Legislation governing wastewater discharges in the Czech Republic

V Singrova¹ and P Hlustik¹

¹Institute of municipal water management, Brno University of Technology, Faculty of Civil Engineering, Žižkova 17, 602 00 Brno, Czech Republic

Abstract. The aim of this article is to describe and compare individual laws concerning wastewater discharges and their monitored indicators. Relevant laws and government regulations have been in existence since 1953, when the Central Administration of Water Management was established, with the latest regulation being Government Decree No. 401/2015 Sb. This article deals with the development of legislation, its amendments and improvements. This results in a gradual adjustment of the monitored indicators and decreasing indicator values in connection with improving treatment processes and technologies. This is also related to the Czech Republic’s accession to the EU and the adoption of Council Directive 91/271/EEC, which emphasises, inter alia, environmental protection.

1. Introduction

Any wastewater discharges into surface water or groundwater should be subject to certain rules, conditions and permits due to potential negative environmental impacts. Legislation regulating this area has developed over time this revealing other areas that had to be considered and added. The article includes legislative development concerning wastewater discharges in the Czech Republic. The description of all legal decrees is focused on those sections that are only related to wastewater discharges. Emphasis was placed primarily on the fundamental changes and newly drawn up sections of the law. Of course, these decrees also include cover other matters, including their development.

2. Historical development of the legislation

2.1. Government Decree No. 92/1953 Sb.

Government Decree No. 92/1953 Sb., Government Decree establishing the Central Administration of Water Management [1].

- wording effective from 16th December 1953-31st December 1954

The Central Administration of Water Management as the central authority was managed by a chairman appointed by the government. This Administration reported to the Minister of Forests and Wood-Processing Industry. In addition, the Administration of Water Management was also established in Slovakia. It was headed by a chairman appointed by the Board of Commissioners and reported to the Commissioners of Forestry and Wood-Processing Industry.

These authorities were responsible for the management of water resources ad water management, water distribution, including the care for water management improvement, river engineering and cleanliness. They were also in charge of watercourse navigability and waterways construction. What was also essential was water management planning, administration, operation and maintenance of water reservoirs and facilities, management of comprehensive engineering services and management.
of preparation and construction of investment projects in connection with energy facilities. Last but
not least, it included research, technical development and other areas.
The Central Administration of Water Management acted directly or through its competent bodies:
- water management development centres,
- water research institute,
- state institute for water-related engineered structures - Hydroprojekt,
- economic-production areas of water management.

2.2. Act 11/1955 Sb.
Act No. 11/1955 Sb., Water Management Act [2].
- wording effective from 1st January 1955- 31st March 1975
- amended by Act No. 12/1959 Sb.
This law stipulated the obligation to maintain and preserve the natural condition of surface water and
groundwater. If there was a suitable treatment facility available, or wastewater disposal was taken care
of in a different manner, the water authority issued a permit to discharge these waters. The government
could also set fees for wastewater discharges depending on its volumes and pollutant concentrations.
The Act did not clearly define any limit values and no specifications regarding discharge of
wastewater into sewerage systems.

2.3. Act 138/1973 Sb.
Act 138/1973 Sb., Act on Water (Water Act) [3].
- wording effective from 1st April 1975- 31st December 2001
- amended by Act 14/1998 Sb. and 58/1998 Sb.
This Act dealt with the discharges of wastewater and special water into surface water and groundwater
or into sewerage systems. Fees for illicit discharges were set by the water authority.
Discharges into surface water and groundwater. The water management authority established
conditions for measuring the volumes of wastewater discharges into surface or groundwater and its
pollution. Furthermore, it could determine the point and method of measurement, including the
frequency with which results had to be submitted to this authority. The entity discharging wastewater
into surface water or groundwater was obliged to ensure its disposal in an appropriate technical
manner, in accordance with the development of such facilities. The quality of surface water or
groundwater could not be deteriorated or endangered.
The permissible pollution indicators and their values were set by the government. Furthermore, in
exceptional cases defined by the government, the water authority permitted a time-limited exceeding
of these limits and discharges of higher pollution volumes. On the basis of his decision it was possible
to reduce the permissible values or to set other indicators and their values in the event of water
protection emergencies.
Discharges into public sewerage systems. The volumes of discharged wastewater and the maximum
permissible level of pollution were determined by the sewage system operating ds approved by the
water authority. Furthermore, the Act clearly specified substances that were not considered as
wastewater. Their discharges into the public sewerage system were forbidden.
Some water required treatment before discharging. This was subsequently permitted by the water
authority if the water met the requirements set by the sewerage system regulations.

2.3.1. Amendment 58/1998 Sb. Act No. 58/1998 Sb., on Fees for wastewater discharges into surface
water [4].
- wording effective from 30th March 1998- 31st December 2001
The Act specifies fees for discharged wastewater pollution. It included calculations of the fees and the
conditions under which the fees were imposed. It also provided information on fees based on the
volumes of discharged water and on the obligation to monitor and measure wastewater pollution.
The Act explicitly specified the entity authorized to analyze samples. It also specified the fee returns,
terms and conditions for the fee payment postponement and or waivers, penalties and fines.
2.4. Government Decree 25/1975 Sb
Decree of the Government of the Czech Socialist Republic 25/1975 Sb., determining indicators of permissible water pollution [5].

- wording effective from 1st April 1975 - 15th April 1992

Discharges into surface water and groundwater. Permits to discharge wastewater and special waters into surface water were issued by water authorities under this Decree. In some cases, more stringent values could be set, however, up to the maximum of values set for water supply watercourses. Discharges into groundwater were permitted only exceptionally. The water could not endanger or deteriorate the quality of groundwater and therefore had to be treated before being discharged.

Pollution aspects related to discharges into the receiving water. Discharged water was recalculated with regard to local conditions in the receiving body of water based on $Q_{355}$ daily flow rate. Thus, the volume of substances after mixing was essential. These limits were designated as pollution limits. Analyses of water according to technical standards determined the quality of water in the receiving water. Most important were the results from analyses performed at $Q_{355}$. If the surface water quality indicators were already worse than the permitted ones, it was forbidden to make this indicator even worse by water discharging.

As regards water supply watercourses, their indicators had to be satisfactory at any point. Depending on the water management, the water authority identified locations for other surface water where the indicators had to comply with the requirements.

2.5. Government Decree 171/1992 Sb.
Decree of the Government of the Czech Republic 171/1992 Sb., laying down indicators of permissible degree of water pollution [6].

- wording effective from 16th April 1992 - 31st August 1996
- amended by Act 185/1996 Sb.

Discharges into surface water and groundwater. When discharging wastewater, efforts were made to minimize negative impacts on surface water. The water authority followed indicators of permissible level of pollution, which were binding. Discharging wastewater into groundwater was permitted in exceptional cases. Such water had to be cleaned or treated before being discharged.

Emission aspect. This decree was the first one which considered the emission aspect of pollution indicators (BOD, COD, SS, N-NH$_4^+$, P$_{total}$) and the concentration values were related to the size of the source of pollution. This size was related to the PE (population equivalent) and, at the same time, to the maximum volume of kg BOD. The BOD indicator was linked to the production of 60g BOD per capita a day. These values could be tightened by the water authority. This usually happened when it was in the interest of water protection.

Based on a technically substantiated application, the water authority could ease off the discharge requirements for a pre-defined period of time. For example, in the event of equipment failure, reconstruction or commissioning of wastewater treatment plants.

Furthermore, the government decree contained tables with indicators for industrial and special wastewater. The table was divided according to individual industries producing specific wastewater.

2.5.1. Amendment 185/1996 Sb. Government Decree No. 185/1996 Sb., amending and supplementing Government Decree No. 171/1992 Sb., laying down indicators of permissible degree of water pollution [7].

- wording effective from 1st September 1996 - 31st May 1999

The change was mainly related to abandoning the indicator limit values for the size of sources of pollution up to 500 PE. The indicator values were not changed for other sizes of pollution source. Out of the original six size categories defined for pollution sources (according to the number of PE), only 4 categories were set.
2.6. Government Decree 82/1999 Sb.
Government Decree 82/1999 Sb., laying down indicators and values of permissible degree of water pollution [8].

- wording effective from 1st June 1999- 28th February 2003

*Development of emission aspects.* In this Decree, a division between p (permissible) and m (maximum) appears in the table showing permissible values of each indicator. A new indicator $N_{\text{inorg}}$ is added to the indicators and it represents total inorganic nitrogen.

The values of the pollution indicators for sources up to 500 PE were set by the water authority up to the values of the category 501 - 5000 PE. Therefore, a total of 5 categories were set up for the sizes of pollution sources and the indicator values were made more stringent compared to the previous government decree.

The influence of wastewater temperature on the biological stage effluent was also newly taken into account on this decree. If it did not reach 12 °C, the values of some of the indicators were less strict.

The government decree also included permissible concentration values for industrial and special wastewater, which was related to a detailed description of individual types of industries. There were also indicators and their values set for surface water pollution.

*Checks of discharged wastewater samples.* Minimum frequencies for sample taking were newly established and this was also related to the size of the source of pollution (according to the number of PE) and the method of sample taking was described. This also indicated the number of samples that could exceed specified permissible concentrations over a period of one year.

2.7. Government Decree 61/2003 Sb.
Government decree on indicators and values of permissible pollution of surface water and wastewater, requirements for the permit to discharge wastewater into surface water and sewerage and on sensitive areas [9].

- wording effective from 1st March 2003 - 31st December 2015
- amended by 229/2007 Sb. and 23/2011 Sb.

This decree was drawn up in accordance with the European Community law, including Council Directive 91/271/EEC, which is in force to date.

*Development of emission aspects.* The number of categories for the size of the source of pollution (newly the size of WWTP) is still five but the limit values (number of PE) were modified. The concentration values were also slightly modified. The $N_{\text{inorg}}$ indicator was replaced by the indicator $N_{\text{tot}}$.

As regards the emission standards, a table containing the permissible minimum treatment efficiency was first introduced.

Values and indicators for industrial water discharges as well permissible pollution standards for surface water were modified. In addition, pollution standards for surface water used as sources of drinking water, bathing and stretches of watercourses designated as salmonid waters and cyprinid waters, were added.

*Development of sampling.* Types of samples designated as "A" "B" and "C" were specified and a table showing minimum annual sampling frequency was modified. The table showing the permitted number of samples that can fail to meet the permissible values remained almost the same.

2.7.1. Amendment 229/2007 Sb. Government Decree No. 229/2007 Sb. amending Government Decree No. 61/2003 Sb. on indicators and values of permissible pollution of surface water and wastewater, requirements for the permit to discharge wastewater into surface water and sewerage and on sensitive areas [10].

- wording effective from 1st October 2007- 3rd March 2011

Emission limit values were made stricter and were modified. The SS indicator was removed from the table showing minimum efficiency and the minimum required efficiency in relation to the N-NH$_4^+$, P$_\text{total}$, N$_\text{total}$ indicators were reduced. Indicators and concentrations of discharged industrial waters were also modified.
The table showing standards of permissible surface water pollution was combined with the tables intended for water to be treated as drinking water, bathing water and salmonid waters and cyprinid waters.

The sampling frequency was also adjusted. Especially for the <500 PE category. For category >100,000 PE, the TOC indicator was added.

2.7.2. Amendment 23/2011 Sb. Government Decree No. 23/2011 Sb. amending Government Decree No. 61/2003 Sb. on indicators and values of permissible pollution of surface water and wastewater, requirements for the permit to discharge wastewater into surface water and sewerage and on sensitive areas, as amended by Government Decree No. 229/2007 Sb [11].

- wording effective from 4th March 2011 - 31st December 2015

The minimum annual sampling frequency was specified for the largest categories of WWTP newly also for the \( \text{N-NH}_4^+ \) indicator.

\textit{Introduction of BAT limits, efficiency of domestic WWTP.} This Decree provides data on BAT limits - the best available technologies and addressed domestic wastewater treatment plants. The use of a domestic wastewater treatment plants was possible up to 50 PE. The minimum permissible treatment efficiency was set for each category (3 in total). In the case of such treated wastewater reuse (e.g. for bathing and watering) it was necessary to include sanitary treatment (UV, membrane filtration).

3. Current legislation

3.1. Act 254/2001 Sb.

Act No. 254/2001 Sb., on Water and amendment to certain acts (the Water Act) [12].

- wording effective from 1st January 2002

- amended by amendments 20/2004 Sb., 181/2008 Sb., 151/2011 Sb., 275/2013 Sb., 187/2014 Sb. and 113/2018 Sb.

The Act defines water that is considered to be wastewater and which is not, and draws attention to the sewage system regulations. It describes the formulation and content of wastewater discharge permits as well as their change, cancellation and termination. It specifies the obligation to dispose of wastewater in accordance with conditions specified in the wastewater discharge permit, which also specifies the method of measuring the volume and degree of wastewater pollution and subsequent submission of such information.

It specifies wastewater discharges into surface water or groundwater. The Act also lays down remedial measures in case of illicit or incidental wastewater discharges.

It contains information on fees for wastewater discharges including their calculation and amount, which is related to monitoring, measurement and subsequent discharged wastewater records. These are fees related to exceeding the maximum permitted volume of water or pollution exceeding the defined indicators.

3.2. Government Decree No. 401/2015 Sb.

Government Decree No. 401/2015 Sb. on indicators and values of permissible pollution of surface water and wastewater, requirements for the permit to discharge wastewater into surface water and sewerage and on sensitive areas [13].

- wording effective from 1st January 2016

The emission standards and the entire BAT table are the same as in the previous decree. The SS indicator was removed from the limits related to the minimum efficiency of municipal wastewater treatment plants and the \( \text{N}_{\text{total}} \) indicator was added. The table showing indicators of permissible surface water pollution was changed again.

The minimum annual sampling frequency is no longer divided into indicators, which is a simplification. Therefore, only one number is set for each size category - one frequency.
4. Conclusion

The first legal regulations only mentioned wastewater discharges, and no indicators were set to be monitored. Even with the introduction of the first limiting concentration values of selected pollution indicators, the environment was still not protected as it is nowadays. Today, the pollution indicators monitored at the effluent from wastewater treatment plants are logically the most stringent indicators that have ever been set.

The article presents the main sections concerning wastewater discharges and the development of this area is evident. From the original mention of wastewater discharges, to the first limit concentrations of selected indicators, the pollution and emission aspects, to BAT limits and minimum treatment efficiencies.

Acknowledgements

The paper was drawn up within the standard project No. FAST-J-18-5545 “Testing of absorption media for odour removal from sewers”.

References

[1] Government Decree No. 92/1953 Sb.: Government Order No. 92/1953 Sb., Government Decree Establishing the Central Administration of Water Management, In.: Year 1953, No. 92.
[2] Act 11/1955 Sb.: Water Management Act In.: . Year 1955, No. 11.
[3] Act 138/1973 Sb.: Water Act, In.: Year 1973, No. 138.
[4] Act No. 58/1998 Sb.: Act No. 58/1998 Sb., on Fees for Wastewater Discharges into Surface Water, In.: Year 1998, No. 58.
[5] Government Decree 25/1975 Sb.: Decree of the Government of the Czech Socialist Republic laying down Indicators of Permissible Degree of Water Pollution, In.: Year 1975, No. 25.
[6] Government Decree 171/1992 Sb.: Decree of the Government of the Czech Republic laying down Indicators of Permissible Degree of Water Pollution, In. Year 1992, No. 171.
[7] Government Decree No. 185/1996 Sb.: Government Decree No. 185/1996 Sb., amending and supplementing Government Decree No. 171/1992 Sb., laying down indicators of permissible degree of water pollution, In.: Year 1996, No. 185.
[8] Government Decree 82/1999 Sb.: Government Decree laying down indicators and values of permissible degree of water pollution, In. Year 1999, No. 82.
[9] Government Decree No. 61/2003 Sb.: Government Decree on indicators and values of permissible pollution of surface water and wastewater, requirements for the permit to discharge wastewater into surface water and sewerage and on sensitive areas, In.: Year 2003, No. 61.
[10] Government Decree 229/2007 Sb.: Government Decree 229/2007 Sb. amending Government Decree 61/2003 Sb. on indicators and values of permissible pollution of surface water and wastewater, requirements for the permit to discharge wastewater into surface water and sewerage and on sensitive areas, In.: Year 2007, No. 229.
[11] Government Decree 23/2011 Sb: Government Decree 23/2011 Sb. amending Government Decree 61/2003 Sb. on indicators and values of permissible pollution of surface water and wastewater, requirements for the permit to discharge wastewater into surface water and sewerage and on sensitive areas as amended by Government Decree 229/2007 Sb. In.: Year 2011, No. 23.
[12] Act 254/2001 Sb.: Act on Water and amendment to certain acts (the Water Act), as amended, In.: Year 2001, No. 254.
[13] Government Decree No. 401/2015 Sb.: Government Decree n on the indicators and values of permissible surface water and groundwater pollution , requirements for wastewater discharge permits for wastewater discharges into surface water and sewerage systems and sensitive areas, In. Year 2015, No. 401.