

**New targets set by the Federal Republic of Germany  
under the Protocol on Water and Health to the Convention on the Protection and Use of  
Transboundary Watercourses and International Lakes, signed in London on 17 June  
1999**

The main objective of the Protocol on Water and Health is to prevent, control and reduce water-related diseases in Europe. As a result, the Protocol contributes to the advancement of the drinking water supply and the wastewater disposal.

The Protocol requires the Parties to establish and publish national targets in order to achieve a high level of protection from water-related diseases. The areas listed in Article 6, paragraph (2) of the Protocol provide the basis for the setting of national targets.

Article 6 of the Protocol

**Targets and target dates**

1. In order to achieve the objective of this Protocol, the Parties shall pursue the aims of:

- a) Access to drinking water for everyone,
- b) Provision of sanitation for everyone

within a framework of integrated water-management systems aimed at sustainable use of water resources, ambient water quality which does not endanger human health, and protection of water ecosystems.

2. For these purposes, the Parties shall each establish and publish national and/or local targets for the standards and levels of performance that need to be achieved or maintained for a high level of protection against water-related disease. These targets shall be periodically revised. In all these measures, they shall make appropriate practical and/or other provisions for public participation, within a transparent and fair framework, and shall ensure that due account is taken of the outcome of the public participation. Except where national or local circumstances make them irrelevant for preventing, controlling and reducing water-related disease, the targets shall cover, *inter alia*:

- a) The quality of the drinking water supplied, taking into account the Guidelines for drinking-water quality of the World Health Organization;
- b) The reduction of the scale of outbreaks and incidents of water-related disease;
- c) The area of territory, or the population sizes or proportions, which should be served by collective systems for the supply of drinking water or where the supply of drinking water by other means should be improved;
- d) The area of territory, or the population sizes or proportions, which should be served by collective systems of sanitation or where sanitation by other means should be improved;
- e) The levels of performance to be achieved by such collective systems and by such other means of water supply and sanitation respectively;
- f) The application of recognized good practice to the management of the water supply and sanitation, including the protection of waters used as sources for drinking water;
- g) The occurrence of discharges of
  - i) untreated wastewater; and
  - ii) untreated storm water overflows

- from water collection systems to waters within the scope of this Protocol;
- h) The quality of discharges of water from wastewater treatment plants to waters within the scope of this Protocol;
  - i) The disposal or reuse of sewage sludge from collective systems of sanitation or other sanitation installations and the quality of water used for irrigation purposes, taking into account the Guidelines for the safe use of wastewater and excreta in agriculture and aquaculture of the World Health Organization and the United Nations Environment Programme;
  - j) The quality of waters which are used as sources for drinking water, which are generally used for bathing or which are used for aquaculture or for the production or harvesting of shellfish;
  - k) The application of recognized good practice to the management of enclosed waters generally available for bathing;
  - l) The identification and remediation of particularly contaminated sites which adversely affect waters within the scope of this Protocol or are likely to do so and which thus threaten to give rise to water-related disease;
  - m) The effectiveness of systems for the management, development, protection and use of water resources, including the application of recognized good practice to the control of pollution from sources of all kinds;
  - n) The frequency of the publication of information on the quality of the drinking water supplied and of other waters relevant to the targets in this paragraph in the intervals between the publication of information under article 7, paragraph 2.

Germany signed the Protocol on 17 June 1999, and ratified it on 15 January 2007.

As a Party to the Protocol, Germany is required to set targets in line with the latter within two years of becoming a Party. On 8 June 2011, Germany transmitted its national targets to the Protocol Secretariat that is run jointly by the World Health Organization (WHO) and the United Nations Economic Commission for Europe. Since these targets have been largely achieved in the meantime, Germany has initiated a national dialogue process to identify new ones.

Several ministries and higher Federal authorities as well as committees of the German Working Group on water issues of the Federal *Länder*/Federal Government (LAWA) and the *Länder* working group on environment and health (LAUG) were included in this dialogue process. The implementation of the targets, especially those focused on the amendment of legal framework conditions, will involve a comprehensive stakeholder participatory process. To also inform the public, the targets will be posted on the web presence of the German Environment Agency (UBA) after submission to the Protocol's Secretariat.

Below, the new national targets, target dates and measures to be taken in order to achieve the targets are outlined:

**Target area a) *The quality of the drinking water supplied, taking into account the Guidelines for drinking-water quality of the World Health Organization***

**National target 1: Improving safe drinking water quality from domestic distribution systems by means of information campaigns**

**Target date:** 31 December 2022

**Baseline analysis:**

Under the German Drinking Water Ordinance (*Trinkwasserverordnung - TrinkwV*), the requirements governing drinking water quality must be met where the water leaves the taps that are part of the domestic distribution system and serve to deliver drinking water. The term “domestic distribution systems” covers the total of the pipework, fittings and appliances that are installed between the point at which the drinking water is transferred from a water supply to the user and the draw-off point; as a rule, the building owners – i.e. the owners/operators of the drinking water supply are responsible for compliance with the requirements relating to the domestic distribution systems. Consequently, those are also responsible for ensuring that the domestic distribution system is planned, built and operated at least in line with the generally recognised codes of practice.

Any lead in domestic distribution systems should be replaced as soon as possible and completely by other, more appropriate materials that do not pose any risk to human health. For this purpose, the Federal Government’s KfW development bank offers, under certain conditions, owners of buildings used for residential use low-interest loans to replace lead pipework. In addition, a large number of substances made from plastics, metals and other materials used for the production of pipework, seals, gaskets and fittings can migrate to drinking water and compromise its quality. Unnecessarily long pipework, “dead legs” (dead-end pipes), little used pipe sections, poorly thermally insulated pipes and too low hot water system temperatures compromise drinking water quality and can, for instance, lead to higher levels of *Legionella*. However, not only the building owners but also residents as users can help to maintain drinking water quality by, for instance, running standing water (stagnant water) down the drain, regularly flushing little used pipe segments and drawing the owner/operator’s attention to relevant deficits.

The identified deficits include a lack of technical knowledge among the owners/operators and users (e.g. residents) regarding their statutory obligations under the Drinking Water Ordinance, the potential hazards that may emerge or be aggravated in the domestic distribution systems, correct operation, and any repair and remediation measures that may be required. While some information materials on this topic have already been published at the national level, they should be complemented and cater to the above-mentioned target groups to further ensure drinking water quality at the tap. The political agreement on the proposal for a Directive of the European Parliament and of the Council on the quality of water intended for human consumption (recast) of 24 February 2020 (recast EC Drinking Water Directive (Directive 98/83/EC), [https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CONSIL:ST\\_6060\\_2020\\_REV\\_1&from=EN](https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CONSIL:ST_6060_2020_REV_1&from=EN)) formulates, *inter alia*, legal requirements for risk assessments in buildings. However, such a risk assessment already requires a sound knowledge of the domestic distribution systems, local water quality and the ways in which use by the different groups of persons may affect the water quality, which underscores the need for supportive information materials.

**Activities to meet the target:** One central task is to improve access to information and support for the owners/operators of domestic distribution systems as well as users to enable them to contribute to drinking water safety in line with the requirements of the Drinking Water Ordinance. There already exist a number of information materials (such as the information leaflet on lead and drinking water “*Blei und Trinkwasser*”, downloadable at <https://cms.umweltbundesamt.de/en/document/flyer-about-lead-drinking-water-blei-trinkwasser-in>, a recommendation on the problems for drinking water supply posed by lead pipework “*Zur Problematik der Bleileitungen in der Trinkwasserversorgung*“ (*the problem of lead pipework in drinking water supply*) published by the UBA in 2003, accessible at <https://cms.umweltbundesamt.de/en/publikationen/flyer-trinkwasser-wird-bleifrei> and the leaflet “*Trinkwasser wird bleifrei*“ (“drinking water to go lead-free”), available at <https://cms.umweltbundesamt.de/en/publikationen/flyer-trinkwasser-wird-bleifrei>, the UBA brochure “*Trink was – Trinkwasser aus dem Hahn. Gesundheitliche Aspekte der Trinkwasser-Installation*“ (“Have a drink – drinking water from the tap - health aspects of the domestic distribution system”), (downloadable from <https://www.umweltbundesamt.de/publikationen/ratgeber-trink-was-trinkwasser-aus-hahn> as well as other UBA recommendations), that, however, have to be supplemented and/or updated to fully cover the issues involved. In coordination with the Federal Ministry of Health (BMG), the UBA will prepare and publish relevant materials to inform the public, owners/operators and users of domestic distribution systems on the following topics: *Legionella*, materials in contact with drinking water, risk assessment, lead pipework and activities to replace them as well as the risks posed by stagnation water and how to avoid them.

A main role in informing the owners/operators of domestic distribution systems and raising their awareness is played by the local and regional surveillance authorities and health offices. In line with the statutory allocation of tasks, they are supported by higher Federal authorities such as the UBA. The identification of possible risks to drinking water supply and distribution, however, requires an improved sharing of information (such as the reporting of hazards, exceedances, the use of materials in domestic distribution systems). While the setting up of straightforward communication and reporting channels serves to improve this exchange, it must be facilitated and accompanied by political intent and corresponding steering efforts.

**Indicator:** Publication and promotion of the information material

## **National target 2: Expanding the risk-based approach in drinking water supply**

**Target date:** 28 February 2023

### **Baseline analysis:**

In 2004, WHO proposed, in its Guidelines for drinking-water quality, a systematic and preventative risk assessment and management approach for water suppliers, specifically tailored to drinking water suppliers (Water Safety Plan - WSP). This approach is intended to systematically identify, assess and control health risks specific to the individual water supply “from catchment to the tap”.

The EC Directive of the European Parliament and of the Council on the quality of water intended for human consumption (Directive 98/83/EC – Drinking Water Directive DWD) takes up a key element of the WSP (risk assessment), stipulating in its Annex II since October 2015 that the Member States can introduce the option - based on the results of a risk assessment - to derogate from the otherwise fixed scope of parameters and frequency of drinking water monitoring. This was transposed into national law when the Drinking Water Ordinance was amended in January 2018 (introducing the option of risk assessment-based adjustment of sampling - RAP).

To promote its implementation, training materials were developed that cover both the RAP and WSP and that can be accessed free of charge for training purposes. Multipliers have completed train-the-trainers events to go on and share this with various stakeholder groups.

Since neither RAP nor WSP are mandated by law, these approaches are not yet implemented to a significant extent. In response to a 2018 online survey among German water suppliers operating risk management /WSP concepts on the experience they have made so far, for instance, 24 suppliers, two of them small suppliers (less than 5,000 persons served), responded.

For buildings, the Drinking Water Ordinance stipulates that, in case the technical action value for *Legionella* is exceeded, a hazard assessment (a major element of the WSP) has to be drawn up for the system in question. After hearing the Drinking Water Commission, the UBA published a recommendation to inform implementation in 2012<sup>1</sup>. Currently, a general risk management for buildings is not legally required.

The DWD (recast) of December 2020 formulates requirements for risk approaches in the catchment areas of drinking water abstraction points, the water supplies themselves and in buildings. To enable the future nationwide implementation after the adoption of the amended DWD, Germany will have to adjust the Drinking Water Ordinance and maybe other regulations to bring them into line with the European requirements and stipulate responsibilities, *inter alia* for the catchment areas of drinking water supplies. Irrespective of the foregoing, the German approach of designating water protection areas is already fit for the purpose of addressing risks to public water supply.

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<sup>1</sup> Recommendations for the implementation of a risk assessment pursuant to the Drinking Water Ordinance (2012), accessible at <https://www.umweltbundesamt.de/themen/wasser/trinkwasser/rechtliche-grundlagen-empfehlungen-regelwerk/empfehlungen-stellungnahmen-zu-trinkwasser>

**Activities to meet the target:** Implementing the necessary legislative procedure involving the *Länder* and associations

**Indicator:** Promulgation of the revised Drinking Water Ordinance in the *Bundesgesetzblatt* (Federal Law Gazette).

### **National target 3: Improving the data on public drinking water taps in public spaces and drafting of monitoring recommendations**

**Target date:** 31 December 2021 (data evaluation); 31 December 2022 (monitoring recommendations)

#### **Baseline analysis:**

Under the DWD (recast), access to drinking water is to be improved, especially for vulnerable groups. Specifically, Article 16 of the DWD requires that Member States ensure that outdoors and indoors equipment (public drinking water taps) be set up in public spaces, where technically feasible, in order to promote tap water intended for human consumption.

There is currently no data evaluation on the number and operation of such equipment in Germany and the quality of the water supplied by such equipment. To improve the data and baseline analysis, therefore, data on such drinking water taps are to be evaluated to be able to implement further measures on this basis, if necessary. To ensure that all such equipment supplies safe drinking water that is free from contamination, it is necessary to monitor these sets of equipment. Therefore, recommendations should be drafted on the national level for use by the surveillance authorities.

**Activities to meet the target:** At the national level, previously collected data from the Federal *Länder* on outdoors and indoors equipment for the free access to drinking water are to be evaluated. In the context of a working group of representatives from the *Länder* and the Federal authorities, recommendations for the monitoring of public drinking water taps should be drafted to be able to ensure the equitable access to safe drinking water in public places.

**Indicator:** Tabling the data evaluation and the monitoring recommendation, definition of any further need for action.

## **National target 4: Improving the EU-wide and national regulatory basis for hygiene requirements for materials and products in contact with drinking water**

**Target date:** 31 December 2021 for elastomers / thermoplastic elastomers

### **Baseline analysis:**

Currently, the hygiene requirements for products in contact with drinking water in the European Economic Area are not fully harmonised and therefore subject to a multitude of national regulations. This state of affairs is considered to be unsatisfactory not only by the regulatory bodies but, increasingly, also by manufacturers and providers. Started in 1998, work to implement the European Acceptance Scheme (EAS) did not come to fruition due to a lack of support from the EU Commission at the time. In 2011, however, it was resumed on a smaller scale by the four EU Member States (MS) France, Germany, Netherlands and United Kingdom within the context of the 4MS Initiative (4MSI). The cooperative effort established by now as 4MSI and broadened to include Denmark, currently represents the most advanced structure for a common approach to stipulating hygiene requirements for materials in contact with drinking water. Coordinated documents are available specifying the requirements for materials and the inclusion of permitted starting substances - following evaluation and positive assessment - into corresponding positive lists.

At the time of the current revision of the DWD, the 4MSI had already prepared drafts of other important regulatory documents that are closely linked with the future application of the new Article 11 (DWD recast). These include the documents formulated as the “common approach” for the stipulation of hygiene requirements for materials in contact with drinking water as well as for the testing and evaluation of materials and products made from such materials with regard to their compliance with these requirements. In the meantime, the documents have been shared with the relevant European agencies. In the future, starting substances as well as materials in contact with drinking water will be evaluated by the ECHA with support from national authorities and institutions with the corresponding competence. The objective is to continue to use the competence of the national authorities (such as BMG, UBA, Federal Institute for Risk Assessment - BfR) for the implementation of the relevant articles of the DWD, to safeguard the results from the 4MSI process achieved so far and to maintain existing communication channels for the future professional exchange.

A major step ahead made with the recasting of the DWD and, especially, the newly included Article 11, is the fact that the consolidation of all relevant requirements for the materials themselves and for the testing and assessment of source materials and products is to take place in binding regulatory documents. For this purpose, positive lists with starting substances approved for the production of materials and products in contact with drinking water will also be introduced, based on combining existing positive lists from national documents and the work done by the 4MSI so far. With an EU-wide regulation, the aim of a mutual recognition of product testing and certification is within reach.

On the national level, Germany has already regulated the most important materials (metallic materials, enamels and ceramic materials as well as organic materials such as plastics, coatings and lubricants) in binding assessment bases. The mandate for the drafting, publication and binding introduction of these assessment bases is based on section 17 (3) of the Drinking Water Ordinance. Other types of organic materials that are not yet covered by guidelines and recommendations are to be included into the existing assessment bases for organic materials as additions or additional annexes.



**Activities to meet the target:** Further developing the criteria and regulations for materials in contact with drinking water in cooperation with national and European institutions, associations and economic actors as well as stipulating requirements for elastomers/thermoplastic elastomers, further materials under preparation

**Indicator:** Publication of the requirements for elastomers/thermoplastic elastomers as another annex to the assessment basis.

## **National target 5: Making drinking water provisions easier to understand**

**Target date:** scheduled for 28 February 2023

### **Baseline analysis:**

The legal provisions that apply throughout Germany are laid down in the Drinking Water Ordinance. The relevant basis for the German regulations is the European drinking water legislation. At present, the DWD is the basis for the German regulations. Due to continuous amendments of the DWD and the fact that Germany, like other EU Member States, has made use of the option to enact provisions on the national level that, in some places, go beyond those of the DWD or that had already been stipulated in the Drinking Water Ordinance even before the EC Directive was in place, the extent of the Ordinance has been steadily increasing. Oftentimes, new provisions were inserted into the general structure of the existing Ordinance. However, it was not always possible to keep the systematic structure that basically underlies the Ordinance without resorting to complex reorganisation. As a result, the Drinking Water Ordinance has grown into a complex regulation that, in some places, can only be understood by experts.

**Activities to meet the target:** The national target of having easier-to-understand drinking water legislation provisions in place is to be achieved by restructuring, shorter provisions, a subdivision into smaller parts and more comprehensible references. At the same time, this is expected to contribute to a better compliance with drinking water law requirements. To achieve this, the Drinking Water Ordinance will have to be recast and promulgated in the Federal Law Gazette (*Bundesgesetzblatt*).

**Indicator:** This requires the promulgation of a recast Drinking Water Ordinance plus the absorption of the amendments made to comply with the DWD.

**Target area b) *The reduction of the scale of outbreaks and incidents of water-related disease***

**National target 6: Strengthening and continuous adaptation of surveillance and primary prevention of *Legionellosis*, especially amid changes of climatic conditions and population ageing in Germany, to achieve a long-term reduction in incidence.**

**Target date:** No target date.

**Baseline analysis:**

Germany has a comprehensive reporting system for infectious diseases, which generally does not make any distinctions with respect to the transmission route. Diseases are reported at local level, largely based on the notification requirements for laboratories, and the information is immediately transmitted electronically, in an anonymous format, to *Land* (state) and Federal Government level. In addition to individual cases, clusters/outbreaks are also identified and transmitted as linked cases. This system allows the disease to be controlled at local level, as well as the identification of supra-regional events and trend analysis at all levels.

Many significant infections, including water-related disease, that cause diarrhoea (such as salmonellosis, giardiasis) can also be transmitted via other infection routes, primarily via the consumption of contaminated foods, contact with animals, or human-to-human transmission. With isolated cases, it is usually impossible to determine how the disease was transmitted. As a result, water-borne transmission cannot necessarily be assumed for a case of giardiasis, for example. On the other hand, the source of the infection can often be identified from an analysis of case clusters (such as drinking water, or a specific meal or individual dish).

While many clusters of food-borne diarrhoea have been identified in Germany since the aforementioned reporting system was introduced in 2001, only a few isolated cases of explicitly water-related diarrhoeal outbreaks have been identified. Overall, it is assumed that water-related diarrhoeal disease is very rare in Germany, and that therefore, there is no need for improvement here.

*Legionella* are almost exclusively transmitted via water, since human-to-human transmission occurs at most in sporadic cases. Legionnaire's disease is a severe form of pneumonia induced by *Legionella* bacteria; the Pontiac fever that does not manifest as pneumonia but flu-like illness is of minor importance. While *Legionella* are widespread in freshwater, what is particularly relevant here is that they can also populate technical water pipeline systems and sanitary facilities where they may cause infection under certain circumstances. In 2001, compulsory reporting was introduced for all laboratory-diagnosed *Legionella* infections. Germany also has a designated consulting laboratory for *Legionella*, based at Dresden Technical University.

*Legionella*-induced pneumonia is relevant from a clinical viewpoint. From an epidemiological point of view, travel-associated *legionellosis*, nosocomial *legionellosis*, and *legionellosis* acquired in a private or work environment are distinguished. One problematic aspect of the regulation of drinking water systems is the so-called dose-effect paradox – i.e. the concentration of *Legionella* found in drinking water has no direct correlation with the risk of human disease. Since September 2012, Germany participates in the European Legionnaires' Disease Surveillance Network (ELDS-NET), aimed at identifying clusters of disease in hotels

or on cruise ships, for example. The measures launched within the context of the system also benefit the travelling German public.

Overall, the reporting system undercounts Legionnaire's disease by a factor of 10-15, presumably because specific tests for *Legionella* are too rarely commissioned in case pneumonia has been diagnosed. From 2001 to 2018, the incidence rates of cases reported to the Robert Koch Institute (RKI) rose, thought to be partly due to population ageing, climate changes and the more widespread use of the urine antigen test for *Legionella pneumophila* SG1.

At an average of just under 75%, most infections are acquired in the community (i.e. in a private or work environment), while cases where the infection was acquired at a hospital or long-term care facility, account for a minor share at less than five percent each. About one in five cases (20%) are travel-associated. The average lethality rate for travel-associated or community-acquired Legionnaire's disease is 5-9 %, for nosocomial cases it is somewhat higher. Since 2010, several major outbreaks of community-acquired Legionnaire's disease have occurred that - where the source was detected - were associated with evaporation coolers and, in the case of the outbreak in the town of Warstein, with a wastewater treatment plant.

The Drinking Water Ordinance focuses on the primary prevention of drinking water-borne cases of Legionnaire's disease, while investigations and measures in response to a reported case of Legionnaire's disease fall in the realm of secondary prevention.

The 42<sup>nd</sup> Ordinance on the implementation of the Federal Immission Control Act (42. *Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes*) regulates the operation of evaporative cooling systems, cooling towers and wet separators. These plants must be designed, constructed and operated in such a way that contamination with microorganisms, specifically *Legionella*, of the water used are avoided by applying the state of the art to prevent any emissions being released into ambient air. The operators of such facilities must report those to the competent authorities. The facilities must be checked regularly to ascertain the sanitary quality of the water used. Whenever specific levels are exceeded, action must be taken and the authorities informed. This Ordinance aims to, *inter alia*, speed up the identification of possible emitters in case of outbreaks of community-acquired Legionnaire's disease and thus enabling taking concrete measures earlier in order to prevent more cases of Legionnaire's disease.

**Activities to meet the target:** Continuation of the BMG's funding of the consulting laboratory for *Legionella*, based at Dresden Technical University, via the RKI, to promote diagnosis. Data on Legionnaire's disease, which is compulsory to be reported, is used by the RKI within the framework of its surveillance system for notifiable diseases. For more details on *Legionella*, reference is also made to National Target 5: "Making drinking water provisions easier to understand".

**Indicator:** No indicator

**Target area c) *The area of territory, or the population sizes or proportions, which should be served by collective systems for the supply of drinking water or where the supply of drinking water by other means should be improved***

**National target 7a: Improving the data on the quality of drinking water supplied by decentralised small-scale waterworks and small-scale supplies for domestic uses**

**National target 7b: Using the Protocol documents on equitable access to water supply and sanitation**

**Target date:** 31 October 2022

**Baseline analysis:**

Pursuant to Article 3 of the DWD, EU Member States may grant exemptions from the provisions of this Directive for water for human consumption from an individual supply providing less than 10 m<sup>3</sup> a day as an average or serving fewer than 50 persons, unless the water is supplied as part of a commercial or public activity.

Under the Drinking Water Ordinance, the requirements governing drinking water quality must be met by all drinking water supplies, regardless of their size, the quantity supplied, the number of persons served, or organizational and ownership structures. Therefore, all of the quality requirements of the Ordinance also apply to small-scale supplies for domestic uses and decentralised small-scale waterworks. By adopting this approach, Germany ensures non-discriminating, undivided health protection with respect to drinking water for all citizens, irrespective of the type of drinking water supply that people rely on. Such facilities are also subject to regulatory surveillance.

As most of the parameters laid out in the DWD are met in more than 99 % of cases, overall drinking water quality from large, central, public supplies is considered to be "very good". However, comprehensive data on the quality of drinking water from small-scale supplies for domestic uses and decentralised small-scale waterworks are not available at the national level.

In Germany, around 99.4 % of the population were connected to the centralised public water supply in 2016. The exact number of decentralised small-scale water works and small-scale supplies for domestic uses by which the other part of the population is served is not known on the national level.

The Joint Monitoring Programme (JMP) of WHO and the United Nations International Children's Emergency Fund (UNICEF) makes a distinction between drinking water supplies that, by virtue of their design or the type of raw water, are better-suited to adequately protect drinking water from contamination and therefore to supply safe drinking water (improved sources), and those which are unsuitable or less suitable for this purpose (unimproved sources). According to the JMP, moreover, drinking water should be available whenever needed and be free from contamination.

All facilities in the central public drinking water supply system in Germany are rated as the JMP category 'improved'. The drinking water sources primarily used in Germany as decentralised small-scale waterworks and small-scale supplies for domestic uses (such as protected boreholes, protected dug wells and protected springs; on properties exclusively designed as piped systems) are likewise classed as 'improved' according to JMP categories.

Thus, according to JMP definition, 100 % of the population in Germany have access to ‘improved’ drinking water supplies. As such, it is not possible to improve this area any further.

While a slight increase in the level of connection to the central public drinking water supply is anticipated in the future, part of the rural population will continue to receive their drinking water from small-scale supplies for domestic uses and decentralised small-scale waterworks. This is expedient for hygiene, technical and economic reasons. Pipelines of the central drinking water supplies that supply only one or only a few delivery points in remote areas can experience non-negligible periods of stagnation, representing a hygiene risk. In certain cases, connecting remote properties to the central drinking water supply via pipework would also entail significant, not always proportionate technical and economic input.

It is not possible to assess to what extent access to safe drinking water as called for in the United Nations Sustainable Development Goal 6.1 is guaranteed in the case of decentralised small-scale waterworks and small-scale supplies for domestic uses since data on the quality of drinking water provided by such supplies are not available on the national level. Such a survey that should also focus on any differences between urban and rural areas can improve the data on the equitable access to safe drinking water.

Moreover, there is as yet no sufficient data on the equitable access to water supply and sanitation. For this purpose, useful papers were developed under the Protocol that could also be applied in Germany, but are only available in English so far. Their translation and use would also be a response to the European citizens’ initiative Right2Water, whose request was taken into account in Article 16 of the recast of the DWD under the aspect “access to water intended for human consumption”.

**Activities to meet the target:** Collection of data on drinking water supplied by decentralised small-scale waterworks and small-scale supplies for domestic uses.

Translation of the documents on equitable access to water supply and sanitation drafted under the Protocol on Water and Health entitled “No One Left Behind: Good practices to ensure equitable access to water and sanitation in the pan-European region”, “Equitable Access Score-card: supporting policy processes to achieve the human right to water and sanitation” as well as the “Guidance Note on the Development of Action Plans to Ensure Equitable Access to Water and Sanitation” into German to promote their application in Germany and create a basis for any further measures.

*(Note: the following are the links to the foregoing documents for those interested)*

<https://unece.org/environment-policy/water/no-one-left-behind>

<https://unece.org/environment-policy/publications/equitable-access-score-card-supporting-policy-processes-achieve>

<https://unece.org/environment-policy/publications/guidance-note-development-action-plans-ensure-equitable-access> )

**Indicator:** Data collected and evaluated. Documents available in German.

**Target area d) *The area of territory, or the population sizes or proportions, which should be served by collective systems of sanitation or where sanitation by other means should be improved***

**In view of the connection levels achieved, no target has been set.**

**Baseline analysis:**

In 2016, 100 % of the German population were connected to collective sanitation systems or other means of wastewater treatment. 97.1 % of the German population are connected to the public sewage system (as of 2016). Wastewater is treated in public treatment plants. The remainder of the population has decentralised sanitation systems such as small wastewater treatment plants or septic tanks, the contents of which are disposed of at regular intervals. At regional level, especially in eastern Germany, there are plans to increase the level of connection in some areas.

**Target area e) *The levels of performance to be achieved by such collective systems and by such other means of water supply and sanitation respectively***

**National target 8: To describe and subsequently continuously improve drinking water quality in small water supply zones**

**Target date:** Continuous improvement. It is not yet possible to specify a target date.

**Baseline analysis:**

Wastewater treatment:

The high level of performance achieved by sanitation systems in Germany is based on the relevant legal and technical regulations.

These include Directive 91/271/EEC (on urban wastewater treatment), the German Act on the regulation of matters pertaining to water (Federal Water Act - *Wasserhaushaltsgesetz* - WHG) the revised version of which entered into force on 1 March 2010, and the Ordinance on Requirements for the Discharge of Wastewater into Waters (Wastewater Ordinance - *Abwasserverordnung*) that was issued based on the WHG, as well as the legal provisions and technical requirements of the 16 German *Länder*.

Directive 91/271/EC requires the collection of wastewater from households and small plants and the reduction of the organic load. Moreover, it makes the removal of not less than 75% of phosphorus and nitrogen a requirement of wastewater treatment in urban wastewater treatment plants. In Germany, approximately 90% of phosphorus and about 81% of nitrogen in wastewater are removed in urban treatment plants. Germany meets and even exceeds these requirements, as confirmed by a report from the European Commission on the implementation of this Directive [http://ec.europa.eu/environment/water/water-urbanwaste/implementation/implementationreports\\_en.htm](http://ec.europa.eu/environment/water/water-urbanwaste/implementation/implementationreports_en.htm).

The Wastewater Ordinance stipulates minimum nationwide requirements for the discharge of wastewater into waters. These minimum requirements are based on the state of the art as required in the WHG.

The Wastewater Ordinance defines the state of the art for wastewater discharges, and by now has 53 industry-specific annexes concerning domestic and urban wastewater as well as individual sectors of trade and industry. Requirements are specified for the wastewater from the areas and sectors regulated by the annexes. These annexes are updated in accordance with the development of the state of the art and the best available technology as set out in the European BREF documents.

The WHG also stipulates that certain wastewater treatment plants, especially those subject to the Directive on Industrial Emissions, may only be constructed, operated and maintained in accordance with the state of the art and other wastewater treatment plants only in accordance with the generally recognised codes of practice. These technical standards can be based on the regulations of the respective trade associations or DIN standards.

In Germany, there are currently some 9,105 public and around 3,300 company and industrial wastewater treatment plants. The majority of public wastewater treatment plants are small to medium-sized plants. There are some 600,000 km of public sewers in Germany.



A general potential for improvement in terms of the purification performance of these wastewater treatment plants can only be realised through procedures that exceed the current defined state of the art (cf. also target areas d), g) and h)). At regional level, discharge permit requirements may be increased under the provisions of the EC Water Framework Directive (Directive 2000/60/EC, WFD) such as for phosphorus or nitrogen elimination but this is impossible to quantify.

The German Wastewater Charges Act (*Abwasserabgabengesetz*) regulates the levying of charges for the direct discharge of wastewater into a water body. The charge is based on the volume and noxiousness of certain discharged substances, further details of which are regulated in an annex to the Act. The fee per unit of noxiousness is currently € 35.79.

Fees for the treatment of wastewater are payable by all producers of wastewater, including private households. The charge rates vary according to region. They are determined by the local authorities responsible for wastewater disposal based on the local conditions (location, geology, density of population, development stage of wastewater treatment plants etc.). According to the most recent statistical survey in 2016, the average wastewater fee was € 2.60 per m<sup>3</sup> (wastewater and base fee).

In the German water sector, the energy efficiency and energy consumption of wastewater treatment plants is currently the subject of some debate. Wastewater treatment plants are increasingly undergoing energy analyses. Moreover, the extraction of energy from wastewater is a subject of current discussion.

The prevention of micro-pollutants, e.g. pharmaceutical residues etc., is also a topic of growing significance. The Federal Government and some *Länder* are already engaged in research and pilot projects to investigate ways of avoiding micro-pollutant discharges. In preparation for a strategy of the Federation to protect water bodies from anthropogenic trace substances, the first phase of the multi-stakeholder dialogue “Trace Substance Strategy of the Federal Government” (*Spurenstoffstrategie des Bundes*) was launched in November 2016. The strategy aims to avoid or reduce trace substance inputs to the aquatic environment. The multi-stakeholder dialogue focuses on options for action in order to reduce inputs to waters from biocides, pesticides, detergents, personal care products, household and industrial chemicals as well as pharmaceutical substances. On completion of the first phase in June 2017, 14 recommendations to policy-makers were drafted together with the stakeholders. The recommendations are for mitigation strategies at the source, on the user side and based on end-of-pipe measures.

Building on the results of phase one of the dialogue, the stakeholders prepared, in phase two from February 2018 to March 2019, more concrete specifications for selected measures from phase one.

The major measures from the multi-stakeholder dialogue inform a strategic approach for the future reduction of trace substance inputs. To ensure long-term effectiveness of the measures, individual elements need to be institutionalised. Prior to that, however, these more concretely fleshed out measures are to be applied, tested and evaluated in a pilot phase (09/2019–12/2020).

Central elements for review are:

- Setting up of an expert body to identify relevant trace substances based on the prepared criteria.
- Stakeholder-led round table(s) to identify and implement prevention and reduction measures for relevant trace substances that are the responsibility of the producers. During the pilot phase, five substances are to be addressed at round tables.
- Linking stakeholder input to the campaign work of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (since autumn 2019) under the roof of the UN Water Decade (2018–2028). Here, the *Länder* can contribute their initiatives and materials.
- Application by the *Länder* of a reference framework for further wastewater treatment (to lower trace substance inputs) to urban wastewater treatment plants.

For the time being, no targets can be derived from these discussions.

In an effort to improve performance levels in sanitation and water supply, voluntary benchmarking projects are being carried out in both areas, see for example [www.bdew.de/wasser-abwasser/benchmarking-und-branchenbild/](http://www.bdew.de/wasser-abwasser/benchmarking-und-branchenbild/) as well as benchmarking projects in the *Länder*.

#### Drinking water supply:

The quality of drinking water supplied by the public drinking water supply in Germany is good. Over the period 2014-2016, "large" water supply zones (more than 1,000 m<sup>3</sup> per day or more than 5,000 supplied individuals), which serve around 88 % of the population in Germany, delivered a very good drinking water quality on average; measurements performed within the context of regulatory monitoring revealed that requirements were met and limit values not exceeded in more than 99% of the cases for most microbial and chemical quality parameters. Thresholds were exceeded in one to three per cent of the relevant measurements only for the indicator parameters of coliform bacteria (in the reporting year 2016) and calcite dissolution capacity.

The situation was similar in "small" water supply zones (50 to 5,000 individuals served): here, too, the statutory requirements were met and limit values not exceeded in more than 99% (up to 100%) of the cases for most microbial and chemical parameters. For a few other parameters, thresholds were exceeded in one to three per cent of the measurements, specifically in tests for the indicator parameters calcite dissolution capacity, coliform bacteria, iron, manganese and turbidity.

Over time, the trend for the containment of water losses has been positive. In the years from 1991 to 2016, water suppliers needed less water overall, in spite of a slight increase from 2013 to 2016, to meet the drinking water demand. Compared with the 5.2 billion cubic metres (bn m<sup>3</sup>) in 2016, it was more than 6.5 bn m<sup>3</sup> as recently as 1991. That is a drop by more than 20 percent <sup>2</sup>. At 9.8% (2016), the average rate of water losses across Germany is extremely

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<sup>2</sup> Source: Table "Wassergewinnung der öffentlichen Wasserversorgung nach Wasserarten" at <https://www.umweltbundesamt.de/daten/wasser/wasserwirtschaft/oeffentliche-wasserversorgung#sinkender-trinkwasserverbrauch-geringere-verluste>

low, even compared with other EU Member States. The water supply utilities have been successful in clearly reducing water losses for instance from breaks and leaks. While, in 1991, a total of 758 million m<sup>3</sup> had been lost this way, losses in 2016 totalled 456 million m<sup>3</sup>.

**Activities to meet the target:** Improving the information base for determining and assessing the level of performance of water supplies in small-scale water supply zones with regard to consistent drinking water quality.

**Indicator:** Level of performance of water supplies in small-scale water supply zones in terms of drinking water quality compared with the level in large water supply zones (more than 5,000 individuals served).

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<sup>3</sup>sources: [https://www.destatis.de/DE/Themen/Querschnitt/Jahrbuch/jb-umwelt.pdf?\\_\\_blob=publicationFile](https://www.destatis.de/DE/Themen/Querschnitt/Jahrbuch/jb-umwelt.pdf?__blob=publicationFile) p. 462, Table 18.2.3 and <https://www.umweltbundesamt.de/daten/wasser/wasserwirtschaft/oeffentliche-wasserversorgung#sinkender-trinkwasserverbrauch-geringere-verluste>).

**Target area f) *The application of recognized good practice to the management of water supply and sanitation, including the protection of waters used as sources for drinking water***

**National target 9: Increasing the number of water suppliers operating a technical safety management**

**Target date:** Continuous target, therefore no target date can be set

**Baseline analysis:**

Wastewater treatment:

The WHG requires that sanitation comply with the state of the art. The Wastewater Ordinance defines the state of the art for public wastewater treatment and for various sectors of trade and industry. For further details, reference is made to the comments on Article 6 (2) (e).

The *Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V. - DWA* (German Association for Water, Wastewater and Waste), as a technical-scientific association, formulates regulations on wastewater treatment in the form of guidelines and fact sheets.

The protection of water bodies as sources for drinking water:

Throughout Germany, the principle of comprehensive groundwater protection applies. This has been fixed in national law, and more recently at the level of EU law, for example with the WFD and its Daughter Directive on the protection of groundwater against pollution and deterioration (Directive 2006/118/EC) which have been transposed into national law.

Article 7 (3) of the WFD calls for the protection of bodies of water used for drinking water supply, with the aim of avoiding a deterioration in their quality and minimising the level of purification treatment required in drinking water supply.

For example, water protection areas have been defined in a legally binding manner for decades in order to protect groundwater resources that are used or will be used for drinking water supply. Depending on the specific protection needs, certain activities are prohibited in these approximately 18,300 areas, which are generally comprised of three protection zones.

The water protection areas total 55,000 km<sup>2</sup> which translates to 15.4% of Germany's territory. This prevents groundwater resources from becoming contaminated with pollutants. In many areas, long-standing voluntary cooperation arrangements exist between farmers and water supply companies, which compensate farmers in line with coordinated rules for the loss of earnings associated with land use or fertilisation restrictions. In addition, further programmes are in place in the Federal *Länder*.

The EEC Nitrates Directive (Directive 91/676/EEC) requires the observance of good agricultural practices and the preparation of action programmes to reduce nitrate run-off, whose effectiveness must be monitored. In Germany, the Nitrates Directive was transposed into national law in the Fertilisers Ordinance (*Düngeverordnung*), which regulates the use of fertilisers, the storage of slurry etc. The Fertilisers Ordinance was amended in March 2020 to better transpose the Nitrates Directive. Due to non-compliant nitrate levels, 27.1% of groundwater bodies in Germany are in a poor chemical condition. This also causes problems for drinking water abstraction. Nitrate is mainly a result of agricultural fertilisers. The recast

Fertilisers Ordinance introduces further nationwide mandatory measures. Specifically, it extends both the blocking periods in which the application of fertilisers is banned during the autumn and winter months and the unfertilised buffer strips around water bodies and bans the fertilisation on frozen soil. The new rules also bring in an improved monitoring of nitrate levels. Going forward, nitrate loads are to be more exactly analysed nation-wide to enable the timely implementation of effective countermeasures. A central measure is the reduction of fertilisation by 20 percent per farm in the areas with particularly high nitrate loads (“red zones”). The recast Fertilisers Ordinance has been in force since 1 January 2021.

Germany has comprehensive monitoring networks with numerous measuring sites for both surface waters and groundwater. The requirements for these monitoring networks are derived from national and European provisions. They serve to continuously monitor the water status and the impacts of any measures implemented, and as the basis for decision-making on the need for further measures.

#### Drinking water supply:

The requirements of the Drinking Water Ordinance are deemed to be met when, *inter alia*, water abstraction, water treatment and water distribution are “at least in compliance with the generally recognised codes of practice”. In addition to other standard-setters, these rules are mainly issued by the German Technical and Scientific Association for Gas and Water (*Deutscher Verein des Gas- und Wasserfaches e.V. - DVGW*) as part of their technical regulations. There are currently some 300 technical standards in place detailing recognised good practices in planning, construction, operation and maintenance throughout all stages in the drinking water supply chain. Collective compliance with these good practices is intended to ensure a safe drinking water supply. The technical standards are updated regularly to reflect the latest scientific and technical developments.

The Ordinance on the General Conditions for Water Supply (*AVBWasserV*), which regulates supply conditions between the water utilities and their connected customers, stipulates that the customer's equipment (or: the domestic distribution system) must also comply with generally recognised codes of practice.

In practice, the extent to which generally recognised codes of practice are applied can vary. Testimonials indicate that technical standards are generally taken into account and applied by the large water utilities, while smaller suppliers have implementation deficits, often due to limited resources (personnel, financial) and a lack of awareness of the problem. In this area in particular, it is necessary to promote the technical standards.

Alongside technical standards, the DVGW's Technical Safety Management (TSM) system, for instance, is a sector-specific management system for voluntary use by the water suppliers which they can also use as a basis for external auditing. Using the TSM strengthens the structural and procedural organisation of water utilities, raises qualification standards, and above all, boosts knowledge and application of the technical standards, which in turn promotes safe drinking water supply. Germany currently has some 435 (as of January 2019) water utilities with a confirmed TSM.

The recast DWD envisages requirements for risk assessment and risk management in drinking water supply and, as such, has incorporated requirements regarding the WSP approach proposed by WHO into the revised DWD. The requirements and methodological components of the WSP approach have already been integrated into technical standards in Germany with

the DIN EN 15975-2 “*Sicherheit der Trinkwasserversorgung - Leitlinien für das Risiko- und Krisenmanagement - Teil 2: Risikomanagement*“ (“Security of drinking water supply - Guidelines for risk and crisis management - Part 2: Risk management”) and the risk management-related elements of the DVGW Guideline W 1001 “*Sicherheit in der Trinkwasserversorgung – Risiko- und Krisenmanagement*“ (“Safe and secure drinking water supply - risk management under normal operating conditions”) and linked to the TSM.

**Activities to meet the target:** Within the framework of voluntary activities undertaken by the water supply sector.

**Indicator:** Increase in the number of water suppliers in Germany that operate a technical safety management.

**Target area g) *The occurrence of discharges of: i) Untreated wastewater and ii) Untreated storm water overflows from wastewater collection systems to waters within the scope of this Protocol***

**No target has been set.**

**Baseline analysis:**

The deliberate discharge of wastewater into water bodies without proper treatment is not permitted.

In most built-upon or surface-sealed areas, only some of the precipitation water reaches the hydrological cycle naturally; a significant portion is discharged via the sewer system. In Germany, two different sewage systems are used, the combined discharge of precipitation water and sewage (combined system), and discharge in two separate sewers (separate system). However, in the past, discharges of precipitation water from separate sewers and overflows from combined systems have led to quality problems in water bodies. These adverse impacts were primarily addressed by building more than 45,000 rainwater treatment facilities (storm overflow tanks and storage sewers, stormwater basins and stormwater sedimentation basis), a large proportion of which are only triggered in intense precipitation events.

Many wastewater treatment plants in Germany have been modernised in recent years and their purification performance enhanced in line with the state of the art. In the meantime, in the event of heavy rain, significantly higher pollutant loads are in some cases discharged into water bodies from the public wastewater system as a result of combined sewer overflows - and to a lesser extent by rainwater discharges - than is the case with normal operation of wastewater treatment plants. Implementation of the WFD has confirmed the importance of rainwater discharges for water quality. For this reason, over the next few years, further action will be taken to reduce pollutant run-off during rain events. Measures include the decentralised, local infiltration of rainwater, especially in new residential developments, the more widespread use of separate sewers, and the improved treatment of combined sewage and rainwater. This target was made a legal requirement in Section 55 (2) of the WHG. With infiltration, however, care must be taken to ensure that this does not conflict with other water management concerns. These include, for instance, that infiltration may not take place over contaminated sites. The largely decentralised management of rainwater with local infiltration or local discharge has already been successfully trialled in Germany. Some of the *Länder* have created subsidy programmes for ecological rainwater management.

If the bathing water profiles prepared under the EC Bathing Water Directive (Directive 2006/7/EC) reveal significant hygiene pressures on bathing waters as a result of combined sewage discharges, requirements will need to be imposed to improve bathing water quality in this area too. For example, better protection from hygiene pressures can also be achieved by interspersing planted soil filters, the expansion of intermediate reservoirs or by reducing the frequency of combined sewage discharges. For further details, reference is made to the comments on Article 6 (2) (j).

**Target area h) *The quality of discharges of wastewater from wastewater treatment plants to waters within the scope of this Protocol***

**No target has been set in view of the standard of quality achieved.**

**Baseline analysis:**

In Germany, generally speaking, the construction and operation of wastewater treatment plants and the discharge of treated wastewater into the receiving water bodies requires the approval or authorisation of the competent water authorities, in accordance with the statutory guidelines (cf. in this connection the comments under target area e)).

The operation of wastewater treatment plants and the quality of the treated wastewater are regularly monitored by the competent authorities as well as by the operators of wastewater treatment plants under the self-monitoring scheme, which has been tried and tested for many years now.

In the event of malfunctions with potential to impact water quality, there are warning and alert chains which are also linked to the warning and alert systems on international rivers.

For further details, reference is made to the comments on Article 6 (2) (e).

More ambitious targets for nitrogen and phosphorous elimination or other contaminant parameters may be adopted at a regional level as a result of the WFD. Any plants that do not comply with these requirements must be upgraded. The water authorities have to examine, at the latest when the time-limited discharge permit expires, if the discharge is still in line with the state of the art and other relevant requirements. This goes for all commercial industrial sites as well as for discharges from municipal wastewater treatment plants and small wastewater treatment plants.

If the bathing water profiles prepared in accordance with the EC Bathing Water Directive (Directive 2006/7/EC) reveal significant hygiene pressures on bathing waters as a result of wastewater, the treated wastewater should also be subject to microbial quality requirements (cf. also in this regard target areas g) and j)).

A general national target cannot be derived from these regional-specific objectives.



**Target area i) *The disposal or reuse of sewage sludge from collective systems of sanitation or other sanitation installations and the quality of wastewater used for irrigation purposes, taking into account the Guidelines for the safe use of wastewater and excreta in agriculture and aquaculture of the World Health Organization and the United Nations Environment Programme***

**National target 10: Implementing the national Sewage Sludge Ordinance (AbfKlärV), introduction of mandatory phosphorus recovery**

**Target date:**

Sewage sludge:

From 1 January 2029, or 1 January 2032 respectively (requirement to recover phosphorus from phosphorus-containing sewage sludge and sewage sludge incineration ashes in case of a phosphorus level of 20 grammes or more per kilogramme dry matter. Soil application of sewage sludge, independent of its phosphorus level, will only be possible from treatment plants with an authorised capacity of serving of up to 100,000 inhabitants (until 2032) or up to 50,000 inhabitants (from 2032))

Preliminary note: The terms "disposal or reuse", as cited in the text of the Protocol, are sometimes defined differently in Germany. In Germany, "disposal" ("*Entsorgung*") encompasses both the recovery (e.g. application of sewage sludge to soils for fertilisation) and disposal of sewage sludge (e.g. after thermal treatment in incineration plants). The term "reuse" ("*Wiederverwendung*") presupposes that the material has previously been used, which is not the case with sewage sludge.

**Baseline analysis:**

Sewage sludge:

In Germany, sewage sludge is applied to the soil as an agricultural and horticultural fertiliser, or for (thermal) energy recovery. Apart from plant nutrients (particularly phosphorus), sewage sludge can also contain a number of pollutants such as heavy metals, multidrug-resistant microorganisms or pharmaceutical residues. While, in recent years, levels of regulated heavy metals in sewage sludge have decreased significantly, it may still contain pollutants that are not readily degradable, specifically a large number of organic pollutants. Apart from a general increase in environmental awareness among society, the decrease in heavy metal-contamination is also attributable, for example, to the improved monitoring of indirect dischargers, i.e. avoiding inputs at the source.

For reasons of water and soil protection, the trend over recent years has been away from the direct agricultural and horticultural application of sewage sludge and towards thermal treatment of sewage sludge (in sewage sludge incineration plants and waste incineration plants as well as co-incineration of sewage sludge in power plants and cement works). In recent years, this trend has intensified as a result of more stringent fertilisation law provisions (especially Fertilisers Ordinance, see above target area f)) and the ambitious requirements of the Sewage Sludge Ordinance as amended in 2017. While, in 2007, approximately 47% of the total sewage sludge quantity generated by biological public wastewater treatment (2.05 million tonnes of dry matter) were applied to soil, this proportion more than halved in 2019 to approximately 20 percent (of the total quantity of 1.74 million tonnes of dry matter).

On the EU level, the soil application of sewage sludge in agriculture is governed by the EEC Sewage Sludge Directive (Directive 86/278/EEC) that seeks to ensure the protection of the environment, and in particular of the soil, when using sewage sludge in agriculture. The Directive was transposed into German national law with the Sewage Sludge Ordinance, which imposes far more stringent requirements than the Directive. Particularly the amended Fertilisers Ordinance and the Sewage Sludge Ordinance as amended in 2017, further tightened the requirements for the application of sludge to the soil. Specifically, the Sewage Sludge Ordinance extended the Ordinance's scope to include landscaping, expanded the provisions governing pollutants, tightened the restrictions on spreading and introduced a regular, voluntary quality assurance.

Starting 2029, sewage sludges and ashes from the thermal pre-treatment of these sludges must be subjected to phosphorus recovery, if the sewage sludges have a phosphorus level of 20 grammes or more per kilogramme dry matter. At least 50% phosphorus have to be recovered from sewage sludge and at least 80% from sewage sludge incineration ashes. By way of derogation, only soil application of sewage sludges from small treatment plants will be permitted from 2029 onwards. As well as being vital for life on earth and in limited supply, phosphorous has more recently developed into a strategically important raw material. At a global level, some countries are already engaging in activities to safeguard this natural resource.

Stipulated in the Sewage Sludge Ordinance, the high standards for a future comprehensive sludge recovery in Germany are instrumental in further reducing or avoiding management-related pollutant emissions especially into water bodies and soil, and promoting a sustainable closed-substance cycle of the sludge's value-enhancing ingredients for the sake of resource conservation.

Although there are various technical procedures available in Germany for the recovery of phosphorus and other nutrients, particularly due to research financed by the Federal Government and *Länder*, much work is still needed before a large-scale and marketable technical application can be implemented nationwide. Even today, the trend is towards thermal pre-treatment of sewage sludges in dedicated sewage sludge incineration plants.

Under the Sewage Sludge Ordinance, co-incineration in waste incineration plants of sewage sludges with phosphorus levels of 20 grammes or more in dry matter will only be permitted from 2029 if these plants are coal- or gas-fired. Phosphorus will also have to be recovered from these incineration ashes. From 2029, sewage sludge containing 20 grammes or more phosphorus per kg/dry matter may no longer be used in waste incineration plants, especially since the phosphorus level in the resulting sewage sludge ash is likely to be heavily diluted and phosphorus recovery would therefore be uneconomical.

In mid-2020, the instructions for implementation of the Sewage Sludge Ordinance (*Vollzugshinweise zur Umsetzung der Klärschlammverordnung*) of the Federal/State Waste Committee (*Bund/Länder-Arbeitsgemeinschaft Abfall - LAGA*) were published.

Federal-*Länder* activities for the sustainable use of plant nutrients from wastewater, sewage sludge and other substances (closed substance cycle) are an ongoing task.

The Federal and *Länder* Governments support such activities through research and development projects as well as through investment projects to demonstrate the practical suitability of existing nutrient recovery techniques.

## Wastewater:

In Germany, treated wastewater is so far only used for direct irrigation purposes in few exceptional cases. Under the German Fertiliser Act (*Düngegesetz*) and the Fertilisers Ordinance, untreated domestic wastewater may not be applied to agricultural land. Since 1999, there has been a DIN standard (DIN 19650: 1999-02, *Bewässerung - Hygienische Belange von Bewässerungswasser*) (Irrigation - Hygienic concerns of irrigation water) that addresses hygiene requirements for irrigation water.

The new EU Regulation on minimum requirements for the reuse of treated wastewater from urban wastewater treatment plants for agricultural irrigation (Regulation (EU) 2020/741) includes uniform minimum requirements for the quality of treated wastewater for agricultural irrigation and the monitoring of defined parameters, a risk management approach to protect the environment and health as well as targets to requirements to improve data transparency. The requirements of the Regulation will become applicable from mid-2023. The Regulation will enable the Member States, when providing appropriate reasons, to disallow the use of treated wastewater for agricultural irrigation for their territory or parts of it or to postpone it to a later date. The decision if and, in this case, for which areas in Germany this option to disallow the reuse of treated wastewater should be resorted to is still pending. However, it must be made in good time ahead of mid-2023 and communicated to the European Commission.

**Activities to meet the target:** None.

**Indicator:** Degree of introduction of phosphorus recovery

**Target area j) *The quality of waters which are used as sources for drinking water, which are generally used for bathing or which are used for aquaculture or for the production or harvesting of shellfish***

**No target has been set.**

**Baseline analysis:**

Regarding the quality of waters used for drinking water, reference is made to the comments under Article 6 (2) (f).

**Water bodies used for bathing:**

The requirements governing the quality of water bodies which are generally used for bathing are derived from the EC Bathing Water Directive (Directive 2006/7/EC). It stipulates that microbial requirements for the indicators *Escherichia coli* and intestinal *Enterococci* have to be met. The parametric values to be complied with are different for coastal and inland bathing waters. Based on these parameters, bathing waters are assigned to one of four quality levels, on the basis of measurements extending over several years. The first classification under the new evaluation system was implemented in 2011. Until then, the limits were those in the old EEC Directive (Directive 76/160/EEC). By 2015, all bathing waters designated under the Directive should exhibit adequate quality as a minimum requirement.

Directive 2006/7/EC was transposed into national law in 16 Ordinances in the German *Länder*. Germany's bathing waters are continuously monitored in accordance with the aforementioned guidelines. Their status has been consistently good for years.

At the end of each year, Germany reports to the European Commission on the quality of its bathing waters during the preceding bathing season. The European Environment Agency (EEA) publishes the results from all EU Member States on the internet. For the 2019 bathing season, reference is made to the link <https://eea.europa.eu/themes/water/europes-seas-and-coasts/assessments/state-of-bathing-water>.

For the 2019 bathing season, Germany reported 2,291 bathing waters, including 367 in coastal waters and 1,924 in inland waters, i.e. lakes or rivers. In 2019, the binding EU limits were met by 99.2 % of designated coastal bathing waters and 99.7 % of designated inland bathing waters.

The EC Bathing Water Directive requires the preparation of so-called bathing water profiles that serve to, *inter alia*, describe the bathing waters and identify and assess potential sources of pollution.

The aforementioned profiles were prepared for the first time in March 2011 and are regularly reviewed and updated.

**Waters used for aquaculture and for the production or harvesting of shellfish:**

Directive 2006/88/EC sets out health and hygiene provisions for aquaculture animals and products thereof, and for the prevention and control of certain diseases in aquatic animals. The main focus is on preventing outbreaks of disease in aquaculture animals. In particular,

Directive 2006/88/EC aims to improve trade within the Community and with third countries. Directive 2006/88/EC covers fish, molluscs and crustaceans and the products thereof.

It provides for the licensing of aquaculture production businesses and processing establishments by the competent authority in the relevant Member State. Directive 2006/88/EC contains a list of exotic and non-exotic diseases and the animals susceptible to them. It also outlines the measures to be taken if one of the listed diseases is suspected, including in particular the analysis of samples in a qualified laboratory, together with a ban on the movement of aquatic animals out of or into the operation in question, and the performance of epidemiological studies. If the outbreak of a listed disease is confirmed, a containment area should be set up around the operation, together with a surveillance zone, and a ban on the movement of animals should be imposed. Germany transposed Directive 2006/88/EC into national law with the Fish Disease Prevention Ordinance (*Fischseuchenverordnung*) of 2008.

There is no reason to set national targets.

**Target area k) *The application of recognized good practice to the management of enclosed waters generally available for bathing***

**National target 11: To update the technical regulations on swimming pool water**

**Target date:** 31 December 2021

**Baseline analysis:**

Section 37 (2) of the Act on the Prevention and Control of Infectious Diseases in Humans (Protection Against Infection Act - IfSG) regulates the quality of swimming and bathing pool water used for swimming and bathing pools. Waters that are made available for bathing or swimming in commercial operations, public baths or other facilities that are not solely for private use must be of such quality that there is no reason to assume that its use will cause any injury to human health, especially through pathogens.

The treatment of swimming and bathing pool water, including disinfection, is essential in such pools in order to effectively prevent the transmission of pathogens in the pool water. Contamination with the inevitable by-products of disinfection should be minimised down to tolerable exposure levels. The requirements set out in DIN standard series 19643 "*Aufbereitung von Schwimm- und Badebeckenwasser*" ("Treatment of water of swimming pools and baths"), published by the German Institute for Standardization (DIN), are regarded as generally recognised codes of practice.

All pools and baths built in line with the regulations and in which water treatment corresponds to the generally recognised codes of practice can be assumed capable of achieving a hygienically flawless water quality.

Swimming or bathing pools, including their water treatment facilities, are subject to regulatory surveillance by the competent authorities in the *Länder*. Although there is no further nationwide regulation on the quality of swimming and bathing pool waters in Germany, the surveillance authorities in the *Länder* are guided by the technical standards and the existing technical recommendations published by the UBA, such as the recommendation on "Hygiene requirements for swimming pools and the monitoring thereof" (*Hygieneanforderungen an Bäder und deren Überwachung*) as revised in 2014. The Federal Land Schleswig-Holstein has issued, on the basis of the Land's Health Services Act, a bathing facilities hygiene ordinance (*Land ordinance on hygiene and quality requirements for bathing facilities*) that is also closely in line with the technical standards and therefore underscores their importance.

Germany has been involved in the formulation of an 'OECD Guidance Document for Efficacy of Pool and Spa Disinfectants', which serves as the basis for international harmonisation of the efficacy testing and licensing of disinfectants for swimming and bathing pool waters in EU Member States. The OECD document is available in a harmonised version of 2012.

The BMG's Swimming Pool Water Commission (*Schwimm- und Badebeckenwasserkommission*) at the UBA issues recommendations and publications for consumer education, and supports operators and local authorities in ensuring the correct operation of swimming facilities.

Any uncertainties that remain with regard to the assessment of health risks associated with swimming in disinfected pool water need to be resolved. A special focus will be on relevant disinfection by-products. Scientific foundations have to be developed for the corresponding risk assessment. For example, a national research project has been initiated on the topic of "potential of disinfection by-product formation in salty water". This project aims to resolve any remaining uncertainties when it comes to evaluating the health risks associated with swimming in chlorinated, salty pool water, and formulate scientific foundations for risk assessment.

It is envisaged to draft a national swimming and bathing pool water ordinance in the long term. However, it is not possible to formulate a concrete target with a scheduled date at this point in time, since, for reasons of capacity, the regulatory focus over the next few years will be to achieve the national implementation of the revised European Drinking Water Directive, and because the technical standards for pool waters need to be developed further to ensure that such an ordinance reflects the state of the art.

**Activities to meet the target:** The amendment of standard DIN 19643 "Treatment of water of swimming pools and baths", as generally recognised code of practice, will be continued and completed. The contents of the standard will be adapted to reflect the latest scientific findings regarding the formation and health effects of disinfection by-products and new treatment techniques such as disinfection using bromine generated by the ozonation of bromide-containing water.

**Indicators:** Publication of an updated standard DIN 19643 "Treatment of water of swimming pools and baths"

**Target area 1) *The identification and remediation of particularly contaminated sites which adversely affect waters within the scope of this Protocol or are likely to do so and which thus threaten to give rise to water-related disease***

**No target has been set in view of the statutory provisions already in force.**

**Baseline analysis:**

Significant entries into groundwater may be the result of harmful soil changes or contaminated sites. The principal aim of the German Act on Protection against Harmful Changes to Soil and on Rehabilitation of Contaminated Sites (Federal Soil Protection Act - *Bundesbodenschutzgesetz*) of 1998 is to safeguard or restore soil functions for the long term. This involves preventing harmful soil changes and cleaning up the soil and contaminated sites, especially water pollution caused by the latter. The Act defines harmful soil changes as harmful impacts on soil functions that are able to bring about threats, major disadvantages or considerable nuisances for individuals or the general public. Over and beyond merely preventing impacts on the soil that amount to threats, the aim is to also avoid any impairments of its function as far as possible. Therefore, the Federal Soil Protection Act also includes requirements aimed to prevent harmful soil changes. By imposing suitable requirements, new contamination can be prevented from occurring in the future, while also ensuring that existing soil contamination never exceeds the threat limits.

The Federal Soil Protection Act applies to harmful soil changes and contaminated sites unless impacts on the soil are covered by other provisions. These include specifically provisions of the Circular Economy Act (*Kreislaufwirtschaftsgesetz*) and the Federal Immission Control Act (*Bundes-Immissionsschutzgesetz*).

Requirements in other legal instruments, such as the Federal Immission Control Act and the body of sub-statutory regulations based thereon or the Ordinance on Facilities Handling Substances that are Hazardous to Water (*Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen*) serve to prevent new contaminated sites from occurring in the first place, for instance through leakages or accidents.

The Federal Soil Protection Act includes provisions for the adoption of a substatutory set of rules in the form of a Federal Ordinance on Soil Protection and Contaminated Sites (*Bundes-Bodenschutz- und Altlastenverordnung*). This Ordinance, adopted in 1999, concretises the Act's requirements pertaining to the analysis and evaluation of sites suspected of harbouring harmful soil changes or of being a contaminated site, and sets out requirements for decontamination and additional threat prevention and control measures.

The Federal Soil Protection Act stipulates, for example, that the polluter or land owner may be obliged to clean up any damage to groundwater arising as a result of harmful soil changes or contaminated sites. If the trigger values specified in the Soil Conservation Ordinance are exceeded, more in-depth analyses will need to be carried out. If the suspicions are confirmed, further measures will be needed. The requirements pertaining to remedial action are derived from soil protection and water legislation. In addressing contaminated sites, it has been established that, in most cases, the soil-groundwater pathway for threats is critical for the need for remediation.

In the 1990s, the Federal *Länder* have begun to systematically address the problem of residual pollution and to identify any areas suspected of being polluted. In 2003, the Federal/Länder



working group on residual pollution (*Bund/Länder-Arbeitsgemeinschaft Bodenschutz*) first compiled its nationwide statistical data on contaminated sites (*Bundesweite Kennzahlen zur Altlastenstatistik*), and updates the report every year. It includes figures on the areas suspected to be contaminated sites, the completed threat assessments, the contaminated sites, the contaminated sites under remediation, the completed remediations and the contaminated sites being monitored. It does not differentiate which protected resources, such as groundwater, are affected in the respective categories.

Since new industrial products are constantly being developed, it occurs ever so often that “new”, as-yet unknown or unregulated contaminants that are a potential threat for groundwater enter into the soil. While soil protection law has to be applied in these cases, as well, it is sometimes highly challenging for soil protection authorities to identify action, trigger and precautionary values in scientific and legal respects.

**Target area m) *The effectiveness of systems for the management, development, protection and use of water resources, including the application of recognized good practice to the control of pollution from sources of all kinds***

**No target has been set, as the existing systems are effective.**

**Baseline analysis:**

The WFD calls for surface waters and groundwater to be managed on the basis of river basin districts, with the aim of achieving a good status by 2027 at the latest. Germany duly submitted its management plans and programmes of measures under the requirements of the WFD for ten national or international river basin districts for the second time at the end of 2015. The programmes of measures are to be implemented over the next few years, with the aim of improving the ecological, chemical and quantitative status of waters and achieving the specified national targets for the first implementation phase. Updated plans and programmes are to be submitted by the end of 2021.

For a summarising account of the 2015 management plans, reference is made to the brochure published by the BMU and the UBA that is also available in English <https://www.umweltbundesamt.de/publikationen/water-framework-directive>.

The management plans for all of the ten river basins relevant in Germany have been published; a compilation is available at the Federal/Länder information and communication platform WasserBLicK [www.wasserblick.net/servlet/is/148547/](http://www.wasserblick.net/servlet/is/148547/).

The relevant European water protection directives have already been considered in detail under the points on Article 6 (2) above.

Demographic developments and their impacts on wastewater disposal and water supply systems are likewise keenly debated among the relevant associations and with respect to urban planning. Existing systems will need to be adapted as population numbers change regionally, for example with regard to the decreasing volume of wastewater, the re-allocation of fixed costs etc.. In addition, the impact of climate change on these systems have to be factored in as well.

German law sets out requirements governing plant-specific water pollution control, for example with regard to the storage, refilling, handling, production, treatment and use of substances constituting a threat to water in the Ordinance on Facilities Handling Substances that are Hazardous to Water. The facilities must be tight, leaks must be identified quickly and reliably and leaked out substances hazardous to water held back. As a minimum requirement, they must meet the generally recognised codes of practice. Requirements for plant-related water protection are also based on European law, such as Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control).

For further details, reference is made to the comments on the other points on Article 6 (2).

**Target area n) *The frequency of the publication of information on the quality of the drinking water supplied and of other waters relevant to the targets in this paragraph in the intervals between the publication of information under article 7 (2)***

**National target 12: Improving the data on the quality of drinking water from centralised small waterworks**

**Target date:** unspecified

**Baseline analysis:**

In Germany and Europe, there is a wealth of information available regarding the quality of drinking water, bathing waters and other water quality-related criteria.

Water quality and wastewater:

There is a wealth of information available from the BMU, the UBA and the Environment Ministries of Germany's 16 Federal *Länder* regarding the quality of water and water bodies. The links to the websites of the Federal and *Länder* ministries for the Environment are listed here <http://www.lawa.de/Links.html>. Links to the websites of international river basin commissions and national river basin communities, which regularly publish reports on water quality, can also be found here. These pages are all updated at regular intervals, generally in line with the mandatory reporting cycles, especially at European level.

Examples:

The German *Länder* and the competent water and/or health authorities publish information on the quality of bathing waters on the Internet and in up-to-date brochures. A summary is available at the UBA's website on bathing waters (<https://www.umweltbundesamt.de/wasserqualitaet-in-badegewaessern>). For a selection of links, reference is made to the homepage of the BMU at <http://www.bmu.de/gewaesserschutz/fb/badegewaesser/doc/3553.php>

The Federal and *Länder* government information and communication platform *Wasserblick* (<http://www.wasserblick.net/servlet/is/1/?lang=en>) reports on implementation of the WFD as do the relevant websites of the environment ministries of Germany's 16 *Länder*. The summarising report on implementation of the WFD has already been discussed under target area m) above.

European Directives such as the EC Bathing Water Directive or the EEC Public Wastewater Directive (cf. target area e) above) require EU Member States to regularly report data for evaluation by the European Commission and publication on its homepage.

At regular intervals, the Federal Statistical Office ([www.destatis.de](http://www.destatis.de)) compiles official nationwide data on various aspects of public and non-public water resources management, such as water abstraction and water use, water supply and wastewater treatment, differentiated according to the 16 German *Länder*, industry segments etc. By way of example, reference is made to the 2016 structural data on the water sector published in 2018 (*öffentliche Wasserversorgung und öffentliche Abwasserentsorgung*) at <https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Umwelt/Wasserwirtschaft/Publikationen/Downloads->

[Wasserwirtschaft/wasserwirtschaft-2190213169004.html](http://Wasserwirtschaft/wasserwirtschaft-2190213169004.html). The statistical surveys are based, *inter alia*, on the German Environmental Statistics Act.

The European Water Information System WISE (cf. <http://water.europa.eu/>), provides information on all European water protection directives and the status of their implementation in the EU Member States, alongside up-to-date data on water quality etc.

### Drinking Water:

As required by Article 13 of the DWD, every three years the BMG and the UBA publish a consumer information report on the quality of drinking water in Germany. This report, which is drawn from annual drinking water quality reports from the Federal *Länder*, covers large water supply zones that distribute more than 1,000 m<sup>3</sup> per day on average, or that serve more than 5,000 people, for which reporting is mandatory. Over and above the DWD, the Drinking Water Ordinance also includes the small and medium water supply zones that supply 10 m<sup>3</sup> or drinking water per day or more or serve at least 50 persons into the reporting scheme, so that, in Germany, a second, separate part of the foregoing triennial report also covers the water supply zones that distribute at least 10 m<sup>3</sup> drinking water per day or serve at least 50 persons and distribute not more than 1,000 m<sup>3</sup> drinking water per day and serve not more than 5,000 persons. The format of these reports is in line with the relevant requirements of the EU Commission and based on data on non-compliance with the requirements for drinking water quality. They do not include water supplies providing less than 10 m<sup>3</sup> a day (decentralised small-scale waterworks, small-scale supplies for domestic uses, see also target 7).

Moreover, the Drinking Water Ordinance requires the owner/operator of a water supply to ensure that consumers are appropriately informed about the drinking water they receive. The owners/operators must provide the necessary and up-to-date information. They publish information, *inter alia*, on the general quality of drinking water in the daily newspapers, in their own or official bulletins or on the Internet. The owners/operators must notify the persons served with drinking water about circumstances that can lead to restrictions on usage, for example in the case of lead pipes in house connection pipes or the domestic distribution system.

In the event of a deviation from limit values or temporary drinking water usage restriction, the authorities and owners/operators immediately disclose the precise circumstances surrounding the reduction in drinking water quality, the actual or potential effects, and possible remedial action. Under the DWD and the Drinking Water Ordinance, there is a special obligation to notify population groups who have a higher health risk.

The Federal *Länder* transmit their reporting data electronically to the above-mentioned national reporting portal "WasserBLiCK" which includes an interface specifically set up for the purpose of drinking water reporting. In the long term, the national reporting portal, "WasserBLiCK", is to upgrade drinking water reporting in such a way that all national implementation data can be entered into the WISE system from there, as is already the case for implementation of the WFD.

**Activities to meet the target:** The 2014-2016 report on drinking water quality has been published on the UBA's homepage. From spring 2021, the public can access the follow-up report (years under review 2017 - 2019) online on the UBA's website.

**Indicator:** Use of the interface for drinking water in the "WasserBLICK" database, and conversion to an annual reporting cycle for Germany.

## **Additional target area on Article 6 (2) of the Protocol on Water and Health**

### **National target 13: Improving communication and education of the general public with respect to drinking water as well as swimming and bathing pool water with a special focus on child health.**

**Target date:** 30 June 2022

#### **Baseline analysis:**

In order to encourage consumer trust in drinking water and in public water supply as well as to support the responsible stewardship of drinking water, it is vital to ensure that consumers are properly informed about this topic. Effective communication and education must therefore provide background information on drinking water, its quality, potential risks associated with its consumption, the role played by limit values and the implications of exceeding such values, as well as on what citizens themselves can do to avert potential risks associated with drinking water, using consumer-oriented information and a variety of media and targeting a range of different consumer groups.

Whilst the local water utilities often provide public education on drinking water in a regional context, the BMG and the UBA also publish a range of educational materials for the general public. For example, the advice booklet "*Trink was – Trinkwasser aus dem Hahn*" ("Have a drink – drinking water from the tap") has already been published and informs the general public and the operators and owners of buildings about the risks associated with domestic distribution systems, and offers actionable recommendations on the planning and operation of such systems. A range of general information is also available on the UBA's website about drinking water.

Not infrequently, the basically positive aspects of water sports activities have to be weighed against the exposures and health risks involved - not least from substandard water quality and unsafe behaviours. The brochure "*Rund um das Badewasser*" addresses these bathing water-related issues.

#### **Activities to meet the targets:**

1. *UBA brochure on drinking water: "Rund um das Trinkwasser"*: Periodic updating of the existing brochure.
2. *Creation and maintenance of a catalogue of frequently asked questions (FAQs)*: Based on enquiries submitted to the UBA on various aspects of drinking water, which suggest that there is a public interest in this topic, a collection of frequently asked questions and answers is to be compiled. This collection will be continuously updated to reflect e.g. the latest media reports and the subsequent public response to individual drinking water aspects. The collection of FAQs is to be published on the UBA's website. The contents that also concerns the *Länder* will be coordinated in the relevant *Länder*/Federal Government working groups.
3. *Website*: Revision of the UBA's website in the section on drinking water, pool and bathing waters and with the aim of improving access to information by the general public and to provide information about current topics (e.g. AMR (<https://www.umweltbundesamt.de/themen/wasser/schwimmen-baden/badegewaesser/faq-antibiotikaresistente-bakterien-in>) and coronaviruses ([https://www.umweltbundesamt.de/sites/default/files/medien/374/dokumente/stellungnahme\\_uba\\_sars-co2\\_und\\_trinkwasser-1.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/374/dokumente/stellungnahme_uba_sars-co2_und_trinkwasser-1.pdf))).

4. *Short films*: The UBA's website is to include a library of short films on themes related to drinking water. The project kicks off with two short documentaries. The chosen format will allow the film library to be continuously expanded with short, self-contained films in a variety of styles. The short films can also be used at a variety of high-profile events.

**Indicator:** Publication of the foregoing documents.