

# Implementation of the Protocol on Water and Health in Switzerland

Status report 2019-2021  
in accordance with Article 7 of the Protocol



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## Preamble

The Protocol on Water and Health is an international instrument aimed at improving water management to reduce and prevent the spread of water-related diseases. Good management of the entire water cycle is vital to ensure that water intended for human consumption is of good quality and does not endanger consumers' health. The implementation of this Protocol, which has been ratified by Parliament, is primarily the responsibility of the Federal Food Safety and Veterinary Office and the Federal Office for the Environment. These two bodies work closely together in this field and inform the public on the progress made every three years.

This report shows many facets of water management that can affect human health in various ways. This holistic approach shows that many groups are involved in ensuring that the guarantees required by the Protocol are fulfilled. Only concerted action among these groups will allow solutions to be found to the current issues related to drinking water and sanitation.

This report has been made possible thanks to the cooperation between the cantonal inspection authorities and the water suppliers. In a decentralised system like the one in Switzerland, it is these organisations which have the relevant information to enable an objective evaluation of the situation. We would like to express our sincere thanks for their active participation.

This report also looks to the future. It contains a list of objectives showing the intentions of groups responsible for drinking water and sanitation regulation in the years to come.

We hope that the presented items will give readers a good overview of all the work being done to ensure sustainable water and sanitation management in Switzerland.

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## Executive summary

Switzerland ratified the Protocol on Water and Health of the United Nations Economic Commission for Europe (UNECE) and the World Health Organization Regional Office for Europe (WHO-EURO) in 2006. Switzerland's national targets were published in 2017 in line with the requirements stipulated in Article 6 paragraph 2 of the Protocol. These targets contribute towards upholding the commitments made by Switzerland within the Sustainable Development Goals (SDGs), in particular Goal No. 6 (clean water and sanitation).

Section 2 of this report is based on these targets. This time, just like in previous years, Switzerland's report describes the relevant targets taking into account current legal provisions, those that are awaiting a political decision as well as other possible objectives, which are still under discussion among relevant stakeholders. This differentiation indicates that all the aspects of Article 6 paragraph 2 of the Protocol have been analysed and prioritised, resulting in a substantive programme of work for all the stakeholders involved in Switzerland.

The targets related to access to water and sanitation have been largely achieved in both urban and rural areas.

As regards access to sanitation, it should be noted that more than 97 per cent of the Swiss population is connected to a central waste water treatment plant. It can thus be concluded that this target has also been reached. Furthermore, an important development worth noting is the decision by the Swiss Parliament to put in place a new generation of waste water treatment plants, which would be capable of eliminating micro-pollutants. The objective of this investment programme is to ensure that 100 of the most important waste water treatment plants in Switzerland are adequately equipped within the next 20 years. By the end of 2021, 19 waste water treatment plants had already implemented the necessary measures.

As regards the quality of potable water, it is important to note that for the first time, the indicators mentioned in Section 3 come from the whole of Switzerland. The data gathered for this evaluation came from 26 cantons and therefore covers 100 per cent of the population in Switzerland, whereas the previous exercise only covered 20 cantons, i.e. 77 per cent of the population.

The cantonal food enforcement authorities reported that, for the past three years, they had not registered any cases in which the maximum limits for fluoride and chromium VI, the latter recorded for the first time, had been exceeded. However, they highlighted the following cases in which the maximum limits had been exceeded: arsenic (2.7% of the samples), lead (0.16%), iron (1.7%), nitrate (0.48%) and nitrite (0.03%). In each specific case, the water distributors took the necessary corrective measures in order to ensure compliance with the legal requirements.

For the first time, data were also collected on plant protection products (PPPs) and their degradation products (metabolites): with regard to PPPs and relevant metabolites, drinking water quality can generally be assessed as quite good in terms of exceeding maximum limits. However, concentrations above 0.1 µg/l are widely measured for metabolites not classified as relevant for drinking water.

The major challenges regarding water management and sanitation are related to multidisciplinary areas. The diverging interests associated with the utilisation of the soil oblige the relevant stakeholders to seek compromise solutions through negotiations. The compliance with the protection zones is becoming increasingly problematic due to the rise in the population. Regional planning could possibly remedy this situation. Currently, 80% of the population in Switzerland drinks potable water originating from a groundwater source with a legally protected site or from lake water. The evolution of this situation is under scrutiny by the enforcement authorities in order to prevent any possible threats to the health of consumers. Poorly degradable substances used in the inflow area may be transported into the drinking water supply. These substances must be regularly analyzed and, if necessary, measures must be taken on the disruptor, i.e. on the installation or activity responsible for the presence of such substances in the groundwater. In 2021, federal laws were amended to reduce the risks from the use of pesticides. Furthermore, an amendment to the law is in progress which will require inflow areas to be designated for all groundwater supplies of regional importance, as well as other groundwater supplies where there is a risk of contamination.

Switzerland is in a privileged situation in many aspects related to the water supply, noting that the water demand (abstraction, irrigation, etc.) represents only approximately four per cent of the annual precipitation in the entire country. Nevertheless, sometimes regional problems arise in agriculture due to lack of water.

The Covid-19 pandemic did not adversely affect the drinking water and wastewater situation in Switzerland. On the contrary, fewer cases of waterborne disease were reported in 2020. Measures prescribed throughout

Switzerland, such as improved hand hygiene, may have played a role in this. In addition, wastewater monitoring for SARS-CoV-2 was established to give a clearer picture of the epidemiological situation.

Switzerland fulfils the essential requirements of the Protocol on Water and Health and, just like in the past, our country remains committed to sharing the Swiss experience in the management of water and sanitation with other countries in the European Region.

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# 1. General aspects

## 1.1. Publication of national targets

Switzerland set its targets under the Protocol on Water and Health<sup>1</sup> in 2017. These targets were approved by the competent federal offices and publicised in the internet.<sup>2</sup> These evaluations have been conducted on the basis of these targets, which are set out in Section 2 of this document.

## 1.2. Coordination among the competent authorities

The Swiss authorities have not set up an additional coordination group dedicated to activities related to the Protocol, as this comes within the remit of the Federal Food Safety and Veterinary Office (FSVO). The federal and cantonal authorities regularly attend meetings of the working groups described in Section 5.6.

The purpose of the work done by these various working groups is to ensure excellent drinking water quality and optimum wastewater management for the long term. The work done will be described in detail in Section 3.

## 1.3. Strategic planning of the federal authorities in relation to water

In the areas of water protection and sanitation, which come under the responsibility of the Federal Office for the Environment (FOEN), various projects and strategies concerned with issues of water and health and launched independently of the Protocol are ongoing. These serve to analyse the challenges and options for action facing water suppliers and sanitation over the coming decades. The precautions taken by the communes and cantons to guarantee drinking water supplies in severe shortages are being assessed.

In respect of micropollutants in waters, the Swiss government is monitoring both local and diffuse contamination. The Waters Protection Act, revised in 2016, provides for selected waste water treatment plants to be equipped with a fourth treatment stage to remove micropollutants. A number of pesticides that contaminated waters in the past have been made subject to usage restrictions or bans in recent years, and in 2017 the Federal Council enacted the Action Plan for Risk Reduction and Sustainable Use of Plant Protection Products. In 2021, Parliament adopted further water quality improvement measures to complement those already initiated. For example, waste water treatment plants will remove even more nitrogen and micropollutants from wastewater in the future. The pesticide risks to surface waters and groundwater pollution are to be reduced by 50 per cent by 2027 compared to the average for 2012-2015. To prevent groundwater contamination more effectively in the future, inflow areas must be defined for all regionally important groundwater sources and for all groundwater sources at risk.

Environmental targets for the agricultural sector have been specified jointly by the FOEN and Federal Office for Agriculture (FOAG) on the basis of existing law.<sup>3</sup> These include targets in the area of Water.

The national research programme 61 *Sustainable Water Management*, which addresses the future challenges for Swiss water management, particularly in connection with climate change, has been completed<sup>4</sup> (see Section 1.10).

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<sup>1</sup> Protocol of 17 June 1999 on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (SR 0.814.201); <https://unece.org/environment-policy/water/protocol-on-water-and-health/about-the-protocol/introduction>

<sup>2</sup> <https://www.blv.admin.ch/trinkwasser>

<sup>3</sup> FOEN and FOAG (2008) Umweltziele Landwirtschaft. Hergeleitet aus bestehenden rechtlichen Grundlagen. <https://www.bafu.admin.ch/bafu/en/home/topics/biodiversity/publications-studies/publications/umweltziele-landwirtschaft.html>

<sup>4</sup> <http://www.nfp61.ch>

## 1.4. Legislation on the provision of drinking water and sanitation

At federal level, water use and management and associated issues are primarily regulated in the Federal Constitution of the Swiss Confederation (Cst.; SR 101), the Federal Act on the Protection of Waters (Waters Protection Act, WPA; SR 814.20) and the Waters Protection Ordinance (WPO; SR 814.201), the Federal Act on Foodstuffs and Utility Articles (Foodstuffs Act, FoodA; SR 817.0), the corresponding implementing ordinances and the Ordinance on Guaranteeing Supplies of Drinking Water in Situations of Severe Shortage (DWSO; SR 531.32).

Accordingly, in Switzerland, many of the legal bases required for meeting the obligations arising from the ratification of the Protocol are already in place. Like all legal amendments in Switzerland, these legal bases are subject to optional referendum and have been confirmed accordingly.

### 1.4.1. Federal Constitution

According to Article 76 of the Cst. the Confederation shall, within the scope of its powers, ensure the economical use and the protection of water resources and lay down principles on the conservation and exploitation of water resources. It shall legislate on water protection (Art. 76 para. 1-3 Cst.). The cantons shall manage their water resources and may levy charges for the use of water subject to the limits imposed by federal legislation (Art. 76 para. 4 Cst.). According to Article 97 of the Cst. the Confederation shall take measures to protect consumers, and according to Article 118, it shall legislate on the use of foodstuffs.

### 1.4.2. Provisions at national level

The Waters Protection Act (WPA) and the Waters Protection Ordinance (WPO) constitute the **water protection legislation** of Switzerland at national level. The Waters Protection Act contains provisions on comprehensive and use-related measures for protecting waters. In addition to a general prohibition on the pollution of waters (Art. 6 WPA) and other regulations for maintaining the quality of waters, the Waters Protection Act also regulates the spatial planning related to the protection of waters. The law provides for the designation of water protection areas, groundwater protection zones and groundwater protection areas, in which measures are taken to protect water catchment areas in both quantitative and qualitative respects. Sanitation is governed by the principle that contaminated wastewater may only be discharged into waters after being treated. The disposal of wastewater is managed, among other things, by a drainage plan.

The Ordinance on Guaranteeing **Supplies of Drinking Water in Situations of Severe Shortage** (DWSO) regulates the supply of drinking water in cases of severe shortage, triggered by events such as cyber attacks, sabotage, extreme weather, earthquakes, mobile network failures, blackouts and power shortages. It states that the cantons and water suppliers should take precautions to ensure that the regular drinking water supplies are maintained for as long as possible, that any shortcomings are rapidly resolved and that sufficient quantities of drinking water are available at all times.

Since drinking water is considered a foodstuff in Switzerland, it is covered by the **legislation on foodstuffs**, i.e. the Foodstuffs Act and the corresponding ordinances. Drinking water is covered by the Ordinance on Foodstuffs and Utility Articles (FUAO; SR 817.02), the FDHA Ordinance on Hygiene when handling Foodstuffs (FDHA Hygiene Ordinance, HyO; SR 817.024.1) and the FDHA Ordinance on Drinking Water and Water in Public Baths and Shower Facilities (DWBSO, SR 817.022.11). Quality requirements for drinking water are set out in the DWBSO. Additionally, a key element of the Foodstuffs Act, namely self-monitoring, also applies to water supplies. According to Art. 74 et seq. of the FUAO, important instruments of self-monitoring are: (a) the assurance of good practices (Good Hygiene Practice, Good Manufacturing Practice), (b) the application of procedures based on principles of the HACCP concept, (c) traceability and (d) the sampling and analysis of foodstuffs and utility articles.

Finally, the purpose of the Federal Act on **Spatial Planning** (Spatial Planning Act, SPA, SR 700) is to protect natural resources (soil, air, water, forests and landscape) and to guarantee the basis for the provision of sufficient supplies for the country (Art. 1). According to Art. 93 of the Federal Act on Agriculture (Agriculture Act, AgricA, SR 910.1), investment projects relating to water supply and sanitation infrastructure in rural regions (in particular in mountain regions) can also be financially supported.

### **1.4.3. Cantonal and communal provisions**

Cantonal and communal provisions can supplement and specify the federal legislation. Some cantons have laws and ordinances which are especially concerned with water use or water supply, while in other cantons, the water supply is regulated differently, for example in the cantonal Fire Protection Ordinance. Details concerning the water supply are also often regulated at communal level.

Sanitation at cantonal level is regulated in enforcement provisions to the national Waters Protection Act, which implement the national water protection legislation at cantonal level. These provisions are usually specified in the form of an introductory act to the national Waters Protection Act. Here too, the provisions vary from canton to canton.

## **1.5. Relevant international agreements**

At international level, Switzerland has entered into legally binding commitments within the framework of its membership of international water protection commissions. In addition to its efforts to maintain the quality of its own waters, Switzerland fulfils its responsibilities by actively participating in international commissions, specifically the International Commission for the Protection of the Rhine (ICPR)<sup>5</sup>, the International Commission for the Protection of Lake Constance (IGKB)<sup>6</sup>, the International Commission for the Protection of Lake Geneva (CIPEL)<sup>7</sup>, the Joint Commission for the Protection of Swiss-Italian Waters (CIPAIS)<sup>8</sup> and the Commission for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)<sup>9</sup> (see Section 5.7.2).

## **1.6. Cost-benefit analysis of projects undertaken**

### **1.6.1. Wastewater treatment**

A survey conducted in 2020 into the costs and quality of service of public wastewater management in Switzerland showed that the quality of wastewater treatment had improved again in the last ten years, while reducing the costs per connected resident. In particular, nitrogen elimination was further expanded. Elimination of micropollutants was introduced at several plants. This process will be completed in 2040, by which time all plants meeting the legal criteria must have introduced this new process stage. With a few exceptions, all communes now have a General Drainage Plan (GDP), while sanitation has become more professionally run.

### **1.6.2. Water supply**

A water supply benchmarking study<sup>10</sup> showed that the relevant factor affecting the cost of drinking water in CHF/m<sup>3</sup> is the specific network output in m<sup>3</sup>/km x year.<sup>11</sup> This is why large water supplier with a dense connection structure tend to offer their customers lower fees and charges than smaller ones, even though they incur higher water acquisition and treatment costs. The fee structure of Swiss water supplies is highly variable. Charges paid at regular intervals usually comprise a fixed standing charge and a price based on volume.

The Swiss Gas and Water Industry Association (SGWA) has issued recommendations on the funding of water supplies (W1006), laying down principles for cost calculation and for the calculation of fees and charges based on usage. As water suppliers have high fixed costs, the recommendations are that 50 to 80 per cent of the costs should be covered by standing charges and 20 to 50 per cent by prices based on volume. Water suppliers are generally supposed to be not-for-profit bodies. This means that the fees they charge must cover all their costs, but they must not actually make a profit.

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<sup>5</sup> [www.iksr.org/en/](http://www.iksr.org/en/)

<sup>6</sup> [www.igkb.org](http://www.igkb.org)

<sup>7</sup> [www.cipel.org/en/](http://www.cipel.org/en/)

<sup>8</sup> [www.cipais.org](http://www.cipais.org)

<sup>9</sup> [www.ospar.org](http://www.ospar.org)

<sup>10</sup> Kappeler J. (2010). Benchmarking für Wasserversorgungen: Erkenntnisse für die Branche. gwa 4: 305-314

<sup>11</sup> If losses are very high for equivalent amounts of water entering the network, then the cost per cubic metre rises accordingly.



## **1.7. Public participation**

The political system in Switzerland is characterised by direct democracy and federalism. The people's right of co-determination includes voting, initiative, referendum and petition rights.<sup>12</sup> Accordingly, the Swiss population is actively involved in framing legislation. This is achieved at national and cantonal level via compulsory and optional referendums and by people's initiatives. Likewise at cantonal and communal level, the population frequently decides on specific projects, e.g. budgets, project loans, etc.

## **1.8. Production of the status report**

Responsibility for the management of the Protocol on Water and Health has been handed over to the FSVO. This federal office, which is responsible for drinking water legislation in particular, is in charge of coordinating the implementation of the Protocol in Switzerland. The FOEN was called on to make a significant contribution to the production of this report, as it is responsible for issues relating to water management and sanitation. Other cantonal bodies, primarily the cantonal laboratories, were also involved in providing the information needed to produce this report, since under the Swiss federal system water belongs to the cantons. A list of the persons involved is given at the end of the report (see Section 7).

## **1.9. Decentralised water management**

It is important to stress that, under Switzerland's federal system, water belongs to the cantons, which can delegate their powers to the communes which normally act as water suppliers. The communes are required to comply with statutory federal requirements and are overseen by the cantonal authorities (consumer department or environmental department) responsible for ascertaining whether the self-monitoring system set up by each water supplier is acceptable.

## **1.10. Emerging challenges in water management**

### **1.10.1. Climate change and water**

As part of the project Effects of climate change on Swiss water bodies (Hydro-CH2018),<sup>13</sup> the effects of climate change on Switzerland's water supplies and water bodies up until 2100 were investigated. The Swiss Climate Change Scenarios CH2018<sup>14</sup> served as a climatological basis. The key results are documented in this project's synthesis report and are summarised here.

As an alpine country, Switzerland is affected by climate change more than average. Climate change alters the entire water balance, but especially the seasonal distribution of water resources in surface waters and groundwater. Low water levels will become more frequent and water bodies warmer. Drought will increase, especially in summer. The change in water availability may lead to conflicts over use. This particularly affects the sectors of flood protection, municipal water management, water-related biodiversity, crop irrigation, thermal water usage and artificial snow-making. However, as the results of the National Research Programme 61<sup>15</sup> show, besides the effects of climate change, settlement development and changes in land use also show great effects on waters and water resources.

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<sup>12</sup> The Swiss Confederation – a brief guide: <https://www.bk.admin.ch/bk/en/home/dokumentation/the-swiss-confederation--a-brief-guide.html>

<sup>13</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/effects-of-climate-change-on-swiss-water-bodies.html>

<sup>14</sup> [https://www.nccs.admin.ch/dam/nccs/de/dokumente/web-site/klima/CH2018\\_Technical\\_Report.pdf.download.pdf/CH2018\\_Technical\\_Report.pdf](https://www.nccs.admin.ch/dam/nccs/de/dokumente/web-site/klima/CH2018_Technical_Report.pdf.download.pdf/CH2018_Technical_Report.pdf)

<sup>15</sup> <http://www.nfp61.ch/>

### 1.10.1.1. Switzerland's climate adaptation strategy – water sub-strategy

The Federal Council's strategy for adapting to climate change was adopted in 2012 and covers in one part the targets and basic principles of adaptation.<sup>16</sup> The first action plan for adaptation to climate change was prepared for the period 2014-2019,<sup>17</sup> followed by the second action plan for adaptation to climate change for the period 2020-2025.<sup>18</sup> In the area of water management (for all affected areas, see Section 1.10.1), around a dozen measures have been adopted and are currently being implemented. In addition, measures from the Federal Council's report entitled *Umgang mit lokaler Wasserknappheit* on managing local water shortages are also being implemented in order to adapt to the challenge of summer drought.<sup>19</sup> The second follow-up OWARNA<sup>20</sup> report identified, among other things, the need for action on a nationally coordinated monitoring and forecasting system and official drought warnings. A proposal for the implementation of the measure *Development of drought warnings* will come before the Federal Council in May 2022.

The federal government's adaptation strategy also includes the pilot program *Adaptation to Climate Change*.<sup>21</sup> It supports exemplary, innovative projects by the cantons, regions, cities and municipalities and shows how Switzerland can adapt to the changing climate in concrete terms. The projects serve to minimize local climate risks, increase adaptive capacity and exploit opportunities. The pilot program has been running since 2013, and a first phase with 31 projects was successfully completed in 2017. The second program phase is currently underway with a total of 50 projects. In the area of water, these are divided into the clusters of increasing summer drought, increasing flood risk, decreasing slope stability and more frequent mass movements, and changes in habitats, species composition and landscape.

### 1.10.1.2. Planning and managing water resources

Even as Europe's *water tower*, Switzerland can still be affected by local temporary water shortage problems, as demonstrated by those of summer 2003, spring 2011 or the 2015 and 2018 droughts. On top of this, buildings in groundwater protection zones and areas are increasingly endangering water security.

Such problems can be tackled in good time and disputes over water supply avoided with the proactive regional planning of water resources. The FOEN is providing practical guidelines for dealing with these water shortage problems that come in three modules<sup>22</sup> and are based on the guiding principles of river basin management (see Section 2.19). The practical guidelines are directed at cantonal authorities, regional stakeholders in the Swiss water sector, communes, water suppliers and, last but not least, engineers and technical consultancies. Among other things, they explain potential regional approaches for tackling land use disputes between water catchment areas and buildings in groundwater protection zones or for withdrawing water for irrigation during droughts.

### 1.10.2. Micropollutants in waters

Since 2018, the Swiss long-term monitoring programme NAWA TREND has been studying micropollutant residues in watercourses. This involves taking three-day to two-week composite samples at a total of 38 sites and testing them for 49 pesticides, 13 pharmaceutical products and 3 other substances. In addition, levels of up to 90 other micropollutants, including artificial sweeteners and individual industrial chemicals, are measured in samples from selected monitoring sites.

Since 2020, ecotoxicologically based limits have been in force for 19 pesticides and 3 pharmaceutical products. Limits for other substances are currently being developed. These ecotoxicologically based limits take into

<sup>16</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/climate/publications-studies/publications/adaptation-climate-change-switzerland-2012.html>

<sup>17</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/climate/publications-studies/publications/anpassung-klimawandel-schweiz-2014.html>

<sup>18</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/climate/publications-studies/publications/anpassung-klimawandel-schweiz-aktionsplan-2020-2025.html>

<sup>19</sup> [https://www.bafu.admin.ch/dam/bafu/de/dokumente/wasser/fachinfo-da-ten/umgang\\_mit\\_lokalerwasserknappheitinderschweiz.pdf.download.pdf/umgang\\_mit\\_lokalerwasserknappheitinderschweiz.pdf](https://www.bafu.admin.ch/dam/bafu/de/dokumente/wasser/fachinfo-da-ten/umgang_mit_lokalerwasserknappheitinderschweiz.pdf.download.pdf/umgang_mit_lokalerwasserknappheitinderschweiz.pdf)

<sup>20</sup> Optimization of warning and alerting for natural hazards

<sup>21</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/climate/info-specialists/adaptation/pilot-programme.html>

<sup>22</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/info-specialists/measures-for-water-protection/high-level-instruments/water-resource-management.html>

account the different toxicities of the substances. As the effects of micropollutants also depend on the duration of exposure, each of the 22 substances has a limit for short-term exposure (must never be exceeded) and a limit for long-term exposure (must not be exceeded on average over two weeks). Based on the water quality assessment using these figures, efficient measures to improve water quality must be implemented in affected waters if the requirements are not met.

#### **1.10.2.1. Micropollutants from municipal drainage**

Treated communal wastewater in the densely populated parts of Switzerland makes a significant contribution to water contamination by micropollutants. This input is to be minimised by expanding existing wastewater treatment plants to include an additional stage with more advanced techniques such as powdered activated carbon adsorption or ozonation. This can significantly improve water quality.<sup>23</sup>

The federal government's plan for implementation stipulates that the largest wastewater treatment plants (WWTPs), large WWTPs in the drainage basin of lakes and other WWTPs for waters that are heavily polluted with wastewater are to be upgraded with additional processes to eradicate micropollutants. A special grant has been made to cover 75 per cent of the start-up costs thanks to an amendment to the Waters Protection Act: all Swiss WWTPs pay a levy based on the number of customers they have. The necessary legal basis for this was adopted by the Swiss Federal Assembly in spring 2014. The statutory provisions came into force on 1 January 2016. The targeted upgrade of WWTPs will be implemented by 2040. By then, over 70 per cent of communal wastewater in Switzerland will be treated for micropollutants. Around 185 of the approximately 720 WWTPs in Switzerland are likely to be upgraded, pushing the cost of sanitation in Switzerland up by around 12 per cent.

#### **1.10.2.2. Micropollutants in waters from diffuse sources**

In 2015, the FOEN completed an extensive situational analysis of micropollutants in overground waters from diffuse sources, demonstrating that many Swiss watercourses are polluted by micropollutants from diffuse inputs. These inputs are often highly dynamic and mean that ecotoxicologically derived quality criteria are repeatedly being exceeded, particularly in small watercourses. The most crucial sources of the diffuse input of micropollutants are agriculture and, to a lesser degree, settlements; the most relevant substances are pesticides, some heavy metals and a few biocides. The long-term monitoring programme NAWA TREND confirms that pesticide contamination is most pronounced in the small and medium-sized watercourses studied. In almost all the streams and small rivers studied, pesticides exceeded their ecotoxicological limits. Pesticide contamination is significantly lower in the large rivers. In most of these waters, no pesticides exceeded their limits.<sup>24</sup>

In groundwater, pesticides rarely exceed the limits. Groundwater quality, on the other hand, is significantly impaired by pesticide metabolites, especially by metabolites of the fungicide chlorothalonil, as shown by studies of the National Groundwater Monitoring Network NAQUA.<sup>25</sup> Arable farming areas on the Swiss Plateau are particularly affected. Along watercourses and below settlement areas, other micropollutants also occur in groundwater, originating from industry and contaminated sites as well as from business and households.

Accordingly, efficient measures to improve water quality must be implemented in the affected waters. The National Action Plan for Risk Reduction and the Sustainable Use of Pesticides, adopted by the Federal Council on 6 September 2017, plays a crucial role in this regard. In 2021, Parliament passed the *Federal Act on the Reduction of Risks from the Use of Pesticides*, introducing further water quality improvement measures to complement those already in place. For example, the pesticide risks to surface waters and groundwater contamination must be reduced by 50 per cent by 2027 compared to the average for 2012-2015. In addition, the licensing of pesticides that repeatedly and widely exceed the limits will be reviewed in future and adjusted so as to prevent limits being exceeded. In drinking water catchment areas, pesticides may be used only if their use does not lead to concentrations of active substances and degradation products exceeding 0.1 µg/l in

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<sup>23</sup> FOEN (2012) Micropollutants in municipal wastewater (summary). Processes for advanced removal in wastewater treatment plants. <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/micropollutants-municipal-wastewater-summary.html>

<sup>24</sup> BAFU (2022) Gewässer in der Schweiz. Zustand und Massnahmen. <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/gewaesserbericht.html>

<sup>25</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/info-specialists/state-of-waterbodies/state-of-groundwater/groundwater-quality/plant-protection-products-in-groundwater/chlorothalonil-metabolites-in-groundwater.html>

groundwater. As only a few inflow areas have been defined, a deadline is to be introduced by which inflow areas must be defined for all regionally important groundwater catchments and for all groundwater catchments at risk. The Federal Council will present a bill to this effect to Parliament.

## **1.11. New challenges in drinking water**

### **1.11.1. Plant protection products: active ingredients and metabolites**

As metabolites of plant protection products are widely measured in groundwater (see Section 1.10.2.2), the situation in drinking water has now also been surveyed. The cantonal food enforcement authorities published a campaign report on this problem back in 2019.<sup>26</sup> The figures now shown (see Section 3.1.4) provide an initial overview of nationwide contamination with plant protection products and their metabolites in drinking water in the years 2019 to 2021.

### **1.11.2. Chromium VI**

As an additional inorganic chemical parameter, data were requested on chromium VI, the limit for which is 20 µg/l according to the DWBSO.

### **1.11.3. Micropollutants in drinking water**

The detection of micropollutants in drinking water has led the federal authorities to publish a guide for use in assessing these unregulated foreign substances. This assessment of substances that have recently been identified and whose toxicity is not known is based on the TTC concept. This concept takes account of the precautionary principle and sets a maximum threshold for potentially genotoxic substances (0.1 µg/l) and another threshold for all other substances (10 µg/l). This concept was enshrined in the FDHA Ordinance on Xenobiotic Substances and Components in Foodstuffs (since repealed) on 1 January 2014 and incorporated into the DWBSO on 1 May 2017.

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<sup>26</sup> [https://www.kantonschemiker.ch/mm/VKCS%20Kampagne%202019%20Bericht\\_2019\\_09\\_09\\_D.pdf](https://www.kantonschemiker.ch/mm/VKCS%20Kampagne%202019%20Bericht_2019_09_09_D.pdf)

## 2. Targets and target achievement: review of the current situation

The following subsections correspond to those set out in the guidelines on reporting and achieving targets,<sup>27</sup> which follow Article 6 paragraph 2 of the Protocol.<sup>28</sup> The targets described in the following subsections are structured differently. The following classification applies:

**Target (A):** A target that was discussed and laid down definitively by the federal offices and established on a legal basis.

**Proposed target (B):** A target decided by the authorities but which will require the law to be amended. However, not all the steps associated with amending the corresponding act or ordinance (consultation process, referendum, possible vote) have yet been completed.

**Possible target (C):** A target proposed by an authority but which has not yet been discussed with all the stakeholders concerned.

### 2.1. Quality of drinking water supply [Art. 6, Paragraph 2 (a)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Setting of national evaluations based on optimal drinking water data management (C).	1.1.2020	FSVO	National evaluation on drinking water

**Possible target:** Setting of national evaluations based on optimal drinking water data management.

**Background:** Art. 5 of the DWBSO states that any party supplying drinking water to consumers via a water supply plant must provide consumers with comprehensive information about the quality of the drinking water at least once a year. The SGWA offers interested water suppliers the opportunity to publish their quality data at [www.trinkwasser.ch](http://www.trinkwasser.ch).

The information supplied by the cantonal enforcement authorities is published in 20 separate annual reports.

**Target achievement:** The Food Chain Strategy stipulates that the federal government and the enforcement authorities must carry out detailed analysis of drinking water quality throughout Switzerland. To this end, the Commission for Drinking and Bathing Water led by the Swiss Association of Cantonal Chemists defines the optimal analysis based on the available data.

This target contributes to the fulfilment of target 6.1 of the 2030 Sustainable Development Agenda.

### 2.2. Reduction of the scale of outbreaks and incidents of water-related disease [Art. 6, Paragraph 2 (b)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Developing a reporting system for incidents and outbreaks of disease caused by water, in collaboration with the reporting systems for infectious diseases (B)	1.1.2022	FSVO in collaboration with FOPH	No. of registered cases for drinking water

<sup>27</sup> UNECE/WHO-EURO (2010) Guidelines on the setting of targets, evaluation of progress and reporting under the Protocol on Water and Health. <https://unece.org/environment-policy/publications/guidelines-setting-targets-evaluation-progress-and-reporting-under>

<sup>28</sup> Protocol of 17 June 1999 on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (SR 0.814.201); <https://unece.org/environment-policy/water/protocol-on-water-and-health/about-the-protocol/introduction>

No targets have been set for this point so far. However, the existing national statistics regarding diseases caused by drinking water are not satisfactory (see Section 3.2). The development of a reporting system for incidents and outbreaks of disease caused by water therefore constitutes one possible target.

**Proposed target:** Developing a reporting system for incidents and outbreaks of disease caused by water.

**Background:** Since water-related diseases are extremely rare in Switzerland, this target has not thus far been considered a priority.

### 2.3. Access to drinking water [Art. 6, Paragraph 2 (c)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Creating emergency infrastructure to improve water supply in exceptional situations. Revision of the Ordinance on the Guaranteed Supply of Drinking Water in Emergencies (B)	2019	FOEN	Approval of the new ordinance

Since the whole population of Switzerland has access to drinking water (see Section 3.4), the definition of targets in this area is not a priority. Proposed targets relate to improving the security of drinking water supplies in normal operations and devising measures in situations of severe shortage, e.g. cyber attacks, sabotage, extreme weather events, earthquakes, mobile network failures, blackouts and power shortages.

**Proposed target:** Devising emergency strategies to improve water supply in exceptional situations.

**Background:** The existing strategies to guarantee drinking water supplies in situations of severe shortage are only partially in place. The droughts in recent years, although not a situation of severe shortage, have given an indication of the resilience of the supply network. Those cantons that have carried out regional water supply planning have been able to identify areas with gaps that require measures such as increased interconnection. Overall, the situation is improving, but much more needs to be done. For cases of severe shortage, the Ordinance has introduced additional regulations that must now be implemented by the cantons, communes and water authorities.

**Target achievement:** The new Ordinance on Guaranteeing Supplies of Drinking Water in Situations of Severe Shortage (DWSO) came into force with effect from 1 October 2020. The federal government will conduct further surveys of the cantons to determine the extent to which that Ordinance is being enforced.

### 2.4. Access to sanitation [Art. 6, Paragraph 2 (d)]

Defined target (classification)	Deadline	Responsibility	Target indicator
97% of the Swiss population is connected to a central wastewater treatment plant (WWTP). No further targets	Target completed	FOEN	% of the Swiss population connected to a central wastewater treatment plant

Wastewater infrastructure was, for the most part, constructed during the second half of the 20th century. This involved passing legislation and federal subsidies were required in order to implement it. Today, 97 per cent of the Swiss population is connected to a central wastewater treatment plant (WWTP). The target has therefore been achieved and there is no need to define further targets.

## 2.5. Levels of performance in water supply [Art. 6, Paragraph 2 (e)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Conserving the value of infrastructure (water supply network, catchment areas, reservoirs, laboratories) (A)	Ongoing	FOEN	Implementation of regional plans for water supply
Encouraging regional planning and cross-linking of water suppliers (C)			

**Target:** Conserving the value of infrastructure (water supply network, catchment areas, reservoirs and labs).

**Background:** The necessary drinking water supply infrastructure is widely available. Expanding and maintaining this in a targeted way will be a priority in future. The public drinking water supply system is self-financing as a basic principle, i.e. its funding is secure in the long term as required by law. Value conservation is generally covered by charges, although federal legislation makes no provision to this effect. In hill and mountain areas, water supplies of agricultural importance receive financial support. Cantonal regulations are of major importance and the water suppliers also follow the guidelines and recommendations issued by professional associations.

This target contributes to the fulfilment of target 6.1 of the 2030 Sustainable Development Agenda.

**Target achievement:** Long-term task. Depending on the sector, recommendations for the management of infrastructure will be developed by the competent authorities. A cross-sector recommendation for the strategic planning, creation and conservation of communal network infrastructure was compiled in 2014 by various professional associations working with the FOEN.<sup>29</sup>

**Possible target:** Encouraging regional planning and cross-linking of water suppliers.

**Background:** There are no provisions whatsoever in Switzerland regarding planning for water supply infrastructure. The cantons are therefore implementing this in very different ways. Many water suppliers are coming under increasing pressure as a result of the high density of use in Switzerland. People are increasingly giving up on drinking water catchment areas due to conflicts with settlements or transport infrastructure over use. This pressure will increase further.

Regional planning needs to identify strategically important drinking water catchment areas and groundwater resources that must be protected in any conflicts over use as a matter of priority. In order to resolve conflicts over use at planning level as early as possible, groundwater protection zones in drinking water catchment areas and groundwater protection areas for important groundwater resources must be embedded in spatial planning. Links should likewise be forged between water suppliers across different communes in order to minimise the effects of disruptions and to mobilise additional capacities if need be.

This target contributes to the fulfilment of targets 6.4, 6.5 and 6b of the 2030 Sustainable Development Agenda.

**Target achievement:** Various cantons are stipulating a regional plan for water supply and have made cross-links. In the absence of federal regulations, other cantons have not taken any precautionary measures whatsoever in this regard.

<sup>29</sup> Organisation Kommunale Infrastruktur und Wasser-Agenda 21 (2014) Handbuch Infrastrukturmanagement – Empfehlungen für die strategische Planung, Erstellung und Werterhaltung kommunaler Netzinfrastrukturen. <https://wa21.ch/themen/infrastrukturmanagement/handbuch/>

## 2.6. Levels of performance in sanitation [Art. 6, Paragraph 2 (e)]

Defined target (classification)	Deadline	Responsibility	Target indicator
In order to protect plants and animals in waters as well as in drinking water resources, the largest WWTPs, large WWTPs in the drainage basin of lakes and other WWTPs for waters that are polluted are to be upgraded with additional processes targeted at eradicating organic trace elements (A)	Long-term task 2040	FOEN	No. of WWTPs upgraded
Ensuring the value of infrastructure is conserved (sewerage system, sewage treatment plants) (B)	Ongoing		Not applicable
Promoting the regionalisation of municipal drainage (C)	Ongoing		Not applicable

**Target:** In order to protect plants and animals in waters as well as drinking water resources, the largest WWTPs, large WWTPs in the drainage basin of lakes and other WWTPs for waters that are polluted are to be upgraded with additional processes targeted at eradicating organic trace elements.

**Background:** WWTPs that were originally constructed to eliminate nutrients in wastewater only partially remove, or do not remove at all, organic trace elements such as chemical products in daily use, pharmaceuticals or pesticides. These micropollutants enter watercourses and lakes along with the treated wastewater, where they can harm the aquatic flora and fauna and impair the quality of the drinking water reserves, particularly when surface waters polluted with treated wastewater infiltrate groundwater. Upgrading selected WWTPs is intended to reduce the quantity of organic trace elements entering waters. Parliament endorsed this approach and approved nationwide funding for these measures on 21 March 2014 by amending the Waters Protection Act (WPA). These statutory provisions came into force on 1 January 2016.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** The legislation came into force on 1 January 2016. Nineteen WWTPs have already been upgraded, while more than 40 are undergoing work or have concrete planning projects in place. At present, it is thought that measures to eradicate organic trace elements will need to be taken in around 180 WWTPs by 2040. To finance the measures, a fund has been set up that is supported by Swiss WWTPs and that will run until 2040. All of the relevant measures must have been launched by this point.

**Proposed target:** Ensuring the value of infrastructure is conserved (sewerage system, sewage treatment plants).

**Background:** The value of wastewater infrastructure in Switzerland is estimated to be around CHF 80 billion. Communal infrastructure is widespread and expanding and maintaining this in a targeted way will be a priority in future.

This target contributes to the long-term fulfilment of target 6.2 of the 2030 Sustainable Development Agenda.

**Target achievement:** Depending on the sector, recommendations for the management of infrastructure will be developed by the competent authorities. A cross-sector recommendation for the strategic planning, creation and conservation of communal network infrastructure was compiled in 2014 by various professional associations working with the FOEN.<sup>30</sup> The current value of the infrastructure and the investments made in the past years are currently being ascertained in a national key data study. This will be a long-term task for the cantons, so there is little point in defining targets.

**Possible target:** Promoting the regionalisation of municipal drainage.

<sup>30</sup> Organisation Kommunale Infrastruktur und Wasser-Agenda 21 (2014) Handbuch Infrastrukturmanagement – Empfehlungen für die strategische Planung, Erstellung und Werterhaltung kommunaler Netzinfrastrukturen. <https://wa21.ch/themen/infrastrukturmanagement/handbuch/>



This target is currently being discussed and prepared by the federal offices concerned. At cantonal level, regionalisation measures are already being implemented in some cases.

**Background:** The organisation of wastewater management in Switzerland is characterised by federalism, direct democracy and municipal autonomy. Small-scale organisational structures (usually communes), a *militia* political system with inadequately qualified personnel and a lack of continuity contrast with the growing complexity of the regulations and additional challenges such as cost control, infrastructure maintenance and the management of micropollutants.<sup>31</sup>

This target contributes to the fulfilment of target 6b of the 2030 Sustainable Development Agenda.

**Target achievement:** The Swiss Water Association (VSA) immediately included the topic in its guidelines for General Drainage Plans (GDPs), explicitly recommending regionalisation. Regionalisation is a continuous process: at the start of 2021, there were 720 WWTPs with a capacity exceeding 200 population equivalents in operation. Since 2016, 40 WWTPs have been abolished and instead connected to a more powerful WWTP. This will be a long-term task for the cantons. The practicality of regionalisation depends on (local) economic, geographical and technical aspects. It is therefore not appropriate to define a national target.

## 2.7. Application of recognised good practice to the management of the water supply [Art. 6, Paragraph 2 (f)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Producing good practice guidelines in accordance with the HACCP concept defined in Art. 78 of the Ordinance on Foodstuffs and Utility Articles (A)	2018	FSVO	No. of non-conformities during cantonal inspections by the DW Inspectorates
Preparing and distributing drinking water in line with the detailed guidelines issued by the SGWA trade association, the FSVO and the FOEN (B)	Ongoing		

**Target:** Producing good practice guidelines in accordance with Art. 80 of the Ordinance on Foodstuffs and Utility Articles (FUAO).

**Background:** Article 80 of the FUAO envisages the drawing up by the food industry of guidelines for good practice, which will then need to be approved by the FSVO. Guidelines like these can replace self-monitoring systems and a guideline for drinking water should help water suppliers (particularly small and medium-sized suppliers) to observe the basic rules of hygiene and apply the HACCP principles specified for the catchment, preparation and distribution of water.

This target contributes to the fulfilment of target 6.1 of the 2030 Sustainable Development Agenda.

**Target achievement:** The target has been achieved. As from May 2017, the Swiss Gas and Water Industry Association (SGWA) published the FSVO-approved draft guidelines for good practice in drinking water supplies (*Leitlinie für eine gute Verfahrenspraxis in Trinkwasserversorgungen*).<sup>32</sup> An updated version of the guidelines with additional treatment methods is expected to be published in 2022.

**Proposed target:** Preparing and distributing drinking water in line with the detailed guidelines issued by the SGWA trade association, the FSVO and the FOEN.

**Background:** The FSVO has already issued documents describing recognised treatment processes and substances for drinking water. The regulations of the SGWA association include guidelines for monitoring quality in the drinking water supply,<sup>33</sup> quality assurance in groundwater protection zones<sup>34</sup> and recommendations for

<sup>31</sup> BG Consulting Engineers (2008) for the FOEN: Organisation of waste water disposal. Bern

<sup>32</sup> SGWA, Richtlinie W12: Leitlinie für eine gute Verfahrenspraxis in Trinkwasserversorgungen, 2017. <https://www.blv.admin.ch/blv/de/home/lebensmittel-und-ernaehrung/rechts-und-vollzugsgrundlagen/hilfsmittel-und-vollzugsgrundlagen/leitlinien-gute-verfahrenspraxis.html>

<sup>33</sup> SGWA, Richtlinie W1 für die Qualitätsüberwachung in der Trinkwasserversorgung, 2005

<sup>34</sup> SGWA, Richtlinie W2 zur Qualitätssicherung in Grundwasserschutz zonen, 2005

a quality assurance system.<sup>35</sup> The FOEN has also issued various implementation guidelines explaining in concrete terms the legal bases and thus serving as a practical aid for water suppliers. There are still certain areas, however, where further documents should be provided, for example guidelines or recommendations for water treatment. Furthermore, the corresponding specialist groups must be informed about the existing documents so that these are also put into practice.

This target contributes to the fulfilment of target 6.1 of the 2030 Sustainable Development Agenda.

**Target achievement:** The target for large water suppliers is largely achieved. No statements can currently be made at national level about small and medium-sized water suppliers.

Defined target (classification)	Deadline	Responsibility	Target indicator
In accordance with the Waters Protection Act, allowing over-extraction of groundwater resources to occur for limited periods only (A)	Ongoing	FOEN	Not applicable
Implementation of the recommendation for strategic planning of the water supply, published by the SGWA. (A)	Ongoing		Not applicable
Designating water protection areas and groundwater protection zones as defined in the water protection legislation and the FOEN implementation guidelines in order to protect the quality and quantity of the groundwater, while systematically enforcing the restrictions on use within the groundwater protection zones and areas in accordance with the Waters Protection Ordinance and, where applicable, more comprehensive regulations for groundwater protection zones (enforcement of groundwater protection planning). (A)	Ongoing		% of the population provided by protected catchment, in compliance with the national legislation
Safeguarding groundwater reserves for future water requirements. The cantons designate appropriate groundwater protection areas (future reserves) to safeguard the water supply for future generations (A)	Ongoing		Not applicable
Sustainable agricultural production; conserving natural resources. (A)	Ongoing		Not applicable

**Target:** In accordance with the Waters Protection Act, allowing over-extraction of groundwater resources to occur, at most, for limited periods only.

**Background:** In order to preserve groundwater resources in the long term, the Waters Protection Act only allows short-term periods of over-extraction.

This target contributes to the fulfilment of target 6.6 of the 2030 Sustainable Development Agenda.

**Target achievement:** The cantons monitor the situation and record the corresponding data. The degree of implementation varies between the cantons.

**Target:** Support for strategic planning of the water supply.

**Background:** To date, Switzerland has no agreed requirements for planning the water supply. The federal government has no regulatory authority in this regard. The SGWA association has therefore developed a useful working instrument in the form of a recommendation for strategic planning of the water supply (*Empfehlung zur strategischen Planung der Wasserversorgung*, published 2009: W1005). This recommendation takes into account all the aspects relevant in planning a water supply, including groundwater protection zones and their regulation. In addition to technical aspects, it also covers economic, organisational and structural issues. To

<sup>35</sup> SGWA, Empfehlung W1002 für ein einfaches Qualitätssicherungssystem für Wasserversorgungen (WQS), 2013

support/coordinate the general water supply planning (GWP), the SGWA additionally published recommendation W1011 *Muster-GWP* in 2019.

This target contributes to the fulfilment of target 6b of the 2030 Sustainable Development Agenda.

**Target achievement:** The guideline has been published. The publication is intended primarily for political and financial decision-makers, the respective managers at water suppliers, representatives of engineering offices and teachers.

**Target:** Designating water protection areas and groundwater protection zones as defined in the water protection legislation and the FOEN implementation guidelines in order to protect the quality and quantity of the groundwater, while systematically enforcing the restrictions on use within the groundwater protection zones and areas in accordance with the Waters Protection Ordinance and, where applicable, far-reaching regulations for groundwater protection zones (enforcement of groundwater protection planning).

**Background:** Groundwater protection planning has been anchored in law since 1972.

This target contributes to the fulfilment of targets 6.4 and 6.6 of the 2030 Sustainable Development Agenda.

**Target achievement:** The cantons enforce these regulations. The degree of implementation varies between the cantons. A survey conducted in the cantons in 2017-2018<sup>36</sup> provided an overview of the situation regarding the protection of groundwater in Switzerland. It demonstrates that approximately 80 per cent of the drinking water supplied to the population comes from groundwater with correctly dimensioned protection zones (60 per cent) or from lake water (20 per cent). Conflicts of use in groundwater protection zones are observed throughout Switzerland. Rectifying these conflicts is a major task for the cantons. The development of the situation will constitute an indicator.

**Target:** Safeguarding groundwater reserves for future water requirements. The cantons designate appropriate groundwater protection areas (future reserves) to safeguard the water supply for future generations.

**Background and target achievement:** The different information collected to date demonstrates that there are sufficient groundwater resources available to supply the population with drinking water. More than 400 groundwater protection zones have already been designated. A further, more precise survey of the groundwater protection zones will be conducted.

This target contributes to the fulfilment of targets 6.4 and 6.6 of the 2030 Sustainable Development Agenda.

**Target:** Sustainable agricultural production; conserving natural resources.

**Background:** The federal constitution states that agriculture should pursue sustainable and market-oriented production in order to make a substantial contribution to reliably supplying the population and conserving natural resources. The federal government provides support in this context. One important instrument in agricultural policy with a bearing on water quality is proof of ecological performance (PEP), which is required in order to receive direct payments. It covers aspects of environmental law enforcement, e.g. a balanced use of nutrients (Art. 14, Paragraph 1 WPA, Annex 2.6 Clause 3.1 Ordinance on Risk Reduction related to the Use of certain particularly dangerous Substances, Preparations and Articles [Chemical Risk Reduction Ordinance, ORR-Chem); SR 814.81]), and in some areas goes further, e.g. by requiring crop rotation and a limited selection and targeted application of pesticides. Ecological direct payments provide farmers with an incentive to provide specific ecological services that go beyond generally applicable environmental laws. Switzerland's agricultural policy for the period 2014-2017 refined the existing system of direct payments and placed a more systematic emphasis on non-market-oriented services in agriculture. By adopting the *Federal Act on the Reduction of Risks from the Use of Pesticides* in 2021, Parliament strengthened the protection of water bodies in general and specifically their use as drinking water resources. For example, nutrient losses must be adequately reduced by 2030 and the risks to water bodies from the use of pesticides must be reduced by 50 per cent by 2027 compared to 2012-15. As a result, the Federal Council plans to adapt a package of agricultural ordinances by 2023 as part of the *Clean Water* action plan. This will further restrict the selection of active substances in pesticides in the ecological performance certificate, make measures to prevent run-off and drift

<sup>36</sup> BAFU (2018) Schutz der Grundwasserfassungen in der Schweiz – Stand des Vollzugs. Bericht zur Umfrage bei den kantonalen Fachstellen. [https://www.bafu.admin.ch/dam/bafu/de/dokumente/grundwasser/fachinfo-daten/schutz\\_der\\_grundwasserfassungen\\_%20in\\_der\\_schweiz\\_-\\_stand\\_des\\_vollzugs.pdf.download.pdf/BAFU\\_Nov\\_18\\_Schutz\\_der\\_Grundwasserfassungen\\_in\\_der\\_Schweiz.pdf](https://www.bafu.admin.ch/dam/bafu/de/dokumente/grundwasser/fachinfo-daten/schutz_der_grundwasserfassungen_%20in_der_schweiz_-_stand_des_vollzugs.pdf.download.pdf/BAFU_Nov_18_Schutz_der_Grundwasserfassungen_in_der_Schweiz.pdf)

compulsory, promote resource-conserving production systems and tighten the requirement for a balanced nutrient balance. In 2020, the Federal Council adopted the *Dispatch on Agricultural Policy from 2022 (AP22+)*. Among other things, it proposes a regionalisation of the ecological performance certificate and contributions for site-adapted agriculture. Parliament has decided to suspend discussion of AP22+ until the Federal Council has presented a report on the future direction of agricultural policy. An overall strategy is required that goes beyond the time horizon of AP22+.

This target contributes to the fulfilment of targets 2, 6.3 and 6.6 of the 2030 Sustainable Development Agenda.

**Target achievement:** Agricultural environmental monitoring tracks environmentally relevant developments in agriculture on an ongoing basis and draws attention to them in annual agricultural reports. A status report<sup>37</sup> on the achievement of environmental goals for agriculture was published in 2016. None of the environmental goals has been fully achieved to date. For instance, many surface waters, predominantly small ones, are so heavily polluted with agricultural pesticides (see Section 1.10.2) that the living conditions required for sensitive aquatic organisms to survive are compromised. Moreover, the agricultural nitrogen surplus has remained virtually unchanged at the same high level for around 20 years. The measures adopted by Parliament and planned by the Federal Council, if systematically implemented in terms of pesticides from 2023, will lead to a significant improvement in achieving targets. In regard to nutrients, especially as far as the nitrogen surplus is concerned, the achievement of targets remains open and depends on the specific Federal Council targets and the future measures to be taken by the Swiss government and relevant sectors.

## 2.8. Application of recognised good practice to the management of sanitation [Art. 6, Paragraph 2 (f)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Recognised practice for communal sanitation is defined in, and ensured by, the FOEN recommendations and Swiss Water Association (VSA) guidelines. For industrial wastewater, the latest technology according to the Waters Protection Ordinance and the decisions and recommendations of international water protection commissions apply (A)	Completed	FOEN	Recommendations published
Draining the total sealed surface area in housing areas according to GDPs (A)	Ongoing		Not applicable

**Target:** Recognised practice for communal sanitation is defined in, and ensured by, the FOEN recommendations and Swiss Water Association (VSA) guidelines. For industrial wastewater, the latest technology according to the Waters Protection Ordinance and the decisions and recommendations of international water protection commissions apply.

**Background:** The FOEN works with professional associations to develop implementation aids for various aspects relating to sanitation. If necessary, the FOEN also issues its own guidelines, such as the *Groundwater protection guidelines*.<sup>38</sup>

Various guidelines and recommendations have also been issued in connection with international agreements such as the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic or the International Commission for the Protection of the Rhine (ICPR).<sup>39</sup>

This target contributes to the fulfilment of targets 6.3, 6.5 and 6.6 of the 2030 Sustainable Development Agenda.

<sup>37</sup> FOEN and FSVO (2016). Umweltziele Landwirtschaft – Statusbericht 2016. <https://www.bafu.admin.ch/bafu/de/home/themen/biodiversitaet/publikationen-studien/publikationen/umweltziele-landwirtschaft-statusbericht-2016.html>

<sup>38</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/wegleitung-grundwasserschutz.html>

<sup>39</sup> <http://www.iksr.org/en/>

**Target achievement:** The cantons monitor the situation and possess corresponding data. The VSA carried out a comprehensive survey in 2011 in order to obtain an overview of the key data relating to sanitation at the national level. The report on costs and services relating to sanitation entitled *Kosten und Leistungen der Abwasserentsorgung* summarises the results.<sup>40</sup> An up-to-date report with the key figures for 2021 is currently being prepared.

**Target:** Draining the total sealed surface area in housing areas according to GDPs.

**Background:** The General Drainage Plan (GDP) is the communes' central planning instrument for municipal drainage and forms the basis for the extension, adaptation, maintenance and repair (preservation) of the public sewage network. It should guarantee adequate water protection in communes and effective draining of housing areas. Every commune is required by law to produce a GDP. This process is subsidised by the federal government and by cantons. The subsidies are mostly dependent on compliance with binding deadlines.

This target contributes to the fulfilment of targets 6.3, 6.5 and 6.6 of the 2030 Sustainable Development Agenda.

**Target achievement:** The creation of the GDPs has largely been completed. Only a few communes do not yet have a completed GDP.

## 2.9. Discharges of untreated wastewater [Art. 6, Paragraph 2 (g) (i)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Not allowing contaminated wastewater to be discharged untreated or allowed to leach into water bodies in Switzerland (A)	Ongoing	FOEN	Not applicable

**Target:** Not allowing contaminated wastewater to be discharged untreated or allowed to leach into water bodies in Switzerland.<sup>41</sup>

**Background:** According to Article 5 of the Waters Protection Ordinance (WPO), the cantons are responsible for drawing up GDPs which guarantee adequate water protection in communes and effective municipal drainage (see Section 2.8).

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** Identifying and rectifying inappropriate sewer connections by means of GDPs. The GDPs therefore aid implementation of this ban. Varying degrees of progress have been made on implementing these measures to date, since an initial GDP was not completed at the same time in all cantons.

## 2.10. Storm water [Art. 6, Paragraph 2 (g) (ii)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Putting appropriate measures in place to prevent direct infiltration of agricultural pesticides and nutrients in runoff from farmyards and open fields and from drainage systems. (A)	2023	FOAG	Implementation of national pesticide action plan
Carrying out a data survey of untreated storm water overflows (C)	2021	FOEN	Completed by 2021

**Target:** Putting appropriate measures in place to prevent direct infiltration of plant protection products (PPPs) and nutrients in runoff from farmyards and open fields and from drainage systems.

<sup>40</sup> <https://vsa.ch/Mediathek/kosten-und-leistungen-der-abwasserentsorgung/>

<sup>41</sup> Art. 7 Waters Protection Act, Art. 8 Waters Protection Ordinance

**Background:** Enforcement of measures stipulated in the water protection legislation is regulated under Switzerland's federal system, i.e. differently in each of the 26 cantons. The federal government issues implementation guidelines with the aim of standardising and reinforcing implementation. In the agricultural sector, there are implementation guidelines on structural water protection, the use of PPPs, the use of nutrients and fertilisers, biogas plants and soil protection, and the legal basis for water protection and air pollution control. In addition, the federal government is strengthening enforcement by the cantons by supporting the Conference of Environmental Offices (KVU) in harmonising and promoting the basic inspections for the ecological performance certificate (ÖLN) in the area of water protection. These inspections will include the drainage of filling and washing areas for PPP spraying equipment. The action plan for risk reduction and sustainable use of PPPs adopted by the Federal Council in 2017 includes measures on farmyard and field road drainage and drainage systems. For example, to prevent the selective introduction of PPPs, the national government and cantons have been supporting such filling and washing areas since 2018 by providing structural improvement contributions. In 2020, the Conference of Agricultural Offices (KOLAS) and the KVU, together with the *Plant protection products and water bodies* platform, published the intercantonal recommendation for filling and washing stations. In 2021, the Federal Law on the Reduction of Risks from the Use of Pesticides was adopted.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** The implementation guidelines on nutrients and the use of fertilisers in agriculture entitled *Nährstoffe und Verwendung von Dünger in der Landwirtschaft* were published in 2012. The implementation guidelines on the use of pesticides in agriculture entitled *Verwendung von PSM in der Landwirtschaft* were published in 2013. By 2020, the inspecting of filling and washing stations for PPP sprayers had started in more than half of the cantons. If the adopted and planned measures for reducing emissions and the use of pesticides and for better protecting the waters are systematically implemented, they could make a significant contribution to achieving the target.

### 2.10.1. Discharges of untreated storm water overflows

**Possible target:** Carrying out a data survey of untreated storm water overflows.

**Background:** Detailed guidelines for the management of storm water in Switzerland have been issued by the VSA.<sup>42</sup> As a general rule, non-polluted storm water must be allowed to infiltrate into the ground if permitted by local conditions. This practice will be introduced in stages in the course of drafting and updating the General Drainage Plans (GDPs). This will reduce the quantity of storm water in mixed water sewers in the long term and thus the frequency of discharges of untreated storm water overflows into waters. At the same time, however, it is important to ensure that the groundwater is not put at risk due to improper or unlawful leaching. However, no nationwide data are currently available on the frequency, quantities and pollution levels of discharges of untreated storm water overflows.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** New guidelines on discharges of storm water overflows into water bodies during rainy weather entitled *Abwassereinleitungen in Gewässer bei Regenwetter* have been produced, in which the design and dimensions of storm water relief systems and storm water tanks have been revised in line with a new, impact-oriented approach. The guidelines will be used for new infrastructure and, in particular, infrastructure requiring remediation. Data on discharges from combined sewer overflows are currently being collected as part of a national key indicator survey.

## 2.11. Quality of discharges from treatment plants [Art. 6, Paragraph 2 (h)]

Defined target (classification)	Deadline	Responsibility	Target indicator
100% of wastewater treatment plants fulfilling the requirements for discharges of communal wastewater specified in the Waters Protection Ordinance. Treating industrial wastewater according to the latest technology (A)	Ongoing	FOEN	Not applicable
	2021		Not applicable

<sup>42</sup> <https://vsa.ch/fachbereiche-cc/siedlungsentwaesserung/regenwetter/>

Defined target (classification)	Deadline	Responsibility	Target indicator
Optimising central data capture with respect to wastewater treatment at federal level. (B)			

**Target:** One hundred per cent of wastewater treatment plants fulfilling the requirements for discharges of communal wastewater specified in the Waters Protection Ordinance. Treating industrial wastewater according to the latest technology.

**Background and target achievement:** By law, cantonal authorities verify periodically whether enterprises which discharge industrial wastewater into public sewers and wastewater treatment plants which discharge wastewater into public sewers or into a body of water are complying with the requirements. They adjust the authorisations if necessary and order the required measures. The cantons possess the corresponding data. The degree of target achievement has not so far been established at national level.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Proposed target:** Optimising central data capture with respect to wastewater treatment at federal level.

**Background:** In Switzerland, more than 700 central WWTPs treat the country's wastewater to a high technical standard. For this reason, the current emphasis is on preserving the value and performance of these plants and on optimising operational and organisational processes. It may be necessary to expand the capacity of the WWTPs and to incorporate further treatment stages in order to equip existing plants for the future (see Sections 1.6.1 and 1.10.2.1). An implementation guideline defines the reporting of operational data from WWTPs, taking this into account.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** Based on the Federal Act on Geoinformation (GeolA), which has been in force since 2008, two data models (WWTP and GDP) were created in 2017, which establish binding federal legal standards at national level for the recording, modelling and exchange of federal government geodata. This will improve access for federal offices, the business community and the population to these data, which are recorded and managed at great expense. A first collection of data is ongoing and is scheduled for completion by mid-2022.

## 2.12. Disposal or reuse of sewage sludge [Art. 6, Paragraph 2 (i), first part]

Defined target (classification)	Deadline	Responsibility	Target indicator
The agricultural use of sewage sludge has been banned in Switzerland since 2008	None	FOEN	Not applicable

The agricultural use of sewage sludge has been banned in Switzerland since 2008.<sup>43</sup> Sewage sludge is burned at incineration plants, cement works and waste incineration plants. Target for 2026: The Waste Ordinance (Ordinance on the Avoidance and the Disposal of Waste, ADWO; SR 814.600) saw the introduction of an obligation to recover phosphorus from sewage sludge and carcass meal with a transitional period lasting until 2026.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Background and target achievement:** Phosphorus is a non-renewable and non-substitutable resource. FOEN studies show that waste areas are phosphorus traps; phosphorus ends up in landfills together with bottom ash from waste incineration plants or in building materials due to the use of sewage sludge to generate heat in cement works. This unused potential amounts to around 6,000 tonnes of phosphorus per year, about the same volume as is imported as mineral fertilisers. With the obligation to recover phosphorus, this potential is set to be exploited. The ADWO does not prescribe a procedure for recovering phosphorus, although the FOEN describes the latest phosphorus recovery techniques in an implementation guideline. This ensures that phosphorus is recovered in compliance with a standard that applies to all providers offering these techniques.

<sup>43</sup> Annex 2.6 ORRChem

This implementation guideline is being compiled in collaboration with cantons, federal offices and business organisations.

### 2.13. Quality of wastewater used for irrigation purposes [Art. 6, Paragraph 2 (i), second part]

Defined target (classification)	Deadline	Responsibility	Target indicator
According to Art. 7 of the Waters Protection Act (WPA) and Art. 8 of the Waters Protection Ordinance (WPO), contaminated wastewater may not be used for irrigation purposes in Switzerland. Therefore no targets are set in this regard.	None	FOEN	Not applicable

According to Art. 7 of the Waters Protection Act (WPA) and Art. 8 of the Waters Protection Ordinance (WPO), contaminated wastewater may not be used for irrigation purposes in Switzerland. No targets are therefore set for this parameter.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

### 2.14. Quality of waters used as sources for drinking water [Art. 6, Paragraph 2 (j), first part]

Defined target (classification)	Deadline	Responsibility	Target indicator
The quality of groundwater used or intended for use as drinking water meets the requirements of Annex 2 WPO (A)	None	FOEN	Not applicable
Reducing the nitrate levels in groundwater (projects according to Article 62a WPA) (A)	None	FOAG, FOEN	
Improving water protection enforcement: increasing information and supervision (B)	None		
Fulfilling the quality requirements of the Waters Protection Ordinance, Annex 2 (A)	None		
Comprehensively recording surface water quality in Switzerland by means of the harmonised <i>Methods for assessing the ecological status of rivers</i> and by corresponding methods for the lakes (A)	2022		

#### 2.14.1. Groundwater

**Target:** The quality of groundwater used or intended for use as drinking water meets the requirements of Annex 2 WPO.

**Background:** The quality of waters is continuously being improved with all manner of measures, including planning-related water protection and nitrate or pesticide projects (see next target).

This target contributes to the fulfilment of target 6.1 of the 2030 Sustainable Development Agenda.

**Target achievement:** Nationwide, 79 per cent of drinking water is taken from groundwater and around 36 per cent of this is supplied without treatment.<sup>44</sup> Fifty-three per cent of the groundwater is treated using a simple, single-stage method (often a preventative measure, such as disinfection using chlorine or UV). The National Groundwater Quality Monitoring Network (NAQUA) is monitoring the extent to which the groundwater quality requirements set out in the Waters Protection Ordinance are being complied with at national level. Nitrates

<sup>44</sup> Freiburghaus M. (2021). W15001 Statistische Erhebungen der Wasserversorgungen in der Schweiz zum Betriebsjahr 2020. SGWA



and various organic substances such as plant protection products or their metabolites and halogenated hydrocarbons are having a negative impact on groundwater quality at many measuring sites, mainly on the Swiss Plateau (see Section 3.6.1.2).

The implementation guideline on environmental protection in agriculture brings together the provisions of water protection legislation applicable to agriculture and explains unclear legal terms. These include the provisions for protecting groundwater. The implementation guideline reinforces implementation and achieves a more uniform standard throughout Switzerland. It contains various modules including construction-related environmental protection, nutrients and the use of fertilisers and pesticides.

If they breach the quality requirements for waters, cantons are obliged to clarify the extent and causes of the contamination, to determine possible measures and implement these if they are deemed reasonable and expedient. As in various other areas, the extent of enforcement varies widely from canton to canton. Some remediation projects receive funding from federal sources (Art. 62a WPA, contaminated sites, see following targets).

In addition, the Federal Act on the Reduction of Risks from the Use of Pesticides adopted in 2021 requires that groundwater contamination with pesticides and their degradation products be reduced by 50 per cent by 2027 compared to the average for 2012-2015. If limits for pesticides or their degradation products are repeatedly and widely exceeded, the products' licences must be reviewed and adjusted. In addition, only pesticides whose use does not lead to concentrations of active substances and degradation products above 0.1 µg/l in groundwater may be used in inflow areas.

**Target:** Reducing the nitrate levels in groundwater (projects according to Article 62a WPA)

**Background:** If nitrate concentrations in excess of 25 mg/l (the figure stipulated in Annex 2 WPO) are detected in a groundwater body used or intended for use as drinking water, the cantons are required to draw up and implement remediation measures in accordance with the water protection legislation. Under Article 62a WPA, the federal government pays compensation for agricultural measures if they are not economically viable. Implementation takes the form of specific projects in affected catchment areas. The costs are compensated primarily by the federal government but, to a lesser extent, by the cantons, communes or water suppliers as well.

This target contributes to the fulfilment of targets 6.1 and 6.6 of the 2030 Sustainable Development Agenda.

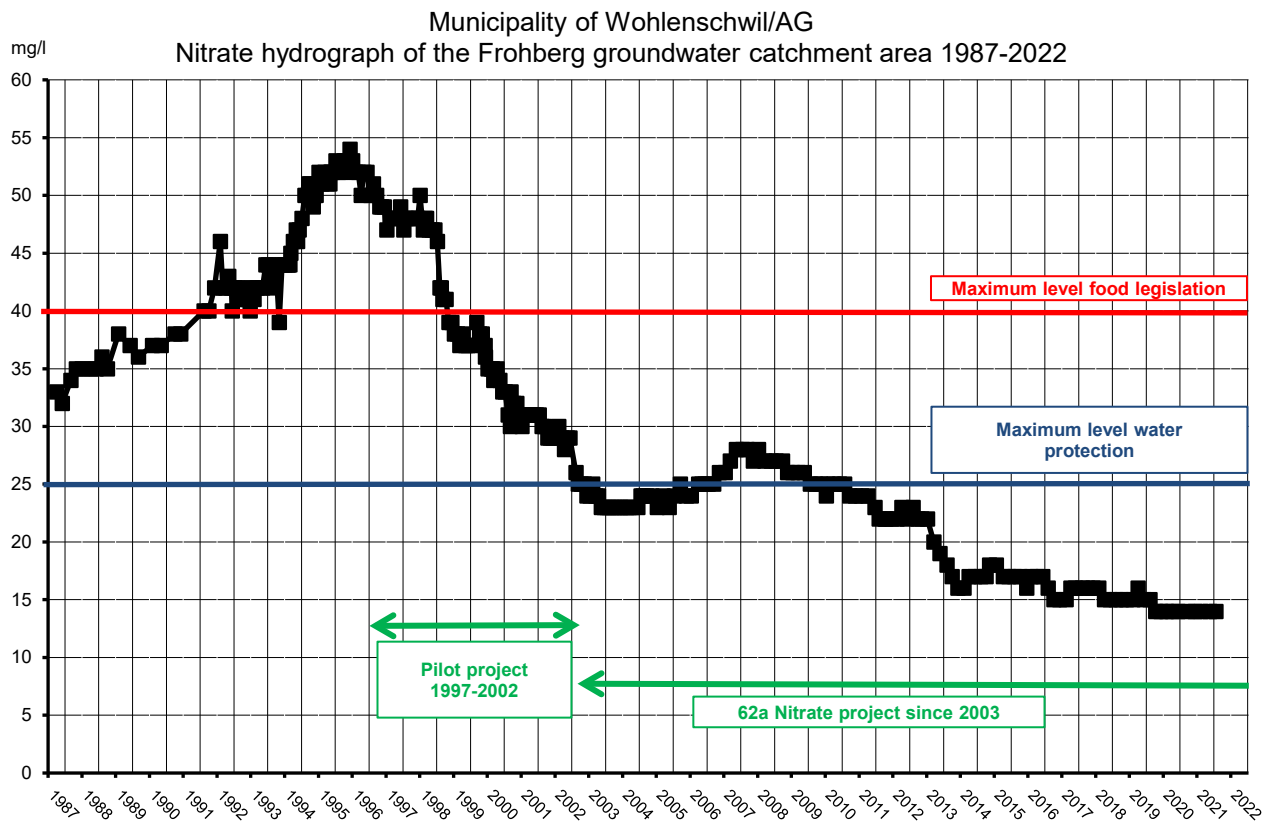
**Target achievement:** When implemented consistently, projects in accordance with Article 62a WPA prove successful, as shown by an example (see box below), although groundwater remediation of this kind can take several decades if the groundwater is retained for a long time. Once the target situation has been achieved, the measures must be maintained permanently. To ensure the success of the projects, the enforcement is currently being adapted.

In view of the current nitrate situation in groundwater, however, the cantons make little use of this option. In 2021, for example, only 24 nitrate projects were underway, for which the federal government paid CHF 2.4 million. The legal requirement of 40 mg/l nitrate in drinking water can also be met by abandoning the contaminated drinking water catchment area or combining polluted water with uncontaminated water from other sources.

Comprehensively reducing the negative effect on waters can only be achieved by decreasing the surplus of nutrients. The Federal Law on the Reduction of Risks from the Use of Pesticides requires the Federal Council to define the goals for adequately reducing nutrient surpluses by 2030. However, simply reducing nutrient-intensive soil management, e.g. through a general reduction in nutrient surpluses, will not solve the problem of nitrate in groundwater in inflow areas with a lot of arable and vegetable farming. Further targeted incentives or measures in the affected inflow areas are necessary.

### Nitrate project under Article 62a WPA: Wohlenschwil, canton of Aargau

An illustrative example of a targeted nitrate remediation project is Wohlenschwil (canton of Aargau), where intensive efforts have been made to reduce nitrate leaching since 1996. In addition to measures such as maintaining a green cover in winter or introducing no-till systems, around 22 hectares of arable land have been converted to pasture, with the result that about 45 of the 62 hectares of agricultural land in the drainage basin are now used as grassland.



If the measures are taken in the correct place, it will take a few years to decades, depending on the natural conditions, until the water quality requirements are met. These requirements have already been met in various projects. To prevent the water quality from deteriorating again, the measures must be maintained permanently. After the project development and remediation phase, a new safeguard phase should therefore be introduced. The legal options for this and how the agricultural measures are to be compensated in the safeguard phase are to be shown in a new module of the Implementation Guide for Environmental Protection in Agriculture. The same problem is also true of other waters that have been contaminated by agriculture (e.g. excessive amounts of phosphorus in lakes in central Switzerland).

**Proposed target:** Improving water protection enforcement: increasing information and supervision.

**Background:** In some areas, there is a backlog in the designation and management of groundwater protection zones. This proposed target was developed as part of the Federal Council's report on the management of local water shortages in Switzerland.<sup>45</sup>

This target contributes to the fulfilment of target 6.6 of the 2030 Sustainable Development Agenda.

<sup>45</sup> FOEN 2012: Umgang mit lokaler Wasserknappheit in der Schweiz. Federal Council's report on the postulate *Wasser und Landwirtschaft. Zukünftige Herausforderungen*. <https://www.bafu.admin.ch/bafu/en/home/topics/water.html>

## 2.14.2. Surface waters

**Target:** Fulfilling the quality requirements of the Waters Protection Ordinance, Annex 2.

**Background:** Monitoring of the quality of surface waters is carried out by the cantons and coordinated at national level.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** Over 20 per cent of drinking water comes from surface waters, mainly from lakes and larger rivers. Drinking water supply from surface waters is monitored and is assured thanks to good treatment facilities.

Nutrient loads in surface waters have been greatly reduced since the 1970s due to intensive efforts to protect bodies of water. Water quality has improved significantly. The larger rivers now meet the legal requirements. However, nutrient levels in small and medium-sized watercourses not used for drinking water purposes still exceed the limits in 5 to 30 per cent of cases (see Section 3.6.1.1). In addition, several lakes are still over-fertilised.<sup>46</sup> In many lakes, the drop in phosphorus concentrations is resulting in improved oxygenation of the deep waters. This is an ongoing process. However, in over 60 per cent of the larger lakes, the 4 mg of oxygen per litre requirement stipulated by the Waters Protection Ordinance is not yet being achieved, or is being achieved only thanks to artificial aeration. Even in lakes that have recovered, oxygen levels in the deep water may fall again in the future, as some lakes have poorer intermixing due to climate change (rising water temperatures).<sup>47</sup>

The legal requirements for water quality with regard to organic micropollutants are generally met in lakes and large watercourses. In small and medium-sized watercourses not used for drinking water purposes, however, these requirements are often exceeded (see Section 3.6.1.1).

**Target:** Comprehensively recording surface water quality in Switzerland by means of the harmonised methods for assessing watercourses (*Methoden zur Erhebung und Beurteilung der Fliessgewässer*) and by corresponding methods for the lakes.

**Background:** The harmonised *Methoden zur Erhebung und Beurteilung der Fliessgewässer*<sup>48</sup> provide standardised methods for investigating and assessing the state of watercourses in Switzerland. There is also a plan for investigating and assessing the state of the lakes. In levels of different processing intensity (stages), the methods record the structural and hydrological, biological, chemical and ecotoxicological aspects of water quality. The developed methods serve as implementation aids for the cantonal authorities.

**Target achievement:** The methods for watercourses that have already been prepared will be applied by the cantons as part of the cantonal monitoring of waters. Since 2011, the methods have also been applied at national level at over 100 locations across Switzerland as part of the *National Surface Water Quality Monitoring Programme* (NAWA).<sup>49</sup> This project is intended to form the basis for documenting and evaluating the condition and development of Swiss surface waters at national level (initially only in watercourses, and subsequently in lakes as well).

In 2018, the NAWA was supplemented with the collection of data concerning micropollutants, particularly pesticides in small watercourses. In monitoring the quality of water resources, it is also important to ensure that laboratories capable of carrying out the water analyses are available in the long term. A standardised method for the assessment of micropollutants is also currently being developed.

## 2.15. Quality of waters used for bathing (rivers and lakes) [Art. 6, Paragraph 2 (j), second part]

<sup>46</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/fachinformationen/zustand-der-gewaesser/zustand-der-seen/wasserqualitaet-der-seen.html>

<sup>47</sup> BAFU (2022) Gewässer in der Schweiz. Zustand und Massnahmen. <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/gewaesserbericht.html>

<sup>48</sup> <http://www.modul-stufen-konzept.ch>

<sup>49</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/zustand/wasser--messnetze/nationale-beobachtung-oberflaechengewasserqualitaet--nawa-.html>

Defined target (classification)	Deadline	Responsibility	Target indicator
Revising the existing recommendation on recording and assessing the quality of the water in bathing lakes and rivers, in line with EU Directive 2006/7/EC (B)	Earliest 2024	FOEN	Not applicable

**Proposed target:** Revising the existing recommendation on recording and assessing the quality of the water in bathing lakes and rivers, in line with EU Directive 2006/7/EC.

**Background:** Since the 1960s, efforts have been made in Switzerland to protect the health of bathers by the hygiene assessment of bathing lakes and rivers.

The quality of bathing water is monitored by the cantonal laboratories. In view of the experience acquired over the past few years in the practical implementation of hygiene assessments of bathing lakes and rivers, and in view of developments in microbiological methods, it was decided to revise the Swiss recommendation<sup>50</sup> on the basis of EU Directive 2006/7/EC.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** A working group, consisting of representatives of the FOPH, FOEN and the cantonal laboratories, has revised the recommendation of 1991 on the basis of EU Directive 2006/7/EC and in consultation with the cantonal laboratories.<sup>51</sup> The data collected show that people need have no concerns about bathing in almost any lake or river in Switzerland. Thanks to a range of protective measures and major efforts in terms of wastewater treatment that have been undertaken in recent decades, the hygienic water quality in Swiss rivers and lakes is now very good.

## 2.16. Quality of waters used for aquacultures [Art. 6, Paragraph 2 (j), third part]

Defined target (classification)	Deadline	Responsibility	Target indicator
Since no significant aquacultures exist in Switzerland, no targets are set for this parameter.	None	FOEN	Not applicable

Since no significant aquacultures exist in Switzerland, no targets are set for this parameter.

## 2.17. Application of recognised good practice to the management of enclosed waters used for bathing [Art. 6, Paragraph 2 (k)]

Defined target (classification)	Deadline	Responsibility	Target indicator
Lay down a Swiss Bathing Water Ordinance at national level (A).	2018	SFVO	Adoption of the new legislation

**Target:** Producing a Bathing Water Ordinance for Switzerland.

**Background and target achievement:** When the Foodstuffs Act was completely revised, a new Ordinance on Drinking Water and Water in Public Baths and Shower Facilities (DWBSO) was enacted. In particular, this sets out national requirements for water in public swimming baths, including whirlpools, thermal baths, mineral baths, salt-water baths, spa baths, therapeutic baths, children's paddling pools and similar facilities, as well as public swimming baths with biological regeneration. This ordinance entered into force on 1 May 2017.

## 2.18. Identification and remediation of particularly contaminated sites [Art. 6, Paragraph 2 (l)]

<sup>50</sup> SAEFL, Empfehlungen für die hygienische Beurteilung von See- und Flussbädern, 1991

<sup>51</sup> FOEN, FOPH, Beurteilung der Badegewässer, Empfehlungen zur Untersuchung und Beurteilung der Badewasserqualität von See- und Flussbädern, 2013. <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/publikationen-studien/publikationen-wasser/beurteilung-der-badegewaesser.html>

Defined target (classification)	Deadline	Responsibility	Target indicator
Recording, investigating and remediating contaminated sites. The cantons fulfil their obligations in accordance with the Contaminated Sites Ordinance concerning local pollutants that could jeopardise waters, soil and air (A)	2007	FOEN	All the polluted sites are registered
	2025		Investigations of the sites are finished
	2040		Remediation is finished

**Target:** Recording, investigating and remediating contaminated sites. The cantons fulfil their obligations in accordance with the Contaminated Sites Ordinance concerning local pollutants that could jeopardise waters.

**Background:** According to the Ordinance on the Remediation of Contaminated Sites (Contaminated Sites Ordinance, CSO; SR 814.680) and the Waters Protection Ordinance (WPO), if the cantons detect any pollutants originating from contaminated sites (landfills, industrial sites or sites of accidents) which could jeopardise waters, they must determine their causes and define and implement corresponding measures.

This target contributes to the fulfilment of target 6.3 of the 2030 Sustainable Development Agenda.

**Target achievement:** The management of contaminated sites in Switzerland is on target: both the federal government's and the cantons' registers of contaminated sites have been completed and are available on the Internet.<sup>52</sup> There are around 38,000 contaminated sites in total and approximately 4,000 of these may require remediation. There were originally almost 16,000 sites which needed to be investigated; by the end of 2020, approximately 11,000 of them had already been investigated and classified by the authorities. More than 1,500 remediation projects – including major cases such as the landfill sites in Kölliken, Bonfol and Monthey (Pont Rouge landfill site) – have already been completed. The authorities are dedicating substantial resources to dealing with contaminated sites.<sup>53</sup>

## 2.19. Effectiveness of systems for managing, developing, protecting and using water resources [Art. 6, Paragraph 2 (m)]

Defined target (classification)	Deadline	Responsibility	Target indicator
The federal government promotes integrated river basin management (A) and aquatic restoration.	2090	FOEN	25% of waters in a bad morphological state must be restored
Restoring one quarter of the heavily engineered waters back to natural conditions, as much as possible. Allocate adequate space to all waters, which may only be managed extensively (no fertilisers, no pesticides) and as ecological compensation areas (biodiversity promotion areas).			All water bodies must be allocated adequate space for natural development
In addition, mitigating the negative effects of hydroelectric power production (hydropeaking, bed-load balance, accessibility for fish) as far as possible within 20 years from 2011 (A)	2030		Mitigate negative impact of hydropower production in a defined number of hydropower plants

<sup>52</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/altlasten/fachinformationen/altlastenbearbeitung/stand-der-altlastenbearbeitung-in-der-schweiz/online-kataster-von-kantonen-und-bundesstellen.html>

<sup>53</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/altlasten/fachinformationen/altlastenbearbeitung/stand-der-altlastenbearbeitung-in-der-schweiz.html>

**Target:** The federal government promotes integrated river basin management.

Background: Although Switzerland has not adopted the EU's Water Framework Directive (Directive 2000/60/EC), the federal government sees great potential benefit in the integrated management of water resources. As a member of various international commissions (see Section 5.7.2), Switzerland is working with its neighbouring countries and thus indirectly applies certain principles of the Water Framework Directive.<sup>54</sup> The aim in the long term is to produce a wide-ranging strategy for the management of water resources, waters and water infrastructure. The efforts to promote integrated water management are based on partnerships between the various users, which take into account all the interests of water management. Certain drainage basins are already being managed according to these principles.

This approach particularly highlights conflicting targets, e.g. the use of water to generate hydroelectric power versus the need to protect waters/landscapes, and the space needed for the waters to perform their function and for renaturing waters (see next target) versus agriculture, and, to a significantly lesser extent, protecting groundwater as a resource for drinking water. The principles of integrated river basin management, which take a wide-ranging, long-term and cross-sectoral approach, can provide greater freedom in the search for solutions in this context.

This target contributes to the fulfilment of target 6.5 of the 2030 Sustainable Development Agenda.

**Target achievement:** River basin management offers an opportunity for taking an efficient approach to new cross-sectoral challenges in the area of water management, whether these are related to climate change or the pressure resulting from settlements or use. Between 2008 and 2017, a national *Integrated River Basin Management*<sup>55</sup> working group coordinated activities in order to devise basic principles for integrated river basin management.

The federal government is taking action at various levels in order to get one step closer to implementing the principles of river basin management. This action has included supporting pilot projects at cantonal level. The principles were explained in a mission statement. A practical guideline fleshes out these principles, describes the methodical approach, illustrating this through case studies, and offers resources. In order to implement this, committed stakeholders are required at all levels who are willing to align their activities with the commonly devised targets for the river basin.

Some cantons have already enshrined the management of waters in river basins in their legislation, initiated corresponding processes and achieved success in implementing projects.

**Target:** Transforming some of the heavily engineered waters into as natural a condition as possible within a few generations, and defining an adequate area for all waters which may only be managed extensively (biodiversity contributions can be claimed for agricultural land). In addition, eliminating the negative effects on waters of hydroelectric power generation (hydropeaking, bed-load balance, accessibility for fish) as far as possible until 2030.

**Background:** The revitalisation of waters should restore their natural functions and strengthen their social benefit, while at the same time eliminating the major negative environmental effects arising from hydroelectric power generation (hydropeaking, inadequate connectivity and disrupted bed-load balance). These aims were formulated in a parliamentary counter-proposal to an initiative of the Swiss Federation of Anglers.

This target contributes to the fulfilment of target 6.6 of the 2030 Sustainable Development Agenda.

**Target achievement:** The revised Waters Protection Act came into force on 1 January 2011, with the corresponding changes to the Waters Protection Ordinance taking effect on 1 June 2011. In order to support the implementation of the new requirements, they were explained in detail in modular implementation guidelines (with modules covering the aspects of revitalisation, fish migration, hydropeaking and bed-load balance) and as a working aid (for the aquatic environment).<sup>56</sup> In 2014, the cantons completed their strategic planning. An important result of this work is the definition of the hydropower plants/obstacles for which rehabilitation

<sup>54</sup> <https://www.eea.europa.eu/soer/2010>

<sup>55</sup> <https://wa21.ch/themen/einzugsgebietsmanagement/>; <https://www.bafu.admin.ch/bafu/en/home/topics/water.html>

<sup>56</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/fachinformationen/massnahmen-zum-schutz-der-gewaesser/renaturierung-der-gewaesser/vollzugshilfe--renaturierung-der-gewaesser-.html>

measures (regarding hydropeaking, bed-load balance and accessibility for fish) need to be studied and implemented by 2030 and of those river stretches that should be primarily restored. Ensuring sufficient, ecologically valuable aquatic environments is proving to be very challenging, especially due to the resistance in agricultural circles.

The revision of the Waters Protection Act in 2011 represents one of the most important stages in Switzerland's water protection efforts. Currently about 40 per cent of the watercourses in central Switzerland, and more than 80 per cent in urban areas, are engineered. Energy is generated from more than 90 per cent of all usable waters. Water bodies should once again be given more space so that they can perform their natural functions. The changes to the Waters Protection Act are an important step towards ensuring that watercourses and lake shores in Switzerland can become more natural again and can contribute to maintaining biodiversity by becoming species-rich habitats. Moreover, this will increase the benefit they provide to the population in the form of recreation areas and tourist attractions.

## 2.20. Risk-based inspections of water suppliers

Defined target (classification)	Deadline	Responsibility	Target indicator
Implementation of a risk-based evaluation of the drinking water suppliers by the cantonal laboratories	Ongoing	FSVO	Implementation through the enforcement authorities

The supervisory authorities, acting through the Swiss Association of Cantonal Chemists, have published a plan for *Determining inspection frequencies in drinking water supplies based on the setting of static and dynamic criteria*.<sup>57</sup> This document describes the procedure for evaluating the risk associated with the supply of drinking water by the official supervisory authorities. It applies to all forms of drinking water distribution, irrespective of whether an HACCP process or Good Manufacturing Practice guidelines (SGWA Directive W 12) are used.

This target contributes to the fulfilment of target 6.6 of the 2030 Sustainable Development Agenda.

<sup>57</sup> <https://www.blv.admin.ch/blv/de/home/lebensmittel-und-ernaehrung/lebensmittelsicherheit/verantwortlichkeiten.html>

### 3. Indicators

To achieve a degree of consistency throughout the UNECE/WHO-EURO region, the contracting parties of the Protocol reached an agreement to supply information on several indicators that were determined jointly. These indicators are closely related to the areas under Article 6 Paragraph 2 of the Protocol, for which targets should be set. Data for Switzerland regarding these indicators are presented below in the template for summary reports under the Protocol<sup>58</sup> on Water and Health and the guidelines for reporting and evaluation of progress.<sup>59</sup>

#### 3.1. Quality of the drinking water supplied

##### 3.1.1. Framework conditions

The food control authorities in Switzerland analyse over 50,000 drinking water samples (official samples and self-inspection samples for water suppliers) each year and carry out regular inspections of water suppliers. They also obtain information about problems with drinking water via complaints from consumers. Even if the food control authorities do not supervise drinking water around the clock and carry out their inspections based on risk, they still have a good overview of the quality of the drinking water.

The data survey for the following parameters was sent to all cantonal food enforcement authorities. For the first time, data were collected on chromium VI and micropollutants, i.e. PPPs and their degradation products. The survey did not ask for individual measurements, but rather for summary statements in relation to the water supplies. For example, in the case of microbiological contamination, respondents were asked how many water supplies had problems with faecal pathogens, i.e. *Escherichia coli* and enterococci, and how many drinking water consumers were affected by the contamination.

For the first time, it was possible to compile data from all 26 cantons. The information relates to 4,163 water facilities supplying 8.6 million residents, i.e. 100 per cent of the Swiss population. It is not possible to differentiate between urban and rural areas using the available data. However, such differentiation is not relevant for Switzerland, as access to water and sanitation is guaranteed for the entire population.

The results of this first complete survey of Switzerland cannot be compared with the estimates from previous reports, but will allow trends to be identified for future reporting periods.

##### 3.1.2. Microbiological parameters

###### *E. coli*

- 26 cantons submitting reports
- 87,400 measurements in 3 years
- 1,182 results above the maximum threshold = 1.4%
- 737,998 residents affected in the short term by levels above the maximum threshold = 2.9% of residents in the measurement area per year

Legal requirement: not detectable per 100 ml of water

###### Enterococci

- 26 cantons submitting reports
- 86,909 measurements in 3 years
- 1,365 results above the maximum threshold = 1.6%
- 840,085 residents affected in the short term by levels above the maximum threshold = 3.3% of residents in the measurement area per year

Legal requirement: not detectable per 100 ml of water

##### Statements:

<sup>58</sup> <https://unece.org/fifth-reporting-exercise-under-protocol-water-and-health-november-2021-april-2022>

<sup>59</sup> UNECE/WHO-EURO (2010) Guidelines on the setting of targets, evaluation of progress and reporting under the Protocol on Water and Health. <https://unece.org/environment-policy/publications/guidelines-setting-targets-evaluation-progress-and-reporting-under>



- In most cases, both parameters (*E. coli* and Enterococci) are measured simultaneously.
- Both parameters are above the maximum threshold with similar frequency.
- Approximately 3% of residents were affected in the short term by levels above the maximum threshold. Suitable measures were taken and the situation was rectified within a short period of time.

**Measures:**

- Flushing the drinking water network
- Chlorination
- UV disinfection
- Asking population to boil their drinking water temporarily

**Conclusion:** The data situation allows a nationwide overview of the individual parameters tested. The microbiological quality can be rated very good overall.

**3.1.3. Chemical parameters**

**3.1.3.1. Arsenic**

- 22 cantons with measurements out of the 26 cantons submitting reports represent 7.7 million residents
  - 3,483 measurements in 3 years
  - 93 results above the maximum threshold = 2.7%
  - 19,530 residents affected in the short term by levels above the maximum threshold = 0.08% of residents in the measurement area per year
- Legal requirement: max. 10 µg/l

**Statements:**

- Number of residents affected by elevated values < 0.1%
- 6 cantons with extensive arsenic testing in the reporting period – mostly geogenic occurrences

**Measures:**

- Treatment processes, e.g. arsenic filter
- Combining of different sources/dilution

**3.1.3.2. Lead**

- 21 cantons with measurements out of the 26 cantons submitting reports represent 7.8 million residents
  - 2,546 measurements in 3 years
  - 4 results above the maximum threshold = 0.16%
  - 11,710 residents affected in the short term by levels above the maximum threshold = 0.05% of residents in the measurement area per year
- Legal requirement: max. 10 µg/l

**Statements:**

- Measurements were slightly reduced in the reporting period
- 6 cantons with more sampling in the reporting period (> 200 measurement values)

**3.1.3.3. Iron**

- 21 cantons with measurements out of the 26 cantons submitting reports represent 7.9 million residents
  - 3,631 measurements in 3 years
  - 61 results above the maximum threshold = 1.7%
  - 34,462 residents affected in the short term by levels above the maximum threshold = 0.15% of residents in the measurement area per year
- Legal requirement: max. 0.2 mg/l

**Statements:**

- Causes: old drinking water pipes, defect in treatment process

**3.1.3.4. Chromium VI**

- 17 cantons with measurements out of the 26 cantons submitting reports represent 5.1 million residents
  - 1,971 measurements in 3 years
  - No results above the maximum threshold
- Legal requirement: max. 20 µg/l

**Statements:**

- The number of measurements and distribution over the population supplied lead to the conclusion that there is no risk in Switzerland and that reduced sampling is therefore possible (only few measurements required)

**3.1.3.5. Fluoride**

- 21 cantons with measurements out of the 26 cantons submitting reports represent 7.4 million residents
  - 10,500 measurements in 3 years
  - No results above the maximum threshold
- Legal requirement: max. 1.5 mg/l

**Statements:**

- The number of measurements is similar to that in the last reporting period
- The number of measurements and distribution over the population supplied lead to the conclusion that there is no risk in Switzerland and that reduced sampling is therefore possible (only few measurements required)

**3.1.3.6. Nitrate**

- 25 cantons with measurements out of the 26 cantons submitting reports represent 8.5 million residents
  - 21,978 measurements in 3 years
  - 105 results above the maximum threshold = 0.48%
  - 34,870 residents affected in the short term by levels above the maximum threshold = 0.14% of residents in the measurement area per year
- Legal requirement: max. 40 mg/l

**Statements:**

- Measurements in drinking water supply systems only
- In relation to the last reporting period, 7.5 times more residents were exposed in the short term to levels above the maximum threshold.

**Measures:**

- Mixing of different sources/dilution
- Resolving protection zone conflicts
- In addition, compensation for agricultural measures is possible in accordance with Article 62a WPA (see Section 2.14.1)

**3.1.3.7. Nitrite**

- 23 cantons with measurements out of the 26 cantons submitting reports represent 8.1 million residents
- 14,729 measurements in 3 years
- 5 results above the maximum threshold = 0.03%

- 7,890 residents affected in the short term by levels above the maximum threshold = 0.03% of residents in the measurement area per year  
Legal requirement: max. 0.1 mg/l

**Statements:**

- The number of measurements and distribution over the population supplied lead to the conclusion that there is no risk in Switzerland and that reduced sampling is therefore possible (only few measurements required)

**Conclusion:** The data allow for a nationwide overview of the individual parameters investigated. In terms of inorganic chemical parameters, the drinking water quality can be rated as quite good.

**3.1.4. Plant protection products (PPPs) and their metabolites**

**3.1.4.1. PPPs**

- 6 PPPs with levels above the maximum (> 0.1 µg/l)
- Maximum level exceedances between 0.04 and 0.42%
- Between 0.02 and 0.17% of residents in the measurement area per year affected in the short term by levels above the maximum  
Legal requirement: max. 0.1 µg/l

PPP	Cantons with measurements	Number of measurements	Measurements over the maximum levels		Residents affected in measurement area per year	
Bentazone	10	2,599	11	0.42%	6,650	0.17%
Terbutylazine	12	2,541	2	0.08%	0	0.00%
Metolachlor	11	2,211	1	0.05%	0	0.00%
2,4-D	8	2,230	1	0.04%	433	0.02%
Atrazine	12	2,556	1	0.04%	30	0.00%
Mecoprop	11	2,645	1	0.04%	0	0.00%

**Statements:**

- Only a few residents are affected by maximum levels being exceeded due to PPPs

**Measures:**

- Various such as mixing to comply again with maximum values

**3.1.4.2. Relevant PPP metabolites**

- 2 relevant metabolites with levels over the maximum (0.1 µg/l)
- Maximum level exceedances between 0.05 and 0.26%
- ≤ 0.01% of residents in the measurement area per year affected in the short term by levels above the maximum  
Legal requirement: max. 0.1 µg/l

PPP metabolites, relevant	Cantons with measurements	Number of measurements	Measurements over the maximum levels		Residents affected in measurement area per year	
Metazachlor: BH 479-09	3	384	1	0.26%	167	0.01%
Atrazine: desethyl-atrazine	13	2,220	1	0.05%	50	0.00%

**Statements:**

- Only a few residents are affected by maximum levels being exceeded due to relevant metabolites

**Measures:**

- Various such as mixing to comply again with maximum values

**3.1.4.3. PPP metabolites not classed as relevant to drinking water**

<ul style="list-style-type: none"> <li>• 11 non-relevant metabolites with measurement values &gt; 0.1 µg/l</li> <li>• Between 0.05 and 14% of measurements with values &gt; 0.1 µg/l</li> <li>• Between 0.01 and 4.7% of residents in measurement area per year affected</li> </ul> Legal requirement: none						
PPP metabolites, non-relevant	Cantons with measurements	Number of measurements	Measurements > 0.1 µg/l		Residents affected in measurement area per year	
Chloridazon: desphenyl-chloridazon (metabolite B)	12	2,832	396	14%	200,833	4.7%
Chloridazon: methyl-desphenyl-chloridazon (metabolite B 1)	9	2,307	87	3.8%	21,233	0.59%
Dimethachlor: CGA 369873	5	1,036	22	2.1%	6,837	0.42%
S-Metolachlor: metolachlor-ESA (CGA 354743)	9	2,908	57	2.0%	31,300	0.89%
Tolyfluanid: dimethylsulfamid (DMS)	3	2,064	16	0.78%	5,367	0.21%
Dichlobenil, fluopicolid: 2,6-Dichlorbenzamid (BAM, M-01)	1	393	2	0.51%	1,933	0.24%
Terbutylazine: LM6	5	1,036	4	0.39%	263	0.02%
Metazachlor: BH 479-08	5	1,236	3	0.24%	2,517	0.19%
Metazachlor: BH 479-04	2	974	2	0.21%	1,833	0.16%
Nicosulfuron: UCSN	5	1,036	1	0.10%	233	0.01%
Dimethachlor: dimethachlor ESA (CGA 354742)	7	1,930	1	0.05%	1,000	0.05%

**Statements:**

- Non-relevant metabolites are presented without information on maximum value exceedances.

### 3.1.5. Chlorothalonil metabolites

<ul style="list-style-type: none"> <li>• 3 metabolites with measurement values &gt; 0.1 µg/l</li> <li>• Between 0.55 and 36% of measurements with values &gt; 0.1 µg/l</li> <li>• Between 0.12 und 11% of residents in measurement area per year affected</li> </ul> Legal requirement: open						
Chlorothalonil metabolites	Cantons with measurements	Number of measurements	Measurements > 0.1 µg/l		Residents affected in measurement area per year	
R471811	18	4,104	1,462	36%	685,883	11%
R417888	14	4,586	509	11%	208,353	3.9%
SYN 507900	14	2,914	16	0.55%	6,543	0.12%

#### Statements:

- Due to ongoing judicial proceedings, the relevance of chlorothalonil metabolites in drinking water remains open. They are therefore presented without information on maximum value exceedances.

**Conclusion:** The data allow a nationwide overview of the individual parameters investigated. In terms of PPPs and their relevant metabolites, the drinking water quality can be rated as quite good. It should be noted that water suppliers are already required to implement short- and long-term measures in water extraction and treatment in order to minimise or avoid undesirable maximum level exceedances of these substances in drinking water. However, for metabolites not classified as relevant for drinking water, levels above 0.1 µg/l are commonly measured.

### 3.1.6. Incidents

**Definition:** An incident is defined as a situation in which foodstuffs law requirements are not complied with for a certain period of time due to an occurrence, necessitating specific measures in order to restore perfect quality of the drinking water supply (it is entirely possible that one incident may require multiple analyses, inspections or measures).

- 23 out of the 26 cantons submitting reports managed incidents
- A total of 211 incidents were reported during the 3-year period

#### 3.1.6.1. Incidents: faecal contamination

- 20 out of the 26 cantons submitting reports managed incidents caused by faecal contamination
- 157 of the 211 incidents in total = 74%
- 860 residents affected by each incident (median)

#### Statements:

- Main causes: storm, flooding, heavy rainfall

#### Measures:

- Chlorination or UV disinfection
- Flushing/cleaning of reservoirs and distribution networks
- Repair of defective (parts of) plants
- Improving protection and protected zones (groundwater, tanks)
- Taking the drinking water catchment area out of service temporarily
- Affected consumers instructed to boil water temporarily

### 3.1.6.2. Incidents: smell/taste/appearance, chemical contamination

- 11 out of the 26 cantons submitting reports managed incidents involving smell/taste/appearance, chemical contamination
- 36 of the 211 incidents in total = 17%
- 1,100 residents affected by each incident (median)

#### Statements:

- Contamination: arsenic (geogenic), hydrocarbons, nitrates, PFAS
- Causes: heavy rainfall, agriculture, accidents, defective installation

#### Measures:

- Depending on the incident, the necessary short- or long-term measures were taken to ensure that the drinking water complied again with the legal requirements.

### 3.1.6.3. Incidents: plant protection products

- 7 out of the 26 cantons submitting reports managed incidents caused by plant protection products
- 18 of the 211 incidents in total = 8.5%
- 8,000 residents affected by each incident (median)

#### Statements:

- The incidents mainly involved chlorothalonil metabolites

#### Measures:

- Mixing different sources/dilution
- Closing sources

## 3.2. Outbreaks of infectious diseases and incidents of water-related diseases

According to the guidelines for the fifth reporting exercise under the Protocol,<sup>60</sup> the following pathogens/diseases are taken into account for the occurrence of infectious diseases: cryptosporidiosis, EHEC, hepatitis A, Legionnaires' disease,<sup>61</sup> shigellosis and typhoid fever.

According to the FDHA Ordinance on the Reporting of Observations of Communicable Diseases in Humans (SR 818.101.126), all of these infectious diseases must be reported to the Federal Office of Public Health (FOPH) in Switzerland, with the exception of cryptosporidiosis. Diagnostic laboratories must report the detection of the pathogen in humans. There is also a reporting obligation for doctors, with the exception of shigellosis.

In the two to three years before the Covid-19 pandemic, there was an increase in reported cases of EHEC and shigellosis, largely related to increased testing due to new technological methods and the associated increased frequency of case detection. An increase in cases was also recorded for hepatitis A, following a Europe-wide outbreak among men who have sex with men (MSM). A rising trend in case numbers was also noted for Legionnaires' disease. Typhus, on the other hand, occurs only rarely in Switzerland and is mainly imported from warm countries with low hygiene standards.

In 2020, marked by the Covid-19 pandemic, the case numbers for EHEC, hepatitis A, Legionnaires' disease, shigellosis and typhoid fell. In 2021, however, case numbers returned almost to pre-pandemic levels. The pandemic may have led to under-reporting of actual case numbers due to health system factors (e.g. due to the workload of laboratories and doctors as well as patients' individual reluctance to attend medical facilities), which could have led to a reduction in the number of reported cases with the incidence remaining the same. On the other hand, the prescribed Covid-19 measures, travel restrictions and individual behavioural changes also influenced the transmission of other pathogens. The Covid-19 pandemic might therefore have led to a *de facto* reduction.

<sup>60</sup> <https://unece.org/fifth-reporting-exercise-under-protocol-water-and-health-november-2021-april-2022>

<sup>61</sup> Legionnaires' disease: Legionella detected by laboratory chemical tests with clinical diagnosis of pneumonia

Pathogen/disease	Incidence (cases per 100,000 residents)		
	2005	2018	2021*
Cryptosporidiosis	-	-	-
EHEC	0.83	10.33	10.41
Hepatitis A	1.96	1.22	0.53
Legionnaires' disease	1.95	6.33	6.40
Shigellosis	4.62	2.89	1.15
Typhus	0.52	0.30	0.03

\*Incidence calculated on basis of 2020 population data

Despite the nationwide flooding in summer 2021 and the associated risk of drinking water contamination, no increase in case numbers above the norm was detected during the period concerned. Legionella are an exception here. However, it is unclear to what extent this increase is related to drinking water contamination and what influence might be attributable to other meteorological features, such as heavy precipitation, humidity and temperatures. In 2021, two Legionnaires' disease outbreaks involving 8 and 15 human cases respectively were reported. The source of infection could not be determined in either outbreak. In one case, the bathing water of a thermal bath is a possible source.

There is no systematic nationwide overview in Switzerland on the number of water-borne outbreaks. Under the Ordinance on the Implementation of Foodstuffs Legislation (FLIO; SR 817.042), three outbreaks were reported to the FSVO during the reporting period. However, no direct link between cases of illness and contaminated water could be established.

**Conclusion:** According to the national statistics on infectious diseases, water-related infectious diseases rarely occur in Switzerland. Nevertheless, water-related outbreaks do occur sporadically.

### 3.3. Covid-19: wastewater monitoring of SARS-CoV-2

Swiss and international pilot studies have shown that the spread of the SARS-CoV-2 virus can be demonstrated effectively by measuring the virus RNA in wastewater. Research groups at Eawag<sup>62</sup> and EPFL<sup>63</sup> have been successfully determining virus levels in wastewater since the beginning of the pandemic. They developed and optimised the testing method and investigated whether the number of infected persons can be estimated using wastewater analysis. It has been shown that virus levels in wastewater correlate well with clinical case numbers. In addition to case numbers, hospitalisations and vaccination status, wastewater monitoring therefore has the potential to serve as a further tool for assessing the epidemiological situation.

<sup>62</sup> <https://www.eawag.ch/en/departement/sww/projects/sars-cov2-in-wastewater/>

<sup>63</sup> <https://actu.epfl.ch/news/covid-19-using-wastewater-to-track-the-pandemic/>

### 3.4. Access to drinking water

Percentage of individuals with access to clean drinking water <sup>64</sup>	Value in 2005	Value in 2012	Current value (2021)
Overall	100%	100%	100%
In urban areas	100%	100%	100%
In rural areas	100%	100%	100%

**Conclusion:** The total urban and rural population of Switzerland has access to clean drinking water.  
=> *Access to improved drinking water sources* (as per definition of the WHO/UNICEF Joint Monitoring Programme<sup>65</sup>)

### 3.5. Connection to sanitation system

Proportion of individuals connected to a collective sanitation system <sup>66</sup>	Value in 2005	Value in 2012	Current value (2021)
Overall	99%	99%	99%
In urban areas	100%	100%	100%
In rural areas	97% (collective systems) 2% (decentralised systems)	97% (collective systems) 2% (decentralised systems)	97% (collective systems) 2% (decentralised systems)

**Conclusion:** 99 per cent or more of the sewage is treated. All potential households are connected to a central sewage treatment plant or a decentralised treatment system.  
=> *Access to improved sanitation facilities* (as per definition of the WHO/UNICEF Joint Monitoring Programme<sup>67</sup>)

### 3.6. General condition of waters and water use

#### 3.6.1. Water quality

##### 3.6.1.1. Surface waters

Over the past few decades, the water quality of lakes and rivers has vastly improved in relation to nutrients, primarily thanks to the provision and improvement of wastewater treatment plants. Nevertheless, there are still shortcomings in the condition of surface waters, some of them significant. Specifically, these are due to the entry of micropollutants and, in isolated cases, nutrients. As a result, not all the waters are able to perform their key functions for people and ecosystems.

With its National Surface Water Quality Monitoring Programme (NAWA), the federal government and cantons have been running a joint monitoring programme to thoroughly examine the condition of watercourses<sup>68</sup> since

<sup>64</sup> SGWA assessment

<sup>65</sup> <https://washdata.org/monitoring/drinking-water>

<sup>66</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/dossiers/internationaler-tag-des-wassers-2017.html>

<sup>67</sup> <https://washdata.org/monitoring/sanitation>

<sup>68</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/zustand/wasser--messnetze/nationale-beobachtung-oberflaechengewasserqualitaet--nawa-.html>



2011. The programme includes monthly random sampling of over 100 streams and rivers for nutrient analyses, and biological investigations which are carried out every four years. Since 2018, NAWA has also been investigating micropollutant residues predominantly in small and medium-sized watercourses on the Swiss Plateau and in the valleys.<sup>69</sup> The number of sites has increased continuously in recent years. Data from 28 sites are available for 2019, and a total of 38 sites will be available in 2022. Combined samples are taken every three days to two weeks and analysed for 49 pesticides, 13 pharmaceutical products and 3 other substances. In addition, up to 90 other micropollutants, including artificial sweeteners and individual industrial chemicals, are measured in samples from selected monitoring sites.<sup>70</sup>

**Nutrients:** As regards nutrients, the trend since the 1970s can be demonstrated by a comparison of data from the periods 1976-1980 and 1996-2000 of the Hydrological Atlas of Switzerland (map sheet 7.6).<sup>71</sup> The assessment is carried out using the Modular Stepwise Procedure (MSP).<sup>72</sup>

The following tables show the percentages of measuring sites in each MSP quality class; for each NAWA measurement, the mean has been taken of the annual values. When comparing values from previous periods (1976-1980 and 1996-2000), note the different make-up of the measuring sites, meaning that developments over time must be interpreted with caution. Despite this, there still is a stark decrease in nutrient pollution in watercourses.

Currently, around 95 per cent of measuring sites are in a very good or good condition, illustrating an improvement on the periods 1996-2000 (89 per cent of measuring sites) and 1976-1980 (66 per cent). Ammonium is harmful for aquatic organisms because higher temperatures and pH values speed up its transformation into ammonia, which is poisonous to fish. Ammonium enters waters at isolated points via wastewater discharges and diffusely from agriculture. The numerical requirements in accordance with Annex 2 of the Waters Protection Ordinance (equivalent to the class boundaries between good and fair according to the MSP) apply to watercourses.

Classification based on NH <sub>4</sub> -nitrogen <sup>73</sup>	Value (1976-1980) 117 measuring sites	Value (1996-2000) 117 measuring sites	Value (2011-2014) 111 measuring sites	Current value (2015-2019) 104 measuring sites
Very good	19% of measuring sites	52%	53%	54%
Good	47% of measuring sites	37%	42%	42%
Fair	13% of measuring sites	7%	3%	2%
Unsatisfactory	0% of measuring sites	0%	1%	1%
Poor	21% of measuring sites	4%	1%	1%

**Conclusion:** The pollution of water courses by ammonium reduced until the late 1990s. It has hardly changed since the 2000s. Around 95 per cent of the measuring sites currently meet the value required by the WPO.

The following table shows the classification based on nitrate-nitrogen, as an indicator of agricultural and residential nutrient pollution: A requirement of 5.6 mg/l N (equivalent to the class boundaries between good and

<sup>69</sup> Doppler T., Dietzel A., Wittmer I., Grelot J., Kunz M. und Rinta P. (2020) Mikroverunreinigungen im Gewässermonitoring – Ausbau von NAWA TREND und erste Resultate. Aqua & Gas 7/8: 44-53.

<sup>70</sup> BAFU (2022) Gewässer in der Schweiz. Zustand und Massnahmen. <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/gewaesserbericht.html>

<sup>71</sup> Jakob et al. (2004) Veränderung ausgewählter chemischer Parameter in Fließgewässern und Seen 1976-2000. [https://hydrologischeratlas.ch/downloads/01/content/Tafel\\_76.pdf](https://hydrologischeratlas.ch/downloads/01/content/Tafel_76.pdf)

<sup>72</sup> <http://www.modul-stufen-konzept.ch>

<sup>73</sup> <http://www.modul-stufen-konzept.ch>

fair according to the MSP) applies to nitrate (NO<sub>3</sub>-N) in overground waters used for drinking water in accordance with Annex 2 WPO. Note that most of the watercourses studied are not used for drinking water.

Classification based on NH <sub>3</sub> nitrogen <sup>74</sup>	Value in 2012 107 measuring sites	Value (1996-2000) 107 measuring sites	Value (2011-2014) 109 measuring sites	Current value (2015-2019) 105 measuring sites
Very good (<1.5 mg/l N)	43% of measuring sites	43%	42%	39%
Good (1.5-5.6 mg/l N)	48% of measuring sites	45%	49%	45%
Fair (5.6-8.4 mg/l N)	8% of measuring sites	11%	7%	11%
Unsatisfactory (8.4-11.2 mg/l N)	1% of measuring sites	0%	1%	4%
Poor (≥ 11.2 mg/l N)	0% of measuring sites	1%	1%	1%

**Conclusion:** Based on the available data it can be concluded that there has been no clear change regarding the pollution of watercourses by nitrate. Around 85 per cent of the measuring sites meet the value required by the WPO.

**Micropollutants:** Many waters of the Swiss Plateau and valleys are contaminated with micropollutants. In 2019, 20 substances exceeded their ecotoxicological limits specified in the Waters Protection Ordinance. Only one of the 28 water bodies examined complied with the limits. Pesticide contamination is most pronounced in the small and medium-sized watercourses studied. In almost all of these waters, pesticides exceeded their ecotoxicological limits. Pesticide contamination in the large rivers is significantly lower. In most of these waters, no pesticides exceeded their limit values. Most of the three pharmaceuticals regulated by the WPO exceeded the limits in medium to large watercourses. The painkiller diclofenac caused by far the most cases of ecotoxicological limits being exceeded. Any exceeding of ecotoxicological limits means that sensitive animal and plant species are exposed to an excessive risk of damage from these substances.

**Biology:** Alongside nutrient pollution, the biological condition of watercourses has also improved over the last few decades, albeit only in some cases. Based on the indicators fish and aquatic plants, only around one third of the NAWA measuring sites were rated good or very good. The following table shows the classification of NAWA measuring sites for the bioindicators fish, invertebrates and aquatic plants from the surveys in 2012, 2015 and 2019 (each as a percentage of measuring sites). The shortcomings established can be traced back to water contamination due to substances entering the water, damming and hydroelectric power plants. In general, the condition of the waters at the NAWA measuring sites tended to rate worse the higher their proportion of wastewater and settlement area or the worse their ecomorphological condition.

<sup>74</sup> <http://www.modul-stufen-konzept.ch>

Classification based on bioindicators <sup>75</sup>	Fish			Invertebrates			Aquatic plants		
	2012	2015	2019	2012	2015	2019	2012	2015	2019
Very good	2	2	2	7	8	36	22	9	9
Good	27	29	31	55	57	44	17	26	22
Fair	60	61	58	32	33	16	31	39	56
Unsatisfactory	11	8	9	6	2	4	26	22	13
Poor	0			0			4	4	

**Conclusion:** Measured against the biological parameters of fish, invertebrates and aquatic plants, up to 70 per cent of the watercourses studied do not satisfactorily fulfil their role as habitats for animals and plants.

Phosphorus usually limits algae growth in **lakes**. The more phosphorus enters the lakes, the higher the oxygen consumption as dead organic matter decomposes, which in eutrophic lakes has led to a lack of oxygen. Since the 1980s, the concentration of phosphorus in Swiss lakes has decreased, alleviating the problem of eutrophication in most lakes. However, in drainage basins with high livestock density or in a large settlement area, individual lakes are still too heavily polluted with phosphorus.

Despite a reduced input of phosphorus, the numerical requirements of the WPO – for the oxygen content never to fall below 4 mg/l at any depth of the lake – were not reached or only with the help of artificial aeration or circulation. This is due partly to the large volume of organic matter stored in the sediments that continues to consume oxygen as it decomposes. Even in lakes that have recovered, oxygen levels in the deep water may fall again in the future, as some lakes have less intermixing due to climate change (rising water temperatures).

**Conclusion:** Around 40 per cent of the 20 largest Swiss lakes currently fulfil the numerical requirement of 4 mg O<sub>2</sub>/l at all times. The input of phosphorus from settlements and/or agriculture must be further reduced.

Among the small lakes analysed by the cantons, only around two-thirds are in a near-natural state with regard to nutrients.<sup>76</sup> At lower altitudes, half of the small lakes are over-polluted and over-fertilised. The main cause is high inputs of nutrients from agriculture.

### 3.6.1.2. Groundwater

In Switzerland, around 80 per cent of the total drinking water and industrial water supply is obtained from groundwater.<sup>77</sup> Although groundwater in Switzerland is generally available in sufficient quantity, groundwater resources are under pressure, especially in Central Switzerland. Settlement growth and conflicts of use restrict usability, and pollutants from agriculture impair groundwater quality.

The National Groundwater Monitoring Network NAQUA collects groundwater quality data representative of the country<sup>78</sup> as a whole. NAQUA comprises a total of 545 measuring sites and has been run in close cooperation by the FOEN and specialist cantonal agencies since 2002. The quality of groundwater is evaluated on the basis of nitrate, pesticide residues and volatile halogenated hydrocarbons in the context of the WHO Protocol.

In 2020, **nitrate** concentrations were above the 25 mg/l threshold value set in Annex 2 of the Waters Protection Ordinance at 15 per cent of the NAQUA measuring sites and thus at a slightly higher level than the years

<sup>75</sup> <http://www.modul-stufen-konzept.ch>

<sup>76</sup> Binderheim E. (2019) Wie steht es um die Schweizer Kleinseen? Erfassung des trophischen Zustands. Aqua & Gas 6: 60-65.

<sup>77</sup> Freiburghaus M. (2009): Wasserbedarf der Schweizer Wirtschaft. Aqua & Gas 12: 1001-1009.

<sup>78</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/publikationen-studien/publikationen-wasser/ergebnisse-grundwasserbeobachtung-schweiz-naqua.html>

immediately before. The maximum threshold of 40 mg/l,<sup>79</sup> which is the value applicable to drinking water, was also exceeded at four per cent of the measuring sites.

Proportion of groundwater measuring sites with a nitrate concentration of <sup>80</sup>	2011 (531 measuring sites)	2014 (529 measuring sites)	2020 (520 measuring sites)
> 25 mg/l	16%	14%	15%
> 40 mg/l	3%	2%	4%

**Pesticide** residues were found in groundwater at a total of 58 per cent of NAQUA measuring sites in 2020. The threshold value of 0.1 µg/l laid down in Annex 2 of the Waters Protection Ordinance was exceeded at two per cent of the measuring sites due to active substances from pesticides. Products of decomposing agricultural pesticides (metabolites) were found at concentrations over 0.1 µg/l at 36 per cent of measuring sites. In particular, the metabolites of the fungicide chlorothalonil, which were detected for the first time in 2017 as part of a NAQUA pilot study, pollute groundwater resources on a large scale in the Central Plateau.<sup>81</sup> Since the range of substances analysed in groundwater has greatly expanded in recent years, the data from this period cannot be compared directly. The long-term development can only be assessed specifically for particular substances.

Proportion of groundwater measuring sites with PPP and metabolite residue concentrations of <sup>82</sup>	2011 (531 measuring sites)	2014 (530 measuring sites)	2020 (517 measuring sites)
> quantification limit	55%	56%	58%
> 0.1 µg/l	21%	20%	36%

In 2020, the threshold value for **volatile halogenated hydrocarbons** of 1 µg/l laid down in Annex 2 of the Waters Protection Ordinance was exceeded at three per cent of the NAQUA measuring sites. Volatile halogenated hydrocarbons were detected in groundwater at 25 per cent of the measuring sites in total. The number of measuring sites where VHCs were present in elevated concentrations has dropped slightly over the last few years.

Proportion of groundwater measuring sites with a volatile halogenated hydrocarbon concentration of <sup>83</sup>	2011 (531 measuring sites)	2014 (527 measuring sites)	2020 (514 measuring sites)
> quantification limit	25%	25%	25%
> 1 µg/l	5%	4%	3%

<sup>79</sup> Annex DWBSO

<sup>80</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/info-specialists/state-of-waterbodies/state-of-groundwater/groundwater-quality/nitrate-in-groundwater.html>

<sup>81</sup> [www.bafu.admin.ch/chlorothalonil](http://www.bafu.admin.ch/chlorothalonil)

<sup>82</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/info-specialists/state-of-waterbodies/state-of-groundwater/groundwater-quality/plant-protection-products-in-groundwater.html>

<sup>83</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/info-specialists/state-of-waterbodies/state-of-groundwater/groundwater-quality/volatile-organic-compounds.html>

**Conclusion:** The threshold values laid down in the Waters Protection Ordinance are being met at the vast majority of groundwater measuring sites run by the National Groundwater Monitoring Network NAQUA. Residues of fertilisers, pesticides and other synthetic organic substances occur in groundwater particularly where the land is intensively farmed and in densely populated areas.

### 3.6.2. Water use

Questions concerning water consumption in Switzerland usually involve recourse to the SGWA's annual statistics on drinking water, which first appeared in the operating year 1900. In addition to public water suppliers, which served 939 million m<sup>3</sup> in 2020,<sup>84</sup> business, industry and agriculture also obtain substantial volumes of water, as an SGWA study demonstrated for the first time in 1975.

The FOEN-backed survey by the SGWA in 2007/2008 demonstrates that around half of the volume of water required by the Swiss economy is covered by private supply and that private supply from industry remains at the same level as it was three decades ago, albeit with a major shift between sectors.<sup>85</sup>

The following table<sup>86</sup> provides an overview of the estimated annual volume of water required for the various modes of use in Switzerland. Hydropower is not listed as a use and neither is the use of water flows in cooling at nuclear power plants. It makes no sense to quantify these uses due to their complexity (transitions between drainage basins, multiple uses in pumped-storage and run-of-river power stations, questions about whether the water is being used or consumed).

Use	Description	Total (km <sup>3</sup> /year)
Households	Households and small businesses	0.5
Business and industry	Business and industry	1.1
Agriculture	Total <sup>87</sup>	0.4
Public purposes	Incl. fountains	0.08
Waste		0.12
Total		2.2

The following table shows the percentage comparison of demand in relation to mean precipitation and total runoff, averaged over the year and throughout Switzerland, as an indicator of water availability.

Water balance <sup>88</sup>	km <sup>3</sup> /year	% of total demand
Precipitation	60	4
Runoff	40.5	6

**Conclusion:** The huge difference between the two clearly illustrates that, at national level, Switzerland deserves to be called the *water tower*. This will continue to be the case in future, regardless of any changes there may be in supply or demand. Despite this conclusion on the overall level of Switzerland, there are vulnerable areas at local and regional level which are temporarily affected by problems of scarcity,<sup>89</sup> see also Section 1.10.1.

<sup>84</sup> Freiburghaus M. (2021). W15001 Statistische Erhebungen der Wasserversorgungen in der Schweiz zum Betriebsjahr 2020. SVGW.

<sup>85</sup> Freiburghaus M. (2009). Der Wasserbedarf der Schweizer Wirtschaft, Bezugsjahr 2006. SGWA

<sup>86</sup> Freiburghaus M. (2009): Wasserbedarf der Schweizer Wirtschaft. Aqua & Gas 12: 1001-1009.

<sup>87</sup> without use of rainwater

<sup>88</sup> Hubacher R., Schädler B. 2010: Wasserhaushalt grosser Einzugsgebiete im 20. Jahrhundert. Tafel 6.6. In: Weingartner R., Spreafico M. (Hrsg.): Hydrologischer Atlas der Schweiz (HADES). Bundesamt für Umwelt, Bern. Average for the period 1901-2000.

<sup>89</sup> Pfandler M. (2010) Geht der Schweiz das Wasser aus? Zwischen Wasserschloss und Wasserknappheitsszenarien. Geomatik Schweiz 108: 440-444. <http://doi.org/10.5169/seals-236708>

## 4. Water-related disease surveillance and response systems

**In accordance with the provisions of Article 8 of the Protocol:**

Has your country established comprehensive water-related disease surveillance and early warning systems according to paragraph 1 (a)?

YES             NO             IN PROGRESS

Has your country prepared comprehensive national or local contingency plans for responses to outbreaks and incidents of water-related disease according to paragraph 1 (b)?

YES             NO             IN PROGRESS

Do relevant public authorities have the necessary capacity to respond to such outbreaks, incidents or risks in accordance with the relevant contingency plan according to paragraph 1 (c)?

YES             NO             IN PROGRESS

The procedures and documents required for outbreak investigations are made available to the public authorities concerned. They apply to both the food and drinking water sectors: <https://www.blv.admin.ch/alek>, <https://www.blv.admin.ch/alek-fr>

Optimisations and adaptations are in progress for the area of shower and bath water.

## 5. Overall evaluation

### 5.1. Switzerland as *water tower*

Switzerland, Europe's *water tower*, is in the fortunate position of having adequate natural water resources. The demand for drinking water for the whole of Switzerland can be covered by approximately two per cent of its annual precipitation. With its 1,500 lakes, countless streams and rivers and its glaciers, Switzerland not only benefits from abundant valuable freshwater resources, but their quality can also be considered as good from a microbiological and chemical point of view. This is largely due to extensive water protection efforts.

Over 4,000 water suppliers ensure the availability of drinking water. Sophisticated water treatment processes are rarely required thanks to the high quality of untreated water resources. Disease outbreaks resulting from impurities in the drinking water have only occurred to date in isolated cases as a result of failure to comply with the legally prescribed protective measures. Around 750 large-scale and 3,500 small-scale sewage treatment plants and 90,000 km of sewage pipes ensure almost complete coverage for the removal and comprehensive treatment of wastewater.

### 5.2. Implementation of the Protocol on Water and Health in Switzerland

For decades, Switzerland has made great efforts to improve and preserve the water quality of its groundwater and surface waters. In 1953, the Swiss people approved the inclusion of a water protection article in the Federal Constitution. The first Waters Protection Act came into effect in 1957 on the basis of this article. This was followed in 1992 by a new, more comprehensive Waters Protection Act, which was designed to protect waters from all kinds of adverse influences. As a foodstuff, drinking water is subject to comprehensive food legislation.

Irrespective of the Protocol on Water and Health, the two federal authorities responsible for water protection and for drinking water, the FOEN and the FSVO, have always developed strategies and formulated objectives designed to implement the legal requirements and thus preserve and improve water quality. This is one reason why little attention has been paid in Switzerland to the Protocol on Water and Health until now. The targets in this report have thus far been specified largely independently of the Protocol.

Setting targets in relation to water is not new for Switzerland; targets and requirements are embedded in the legislation (for example in the Waters Protection Act). What is new for Switzerland about the strategy of the Protocol, however, is the nature of the programme, i.e. that the achievement of targets is linked to a specific time frame. The Protocol also promotes cooperation between the relevant departments and other stakeholders concerned with water. Finally, the Protocol provides the option of forcing targets to be set or of lending greater weight to certain targets.

Switzerland meets the key requirements of the Protocol on Water and Health thanks to the high quality of water resources and drinking water it has achieved as well as the existing infrastructure.

### 5.3. Data on water quality

There is as yet no central overview of the quality of drinking water in Switzerland; this data can only be found in the individual cantons and water suppliers (see also Section 2.1). The implementation of national evaluations (see Section 3.1) should rectify this situation. The available data show that the chemical and microbiological quality of drinking water in Switzerland is generally good.

In the area of groundwater and surface waters, the national monitoring carried out by the FOEN in cooperation with the cantonal agencies – the National Groundwater Monitoring Network NAQUA, the Swiss federal river monitoring and survey programme NADUF and the National Surface Water Quality Monitoring Network NAWA – provides nationally representative quality data. The data from these three monitoring programmes have been managed by the FOEN in a central database since 2013. Other environmental data are held in various data sources at the FOEN, institutes and cantonal offices. Micropollutants represent a major challenge and a potentially important problem, especially in the densely populated Central Plateau with its intensive agricultural use.

## 5.4. Raising public awareness

The public has hitherto been informed about the Protocol mainly via the FSVO and corresponding media releases. Further information on drinking and bathing water can be found on the internet.<sup>90</sup> Furthermore, all drinking water suppliers are obliged to provide information about the quality of the supplied drinking water at least once a year. Many suppliers use an internet platform set up and provided free of charge by the SGWA.<sup>91</sup> Important information on drinking and bathing water is also made available to the public by the cantonal laboratories, e.g. in the form of their annual reports or via the internet. In addition, a national overview of the quality of bathing waters which are relevant from a European perspective is published.<sup>92</sup>

The public can obtain comprehensive information on water protection (surface water and groundwater) from the FOEN website,<sup>93</sup> the Swiss waters report<sup>94</sup> and the environmental<sup>95</sup> report. More detailed information and analyses on groundwater quality are published in the NAQUA report,<sup>96</sup> which is a key element of reporting on groundwater resources. At cantonal level, information is provided by the environmental protection departments via corresponding media sources. Overall, therefore, the public has numerous information channels at its disposal for obtaining an overview of the wide variety of issues connected with water.

## 5.5. Research and education

The state of research in Switzerland in respect of water is highly varied and there are a wide range of educational opportunities at basic and advanced levels.

Eawag<sup>97</sup> is a world-leading water research institute. The combination of natural and social scientists and engineers permits a wide range of water research, across the continuum from relatively undisturbed aquatic ecosystems to fully engineered wastewater management systems. To ensure that new findings and concepts from research are put into practice as quickly as possible, Eawag also fosters close contacts with experts from industry, the administration and professional associations.

Various universities in Switzerland offer courses that teach the basics of water management and urban water management.

The key to the high level attained by water supply and disposal facilities in Switzerland is the thorough training given to operatives (Switzerland's dual vocational training system). The industry associations SGWA and VSA also offer a wide range of vocational training, encompassing plant management, pipe construction, installation supervision, quality assurance and occupational safety. Vocational training is supplemented with technical meetings to discuss current topics in the water sector.

The technical journal Aqua&Gas, which is also the publication medium of the SGWA and the VSA, is widely considered to be the leading journal in the field of drinking water supply, municipal water management and watercourse quality.

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<sup>90</sup> <https://www.blv.admin.ch/trinkwasser>

<sup>91</sup> [www.trinkwasser.ch](http://www.trinkwasser.ch)

<sup>92</sup> <https://www.bafu.admin.ch/bafu/de/home/themen/wasser/fachinformationen/zustand-der-gewaesser/zustand-der-fliessgewaesser/wasserqualitaet-der-fliessgewaesser/badegewaesserqualitaet.html>

<sup>93</sup> <https://www.bafu.admin.ch/bafu/en/home/topics/water/info-specialists/state-of-waterbodies.html>

<sup>94</sup> BAFU (2022) Gewässer in der Schweiz. Zustand und Massnahmen. <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/gewaesserbericht.html>

<sup>95</sup> <https://www.bafu.admin.ch/bafu/en/home/documentation/reports.html>

<sup>96</sup> BAFU (2019) Zustand und Entwicklung Grundwasser Schweiz. Ergebnisse der Nationalen Grundwasserbeobachtung NAQUA. <https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/ergebnisse-grundwasserbeobachtung-schweiz-naqua.html>

<sup>97</sup> <https://www.eawag.ch/en/>



## 5.6. National cooperation

The table below provides an overview of the various working groups which involve the national and cantonal authorities in Switzerland and the water suppliers:

Organisation, working group	Members ( <u>coordination</u> )	Purpose
Strategic Advisory Group on the evaluation of waters SBGB; Steering Committee on the evaluation of waters LGB	<u>FOEN, EAWAG, cantonal authorities</u>	Strategic and technical support for analysing waters as a basis for enforcement, planning measures and environmental monitoring (with a focus on chemistry, biology and morphology)
Working group on NAQUA parameters	FOEN, cantons (KVU, SACCh), FSVO, FOAG, FOPH, SGWA, research, industry	Advising the National Groundwater Quality Monitoring Network (NAQUA) on the priorities and focus of issues relating to groundwater quality
Working group on nitrates/PPPs	FOAG, FOEN, FSVO, KVU, KOLAS	Supporting and advising projects in accordance with Article 62a WPA on agricultural measures to remediate contaminated waters; further developing the basic principles
Drinking water and bathing water commission of the Swiss Association of Cantonal Chemists SACCh	<u>SACCh, FSVO</u>	Uniform implementation of legislation on drinking water and bathing water
Principal water commission of the SGWA (Swiss Gas and Water Industry Association)	<u>SGWA, FOEN, FSVO, SACCh</u>	Management of drinking water, decisions concerning water distribution
ISDC – water, Interdepartmental Sustainable Development Committee on Water	<u>SDC</u> , <sup>98</sup> FOAG, FOEN, FSVO (from 2021), SECO	Coordination of international activities, joint statements
Drinking water division, guaranteeing water supply in situations of shortage	<u>FONES, FOEN, FSVO, SGWA</u>	Coordination of measures in situations where there are problems with the national supply

## 5.7. International cooperation

### 5.7.1. Protocol on Water and Health and sustainability indicators

Switzerland was elected a Member of the Bureau of the UNECE/WHO Europe Protocol on Water and Health at the 5<sup>th</sup> Session of the Meeting of the Parties to the Protocol (Belgrade, Serbia, 19-21 November 2019). Thus, Switzerland has participated actively in the work of the Bureau for the past three years. Furthermore, Switzerland is currently leading the Core Group on Financing of the Protocol, which was set up under the Bureau. The objective of the Core Group on Financing is to examine and propose options for the sustainable funding of the activities of the Protocol on Water and Health.

Switzerland is also one of the Lead Parties of Programme Area No. 1: Improving Governance for Water and Health through Setting Targets, Implementing Measures and Reporting. The objectives of Programme Area

<sup>98</sup> Directorate for Development and Cooperation

No. 1 are to reinforce the implementation of the core provisions of the Protocol as regards target setting and reporting under Articles 6 and 7 and support related action at national level. In addition, Switzerland has fully exercised the responsibility of chairing the Task Force on Target Setting and Reporting under the Protocol in the Programme of Work for 2020-2022.

The SDC is involved in certain aspects of the Protocol in the context of the Sustainable Development Goals (SDGs). On the basis of Goal no. 6, the SDC is committed to ensuring the availability of clean drinking water for all by 2030.<sup>99</sup>

### **5.7.2. International commissions**

In the area of water protection, Switzerland has entered into various obligations at international level, specifically in connection with the following six international water protection commissions: the International Commission for the Protection of the Rhine (ICPR),<sup>100</sup> the International Commission for the Protection of Lake Constance (IGKB),<sup>101</sup> the Association of Waterworks in the Lake Constance/River Rhine Region (AWBR),<sup>102</sup> the International Commission for the Protection of the Waters of Lake Geneva (CIPEL),<sup>103</sup> the International Commission for the Protection of Italian-Swiss Waters (CIPAIS)<sup>104</sup> and the Commission for the Protection of the Marine Environment of the North-East Atlantic (OSPAR).<sup>105</sup>

Led by the FOEN, Switzerland is actively involved in protecting these transboundary water bodies. As a result, e.g. thanks to the great efforts in Swiss water protection over the past few decades, pollution of the Rhine with nutrients and other pollutants has been substantially reduced. For example, the discharge of toxic heavy metals such as mercury, cadmium and lead has declined by over 95 per cent in the last 20 years. All of the targets set by the ICPR for the quality of water in Basel are currently met. Nevertheless, the water quality will continue to be monitored in order to ensure, for example, that in the event of an incident in which chemicals could potentially enter the Rhine, the downstream areas are informed quickly and comprehensively.

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<sup>99</sup> <https://www.eda.admin.ch/dam/deza/en/documents/themen/wasser/gpw-strategy-final-EN.pdf>

<sup>100</sup> [www.iksr.org/en/](http://www.iksr.org/en/)

<sup>101</sup> [www.igkb.org](http://www.igkb.org)

<sup>102</sup> <https://www.awbr.org>

<sup>103</sup> [www.cipel.org/en/](http://www.cipel.org/en/)

<sup>104</sup> [www.cipais.org](http://www.cipais.org)

<sup>105</sup> [www.ospar.org](http://www.ospar.org)

## 6. Thematic part linked to priority areas of work under the Protocol

### 6.1. Water, sanitation and hygiene in institutional settings

1. In the table below, please provide information on the proportion of schools (primary and secondary) and health-care facilities that provide basic water, sanitation and hygiene (WASH) services.

Institutional setting	Current value (specify year)
<i>Schools</i>	
Basic sanitation service	-
Basic drinking-water service	-
Basic hygiene service	-
<i>Health-care facilities</i>	
Basic sanitation service	-
Basic drinking-water service	-
Basic hygiene service	-

2. Has the situation of WASH in schools been assessed in your country?

YES  NO  IN PROGRESS

3. Has the situation of WASH in health-care facilities been assessed in your country?

YES  NO  IN PROGRESS

The situation of schools and health care facilities have not been monitored so far in Switzerland.

4. Do approved policies or programmes include actions (please tick all that apply):

- To improve WASH in schools  
 To improve WASH in health-care facilities

5. If yes, please provide reference to main relevant national policy(ies) or programme(s).

### 6.2. Safe management of drinking-water supply

6. Is there a national policy or regulation in your country which requires implementation of risk-based management, such as WHO water safety plans (WSPs), in drinking water supply?

YES  NO  IN PROGRESS

7. If yes, please provide reference to relevant national policy(ies) or regulatory documentation.

The legislation on Foodstuffs and Utility articles (see Section 2.7).

8. In the table below, please provide information on the percentage of the population serviced with drinking-water under a WSP.

Percentage of population	Current value (specify year)
Total	100% (2021), see Section 3.4

### 6.3. Equitable access to water and sanitation

9. Has the equity of access to safe drinking-water and sanitation been assessed?

YES  NO  IN PROGRESS

10. Do national policies or programmes include actions to improve equitable access to water and sanitation (please tick all that apply):

- To reduce geographical disparities
- To ensure access for vulnerable and marginalized groups
- To keep water and sanitation affordable for all

11. If yes, please provide reference to main relevant national policy(ies) and programme(s).

The Swiss situation has been assessed in Sections 3.4 Access to drinking water and 3.5 Connection to sanitation system. Specific targets are also described under Sections 2.3 and 2.4.

## **7. Information on the persons involved in the report**

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