



MONITORING OF THE SLOVAK SURFACE WATER FROM THE POINT OF VIEW OF TREATMENT TO THE WATER FOR HUMAN CONSUMPTION

PRESENT AND FUTURE

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LEGISLATION BACKGROUND

- ❑ Water Framework Directive(2000/60/ES),
- ❑ Directive 2008/105/EC of the European Parliament and the Council on environmental quality standards in the field of water policy,
- ❑ Directive 2006/118/EC of the European Parliament and the Council on the protection of ground water against pollution and deterioration,
- ❑ **Directive (EÚ) 2020/2184/EC of the European Parliament and the Council on the quality of water intended for human consumption,**
- ❑ Law no. 364/2004, Coll. on water and on the amendment of Act of the Slovak National Council no. 372/1990 Coll. on offenses as amended, as amended by later regulations,
- ❑ Law no. 442/2002 Coll. on public water supplies and public sewers and on amendments to Act No. 276/2001 Coll. on regulation in network industries, as amended,
- ❑ Regulation of the Government of the Slovak Republic no. 269/2010 Coll., establishing requirements for achieving good water status, as amended,



LEGISLATION BACKGROUND

- ❑ Law no. 305/2018, Coll. on protected areas of natural water accumulation and on amendments to certain laws, as amended,
- ❑ Decree of the Ministry of Agriculture, Regional Development and Environment of the Slovak Republic no. 418/2010, Coll. about the execution of some provisions of the Water Act in the sense of later regulations,
- ❑ **Decree of the Ministry of Health of the Slovak Republic no. 91/2023, Coll., which establishes the indicators and limit values of drinking water quality and hot water quality, the procedure for monitoring drinking water, risk management of the drinking water supply system and risk management of domestic distribution systems,**
- ❑ Other related EU Directives, laws of Slovak Republic, regulations of the Government of the Slovak Republic and decrees,
- ❑ River Basin Management Plan 2021,
- ❑ Monitoring programmes.



MONITORING OF THE SLOVAK SURFACE WATER

Framework monitoring programmes for water

- ☐ 2010 - 2015
- ☐ 2016 - 2021
- ☐ 2022 - 2027

Goals, regulations, obligations of the Slovak Republic, monitoring networks, purposes, determinants, frequencies, methods, data management, competences and responsibilities of institutions, quality control systems, indicators, estimation of costs.

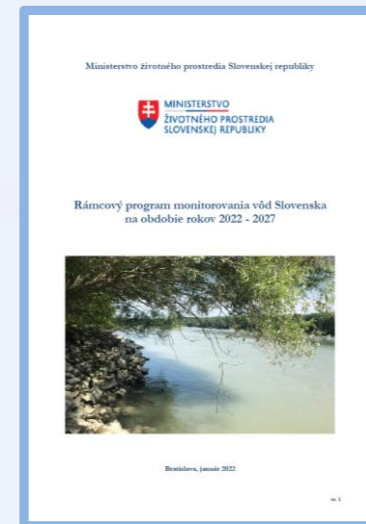
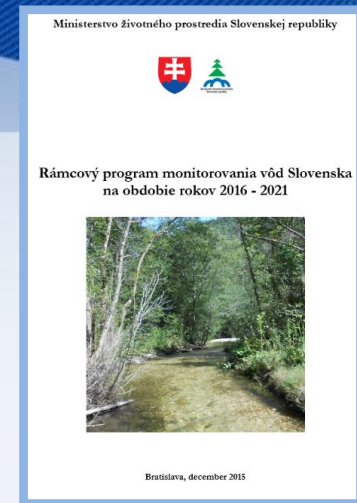
Annual additions to the Framework program for water monitoring

Current and detailed information for a specific year

Publication:

<https://old.vuvb.sk/rsv2/?lang=SK>

<https://www.minzrp.sk/voda/koncepcne-dokumenty/>



MONITORING PROGRAMMES FOR WATER



- Surface water
- Ground water
- Protected areas (defined according to §5 of Water Act):
 - ✓ **areas with surface water intended for drinking water abstraction,**
 - ✓ areas with water intended for bathing,
 - ✓ areas with surface water suitable for the life and reproduction of native fish species,
 - ✓ protected areas of natural water accumulation,
 - ✓ protective zones of water resources,
 - ✓ reference sites,
 - ✓ sensitive areas,
 - ✓ vulnerable areas,
 - ✓ protected areas and their protection zones according to a special regulation.



MONITORING PROGRAMMES FOR WATER

Protected areas designated for the abstraction of drinking water (water for human consumption) are:

- protective zones of water supply resources,
- basins of water supply streams,
- protected water management areas.

Surface water supply resources:

- water supply reservoirs,
- water supply rivers.

Water supply resources (§7, sect. 1 of Water Act)

Water in surface water bodies (and in underground water bodies) used for abstraction for water for human consumption or usable for supplying the population for more than 50 people, or enabling the abstraction of water for such a purpose in an average of more than 10 m³ per day in the original state or after treatment.



MONITORING OF WATER SUPPLY RESOURCES

- ❑ **Administrators of significant water courses** (Slovak Water Management Enterprise), **or other authorized legal entities**
(Water Act 364/2004, Government Regulation 269/2010, Directive 2000/60/EC – article 7, Directive 2020/2184/EC)
- ❑ **Owners of collection systems and public water supply facilities.**
(Act 442/2002)

Both monitoring systems differ in terms of determinants, frequencies and sampling points, especially in relation to water treatment technology

Monitoring:

- ❑ surveillance (ES, EP, CHS)
- ❑ operational (different aims)
- ❑ investigative (monitoring of unknown causes of quality and status deterioration)

Water supply resources

in delineated but also in un-delineated water bodies



DELINEATION OF SURFACE WATER BODIES

Directive 2000/60/EC – the basic unit for monitoring and assessment and subsequent improvement measures is the **water body** (Σ 1351)

The criterion is the **size of the catchment area**

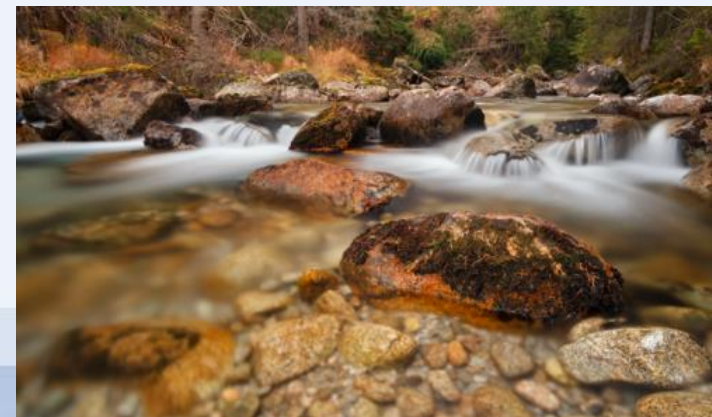
- the river above 10 km²
- reservoirs – above 0,5 km² of surface of reservoir or lake

Water supply rivers – types:

small (10-100 km²) and middle size (100-1000 km²)

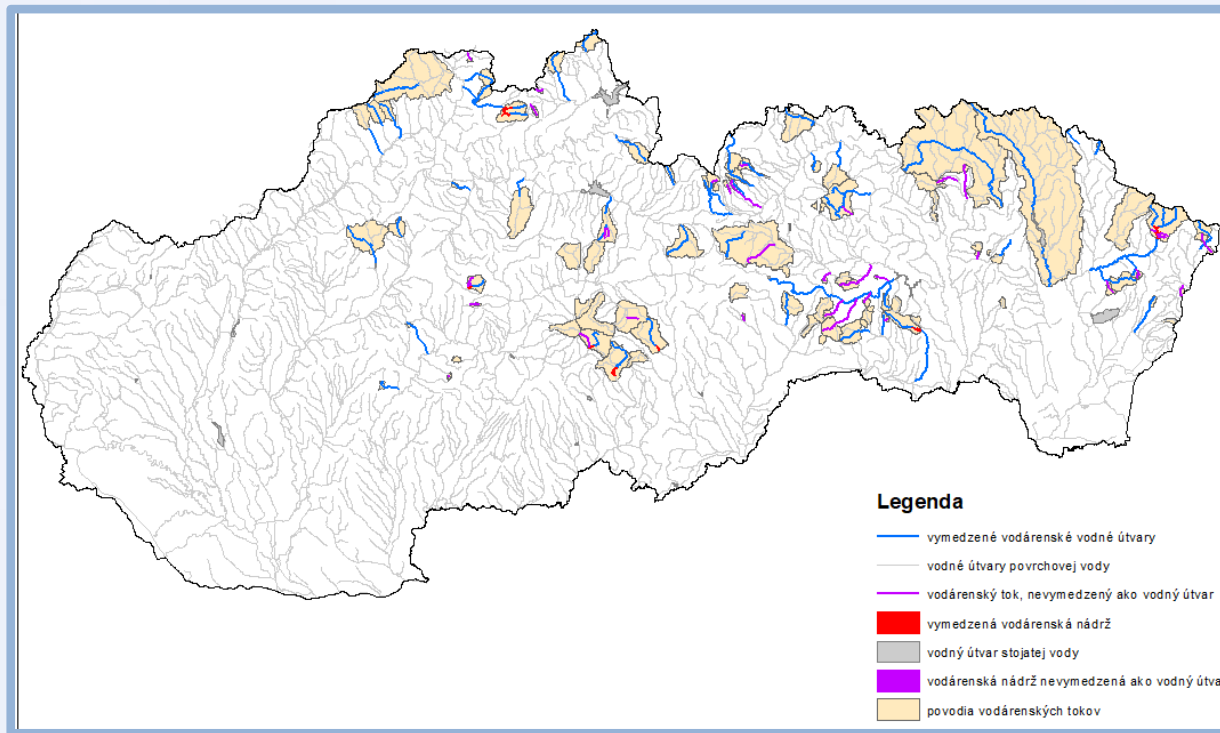
Decree No. 211/2005 (Annex 2) establishes a list of water supply streams:

- sections of streams, usually from the source to the point of abstraction or the profile of a weir,
- marked segments (r.km),
- together 122 segments,
- both utilized and unused resources.



WATER SUPPLY STREAMS AND RESERVOIRS

- delineated and un-delineated
- utilized and unused
- monitored and un-monitored



WATER SUPPLY STREAMS AND RESERVOIRS

monitored in the frame of Framework monitoring programme for Slovak water
in the period 2022-2027

VODÁRENSKÉ NÁDRŽE	
Vymedzené	VN Bukovec, VN Starina, VN Málinec, VN Hriňová, VN Klenovec, VN Turček, VN Nová Bystrica
Nevymedzené	VN Rozgrund
VODÁRENSKÉ TOKY	
Vymedzené	Bodva, Ida, Zábava, Hermanovský potok, Laborec, Cirocha, Zbojský potok, Barnov, Daňová, Kamenica, Stružnica, Žiarovnica, Smolík, Lipník-2, Javorinka, Hnilec (Hrelíkov potok), Torysa, Perlový potok, Škapová, Rovinný potok, Bystrá-1, Ipel', Nitrica, Tužina, Poprad, Studený potok, Lomnický potok, Jakubianka, Mlynica, Štiavnik, Kežmarská Biela Voda, Slatina, Starohutský potok, Prochotský potok, Hukava, Klenovská Rimava, Súľovský potok, Polhoranka, Turiec-1, Kysuca, Bystrica-2, Staňov potok, Demänovka, Zadná voda, Ipoltica, Studený potok-1, Mútňanka, Ľubochnianka, Kamenistý potok, Klubinský potok, Oščadnica, Pivovarský potok, Petrovička, Štiavnik, Papradnianka, Harvelka, Ondava, Topľa, Domanižianka
Nevymedzené	Hájny potok, Čierny potok, Oľšavica, Nová rieka, Riečka, Stankovský potok, Javorovec, Kaltwasser, Ráztoka, Židlovský potok, Smrečník, Čierny potok, Dara, Berezovec, Hricov potok, Hybkaňa, Bystriansky potok, Brusný potok, Veľká Biela voda, Zimná, Slovinský potok, Bystrý potok-5, Smolník-1, Veľký Hutný potok, Žakarovský potok, Pastovník, Sigordský potok, Hrabovec, Ľadový potok, Hromadná voda, Slavkovský potok, Zelený potok, Priečny potok, Otupnianka, Suchý potok-12, Nová Rieka, Riečka

OBJECTIVES FOR WATER SUPPLY RESOURCES

Directive 2000/60/EC - articles 4, 7 – in water supply resources

- achieve **higher environmental objectives** related to raw water used for human consumption (Governmental Regulation 269/2010 – Annex 2 – part 2);
- achieve **environmental objectives for surface water bodies** (Governmental Regulation 269/2010 – Annex 12 – ES, EP, Governmental Regulation 167/2015 – CHS);

Article 4 of Directive 2000/60/EC demands:

- take the **necessary measures** to prevent the deterioration of the status of all surface water bodies;
- to protect, improve and restore** all bodies of surface water in order to achieve good surface water status;
- to introduce necessary measures** with the aim of gradually **reducing pollution** caused by priority substances and **stopping** or gradually **ending emissions, discharges and leaks** of priority hazardous substances.

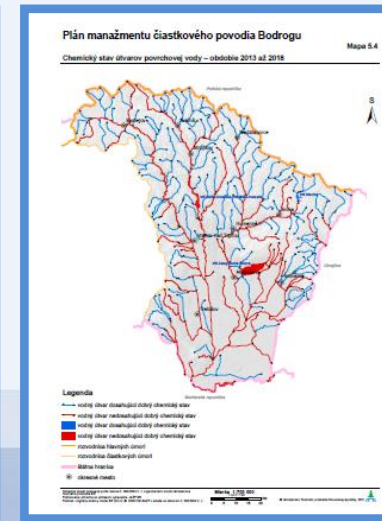
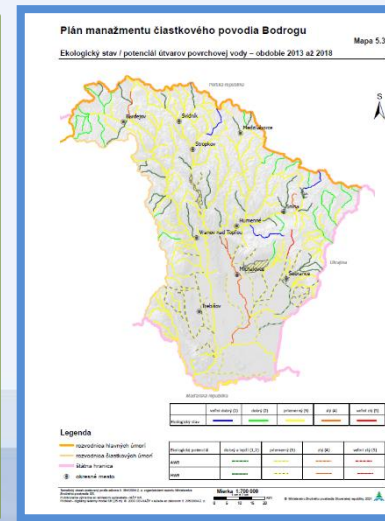
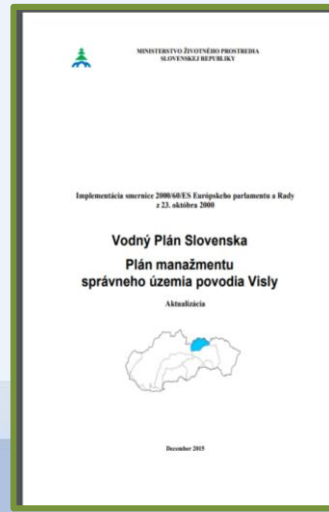
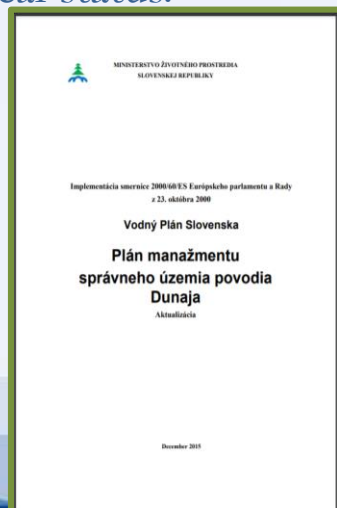
ASSESSMENT OF WATER SUPPLY STREAMS AND RESERVOIRS

□ Annually – Yearbooks of surface water quality

- ✓ <https://www.shmu.sk/sk/?%20page=1776>
- ✓ Acc. Governmental Regulation 269/2010 Annex 2, part A

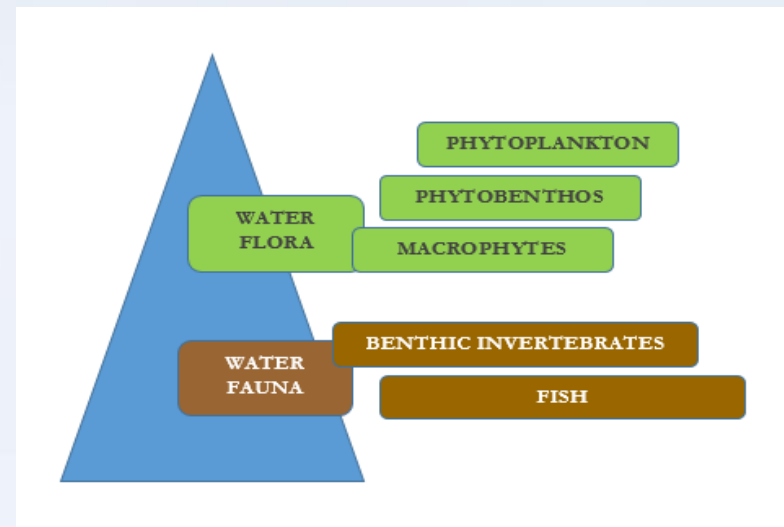
□ 6-years intervals – as a status assessment– River Basin Management Plans (Danube, Vistula) 2009, 2015, 2021 – Annex 5.1

- ✓ <https://www.minzp.sk/voda/vodny-plan-slovenska/vodny-plan-slovenska-2009.html>
- ✓ <https://www.minzp.sk/voda/vodny-plan-slovenska/vodny-plan-slovenska-aktualizacia-2015.html>
- ✓ <https://www.minzp.sk/voda/vodny-plan-slovenska/>
- ✓ Acc. Governmental Regulation 269/2010 - Annex 12, 13 and Governmental Regulation 167/2015 - assessment of ecological status, ecological potential and chemical status.



ASSESSMENT OF WATER SUPPLY STREAMS AND RESERVOIRS

from the point of view of ecological status and potential



HYDRO-MORPHOLOGICAL QUALITY ELEMENTS

Hydrological regime, River continuity,
Morphological conditions

PHYSICO-CHEMICAL QUALITY ELEMENTS

pH, O₂, temperature, BOD₅, COD_{Cr},
conductivity, alkalinity, acidity, N-NH₄,
N-NO₃, Total-N, P-PO₄, Total-P

SLOVAK NATIONAL RELEVANT SUBSTANCES

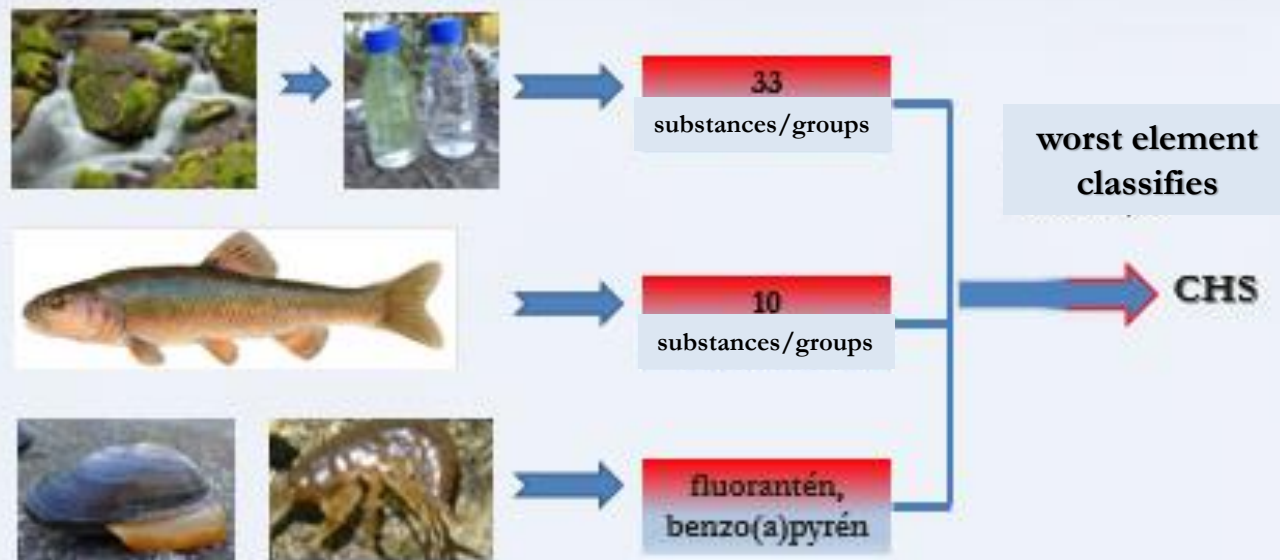
As, Cr, Cu, Zn, Aniline, Benzene sulphonamide, Benzothiazole, Biphenyl (phenyl benzene), Bisphenol A, Clopyralid, Desmediphame, Di butyl phthalate, Diphenylamine, Ethofumesate, Phenanthrene Formaldehyde, Glyphosate, Cyanides, MCPA, 4-methyl-2,6-di-tert butyl phenol, PCB and its congeners, Pendimethalin, 1,1,2-trichloroethane, Toluene, Vinylbenzene (styrene), Xylenes (isomers)

ASSESSMENT OF WATER SUPPLY STREAMS AND RESERVOIRS

from the point of view of chemical status

Assessment of 45 priority substances and groups of substances

- ❑ Characteristics: toxic, accumulated and difficult to decompose in aquatic environment,
- ❑ Monitoring: water (monthly), biota (yearly)
- ❑ Assessment: annual average, MAC (P90), EQS (Governmental regulation 167/2015)



ASSESSMENT OF WATER SUPPLY RESERVOIRS

Reference period 2013-2018

In the delineated water supply reservoirs only (without Rozgrund reservoir)

Code	Water body	Ecological potential	Confidence		Chemical status (water)		Chemical status (biota)	
SKA1001	VN Bukovec	moderate	low	<i>Cu</i>	G		F	<i>Hg, BDE, dioxins</i>
SKB1001	VN Starina	good	medium		G		NM	
SKI1001	VN Málinec	good	high		F	<i>fluorantbene</i>	NM	
SKR1001	VN Hřiňová	moderate	high	<i>FB</i>	G		NM	
SKS1003	VN Klenovec	good	high		G		NM	
SKV1005	VN Turček	good	high		G		NM	
SKV1006	VN Nová Bystrica	good	high		F	<i>benzo(a)pyrene</i>	NM	

ASSESSMENT OF WATER SUPPLY STREAMS

Reference period 2013-2018

In the delineated water supply rivers only – totaly 103

Ecological status		Ecological potential	
No. of WB	%	No. of WB	%
16	15,5	3	2,91
50	48,5	3	2,91
30	29,1		
1	0,9		

Confidence		
	No. of WB	%
High	34	33,00
Medium	33	32,01
Low	36	34,95

	Chemical status			
	water		biota	
	No. of WB	%	No. of WB	%
G	45	43,69	1	0,97
F	9	8,74	22	21,36
NM	49	47,57	80	77,67

Confidence		
	No. of WB	%
High	19	18,45
Medium	39	37,86
Low	45	43,69

Problematic substances

water: As, Cu, Zn, Total Cyanides

water: Cd, Pb, benzo(a)pyrene, fluoranthene

biota: BDE, Hg

WHAT AWAITS US?

- ❑ **Amendment and harmonization of EU regulations**
 - ✓ Water Framework Directive,
 - ✓ Directive on environmental quality standards,
 - ✓ Directive on the groundwater protection,
 - ✓ Directive concerning urban waste water treatment,

- ❑ **Implementation of EU regulations into national legislation**
 - ✓ Laws,
 - ✓ Government regulations,
 - ✓ Decrees,

- ❑ **Introduction of the Directive on the quality of water intended for human consumption into practice.**



THE TASKS THAT AWAIT US



- ❑ **Delineation of catchment area** above the site of abstraction for the human consumption,
- ❑ Development of a thorough **analysis of** the delineated catchment areas in relation to potential **pressures (stressors)**,
- ❑ Carry out research work (e.g. **screenings**) as a basis for future monitoring programs,
- ❑ **Introducing analytical methods** for new priority substances (including Watch list substances) and for substances of stricter EQS, or to introduce new sampling methods due to low concentration levels for some of the priority substances,
- ❑ Development of **monitoring programmes** for the future period,
- ❑ Ensuring capacity in **the analytical laboratories** as well as resources for implementation of directives and for realization of future monitoring programs.

Thank you for your attention

