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Second River Basin Management Plans – Member State: Slovakia

Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC)
Second River Basin Management Plans
First Flood Risk Management Plans

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Acronyms and definitions

EQS Directive	Environmental Quality Standards Directive
FD	Floods Directive
Km	Kilometre
km^2	Kilometre squared
KTM	Key Type of Measure
PoM	Programme of Measures
RBD	River Basin District
RBMP	River Basin Management Plan
WFD	Water Framework Directive
WISE	Water Information System for Europe
Annex 0	Member States reported the structured information on the second RBMPs to WISE (Water Information System for Europe). Due to the late availability of the reporting guidance, Member States could include in the reporting an Annex 0, consisting of a short explanatory note identifying what information they were unable to report and the reasons why. This Annex was produced using a template included in the reporting guidance. If Member States reported all the required information, this explanatory note was not necessary.

Foreword

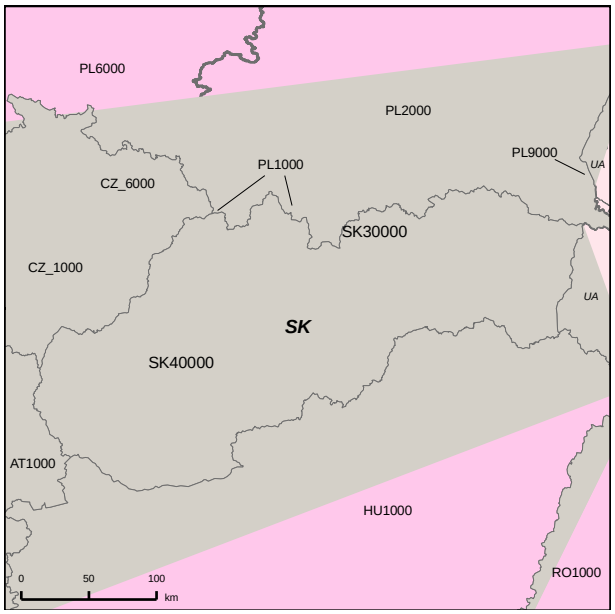
The Water Framework Directive (WFD) (2000/60/EC) requires in its Article 18 that each Member State reports its River Basin Management Plan(s) (RBMPs) to the European Commission. The second RBMPs were due to be adopted by the Member States in December 2015 and reported to the European Commission in March 2016.

This Member State Assessment report was drafted on the basis of information that was reported by Member States through the Water Information System for Europe (WISE) electronic reporting.

The Member State Reports reflect the situation as reported by each Member State to the European Commission in 2016 or 2017 and with reference to RBMPs prepared earlier. The situation in the Member States may have changed since then.

General Information

Map A ***Map of River Basin Districts***



Source: WISE, Eurostat (country borders)

International River Basin Districts (within European Union)
International River Basin Districts (outside European Union)
National River Basin Districts (within European Union)
Countries (outside European Union)
Coastal Waters

About 60% of the Slovak territory has an altitude over 300 m above the sea level, prevailingly in the West Carpathians. The total area of Slovakia is 48 845 km² and the population is 5.4 million.

The territory of Slovakia belongs to two international River Basin Districts (RBDs): Danube River basin and Vistula River basin. The Danube RBD is shared with 18 countries. The Vistula RBD is shared with Poland, Czech Republic, Belarus and Ukraine.

Information on areas of the national RBDs including sharing countries is provided in Table A and Slovakia's share of the international RBDs is shown in Table B.

Table A: Overview of Slovakia's River Basin Districts

RBD / Sub-basin	Name	Size (km^2)	% of SK territory	Countries sharing RBD
SK30000	Vistula (Dunajec & Poprad sub-basins)	1 950	4	BY, UA, PL, CZ
SK40000	Danube	47 084	96	DE, PL, UA, AT, BG, CZ, HR, HU, RO, IT, MD, ME, RS, SI, BA, AL, CH, MK
Sub-basin				
	Morava sub-basin	2 282		
	Dunaj sub-basin	1 158		
	Vah sub-basin	18 769		
	Hron sub-basin	5 465		
	Ipel sub-basin	3 649		
	Slana sub-basin	3 217		
	Bodva sub-basin	858		
	Hornad sub-basin	4 414		
	Bodrog sub-basin	7 272		

Source: RBMP reported to WISE

Table B: Transboundary river basins by category and % share in Slovakia

Name international river basin	National RBD	Countries sharing RBD	Coordination category			
			1		3	
			km²	%	km²	%
Vistula	SK30000	BY, UA, PL, CZ			1 950	1.0
Danube	SK40000	DE, PL, UA, AT, BG, CZ, HR, HU, RO, IT, MD, ME, RS, SI, BA, AL, CH, MK	47 084	5.8		

Source: WISE electronic reports

Category 1: International agreement, permanent cooperation body and international RBMP in place.
Category 2: International agreement and permanent cooperation body in place.
Category 3: International agreement in place.
Category 4: No cooperation formalised.

Status of the second river basin management plan reporting

The two RBMPs of Slovakia (Vistula, Danube) were published on 22 December 2015. Documents are available from the European Environment Agency (EEA) EIONET Central Data Repository https://cdr.eionet.europa.eu/.

Key strengths, improvements and weaknesses of the second River Basin Management Plan(s)

The main strengths and shortcomings of the second RBMP of Slovakia are as follows:

- **Governance and public consultation**

  - Slovakia used several mechanisms to inform the public about the RBMPs, including a media campaign, an interactive exhibition and guides for schools.

  - Slovakia involved stakeholders during the preparation of the RBMPs via consultations, workshops and negotiations.

  - Slovakia has established its Flood Risk Management Plans as sub-plans to its RBMPs, which provides a basis for strengthening coordination.

- **Characterisation of the RBD**

  - Since the first cycle there has been biological validation, verification and refinement of river types.

  - There is no assessment of the linkages of groundwater bodies with surface water bodies and terrestrial ecosystems.

  - "Unknown impact type" was identified for 55% of river water bodies, which may indicate potential gaps in the methodologies used to assess pressures and impacts. In addition, the significance of pressures was not defined in terms of thresholds.

- **Monitoring, assessment and classification of ecological status**

- According to WISE reporting, there was a significant increase in the numbers of sites used for surveillance monitoring since the first RBMPs, but a significant decrease in the number of sites used for operational monitoring. However, Slovakia subsequently provided new figures concerning monitoring sites, according to which there was a significant increase for both surveillance and operational monitoring sites.

  - All required biological, physicochemical and hydromorphological quality elements were monitored in rivers.

- 26 River Basin Specific Pollutants were reported to be monitored, only in water. They were monitored at only 14 of the 1 152 sites reported to be used for surveillance and/or operational monitoring.

- Environmental Quality Standards were established for all 26 River Basin Specific Pollutants in accordance with the Technical Guidance n. 27.

- Only 51% of river water bodies included in surveillance monitoring were monitored for all required biological quality elements. 96% were monitored for all required physicochemical quality elements and 18% for all required hydromorphological quality elements. This seems to indicate an over-reliance on the physicochemical quality elements.

- Only 11% of river water bodies were included in operational monitoring. This proportion is low when compared to the 44% of river water bodies which were reported to be at less than good ecological status/potential and the 71% which had at least one significant pressure.

- All water bodies were classified in terms of ecological status/potential. However, the classification at quality element level was only reported for 31% of water bodies, while the other water bodies were classified based on extrapolation of the overall results of ecological status in the group of water bodies with the same characteristics.

- The proportion of water bodies reported to be in good or better status decreased from 64% in the first RBMPs to 56% in the second. However, there was a significant re-delineation of water bodies, which makes an assessment of the evolution of status/potential unreliable.

- There was an improvement in the level of confidence, with 16% being classified with high and 13% with medium confidence, even though this means that 71% of river water bodies have still been classified with low confidence.

- **Monitoring, assessment and classification of chemical status in surface water bodies**

- Between the two RBMPs, there was a small increase in the proportion of river water bodies with good chemical status from 95% to 98% and a corresponding decrease in the proportion failing to achieve good status from 5% to 2%.

- 74% of water bodies were classified with low confidence using expert judgement.

- Slightly more than a quarter of river water bodies were monitored for chemical status. Between the two RBMPs, there has been a net decrease in surface water bodies monitored for chemical status for operational purposes. However, the number of water bodies monitored for surveillance monitoring of chemical status increased substantially.
- 41 priority substances (so including those identified as discharged) are monitored in water and used for status assessment in both RBDs, at or above the recommended minimum frequency.
- In biota, mercury, hexachlorobenzene and hexachlorobutadiene have been monitored in 51 water bodies for status assessment, at the recommended minimum frequency.
- According to the information provided in the RBMPs, the method for dealing with concentrations below the limit of quantification did not comply with the requirements of the Commission Directive on technical specifications for chemical analysis and monitoring of water status.
- For trend assessment, Slovakia has monitored two of the required 14 Priority Substances in sediment, in the Vistula RBD and in Danube RBD, at the recommended minimum frequency. Monitoring was carried out at 67 of sites.

- The Environmental Quality Standards used were not entirely clear in the reporting to WISE and in the RBMPs. Slovakia reported both the use of the standards from the Directive (version in force in 2009) and some additional standards in water, sediment and biota. Some explanations for these standards were provided in the RBMPs.
- **Monitoring, assessment and classification of quantitative status of groundwater bodies**
  - A gap remains in the quantitative monitoring of groundwater as 28% of all groundwater bodies were not subject to monitoring.
  - The total number of groundwater bodies failing good quantitative status declined from five groundwater bodies in the first RBMP to three in the second RBMP (from 5.4% to 2.8% of the total groundwater body area). The number of groundwater bodies with unknown status slightly increased from 26 to 27. 72 of the 102 groundwater bodies were at good quantitative status.
- **Monitoring, assessment and classification of chemical status of groundwater bodies**
  - A considerable number of groundwater bodies are not monitored for chemical status. However, and according to subsequent clarification by Slovakia all substances posing risk are monitored.

- 27% of groundwater bodies are without a clear status assessment and the confidence in the status results is low or unknown for about 60% of the groundwater bodies.

- **Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential**

  - The national methodology for designating HMWB describes how the significant adverse effects of restoration measures on the use and the wider environment have been defined but no specific criteria agreed at national level are given (it seems that decisions for this type of assessment are taken on case-by-case basis). No information was found on the details of the outcome of assessing significant adverse effects for individual water bodies. The assessment has also included information on other means to achieve the beneficial objectives provided by the hydromorphological alterations (e.g. for heavily modified water body related to flood protection, drinking water supply, energy production and irrigation).

  - Good ecological potential has been defined in terms of biology. Although good ecological potential was defined for rivers, only some details about preliminary classification methodology was provided in the RBMPs. The descriptions of whether and how actual values for the biological quality elements are estimated were not reported in WISE, but these have been included in the RBMPs. Mitigation measures for defining good ecological potential are reported but no information is given about the assessment of the effects of such measures on biology (as the effectiveness of the implemented measures on biological terms was not apparent in 2015 yet).

- **Environmental objectives and exemptions**

  - Environmental objectives for ecological and chemical status in surface water bodies and quantitative and chemical status of groundwater bodies have been reported in all RBDs.

  - Drivers, pressures and pollutants leading to exemptions are reported.

  - Justifications for exemptions have been provided at water body level. Criteria have been developed for the application of exemptions with regard to technical feasibility and disproportionate costs. Overall Article 4(4) exemptions have been applied more widely in surface water bodies.

- **Programme of Measures**

  - Progress has been made in identifying pressures and most are being addressed with measures. New legislation or regulations to implement the Programme of Measures (PoM) has been adopted in both RBDs. A clear financial commitment has been secured for the implementation of the PoM in both RBDs.

  - A combination of qualitative and quantitative cost-effectiveness analysis was carried out in both RBDs to support the selection of measures proposed under the 2015-2021 PoM.

  - For surface water bodies, gap analyses have been performed for 2015 and 2021 for most significant pressures. No gap analyses have been performed for 2027, although progress anticipated in closing the gaps by 2021 is very modest. For groundwater in the Danube RBD gap analyses were presented for 2015 only.

  - For surface water bodies most significant pressures are covered by operational KTMs. However in groundwater bodies, not all significant pressures have been addressed with operational KTMs.

  - Slovakia has mapped a total of 22 national basic measures and 23 national supplementary measures against a total of 12 KTMs.

  - There is no information on River Basin Specific Pollutants in the Vistula RBD or in the Danube RBD. Tetrachloroethylene in groundwater in the Danube RBD is reported to cause failure of objectives and is covered by a KTM (KTM14 – Research and KTM4 - Remediation).

  - Only 4 of 11 Priority Substances in the Danube RBD are covered by a KTM (all KTM14 - Research), and none in the Vistula RBD (only one reported to cause failure of objectives).

  - The RBMPs and Floods Directive Flood Risk Management Plans have been integrated in both RBDs. No “win-win” measures in terms of achieving the objectives of the WFD and Floods Directive have been applied, and WFD Article 9(4) has not been applied to impoundment for flood protection.

- **Measures related to abstractions and water scarcity**

- Water abstraction pressure has not been reported as significant for Slovakia.
- The calculation methods for the water consumption (e.g. metering, estimations) have not been reported.
- There is a permitting regime and a register of abstractions for surface water and groundwater and a concession, authorisation and/or permitting regime to control water impoundment and a register of impoundments in place. Small abstractions are not billed and do not require permits.
- Specific water resource allocation and management plans have been set up.
- An amendment to the Water Act from 2014 made metering compulsory for water abstractions by all business/economic activities including agriculture.

- **Measures related to pollution from agriculture**

- There is a clear link between agricultural pressures and agricultural measures.
- Management objectives for nutrient pollution and a gap assessment for nutrients has been undertaken in all RBDs
- Basic measures under Article 11(3)(h) for the control of diffuse pollution from agriculture at source are ensured in all RBDs where the same rules apply across the whole RBD, including for pesticides.
- Financing of measures is secured in all basins. Supplementary measures for reducing pollution from agriculture are reported.
- Even though there is a clear understanding of the areas that need to be covered by agricultural measures, the PoM relies on voluntary measures as well as basic measures.

- **Measures related to pollution from sectors other than agriculture**

- The Slovak Republic reported a large range of KTM to tackle non agricultural sources of pollution.
- Priority Substances and River Basin Specific Pollutants are reported to be tackled by specific Key Types of Measures.

- An assessment of the gap to reach good chemical status for surface water and groundwater has been made and indicators reported for 2015 and 2021 for most KTMs. Measures to tackle urban waste water discharges and input from urban areas, transport and built infrastructure are expected to lead to progress in reaching good status, however little progress is expected by 2021 from the implementation of other KTMs.

- For pollution from sectors other than agriculture the Slovak Republic does not report values for key indicators for 2027 (this was an optional element in the reporting), it is therefore unclear when the environmental objectives for these pressures will be met.

- **Measures related to hydromorphology**

- A larger number of hydromorphological measures are planned to be implemented in the second cycle, compared to the first RBMPs, which only included two relevant measures. Progress has also been made in linking specific hydromorphological pressures with specific sectors and measures as well as providing information on the contribution of measures to achieving the WFD objectives.

- Concerning progress expected, it can be concluded that for significant physical and hydrological alterations, there will be little progress in terms of closing the gap between 2015 and 2021. Specifically for 'measures to ensure the continuity of rivers and habitats', the RBMPs mention that financing for the implementation of the measures will be spread over a longer period of time - until 2027.

- Ecological flows have not been derived nor implemented for the relevant water bodies in any of the RBDs but there are plans to do so during the second cycle.

  Information on the use of win-win measures in terms of achieving the objectives of the WFD and Floods Directive and Natural Water Retention Measures to tackle significant pressures was not reported.

- **Economic analysis and water pricing policies**

- No new information on the application of the Polluter Pays Principle was reported which is implemented mainly by the charges for discharging waste water into surface water.

- A broad definition of water services has been used with 10 water services being reported.
- Cost recovery rates are calculated for five out of ten water services
- Environmental and resource costs are reported to be calculated, internalised and considered significant for only three water services. Further work is on-going to develop methodologies/approaches to derive environmental costs and resource costs based on available published approaches.
- There was little information on the incentive function of water pricing policies in the RBMPs, although an analysis of the pricing policy in terms of adequate incentives is reported to have been carried out, and an affordability index was determined. Pricing policies have been modified to include agricultural water use.

- **Considerations specific to Protected Areas (identification, monitoring, objectives and measures)**
  - Specific objectives for drinking water areas (surface and groundwater) have not been set. Generally for all Habitat and Birds Directive related Protected Areas it has been reported that good ecological status is considered sufficient to meet the objectives of these directives. Objectives have therefore not been set on a site by site basis. Additional objectives have not been set.
  - Little or no specific monitoring of Protected Areas has been reported.
  - Safeguard zones for the protection of Drinking Waters have been established. Different restrictions are implemented based on the distance to the abstraction point (mainly groundwater wells).
- **Adaptation to drought and climate change**
  - Climate change was considered in both river basin districts and it is stated that the Common Implementation Strategy guidance document on how to adapt to climate change was used.
  - A climate change check of the PoM was carried out for the second cycle.

  Droughts have not been reported to be relevant for the country and therefore drought management plans have not been developed

Recommendations

- Slovakia should include clear information in national RBMPs on international coordination efforts in order to increase transparency.

- Slovakia should continue to improve international cooperation, including coordinated assessments of the technical aspects of the WFD such as ensuring a harmonized approach for status assessment and a coordinated PoM in order to ensure the timely achievement of the WFD objectives.

- Slovakia needs to establish reference conditions for all types of Quality Elements, in particular hydromorphological Quality Elements, for which no reference conditions have been established, and to improve the assessment of pressures and impacts.

- Slovakia should complete the monitoring framework, as an adequate WFD-compliant monitoring and assessment framework is a necessary pre-requisite to design effective PoMs and ultimately to achieve the WFD objectives. There are a number of gaps in the monitoring programmes which need to be addressed. There is no adequate fish monitoring in rivers, only phytoplankton is monitored in lakes, there is no monitoring of priority substances in sediments and biota, and not all priority substances were monitored in all water bodies. These gaps in the monitoring design resulted in an incomplete status assessment of surface water bodies, which has to be improved. In particular, mercury, hexachlorobenzene and hexachlorobutadiene should be monitored in biota for comparison with the biota standards in the EQSD, unless water EQS providing an equivalent level of protection are derived, and trend monitoring in sediment or biota for at least the substances specified in EQSD Article 3(3) will also need to be reflected in the next RBMP.

- Slovakia should improve monitoring, as there are still important gaps. Monitoring should cover all relevant quality elements in all water categories in a sufficient number of sites, particularly for biological and hydromorphological quality elements. The number of monitoring sites for River Basin Specific Pollutants should increase significantly. Operational monitoring needs to include all water bodies which are subject to significant pressures, as they are under-monitored in the second RBMPs.

- Improved monitoring should lead to an increased level of confidence in the classification of ecological status/potential.

- Slovakia should complete the development of assessment methods, including reference conditions, for all relevant quality elements. The assessment of ecological status should include assessments of all relevant quality elements.

- Slovakia should improve the confidence in the assessment of status. In particular, monitoring should be performed in a way that provides sufficient spatial coverage (including in biota), to reach good confidence in the assessment, if necessary in combination with robust extrapolation/grouping methods.

- Treat measurements of Priority Substances lower than the limit of quantification in the way specified in Article 5 of Commission Directive 2009/90/EC.

- Slovakia should further improve trend monitoring, to ensure that all the relevant substances specified in Directive 2008/105/EC are monitored in a way that provides sufficient spatial coverage.

- Slovakia should continue working for trend assessment in groundwater.

- Further efforts are needed to improve the designation process of heavily modified and artificial water bodies since progress is still limited compared to the first RBMPs. The designation needs to comply with all the requirements of Article 4(3). Clear criteria need to be developed for the assessment of significant adverse effects of a comprehensive set of restoration measures on the use or the wider environment and the lack of significantly better environmental options. This needs to be specifically mentioned in the RBMPs in order to ensure the transparency of the designation process. Similarly, a transparent approach for the definition of ecological potential is needed, taking into account all relevant mitigation measures and their effects in order to define ecological potential also in terms of biology for all relevant water categories.

- A significant number of Article 4(4) exemptions is still applied in Slovakia in the second RBMPs. Efforts should be continued to ensure the ambitious implementation of measures for the timely achievement of the WFD objectives.

- Slovakia needs to ensure a thorough assessment of any planned new modifications in line with the requirements of the WFD and as further specified by the Judgment of the Court in case C-461/13. The use of exemptions under Article 4(7) needs to be based on a thorough assessment of all the steps as requested by the WFD, in particular an assessment of whether the project is of overriding public interest and whether the benefits to society outweigh the environmental degradation, and the absence of

alternatives that would be a better environmental option. Furthermore, these projects may only be carried out when all practicable steps are taken to mitigate the adverse impact on the status/potential of the water bodies. Respective information on the application of Article 4(7) needs to be reported in the RBMPs.

- KTMs in Vistula RBD should be mapped against individual pressures and be operational.
- Gap analysis should be performed to cover all significant pressures on groundwater.
- Slovakia should consider, in all RBDs, the inclusion of measures to address agricultural pressures in accordance with WFD Article 11(3) (e) and (g), i.e. abstraction and point sources.
- KTMs should be mapped against River Specific Basin Pollutants and Priority Substances, covering all substances causing failure of objectives.
- Slovakia should make sure the measures reported for individual substances causing failure are sufficient to reach the WFD objectives of good status. Slovakia should also implement and clearly report measures to suppress emissions from priority hazardous substances.
- Slovakia should continue with its work to define the necessary measures to address all hydromorphological pressures and to ensure restoration of water bodies. These measures need to be implemented as soon as possible and included in the next RBMPs.
- Slovakia needs to establish and implement ecological flows for relevant water bodies in all RBDs.
- Slovakia should continue to consider river restoration and prioritise the use of green infrastructure and/or natural water retention measures that provide a range of environmental (improvements in water quality, increase water infiltration and thus aquifer recharge, flood protection, habitat conservation etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure.
- Slovakia should apply cost recovery for water use activities having a significant impact on water bodies or justify any exemptions using Article 9(4). It should continue to transparently present how financial, environmental and resource costs have been calculated and how the adequate contribution of the different users is ensured. Slovakia

should also transparently present the water-pricing policy, including the use of adequate incentives for users to use water efficiently and provide a transparent overview of estimated investments and investment needs.

- Slovakia should continue to work on setting specific additional objectives for all Protected Areas under relevant Directives and ensure their link to the WFD implementation. The monitoring of Protected Areas should be improved, and the monitoring schemes under other Directives should be reported appropriately under the WFD.

Topic 1 Governance and public participation

1.1 Assessment of implementation and compliance with WFD requirements in the second cycle

1.1.1 Administrative arrangements – RBDs

Slovakia has two RBDs, the Vistula (SK30000) – covering approximately 4% of national territory – and the Danube (SK40000), covering the remaining 96%. Both are part of international RBDs.

In the first cycle, Slovakia prepared a single RBMP for both RBDs. In its assessment, the European Commission called on Slovakia to prepare one RBMP per RBD, rather than one for the whole country. Slovakia has implemented this recommendation and prepared two RBMPs for the second cycle.

1.1.2 Administrative arrangements – competent authorities

Slovakia reports one competent authority, the Ministry of Environment, whose main roles comprise: monitoring and assessment of status of surface water and groundwater; enforcement of regulations; pressure and impact analysis; economic analysis; preparation of the RBMPs and PoM; public participation; implementation of measures; coordination of implementation, and; reporting to the European Commission.

1.1.3 RBMPs – structure and Strategic Environmental Assessment

On WISE, Slovakia reports three types of sub-plans for its two RBMPs: hydropower; the Public Water Supply and Sewerage Development Plan of Slovakia, and the Flood Risk Management Plans (Figure 1.1).

Figure 1.1 Issues, sectors, sub-basins or water categories in Slovakia supplemented by more detailed sub-plans for the second cycle

RBD	Agriculture	Chemical industry	Hydropower	Transport	Water Scarcity and droughts	Climate change	Coastal erosion	Rural planning	Urban planning	Nutrient enrichment	Chemical pollution	Other: Hydromorphology, migration continuity
SK30000			✓				n/r					✓
SK40000			✓				n/r					✓

Source: WISE electronic reports

✓	Covered by sub-plans
n/r	Not relevant in Member State

A Strategic Environmental Assessment was prepared for each of Slovakia's two RBMPs.

1.1.4 Public consultation

The public and interested parties were informed by direct mailing, internet, meetings and written consultation. Documents were available via direct mailing (email) and download and were available for the requisite six months.

Slovakia reported that the following stakeholder groups were actively involved in the development of the RBMPs: agriculture/farmers; energy/hydropower; industry and other sectors. The mechanisms for active involvement were: an information campaign on water within a LIFE+ project, including a media campaign; an interactive exhibition; guides for schools, and consultations with the sectors involved (telephone and email consultations were used including with investors in new infrastructure projects).

Slovakia reported that the results of public consultation led to the addition of new information and adjustment of specific measures. There was international coordination of public participation for both RBMPs.

Moreover, according to the RBMPs, during their preparation, a range of consultations, workshops and negotiations were held with the sectors concerned in order to more effectively incorporate water policy objectives into other environmental and sectoral policies and ensure

the participation of all parties concerned with removing obstacles for meeting the environmental goals.

In its recommendations on Slovakia's first RBMP, the European Commission recommended good coordination between the public administration and other stakeholders to improve planning and implementation of the PoM. Based on the information available, this recommendation has been implemented.

In addition, the European Commission called for more information on the involvement of interested parties and consultation. It appears that there has been progress in this area, as Slovakia's reporting to WISE as well as its RBMPs provides information on consultation and on active involvement of stakeholders.

1.1.5 Integration with the Floods Directive and the Marine Strategy Framework Directive

In its WISE reporting on its RBMPs, Slovakia indicates that the RBMP and the Flood Risk Management Plan under the Floods Directive[1] were integrated into a single plan in both RBDs and that the Flood Risk Management Plans were sub-plans to the RBMP. Reporting for the Flood Risk Management Plans indicates that these plans were prepared for sub-basins and are formally considered parts (i.e. sub-plans) of the RBMPs.

Slovakia reports that joint consultation was carried out for the RBMPs and Flood Risk Management Plans.

1.1.6 International coordination

Slovakia's two RBDs are both part of international RBDs, the Danube and the Vistula. For the Danube, Slovakia reports that there is an international agreement, permanent cooperation body and international RBMP (designated as category 1 cooperation). Moreover, there is an international report ("roof report") and explicit links have been made with national RBMPs within the international RBMPs.

Slovakia has coordinated with neighbouring countries as well as other Danube countries via the International Commission for the Protection of the Danube River (ICDPR), and is a member of the Tisza Group, a platform established by ICDPR for coordination within this sub-basin. For further information see the reports on international coordination on the WFD.

[1] Directive 2007/60/EC on the assessment and management of flood risks entered into force on 26 November 2007 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007L0060

Slovakia has bilateral agreements for water management in place with neighbouring Member States – Austria, Czech Republic, Hungary and Poland – and with Ukraine.

1.2 Main changes in implementation and compliance since the first cycle

In the first cycle, Slovakia prepared a single RBMP for both RBDs. In the second cycle, Slovakia has prepared two separate RBMPs for its two RBDs. In the first cycle, Slovakia prepared sub-plans for the sub-basins of its RBDs. also introduced sectorial plans (for hydropower, public water supply and sewerage as well as the Flood Risk Management Plans which was reported as a third type of sub-plans).

1.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

The 2012 Commission Staff Working Document has three recommendations related to governance.

- Recommendation: Ensure *good coordination between public administration and other stakeholders to improve the planning and implementation of the Programme of Measures and to monitor their effectiveness, i.e. a more detailed implementation plan for the Programme of Measures and information about the control mechanisms should be included in the second RBMPs cycle. Furthermore, Slovakia should ensure effective coordination between WFD and Floods Directive.*

  Assessment: With regard to good coordination between the public administration and other stakeholders, the RBMPs indicate that for their preparation, a range of consultations, workshops and negotiations were held with the sectors concerned in order to more effectively incorporate water policy objectives into other environmental and sectoral policies and ensure the participation of all parties concerned at removing obstacles for meeting the environmental goals.

  Regarding coordination between WFD and Floods Directive, in its WISE reporting on its RBMPs, Slovakia indicates that the RBMP and the Flood Risk Management Plan were integrated into a single plan in both RBDs and at the same time that the Flood Risk Management Plans were sub-plans to the RBMP. Slovakia's reporting for the Flood Risk Management Plans indicate that these plans were prepared on a sub-basin basis and are formally considered part (i.e. sub-plans) of the RBMPs, although the Flood Risk

Management Plans remain separate plans. Overall, based on the information available, Slovakia has fulfilled this recommendation.

- Recommendation: *There is one plan for two RBDs and the plan does not always provide a clear guide as to whether an issue/problem is relevant for both or only for one RBD. It was often difficult to identify RBD-specific information. Future RBMPs need to be more transparent in this respect, and it is recommended that Slovakia develops one RBMP per national part of the RBD on its territory.*

  Assessment: Slovakia has followed this recommendation and prepared two separate RBMPs. Consequently, this recommendation has been fulfilled.

- Recommendation: *More information needs to be included in the plan on the involvement of interested parties and consultation, since it is not clear from the RBMP which stakeholders were involved, and what impact the consultation had on the content of the RBMP.*

  Assessment: It appears that there has been progress in this area, as information has been provided on the consultation and on active involvement of interested parties - for the latter, Slovakia drew on the resources of a LIFE+ project. This recommendation has been fulfilled.

Topic 2 Characterisation of the River Basin District

2.1 Assessment of implementation and compliance with WFD requirements in the second cycle

2.1.1 Delineation of water bodies and designation of heavily modified and artificial water bodies

Slovakia did not identify lakes, transitional or coastal water bodies in either cycle. Lakes with a size of over 10 km^2 are not found in Slovakia and it is a landlocked country. There was a 14% reduction in the numbers of identified river water bodies from the first RBMP to the second RBMP (Table 2.1), with the most significant changes in the Danube RBD. 23 of the 1 510 river water bodies were previously reported to be reservoirs but these were rivers which had been dammed and were therefore re-designated as rivers in the second cycle.

Table 2.1 Number and size distribution of delineated surface water bodies in Slovakia for the second and first cycles

Year	RBD	Number of water bodies	River water bodies length(km)			
			Total length of water bodies	Minimum	Maximum	Average
2016	SK30000	74	831	4.72	47.34	11.24
2016	SK40000	1 436	16 833	1.57	172.75	11.9
2016	Total	1 510	17 665			
2010	SK30000	83	902	4.6	54.1	10.87
2010	SK40000	1 677	18 042	1.6	172.4	10.91
2010	Total	1 760	18 944			

Source: WISE electronic reports

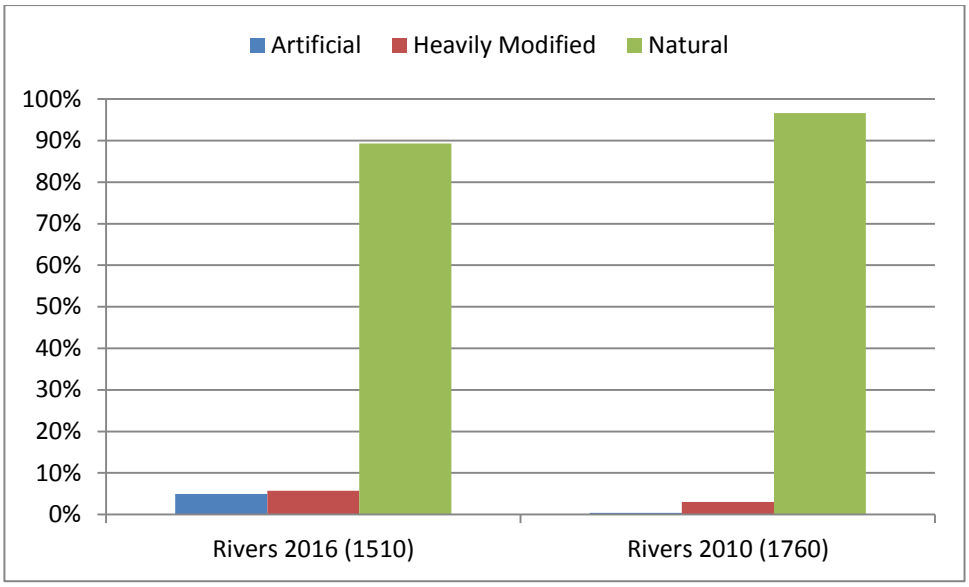
The RBMP reported that river water bodies were delineated for catchments greater than 10 km^2. The Joint Implementation Strategy of the EC was reported to have been used: "Identification of Water Bodies - Horizontal Methodological Guidance". Water bodies with less than 10 km^2 were not delineated and are part of the main river water bodies within the catchment. The RBMP reported changes of the boundaries of the river water bodies or merging and pooling of water bodies. The criteria for merging of water bodies are as follows:

- River length less than 8 km;

- River basin area less than 10 km^2;
- Without significant impacts, and;
- Leaking channels, or dry or partially culverted water bodies.

Despite the reduction in the numbers of river water bodies, there was 10-fold increase in the number of designated artificial water bodies between the two cycles and also an increase in the number and proportion of heavily modified water bodies (Figure 2.1). This was accompanied by decreases in number and proportion of natural water bodies. Slovakia reported that these significant changes are due to a lengthy process, which is still not completed, of identification of heavily modified and artificial water bodies.

Figure 2.1 Proportion of surface water bodies in Slovakia designated as artificial, heavily modified and natural for the second and first cycles. Note that the numbers in parenthesis are the numbers of water bodies in each water category



Source: WISE electronic reports.

There was only a small change in the number (and area) of groundwater bodies between the two cycles with 101 delineated in the first RBMP and 102 in the second RBMP (Table 2.2).

Table 2.3 summarises the information provided by Slovak Republic on how water bodies have evolved between the two cycles.

Table 2.2 Number and area of delineated groundwater bodies in Slovakia for the second and first cycles

Year	RBD	Number	Area (km^2)		
			Minimum	Maximum	Average
2016	SK30000	4	72.43	1 707.30	597.95
2016	SK40000	98	33.15	6 248.61	765.49
2016	Total	102	33.15	6 248.61	758.92
2010	SK30000	4	72.42	1 707.20	597.91
2010	SK40000	97	33.15	6 248.37	772.52
2010	Total	101	33.15	6 248.37	765.6

Source: WISE electronic reports

Table 2.3 Type of change in delineation of groundwater and surface water bodies in Slovakia between the second and first cycles

Type of water body change for second cycle	Groundwater Body	River Water Body
Aggregation		
splitting		
Aggregation and splitting		
ExtendedArea		
Creation	1	1
Deletion		251
Change in code		
Change		4
No change	101	1506
Total water bodies before deletion	102	1761
Delineated for second cycle (after deletion from first cycle)	102	1510

Source: WISE electronic reports.

2.1.2 Identification of transboundary water bodies

50 transboundary river water bodies from eight of the nine subunits in the Danube RBD and the Vistula RBD were reported. All six reported transboundary groundwater bodies were from the Danube RBD. In the RBMPs there is a general statement that the water bodies forming the border were harmonised both in terms of delineation and types of water bodies.

2.1.3 Typology of surface water bodies

Table 2.4 shows the number of surface water body types at RBD level in Slovakia for the first and second cycles. Overall in Slovakia 39 river types were reported in the first RBMP and 42 in the second RBMP. Four types are common to the two RBDs. The RBMPs reported that the increase in types was a result of the change of category of reservoirs, which were reported as rivers in the second RBMPs but not in the first, as well as of the biological validation, verification and refinement of river types. This was carried out based on statistical data processing of abiotic, biological and chemical data. Within the river water body types, it should be noted that 14 reservoir types were reported in the first RBMP and the second RBMP.

Table 2.4 Number of surface water body types at RBD level in Slovakia for the first and second cycles

RBD	Rivers	
	2010	2016
SK30000	5	6
SK40000	34	36
TOTAL	39	42

Source: WISE electronic reports.

Note that the total is not the sum of the types in each RBD as some types are shared by RBDs

17 river types in Slovakia were reported to have six equivalent river intercalibration types. 13% of river water bodies in Slovakia did not have any applicable equivalent intercalibration types.

It was noted in the RBMPs that the typology of the transboundary rivers was discussed during the preparation of the first RBMPs. At the level of the Ecological Status Working Group (ECOSTAT) where the intercalibration process of the biological methods of environmental assessment has been undertaken, an intercalibration typology was created. Within the Eastern Intercalibration Geographical Intercalibration Group, most Slovak types were included. It was reported that all the procedures according to the requirements of the European Commission Intercalibration Instructions (Common Implementation Strategy WFD Guidance Document No. 30[2]) have been followed.

2.1.4 Establishment of reference conditions for surface water bodies

Table 2.5 shows the percentage of surface water body types in the Slovak Republic with reference conditions established for the first and second RBMPs. Reference conditions have

[2] https://circabc.europa.eu/sd/a/5aee6446-276c-4440-a7de-0d4dec41ed4b/IC_manual_2015_to%20be%20published.pdf

not been reported for any of the hydromorphological quality elements in any type in Slovakia[3]. For all non-reservoir types, reference conditions were reported to have been established for all biological and all physicochemical quality elements. For the 14 reservoir types, reference conditions have only been reported for some biological quality elements but not for any hydromorphological or any physicochemical quality elements.

Table 2.5 Percentage of surface water body types in Slovakia with reference conditions established for all, some and none of the biological, hydromorphological and physicochemical quality elements

Water category	Water types	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Rivers	All	63%		63%
	Some	37%		
	None		100%	37%

Source: WISE electronic reports

2.1.5 Characteristics of groundwater bodies

Slovakia reported the characteristics of the geological formation of its aquifers and whether or not water bodies were layered. The RBMPs noted that there was better knowledge of groundwater since the first cycle, a better conceptual understanding and more monitoring data available. However, no information was reported on groundwater body links to surface water bodies or groundwater dependent terrestrial ecosystems (Annex 0).

2.1.6 Significant pressures on water bodies

26 pressure types were reported to be affecting river water bodies in Slovakia in the second RBMP. The most predominant pressures in terms of proportion of water bodies affected were diffuse agriculture (33% of surface water bodies), Physical alteration of channel/bed/riparian area/shore - Flood protection (29%) and Physical alteration of channel/bed/riparian area/shore - Agriculture (14%) (Figure 2). Each of 11 of the 26 pressures affected less than 1% of surface water bodies.

[3] Slovakia subsequently clarified that reference conditions for hydromorphological quality elements were established for natural types in 2007.

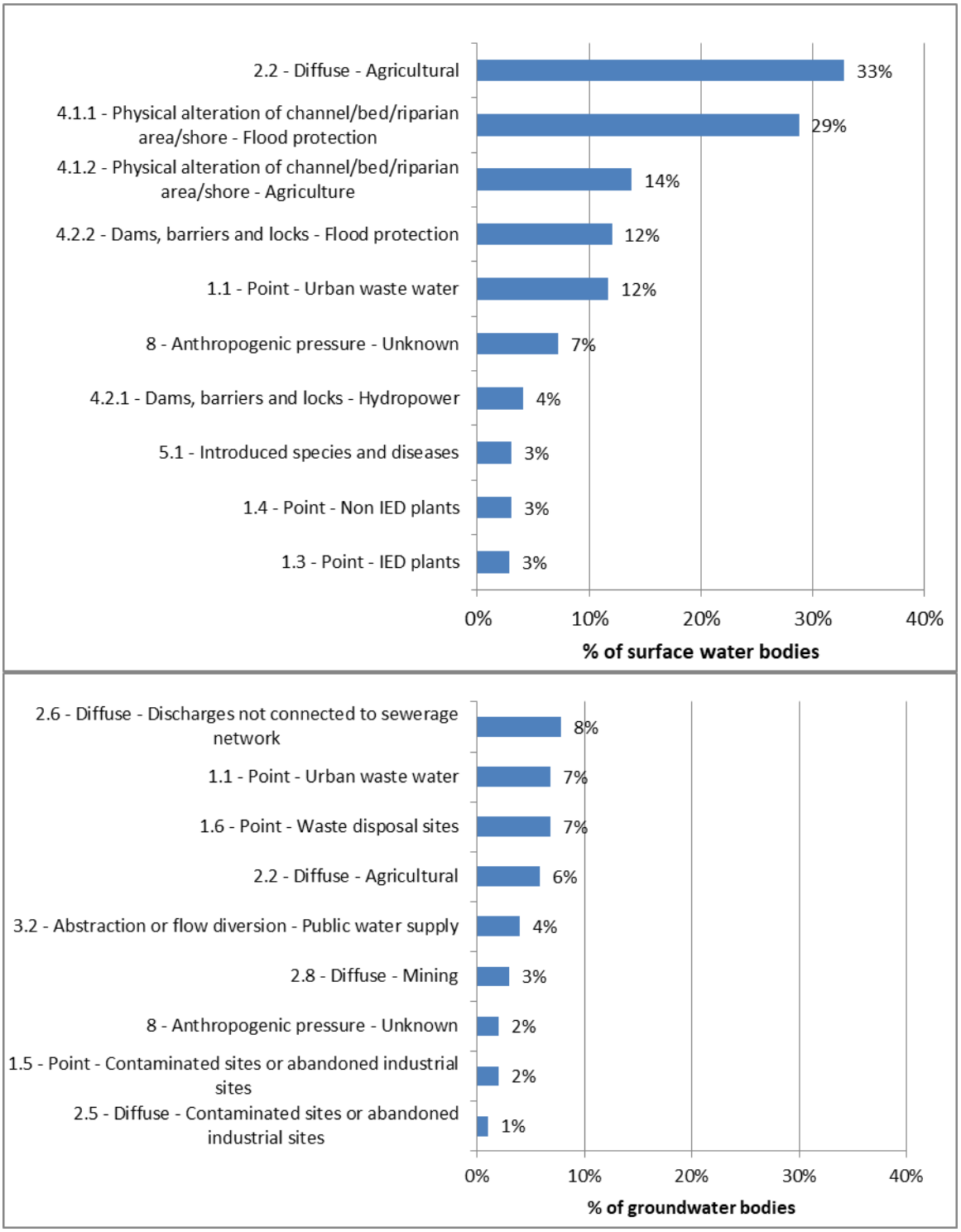
The RBMP explained that since the first cycle different pressures were being identified with activities being implemented or in the preparatory phase, these include:

- Invasive species;
- Lack of water and drought (drought indicators, ecological flows, water bills);
- Climate change;
- Qualitative and quantitative aspects of sediment management (issue specific to the Danube), and;
- Pressures on sturgeon.

No significant pressures were reported for groundwater bodies in the Vistula RBD. Nine different pressure types were reported to be significant on groundwater bodies in the Danube RBD. The most significant were Diffuse - Discharges not connected to sewerage network affecting 8% of groundwater bodies, point urban waste water pressures (7% of groundwater bodies) and point waste disposal sites (7%) (Figure 2.2).

Slovakia did not report data to WISE on specific pressures in the first RBMP.

Figure 2.2 The most significant pressures on surface water bodies and groundwater bodies in Slovakia for the second cycle



Source: WISE electronic reports.

2.1.7 Definition and assessment of significant pressures on surface and groundwater

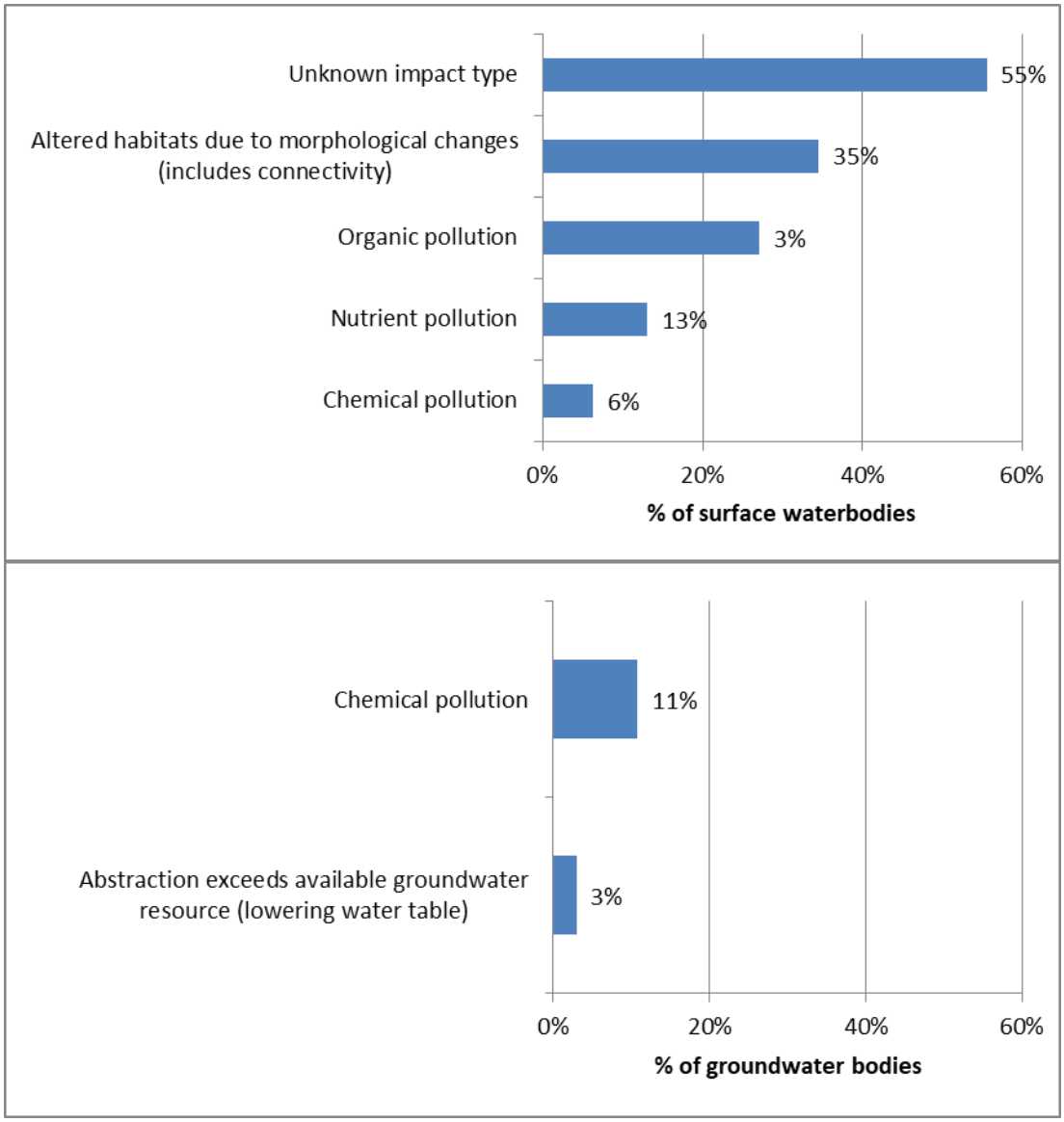
The RBMP did not highlight any changes in the methodology or the criteria for the assessment of significance for the second RBMPs. Numerical tools were used to assess point source pressures and a combination of both numerical tools and expert judgement were used for diffuse source pressures. Significance was not defined in terms of thresholds.

A combination of both numerical tools and expert judgement were used to assess the significance of point source, diffuse source and abstraction pressures on groundwater bodies. Significance has been defined in terms of thresholds and has been linked to failure of objectives in groundwater.

2.1.8 Significant impacts on water bodies

Four impact types were reported to be significant for river water bodies in Slovakia in the second RBMPs. Altered habitats due to morphological changes impacted 35% of river water bodies, followed by organic pollution (27%), nutrient pollution (13%) and chemical pollution (6%) (Figure 2.3). “Unknown impact type” was identified for 55% of river water bodies. No significant impacts were reported for groundwater bodies in the Vistula RBD in the second RBMP, while in the Danube RBD chemical pollution impacted 11% and in 3% abstraction exceeded available groundwater resource of groundwater body (Figure 3).

Figure 2.3 Significant impacts on surface water and groundwater bodies in Slovakia for the second cycle. Percentages of numbers of water bodies



Source: WISE electronic reports

2.1.9 Groundwater bodies at risk of not meeting good status

7% of groundwater bodies in the Danube RBD were reported to be at risk of failing good chemical status; there were none in the Vistula RBD. Eight chemical substances were causing the risk with sulphate causing the risk in 7% of groundwater bodies and nitrate in 4%.

8% of groundwater bodies in the Danube RBD were at risk of failing good quantitative status with the risk being associated with water balance and risks to associated surface water bodies.

2.1.10 Quantification of gap to achieve status objectives

Gaps to be filled to achieve objectives were mostly reported for those pressures reported to be significant at the surface water body level in the Vistula RBD. Gaps were reported for three pressures that were not reported as significant at the water body level (Point - Non Industrial Emissions Directive[4] plants, Dams, diffuse - Discharges not connected to sewerage network, barriers and locks - Unknown or obsolete) and no gaps were reported for two pressures (dams, barriers and locks related to recreation and unknown anthropogenic pressures).

In the Danube RBD, gaps were not reported for five pressures reported to be significant at the groundwater body level including point source pressures from urban waste water and waste disposal sites. Gaps were reported for the other four pressures reported at the groundwater body level, including agriculture and abstraction for public water supply.

For surface water in the Danube RBD, gaps were reported for 25 different pressures that had been reported to be significant at the water body level.

Gaps were reported for three pollutants causing failure of objectives in groundwater and for six Priority Substances causing failure of objectives in surface waters in the Danube RBD.

2.1.11 Inventories of emissions, discharges and losses of chemical substances

Article 5 of the Environmental Quality Standards Directive (EQS Directive[5]) requires Member States to establish an inventory of emissions, discharges and losses of all Priority Substances and the eight other pollutants listed in Part A of Annex I EQS Directive for each RBD, or part thereof, lying within their territory. This inventory should allow Member States to further target measures to tackle pollution from priority substances. It should also inform the review of the monitoring networks, and allow the assessment of progress made in reducing (respectively suppressing) emissions, discharges and losses for priority substances (respectively priority hazardous substances).

Slovakia reported inventories for both of its RBDs. According to the WISE reporting, the reported inventory for the Vistula RBD contained only one Priority Substance. For the other RBD, 22 different Priority Substances were included in an inventory in at least one of the subunits. Lead, mercury, nickel and cadmium were included in inventories in eight subunits.

4 Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075

5 Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008L0105-20130913

Five substances were included in inventories for only one sub-unit. In Annex 0 of the WISE reporting, Slovakia explained that the inventories were established according to the CIS Guidance no. 28 and are included in the RBMPs, but this was done at water body level and therefore could not be reported to WISE, which required reporting at the level of sub-units.

According to the WISE reporting, the two step approach from the Common Implementation Strategy Guidance Document n°28 has been followed for all substances considered in the inventories. Tier 1+ 2 of the methodology was implemented The data quality was assessed as medium.

2.2 Main changes in implementation and compliance since the first cycle

There was a 14% reduction in the number of identified river water bodies in Slovakia from the first RBMP to the second RBMP. There was a 10 fold increase in the number of designated artificial water bodies between the two cycles and also an increase in the number and proportion of heavily modified water bodies. This was accompanied by decreases in number and proportion of natural water bodies. Slovakia reported that these significant changes are due to a lengthy process, which is still not completed, of identification of heavily modified and artificial water bodies.

Overall in Slovakia 39 river types were reported in the first RBMP and 42 in the second RBMP: for both cycles there were no common type codes across the two RBDs.

In the first RBMP, reference conditions were established for all biological quality elements but for fish they are only preliminary. In the second RBMP reference conditions were reported to be established for all non-reservoir river types indicating that there had been some progress since the first RBMPs.

2.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *Where there are currently high uncertainties in the characterisation of the RBDs, identification of pressures, and in the assessment of status, these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle. Regarding characterisation, for instance, reference conditions should be established for all biological quality elements.*

Assessment: Reference conditions have been established for all biological quality elements in 28 of the 42 river types, and for some biological quality elements in 14 types which are all reservoir types. More significantly no reference conditions have been set for any types in terms of hydromorphological quality elements. In terms of physiochemical quality elements, reference conditions have been established for all relevant elements in 28 types but for none of the elements in the reservoir types.

A combination of both numerical tools and expert judgement was used for determining the significance of diffuse pressures on surface and groundwater.

In conclusion there has been some progress but there are still major gaps in fulfilling this recommendation, so it has been partially fulfilled.

- Recommendation: *The RBMPs need to provide more information on the links between pressures and status, and the respective measures for surface waters.*

  This recommendation is addressed in Chapter 9 on the PoM.

Topic 3 Monitoring, assessment and classification of ecological status in surface water bodies

3.1 Assessment of implementation and compliance with WFD requirements in the second RBMPs

3.1.1 Monitoring of ecological status/potential

Monitoring programmes

Separate surveillance and operational monitoring programmes have been reported for each of the two designated water categories: rivers and groundwater.

Monitoring sites

Table 3.1 compares the number of monitoring sites used for surveillance and operational purposes between the first and second RBMPs, and Table 3.2 gives the number of sites used for different purposes for the second RBMPs.

There were significant changes in delineation of surface water bodies from the first to the second RBMPs. In particular, reservoirs had been reported as lakes in the first RBMPs but were reported as rivers in the second RBMPs, as specified in the reporting guidance. A comparison of data between the first and second RBMPs is therefore difficult and is meaningful only for the total number of monitoring sites in surface waters. Taking this into account, according to the reporting in WISE there was a significant increase in the number of sites used for surveillance monitoring but a significant decrease in the number of sites used for operational monitoring. Slovakia subsequently provided different numbers for monitoring sites, explaining that sites used for surveillance monitoring were also used for operational monitoring. According to the latter data provided by Slovakia, there was also a significant increase in the number of sites used for operational monitoring.

Table 3.1 Number of sites used for surveillance and operational monitoring in Slovakia for the second and first RBMPs. Note that for reasons of comparability with data reported in the first RBMPs, the data for the second RBMPs does not take into account whether sites are used for ecological and/or chemical monitoring. Note the total number of monitoring sites may differ from the sum of monitoring sites by type because some sites are used for more than one purpose.

	Rivers		**Lakes**	
	Surv.	**Op**	**Surv.**	**Op**
second RBMP				
SK_30000	41 (37)	22 (41)	-	-
SK_40000	834 (749)	255 (1.071)	-	-
Total by type of site	*875 (786)*	*277 (1.112)*	-	-
Total number of monitoring sites	*1.144 (1.898)*		-	
first RBMP				
SK_30000	31 (6)	29 (9)	-	-
SK_40000	529 (97)	565 (190)	23	7
Total by type of site	*560 (103)*	*594 (199)*	*23*	*7*
Total number of monitoring sites	*698 (241)*		*23*	

Sources: Member States electronic reports to WISE . The numbers in parentheses were subsequently provided by Slovakia and are different from those reported in WISE.

Table 3.2 Number of monitoring sites in relevant water categories used for different purposes in Slovakia. Note the total number of monitoring sites may differ from the sum of monitoring sites by type because some sites are used for more than one purpose.

Monitoring Purpose	**Rivers**
CHE - Chemical status	402
DWD - Drinking water - WFD Annex IV.1.i	7
ECO - Ecological status	447
OPE - Operational monitoring	277
QUA - Quantitative status	417
REF - Reference network monitoring site	35
RIV - International network of a river convention (including bilateral agreements)	32
SOE - EIONET State of Environment monitoring	2
SUR - Surveillance monitoring	875
Total sites irrespective of purpose	**1144**

Source: WISE electronic reports

Quality elements monitored (excluding River Basin Specific Pollutants)

Table 3.3 illustrates the quality elements used for the monitoring of lakes and rivers for the second RBMPs: no differentiation is made between purposes of monitoring.

Table 3.3 Quality elements monitored for the second RBMPs in Slovakia (excluding River Basin Specific Pollutants). Note; quality element may be used for surveillance and/or operational monitoring

	Biological quality elements										Hydromorphological quality elements		
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Angiosperms	Macroalgae	Other aquatic flora	Other species		Hydrological or tidal regime	Continuity conditions	Morphological conditions
Rivers	Yes	Yes	Yes	Yes	Yes	No	No	No	No		Yes	Yes	Yes

	General physicochemical quality elements								
	Transparency conditions	Thermal conditions	Oxygenation conditions	Salinity conditions	Acidification status	Nitrogen conditions	Phosphorus Conditions	Silicate	Other determinand for nutrient conditions
Rivers		Yes	Yes	Yes	Yes	Yes	Yes	No	No

Source: WISE electronic reports

All expected biological quality elements and physicochemical quality elements were reported to be monitored in rivers. In addition phytoplankton was monitored in reservoirs (re-designated as rivers in the second RBMPs) and some other river water bodies. Hydromorphological conditions and River Basin Specific Pollutants were also monitored.

In the first RBMPs it was reported that all required quality elements were monitored in rivers, except for fish. In the second RBMPs fish were monitored, indicating some progress since the first RBMPs.

23 (1.6%) of the 1 510 identified river water bodies were reported to be reservoirs that had originally been a river. Phytoplankton, macrophytes, phytobenthos were monitored in these water bodies but not benthic invertebrate or fish. If these were being monitored and assessed as lakes, it would be expected that fish and benthic invertebrates would have been monitored: as they are not, this is a shortcoming in the current monitoring. In addition hydromorphological

quality elements were not monitored in reservoirs. All the expected physicochemical quality elements were monitored in reservoirs.

Annex V of the Water Framework Directive provides guidance on the frequency of monitoring of the different quality elements. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the period covered by a RBMP i.e. six years. For phytoplankton this should be done twice during the monitoring year and for the other biological quality elements once during the year. As a guideline, operational monitoring should take place at intervals not exceeding once every six months for phytoplankton and once every three years during the six year cycle for the other biological quality elements. Greater intervals may be justified on the basis of technical knowledge and expert judgement.

All biological quality elements included in surveillance monitoring were sampled at, or more than, the WFD minimum recommended frequency at all sites where they are monitored. Three of the four biological quality elements used for operational monitoring were also sampled at, or at more than, the recommended frequency at all sites. None of the sites used for fish were sampled at the recommended minimum frequency.

River Basin Specific Pollutants and matrices monitored

Table 3.4 shows the number of sites used to monitor River Basin Specific Pollutants in Slovakia in the first and second RBMPs.

26 different River Basin Specific Pollutants were reported to be monitored for Slovakia, all were only monitored in water. River Basin Specific Pollutants were reported to be monitored at either 14 sites (for four metals) or 13 sites (for 22 other pollutants). In terms of surveillance monitoring all 26 pollutants were monitored at all sites at a frequency that met the minimum WFD minimum frequency of four times in one year of the six year WFD cycle. However for operational monitoring only two of the seven sites used for the operational monitoring of River Basin Specific Pollutants were sampled for the 26 substances at least at the minimum recommended frequency of four times a year in each year of the six year WFD cycle.

Slovakia reported 1.144 monitoring sites for either surveillance and/or operational purposes: the 14 sites used for River Basin Specific Pollutants represent only 1.2% of these sites[6].

[6] Slovakia subsequently stated that the number of monitoring sites is 1,898.

Table 3.4 ***Number of sites used to monitor River Basin Specific Pollutants reported in the second RBMPs in Slovakia. Note not all Member States reported information at the site level for the first RBMPs meaning that there were no equivalent data***

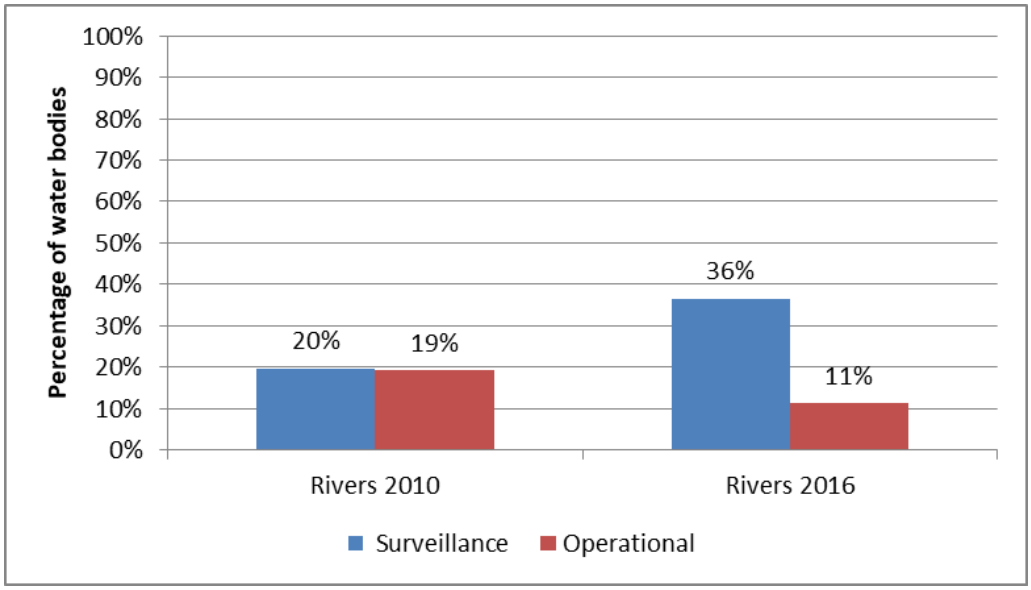
RBMP		Rivers
second RBMP	Sites used to monitor River Basin Specific Pollutants	14 for metals 13 for other pollutants
first RBMP	Sites used to monitor non-priority specific pollutants and/or other national pollutants	Not Reported

Sources: WISE electronic reports

Surveillance monitoring of surface water bodies

Figure 3.1 shows that, according to the reporting in WISE, there has been an increase in surveillance monitoring and a decrease in operational monitoring of water bodies from the first to the second RBMPs[7]. Figure 3.2 shows the proportion of water bodies subject to surveillance monitoring within each ecological status class. Water bodies at bad status were fully represented whereas a quarter of water bodies at good status were covered by surveillance monitoring.

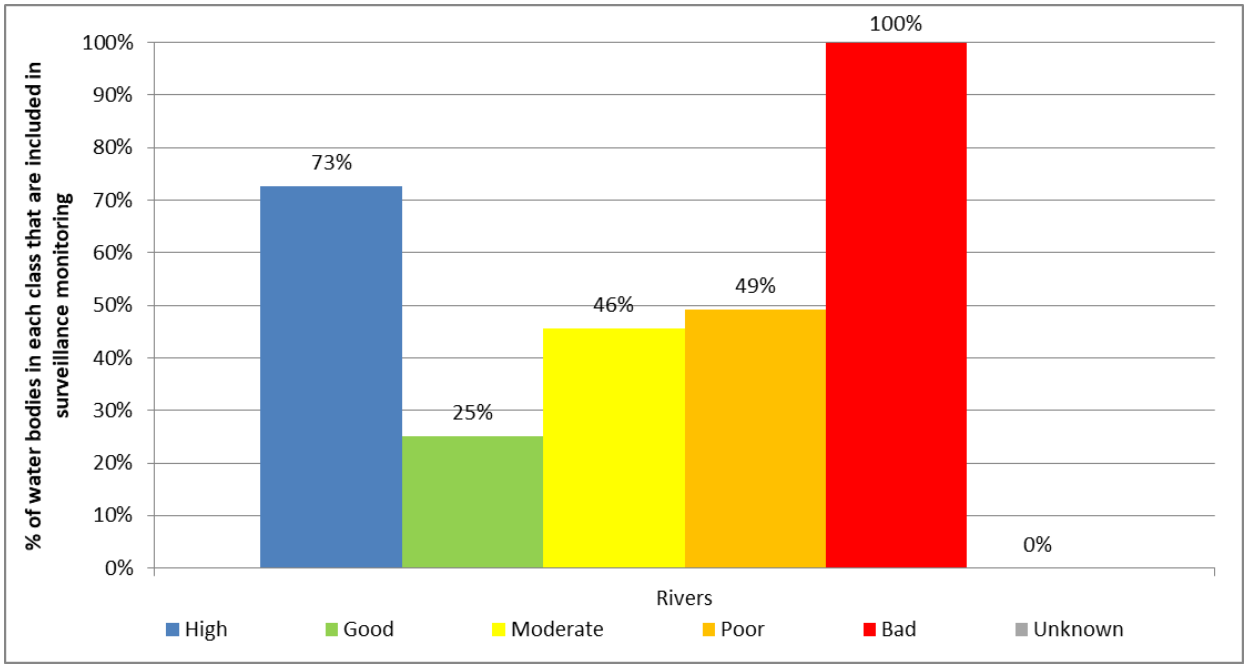
Figure 3.1 ***Percentage of water bodies included in surveillance and operational monitoring in Slovakia for the first RBMPs (2010) and second RBMPs (2016). Note no differentiation is made between water bodies included in ecological and/or chemical monitoring***



Source: WISE electronic reports

[7] Slovakia subsequently provided different numbers for monitoring sites, explaining that sites used for surveillance monitoring were also used for operational monitoring. According to the latter data provided by Slovakia, there was also a significant increase in the number of sites used for operational monitoring.

Figure 3.2 ***Proportion of water bodies in each ecological status/potential class that are included in surveillance monitoring in Slovakia***



Source: WISE electronic reports

According to the reporting in WISE, only 51% of river water bodies included in surveillance monitoring of ecological status/potential were monitored for all required biological quality elements. 96% were monitored for all required physicochemical quality element and none for all required hydromorphological quality elements. Slovakia subsequently explained that 18.9% of river water bodies were in fact monitored for all required hydromorphological quality elements. In Slovakia as a whole 28% of river water bodies were included in surveillance monitoring of ecological status/potential and for comparison 11% were included in operational monitoring.

As there was a significant re-delineation of surface water bodies between the first and second RBMPs and there were errors in the reporting of monitoring in WISE, comparisons between numbers of water bodies monitored in the first and second RBMPs are not meaningful.

Operational monitoring of surface water bodies

The WFD states that "operational monitoring shall be carried out for all those bodies of water which are identified as being at risk of failing to meet their environmental objectives under Article 4". In Slovakia as a whole, only 11% of river water bodies were included in operational monitoring. This is in spite of the fact that 44% of river water bodies were reported to be at less than good ecological status/potential and 71% had at least one significant pressure. Even though Slovakia indicated that grouping was used in the assessment of status/potential, this

seems to be a low number. However, Slovakia subsequently explained that the monitoring sites used for surveillance monitoring were also used for operational monitoring for the parameters which were considered relevant.

All relevant biological quality elements were included in operational monitoring. According to the reporting in WISE, morphological conditions were the only hydromorphological quality elements included in operational monitoring: this was monitored in 8 of the 12 water bodies included in operational monitoring[8]. All the monitored physicochemical quality elements were monitored in 10 of the 12 water bodies in operational monitoring and River Basin Specific Pollutants in six.

Transboundary surface water body monitoring

Slovakia reported 32 monitoring sites that were part of an international network of a river convention: three in the Vistula RBD and 29 in the Danube RBD.

3.1.2 Ecological Status/potential of surface water

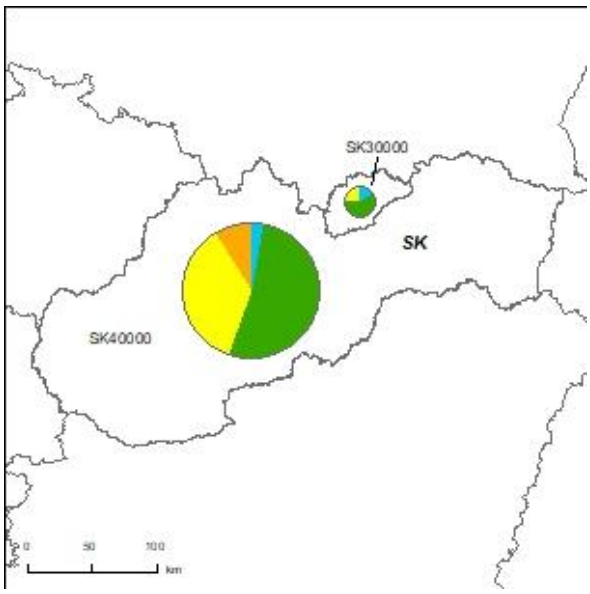
The ecological status/potential of surface water bodies in Slovakia for the second RBMPs is illustrated in Map 3.1.

This is based on the most recent assessment of status. A detailed breakdown of ecological status/potential in each RBD and water category can be viewed in the WISE electronic reports.

[8] Slovakia subsequently stated that all hydromorphological quality elements were monitored.

Map 3.1 Ecological status or potential of surface water bodies in Slovakia based on the most recently assessed status/potential of the surface water bodies

Note: Standard colours based on WFD Annex V, Article 1.4.2(i).



Source: WISE, Eurostat (country borders)

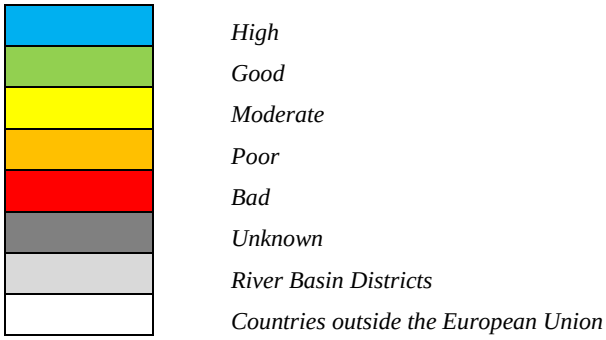
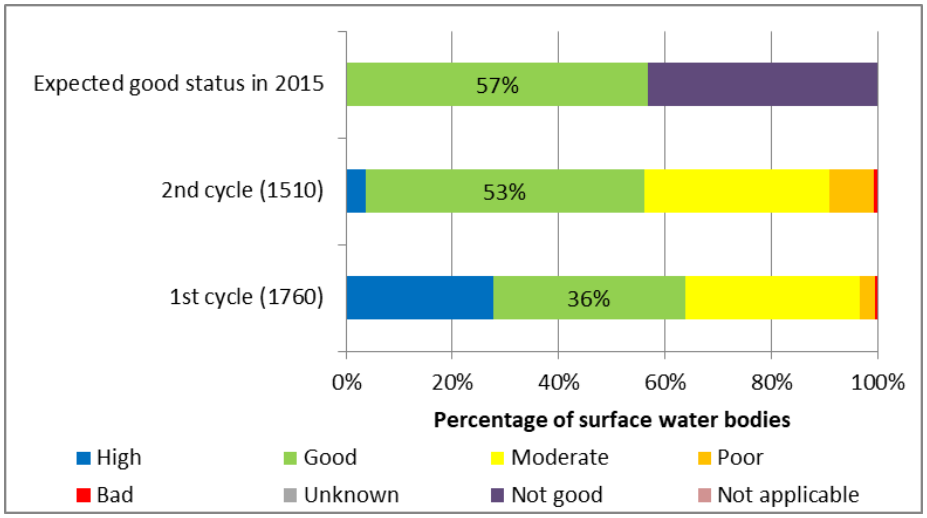


Figure 3.3 compares the ecological status of surface water bodies in Slovakia for the first RBMPs with that for the second (based on the most recent assessment of status/potential) and that expected by 2015.

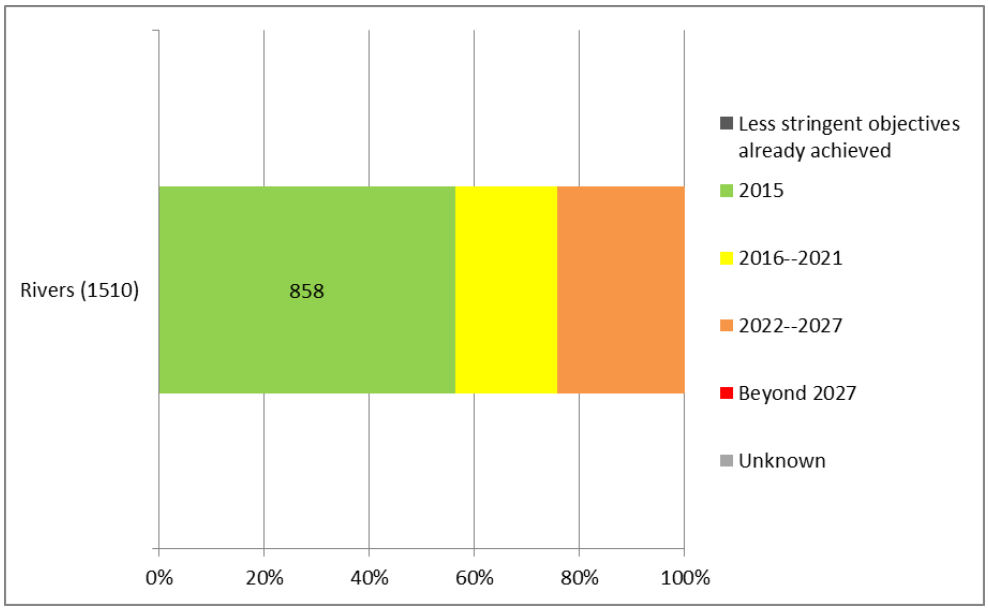
Member States were asked to report the expected date for the achievement of good ecological status/potential. The information for Slovakia is shown in Figure 3.4. All surface water bodies are expected to achieve good ecological status/potential by 2027.

Figure 3.3 ***Ecological status or potential of surface water bodies in Slovakia for the second RBMPs, for the first RBMPs and expected in 2015. The number in parenthesis is the number of surface water bodies for each cycle. Note the period of the assessment of status for the second RBMPs was 2009 to 2012. The year of the assessment of status for first RBMPs is not known***



Source: WISE electronic reports

Figure 3.4 ***Expected date of achievement of good ecological status/potential of surface water bodies in Slovakia. The number in the parenthesis is the number of water bodies in each category***



Source: WISE electronic reports

None of the surface water bodies in Slovakia were reported to have unknown ecological status/potential in both the first and second RBMPs. 64% were reported to be of good or better

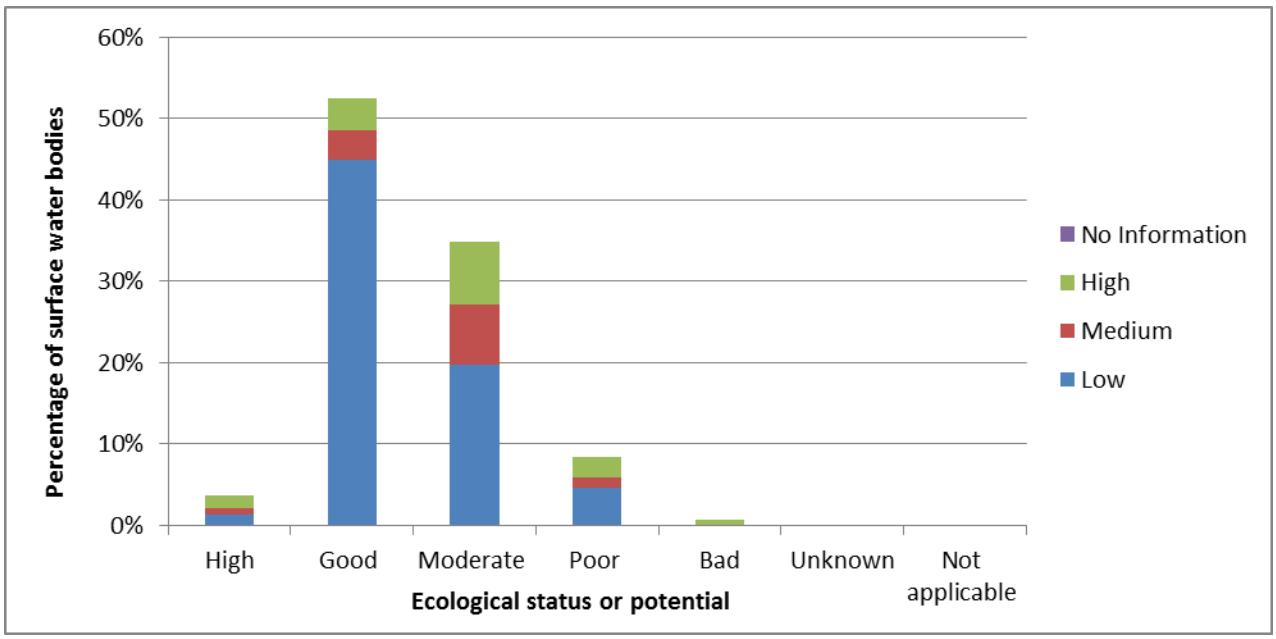
status for the first RBMPs and 56% for the second. However, there was significant reduction in the number of delineated water bodies from the first to the second RBMPs which makes a comparison of status/potential unreliable.

The RBMPs state that significant changes are identified in high and good status / potential classes (as shown in Figure 3.3). In other classes, the differences are not significant. Changes in the classification results are reported to be due to both the updating of water bodies and the increased reliability of the assessment.

Confidence in ecological status assessment

Figure 3.5 shows the confidence in the classification of ecological status/potential.

Figure 3.5 Confidence in the classification of ecological status or potential of surface water bodies in Slovakia based on the most recently assessed status/potential



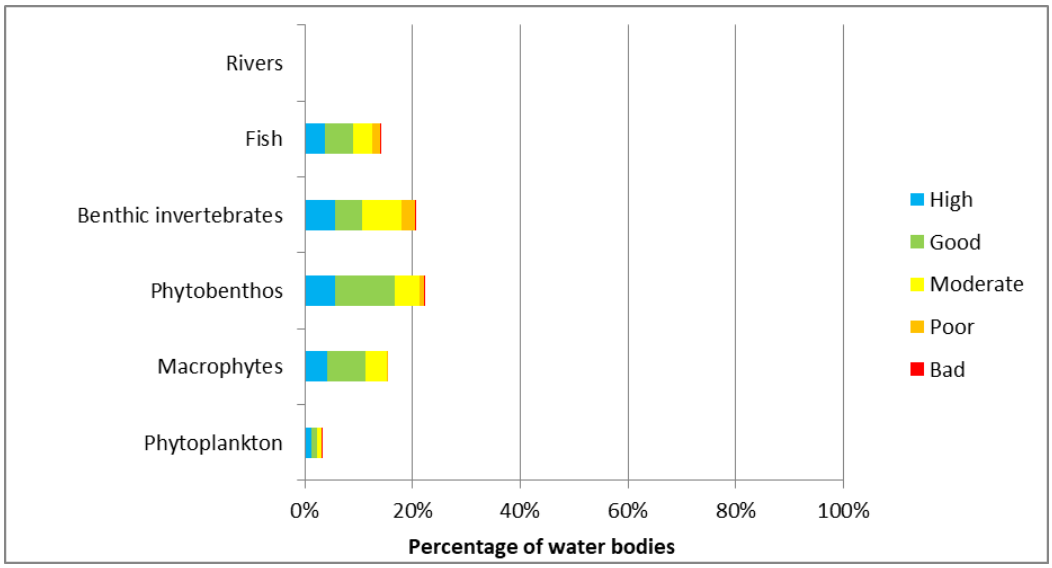
Source: WISE electronic reports

Water bodies were classified with low (88%) or medium (12%) confidence for the first RBMP. For the second RBMP, there was an improvement in the level of confidence with 16% being classified with high and 13% with medium confidence although the levels of confidence were still low overall (with 71% of water bodies remaining at low confidence).

Classification of ecological status in terms of each classified quality element

Figure 3.6 shows the percentage of water bodies in terms of the biological quality element used for classification.

Figure 3.6 ***Ecological status/potential of the biological quality elements used in the classification of surface waters in Slovakia. Note that water bodies with unknown status/potential, and those that are monitored but not classified or not applicable, are not presented.***

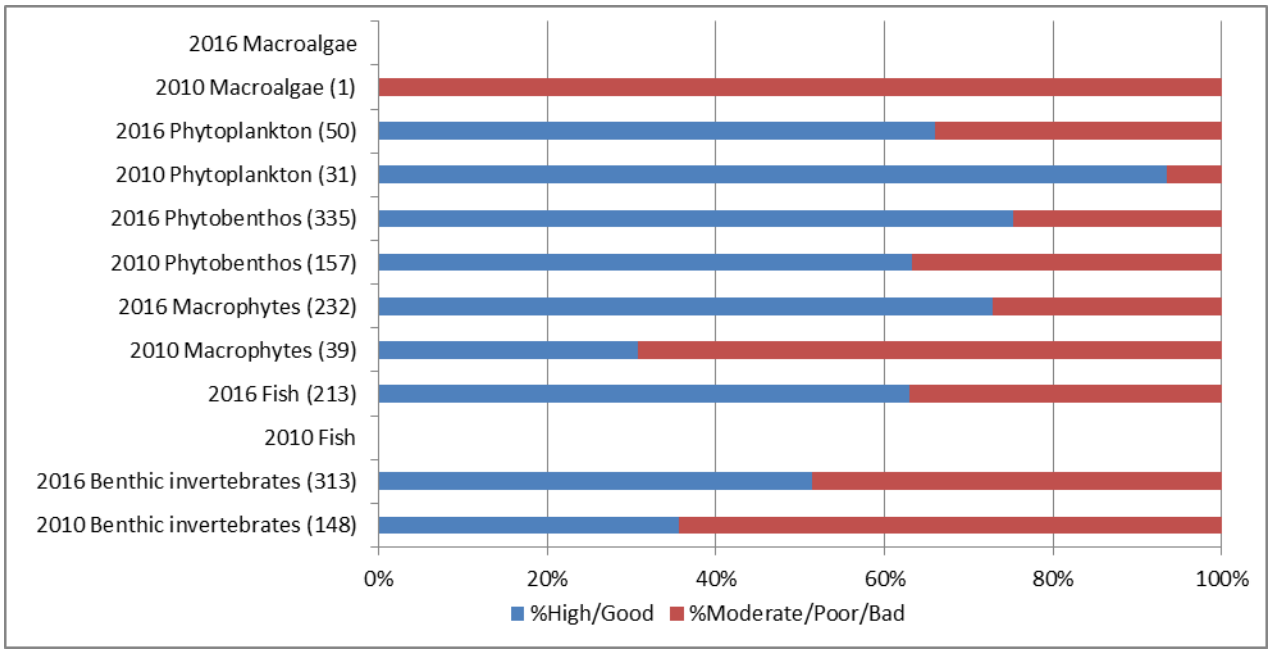


Source: WISE electronic reports

Figure 3.7 compares the classification of biological quality elements in terms of ecological status/potential for the first and second RBMPs. It should be noted that this comparison should be treated with some caution as there are differences between the numbers of surface water bodies classified for individual elements from the first to the second RBMPs.

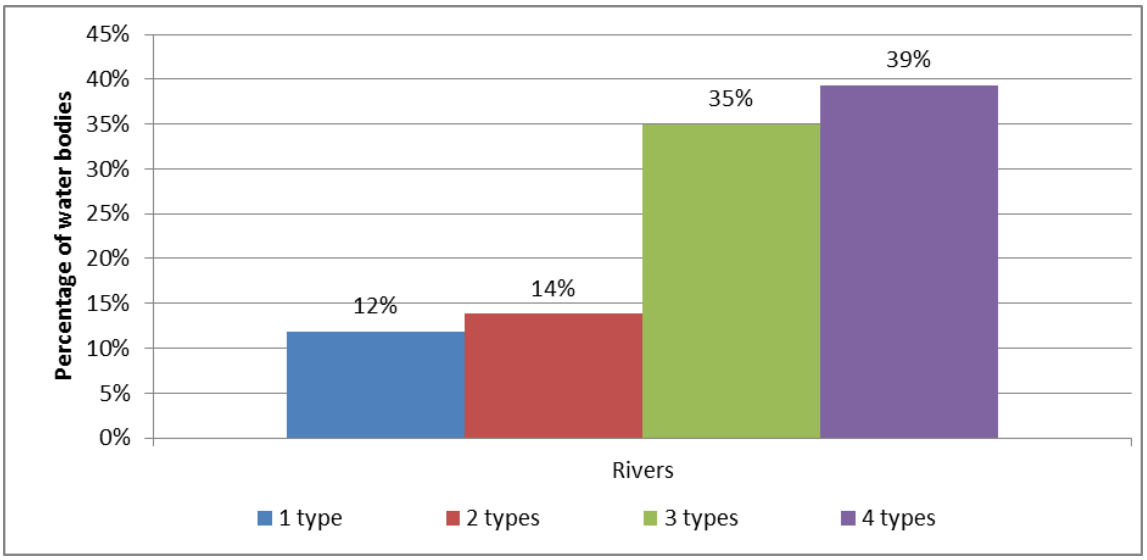
Figure 3.8 and Figure 3.9 illustrate the basis of the classification of ecological status/potential of rivers in Slovakia for the second RBMPs.

Figure 3.7 ***Comparison of ecological status/potential in Slovakia according to classified biological quality elements in surface waters between the first and second RBMPs***



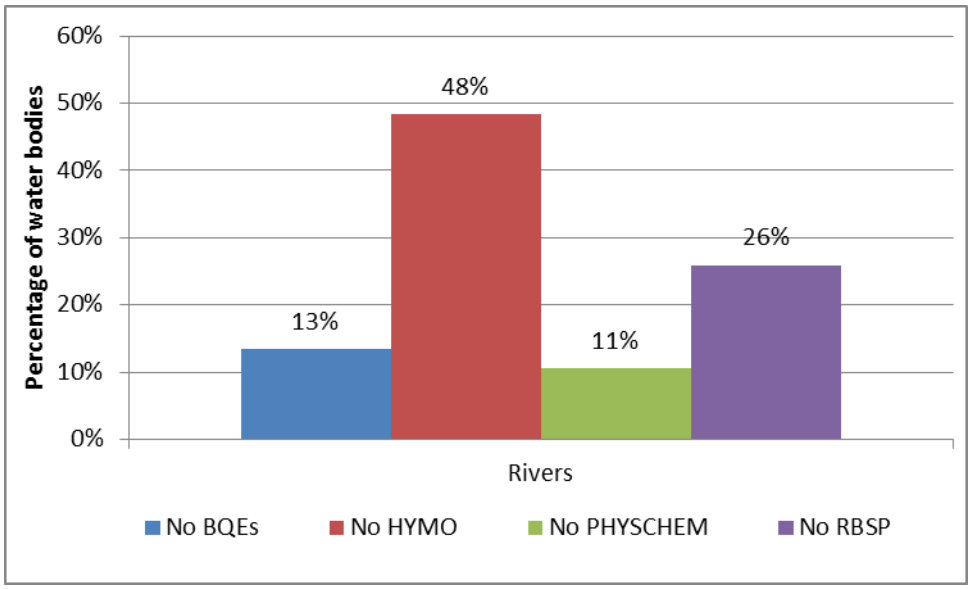
Source: WISE electronic reports

Figure 3.8 ***The classification of the ecological status or potential of surface waters in Slovakia using 1, 2, 3 or 4 types of quality element. Note: The four types are: biological; hydromorphological, general physicochemical and River Basin Specific Pollutants.***



Source: WISE electronic reports

Figure 3.9 ***The percentage of surface water bodies in Slovakia where no biological quality element or no hydromorphological (HYMO) or no general physicochemical (PHYSCHEM) or no river basin specific pollutant (RBSP) has been used in the classification of ecological status or potential***



Source: WISE electronic reports

While all water bodies have been assigned an overall ecological status/potential, the detailed overview on which quality elements were classified reveals considerable gaps in the use of quality elements to classify the water bodies. On average, around 75% of water bodies show 'unknown' status/potential (see Figure 3.6) at the level of each individual quality element.

All 1 510 water bodies were classified in terms of ecological status/potential. However, the classification at the quality element level was only reported for 463 (31%) water bodies. For the other 69% of water bodies, classification was based on extrapolation of overall results of ecological status/potential within groups of water bodies with the same characteristics. The confidence of assessment of these water bodies was reported as low.

Assessment methods and classification of biological quality elements

According to the reporting in WISE, for some national river types (mostly those for which no intercalibration type has been assigned), certain biological reference conditions were not defined. Also physicochemical reference conditions were not defined for some types. Hydromorphological reference conditions were not defined for all river types. However, Slovakia subsequently clarified that reference conditions for all quality elements were set in a Governmental Regulation.

Assessment methods were reported for all biological quality elements relevant for rivers. The methods were reported to be sensitive to most defined impact types except for chemical pollution for which no method was reported to be sensitive. Chemical pollution was reported to be significant in both RBDs.

Assessment methods for hydromorphological quality elements

Morphological conditions were reported to be assessed in terms of ecological status/potential in rivers but the classification boundaries for this supporting quality element were not related to the class boundaries for the sensitive biological quality elements. River continuity and hydrological regime were not. included in the assessment of ecological status.

Assessment methods for general physicochemical quality elements

4 physicochemical quality elements (thermal, oxygenation, salinity and nutrient conditions) were reported to be assessed in terms of ecological status/potential in rivers.

Standards were reported for 12 physicochemical determinants covering five groups of physicochemical quality elements: they included determinants for acidification conditions which had not been reported as being assessed in terms of ecological status/potential. All standards were reported to be consistent with the good-moderate status boundary of the relevant sensitive biological quality elements.

Selection of River Basin Specific Pollutants and use of Environmental Quality Standards

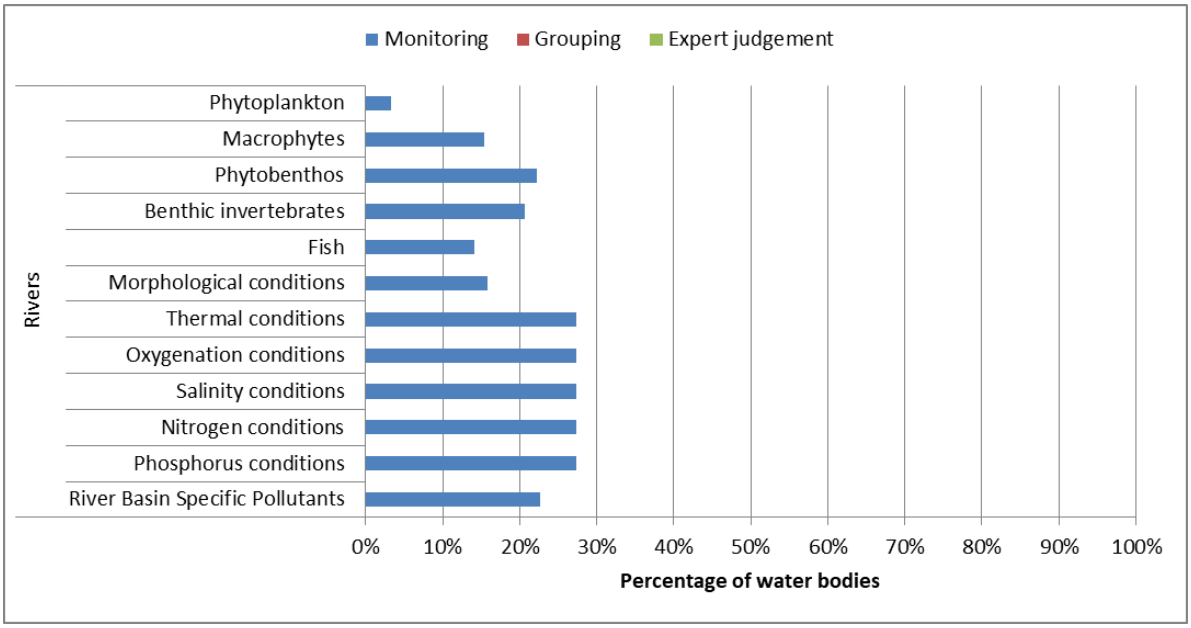
Environmental quality standards were reported for 26 different River Basin Specific Pollutants in Slovakia, all for water (none in sediment and/or biota). All were reported to have been derived in accordance with the 2011 Technical Guidance Document No 27 and the analytical methods used meet the minimum performance criteria laid down in Article 4(1) of the Commission Directive on technical specifications for chemical analysis and monitoring of water status [9] for the strictest standard applied for all substances.

Use of monitoring results for classification

Figure 3.10 illustrates the basis on which classification of ecological status/potential was made for each element.

[9] Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1524565750309&uri=CELEX:32009L0090

Figure 3.10 Basis of the classification of ecological status/potential in Slovakia. The percentages are in terms of all water bodies in each category.



Source: WISE electronic reports

Grouping has been used to classify around 70% of river water bodies at the quality element level. The remaining 30% are classified using monitoring results except for a few individual water bodies classified by expert judgment (not shown in Figure 3.9) in terms of physicochemical quality elements. This may be because of a lack of confidence in some monitoring results.

The two most commonly used biological quality elements for the classification of ecological status/potential in rivers in Slovakia were phytobenthos and benthic invertebrates being used to classify around 24% and 23%, respectively, of classified water bodies. Macrophytes, fish and phytoplankton were also classified. The classification of status/potential for all classified water bodies was based on monitoring results. More water bodies were directly monitored than were subsequently classified by the biological quality elements indicating that there was probably some uncertainty in the assessment of status for some water bodies and biological quality elements. Monitoring results for morphological conditions were used to classify 16% of river water bodies even though 18 % were directly monitored. Proportionally more river water bodies (27%) were classified using the monitoring results of the physicochemical quality elements than for either the biological quality elements or hydromorphological quality elements: approximately the same number of water bodies were classified and directly monitored for the physicochemical quality elements perhaps indicating a greater level of confidence in the monitoring results of these elements.

It remains unclear how the grouping of water bodies has been carried out. Given that the overall number of biological quality elements applied in water body classification is very low, the grouping of water bodies might introduce a high level of uncertainty in the classification.

Overall classification of ecological status (one-out, all-out principle)

Slovakia reported that the one-out, all-out principle had been used in the derivation of the overall ecological status/potential of water bodies.

3.2 Main changes in implementation and compliance since the first RBMPs

There were significant changes in delineation of surface water bodies from the first to the second RBMPs. In particular, reservoirs had been reported as lakes in the first RBMPs but were reported as rivers in the second RBMPs, as specified in the reporting guidance. A comparison of data between the first and second RBMPs is therefore difficult and is meaningful only for the total number of monitoring sites in surface waters. Taking this into account, according to the reporting in WISE there was a significant increase in the number of sites used for surveillance monitoring but a significant decrease in the number of sites used for operational monitoring. Slovakia subsequently provided different numbers for monitoring sites, explaining that sites used for surveillance monitoring were also used for operational monitoring. According to the latter data provided by Slovakia, there was also a significant increase in the number of sites used for operational monitoring.

Only half as many water bodies were included in operational monitoring in the second RBMPs compared to the first.

In the first RBMPs it was reported that all required quality elements were monitored except for fish in rivers. In the second RBMPs fish were monitored, indicating that some progress has been made since the first RBMPs.

64% of water bodies were reported to be of good or better status for the first RBMPs and 56% for the second. However, there was significant reduction in the number of delineated water bodies from the first to the second RBMPs which makes a comparison of status/potential between the cycles unreliable. The comparison of water body classifications between the first and the second RBMPs revealed that the classifications (and therefore possibly the underlying assessments) differed significantly between them, with considerably more water bodies reaching high status in the first RBMPs.

3.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *The ecological status assessment in rivers lacks the assessment of fish, and for lakes it is only based on phytoplankton. The ecological status assessment does not include hydromorphological quality elements. No assessment system for lakes has been intercalibrated. Most of the biological quality elements have not been intercalibrated, and have thus not been used in the classification. All these shortcomings need to be addressed.*

  Assessment: The monitoring of fish in rivers was included for the second RBMPs but in fewer water bodies than other biological quality elements. The lakes reported for the first RBMPs were re-designated as rivers as they had been formed by damming river water bodies. More biological quality elements were monitored in reservoirs but not all the required elements: In terms of hydromorphology, only morphological conditions are used in the classification of rivers, with river continuity and hydrological regime being monitored but not used in the assessment .

  The assessment methods for all biological quality elements were developed and intercalibrated for natural rivers, while there is no intercalibration at EU level for reservoirs. The recommendation has been partially fulfilled.

- Recommendation: *There are a number of gaps in the monitoring programmes which need to be addressed. There is no adequate fish monitoring in rivers, only phytoplankton is monitored in lakes, there is no monitoring of priority substances in sediments and biota, and not all priority substances were monitored in all water bodies. These gaps in the monitoring design resulted in an incomplete status assessment of surface water bodies, which has to be improved. In particular, mercury, hexachlorobenzene and hexachlorobutadiene should be monitored in biota for comparison with the biota standards in the EQSD, unless water EQS providing an equivalent level of protection are derived, and trend monitoring in sediment or biota for at least the substances specified in EQSD Article 3(3) will also need to be reflected in the next RBMP.*

- Recommendation: *Complete the monitoring framework, as an adequate WFD-compliant monitoring and assessment framework is a necessary pre-requisite to design an effective Programme of Measures and ultimately to achieve the WFD objectives.*

  Assessment: The monitoring of fish in rivers was included for the second RBMPs but in fewer water bodies than other biological quality elements. Lakes were not delineated for

the second RBMPs, since reservoirs were delineated as rivers. In terms of hydromorphology, only morphological conditions have been used in the classification of rivers with river continuity and hydrological regime being monitored but not included in the assessment. Coverage of water bodies as a whole is fairly sparse for example only 13 (around 1%) of surface water bodies are monitored for River Basin Specific Pollutants. The recommendation has been partially fulfilled.

- Recommendation: *Where there are currently high uncertainties in the characterisation of the RBDs, in the identification of pressures, and in the assessment of status, these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle. Regarding characterisation, for instance, reference conditions should be established for all biological quality elements.*

  Assessment: Biological quality element reference conditions were defined. Physicochemical and hydromorphological quality element reference conditions were defined for natural river types but not for reservoirs. The recommendation has been fulfilled.

Topic 4 Monitoring, assessment and classification of chemical status in surface water bodies

4.1 Assessment of implementation and compliance with WFD requirements in the second cycle

4.1.1 Monitoring of chemical status in surface waters

Monitoring sites and monitored water bodies used for monitoring of chemical status

Member States have to implement surveillance and operational monitoring programmes in accordance with the requirements of the WFD and of the EQS Directive[10], for the assessment of ecological status/potential and chemical status.

Surveillance monitoring programmes should allow Member States to supplement and validate the impact assessment procedure, to efficiently and effectively review the design of their monitoring programmes, and to assess the long-term changes in natural conditions and those resulting from widespread anthropogenic activity. For operational purposes, monitoring is required to establish the status of water bodies identified as being at risk of failing to meet their environmental objectives, and to assess any changes in the status of such water bodies resulting from the PoM.

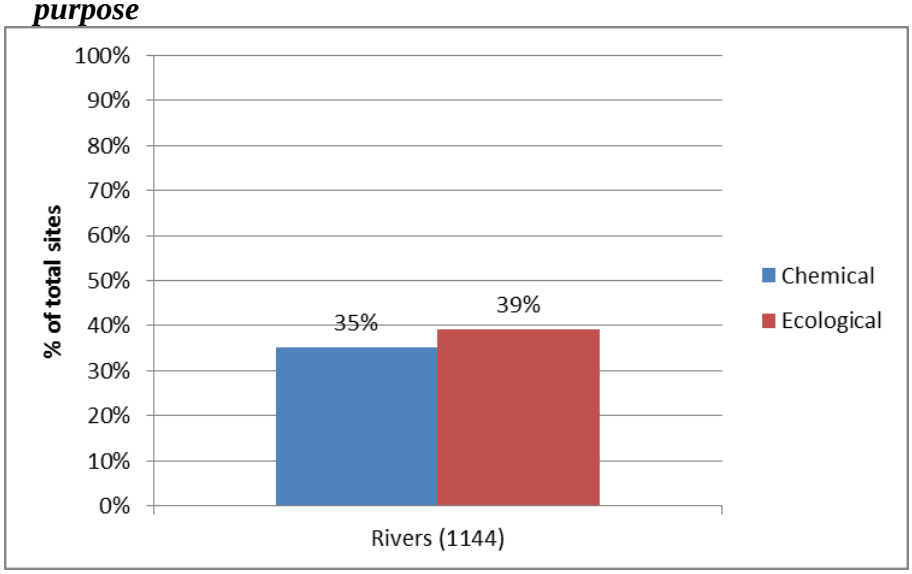
Section 3.1.1 of this report summarises the characteristics of the surveillance and operational monitoring programmes in Slovakia for the second RBMP.

Figure 1 summarises the proportion of sites used for the monitoring of chemical status in rivers for the second RBMP. In this figure, no distinction is made between sites used for surveillance and/or operational purposes. More detailed information can be found on the website of the European Environment Agency[11]. Figure 4.1 shows that over a third of monitoring sites were used for assessment of chemical status. Marginally more sites were used for the assessment of ecological status.

[10] Directive 2008/105/EC. Available at : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0105

[11] https://www.eea.europa.eu/publications/state-of-water

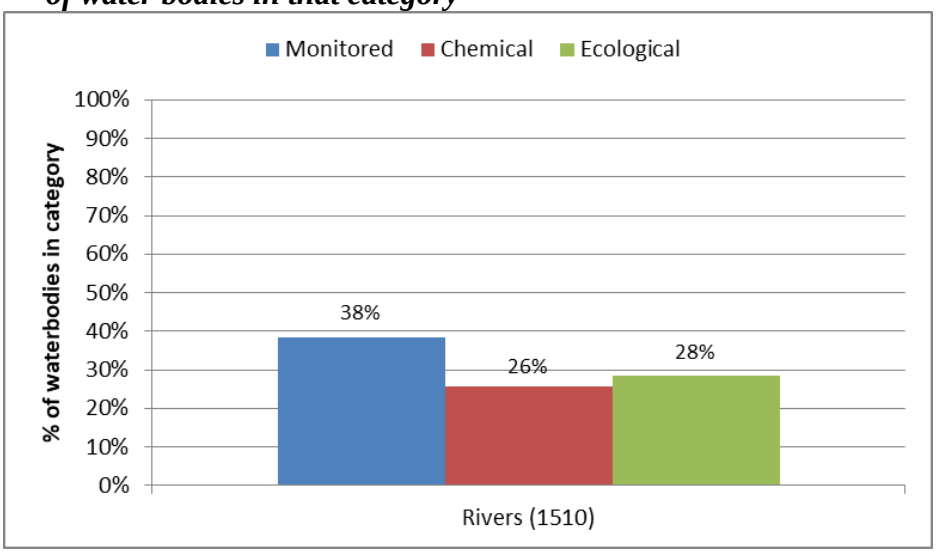
Figure 4.1 ***Proportion of sites used for monitoring of chemical status and, for comparison, ecological status, in Slovakia. The number in parenthesis next to the category is the total number of monitoring sites irrespective of their purpose***



Source: WISE electronic reporting

Figure 4.2 summarises the proportion of water bodies monitored for chemical status in rivers for the second RBMP. In this figure, no distinction is made between sites used for surveillance and/or operational purposes. Also given is the proportion of water bodies monitored for any purpose and, for comparative purposes, those for ecological status. Figure 4.2 shows that 26% of approximately 1 500 river water bodies were monitored for chemical status.

Figure 4.2 ***Proportion of total water bodies in each category which are monitored, monitored for chemical status and, monitored for ecological status, in Slovakia. The number in parenthesis next to the category is the total number of water bodies in that category***



Source: WISE electronic reporting

In Slovakia as a whole, 97% of the water bodies that are failing to achieve good chemical status were monitored for the substances causing failure as part of the operational monitoring programme.

Long-term trend monitoring and monitoring of Priority substances in water, sediment and biota for status assessment

Monitoring for status assessment

Requirements

Article 8(1) of the WFD requires Member States to establish monitoring programmes in order to provide inter alia a coherent and comprehensive overview of water status within each RBD. The amount of monitoring undertaken in terms of priority substances, frequency and numbers of sites should be sufficient to obtain a reliable and robust assessment of status. According to the EQS Directive (version in force in 2009), mercury, hexachlorobenzene and hexachlorobutadiene have to be monitored in biota for status assessment, unless Member States derived a standard for another matrix, which is at least as protective as the biota standard.

Spatial coverage

All 41 Priority Substances and groups of priority substances were monitored in water in both RBDs.

Slovakia reports that 9.5% and 26% of river water bodies are monitored for more than 10 Priority Substances for the Vistula and Danube RBDs, respectively. This equates to 26% of river water bodies in Slovakia. It was also reported that 74% of river water bodies in Slovakia were not monitored for any Priority Substances (65 and 1059 in the Vistula and Danube, respectively).

For biota, Slovakia has monitored the required three Priority Substances in the Vistula RBD for status assessment. Mercury, hexachlorobenzene and hexachlorobutadiene were monitored for biota at one river monitoring site only in the Vistula RBD. No information was reported to WISE for the Danube RBD. Slovakia subsequently clarified that mercury, hexachlorobenzene and hexachlorobutadiene were also monitored in biota for status assessment in 50 sites in this RBD.

Frequencies

The WFD indicates that, for the surveillance and operational monitoring of Priority Substances in water, the frequency of monitoring should be at least monthly for one year during the RBMP

cycle and at least monthly every year, respectively. Monitoring in biota for status assessment should take place at least once every year according to the EQS Directive. In all cases greater intervals can be applied by Member States if justified on the basis of technical knowledge and expert judgement.

Monitoring frequencies in water are reported for 41 Priority Substances at site level in both RBDs. In both the Vistula and Danube RBDs all Priority Substances were monitored 12 times per year (depending on the sites, monitoring took place every one, two or three or four years). Where monitoring in biota occurred, the sampling frequency was once every year. The reported frequencies in both water and biota are therefore exactly the minimum recommended frequencies.

Monitoring for long-term trend assessment

Requirements

Article 3(3) of the EQS Directive (version in force in 2009) requires Member States to monitor 14 priority substances[12] that tend to accumulate in sediment and/or biota, for the purpose of long-term trend assessment

Spatial coverage

Slovakia has monitored two (mercury and hexachlorobenzene) of the required 14 Priority Substances in sediments in three sites in the Vistula RBD. Although no information was reported to WISE for the Danube RBD, Slovakia subsequently clarified that these two substances were also monitored in sediment for trend assessment in 64 sites of the Danube RBD.

Frequencies

Monitoring should take place at least once every three years, unless technical knowledge and expert judgment justify another interval.

Where Priority Substances are monitored for long-term trends in river water bodies (in the Vistula RBD only) this is reported to occur once per year, and therefore is above the minimum recommended frequency.

[12] Anthracene, brominated diphenylether, cadmium, C10-13 chloroalkanes, DEHP, fluoranthene, hexachlorobenzene, hexabutadiene, hexachlorocyclohexane, lead, mercury, pentachlorobenzene, PAH, Tributyltin.

Monitoring of Priority Substances that are discharged in each RBD

Annex V of the WFD states, in Section 1.3.1 (Design of surveillance monitoring), that "Surveillance monitoring shall be carried out for each monitoring site for a period of one year during the period covered by a river basin management plan for [*inter alia*]: priority list pollutants which are discharged into the river basin or sub-basin." Section 1.3.2 (Design of operational monitoring) of the Directive states that "In order to assess the magnitude of the pressure to which bodies of surface water are subject Member States shall monitor for those quality elements which are indicative of the pressures to which the body or bodies are subject. In order to assess the impact of these pressures, Member States shall monitor as relevant [*inter alia*]: all priority substances discharged, and other pollutants discharged in significant quantities."

Member States are therefore required to monitor all Priority Substances which are discharged into the river basin or sub-basin.

In the Vistula RBD only one Priority Substance (Nickel) was in an inventory and discharged; this substance was also monitored.

In the Danube RBD, 18 Priority substances were included in inventories and discharged. These substances were all monitored.

Performance of analytical methods used

For 31 Priority Substances and groups of Priority Substances, the analytical methods used meet the minimum performance criteria laid down in Article 4(1) of the Commission Directive on technical specifications for chemical analysis and monitoring of water status[13] for the strictest standard applied. For the remaining 10 reported, the analytical methods complied with the requirements laid down in Article 4(2) of that Directive.

The method of dealing with measurements of Priority Substances below the limit of quantification is reported to be as specified in Article 5 of the Commission Directive on technical specifications for chemical analysis and monitoring of water status. However, the actual review of the RBMPs revealed that a different approach was undertaken. It is stated that if the limit of quantification of the best available method was higher than the environmental quality standard and if all the measured values were below this best available quantification limit, this result was considered in the assessment of compliance with the environmental quality standard values for chemical status as "assessment complies with environmental quality

[13] Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1524565750309&uri=CELEX:32009L0090

standard" and in such cases, the reliability of status evaluation was reduced. This method is not in line with the requirements of Article 5 of the Commission Directive on technical specifications for chemical analysis and monitoring of water status.

4.1.2 Chemical Status of surface water bodies

Member States are required to report the year on which the assessment of chemical status is based. This may be the year that the surface water body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored surface water bodies within the same group. The chemical assessments were carried out in unspecified years between 2009 and 2012 in both RBDs.

The chemical status of surface water bodies in Slovakia for the second RBMP is illustrated on the map below. This is based on the most recent assessment of status. Map 4.1 shows that around 98% of water bodies are at Good status and only 2% are failing to achieve good.

Map 4.1 Chemical status of surface water bodies in Slovakia based on the most recently assessed status of the surface water bodies

Note: Standard colours based on WFD Annex V, Article 1(4)(3).

Source: WISE, Eurostat (country borders)

Good
Failing to achieve to good
Unknown
River Basin Districts
Countries outside the EU

The chemical status of rivers in Slovakia for the first and second RBMPs is given in Table 4.1. Between the two cycles there was a small increase in the proportion of river water bodies with good chemical status from 95% to 98% and decrease in the proportion failing to achieve good status from 5 % to 2 %. This pattern occurred generally across all RBDs and Natural/Heavily Modified/Artificial water body categories.

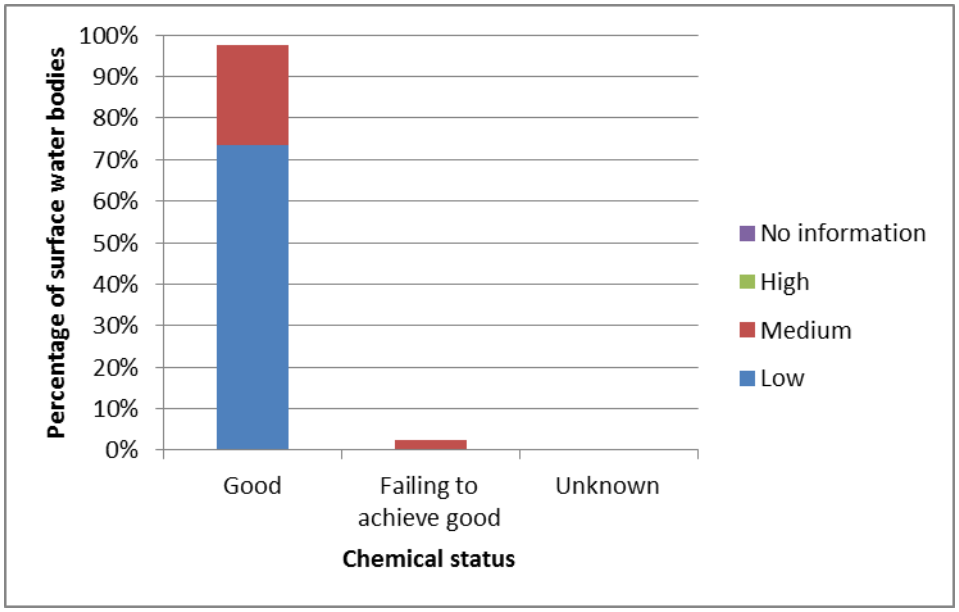
Table 4.1 Chemical status of surface water bodies in Slovakia for the second and first RBMP. Note: the number in parenthesis next to the water category is the number of water bodies. Note: Chemical status assessment is based on the standards laid down in EQS Directive 2008/105/EC (version in force on 13 January 2009). Some Member States did not implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs.

Category	Good		Failing to achieve good		Unknown	
	Number	%	Number	%	Number	%
second RBMP						
Rivers (1510)	1473	98%	37	2%		
first RBMP						
Rivers (1760)	1673	95. %	87	5. %		

Source: WISE electronic reporting

Figure 4.3 shows the confidence in the classification of chemical status for the second RBMP. In Slovakia, overall, 26% of surface water bodies (all rivers) were classified for chemical status with medium confidence and 74% were classified with low confidence. Confidence in the classification of chemical status for the first RBMPs was not reported. Expert judgement has been used to classify 74% of the river water bodies but the approach is not clear: The RBMPs state the approach used was to transfer results but only in adjacent water bodies in the "direction of diffusion" and additionally by assessing the occurrence of pollution sources. It is important to note in addition that the inventories of emissions are incomplete – they do not include all (groups of) priority substances. It is therefore unclear whether all relevant pressures have been identified for the water bodies that are not monitored but assessed as in good chemical status.

Figure 4.3 Confidence in the classification of chemical status of surface water bodies in Slovakia based on the most recently assessed status/potential



Source: WISE electronic reporting

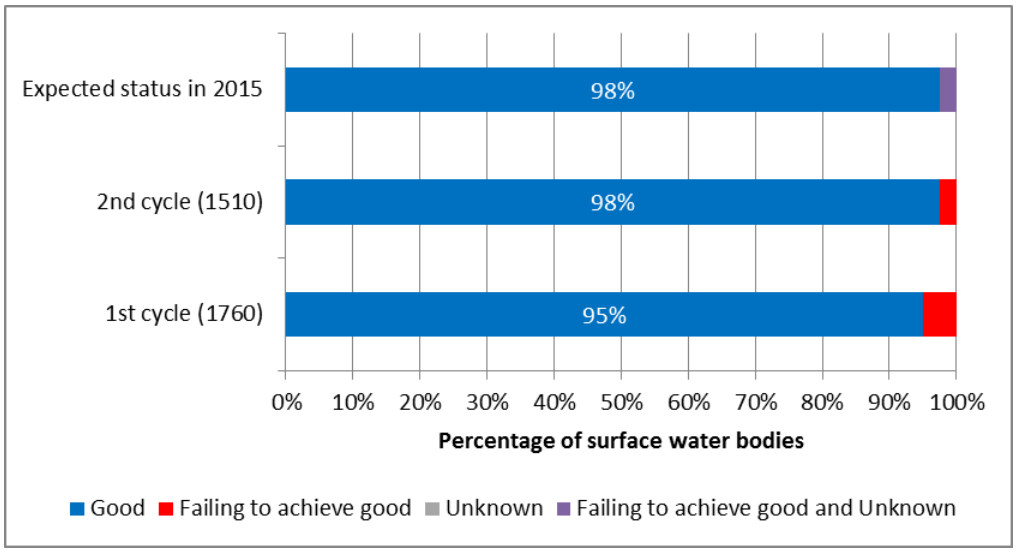
Figure 4.4 compares the chemical status of surface water bodies in Slovakia for the first RBMP with that for the second RBMP (based on the most recent assessment of status) and that expected by 2015. The chemical status reported in the second RBMP matches what was expected.

The assessment of chemical status for the second RBMPs was expected to be based on the standards laid down in EQS Directive 2008/105/EC[14] (version in force on 13 January 2009[15]). Some Member States did not implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs.

[14] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008L0105-20130913

[15] Directive 2013/39/European Union, which amended the Environmental Quality Standards Directive, introduced a less stringent annual average environmental quality standard for naphthalene in transitional and coastal waters. This less stringent environmental quality standard should be taken into account for the determination of surface water chemical status by the 2015 deadline laid down in Article 4 of the WFD.

Figure 4.4 ***Chemical status of surface water bodies in Slovakia for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of surface water bodies for both cycles. Note the period of the assessment of status for the second RBMPs was 2009 to 2014. The year of the assessment of status for the first RBMP is not known***



Source: WISE electronic reporting

More information on the chemical status in each RBD and water category can be found on the website of the European Environment Agency[16].

Directive 2013/39/EU amended the EQS Directive. In particular, it sets more stringent environmental quality standards for seven substances[17]. Member States were required to indicate if the new standards caused the status of the surface water body to appear to deteriorate. This was the case for 2% surface water bodies for benzo(a)pyrene and for 1% of surface water bodies for fluoranthene and lead.

Good chemical status should be reached by 2021 in relation to the revised environmental quality standards, unless Member States apply exemptions under WFD Article 4(4) or less stringent objectives under WFD Article 4(5).

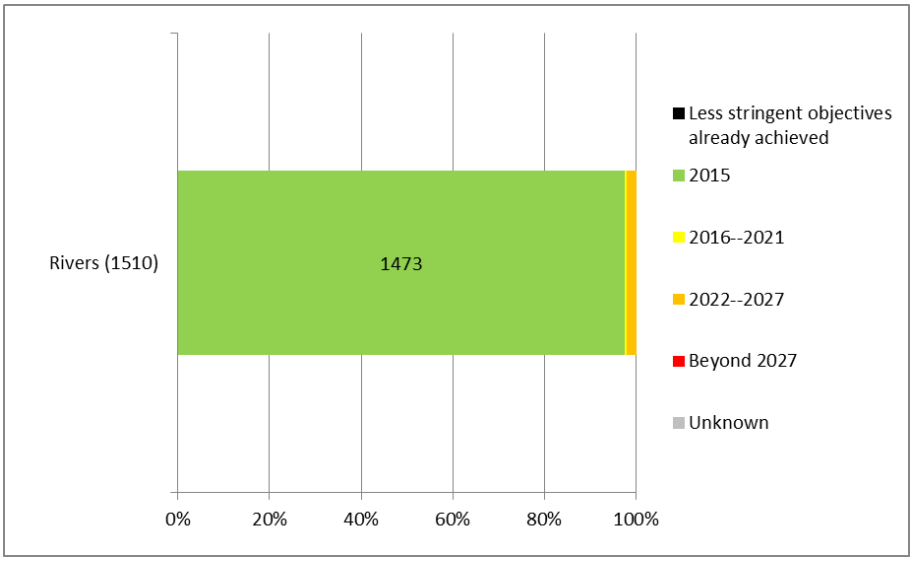
Member States were asked to report the expected date for the achievement of good chemical status. The information for Slovakia is shown in Figure 4.5. Good chemical status of all

[16] https://www.eea.europa.eu/publications/state-of-water

[17] Anthracene, Brominated diphenylether, Fluoranthene, Lead and its compounds, Naphthalene, Nickel and its compounds, Polyaromatic hydrocarbons (PAH)

surface water bodies is expected to be achieved by the end of the third planning cycle in both of the RBDs.

Figure 4.5 Expected date of achievement of good chemical status of surface water bodies in Slovakia. The number in the parenthesis is the number of water bodies in each category



Source: WISE electronic reporting

Priority substances causing the failure of good chemical status

Member States were expected to report exceedances based on the revised, more stringent standards from Directive 2013/39/EU, but in all likelihood, Slovakia reported the exceedances below based on the initial standards. (Information on the effect of the new standards is however available in the section above.)

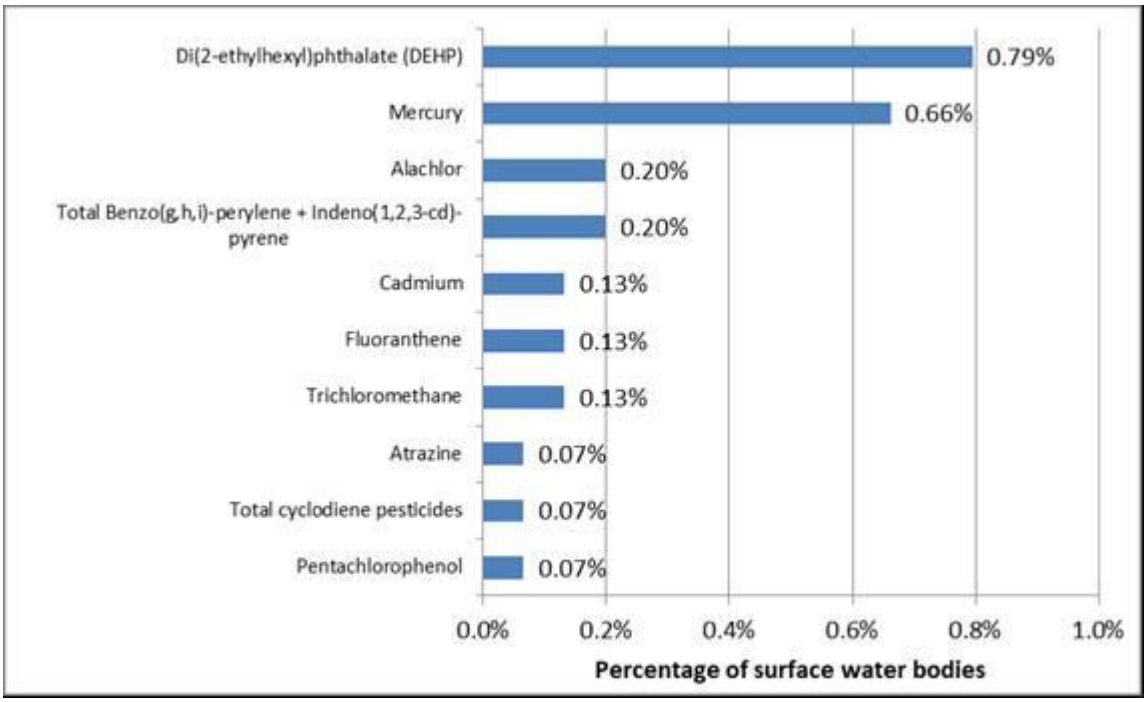
The Priority Substances causing the greatest proportion of water bodies to fail good chemical status were di(2-ethylhexyl)phthalate (DEHP) (0.79% of all surface water bodies are failing to achieve good status because of DEHP) and mercury and its compounds (0.66% of water bodies failing to achieve good status).

The "top-10" in terms of the proportion of water bodies failing because of the substance are shown in Figure 4.6.

For surface water bodies in Slovakia in general, the largest proportion of exceedances were for the annual average-environmental quality standard for di-(2-ethylhexyl)phthalate (DEHP), alachlor, mercury, total Benzo(g,h,i)-perylene +Indeno(1,2,3-cd)-pyrene, fluoranthene and trichloromethane. Exceedances of maximum acceptable concentration environmental quality

standards were largest for mercury. In terms of exceedance of both the annual average and maximum allowable concentration environmental quality standards, the largest proportion was also for mercury.

Figure 4.6 The top-10 Priority Substances causing failure to achieve good chemical status in surface water bodies in Slovakia



Source: WISE electronic reporting

Ubiquitous persistent, bioaccumulative and toxic Priority Substances

According to article 8(a) of the EQS Directive[18], eight priority substances and groups of priority substances are behaving like ubiquitous, persistent, bioaccumulable and toxic substances[19]. These substances are generally expected to cause widespread exceedances, and their emissions can be challenging to tackle (e.g. due to long-range atmospheric transport and deposition). In order to show the progress made in tackling other priority substances, Member States have the possibility to present the information related to chemical status separately for these substances.

The influence of ubiquitous persistent, bioaccumulative and toxic Priority Substances on the chemical status of river water bodies was assessed as limited. While mercury in biota and one group of PAHs did cause failure to achieve good status in a small proportion of river water bodies (0.66 and 0.2% respectively), other Priority Substances environmental quality standards

[18] Amended by Directive 2013/39/EU

[19] Brominated diphenylether, Mercury and its compounds, Polyaromatic hydrocarbons (PAH), Tributyltin, PFOS, dioxins, hexabromocyclodecane and heptachlor

were also exceeded in these water bodies. However, the full extent of the influence of these substances is not known because a large majority of the water bodies are not monitored and are classified on the basis of expert judgement. Monitoring of biota for status assessment is limited to a single site.

This is illustrated in the 2018 State of Water report of the European Environment Agency[20].

Priority substances used in the assessment of chemical status compared to those monitored

Slovakia reports that all Priority Substances and groups of priority substances are used in the classification of chemical status and are also monitored.

Application of alternative environmental quality standards for water, biota and sediment

According to the EQS Directive, Member States may opt to apply environmental quality standards for another matrix than the one specified in the Directive for a given substance. If they do so, they have to ensure the environmental quality standard they set in the other matrix (or matrices) offers at least the same level of protection as the standard established in the Directive.

Slovakia reported that all of the environmental quality standards laid down in Part A of Annex I of Directive 2008/105/EC had been applied for assessment of the chemical status of bodies of surface water.

However, it was also reported that alternative and/or additional standards for particular Priority Substances had been applied for 41 substances in water applied at the International Scale in the river water bodies in both RBDs; many of these are the same as the values in the Directive. It was also reported that alternative and/or additional standards for particular Priority Substances had been applied for three substances in biota-fish at the International Scale and three substances for sediment at the National Scale. These substances are mercury, hexachlorobenzene and hexachlorobutadiene and the environmental quality standards reported to WISE include those in the Directive (version in force in 2009) alongside others. No further information was found in the RBMPs. The actual environmental quality standards used remain unclear.

Use of mixing zones

Article 4 of EQS Directive provides Member States with the option of designating mixing zones adjacent to points of discharge. Concentrations of substances may exceed the relevant environmental quality standard within such mixing zones if they do not affect the compliance

[20] https://www.eea.europa.eu/publications/state-of-water (p40-41 of the report). Also available in a more interactive format

of the rest of the body of surface water with those standards. Member States that designate mixing zones are required to include within their RBMPs a description of: the approaches and methodologies applied to define such zones, and; measures taken with a view to reducing the extent of the mixing zones in the future.

Mixing zones have not been designated.

Background Concentrations and Bioavailability

The EQS Directive stipulates that Member States have the possibility, when assessing the monitoring results against the environmental quality standard, to take into account:

(a) natural background concentrations for metals and their compounds, if they prevent compliance with the environmental quality standard, and;

(b) hardness, pH or other water quality parameters that affect the bioavailability of metals.

In both RBDs, natural background concentrations for metals and their compounds are reported to be taken into consideration where such concentrations prevent compliance with the relevant environmental quality standard.

Water quality parameters that affect the bioavailability of metals have also been taken into account when assessing monitoring results against relevant environmental quality standards in both RBDs.

4.2 Main changes in implementation and compliance since the first cycle

In comparing the number of sites and water bodies monitored for operational and surveillance purposes between the first and second RBMPs, there appears to be a net decrease in monitoring sites and surface water bodies monitored for operational purposes (a decrease of 324 sites and 174 waterbodies). For surveillance monitoring, the number of sites has increased by 292 and the number of water bodies has increased by 181 since the first RBMP.

There is no specific mention of the changes in the monitoring programme for chemical status assessment in either of the RBMPs.

Between the two RBMPs there was a small increase in the proportion of river water bodies with good chemical status from 95% to 98% and decrease in the proportion failing to achieve good status from 5 % to 2 %. This pattern occurred generally across both RBDs and Natural/Heavily Modified/Artificial water body categories.

Since the first RBMP, Slovakia has carried out some limited monitoring of selected Priority Substances in sediment and biota.

Information on Priority Substances causing failure of good chemical status for the first cycle was not systematically reported making comparison with the second cycle difficult. However, examination of the first RBMPs showed that DEHP was also causing the greatest proportion of failures followed by mercury.

Slovakia reported that eight Priority Substances improved from failing to achieve good status to good chemical status since the first RBMP including di(2-ethylhexyl)phthalate (DEHP) (1%) and mercury (1%).

4.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: "*Where there are currently high uncertainties in the characterisation of the RBDs, in the identification of pressures, and in the assessment of status, these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle. Regarding characterisation, for instance, reference conditions should be established for all BQEs"*

  Assessment: All priority substances (including discharged substances) are monitored at the minimum recommended frequency and used in the assessment of chemical status. However, the spatial coverage of monitoring is limited to about a quarter of water bodies. Expert judgment is used to classify a very significant proportion of water bodies, and the basis for this expert judgment is not entirely clear. Almost all water bodies classified on the basis of expert judgment are in good chemical status. However, the inventories of emissions do not include all priority substances, so it is unclear whether all relevant pressures have been identified for these non-monitored water bodies. The confidence of the assessment is low for a significant proportion of water bodies. According to the information provided in the RBMPs, the method for dealing with values below the limit of quantification is not in line with Article 5 of the Commission Directive on technical specifications for chemical analysis and monitoring of water status. This recommendation has been partially fulfilled.

- Recommendation: *More information needs to be included in the RBMPs on Priority Substances, such as a detailed description of which Priority Substances are monitored in which water bodies and, when substances are not assessed, a clear explanation of the reasons, in order to fully assess the chemical status.*

Assessment: The second RBMP has provided the necessary information on which Priority Substances are monitored where they are monitored and at what frequencies. A clear explanation of the reasons for substances being monitored or not monitored (for example in sediments and/or biota) cannot be readily found within the RBMPs. Some progress has therefore been made towards addressing this recommendation and it is partially fulfilled.

The following two recommendations are assessed jointly:

- Recommendation: *Complete the monitoring framework, as an adequate WFD-compliant monitoring and assessment framework is a necessary pre-requisite to design effective PoMs and ultimately to achieve the WFD objectives; and,*

- Recommendation: *There are a number of gaps in the monitoring programmes which need to be addressed. There is no adequate fish monitoring in rivers, only phytoplankton is monitored in lakes, there is no monitoring of priority substances in sediments and biota, and not all priority substances were monitored in all water bodies. These gaps in the monitoring design resulted in an incomplete status assessment of surface water bodies, which has to be improved. In particular, mercury, hexachlorobenzene and hexachlorobutadiene should be monitored in biota for comparison with the biota standards in the EQS Directive, unless water environmental quality standards providing an equivalent level of protection are derived, and trend monitoring in sediment or biota for at least the substances specified in EQS Directive, Article 3(3), will also need to be reflected in the next RBMP*.

Assessment:

Slovakia reports that about a quarter of river water bodies are monitored for Priority Substances. The monitoring frequencies applied are the recommended minimum frequencies. It appears that all Priority Substances discharged are monitored in both RBDs based on the data reported. 74% of water bodies were classified with low confidence using expert judgement.

With regards to status assessment, mercury, hexachlorobenzene and hexachlorobutadiene have been monitored in biota at one river monitoring site in the Vistula RBD and in 50 sites in the Danube RBD. The EQS Directive environmental quality standards are reported to have been used.

With regard to trend assessment, arrangements are reported to not be in place for the long-term trend analysis in either of the two RBDs. However, Slovakia then clarified that 2 of

the 14 of the Priority Substances required were monitored in sediment for trend assessment in the Vistula RBD, and in 64 sites in the Danube RBD.

For 31 Priority Substances the analytical methods used meet the minimum performance criteria laid down in Article 4(1) of Commission Directive on technical specifications for chemical analysis and monitoring of water status[21] for the strictest standard applied. For the remaining 10 reported, the analytical methods complied with the requirements laid down in Article 4(2) of that Directive.

In conclusion, progress has been made with both of the recommendations and they are partially fulfilled.

[21] Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1524565750309&uri=CELEX:32009L0090

Topic 5 Monitoring, assessment and classification of quantitative status of groundwater bodies

5.1 Assessment of implementation and compliance with WFD requirements in the second cycle

5.1.1 Monitoring of quantitative status in groundwater

The total number of groundwater bodies in Slovakia reported under the second cycle was 102 (Table 5.1); 29 groundwater bodies were not subject to monitoring for quantitative status (Table 5.2). This means that 28% of groundwater bodies were not monitored. For these water bodies no evidence could be found to indicate that they had been classified by grouping.

The number of groundwater bodies increased from 101 in the first RBMP to 102 in the second RBMP and the total groundwater body area remained almost the same.

Table 5.1 Proportion of groundwater bodies in Slovakia monitored for quantitative status

RBD code	No of groundwater bodies with quantitative monitoring	Total No. groundwater bodies	% of total groundwater bodies monitored for quantitative status
SK30000	4	4	100%
SK40000	69	98	70.41%

Source: WISE electronic reporting

Table 5.2 Number of water bodies in Slovakia directly monitored and the purpose of monitoring

RBD code	Total ground water bodies directly monito-red	Monitoring Purpose									
		CHE – Chemi-cal status	DWD – Drink-ing water - WFD Annex IV.1.i	INT – Interna-tional network of other interna-tional conven-tion	NID - Nutrient sensitive area under the Nitrates Direc-tive - WFD Annex IV.1.iv	OPE – Opera-tional monitor -ing	QUA – Quanti-tative status	RIV – Interna-tional network of a river conven-tion (include -ing bilateral agree-ments)	SOE - EIONET State of Environ-ment monitor-ing	SUR – Survei llance moni-toring	TRE – Chemi-cal trend assess-ment
SK30000	4		2		3	2	4		4	4	4
SK40000	70		37	2	60	43	69	17	70	70	70

Source: WISE electronic reporting

The number of monitored groundwater bodies increased from 66 in the first RBMP to 73 in the second RBMP. The number of monitoring sites for quantitative status is listed in Table 5.3 and shows a slight decrease from 1 507 in the first RBMP to 1 502 in the second RBMP.

34 of 98 groundwater bodies are identified as drinking water protected areas, allocated in the Danube RBD (Danube). No information for this category was provided for the Vistula RBD.

Table 5.3 Number of groundwater monitoring sites in Slovakia and their purpose

RBD code	Total ground-water monito-ing sites	Monitoring Purpose								
		DWD – Drink-ing water - WFD Annex IV.1.i	INT – Internatio-nal network of other internatio-nal convention	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE – Operatio-nal monitor-ing	QUA – Quanti-tative status	RIV – Internatio-nal network of a river convention (including bilateral agreements)	SOE - EIONET State of Environ-ment monitoring	SUR – Surveil-lance monitor -ing	TRE - Chemical trend assessment
SK30000	42	3		15	7	39		19	12	41
SK40000	2 244	61	226	1 091	408	1 463	569	583	164	1 612

Source: WISE electronic reporting

5.1.2 Assessment and classification of quantitative status for groundwater

Map 5.1 displays the most recently assessed quantitative status of groundwater bodies. It shows that 72 of 102 groundwater bodies (71%) were of good quantitative status, three (3%) are failing good status and 27 groundwater bodies (26%) are of unknown status (Figure 5.1). In terms of area this means that about 3% by area are failing good quantitative status and 23% by area are of unknown status. Figure 5.2 shows that all groundwater bodies with good quantitative status have been classified with high confidence.

The total number of groundwater bodies failing good quantitative status declined from five groundwater bodies in the first RBMP to three in the second RBMP (from 5.4% to 2.8% of the total groundwater body area). The number of groundwater bodies with unknown status slightly increased from 26 to 27.

For both river basin districts water balance was assessed by a comparison of annual average groundwater abstraction against the ‘available groundwater resource’ for every groundwater body.

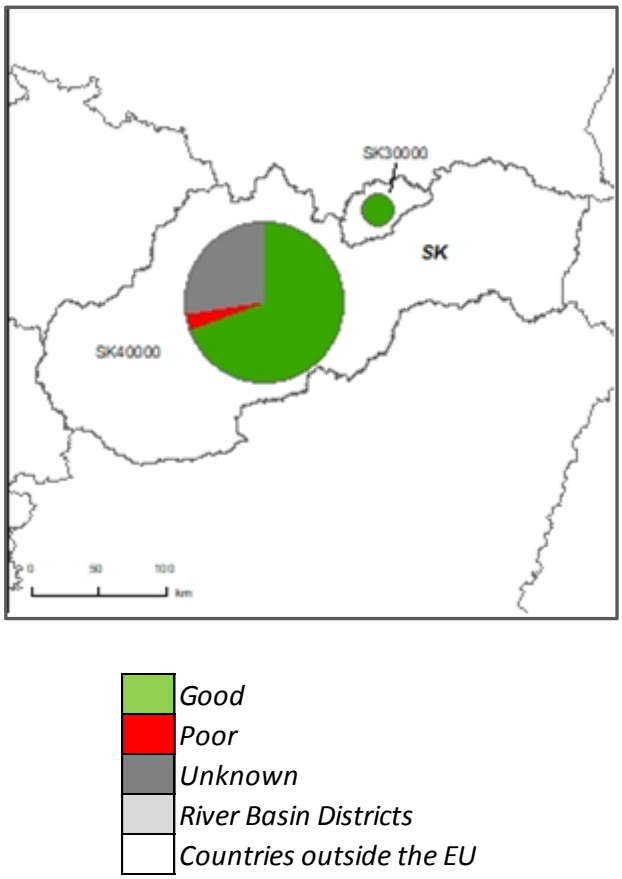
The reasons for the failure of good quantitative status of groundwater bodies are shown in Figure 5.3. Three groundwater bodies are failing good status due to failing the water balance test, which means that the long-term annual average rate of groundwater abstraction is exceeding the available groundwater resource. The expected date of achievement of good quantitative status in Slovakia is at the end of the 3rd RBMP in the year 2027 as shown in Figure 5.4.

In both river basin districts the criterion of ‘available groundwater resource’ has been partially applied in accordance with WFD Article 2(27). From all environmental objectives only water balance, the surface water objectives and diminution of surface water status has been

considered in the status assessment. Groundwater dependent terrestrial ecosystems and saline intrusion have not been considered.

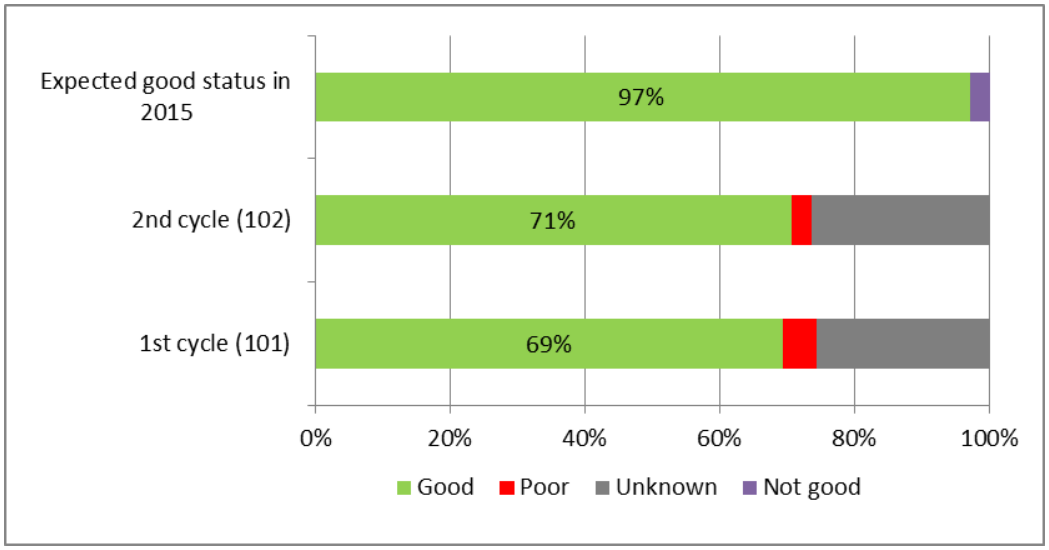
In total eight groundwater bodies (8%) are at risk of failing good quantitative status. Two groundwater bodies are at risk of failing good quantitative status due to harm to actual or potential legitimate uses or functions of groundwater and seven due to diminution of the status of groundwater associated aquatic ecosystems.

Map 5.1 Map of the most recently assessed quantitative status of groundwater bodies



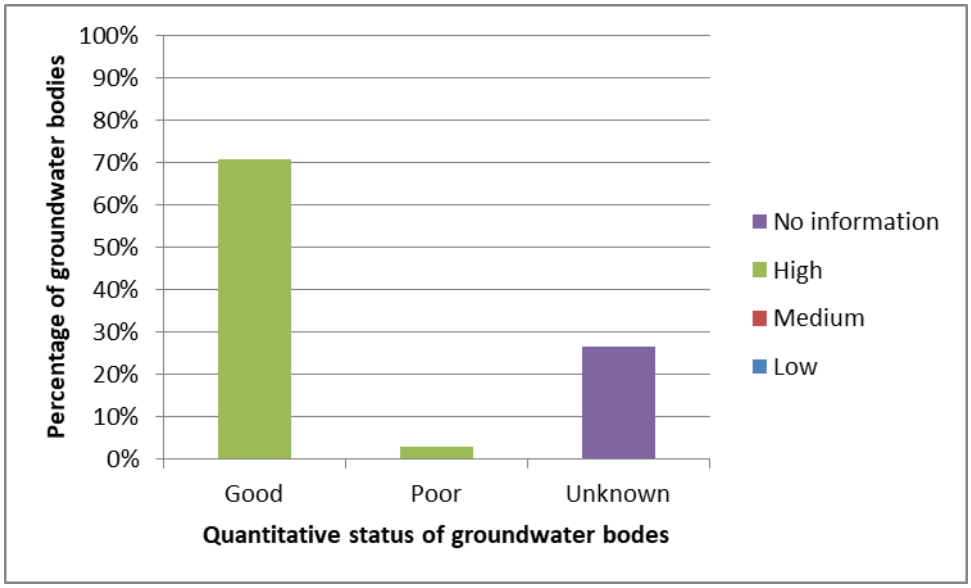
Note: Standard colours based on WFD Annex V, Article 2(2)(4).
Source: WISE, Eurostat (country borders)

Figure 5.1 ***Quantitative status of groundwater bodies in Slovakia for the second RBMP, for the first RBMP and expected in 2015. The number in parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2004 to 2012. The year of the assessment of status for first RBMP is not known***



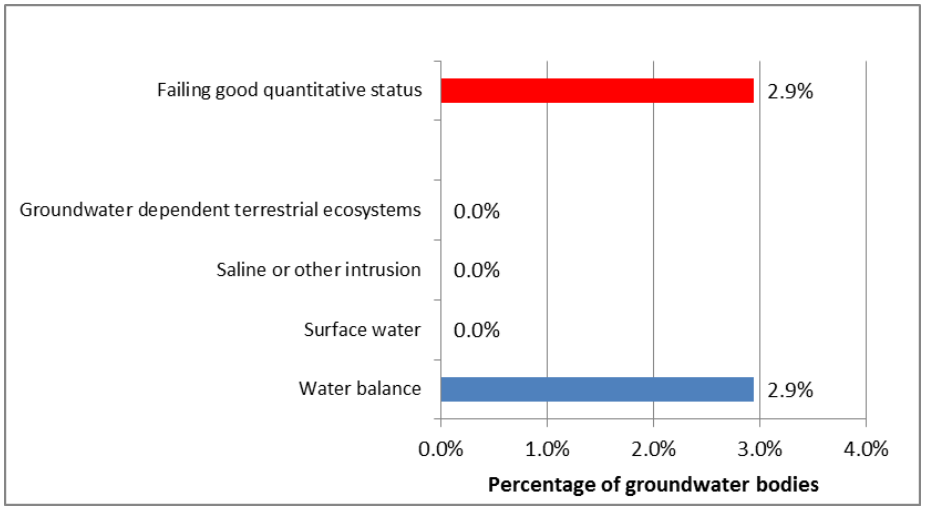
Source: WISE electronic reporting

Figure 5.2 ***Confidence in the classification of quantitative status of groundwater bodies in Slovakia based on the most recent assessment of status***



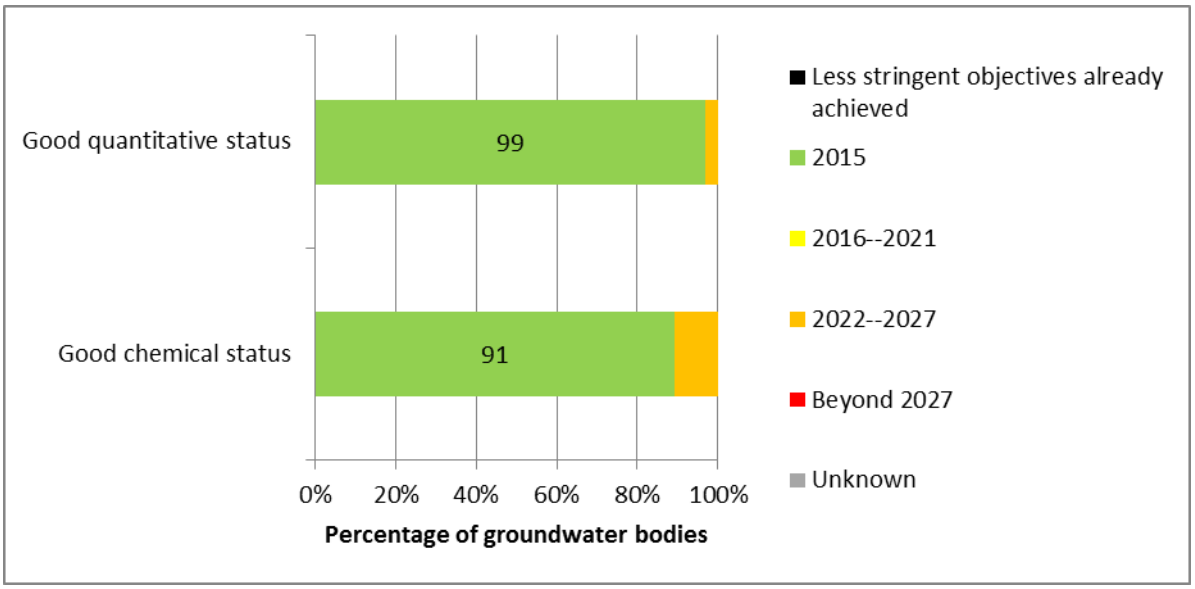
Source: WISE electronic reporting

Figure 5.3 ***Reasons for the failure of good quantitative status of groundwater in Slovakia based on the most recent assessment of status***



Source: WISE electronic reporting

Figure 5.4 ***Expected date of achievement of good quantitative and good chemical status of groundwater bodies in Slovakia. 102 groundwater bodies delineated for second RBMP***



Source: WISE electronic reporting

5.1.3 Consideration of groundwater associated surface waters and/or groundwater dependent ecosystems

Groundwater bodies with groundwater associated surface waters have not been reported. However, for seven groundwater bodies risk is related to associated surface waters.

Groundwater associated surface waters have been considered in status assessment in all river basin districts.

No groundwater bodies are linked with groundwater dependent terrestrial ecosystems and there is no related risk. Groundwater dependent terrestrial ecosystems have not been considered in status assessment.

5.2 Main changes in implementation and compliance since the first cycle

All 101 groundwater bodies from the first RBMP remained unchanged. Only one groundwater body has been added.

Assessment of the RBMP and background documents found that the RBMP of the Danube RBD summarised the evaluation of the progress made from the first planning cycle. Both RBMPs (the Danube and the Vistula) state that, in relation to quantitative monitoring, in order to evaluate the status of habitats and species of European importance, the State Nature Protection [Agency/organisation] had been developing (between 2013 and 2015) the complex information and monitoring system (KIMS) required. It was stated that once finalised, the status of habitats (favourable/unfavourable) would be evaluated and regular monitoring would be carried out of groundwater bodies in an interdisciplinary way.

The groundwater monitoring situation did slightly improve, but 28% of the groundwater bodies remain unmonitored. The assessment of RBMP and background documents found the following description, which does not fully explain why 28% of the groundwater bodies remain unmonitored: *"The groundwater monitoring program for 2009 to 2012 covered all groundwater bodies in poor quantitative status. In addition, all other groundwater bodies in quaternary sediments and in pre-quaternary rocks in good status were monitored, where the share of groundwater use exceeds 10% of the documented quantities and with at least one monitoring facility. The groundwater quantity monitoring program is aimed exclusively at bodies of groundwater in quaternary sediments and groundwater bodies in pre- quaternary rocks. Quantitative monitoring does not cover 27 geothermal waters."*

The status situation improved from 5.4% of the total groundwater body area failing good status in the first RBMP to 2.8% in the second RBMP.

5.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *There are a number of gaps in the monitoring programmes which need to be addressed.*

Assessment: This recommendation regarding monitoring has not been fulfilled. The gap in groundwater quantity monitoring is still significant (28% of groundwater bodies are not monitored for quantitative status) and remains unchanged.

Topic 6 Monitoring, assessment and classification of chemical status of groundwater bodies

6.1 Assessment of implementation and compliance with WFD requirements in the second cycle

6.1.1 Monitoring of chemical status in groundwater

The total number of groundwater bodies in Slovakia reported for the second cycle was 102 (Table 2.3). In total 28 (27.5%) groundwater bodies (27 geothermal groundwater bodies and 1 groundwater body on pre-quaternary rocks) were not subject to surveillance monitoring (Table 7). 45 of the 102 were subject to operational monitoring. For groundwater bodies not monitored, no evidence could be found to indicate that they had been classified by grouping.

The number of groundwater bodies increased from 101 in the first RBMP to 102 in the second RBMP and also the total groundwater body area remained almost the same. All 101 groundwater bodies remained unchanged since the first RBMP.

The number of groundwater bodies with surveillance monitoring increased from 62 in the first RBMP to 74 in the second RBMP. The number of monitoring sites (as listed in Table 5.3) showed an increase from 130 in the first RBMP to 176 in the second RBMP. The number of operational monitoring sites decreased significantly since the first RBMP, from 1 106 (in 60 groundwater bodies) to 415 (in 45 groundwater bodies).

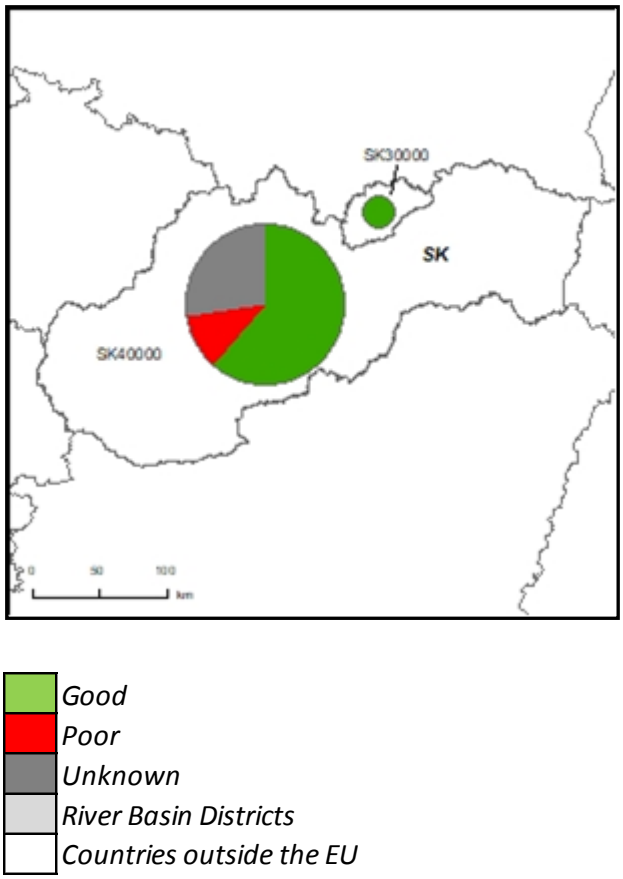
Not all substances causing risk of deterioration in chemical status were subject to monitoring. In the Danube RBMP no explanation was found why BTEX (benzene, toluene, ethylbenzene and xylene) and Petroleum products were not covered by monitoring. Except for pH, all other WFD core parameters (nitrate, ammonium, electrical conductivity and oxygen) were monitored[22]. Seven groundwater bodies (7%) were reported to be at risk of failing good chemical status (Figure 13).

[22] Slovakia subsequently clarified that for the monitoring of groundwater chemical status, 183 indicators (terrain characteristics, the basic physical and chemical parameters, trace elements, the relevant substances, pesticides and other specific organic compounds) were established. They are divided into basic and supplementary sets of indicators. The basic set of indicators was determined at all sampling points. The scope of the supplementary set was determined only in selected water bodies depending on the type of pollution affecting it. (e.g. pesticides are monitored in agricultural areas and volatile hydrocarbons in industrial areas). All substances causing risk of deterioration in chemical status were subject to monitoring. In the Danube and Vistula RBMP all BTEX (benzene, toluene, ethylbenzene and xylene) and petroleum products were monitored. WFD core parameters (nitrate, ammonium, pH, electrical conductivity and oxygen) were monitored. Only the 27 geothermal GWBs and 1 GWB in pre-quaternary rock were not monitored.

6.1.2 Assessment and classification of chemical status in groundwater

Map 6.1 and Figure 6.1 display the chemical status of groundwater bodies for the most recently assessed status. It shows that 64 of 102 groundwater bodies (63%) were of good chemical status, 11 groundwater bodies (11%) were failing good status and 27 groundwater bodies were of unknown status (26%). In terms of area this means that about 17% were failing good chemical status. Figure 6.2 shows the confidence in status classifications, which is low or even unknown for about 60% of the groundwater bodies. The number of groundwater bodies with unknown status increased from 26 in the first RBMP to 27 in the second RBMP.

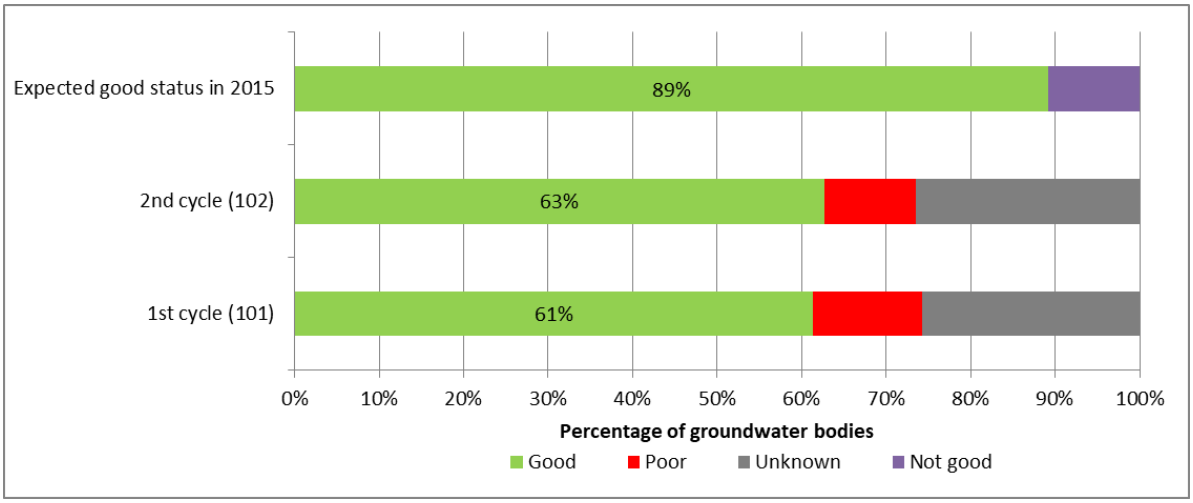
Map 6.1 ***Map of chemical status of groundwater bodies in Slovakia based on the most recently assessed status of the groundwater water bodies***



Note: Standard colours based on WFD Annex V, Article 2(4)(5).
Source: WISE, Eurostat (country borders)

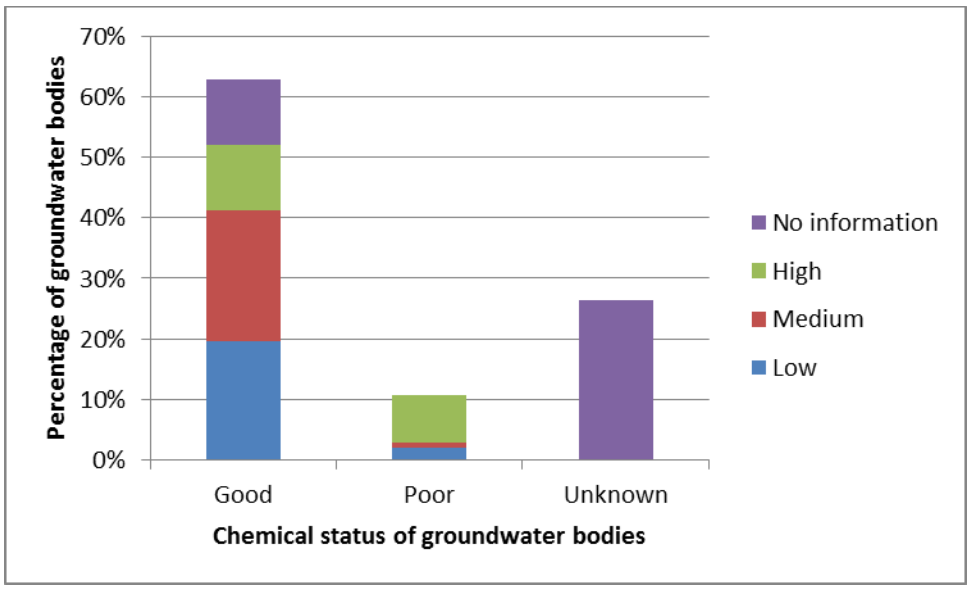
The total number of groundwater bodies failing good chemical status decreased since the first RBMP from 13 (13%) to 11 (11%) groundwater bodies (see Figure 6.2) (from 18% to 17% of the total groundwater body area). The expected date of achievement of good chemical status in Slovakia is shown in Figure 5.4. All groundwater bodies are expected to achieve good chemical status by the end of the third cycle.

Figure 6.1 ***Chemical status of groundwater bodies in Slovakia for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was in 2011. The year of the assessment of status for the first RBMP was 2007***



Source: WISE electronic reports

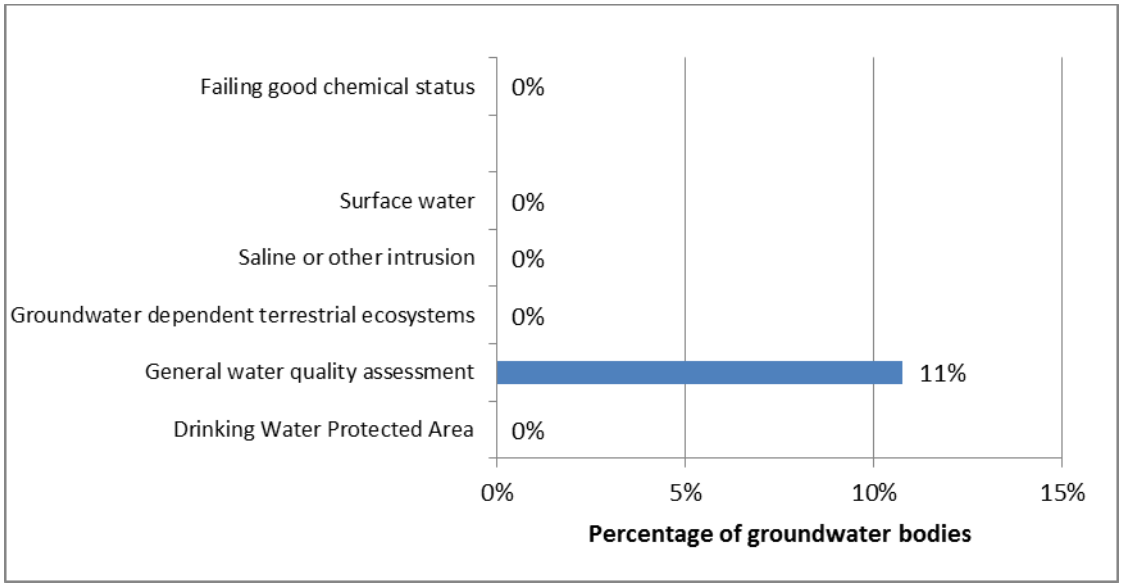
Figure 6.2 ***Confidence in the classification of chemical status of groundwater bodies in Slovakia based on the most recent assessment of status***



Source: WISE electronic reports

The reasons for the failure of good chemical status of groundwater bodies are shown in Figure 6.3. For all 11 groundwater bodies the general assessment of the chemical status for the groundwater body as a whole failed. This assessment considers the significant environmental risk from pollutants across a groundwater body and a significant impairment of the ability to support human uses.

Figure 6.3 Reasons for failing good chemical status in Slovakia for the most recent assessment of status



Source: WISE electronic reports

Figure 6.4[23] shows the pollutants causing failure of status and Figure 6.5 shows a sustained upward trend. In the Danube RBD the calculation of the extent of exceedance of a groundwater quality standard or a groundwater threshold value is based on the groundwater body area. Due to no exceedances occurring in the Vistula RBD, a method was not reported.

Groundwater threshold values have not been established for all pollutants or indicators of pollution causing a risk of failure of good chemical status. No explicit indication was found that all Groundwater Directive[24] Annex II substances have been considered, it is mentioned in the RBMP that only some substances were considered[25]. In all RBDs natural background levels have been considered in the establishment of groundwater threshold values.

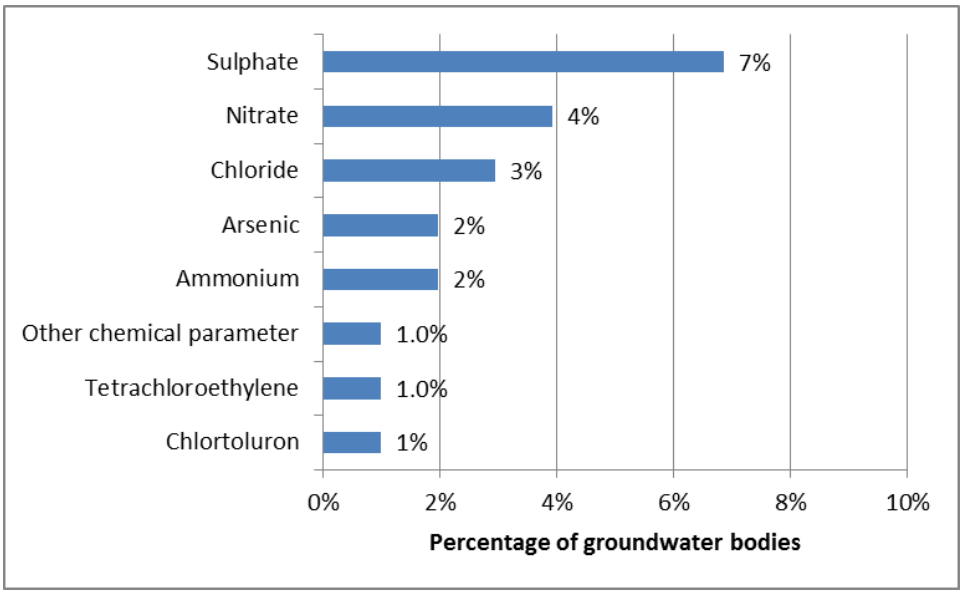
[23] It should be noted that the number of groundwater bodies reported as failing good status due to nitrates is significantly lower than indicated in the Slovak reporting under the Nitrates Directive.

[24] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006L0118-20140711

[25] Slovakia subsequently clarified that threshold values have been set for all substances listed in Annex II, Part B of Directive 2006/118 / EC. This was in turn reflected in the Government Regulation Collection Act 282/2010.

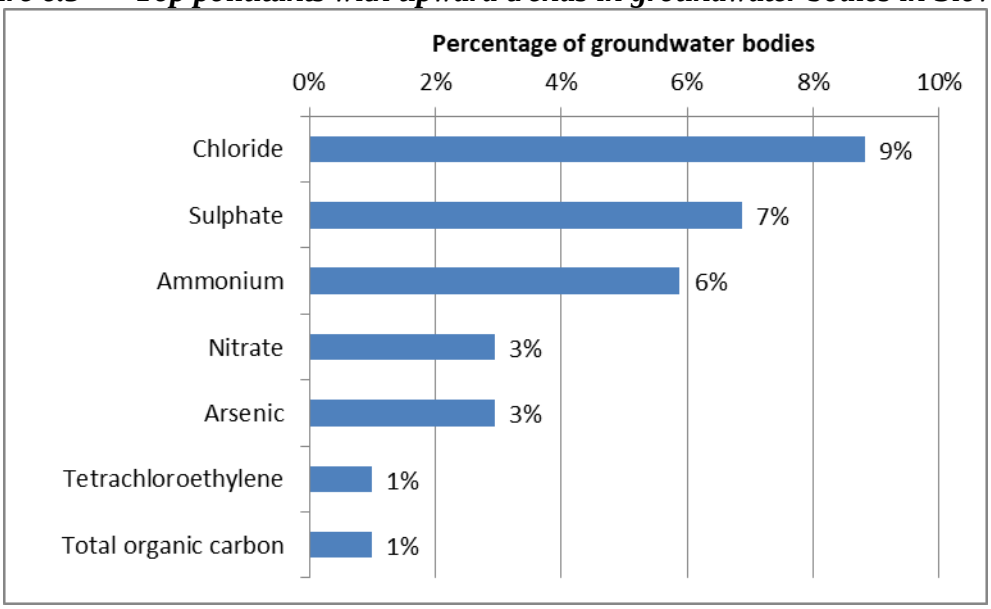
A trend and trend reversal methodology was available and assessments have been carried out in all RBDs.

Figure 6.4[26] ***Top groundwater pollutants causing failure of good chemical status in Slovakia***



Source: WISE electronic reports

Figure 6.5 ***Top pollutants with upward trends in groundwater bodies in Slovakia***



Source: WISE electronic reports

[26] Please see footnote 22.

6.1.3 Consideration of groundwater associated surface waters and/ or groundwater dependent ecosystems

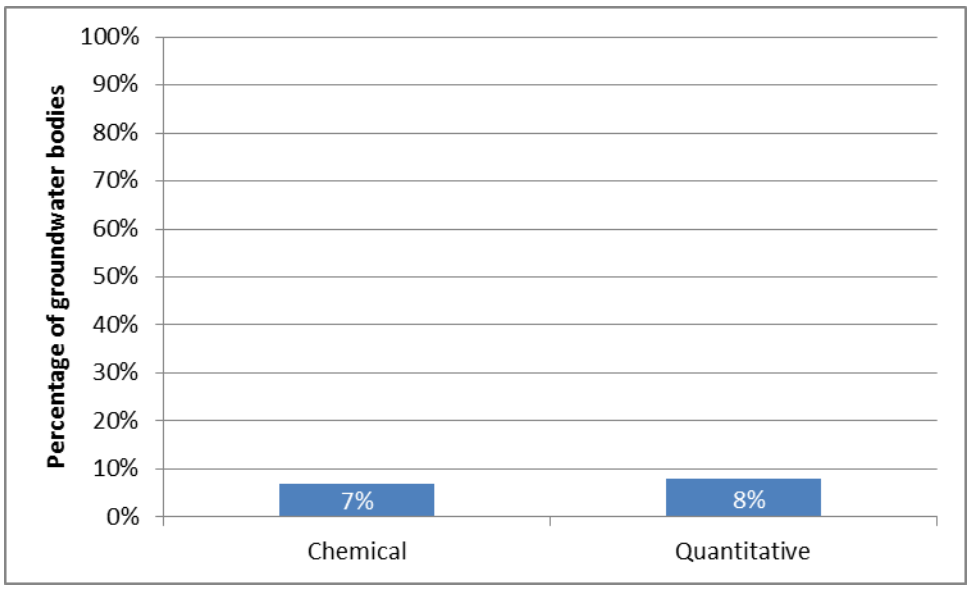
Groundwater bodies with groundwater associated surface waters have not been reported and associated surface waters were not considered in the status assessment although for one groundwater body, a risk was related to associated surface waters.

Groundwater bodies with groundwater dependent terrestrial ecosystems have not been reported and groundwater dependent ecosystems were not considered in the assessment of status although for one groundwater body, a risk was related to these ecosystems[27].

Groundwater associated aquatic ecosystems and groundwater dependent terrestrial ecosystems have not been considered in the establishment of groundwater threshold values, although as mentioned, risks have been associated.

Figure 6.6 shows the percentage of groundwater bodies at risk of failing good chemical status and good quantitative status.

Figure 6.6 Percentage of groundwater bodies in Slovakia at risk of failing good chemical status and good quantitative status for the second RBMP



Source: WISE electronic reports

[27] Slovakia subsequently clarified that the impact assessment on groundwater body contamination on the terrestrial ecosystems has not been compiled at the time of submission due to a lack of information. For the 2nd planning cycle, The State Nature Conservation Agency of Slovak Republic (SNCA SR) has proposed a list of sites, significant in the context of the groundwater dependent terrestrial ecosystems. For the assessment of the status of habitats and species, the SNCA SR has been building a comprehensive information monitoring system since 2013. After its completion, the status of habitats will be evaluated and then regular monitoring will be carried out in an interdisciplinary manner, This will be reported for the 3rd RBMPs

6.2 Main changes in implementation and compliance since the first cycle

All 101 groundwater bodies from the first RBMP remained unchanged. Only one (geothermal) groundwater body was added.

The RBMP and background documents stated that, in comparison to the first cycle, chemical status was assessed in accordance with the requirements in Groundwater Directive[28] Annex III only for those quaternary and pre-aquatic groundwater bodies, which were classified in the first RBMP as being of poor chemical status. It was also mentioned that a trend assessment methodology had been developed. The results of the trend assessments were one of the criteria for assessing the status of groundwater bodies.

The level of monitoring has improved as more groundwater bodies were covered by more surveillance monitoring sites. However, around 28 % of groundwater bodies (27 geothermal GWBs and 1 GW in pre-quaternary rocks) were not monitored. Slovakia clarified that all substances causing risk were monitored even though initially the assessment found the contrary.

Chemical status improved marginally with the number of groundwater bodies failing good chemical status decreasing from 13 to 11 and the percentage of the total groundwater body area failing good chemical status decreasing from 18% to 17%.

6.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *There are a number of gaps in the monitoring programmes which need to be addressed.*

  Assessment: The recommendation regarding monitoring of groundwater bodies has not been fulfilled. The coverage of surveillance monitoring was increased but the gap is still significant (about 28% of the groundwater bodies). Not all substances/indicators causing risk are subject to operational monitoring.

[28] Groundwater Directive (GWD): Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.

- Recommendation: *A methodology for trend analysis in groundwater assessment should be in place, even if it was not possible to carry out such an analysis during the first RBMP cycle. This needs to be in place for the second cycle.*

  Assessment: The recommendation regarding trend assessment has been fulfilled. A trend analysis was carried out for the *second RBMPs* and trend reversal methodology is reported as being available and assessments have been performed in both RBDs.

Topic 7 Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential

7.1 Assessment of implementation and compliance with WFD requirements in the second cycle for designation

7.1.1 Designation of Heavily Modified and Artificial Water Bodies

The WFD requires a review of designation every six years. The number of river water bodies designated as heavily modified water bodies has increased since the first RBMP: in the Danube RBD, the number has increased from 53 to 85 river heavily modified water bodies (from 3.2% to 5.9% of total river water bodies) and in the Vistula RBD, one river water body has been designated as a heavily modified water body compared to none in the first RBMP (Figure 31). There are 23 water bodies which were originally reservoirs created by damming rivers, which have subsequently been designated as river heavily modified water bodies.

The number of designated river artificial water bodies increased significantly since the first RBMP from seven (0.4% of total river water bodies) to 75 (5.2% of total river water bodies, see Figure 7.1).

The main water use for which river water bodies have been designated as heavily modified water bodies is for flood protection, followed in some cases by hydropower, irrigation, tourism/recreation, industry and drinking water supply. The main physical alterations of river heavily modified water body are weirs/dams/reservoirs and channelisation/straightening/bed stabilisation/bank reinforcement.

When defining heavily modified or artificial water bodies, as in the first planning cycle, a step-by-step approach that follows the Common Implementation Strategy Guidance Document No. 4[29] was used.

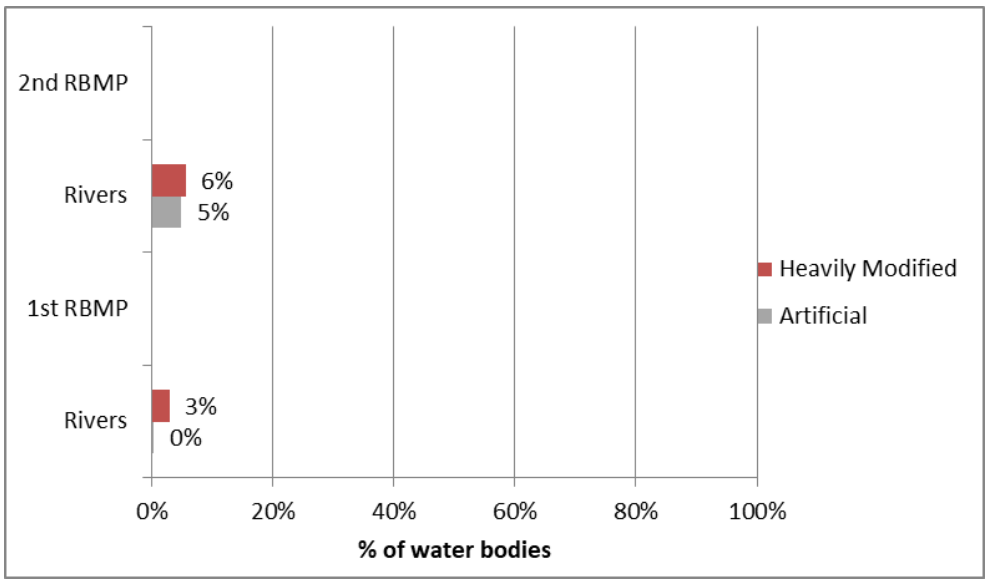
The national methodology describes how the significant adverse effects of restoration measures on the use and the wider environment (Article 4(3)(a)) have been defined. In assessing the significance of the adverse effects of proposed measures on other water uses, the socio-economic aspects of the region have been taken into account: for example in the case of flood protection, this has considered the degree of direct threat to protected territories and to land owners; in the case of hydropower, losses of electricity generation have been compared

[29] https://circabc.europa.eu/sd/a/f9b057f4-4a91-46a3-b69a-e23b4cada8ef/Guidance%20No%204%20-%20heavily%20modified%20water%20bodies%20-%20HMWB%20(WG%202.2).pdf

with benefits for improving water status for large hydropower plants. No further information was found on specific criteria agreed at national level, although decisions for this type of assessment are possibly taken on case-by-case basis at water body level.

If the effect of the proposed restoration measures was shown to be significant on the use or the wider environment, the water body was also evaluated in terms of other means to achieve the beneficial objectives provided by the hydromorphological alterations. In the Vistula RBMP, alternative sources of water for irrigation of agricultural land were assessed as to whether they could be a better environmental option. In case of flood protection in the Danube RBMP, flood protection within municipalities cannot be ensured by other technical means that would provide a better environmental option, due to spatial limitations and the purpose of flood protection (protection of life and human health, avoidance of property damage). In the case of energy production, alternative sources of energy such as photovoltaic, biomass, or wind power plants to ensure electricity generation as alternatives to hydroelectric power plants were not considered to provide a better environmental option.

Figure 7.1 Proportion of total water bodies in each category in Slovakia that has been designated as heavily modified or artificial



Source: WISE electronic reports

7.1.2 Definition of Good Ecological Potential for Heavily Modified and Artificial Water Bodies

Good ecological potential is reported as defined in both RBDs, using the Common Implementation Strategy Guidance approach (approach based on biological quality elements as

illustrated in Common Implementation Strategy Guidance No. 4[30]). In both RBDs, definition of good ecological potential has been carried out for groups of heavily modified water bodies/artificial water bodies of the same use/physical modification.

Good ecological potential is also reported as being defined by biological conditions in both RBDs. The biological quality elements for which biological values have been derived to define maximum ecological potential and good ecological potential are reported as being macrophytes, phytobenthos, benthic invertebrates and phytoplankton. According to the WISE reporting, a comparison between good ecological potential and good ecological status has been made in both RBDs and mitigation measures for defining good ecological potential have been reported at RBD level.

A methodology for defining good ecological potential in rivers is reported to be in place. The preliminary methodology for the classification of heavily modified and artificial water bodies has been described in the RBMPs (isolated channels, drainage systems, multipurpose and drinking water reservoirs). The RBMPs also describe the relevance of the selected biological quality elements for the definition of good ecological potential. No information is given with regard to the assessment of mitigation measures, whether the effects of such measures on biology are assessed, or whether actual values for the biological quality elements at good ecological potential have been estimated. Slovakia subsequently clarified that the effect of the measures could not be assessed yet in 2015, as these were not accomplished yet.

There is one method for assessing fish in rivers which is sensitive to altered habitats due to both hydrological and morphological changes as well as one method for benthic invertebrates which is only sensitive to morphological changes. The methods for assessing phytoplankton, macrophytes and phytobenthos are not sensitive to hydromorphological changes.

7.2 Main changes in implementation and compliance since the first cycle

As described, there have been modifications in the extent of designation of water bodies as heavily modified or artificial since the first RBMPs.

In the first planning cycle, due to the time-consuming nature of the final heavily modified water body definition process, not all candidate heavily modified water bodies were tested for final designation; the process rather concentrated on large and medium-sized streams with a surface catchment area over 100 km^2 and only partly on streams with small flows with a surface catchment area below 100 km^2. For this reason, most candidate heavily modified water

[30] https://circabc.europa.eu/sd/a/f9b057f4-4a91-46a3-b69a-e23b4cada8ef/Guidance%20No%204%20-%20heavily%20modified%20water%20bodies%20-%20HMWB%20(WG%202.2).pdf

bodies in small flows were considered to be natural bodies of surface water. The testing process for finalising heavily modified water body designation continued into the second planning cycle. In 2010-2012, further surface water bodies which were preliminarily identified as heavily modified water bodies with small flows were tested and part of these were designated as heavily modified water bodies and part as artificial water bodies. In a number of water bodies, the test results have not yet been confirmed as they are currently undergoing assessment processes based mainly on ichthyologic aspects related to hydromorphological impacts.

In addition, based on the review/update of the hydromorphological impact screening of all surface water bodies, some changes have been identified in the physical characteristics in some water bodies, in particular as a result of the implementation of small hydropower plants and/flood defence schemes. All new changes and their potential impact on the ecological status/potential of the relevant surface water bodies have been the subject of expert judgment and, based on the results of this assessment, were subject to testing for designation as heavily modified water bodies or artificial water bodies.

The methodology used for heavily modified water body designation appears to be very similar to that used in the first RBMP, but there is clear evidence that the designations from the first planning cycle have been reviewed, as described above.

In the first cycle, the methodology for defining good ecological potential in Slovakia was incomplete because the assessment methods for the biological quality elements were not fully developed. In the second cycle, good ecological potential has been reported as being defined also in terms of biology. The preliminary methodology for the classification of heavily modified and artificial water bodies has been described in the RBMPs (isolated channels, drainage systems, multipurpose and drinking water reservoirs). The RBMPs also describe the relevance of the selected biological quality elements for the definition of good ecological potential.

7.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation (report 2012): *The designation of heavily modified water bodies should comply with all the requirements of Article 4(3). The assessment of significant adverse effects on their use or the environment and the lack of significantly better*

environmental options should be specifically mentioned in the RBMPs. This is needed to ensure transparency of the designation process.

Assessment: Overall, the methodology for designation of heavily modified water bodies has not changed since the first RBMPs but there is clear evidence that the designations from the first planning cycle have been reviewed. The national methodology describes how the significant adverse effects of restoration measures on the use and the wider environment have been defined but no specific criteria agreed at national level are given (it seems that decisions for this type of assessment are taken on case-by-case basis). No information was found on the details of the outcome of assessing significant adverse effects for individual water bodies. The assessment in the RBMPs and background documents has nevertheless included information on other means to achieve the beneficial objectives provided by the hydromorphological alterations (e.g. for heavily modified water bodies related to flood protection, drinking water supply, energy production and irrigation).

Based on the information found, it can be concluded that this recommendation has been partially fulfilled.

- Recommendation (report 2012): *The methodology for defining good ecological potential in Slovakia is incomplete because the assessment methods for the biological quality elements are not yet fully developed. More work needs to be done fulfilling the requirements of WFD Article 4(1)(a)(iii)*[31]*, collecting the missing data, and updating evaluation systems and classification.*

  Assessment: In the second RBMPs, good ecological potential was reported in WISE as defined, also in terms of biology, for heavily modified river water bodies. However, no information is given about the assessment of mitigation measures, whether the effects of such measures on biology are assessed, or whether and how actual values for the biological quality elements at good ecological potential have been estimated. Therefore, on the basis of the evidence available, it has been concluded that this recommendation has been partially fulfilled.

[31] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

Topic 8 Environmental objectives and exemptions

8.1 Assessment of implementation and compliance with WFD requirements in the second cycle

8.1.1 Environmental objectives

The environmental objectives are defined in Article 4 of the WFD. The aim is long-term sustainable water management based on a high level of protection of the aquatic environment. Article 4(1) defines the WFD general objective to be achieved in all surface and groundwater bodies, i.e. good status by 2015. Within that general objective, specific environmental objectives are defined for heavily modified water bodies (good ecological potential and good chemical status by 2015[32]), groundwater (good chemical and quantitative status by 2015) and for Protected Areas (achievement of the objectives of the associated Directive by 2015 unless otherwise specified).

Environmental objectives for ecological and chemical status in surface water and quantitative and chemical status in groundwater have been reported in all RBDs. It is noted that nearly all surface water bodies were reported to be in good chemical status (see Chapter 4).

Member States are also required to specify additional environmental objectives and standards in Protected Areas. An assessment of such additional objectives for Slovakia is provided in Chapter 15 of this report.

Assessments of the current status of surface and groundwater bodies in Slovakia are provided elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6); status of surface and groundwater bodies associated with Protected Areas (Chapter 15).

For the second cycle plans, Member States are required to report the date when they expect each surface and groundwater body to meet its environmental objective. This information is summarised for Slovakia elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5), and; chemical status of groundwater bodies (Chapter 6).

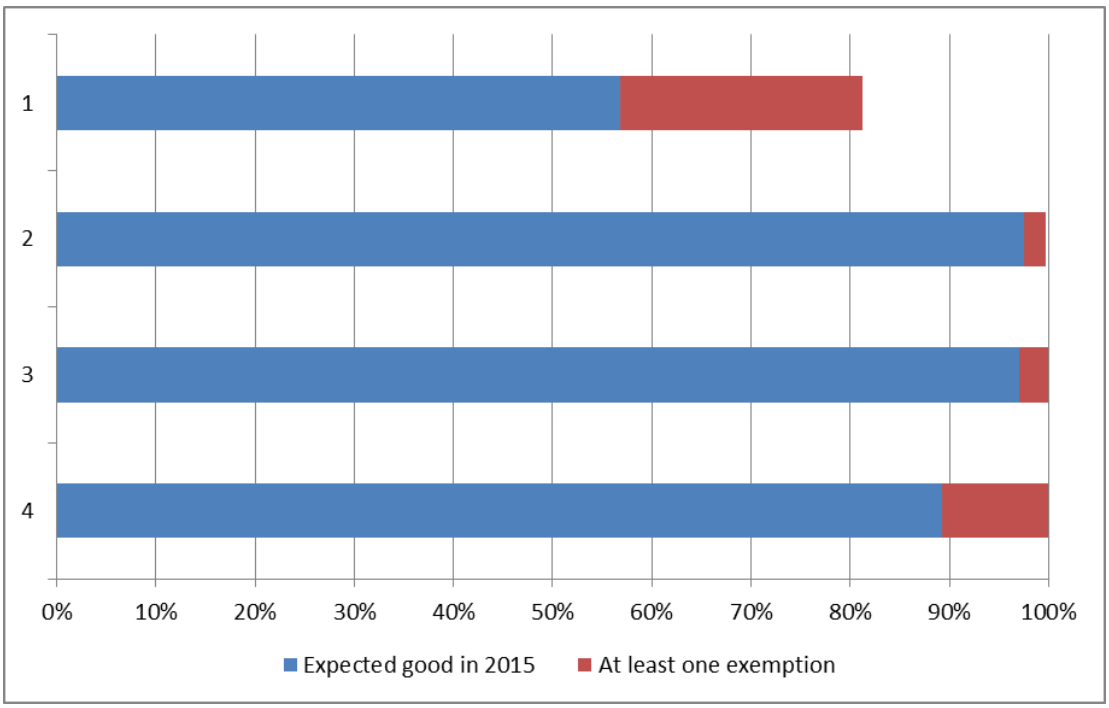
[32] For priority substances newly introduced by Directive 2013/39/EU, good status should be reached by 2027, and for the 2008 priority substances, for which the Environmental Quality Standards were revised by Directive 2013/39/EU, good status should be reached in 2021.

8.1.2 Exemptions

Where environmental objectives have not been met a series of exemptions can be applied.

Figure 8.1 summarises the percentage of water bodies expected to be at least in good status in 2015 and the use of at least one exemption in Slovakia for the four main sets of environmental objectives. Exemptions are most widely applied in relation to ecological status/potential objectives.

Figure 8.1 ***Water bodies in Slovakia expected to be in at least good status in 2015 and use of exemptions. 1 = Surface water body ecological status/potential; 2 = Surface water body chemical status; 3 = Groundwater body quantitative status; 4 = Groundwater body chemical status***

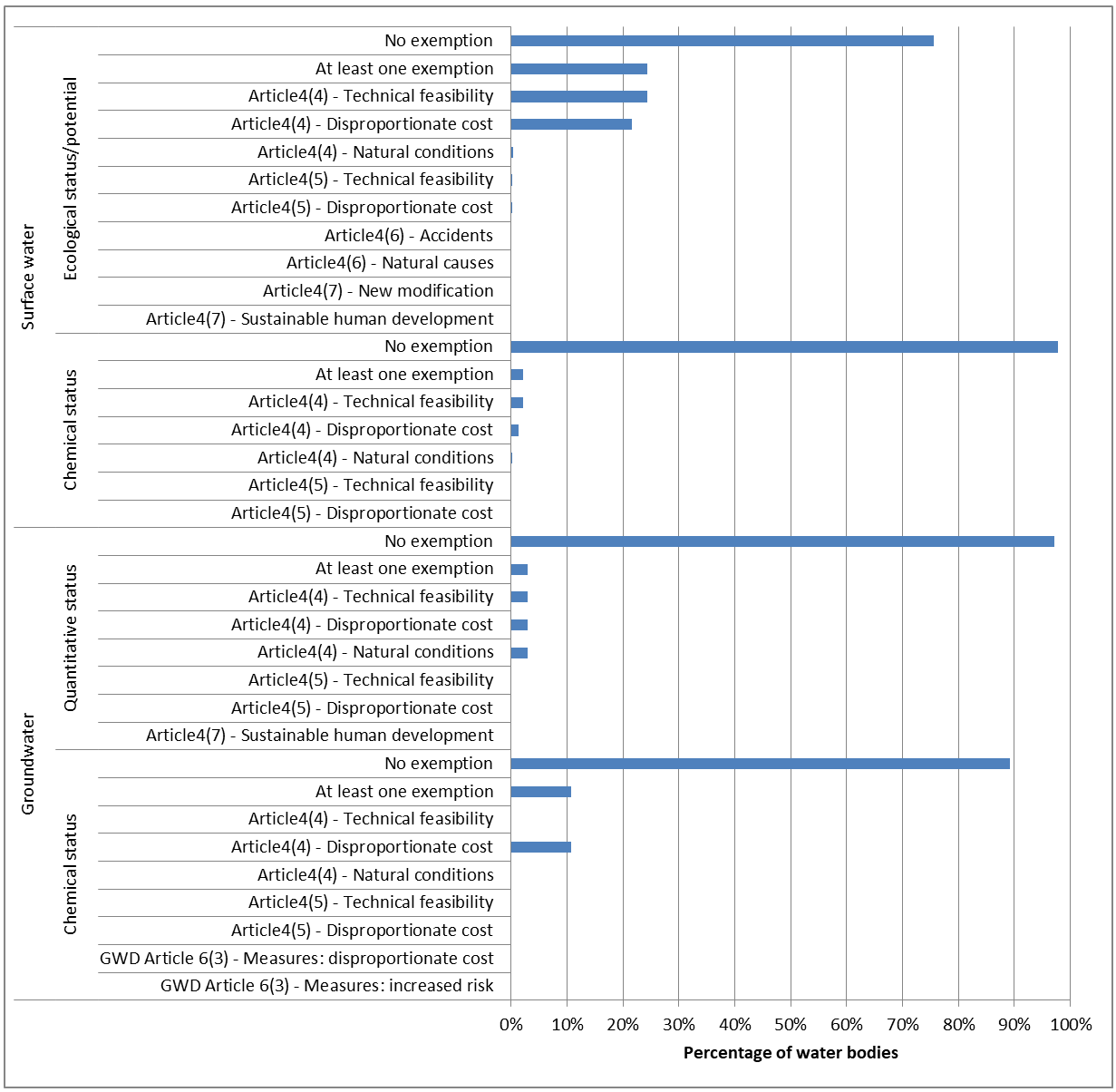


Source: WISE electronic reports

Article 4 of the WFD allows under certain conditions for different exemptions to the objectives: an extension of deadlines beyond 2015, less stringent objectives, a temporary deterioration, or deterioration / non-achievement of good status / potential due to new modifications, provided a set of conditions is fulfilled. The exemptions under WFD Article 4 include the provisions in Article 4(4) - extension of deadline, 4(5) - lower objectives, 4(6) - temporary deterioration, and 4(7) - new modifications / new sustainable human development activities. Article 4(4) exemptions may be justified by: disproportionate cost, technical feasibility or natural conditions, and Article 4(5) by disproportionate cost or technical feasibility.

Figure 8.2 summarises the percentage of water bodies subject to each type of exemption (and reason) in relation to the four types of environmental objective in Slovakia.

Figure 8.2 ***Type of exemptions applied to surface water and groundwater bodies for the second RBMP in Slovakia. Note: Ecological status and groundwater quantitative status exemptions are reported at the water body level. Chemical exemptions for groundwater are reported at the level of each pollutant causing failure of good chemical status, and for surface waters for each Priority Substances that is causing failure of good chemical status***



Source: WISE electronic reports

Application of Article 4(4)

While the total number of water bodies decreased compared to the first cycle, Article 4(4) has been applied more widely in surface water. In the Vistula RB, Article 4(4) was applied for nine (12.1%) water bodies as regards good ecological status/potential, with a length of 216 km (26.9%). One exemption was applied, for water body SKP0055 Vrbovský potok, due to exceeding the environmental quality standard for a pesticide. In the Danube good ecological status/potential is achieved in 55% of the water bodies and chemical status in 98%. Table 1 shows the number of water bodies with exemptions relating to Priority Substances failing to achieve good chemical status.

The reason for the application of Article 4(4) in surface waters in the Danube and the Vistula RBD are technical feasibility, disproportionate costs and natural conditions.

In the Vistula RBD no exemptions were applied for groundwater in the first RBMP and the situation has not changed in the second cycle. The application of Article 4(4) in the Danube RBD has decreased for groundwater and the remaining exemptions are justified by technical feasibility, disproportionate costs and natural conditions. Article 4 (4) of the WFD is now applied for 11 groundwater bodies in poor chemical status (7 quaternary and 4 pre-quaternary) for nitrogenous substances and two cases for pesticides chlorotoluron and phenmedipham and for three groundwater bodies relating to quantitative status.

Slovakia has developed a Methodology for Economic Explanation of Exemptions under Article 4(4) and 4(5) of the WFD[33] for determining/deciding whether a water body should be exempted from achieving the environmental objectives under Article 4 (4) or pursuant to Article 4(5). The methodology contains sections on essential questions related to Article 4(4) and Article 4(5) and guidance on the logic to be applied when applying one of the two provisions. Further explanation and guidance on how these two exemptions should be applied is given. The following criteria were considered:

- Whether the implementation of the proposed measures are technically feasible within a given time period;
- Whether or not the costs over this time period will be disproportionately high;

[33] http://www.vuvh.sk/rsv2/WFD_reporting/2016

- Whether the water body is exposed to one or more impacts (solving one of the problems in the given water body does not necessarily ensure the achievement of the objective);
- Whether natural conditions make it possible to achieve the necessary improvements to reach environmental objectives in the required time.

For technical feasibility the criteria to be considered are listed as:

- if the cause of the risk of not meeting the environmental targets is not sufficiently understood because water bodies are usually exposed to multiple impacts;
- if the technical solution is not possible to be implemented in a given time period i.e. within three years of the adoption of the management plan for the RBD, and the costs for such a short time span would be disproportionately high. The main problems associated with technical feasibility of proposed measures in the given time period include:
    - time requirements for design and construction;
    - the lengthy approval of projects;
    - lengthy public procurement of works contracts;
    - settlement of property rights, and;
    - high financial demands, requiring the pooling of all public resources.

For the assessment of disproportional costs, the methodology recommends the use of the following analytical tools:

- affordability,
- cost-effectiveness analysis,
- social and sectoral impacts, and;
- benefit assessment.

The main drivers behind exemptions to surface water are agriculture, industry, flood protection and urban development. The main drivers for exemptions to groundwater bodies are agriculture, climate change, energy, industry, urban development and unknown drivers.

The main pressures to surface water responsible for exemptions in both basins come from a broad range of activities including urbanisation, industry, agriculture, introduced species and diseases and dams, barriers and locks as well as physical alteration of channel/bed/riparian areas and atmospheric deposition (Table 8.1). In addition, in Slovakia, abstraction and hydrological alterations are reported. In both basins the main drivers behind these pressures are industry, agriculture, flood protection and urban development.

The main pressures to groundwater bodies that are responsible for exemptions are abstraction for public water supply and point and diffuse pollution with the main drivers being urban development, climate change, energy, industry and agriculture (Table 8.2).

Table 8.1 Pressure responsible for Priority Substances in Slovakia failing to achieve good chemical status and for which exemptions have been applied

Significant pressure on surface water bodies	Failing Priority Substances	Article 4(4) - Technical feasibility exemptions	Article 4(5) - Technical feasibility exemptions
	Number	Number	Number
1.3 - Point - Industrial Emissions Directive plants	4	6	0
1.4 - Point - Non Industrial Emissions Directive plants	2	2	0
1.5 - Point - Contaminated sites or abandoned industrial sites	1	1	0
2.5 - Diffuse - Contaminated sites or abandoned industrial sites	5	7	0
2.7 - Diffuse - Atmospheric deposition	3	12	0
8 - Anthropogenic pressure - Unknown	6	17	0
9 - Anthropogenic pressure - Historical pollution	2	4	0

Source:, WISE electronic reports

The impacts causing Article 4(4) exemptions in groundwater are organic, chemical and nutrient pollution and a lowered water table. For surface waters, these are organic and nutrient pollution as well as altered habitats.

Table 82 Pressure on surface water bodies responsible for pollutants in Slovakia failing to achieve good chemical status in groundwater and for which exemptions have been applied

Significant pressure on groundwater	Number of failing pollutants	Number of exemptions
		Article 4(4) - Disproportionate cost
1.5 - Point - Contaminated sites or abandoned industrial sites	1	1
1.6 - Point - Waste disposal sites	2	3
2.2 - Diffuse - Agricultural	6	18
2.5 - Diffuse - Contaminated sites or abandoned industrial sites	1	1
2.6 - Diffuse - Discharges not connected to sewerage network	4	10
2.8 - Diffuse - Mining	1	2
8 - Anthropogenic pressure - Unknown	1	2

Source: WISE electronic reports

Application of Article 4(5)

Article 4(5) was not applied in the first RBMP but has been applied in the second cycle in the Danube RBD in one surface water body due to technical feasibility and disproportionate costs. The driver behind this is the industry sector, impacting the water body by chemical, nutrient and organic pollution.

The impacts causing Article 4(5) exemptions in surface water are organic, chemical and nutrient pollution although pressures have not been reported in Table 1 for Priority Substances.

Application of Article 4(6)

Article 4(6) has not been applied.

Application of Article 4(7)

Article 4(7) has not been reported to be applied. Exemptions under Article 4(7) due to new infrastructure projects are not yet in place in the management plan of the Danube and Vistula RBD. The RBMPs include forward-looking objectives for infrastructure projects, the implementation of which originates from sectoral policies and other strategic development documents which determine the basic policy-strategic framework for the long-term development of individual sectors/areas of the Slovak economy.

Since the implementation of these prospective infrastructure projects by implementing specific projects may lead to new changes in the physical (hydromorphological) characteristics of the surface water bodies or changes in the levels of the bodies of groundwater as a prerequisite for issuing a territorial decision on the implementation of these projects, their assessment under Article 4(7) of the WFD will be required in the future.

Application of Article 6(3) GWD

No exemptions according to Article 6(3) Groundwater Directive[34] have been applied.

8.2 Main changes in implementation and compliance since the first cycle

While the total number of water bodies decreased compared to the first cycle, Article 4(4) has been applied more widely in surface water. In the second planning cycle (2015-2021) in Slovakia, exemptions for surface water bodies were applied by extending the deadline for achieving good status by applying Article 4(4) and in one case by applying lower objectives

[34] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006L0118-20140711

according to Article 4(5). Exemptions related to chemical status on the basis of technical feasibility are applied due to the contamination of surface water bodies by specific synthetic substances and non-synthetic substances. The Application of Article 4(4) in the Danube RBD has decreased for groundwater bodies. The exemption under Article 4(4) was applied for groundwater bodies for nitrates and pesticides. For both RBDs exemptions according to Article 4(6) were not applied in the first RBMPs and also not in the second RBMPs.

In the first RBMPs no information was provided on the application of exemptions according to Article 4(7). For the second RBMPs it was stated that Article 4(7) has not been applied.

8.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM reports requested action on the following:

- Recommendation: *Indicate in the second RBMPs when WFD objectives will be achieved. Exemptions should be adequately justified at water body level, and in particular Slovakia needs to ensure compliance with Article 4(7) of the WFD in the second RBMP cycle.*

  Assessment: The recommendation has been implemented as justifications for exemptions are provided at water body level. Criteria have been developed for the application of "technical unfeasibility and disproportionate costs". This recommendation has been fulfilled. *With regard to Article 4(7) see further below.*

- Recommendation: *Make sure that new hydromorphological modifications (e.g. new hydropower plants, new or reconstructed drainage, etc.) comply with the requirements of the WFD for these exemptions, and are adequately justified and supported by a proper assessment of alternative solutions and include all necessary mitigation measures.*

  Assessment: Article 4(7) has not been applied but the RBMP outlines that future infrastructure projects will require the application of the Article 4(7) procedures. Therefore further information will be needed to assess whether the recommendation has been fulfilled.

- Recommendation: *A large number of exemptions have been applied in this first cycle of RBMPs. While the WFD provides for exemptions, specific criteria must be fulfilled for their use to be justified. The application of exemptions needs to be more transparent and the reasons for the exemptions should be clearly justified in the plans. The high number of exemptions applied in these first RBMPs is a cause for concern.*

Assessment: The recommendation has been partly fulfilled as the number of exemptions for groundwater decreased but the number for surface water bodies increased. Criteria for exemptions have been elaborated.

- Recommendation: *Only little improvement of the water status is expected by 2015 and the objectives for subsequent planning deadlines are not always clear.*

  Assessment: Deadlines for meeting WFD objectives are set. The recommendation has been fulfilled.

Topic 9 Programme of measures

The aim of this chapter is to provide an overview of the PoM reported by Member States; more specific information on measures relating to specific pressures (for example arising from agriculture) is provided in subsequent chapters.

The Key Types of Measures (KTM) referred to in this section are groups of measures identified by Member States in the PoM, which target the same pressure or purpose. The individual measures included in the Programme of Measure (being part of the RBMP) are grouped into Key Types of Measures for the purpose of reporting. The same individual measure can be part of more than one Key Types of Measure because it may be multi-purpose, but also because the Key Types of Measures are not completely independent silos. Key Types of Measures have been introduced to simplify the reporting of measures and to reduce the very large number of Supplementary Measures reported by some Member States (WFD Reporting Guidance 2016).

A Key Type of Measure may be one national measure but it would typically comprise more than one national measure. The 25 predefined Key Types of Measures are listed in the WFD Reporting Guidance 2016.

The Key Type of Measures should be fully implemented and made operational within the RBMP planning period to address specific pressures or chemical substances and achieve the environmental objectives.

9.1 Assessment of implementation and compliance with WFD requirements in the second cycle

9.1.1 General issues

An indication as to whether or not measures have been made operational is when they have been reported as being planned to tackle significant pressures (Key Types of Measure level). Significant pressures are also reported at the water body level. It would be expected that there would be measures planned to tackle all significant pressures. For surface water, KTMs were reported for most significant pressures in both RBDs; the exceptions were “Barriers etc. – recreation” in SK30000 (Vistula), “Barriers etc. – navigation” in SK40000 (Danube), and “Anthropogenic pressures – unknown” in both RBDs. For groundwater KTMs were reported for four out of nine pressure types in the Danube RBD; no significant pressures were reported

for the Vistula RBD. Some additional KTMs were included for which no significant pressures were identified, including, for the Danube RBD for groundwater and surface water, individual chemical substances/priority pollutants.

For each RBD Slovakia has mapped the number of national basic measures and national supplementary measures incorporated into each KTM; in total there are 22 national basic measures mapped against eight KTMs, and 23 national supplementary measures against 10 KTMs. There are 12 KTMs in total; all except KTM24 – Adaptation to climate change apply to both RBDs. The basic measure types have also been reported; all relate to Articles 11(3)i), g), h), or d).

Links to documents on Article 11(3)(c-k) basic measures are provided, and information on the inventory of national basic measures, including supplementary measures is also provided.

For both RBDs all KTMs, except KTM21 - Pollution from urban areas etc., is reported to be tackling significant pressures covered by KTMs mapped against national measures, although for the Vistula RBD not all KTMs mapped appear against individual pressures, therefore it is not clear if these are relevant/will be made operational.

The percentage of water bodies not expected to achieve good status/potential by 2027 has been identified as a zero for all significant pressures on surface waters for both RBDs (information provided for nine sub-basins of the Danube RBD). For groundwater in the Danube RBD "no information" has been indicated against all significant pressures, and there are no significant pressures on groundwater in the Vistula RBD.

KTMs have been mapped against substances in groundwater in the Danube RBD only; all causing failure of objectives have been addressed. There is no information for River Basin Specific Pollutants in surface water for the Danube RBD, and nothing was reported for groundwater or surface water in the Vistula RBD. The reason is that no substance causes failure of WFD objectives for groundwater in the Vistula RBD, all groundwater bodies were classified at good status.

KTMs have been reported for 4 of 11 Priority Substances (individual chemicals or groups of substances) causing failure of WFD objectives in the Danube RBD; all are KTM14 – Research, improvement of knowledge base reducing uncertainty. No KTM was reported in the Vistula RBD, where one group of substances caused failure of objectives in one water body. The number of surface water bodies failing objectives has also been listed for both RBDs.

Slovakia reported quantitative indicators and gap values, as well as KTM indicators and values for most significant pressures (including individual chemical / Priority Substances) on groundwater and surface water for the Danube RBD and for surface water in the Vistula RBD (no significant pressures were reported on groundwater in the Vistula RBD). In most cases the gap values were for 2015 and 2021, with relatively modest achievements or none expected by 2021. For groundwater in the Danube RBD the gap values were for 2015 only (except for chemical substances which were for 2015 and 2021) and a number of gap indicators referred to exemptions. No gap values were presented for 2027.

Cost-effectiveness analysis is an appraisal technique that provides a ranking of alternative measures on the basis of their costs and effectiveness, where the most cost-effective measure of package of measures has the highest ranking. In the first as well as second cycle the cost-effectiveness analysis of measures was performed. For the second cycle a combination of qualitative and quantitative cost-effectiveness analysis was carried out in both RBDs to support the selection of measures proposed under the 2015-21 PoM. No further details have been provided on prioritisation of measures. Links to relevant documents have been provided.

A critical factor in the success of the implementation of the PoM is the availability of funding to support the investments required. Investment costs have been reported for the first cycle (covering years 2009-15) for both RBDs as the total for Article 11(3)(b-l)/11(4)/11(5) (€1 086 million at Member State level). For the second cycle investment and annual costs were presented for the years 2016-21 for both RBDs separately for Article 11(3)(a) (measures required to implement Community legislation for the protection of water) (€1685 million investment and €281 million annual costs at Member State level); and Article 11(3)(b-l)/11(4)/11(5) (all other measures) (€370 million investment and €62 million annual costs at Member State level); depreciation has not been included in any calculations. European Union investment funding figures were also presented for the first cycle and estimated for the second cycle. Links to relevant documents have been provided.

A clear financial commitment has been secured for the implementation of the PoM in both RBDs. On a sectoral basis, commitments have been secured for both RBDs for Agriculture, Industry, Urban, Hydropower and Flood Protection, whereas Transport, Energy, Aquaculture and Recreation were identified as “not applicable” in both RBDs.

Coordination with the Marine Strategy Framework Directive is not relevant as Slovakia is landlocked.

The RBMPs and Floods Directive Flood Risk Management Plans have been integrated in both RBDs; (i) joint consultation of RBMPs and Flood Risk Management Plans was carried out, (ii) the objectives and requirements of the Floods Directive were considered in the second RBMPs and PoM, (iii) drought management and use of Natural Water Retention Measures have been included in the PoM, (iv) the design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, has been adapted to take account of WFD environmental objectives in both RBDs, and (v) clear financial commitments have been secured for the implementation of the PoM in the flood protection sector. However, no "win-win measures" in terms of achieving the objectives of the WFD and Floods Directive have been applied. The above information applies equally to both RBDs.

9.1.2 Measures related to other significant pressures

One "other significant pressure" (Introduced species/diseases) has been reported for surface water for both RBDs, with gap indicators and measure indicators for 2015 and 2021, but no improvements were expected during this time. KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases is listed but no national measures have been mapped against it. No "other significant pressures" have been reported for groundwater.

9.1.3 Mapping of national measures to Key Types of Measures

It was expected that Member States would be able to report their PoM by associating their national measures with predefined Key Types of Measures. Key Types of Measures are expected to deliver the bulk of the improvements through reduction in pressures required to achieve WFD environmental objectives. A Key Type of Measure may be one national measure but it would typically comprise more than one national measure. Member States are required to report on the national measures associated with the Key Types of Measures, and whether the national measures are basic (Article 11(3)(a) or Article 11(3)(b-l)) or supplementary (Article 11(4)).

Table 9.1 summarises the number of national measures that have been mapped to the relevant Key Types of Measures in Slovakia. Also shown is the number of RBDs for which the Key Type of Measure has been reported. Table 9.2 then summarises the type of basic measures associated with the national measures mapped against the Key Type of Measures.

Table 9.1 Mapping of the types of national measures to Key Types of Measure in Slovakia

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM1 - Construction or upgrades of wastewater treatment plants	9	4	2
KTM14 - Research, improvement of knowledge base reducing uncertainty	2	6	2
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances	1	1	2
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).	1		2
KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases		1	2
KTM2 - Reduce nutrient pollution from agriculture	4	2	2
KTM24 - Adaptation to climate change		1	1
KTM3 - Reduce pesticides pollution from agriculture.	1	5	2
KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)	3	1	2
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)		1	2
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity		1	2
KTM7 - Improvements in flow regime and/or establishment of ecological flows	1		2
Total number of Mapped Measures	**22**	**23**	**2**

Source: Member States reports to WISE

Table 9.2 Type of basic measure mapped to Key Type of Measures in Slovakia

Key Type of Measure	Basic Measure Type							
	Hydromorphology	IPPC IED	Nitrates	Point source discharges	Pollutants diffuse	Pollutants direct groundwater	Protection water abstraction	Urban Waste Water
KTM1 - Construction or upgrades of wastewater treatment plants				2				7
KTM14 - Research, improvement of knowledge base reducing uncertainty							2	
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of				1				

Key Type of Measure	Basic Measure Type							
	Hydromorphology	IPPC IED	Nitrates	Point source discharges	Pollutants diffuse	Pollutants direct groundwater	Protection water abstraction	Urban Waste Water
Priority Substances								
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).		1						
KTM2 - Reduce nutrient pollution from agriculture			4		2			
KTM3 - Reduce pesticides pollution from agriculture.					1			
KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)					3			
KTM7 - Improvements in flow regime and/or establishment of ecological flows	1							

Source: Member States reports to WISE

'Hydromorphology' = Article 11(3)(i): Measures to control any other significant adverse impact on the status of water, and in particular hydromorphological impacts.
'IPPC IED' = Integrated Pollution Prevention Control Directive (96/61/EC) as repealed and replaced by the Industrial Emissions Directive (2010/75/EU).
'Nitrates' = Nitrates Directive (91/676/EEC).
'Point source discharges' = Article 11(3)(g): Requirement for prior regulation of point source discharges liable to cause pollution.
'Pollutants diffuse' = Article 11(3)(h): Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution.
'Pollutants direct groundwater' = Article 11(3)(j): Prohibition of direct discharge of pollutants into groundwater.
'Protection water abstraction' = Article 11(3)(d): Measures for the protection of water abstracted for drinking water (Article 7) including those to reduce the level of purification required for the production of drinking water.
'Urban Waste Water' = Urban Waste Water Treatment Directive (91/271/EEC).

9.1.4 Pressures for which gaps need to be filled to achieve WFD objectives and the Key Types of Measures planned to achieve objectives

Member States are required to report the gaps that need to be filled to achieve WFD environmental objectives in terms of all significant pressures on surface waters and groundwater, in terms of Priority Substances causing failure of good chemical status and in terms of River Basin Specific Pollutants causing failure of good ecological status/potential. Member States were asked to report predefined indicators of the gaps to be filled or other indicators where relevant. Values for the gap indicators were required for 2015 and 2021, and were optional for 2027.

The information reported in WISE on the gaps to fulfil to achieve good ecological status include detailed data on the significant pressures on surface and groundwaters that may cause failure on the environmental objectives. For chemical status, the Member States reported the specific chemical substances causing failure.

This information is reported at the sub-unit level. Sub-units are smaller geographic areas within particular RBDs identified by Member States. Not all Member States have defined and reported sub-units.

Member States were required to report which KTMs are to be made operational to reduce the gaps to levels compatible with the achievement of WFD environmental objectives. A number of indicators were predefined for each KTM. Values of the indicators for the second and subsequent planning cycles were also to be reported to give an indication of the expected progress and achievements: the values for 2027 could be optionally reported. This means that the value of the indicator will be reduced with time as measures are implemented. A value of zero is comparable with 100 % good ecological status or potential or good chemical status.

This information was reported at sub-unit level, or at RBDs level if sub-units have not been reported by the Member State.

9.2 Main changes in implementation and compliance since the first cycle

The level of implementation of the first cycle of PoM in both RBDs (the Vistula and the Danube) was reported as “some measures completed”. Delays and lack of finance were reported as the only obstacles. No summary of progress has been provided in the plans but progress has been made in identifying pressures and most are being addressed with measures including gap analyses. A combination of qualitative and quantitative cost-effectiveness analysis was carried out in both RBDs to support the selection of measures proposed under the 2015-21 PoM. Costs of measures have been reported, including estimated European Union funding, and financial commitments have been made to implement the PoM. Gap analyses have been performed for most significant pressures for 2015 and 2021 (not for 2027), but progress anticipated by 2021 is modest.

9.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *Where there are currently high uncertainties in the characterisation of the RBDs, identification of pressures, and in the assessment of status, these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle. Regarding characterisation, for instance, reference conditions should be established for all biological quality elements.* •

Assessment: Progress has been made in identifying pressures and most are being addressed with measures including gap analyses. Further assessment of the RBMPs indicates that the typology of the rivers in the common border water bodies was discussed during the preparation of the first RBMP of Slovakia within the working groups of experts of the Border Waters Commissions (Slovak-Austrian, Slovak-Hungarian, Slovak-Polish and Slovak-Czech). All common border water bodies forming the border were harmonised both in terms of types and boundaries of water bodies. At the level of the EKOSTAT working group, where the intercalibration process of biological methods of environmental assessment is underway, an intercalibration typology was created. Within the Eastern Intercalibration GIG, all relevant Slovak types were also included. (Additional information may emerge from Topics 2 and 3 and Task 3).

This recommendation has been partially fulfilled.

- Recommendation: *The RBMPs need to provide more information on the links between pressures and status, and the respective measures for surface waters.*

  Assessment: Most of the pressures on surface waters have been addressed with measures, and gap analyses have been carried out to assess the effects on status. This recommendation has been partially fulfilled.

- Recommendation: *Ensure in the second RBMPs that measures adopted in the Programme of Measures are based on a reliable status assessment of water bodies and are linked to the relevant pressures. The explanation of the links between pressures and status and respective measures should be included in the update of the RBMPs.*

  Assessment: For this Topic, this issue has been addressed through the gap analyses. This recommendation has been partially fulfilled.

- Recommendation: *Ensure that the quantitative assessment of how much the pressures have to be reduced to achieve the WFD objectives is clearly identified in RBMPs. The gap that needs to be closed for the achievement of WFD objectives by 2015 (or later) has to be clearly quantified in terms of the reductions needed in the pressures causing water bodies to fail or be at risk of failing the environmental objectives. The applied Environmental Quality Standards should be specified in the second RBMPs. The identified impacts have to be clearly apportioned between the sources and sectors/drivers responsible for the pressures for all significant water management issues. In the second RBMP cycle, Slovakia should consider supplementary measures for River Basin Specific Pollutants and Priority Substances that show exceedances.* •

Assessment: The issue has been addressed through gap analyses, and supplementary measures are in place, although most of the Priority Substances seem to be addressed using KTM14 - Research. The environmental quality standards applied for the assessment of chemical status have been specified in the second RBMP; however, for some Priority Substances in some matrices, it is not clear which values have been used. This recommendation has been mostly fulfilled.

- Recommendation: *It is not clear if the measures proposed in the Plan have been based on the assessment of the status of surface water bodies. This means that the Programme of Measures for surface waters may be based on the risk analysis rather than on monitoring data or status assessment, this is a shortcoming to be addressed*[35]*. Meaningful information regarding the scope, the timing and the funding of the measures should be included in the Programme of Measures so that the approach to achieve the objectives is clear. All the relevant information on basic and supplementary measures should be included in the summary of the Programme of Measures to ensure transparency of the planned actions for the achievement of the environmental objectives set out in the WFD.* •

  Assessment: This has also been partially addressed through the gap analyses. National basic measures have been mapped, including supplementary measures; Priority Substances are addressed mainly by research, and substances have only been reported and addressed in groundwater in the Danube RBD. Although funding commitments are in place, there is no clear information on scope, timing and funding of measures. This recommendation has been partially fulfilled.

- Recommendation: *Carry out a cost-effectiveness analysis of potential measures (voluntary or obligatory), for achieving the environmental objectives. The effectiveness of the implemented measures will have to be demonstrated by the assessment of the status/potential of water bodies in the second RBMPs. Available funding, in particular the European Union funds (e.g. RDP funds, Structural and Investment Funds, LIFE Integrated Projects and Horizon 2020) needs to be exploited as much as feasible in order to implement the Programme of Measures. Consequently, appropriate priorities should be set in the programming documents (Protected Areas, Operational Programmes and Rural Development Programmes) of the new European Union funding policy 2014-2020.* •

[35] On the review of the report SK reported that not all measures are based on risk analysis. Some are directly applied in terms of implementation of EU legislation (UWWT Directive, Industrial Emissions Directive) and the water monitoring results indicate the problem which can be solved by building/upgrading of waste water treatment plants and/or reassessment of already adopted measures including the revision of permits for waste water discharges. Risk analysis is relevant for nutrient pollution from agricultural land and corresponds to (re)definition of Nitrates Directive vulnerable zones and actualization of Action plan

Assessment: A combination of qualitative and quantitative cost-effectiveness analysis was carried out in both RBDs to support the selection of measures proposed under the 2015-21 PoM, but further assessment revealed no further information on prioritisation of measures. Costs of measures and estimated European Union funding have also been reported. This recommendation has been partially fulfilled.

Topic 10 Measures related to abstractions and water scarcity

10.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Water exploitation and trends

Water abstraction pressure has not been reported as significant for Slovakia, where only 3% of surface water bodies in the Danube RBD are subject to significant abstraction pressures. The Water Exploitation Index + (2012) is reported as 2.7% for the Vistula RBD and 0.01% for the Danube RBD (non-stressed countries have values < 10%). Water scarcity issues are not considered relevant at the international level. However, specific water resource allocation and management plans have been set up, and there remains an important information gap as 27.5% of groundwater bodies are reported to have unknown quantitative status.

Main uses for water consumption

The major use for water consumption is "urban" followed by "industry", with agriculture consuming only minor resources. This applies to both surface and groundwater bodies, with surface water being more relevant for industry in the Danube RBD. Calculation methods for water consumption (e.g. metering, estimations) have not been reported.

Measures related to abstractions and water scarcity

Regarding basic measures (Article 11(3)(e)), in Slovakia there is a permitting regime and a register of abstractions for surface water and groundwater and a concession, authorisation and/or permitting regime to control water impoundment and a register of impoundments in place; and small abstractions are exempted from these controls: abstractions of less than 1 250 m^3 per month or less than 15 000 m^3 per annum are not billed and do not require permits.

No measures for the efficient and sustainable use of water (Article 11(3)(c)) were implemented in the first cycle but new measures and/or significant changes were planned for the 2016-2021 period. An amendment to the Water Act from 2014 made metering compulsory for water abstractions by all business/economic activities including agriculture, and follow-up actions are expected. Up until the second RBMP, water abstraction for irrigation was not billed; the new amendment to the Water Act (under preparation during the drafting of the RBMP; finalised as of the second RBMP) includes billing for abstraction of water for irrigation.

Measures for the prior authorisation of artificial recharge or augmentation of groundwater bodies (Article 11(3)(f)) have not been implemented in the previous cycle, but new measures or significant changes are planned for the next period.

Complementary measures are planned to be implemented in the Danube RBD associated to KTM7 - Improvements in flow regime and/or establishment of ecological flows addressing two surface water bodies, and KTM14 - Research, improvement of knowledge base reducing uncertainty and KTM24 - Adaptation to climate change addressing the gaps for three groundwater bodies. Reuse is not a measure foreseen in any RBDs.

10.2 Main changes in implementation and compliance since the first cycle

An amendment to the Water Act from 2014 made metering compulsory for water abstractions by all business/economic activities including agriculture, and follow-up actions are expected.

10.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMPs and first PoM for this topic.

Topic 11 Measures related to pollution from agriculture

11.1 Assessment of implementation and compliance with WFD requirements in the second cycle

The type of pressures from agriculture and the measures taken have not changed between the two cycles. Measures have been linked to pressures except for physical alteration of channel/bed/riparian area/shore due to agriculture. Only KTM2 – Reduce nutrient pollution from agriculture, has been reported as a measure.

The PoM provides information on measures associated with types of pollution such as by organic substances, nutrients or Priority Substances, and then categorises them according to basic and supplementary measures and whether they are mandatory or voluntary.

KTM2 – Reduce nutrient pollution from agriculture, KTM3 - Reduce pesticides pollution and KTM17 - Measures to reduce sediment from soil erosion and surface run-off are linked to cross-compliance conditions as part of Good Agricultural and Environmental Condition within the Common Agricultural Policy. These are all basic (the minimum requirement to be complied with) measures within the PoM as stated above. Supplementary measures relevant for pollution from nutrients are:

- Measure 1. Transfer of knowledge and information activities - education and information activities focusing on reducing pollution of the individual components of the environment - air, water, soil, climate and biodiversity; education in the field of water management on agricultural land - counter-measures and flood control measures.
- Measure 2. Advisory services - provision of counselling, training of advisors.
- Measure 4. Investments in tangible assets – to reduce environmental burden including technologies to reduce greenhouse gas emissions, improve irrigation.
- Measure 5. Restoring the potential of agricultural production destroyed by natural disasters and catastrophic events and introducing appropriate preventive measures - rehabilitation, modernization, repair and completion of drainage systems, regulated drainage channels and service stations and their facilities that are in line with relevant RBMPs.
- Measure 8. Investment in forestry development and improvement of forest viability - support of preventive flood and fire measures to improve water management in the forest.
- Measure 10. Agri-environment and Climate Action - Integrated production in fruit growing, vegetables and viticulture, protection against erosion, protection of biotopes of

semi-natural and natural grassland, multifunctional field margins, green corridors on arable land, protection of water resources (CHVO Žitný ostrov).

- Measure 11. Organic farming.
- Measure 12. Payments under the NATURA 2000 system.

No information concerning safeguard zones around drinking water protection areas has been provided[36]. In the PoM, in relation to pollution from organic substances and Article 11(3) of the WFD, it is stated that until 2021 there will be a harmonisation of the handling of polluting substances with the conditions set in the Water Act no. 364/2004. This includes reconsideration of permits issued in accordance with section 8 paragraph 3 of the Water Act. According to WISE, the implementation of basic measures under Article 11(3)(h) for the control of diffuse pollution from agriculture at source is ensured in all RBDs where the same rules apply across the whole RBD. Issues covered include pesticides.

Farmers/Farmers' Unions have been consulted under the Public Consultation process in all basins.

Financing of agricultural measures is secured in all basins. The RBMPs mention RDP 2014-2020 in the financing section for the specific PoM. Information for the investments for agricultural measures between 2009 and 2015 are provided.

11.2 Main changes in implementation and compliance since the first cycle

The type of pressures from agriculture and the measures taken have not changed since the first cycle.

11.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *Agriculture is indicated as exerting a significant pressure on the water resources in Slovakia. This should be translated into a clear strategy that defines the basic/mandatory measures that all farmers should adhere to and the additional supplementary measures that can be financed. This should be developed with the farming community to ensure technical feasibility and acceptance. There needs to be a very clear baseline so that any farmer knows the rules this can be adequately advised and enforced and so that the authorities in charge of the Common Agricultural Policy*

[36] Slovakia subsequently indicated that protection of spatially defined drinking water protection areas is provided by special sets of measures adapted to suit specific drinking water protection areas.

funds can adequately set up Rural Development programmes and cross compliance water requirements.

Assessment: The evidence suggests that this recommendation has been fulfilled as implementation of basic measures under Article 11(3)(h) is part of the RBMP and rules apply across the whole RBD.

- Recommendation: *Provide a coherent strategy to address agriculture's pressure on water in the second RBMPs cycle (how the gaps on basic measures will be closed, what supplementary measures, including under the RDP, will be included in the second RBMP, an assessment of the extent to which the basic and supplementary measures in the second cycle will be sufficient to address agricultural pressures to allow the achievement of good status, etc.). Agriculture is considered as a key source of pollution by nutrients, organic substances and pesticides. The major release of pollutants from agriculture occurs through diffuse sources. Slovakia should implement through national law and include in the second RBMPs basic measures, consistent with article 11.3, to address nutrients, sediment, hydromorphology and pesticides. Slovakia should ensure a better control of abstractions in the second RBMP cycle (e.g. information to be provided on how metering of water consumption in agriculture is ensured).*

  Assessment: Part of the recommendation has been acted on: A gap assessment has been performed for pesticides and nutrients, although it is not clear what the contribution from the Nitrates Directive would be[37]. Implementation of basic measures under Article 11(3)(h) is part of the RBMP and rules apply across the whole RBD. Article 11(3)(g) basic measures to control point sources, is also not applied in all basins. Article 11(3)(e) basic measures to control abstractions from agriculture are not applied[38]. The PoM provides measures according to the type of pollution - e.g. by organic substances, nutrients, priority substances etc, and then describes relevant measures divided according to basic and supplementary and whether mandatory or voluntary. Explicit mention of advice is given by applying measure 2 (see Section 11.1) but there is no information provided on monitoring and inspection regimes for the measures[39].

[37] Slovakia subsequently indicated that according to the results reported, the increase in content of nitrates in groundwater in Slovakia has significantly slowed down, as a result of the decline in the intensity of agricultural production and the application of the Nitrates Directive measures. (Ministry of Environment, 2012. Report on the state of implementation of Council Directive 91/676 / EEC on the protection of waters against pollution caused by nitrates from agricultural sources in the SR, p. 12 (in Slovak)).

[38] Slovakia subsequently indicated that with regard to basic measures under Art. 11(3)(g), point sources, relevant pressures were identified recently to be included in reporting. In the case of Art. 11(3)(e), water abstraction (mainly for irrigation purposes) is based on previous permission of state authority.

[39] Slovakia subsequently indicated that inspections are carried out by the Slovak Environmental Inspectorate pursuant to the Water Act 364/2004 and the Central Control and Testing Institute in Agriculture in Bratislava

Topic 12 Measures related to pollution from sectors other than agriculture

12.1 Assessment of implementation and compliance with WFD requirements in the second cycle

In the context of this topic, pollution is considered in terms of nutrients, organic matter, sediment, saline discharges and chemicals (priority substances, river basin specific pollutants, groundwater pollutants and other physico-chemical parameters) arising from all sectors and sources apart from agriculture. KTMs are groups of measures identified by Member States in their Programmes of Measures which target the same pressure or purpose. A KTM could be one national measure but would typically comprise more than one national measure. The same individual measure can also be part of more than one KTM because it may be multipurpose but also because the KTMs are not completely independent of one another. For general information on the link between individual measures and Key Types of Measures, see explanations at the beginning of Chapter 9).

Slovakia has identified 12 Key Types of Measures in its PoM, six of these are relevant to this Topic. They are:

- KTM1 – Construction or upgrades of wastewater treatment plants.
- KTM4 – Remediation of contaminated sites.
- KTM 14 – Research, improvement of knowledge base reducing uncertainty.
- KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances.
- KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).
- KTM21 – Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure.

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pursuant to the Act No 136/2000 Coll. on fertilizers and Pesticide Legislation (Regulation (EU) No 540/2011). Further information is available in the National Action Plan to achieve the sustainable use of pesticides published in 2012 by the Ministry of Agriculture and Rural Development.

Slovakia has reported that there are measures to eliminate pollution of surface waters by Priority Substances and to progressively reduce pollution by other substances, which would otherwise prevent achievement of the objectives for the bodies of surface waters as set out in Article 4 (Article 11(3)(k)). For second RBMP reporting, Member States have been asked to report on which KTMs they are using to reduce significant pressures including those from chemical substances.

Slovakia has reported five significant pressures acting on surface waters which are relevant to this topic, including point and diffuse significant pressure types, which are to be tackled by KTMs (i.e. measures made operational). The KTMs reported are those listed above. KTM14 - Research, improvement of knowledge base reducing uncertainty, is reported to tackle the significant pressure 'Diffuse - Contaminated sites or abandoned industrial sites' and for each of the named Priority Substances (trichloromethane, fluoranthene, mercury and cadmium). No specific River Basin Specific Pollutants were reported against measures for surface waters.

For groundwater, two significant pressures relevant to this topic which have been reported and eight pollutants including one Priority Substance (Tetrachloroethylene) causing failure of objectives. The KTMs are reported for seven of the eight pollutants, and these KTMs include KTM1, KTM 3, KTM4 and KTM14.

Both basic and supplementary measures are required to meet objectives for all reported KTMs with the exception of KTM16. The basic measure types reported include urban wastewater treatment and point source discharges (for KTM1), diffuse pollutants (for KTM4), point source discharges (for KTM15) and Industrial Emissions Directive[40] (for KTM16).

Slovakia reports the use of authorisation and/or permitting regime to control waste water point source discharges (Basic measures Article 11(3)(g)) for all RBDs for surface and groundwater. A Register of waste water discharges (Basic measures Article 11(3)(g)) is available for surface and groundwater though small discharges are exempted from controls in all RBDs. There is a prohibition of all direct discharges to groundwater in all RBDs. Examination of the second RBMPs and background documents provided no further information on the proposed measures to tackle Priority Substances or River Basin Specific Pollutants in the content of this topic.

In terms of the expected progress in the implementation of KTMs over the three planning cycles, Slovakia has provided values for key indicators for: all KTMs for the first cycle; for some KTMs for the second cycle; and not for the 3rd cycle. Slovakia is not reporting significant

[40] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075

progress as a result of any of the reported KTMs in the second planning cycle with the exception of that in relation to KTM1. Slovakia is not expecting the gap to the achievement of environmental objectives to be closed by 2021 except in relation to the application of KTM21. For the remainder, with no values for key indicators reported for 2027, it is unclear when the objectives will be met.

12.2 Main changes in implementation and compliance since the first cycle

Revision of permits/authorisations and construction of wastewater treatment plants were among the key measures to be taken to tackle chemical pollution in the first RBMPs and no information was provided on substance specific measures.

The second cycle WISE reporting has facilitated the provision of further detail on the measures related to pollution from sectors other than agriculture. Essentially the measures applied in the first cycle are continuing to be applied in the second cycle; KTM1 and KTM21 (mentioned above) related to the improvement of the urban waste water collection and treatment infrastructure are those where greatest progress towards the achievement of environmental objectives is expected.

While in the first cycle no information was provided on substance specific measures, the KTM assigned to substances causing failure for the second cycle was KTM14 and it not clear how effective this measure will be.

12.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Ensure in the second RBMPs that measures adopted in the PoMs are based on a reliable status assessment of water bodies and are linked to the relevant pressures. The explanation of the links between pressures and status and respective measures should be included in the update of the RBMPs. In the second RBMP cycle, Slovakia should consider supplementary measures for River Basin Specific Pollutants and Priority Substances that show exceedances.*

  Assessment: Information reported to WISE indicates that supplementary measures have been identified for KTM14 - research, improvement of knowledge base reducing uncertainty, and KTM4 - remediation of contaminated sites (historical pollution including sediments, groundwater, soil) which have been assigned to tackle River Basin Specific

Pollutants and Priority Substances causing failure. No further information was found in the RBMPs on the nature of these supplementary measures. This recommendation has been partially fulfilled.

- Recommendation: *Identify clearly basic measures in the second RBMPs to allow for a clear assessment of the need for additional measures, e.g. Slovakia should provide all information on the level of compliance and timing to reach full compliance with Directive 91/271/EEC*[41] *(Article 15 and following).*

  Assessment: Quantitative information on basic and supplementary measures (number of measures per KTM) has been provided in the WISE reporting for all significant pressures relevant to this topic. The reported information indicates progress with the recommendation but it cannot be fully judged from this assessment.

  Based on the information available in this assessment, it is not possible to judge the progress of the aspect of this recommendation related to the level of compliance with Directive 91/271/EEC (Article 15 and following).

[41] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31991L0271

Topic 13 Measures related to hydromorphology

13.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Significant hydromorphological pressures for rivers and operational KTM to tackle these pressures are reported in both RBDs. The KTM made operational to reduce hydromorphological pressures are: KTM5- Improving longitudinal continuity; KTM6- Improving hydromorphological conditions of water bodies other than longitudinal continuity, and KTM7- Improvements in flow regime and/or establishment of ecological flows.

Although prioritisation of measures related to restoration of river continuity was carried out in the first cycle, overall management objectives in terms of restoring river continuity have not been set in the second RBMPs.

Significant hydromorphological pressures related to dams/barriers/locks and physical alterations were assigned to specific sectors. Physical alterations were mainly related to flood protection and agriculture. Dams/barriers/locks were related to a broad range of uses, but in most of the affected water bodies, they were reported to be used for flood protection, followed by hydropower, recreation, irrigation, industry and drinking water. Hydrological alterations were related in some water bodies to hydropower and public water supply, but in most affected water bodies, the use was not specified according to the uses listed in WISE ("other use" was reported).

The types of specific hydromorphological measures planned include fish ladders, bypass channels, habitat restoration, removal of structures, reconnection of meander bends, setting of ecological flows, measures to address hydropeaking, as well as research activities.

In terms of basic measures planned to tackle hydromorphological pressures, there is an authorisation and/or permitting regime in place to control physical modifications in both RBDs, which covers changes to the riparian area of water bodies according to WFD article 11(3)(i). There is also a register of physical modifications of water bodies.

The design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, was reported to have been adapted to take into account WFD objectives in both RBDs.

Win-win measures in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures were not included in the

PoM and the KTM23 - Natural Water Retention Measures was not reported to tackle any significant pressures.

Ecological flows have not been derived nor implemented for the relevant water bodies in any of the RBDs but there were plans to do so during the second cycle.

Indicators on the gap to be filled for significant hydromorphological pressures and KTM value indicators are reported for 2015 and 2021 but not for 2027. At the same time, it should be noted that Slovakia has quantified only certain KTM so far in terms of their indicator values. From the information available, it can be concluded that for significant physical alterations and hydrological alterations, there will be very little progress in terms of closing the gap between 2015 and 2021. In the case of significant hydromorphological pressures related to continuity barriers, the evidence suggests that some more progress in closing the gap is likely to be made; the number of dams/weirs/barriers which have conditions not compatible with the achievement of objectives are expected to be reduced by around 18% up until 2021.

Specifically for “measures to ensure the continuity of rivers and habitats”, it was mentioned in the RBMPs that financing for the implementation of the measures will be spread over a longer period of time - up until 2027. The economic justification for the shift in the implementation of measures into the next planning cycle was formulated in close contact with the implementers of the measures, considering all available sources of funding. Some measures were not expected to be implemented until 2021 (13 measures in the RBD Vistula and 113 the RBD Danube) and some measures in the following cycle. According to the Slovak Water Plan for the first cycle, the implementation of measures to ensure the lateral continuity of wetlands/floods with flow and other morphological measures is expected to be achieved between 2021 and 2027.

13.2 Main changes in implementation and compliance since the first cycle

In the first RBMPs, only two measures addressing hydromorphological pressures were implemented and information on particular sectors causing pressures on hydromorphology was unclear. According to information provided by Slovakia to the European Commission after the first RBMPs, hydromorphological pressures were to be addressed in the second cycle.

In the second RBMPs, progress has been made with linking specific hydromorphological pressures to specific measures and providing information on their contribution to achieving the WFD objectives. Also information on particular sectors causing pressures on hydromorphology is clearer than in the first RBMP. A greater number of measures were planned to be implemented compared to the first RBMPs.

13.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *Provide information on future and current actions to address hydromorphological pressures deriving from water management, hydropower, private users and other related sectors, and to put in place adequate measures to address these hydromorphological pressures in the second RBMPs.*

  Assessment: Progress has been made on some of these actions. Hydromorphological pressures have been assigned to specific sectors, especially physical alterations and dams/barriers/locks. KTM to tackle the identified hydromorphological pressures are reported in both RBDs. In terms of their contribution to the achievement of objectives, indicators on the gap to be filled for significant hydromorphological pressures and KTM value indicators were reported for 2015 and 2021 but not for 2027. From the information available, it is possible to draw some conclusions on the level of ambition in terms of closing the gap by 2021 and beyond.

  Ecological flows have yet to be derived or implemented for the relevant water bodies. Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Consider and prioritise the use of green infrastructure and/or natural water retention measures that provide a range of environmental (improvements in water quality, increase water infiltration and thus aquifer recharge, flood protection, habitat conservation etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure.*

  Assessment: No progress is noted with regard to this recommendation. Win-win measures in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures are not included in the PoM and KTM23 - Natural Water Retention Measures is not reported to tackle any significant pressures. Thus, this recommendation has not been fulfilled.

Topic 14 Economic analysis and water pricing policies

14.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes in implementation and compliance since the first cycle

Slovakia has reported a broad definition of water services covering the following:

- Drinking water abstraction (surface and/or groundwater), treatment and distribution;
- Impoundment and storage of water
- Infrastructure for flood protection;
- Infrastructure for navigation;
- Irrigation water abstraction, treatment and distribution;
- Self-Abstraction;
- Sewage collection and wastewater treatment, and;
- 3 "other" water services, which include abstraction of surface water from watercourses, abstraction of water for hydro-power generation and the hydro-energy potential of a watercourse.

Summary cost recovery rates are provided only for five out of the ten water services. The cost recovery analysis does not include flood protection, navigation, irrigation water for agriculture, and self-service abstractions.

In the second cycle, Article 9(4) of the WFD was not applied.

A general explanation was provided that through the pricing policies in place (charging, licensing etc.), an adequate contribution to cost recovery would be ensured.

Environmental and resource costs were calculated the same way as in the first RBMP: the costs were assessed as internalised costs in the financial costs that underlie the price of waste-water treatment and collection and drinking water production.

Slovakia is reported to be working on developing methodologies/approaches to derive environmental costs and costs based on available published approaches.

There is little information on the incentive function of water pricing policies in the RBMPs.

The Polluter Pays Principle in Slovakia was stated to be implemented due to the charges for discharging waste water into surface water.

Progress in the implementation of pricing policy has been made in comparison to the first cycle.

The economic analysis is reported as being updated.

14.2 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *The cost-recovery should address a broad range of water services, including impoundments, abstraction, storage, treatment and distribution of surface waters, and collection, treatment and discharge of waste water, also when they are "self-services", for instance self-abstraction for agriculture. The cost recovery should be transparently presented for all relevant user sectors, and environment and resource costs should be included in the costs recovered. Information should also be provided on the incentive function of water pricing for all water services, with the aim of ensuring an efficient use of water. Information on how the Polluter Pays Principle has been taken into account should be provided in the RBMPs.*

  Assessment: Slovakia applies a broad definition of water services, covering 10 water services.

  Cost recovery rates are provided for five out of the ten water services (for drinking water supply, sewage collection and wastewater treatment, hydro-energy potential of watercourse, abstraction of energy water from watercourse, abstraction of surface water from watercourse, with cost recovery rates being from 5% to above 100%). The cost recovery analysis does not include flood protection, navigation, irrigation water for agriculture, and self-service abstractions (although significant pressures are linked to some of these activities; however, this link is not established in the RBMPs)[42]. It is also stated that the assessment of the estimated cost of water management was made for the supply and distribution of drinking water and for the cleaning and drainage of waste

[42] Slovakia subsequently clarified that the selection of water services is based on the water services which are directly paid by users in Slovakia. Uses such as navigation or flood protection is "paid" for by the state and not directly by the user of these services; hence, cost recovery has not been calculated for such uses/services.

water, as well as for other water services provided by the river basin sector such as abstraction of surface water and energy water and use of hydroenergy potential.

A general explanation is provided that through the pricing policies in place (charging, licensing etc.) an adequate contribution to cost recovery is ensured

Environmental and resource costs are reported to be calculated, internalised and considered significant for three water services. However, because there was still no methodology available for the calculation of environmental and resource costs, they were calculated the same way as in the first RBMP: the costs are assessed as internalised costs in the financial costs forming the price of waste-water treatment and collection and drinking water production.

Slovakia is working on developing methodologies/approaches to derive environmental and resource costs based on available published approaches.

There is limited information on the incentive function of water pricing policies in the RBMPs, although an analysis of the pricing policy in terms of adequate incentives is reported to have been carried out, and an affordability index was determined (i.e. the percentage of household income available for paying for water services).

The Polluter Pays Principle in Slovakia is stated to be implemented mainly by the charges for discharging waste water into surface water[43]. Waste water discharge charges apply to those who dispose of waste water to surface water in quantities exceeding 10 000 m^3 per year or 1 000 m^3 per month and if they exceed the permitted limits.

In summary, there has been progress regarding pricing policies (amendment to the Water Act); cost recovery rates are calculated only for five out of ten water services. Some progress has been made on environmental and resource costs and the Polluter Pays Principle. The recommendation is partially fulfilled.

- Recommendation: *Develop fully the economic analysis of water use, including the calculation of Environmental and Resource Costs. Slovakia should ensure water pricing in agriculture. Slovakia should elaborate on this issue in the second RBMPs.*

[43] Slovakia subsequently clarified that it has applied the polluter pays principle for instance by internalisation of fees for discharge of wastewater in the price for collection and treatment of wastewater and that it has made steps compared to the first RBMP on a methodology for establishing environmental and resource costs, in line with EU approaches.

Assessment: The first part of this recommendation is covered above which indicates that some progress has been made.

Since the first cycle, progress in the implementation of pricing policy has been made as follows:

An amendment to the Water Act, which entered into force on 15 January 2015, introduced charging for irrigation water for agricultural land, which since 2004 had not been charged for.

The amendment also resulted in a change in the water abstraction permits issued by the State Water Administration for the abstraction of freshwater and groundwater for a new period of 10 years, after which they would be re-evaluated. Under the previous Water Act these permits were issued without a time limit.

The amendment to the Water Act also introduced other measures concerning water permits which contributed to the implementation of Article 9 of the WFD and towards an efficient use of water (these measures are described in the background documents to the RBMPs).

It is also stated in the RBMP that in future years, the analysis of financial and economic instruments as part of the pricing policy under Article 9 WFD would continue to form a basis for policy decisions.

Overall, progress can be reported. The recommendation is partially fulfilled.

Topic 15 Considerations specific to Protected Areas (identification, monitoring, objectives and measures)

15.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Protected Areas have been identified for all relevant surface water types, except for the Nitrates Directive where no associated surface water areas have been identified. For groundwaters, nutrient sensitive Protected Areas have been identified along with Drinking Water Protected Areas (Table 15.1).

Table 15.1 Number of protected areas of all types in each RBD of Slovakia, for surface and groundwater

Protected Area type	Number of Protected Areas associated with[44]	
	Rivers	Groundwater
Abstraction of water intended for human consumption under Article 7	34	1734 (Danube 1688, Vistula 46)
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC[45]	26	
Protection of species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)[46]	40	
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)[47]	219	
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC[48] and areas designated as sensitive areas under Directive 91/271/EEC[49]	1	1520
Areas designated for the protection of economically significant aquatic species	65	
Other		7

Source: Member States reports to WISE

[44] Slovakia subsequently corrected the data reported in WISE (the amended numbers are in brackets in this table)

[45] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0007

[46] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147

[47] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043

[48] Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:31991L0676

[49] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31991L0271

The status assessment is mainly based on information with low confidence indicating a significant need for additional monitoring data.

For Birds and Habitat Protected Areas related to surface water it was reported for all water bodies that the achievement of good ecological status is sufficient to reach the objectives of the Directives. It was not possible to determine whether this assessment had been based on a specific analysis of each water body or if it is used as a default. As such, additional objectives have not been set.

No data was reported with regard to specific monitoring of Protected Areas. Table 15.2 shows the number of monitoring sites that are associated with Protected Areas in Slovakia. From the information on status assessment it is likely that there is a significant need for additional monitoring to increase the level of confidence.

Table 15.2 Number of monitoring sites associated with Protected Areas in Slovakia

Protected Area type	**Number of monitoring sites associated with Protected Areas in**[50]	
	Rivers	**Groundwater**
Abstraction of water intended for human consumption under Article 7	7	(1264)
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC and areas designated as sensitive areas under Directive 91/271/EEC		1106(1340)

Source: WISE electronic reports

Safeguard zones for the protection of Drinking Waters have been established. Different restrictions are implemented based on the distance to the abstraction point (mainly groundwater wells).

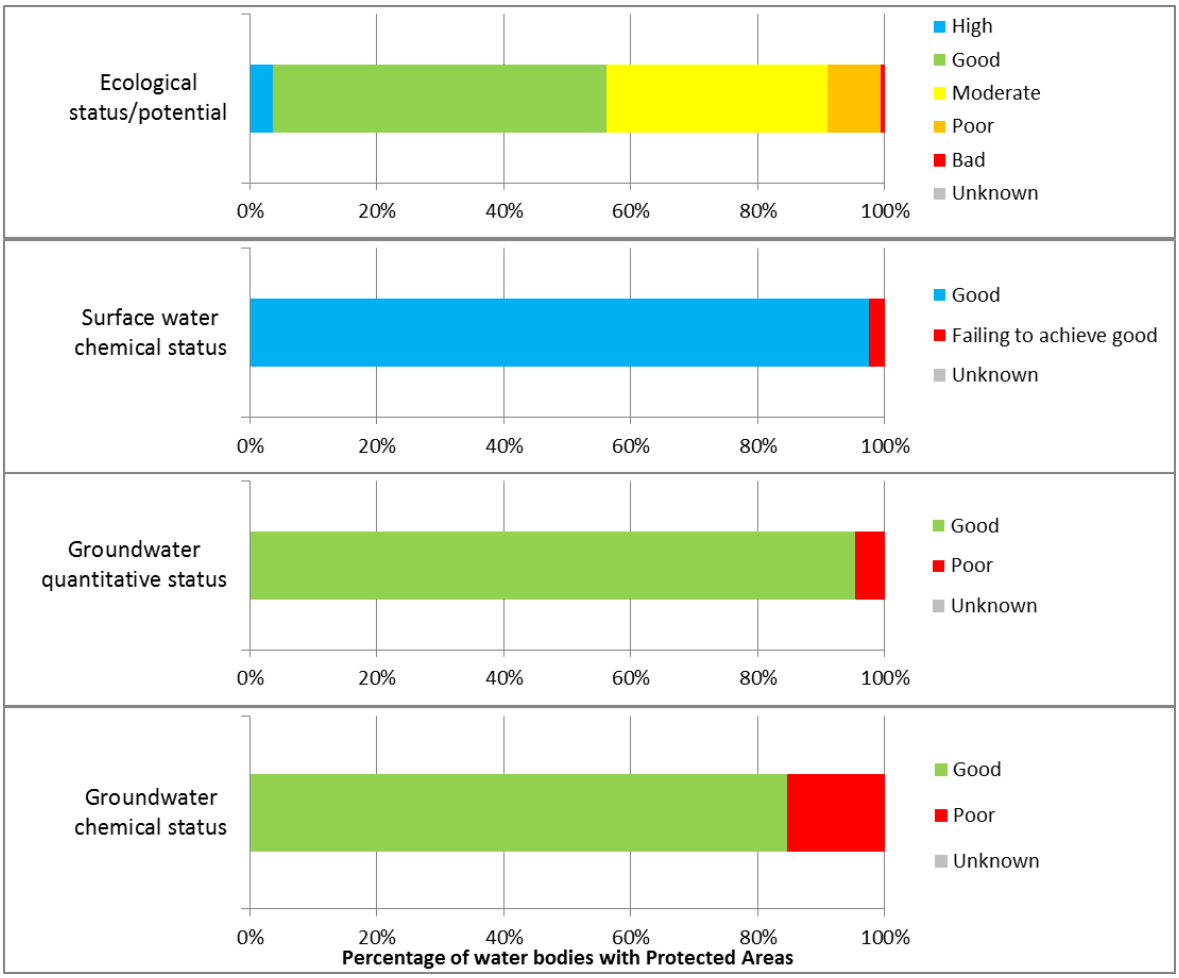
No information was found on additional measures related to other types of Protected Areas – which might be explained to a certain extent by the fact that for nature areas, the achievement of good ecological status was considered sufficient to reach the objectives of the Birds and Habitats Directives; hence additional measures may have been deemed as not necessary.

Exemptions related to Protected Areas have not been applied.

[50] Slovakia subsequently corrected the data reported in WISE (the amended numbers are in brackets in this table)

Figure 15.1 provides an overview of the status (chemical and ecological and for groundwater also quantitative) of water bodies associated with Protected Areas is reported. The chemical status of surface water bodies and groundwater bodes as well as the quantitative status of groundwater bodies associated with Protected Areas is generally good. Around 60% of water bodies associated with Protected Areas have good or better ecological status/potential.

Figure 15.1 Status of water bodies associated with the Protected Areas report for Slovakia. Note: based on status/potential aggregated for all water bodies associated with all Protected Areas



Source: WISE electronic reports

15.2 Main changes in implementation and compliance since the first cycle

For the Danube in contrast to the first planning cycle, targets for protected areas associated with wetlands of international importance were set in accordance with the 4th Ramsar Strategic Plan for 2016-2021.

15.3 Progress with Commission recommendations

The Commission made no recommendations based on the first River Basin Management Plans and first PoM.

Topic 16 Adaptation to drought and climate change

16.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Climate Change

Climate change was considered in all RBDs and it is stated that the guidance on how to adapt to climate change (Common Implementation Strategy Guidance Document No. 24[51]) was used. Climate change was considered when assessing direct and indirect climate pressures, for detecting climate change signals, when managing drought, floods and water scarcity. It was also reported to be considered when monitoring change at reference sites and in setting objectives.

KTM 24 - "Adaptation to climate change" has been made operational to address significant pressures in the Danube RBD. Also national measures were mapped against KTM 24 in the Danube RBD. No specific sub-plans addressing climate change were reported.

Effects and impacts of prolonged droughts, as well as related measures

According to the 2012 "Topic report on: Assessment of Water Scarcity and Drought aspects in a selection of European Union RBMPs"[52], droughts are not relevant for the country in local sub-basins. No exemptions have been applied for Slovakia following Article 4(6) due to prolonged droughts.

Even though there is no legal obligation to prepare Drought Management Plans, many Member States have prepared them in order to cope with droughts. No Drought Management Plans have been developed in Slovakia. The European Commission made no recommendations regarding drought management.

16.2 Main changes in implementation and compliance since the first cycle

A climate check of the PoM was not carried out in the first RBMP although it was carried out in the second cycle.

[51] https://circabc.europa.eu/sd/a/a88369ef-df4d-43b1-8c8c-306ac7c2d6e1/Guidance%20document%20n%2024%20-%20River%20Basin%20Management%20in%20a%20Changing%20Climate_FINAL.pdf

[52] http://ec.europa.eu/environment/water/quantity/pdf/Assessment%20WSD.pdf

16.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first PoM requested action on the following:

- Recommendation: *Ensure that climate change is adequately considered in the assessment of pressures and status of water bodies and that the objectives of the Slovakian Strategy for Adaptation to Climate Change are properly taken into account in the design of the Programme of Measures.*

  Assessment: In the second RBMP it is reported that climate change was considered when setting objectives and when assessing direct and indirect climate pressures, therefore this recommendation has been fulfilled.