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## **Waters Protection Ordinance (WPO)**

of 28 October 1998 (Status as of 1 June 2018)

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*The Swiss Federal Council,*

based on Articles 9, 14 paragraph 7, 16, 19 paragraph 1, 27 paragraph 2, 36a paragraph 2, 46 paragraph 2, 47 paragraph 1 and 57 paragraph 4 of the Waters Protection Act of 24 January 1991<sup>1</sup> (WPA),<sup>2</sup>

*ordains:*

### **Chapter 1 General Provisions**

#### **Art. 1 Purpose and principle**

<sup>1</sup> This Ordinance shall facilitate the protection of surface and underground waters from harmful effects and enable their sustainable use.

<sup>2</sup> For this purpose, all measures taken under this Ordinance must take account of the ecological goals for waters (Annex 1).

#### **Art. 2 Scope**

<sup>1</sup> This Ordinance regulates:

- a. ecological goals for waters;
- b. requirements on water quality;
- c. disposal of waste water;
- d. disposal of sewage sludge;
- e. requirements for animal husbandry farms;
- f. protection of waters in terms of area planning;
- g. maintenance of appropriate residual flow;
- h.<sup>3</sup> prevention and remediation of other harmful effects on waters;
- i. granting of federal contributions.

AS 1998 2863

<sup>1</sup> SR 814.20

<sup>2</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>3</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>2</sup> The Ordinance applies to radioactive substances, insofar as such substances have biological effects resulting from their chemical characteristics. Insofar as these substances have biological effects resulting from radiation, the legislation on radiation protection and nuclear energy applies.

## Chapter 2 Disposal of Waste Water

### Section 1

#### Differentiation between Polluted and Non-Polluted Waste Water

##### Art. 3

<sup>1</sup> The authorities shall assess whether waste water entering a body of water by way of discharge or infiltration is considered to be polluted or non-polluted, taking account of:

- a. the type, the amount, the characteristics and the temporal occurrence of potential water pollutants substances in the waste water;
- b. the condition of the receiving waters.

<sup>2</sup> During infiltration of waste water, they shall also take account of whether:

- a. waste water can be polluted because of existing soil pollution or the unsaturated subsoil;
- b.<sup>4</sup> waste water is sufficiently purified in the soil or in the unsaturated subsoil;
- c. guide values under the Ordinance of 1 July 1998<sup>5</sup> on the Pollution of Soil (SoilPO) can be maintained in the long term, excepting infiltration into a plant intended for this purpose, or onto roads next to embankments or grass verges.

<sup>3</sup> Precipitation water running off built-up or sealed surfaces is as a rule considered to be non-polluted waste water if it:

- a. originates from roof surfaces;
- b.<sup>6</sup> originates from roads, paths and areas on which no substantial amounts of potential water pollutants are unloaded, processed and stored and if they are sufficiently purified by infiltration into the ground. In assessing whether amounts of substances are substantial, the risk of accidents must be taken into consideration;
- c.<sup>7</sup> originates from track installations where there is a long-term guarantee that pesticides will not be used or if pesticides have been sufficiently retained and degraded by a biologically active layer of soil.

<sup>4</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS **2011** 1955).

<sup>5</sup> SR **814.12**

<sup>6</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS **2011** 1955).

<sup>7</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS **2011** 1955).

## Section 2     **Drainage Planning**

### **Art. 4**           Regional drainage planning

<sup>1</sup> The cantons shall ensure that a regional drainage plan (RDP) is drawn up to guarantee appropriate waters protection in a limited, hydrologically-related area in which waters protection measures of the communes must be coordinated.

<sup>2</sup> The RDP determines in particular:

- a. the locations of waste water treatment plants and areas which are to be joined to them;
- b. which and to what extent surface waters are suitable for the discharge of waste water, particularly that arising from precipitation;
- c. the waste water treatment plants for which requirements in respect of discharge of waste water must be stricter or supplemented.

<sup>3</sup> In drawing up the RDP, the authorities shall take account of spatial requirements of waters, flood protection and measures for waters protection other than waste water treatment.

<sup>4</sup> The RDP is mandatory for planning and establishing of waters protection measures in communes.

<sup>5</sup> It shall be accessible to the public.

### **Art. 5**           Communal drainage planning

<sup>1</sup> The cantons shall ensure that general drainage plans (GDP) are drawn up which guarantee adequate waters protection in communes and effective drainage of housing areas.

<sup>2</sup> The GDP shall specify as a minimum:

- a. waste water treatment areas that must be served by public sewers;
- b. areas in which precipitation water running off built-up or sealed surfaces must be disposed of separately from other waste water;
- c. areas in which non-polluted waste water must be allowed to infiltrate;
- d. areas in which non-polluted waste water must be discharged into surface waters;
- e. measures by which non-polluted waste water with permanent flow must be kept away from waste water treatment plants;
- f. the locations where waste water treatment plants must be set up, and with which treatment system and with what capacity;
- g. areas in which systems other than waste water treatment plants must be used, and how, in these areas, waste water is to be disposed of.

<sup>3</sup> The GDP shall be adjusted if necessary:

- a. to take account of developments in housing areas;

- b. if a RDP is drawn up or changed.
- <sup>4</sup> It shall be accessible to the public.

### **Section 3            Discharge of Polluted Waste Water**

#### **Art. 6                Discharge into waters**

<sup>1</sup> The authorities shall authorise the discharge of polluted waste water into surface waters, drainage areas, underground rivers and streams if the requirements on discharge into waters according to Annex 3 are complied with.

<sup>2</sup> They shall set additional or stricter requirements, if:

- a. the waters concerned by the discharge of waste water do not fulfil water quality requirements according to Annex 2 or if this is necessary to comply with international agreements or decisions; and
- b. on the basis of investigation (Art. 47) it is certain that deficient water quality is largely due to discharge of waste water, and procedures necessary to comply are not disproportionate for the waste water treatment plant.

<sup>3</sup> They may set additional or stricter requirements if the water quality according to Annex 2 is not sufficient for a specific use of the body of water concerned.

<sup>4</sup> They may apply less stringent requirements if:

- a. by reducing the amounts of waste water discharged, fewer potential water pollutants are discharged even though the concentrations allowed are higher; or
- b. the environment as a whole is less impaired by the discharge of non-recyclable substances in industrial waste water than by another method of disposal; requirements on water quality according to Annex 2 and international agreements or decisions must be complied with.

#### **Art. 7                Discharge into public sewers**

<sup>1</sup> The authorities shall authorise discharge of waste water from industry according to Annex 3.2 or of other waste water according to Annex 3.3 into public sewers if the requirements of the relevant Annex are complied with.

<sup>2</sup> They shall set additional or stricter requirements if by discharge of waste water:

- a. operation of public sewers may be restricted or disrupted;
- b. in the case of waste water from the central waste water treatment plant, the requirements on discharge into a body of water are not met or may only be met by disproportionate measures, or could restrict or disrupt the operation of the plant in another way; or

c.<sup>8</sup> ...

<sup>8</sup> Repealed by No I of the O of 4 Nov. 2015, with effect from 1 Jan. 2016 (AS 2015 4791).

- d. the operation of the plant in which sludge is incinerated may be restricted or disrupted.
- <sup>3</sup> They may apply less stringent requirements if:
- a. by reducing the amounts of waste water discharged, fewer potential water pollutants are discharged even though the concentrations allowed are higher; or
  - b. the environment as a whole will be less impaired by the discharge of non-recyclable substances in industrial waste water than by another disposal method, and in the case of waste water from the central waste water treatment plant, requirements on discharge into a body of water are met; or
  - c. this is appropriate for the operation of the waste water treatment plant.

#### **Art. 8** Infiltration

<sup>1</sup> The infiltration of polluted waste water is prohibited.

<sup>2</sup> The authorities may authorise the infiltration of communal waste water or of other polluted waste water of comparable composition, if:

- a. the waste water has been treated and meets the requirements for discharge into waters;
- b. in the case of the groundwater concerned, water quality requirements according to Annex 2 are met after infiltration of the waste water;
- c. infiltration ensues at an installation intended for the purpose, the directives of the SoilPO<sup>9</sup> are not exceeded even in the long term, or in the absence of directives soil fertility is also guaranteed in the long term; and
- d. requirements valid for waste water treatment plants which discharge waste water into a body of water are met (Arts. 13–17).

#### **Art. 9** Waste water of specific origin

<sup>1</sup> Polluted waste water occurring outside public sewers for which neither discharge into waters, nor infiltration, nor use combined with farm manure (Art. 12 para. 4 WPA) is permitted must be collected in a cesspit which is regularly emptied with its contents being transferred to a central waste water treatment plant or facility for special treatment.

<sup>2</sup> Waste water from processing farm manure, hydroponics and other horticultural methods must be used in an environmentally compatible manner and reused agriculturally or horticulturally according to the state of the art.

<sup>3</sup> Waste water from mobile sanitation facilities must be collected and may be discharged into public sewers only by using equipment intended for this purpose. Excluded from this are sanitation facilities in:

- a. railway carriages with their own waste water treatment facilities;

<sup>9</sup> SR 814.12

- b. railway carriages for long-distance traffic which were commissioned before 1 January 1997;
- c. railway carriages for regional or urban traffic which were commissioned before 1 January 2000.

**Art. 10** Prohibition of waste disposal with waste water

It is prohibited:

- a. to dispose of solid and liquid wastes with waste water unless this is expedient for treatment of waste water;
- b. to discharge substances in a way which is contrary to instructions on the manufacturer's label or in the directions for use.

**Section 4**  
**Construction and Operation of Waste Water Treatment Plants**

**Art. 11** Separation of waste water in buildings

During construction or substantial building alterations, the persons responsible for the buildings must ensure that precipitation water and permanent flows of non-polluted waste water are channelled off separately from polluted waste water prior to reaching the outside of the building.

**Art. 12** Connection to sewers

<sup>1</sup> The discharge of polluted waste water into public sewers outside building zones (Art. 11 para. 2 let. c WPA) is:

- a. expedient if the connection may be constructed properly and with standard building expenditure;
- b. reasonable if the costs of the connection do not substantially exceed those for comparable connections within the building zone.

<sup>2</sup> The authorities may only authorise new discharges of permanent flows of non-polluted waste water into a central waste water treatment plant (Art. 12 para. 3 WPA) if local conditions do not permit infiltration or discharge into a body of water

<sup>3</sup> In order for a farm to qualify for exemption from the bond to be connected to the public sewers (Art 12 para. 4 WPA), its cattle and pig stock must comprise at least eight livestock units.

**Art. 13** Expert operation

<sup>1</sup> Persons responsible for waste water treatment plants must:

- a. maintain the facilities in working order;

- b. identify cases of divergence from normal operation, clarify the causes and immediately rectify these;
  - c. during operation take all reasonable measures to contribute to reducing the amount of substances discharged.
- <sup>2</sup> Persons responsible for enterprises discharging industrial waste water into public sewers as well as persons responsible for waste water treatment plants discharging waste water into the public sewers or into a body of water must ensure that:
- a. those responsible for the operation are named;
  - b. operating staff possess the necessary expert knowledge; and
  - c. that amounts and concentrations of substances discharged are determined if the authorisation contains numerical requirements.
- <sup>3</sup> Under paragraph 2, the authorities may require that owners:
- a. determine the amounts and concentrations of substances discharged which would influence the quality of the polluted water and of the receiving waters by virtue of their properties, quantity and period of discharge, even if the authorisation contains no numerical requirements;
  - b. conserve certain waste water test results for an appropriate period;
  - c. determine the effects of waste water discharge or infiltration on water quality if there is a risk that the water quality requirements under Annex 2 are not complied with.
- <sup>4</sup> The amounts and concentrations of substances discharged may be determined arithmetically on the basis of substance flows.

#### **Art. 14** Operational reports

- <sup>1</sup> Persons responsible for enterprises that discharge industrial waste water into public sewers and persons responsible for waste water treatment plants who discharge waste water into public sewers or into a body of water must report to and as instructed by the authorities:
- a. the amount of waste water discharged;
  - b. the amounts and concentrations of substances discharged which they must determine according to Article 13.
- <sup>2</sup> Persons responsible for central waste water treatment plants must also report:
- a. important operating data such as degree of effectiveness, quantity and characteristics of sludge, type of sludge disposal, energy consumption and operating costs;
  - b. conditions in the catchment area of the plant, such as connection rate and the percentage of non-polluted waste water with permanent flow.

**Art. 15** Supervision by the authorities

<sup>1</sup> The authorities shall examine periodically whether:

- a. enterprises which discharge industrial waste water into public sewers, and waste water treatment plants which discharge waste water into public sewers or into a body of water are complying with the requirements set out in the authorisation;
- b. these requirements continue to guarantee adequate waters protection.

<sup>2</sup> For this purpose, they shall take account of the results of the assessments made by the person responsible.

<sup>3</sup> They shall adjust the authorisations if necessary and order the required measures. In doing so, they shall take account of the urgency of the required measures, as well as the obligations resulting from international agreements or decisions.

**Art. 16** Measures with reference to exceptional events

<sup>1</sup> The persons responsible for waste water treatment plants that discharge waste water into a body of water and persons responsible for enterprises who discharge industrial waste water into a waste water treatment plant must take appropriate and economically acceptable measures to reduce the risk of pollution of a body of water arising from exceptional events.

<sup>2</sup> If in spite of these measures the risk is unacceptable, the authorities shall order the necessary additional measures.

<sup>3</sup> Regulations in the Major Accidents Ordinance of 27 February 1991<sup>10</sup> and the Ordinance of 20 November 1991<sup>11</sup> on the Guarantee of Drinking Water Supplies in Emergencies that go further are reserved.

**Art. 17** Reporting on exceptional events

<sup>1</sup> Persons responsible for waste water treatment plants that discharge waste water into a body of water must ensure that any event which is exceptional is reported immediately to the authorities, if such an event or events could lead to a situation in which it is no longer possible to guarantee compliance with the regulations on the discharge of waste water into a body of water or the intended use or disposal of sludge.

<sup>2</sup> Persons responsible for enterprises that discharge industrial waste water must ensure that exceptional events are immediately reported to the owner of the waste water treatment plant if these could lead to a situation in which the normal, orderly operation of the water or waste water treatment plant is restricted or disrupted.

<sup>3</sup> The authorities shall ensure that the communities and individuals affected by an exceptional event are informed about possible harmful effects on waters in due time. If substantial effects may be expected beyond cantonal or national boundaries, they

<sup>10</sup> SR 814.012

<sup>11</sup> SR 531.32



shall also ensure that the federal alarm centre, as well as the neighbouring cantons and states are notified.

4 ...<sup>12</sup>

<sup>5</sup> Reporting and information obligations arising from the Major Accidents Ordinance are reserved.

### Chapter 3 Disposal of Sludge

#### Art. 18 Sludge disposal plan

<sup>1</sup> The cantons shall draw up a sludge disposal plan and bring it into line with the new requirements within the deadlines imposed by experts.

<sup>2</sup> The disposal plan sets the following as a minimum:

- a. how sludge from the central waste water treatment plants should be disposed of;
- b. which procedures, including construction and modification of installations used for disposal of sludge, are required at what time.

<sup>3</sup> The sludge disposal plan shall be accessible to the public.

#### Art. 19 Storage facilities

<sup>1</sup> Persons responsible for waste water treatment plants shall ensure that they can store the sludge until environmentally compatible disposal is guaranteed.

<sup>2</sup> If sludge from a waste water treatment plant cannot be disposed of in an environmentally compatible manner at any time, the plant must have a storage capacities of at least two months.<sup>13</sup>

3 ...<sup>14</sup>

#### Art. 20 Inspection and obligation to report

<sup>1</sup> Persons responsible for waste water treatment plants must ensure that the quality of sludge is inspected within the deadlines imposed by experts.

2 ...<sup>15</sup>

3 ...<sup>16</sup>

<sup>12</sup> Repealed by No I of the O of 4 Nov. 2015, with effect from 1 Jan. 2016 (AS **2015** 4791).

<sup>13</sup> Amended by Annex No 1 of the O of 26 March 2003, in force since 1 Oct. 2006 (AS **2003** 940).

<sup>14</sup> Repealed by Annex No 1 of the O of 26 March 2003, with effect from 1 Oct. 2006 (AS **2003** 940).

<sup>15</sup> Repealed by No I of the O of 18 Oct. 2006, with effect from 1 Jan. 2007 (AS **2006** 4291).

<sup>16</sup> Repealed by No I of the O of 4 Nov. 2015, with effect from 1 Jan. 2016 (AS **2015** 4791).

**Art. 21** Supply

<sup>1</sup> Persons responsible for central waste water treatment plants must keep a record of recipients of sludge, the amount supplied, type of disposal declared and time of supply and retain this information for at least ten years and make it available to the authorities on request.

2 ...<sup>17</sup>

3 ...<sup>18</sup>

<sup>4</sup> They may only dispose of sludge other than as planned in the cantonal Sludge Disposal Plan with the agreement of cantonal authorities. If sludge is to be disposed of in another canton, the cantonal authorities shall consult the authorities of the receiving canton in advance.

**Chapter 4 Requirements for Animal Husbandry Farms****Art. 22** Animal husbandry farms

The following are deemed to be animal husbandry farms (Art. 14 WPA):

- a. farms and farming co-operatives that keep livestock;
- b. other enterprises involved in commercial animal husbandry; enterprises which keep zoo and circus animals or individual draft or riding animals or pets are excepted.

**Art. 23** Livestock units (LU)

The calculation for converting the number of livestock on any enterprise into LU (Art. 14 para. 4 WPA) is based on the quantity of manure produced by them annually. For one LU, this quantity is taken as containing a total of 105 kg of nitrogen and 15 kg of phosphorus.

**Art. 24** Normal local farming area

<sup>1</sup> The normal local farming area (Art. 14 para. 4 WPA) is the agricultural land located within 6 km by road from the livestock buildings in which the farm manure is produced.<sup>19</sup>

<sup>2</sup> In order to take account of local farming conditions, the cantonal authorities may reduce or extend this limit by a maximum of 2 km.

<sup>17</sup> Repealed by No I of the O of 4 Nov. 2015, with effect from 1 Jan. 2016 (AS 2015 4791).

<sup>18</sup> Repealed by Annex 3 No II 4 of the O of 22 June 2005 on Movements of Waste, with effect from 1 Jan. 2006 (AS 2005 4199).

<sup>19</sup> Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS 2013 4145).

**Art. 25** Exceptions to the requirements relating to agricultural land

<sup>1</sup> Farms that keep poultry or horses and farms serving the public interest need not have their own or leased agricultural land on which at least half of the farm manure accumulating in the enterprise can be used if it is guaranteed that the farm manure will be used by an organisation or another farm.<sup>20</sup>

2 ...<sup>21</sup>

<sup>3</sup> Farms serving the public interest (Art. 14 para. 7 let. b WPA) are:

- a. farms that serve experimental, research or development purposes (research institutes, university farms, performance testing institutions, insemination stations, etc.);
- b.<sup>22</sup> pig farms that cover at least 25 per cent of the energy needs of pigs with food by-products that come from milk processing;
- c.<sup>23</sup> pig farms that cover at least 40 per cent of the energy needs of pigs with food by-products that do not come from milk processing;
- d. <sup>24</sup> pig breeding enterprises that cover at least 40 per cent of the energy needs of pigs with food by-products that come both from milk processing and not from processing.

<sup>4</sup> In mixed animal husbandry farms, the exception under paragraph 1 applies only to that part of the animal husbandry that fulfils conditions for granting an exception.<sup>25</sup>

<sup>5</sup> The cantonal authorities shall in each case grant an exception under paragraph 1 for a duration of five years at most.<sup>26</sup>

**Art. 26 and 27<sup>27</sup>**

<sup>20</sup> Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS **2013** 4145).

<sup>21</sup> Repealed by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, with effect from 1 Jan. 2014 (AS **2013** 4145).

<sup>22</sup> Amended by No II of the O of 27 Oct. 2010, in force since 1 Jan 2011 (AS **2010** 5881). See also the Transitional Provision at the end of this text.

<sup>23</sup> Amended by No III of the O of 25 May 2011, in force since 1 July 2011 (AS **2011** 2407).

<sup>24</sup> Inserted by No III of the O of 25 May 2011, in force since 1 July 2011 (AS **2011** 2407). See also the Transitional Provision at the end of this text.

<sup>25</sup> Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS **2013** 4145).

<sup>26</sup> Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS **2013** 4145).

<sup>27</sup> Repealed by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, with effect from 1 Jan. 2014 (AS **2013** 4145).

**Art. 28** Inspection of storage facilities for farm manure and liquid digestate<sup>28</sup>

<sup>1</sup> The cantonal authorities shall ensure that storage facilities for farm manure and liquid digestate are regularly inspected; the frequency of the inspections shall correspond to the risk of pollution to the waters.<sup>29</sup>

<sup>2</sup> The following shall be inspected:

- a. whether the prescribed storage capacity is available;
- b. whether the storage facilities (including pipes) leak;
- c. whether facilities are in working order;
- d. whether the facilities are operated in accordance with the regulations.

## Chapter 5 Protection for Waters in terms of Area Planning

**Art. 29** Designation of water protection areas and determination of groundwater protection zones and areas

<sup>1</sup> When dividing their territory into water protection areas (Art. 19 WPA), the cantons shall indicate those at particular risk and the other areas. Those described in Annex 4 number 11 as at particular risk include:

- a. water protection area  $A_u$  for the protection of exploitable underground waters;
- b. water protection area  $A_o$  for the protection of water quality of surface waters if this is required to guarantee a specific use of a body of water;
- c. the area of contribution  $Z_u$  intended for the protection of water quality at existing and planned groundwater wells serving the public interest if the water is polluted by substances which are not sufficiently degraded or retained, or if there is a genuine risk of pollution by such substances;
- d.<sup>30</sup> the area of contribution  $Z_o$  intended for the protection of water quality of surface waters if water is polluted by run-off of pesticides or nutrients.

<sup>2</sup> They shall designate groundwater protection zones (Art. 20 WPA) described in Annex 4 number 12 in order to protect groundwater wells and groundwater recharge installations serving the public interest. They may designate groundwater protection zones even for planned wells and recharge installations serving the public interest, the locations of which and amount of withdrawals from which are established.

<sup>3</sup> They shall designate the groundwater protection areas described in Annex 4 number 13 (Art. 21 WPA) in order to protect the underground waters planned for use.

<sup>28</sup> Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS **2013** 4145).

<sup>29</sup> Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS **2013** 4145).

<sup>30</sup> Amended by No II 9 of the O of 18 May 2005 on the Repeal and Amendment of Ordinances in connection with the Commencement of the Chemicals Act, in force since 1 Aug. 2005 (AS **2005** 2695).

<sup>4</sup> They shall base their decisions on the designation of water protection areas and groundwater protection zones and areas on existing hydro-geological findings. If these are not sufficient, they shall ensure that the required hydro-geological investigations are conducted.

**Art. 30** Water protection maps

<sup>1</sup> The cantons shall draw up waters protection maps and adjust these as necessary. The waters protection maps shall indicate as a minimum:

- a. water protection areas;
- b. groundwater protection zones;
- c. groundwater protection areas;
- d. groundwater outflow points, wells and recharge installations that are of significance for water supply.

<sup>2</sup> The waters protection maps shall be accessible to the public. The cantons shall provide the Federal Office for the Environment (FOEN) and neighbouring cantons concerned with the waters protection maps and their annual modifications in digital form.<sup>31</sup>

**Art. 31** Protection measures

<sup>1</sup> Any person who constructs or alters installations or carries out activities which represent a risk to waters in areas particularly at risk (Art. 29 para. 1) as well as in groundwater protection zones and areas must take all measures expedient for the protection of the waters according to the circumstances and in particular must:

- a. take the measures required under Annex 4 number 2;
- b. set up the necessary monitoring, alarm and stand-by arrangements.

<sup>2</sup> The authorities shall ensure that:

- a. for existing installations in areas under paragraph 1, where there is a genuine risk of pollution of the waters, measures to protect waters, especially those under Annex 4 number 2, are taken, according to circumstances;
- b. existing installations in groundwater protection Zones S1 and S2 that endanger a groundwater well or a recharge installation are removed within an appropriate period of time, and that until removal of these installations other measures for protecting the drinking water are taken, in particular disinfection or filtration.

**Art. 32** Authorisations for installations and activities in areas particularly at risk

<sup>1</sup> ...<sup>32</sup>

<sup>31</sup> Amended by No I of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS 2015 4791).

<sup>32</sup> Repealed by No I of the O of 18 Oct. 2006, with effect from 1 Jan. 2007 (AS 2006 4291).

<sup>2</sup> In the areas particularly at risk (Art. 29) an authorisation is especially required for:<sup>33</sup>

- a. underground buildings;
- b. installations which damage protective layers or aquicludes;
- c. using the groundwater (including use for heating or cooling purposes);
- d. permanent drainage and irrigation;
- e. exposure of the groundwater table;
- f. drillings;
- g.<sup>34</sup> storage installations for liquid manure and liquid digestate;
- h.<sup>35</sup> storage installations for liquids that may pollute waters already in small quantities and with a usable volume of more than 2000 l per storage tank;
- i.<sup>36</sup> storage installations for liquids that may pollute waters in groundwater protection zones and areas with a usable volume of more than 450 l;
- j.<sup>37</sup> transshipment areas for liquids which may pollute waters.

<sup>3</sup> If authorisation is required, the applicant must prove that the requirements for protection of waters are fulfilled and provide the documents necessary for this (if necessary hydro-geological investigations).

<sup>4</sup> The authorities shall grant an authorisation if adequate protection of waters can be guaranteed subject to conditions and requirements. It shall also lay down requirements for decommissioning the installations.

**Art. 32a<sup>38</sup>** Inspection of storage installations for liquids which may pollute waters

<sup>1</sup> The persons responsible for storage installations for liquids that may pollute waters that require authorisation must arrange for an external visual inspection to be conducted every ten years in order to check for defects.<sup>39</sup>

<sup>2</sup> An internal visual inspection must be conducted every ten years for:

- a. storage tanks with more than 250 000 l usable volume that do not have a protective construction or a double-walled floor;
- b. single-walled underground storage tanks.

<sup>3</sup> The persons responsible must arrange for the inspection of the proper functioning of the leak detection system in storage installations for liquids which may pollute

<sup>33</sup> Amended by No I of the O of 18 Oct. 2006, in force since 1 Jan 2007 (AS **2006** 4291).

<sup>34</sup> Inserted by No I of the O of 18 Oct. 2006 (AS **2006** 4291). Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS **2013** 4145).

<sup>35</sup> Inserted by No I of the O of 18 Oct. 2006, in force since 1 Jan 2007 (AS **2006** 4291).

<sup>36</sup> Inserted by No I of the O of 18 Oct. 2006, in force since 1 Jan 2007 (AS **2006** 4291).

<sup>37</sup> Inserted by No I of the O of 18 Oct. 2006, in force since 1 Jan 2007 (AS **2006** 4291).

<sup>38</sup> Inserted by No I of the O of 18 Oct. 2006, in force since 1 Jan 2007 (AS **2006** 4291).

<sup>39</sup> Amended by No I of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS **2015** 4791).

waters every two years in the case of double-walled containers and pipes and every year in the case of single-walled containers and pipes.

## Chapter 6 Maintaining Appropriate Rates of Residual Water Flow

### Art. 33 Water withdrawals from watercourses

<sup>1</sup> For withdrawals from watercourses (Art. 29 WPA) which comprise stretches with permanent flow and others without permanent flow, a permit is required if the site of the water withdrawal shows permanent flow. The conditions for granting the permit must be fulfilled only in the stretches with a permanent flow (Art. 30 WPA).

<sup>2</sup> If the waters at the site of water withdrawal shows no permanent flow, the authorities shall ensure that the required measures under Federal Act of 1 July 1966<sup>40</sup> on the Protection of Nature and Cultural Heritage and the Federal Act of 21 July 1991<sup>41</sup> on Fish and Fisheries are taken.

### Art. 33a<sup>42</sup> Ecological potential

When determining the ecological potential of a body of water, consideration shall be given to the following:

- a. the ecological importance of the body of water in its current state;
- b. the potential ecological importance of the body of water in a state in which the man-made harm is eliminated to the extent possible at a reasonable cost.

### Art. 34 Protection and utilisation plan

<sup>1</sup> The authorities shall file the application for the approval of a protection and utilisation plan (Art. 32 let. c WPA) with the FOEN<sup>43</sup>.

<sup>2</sup> The application shall contain:

- a. the protection and utilisation plan decided on;
- b. the justification why the measures planned represent sufficient compensation for a lower minimum residual flow;
- c. information on how the planned measures should be made binding on all concerned for the duration of the license.

<sup>3</sup> Compensatory measures in the context of the protection and utilisation plan are deemed appropriate if they serve to protect waters or the habitats depending on it.

<sup>40</sup> SR 451

<sup>41</sup> SR 923.0

<sup>42</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>43</sup> Expression in accordance with No I 13 of the O of 7 Nov. 2007 on the New System of Fiscal Equalisation and the Division of Tasks between the Confederation and the Cantons, in force since 1 Jan. 2008 (AS 2007 5823). This amendment has been made throughout the text.

Measures that would be necessary in any case, according to federal regulations on environmental protection, are not taken into consideration.

**Art. 35** Residual flow report

<sup>1</sup> For water withdrawals which are subject to an environmental impact assessment (EIA), the residual flow report is part of the environmental impact report (Art. 33 para. 4 WPA).

<sup>2</sup> For water withdrawals on which the federal government must be consulted and which are not subject to an EIA, the authorities shall ensure that the opinion of the cantonal expert body on the residual water report or on an amended draft thereof is made available to the FOEN. The FOEN may limit itself to making a summary review of the documents.<sup>44</sup>

**Art. 36** Inventory of existing water withdrawals

<sup>1</sup> For water withdrawals serving installations using water power, the inventory shall include (Art. 82 para. 1 WPA) as a minimum:

- a. a description of the water withdrawal and restitution (names, co-ordinates, height above sea level and, where appropriate, names of power stations and dams);
- b. the beginning and duration of the right of use granted, its extent, in particular the amount of water extractable in m<sup>3</sup>/s as well as the name of the person entitled to extract (the user);
- c. the removable amount of water in m<sup>3</sup>/s;
- d. the residual flow maintained previously with details of the location or the water endowment flow in l/s;
- e. other obligations to transfer water imposed on the user;
- f. the participation of the user in maintaining and correcting the waters;
- g. further conditions or installations in the interests of waters protection and fisheries;
- h. the Q347 flow rate, the flow regime of the watercourse upstream of the water withdrawal point and the amount withdrawn every month in m<sup>3</sup>/s, expressed as the average over several years, to the extent that this data is available at the time the inventory is drawn up;
- i. whether the water is withdrawn from a watercourse flowing through landscapes or habitats which are listed in the national or cantonal inventories.

<sup>2</sup> For withdrawals using fixed non-hydropower equipment which may be authorised under Article 30 letter a WPA, the inventory shall as a minimum state the purpose of the withdrawal and the information in paragraph 1, letters a, b, d, h, and i.

<sup>44</sup> Amended by No 11 of the O of 29 June 2011 on the Amendment of Ordinances in the Environment Sector, in force since 1 Aug. 2011 (AS 2011 3379).



<sup>3</sup> For withdrawals using fixed non-hydropower equipment which may be authorised under Article 30 letters b or c WPA, the inventory shall state the information in paragraph 1 letters a and b.

**Art. 37** List of water withdrawals not listed in the inventory

The cantons shall draw up a list of withdrawals for the use of water power from watercourses without permanent flow.

**Art. 38** Remediation report

<sup>1</sup> For every withdrawal of water listed in the inventory under Article 36 paragraphs 1 and 2, the remediation report (Art. 82 para. 2 WPA) shall indicate whether the watercourse requires remediation; if this is the case, the report indicates the reasons for such remediation, its extent and the period of time forecast to implement it.

<sup>2</sup> For every water withdrawal, the report contains in particular:

- a. the description of the water withdrawal and return (names, co-ordinates, height above sea level and, where appropriate, names of any power stations or dams);
- b. the rate of  $Q_{347}$  flow;
- c. data relating to the flow regime of the watercourse upstream of the water withdrawal point and in the stretch of residual water flow;
- d. the amount withdrawn every month in  $m^3/s$  expressed as the average over several years.

<sup>3</sup> For water withdrawals where remediation is necessary, the report shall also contain information on:

- a. remediation measures which may be imposed without infringing rights of use which justify a claim for compensation by the user (Art. 80 para. 1 WPA);
- b. more extensive remediation measures which are necessary because of overriding public interests (Art. 80 para. 2 WPA); for watercourses flowing through landscapes or habitats which are listed in national or cantonal inventories, the report shall name the special requirements for the watercourse arising from the protection targets defined in the inventory;
- c. type of remediation measures (higher levels of water endowment, structural, operational and other measures);
- d. the expected schedule for completion of the remediation measures.

**Art. 39** Information obligation

<sup>1</sup> The user must provide the authorities with the information required to draw up the inventory and the remediation report.

<sup>2</sup> The authorities may require the user to carry out flow measurements.

**Art. 40** Submission, updating and accessibility of inventories, lists and remediation reports

<sup>1</sup> The cantons shall submit the inventories, lists and remediation reports to the FOEN.

<sup>2</sup> They shall update the inventories and lists.

<sup>3</sup> They shall ensure that the inventories, lists and remediation reports are made accessible to the public after consulting those concerned. Business secrecy shall be preserved.

**Art. 41** Water withdrawals under licences already granted

Articles 36–40 apply by analogy to planned water withdrawals for which a licence was granted before the entry into force of the Waters Protection Act (Art. 83 WPA).

## Chapter 7

### Prevention and Remediation of Other Harmful Effects on Waters<sup>45</sup>

#### Section 1<sup>46</sup>

#### Space provided for Waters and Rehabilitation of Watercourses

**Art. 41a** Space provided for watercourses

<sup>1</sup> In biotopes of a national importance, in cantonal nature conservation areas, in mire landscapes of exceptional beauty and national importance, in water bird and migratory bird reserves of international or national importance and, in the case of waters-related protection targets, in landscapes of national importance and cantonal landscape conservation areas the width of the space provided for waters must amount to at least:

- a. for watercourses with a channel bed of less than 1 m natural width: 11 m;
- b. for watercourses with a channel bed of 1–5 m natural width: 6 times the width of the channel bed plus 5 m;
- c. for watercourses with a channel bed of more than 5 m natural width: the width of the channel bed plus 30 m.

<sup>2</sup> In other areas, the width of the space provided for waters must amount to at least:

- a. for watercourses with a channel bed of less than 2 m natural width: 11 m;
- b. for watercourses with a channel bed of 2–15 m natural width: 2.5 times the width of the channel bed plus 7 m.

<sup>3</sup> The width of the space provided for waters calculated in accordance with paragraphs 1 and 2 must be increased where this is required to guarantee:

<sup>45</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>46</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955). See also the transitional provision relating to this amendment at the end of the text.

- a. protection against flooding;
- b. the space required for rehabilitation;
- c. the protection targets for watercourses under paragraph 1 and other overriding interests of nature and landscape conservation;
- d. a use of the waters.

<sup>4</sup> Provided protection against flooding is guaranteed, the width of the space provided for waters may be adapted:

- a. to the structural conditions in densely built-up areas;
- b. to the topographic conditions on stretches of waters:
  1. in which the waters largely fill the valley floor, and
  2. that have slopes on both sides that are too steep to permit farming activities.<sup>47</sup>

<sup>5</sup> In the absence of any overriding interests to the contrary, determining the space provided for waters may be dispensed with if the waters:

- a. are located in forest or in areas, that are not designed mountain- or valley areas in accordance with the agriculture legislation in the arable land register;
- b. are culverted; or
- c. are artificially laid out; or
- d.<sup>48</sup> are very small.

**Art. 41b** Space provided for standing waters

<sup>1</sup> The width of the space provided for waters must amount to at least 15 m measured from the shoreline.

<sup>2</sup> The width of the space provided for waters calculated in accordance with paragraphs 1 must be increased where this is required to guarantee:

- a. protection against flooding;
- b. the space required for rehabilitation;
- c. overriding interests of the nature- and landscape conservation;
- d. the use of the waters.

<sup>3</sup> The width of the space provided for waters may be adapted to the structural conditions in densely built-up areas provided protection against flooding is guaranteed.

<sup>4</sup> In the absence of any overriding interests to the contrary, determining the space provided for waters may be dispensed with if the waters:

- a. are located in forest or in areas, that are not designed mountain- or valley areas in accordance with the agriculture legislation in the arable land register;

<sup>47</sup> Amended by No I of the O of 22 March 2017, in force since 1 May 2017 (AS 2017 2585).

<sup>48</sup> Inserted by No I of the O of 22 March 2017, in force since 1 May 2017 (AS 2017 2585).

- b. have a surface area of less than 0.5 ha; or
- c. are artificially laid out.

**Art. 41c** Extensive structuring and management of the space provided for waters

<sup>1</sup> In the space provided for waters, only fixed installations serving the public interest such as footpaths and hiking trails, run-of-river power plants or bridges may be built. The authority may authorise the following installations provided there are no overriding interests to the contrary:

- a. in densely built-up areas, installations that meet zoning requirements;
- a<sup>bis.49</sup> installations that meet zoning requirements outside densely built-up areas on individual plots of ground that have not been built on within a series of several plots of ground that have been built on;
- b. agricultural and forestry tracked and gravel paths with a distance of at least 3m from the shoreline of the waters if topographically limited spatial conditions pertain;
- c. fixed parts of installations that aid water withdrawal or discharge;
- d.<sup>50</sup> small installations that serve the use of the waters.<sup>51</sup>

<sup>2</sup> The continued existence of installations and permanent crops in terms of Article 22 paragraph 1 letters a–c, e and g–i of the Agricultural Terms Ordinance of 7 December 1998<sup>52</sup> in the space provided for waters that are lawfully constructed and useable as intended is in principle protected.<sup>53</sup>

<sup>3</sup> No fertilisers and plant health products may be used in the space provided for waters. Individual treatments of problem plants are permitted outside a 3-metre wide strip along the bank where these cannot be controlled mechanically at a reasonable cost.

<sup>4</sup> The space provided for waters may be used for agricultural purposes if it is used in accordance with the requirements of the Direct Payments Ordinance of 23 October 2013<sup>54</sup> as straw fields, hedgerows, field or riparian woodland, riparian meadow along watercourses, extensively used meadow, extensively used pasture ground or wooded pasture ground. These requirements also apply to the use of areas outside the agricultural land in use.<sup>55</sup>

<sup>4bis</sup> If in the case of roads and paths with a base layer or railway lines that run alongside waters the space provided for waters on the land side extends only a few metres beyond the transport infrastructure, the authority may authorise exceptions from the

<sup>49</sup> Inserted by No 1 of the O of 22 March 2017, in force since 1 May 2017 (AS 2017 2585).

<sup>50</sup> Inserted by No 1 of the O of 22 March 2017, in force since 1 May 2017 (AS 2017 2585).

<sup>51</sup> Amended by No 1 of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS 2015 4791).

<sup>52</sup> SR 910.91

<sup>53</sup> Amended by No 1 of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS 2015 4791).

<sup>54</sup> SR 910.13

<sup>55</sup> Amended by Annex 9 No 2 of the Direct Payments Ordinance of 23 Oct. 2013, in force since 1 Jan. 2014 (AS 2013 4145).

management restrictions in paragraphs 3 and 4 for the part on the land side provided no fertilisers or plant health products can enter the water.<sup>56</sup>

<sup>5</sup> Measures against natural erosion of the banks of a watercourse are permitted only if required for protection against flooding or to prevent an unreasonable loss of agricultural land.

<sup>6</sup> The following do not apply:

- a. paragraphs 1–5 to that part of the space provided for waters that exclusively serves to guarantee the use of the waters;
- b. paragraphs 3 and 4 to the space provided for culverted waters.

**Art. 41<sup>c</sup>bis**<sup>57</sup> Farming land with the quality of crop rotation areas in the space provided for waters

<sup>1</sup> Arable farming land with the quality of crop rotation areas in the space provided for waters must be shown separately by the cantons when making the inventory of crop rotation areas in accordance with Article 28 of the Spatial Planning Ordinance of 28 June 2000<sup>58</sup>. It may continue to be included in the cantonal minimum of crop rotation areas. If a related federal decree is issued (Art. 5 WPA), these areas may be intensively farmed in emergency situations.

<sup>2</sup> Alternative land must be provided in accordance with the sectoral plan for crop rotation areas (Art. 29 of the Spatial Planning Ordinance of 28 June 2000) in compensation for arable farming land with the quality of crop rotation areas in the space provided for waters that is required to implement structural flood protection or rehabilitation measures.

**Art. 41d** Planning of rehabilitation projects

<sup>1</sup> The cantons shall devise the principles required to plan the rehabilitation of watercourses. The principles shall include information on the following in particular:

- a. the ecomorphological condition of the waters;
- b. the installations in the space provided for waters;
- c. the ecological potential and the agricultural importance of the waters.

<sup>2</sup> They shall set out in a plan for a period of 20 years the stretches of water to be rehabilitated, the form of the rehabilitation measures and the deadlines by which the measures must be implemented, and shall coordinate the plan with the neighbouring cantons to the extent that this is required. Rehabilitation projects shall primarily be planned where their benefits:

- a. are substantial for nature and the landscape;
- b. are substantial compared with the probable cost;

<sup>56</sup> Inserted by No I of the O of 22 March 2017, in force since 1 May 2017 (AS 2017 2585).

<sup>57</sup> Inserted by No I of the O of 4 Nov. 2015 (AS 2015 4791). Amended by No I of the O of 22 March 2017, in force since 1 May 2017 (AS 2017 2585).

<sup>58</sup> SR 700.1

- c. may be increased through coordination with other measures to protect natural habitats or to prevent flooding.

<sup>3</sup> They shall adopt the plans under paragraph 2 for watercourses by 31 December 2014 and for standing waters by 31 December 2022. They shall submit the plans to the FOEN one year before their adoption so that the FOEN may comment thereon.<sup>59</sup>

<sup>4</sup> They shall renew the plans under paragraph 2 every 12 years for a period of 20 years and shall submit these plans to the FOEN one year before their adoption so that the FOEN may comment thereon.

## Section 2<sup>60</sup> Hydropeaking

### Art. 41e Serious harm due to hydropeaking

There is serious harm to indigenous flora and fauna and to their habitats due to hydropeaking where:

- a. the flow rate for upsurge is at least 1.5 times greater than for downsurge; and
- b. the site-specific quantity, composition and diversity of the plant and animal communities are changed to their detriment, in particular because regularly and in an unnatural manner fish are run ashore, fish spawning grounds are destroyed, aquatic animals are washed away, turbidity arises or the water temperature is altered in an unlawful manner.

### Art. 41f Planning remediation measures for hydropeaking

<sup>1</sup> The cantons shall submit to the FOEN a plan for measures to remediate hydropower plants that cause hydropeaking in accordance with the procedure described in Annex 4a number 2.

<sup>2</sup> The persons responsible for hydropower plants must grant access to the authority responsible for the plan and provide the required information, in particular on:

- a. the coordinates and the designation the individual parts of the plant;
- b. the flow rates of the watercourse concerned with measured values at intervals of no more than 15 minutes (hydrograph) over a period covering the past five years; If these measured values are not available, the hydrograph may be calculated using data relating to hydro-electric power production at the plant and the water flow;
- c. the measures carried out and planned to reduce the effects of hydropeaking;
- d. the available results of the study on the effects of hydropeaking;
- e. the planned structural and operational changes at the plant.

<sup>59</sup> Amended by No 14 of the O of 28 Jan. 2015 on Amendments to Ordinance Law on the Environment, in particular in relation to the programme agreements for the programme period 2016-2019, in force since 1 Jan. 2016 (AS 2015 427).

<sup>60</sup> Inserted by No 1 of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

**Art. 41g** Remediation measures for hydropeaking

<sup>1</sup> Based on the measures plan, the cantonal authority shall order the remediation of hydropeaking and require the persons responsible for hydropower plants to examine various types of remediation measure in order to implement the plan.

<sup>2</sup> Before it decides on the remediation project, it shall consult the FOEN. With a view to an application under Article 30 paragraph 1 of the Energy Ordinance of 1 November 2017<sup>61</sup> (EnO), the FOEN shall verify whether the criteria of Annex 3 number 2 EnO are met.<sup>62</sup>

<sup>3</sup> The persons responsible for hydropower plants shall verify the effectiveness of the measures taken as required by the authority.

**Section 3 Flushing out and Emptying of Impoundments**<sup>63</sup>**Art. 42** ...<sup>64</sup>

<sup>1</sup> Before an authority authorises the flushing out or emptying of an impoundment, it shall ensure that sediments are removed other than by washing away if this is environmentally compatible and economically acceptable.

<sup>2</sup> When washing away sediments the authorities shall ensure that communities of plants, animals and micro-organisms are harmed as little as possible, in particular by laying down:

- a. time and type of flushing out or emptying;
- b. the maximum concentration of suspended matter in the water which must be respected during the flushing out or emptying;
- c. to what extent washing away must be carried out so that during the flushing out or emptying, fine matter deposited in watercourses is removed.

<sup>3</sup> Paragraphs 1 and 2 do not apply to the abrupt lowering of the water level following an exceptional event (Art. 40 para. 3 WPA).

**Section 4 Bed Load Budget**<sup>65</sup>**Art. 42a**<sup>66</sup> Serious harm due to change in the bed load budget

A change in the bed load budget causes serious harm to the indigenous flora and fauna and their habitats if installations such as hydropower plants, gravel excavation

<sup>61</sup> SR 730.01

<sup>62</sup> Second sentence amended by Annex 7 No II 2 of the Energy Ordinance of 1 Nov. 2017, in force since 1 Jan. 2018 (AS 2017 6889).

<sup>63</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>64</sup> Repealed by No I of the O of 4 May 2011, with effect from 1 June 2011 (AS 2011 1955).

<sup>65</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>66</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

sites, bed load traps or river control structures alter the morphological structures or the morphological dynamics of the waters to their detriment.

**Art. 42<sup>b67</sup>** Planning the measures to remediate the bed load budget

<sup>1</sup> The cantons shall submit a plan to the FOEN of their measures to remediate the bed load budget in accordance with the procedure described in Annex 4a number 3.

<sup>2</sup> The persons responsible for installations must allow access to the authority responsible for the plan and provide the required information, in particular on:

- a. the details and the designation of the installations and in the case of hydropower plants the individual parts of the installation;
- b. how the bed load is dealt with;
- c. the measures carried out and the planned in order to improve the bed load budget;
- d. the available results of the study of the bed load budget;
- e. the planned structural and operational changes to the installation.

**Art. 42<sup>c68</sup>** Measures to remediate the bed load budget

<sup>1</sup> In the case of installations which according to the plan require measures to remediate the bed load budget, the cantons shall prepare a study on the nature and extent of the required measures.

<sup>2</sup> Based on the study, the cantonal authority shall in accordance with paragraph 1 order the remediation measures. In the case of hydropower plants, the bed load must wherever possible be made to pass through the installation.

<sup>3</sup> Before it decides on the remediation project in the case of hydropower plants, it shall consult the FOEN. The FOEN shall examine with a view to an application under Article 30 paragraph 1 EnO<sup>69</sup> whether the criteria of Annex 3 number 2 EnO are met.<sup>70</sup>

<sup>4</sup> The persons responsible for hydropower plants shall verify the effectiveness of the measures taken in accordance with instructions from the cantonal authority.

**Art. 43** Extraction of gravel, sand and other materials from watercourses

<sup>1</sup> In order that the bed load budget in a watercourse is not unfavourably influenced by extraction of gravel, sand or other materials (Art. 44 para. 2 let. c WPA), the authorities must ensure that:

- a. the quantity of bed load extracted from the watercourse does not exceed the natural supply;

<sup>67</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>68</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>69</sup> SR 730.01

<sup>70</sup> Second sentence amended by Annex 7 No II 2 of the Energy Ordinance of 1 Nov. 2017, in force since 1 Jan. 2018 (AS 2017 6889).



- b. the extraction does not in the long term lead to a subsidence of the bottom outside the extraction perimeter;
- c. the extraction does not render impossible the maintenance and re-establishment of inventoried floodplains;
- d. the extraction does not lead to a substantial change in the particle size distribution of the bottom material outside the extraction perimeter.

<sup>2</sup> Extraction according to paragraph 1 should not lead to turbidity that may impair fishing waters.

## Section 5 Drainage Water from Underground Buildings<sup>71</sup>

### Art. 44 ...<sup>72</sup>

<sup>1</sup> Drainage water from underground buildings must be contained and channelled off in such a way that it cannot be polluted by such construction operations, in particular by exceptional events. This does not apply to small amounts of drainage water if retention measures prevent the pollution of the receiving waters.

<sup>2</sup> For the discharge of drainage water from underground buildings into watercourses, the following applies:

- a. the spillway construction must be such as to ensure homogeneous and rapid mixing of the water;
- b. the temperature of the receiving waters must not be raised over its near as possible natural state by more than 3 °C; if the stretch belongs to a trout zone, the temperature must not be raised by more than 1.5 °C;
- c. the discharge must not result in the water temperature exceeding 25 °C.

<sup>3</sup> Depending on local circumstances the authorities shall specify:

- a. requirements for discharge into lakes and infiltration;
- b. additional requirements for discharge into watercourses if necessary.

## Chapter 8 Enforcement

### Art. 45<sup>73</sup> Enforcement by cantonal and federal authorities

<sup>1</sup> The cantons shall enforce this Ordinance unless it delegates enforcement to the Confederation.

<sup>71</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>72</sup> Repealed by No I of the O of 4 May 2011, with effect from 1 June 2011 (AS 2011 1955).

<sup>73</sup> Amended by No II 12 of the O of 2 Feb. 2000 to the Federal Act on the Coordination and Simplification of Decision-Making Procedures, in force since 1 March 2000 (AS 2000 703).

<sup>2</sup> If the federal authorities apply other federal laws, or international treaties or decisions that relate to the subject matter of this Ordinance, they shall also enforce this Ordinance. The cooperation of the FOEN and the cantonal authorities is governed by Article 48 paragraph 1 WPA; statutory duties of secrecy are reserved.

<sup>3</sup> At the request of the cantons, the federal authorities shall take account of their provisions and measures, unless fulfilment of the tasks of the federal authority is thereby rendered impossible or made disproportionately difficult.

<sup>4</sup> If the federal authorities enact administrative ordinances such as guidelines or instructions that concern waters protection, they shall consult the FOEN.

<sup>5</sup> The Federal Department of the Environment, Transport, Energy and Communications (the Department) may, if required, amend the lists of parameters and the numerical requirements for water quality in accordance with Annex 2 number 11 paragraph 3, number 12 paragraph 5 and number 22 paragraph 2.<sup>74</sup>

#### **Art. 46** Co-ordination<sup>75</sup>

<sup>1</sup> Where required, the cantons shall coordinate measures under this Ordinance with each other and with measures in other sectors. They shall also ensure the coordination of the measures with those of neighbouring cantons.<sup>76</sup>

<sup>1bis</sup> They shall take account of plans under this Ordinance when drawing up structure and land use plans.<sup>77</sup>

<sup>2</sup> In drawing up the supply plan for drinking water, they include both groundwater resources already used and those intended for exploitation and ensure that water withdrawals are co-ordinated so that no excessive withdrawals take place and the groundwater resources are used economically.

<sup>3</sup> In granting authorisations for discharges and infiltration under Articles 6-8 the authorities shall take account of both the requirements of the Environmental Protection Act of 7 October 1983<sup>78</sup> on public protection from odour emissions as well as the requirements of the Employment Act of 13 March 1964<sup>79</sup> and the Accident Insurance Act of 20 March 1981<sup>80</sup> on protection of the health of staff at waste water treatment plants.

#### **Art. 47** Procedures for polluted waters

<sup>1</sup> If the authorities establish that a body of water does not fulfil the requirements of Annex 2 on water quality or that the specific use of the body of water cannot be guaranteed they shall:

- a. determine and assess the type and extent of the pollution;

<sup>74</sup> Inserted by No I of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS **2015** 4791).

<sup>75</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS **2011** 1955).

<sup>76</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS **2011** 1955).

<sup>77</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS **2011** 1955).

<sup>78</sup> SR **814.01**

<sup>79</sup> SR **822.11**

<sup>80</sup> SR **832.20**

- b. determine the causes of the pollution;
- c. assess the effectiveness of possible measures;
- d. ensure that the required measures are undertaken based on the relevant regulations.

<sup>2</sup> If several sources of pollution are involved, the measures to be taken by those responsible must be coordinated.

**Art. 48** Investigations and assessments

<sup>1</sup> Investigations and assessments are subject to the recognised state of the art; in particular, the relevant standards of the European Committee for Standardisation (CEN) <sup>81</sup> or other standards that provide equivalent results apply.

<sup>2</sup> Insofar as this Ordinance contains no regulations on the type and frequency of sampling or the assessment of compliance with requirements, the authorities shall specify such regulations on a case-by-case basis.

**Art. 49** Information

<sup>1</sup> The FOEN shall provide information on the state of waters and waters protection, provided this is in the interest of Switzerland as a whole. In particular it shall publish reports on the state of waters protection in Switzerland. The cantonal authorities shall provide the necessary information.

<sup>2</sup> The cantonal authorities shall provide information on the state of waters and waters protection in their canton. At the same time they shall also provide information on the measures taken and their impact and on bathing sites where the requirements for bathing are not met (Annex 2 no 11 para. 1 let. e).<sup>82</sup>

**Art. 49a**<sup>83</sup> Geoinformation

The FOEN shall provide specifications for the minimum geodata models and presentation models for the official geodata under this Ordinance for which it is designated federal specialist authority in Annex 1 to the Geoinformation Ordinance of 21 May 2008<sup>84</sup>.

<sup>81</sup> Source: Swiss Association for Standardisation, Sulzerallee 70, 8404 Winterthur; [www.snv.ch](http://www.snv.ch).

<sup>82</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>83</sup> Inserted by Annex 2 No 7 of the O of 21 May 2008 on Geoinformation, in force since 1 July 2008 (AS 2008 2809).

<sup>84</sup> SR 510.620

**Art. 50**<sup>85</sup>**Art. 51** International decisions, recommendations and commissions<sup>86</sup>

<sup>1</sup> The Department is authorised to approve decisions and recommendations that are based on the following international agreements, with the agreement of the Federal Department of Economic Affairs, Education and Research:<sup>87</sup>

- a. Convention of 22 September 1992<sup>88</sup> for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention);
- b. Convention of 29 April 1963<sup>89</sup> on the International Commission for Protection of the Rhine against Pollution;
- c. Convention of 3 December 1976<sup>90</sup> on the Protection of the Rhine against Chemical Pollution.

<sup>2</sup> The FOEN shall supply the approved decisions and recommendations to third parties on request.

<sup>3</sup> The Department shall elect members of the Swiss delegations to the inter-state commissions for protection of waters.<sup>91</sup>

**Chapter 8a**<sup>92</sup> **Federal Waste Water Charge****Art. 51a** Charge rate

The level of the charge in accordance with Article 60*b* WPA amounts to 9 francs per resident per annum. The charge is based on the number of residents that are connected to the waste water treatment plant on 1 January of the calendar year in which the charge is collected.

**Art. 51b** Data provided by the cantons

The cantons must:

<sup>85</sup> Repealed by No III 2 of the O of 12 Aug. 2015, with effect from 1 Oct. 2015 (AS **2015** 2903).

<sup>86</sup> Amended by No II 12 of the O of 2 Feb. 2000 to the Federal Act on the Coordination and Simplification of Decision-Making Procedures, in force since 1 March 2000 (AS **2000** 703).

<sup>87</sup> Amended by No I of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS **2015** 4791).

<sup>88</sup> SR **0.814.293**

<sup>89</sup> [AS **1965** 388, **1979** 93. AS **2003** 1934 Art. 19 No 2, 3]. Today: Convention of 12 April 1999 on the International Commission for Protection of the Rhine against Pollution (SR **0.814.284**).

<sup>90</sup> [AS **1979** 97, **1983** 323, **1989** 161. AS **2003** 1934 Art. 19 No 2].

<sup>91</sup> Inserted by fig. II 12 of the O of 2 Feb. 2000 to the Federal Act on the Coordination and Simplification of Decision-Making Procedures, in force since 1 March 2000 (AS **2000** 703).

<sup>92</sup> Inserted by No I of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS **2015** 4791).

- a. notify the FOEN each year by 31 March of the number of residents that are connected to each waste water treatment plant on their territory as of 1 January of the calendar year in question;
- b. submit to the FOEN by 31 October of each calendar year the final accounts with requests for compensatory payments under Article 60b paragraph 2 WPA that are received by 30 September of the same calendar year.

**Art. 51c** Collection of the charge

<sup>1</sup> The FOEN shall invoice the charge to the subjects liable to pay by 1 June in the calendar year concerned. It shall issue a ruling on the charge in the event of any dispute over the invoice.

<sup>2</sup> At the request of the canton, the FOEN may invoice the canton for the charge if the canton confirms that it collects the charge from the waste water treatment plants on its territory on the same terms as those of the FOEN. This request must be submitted to the FOEN by 31 March.

<sup>3</sup> Payment must be made within 60 days of the due date. The charge becomes due on receipt of the invoice or, if the invoice is disputed, on the ruling on the charge taking full legal effect in accordance with paragraph 1. In the event of late payment, interest of 5 per cent becomes due.<sup>93</sup>

**Art. 51d** Time limit

<sup>1</sup> The right to collect the charge lapses ten years from the end of the calendar year in which it arises.

<sup>2</sup> The time limitation period is interrupted and restarted:

- a. if the subject liable to the charge acknowledges the right to collect it;
- b. by any official act by which the right to collect the charge is enforced against the subject liable to pay it.

<sup>3</sup> The right to collect the charge expires in every case 15 years from the end of the calendar year in which it arises.

<sup>93</sup> Amended by No I of the O of 22 March 2017, in force since 1 May 2017 (AS 2017 2585).

## Chapter 9 Granting of Federal Subsidies

### Section 1<sup>94</sup> Measures

#### Art. 52 Nitrogen removal at waste water treatment plants<sup>95</sup>

<sup>1</sup> The level of the global compensatory payments made to installations and equipment for nitrogen removal (Art. 61 para. 1 WPA) is governed by the number of tonnes of nitrogen removed each year.

<sup>2</sup> Insofar as it is necessary to comply with international agreements or decisions of international organisations, the extent and complexity of the measures may also be taken into account.

<sup>3</sup> The level of the global compensatory payments shall be agreed between the FOEN and the canton concerned.

#### Art. 52a<sup>96</sup> Elimination of organic trace substances at waste water plants

<sup>1</sup> Compensatory payments in respect of measures to eliminate organic trace substances under Article 61a paragraph 1 WPA shall be made to the cantons on a case-by-case basis.

<sup>2</sup> If the measure giving rise to the compensatory payment is not implemented within five years of payment being assured, the assurance is no longer valid.

<sup>3</sup> If sewers are constructed instead of installations and equipment to eliminate organic trace substances, the maximum costs attributable are those that could have arisen in the event of measures being taken at the waste water treatment plant itself.

<sup>4</sup> Before the authority decides on the measure, it shall consult the FOEN.

#### Art. 53 Waste disposal installations

Compensatory payments made in respect of waste disposal installations eligible for subsidies (Art. 62 paras 1 and 2 WPA) shall be made on a case by case basis for planning, initial establishment and extension.

#### Art. 54 Measures in agriculture

<sup>1</sup> The level of the global compensatory payments made in respect of measures in agriculture (Art. 62a WPA) is governed by the properties and the number of kilograms of the substances that are prevented from washing away or leaching each year.

<sup>2</sup> For measures that result in changes in farm structures, the level is also governed by the attributable costs.

<sup>94</sup> Amended by No I 13 of the O of 7 Nov. 2007 on the New System of Fiscal Equalisation and the Division of Tasks between the Confederation and Cantons, in force since 1 Jan. 2008 (AS 2007 5823).

<sup>95</sup> Amended by No I of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS 2015 4791).

<sup>96</sup> Inserted by No I of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS 2015 4791).

<sup>3</sup> The level of the global compensatory payments shall be agreed between the Federal Office for Agriculture (FOAG) and the canton concerned.

**Art. 54<sup>a97</sup>** Planning of rehabilitation measures

<sup>1</sup> The level of the global compensatory payments made for planning measures to rehabilitate waters (Art. 62*b* para. 1 WPA) is governed by the length the bodies of water to which the plan relates.

<sup>2</sup> The level of the global compensatory payments shall be agreed between the FOEN and the canton concerned.

**Art. 54<sup>b98</sup>** Implementation of rehabilitation measures

<sup>1</sup> The level of the global compensatory payments for measures to rehabilitate waters (Art. 62*b* para. 1 WPA) is governed by:

- a. the length of the stretch of water that is to be rehabilitated or is opened by the removal of obstructions;
- b. the width of the channel bed of the watercourse;
- c. the width of the space provided for the waters that are to be rehabilitated;
- d. the benefits of rehabilitation for nature and the landscape in comparison with the probable costs;
- e. the benefits of rehabilitation for recreation;
- f. the quality of the measures.

<sup>2</sup> The level of the global compensatory payments shall be agreed between the FOEN and the canton concerned.

<sup>3</sup> Compensatory payments may be made individually if the measures:

- a. cost more than five million francs;
- b. have a supracantonal impact or concern border waters;
- c. affect protected zones or properties listed in national inventories;
- d. require a complex or special expert assessment due to the possible alternatives or for other reasons; or
- e. were unforeseeable.

<sup>4</sup> The contribution to the attributable costs of the measures under paragraph 3 shall amount to between 35 and 80 per cent and is governed by the criteria listed in paragraph 1.

<sup>5</sup> Compensatory payments for rehabilitation shall only be granted if the canton concerned has drawn up a rehabilitation plan that meets the requirements of Article 41*d*.

<sup>97</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>98</sup> Inserted by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955). See also the transitional provision relating to this amendment at the end of the text.

<sup>6</sup> No compensatory payments shall be granted under Article 62*b* paragraph 1 WPA for measures required under Article 4 of the Federal Act of 21 June 1991<sup>99</sup> on Hydraulic Engineering.

**Art. 55** Initial procurement studies

<sup>1</sup> Compensatory payments for ascertaining the causes of inadequate water quality in an important body of water with a view to carrying out remediation measures (Art. 64 para. 1 WPA) will be paid on a case-by-case basis insofar as the projects concern the state of the body of water and its tributaries.

<sup>2</sup> The compensatory payments for the provision of fundamentals amount to 30 per cent of the attributable costs and those for the inventories on water supply installations and groundwater resources (Art. 64 para. 3 WPA) 40 per cent of the attributable costs.

**Art. 56** Training of specialists and provision of information to the public

<sup>1</sup> Financial assistance for the training of specialists (Art. 64 para. 2 WPA) amounts to:

- a. a maximum of 25 per cent of the costs;
- b. a maximum of 40 per cent of the costs in the case of projects that are particularly expensive given the number of probable participants.

<sup>2</sup> Financial assistance for the provision of information to the public (Art. 64 para. 2 WPA) may be granted to projects if:

- a. they are of significance for Switzerland as a whole; and
- b. provided the information documents are made available for distribution throughout Switzerland.

<sup>3</sup> The financial assistance for the provision of information to the public amounts to:

- a. a maximum of 40 per cent the costs for the preparation of documents;
- b. a maximum of 20 per cent the costs for the conduct of information campaigns.

<sup>4</sup> The FOEN shall grant financial assistance for the training of specialists and for the provision of information to the public on a case-by-case basis.

**Art. 57** Risk guarantee

<sup>1</sup> A risk guarantee for promising new forms of installations and equipment (Art. 64*a* WPA), that perform a public service may be granted provided company guarantees are not available.

<sup>2</sup> The risk guarantee applies to the costs incurred in rectifying defects or if necessary for the reconstruction of the installations and equipment in the first five years after

<sup>99</sup> SR 721.100



beginning operations must, provided they are not made necessary through the fault of the person responsible for the installation or equipment.

<sup>3</sup> The risk guarantee amounts to at least 20 but no more than 60 per cent of the costs in accordance with paragraph 2.

<sup>4</sup> For the procedure, Articles 61c and 61d apply by analogy.

**Art. 58**<sup>100</sup>      Attributable costs

<sup>1</sup> Attributable costs are those costs that are genuinely incurred and are directly connected with implementing projects giving rise to entitlement to subsidy. These include the cost of pilot projects, and in the case of the rehabilitation of bodies of water, the cost of acquiring the required land.

<sup>2</sup> Costs that are not attributable are in particular fees and taxes.

**Section 2**<sup>101</sup>    **Procedure for Granting Global Compensatory Payments**

**Art. 59**            Application

<sup>1</sup> The canton shall submit the application for global compensatory payments to the competent federal office (Art. 60 para. 1).

<sup>2</sup> The application must include information on:

- a. the programme goals to be achieved and in the case of compensatory payments for measures in agriculture information on the goals to be achieved in the canton as a whole;
- b. the measures probably required to achieve the goals and how they are to be implemented;
- c. the effectiveness of the measures.

**Art. 60**            Programme agreement

<sup>1</sup> The following authorities are responsible for concluding the programme agreement:

- a.<sup>102</sup> the FOEN for compensatory payments to waste water treatment plants and for the planning and conduct of measures to rehabilitate waters;
- b. the FOAG for compensatory payments for measures in agriculture.

<sup>2</sup> The programme agreement shall be concluded for a specific territory. The subject matter of the programme agreement shall in particular be:

<sup>100</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

<sup>101</sup> Amended by No I 13 of the O of 7 Nov. 2007 on the New System of Fiscal Equalisation and the Division of Tasks between the Confederation and Cantons, in force since 1 Jan 2008 (AS 2007 5823).

<sup>102</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

- a. the strategic programme goals that must be jointly achieved;
- b. the obligations of the Canton;
- c. the federal subsidy to be provided;
- d. controlling.

<sup>3</sup> The duration of the programme agreement amounts in the case of compensatory payments to:

- a. measures in agriculture: normally 6 years;
- b. other measures: 4 years.<sup>103</sup>

<sup>4</sup> The competent Federal Office shall issue guidelines on the procedure in the case of programme agreements and on the information and documents on the subject matter of the programme agreement.

#### **Art. 61** Payment

Global compensatory payments are paid out in instalments.

#### **Art. 61a** Reporting and controls

<sup>1</sup> The canton shall report annually to the competent Federal Office on the use of the global compensatory payments.

<sup>2</sup> The competent Federal Office shall verify by random sample:

- a. the implementation of individual measures in accordance with the programme goals;
- b. the use of the subsidies paid out.

#### **Art. 61b** Inadequate fulfilment and misuse of subsidies

<sup>1</sup> The competent Federal Office shall withhold all or part of the instalment payments during the programme if the canton:

- a. fails to fulfil its reporting duty (Art. 61a para. 1);
- b. fails to meet its obligations to a substantial extent through its own fault.

<sup>2</sup> If on conclusion of the programme it emerges that the canton has failed to meet its obligations, the competent Federal Office shall require the canton to rectify the situation; it shall set the Canton an appropriate deadline for doing so.

<sup>3</sup> If installations or equipment for which compensatory payments have been made are used for a purpose other than that intended, the competent Federal Office may require the canton to stop or remedy the misuse within a reasonable period.

<sup>103</sup> Amended by No I of the O of 4 May 2011, in force since 1 June 2011 (AS **2011** 1955).

<sup>4</sup> If the defects are not rectified or if the misuse does not stop or is not remedied, the payments may be reclaimed in accordance with Articles 28 and 29 of the Subsidies Act of 5 October 1990<sup>104</sup>.

### **Section 3<sup>105</sup>**

#### **Procedure for Granting Compensatory Payments or Financial Assistance in Specific Cases**

##### **Art. 61c** Application

<sup>1</sup> The application for financial assistance or compensatory payments in specific cases is submitted to the FOEN.

<sup>2</sup> It shall issue guidelines on the information and documents to be included in the application.

##### **Art. 61d** Granting and payment of subsidies

<sup>1</sup> The FOEN shall specify the subsidies in a ruling or enter into an agreement with the recipient of the subsidies for this purpose.

<sup>2</sup> It shall pay out the subsidies according to how the project is progressing.

##### **Art. 61e** Inadequate fulfilment and misuse of subsidies

<sup>1</sup> If the recipient of a promised compensatory payment or financial assistance despite being warned fails to carry out a measure not or does so inadequately, the compensatory payment or financial assistance shall not be paid out or shall be reduced.

<sup>2</sup> If compensatory payments or financial assistance have been paid out and the recipient despite being warned fails to carry out a measure not or does so inadequately, the payments may be reclaimed in accordance with Articles 28 and 29 of the Subsidies Act<sup>106</sup>.

<sup>3</sup> If installations or equipment for which compensatory payments or financial assistance have been paid out are used for a purpose other than that intended, the FOEN may require the canton to stop or remedy the misuse within a reasonable period.

<sup>4</sup> If the misuse is not stopped or remedied, the payments may be reclaimed in accordance with Article 29 of the Subsidies Act.

##### **Art. 61f** Reporting and controls

Reporting and controls in relation to compensatory payments and financial assistance in specific cases are governed by analogy by Article 61a.

<sup>104</sup> SR 616.1

<sup>105</sup> Inserted by No I 13 of the O of 7 Nov. 2007 on the New System of Fiscal Equalisation and the Division of Tasks between the Confederation and Cantons, in force since 1 Jan. 2008 (AS 2007 5823).

<sup>106</sup> SR 616.1

## Chapter 10 Commencement

### Art. 62

This Ordinance comes into force on 1 January 1999.

### Transitional provision to the Amendment of 18 October 2006<sup>107</sup>

Installations and parts of installation that were constructed in accordance with the regulations before this Amendment comes into force may continue to be operated if they are fit for operation and do not represent a specific risk to the waters; single wall underground storage tanks for liquids which may pollute water may continue to be used until 31 December 2014 at the latest.

### Transitional Provisions to the Amendment of 4 May 2011<sup>108</sup>

<sup>1</sup> The cantons shall specify the space provided for waters in accordance with Articles 41a and 41b by 31 December 2018.

<sup>2</sup> Until they have specified the space provided for waters, the regulations on installations in accordance with Article 41c paragraphs 1 and 2 apply along waters with a margin on each side with a width in each case of:

- a. 8 m plus the width of the existing channel bed in the case of watercourses with a channel bed of no more than 12 m width;
- b. 20 m in the case of watercourses with an existing channel bed of more than 12 m width;
- c. 20 m in the case of standing waters with a surface area of more than 0.5 ha.

<sup>3</sup> Instead of the criteria under Article 54b paragraph 1 letters a and b, the level of the compensatory payments for rehabilitation operations carried out before 31 December 2019 may be determined by the extent of the measures.<sup>109</sup>

<sup>4</sup> Article 54b paragraph 5 does not apply to rehabilitation operations carried out before 31 December 2015.

### Transitional Provision to the Amendment of 25 May 2011<sup>110</sup>

The cantonal authority may grant an exception under Article 25 paragraph 1 until 31 December 2015 at the latest to farms that no longer meet the requirements of Article 25 paragraph 3 letters c and d, as a result of the ban on the feeding of slaugh-

<sup>107</sup> AS 2006 4291

<sup>108</sup> AS 2011 1955

<sup>109</sup> Amended by No 14 of the O of 28 Jan. 2015 on Amendments to Ordinance Law on the Environment, in particular in relation to the programme agreements for the programme period 2016-2019, in force since 1 Jan. 2016 (AS 2015 427).

<sup>110</sup> AS 2011 2407

terhouse and butcher's by-products and left-over food, provided these farms prove that they have used slaughterhouse and butcher's by-products and left-over food as feed and cannot compensate for the loss of such feed by using other food by-products.

### **Transitional Provision to the Amendment of 4 November 2015<sup>111</sup>**

<sup>1</sup> The cantons shall ensure that the implementation of all the measures required to comply with the requirements of Annex 3.1 clause 2 no 8 begin by 31 December 2035 at the latest. They shall fix the last possible date for implement the measures according to their urgency and in doing so take account of the following:

- a. the remediation and renewal cycles of the waste water treatment plants;
- b. the size of the waste water treatment plants;
- c. the volume of waste water in the receiving waters;
- d. the length of the flow section in waters that are affected by the discharge of waste water.

<sup>2</sup> For groundwater wells and groundwater recharge installations in highly heterogeneous karst and fissured rock aquifers, Zones S<sub>h</sub> and S<sub>m</sub> in terms of Annex 4 number 125 need not be designated if the groundwater protection zones and areas of contribution were designated under the previous law and have not been modified to a substantial extent.

<sup>111</sup> AS 2015 4791

## Ecological Objectives for Waters

### 1 Surface waters

<sup>1</sup> The communities of plants, animals and micro-organisms in surface waters and the surroundings influenced by them shall:

- a. be close to nature and appropriate to the location as well as reproducing and regulating themselves;
- b. show a diversity and frequency of species that are specific to unpolluted or slightly polluted waters of the type in question.

<sup>2</sup> The hydrodynamics (bed load transport rate, and flow regimes) and the morphology should be near-natural. In particular, they should guarantee unreservedly the self-cleaning processes, the natural exchange of substances between water and the channel bed as well as the interactions with the surroundings.

<sup>3</sup> The water quality shall be such that:

- a. the temperature conditions are near-natural;
- b. the water, suspended matter and sediments contain no persistent synthetic substances;
- c. other potential water pollutants which could enter the water as a result of human activities,
  - do not accumulate in the plants, animals, micro-organisms, suspended matter or sediments,
  - do not have any harmful effects on the communities of plants, animals and micro-organisms and on the use of the water,
  - do not cause an unnaturally high production of bio-mass,
  - do not harm the biological processes that fulfil the basic physiological needs of plant and animal life, such as the metabolic processes, the reproductive processes and the olfactory orientation of animals,
  - occur in the body of water in concentrations that are within the range of natural concentrations where they are already present naturally,
  - occur in the body of water only in near-zero concentrations where they are not naturally present.

### 2 Underground waters

<sup>1</sup> The biotic community of underground waters shall:

- a. be close to nature and appropriate to the location;
- b. be specific to unpolluted or only slightly polluted waters.

<sup>2</sup> The aquifer (flow section, permeability), the upper and lower confining beds and the hydro-dynamism of the groundwater (groundwater levels, flow regime) should correspond to near natural conditions. In particular, the self-cleaning processes and the interactions between water and its surroundings should be guaranteed unreservedly.

<sup>3</sup> The groundwater quality shall be such that:

- a. the temperature conditions are near natural;
- b. the water contains no persistent synthetic substances;
- c. other potential water pollutants which could enter the water as a result of human activities:
  - do not accumulate in the biotic community or in the inert matter of the aquifer,
  - occur in concentrations that are within the range of natural concentrations where these are already present in natural state groundwater,
  - do not occur in groundwater where they are not present naturally
  - have no harmful effects on the use of the groundwater.

*Annex 2*<sup>112</sup>  
(Art. 6, 8, 13 and 47)

## Requirements on Water Quality

### 1 Surface waters

#### 11 General requirements

<sup>1</sup> The water quality must be such that:

- a. no visible colonies of bacteria, fungi or protozoa and no unnatural proliferation of algae or higher water plants are formed in any waters;
- b. fish-spawning grounds are preserved;
- c. after application of appropriate treatment, the water complies with requirements of the legislation on foodstuffs;
- d. groundwater is not contaminated by infiltration of water;
- e. the hygiene requirements for bathing are met at sites where bathing is expressly permitted by the authorities or where a large number of people normally bathe and the authorities do not advise against it;
- f. substances that enter waters as a result of human activities do not detrimentally affect the reproduction, development and health of sensitive plants, animals and microorganisms.

<sup>2</sup> After waste water has undergone homogeneous mixing with the body of water the mixture must not result in:

- a. the formation of mud;
- b. any turbidity, discoloration or foam, except in the event of heavy rainfall;
- c. any noticeable alteration in the odour of the water in comparison with its natural state;
- d. any lack of oxygen or unfavourable pH values.

<sup>3</sup> The following numerical requirements apply to every water flow after thorough mixing of the waste water discharged into the receiving waters; a reserve may be made for particular natural conditions such as water discharge from mires, rare high-water peaks or rare low-water events.

<sup>112</sup> Revised by Annex 2 No 4 of the Plant Protection Products Ordinance of 23 June 1999 (AS 1999 2045) and No II 9 of the O of 18 May 2005 on the Repeal and Amendment of Ordinances in connection with the Commencement of the Chemicals Act (AS 2005 2695), No III of the O of 4 Nov. 2015 (AS 2015 4791) and the correction of 2 Feb. 2016 (AS 2016 473).



No	Parameter	Requirements
1	Nitrate ( $NO_3^- - N$ )	For waters which serve as a source of drinking water: 5.6 mg/l N (corresponds to 25 mg/l Nitrate)
2	Lead ( <i>Pb</i> )	0.01 mg/l Pb (total) <sup>1</sup> 0.001 mg/l Pb (dissolved)
3	Cadmium ( <i>Cd</i> )	0.2 µg/l Cd (total) <sup>1</sup> 0.05 µg/l Cd (dissolved)
4	Chromium ( <i>Cr</i> )	0.005 mg/l Cr (total) <sup>1</sup> 0.002 mg/l Cr (III and VI)
5	Copper ( <i>Cu</i> )	0.005 mg/l Cu (total) <sup>1</sup> 0.002 mg/l Cu (dissolved)
6	Nickel ( <i>Ni</i> )	0.01 mg/l Ni (total) <sup>1</sup> 0.005 mg/l Ni (dissolved)
7	Mercury ( <i>Hg</i> )	0.03 µg/l Hg (total) <sup>1</sup> 0.01 µg/l Hg (dissolved)
8	Zinc ( <i>Zn</i> )	0.02 mg/l Zn (total) <sup>1</sup> 0.005 mg/l Zn (dissolved)
9	Organic pesticides (biocidal and plant protection products)	0.1 µg/l per individual substance unless regulated otherwise below.

<sup>1</sup> The dissolved concentration is determinant. If the value specified for the total concentration is respected, it may be assumed that the value for the dissolved concentration is also respected.

## 12 Additional requirements for watercourses

<sup>1</sup> The water quality must be such that:

- a. no visible iron sulphide patches form in the channel bed, unless due to particular natural conditions;
- b. nitrite and ammonia concentrations do not interfere with the reproduction development and health of sensitive organisms, such as salmonidae.

<sup>2</sup> The oxygen content on the channel bed must not be adversely affected by:

- a. increased oxygen consumption due to an unnatural excess of oxidisable substances;
- b. a reduced permeability of the bottom resulting from unnaturally high sedimentation of fine particles (clogging) or artificial sealing.

<sup>3</sup> The hydrodynamics, morphology and temperature conditions of the water must not be so changed by water withdrawals, water discharges and building activities that its self-purification capacity is reduced or the water quality in the body of water is made insufficient to sustain communities specific to it.

<sup>4</sup> The introduction or the withdrawal of heat must not alter the temperature in a watercourse by more than 3 °C above or below the temperature in its as near natural as possible state, or, in trout water stretches, by more than 1.5 °C; furthermore, the

water temperature must not exceed 25°C. These requirements apply after thorough mixing.

<sup>5</sup> The following numerical requirements apply to every water flow after thorough mixing of the waste water discharged into the receiving waters; a reserve may be made for particular natural conditions such as water discharge from mires, rare high-water peaks or rare low-water events.

No.	Parameter	Requirements
1	Biochemical oxygen demand ( <i>BOD<sub>5</sub></i> )	2 to 4 mg/l O <sub>2</sub> The lower value applies to waters which are naturally only slightly polluted.
2	Dissolved organic carbon ( <i>DOC</i> )	1 to mg/l C The lower value applies to waters which are naturally only slightly polluted.
3	Ammonium ( <i>sum of NH<sub>4</sub><sup>+</sup> - N and NH<sub>3</sub> - N</i> )	at temperatures: – above 10 °C: 0.2 mg/l N – below 10 °C: 0.4 mg/l N

### 13 Additional requirements for standing waters

<sup>1</sup> The morphology and functions of the upper layers of sediments which are essential for providing the water quality required to preserve the communities of plants, animals and micro-organisms must not be durably altered by changes made to the terrain (e.g. dredging, movement of excavated material within the expanse of water, levelling or backfilling of banks, reinforcement of banks or creation of dikes).

<sup>2</sup> The nutrient content should allow at most an average production of biomass; subject to particular natural circumstances.

<sup>3</sup> For lakes, moreover, the following applies:

- a. the regulation of the lake waters, the discharge and extraction of water, the use of water for cooling and for the extraction of heat, should not alter the natural regime of temperatures or the distribution of nutrients within the expanse of water, nor should it disrupt conditions for living and reproduction of organisms, particularly in the riparian zone;
- b. the oxygen content of the water should at no time and at no lake depth amount to less than 4 mg/l O<sub>2</sub>; in addition, it must be sufficient for sensitive animals such as worms to be able to inhabit the lake bottom throughout the year and in numbers as close as possible to natural abundance, subject to particular natural conditions.

## 2 Underground waters

### 21 General requirements

<sup>1</sup> The concentration of substances in the groundwater for which requirements are specified in No 22 should not continually increase.

<sup>2</sup> The quality of the groundwater must be such that it does not pollute surface water after exfiltration.

<sup>3</sup> The introduction or withdrawal of heat must not alter the temperature of the groundwater by more than 3 °C above or below the temperature in its natural state; this does not apply to very local changes in temperature.

<sup>4</sup> Infiltration of waste water into underground waters must not result in:

- a. any disturbing change in the odour of the water;
- b. any lack of oxygen or unfavourable pH values;
- c. any turbidity or discoloration, except in the case of consolidated rock groundwater.

<sup>5</sup> Infiltration installations, withdrawals of water and other interventions connected with construction work must not, insofar as possible, damage the protective upper confining bed, or alter the hydrodynamics in such a way as to have detrimental effects on the quality of water.

## 22 Additional requirements for groundwater which is used for drinking water or is intended as such

<sup>1</sup> The water quality must be such that after the use of basic water conditioning, it complies with the requirements of the foodstuffs legislation.

<sup>2</sup> The following numerical requirements apply, subject to the particular natural circumstances. For substances originating from polluted sites, these requirements do not apply in the downstream area where the greater part of these substances is degraded or retained.

No.	Parameter	Requirement
1	Dissolved organic carbon ( <i>DOC</i> )	2 mg/l C
2	Ammonium (sum of $\text{NH}_4^+$ - N and $\text{NH}_3$ - N)	In oxic conditions: 0.08 mg/l N (corresponds to 0.1 mg/l ammonium) In anoxic conditions: 0.4 mg/l N (corresponds to 0.5 mg/l ammonium)
3	Nitrate ( $\text{NO}_3^-$ - N)	5.6 mg/l N (corresponds to 25 mg/l nitrate)
4	Sulphate ( $\text{SO}_4^{2-}$ )	40 mg/l $\text{SO}_4^{2-}$
5	Chloride ( $\text{Cl}^-$ )	40 mg/l $\text{Cl}^-$
6	Aliphatic hydrocarbons	0.001 mg/l per single substance
7	Monocyclic aromatic hydrocarbons	0.001 mg/l per single substance
8	Polycyclic aromatic hydrocarbons ( <i>PAH</i> )	0.1 µg/l per single substance
9	Volatile organic halogens ( <i>VOX</i> )	0.001 mg/l per single substance
10	Adsorbable organic halogens ( <i>AOX</i> )	0.01 mg/l X
11	Organic pesticides (biocidal products and plant protection products)	0.1 µg/l per single substance.

## Requirements for the Discharge of Polluted Waste Water

*Annex 3.1*<sup>113</sup>  
(Art. 6 para. 1)

### Discharge of communal waste water into waters

#### 1 Definition and principles

<sup>1</sup> Communal waste water includes:

- a. domestic waste water (waste water from households and similar waste water);
- b. precipitation water running off built-up or sealed surfaces and discharged along with domestic waste water.

<sup>2</sup> The following requirements apply to communal waste water from waste water treatment plants treating in excess of 200-population equivalent (PE<sup>114</sup>). They apply at the site of discharge and for the standard operation of the plant, subject to exceptional situations such as unusually heavy rainfall.

<sup>3</sup> For communal waste water from waste water treatment plants with 200 PE or fewer and for waste water from overflows from combined systems, the authorities determine the requirements from case to case taking local conditions into consideration.

<sup>4</sup> If the waste water from a central waste water treatment plant also contains industrial waste water (Annex 3.2) or other polluted waste water (Annex 3.3), the authorities shall specify the requirements for discharge into waters in their authorisation, if necessary in derogation from the requirements listed in Nos 2 and 3, in such a way that no more potential water pollutants are discharged with the waste water than would be the case if the different waste waters were treated separately in compliance with the requirements of the corresponding Annexes.

<sup>113</sup> Revised by No I of the O of 31 Oct. 2001 (AS **2001** 3168) and No III of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS **2015** 4791). See also the transitional provision to this amendment above. The revision of 7 Feb. 2017 relates to the Italian text only (AS **2017** 509).

<sup>114</sup> One PE corresponds to one organic biodegradable load with a biochemical oxygen demand in 5 days of 60 g of oxygen per day.

## 2 General requirements

No.	Parameter	Requirements
1	Total suspended solids	<p>For waste water from plants of less than 10 000 PE the following requirements apply:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 20 mg/l</li> </ul> <p>For waste water from plants from 10 000 PE the following applies:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 15 mg/l</li> </ul>
2	Chemical oxygen demand (COD)	<p>For waste water from plants of less than 10 000 PE the following requirements apply:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 60 mg/l O<sub>2</sub> and</li> <li>– removal efficiency, with respect to raw waste water: 80%</li> </ul> <p>For waste water from plants of 10,000 PE or over the following requirements apply:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 45 mg/l O<sub>2</sub> and</li> <li>– removal efficiency, with respect to raw waste water: 85%</li> </ul>
3	Dissolved organic carbon (DOC)	<p>For waste water from plants of 2000 PE or over the following requirements apply:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 10 mg/l and</li> <li>– removal efficiency: 85%, expressed as</li> </ul> $100 \cdot \left( 1 - \frac{\text{mg DOC in purified waste water}}{\text{mg total organic carbon in raw waste water}} \right)$ <p>If the value is not complied with, the authorities shall assess the substances, determine their origin and if necessary specify the required procedures in accordance with Annexes 3.2 and 3.3.</p>
4	Transparency (Snellen method)	30 cm
5	Ammonium (sum of NH <sub>4</sub> <sup>+</sup> - N and NH <sub>3</sub> - N)	<p>If the ammonium concentrations in the waste water are potentially detrimental to the water quality of a watercourse, the following requirements apply if the waste water temperature is higher than 10 °C;</p> <ul style="list-style-type: none"> <li>– discharge concentration: 2 mg/l N and</li> <li>– removal efficiency: 90 %, expressed as</li> </ul> $100 \cdot \left( 1 - \frac{\text{mg ammonium - N in purified waste water}}{\text{mg Kjeldahl - N in raw waste water}} \right)$ <p>In these cases nitrification must be carried out throughout the year:</p> <p><i>Remark:</i> Kjeldahl nitrogen is the sum of the nitrogen in the ammonium, ammonia and organic nitrogen.</p>
6	Nitrite (NO <sub>2</sub> <sup>-</sup> - N)	0.3 mg/l N (guide value)
7	Adsorbable organic halogen (AOX)	<p>0.08 mg/l X.</p> <p>If the value is not complied with, the authorities shall assess the substances, determine their origin and if necessary specify the required procedures in accordance with Annexes 3.2 and 3.3.</p>

No.	Parameter	Requirements
8	Organic substances that can pollute waters even in low concentrations ( <i>organic trace substances</i> )	<p>The removal efficiency with respect to raw waste water and measured using selected substances must amount to 80 % for waste water from:</p> <ul style="list-style-type: none"> <li>– plants with 80 000 or more connected residents;</li> <li>– plants with 24 000 or more connected residents in the catchment area of lakes; the canton may authorise exceptions if the benefit of removal for the environment and for the drinking water supply is negligible;</li> <li>– plants with 8000 or more connected residents that discharge into a watercourse containing more than 10 % waste water untreated for organic trace substances; the canton shall identify the plants that must take measures as part of a plan for the catchment area;</li> <li>– other plants with 8000 or more connected residents if removal is required due to special hydrogeological conditions;</li> <li>– ...<sup>115</sup></li> </ul> <p>The Department shall specify the substances to be used to measure the removal efficiency in an ordinance, and how efficiency is calculated.</p>
9	Biochemical oxygen demand ( <i>Bod<sub>5</sub>, with nitrification inhibition</i> )	<p>For waste water from plants with less than 10 000 PE for which the Bod<sub>5</sub> concentrations in the waste water have a detrimental effect on the water quality of a watercourses the following applies:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 20 mg/l O<sub>2</sub></li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>– removal efficiency with respect to raw waste water: 90 %</li> </ul> <p>For waste water from plants from 10 000 PE for which the Bod<sub>5</sub> concentrations in the waste water have a detrimental effect on the water quality of a watercourses the following applies:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 15 mg/l O<sub>2</sub></li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>– removal efficiency with respect to raw waste water: 90 %</li> </ul>

### 3 Additional requirements for discharge into sensitive waters

No.	Parameter	Requirements
1	Total phosphorus (after conversion to dissolved orthophosphate)	<p>For waste water from plants</p> <ul style="list-style-type: none"> <li>– in the catchment area of lakes,</li> <li>– situated on watercourses downstream of lakes, if this is required for the protection of the watercourse, and</li> <li>– of 10.000 PE or over, situated on watercourses in the catchment area of the Rhine downstream of lakes,</li> </ul> <p>the following requirements apply:</p> <ul style="list-style-type: none"> <li>– discharge concentration: 0.8 mg/l P and</li> <li>– removal efficiency, with respect to raw waste water: 80%</li> </ul>

<sup>115</sup> In force from 1 Jan. 2021 (AS 2015 4791).

No.	Parameter	Requirements
2	Total nitrogen	<p>In plants for which no discharge concentration and no removal efficiency for total nitrogen is specified, must be operated in such a way that during waste water purification and sludge treatment as much nitrogen as possible is eliminated. All structural modifications which are possible at no great cost must be undertaken; this applies particularly to plants that already carry out nitrification.</p> <p>Prior to 28 February 2002, cantons in the catchment area of the Rhine shall work out a plan on how to reduce discharges of nitrogen by 2600 tonnes compared to 1995 with effect from the year 2005 onwards. Plants that are earmarked in this plan for nitrogen elimination must be operational by 2005 at the latest.</p>

## 4 Frequency of sampling and admissible divergences

### 41 Frequency of sampling

<sup>1</sup> The requirements under Nos 2 and 3 refer to an examination period of one year and to continuous sampling, conducted at regular intervals on different days of the week. With regard to organic trace substances, the samples must be taken over 48 hours and with regard to other parameters over 24 hours.

<sup>2</sup> The number of samples per year depends on the size of the plant:

- a. Plants of less 2000 PE      The cantonal authorities shall specify the minimum number of samples to be analysed on a case by case basis.
- b. Plants of 2000 PE or over      In the first year after the commissioning or extension of the plant at least twelve samples. In the following years at least four samples if the waste water complied with the requirements in the first year. If the waste water does not comply with the requirements in any year, a further twelve samples at least must be analysed the following year.  
  
With regard to organic trace substances, at least eight samples must be analysed instead of at least twelve.
- c. Plants of 10 000 PE and over      At least twelve samples per year.  
  
With regard to organic trace substances, from the second year after the commissioning or extension of the plant at least six samples must be analysed if the waste water complied with the requirements in the first year; If the waste water does not comply with the requirements in any year, a further twelve samples at least must be analysed the following year.

- d. Plants of 50 000 PE and over  
 At least 24 samples per year.  
 With regard to organic trace substances, from the second year after the commissioning or extension of the plant at least twelve samples must be analysed if the waste water complied with the requirements in the first year; If the waste water does not comply with the requirements in any year, a further 24 samples at least must be analysed the following year.

**42 Admissible non-compliant samples**

<sup>1</sup> The maximum number of non-compliant samples admissible depends on the total number of samples as indicated in the table below.

<sup>2</sup> The following values must never be exceeded:

- Total suspended solids 50 mg/l
- Chemical oxygen demand (BOD<sub>5</sub>) 120 mg/l
- Dissolved organic carbon (DOC) 20 mg/l
- Biochemical oxygen demand (BOD<sub>5</sub>) 40 mg/l

<sup>3</sup> The following annual averages must not be exceeded:

- Phosphorus in plants of 10 000 PE and over 0.8 mg/l P

**Table: admissible number of non-compliant samples**

Number of samples per year	Admissible number of non-compliant samples	Number of samples per year	Admissible number of non-compliant samples
4- 7	1	172-187	14
8- 16	2	188-203	15
17- 28	3	204-219	16
29- 40	4	220-235	17
41- 53	5	236-251	18
54- 67	6	252-268	19
68- 81	7	269-284	20
82- 95	8	285-300	21
96-110	9	301-317	22
111-125	10	318-334	23
126-140	11	335-350	24
141-155	12	351-365	25
156-171	13		



*Annex 3.2*<sup>116</sup>  
(Art. 6, para. 1 and 7 para. 1)

## **Discharge of industrial waste water into waters or into public sewer systems**

### **1 Definition and principles**

<sup>1</sup> Industrial waste water includes:

- a. waste water from industrial plants;
- b. comparable waste water, such as that from laboratories and hospitals.

<sup>2</sup> Any person who discharges industrial waste water must, during production processes and waste water treatment take the require stat-of-the-art measures to avoid polluting waters. In particular, he or she must ensure that:

- a. as little waste water is generated and as few potential water pollutants are discharged as is technically and operationally feasible and economically acceptable;
- b. unpolluted waste water and cooling water are separated from polluted waste water;
- c. polluted waste water is neither diluted nor mixed with other waste water in order to comply with the requirements; dilution or mixing is permitted if this is appropriate for the treatment of the waste water and as a result no more potential water pollutants are discharged than would be the case if the waste waters were treated separately.

<sup>3</sup> At the site of discharge, when discharging waste water into waters or public sewers they must comply with:

- a. the general requirements in accordance with No 2; and
- b. the special requirements for specific substances in accordance with No 3 for waste water from certain industrial sectors.

<sup>4</sup> If the person responsible for the concern can prove that he or she has taken the required state-of-the-art measures mentioned in paragraph 2, and that compliance with the general requirements specified in No 2 would be disproportionate, the authorities shall specify less stringent values.

<sup>5</sup> If the required state-of-the-art measures mentioned in paragraph 2 make it possible to comply with more stringent requirements than those specified in Nos 2 and 3, the authorities shall apply more stringent values based on the information received from the person responsible for the concern and after having heard this person.

<sup>6</sup> If Nos 2 and 3 contain no requirements for specific potential water pollutants, the authorities shall specify the necessary requirements based on the state of the art in the authorisation. In so doing they shall take account of international or national

<sup>116</sup> Revised by No I of the O of 22 Oct. 2003, in force since 1 Jan 2004 (AS **2003** 4043).

standards, directives published by the FOEN or standards drawn up by the industrial sector concerned in collaboration the FOEN.

<sup>7</sup> If industrial waste water also containing communal waste water (Annex 3.1) or other polluted waste water (Annex 3.3) is discharged into a body of water, the authorities shall specify the requirements in the authorisation in such a way that no more potential water pollutants are discharged with the waste water than would be the case if the different waste waters were treated separately in compliance with the requirements of the corresponding Annexes.

## 2 General requirements

No.	Parameter	Column 1: requirements for discharge into waters	Column 2: requirements for discharge into public sewers
1	pH	6.5 to 9.0	6.5 to 9.0; divergences are admissible if there is sufficient mixing with other waste waters in the sewers.
2	Temperature	At most 30 °C. The authorities may allow minor short-term excesses in summertime.	At most 60 °C. The temperature in the sewer system must not exceed 40 °C after mixing.
3	Transparency ( <i>Snellen method</i> )	30 cm	–
4	Total suspended solids	20 mg/l	–
5	Arsenic ( <i>As</i> )	0.1 mg/l As (total)	0.1 mg/l As (total)
6	Lead ( <i>Pb</i> )	0.5 mg/l Pb (total)	0.5 mg/l Pb (total)
7	Cadmium ( <i>Cd</i> )	0.1 mg/l Cd (total)	0.1 mg/l Cd (total)
8	Chromium ( <i>Cr</i> )	2 mg/l Cr (total); 0.1 mg/l Cr-VI	2 mg/l Cr (total)
9	Cobalt ( <i>Co</i> )	0.5 mg/l Co (total)	0.5 mg/l Co (total)
10	Copper ( <i>Cu</i> )	0.5 mg/l Cu (total)	1 mg/l Cu (total)
11	Molybdenum ( <i>Mo</i> )	–	1 mg/l Mo (total)
12	Nickel ( <i>Ni</i> )	2 mg/l Ni (total)	2 mg/l Ni (total)
13	Zinc ( <i>Zn</i> )	2 mg/l Zn (total)	2 mg/l Zn (total)
14	Cyanide ( $CN^-$ )	0.1 mg/l $CN^-$ (free and easily releasable cyanide)	0.5 mg/l $CN^-$ (free and easily releasable cyanide)
15	Total hydrocarbons	10 mg/l	20 mg/l
16	Volatile chlorinated hydrocarbons ( <i>VOC</i> ) or volatile organic halogens ( <i>VOX</i> )	0.1 mg/l Cl or 0.1 mg/l X	0.1 mg/l Cl or 0.1 mg/l X

### 3 Special requirements for specific substances from certain industrial sectors

In addition to the following requirements, the internationally agreed decisions and recommendations approved by the Federal Council or the Department in under Article 51 apply to the whole of Switzerland.<sup>117</sup>

#### 31 Foodstuff processing

No.	Sector/process	Column 1: requirements for discharge into waters	Column 2: requirements for discharge into public sewers
	<ul style="list-style-type: none"> <li>– Milk processing</li> <li>– Fruit and vegetable processing</li> <li>– Manufacture and bottling of soft drinks</li> <li>– Potato processing</li> <li>– Meat processing</li> <li>– Breweries</li> <li>– Manufacture of alcohol and alcoholic drinks</li> <li>– Manufacture of fodder from plant products</li> <li>– Manufacture of leather glue, gelatine and bone glue</li> <li>– Malt factories</li> <li>– Fish processing</li> </ul>	<p>Requirements for communal waste water in accordance with Annex 3.1 apply.</p> <p>Excepted are the requirements for total phosphorus in cases in where phosphorus must be added in the waste water treatment plant for the biological treatment step.</p>	<p>In fat and oil processing plants, separators must be fitted if necessary.</p>

#### 32 Secondary iron and steel industry

No.	Sector/process	Parameter/requirements for discharge into waters and public sewers
1	Continuous casting	<p><i>Process water:</i></p> <ul style="list-style-type: none"> <li>– at least 95 per cent recirculation</li> </ul> <p><i>Total suspended solids:</i></p> <ul style="list-style-type: none"> <li>– 10 g/t processed steel ( daily average)</li> </ul> <p><i>Oil:</i></p> <ul style="list-style-type: none"> <li>– 5 g/t processed steel (daily average)</li> </ul>
2	Cold rolling	<p><i>Total suspended solids:</i></p> <ul style="list-style-type: none"> <li>– 10 g/t processed steel (daily average)</li> </ul> <p><i>Oil:</i></p> <ul style="list-style-type: none"> <li>– 5 g/t processed steel (daily average)</li> </ul>

<sup>117</sup> Available from the Federal Office for the Environment, 3003 Bern

No.	Sector/process	Parameter/requirements for discharge into waters and public sewers
3	Hot rolling	<i>Process water:</i> – at least 95 per cent recirculation <i>Total suspended solids:</i> – 50 g/t processed steel (daily average) <i>Oil:</i> – 10 g/t processed steel (daily average)
4	Pickling plants	<i>Cadmium (Cd):</i> – 0.2 mg/l Cd (daily average) or <i>Chromium (Cr):</i> – 0.1 mg/l Cr-VI (daily average) – 1 mg/l Cr (total) (daily average) <i>Nickel (Ni):</i> – 1 mg/l Ni (daily average) <i>Zinc (Zn):</i> – 2 mg/l Zn (daily average) <i>Acid regeneration:</i> – Acid regeneration for reduction of nitrate discharge from pickling plants using more than 20 tonnes of nitric acid per year, or other equivalent measures

For plants that were commissioned before 1 January 1993, the authorities shall specify the requirements on a case-by-case basis.

### 33 Surface treatment / electroplating

No.	Sector/ process	Parameter / requirements for discharge into waters and public sewers
1	Use of 1,2-dichloroethane to degrease metals	<i>1,2-dichloroethane:</i> – 0.1 mg/l (monthly average) – 0.2 mg/l (daily average)
2	Use of trichloroethene to degrease metals	<i>Trichloroethene:</i> – 0.1 mg/l (monthly average) – 0.2 mg/l (daily average)
3	Use of tetrachloroethene to degrease metals	<i>Tetrachloroethene:</i> – 0.1 mg/l (monthly average) – 0.2 mg/l (daily average)
4	Surface treatment	<i>Volatile organic halogens (VOX):</i> – 0.1 mg/l VOX (daily average) <i>Cyanide (CN<sup>-</sup>):</i> – 0.2 mg/l CN <sup>-</sup> (unbound) (daily average) <i>Mercury (Hg):</i> – 0.05 mg/l Hg (daily average) or – 0.03 kg Hg per tonne of mercury used (daily average) <i>Cadmium (Cd):</i> – 0.2 mg/l Cd (daily average) or – 0.3 kg Cd per tonne of cadmium used (daily average)

No.	Sector/ process	Parameter / requirements for discharge into waters and public sewers
		<p><i>Chromium (Cr):</i></p> <ul style="list-style-type: none"> <li>- 0.1 mg/l Cr-VI (daily average)</li> <li>- 0.5 mg/l Cr (total) (daily average)*</li> </ul> <p><i>Lead (Pb):</i></p> <ul style="list-style-type: none"> <li>- 0.5 mg/l Pb (daily average)*</li> </ul> <p><i>Copper (Cu):</i></p> <ul style="list-style-type: none"> <li>- 0.5 mg/l Cu (daily average)*</li> </ul> <p><i>Nickel (Ni):</i></p> <ul style="list-style-type: none"> <li>- 0.5 mg/l Ni (daily average)*</li> </ul> <p><i>Zinc (Zn):</i></p> <ul style="list-style-type: none"> <li>- 0.5 mg/l Zn (daily average); in justified cases the authorities may admit up to 2 mg/l Zn (daily average)</li> </ul> <p><i>Silver (Ag):</i></p> <ul style="list-style-type: none"> <li>- 0.1 mg/l Ag (daily average)</li> </ul> <p><i>Tin (Sn):</i></p> <ul style="list-style-type: none"> <li>- 2 mg/l Sn (daily average).</li> </ul>
		<p>* For surface treatment plants discharging small quantities of metals (defined as: sum of total chromium, lead, copper, nickel and zinc less than 200 g/day), the authorities may admit up to 2 mg/l (monthly average).</p>

### 34 Chemical industry

No.	Sector/process	Parameter/requirements on discharge into waters and public sewers
1	Manufacture of chlorine by chlorine-alkali electrolysis	<p><i>Mercury (Hg):</i></p> <p>Use of mercury-free processes.</p> <p>for existing plants applies:</p> <ul style="list-style-type: none"> <li>- 0.5 g Hg per tonne of chlorine production capacity in monthly average</li> <li>- 2.0 g Hg per tonne of chlorine production capacity (daily average)</li> </ul>
2	Production of cadmium pigments	<p><i>Cadmium (Cd):</i></p> <ul style="list-style-type: none"> <li>- 0.2 mg/l Cd (monthly average)</li> <li>- 0.4 mg/l Cd (daily average)</li> </ul>

**35 Manufacture of paper, cardboard and pulp**

No.	Sector/process	Parameter/requirements on discharge into waters	Parameter/requirements on discharge into public sewers
1	Production of paper or cardboard	<p><i>Total suspended solids:</i></p> <ul style="list-style-type: none"> <li>– 1 kg per tonne production of paper or cardboard (daily average) or 50 mg/l (daily average)</li> </ul> <p><i>Chemical oxygen demand (COD)/dissolved organic carbon (DOC):</i></p> <ul style="list-style-type: none"> <li>– according to type of paper: 2,5–5 kg COD per tonne production of paper or cardboard (daily average) or 1,5–2,5 kg DOC per tonne production of paper or cardboard (daily average)</li> </ul> <p><i>Biochemical oxygen demand (BOD<sub>5</sub>):</i></p> <ul style="list-style-type: none"> <li>– according to type of paper: 0,5–1 kg per tonne production of paper or cardboard (daily average); in justified cases the authorities may instead of the above-mentioned requirement admit a value of 25 mg/l BOD<sub>5</sub> (daily average).</li> </ul>	The authorities set the requirements from case to case
2	Production of sulphite pulp	<p><i>(BOD<sub>5</sub>):</i></p> <ul style="list-style-type: none"> <li>– 5 kg per tonne production of air dry pulp (monthly average)</li> </ul> <p><i>Chemical oxygen demand (COD):</i></p> <ul style="list-style-type: none"> <li>– 35 kg per tonne production of air dry pulp (monthly average)</li> <li>– 70 kg per tonne production of air dry pulp (monthly average) for plants which were commissioned before 1.1.1997</li> </ul> <p>If the correlation between the COD and the total organic carbons (TOC) is given and proved, monitoring may be carried out on the TOC instead of on the COD.</p> <p><i>Total suspended solids:</i></p> <ul style="list-style-type: none"> <li>– 4.5 kg per tonne production of air dry pulp (monthly average)</li> <li>– 8.0 kg per tonne production of air dry pulp (monthly average) from 1.1.2000 for plants which were commissioned before 1.1.1997 and did not increase their production capacity after 1.1.1997 by more than 50 per cent.</li> </ul> <p><i>Adsorbable organic halogens (AOX), for plants which do not produce exclusively chlorine-free bleached pulp:</i></p> <ul style="list-style-type: none"> <li>– 0.5 kg per tonne production of bleached air dry pulp (monthly average)</li> </ul> <p><i>Molecular chlorine ratio:</i></p> <ul style="list-style-type: none"> <li>– less than 0.05 to 0.1, according to type of pulp</li> </ul>	

### 36 Public utilities and waste disposal plants

No.	Sector / process	Column 1: requirements on discharge into waters	Column 2: requirements on discharge into public sewers
1	Filter water from water treatment	<i>Total suspended solids:</i> – 30 mg/l (daily average) (guide value)	No special requirements
2	Waste incineration plants	<i>Antimony (Sb):</i> – 0.1 mg/l Sb <i>Arsenic (As):</i> – 0.1 mg/l As <i>Lead (Pb):</i> – 0.1 mg/l Pb <i>Cadmium (Cd):</i> – 0.05 mg/l Cd <i>Chromium (total Cr):</i> – 0.1 mg/l Cr <i>Copper (Cu):</i> – 0.1 mg/l (Cu) <i>Nickel (Ni):</i> – 0.1 mg/l Ni <i>Zinc (Zn):</i> – 0.1 mg/l Zn <i>Mercury (Hg):</i> – 0.001 mg/l Hg <sup>1</sup> <i>Dissolved organic carbon (DOC):</i> – 10 mg/l DOC	<i>Antimony (Sb):</i> – 0.1 mg/l Sb <i>Arsenic (As):</i> – 0.1 mg/l As <i>Lead (Pb):</i> – 0.1 mg/l Pb <i>Cadmium (Cd):</i> – 0.05 mg/l Cd <i>Chromium (total cr):</i> – 0.1 mg/l Cr <i>Copper (Cu):</i> – 0.1 mg/l Cu <i>Nickel (Ni):</i> – 0.1 mg/l Ni <i>Zinc (Zn):</i> – 0.1 mg/l Zn <i>Mercury (Hg):</i> – 0.001 mg/l Hg <i>Sulphate:</i> If there is a risk of corrosion in the public sewers, the authorities shall specify a value for admissible sulphate concentrations in each individual case.
3	Processing wastes containing mercury	<i>Mercury (Hg):</i> – 0.05 mg/l Hg in monthly average – 0.1 mg/l Hg in daily average	<i>Mercury (Hg):</i> – 0.05 mg/l Hg in monthly average – 0.1 mg/l Hg in daily average
4	Desilverisation of fixative baths	<i>Silver (Ag):</i> The authorities set the requirements from case to case.	<i>Silver (Ag):</i> – 5 mg/l Ag

No.	Sector / process	Column 1: requirements on discharge into waters	Column 2: requirements on discharge into public sewers
5	Desilverisation of bleach-hardeners	<i>Silver (Ag) and bleaching agents:</i> The authorities shall apply the requirements in each individual case.	<i>Silver (Ag) and bleaching agents:</i> – 5 mg/l Ag <i>Poorly biodegradable bleaching agents (especially Fe-EDTA -complex and EDTA-surplus):</i> – the authorities set the requirements from case to case.
<sup>1</sup> Guide value for requirements on discharge to be specified by the authorities on a case by case basis depending on the actual conditions.			

### 37 Other sectors

No.	Sector/ process	Column : requirements on discharge into waters	Column 2: requirements on discharge into public sewers
1	Photographic processes	<i>Silver (Ag):</i> the authorities set the requirements from case to case.	<i>Silver (Ag):</i> 50 mg/l Ag in cases where annual consumption of fixative bath does not exceed 1000 l/a 5 mg/l Ag in cases where consumption of fixative bath is in excess of 1000 l/a
2	Manufacture of primary batteries containing mercury	<i>Mercury (Hg):</i> – 0.05 mg/l Hg (monthly average) – 0.1 mg/l Hg (daily average) – 0.03 g/kg Hg per kg of mercury used (monthly average) – 0.06 g/kg Hg per kg of mercury used (daily average)	
3	Manufacture of other primary batteries and secondary batteries	<i>Cadmium (Cd):</i> – 0.2 mg/l Cd (monthly average) – 0.4 mg/l Cd (daily average)	
4	Processes requiring use of pathogenic micro-organisms	–	<i>Pathogenic micro-organisms:</i> inactivation
5	Dental surgeries and clinics	<i>Amalgam:</i> The authorities specify the requirements on a case to case basis.	<i>Amalgam:</i> Treatment units in which amalgam is processed, shall be equipped with an amalgam separator with a removal efficiency of at least 95%.



*Annex 3.3*<sup>118</sup>  
(Art. 6, para. 1 and 7, para. 1)

## **Discharge of Other Polluted Waste Water into Waters or into Public Sewers**

### **1 General requirements**

<sup>1</sup> For polluted waste water other than communal or industrial waste water, the authorities shall determine the requirements on discharge on the basis of the characteristics of the waste water, the state of the art and the condition of the body of waters concerned. In so doing they shall take account of international or national standards, directives published by the FOEN or standards worked out by the sector concerned in co-operation with the FOEN.

<sup>2</sup> Precipitation water running off built-up or sealed surfaces and not mixed with other polluted waste water is also regarded as other polluted waste water.

<sup>3</sup> In order that the state of the art be maintained, polluted waste water from sectors, processes and plants, must comply at least with the requirements of No 2; numerical requirements apply at the site of discharge.

### **2 Special requirements**

#### **21 Continuous cooling installations**

<sup>1</sup> Plants with continuous cooling installations must be designed and operated according to the state of the art so that as little heat as possible is generated and the waste heat is recovered as far as possible.

<sup>2</sup> Dissolved organic carbon in the cooling water (DOC) may be increased by at most 5 mg/l DOC.

<sup>3</sup> If potential water pollutants are added to the cooling water (e.g. biocides), requirements for discharge of these substances shall be specified.

<sup>4</sup> In addition, for discharge into watercourses and stretches of standing water on rivers, the following apply:

- a. the temperature of the cooling water may amount to a maximum of 30 °C; in derogation, the authority may permit the temperature to amount to a maximum of 33 °C if the temperature of the waters from which the withdrawal is made exceeds 20 °C; if the water temperature exceeds 25 °C, the authority may permit exceptions if the increase in the water temperature amounts to a maximum of 0.01 °C per discharge or the discharge comes from an existing nuclear power plant;
- b. a watercourse must not warm up by more than 3 °C above or below the temperature in its as near natural as possible state, or, in trout water stretches, by

<sup>118</sup> Revised by No I of the O of 11 April 2018, in force since 1 June 2018 (AS 2018 1685).

more than 1.5 °C; furthermore, the water temperature must not exceed 25 °C;

- c. the spillway construction must guarantee rapid mixing;
- d. the waters must be warmed up slowly enough to avoid any harmful effects on communities of plants, animals and micro-organisms.

<sup>5</sup> When discharging into lakes, additional requirements in accordance with paragraphs 1–3 of the discharge conditions shall be determined on a case by case basis according to local conditions, in particular concerning the temperature of the cooling water, the depth and type of discharge.

<sup>6</sup> When discharging into public sewers, in addition to the requirements in accordance with paragraphs 1–3, the temperature of the waste water discharged may not exceed 60 °C and the temperature in the sewer systems may not exceed 40 °C after mixing.

## 22 Closed-circuit cooling installations

<sup>1</sup> When discharging mud-loaded water from closed-circuit cooling installations into a body of water the following values may not be exceeded:

- a. temperature: 30 °C;
- b. total suspended solids: 40 mg/l;
- c. dissolved organic carbon (*DOC*): 10 mg/l.

<sup>2</sup> If potential water pollutants are added to the cooling water, requirements for such substances shall be specified.

## 23 Construction sites

<sup>1</sup> Waste water from construction sites may be discharged into a body of water or public sewers if it complies with the general requirements for industrial waste water in accordance with Annex 3.2 number 2.

<sup>2</sup> In addition, the following values may not be exceeded when discharging into a body of water:

- a. AOX: 0.08 mg/l X;
- b. nitrite: 0.3 mg/l N.

## 24 Façade and tunnel cleaning

<sup>1</sup> Waste water from façade or tunnel cleaning may be discharged into a body of water only if it contains no detergent and has been sufficiently purified in a plant.

<sup>2</sup> It may be discharged into public sewers if it does not make the recovery of the sludge difficult and if the treatment efficiency of the plant is sufficient to eliminate potential water pollutants.

## 25 Landfills

<sup>1</sup> Landfill leachate may be discharged into waters if:

- a. it complies with the general requirements for industrial waste water in accordance with Annex 3.2 number 2;
- b. the biochemical oxygen demand (*BOD<sub>5</sub>*) does not exceed 20 mg/l O<sub>2</sub>; and
- c. dissolved organic carbon (*DOC*) does not exceed 10 mg/l C.

<sup>2</sup> It may be discharged into a public sewer if it complies with the general requirements in accordance with Annex 3.2 number 2.

<sup>3</sup> The authorities shall determine on a case by case basis whether the values specified in paragraphs 1 and 2 must be adapted and if additional requirements must be issued due to the composition of the leachate or the condition of the of waters in question.

## 26 Gravel conditioning

<sup>1</sup> Water from gravel washing may be discharged into a body of water if:

- a. it complies with the general requirements for industrial waste water in accordance with Annex 3.2 number 2;
- b. the pH does not exceed 9.

<sup>2</sup> It shall not be discharged into a public sewer.

## 27 Fish farms

<sup>1</sup> Only feedstuff low in phosphorus may be used on fish farms.

<sup>2</sup> Plants must be de-sludged according to directions of the authorities.

<sup>3</sup> Water discharged from the plant may not contain more than 20 mg/l (guide value) of total suspended solids.

<sup>4</sup> If therapeutic or other potential water pollutants are used, in particular in order to maintain the health of fish, the authorities shall specify the requirements for the protection of the body of water on a case by case basis.

## 28 Swimming pools

Water from swimming pools may be discharged into a body of water only if it does not contain more than 0.05 mg/l (guide value) of disinfectant (e.g. active chlorine).

*Annex 4*<sup>119</sup>  
(Art. 29 and 31)

## **Planning the Protection of Waters**

### **1 Description of water protection areas at particular risk and determination of groundwater protection zones and areas**

#### **11 Particularly endangered water protection areas**

##### **111 Water protection area $A_u$**

<sup>1</sup> The water protection area  $A_u$  comprises the exploitable underground waters as well as the marginal areas necessary for their protection.

<sup>2</sup> An underground body of water is exploitable or suitable for procurement of water if the water in its natural or enriched state:

- a. is available in sufficient quantity to be exploitable, demand not being taken into account; and
- b. complies with the requirements of the foodstuff legislation for drinking water, if necessary after basic treatment.

##### **112 Water protection area $A_o$**

The water protection area  $A_o$  comprises the surface waters and their riparian zone, as far as these are required for guaranteeing special use.

##### **113 Area of contribution $Z_u$**

The area of contribution  $Z_u$  comprises the region from which, at low water level, about 90 per cent of the groundwater originates that may be at most withdrawn at the groundwater well. If this area can be determined only with disproportionate expense, the area of contribution  $Z_u$  comprises the entire catchment area of the groundwater well.

##### **114 Area of contribution $Z_o$**

The area of contribution  $Z_o$  comprises the catchment area from which the major part of the pollution of the surface waters originates.

<sup>119</sup> Revised by Annex 2 No 4 of Plant Protection Products Ordinance of 23 June 1999 (AS 1999 2045), No II 9 of the O of 18 May 2005 on the Repeal and Amendment of Ordinances in connection with the Commencement of the Chemicals Act (AS 2005 2695), No II of the O of 18 Oct. 2006 (AS 2006 4291), No II para. 1 of the O of 4 May 2011 (AS 2011 1955) and No III of the O of 4 Nov. 2015, in force since 1 Jan. 2016 (AS 2015 4791). See also the transitional provision to this amendment above.

## **12 Groundwater protection zones**

### **121 General**

<sup>1</sup> Groundwater protection zones consist of Zones S1 and S2 and:

- a. in the case of unconsolidated sediment and weakly heterogeneous karst and fissured-rock aquifers: Zone S3;
- b. in the case of strongly heterogeneous karst and fissured-rock aquifers: Zones S<sub>h</sub> and S<sub>m</sub>; Zone S<sub>m</sub> must not be designated in the case of karst and fissured rock groundwater if designation as an area of contribution Z<sub>u</sub> can ensure equivalent protection.

<sup>2</sup> In the case of extraction wells, the dimensioning of groundwater protection zones is determined by the maximum quantity that could be extracted.

### **122 Zone S1**

<sup>1</sup> Zone S1 is intended to prevent damage to and pollution of groundwater wells and recharge installations as well as their immediate surroundings.

<sup>2</sup> In the case of strongly heterogeneous karst and fissured-rock aquifers, it should also prevent the pollution of the immediate environment of geological structures where concentrated surface water enters the subsoil (sinkholes) and where there is a risk to sources of drinking water.

<sup>3</sup> It comprises the groundwater well or recharge installation and the immediate surroundings of the installations. In the case of karst or fissured rock groundwater, it also comprises the immediate environment of sinkholes where there is a risk to sources of drinking water.

### **123 Zone S2**

<sup>1</sup> Zone S2 is intended to prevent:

- a. the groundwater being polluted by excavations and underground works near to groundwater wells or recharge installations; and
- b. the groundwater well inflow being obstructed by underground installations.

<sup>2</sup> In the case of unconsolidated sediment and weakly heterogeneous karst and fissured-rock aquifers, it should also prevent pathogens and substances that may pollute water from entering the groundwater well in such quantities that there is a risk to sources of drinking water.

<sup>3</sup> They shall be separated around groundwater wells or recharge installations and shall be dimensioned in such a way that:

- a. the distance from Zone S1 to the outer border of Zone S2 shall amount to at least 100 m in the upstream direction; it may be less if hydrogeological investigations prove that the groundwater well or recharge installation are equally well protected by intact and relatively impermeable cover layers; and

- b. in the case of unconsolidated sediment and weakly heterogeneous karst and fissured-rock aquifers the flow duration of the groundwater from the outer border of Zone S2 to the groundwater well or the recharge installation will be at least ten days.

## 124 Zone S3

<sup>1</sup> Zone S3 is intended to guarantee that in the case of imminent dangers (e.g. accidents with substances which may pollute water) enough space and time is available for the necessary measures.

<sup>2</sup> The distance from the outer border of Zone S2 to the outer border of Zone S3 is as a rule at least as great as the distance from zone 1 to the outer border of Zone S2.

## 125 Zones S<sub>h</sub> and S<sub>m</sub>

<sup>1</sup> Zones S<sub>h</sub> and S<sub>m</sub> are intended to prevent:

- a. groundwater from being polluted by the construction and operation of installations and output of substances; and
- b. the hydrodynamics of the groundwater being adversely affected by building activities.

<sup>2</sup> Zone S<sub>h</sub> includes areas of high vulnerability in the catchment area of a groundwater well.

<sup>3</sup> Zone S<sub>m</sub> includes areas of at least moderate vulnerability in the catchment area of a groundwater well.

<sup>4</sup> The vulnerability is determined on the basis of the properties of the covering (soil and protective layer) and of the karst or fissured rock system and the infiltration conditions.

## 13 Groundwater protection area

Groundwater protection areas are demarcated in such a way as to enable the locations of the groundwater wells and recharge installations to be determined appropriately and to demarcate the groundwater protection zones accordingly.

### 2 Measures for the protection of waters

#### 21 Protection of areas particularly at risk

##### 211 Water protection areas A<sub>u</sub> and A<sub>o</sub>

<sup>1</sup> In the water protection areas A<sub>u</sub> and A<sub>o</sub>, no installations may be constructed that constitute a special risk to a body of water; in particular, the construction of storage tanks with more than 250 000 l usable volume and containing liquids that may

pollute waters already in small quantities is not permitted. The authority may permit exceptions for good cause.

<sup>2</sup> In water protection area  $A_U$ , no installations may be constructed which lie below the average groundwater level. The authorities may grant exemptions where the flow-through capacity of the groundwater is reduced by a maximum of 10 per cent when compared with its state when uninfluenced by the plant in question.

<sup>3</sup> For the excavation of gravel, sand and other material in water protection area  $A_U$ :

- a. a protective layer of material must be left that is at least 2 m above the highest maximum ten-year groundwater level; in the case of a recharge installation, the actual level of the water table applies if it is higher than the maximum ten-year high;
- b. the excavation area shall be limited in such a way that natural groundwater recharge is guaranteed;
- c. after excavation, the soil shall be restored so that it offers the same protection as in its original state.

## 212 Areas of contribution $Z_U$ and $Z_O$

If, due to soil use, waters are polluted in the areas of contribution  $Z_U$  and  $Z_O$  by runoff and leaching of substances such as plant protection products or fertilisers, the cantons shall specify the measures required for waters protection. For example:

- a. restrictions of use for plant protection products and fertilisers specified by the cantons in accordance with Annexes 2.5 number 1.1 paragraph 4 and 2.6 number 3.3.1 paragraph 3 ORRChem<sup>120</sup>;
- b. limiting the areas for production of large crops and vegetables;
- c. limiting crop selection and rotation as well as farming techniques;
- d. refraining from ploughing grasslands in autumn;
- e. refraining from converting pasture into arable land;
- f. maintaining permanent plant cover on the soil in all circumstances;
- g. only using mechanical aids, techniques, equipment and cultural methods that are particularly adapted.

## 22 Groundwater protection zones

### 221 Zone S3

<sup>1</sup> In Zone S3, the following are not permitted:

- a. industrial and commercial plants that place groundwater at risk;

- b. constructions that decrease the storage volume or the flow capacity of the aquifer; the authority may permit exceptions for good cause if a risk to drinking water sources can be excluded;
- c. infiltration of waste water, except for infiltration of non-polluted waste water from roof tops (Art. 3 para. 3 letter a) through a biologically active soil;
- d. substantial reductions in the protective covering (soil and protective layer);
- e. pipelines which are subject to the Pipelines Act of 4 October 1963<sup>121</sup>; gas pipelines are exempt;
- f. circuits that remove heat from or add heat to the subsoil;
- g. underground storage tanks and pipes containing liquids which may pollute water;
- h. storage tanks containing liquids which may pollute water with more than 450 l of usable volume in each protective structure; exempted therefrom are free-standing storage tanks with heating oil or diesel that supply energy to buildings or facilities for no more than two years; the total usable volume may amount to a maximum of 30 m<sup>3</sup> for each protective structure;
- i. operating plants containing liquids which may pollute water with more than 2000 l of usable volume; exempted therefrom are plants that are permitted in Zone S3 under Article 7 paragraph 2 of the Low Current Installations Ordinance of 30 March 1994<sup>122</sup> or Article 7 paragraph 2 of the Heavy Current Installations Ordinance of 30 March 1994<sup>123</sup>.

<sup>2</sup> The application of plant protection substances, wood protection substances, as well as fertilisers and similar products, is governed by Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem.

## **221<sup>bis</sup> Zone S<sub>m</sub>**

<sup>1</sup> The following are not permitted in Zone S<sub>m</sub>:

- a. industrial and commercial plants that place groundwater at risk;
- b. building activities that have detrimental effects on the hydrodynamics of the groundwater;
- c. infiltration of waste water, with the exception of the infiltration of non-polluted waste water (Art. 3 para. 3) through a biologically active layer of soil and of polluted communal waste water from small treatment plants in compliance with the requirements of Article 8 paragraph 2, if the cost of discharging the communal waste water from the protection zone would disproportionate and a risk to drinking water sources can be excluded;
- d. substantial reductions in the protective covering (soil and protective layer);

<sup>121</sup> SR 746.1

<sup>122</sup> SR 734.1

<sup>123</sup> SR 734.2



- e. pipelines subject to the Pipelines Act of 4 October 1963<sup>124</sup>; exempted therefrom are gas pipelines;
- f. circuits that remove heat from or add heat to the subsoil;
- g. underground storage tanks and pipes containing liquids which may pollute water;
- h. storage tanks containing liquids which may pollute water with more than 450 l of usable volume in each protective structure; exempted therefrom are free-standing storage tanks with heating oil or diesel that supply energy to buildings or facilities for no more than two years; the total usable volume may amount to a maximum of 30 m<sup>3</sup> for each protective structure;
- i. operating plants containing liquids which may pollute water with more than 2000 l of usable volume; exempted therefrom are plants that are permitted in Zone S3 under Article 7 paragraph 2 of the Low Current Installations Ordinance of 30 March 1994<sup>125</sup> or Article 7 paragraph 2 of the Heavy Current Installations Ordinance of 30 March 1994<sup>126</sup>.

<sup>2</sup> The application of plant protection substances, wood protection substances, as well as fertilisers and similar products, is governed by Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem.

### **221<sup>ter</sup>            Zone S<sub>h</sub>**

<sup>1</sup> In Zone S<sub>h</sub>, the requirements of Number 221<sup>bis</sup> apply; in addition, the following are not permitted:

- a. plants and activities that place groundwater at risk;
- b. the infiltration of waste water, with the exception of the infiltration of non-polluted waste water (Art. 3 para. 3) through a biologically active layer of soil.

<sup>2</sup> For the application of wood protection substances, plant protection substances and fertilisers, Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem apply.

### **222    Zone S2**

<sup>1</sup> In Zone S2, requirements in accordance with No 221 apply; in addition subject to paragraphs 2 and 3, the following are not permitted:

- a. the construction of installations; the authorities may permit exceptions for good cause, provided there is no risk to the exploitation of drinking water;
- b. excavations that cause detrimental change to the protective covering (soil and protective layer);

<sup>124</sup> SR 746.1

<sup>125</sup> SR 734.1

<sup>126</sup> SR 734.2

- c. infiltration of waste water;
- d. other activities that place groundwater at risk.

<sup>2</sup> For the application of wood protection substances, plant protection substances and fertilisers, Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem apply.

### **223 Zone S1**

In Zone S1, the only construction work and other activities permitted are those connected with the supply of drinking water, except for the cutting of grass which is then left on site.

### **23 Groundwater protection areas**

<sup>1</sup> Construction work and other activities carried on in groundwater protection areas must comply with requirements set out in No 222 paragraph 1.

<sup>2</sup> If the position and the extent of the future outer protection zone (Zone S3) are known, the corresponding areas must comply with the requirements set out in No 221 paragraph 1.

*Annex 4a*<sup>127</sup>  
(Art. 41f and 42b)

## **Planning Remediation Measures for Hydropeaking and Bed Load Budget**

### **1 Definition**

There are special conditions in particular if:

- a. two or more installations cause serious harm in the same catchment area; and
- b. the degree of harm caused by each individual installation cannot yet be assessed.

### **2 Planning stages for the remediation of hydropeaking**

<sup>1</sup> The cantons shall submit an interim report to the FOEN by 30 June 2013. The report shall contain:

- a. for each catchment area, a list of the existing hydropower plants that may cause flow fluctuations (pumped-storage power plants and run-of-river power plants);
- b. information as to which hydropower plants on which stretches of water are seriously harming the indigenous flora and fauna and their habitats due to hydropeaking;
- c. an assessment of the ecological potential of the seriously harmed stretches of water and of the degree of harm;
- d. for each hydropower plant that is seriously harming indigenous flora and fauna and their habitats due to hydropeaking: possible remediation measures, their assessment and a list of the measures to be taken and information on the coordination of these measures in the catchment area;
- e. for hydropower plants for which no decision can yet be made on the remediation measures to be taken under letter d due to special circumstances: a deadline by which the information under letter d must be submitted to the FOEN.

<sup>2</sup> They must submit the agreed plan to the FOEN by 31 December 2014. It shall contain:

- a. a list of the hydropower plants whose responsible person must take measures to remediate serious harm to the indigenous flora and fauna and their habitats due to hydropeaking, with information on the remediation measures to be taken and the deadlines by which these must be planned and implemented. The deadlines are governed by the urgency of the need for remediation;

<sup>127</sup> Inserted by No II para. 2 of the O of 4 May 2011, in force since 1 June 2011 (AS 2011 1955).

- b. Information on how the remediation measures in the catchment area of the body of water concerned will be coordinated with other measures to protect natural habitats and against flooding;
- c. for hydropower plants for which no decision can yet be made on the remediation measures due to special circumstances: a deadline by which the canton shall specify whether and if applicable which remediation measures must be planned and implemented and by when.

### **3 Planning stages in the case of the remediation of the bed load budget**

<sup>1</sup> The cantons shall submit an interim report to the FOEN by 31 December 2013. It shall contain:

- a. a list of stretches of water where the indigenous flora and fauna and their habitats, the groundwater regimen or flood protection are seriously harmed by a change in the bed load budget;
- b. an assessment of the ecological potential of the seriously harmed stretches of water and of the degree of the harm;
- c. a list of all hydropower plants on the seriously harmed stretches of water as well as other installations causing serious harm to the stretches of water under letter a;
- d. a list of the installations whose responsible person must probably take remediation measures, with information on the feasibility of the remediation measures and on the coordination of these measures in the catchment area.

<sup>2</sup> They shall submit the agreed plan to the FOEN by 31 December 2014. It shall contain:

- a. a list of the installations whose responsible person must take measures to remediate serious harm to the indigenous flora and fauna and their habitats, the groundwater regimen or flood protection due to a change in the bed load budget and the deadlines by which the measures must be planned and be implemented. The deadlines are governed by the urgency of the need for remediation;
- b. information on how other measures to protect natural habitats and against flooding shall be taken into account in the remediation of the bed load budget;
- c. for installations for which no decision can yet be made on the remediation measures due to special circumstances: a deadline by which the canton shall specify whether and if applicable by when remediation measures must be planned and implemented.

## Repeal and Amendment of Previous Law

### 1. The following are repealed:

- a. General Water Protection Ordinance of June 19, 1972<sup>128</sup>;
- b. Ordinance of 8 December 1975<sup>129</sup> on Waste Water Discharge;
- c. Ordinance of 22 October 1981<sup>130</sup> on Zone Surveys for Protection of Bodies of Water;
- d. Regulations of 9 August 1972<sup>131</sup> of the Federal Water Protection Commission.

### 2.-5.

...<sup>132</sup>

<sup>128</sup> [AS 1972 967, 1980 48, 1986 1254 No II 2, 1991 370 Annex No 6, 1993 3022 No I, II]

<sup>129</sup> [AS 1975 2403, 1989 2048, 1993 3022 No IV 5]

<sup>130</sup> [AS 1981 1738]

<sup>131</sup> [AS 1972 1708]

<sup>132</sup> The amendments may be consulted under AS 1998 2863..

