releases of nitrate or pesticides into the environment relates to the necessity to ensure safe and high quality drinking water.

Although drinking water legislation is unlikely on its own to directly affect the authorisation of new pesticides on the market, it has increased awareness and thus may have an effect on the extent to which they are used. The DWD parametric drinking water value of 0.1 µg/l is for example used for modelling or as a reference concentration for soil, plants, or groundwater in PPP approvals.

As the DWD intervenes at the very end of the supply chain, many factors that affect drinking water sources can only be detected later and have to be sorted out by DWD. For example, some metabolites of pesticides removed from the market decades before can still be found in drinking water and sometimes beyond the allowed values. Their removal from the water system would however be difficult and costly. Thus in many of such cases, source protection is considered more effective than end-of-the-pipe solutions.

### **Influences on the society and on consumers**

A further positive unintended effect of the DWD beyond the main aim of the Directive is the creation of awareness of drinking water as a precious resource at the level of all stakeholders involved, even if regulators are most affected. In some cases, like Portugal, it contributed to a change of national institutional organisation, and to the creation of a specific water services regulation authority.

The DWD also led to more cooperation between Member States. Networks of national regulators were formed across the EU to discuss issues that are present in different countries, leading to learning, advice, knowledge sharing and informal discussions.

The focus on transparency and provision of information to the public has made consumers more aware and informed about the quality of the water supplied in their area. According to the Public Consultation, around 59 % of the responding citizens consider themselves well-informed about the quality of their drinking water, but 23 % of the responding citizens claim that they are not well informed.

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<sup>44</sup> Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC

OJ L 309, 24.11.2009, p. 1–50

<sup>45</sup> Recognised by the Dutch Bureau of Statistics, Wageningen UR and the Netherlands Environmental Assessment Agency (Evaluation Study, Footnote 52).

As drinking bottled water, which in literature is described as a social phenomenon related to trendy consumer habits and lifestyle, is shaped by many factors, it is almost impossible to state whether the DWD has influenced consumer behaviour relating to bottled and tap water, and whether this is positive or negative. Further details on consumer information are discussed in chapter 6.4 on relevance under on citizens' expectations.

### **Influences on the economy**

Article 10 of the DWD requires that Member States take all measures necessary to ensure that treatment and contact materials are secure. The DWD recognises the need to regulate materials and substances in contact with drinking water because products used for the distribution of drinking water may have a negative effect on human health. But the DWD leaves it open to Member States to determine what are the necessary measures, and makes a reference to construction products. As the requirements have not been harmonised at EU level, some national approval systems could be considered to constitute a technical barrier to trade, which makes the provision ineffective.<sup>46</sup>

With the availability of drinking water that is both wholesome and clean, EU industries that use high quantities of water such as the food and drink industry can rely on EU drinking water supplies and do not need to install their own extensive treatment facilities. Equally, it can be reasonably assumed that there are considerable positive economic impacts of saved time and energy by consumers not having to boil the water for daily use. However, there is no specific data on the extent of these benefits in the evaluation study.

Finally, the DWD resulted in innovation focused on applications that produce higher quality water at lower costs. EU companies are large exporters of water technologies, whereby market drivers are dominated by the implementation of stricter regulations like the DWD and the need to improve treatment processes<sup>47</sup>.

The changes described above for the environment, society and economy prove that the DWD has achieved positive results beyond health protection.

*Summary of Stakeholder views: The results that the DWD is effective are fully supported by stakeholders from various regulators, water utility operators, members of the academia, members of the industry and consumer stakeholder groups as well at the conference, or by interviews or position papers. The only issue where all kinds of stakeholders found the DWD to not be effective relates to quality assurance of materials required by Article 10. Stakeholders are concerned about the increasing disparity with some Member States having specific requirements in place, requiring often multiple national approvals. A specific European industry consortium on products in contact with drinking water (ICPCDW), which*

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<sup>46</sup> Example: One company complained that they have in the EU to deal with more than 1300 approvals and more than 40 quality marks which cost this company between 2 and 4 million Euro per year.

<sup>47</sup> EPEC Study 2011; Environmental Technology Verification

<http://ec.europa.eu/environment/etv/pdf/ETV%20Final%20Report.pdf>

<http://ec.europa.eu/environment/etv/pdf/ETV%20Final%20Report%20Market%20Annex.pdf>



*is supported by many industrial sectors has been created. This observation is also supported by many of the responses to the Public Consultation. Asked about the necessity to regulate certain aspects of drinking water at EU level, a majority across all respondents (74%) voted for a harmonized regulation of the materials in contact with drinking water.*

## **6.2. Efficiency**

The analysis of efficiency looks into costs and benefits and the "appropriateness" of the ratio between the two, with a view to learning from experience and gaining information about whether there could be more efficient ways to achieve the objectives of the Directive.

**What are the costs and benefits associated with the implementation of the DWD? To what extent are the costs involved with implementing the DWD justified given the benefits which have been achieved?**

As explained in the section on effectiveness, the DWD intervention has resulted in various benefits due to an improvement of the quality of drinking water and beyond, for instance, to better environmental protection of water bodies used for the abstraction of drinking water. Other benefits are increased consumer information and organoleptic effects (odour, taste, colour, turbidity<sup>48</sup>), or the replacement of inappropriate pipes, i.e. lead pipes in the distribution network. As explained in the section on the method used for this evaluation, benefits have been assessed at a qualitative level, backed up by some quantitative examples. The evaluation found for example that the lead standard set by the DWD and the subsequent replacement of lead pipes has significantly contributed to a lower level of neuro-toxic lead exposure through drinking water across Europe, and that appropriate treatment can efficiently prevent the cost of outbreaks (see examples in Boxes 3 and 4 below)

For the DWD costs, the overall supply costs have been extrapolated from expenditure data collected by a VEWA study on European water prices<sup>49</sup> from 6 Member States and taking into account differences in income. The result is that the estimated total annual cost for supplying drinking water in the EU in 2014 amounts to roughly €46.5 billion<sup>50</sup>. Ultimately the drinking water consumer bears these costs through tariffs, taxes and transfers; they do not "burden" industry and suppliers. The study updated a previous study of 2010. Results confirm that the figures are broadly reliable and also stable.

As these water costs relate to the quantity of water supplied, a model how to estimate shares of attribution to the DWD has been developed. The model tries to identify which parts of the water costs relate to the DWD and its requirements. As explained in chapter 4.2, this attribution is difficult to determine, as many factors play a role on drinking water quality. In

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<sup>48</sup> Cloudiness, haziness, or opacity (lack of clarity/transparency) of a fluid

<sup>49</sup> VEWA-Study, 2015. Comparison of European Water and Wastewater Prices. Water price expenditure information for 2007-2012.

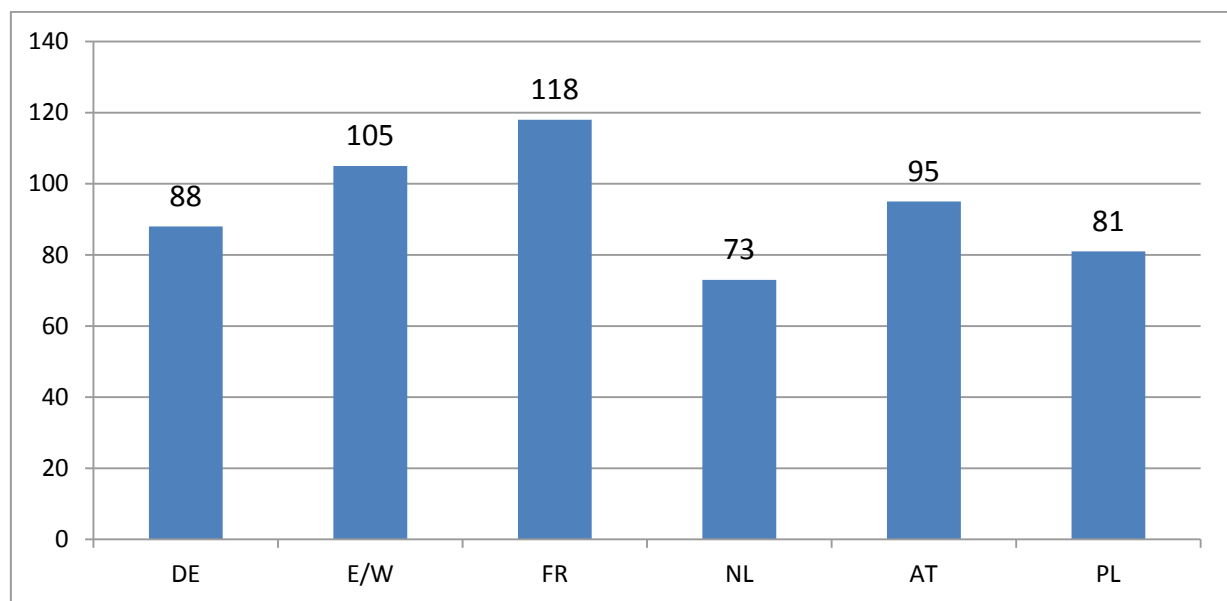
<sup>50</sup> To put this figure into context, the turnover of the bottled water industry is for example € 12.4 billion, source:

([http://www.efbw.eu/fileadmin/user\\_upload/documents/Publications/EFBW\\_Industry\\_Report\\_2015\\_02.pdf](http://www.efbw.eu/fileadmin/user_upload/documents/Publications/EFBW_Industry_Report_2015_02.pdf))

addition, many provisions and parametric values were already in place prior to the 1998 or 1980 DWD.

To place these cost considerations in a wider context, it should be noted that drinking water prices in the EU are influenced by many circumstances and not comparable. Available literature shows significant differences of drinking water prices even within one Member State. In Germany, for instance, price differences of over 400 % were found in North Rhine-Westphalia and in Hessen, and for industry in Hessen a difference of 300 % was found between the communes with the most expensive and cheapest providers<sup>51</sup>. The German Ministries of Health and Environment have issued a catalogue<sup>52</sup> that explains that often preventive long-term measures that pay off only in the long run can cause price differences.

The VEWA study found that a simple comparison of prices per m<sup>3</sup> does not adequately reflect the actual burden for citizens. In this study the water prices of 6 Member States were compared and adjusted to a uniform standard of service. However, significant differences in price levels in Europe were still found, for example in France, prices were 60 % higher than in the Netherlands.



**Figure 6: Total expenditure for water delivery in € per capita and year, price indexed and adjusted for purchasing power, adjusted to uniform service level (E/W: England and Wales)<sup>53</sup>**

<sup>51</sup> From a contribution to the Public Consultation by Rudolf Bachfeld, Arbeitskreis Faires Wasser, im Deutschen Konsumentenbund, 16.04.2014

<sup>52</sup> Katalog vorsorgender Leistungen der Wasserversorger für den Gewässer- und Gesundheitsschutz, 2014: [http://www.bmub.bund.de/fileadmin/Daten\\_BMU/Download\\_PDF/Gesundheit\\_Umwelt/gesundheits\\_gewaeserserschutz\\_katalog\\_bf.pdf](http://www.bmub.bund.de/fileadmin/Daten_BMU/Download_PDF/Gesundheit_Umwelt/gesundheits_gewaeserserschutz_katalog_bf.pdf)

<sup>53</sup> Figures from VEWA Study – Comparison of European Water and Wastewater Prices 3rd Edition, 2015, civity?.

Nevertheless, for this evaluation attribution-percentages have been estimated and verified using Member States and stakeholders contacts. As a result, around 18% (€8.3 billion or €16 per capita in 2014) can be attributed to the implementation of the DWD<sup>54</sup>, see table 1 below.

<b>Drinking water costs and breakdown<sup>55</sup></b>	<b>%</b>	<i>Annual Costs(2014) in billion</i>	<i>Share of annual cost Attributable to DWD %</i>	<i>Attributable to DWD (2014) in billion</i>
Taxes, levies, fees, concession fees, Water abstraction charges	7	€3.3	0	€0
Metrology / quality control	3	€1.4	34	€0.5
Building management	5	€2.3	5	€0.1
IT technical support processes	15	€6.9	5	€0.3
Resource Management / Water procurement / Extraction / Processing	18	€8.4	30	€2.5
Treatment of drinking water	18	€8.4	30	€2.5
Imputed Costs, such as the pipeline system and overall amortization	33	€15.4	14	€2.1
Other costs	1	€0.5	30	€0.1
Average	100	<b>€46.5</b>	<b>18</b>	<b>€8.3</b>

**Table 1: Drinking water costs, breakdown, and attribution to the DWD**

The table above shows that the imputed costs for the water distribution/supply (investments, interest, amortisation, maintenance, repair of leakages due do ageing infrastructure, etc.) are the highest. Depending on local conditions they can be a much higher percentage than the estimated average of 33 %.

Within this evaluation no comprehensive cost-benefit-analysis was possible, as explained in chapter 4.2. However, two examples on typical drinking water problems highlight why the DWD appears to have been efficient – see Boxes 3 and 4.

### **Box 3: Cost example lead pipes**

A case study<sup>56</sup> compared the costs and benefits of replacing lead pipes across the 28 Member States of the EU between 1998 and 2014. The study showed a total lifetime health benefit for EU citizens of over €400 billion, whereas the costs of the calculated distribution pipe replacement would be around €1 billion or one fifth of the estimated benefits arising. One can easily derive from this that replacing lead pipes has had a significant positive welfare and health impact that clearly outweighs the investment costs. Thus the DWD intervention on lead has high costs, but much higher benefits, and was therefore efficient.

<sup>54</sup> The share of total cost per MS that is related to provisions in the DWD (the attributability) has been estimated through a combination of interviews with MS experts and expert judgement.

<sup>55</sup> Aquabench for Germany (SWB Regional GmbH, 2015)

<sup>56</sup> Case study in the evaluation study build on work by Pichery et al., 2011, who investigated the welfare effect of lead exposure to minors

#### **Box 4: Cost example health costs**

In Ireland, a *Cryptosporidium* outbreak (microbiological pollution) occurred in Galway in 2007, resulting in 242 confirmed illnesses. The cost of the outbreak that lasted 23 weeks was estimated at €19 million (€120,000 per day of the outbreak). An investment of €1,674,000 (decommissioning the old plant and upgrading the new and installing a UV water treatment) could have potentially prevented these costs. The results indicate that there are considerable economic benefits of investing in safe drinking water supplies and water treatment enhancement. In the case of Galway the savings based on this one outbreak would have been €1 for every euro invested.<sup>57</sup>

In summary, considering the limitations discussed, and supported by these two case studies, expert judgment and conducted interviews, it was found that total attributable benefits could possibly outweigh total attributable costs quite significantly.

#### **What provisions in the Directive have caused excessive administrative/regulatory costs compared to the benefits?**

The assessment of costs and possible administrative burden did not find any provisions that have caused excessive administrative costs related to monitoring, information provision and reporting.

It turned out that the fixed monitoring requirements introduced by the DWD, which appeared initially an excessive burden, account for a very low share (3%) of costs. Using literature data and referring to a study including monitoring costs<sup>58</sup>, the total monitoring costs for large water supplies in 2014 were roughly €67 million, and costs for small water supplies in 2014 were €22 million. These figures show that small supplies are not overburdened. In average a small supply bears only a twentieth part of the monitoring costs of a large supply<sup>59</sup>.

The study assessed in detail the costs for information obligations and reporting to the Commission. The total costs for providing information to consumers is about 2.1 million euro in 2014, and the costs that can be related to the reporting on quality of large water supplies is about 1.1 million euro in 2014.

In comparison with the overall estimated costs of €8.3 billion or €16 per capita that can be attributed to the implementation of the DWD, the provisions identified as candidates for reduction of administrative burden were found to be negligible. Since the DWD does not address suppliers directly, and costs are always transferred to consumers, calculations show

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<sup>57</sup> Presentation given by Ireland at DWD Seminar on 21/1/2016 in Brussels, available on CIRCABC, and EPA Research Report 177 on <http://www.epa.ie/pubs/reports/research/water/researchreport177.html>

<sup>58</sup> Mancini G., Roccaro P., Vagliasindi F., 2005 Water intended for human consumption – Part II: Treatment alternatives, monitoring issues and resulting costs.

<sup>59</sup> Total costs identified in the Evaluation Study, 22 Million for 85,000 small supplies (Ø € 260) and 67 Million for 11,000 large supplies (Ø € 6090)

that the annual DWD related costs per capita are 18 cent (€) for monitoring, 0.4 cent for information requirements, and 0.2 cent for reporting. Compared to the essential role monitoring and reporting to the Commission plays in delivering the objectives to inform consumers and towards transparency, these limited costs can be considered as duly justified.

A sensitivity analysis and comparison show that the overall estimated costs could be slightly overestimated, whereas the figures for monitoring, reporting and information used in this analysis could be slightly underestimated<sup>60</sup>. But even if the overall estimated cost would be half, resulting in €8 annual DWD costs per capita, and if the specific costs doubled, the annual monitoring costs of 36 cents, of 0.8 cents for information, and of 0.4 cents for reporting would remain very low and significantly below 1 Euro per citizen per year for an important consumer product. They support the conclusion that the DWD does not cause excessive administrative/regulatory burden.

In summary, this evaluation found none of the monitoring and reporting provisions problematic in terms of administrative/cost burden. The analysis of effectiveness and relevance, however, found the information flows and the transfer of information to the public to be inefficient (see Chapter 6.4 on citizens' expectations). Given that these information flows contain the same data, the information flow has not worked well. It would appear from looking at the systems in place that the potential for modern information technology to make efficient use of all the data for different purposes by multi-client-enabled systems has not yet been unleashed.

With regard to Article 10 and the associated costs for certification/approval of products in contact with drinking water in the EU, a study<sup>61</sup> estimated the total cost to be €1,208 billion per year, of which by means of mutual recognition<sup>62</sup> enterprises could save costs of 55% (€ 664 million). These findings were supported by a further industry survey<sup>63</sup>. Hence, based on these studies, the current situation and the legal flexibility of Article 10 could be causing a significant unnecessary burden for industry of over half a billion Euro. A further study on the issue has been launched and results are expected by the end of 2016.

### **Have there been technical or other developments since the elaboration of the Directive that could contribute to achieving the objective more efficiently, for example the risk based water safety planning of the WHO?**

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<sup>60</sup> The figure of 34% of 3% of water costs for monitoring in Table 1 allocated per capita and per year would mean around 80 cents monitoring costs for large water supplies

<sup>61</sup> Panteia Study by the Dutch Government on Economic Effects of article 10 of the Drinking Water Directive, Final report January 2016

<sup>62</sup> Mutual recognition guarantees that any product that is not subject to EU harmonisation but lawfully sold in one EU country can be sold in another ([http://ec.europa.eu/growth/single-market/goods/free-movement-sectors/mutual-recognition\\_en](http://ec.europa.eu/growth/single-market/goods/free-movement-sectors/mutual-recognition_en))

<sup>63</sup> Study:

FIGAWA Study - Effects of Article 10 of the EU Drinking Water Directive on test and certification costs for products in contact with drinking water - Member survey Period: September 2015 to March 2016, July 2016

The 2015 amendment to Annexes II and III (technical and scientific progress) of the Directive reacts to the water safety plan approach laid down in the World Health Organisation's (WHO) Guidelines for Drinking Water Quality, introduced firstly in 3rd edition of the Guidelines (2004), and also the principle of 'hazard analysis and critical control point' (HACCP), already used in food hygiene legislation<sup>64</sup>. This amendment has introduced a voluntary use of a risk-based approach, and sets criteria to extend monitoring, to reduce frequency or to remove parameters on the basis of the results of a risk assessment and hence should also improve future efficiency.

**To what extent does the Directive allow for efficient policy monitoring (e.g. reporting mechanism)? How far do the reporting processes allow for efficient collection of all relevant information?**

Within the efficiency criterion, the policy monitoring of the DWD has also been analysed. The Directive has only one important policy monitoring tool at EU level, the triannual reporting. This monitoring focusses on compliance with the parametric values. It has, in general, allowed an efficient monitoring of the DWD implementation in Member States subject to the limitations identified earlier. The tool has to a certain extent become less meaningful over time, as nearly all Member States have achieved up to 99 % compliance and are able to maintain this level.

Reporting restricted to large water supplies, as included in Article 13(2) of the DWD, is working well. While this reporting covers around 11,000 supplies and 80% of the population, it omits the remaining population supplied by around 85,000 small supplies. Voluntary reporting on these small supplies does however not work well. For the period 2011-13 only 15 Member States provided data on these smaller supplies to the Commission. Furthermore, the distinction into large, small and very small exempted water supplies or supply zones, defined for monitoring purposes, was found to be patchy and thus inconsistent. In several Member States, this approach led to an incomplete coverage of the population.

The triannual reporting obligation on large supplies from Member States to the Commission has improved transparency and knowledge on the quality of drinking water, and enables the Commission to assess legal compliance with the Directive. Although this requirement is generally complied with, the study to support this evaluation found that the reporting process is too slow. The use and the publication of several years old and thus outdated compliance data is narrow, and does not tap the potential of modern information technology and data management.

*Summary of Stakeholder views: Looking across the different stakeholder groups, the results indicate that the DWD is efficient, that it does not cause administrative burden, and that the benefits outweigh the costs was fully backed up by the majority of respondents. Industry stakeholders, supported by consumer organisations and confirmed by authorities, raised the*

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<sup>64</sup> Commission Directive (EU) 2015/1787 of 6 October 2015 amending Annexes II and III to Council Directive 98/83/EC on the quality of water intended for human consumption

*issue of burden and costs of national approval systems for products in contact with drinking water. Authorities responsible for reporting rate the reporting exercise to the Agency as a burden. Several stakeholders from the supply sector at the conference supported the finding that the current system in which only large supplies need to be reported is too limited. However, comments from Member States acknowledged that if reporting on small supplies were mandatory, the resulting reporting system would put an enormous administrative burden on those Member States which have many small water supplies within their territories.*

### **6.3. Coherence**

Under this criterion synergies, gaps and overlaps are assessed, internally within the DWD, and externally with other EU legislation.

**To what extent are the Drinking Water provisions internally coherent? Do provisions overlap or contradict, do they co-act as intended? To what extent are there overlaps, discrepancies, contradictions? What impacts do these overlaps have on effectiveness or efficiency?**

Regarding internal coherence it was found that the Article 10 objectives on the quality assurance of materials partly overlap with the Article 5 objectives on quality standards and the parametric values of Annex I. This annex includes metallic and organic parameters that explicitly relate to materials in contact with drinking water. Annex III specifies further that these parameters shall be controlled by product specifications. These specific requirements are supplemented by a general Article 10 requirement to take all measures necessary. As this evaluation finds that better drinking water quality is ensured by the DWD intervention approach overall, meaning the synergic application of standards, monitoring and remedial measures, with a strong success for parameters related to distribution materials in contact, the supplementary role of Article 10 is found to be rather limited. Therefore also the impacts of this overlap on the overall effectiveness or efficiency of the instrument are limited. This is supported by the compliance data which roughly shows no significant differences in water quality across all Member States. This can be linked to consistent application of the Article 5 and Annex I standards, but less to the partial application of Article 10 in some Member States, as those that have legislation for drinking water contact materials or products in place do not set themselves clearly apart from the others. No other internal incoherencies were found.

**To what extent can effects be linked to provisions in other EU legislation? Which effects had the DWD on areas targeted by other EU legislation? To what extent are there any gaps between the DWD and other relevant EU legislation or initiatives that could prevent the objectives of the DWD being met?**

The coherence of the DWD with the Water Framework Directive (WFD) is especially important as the protection of drinking water resources is established as an indispensable part of the plans and measures under the WFD. Article 7 of the WFD requires Member States to identify bodies of water for the abstraction of drinking water and to protect them, so that the resulting water will meet the DWD requirements under the water treatment regime applied. Legally no discrepancies between DWD and WFD could be identified; however, the analysis



of stakeholder views indicated several problems predominantly related to the way each Member State implements the DWD:

- The WFD requirement to assess the water body status and the reporting of the results of the assessments every 6 years in the River Basin Management Plans do not always match with the needs of drinking water suppliers and the DWD reporting cycle.
- On the one hand, the WFD and its daughter Directive on Environmental Quality Standards<sup>65</sup> setting stringent standards values for a range of chemical substances in the aquatic environment does increasingly contribute to produce sufficiently safe water. On the other hand, there are obligations in the WFD (Article 4(1)c and 7) to apply quality standards relevant for DWD compliance in all water bodies used for the production of drinking water. However, the assessment of implementation so far<sup>66</sup> shows that such obligations are in general not well implemented, possibly due to lack of clarity. Therefore the synergy of these provisions of the WFD for the DWD is lower than expected.
- In Member States where the general obligations of Article 7 WFD on waters used for the abstraction of drinking water have not been well transposed and/or implemented into concrete actions in the national legal and administrative frameworks, drinking water suppliers and regulators struggle to act on or influence the protection of raw water resources they use, as the importance of drinking water source protection and abstraction is not recognised in the DWD.

These issues and the missing link in the DWD to the protection of waters resources to be used for the abstraction of drinking water have also been identified as important factors standing in the way of achieving the objectives of the DWD.

When assessing the causes of drinking water contamination reported by Member States under the DWD, it became apparent that a high number of problems relate to contamination at the catchment sources (i.e. by nitrate, or pesticides or their metabolites). This indicates that information about health risks in raw water resources was not always effectively collected and used to combat pollution relevant to the protection of drinking water resources.

This missing link also complicates the application of the polluter-pays-principle and the precautionary principle<sup>67</sup> that preventive action should be taken, and that environmental damage should as a priority be rectified at source and that the polluter should pay. The cost savings by simply reducing for instance the use of pesticides or nitrate is only a fraction of the costs of fixing the problem afterwards by removing them from the polluted water, which is

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<sup>65</sup> Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council  
OJ L 348, 24.12.2008, p. 84–97

<sup>66</sup> See WFD Implementation Reports, inter alia: [http://ec.europa.eu/environment/water/water-framework/pdf/4th\\_report/COM\\_2015\\_120\\_en.pdf](http://ec.europa.eu/environment/water/water-framework/pdf/4th_report/COM_2015_120_en.pdf)

<sup>67</sup> Environmental principle defined in the Treaty Article 191(2) TFEU



complex and costly. Compared to treatment after the event, preventing water pollution at source can have a cost-benefit ratio as high as 1:65<sup>68</sup>. France for example estimates its annual social and environmental cost related to the various externalities generated by nitrogen fertilizers such as pollution, greenhouse gas emissions and biodiversity degradation in a range of 0.9 to 2.9 billion euros<sup>69</sup>.

Furthermore, pressures related to human and economic activities or to climate change effects (floods, droughts, scarcity) that predominantly affect water resources are rising<sup>70</sup>. These pressures are passed on to and may put drinking water at risk due to emerging contaminants, microbiological growth and variability of both water quantity and quality resulting from climate change that will exacerbate these pressures.

Other aspects of water legislation were already assessed in the Fitness Check of EU Freshwater Policy<sup>71</sup>. This Fitness Check found coherence of the DWD with the Groundwater Directive, Environmental Quality Standards Directive, Floods Directive<sup>72</sup>, Bathing Water Directive<sup>73</sup>, and the Water Framework Directive, which addresses Drinking Water through its Article 7. The majority of respondents to the public consultation for the Fitness Check replying to a question about the coherence of other EU law with these legislative instruments felt that they were at least partially coherent with the remainder of EU water legislation, but that there is a missing link between the Drinking Water Directive and the protection of drinking water supplies through water safety plans recommended by the WHO that provide a holistic and proactive approach to systematically managing risks in drinking water from catchment to tap.

No incoherence with the Nitrates Directive was found. The two directives are complementary and partly aligned to each other (referring for example to the same parametric values like 50 mg/l for Nitrate).

This evaluation echoes a concern expressed in the Fitness Check that further work is required to ensure full coherence with pesticides legislation and other pollution related to agriculture. One smaller technical issue, relating to some inconsistent definitions of 'relevant' pesticides metabolites and their assessments, was identified. For the bigger picture, it was noted that a lot of new agricultural and plant protection policies came into force in the last years, supplementary to WFD measures in River Basin Management Programmes relevant for drinking water, like rural development programmes, integrated pest management, fencing of watercourses, slurry/manure management, measures under the National Action Plans under

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<sup>68</sup> UK Study Diffuse Pollution of Water by Agriculture:

<http://researchbriefings.files.parliament.uk/documents/POST-PN-478/POST-PN-478.pdf>

<sup>69</sup> French study: <http://www.developpement-durable.gouv.fr/IMG/pdf/ED136.pdf>

<sup>70</sup> See OECD Reports for example: <http://www.oecd.org/environment/resources/49839058.pdf>

<sup>71</sup> SWD(2012) 393 final of 15.11.2012, <http://ec.europa.eu/environment/water/blueprint/pdf/SWD-2012-393.pdf>

<sup>72</sup> Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, OJ L 288, 6.11.2007, p. 27–34

<sup>73</sup> Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC, OJ L 64, 4.3.2006, p. 37–51

the Sustainable Use of Pesticides Directive<sup>74</sup> to reduce risks and impacts of pesticide use, etc. As the implementation of all these measures, which appear to be complementary, is still ongoing, no final assessment of the effects on Drinking Water, and whether there are synergies, gaps or incoherencies, could be made.

Regarding external coherence with other Directives, like on food, mineral waters, radioactivity, etc., no incoherencies became manifest during the evaluation, probably due to clearly defined different scopes and the *lex-specialis-principle*<sup>75</sup>.

Similar to pressure related activities on water resources, this evaluation notes that pressures remain in relation to distribution materials and products in contact with drinking water. Although the lead provisions have been effective and efficient, leaching of other substances from pipes, problems with odour and taste, contamination through leakages, microbiological re-contamination, and other material related to pollution continue to be found. This relates inter alia to the objective of wholesome and clean drinking water e.g. it has been in many cases observed that plastic pipes, which are increasingly being used in place of copper or other metal water pipes, can significantly affect the odour and taste of drinking water<sup>76</sup>. The reference to the Construction Products Directive in Article 10 has not triggered harmonised requirements for construction products<sup>77</sup> in contact with drinking water, although efforts were taken to develop some EU standards. Therefore all these products are still non-harmonised, which allows Member States to regulate and approve them nationally<sup>78</sup>.

Several Member States have set up their own approval systems for products in contact with drinking water, which have been identified as an obstacle to the internal market, since mutual recognition of such products mostly does not work. Also the references for some parameters in Annex III of the Directive "to be controlled by products specifications" were left void. These requirements were included because at that time no direct analytical methods were available and/or calculation methods to determine product specifications were judged unsuitable. In the meantime detailed requirements for food contact materials have been developed<sup>79</sup>. Thus the requirements for plastic packaging materials for food are well specified i.e. with positive lists, whereas materials in contact with drinking water remain unregulated.

The triannual reporting collects some information of causes of non-compliance e.g. whether they relate to the three simplified categories - catchment, distribution or treatment. Although over 20 % of causes relates to treatment<sup>80</sup>, no major incoherencies were found, neither

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<sup>74</sup> Directive 2009/128/EC Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides

<sup>75</sup> See for example Recital 8 of COMMISSION DIRECTIVE (EU) 2015/1787 that clarifies that water put into bottles or containers intended for sale is covered not by the DWD, but by *lex-specialis* Regulation (EC) No 178/2002.

<sup>76</sup> <https://www.sciencedaily.com/releases/2007/08/070823141100.htm>

<sup>77</sup> Regulation (EU) No 305/2011 for construction products (CPR), replacing CPD 89/106/EEC

<sup>78</sup> See chapter 6.2, page 25 on the administrative burden of these approval systems

<sup>79</sup> Regulation (EC) No 1935/2004 on materials and articles which are in contact with food, Commission Regulation (EU) No 10/2011 on plastic materials and articles

<sup>80</sup> Reporting exercise 2011-2013: In total 33404 treatment related cases reported

internally with Article 7(1) and its minimisation order for disinfection by-products, nor externally with Biocidal Products<sup>81</sup>.

*Summary of Stakeholder views: The coherence issue with the WFD implementation and water source protection were highlighted by drinking water regulators (often health authorities) and water suppliers, which have no or nearly no say on their water resources and its protection and they call for more work towards the polluter-pays-principle, as they have to solve upstream problems with downstream measures and therefore incur costs. The issue with materials in contact was raised by stakeholders across the board, and also got the highest score (74%) when respondents to the public consultation were asked to identify necessary action. Most vocal are industry stakeholders facing high costs and delays to cope with national approval systems for their products, who have to deal with the virtual non-existence of mutual recognition of approvals, certificates, and test results.*

#### **6.4. Relevance**

The criterion 'relevance' assesses whether the DWD approach to protect human health from the adverse effects of any contamination of drinking water is still appropriate. Relevance looks at the relationship between societal needs and objectives of the DWD.

**To what extent is the DWD approach to protect human health from the adverse effects of any contamination of drinking water still appropriate?**

The significant increase in drinking water quality, expressed through impressive and still steadily rising compliance rates, which rose from around 95% in 1998 to above 99% in 2013, prove that the DWD approach was appropriate. In the methods section it has been explained how compliance rates are linked to health protection and that high compliance means that negative health effects that would otherwise result from the consumption of poor water quality are unlikely. One of the main strengths of the Directive is the uniform application of parametric values throughout the EU and the systematic monitoring of all water supplies, which needs to be continued to maintain the high level and equal protection for all EU citizens. Thus the DWD, which has led to a consistent regulatory framework when compared to 20 years ago, guarantees and continues to guarantee an overall minimum level of drinking water quality within the EU.

**Which other approaches or parameters than those set currently in the DWD became more important for human health? Can any obsolete provision in the Directive be identified and if yes, why are such provisions obsolete?**

The essential quality standards in Annex I of the DWD on microbiological and chemical parameters applied uniformly should contribute to ensure a high level of health protection.

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<sup>81</sup> Biocidal Product Regulation (EU) No 528/2012 (BPR), including Product Authorisations, Products Guidance, and Guidance on Evaluation of Environmental Risk Mitigation Measures for Disinfectants Product Type 5 (Drinking water)

They have not been revised since 1998, whilst WHO guideline values<sup>82</sup> have been updated several times to reflect scientific progress, better risk assessments, changed behaviour and environmental pressures. The DWD parameters have to be reviewed every five years by the Commission. The last review in 2010 found that the standards still reflected the knowledge at that time and did not demand an ordinary legislative proposal.

Evidence collected in the last years indicates however that several parameters and values could be partly outdated. To support the regular review, the Commission has initiated a cooperation project with the WHO, to ensure that this review is based on the latest scientific knowledge, and considering the vast WHO experience on human health effects. The project runs until mid-2017. It will also assess other and emerging parameters than those currently set in the DWD that could be potentially more relevant to safeguard human health. Furthermore, the project may also identify parameters that could be removed, and identify potential for simplification.

As the current list has not been adapted in 18 years to reflect scientific progress, among other things, there is a risk that the relevance of the parameters has possibly decreased. The current parameters may not correspond anymore to changing pressures, be it other raw water pollutants, other treatment-by-products, or other distribution materials. The analysis of effectiveness undertaken in this review was based on checking compliance against the existing list of parameters. These findings, however, have to be re-considered in light of the observation that some of the parameters may no longer be as relevant as previously assumed. The very high compliance rates, for some substances like 1,2 dichlorethane or cyanide of even exactly 100%<sup>83</sup>, suggest that these substances are "false friends" as these substances practically do not occur in drinking water anymore. This means that the observed high and increasing effectiveness see chapter 6.1 on page 14/15, as measured against criteria that are possibly not any more fully appropriate, would only be seemingly high. It could be lower or even decreasing if it were measured against other parameters.

**Box 5: Example for a not-considered parameter: Chlorate**

A scientific opinion from the European Food Safety Authority (EFSA) on risks for public health related to the presence of chlorate in food, including its presence in drinking water was published on 24 June 2015. In the opinion EFSA derived toxicological reference values for chlorate and evaluated occurrence data which revealed in the exposure assessment chronic health risks on the thyroid in infants, young children and older children. The main contributing food source is drinking water, accounting for 40-60% to the total chlorate exposure in children. This raises questions relating to the drinking water directive, as currently at EU level no specific limits are set for chlorate in drinking water.

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<sup>82</sup> DWD was based on the second edition of the WHO Guidelines. WHO revises currently the fourth edition towards its first addendum.

<sup>83</sup> See 2011-13 DWD Synthesis Report

In particular, special attention should be paid to the relevance of microbiological parameters like *E. coli* and Enterococci. In the chapter on effectiveness it was described that drinking water quality with regard to these parameters had improved, but that no or only an anecdotal correlation to less microbiological-related outbreaks could be established. This issue was also highlighted as a limitation in the methodology; it was not possible to relate disease outbreaks of enteric infections to drinking water quality. So, on one hand we have the success story of *E. coli* which has shown positive trends in terms of compliance, but on the other hand we still have incidents with waterborne pathogens. In the last few years a shift of opinions commenced, recognising that monitoring just *E. coli* and Enterococci is too little and too late, considering also that more and more emerging pathogens, viruses, and microorganisms with antibiotic resistance were found in the environment and in drinking water, which led to outbreaks or sporadic infections with substantial epidemiological relevance. The analysis of water-associated outbreaks shows in particular that heavy rainfalls and other climatic change conditions cause outbreaks due to insufficient treatment or leakages in the water supply system.<sup>84</sup> In some cases these 'new' pathogens present real challenges for the treatment of drinking water. Also, the pattern of occurrence of known pathogens like *Cryptosporidium*, *Giardia*, *Norovirus* may change due to climate change and demographic conditions. Thus the occurrence and dynamics of such pathogens agents needs to be better understood to bring them under control. These considerations lead to the question whether the current microbiological 'indicator' parameters are still relevant enough to ensure monitoring and remedial action against such highly infective pathogens, i.e. with extremely low infectious doses, and/or whether other approaches to tackle such issues are missing i.e. through rapid sensor system for pathogens, effective risk based approaches and risk management, communication to decision-makers and the general public, etc.

Another important approach that became more important in the last decade, in particular in response to the microbiological-related challenges explained above, is the water safety plan implementing the risk-based approach laid down by the WHO<sup>85</sup>. The discussion above on new parameters and outbreaks indicates that preventive safety planning and risk based elements are so far only under-proportionately considered in the DWD and that this represents a weakness of the current DWD. The risk-based approach offers opportunities to concentrate time and resources on risks that matter and to avoid analyses on non-occurring parameters, in particular in small supplies with risks easy to survey. The new water safety plan approach has been partly considered by the 2015 amendment of Annexes II and III. A strong consideration of the water safety plan approach was however not possible as this amendment was procedurally limited to the technical Annexes. Although the implementation of Annexes II and III, which can only be fully analysed after the 24-month transposition period, will increase the DWDs relevance with regard to water safety planning, this evaluation found that that even with the new Annexes II and III the risk-based approach will scarcely feature in the

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<sup>84</sup> RiSKWa status paper - Review concepts of microbiology October 2015

[http://www.bmbf.riskwa.de/media/RISKWA\\_Statuspapier\\_Mikrobiologie\\_2015\\_10\\_30.pdf](http://www.bmbf.riskwa.de/media/RISKWA_Statuspapier_Mikrobiologie_2015_10_30.pdf)

<sup>85</sup> WHO Water Safety Plan Portal: <http://www.who.int/wsportal/en/>

DWD. The newly introduced Risk Assessment in Annex II is restricted to monitoring and thus likely not as effective as full water safety plan provision in the body of the Directive would be. This finding that a comprehensive risk-based approach is missing in the current DWD is strongly supported by stakeholders.

### **What are citizens' expectations for the role of the EU to ensure drinking water quality?**

The main expectation of EU citizens regarding drinking water is that they can trust the quality of drinking water that comes from the tap. Access to safe drinking water is considered a basic human right and a component of effective policy for health protection. From the consultation done for this evaluation and repeated in various fora like Expert Group and Drinking Water Regulators Meetings Member States representatives and stakeholders want the EU to set and enforce the same rules for all EU citizens. These rules should prevent failures to drinking water safety that may expose the community to the risk of outbreaks of intestinal and other infectious diseases. The replies above have shown that the DWD plays an important role and is relevant to citizens. However, as shown by the public consultation, citizens expect that the DWD is adapted to new threats. They found in particular that the current DWD parameter list misses out new and emerging pollutants that might impact on human health.

The DWD has a requirement directly addressing the citizens, to provide up-to-date information on water quality to consumers. This relevant provision is also seen as increasingly important in view of a more critical attitude of present-day consumers. Consumer expectations are however often focused on practical consumer information like water hardness and water prices, which are not health relevant and not regulated in the DWD. The relevance-analysis in the supporting study found that the provisions in the DWD on information to consumers were too short and imprecise. The DWD does not indicate who is responsible for providing consumer information and does not specify what, when and how this information is to be shared with the consumer. Consequently information practice between Member States and also between water suppliers differs significantly, from nearly no access to information, to detailed online publications (Box 6). Further details on consumer information is discussed in chapter 6.1 on effectiveness.

#### **Box 6: Information to consumers:**

In many Member States or regions, water quality information can be found online, for example by indicating the postal code, Example Austria: <http://www.trinkwasserinfo.at/>, by maps, Example Saxony-Anhalt: <https://lpsa-lav.azurewebsites.net/wasserkarte/atlas.html>, by central databases, Example Spain: <http://sinac.msc.es/SinacV2/>, or by mobile phone Apps, Example Portugal <http://www.ersar.pt/website/viewcontent.aspx?name=appERSAR>. In a few cases, for example where benchmarking initiatives take place, also detailed information on fees and tariffs is available, example: Rhineland-Palatinate <http://www.wasser.rlp.de/servlet/is/8646/>, whereas for many supplies or regions no information is available online.

*Summary of Stakeholder views: Nearly all stakeholders<sup>86</sup> contributing to the consultation meeting fully shared the view that the Annex I parameters are partly outdated, and that risk-based elements are underrepresented in the DWD. The consultation related to the amendment of Annexes II and III has however shown that the regular monitoring of the microbiological parameters *E. coli* and *Enterococci* as important indicators for possible microbiological pollution should be maintained. The importance of good and up-to-date information to consumers was recognised by the consultations; however, views diverged on who should do it and how<sup>87</sup>. Water suppliers see this often as an obligation for authorities only. According to the Public Consultation, 67% of all respondents require easily understandable information, which however provides details on the analyses performed and parameter values, as well as an indication, if the recorded values meet the relevant legal requirements. Asked on the ways of keeping consumers informed, the majority of respondents (77%) share the opinion that the current information provisions are far from adequate and that more up-to-date information should be published online<sup>88</sup>.*

### **6.5. The EU-added value**

**What has been the EU added value of the Directive, and do the issues addressed continue to require action at EU level?**

The DWD intervention cannot be seen in an isolated way due to the long history of drinking water supply and protection. In the early 20th century the health problems associated with water pollution seemed to have been resolved in the industrialized countries when chlorination and other water treatment techniques were developed and widely taken into use. Microbiological problems related to water were largely considered a problem of the developing world. However, in recent decades the biological hazards as well as chemical hazards transmitted by water emerged again. The overall amount of known biological and chemical health hazards transmitted by water increased manifold during the last half of the 20th century, and is still increasing. The effects of climate change, such as prolonged heatwaves and droughts, will intensify existing hazards, and may introduce the necessity to address new hazards.

The DWD plays a role here, but is only one element contributing to the prevention of adverse effects on human health, and acts together in a concert with many other elements of chemical, environmental, food, product, and water legislation as well as climate change policies. In the methodology and in the chapter on efficiency the concept of attribution of costs has been introduced, considering that many hydrogeological, historical, or anthropogenic factors play

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<sup>86</sup> "Voting Exercise at the Stakeholder Meeting: The current DWD does not include all pollutants in the list of parameters." Response agree: 50; disagree: 3"

<sup>87</sup> Stakeholder meeting Minutes: <https://circabc.europa.eu/w/browse/851b7c05-2ff1-4de8-9b92-89eaf8cf1ed3>

<sup>88</sup> Public consultation report: <https://circabc.europa.eu/w/browse/0070b535-5a6c-4ee4-84ba-6f6eb1682556>



their role, and that due to historical reasons many provisions were in place prior to the 1998 DWD in national legislation and in EU legislation since 1975<sup>89</sup> and 1980<sup>90</sup>.

The DWD intervention is estimated to account for 18 % of the overall drinking water supply costs (see chapter 6.2). Whilst the added value of the DWD intervention to prevent adverse effects on human health at EU level cannot be quantified, it is reasonable to suggest that it provides significant added value as demonstrated above in the chapters on effectiveness, efficiency, and relevance. The objective of the DWD to prevent adverse effects on human health equally for the whole EU population requires an EU intervention transposing voluntary WHO guideline values into a binding EU legal framework. The significant harmonisation over time of water quality with high compliance rates for all Member States demonstrates this, see figure 3, chapter 6.1. The essential minimum quality standards set at EU level empower the national health authorities to reinforce measures for the provision of clean and wholesome drinking water. The DWD carries weight also for subsequent EU food or food contact material legislation, which refers to drinking water standards.

EU measures are also seen by all stakeholders as best placed to address emerging health hazards by water. Most and in particular smaller Member States, who don't have always the resources and specific expertise, expect the EU to set the essential chemical and microbiological parameters and values, and to set rules for materials in contact with drinking water and to enforce them uniformly across the EU. Member States describe the DWD added value by saying that "Member States individually could go faster, but only together we can go further"<sup>91</sup>. And reliable high uniform water quality has a strong influence on decisions as to where to locate business plants for European food and other industries, whose branches in different Member States benefit from the same standards<sup>92</sup>.

The added value of the DWD is thus that it ensures the same level of protection of human health from adverse effects of any contamination equally across the whole EU. The citizens, Member States, and businesses call upon the EU to set and maintain up to date EU-wide common drinking water standards. This clear demand justifies to continue to require action at EU level.

### **Is there any possibility to compare EU legislation and its effectiveness with what is in place elsewhere in similar regions, e.g. in Asia, Latin-America or North America?**

Although it is impossible to identify and quantify the total benefits of prevented drinking water incidents, an anecdotal comparison with many drinking water catastrophes observed outside but not within the EU (like recently Flint/US, Rio Doce/Brasil, Lanzhou/China),

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<sup>89</sup> COUNCIL DIRECTIVE of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (75/440/EEC) repealed by the WFD

<sup>90</sup> Council Directive 80/778/EEC of 15 July 1980 relating to the quality of water intended for human consumption, OJ L 229, 30.8.1980, p. 11–29

<sup>91</sup> Oral Statement at the Drinking Water Regulators Meeting ENDWARE in Zadar 28 April 2016

<sup>92</sup> DWD purpose is similar to the EU food safety law that contributes to the competitiveness of the European food industry, see: [https://ec.europa.eu/growth/sectors/food/competitiveness\\_en](https://ec.europa.eu/growth/sectors/food/competitiveness_en)



suggest its added precautionary value, although the prevention of incidents cannot be demonstrably proven by the existence of DWD. Although such catastrophes cannot be totally prevented, the fact that no similar incidents have happened in the EU can be partly accredited to the comprehensive and well enforced legislation like the DWD including regular monitoring, strong remedial action requirements, and prompt consumer information.

### **What would be the most likely consequences of withdrawing the Directive?**

The most likely consequence of withdrawing the DWD is that it would be seen as the Commission retracting its support for citizens and consumer's health. Analysis in the supporting study, supported by interviews found that withdrawing legislation at EU level would endanger the achieved improvements in water quality and water protection combined with a high security of supply. Stakeholder interviews, confirmed in discussions with national regulators, raised the concern that Member States could drop out and/or not fully maintain the current protection level, and that necessary investments could be easily hampered without a European regulatory framework, with a further risk of again different levels in independent regions. Applying National based standards would jeopardise the European water industry and lead to a fragmentation of the European water internal market.

*Summary of Stakeholder views: Member States and other stakeholders recognised the DWD added value and supported that the EU is the right level to set drinking water standards. Nearly all Stakeholders shared the view that the Annex I parameters are partly outdated, and that risk-based elements are underrepresented in the DWD. The importance of good and up-to-date information to consumers was fully recognised, however views diverged on who should do it and how. Water suppliers see this often as an obligation for authorities only.*

## **7. Conclusions**

The Evaluation of the Drinking Water Directive (DWD) is a REFIT evaluation to assess whether the DWD delivers its intended benefits for citizens, businesses and society, while identifying red tape and potential for lowering costs. It aims to make EU laws simpler and easier to understand. This allows for a comprehensive and transparent assessment of whether the DWD intervention is fit for purpose. I.e. put simply, does the DWD achieve its objectives at minimal costs and is there potential for simplification?

The DWD was evaluated on five criteria: effectiveness, efficiency, coherence, relevance, and EU added value. For each criterion several evaluation questions were developed (Chapter 3). An evaluation method was established (Chapter 4). This chapter also addresses the limitations (i.e. unavailable data, reliability of indicators, difficulties to relate disease outbreaks of enteric infections to drinking water quality). Despite these limitations, the evaluation method supported by extensive stakeholder consultations provided sufficient and ample evidence ensuring that this evaluation is well-founded. The evaluation considers further the well documented high level of implementation (Chapter 5), and finally answers systematically the evaluation questions (Chapter 6).

The **effectiveness** analysis confirmed that the Directive is achieving its objectives and contributing to the protection of human health from the adverse effects of contamination by ensuring a high level compliance with the parametric values, although the significance of compliance rates measured against partly outdated parameters is limited. Better drinking water quality can be accredited mostly to the overall DWD intervention (parameter setting, monitoring, remedial action, information to consumers, reporting) and not to specific provisions. An important provision is the EU value limiting lead in drinking water at the tap. The DWD reduced the lead value from 50µg/l stepwise over 25 µg/l to 10µg/l via a derogation that lasted 15 years. This requirement effectively reduced lead in drinking water. However the Article 10 provision on contact materials leaves too much room for Member States to determine what necessary measures are, which made the provision ineffective. As the DWD intervenes at the very end of the supply chain, and lacks of upstream risk assessment elements, many factors that affect drinking water sources can only be detected later and have to be sorted out by DWD. Above all, the DWD caused positive effects on industry and consumers that are more aware and informed about the quality.

The **efficiency** analysis estimated the total cost for supplying drinking water in the EU in 2014 to roughly €46.5 billion, of which €8.3 billion can be attributed to the implementation of the DWD. Although health benefits through the DWD could not be quantified, as discussed in the limitations, it was found that total attributable benefits could possibly outweigh total attributable costs quite significantly. The assessment of costs and possible administrative burden did not find any provisions that have caused excessive administrative costs related to monitoring, information provision and reporting. Only the legal flexibility of Article 10 could be causing a significant unnecessary burden for industry of annually over half a billion Euro. A 2015 amendment to the monitoring Annexes that introduced a voluntary use of a risk-based approach should also improve future efficiency . Finally, the current reporting does not tap the potential of modern information technology and data management.

The **coherence** of the DWD with the Water Framework Directive (WFD) is especially important as the protection of drinking water resources is established as an indispensable part of the plans and measures under the WFD. The DWD does not refer to the protection of waters resources to be used for the abstraction of drinking water. This has been identified as an important factor standing in the way of achieving the objectives of the DWD. This missing link also complicates the application of the polluter-pays-principle and the precautionary principle that preventive action should be taken, and that environmental damage should as a priority be rectified at source and that the polluter should pay.

With regard to **relevance**, the analysis found that the quality standards set in the DWD may not be appropriate anymore to protect human health from the adverse effects of any contamination of drinking water. The essential quality standards in Annex I of the DWD on microbiological and chemical parameters have not been revised since 1998 and do not fully reflect any more scientific progress, better risk assessments, changed behaviour and environmental pressures. Special attention should be paid to the relevance of microbiological

parameters, where 'new' pathogens not considered in the current DWD present real challenges. The DWD has no replies to such challenges, which can be better met by new concepts like risk based approaches and water safety plans. The evaluation looked also at citizens' expectations for the role of the EU to ensure drinking water. According to a public survey almost three-quarter of the Europeans (73%) accept the quality of the drinking water in the places where they live. The analysis of the DWD found its requirement to provide up-to-date information on water quality to consumers too imprecise. Consequently information practice between Member States and also between water suppliers differs significantly. These evaluation findings are echoed by the majority of respondents (77%) to the public survey. They share the opinion that the current information provisions are far from adequate and that more up-to-date information should be published online.

Finally, the **EU added value** of the Directive is that it ensures the same level of protection of human health from adverse effects of any contamination equally across the whole EU. Citizens, Member States, and businesses rely on the EU to set and maintain EU-wide common drinking water standards and a regulatory frame up to date. This clear demand justifies continuing to require action at EU level. Comparing EU legislation and its effectiveness with what is in place elsewhere in similar regions, e.g. in Asia, Latin-America or North America, it is noted that anecdotally less major drinking water incidents were observed in Europe, but the prevention of incidents cannot be demonstrably proven by the existence of DWD.

The results of this evaluation confirm that the DWD is one of the tools relevant to ensure the quality of the water consumed in the EU. It fulfills its basic purpose to enforce drinking water monitoring and its restoration in case of non-compliance. However, the following four areas leave room for improvement, on: 1. parameters, 2. risk-based approach, 3. information to consumers, and 4. contact materials:

1. The DWD intervention, transposing the most essential voluntary WHO guideline values into an EU legal frame, and obliging Member States to monitor these parameters systematically in drinking water in the EU, is considered an appropriate response. The performance of the DWD is however difficult to measure. The evaluation identified compliance rates with the parametric values as the most suitable available indicator. This compliance with the DWD standards has risen from 1998 from around 95% to over 99% for most parameters in 2013 in all Member States. Increased compliance of uniformly applied parameters provides an increase in water quality ensuring a high level of health protection, and also that necessary DWD implementation measures to reach these compliance rates were performed. However, as the related quality standards and values have not been revised in the last 18 years, they could be partly not relevant anymore, and do not match emerging pressures and latest scientific knowledge and changing pollution pressure.
2. The evaluation found that the DWD method is not optimal as it is not comprehensive enough. This is discussed in the limitations – where particular issues are identified relating to missing definitions (water supplies), unknown populations, problems with

indicators of water quality, missing parameters/incomplete coverage of indicators, all further hampered by a diverse application of monitoring across Member States. In particular, no clear link between DWD standards and health effects could be found. Also despite the compliance data gathered through monitoring and reporting under the DWD, it has not been possible to judge decisively whether drinking water is really safe. This discussion indicates that preventive safety planning and risk based elements are so far only under-proportionately considered. This represents a weakness of the current DWD. The concept of a water safety plan was introduced in 2004 by the WHO, implementing the risk-based approach. This concept has become more important and well recognized by many water suppliers and already legally implemented in a few Member States like in Hungary, the Netherlands, or the UK. In the last decade, in particular in response to microbiological-related challenges. It offers opportunities to concentrate time and resources on risks that matter and to avoid analyses on non-occurring parameters, in particular in small supplies with risks easy to survey. The approach has been partly considered in the DWD by the 2015 amendment of Annexes II and III, but is restricted to the monitoring Annexes and hence is not fully integrated as part of the Directive, limiting its impact.

3. The DWD is directly relevant for citizens but they want to see more up-to-date and easily understandable information published online. This view was confirmed by a range of consultation activities. The general provisions in the DWD to ensure availability of adequate and up-to-date information to consumers were found too imprecise, and led to significantly differing information practice between Member States and also between water suppliers, from nearly no access to detailed online information. Thus the current access to information on water quality and transparency is not good enough. The additional triannual reporting obligation on large supplies from Member States to the Commission has improved transparency and knowledge on the quality of drinking water, and enables the Commission to assess legal compliance with the Directive. The evaluation found that this reporting process is slow, as it does not tap the potential of modern information technology and data management for a swift and multiple use of information.
4. The benefits attributable to the DWD could possibly considerably outweigh its costs. However there is no specific data on the extent of the DWD benefits, even if there is evidence that the DWD contributes to prevent long-term adverse effects and to avoid short term microbiological outbreaks. This finding is strongly supported by case studies, expert judgment and conducted interviews. This indicates that the DWD is in general a highly efficient instrument across the EU. In comparison with the estimated annual costs of €3.3 billion or €16 per capita that can be attributed to the implementation of the DWD, which represent around one fifth of the overall drinking water supply costs, the provisions identified as candidates for reduction of administrative burden on monitoring, information requirements, and for reporting were found to be negligible. Compared to the essential role monitoring and reporting to the Commission plays in delivering the objectives, these limited costs can be

considered as duly justified. One burden that was identified and raised by stakeholders consulted is the non-recognition of national approval systems for products in contact with drinking water. The nationally required multiple testing and approval can be seen as an obstacle to the internal market. This burden originates in the DWD Article 10 requirements for materials in contact with drinking water which permit too much legal flexibility. Thus the Article 10 provisions do not work well and represent a long term challenge to the provision of clean and healthy drinking water in the EU.

The conclusions suggest exploring further various policy options to resolve the identified weaknesses by way of initiating an Impact Assessment for a possible revision of the DWD.

## Annexes

### 1. Procedural information

2014	March	Public Consultation on Drinking Water announced in the Commissions Reply to the ECI Right2Water
2014	April	Inter-service Steering Group set up (incl. DG SG, GROW, SANTE, REGIO, RTD, JRC, CLIMA) , first ISG Meeting 30/04/2014
2014	June	Public Consultation performed from 23/06/2014 until 23/09/2014 (EUSurvey), Results published afterwards
2014	September	Stakeholder Dialogue on Transparency and Benchmarking launched, two dialogues performed in September 2014 and October 2015
2014	December	Inclusion of the DWD Evaluation in the Commission Work Programme 2015 A New Start, COM(2014) 910 final of 16/12/2014 Annex 3 Refit
2015	January	Evaluation Study kicked off
2015		Inter-Service Group Meetings steering the evaluation carried out on 08/01/2015, 10/04/2015, 08/10/2015, 11/12/2015, 04/04/2016
2015	May	Stakeholder Consultation Conference organised on 26/05/2015
2015	May	Drinking Water Expert Group held on 27/05/2015
2015	June	Drinking Water Roadmap published
2015	December	Draft Final Evaluation Study published, and preliminary results presented a further Stakeholder Conference on 08/12/2015
2016	January	Seminar on Drinking Water Protection performed on 21/01/2016
2016	July	Evaluation Study finalised and published: <a href="http://www.safe2drink.eu/dwd-evaluation/">http://www.safe2drink.eu/dwd-evaluation/</a>

## 2. Synopsis Stakeholder Consultation

This evaluation performed and used several types of stakeholder consultations, to reach as well the public and also all different categories of stakeholders.

With regard to consult citizens, the evaluation has considered an EU-wide public open consultation in all languages on drinking water, which took place in 2014. The public consultation triggered by the European Citizens' Initiative predated the evaluation. However, many questions were already designed in anticipation of a future evaluation. The aim of this consultation was to get a better understanding of citizens' views on the need and the possible range of actions which could be undertaken in order to improve the supply with high quality drinking water. The questionnaire included a general part on citizens' perceptions on access to and the quality of drinking water, and a specific part on the part on the DWD. This consultation received 5908 answers as well as 136 positions submitted by email<sup>93</sup>.

A specific DWD evaluation stakeholder conference took place on 26th May 2015. The aim of this expert consultation was to get detailed feedback inter alia from the water sector and authorities on stakeholder expectations and experiences on which DWD actions contributed to achieving the objectives. The target groups were experts from the water supply sector and competent authorities and supervising bodies, and included also consumer organisations and environmental NGOs. Thanks to many follow-up actions after the Citizens' Initiative (Commissions' stakeholder dialogue on Benchmarking, EP Resolution, etc.) the evaluation and also the project website "safe2drink" received broad interest from many groups of stakeholders. The conference was attended by approximately 70 stakeholders from across the EU. Stakeholders had the opportunity over several months to provide written comments. Detailed information on the consultation and the stakeholder conference including agenda, presentations, minutes and participants is publicly available on the project website<sup>94</sup> 17 position papers were sent after the conference. Some 30 specific evaluation interviews with key stakeholders representing regulators, industry, utilities, NGOs, and academics from 16 Member States were performed. Six of those interviews were conducted with various sector representatives. The interviewee list and overview of position papers can be found in Annex F to the Evaluation Study, also available on the project website<sup>95</sup>.

All of the above stakeholder opinions were analysed and a summary of their emerging positions is provided further below. Further details can be found in Annex F to the Evaluation Study, also available on the project website<sup>96</sup>.

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<sup>93</sup> A detailed analysis, the questionnaire and further information is available on:

[http://ec.europa.eu/environment/consultations/water\\_drink\\_en.htm](http://ec.europa.eu/environment/consultations/water_drink_en.htm)

<sup>94</sup> <http://www.safe2drink.eu/dwd-evaluation/>

<sup>95</sup> <http://www.safe2drink.eu/dwd-evaluation/>

<sup>96</sup> <http://www.safe2drink.eu/dwd-evaluation/>

## **Summary of Stakeholder views on the five evaluation criteria:**

A summary of the main stakeholder views is provided below, and in addition at the end of each sub chapter in chapter 6 assessing the five evaluation criteria.

**Effectiveness:** The results that the DWD is in general effective are fully supported by stakeholders from various regulators, water utility operators, members of the academia, members of the industry and consumer stakeholder groups as well at the conference, or by interviews or position papers. The only issue where all kinds of stakeholders found the DWD not effective relates to quality assurance of materials required by Article 10. Stakeholders are concerned about the increasing disparity with some Member States having specific requirements in place, requiring often multiple national approvals. This is also supported by many of the responses to the Public Consultation. Asked about the necessity to regulate certain aspects of drinking water at EU level, the highest rate of respondents (74%) voted for a harmonized regulation of the materials in contact with drinking water.

**Efficiency:** The results that the DWD is efficient, that it does not cause admin burden, and that benefits outweigh the costs was fully backed up by the majority of stakeholders. Authorities responsible for reporting rate the reporting exercise to the Agency as a burden. Several stakeholders from the supply sector at the conference supported the finding that the current system in which only large supplies need to be reported is too limited. However, comments from Member States have been acknowledged that if reporting on small supplies were mandatory, the resulting reporting system would put an enormous administrative burden on those Member States which have many small water supplies within their territories.

**Coherence:** The coherence issue with the WFD implementation and water source protection were highlighted by drinking water regulators (often health authorities) and water suppliers, which have no or nearly no say on their water resources and its protection and they call upon to work towards the polluter-pays-principle, as they have to solve upstream problems with downstream measures and pay therefore. The issue with materials in contact, see also under effectiveness, was raised by stakeholders across the board, and also got the highest score (74%) of necessary action in the public consultation. Most vocal are industry stakeholders facing high costs and delays to cope with national approval systems for their products, and nearly non-existing mutual recognition of approvals, certificates, and test results.

**Relevance:** Nearly all stakeholders<sup>97</sup> contributing to the consultation meeting fully shared the view that the Annex I parameters are partly outdated, and that risk-based elements are underrepresented in the DWD. The consultation related to the amendment of Annexes II and III has however shown that the regular monitoring of the microbiological parameters E. coli and Enterococci as important indicators for possible microbiological pollution should be maintained. The importance of good and up-to-date information to consumers was recognised by the consultations, the views diverged however who should do it and how<sup>98</sup>. Water suppliers

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<sup>97</sup> "Voting Exercise at the Stakeholder Meeting: The current DWD does not include all pollutants in the list of parameters." (Response agree: 50; disagree: 3")

<sup>98</sup> Stakeholder meeting Minutes: <https://circabc.europa.eu/w/browse/851b7c05-2ff1-4de8-9b92-89eaf8cf1ed3>



see this often as an obligation for authorities only. According to the Public Consultation, a large share of the respondents (67%) require easily understandable information, which however provides details on the analyses performed and parameter values, as well as an indication, if the recorded values meet the relevant legal requirements. Asked on the ways of keeping consumers informed, the majority of respondents (77%) share the opinion that the current information provisions are far from adequate and that more up-to-date information should be published online.

**EU-Added value:** Member States and other stakeholders recognised the DWD added value and supported that the EU is the right level to set drinking water standards. Nearly all Stakeholders shared the view that the Annex I parameters are partly outdated (94%), and that risk-based elements are underrepresented in the DWD. The importance of good and up-to-date information to consumers was fully recognised, however views diverged on who should do it and how. Water suppliers see this often as an obligation for authorities only.

### Summary Public Consultation

#### *Aim*

In 2014, the Commission launched an EU-wide public consultation on the DWD on drinking water in the EU. The aim of this consultation was to get a better understanding of citizens' views on the need and the possible range of actions which could be undertaken in order to improve the supply with high quality drinking water. The survey was opened from 23.06.2014 until 23.09.2014 at <http://ec.europa.eu/eusurvey/> and was available in all EU languages. The report on the Public Consultation is part of the current evaluation study and provides a valuable source of information. The report is available online as a separate document: "Analysis of the public consultation on the quality of drinking water"<sup>99</sup>.

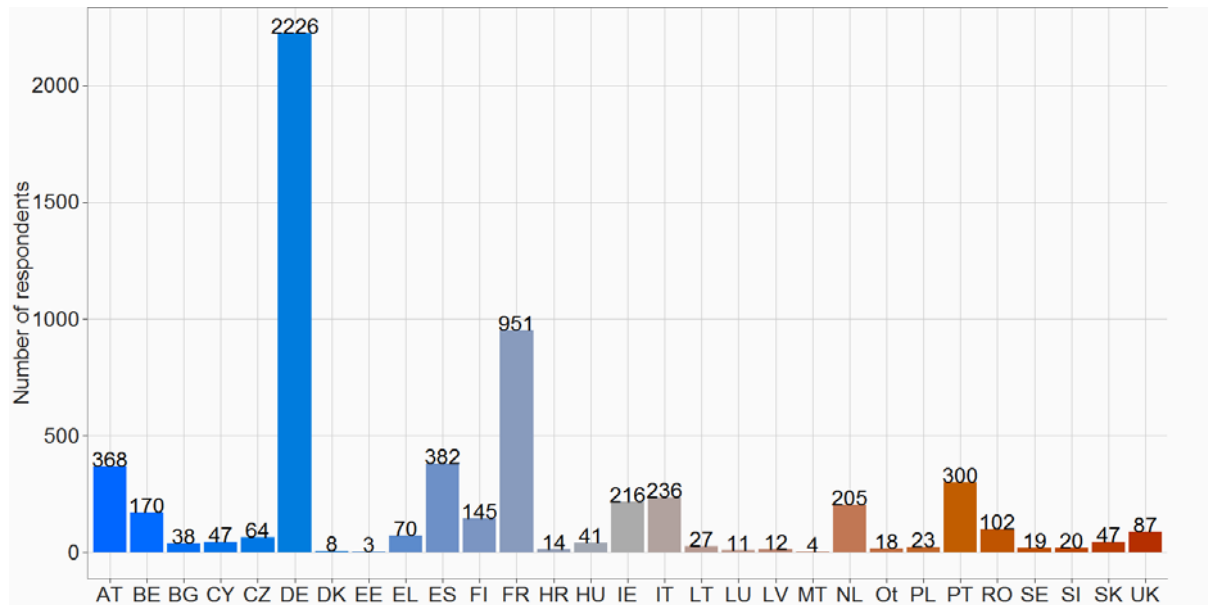
#### *Responses*

In total, 5908 answers were received. Some surveys were incomplete and hence removed from the database. The final database therefore consists of 5875 surveys. In addition to the survey, stakeholders (national authorities, international organisations, non-governmental organisations and other interested parties including individual citizens) were invited to provide feedback and to submit position papers. As a result of this invitation 56 positions from institutions were received. Furthermore a total of 80 citizens also expressed their opinion and sent their positions.

Figure 3 Distribution of the public consultation responses by country of origin

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<sup>99</sup> Public consultation report: <https://circabc.europa.eu/w/browse/0070b535-5a6c-4ee4-84ba-6f6eb1682556>



Source: Analysis of the public consultation on the quality of drinking water/Evaluation Study, Ecorys (2015)

### *Analysis*

Each survey answer was given unique identification number. All answers to open questions were translated into English and all closed questions were coded. Identification of data was done according to; the type of respondent; type of institution; type of sector; country of origin; type of area – rural or urbanized; and the size of the water supplies. The outcome of the survey provides the evaluation study with some very interesting and important outcomes, such as:

- Drinking water in the EU is perceived as accessible (82%) where people live, but only for a much lower % for the EU;
- Drinking water and drinking water services are affordable in the EU (65%);
- The quality and sensation of drinking water in the EU is acceptable (71%).

However, there are also threats to the quality of drinking water. Citizens perceive the pollution from agriculture (such as pesticides and fertilizers), abstraction of hydrocarbons (shale gas and oil), industrial sources (heavy metals) and human consumption in combination with inadequate treatment (ammonium and nitrate).

Respondents were additionally asked to provide feedback regarding the functioning and future aims of the DWD. Questions related to the quality standards in the DWD, the monitoring approach and control of drinking water, outcome of activities to inform consumers on the quality of their drinking water and most effective ways to improve providing information to consumers. The most notable results are provided below:

- Respondents disagreed (55%) with the statement that the list of parameters to be monitored could be reduced to a few key parameters, most relevant for human health.
- 57% agreed that the parameter list should be updated to include new and upcoming pollutants, however this should only in special cases lead to an increase in costs for the consumer.
- Respondents believe that monitoring should not be reduced and that results need to be more transparent and available (through online fora).
- Consumer information should, if not done already, be easily available to consumers and more importantly be understandable for the general public. In the coming years consumers additionally expect that information is more up-to-date or near real-life.
- In the case of a pollutant in the water supply around 50% of respondents believe that the current regime for taking remedial action is appropriate. However, the current regime should be supplemented by additional preventative actions (and faster communication if there is a drinking water problem).
- Respondents were not overly positive or negative when it came to derogations. Overall the data shows however that respondents favour a reduction in the number of granted derogations. Furthermore a new derogation regime should be stricter.

In addition to this, respondents were invited to provide feedback in a broader context. Main interest of respondents, with respect to possible aims that the DWD can in the future deal with, are related to materials in contact with drinking water (74%), incentives to reduce the amount of drinking water consumed (73%), move from controlling at the tap towards a system control approach (71%) and inform consumers on the possibilities of water reuse in households (67%).

#### Summary Stakeholder conference

At an early stage of the evaluation, a stakeholder conference was organised. The goal of the conference was to inform stakeholders on the evaluation methodology approach and to gather information on the functioning of various aspects of the DWD. The stakeholder conference provided an interesting platform where participants shared opinions regarding the functioning of the DWD. The stakeholders represented industry (17), consultants (2), research centres or universities (4), government or public authorities (13), and NGOs or civil organisation (2). Minutes of the conference and all presentations given are available on CIRCABC<sup>100</sup>.

#### Summary Interviews with key stakeholders (30)

After the stakeholder conference consortium experts developed a list of questions which was used to collect additional, and where possible evidence-based, information regarding the functioning of the DWD on the five main evaluation criteria. The stakeholder conference and the contributions from stakeholders were used to identify interview candidates and to approach various stakeholders. The evaluators interviewed various MS regulators, water utility operators, members of the academia, and members of the industry and consumer

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<sup>100</sup> <https://circabc.europa.eu/w/browse/ca2f82a5-20ab-4106-9c44-7b67a911ac2f>

stakeholder groups to collect further information for the main evaluation questions.. A full list of all interviewed persons is found in Annex F of the Evaluation Study.

Summary Position papers received from:

- CEIR (Final position CEIR on DWD)
- Europump (Position paper)
- ANEC (ANEC regarding policy options, updated version)
- Vewin (IA Stakeholder workshop evaluation)
- Swedish Department of Geohydrology (Proposal improvements DWD)
- Veolia (DWD policy options)
- CEEP (Opinion on the review of the DWD)
- Public health agency of Sweden (Comments on policy options for a revised DWD)
- National food agency of Sweden (Comments and views on a revised DWD)
- SUEZ (Reaction to study supporting the revision of the EU DWD)
- Eureau (Position paper on policy options)
- Veolia (Contributions and comments on the DWD)
- BDEW (Remarks - policy options)
- EHI (EHI DWD position paper)
- FSA/PlasticsEurope/Cefic (DWD revision)
- AquaFed (DWD revision)
- AöW Allianz der öffentlichen Wasserwirtschaft (Comment on the review of the DWD)

Overview of comments on the evaluation of the DWD:

On parameters and monitoring:

EurEau “there should be a core list of parameters and also a risk -based list of parameters. EurEau welcomes the risk-based holistic approach covering catchment to tap, but would like also to raise the issue about who bears the responsibility to assess and manage the risks, since catchment areas and households’ installations are not under the control of drinking water operators.”

ANEC: “include emerging pollutants”

Veolia: “This means that the parametric values to be monitored should be updated while remaining at a reasonable level in terms of numbers, and should be aligned with global evolutions prescribed by the World Health Organization. We also believe that matters which prove to be of EU relevance, such as endocrine disrupting compounds, must be monitored”

National Food Agency of Sweden: “There is a need for a simplified legal procedure to quicker adapt Annex I in the DWD to newly discovered relevant risks”. “As many MS already introduced, or are likely to introduce in the near future RBA in different ways (WSP, HACCP), EU is presently sitting in the back-seat”.

BDEW: “As till now – it should be up to the MS to decide whether they want to extend their monitoring and controlling mechanisms for the special protection of drinking water”. “WHO revision is good, but not extend the list of parameters to be monitored”.

Swedish Department of Geohydrology: “trends should be monitored and evaluated in order to establish a good base for the drinking water of tomorrow”.

Study supporting the revision of the EU Drinking Water Directive

Public health agency of Sweden: “it would be valuable if new or emerging substances more easily than now could be added to the requirements. Detection limits for methods must be within action limits for the substance”.

SUEZ: “River basin Authorities should select relevant parameters from the list to draw a shorter, tailor-fitted list at the local level following the RBA”. “RBA constitutes a moer cost-effective way of monitoring risks and avoiding threats to water quality. Defining minimum requirements on the establishment of the WSP, on its content and control, at EU level could be an interesting way forward”.

Dutch position on DWD: “there is no need for specific requirements for water quality and monitoring requirements in the food industry and these provisions now occurring in the DWD should be omitted”. “To our opinion a clear legal basis for RBA should be given in the DWD”.

National Farmers Union: “Parameter values should be set based on a scientific basis and not on the precautionary principle”. “EU limits for pesticides should be replaced by a RBA assessment, with individual values for each approved pesticide”.

On materials in contact with drinking water:

EHI, European heating industry: Common European legislation should focus on essential requirements and requirements for materials and products in contact with drinking water should be harmonized.

Plastics Europe / Cefic-FSA: “We do see the revision of the DWD as a placeholder for requesting the European Commission to develop pragmatic and workable EU harmonized

Regulation on materials and articles in contact with drinking water following one unified and science-based approach that ensures an adequate consumer protection and a level playing field for industry”.

BDEW: We urge the European Commission to examine, whether the Member States could implement Art 10 together. In this context a proposal of the four Member States could be the basis.

Europump: We support a transformation of Article of the DWD into a new European regulation, where third party certification of materials, components and products can remain on a voluntary basis.

CEIR: “CEIR recommends that the issue of products in contact with drinking water is removed from the Drinking Water Directive [98/83/EC](#) and transformed into a new, dedicated and comprehensive European Regulation”.

On providing information to the consumers (reporting):

CEIR: “Quality perception of drinking water has to be improved”.

NFU: “Information for professional users, having high detail, has benefits for third parties”.

AquaFed: Information and transparency provided to consumers is currently lacking.

On other issues:

BDEW: The current scope and aim of the Directive are considered relevant and should be maintained.

National food agency of Sweden: The current scope of the Directive is relevant and should be maintained.

CEEP: The DWD text does not include a cross-reference to WFD, in particular Article 7 thereof, the GWD and the PSD.

AöW: The objective of the DWD should be only the quality of water for human consumption. Additionally, members of AöW find that the DWD is a well-functioning legal instrument, which should be kept in place.